Town of Thompson's Station
Board of Mayor and Aldermen Agenda
Work Session - 6:00 p.m.
Regular Meeting - 7:00 p.m.
January 14, 2020

Meeting Called To Order

Pledge Of Allegiance

Consent Agenda

A. Consideration Of The Minutes Of The November 12, 2019 Regular Meeting

Documents:

ITEM A - BOMA MINUTES 11_12_2019.PDF

B. Planning Commission Appointments

Documents:

ITEM B - PLANNING COMMISSION APPLICANTS.PDF

C. Approval Of BOMA Regular Meetings/Work Sessions Dates & Times For 2020

Documents:

ITEM C - 2020 MEETING DATES TIMES.PDF

D. Approve Lease Agreement For TN Equine Hospital, PLLC.

Documents:

ITEM D - LEASE AGREEMENT TN EQUINE HOSPITAL.PDF
ITEM D - LEASE PAYMENTS 2019.PDF
ITEM D - OLD LEASE AGREEMENT TN EQUINE.PDF

E. Approve Bridgemore Phase 6 Section 6-B

Documents:

ITEM E - BRIDGEMORE PHASE 6, SECTION 6B ROAD DEDICATION AND SURETY REDUCTION.PDF
ITEM E - RESO 2020-005 BRIDGEMORE VILLAGE SECTION 6B.PDF
ITEM E - SECTION 6B PLAT.PDF

F. Approval Of Resolution 2020-004 For Healthcare Insurance

Documents:

ITEM F - RESOLUTION 2020-004 NEUTRAL.PDF
ITEM F - MOU STATE OF TN HEALTH INSURANCE.PDF

G. Approval Of Resolution 2020-003 To Approve A Subdivision Development Agreement With The Littlebury Development Company For The Littlebury Neighborhood/Subdivision (Lots 1-91) And Authorize The Mayor To Execute

Said Document

Documents:

ITEM G - LITTLEBURY DA MEMO.PDF
ITEM G - RESOLUTION 2020-003 FOR LITTLEBURY DA.PDF
ITEM G - DEVELOPMENT AGREEMENT LITTLEBURY.PDF
ITEM G - LITTLEBURY DA MOU SIGNED.PDF

Public Comments-

Unfinished Business:

1. Public Hearing And Second Reading Of Ordinance 2019-010: An Ordinance Of The Town Of Thompson's Station To Adopt The 2015 Edition Of The International Property Maintenance Code.

Documents:

ITEM 1 - ORDINANCE 2019 - 010 PROPERTY MAINTENANCE ORDINANCE.PDF
ITEM 1 - IPMC 2015_OP.PDF

2. Critz Lane - Contract Design And Bidding Of Project.

Documents:

ITEM 2 - 2020.01.03_CRITZ LANE CEI PH I.PDF

New Business:

3. Approval Of Resolution 2020-001: A Resolution Of The Town Of Thompson's Station, TN Approving A Contract With Civil War Trails, Inc. For The Development And Installation Of Six Historic Sign Markers And To Authorize The Mayor To Sign A Contract With Civil War Trails, Inc.

Documents:

ITEM 3 - HISTORIC MARKERS CIVIL WAR TRAILS BOMA MEMO.PDF
ITEM 3 - RESO 2020 - 001 CIVIL WAR TRAILS CONTRACT AWARD (1).PDF
ITEM 3 - CIVIL WAR TRAILS PROPOSAL.PDF

4. Approval Of Resolution 2020-002: A Resolution Of The Town Of Thompson's Station, TN For The Design And Development Of Phase 2 Of The Town's Greenway And To Authorize The Mayor To Sign A Contract With Kimley Horn For The Consulting Services.

Documents:

ITEM 4 - ATP GRANT KIMELY HORN BOMA MEMO.PDF
ITEM 4 - RESO 2020-002 KIMLEY HORN.DOC.PDF
ITEM 4 - GREENWAY TRAIL MAP.PDF
ITEM 4 - KIMLEY HORN AGREEMENT-THOMPSONS STATION GREENWAY - PHASE II-20191220 (1).PDF

5. First Reading Of Ordinance 2020-003: An Ordinance To Amend Title 12, Chapter 4 Of The Municipal Code Regarding The Impact Assessment Fees: Presentation By Clancy Mulllen With Duncan Associates.

Documents:

ITEM 5 - ORDINANCE 2020-003 ADOPTION OF IMPACT FEES.PDF
ITEM 5 - IMPACT FEE PRESENTATION 1-14-2020.PDF
ITEM 5 - BARGE MTP PRESENTATION 3.PDF
ITEM 5 - DUNCAN ASSOCIATES.PDF
ITEM 5 - MEMO ROADWAY IMPACT FEE STUDY.PDF
ITEM 5 - OLD ORDINANCE 2013-016 IMPACT FEES.PDF
ITEM 5 - OLD RESOLUTION 2019-005 DUNCAN AGREEMENT.PDF
ITEM 5 - OLD RESOLUTION 2019-006 BARGE MTP.PDF
ITEM 5 - THOMP STN STUDY REV6_OP.PDF

6. First Reading Of Ordinance 2020-001: An Ordinance To Amend The Specific Plan For The Roderick Place Development.

Documents:

ITEM 6 - RODERICK STAFF REPORT BOMA MEMO.PDF
ITEM 6 - ORDINANCE 2020-001 RODERICK PLACE.PDF
ITEM 6 - RODERICK 24X36 CONCEPT PLAN_OP.PDF
ITEM 6 - RODERICK PATTERN BOOK REDLINED 12.13.19_OP.PDF
ITEM 6 - RODERICK PATTERN BOOK REVISED_OP.PDF
ITEM 6 - RODERICK PLACE - TRAFFIC STUDY_OP.PDF

7. First Reading Of Ordinance 2020-002: An Ordinance To Amend Title 8, Alcoholic Beverages Ordinance.

Documents:

ITEM 7 - ORDINANCE 2020-002 TO AMEND BEER BOARD TITLE 8 ALCOHOLIC BEVERAGE ORDINANCE 12.31.19.PDF
ITEM 7 - BEER BOARD ORDINANCE 96-001.PDF

8. ELI - Energy & Infrastructure: Potential Contract For Town Scape For Thompson's Station.

Documents:

ITEM 8 - MEMO ON ELI.PDF
ITEM 8 - THOMPSONS STATION ROAD UPDATE 1-3-2020.PDF

Announcements/Agenda Requests

Adjourn

Information Only:

Finance Report - Dec 2019

Documents:

DEC2019 BOMA FINANCE REPORT.PDF

This meeting will be held at 7:00 p.m. at Thompson's Station Community Center
1555 Thompson's Station Road West

Town of Thompson's Station
Board of Mayor and Aldermen
Meeting Minutes
November 12, 2019 7:00 p.m.

Call to Order:
The meeting of the Board of Mayor and Aldermen of the Town of Thompson's Station was called to order at 7:00 p.m. on November 12, 2019 at the Thompson's Station Community Center with the required quorum. Members and staff in attendance were: Mayor Corey Napier; Alderman Shaun Alexander; Alderman Brandon Bell; Alderman Ben Dilks; Alderman Brian Stover; Town Administrator Ken McLawhon; Town Planner Wendy Deats; Finance Director Steve Banks; Town Recorder/Clerk Regina Fowler and Town Attorney, Kirk Vandivort.

Pledge of Allegiance:

I. **Approval of adding item #9 under new business to this agenda, consideration of work session prior to monthly BOMA meetings.** A motion was made by Alderman Stover to add item #9 under new business to this agenda, the consideration of a work session prior to monthly BOMA meetings. The motion was seconded and carried unanimously.

II. **Approval of adding item #10 under new business to this agenda, discussion with Town Attorney as to the specific authority of the Town Administrator particularly as to the hiring process.** A motion was made by Alderman Dilks to approve adding item #10 under new business to this agenda, discussion with Town Attorney as to the specific authority of the Town Administrator particularly as to the hiring process. The motion was seconded and carried unanimously.

Consent Agenda:

a. - b. Consideration of the September 10, 2019 and October 8, 2019 regular minutes. Alderman Alexander made a motion to approve items a and b on the Consent Agenda September 10, 2019 and October 9, 2019 meeting minutes. The motion was seconded and carried unanimously.

c. – d. Approval of Resolution 2019-030 – A resolution of the Town of Thompson's Station, TN to declare certain property (2007 Ford Ranger) of the town, surplus and give the authority to the Town Administrator to dispose of said surplus items and the Purchase of a New Vehicle. Alderman Dilks made a motion to approve resolution 2019-030, a resolution of the Town of Thompson's to declare certain property (2007 Ford Ranger) of the town, surplus and give the authority to the Town Administrator to dispose of said surplus items and the Purchase of a New Vehicle. The motion was seconded and carried unanimously.

e. Purchase of a Chipper for Public Works. Alderman Dilks made a motion to defer the purchase of a chipper for public works until the January BOMA meeting. The motion was seconded and carried unanimously.

f. Purchase of a Blower for Wastewater Department. Alderman Dilks made a motion to purchase a Blower for the wastewater department. The motion was seconded and carried unanimously.

Public Comments:

A presentation of a railroad spike plaque was presented to Wendy Deats, Town Planner for her hard work and dedication to the Town of Thompson's Station. Ms. Deats has chosen to resign. Ken McLawhon introduced Micah Woods, as the Interim Town Planner until a permanent town planner can be hired.

Unfinished Business:

1. **Public Hearing and Second Reading of 0rdinance 2019-008: An ordinance to amend certain provisions of the Land Development Ordinance LDO Amendments (LDO Amend 2019-002).** A motion was made by Alderman Bell to approve Second Reading of Ordinance 2019-008, an ordinance to amend certain provisions of the Land Development Ordinance LDO Amendments (LDS Amend 2019-002). The motion was seconded and carried unanimously.

2. **Public Hearing and Second Reading of 0rdinance 2019-009: An ordinance of the Town of Thompson's Station, Tennessee, providing that the Code of Ordinances of the Town of Thompson's Station be amended by adding a new chapter to Title 16 therein, providing for the installation and maintenance of communications facilities in the public right-of-way.** A motion was made by Alderman Stover to approve second reading of ordinance 2019-009. An ordinance of the town of Thompson's Station, Tennessee, providing that the Code of Ordinances of the Town of Thompson's Station be amended by adding a new chapter to Title 16 therein, providing for the installation and maintenance of communications facilities in the public right-of-way. The motion was seconded and passed unanimously.

3. **Approve Participation Agreement for Critz Lane Project (Phase I).** Alderman Bell made a motion to approve Participation Agreement for Critz Lane Project (Phase 1). The motion was seconded and passed unanimously.

4. **Approve Draft for Sewage Agreement for Critz Lane Project.** Alderman Bell made a motion to approve the Sewage Agreement for Critz Lane Project including variations 2. a. and c. as discussed in the work session. The motion was seconded and passed unanimously.

5. **First Reading of Ordinance 2019-010: An ordinance of the Town of Thompson's Station to adopt the 2015 Edition of the International Property Maintenance Code.** Alderman Bell made a motion to approve first reading of Ordinance 2019-010. An Ordinance of the Town of Thompson's Station to adopt the 2015 Edition of the International Property Maintenance Code. The motion was seconded and passed unanimously.

New Business

6. **Approval of Resolution 2019-026: A resolution of the Town of Thompson's Station, TN to approve a subdivision development agreement with MBSC, TN Homebuilders for Phase 18 (Section 18A) of Tollgate Village and to authorize the Mayor to execute said agreement.** Alderman Bell made a motion to approve Resolution 2019-026. A resolution of the Town of Thompson's Station, TN to approve a subdivision development agreement with MBSC, TN Homebuilders for Phase 18 (Section 18A) of Tollgate Village and to authorize the Mayor to execute said agreement. The motion was seconded and passed unanimously.

7. **Approval of Resolution 2019-027: A resolution of the Town of Thompson's Station TN to accept the dedication of public infrastructure within Phase 6, Section 6A of Bridgemore Village and set a maintenance surety for a period of one year.** Alderman Stover made a motion to approve Resolution 2019-027. A resolution of the Town of Thompson's Station TN to accept the dedication of public infrastructure within Phase 6, Section 6A of Bridgemore Village and set maintenance surety for a period of one year. The motion was seconded and passed unanimously.

8. **Approval of Resolution 2019-029: A resolution of the Town of Thompson's Station, Tennessee for a Software Contract approving the Subscription Agreement with DUDE Solutions, Inc.** Alderman Bell made a motion to approve Resolution 2019-029. A resolution of the Town of Thompson's Station, Tennessee for a software contract approving the subscription agreement with DUDE Solutions, Inc. The motion was seconded and passed unanimously**.**

9. **Approve monthly Work Sessions to begin at 6:00 p.m. prior to regular monthly BOMA meetings.** After much discussion, it was determined that approval of the 2020 BOMA calendar will be on the January agenda for approval including any needed work sessions at 6:00 p.m. prior to the monthly BOMA meetings.

10. **Town Administrator Hiring Process:** After much discussion Alderman Dilks felt that the Mayor of Thompson's Station, while acting Interim Town Administrator, illegally created two new positions and filled them with friends. According to Alderman Dilks, his interpretation of the Town Charter and Municipal Code, any new position should be presented to BOMA for their approval. After questioning, Town Attorney Vandivort felt due to the alleged allegations and potential litigation an Executive Session would be in order. Vandivort said the Town Charter and Municipal Code spoke for itself and interpretations may vary. Dilks told Town Administrator, McLawhon that he expected him to take immediate action to rectify said contract of Chris Daskam. McLawhon noted that the contract was dated 11/30/2018 thru 11/30/2019, in terms of expiring later in the month, absent sooner cause. Alderman Bell was unaware

of said allegations and felt it imperative that if a claim is made that Town Attorney should provide a written opine to all BOMA members. Other BOMA members agreed. Attorney Vandivort said he would comply with their wishes and provide a written response to BOMA.

11. **Plans for Town Planner Position.** Alderman Dilks wanted to know the plans for the Town Planner Position. Mr. McLawhon noted that advertisements had been sent to all pertinent websites and newspapers. It was determined that the final top 2-3 candidates would be interviewed by a couple of BOMA representatives and the Town Administrator.

12. **Ethics Policy Discussion:** Alderman Dilks also wanted to know why the Town of Thompson's Station Ethics Policy was sent to BOMA members at this time. Town Attorney Vandivort stated, "they were unaware of the last time BOMA had been familiarized with the policy therefore, they felt it appropriate to send it out and be pro-active rather than re-active thusly, deciding to send it out to all BOMA and other town board members".

Adjourn:

There being no further business, the meeting was adjourned at 8:42 p.m.

_____ _____

Corey Napier, Mayor **Regina Fowler Town Recorder/Clerk**

Tyler Rainey <trainey@thompsons-station.com>

Online Form Submittal: Planning Commission Interest Form

noreply@civicplus.com <noreply@civicplus.com> Tue, Oct 22, 2019 at 4:10 PM
To: webmaster@thompsons-station.com

Planning Commission Interest Form

First Name	Bob
Last Name	Whitmer
Address1	3845 Somers Lane
Address2	*Field not completed.*
City	Thompson's Station
State	TN
Zip	37179
E-mail Address	Bwhitmer13@Gmail.com
Phone Number	6154068869
Introduce yourself and explain your interest in participating in the Planning Commission*	I am a 20-year resident of the Southern Williamson County area having lived the last 6 years in Thompsons Station with my wife Carol. Most of my career has been in the accounting and finance field in a variety of positions including controller and Director of Finance. I currently work as an accounting Manager for a large industrial contractor. My time is split working from my home and our home office in Chattanooga. I would like to continue serving Thompsons Station in the role as planning commissioner. Thompsons Station is on the brink of some great things. With our General Plan, LDO and Major Thoroughfare Plan in place we have laid the groundwork for developing a truly remarkable town. A developing park system and reasoned approach to growth is bringing the town recognition as a desirable place to call home. I want to help to continue to lay the groundwork along our current path. I have learned much about our LDO and the planning process having served on the planning commission the last 2 years. The coming years should bring a flurry of activity. We need folks to serve in a variety of positions for the town that have an interest in continuing to develop Thompsons Station for us and future generations. I want to look at the Thompsons Station in 20 year from now with pride and be able to say I had a small part.

Email not displaying correctly? View it in your browser.

Tyler Rainey <trainey@thompsons-station.com>

Online Form Submittal: Planning Commission Interest Form

noreply@civicplus.com <noreply@civicplus.com> Tue, Oct 22, 2019 at 7:05 PM
To: webmaster@thompsons-station.com

Planning Commission Interest Form

First Name	Tara
Last Name	Rumpler
Address1	2235 Chantry Place Lane
Address2	*Field not completed.*
City	Thompsons Station
State	TN
Zip	37179
E-mail Address	T.rumps30@gmail.com
Phone Number	3522139480
Introduce yourself and explain your interest in participating in the Planning Commission*	I'm currently serving as a planning commissioner and would like to continue my term for an additional year.

Email not displaying correctly? View it in your browser.

Tyler Rainey <trainey@thompsons-station.com>

Online Form Submittal: Planning Commission Interest Form

noreply@civicplus.com <noreply@civicplus.com> Thu, Oct 3, 2019 at 6:31 AM
To: webmaster@thompsons-station.com

Planning Commission Interest Form

First Name	Rick
Last Name	Guard
Address1	2622 country haven Dr.
Address2	*Field not completed.*
City	Thompsons Station
State	TN
Zip	37179
E-mail Address	rick.guard@outlook.com
Phone Number	615.969.1819
Introduce yourself and explain your interest in participating in the Planning Commission*	My name is Rick Guard and would like to participate in the Thompsons Station Planning Commission. As a married man and father of two who lives in Thompsons Station, I have great interest in the development of town where my family lives and plays. As we lay roots in this area, I would like to serve my community and see that Thompsons Station stays a great place to live and raise a family. Thank you for your consideration and time.

Email not displaying correctly? View it in your browser.

Tyler Rainey <trainey@thompsons-station.com>

Online Form Submittal: Planning Commission Interest Form

noreply@civicplus.com <noreply@civicplus.com> Tue, Sep 24, 2019 at 9:29 AM
To: webmaster@thompsons-station.com

Planning Commission Interest Form

First Name	Lori
Last Name	Clemons
Address1	2534 Tapestry Street
Address2	*Field not completed.*
City	Thompson's Station
State	Tennessee
Zip	37179
E-mail Address	lorirclemons@gmail.com
Phone Number	4438780300
Introduce yourself and explain your interest in participating in the Planning Commission*	I am currently on BZA and interested in getting more involved especially with the planning commission regarding ADA accessibility within the community on roads and green-ways since my husband is disabled. I think I could help bring a unique perspective to the planning. I currently live in Canterbury so I am directly effected on a daily basis by the growth happening on Critz. In a few years I will be living off of Bethesda Rd so I'm also interested in how that area will be developed. I hope that by having someone on the commission who lives in that area it will help with making good decisions in the rural town areas. Thank you for your consideration. I'm available any time to discuss my candidacy further. Lori Clemons

Email not displaying correctly? View it in your browser.

Thompson's Station Board of Mayor and Aldermen
2020 Meetings/Work Session Dates & Times

All regular meetings are held at **7:00 pm** in the Thompson's Station Community Center located at 1555 Thompson's Station Road West, unless otherwise noted. A **work session** may be held at **6:00 pm prior to the regular meetings**. When scheduled agendas and advance notice will also be provided.

January 14

February 11

March 10

April 14

May 12

June 9

No July Meeting

August 11

September 8

October 13

November 10

No December Meeting

LEASE AGREEMENT

This Lease is made and entered into this _____ day of _____, 2020 by and between the **Town of Thompson's Station, Tennessee**, a municipality, herein called "Town", and **Tennessee Equine Hospital, PLLC**, a Tennessee limited liability company, herein called "Lessee."

WHEREAS, the Town owns real property which was formerly used as a cattle farm, including barns, fencing and other structures, which is located at 1600 Thompson's Station Road West; and

WHEREAS, this property is intended to be used as primarily as a passive park and to preserve the rural, agricultural and pastoral character of the Town; and

WHEREAS, Lessee operates an equine hospital in the Town and wishes to use a portion of the property, including the existing structures, for its business; and

WHEREAS, it is in the Town's and public's interest for the property to be maintained in its current condition and for a similar agricultural use; and

WHEREAS, the Lessee will make the property available for public and educational use as set out herein, and shall comply with all federal, state and local statutory requirements for such operation; and

NOW THEREFORE, in consideration of the promises and commitments made herein, the sufficiency of which is hereby acknowledged, it is agreed as follows:

1. PRESMISES. The Town hereby leases to Lessee, upon the following terms and conditions, a portion of the property and improvements, located at 1600 Thompson's Station Road West, more particularly described on **Exhibit A**, attached hereto, hereinafter the "Premises."

2. TERM. The term of this Lease shall be three (3) years, and shall begin on the 1st day of May, 2019 and end on the 30th day of April, 2022. The parties may agree to extend the Lease term or terminate the lease in accordance with Section 6.

3. RENT. The Lessee shall pay to Town a total rent of $250.00 per month for the term.

4. REPAIRS AND MAINTANCE. As additional consideration, Lessee agrees to maintain the Premises in a clean and safe condition for its use and the Town's or public's access as set forth in the General Terms and Conditions set forth in **Exhibit B**.

5. USE. Lessee shall use said Premises for the following purposes and no others without prior written consent of the Town:

   Lessee shall use the Promises for the boarding of horses for breeding and artificial reproduction purposes. The Promises may also serve as overflow boarding for Lessee's equine hospital. To the extent feasible and practicable, Lessee shall endeavor to provide to make the Premises available to other groups and members of the public for educational and/ or other civic purposes. The

Lessee will work with the Town to create a plan and schedule of events to allow public access to and tours of the Premises from time to time.

No other uses, activates or operations shall be conducted by the Lessee from the leased Premises without first obtaining the prior written consent of Town.

Lessee understand that Premises are governing by a Conservation Easement for that benefit of the Land Trust of Tennessee. Lessee agrees to comply with all terms and restrictions of said easement and agrees that it will be responsible and liable to the Town and / or Land Trust for any violations of such easement,

6. LEASE EXTENSION: TERMINATION. This lease may be renewed for two (2) additional one (1) year terms upon the mutual consent of both parties. Written notice of the request to renew must be given by the Lessee to the Town at least sixty (60) days prior to the end of the Term. If agreement on renewal or on the terms of renewal cannot be reached prior to the termination date of this lease, then this lease will terminate according to its term. Any renewal of this lease may be in an addendum form at the option of the Town. In addition to the foregoing, after April 30th, 2022, either party may terminate this lease at any time upon ninety (90) days written notice.

7. INSURANCE. The Lessee shall carry fire and extended coverage insurance on the facility. In the case of loss, the decision to repair, replace, or demolish rests solely with the Town. Lessee shall also carry general liability insurance, covering its use of the Premises, in the amount of at least $1,000,000/ $2,000,000, naming the Town as an additional insured, and shall provide the Town a copy of said insurance policy prior to occupying the Premises or at the time of execution of this Lease.

8. LIABILITY. Lessee agrees to hold the Town harmless for any bodily injury or property damage done by the Lessee or its invitees on the premises during the period of this lease.

9. INDEMNIFICATION. Lessee agrees for itself, its successors and assigns, to defend, indemnify, and hold harmless the Town, its appointed and elected officials, and employees from and against liability for all claims, demands, suits, and judgements, including cost of defense, which is caused by, arises out of, or is incidental to Lessee's breach or violation of terms of this agreement.

10. GENERAL TERMS AND CONDITIONS. Attached hereto as Exhibit B and incorporated herein by reference are the General Terms and Conditions. In the event of any conflict or inconsistency between the terms of this Lease and the Town of Thompson's Station General Terms and Conditions, the terms of this Lease shall control.

11. DEFAULT. Lessee's failure to keep, observe or perform any term or conditions of the Lease, including those set forth in Exhibit B, shall constitute a default. In the event of default, the Town shall be entitled to terminate the Lease, re-enter and take possession of the Premises. Lessee shall pay reimbursement to the Town for any and all cost Town incurs to protect its interest as a result of a default, including reasonable attorneys and court cost.

12. ENTIRE AGREEMENT-AMENDMENTS: This printed Lease together with the attached General Terms and Conditions, all referenced exhibits, expressly incorporated herein by reference and attached hereto shall constitute the whole agreement between the parties. There are no terms obligations, covenants or conditions other than those contained herein. Except as otherwise provided herein, no modification or amendment of this Lease shall be valid or effective unless evidenced by an agreement in writing signed by both parties.

13. SURRENDER. Upon the expiration or termination of this Lease, Lessee shall surrender the Premises of Town in the same condition and repair as delivered, ordinary wear and tear excepted. If Lessee fails to remove any of its property from the Premises upon expiration or termination, the Town may remove and store such property, and any such property shall deem abandoned. Lessee agrees to pay Town any expenses incurred by Town in the removal, storage or disposal of such property, and Town may remove, store and dispose of such property as Town shall determine, without liability to Lessee whatsoever.

14. NOTICES. Required notices except legal notices shall be given in writing to the following respective address:

To Town:
Town of Thompson's Station Tennessee
1550 Thompson's Station Road West
P.O. Box 100
Thompson's Station, TN 37179

To Lessee:
Tennessee Equine Hospital, PLLC
1508 Thompson's Station Road West
Thompson's Station, TN 37179

IN WITNESS WHEREOF, the parties hereto have subscribed their names as of the _____ day of _____, 2020

LESSEE:

Tennessee Equine Hospital, PLLC

BY: _____

Date: _____

LESSOR:

Town of Thompson's Station, Tennessee

BY: _____

Corey Napier Mayor

Date: _____

Approved as to form:

_____

Town Attorney

EXHIBIT A

Beginning at a railroad spike found in the centerline of Thompson Station Road, said spike laying 713 feet +/- northerly along centerline from CSX Railroad tracks, also being the southwest corner of this tract and the northwest corner of the John R. Ragan property (Deed Book 330, Page 111); thence, along the existing centerline and projection of the centerline of Thompson Station Road, north 00 degrees 04 minutes 00 seconds west 546.42 feet to an iron pin (old) in the southerly line of William F. Dodson (Deed Book 318, Page 758); thence, with Dodson's line as follows: south 87 degrees 14 minutes 27 seconds East 171.73 feet to an iron pin (old) at fence corner, north 02 degrees 34 minutes 08 seconds East 3, 122.07 feet to a stone marker at an 8 inch Hackberry tree at fence line intersection with southerly line of Howard W. Hay, Jr. (Deed Book 476, Page 312); thence, north 65 degrees 29 minutes, 59 seconds East 150.18 feet to a stone marker at a 12 inch Hickory tree at fence line intersection; thence with southerly line of Hardie Shearin Fields, trustee property (Deed Book 1,013, Page 301) as follows: south 27 degrees 39 minutes 26 seconds east 296.47 feet to stone at fence corner, south 87 degrees 04 minutes 14 seconds east 568.64 feet to an iron pin (new) at fence intersection, south 89 degrees 57 minutes 34 seconds east 1,148.04 feet to an iron pin (new) in centerline of CSX Transportation Railroad tracks, having an apparent 60 foot right-of-way; thence with the center of said railroad tracks and a curve to the left having a delta of 26 degrees 37 minutes 22 seconds, a radius of 2,370.58 feet, a tangent of 560.88 feet, an arc length of 1,101.50 and a chord of sough 00 degrees 17 minutes 28 seconds east 1,091.61 feet to an iron pin (new), said pin also being the northeastern corner of the aforementioned John R. Ragan property; thence with Ragan's line as follows: South 79 degrees 18 minutes 16 seconds West 925.39 feet to an iron pipe (old); south 29 degrees 28 minutes 08 seconds west 710.85 feet to an iron pin (old); south 52 degrees 07 minutes 47 seconds west 154.26 feet to an iron pipe (old); south 01 degrees 18 minutes 54 seconds west 1,388.12 feet to an iron pipe (old); south 89 degrees 07 minutes 44 seconds west 995.17 feet to the point of beginning, according to a survey by Thomas, Miller and Partners, dated November 7, 1994.

EXHIBIT B

TOWN OF THOMPSON'S STATION TENNESSEE

GENERAL TERMS AND CONDITIONS

1. COMPLIANCE WITH ALL LAWS AND REGULATONS. In leasing the Premises, Lessee will comply with all applicable laws, ordinances, and regulations from any and all authorities having jurisdiction.

2. UTILITES. Lessee shall timely pay for all cost, expenses, fees, services, and charges of all kinds for heat, light, water, gas, telephone, and for all other utilities used on said Premises.

3. IMPROVEMENTS AND ALTERATONS. Lessee shall make no alterations or improvements to or upon the Premises (other than ordinary cleaning, painting or minor repairs), or install any fixtures (other than trade fixtures which can be removed without injury to the Premises) without first obtaining written approval from Town. Unless otherwise stipulated, all improvements or alterations erected or made on the Premises shall upon expiration of this. Lease, belong to Town without compensation to the Lessee.

4. CONDITION OF PREMISES. THE LESSEE HAS INSPECTED AND KNOWS THE CONDITION OF THE PRIMISES AND IT IS UNDERSTOOD AND AGREED THAT THE PREMISES ARE LEASED ON AN "AS IS" AND "WITH ALL FAULTS" BASIS WITHOUT ANY OBLICATION ON THE PART OF TOWN TO MAKE ANY CHANGES, IMPROVEMENTS, OR TO INCUR ANY EXPENSES WHATSOEVER FOR THE MAINTENANCE OF REPAIR OF THE PREMISES.

5. CONSTRUCTION DEFECTS. The Town shall not be liable to the Lessee for claims or damages arising from any defect in the construction of or the present condition of the Premises, whether know or unknown, or for damage by storm, rain, or leakage or any other occurrence.

6. MAINTENANCE. The Lessee shall throughout the term of this Lease without cost or expense to Town, keep and maintain the leased Premises in a neat, clean, safe and sanitary condition and shall at all times preserve the Premises in good and safe repair.

7. SIGNS. No sign, advertisement, notice, or other lettering will be exhibited, inscribed, painted, or affixed by Lessee on any part of the outside of the Premises without the prior written consent of Town.

8. ASSIGNMENT OR SUBLEASE. Lessee shall not assign or transfer this Lease or any interest therein, nor sublet the whole or any part of the Premises, nor grant an option for assignment, transfer or sublease for the whole or any part of the Premises, nor shall this Lease or any interest thereunder be assignable or transferable by operation of law, or by any process or proceeding of any court or otherwise.

9. RIGHT OF ENTRY- At all times during normal business hours, free access to the premises will be given to representatives of the Town for purposes of inspecting the property.

Date	Transaction Type	Num	Name	Memo/Description	Account	Amount
01/11/2019	Sales Receipt	Rental	H Clark Distilling	Property Rent - Jan 19	37990 Total All Other Revenues:Other Revenue	575.00
02/19/2019	Sales Receipt	1811	H Clark Distilling	Property Rent	37990 Total All Other Revenues:Other Revenue	575.00
03/18/2019	Sales Receipt	1860	H Clark Distilling	Property Rent	37990 Total All Other Revenues:Other Revenue	575.00
04/25/2019	Sales Receipt	Rent	H Clark Distilling	Property Rent	37990 Total All Other Revenues:Other Revenue	575.00
05/17/2019	Sales Receipt	Rental	H Clark Distilling	Property Rent	37990 Total All Other Revenues:Other Revenue	575.00
06/19/2019	Sales Receipt	2019-10	H Clark Distilling	Property Rent - June	37990 Total All Other Revenues:Other Revenue	575.00
07/12/2019	Sales Receipt	July Rent	H Clark Distilling	Property Rent	37990 Total All Other Revenues:Other Revenue	575.00
09/16/2019	Sales Receipt	R8113	H Clark Distilling	Property Rent	37990 Total All Other Revenues:Other Revenue	575.00
10/18/2019	Sales Receipt	R8149	H Clark Distilling	Property Rent	37990 Total All Other Revenues:Other Revenue	575.00
11/26/2019	Sales Receipt	R8219	H Clark Distilling	Property Rent	37990 Total All Other Revenues:Other Revenue	525.00
12/16/2019	Sales Receipt	R8278	H Clark Distilling	Property Rent	37990 Total All Other Revenues:Other Revenue	625.00
					TOTAL Rental Payments Received	6,325.00
02/08/2019	Sales Receipt	1792	Tennessee Equine Hospital	Property Rent	37990 Total All Other Revenues:Other Revenue	250.00
02/19/2019	Sales Receipt	1805	Tennessee Equine Hospital	Property Rent	37990 Total All Other Revenues:Other Revenue	250.00
03/19/2019	Sales Receipt	1864	Tennessee Equine Hospital	Property Rent	37990 Total All Other Revenues:Other Revenue	250.00
04/25/2019	Sales Receipt	April Rent	Tennessee Equine Hospital	Property Rent	37990 Total All Other Revenues:Other Revenue	250.00
12/09/2019	Sales Receipt	R8234	Tennessee Equine Hospital	Property Rent	37990 Total All Other Revenues:Other Revenue	2,000.00
					TOTAL Rental Payments Received	3,000.00

LEASE AGREEMENT

This Lease is made and entered into this 14 day of July, 2016 by and between the **Town of Thompson's Station, Tennessee**, a municipal corporation, herein called "Town", and **Tennessee Equine Hospital, PLLC**, a Tennessee limited liability hospital, herein called "Lessee."

WHEREAS, the Town owns real property which was formerly used as a cattle farm, including barns, fencing and other structures, which is located at ____ Thompson's Station Road West; and

WHEREAS, this property is intended to be used as primarily as a passive park and to preserve the rural, agricultural and pastoral character of the Town; and

WHEREAS, Lessee operates an equine hospital in the Town and wishes to use a portion of the property, including the existing structures, for its business; and

WHEREAS, it is in the Town's and public's interest for the property to be maintained in its current condition and for a similar agricultural use; and

WHEREAS, the Lessee will make the property available for public and educational use as set out herein.

NOW THEREFORE, in consideration of the promises and commitments made herein, the sufficiency of which is hereby acknowledged, it is agreed as follows:

1. PREMISES. The Town hereby leases to Lessee, upon the following terms and conditions, a portion of the property and improvements, located at 1600 Thompson's Station Road West, more particularly described on Exhibit A, attached hereto, hereinafter the "Premises."

2. TERM. The term of this Lease shall be three (3) years, and shall begin on the _1st_ day of _May___, 2016, and end on the _30th_ day of __April___ 2019. The Parties may agree to extend the Lease term or terminate the lease in accordance with Section 6.

3. RENT. The Lessee shall pay to Town a total rent of $250.00 per month for the term.

4. REPAIRS AND MAINTENANCE. As additional consideration, Lessee agrees to maintain the Premises in a clean and safe condition for its use and the Town's or public's access as set forth in the General Terms and Conditions set forth in Exhibit B.

5. USE. Lessee shall use said Premises for the following purposes and no others without prior written consent of the Town:

   Lessee shall use the Premises for the boarding of horses for breeding and artificial reproduction purposes. The Premises may also serve as overflow boarding for Lessee's equine hospital. To the extent feasible and practicable, Lessee shall endeavor to provide to make the Premises available to other groups and members of the public for educational and/or other civic purposes. The Lessee will work with the Town to create a plan and schedule of events to allow public access to and tours of the Premises from time to time.

No other uses, activities or operations shall be conducted by the Lessee from the leased Premises without first obtaining the prior written consent of Town.

Lessee understands that the Premises are governing by a Conservation Easement for the benefit of the Land Trust of Tennessee. Lessee agrees to comply with all terms and restrictions of said easement and agrees that it will be responsible and liable to the Town and/or Land Trust for any violations of such easement,

6. LEASE EXTENSION; TERMINATION. This lease may be renewed for two (2) additional one (1) year terms upon the mutual consent of both parties. Written notice of the request to renew must be given by the Lessee to the Town at least sixty (60) days prior to the end of the Term. If agreement on renewal or on the terms of renewal cannot be reached prior to the termination date of this lease, then this lease will terminate according to its terms. Any renewal of this lease may be in an addendum form at the option of the Town. In addition to the foregoing, after April 30, 2018, either party may terminate this lease at any time upon ninety (90) days written notice.

7. INSURANCE. The Lessee shall carry fire and extended coverage insurance on the facility. In the case of loss, the decision to repair, replace, or demolish rests solely with the Town. Lessee shall also carry general liability insurance, covering its use of the Premises, in the amount of at least $1,000,000/$2,000,000, naming the Town as an additional insured, and shall provide the Town a copy of said insurance policy prior to occupying the Premises.

8. LIABILITY. Lessee agrees to hold the Town harmless for any bodily injury or property damage done by the Lessee or its invitees on the premises during the period of this lease.

9. INDEMNIFICATION. Lessee agrees for itself, its successors and assigns, to defend, indemnify, and hold harmless the Town, its appointed and elected officials, and employees from and against liability for all claims, demands, suits, and judgments, including costs of defense, which is caused by, arises out of, or is incidental to Lessee's breach or violation of the terms of this agreement.

10. GENERAL TERMS AND CONDITIONS. Attached hereto as Exhibit B and incorporated herein by reference are the General Terms and Conditions. In the event of any conflict or inconsistency between the terms of this Lease and the Town of Thompson's Station General Terms and Conditions, the terms of this Lease shall control.

11. DEFAULT. Lessee's failure to keep, observe or perform any term or conditions of the Lease, including those set forth in Exhibit B, shall constitute a default. In the event of default, the Town shall be entitled to terminate the Lease, re-enter and take possession of the Premises. Lessee shall pay reimburse the Town for any and all costs Town incurs to protect its interests as a result of a default, including reasonable attorneys and court costs.

12. ENTIRE AGREEMENT - AMENDMENTS. This printed Lease together with the attached General Terms and Conditions, all exhibits expressly incorporated herein by reference and attached hereto shall constitute the whole agreement between the parties. There are no terms, obligations, covenants or conditions other than those contained herein. Except as otherwise provided herein, no modification or amendment of this Lease shall be valid or effective unless evidenced by an agreement in writing signed by both parties.

13. SURRENDER. Upon the expiration or termination of this Lease, Lessee shall surrender the Premises to Town in the same condition and repair as delivered, ordinary wear and tear

excepted. If Lessee fails to remove any of its property from the Premises upon expiration or termination, the Town may remove and store such property, and any such property shall be deemed abandoned. Lessee agrees to pay Town any expenses incurred by Town in the removal, storage or disposal of such property, and Town may remove, store or dispose of such property as Town shall determine, without liability to Lessee whatsoever.

14. NOTICES. Required notices except legal notices shall be given in writing to the following respective address:

To Town:
Town of Thompson's Station Tennessee
1550 Thompson's Station Road West
P. O. Box 100
Thompson's Station, TN 37179

To Lessee:
Tennessee Equine Hospital, PLLC
1508 Thompson's Station Road West
Thompson's Station, TN 37179

IN WITNESS WHEREOF, the parties hereto have subscribed their names as of the _____day of_____, 2016.

LESSEE:
Tennessee Equine Hospital, PLLC

BY: Monty McCloy (President)

7/14/16
Date

LESSOR:
Town of Thompson's Station, Tennessee

BY:_____
Corey Napier, Mayor

Date_____

EXHIBIT B

TOWN OF THOMPSON'S STATION TENNESSEE
GENERAL TERMS AND CONDITIONS

1. COMPLIANCE WITH ALL LAWS AND REGULATIONS. In using the Premises, Lessee will comply with all applicable laws, ordinances, and regulations from any and all authorities having jurisdiction.

2. UTILITIES. Lessee shall timely pay for all costs, expenses, fees, services, and charges of all kinds for heat, light, water, gas, and telephone, and for all other utilities used on said Premises.

3. IMPROVEMENTS AND ALTERATIONS. Lessee shall make no alterations or improvements to or upon the Premises (other than ordinary cleaning, painting or minor repairs), or install any fixtures (other than trade fixtures which can be removed without injury to the Premises) without first obtaining written approval from Town. Unless otherwise stipulated, all improvements or alterations erected or made on the Premises shall, upon expiration of this Lease, belong to Town without compensation to the Lessee.

4. CONDITION OF PREMISES. THE LESSEE HAS INSPECTED AND KNOWS THE CONDITION OF THE PREMISES AND IT IS UNDERSTOOD AND AGREED THAT THE PREMISES ARE LEASED ON AN "AS IS" AND "WITH ALL FAULTS" BASIS WITHOUT ANY OBLIGATION ON THE PART OF TOWN TO MAKE ANY CHANGES, IMPROVEMENTS, OR TO INCUR ANY EXPENSES WHATSOEVER FOR THE MAINTENANCE OR REPAIR OF THE PREMISES.

5. CONSTRUCTION DEFECTS. The Town shall not be liable to the Lessee for claims or damages arising from any defect in the construction of or the present condition of the Premises, whether known or unknown, or for damage by storm, rain, or leakage or any other occurrence.

6. MAINTENANCE. Town shall throughout the term of this Lease without cost or expense to Lessee, keep and maintain the leased Premises in a neat, clean, safe and sanitary condition and shall at all times preserve the Premises in good and safe repair.

7. SIGNS. No sign, advertisement, notice, or other lettering will be exhibited, inscribed, painted, or affixed by Lessee on any part of the outside of the Premises without the prior written consent of Town.

8. ASSIGNMENT OR SUBLEASE. Lessee shall not assign or transfer this Lease or any interest therein, nor sublet the whole or any part of the Premises, nor grant an option for assignment, transfer or sublease for the whole or any part of the Premises, nor shall this Lease or any interest thereunder be assignable or transferable by operation of law, or by any process or proceeding of any court or otherwise.

9. RIGHT OF ENTRY - At all times during normal business hours, free access to the premises will be given to representatives of the Town for purposes of inspecting the property.

Phone: (615) 794-4333
Fax: (615) 794-3313
www.thompsons-station.com

1550 Thompson's Station Road W.
P.O. Box 100
Thompson's Station, TN 37179

MEMORANDUM

DATE: January 14, 2020

TO: Board of Mayor and Aldermen (BOMA)

FROM: Micah Wood, Interim Town Planner

SUBJECT: Bridgemore Phase 6, Section 6B Road Dedication and Surety Reduction

---

The developer of the Bridgemore Village subdivision has requested the Town's acceptance of all infrastructure within Phase 6, Section 6B in the development. This section consists of development consists of 21 single family lots. Improvement within this section are fully complete including final topcoat of pavement.

If accepted, the Town would be assuming responsibility for all public infrastructure within the development including storm drains, roadways, and wastewater facilities.

The development has been evaluated and the following maintenance surety amounts are being recommended:

Roads, Drainage, and Erosion Control	$22,000.00
Sanitary Sewer	$12,800.00

These amounts will be held in place for one year to ensure infrastructure is performing as expected. Engineering certification and as-built documents have been received as required by the Town's Dedication Policy.

BOMA Action:

Approve the request for acceptance of the public infrastructure and set maintenance surety amounts as recommended.

RESOLUTION NO. 2020-005

A RESOLUTION OF THE TOWN OF THOMPSON'S STATION, TENNESSEE TO ACCEPT THE DEDICATION OF PUBLIC INFRASTRUCTURE WITHIN PHASE 6, SECTION 6B OF BRIDGEMORE VILLAGE AND SET A MAINTENANCE SURETY FOR A PERIOD OF ONE YEAR.

WHEREAS, Blueprint Properties, LLC ("Developer") has completed Phase 6, Section 6B of Bridgemore Village and is requesting the Town accept their dedication of the public infrastructure for such section;

WHEREAS, the Town's Land Development Ordinance requires the acceptance of streets, and other public improvements for public maintenance, except utilities, shall be action of the Board of Mayor and Aldermen; and

WHEREAS, the Town's Land Development Ordinance requires that the developer shall be required to maintain all improvements for one year after acceptance of the public improvements by the Town and a maintenance surety will be required for a period of one year; and

WHEREAS, the Board of Mayor and Aldermen have determined that it is in the best interest of the Town to accept the public infrastructure as shown in the attached recorded plat for Phase 6, Section 6A of Bridgemore Village.

NOW, THEREFORE, BE IT RESOLVED by the Board of Mayor and Aldermen of the Town of Thompson's Station as follows:

That the public infrastructure within Section 6B (see attached plat hereto as Exhibit A and incorporated herein by reference), is accepted and a surety shall be set for a period of one year.

RESOLVED AND ADOPTED this 14th day of January, 2020.

_____
Corey Napier, Mayor

ATTEST:

_____
Regina Fowler, Town Recorder

APPROVED AS TO LEGALITY AND FORM:

_____
Town Attorney

GENERAL NOTES

1. THE PURPOSE OF THIS PLAT IS TO CREATE 21 SINGLE-FAMILY LOTS, ONE OPEN SPACE TRACT AND TO DEDICATE RIGHT-OF-WAY AND EASEMENTS.

2. BEARINGS SHOWN HEREON ARE BASED ON THE TENNESSEE COORDINATE SYSTEM OF 1983. GPS EQUIPMENT WAS USED TO DETERMINE THE POSITION OF CONTROL POINTS ON THE SURVEYED PROPERTY TO ESTABLISH THE BEARING BASE FOR THE SURVEY. TYPE OF EQUIPMENT USED: LEICA, MODEL GX1230, DUAL FREQUENCY RECEIVER. THE TYPE OF GPS SURVEY: NETWORK ADJUSTED REAL TIME KINEMATIC.

3. THE PROPERTY IS ZONED LOW INTENSITY RESIDENTIAL (D1).

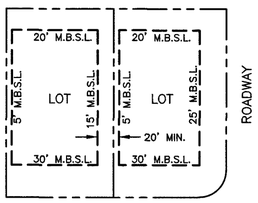
   MINIMUM BUILDING SETBACKS: FRONT – 30'
   SIDE – 5'/15' (20' BETWEEN STRUCTURES)
   REAR – 20'

4. WITHIN ALL NEW DEVELOPMENTS AND FOR OFF-SITE LINES CONSTRUCTED AS A RESULT OF, OR TO PROVIDE SERVICE TO, THE NEW DEVELOPMENT, ALL UTILITIES, SUCH AS CABLE TELEVISION, ELECTRICAL, GAS, SEWER, TELEPHONE, AND WATERLINES SHALL BE PLACED UNDERGROUND.

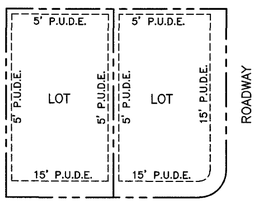
5. BY SCALED MAP LOCATION AND GRAPHIC PLOTTING ONLY, THE PROPERTY LIES WITHIN FLOOD ZONE "X", AS DESIGNATED ON CURRENT FEDERAL EMERGENCY MANAGEMENT AGENCY MAP NO. 47187C0345F AND 47187C0365F, WITH AN EFFECTIVE DATE OF SEPTEMBER 29, 2006, WHICH MAKES UP A PART OF THE NATIONAL FLOOD INSURANCE ADMINISTRATION REPORT; COMMUNITY NO. 470424, PANEL NOS. 0345 AND 0365, SUFFIX F, WHICH IS THE CURRENT FLOOD INSURANCE RATE MAP FOR THE COMMUNITY IN WHICH SAID PREMISES IS SITUATED. SAID MAP DEFINES ZONE "X" UNDER "OTHER AREAS" AS "AREAS DETERMINED TO BE OUTSIDE THE 0.2% ANNUAL CHANCE FLOODPLAIN."

6. THIS SURVEYOR HAS NOT PHYSICALLY LOCATED THE UNDERGROUND UTILITIES. ABOVE GRADE AND UNDERGROUND UTILITIES SHOWN WERE TAKEN FROM VISIBLE APPURTENANCES, PUBLIC RECORDS, AND/OR MAPS PREPARED BY OTHERS. THE SURVEYOR MAKES NO GUARANTEE THAT THE UNDERGROUND UTILITIES SHOWN COMPRISE ALL SUCH UTILITIES IN THE AREA, EITHER IN SERVICE OR ABANDONED. THE SURVEYOR FURTHER DOES NOT WARRANT THAT THE UNDERGROUND UTILITIES SHOWN ARE IN THE EXACT LOCATION INDICATED. THEREFORE, RELIANCE UPON THE TYPE, SIZE AND LOCATION OF UTILITIES SHOWN SHOULD BE DONE SO WITH THIS CIRCUMSTANCE CONSIDERED. DETAILED VERIFICATION OF EXISTENCE, LOCATION AND DEPTH SHOULD ALSO BE MADE PRIOR TO ANY DECISION RELATIVE THERETO IS MADE. AVAILABILITY AND COST OF SERVICE SHOULD BE CONFIRMED WITH THE APPROPRIATE UTILITY COMPANY. IN TENNESSEE, IT IS A REQUIREMENT, PER "THE UNDERGROUND UTILITY DAMAGE PREVENTION ACT", THAT ANYONE WHO ENGAGES IN EXCAVATION MUST NOTIFY ALL KNOWN UNDERGROUND UTILITY OWNERS NO LESS THAN THREE (3) NOR MORE THAN TEN (10) WORKING DAYS PRIOR TO THE DATE OF THEIR INTENT TO EXCAVATE AND ALSO TO AVOID ANY POSSIBLE HAZARD OR CONFLICT. TENNESSEE ONE CALL, DIAL 811.

7. HOMEOWNER'S ASSOCIATION WILL MAINTAIN ALL SIDEWALKS AND OPEN SPACE, INCLUDING LANDSCAPE AND DETENTION/RETENTION AREAS. ALL ROADWAYS SHALL BE PUBLIC STREETS, CONSTRUCTED TO THE SPECIFICATIONS OF THOMPSON'S STATION AS PUBLIC RIGHT-OF-WAYS.



ROADWAY
(STREET LOADED)
TYPICAL LOT SETBACK LINES
(NOT TO SCALE)



ROADWAY
(STREET LOADED)
TYPICAL LOT EASEMENT LINES
(NOT TO SCALE)

LOT AREA TABLE		
LOT	SQ. FT.±	ACRES±
6012	16,200	0.37
6013	16,200	0.37
6014	16,200	0.37
6015	16,200	0.37
6016	16,200	0.37
6017	16,200	0.37
6018	16,200	0.37
6019	16,200	0.37
6020	16,200	0.37
6021	16,017	0.37
6022	37,086	0.85
6023	34,891	0.80
6024	16,783	0.39
6025	16,200	0.37
6026	16,200	0.37
6027	16,200	0.37
6028	16,200	0.37
6029	16,200	0.37
6030	16,200	0.37
6031	17,866	0.41
6077	17,866	0.41

OPEN SPACE AREA TABLE		
OPEN SPACE	SQ. FT.±	ACRES±
6098	3,035	0.07

PROPERTY MAP REFERENCE

BEING A PORTION OF PARCEL NUMBER 14.02 AS SHOWN ON WILLIAMSON COUNTY PROPERTY MAP NUMBER 145.

DEED REFERENCE

BEING A PORTION OF THE SAME PROPERTY CONVEYED TO BLUEPRINT PROPERTIES, LLC FROM MBSC BRIDGEMORE, LLC BY SPECIAL WARRANTY DEED OF RECORD IN BOOK 6603, PAGE 979, REGISTER'S OFFICE FOR WILLIAMSON COUNTY, TENNESSEE.

(SEE NOTE 2)

VICINITY MAP
(NOT TO SCALE)

OWNER / DEVELOPER
BLUEPRINT PROPERTIES, LLC
C/O JIMMY FRANKS
245 NOAH DRIVE
FRANKLIN, TENNESSEE 37067
(615) 794-7415
JIMMY@TENNESSEEVALLEYHOMES.COM

SURVEYOR
RAGAN-SMITH ASSOCIATES, INC.
C/O KEVIN L. BIRDWELL, RLS
315 WOODLAND STREET
NASHVILLE, TENNESSEE 37206
(615) 244-8591
KBIRDWELL@RAGANSMITH.COM

LEGEND

R.O.W.	RIGHT-OF-WAY
R.O.W.C.T.	REGISTER'S OFFICE FOR WILLIAMSON COUNTY, TENNESSEE

RECORDER'S INFORMATION
I-662
10/20/2016 - 11:57:00 AM
16046049
1 PGS:AL-PLAT
BATCH: 469800
PLAT BOOK: P65
PAGE: 9

REC FEE	30.00
DP FEE	2.00
TOTAL	32.00

STATE OF TENNESSEE, WILLIAMSON CO
SADIE WADE

P65/9a

AREA SUMMARY TABLE

TOTAL LOT AREA –	8.80 AC.±
OPEN SPACE AREA –	0.07 AC.±
R.O.W. AREA –	1.36 AC.±
TOTAL SITE AREA –	10.23 AC.±

REVISED: AUGUST 12, 2016

BRIDGEMORE VILLAGE
SECTION 6B
LOTS 6012 - 6031 & 6077 AND
OPEN SPACE 6098

ELEVENTH CIVIL DISTRICT OF WILLIAMSON COUNTY,
TOWN OF THOMPSON'S STATION, TENNESSEE
DRAWN BY: AMR/DDB/CJM DATE: JULY 27, 2016
JOB NO. 11-052 W.O. 0329 SHEET 1 OF 2

CERTIFICATE OF APPROVAL OF MIDDLE TENNESSEE ELECTRIC MEMBERSHIP CORPORATION

I HEREBY CERTIFY THAT THE REQUIREMENTS SET FORTH IN RULES, REGULATIONS BY-LAWS, POLICY AND OPERATIONAL BULLETINS, PLAT APPROVAL CHECKLIST AND TREE PLANTING GUIDELINES HAVE BEEN MET FOR MTEMC. ANY APPROVAL IS AT ALL TIMES CONTINGENT UPON CONTINUING COMPLIANCE WITH THE AFOREMENTIONED REQUIREMENTS.

9/7/, 2016
DATE
MIDDLE TENNESSEE ELECTRIC MEMBERSHIP CORPORATION

CERTIFICATE OF APPROVAL OF SUBDIVISION NAME AND STREET NAMES

I DO HEREBY CERTIFY THAT THE SUBDIVISION NAME AND STREET NAMES DENOTED ON THIS FINAL PLAT HAVE BEEN APPROVED BY THE WILLIAMSON COUNTY EMERGENCY COMMUNICATIONS AGENCY.

9-7, 2016
DATE
WILLIAMSON COUNTY DEPARTMENT OF EMERGENCY COMMUNICATONS

CERTIFICATE FOR ADDRESSES

I DO HEREBY CERTIFY THAT THE ADDRESSES DENOTED ON THIS FINAL PLAT ARE THOSE ASSIGNED BY DEPARTMENT OF INFORMATION TECHNOLOGY (IT).

9/7, 2016
DATE
IT DEPT.
E-911 ADDRESSING COORDINATOR

CERTIFICATE OF OWNERSHIP & DEDICATION

I (WE) HEREBY CERTIFY THAT I AM (WE ARE) THE OWNER(S) OF THE PROPERTY SHOWN AND DESCRIBED HEREON AS EVIDENCED IN BOOK 6603, PAGE 979, R.O.W.C., AND THAT I (WE) HEREBY ADOPT THIS PLAN OF SUBDIVISION WITH MY (OUR) FREE CONSENT, ESTABLISH THE MINIMUM BUILDING RESTRICTION LINE, AND THAT OFFERS OF IRREVOCABLE DEDICATION FOR ALL PUBLIC STREETS, UTILITIES AND OTHER FACILITIES HAVE BEEN FILED AS REQUIRED BY THESE REGULATIONS.

9/12/16, 20
DATE
BLUEPRINT PROPERTIES, LLC
TITLE: Member

CERTIFICATE OF ACCURACY

I HEREBY CERTIFY THAT THE PLAN, SHOWN, AND DESCRIBED HEREON IS A TRUE AND CORRECT SURVEY TO THE ACCURACY REQUIRED BY THE THOMPSON'S STATION MUNICIPAL PLANNING COMMISSION AND THAT THE MONUMENTS HAVE BEEN OR WILL BE PLACED AS SHOWN HEREON TO THE SPECIFICATIONS OF THE SUBDIVISION REGULATIONS, AS APPROVED BY THE TOWN ENGINEER. THIS IS A CATEGORY 1 SURVEY AND THE RATIO OF PRECISION OF THE UNADJUSTED SURVEY IS GREATER THAN 1:10000 AS SHOWN HEREON.

RAGAN - SMITH - ASSOCIATES, INC.

9/9/16
DATE
REGISTERED LAND SURVEYOR

CERTIFICATE OF APPROVAL OF UTILITY SYSTEMS

I HEREBY CERTIFY THAT THE FOLLOWING UTILITY SYSTEMS OUTLINED OR INDICATED ON THE PLAN SHOWN HEREON HAVE BEEN INSTALLED IN ACCORDANCE WITH CURRENT LOCAL AND/OR STATE GOVERNMENT REQUIREMENTS OR THAT A SURETY BOND HAS BEEN POSTED WITH THE PLANNING COMMISSION TO ASSURE COMPLETION OF ALL REQUIRED IMPROVEMENTS IN CASE OF DEFAULT. ALSO, I CERTIFY THAT THE HYDRAULIC DESIGN CRITERIA SPECIFIED IN SECTION 3-106 OF THE THOMPSON'S STATION SUBDIVISION REGULATIONS HAVE BEEN MET.

WATER SYSTEM SEPT. 7TH, 2016
DATE
H&TS UTILITY DISTRICT
ASST. GENERAL MANAGER

SEWER SYSTEM Oct 19, 2016
DATE
NAME, TITLE, AND AGENCY OF AUTHORIZED APPROVING AGENT

CERTIFICATION OF THE APPROVAL OF STREETS

I HEREBY CERTIFY: (1) THAT ALL STREETS DESIGNATED ON THIS FINAL SUBDIVISION PLAT HAVE BEEN INSTALLED IN AN ACCEPTABLE MANNER AND ACCORDING TO THOMPSON'S STATION'S SUBDIVISION REGULATIONS, OR (2) THAT A SURETY BOND HAS BEEN POSTED WITH THE PLANNING COMMISSION TO ASSURE COMPLETION OF ALL REQUIRED IMPROVEMENTS IN CASE OF DEFAULT.

9-20, 2016
DATE
TOWN ENGINEER

CERTIFICATE OF APPROVAL FOR RECORDING

I HEREBY CERTIFY THAT THE SUBDIVISION PLAT SHOWN HEREON HAS BEEN FOUND TO COMPLY WITH THOMPSON'S STATION SUBDIVISION REGULATIONS WITH THE EXCEPTION OF SUCH VARIANCES, IF ANY, AS ARE NOTED IN THE MINUTES OF THE PLANNING COMMISSION AND THAT IT HAS BEEN APPROVED FOR RECORDING IN THE OFFICE OF THE COUNTY REGISTER.

9/15, 2016
DATE
SECRETARY OF PLANNING COMMISSION

FINAL PLAT

TOWN OF THOMPSON'S STATION
PLANNING COMMISSION

NET AREA:	10.23 AC.±	TOTAL LOTS:	21
ACRES NEW ROAD:	1.36 AC.±	CIVIL DISTRICT:	11TH
MILES NEW ROAD:	0.21±	CLOSURE ERROR:	1:15000

OWNER: BLUEPRINT PROPERTIES, LLC
SURVEYOR: RAGAN – SMITH – ASSOCIATES, INC.
SCALE: 1"= 100' 0 50' 100' 200'

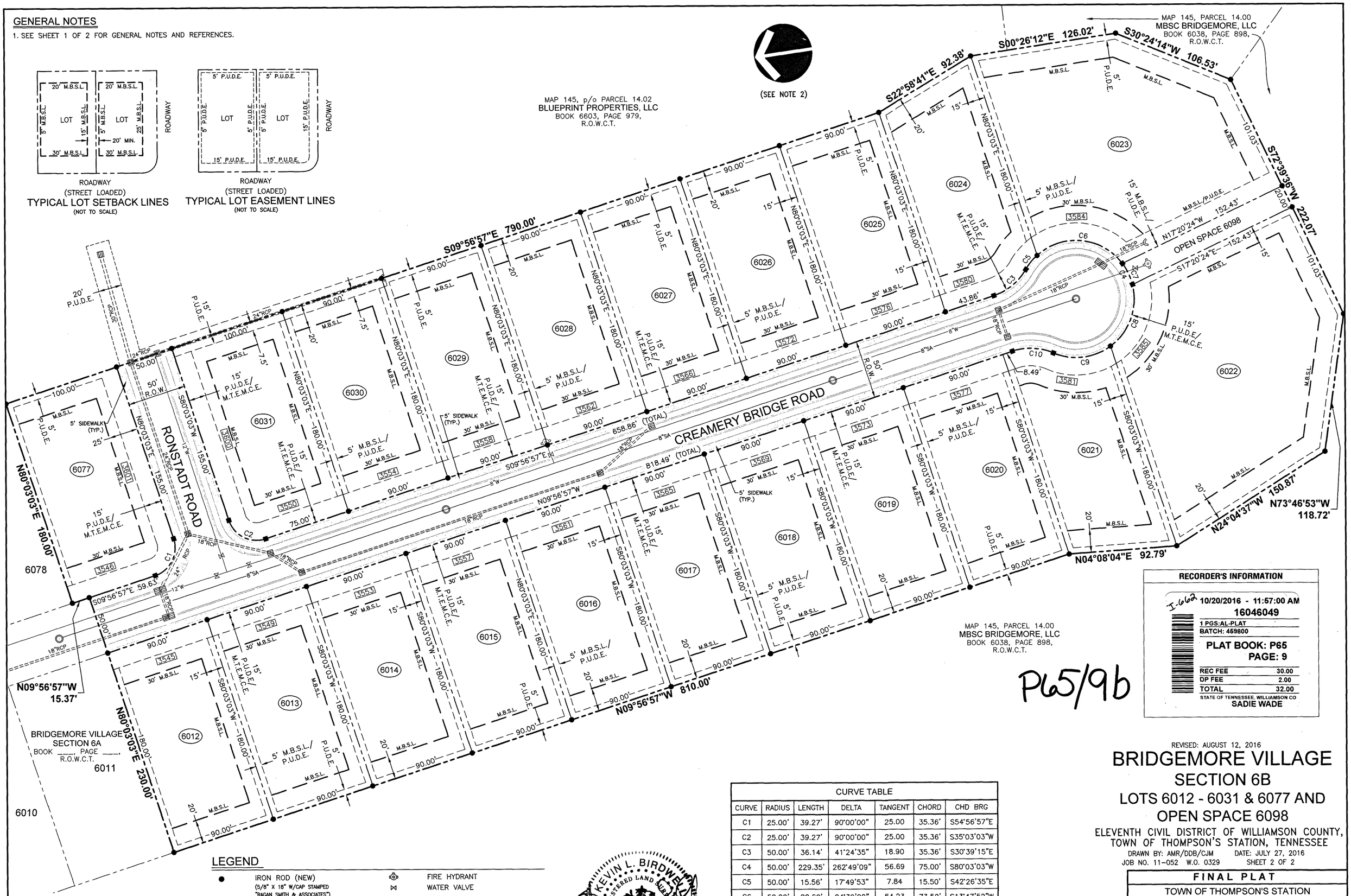
G:\11052-0329\1-Survey\PLATS\FINAL PLAT\PHASE 6B\BRIDGEMORE 6B PLAT.DWG

GENERAL NOTES

1. SEE SHEET 1 OF 2 FOR GENERAL NOTES AND REFERENCES.

ROADWAY
(STREET LOADED)
TYPICAL LOT SETBACK LINES
(NOT TO SCALE)

ROADWAY
(STREET LOADED)
TYPICAL LOT EASEMENT LINES
(NOT TO SCALE)



RECORDER'S INFORMATION

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1 PGS:AL-PLAT
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PAGE: 9

REC FEE	30.00
DP FEE	2.00
TOTAL	32.00

STATE OF TENNESSEE, WILLIAMSON CO
SADIE WADE

P65/9b

LEGEND

●	IRON ROD (NEW) (5/8" X 18" W/CAP STAMPED "RAGAN SMITH & ASSOCIATES")
■	MONUMENT (NEW) (4" DIAMETER ALUMINUM DISC W/ 5/8" IRON ROD MARKED "RAGAN-SMITH ASSOCIATES")
RCP	REINFORCED CONCRETE PIPE
	CATCH BASIN
◎	SANITARY SEWER MANHOLE
—SA—	SANITARY SEWER LINE
—W—	WATER LINE
	FIRE HYDRANT
⋈	WATER VALVE
R.O.W.	RIGHT-OF-WAY
R.O.W.C.T.	REGISTER'S OFFICE WILLIAMSON COUNTY, TENNESSEE
M.B.S.L.	MINIMUM BUILDING SETBACK LINE
1234	ADDRESS
P.U.D.E.	PUBLIC UTILITY & DRAINAGE EASEMENT
P.U.D.E./ M.T.E.M.C.E.	PUBLIC UTILITY & DRAINAGE EASEMENT MIDDLE TENN ELECTRIC MEMBERSHIP CORP ESMT

KEVIN L. BIRDWELL
REGISTERED LAND SURVEYOR
AGRICULTURE
TENNESSEE NO. 2076

CURVE TABLE

CURVE	RADIUS	LENGTH	DELTA	TANGENT	CHORD	CHD BRG
C1	25.00'	39.27'	90°00'00"	25.00	35.36'	S54°56'57"E
C2	25.00'	39.27'	90°00'00"	25.00	35.36'	S35°03'03"W
C3	50.00'	36.14'	41°24'35"	18.90	35.36'	S30°39'15"E
C4	50.00'	229.35'	262°49'09"	56.69	75.00'	S80°03'03"W
C5	50.00'	15.56'	17°49'53"	7.84	15.50'	S42°26'35"E
C6	50.00'	82.60'	94°39'02"	54.23	73.52'	S13°47'52"W
C7	50.00'	20.14'	23°04'26"	10.21	20.00'	S72°39'36"W
C8	50.00'	59.30'	67°57'03"	33.69	55.88'	N61°49'39"W
C9	50.00'	51.76'	59°18'44"	28.47	49.48'	N01°48'15"E
C10	50.00'	36.14'	41°24'35"	18.90	35.36'	N10°45'20"E

REVISED: AUGUST 12, 2016

BRIDGEMORE VILLAGE
SECTION 6B
LOTS 6012 - 6031 & 6077 AND OPEN SPACE 6098

ELEVENTH CIVIL DISTRICT OF WILLIAMSON COUNTY,
TOWN OF THOMPSON'S STATION, TENNESSEE

DRAWN BY: AMR/DDB/CJM DATE: JULY 27, 2016
JOB NO. 11-052 W.O. 0329 SHEET 2 OF 2

FINAL PLAT

TOWN OF THOMPSON'S STATION
PLANNING COMMISSION

NET AREA:	10.23 AC.±	TOTAL LOTS:	21
ACRES NEW ROAD:	1.36 AC.±	CIVIL DISTRICT:	11TH
MILES NEW ROAD:	0.21±	CLOSURE ERROR:	1:15000

OWNER: BLUEPRINT PROPERTIES, LLC
SURVEYOR: RAGAN – SMITH – ASSOCIATES, INC.
SCALE: 1"= 50' 0 25' 50' 100'

G:\11052-0329\1-Survey\PLATS\FINAL PLAT\PHASE 6B\BRIDGEMORE 6B PLAT.DWG

RESOLUTION NO. 2020-004

A RESOLUTION OF THE TOWN OF THOMPSON'S STATION, TENNESSEE APPROVING THE TOWN CONTRACTING WITH TENNESSEE PARTNERS FOR HEALTH PROGRAM FOR HEALTH AND VISION BENEFITS FOR TOWN STAFF

WHEREAS, the Town of Thompson's Station currently provides Town Staff with health and vision benefits, which benefits are scheduled for renewal; and

WHEREAS, the Town Staff, upon receiving the renewal notice for the health and vision benefits under the current plan as previously existed, learned such benefits will result in an increase of 33%;

WHEREAS, the Town Staff researched and reviewed options for consideration for the same or improved health and vision benefits while keeping the overall costs neutral;

WHEREAS, the Town Staff proposes using the services of Tennessee Partners for Health Program as outlined in the attached Proposal and Memorandum of Understanding Between the State of Tennessee and Local Government Agency for health and vision benefits dated January 14, 2020;

WHEREAS, the Town of Thompson's Station desires to continue to provide health and vision benefits to Town Staff and determining that the Tennessee Partners For Health Program under the Proposal dated January 14, 2020 offers better benefits with an affordable rate;

WHEREAS, the Board of Mayor and Aldermen has determined that it is in the best interest of the Town and Town Staff to approve the health and visions benefits offered by Tennessee Partners Health Program;

NOW, THEREFORE, BE IT RESOLVED by the Board of Mayor and Aldermen of the Town of Thompson's Station as follows:

That the Town of Thompson's Station does approve the Proposal and Memorandum of Understanding Between the State of Tennessee and Local Government with Tennessee Partners Health Program date January 14, 2020 as to provide health and vision benefits for Town Staff;

That Proposal dated January 14, 2020 is hereby approved, and the Mayor is authorized to sign the contract or appropriate documents on behalf of the Town, as necessary.

RESOLVED AND ADOPTED this ____ day of _____ 2020.

_____

Corey Napier, Mayor

ATTEST:

_____
Town Recorder

APPROVED AS TO LEGALITY AND FORM:

_____
Town Attorney

Benefit Offered	Vendor	Description	Current UHC Town Costs	Renewal Rate United Health as 12/1/19	UHC Alt	BCBS PPO	BCBS HDHP	Humana	TN State
Medical	United Healthcare	Premium covered 100% for Employee $2000/$4000 Plan Deductible	$ 432.27	$ 577.00	$ 495.00	$ 459.00	$ 642.00	$ 563.00	$ 434.00
Vision	United Healthcare	Premium covered 100% for Employee	$ 4.97	$ 4.97	$ 4.97	$ 4.97	$ 4.97	$ 4.97	$ 3.07
		Health/Vision Costs/Per Person	**$ 437.24**	$ 581.97	$ 499.97	$ 463.97	$ 646.97	$ 567.97	**$ 437.07**
				33.10% Increase	14.35% Increase	6.11% Increase	47.97% Increase	29.90% Increase	$ (0.17) Savings Decrease

	Current EE $$	United Health	UHC Alt	BCBS PPO	BCBS HDHP	Humana	TN State
Health Savings Account	$ 2,500.00	$ 2,500.00	$ 2,500.00	$ -	$ 2,500.00	$ 2,500.00	$ 2,500.00
Maximum out of pocket	$ (6,500.00)	$ (6,700.00)	$ (6,650.00)	$ (7,500.00)	$ (5,000.00)	$ (6,550.00)	$ (5,000.00)
Net dollars out of EE pockets	**$ (4,000.00)**	$ (4,200.00)	$ (4,150.00)	$ (7,500.00)	$ (2,500.00)	$ (4,050.00)	**$ (2,500.00)**

$ (1,500.00) EE Savings

January 14, 2020

The Town currently provides the staff with health and vision benefits.

The renewal date for these benefits was on December 1, 2019. Typically we receive notice of renewals in early October of each year. This year (2019) we received the renewal notice and the plan benefits that is similiar to our current plan, results in an increase of 33.1%.

Staff requested additional quotes from other vendors and the results were not satisfactory. Staff then research the state benefits website, which resulted in the state run Partners for Health.

Tennessee Partners for Health is self-funded insurance program specifically offer to municipalities like Thompson's Station to be able to offer better benefits at affordable rates. This program will also offer us the advantage of obtaining an insurance rating within two years.

Staff recommends contracting with the state Partners for Health program for the purpose of keeping our overall costs down and improved benefits to staff.

Steve Banks
Finance Director

STATE OF TENNESSEE
DEPARTMENT OF FINANCE AND ADMINISTRATION
BENEFITS ADMINISTRATION
312 Rosa L. Parks Avenue
Suite 1900 William R. Snodgrass Tennessee Tower
Nashville, Tennessee 37243-1102
Phone (615) 741-3590 or (800) 253-9981
FAX (615) 253-8556

Stuart C. McWhorter
COMMISSIONER

Laurie Lee
EXECUTIVE DIRECTOR

MEMORANDUM OF UNDERSTANDING BETWEEN THE STATE OF TENNESSEE AND LOCAL GOVERNMENT AGENCY

TERMS AND DEFINITIONS

1. **Additional Benefits** means benefit plans offered separately by Local Government Agencies, including those which provide (a) dental benefits, (b) vision benefits, (c) long-term care benefits, (d) disability insurance benefits, (e) life insurance benefits, (f) tort liability or workers' compensation benefits, (g) benefits for a specific disease and/or illness (e.g., cancer, heart, stroke), (h) benefits limited to a fixed amount per day (or other period) of hospitalization, (i) accident, death and dismemberment benefits and (j) any other benefits approved in writing by the Division of Benefits Administration. Any of the above listed plans or policies which reimburses, subsidizes, supplements or pays the costs of participating in the Local Government Health Insurance Plan, or provides coverage, subsidies, credits or payouts of any kind for or related to services or pharmaceuticals covered by the Local Government Health Insurance Plan, including co-pays, member contributions, coinsurance and deductibles, **must** be submitted to benefits.info@tn.gov and approved in writing by the Division of Benefits Administration.

2. **Agency Benefits Coordinator** (ABC) means an individual who serves as the liaison between the State Group Insurance Program, members and Benefits Administration.

3. **Annual Enrollment** means a period in the fall when members are able to change, add or remove benefits. Specific dates for this period are set by Benefits Administration each year.

4. **ACH** means Automatic Clearing House.

5. **Benefits Administration** (BA) means the division of the Tennessee Department of Finance & Administration that administers the State Group Insurance Program.

6. **Business Days** means traditional workdays, including Monday, Tuesday, Wednesday, Thursday and Friday. State government holidays are excluded.

7. **Calendar Days** means all seven days of the week.

8. **CFR** means Code of Federal Regulations.

9. **COBRA** means Consolidated Omnibus Budget Reconciliation Act.

10. **Day(s)** means Calendar Day(s) unless otherwise specified in the MOU.

11. **Edison** means the State's enterprise resource planning system for the administration of benefits enrollment and premium data.

12. **GASB** means Governmental Accounting Standards Board.

13. **Head of Agency** means the chief signing authority for the Local Government Agency.

14. **HIPAA** means Health Insurance Portability and Accountability Act of 1996, Public Law 104-191 and implementing regulations.

15. **HITECH** means Health Information Technology for Economic and Clinical Health Act.

16. **LGA** means Local Government Agency.

17. **Local Government Health Insurance Plan** (also Local Government Plan) means the insurance plans authorized by Tenn. Code Ann. 8-27-702.

18. **Local Government Insurance Committee** means the policy making body for the Local Government Insurance Plan established under Tennessee statelaw.

19. **Local Government Plan Document** (also Plan Document) means the legal publication that defines eligibility, enrollment, benefits and administrative rules of the Local Government Health Insurance Plan.

20. **Member** means any person who is enrolled in one of the medical benefit or voluntary benefit plan options offered through the Local Government Plan.

21. **MOU** means Memorandum of Understanding.

22. **Notify,** unless otherwise specified within this MOU, means to notify Benefits Administration in writing, and the notification may be delivered by electronic mail, facsimile or the U.S. Postal Service.

23. **OPEB** means Other Post-Employment Benefits (other than pensions) that an employee is eligible to receive at the start of retirement.

24. **PHI** means Protected Health Information.

25. **PPACA** means Patient Protection and Affordable Care Act, Public Law 111-148 as amended by Public Law 111-152.

26. **State** means the State of Tennessee.

27. **State Government Holidays** means those days on which official holidays and commemorations as defined in Tennessee Code Annotated 15-1-10 I et seq. are observed.

28. **State Group Insurance Program** means the system operating the insurance plans and benefits for individuals from public sector organizations in Tennessee. The program is operated under the authority of the Local Government Insurance Committee and managed by Benefits Administration within the Department of Finance and Administration.

29. **TCA** means Tennessee Code Annotated.

30. **TCRS** means Tennessee Consolidated Retirement System.

31. **The Tennessee Plan** means the plan offering supplemental medical insurance for retirees with Medicare as defined in Tenn. Code Ann. 8-27-706.

32. **Voluntary Benefits** means benefits other than health insurance benefits which are established and offered by the Local Government Insurance Committee, and fully paid by the employee as defined in Tenn. Code Ann. 8-27-104. Examples include dental and vision insurance.

33. **Website** means the ParTNers for Health Website (www.tn.gov/partnersforhealth), which includes a section specifically for ABCs. ParTNers for Health and ABC information, including publications and forms, can be accessed from this site by going to www.tn.gov/partnersforhealth.

INTRODUCTION

This Memorandum of Understanding (MOU) defines the administrative responsibilities of the Tennessee Department of Finance and Administration, Benefits Administration ("BA") and the _____, an eligible Local Government Agency ("LGA") for the provision of group plan coverage through the State of Tennessee Local Government Health Insurance Plan ("Local Government Plan"), and any available voluntary benefit plans pursuant to TCA 8- 27-702 *et seq.* and TCA 8-27-104.

The Local Government Plan Document ("Plan Document"), approved by the Local Government Insurance Committee pursuant to TCA 8-27-702, defines the eligibility, enrollment, benefits and administrative provisions for the Local Government Insurance Plan. Tenn. Code Ann. 8-27-703(c)(2) requires LGAs to implement and comply with the financial determination of the Insurance Committee, including entering into an MOU. Should any terms of this MOU conflict with any provision of the Plan Document, the Plan Document and Summary Plan Description for The Tennessee Plan (Supplemental Medical Insurance for Retirees with Medicare), or the current certificates of coverage for voluntary benefits, the provisions of those Plan Documents and/or certificates shall control.

This MOU supersedes and replaces all prior MOUs, agreements or other documentation between BA and the LGA describing the responsibilities of the parties with respect to such group benefits.

SECTION 1A- RESPONSIBILITIES OF THE LGA

1. The LGA and its officers and employees shall abide by and enforce all the eligibility criteria for all benefit options offered, including but not limited to, the health plan which is outlined in the Local Government Plan Document, the Plan Document and Summary Plan Description for The Tennessee Plan and the current certificates of coverage for voluntary benefits.

   Individual agencies shall not determine eligibility in a way that conflicts with the Local Government Plan Document or eligibility documents for the voluntary benefit plans, including the Plan Document for The Tennessee Plan and the certificates of coverage. For example, the LGA shall not use a different set of required hours worked to be eligible.

   The eligibility, enrollment, benefit and administrative provisions of the Plan Document, the Plan Document for The Tennessee Plan or the current certificates of coverage for voluntary benefits shall be uniformly enforced by the LGA.

   The LGA shall offer ALL options of the medical plans, including any carriers, networks or plan types available to them. If the LGA elects to participate in the voluntary benefit plans, the LGA shall offer ALL options of those voluntary plans to employees for their selection, including any carriers, networks or plan types available to them.

2. At execution of this MOU, the LGA shall identify a contact person within the organization to serve as an Agency Benefits Coordinator ("ABC") . The ABC must be an employee of the LGA responsible for plan administration and be a liaison between the LGA, its employees and BA. Only ABCs shall have data update and/or inquiry access to Edison for the employees of the agency and their dependents. In no event shall an ABC allow an insurance agent, insurance broker or insurance agency access to Edison. Duties and responsibilities of the ABC are outlined in Section 2 of this document.

3. The LGA shall notify BA within ten (10) business days after a current ABC terminates employment or is no longer responsible for the duties of an ABC. The LGA shall also provide BA with contact information for the new ABC immediately upon designation.

4. The LGA shall notify BA within ten (10) business days of the appointment or election of a new Head of Agency.

5. A first time participating LGA shall complete the Retiree Coverage Election Form, selecting one of the retiree coverage options listed on the form and obtaining appropriate approvals and signatures as outlined on the form. Existing participating LGAs who have previously chosen to opt-in active employees and current retirees or a limited opt out with continued retiree coverage for only current retirees may change its election in a subsequent plan year in accordance with Plan Document section 4.06(A). All retiree coverage elections shall remain in effect unless changed in the manner set out in Plan Document section 4.06(A).

6. The LGA shall assist BA with any audits and other requests related to the compliance of all parties with the Plan Document, the Plan Document and Summary Plan Description for The Tennessee Plan, or eligibility rules for the voluntary plans within fifteen (15) business days of the request.

   The LGA shall be responsible for a financial assessment equal to any expense assessed to BA as a result of the LGA's failure to provide information as requested. BA may deduct assessed expenses from the LGA's Automatic Clearing House (ACH) debit account. BA reserves the ability to waive the assessment as it deems appropriate, and its decisions shall not be subject to appeal or review.

7. The LGA shall respond to survey and information requests from BA within fifteen (15) business days, including but not limited to surveys related to (a) employer/participating agency premium contributions for employees and dependents; (b) employer/participating agency contribution levels based on retirees' years of service for Government Accounting Standards Board Statement #75 (GASB 75)/Other Post-Employment Benefits (OPEB) purposes; and (c) documentation, including pamphlets, enrollment materials, policies, etc. of all additional benefits and other products offered by the employer/participating agency.

   Failure of the LGA to provide the information required by paragraph number 7 may result in BA assessing and collecting the costs incurred by the LGA's failure to cooperate. This assessment may include actuarial consulting fees and the additional cost to the plan caused by non-compliance. In addition, non-compliance may also result in termination of the LGA's participation in the plan. Additionally, the LGA's failure to provide the requested survey information with regard to data required for an OPEB calculation required by GASB 75 shall result in said LGA being excluded from the annual actuarial calculations, valuations and OPEB liability determinations by the actuaries under contract with the State's Department of Finance & Administration. BA reserves the ability to waive the assessment as it deems appropriate, and its decisions shall not be subject to appeal or review.

8. The LGA shall remit the premiums for health and any voluntary plans of coverage if applicable, by means of an ACH debit account. The LGA shall provide the Department of Finance & Administration with at least sixty (60) days' notice before making any change to its bank account or other information that may impact ACH transactions. The LGA shall use the ACH form, instructions and contact information available under the Agency Benefits Coordinator section of the Website as

described in item 33 of the Terms and Definitions section of this MOU.

9. LGA participation in the Local Government Plan shall continue for at least twenty-four (24) consecutive months unless the LGA is determined to be in violation of requirements which necessitates termination by the Local Government Committee.

10. If the LGA discontinues participation in the Local Government Plan, the LGA may not rejoin the Local Government Plan for twenty-four (24) consecutive months, following the date of termination. The LGA shall provide BA with a sixty (60)-day written notice before terminating its participation with the Local Government Plan. BA will terminate any COBRA or retiree participants, including retirees billed through their TCRS pension or direct bill, from the Plan, along with the active employees if the LGA terminates participation. See Exhibit A, Plan Withdrawal Document, for more detail regarding the withdrawal process.

11. A LGA participating in the Local Government Health Insurance Plan may offer the state-sponsored voluntary plan(s) to its employees and retirees. Retiree vision coverage may only be offered if the LGA has opted in to retiree medical coverage. The dental and/or vision voluntary plan(s) may be effective on the agency's original effective date or on a subsequent January 1. The LGA must submit a written intent to enroll notice to BA by July 1, or another date announced by BA, of the year preceding the January I effective date for dental and/or vision. LGA participation in the dental plan and/or vision plan shall continue for at least twelve (12) consecutive months coinciding with a calendar year. The LGA shall provide BA with a sixty (60) day written notice before terminating its participation in the voluntary plans. If the LGA discontinues participation in the dental and/or vision plan, the LGA acknowledges that its employees will not be eligible for COBRA and that the LGA may not rejoin the dental and/or vision plan for at least twelve (12) consecutive months, beginning on the date of termination. If the LGA rejoins the dental and/or vision plan, eligible employees may sign up during the next annual enrollment period. (For example, an agency that drops the dental plan as of 3/1/18 would not be able to offer the dental plan again until 1/1/20.) If a LGA discontinues participation in the medical insurance plan, participation in the voluntary plans will terminate on the same date as the medical insurance plan.

12. Prohibition on other coverages:
(a) A LGA participating in the Local Government Health Insurance Plan **shall not** offer, subsidize or incentivize enrollment of individuals eligible for the state-sponsored group insurance program into any health plan, health insurance policy or medical expenses plan other than the state-sponsored group insurance plan (including state offered voluntary benefits) and those plans which constitute "additional benefits" as defined in (b) below. A LGA participating in the Local Government Plan may offer additional benefits approved by Benefits Administration, instead of or in addition to the voluntary benefits in the state group insurance program.

(b) For the purpose of (a) above, the term "health plan" includes any health plan or policy, medical insurance plan or policy, excepted benefit policy, supplemental benefit policy, gap or bridge policy and any plan or policy that reimburses, indemnifies, contributes to, supplements or pays the costs of participating in the Local Government Health Insurance Plan, or provides coverage, subsidies or credits for services or pharmaceuticals covered by the Local Government Health Insurance Plan, including co-pays, member contributions, coinsurance and deductibles. For purposes of this MOU, this definition of "health plan" is not affected by whether a plan, or expenses paid under a plan, is considered a supplemental plan, health plan or an excepted benefit under Federal law.

(c) Failure of the LGA to provide the information required by paragraph number 7 regarding additional benefit plans may result in Benefits Administration assessing and collecting the costs incurred by the LGA's failure to cooperate. This assessment may include actuarial consulting fees and the additional cost to the plan caused by non-compliance. In addition, non-compliance may also result in termination of the LGA's participation in the plan.

(d) A LGA's offering, subsidizing or incentivizing participation in any product prohibited by section (a) above may result in Benefits Administration assessing and collecting the costs incurred by the

LGA's failure to cooperate. This assessment may include actuarial consulting fees and the additional cost to the plan caused by non-compliance. In addition, non-compliance may also result in termination of the LGA's participation in the plan.

13. If the LGA does not have any employees enrolled in health coverage for more than sixty (60) days, the agency will be terminated from the Local Government Plan and shall be ineligible to re-join the Local Government Plan for at least twenty-four (24) months.

14. The LGA shall abide by the refund policy as stated in the Local Government Plan Document, with the understanding that any ineligible claims will be recovered before a refund is released to the agency.

15. The LGA has the primary responsibility for determining eligibility pursuant to the provisions of the Plan Document and/or the voluntary benefits eligibility documents. The LGA may refer any eligibility question to BA for written clarification. In the absence of such written clarification, the LGA shall reimburse the State for the cost of benefits provided because of any inaccurate representation of eligibility that its employees may make that result in an otherwise ineligible individual becoming enrolled for and receiving benefits. The LGA shall terminate enrollment for the employee and dependents and notify BA when it is discovered that an employee and/or dependent(s) was ineligible for coverage.

16. All LGAs shall download the Premiums Due Collections Applied reports through Edison (the State's enterprise resource planning system used for the administration of benefits enrollment and premium data). If the LGA fails to download such reports and requests hard copies, the LGA shall first pay an annual fee of six hundred dollars ($600.00) to BA payable/collected through the ACH debit account. BA reserves the authority to waive the annual fee as it deems appropriate, and its decisions shall not be subject to appeal or review.

17. If the LGA has more than twenty-five (25) members, it shall maintain two (2) ABCs who have access to Edison at all times. For security purposes, no LGA shall have more than two ABCs with Edison access unless additional ABCs have been authorized by BA.

18. Each ABC shall perform data entry in Edison. This includes adding biographical and job information for all employees. If the LGA has less than one hundred (100) employees, it must maintain, at minimum, "view only" access to Edison and shall have the option to perform data entry in Edison but only through the end of the 2016 calendar year. Effective 1/1/2017, all LGAs shall perform data entry in Edison regardless of number of employees.

19. The LGA may request in writing a copy of its claims experience and/or enrollment information from BA. BA will only provide a copy of such report results directly to the ABC or other authorized LGA employee. At no time shall BA deliver such report to an insurance agent or broker. Such report shall not contain any personal identifiers or individual claims detail or other information restricted by HIPAA. The guidelines for release of claims and enrollment information and the formal "Request for Enrollment or Claims Information" may be found on the ABC section of the Website as described in item 33 of the Terms and Definitions section of this MOU. BA shall provide claims data consistent with the requirements to provide claims data under TCA §8-27-302(g).

20. The LGA shall notify BA within five (5) business days of receipt of a Medicare demand letter or other notice explaining that Medicare may have made a primary payment for services instead of a secondary payment for services. The LGA shall deliver a copy of such letter or other notice via facsimile, electronic mail or hard copy delivery within the same five-day time period.

21. The LGA shall maintain an up-to-date insurance file on each participating member which shall include, at a minimum, the signed "Employee Insurance Checklist - Local Government Plan" (a copy may be found on the ABC section of the website at www.tn.gov/partnersforhealth/agency-benefits-coordinators, a copy of any manually completed enrollment forms and a copy of any Edison reports reflecting benefits chosen by the member. The LGA can maintain either an electronic or hard copy (or both). Copies of files may be requested by BA for audit determination.

22. The LGA shall be responsible for complying with all employer reporting requirements and employee notifications required under the Patient Protection and Affordable Care Act (PPACA). Each agency on the Plan is considered to be a self-insured employer and must follow the self-insured reporting guidelines.

23. The LGA shall be responsible for any penalties imposed for failure to comply with PPACA. This responsibility includes but is not limited to penalties under the PPACA amendments to the Public Health Service Act (42 U.S.C. 300 gg et seq), the employer responsibility section of the Internal Revenue Code (26 U.S.C. 4980H), and regulations implementing those provisions. The LGA shall also reimburse BA for any expenses caused by the LGA's failure to terminate coverage in Edison when that failure leads to claims being paid after the coverage should have been terminated. This could create a risk of a rescission under the PPACA regulations if untimely notice leads to retroactive termination.

24. For each member termination, the LGA shall enter the termination into Edison or notify BA if the ABC does not have access to Edison within five (5) business days of the termination. The LGA shall reimburse the State for any penalties, fines, assessments or damages incurred associated with late COBRA and other notices that result from a delayed notification from the LGA to BA of the termination of an employee or member. Any termination entered after five (5) business days from the date of termination, shall be subject to premium refund provisions of the Local Government Plan Document.

25. To the extent that the LGA varies its employer contribution by benefit option, third party administrator or premium tier, the LGA assumes all compliance duties and risks associated with the statutory requirements of federal and state law, including but not limited to the nondiscrimination and wellness requirements in the Health Insurance Portability and Accountability Act (HIPAA, Pub. L. 104-191) as amended and the Americans with Disability Act (ADA, Pub. L. 101-336), as amended. The LGA may refer to "Contributions" in the Local Government Plan Document and any other publications or frequently asked questions (FAQs) which BA may publish for information regarding the State's contribution policy. The LGA shall also consult with its legal counsel to ensure that the LGA's approach is in compliance with all applicable legal requirements.

26. In the event that a change in federal laws or regulations, including but not limited to COBRA, requires changes in the procedures set out in Section 1 of this MOU, the LGA will comply with those requirements regardless of whether this MOU is formally amended.

27. Hold Harmless. The LGA agrees to reimburse the State for financial losses caused by the LGA's violation of Federal laws or regulations governing the conduct of a health insurance plan. Such Federal provisions include, but are not limited to the Patient Protection and Affordability Act (PPACA); the Health Insurance Portability and Accountability Act (HIPAA), the Health Information Technology for Economic and Clinical Health Act (HITECH), and the Consolidated Omnibus Budget Reconciliation Act (COBRA). The LGA's responsibility under this provision includes any fines, penalties or legal costs incurred by the State as a result of the LGA's violation of Federal law.

SECTION 1B - OTHER RESPONSIBILITIES OF THE LOCAL GOVERNMENT AGENCY - OBLIGATIONS AND ACTIVITIES WITH REGARDS TO HIPAA

HIPAA and HITECH Compliance

1. The LGA shall comply with obligations under HIPAA and HITECH and their accompanying regulations. The Local Government Plan is a covered entity under the Administrative Simplification Provisions of HIPAA. The LGA shall take all appropriate measures to protect the privacy and security of the protected health information it receives from members electing coverage under the Plan. All agency employees who have access to Edison insurance benefits are required to complete the annual HIPAA training online. Failure to comply with mandatory training requirements may result in suspension of insurance

benefits access. Training requirements will not be waived unless approved in advance by the BA HIPAA compliance officer.

2. The LGA warrants that it is familiar with the requirements of HIPAA and HITECH and their accompanying regulations and shall comply with all applicable HIPAA and HITECH requirements in the course of this Contract, including but not limited to the following:
   - Compliance with the Privacy Rule, Security Rule, Notification Rule;
   - The creation of and adherence to sufficient Privacy and Security Safeguards and Policies;
   - Timely reporting of violations in use and disclosure of PHI; and
   - Timely reporting of privacy and/or security incidents.

3. The LGA warrants that it will cooperate with the covered entity, including cooperation and coordination with covered entity privacy officials and other compliance officers required by HIPAA and HITECH and its regulations, in the course of performance of the duties so that both parties will be in compliance with HIPAA and HITECH.

Privacy & Confidentiality

1. The LGA shall develop, adopt and implement standards, which are, at a minimum, compliant with the HIPAA privacy and security rules in 45 CFR Part 164, to safeguard the privacy and confidentiality of all PHI about members. For example, the LGA shall ensure that it does not have completed forms containing PHI sitting in public view, left in unsecured boxes or files or left unattended in any off-site location (e.g., in an automobile). The LGA's procedures shall include but not be limited to safeguarding the identity of members as members of the State Group Insurance Program and preventing the unauthorized disclosure of PHI. The LGA shall comply with the HIPAA amendments in Public Law 111-5, the HITECH Act, and any implementing regulations when they become effective.

2. The PHI shall be used for the purposes of carrying out the responsibilities of this MOU related to the LGA's participation in the Local Government Insurance Plan.

3. The LGA shall not use or further disclose PHI other than as permitted or required by HIPAA; or as required by law. Use of PHI for payment, treatment or health care operations may include disclosure only as permitted by HIPAA, including when such information is strictly necessary to resolve the issue or concern under discussion and the person has adequate permission or legal authority to review such information.

4. The LGA shall use appropriate safeguards to prevent the unauthorized use or disclosure of the PHI. The LGA shall report to the State any unauthorized use or disclosure of the PHI.

5. The LGA shall mitigate, to the extent practicable, any harmful effect that is known to the LGA of a use or disclosure of PHJ by the LGA in violation of the requirements of the federal privacy rule.

6. The LGA shall provide access to PHI in a "designated record set" in order to meet the requirements under 45 CFR §164.524.

7. The LGA shall make any amendment(s) to PHI in a "designated record set" pursuant to 45 CFR §164.526.

8. The LGA shall document disclosures of PHI and information related to such disclosures as would be required to respond to a request by an individual for an accounting of disclosures of PHI in accordance with 45 CFR §164.528.

9. The LGA shall cooperate in making relevant records available to the secretary of health and human services for determining HIPAA compliance when required by 45 CFR 164.504(e)(2)(ii)(l)

10. The LGA shall (i) implement administrative, physical and technical safeguards that reasonably and appropriately protect the confidentiality, integrity and availability of the electronic PHI that it creates,

receives, maintains or transmits, (ii) report to the State any security incident (within the meaning of 45 CFR § 164.304) of which the LGA becomes aware, and (iii) ensure that any agent of the LGA, including any subcontractor, agrees to the same restrictions and conditions that apply to the LGA with respect to such information.

11. The LGA shall comply with all privacy and security requirements of the Health Insurance Portability and Accountability Act (HIPAA) of 1996 and the Health Information Technology for Economic and Clinical Health (HITECH) Act. Unless the State prior approves in writing the LGA's use of alternate mitigating controls, the LGA shall use Federal Information Processing Standards (FIPS) 140-2 compliant technologies to encrypt all PHI in motion or rest, including back-up media.

12. The LGA shall have full financial responsibility for any penalties, fines or other payments imposed or required as a result of the LGA's non-compliance with or violation of HIPAA or HITECH requirements, and the LGA shall indemnify the State with respect to any such penalties, fines or payments.

13. The LGA is authorized to use PHI for the purpose of carrying out its duties under the MOU. In the course of carrying out these duties, including but not limited to carrying out Benefits Administration's duties under HIPAA. LGA shall fully comply with the requirements under the Privacy Rule applicable to "business associates", as that term is defined in the Privacy Rule and not use or further disclose PHI other than as permitted or required by this agreement or as required by law. Business Associate is subject to requirements of the Privacy Rule as by Public Law 111-5, Section 13404 [designated as 42 U.S.C. 17934].

14. Minimum Necessary- LGA (and its agents or subcontractors) shall only request, use and disclose the minimum amount of protected information necessary to accomplish the purpose of the request, use or disclosure, in accordance with the Minimum Necessary requirements of the Privacy Rule including, but not limited to, 45 C.F.R. Sections 164.502(b) and 164.514(d).

15. Notification of Breach- During the term of this MOU, LGA shall notify Benefits Administration within two (2) business days of any suspected or actual breach of security, intrusion or unauthorized use or disclosure of PHI and/or any actual or suspected use or disclosure of data in violation of any applicable federal or state laws or regulations. LGA shall take (i) prompt corrective action to cure any such deficiencies and (ii) any action pertaining to such unauthorized disclosure required by applicable federal and state laws and regulations.

16. This Agreement authorizes and LGA acknowledges and agrees covered entity shall have the right to immediately terminate this agreement and service contracts in the event LGA fails to comply with, or violates a material provision of, requirements of the Privacy and/or Security Rule or this Memorandum. Upon termination of this MOU for any reason, LGA agrees to return or destroy PHI covered by this agreement at the direction of the Covered Entity as required by 45 CFR 164.504(e)(2)(ii)(J).

SECTION 2 - RESPONSIBILITIES OF THE AGENCY BENEFITS COORDINATOR (ABC)

Note: Applicable forms and publications may be found on the ParTNers For Health Website under the ABC heading.

1. The ABC shall serve as a liaison between the LGA, its employees and BA.

2. During the new employee orientation, the ABC shall:
   - Ensure the employee reviews and signs "Employee Insurance Checklist - Local Government Plan," which shall then be placed in the employee insurance file;
   - Provide to the new employee a TennCare notice and any other notices or information required by the Patient Protection and Affordable Care Act (PPACA), including the federal Marketplace letter;
   - Provide access to the "Benefits Administration Eligibility and Enrollment Guide" for Local Government Employees, HIPAA Notice of Privacy Practices brochure, applicable vendor materials, enrollment forms, any applicable dental and vision handbooks or brochures, provide

web address to locate the Summary of Benefits and Coverage tn.gov/partnersforhealth or provide a printed copy if requested, and provide any materials related to new plans of coverage to the new employee;
- Provide to the employee the deadline to return completed enrollment forms or make their selections online using Employee Self Service (ESS) in Edison;
- Describe to the eligible employee all available benefits options offered under the Local Government Plan;
- Ensure the employee receives any new employee orientation materials provided by BA;
- Explain to the employee the enrollment options including the consequences and next steps if the employee elects not to enroll either self and/or eligible dependents during the initial enrollment period, and how the annual enrollment period works;
- Identify the effective date of coverage for the employee and any dependents;
- Describe to the employee how and when to add newly acquired dependents, and explain the member's responsibility to provide documentation to verify dependent eligibility;
- Provide information to employee on premium amounts for all available benefit programs;
- Specify to the employee how to make changes to coverage or terminate coverage on either self or dependents, including the employee's obligation to immediately notify the ABC and BA of any change in dependent eligibility status;
- Review with the employee the impact of a leave of absence from employment on benefits;
- List for the employee the benefits options members have at the time of termination of employment (COBRA, retirement); and
- Ensure that each new employee is aware of the BA Website and the ParTNers For Health Website (as described in item 33 of the Terms and Definitions section of this MOU), the BA Service Center contact information, and the contact information for each vendor

3. All ABCs must participate in monthly/weekly ABC calls with BA staff.

4. All ABCs must complete any annual mandatory training offered by Benefits Administration. New ABCs, including those who are replacing other ABCs, shall complete initial mandatory training offered by Benefits Administration and may be required to pass a test to get system access. Initial ABC training must be completed within sixty (60) days of becoming a new ABC. Failure to comply with all training requirements will result in suspension of insurance benefits access. Training requirements will not be waived unless approved in advance by BA.

5. All new ABCs must complete initial HIPAA training module in Edison ELM within thirty (30) days of access to system. All ABCs (primary & backup) must complete the HIPAA training ANNUALLY during the scheduled training month or as otherwise prescribed. ABCs are responsible for enrolling and accessing the HIPAA training in the Edison ELM module. Failure to complete the annually HIPAA training will result in suspension of access to Edison and will not be restored until HIPAA training is complete. There is an instructional video for the training provided on the Partners for Health YouTube channel.

6. All ABCs shall comply with the procedures set forth in the "ABC Training Presentation - Session I and ABC Training Presentation - Session II" and the "External Agency Calendar" of Edison activities published on the ABC section of the Website as described in item 33 of the Terms and Definitions section of this MOU. Some of these procedures include but are not limited to:
   - Entering into Edison personal and job information for employees;
   - Answering general member questions on benefits and eligibility;
   - Keeping members' addresses and telephone numbers current in Edison; and
   - Downloading reports as necessary via Edison.

7. The ABC shall refer all eligibility or policy questions related to creditable years of service and monetary retirement benefits to the Tennessee Consolidated Retirement System (TCRS) staff. The ABC shall also be familiar with the various provisions in the "Local Government Plan Document" related to insurance benefits and eligibility for coverage. Questions about retiree eligibility and questions about the annual enrollment period for retirees shall be directed to BA. The ABC is responsible for certifying the Application to Continue Insurance at Retirement.

8. The ABC shall refer the member to the ParTNers For Health Website at www.tn.gov/partnersforhealth for information concerning the process for appeals. This information is available in the Member Handbooks, the Summary of Benefits and Coverage and the Plan Document,

all of which are posted on the Website.

9. The ABC shall answer general questions on the coverages offered by the Local Government Plan. The ABC shall refer any detailed eligibility inquiries to the BA Service Center. The ABC shall refer any detailed benefits inquiries to the appropriate insurance carrier.

10. The ABC shall coordinate or assist with events or benefits fairs related to these products, including reserving meeting space, as requested by BA and ensuring that employees/members are aware of these events.

11. The ABC shall assist with requests from BA to help with ensuring the agency members respond to requests for information and otherwise comply with sections "5.04, Subrogation"; "5.05, Right of Reimbursement"; and "5.06, Recovery of Payment" of the Local Government Plan Document.

12. Quarterly, upon request, the ABC shall provide an email address file for all their employees to Benefits Administration within fifteen (15) days of the request.

13. The ABC shall limit the number of administrative error letters submitted. Administrative errors submitted will be reviewed quarterly. An excessive amount of administrative error letters will result in BA contacting the ABC for retraining. The ABC shall lose access to Edison until retraining is completed. The number of errors allowed will be defined and communicated to all agencies based on agency size.

14. The ABC will be required to respond to a yearly audit of ABC security access for their agency. Failure to comply within the time frame given in the audit email communication will result in removal of the agency's access to the Edison system.

15. The ABC will receive quarterly reports from a data match with the NCOA (National Change of Address) database. The ABC shall update addresses in Edison based on the results.

16. The ABC will receive monthly emails on any missing valid Social Security numbers (SSN) for enrolled members. The ABC shall provide the correct SSN to BA by the end of the current month.

SECTION 3 - RESPONSIBILITIES OF BA

1. BA will notify the LGA of any annual premium increase or benefit changes as soon as this information is available.

2. BA, in conjunction with the State of Tennessee Comptroller of the Treasury, will conduct audits to verify that policies and procedures of the Local Government Plan Document are enforced. In addition, BA will conduct reviews of new enrollments to determine if they are eligible for coverage based on Plan Document provisions.

3. BA will publish an up-to-date version of the Plan Document on the ParTNers For Health Website and notify the LGA of any changes.

4. BA will establish and maintain a call center to assist the ABCs and LGA employees in understanding eligibility Plan provisions of and obtaining benefits under the Local Government Plan.

5. BA will provide information to the ABCs on the programs offered under the State Group Insurance Program.

6. BA will assist the ABCs with policy, premium and eligibility questions, processing enrollment/change applications and refund issues.

7. BA will provide each LGA with any available new employee orientation materials.

8. BA will provide training for ABCs. BA will refer new ABCs to the "ABC Training Presentation

- Day 1 and ABC Training Presentation - Day 2" and will answer questions on using Edison when contacted by ABCs.

9. BA will make available an electronic copy of the "ABC Training Presentation - Session I and ABC Training Presentation Session II" and post a monthly "External Agency Calendar" of scheduled Edison activities on the ParTNers For Health Website under the ABC heading.

10. BA will ensure that members have access to an appeals process.

11. BA will administer the continuation of insurance through COBRA.

12. Where appropriate, BA will provide the LGA with information necessary to assist the agency in complying with employer reporting requirements and employee notifications required PPACA.

13. BA will conduct monthly conference calls to provide information and updates. The conference calls will be held weekly leading up to and during the annual enrollment period. Weekly emails will be sent throughout the year to communicate updated information.

Legal Advice: This is a document that binds the signing parties to legally enforceable obligations. BA recommends that you have your legal counsel review this document. BA does not provide legal advice to LGAs and any information that BA provides concerning State or Federal laws is not intended as legal advice.

We understand and agree to abide by the terms and conditions set forth in this document.

LOCAL GOVERNMENT AGENCY:

_____

Primary ABC (Printed Name/Signature)

_____

Date

_____

Head of Agency (Printed Name/Signature)

_____

Date

_____

Fiscal Officer (Printed Name/Signature)

_____

Date

BENEFITS ADMINISTRATION:

By: Laurie Lee, Executive Director

_____

Signature

_____

Date

Phone: (615) 794-4333
Fax: (615) 794-3313
www.thompsons-station.com

1550 Thompson's Station Road W.
P.O. Box 100
Thompson's Station, TN 37179

DATE: January 14, 2020

TO: The Board of Mayor and Aldermen (BOMA)

FROM: Wendy Deats, Town Planner/Micah Wood Interim Town Planner

SUBJECT: **Item g – Resolution 2020-003 – Littlebury Development Agreement**

On October 28, 2018, the Planning Commission approved the preliminary plat for the creation of 91 single-family lots, 13 open space lots and the removal of 14 trees on 91.17 acres located along the east side of Pantall Road with the following contingencies:

1. Prior to the approval of construction plans, the developer shall enter into a development agreement for the project.
2. Prior to the approval of a final plat, roadway dedication along the entire project frontage on Pantall Road shall be incorporated into the plat for recordation of the public right-of-way.
3. Prior to the approval of construction plans, the developer shall obtain any necessary permits through the Tennessee Department of Environment and Conservation.
4. Prior to the approval of construction plans, the developer shall obtain BOMA approval for a wastewater management plan.
5. Prior to the approval of construction plans, all applicable codes and regulations shall be addressed to the satisfaction of the Town Engineer. Any corrections or issues with the drawings related to regulations may be subject to further Planning Commission review.
6. Prior to the approval of construction drawings, a drainage study shall be submitted to verify that storm water is managed adequately on site.
7. All landscape buffers and replacement trees shall be installed and maintained in a healthy manner.
8. Any signage proposed for the subdivision shall comply requirements set forth within the Land Development Ordinance and shall be located within the open space and maintained by the homeowner's association.
9. Street lights shall be incorporated in accordance with the Land Development Ordinance and shall be documented on the construction drawings.
10. All construction traffic into these phases shall be required to use Cherry Jack during phase 1. Upon completion of phase 1 and the final topping of the roadways within the phase, Littlebury Park shall be used for all construction traffic. No construction traffic is permitted on Baugh Road or Regal Court.
11. All recommendations within the geotechnical report shall be adhered to during construction activities. Any new information or features not identified shall be subject to the review by a geotechnical engineer.
12. All recommendations within the traffic study shall be completed.
13. Any change of use or expansion of the project site shall conform to the requirements set forth within the Land Development Ordinance and shall be approved prior to the implementation of any changes to the project.

Phone: (615) 794-4333
Fax: (615) 794-3313
www.thompsons-station.com

1550 Thompson's Station Road W.
P.O. Box 100
Thompson's Station, TN 37179

14. Prior to final plat approval, Critz Lane improvements shall be complete or additional information related to the direct impact of the project on Critz Lane and Pantall Road shall be submitted for review.

The developer has reviewed and signed the development agreement provided by Staff. Therefore, Staff recommends the Board of Mayor and Aldermen approve the resolution to accept the Development Agreement for the Littlebury development.

Attachments
Resolution 2020-003
Development Agreement

RESOLUTION NO. 2020-003

A RESOLUTION OF THE TOWN OF THOMPSON'S STATION, TENNESSEE TO APPROVE A SUBDIVISION DEVELOPMENT AGREEMENT WITH THE LITTLEBURY DEVELOPMENT COMPANY FOR THE LITTLEBURY NEIGHBORHOOD/SUBDIVISION (LOTS 1 – 91) AND TO AUTHORIZE THE MAYOR TO EXECUTE SAID AGREEMENT.

WHEREAS, Littlebury Development Company ("Developer") is developing 91 lots within Littlebury neighborhood/subdivision and has received plat approval for such development;

WHEREAS, the Town's Land Development Ordinance requires the Developer to enter into a Subdivision Development Agreement with the Town prior to the commencement of construction; and

WHEREAS, the Board of Mayor and Aldermen have determined that it is in the best interest of the Town to approve the attached Subdivision Development Agreement with Developer to allow for the Littlebury development.

NOW, THEREFORE, BE IT RESOLVED by the Board of Mayor and Aldermen of the Town of Thompson's Station as follows:

That the Subdivision Development Agreement attached hereto as Exhibit A and incorporated herein by reference, is approved and the Mayor is hereby authorized to execute said agreement on behalf of the Town.

RESOLVED AND ADOPTED this 14th day of January, 2019.

_____
Corey Napier, Mayor

ATTEST:

_____
Regina Fowler, Town Recorder

APPROVED AS TO LEGALITY AND FORM:

_____
Town Attorney

Development Agreement for
Littlebury: All Phases – Lots 1 – 91

THIS SUBDIVISION DEVELOPMENT AGREEMENT (hereinafter the "Agreement"), is made effective this the 14th day of January**,** 2020 (hereinafter the "Effective Date"), by and between Littlebury Development Company with principal offices located at 7123 Crossroads Boulevard, Suite E, Brentwood, TN 37027, (hereinafter the "Developer(s)"); and the Town of Thompson's Station, Tennessee, a municipality duly incorporated, organized, and existing under the laws of the State of Tennessee (hereinafter the "Town").

I. PURPOSE OF THE AGREEMENT

1. The Developer is the owner of real property located on Pantall Road, south of Critz Lane and identified as Williamson County tax map 145, parcel 034.11. The property contains approximately 91 acres +/-, (hereinafter the "Project Site"). The Project Site is currently zoned D1 (Low Intensity Residential).

2. The Developer desires to improve and develop the Project Site or a portion of the Project Site into a development to be known as Littlebury, (hereinafter the "Project"), under the regulations of the Town current on the Effective Date of the approval of Preliminary Plat.

3. This Agreement is subject to Town approval of the Final Project Documents for the Project, which includes but is not limited to plat approvals (with conditions as determined by the Town), detailed construction plans and specifications, in accordance with the Town's charter, ordinances, rules, regulations, and policies (hereinafter "Town Regulations") as well as State law, and applicable sureties. In addition, this agreement is subject to all the terms and conditions contained in the MOU between the Town and the Developer. The Developer and Town agree that all Final Project Documents, including the MOU shall be attached to this Agreement as **Collective Exhibit "A"** and incorporated herein by reference after their approvals by the Town.

4. The Developer agrees to install necessary and required public improvements (hereinafter "Public Improvements") as shown on the Final Project Documents including, but not limited to: water lines, fire hydrants, sanitary sewer and sanitary sewer lines, grading, streets, curbs, gutters, sidewalks, street name signs, traffic control devices, street lights and underground electrical power and gas utilities, as well as all other improvements designated herein, at no cost to the Town.

5. The Developer agrees to install and maintain private improvements and amenities, as applicable and as shown on the Final Project Documents, including, but not limited to: private streets and alleys, fences, walls, lakes, common open space, site lighting, storm water management systems, retention and/or detention basins, storm sewers, inlets etc., landscaping and related irrigation systems, relative to said Project, none of which shall be accepted for maintenance by the Town.

9. The Town agrees to approve the Project subject to the Developer's compliance with applicable Town Regulations and the conditions set forth herein in **Exhibit "B"**, and the Town agrees to

provide customary services to the Project in accordance with the Town's Regulations after Final Acceptance, as defined herein.

II. GENERAL CONDITIONS

1. *Affidavit of Payment* - Prior to Final Acceptance, the Developer shall deliver to the Town an affidavit certifying that all subcontractors and material suppliers furnishing labor and/or material for the Public Improvements required under this Agreement have been paid in full. The Developer shall also provide a written release of any and all liens and/or security instruments, and of the right to claim liens, from all subcontractors and material suppliers furnishing labor or materials for the Public Improvements.

2. *Approval of the Final Project Documents* - The Final Project Documents, which are attached hereto as **Collective Exhibit "A"** and incorporated herein by reference, shall be stamped as approved by the Town, provided that the same are in compliance with Town Regulations. All construction relating to the Project shall be subject to inspection and approval by the Town until Final Acceptance and shall be subject to any conditions set forth on **Exhibit "B"**.

3. *Construction Activity Periods* - The Developer will not carry on or permit construction activity under this Agreement earlier than 7:00 a.m. and not later than 6:00 p.m., Monday through Saturday, and no construction activity shall occur on Sundays or holidays. Construction hours shall be enforced by the Town at the Developer's expense.

4. *Construction Standards* - The Developer shall construct the Project as shown on the approved Final Project Documents in accordance with requirements of the Town Regulations.

5. *Demolition* - The Developer agrees to secure all required permits from the necessary governmental entities, including the Town, for the demolition of structures on the Project Site. The Developer further agrees that it will haul all scrap, buildings, materials, debris, rubbish and other degradable materials to an authorized landfill and shall not bury such materials within the Project Site.

6. *Deposition of materials in street prohibited* - All construction material, including, without limitation, mud, silt, dirt, and gravel, shall be kept off existing streets at all times. In the event such mud, silt, dirt, gravel or other construction material is washed, blown, or carried into an existing street, the Developer shall take immediate steps to remove such materials. If the Developer does not remove such materials after notification by the Town, and the Town deems it necessary to clean the affected streets, the Developer agrees to reimburse the Town for all such cleaning expenses, plus an additional twenty-five percent (25%) for administrative expenses related to the same.

7. *Development Agreement Modification Fees* - The Developer agrees to pay the fee for any modifications to this Agreement in accordance with the Town schedule of fees applicable to such a modification and that are current at the time of submittal of a written request for a modification by the Developer, including, but not limited to, time extensions, addendums, or amendments.

8. *Developer's Default* - The Developer agrees that should it default in performing any of its obligations under this Agreement, and it becomes necessary to engage an attorney to file necessary legal action to enforce provisions of this Agreement or sue for any sums of money due and owing or liability arising incidental to the Agreement, Developer shall pay to the Town all reasonable attorney's fees and expenses of litigation stemming from said default.

9. *Developer's Liability* - It is expressly understood and agreed that the Town is not and could not be expected to oversee, supervise and/or direct the implementation of all construction and improvements contemplated in this Agreement. The Town is not responsible for the design of the Project or any way the suitability of the property for Project.

   a. The Town Planner or his or her designee may make periodic inspections and has the right to enforce the provisions of this Agreement and Town Regulations.
   b. The Developer now has and shall retain the responsibility to properly anticipate, survey, design and construct the Project improvements and give full assurance that same shall not adversely affect the flow of surface water from or upon any property.
   c. In providing technical assistance, plan and design review, the Town does not and shall not relieve the Developer from liability, and the Town does not accept any liability from the Developer.
   d. The Developer will provide its own Project Engineer and may not rely on the review of Town staff or its engineers with respect to the Project.
   e. Neither observations by the Town, nor inspections, tests or approvals by others shall relieve the Developer from its obligation to perform work in accordance with Town Regulations and the terms of this Agreement.

10. *Duration of Obligations* - The obligations of the Developer hereunder shall run with the Project Site until the Developer's obligations have been fully met, as determined by the Town in its sole and absolute discretion. Any party taking title to the Project Site, or any part thereof, prior to Final Acceptance shall take said real property subject to such obligations. The Developer shall not be released of its obligations under this agreement without the express, written approval of the Town.

11. *Easements* - The Developer agrees that it will grant all necessary easements and rights-of-way, as determined by the Town, across its property necessary to satisfy the requirements of this Agreement without expense to the Town and will waive any claim for damages from the Town. Any off-site easements and/or right-of-way owned by others but required for the project must be obtained by Developer, recorded prior to approval of the Agreement, and noted on the Final Project Documents.

12. *Emergency Response* - In emergencies affecting the safety or protection of persons or the work or property at the Project Site or adjacent thereto, the Developer, without special instruction or authorization from the Town, is obligated to act to prevent threatened or eminent damage, injury, or loss.

13. *Indemnity* - Developer shall indemnify and hold the Town harmless and agrees to defend the Town and the Town employees, agents, and assigns against any and all claims that may or happen to arise out of or result from the Developer's performance or lack of performance under this Agreement, whether such claims arise out of the actions or inactions of the Developer, any subcontractor of the Developer, or anyone directly or indirectly employed by,

or otherwise directly or indirectly involved with the Project at the direction of the Developer or subcontractor of the Developer. This indemnity and hold harmless agreement includes, without limitation, all tort claims, both intentional and otherwise, and all claims based upon any right of recovery for property damage, personal injuries, death, damages caused by downstream deposits, sediment or debris from drainage, damages resulting from the Developer changing the volume or velocity of water leaving the Developer's property and entering upon the property of others, storm water that is allegedly impounded on another property and claims under any statutes, Federal or state, relative to water, drainage and/or wetlands, and reasonable attorney's fees and costs incurred by the Town in defending itself or its employees, agents, or assigns as a result of the aforesaid causes and damages and/or enforcing this Agreement.

14. *Notice of Violation* - The Town Planner and/or Town Engineer, or his or her designee, may issue a Notice of Violation (NOV) when violations of Town, State, or Federal laws and/or regulations are observed.

    a. If the Developer has not corrected the violation identified in the NOV, then the Developer agrees that the Town acting through the Town Planner and/or Town Engineer may perform the necessary work to eliminate the violation and document all expenses incurred in performing the work. Developer shall reimburse the Town for all such expenses plus an additional reasonable administrative cost not to exceed twenty-five percent (25%).
    b. Prior to releasing any Security hereunder and as herein defined, all expenses incurred by the Town relative to the foregoing shall be paid in full by the Developer.
    c. The Town may issue a Stop Work Order (SWO) if the Developer does not promptly correct any deficiency or violation identified in the NOV in the reasonable time determined by the Town. The Developer agrees to comply with any SWO issued by the Town. If Developer fails to comply with a SWO, the Developer shall be responsible for all costs the Town incurs, including reasonable attorneys' fees, in seeking a restraining order or other injunctive relief or legal action to remedy any deficiency or violation.

15. *Ownership of Public Improvements* - The Developer shall be responsible for all Public Improvements until Final Acceptance by the Town. Developer shall have no claim, direct or implied, in the title or ownership of the Public Improvements after Final Acceptance. The Town shall have no obligation to maintain any Public Improvements unless and until Final Acceptance of the Public Improvement(s).

16. *Permit Availability* - A copy of all required permits and Final Project Documents must be kept on the Project Site at all times. If a NPDES Storm Water Construction Permit is required by TDEC, or any other permit required by any governmental entity, a copy of the Notice of Intent and the Notice of Coverage, or equivalent documents, shall be provided to the Town Engineer prior to commencement of construction for the Project.

17. *Relocation of Existing Improvements* - The Developer shall be responsible for the cost and liability of any relocation, modification, and/or removal of utilities, streets, sidewalks, drainage and other improvements made necessary by the development of the Project, both on and off site.

18. *Right of Entry* - The Developer agrees that the Town shall have the right, but not the duty, to enter the Project Site and make emergency repairs to any public improvements when the

health and safety of the public requires it, as determined by the Town in its sole and absolute discretion. The Developer will reimburse the Town for the costs incurred by the Town in making said repairs, plus an additional reasonable fee for administrative costs not to exceed twenty-five percent (25%).

19. *Safety* - The Developer shall maintain barricades, fences, guards, and flagmen as reasonably necessary to ensure the safety of all persons at or near the Project Site at all reasonable and necessary times.

20. *Stop Work Orders* - The Town Planner and/or Town Engineer may issue Stop Work Orders (SWO) to remedy and enforce the provisions of this Agreement.

21. *Termination of Agreement* – This Agreement may be terminated by the Town if the Developer fails to comply fully with the terms and conditions of this Development Agreement.

    a. The Town will give the Developer sixty (60) days written notice of the intent of the Town to terminate the Development Agreement, stating the reasons for termination, and giving the Developer a reasonable time to correct any failures in compliance, as determined by the Town.
    b. If after receiving a Notice of Termination of the Development Agreement by the Town, the Developer corrects the non-compliance within the time specified in the Notice of Termination, the Development Agreement shall remain in full force and effect.
    c. Failure by the Developer to correct the non-compliance will result in termination of the Development Agreement and collection of the Security by the Town.

    If the Town terminates the Agreement, the Developer shall cease all work on the Project except as necessary to ensure the safety of all persons. The Developer (or a subsequent Developer) may apply to the Town for approval of a new Development Agreement, which approval shall not be withheld provided that all violations of this Agreement have been remedied.

22. *Transfers of Project Ownership* - Until all obligations of the Developer under this Agreement have been fully met and satisfied, the Developer agrees that neither the Project Site nor any portion thereof will be transferred to another party without first providing the Town with a fifteen (15) calendar day written notice of when the proposed transfer is to occur and the identity of the proposed transferee, along with the appropriate contact information for the proposed transferee, including address and telephone number of the proposed transferee.

    a. If it is the proposed transferee's intention to develop the Project Site or any portion thereof in accordance with this Agreement, the Developer agrees to furnish the Town with an assumption agreement, or equivalent as determined by the Town, by which the transferee agrees to perform the obligations required under this Agreement that are applicable to the property to be acquired by the proposed transferee.

    b. Unless otherwise agreed to by the Town, the Developer will not be released from any of its obligations hereunder by such transfer and the Developer and the transferee both shall be jointly and severally liable to the Town for all obligations hereunder that are applicable to the property transferred. The proposed transferee will be required to furnish new

Performance Security and Maintenance Security acceptable to the Town, as applicable and determined by the Town.

c. If it is not the proposed transferee's intention to develop the Project Site or any portion thereof in accordance with this Agreement, the transferee must satisfy all applicable requirements of the Town, as determined by the Town, including payment of all outstanding fees, and must receive Town approval, in writing, to void this Agreement.

d. The Developer agrees that if it transfers said property without providing the notice of transfer and assumption agreement, or equivalent, as required herein, it will be in breach of this Agreement and the Town may require that all work be stopped relative to the Project and may require payment of the Performance and Maintenance Security to assure the completion of the Project, as determined by the Town in its sole and absolute discretion.

23. *Underground Utilities* - All electrical utilities shall be installed underground unless the requirement is expressly waived by the Planning Commission.

24. *Building Permits* – The Developer understands and agrees that, if the Developer applies for a building permit from the Town, the building permit shall be subject to all Town Regulations, as well as applicable State and Federal laws and regulations, in existence at the time the building permit is applied for and obtained.

25. *Soil Dedication and Mapping*. – The Developer understands and agrees that the Developer shall dedicate one and one-half (1 and ½) times the amount of soils the Town requires for effluent wastewater disposal as determined by the number of taps to be allocated per the Final Plat. The dedication must occur at the time of approval of the Final Plat. Prior to dedication, the Developer must present the Town with an extra high intensity soil map, per Tennessee Department of Environment and Conservation standards and requirements, of the soils contemplated for dedication. All soils must meet the needs of the Town for effluent wastewater disposal, including but not limited to use and area. In the event the Developer cannot dedicate the required amount of soils as determined herein, in whole or in part, the Developer must pay a fee in lieu of dedication as to said soils in an amount equal to one hundred percent (100%) of the value of said soils, as determined by the Town, at the time of approval of the Final Plat. Said fee shall be remitted to the Town's wastewater fund.

III. REQUIRED IMPROVEMENTS

The Developer agrees to pay the full cost of all the improvements listed below if applicable to the Project.

1. *Water System* - The Developer agrees to pay the cost of a State of Tennessee approved potable water system, including, without limitation: water mains, fire hydrants, valves, service lines, and accessories, located within the Project, and water mains, fire hydrants, valves, service lines, and accessories, located outside the Project but required to serve the Project. The Developer acknowledges that the Town does not provide water service and will not accept any water system infrastructure. The Developer agrees to bear the cost of all engineering,

inspection, and laboratory costs incurred by Developer incidental to the water service system in or to the Project.

2. *Sanitary Sewer System* - The Developer agrees to pay the cost of a State of Tennessee approved sanitary sewer system as required by Town Regulations with necessary sewer mains, manholes, pump stations, force mains and service laterals in the Project, along with all necessary sewer mains, manholes, pump stations, force mains, and service laterals outside the Project but required to provide sanitary sewer service to the Project. **The Developer is approved to construct a bioclere system with a gravity collection which will provide for 91 sewer taps until such time when the Town's system can accommodate the project (refer to MOU between the Town and the Developer).** The Developer agrees to bear the cost of all engineering, inspection, and laboratory testing costs incurred by the Developer incidental to the sewer system in or to the Project, and, if the Town Engineer or his or her designee deems it necessary, to have additional work of such nature performed as directed without cost to the Town.

3. *Streets* - The Developer agrees to dedicate and improve and/or construct, at no cost to the Town, all public and/or private streets, including but not limited to: curbs, gutters, and sidewalks, located within or required by this Project to comply with Town Regulations in accordance with the Final Project Documents.

   a. In some circumstances, the Town may require the payment of an in-lieu of construction fee as an alternate to the construction of the required improvements by the Developer. The amount of any in-lieu construction fee will be one hundred and twenty-five percent (125%) of the estimated construction cost of the improvements, as determined by the Town in its sole and absolute discretion.
   b. The Developer shall furnish and install base asphalt and a final wearing surface asphalt course on all streets, public and private, in accordance with the Town Regulations and the Final Project Documents. The Developer shall make all necessary adjustments to manholes, valve boxes, and other appurtenances as required to meet finished surface grade and to repair any areas designated by the Town, as required prior to the installation of the final surface asphalt.
   c. The Developer agrees to install permanent street signposts and markers at all street intersections in the Project and to install traffic control devices, signage, and striping relative to and as required for the Project. All traffic control devices, signage, and striping shall be installed as per the latest edition of the Manual on Uniform Traffic Control Devices (MUTCD) and approved by the Town Engineer.
   d. The Developer agrees to pay the cost of all engineering, inspection, and laboratory costs incurred by the Developer incidental to the construction of street(s) to be constructed or improved pursuant to this Agreement, including, but not limited to: material and density testing, and, if the Town Planner or his or her designee deems it necessary, to have additional work of such nature performed as directed without cost to the Town.

4. *Streetlights* - The Developer agrees to pay the cost of installation of Street Lighting along all public roadways improved as part of the Project, with said Street Lighting determined by Town Regulations and Final Project Documents.

5. *Power Distribution Poles* – The Developer agrees to pay the full cost difference between steel electric power distribution poles and the cost of wood electric power distribution poles for the

Project frontage. If the Project frontage is along both sides of the public road, the Developer agrees to pay the full cost difference between steel electric power distribution poles and the cost of wood electric power distribution poles for the Project. If the Project is only along one side of the public road, the Developer agrees to pay one-half the cost of the difference between steel electric power distribution poles and the cost of wood electric power distribution poles for the Project frontage.

6. *Gas and Electric Service* - The Developer shall install underground electric and natural gas service to the Project in accordance with Town Regulations in effect at the time of such installation.

7. *Stormwater Management System* - The Developer agrees that all storm water management systems and related facilities, including, without limitation: permanent post-construction storm water runoff management best management practices, ditch paving, bank protection, and fencing adjacent to open ditches, made necessary by the development of the Project are to be constructed and maintained by the Developer.

8. *Stormwater Pollution Prevention Plan* - The Developer agrees that it will prepare, implement, and maintain a Stormwater Pollution Prevention Plan for the Project in accordance with all Town, State, or Federal regulations, and as approved in the Final Project Documents.

9. *Best Management Practices* - The Developer agrees that it will provide all necessary best management practices (BMPs) for erosion and sediment control. BMPs to control erosion and sediment during construction, include, but are not limited to, temporary vegetation, construction exit, inlet protection, and silt fence.

   a. All freshly excavated and embankment areas not covered with satisfactory vegetation shall be fertilized, mulched, seeded and/or sodded, or otherwise protected as required by the Town Engineer to prevent erosion.
   b. In the event the Town Engineer determines that necessary erosion and sediment control is not being provided by the Developer, the Town Engineer may issue a Notice of Violation (NOV) to the Developer.

10. *Engineer's Certification* - The Developer shall provide the written opinion of a professional engineer, currently licensed to practice in Tennessee, attesting that the entire watershed where the Project Site is located has been reviewed, and that upon full development at the greatest allowable use density under existing zoning of all land within that watershed, the proposed development of the Project will not increase, alter, or affect the flow of surface runoff water, nor contribute to same, so as to damage, flood, or adversely affect any downstream property.

11. *Stream Buffers* - The Developer agrees to provide stream buffers along all regulated watercourses in accordance with Town Regulations and the TDEC General Construction Permit.

12. *Changes and Substitutions* - Should the Developer determine that changes or substitutions to the approved Final Project Documents may be necessary or desirable, the Developer shall notify the Town Engineer, in writing, requesting approval of the desired changes or substitutions, explaining the necessity or desirability of the proposed changes or

substitutions. The request by the Developer must be accompanied by sufficient documentation, including drawings, calculations, specifications, or other materials necessary for the Town to evaluate the request. No changes are to be made in the field until express, written permission is granted by the Town Engineer.

IV. PROJECT SCHEDULE

1. *Approved Final Project Documents* – Prior to the recording of the Final Plat, the Developer shall provide to the Town electronic copies (PDF scans) of the Approved Final Project Documents (Collective Exhibit A) along with a signed acknowledgment that the documents submitted are incorporated into this Agreement by reference.

2. *Demolition Permits* - If demolition of any improvement on the Project Site is anticipated, a demolition permit from the Town must be obtained by the Developer.

3. *Certificate of Insurance* - Prior to the recording of the Final Plat, the Developer will furnish to the Town a Certificate of Insurance evidencing the required coverage and listing the Town as additional insured. The furnishing of the aforesaid insurance shall not relieve the Developer of its obligation to indemnify and hold harmless the Town in accordance with the provisions of this Agreement.

4. *Surety* - The Developer must pay all fees, furnish all required Sureties, as determined by the Town, prior to the recording of the Final Plat.

5. *Commencement of Construction* - The Developer agrees to commence construction within twenty-four (24) calendar months from the Effective Date. The failure of the Developer to commence Construction within twenty-four (24) months of the Effective Date will be considered an expiration of the Agreement, and a new agreement shall and must be approved before any Construction may begin.

6. *Project Duration* – It is anticipated that the Developer shall substantially complete the Project on a timely schedule and in an expeditious manner, with the date of Substantial Completion to be not later than **60 months** from when the Developer commences construction of the Project.

7. *Request for Extension* - The Developer agrees that, if due to unforeseen circumstances it is unable to Substantially Complete all work included in this Agreement on or before the Substantial Completion Date specified above, it will submit a written request for extension of the Substantial Completion Date to the Town at least sixty (60) days prior to the specified date, stating the reason for its failure to complete the work as agreed, and a revised Substantial Completion Date. The Town will not unreasonably withhold approval of extensions of time where the Developer has complied with the requirements of notice to the Town and provided any required additional Security.

8. *Breach of Agreement for Time Extension* - The Developer agrees that its failure to follow the extension of time procedure provided herein shall constitute a breach of this Agreement, and the Town may take legal action, in its discretion, as described herein and as allowed by Town Regulations and applicable law.

9. *Withholding or Withdrawal of Service* - The Developer agrees that, should it fail to complete any part of the work outlined in this Agreement in a good and workmanlike manner, the Town shall reserve the right to withhold and/or withdraw all building permits and/or water and sewer service within the Project until all items of this Agreement have been fulfilled by the Developer, or as an alternative draw upon the Security to complete the work.

V. PROJECT CLOSEOUT

1. *As-Built Drawings* - Prior to Final Acceptance, the Developer shall submit as-built plans / as-built drawings of the improvements installed as part of the Project, including but not limited to: the potable water system, the sanitary sewer system, the drainage/detention/stormwater management system, landscaping, irrigations system, photometric plan, and streets including curbs and gutters and sidewalks, signed and sealed by a Design Professional, confirming that the installed improvements are in compliance with Town Regulations and the approved Final Project Documents.

2. *Letter of Completeness* – Prior to Final Acceptance, the Town shall conduct a site check visit and if appropriate issue a Letter of Completeness that the Project is ready to be considered for acceptance by the Board of Mayor and Aldermen. The Letter of Completeness does not constitute acceptance of the Project by the Town. Until Final Acceptance by the Board of Mayor and Aldermen any part of the Project is subject to correction. Developer shall comply with the Town's Dedication of Public Improvements Policy.

3. *Curbs and Gutters* - All required curbs and gutters must be completed and without defect prior to Final Acceptance of the Project. The Developer shall be responsible for repairing any latent defects and/or failures in the curbs and gutters which may occur prior to formal dedication and acceptance of the Project.

4. *Final Construction Cost* - The Developer shall furnish in writing the itemized as-built construction costs of all public improvements prior to issuance of a Letter of Completeness for the Project.

5. *Tree Mitigation/Replacement* - Prior to the issuance of a Letter of Completeness, the Developer shall submit an as-built landscaping plan that reflects the required tree mitigation and replacement as well as all revisions to the mitigation plan as approved by the Planning Commission. Tree mitigation/replacement shall be reviewed by the Town Planner.

6. *Sidewalks* - All required sidewalks shall be completed and without defect prior to acceptance of the Project. The Developer shall be responsible for repairing any latent defects in the sidewalks prior to acceptance of the Project. All references to sidewalks include required handicap ramps. Nothing herein shall be construed to require acceptance of sidewalks by the Town for a Project.

VI. SECURITY

1. *Cost Estimates* - The Developer shall furnish to the Town estimates as to quantity and cost of all public improvements relative to the Project, such estimate being set forth on **Exhibit "C"** attached hereto and incorporated herein by reference. These estimates will be used to assist the Town Engineer in establishing the amount of Security required for the Project.

2. *Security for Public Improvements* - The Developer shall provide, at the time of final plat to the Town, a Performance Security instrument in the amount which sum represents and totals to one hundred and ten percent (110%) of the estimated cost of all approved public improvements.

3. The Performance and Maintenance Security shall have an expiration date of one (1) year after the Effective Date, but **shall automatically renew** for successive one (1) year periods without effort or action by the Town until the Security is released by the Town at the time of acceptance, and the Performance and Maintenance Security documentation shall reflect the aforementioned requirements.

4. *Form of Security* - The form and substance of any Security shall be subject to the approval of the Town Attorney. A copy of the Performance Security is attached to this Agreement as **Exhibit "D"** and made a part hereof guaranteeing, to the extent of the Security, the faithful performance of this Agreement by the Developer. The Security, if a Letter of Credit, shall provide that the physical presence of a representative of the Town shall not be required for presentation and that venue and jurisdiction shall be in a court of competent jurisdiction in Williamson County, Tennessee.

5. *Notification of Non-Renewal* - Should the Issuer or Developer elect to not renew the Performance Security, written notice must be received by the Town no later than ninety (90) days prior to its expiration date, at which time the Town may draw up to the face value of the Performance Security in the Town's unfettered discretion. Failure to provide notice as herein described shall be considered a material breach of this Agreement and the Security, and the Town may institute legal proceedings as provided herein and be awarded reasonable attorney's fees and litigation costs for said legal proceedings.

6. *Maintenance Security* - The amount of the Performance Security may be reduced to a reasonable sum as determined by the Town Engineer to cover Developer's warranty obligations hereunder, thus establishing a Maintenance Security instrument. The Maintenance Security shall remain in place until the Security is released by the Town at the time of dedication and acceptance.

7. *Full Financial Responsibility* - It is understood and agreed by the Developer that the Performance Security and the Maintenance Security, subject to their limits, are to furnish Security for the Developer's obligations hereunder, but that such obligations are not limited by the amount of such Security. The Security shall remain in force until the Security is released by the Town, although the same may be reduced from time to time as provided herein. All collection expenses, court costs, attorney's fees, and administration costs incurred by the Town in connection with collection under the Security shall be paid by the Developer and such obligations are included in the amount of the Security.

8. *Right of Town to Performance Security* - The Town reserves the right to draw upon the Performance Security, in an amount deemed necessary by the Town in its sole discretion, upon failure of the Developer to comply with any obligations of Developer contained in this Agreement which arise prior to, or as a condition to, acceptance.

9. *Right of Town to Maintenance Security* - The Town reserves the right to draw upon the Maintenance Security, in an amount deemed necessary by the Town in its sole discretion, upon failure of the Developer to comply with any obligations of Developer contained in this Agreement which arise prior to, or as a condition to, acceptance.

10. *Current Project Cost* – The Developer agrees that if the Security furnished to secure the obligations of the Developer under this Agreement, due to inflation and/or rising costs, previous errors in estimation, or any other reason, is inadequate to secure such obligations at the time an extension of time is sought, the Developer will provide additional Security to bring the Security amount in line with current cost projections made by the Town Engineer.

VII. WARRANTY

1. *Warranty Period* - The Developer is required to complete the Public Improvements and all other improvements required herein and by Town Regulations relative to the Project, in accordance with the terms of this Agreement. Further, the Developer is to correct any defects or failures as directed by the Town Planner or his or her designee that occur to any such improvements within one (1) year following acceptance.

2. *Scheduled Inspections* - Prior to the expiration of the Warranty Period, Town staff may inspect the streets, curbs and gutters, sidewalks, drainage/detention/stormwater management system, landscaping, lighting, irrigation, fencing and all other required improvements to determine any defects or failures of the same.

   a. Prior to the end of the Warranty Period, the Town will perform an inspection and prepare a list of defects and/or other work that maybe required for the Town to accept the improvements for permanent maintenance. The list of defects and/or other required work will be furnished to the Developer no later than forty-five (45) days from the end of the Warranty Period.

   b. If no defects or failures are found by the Town at such inspection, or if a defect is found by the Town but same is cured prior to the end of the Warranty Period, the Town Planner or his or her designee shall recommend that the Board of Mayor and Aldermen (BOMA) accept the improvements for permanent maintenance and any remaining Maintenance Security may be released.

   Nothing herein shall be construed to impose a duty on the Town to inspect the required improvements or to relieve Developer of any liability related to these improvements.

3. *Re-Inspection* - If all deficiencies noted in the inspection have not been corrected by the Developer prior to the expiration of the Warranty Period, Town staff shall re-inspect the Project and provide an updated list of deficiencies. The Developer shall have a specified number of days, as determined by the Town, to make the remaining corrections, and the Warranty Period will be extended to allow the deficiencies to be corrected. If all corrections are not made by the Developer by the end of the time extension, the Town may demand payment on the Security and draw upon the same, and, upon collection, shall proceed to make the corrections. If and when the Developer or the Town, as the case may be, has

corrected all failures and defects, the Town Planner or his or her designee shall recommend Final Acceptance by the BOMA and any remaining Maintenance Security may be released.

4. *Formal Acceptance* – Upon recommendation of the Town Planner or her designee, the BOMA may approve acceptance of the Project, including the release of the Maintenance Security, and assume full ownership and maintenance responsibility for all public improvements associated with the Project, if the BOMA determines that acceptance of the dedication of the Public Improvements by the Developer is warranted under Town Regulations and applicable State and Federal laws.

VIII. INSURANCE

1. *Comprehensive General Liability Insurance* - The Developer shall purchase and maintain comprehensive general liability and all other necessary and required insurance that shall insure against claims arising out of the Developer's performance, or non-performance, under this Agreement, whether such claims arise out of the actions or lack of action of the Developer, any subcontractor of the Developer, their employees, agents or independent contractors or anyone for whose actions or lack of action any of them may be liable, including, without limitation:

   a. Claims for the personal injury, occupational illness or death of the Developer's employees, if any;
   b. Claims for the personal injury, illness or death of any person other than the Developer's employees or agents;
   c. Claims for injury to or destruction of tangible property, including loss of use resulting therefrom;
   d. Claims for property damage or personal injury or death of any person arising out of the ownership, maintenance or use of any motor vehicle; and,
   e. Claims by third parties for personal injury and property damage arising out of the Developer's failure to comply with the Developer's obligations under this Agreement.
   f. Claims brought under worker's compensation; provided, however, if Developer has no employees who are eligible to be covered under worker's compensation insurance, the Developer shall not be required to furnish insurance against worker's compensation but shall require the party(s) contracting with Developer to perform work on the Project Site to furnish evidence of such insurance for the employees of same.

2. *Coverage Required* - The insurance coverage required by this Agreement shall include the coverage specified above with policy limits of not less than $1,000,000 Combined Single Limit general liability and $500,000 Combined Single Limit automobile liability per occurrence.

   a. The comprehensive general liability insurance coverage shall include completed operations insurance coverage and liability insurance applicable to the Developer's obligations under this Agreement.
   b. Each insurance policy shall contain a provision stating that the insurer will give the Town thirty (30) days prior written notice of its intent to cancel or materially change the policy. All such insurance shall remain in effect until the BOMA approves acceptance and releases of Security of the completed Project.

c. In addition, the Developer shall maintain completed operations insurance for at least one (1) year after the BOMA approves acceptance and release of the applicable Security.
d. The Developer shall furnish the Town with evidence of the continuation of all such insurance at the time of issuance of the notice of acceptance and release of Security.

XII. MISCELLANEOUS PROVISIONS

1. *Notices* - All notices, demands and requests required or permitted by this Agreement shall be in writing (including telecopy communications) and shall be sent by email, certified mail, or hand delivery. Any notice, demand or request which is mailed, hand delivered or sent by courier shall be deemed given for all purposes under this Agreement when delivered to the intended address.

TOWN	**DEVELOPER**	**OWNER**
Town of Thompson's Station P. O Box 100 Thompson's Station, TN 37179	Littlebury Development Company 7123 Crossroads Boulevard, Suite E Brentwood, TN 37027	Same

2. *Change of Address* - Any party to this Agreement may change such party's address for the purpose of notices, demands and requests required or permitted under this Agreement by providing written notice of such change of address to the other party, which change of address shall only be effective when notice of the change is actually received by the party who thereafter sends any notice, demand or request.

3. *Choice of Law & Venue* - This Agreement is being executed and delivered and is intended to be performed in the State of Tennessee, and the laws (without regard to principles of conflicts of law) of the State of Tennessee shall govern the rights and duties of the parties hereto in the validity, construction, enforcement and interpretation hereof. Venue for any action arising from this Agreement shall be in a court of competent jurisdiction in Williamson County, Tennessee.

4. *Joinder of Owner* - If the Developer is not the Owner of the Project Site, the Owner shall join in this Agreement, and, by the Owner's execution of this Agreement, the Owner is jointly and severally liable for the representations, warranties, covenants, agreements and indemnities of Developer.

5. *Interpretation and Severability* - If any provision of this Agreement is held to be unlawful, invalid, or unenforceable under present or future laws effective during the terms hereof, such provisions shall be fully severable and this Agreement shall be construed and enforced as if such unlawful, invalid, or unenforceable provision was not a part of this Agreement. Furthermore, if any provision of this Agreement is capable of two constructions, one of which would render the provision void and the other of which would render the provision valid, then the provision shall have the meaning which rends it valid.

6. *No Waiver* - The failure of the Town to insist upon prompt and strict performance of any of the terms, conditions or undertakings of this Agreement, or to exercise any right herein

conferred, in any one or more instances, shall not be construed as a waiver of the same or any other term, condition, undertaking or right.

7. *Amendments and Modification* - This Agreement shall not be modified in any manner, except by an instrument in writing executed by or on behalf of all parties. All legal fees, costs and expenses incurred with agreement modifications shall be at the sole expense of the Developer.

8. *Authority to Execute* – Town, Developer, and Owner each warrant and represent that the party signing this Agreement on behalf of each has authority to enter into this Agreement and to bind them, respectively, to the terms, covenants and conditions contained herein. Each party shall deliver to the other, upon request, all documents reasonably requested by the other evidencing such authority, including a copy of all resolutions, consents or minutes reflecting the authority of persons or parties to enter into agreements on behalf of such party.

9. *Binding Agreement* - This Agreement is the full and complete agreement between the Town and the Developer and/or Owner(s) and supersedes all other previous agreements or representations between the parties, either written or oral, and the parties agree that the terms and provisions of this agreement is binding upon all parties to the Agreement and their respective heirs, successors, or assigns until the terms of the Agreement are fully met.

WITNESS the due execution hereof:

DEVELOPER:

_____

_____
Print Name & Title

Date:_____

OWNER (if applicable):

_____

_____
Print Name

Date:_____

TOWN OF THOMPSON'S STATION:

_____
Mayor Corey Napier

Date:_____

Exhibit "A"
Final Project Documents

Exhibit "B"

Conditions of approval established by the Board of Mayor and Aldermen, the Planning Commission (PC) and/or the Design Review Commission (DRC)

Exhibit "C"

Estimated Cost of Public Improvements

Exhibit "D"

Performance and Maintenance Security Documents

MEMORANDUM OF UNDERSTANDING

This Memorandum of Understanding (this "Memorandum") is entered into and made effective as of the date of the last signature as indicated on the signature page hereto (the "Effective Date"), by and between Littlebury Development Company, LLC, a Tennessee limited liability company ("Littlebury"), with an address of 7123 Crossroads Blvd. #E, Brentwood, Tennessee 37027, and the Town of Thompson's Station, Tennessee, with an address of 1550 Thompson's Station Road West, Thompson's Station, Tennessee 37179 (the "Town") (Littlebury and the Town are hereinafter sometimes referred to hereinafter individually as a "Party" and collectively as the "Parties").

W I T N E S S E T H:

WHEREAS, Littlebury is the owner of approximately 91 acres of real property generally bounded by Pantall Road, Baugh Road, and Interstate 65 in Thompson's Station, Williamson County, Tennessee, Tax Parcel No. 145 03411 00011145 (the "Property"); and

WHEREAS, the Town previously approved the development of the Property in three separate phases (each a "Phase") based on Littlebury's construction and installation of a sequencing batch reactor system ("SBR System") in order to treat wastewater generated from the Property; and

WHEREAS, the Parties acknowledge the Town is in the process and has been making efforts to expand the Town's ability for treatment of wastewater and sewer generated and capacity is contingent on those continued improvements;

WHEREAS, the Town has indicated to Littlebury that, in lieu of the SBR System, the Town will permit Littlebury to either (i) tie into the regional sewer system closest in proximity to the Property (the "Regional Tie-In"), or (ii) construct and install a Bio-Clere sewer treatment system (the "Bio-Clere System"); and

WHEREAS, the Town has not yet made its election between the Regional Tie-In and the Bio-Clere System, and the Parties desire to set forth their agreement and understanding regarding the timing, terms and conditions of such election by the Town.

NOW, THEREFORE, in consideration of the mutual promises and covenants set forth below, and other good and valuable consideration, the receipt and sufficiency of which hereby is acknowledged, and intending to be legally bound, the Parties hereby agree as follows:

1. The Parties do incorporate by reference herein, **Exhibit A** attached hereto, which is the proposed timeline for consideration upon the election by the Town and the rights and responsibilities of the Parties, based upon that election.

2. Further, the following general and specific conditions shall be applicable between the Parties:

a. Under any of the Phases (I, II, III), where upon the Town assumes responsibility by acceptance of the Bio-Clere System, Littlebury shall provide to the Town a warranty from the date the Town accepts the system and for one (1) year from the date town obtains 25% of the platted lots in the phase connected to the system. Such warranty shall be for the system in its entirety including collection lines and any additions to the system as additional phases are developed. Littlebury will be allowed to cure, repair, or remedy any defects in workmanship or materials within a reasonable time prior to Town repairing the defect. Littlebury shall reimburse Town upon demand for all costs and expenses incurred by Town to repair all defects of any type whatsoever arising from any cause during the warranty period. Littlebury also warrants that the sewer system improvements shall be paid for in full and that no liens or encumbrances shall remain with regard to said improvements. The warranties set forth in this Section 2(a) shall expire one (1) year after the date upon which 25% of the platted lots in the applicable Phase have been connected to the Bioclere system.

b. Under any of the Phases (I, II, III) where upon the Town assumes responsibility by acceptance of the Bio-Clere System, Littlebury shall transfer ownership of such property on which the Bio-Clere System is installed and shall ensure the Town has direct access to such System either by public roadway or by the grant of an easement to the Town by Littlebury or any necessary entity. Littlebury will be provided necessary easements, to be determined by the Town, in any such transferred area for the purpose of expanding the collection, treatment, and disposal systems for additional Phases.

c. Under any of the Phases (I, II, III) where upon the Town elects to permit Littlebury to construct the Bio-Clere System, Littlebury will provide the Town any and all design, construction or installation plans, documents or specifications for the Bio-Clere System. No construction will be permitted on the Bio-Clere system until all plans are approved by the Town. Additionally, the Town, its agent or assigns shall be allowed access, without notice, for inspection during all Phases of construction or installation of such Bio-Clere System and any subsequent additions or expansions of the system. Any requested changes, deviations, or modifications from the approved plans, must be submitted and approved by the Town prior to any changes being made.

d. Under any of the Phases (I,II, III) wherein the Town shall receive from Littlebury drip field area(s), Littlebury shall, at its own expense, provide to the Town by deed, executed by Littlebury's authorized agent, containing the appropriate legal description for such drip field area(s), which shall be incorporated by reference to this Agreement or Understanding of the Parties contained herein. Littlebury will be provided necessary easements, to be determined by the Town, in any such transferred area for the purpose of expanding the collection, treatment, and disposal systems for additional Phases..

e. Under any of the Phases (I, II, III) wherein the Town determines to decommission the Bioclere System as to tie-in to the Regional System (which determination to decommission shall be made, if at all, no later than the completion of the final Phase), Littlebury shall be responsible for all costs and expenses associated with decommissioning the Bioclere System in accordance with decommissioning plans submitted to and approved by the Town.

3. This Memorandum may be delivered by facsimile or other electronic transmission, and may be executed in multiple counterparts, each of which shall be deemed to be an original and all of which, when taken together, shall constitute one and the same agreement. Time is of the essence of this Memorandum. The recitals set forth above are hereby incorporated as true and correct. This Memorandum shall be governed by and construed in accordance with the laws of the State of Tennessee. In the event of any litigation arising out of this Memorandum, the prevailing Party shall be entitled to recover its reasonable attorneys' fees and court costs from the non-prevailing Party. Each Party hereby waives the right to trial by jury in connection with any litigation arising out of this Memorandum. The Parties agree the jurisdiction and venue for any such litigation shall be with the Chancery Court for Williamson County, Tennessee. Should any term or provision be properly determined to be invalid, illegal or unenforceable, it shall not affect the validity, legality or enforceability of the remaining terms and provisions, which shall remain valid, legal and enforceable. All notices under this Memorandum shall be in writing and shall be delivered to each Party at the address set forth above by certified U.S. Mail or reputable overnight carrier (e.g., Federal Express).

IN WITNESS WHEREOF, the Parties have set their signatures hereto effective as of the Effective Date.

LITTLEBURY:

LITTLEBURY DEVELOPMENT COMPANY, LLC

By: Great Tennessee Land Company, LLC
Its: Sole Member

By: _____
Name: DARWIN WOODS
Its: VP of OPERATIONS

Date of Execution: October 21st, 2019

THE TOWN:

THE TOWN OF THOMPSON'S STATION, TENNESSEE

By: _____
Name: COREY NATHER
Its: MAYOR

Date of Execution: October 8, 2019

Regina Fowler

Town Recorder

APPROVED AS TO LEGALITY AND FORM:

Kirk Vandervoort

Town Attorney

EXHIBIT A

(Next Page)

EXHIBIT A TO THE LITTLEBURY MEMORANDUM OF UNDERSTANDING (MOU)

PHASE I (32 lots)

Sewer election date: March 31st, 2020

Estimated phase delivery date: July 31st, 2020

IF ELECTION IS "BIOCLERE" BY THE TOWN (no later than March 31st):

- Infrastructure will be constructed by Littlebury for potential connection to regional system via Bridgemore Village manhole on Pantall Road.
- Once Bioclere system is installed by Developer, the Town will inspect the system. If the system meets all of the Town's requirements and is deemed acceptable, the Town will assume ownership of the system (including drip fields) upon conveyance of the system to the Town by Developer pursuant to the terms provided herein.. No connections are to be made to the system until the system is accepted by the Town and placed into operation.
- The first house is anticipated to come on-line at the end of 2020. On the date that the Bioclere is accepted by the Town,Developer shall provide the Town with a bond in an amount equal to the current sewer impact fee times the number of lots represented on the final plat for the phase being developed. For example, the Developer, would currently post a bond for $195, 200 (equal to sewer fees for 32 lots @ $6100 ea per LDO). The bond shall be maintained until the sooner of connection of Phase 1 to the regional treatment facility or one (1) year after completion of the final phase of the development. If, at one year after the completion of the development the Bioclere system is not decommissioned and is still operational, the bond amount will be refunded to developer in full. If at any timeduring the development of Littlebury and for one year after the completion of the development, the Town elects to decommission the Bioclere system and have phase I tied to regional system, the Town will retain the full bond amount.

IF ELECTION IS "TO TIE TO REGIONAL SYSTEM" BY THE TOWNif determined by March 31st):

- Sewer development fees paid in full by Littlebury for phase I (32 lots) per LDO guidelines and time frames.
- All sewage will be sent from the on-site pump station to the manhole at Bridgemore Village along Pantall Road.
- All homes will be required to pay tap fees per Land Development Ordinance.
- Drip fields donated to the Town by Littlebury.

PHASE II (37 lots)

Sewer election date: March 31st, 2021

Estimated phase delivery date: July 31st, 2021

*NOTE: The Town will consider the Bio-Clere system on a phase by phase basis as may be determined by the Town as subject to and conditioned on and to the availability of capacity for treatment of wastewater and sewer.

IF ELECTION IS "BIOCLERE" BY THE TOWN (no later than March 31st):

- An additional treatment tank will be installed by developer (Littlebury) for treatment of phase II and connection to existing Bio-Clere system shall be permissible by the Town.
-
- Once the system improvements are installed by Developer, the Town will inspect the system. If the system improvements meet all of the Town's requirements and is deemed acceptable, the Town will assume ownership of the system (including drip fields) upon conveyance of the system to the Town by Developer. No connections are to be made to the system until the system is accepted by the Town and placed into operation.
- On the date that Bioclere expansion is accepted by the Town, the Developer (LIttlebury) Developer shall provide the Town with a bond in an amount equal to the current sewer impact fee times the number of lots represented on the final plat for the phase being developed. For example, the Developer, would currently post a bond for $225,700 (equal to sewer fees for 37 lots @ $6100 ea per LDO).. The bond shall be maintained until the sooner of connection of Phase 2 to the regional treatment facility or one (1) year after completion of the final phase of the development. . If, at one year after the completion of the development the Bioclere system is not decommissioned and is still operational, the bond amount will be refunded to developer in full. If at any time during the development of Littlebury and for one year after the completion of the development the Town elects to decommission the Bioclere system and have phase II tied to regional system, the Town will retain the full bond amount.

IF ELECTION IS "TO TIE TO REGIONAL SYSTEM" BY THE TOWN (if determined by March 31st):

- Sewer development fees paid in full by Littlebury for phase II (37 lots) per LDO guidelines and time frames.
- All sewage will be sent from the on-site pump station to the manhole at Bridgemore Village along Pantall Road.
- All homes will be required to pay tap fees per Land Development Ordinance.

PHASE III (22 lots)

Sewer election date: March 31st, 2022

Estimated phase delivery date: July 31st, 2022

*NOTE: The Town will consider the Bio-Clere system on a phase by phase basis as may be determined by the Town as subject to and conditioned on and to the availability of capacity for treatment of wastewater and sewer.

IF ELECTION IS "BIOCLERE" BY THE TOWN (no later than March 31st):

- An additional treatment tank will be installed by Developer (Littlebury) for treatment of phase III and connection to existing Bio -Clere system shall be permissible by the Town.
- Once the system improvements are installed by Developer, the Town will inspect the system. If the system improvements meet all the Town's requirements and is deemed acceptable, the Town will assume ownership of the system (including drip fields) upon conveyance of the

system to the Town by Developer. No connections are to be made to the system until the system is accepted by the Town and placed into operation.

-

- The first house is anticipated to come online at the end of 2022. On the date that the system expansion is accepted by the Town, Developer (Littlebury) shall provide the Town with a bond in an amount equal to the current sewer impact fee times the number of lots represented on the final plat for the phase being developed. For example, the Developer, would currently post a bond for $134,200. (equal to sewer fees for 22 lots @ $6100 ea per LDO) . The bond shall be maintained until the sooner of connection of Phase 3 to the regional treatment facility or one (1) year after completion of the final phase of the development. If, at one year after the completion of the development the Bioclere system is not decommissioned and is being used by the Town to provide wastewater service, the bond amount will be refunded to developer in full. If at any time during the construction of Phase 3 and through the 1 year period post construction period the Town elects to decommission the Bioclere system and have phase III tied to regional system, the Town will retain the full bond amount.

IF ELECTION IS "TO TIE TO REGIONAL SYSTEM" BY THE TOWN (if determined by March 31st):

- Sewer development fees paid in full by Littlebury for phase III (22 lots).
- All sewage will be sent from the on-site pump station to the manhole at Bridgemore Village along Pantall Road.
- All homes will be required to pay tap fees per Land Development Ordinance.

If the Town fails to timely elect between the Bioclere system and tie-in to the regional system, the Town shall be deemed to have elected and approved the Bioclere system.

*IF AT ANY POINT THE CHOICE IS TO TIE TO REGIONAL SYSTEM, THEN THE TOWN WILL EVALUATE AND DETERMINE THE APPROPRIATENESS AND NECESSITY OF FURTHER INSTALLATION OF THE BIO-CLERE SYSTEM. . WHEN THE DETERMINATION BY THE TOWN IS TO TIE IN TO THE REGIONAL SYSTEM, ALL FEES WILL BE PAID IN FULL PER LAND DEVELOPMENT ORDINACE. DRIP FIELDS WILL BE DONATED TO THE TOWN.

ORDINANCE NUMBER 2019-010

An ordinance adopting the 2015 edition of the International Property Maintenance Code establishing the minimum regulations governing the conditions and maintenance of all property, buildings and structures; by providing the standards for supplied utilities and facilities and other physical things and conditions essential to ensure that structures are safe, sanitary and fit for occupation and use, and the condemnation of buildings and structures unfit for human occupancy and use and the demolition of such structures; known as the Property Maintenance Code.

Be it Ordained by the Board of Mayor and Aldermen of the Town of Thompson's Station, Tennessee as follows:

Section 1. That a certain document, a copy of which is on file in the office of the Town Recorder of the Town of Thompson's Station, being marked and designated as the International Property Maintenance Code, 2015 edition, as published by the International Code Council, Inc., be and is hereby adopted as the Property Maintenance Code of the Town of Thompson's Station, in the State of Tennessee; for the control of buildings and structures as herein provided; and each and all of the regulations, provisions, penalties, conditions and terms of said Property Maintenance Code are hereby referred to, adopted, and made a part thereof, as if fully set out in this ordinance, with the additions, insertions, deletions and changes, if any, prescribed in Section 2 of this ordinance.

Section 2. The following sections are hereby revised:

Section 101.1. Insert: Town of Thompson's Station
Section 103.5. Insert: Schedule of fees.
Section 111.2. Delete and substitute the following: The Board of Appeals shall consist three members of the Town's Planning Commission appointed by Mayor.
Section 111.2.1 Delete and substitute the following: The Mayor shall appoint two (2) members of the Planning Commission to serve as an alternate member who shall be called by the board chairman to hear appeals during the absence or disqualification of a member.
Section 112.4. Insert: $50.00 and $1,000.00.
Section 302.2. Delete.
Section 302.4. Delete.
Section 302.5. Delete.
Section 302.8. Delete.
Section 302.9. Delete.
Section 303. Delete.
Section 304.3. Delete.
Section 304.12. Delete.
Section 304.13. Delete.
Section 304.13.2. Delete.
Section 304.14. Delete.
Section 304.15. Delete: Section 702.3; Insert: *International Building Code*.

Section 305. Delete.
Section 307. Delete.
Chapter 4. Delete.
Chapter 5. Delete.
Chapter 6. Delete.
Chapter 7. Delete.

Section 3. That any ordinances or parts of ordinances in conflict herewith are hereby repealed.

Section 4. Nothing in this ordinance or in the Property Maintenance Code hereby adopted shall be construed to affect any suit or proceeding impending in any court, or any rights acquired, or liability incurred, or any cause or causes of action acquired or existing, under any act or ordinance hereby repealed as cited in Section 2 of this ordinance; nor shall any just or legal right or remedy of any character be lost, impaired or affected by this ordinance.

Section 5. Penalties. Any person who shall violate a provision of the building and property maintenance code of the city, or fail to comply therewith, or with any of the requirements thereof, shall be prosecuted within the limits provided by state or local laws. Such fines shall be $50.00 per day of violation, and shall hereafter be cited as the Town of Thompson's Station general penalty clause. Each day of violation after due notice has been served shall be deemed as a separate offense.

Section 6. That the Town Recorder shall certify to the adoption of this ordinance, and cause the same to be published as required by law; and this ordinance shall take effect and be in force from and after its approval as required by law.

_____
Corey Napier, Mayor

ATTEST:

_____
Regina Fowler, Town Recorder

Passed First Reading: _____

Passed Second Reading: _____

Submitted to Public Hearing on the ____ day of _____, 2019, at 7:00 p.m., after being advertised in the *Williamson AM* Newspaper on the ____ day of _____, 2019.

APPROVED AS TO FORM AND LEGALITY:

_____
Town Attorney

IPMC®

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ICC INTERNATIONAL CODE COUNCIL®

2015 International Property Maintenance Code®

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PREFACE

Introduction

Internationally, code officials recognize the need for a modern, up-to-date property maintenance code governing the maintenance of existing buildings. The *International Property Maintenance Code*®, in this 2015 edition, is designed to meet this need through model code regulations that contain clear and specific property maintenance requirements with required property improvement provisions.

This 2015 edition is fully compatible with all of the *International Codes*® (I-Codes®) published by the International Code Council (ICC)®, including the *International Building Code*®, *International Energy Conservation Code*®, *International Existing Building Code*®, *International Fire Code*®, *International Fuel Gas Code*®, *International Green Construction Code*® , *International Mechanical Code*®, ICC *Performance Code*®, *International Plumbing Code*®, *International Private Sewage Disposal Code*®, *International Residential Code*®, *International Swimming Pool and Spa Code*™, *International Wildland-Urban Interface Code*® and *International Zoning Code*®.

The *International Property Maintenance Code* requirements provide many benefits, among which is the model code development process that offers an international forum for code officials and other interested parties to discuss performance and prescriptive code requirements. This forum provides an excellent arena to debate proposed revisions. This model code also encourages international consistency in the application of provisions.

Development

The first edition of the *International Property Maintenance Code* (1998) was the culmination of an effort initiated in 1996 by a code development committee appointed by ICC and consisting of representatives of the three statutory members of the International Code Council at that time, including: Building Officials and Code Administrators International, Inc. (BOCA), International Conference of Building Officials (ICBO) and Southern Building Code Congress International (SBCCI). The committee drafted a comprehensive set of regulations for existing buildings that was consistent with the existing model property maintenance codes at the time. This 2015 edition presents the code as originally issued, with changes reflected through the previous 2012 edition and further changes developed through the ICC Code Development Process through 2013. A new edition of the code is promulgated every 3 years.

This code is founded on principles intended to establish provisions consistent with the scope of a property maintenance code that adequately protects public health, safety and welfare; provisions that do not unnecessarily increase construction costs; provisions that do not restrict the use of new materials, products or methods of construction; and provisions that do not give preferential treatment to particular types or classes of materials, products or methods of construction.

Adoption

The International Code Council maintains a copyright in all of its codes and standards. Maintaining copyright allows ICC to fund its mission through sales of books, in both print and electronic formats. The *International Property Maintenance Code* is designed for adoption and use by jurisdictions that recognize and acknowledge the ICC's copyright in the code, and further acknowledge the substantial shared value of the public/private partnership for code development between jurisdictions and the ICC.

The ICC also recognizes the need for jurisdictions to make laws available to the public. All ICC codes and ICC standards, along with the laws of many jurisdictions, are available for free in a non-downloadable form on the ICC's website. Jurisdictions should contact the ICC at adoptions@iccsafe.org to learn how to adopt and distribute laws based on the *International Property Maintenance Code* in a manner that provides necessary access, while maintaining the ICC's copyright.

Maintenance

The *International Property Maintenance Code* is kept up to date through the review of proposed changes submitted by code enforcing officials, industry representatives, design professionals and other interested parties. Proposed changes are carefully considered through an open code development process in which all interested and affected parties may participate.

The contents of this work are subject to change through both the code development cycles and the governmental body that enacts the code into law. For more information regarding the code development process, contact the Codes and Standards Development Department of the International Code Council.

While the development procedure of the *International Property Maintenance Code* ensures the highest degree of care, the ICC, its members and those participating in the development of this code do not accept any liability resulting from compliance or noncompliance with the provisions because the ICC does not have the power or authority to police or enforce compliance with the contents of this code. Only the governmental body that enacts the code into law has such authority.

Code Development Committee Responsibilities (Letter Designations in Front of Section Numbers

In each code development cycle, proposed changes to this code are considered at the Committee Action Hearings by the International Property Maintenance/Zoning Code Development Committee, whose action constitutes a recommendation to the voting membership for final action on the proposed changes. Proposed changes to a code section having a number beginning with a letter in brackets are considered by a different code development committee. For example, proposed changes to code sections that have the letter [F] in front of them (e.g., [F] 704.1) are considered by the International Fire Code Development Committee at the Committee Action Hearings.

The content of sections in this code that begin with a letter designation is maintained by another code development committee in accordance with the following:

[A] = Administrative Code Development Committee;

[F] = International Fire Code Development Committee;

[P] = International Plumbing Code Development Committee;

[BE] = IBC – Means of Egress Code Development Committee; and

[BG] = IBC – General Code Development Committee.

For the development of the 2018 edition of the I-Codes, there will be three groups of code development committees and they will meet in separate years. Note that these are tentative groupings.

Group A Codes (Heard in 2015, Code Change Proposals Deadline: January 12, 2015)	Group B Codes (Heard in 2016, Code Change Proposals Deadline: January 11, 2016)	Group C Codes (Heard in 2017, Code Change Proposals Deadline: January 11, 2017)
International Building Code – Fire Safety (Chapters 7, 8, 9, 14, 26) – Means of Egress (Chapters 10, 11, Appendix E) – General (Chapters 2-6, 12, 27-33, Appendices A, B, C, D, K)	Administrative Provisions (Chapter 1 of all codes except IRC and IECC, administrative updates to currently referenced standards, and designated definitions)	International Green Construction Code
International Fuel Gas Code	International Building Code – Structural (Chapters 15-25, Appendices F, G, H, I, J, L, M)	
International Existing Building Code	International Energy Conservation Code	
International Mechanical Code	International Fire Code	
International Plumbing Code	International Residential Code – IRC-B (Chapters 1-10, Appendices E, F, H, J, K, L M, O, R, S, T, U)	
International Private Sewage Disposal Code	International Wildland-Urban Interface Code	
International Property Maintenance Code		
International Residential Code – IRC-Mechanical (Chapters 12-24) – IRC-Plumbing (Chapter 25-33, Appendices G, I, N, P)		
International Swimming Pool and Spa Code		
International Zoning Code		

Note: Proposed changes to the ICC Performance Code will be heard by the Code Development Committee noted in brackets [ ] in the text of the code.

Code change proposals submitted for code sections that have a letter designation in front of them will be heard by the respective committee responsible for such code sections. Because different committees hold code development hearings in different years, it is possible that some proposals for this code will be heard by committees in both the 2015 (Group A) and the 2016 (Group B) code development cycles.

For instance, every section of Chapter 1 of this code is designated as the responsibility of the Administrative Code Development Committee, and that committee is part of the Group B portion of the hearings. This committee will hold its code development hearings in 2016 to consider all code change proposals for Chapter 1 of this code and proposals for Chapter 1 of all I-Codes except the *International Energy Conservation Code*, *International Residential Code* and ICC *Performance Code*. Therefore, any proposals received for Chapter 1 of this code will be assigned to the Administrative Code Development Committee for consideration in 2016.

It is very important that anyone submitting code change proposals understand which code development committee is responsible for the section of the code that is the subject of the code change proposal. For further information on the code development committee responsibilities, please visit the ICC website at www.iccsafe.org/scoping.

Marginal Markings

Solid vertical lines in the margins within the body of the code indicate a technical change from the requirements of the 2012 edition. Deletion indicators in the form of an arrow (➡) are provided in the margin where an entire section, paragraph, exception or table has been deleted or an item in a list of items or a table has been deleted.

A single asterisk [*] placed in the margin indicates that text or a table has been relocated within the code. A double asterisk [**] placed in the margin indicates that the text or table immediately

following it has been relocated there from elsewhere in the code. The following table indicates such relocations in the 2015 edition of the *International Property Maintenance Code*.

2015 LOCATION	2012 LOCATION
None	None

Italicized Terms

Selected terms set forth in Chapter 2, Definitions, are italicized where they appear in code text. Such terms are not italicized where the definition set forth in Chapter 2 does not impart the intended meaning in the use of the term. The terms selected have definitions that the user should read carefully to facilitate better understanding of the code.

EFFECTIVE USE OF THE INTERNATIONAL PROPERTY MAINTENANCE CODE

The *International Property Maintenance Code* (IPMC) is a model code that regulates the minimum maintenance requirements for existing buildings.

The IPMC is a maintenance document intended to establish minimum maintenance standards for basic equipment, light, ventilation, heating, sanitation and fire safety. Responsibility is fixed among owners, operators and occupants for code compliance. The IPMC provides for the regulation and safe use of existing structures in the interest of the social and economic welfare of the community.

Arrangement and Format of the 2015 IPMC

Before applying the requirements of the IPMC it is beneficial to understand its arrangement and format. The IPMC, like other codes published by ICC, is arranged and organized to follow sequential steps that generally occur during an inspection. The IPMC is divided into eight different parts:

Chapters	Subjects
1	Administration
2	Definitions
3	General Requirements
4	Light, Ventilation and Occupancy Limitations
5	Plumbing Facilities and Fixture Requirements
6	Mechanical and Electrical Requirements
7	Fire Safety Requirements
8	Referenced Standards

The following is a chapter-by-chapter synopsis of the scope and intent of the provisions of the *International Property Maintenance Code:*

Chapter 1 Scope and Administration. This chapter contains provisions for the application, enforcement and administration of subsequent requirements of the code. In addition to establishing the scope of the code, Chapter 1 identifies which buildings and structures come under its purview. Chapter 1 is largely concerned with maintaining "due process of law" in enforcing the property maintenance criteria contained in the body of the code. Only through careful observation of the administrative provisions can the building official reasonably expect to demonstrate that "equal protection under the law" has been provided.

Chapter 2 Definitions. All terms that are defined in the code are listed alphabetically in Chapter 2. While a defined term may be used in one chapter or another, the meaning provided in Chapter 2 is applicable throughout the code.

Where understanding of a term's definition is especially key to or necessary for understanding of a particular code provision, the term is shown in italics wherever it appears in the code. This is true only for those terms that have a meaning that is unique to the code. In other words, the generally understood meaning of a term or phrase might not be sufficient or consistent with the meaning prescribed by the code; therefore, it is essential that the code-defined meaning be known.

Guidance is provided regarding tense, gender and plurality of defined terms as well as terms not defined in this code.

Chapter 3 General Requirements. Chapter 3, "General Requirements," is broad in scope. It includes a variety of requirements for the exterior property areas as well as the interior and exterior elements of the structure. This chapter provides requirements that are intended to maintain a minimum level of safety and sanitation for both the general public and the occupants of a structure, and to maintain a building's structural and weather-resistance performance. Chapter 3 provides specific criteria for regulating the installation and maintenance of specific building components; maintenance requirements for vacant structures and land; requirements regulating the safety, sanitation and appearance of the interior and exterior of structures and all exterior property areas; accessory structures; vehicle storage regulations and establishes who is responsible for complying with the chapter's provisions. This chapter also contains the requirements for swimming pools, spas and hot tubs and the requirements for protective barriers and gates in these barriers. Chapter 3 establishes the responsible parties for exterminating insects and rodents, and maintaining sanitary conditions in all types of occupancies.

Chapter 4 Light, Ventilation and Occupancy Limitations. The purpose of Chapter 4 is to set forth these requirements in the code and to establish the minimum environment for occupiable and habitable buildings, by establishing the minimum criteria for light and ventilation and identifies occupancy limitations including minimum room width and area, minimum ceiling height and restrictions to prevent overcrowding. This chapter also provides for alternative arrangements of windows and other devices to comply with the requirements for light and ventilation and prohibits certain room arrangements and occupancy uses.

Chapter 5 Plumbing Facilities and Fixture Requirements. Chapter 5 establishes the minimum criteria for the installation, maintenance and location of plumbing systems and facilities, including the water supply system, water heating appliances, sewage disposal system and related plumbing fixtures.

Sanitary and clean conditions in occupied buildings are dependent upon certain basic plumbing principles, including providing potable water to a building, providing the basic fixtures to effectively utilize that water and properly removing waste from the building. Chapter 5 establishes the minimum criteria to verify that these principles are maintained throughout the life of a building.

Chapter 6 Mechanical and Electrical Requirements. The purpose of Chapter 6 is to establish minimum performance requirements for heating, electrical and mechanical facilities and to establish minimum standards for the safety of these facilities.

This chapter establishes minimum criteria for the installation and maintenance of the following: heating and air-conditioning equipment, appliances and their supporting systems; water heating equipment, appliances and systems; cooking equipment and appliances; ventilation and exhaust equipment; gas and liquid fuel distribution piping and components; fireplaces and solid fuel-burning appliances; chimneys and vents; electrical services; lighting fixtures; electrical receptacle outlets; electrical distribution system equipment, devices and wiring; and elevators, escalators and dumbwaiters.

Chapter 7 Fire Safety Requirements. The purpose of Chapter 7 is to address those fire hazards that arise as the result of a building's occupancy. It also provides minimum requirements for fire safety issues that are most likely to arise in older buildings.

This chapter contains requirements for means of egress in existing buildings, including path of travel, required egress width, means of egress doors and emergency escape openings.

Chapter 7 establishes the minimum requirements for fire safety facilities and fire protection systems, as these are essential fire safety systems.

Chapter 8 Referenced Standards. The code contains numerous references to standards that are used to regulate materials and methods of construction. Chapter 8 contains a comprehensive list of all standards that are referenced in the code. The standards are part of the code to the extent of the reference to the standard. Compliance with the referenced standard is necessary for compliance with this code. By providing specifically adopted standards, the construction and installation requirements necessary for compliance with the code can be readily determined. The basis for code compliance is, therefore, established and available on an equal basis to the code official, contractor, designer and owner.

Chapter 8 is organized in a manner that makes it easy to locate specific standards. It lists all of the referenced standards, alphabetically, by acronym of the promulgating agency of the standard. Each agency's standards are then listed in either alphabetical or numeric order based upon the standard identification. The list also contains the title of the standard; the edition (date) of the standard referenced; any addenda included as part of the ICC adoption; and the section or sections of this code that reference the standard.

LEGISLATION

Jurisdictions wishing to adopt the 2015 *International Property Maintenance Code* as an enforceable regulation governing existing structures and premises should ensure that certain factual information is included in the adopting legislation at the time adoption is being considered by the appropriate governmental body. The following sample adoption legislation addresses several key elements, including the information required for insertion into the code text.

SAMPLE LEGISLATION FOR ADOPTION OF THE *INTERNATIONAL PROPERTY MAINTENANCE CODE* ORDINANCE NO._____

A**[N] [ORDINANCE/STATUTE/REGULATION]** of the **[JURISDICTION]** adopting the 2015 edition of the *International Property Maintenance Code*, regulating and governing the conditions and maintenance of all property, buildings and structures; by providing the standards for supplied utilities and facilities and other physical things and conditions essential to ensure that structures are safe, sanitary and fit for occupation and use; and the condemnation of buildings and structures unfit for human occupancy and use, and the demolition of such existing structures in the **[JURISDICTION]**; providing for the issuance of permits and collection of fees therefor; repealing **[ORDINANCE/STATUTE/REGULATION]** No. _____ of the **[JURISDICTION]** and all other ordinances or parts of laws in conflict therewith.

The **[GOVERNING BODY]** of the **[JURISDICTION]** does ordain as follows:

Section 1. That a certain document, three (3) copies of which are on file in the office of the **[TITLE OF JURISDICTION'S KEEPER OF RECORDS]** of **[NAME OF JURISDICTION]**, being marked and designated as the *International Property Maintenance Code*, 2015 edition, as published by the International Code Council, be and is hereby adopted as the Property Maintenance Code of the **[JURISDICTION]**, in the State of **[STATE NAME]** for regulating and governing the conditions and maintenance of all property, buildings and structures; by providing the standards for supplied utilities and facilities and other physical things and conditions essential to ensure that structures are safe, sanitary and fit for occupation and use; and the condemnation of buildings and structures unfit for human occupancy and use, and the demolition of such existing structures as herein provided; providing for the issuance of permits and collection of fees therefor; and each and all of the regulations, provisions, penalties, conditions and terms of said Property Maintenance Code on file in the office of the **[JURISDICTION]** are hereby referred to, adopted, and made a part hereof, as if fully set out in this legislation, with the additions, insertions, deletions and changes, if any, prescribed in Section 2 of this ordinance.

Section 2. The following sections are hereby revised:

Section 101.1. Insert: **[NAME OF JURISDICTION]**

Section 103.5. Insert: **[APPROPRIATE SCHEDULE]**

Section 112.4. Insert: **[DOLLAR AMOUNT IN TWO LOCATIONS]**

Section 302.4. Insert: **[HEIGHT IN INCHES]**

Section 304.14. Insert: **[DATES IN TWO LOCATIONS]**

Section 602.3. Insert: **[DATES IN TWO LOCATIONS]**

Section 602.4. Insert: **[DATES IN TWO LOCATIONS]**

Section 3. That **[ORDINANCE/STATUTE/REGULATION]** No. _____ of **[JURISDICTION]** entitled **[FILL IN HERE THE COMPLETE TITLE OF THE LEGISLATION OR LAWS IN EFFECT AT THE PRESENT TIME SO THAT THEY WILL BE REPEALED BY DEFINITE MENTION]** and all other ordinances or parts of laws in conflict herewith are hereby repealed.

Section 4. That if any section, subsection, sentence, clause or phrase of this legislation is, for any reason, held to be unconstitutional, such decision shall not affect the validity of the remaining portions of this ordinance. The **[GOVERNING BODY]** hereby declares that it would have passed this law, and each section, subsection, clause or phrase thereof, irrespective of the fact that any one or more sections, subsections, sentences, clauses and phrases be declared unconstitutional.

Section 5. That nothing in this legislation or in the Property Maintenance Code hereby adopted shall be construed to affect any suit or proceeding impending in any court, or any rights acquired, or liability incurred, or any cause or causes of action acquired

or existing, under any act or ordinance hereby repealed as cited in Section 3 of this law; nor shall any just or legal right or remedy of any character be lost, impaired or affected by this legislation.

Section 6. That the **[JURISDICTION'S KEEPER OF RECORDS]** is hereby ordered and directed to cause this legislation to be published. (An additional provision may be required to direct the number of times the legislation is to be published and to specify that it is to be in a newspaper in general circulation. Posting may also be required.)

Section 7. That this law and the rules, regulations, provisions, requirements, orders and matters established and adopted hereby shall take effect and be in full force and effect **[TIME PERIOD]** from and after the date of its final passage and adoption.

TABLE OF CONTENTS

CHAPTER 1
SCOPE AND ADMINISTRATION

PART 1 — SCOPE AND APPLICATION

SECTION 101
GENERAL

[A] 101.1 Title. These regulations shall be known as the *International Property Maintenance Code* of **[NAME OF JURISDICTION]**, hereinafter referred to as "this code."

[A] 101.2 Scope. The provisions of this code shall apply to all existing residential and nonresidential structures and all existing *premises* and constitute minimum requirements and standards for *premises*, structures, equipment and facilities for light, *ventilation*, space, heating, sanitation, protection from the elements, a reasonable level of safety from fire and other hazards, and for a reasonable level of sanitary maintenance; the responsibility of *owners*, an owner's authorized agent, *operator*s and *occupants*; the *occupancy* of existing structures and *premises*, and for administration, enforcement and penalties.

[A] 101.3 Intent. This code shall be construed to secure its expressed intent, which is to ensure public health, safety and welfare insofar as they are affected by the continued *occupancy* and maintenance of structures and *premises*. Existing structures and *premises* that do not comply with these provisions shall be altered or repaired to provide a minimum level of health and safety as required herein.

[A] 101.4 Severability. If a section, subsection, sentence, clause or phrase of this code is, for any reason, held to be unconstitutional, such decision shall not affect the validity of the remaining portions of this code.

SECTION 102
APPLICABILITY

[A] 102.1 General. Where there is a conflict between a general requirement and a specific requirement, the specific requirement shall govern. Where differences occur between provisions of this code and the referenced standards, the provisions of this code shall apply. Where, in a specific case, different sections of this code specify different requirements, the most restrictive shall govern.

[A] 102.2 Maintenance. Equipment, systems, devices and safeguards required by this code or a previous regulation or code under which the structure or *premises* was constructed, altered or repaired shall be maintained in good working order. No *owner*, owner's authorized agent, *operator* or *occupant* shall cause any service, facility, equipment or utility that is required under this section to be removed from, shut off from or discontinued for any occupied dwelling, except for such temporary interruption as necessary while repairs or alterations are in progress. The requirements of this code are not intended to provide the basis for removal or abrogation of fire protection and safety systems and devices in existing structures. Except as otherwise specified herein, the *owner* or the *owner's* authorized agent shall be responsible for the maintenance of buildings, structures and *premises*.

[A] 102.3 Application of other codes. Repairs, additions or alterations to a structure, or changes of *occupancy*, shall be done in accordance with the procedures and provisions of the *International Building Code*, *International Existing Building Code*, *International Energy Conservation Code*, *International Fire Code*, *International Fuel Gas Code*, *International Mechanical Code*, *International Residential Code*, *International Plumbing Code* and NFPA 70. Nothing in this code shall be construed to cancel, modify or set aside any provision of the *International Zoning Code*.

[A] 102.4 Existing remedies. The provisions in this code shall not be construed to abolish or impair existing remedies of the jurisdiction or its officers or agencies relating to the removal or demolition of any structure that is dangerous, unsafe and insanitary.

[A] 102.5 Workmanship. Repairs, maintenance work, alterations or installations that are caused directly or indirectly by the enforcement of this code shall be executed and installed in a *workmanlike* manner and installed in accordance with the manufacturer's instructions.

[A] 102.6 Historic buildings. The provisions of this code shall not be mandatory for existing buildings or structures designated as historic buildings where such buildings or structures are judged by the *code official* to be safe and in the public interest of health, safety and welfare.

[A] 102.7 Referenced codes and standards. The codes and standards referenced in this code shall be those that are listed in Chapter 8 and considered part of the requirements of this code to the prescribed extent of each such reference and as further regulated in Sections 102.7.1 and 102.7.2.

Exception: Where enforcement of a code provision would violate the conditions of the listing of the equipment or appliance, the conditions of the listing shall apply.

[A] 102.7.1 Conflicts. Where conflicts occur between provisions of this code and the referenced standards, the provisions of this code shall apply.

[A] 102.7.2 Provisions in referenced codes and standards. Where the extent of the reference to a referenced code or standard includes subject matter that is within the scope of this code, the provisions of this code, as applicable, shall take precedence over the provisions in the referenced code or standard.

[A] 102.8 Requirements not covered by code. Requirements necessary for the strength, stability or proper operation of an existing fixture, structure or equipment, or for the pub-

lic safety, health and general welfare, not specifically covered by this code, shall be determined by the *code official*.

[A] 102.9 Application of references. References to chapter or section numbers, or to provisions not specifically identified by number, shall be construed to refer to such chapter, section or provision of this code.

[A] 102.10 Other laws. The provisions of this code shall not be deemed to nullify any provisions of local, state or federal law.

PART 2 — ADMINISTRATION AND ENFORCEMENT

SECTION 103
DEPARTMENT OF PROPERTY MAINTENANCE INSPECTION

[A] 103.1 General. The department of property maintenance inspection is hereby created and the executive official in charge thereof shall be known as the *code official*.

[A] 103.2 Appointment. The *code official* shall be appointed by the chief appointing authority of the jurisdiction.

[A] 103.3 Deputies. In accordance with the prescribed procedures of this jurisdiction and with the concurrence of the appointing authority, the *code official* shall have the authority to appoint a deputy(s). Such employees shall have powers as delegated by the *code official*.

[A] 103.4 Liability. The *code official,* member of the board of appeals or employee charged with the enforcement of this code, while acting for the jurisdiction, in good faith and without malice in the discharge of the duties required by this code or other pertinent law or ordinance, shall not thereby be rendered civilly or criminally liable personally, and is hereby relieved from all personal liability for any damage accruing to persons or property as a result of an act or by reason of an act or omission in the discharge of official duties.

[A] 103.4.1 Legal defense. Any suit or criminal complaint instituted against any officer or employee because of an act performed by that officer or employee in the lawful discharge of duties and under the provisions of this code shall be defended by the legal representative of the jurisdiction until the final termination of the proceedings. The code official or any subordinate shall not be liable for costs in an action, suit or proceeding that is instituted in pursuance of the provisions of this code.

[A] 103.5 Fees. The fees for activities and services performed by the department in carrying out its responsibilities under this code shall be as indicated in the following schedule.

[JURISDICTION TO INSERT APPROPRIATE SCHEDULE.]

SECTION 104
DUTIES AND POWERS OF THE CODE OFFICIAL

[A] 104.1 General. The *code official* is hereby authorized and directed to enforce the provisions of this code. The *code official* shall have the authority to render interpretations of this code and to adopt policies and procedures in order to clarify the application of its provisions. Such interpretations, policies and procedures shall be in compliance with the intent and purpose of this code. Such policies and procedures shall not have the effect of waiving requirements specifically provided for in this code.

[A] 104.2 Inspections. The *code official* shall make all of the required inspections, or shall accept reports of inspection by *approved* agencies or individuals. Reports of such inspections shall be in writing and be certified by a responsible officer of such *approved* agency or by the responsible individual. The *code official* is authorized to engage such expert opinion as deemed necessary to report upon unusual technical issues that arise, subject to the approval of the appointing authority.

[A] 104.3 Right of entry. Where it is necessary to make an inspection to enforce the provisions of this code, or whenever the *code official* has reasonable cause to believe that there exists in a *structure* or upon a *premises* a condition in violation of this code, the *code official* is authorized to enter the structure or *premises* at reasonable times to inspect or perform the duties imposed by this code, provided that if such *structure* or *premises* is occupied the *code official* shall present credentials to the *occupant* and request entry. If such structure or *premises* is unoccupied, the *code official* shall first make a reasonable effort to locate the *owner*, owner's authorized agent or other person having charge or control of the *structure* or *premises* and request entry. If entry is refused, the *code official* shall have recourse to the remedies provided by law to secure entry.

[A] 104.4 Identification. The *code official* shall carry proper identification when inspecting *structure*s or *premises* in the performance of duties under this code.

[A] 104.5 Notices and orders. The *code official* shall issue all necessary notices or orders to ensure compliance with this code.

[A] 104.6 Department records. The *code official* shall keep official records of all business and activities of the department specified in the provisions of this code. Such records shall be retained in the official records for the period required for retention of public records.

SECTION 105
APPROVAL

[A] 105.1 Modifications. Whenever there are practical difficulties involved in carrying out the provisions of this code, the *code official* shall have the authority to grant modifications for individual cases upon application of the *owner* or *owner*'s authorized agent, provided the *code official* shall first find that special individual reason makes the strict letter of this code impractical, the modification is in compliance with the intent and purpose of this code and that such modification does not lessen health, life and fire safety requirements. The details of action granting modifications shall be recorded and entered in the department files.

[A] 105.2 Alternative materials, methods and equipment. The provisions of this code are not intended to prevent the installation of any material or to prohibit any method of construction not specifically prescribed by this code, provided

that any such alternative has been *approved*. An alternative material or method of construction shall be *approved* where the *code official* finds that the proposed design is satisfactory and complies with the intent of the provisions of this code, and that the material, method or work offered is, for the purpose intended, at least the equivalent of that prescribed in this code in quality, strength, effectiveness, fire resistance, durability and safety. Where the alternative material, design or method of construction is not *approved*, the *code official* shall respond in writing, stating the reasons the alternative was not *approved*.

[A] 105.3 Required testing. Whenever there is insufficient evidence of compliance with the provisions of this code or evidence that a material or method does not conform to the requirements of this code, or in order to substantiate claims for alternative materials or methods, the *code official* shall have the authority to require tests to be made as evidence of compliance at no expense to the jurisdiction.

[A] 105.3.1 Test methods. Test methods shall be as specified in this code or by other recognized test standards. In the absence of recognized and accepted test methods, the *code official* shall be permitted to approve appropriate testing procedures performed by an *approved* agency.

[A] 105.3.2 Test reports. Reports of tests shall be retained by the *code official* for the period required for retention of public records.

[A] 105.4 Used material and equipment. The use of used materials that meet the requirements of this code for new materials is permitted. Materials, equipment and devices shall not be reused unless such elements are in good repair or have been reconditioned and tested where necessary, placed in good and proper working condition and *approved* by the *code official*.

[A] 105.5 Approved materials and equipment. Materials, equipment and devices *approved* by the *code official* shall be constructed and installed in accordance with such approval.

[A] 105.6 Research reports. Supporting data, where necessary to assist in the approval of materials or assemblies not specifically provided for in this code, shall consist of valid research reports from *approved* sources.

SECTION 106
VIOLATIONS

[A] 106.1 Unlawful acts. It shall be unlawful for a person, firm or corporation to be in conflict with or in violation of any of the provisions of this code.

[A] 106.2 Notice of violation. The *code official* shall serve a notice of violation or order in accordance with Section 107.

[A] 106.3 Prosecution of violation. Any person failing to comply with a notice of violation or order served in accordance with Section 107 shall be deemed guilty of a misdemeanor or civil infraction as determined by the local municipality, and the violation shall be deemed a *strict liability offense*. If the notice of violation is not complied with, the *code official* shall institute the appropriate proceeding at law or in equity to restrain, correct or abate such violation, or to require the removal or termination of the unlawful *occupancy* of the structure in violation of the provisions of this code or of the order or direction made pursuant thereto. Any action taken by the authority having jurisdiction on such *premises* shall be charged against the real estate upon which the structure is located and shall be a lien upon such real estate.

[A] 106.4 Violation penalties. Any person who shall violate a provision of this code, or fail to comply therewith, or with any of the requirements thereof, shall be prosecuted within the limits provided by state or local laws. Each day that a violation continues after due notice has been served shall be deemed a separate offense.

[A] 106.5 Abatement of violation. The imposition of the penalties herein prescribed shall not preclude the legal officer of the jurisdiction from instituting appropriate action to restrain, correct or abate a violation, or to prevent illegal *occupancy* of a building, structure or *premises*, or to stop an illegal act, conduct, business or utilization of the building, structure or *premises*.

SECTION 107
NOTICES AND ORDERS

[A] 107.1 Notice to person responsible. Whenever the *code official* determines that there has been a violation of this code or has grounds to believe that a violation has occurred, notice shall be given in the manner prescribed in Sections 107.2 and 107.3 to the person responsible for the violation as specified in this code. Notices for condemnation procedures shall also comply with Section 108.3.

[A] 107.2 Form. Such notice prescribed in Section 107.1 shall be in accordance with all of the following:

1. Be in writing.
2. Include a description of the real estate sufficient for identification.
3. Include a statement of the violation or violations and why the notice is being issued.
4. Include a correction order allowing a reasonable time to make the repairs and improvements required to bring the *dwelling unit* or structure into compliance with the provisions of this code.
5. Inform the property *owner* or owner's authorized agent of the right to appeal.
6. Include a statement of the right to file a lien in accordance with Section 106.3.

[A] 107.3 Method of service. Such notice shall be deemed to be properly served if a copy thereof is:

1. Delivered personally;
2. Sent by certified or first-class mail addressed to the last known address; or
3. If the notice is returned showing that the letter was not delivered, a copy thereof shall be posted in a conspicuous place in or about the structure affected by such notice.

[A] 107.4 Unauthorized tampering. Signs, tags or seals posted or affixed by the *code official* shall not be mutilated, destroyed or tampered with, or removed without authorization from the *code official*.

[A] 107.5 Penalties. Penalties for noncompliance with orders and notices shall be as set forth in Section 106.4.

[A] 107.6 Transfer of ownership. It shall be unlawful for the *owner* of any *dwelling unit* or structure who has received a compliance order or upon whom a notice of violation has been served to sell, transfer, mortgage, lease or otherwise dispose of such *dwelling unit* or structure to another until the provisions of the compliance order or notice of violation have been complied with, or until such *owner* or the owner's authorized agent shall first furnish the grantee, transferee, mortgagee or lessee a true copy of any compliance order or notice of violation issued by the *code official* and shall furnish to the *code official* a signed and notarized statement from the grantee, transferee, mortgagee or lessee, acknowledging the receipt of such compliance order or notice of violation and fully accepting the responsibility without condition for making the corrections or repairs required by such compliance order or notice of violation.

SECTION 108
UNSAFE STRUCTURES AND EQUIPMENT

[A] 108.1 General. When a structure or equipment is found by the *code official* to be unsafe, or when a structure is found unfit for human *occupancy*, or is found unlawful, such structure shall be *condemned* pursuant to the provisions of this code.

[A] 108.1.1 Unsafe structures. An unsafe structure is one that is found to be dangerous to the life, health, property or safety of the public or the *occupants* of the structure by not providing minimum safeguards to protect or warn *occupants* in the event of fire, or because such structure contains unsafe equipment or is so damaged, decayed, dilapidated, structurally unsafe or of such faulty construction or unstable foundation, that partial or complete collapse is possible.

[A] 108.1.2 Unsafe equipment. Unsafe equipment includes any boiler, heating equipment, elevator, moving stairway, electrical wiring or device, flammable liquid containers or other equipment on the *premises* or within the structure which is in such disrepair or condition that such equipment is a hazard to life, health, property or safety of the public or *occupants* of the *premises* or structure.

[A] 108.1.3 Structure unfit for human occupancy. A structure is unfit for human *occupancy* whenever the *code official* finds that such structure is unsafe, unlawful or, because of the degree to which the structure is in disrepair or lacks maintenance, is insanitary, vermin or rat infested, contains filth and contamination, or lacks *ventilation*, illumination, sanitary or heating facilities or other essential equipment required by this code, or because the location of the structure constitutes a hazard to the *occupants* of the structure or to the public.

[A] 108.1.4 Unlawful structure. An unlawful structure is one found in whole or in part to be occupied by more persons than permitted under this code, or was erected, altered or occupied contrary to law.

[A] 108.1.5 Dangerous structure or premises. For the purpose of this code, any structure or *premises* that has any or all of the conditions or defects described below shall be considered dangerous:

1. Any door, aisle, passageway, stairway, exit or other means of egress that does not conform to the *approved* building or fire code of the jurisdiction as related to the requirements for existing buildings.
2. The walking surface of any aisle, passageway, stairway, exit or other means of egress is so warped, worn loose, torn or otherwise unsafe as to not provide safe and adequate means of egress.
3. Any portion of a building, structure or appurtenance that has been damaged by fire, earthquake, wind, flood, *deterioration*, *neglect*, abandonment, vandalism or by any other cause to such an extent that it is likely to partially or completely collapse, or to become *detached* or dislodged.
4. Any portion of a building, or any member, appurtenance or ornamentation on the exterior thereof that is not of sufficient strength or stability, or is not so *anchored*, attached or fastened in place so as to be capable of resisting natural or artificial loads of one and one-half the original designed value.
5. The building or structure, or part of the building or structure, because of dilapidation, *deterioration*, decay, faulty construction, the removal or movement of some portion of the ground necessary for the support, or for any other reason, is likely to partially or completely collapse, or some portion of the foundation or underpinning of the building or structure is likely to fail or give way.
6. The building or structure, or any portion thereof, is clearly unsafe for its use and *occupancy*.
7. The building or structure is *neglected*, damaged, dilapidated, unsecured or abandoned so as to become an attractive nuisance to children who might play in the building or structure to their danger, becomes a harbor for vagrants, criminals or immoral persons, or enables persons to resort to the building or structure for committing a nuisance or an unlawful act.
8. Any building or structure has been constructed, exists or is maintained in violation of any specific requirement or prohibition applicable to such building or structure provided by the *approved* building or fire code of the jurisdiction, or of any law or ordinance to such an extent as to present either a substantial risk of fire, building collapse or any other threat to life and safety.

9. A building or structure, used or intended to be used for dwelling purposes, because of inadequate maintenance, dilapidation, decay, damage, faulty construction or arrangement, inadequate light, *ventilation*, mechanical or plumbing system, or otherwise, is determined by the *code official* to be unsanitary, unfit for human habitation or in such a condition that is likely to cause sickness or disease.
10. Any building or structure, because of a lack of sufficient or proper fire-resistance-rated construction, fire protection systems, electrical system, fuel connections, mechanical system, plumbing system or other cause, is determined by the *code official* to be a threat to life or health.
11. Any portion of a building remains on a site after the demolition or destruction of the building or structure or whenever any building or structure is abandoned so as to constitute such building or portion thereof as an attractive nuisance or hazard to the public.

[A] 108.2 Closing of vacant structures. If the structure is vacant and unfit for human habitation and *occupancy*, and is not in danger of structural collapse, the *code official* is authorized to post a placard of condemnation on the *premises* and order the structure closed up so as not to be an attractive nuisance. Upon failure of the *owner* or owner's authorized agent to close up the *premises* within the time specified in the order, the *code official* shall cause the *premises* to be closed and secured through any available public agency or by contract or arrangement by private persons and the cost thereof shall be charged against the real estate upon which the structure is located and shall be a lien upon such real estate and shall be collected by any other legal resource.

[A] 108.2.1 Authority to disconnect service utilities. The *code official* shall have the authority to authorize disconnection of utility service to the building, structure or system regulated by this code and the referenced codes and standards set forth in Section 102.7 in case of emergency where necessary to eliminate an immediate hazard to life or property or where such utility connection has been made without approval. The *code official* shall notify the serving utility and, whenever possible, the *owner* or owner's authorized agent and *occupant* of the building, structure or service system of the decision to disconnect prior to taking such action. If not notified prior to disconnection the *owner*, owner's authorized agent or *occupant* of the building structure or service system shall be notified in writing as soon as practical thereafter.

[A] 108.3 Notice. Whenever the *code official* has condemned a structure or equipment under the provisions of this section, notice shall be posted in a conspicuous place in or about the structure affected by such notice and served on the *owner*, owner's authorized agent or the person or persons responsible for the structure or equipment in accordance with Section 107.3. If the notice pertains to equipment, it shall be placed on the condemned equipment. The notice shall be in the form prescribed in Section 107.2.

[A] 108.4 Placarding. Upon failure of the *owner*, owner's authorized agent or person responsible to comply with the notice provisions within the time given, the *code official* shall post on the *premises* or on defective equipment a placard bearing the word "Condemned" and a statement of the penalties provided for occupying the *premises*, operating the equipment or removing the placard.

[A] 108.4.1 Placard removal. The *code official* shall remove the condemnation placard whenever the defect or defects upon which the condemnation and placarding action were based have been eliminated. Any person who defaces or removes a condemnation placard without the approval of the *code official* shall be subject to the penalties provided by this code.

[A] 108.5 Prohibited occupancy. Any occupied structure condemned and placarded by the *code official* shall be vacated as ordered by the *code official*. Any person who shall occupy a placarded *premises* or shall operate placarded equipment, and any *owner*, owner's authorized agent or person responsible for the *premises* who shall let anyone occupy a placarded *premises* or operate placarded equipment shall be liable for the penalties provided by this code.

[A] 108.6 Abatement methods. The *owner*, owner's authorized agent, *operator* or *occupant* of a building, *premises* or equipment deemed unsafe by the *code official* shall abate or cause to be abated or corrected such unsafe conditions either by repair, rehabilitation, demolition or other *approved* corrective action.

[A] 108.7 Record. The *code official* shall cause a report to be filed on an unsafe condition. The report shall state the *occupancy* of the structure and the nature of the unsafe condition.

SECTION 109
EMERGENCY MEASURES

[A] 109.1 Imminent danger. When, in the opinion of the *code official*, there is *imminent danger* of failure or collapse of a building or structure that endangers life, or when any structure or part of a structure has fallen and life is endangered by the occupation of the structure, or when there is actual or potential danger to the building *occupants* or those in the proximity of any structure because of explosives, explosive fumes or vapors or the presence of toxic fumes, gases or materials, or operation of defective or dangerous equipment, the *code official* is hereby authorized and empowered to order and require the *occupants* to vacate the *premises* forthwith. The *code official* shall cause to be posted at each entrance to such structure a notice reading as follows: "This *Structure* Is Unsafe and Its *Occupancy* Has Been Prohibited by the *Code Official*." It shall be unlawful for any person to enter such structure except for the purpose of securing the structure, making the required repairs, removing the hazardous condition or of demolishing the same.

[A] 109.2 Temporary safeguards. Notwithstanding other provisions of this code, whenever, in the opinion of the *code official*, there is *imminent danger* due to an unsafe condition, the *code official* shall order the necessary work to be done,

including the boarding up of openings, to render such structure temporarily safe whether or not the legal procedure herein described has been instituted; and shall cause such other action to be taken as the *code official* deems necessary to meet such emergency.

[A] 109.3 Closing streets. When necessary for public safety, the *code official* shall temporarily close structures and close, or order the authority having jurisdiction to close, sidewalks, streets, *public ways* and places adjacent to unsafe structures, and prohibit the same from being utilized.

[A] 109.4 Emergency repairs. For the purposes of this section, the *code official* shall employ the necessary labor and materials to perform the required work as expeditiously as possible.

[A] 109.5 Costs of emergency repairs. Costs incurred in the performance of emergency work shall be paid by the jurisdiction. The legal counsel of the jurisdiction shall institute appropriate action against the *owner* of the *premises* or owner's authorized agent where the unsafe structure is or was located for the recovery of such costs.

[A] 109.6 Hearing. Any person ordered to take emergency measures shall comply with such order forthwith. Any affected person shall thereafter, upon petition directed to the appeals board, be afforded a hearing as described in this code.

SECTION 110
DEMOLITION

[A] 110.1 General. The *code official* shall order the *owner* or owner's authorized agent of any *premises* upon which is located any structure, which in the *code official's* or owner's authorized agent judgment after review is so deteriorated or dilapidated or has become so out of repair as to be dangerous, unsafe, insanitary or otherwise unfit for human habitation or occupancy, and such that it is unreasonable to repair the structure, to demolish and remove such structure; or if such structure is capable of being made safe by repairs, to repair and make safe and sanitary, or to board up and hold for future repair or to demolish and remove at the *owner's* option; or where there has been a cessation of normal construction of any structure for a period of more than two years, the *code official* shall order the *owner* or owner's authorized agent to demolish and remove such structure, or board up until future repair. Boarding the building up for future repair shall not extend beyond one year, unless *approved* by the building official.

[A] 110.2 Notices and orders. Notices and orders shall comply with Section 107.

[A] 110.3 Failure to comply. If the *owner* of a *premises* or owner's authorized agent fails to comply with a demolition order within the time prescribed, the *code official* shall cause the structure to be demolished and removed, either through an available public agency or by contract or arrangement with private persons, and the cost of such demolition and removal shall be charged against the real estate upon which the structure is located and shall be a lien upon such real estate.

[A] 110.4 Salvage materials. When any structure has been ordered demolished and removed, the governing body or other designated officer under said contract or arrangement aforesaid shall have the right to sell the salvage and valuable materials. The net proceeds of such sale, after deducting the expenses of such demolition and removal, shall be promptly remitted with a report of such sale or transaction, including the items of expense and the amounts deducted, for the person who is entitled thereto, subject to any order of a court. If such a surplus does not remain to be turned over, the report shall so state.

SECTION 111
MEANS OF APPEAL

[A] 111.1 Application for appeal. Any person directly affected by a decision of the *code official* or a notice or order issued under this code shall have the right to appeal to the board of appeals, provided that a written application for appeal is filed within 20 days after the day the decision, notice or order was served. An application for appeal shall be based on a claim that the true intent of this code or the rules legally adopted thereunder have been incorrectly interpreted, the provisions of this code do not fully apply, or the requirements of this code are adequately satisfied by other means.

[A] 111.2 Membership of board. The board of appeals shall consist of not less than three members who are qualified by experience and training to pass on matters pertaining to property maintenance and who are not employees of the jurisdiction. The *code official* shall be an ex-officio member but shall have no vote on any matter before the board. The board shall be appointed by the chief appointing authority, and shall serve staggered and overlapping terms.

[A] 111.2.1 Alternate members. The chief appointing authority shall appoint not less than two alternate members who shall be called by the board chairman to hear appeals during the absence or disqualification of a member. Alternate members shall possess the qualifications required for board membership.

[A] 111.2.2 Chairman. The board shall annually select one of its members to serve as chairman.

[A] 111.2.3 Disqualification of member. A member shall not hear an appeal in which that member has a personal, professional or financial interest.

[A] 111.2.4 Secretary. The chief administrative officer shall designate a qualified person to serve as secretary to the board. The secretary shall file a detailed record of all proceedings in the office of the chief administrative officer.

[A] 111.2.5 Compensation of members. Compensation of members shall be determined by law.

[A] 111.3 Notice of meeting. The board shall meet upon notice from the chairman, within 20 days of the filing of an appeal, or at stated periodic meetings.

[A] 111.4 Open hearing. Hearings before the board shall be open to the public. The appellant, the appellant's representa-

tive, the *code official* and any person whose interests are affected shall be given an opportunity to be heard. A quorum shall consist of a minumum of two-thirds of the board membership.

[A] 111.4.1 Procedure. The board shall adopt and make available to the public through the secretary procedures under which a hearing will be conducted. The procedures shall not require compliance with strict rules of evidence, but shall mandate that only relevant information be received.

[A] 111.5 Postponed hearing. When the full board is not present to hear an appeal, either the appellant or the appellant's representative shall have the right to request a postponement of the hearing.

[A] 111.6 Board decision. The board shall modify or reverse the decision of the *code official* only by a concurring vote of a majority of the total number of appointed board members.

[A] 111.6.1 Records and copies. The decision of the board shall be recorded. Copies shall be furnished to the appellant and to the *code official*.

[A] 111.6.2 Administration. The *code official* shall take immediate action in accordance with the decision of the board.

[A] 111.7 Court review. Any person, whether or not a previous party of the appeal, shall have the right to apply to the appropriate court for a writ of certiorari to correct errors of law. Application for review shall be made in the manner and time required by law following the filing of the decision in the office of the chief administrative officer.

[A] 111.8 Stays of enforcement. Appeals of notice and orders (other than *Imminent Danger* notices) shall stay the enforcement of the notice and order until the appeal is heard by the appeals board.

SECTION 112
STOP WORK ORDER

[A] 112.1 Authority. Whenever the *code official* finds any work regulated by this code being performed in a manner contrary to the provisions of this code or in a dangerous or unsafe manner, the *code official* is authorized to issue a stop work order.

[A] 112.2 Issuance. A stop work order shall be in writing and shall be given to the *owner* of the property, to the *owner's* authorized agent, or to the person doing the work. Upon issuance of a stop work order, the cited work shall immediately cease. The stop work order shall state the reason for the order and the conditions under which the cited work is authorized to resume.

[A] 112.3 Emergencies. Where an emergency exists, the *code official* shall not be required to give a written notice prior to stopping the work.

[A] 112.4 Failure to comply. Any person who shall continue any work after having been served with a stop work order, except such work as that person is directed to perform to remove a violation or unsafe condition, shall be liable to a fine of not less than **[AMOUNT]** dollars or more than **[AMOUNT]** dollars.

CHAPTER 2
DEFINITIONS

SECTION 201
GENERAL

201.1 Scope. Unless otherwise expressly stated, the following terms shall, for the purposes of this code, have the meanings shown in this chapter.

201.2 Interchangeability. Words stated in the present tense include the future; words stated in the masculine gender include the feminine and neuter; the singular number includes the plural and the plural, the singular.

201.3 Terms defined in other codes. Where terms are not defined in this code and are defined in the *International Building Code, International Existing Building Code, International Fire Code, International Fuel Gas Code, International Mechanical Code, International Plumbing Code, International Residential Code, International Zoning Code* or NFPA 70, such terms shall have the meanings ascribed to them as stated in those codes.

201.4 Terms not defined. Where terms are not defined through the methods authorized by this section, such terms shall have ordinarily accepted meanings such as the context implies.

201.5 Parts. Whenever the words "*dwelling unit,*" "dwelling," "*premises,*" "building," "*rooming house,*" "*rooming unit,*" "*housekeeping unit*" or "story" are stated in this code, they shall be construed as though they were followed by the words "or any part thereof."

SECTION 202
GENERAL DEFINITIONS

ANCHORED. Secured in a manner that provides positive connection.

[A] APPROVED. Acceptable to the *code official.*

BASEMENT. That portion of a building which is partly or completely below grade.

BATHROOM. A room containing plumbing fixtures including a bathtub or shower.

BEDROOM. Any room or space used or intended to be used for sleeping purposes in either a dwelling or *sleeping unit.*

[A] CODE OFFICIAL. The official who is charged with the administration and enforcement of this code, or any duly authorized representative.

CONDEMN. To adjudge unfit for *occupancy.*

COST OF SUCH DEMOLITION OR EMERGENCY REPAIRS. The costs shall include the actual costs of the demolition or repair of the structure less revenues obtained if salvage was conducted prior to demolition or repair. Costs shall include, but not be limited to, expenses incurred or necessitated related to demolition or emergency repairs, such as asbestos survey and abatement if necessary; costs of inspectors, testing agencies or experts retained relative to the demolition or emergency repairs; costs of testing; surveys for other materials that are controlled or regulated from being dumped in a landfill; title searches; mailing(s); postings; recording; and attorney fees expended for recovering of the cost of emergency repairs or to obtain or enforce an order of demolition made by a *code official*, the governing body or board of appeals.

DETACHED. When a structural element is physically disconnected from another and that connection is necessary to provide a positive connection.

DETERIORATION. To weaken, disintegrate, corrode, rust or decay and lose effectiveness.

[BG] DWELLING UNIT. A single unit providing complete, independent living facilities for one or more persons, including permanent provisions for living, sleeping, eating, cooking and sanitation.

[Z] EASEMENT. That portion of land or property reserved for present or future use by a person or agency other than the legal fee *owner*(s) of the property. The *easement* shall be permitted to be for use under, on or above a said lot or lots.

EQUIPMENT SUPPORT. Those structural members or assemblies of members or manufactured elements, including braces, frames, lugs, snuggers, hangers or saddles, that transmit gravity load, lateral load and operating load between the equipment and the structure.

EXTERIOR PROPERTY. The open space on the *premises* and on adjoining property under the control of *owners* or *operators* of such *premises*.

GARBAGE. The animal or vegetable waste resulting from the handling, preparation, cooking and consumption of food.

[BE] GUARD. A building component or a system of building components located at or near the open sides of elevated walking surfaces that minimizes the possibility of a fall from the walking surface to a lower level.

[BG] HABITABLE SPACE. Space in a structure for living, sleeping, eating or cooking. *Bathrooms*, *toilet rooms*, closets, halls, storage or utility spaces, and similar areas are not considered *habitable spaces*.

HISTORIC BUILDING. Any building or structure that is one or more of the following:

1. Listed or certified as eligible for listing, by the State Historic Preservation Officer or the Keeper of the National Register of Historic Places, in the National Register of Historic Places.
2. Designated as historic under an applicable state or local law.

3. Certified as a contributing resource within a National Register or state or locally designated historic district.

HOUSEKEEPING UNIT. A room or group of rooms forming a single *habitable space* equipped and intended to be used for living, sleeping, cooking and eating which does not contain, within such a unit, a toilet, lavatory and bathtub or shower.

IMMINENT DANGER. A condition which could cause serious or life-threatening injury or death at any time.

INFESTATION. The presence, within or contiguous to, a structure or *premises* of insects, rats, vermin or other pests.

INOPERABLE MOTOR VEHICLE. A vehicle which cannot be driven upon the public streets for reason including but not limited to being unlicensed, wrecked, abandoned, in a state of disrepair, or incapable of being moved under its own power.

[A] LABELED. Equipment, materials or products to which have been affixed a label, seal, symbol or other identifying mark of a nationally recognized testing laboratory, inspection agency or other organization concerned with product evaluation that maintains periodic inspection of the production of the above-*labeled* items and whose labeling indicates either that the equipment, material or product meets identified standards or has been tested and found suitable for a specified purpose.

LET FOR OCCUPANCY or LET. To permit, provide or offer possession or *occupancy* of a dwelling, *dwelling unit*, *rooming unit*, building, premise or structure by a person who is or is not the legal *owner* of record thereof, pursuant to a written or unwritten lease, agreement or license, or pursuant to a recorded or unrecorded agreement of contract for the sale of land.

NEGLECT. The lack of proper maintenance for a building or *structure*.

[A] OCCUPANCY. The purpose for which a building or portion thereof is utilized or occupied.

OCCUPANT. Any individual living or sleeping in a building, or having possession of a space within a building.

OPENABLE AREA. That part of a window, skylight or door which is available for unobstructed *ventilation* and which opens directly to the outdoors.

OPERATOR. Any person who has charge, care or control of a structure or *premises* which is let or offered for *occupancy*.

[A] OWNER. Any person, agent, *operator*, firm or corporation having legal or equitable interest in the property; or recorded in the official records of the state, county or municipality as holding title to the property; or otherwise having control of the property, including the guardian of the estate of any such person, and the executor or administrator of the estate of such person if ordered to take possession of real property by a court.

PERSON. An individual, corporation, partnership or any other group acting as a unit.

PEST ELIMINATION. The control and elimination of insects, rodents or other pests by eliminating their harborage places; by removing or making inaccessible materials that serve as their food or water; by other *approved pest elimination* methods.

[A] PREMISES. A lot, plot or parcel of land, *easement* or *public way*, including any structures thereon.

[A] PUBLIC WAY. Any street, alley or similar parcel of land essentially unobstructed from the ground to the sky, which is deeded, dedicated or otherwise permanently appropriated to the public for public use.

ROOMING HOUSE. A building arranged or occupied for lodging, with or without meals, for compensation and not occupied as a one- or two-family dwelling.

ROOMING UNIT. Any room or group of rooms forming a single habitable unit occupied or intended to be occupied for sleeping or living, but not for cooking purposes.

RUBBISH. Combustible and noncombustible waste materials, except garbage; the term shall include the residue from the burning of wood, coal, coke and other combustible materials, paper, rags, cartons, boxes, wood, excelsior, rubber, leather, tree branches, *yard* trimmings, tin cans, metals, mineral matter, glass, crockery and dust and other similar materials.

[BG] SLEEPING UNIT. A room or space in which people sleep, which can also include permanent provisions for living, eating and either sanitation or kitchen facilities, but not both. Such rooms and spaces that are also part of a *dwelling unit* are not *sleeping units*.

STRICT LIABILITY OFFENSE. An offense in which the prosecution in a legal proceeding is not required to prove criminal intent as a part of its case. It is enough to prove that the defendant either did an act which was prohibited, or failed to do an act which the defendant was legally required to do.

[A] STRUCTURE. That which is built or constructed or a portion thereof.

TENANT. A person, corporation, partnership or group, whether or not the legal *owner* of record, occupying a building or portion thereof as a unit.

TOILET ROOM. A room containing a water closet or urinal but not a bathtub or shower.

ULTIMATE DEFORMATION. The deformation at which failure occurs and which shall be deemed to occur if the sustainable load reduces to 80 percent or less of the maximum strength.

[M] VENTILATION. The natural or mechanical process of supplying conditioned or unconditioned air to, or removing such air from, any space.

WORKMANLIKE. Executed in a skilled manner; e.g., generally plumb, level, square, in line, undamaged and without marring adjacent work.

[Z] YARD. An open space on the same lot with a structure.

CHAPTER 3
GENERAL REQUIREMENTS

SECTION 301
GENERAL

301.1 Scope. The provisions of this chapter shall govern the minimum conditions and the responsibilities of persons for maintenance of structures, equipment and *exterior property*.

301.2 Responsibility. The *owner* of the *premises* shall maintain the structures and *exterior property* in compliance with these requirements, except as otherwise provided for in this code. A person shall not occupy as owner-occupant or permit another person to occupy *premises* that are not in a sanitary and safe condition and that do not comply with the requirements of this chapter. *Occupants* of a *dwelling unit, rooming unit* or *housekeeping unit* are responsible for keeping in a clean, sanitary and safe condition that part of the *dwelling unit, rooming unit, housekeeping unit* or *premises* which they occupy and control.

301.3 Vacant structures and land. Vacant structures and *premises* thereof or vacant land shall be maintained in a clean, safe, secure and sanitary condition as provided herein so as not to cause a blighting problem or adversely affect the public health or safety.

SECTION 302
EXTERIOR PROPERTY AREAS

302.1 Sanitation. *Exterior property* and *premises* shall be maintained in a clean, safe and sanitary condition. The *occupant* shall keep that part of the *exterior property* that such *occupant* occupies or controls in a clean and sanitary condition.

302.2 Grading and drainage. *Premises* shall be graded and maintained to prevent the erosion of soil and to prevent the accumulation of stagnant water thereon, or within any structure located thereon.

Exception: *Approved* retention areas and reservoirs.

302.3 Sidewalks and driveways. Sidewalks, walkways, stairs, driveways, parking spaces and similar areas shall be kept in a proper state of repair, and maintained free from hazardous conditions.

302.4 Weeds. *Premises* and *exterior property* shall be maintained free from weeds or plant growth in excess of **[JURISDICTION TO INSERT HEIGHT IN INCHES]**. Noxious weeds shall be prohibited. Weeds shall be defined as all grasses, annual plants and vegetation, other than trees or shrubs provided; however, this term shall not include cultivated flowers and gardens.

Upon failure of the *owner* or agent having charge of a property to cut and destroy weeds after service of a notice of violation, they shall be subject to prosecution in accordance with Section 106.3 and as prescribed by the authority having jurisdiction. Upon failure to comply with the notice of violation, any duly authorized employee of the jurisdiction or contractor hired by the jurisdiction shall be authorized to enter upon the property in violation and cut and destroy the weeds growing thereon, and the costs of such removal shall be paid by the *owner* or agent responsible for the property.

302.5 Rodent harborage. Structures and *exterior property* shall be kept free from rodent harborage and *infestation*. Where rodents are found, they shall be promptly exterminated by *approved* processes that will not be injurious to human health. After pest elimination, proper precautions shall be taken to eliminate rodent harborage and prevent reinfestation.

302.6 Exhaust vents. Pipes, ducts, conductors, fans or blowers shall not discharge gases, steam, vapor, hot air, grease, smoke, odors or other gaseous or particulate wastes directly upon abutting or adjacent public or private property or that of another *tenant*.

302.7 Accessory structures. Accessory structures, including *detached* garages, fences and walls, shall be maintained structurally sound and in good repair.

302.8 Motor vehicles. Except as provided for in other regulations, no inoperative or unlicensed motor vehicle shall be parked, kept or stored on any *premises*, and no vehicle shall at any time be in a state of major disassembly, disrepair, or in the process of being stripped or dismantled. Painting of vehicles is prohibited unless conducted inside an *approved* spray booth.

Exception: A vehicle of any type is permitted to undergo major overhaul, including body work, provided that such work is performed inside a structure or similarly enclosed area designed and *approved* for such purposes.

302.9 Defacement of property. No person shall willfully or wantonly damage, mutilate or deface any exterior surface of any structure or building on any private or public property by placing thereon any marking, carving or graffiti.

It shall be the responsibility of the *owner* to restore said surface to an *approved* state of maintenance and repair.

SECTION 303
SWIMMING POOLS, SPAS AND HOT TUBS

303.1 Swimming pools. Swimming pools shall be maintained in a clean and sanitary condition, and in good repair.

303.2 Enclosures. Private swimming pools, hot tubs and spas, containing water more than 24 inches (610 mm) in depth shall be completely surrounded by a fence or barrier not less than 48 inches (1219 mm) in height above the finished ground level measured on the side of the barrier away from the pool. Gates and doors in such barriers shall be self-closing and self-latching. Where the self-latching device is not less than 54 inches (1372 mm) above the bottom of the

gate, the release mechanism shall be located on the pool side of the gate. Self-closing and self-latching gates shall be maintained such that the gate will positively close and latch when released from an open position of 6 inches (152 mm) from the gatepost. No existing pool enclosure shall be removed, replaced or changed in a manner that reduces its effectiveness as a safety barrier.

Exception: Spas or hot tubs with a safety cover that complies with ASTM F 1346 shall be exempt from the provisions of this section.

SECTION 304
EXTERIOR STRUCTURE

304.1 General. The exterior of a structure shall be maintained in good repair, structurally sound and sanitary so as not to pose a threat to the public health, safety or welfare.

304.1.1 Unsafe conditions. The following conditions shall be determined as unsafe and shall be repaired or replaced to comply with the *International Building Code* or the *International Existing Building Code* as required for existing buildings:

1. The nominal strength of any structural member is exceeded by nominal loads, the load effects or the required strength;
2. The *anchorage* of the floor or roof to walls or columns, and of walls and columns to foundations is not capable of resisting all nominal loads or load effects;
3. Structures or components thereof that have reached their limit state;
4. Siding and masonry joints including joints between the building envelope and the perimeter of windows, doors and skylights are not maintained, weather resistant or water tight;
5. Structural members that have evidence of *deterioration* or that are not capable of safely supporting all nominal loads and load effects;
6. Foundation systems that are not firmly supported by footings, are not plumb and free from open cracks and breaks, are not properly *anchored* or are not capable of supporting all nominal loads and resisting all load effects;
7. Exterior walls that are not *anchored* to supporting and supported elements or are not plumb and free of holes, cracks or breaks and loose or rotting materials, are not properly *anchored* or are not capable of supporting all nominal loads and resisting all load effects;
8. Roofing or roofing components that have defects that admit rain, roof surfaces with inadequate drainage, or any portion of the roof framing that is not in good repair with signs of *deterioration*, fatigue or without proper anchorage and incapable of supporting all nominal loads and resisting all load effects;
9. Flooring and flooring components with defects that affect serviceability or flooring components that show signs of *deterioration* or fatigue, are not properly *anchored* or are incapable of supporting all nominal loads and resisting all load effects;
10. Veneer, cornices, belt courses, corbels, trim, wall facings and similar decorative features not properly anchored or that are anchored with connections not capable of supporting all nominal loads and resisting all load effects;
11. Overhang extensions or projections including, but not limited to, trash chutes, canopies, marquees, signs, awnings, fire escapes, standpipes and exhaust ducts not properly *anchored* or that are *anchored* with connections not capable of supporting all nominal loads and resisting all load effects;
12. Exterior stairs, decks, porches, balconies and all similar appurtenances attached thereto, including *guard*s and handrails, are not structurally sound, not properly *anchored* or that are *anchored* with connections not capable of supporting all nominal loads and resisting all load effects; or
13. Chimneys, cooling towers, smokestacks and similar appurtenances not structurally sound or not properly *anchored*, or that are anchored with connections not capable of supporting all nominal loads and resisting all load effects.

Exceptions:

1. Where substantiated otherwise by an *approved* method.
2. Demolition of unsafe conditions shall be permitted where *approved* by the *code official*.

304.2 Protective treatment. Exterior surfaces, including but not limited to, doors, door and window frames, cornices, porches, trim, balconies, decks and fences, shall be maintained in good condition. Exterior wood surfaces, other than decay-resistant woods, shall be protected from the elements and decay by painting or other protective covering or treatment. Peeling, flaking and chipped paint shall be eliminated and surfaces repainted. Siding and masonry joints, as well as those between the building envelope and the perimeter of windows, doors and skylights, shall be maintained weather resistant and water tight. Metal surfaces subject to rust or corrosion shall be coated to inhibit such rust and corrosion, and surfaces with rust or corrosion shall be stabilized and coated to inhibit future rust and corrosion. Oxidation stains shall be removed from exterior surfaces. Surfaces designed for stabilization by oxidation are exempt from this requirement.

[F] 304.3 Premises identification. Buildings shall have *approved* address numbers placed in a position to be plainly legible and visible from the street or road fronting the property. These numbers shall contrast with their background. Address numbers shall be Arabic numerals or alphabet letters. Numbers shall be not less than 4 inches (102 mm) in height with a minimum stroke width of 0.5 inch (12.7 mm).

304.4 Structural members. Structural members shall be maintained free from *deterioration*, and shall be capable of safely supporting the imposed dead and live loads.

304.5 Foundation walls. Foundation walls shall be maintained plumb and free from open cracks and breaks and shall be kept in such condition so as to prevent the entry of rodents and other pests.

304.6 Exterior walls. Exterior walls shall be free from holes, breaks, and loose or rotting materials; and maintained weatherproof and properly surface coated where required to prevent *deterioration*.

304.7 Roofs and drainage. The roof and flashing shall be sound, tight and not have defects that admit rain. Roof drainage shall be adequate to prevent dampness or *deterioration* in the walls or interior portion of the structure. Roof drains, gutters and downspouts shall be maintained in good repair and free from obstructions. Roof water shall not be discharged in a manner that creates a public nuisance.

304.8 Decorative features. Cornices, belt courses, corbels, terra cotta trim, wall facings and similar decorative features shall be maintained in good repair with proper anchorage and in a safe condition.

304.9 Overhang extensions. Overhang extensions including, but not limited to, canopies, marquees, signs, metal awnings, fire escapes, standpipes and exhaust ducts shall be maintained in good repair and be properly *anchored* so as to be kept in a sound condition. Where required, all exposed surfaces of metal or wood shall be protected from the elements and against decay or rust by periodic application of weather-coating materials, such as paint or similar surface treatment.

304.10 Stairways, decks, porches and balconies. Every exterior stairway, deck, porch and balcony, and all appurtenances attached thereto, shall be maintained structurally sound, in good repair, with proper anchorage and capable of supporting the imposed loads.

304.11 Chimneys and towers. Chimneys, cooling towers, smoke stacks, and similar appurtenances shall be maintained structurally safe and sound, and in good repair. Exposed surfaces of metal or wood shall be protected from the elements and against decay or rust by periodic application of weather-coating materials, such as paint or similar surface treatment.

304.12 Handrails and guards. Every handrail and *guard* shall be firmly fastened and capable of supporting normally imposed loads and shall be maintained in good condition.

304.13 Window, skylight and door frames. Every window, skylight, door and frame shall be kept in sound condition, good repair and weather tight.

304.13.1 Glazing. Glazing materials shall be maintained free from cracks and holes.

304.13.2 Openable windows. Every window, other than a fixed window, shall be easily openable and capable of being held in position by window hardware.

304.14 Insect screens. During the period from **[DATE]** to **[DATE]**, every door, window and other outside opening required for *ventilation* of habitable rooms, food preparation areas, food service areas or any areas where products to be included or utilized in food for human consumption are processed, manufactured, packaged or stored shall be supplied with *approved* tightly fitting screens of minimum 16 mesh per inch (16 mesh per 25 mm), and every screen door used for insect control shall have a self-closing device in good working condition.

Exception: Screens shall not be required where other *approved* means, such as air curtains or insect repellent fans, are employed.

304.15 Doors. Exterior doors, door assemblies, operator systems if provided, and hardware shall be maintained in good condition. Locks at all entrances to dwelling units and sleeping units shall tightly secure the door. Locks on means of egress doors shall be in accordance with Section 702.3.

304.16 Basement hatchways. Every *basement* hatchway shall be maintained to prevent the entrance of rodents, rain and surface drainage water.

304.17 Guards for basement windows. Every *basement* window that is openable shall be supplied with rodent shields, storm windows or other *approved* protection against the entry of rodents.

304.18 Building security. Doors, windows or hatchways for *dwelling units*, room units or *housekeeping units* shall be provided with devices designed to provide security for the *occupant*s and property within.

304.18.1 Doors. Doors providing access to a *dwelling unit*, *rooming unit* or *housekeeping unit* that is rented, leased or let shall be equipped with a deadbolt lock designed to be readily openable from the side from which egress is to be made without the need for keys, special knowledge or effort and shall have a minimum lock throw of 1 inch (25 mm). Such deadbolt locks shall be installed according to the manufacturer's specifications and maintained in good working order. For the purpose of this section, a sliding bolt shall not be considered an acceptable deadbolt lock.

304.18.2 Windows. Operable windows located in whole or in part within 6 feet (1828 mm) above ground level or a walking surface below that provide access to a *dwelling unit*, *rooming unit* or *housekeeping unit* that is rented, leased or let shall be equipped with a window sash locking device.

304.18.3 Basement hatchways. *Basement* hatchways that provide access to a *dwelling unit*, *rooming unit* or *housekeeping unit* that is rented, leased or let shall be equipped with devices that secure the units from unauthorized entry.

304.19 Gates. Exterior gates, gate assemblies, operator systems if provided, and hardware shall be maintained in good condition. Latches at all entrances shall tightly secure the gates.

SECTION 305
INTERIOR STRUCTURE

305.1 General. The interior of a structure and equipment therein shall be maintained in good repair, structurally sound and in a sanitary condition. *Occupants* shall keep that part of

the structure that they occupy or control in a clean and sanitary condition. Every *owner* of a structure containing a *rooming house*, *housekeeping units*, a hotel, a dormitory, two or more *dwelling unit*s or two or more nonresidential occupancies, shall maintain, in a clean and sanitary condition, the shared or public areas of the structure and *exterior property*.

305.1.1 Unsafe conditions. The following conditions shall be determined as unsafe and shall be repaired or replaced to comply with the *International Building Code* or the *International Existing Building Code* as required for existing buildings:

1. The nominal strength of any structural member is exceeded by nominal loads, the load effects or the required strength;
2. The anchorage of the floor or roof to walls or columns, and of walls and columns to foundations is not capable of resisting all nominal loads or load effects;
3. Structures or components thereof that have reached their limit state;
4. Structural members are incapable of supporting nominal loads and load effects;
5. Stairs, landings, balconies and all similar walking surfaces, including *guards* and handrails, are not structurally sound, not properly *anchored* or are *anchored* with connections not capable of supporting all nominal loads and resisting all load effects;
6. Foundation systems that are not firmly supported by footings are not plumb and free from open cracks and breaks, are not properly *anchored* or are not capable of supporting all nominal loads and resisting all load effects.

Exceptions:

1. Where substantiated otherwise by an *approved* method.
2. Demolition of unsafe conditions shall be permitted when *approved* by the *code official*.

305.2 Structural members. Structural members shall be maintained structurally sound, and be capable of supporting the imposed loads.

305.3 Interior surfaces. Interior surfaces, including windows and doors, shall be maintained in good, clean and sanitary condition. Peeling, chipping, flaking or abraded paint shall be repaired, removed or covered. Cracked or loose plaster, decayed wood and other defective surface conditions shall be corrected.

305.4 Stairs and walking surfaces. Every stair, ramp, landing, balcony, porch, deck or other walking surface shall be maintained in sound condition and good repair.

305.5 Handrails and guards. Every handrail and *guard* shall be firmly fastened and capable of supporting normally imposed loads and shall be maintained in good condition.

305.6 Interior doors. Every interior door shall fit reasonably well within its frame and shall be capable of being opened and closed by being properly and securely attached to jambs, headers or tracks as intended by the manufacturer of the attachment hardware.

SECTION 306
COMPONENT SERVICEABILITY

306.1 General. The components of a structure and equipment therein shall be maintained in good repair, structurally sound and in a sanitary condition.

306.1.1 Unsafe conditions. Where any of the following conditions cause the component or system to be beyond its limit state, the component or system shall be determined as unsafe and shall be repaired or replaced to comply with the *International Building Code* or the *International Existing Building Code* as required for existing buildings:

1. Soils that have been subjected to any of the following conditions:
   1.1. Collapse of footing or foundation system;
   1.2. Damage to footing, foundation, concrete or other structural element due to soil expansion;
   1.3. Adverse effects to the design strength of footing, foundation, concrete or other structural element due to a chemical reaction from the soil;
   1.4. Inadequate soil as determined by a geotechnical investigation;
   1.5. Where the allowable bearing capacity of the soil is in doubt; or
   1.6. Adverse effects to the footing, foundation, concrete or other structural element due to the ground water table.
2. Concrete that has been subjected to any of the following conditions:
   2.1. *Deterioration*;
   2.2. *Ultimate deformation*;
   2.3. Fractures;
   2.4. Fissures;
   2.5. Spalling;
   2.6. Exposed reinforcement; or
   2.7. *Detached*, dislodged or failing connections.
3. Aluminum that has been subjected to any of the following conditions:
   3.1. *Deterioration*;
   3.2. Corrosion;
   3.3. Elastic deformation;
   3.4. *Ultimate deformation*;
   3.5. Stress or strain cracks;
   3.6. Joint fatigue; or
   3.7. *Detached*, dislodged or failing connections.

4. Masonry that has been subjected to any of the following conditions:
   4.1. *Deterioration;*
   4.2. *Ultimate deformation;*
   4.3. Fractures in masonry or mortar joints;
   4.4. Fissures in masonry or mortar joints;
   4.5. Spalling;
   4.6. Exposed reinforcement; or
   4.7. *Detached,* dislodged or failing connections.
5. Steel that has been subjected to any of the following conditions:
   5.1. *Deterioration;*
   5.2. Elastic deformation;
   5.3. *Ultimate deformation;*
   5.4. Metal fatigue; or
   5.5. *Detached,* dislodged or failing connections.
6. Wood that has been subjected to any of the following conditions:
   6.1. *Ultimate deformation;*
   6.2. *Deterioration;*
   6.3. Damage from insects, rodents and other vermin;
   6.4. Fire damage beyond charring;
   6.5. Significant splits and checks;
   6.6. Horizontal shear cracks;
   6.7. Vertical shear cracks;
   6.8. Inadequate support;
   6.9. *Detached,* dislodged or failing connections; or
   6.10. Excessive cutting and notching.

Exceptions:

1. Where substantiated otherwise by an *approved* method.
2. Demolition of unsafe conditions shall be permitted where *approved* by the *code official.*

SECTION 307
HANDRAILS AND GUARDRAILS

307.1 General. Every exterior and interior flight of stairs having more than four risers shall have a handrail on one side of the stair and every open portion of a stair, landing, balcony, porch, deck, ramp or other walking surface that is more than 30 inches (762 mm) above the floor or grade below shall have *guards.* Handrails shall be not less than 30 inches (762 mm) in height or more than 42 inches (1067 mm) in height measured vertically above the nosing of the tread or above the finished floor of the landing or walking surfaces. *Guards* shall be not less than 30 inches (762 mm) in height above the floor of the landing, balcony, porch, deck, or ramp or other walking surface.

Exception: *Guards* shall not be required where exempted by the adopted building code.

SECTION 308
RUBBISH AND GARBAGE

308.1 Accumulation of rubbish or garbage. *Exterior property* and *premises,* and the interior of every structure, shall be free from any accumulation of *rubbish* or garbage.

308.2 Disposal of rubbish. Every *occupant* of a structure shall dispose of all *rubbish* in a clean and sanitary manner by placing such *rubbish* in *approved* containers.

308.2.1 Rubbish storage facilities. The *owner* of every occupied *premises* shall supply *approved* covered containers for *rubbish,* and the *owner* of the *premises* shall be responsible for the removal of *rubbish.*

308.2.2 Refrigerators. Refrigerators and similar equipment not in operation shall not be discarded, abandoned or stored on *premises* without first removing the doors.

308.3 Disposal of garbage. Every *occupant* of a structure shall dispose of garbage in a clean and sanitary manner by placing such garbage in an *approved* garbage disposal facility or *approved* garbage containers.

308.3.1 Garbage facilities. The *owner* of every dwelling shall supply one of the following: an *approved* mechanical food waste grinder in each *dwelling unit;* an *approved* incinerator unit in the structure available to the *occupants* in each *dwelling unit;* or an *approved* leakproof, covered, outside garbage container.

308.3.2 Containers. The *operator* of every establishment producing garbage shall provide, and at all times cause to be utilized, *approved* leakproof containers provided with close-fitting covers for the storage of such materials until removed from the *premises* for disposal.

SECTION 309
PEST ELIMINATION

309.1 Infestation. Structures shall be kept free from insect and rodent *infestation.* Structures in which insects or rodents are found shall be promptly exterminated by *approved* processes that will not be injurious to human health. After pest elimination, proper precautions shall be taken to prevent reinfestation.

309.2 Owner. The *owner* of any structure shall be responsible for pest elimination within the structure prior to renting or leasing the structure.

309.3 Single occupant. The *occupant* of a one-family dwelling or of a single-*tenant* nonresidential structure shall be responsible for pest elimination on the *premises.*

309.4 Multiple occupancy. The *owner* of a structure containing two or more *dwelling units,* a multiple *occupancy,* a

rooming house or a nonresidential structure shall be responsible for pest elimination in the public or shared areas of the structure and *exterior property*. If *infestation* is caused by failure of an *occupant* to prevent such *infestation* in the area occupied, the *occupant* and *owner* shall be responsible for pest elimination.

309.5 Occupant. The *occupant* of any structure shall be responsible for the continued rodent and pest-free condition of the structure.

Exception: Where the *infestations* are caused by defects in the structure, the *owner* shall be responsible for pest elimination.

CHAPTER 4
LIGHT, VENTILATION AND OCCUPANCY LIMITATIONS

SECTION 401
GENERAL

401.1 Scope. The provisions of this chapter shall govern the minimum conditions and standards for light, *ventilation* and space for occupying a structure.

401.2 Responsibility. The *owner* of the structure shall provide and maintain light, *ventilation* and space conditions in compliance with these requirements. A person shall not occupy as *owner-occupant*, or permit another person to occupy, any *premises* that do not comply with the requirements of this chapter.

401.3 Alternative devices. In lieu of the means for natural light and *ventilation* herein prescribed, artificial light or mechanical *ventilation* complying with the *International Building Code* shall be permitted.

SECTION 402
LIGHT

402.1 Habitable spaces. Every *habitable space* shall have not less than one window of *approved* size facing directly to the outdoors or to a court. The minimum total glazed area for every *habitable space* shall be 8 percent of the floor area of such room. Wherever walls or other portions of a structure face a window of any room and such obstructions are located less than 3 feet (914 mm) from the window and extend to a level above that of the ceiling of the room, such window shall not be deemed to face directly to the outdoors nor to a court and shall not be included as contributing to the required minimum total window area for the room.

Exception: Where natural light for rooms or spaces without exterior glazing areas is provided through an adjoining room, the unobstructed opening to the adjoining room shall be not less than 8 percent of the floor area of the interior room or space, but a minimum of 25 square feet (2.33 m^2). The exterior glazing area shall be based on the total floor area being served.

402.2 Common halls and stairways. Every common hall and stairway in residential occupancies, other than in one- and two-family dwellings, shall be lighted at all times with not less than a 60-watt standard incandescent light bulb for each 200 square feet (19 m^2) of floor area or equivalent illumination, provided that the spacing between lights shall not be greater than 30 feet (9144 mm). In other than residential occupancies, means of egress, including exterior means of egress, stairways shall be illuminated at all times the building space served by the means of egress is occupied with not less than 1 footcandle (11 lux) at floors, landings and treads.

402.3 Other spaces. All other spaces shall be provided with natural or artificial light sufficient to permit the maintenance of sanitary conditions, and the safe *occupancy* of the space and utilization of the appliances, equipment and fixtures.

SECTION 403
VENTILATION

403.1 Habitable spaces. Every *habitable space* shall have not less than one openable window. The total openable area of the window in every room shall be equal to not less than 45 percent of the minimum glazed area required in Section 402.1.

Exception: Where rooms and spaces without openings to the outdoors are ventilated through an adjoining room, the unobstructed opening to the adjoining room shall be not less than 8 percent of the floor area of the interior room or space, but not less than 25 square feet (2.33 m^2). The *ventilation* openings to the outdoors shall be based on a total floor area being ventilated.

403.2 Bathrooms and toilet rooms. Every *bathroom* and *toilet room* shall comply with the *ventilation* requirements for *habitable spaces* as required by Section 403.1, except that a window shall not be required in such spaces equipped with a mechanical *ventilation* system. Air exhausted by a mechanical *ventilation* system from a *bathroom* or *toilet room* shall discharge to the outdoors and shall not be recirculated.

403.3 Cooking facilities. Unless *approved* through the certificate of *occupancy*, cooking shall not be permitted in any *rooming unit* or dormitory unit, and a cooking facility or appliance shall not be permitted to be present in the *rooming unit* or dormitory unit.

Exceptions:

1. Where specifically *approved* in writing by the *code official*.
2. Devices such as coffee pots and microwave ovens shall not be considered cooking appliances.

403.4 Process ventilation. Where injurious, toxic, irritating or noxious fumes, gases, dusts or mists are generated, a local exhaust *ventilation* system shall be provided to remove the contaminating agent at the source. Air shall be exhausted to the exterior and not be recirculated to any space.

403.5 Clothes dryer exhaust. Clothes dryer exhaust systems shall be independent of all other systems and shall be exhausted outside the structure in accordance with the manufacturer's instructions.

Exception: Listed and *labeled* condensing (ductless) clothes dryers.

SECTION 404
OCCUPANCY LIMITATIONS

404.1 Privacy. *Dwelling units*, hotel units, *housekeeping units*, *rooming units* and dormitory units shall be arranged to provide privacy and be separate from other adjoining spaces.

404.2 Minimum room widths. A habitable room, other than a kitchen, shall be not less than 7 feet (2134 mm) in any plan dimension. Kitchens shall have a minimum clear passageway of 3 feet (914 mm) between counterfronts and appliances or counterfronts and walls.

404.3 Minimum ceiling heights. *Habitable spaces*, hallways, corridors, laundry areas, *bathrooms*, *toilet rooms* and habitable *basement* areas shall have a minimum clear ceiling height of 7 feet (2134 mm).

Exceptions:

1. In one- and two-family dwellings, beams or girders spaced not less than 4 feet (1219 mm) on center and projecting a maximum of 6 inches (152 mm) below the required ceiling height.
2. *Basement* rooms in one- and two-family dwellings occupied exclusively for laundry, study or recreation purposes, having a minimum ceiling height of 6 feet 8 inches (2033 mm) with a minimum clear height of 6 feet 4 inches (1932 mm) under beams, girders, ducts and similar obstructions.
3. Rooms occupied exclusively for sleeping, study or similar purposes and having a sloped ceiling over all or part of the room, with a minimum clear ceiling height of 7 feet (2134 mm) over not less than one-third of the required minimum floor area. In calculating the floor area of such rooms, only those portions of the floor area with a minimum clear ceiling height of 5 feet (1524 mm) shall be included.

404.4 Bedroom and living room requirements. Every *bedroom* and living room shall comply with the requirements of Sections 404.4.1 through 404.4.5.

404.4.1 Room area. Every living room shall contain not less than 120 square feet (11.2 m^2) and every bedroom shall contain not less than 70 square feet (6.5 m^2) and every bedroom occupied by more than one person shall contain not less than 50 square feet (4.6 m^2) of floor area for each occupant thereof.

404.4.2 Access from bedrooms. *Bedrooms* shall not constitute the only means of access to other *bedrooms* or *habitable spaces* and shall not serve as the only means of egress from other *habitable spaces*.

Exception: Units that contain fewer than two *bedrooms*.

404.4.3 Water closet accessibility. Every *bedroom* shall have access to not less than one water closet and one lavatory without passing through another *bedroom*. Every *bedroom* in a *dwelling unit* shall have access to not less than one water closet and lavatory located in the same story as the *bedroom* or an adjacent story.

404.4.4 Prohibited occupancy. Kitchens and nonhabitable spaces shall not be used for sleeping purposes.

404.4.5 Other requirements. *Bedrooms* shall comply with the applicable provisions of this code including, but not limited to, the light, *ventilation*, room area, ceiling height and room width requirements of this chapter; the plumbing facilities and water-heating facilities requirements of Chapter 5; the heating facilities and electrical receptacle requirements of Chapter 6; and the smoke detector and emergency escape requirements of Chapter 7.

404.5 Overcrowding. Dwelling units shall not be occupied by more occupants than permitted by the minimum area requirements of Table 404.5.

TABLE 404.5
MINIMUM AREA REQUIREMENTS

SPACE	MINIMUM AREA IN SQUARE FEET		
	1-2 occupants	3-5 occupants	6 or more occupants
Living room[a, b]	120	120	150
Dining room[a, b]	No requirement	80	100
Bedrooms	Shall comply with Section 404.4.1		

For SI: 1 square foot = 0.0929 m^2.

a. See Section 404.5.2 for combined living room/dining room spaces.

b. See Section 404.5.1 for limitations on determining the minimum occupancy area for sleeping purposes.

404.5.1 Sleeping area. The minimum occupancy area required by Table 404.5 shall not be included as a sleeping area in determining the minimum occupancy area for sleeping purposes. Sleeping areas shall comply with Section 404.4.

404.5.2 Combined spaces. Combined living room and dining room spaces shall comply with the requirements of Table 404.5 if the total area is equal to that required for separate rooms and if the space is located so as to function as a combination living room/dining room.

404.6 Efficiency unit. Nothing in this section shall prohibit an efficiency living unit from meeting the following requirements:

1. A unit occupied by not more than one occupant shall have a minimum clear floor area of 120 square feet (11.2 m^2). A unit occupied by not more than two *occupants* shall have a minimum clear floor area of 220 square feet (20.4 m^2). A unit occupied by three *occupants* shall have a minimum clear floor area of 320 square feet (29.7 m^2). These required areas shall be exclusive of the areas required by Items 2 and 3.
2. The unit shall be provided with a kitchen sink, cooking appliance and refrigeration facilities, each having a minimum clear working space of 30 inches (762 mm) in front. Light and *ventilation* conforming to this code shall be provided.
3. The unit shall be provided with a separate *bathroom* containing a water closet, lavatory and bathtub or shower.
4. The maximum number of *occupants* shall be three.

404.7 Food preparation. All spaces to be occupied for food preparation purposes shall contain suitable space and equipment to store, prepare and serve foods in a sanitary manner. There shall be adequate facilities and services for the sanitary disposal of food wastes and refuse, including facilities for temporary storage.

CHAPTER 5
PLUMBING FACILITIES AND FIXTURE REQUIREMENTS

SECTION 501
GENERAL

501.1 Scope. The provisions of this chapter shall govern the minimum plumbing systems, facilities and plumbing fixtures to be provided.

501.2 Responsibility. The *owner* of the structure shall provide and maintain such plumbing facilities and plumbing fixtures in compliance with these requirements. A person shall not occupy as *owner-occupant* or permit another person to occupy any structure or *premises* that does not comply with the requirements of this chapter.

SECTION 502
REQUIRED FACILITIES

[P] 502.1 Dwelling units. Every *dwelling unit* shall contain its own bathtub or shower, lavatory, water closet and kitchen sink that shall be maintained in a sanitary, safe working condition. The lavatory shall be placed in the same room as the water closet or located in close proximity to the door leading directly into the room in which such water closet is located. A kitchen sink shall not be used as a substitute for the required lavatory.

[P] 502.2 Rooming houses. Not less than one water closet, lavatory and bathtub or shower shall be supplied for each four *rooming units*.

[P] 502.3 Hotels. Where private water closets, lavatories and baths are not provided, one water closet, one lavatory and one bathtub or shower having access from a public hallway shall be provided for each 10 *occupants.*

[P] 502.4 Employees' facilities. Not less than one water closet, one lavatory and one drinking facility shall be available to employees.

[P] 502.4.1 Drinking facilities. Drinking facilities shall be a drinking fountain, water cooler, bottled water cooler or disposable cups next to a sink or water dispenser. Drinking facilities shall not be located in *toilet rooms* or *bathrooms*.

[P] 502.5 Public toilet facilities. Public toilet facilities shall be maintained in a safe, sanitary and working condition in accordance with the *International Plumbing Code*. Except for periodic maintenance or cleaning, public access and use shall be provided to the toilet facilities at all times during *occupancy* of the *premises.*

SECTION 503
TOILET ROOMS

[P] 503.1 Privacy. *Toilet rooms* and *bathrooms* shall provide privacy and shall not constitute the only passageway to a hall or other space, or to the exterior. A door and interior locking device shall be provided for all common or shared *bathrooms* and *toilet rooms* in a multiple dwelling.

[P] 503.2 Location. *Toilet rooms* and *bathrooms* serving hotel units, *rooming units* or dormitory units or *housekeeping units*, shall have access by traversing not more than one flight of stairs and shall have access from a common hall or passageway.

[P] 503.3 Location of employee toilet facilities. Toilet facilities shall have access from within the employees' working area. The required toilet facilities shall be located not more than one story above or below the employees' working area and the path of travel to such facilities shall not exceed a distance of 500 feet (152 m). Employee facilities shall either be separate facilities or combined employee and public facilities.

Exception: Facilities that are required for employees in storage structures or kiosks, which are located in adjacent structures under the same ownership, lease or control, shall not exceed a travel distance of 500 feet (152 m) from the employees' regular working area to the facilities.

[P] 503.4 Floor surface. In other than *dwelling units*, every *toilet room* floor shall be maintained to be a smooth, hard, nonabsorbent surface to permit such floor to be easily kept in a clean and sanitary condition.

SECTION 504
PLUMBING SYSTEMS AND FIXTURES

[P] 504.1 General. Plumbing fixtures shall be properly installed and maintained in working order, and shall be kept free from obstructions, leaks and defects and be capable of performing the function for which such plumbing fixtures are designed. Plumbing fixtures shall be maintained in a safe, sanitary and functional condition.

[P] 504.2 Fixture clearances. Plumbing fixtures shall have adequate clearances for usage and cleaning.

[P] 504.3 Plumbing system hazards. Where it is found that a plumbing system in a structure constitutes a hazard to the *occupants* or the structure by reason of inadequate service, inadequate venting, cross connection, backsiphonage, improper installation, *deterioration* or damage or for similar reasons, the *code official* shall require the defects to be corrected to eliminate the hazard.

SECTION 505
WATER SYSTEM

505.1 General. Every sink, lavatory, bathtub or shower, drinking fountain, water closet or other plumbing fixture shall be properly connected to either a public water system or to an *approved* private water system. Kitchen sinks, lavatories, laundry facilities, bathtubs and showers shall be supplied

with hot or tempered and cold running water in accordance with the *International Plumbing Code*.

[P] 505.2 Contamination. The water supply shall be maintained free from contamination, and all water inlets for plumbing fixtures shall be located above the flood-level rim of the fixture. Shampoo basin faucets, janitor sink faucets and other hose bibs or faucets to which hoses are attached and left in place, shall be protected by an approved atmospheric-type vacuum breaker or an approved permanently attached hose connection vacuum breaker.

505.3 Supply. The water supply system shall be installed and maintained to provide a supply of water to plumbing fixtures, devices and appurtenances in sufficient volume and at pressures adequate to enable the fixtures to function properly, safely, and free from defects and leaks.

505.4 Water heating facilities. Water heating facilities shall be properly installed, maintained and capable of providing an adequate amount of water to be drawn at every required sink, lavatory, bathtub, shower and laundry facility at a minimum temperature of 110°F (43°C). A gas-burning water heater shall not be located in any *bathroom*, *toilet room*, *bedroom* or other occupied room normally kept closed, unless adequate combustion air is provided. An *approved* combination temperature and pressure-relief valve and relief valve discharge pipe shall be properly installed and maintained on water heaters.

SECTION 506
SANITARY DRAINAGE SYSTEM

[P] 506.1 General. Plumbing fixtures shall be properly connected to either a public sewer system or to an *approved* private sewage disposal system.

[P] 506.2 Maintenance. Every plumbing stack, vent, waste and sewer line shall function properly and be kept free from obstructions, leaks and defects.

[P] 506.3 Grease interceptors. Grease interceptors and automatic grease removal devices shall be maintained in accordance with this code and the manufacturer's installation instructions. Grease interceptors and automatic grease removal devices shall be regularly serviced and cleaned to prevent the discharge of oil, grease, and other substances harmful or hazardous to the building drainage system, the public sewer, the private sewage disposal system or the sewage treatment plant or processes. Records of maintenance, cleaning and repairs shall be available for inspection by the code official.

SECTION 507
STORM DRAINAGE

[P] 507.1 General. Drainage of roofs and paved areas, *yards* and courts, and other open areas on the *premises* shall not be discharged in a manner that creates a public nuisance.

CHAPTER 6
MECHANICAL AND ELECTRICAL REQUIREMENTS

SECTION 601
GENERAL

601.1 Scope. The provisions of this chapter shall govern the minimum mechanical and electrical facilities and equipment to be provided.

601.2 Responsibility. The *owner* of the structure shall provide and maintain mechanical and electrical facilities and equipment in compliance with these requirements. A person shall not occupy as *owner-occupant* or permit another person to occupy any *premises* that does not comply with the requirements of this chapter.

SECTION 602
HEATING FACILITIES

602.1 Facilities required. Heating facilities shall be provided in structures as required by this section.

602.2 Residential occupancies. Dwellings shall be provided with heating facilities capable of maintaining a room temperature of 68°F (20°C) in all habitable rooms, *bathrooms* and *toilet rooms* based on the winter outdoor design temperature for the locality indicated in Appendix D of the *International Plumbing Code*. Cooking appliances shall not be used, nor shall portable unvented fuel-burning space heaters be used, as a means to provide required heating.

Exception: In areas where the average monthly temperature is above 30°F (-1°C), a minimum temperature of 65°F (18°C) shall be maintained.

602.3 Heat supply. Every *owner* and *operator* of any building who rents, leases or lets one or more *dwelling units* or *sleeping units* on terms, either expressed or implied, to furnish heat to the *occupants* thereof shall supply heat during the period from **[DATE]** to **[DATE]** to maintain a minimum temperature of 68°F (20°C) in all habitable rooms, *bathrooms* and *toilet rooms*.

Exceptions:

1. When the outdoor temperature is below the winter outdoor design temperature for the locality, maintenance of the minimum room temperature shall not be required provided that the heating system is operating at its full design capacity. The winter outdoor design temperature for the locality shall be as indicated in Appendix D of the *International Plumbing Code*.
2. In areas where the average monthly temperature is above 30°F (-1°C), a minimum temperature of 65°F (18°C) shall be maintained.

602.4 Occupiable work spaces. Indoor occupiable work spaces shall be supplied with heat during the period from **[DATE]** to **[DATE]** to maintain a minimum temperature of 65°F (18°C) during the period the spaces are occupied.

Exceptions:

1. Processing, storage and operation areas that require cooling or special temperature conditions.
2. Areas in which persons are primarily engaged in vigorous physical activities.

602.5 Room temperature measurement. The required room temperatures shall be measured 3 feet (914 mm) above the floor near the center of the room and 2 feet (610 mm) inward from the center of each exterior wall.

SECTION 603
MECHANICAL EQUIPMENT

603.1 Mechanical appliances. Mechanical appliances, fireplaces, solid fuel-burning appliances, cooking appliances and water heating appliances shall be properly installed and maintained in a safe working condition, and shall be capable of performing the intended function.

603.2 Removal of combustion products. Fuel-burning equipment and appliances shall be connected to an *approved* chimney or vent.

Exception: Fuel-burning equipment and appliances that are *labeled* for unvented operation.

603.3 Clearances. Required clearances to combustible materials shall be maintained.

603.4 Safety controls. Safety controls for fuel-burning equipment shall be maintained in effective operation.

603.5 Combustion air. A supply of air for complete combustion of the fuel and for *ventilation* of the space containing the fuel-burning equipment shall be provided for the fuel-burning equipment.

603.6 Energy conservation devices. Devices intended to reduce fuel consumption by attachment to a fuel-burning appliance, to the fuel supply line thereto, or to the vent outlet or vent piping therefrom, shall not be installed unless *labeled* for such purpose and the installation is specifically *approved*.

SECTION 604
ELECTRICAL FACILITIES

604.1 Facilities required. Every occupied building shall be provided with an electrical system in compliance with the requirements of this section and Section 605.

604.2 Service. The size and usage of appliances and equipment shall serve as a basis for determining the need for additional facilities in accordance with NFPA 70. *Dwelling units* shall be served by a three-wire, 120/240 volt, single-phase electrical service having a minimum rating of 60 amperes.

604.3 Electrical system hazards. Where it is found that the electrical system in a structure constitutes a hazard to the *occupants* or the structure by reason of inadequate service, improper fusing, insufficient receptacle and lighting outlets, improper wiring or installation, *deterioration* or damage, or for similar reasons, the *code official* shall require the defects to be corrected to eliminate the hazard.

604.3.1 Abatement of electrical hazards associated with water exposure. The provisions of this section shall govern the repair and replacement of electrical systems and equipment that have been exposed to water.

604.3.1.1 Electrical equipment. Electrical distribution equipment, motor circuits, power equipment, transformers, wire, cable, flexible cords, wiring devices, ground fault circuit interrupters, surge protectors, molded case circuit breakers, low-voltage fuses, luminaires, ballasts, motors and electronic control, signaling and communication equipment that have been exposed to water shall be replaced in accordance with the provisions of the *International Building Code*.

Exception: The following equipment shall be allowed to be repaired where an inspection report from the equipment manufacturer or *approved* manufacturer's representative indicates that the equipment has not sustained damage that requires replacement:

1. Enclosed switches, rated a maximum of 600 volts or less;
2. Busway, rated a maximum of 600 volts;
3. Panelboards, rated a maximum of 600 volts;
4. Switchboards, rated a maximum of 600 volts;
5. Fire pump controllers, rated a maximum of 600 volts;
6. Manual and magnetic motor controllers;
7. Motor control centers;
8. Alternating current high-voltage circuit breakers;
9. Low-voltage power circuit breakers;
10. Protective relays, meters and current transformers;
11. Low- and medium-voltage switchgear;
12. Liquid-filled transformers;
13. Cast-resin transformers;
14. Wire or cable that is suitable for wet locations and whose ends have not been exposed to water;
15. Wire or cable, not containing fillers, that is suitable for wet locations and whose ends have not been exposed to water;
16. Luminaires that are listed as submersible;
17. Motors;
18. Electronic control, signaling and communication equipment.

604.3.2 Abatement of electrical hazards associated with fire exposure. The provisions of this section shall govern the repair and replacement of electrical systems and equipment that have been exposed to fire.

604.3.2.1 Electrical equipment. Electrical switches, receptacles and fixtures, including furnace, water heating, security system and power distribution circuits, that have been exposed to fire, shall be replaced in accordance with the provisions of the *International Building Code*.

Exception: Electrical switches, receptacles and fixtures that shall be allowed to be repaired where an inspection report from the equipment manufacturer or *approved* manufacturer's representative indicates that the equipment has not sustained damage that requires replacement.

SECTION 605
ELECTRICAL EQUIPMENT

605.1 Installation. Electrical equipment, wiring and appliances shall be properly installed and maintained in a safe and *approved* manner.

605.2 Receptacles. Every *habitable space* in a dwelling shall contain not less than two separate and remote receptacle outlets. Every laundry area shall contain not less than one grounding-type receptacle or a receptacle with a ground fault circuit interrupter. Every *bathroom* shall contain not less than one receptacle. Any new *bathroom* receptacle outlet shall have ground fault circuit interrupter protection. All receptacle outlets shall have the appropriate faceplate cover for the location.

605.3 Luminaires. Every public hall, interior stairway, *toilet room*, kitchen, *bathroom*, laundry room, boiler room and furnace room shall contain not less than one electric luminaire. Pool and spa luminaires over 15 V shall have ground fault circuit interrupter protection.

605.4 Wiring. Flexible cords shall not be used for permanent wiring, or for running through doors, windows, or cabinets, or concealed within walls, floors, or ceilings.

SECTION 606
ELEVATORS, ESCALATORS AND DUMBWAITERS

606.1 General. Elevators, dumbwaiters and escalators shall be maintained in compliance with ASME A17.1. The most current certificate of inspection shall be on display at all times within the elevator or attached to the escalator or dumb-

waiter, be available for public inspection in the office of the building *operator* or be posted in a publicly conspicuous location *approved* by the *code official*. The inspection and tests shall be performed at not less than the periodic intervals listed in ASME A17.1, Appendix N, except where otherwise specified by the authority having jurisdiction.

606.2 Elevators. In buildings equipped with passenger elevators, not less than one elevator shall be maintained in operation at all times when the building is occupied.

Exception: Buildings equipped with only one elevator shall be permitted to have the elevator temporarily out of service for testing or servicing.

SECTION 607
DUCT SYSTEMS

607.1 General. Duct systems shall be maintained free of obstructions and shall be capable of performing the required function.

CHAPTER 7

FIRE SAFETY REQUIREMENTS

SECTION 701
GENERAL

701.1 Scope. The provisions of this chapter shall govern the minimum conditions and standards for fire safety relating to structures and exterior *premises*, including fire safety facilities and equipment to be provided.

701.2 Responsibility. The *owner* of the *premises* shall provide and maintain such fire safety facilities and equipment in compliance with these requirements. A person shall not occupy as *owner-occupant* or permit another person to occupy any *premises* that do not comply with the requirements of this chapter.

SECTION 702
MEANS OF EGRESS

[F] 702.1 General. A safe, continuous and unobstructed path of travel shall be provided from any point in a building or structure to the *public way*. Means of egress shall comply with the *International Fire Code.*

[F] 702.2 Aisles. The required width of aisles in accordance with the *International Fire Code* shall be unobstructed.

[F] 702.3 Locked doors. Means of egress doors shall be readily openable from the side from which egress is to be made without the need for keys, special knowledge or effort, except where the door hardware conforms to that permitted by the *International Building Code*.

[F] 702.4 Emergency escape openings. Required emergency escape openings shall be maintained in accordance with the code in effect at the time of construction, and the following. Required emergency escape and rescue openings shall be operational from the inside of the room without the use of keys or tools. Bars, grilles, grates or similar devices are permitted to be placed over emergency escape and rescue openings provided the minimum net clear opening size complies with the code that was in effect at the time of construction and such devices shall be releasable or removable from the inside without the use of a key, tool or force greater than that which is required for normal operation of the escape and rescue opening.

SECTION 703
FIRE-RESISTANCE RATINGS

[F] 703.1 Fire-resistance-rated assemblies. The required fire-resistance rating of fire-resistance-rated walls, fire stops, shaft enclosures, partitions and floors shall be maintained.

[F] 703.2 Opening protectives. Required opening protectives shall be maintained in an operative condition. Fire and smokestop doors shall be maintained in operable condition. Fire doors and smoke barrier doors shall not be blocked or obstructed or otherwise made inoperable.

SECTION 704
FIRE PROTECTION SYSTEMS

[F] 704.1 General. Systems, devices and equipment to detect a fire, actuate an alarm, or suppress or control a fire or any combination thereof shall be maintained in an operable condition at all times in accordance with the *International Fire Code*.

[F] 704.1.1 Automatic sprinkler systems. Inspection, testing and maintenance of automatic sprinkler systems shall be in accordance with NFPA 25.

[F] 704.1.2 Fire department connection. Where the fire department connection is not visible to approaching fire apparatus, the fire department connection shall be indicated by an *approved* sign mounted on the street front or on the side of the building. Such sign shall have the letters "FDC" not less than 6 inches (152 mm) high and words in letters not less than 2 inches (51 mm) high or an arrow to indicate the location. Such signs shall be subject to the approval of the fire code official.

[F] 704.2 Single- and multiple-station smoke alarms. Single- and multiple-station smoke alarms shall be installed in existing Group I-1 and R occupancies in accordance with Sections 704.2.1 through 704.2.3.

[F] 704.2.1 Where required. Existing Group I-1 and R occupancies shall be provided with single-station smoke alarms in accordance with Sections 704.2.1.1 through 704.2.1.4. Interconnection and power sources shall be in accordance with Sections 704.2.2 and 704.2.3.

Exceptions:

1. Where the code that was in effect at the time of construction required smoke alarms and smoke alarms complying with those requirements are already provided.
2. Where smoke alarms have been installed in occupancies and dwellings that were not required to have them at the time of construction, additional smoke alarms shall not be required provided that the existing smoke alarms comply with requirements that were in effect at the time of installation.
3. Where smoke detectors connected to a fire alarm system have been installed as a substitute for smoke alarms.

[F] 704.2.1.1 Group R-1. Single- or multiple-station smoke alarms shall be installed in all of the following locations in Group R-1:

1. In sleeping areas.
2. In every room in the path of the *means of egress* from the sleeping area to the door leading from the *sleeping unit*.

3. In each story within the *sleeping unit*, including basements. For *sleeping units* with split levels and without an intervening door between the adjacent levels, a smoke alarm installed on the upper level shall suffice for the adjacent lower level provided that the lower level is less than one full story below the upper level.

[F] 704.2.1.2 Groups R-2, R-3, R-4 and I-1. Single- or multiple-station smoke alarms shall be installed and maintained in Groups R-2, R-3, R-4 and I-1 regardless of *occupant load* at all of the following locations:

1. On the ceiling or wall outside of each separate sleeping area in the immediate vicinity of bedrooms.
2. In each room used for sleeping purposes.
3. In each story within a *dwelling unit*, including *basements* but not including crawl spaces and uninhabitable attics. In *dwellings* or *dwelling units* with split levels and without an intervening door between the adjacent levels, a smoke alarm installed on the upper level shall suffice for the adjacent lower level provided that the lower level is less than one full story below the upper level.

[F] 704.2.1.3 Installation near cooking appliances. Smoke alarms shall not be installed in the following locations unless this would prevent placement of a smoke alarm in a location required by Section 704.2.1.1 or 704.2.1.2.

1. Ionization smoke alarms shall not be installed less than 20 feet (6096 m) horizontally from a permanently installed cooking appliance.
2. Ionization smoke alarms with an alarm-silencing switch shall not be installed less than 10 feet (3048 mm) horizontally from a permanently installed cooking appliance.
3. Photoelectric smoke alarms shall not be installed less than 6 feet (1829 mm) horizontally from a permanently installed cooking appliance.

[F] 704.2.1.4 Installation near bathrooms. Smoke alarms shall be installed not less than 3 feet (914 mm) horizontally from the door or opening of a bathroom that contains a bathtub or shower unless this would prevent placement of a smoke alarm required by Section 704.2.1.1 or 704.2.1.2.

[F] 704.2.2 Interconnection. Where more than one smoke alarm is required to be installed within an individual *dwelling* or *sleeping unit*, the smoke alarms shall be interconnected in such a manner that the activation of one alarm will activate all of the alarms in the individual unit. Physical interconnection of smoke alarms shall not be required where listed wireless alarms are installed and all alarms sound upon activation of one alarm. The alarm shall be clearly audible in all bedrooms over background noise levels with all intervening doors closed.

Exceptions:

1. Interconnection is not required in buildings that are not undergoing *alterations*, repairs or construction of any kind.
2. Smoke alarms in existing areas are not required to be interconnected where *alterations* or repairs do not result in the removal of interior wall or ceiling finishes exposing the structure, unless there is an attic, crawl space or basement available that could provide access for interconnection without the removal of interior finishes.

[F] 704.2.3 Power source. Single-station smoke alarms shall receive their primary power from the building wiring provided that such wiring is served from a commercial source and shall be equipped with a battery backup. Smoke alarms with integral strobes that are not equipped with battery backup shall be connected to an emergency electrical system. Smoke alarms shall emit a signal when the batteries are low. Wiring shall be permanent and without a disconnecting switch other than as required for overcurrent protection.

Exceptions:

1. Smoke alarms are permitted to be solely battery operated in existing buildings where no construction is taking place.
2. Smoke alarms are permitted to be solely battery operated in buildings that are not served from a commercial power source.
3. Smoke alarms are permitted to be solely battery operated in existing areas of buildings undergoing *alterations* or repairs that do not result in the removal of interior walls or ceiling finishes exposing the structure, unless there is an attic, crawl space or *basement* available that could provide access for building wiring without the removal of interior finishes.

[F] 704.2.4 Smoke detection system. Smoke detectors listed in accordance with UL 268 and provided as part of the building's fire alarm system shall be an acceptable alternative to single- and multiple-station smoke alarms and shall comply with the following:

1. The fire alarm system shall comply with all applicable requirements in Section 907 of the *International Fire Code*.
2. Activation of a smoke detector in a dwelling or sleeping unit shall initiate alarm notification in the *dwelling* or *sleeping unit* in accordance with Section 907.5.2 of the *International Fire Code*.
3. Activation of a smoke detector in a *dwelling* or *sleeping unit* shall not activate alarm notification appliances outside of the *dwelling* or *sleeping unit*, provided that a supervisory signal is generated and monitored in accordance with Section 907.6.5 of the *International Fire Code*.

CHAPTER 8
REFERENCED STANDARDS

This chapter lists the standards that are referenced in various sections of this document. The standards are listed herein by the promulgating agency of the standard, the standard identification, the effective date and title and the section or sections of this document that reference the standard. The application of the referenced standards shall be as specified in Section 102.7.

ASME

American Society of Mechanical Engineers
Three Park Avenue
New York, NY 10016-5990

Standard reference number	Title	Referenced in code section number
ASME A17.1/CSA B44—2013	Safety Code for Elevators and Escalators	606.1

ASTM

ASTM International
100 Barr Harbor Drive
West Conshohocken, PA 19428-2959

Standard reference number	Title	Referenced in code section number
F 1346—91 (2010)	Performance Specifications for Safety Covers and Labeling Requirements for All Covers for Swimming Pools, Spas and Hot Tubs	303.2

ICC

International Code Council
500 New Jersey Avenue, NW
6th Floor
Washington, DC 20001

Standard reference number	Title	Referenced in code section number
IBC—15	International Building Code®	102.3, 201.3, 401.3, 702.3
IEBC—15	International Existing Building Code®	305.1.1, 306.1.1
IFC—15	International Fire Code®	201.3, 604.3.1.1, 604.3.2.1, 702.1, 702.2, 704.1, 704.2
IFGC—15	International Fuel Gas Code®	102.3
IMC—15	International Mechanical Code®	102.3, 201.3
IPC—15	International Plumbing Code®	201.3, 505.1, 602.2, 602.3
IRC—15	International Residential Code®	201.3
IZC—15	International Zoning Code®	102.3, 201.3

NFPA

National Fire Protection Association
1 Batterymarch Park
Quincy, MA 02269

Standard reference number	Title	Referenced in code section number
25—14	Standard for the Inspection, Testing and Maintenance of Water-Based Fire Protection Systems	704.1.1
70—14	National Electrical Code	102.4, 201.3, 604.2

APPENDIX A
BOARDING STANDARD

The provisions contained in this appendix are not mandatory unless specifically referenced in the adopting ordinance.

A101
GENERAL

A101.1 General. Windows and doors shall be boarded in an *approved* manner to prevent entry by unauthorized persons and shall be painted to correspond to the color of the existing structure.

A102
MATERIALS

A102.1 Boarding sheet material. Boarding sheet material shall be minimum $^1/_2$-inch-thick (12.7 mm) wood structural panels complying with the *International Building Code*.

A102.2 Boarding framing material. Boarding framing material shall be minimum nominal 2-inch by 4-inch (51 mm by 102 mm) solid sawn lumber complying with the *International Building Code*.

A102.3 Boarding fasteners. Boarding fasteners shall be minimum $^3/_8$-inch-diameter (9.5 mm) carriage bolts of such a length as required to penetrate the assembly and as required to adequately attach the washers and nuts. Washers and nuts shall comply with the *International Building Code*.

A103
INSTALLATION

A103.1 Boarding installation. The boarding installation shall be in accordance with Figures A103.1(1) and A103.1(2) and Sections A103.2 through A103.5.

A103.2 Boarding sheet material. The boarding sheet material shall be cut to fit the door or window opening neatly or shall be cut to provide an equal overlap at the perimeter of the door or window.

A103.3 Windows. The window shall be opened to allow the carriage bolt to pass through or the window sash shall be removed and stored. The 2-inch by 4-inch (51 mm by 102 mm) strong back framing material shall be cut minimum 2 inches (51 mm) wider than the window opening and shall be placed on the inside of the window opening 6 inches (152 mm) minimum above the bottom and below the top of the window opening. The framing and boarding shall be predrilled. The assembly shall be aligned and the bolts, washers and nuts shall be installed and secured.

A103.4 Door walls. The door opening shall be framed with minimum 2-inch by 4-inch (51 mm by 102 mm) framing material secured at the entire perimeter and vertical members at a maximum of 24 inches (610 mm) on center. Blocking shall also be secured at a maximum of 48 inches (1219 mm) on center vertically. Boarding sheet material shall be secured with screws and nails alternating every 6 inches (152 mm) on center.

A103.5 Doors. Doors shall be secured by the same method as for windows or door openings. One door to the structure shall be available for authorized entry and shall be secured and locked in an *approved* manner.

A104
REFERENCED STANDARD

IBC—12	International Building Code	A102.1, A102.2, A102.3

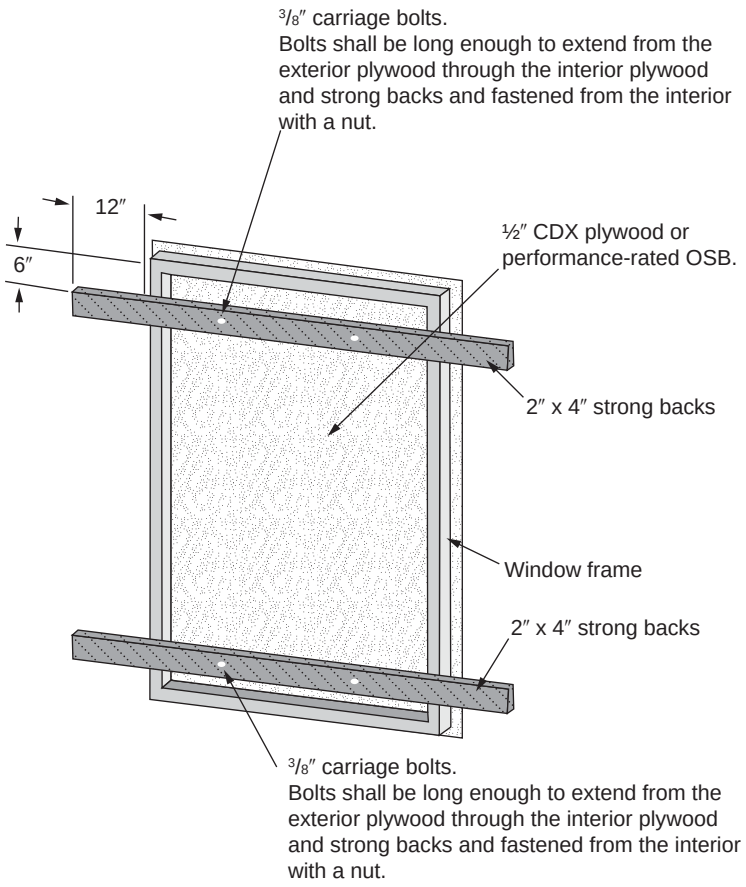

FIGURE A103.1(1)
BOARDING OF DOOR OR WINDOW

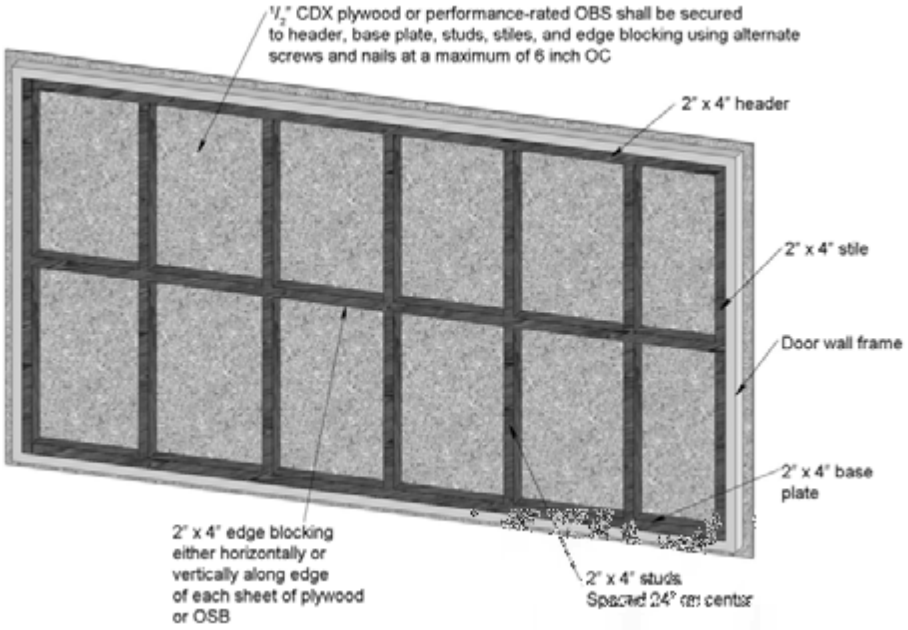

FIGURE A103.1(2)
BOARDING OF DOOR WALL

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WORKMANSHIP

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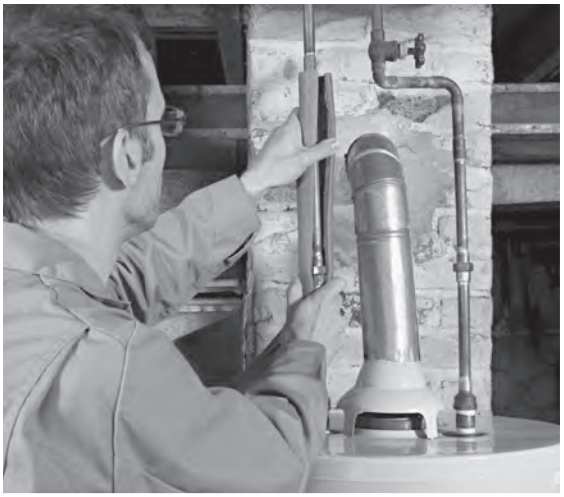
14-09372

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*Some restrictions apply. Speak with an ICC Member Services Representative for details.

14-09333




January 3, 2020

VIA EMAIL: kmclawhon@thompsons-station.com

Mr. Ken McLawhon
Town Administrator
Town of Thompson's Station
1550 Thompson's Station Road W
Thompson's Station, TN 37179

RE: PROFESSIONAL SERVICES PROPOSAL FOR PRE-BID SERVICES CRITZ LANE IMPROVEMENTS, THOMPSON'S STATION, TENNESSEE

Dear Mr. McLawhon:

Ragan-Smith Associates, Inc. is pleased to provide the following proposal to the **Town of Thompson's Station** for Professional Bidding Services to confirm CEI Oversight needs for the Critz Lane Improvement project.

INTRODUCTION

Ragan-Smith has been asked by the **Town of Thompson's Station** to provide a scope of bidding and CEI services for the construction of the Critz Lane Improvements.

It is **Ragan-Smith's** understanding that the project will be funded locally or with a combination of local and private funding sources. The funding source is critical in relation to the final scope of services since other funding sources (i.e. State or Federal) require adherence to strict TDOT Policy. In addition, the town has some latitude in the way in which they solicit bids for the project, and this also has significant impact in the type and degree of construction oversight and inspection. Specifically, the choice of a lump sum or unit price construction bid can each have pros and cons for the town and stakeholders. These items, as well as the contractor's ability to close the road or detour traffic will have significant relationship to the best bid and CEI choice for the project.

PROJECT TIMELINE

Based upon our meeting, the Town has tentatively set a construction start date in the Spring of 2020 with completion date based upon project factors including school operations and the need for lane closures and detours throughout the construction period. The construction duration and most notably the ability for the contractor to detour traffic and close segments of the road should be determined along with the Bid type prior to finalizing the scope of work related to Construction Inspection.

DUE DILIGENCE

We have developed our proposal based upon the following:

- Plans by Ragan-Smith Associates, dated January 14, 2019 for Critz Lane Improvements
- TDOT CEI Scope of Services (attached for information and reference)
- TDOT Construction Inspection Guide dated May 2017
- Construction Cost Estimate

For the purposes of developing the most effective and appropriate scope of services for the project, we suggest two discrete phases for Professional Engineering and Construction Engineering and Inspection (CEI) Services:

Phase I: Pre-Bid Service

a. Determine Bid Type, Construction Period, and Traffic Control Requirements
b. Finalize Construction Cost Estimate, Prepare Bid Documents
c. Bid and Award the Construction Contract

Phase II: CEI Scope and Completion

Based upon Final Decision in Phase I above:
a. Prepare Construction Engineering and Inspection Scope and Fee Proposal
b. CEI Professional Service

PHASE I SCOPE OF BASIC SERVICES

Pre-Bid Services

In consultation with the Town of Thompson's Station and staff, **Ragan-Smith** will complete the following Pre-Bid review:

- Review Project Plans
- Review Engineers Opinion of Probable Cost
- Review Traffic Control for the project including detours and closures
- Review Timeline for Construction and Commitments related to Development or other stakeholders
- Review funding sources and City requirements for Bidding.

Based upon the above, **Ragan-Smith** will advise and recommend as suggested course of action for the Construction project that establishes the following:

- Type of Construction Bid (Lump Sum or Unit Price)
- Contractor Traffic Control including Detours, Closures, Nighttime or Weekend work
- Total Construction Period (Calendar Days or "On or Before" Date)
- Liquidated Damages
- Role of the Inspector Oversight

Bid Documents / Bidding / Award

After the Pre-Bid Services are complete and the Construction and Inspection Scope is Set, **Ragan-Smith** will be responsible for a formal bid document to secure competitive unit price bids for construction. A bid document will be prepared with any Town-specific front-end documents and will include:

- Advertisement
- General and Supplemental Conditions
- Bid Bond and Performance Bonds
- Item Numbers, Estimated Quantities, and Bid From
- Specifications

After approval of the Bid Documents including the Plans, **Ragan-Smith** will coordinate advertisement and bidding procedures and assist with soliciting bids from responsible bidders. Finally, **Ragan- Smith** will review bids, prepare bid tabs and review each bid for mathematical or material imbalances according to Guidelines for Awards of Construction Contracts and for any bid irregularities and make a recommendation for award to the lowest responsible bidder.

COMPENSATION AND FEE SCHEDULE

Ragan-Smith proposes to complete the above Scope of Work for the **Lump Sum Fee of $20,000.** These fees are based upon the projected construction duration and pre-construction and close-out requirements. We have not included fees associated with contract extension or overtime based upon contractor convenience or inactivity. Fees will be billed monthly based upon contract completion as determined by schedule duration.

I.	Pre-Bid Services	$ 20,000
	A. Pre-Bid Review / Bid Documents / Bid Assistance	
	B. Pre-Construction / EPSC and Utility Meetings	
II.	Construction Management and Contract Admin	TBD
	TOTAL LUMP SUM FEES	**$ 20,000**

EXCLUSIONS

- No redesign of plans
- No public meetings other than progress meetings and meetings with Town Staff
- One bid Cycle

Should additional work be required outside the Scope of Services noted above, said work will be mutually agreed to prior to commencing and billed hourly according to the **Ragan-Smith** *Schedule of Services and Expenses, Contract Terms and Conditions* (attached). Invoices will be submitted monthly based on a percentage of completion of the scope of services and are due and payable within 30 days of invoice date. Travel, shipping, printing, government fees and other such expenses directly related to the project will be billed at cost and are in addition to the quoted service fees above.

We appreciate the opportunity to provide this proposal to you and look forward to working with the Town of Thompson's Station to complete this much needed project. If you agree to the terms, please sign and return a copy of this document that will serve as authorization to proceed with the work.

Sincerely,

RAGAN-SMITH ASSOCIATES, INC.

Joseph F. Griffin, P.E.
Executive Vice President – Public Sector

Kenneth E. Freer, P.E., CPESC
Vice President

CLIENT ACCEPTANCE and AUTHORIZATION TO PROCEED

By: _____ Date: _____

Printed/Typed Name: _____ Title: _____

SCHEDULE OF SERVICES AND EXPENSES

The below hourly billing rates are valid and effective for a period of one year from the date of the signed contract unless stated differently in the project specific work agreement. Hourly rates after this period will be based on the most current Ragan-Smith rate sheet and are therefore subject to increase.

PROFESSIONAL SERVICES

Classification	*Hourly Rate*
Principal	$210.00
Senior Project Manager	180.00
Project Manager	155.00
Professional Engineer	130.00
• Civil Engineer	
• Traffic Engineer	
• Hydrology/Hydraulics Engineer	
• Environmental Engineer	
• Construction Engineer	
Registered Landscape Architect	$120.00
Registered Land Surveyor	120.00
Planner	120.00

TECHNICAL SERVICES

Classification	*Hourly Rate*
Senior Designer	$110.00
Senior Technician	105.00
Designer	95.00
Technician	90.00
Administrative Assistant	80.00

FIELD SURVEY SERVICES

Classification	*Hourly Rate*
Survey Manager	$100.00
Two Man Survey Crew	135.00
Three Man Survey Crew	175.00
One Man Robotic or GPS Survey Crew	135.00
3-D Laser Scanning Survey Crew	250.00

CONSTRUCTION SERVICES

Classification	*Hourly Rate*
Construction Manager	$155.00
CEI Resident Engineer	130.00
Asphalt/Concrete Plant Manager	110.00
Senior Inspector	100.00
CEI Contract Specialist	90.00
Inspector	80.00

EXPENSES

Expenses (not limited) are not included in the service fees of this agreement unless specifically stated.

Travel:	Cost
Travel and subsistence expenses (Lodging, meals, mileage, etc.)	
Subcontracts:	Cost
Sundries / Review/Submittal Fees:	Cost
Printing/reproductions:	Commercial Rates

Review/submittal fees over $200 are to be paid by the client directly to the jurisdictional agency.

CONTRACT TERMS AND CONDITIONS

PARTIES, SERVICES, ASSIGNMENT AND ENTIRE AGREEMENT – Ragan-Smith Associates, Inc., as an independent consultant, agrees to provide consulting services to the Client for the Client's sole benefit and exclusive use. No third party beneficiaries are intended by this agreement. The ordering of services from Ragan-Smith constitutes acceptance of the terms and conditions set out in this Agreement. This Agreement may not be assigned by either party without prior written permission of the other party. This Agreement constitutes the entire understanding of Ragan-Smith and the Client and there are no other warranties or representation made other than as set forth herein and specifically within the Agreement.

STANDARD OF CARE – Ragan-Smith agrees to perform consulting services in accordance with the degree of care and skill ordinarily exercised by other reputable members of our profession under similar circumstances. No warranty expressed or implied is made or intended by this Agreement relating to the services provided by Ragan-Smith.

CONCEALED OR UNKNOWN CONDITIONS – If conditions are encountered at the site that are concealed or unknown, then Ragan-Smith will be entitled to an equitable adjustment in the contract sum or contract time or both.

OPINIONS OF COST – When requested by the Client, Ragan-Smith will use its best efforts, experience and judgment to offer an opinion of estimated construction costs. Such opinions are based on available historical data and are intended to provide an estimate of cost. No warranty of the actual construction cost is expressed or implied.

SITE ACCESS – Client will grant or obtain free access to the site for all equipment and personnel necessary for Ragan-Smith to perform the services set forth in this Agreement. Client will notify any and all tenants or possessors of the project site that Client has granted Ragan-Smith free access to the site.

JOB SITE SAFETY - Client agrees that, in accordance with the generally accepted construction practice, the contractor will be solely and completely responsible for working conditions on the job site, including safety of all persons and property during the performance of the services, and with compliance with all OSHA regulations. Neither the professional activities of Ragan-Smith nor the presence of Ragan-Smith or its employees and sub-consultants on the job site shall relieve the General Contractor of its responsibilities.

INSURANCE – Ragan-Smith maintains insurance coverage including Workers' Compensation Insurance, Employer's Liability Insurance, Commercial General Liability Insurance, Automobile Liability Insurance and Professional Errors and Omission Insurance. Certificates of Insurance will be furnished upon request.

LIMITATION OF LIABILITY - In recognition of the relative risks and benefits of the project to both the Client and Ragan-Smith, the risks have been allocated such that the Client agrees, to the fullest extent permitted by law, to limit the total aggregate liability of Ragan-Smith and its sub-consultants to the Client for any and all claims, losses, costs, damages of any nature whatsoever or claims expenses from any cause or causes, to $50,000 or Ragan-Smith's total fee for services rendered on the project, whichever is greater. Such claims and causes include, but are not limited to, claims for negligence, professional errors or omissions, negligent misrepresentation, strict liability, breach of contract, breach of warranty.

WAIVER OF CONSEQUENTIAL DAMAGE – Ragan-Smith and Client waive their right to recover consequential damages against each other, and Ragan-Smith and Client do hereby release each other from consequential damages for claims, disputes or other matters in question arising out of or relating to this Agreement. This mutual waiver is applicable, without limitation, to all consequential damages including damages resulting from the termination of this Agreement.

PAYMENT TERMS – Client will be invoiced once each month for services performed during the preceding period. If payment is not received within thirty (30) days of the invoice date, the Client agrees to pay a service charge on the past due amount of one and one half percent (1 ½%) per month compounded monthly. The Client additionally agrees to pay all attorney fees, collection fees, court and lien costs, and other such expenditures incurred to satisfy any unpaid balance.

LIEN RIGHTS – The parties agree that the design services provided by Ragan-Smith under this Contract will improve the value of the real property, regardless of whether any physical improvements are made to the property in furtherance of Ragan-Smith's services, and the parties agree that Ragan-Smith will have lien rights in and to the property to the extent of the services provided by Ragan-Smith under this agreement regardless of whether any improvements are made to the property.

DISPUTE RESOLUTION/MEDIATION – In an effort to resolve any disputes that arise during or subsequent to the performance of services outlined in this Agreement, the Client and Ragan-Smith agree to submit all such disputes to mediation prior to the commencement of litigation.

TERMINATION – The Agreement may be only terminated for cause upon seven (7) days of written notice. In the event of termination, Ragan-Smith will be entitled to compensation for all services provided and expenses incurred up to and including the termination date

TDOT
PROPOSED SCOPE OF WORK - CEI

SCOPE OF SERVICES SUMMARY

This document is to define as clearly as possible the duties of the consultant with regard to administration of the TDOT construction contract. The intent of the document is to give the Consultant the same responsibility and authority as TDOT personnel when administrating a state highway construction contract. The administration of the TDOT highway construction contract will be conducted by the consultant in full cooperation with the TDOT District Supervisor and/or their representative(s) assigned to the project. The TDOT District Supervisor will have the final word in regard to challenges of consultant authority by the contractor or decisions made by the consultant regarding the work. The ultimate goal of the Department and the Consultant should be to administer the contract in a highly professional manner, conductive of a cooperative relationship between the Consultant, contractors, and the Department, and to complete the work on budget and on time with a minimum inconvenience and maximum safety to the public.

The responsibilities of the Consultant on this project may include:

1. **Project Management Meetings/Updates for transition to Consultant Management and Inspections:** Attend meetings and coordinate with the TDOT office currently overseeing the project in order to transition project management and inspection services. Meet with contractor to address consultant management roles and procedures.

2. **Attend Weekly Meetings:** Prepare the agenda, attend, and conduct meeting every week with TDOT personnel, contractor, sub-contractors, utility personnel and other agencies affected by the project. Be prepared to discuss recent progress, upcoming events in the schedule, and problems associated with the project. Record significant information revealed and discussed at the meeting and distributes typed minutes to the appropriate agencies and attendees.

3. **Project Administration:** Provide project administration and coordinate with the assigned TDOT District Supervisor. Prepare for and attend, when requested, any periodic or in-depth inspections that may be conducted on the project related to project work, progress or records. Prepare for, cooperate with, and assist auditors that may be assigned to review project records, payments, reports, etc. Provide ample inspectors and assistance to adequately oversee all work being done on the contract. Monitor Consultant hours worked on the project and justify need for overtime. Prior to starting work, submit to TDOT District Supervisor a listing of personnel assigned to the project for review and approval. In addition, a list of persons with emergency phone numbers should always be supplied to the TDOT District Supervisor and be available at any time in the case of an emergency on the project. The project Administrator should also obtain from the contractor a list of contractor's personnel that will be responsible for any occurrence that may arise on the project for the life of the project.

4. **Provide Construction Inspection:** Provide effective and qualified super-vision of all inspection services being conducted by Consultant and sub-consultants. The Consultant is not charged with the role of safety regulator, but shall notify the contractor immediately when safety issues are identified. Ensure any safety issues identified are corrected by the Prime Contractor. Imminent safety issues shall be corrected by the Prime Contractor before work proceeds in the affected area. All field technicians must be certified in the applicable TDOT certification workshops listed below:

   - OSHA 10 Safety Training Construction (All field personnel)
   - TDOT:
     - Asphalt Roadway Paving Inspector
     - Class 1 Concrete Technician
     - Asphalt Plant Tech Certification
     - Soils and Aggregate Technician
   - TDEC:
     - EPSC Level 1 – For inspectors conducting EPSC inspections
     - EPSC Level 2 – For supervisors of EPSC inspections
   - Nuclear Gauge Training
   - Work Zone Traffic Control and Flagger
   - Bridge Coating Inspector Certification
     - NACE
     - SSPC

   Certification from another State Highway Department, nationally recognized institution, or other approved agency may be acceptable in lieu of the TDOT certification. Prior approval is required.

5. **Conduct Field Surveys:** Conduct and supervise surveying services to obtain original, final, as well as progress estimate quantities for payment of all earthwork pay items to the contractor. Establish horizontal and vertical control on the project to be utilized by the contractor for construction layout. Be prepared to justify quantities in case of discrepancies by contractors or the Department. Upon request, check construction layout when deemed necessary by the TDOT District Supervisor.

6. **Change Order, Force Account, and VECP:** Notify the TDOT District Supervisor of the necessity of any change orders. Negotiate prices for additional pay items with the contractor while adhering to the "Average Unit Price" listing when possible. Coordinate acceptance of prices with the TDOT District Supervisor. Prepare change orders on the supplied standard form and submit to the TDOT District Supervisor for final review and submittal for processing. The Change Order will also be required to be entered and tracked through SiteManager for final approval by TDOT Finance. Any work that cannot be negotiated with the prime contractor will be pursued by force account as defined in the Standard Specifications and recorded on forms supplied by the Department. Submit Value

Engineering Change Proposals to the TDOT District Supervisor for analysis and distribution to the appropriate division(s).

7. Shop Drawings: See specification for road and bridge construction.

8. **Quality Assurance, Testing for Acceptance, and Training:** *(The intent is for the Consultant to provide all field testing normally provided by the Department with employees certified to perform the tests. Copies of all certifications should be filed in the project records for review by the Department at any time. Any temporary waivers of certification or licensing will be reviewed by the Department for the final decision.)* Provide certification training to Consultant personnel for all necessary field testing and inspection. Monitor the testing provided by the contractor in the field as defined in the Contract, Plans or Specifications. Document Consultant testing on standard forms provided by the Department and distribute as required. Monitor documentation of testing by the contractor. Field testing by the Consultant includes, but is not limited to, all ACI tests for concrete including concrete plant for acceptance by the Department, nuclear density testing of earthwork, base stone, asphalt, structural backfill, and pipe backfill as defined in the Standard Specifications and the Departments sampling and testing schedule. *(Note: All tests normally to be performed by TDOT project personnel will be performed by the consultant.)* Also, included, as the responsibility of the consultant is miscellaneous checking of application rates and dimensions and bearings to assure conformance to Plans and Specifications, the Consultant will submit the initial information on forms supplied by the Department and receive the final disposition of the material after review. Certifications of material submitted by the contractor will be reviewed by the Consultant for conformity to the Specifications. The certification documents submitted to the Department will also be reviewed for completeness and conformance to the Department's standard form of submission. A Final Materials and Tests Certification will be submitted to the Materials and Tests Manager with the Final Records.

9. Progress Payments: The Consultant will document and assemble accurate quantities for Monthly Progress Payments to the prime Contractor from actual project field records, as directed by the special provisions in the contract, from change orders or force accounts. The quantities for payment will be referenced to field records prior to submission for payment. Test reports will be on file prior to payment. The TDOT District Supervisor must approve any waiver of testing documents prior to payment. Pay quantities will be submitted to the TDOT District Supervisor for review and payment. Payments for stockpiled material may be made as defined in the Standard Specifications and approved by the District Supervisor. Estimate "cut-off" will be as follows:

Region 1: the 20th of each month (15th day for June, November, and December)

Region 2 & 3: the last day of each month, except for the month of June with the submission of the quantities to the TDOT District Supervisor for review and payment by the sixth of each month.

Region 4: the 15th of each month.

Copies of approved subcontracts as well as copies of actual DBE subcontractor's contracts should be on file prior to the first Progress Payment.

SiteManager will be utilized for all project records/documentation and estimate payments.

10. **Revisions to the Contract Plans:** Any revisions to the contract plans or cross sections will be submitted to the TDOT District Supervisor for processing.

11. **Distribution of Correspondence:** Submit to the TDOT District Supervisor a copy of all correspondence between the Consultant, contractor, subcontractor, or others concerning matters related to the project. Maintain an office file copy for submission with the project Final Records.

12. **Inspection of Work:** Provide inspection services for conformance to Plans and Specifications for all roadway, structures, and specialty items that are being incorporated into the project. Observe, measure, and record all quantities for payment. Record field measurements in project records for review by the Department or auditors. The records will be recorded for review by the Department or auditors. The records will be recorded in SiteManager. Check traffic control daily, and additionally as required or requested. Notify the contractor of deficiencies or problems immediately. Document weekly (or as often as necessary) project traffic control on forms supplied by the Department and distribute as required. Inspect daily erosion control items for conformance to the plans as well as effectiveness in the field. Notify the contractor of deficiencies.

    Assure that the QA/QC consultant is performing the duties described in the Contract and review documents required quarterly by the QA/QC consultant prior to submitting to the TDOT District Supervisor for forwarding. Verify the days the QA/QC consultant is on the project. Coordinate the recommendations of the QA/QC consultant with the prime contractor for conformance to TDEC policies. Prepare to justify any and all pay quantities in the case of questions by the contractor or Department. Prepare an accurate daily diary, signed by the inspector in SiteManager, consisting of:

    - A record of the contractors on the project
    - Their personnel (number and classification)
    - Equipment (number and type or size)
    - Location and work performed by each contractor or subcontractor
    - Orders given the contractor
    - Events of note on the project
    - Accidents on the project and any details surrounding the accident such as police report numbers, fatalities, causes, time, etc. Obtain a copy of the police report for the project records whenever possible.
    - Weather, amount of precipitation, temperature at morning, noon, and evening, cloudy, clear, etc.

- Days charged
- Equipment arriving or leaving the project, idle equipment
- Any other details that may be important later in the project life.

13. **Contractor's Payrolls, Employee Interviews and Contract Compliance:** Receive and check the contractor's payrolls for conformance to state wage rates as defined in the contract. Late payrolls (two weeks late) are justification to withhold progress payment. Notify the prime contractor of late payrolls and request immediate submission. Notify the TDOT District Supervisor prior to withholding payments. Conduct employee interviews on the forms submitted by the department and compare to the submitted payrolls for accuracy. Notify the prime contractor of inaccuracies and resolve discrepancies. Adhere to Special Provisions concerning reports to be submitted to the Contract Compliance Office.

14. **Reports:** There are numerous reports, documents, etc. that must be generated in the process of contract administration. A copy will be provided by the Department prior to construction, or as needed. Any questions regarding the requirements can be forwarded to the TDOT District Supervisor for clarification at any time.

15. **Final Records:** Submit a compilation of project records in the Department's standard format to the Final Records Department after project completion. Make corrections when/if notified and resubmit the records and a final estimate for the project at the appropriate time. Submit all final forms (FHWA-47, CC3, etc.) with the final records. Coordinate consultant hours after the project completion with the TDOT District Supervisor for approval.

16. **Project Claims:** Prepare documentation and assist in the defense of the Department, when requested, in preparation for Claims or possible Claims resulting in the execution of the contract.

17. **Utility Relocations:** Utility relocations are subject to be a part of this contract. Relocations that are reimbursable will be inspected for quantities that will be reviewed and verified comparing utility company records prior to payment by the Department.

18. **Utility Coordination:**

- **Coordinate with affected utilities to ensure timely utility relocation:**
    a. Review utility relocation schedules and drawings.
    b. Monitor utility relocation progress versus the schedule.
    c. Meet with utility representatives to discuss the work progress and schedule changes.
    d. Communicate frequently with the contractor and TDOT to provide updates on the progress and any problems. The vast majority of communications will be written in the form of emails and meeting minutes.

- **Conduct weekly utility meetings as needed on-site or off-site:**
  a. Prepare the agenda, attend, and conduct utility meetings weekly or biweekly as requested as well as record significant information and distribute written minutes to the attendees. Meetings should include TDOT personnel, contractor, utility personnel and representatives of other agencies affected by the project. Discussion should include recent progress, upcoming events in the schedule, and project-related problems or roadblocks.

- **Prepare and distribute any necessary reports:**
  a. Provide frequent utility time and money savings reports. Prepare and distribute meeting minutes which document discussions about proposed changes and their potential effects on time and money savings.

- **Verify that utilities are located in accordance with the plans:**
  a. Compare utility relocation work versus the plans. Confirm the facilities are located in accordance with the plans and do not conflict with other work show on the plans.

- **Coordinate with utilities and contractors to resolve conflicts:**
  a. Meet with the utility, contractor and TDOT representatives to discuss any unexpected conflicts. Propose cost effective solutions to resolve conflicts that will minimize the schedule impact and cost to the project.

- **Assist the utilities, design firms, and TDOT with issues involving supplemental agreements:**
  a. Help streamline the process to keep construction moving along smoothly.
  b. Follow up with TDOT, contractors, and utilities on paper work and drawing submittals where changes are required.

- **Provide professional consulting services**
  a. The consultant will provide professional consulting services including research and administrative services related to utilities work on roadway construction projects as requested by TDOT.

19. **Erosion Control**: This scope requires the provision of a qualified Erosion Prevention and Sediment Control (EPSC) Inspector with the capacity, upon request, to perform supplementary environmental engineering services associated with construction projects. The procedures contained within this scope follow the current National Pollution Discharge Elimination System (NPDES) Construction General Permit (CGP) and the TDOT Statewide Storm Water Management Plan (SSWMP) requirements.

    The CONSULTANT shall be responsible for inspecting and reporting all EPSC activities and features within the project limits and affected areas during each site visit. All EPSC activities and features that occur between site visits shall be documented at the next site visit through inspection and/or information from the STATE project supervisor. The

activities outlined below will be performed throughout the life of the specified roadway contract. The CONSULTANT shall report directly to the STATE project supervisor. All communications to the contractor will be through the STATE project supervisor, unless otherwise specified by the STATE project supervisor. See - Delegation of Authority. If the STATE project supervisor specifies a designee, please provide the delegation of authority document, to the Contract Coordinator via email and posted on the STATE ftp site. See - Signature Form.

- Submit a written summary of qualifications for each inspector associated with the specific project assigned. Each inspector will be stated at the submittal of the estimate for services. No substitutions or additions to the original specified inspectors are allowed without written approval from the Contract Coordinator in the Headquarters Construction Division (HQ CD). The request to substitute and/or add inspectors must be made in writing to the Contract Coordinator, including no more than a one page summary of qualifications. Written approval must be received from the Contract Coordinator before these individuals are allowed to participate in the inspection services. If the inspector holds a Certified Professional in Erosion & Sediment Control (CPESC) certification, that certification must be specified.
- Copies of the project water quality permits, storm water coverage, the Storm Water Pollution Prevention Plan (SWPPP), and a half-size set of construction plans shall be made available to the CONSULTANT. The CONSULTANT shall obtain a copy of the contractor's permits and NOC for any off-site waste and/or borrow area for the STATE project supervisor.
- Participate in project meetings relative to EPSC, including pre-construction meeting, if possible, on-site meetings with the STATE and contractor, progress meetings, additional meetings required by the regulatory agencies and others as required. The STATE project supervisor may request participation by the CONSULTANT, in biweekly, or similar, meetings conducted by the STATE project supervisor to discuss progress, problems, (general, as well as specific), erosion control issues and their resolution.
- Make site visits to the construction site to:
    a. Conduct a baseline evaluation, notes and pictures, at each outfall for
        - Documentation of the current conditions prior to road construction activities;
        - Inspection of changes related to siltation, in order to notify the STATE project supervisor of conditions that might negatively impact or have potential for erosion problems (i.e. stability of the bank, sediment deposition, and source impacts) to waters of the State;
    b. Review and verify the proper installation, maintenance and effectiveness of EPSC devices/measures per project plans and the SWPPP, or as directed by the STATE project supervisor;

c. Review the completed installation of EPSC devices;

d. Review the effectiveness of EPSC devices;

e. Recommend needed repairs, maintenance and additions to EPSC system;

f. Provide review of the contractor's repairs, maintenance and additions to the EPSC system. It shall be the responsibility of the STATE project supervisor to provide review of this work if reviews are required prior to the CONSULTANT'S routine inspection, except in emergency situations as deemed necessary by the STATE project supervisor. However, this review shall be documented by the CONSULTANT at the next routine site visit;

g. Review areas that have been seeded, mulched or otherwise stabilized for effectiveness and make recommendations for any deficient areas;

h. Review stabilization efforts which are to be completed as required by the current NPDES CGP and/or TDOT SSWMP after final grading or earth moving activities have ceased;

i. Review removal of vegetative ground cover occurring as required by the current NPDES CGP and/or TDOT SSWMP prior to grading or earth moving unless said area is seeded and/or mulched;

j. Review requirement of construction phasing for acreage of disturbance soil as required by the current NPDES CGP, the project SWPPP and/or TDOT SSWMP. If there is a discrepancy, please contact the STATE project supervisor for clarification.

k. Perform oversight of contractor's off-site waste and borrow areas for the project, as specified in the TDOT SSWMP;

l. Review compliance with the current NPDES Permit, TDOT SSWMP and any STATE (MS4) Municipal Separate Storm Water System NPDES permit requirements.

m. The frequency of the site visits shall be as follows:

- Baseline evaluation prior to start of construction activities at outfalls;
- As required by the current NPDES CGP and TDOT SSWMP;
- As required for Quality Assurance (QA) Team compliance visits. The CONSULTANT will work in conjunction with or act as a part of the QA Team.

- Review and make recommendations on the EPSC plans, possibly prepared by others, so that:

a. All EPSC measures are modified to be effective at all times throughout the course of the project;

b. The EPSC plan shows all boundaries of right-of-way and/or easements, as well as, the cut and fill slopes, and the watercourse and wetland boundaries contained within the ecology information provided by the TDOT Environmental Division (ED);

c. The timing of implementation regarding EPSC measures coincides with the construction of the road project;

d. Initial EPSC measures are in place before clearing, grubbing, excavation, grading, cutting or filling occurs;

e. EPSC measures for any relocation of utilities proposed are in place and provide protection for the project before clearing activities occurs if these activities are included as part of the roadway contract;

f. Phasing is appropriate for the EPSC measures and devices and EPSC plans and notes address phasing issues required to construct the project;

g. Stage construction of the EPSC measures is shown on projects and the most effective staging methods are used;

h. All conditions in Section 4 above are met;

i. If anything changes on the EPSC plans as shown in the field SWPPP it is documented in the field SWPPP. All revisions to the field SWPPP shall be made by the CONSULTANT at each field visit;

j. Documentation of all maintenance and repair items necessary on EPSC measures and the corrective action taken for it are shown in the SWPPP. All revisions to the field SWPPP shall be made by the CONSULTANT at each field visit.

- Provide comments, suggestions, and correspondence to the STATE project supervisor at each site visit. See – Circular Letter 209.01-02. The CONSULTANT shall follow-up site visit communications with the STATE project supervisor with a standard written summary within 48 hours of the site visit inspection, including a photo journal of areas. The CONSULTANT shall request from the STATE project supervisor a listing all other parties the CONSULTANT shall forward all appropriate information. In some cases, the STATE project supervisor will request that the CONSULTANT clarify any comments directly to the contractor. If this is the case, the CONSULTANT shall provide this service in the presence of the STATE project supervisor.
- Maintain records, including documenting photographs (photo journal). See - Circular Letter 209.01-02.
- Provide professional services related to the environmental engineering of roadway construction projects as requested by the STATE.
- Prepare and submit reports to the STATE project supervisor, required by the NPDES CGP, the SWPPP, TDOT SSWMP, including:

a. Reports on deficiencies in the EPSC system and corrective actions undertaken. Information must be specific and recommendations for

improvement must be made in the report. The report shall address specifically any items that are reoccurring from past reports;

b. TDOT Inspection reports See - Circular Letter 209.01-02;

c. Summary of all site visits, including photos (See - Circular Letter 209.01-02);

d. Quarterly reports;

e. Other documentation required by SWPPP.

All documentation is to be placed on the STATE ftp site for viewing by others. A folder on this site will be set up for each of the CONSULTANT'S use. This folder must contain the name of the project including contract number for clarity. The file information and password, if needed, shall be supplied to the STATE project supervisor by email. All documentation shall be placed in a chronological series within these folders. Upon request, these reports shall be provided to the STATE construction office in paper form or via email.

Verbal reports shall be presented to the STATE project supervisor at each site visit and written reports within 48 hours, so that the contractor can install the necessary recommendations before the next anticipated rainfall event. An email notification shall be sent to the construction office within 48 hours after the inspection for their use.

- Any time the CONSULTANT becomes aware that sedimentation is occurring or has occurred in streams impacted by the project, the CONSULTANT shall evaluate the EPSC measures employed, make recommendations to the STATE project supervisor to repair or replace defective EPSC measures, and recommendations to install, as applicable, additional or other EPSC measures with the goal of eliminating future sedimentation. If a consensus is not reached between the STATE project supervisor, the contractor and the CONSULTANT on appropriate recommendations within 24 hours, the CONSULTANT shall notify the Regional Environmental Coordinator for elevation procedure. If authority has been delegated on this project, the STATE project supervisor shall be notified anytime a sediment release occurs.
- Acquire all appropriate signatures on EPSC inspection forms for these site visits when an inspection is completed. See - Signature Form. Appropriate signatures are required on all forms.
- The STATE and/or the Contractor shall install rain gauges at all sites where clearing, grubbing, excavation, grading, cutting or filling is being actively performed, or exposed soil has not yet been permanently stabilized. On specific projects, rain gauges may need to be installed at every mile within the project limits per the Environmental Permits Office. The STATE project supervisor may request the CONSULTANT check each gauge after every rainfall event occurring on these sites and maintain detailed records of rainfall events including dates, amounts of rainfall, and the approximate duration or starting and ending times. If the records are maintained by the STATE and/or the contractor, the

CONSULTANT shall be responsible for reviewing these documents at each site visit.

- Prepare and submit any proposals for revision to the EPSC plan to the STATE project supervisor for review and approval in time to allow review prior to implementation, except for recommendations for emergency repairs which will be submitted immediately.
- Maintain, within the SWPPP, a running index of revisions, dates, what occurred, and the page numbers of the EPSC sheets. The CONSULTANT shall make copies of this index for the STATE project supervisor each time a change is made. All implemented revisions shall be marked by the CONSULTANT in red within the field SWPPP, initialed, and dated for revision as soon as the STATE project supervisor, the contractor, and the CONSULTANT agree on changes as they are implemented in the field.
- If any revisions will interfere with any of the other water quality permits, the CONSULTANT shall contact the Manager of the Natural Resources Office within the ED for guidance before implementing.
- Be available, on call, to the STATE project supervisor in the event of an EPSC emergency.
- Keep a chronological log in sheet anytime a site visit, inspection, and/or attendance at meetings occurs. See – Log Sheet. This log in sheet must include the name of the individuals representing the STATE on behalf of the CONSULTANT, the date and time of inspection, and be signed by the STATE project supervisor. This log in sheet must be posted quarterly to the ftp site for inclusion in the STATE files.
- Comply with the evaluation process established by the STATE.
- Comply with any revisions to this scope proposed by the STATE.
- Comply with the cost proposal process established by the STATE.

The responsibilities of the Tennessee Department of Transportation – TDOT on this project are:

1. **TDOT District Supervisor:** Provide a District Supervisor to oversee and coordinate with CEI Supervisor.
2. **Public Information/Relations:** Manage public information/relations for project development.
3. **Materials Testing Laboratory:** Provide designated materials testing laboratory for all applicable testing requirements.
4. **Offsite Fabrication Inspection:** Provide inspection services for all materials manufactured off site (i.e. bridge beams, concrete pipe, etc.).
5. **Geotechnical Services:** Provide all Geotechnical services needed to complete project.

Delegation of Authority

I _____ (print name of TDOT project supervisor), delegate the reporting responsibility of coordination with the EPSC inspection services consultant to _____ (print name of TDOT delegate) for contract # _____.

I am providing delegation of authority as stated above and confirm that the TDOT delegate stated above has direct knowledge of the subject project and the ability to discuss the reports and recommendations from the EPSC inspection services consultant on the subject project directly to the contractor.

_____ (signature of TDOT Project Supervisor)

_____ (date)

SIGNATURE FORM

Date of report:	
Contract #:	
Project Description (including County):	
TDOT project supervisor's or delegate's signature:	
Representative of Contractor's signature:	
EPSC inspection services consultant's signature:	

I have reviewed the attached dated report for the subject project.

TDOT project supervisor or delegate

☐ I agree with the report as written and will perform necessary recommendations.

☐ I agree with the report with the exception of the following comments.

☐ Comments are attached ☐ Comments are as follows

TDOT Contractor and all subcontractors

☐ I agree with the report as written and will perform necessary recommendations.

☐ I agree with the report with the exception of the following comments.

☐ Comments are attached ☐ Comments are as follows

Comments:

_____

_____

_____

_____

_____

_____

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_____

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_____

_____

Log Sheet

EPSC Chronological Log Sheet – Quarter 1 2 3 4 (Circle One)			
Date and Time	**Type of Visit (Rainfall Event Visit, Weekly Inspection, QA/QC meeting, Construction meeting etc.)**	**Representative of EPSC inspection services consultant**	**TDOT Project Supervisor (or designee)**

Phone: (615) 794-4333
Fax: (615) 794-3313
www.thompsons-station.com

1550 Thompson's Station Road W.
P.O. Box 100
Thompson's Station, TN 37179

DATE: January 14, 2020

TO: Board of Mayor and Aldermen

FROM: Micah Wood, Interim Town Planner

SUBJECT: **Civil War Trails Historic Markers**

The Town received one proposal for the Historic Marker Bid solicited in September 2019 from Civil War Trails, Inc for placement in Preservation Park.

At the October 1, 2019 meeting, the Parks and Recreation Advisory Board recommend Civil War Trails, Inc. as the consultant for the historic markers project to the Board of Mayor and Aldermen.

Recommendation
Staff recommends approval of the contract for Civil War Trails, Inc. as the consultant for the historic markers project.

RESOLUTION NO. 2020-001

A RESOLUTION OF THE TOWN OF THOMPSON'S STATION, TENNESSEE APPROVING A CONTRACT WITH CIVIL WAR TRAILS, INC. FOR THE DEVELOPMENT AND INSTALLATION OF SIX HISTORIC SIGN MARKERS AND TO AUTHORIZE THE MAYOR TO SIGN A CONTRACT WITH CIVIL WAR TRAILS, INC.

WHEREAS, the Town released a Request for Proposals (RFP) in order to receive bids to construct and install six historic sign markers within Preservation Park; and

WHEREAS, Civil War Trails has submitted a bid in the amount of $12,600 to provide design services, construction and installation of six sign markers within Preservation Park; and

WHEREAS, the Town's Parks and Recreation Advisory Board is recommending that the Board of Mayor and Aldermen approve the contract for Civil War Trails, Inc. for the historic sign markers; and

WHEREAS, the Board of Mayor and Aldermen has determined that it is in the best interest of the Town to approve a contract with Civil War Trails, Inc. to provide these services to the Town.

NOW, THEREFORE, BE IT RESOLVED by the Board of Mayor and Aldermen of the Town of Thompson's Station as follows:

That the professional services contract with Civil War Trails, Inc. attached hereto as Exhibit "A" is hereby approved, and the Mayor is authorized to sign the contract on behalf of the Town.

RESOLVED AND ADOPTED this 14th day of January 2020.

_____
Corey Napier, Mayor

ATTEST:

_____
Regina Fowler, Town Recorder

APPROVED AS TO LEGALITY AND FORM:

_____
Town Attorney

Drew A. Gruber
EXECUTIVE DIRECTOR
P.O. Box 1862
Williamsburg, Virginia 23187
757-378-5462
www.civilwartrails.org

Preservation Park Historic Markers Proposal

Transmittal Letter

The Office of the Community Development Department
% Wendy Deats, Town Planner
Town of Thompson's Station
PO Box 100
Thompson's Station, TN 37179

Ms. Deats,
Please find enclosed all required documents for the 'Preservation Park Historic Signage/Markers' request for proposals dated September 4th, 2019. Working together the City of Thompson's Station and Civil War Trails, Inc. can create an attractive, accessible, and easily maintained system of signage for *Preservation Park.*

This proposal includes our costs, list of staff and sub-contractors, letter(s) of recommendation, a proposed work schedule, our qualifications, w9, process, and details about our materials.

Drew A. Gruber, Executive Director of Civil War Trails, Inc. will serve as the as the sole contact for this RFP and contract. He can be reached at: executivedirector@civilwartrails.org and 757-378-5462.

Thanks

Preservation Park Historic Markers Proposal
Civil War Trails, Inc.

Contents Index

Preservation Park Historic Markers Proposal

Civil War Trails, Inc.

Bid.

Six interpretive sign package: $12,600.00

One completed 'turn key' sign package; $2,100.00 Ea.

Panel design utilizing text and media provided by customer, customer review, 24x36 UV resistant acrylic, pedestal, professional in-ground installation and storage of the design files.

Service Details:

Design services will seek to replicate the font sizes, margins and layout similar to industry standards using text and media provided to Civil War Trails, Inc. (CWT, Inc.) The artwork will utilize your unique brand, logo and colors, not the branding, colors, etc. related to the Civil War Trails branded, network program. CWT, Inc. will archive the native design files as part of this bid. CWT, Inc. welcomes art direction and is happy to make recommendations to the Town of Thompson's Station as well.

The **pedestal** is a dual leg, cantilever style, *dark brown* powder-coated, frame-in-frame style which is uniquely designed to CWT, Inc. and allows for ease of and reduced costs for future maintenance and updates. This pedestals supports a 23x36 interpretive panel. Future maintenance and upkeep is the responsibility of the property owner. This is warranted for five years against defects in manufacturing.

Our **installation services** quoted herein are for placement of the sign in earth, not through impervious surface and does not include any environmental, cultural, architecture review, or compliance required by zoning, state code, easements, or other encumbrances. CWT Inc. recommends and will perform an installation as close to ADA standards as possible.

The **acrylic panel** is the result of over twenty years of research and development and is printed to our specifications using UV cured ink to extend its life and resist environmental, malicious, or accidental damage. This is warranted for five years against defects in manufacturing.

Proposer Qualifications

Although Civil War Trails, Inc. is mostly noted for the multi-state Civil War Trails branded, networked tourism program we are also a full service sign vendor bringing years of experience to municipal projects similar to this one.

After twenty five years of research and development CWT, Inc. has developed interpretive sign materials, design standards, and installation methods which are uniquely designed for ease of maintenance, updates, and ADA compliance.

These are outlined in detail on Page 1 but can be further defined. For instance, no other 'vendor' currently offers a sign pedestal which can be repaired piece by piece. Moreover, no other frame-in-frame design exists in the market place, allowing the materials to expand and contract with extreme weather thereby extending the life of the panel and frame. These are two examples of the nuts and bolts which separate us from the pack.

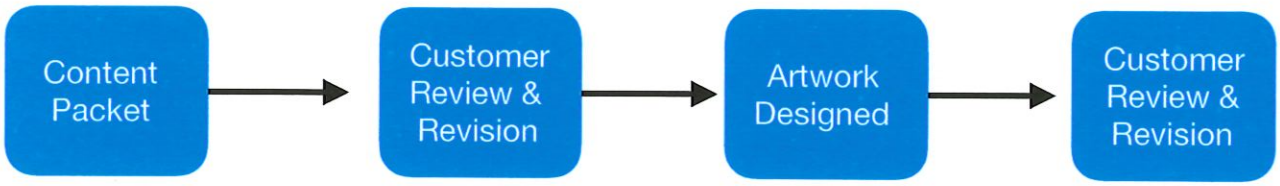
Although it may look simple from a distance, our installation method will carefully consider the sign's relationship to a path or impervious surface maximizing the sign's adherence to physical ADA standards. Furthermore, we install the sign in such a way that removal of the sign or realignment of it in the future is made easier. Signs should be as flexible as visitor and amenity requires and not as a fixed piece of collateral and we ensure your interpretive infrastructure will continue to serve consumers for decades.

The success of the multi-state Civil War Trails branded program is due to our continued focus on our the guest. Their expectations, reactions, interest, and approach inform everything we do from the fonts and colors we use to the bolts, paint, and materials. We bring this invaluable experience to the table in this application.

Proposed Process & Schedule

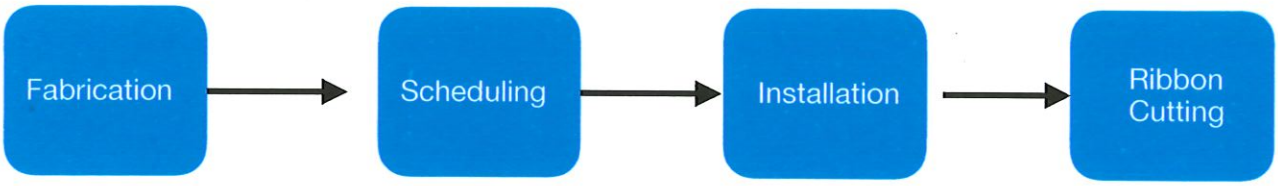
Content Development through Artwork Approval

- Reward and receipt of contract (1-2 weeks)
  Review
- Review of submitted content packet (Approx: 3-5 weeks)
  The packet must include final text, logos, hi-res media, and art direction
- Sign design and customer review (Approx: 3-5 weeks)
  Review and revisions



Fabrication through Installation (Varies)

- Fabrication of materials (Approx: 5-7 weeks)
  Material pre-production, production, dry fit, and scheduling of installation
- Site installation (TBA)
  Varies depending on weather, and is predicated on the above timeline



Staff and Subcontractors

Civil War Trails, Inc.
Project Role: Proposer/Contractor
Executive Director: Drew A. Gruber
Program Administrator: Chris D. Brown
Address: PO Box 1862
Williamsburg, Virginia 23187
Phone: 757-378-5462
EIN: 54-188-5764

Subcontractors

Nature Graphics, LLC.
Project Role: Pedestal production
Owner: Lea Beazley
Address: 207 Horseshoe Bend Rd.
Littleton, NC 27850
Phone: 704-880-5026
EIN: 75-3122532

Worth Higgins & Associates
Project Role: Panel production
Sales Representative: Sue Stocks
Address: 8770 Park Central Dr.,
Richmond, VA 23227
Phone: 1800-883-7768
EIN: 54-0880197

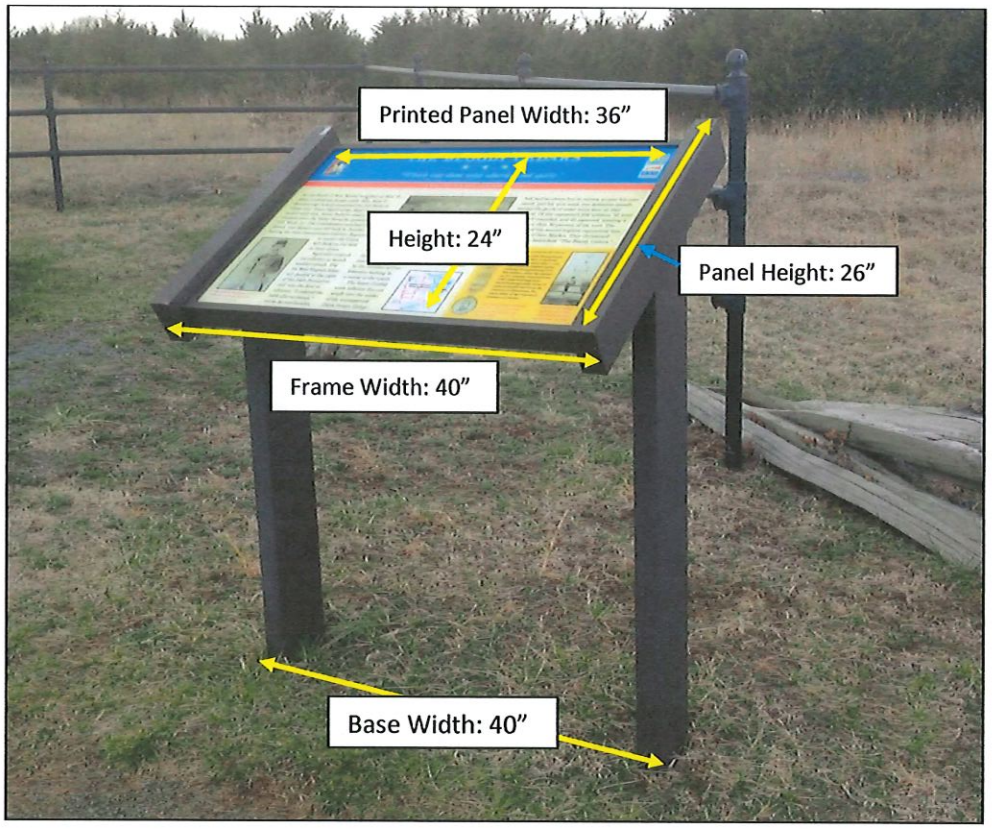
JNS Contracting
Project Role: Operations and installation
Owner: Jason N. Shaffer
Address: 1111 S. Providence Rd.,
N. Chesterfield, VA 23236
Phone: 804-291-6326
EIN: 231138607

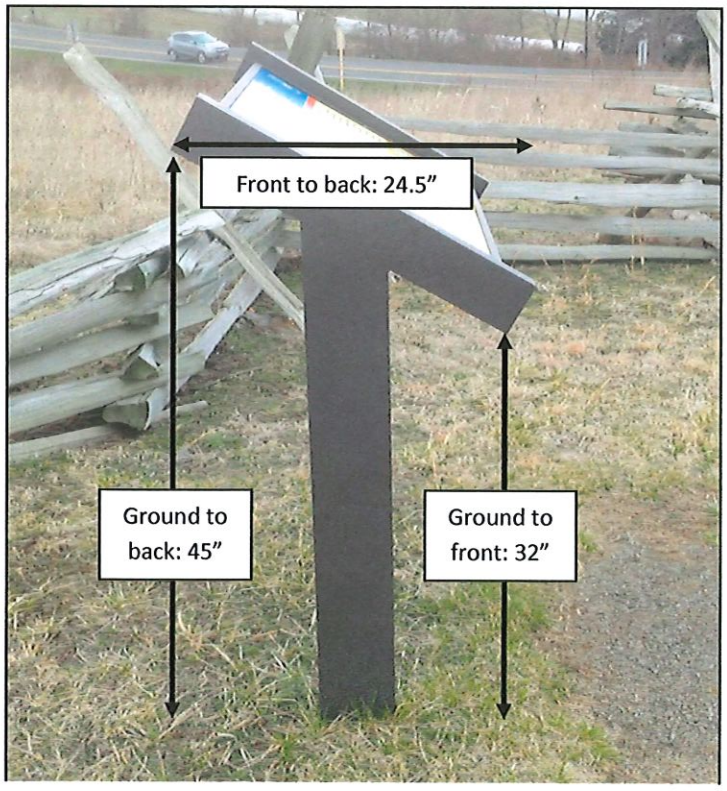
Preservation Park Historic Markers Proposal

Civil War Trails, Inc.

Page 5.

Diagram & Suggested Dimensions





Artwork examples

MIFFLIN HOUSE

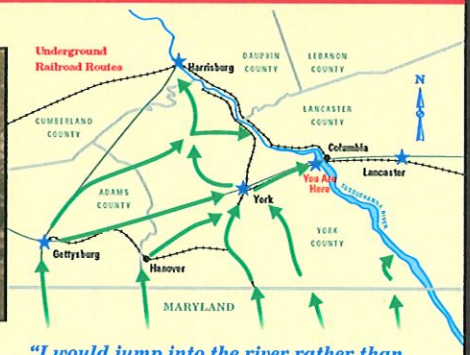
Underground Railroad to Civil War

Across the field to your right front stands Hybla, which Jonathan and Susanna Mifflin, a Quaker couple, built late in the 1700s. Mifflin, a Revolutionary War captain (afterward a colonel), and his wife hid freedom seekers on their estate and helped them escape across the river into Lancaster County, often in conjunction with free black boatman Robert Loney. Once across, Susanna Mifflin's brother William Wright, a leading abolitionist in the river region, welcomed them and ensured their safe passage to other conductors farther east. Their secret activities were part of a network that came to be called the Underground Railroad. Samuel W. Mifflin inherited Hybla in 1840 on his father's death. He and his wife Elizabeth continued their Underground Railroad operations until moving away in 1846 as Samuel constructed bridges for the emerging railroad industry.

Samuel Wright Mifflin (1805–1885), portrait by James R. Lambdin
Courtesy Mifflin descendant Duncan Ely

Hybla, late 19th century – *Courtesy York County History Center*

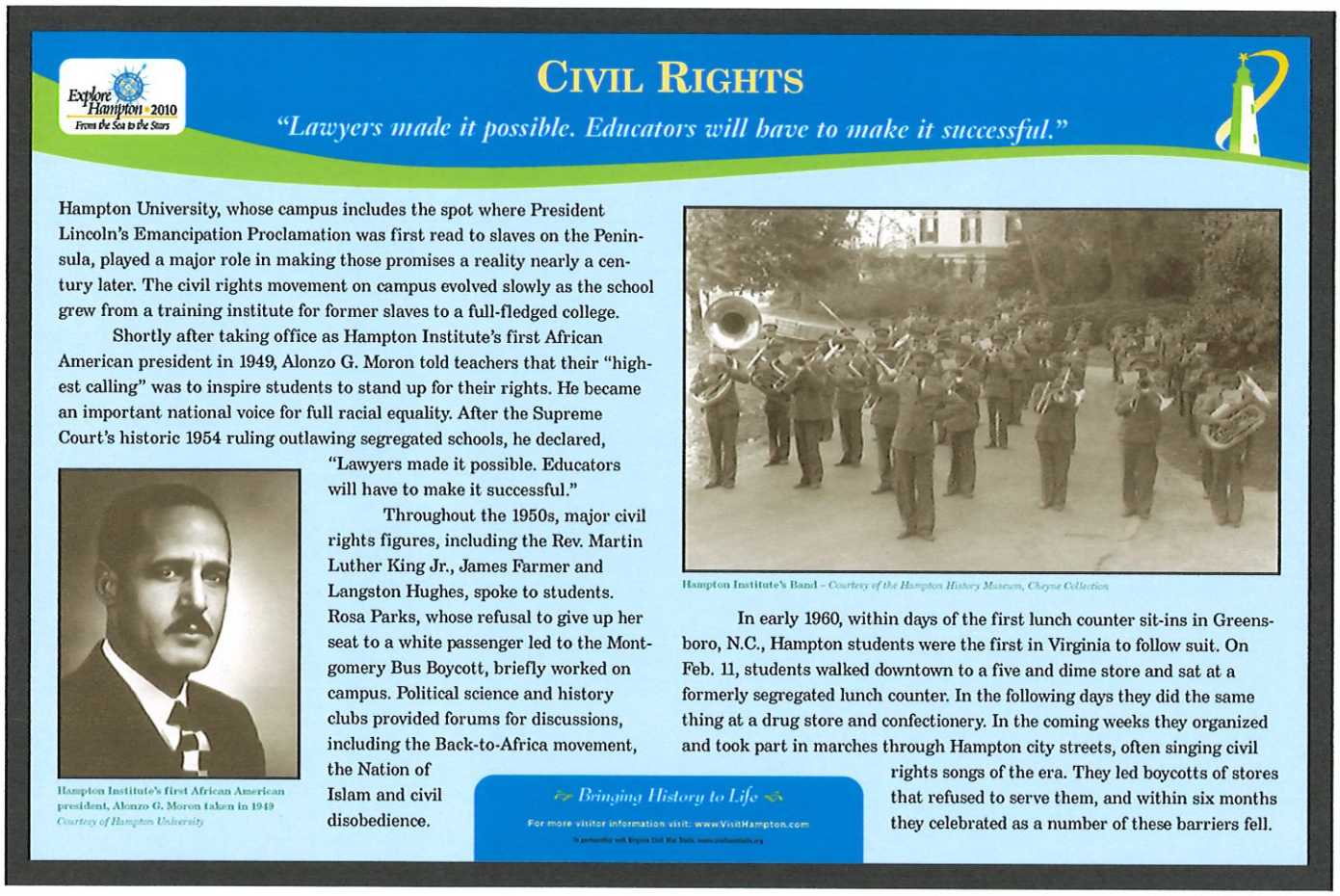
By the time of the Civil War, Jacob Huber and his family lived in Hybla. During the Gettysburg Campaign, Confederate soldiers marched to Wrightsville to seize the bridge to cross into Lancaster County and march to Harrisburg. Pennsylvania state militia and other Union troops, augmented by 53 free black men from the river region, resisted the Confederate advance for a short time before withdrawing across the nearby covered bridge to Columbia. Confederate artillery fired multiple explosive shells at the Union lines from the yard of Hybla during the engagement on June 28, 1863.



***"I would jump into the river rather than return to bondage."*—"Ensor Sam" Berry, Baltimore Co., Maryland, slave who passed through Wrightsville**

The "Mifflin House" sign sits immediately adjacent to a Civil War Trails branded sign. As such the Borough of Wrightsville Pennsylvania asked us to replicate many of the same design standards.

Artwork examples (Cont'd)



This "Civil Rights" sign in Hampton, Virginia is one of several dozen signs that CWT, Inc. completed on their behalf. This 'Explore Hampton' series covers topics from pre-contact Native American history, through Piracy, the American Revolution, and the Space Age. The banner color, design, and logo are drawn directly from City of Hampton's brand.

Artwork examples (Cont'd)

FORT GRANGER

From Slaves to Soldiers

Contraband man – *Courtesy Library of Congress*

On March 24, 1863, President Abraham Lincoln told Tennessee Military Governor Andrew Johnson, "The colored population is the great available, and yet unavailed of, force for restoring the Union." In September 1863, Johnson gave permission to Maj. George Stearns to recruit free blacks and contrabands as soldiers. As part of securing emancipation, enslaved recruits were freed on enlistment.

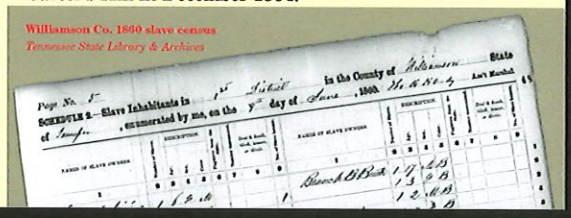
From late 1863 to the war's end, Tennessee's 20,133 United States Colored Troops (USCT) served in almost every military engagement across the state. Dozens of men from Williamson and Maury Counties mustered in at Franklin, and several became part of Co. A, 13th USCT. Before being mustered out in 1866, at least 5,107 USCT casualties suffered death, disease, and capture in Tennessee. At least 290 of these men were born in Franklin and Williamson County with most serving in the infantry, a few in cavalry, and roughly fifty in artillery units.

Former slave owners grappled with the reality of slaves as soldiers. Moscow Carter, of the Carter House, wrote to his younger brother Tod in March 1864, "We have for the first time during the Federal occupancy, of this town, a corps of n___ soldiers, or as I heard a soldier call them the other day, 'smoked Yankees' quartered in this vicinity.

Two USCTs – *Library of Congress*

I think there is a company yet —though I understand it will be increased to a regiment."

The 17th USCT, organized in Nashville in December 1863, also had Williamson County recruits. It performed guard duty at various posts, including Franklin, until November 1864. On December 17–19, this unit, along with other USCT regiments, fought the remnants of Confederate Gen. John B. Hood's army as it moved southward after the Battle of Nashville. As U.S. quartermasters searched for Federal dead following the war, two unknown soldiers identified as members of Co. K, 17th USCT, were buried at Carter's Hill in December 1864.



Williamson Co. 1860 slave census
Tennessee State Library & Archives

This sign titled, "Fort Granger" was completed on behalf of the City of Franklin Parks and Recreation as part of a series of signs at this park. The banner color is directly drawn from their logo color as is the 'strike' between the title and subtitle. This sign provides an example of how primary source documents can be inset onto the sign (bottom right) to break up the text narrative. Also now how the Heritage Area logo (top left) disrupts the banner. This can be avoided by providing logos which transparent backgrounds or which have versatile color schemes.

Artwork examples (Cont'd)

CARNTON

The Springhouse

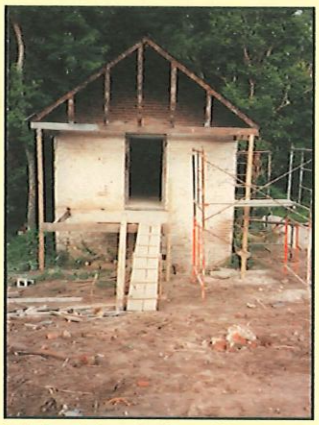
One of the reasons that Randal McGavock chose this area for his home was because of a nearby water source. A natural spring still flows at the bottom of this slope.

Detached kitchens, dwellings for the enslaved, smokehouses, and springhouses were the most common domestic buildings on farms in this area during the early 19th century. Springhouses were typically one-room, brick structures built into the slope of a hill. A springhouse protected a water source from debris and animals and provided a constant supply of cool water. It also aided in the preservation of foodstuffs. Water flowing from the earth was typically directed through a trough in the building where it would pool to about two feet deep. A spring branch carried the outflow to a larger stream.

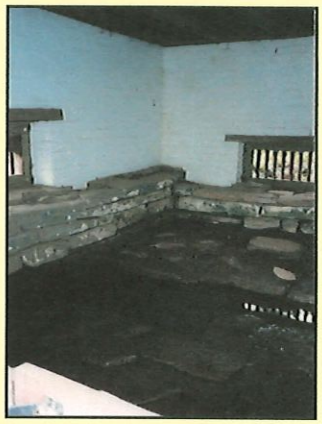
Bottle and crock fragments like these found near the springhouse show how foodstuffs were stored

Images courtesy The Battle of Franklin Trust

The cool temperature inside the springhouse served as a form of early refrigeration. A stone shelf built around the perimeter of the interior provided space for milk, butter, and other perishables. The second level provided a drier storage space for items less tolerant of moisture. One or two of the enslaved people at Carnton likely maintained the springhouse and ensured the safety of the contents. They may have lived in the nearby brick dwelling.



Springhouse during restoration, ca. 1987



Stone shelf inside springhouse

The springhouse was first restored in 1987. Severe damage occurred during flooding in May 2010 when water rose to the top of the building. A restoration was completed in 2019.

This sign titled, "Carnton" was completed on behalf of the Battle of Franklin Trust. The 'strike' between the title and subtitle is drawn from their logo although the banner color does not match their logo. This is a great example of how you blend artifacts into the text.

References.

Douglas Harvey Museum Services

214 Coffee Road, Lynchburg, VA 24503

September 6, 2019

To Whom It May Concern:

During my tenure as Museum System Director for the City of Lynchburg, Virginia (2005—2017), we contracted with Virginia Civil War Trails on two occasions for historical markers dealing with the history of the city. The first project was a series of nine markers installed throughout the Downtown and the second a custom marker for Lynchburg native Desmond Doss, the non-combatant recipient of the Medal of Honor.

Both projects were done on time and within budget and all involved agreed that they are a great addition to the community. Communication, design, graphics, and installation were all handled with efficiency and professionalism and I can heartily recommend Drew Gruber and his team at Virginia Civil War Trails without reservation.

Please call on me if further information is desired.

Sincerely,

Douglas K. Harvey

Douglas Harvey Museum Services

www.dkhmuseumservices.com

(434) 941 0673

References (Cont'd)

September 11, 2019

Mr. Drew Gruber
Civil War Trails
P.O. Box 1862
Williamsburg, Virginia 23187

Drear Drew:

It is my pleasure to serve as a reference for Civil War Trails and a resource for municipalities that may be interested in utilizing Civil War Trails as a design, fabrication and installation provider.

Hampton Convention & Visitor Bureau, a department of the City of Hampton, coordinates the interpretation of Hampton's rich 410-year history at public and private locations throughout the city. Our complete satisfaction in the presentation and placement of approximately 30 Hampton Civil War Trails markers led to the Hampton CVB's seeking of Civil War Trails to design and fabricate 100 Hampton heritage markers that interpreted four centuries of Hampton history when Hampton commemorated its 400-year anniversary in 2010.

The marker series that resulted allows residents and visitors to learn about historical happenings that took place on sites that now may be home to churches, schools, neighborhoods, parks and business districts. Civil War Trails is easy to work with and responsive to our requests. Our partnership with Civil War Trails ensures our history is accessible through sustainable environmentally friendly interpretive signage.

Hampton is very proud of its historical legacy as the oldest continuous English–speaking city in North America, the original training ground for America's astronauts, the site of the first free public education, the invention site of seafood pasteurization, and the location where the first Africans landed in English North America, to name just a few. I am pleased to answer questions and may be reached at 757-728-5327 and mary@hamptoncvb.com.

Best regards,

Mary Fugere
Director

1919 Commerce Drive, Suite 290 | Hampton, Virginia 23666
757.722.1222 | 800.487.8778 | fax 757.896.4600 | www.hamptoncvb.com

Certificate

Civil War Trails, Inc. has been recognized as a 'Certified Green Tourism Partner' in the Commonwealth of Virginia as well as for our commitment to recyclable and sustainable products by the *Maryland Department of the Environment*.

Phone: (615) 794-4333
Fax: (615) 794-3313
www.thompsons-station.com

1550 Thompson's Station Road W.
P.O. Box 100
Thompson's Station, TN 37179

DATE: January 14, 2020

TO: Board of Mayor and Aldermen

FROM: Micah Wood, Interim Town Planner

SUBJECT: **Active Transportation Program (ATP) Grant Consultant – Phase 2 of the Thompson's Station Greenway**

The Town received nine letters of interest for phase 2 of the greenway trail. After reviewing the letters of interest, five potential candidates were identified and interviewed by a three-person panel. The interviews were based upon the phase 2 evaluation as set forth in the TDOT advertisement of the project consisting of the firm's qualifications will TDOT Local Programs, ability to manage the project, current workload with TDOT Local Programs, technical approach to handling the project and the overall presentation during the interview process.

The interview panel is recommending Kimley Horn for the project. Kimley Horn demonstrated not only their knowledge and working relationship with Local Programs but such a studied and detailed understanding of our specific project beyond even their pursuit of this grant for us. They have a team with experience working with Local Programs and are prepared to manage the project from start to finish. They thoroughly understand NEPA, the TDOT process, Design, Utility Coordination, Bidding, CEI and can manage a project within appropriate timelines/deadlines.

At the November 5, 2019 meeting, the Parks and Recreation Advisory Board recommend Kimley Horn as the consultant for the phase 2 greenway project to the Board of Mayor and Aldermen.

Recommendation
Staff recommends approval of the contract for Kimley Horn as the consultant for the phase 2 greenway.

RESOLUTION NO. 2020-002

A RESOLUTION OF THE TOWN OF THOMPSON'S STATION, TENNESSEE APPROVING A CONTRACT WITH KIMLEY HORN FOR THE DESIGN AND DEVELOPMENT OF PHASE 2 OF THE TOWN'S GREENWAY AND TO AUTHORIZE THE MAYOR TO SIGN A CONTRACT WITH KIMLEY HORN FOR CONSULTING SERVICES

WHEREAS, the Town received an Active Transportation Program (ATP) grant for the development of Phase 2 of the Town's greenway system (PIN 128762.00); and

WHEREAS, the Town released a Request for Qualifications (RFQ) in order to receive qualifications for the development of the Town's Phase 2 greenway project within Preservation Park; and

WHEREAS, Kimley Horn has submitted qualifications consistent with the requirements set forth in the Town's Consultant Selection Policy to provide consulting services for the Phase 2 greenway project within Preservation Park; and

WHEREAS, the Town's Parks and Recreation Advisory Board is recommending that the Board of Mayor and Aldermen approve the contract for Kimley Horn; and

WHEREAS, the Board of Mayor and Aldermen has determined that it is in the best interest of the Town to approve a contract with Kimley Horn for consulting services for the project.

NOW, THEREFORE, BE IT RESOLVED by the Board of Mayor and Aldermen of the Town of Thompson's Station as follows:

That the professional services contract with Kimley Horn attached hereto as Exhibit "A" is hereby approved, and the Mayor is authorized to sign the contract on behalf of the Town.

RESOLVED AND ADOPTED this 14th day of January 2020.

_____
Corey Napier, Mayor

ATTEST:

_____
Regina Fowler, Town Recorder

APPROVED AS TO LEGALITY AND FORM:

_____

Town Attorney

Greenway Trail - Phase 2
Thompson's Station, TN

N

Legend

- Greenway Trail (Phase 1 complete)
- Greenway Trail (Phase 2 currently underway)
- Greenway Trail (Phase 3 soon to be underway)
- Existing Canterbury Sidewalk
- Streams
- CSX Railroad
- Roads
- Town Parks

Existing Trails

- Greenway Trail North
- Dog Park Loop
- Dog Park Entrance
- Depot Trail
- Hilltop Path
- Railroad Trail
- Battlefield Trail
- Service Road

Community Gardens

Nutro Dog Park

Greenway Trail (Phase 1)

INTERSTATE 840 HWY

INTERSTATE 840 HWY

Preservation Park

Depot Trail

Railroad Trail

Battlefield Trail

COLUMBIA PIKE

Fields of Canterbury

HAMPSHIRE PL

ALY

WESTERHAM

REDWOOD TRL

BECKET CIR

CRITZ LN

Greenway Trail (Phase 3)

Greenway Trail (Phase 2)

THOMPSONS STATION RD W

FOUR WINDS LN

DEAN RD

OLD THOMPSONS STATION RD

CSX Railroad

Town Center

1 inch = 400 feet

T. Rainey 9/16/19

Kimley»Horn

December 20, 2019

Mr. Ken McLawhon
Town Administrator
Town of Thompson's Station, Tennessee
1500 Thompson's Station Road West
Thompson's Station, Tennessee 37179

RE: ***Professional Services Agreement***
Thompson's Station Greenway – Phase II
Thompson's Station, Tennessee

Dear Mr. McLawhon:

Kimley-Horn and Associates, Inc. ("Kimley-Horn" or "the Consultant") is pleased to submit this letter agreement (the "Agreement") to the Town of Thompson's Station (the "Client" or the "Town") for professional consulting services for the above referenced project.

SCOPE OF SERVICES

Based on the information provided, we understand that the Town of Thompson's Station wishes to construct a second phase of the greenway from the end of Phase I greenway near the treatment plant just before the CSX railroad crossing to the Town Center. The proposed scope of the project will extend the Town's existing greenway by 1.75 miles, connecting the southern end of the first phase of the greenway (south of I-840) to the Town Center. The project will begin where the existing trail ends near Nutro Dog Park and traverses through Preservation Park to the existing south trailhead at Thompson's Station Road West. The following quarter mile of the project will serve as a sidewalk adjacent to Thompson's Station Road West to connect with the Town Center. The project limits are attached to this agreement as Exhibit A.

The scope provided below is for Survey, Preliminary Engineering and NEPA. Upon completion of these tasks we will provide the Town with an amendment to this agreement that will outline the scope and fee for the remaining tasks through the end of design. A final amendment will be submitted for Construction Engineering Inspection.

Our Scope of Services, Fee, and Schedule are as follows:

Task 1 – Project Coordination Services

This task will consist of general project management, administrative, and accounting activities for the project. It will further consist of project status and reviews, conference calls, preparing and distributing reports and memos, scheduling of review meetings and activities, monthly project status reporting, and discussion of any project issues during the project. In addition, this task will consist of monthly work

planning efforts and will comprise the initial schedule development and monthly maintenance of the scope of services and project milestones.

Task 1.1 – Project Meetings

Kimley-Horn will coordinate and facilitate periodic project meetings, up to four, at a location in the Town of Thompson's Station (to be determined by Town staff) or at the Tennessee Department of Transportation's (TDOT) offices. Each meeting will consist of project status updates, schedule review, and discussion of upcoming milestones for both the project team and Town of Thompson's Station staff. Kimley-Horn will prepare and distribute both meeting agendas and meeting minutes for each meeting. These meetings are as follows:

- Project Kickoff Meeting
    - The team will facilitate a kick-off meeting with representatives of Town Planning, Parks and Recreation, Police, and other departments involved with design, development, and operations to review and discuss potential areas of improvement, modification, or additions. At this initial meeting, team members will review the project schedule, coordination procedures, and duties required of both the consultant and Town staff.
- Project kickoff meeting with TDOT Enhancement Office Staff
- Project Status Meeting (following completion of Preliminary Plans)
- Project Status Meeting (in preparation for Public Involvement meeting)

Task 1.2 – Evaluate Trail Routing

Kimley-Horn will assemble available data, consisting of the GIS mapping along with map, parcel and owner information provided by the Town, FEMA Flood Maps, available aerial photography, and any other information in the possession of the Town which we deem necessary to complete the services described herein. Concurrently, the project team will conduct site visits to review the proposed route and to gain an understanding of the trail location with respect to Town property, Right of Way, and private property. Kimley-Horn will review the proposed routing and identify locations for trailhead sites, bridge crossings, and determine areas where engineered structures will be required to construct the trail. We will document its findings and suggest alternative route options where environmental or cost concerns may be an issue. During the site visit, we will field stake or flag the centerline of the trail based solely on visual site conditions.

Task 2 – Field Survey and Data Collection

Kimley-Horn, through our sub-consultant, will provide land surveying services for the project under the supervision of a Professional Land Surveyor licensed in the State of Tennessee. We will perform the Field Surveying using conventional ground surveying methods, static LiDAR or other acceptable methods as determined by the surveyor and field conditions. All survey information gathered for the project shall adhere to generally accepted surveying practices and shall be tied to the State Plane Coordinate System using the Tennessee Geodetic Reference Network (TGRN).

We will begin the field surveying services following task 1.2 when the route has been staked in the field. The survey area will consist of an 80' wide corridor in green field locations through Preservation Park, existing trailhead, full right of way width along Thompsons Station Road West from trailhead to Town Hall and the entire Town Hall property. Our team will provide a field-run survey within the corridor locating the topographic features, the physical features, readily available property corners along the right of way (will not perform an extensive search for property corners), visible evidence of utilities along with any markings by TN One Call. This data will consist of existing features, such as edge of pavements, pavement markings, curbs, curb cuts and medians, utilities, top of banks, toe of slopes, grade changes, wood lines, any trees greater than 6 inches in diameter, fences, mailboxes, drainage features (ditches, pipes, structures), right-of-way limits, property lines, property information, and any easements along the proposed trail route. We will establish the southern right of way line of Thompson's Station Road West along the property boundaries, any adjacent private property lines and any easements as they may appear on plats of record or other documents provided to us. We will produce a planimetric AutoCAD drawing and a surface model. From the surface model we will produce contours at 1-foot intervals. The drawing will show the information as designated above.

Survey work at the railroad crossing will be completed by the use of static LiDAR. It is assumed that this work will not require a Railroad Agreement for Right of Entry, railroad specific insurance, flagmen or any associated additional cost for this work. Should any of the above items be required, they can be provided as an Additional Service to this agreement.

In addition to the existing topographic features and property lines, both above and below ground utilities will be located based upon available mapping and as marked by TN One Call. Additionally, we will notify adjacent property owners prior to survey, perform property research, property line and Right of Way establishment, develop the acquisition table, develop the utility owner table, provide property line bearings and distances, develop the DTM and provide necessary labeling on the final drawing.

We will base our horizontal data on the State Plane Coordinate System of 1983 and the vertical data will be based on NVGD 88. This data will be collected under the supervision of a Tennessee Registered Land Surveyor.

In addition, one field visit will be performed by Kimley-Horn staff to review the survey data.

Task 3 – Preliminary Design

Kimley-Horn will design the multi-use trail along the project limits as shown in Exhibit A. Project limits for this phase of preliminary engineering shall begin with the 12' wide multi-use path at the southernmost end of Phase 1 near the Nutro Dog Park and end at the existing trailhead parking lot. The next portion of the project will be a 5' sidewalk from the existing trailhead parking lot along Thompson's Station Road West to the Town Center and terminate at the Town Hall building. These project limits consist of approximately 1.75 miles of combination trail and sidewalk. The design will also incorporate elements such as benches, trash receptacles, bike racks, landscaping, trailhead

enhancements, signage (trailhead, traffic and pedestrian), additional railroad pedestrian crossing elements, and striping along the existing right of way.

Task 3.1 – Preliminary Design (50 Percent Design Submittal)
Preliminary Design plans (approximately 50 percent complete) will be provided to the Client for review and comment. Construction plans will conform to TDOT's current standards, and TDOT's *Roadway Design Guidelines*. The plans will be prepared for a construction cost review stage and will consist of the following preliminary sheets.

- Cover Sheet
- Estimated Quantities sheets
- Right of Way Sheets
- Layout Sheets
- Grading and Drainage Sheets
- Landscaping Sheets
- Trailhead Plan
- Signing and Pavement Marking Plan
- Railroad Crossing Plans

Task 3.2 – Preliminary Engineer's Opinion of Probable Construction Cost
Kimley-Horn staff will prepare an engineer's opinion of the probable construction cost to accompany the 50% preliminary design plans. The opinion of probable construction cost will be based on actual bid prices for recent projects which involved similar equipment and construction, to the extent that such information is available. This cost will be based on preliminary construction quantities developed from the preliminary construction plans.

The Consultant has no control over the cost of labor, materials, equipment, or over the Contractor's methods of determining prices or over competitive bidding or market conditions. Opinions of probable costs provided herein are based on the information known to Consultant at this time and represent only the Consultant's judgment as a design professional familiar with the construction industry.
The Consultant cannot and does not guarantee that proposals, bids, or actual construction costs will not vary from its opinions of probable costs.

Kimley-Horn staff will meet with Town officials following the submittal and to review the 50% Preliminary design plans and Engineer's Opinion of Probable Construction Cost. The 50% design plans and engineer's opinion of probable construction cost will be based on Kimley-Horn's recommended trail routing.

Task 4 – NEPA Documentation Preparation

Given the nature of the proposed project, the environmental document is a likely candidate for classification either as a Programmatic Categorical Exclusion (PCE) or as a Documented Categorical Exclusion (D-List CE). This determination can only be made, however, by TDOT in cooperation with the Federal Highway Administration (FHWA).

Kimley-Horn will utilize the project location map and description of the proposed improvements from the Active Transportation Program Grant Application prepared by Thompson's Station for submittal to TDOT. Based on this information, TDOT and the FHWA will determine the level of documentation and the environmental technical studies required for this project.

Based on the assumption that TDOT and the FHWA will determine that either a PCE or D-List CE is appropriate for this project, Kimley-Horn will prepare the CE document as described in the sub-tasks below in accordance with the Tennessee Environmental Procedures Manual (June 2011 edition) and FHWA guidance as outlined in FHWA Technical Advisory T6640.8A, Guidance for Preparing and Processing Environmental and Section 4(f) Documents as well as TDOT's Local Government Guidelines for the Management of Federal and State-Funded Transportation Projects (March 2018).

One Build Alternative will be studied and will be based on functional plans or on preliminary plans (50 percent complete) as defined on Page 4-5 of TDOT's Local Government Guidelines for the Management of Federal and State-Funded Transportation Projects (March 2018). In addition, the No-Build Alternative will be examined to document what would happen if the proposed project was not constructed and serves as a baseline to compare the Build Alternative against.

Task 4.1 – Develop Purpose and Need Statement

Kimley-Horn will prepare a "Purpose and Need" statement for inclusion in the environmental document. The statement will clearly describe the need that exists for the proposed improvements and will describe the problems that the proposed action is intended to correct.

Task 4.2 – Agency Coordination

Kimley-Horn will prepare and send initial coordination letters to the following federal and state agencies requesting a review of the proposed project's impacts to threatened and endangered species, wetlands, and/or streams. Along with the letter request, Kimley-Horn will prepare an Environmental Technical Study Area Map (ETSA) for distribution to the agencies.

- Tennessee Department of Environment and Conservation (TDEC)
- U.S. Fish and Wildlife Service (USFWS)
- U.S. Army Corps of Engineers (USACE)
- Tennessee Wildlife Resources Agency (TWRA)

Task 4.3 – Conduct Technical Studies

The ETSA, as developed under Task 4.2, will serve as the study area limits for the environmental technical studies outlined below. If further design details or plans become available during preparation of the initial environmental document and the expected right-of-way limits exceed what is presented in the ETSA then the environmental technical studies will

need to be updated to reflect the latest design plans. Updates to the environmental technical studies can be completed in accordance with the Additional Services clause of this agreement.

Task 4.3.1 – Cultural Resources / Section 106 Coordination

As part of the environmental review process, a Section 106 Assessment will be completed. This assessment consists of a review and search of the archaeological and architectural/historical records for the general project area. As part of the Section 106 Assessment, Kimley-Horn will submit the following items to TDOT:

- USGS topographic map of the project area
- Photographs of the site, along with a key map
- Dates of construction for buildings in the project area where this information is readily available.

Following completion of the Section 106 Assessment, Kimley-Horn will submit the assessment to TDOT for approval. TDOT will then submit the Section 106 Assessment to the Tennessee State Historical Preservation Officer (SHPO) requesting a Section 106 review of the proposed project area.

Task 4.3.2 – Archaeology

Due to the project's location, within a known Civil War Battle Site, Kimley-Horn's subconsultant, New South Associates, will be responsible for conducting an archeological study to identify resources that are listed in, or eligible for listing in, the National Register of Historic Places (NRHP) and to identify the effects to such resources, pursuant to 36 CFR 800. All elements of the archaeology task will be conducted in accordance with the TDOT Environmental Division Archaeology Section's Scope of Work.

A Phase I Archaeological Survey will be prepared, using information obtained in a records search and any previously completed studies for this project. The Phase I Archaeological Survey will contain sufficient information to allow an evaluation of whether additional investigations are warranted to determine NRHP eligibility. New South Associates will prepare the draft report and submit it to the TDOT Environmental Division for review. TDOT will submit the draft report to the Tennessee State Historic Preservation Office (TN-SHPO) for review. Following the receipt of comments, New South Associates will finalize the Phase I Archaeological report, providing copies as specified in the TDOT scope of work for Phase I Archaeological Surveys.

Assumptions:

- No Phase 2 Testing- If required, this work can be completed in accordance with the Additional Services clause of this agreement.
- If a Memorandum of Agreement is needed to confirm agreed upon mitigation measures for the preferred alternative, it will be conducted in accordance with the Additional Services clause of this agreement.

- If Phase III work, data recovery, is necessary, it can be included in accordance with the Additional Services clause of this agreement.

Task 4.3.3 – Native American Consultation

Native American Consultation will be completed by the TDOT Environmental Division, Archaeology Section and incorporated into the environmental document by Kimley-Horn.

Task 4.3.4 – Historic Architecture

Given that the proposed project is nearby several NRHP listed or potentially eligible buildings, a Historic Architecture Assessment will be required by TDOT and/or the TN-SHPO. Kimley-Horn's subconsultant, New South Associates, will complete the Historic/Architecture Assessment.

Once the Historic Architecture Assessment is complete, the report will be submitted to the TDOT Environmental Division for review and comment. Following approval by TDOT, the report will be submitted to the TN-SHPO for approval. The results of both the Historic/Architectural Assessment as well as a copy of the TN-SHPO letter will be incorporated directly into the environmental document.

Assumptions:

If additional coordination with the TN-SHPO is required or if additional historic architecture documentation is needed past the preparation of the Historic Architecture Assessment previously mentioned, these services can be provided in accordance with the Additional Services clause of this agreement.

Task 4.3.5 – Waters of the U.S. Determination (Streams and Wetlands)

Kimley-Horn, through the use of a sub-consultant, will provide a Waters of the US Determination (i.e. streams and wetlands) for the project area. In performing the jurisdictional determinations, the 1987 Corps of Engineers Wetlands Delineation Manual and the 2012 Regional Supplement: Eastern Mountains and Piedmont Region, Version 2.0, will be closely followed to establish a description of the soils, plants and hydrologic conditions of the site.

Our team will perform the following tasks:

1. Using the 1987 Corps of Engineers Wetland Delineation Manual and the 2012 Regional Supplement: Eastern Mountains and Piedmont Region, Version 2.0 delineate potential wetlands located in the proposed site.
2. Complete the Corps of Engineers Wetland Data Forms for each wetland/upland sampling site.
3. Using a Trimble® GeoXT GPS Unit, map the wetland boundaries (if present) to determine area, and log lat/long of each soil pit along with hue, value and chroma of the soil using a standard Munsell® Color Chart.
4. Complete the Rapid Bioassessment Protocols for Use in Streams and Wadeable Rivers Habitat Assessment Forms, which the Corps currently uses to determine mitigation ratios.

5. Submit wet weather conveyance and stream determinations as a Qualified Hydrologic Professional to TDEC.
6. Prepare a summary report describing the findings that includes the routine wetland determination data forms, Hydrologic Determination forms, Habitat Assessment forms, a photo summary, and delineation map.

Task 4.3.6 – Endangered Species

Kimley-Horn, through the use of a sub-consultant, will perform initial consultation with the Tennessee Department of Environment and Conservation, Division of Natural Heritage (DNH), to identify the likelihood of presence of threatened or endangered species along the proposed corridor and whether the project would adversely affect listed species or designated critical habitat.

Assumptions:

No individual plant or animal species surveys will be conducted as part of this proposed scope of services and fee estimate. If the Client, TDOT or another state and/or federal agency, requests a species survey, this work can be completed by Kimley-Horn in accordance with Additional Services clause of this agreement.

Task 4.3.7 – Hazardous Materials

Kimley-Horn will complete a desktop review of available hazardous materials databases to determine whether the proposed project area has the potential to contain hazardous materials that may be impacted by the project.

Hazardous materials databases to be reviewed include the Underground Storage Tank (UST) Data and Reports database provided by TDEC, the “EnviroMapper” database maintained by the Environmental Protection Agency (EPA), and the Public Data Viewer maintained by the TDEC Division of Water Resources.

Kimley-Horn will submit a summary of the desktop review to the TDOT Environmental Division as part of the initial coordination efforts. Based on the data provided, the TDOT Hazardous Materials Section will recommend whether additional studies may be necessary.

Assumptions:

If additional studies such as a Phase I or Phase II Environmental Site Assessment are required, these services can be provided by Kimley-Horn in accordance with Additional Services clause of this agreement.

Task 4.3.8 – Noise Impacts

Given the current scope of work, this project is understood to classify as a Type III project under FHWA and TDOT guidelines. Type III projects do not require a noise analysis.

Kimley-Horn will coordinate with the TDOT Environmental Division for appropriate language to be included in the environmental document. If TDOT or any other agency determines additional

noise analysis are required for this project, these services can be provided by Kimley-Horn in accordance with Additional Services clause of this agreement.

Task 4.3.9 – Air Quality

TDOT's Environmental Division will be responsible for updating the air quality analysis to meet the requirements of the Clean Air Act Amendment and TDOT's Air Quality Evaluation Policy. The air quality analysis will be updated to determine and compare the potential impacts of the project's alternatives on regional and local air quality.

TDOT will provide the results of the air quality analysis to Kimley-Horn and Kimley-Horn will incorporate TDOT's findings into the environmental document. If TDOT or any other agency determines that an air quality analysis is required for this project, these services can be provided by Kimley-Horn in accordance with Additional Services clause of this agreement.

Task 4.3.10 – Relocation Impacts

No business, residential or non-profit organization displacements are anticipated with the construction of the proposed project. If a relocation study is deemed necessary for this project, this service can be provided by Kimley-Horn in accordance with Additional Services clause of this agreement.

Task 4.3.11 – Farmland

It is assumed that coordination with the Natural Resource and Conservation Service (NRCS) will not be required for this project. If farmland resources are identified and coordination with the NRCS is deemed necessary by TDOT, these services can be provided by Kimley-Horn in accordance with Additional Services clause of this agreement.

Task 4.3.12 – Section 4(f) Historic Resource

A potentially eligible NRHP civil war battle site (Battle of Thompson's Station) is within the boundaries of the project area. Depending on the civil war battle site's determination of eligibility, the civil war battle site could be identified as a potential Section 4(f) resource. If the project is determined to have Section 4(f) impacts on the civil war battle site, a Section 4(f) De minimis Determination will be prepared by New South Associates and submitted to TDOT as well as the TN-SHPO for final review and approval.

In order to make a Section 4(f) De Minimis Determination, the following steps would occur for a historic site:

1. Section 106 finding of "No Historic Properties Affected" or "No adverse effect".
2. Inform the Official with Jurisdiction (OWJ) of intent to use Section 106 finding to make De Minimis impact determination.
3. Consulting party consultation
4. Obtain OWJ written concurrence on Section 106 finding.

Assumptions:

- A "will not adversely affect the activities, features, or attributes" determination from Thompson's Station is anticipated for this project as well as a Section 4 (f) De Minimis Determination from the FHWA. If TDOT, FHWA or the Official with Jurisdiction request the preparation of either a Programmatic Section 4(f) Evaluation or an Individual Section 4(f) Evaluation, an addendum to this scope of services and fee estimate will be required.

Task 4.3.13 – Section 4(f) Recreational Resource

With the identification of a Section 4(f) resource within the project area, Preservation Park, a Section 4(f) De Minimis Determination may need to be developed. Kimley-Horn will prepare the Section 4(f) De Minimis Determination for the project and submit it to Thompson's Station/TDOT for initial review. Once the initial review has been completed by TDOT, the Section 4(f) De Minimis Determination will be submitted to FHWA for final approval.

In order for the proposed project to receive a De Minimis Finding the following criteria must be met:

- Completion of the Determination of Section 4(f) De Minimis Determination for a recreational resource.
- Inform the Official with Jurisdiction of the intent to make a De Minimis impact finding. In the case of this project, it is assumed that the Official with Jurisdiction is assumed to be the Town of Thompson's Station.
- Obtain written concurrence from the Official with Jurisdiction of the De Minimis finding.
- Provide the public with the opportunity to review and comment on the effects of the project on the Section 4(f) property via a legal announcement and map in the local newspaper.

Assumptions:

- A "will not adversely affect the activities, features, or attributes" determination from Thompson's Station is anticipated for this project as well as a Section 4 (f) De Minimis Determination from the FHWA. If TDOT, FHWA or the Official with Jurisdiction request the preparation of either a Programmatic Section 4(f) Evaluation or an Individual Section 4(f) Evaluation, an addendum to this scope of services and cost estimate will be required.
- Thompson's Station will cover the cost associated with printing the public notice.

Deliverables by the Consultant:

- Completion of the Section 4(f) De Minimis Determination.
- Section 4(f) language for incorporation by Kimley-Horn into the Categorical Exclusion.
- Public notice.
- Official with Jurisdiction approval letter.

Task 4.3.14 – Parks and Recreational Resources / Section 6(f) Impacts

It is not anticipated that the proposed project will acquire any right-of-way or easements from a Section 6(f) resource. If a Section 6(f) evaluation is deemed necessary by TDOT or any other agency, these services can be provided by Kimley-Horn in accordance with Additional Services clause of this agreement.

Task 4.3.15 – Environmental Justice

An Environmental Justice (EJ) evaluation will be undertaken in conformance with Executive Order 12898 and FHWA Order 6640.23 (December 2, 1998). The analysis will consider the composition of the affected area, to determine whether minority or low-income populations are present in the area affected by the proposed action, and if so whether there may be disproportionately high and adverse human health or environmental effects on minority and low-income populations.

Baseline data will be collected for low income and minority populations using U.S. Census data. The data will include race, color, national origin, age and level of income of overall population, as well as the existence of any minority or low-income populations or communities. Potential areas of EJ populations will be displayed on GIS mapping.

The EJ analysis will be limited to desk-top research only. No field work will be completed. If a disproportionately high and adverse effect on a low-income population or minority population is revealed, the analysis will show how the effects are distributed within the affected community. If potential mitigation measures or potential community outreach efforts are identified, these services can be provided by Kimley-Horn in accordance with Additional Services clause of this agreement. The EJ analysis will be incorporated directly into the environmental document.

Task 4.3.16 – Floodplains

Floodplains and floodways in the project area will be identified, as part of the environmental screening, through the review of National Flood Insurance Rate Maps (FIRMs). This information will be included as part of the environmental document including the preparation of a FIRM map specific for the project area.

Task 4.4 – Categorical Exclusion Document Preparation and Approval

The purpose of this task is to develop the CE documentation, consistent with the requirements of the FHWA Technical Advisory T6640.8A, Guidance for Preparing and Processing Environmental and Section 4(f) Documents, the TDOT Environmental Procedures Manual (June 2011 edition), and the TDOT's Local Government Guidelines for the Management of Federal and State-Funded Transportation Projects (March 2018).

Kimley-Horn will incorporate the Purpose and Need, a project description and results of the environmental technical studies into the environmental document. As a part of the environmental

documentation, tables and figures will be developed to illustrate and explain the project area characteristics, alternatives, location of impacts and comparison of impacts.

Following completion of the document by Kimley-Horn, the environmental document will be submitted to the Town of Thompson's Station for review and comment. Kimley-Horn will then revise the environmental document based on the Thompson's Station's comments. Once Thompson's Station approves the environmental document, the document will be submitted to the TDOT Environmental Division/FHWA for initial review and subsequent approval.

Deliverables:

1. Copy of all correspondence and submittals to various regulatory agencies (electronic copy in Adobe PDF format)
2. Waters of the US Determination (electronic copy in Adobe PDF format)
3. Architectural Survey/Section 106 Assessment of Effects (4 hard copies, electronic copy in Adobe PDF format)
4. Phase I Archaeological Survey (4 hard copies, electronic copy in Adobe PDF format)
5. Section 4(f) De Minimis Determination (Two separate Determinations for Preservation Park and the Civil War Battle Site at Thompson's Station) (4 hard copies of each Section 4(f) Determination, electronic copy in Adobe PDF format)
6. Draft Categorical Exclusion document for the Town of Thompson's Station's review (electronic copy in Adobe PDF format)
7. Draft Categorical Exclusion document for TDOT/FHWA review (electronic copy in Adobe PDF format)
8. Final Categorical Exclusion document for TDOT/FHWA review and approval (electronic copy in Adobe PDF format)

Task 5 – Public Involvement

Kimley-Horn will coordinate with Town staff to collect, review and analyze any information or feedback that was gathered during prior public meetings in preparation for Phase 1 of the greenway or in preparation for the grant application for Phase 2. We will utilize this prior information as a basis for our preliminary design.

We will then organize and facilitate one (1) public meeting at a date and location to be determined by a combination of Town staff and Kimley-Horn. This meeting will be held once we have a level of preliminary design that can show the public a general idea of what we plan to build. The meeting will be up to four hours total through a combination of a project specific public meeting and also a booth at an event within the Town. The intent of the meeting will be to gather feedback from the general public and area neighborhood associations to receive input regarding alignment, site furnishings and connections. Kimley-Horn will prepare an agenda, presentation, graphics, and document a summary of the meeting and feedback we receive.

Kimley-Horn will present the preliminary plans and the results of the public meeting at a Town Board of Mayor and Alderman (BOMA) meeting.

Should additional meetings be required beyond what is listed in this task, effort associated with those meetings / coordination will be considered Additional Services as described in Task 6.

Following the completion of Tasks 1 – 5, Kimley-Horn will submit an amendment to this letter agreement for the Phase 2 scope of services consisting of the following tasks:

- NEPA documentation and submittals
- Public Involvement
- Final Design
- TDOT and Town submittals and approvals
- TDEC and ACOE permitting
- Bidding Phase Services

Task 6 – Additional Services

Any services not specifically provided for in the above scope, as well as any changes in the scope the Client requests, will be considered Additional Services and will be performed at our then current hourly rates. Additional Services Kimley-Horn can provide include, but are not limited to, the following:

- Final Design
- Permitting
- Bid Phase Services
- No-Rise Flood Study
- Additional environmental technical studies outside of those describe above
- Additional environmental documentation beyond the D-list Categorical Exclusion document
- Additional survey
- Lighting Plans
- Utility Relocation Plans
  - Right of Way Services consisting of:
  - Property Acquisition
  - Easement Acquisition
  - Appraisals
  - Surveys and legal descriptions for land transfer
  - Property negotiations
  - Property Closing services
- Environmental Permits
- Additional bid phase and pre-construction services should the Town decide to bid the project multiple times
- Multiple phased design

- Attendance at review meetings and / or public hearings
- Construction Engineering Inspection Services consisting of:
  - Pre-construction Conference
  - Progress Meetings
  - Utility Coordination
  - Change Orders
  - Shop Drawings/Submittals
  - Testing
  - Progress Payments
  - Inspection
  - Payrolls
  - Final Records
- Others as requested by the Town

INFORMATION PROVIDED BY CLIENT

We shall be entitled to rely on the completeness and accuracy of all information provided by the Client or the Client's consultants or representatives. The Client shall provide all information requested by Kimley-Horn during the project, including but not limited to the following:

- Existing GIS and/or digital photography data for the project area
- Existing plans for the sidewalk connecting to or adjacent to the proposed site
- Any as-built survey information within the project limits

SCHEDULE

We will provide our services as expeditiously as practical. Once a designated route for the alignment is determined, our is prepared to provide the field survey within eight weeks following the completion of Task 1. The remaining schedule will be modified as needed to meet a mutually agreed upon schedule.

FEE AND BILLING

Kimley-Horn will perform the services described in Tasks 1 through 5 for the total lump sum fee below. Individual task amounts are for informational only. All permitting, application, and similar project fees will be paid directly by the Client.

Task 1 – Project Coordination Services	$11,700
Task 2 – Field Survey and Data Collection	$29,000
Task 3 – Preliminary Design	$49,000
Task 4 – NEPA Documentation	$58,000
Task 5 – Public Involvement	$9,000

Individual task amounts are provided for budgeting purposes only. Kimley-Horn reserves the right to reallocate amounts among tasks as necessary (as allowed by the TDOT Local Government Guidelines for the Management of Federal and State Funded Transportation Projects).

Kimley-Horn will perform the services described in Task 6 (Additional Services) of the Scope of Services on a labor fee plus expense basis. Effort associated with Task 6 will not be performed without authorization from you.

Fees and expenses will be invoiced monthly based, as applicable, upon the percentage of services performed or actual services performed and expenses incurred as of the invoice date. Payment will be due within 25 days of your receipt of the invoice.

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CLOSURE

In addition to the matters set forth herein, our Agreement shall include and be subject to, and only to, the attached Standard Provisions, which are incorporated by reference. As used in the Standard Provisions, "Consultant" shall refer to Kimley-Horn and Associates, Inc., and "Client" shall refer to **Town of Thompson's Station, Tennessee**.

Kimley-Horn, in an effort to expedite invoices and reduce paper waste, submits invoices via email in an Adobe PDF format. We can also provide a paper copy via regular mail if requested. Please include the invoice number and Kimley-Horn project number with all payments. Please provide the following information:

____ Please email all invoices to _____

____ Please copy _____

If you concur in all the foregoing and wish to direct us to proceed with the services, please have authorized persons execute both copies of this Agreement in the spaces provided below, retain one copy, and return the other to us. We will commence services only after we have received a fully-executed agreement. Fees and times stated in this Agreement are valid for sixty (60) days after the date of this letter.

To ensure proper set up of your projects so that we can get started, please complete and return with the signed copy of this Agreement the attached Request for Information. Failure to supply this information could result in delay in starting work on your project.

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We appreciate the opportunity to provide these services to you. Please contact us if you have any questions.

Sincerely,

Kimley-Horn AND ASSOCIATES, INC.

Alisha Eley, PLA
Project Manager

Zachary J. Dufour, P.E.
Assistant Secretary

Attachment – Request for Information
Attachment – Standard Provisions

Agreed to this _____ day of _____, 2019.

Thompson's Station, Tennessee
A Town Government

By: _____

_____
(Date)

_____
(Print or Type Name)

Title: _____
(Member or Manager, as authorized)

_____
(Email Address)

_____, Witness
(Print or Type Name)

Kimley-Horn AND ASSOCIATES, INC.
STANDARD PROVISIONS

(1) **Consultant's Scope of Services and Additional Services.** The Consultant will perform only the services specifically described in this Agreement. If requested by the Client and agreed to by the Consultant, the Consultant will perform Additional Services, which shall be governed by these provisions. Unless otherwise agreed to in writing, the Client shall pay the Consultant for any Additional Services an amount based upon the Consultant's then-current hourly rates plus an amount to cover certain direct expenses including telecommunications, in-house reproduction, postage, supplies, project related computer time, and local mileage. Other direct expenses will be billed at 1.15 times cost.

(2) **Client's Responsibilities.** In addition to other responsibilities herein or imposed by law, the Client shall:
(a) Designate in writing a person to act as its representative, such person having complete authority to transmit instructions, receive information, and make or interpret the Client's decisions.
(b) Provide all information and criteria as to the Client's requirements, objectives, and expectations for the project and all standards of development, design, or construction.
(c) Provide the Consultant all available studies, plans, or other documents pertaining to the project, such as surveys, engineering data, environmental information, etc., all of which the Consultant may rely upon.
(d) Arrange for access to the site and other property as required for the Consultant to provide its services.
(e) Review all documents or reports presented by the Consultant and communicate decisions pertaining thereto within a reasonable time so as not to delay the Consultant.
(f) Furnish approvals and permits from governmental authorities having jurisdiction over the project and approvals and consents from other parties as may be necessary.
(g) Obtain any independent accounting, legal, insurance, cost estimating and feasibility services required by Client.
(h) Give prompt written notice to the Consultant whenever the Client becomes aware of any development that affects the Consultant's services or any defect or noncompliance in any aspect of the project.

(3) **Period of Services.** Unless otherwise stated herein, the Consultant will begin work after receipt of a properly executed copy of this Agreement. This Agreement assumes conditions permitting continuous and orderly progress through completion of the services. Times for performance shall be extended as necessary for delays or suspensions due to circumstances that the Consultant does not control. If such delay or suspension extends for more than six months, Consultant's compensation shall be renegotiated.

(4) **Method of Payment.** Client shall pay Consultant as follows:
(a) Invoices will be submitted periodically for services performed and expenses incurred. Payment of each invoice will be due within 25 days of receipt. The Client shall also pay any applicable sales tax. All retainers will be held by the Consultant and applied against the final invoice. Interest will be added to accounts not paid within 25 days at the maximum rate allowed by law. If the Client fails to make any payment due under this or any other agreement within 30 days after the Consultant's transmittal of its invoice, the Consultant may, after giving notice to the Client, suspend services and withhold deliverables until all amounts due are paid.
(b) If the Client relies on payment or proceeds from a third party to pay Consultant and Client does not pay Consultant's invoice within 60 days of receipt, Consultant may communicate directly with such third party to secure payment.
(c) If the Client objects to an invoice, it must advise the Consultant in writing giving its reasons within 14 days of receipt of the invoice or the Client's objections will be waived, and the invoice shall conclusively be deemed due and owing. If the Client objects to only a portion of the invoice, payment for all other portions remains due within 25 days of receipt.
(d) If the Consultant initiates legal proceedings to collect payment, it may recover, in addition to all amounts due, its reasonable attorneys' fees, reasonable experts' fees, and other expenses related to the proceedings. Such expenses shall include the cost, at the Consultant's normal hourly billing rates, of the time devoted to such proceedings by its employees.
(e) The Client agrees that the payment to the Consultant is not subject to any contingency or condition. The Consultant may negotiate payment of any check tendered by the Client, even if the words "in full satisfaction" or words intended to have similar effect appear on the check without such negotiation being an accord and

satisfaction of any disputed debt and without prejudicing any right of the Consultant to collect additional amounts from the Client.

(5) **Use of Documents.** All documents and data prepared by the Consultant are related exclusively to the services described in this Agreement, and may be used only if the Client has satisfied all of its obligations under this Agreement. They are not intended or represented to be suitable for use or reuse by the Client or others on extensions of this project or on any other project. Any modifications by the Client to any of the Consultant's documents, or any reuse of the documents without written authorization by the Consultant will be at the Client's sole risk and without liability to the Consultant, and the Client shall indemnify, defend and hold the Consultant harmless from all claims, damages, losses and expenses, including but not limited to attorneys' fees, resulting therefrom. The Consultant's electronic files and source code remain the property of the Consultant and shall be provided to the Client only if expressly provided for in this Agreement. Any electronic files not containing an electronic seal are provided only for the convenience of the Client, and use of them is at the Client's sole risk. In the case of any defects in the electronic files or any discrepancies between them and the hardcopy of the documents prepared by the Consultant, the hardcopy shall govern.

(6) **Opinions of Cost.** Because the Consultant does not control the cost of labor, materials, equipment or services furnished by others, methods of determining prices, or competitive bidding or market conditions, any opinions rendered as to costs, including but not limited to the costs of construction and materials, are made solely based on its judgment as a professional familiar with the industry. The Consultant cannot and does not guarantee that proposals, bids or actual costs will not vary from its opinions of cost. If the Client wishes greater assurance as to the amount of any cost, it shall employ an independent cost estimator. Consultant's services required to bring costs within any limitation established by the Client will be paid for as Additional Services.

(7) **Termination.** The obligation to provide further services under this Agreement may be terminated by either party upon seven days' written notice in the event of substantial failure by the other party to perform in accordance with the terms hereof, or upon thirty days' written notice for the convenience of the terminating party. The Consultant shall be paid for all services rendered and expenses incurred to the effective date of termination, and other reasonable expenses incurred by the Consultant as a result of such termination.

(8) **Standard of Care.** The standard of care applicable to Consultant's services will be the degree of care and skill ordinarily exercised by consultants performing the same or similar services in the same locality at the time the services are provided. No warranty, express or implied, is made or intended by the Consultant's performance of services, and it is agreed that the Consultant is not a fiduciary with respect to the Client.

(9) **LIMITATION OF LIABILITY.** In recognition of the relative risks and benefits of the Project to the Client and the Consultant, the risks are allocated such that, to the fullest extent allowed by law, and notwithstanding any other provisions of this Agreement or the existence of applicable insurance coverage, that the total liability, in the aggregate, of the Consultant and the Consultant's officers, directors, employees, agents, and subconsultants to the Client or to anyone claiming by, through or under the Client, for any and all claims, losses, costs or damages whatsoever arising out of or in any way related to the services under this Agreement from any causes, including but not limited to, the negligence, professional errors or omissions, strict liability or breach of contract or any warranty, express or implied, of the Consultant or the Consultant's officers, directors, employees, agents, and subconsultants, shall not exceed twice the total compensation received by the Consultant under this Agreement or $50,000, whichever is greater. Higher limits of liability may be negotiated for additional fee. This Section 9 is intended solely to limit the remedies available to the Client or those claiming by or through the Client, and nothing in this Section 9 shall require the Client to indemnify the Consultant.

(10) **Mutual Waiver of Consequential Damages.** In no event shall either party be liable to the other for any consequential, incidental, punitive, or indirect damages including but not limited to loss of income or loss of profits.

(11) **Construction Costs.** Under no circumstances shall the Consultant be liable for extra costs or other consequences due to unknown conditions or related to the failure of contractors to perform work in accordance with the plans and specifications. Consultant shall have no liability whatsoever for any costs arising out of the

Client's decision to obtain bids or proceed with construction before the Consultant has issued final, fully-approved plans and specifications. The Client acknowledges that all preliminary plans are subject to substantial revision until plans are fully approved and all permits obtained.

(12) **Certifications.** The Consultant shall not be required to execute certifications or third-party reliance letters that are inaccurate, that relate to facts of which the Consultant does not have actual knowledge, or that would cause the Consultant to violate applicable rules of professional responsibility.

(13) **Dispute Resolution.** All claims by the Client arising out of this Agreement or its breach shall be submitted first to mediation in accordance with the American Arbitration Association as a condition precedent to litigation. Any mediation or civil action by Client must be commenced within one year of the accrual of the cause of action asserted but in no event later than allowed by applicable statutes.

(14) **Hazardous Substances and Conditions.** Consultant shall not be a custodian, transporter, handler, arranger, contractor, or remediator with respect to hazardous substances and conditions. Consultant's services will be limited to analysis, recommendations, and reporting, including, when agreed to, plans and specifications for isolation, removal, or remediation. The Consultant will notify the Client of unanticipated hazardous substances or conditions of which the Consultant actually becomes aware. The Consultant may stop affected portions of its services until the hazardous substance or condition is eliminated.

(15) **Construction Phase Services.**
(a) If the Consultant prepares construction documents and the Consultant is not retained to make periodic site visits, the Client assumes all responsibility for interpretation of the documents and for construction observation, and the Client waives any claims against the Consultant in any way connected thereto.
(b) The Consultant shall have no responsibility for any contractor's means, methods, techniques, equipment choice and usage, sequence, schedule, safety programs, or safety practices, nor shall Consultant have any authority or responsibility to stop or direct the work of any contractor. The Consultant's visits will be for the purpose of endeavoring to provide the Client a greater degree of confidence that the completed work of its contractors will generally conform to the construction documents prepared by the Consultant. Consultant neither guarantees the performance of contractors, nor assumes responsibility for any contractor's failure to perform its work in accordance with the contract documents.
(c) The Consultant is not responsible for any duties assigned to it in the construction contract that are not expressly provided for in this Agreement. The Client agrees that each contract with any contractor shall state that the contractor shall be solely responsible for job site safety and its means and methods; that the contractor shall indemnify the Client and the Consultant for all claims and liability arising out of job site accidents; and that the Client and the Consultant shall be made additional insureds under the contractor's general liability insurance policy.

(16) **No Third-Party Beneficiaries; Assignment and Subcontracting.** This Agreement gives no rights or benefits to anyone other than the Client and the Consultant, and all duties and responsibilities undertaken pursuant to this Agreement will be for the sole benefit of the Client and the Consultant. The Client shall not assign or transfer any rights under or interest in this Agreement, or any claim arising out of the performance of services by Consultant, without the written consent of the Consultant. The Consultant reserves the right to augment its staff with subconsultants as it deems appropriate due to project logistics, schedules, or market conditions. If the Consultant exercises this right, the Consultant will maintain the agreed-upon billing rates for services identified in the contract, regardless of whether the services are provided by in-house employees, contract employees, or independent subconsultants.

(17) **Confidentiality.** The Client consents to the use and dissemination by the Consultant of photographs of the project and to the use by the Consultant of facts, data and information obtained by the Consultant in the performance of its services. If, however, any facts, data or information are specifically identified in writing by the Client as confidential, the Consultant shall use reasonable care to maintain the confidentiality of that material.

(18) **Miscellaneous Provisions.** This Agreement is to be governed by the law of the State where the Project is located. This Agreement contains the entire and fully integrated agreement between the parties and supersedes

all prior and contemporaneous negotiations, representations, agreements or understandings, whether written or oral. Except as provided in Section 1, this Agreement can be supplemented or amended only by a written document executed by both parties. Any conflicting or additional terms on any purchase order issued by the Client shall be void and are hereby expressly rejected by the Consultant. Any provision in this Agreement that is unenforceable shall be ineffective to the extent of such unenforceability without invalidating the remaining provisions. The non-enforcement of any provision by either party shall not constitute a waiver of that provision nor shall it affect the enforceability of that provision or of the remainder of this Agreement.

ORDINANCE NO. 2020-003

AN ORDINANCE OF THE TOWN OF THOMPSON'S STATION, TENNESSEE, TO AMEND TITLE 12, CHAPTER 4 OF THE MUNICIPAL CODE REGARDING THE IMPACT ASSESSMENT FEE.

WHEREAS, the Town is authorized pursuant to Tennessee Code Annotated § 6-2-201(15) and other applicable law to assess fees for use of or impact upon certain public infrastructure, including roadways, public parks, and recreation facilities; and

WHEREAS, the Town is experiencing and anticipating both rapid growth and an increase in commercial development which requires public facilities and infrastructure improvements to meet the demand created by such growth and development;

WHEREAS, the Board of Mayor and Aldermen has determined that it is in the best interest of the Town to amend the current code provisions related to its Impact Assessment Fees.

NOW, THEREFORE, BE IT ORDAINED by the Town of Thompson's Station as follows:

Section 1. That Title 12, Chapter 4 of the Municipal Code, *Impact Fees*, be deleted in its entirety upon the effective date of this ordinance and shall be amended by adding a new Chapter 4, *Impact Fees*, as set forth below:

CHAPTER 4

IMPACT FEES

SECTION

12-401. Title, authority, applicability (a) This article shall be known and may be cited as the "Impact Fee Ordinance."

(b) Authority to implement this article is granted under the General Law Mayor-Aldermanic Charter, and such other additional powers granted to municipalities by the state legislature. The enumeration of particular powers in this article is not exclusive of others, not restrictive of general words or phrases granting powers and all powers shall be construed so as to permit the town to exercise freely any one or more such powers.

(c) Except as provided herein, this article shall be applicable to all new buildings constructed or additions to existing buildings constructed after the effective date of this Ordinance.

(d) This chapter is intended to impose an impact fee at the time of building permit or certificate of occupancy issuance, in an amount based upon the gross square footage of residential or nonresidential development and number of such residential dwelling units in order to finance public facilities, the demand for which is generated by new development. The Town will meet, to the extent finances permit through the use of general revenues, all capital improvement needs associated with existing development. This chapter shall be uniformly applicable to development that occurs within the Town limits and the urban growth boundary.

12-402. Definitions. The following words, terms and phrases, when used in this chapter, shall have the meanings ascribed to them in this section, except where the context clearly indicates a different meaning:

For the purpose of this chapter, the following definitions shall apply unless the context clearly indicates or requires a different meaning.

Building Permit. The permit required for new construction and additions pursuant to the International Building Code heretofore adopted. The term *BUILDING PERMIT*, as used herein, shall not be deemed to include permits required for remodeling, rehabilitation or other improvements to an existing structure or rebuilding a damaged or destroyed structure; provided, there is no increase in gross floor area or number of dwelling units resulting therefrom.

Capital Improvements.

(1) Public facilities that are treated as capitalized expenses according to generally accepted accounting principles and does not include costs associated with the operation, administration, maintenance or replacement of capital improvements, nor does it include administrative facilities.

(2) Any and/or all of the following, and including acquisition of land, construction, improvements, equipping and installing of same and which facilities are identified in the capital improvements plan to be financed by the imposition of an impact fee:
(a) Parks and recreational facilities;
(b) Road systems;
(c) Other facilities the costs of which may be substantially attributed to new development.

Board. The duly constituted governing body of the Town, or the Board of Mayor and Aldermen.

Building. Any permanent structure having a roof and used or built for the enclosure or shelter of persons, animals, vehicles, goods, merchandise, equipment, materials or property of any kind.

Building permit means an official document or certificate issued by the town authorizing the construction of any building.

Development. Any human-made change to improved or unimproved real property, the use of any principal structure or land or any other activity that requires issuance of a building permit.

Development Subareas. The Town limits and the urban growth boundary in which development potential may create the need for capital improvements program to be funded by impact fees.

Gross Floor Area. The total square feet of enclosed space on the floor or floors comprising the structure. The total of the gross horizontal area of all floors that will be heated or cooled, including usable basements, cellars and attics, below the roof and within the outer surface of the main walls of principal or accessory buildings or the centerlines of a party wall separating such buildings or portions thereof, or within lines drawn parallel to and two feet within the roof line of any building or portions thereof without walls, but excluding enclosed parking areas, farm buildings, and arcades, porticoes and similar open areas that are accessible to the general public and are not designed or used as sales, display, storage, service or production areas.

Impact Fee. Any construction privilege tax charge, fee or assessment levied as a condition of issuance of a building permit or development approval for the purpose of funding when any portion of the revenues collected is intended to fund any portion of the costs of capital improvements or any public facilities attributable to accommodating the additional demands created by new development.

Impact Fee Coefficient. The charge per square foot of non-residential development or per dwelling unit as calculated for each designated development subarea by dividing total public facility costs by the gross square footage and/or number of dwelling units.

Land Development Ordinance. The official adopted zoning map and text regulating all development and land use in the Town.

Residential Development. Any development approved by the local government for residential use.

Site. The land on which development takes place.

Town. The Town of Thompson's Station, a duly constituted political subdivision of the State of Tennessee.

Zoning Districts. Those areas designated in the Land Development Ordinance as being reserved for specific land uses, subject to development and use regulations specified in the ordinance.

12-403. <u>Intent and Purposes</u>. (a) The board of mayor and aldermen has determined that the rapid growth rate which the town has experienced and is expected to experience in the foreseeable future necessitates capital improvements and makes it necessary to regulate land

development and building activity that generates increased traffic and other impacts within the Town. It is the intent of the Town that the capacity of the road network in the community should handle the traffic demands generated by new development, thus maintaining a satisfactory quality of life in Thompson's Station. Additionally, the demands on the public parks and recreational facilities caused by new development must be addressed to maintain a satisfactory quality of life in Thompson's Station.

(b) In order to finance the necessary capital improvements required to meet the traffic demands, park demands, and recreational facility demands, as well as other capital improvement projects, created by growth in population and business activity, a variety of financial sources shall be used to fund the planning, engineering, and construction of future capital improvement projects.

(c) It shall be the purpose of this chapter to establish a regulatory system and method by which the Town calculates, collects, and obligates a regulatory fee hereinafter referred to as the impact fee. Except as otherwise provided for in this chapter, this fee shall be assessed on each new building or addition to an existing structure constructed within the Town. The fee shall provide a portion of the revenues required to complete infrastructure and public works projects necessary to service this new development.

(d) The public health, safety, and general welfare is protected when adequate financial resources are available to fund the public works projects needed to handle traffic demand generated from land development activities and the construction of new buildings in the Town.

(e) The intent of this chapter is to allow for continued land development and new building construction in accordance with orderly fulfillment of appropriate capital improvement projects.

(f) The impact fee shall be assessed to each new land development and building based on a reasonably estimated proportionate share of the anticipated cost of future public works projects.

12-404. Basis for fees. The Board shall approve by resolution the capital improvement projects and the estimated costs of each project, which shall establish the basis for the impact fee schedule. The impact fee schedule shall also be based upon use of available land use planning data related to the Town, other transportation studies in the vicinity and other available transportation related studies and traffic general analysis and basic assumptions as updated by the Institute of Transportation Engineers (ITE), as well as any other information relevant to traffic, roadways, public parks, and recreational facilities, including census data and other reliable metrics.

12-405. Use of fees. The impact fees generated by this ordinance shall be used to pay for the public infrastructure required by new development, to include roadways, public parks, and recreational facilities. Upon the recommendation of the Town Administrator, the Board shall approve all impact fee fund expenditures as related to the costs of capital improvements.

12-406. Fee calculations. (a) A schedule of impact fees, based on the method of calculation promulgated by this chapter, shall be adopted by resolution of the Board.

(b) For each land use, a demand factor shall be determined for use in calculating the appropriate impact fee. Such demand factors shall be based on the average cost to replace major roadway capacity consumed by new development, with regard to roads, and based on the applicable service unit or equivalent dwelling unit used at the time by the Town, with regard to public parks and recreation facilitates.

(c) Any resolution adopting the impact fee schedule shall be based upon current information provided to the Board.

12-407. Payment of fee; appeals. (a) Payment of the impact fee shall be made at the time that a building permit is issued by the town. No building permit shall be issued for a development unless the impact fee is imposed and calculated pursuant to this chapter.

(b) Appeals. (1) A person may challenge the calculation or application of a fee imposed pursuant to this chapter by filing with the Town Administrator a written notice of appeal with a full statement of the grounds and an appeal fee of two hundred and fifty dollars ($250.00) or such other amount as may be fixed from time to time by resolution of the Board. Notwithstanding the appeal, the building permit for the land use may be issued if the notice of appeal is accompanied by a bond, cashier's check or other security acceptable to the Town Administrator in an amount equal to the fee. Appeals filed pursuant to this section must be submitted prior to issuance of the building permit or within ten (10) days thereafter.

(2) The appellant bears the burden of demonstrating that the amount of the fee was not calculated or applied according to the procedures established in this chapter.

(3) The board of zoning appeals shall hear the appeal at a regularly scheduled meeting or special called meeting which falls within thirty (30) days following receipt of the notice of appeal by the Town Administrator. The determination of the board of zoning appeals shall be announced at the conclusion of the hearing or at the next regular meeting of the board of zoning appeals. The determination of the board of zoning appeals shall be final.

12-408. Credits. (a) A property owner may elect, with written permission of the Board, to construct an eligible capital improvement listed in the capital improvements plan. If the property owner elects to make such improvement, the property owner must enter into an agreement with the Town prior to issuance of any building permit. The agreement must establish the estimated cost of the improvement, the schedule for initiation and completion of the improvement, a requirement that the improvement be completed to Town standards, and such other terms and conditions as deemed necessary by the Town. The Town must review the improvement plan, verify costs and time schedules, determine if the improvement is an eligible improvement, and determine the amount of the applicable credit for such improvement to be applied to the otherwise applicable impact fee prior to issuance of any building permit. In no event may the Town provide a refund for a credit that is greater than the applicable impact fee. If, however, the amount of the credit is calculated to be greater than the amount of the impact fee due, the property owner may utilize such excess credit toward the impact fees imposed on other building permits for development on the same site and in the same ownership.

(b) No credits shall be given for the construction of local on-site facilities required by zoning, subdivision or other Town regulations.

Section 5. All Prior Conflicting Ordinances Repealed; Interpretation. That upon the effective date of this ordinance, all prior ordinances and resolutions in conflict herewith be repealed.

Section 6. Severability. If any section, sentence, clause or phrase of this ordinance should be held to be invalid or unconstitutional by a court of competent jurisdiction, such invalidity or unconstitutionality shall not affect the validity or constitutionality of any other section, sentence, clause, or phrase of this ordinance.

Section 7. Effective date. This ordinance shall take effect upon its passage on final reading, provided that it shall not take effect earlier than fifteen (15) days after the first passage thereof, the public welfare requiring.

Duly approved and adopted by the Board of Mayor and Aldermen of the Town of Thompson's Station, Tennessee.

_____
Mayor Corey Napier

ATTEST:

_____
Town Recorder

Passed First Reading: _____

Passed Second Reading: _____

Submitted to Public Hearing on the ____ day of _____ 2020, at 7:00 p.m., after being advertised in the *Williamson AM* Newspaper on the ____ day of _____, 2020.

APPROVED AS TO FORM AND LEGALITY:

_____
Town Attorney

Road and Park Impact Fee Study

Presentation to Town of Thompson's Station
Board of Mayor and Aldermen

January 14, 2020

duncan associates

Overview

- Summary of recommendations
- Methodology
- Changes in road fees
- Potential impact fee revenue
- Comparison to fees charged by nearby cities
- Implementation Options

Summary of Recommendations

- Change road methodology from “plan-based” to “demand-driven”
- Account for length of trips, not just number of trips
- Standardize land use categories
- Base fees on current travel demand data
- Consider potential new park impact fees

Methodology

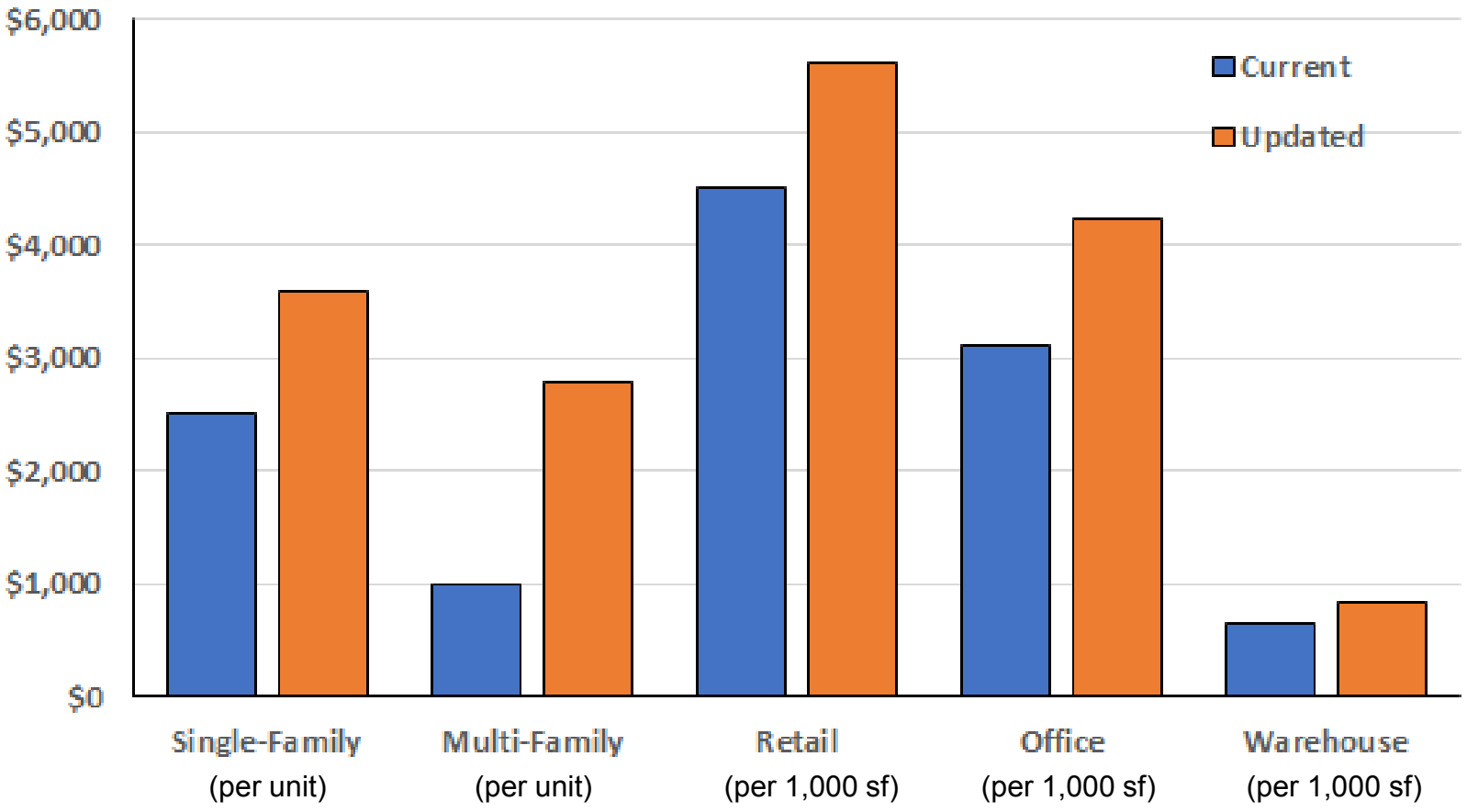
- Current “plan-based” approach not feasible to update
  - Major Thoroughfare Plan not sufficient to establish nexus between planned costs and growth
- “Demand-based” approach has advantages
  - Most bullet-proof from legal attacks
  - Provides most flexibility in expenditures
  - Used by most other jurisdictions in the Nashville area
- Modified variation recommended
  - Charge for more than 1-1 ratio of capacity to demand
  - Higher ratio needed because demand not evenly distributed

Road Fee Changes, Major Land Uses

Land Use Type	Unit	Current Fees	Updated Fees	Percent Change
Single-Family Detached*	Dwelling	$2,500	$3,593	44%
Multi-Family*	Dwelling	$1,000	$2,786	179%
Retail/Commercial/Shopping Center	1,000 sf	$4,513	$5,601	24%
Office/Institutional	1,000 sf	$3,097	$4,238	37%
Warehouse	1,000 sf	$652	$823	26%

* Current fees are $1 per sq. ft. (assumes 2,500 sq. ft. single-family unit and 1,000 sq. ft. multi-family unit)

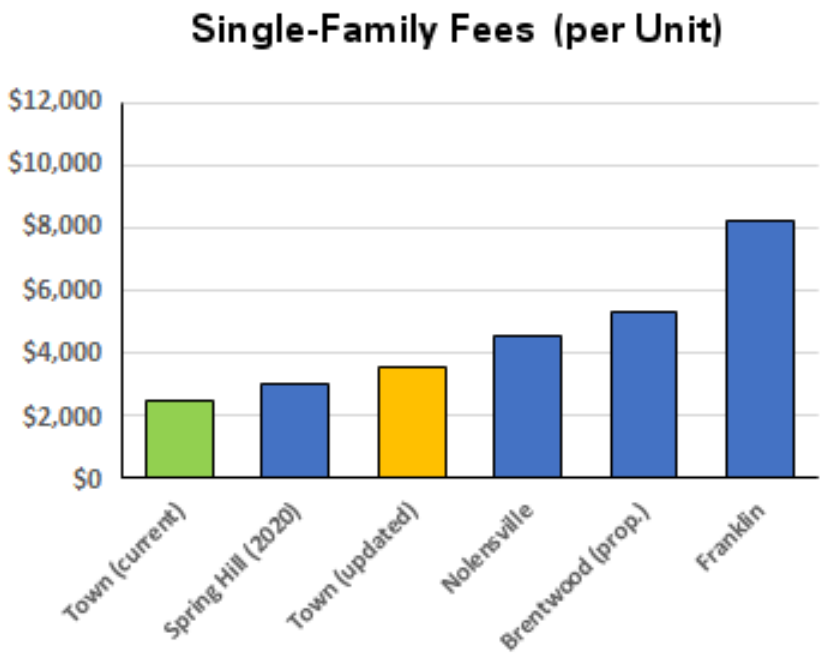
Road Fee Changes by Land Use

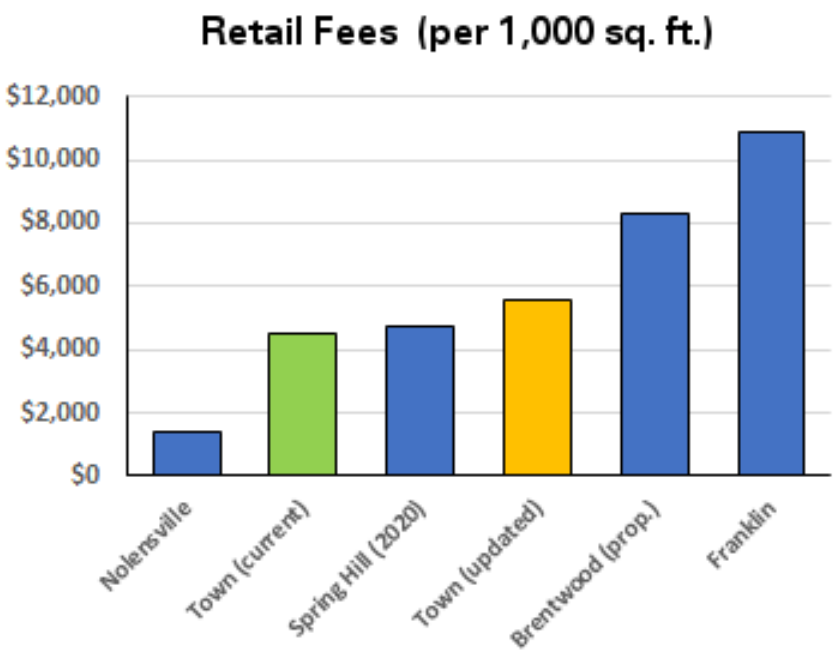


Potential Impact Fee Revenue

	Roads	Parks	Total
Current Fee per Unit	$2,500	$0	$2,500
Proposed Fee per Unit	$3,593	$488	$4,081
x Units Permitted per Year	200	200	200
Annual Revenue under Current Fees	$500,000	$0	$500,000
Annual Revenue under Proposed Fees Fees	$718,600	$97,600	$816,200
Percent Increase	44%	n/a	63%

Comparative Fees (nearby cities)





Implementation Options

- Adopt updated fees at 100%
- Adopt updated fees at less than 100% initially, and increase percentage to 100% over a fixed period
- Adopt updated fees at less than 100%
- Adjust fees annually based on a cost inflation index

Town of Thompson's Station, TN

Major Thoroughfare Plan

Findings and Recommendations

January 14, 2020

Tonight's Agenda

Brief overview of the MTP process

Findings and recommendations

What is a Major Thoroughfare Plan?

Long-Range Vision for the Town

Guidance Document for Future Growth

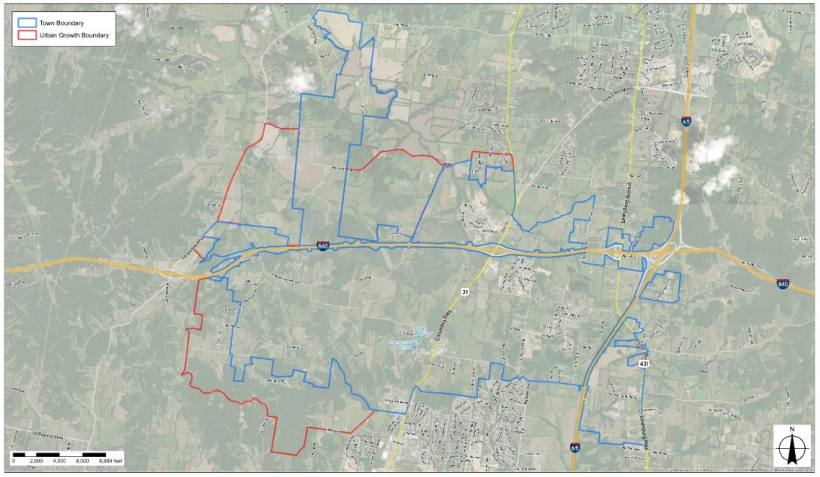
Regulatory Plan/Policy for Future Improvements

Implementation of the General Plan

Project history

April 18th Open House	June 18th Public Meeting	July 23rd PC meeting	August 27th PC Meeting	January 14th BOMA Meeting
• Met with citizens and received feedback	• Presented preliminary findings and received more feedback	• Presented draft plan and document	• MTP Adoption	

Transportation Comments



Major Thoroughfare Plan — Thompson's Station, Tennessee

Community Feedback

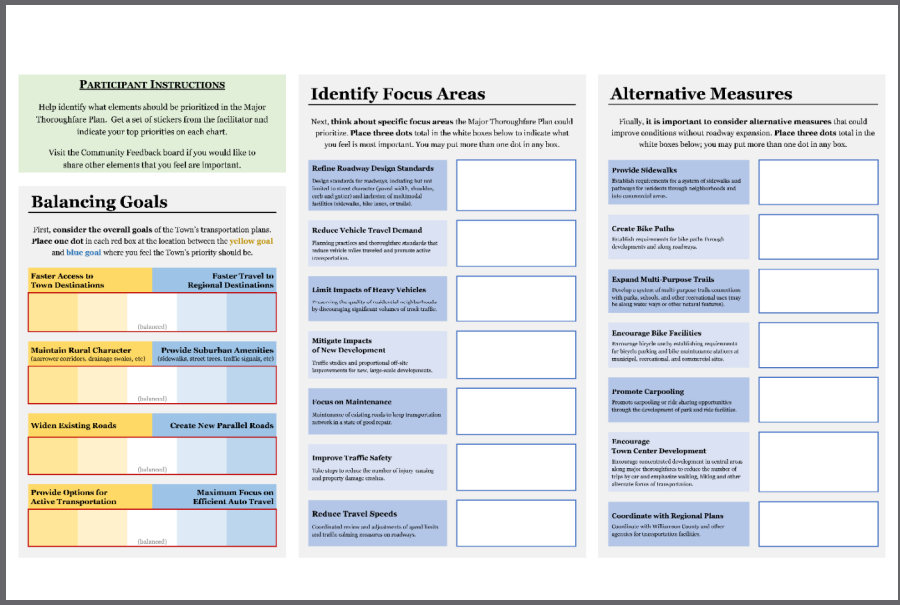
Participant Instructions

Is there anything else that you would like to share about how you get around town now or things you would like to see in the future?

Please leave your thoughts on a post-it note!
Comment cards are also available.

Major Thoroughfare Plan — Thompson's Station, Tennessee

Mark Comments on Map



Participant Instructions

Help identify what elements should be prioritized in the Major Thoroughfare Plan. Get a set of stickers from the facilitator and indicate your top priorities on each chart.

Visit the Community Feedback board if you would like to share other elements that you feel are important.

Balancing Goals

First, **consider the overall goals** of the Town's transportation plans. **Place one dot** in each red box at the location between the yellow goal and blue goal where you feel the Town's priority should be.

- Faster Access to Town Destinations ↔ Faster Travel to Regional Destinations
- Maintain Rural Character (narrower corridors, drainage swales, etc) ↔ Provide Suburban Amenities (sidewalks, street trees, traffic signals, etc)
- Widen Existing Roads ↔ Create New Parallel Roads
- Provide Options for Active Transportation ↔ Maximum Focus on Efficient Auto Travel

(balanced)

Identify Focus Areas

Next, **think about specific focus areas** the Major Thoroughfare Plan could prioritize. **Place three dots** total in the white boxes below to indicate what you feel is most important. You may put more than one dot in any box.

- **Refine Roadway Design Standards** — Design standards for roadways, including but not limited to street character (paved width, shoulder, curb and gutter) and inclusion of multimodal facilities (sidewalks, bike lanes, or trails).
- **Reduce Vehicle Travel Demand** — Planning practices and thoroughfare standards that reduce vehicle miles traveled and promote active transportation.
- **Limit Impacts of Heavy Vehicles** — Preserving the quality of residential neighborhoods by discouraging significant volumes of truck traffic.
- **Mitigate Impacts of New Development** — Traffic studies and proportional off-site improvements for new, large-scale developments.
- **Focus on Maintenance** — Maintenance of existing roads to keep transportation network in a state of good repair.
- **Improve Traffic Safety** — Take steps to reduce the number of injury causing and property damage crashes.
- **Reduce Travel Speeds** — Coordinated review and adjustments of speed limits and traffic calming measures on roadways.

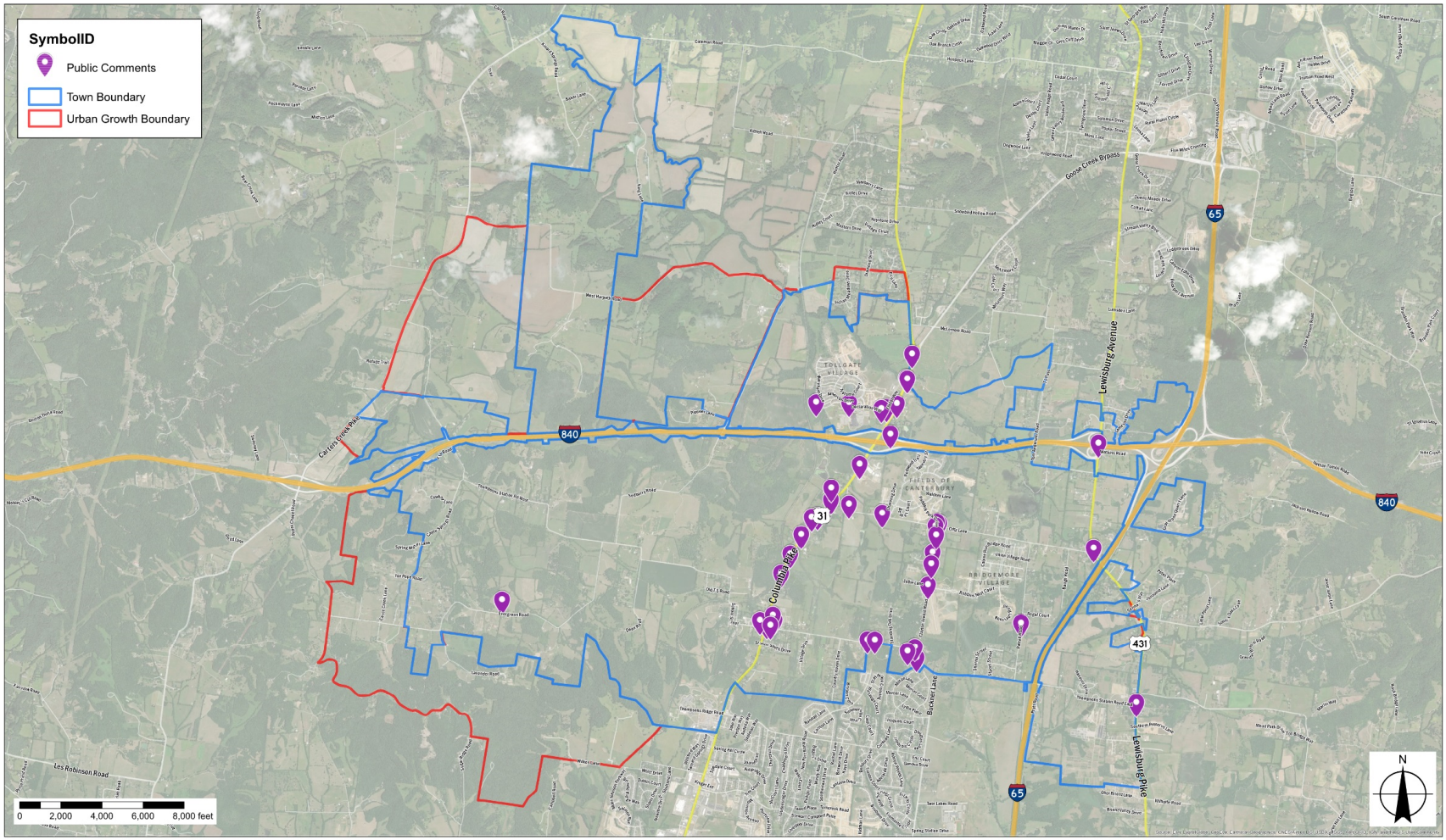
Alternative Measures

Finally, **it is important to consider alternative measures** that could improve conditions without roadway expansion. **Place three dots** total in the white boxes below, you may put more than one dot in any box.

- **Provide Sidewalks** — Establish requirements for a system of sidewalks and pathways for residents through neighborhoods and into commercial areas.
- **Create Bike Paths** — Establish requirements for bike paths through developments and along roadways.
- **Expand Multi-Purpose Trails** — Develop a system of multi-purpose trails connections with parks, schools, and other recreational uses (may be along water ways or other natural features).
- **Encourage Bike Facilities** — Encourage bicycle use by establishing requirements for bicycle parking and bike maintenance stations at municipal, recreational, and commercial sites.
- **Promote Carpooling** — Promote carpooling or ride sharing opportunities through the development of park and ride facilities.
- **Encourage Town Center Development** — Encourage concentrated development in central areas along major thoroughfares to reduce the number of trips by car and emphasize walking, biking and other alternate forms of transportation.
- **Coordinate with Regional Plans** — Coordinate with Williamson County and other agencies for transportation facilities.

Choose Future Priorities

Write Feedback


SymbolID
Public Comments
Town Boundary
Urban Growth Boundary
Goose Creek Bypass
Lewisburg Avenue
Columbia Pike
Carters Creek Pike
Les Robinson Road
Lewisburg Pike
Bucher Lane
840
65
31
431
0
2,000
4,000
6,000
8,000 feet
N

COMMUNITY PRIORITIES

PARTICIPANT INSTRUCTIONS

Help identify what elements should be prioritized in the Major Thoroughfare Plan.

Get a set of stickers from the facilitator and mark your top priorities on each chart.

Visit the Community Feedback board if you would like to share other elements that you feel are important.

Note: Response totals from Open House on Tuesday, April 16, 2019 are noted in **purple**.

1. Balance Goals

First, **consider the overall goals** of the Town's transportation plans. **Place one dot** in each red box at the location between the **yellow goal** and **blue goal** where you feel the Town's priority should be.

Faster Access to Town Destinations				**Faster Travel to Regional Destinations**
3	8	9.5 responses	7.5	2

Maintain Rural Character (narrower corridors, drainage swales, etc)			**Provide Suburban Amenities** (sidewalks, street trees, traffic signals, etc)	
5	7	8 responses	6	3

Widen Existing Roads			**Create New Roads**	
20	5	4 responses	2	1

Choices for Alternative Transportation			**Maximum Focus on Efficient Auto Travel**	
0	3	8 responses	9	6

2. Identify Focus Areas

Next, **think about specific focus areas** the Major Thoroughfare Plan could prioritize. **Place three dots** total in the white boxes below to indicate what you feel is most important. You may put more than one dot in any box.

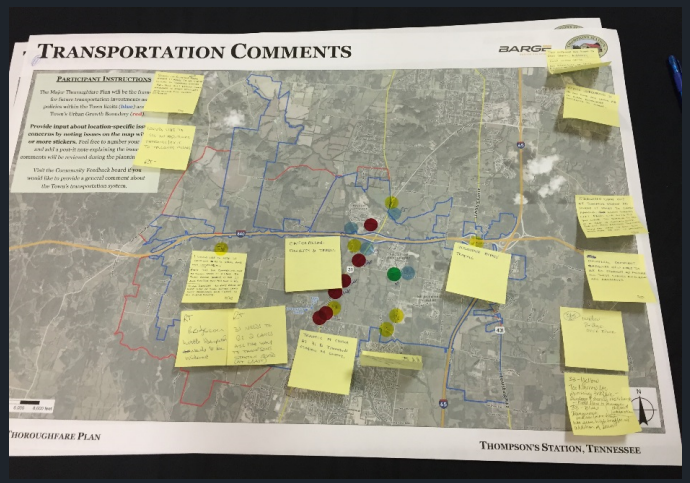
Refine Roadway Design Design standards for roadways, such as street character (paved width, shoulder, curb and gutter) and inclusion of multimodal facilities (sidewalks, bike lanes, or trails).	25 responses
Reduce Vehicle Travel Demand Planning practices and thoroughfare standards that reduce vehicle miles traveled and promote active transportation.	7 responses
Limit Impacts of Heavy Vehicles Preserving the quality of residential neighborhoods by discouraging significant volumes of truck traffic.	10 responses
Address Impacts of New Development Traffic studies and proportional off-site improvements for new, large-scale developments.	25 responses
Better Road Maintenance Maintenance of existing roads to keep transportation network in a state of good repair.	10 responses
Improve Traffic Safety Take steps to reduce the number of injury-causing and property damage crashes.	9 responses
Reduce Travel Speeds Coordinated review and adjustments of speed limits and traffic calming measures on roadways.	4 responses

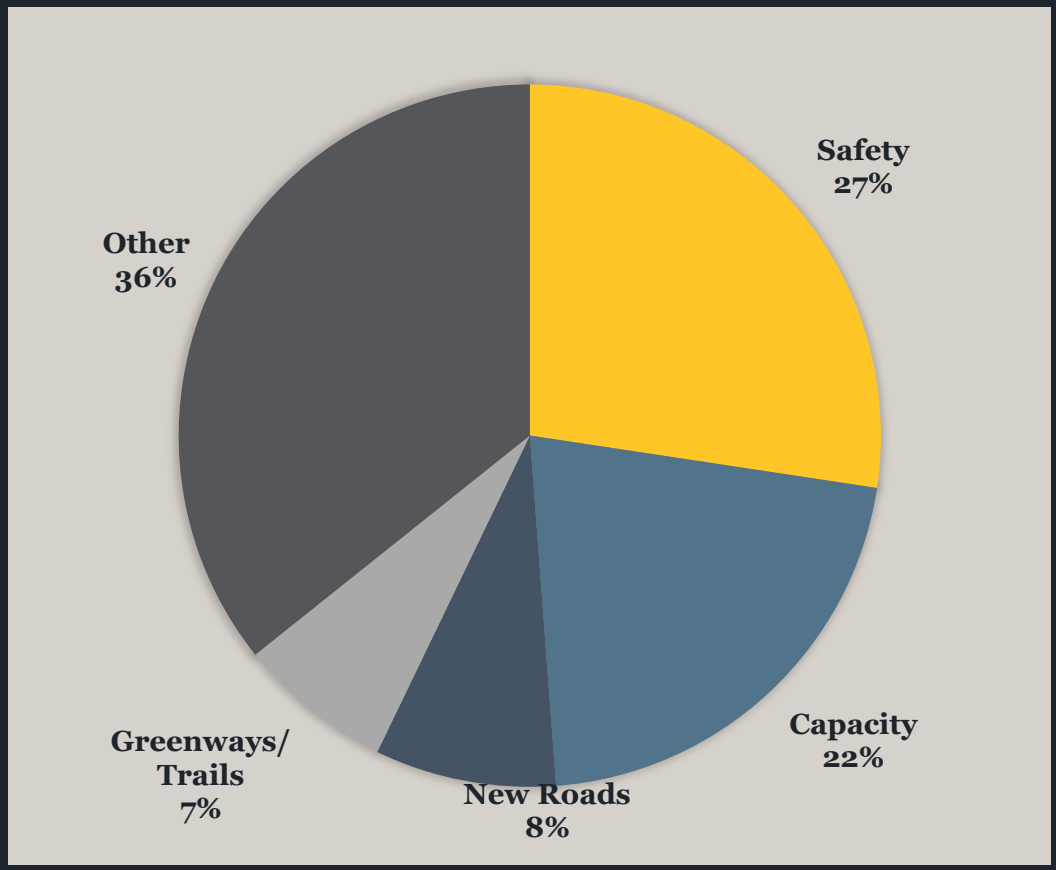
3. Alternative Measures

Finally, **it is important to consider alternative measures** that could improve conditions without roadway expansion. **Place three dots** total in the white boxes below. You may put more than one dot in any box.

Provide Sidewalks Establish requirements for a system of sidewalks and pathways for residents through neighborhoods and into commercial areas.	8 responses
Create Bike Paths Establish requirements for bike paths through developments and along roadways. Encourage bicycle use by installing additional bike parking and maintenance stations at parks and commercial sites.	8 responses
Expand Multi-Purpose Trails Develop a system of multi-purpose trails connections with parks, schools, and other recreational uses (may be along water ways or other natural features).	25 responses
Consider Public Transit Opportunities Explore possibility of expanding commuter, regional, or paratransit bus service to town center areas.	3 responses
Promote Carpooling Promote carpooling or ride sharing opportunities through the development of park and ride facilities.	1 response
Encourage Town Center Development Encourage concentrated development in central areas along major thoroughfares to reduce the number of trips by car and emphasize walking, biking and other alternate forms of transportation.	39 responses
Coordinate with Regional Plans Coordinate with Williamson County and other agencies for transportation facilities.	13 responses

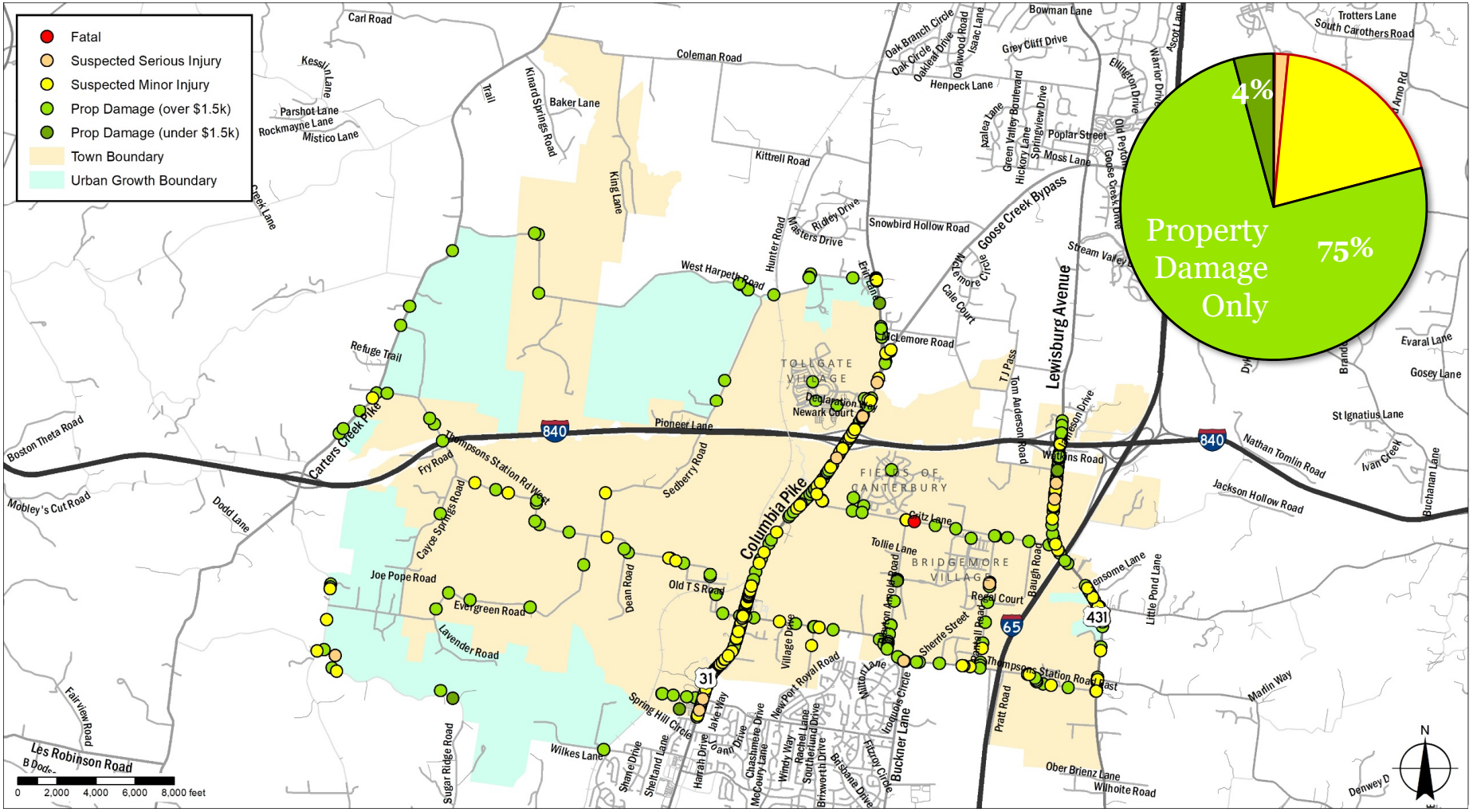
Concerns


TRANSPORTATION COMMENTS
PARTICIPANT INSTRUCTIONS
THOROUGHFARE PLAN
THOMPSON'S STATION, TENNESSEE


Safety
27%
Capacity
22%
New Roads
8%
Greenways/
Trails
7%
Other
36%

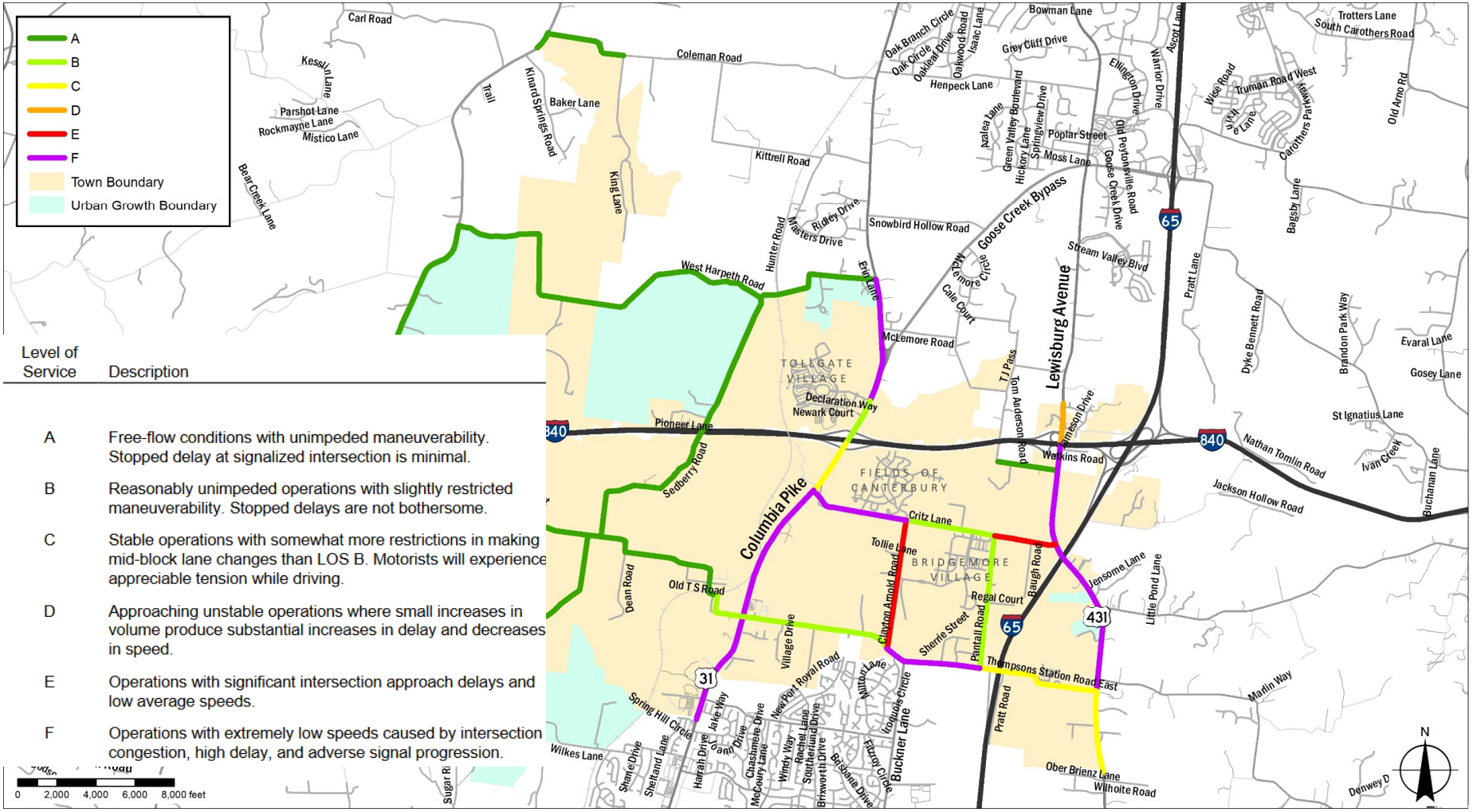
Existing Conditions

2016 - 2018 Crashes



Thompson's Station Major Thoroughfare Plan

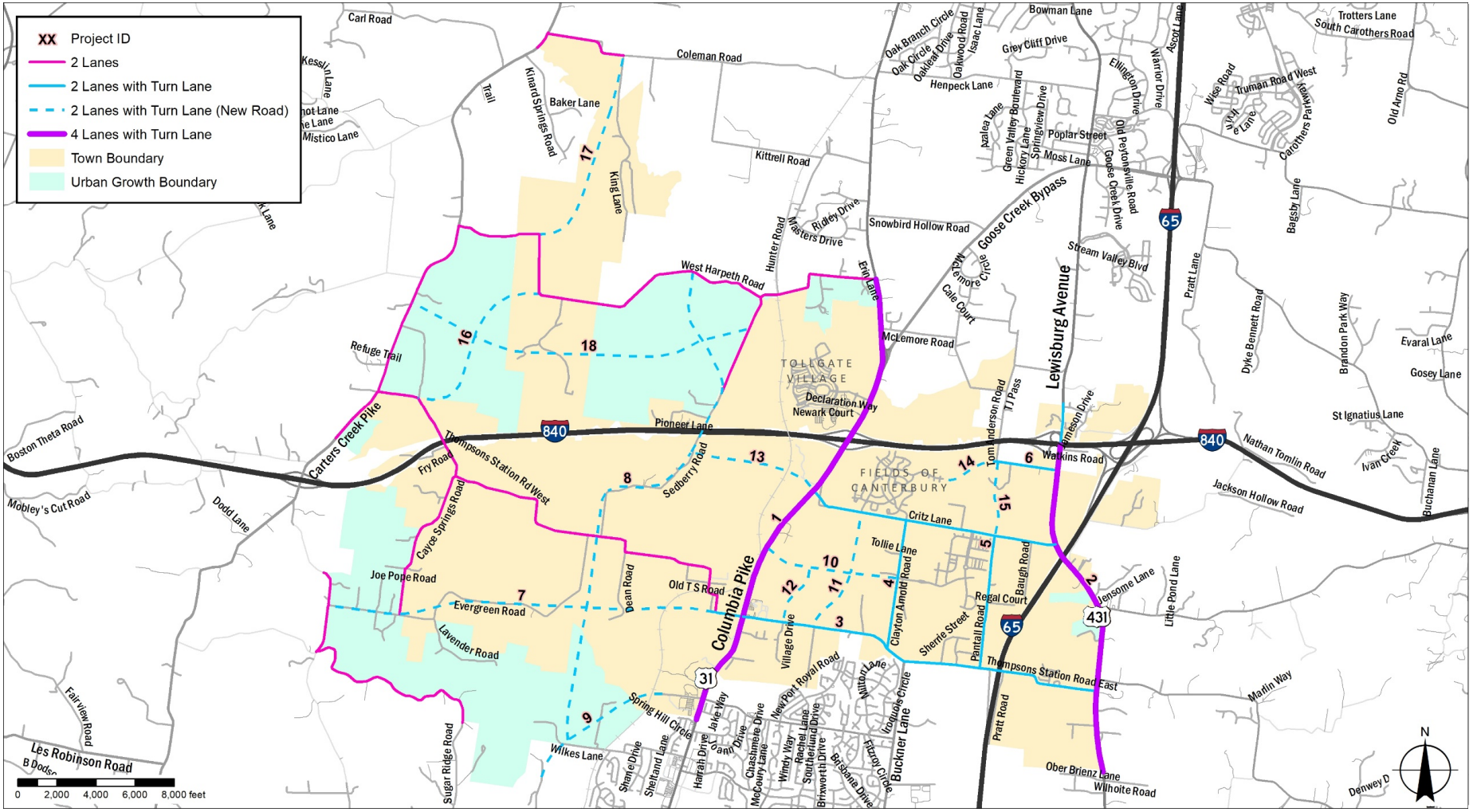
2018 Existing LOS



Thompson's Station Major Thoroughfare Plan

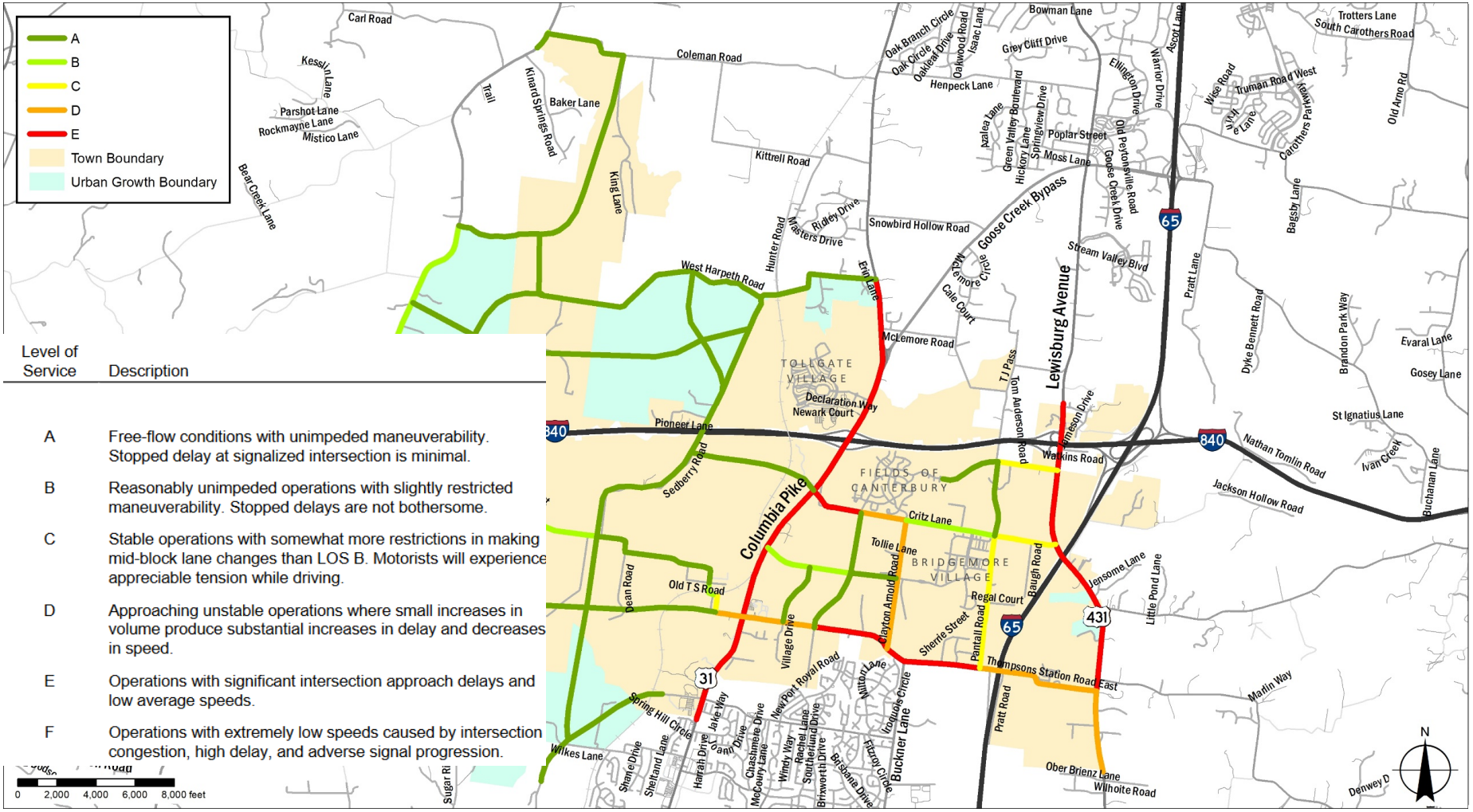
Future Conditions (2040)

2040 Proposed Laneage



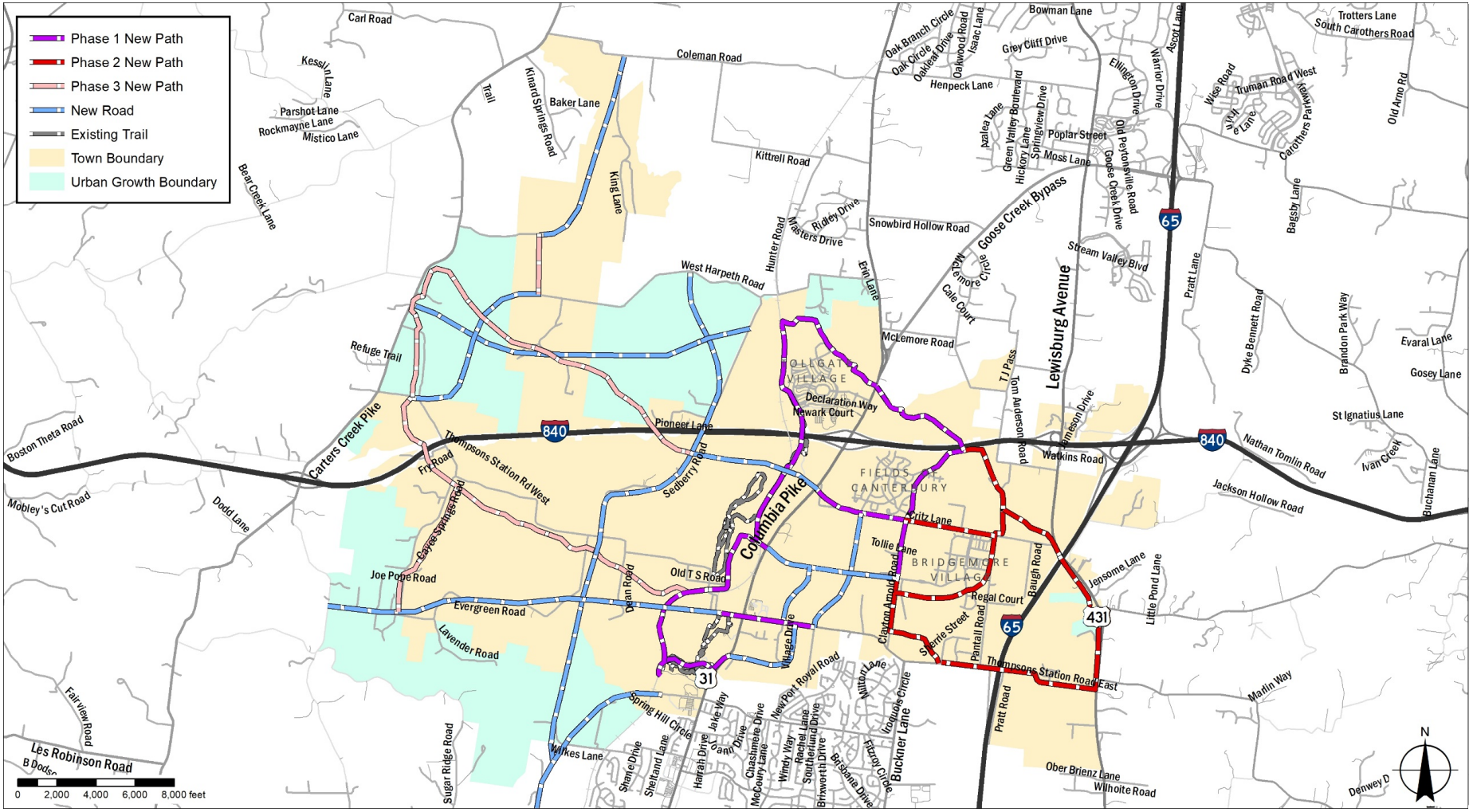
Thompson's Station Major Thoroughfare Plan

2040 Projected with Improvement LOS



Thompson's Station Major Thoroughfare Plan

Greenways



Thompson's Station Major Thoroughfare Plan

Appendix A
Recommended Improvement Projects

Project	Length	Total Cost (Estimated)	Town Share of Cost (Est'd)	Roadway Classification	Priority
01. Columbia Pike Widening	4.59 miles	$26,699,800	$5,339,900	Arterial	Short-Term
02. Lewisburg Pike Widening	3.70 miles	$25,818,100	$5,163,600	Arterial	Mid-Term
03. Thompson's Station Road East Improvements	3.59 miles	$17,895,800	$3,579,100	Major Collector	Private Dev.
04. Clayton Arnold Road Improvements	1.26 miles	$4,243,900	$848,800	Minor Collector	Private Dev.
05. Pantall Road Improvements	1.29 miles	$4,492,500	$0	Minor Collector	Private Dev.
06. Tom Anderson Road Improvements	0.61 miles	$2,490,200	$0	Minor Collector	Private Dev.
07. Evergreen Road Realignment and Extension	4.05 miles	$18,568,800	$3,713,700	Major Collector	Private Dev.
08. Sedberry Road Realignment and Extension	5.32 miles	$22,336,300	$4,467,300	Major Collector	Private Dev.
09. Buckner Road Extension	1.53 miles	$8,689,200	$0	Major Collector	Private Dev.
10. Future Road 1	1.31 miles	$6,622,300	$0	New Minor Collector	Private Dev.
11. Future Road 2	1.24 miles	$5,798,800	$0	New Minor Collector	Private Dev.
12. Future Road 3	0.61 miles	$3,219,500	$0	New Minor Collector	Private Dev.
13. Future Road 4 (Critz Lane Extension)	1.28 miles	$6,882,400	$0	New Minor Collector	Private Dev.
14. Future Road 5 (Chaucer Park Lane Extension)	0.58 miles	$3,572,600	$0	New Minor Collector	Private Dev.
15. Future Road 6 (Critz - Tom Anderson Connector)	0.73 miles	$4,217,800	$0	New Minor Collector	Private Dev.
16. Future Road 7 (T.S. West - Harpeth Connector)	1.80 miles	$8,121,900	$0	New Minor Collector	Private Dev.
17. Future Road 8 (Harpeth - Coleman Connector)	2.04 miles	$9,058,900	$0	New Minor Collector	Private Dev.
18. Future Road 9 (Carters Cr. - Sedberry Connector)	3.42 miles	$13,700,100	$0	New Minor Collector	Private Dev.
19. Off-Street Greenways (Phase 1)	11.05 miles	$11,050,000	$2,210,000	New Greenway	Short-Term
20. Off-Street Greenways (Phase 2)	8.28 miles	$8,280,000	$1,656,000	New Greenway	Mid-Term
21. Off-Street Greenways (Phase 3)	10.25 miles	$10,250,000	$2,050,000	New Greenway	Long-Term
Total	**68.52 miles**	**$222,008,900**	**$29,028,400**		

Based on 2018 dollars

Estimated 20% match as part of TDOT projects

Possible for State funding at an 80/20 match

Area may not be developed by 2040, Town may want to pursue at an 80/20 match with TDOT

Anticipated to be 80/20 grants with TDOT

BARGE DESIGN SOLUTIONS

BARGEDESIGN.COM

Thank You!

TS.MTP@bargedesign.com

RESOLUTION NO. 2019-007

A RESOLUTION OF THE TOWN OF THOMPSON'S STATION, TENNESSEE TO APPROVE AN AGREEMENT WITH DUNCAN & ASSOCIATES TO CONDUCT AN IMPACT FEE STUDY

WHEREAS, the Town advertised and received responses to its Request for Qualifications ("RFQ") for a contractor to conduct an impact fee study (the "Project"); and.

WHEREAS, the Board of Mayor and Aldermen previously authorized the Mayor and Town Administrator to enter into negotiations for an agreement for the Project with Duncan & Associates for the Project.

NOW, THEREFORE, BE IT RESOLVED by the Board of Mayor and Aldermen of the Town of Thompson's Station as follows:

That the agreement with Duncan & Associates for the Project attached hereto as Exhibit A is approved and the Mayor is authorized to sign it on behalf of the Town.

RESOLVED AND ADOPTED this 12 day of February 2019.

Corey Napier, Mayor

ATTEST:

Jennifer Jones, Town Recorder

APPROVED AS TO LEGALITY AND FORM:

Todd Moore, Town Attorney

PROFESSIONAL SERVICES AGREEMENT
BETWEEN TOWN OF THOMPSON'S STATION AND JAMES DUNCAN AND ASSOCIATES, INC.

THIS PROFESSIONAL SERVICES AGREEMENT ("Agreement") is entered into by and between the Town of Thompson's Station, a Tennessee municipal corporation ("Town"), and James Duncan and Associates, Inc., a Texas Corporation doing business as Duncan Associates ("Consultant").

WHEREAS, Town has determined that it requires professional services to prepare an impact fee study; and

WHEREAS, Town advertised and received responses to its Request for Qualifications ("RFQ") for a Consultant to perform these services.

WHEREAS, Consultant is qualified to perform such professional services by virtue of its experience and the training, education and expertise of its principals and employees;

WHEREAS, Consultant is willing to perform such services in accordance with the terms and conditions set forth in this Agreement.

NOW, THEREFORE, for and in consideration of the mutual covenants and conditions herein contained, Town and Consultant agree as follows:

1. DEFINITIONS

"Scope of Services": Such professional services as are set forth in Exhibit A attached hereto and incorporated herein by reference.

"Commencement Date": The date notice to proceed is provided by Town to Consultant following execution of this agreement.

2. TERM

The term of this Agreement shall commence at 12:00 a.m. on the Commencement Date and shall expire upon completion of the Scope of Services unless extended by written agreement of the parties or terminated earlier in accordance with Section 14 ("Termination") below. Consultant understands and agrees that the timely completion of these tasks is an important and material condition of this Agreement.

3. CONSULTANT'S SERVICES

Consultant shall perform the services identified in the Scope of Services. Town shall have the right to request, in writing, changes in the Scope of Services. Any such changes mutually agreed upon by the parties, and any corresponding increase or decrease in compensation, shall be incorporated by written amendment to this Agreement.

Consultant shall perform all work to the highest professional standards of Consultant's profession. Consultant shall comply with all applicable federal, state and local laws and regulations, including the conflict of interest provisions of the Town Municipal Code.

During the term of this Agreement, Consultant shall not perform any work for another person or entity for whom Consultant was not working at the Commencement Date if *both* (i) such work would require Consultant to abstain from a decision under this Agreement pursuant to a conflict of interest statute and (ii) Town has not consented in writing to Consultant's performance of such work.

Consultant represents that it has, or will secure at its own expense, all personnel required to perform the services identified in the Scope of Services. All such services shall be performed by Consultant or under its supervision, and all personnel engaged in the work shall be qualified to perform such services.

Clancy Mullen shall be Consultant's project administrator and shall have direct responsibility for management of Consultant's performance under this Agreement. No change shall be made in Consultant's project administrator without Town's prior written consent.

4. COMPENSATION

Town agrees to compensate Consultant for the services provided under this Agreement, and Consultant agrees to accept in full satisfaction for such services, payments pursuant to Exhibit B for a [road impact fees study] [road and park impact fee study]

In no event shall the total compensation and costs payable to Consultant under this Agreement exceed the sum of **Thirty-Six Thousand Dollars ($36,000.00)** unless specifically approved in advance and in writing by Town.

5. OWNERSHIP OF WRITTEN PRODUCTS

All reports, documents or other written material ("written products" herein) developed by Consultant in the performance of this Agreement shall be and remain the property of Town without restriction or limitation upon its use or dissemination by Town. Consultant may take and retain copies of such written products as desired, but no such written products shall be the subject of a copyright application by Consultant.

6. RELATIONSHIP OF PARTIES

Consultant is, and shall at all times remain as to Town, a wholly independent contractor. Consultant shall have no power to incur any debt, obligation, or liability on behalf of Town or otherwise to act on behalf of Town as an agent. Neither Town nor any of its agents shall have control over the conduct of Consultant or any of Consultant's employees, except as set forth in this Agreement. Consultant shall not represent that it is, or that any of its agents or employees are, in any manner employees of Town.

7. CONFIDENTIALITY

All data, documents, discussion, or other information developed or received by Consultant or provided for performance of this Agreement are deemed confidential and shall not be disclosed by Consultant without prior written consent by Town. Town shall grant such consent if disclosure is legally required. Upon request, all Town data shall be returned to Town upon the termination or expiration of this Agreement.

8. INDEMNIFICATION

The parties agree that Town, its officers, agents, employees and volunteers should, to the fullest extent permitted by law, be protected from any and all loss, injury, damage, claim, lawsuit, cost, expense, attorneys' fees, litigation costs, or any other cost arising out of or in any way related to the performance of this Agreement. Accordingly, the provisions of this indemnity provision are intended by the parties to be interpreted and construed to provide the Town with the fullest protection possible under the law. Consultant acknowledges that Town would not enter into this Agreement in the absence of Consultant's commitment to indemnify and protect Town as set forth herein.

To the fullest extent permitted by law, Consultant shall indemnify, hold harmless and defend Town, its officers, agents, employees and volunteers from and against any and all claims and losses, costs or expenses for any damage due to death or injury to any person and injury to any property resulting from any alleged intentional, reckless, negligent, or otherwise wrongful acts, errors or omissions of Consultant or any of its officers, employees, servants, agents, or subcontractors in the performance of this Agreement. Such costs and expenses shall include reasonable attorneys' fees incurred by counsel of Town's choice.

Town does not waive any immunities, defenses or tort liability limits that it may possess under the Tennessee Governmental Tort Liability Act or other law.

9. INSURANCE

During the term of this Agreement, Consultant shall carry, maintain, and keep in full force and effect insurance against claims for death or injuries to persons or damages to property that may arise from or in connection with Consultant's performance of this Agreement. Such insurance shall be of the types and in the amounts as set forth below:

Comprehensive General Liability Insurance with coverage limits of not less than One Million Dollars ($1,000,000) including products and operations hazard, contractual insurance, broad form property damage, independent consultants, personal injury, underground hazard, and explosion and collapse hazard where applicable.

Automobile Liability Insurance for vehicles used in connection with the performance of this Agreement with minimum limits of One Million Dollars ($1,000,000) per claimant and One Million dollars ($1,000,000) per incident.

Worker's Compensation Insurance as required by the laws of the State of Tennessee.

Professional Errors and Omissions Insurance with coverage limits of not less than One Million Dollars ($1,000,000).

Consultant shall require each of its subcontractors to maintain insurance coverage that meets all of the requirements of this Agreement. The policy or policies required by this Agreement shall be issued by an insurer admitted in the State of Tennessee and with a rating of at least A:VII in the latest edition of Best's Insurance Guide.

Consultant agrees that if it does not keep the aforesaid insurance in full force and effect, Town may either (i) immediately terminate this Agreement; or (ii) take out the necessary insurance and pay, at Consultant's expense, the premium thereon.

At all times during the term of this Agreement, Consultant shall maintain on file with the Town a certificate or certificates of insurance showing that the aforesaid policies are in effect in the required amounts and naming the Town and its officers, employees, agents and volunteers as additional insureds. Consultant shall, prior to commencement of work under this Agreement, file with the Town such certificate(s).

Consultant shall provide proof that policies of insurance required herein expiring during the term of this Agreement have been renewed or replaced with other policies providing at least the same coverage. Such proof will be furnished at least two weeks prior to the expiration of the coverages.

The General Liability Policy of insurance required by this Agreement shall contain an endorsement naming Town and its officers, employees, agents and volunteers as additional insureds. The General Liability Policy required under this Agreement shall contain an endorsement providing that the policies cannot be canceled or reduced except on thirty days' prior written notice to Town. Consultant agrees to require its insurer to modify the certificates of insurance to delete any exculpatory wording stating that failure of the insurer to mail written notice of cancellation imposes no obligation, and to delete the word "endeavor" with regard to any notice provisions.

The insurance provided by Consultant shall be primary to any coverage available to Town. Any insurance or self-insurance maintained by Town and/or its officers, employees, agents or volunteers, shall be in excess of Consultant's insurance and shall not contribute with it.

All insurance coverage provided pursuant to this Agreement shall not prohibit Consultant, and Consultant's employees, agents or subcontractors, from waiving the right of subrogation prior to a loss. Consultant hereby waives all rights of subrogation against the Town.

Any deductibles or self-insured retentions must be declared to and approved by the Town. At the option of Town, Consultant shall either reduce or eliminate the deductibles or self-insured retentions with respect to Town, or Consultant shall procure a bond or other security guaranteeing payment of losses and expenses.

Procurement of insurance by Consultant shall not be construed as a limitation of Consultant's liability or as full performance of Consultant's duties to indemnify, hold harmless and defend under Section 10 of this Agreement.

10. MUTUAL COOPERATION

Town shall provide Consultant with all pertinent data, documents and other requested information as is reasonably available for the proper performance of Consultant's services under this Agreement.

In the event any claim or action is brought against Town relating to Consultant's performance in connection with this Agreement, Consultant shall render any reasonable assistance that Town may require.

It is agreed that all claims, disputes, or other matters in question arising out of or related to this Agreement shall be submitted to nonbinding mediation before any legal proceeding is commenced. The parties shall equally bear the fees and expenses charged by the mediator.

11. RECORDS AND INSPECTIONS

Consultant shall maintain full and accurate records with respect to all matters covered under this Agreement for a period of three years after the expiration or termination of this Agreement. Town shall have the right to access and examine such records during normal business hours, without charge, or to request copies of such records at its expense.

12. PERMITS AND APPROVALS

Consultant shall obtain, at its sole cost and expense, all permits and regulatory approvals necessary in the performance of this Agreement. This includes, but shall not be limited to, encroachment permits and building and safety permits and inspections.

13. NOTICES

Any notices, bills, invoices, or reports required by this Agreement shall be deemed received on: (i) the day of delivery if delivered by hand, email or overnight courier service during Consultant's and Town's regular business hours; or (ii) on the third business day following deposit in the United States mail if delivered by mail, postage prepaid, to the addresses listed below (or to such other addresses as the parties may, from time to time, designate in writing).

If to the Town:

Town of Thompson's Station, Tennessee
Attn: Town Administrator
P.O. Box 100
Thompson's Station, Tennessee 37179

If to the Consultant:

Clancy Mullen, President
17409 Rush Pea Circle
Austin, TX 78738
clancy@duncanassociates.com

14. TERMINATION

Town shall have the right to terminate this Agreement for any reason on five calendar days' written notice to Consultant. Consultant shall have the right to terminate this Agreement for any reason on sixty calendar days' written notice to Town. Consultant agrees to cease all work under this Agreement on or before the effective date of any notice of termination. All Town data, documents, objects, materials or other tangible things shall be returned to Town upon the termination or expiration of this Agreement.

If Town terminates this Agreement due to no fault or failure of performance by Consultant, then Consultant shall be paid based on the work satisfactorily performed at the time of termination. In no event shall Consultant be entitled to receive more than the amount that would be paid to Consultant for the full performance of the services required by this Agreement.

15. GENERAL PROVISIONS

15.1 Consultant shall not delegate, transfer, subcontract or assign its duties or rights hereunder, either in whole or in part, without Town's prior written consent, and any attempt to do so shall be void and of no effect. Town shall not be obligated or liable under this Agreement to any party other than Consultant.

15.2 In the performance of this Agreement, Consultant shall not discriminate against any employee, subcontractor, or applicant for employment because of race, color, creed, religion, sex, marital status, sexual orientation, national origin, ancestry, age, physical or mental disability or medical condition.

15.3 The captions appearing at the commencement of the sections hereof, and in any paragraph thereof, are descriptive only and for convenience in reference to this Agreement. Should there be any conflict between such heading, and the section or paragraph thereof at the head of which it appears, the section or paragraph thereof, as the case may be, and not such heading, shall control and govern in the construction of this Agreement. Masculine or feminine pronouns shall be substituted for the neutral form and vice versa, and the plural shall be substituted for the singular form and vice versa, in any place or places herein in which the context requires such substitution(s).

15.4 The waiver by Town or Consultant of any breach of any term, covenant or condition herein contained shall not be deemed to be a waiver of such term, covenant or condition or of any subsequent breach of the same or any other term, covenant or condition herein contained. No term, covenant or condition of this Agreement shall be deemed to have been waived by Town or Consultant unless in writing.

15.5 Consultant shall not be liable for any failure to perform if Consultant presents acceptable evidence, that such failure was due to causes beyond the control and without the fault or negligence of Consultant.

15.6 Each right, power and remedy provided for herein or now or hereafter existing at law, in equity, by statute, or otherwise shall be cumulative and shall be in addition to every other right, power, or remedy provided for herein or now or hereafter existing at law, in equity, by statute, or otherwise. The exercise, the commencement of the exercise, or the forbearance of the exercise by any party of any one or more of such rights, powers or remedies shall not preclude the simultaneous or later exercise by such party of any of all of such other rights, powers or remedies. In the event legal action shall be necessary to enforce any term, covenant or condition herein contained, the party prevailing in such action, whether reduced to judgment or not, shall be entitled to its reasonable court costs, including accountants' fees, if any, and attorneys' fees expended in such action. The venue for any litigation shall be Williamson County, Tennessee.

15.7 If any term or provision of this Agreement or the application thereof to any person or circumstance shall, to any extent, be invalid or unenforceable, then such term or provision shall be amended to, and solely to, the extent necessary to cure such invalidity or unenforceability, and in its amended form shall be enforceable. In such event, the remainder of this Agreement, or the application of such term or provision to persons or circumstances other than those as to which it is held invalid or unenforceable, shall not be affected thereby, and each term and provision of this Agreement shall be valid and be enforced to the fullest extent permitted by law.

15.8 This Agreement shall be governed and construed in accordance with the laws of the State of Tennessee.

15.9 All documents referenced as exhibits in this Agreement are hereby incorporated into this Agreement. In the event of any material discrepancy between the express provisions of this Agreement and the provisions of any document incorporated herein by reference, the provisions of this Agreement shall prevail. This instrument contains the entire Agreement between Town and Consultant with respect to the transactions contemplated herein. No other prior oral or written agreements are binding upon the parties. Amendments hereto or deviations herefrom shall be effective and binding only if made in writing and executed by Town and Consultant.

TO EFFECTUATE THIS AGREEMENT, the parties have caused their duly authorized representatives to execute this Agreement on the dates set forth below.

"Town"
Town of Thompson's Station

By: _____

Corey Napier, Mayor
Date: 2/12/19

"Consultant"
James Duncan and Associates, Inc.

By: _____

Clancy Mullen, President
Date: 2/21/19

Approved as to form:

By: _____
Town Attorney
Date: 3/18/19

EXHIBIT A
SCOPE OF SERVICES

Task 1: Project Organization/Data Collection

This task will involve data collection and project organization for the road (or road and park) impact fee study. Upon notice to proceed, the consultant will work with the Town's project manager to schedule a conference call or in-person meeting with key members of Town staff (an in-person meeting would involve additional costs that would be billed under Task 4). During the conference call or meeting, the consultant will gather available information related to the project, identify major policy issues involved in updating the road impact fee program, coordinate staff and consultant responsibilities and establish the project schedule. The Town should provide the consultant team, without charge, copies of all relevant plans, studies and documents needed to perform the scope of work. At the conclusion of the task, the consultant will prepare a memorandum summarizing the organizational framework for the project and listing additional data to be provided by the Town.

Deliverables: Project Organization Meetings
Project Organization Memorandum

Task 2: Staff Review Draft

This task entails the preparation of an initial draft of the road (or road and park) impact fee study for staff review. The study will be based on review of levels of service, land use trends and policies, facility master plans, planned capital improvements, and growth projections. It will include all the elements mandated by impact fee case law, including compliance with the dual rational nexus test. These elements include an inventory of existing capital facilities; the cost of improvements required to remedy any existing service deficiencies; the proportionate share of the cost of improvements re-quired to accommodate increased service demands; and appropriate revenue credits to ensure that new development is not charged more than its proportionate share of the cost of new facilities. The analysis will include a table that establishes the number of service units and amount of facility demand associated with different land use types. The study will include a net unit cost schedule that represents the maximum impact fees that could be charged.

Deliverable: Staff Review Draft Study

Task 3: Public Review Draft/Ordinance

Following receipt of Town staff comments on the staff review draft, the consultant will make appropriate modifications to the grrroad (or road and park) impact fee study. Concurrently with the public review draft of the study, the consultant will provide a draft ordinance amendment to implement the updated road (or road and park) impact fees and comply with all the requirements

of impact fee case law. Based on input from public meetings, the consultant will make appropriate modifications to the impact fee study, if necessary, and provide final report documents.

Deliverables: Public Review Draft Impact Fee Study and Spreadsheets
Draft Impact Fee Ordinance Amendment
Final Impact Fee Study and Spreadsheets (if required)

Task 4: Meetings and Presentations

Throughout the project, key members of the consulting team shall be available to attend and participate in local meetings with staff, stakeholders, Board of Mayor and Aldermen and/or the public as desired by the Town. Multiple meetings held on the same day will count as one meeting.

Deliverables: Meetings/Presentations

EXHIBIT B
TIME SCHEDULE AND BUDGET

Time Schedule

The proposed scope of services is anticipated to take approximately two and one-half months from project organization to delivery of the staff review draft. The timing of the rest of the project is dependent on staff review time, the extent of the desired public participation, and meeting scheduling.

Budget

The consultant cost for the scope of services outlined above, excluding meeting attendance, is a fixed-fee price of $25,000 for a road impact fee study or $30,000 for a road and park impact fee study, whichever is chosen by the Town, as broken down by task below. Consultant attendance at local meetings will be provided for a fixed fee, including preparation and travel time and expenses, of $3,000 per trip. The client will be billed monthly, based on the partial (as demonstrated by hours spent times the Consultant's hourly rate) or full completion of each task, or for meetings attended.

Task	Roads Only	Roads & Parks
1. Project Organization/Data Collection	$1,500	$2,000
2. Staff Review Draft	$18,000	$21,000
3. Public Review Draft/Ordinance	$5,500	$7,000
Study Total	$25,000	$30,000
4. In-Person Meetings (per trip)	$30,000	$3,000

Additional services related to this project shall be provided on a time-and-expense basis or for a fixed-fee as may be negotiated with the client. Duncan Associates' standard billing rate is $175 per hour, inclusive of all overhead and office expenses, but excluding travel expenses.

Phone: (615) 794-4333
Fax: (615) 794-3313
www.thompsons-station.com

1550 Thompson's Station Road W.
P.O. Box 100
Thompson's Station, TN 37179

DATE: January 3, 2019

TO: The Board of Mayor and Aldermen (BOMA)

FROM: Wendy Deats, Town Planner

SUBJECT: **Roadway Impact Fee Study**

The Town released an RFQ to solicit statements of qualifications for an impact fee study to update and clarify the Town's roadway impact fees. The Town received two statements of qualifications for the roadway impact fee study. The companies that submitted their qualifications were Tishler Bise and Duncan & Associates. Upon review of the two submittals, Staff finds that both companies have national and local experience and meet the requirements set forth within the request for qualifications. Staff believes that both firms have presented information to demonstrate their competency in preparing our impact fee study. Upon review of the references, both companies received positive feedback related to their work product, communication and adhering to a schedule. However, the submittal for Duncan & Associates did provide more references in Tennessee, one of which had used Duncan for review of fees a few times since 1999. Staff believes Duncan & Associates can provide well thought out information, communicate well and deliver the work product on schedule. Therefore Staff recommends that the Board of Mayor and Aldermen adopt a resolution authorizing the mayor to enter into an agreement with Duncan for the preparation of the impact fee study.

Attachments
Resolution 2019-005

ORDINANCE NO. 13-016

AN ORDINANCE OF THE TOWN OF THOMPSON'S STATION, TENNESSEE, TO AMEND TITLE 14, CHAPTER 5 AND TITLE 12 OF THE MUNICIPAL CODE REGARDING THE IMPACT ASSESSMENT FEE FOR NEW DEVELOPMENT.

WHEREAS, the Town is authorized pursuant to Tennessee Code Annotated § 6-2-201(15) and other applicable law to assess fees for use of or impact upon certain public infrastructure; and

WHEREAS, the Town is experiencing and anticipating both rapid growth and an increase in commercial development which requires public facilities and infrastructure improvements to meet the demand created by such growth and development;

WHEREAS, the Board of Mayor and Aldermen has determined that it is in the best interest of the Town to amend the current code provisions related to its Impact Assessment Fees.

NOW, THEREFORE, BE IT ORDAINED by the Town of Thompson's Station as follows:

Section 1. That Title 14, Chapter 5 of the Municipal Code, Impact Assessment Fees, be deleted in its entirety upon the effective date of this ordinance and that Title 12 shall be amended by adding a new Chapter 4, Impact Fees as set forth below.

CHAPTER 4

IMPACT FEES

SECTION

14-401. Title, authority, applicability. (a) This article shall be known and may be cited as the "Impact Fee Ordinance."

(b) Authority to implement this article is granted under the General Law Mayor-Aldermanic Charter, and such other additional powers granted to municipalities by the state legislature. The enumeration of particular powers in this article is not exclusive of others, not restrictive of general words or phrases granting powers and all powers shall be construed so as to permit the town to exercise freely any one or more such powers.

(c) Except as provided herein, this article shall be applicable to all new buildings constructed or additions to existing buildings constructed after the effective date of this Ordinance.

12-402. Definitions. The following words, terms and phrases, when used in this chapter, shall have the meanings ascribed to them in this section, except where the context clearly indicates a different meaning:

Accessory building or accessory structure means a detached, subordinate building or structure, the use of which is clearly incidental and related to a principal building or use of the land, and which is located on the same lot as that of the principal building or use.

Adjusted base trip cost means the base trip cost as defined in this section, adjusted for estimated future contributions toward the cost of public works projects from currently unidentified sources other than locally generated revenues.

Base trip cost means the town's share of the cost of certain public works projects, as determined by action of the board of mayor and aldermen, divided by total trips, as determined pursuant to this article.

Bonds means bonds, interim certificates or other financial obligations of a municipality issued by its governing body pursuant to this article, or pursuant to any other law, as supplemented by, or in conjunction with this article.

Building means any permanent structure having a roof and used or built for the enclosure or shelter of persons, animals, vehicles, goods, merchandise, equipment, materials or property of any kind.

Building permit means an official document or certificate issued by the town authorizing the construction of a building.

Capacity means the maximum number of vehicles for a given time period which a road can safely and efficiently carry; usually expressed in terms of vehicles per day.

Dwelling unit means a structure designed and intended for human habitation.

Impact fee means the fee established by this article based upon traffic generation information, growth projections, public works project cost estimates, and future public works project requirements as established by the board of mayor and aldermen.

Land development activity and building activity that generates increased traffic means any building activity on a tract of land or vacant lot on which may be constructed one or more structures or any change in the use or appearance of any structure within the guidelines of the applicable land use zoning that attracts or produces vehicular trips over and above that produced by the existing use of land.

Major road network system means all arterial and collector roads within the town, including future arterial and collector roads necessitated by land development and building activity.

Worship facility means a building or a portion thereof which is used by a religious institution for worship services and customarily incidental functions.

Public works project includes any one or more or any combination of the following improvements: bridges, tunnels, viaducts, flood control, streets, roads, avenues, alleys, highways, sidewalks, curbs, gutters, stormwater sewers or drains, and all property real and personal, appurtenant thereto or connected with such work, including an extension, addition, betterment or improvement.

Site related improvements means road construction or road improvements at or near the development site which are necessary to interface the development with the major road network system. Site related improvements shall include acceleration and deceleration lanes and necessary right-of-way dedications which are related to the development and any other right-of-way dedicated to the town within 30 feet of the centerline of existing roadways.

Traffic impact analysis means a study prepared by a qualified professional engineer, licensed to practice within the state, to determine the vehicular impact of a development upon the major road network system. This study shall include, but is not limited to, determination of trip generation; trip distribution; traffic assignment; capacity analyses; and improvements to the roadway system necessitated by the development, such as required new roads, additional lanes and signalization.

Trip means a one-way movement of vehicular travel from an origin (one trip end) to a destination (the other trip end). For the purposes of this article, trip shall have the meaning which it has in commonly accepted traffic engineering practice and which is substantially the same as that definition in the previous sentence.

Trip generation means the attraction or production of trips caused by a given type of land development.

12-403. Intent and Purposes. (a) The Board of Mayor and Aldermen has determined that the rapid growth rate which the Town has experienced and is expected to experience in the foreseeable future necessitates public works projects and makes it necessary to regulate land development and building activity that generates increased traffic. It is the intent of the town that the capacity of the road network in the community should handle the traffic demands generated by new development, thus maintaining a satisfactory quality of life in Thompson's Station.

(b) In order to finance the necessary public works projects required to meet the traffic demands created by growth in population and business activity, a variety of financial sources shall be used to fund the planning, engineering, and construction of future road projects.

(c) It shall be the purpose of this article to establish a regulatory system and method by which the town calculates, collects, and obligates a regulatory fee hereinafter referred to as the impact fee. Except as otherwise provided for in this article, this fee shall be assessed on each new building or addition to an existing structure constructed within the town. The fee shall provide a portion of the revenues required to complete infrastructure and public works projects necessary to service this new development.

(d) The public health, safety, and general welfare is protected when adequate financial resources are available to fund the public works projects needed to handle traffic demand generated from land development activities and the construction of new buildings in the Town.

(e) The intent of this chapter is to allow for continued land development and new building construction in accordance with orderly fulfillment of appropriate transportation related public works projects.

(f) The impact fee shall be assessed to each new land development and building based on a reasonably estimated proportionate share of the anticipated cost of future public works projects. The traffic generation for each land use category shall serve as the basis for establishing and modifying the fee.

12-404. Basis for fees. The Board of Mayor and Aldermen shall approve by resolution the capital improvement projects and the estimated costs of each project, which shall establish the basis for the impact fee schedule. The impact fee schedule shall also be based upon use of available land use planning data related to the Town, other transportation studies in the vicinity and other available transportation related studies and traffic general analysis and basic assumptions as updated by the Institute of Transportation Engineers (ITE).

12-405. Use of fees. The impact fees generated by this ordinance shall be used to pay for the public infrastructure required by new development. Upon the recommendation of the Town Administrator, the Board of Mayor and Aldermen shall approve all impact fee fund expenditures as related to the costs of public infrastructure.

12-406. Fee calculations. (a) A schedule of impact fees, based on the method of calculation promulgated by this section, shall be adopted by resolution of the board of mayor and aldermen.

(b) For each land use, a demand factor shall be determined for use in calculating the appropriate impact fee. Such demand factors shall be based on the estimated trip generation rates for various land uses as identified in the latest edition of the ITE's Trip Generation. In order to avoid the double counting of vehicular trips between land uses, the ITE's estimated trip generation rate shall be divided by two to determine the appropriate demand factor.

(c) The base trip cost shall be determined by dividing the total estimated cost to the Town of the public works projects, as designated by the board of mayor and aldermen, by the number of total daily trips for all land uses in the prior year as estimated by the town's planning and codes department. The base trip cost as so determined may be adjusted for estimated future contributions toward the cost of public works projects from currently unidentified sources other than locally generated revenues. The demand factor for each land use shall be multiplied by the adjusted base trip cost to yield the appropriate impact fee per type of land use.

(d) Any land use generating local sales tax revenues from retail operations shall be eligible for a 20 percent reduction of the per unit impact fee calculation based on space allocated within that land use for retail operations.

(e) Revisions to fee schedule:

(1) Construction data used as a basis for the calculation of impact fees shall be reviewed annually as a part of the town's capital improvements program and periodically modified based upon actual bid documentation. Fluctuation in the base trip cost resulting from changes in the technical data base or in the scope, size, status or cost of the designated public works projects shall not necessarily dictate an adjustment in the impact fee structure. Adjustments in the fee structure shall occur, when, in the determination of the Board of Mayor and Aldermen, based on a recommendation from the Town Administrator:

a. The variance between the estimated base trip cost and the base trip cost used to establish impact fees is significant enough to warrant a change; or

b. The variance between the estimated demand factors and the demand factors used to establish impact fees is significant enough to warrant a change.

(2) Upon such a determination, a revised schedule of impact fees shall be adopted by resolution of the board of mayor and aldermen.

(f) Alternative fee determination: An alternative determination of the impact fee for a land use may be allowed under the following criteria and conditions:

(1) An applicant may appeal in writing to the town administrator for review of an alternative proposal related to land use traffic generation calculations.

(2) Documentation in support of an alternative trip generation calculation shall be provided in the form of a traffic impact analysis and shall include, but not be limited to, the following factors:

a. Traffic characteristics and levels of service of existing major road network systems directly affected by the proposed new development.

b. Trip generation, trip distribution, and trip projections for the proposed new development.

c. Impacts of the proposed new development on affected major road network systems including anticipated changes in the level of service.

d. Impacts of previously approved new development affecting the same major road network systems combined with the proposed new development.

e. Benefits of proposed roadway system improvements to be made a part of the new development, including intersection improvements such as turn lanes and signalization.

(3) If the applicant's alternative calculation of the public work project fee is accepted by the town commission, the Town reserves the right to review the actual traffic trip generation for the development for a period of two years after completion. If the actual traffic generation is found to exceed by ten percent that figure previously projected by the development, the town reserves the right to require an additional payment up to 150 percent of the scheduled impact fee level.

(g) If a land use for a specific property or facility is changed to one which would fall into a land use category for which a higher fee would apply, then a fee based upon the current fee schedule shall be assessed for the new land use, less the amount applicable for the prior land use under the then existing fee schedule.

12-407. Payment of fee; appeals. (a) Payment of the impact fee shall be made at the time that a building permit is issued by the town.

(b) Appeals. (1) A person may challenge the calculation or application of a fee imposed pursuant to this article by filing with the Town Administrator a written notice of appeal with a full statement of the grounds and an appeal fee of two hundred dollars ($200.00) or such other amount as may be fixed from time to time by resolution of the Board of Mayor and Aldermen. Notwithstanding the appeal, the building permit for the land use may be issued if the notice of appeal is accompanied by a bond, cashier's check or other security acceptable to the town administrator in an amount equal to the fee. Appeals filed pursuant to this section must be submitted prior to issuance of the building permit or within ten days thereafter.

(2) The appellant bears the burden of demonstrating that the amount of the fee was not calculated or applied according to the procedures established in this article.

(3) The Board of Mayor and Aldermen shall hear the appeal at a regularly scheduled meeting or special call meeting which falls within 30 days following receipt of the notice of appeal by the town administrator. The determination of the Board of Mayor and Aldermen shall be announced at the conclusion of the hearing or at the next regular meeting of the Board of Mayor and Aldermen. The determination of the Board of Mayor and Aldermen shall be final.

Section 5. All Prior Conflicting Ordinances Repealed; Interpretation. That upon the effective date of this ordinance, all prior ordinances and resolutions in conflict herewith be repealed

Section 6. Severability. If any section, sentence, clause or phrase of this ordinance should be held to be invalid or unconstitutional by a court of competent jurisdiction, such invalidity or unconstitutionality shall not affect the validity or constitutionality of any other section, sentence, clause, or phrase of this ordinance.

Section 7. Effective date. This ordinance shall take effect upon its passage on final reading, provided that it shall not take effect earlier than fifteen (15) days after the first passage thereof, the public welfare requiring.

Duly approved and adopted by the Board of Mayor and Aldermen of the Town of Thompson's Station, Tennessee.

Corey Napier, Mayor

ATTEST:

Leah Rainey, Town Recorder

Passed First Reading: August 13, 2013

Passed Second Reading: Sept 10, 2013

Submitted to Public Hearing on the 10th day of September 2013, at 7:00 p.m., after being advertised in the *Williamson AM* Newspaper on the 5th day of September, 2013.

APPROVED AS TO FORM AND LEGALITY:

Todd Moore, Town Attorney

RESOLUTION NO. 2019-005

A RESOLUTION OF THE TOWN OF THOMPSON'S STATION, TENNESSEE TO AUTHORIZE THE MAYOR AND TOWN ADMINISTRATOR TO NEGOTIATE AN AGREEMENT WITH DUNCAN & ASSOCIATES TO CONDUCT AN IMPACT FEE STUDY

WHEREAS, the Town has advertised and received responses to its Request for Qualifications ("RFQ") for a contractor to conduct an impact fee study (the "Project"); and.

WHEREAS, based on the responses received, the Board of Mayor and Aldermen has determined that it is in the best interest of the Town to enter into negotiations for an agreement with Duncan & Associates for the Project.

NOW, THEREFORE, BE IT RESOLVED by the Board of Mayor and Aldermen of the Town of Thompson's Station as follows:

That the Mayor and Town Administrator is authorized to negotiate an agreement with Duncan & Associates for the Project consistent with the RFQ and proposed budget, the final agreement to be considered for approval by the Board of Mayor and Aldermen.

RESOLVED AND ADOPTED this 8th day of January 2019.

Corey Napier, Mayor

ATTEST:

Jennifer Jones, Town Recorder

APPROVED AS TO LEGALITY AND FORM:

Todd Moore, Town Attorney

RESOLUTION NO. 2019 - 006

A RESOLUTION OF THE TOWN OF THOMPSON'S STATION, TENNESSEE APPROVING A CONTRACT WITH BARGE DESIGN SOLUTIONS, INC. FOR ENGINEERING SERVICES RELATED FOR THE PREPARATION OF A MAJOR THOROUGHARE PLAN AND TO AUTHORIZE THE MAYOR TO SIGN THE CONTRACT

WHEREAS, Barge Designs Solutions, Inc. is currently working with the Town on road construction and traffic-related projects; and

WHEREAS, the Town needs professional engineering services to develop a major thoroughfare plan; and

WHEREAS, the Board of Mayor and Aldermen has determined that it is in the best interest of the Town to approve a professional services contract with Barge Design Solutions, Inc. to provide these services to the Town.

NOW, THEREFORE, BE IT RESOLVED by the Board of Mayor and Aldermen of the Town of Thompson's Station as follows:

That the professional services contract with Barge Design Solutions, Inc. attached hereto as Exhibit "A" is hereby approved, and the Mayor is authorized to sign the contract on behalf of the Town.

RESOLVED AND ADOPTED this ____ day of January 2019.

_____
Corey Napier, Mayor

ATTEST:

_____
Jennifer Jones, Town Recorder

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Road and Park Impact Fee Study

for the Town of Thompson's Station, Tennessee

prepared by

Duncan Associates

November 2019
Review Draft

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EXECUTIVE SUMMARY

The purpose of this project is to assist the Town of Thompson's Station in an update of the Town's impact fees. The current fees are used only for road improvements. This update updates the road impact fees and calculates potential park impact fees.

Current Road Impact Fees

The Town's current road impact fee ordinance is Ordinance No. 13-016, which became effective on September 10, 2013. As the ordinance notes, authority to adopt impact fees is provided under Tennessee statutes for General Law Mayor-Aldermanic Charter municipalities. The ordinance lays out the general methodology by which the fees are to be calculated, and the fee schedule is adopted by separate resolution. The current fee schedule is shown Table 1. Average daily trip ends are divided by two to avoid double-counting. The number of daily trips per unit rate is multiplied by the base trip cost to determine the fee (the residential trip rate and fee shown in the table is for a single-family detached dwelling, but the fees are assessed on all residential based on $1 per square foot.) As set forth in the ordinance, the base trip cost is determined by dividing the total cost of planned improvements designated by the Board of Mayor and Aldermen (BOMA) by the total number of daily trips estimated to be generated by all land uses in the previous year by the Planning and Codes Department. Retail uses are given a 20% reduction in recognition of sales tax revenues they generate.

Table 1. Current Road Impact Fees

Land Use Category	Unit	Avg. Rate	Demand	Base Trip	Retail Adjustment	Unit Rate
Residential*	Dwelling	9.57	4.785	$262.75	100%	$1,257.27
Hotel/Motel	Room	9.02	4.510	$262.75	80%	$948.01
Golf Course	Acre	5.04	2.520	$262.75	100%	$662.14
Recreational Facility	1,000 sq. ft.	1.62	0.810	$262.75	100%	$212.83
Elementary Schoool	Student	1.29	0.645	$262.75	100%	$169.48
Middle School	Student	1.62	0.810	$262.75	100%	$212.83
High School	Student	1.71	0.855	$262.75	100%	$224.65
Community Co9llege	Student	1.20	0.600	$262.75	100%	$157.65
Day Care Center	Student	4.48	2.240	$262.75	100%	$588.57
Hospital	Bed	11.81	5.905	$262.75	100%	$1,551.56
Assisted Living	Bed	2.74	1.370	$262.75	100%	$359.97
General Office Building	1,000 sq. ft.	23.57	11.785	$262.75	100%	$3,096.54
General Retail Building	1,000 sq. ft.	42.94	21.470	$262.75	80%	$4,513.05
Restaurant	1,000 sq. ft.	89.95	44.975	$262.75	80%	$9,453.75
High Turnover Restaurant	1,000 sq. ft.	127.15	63.575	$262.75	80%	$13,363.62
Gas Station w/Conv. Mkt	1,000 sq. ft.	96.37	48.185	$262.75	80%	$10,128.60
Gas Station	Pump	15.65	7.825	$262.75	80%	$1,644.83
Warehousing	1,000 sq. ft.	4.96	2.480	$262.75	100%	$651.63
Church	1,000 sq. ft.	9.11	4.555	$262.75	100%	$1,196.84

* Residential impact fees to remain at $1.00 per sq. ft.

Source: "Exhibit C - Schedule of Impact Fees," Thompson's Station Town Planner, October 29, 2018.

Recommended Road Fee Changes

Methodology. The major recommendation for this update is to base the fees on a "demand-based" methodology. The Town's current impact fees were calculated using the methodology described in the ordinance. This is an unusual variation of the "plan-based" methodology, which divides total planned improvement costs by new trips generated over the same time period. In the Town's formulation, a planning horizon is not specified, and total planned costs are simply divided by existing trips. Regardless of how the calculation is performed, a list of planned improvements is not a sufficient basis for an impact fee calculation. It does not, by itself, establish that the planned improvements are necessary to serve growth, as opposed to remedying existing capacity deficiencies or increasing the level of service beyond what is currently provided to existing development. This update uses the alternative "demand-based" methodology (see the Methodology chapter for a detailed description of this approach).

Service Unit. While a plan-based fee calculation can be based on either the number of vehicle trips or vehicle-miles of travel (VMT) generated by the development, the demand-based methodology requires the use of VMT for the unit of impact, or "service unit." Consequently, the updated fees need to take into account not only the number of trips generated, but the average length of those trips. They also need to exclude pass by trips, which do not add additional VMT. These adjustments will more than compensate for the removal of the 20% reduction for retail uses, which does not appear to have an empirical basis.

Land Use Categories. The major proposed changes to the land use categories in the fee schedule are to differentiate residential fees by single-family detached and multi-family and to assess residential uses on the basis of dwelling units rather than square feet of living area. While there is some evidence that trip generation increases somewhat with dwelling unit size, available data is scant and the relationship does not appear to be linear (e.g., a unit twice as large will not generate twice as many trips).

Additional categories have been included, such as senior adult housing, golf course, industrial and mini-warehouse. Finally, some nonresidential categories (schools, day care centers, hospitals and nursing homes) that are currently assessed on characteristics that are difficult to quantify, such as number of students or beds, are proposed to be assessed on the amount of building square footage. Definitions of the proposed land use categories are provided in Appendix B.

Updated Road Fees

The updated road fees are compared to current fees in Table 2. Current residential fees, which are assessed at $1 per square foot, are assumed based on typical sizes for single-family and multifamily units. Current fees cannot be shown for new land uses or those with different assessment bases. The wide variation in percentage changes for specific land use categories reflects the inclusion of new trip factors and average trip lengths, the elimination of the 20% retail reduction, and changes in trip generation rates in the latest edition of the ITE *Trip Generation Manual*.

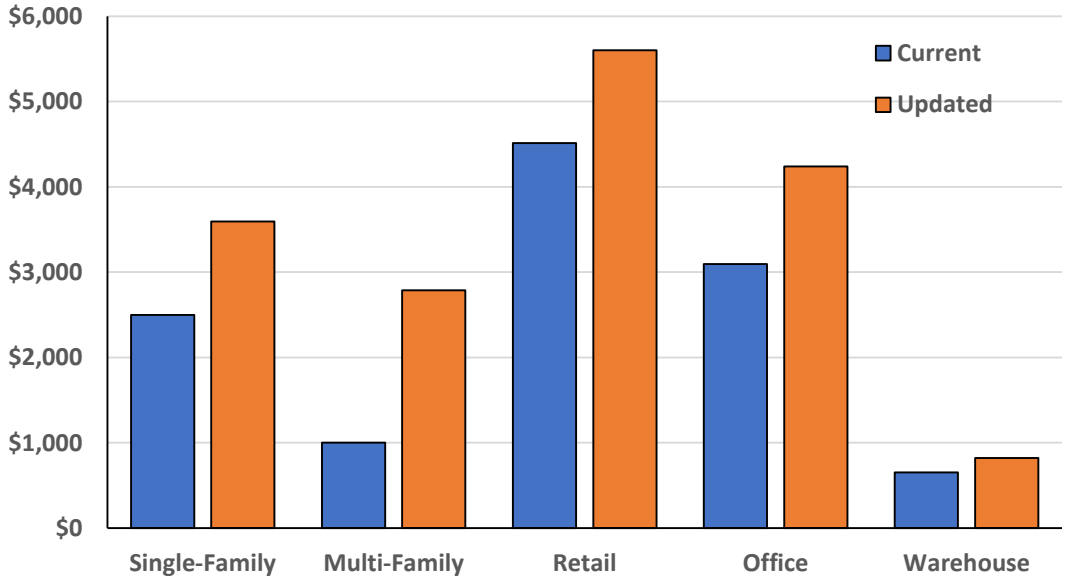
Table 2. Updated Road Impact Fees

Land Use Type	Unit	Current Fees	Updated Fees	Percent Change
Single-Family Detached*	Dwelling	$2,500	$3,593	44%
Multi-Family*	Dwelling	$1,000	$2,786	179%
Senior Adult Housing, Detached	Dwelling	n/a	$1,621	n/a
Senior Adult Housing, Attached	Dwelling	n/a	$1,408	n/a
Golf Course	Hole	n/a	$1,028	n/a
Hotel/Motel	Room	$948	$2,230	135%
Retail/Commercial/Shopping Center	1,000 sf	$4,513	$5,601	24%
Restaurant, Standard	1,000 sf	$9,454	$10,744	14%
Restaurant, Drive-Through	1,000 sf	n/a	$23,904	n/a
Gas Station w/Convenience Mkt.	1,000 sf	$10,129	$9,274	-8%
Office/Institutional	1,000 sf	$3,097	$4,238	37%
Elementary/Secondary School	1,000 sf	n/a	$1,312	n/a
Community College	1,000 sf	n/a	$2,963	n/a
Day Care Center	1,000 sf	n/a	$3,487	n/a
Hospital	1,000 sf	n/a	$3,275	n/a
Nursing Home	1,000 sf	n/a	$1,997	n/a
Place of Worship	1,000 sf	$1,197	$2,119	77%
Industrial	1,000 sf	n/a	$1,590	n/a
Warehouse	1,000 sf	$652	$823	26%
Mini-Warehouse	1,000 sf	$652	$711	9%

* current fee is $1 per square foot; unit sizes of 2,500 sq. ft. single-family and 1,000 sq. ft. multi-family are assumed for comparison purposes.

Source: Current fees from Table 1; updated fees from Table 16.

Figure 1. Current and Updated Road Impact Fees, Major Land Uses



Comparative Road Fees

Communities in the process of updating impact fees are naturally interested in knowing what nearby or comparable jurisdictions are charging. However, often-expressed concerns about the need to be "competitive" with other jurisdictions are not necessarily well-founded. Studies have found differences in impact fees between cities or counties in a state or region had no measurable effect on the rates of development. This is not surprising, given the myriad other market and regulatory factors that differ between jurisdictions besides impact fees.

The Town's current and updated road impact fees are compared to road impact fees currently charged by four nearby Tennessee municipalities in Table 3. Brentwood is currently in the process of updating its fees, which were last adjusted in 2007. Spring Hill's fees were updated earlier this year and after a phase-in will be at 100% in 2020.

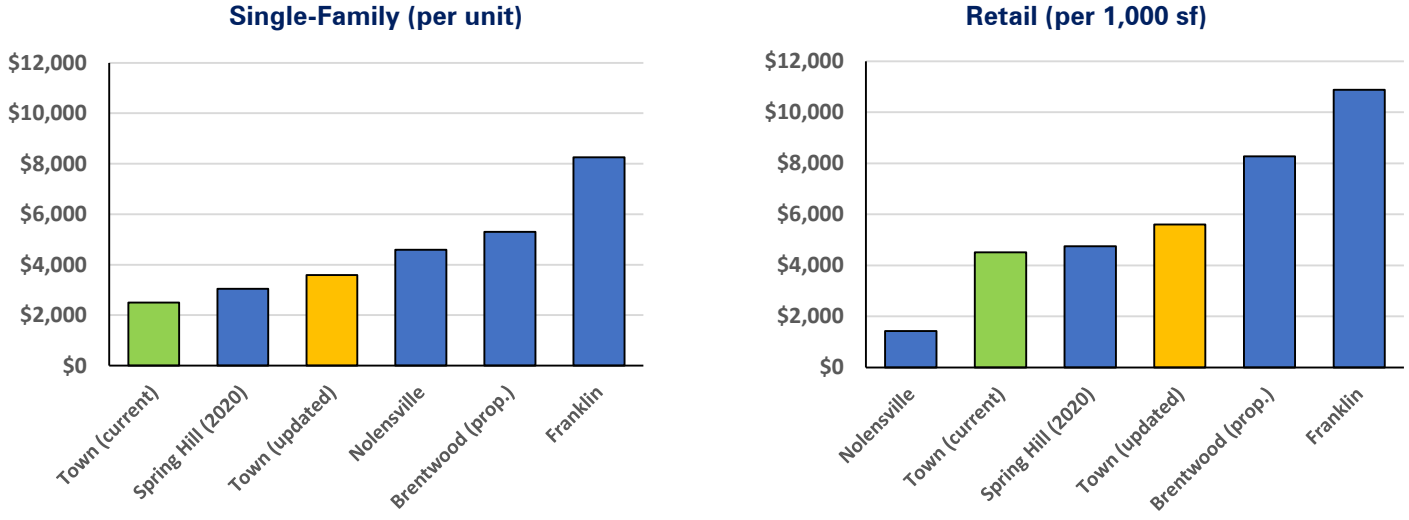
Table 3. Comparative Road Impact Fees

Municipality	Single-Family (unit)	Multi-Family (unit)	Retail (1,000 sf)	Office (1,000 sf)	Industrial (1,000 sf)	Ware-house (1,000 sf)	Rest-aurant (1,000 sf)
Town (current)	$2,500	$1,000	$4,513	$3,097	n/a	$652	$9,454
Town (updated)	$3,593	$2,786	$5,601	$4,238	$1,590	$823	$10,744
Brentwood (proposed)	$5,297	$4,107	$8,269	$6,252	$2,346	$1,214	$15,860
Franklin	$8,251	$5,233	$10,878	$7,801	$6,120	$3,187	$20,255
Nolensville	$4,594	$2,527	$1,424	$2,619	$1,470	$551	$1,424
Spring Hill (2020)	$3,048	$2,364	$4,753	$3,599	$1,350	$697	$9,118

Source: Current and updated Town fees from Table 2; other fees from Duncan Associates internet survey (Spring Hill fees shown are 100% of fees calculated in 2019 study, which become effective July 1, 2020 – current fees are at 33%).

Single-family and retail road impact fees from the table above are illustrated in Figure 2.

Figure 2. Comparative Single-Family and Retail Road Impact Fees



Potential Park Fees

The Town does not currently assess park impact fees. This study calculates potential park impact fees of $488 per single-family detached and $327 per multi-family unit (see Table 27 in Parks chapter). Park impact fee revenue could be used to acquire additional park land, construct new park improvements, or retire existing debt on existing park facilities.

Potential Impact Fee Revenue

Development in Thompson's Station is predominately residential, and consists mostly of new single-family detached units. The Town has issued an average of 204 residential permits annually for the last nine years, which can be rounded down to 200 permits per year. The proposed 44% increase in road fees, coupled with new park fees, would generate about $800,000 annually, compared to about $500,000 under the current road fees, or over 60% more revenue.

Table 4. Potential Road and Park Impact Fee Revenue

	Roads	Parks	Total
Current Fee per Unit	$2,500	$0	$2,500
Proposed Fee per Unit	$3,593	$488	$4,081
x Units Permitted per Year	200	200	200
Annual Revenue under Current Fees	$500,000	$0	$500,000
Annual Revenue under Proposed Fees Fees	$718,600	$97,600	$816,200
Percent Increase	44%	n/a	63%

Source: Current and proposed fees per single-family detached unit from Table 2 (roads) and Table 27 (parks); annual residential permits from 2010 through 2018 derived from Table 28.

LEGAL FRAMEWORK

Impact fees are imposed on new development to pay for improvements necessitated by growth. Impact fees are a way for local governments to require new developments to pay a proportionate share of the infrastructure costs they impose on the community. In contrast to "negotiated" developer exactions, impact fees are charges assessed on new development using a standard formula based on objective characteristics, such as the number and type of dwelling units constructed. The fees are a one-time, up-front charge, with the payment made at the time of building permit issuance. Impact fees require that each new development project pay a pro-rata share of the cost of new capital facilities required to serve that development.

Statutory Authority

State law provides mayor-aldermanic charter municipalities like the Town of Thompson's Station with very broad authority to levy taxes and fees. The general powers enumerated in Tennessee Code, Title 66, Chapter 2, Part 2, Section 6-2-201 have been interpreted to include the authority to impose impact fees. The enumerated powers do not contain the term "impact fee" or otherwise provide any guidance about how such fees should be calculated. For this we need to turn to case law.

Case Law

Impact fees were pioneered in states that lacked specific enabling legislation, and the authority to impose them has generally been based on local government's broad "police power" to regulate land development in order to protect the health, safety and welfare of the community. In general, it is necessary to meet the following requirements to qualify as an impact fee and to avoid having the fee struck down as an illegal tax.

Proportionality

One of the fundamental legal principles of impact fee case law is that the fees for each individual land use type should be proportional to the impact of that use. Policy reductions or waivers for selected land use categories or types of development weaken that relationship and should be avoided or at least strictly limited. At a minimum, the impact fee fund should be reimbursed for the lost revenue from general fund sources. In addition, a revenue credit may need to be provided for other land uses not subject to the reduction. Even if the targeted reductions are replaced with general funds, new development that is not eligible for the reduction will generate future general fund revenues that will be used to pay for the reduced fees for future development. This could arguably amount to new development that is not eligible paying more than its proportionate share of transportation improvement costs. While this issue has not been litigated, the prudent course would be either not to apply targeted fee reductions or else make up the lost revenue and calculate an appropriate revenue credit for non-eligible development types.

Developer Credits

Another fundamental requirement articulated in impact fee case law is the need to avoid double-charging new development through impact fees and other requirements or taxes. Developers should not be required to make site-specific dedications or improvements that meet the same need being addressed by the impact fees, while also being required to pay the fee. In general, impact fees should be reduced by the value of dedications or improvements required of developers for the same type of improvements that would be eligible to be funded with the impact fees. These reductions are referred to as developer credits.

It is reasonable to have some restrictions on the types of improvements that are eligible for credit. Granting credits is essentially spending future impact fees, and the fees should be spent for priority improvements that benefit the community at large. Developers should not be allowed to monopolize the fees for localized improvements if they choose to develop in areas that lack adequate infrastructure. For example, credit eligibility could be restricted to contributions related to projects identified in an adopted list of planned road improvements. However, developers should be eligible for credits for required improvements related to projects that are consistent with the jurisdiction's land use and capital plans.

Revenue Credits

A revenue credit is a reduction from the cost per service unit designed to equalize the burden between existing and new development arising from the expenditure of future revenues that can be attributed in part to new development. While developer credits are provided on a case-by-case basis, revenue credits must be addressed in the fee calculation study.

As noted previously, if there are existing deficiencies with respect to the level of service used in the fee calculation, the fees should be reduced by a credit that accounts for the contribution of new development toward remedying the existing deficiencies. A similar situation arises when the existing level of service has not been fully paid for. Outstanding debt on existing facilities that are counted in the existing level of service will be retired, in part, by revenues generated from new development. Given that new development will pay impact fees to provide the existing level of service for itself, the fact that new development may also be paying for the facilities that provide that level of service for existing development could amount to paying for more than its proportionate share. Consequently, impact fees should be reduced to account for future payments that will retire outstanding debt on existing facilities that provide the level of service on which the fees are based for existing development.

The issue is less clear-cut when it comes to other types of revenue that may be used to make capacity-expanding capital improvements of the same type being funded by impact fees. The clearest case occurs when general fund tax revenues are programmed for capacity-expanding improvements on an "as available" basis because impact fees are insufficient to fund all needed growth-related improvements. These general fund contributions could be booked as a loan to the impact fee fund, to be repaid when sufficient impact fee funds are available.

Similar considerations apply to dedicated funding sources, such as special taxes that can only be used for the same type of facilities as the impact fees. Like discretionary revenue, these types of dedicated revenue sources are typically not specifically dedicated only for capacity-expanding improvements, and even if they are, their use to fund capacity-related improvements improves the level of service for both existing and new development.

Outside funding or grants for capacity-expanding improvements to major roads that can reasonably be anticipated in the future could warrant a credit, but again this is not clear-cut. In addition to the argument made above (i.e., the additional funding raises the level of service and benefits both new development and existing development), two additional arguments can be made against providing credits for such funding. First, new development in a community does not directly pay for State and Federal grants in the same way they pay local gasoline and property taxes. Second, future grant funding is far more uncertain than dedicated revenue streams.

While these arguments are compelling, they have not been litigated, and the law on whether revenue credits may be warranted in situations other than existing deficiencies or outstanding debt on existing facilities is currently unclear. This update incorporates revenue credits for Federal/State funding anticipated to be available to help fund growth-related transportation improvements.

Summary

The Town derives its authority to impose impact fees from the statutory powers granted to mayor-aldermanic municipalities. The principles derived from impact fee case law can be stated briefly as follows:

1) Don't charge new development for a higher level of service than is provided to existing development;
2) Make the fee proportional to the impact of the development;
3) Don't charge twice through other taxes or fees for the same improvements;
4) Give developers credit for the value of their contributions to projects programmed in the long-range plan; and
5) Spend the funds on improvements that benefit new development.

ROADS

This chapter calculates updated road impact fees. The updated fees are based on a different methodology from the one used to calculate the current fees.

Methodology

The methodology used to calculate an impact fee should comply with the legal principles described in the Legal Framework chapter. In impact fee analysis, existing and projected development is translated into "service units," which is a common indicator of demand (such as vehicle trips). Fees are based on the cost per service unit, which is then multiplied by service units generated per development unit (e.g., dwelling unit or 1,000 square feet) to calculate the fee schedule.

A methodology is defined by how the cost per service unit is calculated. There are two basic types of methodologies: plan-based and demand-based. The Town's current fees were calculated using a variation of the plan-based methodology. The consultant recommends switching to a demand-based methodology in this update. Regardless of the methodology used, the final fee calculations may need to reduce the fees to ensure there is no double-charging, as discussed in the revenue credits section of the Legal Framework chapter.

Plan-Based Methodology

A plan-based methodology calculates the cost per service unit by dividing planned improvement costs over a fixed time horizon by the anticipated growth in service units over the same period. Dividing anticipated growth costs by anticipated new service units yields the cost per service unit to accommodate growth. A plan-based road impact fee methodology may utilize either vehicle trips or vehicle-miles of travel as the service unit. As the name implies, the plan-based methodology presupposes the existence of a plan.

The legal requirements for impact fees set a relatively high bar for a plan-based methodology. The plan must create a tight nexus between the amount of growth projected over a specified period and the improvements needed to serve that growth. The list of planned improvements must be developed using a rigorous analysis, such as the modeling used to develop a transportation master plan, to establish the required nexus between the anticipated growth and the specific list of improvements required to serve that growth. The Town does not have a long-range transportation master plan that would meet this requirement.

The Town's ordinance specifies an unusual variation of the plan-based approach that divides planned costs by existing trips (see description in Executive Summary). There is no available analysis of existing levels of service, identification of existing deficiencies, or documentation on how the cost per service unit was determined. The method for calculating the current fees does not appear to demonstrate the strong nexus between planned growth and improvement needs required to support a plan-based methodology.

Demand-Based Methodology

The alternative to the plan-based methodology is referred to as "demand-based" (also called "consumption-based" when used for road fees). This approach is probably more commonly-used in Tennessee than the plan-based approach. It bases the fee on the average cost to replace major roadway capacity consumed by new development. It does not depend on having a list of planned improvements or growth projections, although planned improvement costs may be used to determine the average cost to add new roadway capacity, credit against the fee may be restricted to the list of planned improvements, and growth projections may be used to forecast future revenues. It allows fee revenues to be used for any needed capacity-expanding improvement, although expenditures could be limited to a pre-determined list of projects. It is based on a level of service expressed as a system-wide capacity to demand ratio (i.e., vehicle-miles of capacity per vehicle-miles of travel, or VMC/VMT). If the fees are based on a ratio no higher than the existing one, there are no deficiencies. The consultant recommends using this methodology in the update.

The service unit for the demand-based methodology must be in terms of vehicle-miles of travel (VMT), because it is not possible to determine the capacity needed to accommodate a trip without considering the length of the trip. VMT (trips times trip length) takes into account not only the number of trips, but the average length of those trips. Retail trips, for example, tend to be shorter than trips to office or industrial uses. Adding the trip length component more accurately assesses road impacts by land use. Trips for retail and certain other land uses should also be reduced to recognize pass-by traffic; that is, trips that are stopping at the use on their way to another primary destination. Pass-by trips do not place any additional burden on the road system.

An issue that arises with the demand-based road fee methodology is what the appropriate level of service (LOS) should be. The "standard" demand-based road methodology multiplies the cost of a vehicle-mile of capacity (VMC) by the vehicle-miles of travel (VMT) generated by a development to calculate the fee. However, a VMC is not the same as a VMT. In mathematical terms, the cost per VMC must be multiplied by the VMC/VMT ratio to get the cost per VMT. The standard demand-based approach implicitly assumes that the VMC/VMT ratio is one. That is, it assumes that the roadway system can function adequately with every road carrying exactly its full capacity. In the real world, however, travel is not evenly distributed proportional to roadway capacity. Drivers may try to avoid driving on congested roadways, but they will always have limited options. Under conditions of full system-wide utilization, any roadway with some excess capacity will be balanced by a roadway that is over-capacity. Reasonably functioning roadways systems must have more aggregate capacity than aggregate demand (e.g., VMC/VMT ratios considerably higher than one-to-one).

The "modified" demand-based approach recognizes this by explicitly using the VMC/VMT ratio in the formula. It either uses the actual existing VMC/VMT ratio, or a lower ratio that is greater than one. If the existing ratio is used, that makes the modified approach conceptually similar to the incremental expansion approach often used for types of facilities for which capacity is more difficult to measure, because it basically says that existing roadway capacity must be expanded in direct proportion to the increase in travel demand to maintain an adequate level of service. Few studies use this approach, however, particularly in less-developed jurisdictions, because the VMC/VMT ratio tends to decline as the community matures. This update incorporates the VMC/VMT ratio.

The formula for the demand-based methodology used in this study is summarized in Figure 3 on the following page. The maximum fee amount calculated with this methodology is the number of service units (VMT) that will be generated by the development times the net cost per service unit.

Figure 3. Demand-Based Road Impact Fee Formula

IMPACT FEE	**=**	**VMT x NET COST/VMT**
Where:		
VMT	=	**TRIPS x % NEW x LENGTH**
TRIPS	=	Trip ends during average weekday ÷ 2
% NEW	=	Percent of trips that are primary trips, as opposed to pass by or diverted-link trips
LENGTH	=	Average length of a trip on the major roadway system
NET COST/VMT	=	**COST/VMT - CREDIT/VMT**
COST/VMT	=	COST/VMC x VMC/VMT
COST/VMC	=	Average cost to add a vehicle-mile of capacity
VMC/VMT	=	Ratio of system-wide capacity to demand in the major roadway system
CREDIT/VMT	=	Credit for certain future revenues to be generated by new development

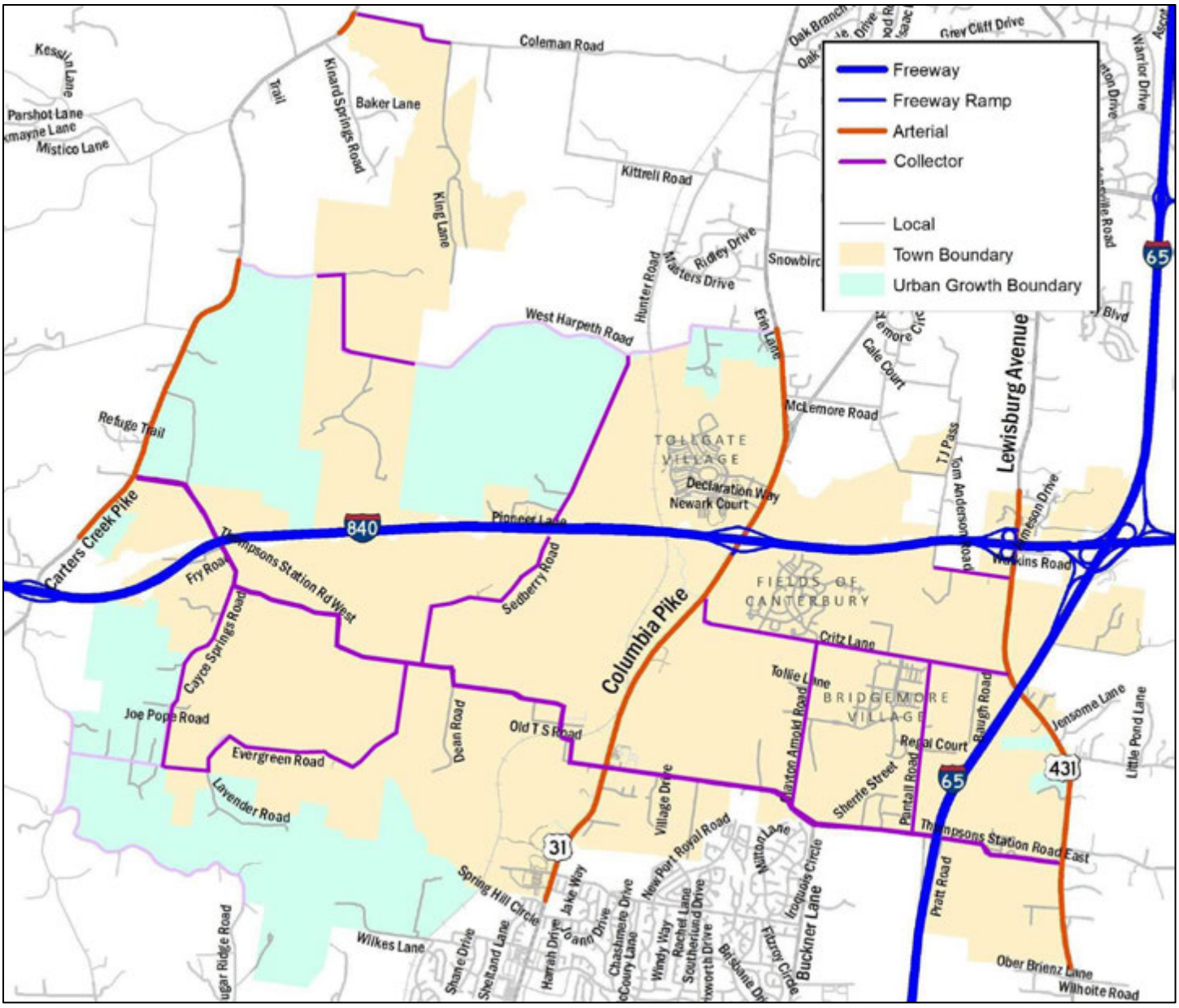
Major Roadway System

A road impact fee program should include a clear definition of the major roadway system that is to be funded with the impact fees. There is no such definition in the Town road impact fee ordinance – presumably the fees could be spent to improve any roadway within the Town limits, including local residential streets of the type typically installed by developers within new subdivisions. Such minor roadways primarily serve to provide access to individual properties and seldom experience capacity constraints. Most road impact fees are restricted to improving major roads that may provide access to adjacent properties but primarily serve to convey traffic over larger areas. Major roads can be categorized as expressways, arterials, and collectors. Major roads within the Town are illustrated in Figure 4.

Expressways are often excluded from municipal road impact fees because cities and towns rarely use the funds for improvements to these facilities, which predominately serve through traffic rather than trips generated by local development. Expressways within Thompson's Station include I-65 and I-640, and these are excluded from the major roadway system as defined in this update. State and Federal roads are often included, because municipal funds are often provided by municipalities for such improvements,[1] and although they may carry a significant amount of through traffic, locally-generated traffic also impacts such roads in adjacent communities. The arterial roads within Thompson's Station are Columbia Pike (US 31/SR 6) and Lewisburg Pike (US 431/SR 106). The collector roads within the Town are all Town roads. Arterial and collector roads are included in the major roadway system as defined in this update.

[1] Spring Hill, for example, has spent close to $11 million in recent years on the widening of Duplex Road (SR 24), while Brentwood has spent about $4 million on widening projects for Franklin Road (US 31) and Concord Road (SR 253).

Figure 4. Existing Major Roads



The characteristics of the Town's existing major roadway system are summarized in Table 5 below. The data are largely drawn from the Town's 2019 *Major Thoroughfare Plan* (MTP). The exception is daily volumes. We compared the model-generated 2018 volumes provided in the MTP with actual 2018 traffic counts conducted by the Tennessee Department of Transportation for eight roadway segments that had estimates from both sources. The modeled volumes averaged 1.5 times as many trips as the counts. The table below contains the TDOT counts that are available, as well as 0.67 (inverse of 1.5) times the modeled volumes for segments where counts are not available (indicated by italics).

Table 5. Existing Major Roadway Inventory

Road		Miles	Lanes	Daily Trips	Capa-city	VMT	VMC
Carters Creek Pike	Coleman Rd to S of Coleman	0.15	2	*2,182*	18,700	327	2,805
Carters Creek Pike	Thompson's Stn Rd to S Limits	0.56	2	4,492	18,700	2,516	10,472
Columbia Pike (US 31/SR 6)	S Town Lmt to Thompson's Stn	1.08	2	*21,299*	18,700	23,003	20,196
Columbia Pike (US 31/SR 6)	Thompson's Stn to Critz Ln	1.35	2	22,396	18,700	30,235	25,245
Columbia Pike (US 31/SR 6)	Critz Lane to I-840	0.57	5	*23,485*	35,300	13,386	20,121
Columbia Pike (US 31/SR 6)	I-840 to Tollgate Blvd	0.44	5	*18,226*	35,300	8,019	15,532
Columbia Pike (US 31/SR 6)	Tollgate Blvd to Goose Crk Bypass	0.47	2	*17,125*	18,700	8,049	8,789
Columbia Pike (US 31/SR 6)	Goose Crk Bypass to N Town Limi	0.49	2	14,690	18,700	7,198	9,163
Lewisburg Pike (US 431/SR 106)	S Limits to Thompson's Stn Rd	0.87	2	6,188	18,700	5,384	16,269
Lewisburg Pike (US 431/SR 106)	Thompson's Stn Rd to Critz Ln	1.57	2	*12,668*	18,700	19,889	29,359
Lewisburg Pike (US 431/SR 106)	Critz Lane to I-840	0.98	2	*16,572*	18,700	16,183	18,261
Lewisburg Pike (US 431/SR 106)	I-840 to N Town Limits	0.41	2	8,330	18,700	3,433	7,707
Subtotal, Arterials		8.94				137,622	183,919
Cayce Springs Road	Thompson's Stn to Evergreen Rd	0.71	2	*235*	18,700	167	13,277
Clayton Arnold Road	Thompson's Stn tp Critz Ln	1.26	2	*8,566*	14,700	10,793	18,522
Coleman Road	Carters Crk Pike to King Ln	0.81	2	*1,675*	18,700	1,357	15,147
Critz Lane	Columbia Pike to Clayton Arnold	0.97	2	*9,872*	14,700	9,576	14,259
Critz Lane	Clayton Arnold to Pantail Rd	0.87	2	*3,551*	14,700	3,089	12,789
Critz Lane	Pantail Rd to Lewisburge Pike	0.59	2	*7,457*	14,700	4,400	8,673
Evergreen Road	Thompson's Stn-Cayce Spgs Rd	2.50	2	*463*	18,700	1,158	46,750
Harpeth Rd W	Town Limits to W of Sedberry	1.38	2	*543*	18,700	749	25,806
Pantall Road	Thompson's Stn Rd to Critz Ln	1.29	2	*4,938*	14,700	6,370	18,963
Sedberry Road	Thompson's Stn to W Harpeth Rd	1.80	2	*1,146*	18,700	2,063	33,660
Thompson's Station Rd W	Carters Crk to Cayce Spgs Rd	1.25	2	1,424	18,700	1,780	23,375
Thompson's Station Rd W	Cayce Spgs to Evergreen Rd	1.58	2	*2,285*	18,700	3,610	29,546
Thompson's Station Rd W	Evergreen to Sedberry Rd	0.11	2	*1,856*	18,700	204	2,057
Thompson's Station Rd W	Sedberry to Columbia Pike	1.95	2	3,568	14,700	6,958	28,665
Thompson's Station Rd E	Columbia Pike to Clayton Arnold	1.46	2	4,009	14,700	5,853	21,462
Thompson's Station Rd E	Clayton Arnold to Pantall Rd	0.95	2	*10,301*	14,700	9,786	13,965
Thompson's Station Rd E	Pantall Rd to Lewisburg Pike	0.18	2	*5,996*	14,700	1,079	2,646
Tom Anderson Rd	Lewisburg Pike to jog in road	0.61	2	*1,675*	14,700	1,022	8,967
Subtotal, Collectors		20.27				70,014	338,529
Total		29.21				207,636	522,448

Source: Segment descriptions, number of lanes and daily capacities from Town of Thompson's Station *Major Thoroughfare Plan* (MTP), adopted by Planning Commission on August 27, 2019; daily trips are 2018 annual average day trip counts from Tennessee Department of Transportation website (trips in italics are two-thirds modeled daily volumes from Table 1 of the MTP – see explanation above); capacities are service volume thresholds at LOS E from Table 2 of the MTP (5- and 6-lane arterial capacities are switched in the table per Barge Design Solutions, October 9, 2019).

As described in the Methodology section, the appropriate level of service for a demand-based fee is the system-wide ratio of capacity (VMC) to demand (VMT). The existing system-wide ratio for the arterial/collector system is 2.52 VMC per VMT, well above the 1.00 ratio used in the standard demand-based methodology. The recommended level of service used to calculate the updated road impact fees is a VMC/VMT ratio of 1.25. This is somewhat lower than the existing level of service for arterial roads, and only about one-half the system-wide average level of service. As long as the updated fees are not based on a higher level of service than currently provided to existing development, there is no existing deficiency on a system-wide basis.

Table 6. Roadway Level of Service

	Arterials	Collectors	Total
Existing Daily Vehicle-Miles of Capacity (VMC)	183,919	338,529	522,448
÷ Existing Daily Vehicle-Miles of Travel (VMT)	137,622	70,014	207,636
Existing VMC/VMT Ratio	1.34	4.84	2.52
Recommended VMC/VMT Ratio			1.25

Source: Table 5.

Travel Demand

The travel demand generated by specific land use types is a product of three factors: 1) trip generation, 2) percent new trips, and 3) average trip length. The first two factors are well documented in the professional literature – the average trip generation characteristics identified in studies of communities around the nation should be reasonably representative of trip generation characteristics in Thompson's Station. In contrast, trip lengths are much more likely to vary between communities, depending on the geographic size and shape of the community and its major roadway system.

Trip Generation

Trip generation rates are based on information published in the most recent edition of the Institute of Transportation Engineers' (ITE) *Trip Generation Manual*. Trip generation rates represent trip ends, or driveway crossings at the site of a land use. Thus, a single trip from home to work counts as one trip end for the residence and one trip end for the workplace, for a total of two trip ends. To avoid over-counting, all trip rates are divided by two. This allocates travel equally between the origin and destination of the trip and avoids double charging. This update utilizes the most current edition of the ITE manual (the 10th edition published in 2017).

New Trip Factor

Trip rates must also be adjusted by a "new trip factor" to exclude pass by and diverted-linked trips. This adjustment is intended to reduce the possibility of over-counting by only including primary trips generated by the development. Pass by trips are those trips that are already on a particular route for a different purpose and simply stop at a development on that route. For example, a stop at a convenience store on the way home from the office is a pass by trip for the convenience store. A pass by trip does not create an additional burden on the street system and therefore should not be counted in the assessment of impact fees. A diverted-linked trip is similar to a pass by trip, but a diversion is made from the regular route to make an interim stop. The reduction for pass by and diverted-linked trips is drawn from ITE manual and other published information.

Average Trip Length

In the context of a road impact fee using a demand-based methodology, it is necessary to determine the average length of a trip on the major roadway system. The average trip length can be determined by dividing the total vehicle-miles of travel (VMT) on the major roadway system by the total number of trips generated by existing development in the service area. Total VMT on the major roadway system is estimated by multiplying the length of each road segment by the current traffic volume on that segment and summing for the entire system. Total trips can be estimated by multiplying existing land uses by the appropriate trip generation rates (adjusted for new trip factors and divided by two) and summing for all existing development within the Town limits.

Existing land use information was compiled from the 2010 Census, residential building permits since 2010, property assessor data for nonresidential non-tax-exempt uses, and scaled estimates of square footage from aerial photography for exempt uses such as government facilities, schools, and churches. Existing land uses in six general categories are multiplied by average daily trip generation rates and summed to determine a reasonable estimate of total daily trips. As shown in Table 7, existing land uses within the Town are estimated to generate 17,284 average daily trips.

Table 7. Existing Average Daily Trips

Land Use	ITE Code	Unit	Existing Units	Trips/ Unit	Daily Trips
Single-Family Detached	210	Dwelling	2,137	4.72	10,087
Multi-Family	220/221	Dwelling	540	3.66	1,976
Subtotal, Residential			2,677		12,063
Retail/Commercial	820	1,000 sq. ft.	246	8.30	2,042
Office	710	1,000 sq. ft.	42	4.87	205
Industrial/Warehouse	130/150	1,000 sq. ft.	168	2.58	433
Public/Institutional	620	1,000 sq. ft.	777	3.27	2,541
Subtotal, Nonresidential			1,233		5,221
Total					17,284

Source: Existing development units from Table 28 (residential) and Table 29 (nonresidential) in Appendix A; trips per unit from Table 10.

A reasonable estimate of the average trip length in the Town can be derived by dividing total daily VMT on the collector road system by the total number of daily trips generated by existing development within the Town. This is conservative, because it excludes travel on the arterials, which carry two-thirds of major roadway traffic. However, given the relatively undeveloped nature of the Town, it is likely that much of the current travel on Columbia and Lewisburg Pikes is through traffic. As presented in Table 8, the average trip length on the major roadway system is estimated to be 4.05 miles.

Table 8. Average Trip Length

Daily VMT on Collector Roads	70,014
÷ Daily Trips	17,284
Average Trip Length (Miles)	4.05

Source: VMT from Table 5; trips from Table 7.

Average trip lengths by trip purpose for the southern region of the U.S. are available from the U.S. Department of Transportation's 2017 *National Household Travel Survey*. Note that the regional average trip length is considerably longer than the local average. This is to be expected, since the regional trip lengths include travel on local streets, expressways, and roads outside to any particular jurisdictional boundary. Using the local-to-regional trip length ratio, reasonable local trip lengths can be derived for specific trip purposes, including home-to-work trips, shopping, school/church and other personal trips, as shown in Table 9.

Table 9. Average Trip Lengths by Trip Purpose

Trip Purpose	Regional Trip Length (miles)	Local/ Regional Ratio	Local Trip Length (miles)
To or from work	11.99	0.421	5.04
Residential	9.62	0.421	4.05
Doctor/Dentist	11.01	0.421	4.63
School/Church	7.74	0.421	3.25
Family/Personal	6.98	0.421	2.93
Shopping	8.55	0.421	3.59
All Trips*	9.62	0.421	4.05

* weighted average (not simple average of trip purposes shown)

Source: Regional average trip lengths for the South Census Region from U.S. Department of Transportation, *National Household Travel Survey*, 2017 (residential trip length assumed same as overall average); "all trips" local trip length from Table 8; local/regional ratio is all trips local to regional trip length; local trip length by trip purpose is the product of regional trip length and local/regional ratio.

Travel Demand Summary

The result of combining trip generation rates, new trip factors, and average trip lengths is the travel demand schedule. The travel demand schedule establishes the average daily vehicle-miles of travel (VMT) generated by various land use types per unit of development on the major roadway system. The updated demand schedule reflects trip generation rates from the Institute of Transportation Engineers (ITE), *Trip Generation*, 10th edition, 2017. Average trip lengths are from the 2017 *National*

Household Travel Survey, calibrated to reflect the average trip length on Thompson's Station's major roadway system. For each land use, daily VMT is the product of trip rate, new trip factor, and trip length. The updated travel demand schedule is presented in Table 10 below.

Some modifications to the land use categories are made in this update to better reflect available data and to simplify the process of fee determination and collection. The major proposed change is to differentiate residential fees by single-family detached and multi-family, and to assess on residential uses on the basis of dwelling units rather than square feet of living area. While there is some evidence that trip generation increases somewhat with dwelling unit size, available data is scant and the relationship does not appear to be linear (i.e., a unit twice as large will not generate twice as many trips). Some additional categories have also been included, such as senior adult housing, golf course, industrial and mini-warehouse. Finally, some nonresidential categories (schools, day care centers, hospitals and nursing homes) that are currently assessed on characteristics that are difficult to quantify, such as number of students or beds, are proposed to be assessed based on building square footage. Definitions of the proposed land use categories are provided in Appendix B to assist Town staff in classifying proposed land uses.

Table 10. Travel Demand Schedule

ITE Code	Land Use	Unit	Trip Ends/ Unit	Trips/ Unit	% New Trips	New Trips/ Unit	Trip Length (mi.)	VMT/ Unit
210	Single-Family Detached	Dwelling	9.44	4.72	100%	4.72	4.05	19.11
220	Multi-Family	Dwelling	7.32	3.66	100%	3.66	4.05	14.82
240	Mobile Home Park	Pad	5.00	2.50	100%	2.50	4.05	10.12
251	Senior Adult Housing, Detached	Dwelling	4.27	2.13	100%	2.13	4.05	8.62
252	Senior Adult Housing, Attached	Dwelling	3.70	1.85	100%	1.85	4.05	7.49
430	Golf Course	Acre	3.74	1.87	100%	1.87	2.93	5.47
310/320	Hotel/Motel	Room	5.86	2.93	100%	2.93	4.05	11.86
820	Retail/Commercial/Shopping Center	1,000 sf	37.75	18.87	44%	8.30	3.59	29.79
931	Restaurant, Standard	1,000 sf	83.84	41.92	38%	15.92	3.59	57.15
934	Restaurant, Drive-Through	1,000 sf	470.95	235.47	30%	70.64	1.80	127.15
853	Gas Station w/Convenience Mkt.	Pump	322.50	161.25	17%	27.41	1.80	49.33
710	Office/Institutional	1,000 sf	9.74	4.87	100%	4.87	4.63	22.54
520/22/30	Elementary/Secondary School	1,000 sf	17.92	8.96	24%	2.15	3.25	6.98
540	Community College	1,000 sf	20.25	10.12	48%	4.85	3.25	15.76
565	Day Care Center	1,000 sf	47.62	23.81	24%	5.71	3.25	18.55
610	Hospital	1,000 sf	10.72	5.36	100%	5.36	3.25	17.42
620	Nursing Home	1,000 sf	6.54	3.27	100%	3.27	3.25	10.62
560	Place of Worship	1,000 sf	6.95	3.47	100%	3.47	3.25	11.27
130	Industrial	1,000 sf	3.37	1.68	100%	1.68	5.04	8.46
150	Warehouse	1,000 sf	1.74	0.87	100%	0.87	5.04	4.38
151	Mini-Warehouse	1,000 sf	1.51	0.75	100%	0.75	5.04	3.78

Source: Daily trip ends from Institute of Transportation Engineers (ITE), *Trip Generation Manual*, 10th Edition, 2017; trips per unit is ½ of trip ends to avoid double-counting; new trip percentages from ITE, *Trip Generation Handbook*, 3rd Edition, 2017; new trip percentage for day care and schools based on Preston Hitchens, "Trip Generation of Day Care Centers," *1990 ITE Compendium* (new trips for community college estimated to be double); average trip lengths from Table 9 (drive-through restaurant and convenience store are one-half retail); VMT is product of new trips per unit and average trip length.

Cost per Service Unit

There are two components to determining the average cost to add a unit of capacity to the major roadway system: the cost of constructing the roadway improvement, and the capacity added by the improvement. Roadway systems do not solely consist of travel lanes. Intersection configurations, signals, and signalization timing infrastructure are other critical components of vehicular capacity. Roadways also require rights-of-way and often multi-modal components, including sidewalks, bike lanes, and multi-use paths. These component costs are often included in improvements that add vehicular capacity.

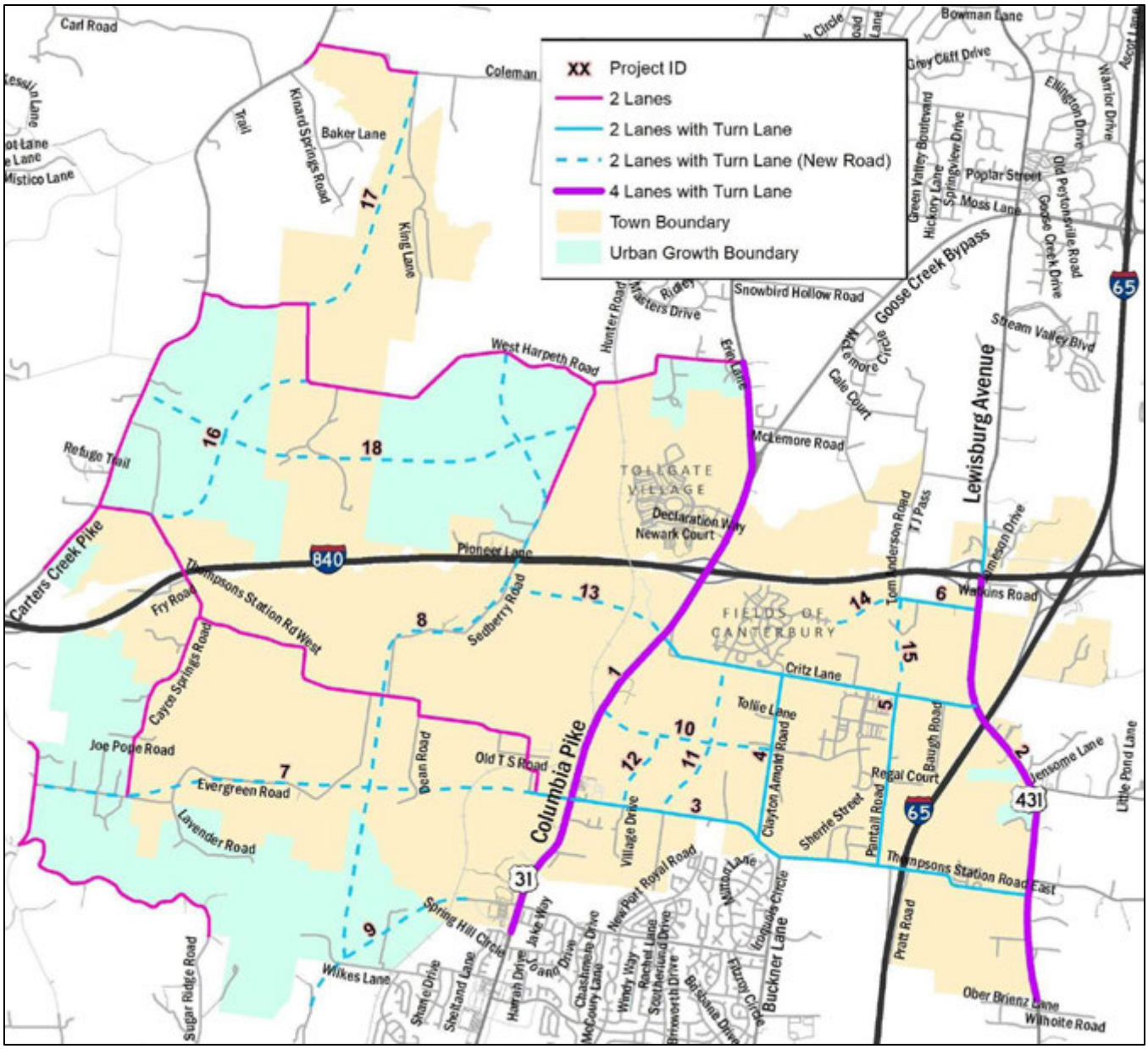
Supporting analysis for the *Major Thoroughfare Plan* (MTP) recently approved by the Planning Commission includes cost estimates for planned projects. These planning-level cost estimates, which include engineering, right-of-way and construction, were prepared by the Town's transportation consultant using Tennessee Department of Transportation cost estimation data and procedures. Planned MTP projects are summarized in Table 11 and illustrated in Figure 5.

Table 11. Major Thoroughfare Plan Projects

ID		Func.		No. of Lanes			New	
No.	Project	Class.	Miles	Ex.	Fut.	New	Ln/Mi.	Total Cost
1	Columbia Pike Widening	Arterial	4.59	2	5	3	13.77	$26,699,800
2	Lewisburg Pike Widening	Arterial	3.70	2	5	3	11.10	$25,818,100
3	Thompson's Stn Rd E Imprvmnts	Maj Coll	3.59	2	2	0	n/a	$17,895,800
4	Clayton Arnold Rd Improvements	Min Coll	1.26	2	2	0	n/a	$4,243,900
5	Pantall Road Improvements	Min Coll	1.29	2	2	0	n/a	$4,492,500
6	Tom Anderson Rd Improvements	Min Coll	0.61	2	2	0	n/a	$2,490,200
7	Evergreen Rd Realign//Extension	Maj Coll	4.05	2	2	0	n/a	$18,568,800
8	Sedberry Rd Realign/Extension	Maj Coll	5.32	2	2	0	n/a	$22,336,300
9	Buckner Road Extension	Maj Coll	1.53	0	3	3	5.00	$8,689,200
10	Columbia Pk-Clayton Arnold Connect	Min Coll	1.31	0	3	3	4.00	$6,622,300
11	Thompson's. Stn-Critz Ln Connector	Min Coll	1.24	0	3	3	4.00	$5,798,800
12	Thompson's. Stn-Project 10 Connector	Min Coll	0.61	0	3	3	2.00	$3,219,500
13	Critz Lane Extension	Min Coll	1.28	0	3	3	4.00	$6,882,400
14	Chaucer Park Lane Extension	Min Coll	0.58	0	3	3	2.00	$3,572,600
15	Critz-Tom Anderson Connector	Min Coll	0.73	0	3	3	2.00	$4,217,800
16	T.S. West-Harpeth Connector	Min Coll	1.80	0	3	3	5.00	$8,121,900
17	Harpeth -Coleman Connector	Min Coll	2.04	0	3	3	6.00	$9,058,900
18	Carters Cr.-Sedberry Connector	Min Coll	3.42	0	3	3	10.00	$13,700,100
19	Off-Street Greenways (Phase 1)	Greenwy	11.05	n/a	n/a	n/a	n/a	$11,050,000
20	Off-Street Greenways (Phase 2)	Greenwy	8.28	n/a	n/a	n/a	n/a	$8,280,000
21	Off-Street Greenways (Phase 3)	Greenwy	10.25	n/a	n/a	n/a	n/a	$10,250,000
Total			68.53					$222,008,900

Source: Barge Design Solutions, *Major Thoroughfare Plan, Appendix A: Recommended Improvement Projects* (not part of the adopted plan).

Figure 5. Locations of Major Thoroughfare Plan Projects



The average cost to add a vehicle-mile of capacity (VMC) is based on the cost estimates in the MTP for projects for which the capacity added can be readily determined. Most of these projects include greenways with multi-use paths. The weighted average cost is $319 per VMC.

Table 12. Average Cost per Vehicle-Mile of Capacity

ID No.	Project	Func. Class.	Miles	Capacity at LOS E Exist.	Future	New	New VMC	Total Cost	Cost/ VMC
1	Columbia Pike Widening	Arterial	3.39	18,700	35,300	16,600	56,274	$26,699,800	$474
2	Lewisburg Pike Widening	Arterial	3.70	18,700	35,300	16,600	61,420	$25,818,100	$420
9	Buckner Road Extension	Maj Coll	1.53	0	18,300	18,300	27,999	$8,689,200	$310
10	Columbia Pk-Clayton Arnold Connect	Min Coll	1.31	0	18,300	18,300	23,973	$6,622,300	$276
11	Thompson's. Stn-Critz Ln Connector	Min Coll	1.24	0	18,300	18,300	22,692	$5,798,800	$256
12	Thompson's. Stn-Project 10 Connector	Min Coll	0.61	0	18,300	18,300	11,163	$3,219,500	$288
13	Critz Lane Extension	Min Coll	1.28	0	18,300	18,300	23,424	$6,882,400	$294
14	Chaucer Park Lane Extension	Min Coll	0.58	0	18,300	18,300	10,614	$3,572,600	$337
15	Critz-Tom Anderson Connector	Min Coll	0.73	0	18,300	18,300	13,359	$4,217,800	$316
16	T.S. West-Harpeth Connector	Min Coll	1.80	0	18,300	18,300	32,940	$8,121,900	$247
17	Harpeth -Coleman Connector	Min Coll	2.04	0	18,300	18,300	37,332	$9,058,900	$243
18	Carters Cr.-Sedberry Connector	Min Coll	3.42	0	18,300	18,300	62,586	$13,700,100	$219
Total/Weighted Average			21.63				383,776	$122,401,400	$319

Source: Table 11, except capacities from Table 5.

The road cost per service unit (VMT) is the cost per VMC times the recommended VMC/VMT ratio of 1.25. The result is $399 per VMT, as shown in Table 13.

Table 13. Road Cost per Service Unit

Cost per Vehicle-Mile of Capacity (VMC)	$319
x Recommended VMT/VMC Ratio	1.25
Cost per Vehicle-Mile of Travel (VMT)	$399

Source: Cost per VMC from Table 13; recommended VMC/VMT ratio from Table 6.

Net Cost per Service Unit

As discussed in the Legal Framework chapter, revenue credits may be warranted for existing deficiencies, outstanding debt, and the availability of State/Federal funding. There are no existing deficiencies from the perspective of the updated road impact fees, because the fees are based on a level of service that is lower than what is currently provided to existing development. The Town does not have any outstanding debt related to past road capacity improvements.

No State/Federal funds are currently programmed in the current (FY 2017-2022) four-year Nashville Area Transportation Improvement Program for roads within the Town limits. Future State and Federal funding of capacity improvements to the major roadway system within the Town limits is hard to predict with any certainty. However, a reasonable guide is historical expenditures over the last decade in the more developed municipalities to the north and south. As summarized in Table 14, the average historical funding for capacity road improvements in Brentwood and Spring Hill results in the present-value equivalent of $211 per VMT. This amount will be used as an estimate of the anticipated future State/Federal funding that will be attributed to new development in Thompson's Station.

Table 14. Road State/Federal Funding Credit

Annual State Federal Funding per VMT, Brentwood	$7.79
Annual State Federal Funding per VMT, Spring Hill	$11.43
Average Annual State/Federal Funding per VMT	$9.61
x Present Value Factor (30 Years)	21.94
State/Federal Funding Credit per Daily VMT	$211

Source: State/Federal funding from Nashville Area Metropolitan Planning Organization, *Transportation Improvement Programs* from FY 2008-2017; present value based on a discount rate of 2.15%, which was the national average yield on AAA 30-year municipal bonds from fmsbonds.com on September 21, 2019.

The net cost per service unit is the cost per VMT less the revenue credit for State/Federal funding. As shown in Table 15, the net cost per service unit is $188 per VMT.

Table 15. Road Net Cost per Service Unit

Cost per Vehicle-Mile of Travel	$399
– State/Federal Funding Credit per VMT	-$211
Net Cost per Daily VMT	$188

Source: Net cost per VMT from Table 13; State/Federal funding credit from Table 14.

Net Cost Schedule

The updated road impact fees for the various land use categories are shown in Table 16. The impact fee calculation for each land use category is the product of daily VMT per development unit on the major roadway system and the net cost per VMT. This takes into account the average cost to add roadway capacity as well as future revenue that will be generated by new development to help offset those costs. The comparison of the updated fees with current fees is presented in the Executive Summary.

Table 16. Updated Road Impact Fees

Land Use Type	Unit	VMT/ Unit	Net Cost/ VMT	Net Cost per Unit
Single-Family Detached	Dwelling	19.11	$188	$3,593
Multi-Family	Dwelling	14.82	$188	$2,786
Mobile Home Park	Pad	10.12	$188	$1,903
Senior Adult Housing, Detached	Dwelling	8.62	$188	$1,621
Senior Adult Housing, Attached	Dwelling	7.49	$188	$1,408
Golf Course	Acre	5.47	$188	$1,028
Hotel/Motel	Room	11.86	$188	$2,230
Retail/Commercial/Shopping Center	1,000 sf	29.79	$188	$5,601
Restaurant, Standard	1,000 sf	57.15	$188	$10,744
Restaurant, Drive-Through	1,000 sf	127.15	$188	$23,904
Gas Station w/Convenience Mkt.	1,000 sf	49.33	$188	$9,274
Office/Institutional	1,000 sf	22.54	$188	$4,238
Elementary/Secondary School	1,000 sf	6.98	$188	$1,312
Community College	1,000 sf	15.76	$188	$2,963
Day Care Center	1,000 sf	18.55	$188	$3,487
Hospital	1,000 sf	17.42	$188	$3,275
Nursing Home	1,000 sf	10.62	$188	$1,997
Place of Worship	1,000 sf	11.27	$188	$2,119
Industrial	1,000 sf	8.46	$188	$1,590
Warehouse	1,000 sf	4.38	$188	$823
Mini-Warehouse	1,000 sf	3.78	$188	$711

Source: VMT per unit from Table 10; net cost per VMT from Table 15.

PARKS

This chapter calculates a potential new impact fee for parks and recreation facilities. The Town provides a number of park facilities for the benefit of residents and will need to expand those facilities as the population grows to maintain the current level of service.

Service Units

A service unit is a standardized measure of demand. The service unit for the park impact fees is the Equivalent Dwelling Unit (EDU). An EDU represents the average number of people residing in an occupied single-family detached dwelling unit. A single-family detached unit is, by definition, one EDU. The number of EDUs per dwelling unit for other housing types is the ratio of the average household size to the average household size of a single-family detached unit.

The only U.S. Census data available on average household size by housing type comes in the form of a 5% sample data set, which an aggregation of annual 1% samples over a five year period. The most recent sample was collected between 2013 and 2017. The published data combine single-family detached and attached units, but the underlying data can be analyzed for different housing types.

Unfortunately, the census data for the Town itself are unreliable, due to small sample sizes in the various categories. However, average household sizes in Williamson County as a whole should be reasonably representative of local conditions. The results of the analysis of the census sample data for Williamson County are shown in Table 17. Mobile home is grouped with single-family detached because it has too small a sample and the two have similar household sizes. Townhomes (single-family attached) clearly have an average household size that is much closer to other forms of multi-family (duplexes, apartments and condominiums) than to single-family detached units. Townhomes and other multi-family types are grouped together because their individual sample sizes are small. The key difference here is that single-family detached and mobile home units have an average household size of almost three people, while multi-family units have only two.

Table 17. Average Household Size by Housing Type, Williamson County

Housing Type	Sample Occ. Units	Weighted Persons	Weighted Occ. Units	Average HH Size
Single-Family Detached	3,222	176,285	59,409	2.97
Mobile Home	48	3,674	1,151	3.19
Single-Family Detached/MH	3,270	179,959	60,560	**2.97**
Multi-Family (except SF Att.)	261	19,185	9,348	2.05
Single-Family Attached	184	6,062	3,252	1.86
Multi-Family	445	25,247	12,600	**2.00**
Total	3,715	205,206	73,160	2.80

Source: U.S. Census Bureau, 2013-2017 American Community Survey 5% sample housing unit microdata for Williamson County, Tennessee.

As described above, park service units are expressed in terms of equivalent dwelling units (EDUs), based on the average number of residents compared to a single-family detached unit. A multi-family unit represents about two-thirds as many residents as a single-family unit, as shown in Table 18.

Table 18. Park Service Unit Multipliers

Housing Type	Average HH Size	EDUs/ Unit
Single-Family Detached/MH	2.97	1.00
Multi-Family	2.00	0.67

Source: Average household size from Table 17; EDUs/unit is ratio to single-family detached.

The number of existing service units is determined by multiplying the existing numbers of units of each housing type by its respective service unit multiplier and summing for all housing types. As shown in Table 19, the Town currently has an estimated 2,499 park service units.

Table 19. Existing Park Service Units

Housing Type	EDUs/ Unit	Existing Units	Existing EDUs
Single-Family Detached/MH	1.00	2,137	2,137
Multi-Family	0.67	540	362
Total			2,499

Source: EDUs per unit from Table 18; existing units from Table 28.

Cost per Service Unit

The Town currently provides 258 acres of park land, as summarized in Table 20.

Table 20. Existing Park Acres

Parks and Recreation Facility	Acres
Sarah Benson Park	25.52
Preservation Park	207.68
Gardens & Dog Park	20.92
Soccer Fields	4.13
Total Park Acres	258.25

Source: Town Planner, March 8, 2019.

Most of the existing park land is in Preservation Park. Based on the 2014 purchase of just over 100 acres, the land cost about $12,000 per acre, as shown below.

Table 21. Park Land Cost per Acre

2014 Preservation Park Purchase	$1,231,200
÷ Number of Acres	102.61
Cost per Acre	$11,999

Source: Town Finance Director, April 16, 2019.

Over the last several years, the Town has invested in several improvements to the parks, totaling about $836,000.

Table 22. Existing Park Improvements

Improvement	Year	Cost
Trails	2012	$25,298
Dog Park Improvements	2014	$111,547
Greenway Trail	2017	$648,255
Greenway Hiking Trail	2017	$50,782
Total Improvement Cost		$835,882

Source: Town Finance Director, April 17, 2019.

The total estimated replacement cost of the Town's existing parks is estimated to be about $4 million, as shown in Table 23. Dividing the replacement cost by existing service units yields a park cost of $1,574 per equivalent dwelling unit (EDU).

Table 23. Park Cost per Service Unit

Land Cost per Acre	$11,999
x Total Park Acres	258.25
Park Land Value	$3,098,742
Park Improvement Cost	$835,882
Total Park Replacement Value	$3,934,624
÷ Existing Service Units (EDUs)	2,499
Park Cost per EDU	$1,574

Source: Land cost per acre from Table 21; acres from Table 21; improvement cost from Table 22; existing EDUs from Table 19.

Net Cost per Service Unit

As described in the Legal Framework chapter, impact fees should be reduced by a credit to account for future revenues that will be generated by new development and used for the same facilities for which the fees are being charged. The Town has about $2.7 million in outstanding debt for the purchase of Preservation Park, as summarized in Table 24. New development will also be paying some of that debt with tax revenue that it will generate.

Table 24. Outstanding Park Debt

Debt Issuer	Date	Purpose	Orig. Amt.	Outstanding
First Farmers Bank	9/26/2013	Preservation Park - park/drip field	$1,153,000	$691,800
Franklin Synergy	5/13/2014	Hill Property - passive park/drip field	$1,000,000	$472,222
First TN Bank	3/2/2018	Preservation Park - wastwater/park facilities	$1,550,000	$1,550,000
Total			$3,703,000	$2,714,022

Source: Town Finance Director, March 8, 2019.

The cost per service unit has been calculated above based on the replacement value of all park facilities. An alternative level of service would be the cost per service unit that has been paid for by existing development. This would explicitly acknowledge that the Town's current parks have excess capacity to serve new development. However, the fee is the same either way, and the Town can use the fee revenue to either acquire and build new park facilities or pay some of the outstanding debt on existing facilities.

The debt credit is calculated as the amount of outstanding debt per service unit. Providing this credit puts new development on an equal footing with existing development. The amount of the credit is identified in Table 25.

Table 25. Park Debt Credit

Outstanding Park Debt	$2,714,022
÷ Existing Service Units (EDUs)	2,499
Park Debt Credit per EDU	$1,086

Source: Outstanding debt from Table 24; existing EDUs from Table 19.

Subtracting the debt credit from the cost per service unit yields the net cost per service unit. As shown in Table 26, the net cost to provide new development with the same level of service provided to existing development is $488 per service unit.

Table 26. Park Net Cost per Service Unit

Park Cost per Service Unit	$1,574
– Park Debt Credit per Service Unit	-$1,086
Net Park Cost per Service Unit	$488

Source: Cost per service unit from Table 23; debt credit from Table 25.

Net Cost Schedule

Park impact fees that reflect the current level of service are calculated in Table 27 by multiplying the service unit multipliers by the net cost per service unit (EDU).

Table 27. Park Net Cost Schedule

Housing Type	EDUs/ Unit	Net Cost/ EDU	Net Cost/ Unit
Single-Family Detached	1.00	$488	$488
Multi-Family	0.67	$488	$327

Source: EDUs per unit from Table 18; net cost per EDU from Table 26.

APPENDIX A: EXISTING LAND USE

Table 28. Existing Residential Units

Housing Type	2010 Units	2010-2018 Permits	2019 Estimate
Single-Family Detached	n/a	n/a	2,137
Multi-Family	n/a	n/a	540
Total	841	1,836	2,677

Source: 2019 total based on 2010 Census and residential building permits since 2010 from Town Planner, March 8, 2019; 2019 multi-family units from Town Planner; 2019 single-family detached is remainder.

Table 29. Existing Nonresidential Square Feet

Land Use Type	Sq. Feet
Retail/Commercial	246,162
Office	41,592
Industrial/Warehouse	168,228
Public/Institutional	777,270
Total Nonresidential Sq. Ft.	1,233,252

Source: Williamson County Property Assessor data for nonresidential non-tax-exempt uses; Town building permit records or scaled estimates of square footage from aerial photography for exempt uses.

APPENDIX B: LAND USE DEFINITIONS

Recommended definitions for the land use categories in the updated road impact fee schedule are provided below. These definitions are intended to assist Town staff in classifying proposed developments and assessing appropriate impact fees. If these definitions are adopted by ordinance or resolution, those that differ from or overlap with zoning or general definitions should have a disclaimer that they only apply to interpretation of the schedule for road impact fees.

Single-Family Detached means a building containing only one dwelling unit, including a mobile home not located in a mobile home park.

Multi-Family means a building containing two or more dwelling units. It includes duplexes, apartments, residential condominiums, townhouses, and timeshares.

Mobile Home/RV Park means a parcel (or portion thereof) or abutting parcels of land designed, used or intended to be used to accommodate two or more occupied mobile homes or recreational vehicles, with necessary utilities, vehicular pathways, and concrete pads or vehicle stands.

Hotel/Motel means a building or group of buildings on the same premises and under single control, consisting of sleeping rooms kept, used, maintained or advertised as, or held out to the public to be, a place where sleeping accommodations are supplied for pay to transient guests or tenants. This land use category includes rooming houses, boardinghouses, and bed and breakfast establishments.

Retail/Commercial/Shopping Center means an integrated group of commercial establishments planned, developed, owned or managed as a unit, or a free-standing retail or commercial use not otherwise listed in the impact fee schedule. Uses located on a shopping center outparcel are considered free-standing for the purposes of this definition. A retail or commercial use shall mean the use of a building or structure primarily for the sale to the public of nonprofessional services, or goods or foods that have not been made, assembled or otherwise changed in ways generally associated with manufacturing or basic food processing in the same building or structure. This category includes but is not limited to all uses located in shopping centers and the following free-standing uses:

Amusement park
Auto parts store
Auto wrecking yard
Automobile repair
Bank without drive-through facilities
Bar and cocktail lounge
Camera shop
Car wash
Convenience food and beverage store without gas pumps
Department store
Florist shop
Food store
Grocery

Hardware store
Health or fitness club
Hobby, toy and game shop
Junkyard
Laundromat
Laundry or dry cleaning
Lawn and garden supply store
Massage establishment
Music store
Newsstand
Nightclub
Racetrack
Recreation facility, commercial
Rental establishment
Repair shop, including auto repair
School, commercial
Specialty retail shop
Supermarket
Theater, indoor (including movie theater)
Used merchandise store
Variety store
Vehicle and equipment dealer

Gas Station with Convenience Market means an establishment offering the sale of motor fuels and convenience items to motorists.

Golf Course means a golf course that is not restricted primarily for use by residents of a residential development of which it is a part, including commercial uses such as pro shop or bar that are designed primarily to serve golfers on the site.

Office/Institutional means a general office, medical office or public/institutional use, as hereby defined, not located in a shopping center.

> **General Office** means a building exclusively containing establishments providing executive, management, administrative, financial, or non-medical professional services, and which may include ancillary services for office workers, such as a restaurant, coffee shop, newspaper or candy stand, or child care facilities. It may be the upper floors of a multi-story office building with ground floor retail uses. Typical uses include banks without drive-in facilities, real estate, insurance, property management, investment, employment, travel, advertising, secretarial, data processing, telephone answering, telephone marketing, music, radio and television recording and broadcasting studios; professional or consulting services in the fields of law, architecture, design, engineering, accounting and similar professions; interior decorating consulting services; and business offices of private companies, utility companies, trade associations, unions and nonprofit organizations. This category does not include an administrative office that is ancillary to a principal commercial or industrial use.

Medical Office means a building primarily used for the examination and/or treatment of patients on an outpatient basis (with no overnight stays by patients) by health professionals, and which may include ancillary services for medical office workers or a medical laboratory to the extent necessary to carry out diagnostic services for the medical office's patients. It includes the use of a site primarily for the provision of medical care and treatment of animals, which may include ancillary boarding facilities.

Public/Institutional means a governmental, quasi-public or institutional use, or a non-profit recreational use, not separately listed in the impact fee schedule. Typical uses include higher education institutions, city halls, courthouses, post offices, jails, libraries, museums, military bases, airports, bus stations, fraternal lodges, parks and playgrounds. It also includes bus terminals, fraternal clubs, adult day care centers, college dormitories, and prisons.

Restaurant, Standard means a stand-alone establishment, not located in a shopping center but may be located on an out-parcel, that sells meals prepared on site, and does not provide drive-through or drive-in service.

Restaurant, Drive-Through means a stand-alone establishment, not located in a shopping center but may be located on an out-parcel, that sells meals prepared on site, and provides drive-through or drive-in service.

Hospital means an establishment primarily engaged in providing medical, surgical, or skilled nursing care to persons, including overnight or longer stays by patients.

Nursing Home means an establishment primarily engaged in providing limited health care, nursing and health-related personal care but not continuous nursing services.

Place of Worship means a structure designed primarily for accommodating an assembly of people for the purpose of religious worship, including related religious instruction for 100 or fewer children during the week and other related functions.

Day Care Center means a facility or establishment that provides care, protection and supervision for six or more children unrelated to the operator and which receives a payment, fee or grant for any of the children receiving care, whether or not operated for profit. The term does not include public or nonpublic schools.

Elementary/Secondary School means a school offering an elementary through high school curriculum.

Industrial means an establishment primarily engaged in the fabrication, assembly or processing of goods. Typical uses include manufacturing plants, industrial parks, research and development laboratories, welding shops, wholesale bakeries, dry cleaning plants, and bottling works.

Warehouse means an establishment primarily engaged in the display, storage and sale of goods to other firms for resale, as well as activities involving significant movement and storage of products or equipment. Typical uses include wholesale distributors, storage warehouses, trucking terminals, moving and storage firms, recycling facilities, trucking and shipping operations and major mail processing centers.

Mini-Warehouse means an enclosed storage facility containing independent, fully enclosed bays that are leased to persons for storage of their household goods or personal property.

Phone: (615) 794-4333
Fax: (615) 794-3313
www.thompsons-station.com

1550 Thompson's Station Road W.
P.O. Box 100
Thompson's Station, TN 37179

DATE: January 14, 2020

TO: Board of Mayor and Aldermen

FROM: Wendy Deats, Town Planner/Micah Wood Interim Town Planner

SUBJECT: **Roderick Place Amendment to Approved Plan (CP 2019-002)**

On October 22, 2019, the Planning Commission reviewed the proposal and had concerns regarding mitigation for the impacts of the project. In addition, corrections to the density were required.

On October 29, 2019, the applicant, their traffic engineer, town staff including the town traffic engineer met to discuss the issues brought up at the Planning Commission.

On November 5, 2019, the applicant provided the following information via email:

1. *"Residential Density is 3 Units Per Acre based on the actual areas delineated residential on the future to be approved Preliminary plat.*
2. *Right of way will be dedicated along our entire frontage of Columbia Pike approximately 2600 lineal feet. The width to be determined by the state of Tennessee's construction drawings (when they become available).*
3. *A 60 foot right of way will be dedicated from Columbia Pike to the southeastern property line approximately as shown on the revised concept plan and the Major Thoroughfare plan.*
4. *See the attached Traffic Study recommendations and sketches.*
5. *Once the right of way is determined we will have the historic rock wall relocated.*
6. *See the attached projection of Permit and Road Impact fees that we will pay."*

The Town's traffic engineer has reviewed the information submitted from the developer and recommends that the planning documents be modified to show only one full movement access point on Columbia Pike (US 31) and that any other site driveways be shown as right in/right out movement driveways.

On November 13, 2019, the applicant also provided the following additional information for further clarification on their project via email:

"We can build the 2007 existing plan because it is vested, in addition the Planning Commission reapproved the Site plan for lots 1 - 4 of our approved partial preliminary plat.

It does not provide for:
1. *Access dedication to all adjacent property owners.*
2. *A collector road 60' ROW dedication consistent with the new major thoroughfare plan.*
3. *Dedication of right away for the widening of Columbia Pike / US 31.*
4. *Repairing, keeping or moving the existing historic rock wall along Columbia Pike / US 31.*
5. *Keeping approximately 2 acres of old growth Trees, Including beautiful magnolias, maples and oaks.*

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Thompson's Station, TN 37179

Our proposed amendment does, it additional allows us to provide:

1. *A multi purpose, meeting hall, theater and event venue by keeping the existing appx 6,000 square foot event building.*
2. *A longer and wider Vista along Columbia Pike by relocating approximately 2 acres of open space. It will provide for a larger active park with trails and hardscape.*
3. *Less mass grading.*
4. *Future space for a Williamson County Enrichment Center."*

Staff did request the developer consider and plan for additional connections, including a future "collector" in order to provide better connectivity and improve the transportation system in accordance with the major thoroughfare plan. Staff does agree that preserving additional trees and keeping the scenic vista, including the repair of the historic rock wall is advantageous and will improve the aesthetics and protect history.

On November 19, 2019, the Planning Commission reviewed the additional information and is recommending the project with the following contingencies:

1. The project density shall be three (3) units per acre based on the total land area for the residential uses with 45% open space.
2. The project shall maintain 50% open space within the commercial designated area.
3. The project shall include the ST 50-26 for the local roadway and ST 60 -36 for the collector roadway and street lighting accordance with the Land Development Ordinance.
4. The mitigation/recommendations for traffic improvements shall be incorporated into the traffic study and shall be incorporated into the project.
5. A tree inventory and replacement plan shall be developed and considered during plat review before the Planning Commission.
6. All future plats and site plans shall conform to the general regulations set forth within the approved pattern book and all applicable standards with the Land Development Ordinance.

Attachments
Roderick Concept Plan dated 11-26-19
Roderick Traffic Study dated December 2019
Roderick Redlined Pattern Book & Revised Pattern Book dated November 2019

ORDINANCE NO. 2020-001

AN ORDINANCE OF THE BOARD OF MAYOR AND ALDERMEN OF THE TOWN OF THOMPSON'S STATION, TENNESSEE TO APPROVE AN AMENDED SPECIFIC PLAN CONCEPT PLAN FOR RODERICK PLACE

WHEREAS, Roderick Place is a 79.9-acre site along Columbia Pike / U.S. 31 and is zoned Specific Plan in accordance with the zoning ordinance in effect at that time it was rezoned (Ord. 06-014); and

WHEREAS, the Town approved in 2007 a Specific Plan Concept Plan for Roderick Place; and

WHEREAS, the developer/owner of Roderick Place has submitted an Amended Specific Plan Concept Plan for Roderick Place; and

WHEREAS, the Town of Thompson's Station Planning Commission recommended approval of the Amended Specific Plan Concept Plan for Roderick Place at its November, 2019 regular meeting and has recommended the same to the Board of Mayor and Aldermen; and

WHEREAS, the Board of Mayor and Aldermen of the Town of Thompson's Station has determined that the Amended Specific Plan Concept Plan for Roderick Place is consistent with the General Plan and the newly adopted Major Thoroughfare Plan and will not have a deleterious effect on surrounding properties or the Town as a whole.

NOW, THEREFORE, BE IT ORDAINED by the Board of Mayor and Aldermen of the Town of Thompson's Station, Tennessee, as follows:

Section 1. That the previously approved Specific Concept Plan for Roderick Place within the Town of Thompson's Station, Tennessee is hereby amended and revised by repealing the previously approved plans and replacing the same with the Amended Specific Plan Concept Plan attached hereto and incorporated herein as Exhibit "A", subject to the conditions set forth in Section 2 below. The zoning for this territory shall remain Specific Plan (SP) and any further changes shall be subject to review by the Board of Mayor and Aldermen in accordance with the SP requirements.

Section 2. The following conditions, agreed to by the owner/developer of Roderick Place, shall apply to the Amended Specific Plan Concept Plan:

1. The project density shall be three (3) units per acre based on the total land area for the residential uses with 45% open space.
2. The project shall maintain 50% open space within the commercial designated area.
3. The project shall include the roadway cross sections and street lighting accordance with the Land Development Ordinance.
4. The mitigation and recommendations for traffic improvements shall be incorporated into the traffic study and shall be incorporated into the project.
5. A tree inventory and replacement plan shall be developed and considered during plat review before the Planning Commission.

6. All future plats and site plans shall conform to the general regulations set forth within the approved pattern book and all applicable standards with the Land Development Ordinance.

Section 2. This ordinance shall take effect immediately upon the publication of its caption in a newspaper of general circulation after final reading by the Board of Mayor and Aldermen, the public welfare requiring it.

Duly approved and adopted by the Board of Mayor and Aldermen of the Town of Thompson's Station, Tennessee, on the _____ day of _____, 2020.

_____
Corey Napier, Mayor

ATTEST:

_____
Regina Fowler, Town Recorder

Passed First Reading: _____

Passed Second Reading: _____

Submitted to Public Hearing on the ____ day of _____, 2020, at 7:00 p.m., after being advertised in the *Williamson AM* Newspaper on the ____ day of _____, 2020.

Recommended for approval by the Planning Commission on the ____ day of _____, 2018.

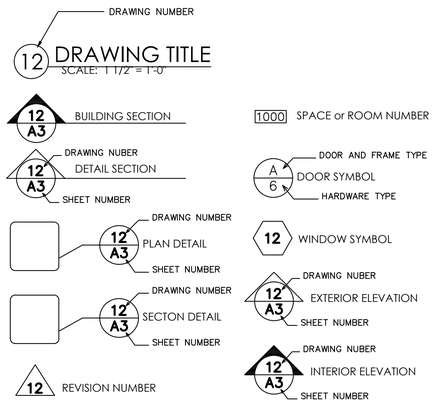
APPROVED AS TO FORM AND LEGALITY:

_____
Town Attorney

RODERICK PLACE
CONCEPTUAL SITE PLAN

4630 COLUMBIA PIKE
THOMPSON'S STATION, TENNESSEE

SYMBOLS LEGEND



DEVELOPER

Sampson J/V
144 Southeast Parkway, Suite 230
Franklin, TN. 37064
Jay Franks: 615.300.0001
E: jfranks130@gmail.com

OWNER

Leon C. Heron Jr.
Chief Manger / Sole Member
KMK Acres, LLC.
2655 Ranch Club Blvd.
Myakka City, FL. 34251
E: angus1600@comcast.net

PROGRAM MANAGEMENT:

BINKLEY DESIGNED, LLC.
144 Southeast Parkway, Suite 230
Turner Binkley: 407.459.9344
E: turner@binkleydesigned.com

ARCHITECT

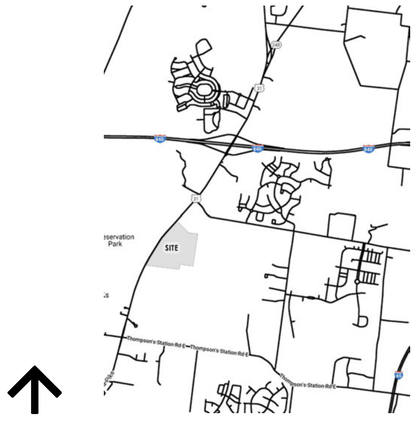
ED BINKLEY, AIA.
144 Southeast Parkway, Suite 230
Franklin, TN. 37064

I hereby certify that these plans and specifications have been prepared by me or under my supervision. I further certify that to the best of my knowledge these plans and specifications are as required by law and in compliance with applicable codes and the 2015 IBC.

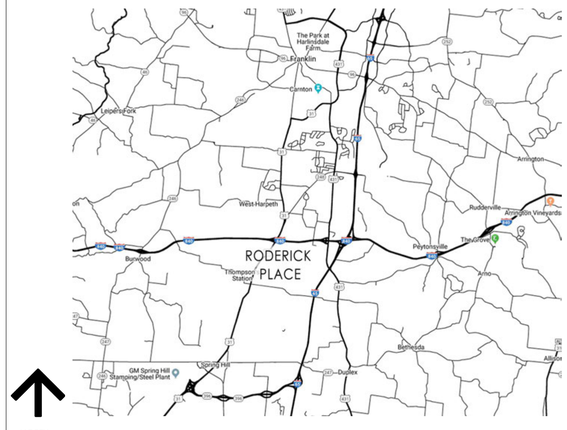
INDEX OF DRAWINGS

APPROVALS

LOCATION MAP:



VICINTY MAP:



BUILDING CODE LOCATION

Building Code information, Occupancy information and Life Safety Data is shown on Sheet BC1.0 are provide to completely delineate the component design of the buildings.

ARCHAEOLOGICAL

Glyn D. DuVall, M.A.
Archaeological Consultant
5371 leiper's Creek Road
Franklin, TN 37064

SOILS ENGINEER

Terra Nova Engineering
170D East Main Street #124
Hendersonville, TN 37075

CIVIL ENGINEER

Energy Land & Infrastructure
1420 Donelson Pike, Suite A12
Nashville, TN 37217

BINKLEY DESIGNED
144 SOUTHEAST PKWY.
SUITE 230
FRANKLIN TN.
37064

RODERICK PLACE
CONCEPTUAL SITE PLAN
THOMPSON'S STATION, TENNESSEE

ISSUE 07.19.19
RE-ISSUE 11.26.19

PROJECT RODERICK PLACE

DEVELOPER
SAMSON J/V
144 SOUTHEAST PKWY. SUITE 230
FRANKLIN TN. 37064

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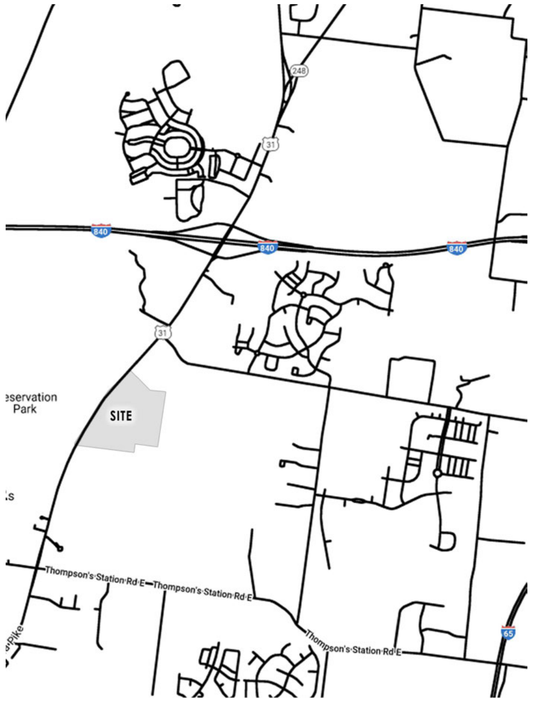
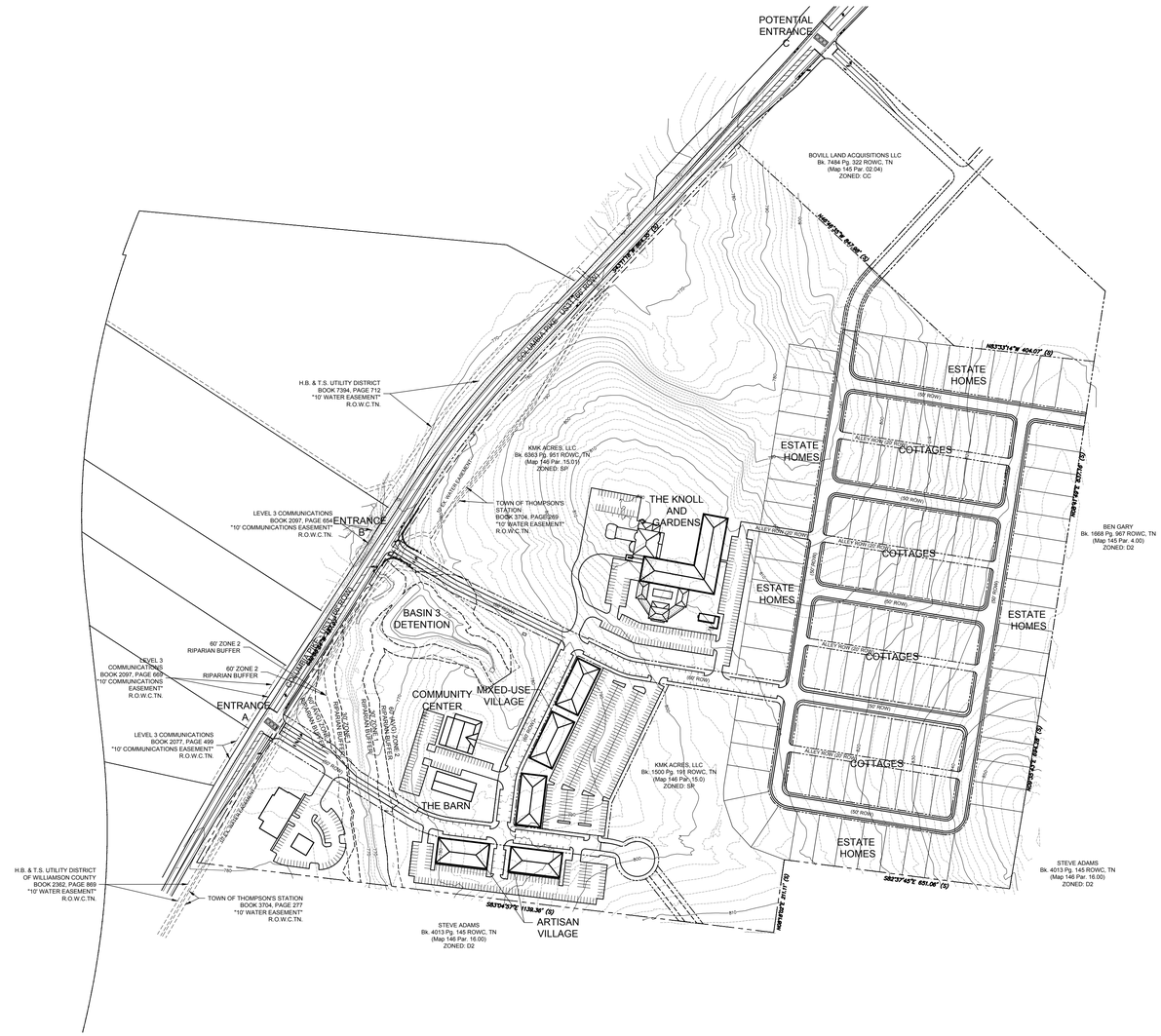


SITE LOCATION MAP

SCALE: 1"=2000'-0"



CONCEPT PLAN

0 200 400 600 feet

N

Master Plan Tabular Data

Existing Zoning: High Intensity District
Gross Site Area: 79.90 AC

Requirements of Proposed Zoning: Specific Plan, High Intensity District (Cluster Option)
- General Plan Requirements:
-Maximum Density: 3.00 DU/AC
-Maximum Height: 3 Stories
-Required Open Space: 40% Residential | 50% Commercial
-Minimum Site Area: 10 Acres
-Maximum Site Area: 100 Acres
-Area Permitted as Residential: 100%
-Area Permitted as Commercial: 100%

Density:

-Gross Permitted Density:	3.00 DU/AC
-Total Residential:	211 Units
-Estate Lots:	54 Units
-Cottage Lots:	72 Units
-Multistory dwellings/ live work:	85 Units
-Total Commercial:	129,367 S.F.
-Event Center & Historic Barn:	13,500 S.F.
-Hotel w/ Senior Residences:	92 Units
-Senior Living (IL,AL,ALZ):	100 Beds

Open Space:
-Total Land Area: 79.90 Acres
-Total Commercial Area: 9.26 Acres X 50% = 4.63 Acres
-Total Residential Area: 70.64 Acres X 40% = 28.25 Acres
-Total Required Open Space: 32.88 Acres
-Total Provided Open Space: 35.80 Acres

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RODERICK PLACE
CONCEPTUAL SITE PLAN
THOMPSON'S STATION, TENNESSEE

ISSUE 07.19.19
RE-ISSUE 11.26.19

PROJECT RODERICK PLACE

DEVELOPER
SAMSON J/V
144 SOUTHEAST PKWY. SUITE 230
FRANKLIN TN. 37064

CP

01

PHASING PLAN

0 200 400 600 feet

N

NOTE: SUBJECT TO CHANGE

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RODERICK PLACE
CONCEPTUAL SITE PLAN
THOMPSON'S STATION, TENNESSEE

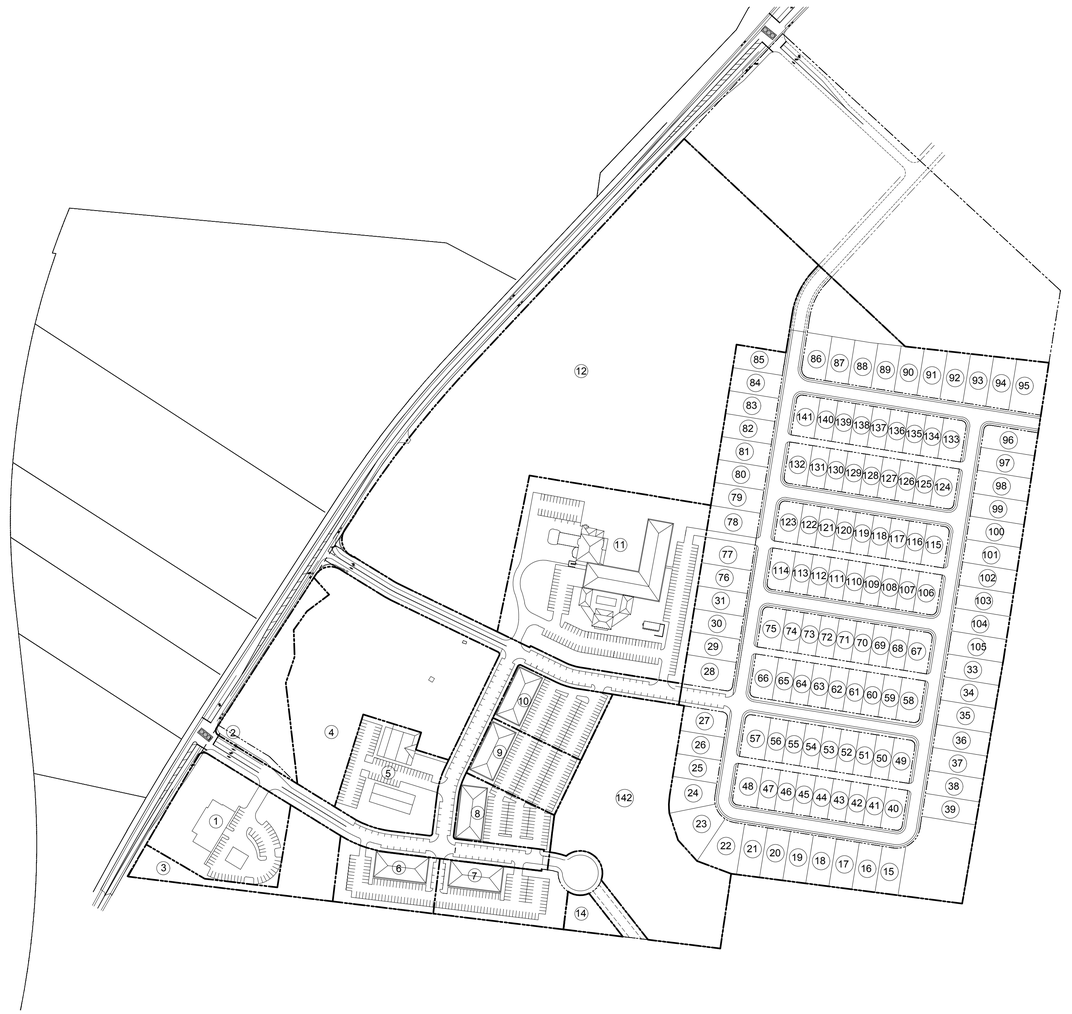
ISSUE 07.19.19
RE-ISSUE 11.26.19

PROJECT RODERICK PLACE

DEVELOPER
SAMSON J/V
144 SOUTHEAST PKWY. SUITE 230
FRANKLIN TN. 37064

CP

02



CONCEPT LOT PLAN

0 200 400 600 feet

N

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FRANKLIN TN.
37064

RODERICK PLACE
CONCEPTUAL SITE PLAN
THOMPSON'S STATION, TENNESSEE

ISSUE 07.19.19

RE-ISSUE 11.26.19

PROJECT RODERICK PLACE

DEVELOPER
SAMSON J/V
144 SOUTHEAST PKWY. SUITE 230
FRANKLIN TN. 37064

CP

CONCEPT NATURAL RESOURCES PLAN PLAN

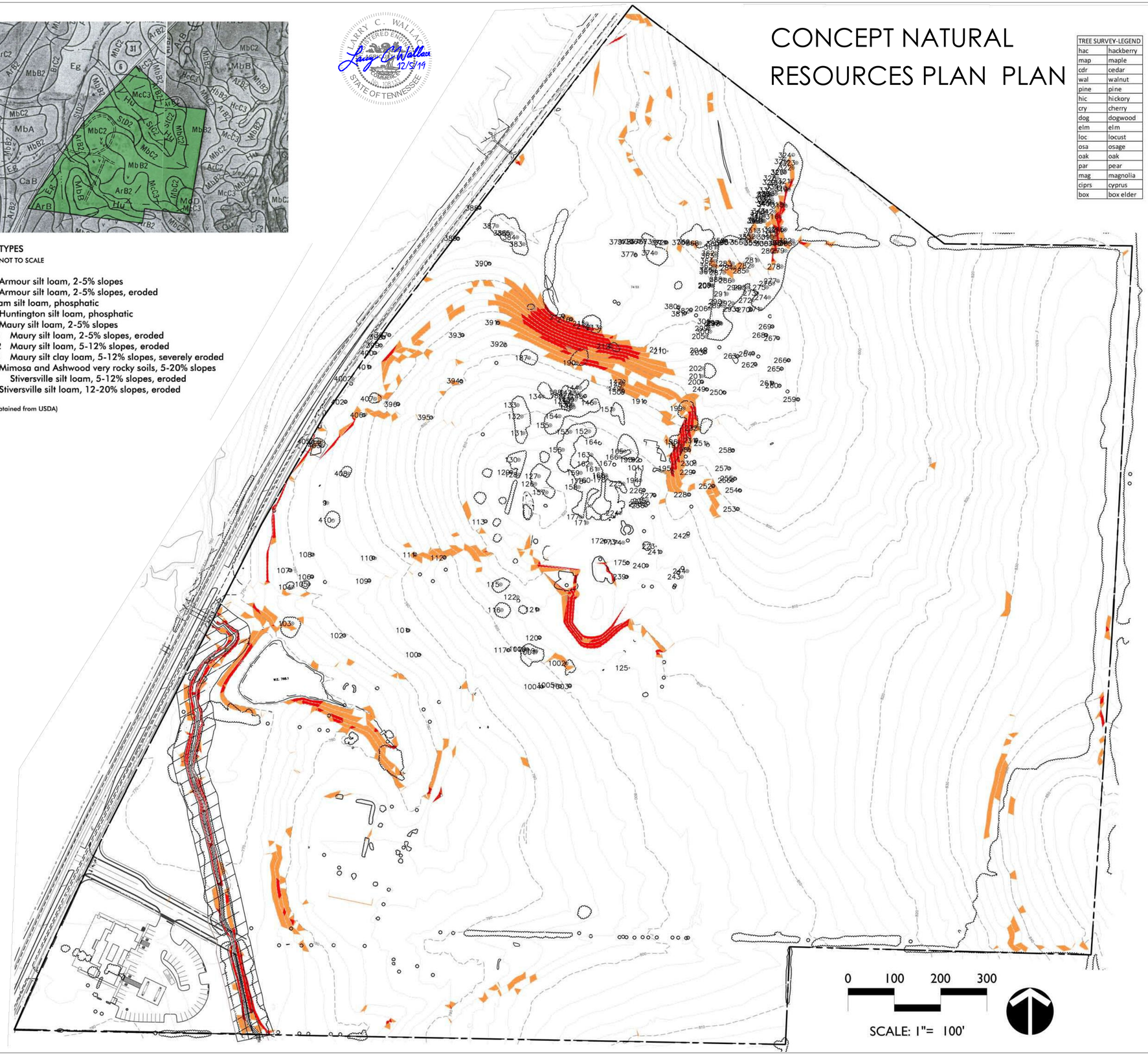
SOIL TYPES

IMAGE NOT TO SCALE

ArB Armour silt loam, 2-5% slopes
ArB2 Armour silt loam, 2-5% slopes, eroded
Eg Egam silt loam, phosphatic
Hu Huntington silt loam, phosphatic
MbB Maury silt loam, 2-5% slopes
MbB2 Maury silt loam, 2-5% slopes, eroded
MbC2 Maury silt loam, 5-12% slopes, eroded
McC3 Maury silt clay loam, 5-12% slopes, severely eroded
MoD Mimosa and Ashwood very rocky soils, 5-20% slopes
StC2 Stiversville silt loam, 5-12% slopes, eroded
StD2 Stiversville silt loam, 12-20% slopes, eroded

(Data obtained from USDA)

LARRY C. WALLACE
REGISTERED ENGINEER
12/5/19
STATE OF TENNESSEE



0 100 200 300

SCALE: 1"= 100'

TREE SURVEY-LEGEND	
hac	hackberry
map	maple
cdr	cedar
wal	walnut
pine	pine
hic	hickory
cry	cherry
dog	dogwood
elm	elm
loc	locust
osa	osage
oak	oak
par	pear
mag	magnolia
cipr s	cyprus
box	box elder

TREE SURVEY-POINT DESCRIPTION

Point #	Description	Point #	Description	Point #	Description	Point #	Description
100	51 hac	201	24 hac	302	14 elm	389	22 wal
101	60 tree	202	12 hac	303	28 wal	390	20 map
102	6 map	203	12 elm	304	16 wal	391	12 hic
103	36 cdr	204	22 hac	305	10 hac	392	18 oak
104	10 cipr s	205	20 wal	306	20 hac	393	6 par
105	10 cipr s	206	20 hac	307	10 hac	394	14 oak
106	12 hac	207	20 wal	308	14 hac	395	6 oak
107	15 map	208	16 hac	309	10 wal	396	10 map
108	17 oak	209	8 hac	310	6 hac	397	20 wal
109	10 red map	210	24 hac	311	20 wal	398	18 wal
110	60 hic	211	26 hac	312	30 map	399	6 dog clust
111	11 cry	212	10 map clust	313	12 wal	400	6 dog clust
112	16 cry	213	20 hac	314	8 hac tri	401	8 dog tri
113	25 tree	214	24 wal	315	12 elm	402	6 par
114	25 wall	215	18 hac	316	10 hac	403	28 hac
115	14 map	216	24 hac	317	10 hac	404	30 hac
116	16 map	217	28 hac	318	18 hac	405	12 dog
117	14 wal	226	20 wal	319	10 hac	406	12 cry
118	16 pine	227	18 wal	320	10 hac	407	8 mag
119	18 map	228	38 hac	321	24 hac	408	12 oak
120	16 wal	229	18 hac	322	24 cry	410	8 mag clust
121	21 hic	230	18 hac	323	32 hac		
122	12 map clust	231	12 wal	324	28 hac		
126	17 mag	232	24 elm	325	8 hac		
127	48 mag	235	16 wal	326	6 hac		
128	22 wal	236	22 wal	327	26 hac		
129	18 hac	237	8 wal	328	18 hac		
130	24 mag twn	238	14 wal	329	26 wal		
131	46 hic	239	16 wal	330	20 wal		
132	17 pine	240	8 map	331	12 hac		
133	50 hol clust	241	8 map	332	14 hac tri		
134	52 hic	242	20 wal	333	14 hac		
135	15 wal	243	22 wal	334	12 hac		
136	15 wal	244	20 wal	335	8 hac twn		
137	15 wal	249	24 wal	336	14 hac		
138	12	250	24 wal	337	6 hac		
139	16 wal	251	26 wal	338	8 hac		
140	7 wal	252	20 wal	339	20 hac		
141	7 wal	253	26 wal	340	12 hac twn		
142	14 wal	254	24 wal	341	20 hac		
143	14 wal	255	22 wal	342	10 elm		
144	36 wal	256	16 wal	343	8 hac		
145	36 wal twn	257	22 wal	344	12 hac		
146	24 map clust	258	28 wal	345	30 hac		
147	24 wal	259	28 wal	346	8 hac		
148	6 wal	260	18 wal	347	12 hac		
149	10 wal	261	22 wal	348	14 oak		
150	72 wal clust	262	18 wal	349	16 hac		
151	17 map	263	20 wal	350	6 hac twn		
152	10 map	264	24 wal	351	12 hac tri		
153	15 map	265	24 wal	352	16 hac twn		
154	15 map	266	24 wal	353	16 map		
155	15 hic	267	26 wal	354	12 wal		
156	25 elm	268	26 wal	355	10 hac		
157	60 hic	269	26 wal	356	12 hac		
158	10 box	270	28 wal	357	16 hac		
159	40 mag clust	271	15 wal	358	12 hac		
160	16 mag clust	272	32 hac	359	14 hac		
161	10 pine	273	16 hac	360	12 cry		
162	10 map	274	16 wal	361	18 wal		
163	8 wal	275	6 loc	362	14 hac		
164	20 dog clust	276	24 wal	363	20 hac		
165	24 wal	277	8 osa clust	364	14 hac		
166	24 wal	278	18 wal	365	14 hac twn		
167	18 wal	279	20 elm	366	16 hac		
168	16 wal	280	18 hac	367	14 hac		
169	8 wal	281	16 wal	368	34 hac		
170	24 wal	282	16 hac	369	26 hac		
171	8 dog	283	12 wal	370	14 hac		
172	30 hic	284	16 wal	371	26 hac		
173	14 map	285	28 hac	372	14 hac		
174	32 wal	286	12 wal	373	32 hac		
175	24 wal	287	8 wal	374	20 osa twn		
187	10 mag clust	288	12 wal	375	28 hac		
188	12 wal	289	16 wal	376	22 hac		
189	10 wal	290	18 wal	377	40 wal		
190	22 oak	291	14 wal	378	30 hac		
191	18 map	292	14 wal	379	26 hac		
192	20 wal	293	28 hac	380	12 hic		
193	18 wal	294	12 wal	381	24 hac		
194	20 mag	295	18 hac	382	26 elm		
195	30 wal	296	14 hac	383	20 pine		
196	18 map	297	12 hac	384	16 pine		
197	22 map	298	18 hac	385	16 pine		
198	24 hac	299	18 hac	386	16 pine		
199	30 map	300	24 hac	387	20 pine		
200	24 elm	301	14 hac twn	388	22 wal		

SLOPE ANALYSIS			
NUMBER	COLOR	RANGE BEG.	RANGE END
1		15.00%	24.99%
2		25.00%	100.00%

ENERGY LAND & INFRASTRUCTURE
1420 EXECUTIVE PARK DRIVE, SUITE 210
OFFICE 615-383-6300 • WWW.ELI-LLC.COM
ENGINEERS • SURVEYORS • INFRASTRUCTURE • ENVIRONMENTAL

RODERICK PLACE
CONCEPTUAL SITE PLAN
THOMPSON'S STATION, TENNESSEE

ISSUE 07.19.19
RE-ISSUE 08.07.19

PROJECT RODERICK PLACE

OWNER
SAMSON J/V
144 SOUTHEAST PKWY. SUITE 230
FRANKLIN TN. 37064

C

1.0

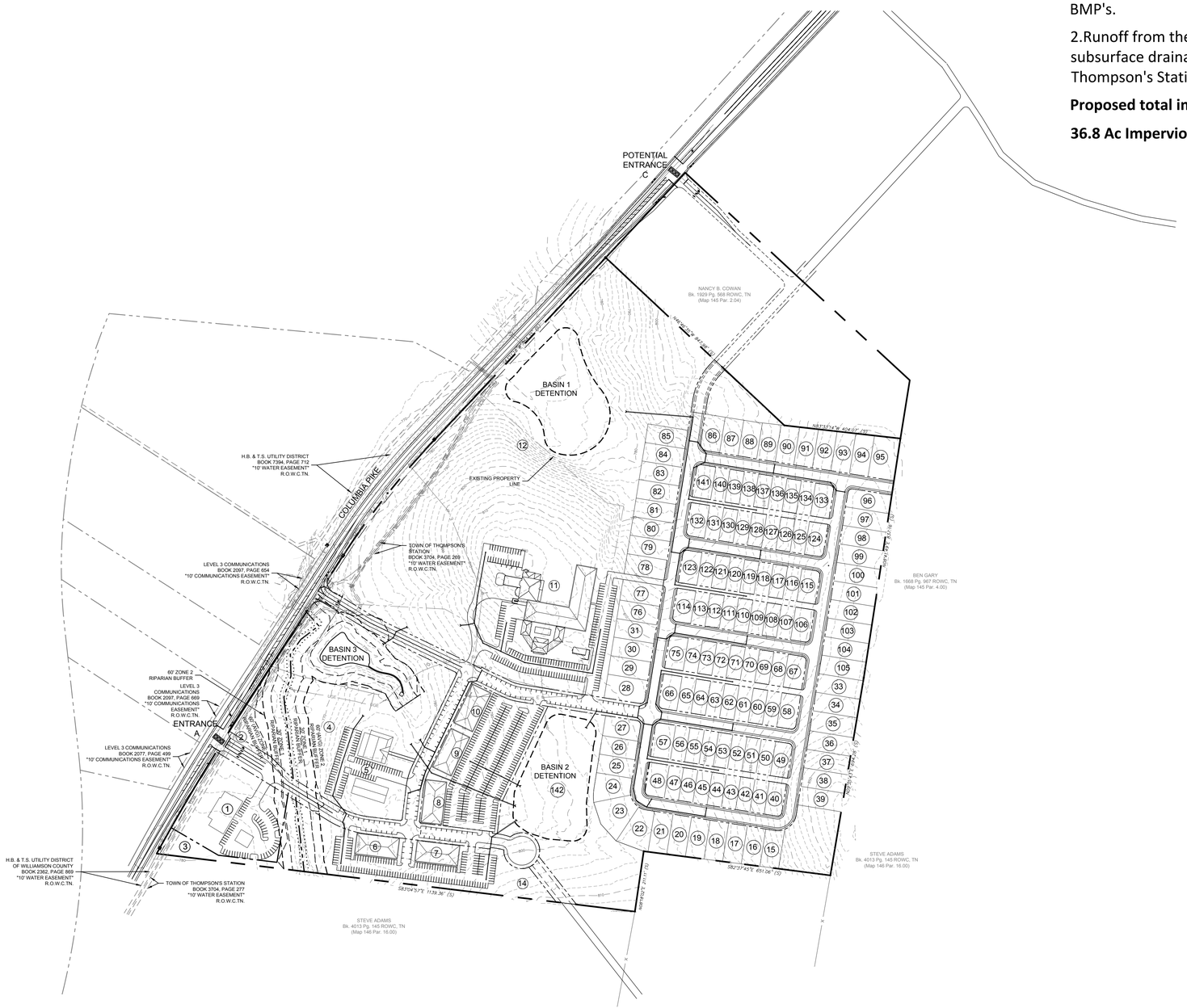
STORMWATER NARRATIVE

1.The additional impervious area to this site will be treated using approved BMP's.

2.Runoff from the impervious areas will either sheet flow or be collected in subsurface drainage networks. All discharges will meet or exceed the Town of Thompson's Stations stormwater requirements.

Proposed total impervious area = 36.8 Acres

36.8 Ac Impervious / 79.9 Ac Total = ±46%



ENERGY LAND & INFRASTRUCTURE
1420 DONELSON PIKE, SUITE A-12, NASHVILLE, TN 37217
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RODERICK PLACE
CONCEPTUAL SITE PLAN
THOMPSON'S STATION, TENNESSEE

LARRY C. WALLACE
REGISTERED ENGINEER
12/5/19
No. 108133
STATE OF TENNESSEE

CONCEPT STORMWATER PLAN

0 200 300 400 feet

N

ISSUE 07.19.19
RE-ISSUE 08.07.19

PROJECT RODERICK PLACE

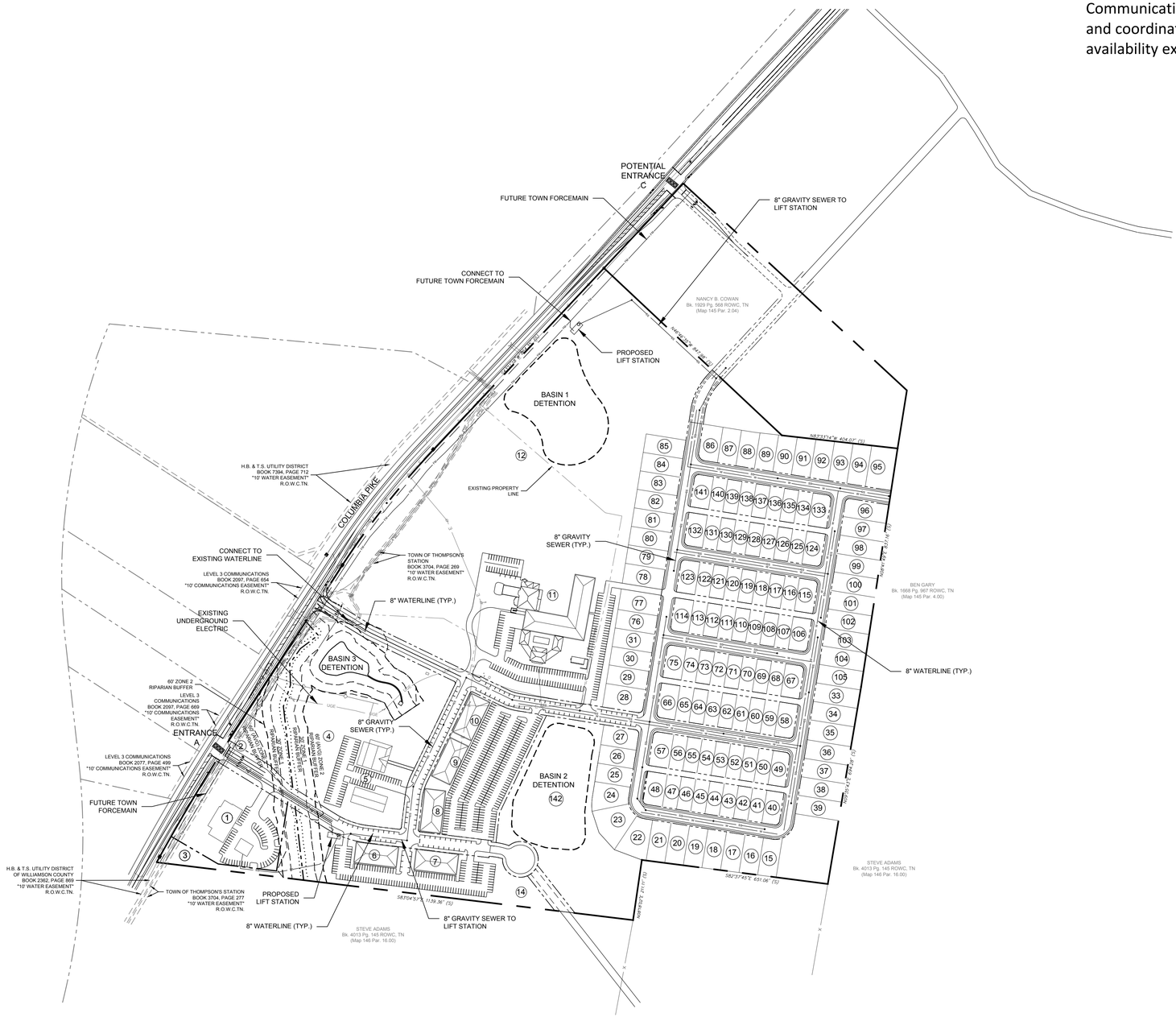
OWNER
SAMSON J/V
144 SOUTHEAST PKWY. SUITE 230
FRANKLIN TN. 37064

C

3.0

UTILITY NARRATIVE

Communications with outside utility providers (ATMOS, HB&TS, MTEMC) and coordination with Thompson's Station (Sewer) have indicated that availability existing to meet anticipated demands.



LARRY C. WALLACE
REGISTERED ENGINEER
12/9/19
STATE OF TENNESSEE

CONCEPT UTILITY PLAN

0 200 300 400 feet

N

ENERGY LAND & INFRASTRUCTURE
1420 CENTERPOINT BLVD. SUITE 1 KNOXVILLE, TN 37932
OFFICE 615-383-6300 • WWW.ELI-LLC.COM
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RODERICK PLACE
CONCEPTUAL SITE PLAN
THOMPSON'S STATION, TENNESSEE

ISSUE 07.19.19
RE-ISSUE 08.07.19

PROJECT RODERICK PLACE

OWNER
SAMSON J/V
144 SOUTHEAST PKWY. SUITE 230
FRANKLIN TN, 37064

C

5.0

RODERICK PLACE

SPECIFIC PLAN AMENDMENT

CONCEPT PLAN AMENDMENT PROPOSAL
(HOW IT COMPARES TO THE ORIGINAL APPROVED 2007 CONCEPT PLAN)

R O D E R I C K P L A C E

SPECIFIC PLAN - ZONING REQUEST

October 2, 2007

Board of Mayor and Alderman,

This is a request to amend the 2007 Specific Zone Plan for Roderick Place. This will allow us to develop the property with a plan that is current in today's market. The existing approved plan does not provide for:

- Access dedication to all adjacent property owners.
- A collector road 60' right of way dedication consistent with the new major thoroughfare plan.
- Dedication of right of way for the widening of Columbia Pike / US 31.
- Dedication of a portion of right of way needed for the future sewer force main from the existing pump station in front of Thompson's Station Baptist Church to the existing TDOT stub out.
- Repairing, keeping or moving the existing historic rock wall along Columbia Pike / US 31.
- Preserving approximately 2 acres of old growth Trees, Including beautiful magnolias, maples and oaks.

This proposed amendment **does include the above items**, and allows us to additionally provide:

- A multi purpose, meeting hall, theater and event venue by keeping the existing appx 6,000 square foot event building.
- A longer and wider Vista along Columbia Pike by relocating approximately 2 acres of open space. It will provide for a larger active park with trails and hardscape .
- Less mass grading.
- Future space for a Williamson County Enrichment Center.

Thank you for your consideration.

Best regards,

Jay Franks

TABLE OF CONTENTS

~~C&L Development, LLC~~
~~P.O. Box 241~~
~~Thompsons Station, TN 37179~~
~~V:615.595.5877~~

LandDesign.
135 Second Avenue N.
Franklin TN, 37064
V:615.591.7164

SUTTLE MINDLIN
ARCHITECTURE + MASTER PLANNING + INTERIOR DESIGN
345 Marshall Avenue
Suite 102
St. Louis, Missouri 63119
V: 314.961.0102

Survey provided by:
LandDesign Survey
135 Second Avenue N.
Franklin TN, 37064
V:615.591.7164

Topographic information provided by:
Paul A Badr
Independent Mapping consultants, inc.
8037 Corporate Center Drive Suite 300
Charlotte NC 28226
V:704.540.0087

The envisioning book for the Roderick Place Specific Plan Zoning Request was originally submitted on August 23, 2006.

The plan and envisioning book were resubmitted on October 2, 2007 for consideration at the Planning Commission meeting on October 15, 2007.

Samson J/V
144 Southeast Parkway 230
Franklin, TN, 37064
Jay Franks: 615.300.0001

KCI Technologies Inc.
Traffic Engineer
1101 17th Ave S.
Nasvhille , TN, 37212
Robert Murphy:
Email: robert.murphy@kci.com

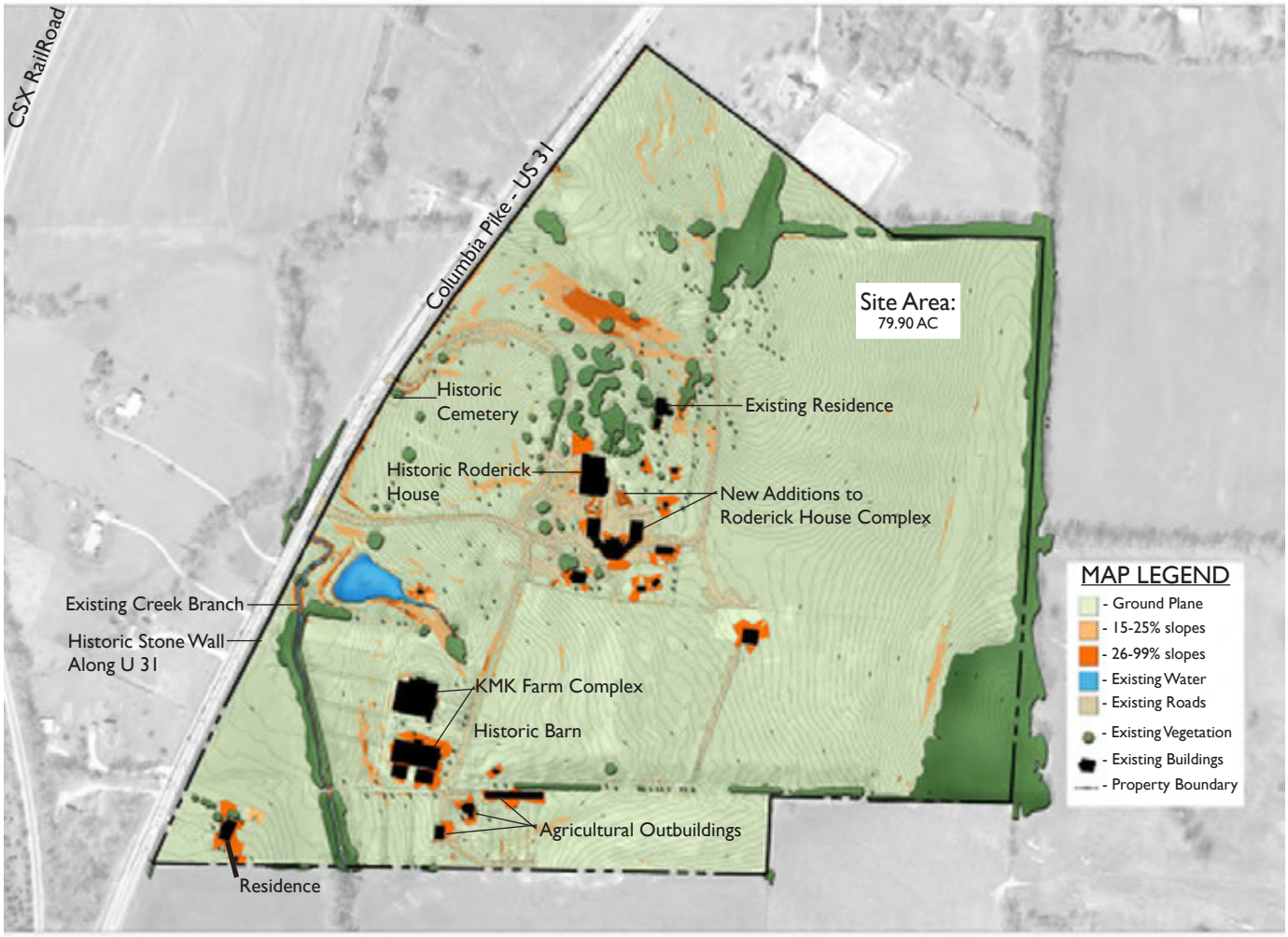
Energy Land & Infrastructure
Civil Engineer
1420 Donelson Pike Suite A12
Nasvhille , TN, 37217
Michael Ray: 615.440.7956
Email: micheal.ray@eli-llc.com

Binkley Designed, LLC.
4630 Columbia Pike
Thompson's Station, TN, 37179
Turner Binkley: 407.459.9344

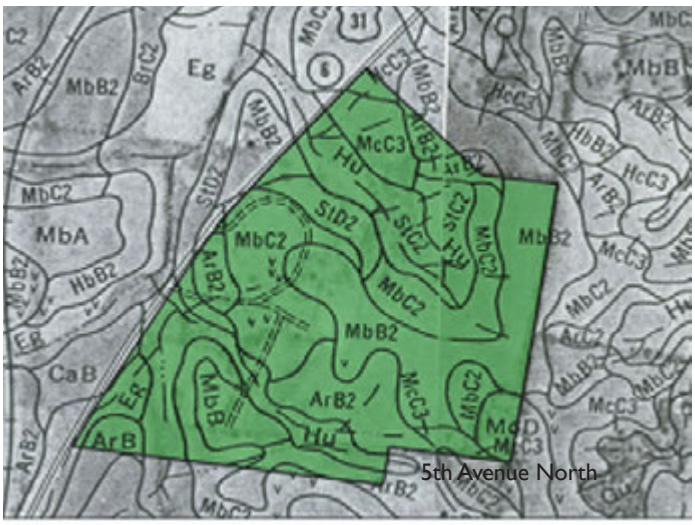
History of Roderick Farm

During the Civil War, at the Battle of Thompson's Station, noted General Nathan Bedford Forrest's horse, Roderick, was killed in effort to stand with the General. Roderick Farm is named for that horse. Roderick Place is located on a small portion of the original Roderick Farm Property which consisted of some three thousand acres belonging to Spencer Buford. A number of the site's historic elements will be retained as Roderick Place develops. Spencer Buford and his wife built the existing Federal Style home in 1801. This house is the focal point of the entire project. Existing stone walls, mature tree stands and a cemetery marking the burial places of historical figures of the community will all be preserved. A memorial to Roderick, who is buried in an unmarked grave at Roderick Farms, ~~will be created and placed on the site.~~

Since the civil War and the Battle of Thompson's Station, Roderick Farms has been used as an Aderdeen Cattle farm known as KMK Acres.



In the rural farmlands of Thompson's Station, historic Roderick Farm is situated on gently sloping land with existing creeks and dotted with mature trees. The 79.9 acre site is surrounded by farmland and beautiful existing vegetation and makes an ideal site for a project intending to preserve both cultural and natural features. Roderick Farm is located 7 miles south of Franklin, TN and just north of Spring Hill.



ArB	Armour silt loam, 2-5% slopes
ArB2	Armour silt loam, 2-5% slopes, eroded
Eg	Egam silt loam, phosphatic
Hu	Huntington silt loam, phosphatic
MbB	Maury silt loam, 2-5% slopes
MbB2	Maury silt loam, 2-5% slopes, eroded
MbC2	Maury silt loam, 5-12% slopes, eroded
McC3	Maury silt clay loam, 5-12% slopes, severely eroded
MoD	Mimosa and Ashwood very rocky soils, 5-20% slopes
StC2	Stiversville silt loam, 5-12% slopes, eroded
StD2	Stiversville silt loam, 12-20% slopes, eroded

View of the existing structure overlooking the pond.

View of the existing rock wall along Columbia Pike.

View of the existing stream on site.

View of existing cemetery along Columbia Pike.

View of existing tree line.

View of the preserved Roderick House.

View of existing barn.

Centered around the Civil War era Federal style Roderick House, Roderick Place responds to the importance of this historic land and historic home and enhances the story of this special place. This high quality mixed-use community is home to several distinct planned districts with a traditional Tennessee Federal house at its heart.

The Knoll is centered on the Roderick House and will feature a restaurant with a conference and reception center. Landscaped gardens surround and interconnect the house and new wellness facility with an adjoining day spa and an inn. An assortment of Neighborhoods radiate from the Knoll ranging from luxury condominium living and townhomes, to cottages and large estate lots. The Country Drive encircles the Knoll and connects the Village at the south entrance to the northern most Estate Lots. The Barn, Covered Bridge, and Village present the commercial face of Roderick Place by providing a location for recreational amenities and a cluster of small picturesque commercial buildings and alongside the highway at the south entrance.

Roderick Place weaves together diverse planning concepts in a complex and interesting way, maximizing the features of the landscape and history. Formal symmetry works with unexpected informality to create exciting experiences throughout the site. Each distinct neighborhood has unique characteristics and strives to create a sense of "belonging." Some neighborhoods are traditional and formal, while others are more relaxed and informal. However, everything is designed to be luxurious and inviting. Roderick Place also brings new residential forms and patterns, yet unseen in this region, which fit perfectly within the fabric of the overall development.

An extensive trail network meanders through Roderick Place, linking a compelling sequence of events as you move through the property. Trails and pathways interconnect all areas of the site providing both recreational opportunities and access to the Knoll. The development offers a complete range of landscape features including open hillside meadows existing boxwood gardens and formal floral gardens. Low stone walls, derived from the existing stone wall along Columbia Pike, are used throughout the site and are another important visual element within the development.

The Knoll - The centerpiece of the development is the Roderick mansion. It will be carefully expanded to include approximately 71 luxury age restricted apartments in a beautiful garden setting. Additionally the Roderick will provide terraces, porches and multiple open spaces for relaxing, dining and entertaining.

The original and future commercial uses have been relocated just to the south of the knoll and fronting the park. The majority of the parking is location in the rear of these mixed - use buildings.

This community will be designed to promote healthy lifestyles and create a sense of belonging where residents thrive .

MASTER PLAN TABULAR DATA

EXISTING ZONING: High Intensity District
GROSS SITE AREA: 79.90 AC

REQUIREMENTS OF PROPOSED ZONING: Specific Plan, High Intensity District (Cluster Option)- General Plan Requirements:
- Maximum Density: 3.00 DU/AC
- Permitted Gross Density (minus Commercial Area): 2.55 DU/AC
- Maximum Height: 3 Stories
- Required Open Space: 45%
- Minimum Site Area: 10 Acres
- Maximum Site Area: 100 Acres
- Area Permitted as Residential: 100%
- Area Permitted as Commercial: 100%

COMMERCIAL AREAS: (The Knoll & The Barn and Village)

Net Commercial Area:	13.90 AC
Total Square footage:	127,606 sf
Net FAR:	0.21

RESIDENTIAL AREAS:

Net Residential Area:	66.0 AC
Total Units:	174 Dwelling Units
Gross Density:	2.18 DU/AC

OPEN SPACE:

Required:	35.96 AC (45.0% of gross area)
Total provided:	36.70 AC (45.9% of gross area)

DISCRETIONARY DENSITY BONUSES:

Historic Preservation Bonus

- Historic Barn:	5% Increase in Gross Density
- Roderick House:	5% Increase in Gross Density

Increase to permitted density = .255 (10%)

Permitted density with Discretionary Density Bonuses: 2.80 DU/AC

Master Plan Tabular Data

Existing Zoning: High Intensity District
Gross Site Area: 79.90 AC

Requirements of Proposed Zoning: Specific Plan, High Intensity District (Cluster Option)
- General Plan Requirements:
-Maximum Density: 3.00 DU/AC
-Maximum Height: 3 Stories
-Required Open Space: 40% Residential | 50% Commercial
-Minimum Site Area: 10 Acres
-Maximum Site Area: 100 Acres
-Area Permitted as Residential: 100%
-Area Permitted as Commercial: 100%

Density:

-Gross Permitted Density:	3.00	DU/AC
-Total Residential:	211	Units
-Estate Lots:	54	Units
-Cottage Lots:	72	Units
-Multistory dwellings/ live work:	85	Units
-Total Commercial:	129,367	S.F.
-Event Center & Historic Barn:	13,500	S.F.
-Hotel w/ Senior Residences:	92	Units
-Senior Living (IL,AL,ALZ):	100	Beds

Open Space:
-Total Land Area: 79.90 Acres
-Total Commercial Area: 9.26 Acres X 50% = 4.63 Acres
-Total Residential Area: 70.64 Acres X 40% = 28.25 Acres
-Total Required Open Space: 32.88 Acres
-Total Provided Open Space: 35.80 Acres

The Knoll - The centerpiece of the development is the Roderick mansion. It will be carefully expanded to include approximately 71 luxury age restricted apartments in a beautiful garden setting. Additionally the Roderick will provide terraces, porches and multiple open spaces for relaxing, dining and entertaining.

~~**The Knoll** – Pedestrian oriented heart of the project features a restaurant, a conference and reception center, a country inn and a wellness facility and day spa.~~

The Barn, Mixed-Use and Artisan Village

~~**The Barn, Covered Bridge and Village**~~ – An existing barn, high quality commercial buildings and a small creek side park ~~with a covered bridge~~, all located at the south entrance.

Neighborhoods – Variety of housing types that expand upon the regional availability ~~through individual neighborhoods with distinct character.~~ — by utilizing an architectural palette that reinforces and compliments the character of Thompson's Station

Landscape Amenities – An integral part of celebrating each individual area of the development

History – Preservation of the existing barn, boxwood gardens, and the original house recall the Civil War period, while ~~the integration of a new equestrian pavilion~~ and an interpretive memorials pay tribute to the Roderick story.

Pedestrian Quality – Extensive network of paths, gardens and trails allow residents to enjoy the varied beauty of the natural and built landscape.

OPEN SPACE PLAN

The open space at Roderick Place is the projects driving force. The entire master plan concept evolved from the desire to celebrate the site's natural features while preserving a significant amount of open space. The master plan balances residential homes with exceptional and expansive natural scenery.

The Open Space Plan is intended to show some of the opportunities inherent in such an approach. Recreational amenities such as walking paths, nature trails and ~~an amphitheater~~ green houses and gardens will enhance the sites natural features. In addition, it is the intention of the plan to restore as much of the natural habitat to its original condition as is possible after years of degradation from grazing.

This natural habitat will be contrasted with a collection of formal greens, squares and neighborhood parks within the neighborhoods, that will create formal settings for outdoor enjoyment. All of these spaces will be linked by a network of sidewalks, pedestrian footpaths and bikeways, allowing non-motorized traffic to move freely throughout the site.

Scenery to be preserved

Conceptual open space images

COMMUNITY OPEN SPACE/LANDSCAPE GUIDELINES:

Community Buffers

1 Residential Lot /Columbia Pike Buffer - A landscape buffer with a minimum width of 60 feet shall be provided to buffer residences. One canopy tree shall be provided for every 25 feet of Columbia Pike frontage~~, and a continuous evergreen hedge row shall be provided along the residential property line with a minimum mature height of six feet and an installed height of at least 36 inches. Plants shall be a minimum of 48 inches on center.~~

2 ~~Property Boundary Buffer - A landscape buffer with a minimum width of 20 feet shall be provided at the exterior boundary of this development. Existing trees should be preserved where possible. Where existing trees do not exist or need to be supplemented, one canopy tree and 10 shrubs shall be planted for every 35 feet of adjacent boundary. Trees shall be a minimum of 2.5 inch caliper. One out of every three canopy trees installed shall be evergreen. Shrubs shall have a mature height of at least four feet.~~

3 Barn and Village Buffer - A minimum width of 15 feet informally planted canopy trees shall be provided with one tree for every 50 feet of adjacent Columbia Pike Right-of-Way. Canopy Trees shall be a minimum of 2.5 inch caliper.

4 Eastern Property Boundary - Minimum of 50 feet landscape buffer shall be provided and existing trees will be preserved where possible.

Street Trees

All street trees shall be provided per the street sections beginning on page 31.

Sidewalks

- All sidewalks to be provided per street sections beginning on page 31.
- Interconnecting (primary) sidewalks are encouraged and shall be a minimum of five feet wide, constructed with concrete, stone, asphalt, or brick materials. Gravel or garden (secondary) walks may be provided within residential clusters or community gardens or parks and shall be a minimum of four feet wide.

Parking Lot Landscape Requirements

- All off street parking should be hidden from view of the public street and located at the rear of all proposed buildings where possible.
- Where off-street parking abuts a public or private road it shall have a minimum 7' buffer.
- Parking should be designed to minimize site impact on existing natural features.
- For every 12 continuous parking spaces there shall be a planting island.

Dumpster Requirements

- Where dumpsters are required, an opaque screen wall / fence shall be provided surrounding its perimeter with a minimum height of 72 inches.
- Dumpster screen / wall shall consist of wood, brick masonry, stone or faux stone.
- Access gates shall be a minimum 72 inches in height, opaque and ornate in nature.
- Foundation planting shall be provided with an evergreen hedge with a minimum height of 30 inches at the time of installation.

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type 2 buffer

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- Access gates shall be a minimum 72 inches in height, opaque and ornate in nature.
- Foundation planting shall be provided with an evergreen hedge with a minimum height of 30 inches at the time of installation.

Preserved Open Lawn - The sloping meadow along Columbia Pike is bordered by an existing stone wall and includes the historic cemetery. ~~The plan proposes a picturesque pond and a dramatic forest hedgerow flanking and framing views of the Roderick House.~~

The plan proposes a picturesque view shed from 31 by preserving the current landscape and sheltering the majority of the development to the east side of the property.

Neighborhood Park - "Creekside Park" - The park includes ~~an amphitheater, a stone bridge, waterfalls,~~ a memorial to Roderick the horse, the park and trail system and the wooded beauty of the existing creek. ~~A stone wall provides privacy and separates the park from the homes and alleys behind the Crescent on the Park.~~

The Gardens of The Knoll - These gardens include ~~the Wellness Garden,~~ Formal Garden, Revitalized Boxwood Garden, and both paved and grassed terraces. The gardens of the Knoll surround the ~~conservatory, overlook~~ the open lawn and form a strong visual connection to the Grand Lawn.

Wellness Fountain

preserved century old magnolia trees add a unique charm for the residents of the Knoll and pay tribute to the intent of retaining and enhancing the sites original landscape.

~~**The Grand Lawn** - The equestrian themed Grand Lawn is available for community functions and events. A park pavilion provides an architectural terminus to the axis from Roderick House. The space is formally defined by a stone privacy wall at the edge of the perimeter roadway. Four small gazebos define the entrance to this space and provide a beautiful arrival experience for the adjacent neighborhoods.~~

~~**The Center Garden in the Garden Courtyard Residences** - A charming Southern garden with academic and horticultural influences, this garden uses an existing stand of mature trees and sloping topography to create a unique focal point for the Garden Courtyard Neighborhood. This park could include water features and ornamental structures to compliment the serene nature of the garden.~~

REGULATING PLAN

The Regulating Plan for Roderick Place graphically articulates the different neighborhoods and specifies the building types permitted within each. This is intended to ensure a project that will, at full build out, meet or exceed the goals of both the developer and the Town of Thompson's Station, while creating an attractive, appealing and functionally sustainable community.

In general, the Roderick Place Regulating Plan defines the project's distinctive neighborhoods of varying densities and configurations and provides a range of housing types and prices. This plan is structured to encourage maximum compatibility with adjoining property uses and zoning. In addition, the Regulating Plan defines opportunities for commercial and civic uses within The Knoll and Barn & Village to reinforce the sense of place and to provide community services.

Building Typologies

A. The Knoll
B. The Barn, Covered Bridge, and Village
C. Estate Lots
D. (District Removed)
E. Live/ Work Units
F. Cottages on the Green or Garden Courtyard Residence
G. Residential Buildings or Row Houses
H. The Mews or Row Houses or Residential Buildings
I. The Mews or Cottages
J. Cottages on the Green
K. Row Houses or Cottages on the Green
L. Row Houses or Residential Buildings
M. Cottages on the Green or Row Houses or Residential Buildings
N. Cottages on the Green or Row Houses or Residential Buildings
O. Residential Buildings and Community Amenity

Notes

1. The regulatory plan is representitive of the intendended develoment. Actual plan may differ in product mix, location, density & size - not exceeding minimums or maximums established as part of this zoning document.
2. A variety of housing types will be built and may include: detached single family homes, attached single family homes, townhomes , live-work units, multi-family condos and resort residence.
3. For further information, see the following building typologies beginning on page 14.

Building Typologies

A. THE KNOLL
B. THE BARN AND MIXED USE ARTISAN VILLAGE
C. LIVE-WORK / MIXED-USE VILLAGE
D. ESTATE LOTS
E. COTTAGES

Notes

1. The regulatory plan is representitive of the intendended develoment. Actual plan may differ in product mix, location, density & size - not exceeding minimums or maximums established as part of this zoning document.
2. A variety of housing types will be built and may include: detached single family homes, attached single family homes, townhomes , live-work units, multi-family condos and resort residence.
3. For further information, see the following building typologies beginning on page 14.

THE KNOLL (District A)

The Knoll - The centerpiece of the development is the Roderick mansion. It will be carefully expanded to include approximately 71 luxury age restricted apartments in a beautiful garden setting. Additionally the Roderick will provide terraces, porches and multiple open spaces for relaxing, dining and entertaining.

The original and future commercial uses have been relocated just to the south of the knoll and fronting the park. The majority of the parking is location in the rear of these mixed - use buildings.

This community will be designed to promote healthy lifestyles and create a sense of belonging where residents thrive .

PERMITTED USES:

- Restaurant
- Retail Shop
- Boutique Shop
- ~~Country Inn~~ Hotel and Residences
- Guest Cottages
- Day Spa
- Community Club House / Pool
- General office
- Medical office
- Conference rooms
- Residential condominiums
- Residential townhomes

Assised Living and Memory Care

LOT STANDARDS

- Building Coverage: 75% maximum
- Primary Structure Front Setback: 0 feet minimum
- Primary Structure Side Setback: 0 feet minimum
- Primary Structure Rear Setback: 0 feet minimum
- Distance Between Buildings: 10 feet minimum
- Height: 3 stories maximum
- Parking: Permitted uses shall satisfy parking requirements per the Town of Thompson's Station Zoning Ordinance. On-street parking may count toward the required parking if directly adjacent the subject parcel.
- Signage: See page 28 for signage guidelines.

Mixed Use and Artisan Village

THE BARN, ~~COVERED BRIDGE, AND VILLAGE~~ (District B)

The Barn, ~~Covered Bridge~~, and Village present a unique "face" of Roderick Place and create a memorable entrance to the residential community. A large existing barn is retained and given new life as the focal point of the Village. A soaring second floor loft space provides an outstanding location for events, parties and receptions, and creates a unique experience for the residents of Roderick Place and Thompson's Station. The loft also provides an additional venue for conferences taking place at the Knoll or a stage for summer theater productions. The ground floor of the barn houses the services and amenities associated with the event space and could include a marketplace for antiques and collectibles. ~~The adjacent amphitheater, with its hillside park setting along the creek, creates a venue for a variety of musical and theatrical performances~~. A grassy open space next to the Barn ~~and Amphitheater~~ provides remote or overflow parking for events on the property and eliminates the need for large paved parking lots. ~~A covered bridge adds another landmark feature to Roderick Place and connects the many elements of Roderick Place. The historically inspired wooden bridge serves vehicular traffic and offers an attractive and safe pedestrian walkway overlooking the existing stream.~~ The Village itself provides the "necessities" of life including local retail shops for things like milk, and bread and a select group of professional and commercial office suites. It is also a casual place to go for coffee or ice cream after supper. ~~The Village will be built in the Countryside Vernacular architectural style.~~

Artisan

Farmers Market, Food Truck Events, etc...

The adjacent creekside park allows opportunities for movies on the lawn, along with creating a venue for other performacnes

PERMITTED USES:

- Restaurant
- Retail Shops
- Boutique Shops
- ~~Car Care services~~
- General office
- Professional office
- Deli
- Convenience Market
- Community Maintenance Facility
- Residential Apartments
- Farmers / Artisan Market
- Event and Community Center

LOT STANDARDS:

- Building Coverage: 75% maximum
- Primary Structure Front Setback: 0 feet minimum
- Primary Structure Side Setback: 0 feet minimum
- Primary Structure Rear Setback: 0 feet minimum
- Distance Between Buildings: 10 feet minimum
- Height: ~~2~~ 3 stories maximum
- Parking: Permitted uses shall satisfy parking requirements per the Town of Thompson's Station Zoning Ordinance. On-street parking may count toward the required parking if directly adjacent the subject parcel.
- Signage: See page 28 for signage guidelines

MIXED USE VILLAGE (District C)

The Mixed Use Village at Roderick Place will have a mix of residential, retail, restaurants, and offices that will serve the community and a village entrance into the neighborhood and The Knoll.

PERMITTED USES:

- Restaurant
- Retail Shops
- Boutique Shops
- ~~Car Care services~~
- General office
- Professional office
- Deli
- Convenience Market
- Community Maintenance Facility
- Residential Apartments
- Farmers / Artisan Market
- Hotel

LOT STANDARDS:

- Building Coverage: 75% maximum
- Primary Structure Front Setback: 0 feet minimum
- Primary Structure Side Setback: 0 feet minimum
- Primary Structure Rear Setback: 0 feet minimum
- Distance Between Buildings: 10 feet minimum
- Height: 2 stories maximum
- Parking: Permitted uses shall satisfy parking requirements per the Town of Thompson's Station Zoning Ordinance. On-street parking may count toward the required parking if directly adjacent the subject parcel.
- Signage: See page 28 for signage guidelines



ESTATE LOTS ~~ON THE COUNTRY DRIVE~~ (District ~~C~~) D

The Estate Lots are single family dwellings~~ along the outside edge of the Country Drive~~. Appropriately sized, the houses allow for generous front and rear yards. Architectural styles include ~~Tennessee Federal, Updated Neoclassical and Classic American~~ a mix of Historic Americana, Tennessee Farmhouse, and European Revival. Proportion, ornamentation, landscape treatments and soft exterior lighting are important to creating the luxurious and inviting character of this neighborhood. Side entry garages are located behind, to the side or even in front of the house,~~ but never facing the street. If the garage is in front of the house, a generous landscaped and walled auto courtyard provides a pleasant arrival to the front door and to the garage.~~ The lots are not designed for alley access.

INTERIOR LOTS

- Lot Area: ~~11,000~~ 8,000 square feet minimum
- Building Coverage: 55% maximum
- Lot Width ~~at Front Setback~~: ~~90~~ 65 feet minimum
- Lot Depth: 125 feet minimum (measured at the central axis of the lot)
- Primary Structure Front Setback: ~~30~~ 10 (reference D3 guidelines) feet minimum
- Primary Structure Side Setback: 7.5 feet minimum
- Primary Structure Rear Setback: ~~15~~ 20 (reference D3 guidelines) feet minimum
- ~~Porch Front Setback: 24 feet minimum~~
- Porch Side Setback: 5 feet minimum
- Height: 3 stories maximum
- Raised Foundation at Front Façade: 18 inches minimum
- Required Off-street Parking: Minimum 2 cars per unit within an enclosed garage. No garage may face the street.
- Porch Depth: 6 feet minimum
- Driveway Setback: ~~3~~ 1 feet minimum from the property line

Front Facing Garage Setback: 20' (in order to maintain min. driveway length of 20' and eliminate garages in front of the main body of the primary house)

CORNER LOTS (adjacent to a R.O.W.)

- Lot Area: 12,500 square feet minimum 8,750
- Building Coverage: 55% maximum
- Lot Width ~~at Front Setback~~: ~~102.5~~ 70 feet minimum
- Lot Depth: 125 feet minimum (measured at the central axis of the lot)
- Primary Structure Front: 30 feet 10 (reference D3 guidelines)
- Primary Structure Corner Side Setback: ~~20~~ 10 (reference D3 guidelines) feet minimum
- Primary Structure Side Setback: 7.5 feet minimum
- Primary Structure Rear Setback: ~~15~~ 20 (reference D3 guidelines) feet minimum
- ~~Porch Front/Corner Side Setback: 24 feet minimum~~
- Porch Side Setback: 5 feet minimum
- Height: 3 stories maximum
- Raised Foundation at Front Façade: 18 inches minimum
- Required Off-street Parking: Minimum 2 cars per unit within an enclosed garage. No garage may face the street. All access for garages shall be from the Primary Street.
- Porch Depth: 6 feet minimum
- Driveway Side Setback: ~~3~~ 1 feet minimum from the property line

Front Facing Garage Setback: 20' (in order to maintain min. driveway length of 20' and eliminate garages in front of the main body of the primary house)





COTTAGES ~~ON THE GREEN~~ (District E)

Cottages are single family dwellings ~~that front on internal neighborhood parks~~. Designed for smaller residential lots, the houses are appropriately scaled to create a traditional village street. ~~Neighborhood I may be in the Tennessee Federal style and expands upon the original architecture of the area. Neighborhood N could be Classic American, while M and J are Updated Neoclassical style. One neighborhood could emphasize large, inviting front porches, while others might emphasize a formal front stoop. Each street has significant variation within its architectural style; there should not be repeats.~~ Generous landscaping and soft landscape lighting are essential to creating the inviting character of the neighborhood. Garages are accessed from service alleys behind the homes.

located at the core of the neighborhood.

INTERIOR LOTS

- Lot Area: ~~6200~~ 5,750 square feet minimum
- Building Coverage: 75% of lot maximum
- Lot Width ~~at Front Setback~~: 50 feet minimum
- Lot Depth: ~~98~~ 115 feet minimum (measured at the central axis of the lot)
- Primary Structure Front Façade Zone: ~~10 to 15 feet from R.O.W. if Front Porch is provided; 8 to 10 feet from R.O.W. if no Front Porch is provided.~~ 10 (reference D3 guidelines) 7.5 (reference D3 guidelines)
- Primary Structure Side Setback: ~~5~~ feet
- Primary Structure Rear Setback: ~~5~~ feet minimum 20 to allow parking in driveway
- Garage Rear Zone: 4 to 6 feet from alley pavement edge (No driveway parking spaces are permitted. Guest parking shall be provided on-street.)
- Porch Front Setback: 4 feet minimum
- ~~Porch Side Setback: 5 feet minimum~~
- Height: 3 stories maximum
- Raised Foundation at Front Façade: 18 inches minimum
- Required Off-street Parking: Minimum 2 cars per unit within an enclosed garage. Garages shall be alley access only.
- Porch Depth: 6 feet minimum

CORNER LOTS (adjacent to a R.O.W.)

- Lot Area: ~~6500~~ 6,325 square feet minimum
- Building Coverage: 75% of lot maximum
- Lot Width ~~at Front Setback~~: 55 feet minimum
- Lot Depth: ~~98~~ 115 feet minimum (measured at the central axis of the lot)
- Primary Structure Front Façade Zone: ~~10 to 15 feet from R.O.W. if Front Porch is provided; 8 to 10 feet from R.O.W. if no Front Porch is provided.~~ 10 (reference D3 guidelines)
- Primary Structure Corner Street Setback: 10 feet minimum
- Primary Structure Side Setback: ~~5~~ 7.5 (reference D3 guidelines) feet minimum
- Primary Structure Rear Setback: ~~5~~ 20 to allow parking in driveway feet minimum
- Garage Rear Zone: 4 to 6 feet from Alley pavement edge (No driveway parking spaces are permitted. Guest parking shall be provided on-street.)
- Porch Front/Corner Side Setback: 4 feet minimum
- Porch Side Setback: 5 feet minimum
- Height: 3 stories maximum
- Raised Foundation at Front Façade: 18 inches minimum
- Required Off-street Parking: Minimum 2 cars per unit within an enclosed garage. Garages shall be alley access only.
- Porch Depth: 6 feet minimum



GARDEN COURTYARD RESIDENCES

Three layers of gardens organize the experience of this neighborhood. The first and most public garden will contain meandering paths and trees at the center of the neighborhood. A second and more private garden is provided as every residence has its own front garden creating a unique arrival to each home. A final exclusive and intimate courtyard garden is surrounded by the rooms and spaces of the house. The design of the garden courtyard residences focuses on the integration and openness of the gardens and interior spaces, placing emphasis on the landscaping and natural materials more than the formal style of the architecture. The house itself can be a modified version of any of the three residential architectural styles. Many windows help to create views and visual access to the courtyard, which is punctuated by fountains, trellises and other romantic garden elements. The garage and driveway, in a non-traditional arrangement, provide thematic and stylish design elements to the front garden. The zero-lot-lines and high courtyard walls create a desirable enclosure for this exclusive neighborhood.

INTERIOR LOTS

- Lot Area: 7000 square feet minimum
- Building Coverage: 55% maximum
- Lot Width at Front Setback: 50 feet minimum
- Lot Depth: 90 feet minimum (measured at the central axis of the lot)
- Primary Structure Front Façade Zone: 20 to 25 feet from R.O.W.
- Primary Structure Side Setback: 0 feet minimum
- Primary Structure Rear Setback: 0 feet minimum
- Garage Front Setback: 25 feet minimum
- Height: 3 stories maximum
- Raised Foundation at Front Façade: 8 inches minimum
- Required Off-street Parking: Minimum 2 cars per unit within an enclosed garage.




~~ROW HOUSES~~

~~Row Houses are buildings with three or more multi-story units situated side-by-side. The row houses in neighborhood L could be Neoclassical to complement the adjacent Cottages on the Green while The Crescent at Neighborhood K might be Updated Neoclassical, finished in natural and cut stone. Beautifully detailed front entrances provide rhythm and scale to the two or three story facades. Garages are accessed off service alleys at the rear, resulting in private yards located between the house and garage.~~

~~INTERIOR LOTS~~

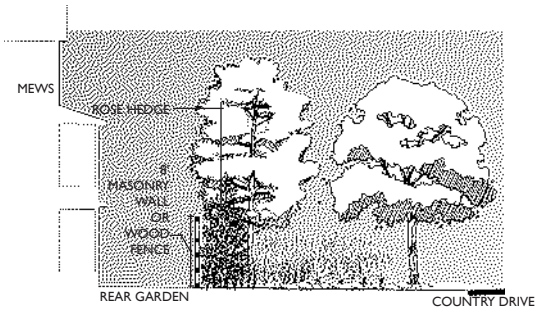
- ~~Lot Width at Front Setback: 20 feet minimum~~
- ~~Lot Depth: 90 feet minimum (measured at the midpoint of the lot)~~
- ~~Distance Between Buildings: 15 feet minimum~~
- ~~Number of Attached Units per Building: 8 Units maximum~~
- ~~Primary Structure Front Façade Zone: 10 to 15 feet from R.O.W.~~
- ~~Primary Structure Side Setback: 0 feet minimum~~
- ~~Primary Structure Rear Setback: 5 feet minimum~~
- ~~Building Side Setback: 10 feet minimum~~
- ~~Garage Rear Zone: 4 to 6 feet from alley pavement edge (No drive way parking spaces are permitted. Guest parking shall be provided on-street.)~~
- ~~Stoop Front Setback: 4 feet minimum~~
- ~~Height: 3 stories maximum~~
- ~~Raised Foundation at Front Façade: 18 inches minimum~~
- ~~Required Off-street Parking: Minimum 2 cars per unit within an enclosed garage. Garages shall be private drive/alley access only.~~

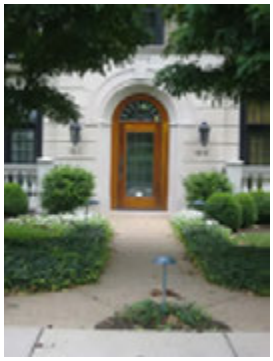

THE MEWS (District H)

The Mews District is a street/courtyard lined with multi-story dwellings, each with their formal front door and garage entrance on the street. Main living spaces are on the second and third floors, creating a picturesque streetscape and controlled views within the neighborhood. The Mews will be located in neighborhood H and will be situated directly adjacent to the Knoll. Architecture is expected to be in the Classic American style, with stone and stucco as the primary materials. The garages and doors are high quality stained wood for a clean, stylish look. The Mews feature balconies, bay windows, dormers, front stoops and carriage lanterns to add interest and rhythm to the facades. Formal landscaping includes street trees in grates, large potted shrubs and dramatic flower boxes. Behind the houses, balcony terraces on the main living level use decorative stairs to connect to enclosed gardens below. Except where the Mews overlook a 3-4 feet masonry wall and adjacent to the pond, a 6 foot wood fence encloses the back gardens.

INTERIOR LOTS

- Lot Width at Front Setback: 36 feet minimum
- Lot Depth: 65 feet minimum (measured at the midpoint of the lot)
- Distance Between Buildings: 18 feet minimum
- Number of Attached Units per Building: 4 Units maximum
- Primary Structure Front Façade: shall be set at 10 feet from private drive court.
- Primary Structure Side Setback: 0 feet minimum
- Primary Structure Rear Setback: 20 feet minimum
- Building Side Setback: 5 feet minimum at ends of street
- Height: 3 stories maximum
- Raised Foundation at Front Façade: 8 inches minimum
- Required Off-street Parking: Minimum 2 cars per unit within an enclosed garage. Garages are off the mews street/ courtyard
- Porch Depth Minimum: 6 feet minimum
- Rear balconies on upper level have a minimum 8' depth. This may extend into the rear setback.





~~THE RESORT RESIDENCE / RESIDENTIAL BUILDINGS (DISTRICTS G & O)~~

~~With their location and size, the Residential Buildings create a formal backdrop to the development of the Knoll. Updated~~ Neoclassical style ~~buildings~~ compliment the historic architecture of the Knoll, but do not ~~detract from~~ the importance of the main house. Large windows, generous ~~terraces and balconies~~ and quality ~~detailing~~ make the residential buildings a grand and beautiful place to live. The front entrances and ~~canopies are attractive features~~ within the arrival courtyards. Residents park in garages beneath the buildings, ~~while~~ guests may park near the entrance. The ~~Residential Buildings~~ offer the opportunity to provide assisted living amenities and services.

~~BUILDING LOTS~~

- Distance Between Buildings: 15 feet minimum
- Primary Structure Front Setback: 15 feet minimum
- Primary Structure Side Setback: 0 feet minimum
- Primary Structure Rear Setback: 35 feet minimum
- Accessory Structure Setback: 15 feet minimum
- Height: 3 stories maximum
- Raised Foundation at Front Façade: 18 inches minimum
- Required Off-street Parking: Minimum 2 cars per unit within an enclosed garage.
- Porch Depth Minimum: 6 feet minimum

LIVE/WORK UNITS (District E)

Situated along the entry loop road, the Live/Work units face the Knoll and the historic Roderick house. This group of buildings creates a dramatic setting with retail shops at ground-level and private residences above. The spaces between buildings contain lobbies and entrances to the private residences and connect to picturesque hillside gardens and the functional alley. The garages along the alley have exclusive elevator access to the residences above. The sidewalk in front of the units is a part of an elaborate step-down garden with decorative features that create a beautiful "front door" for the entire complex.

PERMITTED USES:

- Residential
- Retail Shops
- Boutique Shops
- General office
- Professional office
- Community Services

BUILDING LOTS

- Distance Between Buildings: 10 feet minimum
- Primary Structure Front Facade Zone: 10-20 feet minimum
- Primary Structure Side Setback: 0 feet minimum
- Primary Structure Rear Setback: 0 feet minimum
- Height: 3 stories maximum at front facade (4 stories rear)
- Raised Foundation at Front Façade: 8 inches minimum
- Parking: Permitted uses shall satisfy parking requirements per the Town of Thompson's Station Zoning Ordinance. On-street parking may count toward the required parking if directly adjacent the subject parcel.

A R C H I T E C T U R E
&
S I T E E L E M E N T S

ARCHITECTURAL PALETTE & STYLES

Tennessee Federal Style

- This is the most traditional and formal style in the palette. It is the basis for the proportions, materials and details of all other styles and should be the predominant style used within Roderick Place.
- The façade is orderly, with windows in symmetrical vertical rows around a central door.
- Brick or stone primary building material with cast stone or painted wood accents
- Windows are double-hung with sashes (upper and lower), typically with six panes per sash.
- Cornices are emphasized with tooth-like dentils or other decorative moldings.
- Uses a low hip roof with brick or stone chimneys and optional gable accents or a flat roof with a detailed parapet and cornice.
- A semicircular or elliptical fanlight over panelized front door is typical of this style.
- Palladian and arched windows are typical but restrained. These should only be used in a meaningful way.

Updated Neoclassical Style

- This style uses many of the principles of the Tennessee Federal style, but allows a greater range of less predictable details.
- The form of the house has more freedom and may include wings, terraces, bay windows, dormers and front porches to increase the architectural palette beyond the Tennessee Federal style.
- Brick, stone or stucco are the primary building materials with cast stone or painted wood accents.
- Material changes are acceptable throughout the house. For example, on multi-story houses and buildings, a first story of cast stone, can be used with upper stories of brick or stucco.
- Details like iron work, French doors and appropriately scaled columns are encouraged to add interest to the architecture

Classic American Style

- This style has roots in the country farmhouse, bungalow and shingle styles, and is the most informal of the architectural styles.
- It can retain the basic symmetry and simplicity of the Federal style, or it may introduce rambling floor plans of a looser nature.
- Roofs are more steeply pitched gable roofs with deep overhangs and are finished with wood shingles or standing seam metal.
- Copper roof details and accents may be introduced where appropriate.
- The primary building materials are wood, stucco, brick or stone with wood or cast stone detailing.
- Dormers, chimneys, large front and side porches and other details are highly encouraged and the asymmetrical placement of these will "loosen" the appearance of the house.
- Bay windows, columns and French doors are all encouraged to add interest to the house.

Countryside Vernacular (Not for use in residential architecture)

- This style is an elegant version of a picturesque village. Architecture references barns and stables as well as the charm of Main Street America; all in a park-like setting.
- Stone, brick, stucco and wood are the primary façade materials with simple high quality detailing.
- Roofs are hip or gable and should feature weathervanes, spires and cupolas of painted wood, copper or iron. These should be large-sized, with a strong presence and special attention to historic and creative detailing.
- The buildings should feature large windows and doors, generous front porches, gazebos and an inviting attitude with a sense of hospitality.

* If a design concept is presented and does not specifically fall into the approved styles, it could be reviewed and considered on its own merits.

Overview

These guidelines are not intended to skillfully educate the reader in academics of historic architecture or to prescribe dogmatic historical accuracy of outdated construction practices, but rather establish a platform for expressing the unique character and identity of the individual homeowner that upholds the cornerstone pricipals of Roderick Place.

Roderick Place is envisioned to be a neighborhood with a mix of traditional and modern architectural styles that work in concert to create harmonious streetscapes.

(As the development and character of Roderick Place is progressed through comments, feedback, and additional brainstorming, the development team of Roderick Place will develop a supplemental book. This book will include additional information and pictures that further define the theme and character of this project).

Architectural Styles

The design guidelines for residential architecture at Roderick Place are intended to assist home owners, architects and builders create truly livable homes through timeless design of authentic architecture. Architecture for roderick place is categorized into falling into one of four categories

Permitted Styles

- Refined Rustic
- Historic Americana
- Contemporary Farm
- European Revival

REFINED RUSTIC

HISTORIC AMERICANA

CONTEMPORARY FARM

EUROPEAN REVIVAL

General Building Requirements

- All buildings will use a high level of detail and articulation on all sides of the building to bring a complete architectural idea and a well-crafted feeling to each building.
- Avoid large monolithic massing.
- Use natural building materials and / or historically accurate materials where possible.
- Where two or more materials are combined on a façade, the visually heavier of the two materials shall be located below the lighter. Material composition will be in keeping with historical architectural precedents.
- Primary façade materials shall not change at outside corners. Material changes should happen at offsets in the wall. It is acceptable to change materials where used as trim or accents around windows, doors and cornices.
- Exterior colors shall be compatible and consistent with historical precedents. If bright colors are used, they shall be used in moderation and with respect to neighboring properties.
- The exterior building material of chimneys shall be masonry (stone or brick).
- ~~Windows shall be inset into walls to create shadow lines and a sense of quality.~~ wood or aluminum clad windows will be used on front facades to create a sense of quality
- Secondary structures and garages shall be constructed of the same materials as the primary building or house.
- Rooftop and ground-mounted utility units shall be architecturally screened from public views. A person standing on the property line of the site should not be able to see the equipment. Screening shall be constructed of materials similar to those used on the building.
- ~~Where required, all access to commercial building rooftops shall be by internal roof ladders not visible from the public way.~~
- All trash and service areas, meters, piping, transformers and other ground-installed equipment shall be concealed with architectural enclosures. Architectural screening shall be constructed of materials similar to those used on the building.

ARCHITECTURAL MATERIALS

General Descriptions

- Use natural building materials and / or historic materials where possible.
- Where two or more materials are combined on a façade, the visually heavier of the two materials shall be located below the lighter. Material composition will be in keeping with historical architectural precedents.
- Primary façade materials shall not change at outside corners. Material changes should follow form changes. It is acceptable to change materials where used as trim or accents around windows, doors and cornices.
- Exterior colors shall be compatible and consistent in keeping with historical precedents. If bright colors are used, they shall be used in moderation and with respect to neighboring properties.
- The exterior building material of chimneys shall be made of the primary façade material. Where the primary façade material is wood or stucco, the chimney shall either be made of stone or brick.
- Translucent or back-lit canopies and awnings are prohibited.
- Glass shall be clear and non-reflective

Permitted Building Façade Materials

- Brick (standard modular or matching a historical standard)
- Natural stone or cast stone
- Wood or composite wood
- Stucco

Soffits

- Hardiboard
- Smartboard

aluminum

Permitted Roof Materials

- 25-year composition shingle (or better)
- Standing seam metal
- Wood shingles
- Concrete roof tiles
- Slate
- Flat roofs (where surrounded by a decorative parapet and cornice, with or without a balustrade, or where consistent with the architectural style of the building.)
- Accents of copper (used in dormers, gutters, cupolas, spires, and other roof features)

Foundation Base Cladding

- Cast stone
- Brick
- Natural stone

Permitted Windows and Doors

- Wood windows
- Aluminum clad wood windows
- Steel or wood entry doors
- Clear or subtly tinted, insulated, high performance, lowe-E glazing
- High quality aluminum storefront for commercial use only
- Windows should have appropriate mullions, with true divided lights, or simulated divided lights which place mullion pieces on the inside and outside of the glass.
- Garage doors, especially those facing public roads or courtyards, shall be of high quality painted or stained wood or painted metal, well detailed, and in character with the style of the building. They should be a decorative feature of the elevation, accentuating the style of the building.

Shutters

- Painted or stained wood
- Shutters are to be installed with actual operating hardware or shall have the appearance of operable shutters.
- Shutters should be proportioned to be functional with relation to the size of the window it serves.

Architectural Trim

- Painted or stained wood
- Hardiboard
- Cast stone
- Azek or similar

Columns

- Painted or stained wood
- Brick
- Natural stone
- Cast stone
- Azek or similar

Trellises and Garden Structures

- Painted or stained, or naturally weathering wood
- Steel with decorative finish
- Wrought iron
- Cast stone
- Azek or similar

Awnings

- Commercial quality canvas awning
- Open sides
- Sturdy metal frames

bracketed wood awnings with shingle or standing steam roofs

Signage

A sign is any object, device, or structure, situated outdoors, which is used to advertise, identify, display, direct, or attract attention to any object, person, institution, organization, business, product, service, event or location by any means, including words, letters, figures, designs, symbols, fixtures, colors, illumination or projected images. Signs do not include flags or emblems of any nation, organization of nations, state, city or religious organization.

Categories of Signage

Directional Signage
- Traffic signs
- Street signs
- Parking regulations

Development Signage (at entrances)
- Iron letters mounted to the stone wall
- Soft illumination by discreet lighting placed in the landscape

Neighborhood Identification Signage at each gateway entrance
- Iron letters mounted to masonry walls or pillars
- Soft illumination by discreet lighting placed in the landscaping

Commercial Signage
- Individual letters on the buildings
    - Individual letter signs will be of white, black, gold, bronze or silver. High quality wood or metal letters individually pin-mounted a minimum of one inch from face of wall or background. No plastic letters.
    - Letters shall be prismatic face letterforms with full facets, round face forms, flat faces or layered letterforms with face and liner.
    - Wall signs shall be mounted through the wall material to the structure behind.
- Blade signs
- Awning signs
- Letters painted on storefront glass
- If illuminated, signs should use one of two lighting methods: decorative light source or concealed architectural light source.
- The use of distinctive type styles is encouraged for all commercial signs.

Historical Markers
- Discreet signage noting historical sites will be used as part of the park design.
- Historic markers will denote the preserved pasture, historic cemetery, Roderick memorial and other significant cultural features.

Prohibited Signs
- Signs located in Site Triangles at intersections.
- Signs obstructing view – Signs may not obstruct the view of pedestrians, bicyclists and / or motorists using any street or approaching any street intersection.
- Moving Signs – Signs, other than governmental signs, which contain oscillating, fluctuating, flashing or blinking lights, rotating disks, words or other devices.
- Flashing Signs – Signs with flashing or reflective disks, flashing lights or lights of changing degree of intensities or color or signs with electronically scrolled messages.
- Internally illuminated or halo illuminated signage.
- Billboards and off-premise non-directional signage.
- Post signs for interstate visibility
- Neon signage or decorations
- Box signs, exposed raceways, cabinet signs or signs on the roof of a building

Bridges

Spanning a small pond, a natural stone bridge sits lightly in the quiet country landscape. Large scale lanterns add ambiance and highlight the craftsmanship of the bridge.

Another bridge, the Covered Bridge serves as a landmark for the Village and helps to make Roderick Place a unique destination. See the Barn, Covered Bridge and Village section for more information about this area.

Fences and Walls

Low stone wall (at central loop road around Knoll and at Residential Building Arrival Courts) – 30-36" high

Wall at Barn & Crescent – stone screen wall and retaining wall – 48" on alley side, 48-72" total height on Barn side

Rose hedgerow (at inside edge of Country Drive) – 6' high and growing against a fence. The hedgerow provides a picturesque quality at a natural scale along the Country Drive and screens views of alleys and the sides of homes.

Equestrian fence (at outside edge of Country Drive) – 48" high, dark brown stained wood.

Courtyard Wall (at the rear yard of Mews Residences) – 8' high masonry wall or wood fence at perimeter, 6' high privacy fence between yards

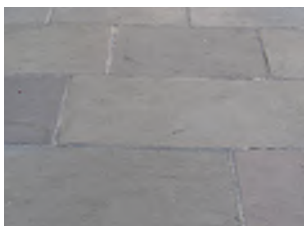
Privacy Walls (at Garden Courtyard Residences, front and courtyard gardens) – varying height, built of the primary building materials of the houses (brick, stone, wood or stucco) – 6-8' high

Walkway and steps (at Live / Work Units) – brick walls, steps, and walkway connecting from Roderick House, through the Live / Work Units, to the Garden Courtyards Residences down the hill.

Typical Residential Fence at alleys – There will be a standard fence between yards and at alleys, specific to each neighborhood. They will vary between 4' and 6' in height.

Sidewalk Requirements

1. All sidewalks to be provided per street sections.
2. Interconnecting (primary) sidewalks are encouraged and shall be a minimum of five feet wide, constructed with concrete, stone, asphalt, or brick materials. Gravel or garden (secondary) walks may be provided within residential clusters, community garden areas or parks and shall be a minimum of four feet wide.

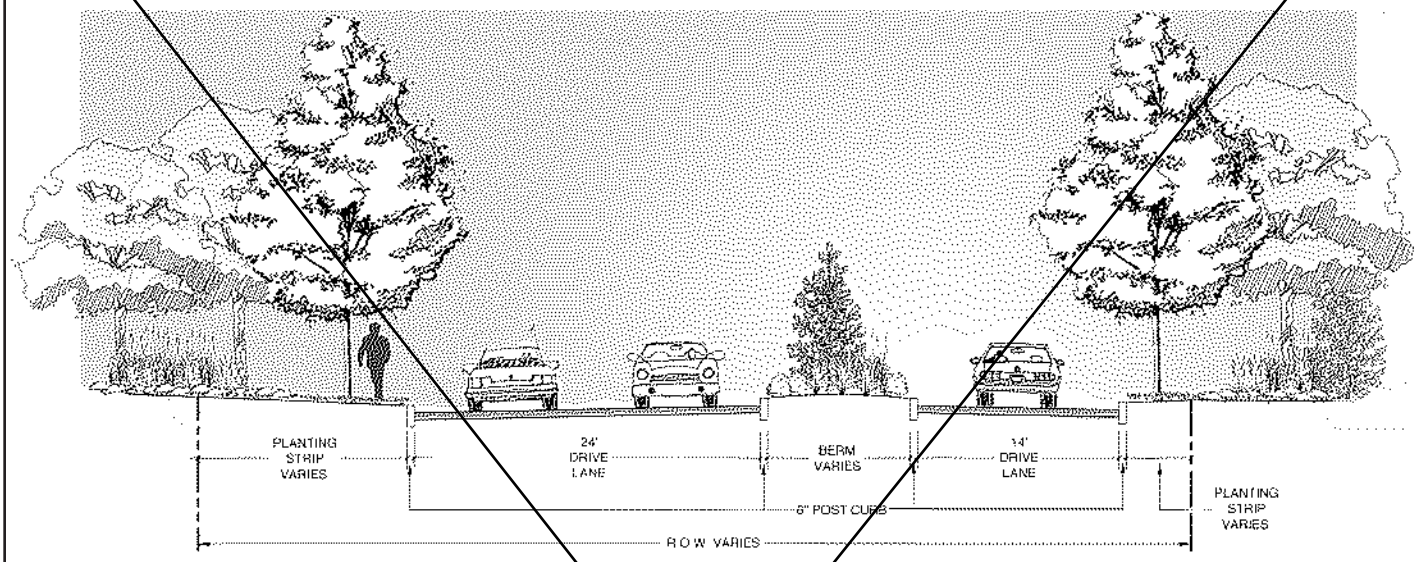


S T R E E T S & W A L K S

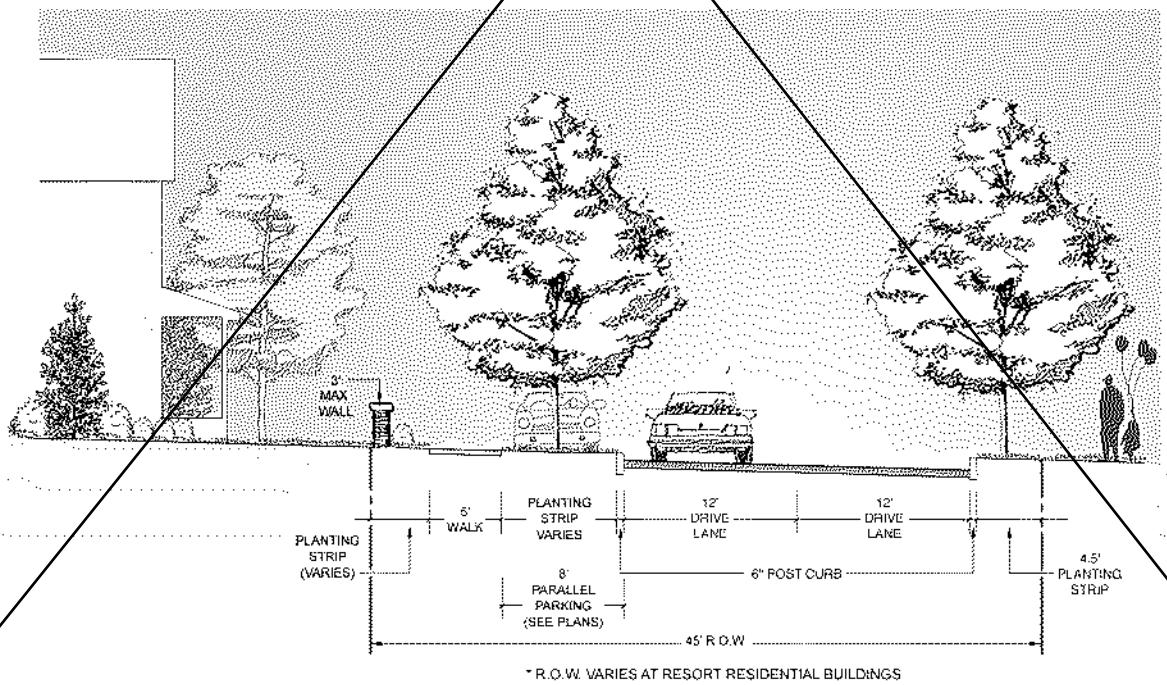
STREET NETWORK

STREET NETWORK

- Entry R.O.W.
- 60' R.O.W.
- 50' R.O.W.
- 20' Alley R.O.W.

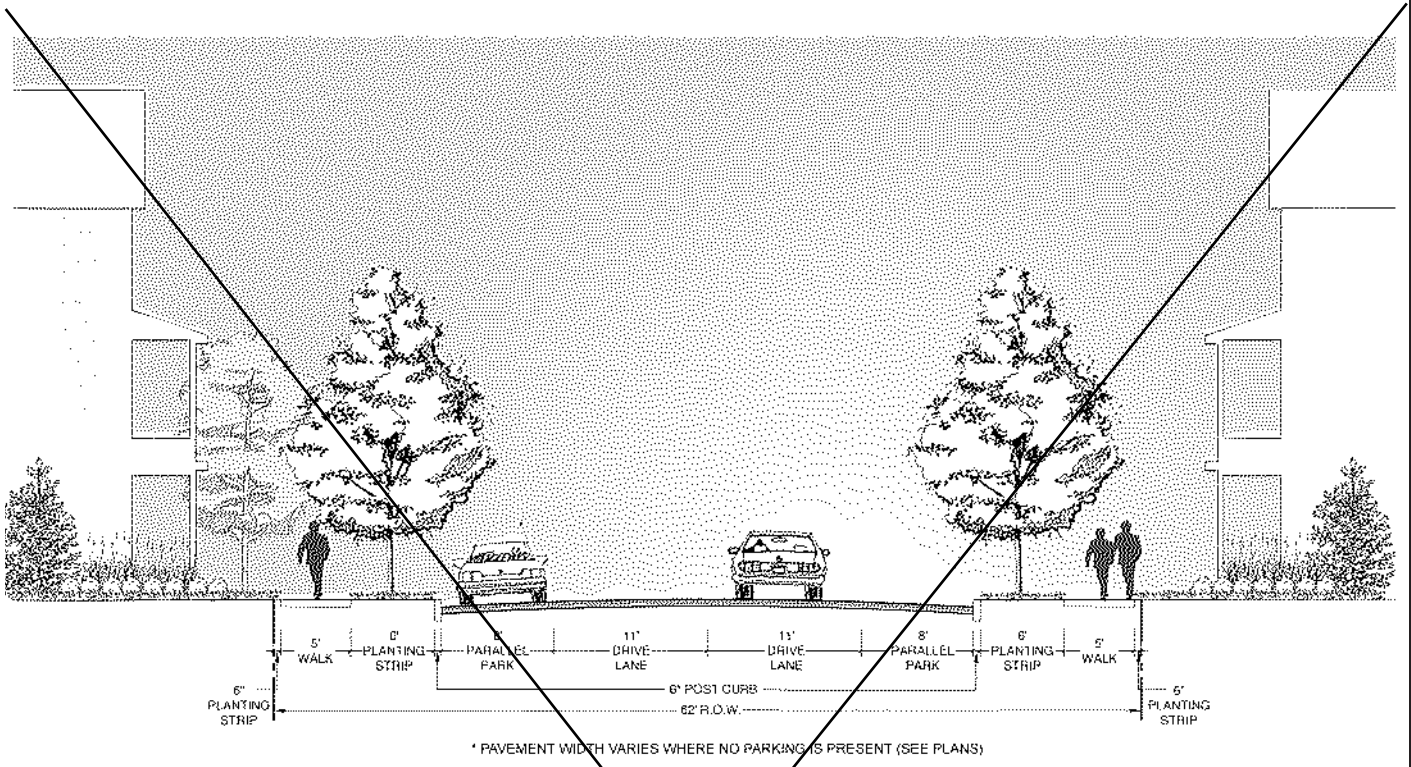


ENTRANCE - Private

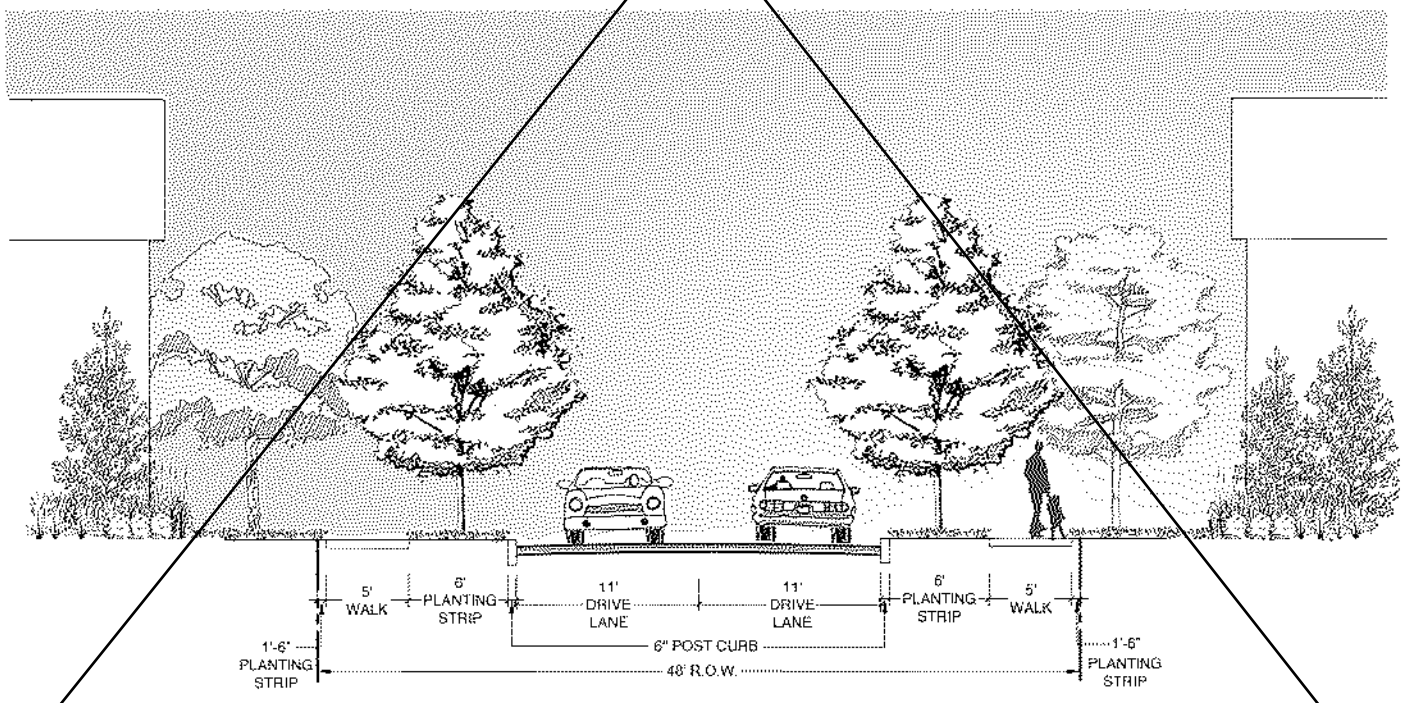


* R.O.W. VARIES AT RESORT RESIDENTIAL BUILDINGS

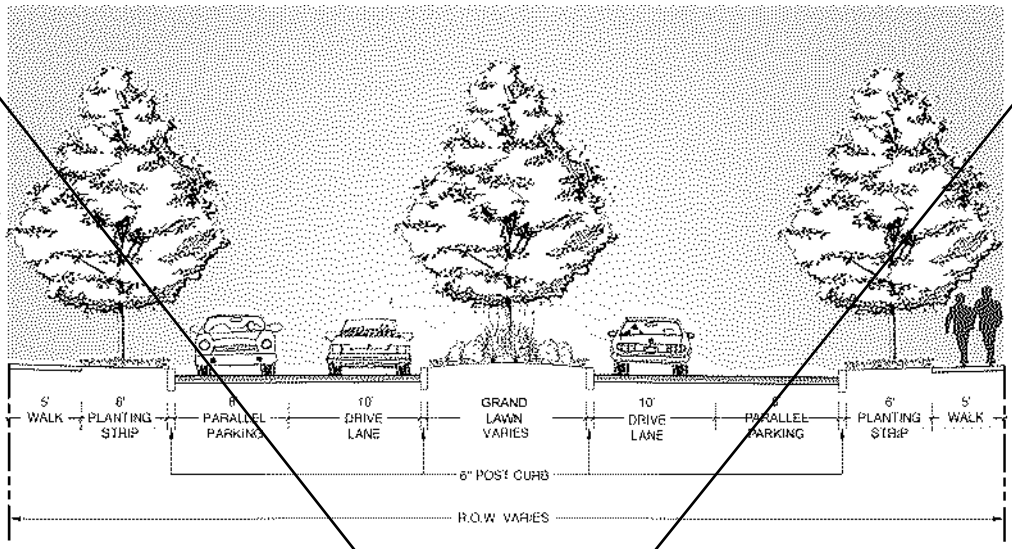
THE KNOLL LOOP - Private



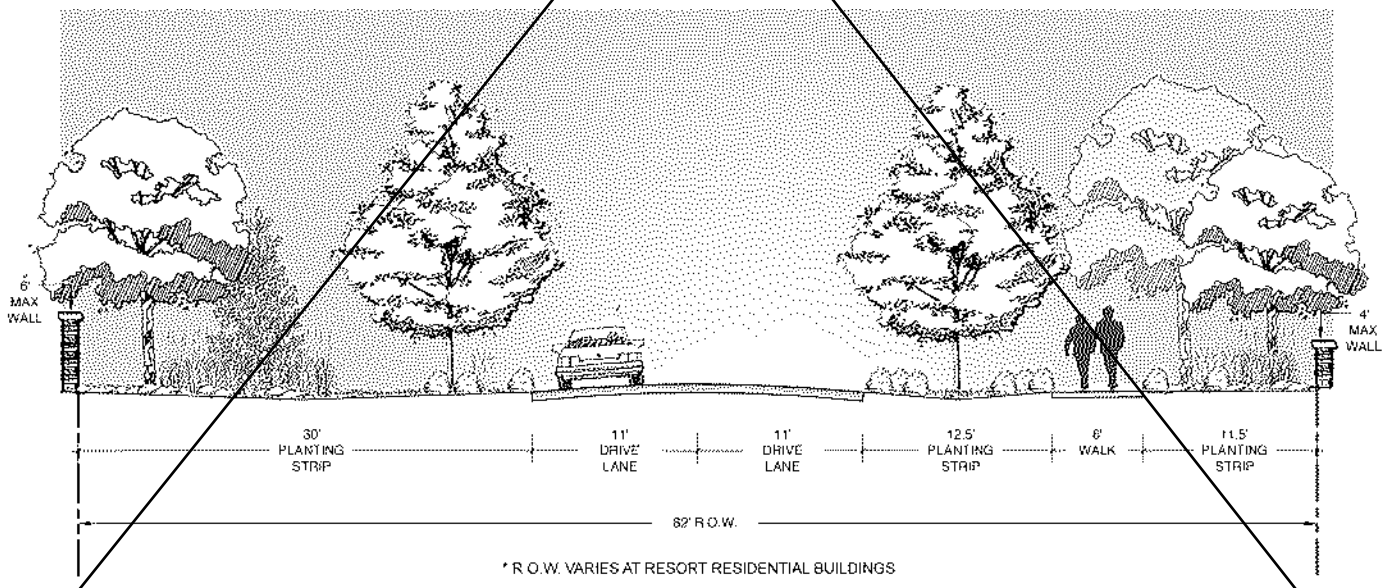
62’ ROW - Private



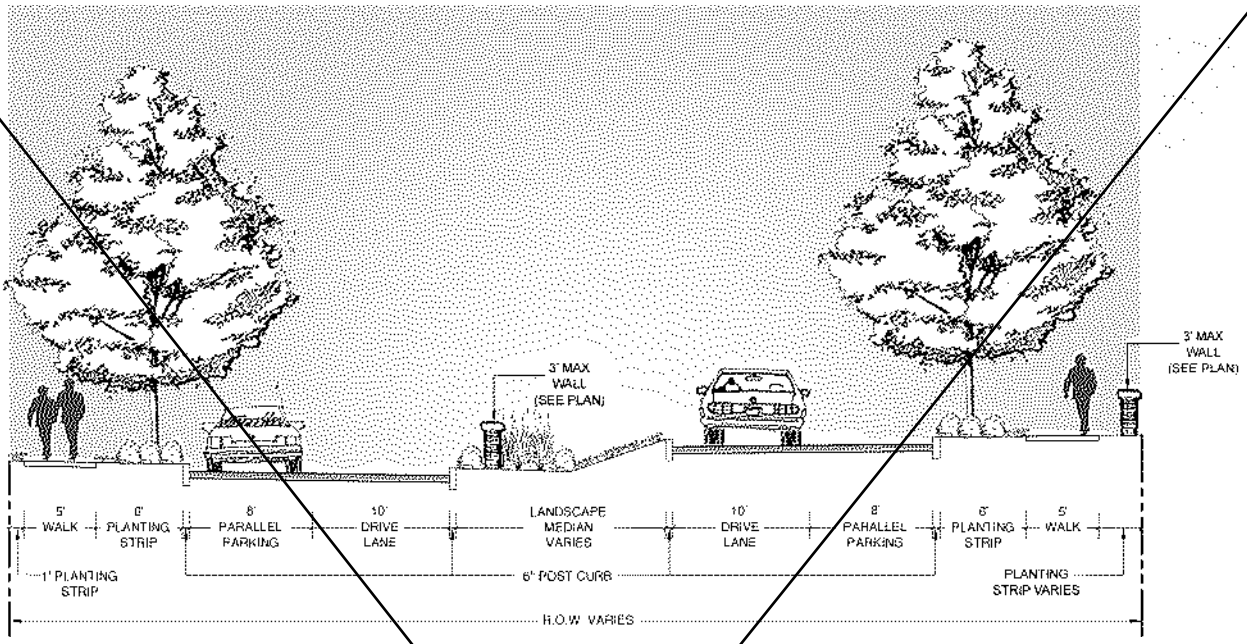
48’ ROW - Private



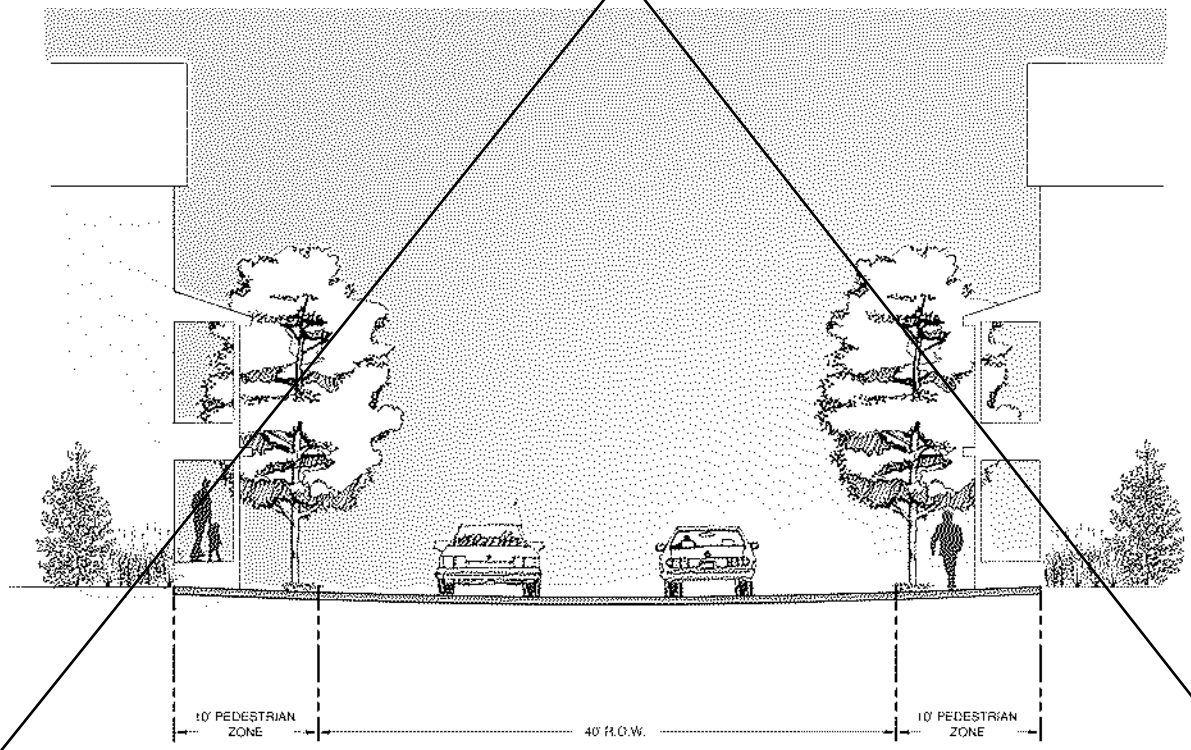
THE GRAND LAWN - Private



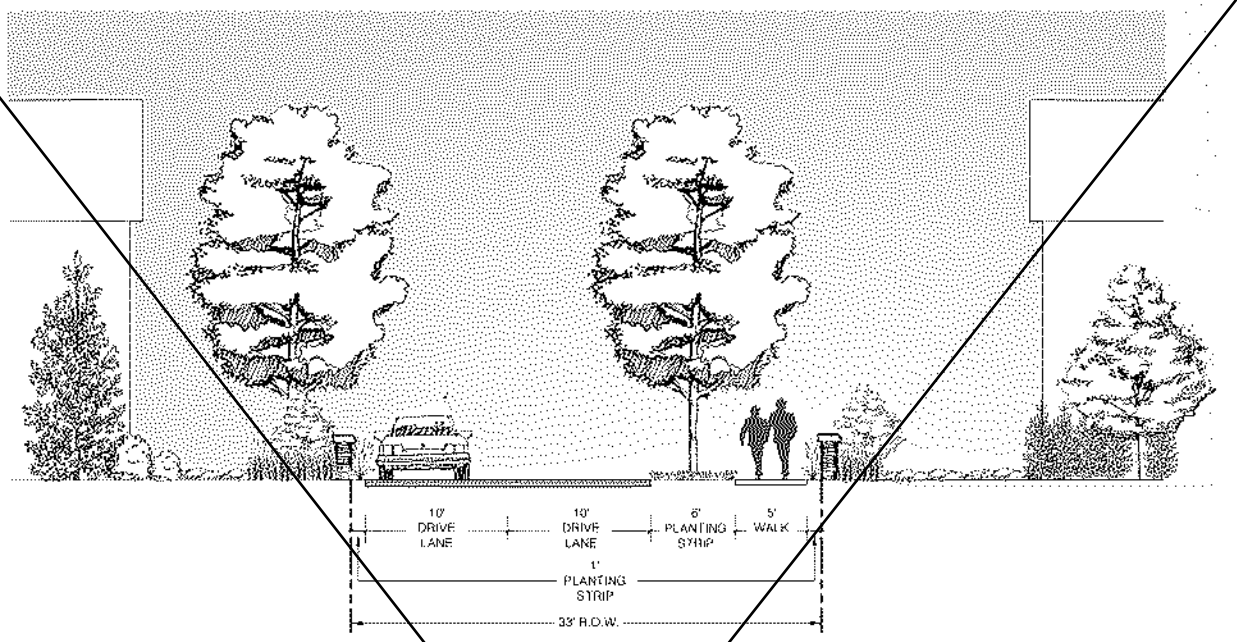
82' ROW COUNTRY DRIVE - Private



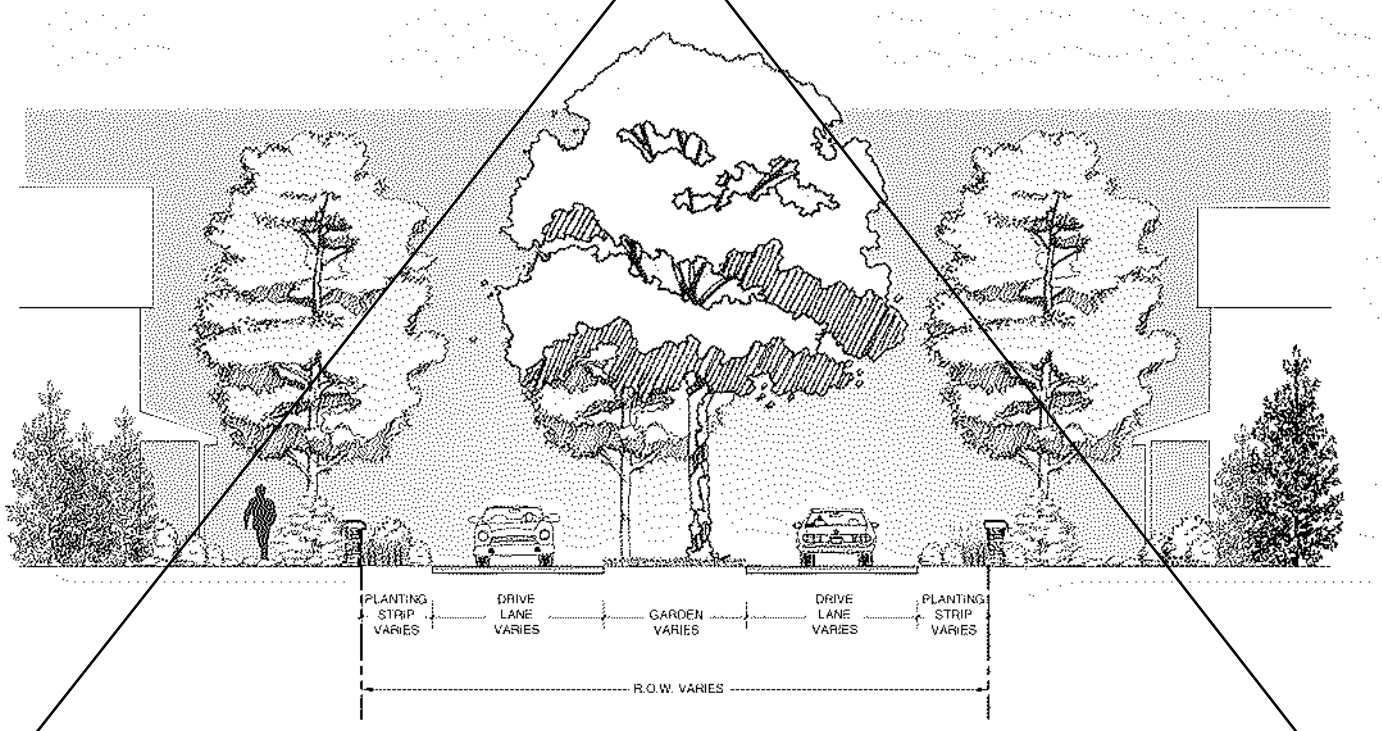
COTTAGES ON THE GREEN - Private



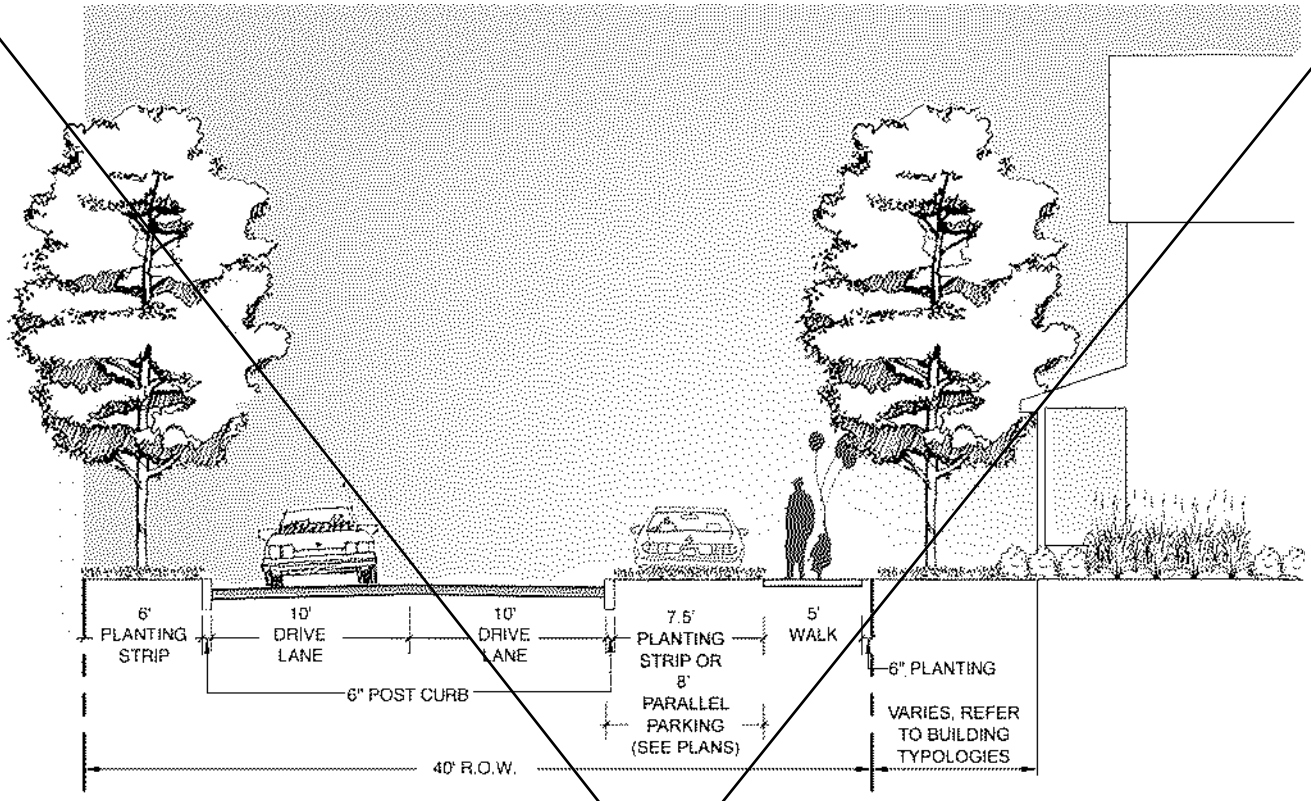
MEWS - Private



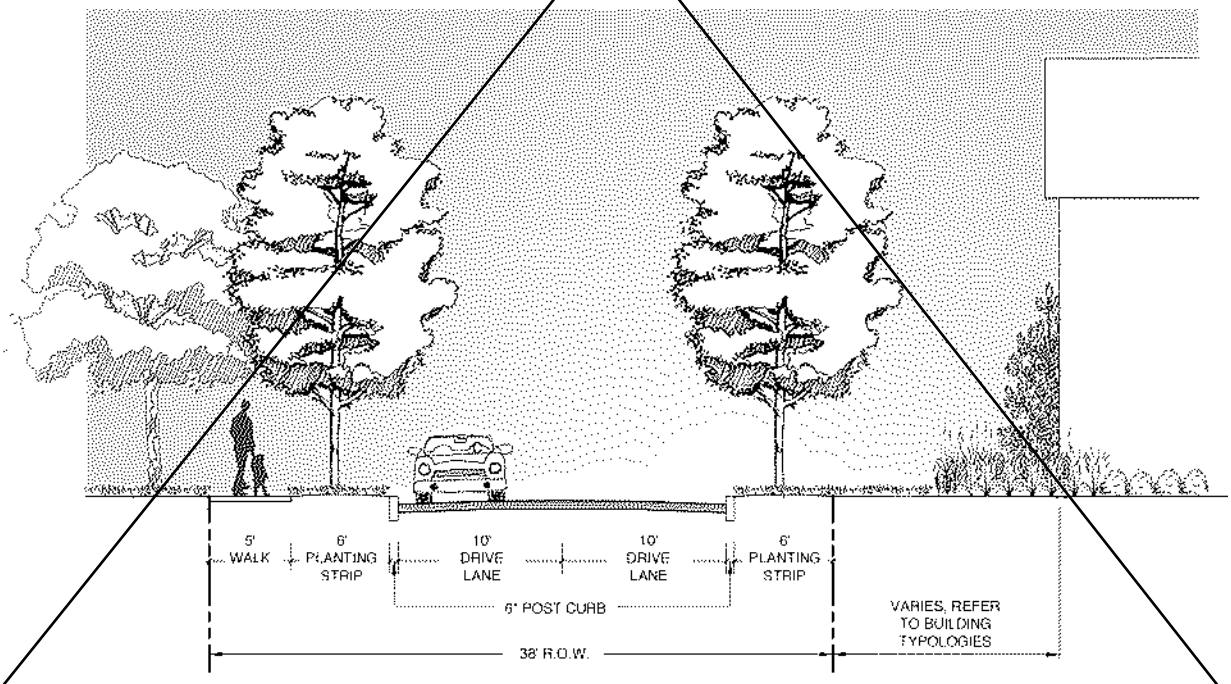
33’ GARDEN COURTYARD ENTRY - Private



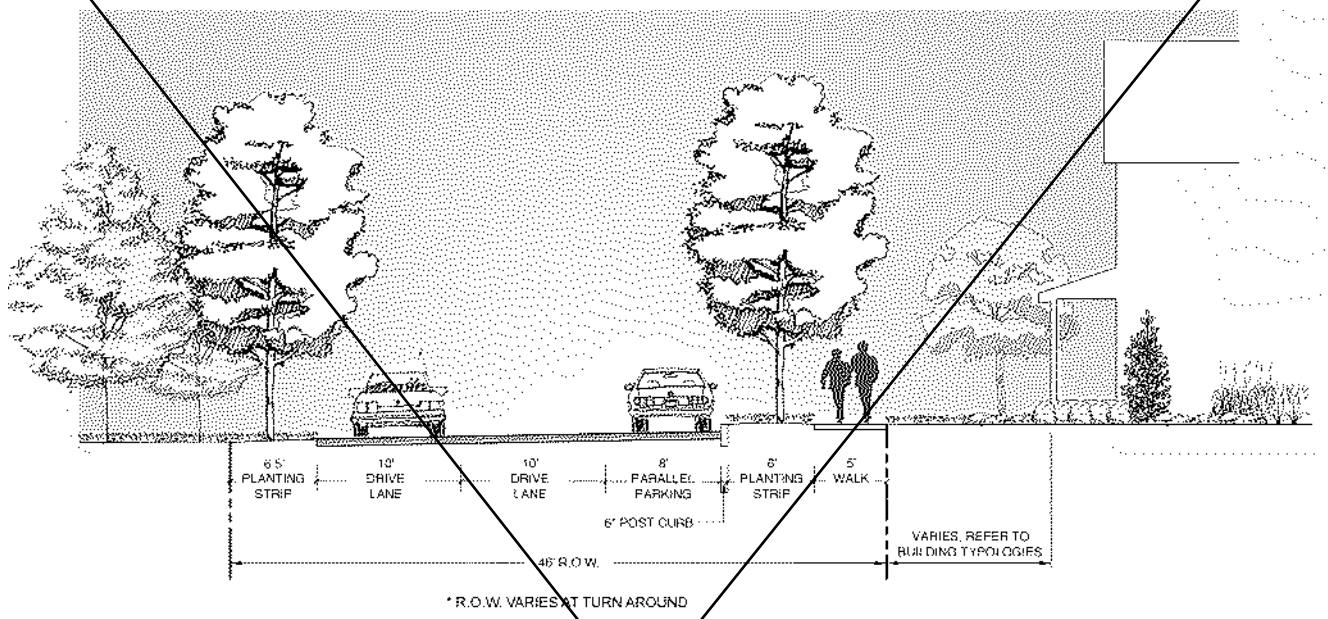
GARDEN COURTYARD - Private



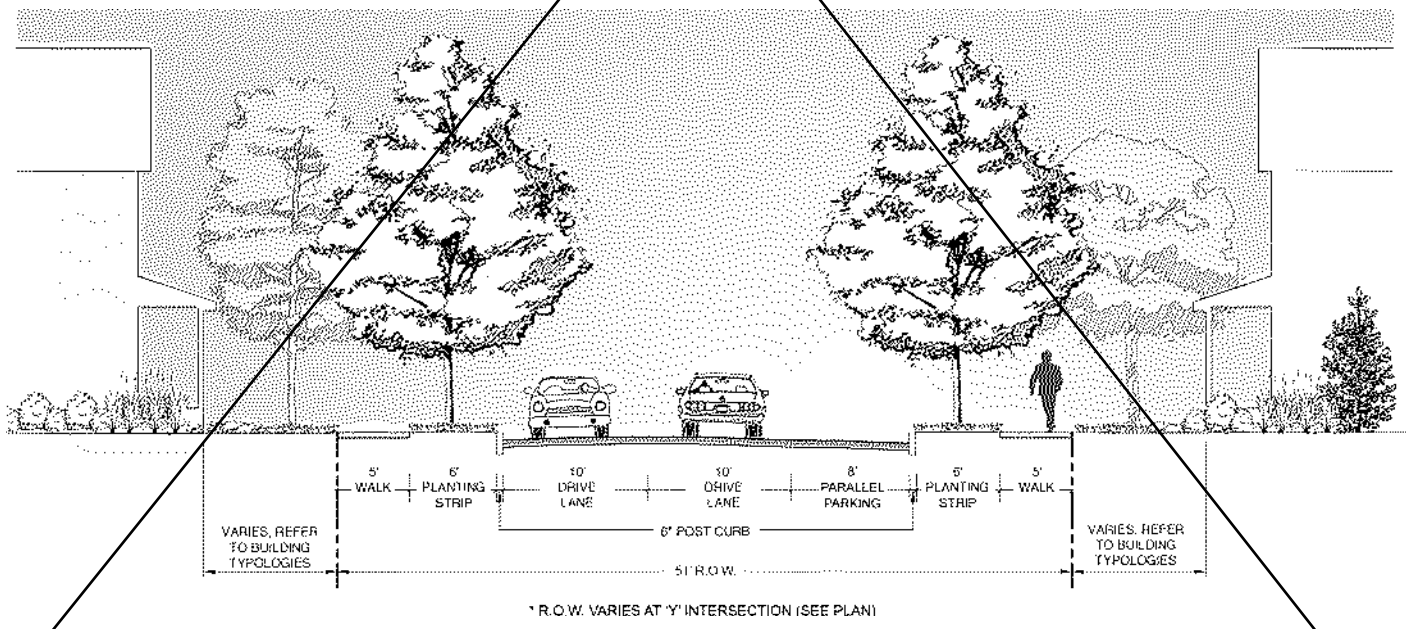
40' ROW - Private



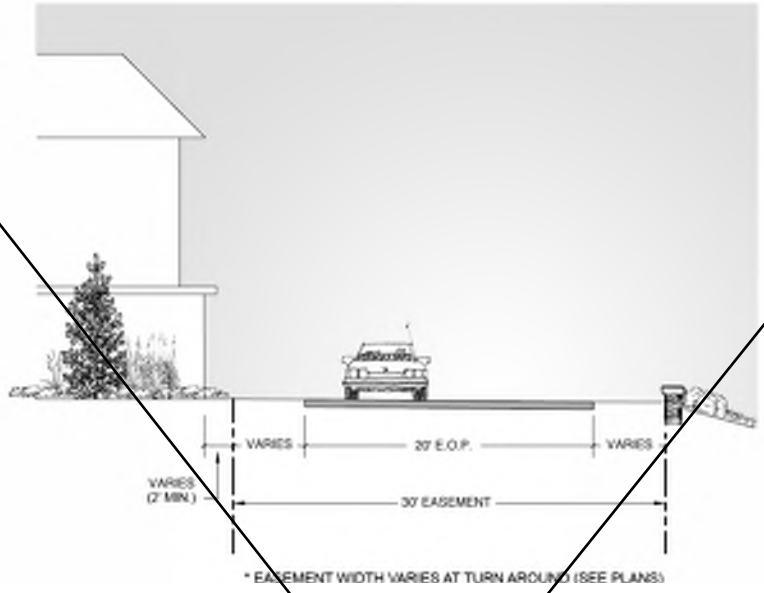
38' ROW - Private



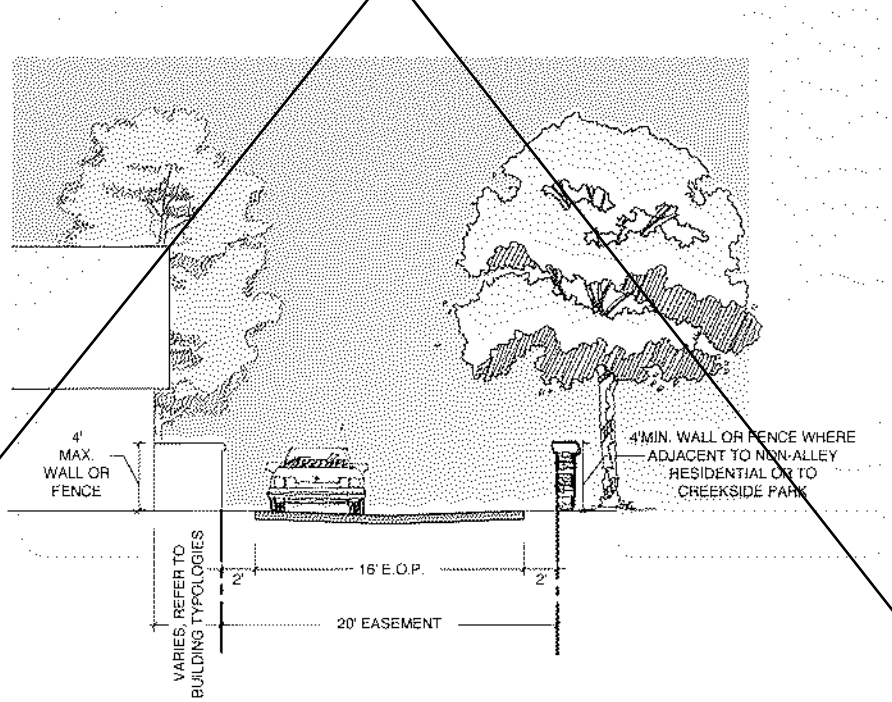
46’ ROW - Private



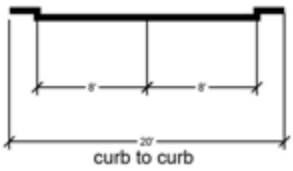
51’ ROW - Private



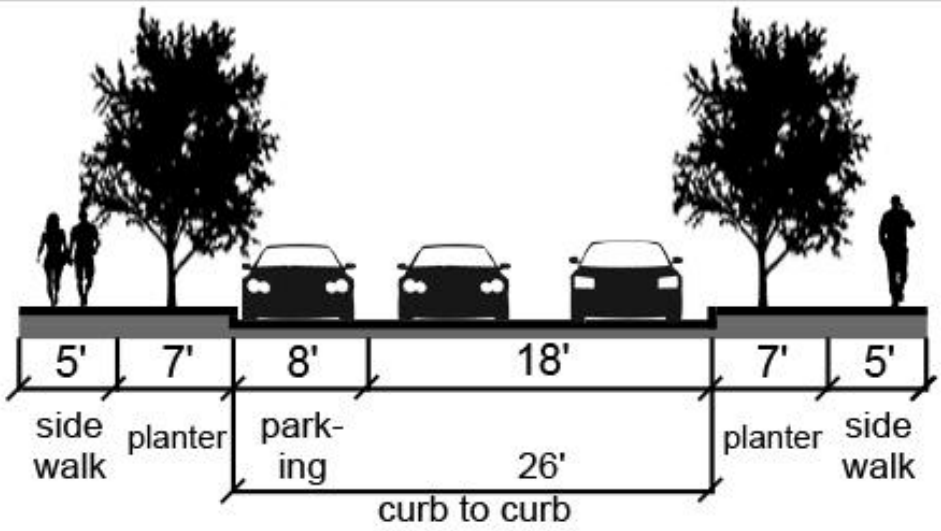
30' ALLEY (Access and Utility Easement - Private)



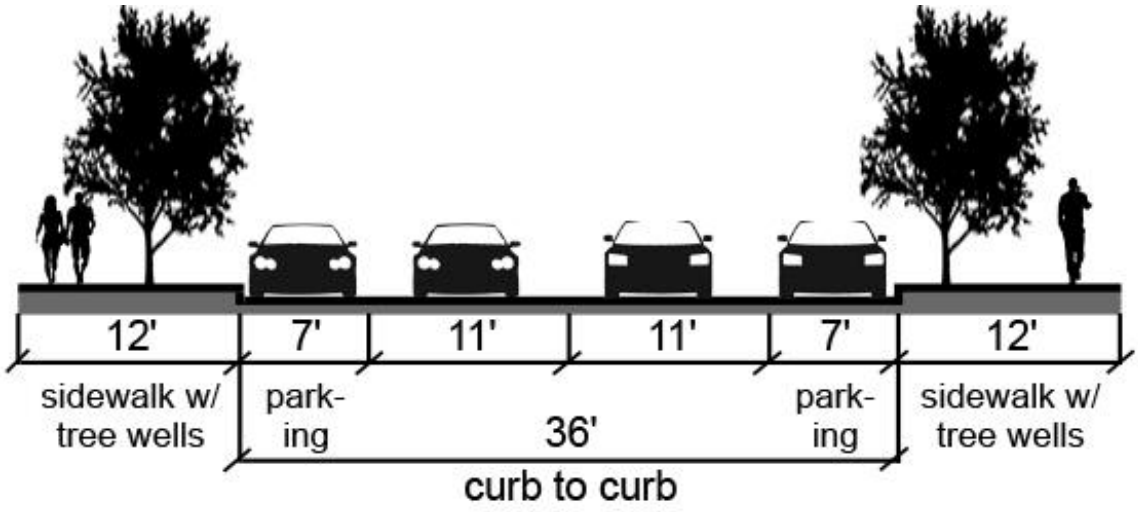
20' ALLEY (Access and Utility Easement - Private)



20' ALLEY ACCESS



50' R.O.W. (ST 50-26)



60' R.O.W. (ST 60-36)

RODERICK PLACE

CONCEPT PLAN VISION BOOK

Introduction

Development Guidelines

Architecture / Lot Standards

Project Description:

Roderick Place is 79.9 acres located in Thompson's Station Tennessee, 7 miles South of Franklin, TN and just North of Spring Hill. The proposed mixed-use community will provide a variety of Live, Shop, Work and Retirement options that will be serve the needs of many people. This amended plan carefully follows the GENERAL PLAN FOR THOMPSON'S STATION (see www.Thompsons-Station.com for the General Plan) Justification Statement: State why the application(s) should be approved, based on the required findings (if any). Attach additional pages if necessary.

This Specific Plan application which is to amend the Specific Plan Concept Plan Approved 2007. The intent of the Specific Plan zoning is to allow unique development to occur within the Town of Thompson's Station which does not fit within the Town's typical zoning classifications. The proposed development of Roderick Place acknowledges the historical past of the property while incorporating planning concepts in practical and interesting ways. A rural-chic coupled with unexpected informality create new and exciting experiences throughout the site. Each of the areas has a unique character and sense of place. While the styles are envisioned to be relaxed and informal, everything is designed to be luxurious and inviting.

Roderick Place is located on US-31 about mid-way between Critz Lane to the North and Thompson's Station Road to the South. With our approved entrance soon to be designed and permitted this will make an ideal point of beginning for the proposed East-West connection to Clayton Arnold Road. This connection opens up appx 500 acres for future development. This also enhances the feasibility of our proposed mixed use areas.

Statement as to how the concept plan is consistent with the General Plan:

Goal 1 – Preserve the rural characteristics of the community while accommodating for future growth in an orderly and sustainable manner. Roderick Place meets this goal by concentrating most of the proposed open space along the US-31 corridor.

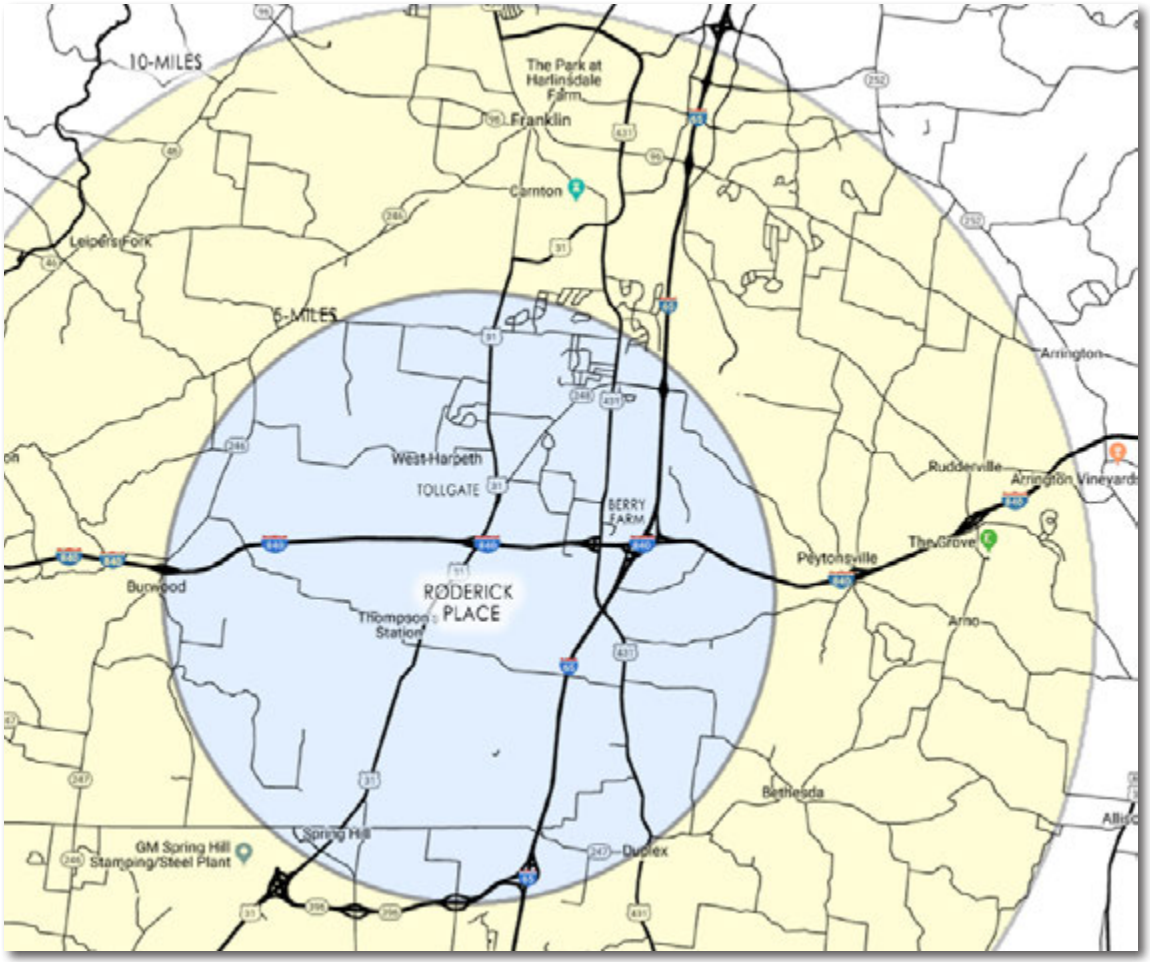
Goal 2 – Achieve a balanced mix of uses within the town. Roderick Place meets this goal. Please see our proposed plan.

Goal 3 – Achieve a balanced mix of non-residential uses within the town. Roderick Place meets this goal. Please see our proposed plan.

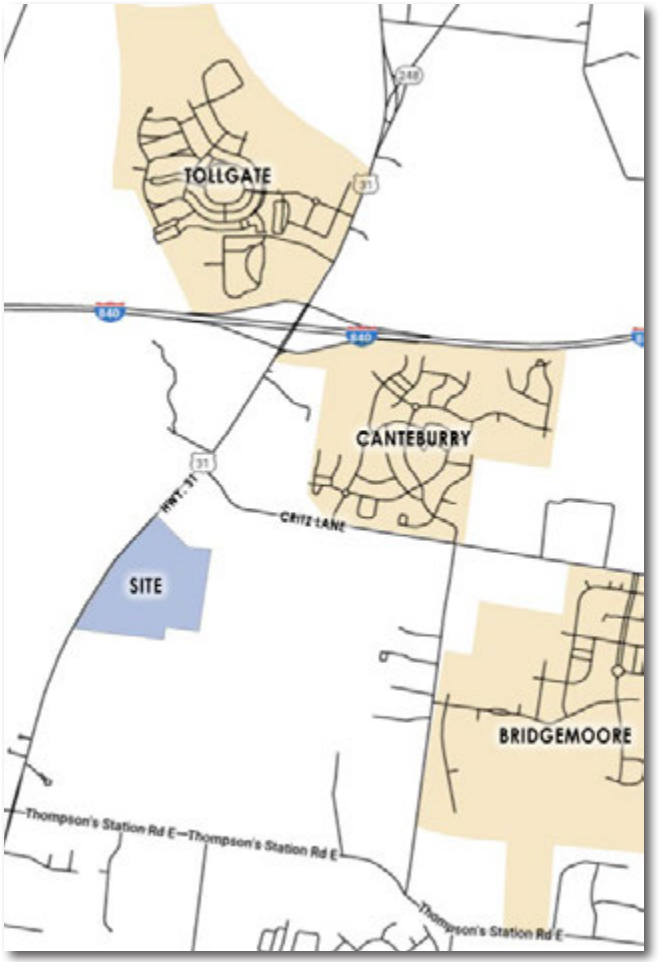
Goal 4 – Encourage design flexibility for future developments, in consideration of site grading, and increased impermeable surfaces. Roderick Place meets this goal. Please see our proposed plan.

Goal 5 – Encourage cluster development for preservation of natural and cultural resources where feasible and consistent with surrounding land uses. Roderick Place meets this goal. Please see our proposed plan.

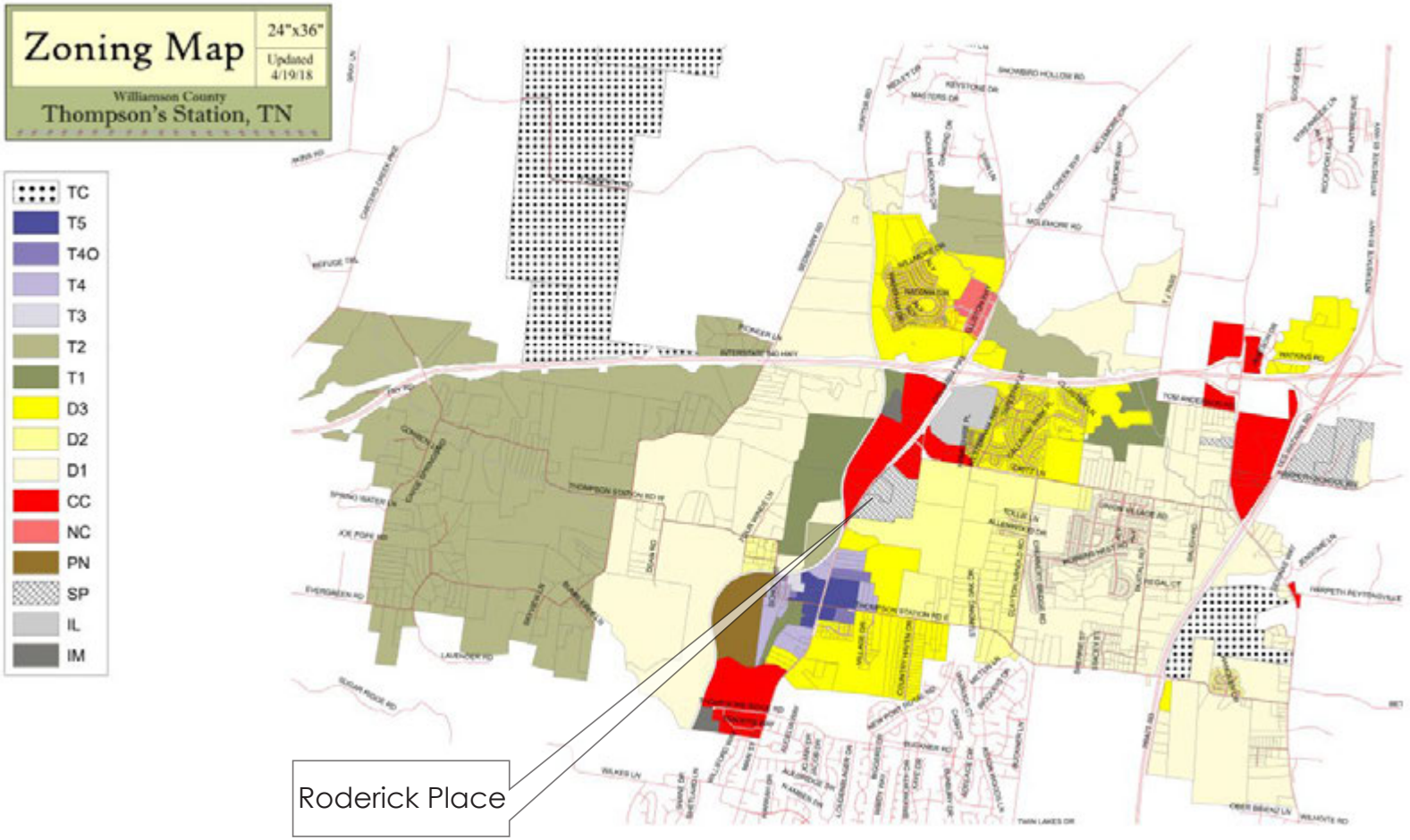
Goal 6 – Evaluate the jobs/housing balance and update plans as necessary to ensure that job opportunities are available through the possible development of land as economically feasible. Roderick Place meets this goal. Please see our proposed plan.z

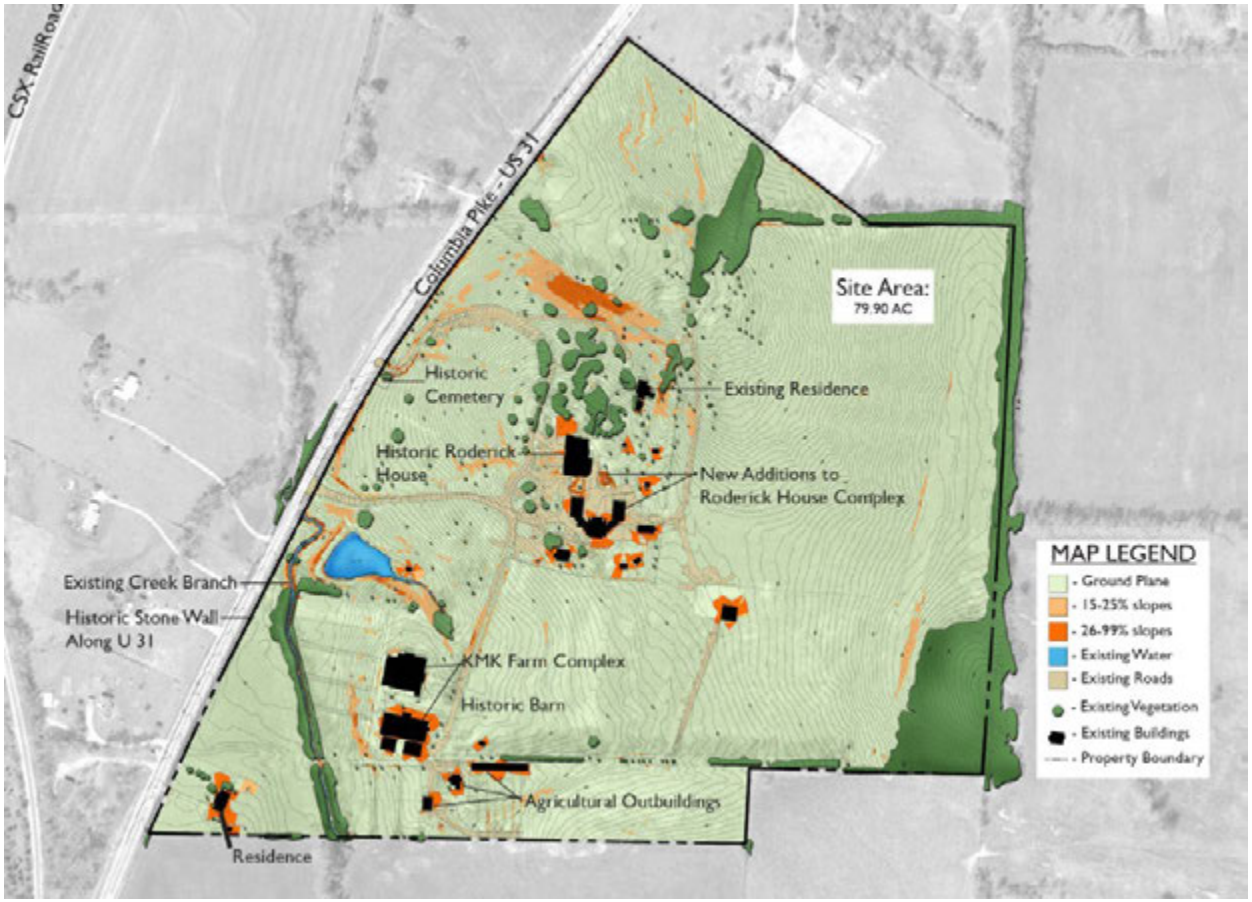


Vicinity Map



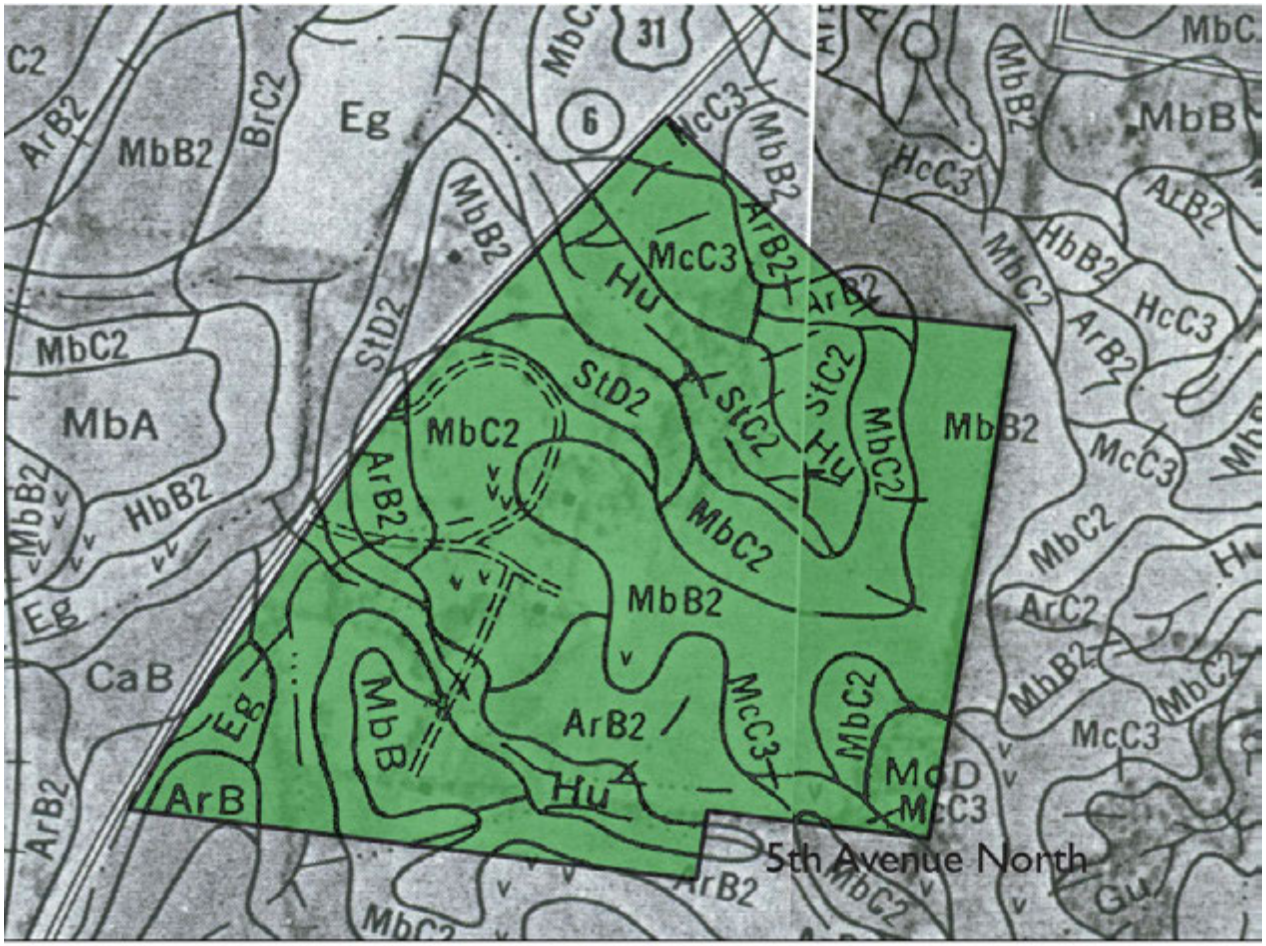
Location Map


Zoning Map
24"x36"
Updated 4/19/18
Williamson County
Thompson's Station, TN
TC
T5
T4O
T4
T3
T2
T1
D3
D2
D1
CC
NC
PN
SP
IL
IM
Roderick Place



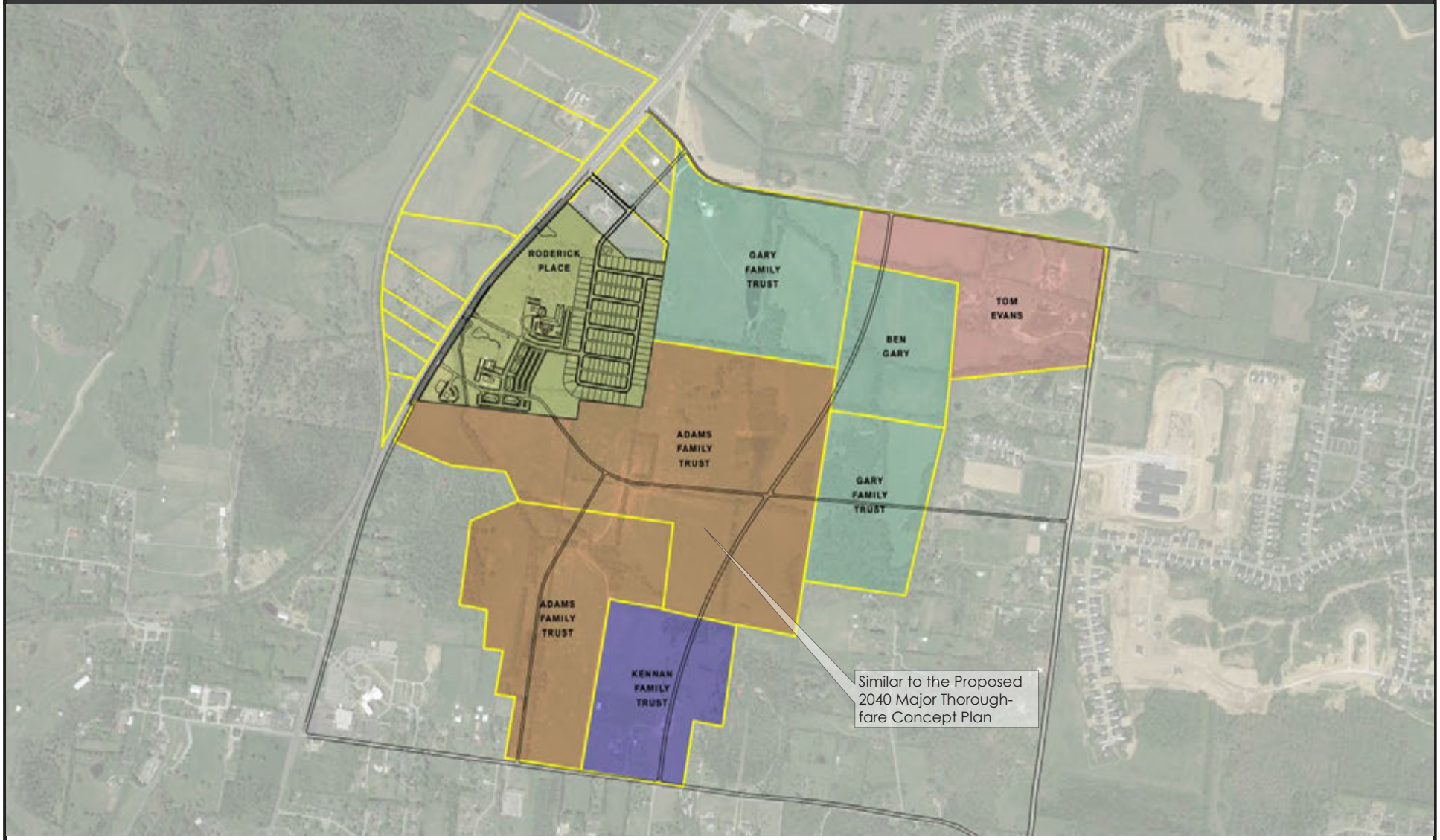

View of the existing structure overlooking the pond.
View of the existing rock wall along Columbia Pike.
View of the existing stream on site.
View of existing cemetery along Columbia Pike.
View of existing tree line.
View of the preserved Roderick House.
View of existing barn.

Existing Conditions



Existing Soils

ArB	Armour silt loam, 2-5% slopes
ArB2	Armour silt laom, 2-5% slopes, erod ed
Eg	Egam silt loam, phosphatic
Hu	Huntington silt laom, phospatic
MbB	Maury Silt loam, 2-5% slopes
MbB2	Maury Silt loam, 2-5% slopes, erod ed
MbC2	Maury Silt loam, 5-12% slopes, erod ed
MbC3	Maury Silt loam, 5-12% slopes, se verely eroded
MoD	Mimosa and Ashwood very rocky soils, 5-20% slopes
StC2	Stiversville silt loam, 5-12% slopes, eroded
StD2	Stiversville silt loam, 12-20% slopes, eroded

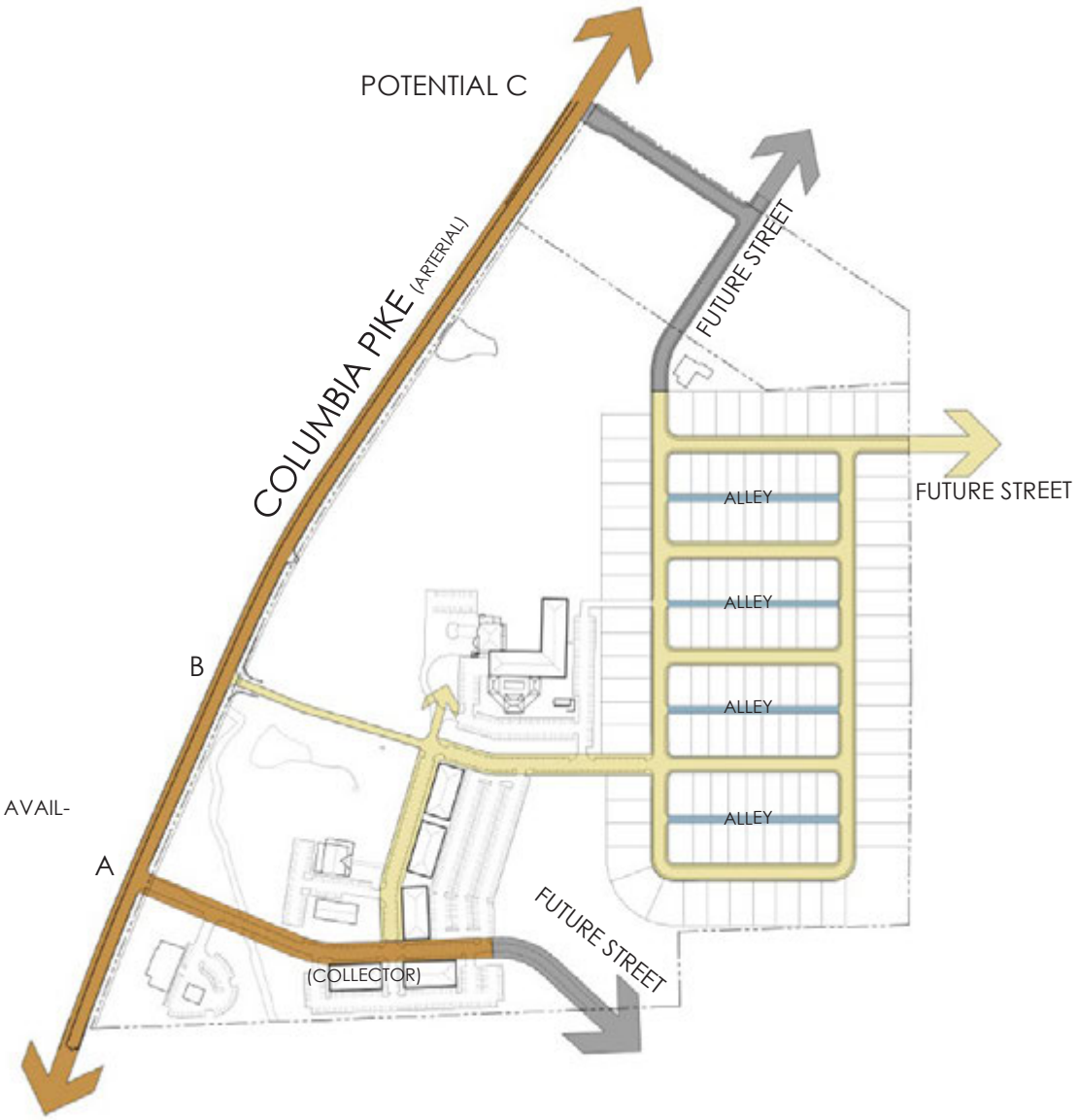


Adjacent Properties

LEGEND

- ARTERIAL, COLLECTOR
- LOCAL
- FUTURE STREETS
- ALLEY

NOTE: IF THE POTENTIAL ENTRANCE "C" IS AVAILABLE, ENTRANCE "B" WILL BE REMOVED



Street Network

Master Plan

RODERICK PLACE

THE VISION - AUGUST 2019 - REVISED NOVEMBER 2019

THOMPSON'S STATION, TN

Master Plan Tabular Data

Existing Zoning: High Intensity District
Gross Site Area: 79.90 AC

Requirements of Proposed Zoning: Specific Plan, High Intensity District (Cluster Option) - General Plan Requirements:
-Maximum Density: 3.00 DU/AC
-Maximum Height: 3 Stories
-Required Open Space: 40% Residential | 50% Commercial
-Minimum Site Area: 10 Acres
-Maximum Site Area: 100 Acres
-Area Permitted as Residential: 100%
-Area Permitted as Commercial: 100%

Density:

-Gross Permitted Density:	3.00 DU/AC
-Total Residential:	211 Units
-Estate Lots:	54 Units
-Cottage Lots:	72 Units
-Multistory dwellings/ live work:	85 Units
-Total Commercial:	129,367 S.F.
-Event Center & Historic Barn:	13,500 S.F.
-Hotel w/ Senior Residences:	92 Units
-Senior Living (IL,AL,ALZ):	100 Beds

Open Space:
-Total Land Area: 79.90 Acres
-Total Commercial Area: 9.26 Acres X 50% = 4.63 Acres
-Total Residential Area: 70.64 Acres X 40% = 28.25 Acres
-Total Required Open Space: 32.88 Acres
-Total Provided Open Space: 35.80 Acres

Open Space Plan

Regulating Plan

The Regulating Plan for Roderick Place graphically depicts the different neighborhoods and specific building types permitted within each. This is intended to ensure a project that will, at full build out, meet or exceed the goals of both the developer and the town of Thompson's Station, while creating an attractive, appealing and functionally sustainable community.

Building Types

A. The Knoll
B. The Barn and Artisan Village
C. Live/Work (Mixed-Use Village)
D. Estate Lots
E. Cottages

Notes

1. The regulatory plan is representative of the intended development. Actual plan may differ in product mix, location, density and size - not exceeding minimums or maximums established as part of this zoning document.
2. A variety of housing types will be built and may include: detached single family homes, attached single family homes, town-homes, Residential Buildings and Multistory Dwelling Units, senior living (IL,AL,ALZ), and Hotel.

The Knoll Main Entrance
Roderick Hotel & Residences

The Knoll

The centerpiece of the development is the Roderick mansion. It will be carefully expanded to include approximately 71 luxury age restricted apartments in a beautiful garden setting. Additionally the Roderick will provide terraces, porches and multiple open spaces for relaxing, dining and entertaining.

This community will be designed to promote healthy lifestyles, and create a sense of belonging where residents thrive.

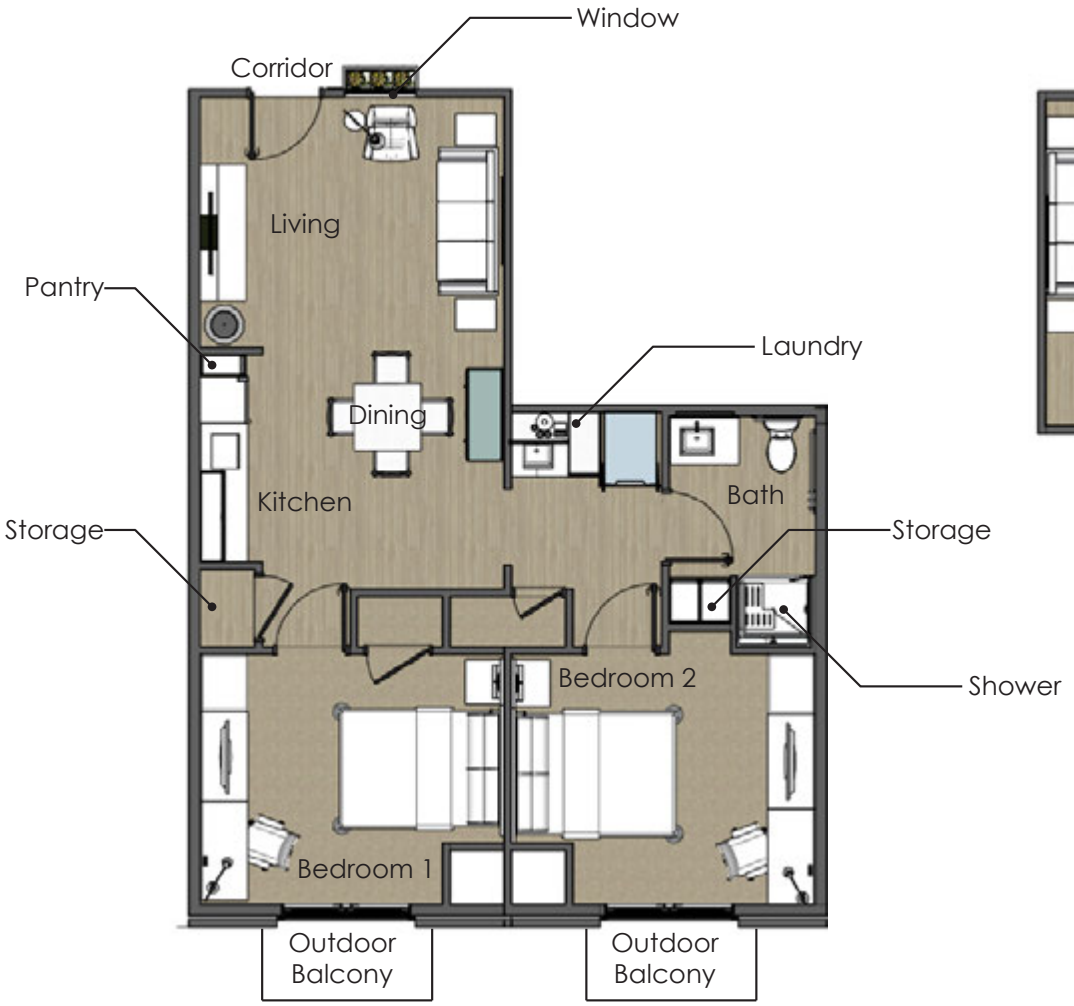
Permitted Uses

-Restaurant
-Retail Shop
-Boutique Shop
-Hotel and Residences
-Day Spa / Fitness
- Pool
-General Office
-Medical Office
-Conference Rooms
-Senior Living (IL,AL, ALZ)
-Residential Buildings and Multistory Dwelling Units

Lot Standards

-Building Coverage: 75% max.
-Primary Structure Front Setback: 0'
-Primary Structure Side Setback: 0'
-Primary Structure Rear Setback: 0'
-Distance Between Buildings: 10' min.
-Height 3 stories max.
-Parking: Permitted uses shall satisfy parking requirements of Thompson's Station Zoning Ordinance. On-street parking may count toward the required parking if directly adjacent the subject parcel

Garden View
Roderick Luxury Residences

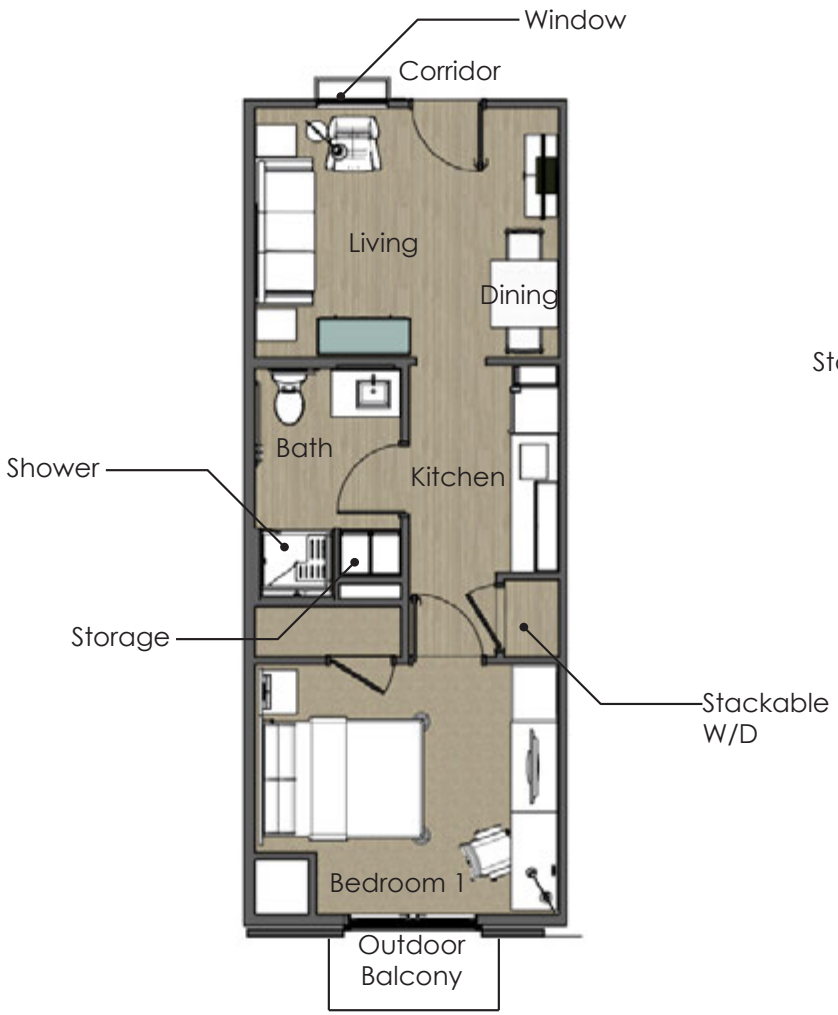


The Roderick 2 Bedroom Suite

775 SF

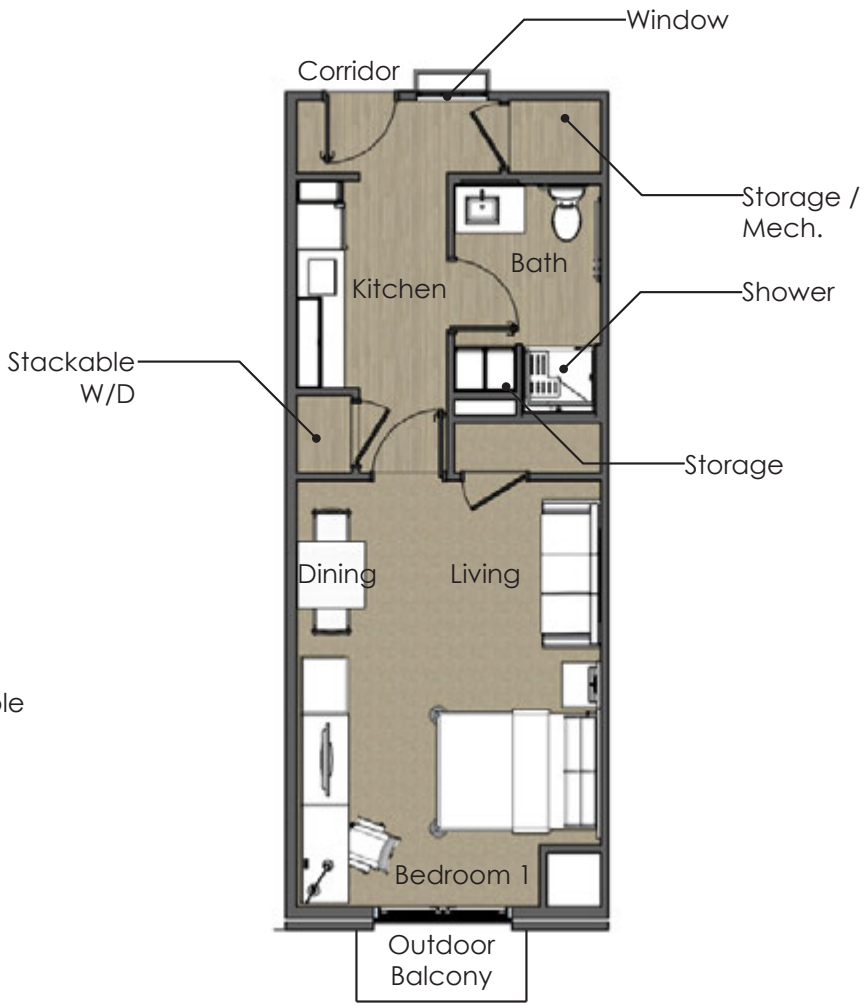
The Bedford 2 Bedroom Suite

680 SF



The 1 Bedroom

490 SF



The Spencer Studio Suite

475 SF

The Barn, Mixed-Use and Artisan Village

The Barn and Artisan Village present a unique "face" of Roderick Place and create a memorable entrance to the residential community. Two large existing barns are retained and given new life as the focal point of the Village. The Community Center will be renovated to include meeting and multi-use convention space for corporate clients, local music events, theatrical shows and church services. The Barn, the second venue has a soaring second floor loft space; providing an outstanding space for wedding events, parties and receptions, creating a unique experience for the residents of Roderick Place and Thompson's Station. The ground floor of the Barn will house the service and amenities associated with the event space and could include an artisan marketplace for locals. A grassy open space next to the Community Center provides outdoor space for family events and weddings. The Village itself provides the "necessities" of life including local retail shops, restaurants, a select group of professional offices, Country Inn, Daycare and Residential Buildings and Multistory Dwelling Units Designed to provide a destination place for work, living and cultural lifestyle of Thompson's Station, Tennessee.

Permitted Uses

-Restaurant
-Retail Shop
-Boutique Shop
-Hotel
-General Office
-Professional Office
-Deli / Butcher
-Convenience Market
-Residential Buildings and Multistory Dwelling Units
-Farmers / Artisan Market
-Medical Services
-Community Center
-Assisted Living / Memory Care
-Arts and Crafts, Ceramics, Metal and Wood Shops

Lot Standards

-Building Coverage: 75% max.
-Primary Structure Front Setback: 0'
-Primary Structure Side Setback: 0'
-Primary Structure Rear Setback: 0'
-Distance Between Buildings: 10' min.
-Height 3 stories max.
-Parking: Permitted uses shall satisfy parking requirements of Thompson's Station Zoning Ordinance. On-street parking may count toward the required parking if directly adjacent the subject parcel

RODERICK PLACE

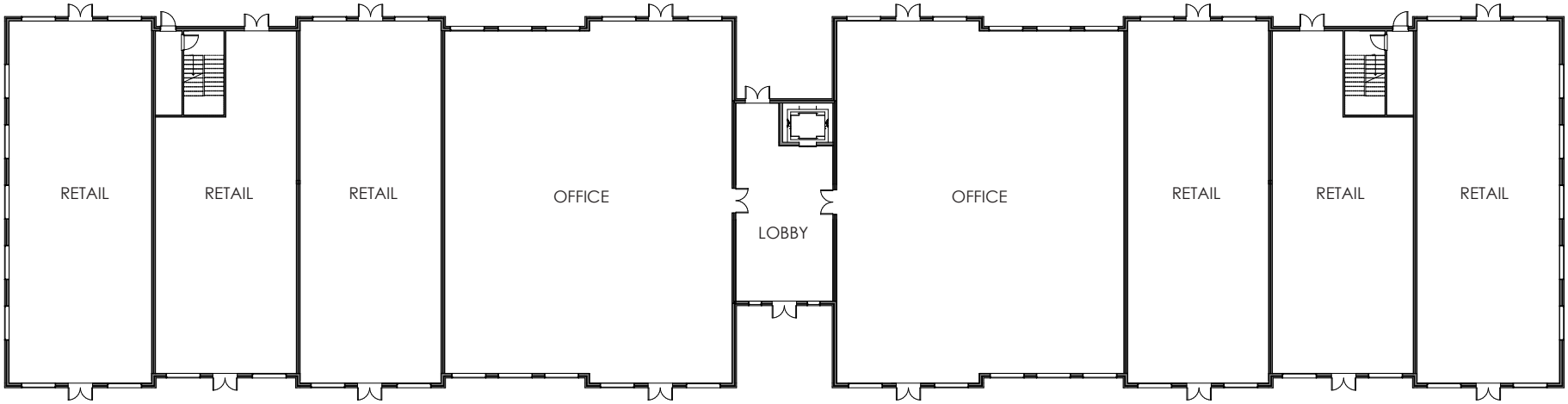
THE VISION - AUGUST 2019 - REVISED NOVEMBER 2019

THOMPSON'S STATION, TN

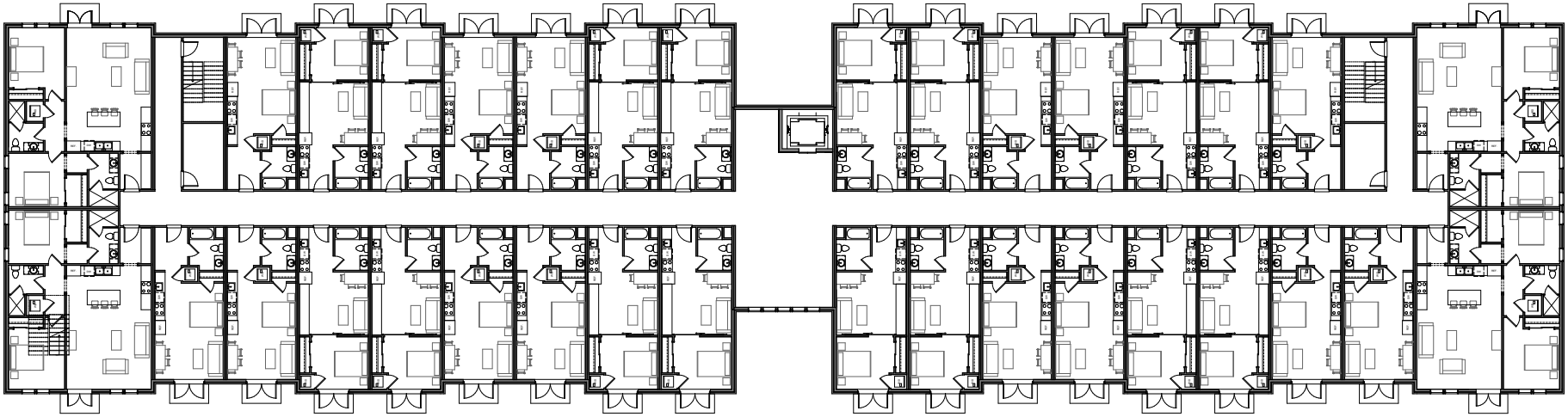




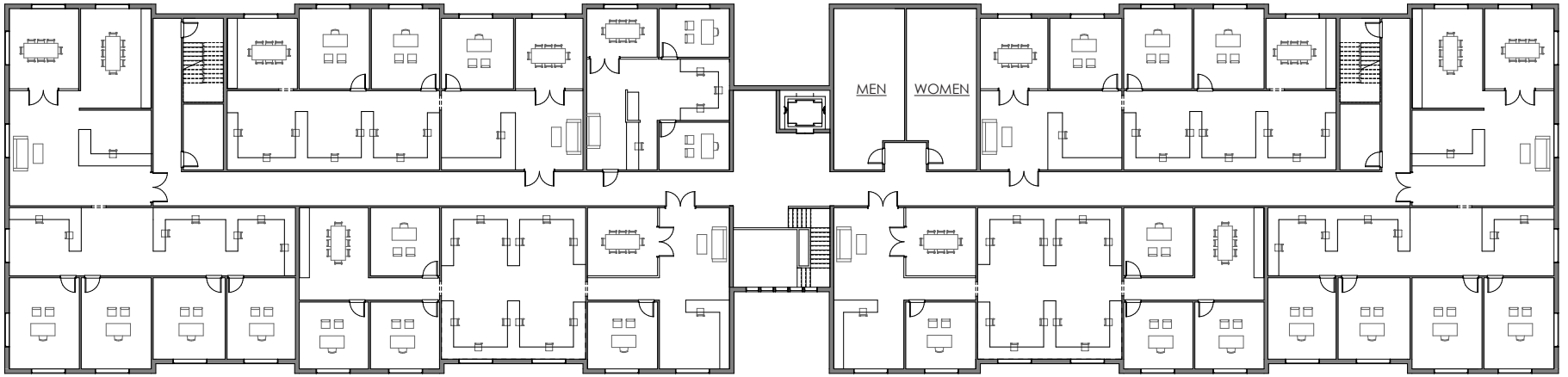

The Barn and Artisan Village Mixed-Use Building Images



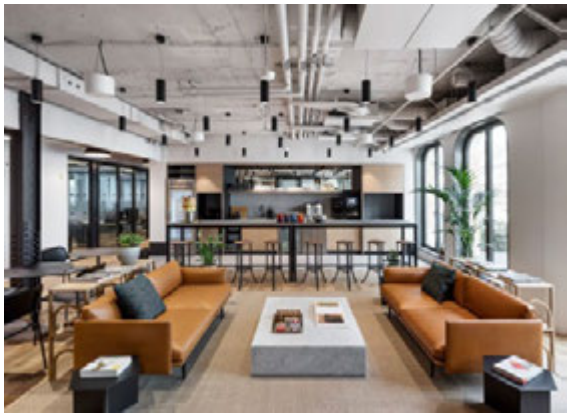
1st Floor Mixed Use



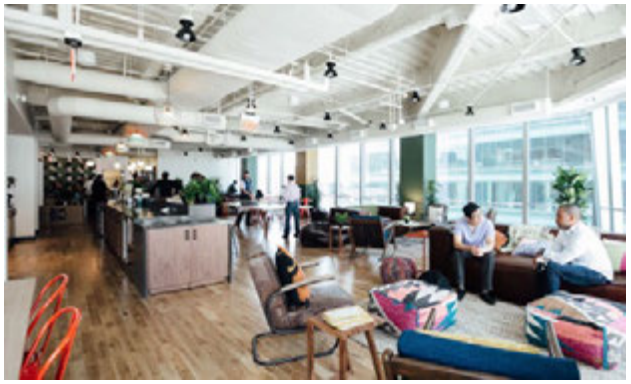
2nd & 3rd Floor Residential



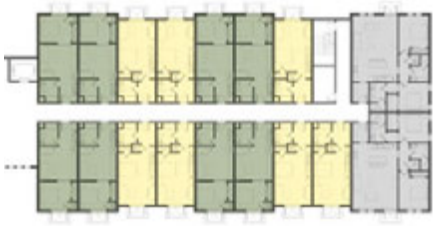
2nd & 3rd Floor Office








The Barn and Artisan Village Mixed-Use Office Interiors

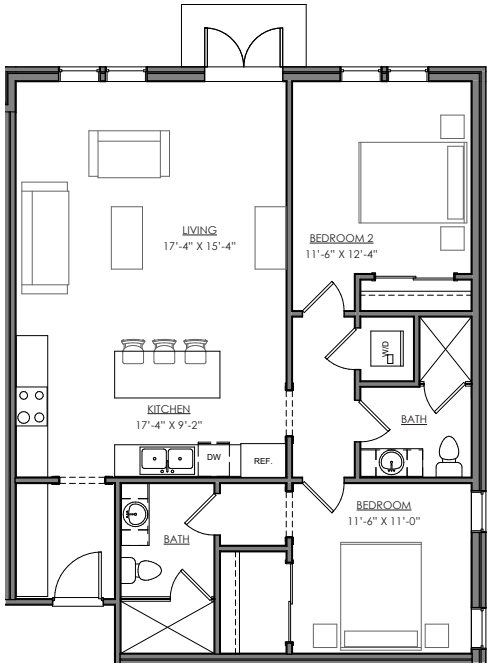


Legend

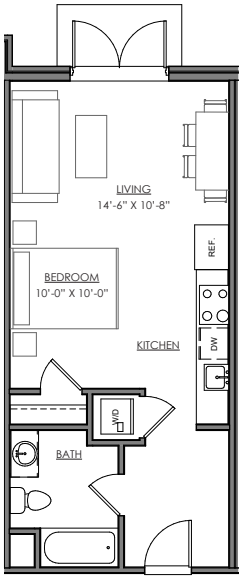
(2) 1,046 SF 2 Bedroom

(7) 474 SF Studio

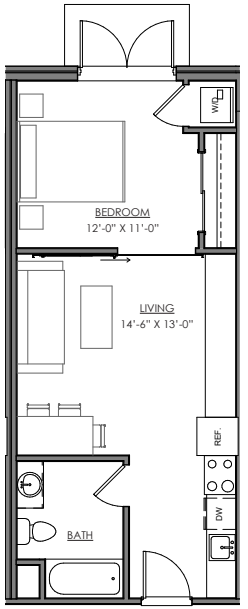
(8) 505 SF Studio Deluxe



2 Bedroom - 1,046 SF



Studio - 474 SF



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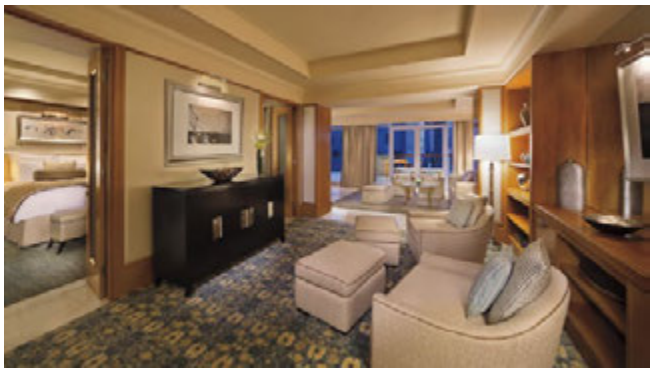





The Barn and Artisan Village Mixed-Use Residential Interiors

Estate Lots

65x140 Lot Standards

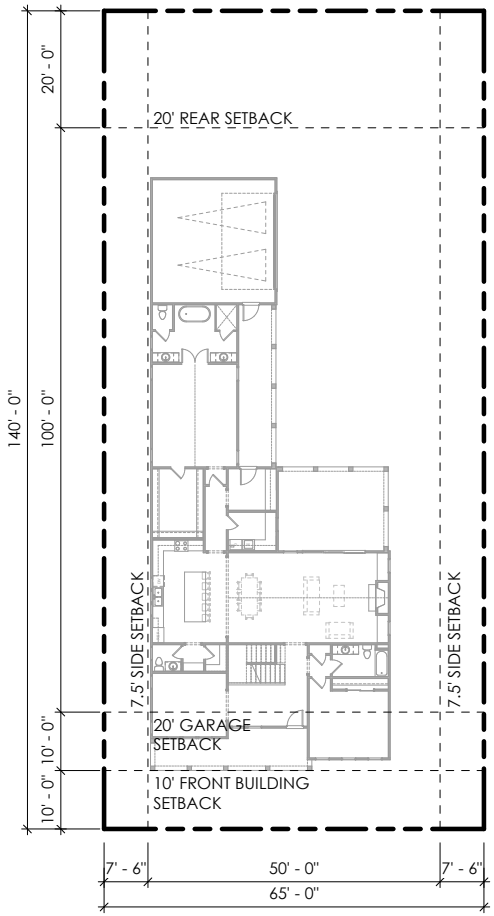
The single family dwellings located along the outside edge of the perimeter drive. Architectural styles follow an Americana influence and include variations of Federal, Classic American Farmhouse, European Cottage, Tudor, Folk Victorian, French Country, and Craftsman. Proportion, ornamentation, landscape treatments and soft exterior lightning are important to creating the luxurious and inviting character of this neighborhood. Side entry garages are located behind the house, and front entry garages are set back at a minimum 10' from the front facade of the home. The lots are not designed for alley access.

Interior Lots

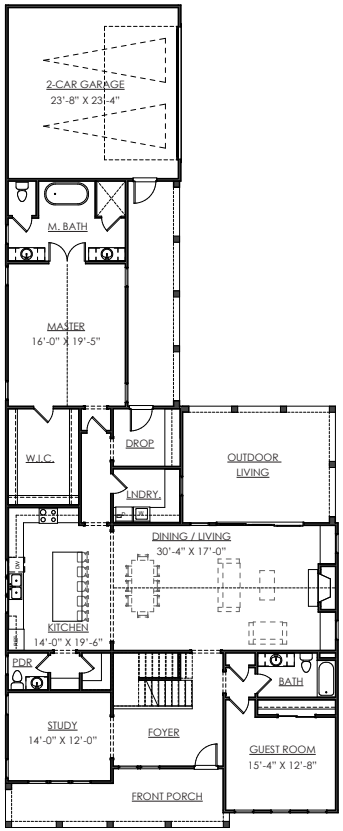
-Lot Area: 9,000 SF min.
-Building Coverage: 55% max.
-Lot Width: 65' min.
-Lot Depth: 140' min.
-Building Front Setback: 10'min.
-Garage Front Setback: 20' min.
-Building Side Setback: 7.5'min.
-Building Rear Setback: 20' min.
-Height: 3 stories max.
-Raised Foundation at Front Facade to be 18" min.
-Required Off-street parking: Min. 2 cars per unit within an enclosed garage.
-Porch Depth: 6' min.
-Driveway Setback: 1' min. from the property line

Corner Lots

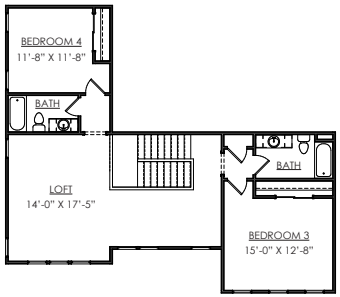
-Lot Area: 9,800 SF min.
-Building Coverage: 55% max.
-Lot Width: 70' min.
-Lot Depth: 140' min.
-Building Front Setback: 10'min.
-Garage Front Setback: 20' min.
-Building Corner Side Setback: 10' min.
-Building Side Setback: 7.5'min.
-Building Rear Setback: 20' min.
-Porch Side Setback: 5' min.
-Height: 3 stories max.
-Raised Foundation at Front Facade to be 18" min.
-Required Off-street parking: Min. 2 cars per unit within an enclosed garage.
-Porch Depth: 6' min.
-Driveway Setback: 1' min. from the property line



Typical Site Plan



First Floor



Second Floor

CONCEPT ELEVATION

CONCEPT ELEVATION

CONCEPT ELEVATION

Estate Lots

65x125 Lot Standards

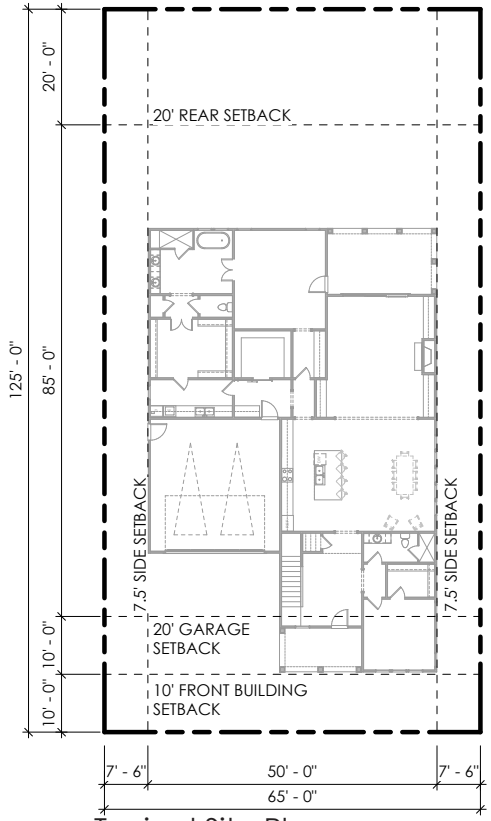
The single family dwellings located along the outside edge of the perimeter drive. Architectural styles follow an Americana influence and include variations of Federal, Classic American Farmhouse, European Cottage, Tudor, Folk Victorian, French Country, and Craftsman. Proportion, ornamentation, landscape treatments and soft exterior lightning are important to creating the luxurious and inviting character of this neighborhood. Side entry garages are located behind the house, and front entry garages are set back at a minimum 10' from the front facade of the home. The lots are not designed for alley access.

Interior Lots

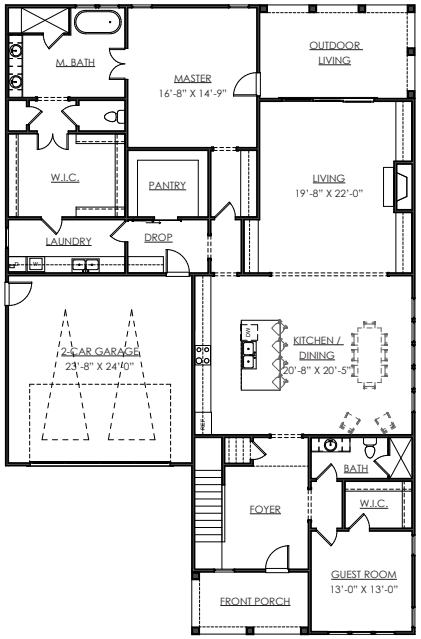
-Lot Area: 8,000 SF min.
-Building Coverage: 55% max.
-Lot Width: 65' min.
-Lot Depth: 125' min.
-Building Front Setback: 10'min.
-Garage Front Setback: 20' min.
-Building Side Setback: 7.5'min.
-Building Rear Setback: 20' min.
-Height: 3 stories max.
-Raised Foundation at Front Facade to be 18" min.
-Required Off-street parking: Min. 2 cars per unit within an enclosed garage.
-Porch Depth: 6' min.
-Driveway Setback: 1' min. from the property line

Corner Lots

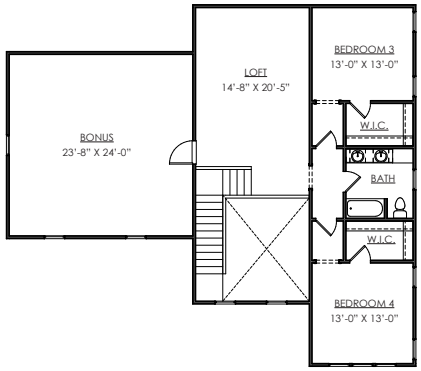
-Lot Area: 8,750 SF min.
-Building Coverage: 55% max.
-Lot Width: 70' min.
-Lot Depth: 125' min.
-Building Front Setback: 10'min.
-Garage Front Setback: 20' min.
-Building Corner Side Setback: 10' min.
-Building Side Setback: 7.5'min.
-Building Rear Setback: 20' min.
-Porch Side Setback: 5' min.
-Height: 3 stories max.
-Raised Foundation at Front Facade to be 18" min.
-Required Off-street parking: Min. 2 cars per unit within an enclosed garage.
-Porch Depth: 6' min.
-Driveway Setback: 1' min. from the property line



Typical Site Plan



First Floor



Second Floor

CONCEPT ELEVATION

CONCEPT ELEVATION

CONCEPT ELEVATION

Cottages

50X115 Lot Standards

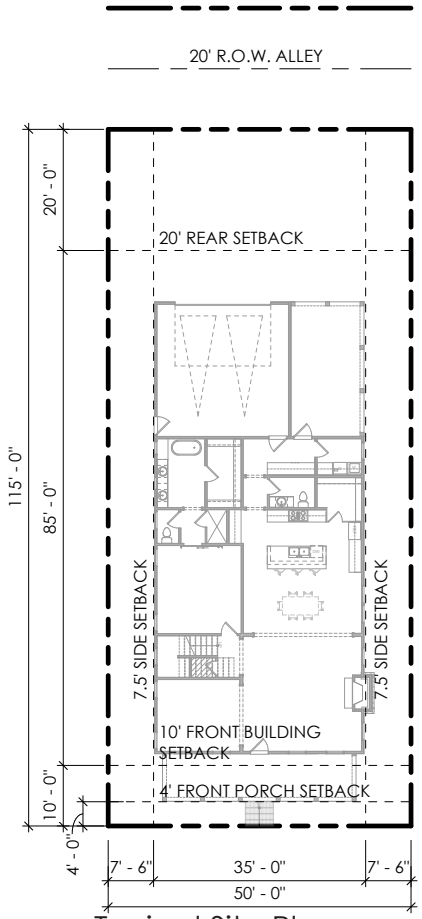
Cottages are single family dwellings located in the core of Roderick Place. Designed for smaller residential lots, the houses are appropriately scaled to create a traditional village street. These houses will emphasize front porch living, while offering inviting front facades. Generous landscaping and soft landscape lighting are essential to creating the inviting character of the neighborhood. Garages are accessed from service alleys behind the homes.

Interior Lots

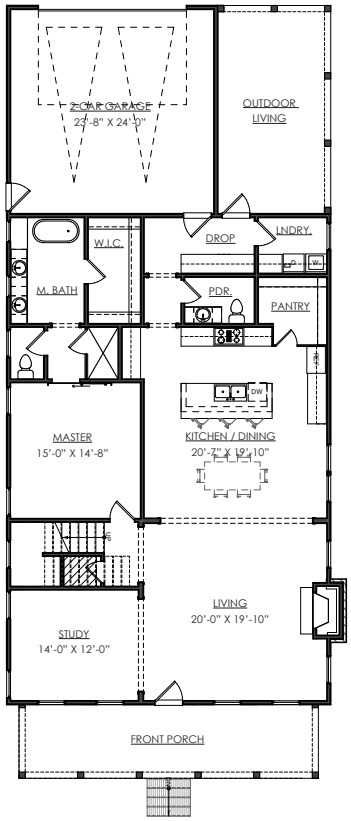
-Lot Area: 5,7 50 SF min.
-Building Coverage: 75% max.
-Lot Width: 50' min.
-Lot Depth: 115' min.
-Building Front Setback: 10'min.
-Building Side Setback: 7.5'min.
-Building Rear Setback: 20' min.
-Garage Rear Setback: 5' min.
-Porch Front Setback: 4' min.
-Height: 3 stories max.
-Raised Foundation at Front Facade to be 18" min.
-Required Off-street parking: Min. 2 cars per unit within an enclosed garage. Garages shall be alley access only.
-Porch Depth: 6' min.

Corner Lots

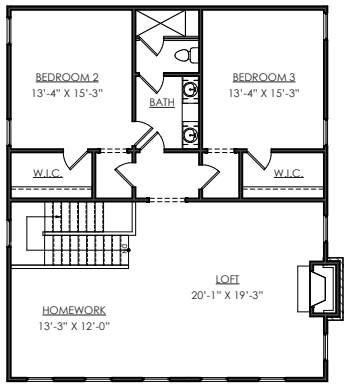
-Lot Area: 6,325 SF min.
-Building Coverage: 75% max.
-Lot Width: 55' min.
-Lot Depth: 115' min.
-Building Front Setback: 10'min.
-Building Side Setback: 7.5'min.
-Building Corner Side Setback: 10' min.
-Building Rear Setback: 20' min.
-Garage Rear Setback: 5' min.
-Porch Front Setback: 4' min.
-Porch Side Setback: 5' min.
-Height: 3 stories max.
-Raised Foundation at Front Facade to be 18" min.
-Required Off-street parking: Min. 2 cars per unit within an enclosed garage. Garages shall be alley access only.
-Porch Depth: 6' min.



Typical Site Plan



First Floor



Second Floor

CONCEPT ELEVATION

CONCEPT ELEVATION

CONCEPT ELEVATION

PROPOSED 2019 CONCEPT PLAN AMENDMENT AND 2007 APPROVED CONCEPT PLAN COMPARISON

COLUMBIA PIKE VIEWSHED AND OPEN SPACE COMPARISON

Samson J/V
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Franklin, TN, 37064

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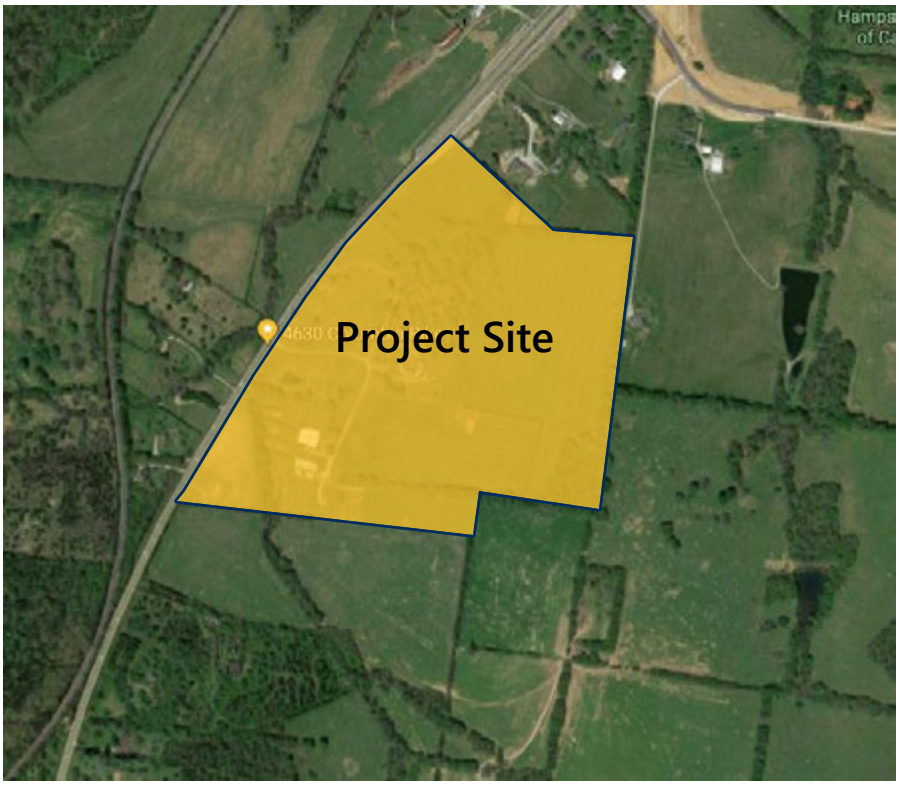
DECEMBER 2019

UPDATED TRAFFIC IMPACT STUDY

RODERICK PLACE

THOMPSON'S STATION, TENNESSEE



PREPARED FOR:

SAMSOM JV

KCI TECHNOLOGIES

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UPDATED TRAFFIC IMPACT STUDY
RODERICK PLACE
THOMPSON'S STATION, TENNESSEE

PREPARED FOR:
Samson JV

PREPARED BY:
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EXECUTIVE SUMMARY

Project Description

The proposed Roderick Place development is located along Columbia Pike (SR 6/US 31) in Thompson's Station, Tennessee. According to the developer, the proposed development includes approximately 92 hotel rooms, 75,606 square feet of office space, 20,000 square feet of commercial space, 19,768 square feet of restaurant space, 85 multi-family residential units, 100 assisted living units, 126 single-family homes, 13,000 square feet of private event space, 12,000 square feet of daycare, and a 4-fueling position convenience market with gasoline pumps. Access to the development is planned to be provided by two access drives on Columbia Pike (SR 6/US 31). The purpose of this study is to analyze the access plan and the traffic impacts associated with this proposed development.

Data Collection

In order to provide data for the traffic impact analysis, manual traffic counts were conducted at the following intersections:

1. Columbia Pike (SR 6/US 31) and Thompson's Station Road (signalized)
2. Columbia Pike (SR 6/US 31) and Critz Lane (signalized)
3. Columbia Pike (SR 6/US 31) and I-840 Eastbound Ramp (signalized)
4. Columbia Pike (SR 6/US 31) and I-840 Westbound Ramp (signalized)
5. Columbia Pike (SR 6/US 31) and Declaration Way

Specifically, KCI Technologies, Inc. conducted the traffic counts from 7:00 – 9:00 AM and 4:00 – 6:00 PM on a typical weekday in May 2019 and from 11:00 AM – 1:00 PM on a typical weekend in July 2019 for the intersections of Columbia Pike and Thompson's Station and Columbia Pike and Critz Lane. KCI Technologies, Inc conducted traffic counts for the remaining intersections on a typical weekday and weekend in August 2019. From the counts, it was determined that the peak hours of traffic flow for the majority of the study intersections occurred from 7:15 – 8:15 AM and 4:45 – 5:45 PM during weekdays and from 11:45 AM – 12:45 PM during weekends. Due to variations in peak hour associated with school and interstate traffic, individual peak hour traffic volumes were utilized at some intersections.

Projection of Future Traffic Volumes

In order to account for the traffic growth prior to the completion of the proposed project, background traffic volumes were established. These volumes include a background growth rate to account for general traffic growth within the study area based on the Tennessee Department of Transportation (TDOT) count station data. Then, the estimated total project-generated traffic volumes for the proposed Roderick Place development were added to the background peak hour traffic volumes in order to obtain the total projected peak hour traffic volumes for the study area intersections.

Conclusions and Recommendations

The analyses presented in this study indicate that the impacts of the proposed project on the existing street network will be manageable by providing the recommendations below. These specific recommendations will provide safe and efficient traffic operations within the study area following the completion of the proposed project. The recommendations are as follows:

Columbia Pike (SR 6/US 31) and Site Access A

- Provide a traffic signal at the intersection. A traffic signal should be installed at approximately 55% occupancy of the development.
- Until the 55% occupancy level is reached, the westbound approach of Site Access A should be stop-controlled and a stop bar and R1-1 'Stop' sign should be installed on the egress approach.
- Site Access A should be designed to include sufficient width for one entering lane and three exiting lanes. The exiting approach should include one left-turn lane and one right-turn lane with approximately 150 feet of storage length and a through lane to account for a future fourth leg of the intersection. This through lane should be striped out until needed.
- Provide a northbound right-turn lane on Columbia Pike (SR 6/US 31) with approximately 100 feet of storage length.
- Provide a southbound left-turn lane on Columbia Pike (SR 6/US 31) with approximately 150 feet of storage length.

Columbia Pike (SR 6/US 31) and Site Access B

- Site Access B should initially be utilized as the development construction entrance.
- Site Access B should be converted from a construction access to a site access at the time when approximately 50% occupancy of the development is reached.

- When Site Access B is converted to a site access, it should operate as right-in/right-out only and should be designed to include sufficient width for one entering lane and one exiting lanes.
- The westbound approach of Site Access B should be stop-controlled and a stop bar and R1-1 'Stop' sign should be installed on the egress approach.

Signal Timing Optimization and Coordination

- Signal timings at all the signalized study intersections should be optimized upon completion of the development. Furthermore, after providing a traffic signals at the intersection of Columbia Pike (SR 6/US 31) and Site Access A, signal timing coordination should be conducted between the three intersections of Columbia Pike (SR 6/US 31) and Thompson's Station Road, Columbia Pike (SR 6/US 31) and Site Access A, and Columbia Pike (SR 6/US 31) and Critz Lane.

Additional Recommendations

- As part of the construction of the project, all internal and external driveway connections should be designed such that the departure sight triangles, as specified by AASHTO, will be clear of all sight obstructions, including landscaping, existing vegetation, monument signs/walls, fences, etc.
- Parking should be developed per code.
- According to the Major Thorough Plan for the Town of Thompson's Station, the construction of a new east-west roadway connecting Columbia Pike to Clayton Arnold Road is planned through this project site. Site Access A is planned to provide the start of that connector roadway and the site plan shows the proposed collector road extending to the southern property line. This internal collector roadway should be designed to Town of Thompson's Station standards for a ST-60-36 collector road. The collector should terminate as a stub and right-of-way should be dedicated for its future extension to the south property line.
- In the event of a large function at the private event space, traffic control officers should be considered to direct traffic.
- Final design of internal roadways and parking should meet all Town of Thompson's Station standards and the latest version of "A Policy of Geometric Design of Highways and Streets" published by AASHTO. Any parking lots and streets associated with the development should ensure that passenger cars and emergency vehicles are capable of making all turning movements. Internal intersections should be two-way stop-controlled unless all-way stop control warrants are met.

- Per the TDOT *Manual for Constructing Driveway Entrances on State Highways*, this development meets the minimum requirements for distance between two site access points.
- The Major Thoroughfare Plan for the Town of Thompson's Station details the following roadway improvements occurring in the vicinity of the project site:
    - The widening of Columbia Pike (SR 6/US 31) to a 4-lane median-divided cross-section, and
    - The construction of an east-west roadway connecting Columbia Pike to Clayton Arnold Road at its intersection with Robbins Nest Road.

  As previously described, the Roderick Place developer shall design a ST-60-36 collector roadway with a 60-foot right-of-way from Columbia Pike to the southern property line approximately as shown on the revised concept plan and the MTP. Additionally, right-of-way shall be dedicated along the entire frontage of Roderick Place (approximately 2,600 linear feet). The width is to be determined by State of Tennessee (TDOT) construction drawings.

In summary, based on the analyses conducted, no further recommendations are presented for the proposed Roderick Place development.

1. INTRODUCTION AND PROJECT DESCRIPTION

The purpose of this study is to analyze the traffic impacts and access plan associated with the proposed Roderick Place mixed-use development located along Columbia Pike (SR 6/US 31) in Thompson's Station, Tennessee. According to the developer, the proposed development includes approximately 92 hotel rooms, 75,606 square feet of office space, 20,000 square feet of commercial space, 19,768 square feet of restaurant space, 85 multi-family residential units, 100 assisted living units, 126 single-family homes, 13,000 square feet of private event space, and 12,000 square feet of daycare, and a 4-fueling position convenience market with gasoline pumps.

As shown by Figure 1, the property is located along Columbia Pike (SR 6/US 31) north of the intersection of Columbia Pike (SR 6/US 31) and Thompson's Station Road. According to the Thompson's Station zoning map, the property is currently zoned SP (Specific Plan). The proposed development is within an area that is characterized by low-density land uses. The property is generally bounded on the west by Columbia Pike (SR 6/US 31) and on the north, south, and east by undeveloped land. Surface parking is planned to be provided for the proposed development.

The current site plan for the Roderick Place development is shown in Appendix A. Based on this site plan, proposed vehicular access for the development will be provided by two site accesses on Columbia Pike (SR 6/US 31), located on the west side of the project site. Site Access A will be intersecting Columbia Pike approximately 420 feet north of the southern property line of the site, and Site Access B will intersect Columbia Pike approximately 650 feet further to the north.

In this study, the current operating characteristics of the adjacent roadways and intersections in the vicinity of the project site are evaluated. The expected trips generated by the proposed development are determined and distributed to the roadway network. The adjacent roadways and intersections are then reevaluated to determine the anticipated traffic impacts of the project. Finally, recommendations are presented, including roadway improvements and/or traffic control improvements that are needed to accommodate the expected traffic.

FIGURE 1. LOCATION OF THE PROJECT SITE

N

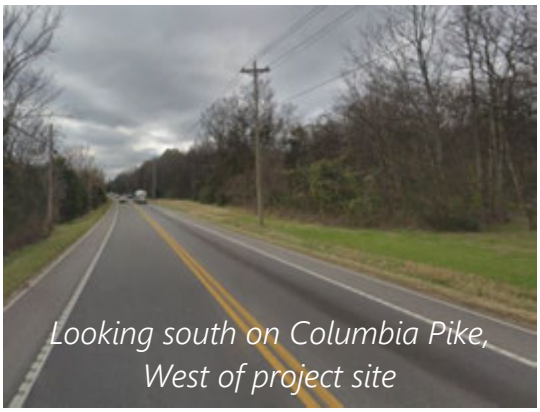
Location of the Project Site
(Not to Scale)

Figure 1.

2. EXISTING CONDITIONS

2.1 Existing Roadway Network

Local access to the site will be provided by Columbia Pike (SR 6/US 31), Thompson's Station Road, Critz Lane, I-840 Eastbound Ramp, I-840 Westbound Ramp, and Declaration Way. A description of these roadways within the project vicinity is as follows:



Looking south on Columbia Pike, West of project site

Columbia Pike (SR 6/US 31) is a two-way roadway that generally travels in a north-south direction. Columbia Pike (SR 6/US 31) includes one travel lane in each direction in the vicinity of the project site. TDOT currently has plans to widen the road to provide four travel lanes in the vicinity of the project site. Completion of the road widening should occur after completion of the proposed development. Near the project site, Columbia Pike provides connection between I-840 to the north and the Town of Thompson's Station to the south. According to the Town of Thompson's Station *Current Roadway Network,* Columbia Pike (SR 6/US 31) is categorized as an arterial roadway near the project site. The posted speed limit is 45 mph near the project site. A bicycle lane is provided in the northbound and southbound direction on Columbia Pike (SR 6/US 31). No pedestrian or transit services are provided near the project site.

Looking east on Thompson's Station Road,

Thompson's Station Road is a two-way roadway that generally travels in an east-west direction. Thompson's Station Road includes one travel lane in each direction. Thompson's Station Road provides connection between Columbia Pike (SR 6/US 31) to the west and Lewisburg Pike to the east. According to the Town of Thompson's Station *Current Roadway Network,* Thompson's Station Road is categorized as a major collector roadway near the project site. The posted speed limit is 45 mph near the project site. No pedestrian, bicycle, or transit services are provided near the project site.

Looking west on Critz Lane, North of the Project Site

Critz Lane is a two-way roadway that generally travels in an east-west direction. Critz Lane includes one travel lane in each direction near the project site. Critz Lane provides connection between Columbia Pike (SR 6/US 31) to the west and Lewisburg Pike to the east. According to the Town of Thompson's Station *Current Roadway Network,* Critz Lane is categorized as a minor collector roadway near the project site. The posted speed limit is 35 mph near the project site. No pedestrian, bicycle, or transit services are provided near the project site.

I-840 is an interstate that generally travels in an east-west direction near Thompson's Station. I-840 provides connection between I-40 and Fairview to the west and I-65, Murfreesboro, and Lebanon to the east. The posted speed limit is 70 mph near the project site. No pedestrian, bicycle, or transit services are provided.

Looking west on Declaration Way, North of the Project Site

Declaration Way is a two-way roadway that generally travels in an east-west direction. Declaration Way includes one travel lane in each direction near the project site. Declaration Way provides connection between Columbia Pike (SR 6/US 31) to the east and Independence High School to the west. According to the Town of Thompson's Station *Current Roadway Network,* Declaration Way is categorized as a local developer-maintained road (private road). The posted speed limit is 20 mph. No pedestrian, bicycle, or transit services are provided on Declaration Way.

The study area includes five existing intersections described as follows:

Thompson's Station Road Looking West at Columbia Pike (SR 6/US 31)

Columbia Pike (SR 6/US 31) and Thompson's Station Road is a signalized intersection with four approaches. The eastbound approach of Thompson's Station Road includes one shared through/right-turn lane and one left-turn lane with approximately 100 feet of storage. The westbound approach of Thompson's Station Road includes one shared through/right-turn lane and one left-turn lane with approximately 85 feet of storage. The northbound approach of Columbia Pike (SR 6/US 31) includes one shared through/right-turn lane and one left-turn lane with approximately 105 feet of storage. The southbound approach of Columbia Pike (SR 6/US 31) includes one shared through/right-turn lane and one left-turn lane with approximately 120 feet of storage. Protected/permissive left-turn signal phasing is provided for all approaches. No pedestrian signals or crosswalks are provided at this intersection. The northbound and southbound approaches of Columbia Pike (SR 6/US 31) include a right-sided bike lane through the intersection.

Columbia Pike (SR 6/US 31) Looking North at Critz Lane

Columbia Pike (SR 6/US 31) and Critz Lane is a signalized intersection with four approaches. The eastbound approach is a private driveway and includes one shared lane for all turning movements. The westbound approach of Critz Lane includes one shared through/right-lane and one left-turn lane with approximately 150 feet of storage. The northbound approach of Columbia Pike (SR 6/US 31) includes one shared through/right-turn lane, one through lane, and one exclusive left-turn lane with approximately 100 feet of storage. The southbound approach of Columbia Pike (SR 6/US 31) includes one shared through/right-turn lane, one through lane, and one exclusive left-turn lane with approximately 275 feet of storage. Protected/permissive left-turn signal phasing is provided for the southbound approach of Columbia Pike (SR 6/US 31) only. The eastbound and westbound approaches operate as split phase, with a westbound right-turn overlap. No pedestrian signals or crosswalks are provided at this intersection. The northbound and southbound approaches of Columbia Pike (SR 6/US 31) include a right-sided bike lane through the intersection.

Columbia Pike (SR 6/US 31) Looking North at I-840 Eastbound Ramp

Columbia Pike (SR 6/US 31) and I-840 Eastbound Ramp is a signalized intersection with three approaches. The eastbound approach of I-840 Eastbound Ramp includes two left-turn lanes and one channelized, right-turn lane with approximately 310 feet of storage length. The northbound approach of Columbia Pike (SR 6/US 31) includes two through lanes and one channelized, right-turn lane with approximately 600 feet of storage. The southbound approach of Columbia Pike (SR 6/US 31) includes two through lanes and one exclusive left-turn lane with approximately 150 feet of storage. Protected/permissive left-turn signal phasing is provided for the southbound approach of Columbia Pike (SR 6/US 31) only. No pedestrian signals or crosswalks, bicycle, or transit facilities are provided at this intersection.

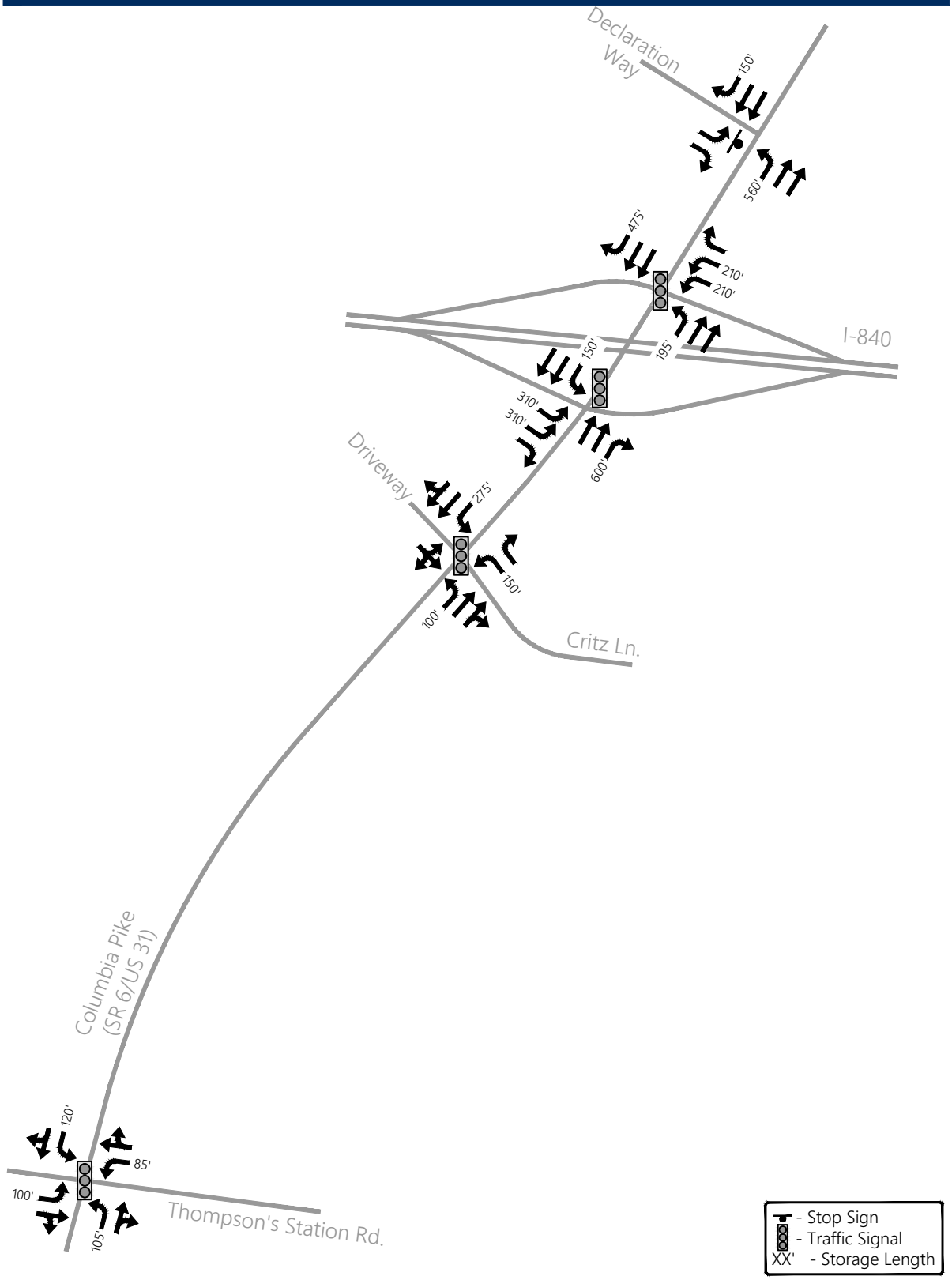
Columbia Pike (SR 6/US 31) Looking North at I-840 Westbound Ramp

Columbia Pike (SR 6/US 31) and I-840 Westbound Ramp is a signalized intersection with three approaches. The westbound approach of I-840 Westbound Ramp includes two left-turn lanes and one channelized, right-turn lane with approximately 225 feet of storage. The northbound approach of Columbia Pike (SR 6/US 31) includes one shared two through lanes and one exclusive left-turn lane with approximately 200 feet of storage. The southbound approach of Columbia Pike (SR 6/US 31) includes two through lanes and one channelized, right-turn lane with approximately 575 feet of storage. Protected-only left-turn signal phasing is provided for the northbound approach of Columbia Pike (SR 6/US 31). No pedestrian signals or crosswalks, bicycle, or transit facilities are provided at this intersection.

Columbia Pike (SR 6/US 31) Looking North at Declaration Way

Columbia Pike (SR 6/US 31) and Declaration Way is an unsignalized intersection with three approaches. The eastbound approach of Declaration Way is stop-controlled and includes one left-turn lane and one right-turn lane with approximately 210 feet of storage length. The northbound approach of Columbia Pike (SR 6/US 31) includes two through lanes and one exclusive left-turn lane with approximately 195 feet of storage. The southbound approach of Columbia Pike (SR 6/US 31) includes two through lanes and one exclusive right-turn lane with approximately 475 feet of storage. No pedestrian signals or crosswalks, bicycle, or transit facilities are provided at this intersection.

The existing laneage at the study intersections is illustrated in Figure 2.



Existing Laneage
(Not to Scale)

Figure 2.

2.2 Existing Traffic Volumes

In order to provide data for the traffic impact analysis, traffic counts were conducted at the following intersections:

1. Columbia Pike (SR 6/US 31) and Thompson's Station Road (signalized)
2. Columbia Pike (SR 6/US 31) and Critz Lane (signalized)
3. Columbia Pike (SR 6/US 31) and I-840 Eastbound Ramp (signalized)
4. Columbia Pike (SR 6/US 31) and I-840 Westbound Ramp (signalized)
5. Columbia Pike (SR 6/US 31) and Declaration Way

Specifically, KCI Technologies, Inc. conducted the traffic counts from 7:00 – 9:00 AM and 4:00 – 6:00 PM on a typical weekday in May 2019 and from 11:00 AM – 1:00 PM on a typical weekend in July 2019 for the intersections of Columbia Pike and Thompson's Station and Columbia Pike and Critz Lane. KCI Technologies, Inc conducted traffic counts for the remaining intersections on a typical weekday and weekend in August 2019. From the counts, it was determined that the peak hours of traffic flow for the majority of the study intersections occurred from 7:15 – 8:15 AM and 4:45 – 5:45 PM during weekdays and from 11:45 AM – 12:45 PM during weekends. Due to variations in peak hour associated with school and interstate traffic, individual peak hour traffic volumes were utilized at some intersections.

It is worth nothing that local schools were not in session when the weekday data for the intersections of Columbia Pike and Thompson's Station Road and Columbia Pike and Critz Lane was collected. KCI Technologies used 24-hour directional tube data collected in January 2019 to validate the existing traffic volumes. This comparison, presented in Appendix B, indicates that traffic volumes are higher when school is out of session. For that reason, no seasonal adjustment factor was applied to the existing turning movement counts.

The existing peak hour turning movement volumes are presented in Figures 3. A detailed summary of the turning movement counts is included in Appendix B.

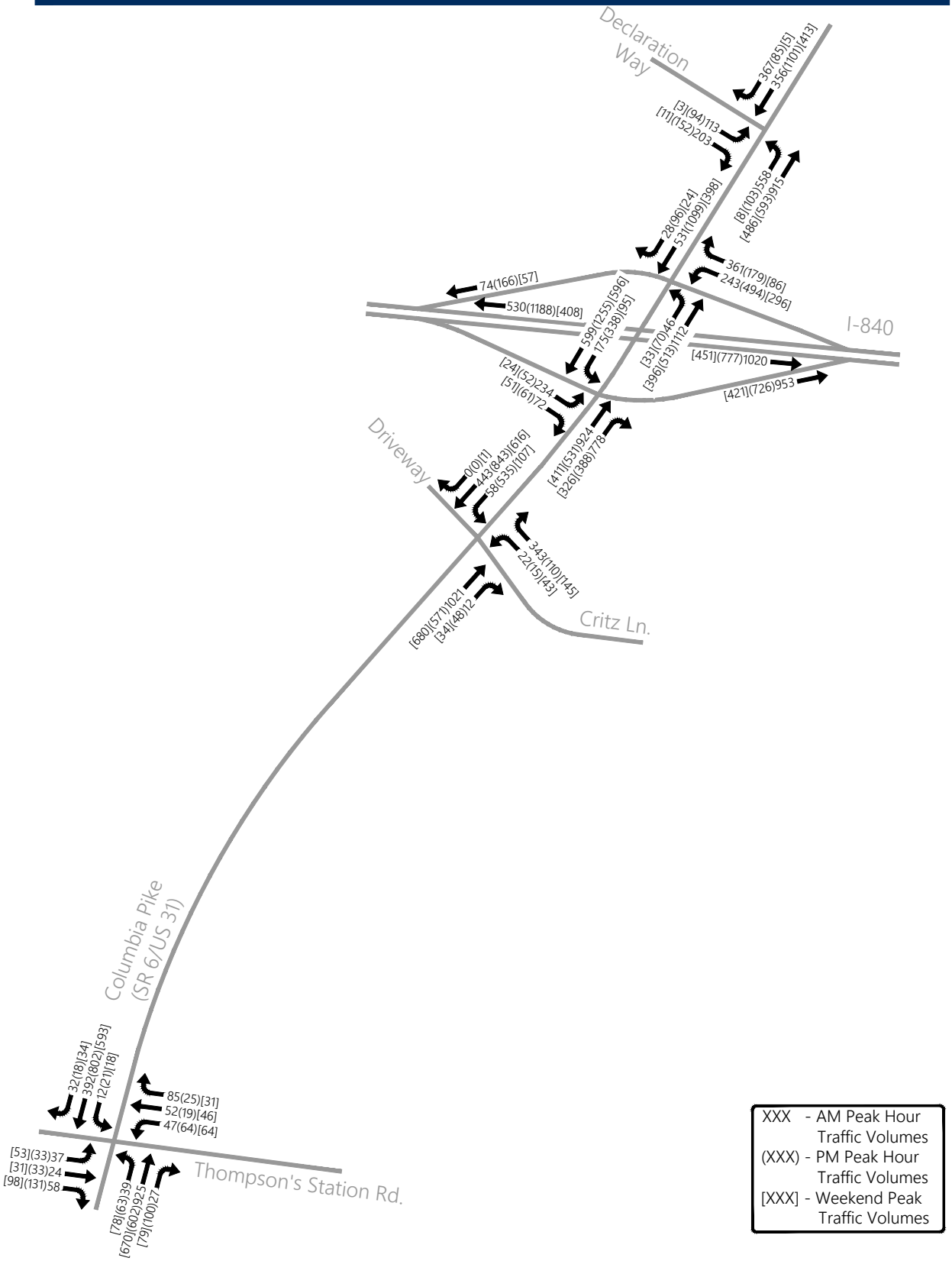
Peak hour factors were determined for each of the intersections. These factors generally range from 0.89 to 0.99. The exception to this was a peak hour factor of 0.82 for the intersection of Columbia Pike and Declaration Way in the AM peak hour. The overall peak hour factor of 0.92 was used for analysis due to the difficult nature of predicting the peak hour factors for future growth and projected traffic volumes generated by the project site, as well as the fact that as peak period traffic volumes increase, a corresponding increase in peak hour factor is typical.

Heavy vehicle percentages for the study network were determined for each of the study periods. For the PM and Weekend peak hours, the heavy vehicle percentage was determined to be at or below 2%. For these scenarios, a default heavy vehicle percentage of 2% was utilized for analysis. For the AM peak hour, the heavy vehicle percentage was determined to be 3%. For this scenario, the heavy vehicle percentage was adjusted to 3%.

In addition to the above information, average daily traffic volumes were obtained from the Tennessee Department of Transportation (TDOT). There are three TDOT count stations located in the vicinity of the project site. The count station locations and annual average daily traffic (AADT) in 2017 are shown in Table 1. Additional TDOT Count Station data is included in Appendix C.

TABLE 1: TDOT COUNT STATION DATA

LOCATION	2017 AADT (vpd)
Columbia Pike (SR 6/US 31)	20,369
Thompson's Station Road West	2,810
Thompson's Station Road East	2,824
I-840 – West of SR-6	23,754
I-840 – West of SR-106	20,398



Existing Peak Hour Traffic Volumes
(Not to Scale)

Figure 3.

2.3 Existing Traffic Operations

To determine the current operation of the study intersections, capacity analyses were performed for the AM and PM peak hours. The capacity calculations were performed according to the methods outlined in the *Highway Capacity Manual*, TRB 2010. The capacity analyses result in the determination of a Level of Service (LOS) for an intersection. The LOS is a concept used to describe how well an intersection or roadway operates. LOS A is the best, while LOS F is the worst. LOS D is typically considered as the minimum acceptable LOS for a signalized intersection in an urbanized area. Table 2 presents the descriptions of LOS for unsignalized intersections. Table 3 presents the descriptions of LOS for signalized intersections.

TABLE 2: DESCRIPTIONS OF LEVEL OF SERVICE FOR UNSIGNALIZED INTERSECTIONS

LEVEL OF SERVICE	DESCRIPTION	CONTROL DELAY (sec/veh)
A	Little or no delay	≤ 10.0
B	Short traffic delay	>10 and ≤ 15
C	Average traffic delay	>15 and ≤ 25
D	Long traffic delay	>25 and ≤ 35
E	Very long traffic delay	>35 and ≤ 50
F	Extreme traffic delay	> 50.0

Source: *Highway Capacity Manual*, TRB 2010

TABLE 3: DESCRIPTIONS OF LEVEL OF SERVICE FOR SIGNALIZED INTERSECTIONS

LEVEL OF SERVICE	DESCRIPTION	CONTROL DELAY (sec/veh)
A	Operations with very low delay. This occurs when progression is extremely favorable. Most vehicles do not stop at all.	≤ 10
B	Operations with stable flows. This generally occurs with good progression and/or short cycle lengths. More vehicles stop than for LOS A, causing higher levels of average delay.	>10 and ≤ 20
C	Operations with stable flow. Occurs with fair progression and/or longer cycle lengths. The number of vehicles stopping is significant, although many still pass through the intersection without stopping.	>20 and ≤ 35
D	Approaching unstable flow. The influence of congestion becomes more noticeable. Longer delays may result from some combination of unfavorable progression, long cycle lengths, or high V/C ratios. Many vehicles stop.	>35 and ≤ 55
E	Unstable flow. This is considered to be the limit for acceptable delay. These high delays generally indicate poor progression, long cycle lengths, and high V/C ratios.	>55 and ≤ 80
F	Unacceptable delay. This condition often occurs with over saturation or with high V/C ratios. Poor progression and long cycle lengths may also cause such delay levels.	>80.0

Source: *Highway Capacity Manual*, TRB 2010

The signal timing and phasing plan for the signalized intersections in the study area were obtained from the Town of Thompson's Station and were utilized for the capacity analysis. Capacity analysis was completed using the traffic modeling software Synchro. HCM 2010 is not available in Synchro for the modeling of ramp merges. Therefore, the two ramp merge points were evaluated using HCS7 modeling software. Additionally, the HCM 2010 methodology was utilized for all study intersections. The signal timing data is included in Appendix G.

The results of the capacity analyses for the existing conditions at the study intersections are presented in Table 4. As shown, all intersections and critical movements operate at LOS D or better in the AM, PM, and weekend peak hours with two exceptions; the eastbound left-turn of Declaration Way at Columbia Pike operates at LOS F in both the AM and PM peak hours. Additionally, the eastbound and westbound I-840 ramp merge intersections are expected to operate at LOS B or better under all conditions. Capacity analyses worksheets are included in Appendix D.

TABLE 4: EXISTING PEAK HOUR LEVELS OF SERVICE

INTERSECTION	TURNING MOVEMENT	LEVEL OF SERVICE (Average Approach Delay in sec/veh)		
		AM Peak Hour	PM Peak Hour	Weekend Peak Hour
Columbia Pike (SR 6/US 31) and Thompson's Station Road	Overall Intersection	D (38.1)	C (31.7)	C (28.7)
Columbia Pike (SR 6/US 31) and Critz Lane	Overall Intersection	D (41.4)	B (10.5)	B (10.7)
Columbia Pike (SR 6/US 31) and I-840 EB Ramp	Overall Intersection	B (11.0)	A (2.1)	A (1.3)
Columbia Pike (SR 6/US 31) and I-840 WB Ramp	Overall Intersection	B (17.8)	C (23.6)	B (14.0)
Columbia Pike (SR 6/US 31) and Declaration Way	Northbound Left-Turn	C (20.6)	B (13.5)	A (8.3)
	Eastbound Left-Turn	F (>300.0)	F (66.3)	B (12.8)
	Eastbound Right-Turn	B (11.1)	C (17.8)	A (9.7)

Notes: For stop-controlled intersections, a LOS is presented for each critical turning movement. For signalized intersections, a LOS is presented for the overall intersection.

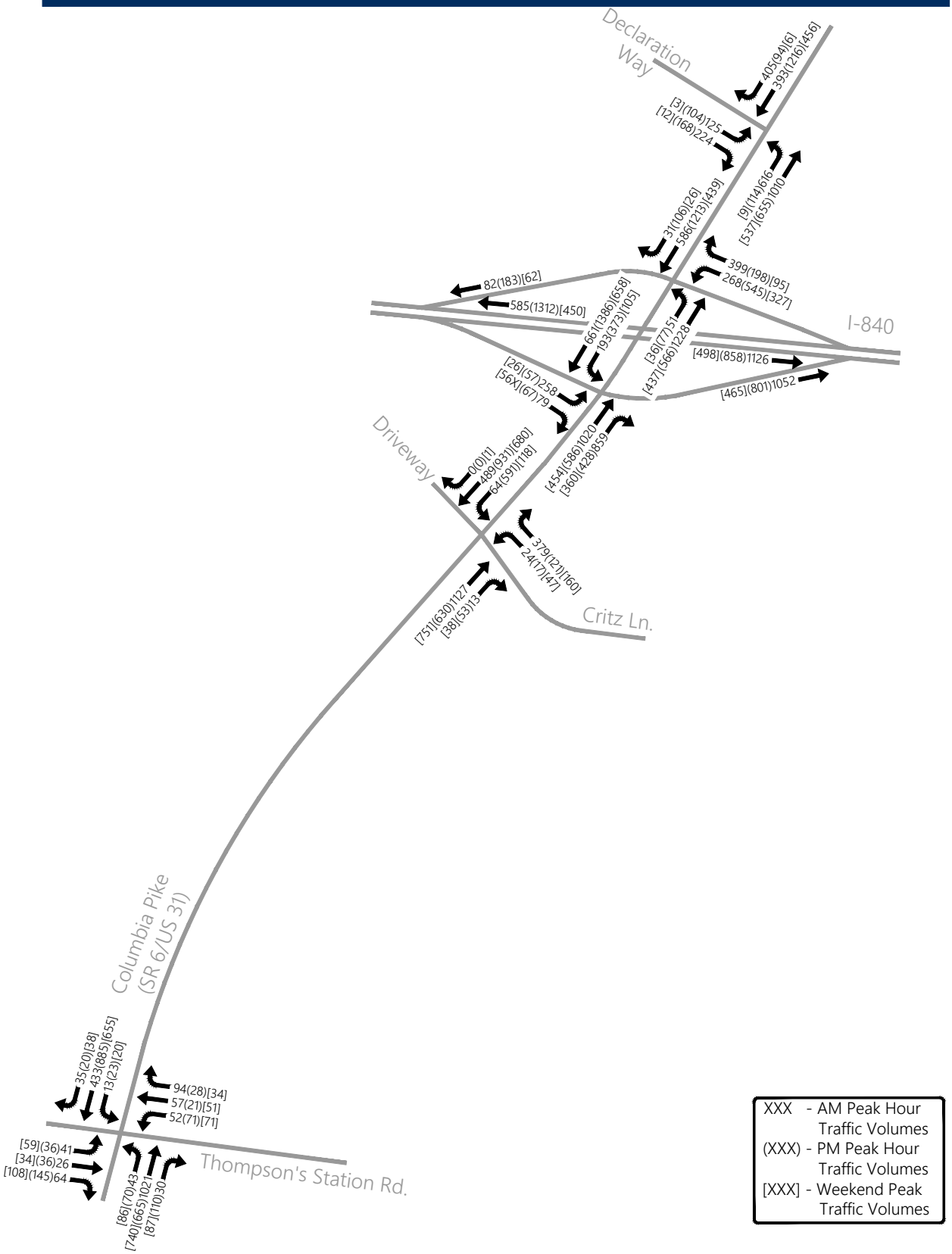
3. BACKGROUND TRAFFIC VOLUMES

3.1 Establishing Background Volumes

In order to account for the traffic growth prior to the completion of the proposed project, background traffic volumes were established. For the purposes of this traffic study, the proposed development was assumed to be completed by the year 2024, which is a 5-year horizon. Historical daily traffic volumes were obtained from the three TDOT count stations located in the vicinity of the project site. Over the past five years, the combined traffic at these three TDOT count stations has increased by an average of 2.0% per year. The TDOT count station data is included in Appendix C.

A growth factor was applied to the existing peak hour traffic volumes to account for background growth for the future conditions. The existing peak hour traffic volumes at the study intersections were increased by 2.0% per year for five years to account for anticipated background traffic growth within the study area.

The background peak hour traffic volumes for horizon year 2024 are presented in Figure 4. These volumes represent the peak hour traffic that is expected to be on the roadway in 2024 even if the proposed Roderick Place development is not completed.



Background Peak Hour Traffic Volumes
(Not to Scale)

Figure 4.

3.2 Background Traffic Operations

To determine the operation of the study area intersections under background conditions, capacity analyses were performed for the AM and PM peak hours. The analyses for the background conditions were based on the same lane configurations, peak hour factors, heavy vehicle percentages, and signal timings as the existing conditions.

As shown in Tables 5A, 5B, and 5C, under background conditions the capacity analyses indicate that all intersections and critical movements are expected to operate at LOS D or better in the AM, PM, and weekend peak hours, with the following exceptions:

- The overall intersection of Columbia Pike (SR 6/US 31) and Thompson's Station Road is expected to operate at LOS E in the AM peak hour.
- The eastbound left-turn of Declaration Way is expected to operate at LOS F in both the AM and PM Peak hours.

Additionally, the eastbound and westbound I-840 ramp merge intersections are expected to operate at LOS B or better under all conditions.

Capacity analyses worksheets are included in Appendix D.

TABLE 5A: BACKGROUND AM PEAK HOUR LEVELS OF SERVICE

INTERSECTION	TURNING MOVEMENT	LEVEL OF SERVICE (Average Approach Delay in sec/veh)	
		Existing AM	Background AM
Columbia Pike (SR 6/US 31) and Thompson's Station Road	Overall Intersection	D (38.1)	E (62.1)
Columbia Pike (SR 6/US 31) and Critz Lane	Overall Intersection	D (41.4)	D (51.9)
Columbia Pike (SR 6/US 31) and I-840 EB Ramp	Overall Intersection	B (11.0)	B (15.4)
Columbia Pike (SR 6/US 31) and I-840 WB Ramp	Overall Intersection	B (17.8)	B (18.6)
Columbia Pike (SR 6/US 31) and Declaration Way	Northbound Left-Turn	C (20.6)	D (32.9)
	Eastbound Left-Turn	F (>300.0)	F (>300.0)
	Eastbound Right-Turn	B (11.1)	B (11.6)

Notes: For stop-controlled intersections, a LOS is presented for each critical turning movement. For signalized intersections, a LOS is presented for the overall intersection.

TABLE 5B: BACKGROUND PM PEAK HOUR LEVELS OF SERVICE

INTERSECTION	TURNING MOVEMENT	LEVEL OF SERVICE (Average Approach Delay in sec/veh)	
		Existing PM	Background PM
Columbia Pike (SR 6/US 31) and Thompson's Station Road	Overall Intersection	C (31.7)	D (41.3)
Columbia Pike (SR 6/US 31) and Critz Lane	Overall Intersection	B (10.5)	B (13.0)
Columbia Pike (SR 6/US 31) and I-840 EB Ramp	Overall Intersection	A (2.1)	A (2.1)
Columbia Pike (SR 6/US 31) and I-840 WB Ramp	Overall Intersection	C (23.6)	C (26.7)
Columbia Pike (SR 6/US 31) and Declaration Way	Northbound Left-Turn	B (13.5)	C (15.3)
	Eastbound Left-Turn	F (66.3)	F (127.6)
	Eastbound Right-Turn	C (17.8)	C (21.0)

Notes: For stop-controlled intersections, a LOS is presented for each critical turning movement. For signalized intersections, a LOS is presented for the overall intersection.

TABLE 5C: BACKGROUND WEEKEND PEAK HOUR LEVELS OF SERVICE

INTERSECTION	TURNING MOVEMENT	LEVEL OF SERVICE (Average Approach Delay in sec/veh)	
		Existing Weekend	Background Weekend
Columbia Pike (SR 6/US 31) and Thompson's Station Road	Overall Intersection	C (28.7)	D (37.8)
Columbia Pike (SR 6/US 31) and Critz Lane	Overall Intersection	B (10.7)	B (11.4)
Columbia Pike (SR 6/US 31) and I-840 EB Ramp	Overall Intersection	A (1.3)	A (1.3)
Columbia Pike (SR 6/US 31) and I-840 WB Ramp	Overall Intersection	B (14.0)	B (14.3)
Columbia Pike (SR 6/US 31) and Declaration Way	Northbound Left-Turn	A (8.3)	A (8.4)
	Eastbound Left-Turn	B (12.8)	B (13.4)
	Eastbound Right-Turn	A (9.7)	A (9.9)

Notes: For stop-controlled intersections, a LOS is presented for each critical turning movement. For signalized intersections, a LOS is presented for the overall intersection.

4. IMPACTS

4.1 Trip Generation

A traffic generation process was used to estimate the amount of traffic expected to be generated by the proposed Roderick Place development. Factors for the trip generation were taken from ITE's *Trip Generation*, 10th Edition. According to ITE's *Trip Generation Handbook*, 2nd Edition, the weighted average rate equation should be used when the R^2 value falls below 0.75. Therefore, where the R^2 value of the fitted curve equation falls below 0.75, the weighted average rate equation was used.

According to the developer, the proposed development includes approximately 92 hotel rooms, 75,606 square feet of office space, 20,000 square feet of commercial space, 19,768 square feet of restaurant space, 85 multi-family residential units, 100 assisted living units, 126 single-family homes, 13,000 square feet of private event space, and 12,000 square feet of daycare, and a 4-fueling position convenience market with gasoline pumps.

It should be noted that the private event space was not included in the analysis since this land use is not anticipated to generate significant traffic volumes during the AM, PM, or Weekend peak periods. Additionally, the daycare was not included in the analysis for the Weekend peak period.

Data presented in the ITE publication, *Trip Generation Handbook*, show that developments containing multiple land uses will commonly have internal trips. A process was used to estimate the amount of internal trips that can be expected between land uses based on methodology presented in NCHRP Report 684, "Enhancing Internal Trip Capture Estimation for Mixed-Use Developments." The methodology contained in the NCHRP Report expands on ITE's methodology, including additional land uses and supporting data.

The internal trip reduction process resulted in the following internal capture rate estimates:

- 29% internal capture rate for the daily trip generation,
- 18.9% internal capture rate for entering trips in the AM peak hour,
- 21.1% internal capture rate for exiting trips in the AM peak hour,
- 37.3% internal capture rate for entering trips in the PM peak hour,
- 38.9% internal capture rate for exiting trips in the PM peak hour, and
- 30% internal capture rate for trips in the Weekend peak hour.

Studies have shown that some service/retail developments generate a reduced number of "new" trips. The traffic volumes entering and exiting these service/retail sites are usually either captured ("pass-by") trips from the adjacent street or diverted trips from street serving other destinations. This traffic is already existing on the roadway system and will be passing by the site even if the proposed development is not constructed.

Data presented in the *Trip Generation Handbook* indicate average pass-by percentages for typical peak periods based on the size and type of various land usage. ITE indicates the average daily pass-by percentage for a gas station is approximately 62% in the AM peak and 56% in the PM peak. To be conservative, 50% of the gas station trips were considered to be pass-by trips. Therefore, 34 of the total AM and PM peak hour external trips generated by the proposed development and 32 of the total Weekend peak hour external trips generated by the proposed development were assumed to be pass-by trips.

Table 6 presents the daily, AM, PM, and Weekend peak hour trip generation for the proposed development. As shown in Table 6, the proposed development can be expected to generate approximately 6,189 new vehicle trips per day. The AM, PM, and Weekend peak hour trip generations will equal approximately 472, 532, and 531 new trips, respectively. These trips represent the new traffic that will be generated by the proposed Roderick Place development.

TABLE 6: DEVELOPMENT TRIP GENERATION

LAND USE	SIZE	GENERATED TRAFFIC							
		DAILY TRAFFIC	AM PEAK		PM PEAK		WEEKEND	
			Enter	Exit	Enter	Exit	Enter	Exit
Hotel (LUC 310)	92 Rooms	612	24	17	22	21	38	30
General Office (LUC 710)	75,606 s.f.	809	84	14	14	73	22	18
Shopping Center (LUC 820)	20,000 s.f.	2,012	12	7	79	86	92	84
Quality Restaurant (LUC 931)	9,884 s.f.	829	3	4	52	25	63	43
High-Turnover (Sit-Down) Restaurant (LUC 932)	9,884 s.f.	1,109	54	44	60	37	57	54
Multi-Family Housing (Low-Rise) (LUC 220)	85 Units	602	9	32	32	19	32	27
Assisted Living (LUC 254)	100 Units	260	12	7	10	16	12	15
Single-Family Detached Housing (LUC 210)	126 Units	1,286	24	70	80	47	67	57
Day Care Center (LUC 565)	12,000 s.f.	571	70	62	63	70	--	--
Convenience Market with Gasoline Pumps (LUC 853)	4 fueling positions	1,290	41	42	46	46	46	46
SUBTOTAL		**9,380**	**333**	**299**	**458**	**440**	**429**	**374**
			632		**898**		**803**	
Internal Trips Reduction		*-2,722*	*-63*	*-63*	*-171*	*-171*	*-128*	*-112*
SUBTOTAL		6,658	270	236	287	269	301	262
			506		556		563	
Pass-By Trips		*-469*	*-17*	*-17*	*-12*	*-12*	*-16*	*-16*
NEW TRIPS		6,189	253	219	275	257	285	246
			472		532		531	

Source: *Trip Generation*, 10th Edition

The calculations for trip generation are included in Appendix E.

4.2 Trip Distribution and Traffic Assignment

A directional distribution of traffic generated by the proposed project was established based on the proposed access, the existing roadway network, and the existing travel patterns developed from the existing peak hour traffic counts. As previously discussed, access to the development will be provided by two access drives on Columbia Pike (SR 6/US 31). Access B was modeled to operate as right-in/right-out only.

Three directional distributions were established for the proposed development; Weekday non-pass-by trips, Weekend non-pass-by trips, and pass-by trips.

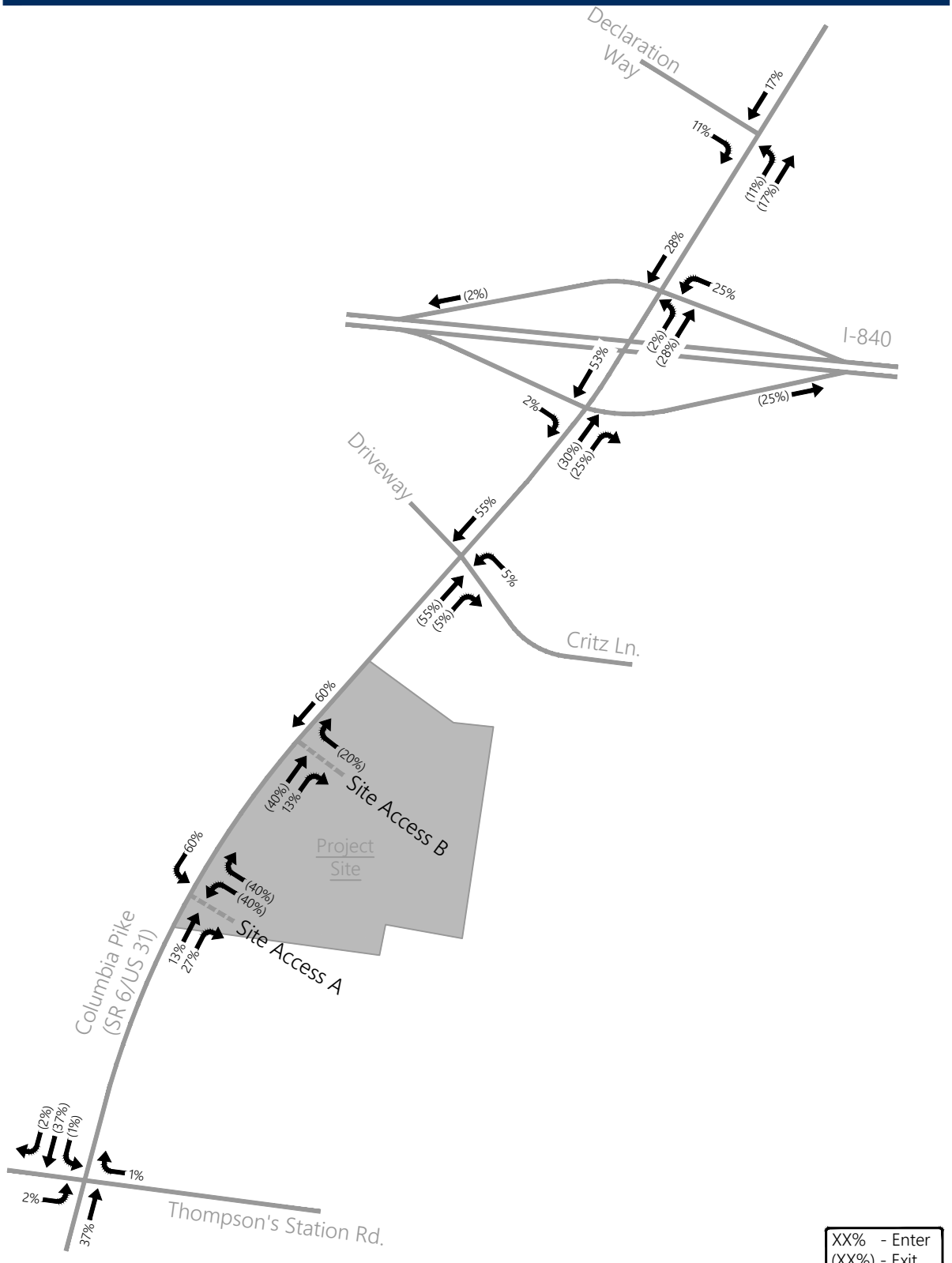
The directional distribution for the Weekday non-pass-by distribution is shown in Figure 5. As shown in the figure,

- approximately 17% of the traffic generated by the development will be oriented to the north on Columbia Parkway (SR 6/US 31),
- 11% to the west on Declaration Way,
- 2% to the west on I-840,
- 25% to the east on I-840,
- 5% to the east on Critz Lane,
- 37% to the south on Columbia Parkway (SR 6/US 31),
- 2% to the west on Thompson's Station Road, and
- 1% to the east on Thompson's Station Road.

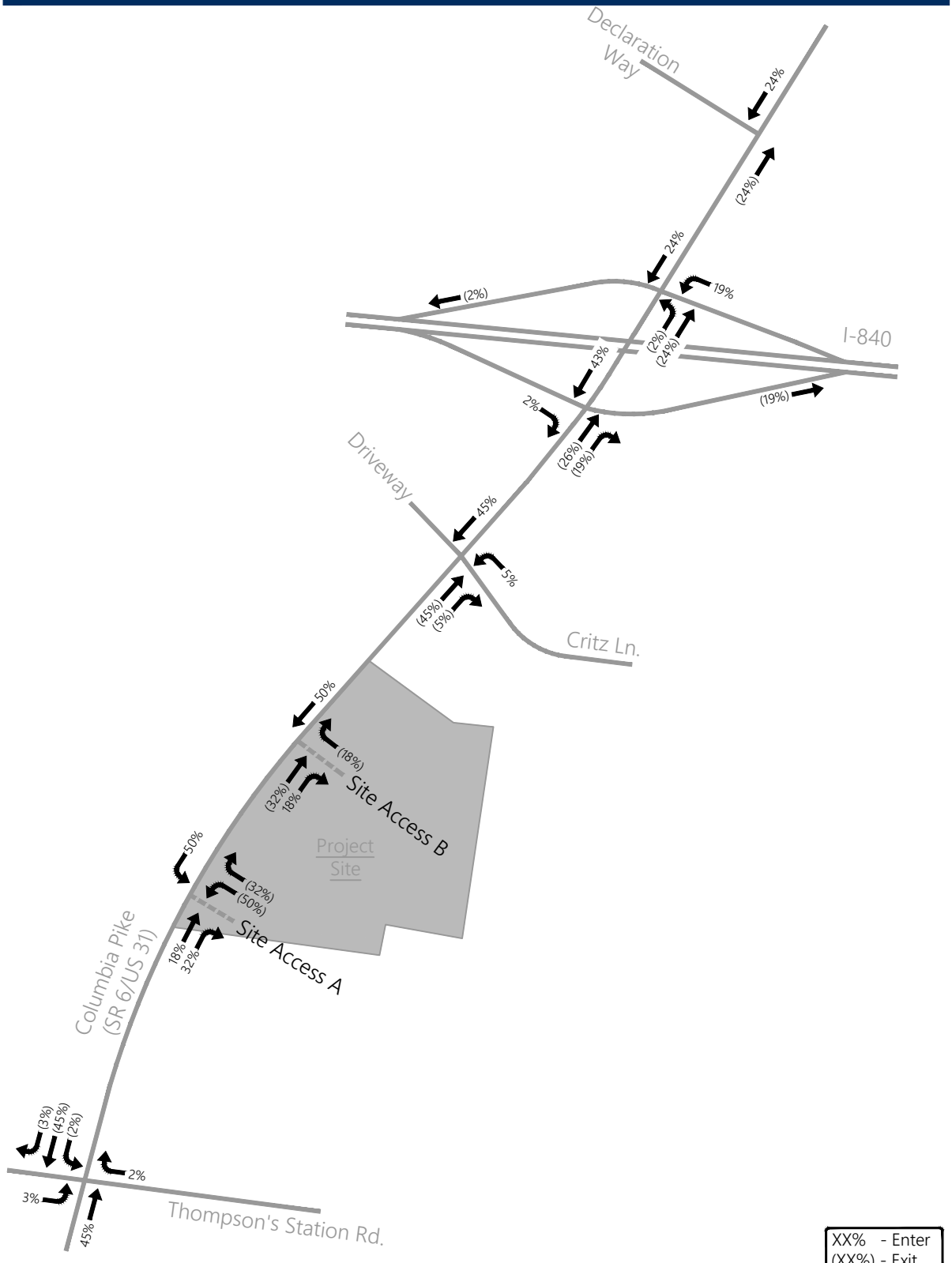
The directional distribution for the Weekend non-pass-by distribution is shown in Figure 6. As shown in the figure,

- approximately 24% of the traffic generated by the development will be oriented to the north on Columbia Parkway (SR 6/US 31),
- 2% west on I-840,
- 19% east on I-840,
- 5% to the east on Critz Lane,
- 45% to the south on Columbia Parkway (SR 6/US 31),
- 3% to the west on Thompson's Station Road, and
- 2% to the east on Thompson's Station Road.

The directional distribution and trip assignment for the pass-by trips are presented in Appendix I. Based on the directional distribution, the project-generated traffic for the AM, PM, and Weekend peak hour was assigned to the roadway network. The traffic assignment for the proposed development is shown in Figure 7.

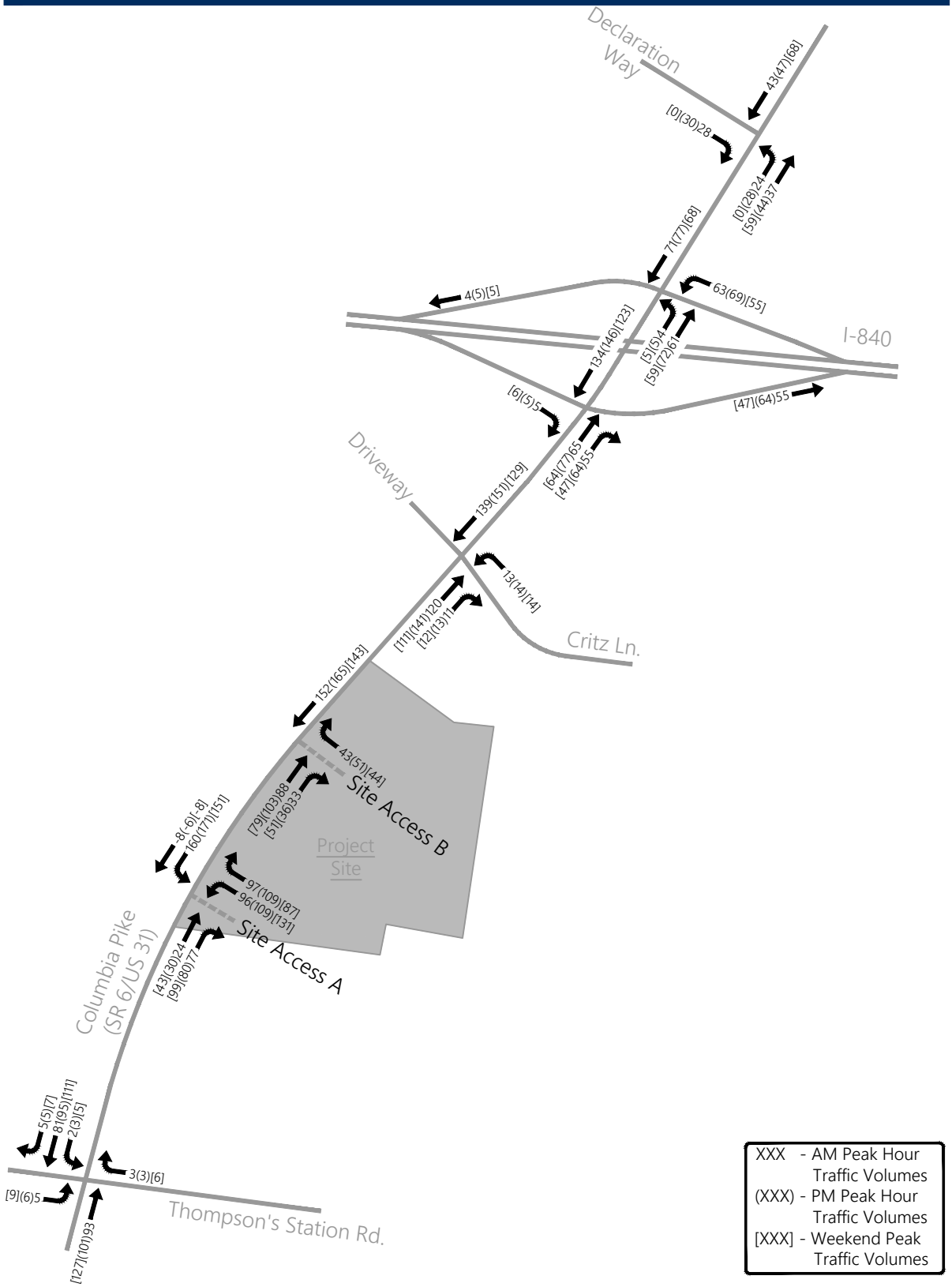


Distribution of Peak Hour Traffic Volumes
Generated by the Project Site (Weekday Non-Pass-By)
(Not to Scale) Figure 5.



Distribution of Peak Hour Traffic Volumes
Generated by the Project Site (Weekend Non-Pass-By)
(Not to Scale)

Figure 6.



Assignment of Peak Hour Traffic Volumes Generated by the Project Site
(Not to Scale)

Figure 7.

4.3 Capacity / Level of Service Analyses

The total site-generated traffic volumes were added to the background peak hour traffic volumes for the proposed Roderick Place development in order to obtain the total projected traffic volumes for the study intersections. Figure 8 presents the total projected AM, PM, and Weekend peak hour traffic volumes expected at the completion of the proposed development.

Capacity analyses were performed in order to determine the impact of the project on the study intersections. These capacity analyses were also used to evaluate the need for roadway and traffic control improvements at the intersections studied. The capacity calculations were performed according to the methods outlined in the *Highway Capacity Manual*, TRB 2010. The results of the capacity analyses for the projected conditions at the study area intersections are presented in Tables 7A, 7B, and 7C. For the analyses, the intersection configurations, peak hour factors, heavy vehicle percentages, and signal timings were the same as the existing and background conditions.

Capacity analyses for the proposed site accesses were also conducted under projected conditions with the following:

- Signalize the intersection of Columbia Pike (SR 6/US 31) and Site Access A. The northbound approach was modeled to include one through lane and one right-turn lane, the southbound approach was modeled to include one through lane and one left-turn lane, and the westbound approach was modeled to include one left-turn lane and one right-turn lane. The southbound left-turn was modeled to include protected-permissive phasing. Signal timing splits were optimized.
- The intersection of Columbia Pike (SR 6/US 31) and Site Access B was unsignalized with Columbia Pike (SR 6/US 31) operating freely and Site Access B operating as stop-controlled. Additionally, the westbound approach of Site Access B was modeled to operate as right-in/right-out only with one right-turn lane, the northbound approach was modeled to include one shared through/right-turn lane, and the southbound approach was modeled to include one through lane.

As shown in Tables 7A, 7B, and 7C, the capacity analyses indicate that the following intersection is expected to deteriorate to or continue to operate at LOS E or LOS F:

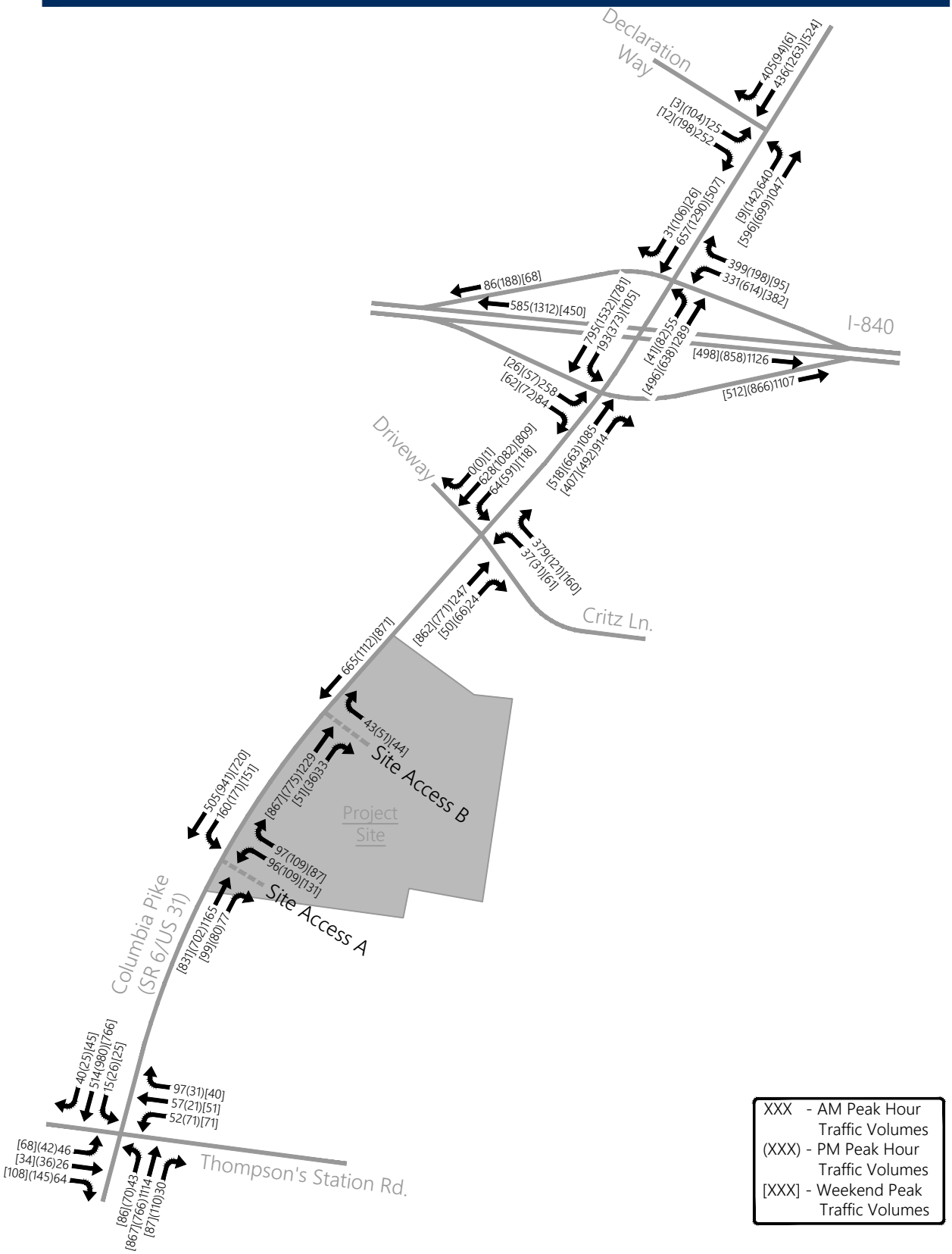
- The intersection of Columbia Pike (SR 6/US 31) and Thompson's Station Road is expected to deteriorate from LOS E to LOS F during the AM peak hour, from LOS D to LOS E during the PM peak hour, and from LOS D to LOS E in the Weekend peak hour.

Additionally, per the requirements set forth by the Town of Thompson's Station's scoping memorandum, the levels of service at each intersection approach and individual turning movements were compared between background and projected conditions. Below, turning movements and approaches that are expected to deteriorate to or continue to operate at LOS E or LOS F are discussed:

- Columbia Pike and Thompson's Station Road
    - The northbound right-turn movement is expected to deteriorate from LOS F with a lane group delay of 89.4 seconds per vehicle (s/veh) to LOS F with a lane group delay of 135.7 s/veh in the AM peak hour. Additionally, in the Weekend peak hour, the northbound right-turn movement is expected to deteriorate from LOS D with a lane group delay of 43.9 s/veh to LOS F with a lane group delay of 91.9 s/veh.
    - The overall northbound approach is expected to deteriorate from LOS F with an approach delay of 86.3 s/veh to LOS F with an approach delay of 131.2 s/veh in the AM peak hour. Additionally, in the Weekend peak hour, the overall northbound approach is expected to deteriorate from LOS D with an approach delay of 41.5 s/veh to LOS F with an approach delay of 86.2 s/veh.
    - The southbound right-turn movement is expected to deteriorate from LOS D with a lane group delay of 46.1 s/veh to LOS F with a lane group of 70.4 s/veh in the PM peak hour. Additionally, in the Weekend peak hour, the southbound right-turn movement is expected to deteriorate from LOS C with a lane group delay of 31.4 s/veh to LOS F with a lane group delay of 51.4 s/veh.
    - The overall southbound approach is expected to deteriorate from LOS D with an approach delay of 45.4 s/veh to LOS E with an approach delay of 69.2 s/veh in the PM peak hour.
- Columbia Pike and Critz Lane
    - Projected results were within the acceptable range.
- Columbia Pike and I-840 EB Ramp
    - Projected results were within the acceptable range.

- Columbia Pike and I-840 WB Ramp
    - Projected results were within the acceptable range.
- Columbia Pike and Declaration Way
    - The eastbound left-turn lane movement is expected to deteriorate from LOS F with a control delay of 1,208.1 seconds to LOS F with a control delay of 2,678.9 seconds in the AM peak hour. Additionally, in the PM peak hour, the eastbound left-turn lane movement is expected to deteriorate from LOS F with a control delay of 127.6 seconds to LOS F with a control delay of 195.1 seconds.
    - The overall eastbound approach is expected to deteriorate from LOS F with a control delay of 440.1 seconds to LOS F with a control delay of 896.5 seconds in the AM peak hour. Additionally, in the PM peak hour, the overall eastbound approach is expected to deteriorate from LOS F with a control delay of 61.8 seconds to LOS F with a control delay of 83.6 seconds in the PM peak hour.
- Columbia Pike and Site Access A
    - The northbound through movement is expected to operate at LOS F in the AM peak hour.
    - The westbound left-turn, right-turn, and overall approach are expected to operate at LOS E in the PM peak hour.
- Columbia Pike and Site Access B
    - The westbound left-turn movement is expected to operate at LOS D or better in the AM, PM, and Weekend peak hours.
- The eastbound and westbound I-840 ramp merge intersections are expected to operate at LOS B or better under all conditions.

Capacity analyses worksheets are included in Appendix D.



Total Projected Peak Hour Traffic Volumes

(Not to Scale)

Figure 8.

TABLE 7A: PROJECTED AM PEAK HOUR LEVELS OF SERVICE

INTERSECTION	TURNING MOVEMENT	LEVEL OF SERVICE (Average Approach Delay in sec/veh)		
		Existing	Background	Projected
Columbia Pike (SR 6/US 31) and Thompson's Station Road	Overall Intersection	D (38.1)	E (62.1)	F (87.2)
Columbia Pike (SR 6/US 31) and Critz Lane	Overall Intersection	D (41.4)	D (51.9)	D (48.0)
Columbia Pike (SR 6/US 31) and I-840 EB Ramp	Overall Intersection	B (11.0)	B (15.4)	B (15.0)
Columbia Pike (SR 6/US 31) and I-840 WB Ramp	Overall Intersection	B (17.8)	B (18.6)	B (19.4)
Columbia Pike (SR 6/US 31) and Declaration Way	Northbound Left-Turn	C (20.6)	D (32.9)	E (45.1)
	Eastbound Left-Turn	F (>300.0)	F (>300.0)	F (>300.0)
	Eastbound Right-Turn	B (11.1)	B (11.6)	B (12.4)
Columbia Pike (SR 6/US 31) and Site Access A	Overall Intersection	--	--	D (39.5)
Columbia Pike (SR 6/US 31) and Site Access B	Westbound Right-Turn	--	--	D (31.5)

Notes: For stop-controlled intersections, a LOS is presented for each critical turning movement. For signalized intersections, a LOS is presented for the overall intersection.

TABLE 7B: PROJECTED PM PEAK HOUR LEVELS OF SERVICE

INTERSECTION	TURNING MOVEMENT	LEVEL OF SERVICE (Average Approach Delay in sec/veh)		
		Existing	Background	Projected
Columbia Pike (SR 6/US 31) and Thompson's Station Road	Overall Intersection	C (31.7)	D (41.3)	E (55.4)
Columbia Pike (SR 6/US 31) and Critz Lane	Overall Intersection	B (10.5)	B (13.0)	B (15.5)
Columbia Pike (SR 6/US 31) and I-840 EB Ramp	Overall Intersection	A (2.1)	A (2.1)	A (2.0)
Columbia Pike (SR 6/US 31) and I-840 WB Ramp	Overall Intersection	C (23.6)	C (26.7)	C (25.0)
Columbia Pike (SR 6/US 31) and Declaration Way	Northbound Left-Turn	B (13.5)	C (15.3)	C (17.0)
	Eastbound Left-Turn	F (66.3)	F (127.6)	F (195.1)
	Eastbound Right-Turn	C (17.8)	C (21.0)	D (25.1)
Columbia Pike (SR 6/US 31) and Site Access A	Overall Intersection	--	--	B (14.3)
Columbia Pike (SR 6/US 31) and Site Access B	Westbound Right-Turn	--	--	C (17.0)

Notes: For stop-controlled intersections, a LOS is presented for each critical turning movement. For signalized intersections, a LOS is presented for the overall intersection.

TABLE 7C: PROJECTED WEEKEND PEAK HOUR LEVELS OF SERVICE

INTERSECTION	TURNING MOVEMENT	LEVEL OF SERVICE (Average Approach Delay in sec/veh)		
		Existing	Background	Projected
Columbia Pike (SR 6/US 31) and Thompson's Station Road	Overall Intersection	C (28.7)	D (37.8)	E (65.5)
Columbia Pike (SR 6/US 31) and Critz Lane	Overall Intersection	B (10.7)	B (11.4)	B (11.3)
Columbia Pike (SR 6/US 31) and I-840 EB Ramp	Overall Intersection	A (1.3)	A (1.3)	A (1.2)
Columbia Pike (SR 6/US 31) and I-840 WB Ramp	Overall Intersection	B (14.0)	B (14.3)	B (13.1)
Columbia Pike (SR 6/US 31) and Declaration Way	Northbound Left-Turn	A (8.3)	A (8.4)	A (8.7)
	Eastbound Left-Turn	B (12.8)	B (13.4)	B (14.3)
	Eastbound Right-Turn	A (9.7)	A (9.9)	B (10.2)
Columbia Pike (SR 6/US 31) and Site Access A	Overall Intersection	--	--	B (14.5)
Columbia Pike (SR 6/US 31) and Site Access B	Westbound Right-Turn	--	--	C (18.9)

Notes: For stop-controlled intersections, a LOS is presented for each critical turning movement. For signalized intersections, a LOS is presented for the overall intersection.

4.4 Signal Warrant Analysis

As noted in the capacity analysis, the intersection of Columbia Pike (SR 6/US 31) and Site Access A is expected to operate at poor LOS under unsignalized projected conditions in the AM, PM, and Weekend peak hours:

A traffic signal should normally be installed at an intersection only when specific warrants are satisfied. Therefore, traffic signal warrant analyses were performed with available data for the intersections based on the anticipated traffic conditions at completion of the development.

The *Manual on Uniform Traffic Control Devices* (MUTCD) sets forth nine different warrants that have been developed by the traffic engineering profession to facilitate the determination of whether a signal is warranted. These warrants include minimum conditions that normally indicate when a traffic signal is justified at a particular location.

Although the MUTCD provides nine different warrants, only three of these are potentially applicable at the intersection under study. These three warrants, described in the MUTCD, are the volume-related signal warrants, which are described as follows:

WARRANT 1A, MINIMUM VEHICULAR VOLUME

The Minimum Vehicular Volume warrant is intended for application where the volume of intersecting traffic is the principal reason for consideration of signal installation. The warrant is satisfied when, for each of any eight hours of an average day, the traffic volumes given below in Table 8 exist on the major street and on the higher volume minor street approach to the intersection.

TABLE 8. MINIMUM VEHICULAR VOLUMES FOR WARRANT 1A

Number of lanes for moving traffic on each approach		Vehicles per hour on major street	Vehicles per hour on higher volume minor approach
Major Street	Minor Street	Total of Both Approaches	One Direction Only
1 Lane	1 Lane	500	150
2 Lanes or more	1 Lane	600	150
2 Lanes or more	2 Lanes or more	600	200
1 Lane	2 Lanes or more	500	200

WARRANT 1B, INTERRUPTION OF CONTINUOUS TRAFFIC

The Interruption of Continuous Traffic warrant applies to operating conditions where the traffic volume on a major street is so heavy that traffic on a minor intersecting street suffers excessive delay or hazard when entering or crossing the major street. The warrant is satisfied when, for each of any eight hours of an average day, the traffic volumes given below in Table 9 exist on the major street and on the higher volume minor street approach to an intersection. In addition, the signal installation shall not seriously disrupt progressive traffic flow.

TABLE 9. MINIMUM VEHICULAR VOLUMES FOR WARRANT 1B

Number of lanes for moving traffic on each approach		Vehicles per hour on major street	Vehicles per hour on higher volume minor approach
Major Street	Minor Street	Total of Both Approaches	One Direction Only
1 Lane	1 Lane	750	75
2 Lanes or more	1 Lane	900	75
2 Lanes or more	2 Lanes or more	900	100
1 Lane	2 Lanes or more	750	100

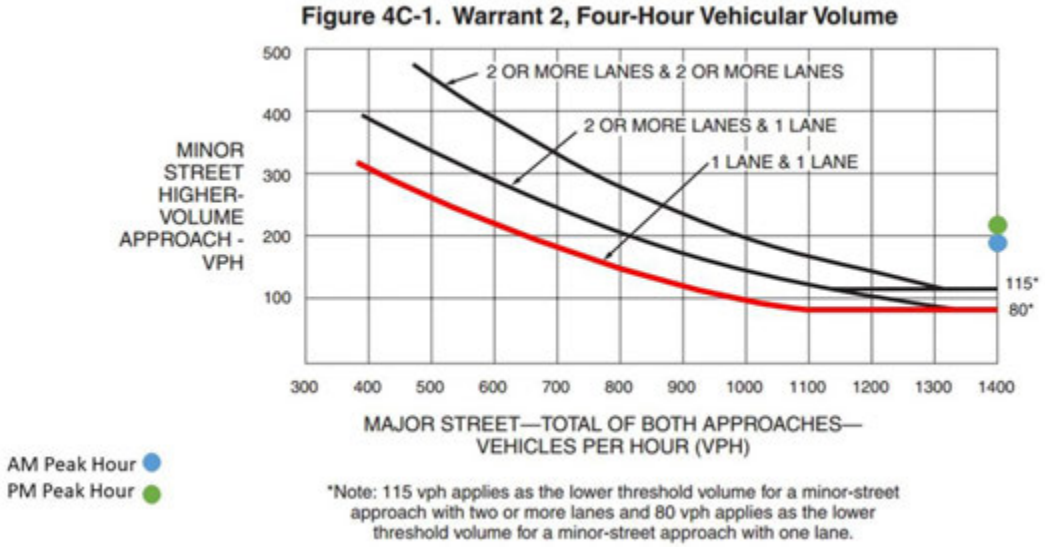
In exceptional cases, traffic signals occasionally may be justified where no single warrant is satisfied but where Warrants 1A and 1B are satisfied to the extent of 80 percent or more of the stated values. This warrant is referred to as Warrant 1C (Combination Warrant).

When only peak hour data is collected, preliminary traffic signal warrant analyses can be based on estimates of the eighth highest hour of a typical day, based off the highest peak hour. The method for this estimation is described in the Manual of Traffic Signal Design, by Iris Fullerton and James H. Kell. This estimation procedure is based on the assumption that the eight highest hours will each exceed 6.25% of the ADT and that the peak hour traffic volume is approximately 10% of the ADT.

WARRANT 2, FOUR HOUR VOLUME

The Four Hour Volume warrant is satisfied when for each of any four high hours of an average day, the plotted points representing the vehicles per hour on the major street (total of both approaches) and the corresponding vehicles per hour on the higher volume minor street approach (one direction only) all fall above the curve in Figure 9, for the appropriate combination of approach lanes. The colored dots below represent the results for each peak hour.

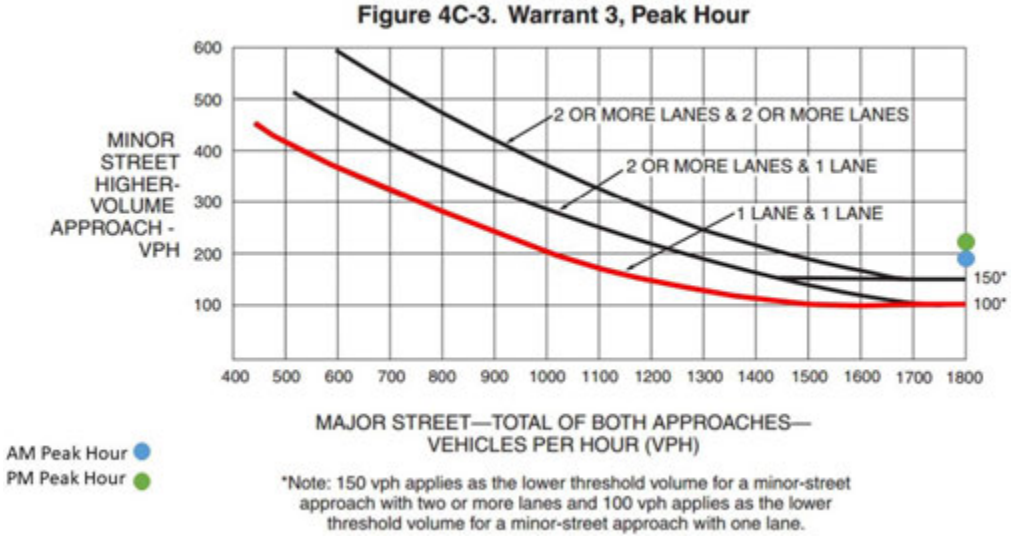
FIGURE 9. WARRANT 2, FOUR-HOUR VEHICULAR VOLUME



WARRANT 3, PEAK HOUR VOLUME

The Peak Hour Volume warrant is intended for application when traffic conditions are such that for one hour of the day, minor street traffic suffers undue traffic delay in entering or crossing the major street. The Peak Hour Volume warrant is satisfied when the plotted points representing the vehicles per hour on the major street (total of both approaches) and the corresponding vehicles per hour on the higher volume minor street approach (one direction only) for one hour (any four consecutive 15 minute periods) of an average day falls above the curve in Figure 10 for the appropriate combination of approach lanes. The colored dots below represent the results for each peak hour.

FIGURE 10. WARRANT 3, PEAK-HOUR VEHICULAR VOLUME



TRAFFIC SIGNAL WARRANT ANALYSIS RESULTS

Based on the geometry of the intersection, the analyses were performed based on one lane on the major street (Columbia Pike) and two lanes on the minor street (Site Access A). The results of the warrant analyses indicated that at the completion of the development, the projected traffic volumes at the intersection of Columbia Pike and Site Access A will warrant a traffic signal. Specifically, the intersection is expected to meet Warrant 1B for the eighth highest hour, Warrant 2 in the AM and PM peak hours, and Warrant 3 in the AM and PM peak hours. Based on the trip generation, a traffic signal for the intersection of Columbia Parkway (SR 6/US 31) and Site Access A is warranted when occupancy of the development reaches approximately 55%. Results of the warrant analyses are shown in Table 10.

TABLE 10: TRAFFIC SIGNAL WARRANT ANALYSIS – SITE ACCESS A

Hour	Main Street Both Directions	Minor Street Highest Approach	1A	1B	1C	2	3
8th Highest Hour	1186	123	No	Yes	n/a	n/a	n/a
AM Peak Hour	1904	135	n/a	n/a	n/a	Yes	Yes
PM Peak Hour	1898	196	n/a	n/a	n/a	Yes	Yes

4.5 Queue Length Analysis

95th percentile queue lengths for the critical movements of the study intersections that are expected to be impacted by the proposed development were also analyzed and evaluated under the projected conditions. Table 11 indicates the results of the queue length analyses for the study intersection.

As shown in Table 11, the 95th percentile queue lengths for the majority of critical movements of the study intersections are less than the available storage length with the following exceptions:

- The westbound left-turn lane at the intersection of Columbia Pike (SR 6/US 31) and Thompson's Station Road during the PM peak hour.
- The southbound left-turn lane at the intersection of Columbia Pike (SR 6/US 31) and Critz Lane during the PM peak hour.
- The westbound right-turn lane at the intersection of Columbia Pike (SR 6/US 31) and I-840 WB Ramp during the AM peak.

TABLE 11: STUDY INTERSECTIONS 95TH QUEUE LENGTH

INTERSECTION	TURNING MOVEMENT	AVAILABLE STORAGE (FEET)	95TH QUEUE LENGTH (FEET)		
			PROJECTED		
			AM Peak Hour	PM Peak Hour	Weekend Peak Hour
Columbia Pike (SR 6/US 31) and Thompson's Station Road	Eastbound Left-Turn	100	51	58	63
	Westbound Left-Turn	85	56	86	65
	Northbound Left-Turn	105	29	65	58
	Southbound Left-Turn	120	m12	m15	m11
Columbia Pike (SR 6/US 31) and Critz Lane	Westbound Left-Turn	150	55	59	74
	Southbound Left-Turn	275	12	496	37
Columbia Pike (SR 6/US 31) and I-840 EB Ramp	Eastbound Left-Turn	--	124	46	21
	Eastbound Right-Turn	350	26	31	2
	Northbound Right-Turn	700	499	272	244
	Southbound Left-Turn	150	120	m30	12
Columbia Pike (SR 6/US 31) and I-840 WB Ramp	Westbound Left-Turn	--	145	229	145
	Westbound Right-Turn	225	#470	84	38
	Northbound Left -Turn	200	m19	#193	3
	Southbound Right-Turn	575	10	34	7
Columbia Pike (SR 6/US 31) and Declaration Way	Northbound Left-Turn	550	348	38	0
	Eastbound Left-Turn	--	430	180	0
	Eastbound Right-Turn	225	40	80	3
Columbia Pike (SR 6/US 31) and Site Access A	Westbound Left-Turn	--	113	145	128
	Westbound Right-Turn	75	46	53	40
	Northbound Right-Turn	50	m43	m30	m32
	Southbound Left-Turn	150	147	58	111
Columbia Pike (SR 6/US 31) and Site Access B	Westbound Right-Turn	--	25	13	13

#: 95th percentile volume exceeds capacity, queue may be longer.
m: Volume for 95th percentile queue is metered by upstream signal.

5. ANALYSIS OF SITE PLAN

5.1 Site Access Review

Based on the current site plan, two proposed vehicular access points for the development will be provided on Columbia Pike (SR 6/US 31), located on the west side of the project site. Site Access A will be intersecting Columbia Pike approximately 420 feet north of the southern property line of the site. The intersection of Columbia Pike and Site Access A is expected to operate at LOS D or better under signalized conditions. It is recommended that when the development reaches approximately 55% occupancy, a signal should be installed at the intersection of Columbia Pike and Site Access A. Site Access B will intersect Columbia Pike approximately 650 feet further to the north. The westbound approach of Site Access B is planned to operate as right-in/right-out only. Additionally, Site Access B is expected to operate at LOS D or better in the AM, PM, and Weekend peak hours.

According to the Major Thorough Plan for the Town of Thompson's Station, the construction of a new east-west roadway connecting Columbia Pike to Clayton Arnold Road is planned through this project site. Specifically, Site Access A is planned to provide the start of that connector roadway. When this connection is established, the site distribution and existing roadway distribution is expected to change.

Based on the information presented above, it was determined that two site accesses should be sufficient to accommodate the peak period demand. The addition of a third access point only serves to increase the number of conflict points/potential crash locations along Columbia Pike and will not provide a significant improvement to the levels of service at the proposed site access points.

5.2 Pedestrian, Bicycle, and Transit Access

Bike lanes are provided on both sides of Columbia Pike (SR 6/US 31) in the vicinity of the project area. No pedestrian or transit services are provided near the project site.

5.3 TDOT Driveway Standards

TDOT permits access to state highways according to the standards outlined in their *Manual for Constructing Driveway Entrances on State Highways,* 2015 Edition. The site accesses for the Roderick Place development were evaluated according to these standards.

According to Section 4.2, one access is permitted for frontages less than 200 feet. Based on the need of additional access to provide better internal circulation and safety, an additional access may be permitted for frontages from 200 to 400 feet, and more than two accesses may be permitted for frontages greater than 400 feet. For frontages greater than 400 feet, additional access points are permitted every 200 feet of continuous frontage. The Roderick Place site plan proposes two accesses on Columbia Pike, and the distance between access points exceeds the recommended 200 feet.

5.4 Lane Warrant Analysis

The northbound approach of Columbia Pike (SR 6/US 31) at Site Access B was evaluated for the need to provide a right-turn lane based on the projected traffic volumes during the AM and PM peak hours. This analysis was based on the procedures outlined in the Intersection Channelization Design Guide (NCHRP 279). The results of the analysis indicate that a right-turn lane is not warranted in the AM or PM peak hour.

All warrant analyses are included in Appendix F.

5.5 Safety Analysis

Crash data was obtained from the Tennessee Department of Transportation. Since 2016, 107 crashes have occurred at the study intersections and along Columbia Pike (SR 6/US 31) on the frontage of the project site. Of the total crashes, 87 were property damage crashes, 18 were minor injury crashes, one involved a serious injury, and one was fatal. Table 12 and Table 13 present the intersection and segment crash analysis, respectively.

TABLE 12: INTERSECTION CRASH RATES

INTERSECTION	COLUMBIA PIKE AND					I-840 EB MERGE	I-840 WB MERGE
	THOMPSON'S STATION RD	CRITZ LANE	I-840 EB RAMP	I-840 WB RAMP	DECLARATION WAY		
Number of Crashes	32	5	23	29	10	4	4
Injuries	5	0	7	6	1	0	0
Fatal	0	0	0	0	0	1	0
Crash Rate	1.321	0.164	0.583	0.875	0.307	0.101	0.121

TABLE 13: SEGMENT CRASH RATES

CRASH TYPE	RESULT
Number of Crashes	9
Injuries	2
Fatal	0
Crash Rate	0.823

Based on the crash analysis, the highest reported intersection crash rate is at the intersection of Columbia Pike and Thompson's Station Road and was determined to be approximately 1.321 crashes per million entering vehicles. The segment crash rate for the property frontage was determined to be 0.823 crashes per million vehicle miles. According to TDOT's *Tennessee Traffic Crash Data*, Tennessee's average crash rate between 2016 and 2018 is 4.3 crashes per million vehicle miles. Additionally, Williamson County's average crash rate for 2018 is 2.988 crashes per million vehicle miles. Therefore, the crash rates along the project site frontage segments are lower than the state and county averages. Based on the fact that intersection and segment crash rates all fall below 2.000, and the segment crash rates fall below state and county average crash rates, no existing safety issues at the study intersections and along the property frontage are noted. Therefore, no safety improvements are recommended at this time.

Crash data calculations are included in Appendix H.

6. CONCLUSIONS

6.1 Capacity Analysis

According to the developer, the proposed development includes approximately 92 hotel rooms, 75,606 square feet of office space, 20,000 square feet of commercial space, 19,768 square feet of restaurant space, 85 multi-family residential units, 100 assisted living units, 126 single-family homes, 13,000 square feet of private event space, and 12,000 square feet of daycare, and a 4-fueling position convenience market with gasoline pumps.

The capacity analyses indicate that the following intersections are expected to deteriorate to or continue to operate at LOS E or LOS F:

- The intersection of Columbia Pike (SR 6/US 31) and Thompson's Station Road is expected to deteriorate from LOS E to LOS F during the AM peak hour, from LOS D to LOS E during the PM peak hour, and from LOS D to LOS E in the Weekend peak hour.
    - *This intersection was reevaluated with improvements to determine what is needed to maintain overall LOS D or better. It was determined the addition of a northbound and southbound through lane would be needed. Additionally, signal timing should be updated in the PM peak. These combined would mitigate any existing, background, or projected LOS E or LOS F. This developer does not own the property surrounding this intersection; however, and there is not currently right-of-way for these improvements. Therefore, the TIS does not present recommendations for this intersection.*

Additionally, per the requirements set forth by the Town of Thompson's Station's scoping memorandum, the levels of service at each intersection approach and individual turning movements were compared between background and projected conditions. Below, turning movements and approaches that are expected to deteriorate to or continue to operate at LOS E or LOS F are discussed:

- Columbia Pike and Thompson's Station Road
    - The northbound right-turn movement is expected to deteriorate from LOS F with a lane group delay of 89.4 seconds per vehicle (s/veh) to LOS F with a lane group delay of 135.7 s/veh in the AM peak hour. Additionally, in the Weekend peak hour, the northbound right-turn

movement is expected to deteriorate from LOS D with a lane group delay of 43.9 s/veh to LOS F with a lane group delay of 91.9 s/veh.
    - The overall northbound approach is expected to deteriorate from LOS F with an approach delay of 86.3 s/veh to LOS F with an approach delay of 131.2 s/veh in the AM peak hour. Additionally, in the Weekend peak hour, the overall northbound approach is expected to deteriorate from LOS D with an approach delay of 41.5 s/veh to LOS F with an approach delay of 86.2 s/veh.
    - The southbound right-turn movement is expected to deteriorate from LOS D with a lane group delay of 46.1 s/veh to LOS F with a lane group of 70.4 s/veh in the PM peak hour. Additionally, in the Weekend peak hour, the southbound right-turn movement is expected to deteriorate from LOS C with a lane group delay of 31.4 s/veh to LOS F with a lane group delay of 51.4 s/veh.
    - The overall southbound approach is expected to deteriorate from LOS D with an approach delay of 45.4 s/veh to LOS E with an approach delay of 69.2 s/veh in the PM peak hour.
    - *This intersection was reevaluated with improvements to determine what is needed to maintain overall LOS D or better. It was determined that the addition of a northbound and southbound through lane would be needed. Additionally, signal timing should be updated in the PM peak. These combined would mitigate any existing, background, or projected LOS E or LOS F. This developer does not own the property surrounding this intersection; however, and there is not currently right-of-way for these improvements. Therefore, the TIS does not present recommendations for this intersection.*
- Columbia Pike and Critz Lane
    - Projected results were within the acceptable range.
- Columbia Pike and I-840 EB Ramp
    - Projected results were within the acceptable range.
- Columbia Pike and I-840 WB Ramp
    - Projected results were within the acceptable range.
- Columbia Pike and Declaration Way
    - The eastbound left-turn lane movement is expected to deteriorate from LOS F with a control delay of 1,208.1 seconds to LOS F with a control delay of 2,678.9 seconds in the AM peak hour. Additionally, in the PM peak hour, the eastbound left-turn lane movement is expected to deteriorate from LOS F with a control delay of 127.6 seconds to LOS F with a control delay of 195.1 seconds.

  - The overall eastbound approach is expected to deteriorate from LOS F with a control delay of 440.1 seconds to LOS F with a control delay of 896.5 seconds in the AM peak hour. Additionally, in the PM peak hour, the overall eastbound approach is expected to deteriorate from LOS F with a control delay of 61.8 seconds to LOS F with a control delay of 83.6 seconds in the PM peak hour.
  - *These values do not depict the existing conditions at this intersection because the intersection is currently being controlled by a crossing guard in the AM and PM peak hours. The crossing guard mitigates the side street delay that would otherwise occur. Intersection should continue to be controlled via a crossing guard during school peaks.*
- Columbia Pike and Site Access A
  - The northbound through movement is expected to operate at LOS F in the AM peak hour.
    - *While the northbound through movement is expected to operate at LOS F in the AM peak hour, the overall intersection of Columbia Pike and Site Access A is expected to operate at good LOS for AM and PM peak hours. Therefore, no mitigation measures are recommended at this time.*
  - The overall westbound approach is expected to operate at LOS E in the PM peak hour.
    - *Signal splits at this intersection show preference to Columbia Pike northbound and southbound movements as these movements hold a higher priority. Signal splits could be set to show preference to Site Access A, however, this is not recommended because it would increase delays for the main street.*
- Columbia Pike and Site Access B
  - The westbound left-turn movement is expected to operate at LOS D or better in the AM, PM, and Weekend peak hours.
- The eastbound and westbound I-840 ramp merge intersections are expected to operate at LOS B or better under all conditions.

Capacity analysis is provided in Appendix D.

6.2 Site Access

Based on the current site plan, two proposed vehicular access points for the development will be provided on Columbia Pike (SR 6/US 31). Site Access A will be intersecting Columbia Pike approximately 420 feet north of the southern property line of the site. The intersection of Columbia Pike and Site Access A is expected to operate at LOS D or better under signalized conditions. It is recommended that when the development reaches approximately 55% occupancy, a signal should be installed at the intersection of Columbia Pike and Site Access A. Site Access B will intersect Columbia Pike approximately 650 feet further to the north. The westbound approach of Site Access B is planned to operate as right-in/right-out only and is expected to operate at LOS D or better in the AM, PM, and Weekend peak hours.

According to the Major Thorough Plan for the Town of Thompson's Station, the construction of a new east-west roadway connecting Columbia Pike to Clayton Arnold Road is planned through this project site. Site Access A is planned to provide the start of that connector roadway. When this connection is established, the site distribution and existing roadway distribution is expected to change so that some traffic from the Roderick development will travel to the east instead of using Columbia Pike for access.

Based on the information presented above, it was determined that two site accesses will be sufficient to accommodate the peak period demand. The addition of a third access point only serves to increase the number of conflict points/potential crash locations along Columbia Pike and will not provide a significant decrease to the levels of service at the proposed site access points.

6.3 Safety Analysis

Based on the crash analysis, the highest reported intersection crash rate is at the intersection of Columbia Pike and Thompson's Station Road and was determined to be approximately 1.321 crashes per million entering vehicles. The segment crash rate for the property frontage was determined to be 0.823 crashes per million vehicle miles. According to TDOT's *Tennessee Traffic Crash Data*, Tennessee's average crash rate between 2016 and 2018 is 4.3 crashes per million vehicle miles. Additionally, Williamson County's average crash rate for 2018 is 2.988 crashes per million vehicle miles. Therefore, the crash rates along the project site frontage segments are lower than the state and county averages. Intersection and segment crash rates all fall below 2.000, and the segment crash rates fall below state and county average crash rates. Therefore, no existing safety issues at the study intersections and along the property frontage are noted. Therefore, no safety improvements are recommended at this time.

7. RECOMMENDATIONS

The proposed Roderick Place development is located along Columbia Pike (SR 6/US 31) in Thompson's Station, Tennessee. According to the developer, the proposed development includes approximately 92 hotel rooms, 75,606 square feet of office space, 20,000 square feet of commercial space, 19,768 square feet of restaurant space, 85 multi-family residential units, 100 assisted living units, 126 single-family homes, 13,000 square feet of private event space, and 12,000 square feet of daycare, and a 4-fueling position convenience market with gasoline pumps. Access to the project site is planned to be provided by two site accesses along Columbia Pike. Site Access A will be intersecting Columbia Pike approximately 420 feet north of the southern property line of the site and Site Access B will intersect Columbia Pike approximately 650 feet further to the north. The analyses presented in this study indicate that the impacts of the proposed project on the existing street network will be manageable by providing the recommendations below. The recommendations are as follows:

Columbia Pike (SR 6/US 31) and Site Access A

- Provide a traffic signal at the intersection. A traffic signal should be installed at approximately 55% occupancy of the development.
- Until the 55% occupancy level is reached, the westbound approach of Site Access A should be stop-controlled and a stop bar and R1-1 'Stop' sign should be installed on the egress approach.
- Site Access A should be designed to include sufficient width for one entering lane and three exiting lanes. The exiting approach should include one left-turn lane and one right-turn lane with approximately 150 feet of storage length and a through lane to account for a future fourth leg of the intersection. This through lane should be striped out until needed.
- Provide a northbound right-turn lane on Columbia Pike (SR 6/US 31) with approximately 100 feet of storage length.
- Provide a southbound left-turn lane on Columbia Pike (SR 6/US 31) with approximately 150 feet of storage length.

Columbia Pike (SR 6/US 31) and Site Access B

- Site Access B should initially be utilized as the development construction entrance.
- Site Access B should be converted from a construction access to a site access at the time when approximately 50% occupancy of the development is reached.
- When Site Access B is converted to a site access, it should operate as right-in/right-out only and should be designed to include sufficient width for one entering lane and one exiting lanes.

- The westbound approach of Site Access B should be stop-controlled and a stop bar and R1-1 'Stop' sign should be installed on the egress approach.

Signal Timing Optimization and Coordination

- Signal timings at all the signalized study intersections should be optimized upon completion of the development. Furthermore, after providing a traffic signals at the intersection of Columbia Pike (SR 6/US 31) and Site Access A, signal timing coordination should be conducted between the three intersections of Columbia Pike (SR 6/US 31) and Thompson's Station Road, Columbia Pike (SR 6/US 31) and Site Access A, and Columbia Pike (SR 6/US 31) and Critz Lane.

Additional Recommendations

- As part of the construction of the project, all internal and external driveway connections should be designed such that the departure sight triangles, as specified by AASHTO, will be clear of all sight obstructions, including landscaping, existing vegetation, monument signs/walls, fences, etc.
- Parking should be developed per code.
- According to the Major Thorough Plan for the Town of Thompson's Station, the construction of a new east-west roadway connecting Columbia Pike to Clayton Arnold Road is planned through this project site. Site Access A is planned to provide the start of that connector roadway and the site plan shows the proposed collector road extending to the southern property line. This internal collector roadway should be designed to Town of Thompson's Station standards for a ST-60-36 collector road. The collector should terminate as a stub and right-of-way should be dedicated for its future extension to the south property line.
- In the event of a large function at the private event space, traffic control officers should be considered to direct traffic.
- Final design of internal roadways and parking should meet all Town of Thompson's Station standards and the latest version of "A Policy of Geometric Design of Highways and Streets" published by AASHTO. Any parking lots and streets associated with the development should ensure that passenger cars and emergency vehicles are capable of making all turning movements. Internal intersections should be two-way stop-controlled unless all-way stop control warrants are met.
- Per the TDOT *Manual for Constructing Driveway Entrances on State Highways*, this development meets the minimum requirements for distance between two site access points.

- The Major Thoroughfare Plan for the Town of Thompson's Station details the following roadway improvements occurring in the vicinity of the project site:
    - The widening of Columbia Pike (SR 6/US 31) to a 4-lane median-divided cross-section, and
    - The construction of an east-west roadway connecting Columbia Pike to Clayton Arnold Road at its intersection with Robbins Nest Road.

  As previously described, the Roderick Place developer shall design a ST-60-36 collector roadway with a 60-foot right-of-way from Columbia Pike to the southern property line approximately as shown on the revised concept plan and the MTP. Additionally, right-of-way shall be dedicated along the entire frontage of Roderick Place (approximately 2,600 linear feet). The width is to be determined by State of Tennessee (TDOT) construction drawings.

In summary, based on the analyses conducted, no further recommendations are presented for the proposed Roderick Place development.

APPENDICES

APPENDIX A
PRELIMINARY SITE PLAN

APPENDIX B
DETAILED TURNING MOVEMENT COUNTS

APPENDIX C
TDOT COUNT DATA

APPENDIX D
CAPACITY ANALYSES

APPENDIX E
TRIP GENERATION CALCULATIONS

APPENDIX F
WARRANT ANALYSIS

APPENDIX G
SIGNAL TIMING SHEETS

APPENDIX H
CRASH DATA

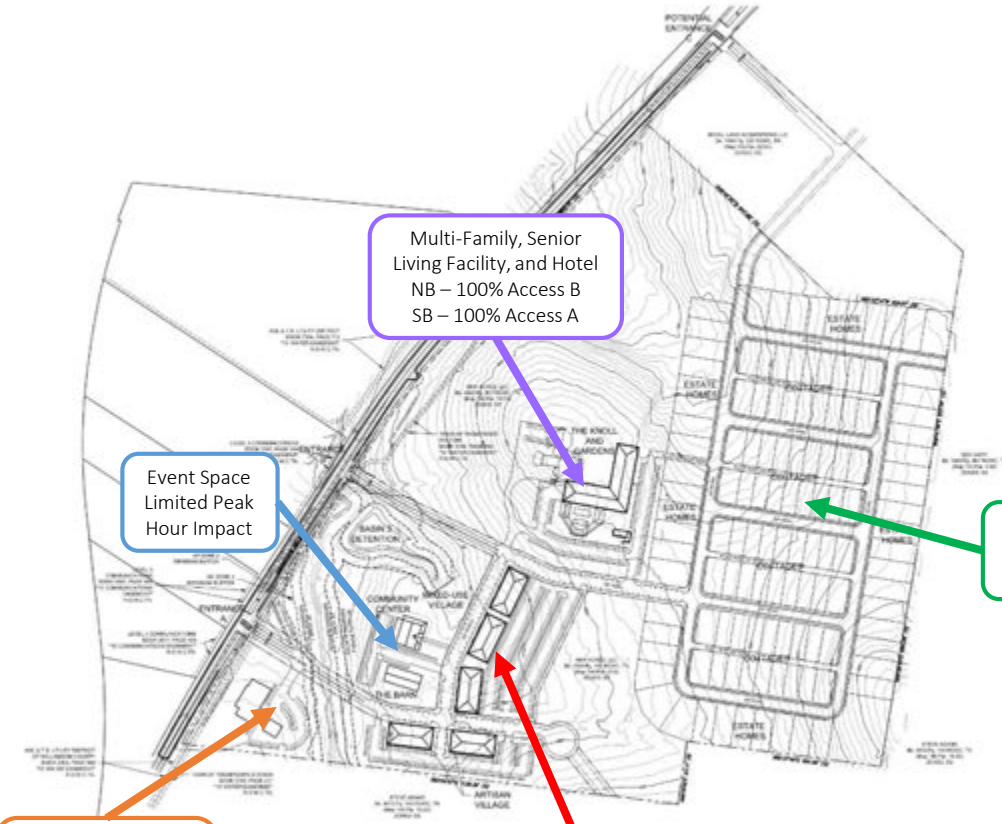
APPENDIX I
PASS-BY DISTRIBUTION AND ASSIGNMENT

APPENDIX A
PRELIMINARY SITE PLAN

Land Use Distributions

SITE LOCATION MAP

SCALE: 1"=2000'-0"



Master Plan Tabular Data

Existing Zoning: High Intensity District
Gross Site Area: 79.90 AC

Requirements of Proposed Zoning: Specific Plan, High Intensity District (Cluster Option)
- General Plan Requirements:
-Maximum Density: 3.00 DU/AC
-Maximum Height: 3 Stories
-Required Open Space: 40% Residential | 50% Commercial
-Minimum Site Area: 10 Acres
-Maximum Site Area: 100 Acres
-Area Permitted as Residential: 100%
-Area Permitted as Commercial: 100%

Density:

-Gross Permitted Density:	3.00 DU/AC
-Total Residential:	211 Units
-Estate Lots:	54 Units
-Cottage Lots:	72 Units
-Multistory dwellings/ live work:	85 Units
-Total Commercial:	129,367 S.F.
-Event Center & Historic Barn:	13,500 S.F.
-Hotel w/ Senior Residences:	92 Units
-Senior Living (IL,AL,ALZ):	100 Beds

Open Space:
-Total Land Area: 79.90 Acres
-Total Commercial Area: 9.26 Acres X 50% = 4.63 Acres
-Total Residential Area: 70.64 Acres X 40% = 28.25 Acres
-Total Required Open Space: 32.88 Acres
-Total Provided Open Space: 35.80 Acres

CONCEPT PLAN

0 200 400 600 feet

N

BINKLEY DESIGNED
144 SOUTHEAST PKWY.
SUITE 230
FRANKLIN TN.
37064

RODERICK PLACE
CONCEPTUAL SITE PLAN
THOMPSON'S STATION, TENNESSEE

ISSUE 07.19.19
RE-ISSUE 11.26.19

PROJECT
RODERICK PLACE

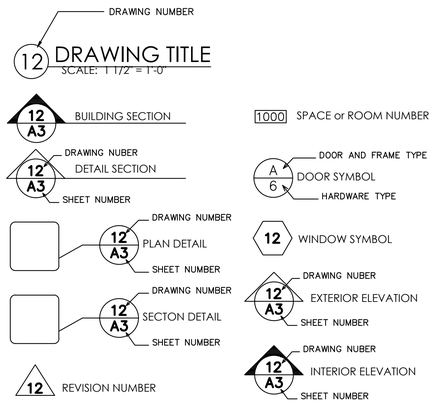
DEVELOPER
SAMSON LEY
144 SOUTHEAST PKWY. SUITE 230
FRANKLIN TN. 37064

CP
01

RODERICK PLACE
CONCEPTUAL SITE PLAN

4630 COLUMBIA PIKE
THOMPSON'S STATION, TENNESSEE

SYMBOLS LEGEND



DEVELOPER

Sampson J/V
144 Southeast Parkway, Suite 230
Franklin, TN. 37064
Jay Franks: 615.300.0001
E: jfranks130@gmail.com

OWNER

Leon C. Heron Jr.
Chief Manger / Sole Member
KMK Acres, LLC.
2655 Ranch Club Blvd.
Myakka City, FL. 34251
E: angus1600@comcast.net

PROGRAM MANAGEMENT:

BINKLEY DESIGNED, LLC.
144 Southeast Parkway, Suite 230
Turner Binkley: 407.459.9344
E: turner@binkleydesigned.com

ARCHITECT

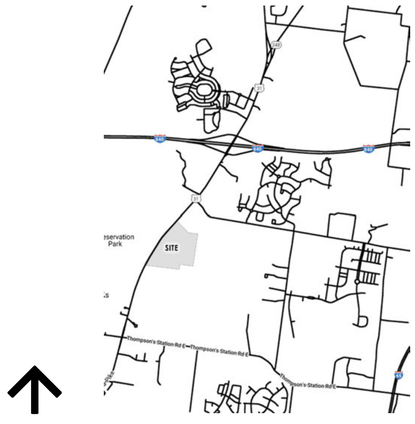
ED BINKLEY, AIA.
144 Southeast Parkway, Suite 230
Franklin, TN. 37064

I hereby certify that these plans and specifications have been prepared by me or under my supervision. I further certify that to the best of my knowledge these plans and specifications are as required by law and in compliance with applicable codes and the 2015 IBC.

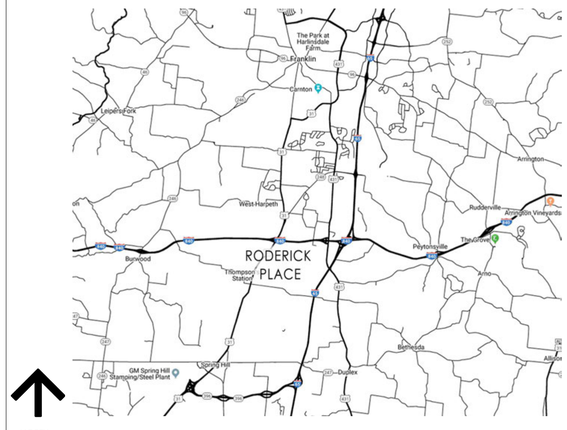
INDEX OF DRAWINGS

APPROVALS

LOCATION MAP:



VICINTY MAP:



BUILDING CODE LOCATION

Building Code information, Occupancy information and Life Safety Data is shown on Sheet BC1.0 are provide to completely delineate the component design of the buildings.

ARCHAEOLOGICAL

Glyn D. DuVall, M.A.
Archaeological Consultant
5371 leiper's Creek Road
Franklin, TN 37064

SOILS ENGINEER

Terra Nova Engineering
170D East Main Street #124
Hendersonville, TN 37075

CIVIL ENGINEER

Energy Land & Infrastructure
1420 Donelson Pike, Suite A12
Nashville, TN 37217

BINKLEY DESIGNED
144 SOUTHEAST PKWY.
SUITE 230
FRANKLIN TN.
37064

RODERICK PLACE
CONCEPTUAL SITE PLAN
THOMPSON'S STATION, TENNESSEE

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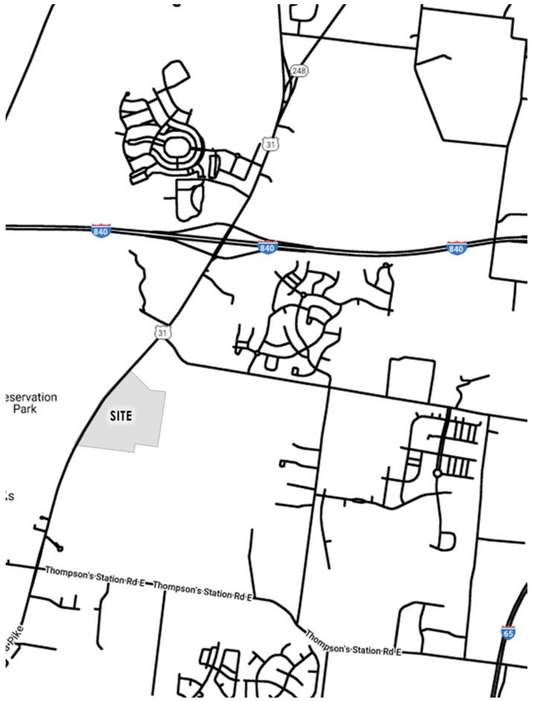
PROJECT RODERICK PLACE

DEVELOPER
SAMSON J/V
144 SOUTHEAST PKWY. SUITE 230
FRANKLIN TN. 37064

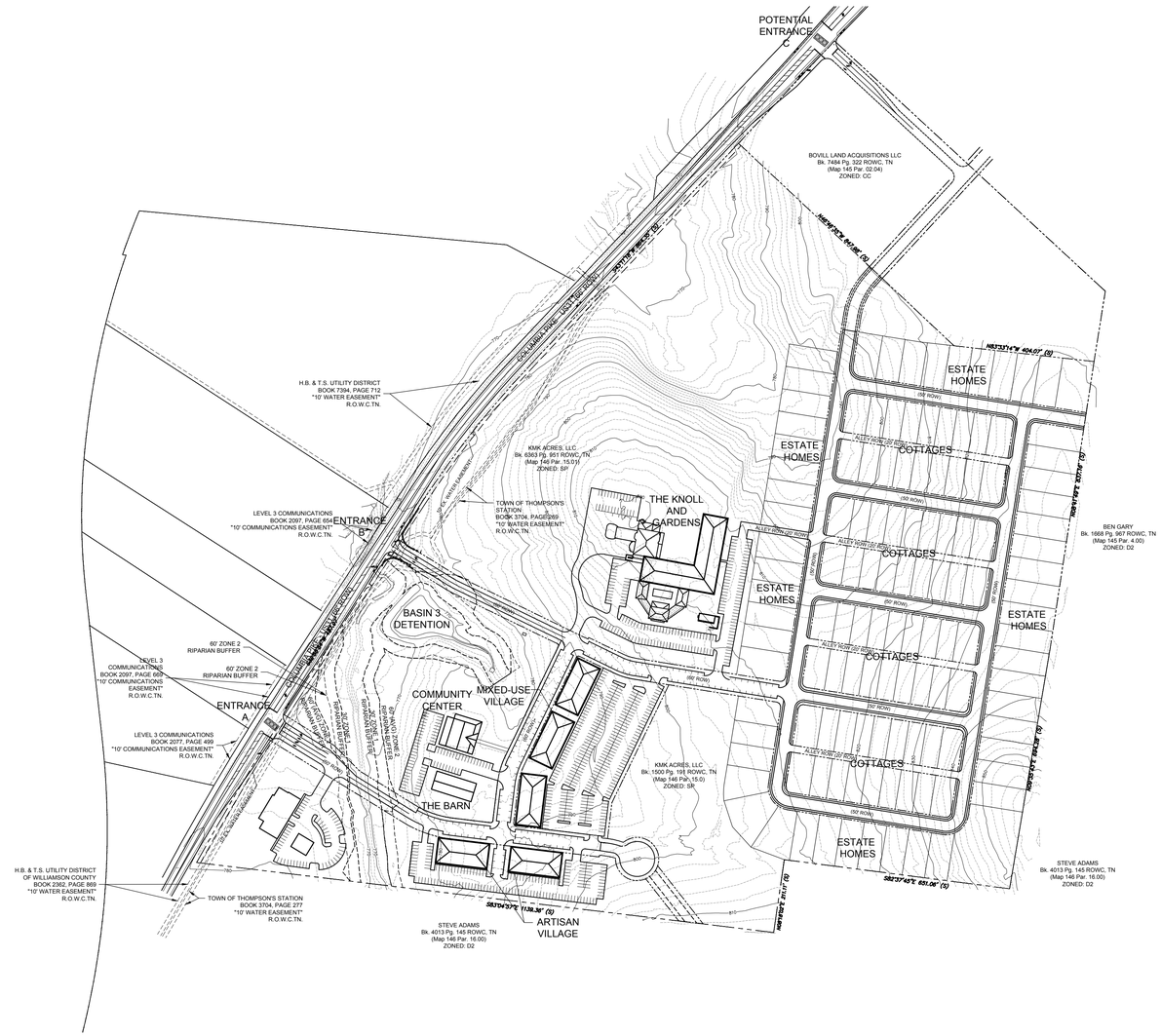
T

01



SITE LOCATION MAP

SCALE: 1"=2000'-0"



CONCEPT PLAN

0 200 400 600 feet

N

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THOMPSON'S STATION, TENNESSEE

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DEVELOPER
SAMSON J/V
144 SOUTHEAST PKWY. SUITE 230
FRANKLIN TN. 37064

CP

01

PHASING PLAN

0 200 400 600 feet

N

NOTE: SUBJECT TO CHANGE

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CONCEPTUAL SITE PLAN
THOMPSON'S STATION, TENNESSEE

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PROJECT RODERICK PLACE

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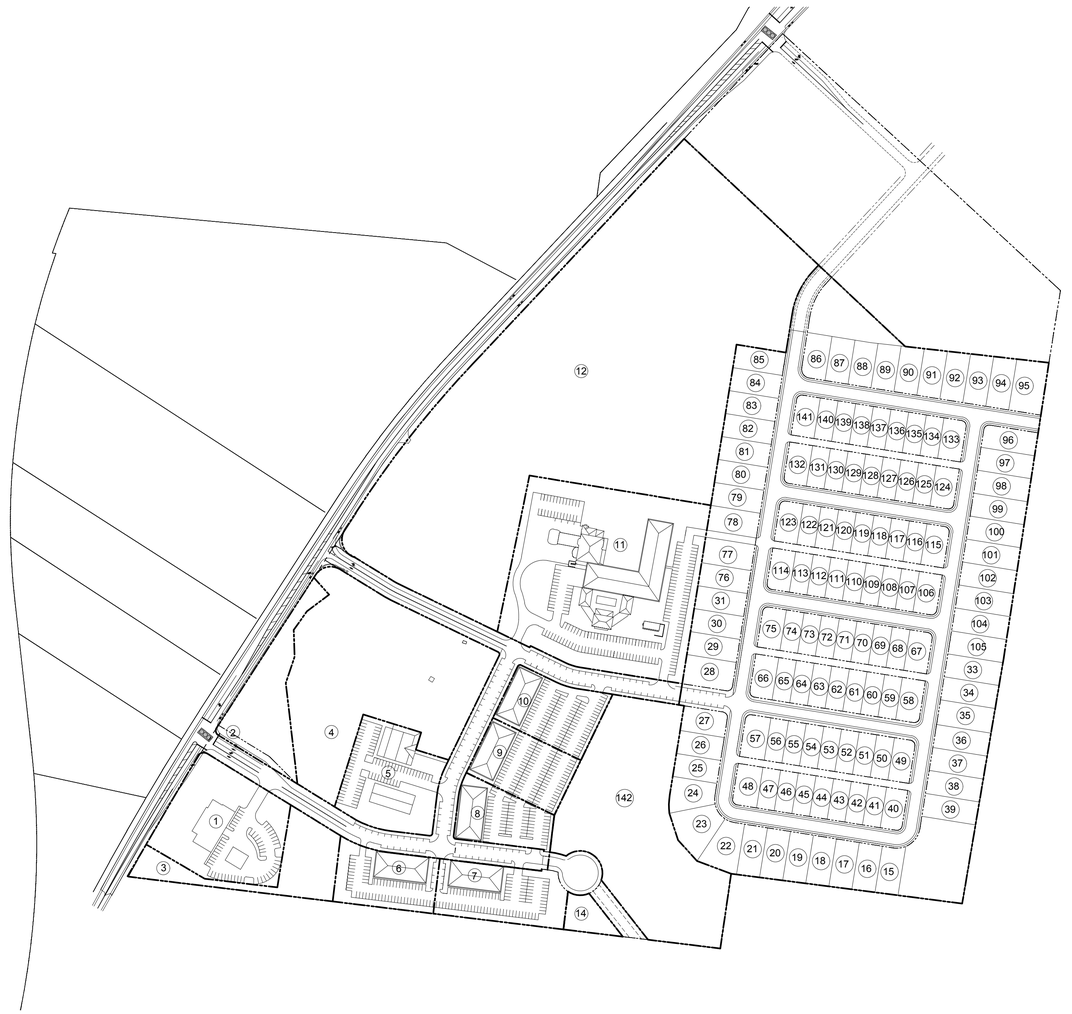
FRANKLIN TN. 37064

CP

02



CONCEPT LOT PLAN

0 200 400 600 feet

N

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SUITE 230
FRANKLIN TN.
37064

RODERICK PLACE
CONCEPTUAL SITE PLAN
THOMPSON'S STATION, TENNESSEE

ISSUE 07.19.19

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PROJECT RODERICK PLACE

DEVELOPER
SAMSON J/V
144 SOUTHEAST PKWY. SUITE 230
FRANKLIN TN. 37064

CP

CONCEPT NATURAL RESOURCES PLAN PLAN

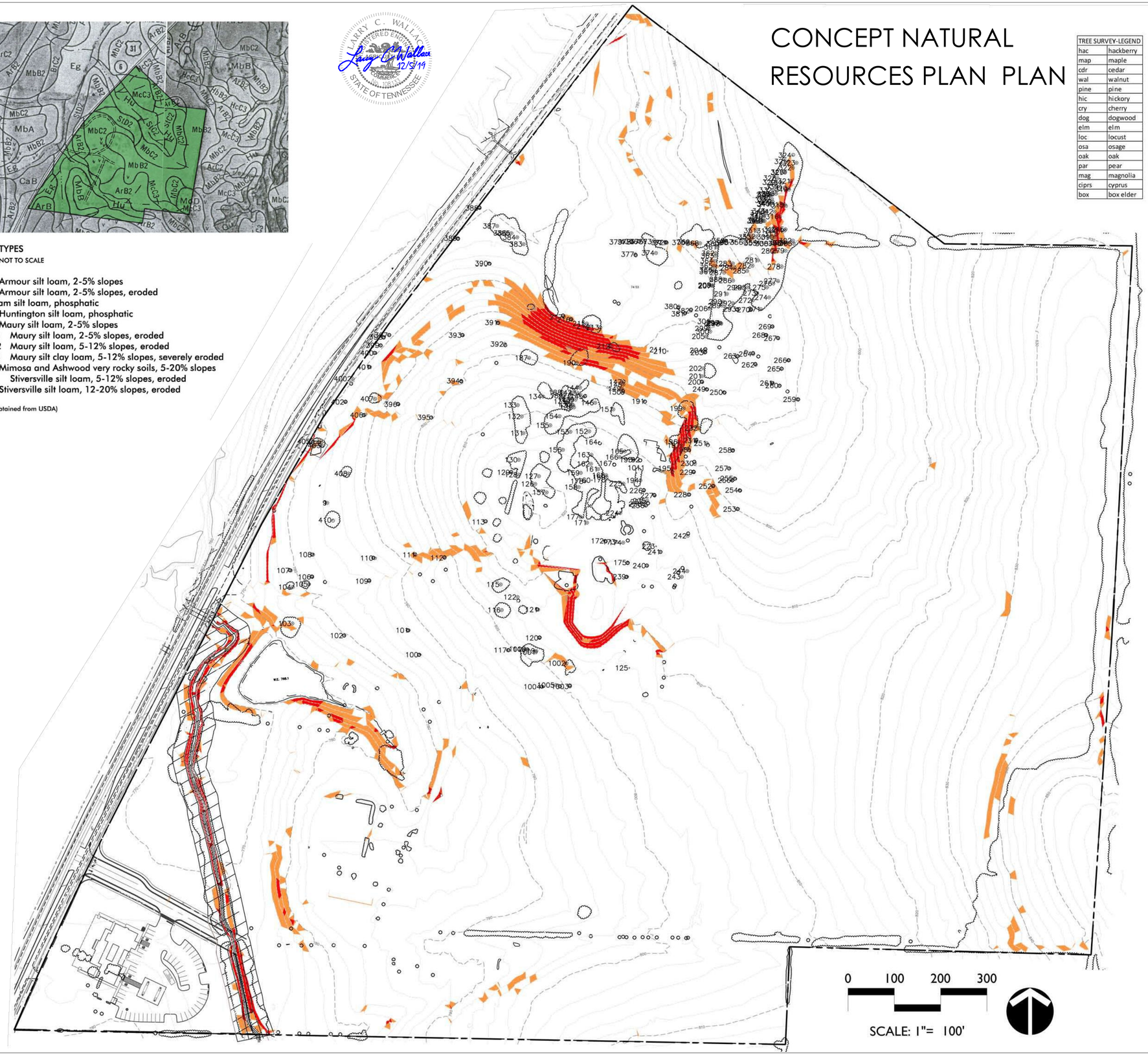
SOIL TYPES

IMAGE NOT TO SCALE

ArB Armour silt loam, 2-5% slopes
ArB2 Armour silt loam, 2-5% slopes, eroded
Eg Egam silt loam, phosphatic
Hu Huntington silt loam, phosphatic
MbB Maury silt loam, 2-5% slopes
MbB2 Maury silt loam, 2-5% slopes, eroded
MbC2 Maury silt loam, 5-12% slopes, eroded
McC3 Maury silt clay loam, 5-12% slopes, severely eroded
MoD Mimosa and Ashwood very rocky soils, 5-20% slopes
StC2 Stiversville silt loam, 5-12% slopes, eroded
StD2 Stiversville silt loam, 12-20% slopes, eroded

(Data obtained from USDA)

LARRY C. WALLACE
REGISTERED ENGINEER
12/5/19
STATE OF TENNESSEE



0 100 200 300

SCALE: 1"= 100'

TREE SURVEY-LEGEND	
hac	hackberry
map	maple
cdr	cedar
wal	walnut
pine	pine
hic	hickory
cry	cherry
dog	dogwood
elm	elm
loc	locust
osa	osage
oak	oak
par	pear
mag	magnolia
cipr s	cyprus
box	box elder

TREE SURVEY-POINT DESCRIPTION

Point #	Description	Point #	Description	Point #	Description	Point #	Description
100	51 hac	201	24 hac	302	14 elm	389	22 wal
101	60 tree	202	12 hac	303	28 wal	390	20 map
102	6 map	203	12 elm	304	16 wal	391	12 hic
103	36 cdr	204	22 hac	305	10 hac	392	18 oak
104	10 cipr s	205	20 wal	306	20 hac	393	6 par
105	10 cipr s	206	20 hac	307	10 hac	394	14 oak
106	12 hac	207	20 wal	308	14 hac	395	6 oak
107	15 map	208	16 hac	309	10 wal	396	10 map
108	17 oak	209	8 hac	310	6 hac	397	20 wal
109	10 red map	210	24 hac	311	20 wal	398	18 wal
110	60 hic	211	26 hac	312	30 map	399	6 dog clust
111	11 cry	212	10 map clust	313	12 wal	400	6 dog clust
112	16 cry	213	20 hac	314	8 hac tri	401	8 dog tri
113	25 tree	214	24 wal	315	12 elm	402	6 par
114	25 wall	215	18 hac	316	10 hac	403	28 hac
115	14 map	216	24 hac	317	10 hac	404	30 hac
116	16 map	217	28 hac	318	18 hac	405	12 dog
117	14 wal	226	20 wal	319	10 hac	406	12 cry
118	16 pine	227	18 wal	320	10 hac	407	8 mag
119	18 map	228	38 hac	321	24 hac	408	12 oak
120	16 wal	229	18 hac	322	24 cry	410	8 mag clust
121	21 hic	230	18 hac	323	32 hac		
122	12 map clust	231	12 wal	324	28 hac		
126	17 mag	232	24 elm	325	8 hac		
127	48 mag	235	16 wal	326	6 hac		
128	22 wal	236	22 wal	327	26 hac		
129	18 hac	237	8 wal	328	18 hac		
130	24 mag twn	238	14 wal	329	26 wal		
131	46 hic	239	16 wal	330	20 wal		
132	17 pine	240	8 map	331	12 hac		
133	50 hol clust	241	8 map	332	14 hac tri		
134	52 hic	242	20 wal	333	14 hac		
135	15 wal	243	22 wal	334	12 hac		
136	15 wal	244	20 wal	335	8 hac twn		
137	15 wal	249	24 wal	336	14 hac		
138	12	250	24 wal	337	6 hac		
139	16 wal	251	26 wal	338	8 hac		
140	7 wal	252	20 wal	339	20 hac		
141	7 wal	253	26 wal	340	12 hac twn		
142	14 wal	254	24 wal	341	20 hac		
143	14 wal	255	22 wal	342	10 elm		
144	36 wal	256	16 wal	343	8 hac		
145	36 wal twn	257	22 wal	344	12 hac		
146	24 map clust	258	28 wal	345	30 hac		
147	24 wal	259	28 wal	346	8 hac		
148	6 wal	260	18 wal	347	12 hac		
149	10 wal	261	22 wal	348	14 oak		
150	72 wal clust	262	18 wal	349	16 hac		
151	17 map	263	20 wal	350	6 hac twn		
152	10 map	264	24 wal	351	12 hac tri		
153	15 map	265	24 wal	352	16 hac twn		
154	15 map	266	24 wal	353	16 map		
155	15 hic	267	26 wal	354	12 wal		
156	25 elm	268	26 wal	355	10 hac		
157	60 hic	269	26 wal	356	12 hac		
158	10 box	270	28 wal	357	16 hac		
159	40 mag clust	271	15 wal	358	12 hac		
160	16 mag clust	272	32 hac	359	14 hac		
161	10 pine	273	16 hac	360	12 cry		
162	10 map	274	16 wal	361	18 wal		
163	8 wal	275	6 loc	362	14 hac		
164	20 dog clust	276	24 wal	363	20 hac		
165	24 wal	277	8 osa clust	364	14 hac		
166	24 wal	278	18 wal	365	14 hac twn		
167	18 wal	279	20 elm	366	16 hac		
168	16 wal	280	18 hac	367	14 hac		
169	8 wal	281	16 wal	368	34 hac		
170	24 wal	282	16 hac	369	26 hac		
171	8 dog	283	12 wal	370	14 hac		
172	30 hic	284	16 wal	371	26 hac		
173	14 map	285	28 hac	372	14 hac		
174	32 wal	286	12 wal	373	32 hac		
175	24 wal	287	8 wal	374	20 osa twn		
187	10 mag clust	288	12 wal	375	28 hac		
188	12 wal	289	16 wal	376	22 hac		
189	10 wal	290	18 wal	377	40 wal		
190	22 oak	291	14 wal	378	30 hac		
191	18 map	292	14 wal	379	26 hac		
192	20 wal	293	28 hac	380	12 hic		
193	18 wal	294	12 wal	381	24 hac		
194	20 mag	295	18 hac	382	26 elm		
195	30 wal	296	14 hac	383	20 pine		
196	18 map	297	12 hac	384	16 pine		
197	22 map	298	18 hac	385	16 pine		
198	24 hac	299	18 hac	386	16 pine		
199	30 map	300	24 hac	387	20 pine		
200	24 elm	301	14 hac twn	388	22 wal		

SLOPE ANALYSIS			
NUMBER	COLOR	RANGE BEG.	RANGE END
1		15.00%	24.99%
2		25.00%	100.00%

ENERGY LAND & INFRASTRUCTURE
1420 EXECUTIVE PARK DRIVE, SUITE 210
OFFICE 615-383-6300 • WWW.ELI-LLC.COM
ENGINEERS • SURVEYORS • INFRASTRUCTURE • ENVIRONMENTAL

RODERICK PLACE
CONCEPTUAL SITE PLAN
THOMPSON'S STATION, TENNESSEE

ISSUE 07.19.19
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PROJECT RODERICK PLACE

OWNER
SAMSON J/V
144 SOUTHEAST PKWY. SUITE 230
FRANKLIN TN. 37064

C

1.0

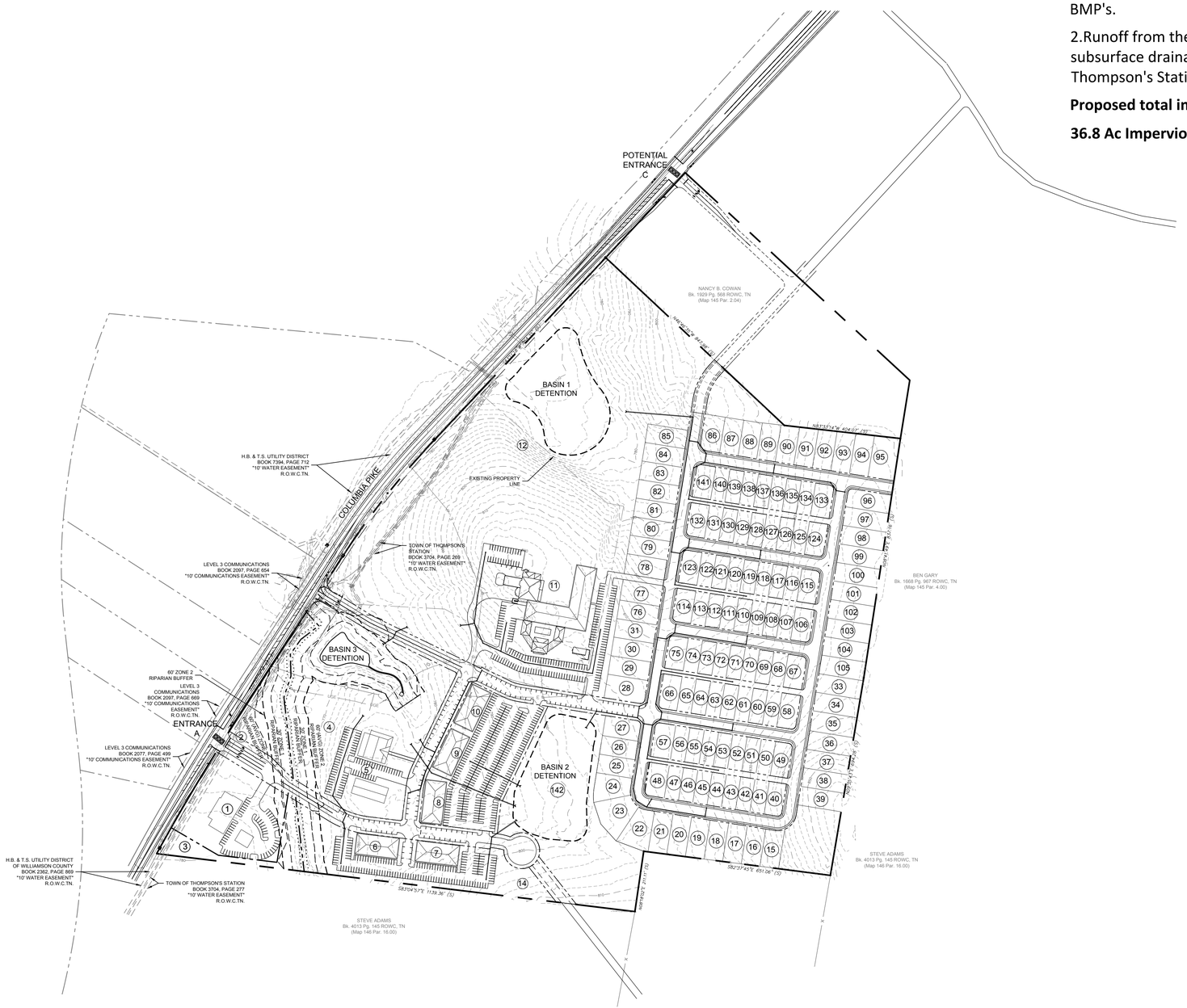
STORMWATER NARRATIVE

1.The additional impervious area to this site will be treated using approved BMP's.

2.Runoff from the impervious areas will either sheet flow or be collected in subsurface drainage networks. All discharges will meet or exceed the Town of Thompson's Stations stormwater requirements.

Proposed total impervious area = 36.8 Acres

36.8 Ac Impervious / 79.9 Ac Total = ±46%



ENERGY LAND & INFRASTRUCTURE
1420 DONELSON PIKE, SUITE A-12, NASHVILLE, TN 37217
OFFICE 615-383-6300 • WWW.ELI-LLC.COM
ENGINEERS • SURVEYORS • INFRASTRUCTURE • ENVIRONMENTAL

RODERICK PLACE
CONCEPTUAL SITE PLAN
THOMPSON'S STATION, TENNESSEE

LARRY C. WALLACE
REGISTERED ENGINEER
12/5/19
No. 108133
STATE OF TENNESSEE

CONCEPT STORMWATER PLAN

0 200 300 400 feet

N

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PROJECT RODERICK PLACE

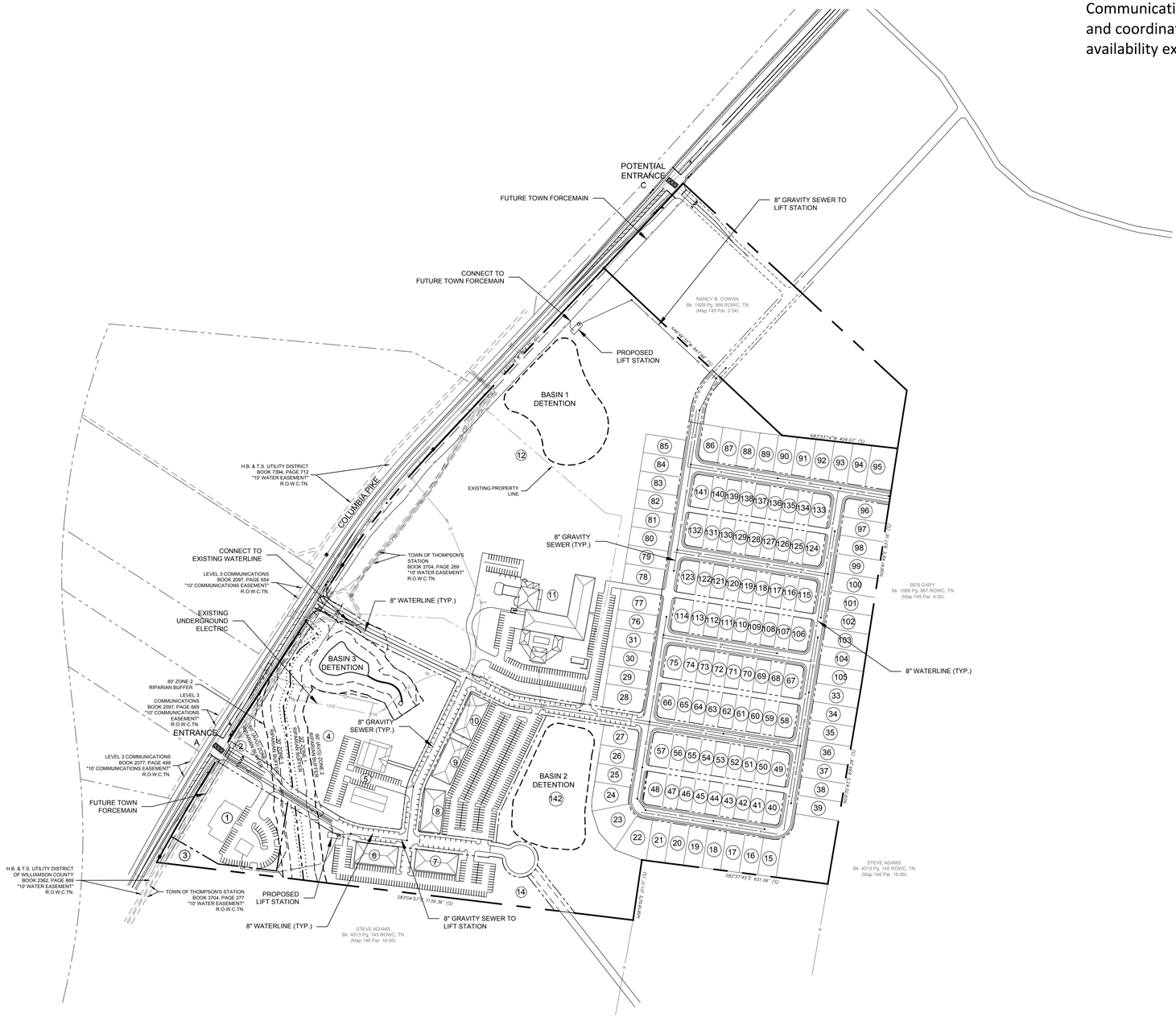
OWNER
SAMSON J/V
144 SOUTHEAST PKWY. SUITE 230
FRANKLIN TN. 37064

C

3.0

UTILITY NARRATIVE

Communications with outside utility providers (ATMOS, HB&TS, MTEMC) and coordination with Thompson's Station (Sewer) have indicated that availability existing to meet anticipated demands.



LARRY C. WALLACE
REGISTERED ENGINEER
12/9/19
STATE OF TENNESSEE

CONCEPT UTILITY PLAN

0 200 300 400 feet

N

ENERGY LAND & INFRASTRUCTURE
1420 CENTERPOINT BLVD. SUITE 1 KNOXVILLE, TN 37932
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RODERICK PLACE
CONCEPTUAL SITE PLAN
THOMPSON'S STATION, TENNESSEE

ISSUE 07.19.19
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PROJECT RODERICK PLACE

OWNER
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144 SOUTHEAST PKWY. SUITE 230
FRANKLIN TN, 37064

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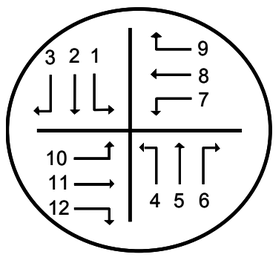
5.0

APPENDIX B
DETAILED TURNING MOVEMENT COUNTS

DETAILED TURNING MOVEMENT COUNTS
WEEKDAY COUNTS



North

INTERSECTION TRAFFIC VOLUME COUNTS

LOCATION: Thompson Station Rd & US 31
DATE: 5/29/2019
RECORDER: Zhiwar Rashid
NOTES:

	Southbound			Northbound			Westbound			Eastbound			
LOCATION	**US 31**			**US 31**			**Thompson Station Rd**			**Thompson Station Rd**			
TIME	**L**	**T**	**R**	**L**	**T**	**R**	**L**	**T**	**R**	**L**	**T**	**R**	
6:00-6:15 AM													**793**
6:15-6:30													**1,179**
6:30-6:45	2	56	2	6	262	4	3	3	21	6	3	9	**1,604**
6:45-7:00	1	77	3	17	266	3	8	4	15	7	1	14	**1,666**
7:00-7:15		74	4	16	229	2	7	10	15	13	3	13	**1,700**
7:15-7:30	2	93	7	9	213	10	18	15	30	9	5	14	**1,730**
7:30-7:45	2	102	9	10	245	3	8	9	22	10	3	16	**1,701**
7:45-8:00	5	105	7	8	247	6	12	16	19	12	6	7	**1,667**
8:00-8:15	3	92	9	12	220	8	9	12	14	6	10	21	**1,632**
8:15-8:30	7	77	9	18	214	5	7	14	14	16	5	10	**1,216**
8:30-8:45	4	78	12	11	215	9	14	2	11	10	9	30	**820**
8:45-9:00	5	97	12	18	200	3	6	9	17	16	9	23	**415**
9:00-9:15													
9:15-9:30													
9:30-9:45													
9:45-10:00													
10:00-10:15													
10:15-10:30													
10:30-10:45													
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2:15-2:30													
2:30-2:45													
2:45-3:00													
3:00-3:15													
3:15-3:30													**428**
3:30-3:45													**878**
3:45-4:00													**1,333**
4:00-4:15	9	182	2	17	116	17	20	5	6	16	11	27	**1,818**
4:15-4:30	7	183	9	10	133	20	19	9	10	11	10	29	**1,854**
4:30-4:45	6	174	8	17	137	26	15	6	4	13	16	33	**1,886**
4:45-5:00	4	192	8	17	160	28	13	6	5	7	7	38	**1,911**
5:00-5:15	5	187	6	15	133	25	28	4	4	14	13	30	**1,877**
5:15-5:30	6	206	3	11	159	24	12	5	6	8	7	35	**1,413**
5:30-5:45	6	217	1	20	150	23	11	4	10	4	6	28	**931**
5:45-6:00	6	180	7	19	136	17	16	8	6	6	9	41	**451**
6:00-6:15													
6:15-6:30													
6:30-6:45													
6:45-7:00													
7:00-7:15													
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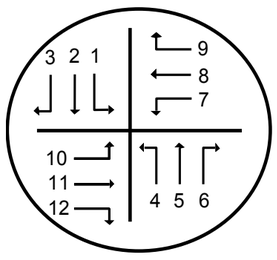
9:00-9:15													
9:15-9:30													
9:30-9:45													
9:45-10:00 PM													
TOTAL	80	2,372	118	251	3,435	233	226	141	229	184	133	418	
AM PK HR	12	392	32	39	925	27	47	52	85	37	24	58	7:15 AM - 8:15 AM
MID PK HR													
PM PK HR	21	802	18	63	602	100	64	19	25	33	33	131	4:45 PM - 5:45 PM



North

INTERSECTION TRAFFIC VOLUME COUNTS

LOCATION: THOMPSON STATION LN & CRITZ LN
DATE: 5/29/2019
RECORDER: ZHIWAR RASHID - AM 8-9a - Darryl Glascock 7-8a & 4-6p
NOTES:

	Southbound			Northbound			Westbound			Eastbound			
LOCATION	US 31			US 31			CRITZ LN			DRIVEWAY			
TIME	**L**	**T**	**R**	**L**	**T**	**R**	**L**	**T**	**R**	**L**	**T**	**R**	
6:00-6:15 AM													
6:15-6:30													**409**
6:30-6:45													**862**
6:45-7:00													**1,368**
7:00-7:15	13	75			237	3	5		76				**1,873**
7:15-7:30	9	106			254	2	4		78				**1,899**
7:30-7:45	15	108			269	7	4		103				**1,889**
7:45-8:00	22	133			245		8		97				**1,800**
8:00-8:15	12	96			253	3	6		65				**1,731**
8:15-8:30	14	104			241	3	6		75				**1,296**
8:30-8:45	18	84		1	237	3	7		66			1	**853**
8:45-9:00	16	111			227	1	9		72				**436**
9:00-9:15													
9:15-9:30													
9:30-9:45													
9:45-10:00													
10:00-10:15													
10:15-10:30													
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2:15-2:30													
2:30-2:45													
2:45-3:00													
3:00-3:15													
3:15-3:30													**534**
3:30-3:45													**1,059**
3:45-4:00													**1,576**
4:00-4:15	108	238			127	23	7		31				**2,085**
4:15-4:30	142	185			153	9	2		34				**2,075**
4:30-4:45	125	187			162	14	3		26				**2,098**
4:45-5:00	129	192			149	12	2		25				**2,122**
5:00-5:15	118	247			121	9	3		26				**2,119**
5:15-5:30	148	186			157	16	9		32				**1,595**
5:30-5:45	140	218			144	11	1		27				**1,047**
5:45-6:00	108	207			141	14	6		30				**506**
6:00-6:15													
6:15-6:30													
6:30-6:45													
6:45-7:00													
7:00-7:15													
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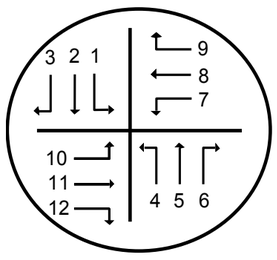
8:45-9:00													
9:00-9:15													
9:15-9:30													
9:30-9:45													
9:45-10:00 PM													
TOTAL	1,137	2,477		1	3,117	130	82		863			1	
AM PK HR	58	443			1,021	12	22		343				7:15 AM - 8:15 AM
MID PK HR													
PM PK HR	535	843			571	48	15		110				4:45 PM - 5:45 PM



North

TOTAL INTERSECTION TRAFFIC VOLUME COUNTS

	Southbound			Northbound			Westbound			Eastbound			
LOCATION	Road A			Road B			Road C			Road D			
TIME	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	
6:00-6:15 AM													**793**
6:15-6:30													**1,588**
6:30-6:45	2	56	2	6	262	4	3	3	21	6	3	9	**2,466**
6:45-7:00	1	77	3	17	266	3	8	4	15	7	1	14	**3,034**
7:00-7:15	13	149	4	16	466	5	12	10	91	13	3	13	**3,573**
7:15-7:30	11	199	7	9	467	12	22	15	108	9	5	14	**3,629**
7:30-7:45	17	210	9	10	514	10	12	9	125	10	3	16	**3,590**
7:45-8:00	27	238	7	8	492	6	20	16	116	12	6	7	**3,467**
8:00-8:15	15	188	9	12	473	11	15	12	79	6	10	21	**3,363**
8:15-8:30	21	181	9	18	455	8	13	14	89	16	5	10	**2,512**
8:30-8:45	22	162	12	12	452	12	21	2	77	10	9	31	**1,673**
8:45-9:00	21	208	12	18	427	4	15	9	89	16	9	23	**851**
9:00-9:15													
9:15-9:30													
9:30-9:45													
9:45-10:00													
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2:00-2:15													
2:15-2:30													
2:30-2:45													
2:45-3:00													
3:00-3:15													
3:15-3:30													**962**
3:30-3:45													**1,937**
3:45-4:00													**2,909**
4:00-4:15	117	420	2	17	243	40	27	5	37	16	11	27	**3,903**
4:15-4:30	149	368	9	10	286	29	21	9	44	11	10	29	**3,929**
4:30-4:45	131	361	8	17	299	40	18	6	30	13	16	33	**3,984**
4:45-5:00	133	384	8	17	309	40	15	6	30	7	7	38	**4,033**
5:00-5:15	123	434	6	15	254	34	31	4	30	14	13	30	**3,996**
5:15-5:30	154	392	3	11	316	40	21	5	38	8	7	35	**3,008**
5:30-5:45	146	435	1	20	294	34	12	4	37	4	6	28	**1,978**
5:45-6:00	114	387	7	19	277	31	22	8	36	6	9	41	**957**
6:00-6:15													
6:15-6:30													
6:30-6:45													
6:45-7:00													
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8:30-8:45													
8:45-9:00													
9:00-9:15													
9:15-9:30													
9:30-9:45													
9:45-10:00 PM													
TOTAL	1,217	4,849	118	252	6,552	363	308	141	1,092	184	133	419	
AM PK HR	70	835	32	39	1,946	39	69	52	428	37	24	58	7:15 AM - 8:15 AM
MID PK HR													
PM PK HR	556	1,645	18	63	1,173	148	79	19	135	33	33	131	4:45 PM - 5:45 PM

KC Technologies

1101 11th Ave South
Nashville, TN

Groups Printed- Unshifted

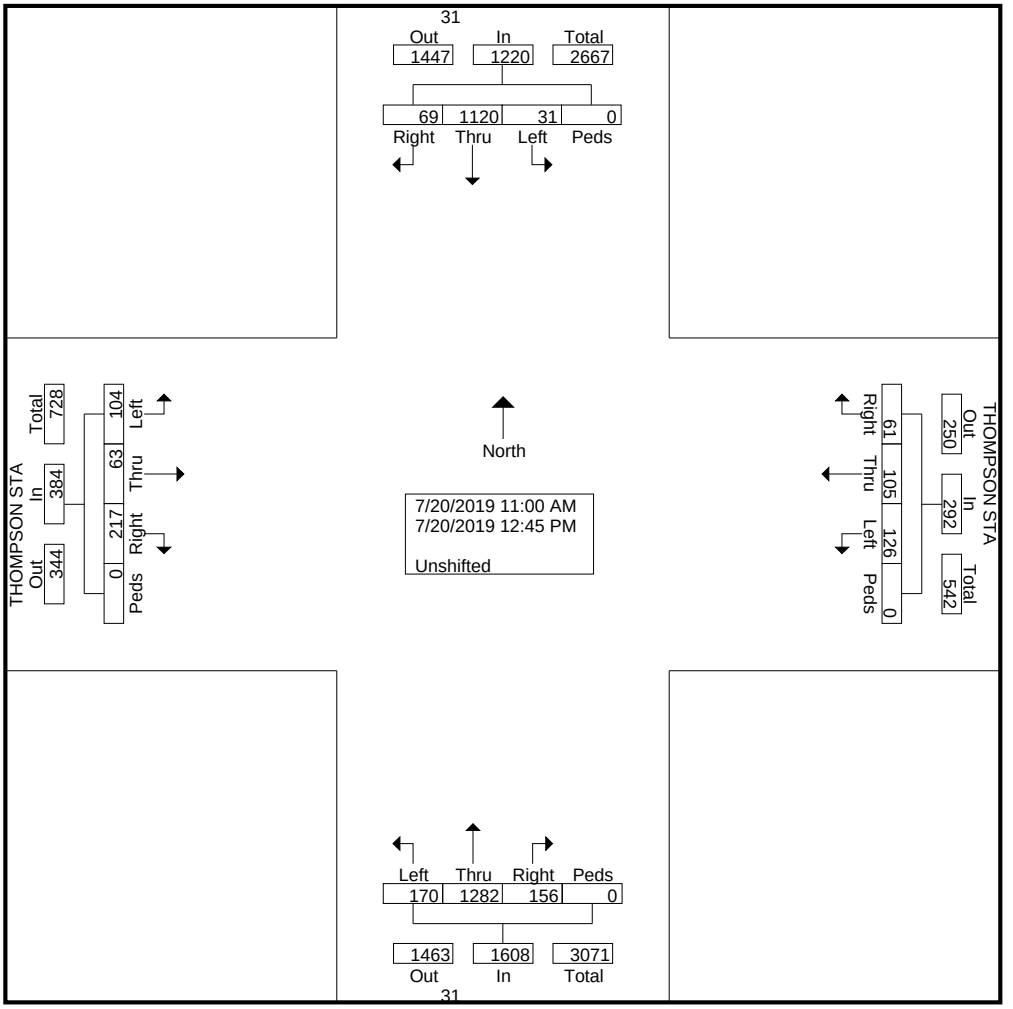
	31 Southbound					31 Northbound					THOMPSON STA Westbound					THOMPSON STA Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
11:00 AM	2	125	7	0	134	26	152	19	0	197	14	21	11	0	46	10	9	27	0	46	423
11:15 AM	4	120	6	0	130	25	166	18	0	209	18	20	4	0	42	11	8	36	0	55	436
11:30 AM	5	140	15	0	160	16	157	21	0	194	18	7	8	0	33	12	9	34	0	55	442
11:45 AM	4	130	7	0	141	25	153	13	0	191	13	11	7	0	31	11	9	25	0	45	408
Total	15	515	35	0	565	92	628	71	0	791	63	59	30	0	152	44	35	122	0	201	1709
12:00 PM	3	163	8	0	174	22	172	20	0	214	18	15	8	0	41	15	3	28	0	46	475
12:15 PM	8	140	8	0	156	18	161	17	0	196	19	12	9	0	40	18	13	23	0	54	446
12:30 PM	3	160	11	0	174	13	184	29	0	226	14	8	7	0	29	9	6	22	0	37	466
12:45 PM	2	142	7	0	151	25	137	19	0	181	12	11	7	0	30	18	6	22	0	46	408
Total	16	605	34	0	655	78	654	85	0	817	63	46	31	0	140	60	28	95	0	183	1795

KC Technologies

1101 11th Ave South
Nashville, TN

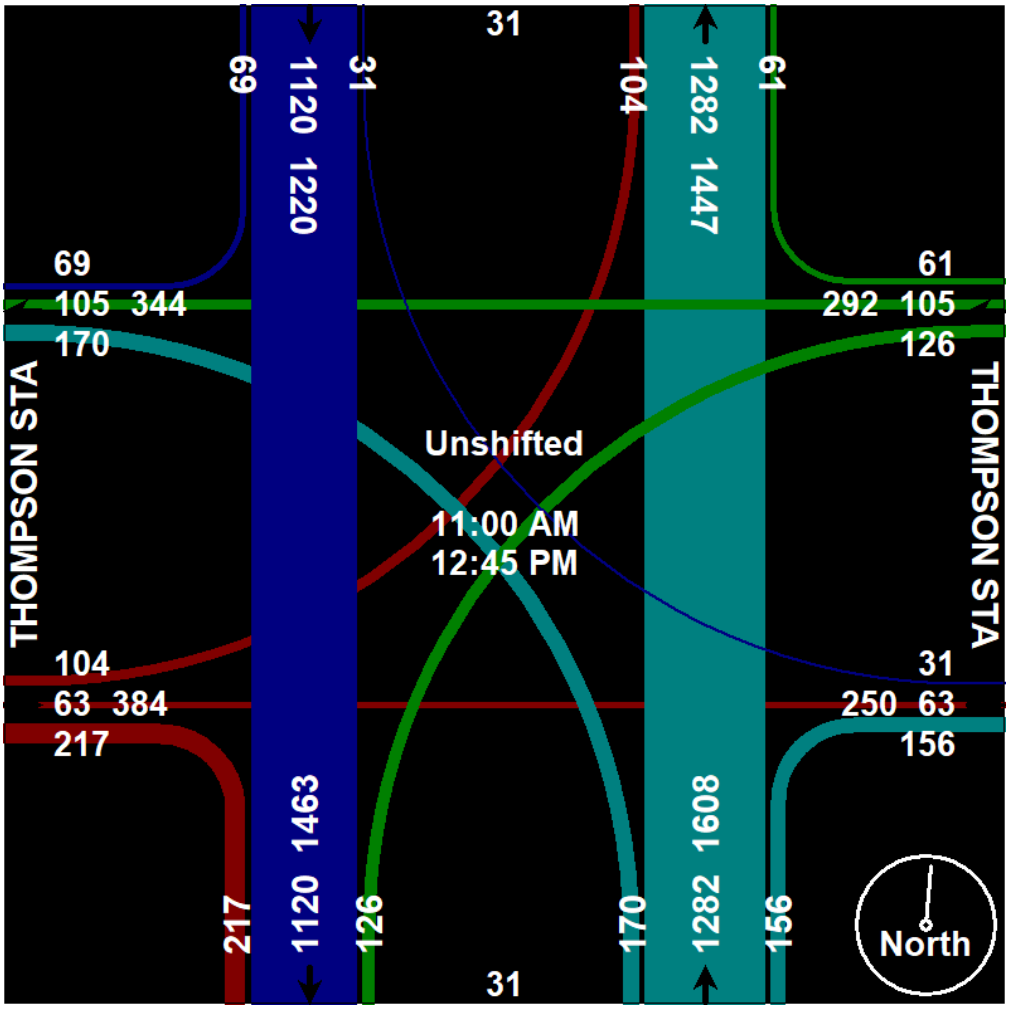
Groups Printed- Unshifted

	31 Southbound					31 Northbound					THOMPSON STA Westbound					THOMPSON STA Eastbound					
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Grand Total	31	1120	69	0	1220	170	1282	156	0	1608	126	105	61	0	292	104	63	217	0	384	3504
Apprch %	2.5	91.8	5.7	0		10.6	79.7	9.7	0		43.2	36	20.9	0		27.1	16.4	56.5	0		
Total %	0.9	32	2	0	34.8	4.9	36.6	4.5	0	45.9	3.6	3	1.7	0	8.3	3	1.8	6.2	0	11	



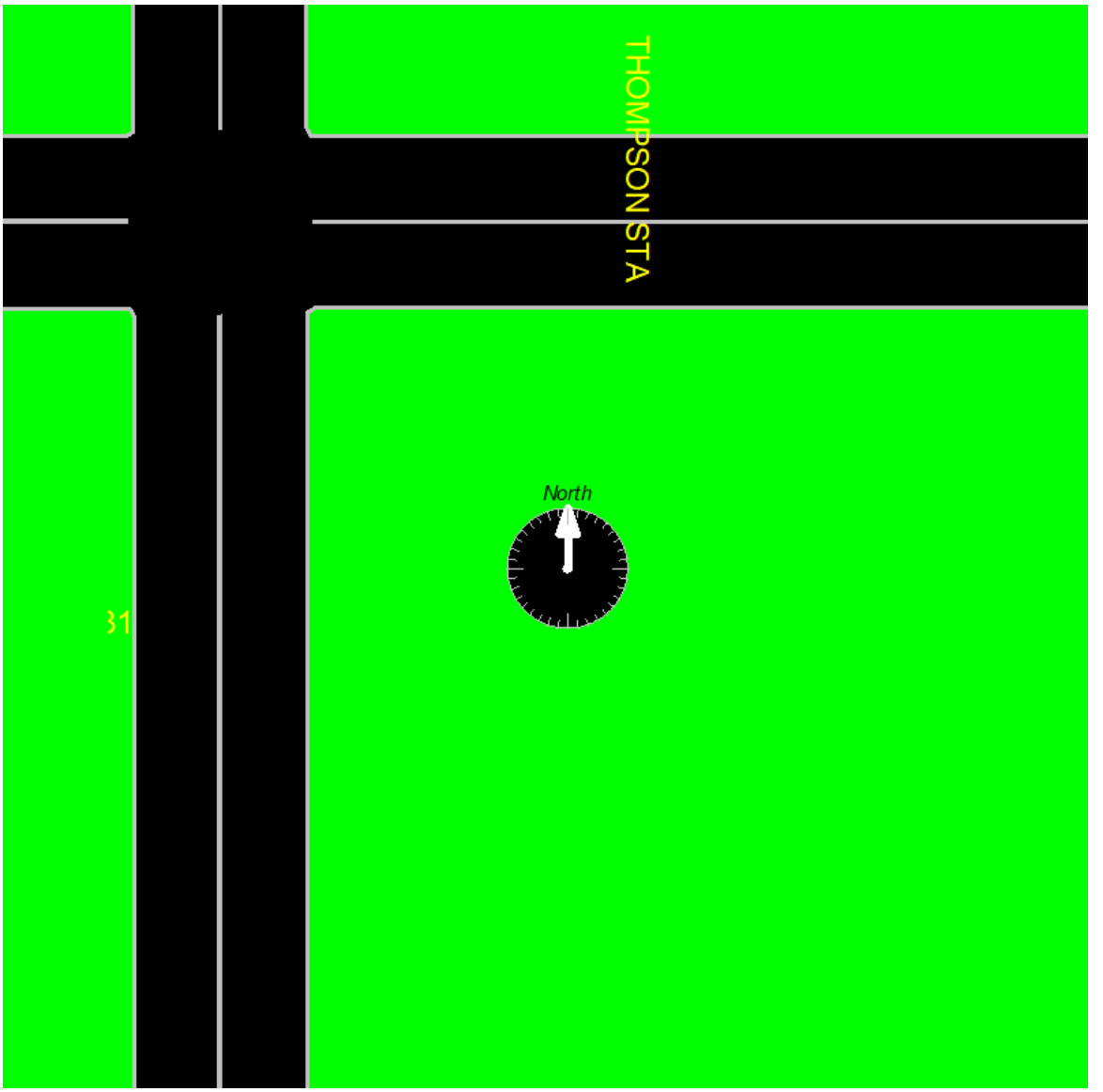
KC Technologies

1101 11th Ave South
Nashville, TN

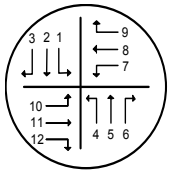


KC Technologies

1101 11th Ave South
Nashville, TN



DETAILED TURNING MOVEMENT COUNTS
WEEKEND COUNTS



North

INTERSECTION TRAFFIC VOLUME COUNTS

LOCATION: US 31 & DECLERATION WAY
DATE: MID-DAY: 8/31/2019
RECORDER: ZHIWAR RASHID
NOTES:

	Southbound			Northbound			Westbound			Eastbound			
LOCATION	Road A			Road B			Road C			Road D			
TIME	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	
6:00-6:15 AM													
6:15-6:30													
6:30-6:45													
6:45-7:00													
7:00-7:15													
7:15-7:30													
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9:15-9:30													
9:30-9:45													
9:45-10:00													
10:00-10:15													
10:15-10:30													**237**
10:30-10:45													**476**
10:45-11:00													**683**
11:00-11:15		118		1	116					1		1	**893**
11:15-11:30		121	3		113					1		1	**878**
11:30-11:45		113		1	93								**900**
11:45-12:00 PM		94		1	109					1		5	**908**
12:00-12:15		91		2	118					2		9	**926**
12:15-12:30		110	3	4	141					1		2	**704**
12:30-12:45		95		1	119								**443**
12:45-1:00		117	2	1	108								**228**
1:00-1:15													
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1:30-1:45													
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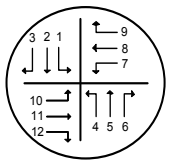
8:45-9:00													
9:00-9:15													
9:15-9:30													
9:30-9:45													
9:45-10:00 PM													
TOTAL		859	8	11	917					6		18	
AM PK HR													
MID PK HR		413	5	8	486					3		11	12:00 PM - 1:00 PM
PM PK HR													



North

INTERSECTION TRAFFIC VOLUME COUNTS

LOCATION: US 31 & 840 WB RAMPS
DATE: MID-DAY: 8/31/2019
RECORDER: ZHIWAR RASHID
NOTES:

	Southbound			Northbound			Westbound			Eastbound			
LOCATION	**Road A**			**Road B**			**Road C**			**Road D**			
TIME	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	
6:00-6:15 AM													
6:15-6:30													
6:30-6:45													
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7:15-7:30													
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9:45-10:00													
10:00-10:15													
10:15-10:30													**285**
10:30-10:45													**580**
10:45-11:00													**866**
11:00-11:15		104	4	10	93		50		24				**1,148**
11:15-11:30		113	6	10	89		57		20				**1,170**
11:30-11:45		118	6	8	73		59		22				**1,213**
11:45-12:00 PM		86	6	5	87		75		23				**1,225**
12:00-12:15		101	6	9	97		69		25				**1,233**
12:15-12:30		107	4	6	120		79		22				**926**
12:30-12:45		86	7	10	98		80		17				**588**
12:45-1:00		104	7	8	81		68		22				**290**
1:00-1:15													
1:15-1:30													
1:30-1:45													
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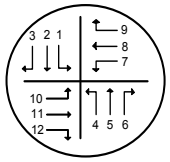
8:45-9:00													
9:00-9:15													
9:15-9:30													
9:30-9:45													
9:45-10:00 PM													
TOTAL		819	46	66	738		537		175				
AM PK HR													
MID PK HR		398	24	33	396		296		86				12:00 PM - 1:00 PM
PM PK HR													



North

INTERSECTION TRAFFIC VOLUME COUNTS

LOCATION: US 31 & EB 840 RAMP
DATE: MID-DAY: 8/31/2019
RECORDER: ZHIWAR RASHID
NOTES:

	Southbound			Northbound			Westbound			Eastbound			
LOCATION	Road A			Road B			Road C			Road D			
TIME	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	
6:00-6:15 AM													
6:15-6:30													
6:30-6:45													
6:45-7:00													
7:00-7:15													
7:15-7:30													
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9:30-9:45													
9:45-10:00													
10:00-10:15													
10:15-10:30													**389**
10:30-10:45													**766**
10:45-11:00													**1,146**
11:00-11:15	25	127			100	120				8		9	**1,517**
11:15-11:30	29	145			91	98				7		7	**1,497**
11:30-11:45	19	151			75	113				8		14	**1,527**
11:45-12:00 PM	22	140			96	102				3		8	**1,527**
12:00-12:15	26	144			102	80				6		11	**1,504**
12:15-12:30	27	160			108	90				7		15	**1,135**
12:30-12:45	19	143			106	92				7		13	**728**
12:45-1:00	23	149			95	64				4	1	12	**348**
1:00-1:15													
1:15-1:30													
1:30-1:45													
1:45-2:00													
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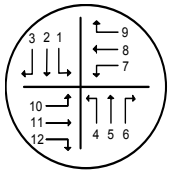
8:45-9:00													
9:00-9:15													
9:15-9:30													
9:30-9:45													
9:45-10:00 PM													
TOTAL	190	1,159			773	759				50	1	89	
AM PK HR													
MID PK HR	94	595			381	385				24		48	11:30 AM - 12:30 PM
PM PK HR													



North

INTERSECTION TRAFFIC VOLUME COUNTS

LOCATION: US 31 & DECLERATION WAY
DATE: MID-DAY: 8/31/2019
RECORDER: ZHIWAR RASHID
NOTES:

	Southbound			Northbound			Westbound			Eastbound			
LOCATION	Road A			Road B			Road C			Road D			
TIME	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	
6:00-6:15 AM													
6:15-6:30													
6:30-6:45													
6:45-7:00													
7:00-7:15													
7:15-7:30													
7:30-7:45													
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9:15-9:30													
9:30-9:45													
9:45-10:00													
10:00-10:15													
10:15-10:30													**237**
10:30-10:45													**476**
10:45-11:00													**683**
11:00-11:15		118		1	116					1		1	**893**
11:15-11:30		121	3		113					1		1	**878**
11:30-11:45		113		1	93								**900**
11:45-12:00 PM		94		1	109					1		5	**908**
12:00-12:15		91		2	118					2		9	**926**
12:15-12:30		110	3	4	141					1		2	**704**
12:30-12:45		95		1	119								**443**
12:45-1:00		117	2	1	108								**228**
1:00-1:15													
1:15-1:30													
1:30-1:45													
1:45-2:00													
2:00-2:15													
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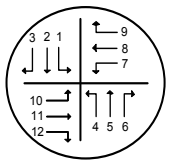
8:45-9:00													
9:00-9:15													
9:15-9:30													
9:30-9:45													
9:45-10:00 PM													
TOTAL		859	8	11	917					6		18	
AM PK HR													
MID PK HR		413	5	8	486					3		11	12:00 PM - 1:00 PM
PM PK HR													



North

INTERSECTION TRAFFIC VOLUME COUNTS

LOCATION: US 31 & 840 WB RAMPS
DATE: MID-DAY: 8/31/2019
RECORDER: ZHIWAR RASHID
NOTES:

	Southbound			Northbound			Westbound			Eastbound			
LOCATION	**Road A**			**Road B**			**Road C**			**Road D**			
TIME	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	
6:00-6:15 AM													
6:15-6:30													
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7:15-7:30													
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9:30-9:45													
9:45-10:00													
10:00-10:15													
10:15-10:30													**285**
10:30-10:45													**580**
10:45-11:00													**866**
11:00-11:15		104	4	10	93		50		24				**1,148**
11:15-11:30		113	6	10	89		57		20				**1,170**
11:30-11:45		118	6	8	73		59		22				**1,213**
11:45-12:00 PM		86	6	5	87		75		23				**1,225**
12:00-12:15		101	6	9	97		69		25				**1,233**
12:15-12:30		107	4	6	120		79		22				**926**
12:30-12:45		86	7	10	98		80		17				**588**
12:45-1:00		104	7	8	81		68		22				**290**
1:00-1:15													
1:15-1:30													
1:30-1:45													
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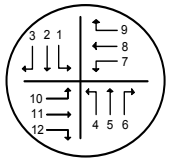
9:00-9:15													
9:15-9:30													
9:30-9:45													
9:45-10:00 PM													
TOTAL		819	46	66	738		537		175				
AM PK HR													
MID PK HR		398	24	33	396		296		86				12:00 PM - 1:00 PM
PM PK HR													



North

INTERSECTION TRAFFIC VOLUME COUNTS

LOCATION: US 31 & EB 840 RAMP
DATE: MID-DAY: 8/31/2019
RECORDER: ZHIWAR RASHID
NOTES:

	Southbound			Northbound			Westbound			Eastbound			
LOCATION	Road A			Road B			Road C			Road D			
TIME	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	
6:00-6:15 AM													
6:15-6:30													
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9:30-9:45													
9:45-10:00													
10:00-10:15													
10:15-10:30													**389**
10:30-10:45													**766**
10:45-11:00													**1,146**
11:00-11:15	25	127			100	120				8		9	**1,517**
11:15-11:30	29	145			91	98				7		7	**1,497**
11:30-11:45	19	151			75	113				8		14	**1,527**
11:45-12:00 PM	22	140			96	102				3		8	**1,527**
12:00-12:15	26	144			102	80				6		11	**1,504**
12:15-12:30	27	160			108	90				7		15	**1,135**
12:30-12:45	19	143			106	92				7		13	**728**
12:45-1:00	23	149			95	64				4	1	12	**348**
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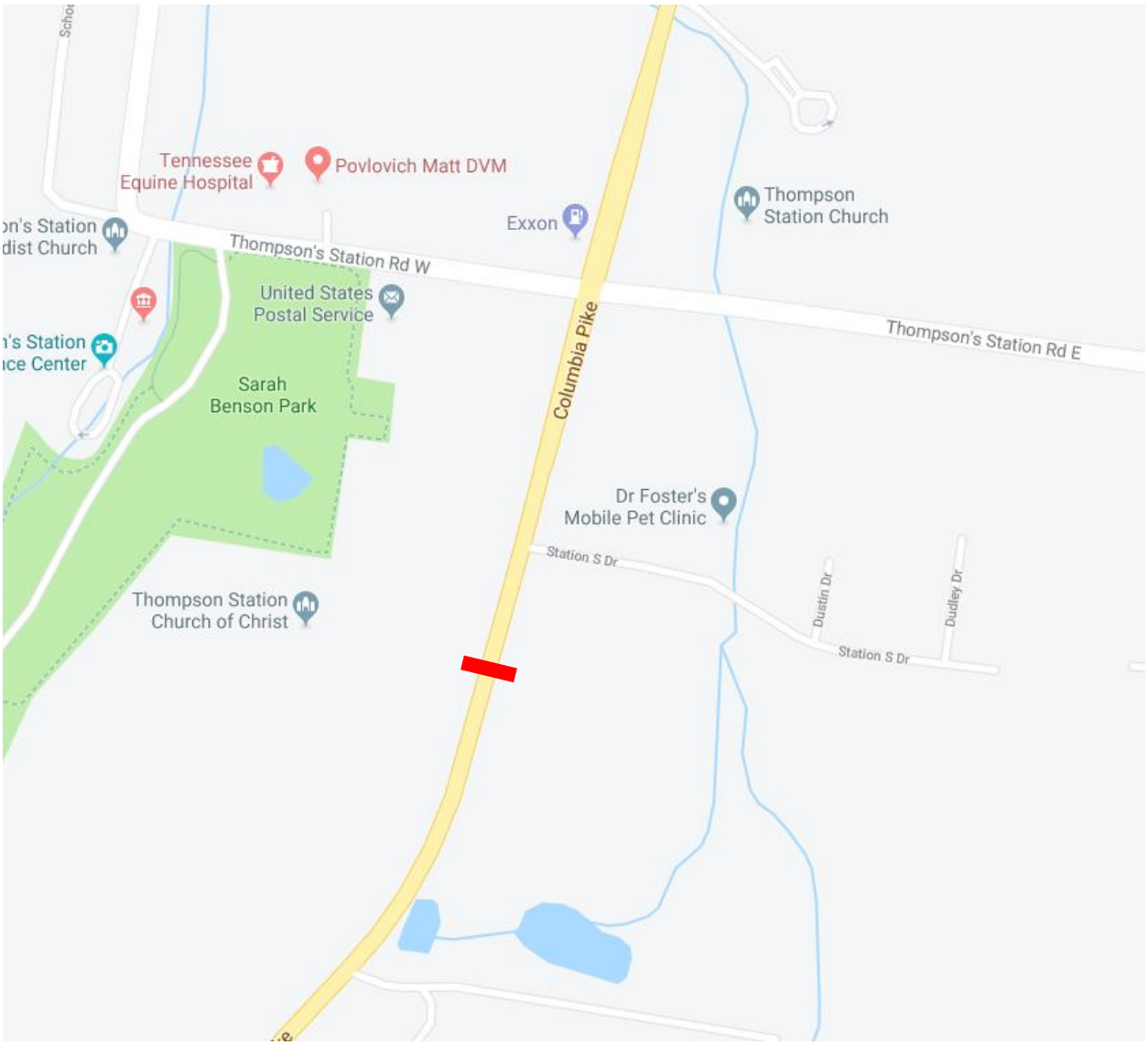
9:00-9:15													
9:15-9:30													
9:30-9:45													
9:45-10:00 PM													
TOTAL	190	1,159			773	759				50	1	89	
AM PK HR													
MID PK HR	94	595			381	385				24		48	11:30 AM - 12:30 PM
PM PK HR													

DETAILED TURNING MOVEMENT COUNTS
SEASONAL GROWTH COMPARISON

Tube Count Comparison Data

KCI Technologies, Inc. collected 24-hour tube count data from January 10, 2019 to January 17, 2018 while local schools were in session. The location of the count station is presented in the figure below.



Data:

1/10/2019			
Time	NB	NB	Total
07:15 - 07:29	92	185	277
07:30 - 07:44	98	171	269
07:45 - 07:59	82	133	215
08:00 - 08:14	87	171	258
16:45 - 16:59	177	163	340
17:00 - 17:14	142	179	321
17:15 - 17:29	170	146	316
17:30 - 17:44	161	158	319

1/11/2019			
Time	NB	NB	Total
07:15 - 07:29	88	138	226
07:30 - 07:44	132	144	276
07:45 - 07:59	97	208	305
08:00 - 08:14	69	137	206
16:45 - 16:59	197	167	364
17:00 - 17:14	220	158	378
17:15 - 17:29	111	162	273
17:30 - 17:44	215	175	390

1/14/2019			
Time	NB	NB	Total
07:15 - 07:29	97	166	263
07:30 - 07:44	92	216	308
07:45 - 07:59	144	145	289
08:00 - 08:14	123	168	291
16:45 - 16:59	218	175	393
17:00 - 17:14	217	161	378
17:15 - 17:29	209	155	364
17:30 - 17:44	234	144	378

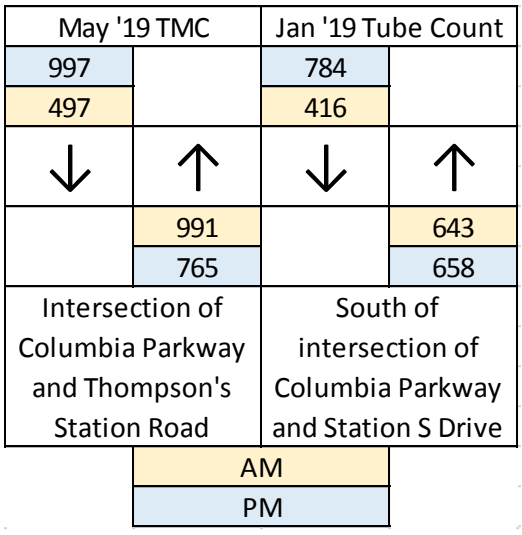
1/15/2019			
Time	NB	NB	Total
07:15 - 07:29	124	137	261
07:30 - 07:44	134	142	276
07:45 - 07:59	98	173	271
08:00 - 08:14	80	145	225
16:45 - 16:59	193	155	348
17:00 - 17:14	233	159	392
17:15 - 17:29	202	164	366
17:30 - 17:44	195	166	361

1/16/2019			
Time	NB	NB	Total
07:15 - 07:29	117	162	279
07:30 - 07:44	108	136	244
07:45 - 07:59	92	127	219
08:00 - 08:14	84	199	283
16:45 - 16:59	236	167	403
17:00 - 17:14	214	189	403
17:15 - 17:29	224	166	390
17:30 - 17:44	240	159	399

1/17/2019			
Time	NB	NB	Total
07:15 - 07:29	121	162	283
07:30 - 07:44	128	170	298
07:45 - 07:59	103	157	260
08:00 - 08:14	104	170	274
16:45 - 16:59	198	153	351
17:00 - 17:14	226	174	400
17:15 - 17:29	174	188	362
17:30 - 17:44	96	163	259

Average Weekday			
Time	SB	NB	Total
07:15 - 07:29	107	158	265
07:30 - 07:44	115	163	279
07:45 - 07:59	103	157	260
08:00 - 08:14	91	165	256
16:45 - 16:59	203	163	367
17:00 - 17:14	209	170	379
17:15 - 17:29	182	164	345
17:30 - 17:44	190	161	351

Average Weekday Peak Hour Movements			
Time	SB	NB	Total
07:15 - 08:14	416	643	1060
16:45 - 17:44	784	658	1442



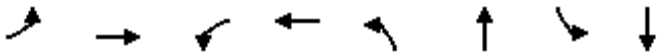
APPENDIX C
TDOT COUNT DATA

TDOT AADT DATA

Station	67	68	66
Route	SR006	1928	1928
Location	COLUMBIA PIKE NEAR THOMPSON'S STATION	THOMPSON'S STATION ROAD WEST	THOMPSON'S STATION ROAD EAST
County	Williamson	Williamson	Williamson
2017	20,369	2,810	2,824
2016	19,816	2,800	2,693
2015	19,620	2,617	2,666
2014	21,013	2,952	2,659
2013	19,666	2,723	2,404
2012	18,101	2,720	3,019
2011	18,685	2,585	2,634
2010	17,900	2,412	2,557
2009	18,342	2,916	2,590
2008	19,891	3,483	2,279
2007	20,488	3,449	3,720
2006	21,645	2,858	2,571
2005	15,488	2,513	2,599
2004	15,037	2,277	2,426
2003	14,599	2,264	2,127
2002	14,037	1,906	1,977
2001	15,108	1,847	1,891
2000	13,289	2,341	1,897
1999	10,915	1,943	2,019
1998	11,015	1,681	1,851
1997	9,499	1,510	1,400
1996	9,418	1,502	1,373
1995	9,079	1,400	1,404
1994	10,337	1,123	1,219
1993	8,121	955	1,036
1992	7,654	946	1,026
1991	7,117	1,231	751
1990	8,427	1,104	701
1989	7,490	1,088	653
1988	11,127	1159	799
1987	10,883	1288	780
1986	10,443	1,350	899
1985	9,342	971	792
1984	N/A	N/A	N/A
1983	N/A	N/A	N/A

APPENDIX D
CAPACITY ANALYSES

EXISTING CONDITIONS CAPACITY ANALYSES



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	40	89	51	149	42	1034	13	461
v/c Ratio	0.17	0.40	0.21	0.54	0.08	0.89	0.07	0.44
Control Delay	29.7	21.0	30.3	29.5	8.6	30.2	7.2	11.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	29.7	21.0	30.3	29.5	8.6	30.2	7.2	11.0
Queue Length 50th (ft)	20	15	26	48	9	510	2	188
Queue Length 95th (ft)	43	58	52	106	26	#1091	6	296
Internal Link Dist (ft)		737		561		511		6076
Turn Bay Length (ft)	100		85		105		120	
Base Capacity (vph)	240	324	247	343	559	1162	208	1054
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.17	0.27	0.21	0.43	0.08	0.89	0.06	0.44

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	37	24	58	47	52	85	39	925	27	12	392	32
Future Volume (veh/h)	37	24	58	47	52	85	39	925	27	12	392	32
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1845	1845	1900	1845	1845	1900	1845	1845	1900	1845	1845	1900
Adj Flow Rate, veh/h	40	26	63	51	57	92	42	1005	29	13	426	35
Adj No. of Lanes	1	1	0	1	1	0	1	1	0	1	1	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	174	52	125	225	72	116	504	1015	29	111	918	75
Arrive On Green	0.04	0.11	0.11	0.05	0.11	0.11	0.04	0.57	0.57	0.02	0.55	0.55
Sat Flow, veh/h	1757	479	1161	1757	636	1027	1757	1784	51	1757	1682	138
Grp Volume(v), veh/h	40	0	89	51	0	149	42	0	1034	13	0	461
Grp Sat Flow(s),veh/h/ln	1757	0	1640	1757	0	1663	1757	0	1836	1757	0	1820
Q Serve(g_s), s	2.0	0.0	5.1	2.5	0.0	8.7	1.0	0.0	55.6	0.3	0.0	15.4
Cycle Q Clear(g_c), s	2.0	0.0	5.1	2.5	0.0	8.7	1.0	0.0	55.6	0.3	0.0	15.4
Prop In Lane	1.00		0.71	1.00		0.62	1.00		0.03	1.00		0.08
Lane Grp Cap(c), veh/h	174	0	177	225	0	188	504	0	1044	111	0	993
V/C Ratio(X)	0.23	0.00	0.50	0.23	0.00	0.79	0.08	0.00	0.99	0.12	0.00	0.46
Avail Cap(c_a), veh/h	235	0	271	277	0	274	598	0	1044	210	0	993
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	37.5	0.0	42.1	37.1	0.0	43.2	10.0	0.0	21.3	24.2	0.0	13.8
Incr Delay (d2), s/veh	0.7	0.0	2.2	0.5	0.0	9.5	0.1	0.0	25.7	0.5	0.0	1.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.0	0.0	2.4	1.3	0.0	4.5	0.5	0.0	35.3	0.2	0.0	8.1
LnGrp Delay(d),s/veh	38.2	0.0	44.3	37.6	0.0	52.7	10.1	0.0	47.0	24.6	0.0	15.4
LnGrp LOS	D		D	D		D	B		D	C		B
Approach Vol, veh/h		129			200			1076			474	
Approach Delay, s/veh		42.4			48.8			45.5			15.6	
Approach LOS		D			D			D			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	8.3	63.4	11.0	17.3	10.6	61.1	10.5	17.8
Change Period (Y+Rc), s	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5
Max Green Setting (Gmax), s	7.5	42.5	7.5	16.5	9.5	40.5	7.5	16.5
Max Q Clear Time (g_c+I1), s	2.3	57.6	4.5	7.1	3.0	17.4	4.0	10.7
Green Ext Time (p_c), s	0.0	0.0	0.0	0.8	0.0	11.5	0.0	0.6

Intersection Summary	
HCM 2010 Ctrl Delay	38.1
HCM 2010 LOS	D

Lane Group	WBL	WBT	NBT	SBL	SBT
Lane Group Flow (vph)	24	373	1123	63	482
v/c Ratio	0.19	0.65	0.46	0.16	0.17
Control Delay	46.3	6.3	9.9	2.3	1.3
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	46.3	6.3	9.9	2.3	1.3
Queue Length 50th (ft)	15	0	131	2	14
Queue Length 95th (ft)	39	8	m259	9	23
Internal Link Dist (ft)		697	409		2564
Turn Bay Length (ft)	150			275	
Base Capacity (vph)	332	698	2443	539	2812
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.07	0.53	0.46	0.12	0.17

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	22	0	343	0	1021	12	58	443	0
Future Volume (veh/h)	0	0	0	22	0	343	0	1021	12	58	443	0
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1845	1900	1845	1845	1900	1845	1845	1900	1845	1845	1900
Adj Flow Rate, veh/h	0	0	0	24	0	373	0	1110	13	63	482	0
Adj No. of Lanes	0	1	0	1	1	0	1	2	0	1	2	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	0	2	0	334	0	298	72	2024	24	345	2401	0
Arrive On Green	0.00	0.00	0.00	0.19	0.00	0.19	0.00	0.57	0.57	0.10	1.00	0.00
Sat Flow, veh/h	0	1845	0	1757	0	1568	901	3548	42	1757	3597	0
Grp Volume(v), veh/h	0	0	0	24	0	373	0	548	575	63	482	0
Grp Sat Flow(s),veh/h/ln	0	1845	0	1757	0	1568	901	1752	1837	1757	1752	0
Q Serve(g_s), s	0.0	0.0	0.0	1.1	0.0	19.0	0.0	19.6	19.6	1.3	0.0	0.0
Cycle Q Clear(g_c), s	0.0	0.0	0.0	1.1	0.0	19.0	0.0	19.6	19.6	1.3	0.0	0.0
Prop In Lane	0.00		0.00	1.00		1.00	1.00		0.02	1.00		0.00
Lane Grp Cap(c), veh/h	0	2	0	334	0	298	72	1000	1048	345	2401	0
V/C Ratio(X)	0.00	0.00	0.00	0.07	0.00	1.25	0.00	0.55	0.55	0.18	0.20	0.00
Avail Cap(c_a), veh/h	0	138	0	334	0	298	72	1000	1048	565	2401	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00
Upstream Filter(I)	0.00	0.00	0.00	1.00	0.00	1.00	0.00	1.00	1.00	0.98	0.98	0.00
Uniform Delay (d), s/veh	0.0	0.0	0.0	33.3	0.0	40.5	0.0	13.4	13.4	8.9	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.0	0.0	0.1	0.0	138.1	0.0	2.2	2.1	0.2	0.2	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.0	0.0	0.6	0.0	19.6	0.0	10.0	10.5	0.6	0.1	0.0
LnGrp Delay(d),s/veh	0.0	0.0	0.0	33.3	0.0	178.6	0.0	15.6	15.5	9.1	0.2	0.0
LnGrp LOS				C		F		B	B	A	A	
Approach Vol, veh/h		0			397			1123			545	
Approach Delay, s/veh		0.0			169.8			15.5			1.2	
Approach LOS					F			B			A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4		6		8
Phs Duration (G+Y+Rc), s	11.5	63.5		0.0		75.0		25.0
Change Period (Y+Rc), s	6.5	6.5		6.5		6.5		6.0
Max Green Setting (Gmax), s	17.5	30.5		7.5		54.5		19.0
Max Q Clear Time (g_c+I1), s	3.3	21.6		0.0		2.0		21.0
Green Ext Time (p_c), s	0.1	5.8		0.0		13.9		0.0

Intersection Summary	
HCM 2010 Ctrl Delay	41.4
HCM 2010 LOS	D

Lane Group	EBL	EBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	254	78	1004	846	190	651
v/c Ratio	0.59	0.26	0.49	0.67	0.47	0.25
Control Delay	46.4	4.4	19.3	9.1	14.0	8.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	46.4	4.4	19.3	9.1	14.0	8.1
Queue Length 50th (ft)	79	0	238	48	51	83
Queue Length 95th (ft)	115	16	381	220	92	125
Internal Link Dist (ft)			2564			882
Turn Bay Length (ft)		350		700	150	
Base Capacity (vph)	816	467	2049	1268	418	2602
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.31	0.17	0.49	0.67	0.45	0.25

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	234	0	72	0	0	0	0	924	778	175	599	0
Future Volume (veh/h)	234	0	72	0	0	0	0	924	778	175	599	0
Number	7	4	14				5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1845	0	1845				0	1845	1845	1845	1845	0
Adj Flow Rate, veh/h	254	0	0				0	1004	0	190	651	0
Adj No. of Lanes	2	0	1				0	2	1	1	2	0
Peak Hour Factor	0.92	0.92	0.92				0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	0	3				0	3	3	3	3	0
Cap, veh/h	338	0	156				0	2247	1005	452	2702	0
Arrive On Green	0.10	0.00	0.00				0.00	0.64	0.00	0.12	1.00	0.00
Sat Flow, veh/h	3408	0	1568				0	3597	1568	1757	3597	0
Grp Volume(v), veh/h	254	0	0				0	1004	0	190	651	0
Grp Sat Flow(s),veh/h/ln	1704	0	1568				0	1752	1568	1757	1752	0
Q Serve(g_s), s	7.3	0.0	0.0				0.0	14.4	0.0	3.6	0.0	0.0
Cycle Q Clear(g_c), s	7.3	0.0	0.0				0.0	14.4	0.0	3.6	0.0	0.0
Prop In Lane	1.00		1.00				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	338	0	156				0	2247	1005	452	2702	0
V/C Ratio(X)	0.75	0.00	0.00				0.00	0.45	0.00	0.42	0.24	0.00
Avail Cap(c_a), veh/h	818	0	376				0	2247	1005	505	2702	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	2.00	2.00	1.00
Upstream Filter(I)	1.00	0.00	0.00				0.00	0.89	0.00	0.97	0.97	0.00
Uniform Delay (d), s/veh	43.8	0.0	0.0				0.0	9.0	0.0	6.0	0.0	0.0
Incr Delay (d2), s/veh	3.4	0.0	0.0				0.0	0.6	0.0	0.6	0.2	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.6	0.0	0.0				0.0	7.0	0.0	1.7	0.1	0.0
LnGrp Delay(d),s/veh	47.2	0.0	0.0				0.0	9.6	0.0	6.6	0.2	0.0
LnGrp LOS	D							A		A	A	
Approach Vol, veh/h		254						1004			841	
Approach Delay, s/veh		47.2						9.6			1.6	
Approach LOS		D						A			A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4		6		
Phs Duration (G+Y+Rc), s	13.0	71.1		15.9		84.1		
Change Period (Y+Rc), s	7.0	7.0		6.0		7.0		
Max Green Setting (Gmax), s	9.0	47.0		24.0		63.0		
Max Q Clear Time (g_c+I1), s	5.6	16.4		9.3		2.0		
Green Ext Time (p_c), s	0.2	13.4		0.7		16.4		

Intersection Summary	
HCM 2010 Ctrl Delay	11.0
HCM 2010 LOS	B

Lane Group	WBL	WBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	264	392	50	1209	577	30
v/c Ratio	0.33	0.91	0.10	0.55	0.26	0.03
Control Delay	33.1	55.4	9.6	18.2	8.6	1.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	33.1	55.4	9.6	18.2	8.6	1.9
Queue Length 50th (ft)	72	196	22	311	77	0
Queue Length 95th (ft)	108	#373	m33	397	104	8
Internal Link Dist (ft)				882	859	
Turn Bay Length (ft)		225	200			575
Base Capacity (vph)	799	433	500	2208	2208	1001
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.33	0.91	0.10	0.55	0.26	0.03

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	243	0	361	46	1112	0	0	531	28
Future Volume (veh/h)	0	0	0	243	0	361	46	1112	0	0	531	28
Number				3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln				1845	0	1845	1845	1845	0	0	1845	1845
Adj Flow Rate, veh/h				264	0	0	50	1209	0	0	577	0
Adj No. of Lanes				2	0	1	1	2	0	0	2	1
Peak Hour Factor				0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %				3	0	3	3	3	0	0	3	3
Cap, veh/h				801	0	368	532	2208	0	0	2208	988
Arrive On Green				0.23	0.00	0.00	0.42	0.42	0.00	0.00	0.63	0.00
Sat Flow, veh/h				3408	0	1568	825	3597	0	0	3597	1568
Grp Volume(v), veh/h				264	0	0	50	1209	0	0	577	0
Grp Sat Flow(s),veh/h/ln				1704	0	1568	825	1752	0	0	1752	1568
Q Serve(g_s), s				6.4	0.0	0.0	4.0	25.9	0.0	0.0	7.3	0.0
Cycle Q Clear(g_c), s				6.4	0.0	0.0	11.3	25.9	0.0	0.0	7.3	0.0
Prop In Lane				1.00		1.00	1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				801	0	368	532	2208	0	0	2208	988
V/C Ratio(X)				0.33	0.00	0.00	0.09	0.55	0.00	0.00	0.26	0.00
Avail Cap(c_a), veh/h				801	0	368	532	2208	0	0	2208	988
HCM Platoon Ratio				1.00	1.00	1.00	0.67	0.67	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	0.00	0.85	0.85	0.00	0.00	1.00	0.00
Uniform Delay (d), s/veh				31.7	0.0	0.0	16.3	18.2	0.0	0.0	8.2	0.0
Incr Delay (d2), s/veh				1.1	0.0	0.0	0.3	0.8	0.0	0.0	0.3	0.0
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				3.1	0.0	0.0	0.9	12.8	0.0	0.0	3.6	0.0
LnGrp Delay(d),s/veh				32.8	0.0	0.0	16.6	19.0	0.0	0.0	8.5	0.0
LnGrp LOS				C			B	B			A	
Approach Vol, veh/h					264			1259			577	
Approach Delay, s/veh					32.8			18.9			8.5	
Approach LOS					C			B			A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2				6		8
Phs Duration (G+Y+Rc), s		70.0				70.0		30.0
Change Period (Y+Rc), s		7.0				7.0		6.5
Max Green Setting (Gmax), s		63.0				63.0		23.5
Max Q Clear Time (g_c+I1), s		27.9				9.3		8.4
Green Ext Time (p_c), s		16.5				19.3		0.7

Intersection Summary	
HCM 2010 Ctrl Delay	17.8
HCM 2010 LOS	B

Intersection	
Int Delay, s/veh	25.9

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	113	203	558	915	356	367
Future Vol, veh/h	113	203	558	915	356	367
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	225	550	-	-	150
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	3	3	3	3	3	3
Mvmt Flow	123	221	607	995	387	399

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	2099	194	786	0	-	0
Stage 1	387	-	-	-	-	-
Stage 2	1712	-	-	-	-	-
Critical Hdwy	6.86	6.96	4.16	-	-	-
Critical Hdwy Stg 1	5.86	-	-	-	-	-
Critical Hdwy Stg 2	5.86	-	-	-	-	-
Follow-up Hdwy	3.53	3.33	2.23	-	-	-
Pot Cap-1 Maneuver	~ 44	812	822	-	-	-
Stage 1	653	-	-	-	-	-
Stage 2	130	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	~ 12	812	822	-	-	-
Mov Cap-2 Maneuver	~ 73	-	-	-	-	-
Stage 1	171	-	-	-	-	-
Stage 2	130	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	169.7	7.8	0
HCM LOS	F		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	822	-	73	812	-	-
HCM Lane V/C Ratio	0.738	-	1.683	0.272	-	-
HCM Control Delay (s)	20.6	-	$ 454.7	11.1	-	-
HCM Lane LOS	C	-	F	B	-	-
HCM 95th %tile Q(veh)	6.8	-	10.6	1.1	-	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

HCS7 Freeway Facilities Report

Project Information

Analyst	KCI Technologies, Inc.	Date	9/13/2019
Agency		Analysis Year	2019
Jurisdiction		Time Period Analyzed	AM Peak Hour
Project Description	Roderick Place TIS: I-840 Eastbound Ramp Existing		

Facility Global Input

Jam Density, pc/mi/ln	190.0	Density at Capacity, pc/mi/ln	45.0
Queue Discharge Capacity Drop, %	7	Total Segments	3
Total Time Periods	1	Time Period Duration, min	15
Facility Length, mi	2.00		

Facility Segment Data

No.	Coded	Analyzed	Name	Length, ft	Lanes
1	Basic	Basic	I-840 EB	5280	2
2	Merge	Merge	EB Ramp from Columbia Pike _I-840 EB	1500	2
3	Basic	Basic	I-840 EB	3780	2

Facility Segment Data

Segment 1: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.92	0.943	1176	4646	0.25	73.5	8.0	A

Segment 2: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.92	0.92	0.943	0.943	2274	1098	4259	2033	0.53	0.54	66.3	66.3	17.1	13.4	B

Segment 3: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.92	0.943	2274	4646	0.49	73.2	15.5	B

Facility Time Period Results

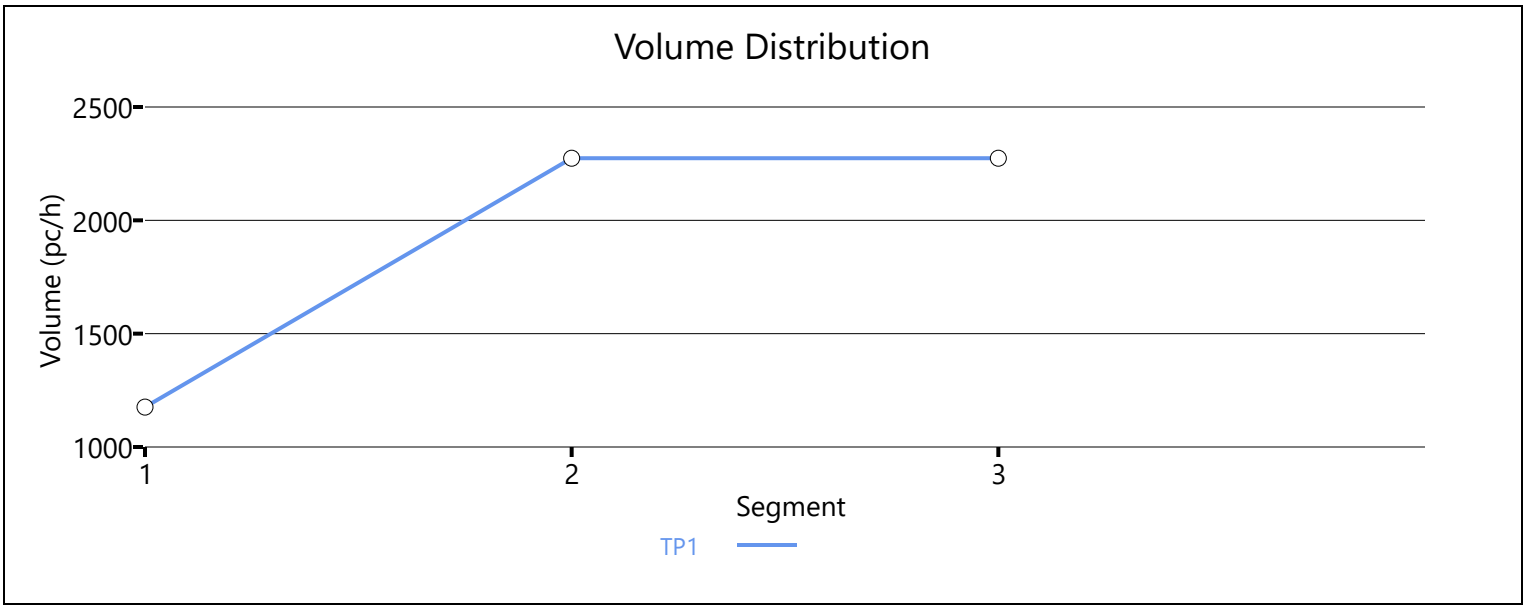
T	Speed, mi/h	Density, pc/mi/ln	Density, veh/mi/ln	Travel Time, min	LOS
1	71.9	12.0	11.3	1.70	B

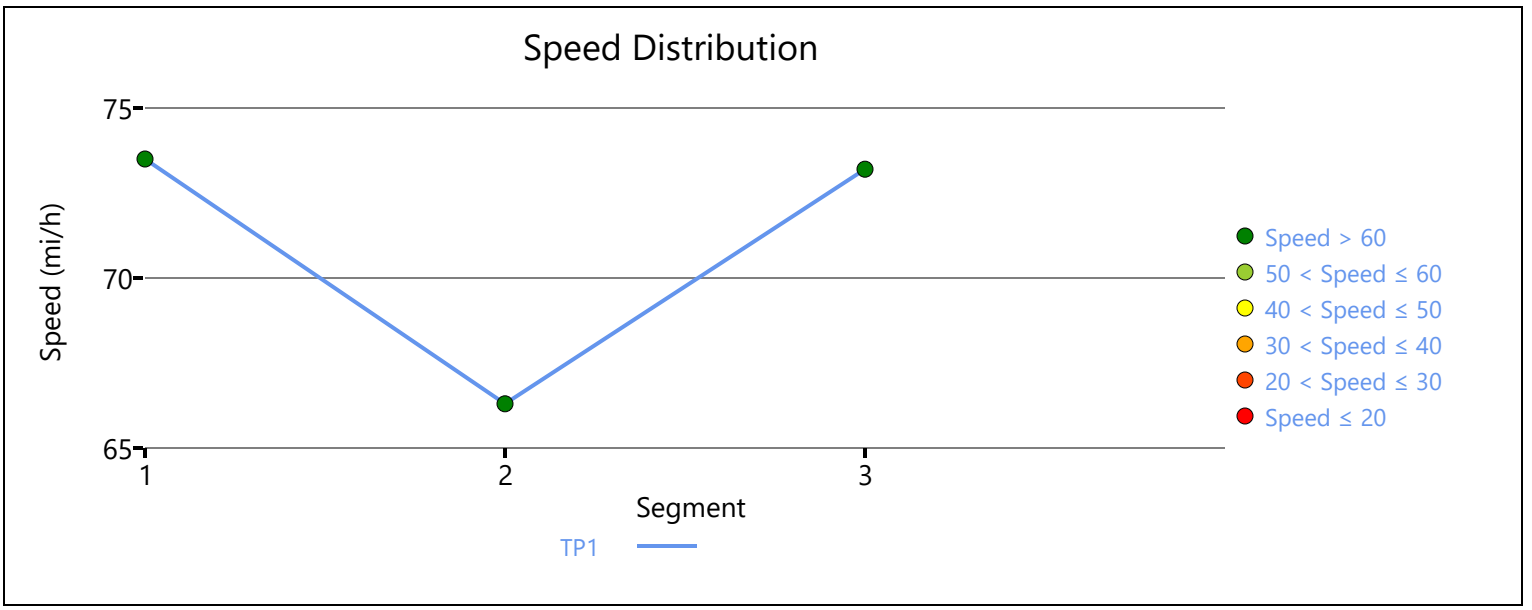
Facility Overall Results

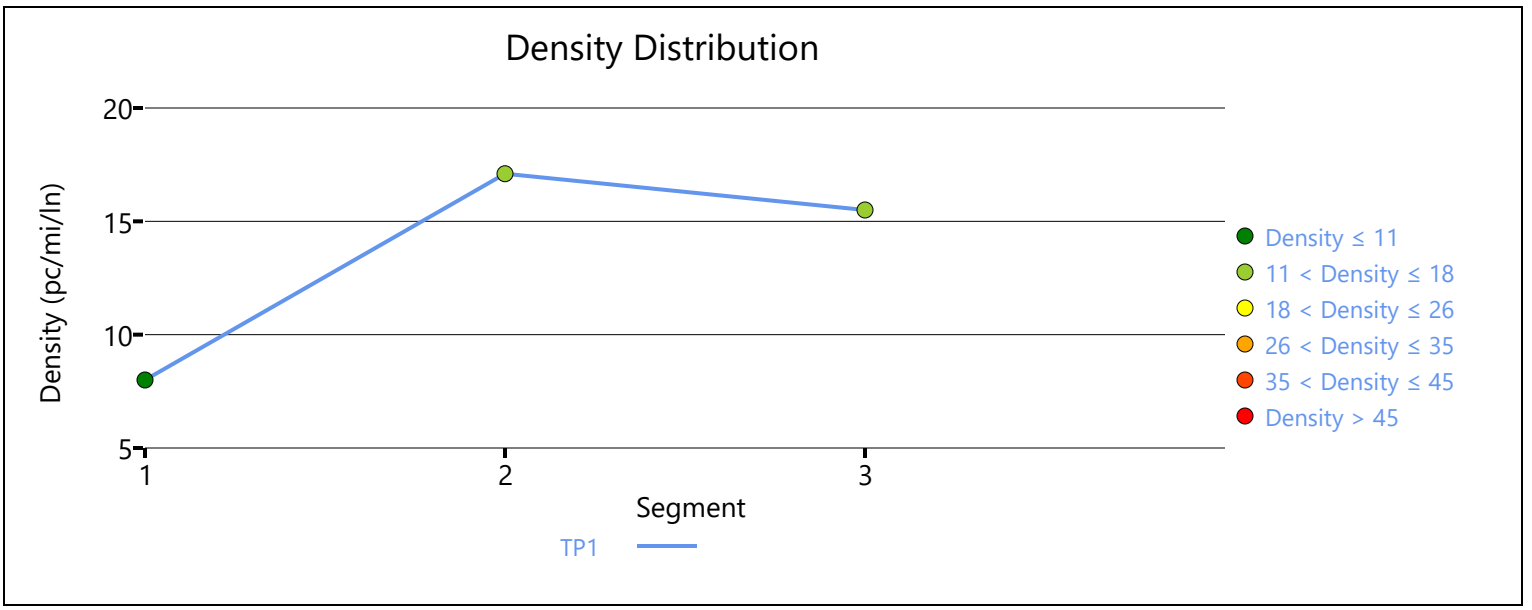
Space Mean Speed, mi/h	71.9	Density, veh/mi/ln	11.3
Average Travel Time, min	1.70	Density, pc/mi/ln	12.0

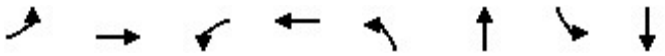
Messages

Comments









Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	46	197	77	57	76	953	28	1092
v/c Ratio	0.21	0.72	0.44	0.31	0.45	0.82	0.13	0.96
Control Delay	38.8	31.5	46.2	28.5	22.5	27.5	10.8	43.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	38.8	31.5	46.2	28.5	22.5	27.5	10.8	43.2
Queue Length 50th (ft)	29	41	50	17	18	608	9	~763
Queue Length 95th (ft)	58	114	86	56	65	#1038	m14	#1277
Internal Link Dist (ft)		737		561		511		4013
Turn Bay Length (ft)	100		85		105		120	
Base Capacity (vph)	229	360	180	276	187	1169	252	1133
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.20	0.55	0.43	0.21	0.41	0.82	0.11	0.96

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	42	36	145	71	21	31	70	766	110	26	980	25
Future Volume (veh/h)	42	36	145	71	21	31	70	766	110	26	980	25
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1900	1863	1863	1900	1863	1863	1900
Adj Flow Rate, veh/h	46	39	158	77	23	34	76	833	120	28	1065	27
Adj No. of Lanes	1	1	0	1	1	0	1	1	0	1	1	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	286	44	178	169	100	148	142	903	130	168	997	25
Arrive On Green	0.04	0.14	0.14	0.05	0.15	0.15	0.05	0.57	0.57	0.03	0.55	0.55
Sat Flow, veh/h	1774	323	1309	1774	680	1005	1774	1593	229	1774	1809	46
Grp Volume(v), veh/h	46	0	197	77	0	57	76	0	953	28	0	1092
Grp Sat Flow(s),veh/h/ln	1774	0	1632	1774	0	1685	1774	0	1822	1774	0	1855
Q Serve(g_s), s	2.6	0.0	14.2	4.4	0.0	3.6	2.2	0.0	57.0	0.8	0.0	66.2
Cycle Q Clear(g_c), s	2.6	0.0	14.2	4.4	0.0	3.6	2.2	0.0	57.0	0.8	0.0	66.2
Prop In Lane	1.00		0.80	1.00		0.60	1.00		0.13	1.00		0.02
Lane Grp Cap(c), veh/h	286	0	223	169	0	247	142	0	1033	168	0	1022
V/C Ratio(X)	0.16	0.00	0.89	0.46	0.00	0.23	0.54	0.00	0.92	0.17	0.00	1.07
Avail Cap(c_a), veh/h	342	0	238	207	0	247	186	0	1033	240	0	1022
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	0.66	0.00	0.66
Uniform Delay (d), s/veh	41.9	0.0	50.9	42.5	0.0	45.2	28.4	0.0	23.6	23.9	0.0	26.9
Incr Delay (d2), s/veh	0.3	0.0	29.1	1.9	0.0	0.5	3.1	0.0	14.6	0.3	0.0	43.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.3	0.0	8.2	2.2	0.0	1.7	1.5	0.0	32.5	0.5	0.0	45.9
LnGrp Delay(d),s/veh	42.2	0.0	80.0	44.4	0.0	45.7	31.5	0.0	38.2	24.3	0.0	70.4
LnGrp LOS	D		F	D		D	C		D	C		F
Approach Vol, veh/h		243			134			1029			1120	
Approach Delay, s/veh		72.9			44.9			37.7			69.2	
Approach LOS		E			D			D			E	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	10.1	74.5	12.5	22.9	12.0	72.7	11.2	24.1
Change Period (Y+Rc), s	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5
Max Green Setting (Gmax), s	8.5	59.5	8.5	17.5	8.5	59.5	8.5	17.5
Max Q Clear Time (g_c+I1), s	2.8	59.0	6.4	16.2	4.2	68.2	4.6	5.6
Green Ext Time (p_c), s	0.0	0.5	0.0	0.1	0.0	0.0	0.0	1.0

Intersection Summary	
HCM 2010 Ctrl Delay	55.4
HCM 2010 LOS	E

Lane Group	WBL	WBT	NBT	SBL	SBT
Lane Group Flow (vph)	34	132	910	642	1176
v/c Ratio	0.29	0.18	0.63	0.81	0.40
Control Delay	59.2	0.5	30.2	39.8	2.4
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	59.2	0.5	30.2	39.8	2.4
Queue Length 50th (ft)	26	0	379	399	53
Queue Length 95th (ft)	59	0	437	497	124
Internal Link Dist (ft)		697	409		2564
Turn Bay Length (ft)	150			275	
Base Capacity (vph)	280	836	1443	805	2937
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.12	0.16	0.63	0.80	0.40

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	31	0	121	0	771	66	591	1082	0
Future Volume (veh/h)	0	0	0	31	0	121	0	771	66	591	1082	0
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1863	1900	1863	1863	1900	1863	1863	1900	1863	1863	1900
Adj Flow Rate, veh/h	0	0	0	34	0	132	0	838	72	642	1176	0
Adj No. of Lanes	0	1	0	1	1	0	1	2	0	1	2	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	0	2	0	180	0	161	60	1630	140	693	2812	0
Arrive On Green	0.00	0.00	0.00	0.10	0.00	0.10	0.00	0.49	0.49	0.49	1.00	0.00
Sat Flow, veh/h	0	1863	0	1774	0	1583	475	3299	283	1774	3632	0
Grp Volume(v), veh/h	0	0	0	34	0	132	0	449	461	642	1176	0
Grp Sat Flow(s),veh/h/ln	0	1863	0	1774	0	1583	475	1770	1813	1774	1770	0
Q Serve(g_s), s	0.0	0.0	0.0	2.1	0.0	9.8	0.0	20.7	20.7	25.7	0.0	0.0
Cycle Q Clear(g_c), s	0.0	0.0	0.0	2.1	0.0	9.8	0.0	20.7	20.7	25.7	0.0	0.0
Prop In Lane	0.00		0.00	1.00		1.00	1.00		0.16	1.00		0.00
Lane Grp Cap(c), veh/h	0	2	0	180	0	161	60	874	895	693	2812	0
V/C Ratio(X)	0.00	0.00	0.00	0.19	0.00	0.82	0.00	0.51	0.51	0.93	0.42	0.00
Avail Cap(c_a), veh/h	0	116	0	281	0	251	60	874	895	855	2812	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00
Upstream Filter(I)	0.00	0.00	0.00	1.00	0.00	1.00	0.00	1.00	1.00	0.81	0.81	0.00
Uniform Delay (d), s/veh	0.0	0.0	0.0	49.4	0.0	52.9	0.0	20.6	20.6	9.1	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.0	0.0	0.5	0.0	11.6	0.0	2.2	2.1	11.8	0.4	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.0	0.0	1.1	0.0	4.8	0.0	10.6	10.9	13.7	0.1	0.0
LnGrp Delay(d),s/veh	0.0	0.0	0.0	49.9	0.0	64.5	0.0	22.8	22.7	20.9	0.4	0.0
LnGrp LOS				D		E		C	C	C	A	
Approach Vol, veh/h		0			166			910			1818	
Approach Delay, s/veh		0.0			61.5			22.7			7.6	
Approach LOS					E			C			A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4		6		8
Phs Duration (G+Y+Rc), s	36.1	65.8		0.0		101.8		18.2
Change Period (Y+Rc), s	6.5	6.5		6.5		6.5		6.0
Max Green Setting (Gmax), s	40.5	27.5		7.5		74.5		19.0
Max Q Clear Time (g_c+I1), s	27.7	22.7		0.0		2.0		11.8
Green Ext Time (p_c), s	1.8	4.1		0.0		24.3		0.4

Intersection Summary	
HCM 2010 Ctrl Delay	15.5
HCM 2010 LOS	B

Lane Group	EBL	EBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	62	78	721	535	405	1665
v/c Ratio	0.28	0.40	0.30	0.43	0.65	0.57
Control Delay	56.5	11.9	18.8	11.1	6.7	1.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	56.5	11.9	18.8	11.1	6.7	1.2
Queue Length 50th (ft)	24	0	172	143	16	33
Queue Length 95th (ft)	46	31	283	272	m29	42
Internal Link Dist (ft)			2564			882
Turn Bay Length (ft)		350		700	150	
Base Capacity (vph)	400	273	2375	1238	732	2930
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.15	0.29	0.30	0.43	0.55	0.57

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	57	0	72	0	0	0	0	663	492	373	1532	0
Future Volume (veh/h)	57	0	72	0	0	0	0	663	492	373	1532	0
Number	7	4	14				5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	0	1863				0	1863	1863	1863	1863	0
Adj Flow Rate, veh/h	62	0	0				0	721	0	405	1665	0
Adj No. of Lanes	2	0	1				0	2	1	1	2	0
Peak Hour Factor	0.92	0.92	0.92				0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	0	2				0	2	2	2	2	0
Cap, veh/h	150	0	69				0	2450	1096	737	3001	0
Arrive On Green	0.04	0.00	0.00				0.00	1.00	0.00	0.19	1.00	0.00
Sat Flow, veh/h	3442	0	1583				0	3632	1583	1774	3632	0
Grp Volume(v), veh/h	62	0	0				0	721	0	405	1665	0
Grp Sat Flow(s),veh/h/ln	1721	0	1583				0	1770	1583	1774	1770	0
Q Serve(g_s), s	2.1	0.0	0.0				0.0	0.0	0.0	8.7	0.0	0.0
Cycle Q Clear(g_c), s	2.1	0.0	0.0				0.0	0.0	0.0	8.7	0.0	0.0
Prop In Lane	1.00		1.00				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	150	0	69				0	2450	1096	737	3001	0
V/C Ratio(X)	0.41	0.00	0.00				0.00	0.29	0.00	0.55	0.55	0.00
Avail Cap(c_a), veh/h	402	0	185				0	2450	1096	904	3001	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	2.00	2.00	2.00	2.00	1.00
Upstream Filter(I)	1.00	0.00	0.00				0.00	0.74	0.00	0.63	0.63	0.00
Uniform Delay (d), s/veh	55.9	0.0	0.0				0.0	0.0	0.0	2.8	0.0	0.0
Incr Delay (d2), s/veh	1.8	0.0	0.0				0.0	0.2	0.0	0.4	0.5	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.0	0.0	0.0				0.0	0.1	0.0	4.0	0.2	0.0
LnGrp Delay(d),s/veh	57.7	0.0	0.0				0.0	0.2	0.0	3.2	0.5	0.0
LnGrp LOS	E							A		A	A	
Approach Vol, veh/h		62						721			2070	
Approach Delay, s/veh		57.7						0.2			1.0	
Approach LOS		E						A			A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4		6		
Phs Duration (G+Y+Rc), s	18.7	90.1		11.2		108.8		
Change Period (Y+Rc), s	7.0	7.0		6.0		7.0		
Max Green Setting (Gmax), s	23.0	63.0		14.0		93.0		
Max Q Clear Time (g_c+I1), s	10.7	2.0		4.1		2.0		
Green Ext Time (p_c), s	1.0	32.6		0.1		38.4		

Intersection Summary	
HCM 2010 Ctrl Delay	2.0
HCM 2010 LOS	A

Lane Group	WBL	WBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	667	215	89	693	1402	115
v/c Ratio	0.47	0.29	1.46	0.41	0.83	0.14
Control Delay	27.1	7.8	307.6	18.4	32.9	3.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	27.1	7.8	307.6	18.4	32.9	3.5
Queue Length 50th (ft)	191	26	~87	121	484	0
Queue Length 95th (ft)	244	77	#193	261	584	32
Internal Link Dist (ft)				882	859	
Turn Bay Length (ft)		225	200			575
Base Capacity (vph)	1416	746	61	1681	1681	812
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.47	0.29	1.46	0.41	0.83	0.14

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	614	0	198	82	638	0	0	1290	106
Future Volume (veh/h)	0	0	0	614	0	198	82	638	0	0	1290	106
Number				3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln				1863	0	1863	1863	1863	0	0	1863	1863
Adj Flow Rate, veh/h				667	0	0	89	693	0	0	1402	0
Adj No. of Lanes				2	0	1	1	2	0	0	2	1
Peak Hour Factor				0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %				2	0	2	2	2	0	0	2	2
Cap, veh/h				1420	0	653	110	1681	0	0	1681	752
Arrive On Green				0.41	0.00	0.00	0.95	0.95	0.00	0.00	0.47	0.00
Sat Flow, veh/h				3442	0	1583	383	3632	0	0	3632	1583
Grp Volume(v), veh/h				667	0	0	89	693	0	0	1402	0
Grp Sat Flow(s),veh/h/ln				1721	0	1583	383	1770	0	0	1770	1583
Q Serve(g_s), s				16.9	0.0	0.0	15.7	1.9	0.0	0.0	41.3	0.0
Cycle Q Clear(g_c), s				16.9	0.0	0.0	57.0	1.9	0.0	0.0	41.3	0.0
Prop In Lane				1.00		1.00	1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				1420	0	653	110	1681	0	0	1681	752
V/C Ratio(X)				0.47	0.00	0.00	0.81	0.41	0.00	0.00	0.83	0.00
Avail Cap(c_a), veh/h				1420	0	653	110	1681	0	0	1681	752
HCM Platoon Ratio				1.00	1.00	1.00	2.00	2.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	0.00	0.96	0.96	0.00	0.00	1.00	0.00
Uniform Delay (d), s/veh				25.7	0.0	0.0	27.1	1.6	0.0	0.0	27.4	0.0
Incr Delay (d2), s/veh				1.1	0.0	0.0	44.1	0.7	0.0	0.0	5.0	0.0
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				8.3	0.0	0.0	4.3	0.9	0.0	0.0	21.2	0.0
LnGrp Delay(d),s/veh				26.8	0.0	0.0	71.2	2.3	0.0	0.0	32.4	0.0
LnGrp LOS				C			E	A			C	
Approach Vol, veh/h					667			782			1402	
Approach Delay, s/veh					26.8			10.2			32.4	
Approach LOS					C			B			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2				6		8
Phs Duration (G+Y+Rc), s		64.0				64.0		56.0
Change Period (Y+Rc), s		7.0				7.0		6.5
Max Green Setting (Gmax), s		57.0				57.0		49.5
Max Q Clear Time (g_c+I1), s		59.0				43.3		18.9
Green Ext Time (p_c), s		0.0				10.9		2.4

Intersection Summary	
HCM 2010 Ctrl Delay	25.0
HCM 2010 LOS	C

Intersection	
Int Delay, s/veh	11.1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	104	198	142	699	1263	94
Future Vol, veh/h	104	198	142	699	1263	94
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	225	550	-	-	150
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	113	215	154	760	1373	102

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	2061	687	1475	0	-	0
Stage 1	1373	-	-	-	-	-
Stage 2	688	-	-	-	-	-
Critical Hdwy	6.84	6.94	4.14	-	-	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	2.22	-	-	-
Pot Cap-1 Maneuver	~ 47	389	453	-	-	-
Stage 1	200	-	-	-	-	-
Stage 2	460	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	~ 31	389	453	-	-	-
Mov Cap-2 Maneuver	~ 103	-	-	-	-	-
Stage 1	132	-	-	-	-	-
Stage 2	460	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	83.6	2.9	0
HCM LOS	F		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	453	-	103	389	-	-
HCM Lane V/C Ratio	0.341	-	1.098	0.553	-	-
HCM Control Delay (s)	17	-	195.1	25.1	-	-
HCM Lane LOS	C	-	F	D	-	-
HCM 95th %tile Q(veh)	1.5	-	7.2	3.2	-	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	118	118	763	87	186	1023
v/c Ratio	0.60	0.42	0.63	0.08	0.42	0.70
Control Delay	63.1	12.9	20.6	6.3	5.2	8.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	63.1	12.9	20.6	6.3	5.2	8.1
Queue Length 50th (ft)	89	0	579	23	28	286
Queue Length 95th (ft)	145	53	731	m30	58	377
Internal Link Dist (ft)	381		4013			560
Turn Bay Length (ft)		75		50	150	
Base Capacity (vph)	346	404	1218	1043	449	1454
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.34	0.29	0.63	0.08	0.41	0.70

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	109	109	702	80	171	941
Future Volume (veh/h)	109	109	702	80	171	941
Number	3	18	2	12	1	6
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	118	118	763	87	186	1023
Adj No. of Lanes	1	1	1	1	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	167	149	1292	1098	459	1485
Arrive On Green	0.09	0.09	0.69	0.69	0.05	0.80
Sat Flow, veh/h	1774	1583	1863	1583	1774	1863
Grp Volume(v), veh/h	118	118	763	87	186	1023
Grp Sat Flow(s),veh/h/ln	1774	1583	1863	1583	1774	1863
Q Serve(g_s), s	7.7	8.8	25.5	2.1	3.4	29.6
Cycle Q Clear(g_c), s	7.7	8.8	25.5	2.1	3.4	29.6
Prop In Lane	1.00	1.00		1.00	1.00	
Lane Grp Cap(c), veh/h	167	149	1292	1098	459	1485
V/C Ratio(X)	0.71	0.79	0.59	0.08	0.41	0.69
Avail Cap(c_a), veh/h	347	310	1292	1098	481	1485
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.52	0.52	1.00	1.00
Uniform Delay (d), s/veh	52.7	53.2	9.6	6.0	8.3	5.5
Incr Delay (d2), s/veh	5.4	9.0	1.0	0.1	0.6	2.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.1	4.2	13.3	0.9	2.0	15.9
LnGrp Delay(d),s/veh	58.1	62.2	10.6	6.0	8.9	8.1
LnGrp LOS	E	E	B	A	A	A
Approach Vol, veh/h	236		850			1209
Approach Delay, s/veh	60.2		10.1			8.2
Approach LOS	E		B			A

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	12.5	89.7				102.2		17.8
Change Period (Y+Rc), s	6.5	6.5				6.5		6.5
Max Green Setting (Gmax), s	7.5	69.5				83.5		23.5
Max Q Clear Time (g_c+I1), s	5.4	27.5				31.6		10.8
Green Ext Time (p_c), s	0.1	19.5				21.2		0.6

Intersection Summary	
HCM 2010 Ctrl Delay	14.3
HCM 2010 LOS	B

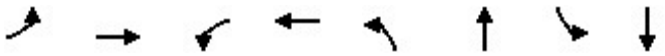
Intersection	
Int Delay, s/veh	0.4

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	51	775	36	0	1112
Future Vol, veh/h	0	51	775	36	0	1112
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	55	842	39	0	1209

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	-	862	0	0	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.22	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.318	-	-	-	-
Pot Cap-1 Maneuver	0	355	-	-	0	-
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	-	355	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	17	0	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBT
Capacity (veh/h)	-	-	355	-
HCM Lane V/C Ratio	-	-	0.156	-
HCM Control Delay (s)	-	-	17	-
HCM Lane LOS	-	-	C	-
HCM 95th %tile Q(veh)	-	-	0.5	-



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	46	197	77	57	76	953	28	1092
v/c Ratio	0.21	0.72	0.44	0.31	0.45	0.82	0.13	0.96
Control Delay	38.8	31.5	46.2	28.5	22.5	27.5	10.8	43.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	38.8	31.5	46.2	28.5	22.5	27.5	10.8	43.2
Queue Length 50th (ft)	29	41	50	17	18	608	9	~763
Queue Length 95th (ft)	58	114	86	56	65	#1038	m14	#1277
Internal Link Dist (ft)		737		561		511		4013
Turn Bay Length (ft)	100		85		105		120	
Base Capacity (vph)	229	360	180	276	187	1169	252	1133
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.20	0.55	0.43	0.21	0.41	0.82	0.11	0.96

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	42	36	145	71	21	31	70	766	110	26	980	25
Future Volume (veh/h)	42	36	145	71	21	31	70	766	110	26	980	25
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1900	1863	1863	1900	1863	1863	1900
Adj Flow Rate, veh/h	46	39	158	77	23	34	76	833	120	28	1065	27
Adj No. of Lanes	1	1	0	1	1	0	1	1	0	1	1	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	286	44	178	169	100	148	142	903	130	168	997	25
Arrive On Green	0.04	0.14	0.14	0.05	0.15	0.15	0.05	0.57	0.57	0.03	0.55	0.55
Sat Flow, veh/h	1774	323	1309	1774	680	1005	1774	1593	229	1774	1809	46
Grp Volume(v), veh/h	46	0	197	77	0	57	76	0	953	28	0	1092
Grp Sat Flow(s),veh/h/ln	1774	0	1632	1774	0	1685	1774	0	1822	1774	0	1855
Q Serve(g_s), s	2.6	0.0	14.2	4.4	0.0	3.6	2.2	0.0	57.0	0.8	0.0	66.2
Cycle Q Clear(g_c), s	2.6	0.0	14.2	4.4	0.0	3.6	2.2	0.0	57.0	0.8	0.0	66.2
Prop In Lane	1.00		0.80	1.00		0.60	1.00		0.13	1.00		0.02
Lane Grp Cap(c), veh/h	286	0	223	169	0	247	142	0	1033	168	0	1022
V/C Ratio(X)	0.16	0.00	0.89	0.46	0.00	0.23	0.54	0.00	0.92	0.17	0.00	1.07
Avail Cap(c_a), veh/h	342	0	238	207	0	247	186	0	1033	240	0	1022
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	0.66	0.00	0.66
Uniform Delay (d), s/veh	41.9	0.0	50.9	42.5	0.0	45.2	28.4	0.0	23.6	23.9	0.0	26.9
Incr Delay (d2), s/veh	0.3	0.0	29.1	1.9	0.0	0.5	3.1	0.0	14.6	0.3	0.0	43.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.3	0.0	8.2	2.2	0.0	1.7	1.5	0.0	32.5	0.5	0.0	45.9
LnGrp Delay(d),s/veh	42.2	0.0	80.0	44.4	0.0	45.7	31.5	0.0	38.2	24.3	0.0	70.4
LnGrp LOS	D		F	D		D	C		D	C		F
Approach Vol, veh/h		243			134			1029			1120	
Approach Delay, s/veh		72.9			44.9			37.7			69.2	
Approach LOS		E			D			D			E	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	10.1	74.5	12.5	22.9	12.0	72.7	11.2	24.1
Change Period (Y+Rc), s	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5
Max Green Setting (Gmax), s	8.5	59.5	8.5	17.5	8.5	59.5	8.5	17.5
Max Q Clear Time (g_c+I1), s	2.8	59.0	6.4	16.2	4.2	68.2	4.6	5.6
Green Ext Time (p_c), s	0.0	0.5	0.0	0.1	0.0	0.0	0.0	1.0

Intersection Summary	
HCM 2010 Ctrl Delay	55.4
HCM 2010 LOS	E

Lane Group	WBL	WBT	NBT	SBL	SBT
Lane Group Flow (vph)	34	132	910	642	1176
v/c Ratio	0.29	0.18	0.63	0.81	0.40
Control Delay	59.2	0.5	30.2	39.8	2.4
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	59.2	0.5	30.2	39.8	2.4
Queue Length 50th (ft)	26	0	379	399	53
Queue Length 95th (ft)	59	0	437	497	124
Internal Link Dist (ft)		697	409		2564
Turn Bay Length (ft)	150			275	
Base Capacity (vph)	280	836	1443	805	2937
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.12	0.16	0.63	0.80	0.40

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	31	0	121	0	771	66	591	1082	0
Future Volume (veh/h)	0	0	0	31	0	121	0	771	66	591	1082	0
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1863	1900	1863	1863	1900	1863	1863	1900	1863	1863	1900
Adj Flow Rate, veh/h	0	0	0	34	0	132	0	838	72	642	1176	0
Adj No. of Lanes	0	1	0	1	1	0	1	2	0	1	2	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	0	2	0	180	0	161	60	1630	140	693	2812	0
Arrive On Green	0.00	0.00	0.00	0.10	0.00	0.10	0.00	0.49	0.49	0.49	1.00	0.00
Sat Flow, veh/h	0	1863	0	1774	0	1583	475	3299	283	1774	3632	0
Grp Volume(v), veh/h	0	0	0	34	0	132	0	449	461	642	1176	0
Grp Sat Flow(s),veh/h/ln	0	1863	0	1774	0	1583	475	1770	1813	1774	1770	0
Q Serve(g_s), s	0.0	0.0	0.0	2.1	0.0	9.8	0.0	20.7	20.7	25.7	0.0	0.0
Cycle Q Clear(g_c), s	0.0	0.0	0.0	2.1	0.0	9.8	0.0	20.7	20.7	25.7	0.0	0.0
Prop In Lane	0.00		0.00	1.00		1.00	1.00		0.16	1.00		0.00
Lane Grp Cap(c), veh/h	0	2	0	180	0	161	60	874	895	693	2812	0
V/C Ratio(X)	0.00	0.00	0.00	0.19	0.00	0.82	0.00	0.51	0.51	0.93	0.42	0.00
Avail Cap(c_a), veh/h	0	116	0	281	0	251	60	874	895	855	2812	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00
Upstream Filter(I)	0.00	0.00	0.00	1.00	0.00	1.00	0.00	1.00	1.00	0.81	0.81	0.00
Uniform Delay (d), s/veh	0.0	0.0	0.0	49.4	0.0	52.9	0.0	20.6	20.6	9.1	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.0	0.0	0.5	0.0	11.6	0.0	2.2	2.1	11.8	0.4	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.0	0.0	1.1	0.0	4.8	0.0	10.6	10.9	13.7	0.1	0.0
LnGrp Delay(d),s/veh	0.0	0.0	0.0	49.9	0.0	64.5	0.0	22.8	22.7	20.9	0.4	0.0
LnGrp LOS				D		E		C	C	C	A	
Approach Vol, veh/h		0			166			910			1818	
Approach Delay, s/veh		0.0			61.5			22.7			7.6	
Approach LOS					E			C			A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4		6		8
Phs Duration (G+Y+Rc), s	36.1	65.8		0.0		101.8		18.2
Change Period (Y+Rc), s	6.5	6.5		6.5		6.5		6.0
Max Green Setting (Gmax), s	40.5	27.5		7.5		74.5		19.0
Max Q Clear Time (g_c+I1), s	27.7	22.7		0.0		2.0		11.8
Green Ext Time (p_c), s	1.8	4.1		0.0		24.3		0.4

Intersection Summary	
HCM 2010 Ctrl Delay	15.5
HCM 2010 LOS	B

Lane Group	EBL	EBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	62	78	721	535	405	1665
v/c Ratio	0.28	0.40	0.30	0.43	0.65	0.57
Control Delay	56.5	11.9	18.8	11.1	6.7	1.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	56.5	11.9	18.8	11.1	6.7	1.2
Queue Length 50th (ft)	24	0	172	143	16	33
Queue Length 95th (ft)	46	31	283	272	m29	42
Internal Link Dist (ft)			2564			882
Turn Bay Length (ft)		350		700	150	
Base Capacity (vph)	400	273	2375	1238	732	2930
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.15	0.29	0.30	0.43	0.55	0.57

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	57	0	72	0	0	0	0	663	492	373	1532	0
Future Volume (veh/h)	57	0	72	0	0	0	0	663	492	373	1532	0
Number	7	4	14				5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	0	1863				0	1863	1863	1863	1863	0
Adj Flow Rate, veh/h	62	0	0				0	721	0	405	1665	0
Adj No. of Lanes	2	0	1				0	2	1	1	2	0
Peak Hour Factor	0.92	0.92	0.92				0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	0	2				0	2	2	2	2	0
Cap, veh/h	150	0	69				0	2450	1096	737	3001	0
Arrive On Green	0.04	0.00	0.00				0.00	1.00	0.00	0.19	1.00	0.00
Sat Flow, veh/h	3442	0	1583				0	3632	1583	1774	3632	0
Grp Volume(v), veh/h	62	0	0				0	721	0	405	1665	0
Grp Sat Flow(s),veh/h/ln	1721	0	1583				0	1770	1583	1774	1770	0
Q Serve(g_s), s	2.1	0.0	0.0				0.0	0.0	0.0	8.7	0.0	0.0
Cycle Q Clear(g_c), s	2.1	0.0	0.0				0.0	0.0	0.0	8.7	0.0	0.0
Prop In Lane	1.00		1.00				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	150	0	69				0	2450	1096	737	3001	0
V/C Ratio(X)	0.41	0.00	0.00				0.00	0.29	0.00	0.55	0.55	0.00
Avail Cap(c_a), veh/h	402	0	185				0	2450	1096	904	3001	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	2.00	2.00	2.00	2.00	1.00
Upstream Filter(I)	1.00	0.00	0.00				0.00	0.74	0.00	0.63	0.63	0.00
Uniform Delay (d), s/veh	55.9	0.0	0.0				0.0	0.0	0.0	2.8	0.0	0.0
Incr Delay (d2), s/veh	1.8	0.0	0.0				0.0	0.2	0.0	0.4	0.5	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.0	0.0	0.0				0.0	0.1	0.0	4.0	0.2	0.0
LnGrp Delay(d),s/veh	57.7	0.0	0.0				0.0	0.2	0.0	3.2	0.5	0.0
LnGrp LOS	E							A		A	A	
Approach Vol, veh/h		62						721			2070	
Approach Delay, s/veh		57.7						0.2			1.0	
Approach LOS		E						A			A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4		6		
Phs Duration (G+Y+Rc), s	18.7	90.1		11.2		108.8		
Change Period (Y+Rc), s	7.0	7.0		6.0		7.0		
Max Green Setting (Gmax), s	23.0	63.0		14.0		93.0		
Max Q Clear Time (g_c+I1), s	10.7	2.0		4.1		2.0		
Green Ext Time (p_c), s	1.0	32.6		0.1		38.4		

Intersection Summary	
HCM 2010 Ctrl Delay	2.0
HCM 2010 LOS	A

Lane Group	WBL	WBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	667	215	89	693	1402	115
v/c Ratio	0.47	0.29	1.46	0.41	0.83	0.14
Control Delay	27.1	7.8	307.6	18.4	32.9	3.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	27.1	7.8	307.6	18.4	32.9	3.5
Queue Length 50th (ft)	191	26	~87	121	484	0
Queue Length 95th (ft)	244	77	#193	261	584	32
Internal Link Dist (ft)				882	859	
Turn Bay Length (ft)		225	200			575
Base Capacity (vph)	1416	746	61	1681	1681	812
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.47	0.29	1.46	0.41	0.83	0.14

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	614	0	198	82	638	0	0	1290	106
Future Volume (veh/h)	0	0	0	614	0	198	82	638	0	0	1290	106
Number				3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln				1863	0	1863	1863	1863	0	0	1863	1863
Adj Flow Rate, veh/h				667	0	0	89	693	0	0	1402	0
Adj No. of Lanes				2	0	1	1	2	0	0	2	1
Peak Hour Factor				0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %				2	0	2	2	2	0	0	2	2
Cap, veh/h				1420	0	653	110	1681	0	0	1681	752
Arrive On Green				0.41	0.00	0.00	0.95	0.95	0.00	0.00	0.47	0.00
Sat Flow, veh/h				3442	0	1583	383	3632	0	0	3632	1583
Grp Volume(v), veh/h				667	0	0	89	693	0	0	1402	0
Grp Sat Flow(s),veh/h/ln				1721	0	1583	383	1770	0	0	1770	1583
Q Serve(g_s), s				16.9	0.0	0.0	15.7	1.9	0.0	0.0	41.3	0.0
Cycle Q Clear(g_c), s				16.9	0.0	0.0	57.0	1.9	0.0	0.0	41.3	0.0
Prop In Lane				1.00		1.00	1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				1420	0	653	110	1681	0	0	1681	752
V/C Ratio(X)				0.47	0.00	0.00	0.81	0.41	0.00	0.00	0.83	0.00
Avail Cap(c_a), veh/h				1420	0	653	110	1681	0	0	1681	752
HCM Platoon Ratio				1.00	1.00	1.00	2.00	2.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	0.00	0.96	0.96	0.00	0.00	1.00	0.00
Uniform Delay (d), s/veh				25.7	0.0	0.0	27.1	1.6	0.0	0.0	27.4	0.0
Incr Delay (d2), s/veh				1.1	0.0	0.0	44.1	0.7	0.0	0.0	5.0	0.0
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				8.3	0.0	0.0	4.3	0.9	0.0	0.0	21.2	0.0
LnGrp Delay(d),s/veh				26.8	0.0	0.0	71.2	2.3	0.0	0.0	32.4	0.0
LnGrp LOS				C			E	A			C	
Approach Vol, veh/h					667			782			1402	
Approach Delay, s/veh					26.8			10.2			32.4	
Approach LOS					C			B			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2				6		8
Phs Duration (G+Y+Rc), s		64.0				64.0		56.0
Change Period (Y+Rc), s		7.0				7.0		6.5
Max Green Setting (Gmax), s		57.0				57.0		49.5
Max Q Clear Time (g_c+I1), s		59.0				43.3		18.9
Green Ext Time (p_c), s		0.0				10.9		2.4

Intersection Summary	
HCM 2010 Ctrl Delay	25.0
HCM 2010 LOS	C

Intersection	
Int Delay, s/veh	11.1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	104	198	142	699	1263	94
Future Vol, veh/h	104	198	142	699	1263	94
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	225	550	-	-	150
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	113	215	154	760	1373	102

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	2061	687	1475	0	-	0
Stage 1	1373	-	-	-	-	-
Stage 2	688	-	-	-	-	-
Critical Hdwy	6.84	6.94	4.14	-	-	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	2.22	-	-	-
Pot Cap-1 Maneuver	~ 47	389	453	-	-	-
Stage 1	200	-	-	-	-	-
Stage 2	460	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	~ 31	389	453	-	-	-
Mov Cap-2 Maneuver	~ 103	-	-	-	-	-
Stage 1	132	-	-	-	-	-
Stage 2	460	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	83.6	2.9	0
HCM LOS	F		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	453	-	103	389	-	-
HCM Lane V/C Ratio	0.341	-	1.098	0.553	-	-
HCM Control Delay (s)	17	-	195.1	25.1	-	-
HCM Lane LOS	C	-	F	D	-	-
HCM 95th %tile Q(veh)	1.5	-	7.2	3.2	-	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	118	118	763	87	186	1023
v/c Ratio	0.60	0.42	0.63	0.08	0.42	0.70
Control Delay	63.1	12.9	20.6	6.3	5.2	8.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	63.1	12.9	20.6	6.3	5.2	8.1
Queue Length 50th (ft)	89	0	579	23	28	286
Queue Length 95th (ft)	145	53	731	m30	58	377
Internal Link Dist (ft)	381		4013			560
Turn Bay Length (ft)		75		50	150	
Base Capacity (vph)	346	404	1218	1043	449	1454
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.34	0.29	0.63	0.08	0.41	0.70

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	109	109	702	80	171	941
Future Volume (veh/h)	109	109	702	80	171	941
Number	3	18	2	12	1	6
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	118	118	763	87	186	1023
Adj No. of Lanes	1	1	1	1	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	167	149	1292	1098	459	1485
Arrive On Green	0.09	0.09	0.69	0.69	0.05	0.80
Sat Flow, veh/h	1774	1583	1863	1583	1774	1863
Grp Volume(v), veh/h	118	118	763	87	186	1023
Grp Sat Flow(s),veh/h/ln	1774	1583	1863	1583	1774	1863
Q Serve(g_s), s	7.7	8.8	25.5	2.1	3.4	29.6
Cycle Q Clear(g_c), s	7.7	8.8	25.5	2.1	3.4	29.6
Prop In Lane	1.00	1.00		1.00	1.00	
Lane Grp Cap(c), veh/h	167	149	1292	1098	459	1485
V/C Ratio(X)	0.71	0.79	0.59	0.08	0.41	0.69
Avail Cap(c_a), veh/h	347	310	1292	1098	481	1485
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.52	0.52	1.00	1.00
Uniform Delay (d), s/veh	52.7	53.2	9.6	6.0	8.3	5.5
Incr Delay (d2), s/veh	5.4	9.0	1.0	0.1	0.6	2.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.1	4.2	13.3	0.9	2.0	15.9
LnGrp Delay(d),s/veh	58.1	62.2	10.6	6.0	8.9	8.1
LnGrp LOS	E	E	B	A	A	A
Approach Vol, veh/h	236		850			1209
Approach Delay, s/veh	60.2		10.1			8.2
Approach LOS	E		B			A

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	12.5	89.7				102.2		17.8
Change Period (Y+Rc), s	6.5	6.5				6.5		6.5
Max Green Setting (Gmax), s	7.5	69.5				83.5		23.5
Max Q Clear Time (g_c+I1), s	5.4	27.5				31.6		10.8
Green Ext Time (p_c), s	0.1	19.5				21.2		0.6

Intersection Summary	
HCM 2010 Ctrl Delay	14.3
HCM 2010 LOS	B

Intersection	
Int Delay, s/veh	0.4

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	51	775	36	0	1112
Future Vol, veh/h	0	51	775	36	0	1112
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	55	842	39	0	1209

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	-	862	0	0	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.22	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.318	-	-	-	-
Pot Cap-1 Maneuver	0	355	-	-	0	-
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	-	355	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	17	0	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBT
Capacity (veh/h)	-	-	355	-
HCM Lane V/C Ratio	-	-	0.156	-
HCM Control Delay (s)	-	-	17	-
HCM Lane LOS	-	-	C	-
HCM 95th %tile Q(veh)	-	-	0.5	-

HCS7 Freeway Facilities Report

Project Information

Analyst	KCI Technologies, Inc.	Date	9/13/2019
Agency		Analysis Year	2019
Jurisdiction		Time Period Analyzed	PM Peak Hour
Project Description	Roderick Place TIS: I-840 Eastbound Ramp Existing		

Facility Global Input

Jam Density, pc/mi/ln	190.0	Density at Capacity, pc/mi/ln	45.0
Queue Discharge Capacity Drop, %	7	Total Segments	3
Total Time Periods	1	Time Period Duration, min	15
Facility Length, mi	2.00		

Facility Segment Data

No.	Coded	Analyzed	Name	Length, ft	Lanes
1	Basic	Basic	I-840 EB	5280	2
2	Merge	Merge	EB Ramp from Columbia Pike _I-840 EB	1500	2
3	Basic	Basic	I-840 EB	3780	2

Facility Segment Data

Segment 1: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.92	0.962	878	4646	0.19	73.5	6.0	A

Segment 2: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.92	0.92	0.962	0.962	1698	820	4259	2033	0.40	0.40	66.9	66.9	12.7	9.0	A

Segment 3: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.92	0.962	1698	4646	0.37	73.4	11.6	B

Facility Time Period Results

T	Speed, mi/h	Density, pc/mi/ln	Density, veh/mi/ln	Travel Time, min	LOS
1	72.1	9.0	8.6	1.70	A

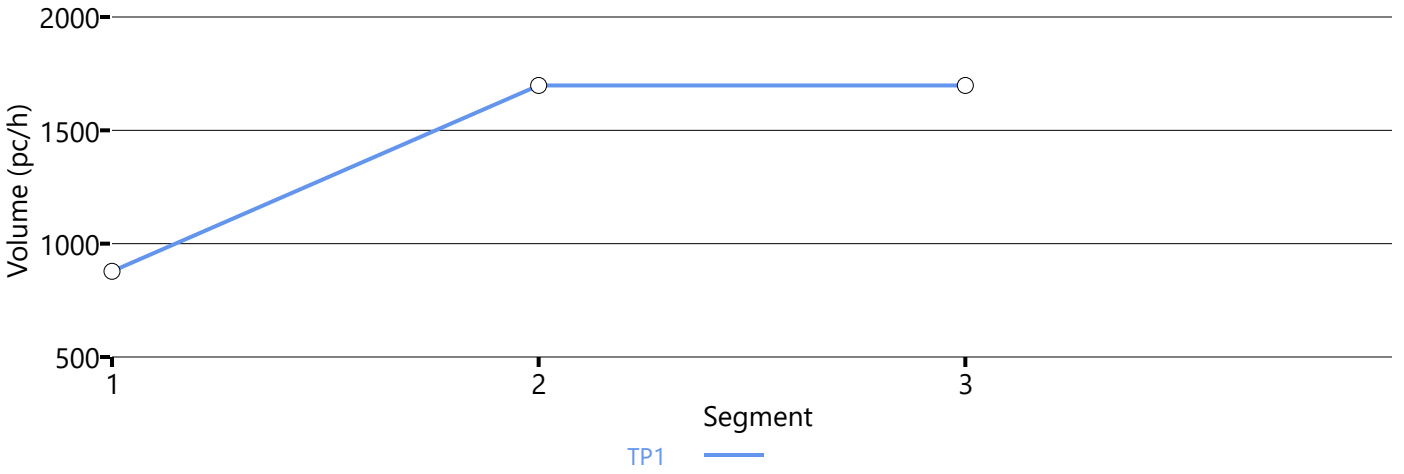
Facility Overall Results

Space Mean Speed, mi/h	72.1	Density, veh/mi/ln	8.6
Average Travel Time, min	1.70	Density, pc/mi/ln	9.0

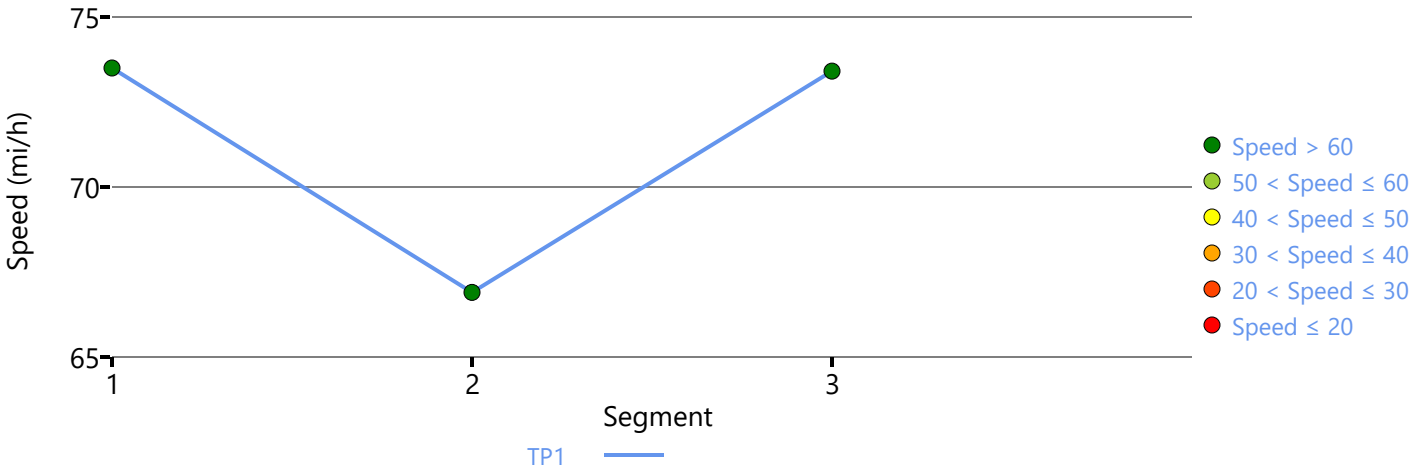
Messages

Comments

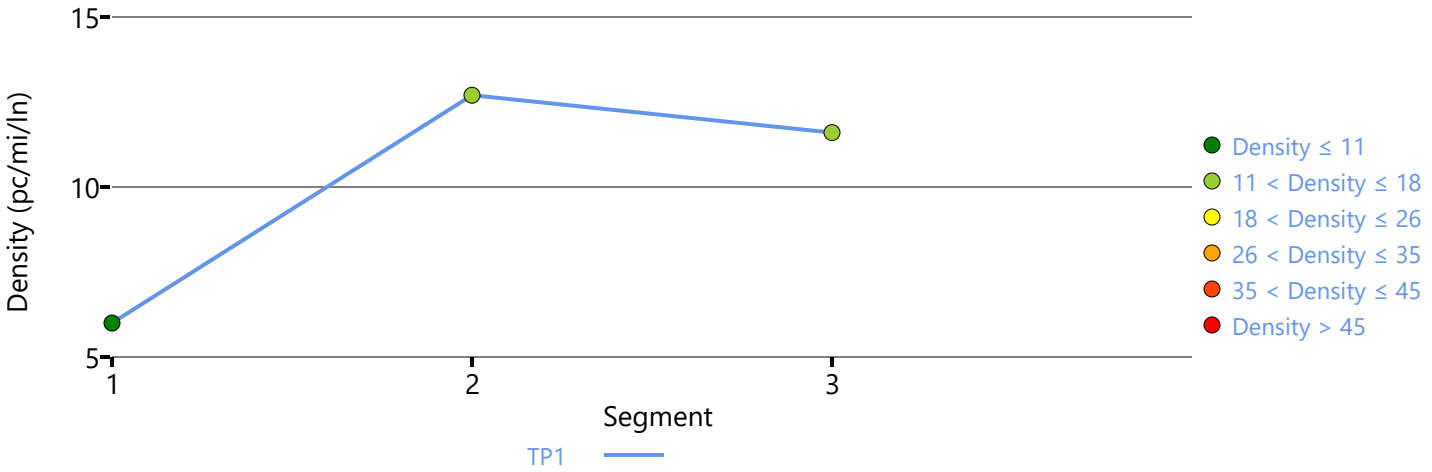
Volume Distribution



Speed Distribution



Density Distribution



HCS7 Freeway Facilities Report

Project Information

Analyst	KCI Technologies, Inc.	Date	9/13/2019
Agency		Analysis Year	2019
Jurisdiction		Time Period Analyzed	PM Peak Hour
Project Description	Roderick Place TIS: I-840 Westbound Ramp Existing		

Facility Global Input

Jam Density, pc/mi/ln	190.0	Density at Capacity, pc/mi/ln	45.0
Queue Discharge Capacity Drop, %	7	Total Segments	3
Total Time Periods	1	Time Period Duration, min	15
Facility Length, mi	1.98		

Facility Segment Data

No.	Coded	Analyzed	Name	Length, ft	Lanes
1	Basic	Basic	I-840 WB	5280	2
2	Merge	Merge	WB Ramp from Columbia Pike _I-840 EB	1400	2
3	Basic	Basic	I-840 WB	3780	2

Facility Segment Data

Segment 1: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.92	0.962	1342	4646	0.29	73.5	9.1	A

Segment 2: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.92	0.92	0.962	0.962	1530	188	4259	2033	0.36	0.09	67.0	67.0	11.4	8.0	A

Segment 3: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.92	0.962	1530	4646	0.33	73.4	10.4	A

Facility Time Period Results

T	Speed, mi/h	Density, pc/mi/ln	Density, veh/mi/ln	Travel Time, min	LOS
1	72.5	9.9	9.5	1.60	A

Facility Overall Results

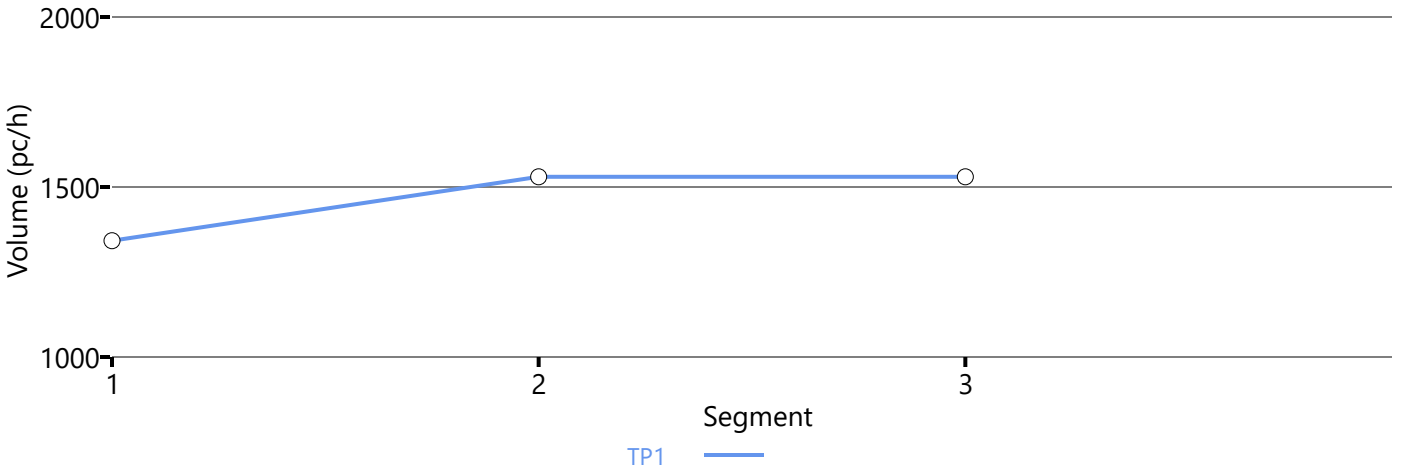
Space Mean Speed, mi/h	72.5	Density, veh/mi/ln	9.5
Average Travel Time, min	1.60	Density, pc/mi/ln	9.9

Messages

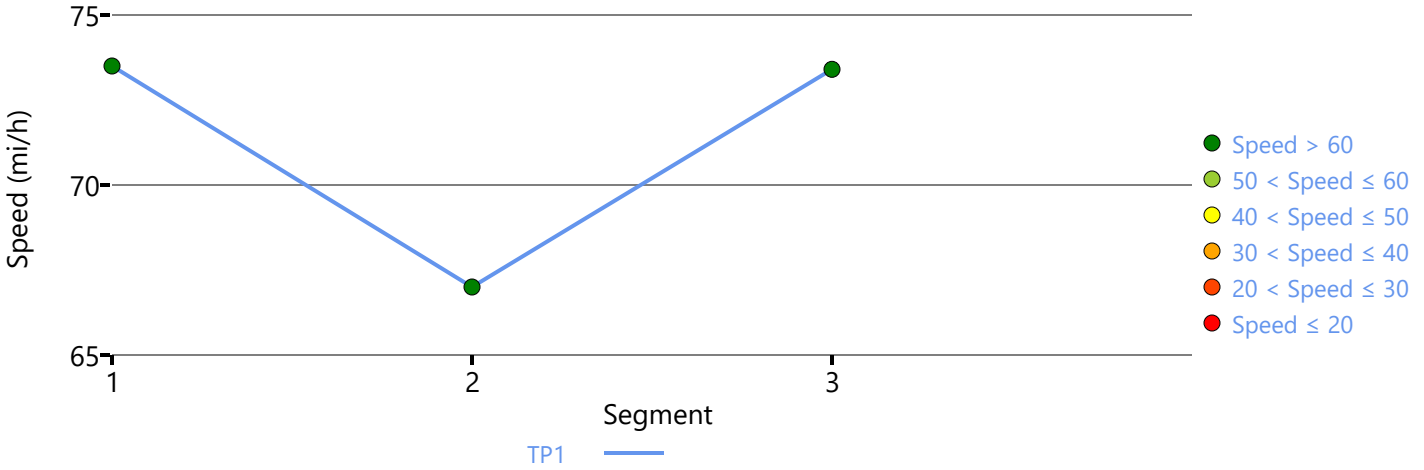
ERROR 1	Acceleration lane length is longer than the segment length for merge segment 2.

Comments

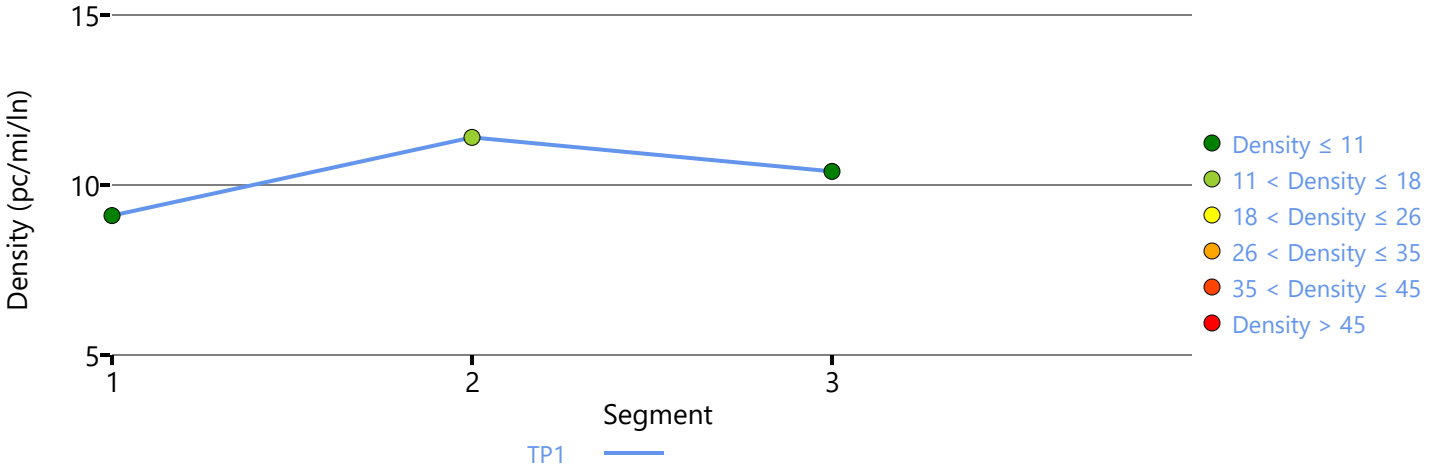
Volume Distribution

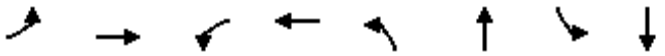


Speed Distribution



Density Distribution





Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	58	141	70	84	85	814	20	682
v/c Ratio	0.24	0.56	0.30	0.43	0.26	0.77	0.08	0.72
Control Delay	27.8	21.0	29.0	31.6	10.2	25.0	9.2	27.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	27.8	21.0	29.0	31.6	10.2	25.0	9.2	27.7
Queue Length 50th (ft)	26	18	31	28	18	293	5	357
Queue Length 95th (ft)	53	71	61	69	42	#747	19	#603
Internal Link Dist (ft)		737		561		511		6096
Turn Bay Length (ft)	100		85		105		120	
Base Capacity (vph)	254	338	244	289	336	1064	283	949
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.23	0.42	0.29	0.29	0.25	0.77	0.07	0.72

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	53	31	98	64	46	31	78	670	79	18	593	34
Future Volume (veh/h)	53	31	98	64	46	31	78	670	79	18	593	34
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1900	1863	1863	1900	1863	1863	1900
Adj Flow Rate, veh/h	58	34	107	70	50	34	85	728	86	20	645	37
Adj No. of Lanes	1	1	0	1	1	0	1	1	0	1	1	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	261	44	137	211	118	80	325	850	100	216	850	49
Arrive On Green	0.05	0.11	0.11	0.06	0.11	0.11	0.06	0.52	0.52	0.03	0.49	0.49
Sat Flow, veh/h	1774	396	1247	1774	1035	704	1774	1635	193	1774	1745	100
Grp Volume(v), veh/h	58	0	141	70	0	84	85	0	814	20	0	682
Grp Sat Flow(s),veh/h/ln	1774	0	1643	1774	0	1739	1774	0	1829	1774	0	1845
Q Serve(g_s), s	2.6	0.0	7.5	3.1	0.0	4.0	2.1	0.0	34.7	0.5	0.0	27.1
Cycle Q Clear(g_c), s	2.6	0.0	7.5	3.1	0.0	4.0	2.1	0.0	34.7	0.5	0.0	27.1
Prop In Lane	1.00		0.76	1.00		0.40	1.00		0.11	1.00		0.05
Lane Grp Cap(c), veh/h	261	0	181	211	0	198	325	0	951	216	0	899
V/C Ratio(X)	0.22	0.00	0.78	0.33	0.00	0.42	0.26	0.00	0.86	0.09	0.00	0.76
Avail Cap(c_a), veh/h	318	0	246	261	0	261	369	0	951	318	0	899
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	32.8	0.0	39.0	33.0	0.0	37.1	14.3	0.0	18.7	16.5	0.0	18.8
Incr Delay (d2), s/veh	0.4	0.0	10.5	0.9	0.0	1.4	0.4	0.0	9.8	0.2	0.0	6.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.3	0.0	3.9	1.6	0.0	2.0	1.0	0.0	20.0	0.3	0.0	15.1
LnGrp Delay(d),s/veh	33.2	0.0	49.5	33.9	0.0	38.5	14.7	0.0	28.5	16.7	0.0	24.7
LnGrp LOS	C		D	C		D	B		C	B		C
Approach Vol, veh/h		199			154			899			702	
Approach Delay, s/veh		44.8			36.4			27.2			24.5	
Approach LOS		D			D			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	8.9	53.3	11.5	16.4	11.8	50.4	11.1	16.8
Change Period (Y+Rc), s	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5
Max Green Setting (Gmax), s	7.5	35.5	7.5	13.5	7.5	35.5	7.5	13.5
Max Q Clear Time (g_c+I1), s	2.5	36.7	5.1	9.5	4.1	29.1	4.6	6.0
Green Ext Time (p_c), s	0.0	0.0	0.0	0.4	0.0	4.5	0.0	0.6

Intersection Summary	
HCM 2010 Ctrl Delay	28.7
HCM 2010 LOS	C

Lane Group	WBL	WBT	NBT	SBL	SBT
Lane Group Flow (vph)	47	158	776	116	671
v/c Ratio	0.30	0.27	0.34	0.22	0.25
Control Delay	42.8	1.2	2.4	3.6	2.7
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	42.8	1.2	2.4	3.6	2.7
Queue Length 50th (ft)	26	0	41	9	28
Queue Length 95th (ft)	58	0	23	28	58
Internal Link Dist (ft)		697	409		2564
Turn Bay Length (ft)	150			275	
Base Capacity (vph)	275	655	2286	617	2734
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.17	0.24	0.34	0.19	0.25

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	43	0	145	0	680	34	107	616	1
Future Volume (veh/h)	0	0	0	43	0	145	0	680	34	107	616	1
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1863	1900	1863	1863	1900	1863	1863	1900	1863	1863	1900
Adj Flow Rate, veh/h	0	0	0	47	0	158	0	739	37	116	670	1
Adj No. of Lanes	0	1	0	1	1	0	1	2	0	1	2	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	0	2	0	216	0	193	80	2072	104	535	2680	4
Arrive On Green	0.00	0.00	0.00	0.12	0.00	0.12	0.00	0.60	0.60	0.13	1.00	1.00
Sat Flow, veh/h	0	1863	0	1774	0	1583	763	3430	172	1774	3626	5
Grp Volume(v), veh/h	0	0	0	47	0	158	0	381	395	116	327	344
Grp Sat Flow(s),veh/h/ln	0	1863	0	1774	0	1583	763	1770	1832	1774	1770	1862
Q Serve(g_s), s	0.0	0.0	0.0	2.2	0.0	8.8	0.0	9.8	9.8	2.0	0.0	0.0
Cycle Q Clear(g_c), s	0.0	0.0	0.0	2.2	0.0	8.8	0.0	9.8	9.8	2.0	0.0	0.0
Prop In Lane	0.00		0.00	1.00		1.00	1.00		0.09	1.00		0.00
Lane Grp Cap(c), veh/h	0	2	0	216	0	193	80	1069	1107	535	1308	1376
V/C Ratio(X)	0.00	0.00	0.00	0.22	0.00	0.82	0.00	0.36	0.36	0.22	0.25	0.25
Avail Cap(c_a), veh/h	0	155	0	276	0	246	80	1069	1107	689	1308	1376
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00
Upstream Filter(I)	0.00	0.00	0.00	1.00	0.00	1.00	0.00	1.00	1.00	0.98	0.98	0.98
Uniform Delay (d), s/veh	0.0	0.0	0.0	35.6	0.0	38.5	0.0	9.0	9.0	5.2	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.0	0.0	0.5	0.0	15.4	0.0	0.9	0.9	0.2	0.5	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.0	0.0	1.1	0.0	4.6	0.0	5.0	5.2	1.0	0.2	0.2
LnGrp Delay(d),s/veh	0.0	0.0	0.0	36.1	0.0	54.0	0.0	9.9	9.9	5.4	0.5	0.4
LnGrp LOS				D		D		A	A	A	A	A
Approach Vol, veh/h		0			205			776			787	
Approach Delay, s/veh		0.0			49.9			9.9			1.2	
Approach LOS					D			A			A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4		6		8
Phs Duration (G+Y+Rc), s	12.2	60.9		0.0		73.0		17.0
Change Period (Y+Rc), s	6.5	6.5		6.5		6.5		6.0
Max Green Setting (Gmax), s	13.5	29.5		7.5		49.5		14.0
Max Q Clear Time (g_c+I1), s	4.0	11.8		0.0		2.0		10.8
Green Ext Time (p_c), s	0.2	7.8		0.0		10.6		0.3

Intersection Summary	
HCM 2010 Ctrl Delay	10.7
HCM 2010 LOS	B

Lane Group	EBL	EBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	26	55	447	354	103	648
v/c Ratio	0.11	0.23	0.18	0.29	0.14	0.22
Control Delay	40.0	2.3	10.0	5.9	1.6	1.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	40.0	2.3	10.0	5.9	1.6	1.4
Queue Length 50th (ft)	7	0	96	73	6	20
Queue Length 95th (ft)	20	0	110	110	11	28
Internal Link Dist (ft)			2564			882
Turn Bay Length (ft)		350		700	150	
Base Capacity (vph)	534	358	2489	1218	803	2927
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.05	0.15	0.18	0.29	0.13	0.22

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	24	0	51	0	0	0	0	411	326	95	596	0
Future Volume (veh/h)	24	0	51	0	0	0	0	411	326	95	596	0
Number	7	4	14				5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	0	1863				0	1863	1863	1863	1863	0
Adj Flow Rate, veh/h	26	0	0				0	447	0	103	648	0
Adj No. of Lanes	2	0	1				0	2	1	1	2	0
Peak Hour Factor	0.92	0.92	0.92				0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	0	2				0	2	2	2	2	0
Cap, veh/h	110	0	50				0	2422	1084	832	2915	0
Arrive On Green	0.03	0.00	0.00				0.00	1.00	0.00	0.12	1.00	0.00
Sat Flow, veh/h	3442	0	1583				0	3632	1583	1774	3632	0
Grp Volume(v), veh/h	26	0	0				0	447	0	103	648	0
Grp Sat Flow(s),veh/h/ln	1721	0	1583				0	1770	1583	1774	1770	0
Q Serve(g_s), s	0.7	0.0	0.0				0.0	0.0	0.0	1.3	0.0	0.0
Cycle Q Clear(g_c), s	0.7	0.0	0.0				0.0	0.0	0.0	1.3	0.0	0.0
Prop In Lane	1.00		1.00				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	110	0	50				0	2422	1084	832	2915	0
V/C Ratio(X)	0.24	0.00	0.00				0.00	0.18	0.00	0.12	0.22	0.00
Avail Cap(c_a), veh/h	535	0	246				0	2422	1084	979	2915	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	2.00	2.00	2.00	2.00	1.00
Upstream Filter(I)	1.00	0.00	0.00				0.00	0.95	0.00	0.97	0.97	0.00
Uniform Delay (d), s/veh	42.5	0.0	0.0				0.0	0.0	0.0	2.4	0.0	0.0
Incr Delay (d2), s/veh	1.1	0.0	0.0				0.0	0.2	0.0	0.1	0.2	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	0.0	0.0				0.0	0.1	0.0	0.6	0.1	0.0
LnGrp Delay(d),s/veh	43.6	0.0	0.0				0.0	0.2	0.0	2.5	0.2	0.0
LnGrp LOS	D							A		A	A	
Approach Vol, veh/h		26						447			751	
Approach Delay, s/veh		43.6						0.2			0.5	
Approach LOS		D						A			A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4		6		
Phs Duration (G+Y+Rc), s	12.5	68.6		8.9		81.1		
Change Period (Y+Rc), s	7.0	7.0		6.0		7.0		
Max Green Setting (Gmax), s	13.0	43.0		14.0		63.0		
Max Q Clear Time (g_c+I1), s	3.3	2.0		2.7		2.0		
Green Ext Time (p_c), s	0.1	8.2		0.0		8.5		

Intersection Summary	
HCM 2010 Ctrl Delay	1.3
HCM 2010 LOS	A

Lane Group	WBL	WBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	322	93	36	430	433	26
v/c Ratio	0.36	0.19	0.07	0.21	0.21	0.03
Control Delay	28.5	7.0	2.8	5.2	9.0	1.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	28.5	7.0	2.8	5.2	9.0	1.5
Queue Length 50th (ft)	76	0	1	7	55	0
Queue Length 95th (ft)	114	36	3	10	79	6
Internal Link Dist (ft)				882	859	
Turn Bay Length (ft)		225	200			575
Base Capacity (vph)	896	482	548	2084	2084	949
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.36	0.19	0.07	0.21	0.21	0.03

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	296	0	86	33	396	0	0	398	24
Future Volume (veh/h)	0	0	0	296	0	86	33	396	0	0	398	24
Number				3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln				1863	0	1863	1863	1863	0	0	1863	1863
Adj Flow Rate, veh/h				322	0	0	36	430	0	0	433	0
Adj No. of Lanes				2	0	1	1	2	0	0	2	1
Peak Hour Factor				0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %				2	0	2	2	2	0	0	2	2
Cap, veh/h				899	0	413	586	2084	0	0	2084	932
Arrive On Green				0.26	0.00	0.00	0.59	0.59	0.00	0.00	0.59	0.00
Sat Flow, veh/h				3442	0	1583	951	3632	0	0	3632	1583
Grp Volume(v), veh/h				322	0	0	36	430	0	0	433	0
Grp Sat Flow(s),veh/h/ln				1721	0	1583	951	1770	0	0	1770	1583
Q Serve(g_s), s				6.9	0.0	0.0	1.7	5.1	0.0	0.0	5.2	0.0
Cycle Q Clear(g_c), s				6.9	0.0	0.0	6.8	5.1	0.0	0.0	5.2	0.0
Prop In Lane				1.00		1.00	1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				899	0	413	586	2084	0	0	2084	932
V/C Ratio(X)				0.36	0.00	0.00	0.06	0.21	0.00	0.00	0.21	0.00
Avail Cap(c_a), veh/h				899	0	413	586	2084	0	0	2084	932
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	0.00	0.99	0.99	0.00	0.00	1.00	0.00
Uniform Delay (d), s/veh				27.1	0.0	0.0	10.3	8.7	0.0	0.0	8.7	0.0
Incr Delay (d2), s/veh				1.1	0.0	0.0	0.2	0.2	0.0	0.0	0.2	0.0
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				3.4	0.0	0.0	0.5	2.5	0.0	0.0	2.6	0.0
LnGrp Delay(d),s/veh				28.2	0.0	0.0	10.5	8.9	0.0	0.0	8.9	0.0
LnGrp LOS				C			B	A			A	
Approach Vol, veh/h					322			466			433	
Approach Delay, s/veh					28.2			9.0			8.9	
Approach LOS					C			A			A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2				6		8
Phs Duration (G+Y+Rc), s		60.0				60.0		30.0
Change Period (Y+Rc), s		7.0				7.0		6.5
Max Green Setting (Gmax), s		53.0				53.0		23.5
Max Q Clear Time (g_c+I1), s		8.8				7.2		8.9
Green Ext Time (p_c), s		6.3				6.3		0.9

Intersection Summary	
HCM 2010 Ctrl Delay	14.0
HCM 2010 LOS	B

Intersection	
Int Delay, s/veh	0.2

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	3	11	8	486	413	5
Future Vol, veh/h	3	11	8	486	413	5
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	225	550	-	-	150
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	3	12	9	528	449	5

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	731	225	454	0	-	0
Stage 1	449	-	-	-	-	-
Stage 2	282	-	-	-	-	-
Critical Hdwy	6.84	6.94	4.14	-	-	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	2.22	-	-	-
Pot Cap-1 Maneuver	357	778	1103	-	-	-
Stage 1	610	-	-	-	-	-
Stage 2	741	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	354	778	1103	-	-	-
Mov Cap-2 Maneuver	462	-	-	-	-	-
Stage 1	605	-	-	-	-	-
Stage 2	741	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	10.4	0.1	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1103	-	462	778	-	-
HCM Lane V/C Ratio	0.008	-	0.007	0.015	-	-
HCM Control Delay (s)	8.3	-	12.8	9.7	-	-
HCM Lane LOS	A	-	B	A	-	-
HCM 95th %tile Q(veh)	0	-	0	0	-	-

HCS7 Freeway Facilities Report

Project Information

Analyst	KCI Technologies, Inc.	Date	9/13/2019
Agency		Analysis Year	2019
Jurisdiction		Time Period Analyzed	Saturday
Project Description	Roderick Place TIS: I-840 Eastbound Ramp Existing		

Facility Global Input

Jam Density, pc/mi/ln	190.0	Density at Capacity, pc/mi/ln	45.0
Queue Discharge Capacity Drop, %	7	Total Segments	3
Total Time Periods	1	Time Period Duration, min	15
Facility Length, mi	2.00		

Facility Segment Data

No.	Coded	Analyzed	Name	Length, ft	Lanes
1	Basic	Basic	I-840 EB	5280	2
2	Merge	Merge	EB Ramp from Columbia Pike _I-840 EB	1500	2
3	Basic	Basic	I-840 EB	3780	2

Facility Segment Data

Segment 1: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.92	0.962	510	4646	0.11	73.5	3.5	A

Segment 2: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.92	0.92	0.962	0.962	986	476	4259	2033	0.23	0.23	67.2	67.2	7.3	3.6	A

Segment 3: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.92	0.962	985	4646	0.21	73.4	6.7	A

Facility Time Period Results

T	Speed, mi/h	Density, pc/mi/ln	Density, veh/mi/ln	Travel Time, min	LOS
1	72.2	5.2	5.0	1.70	A

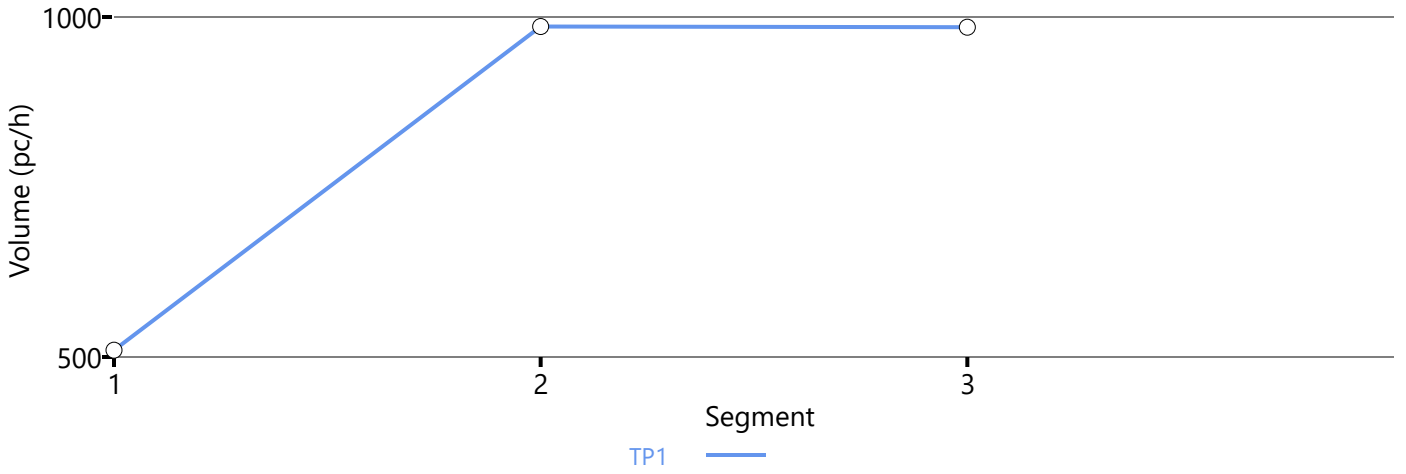
Facility Overall Results

Space Mean Speed, mi/h	72.2	Density, veh/mi/ln	5.0
Average Travel Time, min	1.70	Density, pc/mi/ln	5.2

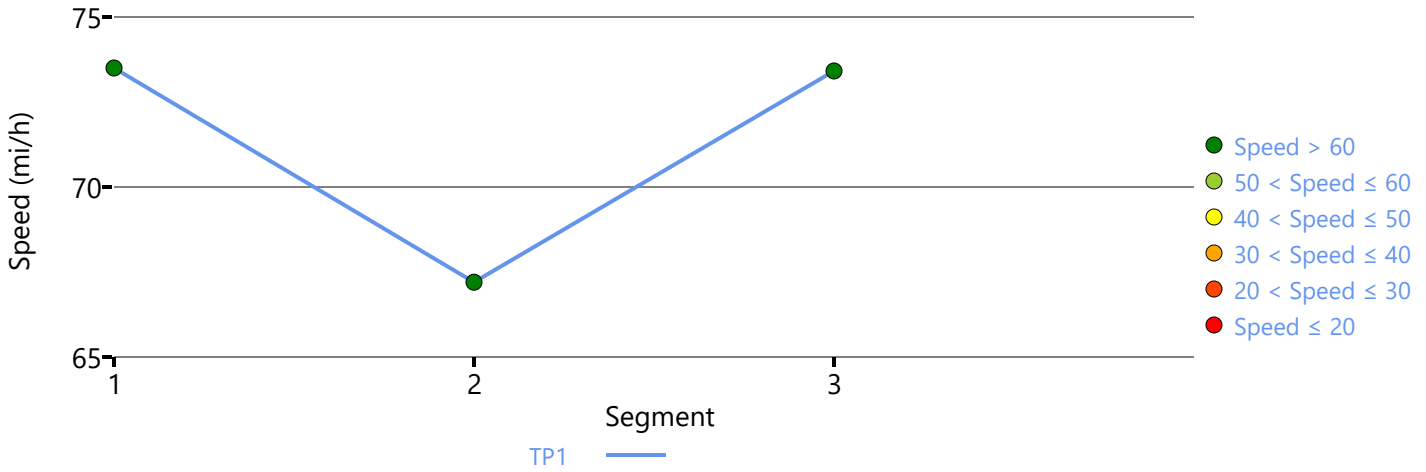
Messages

Comments

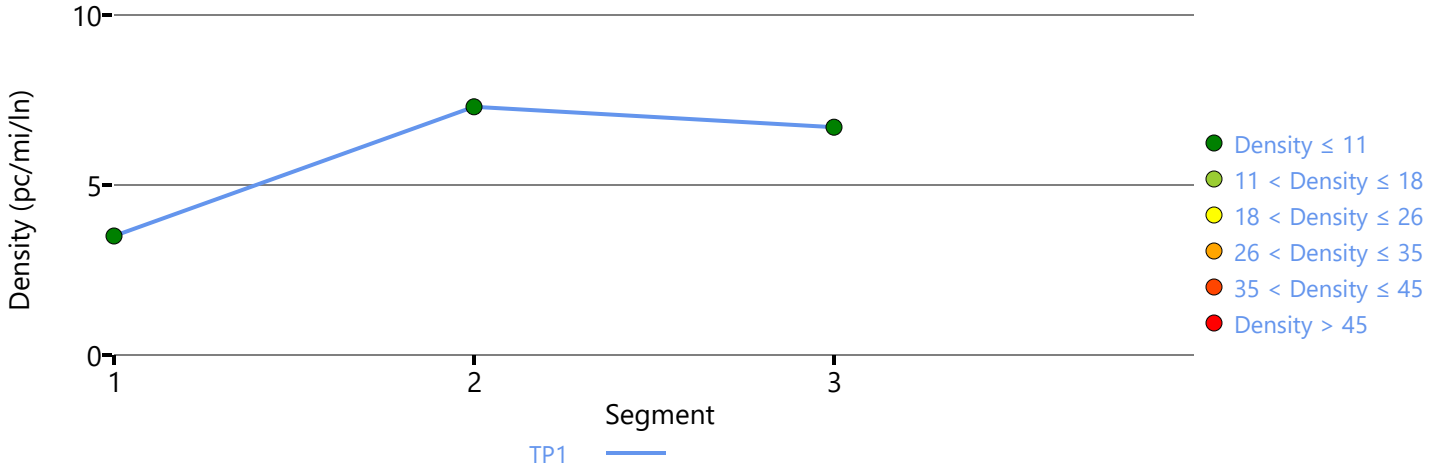
Volume Distribution



Speed Distribution



Density Distribution



HCS7 Freeway Facilities Report

Project Information

Analyst	KCI Technologies, Inc.	Date	9/13/2019
Agency		Analysis Year	2019
Jurisdiction		Time Period Analyzed	Saturday Peak Hour
Project Description	Roderick Place TIS: I-840 Westbound Ramp Existing		

Facility Global Input

Jam Density, pc/mi/ln	190.0	Density at Capacity, pc/mi/ln	45.0
Queue Discharge Capacity Drop, %	7	Total Segments	3
Total Time Periods	1	Time Period Duration, min	15
Facility Length, mi	1.98		

Facility Segment Data

No.	Coded	Analyzed	Name	Length, ft	Lanes
1	Basic	Basic	I-840 WB	5280	2
2	Merge	Merge	WB Ramp from Columbia Pike _I-840 EB	1400	2
3	Basic	Basic	I-840 WB	3780	2

Facility Segment Data

Segment 1: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.92	0.962	461	4646	0.10	73.5	3.1	A

Segment 2: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.92	0.92	0.962	0.962	525	64	4259	2033	0.12	0.03	67.3	67.3	3.9	0.2	A

Segment 3: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.92	0.962	525	4646	0.11	73.4	3.6	A

Facility Time Period Results

T	Speed, mi/h	Density, pc/mi/ln	Density, veh/mi/ln	Travel Time, min	LOS
1	72.5	3.4	3.3	1.60	A

Facility Overall Results

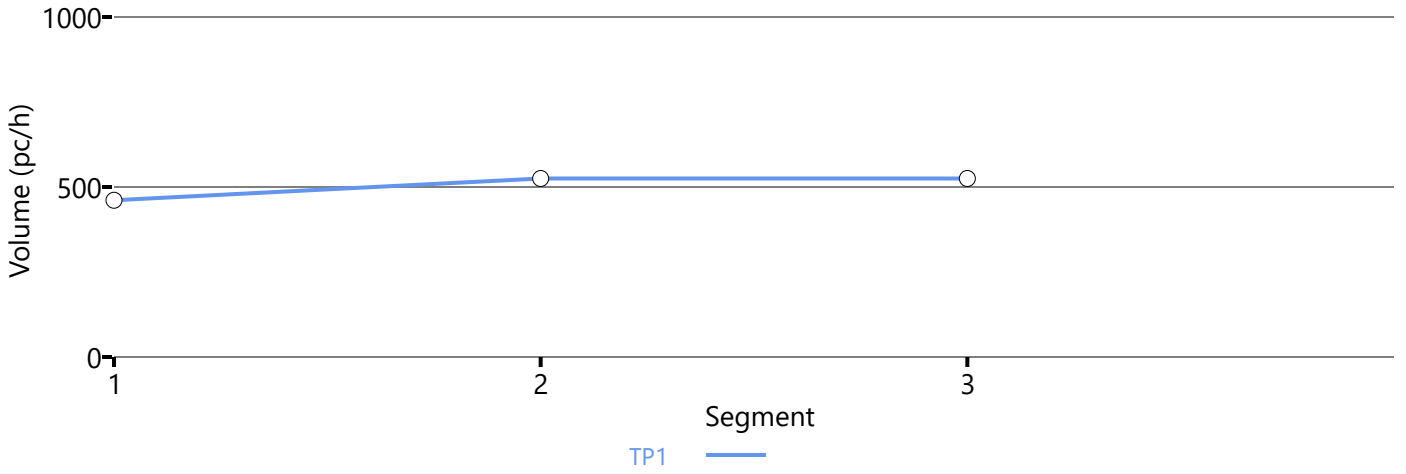
Space Mean Speed, mi/h	72.5	Density, veh/mi/ln	3.3
Average Travel Time, min	1.60	Density, pc/mi/ln	3.4

Messages

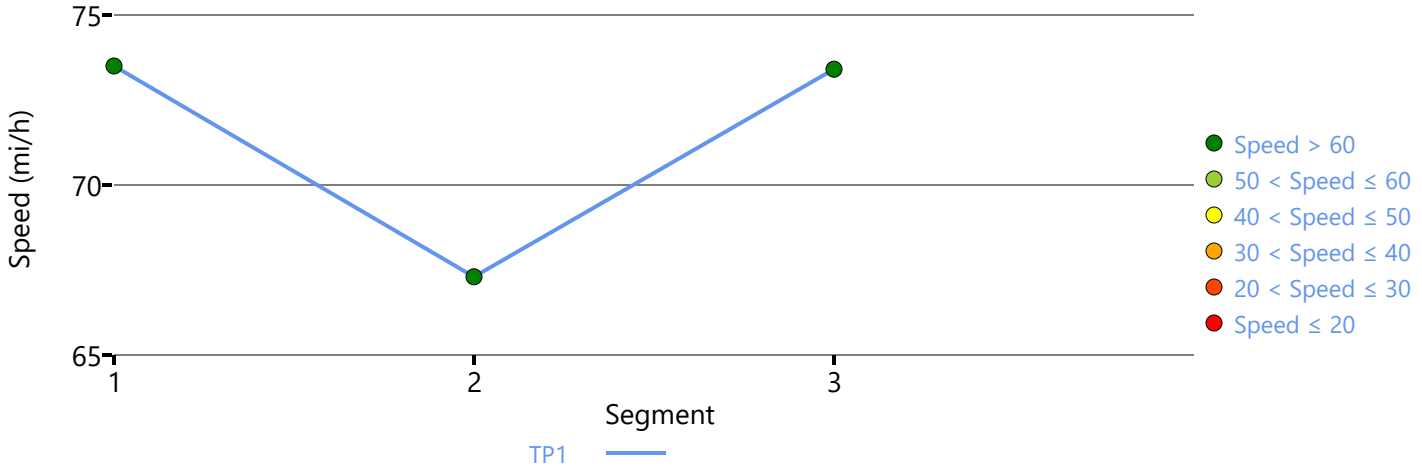
ERROR 1	Acceleration lane length is longer than the segment length for merge segment 2.

Comments

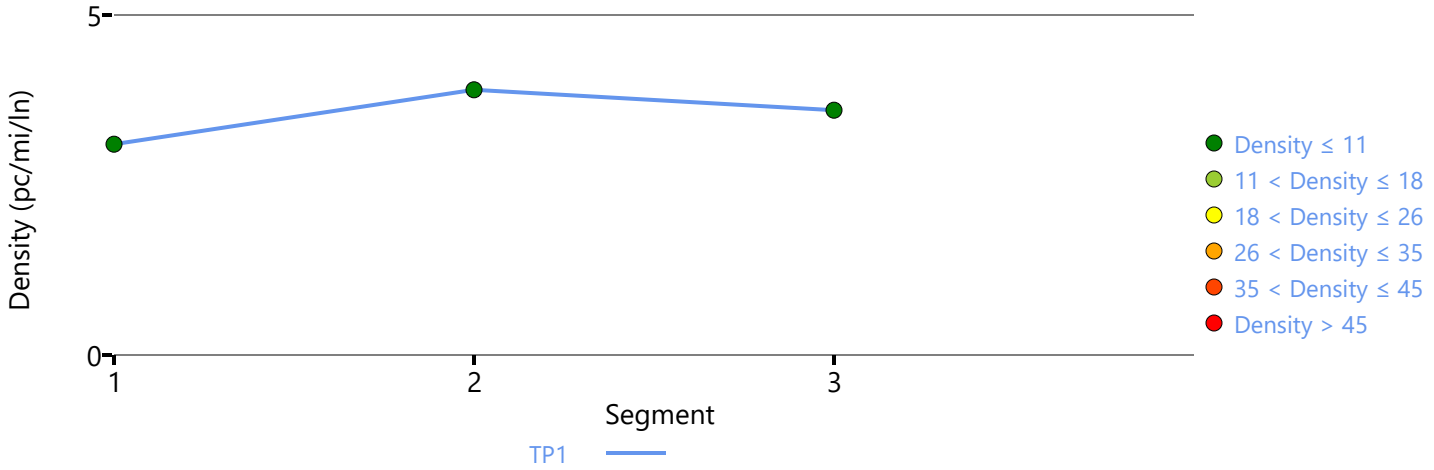
Volume Distribution



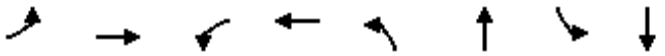
Speed Distribution



Density Distribution



BACKGROUND CONDITIONS CAPACITY ANALYSES

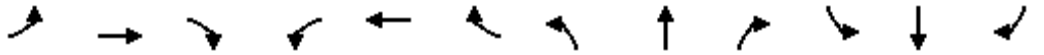


Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	45	98	57	164	47	1143	14	509
v/c Ratio	0.20	0.41	0.23	0.58	0.10	0.99	0.08	0.49
Control Delay	29.6	20.1	30.2	31.1	9.1	47.1	6.8	11.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	29.6	20.1	30.2	31.1	9.1	47.1	6.8	11.5
Queue Length 50th (ft)	22	16	28	57	11	~683	2	216
Queue Length 95th (ft)	47	61	56	118	29	#1253	8	333
Internal Link Dist (ft)		737		561		511		6096
Turn Bay Length (ft)	100		85		105		120	
Base Capacity (vph)	237	330	253	345	513	1152	207	1042
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.19	0.30	0.23	0.48	0.09	0.99	0.07	0.49

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	41	26	64	52	57	94	43	1021	30	13	433	35
Future Volume (veh/h)	41	26	64	52	57	94	43	1021	30	13	433	35
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1845	1845	1900	1845	1845	1900	1845	1845	1900	1845	1845	1900
Adj Flow Rate, veh/h	45	28	70	57	62	102	47	1110	33	14	471	38
Adj No. of Lanes	1	1	0	1	1	0	1	1	0	1	1	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	178	55	137	233	77	126	456	991	29	106	896	72
Arrive On Green	0.04	0.12	0.12	0.05	0.12	0.12	0.04	0.56	0.56	0.02	0.53	0.53
Sat Flow, veh/h	1757	468	1170	1757	628	1034	1757	1782	53	1757	1685	136
Grp Volume(v), veh/h	45	0	98	57	0	164	47	0	1143	14	0	509
Grp Sat Flow(s),veh/h/ln	1757	0	1638	1757	0	1662	1757	0	1835	1757	0	1821
Q Serve(g_s), s	2.2	0.0	5.6	2.8	0.0	9.6	1.2	0.0	55.6	0.4	0.0	18.2
Cycle Q Clear(g_c), s	2.2	0.0	5.6	2.8	0.0	9.6	1.2	0.0	55.6	0.4	0.0	18.2
Prop In Lane	1.00		0.71	1.00		0.62	1.00		0.03	1.00		0.07
Lane Grp Cap(c), veh/h	178	0	191	233	0	202	456	0	1021	106	0	968
V/C Ratio(X)	0.25	0.00	0.51	0.24	0.00	0.81	0.10	0.00	1.12	0.13	0.00	0.53
Avail Cap(c_a), veh/h	235	0	270	281	0	274	546	0	1021	204	0	968
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	36.7	0.0	41.5	36.2	0.0	42.8	11.0	0.0	22.2	24.3	0.0	15.2
Incr Delay (d2), s/veh	0.7	0.0	2.1	0.5	0.0	12.3	0.1	0.0	67.2	0.6	0.0	2.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.1	0.0	2.6	1.4	0.0	5.1	0.6	0.0	46.8	0.2	0.0	9.6
LnGrp Delay(d),s/veh	37.4	0.0	43.6	36.8	0.0	55.1	11.1	0.0	89.4	24.9	0.0	17.3
LnGrp LOS	D		D	D		E	B		F	C		B
Approach Vol, veh/h		143			221			1190			523	
Approach Delay, s/veh		41.6			50.3			86.3			17.5	
Approach LOS		D			D			F			B	

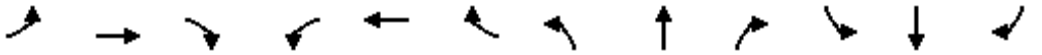
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	8.4	62.1	11.3	18.2	10.9	59.7	10.8	18.7
Change Period (Y+Rc), s	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5
Max Green Setting (Gmax), s	7.5	42.5	7.5	16.5	9.5	40.5	7.5	16.5
Max Q Clear Time (g_c+I1), s	2.4	57.6	4.8	7.6	3.2	20.2	4.2	11.6
Green Ext Time (p_c), s	0.0	0.0	0.0	0.9	0.0	12.4	0.0	0.6

Intersection Summary	
HCM 2010 Ctrl Delay	62.1
HCM 2010 LOS	E

Lane Group	WBL	WBT	NBT	SBL	SBT
Lane Group Flow (vph)	26	412	1239	70	532
v/c Ratio	0.18	0.71	0.51	0.21	0.19
Control Delay	44.2	8.6	11.4	3.3	1.4
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	44.2	8.6	11.4	3.3	1.4
Queue Length 50th (ft)	16	0	179	2	16
Queue Length 95th (ft)	40	33	m276	9	24
Internal Link Dist (ft)		697	409		2564
Turn Bay Length (ft)	150			275	
Base Capacity (vph)	332	698	2407	499	2780
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.08	0.59	0.51	0.14	0.19

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	24	0	379	0	1127	13	64	489	0
Future Volume (veh/h)	0	0	0	24	0	379	0	1127	13	64	489	0
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1845	1900	1845	1845	1900	1845	1845	1900	1845	1845	1900
Adj Flow Rate, veh/h	0	0	0	26	0	412	0	1225	14	70	532	0
Adj No. of Lanes	0	1	0	1	1	0	1	2	0	1	2	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	0	2	0	334	0	298	72	2018	23	313	2401	0
Arrive On Green	0.00	0.00	0.00	0.19	0.00	0.19	0.00	0.57	0.57	0.10	1.00	0.00
Sat Flow, veh/h	0	1845	0	1757	0	1568	860	3549	41	1757	3597	0
Grp Volume(v), veh/h	0	0	0	26	0	412	0	605	634	70	532	0
Grp Sat Flow(s),veh/h/ln	0	1845	0	1757	0	1568	860	1752	1838	1757	1752	0
Q Serve(g_s), s	0.0	0.0	0.0	1.2	0.0	19.0	0.0	22.7	22.7	1.5	0.0	0.0
Cycle Q Clear(g_c), s	0.0	0.0	0.0	1.2	0.0	19.0	0.0	22.7	22.7	1.5	0.0	0.0
Prop In Lane	0.00		0.00	1.00		1.00	1.00		0.02	1.00		0.00
Lane Grp Cap(c), veh/h	0	2	0	334	0	298	72	996	1045	313	2401	0
V/C Ratio(X)	0.00	0.00	0.00	0.08	0.00	1.38	0.00	0.61	0.61	0.22	0.22	0.00
Avail Cap(c_a), veh/h	0	138	0	334	0	298	72	996	1045	531	2401	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00
Upstream Filter(I)	0.00	0.00	0.00	1.00	0.00	1.00	0.00	1.00	1.00	0.97	0.97	0.00
Uniform Delay (d), s/veh	0.0	0.0	0.0	33.3	0.0	40.5	0.0	14.2	14.2	9.8	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.0	0.0	0.1	0.0	191.9	0.0	2.7	2.6	0.3	0.2	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.0	0.0	0.6	0.0	24.1	0.0	11.7	12.2	0.7	0.1	0.0
LnGrp Delay(d),s/veh	0.0	0.0	0.0	33.4	0.0	232.4	0.0	17.0	16.8	10.1	0.2	0.0
LnGrp LOS				C		F		B	B	B	A	
Approach Vol, veh/h		0			438			1239			602	
Approach Delay, s/veh		0.0			220.6			16.9			1.4	
Approach LOS					F			B			A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4		6		8
Phs Duration (G+Y+Rc), s	11.6	63.4		0.0		75.0		25.0
Change Period (Y+Rc), s	6.5	6.5		6.5		6.5		6.0
Max Green Setting (Gmax), s	17.5	30.5		7.5		54.5		19.0
Max Q Clear Time (g_c+I1), s	3.5	24.7		0.0		2.0		21.0
Green Ext Time (p_c), s	0.1	4.3		0.0		16.6		0.0

Intersection Summary	
HCM 2010 Ctrl Delay	51.9
HCM 2010 LOS	D

Lane Group	EBL	EBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	280	86	1109	934	210	718
v/c Ratio	0.61	0.27	0.56	0.74	0.55	0.28
Control Delay	46.2	5.1	22.7	12.7	17.6	8.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	46.2	5.1	22.7	12.7	17.6	8.8
Queue Length 50th (ft)	88	0	307	187	60	97
Queue Length 95th (ft)	124	22	437	496	108	143
Internal Link Dist (ft)			2564			882
Turn Bay Length (ft)		350		700	150	
Base Capacity (vph)	816	467	1970	1258	386	2574
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.34	0.18	0.56	0.74	0.54	0.28

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	258	0	79	0	0	0	0	1020	859	193	661	0
Future Volume (veh/h)	258	0	79	0	0	0	0	1020	859	193	661	0
Number	7	4	14				5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1845	0	1845				0	1845	1845	1845	1845	0
Adj Flow Rate, veh/h	280	0	0				0	1109	0	210	718	0
Adj No. of Lanes	2	0	1				0	2	1	1	2	0
Peak Hour Factor	0.92	0.92	0.92				0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	0	3				0	3	3	3	3	0
Cap, veh/h	366	0	168				0	2206	987	382	2673	0
Arrive On Green	0.11	0.00	0.00				0.00	0.42	0.00	0.13	1.00	0.00
Sat Flow, veh/h	3408	0	1568				0	3597	1568	1757	3597	0
Grp Volume(v), veh/h	280	0	0				0	1109	0	210	718	0
Grp Sat Flow(s),veh/h/ln	1704	0	1568				0	1752	1568	1757	1752	0
Q Serve(g_s), s	8.0	0.0	0.0				0.0	23.2	0.0	4.2	0.0	0.0
Cycle Q Clear(g_c), s	8.0	0.0	0.0				0.0	23.2	0.0	4.2	0.0	0.0
Prop In Lane	1.00		1.00				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	366	0	168				0	2206	987	382	2673	0
V/C Ratio(X)	0.77	0.00	0.00				0.00	0.50	0.00	0.55	0.27	0.00
Avail Cap(c_a), veh/h	818	0	376				0	2206	987	429	2673	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	0.67	0.67	2.00	2.00	1.00
Upstream Filter(I)	1.00	0.00	0.00				0.00	0.85	0.00	0.96	0.96	0.00
Uniform Delay (d), s/veh	43.4	0.0	0.0				0.0	17.4	0.0	9.3	0.0	0.0
Incr Delay (d2), s/veh	3.4	0.0	0.0				0.0	0.7	0.0	1.2	0.2	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.9	0.0	0.0				0.0	11.5	0.0	2.3	0.1	0.0
LnGrp Delay(d),s/veh	46.8	0.0	0.0				0.0	18.1	0.0	10.5	0.2	0.0
LnGrp LOS	D							B		B	A	
Approach Vol, veh/h		280						1109			928	
Approach Delay, s/veh		46.8						18.1			2.6	
Approach LOS		D						B			A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4		6		
Phs Duration (G+Y+Rc), s	13.3	69.9		16.7		83.3		
Change Period (Y+Rc), s	7.0	7.0		6.0		7.0		
Max Green Setting (Gmax), s	9.0	47.0		24.0		63.0		
Max Q Clear Time (g_c+I1), s	6.2	25.2		10.0		2.0		
Green Ext Time (p_c), s	0.1	12.7		0.7		19.5		

Intersection Summary	
HCM 2010 Ctrl Delay	15.4
HCM 2010 LOS	B

Lane Group	WBL	WBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	291	434	55	1335	637	34
v/c Ratio	0.36	1.04	0.12	0.60	0.29	0.03
Control Delay	33.6	88.4	7.4	17.2	8.8	2.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	33.6	88.4	7.4	17.2	8.8	2.2
Queue Length 50th (ft)	80	~267	23	353	88	0
Queue Length 95th (ft)	118	#460	m20	440	116	10
Internal Link Dist (ft)				882	859	
Turn Bay Length (ft)		225	200			575
Base Capacity (vph)	799	417	464	2208	2208	1001
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.36	1.04	0.12	0.60	0.29	0.03

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	268	0	399	51	1228	0	0	586	31
Future Volume (veh/h)	0	0	0	268	0	399	51	1228	0	0	586	31
Number				3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln				1845	0	1845	1845	1845	0	0	1845	1845
Adj Flow Rate, veh/h				291	0	0	55	1335	0	0	637	0
Adj No. of Lanes				2	0	1	1	2	0	0	2	1
Peak Hour Factor				0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %				3	0	3	3	3	0	0	3	3
Cap, veh/h				801	0	368	499	2208	0	0	2208	988
Arrive On Green				0.23	0.00	0.00	0.42	0.42	0.00	0.00	0.63	0.00
Sat Flow, veh/h				3408	0	1568	780	3597	0	0	3597	1568
Grp Volume(v), veh/h				291	0	0	55	1335	0	0	637	0
Grp Sat Flow(s),veh/h/ln				1704	0	1568	780	1752	0	0	1752	1568
Q Serve(g_s), s				7.1	0.0	0.0	4.7	29.6	0.0	0.0	8.2	0.0
Cycle Q Clear(g_c), s				7.1	0.0	0.0	12.9	29.6	0.0	0.0	8.2	0.0
Prop In Lane				1.00		1.00	1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				801	0	368	499	2208	0	0	2208	988
V/C Ratio(X)				0.36	0.00	0.00	0.11	0.60	0.00	0.00	0.29	0.00
Avail Cap(c_a), veh/h				801	0	368	499	2208	0	0	2208	988
HCM Platoon Ratio				1.00	1.00	1.00	0.67	0.67	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	0.00	0.80	0.80	0.00	0.00	1.00	0.00
Uniform Delay (d), s/veh				32.0	0.0	0.0	17.1	19.2	0.0	0.0	8.4	0.0
Incr Delay (d2), s/veh				1.3	0.0	0.0	0.4	1.0	0.0	0.0	0.3	0.0
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				3.5	0.0	0.0	1.1	14.6	0.0	0.0	4.0	0.0
LnGrp Delay(d),s/veh				33.3	0.0	0.0	17.5	20.2	0.0	0.0	8.7	0.0
LnGrp LOS				C			B	C			A	
Approach Vol, veh/h					291			1390			637	
Approach Delay, s/veh					33.3			20.1			8.7	
Approach LOS					C			C			A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2				6		8
Phs Duration (G+Y+Rc), s		70.0				70.0		30.0
Change Period (Y+Rc), s		7.0				7.0		6.5
Max Green Setting (Gmax), s		63.0				63.0		23.5
Max Q Clear Time (g_c+I1), s		31.6				10.2		9.1
Green Ext Time (p_c), s		17.9				22.8		0.8

Intersection Summary	
HCM 2010 Ctrl Delay	18.6
HCM 2010 LOS	B

Intersection	
Int Delay, s/veh	62.7

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	125	224	616	1010	393	405
Future Vol, veh/h	125	224	616	1010	393	405
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	225	550	-	-	150
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	3	3	3	3	3	3
Mvmt Flow	136	243	670	1098	427	440

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	2316	214	867	0	-	0
Stage 1	427	-	-	-	-	-
Stage 2	1889	-	-	-	-	-
Critical Hdwy	6.86	6.96	4.16	-	-	-
Critical Hdwy Stg 1	5.86	-	-	-	-	-
Critical Hdwy Stg 2	5.86	-	-	-	-	-
Follow-up Hdwy	3.53	3.33	2.23	-	-	-
Pot Cap-1 Maneuver	~ 31	788	766	-	-	-
Stage 1	623	-	-	-	-	-
Stage 2	~ 104	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	~ 4	788	766	-	-	-
Mov Cap-2 Maneuver	~ 42	-	-	-	-	-
Stage 1	~ 78	-	-	-	-	-
Stage 2	~ 104	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s$	440.1	12.4	0
HCM LOS	F		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	766	-	42	788	-	-
HCM Lane V/C Ratio	0.874	-	3.235	0.309	-	-
HCM Control Delay (s)	32.9	-	$ 1208.1	11.6	-	-
HCM Lane LOS	D	-	F	B	-	-
HCM 95th %tile Q(veh)	10.9	-	15.1	1.3	-	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

HCS7 Freeway Facilities Report

Project Information

Analyst	KCI Technologies, Inc.	Date	9/13/2019
Agency		Analysis Year	2024
Jurisdiction		Time Period Analyzed	AM Peak Hour
Project Description	Roderick Place TIS: I-840 Eastbound Ramp Background		

Facility Global Input

Jam Density, pc/mi/ln	190.0	Density at Capacity, pc/mi/ln	45.0
Queue Discharge Capacity Drop, %	7	Total Segments	3
Total Time Periods	1	Time Period Duration, min	15
Facility Length, mi	2.00		

Facility Segment Data

No.	Coded	Analyzed	Name	Length, ft	Lanes
1	Basic	Basic	I-840 EB	5280	2
2	Merge	Merge	EB Ramp from Columbia Pike _I-840 EB	1500	2
3	Basic	Basic	I-840 EB	3780	2

Facility Segment Data

Segment 1: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.92	0.943	1298	4646	0.28	73.5	8.8	A

Segment 2: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.92	0.92	0.943	0.943	2511	1213	4259	2033	0.59	0.60	66.0	66.0	19.0	15.2	B

Segment 3: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.92	0.943	2510	4646	0.54	72.7	17.3	B

Facility Time Period Results

T	Speed, mi/h	Density, pc/mi/ln	Density, veh/mi/ln	Travel Time, min	LOS
1	71.6	13.3	12.5	1.70	B

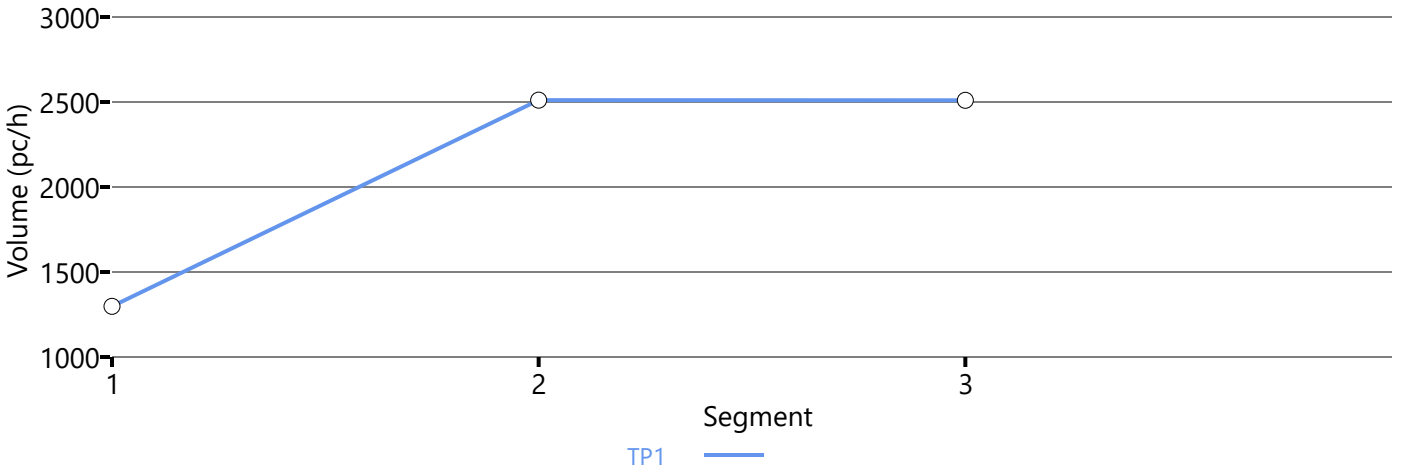
Facility Overall Results

Space Mean Speed, mi/h	71.6	Density, veh/mi/ln	12.5
Average Travel Time, min	1.70	Density, pc/mi/ln	13.3

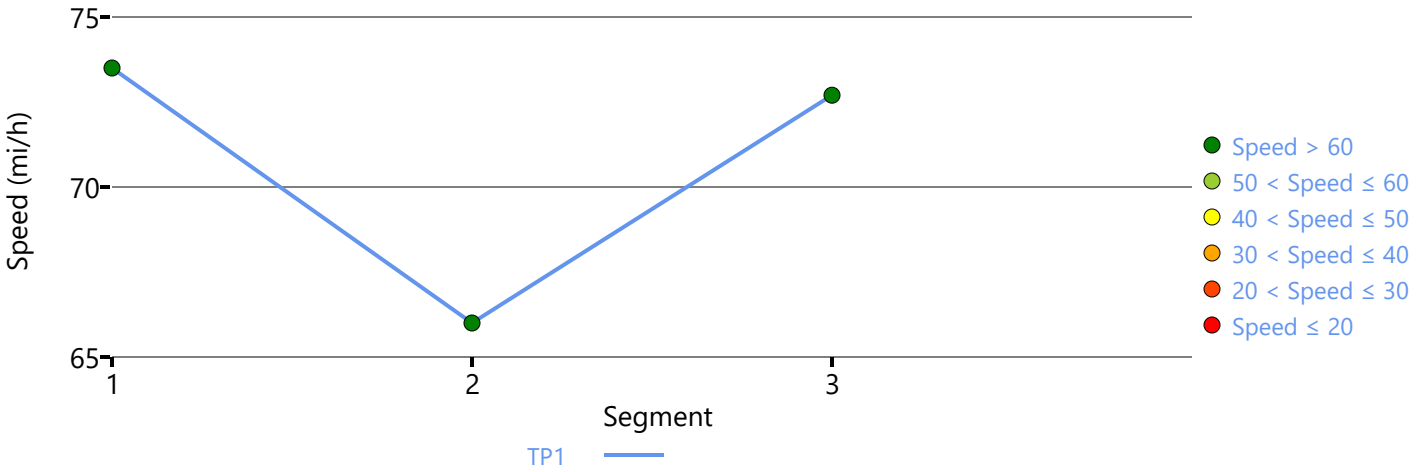
Messages

Comments

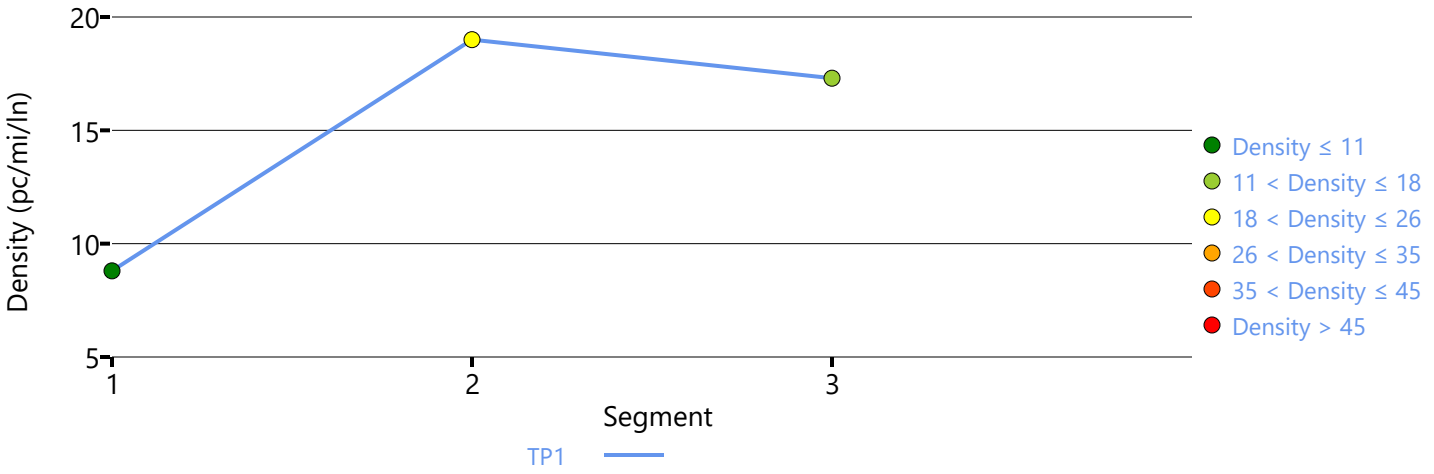
Volume Distribution



Speed Distribution



Density Distribution



HCS7 Freeway Facilities Report

Project Information

Analyst	KCI Technologies, Inc.	Date	9/13/2019
Agency		Analysis Year	2024
Jurisdiction		Time Period Analyzed	AM Peak Hour
Project Description	Roderick Place TIS: I-840 Westbound Ramp Background		

Facility Global Input

Jam Density, pc/mi/ln	190.0	Density at Capacity, pc/mi/ln	45.0
Queue Discharge Capacity Drop, %	7	Total Segments	3
Total Time Periods	1	Time Period Duration, min	15
Facility Length, mi	1.98		

Facility Segment Data

No.	Coded	Analyzed	Name	Length, ft	Lanes
1	Basic	Basic	I-840 WB	5280	2
2	Merge	Merge	WB Ramp from Columbia Pike _I-840 EB	1400	2
3	Basic	Basic	I-840 WB	3780	2

Facility Segment Data

Segment 1: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.92	0.943	674	4646	0.15	73.5	4.6	A

Segment 2: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.92	0.92	0.943	0.943	769	95	4259	2033	0.18	0.05	67.3	67.3	5.7	2.1	A

Segment 3: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.92	0.943	769	4646	0.17	73.4	5.2	A

Facility Time Period Results

T	Speed, mi/h	Density, pc/mi/ln	Density, veh/mi/ln	Travel Time, min	LOS
1	72.5	5.0	4.7	1.60	A

Facility Overall Results

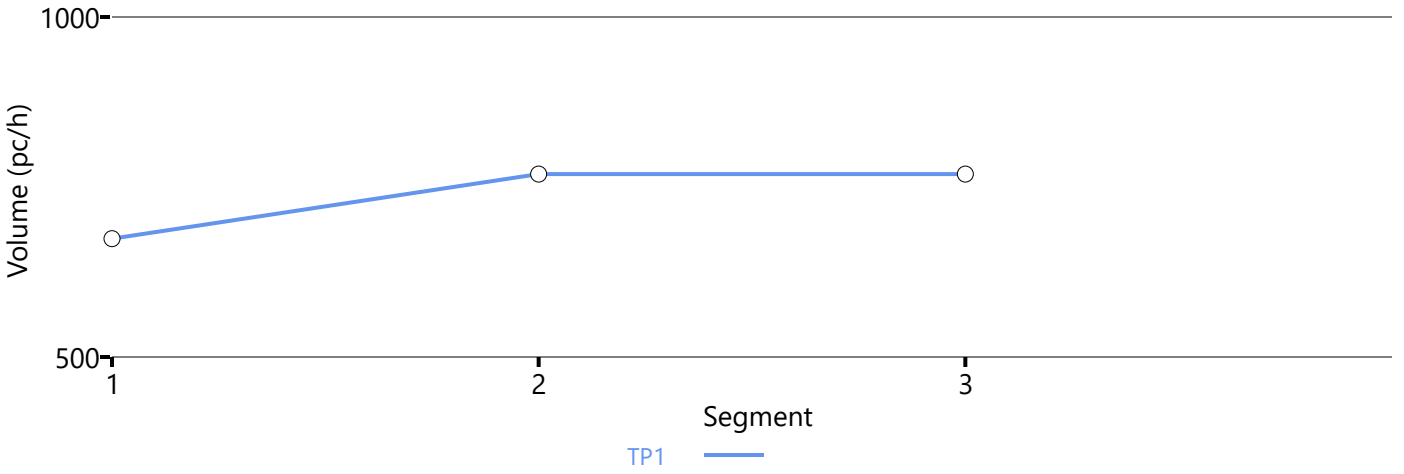
Space Mean Speed, mi/h	72.5	Density, veh/mi/ln	4.7
Average Travel Time, min	1.60	Density, pc/mi/ln	5.0

Messages

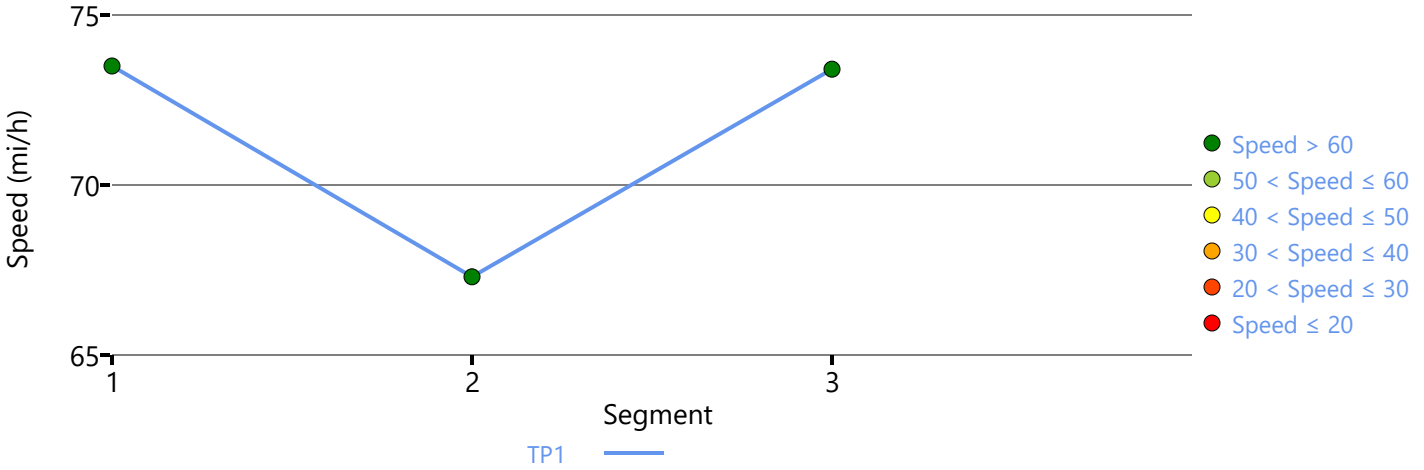
ERROR 1	Acceleration lane length is longer than the segment length for merge segment 2.

Comments

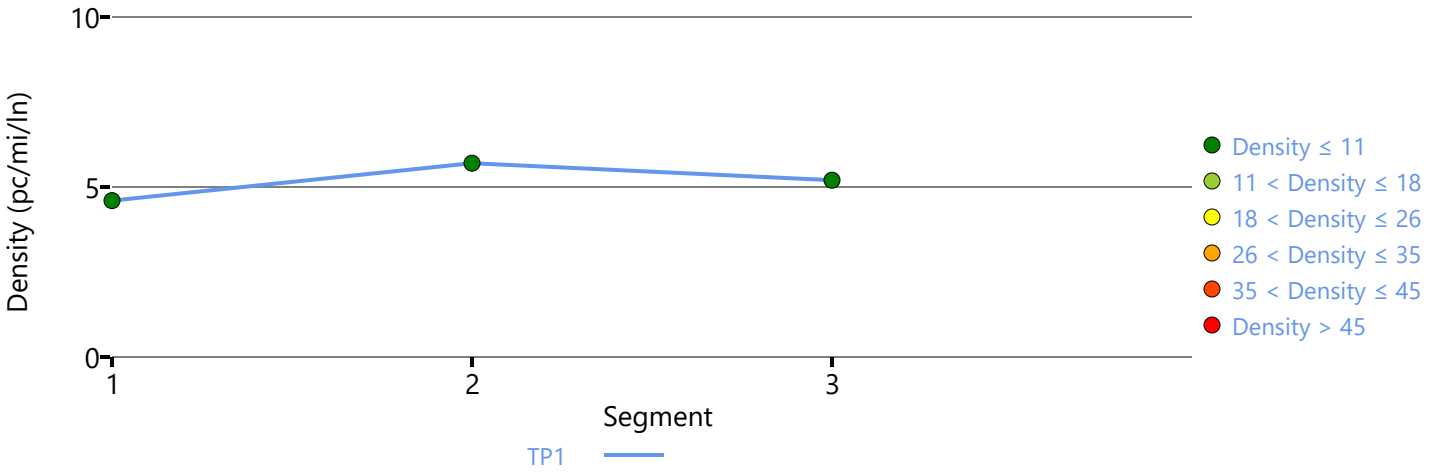
Volume Distribution

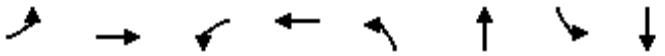


Speed Distribution



Density Distribution





Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	39	197	77	53	76	843	25	984
v/c Ratio	0.18	0.72	0.46	0.24	0.42	0.72	0.09	0.87
Control Delay	38.2	31.5	47.1	28.2	18.4	22.9	12.3	39.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	38.2	31.5	47.1	28.2	18.4	22.9	12.3	39.9
Queue Length 50th (ft)	25	41	50	17	18	476	9	631
Queue Length 95th (ft)	51	114	86	54	57	#850	25	#1086
Internal Link Dist (ft)		737		561		511		6096
Turn Bay Length (ft)	100		85		105		120	
Base Capacity (vph)	230	360	174	285	198	1169	322	1134
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.17	0.55	0.44	0.19	0.38	0.72	0.08	0.87

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	36	36	145	71	21	28	70	665	110	23	885	20
Future Volume (veh/h)	36	36	145	71	21	28	70	665	110	23	885	20
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1900	1863	1863	1900	1863	1863	1900
Adj Flow Rate, veh/h	39	39	158	77	23	30	76	723	120	25	962	22
Adj No. of Lanes	1	1	0	1	1	0	1	1	0	1	1	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	289	44	178	169	110	143	167	887	147	238	1000	23
Arrive On Green	0.04	0.14	0.14	0.05	0.15	0.15	0.05	0.57	0.57	0.03	0.55	0.55
Sat Flow, veh/h	1774	323	1309	1774	735	959	1774	1558	259	1774	1814	41
Grp Volume(v), veh/h	39	0	197	77	0	53	76	0	843	25	0	984
Grp Sat Flow(s),veh/h/ln	1774	0	1632	1774	0	1694	1774	0	1817	1774	0	1855
Q Serve(g_s), s	2.2	0.0	14.2	4.4	0.0	3.3	2.2	0.0	44.8	0.7	0.0	60.8
Cycle Q Clear(g_c), s	2.2	0.0	14.2	4.4	0.0	3.3	2.2	0.0	44.8	0.7	0.0	60.8
Prop In Lane	1.00		0.80	1.00		0.57	1.00		0.14	1.00		0.02
Lane Grp Cap(c), veh/h	289	0	222	169	0	253	167	0	1034	238	0	1023
V/C Ratio(X)	0.13	0.00	0.89	0.46	0.00	0.21	0.45	0.00	0.82	0.11	0.00	0.96
Avail Cap(c_a), veh/h	350	0	238	207	0	253	211	0	1034	313	0	1023
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	42.0	0.0	50.9	42.5	0.0	44.8	27.5	0.0	20.8	18.6	0.0	25.7
Incr Delay (d2), s/veh	0.2	0.0	29.2	1.9	0.0	0.4	1.9	0.0	7.1	0.2	0.0	20.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.1	0.0	8.2	2.2	0.0	1.6	1.5	0.0	24.3	0.4	0.0	36.7
LnGrp Delay(d),s/veh	42.2	0.0	80.1	44.4	0.0	45.2	29.4	0.0	27.9	18.8	0.0	46.1
LnGrp LOS	D		F	D		D	C		C	B		D
Approach Vol, veh/h		236			130			919			1009	
Approach Delay, s/veh		73.8			44.7			28.0			45.4	
Approach LOS		E			D			C			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	9.9	74.8	12.5	22.9	12.0	72.7	10.9	24.5
Change Period (Y+Rc), s	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5
Max Green Setting (Gmax), s	8.5	59.5	8.5	17.5	8.5	59.5	8.5	17.5
Max Q Clear Time (g_c+I1), s	2.7	46.8	6.4	16.2	4.2	62.8	4.2	5.3
Green Ext Time (p_c), s	0.0	9.2	0.0	0.1	0.0	0.0	0.0	1.0

Intersection Summary	
HCM 2010 Ctrl Delay	41.3
HCM 2010 LOS	D

Lane Group	WBL	WBT	NBT	SBL	SBT
Lane Group Flow (vph)	18	132	743	642	1012
v/c Ratio	0.18	0.18	0.50	0.75	0.34
Control Delay	57.4	0.5	41.1	32.6	2.2
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	57.4	0.5	41.1	32.6	2.2
Queue Length 50th (ft)	14	0	314	347	59
Queue Length 95th (ft)	38	0	385	454	92
Internal Link Dist (ft)		697	409		2564
Turn Bay Length (ft)	150			275	
Base Capacity (vph)	280	839	1475	870	2966
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.06	0.16	0.50	0.74	0.34

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	17	0	121	0	630	53	591	931	0
Future Volume (veh/h)	0	0	0	17	0	121	0	630	53	591	931	0
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1863	1900	1863	1863	1900	1863	1863	1900	1863	1863	1900
Adj Flow Rate, veh/h	0	0	0	18	0	132	0	685	58	642	1012	0
Adj No. of Lanes	0	1	0	1	1	0	1	2	0	1	2	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	0	2	0	179	0	160	60	1634	138	755	2813	0
Arrive On Green	0.00	0.00	0.00	0.10	0.00	0.10	0.00	0.49	0.49	0.49	1.00	0.00
Sat Flow, veh/h	0	1863	0	1774	0	1583	555	3304	279	1774	3632	0
Grp Volume(v), veh/h	0	0	0	18	0	132	0	367	376	642	1012	0
Grp Sat Flow(s),veh/h/ln	0	1863	0	1774	0	1583	555	1770	1813	1774	1770	0
Q Serve(g_s), s	0.0	0.0	0.0	1.1	0.0	9.8	0.0	15.8	15.9	25.7	0.0	0.0
Cycle Q Clear(g_c), s	0.0	0.0	0.0	1.1	0.0	9.8	0.0	15.8	15.9	25.7	0.0	0.0
Prop In Lane	0.00		0.00	1.00		1.00	1.00		0.15	1.00		0.00
Lane Grp Cap(c), veh/h	0	2	0	179	0	160	60	876	897	755	2813	0
V/C Ratio(X)	0.00	0.00	0.00	0.10	0.00	0.83	0.00	0.42	0.42	0.85	0.36	0.00
Avail Cap(c_a), veh/h	0	116	0	281	0	251	60	876	897	918	2813	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00
Upstream Filter(I)	0.00	0.00	0.00	1.00	0.00	1.00	0.00	1.00	1.00	0.87	0.87	0.00
Uniform Delay (d), s/veh	0.0	0.0	0.0	49.0	0.0	52.9	0.0	19.3	19.3	6.8	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.0	0.0	0.2	0.0	12.0	0.0	1.5	1.4	5.7	0.3	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.0	0.0	0.6	0.0	4.8	0.0	8.1	8.3	12.6	0.1	0.0
LnGrp Delay(d),s/veh	0.0	0.0	0.0	49.2	0.0	64.9	0.0	20.8	20.8	12.5	0.3	0.0
LnGrp LOS				D		E		C	C	B	A	
Approach Vol, veh/h		0			150			743			1654	
Approach Delay, s/veh		0.0			63.0			20.8			5.0	
Approach LOS					E			C			A	

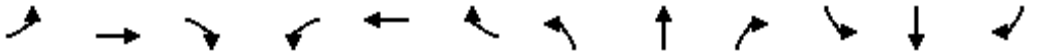
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4		6		8
Phs Duration (G+Y+Rc), s	36.0	65.9		0.0		101.9		18.1
Change Period (Y+Rc), s	6.5	6.5		6.5		6.5		6.0
Max Green Setting (Gmax), s	40.5	27.5		7.5		74.5		19.0
Max Q Clear Time (g_c+I1), s	27.7	17.9		0.0		2.0		11.8
Green Ext Time (p_c), s	1.8	6.6		0.0		17.3		0.4

Intersection Summary	
HCM 2010 Ctrl Delay	13.0
HCM 2010 LOS	B

Lane Group	EBL	EBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	62	73	637	465	405	1507
v/c Ratio	0.28	0.38	0.26	0.37	0.59	0.50
Control Delay	56.5	10.2	14.9	9.0	4.8	1.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	56.5	10.2	14.9	9.0	4.8	1.0
Queue Length 50th (ft)	24	0	122	95	14	28
Queue Length 95th (ft)	46	26	226	221	m22	36
Internal Link Dist (ft)			2564			882
Turn Bay Length (ft)		350		700	150	
Base Capacity (vph)	400	273	2458	1241	791	3042
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.15	0.27	0.26	0.37	0.51	0.50

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	57	0	67	0	0	0	0	586	428	373	1386	0
Future Volume (veh/h)	57	0	67	0	0	0	0	586	428	373	1386	0
Number	7	4	14				5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	0	1863				0	1863	1863	1863	1863	0
Adj Flow Rate, veh/h	62	0	0				0	637	0	405	1507	0
Adj No. of Lanes	2	0	1				0	2	1	1	2	0
Peak Hour Factor	0.92	0.92	0.92				0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	0	2				0	2	2	2	2	0
Cap, veh/h	150	0	69				0	2450	1096	778	3001	0
Arrive On Green	0.04	0.00	0.00				0.00	1.00	0.00	0.19	1.00	0.00
Sat Flow, veh/h	3442	0	1583				0	3632	1583	1774	3632	0
Grp Volume(v), veh/h	62	0	0				0	637	0	405	1507	0
Grp Sat Flow(s),veh/h/ln	1721	0	1583				0	1770	1583	1774	1770	0
Q Serve(g_s), s	2.1	0.0	0.0				0.0	0.0	0.0	8.7	0.0	0.0
Cycle Q Clear(g_c), s	2.1	0.0	0.0				0.0	0.0	0.0	8.7	0.0	0.0
Prop In Lane	1.00		1.00				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	150	0	69				0	2450	1096	778	3001	0
V/C Ratio(X)	0.41	0.00	0.00				0.00	0.26	0.00	0.52	0.50	0.00
Avail Cap(c_a), veh/h	402	0	185				0	2450	1096	945	3001	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	2.00	2.00	2.00	2.00	1.00
Upstream Filter(I)	1.00	0.00	0.00				0.00	0.86	0.00	0.65	0.65	0.00
Uniform Delay (d), s/veh	55.9	0.0	0.0				0.0	0.0	0.0	2.8	0.0	0.0
Incr Delay (d2), s/veh	1.8	0.0	0.0				0.0	0.2	0.0	0.4	0.4	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.0	0.0	0.0				0.0	0.1	0.0	4.0	0.2	0.0
LnGrp Delay(d),s/veh	57.7	0.0	0.0				0.0	0.2	0.0	3.1	0.4	0.0
LnGrp LOS	E							A		A	A	
Approach Vol, veh/h		62						637			1912	
Approach Delay, s/veh		57.7						0.2			1.0	
Approach LOS		E						A			A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4		6		
Phs Duration (G+Y+Rc), s	18.7	90.1		11.2		108.8		
Change Period (Y+Rc), s	7.0	7.0		6.0		7.0		
Max Green Setting (Gmax), s	23.0	63.0		14.0		93.0		
Max Q Clear Time (g_c+I1), s	10.7	2.0		4.1		2.0		
Green Ext Time (p_c), s	1.0	27.0		0.1		30.3		

Intersection Summary	
HCM 2010 Ctrl Delay	2.1
HCM 2010 LOS	A

Lane Group	WBL	WBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	592	215	84	615	1318	115
v/c Ratio	0.39	0.27	1.38	0.39	0.84	0.15
Control Delay	23.2	5.7	278.0	21.7	36.0	4.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	23.2	5.7	278.0	21.7	36.0	4.0
Queue Length 50th (ft)	155	17	~78	132	468	0
Queue Length 95th (ft)	201	63	#180	268	567	34
Internal Link Dist (ft)				882	859	
Turn Bay Length (ft)		225	200			575
Base Capacity (vph)	1530	802	61	1563	1563	763
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.39	0.27	1.38	0.39	0.84	0.15

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	545	0	198	77	566	0	0	1213	106
Future Volume (veh/h)	0	0	0	545	0	198	77	566	0	0	1213	106
Number				3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln				1863	0	1863	1863	1863	0	0	1863	1863
Adj Flow Rate, veh/h				592	0	0	84	615	0	0	1318	0
Adj No. of Lanes				2	0	1	1	2	0	0	2	1
Peak Hour Factor				0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %				2	0	2	2	2	0	0	2	2
Cap, veh/h				1534	0	706	106	1563	0	0	1563	699
Arrive On Green				0.45	0.00	0.00	0.88	0.88	0.00	0.00	0.44	0.00
Sat Flow, veh/h				3442	0	1583	415	3632	0	0	3632	1583
Grp Volume(v), veh/h				592	0	0	84	615	0	0	1318	0
Grp Sat Flow(s),veh/h/ln				1721	0	1583	415	1770	0	0	1770	1583
Q Serve(g_s), s				13.8	0.0	0.0	13.2	3.7	0.0	0.0	39.8	0.0
Cycle Q Clear(g_c), s				13.8	0.0	0.0	53.0	3.7	0.0	0.0	39.8	0.0
Prop In Lane				1.00		1.00	1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				1534	0	706	106	1563	0	0	1563	699
V/C Ratio(X)				0.39	0.00	0.00	0.79	0.39	0.00	0.00	0.84	0.00
Avail Cap(c_a), veh/h				1534	0	706	106	1563	0	0	1563	699
HCM Platoon Ratio				1.00	1.00	1.00	2.00	2.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	0.00	0.98	0.98	0.00	0.00	1.00	0.00
Uniform Delay (d), s/veh				22.3	0.0	0.0	29.9	4.1	0.0	0.0	29.8	0.0
Incr Delay (d2), s/veh				0.7	0.0	0.0	43.5	0.7	0.0	0.0	5.7	0.0
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				6.7	0.0	0.0	4.0	1.9	0.0	0.0	20.6	0.0
LnGrp Delay(d),s/veh				23.0	0.0	0.0	73.4	4.9	0.0	0.0	35.5	0.0
LnGrp LOS				C			E	A			D	
Approach Vol, veh/h					592			699			1318	
Approach Delay, s/veh					23.0			13.1			35.5	
Approach LOS					C			B			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2				6		8
Phs Duration (G+Y+Rc), s		60.0				60.0		60.0
Change Period (Y+Rc), s		7.0				7.0		6.5
Max Green Setting (Gmax), s		53.0				53.0		53.5
Max Q Clear Time (g_c+I1), s		55.0				41.8		15.8
Green Ext Time (p_c), s		0.0				8.8		2.1

Intersection Summary	
HCM 2010 Ctrl Delay	26.7
HCM 2010 LOS	C

Intersection	
Int Delay, s/veh	7.9

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	104	168	114	655	1216	94
Future Vol, veh/h	104	168	114	655	1216	94
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	225	550	-	-	150
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	113	183	124	712	1322	102

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1926	661	1424	0	-	0
Stage 1	1322	-	-	-	-	-
Stage 2	604	-	-	-	-	-
Critical Hdwy	6.84	6.94	4.14	-	-	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	2.22	-	-	-
Pot Cap-1 Maneuver	~ 58	405	474	-	-	-
Stage 1	213	-	-	-	-	-
Stage 2	508	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	~ 43	405	474	-	-	-
Mov Cap-2 Maneuver	123	-	-	-	-	-
Stage 1	157	-	-	-	-	-
Stage 2	508	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	61.8	2.3	0
HCM LOS	F		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	474	-	123	405	-	-
HCM Lane V/C Ratio	0.261	-	0.919	0.451	-	-
HCM Control Delay (s)	15.3	-	127.6	21	-	-
HCM Lane LOS	C	-	F	C	-	-
HCM 95th %tile Q(veh)	1	-	5.9	2.3	-	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

HCS7 Freeway Facilities Report

Project Information

Analyst	KCI Technologies, Inc.	Date	9/13/2019
Agency		Analysis Year	2024
Jurisdiction		Time Period Analyzed	PM Peak Hour
Project Description	Roderick Place TIS: I-840 Eastbound Ramp Background		

Facility Global Input

Jam Density, pc/mi/ln	190.0	Density at Capacity, pc/mi/ln	45.0
Queue Discharge Capacity Drop, %	7	Total Segments	3
Total Time Periods	1	Time Period Duration, min	15
Facility Length, mi	2.00		

Facility Segment Data

No.	Coded	Analyzed	Name	Length, ft	Lanes
1	Basic	Basic	I-840 EB	5280	2
2	Merge	Merge	EB Ramp from Columbia Pike _I-840 EB	1500	2
3	Basic	Basic	I-840 EB	3780	2

Facility Segment Data

Segment 1: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.92	0.962	969	4646	0.21	73.5	6.6	A

Segment 2: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.92	0.92	0.962	0.962	1874	905	4259	2033	0.44	0.45	66.7	66.7	14.0	10.3	B

Segment 3: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.92	0.962	1874	4646	0.40	73.4	12.7	B

Facility Time Period Results

T	Speed, mi/h	Density, pc/mi/ln	Density, veh/mi/ln	Travel Time, min	LOS
1	72.1	9.8	9.4	1.70	A

Facility Overall Results

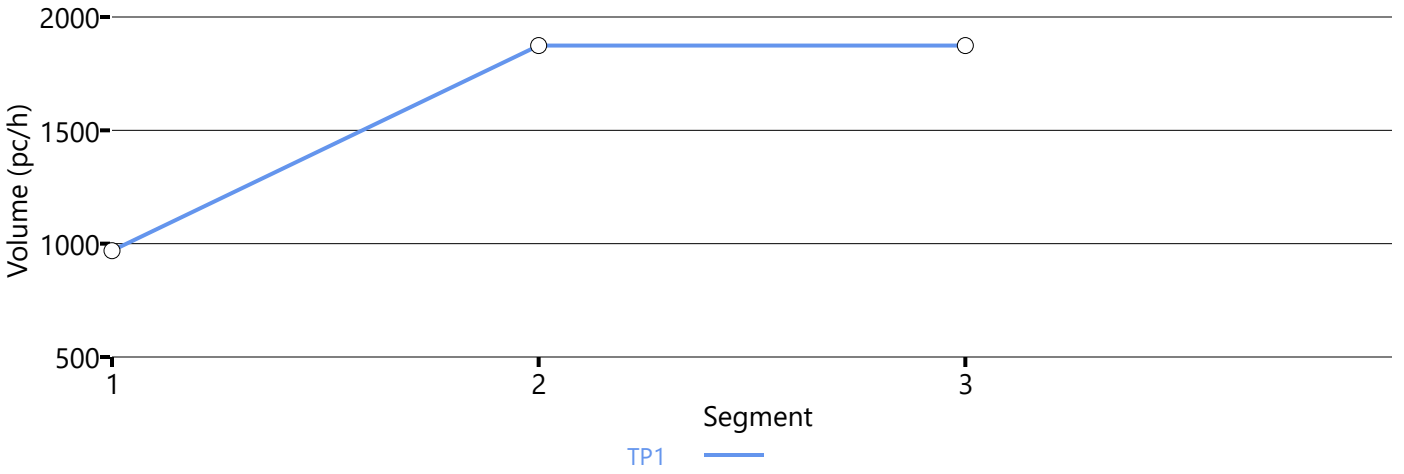
Space Mean Speed, mi/h	72.1	Density, veh/mi/ln	9.4
Average Travel Time, min	1.70	Density, pc/mi/ln	9.8

Messages

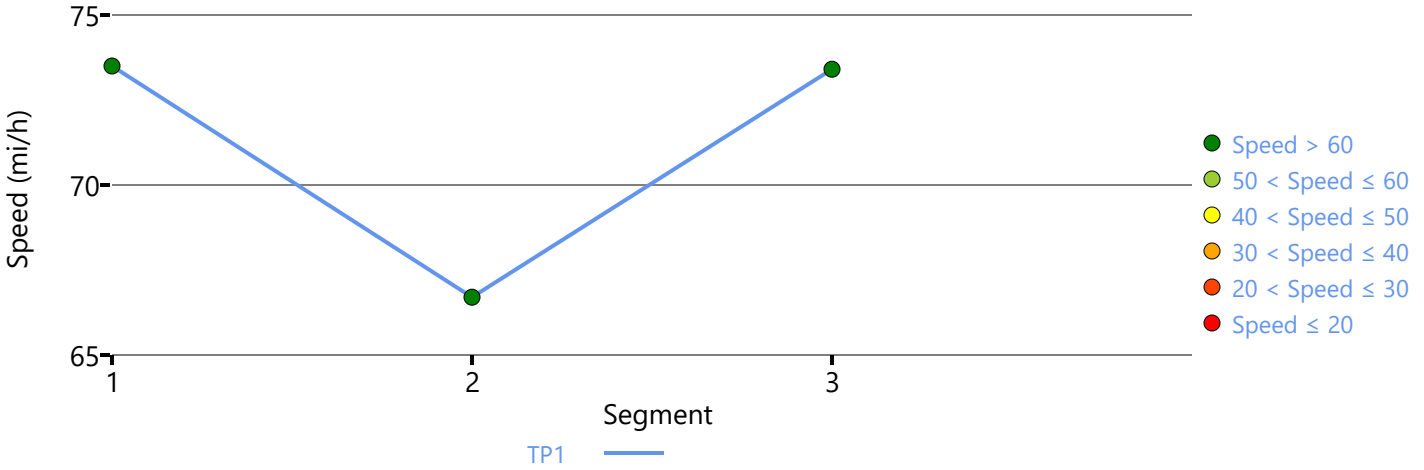
INFORMATION 1	Density for segment 2 in time period 1 is within 0.5 pc/mi/ln of LOS boundary. Be cautious when comparing LOS results.

Comments

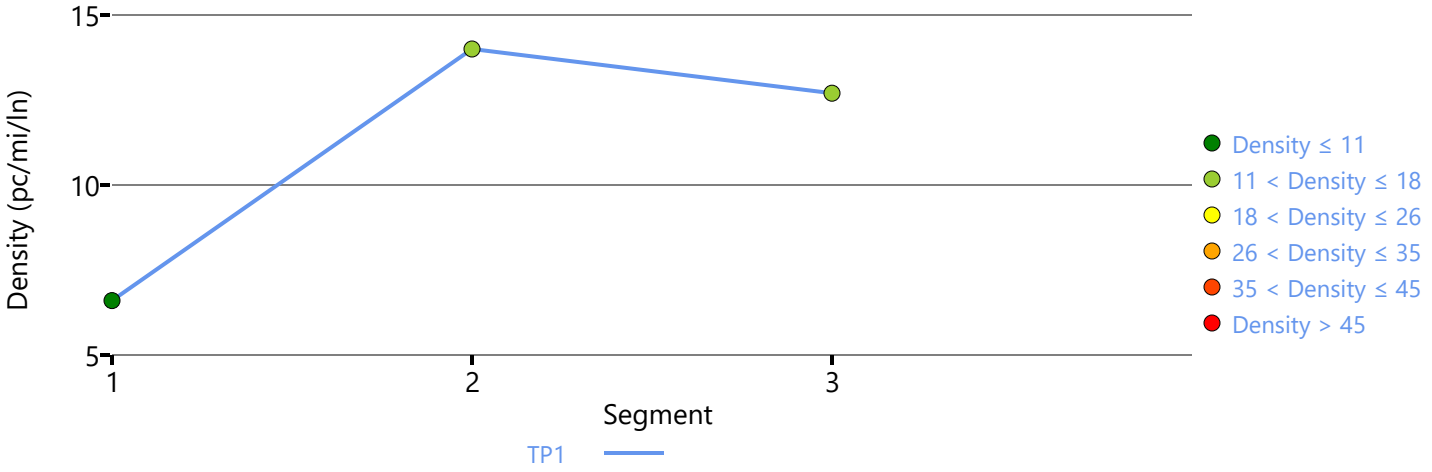
Volume Distribution



Speed Distribution



Density Distribution



HCS7 Freeway Facilities Report

Project Information

Analyst	KCI Technologies, Inc.	Date	9/13/2019
Agency		Analysis Year	2024
Jurisdiction		Time Period Analyzed	PM Peak Hour
Project Description	Roderick Place TIS: I-840 Westbound Ramp Background		

Facility Global Input

Jam Density, pc/mi/ln	190.0	Density at Capacity, pc/mi/ln	45.0
Queue Discharge Capacity Drop, %	7	Total Segments	3
Total Time Periods	1	Time Period Duration, min	15
Facility Length, mi	1.98		

Facility Segment Data

No.	Coded	Analyzed	Name	Length, ft	Lanes
1	Basic	Basic	I-840 WB	5280	2
2	Merge	Merge	WB Ramp from Columbia Pike _I-840 EB	1400	2
3	Basic	Basic	I-840 WB	3780	2

Facility Segment Data

Segment 1: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.92	0.962	1482	4646	0.32	73.5	10.1	A

Segment 2: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.92	0.92	0.962	0.962	1689	207	4259	2033	0.40	0.10	66.9	66.9	12.6	9.2	A

Segment 3: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.92	0.962	1689	4646	0.36	73.4	11.5	B

Facility Time Period Results

T	Speed, mi/h	Density, pc/mi/ln	Density, veh/mi/ln	Travel Time, min	LOS
1	72.4	10.9	10.5	1.60	A

Facility Overall Results

Space Mean Speed, mi/h	72.4	Density, veh/mi/ln	10.5
Average Travel Time, min	1.60	Density, pc/mi/ln	10.9

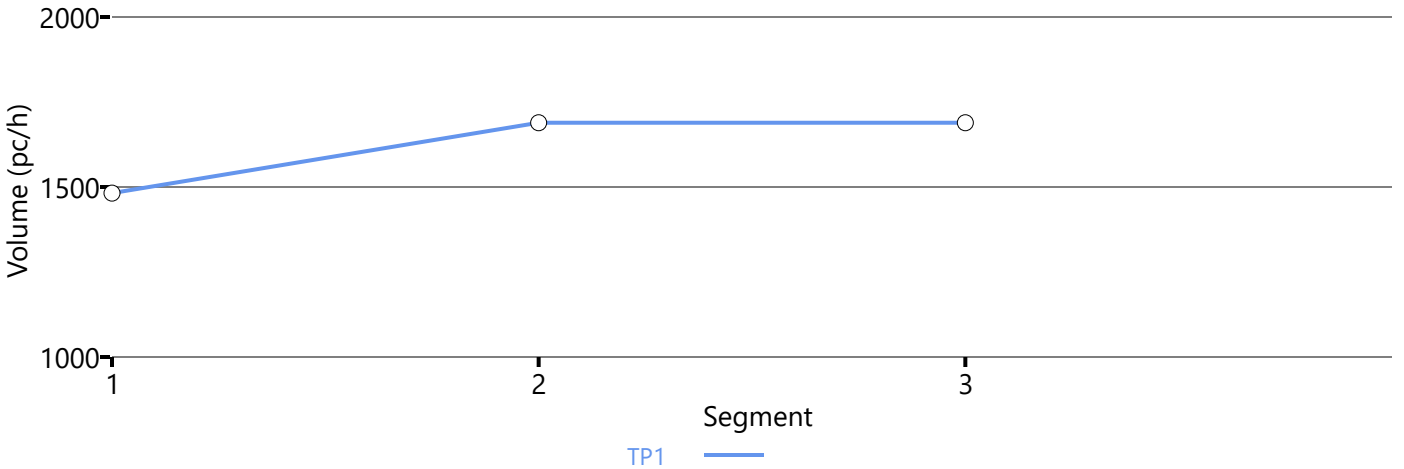
Messages

ERROR 1	Acceleration lane length is longer than the segment length for merge segment 2.

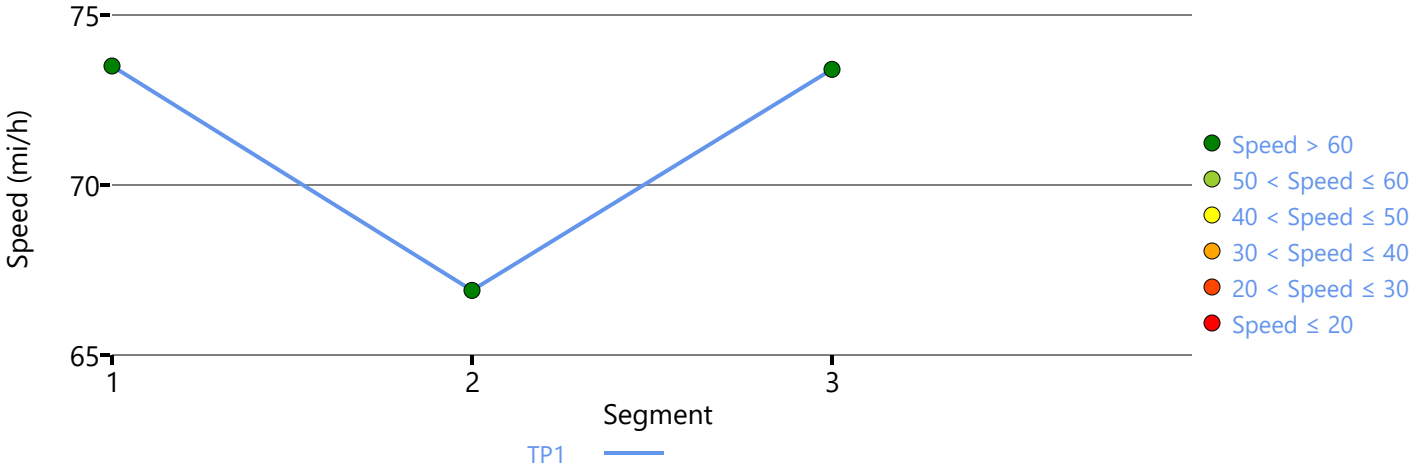
INFORMATION 1	Density for segment 3 in time period 1 is within 0.5 pc/mi/ln of LOS boundary. Be cautious when comparing LOS results.

Comments

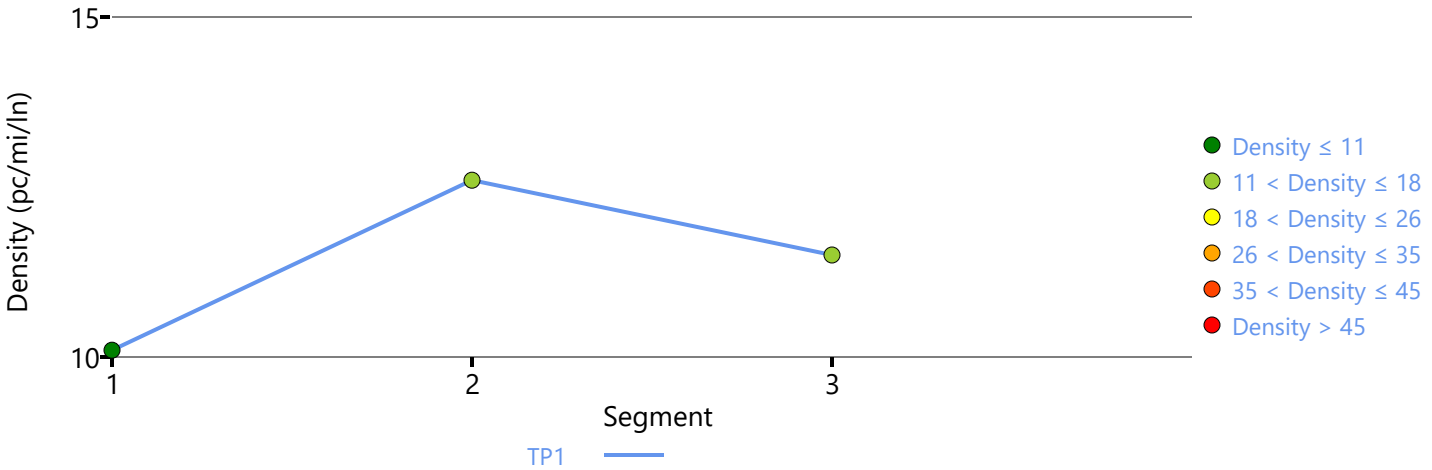
Volume Distribution

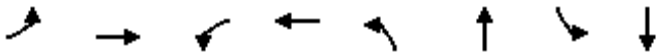


Speed Distribution



Density Distribution

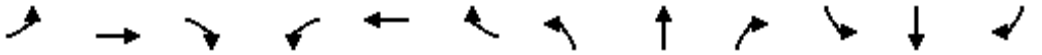




Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	64	154	77	92	93	899	22	753
v/c Ratio	0.26	0.57	0.33	0.45	0.34	0.85	0.11	0.80
Control Delay	27.8	20.7	29.6	32.7	12.0	30.3	9.8	31.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	27.8	20.7	29.6	32.7	12.0	30.3	9.8	31.6
Queue Length 50th (ft)	28	20	34	33	20	358	6	388
Queue Length 95th (ft)	56	74	65	75	46	#865	20	#672
Internal Link Dist (ft)		737		561		511		6096
Turn Bay Length (ft)	100		85		105		120	
Base Capacity (vph)	258	346	239	289	278	1056	232	941
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.25	0.45	0.32	0.32	0.33	0.85	0.09	0.80

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	59	34	108	71	51	34	86	740	87	20	655	38
Future Volume (veh/h)	59	34	108	71	51	34	86	740	87	20	655	38
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1900	1863	1863	1900	1863	1863	1900
Adj Flow Rate, veh/h	64	37	117	77	55	37	93	804	95	22	712	41
Adj No. of Lanes	1	1	0	1	1	0	1	1	0	1	1	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	268	46	147	213	126	85	268	831	98	150	831	48
Arrive On Green	0.05	0.12	0.12	0.06	0.12	0.12	0.06	0.51	0.51	0.03	0.48	0.48
Sat Flow, veh/h	1774	395	1248	1774	1040	700	1774	1635	193	1774	1745	100
Grp Volume(v), veh/h	64	0	154	77	0	92	93	0	899	22	0	753
Grp Sat Flow(s),veh/h/ln	1774	0	1643	1774	0	1739	1774	0	1829	1774	0	1845
Q Serve(g_s), s	2.8	0.0	8.2	3.4	0.0	4.4	2.3	0.0	42.8	0.6	0.0	32.5
Cycle Q Clear(g_c), s	2.8	0.0	8.2	3.4	0.0	4.4	2.3	0.0	42.8	0.6	0.0	32.5
Prop In Lane	1.00		0.76	1.00		0.40	1.00		0.11	1.00		0.05
Lane Grp Cap(c), veh/h	268	0	193	213	0	211	268	0	930	150	0	879
V/C Ratio(X)	0.24	0.00	0.80	0.36	0.00	0.44	0.35	0.00	0.97	0.15	0.00	0.86
Avail Cap(c_a), veh/h	322	0	246	260	0	261	309	0	930	248	0	879
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	32.2	0.0	38.7	32.5	0.0	36.7	17.0	0.0	21.4	20.4	0.0	20.8
Incr Delay (d2), s/veh	0.5	0.0	13.2	1.0	0.0	1.4	0.8	0.0	22.5	0.4	0.0	10.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.4	0.0	4.4	1.7	0.0	2.2	1.2	0.0	27.3	0.3	0.0	19.1
LnGrp Delay(d),s/veh	32.7	0.0	51.9	33.5	0.0	38.1	17.7	0.0	43.9	20.8	0.0	31.4
LnGrp LOS	C		D	C		D	B		D	C		C
Approach Vol, veh/h		218			169			992			775	
Approach Delay, s/veh		46.2			36.0			41.5			31.1	
Approach LOS		D			D			D			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	9.0	52.3	11.6	17.1	11.9	49.4	11.3	17.4
Change Period (Y+Rc), s	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5
Max Green Setting (Gmax), s	7.5	35.5	7.5	13.5	7.5	35.5	7.5	13.5
Max Q Clear Time (g_c+I1), s	2.6	44.8	5.4	10.2	4.3	34.5	4.8	6.4
Green Ext Time (p_c), s	0.0	0.0	0.0	0.4	0.0	0.9	0.0	0.7

Intersection Summary	
HCM 2010 Ctrl Delay	37.8
HCM 2010 LOS	D

Lane Group	WBL	WBT	NBT	SBL	SBT
Lane Group Flow (vph)	51	174	857	128	740
v/c Ratio	0.32	0.30	0.39	0.26	0.27
Control Delay	43.0	1.4	3.3	4.6	3.0
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	43.0	1.4	3.3	4.6	3.0
Queue Length 50th (ft)	28	0	43	11	38
Queue Length 95th (ft)	61	0	m25	34	67
Internal Link Dist (ft)		697	409		2564
Turn Bay Length (ft)	150			275	
Base Capacity (vph)	275	648	2175	576	2727
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.19	0.27	0.39	0.22	0.27

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	47	0	160	0	751	38	118	680	1
Future Volume (veh/h)	0	0	0	47	0	160	0	751	38	118	680	1
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1863	1900	1863	1863	1900	1863	1863	1900	1863	1863	1900
Adj Flow Rate, veh/h	0	0	0	51	0	174	0	816	41	128	739	1
Adj No. of Lanes	0	1	0	1	1	0	1	2	0	1	2	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	0	2	0	234	0	208	80	2035	102	493	2645	4
Arrive On Green	0.00	0.00	0.00	0.13	0.00	0.13	0.00	0.59	0.59	0.13	1.00	1.00
Sat Flow, veh/h	0	1863	0	1774	0	1583	716	3430	172	1774	3627	5
Grp Volume(v), veh/h	0	0	0	51	0	174	0	421	436	128	361	379
Grp Sat Flow(s),veh/h/ln	0	1863	0	1774	0	1583	716	1770	1832	1774	1770	1862
Q Serve(g_s), s	0.0	0.0	0.0	2.3	0.0	9.6	0.0	11.4	11.4	2.3	0.0	0.0
Cycle Q Clear(g_c), s	0.0	0.0	0.0	2.3	0.0	9.6	0.0	11.4	11.4	2.3	0.0	0.0
Prop In Lane	0.00		0.00	1.00		1.00	1.00		0.09	1.00		0.00
Lane Grp Cap(c), veh/h	0	2	0	234	0	208	80	1050	1087	493	1291	1358
V/C Ratio(X)	0.00	0.00	0.00	0.22	0.00	0.83	0.00	0.40	0.40	0.26	0.28	0.28
Avail Cap(c_a), veh/h	0	155	0	276	0	246	80	1050	1087	645	1291	1358
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00
Upstream Filter(I)	0.00	0.00	0.00	1.00	0.00	1.00	0.00	1.00	1.00	0.98	0.98	0.98
Uniform Delay (d), s/veh	0.0	0.0	0.0	34.9	0.0	38.1	0.0	9.8	9.8	5.8	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.0	0.0	0.5	0.0	18.8	0.0	1.1	1.1	0.3	0.5	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.0	0.0	1.2	0.0	5.3	0.0	5.8	6.0	1.1	0.2	0.2
LnGrp Delay(d),s/veh	0.0	0.0	0.0	35.4	0.0	56.9	0.0	10.9	10.9	6.1	0.5	0.5
LnGrp LOS				D		E		B	B	A	A	A
Approach Vol, veh/h		0			225			857			868	
Approach Delay, s/veh		0.0			52.0			10.9			1.3	
Approach LOS					D			B			A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4		6		8
Phs Duration (G+Y+Rc), s	12.3	59.9		0.0		72.2		17.8
Change Period (Y+Rc), s	6.5	6.5		6.5		6.5		6.0
Max Green Setting (Gmax), s	13.5	29.5		7.5		49.5		14.0
Max Q Clear Time (g_c+I1), s	4.3	13.4		0.0		2.0		11.6
Green Ext Time (p_c), s	0.2	8.3		0.0		12.5		0.2

Intersection Summary	
HCM 2010 Ctrl Delay	11.4
HCM 2010 LOS	B

Lane Group	EBL	EBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	28	61	493	391	114	715
v/c Ratio	0.11	0.26	0.20	0.32	0.16	0.24
Control Delay	40.0	2.6	10.2	6.0	1.7	1.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	40.0	2.6	10.2	6.0	1.7	1.4
Queue Length 50th (ft)	7	0	107	82	6	22
Queue Length 95th (ft)	21	0	126	138	12	31
Internal Link Dist (ft)			2564			882
Turn Bay Length (ft)		350		700	150	
Base Capacity (vph)	534	358	2480	1226	779	2924
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.05	0.17	0.20	0.32	0.15	0.24

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	26	0	56	0	0	0	0	454	360	105	658	0
Future Volume (veh/h)	26	0	56	0	0	0	0	454	360	105	658	0
Number	7	4	14				5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	0	1863				0	1863	1863	1863	1863	0
Adj Flow Rate, veh/h	28	0	0				0	493	0	114	715	0
Adj No. of Lanes	2	0	1				0	2	1	1	2	0
Peak Hour Factor	0.92	0.92	0.92				0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	0	2				0	2	2	2	2	0
Cap, veh/h	116	0	53				0	2412	1079	805	2909	0
Arrive On Green	0.03	0.00	0.00				0.00	1.00	0.00	0.13	1.00	0.00
Sat Flow, veh/h	3442	0	1583				0	3632	1583	1774	3632	0
Grp Volume(v), veh/h	28	0	0				0	493	0	114	715	0
Grp Sat Flow(s),veh/h/ln	1721	0	1583				0	1770	1583	1774	1770	0
Q Serve(g_s), s	0.7	0.0	0.0				0.0	0.0	0.0	1.4	0.0	0.0
Cycle Q Clear(g_c), s	0.7	0.0	0.0				0.0	0.0	0.0	1.4	0.0	0.0
Prop In Lane	1.00		1.00				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	116	0	53				0	2412	1079	805	2909	0
V/C Ratio(X)	0.24	0.00	0.00				0.00	0.20	0.00	0.14	0.25	0.00
Avail Cap(c_a), veh/h	535	0	246				0	2412	1079	950	2909	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	2.00	2.00	2.00	2.00	1.00
Upstream Filter(I)	1.00	0.00	0.00				0.00	0.93	0.00	0.96	0.96	0.00
Uniform Delay (d), s/veh	42.4	0.0	0.0				0.0	0.0	0.0	2.5	0.0	0.0
Incr Delay (d2), s/veh	1.1	0.0	0.0				0.0	0.2	0.0	0.1	0.2	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	0.0	0.0				0.0	0.1	0.0	0.7	0.1	0.0
LnGrp Delay(d),s/veh	43.4	0.0	0.0				0.0	0.2	0.0	2.5	0.2	0.0
LnGrp LOS	D							A		A	A	
Approach Vol, veh/h		28						493			829	
Approach Delay, s/veh		43.4						0.2			0.5	
Approach LOS		D						A			A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4		6		
Phs Duration (G+Y+Rc), s	12.7	68.3		9.0		81.0		
Change Period (Y+Rc), s	7.0	7.0		6.0		7.0		
Max Green Setting (Gmax), s	13.0	43.0		14.0		63.0		
Max Q Clear Time (g_c+I1), s	3.4	2.0		2.7		2.0		
Green Ext Time (p_c), s	0.2	9.4		0.0		9.8		

Intersection Summary	
HCM 2010 Ctrl Delay	1.3
HCM 2010 LOS	A

Lane Group	WBL	WBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	355	103	39	475	477	28
v/c Ratio	0.40	0.21	0.07	0.23	0.23	0.03
Control Delay	29.0	6.8	2.6	6.4	9.1	1.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	29.0	6.8	2.6	6.4	9.1	1.7
Queue Length 50th (ft)	85	0	1	8	62	0
Queue Length 95th (ft)	125	38	3	11	87	7
Internal Link Dist (ft)				882	859	
Turn Bay Length (ft)		225	200			575
Base Capacity (vph)	896	489	525	2084	2084	949
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.40	0.21	0.07	0.23	0.23	0.03

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	327	0	95	36	437	0	0	439	26
Future Volume (veh/h)	0	0	0	327	0	95	36	437	0	0	439	26
Number				3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln				1863	0	1863	1863	1863	0	0	1863	1863
Adj Flow Rate, veh/h				355	0	0	39	475	0	0	477	0
Adj No. of Lanes				2	0	1	1	2	0	0	2	1
Peak Hour Factor				0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %				2	0	2	2	2	0	0	2	2
Cap, veh/h				899	0	413	560	2084	0	0	2084	932
Arrive On Green				0.26	0.00	0.00	0.59	0.59	0.00	0.00	0.59	0.00
Sat Flow, veh/h				3442	0	1583	914	3632	0	0	3632	1583
Grp Volume(v), veh/h				355	0	0	39	475	0	0	477	0
Grp Sat Flow(s),veh/h/ln				1721	0	1583	914	1770	0	0	1770	1583
Q Serve(g_s), s				7.6	0.0	0.0	1.9	5.7	0.0	0.0	5.8	0.0
Cycle Q Clear(g_c), s				7.6	0.0	0.0	7.7	5.7	0.0	0.0	5.8	0.0
Prop In Lane				1.00		1.00	1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				899	0	413	560	2084	0	0	2084	932
V/C Ratio(X)				0.40	0.00	0.00	0.07	0.23	0.00	0.00	0.23	0.00
Avail Cap(c_a), veh/h				899	0	413	560	2084	0	0	2084	932
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	0.00	0.99	0.99	0.00	0.00	1.00	0.00
Uniform Delay (d), s/veh				27.4	0.0	0.0	10.6	8.8	0.0	0.0	8.8	0.0
Incr Delay (d2), s/veh				1.3	0.0	0.0	0.2	0.3	0.0	0.0	0.3	0.0
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				3.8	0.0	0.0	0.5	2.8	0.0	0.0	2.9	0.0
LnGrp Delay(d),s/veh				28.7	0.0	0.0	10.9	9.0	0.0	0.0	9.0	0.0
LnGrp LOS				C			B	A			A	
Approach Vol, veh/h					355			514			477	
Approach Delay, s/veh					28.7			9.2			9.0	
Approach LOS					C			A			A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2				6		8
Phs Duration (G+Y+Rc), s		60.0				60.0		30.0
Change Period (Y+Rc), s		7.0				7.0		6.5
Max Green Setting (Gmax), s		53.0				53.0		23.5
Max Q Clear Time (g_c+I1), s		9.7				7.8		9.6
Green Ext Time (p_c), s		7.1				7.2		1.0

Intersection Summary	
HCM 2010 Ctrl Delay	14.3
HCM 2010 LOS	B

Intersection	
Int Delay, s/veh	0.2

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	3	12	9	537	456	6
Future Vol, veh/h	3	12	9	537	456	6
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	225	550	-	-	150
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	3	13	10	584	496	7

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	808	248	503	0	-	0
Stage 1	496	-	-	-	-	-
Stage 2	312	-	-	-	-	-
Critical Hdwy	6.84	6.94	4.14	-	-	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	2.22	-	-	-
Pot Cap-1 Maneuver	319	752	1058	-	-	-
Stage 1	577	-	-	-	-	-
Stage 2	715	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	316	752	1058	-	-	-
Mov Cap-2 Maneuver	431	-	-	-	-	-
Stage 1	572	-	-	-	-	-
Stage 2	715	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	10.6	0.1	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1058	-	431	752	-	-
HCM Lane V/C Ratio	0.009	-	0.008	0.017	-	-
HCM Control Delay (s)	8.4	-	13.4	9.9	-	-
HCM Lane LOS	A	-	B	A	-	-
HCM 95th %tile Q(veh)	0	-	0	0.1	-	-

HCS7 Freeway Facilities Report

Project Information

Analyst	KCI Technologies, Inc.	Date	9/13/2019
Agency		Analysis Year	2024
Jurisdiction		Time Period Analyzed	Saturday
Project Description	Roderick Place TIS: I-840 Eastbound Ramp Background		

Facility Global Input

Jam Density, pc/mi/ln	190.0	Density at Capacity, pc/mi/ln	45.0
Queue Discharge Capacity Drop, %	7	Total Segments	3
Total Time Periods	1	Time Period Duration, min	15
Facility Length, mi	2.00		

Facility Segment Data

No.	Coded	Analyzed	Name	Length, ft	Lanes
1	Basic	Basic	I-840 EB	5280	2
2	Merge	Merge	EB Ramp from Columbia Pike _I-840 EB	1500	2
3	Basic	Basic	I-840 EB	3780	2

Facility Segment Data

Segment 1: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.92	0.962	563	4646	0.12	73.5	3.8	A

Segment 2: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.92	0.92	0.962	0.962	1088	525	4259	2033	0.26	0.26	67.2	67.2	8.1	4.4	A

Segment 3: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.92	0.962	1088	4646	0.23	73.4	7.4	A

Facility Time Period Results

T	Speed, mi/h	Density, pc/mi/ln	Density, veh/mi/ln	Travel Time, min	LOS
1	72.2	5.7	5.5	1.70	A

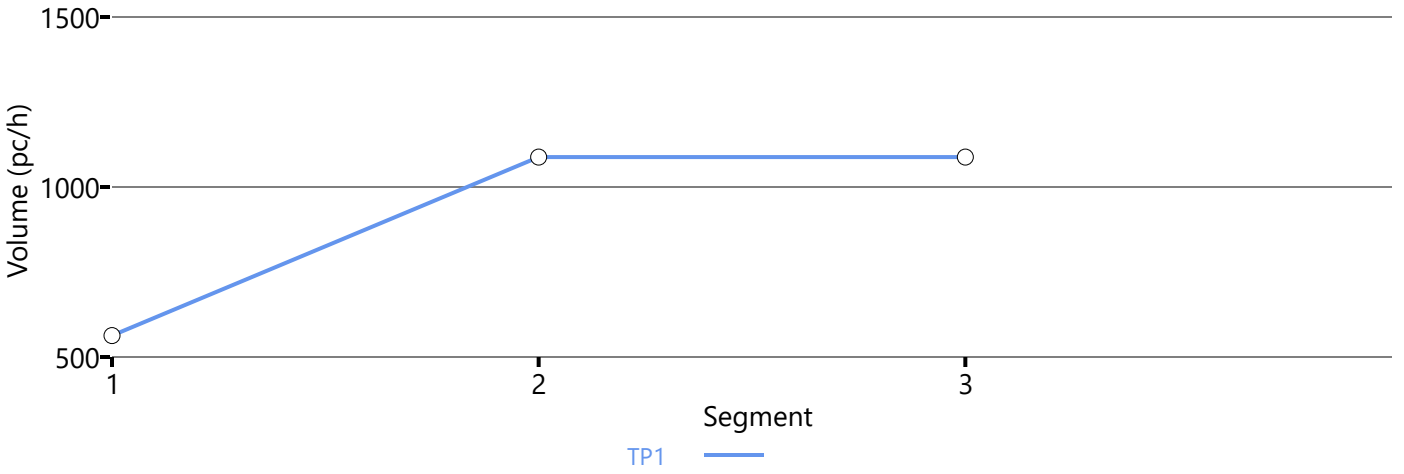
Facility Overall Results

Space Mean Speed, mi/h	72.2	Density, veh/mi/ln	5.5
Average Travel Time, min	1.70	Density, pc/mi/ln	5.7

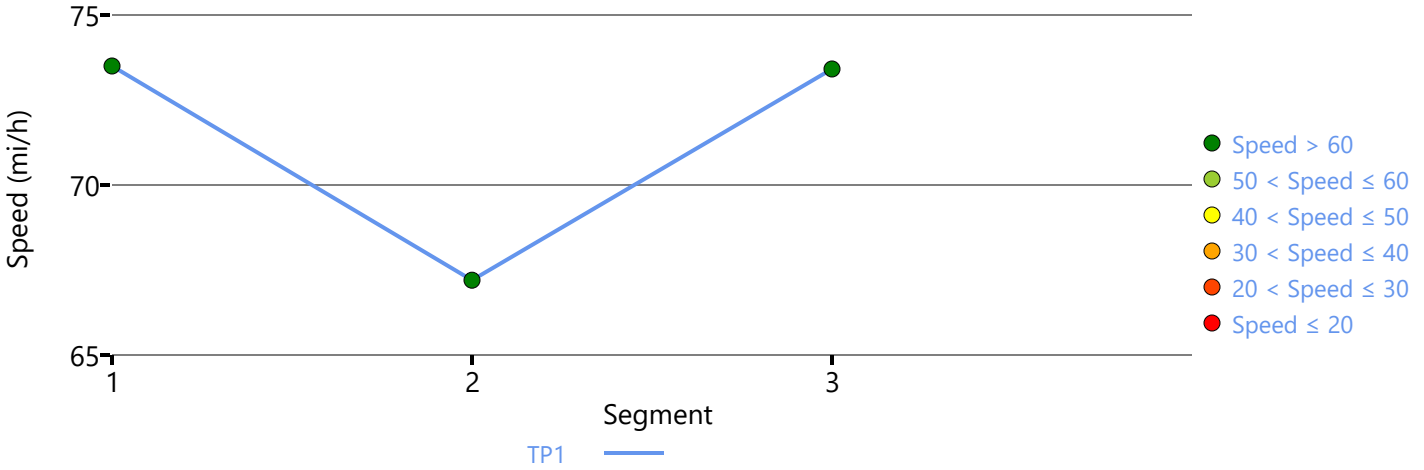
Messages

Comments

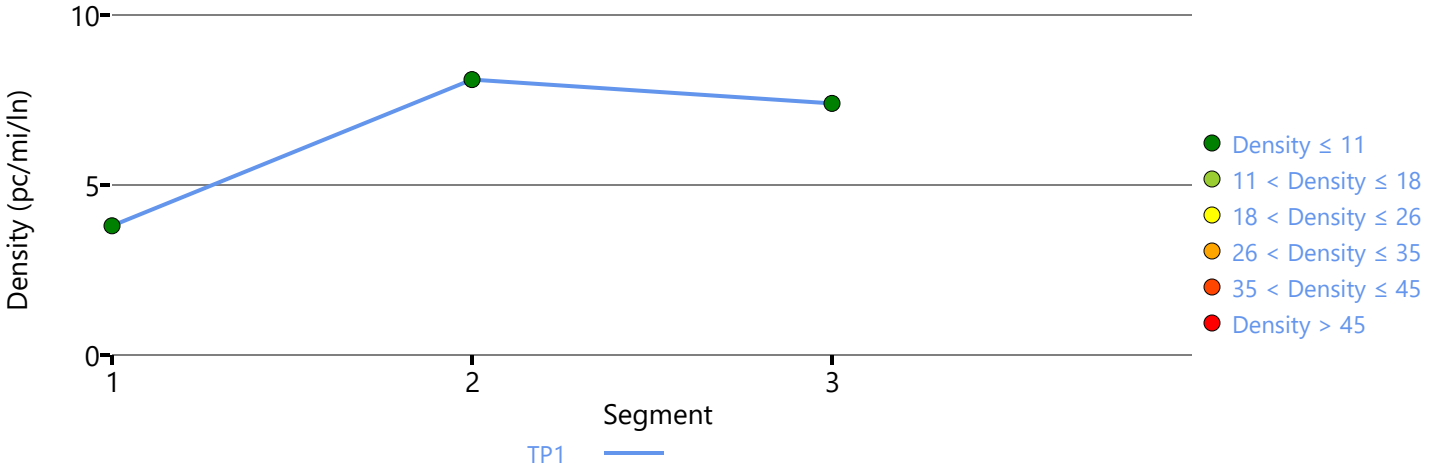
Volume Distribution



Speed Distribution



Density Distribution



HCS7 Freeway Facilities Report

Project Information

Analyst	KCI Technologies, Inc.	Date	9/13/2019
Agency		Analysis Year	2024
Jurisdiction		Time Period Analyzed	Saturday Peak Hour
Project Description	Roderick Place TIS: I-840 Westbound Ramp Background		

Facility Global Input

Jam Density, pc/mi/ln	190.0	Density at Capacity, pc/mi/ln	45.0
Queue Discharge Capacity Drop, %	7	Total Segments	3
Total Time Periods	1	Time Period Duration, min	15
Facility Length, mi	1.98		

Facility Segment Data

No.	Coded	Analyzed	Name	Length, ft	Lanes
1	Basic	Basic	I-840 WB	5280	2
2	Merge	Merge	WB Ramp from Columbia Pike _I-840 EB	1400	2
3	Basic	Basic	I-840 WB	3780	2

Facility Segment Data

Segment 1: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.92	0.962	508	4646	0.11	73.5	3.5	A

Segment 2: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.92	0.92	0.962	0.962	578	70	4259	2033	0.14	0.03	67.3	67.3	4.3	0.6	A

Segment 3: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.92	0.962	579	4646	0.12	73.4	3.9	A

Facility Time Period Results

T	Speed, mi/h	Density, pc/mi/ln	Density, veh/mi/ln	Travel Time, min	LOS
1	72.5	3.8	3.6	1.60	A

Facility Overall Results

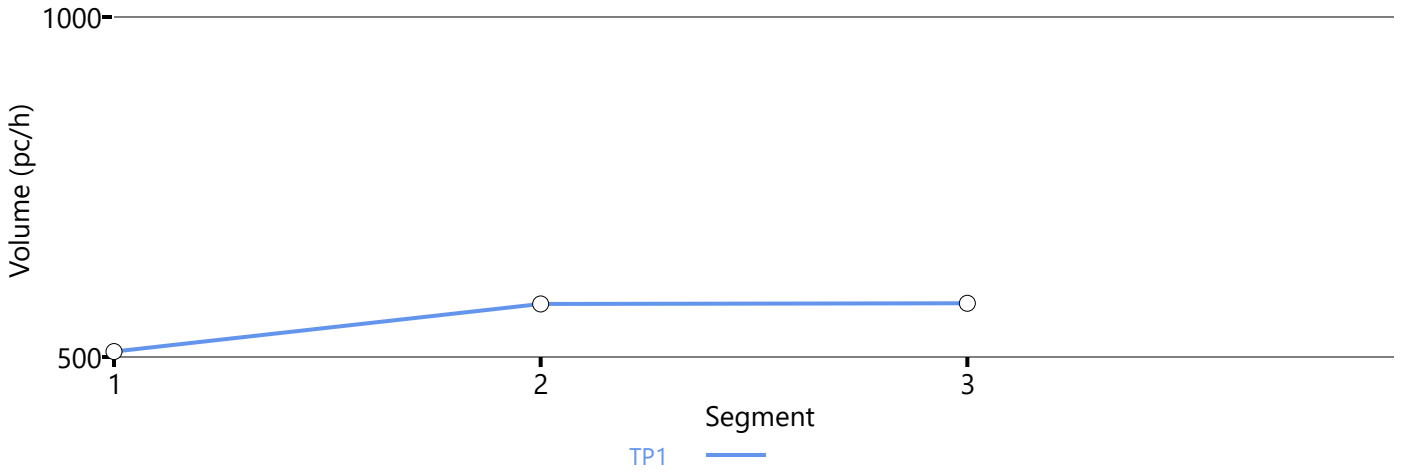
Space Mean Speed, mi/h	72.5	Density, veh/mi/ln	3.6
Average Travel Time, min	1.60	Density, pc/mi/ln	3.8

Messages

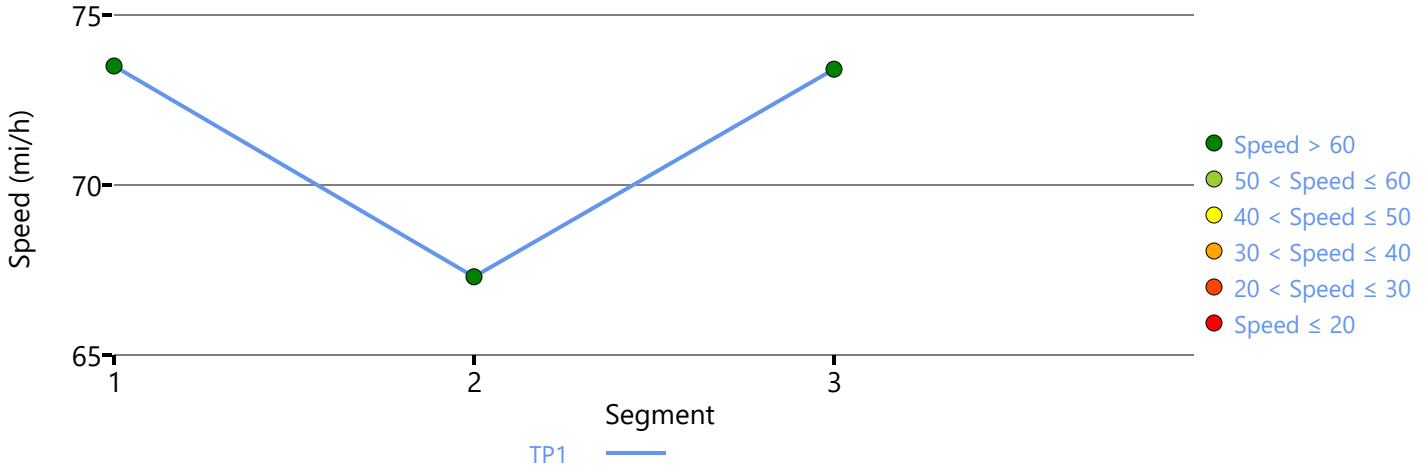
ERROR 1	Acceleration lane length is longer than the segment length for merge segment 2.

Comments

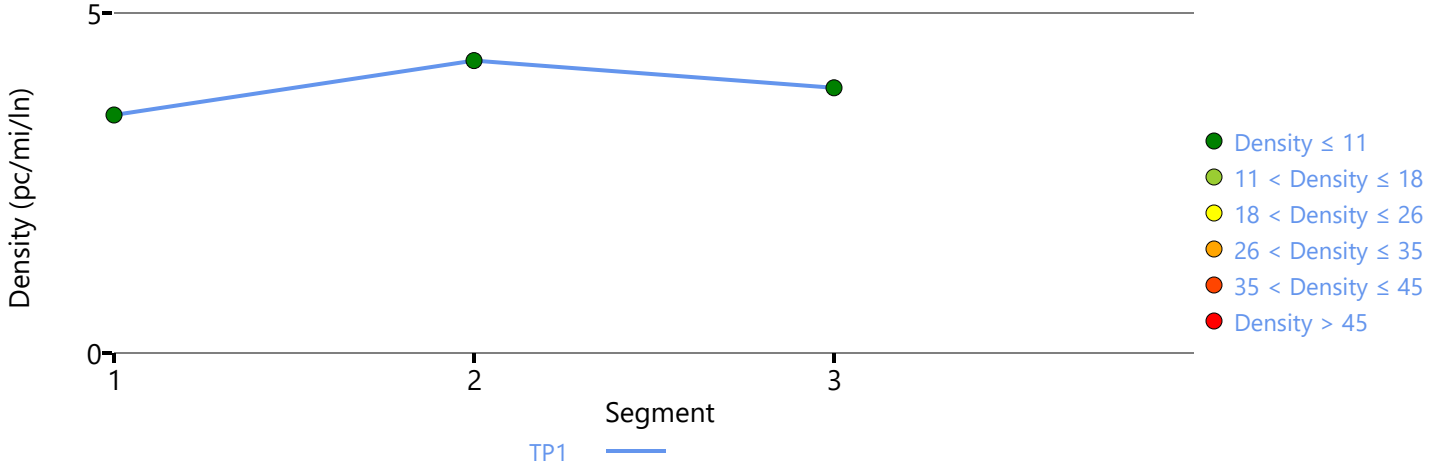
Volume Distribution



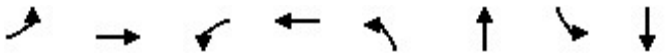
Speed Distribution



Density Distribution



PROJECTED CONDITIONS CAPACITY ANALYSES



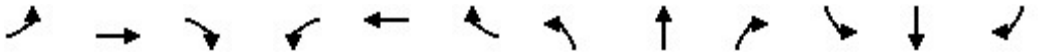
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	50	98	57	167	47	1244	16	602
v/c Ratio	0.23	0.40	0.23	0.66	0.11	1.14	0.09	0.58
Control Delay	30.0	19.6	29.8	36.2	9.4	96.6	10.2	15.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	30.0	19.6	29.8	36.2	9.4	96.6	10.2	15.6
Queue Length 50th (ft)	25	16	28	57	11	~904	2	211
Queue Length 95th (ft)	51	61	56	120	29	#1396	m11	432
Internal Link Dist (ft)		737		561		511		4013
Turn Bay Length (ft)	100		85		105		120	
Base Capacity (vph)	223	330	259	336	447	1095	206	1032
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.22	0.30	0.22	0.50	0.11	1.14	0.08	0.58

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	46	26	64	52	57	97	43	1114	30	15	514	40
Future Volume (veh/h)	46	26	64	52	57	97	43	1114	30	15	514	40
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1845	1845	1900	1845	1845	1900	1845	1845	1900	1845	1845	1900
Adj Flow Rate, veh/h	50	28	70	57	62	105	47	1211	33	16	559	43
Adj No. of Lanes	1	1	0	1	1	0	1	1	0	1	1	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	182	57	141	239	76	129	386	983	27	110	893	69
Arrive On Green	0.05	0.12	0.12	0.05	0.12	0.12	0.04	0.55	0.55	0.02	0.53	0.53
Sat Flow, veh/h	1757	468	1170	1757	616	1044	1757	1787	49	1757	1692	130
Grp Volume(v), veh/h	50	0	98	57	0	167	47	0	1244	16	0	602
Grp Sat Flow(s),veh/h/ln	1757	0	1638	1757	0	1660	1757	0	1836	1757	0	1822
Q Serve(g_s), s	2.4	0.0	5.6	2.8	0.0	9.8	1.2	0.0	55.0	0.4	0.0	23.3
Cycle Q Clear(g_c), s	2.4	0.0	5.6	2.8	0.0	9.8	1.2	0.0	55.0	0.4	0.0	23.3
Prop In Lane	1.00		0.71	1.00		0.63	1.00		0.03	1.00		0.07
Lane Grp Cap(c), veh/h	182	0	198	239	0	205	386	0	1010	110	0	961
V/C Ratio(X)	0.28	0.00	0.49	0.24	0.00	0.81	0.12	0.00	1.23	0.15	0.00	0.63
Avail Cap(c_a), veh/h	234	0	270	287	0	274	476	0	1010	204	0	961
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	0.91	0.00	0.91
Uniform Delay (d), s/veh	36.3	0.0	41.1	35.9	0.0	42.7	12.3	0.0	22.5	24.2	0.0	16.7
Incr Delay (d2), s/veh	0.8	0.0	1.9	0.5	0.0	12.9	0.1	0.0	113.2	0.6	0.0	2.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.2	0.0	2.6	1.4	0.0	5.2	0.6	0.0	59.2	0.2	0.0	12.5
LnGrp Delay(d),s/veh	37.1	0.0	43.0	36.4	0.0	55.6	12.5	0.0	135.7	24.7	0.0	19.5
LnGrp LOS	D		D	D		E	B		F	C		B
Approach Vol, veh/h		148			224			1291			618	
Approach Delay, s/veh		41.0			50.7			131.2			19.6	
Approach LOS		D			D			F			B	

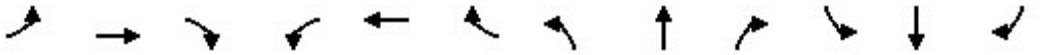
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	8.7	61.5	11.3	18.6	10.9	59.3	11.0	18.9
Change Period (Y+Rc), s	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5
Max Green Setting (Gmax), s	7.5	42.5	7.5	16.5	9.5	40.5	7.5	16.5
Max Q Clear Time (g_c+I1), s	2.4	57.0	4.8	7.6	3.2	25.3	4.4	11.8
Green Ext Time (p_c), s	0.0	0.0	0.0	0.9	0.0	11.3	0.0	0.6

Intersection Summary	
HCM 2010 Ctrl Delay	87.2
HCM 2010 LOS	F

Lane Group	WBL	WBT	NBT	SBL	SBT
Lane Group Flow (vph)	40	412	1381	70	683
v/c Ratio	0.26	0.70	0.58	0.24	0.25
Control Delay	45.8	8.4	17.7	4.4	1.4
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	45.8	8.4	17.7	4.4	1.4
Queue Length 50th (ft)	25	0	485	4	26
Queue Length 95th (ft)	55	34	m424	12	28
Internal Link Dist (ft)		697	409		2564
Turn Bay Length (ft)	150			275	
Base Capacity (vph)	332	697	2387	460	2763
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.12	0.59	0.58	0.15	0.25

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	37	0	379	0	1247	24	64	628	0
Future Volume (veh/h)	0	0	0	37	0	379	0	1247	24	64	628	0
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1845	1900	1845	1845	1900	1845	1845	1900	1845	1845	1900
Adj Flow Rate, veh/h	0	0	0	40	0	412	0	1355	26	70	683	0
Adj No. of Lanes	0	1	0	1	1	0	1	2	0	1	2	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	0	2	0	334	0	298	72	2000	38	278	2401	0
Arrive On Green	0.00	0.00	0.00	0.19	0.00	0.19	0.00	0.57	0.57	0.10	1.00	0.00
Sat Flow, veh/h	0	1845	0	1757	0	1568	748	3518	67	1757	3597	0
Grp Volume(v), veh/h	0	0	0	40	0	412	0	675	706	70	683	0
Grp Sat Flow(s),veh/h/ln	0	1845	0	1757	0	1568	748	1752	1833	1757	1752	0
Q Serve(g_s), s	0.0	0.0	0.0	1.9	0.0	19.0	0.0	27.0	27.1	1.5	0.0	0.0
Cycle Q Clear(g_c), s	0.0	0.0	0.0	1.9	0.0	19.0	0.0	27.0	27.1	1.5	0.0	0.0
Prop In Lane	0.00		0.00	1.00		1.00	1.00		0.04	1.00		0.00
Lane Grp Cap(c), veh/h	0	2	0	334	0	298	72	996	1042	278	2401	0
V/C Ratio(X)	0.00	0.00	0.00	0.12	0.00	1.38	0.00	0.68	0.68	0.25	0.28	0.00
Avail Cap(c_a), veh/h	0	138	0	334	0	298	72	996	1042	495	2401	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00
Upstream Filter(I)	0.00	0.00	0.00	1.00	0.00	1.00	0.00	1.00	1.00	0.95	0.95	0.00
Uniform Delay (d), s/veh	0.0	0.0	0.0	33.6	0.0	40.5	0.0	15.1	15.1	11.2	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.0	0.0	0.2	0.0	191.9	0.0	3.7	3.5	0.4	0.3	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.0	0.0	0.9	0.0	24.1	0.0	14.0	14.6	0.7	0.1	0.0
LnGrp Delay(d),s/veh	0.0	0.0	0.0	33.7	0.0	232.4	0.0	18.8	18.7	11.6	0.3	0.0
LnGrp LOS				C		F		B	B	B	A	
Approach Vol, veh/h		0			452			1381			753	
Approach Delay, s/veh		0.0			214.8			18.8			1.3	
Approach LOS					F			B			A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4		6		8
Phs Duration (G+Y+Rc), s	11.6	63.4		0.0		75.0		25.0
Change Period (Y+Rc), s	6.5	6.5		6.5		6.5		6.0
Max Green Setting (Gmax), s	17.5	30.5		7.5		54.5		19.0
Max Q Clear Time (g_c+I1), s	3.5	29.1		0.0		2.0		21.0
Green Ext Time (p_c), s	0.1	1.3		0.0		21.8		0.0

Intersection Summary	
HCM 2010 Ctrl Delay	48.0
HCM 2010 LOS	D

Lane Group	EBL	EBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	280	91	1179	993	210	864
v/c Ratio	0.61	0.29	0.61	0.79	0.58	0.34
Control Delay	46.2	5.8	29.5	20.8	19.3	9.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	46.2	5.8	29.5	20.8	19.3	9.1
Queue Length 50th (ft)	88	0	358	359	58	120
Queue Length 95th (ft)	124	26	471	498	120	171
Internal Link Dist (ft)			2564			882
Turn Bay Length (ft)		350		700	150	
Base Capacity (vph)	816	467	1944	1250	370	2574
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.34	0.19	0.61	0.79	0.57	0.34

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	258	0	84	0	0	0	0	1085	914	193	795	0
Future Volume (veh/h)	258	0	84	0	0	0	0	1085	914	193	795	0
Number	7	4	14				5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1845	0	1845				0	1845	1845	1845	1845	0
Adj Flow Rate, veh/h	280	0	0				0	1179	0	210	864	0
Adj No. of Lanes	2	0	1				0	2	1	1	2	0
Peak Hour Factor	0.92	0.92	0.92				0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	0	3				0	3	3	3	3	0
Cap, veh/h	366	0	168				0	2206	987	361	2673	0
Arrive On Green	0.11	0.00	0.00				0.00	0.42	0.00	0.13	1.00	0.00
Sat Flow, veh/h	3408	0	1568				0	3597	1568	1757	3597	0
Grp Volume(v), veh/h	280	0	0				0	1179	0	210	864	0
Grp Sat Flow(s),veh/h/ln	1704	0	1568				0	1752	1568	1757	1752	0
Q Serve(g_s), s	8.0	0.0	0.0				0.0	25.1	0.0	4.2	0.0	0.0
Cycle Q Clear(g_c), s	8.0	0.0	0.0				0.0	25.1	0.0	4.2	0.0	0.0
Prop In Lane	1.00		1.00				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	366	0	168				0	2206	987	361	2673	0
V/C Ratio(X)	0.77	0.00	0.00				0.00	0.53	0.00	0.58	0.32	0.00
Avail Cap(c_a), veh/h	818	0	376				0	2206	987	407	2673	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	0.67	0.67	2.00	2.00	1.00
Upstream Filter(I)	1.00	0.00	0.00				0.00	0.79	0.00	0.94	0.94	0.00
Uniform Delay (d), s/veh	43.4	0.0	0.0				0.0	18.0	0.0	10.3	0.0	0.0
Incr Delay (d2), s/veh	3.4	0.0	0.0				0.0	0.7	0.0	1.6	0.3	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.9	0.0	0.0				0.0	12.3	0.0	2.6	0.1	0.0
LnGrp Delay(d),s/veh	46.8	0.0	0.0				0.0	18.7	0.0	11.8	0.3	0.0
LnGrp LOS	D							B		B	A	
Approach Vol, veh/h		280						1179			1074	
Approach Delay, s/veh		46.8						18.7			2.6	
Approach LOS		D						B			A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4		6		
Phs Duration (G+Y+Rc), s	13.3	69.9		16.7		83.3		
Change Period (Y+Rc), s	7.0	7.0		6.0		7.0		
Max Green Setting (Gmax), s	9.0	47.0		24.0		63.0		
Max Q Clear Time (g_c+I1), s	6.2	27.1		10.0		2.0		
Green Ext Time (p_c), s	0.1	13.3		0.7		23.9		

Intersection Summary	
HCM 2010 Ctrl Delay	15.0
HCM 2010 LOS	B

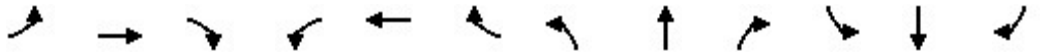
Lane Group	WBL	WBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	360	434	60	1401	714	34
v/c Ratio	0.45	1.06	0.14	0.63	0.32	0.03
Control Delay	34.9	94.5	7.1	16.4	9.1	2.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	34.9	94.5	7.1	16.4	9.1	2.2
Queue Length 50th (ft)	101	~277	24	386	101	0
Queue Length 95th (ft)	145	#470	m19	468	133	10
Internal Link Dist (ft)				882	859	
Turn Bay Length (ft)		225	200			575
Base Capacity (vph)	799	410	422	2208	2208	1001
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.45	1.06	0.14	0.63	0.32	0.03

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	331	0	399	55	1289	0	0	657	31
Future Volume (veh/h)	0	0	0	331	0	399	55	1289	0	0	657	31
Number				3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln				1845	0	1845	1845	1845	0	0	1845	1845
Adj Flow Rate, veh/h				360	0	0	60	1401	0	0	714	0
Adj No. of Lanes				2	0	1	1	2	0	0	2	1
Peak Hour Factor				0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %				3	0	3	3	3	0	0	3	3
Cap, veh/h				801	0	368	461	2208	0	0	2208	988
Arrive On Green				0.23	0.00	0.00	0.42	0.42	0.00	0.00	0.63	0.00
Sat Flow, veh/h				3408	0	1568	726	3597	0	0	3597	1568
Grp Volume(v), veh/h				360	0	0	60	1401	0	0	714	0
Grp Sat Flow(s),veh/h/ln				1704	0	1568	726	1752	0	0	1752	1568
Q Serve(g_s), s				9.0	0.0	0.0	5.6	31.6	0.0	0.0	9.5	0.0
Cycle Q Clear(g_c), s				9.0	0.0	0.0	15.1	31.6	0.0	0.0	9.5	0.0
Prop In Lane				1.00		1.00	1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				801	0	368	461	2208	0	0	2208	988
V/C Ratio(X)				0.45	0.00	0.00	0.13	0.63	0.00	0.00	0.32	0.00
Avail Cap(c_a), veh/h				801	0	368	461	2208	0	0	2208	988
HCM Platoon Ratio				1.00	1.00	1.00	0.67	0.67	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	0.00	0.76	0.76	0.00	0.00	1.00	0.00
Uniform Delay (d), s/veh				32.7	0.0	0.0	18.3	19.8	0.0	0.0	8.6	0.0
Incr Delay (d2), s/veh				1.8	0.0	0.0	0.4	1.1	0.0	0.0	0.4	0.0
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				4.5	0.0	0.0	1.2	15.6	0.0	0.0	4.7	0.0
LnGrp Delay(d),s/veh				34.5	0.0	0.0	18.7	20.9	0.0	0.0	9.0	0.0
LnGrp LOS				C			B	C			A	
Approach Vol, veh/h					360			1461			714	
Approach Delay, s/veh					34.5			20.8			9.0	
Approach LOS					C			C			A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2				6		8
Phs Duration (G+Y+Rc), s		70.0				70.0		30.0
Change Period (Y+Rc), s		7.0				7.0		6.5
Max Green Setting (Gmax), s		63.0				63.0		23.5
Max Q Clear Time (g_c+I1), s		33.6				11.5		11.0
Green Ext Time (p_c), s		18.7				25.4		1.0

Intersection Summary	
HCM 2010 Ctrl Delay	19.4
HCM 2010 LOS	B

Intersection	
Int Delay, s/veh	126.3

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	125	252	640	1047	436	405
Future Vol, veh/h	125	252	640	1047	436	405
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	225	550	-	-	150
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	3	3	3	3	3	3
Mvmt Flow	136	274	696	1138	474	440

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	2435	237	914	0	-	0
Stage 1	474	-	-	-	-	-
Stage 2	1961	-	-	-	-	-
Critical Hdwy	6.86	6.96	4.16	-	-	-
Critical Hdwy Stg 1	5.86	-	-	-	-	-
Critical Hdwy Stg 2	5.86	-	-	-	-	-
Follow-up Hdwy	3.53	3.33	2.23	-	-	-
Pot Cap-1 Maneuver	~ 26	761	735	-	-	-
Stage 1	589	-	-	-	-	-
Stage 2	~ 94	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	~ 1	761	735	-	-	-
Mov Cap-2 Maneuver	~ 22	-	-	-	-	-
Stage 1	~ 31	-	-	-	-	-
Stage 2	~ 94	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	$ 896.5	17.1	0
HCM LOS	F		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	735	-	22	761	-	-
HCM Lane V/C Ratio	0.946	-	6.176	0.36	-	-
HCM Control Delay (s)	45.1	$	2678.9	12.4	-	-
HCM Lane LOS	E	-	F	B	-	-
HCM 95th %tile Q(veh)	13.9	-	17.2	1.6	-	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	104	105	1266	84	174	549
v/c Ratio	0.53	0.39	1.16	0.09	0.69	0.39
Control Delay	50.8	12.2	103.1	11.1	31.4	5.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	50.8	12.2	103.1	11.1	31.4	5.4
Queue Length 50th (ft)	63	0	~985	29	52	45
Queue Length 95th (ft)	113	46	m#968	m34	137	235
Internal Link Dist (ft)	381		4013			560
Turn Bay Length (ft)		75		50	150	
Base Capacity (vph)	411	448	1089	931	339	1396
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.25	0.23	1.16	0.09	0.51	0.39

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	96	97	1165	77	160	505
Future Volume (veh/h)	96	97	1165	77	160	505
Number	3	18	2	12	1	6
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1845	1845	1845	1845	1845	1845
Adj Flow Rate, veh/h	104	105	1266	84	174	549
Adj No. of Lanes	1	1	1	1	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3
Cap, veh/h	158	141	1175	999	209	1438
Arrive On Green	0.09	0.09	0.64	0.64	0.08	0.78
Sat Flow, veh/h	1757	1568	1845	1568	1757	1845
Grp Volume(v), veh/h	104	105	1266	84	174	549
Grp Sat Flow(s),veh/h/ln	1757	1568	1845	1568	1757	1845
Q Serve(g_s), s	5.7	6.5	63.7	2.1	5.6	9.3
Cycle Q Clear(g_c), s	5.7	6.5	63.7	2.1	5.6	9.3
Prop In Lane	1.00	1.00		1.00	1.00	
Lane Grp Cap(c), veh/h	158	141	1175	999	209	1438
V/C Ratio(X)	0.66	0.74	1.08	0.08	0.83	0.38
Avail Cap(c_a), veh/h	413	368	1175	999	344	1438
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.09	0.09	1.00	1.00
Uniform Delay (d), s/veh	44.0	44.4	18.2	7.0	33.0	3.5
Incr Delay (d2), s/veh	4.6	7.5	36.7	0.0	8.7	0.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.0	3.1	44.0	0.9	5.2	5.0
LnGrp Delay(d),s/veh	48.5	51.8	54.8	7.0	41.7	4.2
LnGrp LOS	D	D	F	A	D	A
Approach Vol, veh/h	209		1350			723
Approach Delay, s/veh	50.2		51.8			13.2
Approach LOS	D		D			B

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	14.3	70.2				84.5		15.5
Change Period (Y+Rc), s	6.5	6.5				6.5		6.5
Max Green Setting (Gmax), s	15.5	41.5				63.5		23.5
Max Q Clear Time (g_c+I1), s	7.6	65.7				11.3		8.5
Green Ext Time (p_c), s	0.3	0.0				25.4		0.5

Intersection Summary	
HCM 2010 Ctrl Delay	39.5
HCM 2010 LOS	D

Intersection	
Int Delay, s/veh	0.7

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	43	1229	33	0	665
Future Vol, veh/h	0	43	1229	33	0	665
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	3	3	3	3	3	3
Mvmt Flow	0	47	1336	36	0	723

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	-	1354	0	0	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.23	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.327	-	-	-	-
Pot Cap-1 Maneuver	0	182	-	-	0	-
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	-	182	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	31.5	0	0
HCM LOS	D		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBT
Capacity (veh/h)	-	-	182	-
HCM Lane V/C Ratio	-	-	0.257	-
HCM Control Delay (s)	-	-	31.5	-
HCM Lane LOS	-	-	D	-
HCM 95th %tile Q(veh)	-	-	1	-

HCS7 Freeway Facilities Report

Project Information

Analyst	KCI Technologies, Inc.	Date	9/13/2019
Agency		Analysis Year	2024
Jurisdiction		Time Period Analyzed	AM Peak Hour
Project Description	Roderick Place TIS: I-840 Westbound Ramp		

Facility Global Input

Jam Density, pc/mi/ln	190.0	Density at Capacity, pc/mi/ln	45.0
Queue Discharge Capacity Drop, %	7	Total Segments	3
Total Time Periods	1	Time Period Duration, min	15
Facility Length, mi	1.98		

Facility Segment Data

No.	Coded	Analyzed	Name	Length, ft	Lanes
1	Basic	Basic	I-840 WB	5280	2
2	Merge	Merge	WB Ramp from Columbia Pike _I-840 EB	1400	2
3	Basic	Basic	I-840 WB	3780	2

Facility Segment Data

Segment 1: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.92	0.943	674	4646	0.15	73.5	4.6	A

Segment 2: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.92	0.92	0.943	0.943	773	99	4259	2033	0.18	0.05	67.3	67.3	5.7	2.1	A

Segment 3: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.92	0.943	773	4646	0.17	73.4	5.3	A

Facility Time Period Results

T	Speed, mi/h	Density, pc/mi/ln	Density, veh/mi/ln	Travel Time, min	LOS
1	72.5	5.0	4.7	1.60	A

Facility Overall Results

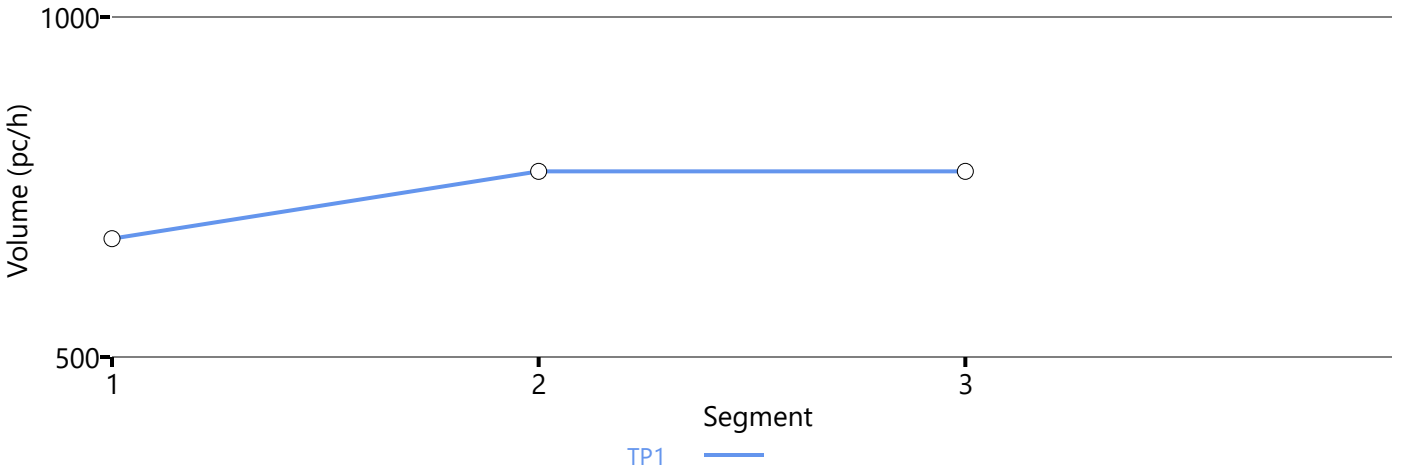
Space Mean Speed, mi/h	72.5	Density, veh/mi/ln	4.7
Average Travel Time, min	1.60	Density, pc/mi/ln	5.0

Messages

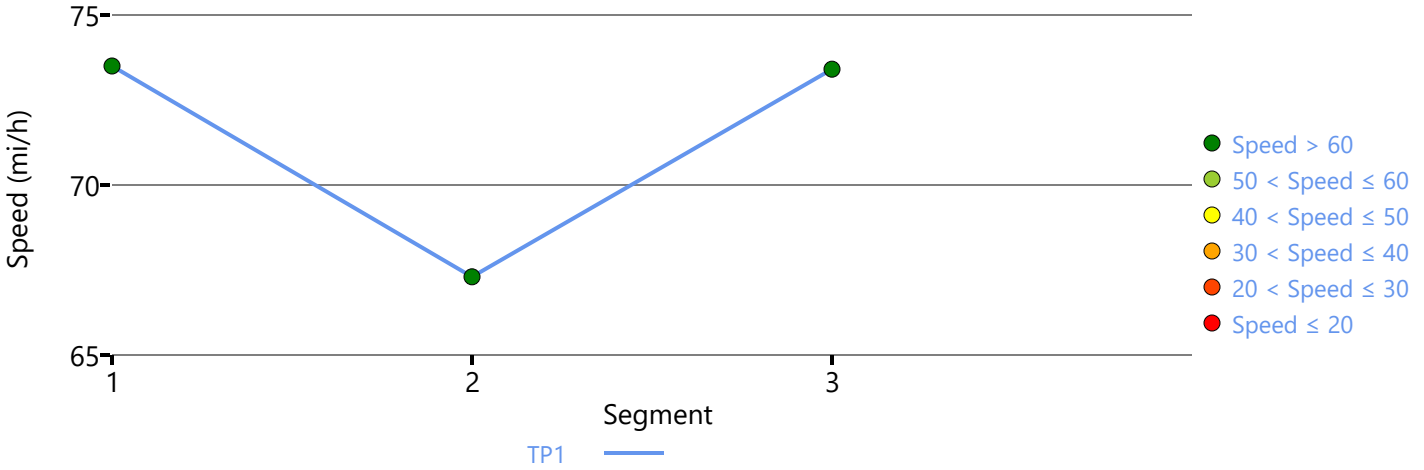
ERROR 1	Acceleration lane length is longer than the segment length for merge segment 2.

Comments

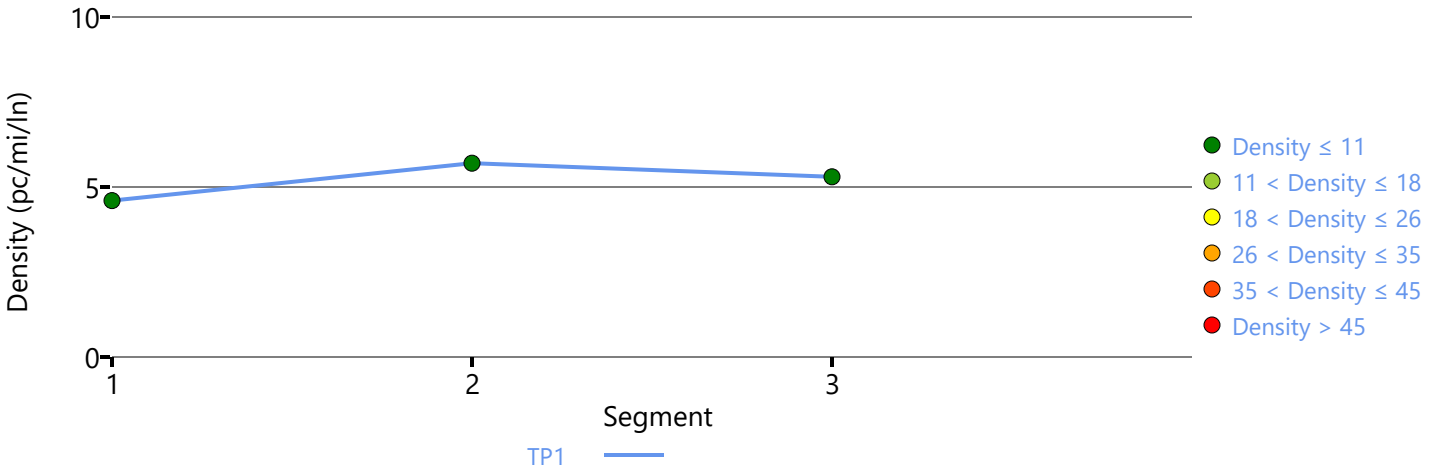
Volume Distribution



Speed Distribution



Density Distribution



HCS7 Freeway Facilities Report

Project Information

Analyst	KCI Technologies, Inc.	Date	9/13/2019
Agency		Analysis Year	2024
Jurisdiction		Time Period Analyzed	AM Peak Hour
Project Description	Roderick Place TIS: I-840 Eastbound Ramp		

Facility Global Input

Jam Density, pc/mi/ln	190.0	Density at Capacity, pc/mi/ln	45.0
Queue Discharge Capacity Drop, %	7	Total Segments	3
Total Time Periods	1	Time Period Duration, min	15
Facility Length, mi	2.00		

Facility Segment Data

No.	Coded	Analyzed	Name	Length, ft	Lanes
1	Basic	Basic	I-840 EB	5280	2
2	Merge	Merge	EB Ramp from Columbia Pike _I-840 EB	1500	2
3	Basic	Basic	I-840 EB	3780	2

Facility Segment Data

Segment 1: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.92	0.943	1298	4646	0.28	73.5	8.8	A

Segment 2: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.92	0.92	0.943	0.943	2574	1276	4259	2033	0.60	0.63	65.9	65.9	19.5	15.6	B

Segment 3: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.92	0.943	2574	4646	0.55	72.4	17.8	B

Facility Time Period Results

T	Speed, mi/h	Density, pc/mi/ln	Density, veh/mi/ln	Travel Time, min	LOS
1	71.4	13.5	12.8	1.70	B

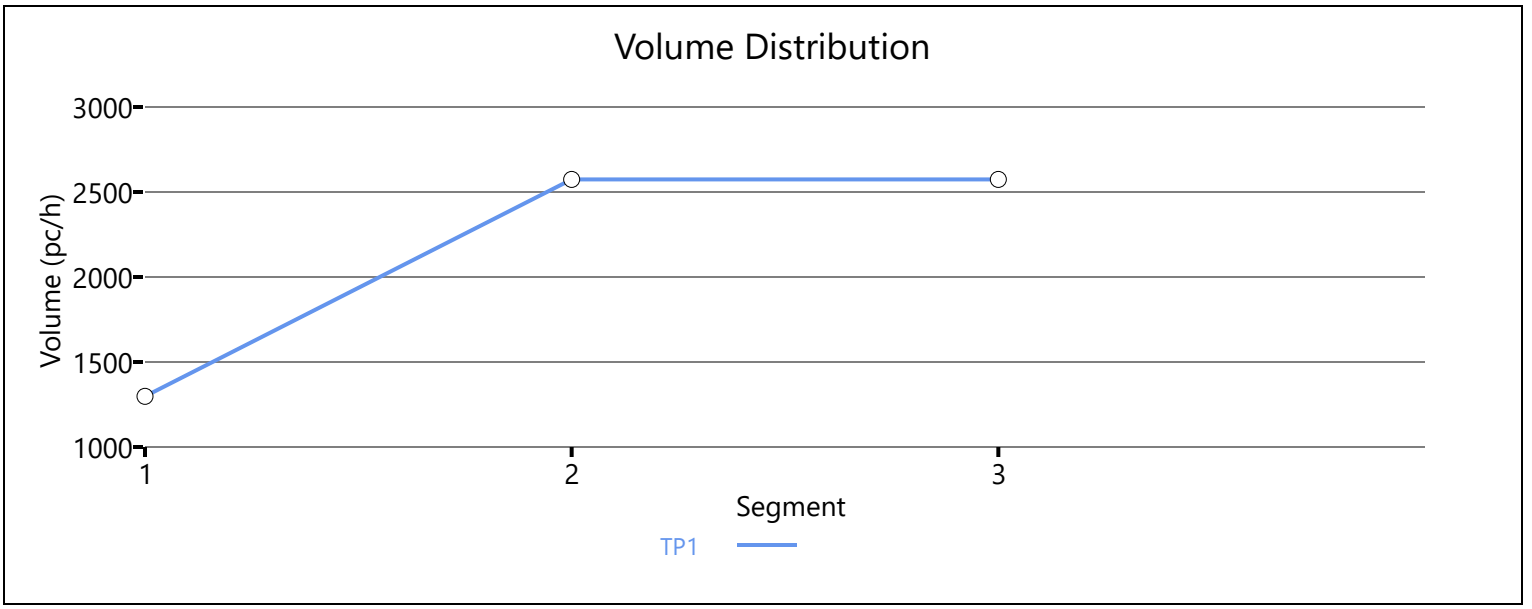
Facility Overall Results

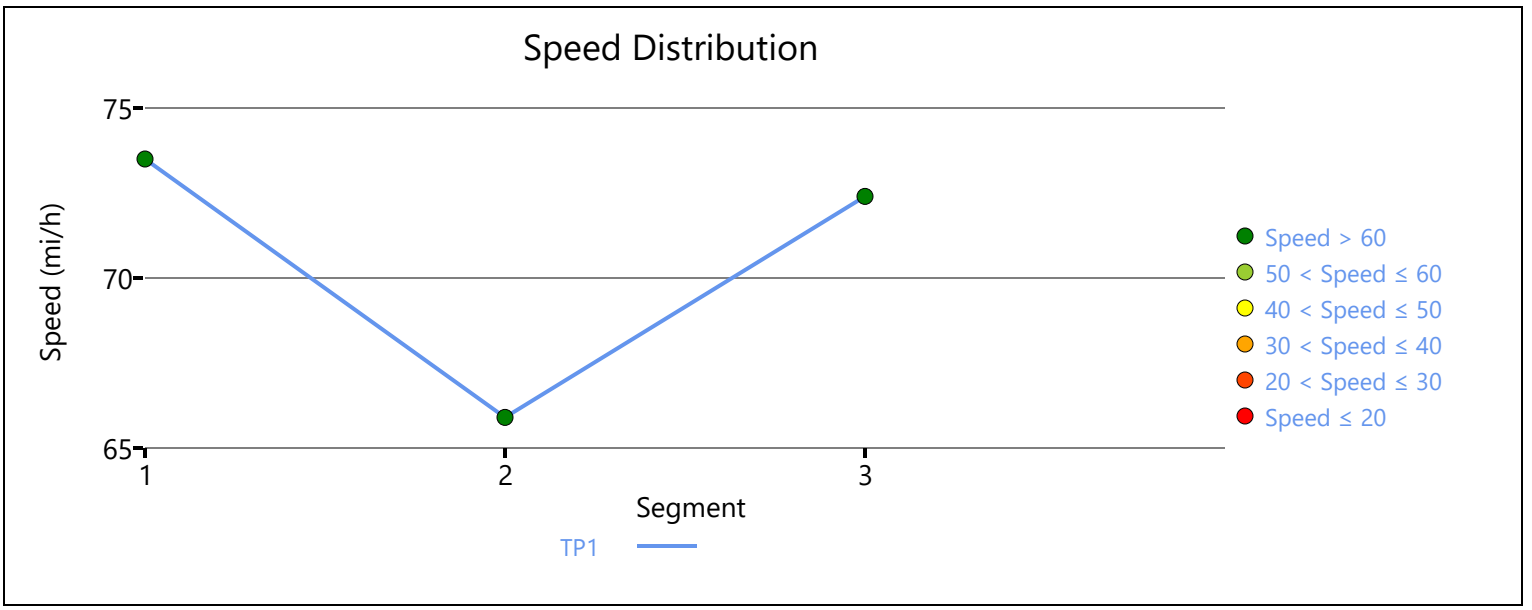
Space Mean Speed, mi/h	71.4	Density, veh/mi/ln	12.8
Average Travel Time, min	1.70	Density, pc/mi/ln	13.5

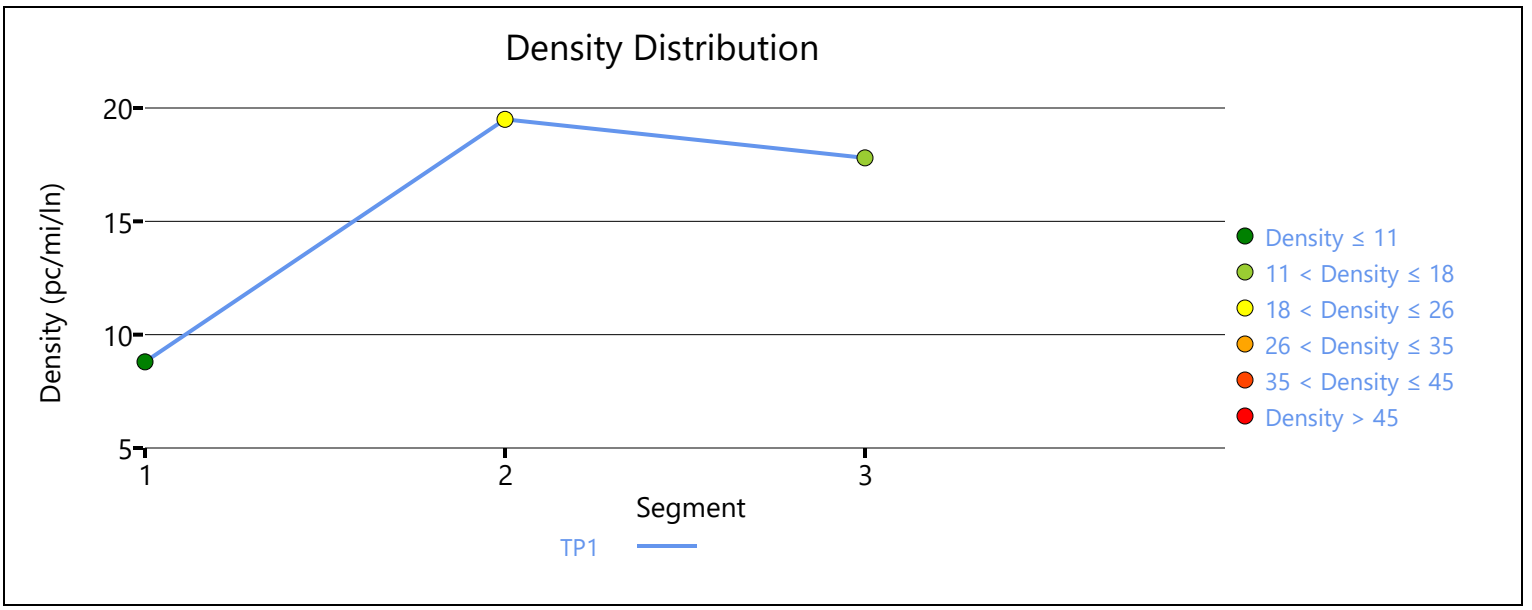
Messages

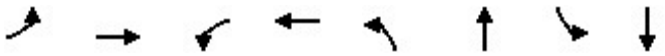
INFORMATION 1	Density for segment 3 in time period 1 is within 0.5 pc/mi/ln of LOS boundary. Be cautious when comparing LOS results.

Comments









Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	46	197	77	57	76	953	28	1092
v/c Ratio	0.21	0.72	0.44	0.31	0.45	0.82	0.13	0.96
Control Delay	38.8	31.5	46.2	28.5	22.5	27.5	10.8	43.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	38.8	31.5	46.2	28.5	22.5	27.5	10.8	43.2
Queue Length 50th (ft)	29	41	50	17	18	608	9	~763
Queue Length 95th (ft)	58	114	86	56	65	#1038	m14	#1277
Internal Link Dist (ft)		737		561		511		4013
Turn Bay Length (ft)	100		85		105		120	
Base Capacity (vph)	229	360	180	276	187	1169	252	1133
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.20	0.55	0.43	0.21	0.41	0.82	0.11	0.96

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	42	36	145	71	21	31	70	766	110	26	980	25
Future Volume (veh/h)	42	36	145	71	21	31	70	766	110	26	980	25
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1900	1863	1863	1900	1863	1863	1900
Adj Flow Rate, veh/h	46	39	158	77	23	34	76	833	120	28	1065	27
Adj No. of Lanes	1	1	0	1	1	0	1	1	0	1	1	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	286	44	178	169	100	148	142	903	130	168	997	25
Arrive On Green	0.04	0.14	0.14	0.05	0.15	0.15	0.05	0.57	0.57	0.03	0.55	0.55
Sat Flow, veh/h	1774	323	1309	1774	680	1005	1774	1593	229	1774	1809	46
Grp Volume(v), veh/h	46	0	197	77	0	57	76	0	953	28	0	1092
Grp Sat Flow(s),veh/h/ln	1774	0	1632	1774	0	1685	1774	0	1822	1774	0	1855
Q Serve(g_s), s	2.6	0.0	14.2	4.4	0.0	3.6	2.2	0.0	57.0	0.8	0.0	66.2
Cycle Q Clear(g_c), s	2.6	0.0	14.2	4.4	0.0	3.6	2.2	0.0	57.0	0.8	0.0	66.2
Prop In Lane	1.00		0.80	1.00		0.60	1.00		0.13	1.00		0.02
Lane Grp Cap(c), veh/h	286	0	223	169	0	247	142	0	1033	168	0	1022
V/C Ratio(X)	0.16	0.00	0.89	0.46	0.00	0.23	0.54	0.00	0.92	0.17	0.00	1.07
Avail Cap(c_a), veh/h	342	0	238	207	0	247	186	0	1033	240	0	1022
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	0.66	0.00	0.66
Uniform Delay (d), s/veh	41.9	0.0	50.9	42.5	0.0	45.2	28.4	0.0	23.6	23.9	0.0	26.9
Incr Delay (d2), s/veh	0.3	0.0	29.1	1.9	0.0	0.5	3.1	0.0	14.6	0.3	0.0	43.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.3	0.0	8.2	2.2	0.0	1.7	1.5	0.0	32.5	0.5	0.0	45.9
LnGrp Delay(d),s/veh	42.2	0.0	80.0	44.4	0.0	45.7	31.5	0.0	38.2	24.3	0.0	70.4
LnGrp LOS	D		F	D		D	C		D	C		F
Approach Vol, veh/h		243			134			1029			1120	
Approach Delay, s/veh		72.9			44.9			37.7			69.2	
Approach LOS		E			D			D			E	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	10.1	74.5	12.5	22.9	12.0	72.7	11.2	24.1
Change Period (Y+Rc), s	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5
Max Green Setting (Gmax), s	8.5	59.5	8.5	17.5	8.5	59.5	8.5	17.5
Max Q Clear Time (g_c+I1), s	2.8	59.0	6.4	16.2	4.2	68.2	4.6	5.6
Green Ext Time (p_c), s	0.0	0.5	0.0	0.1	0.0	0.0	0.0	1.0

Intersection Summary	
HCM 2010 Ctrl Delay	55.4
HCM 2010 LOS	E

Lane Group	WBL	WBT	NBT	SBL	SBT
Lane Group Flow (vph)	34	132	910	642	1176
v/c Ratio	0.29	0.18	0.63	0.81	0.40
Control Delay	59.2	0.5	30.2	39.8	2.4
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	59.2	0.5	30.2	39.8	2.4
Queue Length 50th (ft)	26	0	379	399	53
Queue Length 95th (ft)	59	0	437	497	124
Internal Link Dist (ft)		697	409		2564
Turn Bay Length (ft)	150			275	
Base Capacity (vph)	280	836	1443	805	2937
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.12	0.16	0.63	0.80	0.40

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	31	0	121	0	771	66	591	1082	0
Future Volume (veh/h)	0	0	0	31	0	121	0	771	66	591	1082	0
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1863	1900	1863	1863	1900	1863	1863	1900	1863	1863	1900
Adj Flow Rate, veh/h	0	0	0	34	0	132	0	838	72	642	1176	0
Adj No. of Lanes	0	1	0	1	1	0	1	2	0	1	2	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	0	2	0	180	0	161	60	1630	140	693	2812	0
Arrive On Green	0.00	0.00	0.00	0.10	0.00	0.10	0.00	0.49	0.49	0.49	1.00	0.00
Sat Flow, veh/h	0	1863	0	1774	0	1583	475	3299	283	1774	3632	0
Grp Volume(v), veh/h	0	0	0	34	0	132	0	449	461	642	1176	0
Grp Sat Flow(s),veh/h/ln	0	1863	0	1774	0	1583	475	1770	1813	1774	1770	0
Q Serve(g_s), s	0.0	0.0	0.0	2.1	0.0	9.8	0.0	20.7	20.7	25.7	0.0	0.0
Cycle Q Clear(g_c), s	0.0	0.0	0.0	2.1	0.0	9.8	0.0	20.7	20.7	25.7	0.0	0.0
Prop In Lane	0.00		0.00	1.00		1.00	1.00		0.16	1.00		0.00
Lane Grp Cap(c), veh/h	0	2	0	180	0	161	60	874	895	693	2812	0
V/C Ratio(X)	0.00	0.00	0.00	0.19	0.00	0.82	0.00	0.51	0.51	0.93	0.42	0.00
Avail Cap(c_a), veh/h	0	116	0	281	0	251	60	874	895	855	2812	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00
Upstream Filter(I)	0.00	0.00	0.00	1.00	0.00	1.00	0.00	1.00	1.00	0.81	0.81	0.00
Uniform Delay (d), s/veh	0.0	0.0	0.0	49.4	0.0	52.9	0.0	20.6	20.6	9.1	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.0	0.0	0.5	0.0	11.6	0.0	2.2	2.1	11.8	0.4	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.0	0.0	1.1	0.0	4.8	0.0	10.6	10.9	13.7	0.1	0.0
LnGrp Delay(d),s/veh	0.0	0.0	0.0	49.9	0.0	64.5	0.0	22.8	22.7	20.9	0.4	0.0
LnGrp LOS				D		E		C	C	C	A	
Approach Vol, veh/h		0			166			910			1818	
Approach Delay, s/veh		0.0			61.5			22.7			7.6	
Approach LOS					E			C			A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4		6		8
Phs Duration (G+Y+Rc), s	36.1	65.8		0.0		101.8		18.2
Change Period (Y+Rc), s	6.5	6.5		6.5		6.5		6.0
Max Green Setting (Gmax), s	40.5	27.5		7.5		74.5		19.0
Max Q Clear Time (g_c+I1), s	27.7	22.7		0.0		2.0		11.8
Green Ext Time (p_c), s	1.8	4.1		0.0		24.3		0.4

Intersection Summary	
HCM 2010 Ctrl Delay	15.5
HCM 2010 LOS	B

Lane Group	EBL	EBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	62	78	721	535	405	1665
v/c Ratio	0.28	0.40	0.30	0.43	0.65	0.57
Control Delay	56.5	11.9	18.8	11.1	6.7	1.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	56.5	11.9	18.8	11.1	6.7	1.2
Queue Length 50th (ft)	24	0	172	143	16	33
Queue Length 95th (ft)	46	31	283	272	m29	42
Internal Link Dist (ft)			2564			882
Turn Bay Length (ft)		350		700	150	
Base Capacity (vph)	400	273	2375	1238	732	2930
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.15	0.29	0.30	0.43	0.55	0.57

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	57	0	72	0	0	0	0	663	492	373	1532	0
Future Volume (veh/h)	57	0	72	0	0	0	0	663	492	373	1532	0
Number	7	4	14				5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	0	1863				0	1863	1863	1863	1863	0
Adj Flow Rate, veh/h	62	0	0				0	721	0	405	1665	0
Adj No. of Lanes	2	0	1				0	2	1	1	2	0
Peak Hour Factor	0.92	0.92	0.92				0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	0	2				0	2	2	2	2	0
Cap, veh/h	150	0	69				0	2450	1096	737	3001	0
Arrive On Green	0.04	0.00	0.00				0.00	1.00	0.00	0.19	1.00	0.00
Sat Flow, veh/h	3442	0	1583				0	3632	1583	1774	3632	0
Grp Volume(v), veh/h	62	0	0				0	721	0	405	1665	0
Grp Sat Flow(s),veh/h/ln	1721	0	1583				0	1770	1583	1774	1770	0
Q Serve(g_s), s	2.1	0.0	0.0				0.0	0.0	0.0	8.7	0.0	0.0
Cycle Q Clear(g_c), s	2.1	0.0	0.0				0.0	0.0	0.0	8.7	0.0	0.0
Prop In Lane	1.00		1.00				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	150	0	69				0	2450	1096	737	3001	0
V/C Ratio(X)	0.41	0.00	0.00				0.00	0.29	0.00	0.55	0.55	0.00
Avail Cap(c_a), veh/h	402	0	185				0	2450	1096	904	3001	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	2.00	2.00	2.00	2.00	1.00
Upstream Filter(I)	1.00	0.00	0.00				0.00	0.74	0.00	0.63	0.63	0.00
Uniform Delay (d), s/veh	55.9	0.0	0.0				0.0	0.0	0.0	2.8	0.0	0.0
Incr Delay (d2), s/veh	1.8	0.0	0.0				0.0	0.2	0.0	0.4	0.5	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.0	0.0	0.0				0.0	0.1	0.0	4.0	0.2	0.0
LnGrp Delay(d),s/veh	57.7	0.0	0.0				0.0	0.2	0.0	3.2	0.5	0.0
LnGrp LOS	E							A		A	A	
Approach Vol, veh/h		62						721			2070	
Approach Delay, s/veh		57.7						0.2			1.0	
Approach LOS		E						A			A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4		6		
Phs Duration (G+Y+Rc), s	18.7	90.1		11.2		108.8		
Change Period (Y+Rc), s	7.0	7.0		6.0		7.0		
Max Green Setting (Gmax), s	23.0	63.0		14.0		93.0		
Max Q Clear Time (g_c+I1), s	10.7	2.0		4.1		2.0		
Green Ext Time (p_c), s	1.0	32.6		0.1		38.4		

Intersection Summary	
HCM 2010 Ctrl Delay	2.0
HCM 2010 LOS	A

Lane Group	WBL	WBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	667	215	89	693	1402	115
v/c Ratio	0.47	0.29	1.46	0.41	0.83	0.14
Control Delay	27.1	7.8	307.6	18.4	32.9	3.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	27.1	7.8	307.6	18.4	32.9	3.5
Queue Length 50th (ft)	191	26	~87	121	484	0
Queue Length 95th (ft)	244	77	#193	261	584	32
Internal Link Dist (ft)				882	859	
Turn Bay Length (ft)		225	200			575
Base Capacity (vph)	1416	746	61	1681	1681	812
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.47	0.29	1.46	0.41	0.83	0.14

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	614	0	198	82	638	0	0	1290	106
Future Volume (veh/h)	0	0	0	614	0	198	82	638	0	0	1290	106
Number				3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln				1863	0	1863	1863	1863	0	0	1863	1863
Adj Flow Rate, veh/h				667	0	0	89	693	0	0	1402	0
Adj No. of Lanes				2	0	1	1	2	0	0	2	1
Peak Hour Factor				0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %				2	0	2	2	2	0	0	2	2
Cap, veh/h				1420	0	653	110	1681	0	0	1681	752
Arrive On Green				0.41	0.00	0.00	0.95	0.95	0.00	0.00	0.47	0.00
Sat Flow, veh/h				3442	0	1583	383	3632	0	0	3632	1583
Grp Volume(v), veh/h				667	0	0	89	693	0	0	1402	0
Grp Sat Flow(s),veh/h/ln				1721	0	1583	383	1770	0	0	1770	1583
Q Serve(g_s), s				16.9	0.0	0.0	15.7	1.9	0.0	0.0	41.3	0.0
Cycle Q Clear(g_c), s				16.9	0.0	0.0	57.0	1.9	0.0	0.0	41.3	0.0
Prop In Lane				1.00		1.00	1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				1420	0	653	110	1681	0	0	1681	752
V/C Ratio(X)				0.47	0.00	0.00	0.81	0.41	0.00	0.00	0.83	0.00
Avail Cap(c_a), veh/h				1420	0	653	110	1681	0	0	1681	752
HCM Platoon Ratio				1.00	1.00	1.00	2.00	2.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	0.00	0.96	0.96	0.00	0.00	1.00	0.00
Uniform Delay (d), s/veh				25.7	0.0	0.0	27.1	1.6	0.0	0.0	27.4	0.0
Incr Delay (d2), s/veh				1.1	0.0	0.0	44.1	0.7	0.0	0.0	5.0	0.0
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				8.3	0.0	0.0	4.3	0.9	0.0	0.0	21.2	0.0
LnGrp Delay(d),s/veh				26.8	0.0	0.0	71.2	2.3	0.0	0.0	32.4	0.0
LnGrp LOS				C			E	A			C	
Approach Vol, veh/h					667			782			1402	
Approach Delay, s/veh					26.8			10.2			32.4	
Approach LOS					C			B			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2				6		8
Phs Duration (G+Y+Rc), s		64.0				64.0		56.0
Change Period (Y+Rc), s		7.0				7.0		6.5
Max Green Setting (Gmax), s		57.0				57.0		49.5
Max Q Clear Time (g_c+I1), s		59.0				43.3		18.9
Green Ext Time (p_c), s		0.0				10.9		2.4

Intersection Summary	
HCM 2010 Ctrl Delay	25.0
HCM 2010 LOS	C

Intersection	
Int Delay, s/veh	11.1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	104	198	142	699	1263	94
Future Vol, veh/h	104	198	142	699	1263	94
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	225	550	-	-	150
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	113	215	154	760	1373	102

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	2061	687	1475	0	-	0
Stage 1	1373	-	-	-	-	-
Stage 2	688	-	-	-	-	-
Critical Hdwy	6.84	6.94	4.14	-	-	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	2.22	-	-	-
Pot Cap-1 Maneuver	~ 47	389	453	-	-	-
Stage 1	200	-	-	-	-	-
Stage 2	460	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	~ 31	389	453	-	-	-
Mov Cap-2 Maneuver	~ 103	-	-	-	-	-
Stage 1	132	-	-	-	-	-
Stage 2	460	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	83.6	2.9	0
HCM LOS	F		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	453	-	103	389	-	-
HCM Lane V/C Ratio	0.341	-	1.098	0.553	-	-
HCM Control Delay (s)	17	-	195.1	25.1	-	-
HCM Lane LOS	C	-	F	D	-	-
HCM 95th %tile Q(veh)	1.5	-	7.2	3.2	-	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	118	118	763	87	186	1023
v/c Ratio	0.60	0.42	0.63	0.08	0.42	0.70
Control Delay	63.1	12.9	20.6	6.3	5.2	8.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	63.1	12.9	20.6	6.3	5.2	8.1
Queue Length 50th (ft)	89	0	579	23	28	286
Queue Length 95th (ft)	145	53	731	m30	58	377
Internal Link Dist (ft)	381		4013			560
Turn Bay Length (ft)		75		50	150	
Base Capacity (vph)	346	404	1218	1043	449	1454
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.34	0.29	0.63	0.08	0.41	0.70

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	109	109	702	80	171	941
Future Volume (veh/h)	109	109	702	80	171	941
Number	3	18	2	12	1	6
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	118	118	763	87	186	1023
Adj No. of Lanes	1	1	1	1	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	167	149	1292	1098	459	1485
Arrive On Green	0.09	0.09	0.69	0.69	0.05	0.80
Sat Flow, veh/h	1774	1583	1863	1583	1774	1863
Grp Volume(v), veh/h	118	118	763	87	186	1023
Grp Sat Flow(s),veh/h/ln	1774	1583	1863	1583	1774	1863
Q Serve(g_s), s	7.7	8.8	25.5	2.1	3.4	29.6
Cycle Q Clear(g_c), s	7.7	8.8	25.5	2.1	3.4	29.6
Prop In Lane	1.00	1.00		1.00	1.00	
Lane Grp Cap(c), veh/h	167	149	1292	1098	459	1485
V/C Ratio(X)	0.71	0.79	0.59	0.08	0.41	0.69
Avail Cap(c_a), veh/h	347	310	1292	1098	481	1485
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.52	0.52	1.00	1.00
Uniform Delay (d), s/veh	52.7	53.2	9.6	6.0	8.3	5.5
Incr Delay (d2), s/veh	5.4	9.0	1.0	0.1	0.6	2.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.1	4.2	13.3	0.9	2.0	15.9
LnGrp Delay(d),s/veh	58.1	62.2	10.6	6.0	8.9	8.1
LnGrp LOS	E	E	B	A	A	A
Approach Vol, veh/h	236		850			1209
Approach Delay, s/veh	60.2		10.1			8.2
Approach LOS	E		B			A

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	12.5	89.7				102.2		17.8
Change Period (Y+Rc), s	6.5	6.5				6.5		6.5
Max Green Setting (Gmax), s	7.5	69.5				83.5		23.5
Max Q Clear Time (g_c+I1), s	5.4	27.5				31.6		10.8
Green Ext Time (p_c), s	0.1	19.5				21.2		0.6

Intersection Summary	
HCM 2010 Ctrl Delay	14.3
HCM 2010 LOS	B

Intersection	
Int Delay, s/veh	0.4

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	51	775	36	0	1112
Future Vol, veh/h	0	51	775	36	0	1112
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	55	842	39	0	1209

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	-	862	0	0	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.22	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.318	-	-	-	-
Pot Cap-1 Maneuver	0	355	-	-	0	-
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	-	355	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	17	0	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBT
Capacity (veh/h)	-	-	355	-
HCM Lane V/C Ratio	-	-	0.156	-
HCM Control Delay (s)	-	-	17	-
HCM Lane LOS	-	-	C	-
HCM 95th %tile Q(veh)	-	-	0.5	-

HCS7 Freeway Facilities Report

Project Information

Analyst	KCI Technologies, Inc.	Date	9/13/2019
Agency		Analysis Year	2024
Jurisdiction		Time Period Analyzed	PM Peak Hour
Project Description	Roderick Place TIS: I-840 Eastbound Ramp Scenario 1		

Facility Global Input

Jam Density, pc/mi/ln	190.0	Density at Capacity, pc/mi/ln	45.0
Queue Discharge Capacity Drop, %	7	Total Segments	3
Total Time Periods	1	Time Period Duration, min	15
Facility Length, mi	2.00		

Facility Segment Data

No.	Coded	Analyzed	Name	Length, ft	Lanes
1	Basic	Basic	I-840 EB	5280	2
2	Merge	Merge	EB Ramp from Columbia Pike _I-840 EB	1500	2
3	Basic	Basic	I-840 EB	3780	2

Facility Segment Data

Segment 1: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.92	0.962	969	4646	0.21	73.5	6.6	A

Segment 2: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.92	0.92	0.962	0.962	1947	978	4259	2033	0.46	0.48	66.7	66.7	14.6	10.9	B

Segment 3: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.92	0.962	1948	4646	0.42	73.4	13.3	B

Facility Time Period Results

T	Speed, mi/h	Density, pc/mi/ln	Density, veh/mi/ln	Travel Time, min	LOS
1	72.1	10.1	9.7	1.70	A

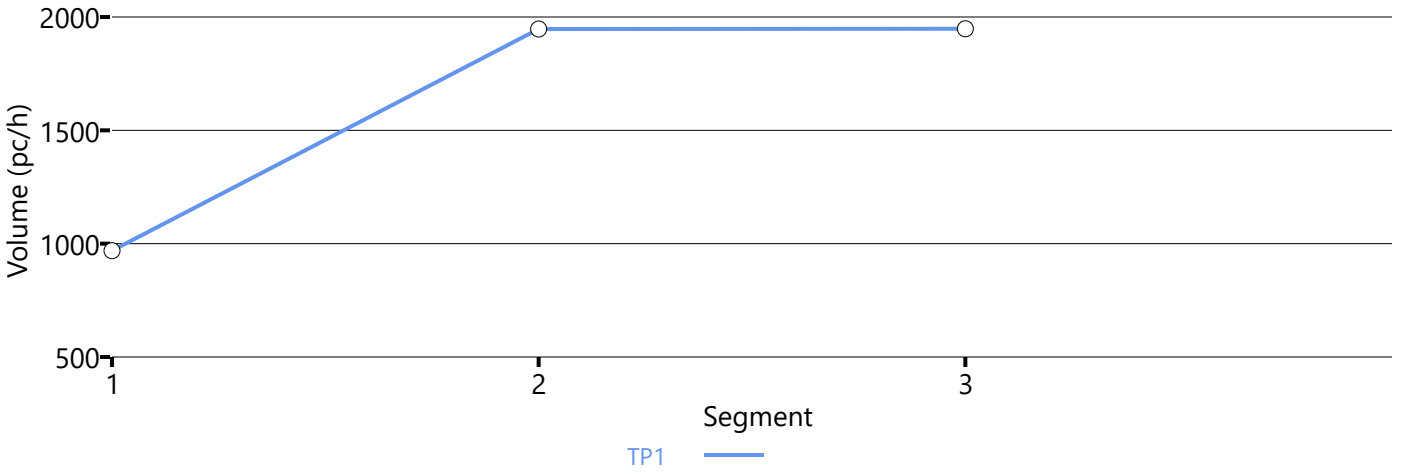
Facility Overall Results

Space Mean Speed, mi/h	72.1	Density, veh/mi/ln	9.7
Average Travel Time, min	1.70	Density, pc/mi/ln	10.1

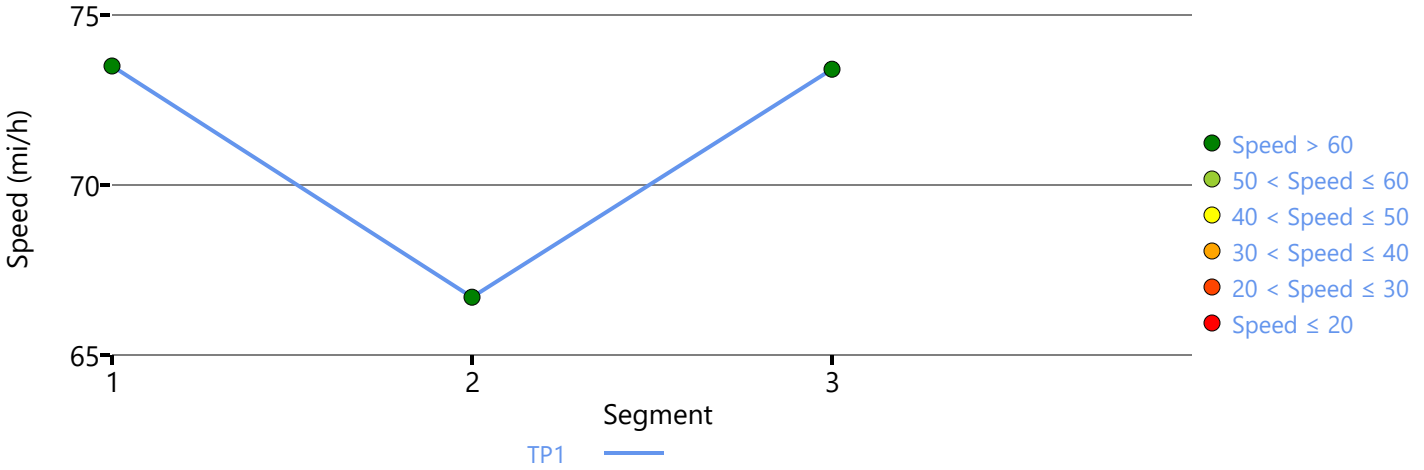
Messages

Comments

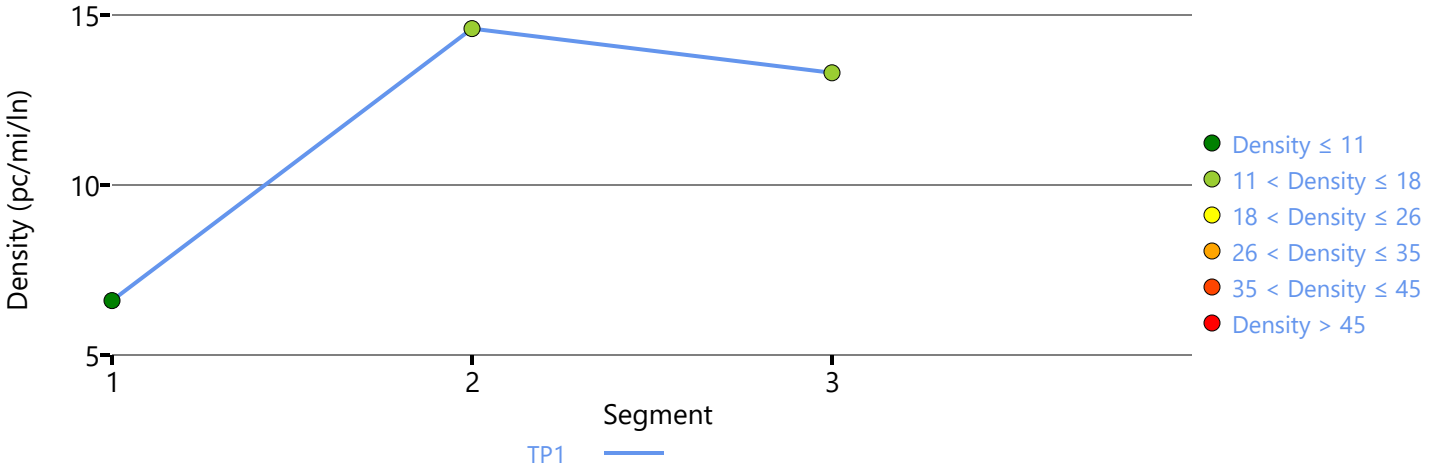
Volume Distribution



Speed Distribution



Density Distribution



HCS7 Freeway Facilities Report

Project Information

Analyst	KCI Technologies, Inc.	Date	9/13/2019
Agency		Analysis Year	2024
Jurisdiction		Time Period Analyzed	PM Peak Hour
Project Description	Roderick Place TIS: I-840 Westbound Ramp		

Facility Global Input

Jam Density, pc/mi/ln	190.0	Density at Capacity, pc/mi/ln	45.0
Queue Discharge Capacity Drop, %	7	Total Segments	3
Total Time Periods	1	Time Period Duration, min	15
Facility Length, mi	1.98		

Facility Segment Data

No.	Coded	Analyzed	Name	Length, ft	Lanes
1	Basic	Basic	I-840 WB	5280	2
2	Merge	Merge	WB Ramp from Columbia Pike _I-840 EB	1400	2
3	Basic	Basic	I-840 WB	3780	2

Facility Segment Data

Segment 1: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.92	0.962	1482	4646	0.32	73.5	10.1	A

Segment 2: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.92	0.92	0.962	0.962	1694	212	4259	2033	0.40	0.10	66.9	66.9	12.7	9.3	A

Segment 3: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.92	0.962	1695	4646	0.36	73.4	11.5	B

Facility Time Period Results

T	Speed, mi/h	Density, pc/mi/ln	Density, veh/mi/ln	Travel Time, min	LOS
1	72.4	11.0	10.5	1.60	A

Facility Overall Results

Space Mean Speed, mi/h	72.4	Density, veh/mi/ln	10.5
Average Travel Time, min	1.60	Density, pc/mi/ln	11.0

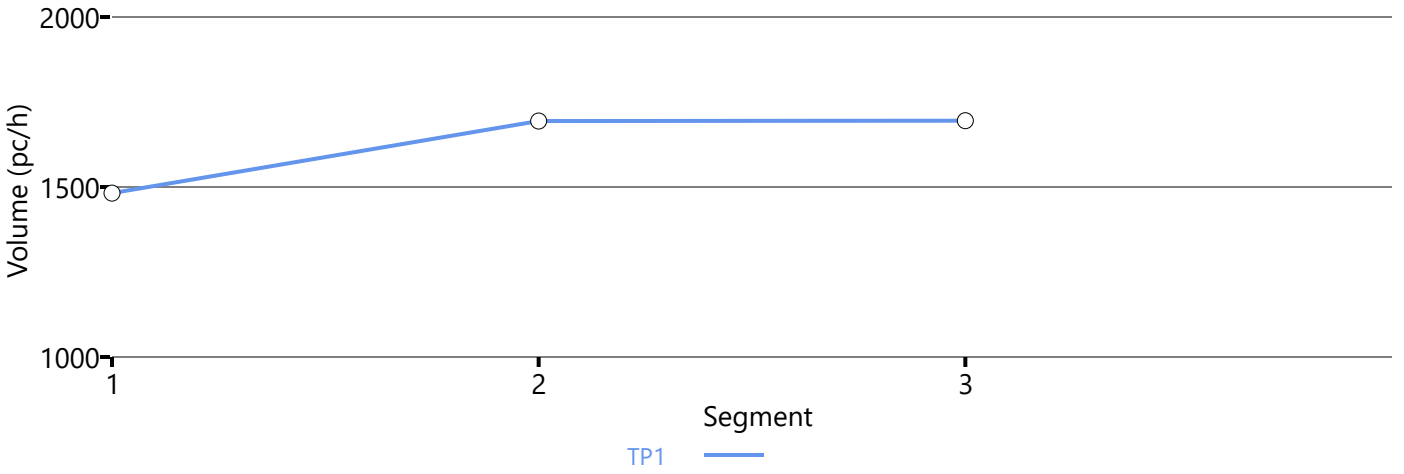
Messages

ERROR 1	Acceleration lane length is longer than the segment length for merge segment 2.

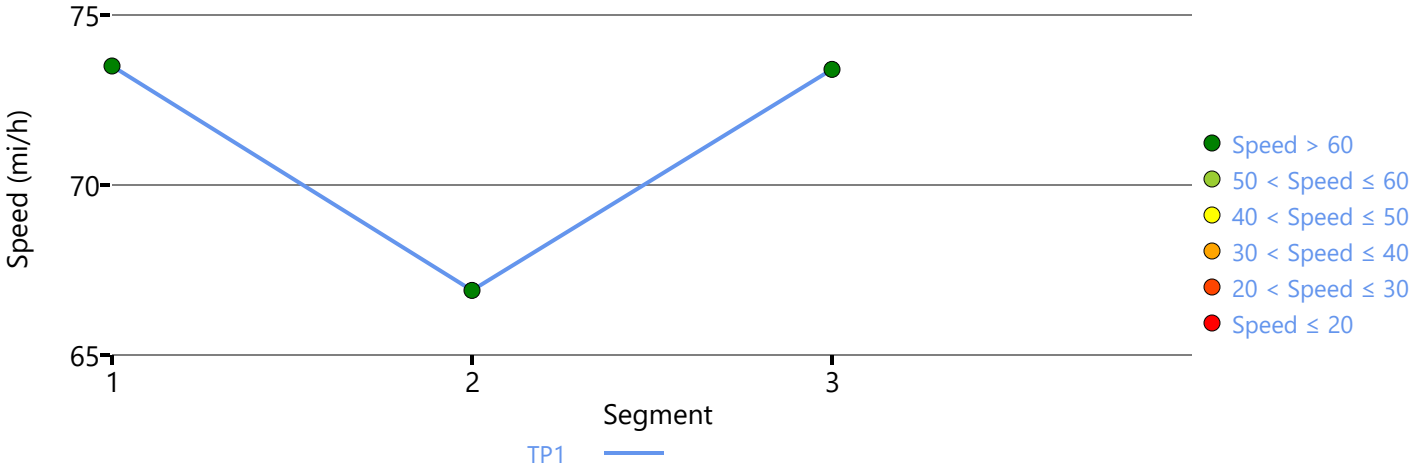
INFORMATION 1	Density for segment 3 in time period 1 is within 0.5 pc/mi/ln of LOS boundary. Be cautious when comparing LOS results.

Comments

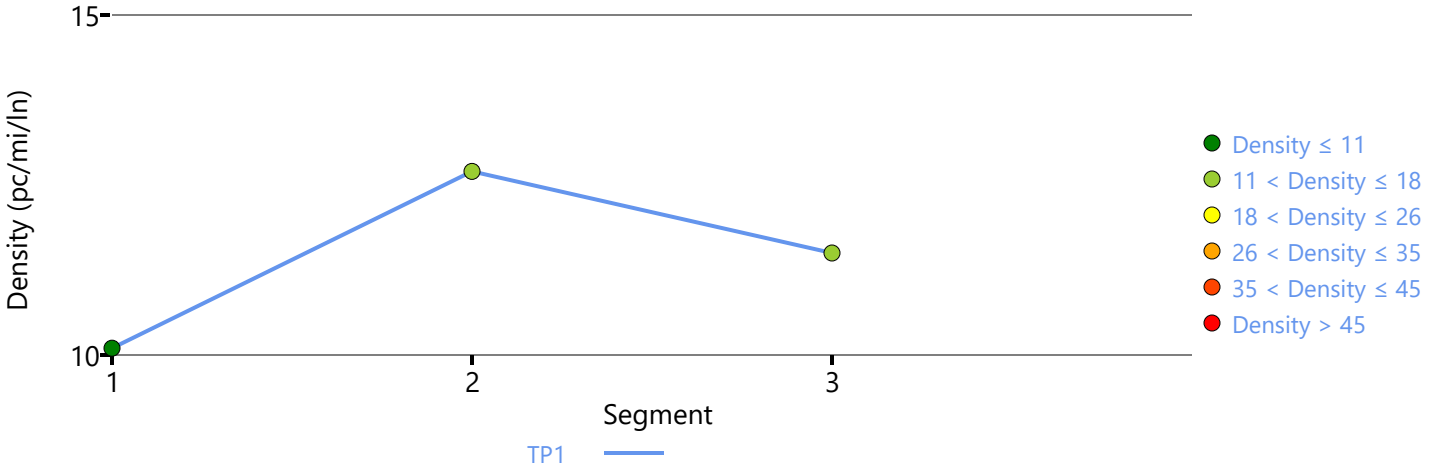
Volume Distribution

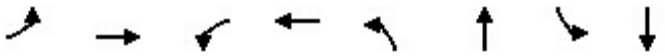


Speed Distribution



Density Distribution





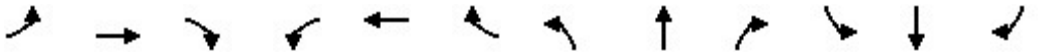
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	74	154	77	98	93	1037	27	882
v/c Ratio	0.29	0.57	0.33	0.47	0.41	0.98	0.13	0.94
Control Delay	28.5	20.5	29.4	32.0	16.5	48.0	9.5	40.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	28.5	20.5	29.4	32.0	16.5	48.0	9.5	40.4
Queue Length 50th (ft)	33	20	34	33	20	486	5	~458
Queue Length 95th (ft)	63	74	65	77	58	#1044	m11	#461
Internal Link Dist (ft)		737		561		511		4013
Turn Bay Length (ft)	100		85		105		120	
Base Capacity (vph)	259	346	241	292	234	1054	232	938
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.29	0.45	0.32	0.34	0.40	0.98	0.12	0.94

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	68	34	108	71	51	40	86	867	87	25	766	45
Future Volume (veh/h)	68	34	108	71	51	40	86	867	87	25	766	45
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1900	1863	1863	1900	1863	1863	1900
Adj Flow Rate, veh/h	74	37	117	77	55	43	93	942	95	27	833	49
Adj No. of Lanes	1	1	0	1	1	0	1	1	0	1	1	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	264	46	147	213	115	90	187	839	85	138	830	49
Arrive On Green	0.06	0.12	0.12	0.06	0.12	0.12	0.06	0.50	0.50	0.03	0.48	0.48
Sat Flow, veh/h	1774	395	1248	1774	970	759	1774	1665	168	1774	1742	102
Grp Volume(v), veh/h	74	0	154	77	0	98	93	0	1037	27	0	882
Grp Sat Flow(s),veh/h/ln	1774	0	1643	1774	0	1729	1774	0	1833	1774	0	1845
Q Serve(g_s), s	3.2	0.0	8.2	3.4	0.0	4.8	2.3	0.0	45.3	0.7	0.0	42.9
Cycle Q Clear(g_c), s	3.2	0.0	8.2	3.4	0.0	4.8	2.3	0.0	45.3	0.7	0.0	42.9
Prop In Lane	1.00		0.76	1.00		0.44	1.00		0.09	1.00		0.06
Lane Grp Cap(c), veh/h	264	0	193	213	0	205	187	0	923	138	0	879
V/C Ratio(X)	0.28	0.00	0.80	0.36	0.00	0.48	0.50	0.00	1.12	0.20	0.00	1.00
Avail Cap(c_a), veh/h	312	0	246	260	0	259	228	0	923	228	0	879
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	0.78	0.00	0.78
Uniform Delay (d), s/veh	32.2	0.0	38.7	32.4	0.0	37.1	20.4	0.0	22.3	21.2	0.0	23.6
Incr Delay (d2), s/veh	0.6	0.0	13.1	1.0	0.0	1.7	2.0	0.0	69.5	0.5	0.0	27.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.6	0.0	4.4	1.7	0.0	2.4	1.2	0.0	40.7	0.4	0.0	28.5
LnGrp Delay(d),s/veh	32.7	0.0	51.8	33.5	0.0	38.8	22.5	0.0	91.9	21.8	0.0	51.4
LnGrp LOS	C		D	C		D	C		F	C		F
Approach Vol, veh/h		228			175			1130			909	
Approach Delay, s/veh		45.6			36.5			86.2			50.5	
Approach LOS		D			D			F			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	9.4	51.8	11.6	17.1	11.9	49.4	11.6	17.2
Change Period (Y+Rc), s	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5
Max Green Setting (Gmax), s	7.5	35.5	7.5	13.5	7.5	35.5	7.5	13.5
Max Q Clear Time (g_c+I1), s	2.7	47.3	5.4	10.2	4.3	44.9	5.2	6.8
Green Ext Time (p_c), s	0.0	0.0	0.0	0.4	0.0	0.0	0.0	0.7

Intersection Summary		
HCM 2010 Ctrl Delay		65.5
HCM 2010 LOS		E

Lane Group	WBL	WBT	NBT	SBL	SBT
Lane Group Flow (vph)	66	174	991	128	880
v/c Ratio	0.38	0.30	0.46	0.30	0.33
Control Delay	43.6	1.4	12.0	6.0	3.7
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	43.6	1.4	12.0	6.0	3.7
Queue Length 50th (ft)	36	0	224	14	55
Queue Length 95th (ft)	74	0	m331	37	85
Internal Link Dist (ft)		697	409		2564
Turn Bay Length (ft)	150			275	
Base Capacity (vph)	275	640	2133	518	2700
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.24	0.27	0.46	0.25	0.33

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	61	0	160	0	862	50	118	809	1
Future Volume (veh/h)	0	0	0	61	0	160	0	862	50	118	809	1
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1863	1900	1863	1863	1900	1863	1863	1900	1863	1863	1900
Adj Flow Rate, veh/h	0	0	0	66	0	174	0	937	54	128	879	1
Adj No. of Lanes	0	1	0	1	1	0	1	2	0	1	2	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	0	2	0	234	0	209	80	2017	116	441	2645	3
Arrive On Green	0.00	0.00	0.00	0.13	0.00	0.13	0.00	0.59	0.59	0.13	1.00	1.00
Sat Flow, veh/h	0	1863	0	1774	0	1583	628	3402	196	1774	3627	4
Grp Volume(v), veh/h	0	0	0	66	0	174	0	487	504	128	429	451
Grp Sat Flow(s),veh/h/ln	0	1863	0	1774	0	1583	628	1770	1828	1774	1770	1862
Q Serve(g_s), s	0.0	0.0	0.0	3.0	0.0	9.6	0.0	13.9	13.9	2.3	0.0	0.0
Cycle Q Clear(g_c), s	0.0	0.0	0.0	3.0	0.0	9.6	0.0	13.9	13.9	2.3	0.0	0.0
Prop In Lane	0.00		0.00	1.00		1.00	1.00		0.11	1.00		0.00
Lane Grp Cap(c), veh/h	0	2	0	234	0	209	80	1049	1084	441	1290	1358
V/C Ratio(X)	0.00	0.00	0.00	0.28	0.00	0.83	0.00	0.46	0.46	0.29	0.33	0.33
Avail Cap(c_a), veh/h	0	155	0	276	0	246	80	1049	1084	594	1290	1358
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00
Upstream Filter(I)	0.00	0.00	0.00	1.00	0.00	1.00	0.00	1.00	1.00	0.97	0.97	0.97
Uniform Delay (d), s/veh	0.0	0.0	0.0	35.2	0.0	38.1	0.0	10.3	10.3	6.3	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.0	0.0	0.7	0.0	18.6	0.0	1.5	1.4	0.3	0.7	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.0	0.0	1.5	0.0	5.3	0.0	7.2	7.4	1.1	0.2	0.2
LnGrp Delay(d),s/veh	0.0	0.0	0.0	35.9	0.0	56.7	0.0	11.8	11.7	6.7	0.7	0.6
LnGrp LOS				D		E		B	B	A	A	A
Approach Vol, veh/h		0			240			991			1008	
Approach Delay, s/veh		0.0			51.0			11.7			1.4	
Approach LOS					D			B			A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4		6		8
Phs Duration (G+Y+Rc), s	12.3	59.9		0.0		72.1		17.9
Change Period (Y+Rc), s	6.5	6.5		6.5		6.5		6.0
Max Green Setting (Gmax), s	13.5	29.5		7.5		49.5		14.0
Max Q Clear Time (g_c+I1), s	4.3	15.9		0.0		2.0		11.6
Green Ext Time (p_c), s	0.2	8.7		0.0		16.3		0.3

Intersection Summary	
HCM 2010 Ctrl Delay	11.3
HCM 2010 LOS	B

Lane Group	EBL	EBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	28	67	563	442	114	849
v/c Ratio	0.11	0.28	0.23	0.36	0.17	0.29
Control Delay	40.0	3.0	13.7	10.1	1.8	1.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	40.0	3.0	13.7	10.1	1.8	1.5
Queue Length 50th (ft)	7	0	153	143	6	27
Queue Length 95th (ft)	21	2	204	244	12	37
Internal Link Dist (ft)			2564			882
Turn Bay Length (ft)		350		700	150	
Base Capacity (vph)	534	358	2480	1241	744	2924
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.05	0.19	0.23	0.36	0.15	0.29

Intersection Summary

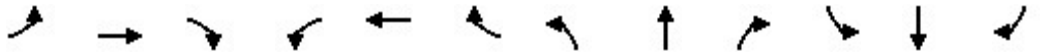
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	26	0	62	0	0	0	0	518	407	105	781	0
Future Volume (veh/h)	26	0	62	0	0	0	0	518	407	105	781	0
Number	7	4	14				5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	0	1863				0	1863	1863	1863	1863	0
Adj Flow Rate, veh/h	28	0	0				0	563	0	114	849	0
Adj No. of Lanes	2	0	1				0	2	1	1	2	0
Peak Hour Factor	0.92	0.92	0.92				0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	0	2				0	2	2	2	2	0
Cap, veh/h	116	0	53				0	2412	1079	766	2909	0
Arrive On Green	0.03	0.00	0.00				0.00	1.00	0.00	0.13	1.00	0.00
Sat Flow, veh/h	3442	0	1583				0	3632	1583	1774	3632	0
Grp Volume(v), veh/h	28	0	0				0	563	0	114	849	0
Grp Sat Flow(s),veh/h/ln	1721	0	1583				0	1770	1583	1774	1770	0
Q Serve(g_s), s	0.7	0.0	0.0				0.0	0.0	0.0	1.4	0.0	0.0
Cycle Q Clear(g_c), s	0.7	0.0	0.0				0.0	0.0	0.0	1.4	0.0	0.0
Prop In Lane	1.00		1.00				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	116	0	53				0	2412	1079	766	2909	0
V/C Ratio(X)	0.24	0.00	0.00				0.00	0.23	0.00	0.15	0.29	0.00
Avail Cap(c_a), veh/h	535	0	246				0	2412	1079	911	2909	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	2.00	2.00	2.00	2.00	1.00
Upstream Filter(I)	1.00	0.00	0.00				0.00	0.88	0.00	0.95	0.95	0.00
Uniform Delay (d), s/veh	42.4	0.0	0.0				0.0	0.0	0.0	2.5	0.0	0.0
Incr Delay (d2), s/veh	1.1	0.0	0.0				0.0	0.2	0.0	0.1	0.2	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	0.0	0.0				0.0	0.1	0.0	0.7	0.1	0.0
LnGrp Delay(d),s/veh	43.4	0.0	0.0				0.0	0.2	0.0	2.6	0.2	0.0
LnGrp LOS	D							A		A	A	
Approach Vol, veh/h		28						563			963	
Approach Delay, s/veh		43.4						0.2			0.5	
Approach LOS		D						A			A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4		6		
Phs Duration (G+Y+Rc), s	12.7	68.3		9.0		81.0		
Change Period (Y+Rc), s	7.0	7.0		6.0		7.0		
Max Green Setting (Gmax), s	13.0	43.0		14.0		63.0		
Max Q Clear Time (g_c+I1), s	3.4	2.0		2.7		2.0		
Green Ext Time (p_c), s	0.2	11.8		0.0		12.5		

Intersection Summary	
HCM 2010 Ctrl Delay	1.2
HCM 2010 LOS	A

Lane Group	WBL	WBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	415	103	45	539	551	28
v/c Ratio	0.46	0.21	0.09	0.26	0.26	0.03
Control Delay	30.0	6.8	2.5	7.1	9.4	1.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	30.0	6.8	2.5	7.1	9.4	1.7
Queue Length 50th (ft)	102	0	1	8	74	0
Queue Length 95th (ft)	145	38	3	11	101	7
Internal Link Dist (ft)				882	859	
Turn Bay Length (ft)		225	200			575
Base Capacity (vph)	896	489	488	2084	2084	949
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.46	0.21	0.09	0.26	0.26	0.03

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	382	0	95	41	496	0	0	507	26
Future Volume (veh/h)	0	0	0	382	0	95	41	496	0	0	507	26
Number				3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln				1863	0	1863	1863	1863	0	0	1863	1863
Adj Flow Rate, veh/h				415	0	0	45	539	0	0	551	0
Adj No. of Lanes				2	0	1	1	2	0	0	2	1
Peak Hour Factor				0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %				2	0	2	2	2	0	0	2	2
Cap, veh/h				899	0	413	518	2084	0	0	2084	932
Arrive On Green				0.26	0.00	0.00	0.78	0.78	0.00	0.00	0.59	0.00
Sat Flow, veh/h				3442	0	1583	853	3632	0	0	3632	1583
Grp Volume(v), veh/h				415	0	0	45	539	0	0	551	0
Grp Sat Flow(s),veh/h/ln				1721	0	1583	853	1770	0	0	1770	1583
Q Serve(g_s), s				9.1	0.0	0.0	1.6	3.7	0.0	0.0	6.8	0.0
Cycle Q Clear(g_c), s				9.1	0.0	0.0	8.4	3.7	0.0	0.0	6.8	0.0
Prop In Lane				1.00		1.00	1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				899	0	413	518	2084	0	0	2084	932
V/C Ratio(X)				0.46	0.00	0.00	0.09	0.26	0.00	0.00	0.26	0.00
Avail Cap(c_a), veh/h				899	0	413	518	2084	0	0	2084	932
HCM Platoon Ratio				1.00	1.00	1.00	1.33	1.33	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	0.00	0.98	0.98	0.00	0.00	1.00	0.00
Uniform Delay (d), s/veh				27.9	0.0	0.0	6.1	4.4	0.0	0.0	9.0	0.0
Incr Delay (d2), s/veh				1.7	0.0	0.0	0.3	0.3	0.0	0.0	0.3	0.0
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				4.5	0.0	0.0	0.4	1.8	0.0	0.0	3.4	0.0
LnGrp Delay(d),s/veh				29.6	0.0	0.0	6.4	4.7	0.0	0.0	9.3	0.0
LnGrp LOS				C			A	A			A	
Approach Vol, veh/h					415			584			551	
Approach Delay, s/veh					29.6			4.8			9.3	
Approach LOS					C			A			A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2				6		8
Phs Duration (G+Y+Rc), s		60.0				60.0		30.0
Change Period (Y+Rc), s		7.0				7.0		6.5
Max Green Setting (Gmax), s		53.0				53.0		23.5
Max Q Clear Time (g_c+I1), s		10.4				8.8		11.1
Green Ext Time (p_c), s		8.6				8.6		1.1

Intersection Summary	
HCM 2010 Ctrl Delay	13.1
HCM 2010 LOS	B

Intersection	
Int Delay, s/veh	0.2

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	3	12	9	596	524	6
Future Vol, veh/h	3	12	9	596	524	6
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	225	550	-	-	150
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	3	13	10	648	570	7

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	914	285	577	0	-	0
Stage 1	570	-	-	-	-	-
Stage 2	344	-	-	-	-	-
Critical Hdwy	6.84	6.94	4.14	-	-	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	2.22	-	-	-
Pot Cap-1 Maneuver	272	712	993	-	-	-
Stage 1	529	-	-	-	-	-
Stage 2	689	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	269	712	993	-	-	-
Mov Cap-2 Maneuver	390	-	-	-	-	-
Stage 1	524	-	-	-	-	-
Stage 2	689	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	11	0.1	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	993	-	390	712	-	-
HCM Lane V/C Ratio	0.01	-	0.008	0.018	-	-
HCM Control Delay (s)	8.7	-	14.3	10.2	-	-
HCM Lane LOS	A	-	B	B	-	-
HCM 95th %tile Q(veh)	0	-	0	0.1	-	-

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	142	95	903	108	164	783
v/c Ratio	0.58	0.32	0.90	0.13	0.59	0.59
Control Delay	45.0	10.0	25.5	12.8	23.9	11.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	45.0	10.0	25.5	12.8	23.9	11.0
Queue Length 50th (ft)	77	0	201	11	47	194
Queue Length 95th (ft)	128	40	m#605	m32	111	319
Internal Link Dist (ft)	381		4013			560
Turn Bay Length (ft)		75		50	150	
Base Capacity (vph)	462	483	1000	861	279	1334
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.31	0.20	0.90	0.13	0.59	0.59

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	131	87	831	99	151	720
Future Volume (veh/h)	131	87	831	99	151	720
Number	3	18	2	12	1	6
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	142	95	903	108	164	783
Adj No. of Lanes	1	1	1	1	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	188	168	1139	968	333	1396
Arrive On Green	0.11	0.11	0.61	0.61	0.07	0.75
Sat Flow, veh/h	1774	1583	1863	1583	1774	1863
Grp Volume(v), veh/h	142	95	903	108	164	783
Grp Sat Flow(s),veh/h/ln	1774	1583	1863	1583	1774	1863
Q Serve(g_s), s	7.0	5.1	32.9	2.6	2.8	16.4
Cycle Q Clear(g_c), s	7.0	5.1	32.9	2.6	2.8	16.4
Prop In Lane	1.00	1.00		1.00	1.00	
Lane Grp Cap(c), veh/h	188	168	1139	968	333	1396
V/C Ratio(X)	0.75	0.56	0.79	0.11	0.49	0.56
Avail Cap(c_a), veh/h	463	413	1139	968	364	1396
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.23	0.23	1.00	1.00
Uniform Delay (d), s/veh	39.1	38.2	13.2	7.3	14.1	4.9
Incr Delay (d2), s/veh	6.0	3.0	1.4	0.1	1.1	1.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.7	2.4	17.0	1.1	2.3	8.9
LnGrp Delay(d),s/veh	45.1	41.2	14.6	7.3	15.2	6.5
LnGrp LOS	D	D	B	A	B	A
Approach Vol, veh/h	237		1011			947
Approach Delay, s/veh	43.5		13.8			8.0
Approach LOS	D		B			A

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	12.4	61.5				73.9		16.1
Change Period (Y+Rc), s	6.5	6.5				6.5		6.5
Max Green Setting (Gmax), s	7.5	39.5				53.5		23.5
Max Q Clear Time (g_c+I1), s	4.8	34.9				18.4		9.0
Green Ext Time (p_c), s	0.1	3.7				16.2		0.6

Intersection Summary	
HCM 2010 Ctrl Delay	14.5
HCM 2010 LOS	B

Intersection	
Int Delay, s/veh	0.5

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	44	867	51	0	871
Future Vol, veh/h	0	44	867	51	0	871
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	48	942	55	0	947

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	-	970	0	0	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.22	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.318	-	-	-	-
Pot Cap-1 Maneuver	0	307	-	-	0	-
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	-	307	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	18.9	0	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBT
Capacity (veh/h)	-	-	307	-
HCM Lane V/C Ratio	-	-	0.156	-
HCM Control Delay (s)	-	-	18.9	-
HCM Lane LOS	-	-	C	-
HCM 95th %tile Q(veh)	-	-	0.5	-

HCS7 Freeway Facilities Report

Project Information

Analyst	KCI Technologies, Inc.	Date	9/13/2019
Agency		Analysis Year	2024
Jurisdiction		Time Period Analyzed	Weekend
Project Description	Roderick Place TIS: I-840 Eastbound Ramp Weekend		

Facility Global Input

Jam Density, pc/mi/ln	190.0	Density at Capacity, pc/mi/ln	45.0
Queue Discharge Capacity Drop, %	7	Total Segments	3
Total Time Periods	1	Time Period Duration, min	15
Facility Length, mi	2.00		

Facility Segment Data

No.	Coded	Analyzed	Name	Length, ft	Lanes
1	Basic	Basic	I-840 EB	5280	2
2	Merge	Merge	EB Ramp from Columbia Pike _I-840 EB	1500	2
3	Basic	Basic	I-840 EB	3780	2

Facility Segment Data

Segment 1: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.92	0.962	563	4646	0.12	73.5	3.8	A

Segment 2: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.92	0.92	0.962	0.962	1142	579	4259	2033	0.27	0.28	67.1	67.1	8.5	4.8	A

Segment 3: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.92	0.962	1141	4646	0.25	73.4	7.8	A

Facility Time Period Results

T	Speed, mi/h	Density, pc/mi/ln	Density, veh/mi/ln	Travel Time, min	LOS
1	72.2	5.9	5.7	1.70	A

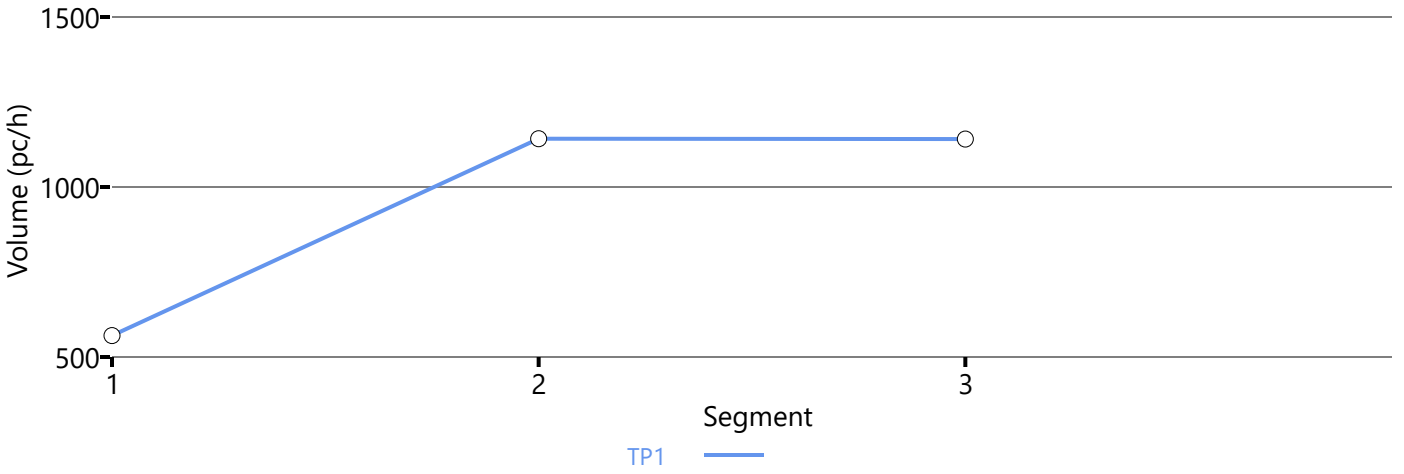
Facility Overall Results

Space Mean Speed, mi/h	72.2	Density, veh/mi/ln	5.7
Average Travel Time, min	1.70	Density, pc/mi/ln	5.9

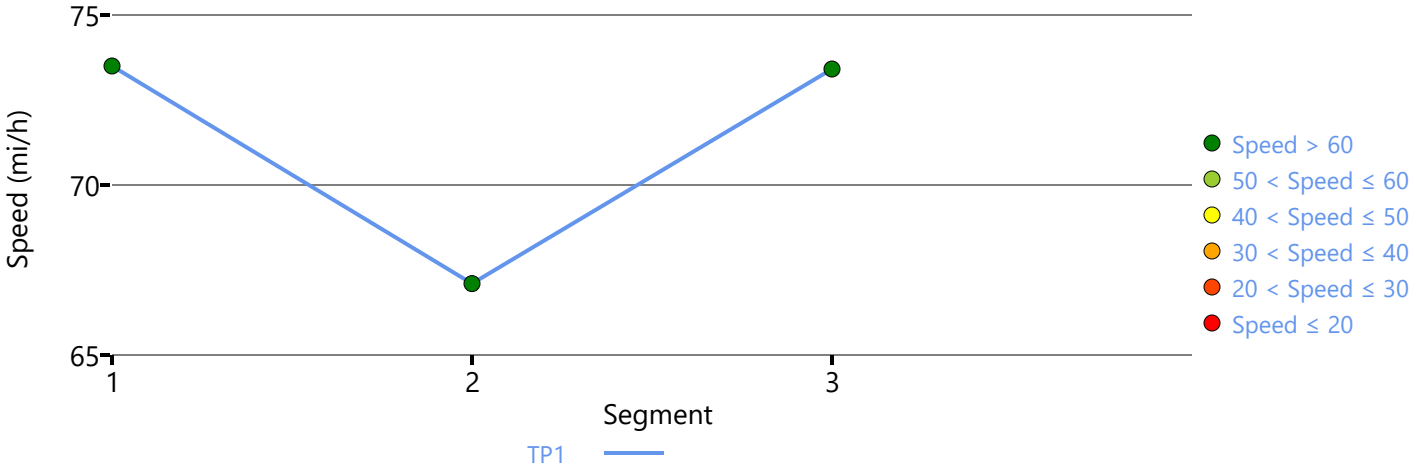
Messages

Comments

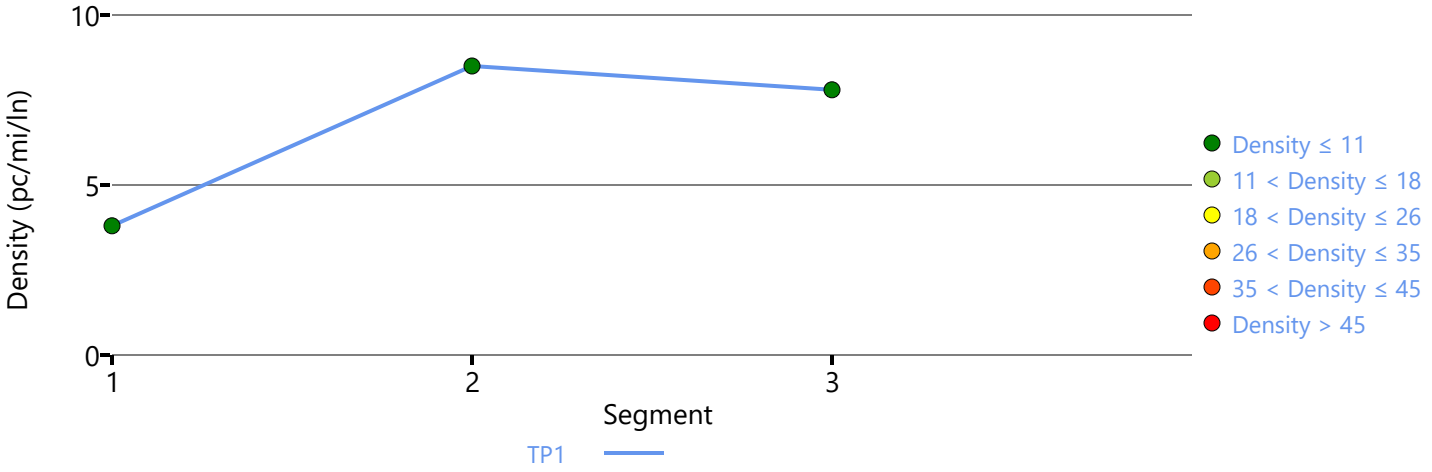
Volume Distribution



Speed Distribution



Density Distribution



HCS7 Freeway Facilities Report

Project Information

Analyst	KCI Technologies, Inc.	Date	9/13/2019
Agency		Analysis Year	2024
Jurisdiction		Time Period Analyzed	Weekend Peak Hour
Project Description	Roderick Place TIS: I-840 Westbound Ramp		

Facility Global Input

Jam Density, pc/mi/ln	190.0	Density at Capacity, pc/mi/ln	45.0
Queue Discharge Capacity Drop, %	7	Total Segments	3
Total Time Periods	1	Time Period Duration, min	15
Facility Length, mi	1.98		

Facility Segment Data

No.	Coded	Analyzed	Name	Length, ft	Lanes
1	Basic	Basic	I-840 WB	5280	2
2	Merge	Merge	WB Ramp from Columbia Pike _I-840 EB	1400	2
3	Basic	Basic	I-840 WB	3780	2

Facility Segment Data

Segment 1: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.92	0.962	508	4646	0.11	73.5	3.5	A

Segment 2: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.92	0.92	0.962	0.962	585	77	4259	2033	0.14	0.04	67.3	67.3	4.3	0.7	A

Segment 3: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.92	0.962	585	4646	0.13	73.4	4.0	A

Facility Time Period Results

T	Speed, mi/h	Density, pc/mi/ln	Density, veh/mi/ln	Travel Time, min	LOS
1	72.5	3.8	3.6	1.60	A

Facility Overall Results

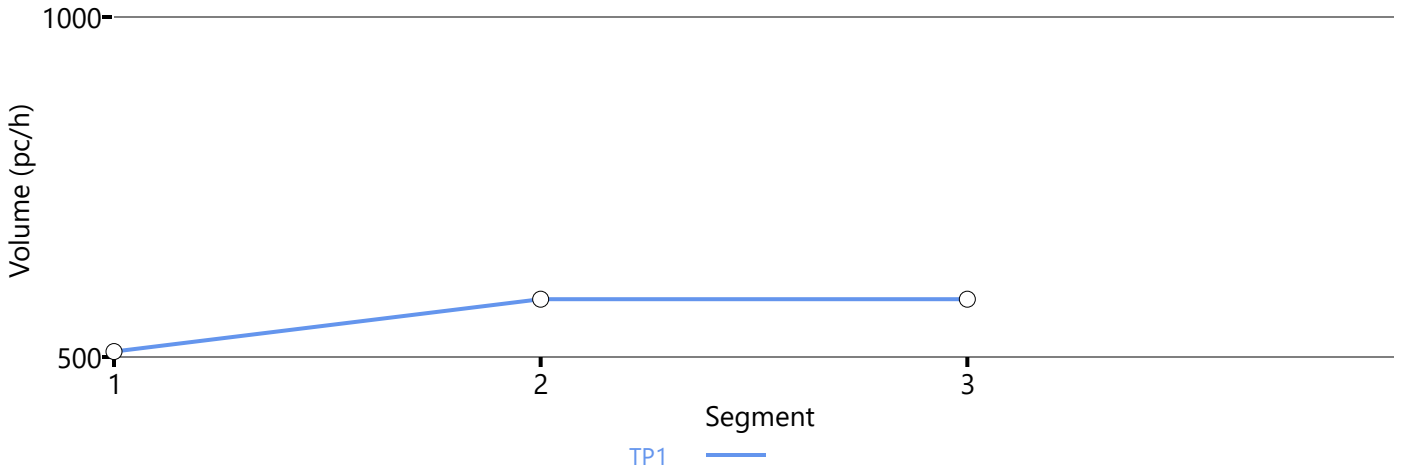
Space Mean Speed, mi/h	72.5	Density, veh/mi/ln	3.6
Average Travel Time, min	1.60	Density, pc/mi/ln	3.8

Messages

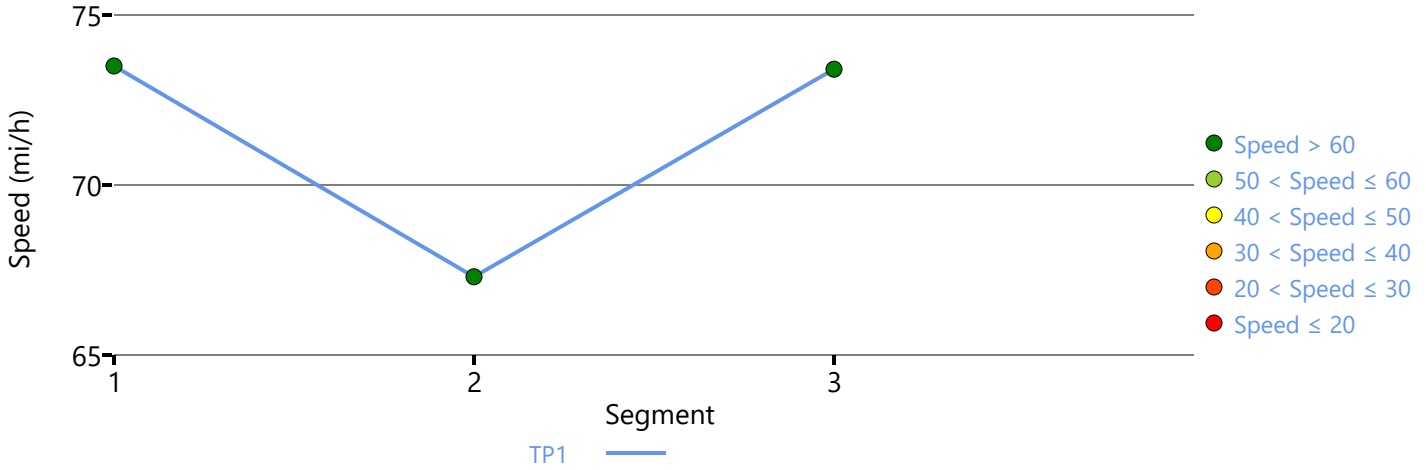
ERROR 1	Acceleration lane length is longer than the segment length for merge segment 2.

Comments

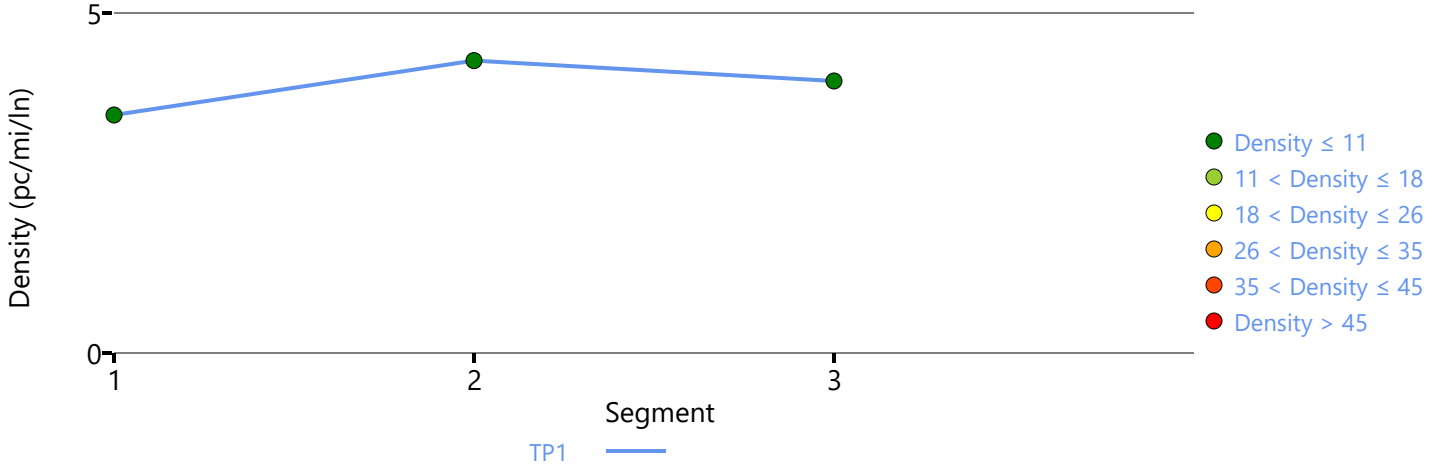
Volume Distribution



Speed Distribution



Density Distribution



APPENDIX E
TRIP GENERATION CALCULATIONS

TOTAL TRIP GENERATION

ITE CODE	LAND USE	# UNITS	UNIT TYPE	ADT	SAT			SUN		
					Enter	Exit	Total	Enter	Exit	Total
310	Hotel	92	Rooms	590	38	30	68			
710	Office	75.606	k.s.f.	167	22	18	40			
820	Shopping Center	20	k.s.f.	922	92	84	176			
931	Quality Restaurant	9.884	k.s.f.	890	63	43	106			
932	High-Turnover (Sit-Down) Restaurant	9.884	k.s.f.	1210	57	54	111			
220	Multi-Family Housing (Low-Rise)	85	units	669	32	27	59			
254	Assisted Living	100	Beds	293	12	15	27			
210	Single-Family Detached Housing	126	units	1219	67	57	124			
853	onvenience Market with Gasoline Pum	4	eling positic	1290	46	46	92			
TOTAL				**7250**	429	374	**803**			

TRIP GENERATION

Hotel

310 ITE Land Code

92 Rooms

Average Daily Traffic:

T = 9.62 * (X) - 294.56

T = 9.62 * (92) - 294.56

T = 590

SAT Peak Hour:

T = 0.69 * (X) + 4.32

T = 0.69 * (92) + 4.32

T = 68

Enter =	38	56%
Exit =	30	44%

SUN Peak Hour:

0

0

T = 0

Enter =	0	0%
Exit =	0	0%

TRIP GENERATION

Office

710 ITE Land Code

75.606 k.s.f.

Average Daily Traffic:

T = 2.21 * (X)

T = 2.21 * (75.606)

T = 167

SAT Peak Hour:

T = 0.53 * (X)

T = 40

Enter =	22	54%
Exit =	18	46%

SUN Peak Hour:

0

0

T = 0

Enter =	0	0%
Exit =	0	0%

TRIP GENERATION

Shopping Center

820 ITE Land Code

20 k.s.f.

Average Daily Traffic:

T = 46.12 * (X)

T = 46.12 * (20)

T = 922

SAT Peak Hour:

Ln(T) = (0.794 * Ln(X) + 2.79)

Ln(T) = (0.794 * Ln(20) + 2.79)

T = 176

Enter =	92	52%
Exit =	84	48%

SUN Peak Hour:

0

0

T = 0

Enter =	0	0%
Exit =	0	0%

TRIP GENERATION

Quality Restaurant

931 ITE Land Code

9.884 k.s.f.

Average Daily Traffic:

T = 90.04 * (X)

T = 90.04 * (9.884)

T = 890

SAT Peak Hour:

T = 10.68 * (X)

T = 10.68 * (9.884)

T = 106

Enter =	63	59%
Exit =	43	41%

SUN Peak Hour:

0

0

T = 0

Enter =	0	0%
Exit =	0	0%

TRIP GENERATION

High-Turnover (Sit-Down) Restaurant

932 ITE Land Code

9.884 k.s.f.

Average Daily Traffic:

T = 122.40 * (X)

T = 122.40 * (9.884)

T = 1210

SAT Peak Hour:

T = 11.19 * (X)

T = 11.19 * (9.884)

T = 111

Enter =	57	51%
Exit =	54	49%

SUN Peak Hour:

0

0

T = 0

Enter =	0	0%
Exit =	0	0%

TRIP GENERATION

Multi-Family Housing (Low-Rise)

220 ITE Land Code

85 units

Average Daily Traffic:

T = 14.01 * (X) - 521.69

T = 14.01 * (85) - 521.69

T = 669

SAT Peak Hour:

T = 1.08 * (X) - 33.24

T = 1.08 * (85) - 33.24

T = 59

Enter =	32	54%
Exit =	27	46%

SUN Peak Hour:

0

0

T = 0

Enter =	0	0%
Exit =	0	0%

TRIP GENERATION

Assisted Living

254 ITE Land Code

100 Beds

Average Daily Traffic:

T = 2.93 * (X)

T = 2.93 * (100)

T = 293

SAT Peak Hour:

T = 0.27 * (X)

T = 0.27 * (100)

T = 27

Enter =	12	46%
Exit =	15	54%

SUN Peak Hour:

0

0

T = 0

Enter =	0	0%
Exit =	0	0%

TRIP GENERATION

Single-Family Detached Housing

210 ITE Land Code

126 units

Average Daily Traffic:

Ln(T) = (0.94 * Ln(X) + 2.56)

Ln(T) = (0.94 * Ln(126) + 2.56)

T = 1219

SAT Peak Hour:

T = 0.84 * (X) + 17.99

T = 0.84 * (126) + 17.99

T = 124

Enter =	67	54%
Exit =	57	46%

SUN Peak Hour:

0

0

T = 0

Enter =	0	0%
Exit =	0	0%

TRIP GENERATION

Convenience Market with Gasoline Pumps

853 ITE Land Code

4 fueling positions

Average Daily Traffic:

T = 322.50 * (X)

T = 322.50 * (4)

T = 1290

SAT Peak Hour:

T = 23.04 * (X)

T = 23.04 * (4)

T = 92

Enter =	46	50%
Exit =	46	50%

SUN Peak Hour:

0

0

T = 0

Enter =	0	0%
Exit =	0	0%

Internal Trips Calculations

Project Name:	Roderick Place	Organization:	KCI Technologies, Inc.
Project Number:	891903440	Performed By:	MAS
Project Location:	Thompson's Station, Tennessee	Date:	12/3/2019
Count Year:	2019	Checked By:	0
Design Year:	2024	Date:	1/0/1900

SAT Peak Hour

Table 1-A: Entering Trips

LUC	% Internal Trips	Total Trips	Internal Trips	External Trips
Office	30%	22	7	**15**
Retail	30%	138	41	**97**
Restaurant	30%	120	36	**84**
Entertainment	30%	0	0	**0**
Residential	30%	111	33	**78**
Hotel	30%	38	11	**27**
Industrial	30%	0	0	**0**
Institutional	30%	0	0	**0**
Medical	30%	0	0	**0**

SUN Peak Hour

Table 1-P: Entering Trips

LUC	% Internal Trips	Total Trips	Internal Trips	External Trips
Office	30%	0	0	**0**
Retail	30%	0	0	**0**
Restaurant	30%	0	0	**0**
Entertainment	30%	0	0	**0**
Residential	30%	0	0	**0**
Hotel	30%	0	0	**0**
Industrial	30%	0	0	**0**
Institutional	30%	0	0	**0**
Medical	30%	0	0	**0**

Table 2-A: Exiting Trips

LUC	% Internal Trips	Total Trips	Internal Trips	External Trips
Office	30%	18	5	**13**
Retail	30%	130	39	**91**
Restaurant	30%	97	29	**68**
Entertainment	30%	0	0	**0**
Residential	30%	99	30	**69**
Hotel	30%	30	9	**21**
Industrial	30%	0	0	**0**
Institutional	30%	0	0	**0**
Medical	30%	0	0	**0**

Table 2-P: Exiting Trips

LUC	% Internal Trips	Total Trips	Internal Trips	External Trips
Office	30%	0	0	**0**
Retail	30%	0	0	**0**
Restaurant	30%	0	0	**0**
Entertainment	30%	0	0	**0**
Residential	30%	0	0	**0**
Hotel	30%	0	0	**0**
Industrial	30%	0	0	**0**
Institutional	30%	0	0	**0**
Medical	30%	0	0	**0**

LUC	Daily Trips	SAT PEAK HOUR		SUN PEAK HOUR	
		Enter	Exit	Enter	Exit
Office	117	15	13	0	0
Retail	1548	97	91	0	0
Restaurant	1470	84	68	0	0
Entertainment	0	0	0	0	0
Residential	1527	78	69	0	0
Hotel	413	27	21	0	0
Industrial	0	0	0	0	0
Institutional	0	0	0	0	0
Medical	0	0	0	0	0
TOTAL	**5075**	**301**	**262**	**0**	**0**

Pass-By Trip Calculations

Project Name:	Roderick Place	Organization:	KCI Technologies, Inc.
Project Number:	891903440	Performed By:	MAS
Project Location:	Thompson's Station, Tennessee	Date:	12/3/2019
Count Year:	2019	Checked By:	0
Design Year:	2024	Date:	1/0/1900

SAT Peak Hour

Table 1-A: Entering Trips

LUC	% Pass-By Trips	Vehicular Trips	Pass-By Trips	Non-Pass-By Trips
Office	0%	15	0	15
Retail	17%	97	16	81
Restaurant	0%	84	0	84
Entertainment	0%	0	0	0
Residential	0%	78	0	78
Hotel	0%	27	0	27
Industrial	0%	0	0	0
Institutional	0%	0	0	0
Medical	0%	0	0	0

SUN Peak Hour

Table 1-P: Entering Trips

LUC	% Pass-By Trips	Vehicular Trips	Pass-By Trips	Non-Pass-By Trips
Office	0%	0	0	0
Retail	0%	0	0	0
Restaurant	0%	0	0	0
Entertainment	0%	0	0	0
Residential	0%	0	0	0
Hotel	0%	0	0	0
Industrial	0%	0	0	0
Institutional	0%	0	0	0
Medical	0%	0	0	0

Table 2-A: Exiting Trips

LUC	% Pass-By Trips	Vehicular Trips	Pass-By Trips	Non-Pass-By Trips
Office	0%	13	0	13
Retail	17%	91	16	75
Restaurant	0%	68	0	68
Entertainment	0%	0	0	0
Residential	0%	69	0	69
Hotel	0%	21	0	21
Industrial	0%	0	0	0
Institutional	0%	0	0	0
Medical	0%	0	0	0

Table 2-P: Exiting Trips

LUC	% Pass-By Trips	Vehicular Trips	Pass-By Trips	Non-Pass-By Trips
Office	0%	0	0	0
Retail	0%	0	0	0
Restaurant	0%	0	0	0
Entertainment	0%	0	0	0
Residential	0%	0	0	0
Hotel	0%	0	0	0
Industrial	0%	0	0	0
Institutional	0%	0	0	0
Medical	0%	0	0	0

LUC	Pass-By Trips		Non-Pass-By Trips	
	Enter	Exit	Enter	Exit
Office	0	0	15	13
Retail	16	16	81	75
Restaurant	0	0	84	68
Entertainment	0	0	0	0
Residential	0	0	78	69
Hotel	0	0	27	21
Industrial	0	0	0	0
Institutional	0	0	0	0
Medical	0	0	0	0
TOTAL	16	16	285	246

LUC	Pass-By Trips		Non-Pass-By Trips	
	Enter	Exit	Enter	Exit
Office	0	0	0	0
Retail	0	0	0	0
Restaurant	0	0	0	0
Entertainment	0	0	0	0
Residential	0	0	0	0
Hotel	0	0	0	0
Industrial	0	0	0	0
Institutional	0	0	0	0
Medical	0	0	0	0
TOTAL	0	0	0	0

TOTAL TRIP GENERATION

ITE CODE	LAND USE	# UNITS	UNIT TYPE	ADT	SAT			SUN		
					Enter	Exit	Total	Enter	Exit	Total
310	Hotel	92	Rooms	590	38	30	68			
710	Office	75.606	k.s.f.	167	22	18	40			
820	Shopping Center	20	k.s.f.	922	92	84	176			
931	Quality Restaurant	9.884	k.s.f.	890	63	43	106			
932	High-Turnover (Sit-Down) Restaurant	9.884	k.s.f.	1210	57	54	111			
220	Multi-Family Housing (Low-Rise)	85	units	669	32	27	59			
254	Assisted Living	100	Beds	293	12	15	27			
210	Single-Family Detached Housing	126	units	1219	67	57	124			
853	onvenience Market with Gasoline Pum	4	eling positic	1290	46	46	92			
TOTAL				**7250**	429	374	**803**			

TRIP GENERATION

Hotel

310 ITE Land Code

92 Rooms

Average Daily Traffic:

T = 9.62 * (X) - 294.56

T = 9.62 * (92) - 294.56

T = 590

SAT Peak Hour:

T = 0.69 * (X) + 4.32

T = 0.69 * (92) + 4.32

T = 68

Enter =	38	56%
Exit =	30	44%

SUN Peak Hour:

0

0

T = 0

Enter =	0	0%
Exit =	0	0%

TRIP GENERATION

Office

710 ITE Land Code

75.606 k.s.f.

Average Daily Traffic:

T = 2.21 * (X)

T = 2.21 * (75.606)

T = 167

SAT Peak Hour:

T = 0.53 * (X)

T = 40

Enter =	22	54%
Exit =	18	46%

SUN Peak Hour:

0

0

T = 0

Enter =	0	0%
Exit =	0	0%

TRIP GENERATION

Shopping Center

820 ITE Land Code

20 k.s.f.

Average Daily Traffic:

T = 46.12 * (X)

T = 46.12 * (20)

T = 922

SAT Peak Hour:

Ln(T) = (0.794 * Ln(X) + 2.79)

Ln(T) = (0.794 * Ln(20) + 2.79)

T = 176

Enter =	92	52%
Exit =	84	48%

SUN Peak Hour:

0

0

T = 0

Enter =	0	0%
Exit =	0	0%

TRIP GENERATION

Quality Restaurant

931 ITE Land Code

9.884 k.s.f.

Average Daily Traffic:

T = 90.04 * (X)

T = 90.04 * (9.884)

T = 890

SAT Peak Hour:

T = 10.68 * (X)

T = 10.68 * (9.884)

T = 106

Enter =	63	59%
Exit =	43	41%

SUN Peak Hour:

0

0

T = 0

Enter =	0	0%
Exit =	0	0%

TRIP GENERATION

High-Turnover (Sit-Down) Restaurant

932 ITE Land Code

9.884 k.s.f.

Average Daily Traffic:

T = 122.40 * (X)

T = 122.40 * (9.884)

T = 1210

SAT Peak Hour:

T = 11.19 * (X)

T = 11.19 * (9.884)

T = 111

Enter =	57	51%
Exit =	54	49%

SUN Peak Hour:

0

0

T = 0

Enter =	0	0%
Exit =	0	0%

TRIP GENERATION

Multi-Family Housing (Low-Rise)

220 ITE Land Code

85 units

Average Daily Traffic:

T = 14.01 * (X) - 521.69

T = 14.01 * (85) - 521.69

T = 669

SAT Peak Hour:

T = 1.08 * (X) - 33.24

T = 1.08 * (85) - 33.24

T = 59

Enter =	32	54%
Exit =	27	46%

SUN Peak Hour:

0

0

T = 0

Enter =	0	0%
Exit =	0	0%

TRIP GENERATION

Assisted Living

254 ITE Land Code

100 Beds

Average Daily Traffic:

T = 2.93 * (X)

T = 2.93 * (100)

T = 293

SAT Peak Hour:

T = 0.27 * (X)

T = 0.27 * (100)

T = 27

Enter =	12	46%
Exit =	15	54%

SUN Peak Hour:

0

0

T = 0

Enter =	0	0%
Exit =	0	0%

TRIP GENERATION

Single-Family Detached Housing

210 ITE Land Code

126 units

Average Daily Traffic:

Ln(T) = (0.94 * Ln(X) + 2.56)

Ln(T) = (0.94 * Ln(126) + 2.56)

T = 1219

SAT Peak Hour:

T = 0.84 * (X) + 17.99

T = 0.84 * (126) + 17.99

T = 124

Enter =	67	54%
Exit =	57	46%

SUN Peak Hour:

0

0

T = 0

Enter =	0	0%
Exit =	0	0%

TRIP GENERATION

Convenience Market with Gasoline Pumps

853 ITE Land Code

4 fueling positions

Average Daily Traffic:

T = 322.50 * (X)

T = 322.50 * (4)

T = 1290

SAT Peak Hour:

T = 23.04 * (X)

T = 23.04 * (4)

T = 92

Enter =	46	50%
Exit =	46	50%

SUN Peak Hour:

0

0

T = 0

Enter =	0	0%
Exit =	0	0%

Internal Trips Calculations

Project Name:	Roderick Place	Organization:	KCI Technologies, Inc.
Project Number:	891903440	Performed By:	MAS
Project Location:	Thompson's Station, Tennessee	Date:	12/3/2019
Count Year:	2019	Checked By:	0
Design Year:	2024	Date:	1/0/1900

SAT Peak Hour

Table 1-A: Entering Trips

LUC	% Internal Trips	Total Trips	Internal Trips	External Trips
Office	30%	22	7	**15**
Retail	30%	138	41	**97**
Restaurant	30%	120	36	**84**
Entertainment	30%	0	0	**0**
Residential	30%	111	33	**78**
Hotel	30%	38	11	**27**
Industrial	30%	0	0	**0**
Institutional	30%	0	0	**0**
Medical	30%	0	0	**0**

SUN Peak Hour

Table 1-P: Entering Trips

LUC	% Internal Trips	Total Trips	Internal Trips	External Trips
Office	30%	0	0	**0**
Retail	30%	0	0	**0**
Restaurant	30%	0	0	**0**
Entertainment	30%	0	0	**0**
Residential	30%	0	0	**0**
Hotel	30%	0	0	**0**
Industrial	30%	0	0	**0**
Institutional	30%	0	0	**0**
Medical	30%	0	0	**0**

Table 2-A: Exiting Trips

LUC	% Internal Trips	Total Trips	Internal Trips	External Trips
Office	30%	18	5	**13**
Retail	30%	130	39	**91**
Restaurant	30%	97	29	**68**
Entertainment	30%	0	0	**0**
Residential	30%	99	30	**69**
Hotel	30%	30	9	**21**
Industrial	30%	0	0	**0**
Institutional	30%	0	0	**0**
Medical	30%	0	0	**0**

Table 2-P: Exiting Trips

LUC	% Internal Trips	Total Trips	Internal Trips	External Trips
Office	30%	0	0	**0**
Retail	30%	0	0	**0**
Restaurant	30%	0	0	**0**
Entertainment	30%	0	0	**0**
Residential	30%	0	0	**0**
Hotel	30%	0	0	**0**
Industrial	30%	0	0	**0**
Institutional	30%	0	0	**0**
Medical	30%	0	0	**0**

LUC	Daily Trips	SAT PEAK HOUR		SUN PEAK HOUR	
		Enter	Exit	Enter	Exit
Office	117	15	13	0	0
Retail	1548	97	91	0	0
Restaurant	1470	84	68	0	0
Entertainment	0	0	0	0	0
Residential	1527	78	69	0	0
Hotel	413	27	21	0	0
Industrial	0	0	0	0	0
Institutional	0	0	0	0	0
Medical	0	0	0	0	0
TOTAL	**5075**	**301**	**262**	**0**	**0**

Pass-By Trip Calculations

Project Name:	Roderick Place	Organization:	KCI Technologies, Inc.
Project Number:	891903440	Performed By:	MAS
Project Location:	Thompson's Station, Tennessee	Date:	12/3/2019
Count Year:	2019	Checked By:	0
Design Year:	2024	Date:	1/0/1900

SAT Peak Hour

Table 1-A: Entering Trips

LUC	% Pass-By Trips	Vehicular Trips	Pass-By Trips	Non-Pass-By Trips
Office	0%	15	0	15
Retail	17%	97	16	81
Restaurant	0%	84	0	84
Entertainment	0%	0	0	0
Residential	0%	78	0	78
Hotel	0%	27	0	27
Industrial	0%	0	0	0
Institutional	0%	0	0	0
Medical	0%	0	0	0

SUN Peak Hour

Table 1-P: Entering Trips

LUC	% Pass-By Trips	Vehicular Trips	Pass-By Trips	Non-Pass-By Trips
Office	0%	0	0	0
Retail	0%	0	0	0
Restaurant	0%	0	0	0
Entertainment	0%	0	0	0
Residential	0%	0	0	0
Hotel	0%	0	0	0
Industrial	0%	0	0	0
Institutional	0%	0	0	0
Medical	0%	0	0	0

Table 2-A: Exiting Trips

LUC	% Pass-By Trips	Vehicular Trips	Pass-By Trips	Non-Pass-By Trips
Office	0%	13	0	13
Retail	17%	91	16	75
Restaurant	0%	68	0	68
Entertainment	0%	0	0	0
Residential	0%	69	0	69
Hotel	0%	21	0	21
Industrial	0%	0	0	0
Institutional	0%	0	0	0
Medical	0%	0	0	0

Table 2-P: Exiting Trips

LUC	% Pass-By Trips	Vehicular Trips	Pass-By Trips	Non-Pass-By Trips
Office	0%	0	0	0
Retail	0%	0	0	0
Restaurant	0%	0	0	0
Entertainment	0%	0	0	0
Residential	0%	0	0	0
Hotel	0%	0	0	0
Industrial	0%	0	0	0
Institutional	0%	0	0	0
Medical	0%	0	0	0

LUC	Pass-By Trips		Non-Pass-By Trips	
	Enter	Exit	Enter	Exit
Office	0	0	15	13
Retail	16	16	81	75
Restaurant	0	0	84	68
Entertainment	0	0	0	0
Residential	0	0	78	69
Hotel	0	0	27	21
Industrial	0	0	0	0
Institutional	0	0	0	0
Medical	0	0	0	0
TOTAL	16	16	285	246

LUC	Pass-By Trips		Non-Pass-By Trips	
	Enter	Exit	Enter	Exit
Office	0	0	0	0
Retail	0	0	0	0
Restaurant	0	0	0	0
Entertainment	0	0	0	0
Residential	0	0	0	0
Hotel	0	0	0	0
Industrial	0	0	0	0
Institutional	0	0	0	0
Medical	0	0	0	0
TOTAL	0	0	0	0

APPENDIX F
WARRANT ANALYSIS

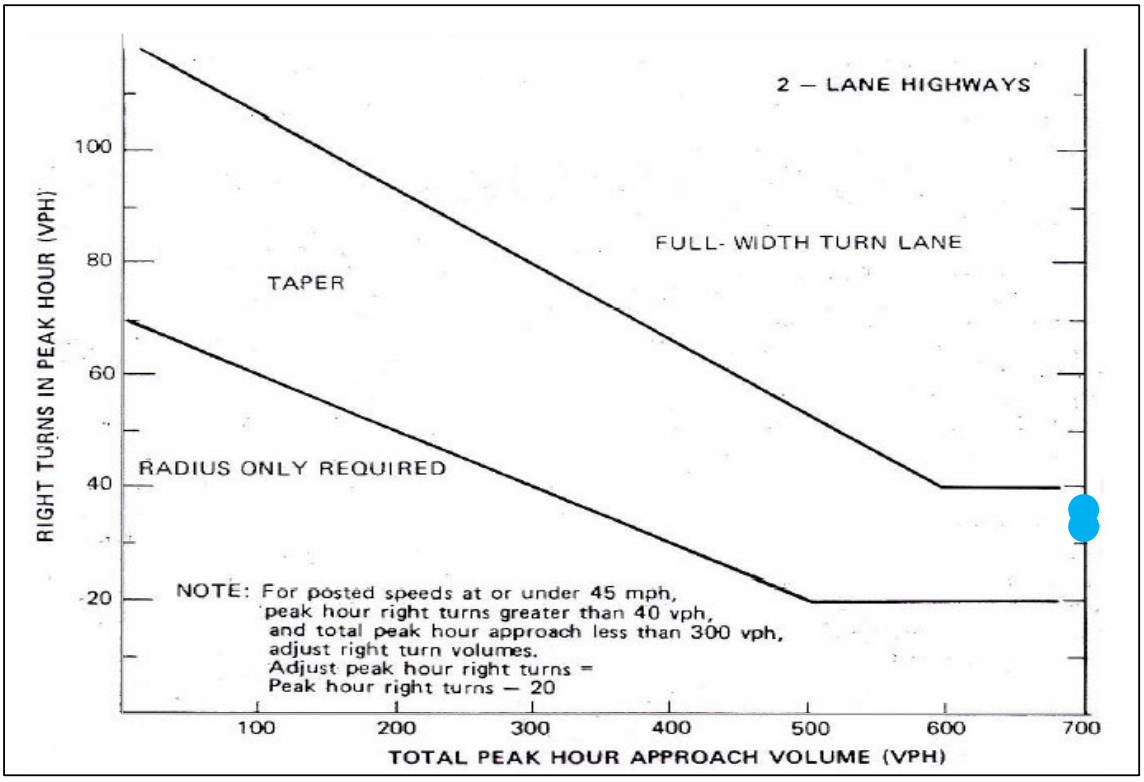
Projected Conditions (Peak Hours)

RIGHT-TURN LANE WARRANT ANALYSIS

(Based on Intersection Channelization Design Guide)

Intersection Approach	AM Peak Hour			PM Peak Hour		
	V_R*	V_A*	Warrant Met?	V_R*	V_A*	Warrant Met?
Columbia Pike and Site Access B	33	1262	No	36	811	No

V_R = Right Turn Volumes, V_A = Advancing Volumes



APPENDIX G
CRASH DATA

COUNTY	= WILLIAMSON	Date:	9/13/2019
Route	= COLUMBIA PIKE (SR 6/US 31)		
Location	= INTERSECTION OF COLUMBIA PIKE AND THOMPSON'S STATION ROAD		
Highway Type	= 2-Lane Undivided Urban Functionally Classified Road		
FUNCTIONAL CLASS=	COLLECTOR		
DATA YEARS	= SEPT. 2016 - SEPT. 2019		
ADT YEARS USED=	Data collected on September 9, 2019		
COMMENTS	=		
ANALYZED BY	= KCI TECHNOLOGIES, INC.		

SECTION = MORE THAN 0.10 MILE / SPOT = LESS THAN 0.10 MILE

BLM	ELM	Length	Average AADT	VMT
0.00	0.00	0.00	0	0
0.00	0.00	0.00	0	0
0.00	0.00	0.00	0	0
0.00	0.00	0.00	0	0
0.00	0.00	0.00	0	0
0.00	0.00	0.00	0	0
0.00	0.00	0.00	0	0
		0.00	0	0

INTERSECTION
Log Mile =

Leg		Traffic AADT
North	=	9,910
East	=	1,970
South	=	8,410
West	=	1,840
Entering AADT	=	22,130

Data Collected On September 9, 2019
2-Lane Undivided Urban Functionally Classified Road
Sept. 2016 - Sept. 2019

		Total	Fatal	Incap. Injury	*Severe Crashes	Other Injury
No. of Crashes	=	32	0	0	0	5
No. of Years	=	3				
SW avg. rate	=	4.178	0.021	N/A	0.021	0.962
14-16 S/W Rates						
Exposure (E)	=	24.2324				
Crash Rate (A)	=	1.321	0.000	0.000	0.000	0.206
Critical Rate (C)	=	5.165				
Severity Index (SI)	=	0.1563				
Actual Rate/SW Average	=	0.32	0.00	#DIV/0!	0.00	0.21
Ratio of A/C	=	0.26				

* Severe Crashes are the sum of fatal and incapacitating injury crashes

Revised 4/3/2007

COUNTY	= WILLIAMSON	Date:	9/13/2019
Route	= COLUMBIA PIKE (SR 6/US 31)		
Location	= INTERSECTION OF COLUMBIA PIKE AND CRITZ LANE		
Highway Type	= 2-Lane Undivided Urban Functionally Classified Road		
FUNCTIONAL CLASS=	COLLECTOR		
DATA YEARS	= SEPT. 2016 - SEPT. 2019		
ADT YEARS USED=	Data collected on September 9, 2019		
COMMENTS	=		
ANALYZED BY	= KCI TECHNOLOGIES, INC.		

SECTION = MORE THAN 0.10 MILE / SPOT = LESS THAN 0.10 MILE

BLM	ELM	Length	Average AADT	VMT
0.00	0.00	0.00	0	0
0.00	0.00	0.00	0	0
0.00	0.00	0.00	0	0
0.00	0.00	0.00	0	0
0.00	0.00	0.00	0	0
0.00	0.00	0.00	0	0
0.00	0.00	0.00	0	0
		0.00	0	0

INTERSECTION
Log Mile =

Leg		Traffic AADT
North	=	10,330
East	=	
South	=	13,780
West	=	3,650
Entering AADT	=	27,760

Data Collected On September 9, 2019

2-Lane Undivided Urban Functionally Classified Road

Sept. 2016 - Sept. 2019

		Total	Fatal	Incap. Injury	*Severe Crashes	Other Injury
No. of Crashes	=	5	0	0	0	0
No. of Years	=	3				
SW avg. rate	=	4.178	0.021	N/A	0.021	0.962
14-16 S/W Rates						
Exposure (E)	=	30.3972				
Crash Rate (A)	=	0.164	0.000	0.000	0.000	0.000
Critical Rate (C)	=	5.057				
Severity Index (SI)	=	0.0000				
Actual Rate/SW Average	=	0.04	0.00	#DIV/0!	0.00	0.00
Ratio of A/C	=	0.03				

* Severe Crashes are the sum of fatal and incapacitating injury crashes

Revised 4/3/2007

COUNTY	= WILLIAMSON	Date:	9/13/2019
Route	= COLUMBIA PIKE (SR 6/US 31)		
Location	= INTERSECTION OF COLUMBIA PIKE AND I-840 EASTBOUND RAMP		
Highway Type	= 4-Lane Undivided Urban Functionally Classified Road		
FUNCTIONAL CLASS=	COLLECTOR		
DATA YEARS	= SEPT. 2016 - SEPT. 2019		
ADT YEARS USED=	Data collected on September 9, 2019		
COMMENTS	=		
ANALYZED BY	= KCI TECHNOLOGIES, INC.		

SECTION = MORE THAN 0.10 MILE / SPOT = LESS THAN 0.10 MILE

BLM	ELM	Length	Average AADT	VMT
0.00	0.00	0.00	0	0
0.00	0.00	0.00	0	0
0.00	0.00	0.00	0	0
0.00	0.00	0.00	0	0
0.00	0.00	0.00	0	0
0.00	0.00	0.00	0	0
0.00	0.00	0.00	0	0
		0.00	0	0

INTERSECTION
Log Mile =

Leg		Traffic AADT
North	=	17,020
East	=	3,060
South	=	15,930
West	=	
Entering AADT	=	36,010

Data Collected On September 9, 2019

4-Lane Undivided Urban Functionally Classified Road

Sept. 2016 - Sept. 2019

		Total	Fatal	Incap. Injury	*Severe Crashes	Other Injury
No. of Crashes	=	23	0	0	0	7
No. of Years	=	3				
SW avg. rate	=	4.178	0.021	N/A	0.021	0.962
14-16 S/W Rates						
Exposure (E)	=	39.4310				
Crash Rate (A)	=	0.583	0.000	0.000	0.000	0.178
Critical Rate (C)	=	4.948				
Severity Index (SI)	=	0.3043				
Actual Rate/SW Average	=	0.14	0.00	#DIV/0!	0.00	0.18
Ratio of A/C	=	0.12				

* Severe Crashes are the sum of fatal and incapacitating injury crashes

Revised 4/3/2007

COUNTY	= WILLIAMSON	Date:	9/13/2019
Route	= COLUMBIA PIKE (SR 6/US 31)		
Location	= INTERSECTION OF I-840 EASTBOUND RAMP AND I-840 EASTBOUND		
Highway Type	= 4-Lane Undivided Urban Functionally Classified Road		
FUNCTIONAL CLASS=	ARTERIAL		
DATA YEARS	= SEPT. 2016 - SEPT. 2019		
ADT YEARS USED=	Data collected on September 9, 2019		
COMMENTS	=		
ANALYZED BY	= KCI TECHNOLOGIES, INC.		

SECTION = MORE THAN 0.10 MILE / SPOT = LESS THAN 0.10 MILE

BLM	ELM	Length	Average AADT	VMT
0.00	0.00	0.00	0	0
0.00	0.00	0.00	0	0
0.00	0.00	0.00	0	0
0.00	0.00	0.00	0	0
0.00	0.00	0.00	0	0
0.00	0.00	0.00	0	0
0.00	0.00	0.00	0	0
		0.00	0	0

INTERSECTION
Log Mile =

Leg		Traffic AADT
North	=	17,020
East	=	3,060
South	=	15,930
West	=	
Entering AADT	=	36,010

Data Collected On September 9, 2019

4-Lane Undivided Urban Functionally Classified Road

Sept. 2016 - Sept. 2019

		Total	Fatal	Incap. Injury	*Severe Crashes	Other Injury
No. of Crashes	=	4	1	0	1	0
No. of Years	=	3				
SW avg. rate	=	4.178	0.021	N/A	0.021	0.962
14-16 S/W Rates						
Exposure (E)	=	39.4310				
Crash Rate (A)	=	0.101	0.025	0.000	0.025	0.000
Critical Rate (C)	=	4.948				
Severity Index (SI)	=	1.0000				
Actual Rate/SW Average	=	0.02	1.20	#DIV/0!	1.20	0.00
Ratio of A/C	=	0.02				

* Severe Crashes are the sum of fatal and incapacitating injury crashes

Revised 4/3/2007

COUNTY	=	WILLIAMSON	Date: 9/13/2019
Route	=	COLUMBIA PIKE (SR 6/US 31)	
Location	=	INTERSECTION OF COLUMBIA PIKE AND I-840 WESTBOUND RAMP	
Highway Type	=	4-Lane Undivided Urban Functionally Classified Road	
FUNCTIONAL CLASS	=	COLLECTOR	
DATA YEARS	=	SEPT. 2016 - SEPT. 2019	
ADT YEARS USED	=	Data collected on September 9, 2019	
COMMENTS	=		
ANALYZED BY	=	KCI TECHNOLOGIES, INC.	

SECTION = MORE THAN 0.10 MILE / SPOT = LESS THAN 0.10 MILE

BLM	ELM	Length	Average AADT	VMT
0.00	0.00	0.00	0	0
0.00	0.00	0.00	0	0
0.00	0.00	0.00	0	0
0.00	0.00	0.00	0	0
0.00	0.00	0.00	0	0
0.00	0.00	0.00	0	0
0.00	0.00	0.00	0	0
		0.00	0	0

INTERSECTION Log Mile =

Leg		Traffic AADT
North	=	11,580
East	=	
South	=	11,950
West	=	6,730
Entering AADT	=	30,260

Data Collected On September 9, 2019

4-Lane Undivided Urban Functionally Classified Road

Sept. 2016 - Sept. 2019

		Total	Fatal	Incap. Injury	*Severe Crashes	Other Injury
No. of Crashes	=	29	0	0	0	6
No. of Years	=	3				
SW avg. rate	=	4.178	0.021	N/A	0.021	0.962
14-16 S/W Rates						
Exposure (E)	=	33.1347				
Crash Rate (A)	=	0.875	0.000	0.000	0.000	0.181
Critical Rate (C)	=	5.019				
Severity Index (SI)	=	0.2069				
Actual Rate/SW Average	=	0.21	0.00	#DIV/0!	0.00	0.19
Ratio of A/C	=	0.17				

* Severe Crashes are the sum of fatal and incapacitating injury crashes

Revised 4/3/2007

COUNTY	=	WILLIAMSON	Date: 9/13/2019
Route	=	COLUMBIA PIKE (SR 6/US 31)	
Location	=	INTERSECTION OF I-840 WESTBOUND RAMP AND I-840 WESTBOUND	
Highway Type	=	4-Lane Undivided Urban Functionally Classified Road	
FUNCTIONAL CLASS=		ARTERIAL	
DATA YEARS	=	SEPT. 2016 - SEPT. 2019	
ADT YEARS USED=		Data collected on September 9, 2019	
COMMENTS	=		
ANALYZED BY	=	KCI TECHNOLOGIES, INC.	

SECTION = MORE THAN 0.10 MILE / SPOT = LESS THAN 0.10 MILE

BLM	ELM	Length	Average AADT	VMT
0.00	0.00	0.00	0	0
0.00	0.00	0.00	0	0
0.00	0.00	0.00	0	0
0.00	0.00	0.00	0	0
0.00	0.00	0.00	0	0
0.00	0.00	0.00	0	0
0.00	0.00	0.00	0	0
		0.00	0	0

INTERSECTION Log Mile =

Leg		Traffic AADT
North	=	11,580
East	=	
South	=	11,950
West	=	6,730
Entering AADT	=	30,260

Data Collected On September 9, 2019

4-Lane Undivided Urban Functionally Classified Road

Sept. 2016 - Sept. 2019

		Total	Fatal	Incap. Injury	*Severe Crashes	Other Injury
No. of Crashes	=	4	0	0	0	0
No. of Years	=	3				
SW avg. rate	=	4.178	0.021	N/A	0.021	0.962
14-16 S/W Rates						
Exposure (E)	=	33.1347				
Crash Rate (A)	=	0.121	0.000	0.000	0.000	0.000
Critical Rate (C)	=	5.019				
Severity Index (SI)	=	0.0000				
Actual Rate/SW Average	=	0.03	0.00	#DIV/0!	0.00	0.00
Ratio of A/C	=	0.02				

* Severe Crashes are the sum of fatal and incapacitating injury crashes

Revised 4/3/2007

COUNTY	= WILLIAMSON	Date:	9/13/2019
Route	= COLUMBIA PIKE (SR 6/US 31)		
Location	= INTERSECTION OF COLUMBIA PIKE AND DECLARATION WAY		
Highway Type	= 4-Lane Undivided Urban Functionally Classified Road		
FUNCTIONAL CLASS=	COLLECTOR		
DATA YEARS	= SEPT. 2016 - SEPT. 2019		
ADT YEARS USED=	Data collected on September 9, 2019		
COMMENTS	=		
ANALYZED BY	= KCI TECHNOLOGIES, INC.		

SECTION = MORE THAN 0.10 MILE / SPOT = LESS THAN 0.10 MILE

BLM	ELM	Length	Average AADT	VMT
0.00	0.00	0.00	0	0
0.00	0.00	0.00	0	0
0.00	0.00	0.00	0	0
0.00	0.00	0.00	0	0
0.00	0.00	0.00	0	0
0.00	0.00	0.00	0	0
0.00	0.00	0.00	0	0
		0.00	0	0

INTERSECTION
Log Mile =

Leg		Traffic AADT
North	=	14,730
East	=	3,160
South	=	11,860
West	=	
Entering AADT	=	29,750

Data Collected On September 9, 2019

4-Lane Undivided Urban Functionally Classified Road

Sept. 2016 - Sept. 2019

		Total	Fatal	Incap. Injury	*Severe Crashes	Other Injury
No. of Crashes	=	10	0	1	1	1
No. of Years	=	3				
SW avg. rate	=	4.178	0.021	N/A	0.021	0.962
14-16 S/W Rates						
Exposure (E)	=	32.5763				
Crash Rate (A)	=	0.307	0.000	0.031	0.031	0.031
Critical Rate (C)	=	5.027				
Severity Index (SI)	=	0.3000				
Actual Rate/SW Average	=	0.07	0.00	#DIV/0!	1.45	0.03
Ratio of A/C	=	0.06				

* Severe Crashes are the sum of fatal and incapacitating injury crashes

Revised 4/3/2007

COUNTY	= WILLIAMSON	Date:	9/13/2019
Route	= COLUMBIA PIKE (SR 6/US 31)		
Location	= FRONTAGE ALONG PARCEL 1		
Highway Type	= 2-Lane Undivided Urban Functionally Classified Road		
FUNCTIONAL CLASS=	COLLECTOR		
DATA YEARS	= SEPT. 2016 - SEPT. 2019		
ADT YEARS USED=	Data collected on September 9, 2019		
COMMENTS	=		
ANALYZED BY	= KCI TECHNOLOGIES, INC.		

SECTION = MORE THAN 0.10 MILE / SPOT = LESS THAN 0.10 MILE

BLM	ELM	Length	Average AADT	VMT
0.00	0.49	0.49	20,369	9,981
0.00	0.00	0.00	0	0
0.00	0.00	0.00	0	0
0.00	0.00	0.00	0	0
0.00	0.00	0.00	0	0
0.00	0.00	0.00	0	0
0.00	0.00	0.00	0	0
		0.49	20,369	9,981

INTERSECTION
Log Mile =

Leg	Traffic AADT
North =	
East =	
South =	
West =	
Entering AADT =	0

Data Collected On September 9, 2019
2-Lane Undivided Urban Functionally Classified Road
Sept. 2016 - Sept. 2019

		Total	Fatal	Incap. Injury	*Severe Crashes	Other Injury
No. of Crashes	=	9			0	2
No. of Years	=	3				
SW avg. rate	=	4.178	0.021	N/A	0.021	0.962
14-16 S/W Rates						
Exposure (E)	=	10.9290				
Crash Rate (A)	=	0.823	0.000	0.000	0.000	0.183
Critical Rate (C)	=	5.663				
Severity Index (SI)	=	0.2222				
Actual Rate/SW Average	=	0.20	0.00	#DIV/0!	0.00	0.19
Ratio of A/C	=	0.15				

* Severe Crashes are the sum of fatal and incapacitating injury crashes

Revised 4/3/2007

COUNTY	= WILLIAMSON	Date:	9/13/2019
Route	= COLUMBIA PIKE (SR 6/US 31)		
Location	= FRONTAGE ALONG PARCEL 2		
Highway Type	= 2-Lane Undivided Urban Functionally Classified Road		
FUNCTIONAL CLASS=	COLLECTOR		
DATA YEARS	= SEPT. 2016 - SEPT. 2019		
ADT YEARS USED=	Data collected on September 9, 2019		
COMMENTS	=		
ANALYZED BY	= KCI TECHNOLOGIES, INC.		

SECTION = MORE THAN 0.10 MILE / SPOT = LESS THAN 0.10 MILE

BLM	ELM	Length	Average AADT	VMT
0.00	0.07	0.07	20,369	1,426
0.00	0.00	0.00	0	0
0.00	0.00	0.00	0	0
0.00	0.00	0.00	0	0
0.00	0.00	0.00	0	0
0.00	0.00	0.00	0	0
0.00	0.00	0.00	0	0
		0.07	20,369	1,426

INTERSECTION
Log Mile =

Leg	Traffic AADT
North =	
East =	
South =	
West =	
Entering AADT =	0

Data Collected On September 9, 2019
2-Lane Undivided Urban Functionally Classified Road
Sept. 2016 - Sept. 2019

		Total	Fatal	Incap. Injury	*Severe Crashes	Other Injury
No. of Crashes	=	5			0	2
No. of Years	=	3				
SW avg. rate	=	4.178	0.021	N/A	0.021	0.962
14-16 S/W Rates						
Exposure (E)	=	22.3041				
Crash Rate (A)	=	0.224	0.000	0.000	0.000	0.090
Critical Rate (C)	=	5.208				
Severity Index (SI)	=	0.4000				
Actual Rate/SW Average	=	0.05	0.00	#DIV/0!	0.00	0.09
Ratio of A/C	=	0.04				

* Severe Crashes are the sum of fatal and incapacitating injury crashes

Revised 4/3/2007

COUNTY	= WILLIAMSON	Date:	9/13/2019
Route	= COLUMBIA PIKE (SR 6/US 31)		
Location	= FRONTAGE ALONG PARCEL 1 & 2 Combined		
Highway Type	= 2-Lane Undivided Urban Functionally Classified Road		
FUNCTIONAL CLASS=	COLLECTOR		
DATA YEARS	= SEPT. 2016 - SEPT. 2019		
ADT YEARS USED=	Data collected on September 9, 2019		
COMMENTS	=		
ANALYZED BY	= KCI TECHNOLOGIES, INC.		

SECTION = MORE THAN 0.10 MILE / SPOT = LESS THAN 0.10 MILE

BLM	ELM	Length	Average AADT	VMT
0.00	0.56	0.56	20,369	11,407
0.00	0.00	0.00	0	0
0.00	0.00	0.00	0	0
0.00	0.00	0.00	0	0
0.00	0.00	0.00	0	0
0.00	0.00	0.00	0	0
0.00	0.00	0.00	0	0
		0.56	20,369	11,407

INTERSECTION
Log Mile =

Leg	Traffic AADT
North =	
East =	
South =	
West =	
Entering AADT =	0

Data Collected On September 9, 2019
2-Lane Undivided Urban Functionally Classified Road
Sept. 2016 - Sept. 2019

		Total	Fatal	Incap. Injury	*Severe Crashes	Other Injury
No. of Crashes	=	14			0	4
No. of Years	=	3				
SW avg. rate	=	4.178	0.021	N/A	0.021	0.962
14-16 S/W Rates						
Exposure (E)	=	12.4903				
Crash Rate (A)	=	1.121	0.000	0.000	0.000	0.320
Critical Rate (C)	=	5.564				
Severity Index (SI)	=	0.2857				
Actual Rate/SW Average	=	0.27	0.00	#DIV/0!	0.00	0.33
Ratio of A/C	=	0.20				

* Severe Crashes are the sum of fatal and incapacitating injury crashes

Revised 4/3/2007

APPENDIX H
SIGNAL TIMING PLANS

TOWN OF THOMPSON'S STATION - SIGNAL TIMING SUMMARY SHEET

INTERSECTION ID

LOCATION: US 31 & TOLLGATE BLVD

DATE: 1/11/2019

NOTES:

TIME BY PHASE (SEC) & FUNCTIONS

PHASE	1	2	3	4	5	6	7	8
INITIAL GREEN		10		6	6	10		
PASSAGE TIME								
YELLOW CHANGE INTERVAL		4.0		4.0	4.0	4.0		
RED CLEAR INTERVAL		2.0		3.0	3.0	2.0		
WALK INTERVAL		7		7		7		
PED CLEARANCE		12		12		12		
MAX 1		40		40	40	40		
MAX 2		0		0	0	0		
MAX 3 LIMIT		0		0	0	0		
MAX 3 ADJUST		0		0	0	0		
MAX OUTS TO ADJ MAX 3								
GAP OUTS TO ADJ MAX 3								
TIME BEFORE REDUCT.								
TIME TO REDUCE								
MIN. GAP								
ADDED INITIAL PER ACT.								
MAX. INITIAL								
MIN RECALL								
MAX RECALL		X				X		
PED RECALL								
SOFT RECALL								
NON-LOCK								
VEH OMIT								
PED OMIT					X			
CNA 1								
CNA 2								
WALK REST. MOD.								

PHASE ALLOCATIONS (SEC)

PHASE	1	2	3	4	5	6	7	8
CYCLE 1 / SPLIT 1		74		26	18	56		
CYCLE 1 / SPLIT 2								
CYCLE 2 / SPLIT 1		66		24	18	48		
CYCLE 2 / SPLIT 2								
CYCLE 3 / SPLIT 1		95		25	20	75		
CYCLE 3 / SPLIT 2								
CYCLE 4 / SPLIT 1								
CYCLE 4 / SPLIT 2								
CYCLE 5 / SPLIT 1								
CYCLE 5 / SPLIT 2								
CYCLE 6 / SPLIT 1								
CYCLE 6 / SPLIT 2								

CYCLE / OFFSETS	1	2	3	4	5	6
CYCLE LENGTH	100	90	120			
OFFSET 1	0	0	0			
OFFSET 2						

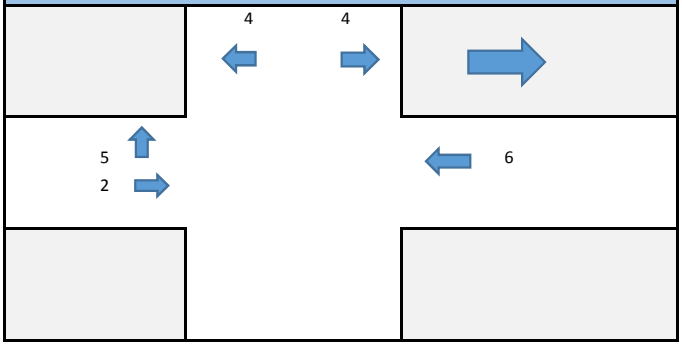
PHASE REVERSAL				COORD. PHASES			CIRCUIT OVERRIDES		
PTRN.	MODE	PHASES LEAD	PHASES LAG	CYCLE	PHASES TO COORD.		CKT.	SYM.	ON/OFF/ TOD
				1	2	6			
				2	2	6			
				3	2	6			
				4					
				5					
				6					

DAY PLAN EVENTS

PLAN	HH:MM	CKT PLN	C/O/S	CKT	ON/OFF
Free	0:00				ON
Free	6:30				OFF
AM	6:30		1/1/1		
MD	9:00		2/1/1		
PM	14:00		3/1/1		
Free	18:30				ON
Free	0:00				ON
Free	8:00				OFF
MD	8:00		2/1/1		
Free	17:00				ON

WEEKLY PROGRAM PLAN	SUN 1	MON 2	TUE 3	WED 4	THU 5	FRI 6	SAT 7
0							
1		X	X	X	X	X	
2	X						X

PHASE ORIENTATION



TOWN OF THOMPSON'S STATION - SIGNAL TIMING SUMMARY SHEET

INTERSECTION ID

LOCATION: US 31 & 840 WB

DATE: 1/11/2019

NOTES:

TIME BY PHASE (SEC) & FUNCTIONS

PHASE	1	2	3	4	5	6	7	8
INITIAL GREEN		10	6			10		6
PASSAGE TIME								
YELLOW CHANGE INTERVAL		5.0	4.0			5.0		4.0
RED CLEAR INTERVAL		2.0	2.5			2.0		2.5
WALK INTERVAL								
PED CLEARANCE								
MAX 1		40	40			40		40
MAX 2		0	0			0		0
MAX 3 LIMIT								
MAX 3 ADJUST								
MAX OUTS TO ADJ MAX 3								
GAP OUTS TO ADJ MAX 3								
TIME BEFORE REDUCT.								
TIME TO REDUCE								
MIN. GAP								
ADDED INITIAL PER ACT.								
MAX. INITIAL								
MIN RECALL								
MAX RECALL			X			X		X
PED RECALL								
SOFT RECALL								
NON-LOCK								
VEH OMIT								
PED OMIT		X	X			X		X
CNA 1								
CNA 2								
WALK REST. MOD.								

PHASE ALLOCATIONS (SEC)

PHASE	1	2	3	4	5	6	7	8
CYCLE 1 / SPLIT 1		70	30			70		30
CYCLE 1 / SPLIT 2								
CYCLE 2 / SPLIT 1		60	30			60		30
CYCLE 2 / SPLIT 2								
CYCLE 3 / SPLIT 1		60	60			60		60
CYCLE 3 / SPLIT 2								
CYCLE 4 / SPLIT 1								
CYCLE 4 / SPLIT 2								
CYCLE 5 / SPLIT 1								
CYCLE 5 / SPLIT 2								
CYCLE 6 / SPLIT 1								
CYCLE 6 / SPLIT 2								

CYCLE / OFFSETS	1	2	3	4	5	6
CYCLE LENGTH	100	90	120			
OFFSET 1	89	60	29			
OFFSET 2						

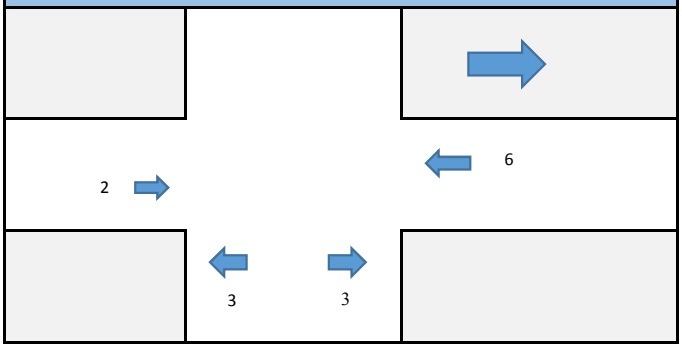
PHASE REVERSAL				COORD. PHASES			CIRCUIT OVERRIDES		
PTRN.	MODE	PHASES LEAD	PHASES LAG	CYCLE	PHASES TO COORD.		CKT.	SYM.	ON/OFF/ TOD
				1	2	6			
				2	2	6			
				3	2	6			
				4					
				5					
				6					

DAY PLAN EVENTS

PLAN	HH:MM	CKT PLN	C/O/S	CKT	ON/OFF
Free	0:00				ON
Free	6:30				OFF
AM	6:30		1/1/1		
MD	9:00		2/1/1		
PM	14:00		3/1/1		
Free	18:30				ON
Free	0:00				ON
Free	8:00				OFF
MD	8:00		2/1/1		
Free	17:00				ON

WEEKLY PROGRAM PLAN	SUN 1	MON 2	TUE 3	WED 4	THU 5	FRI 6	SAT 7
0							
1		X	X	X	X	X	
2	X						X

PHASE ORIENTATION



TOWN OF THOMPSON'S STATION - SIGNAL TIMING SUMMARY SHEET

INTERSECTION ID

LOCATION: US 31 & 840 EB

DATE: 1/11/2019

NOTES:

TIME BY PHASE (SEC) & FUNCTIONS

PHASE	1	2	3	4	5	6	7	8
INITIAL GREEN	6	10	6			10	6	
PASSAGE TIME								
YELLOW CHANGE INTERVAL	4.5	4.5	4.0			4.5	4.0	
RED CLEAR INTERVAL	2.5	2.5	2.0			2.5	2.0	
WALK INTERVAL								
PED CLEARANCE								
MAX 1	40	40	40			40	40	
MAX 2								
MAX 3 LIMIT								
MAX 3 ADJUST								
MAX OUTS TO ADJ MAX 3								
GAP OUTS TO ADJ MAX 3								
TIME BEFORE REDUCT.								
TIME TO REDUCE								
MIN. GAP								
ADDED INITIAL PER ACT.								
MAX. INITIAL								
MIN RECALL								
MAX RECALL		X				X		
PED RECALL								
SOFT RECALL								
NON-LOCK								
VEH OMIT								
PED OMIT								
CNA 1								
CNA 2								
WALK REST. MOD.								

PHASE ALLOCATIONS (SEC)

PHASE	1	2	3	4	5	6	7	8
CYCLE 1 / SPLIT 1	16	54	30			70	30	
CYCLE 1 / SPLIT 2								
CYCLE 2 / SPLIT 1	20	50	20			70	20	
CYCLE 2 / SPLIT 2								
CYCLE 3 / SPLIT 1	30	70	20			100	20	
CYCLE 3 / SPLIT 2								
CYCLE 4 / SPLIT 1								
CYCLE 4 / SPLIT 2								
CYCLE 5 / SPLIT 1								
CYCLE 5 / SPLIT 2								
CYCLE 6 / SPLIT 1								
CYCLE 6 / SPLIT 2								

CYCLE / OFFSETS	1	2	3	4	5	6
CYCLE LENGTH	100	90	120			
OFFSET 1	59	55	74			
OFFSET 2						

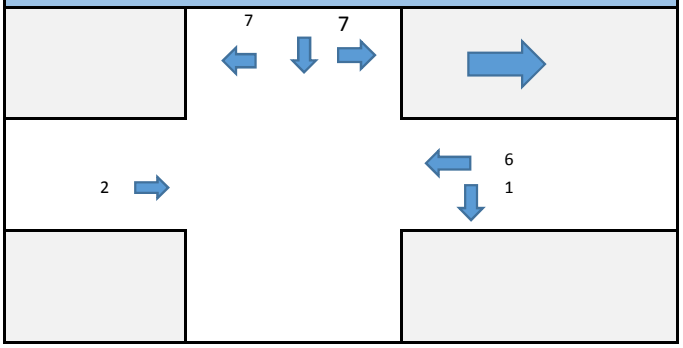
PHASE REVERSAL				COORD. PHASES			CIRCUIT OVERRIDES		
PTRN.	MODE	PHASES LEAD	PHASES LAG	CYCLE	PHASES TO COORD.		CKT.	SYM.	ON/OFF/ TOD
				1	2	6			
				2	2	6			
				3	2	6			
				4					
				5					
				6					

DAY PLAN EVENTS

PLAN	HH:MM	CKT PLN	C/O/S	CKT	ON/OFF
Free	0:00				ON
Free	6:30				OFF
AM	6:30		1/1/1		
MD	9:00		2/1/1		
PM	14:00		3/1/1		
Free	18:30				ON
Free	0:00				ON
Free	8:00				OFF
MD	8:00		2/1/1		
Free	17:00				ON

WEEKLY PROGRAM PLAN	SUN 1	MON 2	TUE 3	WED 4	THU 5	FRI 6	SAT 7
0							
1		X	X	X	X	X	
2	X						X

PHASE ORIENTATION



TOWN OF THOMPSON'S STATION - SIGNAL TIMING SUMMARY SHEET

INTERSECTION ID

LOCATION: US 31 & CRITZ LANE

DATE: 1/11/2019

NOTES:

TIME BY PHASE (SEC) & FUNCTIONS

PHASE	1	2	3	4	5	6	7	8
INITIAL GREEN	6	10	6	6		10		
PASSAGE TIME								
YELLOW CHANGE INTERVAL	4.5	4.5	4.5	4.0		4.5		
RED CLEAR INTERVAL	2.0	2.0	2.0	2.0		2.0		
WALK INTERVAL								
PED CLEARANCE								
MAX 1	40	40	40	40		40		
MAX 2								
MAX 3 LIMIT								
MAX 3 ADJUST								
MAX OUTS TO ADJ MAX 3								
GAP OUTS TO ADJ MAX 3								
TIME BEFORE REDUCT.								
TIME TO REDUCE								
MIN. GAP								
ADDED INITIAL PER ACT.								
MAX. INITIAL								
MIN RECALL								
MAX RECALL								
PED RECALL								
SOFT RECALL								
NON-LOCK								
VEH OMIT								
PED OMIT	X	X	X	X		X		
CNA 1								
CNA 2								
WALK REST. MOD.								

PHASE ALLOCATIONS (SEC)

PHASE	1	2	3	4	5	6	7	8
CYCLE 1 / SPLIT 1	24	37	14	25		61		
CYCLE 1 / SPLIT 2								
CYCLE 2 / SPLIT 1	20	36	14	20		56		
CYCLE 2 / SPLIT 2								
CYCLE 3 / SPLIT 1	47	34	14	25		81		
CYCLE 3 / SPLIT 2								
CYCLE 4 / SPLIT 1								
CYCLE 4 / SPLIT 2								
CYCLE 5 / SPLIT 1								
CYCLE 5 / SPLIT 2								
CYCLE 6 / SPLIT 1								
CYCLE 6 / SPLIT 2								

CYCLE / OFFSETS	1	2	3	4	5	6
CYCLE LENGTH	100	90	120			
OFFSET 1	0	0	106			
OFFSET 2						

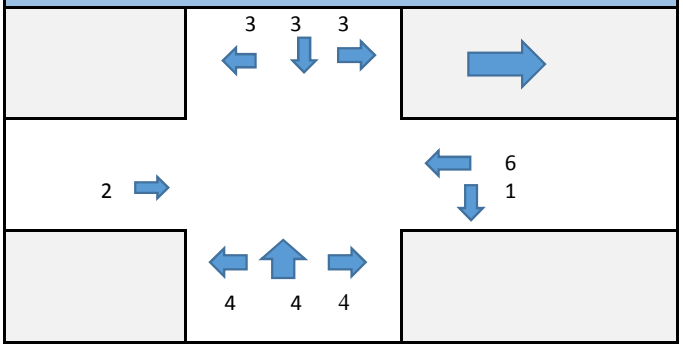
PHASE REVERSAL				COORD. PHASES			CIRCUIT OVERRIDES		
PTRN.	MODE	PHASES LEAD	PHASES LAG	CYCLE	PHASES TO COORD.		CKT.	SYM.	ON/OFF/ TOD
				1	2	6			
				2	2	6			
				3	2	6			
				4					
				5					
				6					

DAY PLAN EVENTS

PLAN	HH:MM	CKT PLN	C/O/S	CKT	ON/OFF
Free	0:00				ON
Free	6:30				OFF
AM	6:30		1/1/1		
MD	9:00		2/1/1		
PM	14:00		3/1/1		
Free	18:30				ON
Free	0:00				ON
Free	8:00				OFF
MD	8:00		2/1/1		
Free	17:00				ON

WEEKLY PROGRAM PLAN	SUN 1	MON 2	TUE 3	WED 4	THU 5	FRI 6	SAT 7
0							
1		X	X	X	X	X	
2	X						X

PHASE ORIENTATION



TOWN OF THOMPSON'S STATION - SIGNAL TIMING SUMMARY SHEET

INTERSECTION ID

LOCATION: US 31 & THOMPSON'S STATION ROAD

DATE: 1/11/2019

NOTES:

TIME BY PHASE (SEC) & FUNCTIONS

PHASE	1	2	3	4	5	6	7	8
INITIAL GREEN	6	10	6	6	6	10	6	6
PASSAGE TIME								
YELLOW CHANGE INTERVAL	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
RED CLEAR INTERVAL	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
WALK INTERVAL								
PED CLEARANCE								
MAX 1	20	40	20	40	20	40	20	40
MAX 2								
MAX 3 LIMIT								
MAX 3 ADJUST								
MAX OUTS TO ADJ MAX 3								
GAP OUTS TO ADJ MAX 3								
TIME BEFORE REDUCT.								
TIME TO REDUCE								
MIN. GAP								
ADDED INITIAL PER ACT.								
MAX. INITIAL								
MIN RECALL								
MAX RECALL		X				X		
PED RECALL								
SOFT RECALL								
NON-LOCK	X		X		X		X	
VEH OMIT								
PED OMIT	X	X	X	X	X	X	X	X
CNA 1								
CNA 2								
WALK REST. MOD.								

PHASE ALLOCATIONS (SEC)

PHASE	1	2	3	4	5	6	7	8
CYCLE 1 / SPLIT 1	14	49	14	23	16	47	14	23
CYCLE 1 / SPLIT 2								
CYCLE 2 / SPLIT 1	14	42	14	20	14	42	14	20
CYCLE 2 / SPLIT 2								
CYCLE 3 / SPLIT 1	15	66	15	24	15	66	15	24
CYCLE 3 / SPLIT 2								
CYCLE 4 / SPLIT 1								
CYCLE 4 / SPLIT 2								
CYCLE 5 / SPLIT 1								
CYCLE 5 / SPLIT 2								
CYCLE 6 / SPLIT 1								
CYCLE 6 / SPLIT 2								

CYCLE / OFFSETS	1	2	3	4	5	6
CYCLE LENGTH	100	90	120			
OFFSET 1	0	50	30			
OFFSET 2						

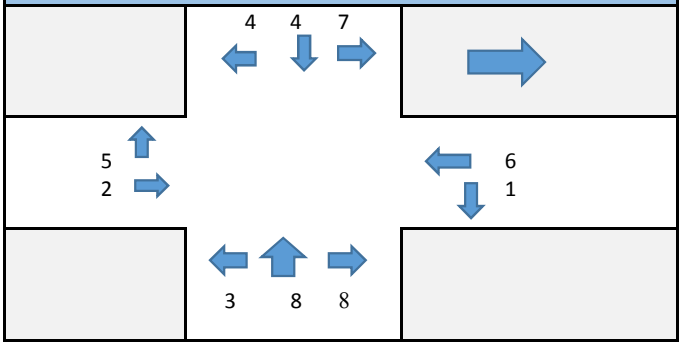
PHASE REVERSAL				COORD. PHASES			CIRCUIT OVERRIDES		
PTRN.	MODE	PHASES LEAD	PHASES LAG	CYCLE	PHASES TO COORD.		CKT.	SYM.	ON/OFF/ TOD
				1	2	6			
				2	2	6			
				3	2	6			
				4					
				5					
				6					

DAY PLAN EVENTS

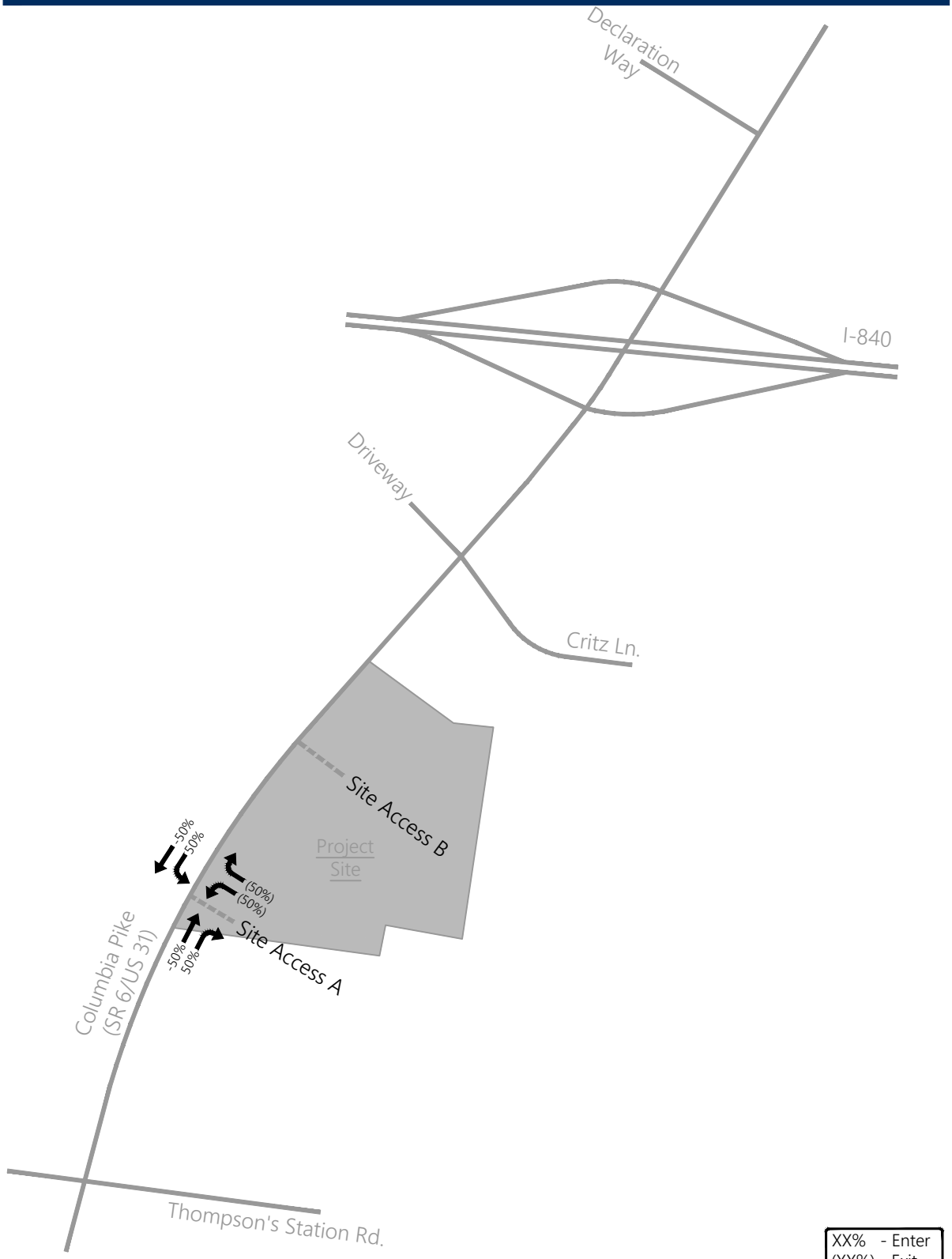
PLAN	HH:MM	CKT PLN	C/O/S	CKT	ON/OFF
Free	0:00				ON
Free	6:30				OFF
AM	6:30		1/1/1		
MD	9:00		2/2/1		
PM	14:00		3/3/1		
Free	18:30				ON
Free	0:00				ON
Free	8:00				OFF
MD	8:00		2/2/1		
Free	17:00				ON

WEEKLY PROGRAM PLAN	SUN 1	MON 2	TUE 3	WED 4	THU 5	FRI 6	SAT 7
0							
1		X	X	X	X	X	
2	X						X

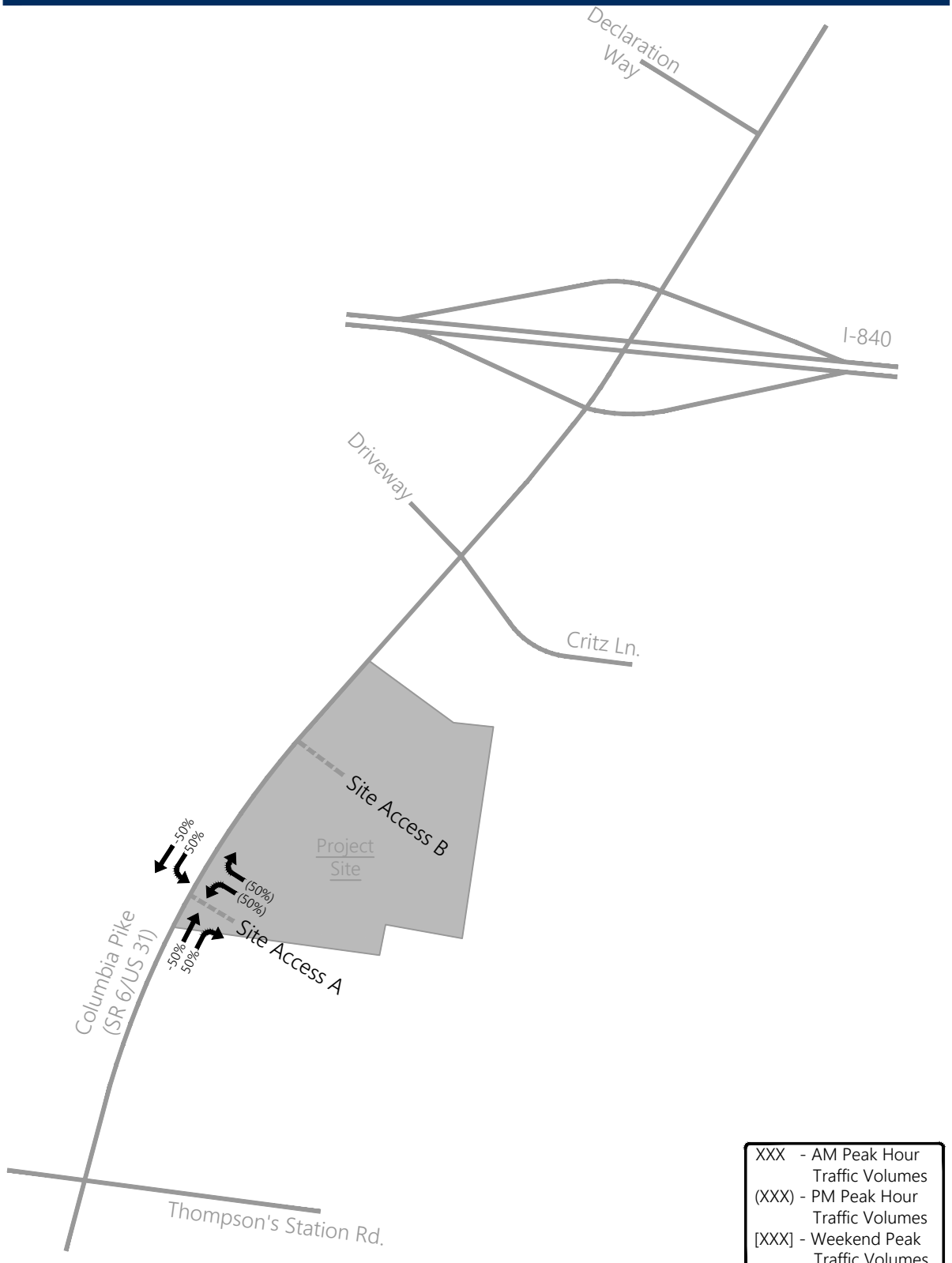
PHASE ORIENTATION



APPENDIX I
PASS-BY DISTRIBUTION AND ASSIGNMENT



Distribution of Peak Hour Traffic Volumes
Generated by the Project Site (Pass-By for Convenience Market)
(Not to Scale) Figure I1.



Assignment of Peak Hour Traffic Volumes
Generated by the Project Site (Pass-By for Convenience Market)
(Not to Scale) Figure I2.

ORDINANCE NO. 2020-002

AN ORDINANCE OF THE TOWN OF THOMPSON'S STATION, TENNESSEE TO AMEND TITLE 8, ALCOHOLIC BEVERAGES ORDINANCE

WHEREAS, Town Staff and the Beer Board is recommending changes certain provisions of the Town's Ordinance, under Title 8, Alcoholic Beverages to improve and clarity as to the process and procedures for the notice, payment and collection of the privilege tax.

WHEREAS, the Beer Board has reviewed these proposed changes and has recommended that the Board of Mayor and Aldermen adopt the amendments to the Ordinance under Title 8 as proposed herein; and

WHEREAS, the Board of Mayor and Aldermen has reviewed the Ordinance under Title 8, Alcoholic Beverages, and has determined, based upon the recommendations of Town Staff, the Beer Board, and the record as a whole, that the proposed amendments are consistent and appropriate to improve the process and procedures for the collection of the privilege tax, and does overall make improvements to the Ordinance, and is in the best interest of the Town.

NOW, THEREFORE, BE IT ORDAINED by the Board of Mayor and Aldermen of the Town of Thompson's Station, Tennessee, as follows:

Section 1. That the Town of Thompson's Station's Ordinance, under Title 8, Alcoholic Beverages is hereby amended by adopting the changes as set out in Exhibit A attached hereto and incorporated herein by reference. After final passage, Town Staff is directed to incorporate these changes into an updated ordinance document and said document shall constitute the Alcoholic Beverages ordinances of the Town.

Section 2. If any section or part of the Ordinance, including any amendments thereto, is determined to be invalid for any reason, such section or part shall be deemed to be a separate and independent provision. All other sections or parts shall remain in full force and effect. If any section or part of the Ordinance is invalid in one or more of its applications, that section or part shall remain in effect for all other valid applications.

Section 3. This ordinance shall take effect immediately upon the publication of its caption in a newspaper of general circulation after final reading by the Board of Mayor and Aldermen, the public welfare requiring it.

Duly approved and adopted by the Board of Mayor and Aldermen of the Town of Thompson's Station, Tennessee, on the _____ day of _____, 2020.

_____

Corey Napier, Mayor

ATTEST:

_____
Regina Fowler, Town Recorder

Passed First Reading: _____

Passed Second Reading: _____

Submitted to Public Hearing on the ____ day of _____, 2020, at 7:00 p.m., after being advertised in the *Williamson AM* Newspaper on the ____ day of _____, 2020.

Recommended for approval by the Beer Board on the _____day of _____, 2020.

APPROVED AS TO FORM AND LEGALITY:

_____
Town Attorney

EXHIBIT A
TITLE 8
ALCOHOLIC BEVERAGES[1]

CHAPTER
1. BEER.

CHAPTER 1
BEER[2]

SECTION

8-101. Beer board established. There is herby established a beer board to be composed of the board of mayor and aldermen. The mayor shall be chairman of the beer board. (Ord. #96-001, April 1996)

8-102. Meeting of the beer board. All meeting of the beer board shall be open to the public. The board shall hold regular meetings in the town hall at such times as it shall prescribe. When there is business to come before

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[1]State law reference
Tennessee Code Annotated, title 57.

[2]State law reference
For a leading case on a municipality's authority to regulate beer, see the Tennessee Supreme Court decision in Watkins v. Naifeh, 635 S.W. 2d 104 (1982).

the beer board, a special meeting may be called b y the chairman, provided he gives a reasonable notice thereof to each member. The board may adjourn a meeting at any time to another tie and place. (Ord. #96-001, April 1996)

8-103. Record of beer board proceedings to be kept. The town recorder shall make a record of the proceedings of all meeting of the beer board. The record shall be a public record

and shall contain at least the following; the date of each meeting; the names of the board members present and absent; the names of the members introducing and recording motions and resolutions, etc., before the board; a copy of each such motion or resolution presented; the vote of each member thereon; and the provisions of each beer permit issued by the board. (Ord. #96-001, April 1996)

8-104. Requirements for beer board quorum and action. The attendance of at least a majority of the members of the beer board shall be required to constitute a quorum for the purpose of transacting business. Matters before the board shall be decided by a majority of the members present if a quorum is constituted. Any member present but not voting shall be deemed to have cast a "nay" vote. (Ord. #96-001, April 1996)

8-105. Powers and duties of the beer board. The beer board shall have the power and it is hereby directed to regulate the selling, storing for sale, distributing for sale, and manufacturing of beer within this town in accordance with the provisions of this chapter. (Ord. #96-001, April 1996)

8-106. "Beer" defined. The term "beer" as used in this Chapter shall mean and include all beers, ales, and other malt liquors having an alcoholic content of not more than five percent (5%) by weight. (Ord. #96-001, April 1996).

8-107 Permit required for engaging in beer business; privilege tax; Notice and Collection (1) It shall be unlawful for any person to sell, store for sale, distribute for sale, or manufacture beer without first making applications to and obtaining a permit from the beer board. The application shall be made on such form as the board shall pre scribe and/or furnish, and pursuant to Tennessee Code Annotated, § 57-5-101(b), and shall be accompanied by a non-refundable application fee of two hundred and fifty dollars ($250.00). Said fee shall be in the form of a cashier's check payable to the Town of Thompson's Station, Tennessee. Each applicant must be a person of good moral character and certify that he has read and is familiar with the provisions of this chapter.

(2) Privilege tax. There is hereby imposed on the business of selling, distribution, storing or manufacturing beer, an annual privilege tax of one hundred dollars ($100.00). Any person, firm, corporation, joint stock company, syndicated or association engaged in the sale, distribution, storage or manufacture of beer shall remit the tax on January 1, 1994, and on or before each successive January 1, to the Town of Thompson's Station, Tennessee. At the time a new permit is issued to any business subject to this tax, the permit holder shall be required to pay the privilege tax on a prorated basis for each month or portion thereof remaining until the next tax payment date. (Ord. #96-001, April 2006)

(3) Notice and collection of the privilege tax. Pursuant to Tenn. Code Ann. §57-5-104 (a)(3), the Town shall mail written notice to each permit holder of the payment date of the

annual tax at least thirty (30) days prior to January 1. Notice shall be mailed to the address specified by the permit holder on its permit application, or at such other address as provided by the permit holder to the Town. If a permit holder does not pay the tax by January 31st or within thirty (30) days after written notice of the tax was mailed by the Town, whichever is later, then the Town shall notify the permit holder by certified mail, return receipt requested, that the tax payment is past due. If a permit holder does not pay the tax within ten (10) days after receiving notice of its delinquency by certified mail, then the Town may suspend or revoke the permit or impose a civil penalty pursuant to Tenn. Code Ann. § 57-5-108.

8-108. Beer permits shall be restrictive. (1) All beer permits shall be restrictive as to the type of beer a business is authorized to sell under the permit. Separate permits shall be required for selling at retail, storing, distributing, and manufacturing. It shall be unlawful for any beer permit holder to engage in any type or phase of the beer business not expressly authorized by his permit. It shall likewise be unlawful for him not to comply with any and all express restrictions or conditions which may be written into his permit authorized by the beer board.

(2) A beer permit issued hereunder shall be issued only in the name of the individual, manager or employee applicant. A permit, except as authorized stated in this chapter, shall continue to be valid so long as that individual, manager or employee is engaged in business at the location authorized in the permit. The individual, manager or employee is charged with compliance of this chapter at the permit location. A permit does not run with the land or business. (Ord. #96-001, April 2006)

8-109. Types of permits. Permits issued by the beer board shall consist of three (3) types:

(1) An "on-premises permit" shall be used for the consumption of beer only on the premises. To qualify for an on-premises permit, an establishment, in addition to meeting the other regulations and restrictions in this chapter, must:

(a) Be a restaurant or eating place; and

(b) Be able to seat a minimum of thirty (30) people, including children, in booths and at tables, in addition to any other seating it may have; and

(c) Have all seating in the interior of the building under a permanent roof.

(2) An "off-premises permit" shall be issued for the consumption of beer only off of the premises. To qualify for an off-premises permit, an establishment, in addition to meeting the other regulations herein, must;

(a) Be a grocery store or convenience type market; and

(b) In either case, be primarily engaged in the sale of grocery and personal and home care and cleaning articles, but may also sell gasoline.

(3) A "special event permit" may be issued by the beer board for the sale of beer for consumption on the premises of a special event upon an application describing the location and type of event. The beer board may waive the permit fee and tax for special events sponsored by

a bona fide charitable or non-profit organization or a governmental entity. The duration of a special event beer permit shall not exceed seventy-two (71) hours and shall not be issued to the same person or entity more than once within any thirty (30) day period. (Ord. #96-0001, April 1996, as amended by Ord. #08-012, June 2008)

8-110. Interference with public health, safety, and morals prohibited. No permit authorizing the sale of beer will be issued when such business(es) would cause congestion of traffic or would interfere with public health, safety and morals. In no event will a permit be issued authorizing the storage, sale or manufacture of beer by the permit holder within three hundred fee (300') of any school or church as measured in a straight line from the nearest corner of the school or church to the nearest corner of the structure where the beer is to be stored, sold or manufactured. (Ord. #05-004, March 20018)

8-111. Issuance of permits to persons convicted of certain crimes prohibited. No beer permit shall be issued to any person who has been convicted for the possession, sale, manufacture or transportation of intoxicating liquor or any crime involving moral turpitude, within the past ten (10) years. No person, firm, corporation, joint-stock company, syndicate or association having at least a five percent (5%) ownership interest in the applicant shall have been convicted of any violation of the laws against possession, sale, manufacture, or transportation of beer or other alcoholic beverages or any crime involving moral turpitude within the past ten (10) years. (Ord. #96-001, April 1996)

8-112. Prohibited conduct or activates by beer permit holders. It shall be unlawful for any beer permit holder to:

(1) Make or allow sale of beer between the hours of 12:00 midnight and 6:00am.;
(2) Allow any loud, unusual or obnoxious noises to emanate from the premises;
(3) Make or allow any sale of beer to a person under twenty-one (21) years of age;
(4) Allow any person under twenty-one (21) years of age to loiter in or about his place of business;
(5) Make or allow any sale of beer to any intoxicated person or to any feeble-minded, insane or otherwise mentally incapacitated person;
(6) Allow durn persons to loiter about the premises;
(7) Serve, sell or allow the consumption on his premises of any alcoholic beverage with an alcoholic content of more than five percent (5%) by weight; and
(8) "Off-premises" permit holders hall not allow the consumption of alcohol in or about their premises whatsoever;
(9) Allow gambling on his premises;
(10) "On-premises" permit holders shall not fail to provide and maintain sanitary toilet facilities;
(11) Allow an employee of the permit holder who is under the age of eighteen (18) years of to sell beer. (Ord. #96-001, April 1996, as amended by Ord. #07-009, Sept. 2007)

8-113. Suspension and revocation of beer permits. (1) The beer board shall have the power to suspend or revoke any beer permit issued under the provisions of this chapter when the holder thereof is guilty of making a false statement or misrepresentation in his application or of violation any of the provisions of this chapter. However, no beer permit shall be suspended or revoked until a public hearing is held by the board after reasonable notice to all the known parties in interest. Suspension or revocation proceedings may be initiated by any member of the beer board upon said member's written request to the chairman of the beer board. Said request shall be in writing, and a notice to the beer permit holder of the initiation of such proceedings shall be sent by certified mail. The notice shall include the basis of such initiation, and the date, time and location of any such public hearing for consideration of such suspension or revocation.

(2) Pursuant to Tennessee Code Annotated, § 57-5-608, the beer board shall not revoke or suspend the permit of a "responsible vendor" qualified under the requirements of Tennessee Code Annotated, § 57-5-606 for a clerk's illegal sale of beer to a minor if the clerk is properly certified and has attended annual meetings since the clerk's original certification, unless the vendor's status as a certified responsible vendor has been revoked by the alcoholic beverage commission. If the responsible vendor's certification has been revoked, the vendor shall be punished by the beer board as if the vendor were not certified as a responsible vendor. "Clerk" means any person working in a capacity to sell beer directly to consumers for off-premises consumption. Under Tennessee Code Annotated, § 57-5-608, the alcoholic beverage commission shall revoke a vendor's status as a responsible vendor upon notification by the beer board that the board has made a final determination that the vendor has sold beer to a minor for the second time in a consecutive twelve (12) month period. The revocation shall be for three (3) years. (Ord. #96-001, April 1996, as amended by Ord. #07-009, Sept. 2007)

8-114. Civil penalty in lieu of revocation or suspension.

(1) Definition. "Responsible vendor" means a person, corporation or other entity that has been issued a permit to sell beer for off-premises consumption and has received certification by the Tennessee Alcoholic Beverage Commission under the "Tennessee Responsible Vendor Act of 2006," Tennessee Code Annotated, § 57-5-601, et seq.

(2) Penalty, revocation or suspension. The beer board may, at the time it imposes a revocation or suspension, offer a permit holder that is not a responsible vendor the alternative of paying a civil penalty not to exceed two thousand five hundred dollars ($2,500.00) for each offense of making or permitting to be made any sales to minors, or a civil penalty not to exceed one thousand dollars ($1,000.00) for any other offense.

The beer board may impose on a responsible vendor a civil penalty not to exceed one thousand dollars ($1,000.00) for each offense of making or permitting to be made any sales to minors or for any other offense.

If a civil penalty is offered as an alternative to revocation or suspension, the holder shall have seven (7) days within which to pay the civil penalty before the revocation or suspension

shall be imposed. If the civil penalty is paid within that time, the revocation or suspension shall be deemed withdrawn.

Payment of the civil penalty in lieu of revocation or suspension by a permit holder shall be an admission by the holder of the violation so charged and shall be paid to the exclusion of any other penalty that the town may impose. (Ord. #07-009, Sept. 2007)

8-115. Revocation of clerk's certification for sale to minor. If the beer board determines that a clerk of an off-premises beer permit holder certified under Tennessee Code Annotated, § 57-5-606, sold beer to a minor, the beer board shall report the name of the clerk to the alcoholic beverage commission within fifteen (15) days of the determination of the sale. The certification of the clerk shall be invalid and the clerk may not reapply for a new certificate for a period of one (1) year from the date of the beer board's determination. (Ord. #07-009, Sept. 2007)

ORDINANCE NO. 96-001

AN ORDINANCE AMENDING THE BEER BOARD REGULATIONS OF THE TOWN OF THOMPSON'S STATION, TENNESSEE, REGARDING BEER BOARD MEETINGS, PROCEEDINGS, POWER AND DUTIES, PERMITS AND PROHIBITED CONDUCT AND ACTIVITIES OF PERMIT HOLDERS AND REGULATIONS FOR SUSPENSION AND REVOCATION OF BEER PERMITS, AND REPEALING ORDINANCE NOS. 91-001 AND 93-004.

WHEREAS, it is deemed necessary by the Mayor and Board of Aldermen of the Town of Thompson's Station, Tennessee, to amend the uniform procedures for the regulation of beer sold within the municipal limits and procedure to govern the issuance and holding of beer permits; and

WHEREAS, upon final adoption of this Amended Ordinance, Ordinance Nos. 91-001 and 93-004, shall be repealed;

NOW, THEREFORE, BE IT ORDAINED by the Town of Thompson's Station, Tennessee, as follows:

1. ESTABLISHMENT OF BEER BOARD: There is hereby established a Beer Board to be composed of the Board of Mayor and Aldermen. The Mayor shall be the chairman of the Beer Board.

2. MEETINGS OF BEER BOARD: All meetings of the Beer Board shall be open to the public. The Board shall hold regular meetings in the Town Hall at such times as it shall prescribe. When there is business to come before the Beer Board, a special meeting may be called by the chairman, provided he gives reasonable notice thereof to each member. The Board may adjourn a meeting at any time to another time and place.

3. RECORD OF BEER BOARD MEETINGS TO BE KEPT: The Recorder shall make a record of the proceedings of all meetings of the Beer Board. The record shall be a public record and shall contain at least the following: the date of the meeting; the names of the Board members present and absent; the names of the members introducing and seconding motions and resolutions, etc., before the Board; a copy of each such motion or resolution presented; the vote of each member thereon and the provisions of each beer permit issued by the Board.

4. REQUIREMENT FOR QUORUM AND ACTION: The attendance of at least a majority of the members of the Beer Board shall be required to constitute a quorum for the purpose of transacting business. Matters before the Board shall be decided by a majority of the members present if a quorum is constituted. Any member present, but not voting, shall be deemed to cast a "nay" vote.

5. POWERS AND DUTIES OF BEER BOARD: The Beer Board shall have the power and is hereby directed to regulate the selling, storing for sale, distributing for sale and manufacturing of beer within this Town in accordance with the provisions herein contained.

6. "BEER" DEFINED: The term "beer" as used in this chapter shall mean and include all beers, ales, and other malt liquors having an alcoholic content of not more than five (5%) percent by weight.

7(a). PERMIT REQUIRED FOR ENGAGING IN BEER BUSINESS: It shall be unlawful for any person to sell, store for sale, distribute for sale, or manufacture beer without first making application to and obtaining a permit from the beer board. The application shall be made on such form as the board shall prescribe and/or furnish, and pursuant to T.C.A. 57-5-101(b), and shall be accompanied by a non-refundable application fee of Two Hundred and Fifty ($250.00) Dollars. Said fee shall be in the form of a

cashier's check payable to the Town of Thompson's Station, Tennessee. Each applicant must be a person of good moral character and certify that he has read and is familiar with the provisions of this chapter.

(b). PRIVILEGE TAX: There is hereby imposed on the business of selling, distributing, storing or manufacturing beer, an annual privilege tax of One Hundred ($100.00) Dollars. Any person, firm, corporation, joint stock company, syndicate or association engaged in the sale, distribution, storage or manufacture of beer shall remit the tax on January 1, 1994, and each successive January 1, to the Town of Thompson's Station, Tennessee. At the time a new permit is issued to any business subject to this tax, the permit holder shall be required to pay the privilege tax on a prorated basis for each month or portion thereof remaining until the next tax payment date.

8(a). BEER PERMITS SHALL BE RESTRICTIVE: All beer permits shall be restrictive as to the type of beer business authorized under them. Separate permit shall be required for selling at retail, storing, distributing and manufacturing. It shall be unlawful for any beer permit holder to engage in any type or phase of beer business not expressly authorized by a particular permit. It shall likewise be unlawful not to comply with any and all express restrictions or conditions which may be written into the permit authorized by the Beer Board.

(b). A beer permit issued hereunder shall be issued only in the name of the individual, manager or employee applicant. A permit, except as authorized stated in this ordinance, shall continue to be valid so long as that individual, manager or employee is engaged in business at the location authorized in the permit. The individual, manager or employee is charged with compliance of this ordinance at the permit location. A permit does not run with the land or business.

9. TYPES OF CONSUMPTION PERMITS: Permits issued by the Beer Board shall consist of two types:

A. An "On-Premises Permit" shall be used for the consumption of beer only on the premises. To qualify for an On-Premises Permit, an establishment, in addition to meeting the other regulations and restrictions in this ordinance, must:

1. be a restaurant or eating place; and

2. be able to seat a minimum of thirty people, including children, in booths and at tables, in addition to any other seating it may have; and

3. have all seating in the interior of the building under a permanent roof.

B. An "Off-Premises Permit" shall be issued for the consumption of beer only off of the premises. To qualify for an Off-Premises Permit, an establishment, in addition to meeting the other regulations herein, must:

1. be a grocery store or convenience type market; and

2. in either case, be primarily engaged in the sale of grocery and personal and home care and cleaning articles, but may also sell gasoline.

10. INTERFERENCE WITH PUBLIC HEALTH, SAFETY AND MORALS PROHIBITED: No permit authorizing the sale of beer will be issued when such businesses would cause congestion of traffic or would interfere with hospitals, schools, churches or other places of public gatherings, or would otherwise interfere with the public health, safety and morals. In no event will a permit be issued authorizing the manufacture or storage of beer or the sale of beer by permit holder, within three hundred (300') feet of any hospital,

school, church or other place of public gathering. The distances shall be measured in a straight line from the nearest point on the property line upon which sets the building from which the beer will be sold, manufactured or stored to the nearest point on the property line of the hospital, school, church or other place of public gathering.

11. ISSUANCE OF PERMITS TO PERSONS CONVICTED OF CERTAIN CRIMES: No beer permit shall be issued to any person who has been convicted for the possession, sale, manufacture or transportation of intoxicating liquor or any crime involving moral turpitude, within the past ten (10) years. No person, firm, corporation, joint-stock company, syndicate or association having at least a Five (5%) Percent ownership interest in the applicant shall have been convicted of any violation of the laws against possession, sale, manufacture, or transportation of beer or other alcoholic beverages or any crime involving moral turpitude within the past ten (10) years.

12. PROHIBITED CONDUCT AND ACTIVITIES BY BEER PERMIT HOLDERS: It shall be unlawful for any beer permit holder to:

a. employ any person convicted for the possession, sale, manufacture or transportation of intoxicating liquor, or any crime involving moral turpitude within the past ten (10) years; and

b. make or allow sale of beer between the hours of 12:00 midnight and 6:00 a.m.; and

c. allow any loud, unusual or obnoxious noises to emanate from the premises; and

d. make or allow any sale of beer to a person under twenty-one (21) years of age; and

e. allow any person under twenty-one (21) years of age to loiter in or about his place of business; and

f. make or allow any sale of beer to any intoxicated person or to any feeble-minded, insane or otherwise mentally incapacitated person; and

g. allow drunk persons to loiter about the premises; and

h. serve, sell or allow the consumption on his premises of any alcoholic beverage with an alcoholic content of more than five (5%) percent by weight; and

i. "Off-Premises" permit holders shall not allow the consumption of alcohol in or about their premises whatsoever; and

j. allow gambling on his premises; and

k. "On-Premises" permit holders shall not fail to provide and maintain sanitary toilet facilities; and

l. allow an employee of the permit holder who is under the age of eighteen (18) years to sell beer.

13(a). SUSPENSION AND REVOCATION OF BEER PERMITS: The Beer Board shall have the power to suspend or revoke any beer permit issued under the provisions of this chapter when the holder thereof is guilty of making a false statement or misrepresentation in his application or of violating any of the provisions of this ordinance. However, no beer permit shall be suspended or revoked until a public hearing is held by the Board after reasonable notice to all the known parties in interest. Suspension or revocation proceedings may be initiated by any member of the Beer Board.

(b). CIVIL PENALTY IN LIEU OF SUSPENSION: The Beer Board may, at the time it imposes a revocation or suspension, offer a permit holder the alternative of paying a civil penalty not to

exceed One Thousand Five Hundred ($1,500.00) Dollars for each offense of making or permitting to be made any sales to minors, or a civil penalty not to exceed One Thousand ($1,000.00) Dollars for any other offense. If a civil penalty is offered as an alternative to revocation or suspension, the holder shall have seven (7) days within which to pay the civil penalty before the revocation or suspension shall be imposed. If the civil penalty is paid within that time, the revocation or suspension shall be deemed withdrawn.

UPON FULL ADOPTION HEREOF, ORDINANCE NO. 91-001 AND ORDINANCE NO. 93-004 ARE REPEALED.

This ordinance shall take effect from and after second reading hereof, the public welfare requiring such.

Cherry B. Jackson
MAYOR

ATTEST:

Marilyn D. Dortch 4/9/96
CITY RECORDER

APPROVED AS TO FORM AND LEGALITY:

CITY ATTORNEY

MEMORANDUM

TO: **Board of Mayor and Aldermen**
FROM: **Town Attorneys**
RE: **Down Town Project**
DATE: **January 3, 2020**

Board,

Please let this Memorandum serve as the Town Attorneys' review of work performed toward the proposed Down Town Project (an area of land that encompasses and surrounds the Thompson's Station Road West & School Road intersection) which includes updated rights-of-way for public roads, public parking, and street scaping in conjunction with planned/proposed new developments in the down town area.

In June of 2019, Energy Land and Infrastructure (ELI) was engaged by the Town to determine the topographical and boundary line areas for the affected area in an effort to determine the appropriate next steps. Their findings and proposal for said next steps are included in your packet.

From the initial efforts and review of the deeds by ELI, it was determined that a title search would be necessary due to absences and inconsistencies within the deeds.

The Town Attorneys engaged Bankers Title and Escrow Dickson, LLC (a title company) to perform an in-depth title search on the effected properties (primarily Parcels: 001.00, 015.00, 016.00, 016.01, 017.00, and 040.01). The title searches revealed that a certain area (likely utilized by the railroad at one time and having later ceased to be utilized by the railroad) did not have a record of ownership, resulting in an "unclaimed area" located in between the railroad and the properties South of Thompson's Station Road West. This "unclaimed area" was not part of the railroad's original charter, and it is currently not within the railroad's right-of-way, nor is it part of any chain and title (and the corresponding legal description thereto) for any of the effected properties.

In an effort to shed light on the "unclaimed area," the Town Attorneys conducted a search of records at the Williamson County Register of Deeds to locate the original plat for the Village of Thompson's Station, as was referenced on multiple deeds and the same possibly evidencing ownership of the "unclaimed area." No original plat was found.

Accordingly, in order to properly outline the public rights-of-way, the public parking, and the street scaping, as well as to confirm the legal claim of the Town to the "unclaimed area," it is recommended by the Town Attorneys for the Town to proceed to develop a full plat of all of the "unclaimed area" for the Down Town Project, through the services of ELI, for recording with the Williamson County Register of Deeds. If the BOMA decides to proceed, the to be created plat would later be submitted to the Planning Commission for final approval.

AEM-BKV

ENERGY LAND & INFRASTRUCTURE

January 3, 2020

Mr. Ken McLawhon
Town Administrator
Town of Thompson's Station
1550 Thompson's Station Road W
Thompson's Station, TN 37179

RE: PROFESSIONAL SERVICES FOR SURVEY AND PLAT PREPARATION
TOWN OF THOMPSON'S STATION

Dear Mr. McLawhon:

Energy Land & Infrastructure, LLC (ELI-LLC) provided a proposal for a boundary and topographic survey on the Thompson's Station Road West and School Road intersection area of the Town of Thompson's Station on June 24, 2019. Once the Notice to Proceed was received from the Town of Thompson's Station, ELI-LLC proceeded with the deed research of the properties and field work to complete the survey. Upon investigation of the researched deeds, it became apparent that a more detailed property research effort would be required to complete a legal boundary survey. During our investigation, we discovered several inconsistencies within the recorded deeds for the properties and found that some information was either never recorded or a recorded document was unable to be found. Below is a summary of the concerns we discovered during our research and potential corrective actions that may be conducted. We have also provided a Preliminary Exhibit for your review. It is attached as Appendix A.

The concerns as listed on the Preliminary Exhibit are described below.

1. Ownership of the property north of deed line to Thompson's Station Road in question in Parcels 1.00, 15.00, 16.00, and 17.00. Deeds are attached as Appendix B.

Parcel Number	Deed Book/ Page	Deed Information
1.00	2348/ 262	• Deed description reads "beginning at an iron post in the southern property line of the L&N Railroad at the northeast corner…"
15.00	1213/ 833	• Deed references Thompson's Station Square; Recorded deed for "Thompson's Station Square" could not be found • Deed references "in line with the outside edge of the front of Smith's store building"
16.00	6144/ 82	• Deed references "fronting 48 feet on the Louisville and Nashville Railroad right of way…"
17.00	3981/ 785	• Deed references that the property is "bounded on the north by Railroad property"

The deeds for parcels 1.00, 16.00, and 17.00 reference that the northern boundary adjoins the railroad property. Parcel 15.00 references that the subject property is south of Thompson's Station Square and that the northern property line is the outside edge of the building. The northern edges of these properties line up to the south side of Thompson's Station Road West. Additionally, these properties are approximately 100 feet deep from the road. Assuming the southern boundaries of these four parcels is shown in the correct location on the Preliminary Exhibit, the northern boundaries of these properties lines up with the front of each building. The recent title research agrees with this analysis.

The railroad map in Appendix C shows the right of way as being a total of 200 feet wide, measuring 100 feet on either side of the centerline of the railroad track. If the four parcels were located with the northern property lines 100 feet to the south of the centerline of the railroad, the approximately 100 feet deep properties would have the southern property lines as being in the middle of the buildings located on the properties. We do not believe this to be correct as mentioned above.

2. Road Right-of-Way widths.

   In Deed Book 1031, Page 128, the CSX Railroad Quitclaims the Town Hall property to the Town of Thompson's Station, TN. The July 14, 1992 Boundary Survey from Tomlin & Associates shows the centerline of "Thompson Station Road" as being 25 feet from the southern property line. This 25-feet to the centerline may conclude that the roadway right of way is 50 feet. Reference the drawing in Appendix D.

   The April 13, 2018 Boundary Topographic Survey of "1544 Thompson Station Road West" by Delle Land Surveying, shows the roadway right of way as being 30 feet in width. Reference the drawing in Appendix E.

3. Porches North of Parcels 1.00, 15.00, 16.00, and 17.00 are shown outside of deeded area.

   Deed book 1213, page 833 for parcel 15.00 states that the northern property line is the "front of Smith's store building". Deeds are attached as Appendix B.

   Deed book 2243, page 819 is a past deed for parcel 16.00. This deed states:

   > "The real property conveyed by this warranty deed does not extend to the right of way of Thompson Station Road and the porch attached to the commercial building located on the premises. Together with the gasoline pumps and related equipment servicing the subject real property, are located on adjacent real property believed to be owned by CSX Railroad and grantors herein expressly make no representations or warranties to grantees regarding the title and right of use of such improvements, and grantee acknowledges that said improvements, although serving the real property herein conveyed, are without easement or other legal right to be located and maintained on the CSX Railroad real property, furthermore, the real property conveyed hereby does not have access to a public road."

4. Sewer Easement West of School Street.
   ELI staff could not find the sewer easement documentation of the 20-foot wide Public Utility Easement at the rear of parcels 40.01 and 1.00.

These items indicate that there is an area between the CSX railroad and Parcels 1.00, 15.00, 16.00, and 17.00 along Thompson's Station Road West where the property ownership is unclear. We recommend that a preliminary plat and a final plat be prepared to resolve the property ownership and establish the roadway right-of-way. This plat will also document the sewer easement at the rear of parcels 40.01 and 1.00. Once the final plat is recorded with the Williamson County Register of Deeds, permanent boundary pins can be set on site. A proposal for these professional services is included as Appendix F.

We appreciate the opportunity to assist and discuss these issues.

Sincerely,

ENERGY LAND & INFRASTRUCTURE, LLC

Suzanne B. Herron, P.E., CPESC

Enclosures

Appendix A – Preliminary Exhibit for The Town of Thompson's Station
Appendix B – Deeds
Appendix C – 1917 Right of Way and Track Map Louisville and Nashville RR Co.
Appendix D - July 14, 1992 Boundary Survey of "Thompson Station Depot" Lot by Tomlin & Associates
Appendix E - April 13, 2018 Boundary Topographic Survey of "1544 Thompson Station Road West" by Delle Land Surveying
Appendix F – Proposal for Professional Services for Plat Preparation, Town of Thompson's Station, TN

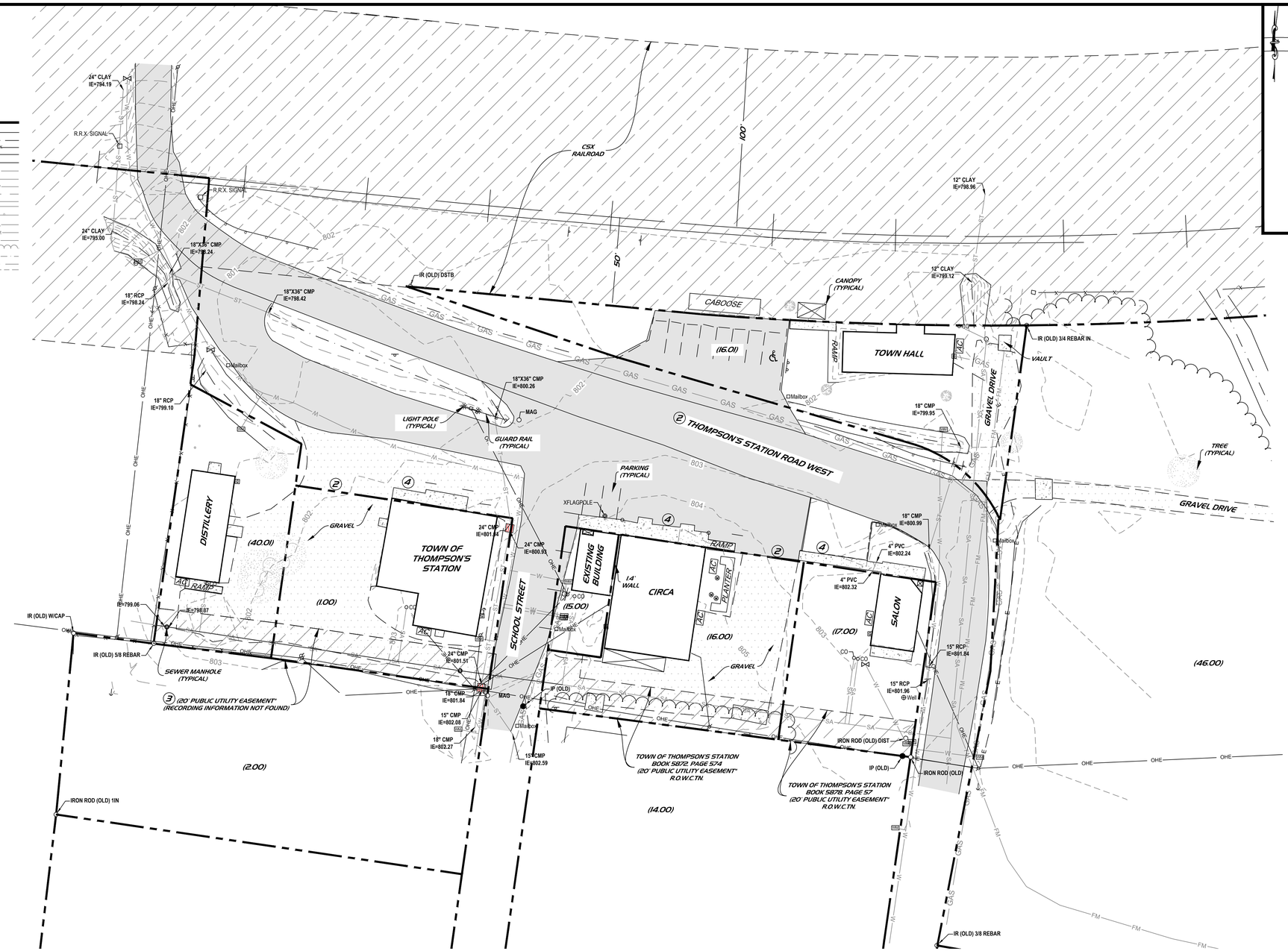
LEGEND

- POWER POLE
- (IRO) IRON ROD OLD
- METAL POST
- IRON PIPE FOUND
- FIRE HYDRANT
- VALVE
- GUY ANCHOR
- WM WATER METER
- SUBJECT PROPERTY LINE
- RIGHT OF WAY/ ADJOINER
- EDGE OF EASEMENT
- FENCE LINE
- TOP BANK
- OVERHEAD
- GAS LINE
- STORM PIPE
- WATER LINE
- UNDERGROUND ELECTRIC
- ROADWAY
- GUARD RAIL
- SEWER LINE
- FORCE MAIN
- RAILROAD
- TREE LINE
- DITCH LINE
- MAJOR CONTOUR LINE
- MINOR CONTOUR LINE

N

TN STATE PLANE
NOTE: BEARINGS ARE RELATIVE TO
TN. S.P.C.S. - NAD 83
DATE OF OBSERVATION 07/31/2019

GRAPHIC SCALE (IN FEET)
30 0 15 30 60
1 inch = 30 ft.



VICINITY MAP
N.T.S.

CONCERN'S

1. Ownership of property North of Deed Line to Thompson's Station Road in question on Parcels 1. 15. 16. and 17..
2. Road Right-of-Way widths
3. Sewer Easement West of School Street
4. Porches North of Parcels 1. 15. 16. and 17 are shown outside of deeded area.

Utility Disclaimer

Energy, Land and Infrastructure, LLC (ELI, LLC) has not physically located the underground utilities. Above grade and underground utilities shown were taken from visible appurtenances at the site, public records and/or maps prepared by others. ELI, LLC makes no guarantee that the underground utilities shown comprise all such utilities in the area, either in service or abandoned. ELI, LLC further does not warrant that the underground utilities are in the exact location indicated. Therefore, reliance upon the type, size and location of utilities shown should be done so with this circumstance considered. Detailed verification of existence, location and depth should also be made prior to any decision relative thereto is made. Availability and cost of service should be confirmed with the appropriate utility company. In Tennessee, it is a requirement, per "The Underground Utility Damage Prevention Act", that anyone who engages in excavation must notify all known underground utility owner, no less than three (3) nor more than ten (10) working days prior to the date of their intent to excavate and also to avoid any possible hazard or conflict. Tennessee One Call 811.

GENERAL NOTES

1. Date field surveyed completed: 07/31/2019
2. Parcel Numbers shown ( ), refer to the Williamson County Tax Map 146 and 146-N, Group "A".
3. Surveyor has made no investigation or independent search for encumbrances, restrictive covenants, ownership title evidence, or any other facts than an accurate and current title search may disclose.
4. This parcel of land is subject to any and all right-of-ways and/or easements either by record and/or prescription that a complete title search may reveal.
5. Boundary information shown was taken from tax records, deeds of record and field evidence at the time of survey.
6. Any location of underground utilities as shown hereon are based solely on observations and field locations of above-ground structures. Additional buried utilities and/or structures may exist.
7. This is a true and accurate portrayal of the boundaries determined from EDM/Theodolite, record data and physical evidence found in the field. I hereby certify that this is a Category 1 Survey and the ratio of precision of the unadjusted survey is greater than 1:10,000 as shown hereon. I also certify that the monuments have been or will be placed as shown hereon to the specifications outlined by the State of Tennessee.
8. Declaration is made to original purchaser of this survey. It is not transferable to additional institutions or subsequent owners.
9. Bearings Shown Hereon Based on Geodetic North Using Global Navigation Satellite Systems (GNSS) Dual Frequency Receiver Topcon HyperSR and Tennessee Department of Transportation (TDOT) Continuously Operated Reference Station (CORS) Network. Date of observation 02/13/2019.
10. Based upon a graphic scale this property is Located in an Area Designated as Zone "X" (Areas Determined to be Outside the 100-Year Floodplain) on the most recent Federal Emergency Management Agency (F.E.M.A.) Flood Insurance Rate Map Community No. 47187, Panel No. 0345 F, Dated September 29, 2006

DEED REFERENCE

WILLIAMSON COUNTY TAX MAP 146-N, GROUP "A"

(1.00)	-	Town of Thompson's Station	-	Book 2348, Page 262 (R.O.W.C.TN.)
(2.00)	-	Janie Lou Brown	-	Book 886, Page 781 (R.O.W.C.TN.)
(14.00)	-	Jane Rachel Osburn	-	Book 2330, Page 564 (R.O.W.,C.TN.)
(15.00)	-	Town of Thompson's Station	-	Book 1213, Page 833 (R.O.W.C.TN.)
(16.00)	-	William Taylor Jordan	-	Book 6144, Page 82 (R.O.W.C.TN.)
(16.01)	-	Town of Thompson's Station	-	Book 1031, Page 128 (R.O.W.C.TN.)
(17.00)	-	Cooper Magli & Wib R. Magi	-	Book 3981, Page 785 (R.O.W.C.TN.)

WILLIAMSON COUNTY TAX MAP 146

(40.00)	-	Whistle Stop Farms, LLC	-	Book 5775, Page 532 (R.O.W.C.TN.)
(40.01)	-	Town of Thompson's Station	-	Book 1521, Page 486 (R.O.W.C.TN.)
(46.1)-		Craig Benson	-	Book 752, Page 183 (R.O.W.C.TN.)

PRELIMINARY EXHIBIT
FOR
THE TOWN OF THOMPSON'S STATION

THOMPSON STATION, WILLIAMSON COUNTY, TENNESSEE

ENERGY LAND & INFRASTRUCTURE
1420 DONELSON PIKE, SUITE A12 • NASHVILLE, TN 37217
OFFICE 615-383-6300 • WWW.ELI-LLC.COM
ENGINEERS•SURVEYORS•INFRASTRUCTURE•ENVIRONMENTAL

ELI File No.: 19-11-6010 Thompson Station

THIS INSTRUMENT PREPARED BY: CLOSING & TITLE SERVICES, INC., 405 TWO MILE PIKE, GOODLETTSVILLE, TENNESSEE 37072

BK 2348 PG 262

STATE OF TENNESSEE
COUNTY OF WILLIAMSON

The actual consideration of value whichever is greater, for this transfer is $-0-. Municipal Exempt.

Affiant

Subscribed and sworn to before me this the 27th day of December, 2001.

Notary Public

My Commission Expires: 4.28.04

LARRY D. CRAIG NOTARY PUBLIC AT LARGE CHEATHAM COUNTY, TENN.
My Commission Expires APRIL 29, 2004

WARRANTY DEED

Address New Owner(s)as follows:	Send Tax Bills To:	Map-Parcel Numbers
Town of Thompson's Station P.O. Box 100 Thompson's Station, TN 37179	Municipal Exempt	Map 146N-A Parcel 1.00

For and in consideration of the sum of Ten ($10.00) Dollars, cash in hand paid by the hereinafter named Grantee, and other good and valuable consideration the receipt of which is hereby acknowledged, **We, James T. Smithson and wife, Patricia S. Smithson, their heirs and assigns**, hereinafter called the Grantors, have bargained and sold, and by these presents do transfer and convey **unto Town of Thompson's Station, a municipal corporation**, hereinafter called the Grantee, its heirs and assigns, a certain tract or parcel of land in Williamson County, State of Tennessee, described as follows, to wit:

A tract or parcel of land lying wholly within the Thompson Station Community, Fourth Civil District, Williamson County, Tennessee, and is bound in general by Gibbs on the West, Brown on the South, L & N Railroad property on the North and a Public Road on the East.

Beginning at an iron post in the southern property line of the L & N Railroad at the northeast corner of Gibbs, as described in Deed Book 96, page 206, ROWC; thence with the southern margin of said railroad property S 87 deg. 30' E 125 feet to an iron pin in the western portion of a public street; thence with said street S. 2 deg. 30' W 100 feet to railroad spike in the western edge of the pavement of said street, the N.E. corner of Brown; thence with his north line N. 87 deg. 30' W 125 feet to an iron post at Gibb's Southeast corner; thence N 2 deg. 30' E 100 feet with his east line to the point of beginning.

Being the same property conveyed to James T. Smithson and wife, Patricia S. Smithson by deed of record in Book 861, page 598, Register's Office for Williamson County, Tennessee.

This is the same legal description as on the previous deed of record.

This conveyance is subject to any and all existing restrictions, setbacks, zoning regulations, covenants, conditions, and easements of record as may affect the aforedescribed tract of land.

This is improved property known as: 1555 Thompson Station Road West, Thompson's Station, TN 37179

To have and to hold the said tract or parcel of land, with the appurtenances, estate, title and interest thereto belonging to the GRANTEE, its heirs and

assigns, forever; and we do covenant with the said GRANTEE that we are lawfully seized and possessed of said land in fee simple, have a good right to convey it, and the same is unencumbered, and we do further covenant and bind ourselves, our heirs and representatives, to warrant and forever defend the title to the said land to the said GRANTEE, its heirs and assigns, against the lawful claims of all persons whomsoever. Whenever used, the singular number shall include the plural, the plural the singular, and the use of any gender shall be applicable to all genders.

Witness our hands this 27th day of December, 2001.

James T. Smithson
JAMES T. SMITHSON

Patricia S. Smithson
PATRICIA S. SMITHSON

STATE OF TENNESSEE
COUNTY OF WILLIAMSON

Personally appeared before me, the undersigned, a notary public in and for said County and State, the within named JAMES T. SMITHSON AND WIFE, PATRICIA S. SMITHSON, the bargainors, with whom I am personally acquainted, (or proved to me on the basis of satisfactory evidence) and who acknowledged that they executed the within instrument for the purposes therein contained.

Witness my hand and seal at Thompson's Station, Tennessee, this 27th day of December, 2001.

NOTARY PUBLIC

My Commission Expires: 4/28/04

LARRY D. CRAIG
NOTARY PUBLIC AT LARGE
CHEATHAM COUNTY
My Commission Expires

State of Tennessee, County of WILLIAMSON
Received for record the 27 day of
DECEMBER 2001 at 9:00 AM. (RECH 452213)
Recorded in official records
Book 2348 Pages 262- 263
Notebook 68 Page 213
State Tax $ .00 Clerks Fee $ .00,
Recording $ 12.00, Total $ 12.00,
Register of Deeds SADIE WADE
Deputy Register KAREN OWENS

CTS\WD

THIS INSTRUMENT PREPARED BY: LARRY D. CRAIG, ATTORNEY AT LAW, 305 FOURTEENTH AVENUE, NORTH, NASHVILLE, TENNESSEE 37203

BK 1213 PG 833

STATE OF TENNESSEE
COUNTY OF WILLIAMSON

The actual consideration of value whichever is greater, for this transfer is $21,000.00. EXEMPT.

Affiant

Subscribed and sworn to before me this the 13th day of July, 1994.

Notary Public

My Commission Expires: 8-4-96

LARRY D. CRAIG NOTARY PUBLIC AT LARGE STATE OF TENNESSEE

WARRANTY DEED

Address New Owner(s)as follows:	Send Tax Bills To:	Map-Parcel Numbers
Town of Thompson's Station, TN P.O. Box 100 Thompson's Station, TN 37179	Same	Map 146N-A Parcel 015.00

MAP 146N A PARCEL 15

For and in consideration of the sum of Ten ($10.00) Dollars, cash in hand paid by the hereinafter named Grantees, and other good and valuable consideration the receipt of which is hereby acknowledged, we, George M. Miller and wife, Margaret A. Miller, hereinafter called the Grantors, have bargained and sold, and by these presents do transfer and convey unto the Town of Thompson's Station, Tennessee, a municipal corporation, hereinafter called the Grantee, its successors and assigns, a certain tract or parcel of land in Williamson County, State of Tennessee, described as follows, to wit:

Land situated in the 4th Civil District of Williamson County, Tennessee, described as follows:

BEGINNING at a point in the east edge of School Street and running thence in an easterly direction with south edge of Thompson's Station Square in line with the outside edge of the front of Smith's store building; a distance of 41.9 feet to a point 16 inches west of the west edge of Smith's store building; thence in a southerly direction parallel to and 16 inches west of the outside edge of west wall of Smith's store building, a distance of 70 feet; thence in a westerly direction and parallel to Thompson's Station Square 41.9 feet to a stake in the east edge of School Street; thence with east edge of School Street in a northerly direction 70 feet to the beginning, according to survey of Campbell Haffner, Surveyor, dated April 18, 1961.

Being the same property conveyed to George M. Miller and wife, Margaret A. Miller, by deed of record in Book 974, Page 871, Register's Office for Williamson County, Tennessee.

1994 City and County taxes have this day been prorated and the Grantee is responsible for the entire tax bills when due and payable.

This is improved property known as 1551 Thompson's Station Road-West, Thompson's Station, Tennessee 37179.

To have and to hold the said tract or parcel of land, with the appurtenances, estate, title and interest thereto belonging to the GRANTEE, its successors and assigns, forever; and we do covenant with the said GRANTEE that we are lawfully seized and possessed of said land in fee simple, have a good right to convey it, and the same is unencumbered, and we do further covenant and bind ourselves, our heirs and representatives, to warrant and forever defend the title to the said land to the said GRANTEE, its successors and assigns, against the lawful claims of all persons whomsoever. Whenever used, the singular number shall include the plural, the plural the singular, and the use of any gender shall be applicable to all genders.

Witness our hands this 13th day of July, 1994.

George M. Miller
GEORGE M. MILLER

Margaret A. Miller
MARGARET A. MILLER

STATE OF TENNESSEE
COUNTY OF WILLIAMSON

Personally appeared before me, the undersigned, a notary public in and for said County and State, the within named George M. Miller and wife, Margaret A. Miller, the bargainors, with whom I am personally acquainted, (or proved to me on the basis of satisfactory evidence) and who acknowledged that they executed the within instrument for the purposes therein contained.

Witness my hand and seal at Brentwood, Tennessee, this 13th day of July, 1994.

NOTARY PUBLIC

My Commission Expires: 8-4-96

LARRY D. CRAIG
NOTARY PUBLIC AT LARGE
STATE OF TENNESSEE

State of Tennessee, County of WILLIAMSON
Received for record the 14 day of
JULY 1994 at 11:05 AM. (INSTR 105888)
Recorded in official records
Book 1213 Page 833- 834
Notebook 53 Page 195
State Tax $ .00 Clerks Fee $ .00.
Recording $ 8.00. Total $ 8.00.
Register of Deeds SARIE WADE
Deputy Register BRENDA KING

BK: 6144 PG: 82-91
14008746
10 PGS:AL-QUITCLAIM DEED
333729 03/13/2014 - 01:24 PM
BATCH 333729
MORTGAGE TAX 0.00
TRANSFER TAX 445.66
RECORDING FEE 50.00
ARCHIVE FEE 0.00
DP FEE 2.00
REGISTER'S FEE 1.00
TOTAL AMOUNT 498.66
STATE OF TENNESSEE, WILLIAMSON COUNTY
SADIE WADE
REGISTER OF DEEDS

MAIL

This Instrument Prepared By:
Sherrard & Roe PLC (CMC)
150 3rd Ave. South, Suite 1100
Nashville, TN 37201

QUITCLAIM DEED

Address New Owners:
William Taylor Jordan
7870 Oscar Green Road
Primm Springs, TN 38476

Send Tax Bills To:
Same

Map/Parcel Number:
Map 146N Group A
Parcel 16.00

WHEREAS, Jenalice Jordan Ramsey (the "Decedent") died on March 1, 2013, and Decedent's Last Will and Testament, dated May 15, 2012, was admitted to probate on March 13, 2013, as File No. P6926 in the Chancery Court for Williamson County, Tennessee (the "Will"); and

WHEREAS, Michel G. Kaplan and William Taylor Jordan are the duly appointed Co-Executors (the "Co-Executors") of the Decedent's Estate (the "Estate") under the Will; and

WHEREAS, the Estate is the current owner of certain real property located in Williamson County, Tennessee, described on **Exhibit A** attached hereto and incorporated herein by this reference (the "Property"); and

WHEREAS, the equal beneficiaries of the Decedent's Estate are (1) the Jenalice Ramsey Family Trust FBO William T. Jordan, (2) the Jenalice Ramsey Family Trust FBO Debra J. Jordan, (3) the Jenalice Ramsey Family Trust FBO Edward R. Jordan and (4) the Jenalice Ramsey Family Trust FBO Julia J. James (collectively, the "Residuary Beneficiary Trusts") and William Taylor Jordan, Debra Jane Jordan, Edward Reams Jordan and Julia J. James, respectively, are the income beneficiaries (the "Income Beneficiaries") of such trusts; and

WHEREAS, Truxton Trust Company and William T. Jordan are the Co-Trustees of the Residuary Beneficiary Trusts; and

WHEREAS, the Co-Executors, the Co-Trustees of the Residuary Beneficiary Trusts and the Income Beneficiaries have entered into that certain Estate Distribution Agreement dated February 14, 2014 (the "Distribution Agreement"); and

WHEREAS, pursuant to the Distribution Agreement, the Co-Executors, the Co-Trustees of the Residuary Beneficiary Trusts and the Income Beneficiaries determined that the best and most cost effective course of action is to distribute the Property to the Income Beneficiaries, outright and free of trust; and

WHEREAS, pursuant to the Distribution Agreement, William Taylor Jordan purchased the undivided twenty-five percent (25%) interests of each Debra Jane Jordan, Julia J. James and Edward Reams Jordan from the Estate for One Hundred Twenty Thousand Four Hundred Fifty Dollars $120,450; and

WHEREAS, pursuant to the Distribution Agreement, Debra Jane Jordan, Julia J. James and Edward Reams Jordan each received cash in the amount of Forty Thousand One Hundred Fifty Dollars ($40,150) from the Estate in lieu of taking an interest in the Property as Income Beneficiaries; and

WHEREAS, Debra Jane Jordan, Julia J. James and Edward Reams Jordan, join in this deed to acknowledge that they retain no ownership in the Property as heirs of Jenalice Jordan Ramsey, either by law or under the Decedent's Will; and

WHEREAS, Truxton Trust Company and William T. Jordan, Co-Trustees of the Residuary Beneficiary Trusts, join in this deed to acknowledge that the Residuary Beneficiary Trusts retain no ownership in the Property as residuary beneficiaries of the Estate of Jenalice Jordan Ramsey, either by law or under the Decedent's Will; and

WHEREAS, the Co-Executors desire to convey all of the Decedent's right, title and interest in the Property to William Taylor Jordan in order to settle matters of the Estate in accordance with the terms of the Decedent's Will and the Distribution Agreement.

NOW, THEREFORE, in consideration of the foregoing premises and no other monetary consideration, the Co-Executors hereby transfer, and convey all of the Co-Executors' right, title and interest in the Property to William Taylor Jordan in fee simple.

This is improved property known as 1549 Thompson Station Road West, Thompson Station, Tennessee 37179.

IN WITNESS WHEREOF, the parties hereto have executed this instrument to be effective as of the 14th day of February, 2014.

ESTATE OF JENALICE JORDAN RAMSEY

Michel G. Kaplan, Co-Executor

Michel G. Kaplan, Co-Executor

STATE OF TENNESSEE)
COUNTY OF DAVIDSON)

Personally appeared before me, a Notary Public in and for said State and County, Michel G. Kaplan, who upon oath acknowledged that he is the Co-Executor of the Estate of Jenalice Jordan Ramsey, deceased (the "Estate"), the within named bargainor, with whom I am personally acquainted (or proved to me on the basis of satisfactory evidence), and who further acknowledged that he executed the within instrument for the purposes therein contained.

WITNESS my hand and seal this 21st day of February, 2014.

Notary Public

My Commission Expires: 9/11/2017

NOTARY PUBLIC
Beverly Sebastian
My Commission Expires
September 11, 2017
STATE OF TENNESSEE

ESTATE OF JENALICE JORDAN RAMSEY

William Taylor Jordan, Co-Executor

STATE OF TENNESSEE)
)
COUNTY OF DAVIDSON)

Personally appeared before me, a Notary Public in and for said State and County, William Taylor Jordan, who upon oath acknowledged that he is the Co-Executor of the Estate of Jenalice Jordan Ramsey, deceased (the "Estate"), the within named bargainor, with whom I am personally acquainted (or proved to me on the basis of satisfactory evidence), and who further acknowledged that he executed the within instrument for the purposes therein contained.

WITNESS my hand and seal this 20th day of February, 2014.

Notary Public

My Commission Expires: 11-5-14

PAM GARDINER
STATE OF TENNESSEE NOTARY PUBLIC
DAVIDSON COUNTY
MY COMMISSION EXPIRES
November 5, 2014

STATE OF TENNESSEE)
)
COUNTY OF DAVIDSON)

The transfer of a twenty-five percent (25%) interest in the Property from the Estate of Jenalice Jordan Ramsey to William Taylor Jordan is exempt from taxation pursuant to T.C.A. 67-4-409 (a)(3)(D). The actual consideration for the transfer of the twenty-five percent (25%) interests of each Debra Jane Jordan, Julia J. James and Edward Reams Jordan to William Taylor Jordan is One Hundred Twenty Thousand Four Hundred Fifty Dollars $120,450.

Affiant

Subscribed and sworn to before me this 21st day of February, 2014.

Notary Public

My Commission Expires: 3-3-14

TRACI BRUCE
STATE OF TENNESSEE NOTARY PUBLIC
DAVIDSON COUNTY

NOTARY PUBLIC
Traci Bruce
My Commission Expires
March 3, 2014
STATE OF TENNESSEE

JENALICE RAMSEY FAMILY TRUST, JENALICE RAMSEY FAMILY TRUST FBO WILLIAM T. JORDAN, JENALICE RAMSEY FAMILY TRUST FBO DEBRA J. JORDAN, JENALICE RAMSEY FAMILY TRUST FBO, EDWARD R. JORDAN, JENALICE RAMSEY FAMILY TRUST FBO JULIA J. JAMES

TRUXTON TRUST COMPANY, CO-TRUSTEE

Denise D. Hendrick, Vice President & Wealth Advisor

STATE OF TENNESSEE)
)
COUNTY OF DAVIDSON)

Before me, a Notary Public in and for the County and State aforesaid, personally appeared Denise D. Hendrick, with whom I am personally acquainted (or proved to me on the basis of satisfactory evidence), and who, upon oath, acknowledged herself to be Vice President and Wealth Advisor of Truxton Trust Company, Co-Trustee, the within named bargainor, a corporation, and that she as such Vice President and Wealth Advisor, being authorized so to do, executed the foregoing instrument for the purposes therein contained, by signing the name of the corporation by herself as Vice President and Wealth Advisor.

Witness my hand and seal this 20th day of February, 2014.

Notary Public

My Commission Expires: 11-5-14

PAM GARDINER
STATE OF TENNESSEE NOTARY PUBLIC
DAVIDSON COUNTY

MY COMMISSION EXPIRES
November 5, 2014

(Remainder of page intentionally left blank.)

JENALICE RAMSEY FAMILY TRUST, JENALICE RAMSEY FAMILY TRUST FBO WILLIAM T. JORDAN, JENALICE RAMSEY FAMILY TRUST FBO DEBRA J. JORDAN, JENALICE RAMSEY FAMILY TRUST FBO, EDWARD R. JORDAN, JENALICE RAMSEY FAMILY TRUST FBO JULIA J. JAMES

William T. Jordan, Co-Trustee

STATE OF TENNESSEE)
)
COUNTY OF DAVIDSON)

Before me, the undersigned, a Notary Public in and for the County and State aforesaid, personally appeared William T. Jordan, Co-Trustee, the within named bargainor, with whom I am personally acquainted (or proved to me on the basis of satisfactory evidence), and who acknowledged that he executed the within instrument for the purposes therein contained.

Witness my hand and seal this 20 day of February, 2014.

Notary Public

My Commission Expires: 11-5-14

PAM GARDINER
STATE OF TENNESSEE NOTARY PUBLIC
DAVIDSON COUNTY

MY COMMISSION EXPIRES
November 5, 2014

(Remainder of page intentionally left blank.)

William T. Jordan, individually, as a beneficiary of the Estate of Jenalice Jordan Ramsey and as an income beneficiary of the Jenalice Ramsey Family Trust FBO William T. Jordan

STATE OF TENNESSEE)
)
COUNTY OF DAVIDSON)

Before me, the undersigned, a Notary Public in and for the County and State aforesaid, personally appeared William T. Jordan, beneficiary of the Estate of Jenalice Jordan Ramsey and as an income beneficiary of the Jenalice Ramsey Family Trust FBO William T. Jordan, the within named bargainor, with whom I am personally acquainted (or proved to me on the basis of satisfactory evidence), and who acknowledged that he executed the within instrument for the purposes therein contained.

Witness my hand and seal this 20th day of February, 2014.

Notary Public

My Commission Expires: 11-5-14

PAM GARDINER
STATE OF TENNESSEE NOTARY PUBLIC
DAVIDSON COUNTY

MY COMMISSION EXPIRES
November 5, 2014

(Remainder of page intentionally left blank.)

Debra J. Jordan, individually, as a beneficiary of the Estate of Jenalice Jordan Ramsey and as an income beneficiary of the Jenalice Ramsey Family Trust FBO Debra J. Jordan

STATE OF TENNESSEE)
)
COUNTY OF Davidson)

Before me, the undersigned, a Notary Public in and for the County and State aforesaid, personally appeared Debra J. Jordan, beneficiary of the Estate of Jenalice Jordan Ramsey and as an income beneficiary of the Jenalice Ramsey Family Trust FBO Debra J. Jordan, the within named bargainor, with whom I am personally acquainted (or proved to me on the basis of satisfactory evidence), and who acknowledged that she executed the within instrument for the purposes therein contained.

Witness my hand and seal this 20th day of February, 2014.

Kendra Farliss
Notary Public

My Commission Expires: 3.8.16

(Remainder of page intentionally left blank.)

KENDRA FARLISS
STATE OF TENNESSEE
NOTARY PUBLIC
DAVIDSON COUNTY, TENN.
My Commission Expires MAR. 8, 2016

Edward R. Jordan, individually, as a beneficiary of the Estate of Jenalice Jordan Ramsey and as an income beneficiary of the Jenalice Ramsey Family Trust FBO Edward R. Jordan

STATE OF TENNESSEE)
)
COUNTY OF Davidson)

Before me, the undersigned, a Notary Public in and for the County and State aforesaid, personally appeared Edward R. Jordan, the within named bargainor, with whom I am personally acquainted (or proved to me on the basis of satisfactory evidence), and who acknowledged that he executed the within instrument for the purposes therein contained.

Witness my hand and seal this 20 day of February, 2014.

Notary Public

My Commission Expires: 11-5-14

PAM GARDINER
STATE OF TENNESSEE NOTARY PUBLIC
DAVIDSON COUNTY

MY COMMISSION EXPIRES:
November 5, 2014

(Remainder of page intentionally left blank.)

Julia J. James, individually, as a beneficiary of the Estate of Jenalice Jordan Ramsey and as an income beneficiary of the Jenalice Ramsey Family Trust FBO Julia J. James

STATE OF SOUTH CAROLINA)
)
COUNTY OF Berkeley)

Before me, the undersigned, a Notary Public in and for the County and State aforesaid, personally appeared Julia J. James, beneficiary of the Estate of Jenalice Jordan Ramsey and as an income beneficiary of the Jenalice Ramsey Family Trust FBO Julia J. James, the within named bargainor, with whom I am personally acquainted (or proved to me on the basis of satisfactory evidence), and who acknowledged that she executed the within instrument for the purposes therein contained.

Witness my hand and seal this 27th day of February, 2014.

Notary Public

My Commission Expires: September 17, 2020

(Remainder of page intentionally left blank.)

EXHIBIT A

Land in the Fourth Civil District of Williamson County, Tennessee, more particularly described as follows:

LOT NO. 1: Beginning at the N.E. corner of a lot recently purchased by Vester Earley, et ux from W. T. Williams et ux, thence east with the railroad right of way 25 feet to the N.W. corner of Lot No. 2 hereinafter described; thence South with the west boundary line of Lot No. 2, 100 feet to the S.W. corner thereof; thence west 25 feet to the S.E. corner of the lot purchased by Early from Williams above referenced to; thence north with the eastern boundary line of said lot purchased from Williams 100 feet to the beginning.

LOT NO. 2: Beginning at the N.E. corner of Lot No. 1 above described running thence in an easterly direction with the south boundary of the railroad 20 feet to the N.W. of the Stovall lot (formerly Pointer); thence South with the west line of Stovall lot, 100 feet to W. T. Williams property, it being the S.W. corner of the Stovall property; thence West 20 feet to the S.E. corner of Lot 1 above described; thence North with the boundary line of said Lot No. 1, 100 feet to the beginning.

LOT NO. 3: A certain lot or parcel of land lying and being in the Fourth Civil District of Williamson County, Tennessee, formerly known as the Sedberry Warehouse property fronting 48 feet on the Louisville and Nashville Railroad right of way and running back between parallel lines 100 feet being bounded on the North by Railroad right of way, on the east by lands of Ridley, South by lands of Williams (formerly Howard) and West by the Public Road.

LOT NO. 4: A certain lot or parcel of land lying and being in the 4th Civil District of Williamson County, Tennessee. Bounded on the North by L & N Railroad East, by property of R. A. Starnowsky, on the South by property of W. T. Williams and on the West by a lot recently purchased by Vester Early et ux, from Irene C. Ridley.

Being the same property conveyed to Michel G. Kaplan and William Taylor Jordan, Co-Executors, by deed from Truxton Trust Company, Trustee, successor to Nashville Bank & Trust, Trustee, of record in Book 6122, page 496, Register's Office for Williamson County, Tennessee.

FROM: CSX TRANSPORTATION, INC.

TO: TOWN OF THOMPSON'S STATION, TENNESSEE

QUITCLAIM DEED

ADDRESS NEW OWNER AS FOLLOWS:

Town of Thompson's Station, TN
P.O. Box 100
Thompson's Station, TN 37139

SEND TAX BILLS TO:

None

MAP-PARCEL NUMBERS
Dist 11
Map 146
Parcel 16.01

This instrument prepared by:

Larry D. Craig
Attorney at Law
305 Fourteenth Avenue, North
Nashville, Tennessee 37203

STATE OF TENNESSEE
COUNTY OF WILLIAMSON

The actual consideration or value, whichever is greater, for this transfer is $ 0.00.

Affiant

Sworn to and subscribed before me this 10th day of [illegible], 1992.

NOTARY PUBLIC

My Commission Expires: 8-4-96

CSX Transportation, Inc., by and through its duly authorized officer, does hereby quitclaim to the Town of Thompson's Station, Tennessee, all of its interest in the following land:

Situated in the Fourth Civil District of Williamson County, Tennessee and being more particularly described by survey dated July 14, 1992, Billy Carl Tomlin & Associates, RLS No. 383, 1931 Lewisburg Pike, Franklin, Tennessee 37064, as follows:

Beginning at an existing iron pin in the southerly right-of-way the CSX Railroad (50 feet from the centerline of the tracks) at the northwest corner of Craig B. Benson, said iron pin also being the northeast corner of the tract herein described; thence, with Benson's westerly line as described in Deed Book 752, Page 183, Register's Office for Williamson County, Tennessee, South 02 degrees 02 minutes West, 110.30 feet to a iron pin set in the easterly margin of Thompson's Station Road (25 feet from centerline); thence, with the margin of Thompson's Station Road as follows: with a curve to the left, radius = 79.37 feet, delta angle = 49 degrees 51 minutes, arc length = 69.06 feet, and long chord bearing and distance North 55 degrees 32 seconds West, 66.89 feet to a point; thence North 79 degrees 25 minutes West 172.77 feet to a point; thence North 77 degrees 10 minutes West, 123.46 feet to a iron pin set in the southerly right-of-way of the CSX Railroad; thence, with the margin of the railroad as follows, North 89 degrees 38 minutes East, 169.03 feet to a point; thence, with a curve to the left, radius = 2,133.48 feet, arc length = 180.71 feet and long chord bearing and distance North 86 degrees 09 minutes East, 180.65 feet to the point of beginning and containing 0.328 acres, more or less.

The aforedescribed tract of land is bounded and adjacent to the following referenced tracts of land, who join in this instrument to convey any and all interest they might possess in and to the same, and for the further purpose to establish boundary lines of the above described tract: John R. Ragan and wife, Martha W. Ragan (Map 146, Parcel 20.01), the owners of record in Book 330, Page 111, Register's Office for Williamson County, Tennessee; George L. Brown and wife, Linda A. Brown (Map 146N, Group A, Parcel 23), the owners of record in Book 241, Page 9, Register's Office for Williamson County, Tennessee; Kennedy M. Gibbs and wife, Elizabeth H. Gibbs (Map 146, Parcel 40), the owners of record in Book 129, Page 472, Register's Office for Williamson County, Tennessee, the said Kennedy M. Gibbs having since died, survived by his wife, Elizabeth H.

Gibbs; Cheryl S. Magli and Mary H. Campbell (Map 146N, Group A, Parcel 17), the owners of record in Book 481, Page 125, Register's Office for Williamson County, Tennessee; William G. Bickley and wife, Lila G. Bickley (Map 146N, Group A, Parcel 16), the owners of record in Volume 481, Page 125, Register's Office for Williamson County, Tennessee; Craig B. Benson and wife, Sarah H. Benson (Map 146, Parcel 46), the owners of record in Volume 752, Page 183, Register's Office for Williamson County, Tennessee; James T. Smithson and wife, Patricia A. Smithson (Map 146N, Group A, Parcel 1), the owners of record in Book 861, Page 699, Register's Office for Williamson County, Tennessee; George M. Miller and wife, Margaret A. Miller (Map 146N, Group A, Parcel 15), the owners of record in Book 974, Page 871, Register's Office for Williamson County, Tennessee.

This is unimproved property situated on Thompson's Station Road known as Map 146, Parcel 16.01, Assessor's Office for Williamson County, Tennessee.

Witness the hand of the duly authorized officer on this the 17th day of November, 1992.

CSX TRANSPORTATION, INC.

Appd. as to Legal Form

BY: GERALD NICHOLS, Vice-President
Senior

Witness our hands this 1 day of Oct., 1992.

JOHN R. RAGAN

MARTHA W. RAGAN

GEORGE L. BROWN

LINDA A. BROWN

ELIZABETH H. GIBBS

CHERYL MAGLI

MARY H. CAMPBELL

WILLIAM G. BICKLEY

LILA G. BICKLEY

CRAIG B. BENSON

SARAH H. BENSON

JAMES T. SMITHSON

PATRICIA A. SMITHSON

GEORGE M. MILLER

MARGARET A. MILLER

STATE OF FLORIDA
COUNTY OF DUVAL

Before me, a Notary Public in and for said County and State, personally appeared Gerald Nichols, with whom I am personally acquainted, (or proved to me on the basis of satisfactory evidence), and who, upon oath, acknowledged himself to be the *Senior Vice-President of CSX Transportation, Inc., a corporation, and that he, as such Vice-President, executed the foregoing instrument for the purposes therein contained, by signing the name of the corporation by himself as Vice-President.

Witness my hand and official seal at JACKSONVILLE, Florida, this 30TH day of NOVEMBER, 1992.

Sandra K. Friedrich
NOTARY PUBLIC

My Commission Expires: FEB. 15, 1995

STATE OF TENNESSEE
COUNTY OF WILLIAMSON

Personally appeared before me, the undersigned, a notary public in and for said County and State, the within named John R. Ragan and wife, Martha W. Ragan, the bargainors, with whom I am personally acquainted, and who acknowledged that they executed the within instrument for the purposes therein contained.

Witness my hand and official seal at FRANKLIN, Tennessee, this 23 day of SEPTEMBER, 1992.

Russell C. Anderson
NOTARY PUBLIC

My commission expires: NOVEMBER 26, 1994

STATE OF TENNESSEE
COUNTY OF Williamson

Personally appeared before me, the undersigned, a notary public in and for said County and State, the within named George L. Brown and wife, Linda A. Brown, the bargainors, with whom I am personally acquainted, and who acknowledged that they executed the within instrument for the purposes therein contained.

Witness my hand and official seal at Hampton Fla., Tennessee, this 2 day of Oct., 1992.

L.D. Davis
NOTARY PUBLIC

My commission expires: 5-1-1995

STATE OF TENNESSEE
COUNTY OF Williamson

Personally appeared before me, the undersigned, a notary public in and for said County and State, the within named Elizabeth H. Gibbs, the bargainor, with whom I am personally acquainted, and who acknowledged that she executed the within instrument for the purposes therein contained.

Witness my hand and official seal at Thompson's Station, Tennessee, this 19th day of September, 1992.

NOTARY PUBLIC

My commission expires: 8-4-96

STATE OF TENNESSEE
COUNTY OF Williamson

Personally appeared before me, the undersigned, a notary public in and for said County and State, the within named Cheryl Magli, the bargainor, with whom I am personally acquainted, and who acknowledged that she executed the within instrument for the purposes therein contained.

Witness my hand and official seal at Franklin, Tennessee, this 6th day of November, 1992.

Dona C. Brown
NOTARY PUBLIC

My commission expires: 12/2/92

Notebook 50 Page 249
State Tax $ .00 Clerks Fee $ .00,
Recording $ 16.00, Total $ 16.00,
Register of Deeds SADIE WADE
Deputy Register BETH LYNCH

BOOK 1031 PAGE 131

State of Tennessee, County of WILLIAMSON
Received for record the 01 day of
DECEMBER 1992 at 8:30 AM. (REC# 34150)
Recorded in official records
Book 1031 Page 128- 131

STATE OF TENNESSEE
COUNTY OF WILLIAMSON

Personally appeared before me, the undersigned, a notary public in and for said County and State, the within named Mary H. Campbell, the bargainor, with whom I am personally acquainted, and who acknowledged that she executed the within instrument for the purposes therein contained.

Witness my hand and official seal at FRANKLIN, Tennessee, this 23 day of SEPTEMBER, 1992.

NOTARY PUBLIC

My commission expires: NOVEMBER 26, 1994

STATE OF TENNESSEE
COUNTY OF Williamson

Personally appeared before me, the undersigned, a notary public in and for said County and State, the within named William G. Bickley and wife, Lila G. Bickley, the bargainors, with whom I am personally acquainted, and who acknowledged that they executed the within instrument for the purposes therein contained.

Witness my hand and official seal at Franklin, Tennessee, this 4th day of November, 1992.

NOTARY PUBLIC

My commission expires: 9-29-96

STATE OF TENNESSEE
COUNTY OF Williamson

Personally appeared before me, the undersigned, a notary public in and for said County and State, the within named Craig B. Benson and wife, Sarah H. Benson, the bargainors, with whom I am personally acquainted, and who acknowledged that they executed the within instrument for the purposes therein contained.

Witness my hand and official seal at Thompson's Station, Tennessee, this 19th day of September, 1992.

NOTARY PUBLIC

My commission expires: 8-4-96

STATE OF TENNESSEE,
COUNTY OF Williamson

Personally appeared before me, the undersigned, a notary public in and for said County and State, the within named James T. Smithson and wife, Patricia A. Smithson, the bargainors, with whom I am personally acquainted, and who acknowledged that they executed the within instrument for the purposes therein contained.

Witness my hand and official seal at Thompson's Station, Tennessee, this 19th day of September, 1992.

NOTARY PUBLIC

My commission expires: 8-4-96

STATE OF TENNESSEE
COUNTY OF Williamson

Personally appeared before me, the undersigned, a notary public in and for said County and State, the within named George M. Miller and wife, Margaret A. Miller, the bargainors, with whom I am personally acquainted, and who acknowledged that they executed the within instrument for the purposes therein contained.

Witness my hand and official seal at FRANKLIN, Tennessee, this 6th day of November, 1992.

NOTARY PUBLIC

My commission expires: 12/2/92

TRANSFERRED
DEC 01 1992
DENNIS ANGLIN PROP ASSESSOR
WILLIAMSON COUNTY

****Re-recording to correct grantees name.****

SPECIAL WARRANTY DEED

STATE OF Tennessee
COUNTY OF Williamson

THE ACTUAL CONSIDERATION OR VALUE, WHICHEVER IS GREATER, FOR THIS TRANSFER IS $150,000.00

Affiant

SUBSCRIBED AND SWORN TO BEFORE ME, THIS THE 6th DAY OF September, 2005.

Notary Public

MY COMMISSION EXPIRES: 6-28-08
(AFFIX SEAL)

KENDRA SAVAGE NOTARY PUBLIC AT LARGE WILLIAMSON COUNTY, TN

05-0503

File

THIS INSTRUMENT WAS PREPARED BY
Mid-State Title & Escrow, Inc., 128 Holiday Court, Suite 125, Franklin, TN 37067

ADDRESS NEW OWNER(S) AS FOLLOWS:	SEND TAX BILLS TO:	MAP-PARCEL NUMBERS
Cooper Magli (NAME)	Owner (NAME)	146N/GroupA/Parcel 017.00
301 Public Square (ADDRESS)	(ADDRESS)	
Franklin, TN 37064 (CITY) (STATE) (ZIP)	(CITY) (STATE) (ZIP)	

FOR AND CONSIDERATION OF THE SUM OF TEN DOLLARS, CASH IN HAND PAID BY THE HEREINAFTER NAMED GRANTEES, AND OTHER GOOD AND VALUABLE CONSIDERATIONS, THE RECEIPT OF WHICH IS HEREBY ACKNOWLEDGED, We, **Cheryl S. Magli and Mary H. Campbell,** HEREINAFTER CALLED THE GRANTOR, HAVE BARGAINED AND SOLD, AND BY THESE PRESENTS DO TRANSFER AND CONVEY UNTO ~~Copper~~ Cooper **Magli and Wib R. Magli, as tenants in common,** HEREINAFTER CALLED THE GRANTEES, THEIR HEIRS AND ASSIGNS, A CERTAIN TRACT OR PARCEL OF LAND IN WILLIAMSON COUNTY, STATE OF TENNESSEE, DESCRIBED AS FOLLOWS, TO-WIT:

CM MC

Book 3981 Page 785

The following described two lots or parcels of land, lying and being in the Village of Thompson Station, Fourth Civil District of Williamson County, Tennessee, more particularly described as follows:

FIRST LOT: Being Lot No. 16 in the Plan of Thompson Station, Tennessee, fronting 25 feet on the railroad property and running back from same 100 feet and bounded on the North by Railroad property, on the East by Road or Street, on the South by what was formerly Betts' lot, and on the West by lot formerly owned by Pointer heirs.

SECOND LOT: Adjoining the above described lot on the West, beginning at the Northwest corner of said lot and running South with the west boundary line thereof 100 feet, more or less, to property now owned by W. T. Williams and wife,; thence with Williams' North line 50 feet; thence North 100 feet, more or less, to the line of the railroad company; thence in an Easterly direction with the railroad company line 50 feet to the beginning.

Excluding any property described in Quitclaim Deed from CSX Transportation, Inc. to the Town of Thompson's Station, Tennessee, of record in Book 1031, page 128, said Register's Office, in which Cheryl S. Magli and Mary H. Campbell joined in execution to quitclaim and all interest they might have possessed in and to the same and for the further purpose of establishing boundary lines.

Being the same property conveyed to Cheryl S. Magli and Mary H. Campbell, as tenants in common by deed from R. A. Starnowsky (one and the same person as Ralph A. Starnowsky) by and through his Attorney-in-Fact Joe Carver of record in Book 481, page 125, Register's Office of Williamson County, Tennessee.

This property is not now, nor has it ever been, the Grantor's principal residence.

unimproved ☐

This is improved ☒ property, known as 1545 Thompson Station Road West, Thompson Station, TN 37179
(House Number) (Street) (P.O. Address) (City or Town) (Postal Zip)

TO HAVE AND TO HOLD the said tract or parcel of land, with the appurtenances, estate, title and interest thereto belonging to the said GRANTEES, their heirs and assigns forever; and we do covenant with the said GRANTEES that we are lawfully seized and possessed of said land in fee simple, have a good right to convey it. Wherever used, the singular number shall include the plural, the plural the singular, and the use of any gender shall be applicable to all genders.

Witness my hand this 6th day of Sept, 2005

BK/PG:3691/410-411
05045236

DEED	
09/20/2005	02:26 PM
BATCH	55731
MTG TAX	0.00
TRN TAX	555.00
REC FEE	10.00
DP FEE	2.00
REG FEE	1.00
TOTAL	568.00

STATE of TENNESSEE, WILLIAMSON COUNTY
SADIE WADE
REGISTER OF DEEDS

Cheryl S. Magli

Mary H. Campbell

STATE OF TENNESSEE

COUNTY OF Williamson

Before me, the undersigned, a Notary Public in and for said State and County, personally appeared Cheryl S. Magli and Mary H. Campbell with whom I am personally acquainted (or proved to me on the basis of satisfactory evidence) and who upon oath, acknowledged themselves to be the within named bargainor and that they executed the foregoing instrument for the purposes therein contained.

Witness my hand and official seal at Franklin this 6th day of Sept 2005.

Commission expires: 6-14-08

Notary Public

YVETTE LYN MELDRUM NOTARY PUBLIC AT LARGE WILLIAMSON COUNTY, TN

RE-REC

BK/PG:3981/785-786
06035075

RERECORDED INSTRUMEN	
07/19/2006	12:16 PM
BATCH	77525
MTG TAX	0.00
TRN TAX	0.00
REC FEE	10.00
DP FEE	2.00
REG FEE	0.00
TOTAL	12.00

STATE OF TENNESSEE, WILLIAMSON COUNTY
SADIE WADE
REGISTER OF DEEDS

THIS INSTRUMENT PREPARED BY: LARRY D. CRAIG, ATTORNEY AT LAW, 305 FOURTEENTH AVENUE, NORTH, NASHVILLE, TENNESSEE 37203 UPON INFORMATION FURNISHED BY THE PARTIES.

BK 1521 PG 486

STATE OF TENNESSEE
COUNTY OF WILLIAMSON

The actual consideration of value whichever is greater, for this transfer is $0.00, MUNICIPAL EXEMPT.

Affiant

Subscribed and sworn to before me this the 13th day of May, 1997.

Notary Public

My Commission Expires: 6-13-2000

LARRY D. CRAIG NOTARY PUBLIC AT LARGE STATE OF TENNESSEE

WARRANTY DEED

MAP 146
PARCEL 40.01

Address New Owner(s)as follows:	Send Tax Bills To:	Map-Parcel Numbers
Town of Thompson's Station P.O. Box 100 Thompson's Station, TN 37179	N/A	Map 146 Parcel 40.00 P/O Fourth CD

For and in consideration of the sum of Ten ($10.00) Dollars, cash in hand paid by the hereinafter named Grantees, and other good and valuable consideration the receipt of which is hereby acknowledged, **KMK Acres, LLC**, hereinafter called the Grantor, has bargained and sold, and by these presents do transfer and convey **unto Town of Thompson's Station, Tennessee, a municipal corporation**, hereinafter called the Grantee, its successors and assigns, a certain tract or parcel of land in Williamson County, State of Tennessee, described as follows, to wit:

Situated and lying in the Fourth Civil District of Williamson County, Tennessee, bounded on the north by Thompson's Station Road West, on the east by James T. Smithson, on the west by KMK Acres, LLC (remaining property), on the south by Janie Lou Brown, and being more particularly described as follows:

Beginning at a fence post in the south margin of Thompson's Station Road West and being the northwest corner of James T. Smithson, and also being the northeast corner of herein described tract; thence with James T. Smithson and fence line South 02 degrees 35 minutes 10 seconds West 121.69 feet to an iron pin; thence with Janie Lou Brown and fence line North 88 degrees 24 minutes 30 seconds West 66.48 feet to an iron pin; thence with KMK Acres, LLC and stake line North 02 degrees 35 minutes 10 seconds East 147.20 feet to a fence post; thence with the south margin of Thompson's Station Road West, South 67 degrees 17 minutes 10 seconds East 70.80 feet to the point of beginning containing 0.205 acres by survey of James D. Webb, Tennessee Registered Land Surveyor No. 596, Maury County, Columbia, Tennessee, dated March 11, 1997.

Being a part of the same property conveyed to KMK Acres, LLC by deed from Elizabeth H. Gibbs, of record in Book 1477, Page 280, Register's Office for Williamson County, Tennessee, and by instrument of record in Book 1485, Page 787, Register's Office for Williamson County, Tennessee.

This is improved property known as Thompson's Station Road West, Thompson's Station, Tennessee 37179.

To have and to hold the said tract or parcel of land, with the appurtenances, estate, title and interest thereto belonging to the GRANTEE, its successors and assigns, forever; and it does covenant with the said GRANTEE that it is lawfully seized and possessed of said land in fee simple, has a good right to convey it, and the same is unencumbered, and does further covenant and bind itself, its successors and representatives, to warrant and forever defend the title to the said land to the said GRANTEE, its successors and assigns, against the lawful claims of all persons whomsoever. Whenever used, the singular number shall include the plural, the plural the singular, and the use of any gender shall be applicable to all genders.

Witness the hand of the duly authorized managing member of the Limited Liability Company on this the 14th day of May, 1997.

KMK ACRES, LLC

BY: Leon C. Heron Jr.
TITLE: MANAGING MEMBER

DOUGLAS S. GOETSCH NOTARY PUBLIC AT LARGE WILLIAMSON CO. TENN.

STATE OF TENNESSEE
COUNTY OF WILLIAMSON

Personally appeared before me, the undersigned, a notary public in and for said County and State, the within named LEON C. HERON, JR., the duly authorized Managing Member of KMK Acres, LLC, who, acknowledged that he, as said Managing Member for KMK Acres, LLC, executed the foregoing instrument for the purpose therein contained by signing the name of the Limited Liability Company by himself as its Managing Member.

Witness my hand and seal at THOMPSON'S STATION, Tennessee, this 14th day of May, 1997.

Douglas S. Goetsch
NOTARY PUBLIC

My Commission Expires: 8/2/2000

State of Tennessee, County of WILLIAMSON
Received for record the 15 day of
MAY 1997 at 12:46 PM. (REC# 219538)
Recorded in official records
Book 1521 Page 486- 487
Notebook 58 Page 31
State Tax $ .00 Clerks Fee $ .00,
Recording $ 8.00, Total $ 8.00,
Register of Deeds SADIE WADE
Deputy Register BETH LYNCH

This Instrument Prepared By:

Brenda Franks Hale, Attorney
Hale and Hale, PLC
312 First Tennessee Bank Building
Franklin, Tennessee 37064

NEW OWNER:	SEND TAX BILL TO:	MAP & PARCEL
Rouhangiz Daftarestefa 7027 Willowick Dr. Brentwood, TN 37027	SAME	Map 146N Group A Parcel 16.00

STATE OF TENNESSEE
COUNTY OF WILLIAMSON

The actual consideration or value, whichever is greater, for this transfer is $127,000.00.

AFFIANT

Sworn to and subscribed before me
this 15 day of August, 2001.

NOTARY PUBLIC

My Commission Expires: 2/23/02

DOUGLAS S. HALE NOTARY PUBLIC AT LARGE WILLIAMSON CO., TENNESSEE EXP. FEB 23, 2002

WARRANTY DEED

For and in consideration of the sum of Ten Dollars, cash in hand paid by the hereinafter named **GRANTEE**, and other good and valuable considerations, the receipt and sufficiency of which is hereby acknowledged, **GREGORY A. LUCKENBILL and wife, EVELYN L. LUCKENBILL** hereinafter called the **"GRANTORS"**, have bargained and sold and by these presents do transfer and convey unto **ROUHANGIZ DAFTAREST**[illegible] **an unmarried person**, hereinafter called the **"GRANTEE"**, her heirs and assigns, a certain tract or parcel of land in Williamson County, Tennessee, described as follows, to-wit:

Land in the Fourth Civil District of Williamson County, Tennessee, more particularly described as follows:

LOT NO. 1: Beginning at the N.E. corner of a lot recently purchased by Vester Earley, et ux from W. T. Williams et ux, thence east with the railroad right of way 25 feet to the N.W. corner of Lot No. 2 hereinafter described; thence South with the west boundary line of Lot No. 2, 100 feet to the S.W. corner thereof; thence west 25 feet to the S.E. corner of the lot purchased by Early from Williams above referred to; thence north with the eastern boundary line of said lot purchased from Williams 100 feet to the beginning.

LOT NO. 2: Beginning at the N.E. corner of Lot No. 1 above described running thence in an easterly direction with the south boundary of the railroad 20 feet to the N.W. corner of the Stovall lot (formerly Pointer); thence South with the west line of Stovall lot, 100 feet to W. T. Williams property, it being the S. W. corner of the Stovall property; thence West 20 feet to the S.E. corner of Lot 1 above described; thence North

with the boundary line of said Lot No. 1, 100 feet to the beginning.

LOT NO. 3: A certain lot or parcel of land lying and being in the Fourth Civil District of Williamson County, Tennessee, formerly known as the Sedberry Warehouse property fronting 48 feet on the Louisville and Nashville Railroad right of way and running back between parallel lines 100 feet being bounded on the North by Railroad right of way, on the east by lands of Ridley, South by lands of Williams (formerly Howard) and West by the Public Road.

LOT NO. 4: A certain lot or parcel of land lying and being in the 4th Civil District of Williamson County, Tennessee. Bounded on the North by L & N Railroad East, by property of R.A. Starnowsky, on the South by property of W.T. Williams and on the West by a lot recently purchased by Vester Early et ux, from Irene C. Ridley.

There is included in the foregoing description but to be excluded therefrom a tract or parcel of land heretofore conveyed by Leon Smith to Harold D. Huff, of record in Deed Book 120, page 184, Register's Office, Williamson County, Tennessee, described as follows: Beginning at a point in the East edge of School Street and running thence in an Easterly direction with south edge of Thompson Station Square in line with outside edge of the front of Smith Store building, a distance of 41.9 feet, to a point 16 inches west of the west of the west edge of Smith Store building; thence in a Southerly direction parallel to and 16 inches west of the outside edge of west wall of Smith Store building, a distance of 70 feet, thence in a westerly direction and parallel to Thompson Station square 41.9 feet to a stake in the East edge of School Street; thence with East edge of School Street in a northerly direction 70 feet to the beginning, according to a survey of Campbell L. Haffner, surveyor, dated April 15, 1961.

Being the same property conveyed to Gregory A. Luckenbill and wife, Evelyn L. Luckenbill by Warranty Deed from Ryan B. Smith and Cyril H. Smith and wife, Nicolette P. Smith by deed of record in Book 1664, page 842, Register's Office for Williamson County, Tennessee.

THIS IS THE SAME DESCRIPTION IN THE PREVIOUS DEED OF RECORD.

THE REAL PROPERTY CONVEYED BY THIS WARRANTY DEED DOES NOT EXTEND TO THE RIGHT OF WAY OF THOMPSON STATION ROAD AND THE PORCH ATTACHED TO THE COMMERCIAL BUILDING LOCATED ON THE PREMISES, TOGETHER WITH THE GASOLINE PUMPS AND RELATED EQUIPMENT SERVICING THE SUBJECT REAL PROPERTY, ARE LOCATED ON ADJACENT REAL PROPERTY BELIEVED TO BE OWNED BY CSX RAILROAD AND GRANTORS HEREIN EXPRESSLY MAKE NO REPRESENTATIONS OR WARRANTIES TO GRANTEES REGARDING THE TITLE AND RIGHT OF USE OF SUCH IMPROVEMENTS, AND GRANTEE ACKNOWLEDGES THAT SAID IMPROVEMENTS, ALTHOUGH SERVING THE REAL PROPERTY HEREIN CONVEYED, ARE WITHOUT EASEMENT OR OTHER LEGAL RIGHT TO BE LOCATED AND MAINTAINED ON THE CSX RAILROAD REAL PROPERTY, FUTHERMORE, THE REAL PROPERTY CONVEYED HEREBY DOES NOT HAVE ACCESS TO A PUBLIC ROAD.

TO HAVE AND TO HOLD the said tract or parcel of land, with the appurtenances, estate, title and interest thereto belonging to said GRANTEE, her heirs and assigns, forever;

AND GRANTORS do covenant with the said GRANTEE that they are lawfully seized and possessed of said land in fee simple, have a good right to convey it and the same is unencumbered, except as follows:

1. Williamson County and City of Thompson Station taxes for the year 2001 are a lien against said property, but are not yet due and payable. Said taxes have been prorated between the parties as of the date of this instrument, with GRANTOR paying their prorata part thereof to GRANTEE, who will be responsible for payment of said taxes when they become due and payable. Map 146N, Group A, Parcel 16.00.

2. Permanent easement for the purpose of maintaining and/or repairing field lines that cross this property of record in Book 911, page 501, Register's Office for Williamson County, Tennessee.

AND GRANTORS DO FURTHER covenant and bind themselves, their heirs and assigns, to warrant and forever defend the title to the said land to the said GRANTEE, her heirs and assigns, against the lawful claims of all persons whomsoever.

This improved property is known as 1549 Thompson Station Road West, Thompson Station, Tennessee 37179.

WITNESS our hands this 15 day of August, 2001 in Franklin, Tennessee.

State of Tennessee, County of WILLIAMSON
Received for record the 15 day of
AUGUST 2001 at 3:48 PM. (RECN 431253
Recorded in official records
Book 2243 Pages 819- 821
Notebook 67 Page 292
State Tax $ 469.90 Clerks Fee $ 1.00
Recording $ 17.00, Total $ 487.90
Register of Deeds SADIE WADE
Deputy Register JESSICA MANGRUM

GREGORY A. LUCKENBILL, by
Evelyn L. Luckenbill, his
Attorney-In-Fact

EVELYN L. LUCKENBILL

STATE OF TENNESSEE
COUNTY OF WILLIAMSON

On this 15 day of August, 2001, before me personally appeared Evelyn L. Luckenbill, to me known (or proved to me on the basis of satisfactory evidence) to be the person who executed the foregoing instrument on behalf of Gregory A. Luckenbill, and who acknowledged that she executed the same as the free act and deed of said Gregory A. Luckenbill by virtue of the Power of Attorney, duly executed by the said Gregory A. Luckenbill and appearing of record in Book 2243, page 816, of the Register's Office for Williamson County, Tennessee.

Witness my hand this 15 day of August, 2001 in Franklin, Tennessee.

Notary Public

DOUGLAS S. HALE NOTARY PUBLIC AT LARGE EXP. FEB 23, 2002 WILLIAMSON CO., TENNESSEE

My Commission Expires: 2/23/02

STATE OF TENNESSEE
COUNTY OF WILLIAMSON

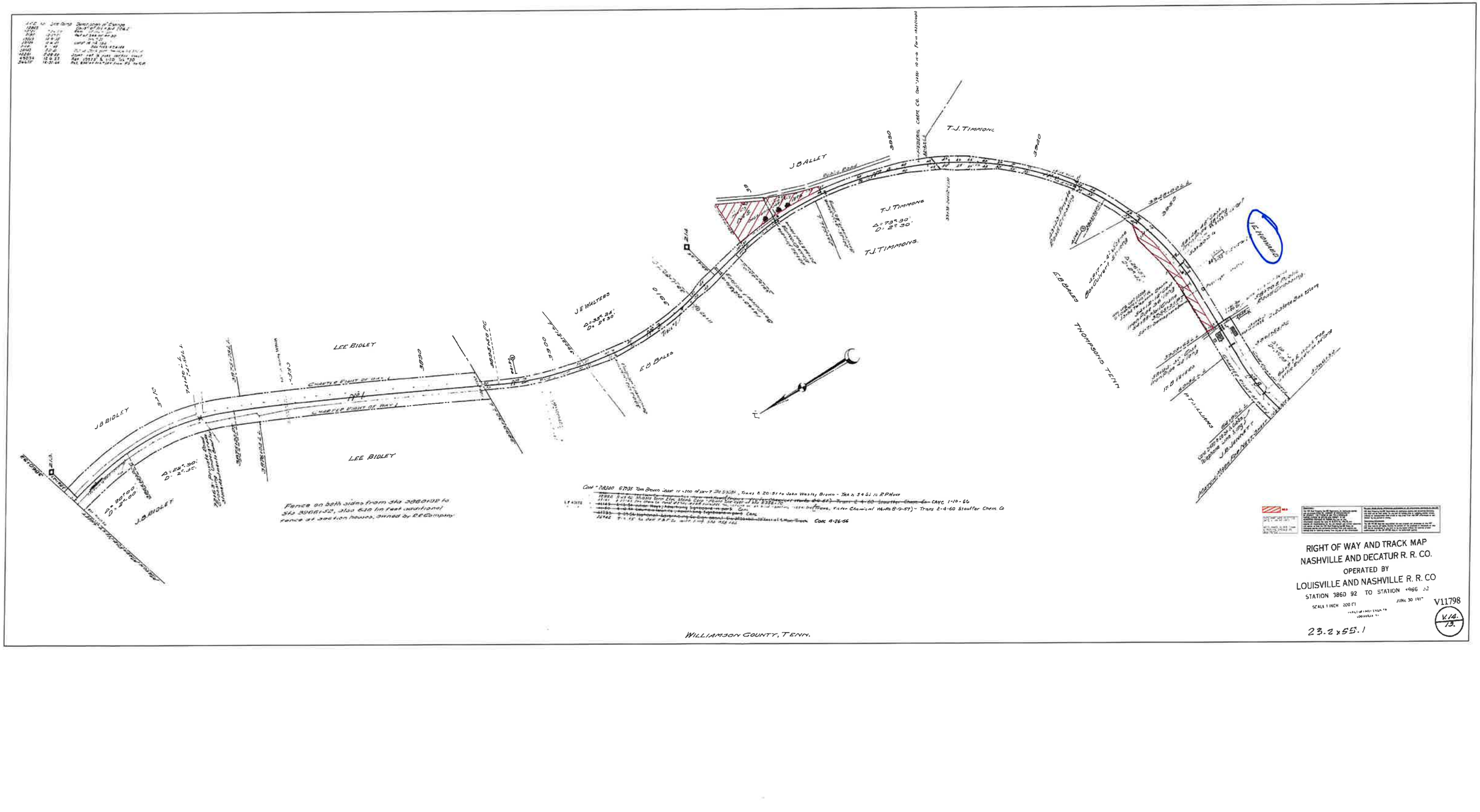
Personally appeared before me, the undersigned, a Notary Public in and for said County and State, the within named Evelyn L. Luckenbill, the bargainors, with whom I am personally acquainted, and who, upon oath, acknowledged that she executed the within instrument for the purposes therein contained.

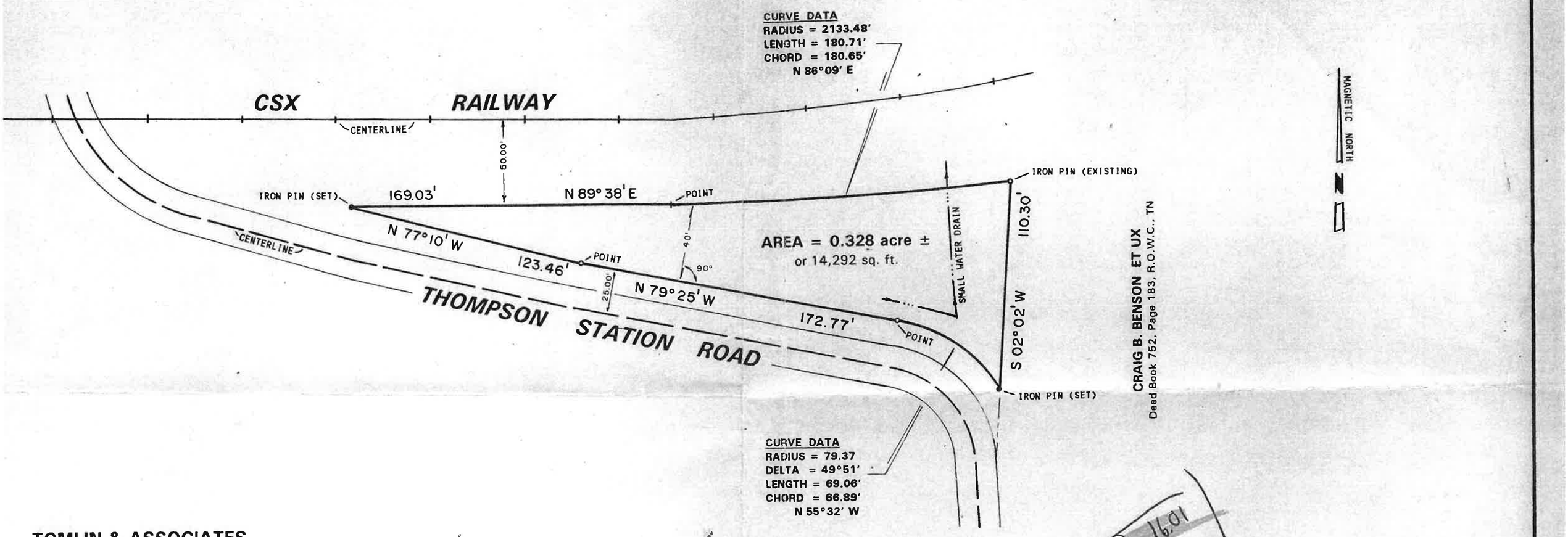
Witness my hand and official seal at Franklin, Tennessee, this 15 day of August, 2001.

Notary Public

DOUGLAS S. HALE NOTARY PUBLIC AT LARGE EXP. FEB 23, 2002 WILLIAMSON CO., TENNESSEE

My commission expires: 2/23/02


T.J. TIMMONS
J.B. ALLEY
T.J. TIMMONS
Δ = 78° 30'
D = 2° 30'
T.J. TIMMONS
J.E. WALTERS
Δ = 33° 24'
D = 2° 30'
LEE BIDLEY
CHARTER RIGHT OF WAY
J.B. BIDLEY
Δ = 22° 30'
D = 2° 30'
Δ = 90° 00'
D = 21° 00'
J.B. BIDLEY
LEE BIDLEY
E.D. BALES
E.D. BALES
THOMPSON'S TENN.
J.E. HOWARD
J.B. HUNT
Fence on both sides from Sta 3860+32 to Sta 3966+52, also 620 lin feet additional fence at section houses, owned by R.R. Company.
Cont. from 4-26-56
RIGHT OF WAY AND TRACK MAP
NASHVILLE AND DECATUR R. R. CO.
OPERATED BY
LOUISVILLE AND NASHVILLE R. R. CO
STATION 3860 92 TO STATION 4966 52
SCALE 1 INCH = 200 FT
JUNE 30 1917
V11798
V.14. 73.
23.2 x 55.1
WILLIAMSON COUNTY, TENN.



TOMLIN & ASSOCIATES
LAND SURVEYORS
1931 Lewisburg Pike
Franklin, Tennessee 37064
615\794-8071

SURVEYOR'S CERTIFICATE:
I HEREBY CERTIFY THAT THIS IS A CATEGORY "II" SURVEY AND THE RATIO OF PRECISION OF THE UNADJUSTED TRAVERSE IS GREATER THAN 1:7,500. THIS SURVEY WAS ACTUALLY MADE IN THE FIELD AND IT IS A TRUE AND ACCURATE SURVEY TO THE BEST OF MY KNOWLEDGE AND ABILITY.

14 July 1992 Billy Carl Tomlin
Job #92035 Billy Carl Tomlin, T.R.L.S.#383
B:TSDEPOT; D.D.#1

BILLY CARL TOMLIN REGISTERED LAND SURVEYOR TENNESSEE NO. 383

"A" 460 16.01

BOUNDARY SURVEY

THOMPSON STATION DEPOT LOT

FOURTH CIVIL DISTRICT OF WILLIAMSON COUNTY TENNESSEE

SCALE : 1" = 50' 14 JULY 1992

100 0 100 200 300

Scale: 1" = 100'

North

DRAWN BY : KSL
DATE: 04/13/18
REV:
JOB #

BOUNDARY TOPOGRAPHIC SURVEY

1544 THOMPSON STATION ROAD WEST

TAX MAP 146 PARCEL 46
NASHVILLE, TENNESSEE

RAILROAD TRACK
WALL
804
799
TOP OF DITCH
IPF
COLUMN
FENCE POSTS
FENCE LINE
D=015°42'04", L=578.06, R=2109.44
N08°15'51"E 110.30'
48" MP
811
TOWN OF THOMPSON STATION
MAP 146N P.016.01
TOP OF DITCH
807
805
CATTLE GUARD
801
802
GUARD RAIL
10" PVC
BOX
EDGE OF GRAVEL
812
806
S06°54'53"W 304.59'
WALLS
EDGE OF GRAVEL
PORCH
STEPS
PORCH
TOP OF DITCH
N03°03'58"E 85.41'
802
HOUSE
EM
DOUGLASS T. DARBY
DB 3410 PG 20
TOP OF DITCH
AC UNITS
GM
STEPS
EDGE OF ASPHALT
EDGE OF GRAVEL
S80°35'07"E 151.80'
FENCE LINE
N10°56'18"E 165.85'
PP
ANCHOR
PP
WM
PTP
ANCHOR
SPIGGOT
PP
769
THOMPSON STATION ROAD WEST
(30' RIGHT OF WAY)
803
TOP OF DITCH
WETLAND
804
SPRING HOUSE
807
805
IRF
FENCE LINE
FENCE LINE
N79°53'15"W 202.98'
391,764 SQ.FT. OR
8.994 ACRES
BARN
SAMUEL DARLING
MAP 146NP01800
807
IPF
S07°36'50"W 459.79'
810
IPD
N06°30'21"E 218.04'
FENCE LINE
IRF
THOMPSON STATION UNITED METHODIST CHURCH
MAP 146NP.019.00
IPF
809
IRF
TF PROPERTIES INC
MAP 146 PAR 52
813
811
FENCE LINE
N79°52'16"W 506.91'
IRF
IRF
TEH LAND LLC
MAP 146 PAR 46.01
FENCE LINE
IRF
MCCULLOUGH & MCINTURFL LLC
MAP 146 PAR 47

STEVEN D. DELLE
LICENSED LAND SURVEYOR
TENNESSEE NO. 1776

CERTIFICATION OF SURVEY ACCURACY

I (WE) HEREBY CERTIFY THAT TO THE BEST OF MY (OUR) KNOWLEDGE AND BELIEF THIS IS A TRUE AND ACCURATE SURVEY OF THE PROPERTY SHOWN HEREON; THAT THIS A CATEGORY "I" LAND SURVEY AS DEFINED IN TITLE 62, CHAPTER 18, TENNESSEE CODE ANNOTATED, AND THAT THE RATIO OF PRECISION IS GREATER THAN OR EQUAL TO 1:10,000.

04/13/18
DATE

STEVEN D. DELLE
NAME

Delle Land Surveying
1104 Pardue Road
Ashland, Tennessee 37015
(615) 642-9146

ENERGY LAND & INFRASTRUCTURE

January 3, 2020

Mr. Ken McLawhon
Town Administrator
Town of Thompson's Station
1550 Thompson's Station Road W
Thompson's Station, TN 37179

RE: PROPOSAL FOR PROFESSIONAL SERVICES FOR PLAT PREPARATION
TOWN OF THOMPSON'S STATION

Mr. McLawhon:

Energy Land & Infrastructure, LLC (ELI-LLC) is submitting this proposal to prepare and submit a Preliminary Plat in accordance with the Land Development Ordinance (LDO) for the Town of Thompson's Station (Town) for Planning Commission approval, prepare and submit a Final Plat prepared in accordance with the LDO for Planning Commission Approval, coordinate with the Town Planner and others, and set permanent boundary pins after recording of the final plat with the Williamson County Register of Deeds on Thompson's Station Road West and School Road intersection area of the Town. The following parcels will be included:

- Town Hall - Williamson County Tax Map 146-N, Group "A", Parcel 16.01
- City Limits Salon - Williamson County Tax Map 146-N, Group "A", Parcel 17.00
- Circa Grill - Williamson County Tax Map 146-N, Group "A", Parcel 16.00
- Town of Thompson's Station - Williamson County Tax Map 146-N, Group "A", Parcel 15.00
- Town of Thompson's Station - Williamson County Tax Map 146-N, Group "A", Parcel 1.00
- Town of Thompson's Station - Williamson County Tax Map 146, Parcel 40.01

This area contains portions of Thompson's Station Road West and School Road.

This work will support the planning and development of the Thompson's Station City Hall and Thompson's Station Road West redevelopment plans being developed by others. At this time site development services and construction survey services are not included in this proposal. Those items may be added with an addendum at any time.

If required, ELI-LLC can also provide a wide array of services on a broad range of project types and sizes as required for each situation. Among these services are Studies and Reports, Bridge and Structural Design, Land Planning, Conceptual Design, Landscape Architecture Design and Detailed Engineering Design, Right-of-Way and Easement Documentation and other related services. We desire that you have a complete understanding of the scope of services prior to entering into an agreement. Please let us know if you have any questions or desire any additions, deletions or amendments to this proposal. We appreciate the opportunity to move forward as your consultant on this project. We feel that ELI-LLC

can provide efficient and cost-conscious services that will contribute to the project's overall success.

Sincerely,

ENERGY LAND & INFRASTRUCTURE, LLC

Suzanne B. Herron, P.E., CPESC
Project Manager/Environmental Practice Lead

Attachments

PROPOSAL AGREEMENT

This Agreement (Agreement) between Energy Land & Infrastructure, LLC (ELI-LLC) and the Town of Thompson's Station (Town) delineates the terms and conditions under which ELI-LLC will provide professional services to the Town.

SCOPE OF SERVICES

ELI will prepare and submit a Preliminary Plat in accordance with the Land Development Ordinance (LDO) for the Town of Thompson's Station (Town) for Planning Commission approval, prepare and submit a Final Plat prepared in accordance with the LDO for Planning Commission Approval, coordinate with the Town Planner and others, and set permanent boundary pins after recording of the final plat with the Williamson County Register of Deeds on Thompson's Station Road West and School Road intersection area of the Town. The Preliminary Plat and Final Plat will each be presented to the Town Planner with a meeting and the engineer will present each item at the Planning Commission meeting for approval. One revision of each plan is included in this estimate.

This work will support the planning and development of the Thompson's Station City Hall and Thompson's Station Road West redevelopment plans being developed by others. Coordination with the other firms is included in this cost proposal. At this time site development services and construction survey services are not included in this proposal. Those items may be added with an addendum at any time.

The Preliminary Plat will include:

- Property location
- Topographic contours with an interval of not more than two feet
- The names of all adjoining property owners, with the deed or record book and page reference or the names of adjoining developments.
- The names of adjoining public ways.
- The bearing, shown to the nearest second, length of all tangent boundary lines of the property figured to the nearest one-hundredth of a foot, and complete curve data for all curved boundary lines.
- Bearings shall be referenced to true north or add adequate notes as to the reference.
- The location of existing public ways, easements, water bodies, streams, and other prominent features, such as wetlands, railroads, buildings, parks, cemeteries, drainage ditches, sink holes, bridges, and other features.
- The width of all existing easements, alleys, and other public ways, and building setback lines.
- Evidence of compliance with §3.8 Block Standards and §3.9 Thoroughfares including: a) block face dimensions, and b) thoroughfare network.
- The location, dimension, and area of all proposed or existing lots.
- Preliminary storm drainage design noting approximate volumes, direction of flows and location of proposed detention or retention areas.
- Proposed extension(s) of water and/or sanitary sewer service to the property along with the proposed routing of such within the subdivision including fire hydrants.
- Culverts and associated drainage structures located and sized along with necessary drainage easements; all other required utility easements.

- The location of all “Land Unsuitable for Development” as specified in §3.2.1.
- The location and boundary of all open space with the proposed owner and designating the entity responsible for care, operation and maintenance.
- Assignment of civic space type for transect community (TC) plans pursuant to Table 3.1 Civic Space Types.
- The limits of floodway and floodway fringe areas and the associated regulatory flood elevation and regulatory flood protection elevation.
- The minimum finished floor elevation of houses to be constructed on lots within the floodway fringe areas.
- The date of the plat, approximate true north arrow, scale, and title flood elevation and regulatory flood protection elevation as determined according to flood maps or flood studies as required.
- Sufficient data to determine readily the general location, bearing, and length of all lines necessary to reproduce such lines upon the ground.
- Name of subdivision and all new public ways, as approved by Williamson County Emergency Communications Agency.
- The zoning classification of all zoned lots, as well as an indication of all uses proposed by the subdivider.
- The distance and bearing of one of the corners of the boundary of the subdivision, to the boundary of the existing public ways and to the original corner of the original survey of parcel of which it is a part.
- Key map showing relation of the subdivision to all public ways, railroads and water courses in all directions to a distance of at least one-half (1/2) mile.
- Phasing plan, for all mutli-phase developments, including a construction traffic plan for such phases.
- Property tax map parcel numbers as recorded on the land tax maps of the county.
- Tennessee Department of Conservation approved soils map(s) of the property.
- The following notations: a) Classification of easement: (public use; access, drainage, utility, telecommunications, etc.); b) Explanation of site easements; c) Explanation of reservations; d) For any lot where public sewer or water systems are not available, the following: 1) Areas designated for use as septic fields by the Williamson County Department of Sewage Disposal Management; 2) Water wells (existing and proposed); and 3) Rock outcroppings, marshes, springs, sinkholes, natural storm drains, and other outstanding topographical features. 4) Statement of compliance with Concept Plan.
- The name and address of the owner(s) of land to be subdivided, the subdivider if other than the owner, and the land surveyor or other person preparing the plat.

The Final Plat will include:

- Property location
- The names of all adjoining property owners of record or the names of adjoining developments.
- The names of adjoining public ways.
- The exact boundary lines of the tract, determined by a field survey, showing angles to the nearest second and distance to the nearest one-hundredth (1/100th) of a foot. A distance and bearing shall be provided which will link a point on the boundary of the subdivision to a reference point in the right-of-way of the nearest prominent public way intersection.

- The location of all public ways, easements, water bodies, streams or rivers, railroads, parks, and cemeteries.
- The limits of floodway and floodway fringe areas and the regulatory flood elevation and regulatory flood protection elevation; as determined by the Planning Commission.
- The location and width of all easements and rights-of-way for public ways, as well as the building setback lines on all lots.
- The location, dimensions, and area of all lots.
- The location, area, and dimensions, to the accuracy set forth above, of all property to be set aside for park or playground use or other public or private reservation, with a designation of the purpose thereof, and conditions, if any, of the dedication or reservation.
- The name and address of the owner(s) of the land being subdivided.
- The name and address of the developer if other than the owner.
- The name and stamp of the land surveyor or other person preparing the plat.
- The date of the plat, approximate true north point, scale, and title of the subdivision.
- Sufficient data to determine readily the location, bearing, and length of all lines necessary to reproduce such lines upon the ground. The location of all monuments and pins shall be indicated on the plat.
- The names of all public ways.
- The zoning classification of all lots as well as an indication of uses other than residential proposed by the developer.
- The total acreage within the subdivision.
- Lot numbers and street numbers.
- The line size and location of water and sewer facilities.
- The location of all fire hydrants.
- For any lot where public sewer or water system is not available, the following shall be shown: 1) Areas to be used for sewage disposal; by the Williamson County Department of Sewage Disposal Management; as approved. 2) Water wells, existing and proposed.
- Applicable certifications in the form reproduced in this section shall appear upon the final plat. All required certificates shall bear the signature of the approving or authorizing agent at the time of application for final plat approval, except that the form for endorsement of the Planning Commission's approval for recording shall appear unsigned at the time of application for approval.
- Commitment notes may be printed or stamped on the final plat reflecting location and dimension of easements, or extent of other agreements or factual data, in lieu of drafted illustration, when applicable, and as approved by the Planning Commission.
- For stormwater detention facilities: 1) Show as a permanent drainage easement, and 2) Provide a note of reference to the deed book and page reference in which the Stormwater Detention Maintenance Agreement is recorded.
- The plat shall contain signature blocks as identified in Appendix C of the Land Development Ordinance.

LUMP SUM FEE FOR SERVICES …….... $ 22,380.00

Terms and Conditions

The attached Terms and Conditions are listed below and are for your review and approval.

Method of Compensation

The attached Schedule of Services and Expenses presents both the hourly billing rates of the various professional and technical classification of staff for purposes of compensation. Additional services can be performed on an hourly basis at the rates included on the fee schedule.

Upon execution of this Agreement, ELI-LLC can perform services once receiving a Notice to Proceed.

CLIENT EXECUTION

By: _____ Date: _____

Printed/Typed Name: _____ Title _____

_____

Approved as to Form

CONTRACT TERMS AND CONDITIONS

PARTIES, SERVICES, ASSIGNMENT AND ENTIRE AGREEMENT – ELI-LLC as an independent consultant, agrees to provide consulting services to the client for the Client's sole benefit and exclusive use. No third party beneficiaries are intended by this agreement. The ordering of services from ELI-LLC constitutes acceptance of the terms and conditions set out in this Agreement. This Agreement may not be assigned by either party without prior written permission of the other party. This Agreement constitutes the entire understanding of ELI-LLC and the Client and there are no other warranties or representation made other than as set forth herein and specifically within the Agreement.

STANDARD OF CARE – ELI-LLC agrees to perform consulting services in accordance with the degree of care and skill ordinarily exercised by other reputable members of our profession under similar circumstances. No warranty expressed or implied is made or intended by this Agreement relating to the services provided by ELI-LLC.

OPINIONS OF COST – When requested by the Client, ELI-LLC will use its best efforts, experience and judgment to offer an opinion of estimated construction costs. Such opinions are based on available historical data and are intended to provide an estimate of cost. No warranty of the actual construction cost is expressed or implied.

INSURANCE – ELI-LLC maintains insurance coverage including Workers' Compensation Insurance, Employer's Liability Insurance, Commercial General Liability Insurance, Automobile Liability Insurance and Professional Errors and Omission Insurance. Certificates of Insurance will be furnished upon request. Commercial General Liability Insurance and Professional Errors and Omissions Insurance will each carry limitations of not less than $1,000,000.00.

LIMITATION OF LIABILITY – In recognition of the relative risks and benefits of the project to both the Client and ELI-LLC, the risks have been allocated such that the Client agrees, to the fullest extent permitted by law, to limit the total aggregate liability of ELI-LLC for any and all claims, losses, costs, damages of any nature whatsoever or claims expenses from any cause or causes, to $1,000,000 or ELI-LLC's applicable insurance, whichever is greater. Such claims and causes include, but are not limited to, claims for negligence, professional errors or omissions, negligent misrepresentation, strict liability, breach of contract, breach of warranty.

WAIVER OF CONSEQUENTIAL DAMAGE – ELI-LLC and Client waive their right to recover consequential damages against each other, and ELI-LLC and Client do hereby release each other from consequential damages for claims, disputes or other matters in question arising out of or relating to this Agreement. This mutual waiver is applicable, without limitation, to all consequential damages including damages resulting from the termination of this Agreement.

PAYMENT TERMS – Client will be invoiced once each month for services performed during the preceding period. If payment is not received within thirty (30) days of the invoice date, the Client agrees to pay a service charge on any undisputed past due

amount of one half percent (½%) per month compounded monthly. The Client additionally agrees to pay all attorney fees, collection fees, court and lien costs, and other such expenditures incurred to satisfy any unpaid balance.

DISPUTE RESOLUTION/MEDIATION – In an effort to resolve any disputes that arise during or subsequent to the performance of services outlined in this Agreement, the Client and ELI-LLC agree to submit all such disputes to mediation prior to the commencement of litigation.

TERMINATION – The Agreement may be terminated for cause upon seven (7) days of written notice. In the event of termination, ELI-LLC will be entitled to compensation for all services provided and expenses incurred up to and including the termination date.

SCHEDULE OF SERVICES AND EXPENSES
PROFESSIONAL SERVICES HOURLY RATE SCHEDULE

Classification	Hourly Rate
Principal Engineer	$195.00
Project Manager	$170.00
Senior Engineer	$145.00
Project Engineer	$125.00
Engineering Intern	$110.00
Senior Designer	$110.00
Registered Surveyor	$100.00
Survey Project Manager	$100.00
CADD Designer	$75.00
Inspector	$75.00
2-person Survey Crew	$120.00
Landscape Architect	$110.00
Administration	$45.00

Monthly Finance Report

Town of Thompson's Station
For the period ended December 31, 2019

Prepared by
Steve Banks, Finance Director

Prepared on
January 7, 2020

Table of Contents

Financial Summary - Notes

December 2019

General Fund

- Cash inflows increased due to receipt of $145k from Evans Group participation agreement
- Closings for ROW acquisitions on Critz Lane began
- Issued 16 Building Permits in December
- Kicked off the design stages for SmartGov permitting software

Wastewater Fund

- Hill property progress billing no. 2 received.
- Total of 39 new accounts established (this only represents new accounts setup not when they started using services – timing issue due how information is received from HB&TS)
- Cell Alarm monitors are now installed for all pumps.

General Fund - Statement of Activity

July - December, 2019

	Jul 2019	Aug 2019	Sep 2019	Oct 2019	Nov 2019	Dec 2019	Total
REVENUES							
34100 Total Property Tax Revenues	716.99	2,134.65	36.28	4.33	17,954.63	15,617.59	36,464.47
34200 Total Sales Tax Revenues	123,972.49	131,054.96	119,652.66	124,474.68	142,265.53	120,523.16	761,943.48
34300 Total Gas Tax Revenues	15,418.17	14,834.83	16,456.98	16,173.23	15,701.34	15,534.75	94,119.30
34400 Total Building/Impact Fees	65,272.75	114,346.00	80,040.15	25,342.50	96,506.59	219,648.00	601,155.99
34500 Total Alcohol Tax Revenues	10,237.13	12,364.69	11,696.80	11,548.53	10,712.06	11,014.00	67,573.21
34700 Total All Other Revenues	9,412.94	7,538.47	4,211.23	3,647.81	7,050.71	5,560.52	37,421.68
Total Revenues	**225,030.47**	**282,273.60**	**232,094.10**	**181,191.08**	**290,190.86**	**387,898.02**	**1,598,678.13**
GROSS REVENUES	**225,030.47**	**282,273.60**	**232,094.10**	**181,191.08**	**290,190.86**	**387,898.02**	**1,598,678.13**
EXPENDITURES							
43100 Total Payroll Costs	57,232.60	63,967.32	70,689.20	86,388.78	66,484.07	73,948.65	418,710.62
43200 Total Streets and Roads	4,245.45	8,183.04	6,093.15	7,298.32	5,549.11	4,953.81	36,322.88
43300 Total Professional Fees	37,675.00	11,377.66	38,060.88	70,700.20	75,313.30	28,240.00	261,367.04
43400 Total Operating Costs	36,998.96	46,022.00	11,598.40	16,613.85	15,953.72	23,967.64	151,154.57
43500 Total County Services	8,992.50	8,992.50	8,992.50	8,992.50	8,992.50	8,992.50	53,955.00
49030 Debt Service			144,105.13				144,105.13
49900 Total Capital Improvement Costs		4,200.00	1,966.22	79,502.38	26,958.00	99,832.00	212,458.60
Total Expenses	**145,144.51**	**142,742.52**	**281,505.48**	**269,496.03**	**199,250.70**	**239,934.60**	**1,278,073.84**
NET CHANGE	**79,885.96**	**139,531.08**	**-49,411.38**	**-88,304.95**	**90,940.16**	**147,963.42**	**320,604.29**
NET CHANGE IN FUND BALANCE	**$79,885.96**	**$139,531.08**	**$ -49,411.38**	**$ -88,304.95**	**$90,940.16**	**$147,963.42**	**$320,604.29**

EXPANDED Statement of Activity General Fund

July - December, 2019

	Jul 2019	Aug 2019	Sep 2019	Oct 2019	Nov 2019	Dec 2019	Total
REVENUE							
34100 Total Property Tax Revenues							0
31111 Real Property Tax Revenue	717	2,135	36	4	17,955	15,618	36,464
Total 34100 Total Property Tax Revenues	**717**	**2,135**	**36**	**4**	**17,955**	**15,618**	**36,464**
34200 Total Sales Tax Revenues							0
31610 Local Sales Tax - Trustee	77,907	75,536	78,839	79,335	80,963	83,733	476,313
31810 Adequate School Facilities Tax	4,854	5,072	5,842	3,814	6,651		26,233
32260 Business Tax Revenue	4,258	8,505	4,019	303	3,902	64	21,052
33320 TVA Payments in Lieu of Taxes					14,532		14,532
33510 Local Sales Tax - State	36,953	41,942	30,952	41,022	36,217	36,726	223,813
Total 34200 Total Sales Tax Revenues	**123,972**	**131,055**	**119,653**	**124,475**	**142,266**	**120,523**	**761,943**
34300 Total Gas Tax Revenues							0
33552 State Streets & Trans. Revenue	782	782	782	782	782	782	4,691
33553 SSA - Motor Fuel Tax	7,897	7,627	7,954	7,871	7,659	7,547	46,555
33554 SSA - 1989 Gas Tax	1,256	1,183	1,321	1,253	1,195	1,200	7,407
33555 SSA - 3 Cent Gas Tax	2,327	2,192	2,447	2,322	2,214	2,223	13,725
33556 SSA - 2017 Gas Tax	3,156	3,051	3,953	3,945	3,852	3,783	21,741
Total 34300 Total Gas Tax Revenues	**15,418**	**14,835**	**16,457**	**16,173**	**15,701**	**15,535**	**94,119**
34400 Total Building/Impact Fees							0
32200 Building Permits	26,220	44,271	33,391	10,540	33,892	171,783	320,096
32230 Submittal & Review Fees	425	800	275	3,013	400	5,292	10,205
32300 Impact Fees	38,628	69,275	46,374	11,790	62,214	42,573	270,854
Total 34400 Total Building/Impact Fees	**65,273**	**114,346**	**80,040**	**25,343**	**96,507**	**219,648**	**601,156**
34500 Total Alcohol Tax Revenues							0
31710 Wholesale Beer Tax	9,430	9,856	10,137	9,179	9,756	7,624	55,983
31720 Wholesale Liquor Tax	187	1,354	992	1,802	86	1,897	6,319
32000 Beer Permits					300	300	600
33535 Mixed Drink Tax	620	1,155	568	567	570	1,193	4,672
Total 34500 Total Alcohol Tax Revenues	**10,237**	**12,365**	**11,697**	**11,549**	**10,712**	**11,014**	**67,573**
34700 Total All Other Revenues							0
31900 CATV Franchise Fee Income	4,799	2,948			2,966		10,713

	Jul 2019	Aug 2019	Sep 2019	Oct 2019	Nov 2019	Dec 2019	Total
32245 Miscellaneous Fees				392			392
36120 Interest Earned - Invest. Accts	3,189	3,328	3,036	2,561	2,664	2,681	17,460
37746 Parks Revenue	1,050	2,087	600	1,320	1,395	655	7,107
37747 Parks Deposit Return	-200	-1,400		-1,200	-500	-400	-3,700
Total 37746 Parks Revenue	**850**	**687**	**600**	**120**	**895**	**255**	**3,407**
37990 Other Revenue	575	575	575	575	525	2,625	5,450
Total 34700 Total All Other Revenues	**9,413**	**7,538**	**4,211**	**3,648**	**7,051**	**5,561**	**37,422**
Total Revenues	**225,030**	**282,274**	**232,094**	**181,191**	**290,191**	**387,898**	**1,598,678**
GROSS REVENUES	**225,030**	**282,274**	**232,094**	**181,191**	**290,191**	**387,898**	**1,598,678**
EXPENDITURES							
43100 Total Payroll Costs							0
41110 Payroll Expense	44,300	52,810	55,663	63,228	53,976	58,532	328,509
41141 Payroll Taxes - FICA	2,850	3,274	3,451	3,914	3,336	3,617	20,442
41142 Payroll Taxes - Medicare	667	766	807	917	780	848	4,784
41147 Payroll Taxes - SUTA	110	58	86	143	39		436
41289 Employee Retirement Expense	2,431	2,164	2,221	2,669	2,337	2,019	13,841
41514 Insurance - Employee Medical	6,876	4,895	8,461	15,518	6,016	8,932	50,699
Total 43100 Total Payroll Costs	**57,233**	**63,967**	**70,689**	**86,389**	**66,484**	**73,949**	**418,711**
43200 Total Streets and Roads							0
41264 Repairs & Maint - Vehicles	160	2,300	1,198	259	1,108	5	5,031
41268 Repairs & Maint-Roads, Drainage	1,015	2,188	1,792	2,078	2,177	947	10,197
41269 SSA - Street Repair Expense	630	2,092	838	3,211	2,181	1,749	10,701
41270 Vehicle Fuel & Oil Expense	2,441	1,603	2,266	1,750	82	2,253	10,394
Total 43200 Total Streets and Roads	**4,245**	**8,183**	**6,093**	**7,298**	**5,549**	**4,954**	**36,323**
43300 Total Professional Fees							0
41252 Prof. Fees - Legal Fees	20,680		21,810	18,339	30,047	26,240	117,116
41253 Prof. Fees - Auditor		1,500	2,500			2,000	6,000
41254 Prof. Fees-Consulting Engineers	1,815	9,878	13,751	52,362	45,081		122,886
41259 Prof. Fees - Other	15,180				185		15,365
Total 43300 Total Professional Fees	**37,675**	**11,378**	**38,061**	**70,700**	**75,313**	**28,240**	**261,367**
43400 Total Operating Costs							0
41211 Postage, Freight & Express Chgs	156				270	165	592
41221 Printing, Forms & Photocopy Exp	467						467

	Jul 2019	Aug 2019	Sep 2019	Oct 2019	Nov 2019	Dec 2019	Total
41231 Publication of Legal Notices	95	208	52	307	568	1,164	2,395
41235 Memberships & Subscriptions	1,750			840	213	269	3,072
41241 Utilities - Electricity	938	1,223	1,168	1,080	905	792	6,107
41242 Utilities - Water	257	210	271	283	292	285	1,598
41244 Utilities - Gas	78	82	82	78	99	256	676
41245 Telecommunications Expense	405	425	440	440	440	440	2,590
41265 Parks & Rec. Expense	500	500	1,817	563	6,346	836	10,561
41266 Repairs & Maint - Bldg					761	361	1,122
41280 Travel Expense	774						774
41285 Continuing Education Expense	1,493		165	200	755	1,463	4,076
41300 Economic Development Expense	500		599	200	75	200	1,574
41311 Office Expense	6,521	10,185	7,004	12,623	4,970	17,737	59,040
41511 Insurance - Property	23,064						23,064
41512 Insurance - Workers Comp.		14,486			258		14,744
41513 Insurance - Liability		16,009					16,009
41515 Insurance - Auto		2,694					2,694
Total 43400 Total Operating Costs	**36,999**	**46,022**	**11,598**	**16,614**	**15,954**	**23,968**	**151,155**
43500 Total County Services							0
41291 Animal Control Services	659	659	659	659	659	659	3,955
41800 Emergency Services	8,333	8,333	8,333	8,333	8,333	8,333	50,000
Total 43500 Total County Services	**8,993**	**8,993**	**8,993**	**8,993**	**8,993**	**8,993**	**53,955**
49030 Debt Service			144,105				144,105
49900 Total Capital Improvement Costs							0
41940 Capital Projects							0
1555 Office Renovations			1,966				1,966
Approved Budget Capital Expenditures				79,502	12,558		92,060
Critz Lane Improvements		4,200			9,800	99,832	113,832
Park Improvements					4,600		4,600
Total 41940 Capital Projects		**4,200**	**1,966**	**79,502**	**26,958**	**99,832**	**212,459**
Total 49900 Total Capital Improvement Costs		**4,200**	**1,966**	**79,502**	**26,958**	**99,832**	**212,459**
Total Expenditures	**145,145**	**142,743**	**281,505**	**269,496**	**199,251**	**239,935**	**1,278,074**
NET CHANGE	**79,886**	**139,531**	**-49,411**	**-88,305**	**90,940**	**147,963**	**320,604**
NET CHANGE IN FUND BALANCE	**$79,886**	**$139,531**	**$ -49,411**	**$ -88,305**	**$90,940**	**$147,963**	**$320,604**

Budget Vs Actual General Fund

July - December, 2019

	General Fund				Total			
	Actual	Budget	over Budget	% of Budget	Actual	Budget	over Budget	% of Budget
REVENUES								
34100 Total Property Tax Revenues	36,464	141,750	-105,286	26.00 %	36,464	141,750	-105,286	26.00 %
34200 Total Sales Tax Revenues	761,943	821,000	-59,057	93.00 %	761,943	821,000	-59,057	93.00 %
34300 Total Gas Tax Revenues	94,119	89,000	5,119	106.00 %	94,119	89,000	5,119	106.00 %
34400 Total Building/Impact Fees	601,156	538,000	63,156	112.00 %	601,156	538,000	63,156	112.00 %
34500 Total Alcohol Tax Revenues	67,573	61,800	5,773	109.00 %	67,573	61,800	5,773	109.00 %
34600 Total Grants		286,000	-286,000		0	286,000	-286,000	0%
34700 Total All Other Revenues	37,422	64,700	-27,278	58.00 %	37,422	64,700	-27,278	58.00 %
Total Revenues	**1,598,678**	**2,002,250**	**-403,572**	**80.00 %**	**1,598,678**	**2,002,250**	**-403,572**	**80.00 %**
GROSS REVENUES	**1,598,678**	**2,002,250**	**-403,572**	**80.00 %**	**1,598,678**	**2,002,250**	**-403,572**	**80.00 %**
EXPENDITURES								
43100 Total Payroll Costs	418,711	463,176	-44,465	90.00 %	418,711	463,176	-44,465	90.00 %
43200 Total Streets and Roads	36,323	126,000	-89,677	29.00 %	36,323	126,000	-89,677	29.00 %
43300 Total Professional Fees	261,367	180,250	81,117	145.00 %	261,367	180,250	81,117	145.00 %
43400 Total Operating Costs	151,155	102,875	48,279	147.00 %	151,155	102,875	48,279	147.00 %
43500 Total County Services	53,955	66,500	-12,545	81.00 %	53,955	66,500	-12,545	81.00 %
49030 Debt Service	144,105	150,633	-6,528	96.00 %	144,105	150,633	-6,528	96.00 %
49900 Total Capital Improvement Costs	212,459	1,956,000	-1,743,541	11.00 %	212,459	1,956,000	-1,743,541	11.00 %
Total Expenditures	**1,278,074**	**3,045,435**	**-1,767,361**	**42.00 %**	**1,278,074**	**3,045,435**	**-1,767,361**	**42.00 %**
NET CHANGE	**320,604**	**-1,043,185**	**1,363,789**	**-31.00 %**	**320,604**	**-1,043,185**	**1,363,789**	**-31.00 %**
NET CHANGE IN FUND BALANCE	**$320,604**	**$ -1,043,185**	**$1,363,789**	**-31.00 %**	**$320,604**	**$ -1,043,185**	**$1,363,789**	**-31.00 %**

General Fund Capital Expenditures Activity

July 2019 - June 2020

Date	Transaction Type	Num	Name	Division	Class	Memo/Description	Amount	Balance
Expenditures								
49900 Total Capital Improvement Costs								
41940 Capital Projects								
1555 Office Renovations								
09/05/2019	Bill	10820	Southern Contracting	General Fund	4500 Community Development	Security Door for Comm Govt	1,966	1,966
Total for 1555 Office Renovations							**$1,966**	
Approved Budget Capital Expenditures								
10/04/2019	Bill	T0M001	Ford of Murfreesboro	General Fund	6000 - Streets & Maintenance	F-350 Crew Cab	48,297	48,297
10/09/2019	Check	5589	Volunteer Paving	General Fund	6000 - Streets & Maintenance	Final payment of Clayton Arnold Road project	31,205	79,502
11/11/2019	Bill	65532A-01	StringFellow Inc	General Fund	6000 - Streets & Maintenance	Hopper - Spreader - Snow plow, Snowdogg - Lift frame and kit	12,558	92,060
Total for Approved Budget Capital Expenditures							**$92,060**	
Critz Lane Improvements								
08/08/2019	Bill	465	R & D Enterprises, Inc.	General Fund	8000 - Town Hall	Tract 22, 24, 26 Acquistion	4,200	4,200
11/20/2019	Bill	481	R & D Enterprises, Inc.	General Fund	8000 - Town Hall	Tract 23,29, 31 - Acquistions	4,200	8,400
11/30/2019	Bill	483	R & D Enterprises, Inc.	General Fund	8000 - Town Hall	Tract 1,2,3,25 Acquistions	5,600	14,000
12/12/2019	Check	5656	Teddy K. Peay	General Fund	8000 - Town Hall	Tract 36	6,700	20,700
12/12/2019	Check	5654	Mary B. Batey	General Fund	8000 - Town Hall	Tract 28	11,050	31,750

Date	Transaction Type	Num	Name	Division	Class	Memo/Description	Amount	Balance
12/12/2019	Check	5655	Troy Batey	General Fund	8000 - Town Hall	Tract 30	12,300	44,050
12/12/2019	Check	5653	William H. Marlin and Mattie Lou Marlin	General Fund	8000 - Town Hall	Tract 19 Acquistion	12,600	56,650
12/18/2019	Bill	494	R & D Enterprises, Inc.	General Fund	8000 - Town Hall	Acquistion - Tract 40	1,400	58,050
12/23/2019	Check	5698	Robert Baughman Jr and Elissa Baughman	General Fund	8000 - Town Hall	Tract 8	4,100	62,150
12/23/2019	Check	5697	Benjamine and Laura Scott	General Fund	8000 - Town Hall	Tract 25	20,082	82,232
12/30/2019	Check	5701	Mary B. Batey	General Fund	8000 - Town Hall	Tract 32	10,533	92,765
12/30/2019	Check	5702	Cynthia P. Giles	General Fund	8000 - Town Hall	Tract 32	10,533	103,299
12/30/2019	Check	5703	Patricia L. White	General Fund	8000 - Town Hall	Tract 32	10,533	113,832
01/02/2020	Check	5705	Williamson County Clerk	General Fund	8000 - Town Hall	Filing Fees on ROW acquistions	586	114,418
Total for Critz Lane Improvements							**$114,418**	
Park Improvements								
11/30/2019	Bill	479537	Martin Brothers Concrete	General Fund	9000 - Parks & Recreation	Pavilion in Park concrete park	4,600	4,600
Total for Park Improvements							**$4,600**	
Total for 41940 Capital Projects							**$213,045**	
Total for 49900 Total Capital Improvement Costs							**$213,045**	
Total for Expenditures							**$213,045**	
Net Change							**$ -213,045**	

Debt Service of General Fund

July 2019 - June 2020

Date	Transaction Type	Num	Name	Division	Class	Memo/Description	Split	Amount	Balance
49030 Debt Service									
09/26/2019	Bill	Note Series	First Farmers & Merchants Bank	General Fund	8000 - Town Hall	Interest on Note Series	21120 Accounts Payable	8,215	8,215
09/26/2019	Bill	Note Series	First Farmers & Merchants Bank	General Fund	8000 - Town Hall	Principal Payment on Note Series	21120 Accounts Payable	115,300	123,515
09/30/2019	Bill	Oct2019	First Tennessee Bank	General Fund	8000 - Town Hall	Interest Payment	21120 Accounts Payable	20,590	144,105
Total for 49030 Debt Service								**$144,105**	

Wastewater Fund Activity by Month

July - December, 2019

	Jul 2019	Aug 2019	Sep 2019	Oct 2019	Nov 2019	Dec 2019	Total
INCOME							
34090 Total Wastewater Fees	105,788	108,054	103,597	110,650	113,135	96,344	637,568
341090 Total Tap Fees	32,500	62,500	35,000	15,000	75,000	40,000	260,000
34200 Total Sales Tax Revenues						5,872	5,872
34700 Total All Other Revenues	1,986	2,088	1,984	-45	2,079	2,131	10,222
Total Income	**140,274**	**172,642**	**140,580**	**125,605**	**190,214**	**144,348**	**913,662**
GROSS PROFIT	**140,274**	**172,642**	**140,580**	**125,605**	**190,214**	**144,348**	**913,662**
EXPENSES							
43100 Total Payroll Costs	11,722	12,011	11,867	11,867	11,867	11,866	71,199
43300 Total Professional Fees	3,120	5,556	8,723	16,295	22,807	9,478	65,978
43400 Total Operating Costs	23,266	13,952	12,955	12,735	13,579	25,561	102,048
43600 Total Interest Expense	889	899	879	832	840	794	5,132
49900 Total Capital Improvement Costs				30,739	169,036	307,507	507,283
Total Expenses	**38,997**	**32,417**	**34,424**	**72,467**	**218,129**	**355,207**	**751,640**
NET OPERATING INCOME	**101,277**	**140,225**	**106,156**	**53,138**	**-27,915**	**-210,859**	**162,022**
OTHER EXPENSES							
Depreciation	37,500	37,500	37,500	37,500	37,500	37,500	225,000
Total Other Expenses	**37,500**	**37,500**	**37,500**	**37,500**	**37,500**	**37,500**	**225,000**
NET OTHER INCOME	**-37,500**	**-37,500**	**-37,500**	**-37,500**	**-37,500**	**-37,500**	**-225,000**
NET INCOME	**$63,777**	**$102,725**	**$68,656**	**$15,638**	**$ -65,415**	**$ -248,359**	**$ -62,978**

EXPANDED Wastewater Activity by month

July - December, 2019

	Jul 2019	Aug 2019	Sep 2019	Oct 2019	Nov 2019	Dec 2019	Total
INCOME							
34090 Total Wastewater Fees							0
31000 Wastewater Treatment Fees	101,578	105,522	99,268	108,070	109,792	92,715	616,945
31010 Septage Disposal Fees	750	750	650	350	800	750	4,050
31050 Late Payment Penalty	3,460	1,782	3,678	2,230	2,543	2,880	16,573
Total 34090 Total Wastewater Fees	**105,788**	**108,054**	**103,597**	**110,650**	**113,135**	**96,344**	**637,568**
341090 Total Tap Fees							0
33000 Tap Fees	32,500	62,500	35,000	15,000	75,000	40,000	260,000
Total 341090 Total Tap Fees	**32,500**	**62,500**	**35,000**	**15,000**	**75,000**	**40,000**	**260,000**
34200 Total Sales Tax Revenues							0
31810 Adequate School Facilities Tax						5,872	5,872
Total 34200 Total Sales Tax Revenues						**5,872**	**5,872**
34700 Total All Other Revenues							0
36120 Interest Earned - Invest. Accts	1,916	2,088	1,984	-45	2,079	2,061	10,082
37990 Other Revenue	70					70	140
Total 34700 Total All Other Revenues	**1,986**	**2,088**	**1,984**	**-45**	**2,079**	**2,131**	**10,222**
Total Income	**140,274**	**172,642**	**140,580**	**125,605**	**190,214**	**144,348**	**913,662**
GROSS PROFIT	**140,274**	**172,642**	**140,580**	**125,605**	**190,214**	**144,348**	**913,662**
EXPENSES							
43100 Total Payroll Costs							0
41110 Payroll Expense	9,061	9,317	9,189	9,189	9,189	9,189	55,134
41141 Payroll Taxes - FICA	562	578	570	570	570	570	3,418
41142 Payroll Taxes - Medicare	131	135	133	133	133	133	799
41289 Employee Retirement Expense	453	466	459	459	459	459	2,757
41514 Insurance - Employee Medical	1,515	1,515	1,515	1,515	1,515	1,515	9,090
Total 43100 Total Payroll Costs	**11,722**	**12,011**	**11,867**	**11,867**	**11,867**	**11,866**	**71,199**
43300 Total Professional Fees							0
41252 Prof. Fees - Legal Fees			3,960	3,440	2,300	720	10,420
41254 Prof. Fees-Consulting Engineers		4,553		12,855	20,507	8,758	46,672
41259 Prof. Fees - Other	3,120	1,003	4,763				8,886
Total 43300 Total Professional Fees	**3,120**	**5,556**	**8,723**	**16,295**	**22,807**	**9,478**	**65,978**

	Jul 2019	Aug 2019	Sep 2019	Oct 2019	Nov 2019	Dec 2019	Total
43400 Total Operating Costs							0
41211 Postage, Freight & Express Chgs	456	669	456	655	914	648	3,799
41220 Lab Water Testing			163	163	676		1,001
41221 Printing, Forms & Photocopy Exp			1,140		1,393	458	2,992
41235 Memberships & Subscriptions						700	700
41241 Utilities - Electricity	8,314	7,726	7,360	7,871	8,298	7,065	46,634
41242 Utilities - Water	111	292	338	295	223	235	1,495
41245 Telecommunications Expense	155	155	165	155	155	165	949
41260 Repairs & Maint WW	12,256	3,984	1,550	830		12,018	30,637
41320 Supplies Expense	629	607	516	2,250	1,317	618	5,937
41691 Bank Charges	518	519	517	517	604	535	3,209
42100 Permits and Fees	827		750			3,120	4,697
Total 43400 Total Operating Costs	**23,266**	**13,952**	**12,955**	**12,735**	**13,579**	**25,561**	**102,048**
43600 Total Interest Expense							0
41633 Interest Expense - Note Payable	889	899	879	832	840	794	5,132
Total 43600 Total Interest Expense	**889**	**899**	**879**	**832**	**840**	**794**	**5,132**
49900 Total Capital Improvement Costs							0
41940 Capital Projects							0
Approved Budget Capital Expenditures				30,739	169,036	307,507	507,283
Total 41940 Capital Projects				**30,739**	**169,036**	**307,507**	**507,283**
Total 49900 Total Capital Improvement Costs				**30,739**	**169,036**	**307,507**	**507,283**
Total Expenses	**38,997**	**32,417**	**34,424**	**72,467**	**218,129**	**355,207**	**751,640**
NET OPERATING INCOME	**101,277**	**140,225**	**106,156**	**53,138**	**-27,915**	**-210,859**	**162,022**
OTHER EXPENSES							
Depreciation	37,500	37,500	37,500	37,500	37,500	37,500	225,000
Total Other Expenses	**37,500**	**37,500**	**37,500**	**37,500**	**37,500**	**37,500**	**225,000**
NET OTHER INCOME	**-37,500**	**-37,500**	**-37,500**	**-37,500**	**-37,500**	**-37,500**	**-225,000**
NET INCOME	**$63,777**	**$102,725**	**$68,656**	**$15,638**	**$ -65,415**	**$ -248,359**	**$ -62,978**

Wastewater Fund Budget Vs Actual

July - December, 2019

	Total			
	Actual	Budget	over Budget	% of Budget
INCOME				
34090 Total Wastewater Fees				
31000 Wastewater Treatment Fees	616,945	588,510	28,435	105.00 %
31010 Septage Disposal Fees	4,050	4,800	-750	84.00 %
31050 Late Payment Penalty	16,573	7,500	9,073	221.00 %
Total 34090 Total Wastewater Fees	**637,568**	**600,810**	**36,758**	**106.00 %**
341090 Total Tap Fees				
33000 Tap Fees	260,000	250,000	10,000	104.00 %
Total 341090 Total Tap Fees	**260,000**	**250,000**	**10,000**	**104.00 %**
34200 Total Sales Tax Revenues				
31810 Adequate School Facilities Tax	5,872		5,872	
Total 34200 Total Sales Tax Revenues	**5,872**		**5,872**	
34700 Total All Other Revenues				
36120 Interest Earned - Invest. Accts	10,082	20,000	-9,918	50.00 %
37990 Other Revenue	140	175	-35	80.00 %
Total 34700 Total All Other Revenues	**10,222**	**20,175**	**-9,953**	**51.00 %**
Total Income	**913,662**	**870,985**	**42,678**	**105.00 %**
GROSS PROFIT	**913,662**	**870,985**	**42,678**	**105.00 %**
EXPENSES				
43100 Total Payroll Costs				
41110 Payroll Expense	55,134	106,552	-51,418	52.00 %
41141 Payroll Taxes - FICA	3,418	6,606	-3,188	52.00 %
41142 Payroll Taxes - Medicare	799	1,439	-639	56.00 %
41147 Payroll Taxes - SUTA		315	-315	
41289 Employee Retirement Expense	2,757	5,328	-2,571	52.00 %
41514 Insurance - Employee Medical	9,090	7,800	1,290	117.00 %
Total 43100 Total Payroll Costs	**71,199**	**128,039**	**-56,840**	**56.00 %**
43300 Total Professional Fees				
41252 Prof. Fees - Legal Fees	10,420		10,420	
41253 Prof. Fees - Auditor		1,250	-1,250	
41254 Prof. Fees-Consulting Engineers	46,672	50,000	-3,328	93.00 %
41259 Prof. Fees - Other	8,886	2,500	6,386	355.00 %
Total 43300 Total Professional Fees	**65,978**	**53,750**	**12,228**	**123.00 %**
43400 Total Operating Costs				
41211 Postage, Freight & Express Chgs	3,799	4,500	-702	84.00 %
41220 Lab Water Testing	1,001	2,000	-999	50.00 %
41221 Printing, Forms & Photocopy Exp	2,992	4,000	-1,009	75.00 %
41235 Memberships & Subscriptions	700		700	
41241 Utilities - Electricity	46,634	42,500	4,134	110.00 %
41242 Utilities - Water	1,495	3,000	-1,505	50.00 %
41245 Telecommunications Expense	949	1,800	-851	53.00 %
41260 Repairs & Maint WW	30,637	50,000	-19,363	61.00 %

	Total			
	Actual	Budget	over Budget	% of Budget
41320 Supplies Expense	5,937	2,500	3,437	237.00 %
41513 Insurance - Liability		10,000	-10,000	
41691 Bank Charges	3,209		3,209	
41899 Other Expenses		500	-500	
42100 Permits and Fees	4,697	3,000	1,697	157.00 %
Total 43400 Total Operating Costs	**102,048**	**123,800**	**-21,752**	**82.00 %**
43500 Total County Services				
41720 Donations		125	-125	
Total 43500 Total County Services		**125**	**-125**	
43600 Total Interest Expense				
41633 Interest Expense - Note Payable	5,132	4,750	382	108.00 %
Total 43600 Total Interest Expense	**5,132**	**4,750**	**382**	**108.00 %**
49900 Total Capital Improvement Costs				
41940 Capital Projects				
Approved Budget Capital Expenditures	507,283	1,850,000	-1,342,717	27.00 %
Total 41940 Capital Projects	**507,283**	**1,850,000**	**-1,342,717**	**27.00 %**
Total 49900 Total Capital Improvement Costs	**507,283**	**1,850,000**	**-1,342,717**	**27.00 %**
Total Expenses	**751,640**	**2,160,464**	**-1,408,824**	**35.00 %**
NET OPERATING INCOME	**162,022**	**-1,289,479**	**1,451,502**	**-13.00 %**
OTHER EXPENSES				
Depreciation	225,000	225,000	0	100.00 %
Total Other Expenses	**225,000**	**225,000**	**0**	**100.00 %**
NET OTHER INCOME	**-225,000**	**-225,000**	**0**	**100.00 %**
NET INCOME	**$ -62,978**	**$ -1,514,479**	**$1,451,502**	**4.00 %**

Wastewater Fund Capital Improvement Activity

July 2019 - June 2020

Date	Transaction Type	Num	Name	Division	Class	Memo/Description	Amount	Balance
Expenses								
49900 Total Capital Improvement Costs								
41940 Capital Projects								
Approved Budget Capital Expenditures								
10/18/2019	Bill	173183	Barge Design Solutions, Inc.	Wastewater	WW	Hill Property WW	30,739	30,739
11/19/2019	Bill	36724-01	W & O Construction Co.	Wastewater	WW	Hill Property Drip Fields installation pay #1	169,036	199,775
12/06/2019	Bill	174643	Barge Design Solutions, Inc.	Wastewater	WW	Hill property Drip Field project management	4,794	204,570
12/11/2019	Bill	36724-01 #2	W & O Construction Co.	Wastewater	WW	Hill Property Drip Fields installation No 2	302,713	507,283
Total for Approved Budget Capital Expenditures							**$507,283**	
Total for 41940 Capital Projects							**$507,283**	
Total for 49900 Total Capital Improvement Costs							**$507,283**	

Cash Balances

General Fund Cash Position	**Dec 2019**
Checking	$ 1,082,564
Savings	$ 5,902,676
Less: Reserve	$ (1,037,827)
Total Cash	$ 5,947,413
Less:	
Note Balance (First Farmers)	$ (461,200)
Note Balance (First Tennessee)	$ (1,420,000)
Due to Wastewater Fund	$ (497,265)
Accounts Payable	$ (28,657)
Committed	$ (
Total Available Funds	**$ 3,540,291**

Wastewater Funds Cash Position	**Dec 2019**
Checking	$ 122,277
Savings	$ 4,331,579
Less: Reserve	$ (519,275)
Total Cash	**$ 3,934,581**
Add:	
Accounts Receivable	$ 174,968
Due from Gen Fund	$ 497,265
Less:	
Note Balance (Franklin Synergy)	$ (379,630)
Accounts Payable	$ (332,938)
Deposits	$ (17,325)
Total Available Funds	**$ 3,876,921**
Less Committed:	
- Hill Prop. Drip fields	$ (3,104,965)
- Cell #1 repairs	$ (500,000)
- Equipment	$ (100,000)
Estimated Ending Funds	**$ 171,956**