



BUCKLEY CITY COUNCIL MEETING AGENDA
December 12, 2017
Multi-Purpose Center, 811 Main Street
City Council Meeting
Opening 7:00 P.M.

Call to Order
Pledge of Allegiance
Roll Call of Council Members

Next Ordinance #25-17
Next Resolution #17-09
Next Agenda Bill #AB17-106

A. Citizen Participation

Time Limit of Three Minutes (Must sign up at City Hall by Wednesday prior to the Council Meeting)

B. Staff Reports

- **Judge Tedrick** – Address the Council
- **Judge Tedrick** – Swear in Judge Freeby
- **Lieutenants & Firefighters** – Swearing in Ceremony

C. Main Agenda

- | | | |
|-----|---|--------|
| 1. | Public Hearing: Plat Amendment – Perkins Prairie | Pg. 8 |
| 2. | Consideration of Perkins Prairie Plat Amendment | Pg. 11 |
| 3. | ORD No. ___-17: Adopting Transportation Element of Comprehensive Plan | Pg. 23 |
| 4. | ORD No. ___-17: 2017 Budget Amendment | Pg.220 |
| 5. | ORD No. ___-17: Authorizing the Transfer of Natural Gas Utility Surplus Funds | Pg.225 |
| 6. | RES No. 17-___ - Amending Personnel Policy – Revision #17 | Pg.228 |
| 7. | Scope of Work - Design Eng. – River Ave. Reconstruction Project – w-Supplement #1 | Pg.235 |
| 8. | Contract – Addendum #1 – City & Foothills Historical Society – Museum Services | Pg.263 |
| 9. | TIB Grant Agreement – Mundy Loss Road | Pg.266 |
| 10. | Cancellation of December 26, 2017 Council Meeting | Pg.275 |

D. Consent Agenda

Pg.276

- | | | |
|-----|--|--|
| 11. | A. Approve Minutes of November 28, 2017 City Council Meeting | |
| | B. Claims | |
| | C. Transfer Voucher | |
| | D. Payroll | |

E. Committee Reports

- | | | |
|-----|--|---------------|
| 12. | Mayor's Report | Johnson |
| | - Cancel City Council Study Session on 1/2/2018 | |
| 13. | Administration, Finance & Public Safety | Boyle Barrett |
| 14. | Transportation & Utilities | Tremblay |
| 15. | Community Services | Rose |
| 16. | Council Member Comments & Good of the Order | |

Council may add and take action on other items not listed on this agenda



CITY OF BUCKLEY ♦ PO BOX 1960 ♦ BUCKLEY, WA 98321
360-829-1921 ♦ Fax 360-829-2659 ♦ <http://www.cityofbuckley.com>

CITY OF BUCKLEY MEETING LIST

Dec 11	10:30 AM	Buckley Hall Board (City Hall)
Dec 12	7:00 PM	City Council
Dec 18	7:00 PM	Planning Commission - CANCELLED
Dec 19	9:30 AM	Admin, Finance & Public Safety (City Hall)
Dec 19	7:00 PM	Transportation & Utilities (City Hall)
Dec 21	4:00 PM	Community Services
Dec 26	7:00 PM	City Council
Jan 2	9:30 AM	Admin, Finance & Public Safety (City Hall)
Jan 2	7:00 PM	City Council Study Session - CANCELLED
Jan 8	10:30 AM	Buckley Hall Board
Jan 8	7:00 PM	Planning Commission
Jan 9	7:00 PM	City Council
Jan 16	9:30 AM	Admin, Finance & Public Safety (City Hall)
Jan 16	7:00 PM	Transportation & Utilities (City Hall)
Jan 18	4:00 PM	Community Services
Jan 22	7:00 PM	Planning Commission
Jan 23	7:00 PM	City Council

The above meetings will be held in the Multi-Purpose Center located at 811 Main Street unless otherwise noted.

Last Revised December 6, 2017

December 2017



Sun	Mon	Tue	Wed	Thu	Fri	Sat
					1	2
3	4 7 Planning Commission	5 9:30 AM Admin, Finance & PS 7 City Council Study Session	6	7	8	9
10	11 10:30 Buckley Hall Board	12 7 City Council	13	14	15	16
17	18 7 Planning Commission	19 9:30 AM Admin, Finance & PS 20 Transportation & Utilities	20	21 4 Community Services	22	23
24	25 	26 7 City Council	27	28	29	30
31 						

January 2018



Sun	Mon	Tue	Wed	Thu	Fri	Sat
	1 	2 9:30 AM Admin, Finance & PS	3	4	5	6
7	8 10:30 Buckley Hall Board 7 Planning Commis- sion	9 7 City Council	10	11	12	13
14	15 	16 9:30 AM Admin, Finance & PS 7 Transportation & Utilities	17	18 4 Community Services	19	20
21	22 7 Planning Commis- sion	23 7 City Council	24	25	26	27
28	29	30	31			

A. CITIZEN PARTICIPATION

B. STAFF REPORTS

C. MAIN AGENDA



CITY COUNCIL AGENDA BILL

City of Buckley
PO Box 1960
Buckley, WA 98321

ITEM INFORMATION			
SUBJECT: Public Hearing: Perkins Prairie Subdivision – Plat Amendment (Park Lot) Cost Impact: N/A Fund Source: N/A Timeline: N/A	Agenda Date: December 12, 2017		AB17-106
	Department/Committee/Individual	Created	Reviewed
	Mayor Pat Johnson		X
	City Administrator – Dave Schmidt		X
	City Attorney – Phil Olbrechts		X
	City Engineer – Dominic Miller		
	City Clerk – Joanne Starr		X
	Finance Dept – Sheila Bazzar		
	Building Official – Mike Deadmond		
	Fire Dept – Chief Predmore		
	Parks & Rec Dept – Ellen Boyd		
	Planning Dept – Kathy Thompson	X	X
	Police Dept – Chief Arsanto		
	Municipal Court – Jessica Cash		
PW/Utilities – Chris Banks			
Attachments: Public Hearing Notice			
SUMMARY STATEMENT: The purpose of the hearing is to obtain public comment on a proposal to provide a new 4,355 sf parcel for the small park located at the NW corner of Couls Avenue and Spruce Street. The parcel is to be equally owned by all lot owners of the Perkins Prairie plats.			
COMMITTEE REVIEW AND RECOMMENDATION: None			
RECOMMENDED ACTION: N/A			
RECORD OF COUNCIL ACTION			
Meeting Date	Action	Vote	

CITY OF BUCKLEY

P.O. Box 1960 ♦ Buckley, WA 98321 ♦ (360) 829-1921 ext. 7801
<http://www.cityofbuckley.com/>; <http://www.codepublishing.com/WA/Buckley/>



PUBLIC HEARING NOTICE

Notice date: November 9, 2017

Publish date: November 15, 2017

NOTICE OF PUBLIC HEARING AMENDMENT TO THE PERKINS PRAIRIE PLAT; (File #SUBA 17-0001)

To: Interested Agencies and Public
Subject: Plat amendment.
Project The amendment will add Tract B (4,355 sf) out of existing Tract E (830,036 sf) to separate
Description: the existing park from the wetland parcel.
Proponent: Perkins Prairie LLC.
Contact: David Follansbee
Location: Southeast corner of Tract E, north of Couls Avenue and west of Spruce Street, south of Tract I for the storm drainage pond.
Parcel Number: 8000091700
Date of Application: November 6, 2016
Determined Complete: N/A
SEPA Determination: N/A
Public Hearing: The public hearing with the city council will be Tuesday, December 12, 2017, at 7 p.m. in the Buckley Multipurpose Building located at 811 Main Street, Buckley.

The purpose of the hearing is to obtain public comment on a proposal to provide a new 4,355 sf parcel for the small park located at the NW corner of Couls Avenue and Spruce Street. The parcel is to be equally owned by all lot owners of the Perkins Prairie plats.

Notice of Complete Status: N/A

Completed application materials and supporting documentation used in evaluating the proposed project referred to as the Perkins Prairie Plat Amendment and is available at Buckley Planning Department, P.O. Box 1960, 811 Main Street, Buckley, Washington 98321, and on the city's website under building & planning, current planning projects.

It is the right of any person to review and comment on the application, receive notice of and participate in any hearings, request a copy of decisions once made and exercise any rights of appeal. Written comments should be delivered in time for the hearing. Final decision on the application shall be made within the time Periods established under BMC 20.01.

The City of Buckley does not discriminate on the basis of disabilities. If you need special accommodation, please contact City Hall within three business days before the public hearing at (360) 761-7801.

Staff Contact: City Planner Kathy James, (360) 761-7812



CITY COUNCIL AGENDA BILL

City of Buckley
PO Box 1960
Buckley, WA 98321

ITEM INFORMATION			
SUBJECT:	Agenda Date: December 12, 2017 AB17-107		
Perkins Prairie Plat Amendment PUBLIC HEARING and decision	Department/Committee/Individual	Created	Reviewed
	Mayor Pat Johnson		
	City Administrator – Dave Schmidt		
	City Attorney – Phil Olbrechts		
	City Engineer – Dominic Miller		
	City Clerk – Joanne Starr		
	Finance Dept – Sheila Bazzar		
	Building Official – Mike Deadmond		
	Fire Dept – Chief Predmore		
	Parks & Rec Dept – Julie Bevaart		
	Planning Dept – Kathy Thompson	x	
Police Dept – Chief Arsanto			
Municipal Court – Jessica Cash			
Cost Impact:			
Fund Source:			
Timeline:			
Attachments: Staff report, declaration of CC&R's, and reduced amended plat drawing.			
<p>SUMMARY STATEMENT:</p> <p>On November 1, 2017, the request for plat alteration was submitted to the city to add Tract B to accommodate the park that was created with phase 2.</p> <p>The purpose of the hearing is to satisfy the requirements of RCW 58.17.210 that states the legislative body shall determine the public use and interest in the proposed alteration and may deny or approve the application for alteration.</p> <p>The council's review is much like the decision on a final plat, except that it must conduct a public hearing.</p>			
COMMITTEE REVIEW AND RECOMMENDATION:			
RECOMMENDED ACTION: MOTION to approve the Perkin's Prairie plat alteration to add Tract B to the plat to accommodate the park.			
RECORD OF COUNCIL ACTION			
<i>Meeting Date</i>	<i>Action</i>	<i>Vote</i>	

CITY OF BUCKLEY

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MEMO REPORT

To: Mayor Pat Johnson
Members of the City Council
From: City Planner Kathy Thompson
Planning Assistant Leticia Wallgren
Date: December 5, 2017
RE: Perkin's Prairie Plat Alteration; File # SUBA-17-0001

Request.

On November 1, 2017, the request for plat alteration was submitted to the city to add Tract B to accommodate the park that was created with phase 2.

Recommendation.

Staff recommends the proposed amendment be approved.

Review.

Plat alterations are reviewed under BMC 18.33.010, which refers to the Revised Code of Washington (RCW) sections 58.17.212 and 58.17.215; RCW 58.17.212 concerns plat vacations and is not applicable to this request.



RCW 58.17.215 states that to alter a subdivision the following need to be true:

1. The application shall contain the signatures of the majority of those persons having an ownership interest of lots, tracts, parcels, sites, or divisions in the subdivision or portion to be altered.
2. The restrictive covenants filed at the time of approval must not be violated by the request. If it is found that there is a violation of the covenants, the application must contain an agreement signed by all parties providing that the parties agree to terminate or alter the relevant covenants to accomplish the alteration.

The city's legislative body is required to conduct a public hearing therefore the department has issued a notice to the owners of the parcels within the subdivision and landowners within a 300-foot radius of the subdivision. Further, notice of the hearing was published in the Enumclaw Courier Herald on November 15, 2017, posted at City Hall, and posted in the Multi-Purpose Building.

In addition, the plat alteration must address Conditions of Approval (COAs) that may be affected by the plat alteration. The entire list of the COAs is attached for your reference. The following COAs appear to affect the proposed plat alteration:

E. Critical Areas:

1. The applicant shall comply with all other State and/or Federal regulations and obtain relevant permits. This includes the U.S. Army Corps of Engineers and the Washington State

Department of Ecology (DOE). It is the sole responsibility of the applicant to contact the other jurisdictions and secure any and all other permits required for this proposed project.

The park is outside a regulated wetland and is in the location of the proposed trail.

2. Pursuant to BMC 12.12.100 the regulated wetland(s) and associated buffer(s) shall either be placed in a separate tract on which development is prohibited, protected by execution of an easement, dedicated to a conservation organization or land trust, or similarly preserved through a permanent protective mechanism acceptable to the city. The location and limitations associated with the wetland(s) and buffer(s) shall be shown on the face of the deed or plat applicable to the property and shall be recorded with the Pierce County assessor's office. ***The proposed amendment takes a portion of Tract E on which a park was constructed. The proposal is to add the area around the park as Tract B, separate from Tract E and to be owned and maintained by the plat owners.***

- F5. Proponent shall grant an easement to the city of at least fifteen feet in width in the wetland area in Tract E (in an alignment to be chosen by the city) for the city's future public use as an interpretive trail. The trail shall connect to future Miller Park adjacent to the subdivision. A trail plan showing all trail dimensions and construction materials shall be submitted to the city for approval prior to construction. The Proponent shall prepare the legal description and legal documents for the easement at its expense. The design, permitting, construction and maintenance of the interpretive trail shall be the responsibility of the city. The Proponent and its successor(s) in interest shall fully cooperate with the city in achieving permitting, as needed. The applicant shall design the amended plat to allow access to the interpretive trail from within the plat boundaries. ***The park is located between the trail and the street.***

- F15. The applicant shall be required to add notes and/or language to the plat map indicating ownership of all tracts. ***The amended plat drawing on the tract table on page 2 of 8 lists Tract B to be active/passive recreation to be owned by all lot owners with an undivided interest. Tract B is shown on page 5 of 8.***

No apparent violations of any of the restrictive covenants filed at the time of approval exist; the Declaration of CC&R's is attached.

History.

The preliminary plat of Perkin's Prairie was approved by the city twice. The first version of the plat (LP-2008-01) included 262 lots on 59.94 acres and was approved June 30, 2009. A revision (LP-2011-01) was submitted a few years later. This revised subdivision contains 177 lots and will be completed in phases (blocks) with 168 lots. A request for extension was timely made and granted; ***the plat expired June 30, 2017.*** Phase 1 was recorded under Assessor's File Number (AFN) 201504155001; Phase 2 was recorded under AFN 201703025002; Phase 3 was recorded under AFN 201711015011.

The city approved the revised preliminary long plat with conditions on October 19, 2011. Construction ensued and is done for Phase 1, Phase 2 and Phase 3.

The project construction was phased; the Hearing Examiner Conditions of Approval (COA) were confirmed by the city at the time of construction for each phase.

Civil construction plans were submitted for Clearwater Estates and approved for the entire plat by the city engineer April 30, 2014

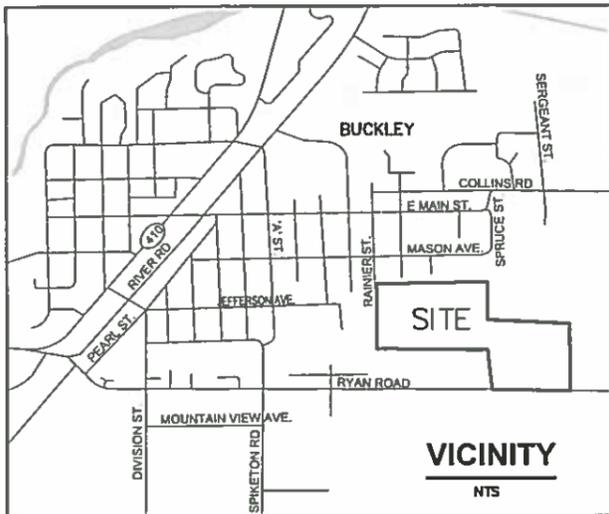
- A pre-construction meeting for Phase 1 was conducted May 28, 2014.
- On June 10, 2014, the city and Investco Financial Corporation entered into a developer agreement to construct the utilities and road system. A bond for this work was offered and the amount (\$829,304) was accepted by the city.
- A latecomers' agreement application for sanitary sewer was approved by the city under Phase 1 and covers the lots in Phase 2. The latecomer's agreement was recorded on May 28, 2015 under AFN 201505280142.
- A pre-construction meeting for Phase 2 was April 19, 2016.
- The pre-construction meeting for Phase 3 was May 22, 2017.

Phase 1 final plat. The final plat request for Phase 1 on parcel numbers 0619038002 and 0619023005 for 58 lots was submitted February 25, 2015, approved with conditions by the council March 22, 2015, and recorded at the county April 15, 2015, under AFN 201504155001.

Phase 2 final plat. The final plat request for Phase 2 on parcel numbers 0619038011 and 0619023025 for 60 lots was made November 21, 2016. On December 2, 2016, the applicant agreed to additional time for the city's review and the plat was approved with conditions January 10, 2017, and recorded March 2, 2017, under AFN 201703025002. As conditions of this phase, the CC&Rs were recorded under AFN 201703020349; the declaration and grant of storm drainage easement was recorded under AFN 201703020350; the declaration and grant of access and utilities easement was recorded under 201703020351; and the trail easement was recorded under AFN 201703020352.

Phase 3. The final plat request for Phase 3 on parcel number 0619023026 contains 50 lots for a plat total of 168 lots. Application was submitted June 21, 2017; an extension was granted July 6, 2017, to enable the council to review the material adequately, to August 8, 2017, and recorded November 1, 2017 under AFN 201711015011.

PERKINS PRAIRIE PH II **SHEET 1 OF 8**
A PORTION OF THE SW 1/4 OF SECTION 02, AND THE SE 1/4 OF SECTION 03,
TOWNSHIP 19 NORTH, RANGE 06 EAST OF THE WILLAMETTE MERIDIAN,
CITY OF BUCKLEY, PIERCE COUNTY, WASHINGTON.



DESCRIPTION

SEE SHEET 2

DEDICATION

KNOW ALL MEN BY THESE PRESENTS THAT WE, THE UNDERSIGNED PERKINS PRAIRIE, LLC, OWNERS IN FEE SIMPLE OF THE LAND HEREBY PLATED, HEREBY DECLARE THIS PLAT AND DEDICATE TO THE USE OF THE PUBLIC FOREVER, ALL STREETS, AVENUES AND ALLEYS SHOWN HEREON AND THE USE THEREOF FOR ALL PUBLIC PURPOSES NOT INCONSISTENT WITH THE USE THEREOF FOR PUBLIC HIGHWAY PURPOSES; ALSO ALL PARKS, EASEMENTS OR WHATEVER PUBLIC PROPERTY OR PLACES THERE ARE SHOWN ON THE PLAT FOR THE PURPOSE THEREON INDICATED; ALSO THE RIGHT TO MAKE ALL NECESSARY SLOPES FOR CUTS OR FILLS UPON THE LOTS, BLOCKS, TRACTS, OR PARCELS OF LAND SHOWN ON THIS PLAT IN THE ORIGINAL REASONABLE GRADING OF ALL THE STREETS, AVENUES, ALLEYS AND PLACES SHOWN THEREON.

IN WITNESS WHEREOF WE HAVE HEREUNTO SET OUR HANDS AND SEALS THIS _____ DAY OF _____ 20____

ACKNOWLEDGEMENT

STATE OF WASHINGTON)
) SS)
 COUNTY OF PIERCE)

THIS IS TO CERTIFY THAT ON THIS _____ DAY OF _____, 20____ BEFORE ME, THE UNDERSIGNED, A NOTARY PUBLIC, PERSONALLY APPEARED _____ TO ME KNOWN TO BE THE PERSON _____ WHO EXECUTED THE FOREGOING DEDICATION, AND WHO ACKNOWLEDGED TO ME THAT _____ SIGNED AND SEALED THE SAME _____ FREE AND VOLUNTARY ACT AND DEED FOR THE USES AND PURPOSES THEREIN MENTIONED.

WITNESS MY HAND AND OFFICIAL SEAL THE DAY AND YEAR FIRST ABOVE WRITTEN.

NOTARY PUBLIC IN AND FOR THE STATE OF WASHINGTON, RESIDING AT _____ WASHINGTON.

SURVEY FOR

PERKINS PRAIRIE, LLC
 INVESTCO FINANCIAL CORPORATION
 1302 PUYALLUP STREET
 SUMNER, WA 98390-1600

SURVEYOR'S CERTIFICATE

I, DAVID C. FOLLANSBEE, A PROFESSIONAL LAND SURVEYOR IN THE STATE OF WASHINGTON, HEREBY CERTIFY THAT THIS MAP CORRECTLY REPRESENTS A SURVEY MADE BY ME OR UNDER MY DIRECT SUPERVISION IN AUGUST, 2016, IN COMPLIANCE WITH THE REQUIREMENTS OF THE SURVEY RECORDING ACT, CHAPTER 58.09 R.C.W. AND 332-130 W.A.C., AT THE REQUEST OF PERKINS PRAIRIE, LLC.

DAVID C. FOLLANSBEE, PLS 45161 _____ DATE

ASSESSOR-TREASURER

I HEREBY CERTIFY THAT ALL STATE AND COUNTY TAXES HERETOFORE LEVIED AGAINST THE PROPERTY DESCRIBED HEREIN, ACCORDING TO THE BOOKS AND RECORDS OF MY OFFICE HAVE BEEN FULLY PAID AND DISCHARGED.

ASSESSOR - TREASURER, PIERCE COUNTY _____ DATE

CITY ENGINEER

I HAVE EXAMINED AND APPROVED THE REQUIRED ENGINEERING ASPECTS OF THIS PLAT ON BEHALF OF THE CITY OF BUCKLEY.

CITY ENGINEER _____ DATE

PLANNING DIRECTOR

EXAMINED AND APPROVED THIS _____ DAY OF _____ 20____ A.D. FOR THE CITY OF BUCKLEY.

PLANNING DIRECTOR-CITY OF BUCKLEY _____

MAYOR

EXAMINED AND APPROVED THIS _____ DAY OF _____ 20____ A.D. FOR THE CITY OF BUCKLEY.

MAYOR-CITY OF BUCKLEY _____

CITY ATTORNEY

EXAMINED AND APPROVED THIS _____ DAY OF _____ 20____ A.D. FOR THE CITY OF BUCKLEY.

ATTORNEY-CITY OF BUCKLEY _____

UTILITIES SUPERINTENDENT

EXAMINED AND APPROVED THIS _____ DAY OF _____ 20____ A.D. FOR THE CITY OF BUCKLEY.

UTILITIES SUPERINTENDENT-CITY OF BUCKLEY _____

FIRE CHIEF

EXAMINED AND APPROVED THIS _____ DAY OF _____ 20____ A.D. FOR THE CITY OF BUCKLEY.

FIRE CHIEF-CITY OF BUCKLEY _____

AUDITOR'S CERTIFICATE

FILED FOR RECORD THIS _____ DAY OF _____, 20____ AT _____ MINUTES PAST _____ M. RECORDS OF THE PIERCE COUNTY AUDITOR, _____ WASHINGTON.

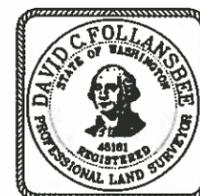
RECORDING NUMBER _____

COUNTY AUDITOR _____

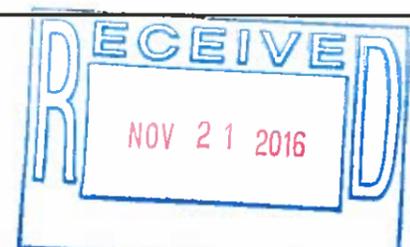
FEE _____

BY _____

DWN. BY	DATE
TD	9/13/16
CHKD. BY	JOB NO.
DF	2160037.50



2215 North 30th Street, Suite 300 Tacoma, WA 98403
 253.383.2422 TEL 253.383.2572 FAX www.ahbl.com WEB



PERKINS PRAIRIE PH II
A PORTIONS OF THE SW 1/4 OF SECTION 02, AND THE SE 1/4 OF SECTION 03,
TOWNSHIP 19 NORTH, RANGE 06 EAST OF THE WILLAMETTE MERIDIAN,
CITY OF BUCKLEY, PIERCE COUNTY, WASHINGTON.

NOTES

1. NO STRUCTURES OR IMPROVEMENTS SHALL BE PERMITTED WITHIN THE BUFFER AREA, INCLUDING BUILDINGS AND DECKS EXCEPT AS OTHERWISE PERMITTED UNDER THE CITY'S ADOPTED SENSITIVE AREAS REGULATIONS.
2. NO LOT FOR RESIDENTIAL PURPOSES SHALL BE DIVIDED OR SOLD INTO ADDITIONAL LOTS OR BUILDING SITES, UNLESS THE PROPOSED LOTS TO BE SUBDIVIDED MEET COMPLIANCE WITH THE EXISTING ZONING REGULATIONS.
3. LEGAL DESCRIPTIONS, EASEMENTS, RESERVATIONS, RESTRICTIONS AND OTHER MATTERS OF RECORD WERE DERIVED FROM: SUBDIVISION GUARANTEE PUGET SOUND TITLE COMPANY ORDER NO. 205622 DATED: OCTOBER 29, 2014.
4. ALL PRIVATE 10' (EXCEPT AS OTHERWISE NOTED) STORM DRAINAGE EASEMENTS (PSDE) ARE HEREBY CONVEYED TO THE LOT OWNERS WHO WOULD BENEFIT FROM THEIR USE FOR OWNERSHIP AND MAINTENANCE PURPOSES.
5. ALL STRUCTURES SHALL CONNECT TO ROOF DRAIN SYSTEMS THAT INCORPORATE PROPER APPLICATION OF FLOW CONTROL BEST MANAGEMENT PRACTICES.
6. SET REBAR AND CAP LS 45161 AT EACH CORNER.
7. PROPONENT SHALL GRANT AN EASEMENT TO THE CITY OF AT LEAST FIFTEEN FEET IN WIDTH IN THE WETLAND AREA IN TRACT E (IN AN ALIGNMENT TO BE CHOSEN BY THE CITY) FOR THE CITY'S FUTURE PUBLIC USE AS AN INTERPRETIVE TRAIL. THE TRAIL SHALL CONNECT TO FUTURE MILLER PARK ADJACENT TO THE SUBDIVISION. A TRAIL PLAN SHOWING ALL TRAIL DIMENSIONS AND CONSTRUCTION MATERIALS SHALL BE SUBMITTED TO THE CITY FOR APPROVAL PRIOR TO CONSTRUCTION. THE PROPONENT SHALL PREPARE THE LEGAL DESCRIPTION AND LEGAL DOCUMENTS FOR THE EASEMENT AT ITS EXPENSE. THE DESIGN, PERMITTING, CONSTRUCTION AND MAINTENANCE OF THE INTERPRETIVE TRAIL SHALL BE THE RESPONSIBILITY OF THE CITY. THE PROPONENT AND ITS SUCCESSOR(S) IN INTEREST SHALL FULLY COOPERATE WITH THE CITY IN ACHIEVING PERMITTING, AS NEEDED. THE APPLICANT SHALL DESIGN THE AMENDED PLAT TO ALLOW ACCESS TO THE INTERPRETIVE TRAIL FROM WITHIN THE PLAT BOUNDARIES.
- FUTURE TRAILS WILL BE GENERALLY AS SHOWN ON THE APPROVED ENGINEERING PLANS DATED APRIL 30, 2014, AND INSTALLED IN CONFORMANCE WITH TITLE 12 BMC. THE INTERPRETIVE TRAIL WILL BE CREATED AT A LOCATION TO BE DEFINED BY THE CITY OF BUCKLEY IN A FUTURE PHASE.
8. UPON APPLICATION FOR A BUILDING PERMIT FOR CONSTRUCTION OF A DWELLING UNIT UPON ANY LOT WITHIN THE PLAT, ADOPTED FEES ASSOCIATED WITH THE IMPACTS TO THE CITY'S TRANSPORTATION SYSTEM, PARKS AND SCHOOLS SHALL BE PAID TO THE CITY OF BUCKLEY.
9. ANY "ON-LOT" FENCING SHALL BE LOCATED OUTSIDE OF ANY EASEMENTS TO BE DEDICATED TO THE CITY UPON RECORDING OF THIS PLAT.
10. MONUMENT EASEMENTS (ME) ARE GRANTED TO THE PERKINS PRAIRIE HOMEOWNERS' ASSOCIATION FOR THE CONSTRUCTION, OCCUPATION AND MAINTENANCE OF PLAT MONUMENT SIGNS.
11. CC&R'S ARE RECORDED UNDER AFN 201511120645.
12. PROPONENT SHALL BE REQUIRED TO INCORPORATE AND INSTALL A PUBLIC TRANSIT BUS STOP INTO THE FRONTAGE IMPROVEMENTS ALONG RYAN ROAD. LOCATION SHALL BE WITHIN RYAN ROAD RIGHT-OF-WAY AND DESIGN SHALL BE COORDINATED AND APPROVED BY PIERCE TRANSIT AND THE CITY ENGINEER. THIS REQUIREMENT IS CONDITIONED UPON PIERCE TRANSIT (OR ITS SUCCESSOR, IF ANY) RETURNING BUS SERVICE TO THE AREA. IF BUS SERVICE HAS NOT RESUMED PRIOR TO THE COMPLETION OF THE LAST PHASE OF DEVELOPMENT AS DETERMINED BY THE CITY MANAGER, THIS CONDITION SHALL BECOME VOID.
13. THE MAXIMUM LOT COVERAGE OF THE PRIMARY DWELLING UNIT SHALL BE 35 PERCENT, NOT INCLUDING OUTBUILDINGS OR ACCESSORY UNITS. THE MAXIMUM LOT COVERAGE OF ALL STRUCTURES SHALL BE 45 PERCENT. THE MAXIMUM OF ALL IMPERVIOUS COVERAGE, INCLUDING DRIVEWAYS AND SIDEWALKS, SHALL BE 60 PERCENT.

BUILDING LOTS

A TOTAL OF 60 BUILDABLE LOTS ARE BEING CREATED IN PHASE 2.

EQUIPMENT USED

3" TOTAL STATION USING STANDARD FIELD TRAVERSE METHODS FOR CONTROL AND STAKING.

TRACT TABLE

TRACT	PURPOSE	OWNER
TRACT A	OPEN SPACE	PERKINS PRAIRIE LLC
TRACT E	OPEN SPACE/RECREATION	PERKINS PRAIRIE LLC
TRACT F	ACTIVE/PASSIVE RECREATION	HDA
TRACT G	STORMWATER	CITY OF BUCKLEY
TRACT H	STORMWATER	CITY OF BUCKLEY

LEGEND

-  SECTION CORNER
-  QUARTER SECTION CORNER
-  CENTER SECTION
-  SET MONUMENT
-  SET REBAR AND CAP LS 45161
-  FOUND PROPERTY CORNER
-  PSDE PRIVATE STORM DRAINAGE EASEMENT--NOTE 4, SHEET 2
-  BSBL BUILDING SETBACK
-  ME MONUMENT EASEMENT--NOTE 11, SHEET 2
-  UE UTILITY EASEMENT--EASEMENT PROVISION, SHEET 3
- XXXX ADDRESS

BUILDING SETBACKS (BSBL)

FRONT YARD	15 FEET
REAR YARD	15 FEET
SIDE YARD	8 FEET
SIDE YARD CORNER LOTS	15 FEET FROM STREET SIDE
FRONT YARD TO GARAGE	22 FEET

EASEMENT PROVISIONS

AN EASEMENT (UE), WITHIN THE BOUNDARIES OF THIS SUBDIVISION IS HEREBY RESERVED FOR AND GRANTED TO CITY OF BUCKLEY, PUGET SOUND ENERGY, INC., ANY WATER COMPANY, ANY TELEPHONE COMPANY, ANY GAS COMPANY, ANY CABLE TELEVISION COMPANY, U.S. POSTAL SERVICE, AND THEIR RESPECTIVE SUCCESSORS AND ASSIGNS, UNDER AND UPON THE FRONT 10 FEET PARALLEL WITH AND ADJOINING THE STREET FRONTAGE OF ALL LOTS AND TRACTS IN WHICH TO INSTALL, LAY, CONSTRUCT, RENEW, OPERATE AND MAINTAIN UNDERGROUND PIPE, CONDUIT, CABLES, WIRES AND SANITARY SEWER LINES AND APPURTENANCES WITH NECESSARY FACILITIES AND OTHER EQUIPMENT FOR THE PURPOSE OF SERVING THIS SUBDIVISION AND OTHER PROPERTY WITH ELECTRIC, TELEPHONE, GAS, SEWER AND UTILITY SERVICE, TOGETHER WITH THE RIGHT TO ENTER UPON THE LOTS AT ALL TIMES FOR THE PURPOSES HEREIN STATED. THESE EASEMENTS ENTERED UPON FOR THESE PURPOSES SHALL BE RESTORED AS NEAR AS POSSIBLE TO THEIR ORIGINAL CONDITION. NO LINES OR WIRES FOR THE TRANSMISSION OF ELECTRIC CURRENT OR FOR TELEPHONE USE OR CABLE TELEVISION SHALL BE PLACED OR PERMITTED TO BE PLACED UPON ANY LOT UNLESS THE SAME SHALL BE UNDERGROUND OR IN CONDUIT ATTACHED TO A BUILDING.

AN EASEMENT IS GRANTED TO THE CITY OF BUCKLEY, 15 FEET IN WIDTH, CENTERED ON TRAIL AS CONSTRUCTED THROUGH TRACT E.

DESCRIPTION

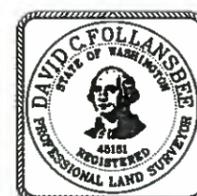
PER CHICAGO TITLE INSURANCE COMPANY ORDER NO. 0078597-TC AMENDMENT DATED SEPTEMBER 8, 2016

THAT PORTION OF PERKINS PRAIRIE PHASE 1, ACCORDING TO THE PLAT THEREOF RECORDED UNDER AUDITOR'S FEE NO. 201504155001, RECORDS OF PIERCE COUNTY, WASHINGTON, BEING MORE PARTICULARLY DESCRIBED AS FOLLOWS:

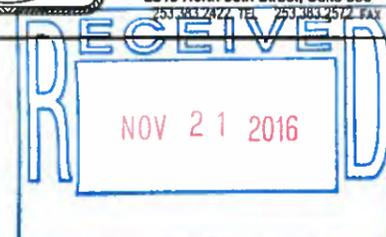
COMMENCING AT THE SOUTHEAST CORNER OF THE SOUTHWEST QUARTER OF SECTION 2, TOWNSHIP 19 NORTH, RANGE 6 EAST OF THE WILLAMETTE MERIDIAN; THENCE NORTH 88°15'15" WEST ALONG THE SOUTH LINE THEREOF A DISTANCE OF 1681.86 FEET TO THE SOUTHEAST CORNER OF SAID PERKINS PRAIRIE PHASE 1; THENCE NORTH 00°4'25" EAST ALONG THE EAST LINE THEREOF A DISTANCE OF 12.21 FEET TO THE NORTH MARGIN OF RYAN ROAD AS DEDICATED IN SAID PHASE 1 AND THE TRUE POINT OF BEGINNING; THENCE NORTH 87°03'49" WEST ALONG SAID MARGIN A DISTANCE 424.41 FEET TO THE BEGINNING OF A NON-TANGENT CURVE FROM WHICH THE RADIUS POINT BEARS NORTH 02°58'11" EAST A DISTANCE OF 20.00 FEET; THENCE NORTHEASTERLY ALONG THE ARC OF SAID CURVE THROUGH A CENTRAL ANGLE OF 98°30'14" A DISTANCE OF 34.38 FEET TO A POINT OF COMPOUND CURVE HAVING A RADIUS OF 430.00 FEET; THENCE NORTHWESTERLY ALONG THE ARC OF SAID CURVE THROUGH A CENTRAL ANGLE OF 6°18'20" A DISTANCE OF 47.32 FEET; THENCE NORTH 12°58'08" WEST A DISTANCE OF 31.24 FEET TO THE BEGINNING OF A CURVE CONCAVE TO THE NORTHEAST HAVING A RADIUS OF 490.00 FEET; THENCE NORTHWESTERLY ALONG THE ARC OF SAID CURVE THROUGH A CENTRAL ANGLE OF 7°05'02" A DISTANCE OF 60.58 FEET; THENCE NORTH 00°51'37" EAST A DISTANCE OF 58.00 FEET; THENCE NORTH 89°08'23" WEST A DISTANCE OF 560.00 FEET; THENCE NORTH 00°51'37" EAST A DISTANCE OF 89.00 FEET TO THE BEGINNING OF A CURVE CONCAVE TO THE SOUTHEAST HAVING A RADIUS OF 20.00 FEET; THENCE NORTHEASTERLY ALONG THE ARC OF SAID CURVE THROUGH A CENTRAL ANGLE OF 90°00'00" A DISTANCE OF 31.42 FEET; THENCE NORTH 00°51'37" EAST A DISTANCE OF 55.00 FEET TO THE BEGINNING OF A NON-TANGENT CURVE FROM WHICH THE RADIUS POINT BEARS NORTH 00°51'37" EAST A DISTANCE OF 20.00 FEET; THENCE NORTHWESTERLY ALONG THE ARC OF SAID CURVE THROUGH A CENTRAL ANGLE OF 90°00'00" A DISTANCE OF 31.42 FEET; THENCE NORTH 89°08'23" WEST A DISTANCE OF 55.00 FEET TO THE BEGINNING OF A NON-TANGENT CURVE FROM WHICH THE RADIUS POINT BEARS NORTH 89°08'23" WEST A DISTANCE OF 20.00 FEET; THENCE SOUTHWESTERLY ALONG THE ARC OF SAID CURVE THROUGH A CENTRAL ANGLE OF 90°00'00" A DISTANCE OF 31.42 FEET; THENCE NORTH 89°08'23" WEST A DISTANCE OF 420.27 FEET TO THE SOUTHEAST CORNER OF TRACT J OF SAID PHASE 1; THENCE NORTH 00°51'37" EAST ALONG THE EAST LINE THEREOF A DISTANCE OF 72.62 FEET TO THE NORTHEAST CORNER OF SAID TRACT; THENCE SOUTH 88°40'27" WEST ALONG THE NORTH LINE THEREOF A DISTANCE OF 439.92 FEET TO THE WEST LINE OF SAID PHASE 1; THENCE NORTH 00°15'28" WEST ALONG SAID LINE A DISTANCE OF 15.85 FEET; THENCE NORTH 88°54'53" WEST ALONG SAID LINE A DISTANCE OF 390.11 FEET; THENCE NORTH 00°15'28" WEST ALONG SAID LINE A DISTANCE OF 790.23 FEET TO THE NORTHWEST CORNER OF SAID PHASE 1; THENCE SOUTH 89°28'16" EAST ALONG THE NORTH LINE THEREOF A DISTANCE OF 1328.84 FEET TO THE WEST LINE OF SAID SECTION 2; THENCE SOUTH 00°51'48" WEST ALONG SAID LINE A DISTANCE OF 490.00 FEET; THENCE LEAVING SAID LINE SOUTH 87°47'15" EAST A DISTANCE OF 474.00 FEET; THENCE SOUTH 00°51'37" WEST A DISTANCE OF 389.79 FEET; THENCE SOUTH 89°08'23" EAST A DISTANCE OF 80.00 FEET TO THE BEGINNING OF A CURVE CONCAVE TO THE NORTHWEST HAVING A RADIUS OF 20.00 FEET; THENCE NORTHEASTERLY ALONG THE ARC OF SAID CURVE THROUGH A CENTRAL ANGLE OF 90°00'00" A DISTANCE OF 31.42 FEET; THENCE SOUTH 89°08'23" EAST A DISTANCE OF 80.00 FEET TO THE BEGINNING OF A NON-TANGENT CURVE FROM WHICH THE RADIUS POINT BEARS SOUTH 89°08'23" EAST A DISTANCE OF 20.00 FEET; THENCE SOUTHEASTERLY ALONG THE ARC OF SAID CURVE THROUGH A CENTRAL ANGLE OF 90°00'00" A DISTANCE OF 31.42 FEET; THENCE SOUTH 89°08'23" EAST A DISTANCE OF 160.00 FEET TO THE BEGINNING OF A CURVE CONCAVE TO THE NORTHWEST HAVING A RADIUS OF 20.00 FEET; THENCE NORTHEASTERLY ALONG THE ARC OF SAID CURVE THROUGH A CENTRAL ANGLE OF 90°00'00" A DISTANCE OF 31.42 FEET; THENCE SOUTH 89°08'23" EAST A DISTANCE OF 55.00 FEET TO THE BEGINNING OF A NON-TANGENT CURVE FROM WHICH THE RADIUS POINT BEARS SOUTH 89°08'23" EAST A DISTANCE OF 20.00 FEET; THENCE SOUTHEASTERLY ALONG THE ARC OF SAID CURVE THROUGH A CENTRAL ANGLE OF 90°00'00" A DISTANCE OF 31.42 FEET; THENCE SOUTH 89°08'23" EAST A DISTANCE OF 93.32 FEET TO THE EAST LINE OF SAID PHASE 1; THENCE SOUTH 00°4'25" WEST ALONG SAID LINE A DISTANCE OF 484.37 FEET TO THE POINT OF BEGINNING.

EXCEPT TRACT I AS DELINEATED ON SAID PHASE 1.

DWN. BY	DATE
TD	9/13/16
CHKD. BY	JOB NO.
DF	2180037.50

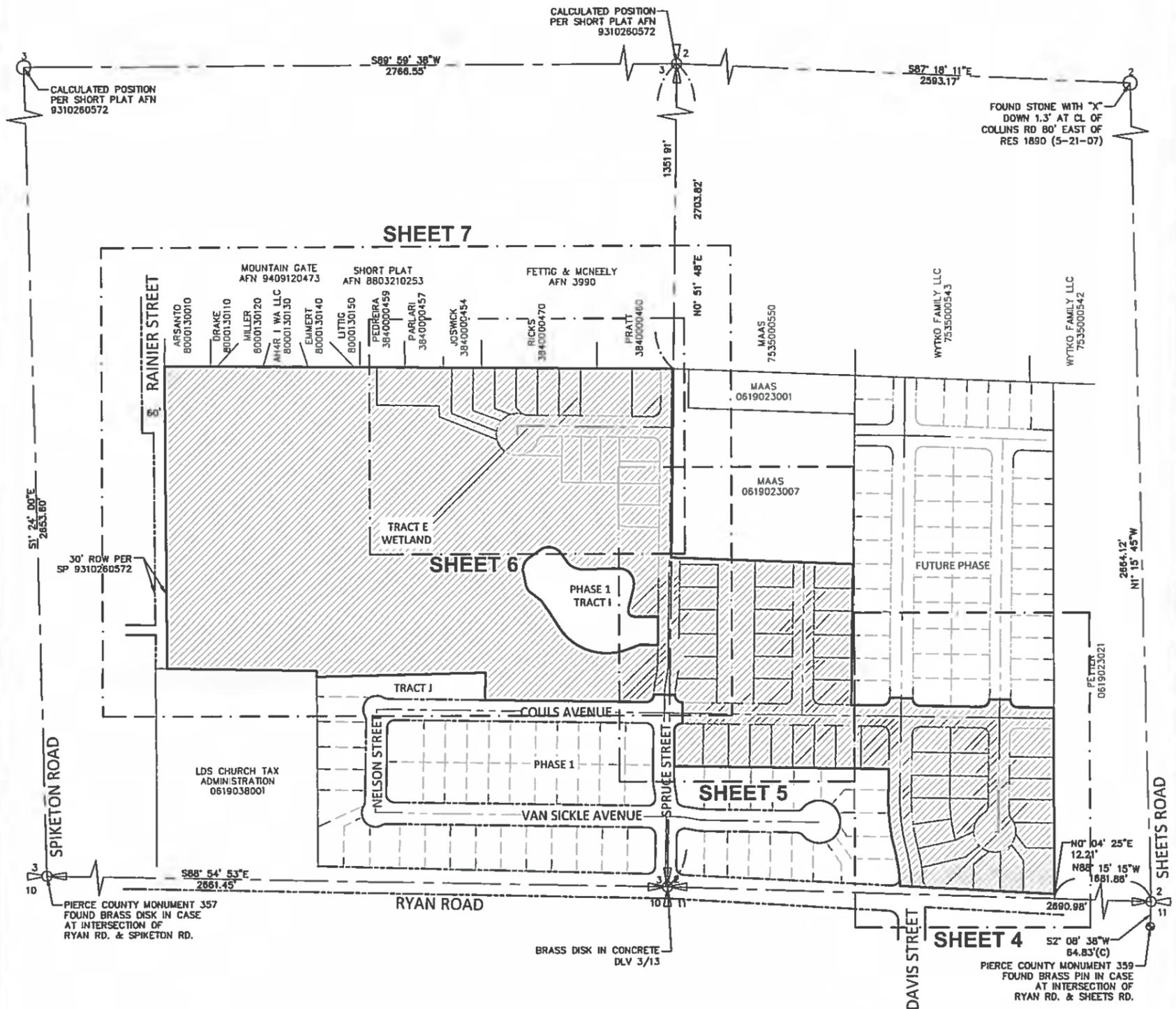


2215 North 30th Street, Suite 300 Tacoma, WA 98403
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PERKINS PRAIRIE PH II
 A PORTIONS OF THE SW 1/4 OF SECTION 02, AND THE SE 1/4 OF SECTION 03,
 TOWNSHIP 19 NORTH, RANGE 06 EAST OF THE WILLAMETTE MERIDIAN,
 CITY OF BUCKLEY, PIERCE COUNTY, WASHINGTON.

SHEET 3 OF 8



BASIS OF BEARING

NAD 83/01
 WASHINGTON STATE PLANE COORDINATE SYSTEM, SOUTH ZONE
 PIERCE COUNTY HORIZONTAL CONTROL
 HOLDING COUNTY MONUMENT NUMBERS 357 AND 359.

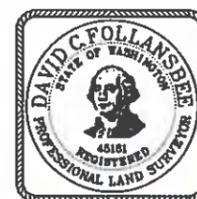
POINT NO. 357
 N=868528.316
 E=1260764.34
 BRASS DISK WITH PUNCH IN CASE AT
 RYAN RD. & SPIKETON RD.

POINT NO. 359
 N=868329.137
 E=1268112.22
 BRASS PIN IN CASE AT
 RYAN RD. & SHEETS RD.

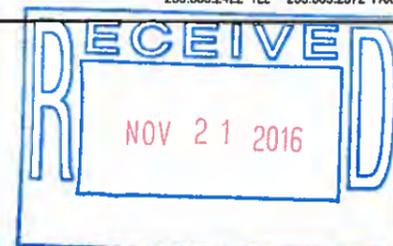
A LINE BETWEEN THE TWO FOUND MONUMENTS BEARS
 SOUTH 87°33'18" EAST.

LEGEND

- SECTION CORNER
- QUARTER SECTION CORNER
- CENTER SECTION
- SET MONUMENT
- SET REBAR AND CAP LS 45181
- FOUND PROPERTY CORNER
- PSDE PRIVATE STORM DRAINAGE EASEMENT-NOTE 4, SHEET 2
- BSBL BUILDING SETBACK MONUMENT EASEMENT-NOTE 11, SHEET 2
- ME UTILITY EASEMENT-EASEMENT PROVISION, SHEET 2
- ADDRESS



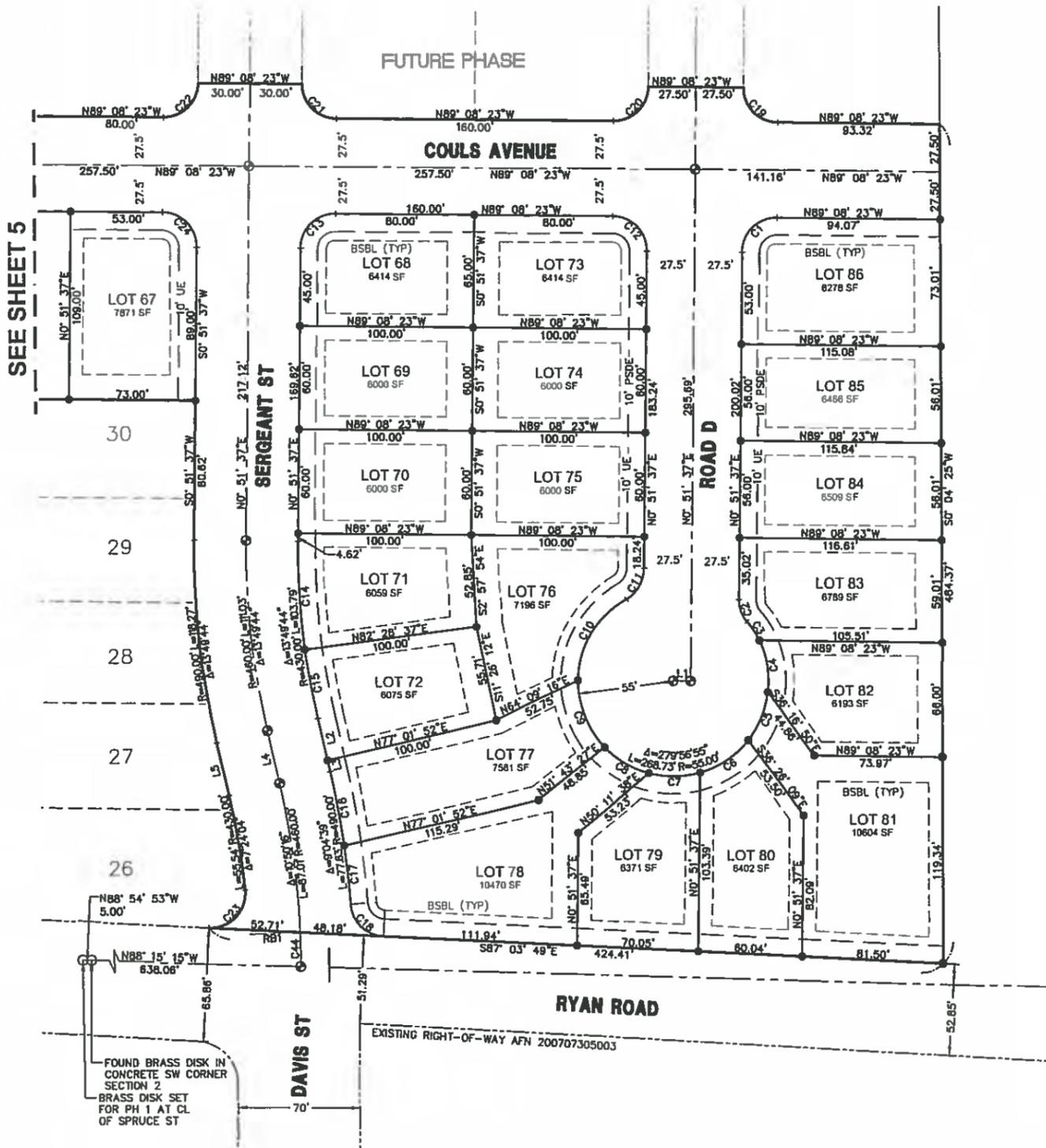
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PERKINS PRAIRIE PH II

SHEET 4 OF 8

A PORTIONS OF THE SW 1/4 OF SECTION 02, AND THE SE 1/4 OF SECTION 03,
TOWNSHIP 19 NORTH, RANGE 06 EAST OF THE WILLAMETTE MERIDIAN,
CITY OF BUCKLEY, PIERCE COUNTY, WASHINGTON.

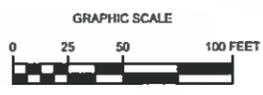


RADIAL DATA

RB1=587°52'08"W

LEGEND

- SECTION CORNER
- QUARTER SECTION CORNER
- CENTER SECTION
- SET MONUMENT
- SET REBAR AND CAP LS 45161
- FOUND PROPERTY CORNER
- PRIVATE STORM DRAINAGE EASEMENT-NOTE 4, SHEET 2
- BUILDING SETBACK
- MONUMENT EASEMENT-NOTE 11, SHEET 2
- UTILITY EASEMENT-EASEMENT PROVISION, SHEET 2
- ADDRESS



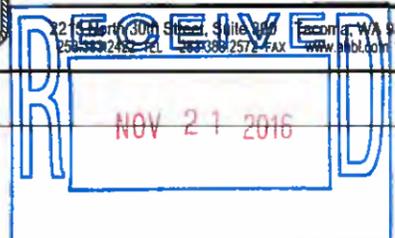
1" = 50 FEET

DWN. BY	DATE
TD	9/13/16
CHKD. BY	JOB NO.
DF	2160037.50



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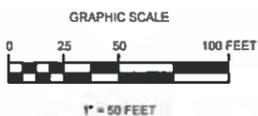
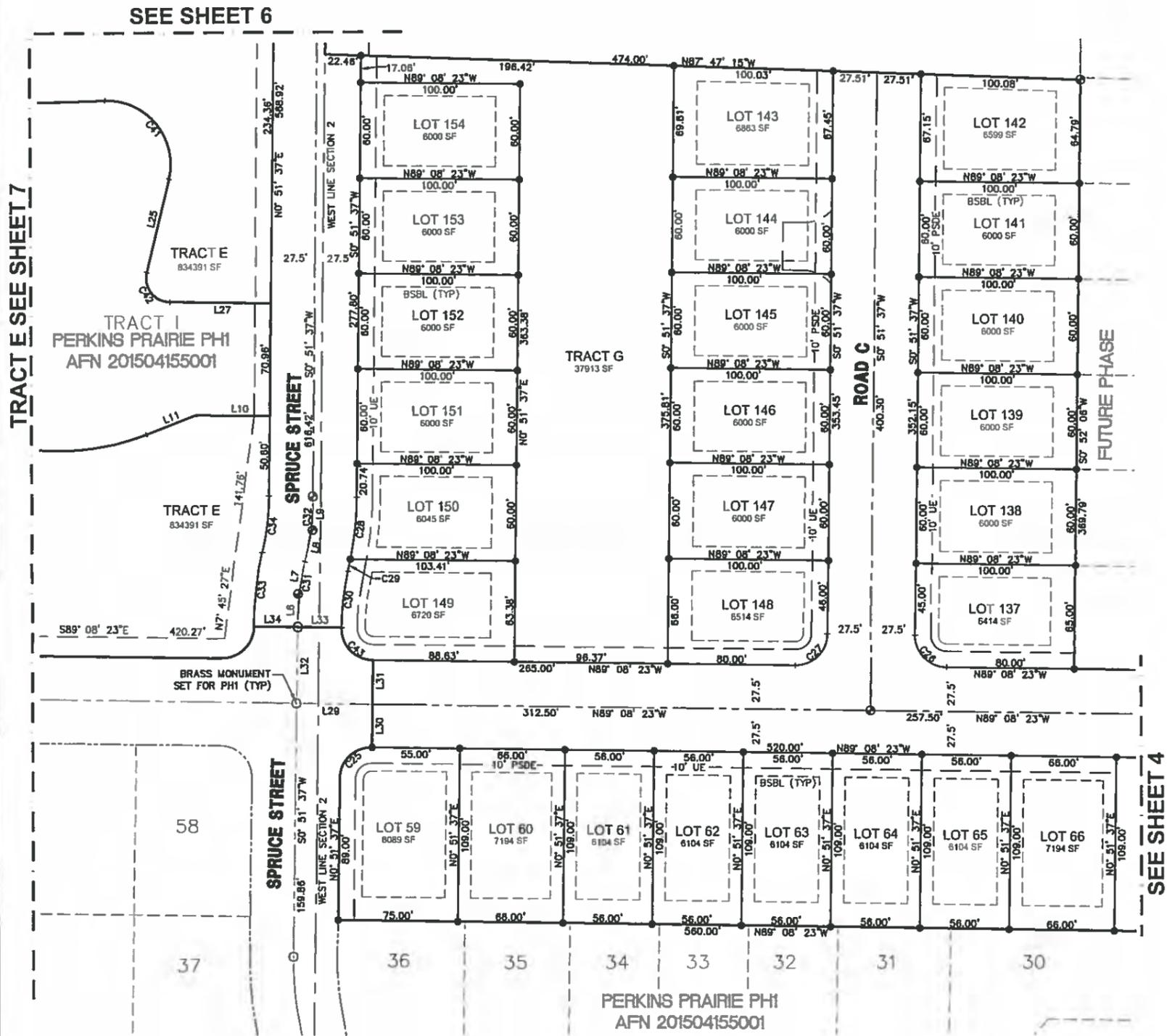
214 North 30th Street, Suite 100 Tacoma, WA 98403
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PERKINS PRAIRIE PH II

SHEET 5 OF 8

A PORTIONS OF THE SW 1/4 OF SECTION 02, AND THE SE 1/4 OF SECTION 03,
TOWNSHIP 19 NORTH, RANGE 06 EAST OF THE WILLAMETTE MERIDIAN,
CITY OF BUCKLEY, PIERCE COUNTY, WASHINGTON.



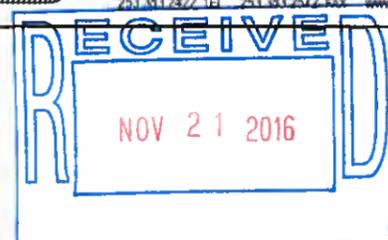
LEGEND

- SECTION CORNER
- QUARTER SECTION CORNER
- CENTER SECTION
- SET MONUMENT
- SET REBAR AND CAP LS 45161
- FOUND PROPERTY CORNER
- PSDE PRIVATE STORM DRAINAGE EASEMENT—NOTE 4, SHEET 2
- BSBL BUILDING SETBACK
- ME MONUMENT EASEMENT—NOTE 11, SHEET 2
- UE UTILITY EASEMENT—EASEMENT PROVISION, SHEET 2
- ADDRESS

DWN. BY	DATE
TD	9/13/16
CHKD. BY	JOB NO.
DF	2160037.50



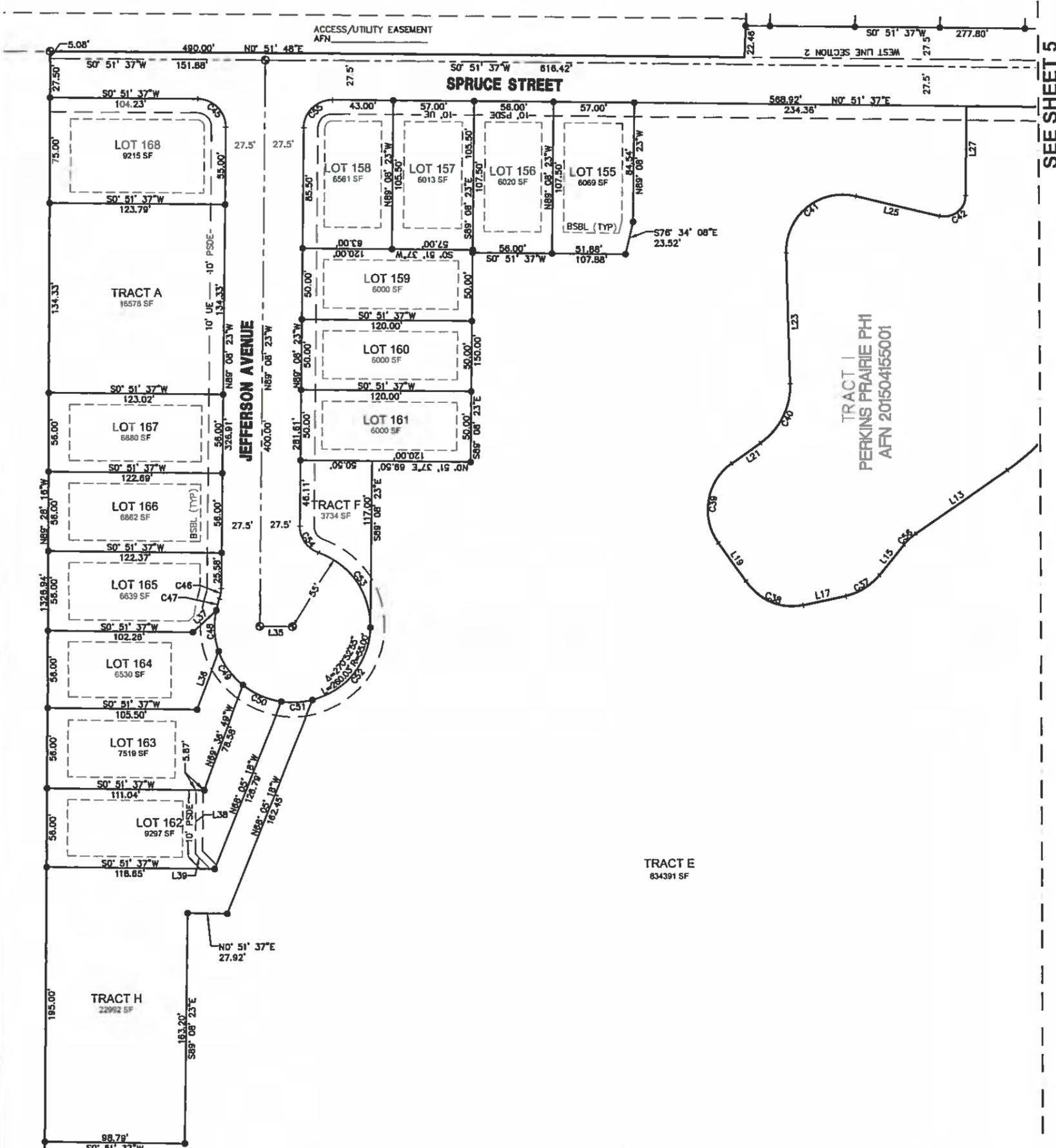
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PERKINS PRAIRIE PH II

SHEET 6 OF 8

A PORTIONS OF THE SW 1/4 OF SECTION 02, AND THE SE 1/4 OF SECTION 03,
TOWNSHIP 19 NORTH, RANGE 06 EAST OF THE WILLAMETTE MERIDIAN,
CITY OF BUCKLEY, PIERCE COUNTY, WASHINGTON.



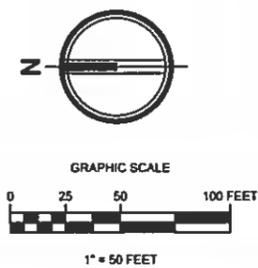
SEE SHEET 5

SEE SHEET 7 FOR TRACT E

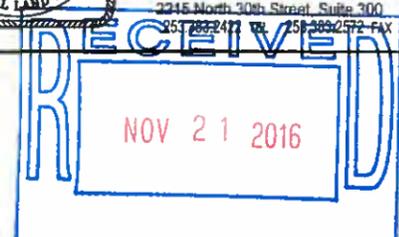
DWN. BY	DATE
TD	9/13/16
CHKD. BY	JOB NO.
DF	2160037.50

LEGEND

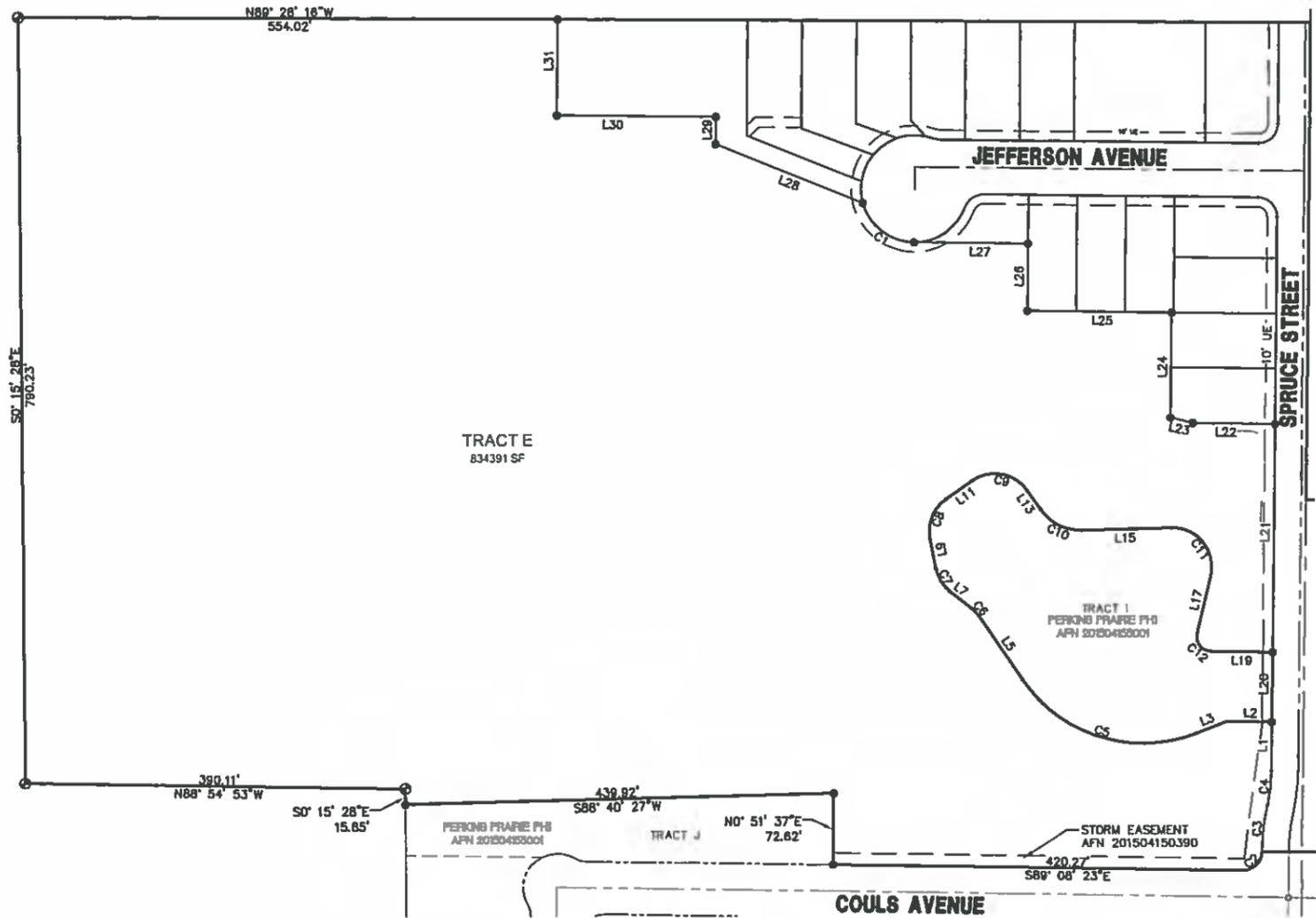
- SECTION CORNER
- QUARTER SECTION CORNER
- CENTER SECTION
- SET MONUMENT
- SET REBAR AND CAP LS 45161
- FOUND PROPERTY CORNER
- PRIVATE STORM DRAINAGE EASEMENT—NOTE 4, SHEET 2
- BUILDING SETBACK
- MONUMENT EASEMENT—NOTE 11, SHEET 2
- UTILITY EASEMENT—EASEMENT PROVISION, SHEET 2
- ADDRESS



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PERKINS PRAIRIE PH II **SHEET 7 OF 8**
A PORTIONS OF THE SW 1/4 OF SECTION 02, AND THE SE 1/4 OF SECTION 03,
TOWNSHIP 19 NORTH, RANGE 06 EAST OF THE WILLAMETTE MERIDIAN,
CITY OF BUCKLEY, PIERCE COUNTY, WASHINGTON.



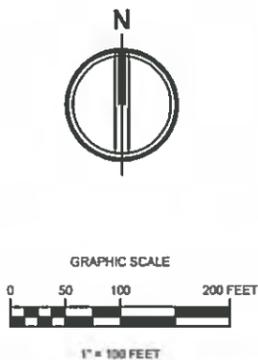
TRACT E CURVE TABLE					
CURVE #	LENGTH	RADIUS	DELTA	CHORD DIRECTION	CHORD LENGTH
C1	71.80	55.00	74 35 07	S51° 50' 50"E	66.65
C2	31.42	20.00	90 00 00	N45° 51' 37"E	28.28
C3	47.34	227.50	11 55 24	S6° 49' 19"W	47.28
C4	35.90	172.50	11 55 24	N6° 49' 19"E	35.83
C5	201.74	150.00	77 03 33	N72° 52' 33"W	186.88
C6	11.88	40.00	17 01 22	N42° 51' 27"W	11.84
C7	28.03	40.00	40 08 49	N31° 17' 43"W	27.46
C8	46.15	40.00	66 06 14	N21° 49' 48"E	43.63
C9	62.83	40.00	80 00 00	S80° 07' 05"E	56.57
C10	49.17	50.00	56 20 24	S63° 17' 17"E	47.21
C11	73.34	40.00	105 03 26	S38° 55' 45"E	63.49
C12	26.90	15.00	102 44 21	S37° 46' 13"E	23.44

TRACT E LINE TABLE		
LINE #	LENGTH	DIRECTION
L1	50.60	S0° 51' 37"W
L2	46.52	N89° 08' 23"W
L3	33.29	S68° 35' 41"W
L5	78.08	N34° 20' 46"W
L7	27.90	N51° 22' 08"W
L9	30.74	N11° 13' 19"W
L11	33.50	N54° 52' 55"E
L13	24.78	S35° 07' 05"E
L15	92.12	N88° 32' 31"E
L17	80.55	S13° 35' 58"W
L19	63.44	S89° 08' 23"E
L20	70.96	S0° 51' 37"W
L21	234.36	S0° 51' 37"W
L22	84.54	N89° 08' 23"W
L23	23.52	S76° 34' 08"E
L24	107.88	S0° 51' 37"W
L25	150.00	S89° 08' 23"E
L26	69.50	S0° 51' 37"W
L27	117.00	S89° 08' 23"E
L28	162.45	N68° 05' 18"W
L29	27.92	N0° 51' 37"E
L30	163.20	S89° 08' 23"E
L31	98.79	S0° 51' 37"W

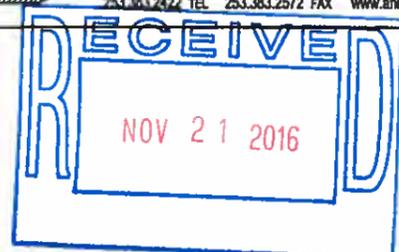
DWN. BY	DATE
TD	9/13/16
CHKD. BY	JOB NO.
OF	2160037.50

LEGEND

-  SECTION CORNER
-  QUARTER SECTION CORNER
-  CENTER SECTION
-  SET MONUMENT
-  SET REBAR AND CAP LS 45161
-  FOUND PROPERTY CORNER
-  PRIVATE STORM DRAINAGE EASEMENT—NOTE 4, SHEET 2
-  BUILDING SETBACK
-  MONUMENT EASEMENT—NOTE 11, SHEET 2
-  UTILITY EASEMENT—EASEMENT PROVISION, SHEET 2
-  ADDRESS



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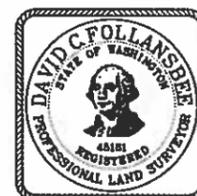
PERKINS PRAIRIE PH II
A PORTIONS OF THE SW 1/4 OF SECTION 02, AND THE SE 1/4 OF SECTION 03,
TOWNSHIP 19 NORTH, RANGE 06 EAST OF THE WILLAMETTE MERIDIAN,
CITY OF BUCKLEY, PIERCE COUNTY, WASHINGTON.

Curve Table					
CURVE #	LENGTH	RADIUS	DELTA	CHORD DIRECTION	CHORD LENGTH
C1	31.42	20.00	90 00 00	S45° 51' 37"W	28.28
C2	13.95	20.00	39 57 36	S19° 07' 12"E	13.67
C3	13.32	55.00	13 52 19	S32° 09' 50"E	13.28
C4	31.11	55.00	32 24 24	N9° 01' 29"W	30.70
C5	30.00	55.00	31 15 08	N22° 48' 17"E	29.63
C6	34.08	55.00	35 30 14	N56° 10' 58"E	33.54
C7	30.00	55.00	31 15 07	N89° 33' 38"E	29.63
C8	30.00	55.00	31 15 07	S59° 11' 15"E	29.63
C9	42.37	55.00	44 08 19	S21° 29' 33"E	41.33
C10	57.86	55.00	60 16 18	S30° 42' 46"W	55.23
C11	20.94	20.00	59 59 18	N30° 51' 16"E	20.00
C12	31.42	20.00	90 00 00	N44° 08' 23"W	28.28
C13	31.42	20.00	90 00 00	S45° 51' 37"W	28.28
C14	62.92	430.00	8 23 00	S3° 19' 53"E	62.86
C15	40.87	430.00	5 26 45	S10° 14' 45"E	40.85
C16	43.18	490.00	5 02 59	N10° 26' 38"W	43.17
C17	34.45	490.00	4 01 40	N5° 54' 19"W	34.44
C18	29.03	20.00	83 10 21	S45° 28' 39"E	28.55
C19	31.42	20.00	90 00 00	S44° 08' 23"E	28.28
C20	31.42	20.00	90 00 00	N45° 51' 37"E	28.28
C21	31.42	20.00	90 00 00	S44° 08' 23"E	28.28
C22	31.42	20.00	90 00 00	N45° 51' 37"E	28.28
C23	34.38	20.00	98 30 14	N43° 41' 03"E	30.30
C24	31.42	20.00	90 00 00	N44° 08' 23"W	28.28
C25	31.42	20.00	90 00 00	S45° 51' 37"W	28.28
C26	31.42	20.00	90 00 00	S44° 08' 23"E	28.28
C27	31.42	20.00	90 00 00	N45° 51' 37"E	28.28
C28	39.46	227.50	9 56 15	N5° 49' 44"E	39.41
C29	7.89	227.50	1 59 09	N11° 47' 26"E	7.88
C30	35.90	172.50	11 55 24	S6° 49' 19"W	35.83
C31	41.62	200.00	11 55 24	S6° 49' 19"W	41.55
C32	41.62	200.00	11 55 24	N8° 49' 19"E	41.55
C33	47.34	227.50	11 55 24	S8° 49' 19"W	47.26
C34	35.90	172.50	11 55 24	N6° 49' 19"E	35.83
C35	201.74	150.00	77 03 33	N72° 52' 33"W	188.88
C37	28.03	40.00	40 08 49	N31° 17' 43"W	27.46
C38	46.15	40.00	66 06 14	N21° 49' 48"E	43.83
C39	62.83	40.00	90 00 00	S80° 07' 05"E	56.57
C40	49.17	50.00	56 20 24	S83° 17' 17"E	47.21
C41	73.34	40.00	105 03 26	S38° 55' 45"E	83.49
C42	26.90	15.00	102 44 21	S37° 46' 13"E	23.44
C43	31.42	20.00	90 00 00	S44° 08' 23"E	28.28
C44	19.95	480.00	2 29 06	N0° 53' 18"W	19.95
C45	31.42	20.00	90 00 00	N45° 51' 37"E	28.28
C46	8.96	20.00	19 56 54	S79° 09' 56"E	6.93
C47	8.14	55.00	8 28 46	N73° 25' 52"W	8.13
C48	30.00	55.00	31 15 08	S88° 42' 11"W	29.63
C49	30.00	55.00	31 15 08	S55° 27' 03"W	29.63
C50	30.00	55.00	31 15 08	S24° 11' 55"W	29.63
C51	22.20	55.00	23 07 38	S2° 59' 28"E	22.05
C52	71.60	55.00	74 35 07	S51° 50' 50"E	66.65
C53	68.09	55.00	70 56 00	N55° 23' 36"E	63.83
C54	24.76	20.00	70 56 00	S55° 23' 37"W	23.21
C55	31.42	20.00	90 00 00	N44° 08' 23"W	28.28
C56	11.88	40.00	17 01 22	N42° 51' 27"W	11.84

LINE TABLE		
LINE #	LENGTH	DIRECTION
L1	9.99	S89° 08' 23"E
L2	24.37	S12° 58' 08"E
L3	6.87	S12° 58' 08"E
L4	31.24	N12° 58' 08"W
L5	31.24	N12° 58' 08"W
L6	20.89	N0° 51' 37"E
L7	20.89	N12° 47' 01"E
L8	20.89	N12° 47' 01"E
L9	20.89	N0° 51' 37"E
L10	46.52	N89° 08' 23"W
L11	33.29	S68° 35' 41"W
L13	78.08	N34° 20' 46"W
L15	27.90	N51° 22' 08"W
L17	30.74	N11° 13' 19"W
L19	33.50	N54° 52' 55"E
L21	24.78	S35° 07' 05"E
L23	92.12	N88° 32' 31"E
L25	60.55	S13° 35' 58"W
L27	63.44	S89° 08' 23"E
L29	47.50	N89° 08' 23"W
L30	27.50	S0° 51' 37"W
L31	27.50	N0° 51' 37"E
L32	47.50	S0° 51' 37"W
L33	27.50	S89° 08' 23"E
L34	27.50	S89° 08' 23"E
L35	23.00	N0° 51' 37"E
L36	44.79	N69° 36' 49"W
L37	22.73	S43° 02' 25"E
L38	45.33	S89° 08' 23"E
L39	15.08	N45° 51' 37"E



DWN. BY	DATE
TD	9/13/16
CHKD. BY	JOB NO.
DF	2180037.50



2215 North 30th Street, Suite 300 Tacoma, WA 98403
 253.383.2422 TEL 253.383.2572 FAX www.ahbl.com WEB



CITY COUNCIL AGENDA BILL

City of Buckley
PO Box 1960
Buckley, WA 98321

ITEM INFORMATION			
SUBJECT: ORD No. __-17 Adopting Comprehensive Plan Element 5 - Transportation	Agenda Date: December 12, 2017		AB17-108
	Department/Committee/Individual	Created	Reviewed
	Mayor Pat Johnson		X
	City Administrator – Dave Schmidt		X
	City Attorney – Phil Olbrechts		X
	City Engineer – Dominic Miller		
	City Clerk – Joanne Starr		X
	Finance Dept – Sheila Bazzar		
	Building Official – Mike Deadmond		
	Fire Dept – Chief Predmore		
	Parks & Rec Dept – Julie Bevaart		
	Planning Dept – Kathy Thompson	X	X
	Police Dept – Chief Arsanto		
Municipal Court – Jessica Cash			
Attachments: December 8, 2016, element, hearing documents			
SUMMARY STATEMENT: Due in June of 2015, Element 5 was reviewed and amended, and four separate hearings were conducted. The planning commission designed goals and policies for the transportation element that are part of this document.			
COMMITTEE REVIEW AND RECOMMENDATION: Planning Commission			
RECOMMENDED ACTION: MOTION to Approve ORD No. __-17 Adopting Comprehensive Plan Element 5 - Transportation			
RECORD OF COUNCIL ACTION			
<i>Meeting Date</i>	<i>Action</i>	<i>Vote</i>	

ORDINANCE NO. ____ - 17

**AN ORDINANCE OF THE CITY OF BUCKLEY, WASHINGTON,
AMENDING THE COMPREHENSIVE PLAN ELEMENT 5,
TRANSPORTATION; PROVIDING FOR SEVERABILITY; AND
ESTABLISHING AN EFFECTIVE DATE.**

WHEREAS, pursuant to the Growth Management Act (RCW 36.70A) the City is required to adopt a Comprehensive Plan that provides for goals, coordination and a planned uses of land within the community to protect the environment and public interest; and

WHEREAS, in order to comply with RCW 36.70A the City of Buckley adopted its first Comprehensive Plan in May, 1995; and

WHEREAS, RCW 36.70A.130 provides that cities shall take action to continuously review and, if needed, revise their comprehensive plans and development regulations to ensure the plan and regulations comply with the requirements of that chapter; and

WHEREAS, the planning commission conducted a hearing on the street plan on August 16, 2010; and

WHEREAS, the planning commission conducted a hearing on the sidewalk and trail plan on September 11, 2013; and

WHEREAS, the planning commission conducted a hearing on Element 5 of the city's comprehensive plan that incorporates streets, sidewalks, and all other required aspects of transportation into one element on February 23, 2015; and

WHEREAS, environmental review was completed and a determination of non-significance was issued April 15, 2015; and

WHEREAS, the element was received by the Department of Commerce on April 8, 2015 under Material Identification Number 21169; and

WHEREAS agencies' comments were responded to and integrated into Element 5 in a new plan submitted to the city December 7, 2016; and

WHEREAS, the city thought it best to wait for the other two unfinished elements before approving Element 5; and

WHEREAS, the planning commission conducted another hearing on Element 5 on November 6, 2017, to review the changes; and

WHEREAS, at a regular meeting of the planning commission November 20, 2017, it voted to transmit the element to the council with a recommendation for approval;

NOW, THEREFORE, THE CITY COUNCIL OF THE CITY OF BUCKLEY, WASHINGTON, DO ORDAIN AS FOLLOWS:

Section 1. The Transportation Element dated December 8, 2016 is hereby adopted by reference as Element 5 of the City of Buckley comprehensive plan and replaces the current Transportation Element of the comprehensive plan.

Section 2. Copy to the Department of Commerce. Pursuant to RCW 36.70A.106, the City Administrator is hereby authorized and directed to provide a copy of this ordinance to the State Department of Commerce within 10 days of adoption.

Section 3. 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 4. Effective date. This ordinance or a summary thereof consisting of the title shall be published in the official newspaper of the city, and shall take effect and be in full force five (5) days after publication.

APPROVED by the Buckley City Council this 12th day of December, 2017.

Pat Johnson, Mayor

ATTEST:

Joanne Starr, City Clerk

**APPROVED AS TO FORM:
OFFICE OF THE CITY ATTORNEY:**

Phil A. Olbrechts

Published: _____, 2017

Effective: _____, 2017

City of Buckley

Comprehensive Plan Update

Transportation Element

Presented by Rory Cameron, P.E.

Gray and Osborne, Inc.

2-23-2015



Overview

- Existing Transportation System
- Transportation Strategy
- Transportation Goals and Policies

Existing System-Street Inventory



- Currently Buckley has:
- 2.93 miles of principal arterials;
- 7.66 miles of minor arterials;
- 1.00 mile of collector streets;
- 20.63 miles of local access streets; and
- 4.31 miles of alleyways within the City limits.
- An additional 2.13 miles of Local Access Streets exist within the Rainier School property.

Existing System-Volumes

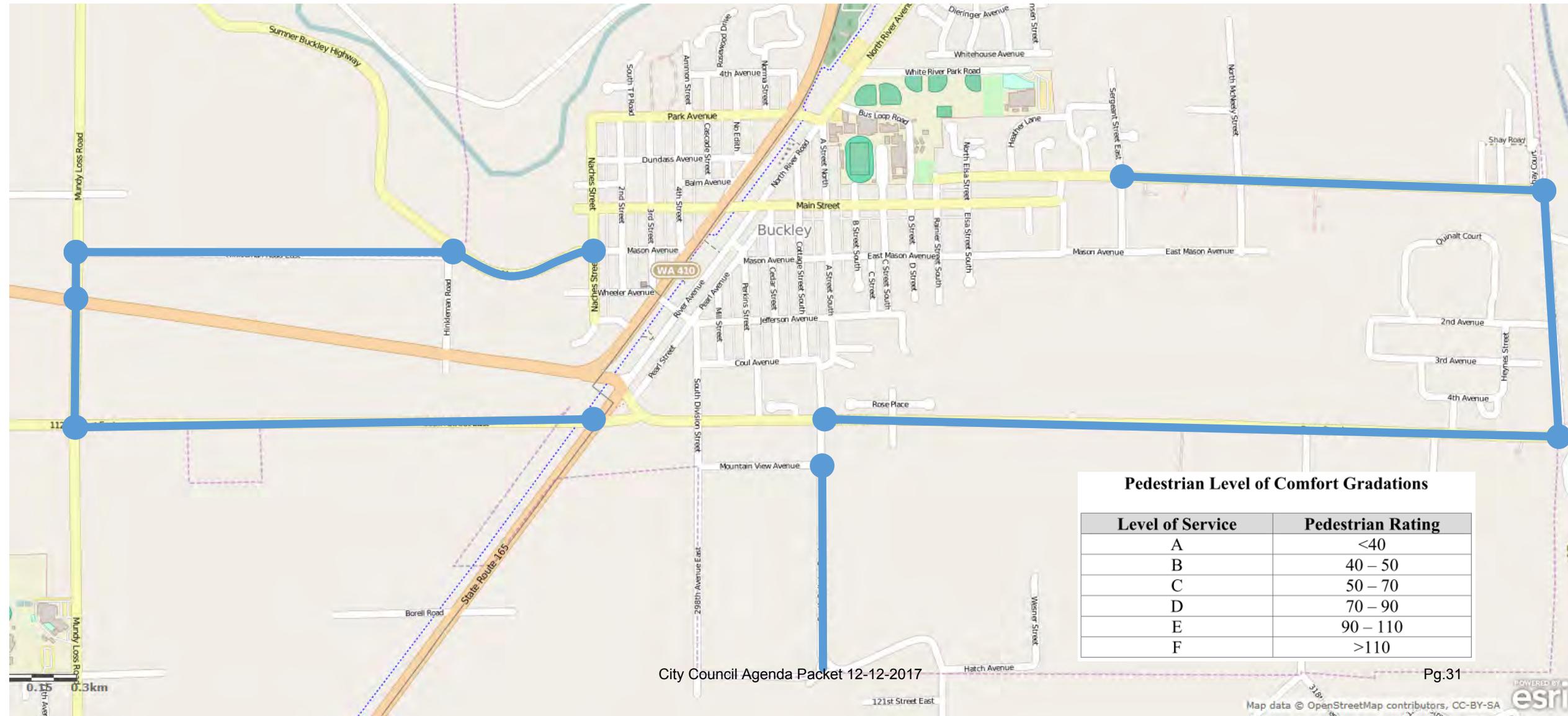


INTERSECTION 1			INTERSECTION 2			INTERSECTION 3			INTERSECTION 4		
Mundy Loss Rd			SR 165 (River Ave)			Ryan Rd (N)			N River Rd		
46	204	7	32	271	0	8	0	80	43	19	8
↶	↓	↷	↶	↓	↷	↶	↓	↷	↶	↓	↷
112th St E			Ryan Rd (E & W)			Ryan Rd (E & W)			A St (N/Pink Ave)		
32	44	22	0	90	90	0	90	90	58	7	7
↶	↓	↷	↶	↓	↷	↶	↓	↷	↶	↓	↷
40	13	32	5	22	19	0	30	0	110	57	5
↶	↓	↷	↶	↓	↷	↶	↓	↷	↶	↓	↷
Mundy Loss Rd			SR 165 (River Ave)			Ryan Rd (N)			N River Rd		
31	148	8	8	138	14	0	0	0	28	16	1
↶	↓	↷	↶	↓	↷	↶	↓	↷	↶	↓	↷
112th St E			A St (N/A St)			Mundy Loss Rd			SR 410		
24	53	4	0	41	71	12	42	28	10	875	46
↶	↓	↷	↶	↓	↷	↶	↓	↷	↶	↓	↷
Main St			Main St			SR 410			Main St		
16	117	6	39	119	5	25	730	120	28	34	28
↶	↓	↷	↶	↓	↷	↶	↓	↷	↶	↓	↷
48	135	48	10	19	9	84	580	13	5	535	80
↶	↓	↷	↶	↓	↷	↶	↓	↷	↶	↓	↷
N/S River Rd/Ave			A St (N/A St)			Mundy Loss Rd			SR 410		
40	48	43	15	138	11	86	51	86	1	54	1
↶	↓	↷	↶	↓	↷	↶	↓	↷	↶	↓	↷
INTERSECTION 9			INTERSECTION 10			INTERSECTION 11			INTERSECTION 12		
Driveway			SR 410			SR 410			Naches St		
6	0	0	2	958	31	82	931	162	81	18	0
↶	↓	↷	↶	↓	↷	↶	↓	↷	↶	↓	↷
SR 410			Wheeler Ave			Pink Ave			W Mason Ave		
106	583	0	4	0	0	15	16	80	12	25	134
↶	↓	↷	↶	↓	↷	↶	↓	↷	↶	↓	↷
SR 165			SR 410			SR 410			Naches St		
101	0	99	3	623	33	31	515	20	7	53	5
↶	↓	↷	↶	↓	↷	↶	↓	↷	↶	↓	↷

Existing System-2013 Vehicular Level of Service



Existing System-2013 Pedestrian Level of Comfort



Strategy - Project Prioritization

1. Maintain the existing transportation network.
2. Improve safety of transportation system.
3. Improve system continuity by constructing missing sidewalk, bicycle route and street links.
4. Upgrade existing infrastructure to adopted LOS standards.
5. Extend infrastructure to accommodate new growth.



Strategy - Safety

- Record and analyze collision reports to identify traffic hazard patterns that can be corrected.
- Conduct traffic counts to determine collision rates, capacity needs, and use in designing improvements.



Existing System – Collisions - 2003-2011



Strategy - Convenience

1. Monitor traffic volumes and LOS to identify capacity deficiencies.
2. Coordinate with Pierce Transit to reinstate public transportation services with Buckley.
3. Coordinate with WSDOT on plans for improving the SR 410 corridor.



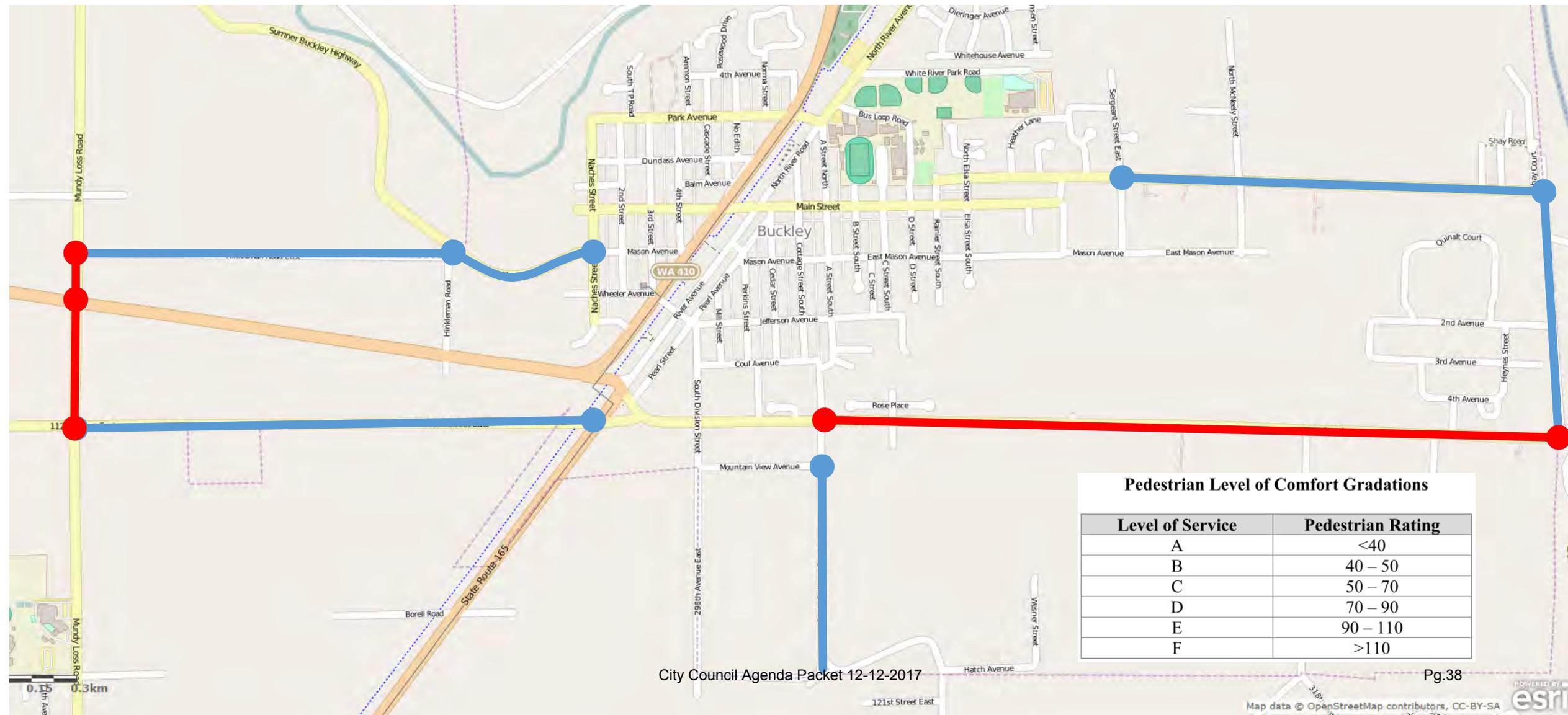
Projected Level of Service-Vehicular-2030



Projected Level of Service-Vehicular-2040



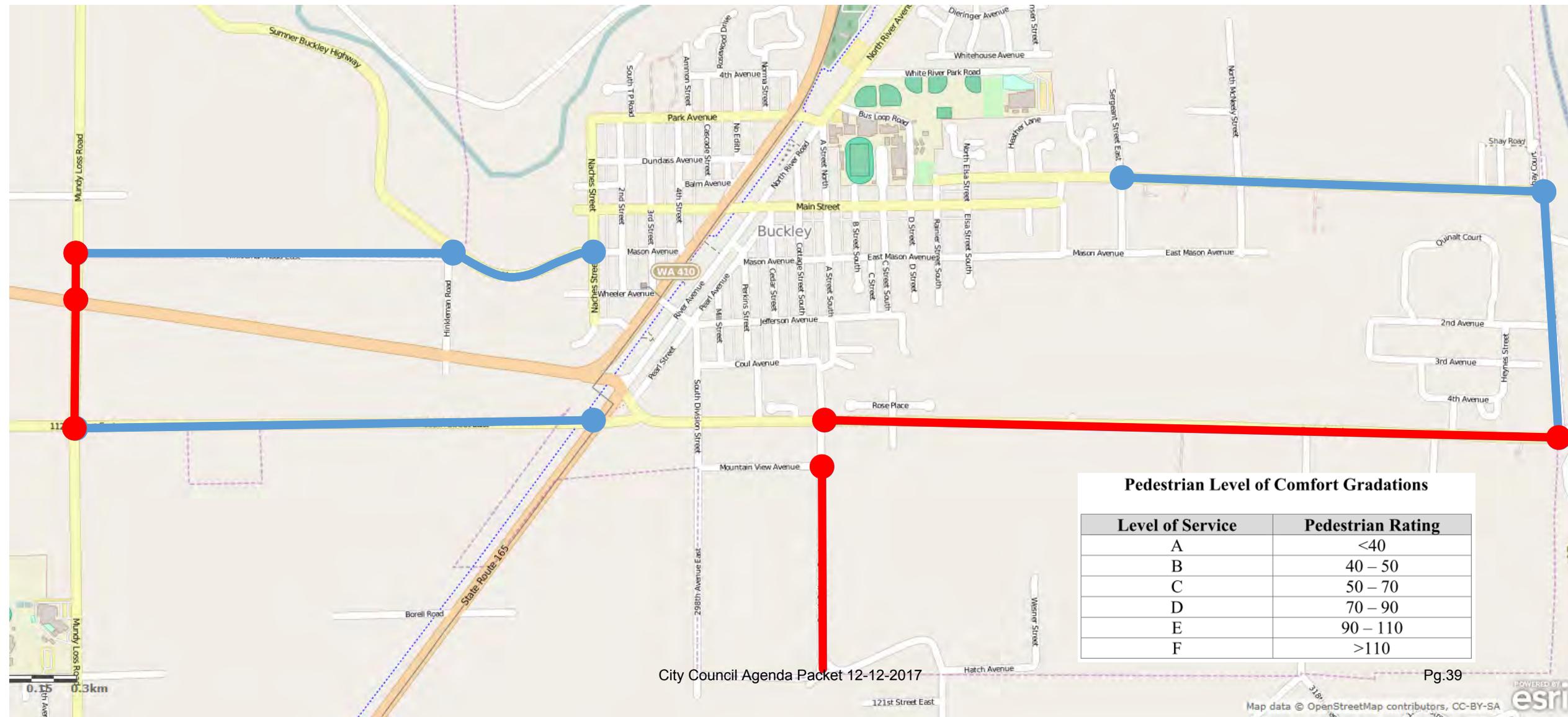
Projected Pedestrian Level of Comfort-2030



Pedestrian Level of Comfort Gradations

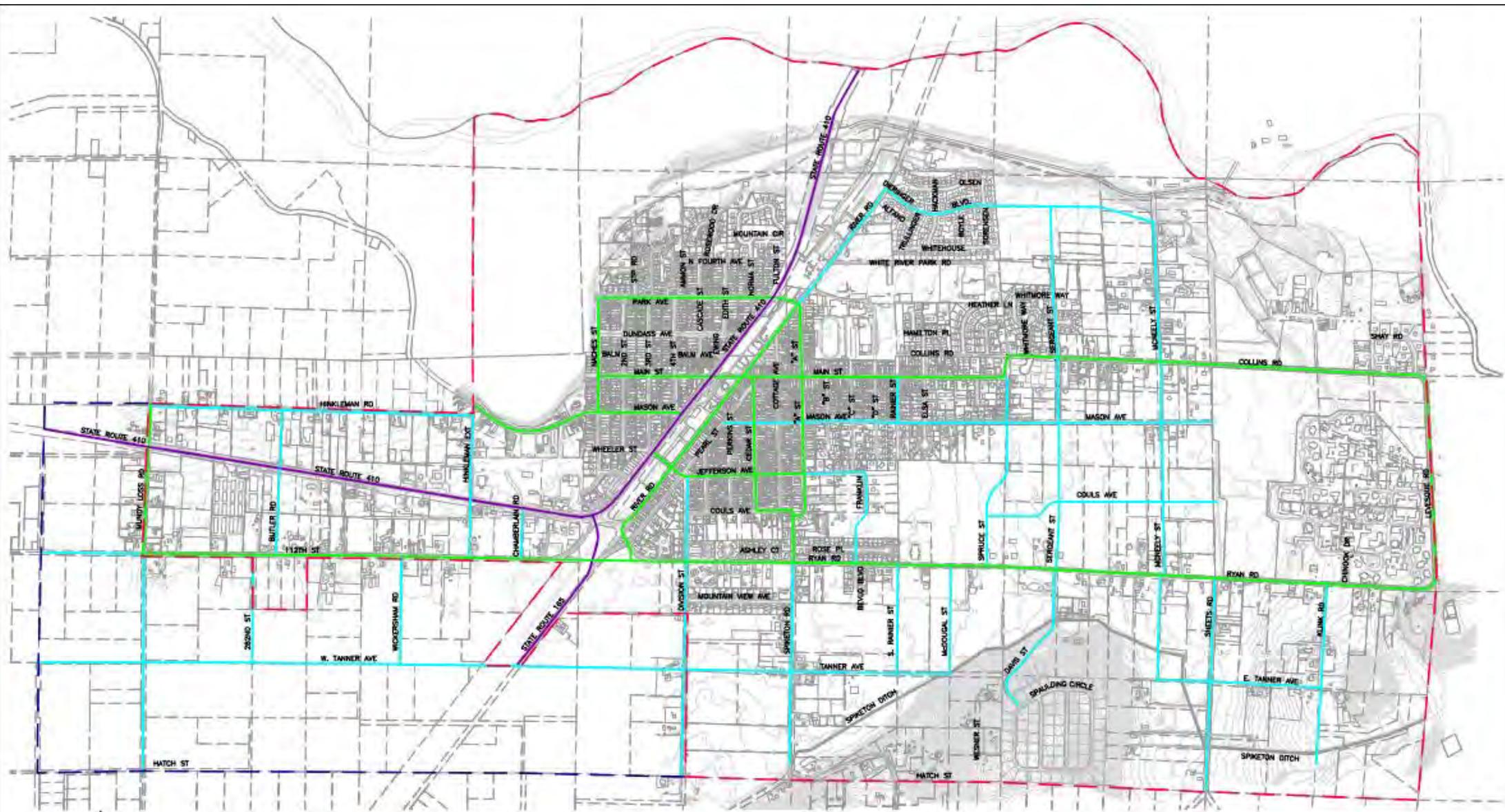
Level of Service	Pedestrian Rating
A	<40
B	40 – 50
C	50 – 70
D	70 – 90
E	90 – 110
F	>110

Projected Pedestrian Level of Comfort-2040



Pedestrian Level of Comfort Gradations

Level of Service	Pedestrian Rating
A	<40
B	40 – 50
C	50 – 70
D	70 – 90
E	90 – 110
F	>110



LEGEND

MAJOR (PRINCIPAL) ARTERIALS	
MINOR (SECONDARY) ARTERIALS	
COLLECTOR STREETS	
CITY BOUNDARY LINE	
UGA	

CITY OF BUCKLEY
FUTURE STREET PLAN
2010 UPDATE



Gray & Osborne, Inc.
 CONSULTING ENGINEERS



Legend

- City Park or recreation area
- Existing and proposed trails (blue is sidewalks)
- Proposed shoreline trail

See enlarged area

Projects - Intersection Improvements

Intersection LOS and Improvements

Intersection	2013 LOS	2030 LOS	Improvements	Mitigated LOS
Mundy Loss and 112 th Street East	B	F	Signal, turn lanes, sidewalks	C
North River Road and A Street	B	F	Signal, turn lanes, sidewalks	B
South River Road and Main Street	C	F	Signal, turn lanes, sidewalks	C
Main Street and A Street	C	F	Signal, turn lanes, sidewalks	B
SR 410 and Mundy Loss	B	F	Widen to five lanes, signal	B
SR 410 and Main	B	E	Widen to five lanes, signal	A
SR 410 and SR 165	F	F	Widen to five lanes, signal	C
SR 410 and Chamberlin, Butler, Hinkleman Extension, Jefferson, or Wickersham			New or existing stop controlled streets will require signalization and five lanes to meet LOS "D."	

Projects - Intersection Improvements

Intersection Mitigations and Costs

Intersection	Improvements	Mitigation Cost	2013 AWDT	Cost per AWDT
Mundy Loss and 112 th Street East	Signal, turn lanes, sidewalks	\$1,364,000	9,070	\$150
SR 410 and SR 165	Realign SR 165	\$2,114,000	30,590	\$69
South River Road and A Street	Signal, turn lanes, sidewalks	\$797,000	7,160	\$111
South River Road and Main Street	Signal, turn lanes, sidewalks	\$789,000	5,580	\$141
Main Street and A Street	Signal, turn lanes, sidewalks	\$498,000	6,470	\$77
SR 410 and Mundy Loss	Widen to five lanes, signal	\$1,170,000	26,730	\$44
SR 410 and Main	Widen to five lanes, signal	\$1,006,000	26,150	\$38
Total		\$8,054,000		\$618

Projects - Walkway Improvements

TABLE 4

Pedestrian Mitigations and Costs

Street	Improvement	Mitigation Cost	2013 ADT	Cost per ADT
Mundy Loss (112 th Street East – SR 410)	Curb, gutter, sidewalk one side	\$669,000	6,230	\$108
Ryan Road (Spiketon – Levesque)	Curb, gutter, sidewalk one side	\$1,584,000	2,770	\$572
Spiketon Road (South of Mt. View Avenue)	Curb, gutter, sidewalk one side	\$588,000	1,020	\$576
Total		\$2,841,000		\$1,256

Strategy – Financing

- Transportation Benefit District
- Partnering with State and Federal Agencies for improvements
- Mitigation Fees

TABLE 6

Intersection Mitigations and Costs

Intersection	Improvements	Mitigation Cost	2013 AWDT	Cost per AWDT
Mundy Loss and 112 th Street East	Signal, turn lanes, sidewalks	\$1,364,000	9,070	\$150
SR 410 and SR 165	Realign SR 165	\$2,114,000	30,590	\$69
South River Road and A Street	Signal, turn lanes, sidewalks	\$797,000	7,160	\$111
South River Road and Main Street	Signal, turn lanes, sidewalks	\$789,000	5,580	\$141
Main Street and A Street	Signal, turn lanes, sidewalks	\$498,000	6,470	\$77
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SR 410 and Main	Widen to five lanes, signal	\$1,006,000	26,150	\$38
Total		\$8,054,000		\$618

Goals and Policies

- Safety. Goal 5.1.
- Design. Goal 5.2.
- Connectivity. Goal 5.3
- Non-Motorized Facilities. Goal 5.4.
- Transit. Goal 5.5.
- Environment. Goal 5.6.
- Finance. Goal 5.8.
- Concurrency. Goal 5.9
- Maintenance. Goal 5.10.
- Construction. Goal 5.11

Safety. Goal 5.1.

Ensure all transportation modes are designed for safety.

Policy 5.1.1

All transportation modes throughout the city should provide safe access to goods and services.

Policy 5.1.2

Right-of-way improvements shall be done to the latest accepted design standards. If the design standards cannot be met, a deviation shall be prepared by the designer, and shall be reviewed for possible approval by the City Engineer.

Policy 5.1.3

Provide needed roadway striping and signing to maintain safe traffic operation service levels that are consistent with the most recent Manual of Uniform Traffic Control Devices (MUTCD).

Policy 5.1.4

The city should ensure adequate visibility for automobiles by enforcing landscape and fence height standards.

Policy 5.1.5

A code enforcement officer should be responsible for enforcing the vegetation height and breadth over sidewalks as well as beside roads.



Design. Goal 5.2.

Enhance the appearance, quality and function of the transportation system in residential and commercial districts.

General.

Policy 5.2.1 - Streets, trails, bikeways, and sidewalks should coordinate with a city theme (coal mining / brick buildings / logging).

Policy 5.2.2 - All materials used for a project should meet the accepted design standards of the City.

Policy 5.2.3 - Public art should be provided on public rights-of-way by new development to enhance the city's sense of place and/or the city theme.

Street grids.

Policy 5.2.4 - Street patterns should be planned as grid systems without dead ends or long blocks; clustered development, such as planned unit developments, should provide a trail system through the property and connect with adjacent rights-of-way or developed trails.

Policy 5.2.5 - Future streets and their classifications should follow a regular distribution pattern that anticipates potential land uses and provides for orderly development.

Alleys.

Policy 5.2.6 - Alleys should be included in plat plans to eliminate the need for placing overhead wires, garages, and garbage cans in front of residences.

Policy 5.2.7 - The size and capacity of transportation facilities should be appropriately matched to the surrounding land uses.

Policy 5.2.8 - The city should consider the costs and benefits of both construction and maintenance when setting guidelines for street dimensions and rights-of-way.

Sidewalks.

Policy 5.2.9 - Sidewalks should be designed to eliminate sheet flow and ponding on the walkway surface.

Policy 5.2.10 - Crosswalks should be paved differently to ensure visibility.

Policy 5.2.11 - Sidewalks that are likely to serve as parking areas or driveways should be designed as driveways to prevent the sidewalk from crumbling through use.

Policy 5.2.12 - Sidewalks should have standard curbs (not rolled curbs).

Policy 5.2.13 - Sidewalks should be sloped toward the street for drainage.

Policy 5.2.14 - Pavement materials and landscaping should be used to create visual connections between trails and the downtown.

Connectivity. Goal 5.3

Provide a variety of ways to get from one part of the city to another part of the city using a variety of transportation modes.

Walkways.

Policy 5.3.1 - Sidewalks also should be part of the city's trail system.

Policy 5.3.2 - Create a coordinated system of trails and walkways within the city.

Policy 5.3.3 - Trails should lead downtown and to the shoreline.

Policy 5.3.4 - Streets that dead end or end in cul-de-sacs should contain pedestrian links to the next street.

New Development.

Policy 5.3.5 - Developers should provide bike and pedestrian connections to adjoining neighborhoods.

Policy 5.3.6 - New development should provide links and signs to the trail system.

Policy 5.3.7 - All new development should provide pedestrian and bicycle infrastructure, such as sidewalks, crosswalks, and bike paths.



Non-Motorized Facilities. Goal 5.4.

Create a continuous network of non-motorized facilities.

Pedestrian.

Policy 5.4.1 - Increase non-motorized trips within the City of Buckley.

Policy 5.4.2 - The City of Buckley should implement transportation demand management measures that provide incentives for walking, biking, and public transportation and disincentives for automobile use.

Policy 5.4.3 - The city should work with Washington State Department of Transportation (WSDOT) to make State Route (SR) 410 safer for pedestrians.

Policy 5.4.4 - Non-motorized links across SR 410 should be by signalized crosswalks or a pedestrian route that is grade separated.

Policy 5.4.5 - The city should ensure safe and secure access to non-motorized amenities.

Policy 5.4.6 - Cars should not park on sidewalks.

Policy 5.4.7 - Crosswalk safety at major intersections should be enhanced through the addition of visual cues such as paving and painting treatments, lighting and/or signage. Where crossing distances are long, i.e. across SR 410, raised medians should be constructed to serve as places of refuge for pedestrians.

Policy 5.4.8 - Future Transit areas should include covered transit shelters.

Education.

Policy 5.4.9 - Provide educational opportunities to provide information about Northwest ecology along bicycling and walking routes, as well as the foothills trail.

Policy 5.4.10 - The city should work with outside cycling and walking groups such as Feet First or Cascade Cycling Group to provide outreach and education regarding the different modes of transportation to schools and other public facilities.

Bicycles.

Policy 5.4.11 - The City should create a continuous bicycle route system linked to the foothills trail and other City Facilities. These routes should be part of a public outreach effort that creates knowledge of the system. The outcome of the public outreach can then be transferred to City and County maps and other publications for circulation.

Policy 5.4.12 - All new commercial and office developments and facilities shall include bicycle parking. Park and ride areas and areas for future transit facilities should include covered bicycle parking.

Policy 5.4.13 - The city should foster Buckley's role as a destination point for recreational cycling by enhancing the town's visibility and identity.

Center of Local Interest.

Policy 5.4.14 - The city should use the foothills trail between Park Street and Ryan Road as a Center of Local Importance to enhance provision of businesses, recreational activities, and public services.

Transit. Goal 5.5.

The city should create park-and-ride lots that are connected to the trail system and will serve to connect with future transit services within the city's downtown and the SR 410 corridor.

Park and rides.

Policy 5.5.1 - The city should ensure safe and secure access to park & ride lots for lighting and other pedestrian amenity improvements.

Policy 5.5.2 - The city should create a park & ride lot near downtown.

Policy 5.5.3 - The city should examine opportunities for combining park & ride lots with a variety of land use activities to enhance the convenience of car-pooling.

Funding.

Policy 5.5.4 - The city should continue to work with regional transit operators for future placement of transit stops within Buckley.

Policy 5.5.5 - The city should continue working with WSDOT and Pierce County to jointly compete for funds to support mass transit funding to and from the City, as well as associated transportation improvements.



Environment. Goal 5.6.

Transportation improvements should be constructed with reduced environmental impacts.

Policy 5.6.1 - All transportation improvements should minimize impervious footprint and use current storm water techniques as required in Title 14 of the Buckley Municipal Code.

Policy 5.6.2 - The city shall pursue low-impact street and parking lot design, construction and maintenance techniques to minimize impervious surface, water pollution and water runoff.

Policy 5.6.3 - New roads and trails should be designed in such a way that they will not affect wetlands, natural preserves, parks and recreation areas, significant historical and cultural resources, and areas identified as critical wildlife habitat.

Policy 5.6.4 - The city should provide plug-in charging stations for electric vehicles.



Finance. Goal 5.8.

The city should finance improvements after considering which project will provide the most benefit for citizens.

Policy 5.8.1 - The City should develop a list of roadway and non-motorized improvements to be accomplished within the next six years and updated annually. Council should consider prioritization of the roadway improvements each spring.

Policy 5.8.2 - The city should use both traditional and innovative methods for financing roadway improvements such as public/private partnerships, impact fees, and so forth.

Policy 5.8.3 - The city should explore funding tools such as road improvement districts (rids), local improvement districts (lids), and other local funding mechanisms to finance projects that provide a primary local benefit.

Policy 5.8.4 - WSDOT, Pierce County, and the City of Buckley should work together to share transportation resources and reduce overlap in transportation expenditures.

Policy 5.8.5 - The city should require maintenance agreements for private roads that are executed by the responsible landowners.

Policy 5.8.6 - The city should continue to compete for funds for transportation improvements.



Concurrency. Goal 5.9

The city should ensure developers pay for impacts to roadway system, as required by concurrency.

Policy 5.9.1 - Each development is financially responsible for related transportation costs.

Policy 5.9.2 - A consistent level of service must be provided.

Policy 5.9.3 - Transportation improvements needed to support new development shall be in place at the time of development to maintain transportation LOS standards.

Policy 5.9.4 - New commercial and multifamily developments must provide roadway improvements as required by the future street map and the Development Guidelines and Public Works Standards.

Policy 5.9.5 - A concurrency management system should be developed.

Policy 5.9.6 - Alternatives for demand managements should be explored.



Maintenance.Goal 5.10.

The city should minimize future maintenance costs by using technologies and techniques that increase pavement longevity.

Policy 5.10.1 - Build and operate an efficient and cost-effective transportation system.

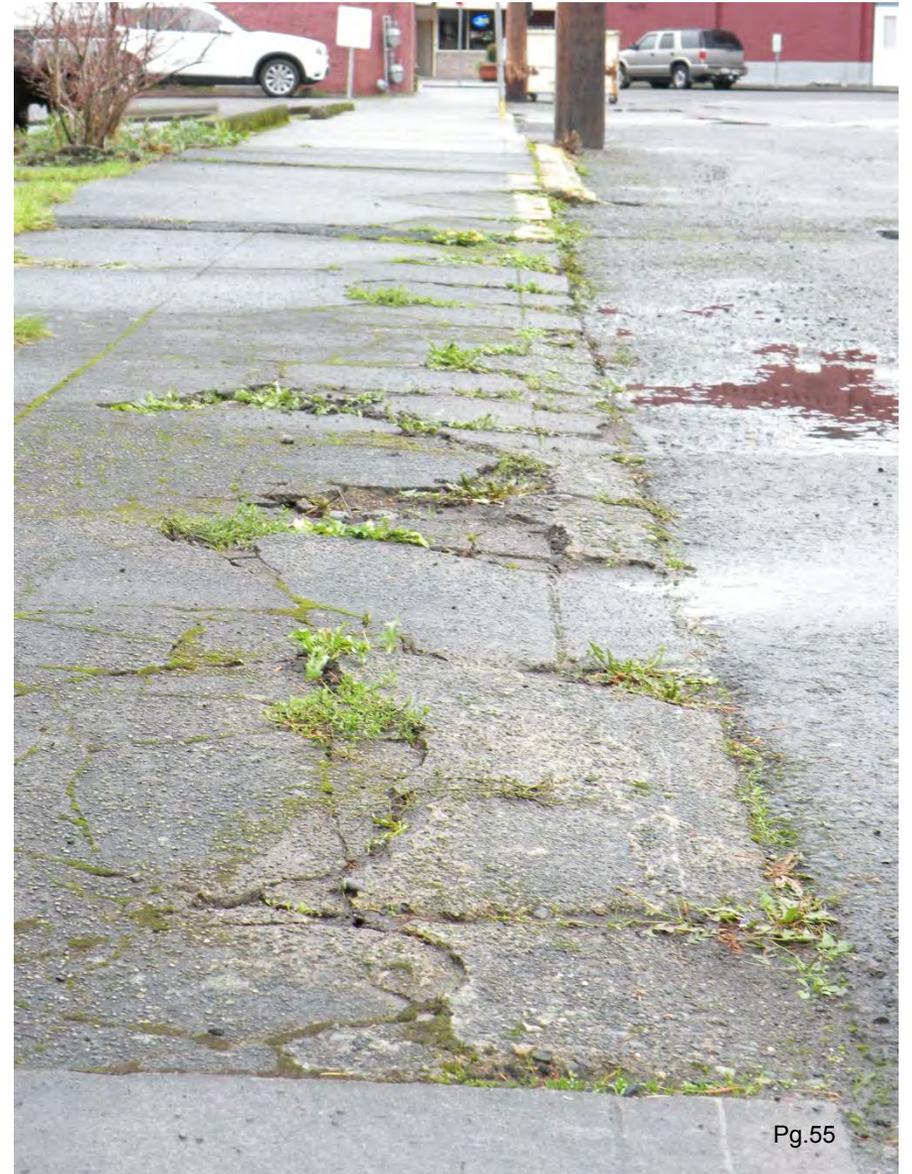
Policy 5.10.2 - Design and construct improvements in a manner that likely will require the least amount of maintenance.

Policy 5.10.3 - The city should investigate relinquishing street facilities that are no longer needed to serve city residents.

Policy 5.10.4 - Create roadway pavement log of existing roadways to record deficiencies and repairs of roadways.

Policy 5.10.5 - The city should provide budget funding for annual roadway paving improvements, such as potholes.

Policy 5.10.6 - Obstructions blocking pedestrian walkways, such as vegetation over trails or sidewalks, should be maintained to eliminate barriers to pedestrians.



Construction. Goal 5.11

Ensure transportation construction needs are met during and after construction.

Policy 5.11.1 - Additional rights-of-way may be required for additional roads and pedestrian ways, as shown on adopted plans of the city.

Policy 5.11.2 - Public notice of traffic impacts that will occur during construction activities should be provided two weeks in advance of the traffic impact.

Policy 5.11.3 - Each transportation mode's right-of-way needs should be addressed when roads are constructed or upgraded with the appropriate traffic control measure as outlined by the Buckley City Development Guidelines and Public Works Standards and MUTCD.

Policy 5.11.4 - Temporary erosion and sediment control measures shall be used in accordance with an approved stormwater pollution prevention plan. Final approval of the permit should depend on permanent stormwater detention and pollution prevention measures being in place.



Closing

Existing Transportation System
Transportation Strategy
Transportation Goals and Policies

Questions and Comments?

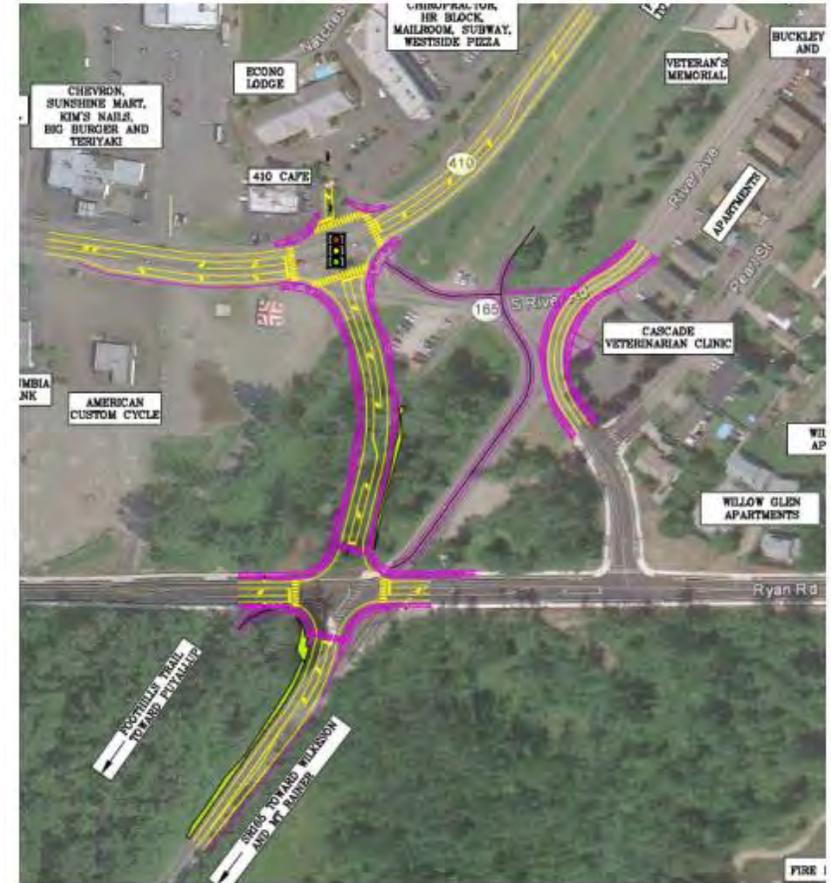


FIGURE 1

Proposed SR 410 and SR 165 Improvements

CITY OF BUCKLEY

PIERCE COUNTY

WASHINGTON



COMPREHENSIVE PLAN TRANSPORTATION ELEMENT UPDATE



G&O #13473
DECEMBER 2016



Gray & Osborne, Inc.
CONSULTING ENGINEERS

TABLE OF CONTENTS

OVERVIEW	1
PLANNING PROCESS	1
EXISTING INFORMATION	2
Pedestrian Facilities	3
Bicycle Facilities	3
Public Transportation Facilities.....	4
Freight Facilities	4
Motorized Vehicular facilities.....	4
Urban Principal Arterial System.....	4
Urban Minor Arterial Street System	5
Urban Collector Street System.....	5
Urban Local Street System	5
Vehicle Level of Service (LOS) standards.....	5
Concurrency	6
TRANSPORTATION STRATEGY	7
Future Transportation Safety Strategy	7
Future Transportation Convenience Strategy.....	7
Mitigation Fees	7
City Operating Cost	8
TRANSPORTATION GOALS AND POLICIES.....	8
Safety	9
Design	9
General	9
Street Grids	10
Alleys.....	10
Sidewalks.....	10
Connectivity	11
Walkways	11
New Development.....	11
Non-Motorized Facilities	11
Pedestrian.....	11
Education	12
Bicycles	12
Center of Local Interest	12
Transit	13
Park and Rides	13
Funding.....	13
Environment	13
Finance	14
Concurrency	14
Maintenance	15
Construction	15

PROJECTS.....	16
Intersection Improvements.....	17
SR 410/SR 165/Ryan Road/South River Road/112 th Street East	
Improvements.....	19
Other SR 410 Corridor Improvements	21

LIST OF TABLES

<u>No.</u>	<u>Table</u>	<u>Page</u>
1	Pedestrian Level of Comfort Gradations	3
2	Highway Capacity Manual 2010 Intersection Level of Service and Delay	6
3	Pedestrian Level of Service and Ratings.....	16
4	Pedestrian Mitigations and Costs	17
5	Intersection LOS and Improvements	18
6	Intersection Mitigations and Costs	18

LIST OF FIGURES

<u>No.</u>	<u>Figure</u>	<u>On Page</u>
1	Proposed SR 410 and SR 165 Improvements	20

APPENDICES

- Appendix A – Volume Maps
- Appendix B – Level of Service Analysis
- Appendix C – Collision Map
- Appendix D – Cost Estimates

OVERVIEW

This Comprehensive Plan Transportation Element establishes goals, policies, and implementation strategies to guide future decisions affecting the City of Buckley's transportation systems including pedestrian, bicycle, transit and vehicular facilities. This element is intended to reinforce Buckley's overall vision of being a safe and friendly historic small town that is an attractive place to live, work, and play.

Along with other elements in the Comprehensive Plan Transportation Element works to preserve Buckley's small town character, efficient provision of services, support diverse housing opportunities, protect the natural environment, foster a strong economic base, ensure safe access to goods and services and develop high quality public spaces that foster community interaction.

The focus of the transportation element is on ensuring safe and convenient access to goods and services through an efficient and environmentally sensitive multimodal transportation system. Pedestrian, bicycle, transit and vehicular facilities are all considered when answering the following questions:

- What are the strengths and weaknesses of Buckley's current transportation system?
- What is Buckley's projected transportation needs in the future?
- What is Buckley's overall strategy for meeting its future transportation needs?
- What are Buckley's goals, policies for improving its transportation system?
- What specific actions can Buckley begin to take to implement its vision?

PLANNING PROCESS

This Transportation Element update was prepared in the following series of steps:

- Historical information was collected including Pierce County Transportation Plans, traffic counts, and street inventory information.
- New traffic counts were taken in April 2013 and intersection approach volumes were determined.

- Both population growth rates and traffic count trends were collected from the Puget Sound Regional Council. Both were reviewed and a 3 percent per year growth rate was selected.
- Vehicle Levels of service (LOS) for 2013 and 2030 were calculated and analyzed using traffic model HCM2010 methods combined with Synchro, and HCS2010 models for high volume intersections.
- Pedestrian LOS was calculated for 2013 and 2030 using a rating equation that incorporates vehicle volumes, pedestrian use and type, vehicle speeds, shoulder widths, and roadway widths.
- Improvements were developed and tested to ascertain a minimum LOS of “D” in 2013. Cost estimates of the selected improvements were then prepared.
- Fair share mitigation fees were developed for each project using 2013 weekday total volumes.

EXISTING INFORMATION

Buckley’s historic neighborhoods are laid out in a traditional street grid pattern on approximately 320 feet by 550 feet street-blocks with alleys running down their middle. This street pattern provides strong pedestrian and vehicular connectivity within the community facilitating convenient access to goods and services. The alleys also enhance street aesthetics by providing alternative corridors for garbage pickup and utilities.

Some of Buckley’s more recent subdivisions are laid out in a loop and lollipop street pattern. This pattern discourages through traffic and increases out of direction travel. It consequently does not provide strong pedestrian or vehicular connectivity resulting in long circuitous routes to cover otherwise short distances. This street pattern developed after the advent of the automobile when accessibility by foot was thought to be no longer crucial. However, as a result of this pattern people’s transportation choices become severely limited. Children and the elderly were especially affected by the lack of safe and convenient pedestrian and bicycle access to activities, goods and services. It was also less recognized how automobile dependence could affect our health. Our country’s obesity epidemic not to mention environmental and safety concerns over the burning of fossil fuels have all been tied to our nation’s heavy reliance upon the automobile.

With the growing awareness of the adverse health, environmental and social impacts of automobile dependence, communities around the country are working to create more walk able and pedestrian friendly neighborhoods to loosen dependence upon the automobile by increasing transportation choices. As residential development continues to occur within Buckley, street patterns will continue to have strong effects upon accessibility and neighborhood character. Finding ways to ensure safe and convenient

multi-modal access and preserve Buckley’s small town character is the primary goal of this Transportation Element.

PEDESTRIAN FACILITIES

Pedestrian facilities include sidewalks, crosswalks and trails throughout the City along with pedestrian amenities such as benches, and lighting within Buckley’s historic area. All are intended to provide safe and convenient access to goods and services by foot.

Currently, the sidewalk system in Buckley is discontinuous with many sidewalks existing in the older and more developed neighborhoods and fewer in the less populated areas. Planting strips run along many sidewalks, but not all and they vary in width. Crosswalks are marked in the historic district but intersections in other areas are not as well distinguished. Approximately 2 miles of the Foothills Trail runs through the middle of the City providing pedestrian and bicycle access to goods and services along the east side of SR 410 as well as providing opportunities for recreational walking and biking.

The LOS scale, reflects the level of comfort experienced by a pedestrian on a roadway, can be seen in Table 1 below. Three roadways currently do not meet Buckley’s LOS D standard. Additional information regarding their deficiencies and suggestions for improvements can be found in the sections on projects.

TABLE 1

Pedestrian Level of Comfort Gradations

Level of Service	Pedestrian Rating
A	<40
B	40 – 50
C	50 – 70
D	70 – 90
E	90 – 110
F	>110

BICYCLE FACILITIES

Bicycle facilities consist of designated bicycle routes, marked bicycle lanes, trails and bicycle parking facilities. Currently Buckley does not have any designated bicycle routes, bicycle lanes, or bicycle parking facilities however, the street system is used by bicyclists of all ages for various types of trips including commuting to work and school, shopping, visiting friends and recreation. Low levels of automobile traffic make bicycle travel along most of Buckley’s streets relatively safe. Certain streets, however, are too dangerous for bicycle travel and require significant improvements to make services along them accessible.

Buckley is especially fortunate to have the Foothills Trail running through the middle of town. The Foothills Trail is a 12-foot-wide non-motorized asphalt trail suitable for bicycles, walking, inline skates and wheel chairs. It also has a soft shoulder path for horses. When completed, the trail will extend through both Pierce and King Counties.

PUBLIC TRANSPORTATION FACILITIES

Public Transportation is not provided in the form of bus service in Buckley. Pierce Transit has had to cut service due to the recent economic recession. Mass transit opportunities still exist in the form of vanpool and other car sharing plans; however, there is no formal park and ride facility within the City.

FREIGHT FACILITIES

The Washington State department of Transportation has designated certain roads as crucial to freight mobility, which is known as the Freight and Goods Transportation System (FGTS). The FGTS classifies roadways using five truck gross tonnage classifications, T-1 through T-5, as follows:

- T-1: More than 10 million tons per year.
- T-2: 4 million to 10 million tons per year.
- T-3: 300,000 to 4 million tons per year.
- T-4: 100,000 to 300,000 tons per year.
- T-5: At least 20,000 tons in 60 days and less than 100,000 tons per year.

The City of Buckley has four freight corridors with this designation:

- State Route 410 (T-2)
- State Route 165 (T-3)
- 112th Street SE (T-3)
- Buckley-Sumner Highway/Mason Avenue (T-3)

MOTORIZED VEHICULAR FACILITIES

Vehicular facilities include the City's streets and their intersections. The City of Buckley's streets are classified in accordance with the National Functional Arterial Classification system into Principal Arterials, Minor Arterials, Collector Streets and Local Access Streets. Definitions of each can be found below:

Urban Principal Arterial System

The principal arterial connect cities that are spaced considerably far from each other with a minimum of access to ensure a good level of service. The primary purpose of this roadway is to serve the traveling public, and not accessing adjacent land.

Urban Minor Arterial Street System

The minor arterial street system should interconnect with and augment the urban principal arterial system and provide service to trips of moderate length at a somewhat lower level of travel mobility than principal arterials. The minor arterial also provides access to industrial, commercial, and large residential developments, however, will not travel into these developments.

Urban Collector Street System

The collector street system provides both land access service and traffic circulation within residential neighborhoods, commercial and industrial areas. It differs from the arterial system in that facilities on the collector system may be inclusive in residential neighborhoods, distributing trips from the arterials through the area to the ultimate destination.

Urban Local Street System

The local street system comprises all facilities not on one of the higher systems. It serves primarily to provide direct access to abutting land and access to the higher order systems. It offers the lowest level of mobility and usually contains no bus routes. Service to through traffic movement usually is deliberately discouraged.

Currently Buckley has:

- 2.93 miles of principal arterials;
- 7.66 miles of minor arterials;
- 1.00 mile of collector streets;
- 20.63 miles of local access streets; and
- 4.31 miles of alleyways within the City limits. An additional 2.13 miles of Local Access Streets exist within the Rainier School property.

VEHICLE LEVEL OF SERVICE (LOS) STANDARDS

To evaluate how well a transportation system functions, transportation engineers use what is referred to as Levels of Service (LOS). LOS is a concept developed to quantify the degree of comfort including such elements such as travel time, number of stops, amount of delay, and impediments caused by other vehicles. Six grades are used to denote the various LOS. These six grades are described qualitatively for signalized intersections in Table 2. Level of Service A denotes the best level of operation and grade F denotes the worst level of operation.

Levels range from A to F with A taking the shortest time and F taking the longest time. Cities decide upon the minimum levels of service (LOS) acceptable for each

transportation facility in their jurisdiction. These LOS are then adopted as standards to evaluate whether improvements are required.

The LOS for intersections is determined by measuring the time it takes a vehicle to pass through an intersection. The following table shows the intersection LOS ratings grades (A – F) along with their ranges of time.

TABLE 2

Highway Capacity Manual 2010 Intersection Level of Service and Delay

Level of Service	Signalized (Seconds)	All-Way Stop Control and Two-Way Stop Control (Seconds)
LOS A	<10	<10
LOS B	10 – 20	10 – 15
LOS C	20 – 35	15 – 25
LOS D	35 – 55	25 – 35
LOS E	55 – 80	35 – 50
LOS F	>80	>50

The City of Buckley utilizes the city standard traffic LOS D.

CONCURRENCY

Once a city has adopted LOS standards it is then required to ensure that it can maintain those standards over the planning period. New development which may negatively affect LOS is required to make improvements to the facilities to mitigate any adverse effects. This requirement is referred to as the concurrency requirement which is specified in RCW 36.70A.070(6). The statute provides “concurrent with development...shall mean that improvements or strategies are in place at the time of development, or that a financial commitment is in place to complete the improvements within 6 years.” WAC 365-195-210 also specifies that public transportation facilities are to be in place to meet adopted level of service standards within 6 years from the time of development.

State Route 410 and State Route 165 travel through the City of Buckley. The right-of-way for these routes is owned by the City, however, the facilities located between curb to curb is maintained by the state. The State has set a level of service standard for these routes, and identified SR 410 as a Tier 2, and will need a LOS D, while SR 165 is a Tier 3 and require a LOS C.

TRANSPORTATION STRATEGY

Buckley's strategy for maintaining and improving its transportation system is to ensure cost effective transportation projects are developed that meet the goals of the Transportation Element. Prioritization of projects is as follows:

1. Maintain the existing transportation network.
2. Improve safety of transportation system.
3. Improve system continuity by constructing missing sidewalk, bicycle route and street links.
4. Upgrade existing infrastructure to adopted LOS standards.
5. Extend infrastructure to accommodate new growth.

FUTURE TRANSPORTATION SAFETY STRATEGY

1. Record and analyze collision reports to identify traffic hazard patterns that can be corrected.
2. Conduct traffic counts to determine collision rates, capacity needs, and use in designing improvements.

FUTURE TRANSPORTATION CONVENIENCE STRATEGY

1. Monitor traffic volumes and LOS to identify capacity deficiencies.
2. Coordinate with Pierce Transit to reinstate public transportation services with Buckley.
3. Coordinate with WSDOT on plans for improving the SR 410 corridor.

MITIGATION FEES

Cost estimates are made for improvements and are used to calculate fair share mitigation fees for new development.

Both vehicular and pedestrian improvements and mitigation fees are identified.

Mitigation improvements and fair share fees identified in this study are intended to be used with grants and other funding sources for the projects. Mitigation fees provide fair share funding identified as development's portion of improvement costs.

Pedestrian traffic varies with weather and season and the Pedestrian LOS recognizes this and is based on daily traffic volumes.

Both the vehicle and pedestrian fair share mitigation fees are determined using 2013 weekday volumes because the improvements provide 24 hour a day capacity.

CITY OPERATING COST

The City sets aside an annual budget for the operation and maintenance of the transportation system through a Transportation Benefit District, which was established by Ordinance No. 13-12 in November of 2012. The Transportation Benefit District Funds:

- City of Buckley Street Fund 101 (operation and maintenance).
- Pavement Preservation and Overlay Program.
- Transportation Projects, described in detail within the (2014 – 2019) 6-Year Transportation Improvement Program.

TRANSPORTATION GOALS AND POLICIES

Goals and policies are intended to provide the City of Buckley with a vision and outline for both preserving and improving its transportation facilities. They will also help guide the State's transportation activities (i.e., plans, improvements, and expenditures) within the City. While general in nature, they are sufficiently specific to assist in prioritizing individual transportation projects. During a time when transportation budgets are stretched, these guidelines will be very helpful in selecting what can best be achieved through the City of Buckley's transportation vision.

During development of the goals and policies, City staff identified several overriding guidelines that have helped structure this effort. These comprehensive guidelines are reflected in the City-wide goals, with one of the most important being the fiscal and efficiency concerns of the transportation plan. The Goals, Policies and Projects must recognize the cost-effectiveness and prudence of preserving and improving existing facilities versus the costs and environmental concerns of building new transportation projects.

What follows is the identification and discussion of goals and policies developed by City staff and the Consultant, with additional input from the City Planning Commission and City Council.

The relationship between goals and policies is defined as follows:

- Goals are broad statements which describe what the City aspires to provide for residents, as well as what they hope to achieve.

- Policies are more specific statements that outline methods of accomplishing goals.
- Projects are specific actions or standards designed to implement Policies.

SAFETY

Goal 5.1 Ensure all transportation modes are designed for safety.

- Policy 5.1.1 All transportation modes throughout the City should provide safe access to goods and services.
- Policy 5.1.2 Right-of-way improvements shall be done to the latest accepted design standards. If the design standards cannot be met, a deviation shall be prepared by the designer and shall be reviewed for possible approval by the City Engineer.
- Policy 5.1.3 Provide needed roadway striping and signing to maintain safe traffic operation service levels that are consistent with the most recent Manual of Uniform Traffic Control Devices (MUTCD).
- Policy 5.1.4 The City should ensure adequate visibility for automobiles by enforcing landscape and fence height standards.
- Policy 5.1.5 A code enforcement officer should be responsible for enforcing the vegetation height and breadth over sidewalks as well as beside roads.

DESIGN

Goal 5.2 Enhance the appearance, quality, and function of the transportation system in residential and commercial districts.

General

- Policy 5.2.1 Streets, trails, bikeways, and sidewalks should coordinate with a City theme (coal mining/brick buildings/logging).
- Policy 5.2.2 All materials used for a project should meet the accepted design standards of the City.
- Policy 5.2.3 Public art should be provided on public rights-of-way by new development to enhance the City's sense of place and/or the City theme.

Policy 5.2.4 All new transportation facilities shall meet current ADA guidelines. All existing facilities shall be inventoried for ADA compliance and prioritized for enhancement where necessary.

Street Grids

Policy 5.2.4 Street patterns should be planned as grid systems without dead ends or long blocks; clustered development, such as planned unit developments, should provide a trail system through the property and connect with adjacent rights-of-way or developed trails.

Policy 5.2.5 Future streets and their classifications should follow a regular distribution pattern that anticipates potential land uses and provides for orderly development.

Alleys

Policy 5.2.6 Alleys should be included in plat plans to eliminate the need for placing overhead wires, garages, and garbage cans in front of residences.

Policy 5.2.7 The sizes and capacities of transportation facilities should be appropriately matched to the surrounding land uses.

Policy 5.2.8 The City should consider the costs and benefits of both construction and maintenance when setting guidelines for street dimensions and rights-of-way.

Sidewalks

Policy 5.2.9 Sidewalks should be designed to eliminate sheet flow and ponding on the walkway surface.

Policy 5.2.10 Crosswalks should be paved differently to ensure visibility.

Policy 5.2.11 Sidewalks that are likely to serve as parking areas or driveways should be designed as driveways to prevent the sidewalk from crumbling through use.

Policy 5.2.12 Sidewalks should have standard curbs (not rolled curbs).

Policy 5.2.13 Sidewalks should be sloped toward the street for drainage.

Policy 5.2.14 Pavement materials and landscaping should be used to create visual connections between trails and downtown.

CONNECTIVITY

Goal 5.3 Provide a variety of ways to get from one part of the City to another part of the City using a variety of transportation modes.

Walkways

- Policy 5.3.1 Sidewalks also should be part of the City's trail system.
- Policy 5.3.2 Create a coordinated system of trails and walkways within the City.
- Policy 5.3.3 Trails should lead downtown and to the shoreline.
- Policy 5.3.4 Streets that dead end or end in cul-de-sacs should contain pedestrian links to the next street.

New Development

- Policy 5.3.5 Developers should provide bike and pedestrian connections to adjoining neighborhoods.
- Policy 5.3.6 New development should provide links and signs to the trail system.
- Policy 5.3.7 All new development should provide pedestrian and bicycle infrastructure, such as sidewalks, crosswalks, and bike paths.

NON-MOTORIZED FACILITIES

Goal 5.4 Create a continuous network of non-motorized facilities.

Pedestrian

- Policy 5.4.1 Increase non-motorized trips within the City of Buckley.
- Policy 5.4.2 The City of Buckley should implement transportation demand management measures that provide incentives for walking, biking, and public transportation and disincentives for automobile use.
- Policy 5.4.3 The City should work with the Washington State Department of Transportation (WSDOT) to make State Route (SR) 410 safer for pedestrians.
- Policy 5.4.4 Non-motorized links across SR 410 should be by signalized crosswalks or a pedestrian route that is grade separated.

Policy 5.4.5 The City should ensure safe and secure access to non-motorized amenities.

Policy 5.4.6 Cars should not park on sidewalks.

Policy 5.4.7 Crosswalk safety at major intersections should be enhanced through the addition of visual cues, such as paving and painting treatments, lighting, and/or signage. Where crossing distances are long, i.e., across SR 410, raised medians should be constructed to serve as places of refuge for pedestrians.

Policy 5.4.8 Future transit areas should include covered transit shelters.

Education

Policy 5.4.9 Provide educational opportunities to provide information about Northwest ecology along bicycling and walking routes as well as the Foothills Trail.

Policy 5.4.10 The City should work with outside cycling and walking groups, such as Feet First or Cascade Cycling Group, to provide outreach and education regarding the different modes of transportation to schools and other public facilities.

Bicycles

Policy 5.4.11 The City should create a continuous bicycle route system linked to the Foothills Trail and other City facilities. These routes should be part of a public outreach effort that creates knowledge of the system. The outcome of the public outreach can then be transferred to City and County maps and other publications for circulation.

Policy 5.4.12 All new commercial and office developments and facilities shall include bicycle parking. Park-and-ride areas and areas for future transit facilities should include covered bicycle parking.

Policy 5.4.13 The City should foster Buckley's role as a destination point for recreational cycling by enhancing the town's visibility and identity.

Center of Local Interest

Policy 5.4.14 The City should use the Foothills Trail between Park Street and Ryan Road as a Center of Local Importance to enhance provision of businesses, recreational activities, and public services.

TRANSIT

Goal 5.5 The City should create park-and-ride lots that are connected to the trail system and will serve to connect with future transit services within the City’s downtown and the SR 410 corridor.

Park and Rides

- Policy 5.5.1 The City should ensure safe and secure access to park-and-ride lots by prioritizing areas around park-and-ride lots for lighting and other pedestrian amenity improvements.
- Policy 5.5.2 The City should create a park-and-ride lot near downtown.
- Policy 5.5.3 The City should examine opportunities for combining park-and-ride lots with a variety of land use activities to enhance the convenience of carpooling.

Funding

- Policy 5.5.4 The City should continue to work with regional transit operators for future placement of transit stops within Buckley.
- Policy 5.5.5 The City should continue working with WSDOT and Pierce County to jointly compete for funds to support mass transit funding to and from the City, as well as associated transportation improvements.

ENVIRONMENT

Goal 5.6 Transportation improvements should be constructed with reduced environmental impacts.

- Policy 5.6.1 All transportation improvements should minimize impervious footprints and use current stormwater techniques as required in Title 14 of the Buckley Municipal Code.
- Policy 5.6.2 The City shall pursue low-impact street and parking lot design, construction, and maintenance techniques to minimize impervious surface, water pollution, and water runoff.
- Policy 5.6.3 New roads and trails should be designed in such a way that they will not affect wetlands, natural preserves, parks and recreation areas, significant historical and cultural resources, and areas identified as critical wildlife habitat.

Policy 5.6.4 The City should provide plug-in charging stations for electric vehicles.

FINANCE

Goal 5.7 The City should finance improvements after considering which project will provide the most benefit for citizens.

Policy 5.7.1 The City should develop a list of roadway and non-motorized improvements to be accomplished within the next 6 years and updated annually. Council should consider prioritization of the roadway improvements each spring.

Policy 5.7.2 The City should use both traditional and innovative methods for financing roadway improvements such as public/private partnerships, impact fees, and so forth.

Policy 5.7.3 The City should explore funding tools such as road improvement districts (RIDs), local improvement districts (LIDs), and other local funding mechanisms to finance projects that provide a primary local benefit.

Policy 5.7.4 WSDOT, Pierce County, and the City of Buckley should work together to share transportation resources and reduce overlap in transportation expenditures.

Policy 5.7.5 The City should require maintenance agreements for private roads that are executed by the responsible landowners.

Policy 5.7.6 The City should continue to compete for funds for transportation improvements.

CONCURRENCY

Goal 5.8 The City should ensure developers pay for impacts to the roadway system, as required by concurrency.

Policy 5.8.1 Each development is financially responsible for related transportation costs.

Policy 5.8.2 A consistent level of service must be provided.

Policy 5.8.3 Transportation improvements needed to support new development shall be in place at the time of development to maintain transportation LOS standards.

Policy 5.8.4 New commercial and multifamily developments must provide roadway improvements as required by the future street map and the Development Guidelines and Public Works Standards.

Policy 5.8.5 A concurrency management system should be developed.

Policy 5.8.6 Alternatives for demand management should be explored.

MAINTENANCE

Goal 5.9 The City should minimize future maintenance costs by using technologies and techniques that increase pavement longevity.

Policy 5.9.1 Build and operate an efficient and cost-effective transportation system.

Policy 5.9.2 Design and construct improvements in a manner that likely will require the least amount of maintenance.

Policy 5.9.3 The City should investigate relinquishing street facilities that are no longer needed to serve City residents.

Policy 5.9.4 Create roadway pavement log of existing sidewalks and roadways to record deficiencies and repairs of roadways.

Policy 5.9.5 The City should provide budget funding for annual roadway paving improvements, such as potholes.

Policy 5.9.6 Obstructions blocking pedestrian walkways, such as vegetation over trails or sidewalks, should be maintained to eliminate barriers to pedestrians.

CONSTRUCTION

Goal 5.10 Ensure transportation construction needs are met during and after construction.

Policy 5.10.1 Additional rights-of-way may be required for additional roads and pedestrian ways, as shown on adopted plans of the City.

Policy 5.10.2 Public notice of traffic impacts that will occur during construction activities should be provided 2 weeks in advance of the traffic impact.

Policy 5.10.3 Each transportation mode's right-of-way needs should be addressed when roads are constructed or upgraded with the appropriate traffic control measure as outlined by the Buckley City Development Guidelines and Public Works Standards and MUTCD.

Policy 5.10.4 Temporary erosion and sediment control measures shall be used in accordance with an approved stormwater pollution prevention plan. Final approval of the permit should depend on permanent stormwater detention and pollution prevention measures being in place.

PROJECTS

This Transportation Element update considers facilities impacted by growth projected to occur within the City of Buckley over the next 20 years. Improvement projects will occur in a sequential manner as funding accrues with development planning, design, right-of-way acquisition, construction mitigations, grants, and other City sources.

The element focuses on pedestrian and vehicle capacity deficiencies and suggests improvements to bring them in line with Buckley’s LOS standard of D. Current and future pedestrian and vehicle capacity deficiencies were identified through forecasting and LOS analysis, and they primarily consist of capacity constraints due to a lack of walkways for pedestrians and inadequate intersections for vehicles. Capacity improvement projects were developed and LOS was tested using projected 2030 volumes.

Three areas for improvement have been prioritized as follows:

- Walkway improvements;
- Intersection improvements; and
- SR 410 improvements.

Four pedestrian routes are projected to fall below LOS D in 2035 with pedestrian ratings exceeding 90. Table 3 identifies the Pedestrian Level of Service and Ratings for each.

TABLE 3

Pedestrian Level of Service and Ratings

Road Segment	2013 LOS Rating	2035 LOS Rating	2035 Mitigated LOS Rating
1. Mundy Loss Road (112 th Street East – SR 410)	D (92)	F (179)	D (90)
2. Ryan Road (Spiketon Road – Levesque Road)	D (79)	F (137)	C (72)
3. West Mason Road (Natches – Hinkleman Extension)	C (76)	F (132)	C (70)

The following table lists the street segments needing improvement, the mitigation costs, and the fair share trip fees.

TABLE 4

Pedestrian Mitigations and Costs

Street	Improvement	Mitigation Cost	2013 ADT	Cost per ADT
Mundy Loss (112 th Street East – SR 410)	Curb, gutter, sidewalk one side	\$669,000	6,230	\$108
Ryan Road (Spiketon – Levesque)	Curb, gutter, sidewalk one side	\$1,584,000	2,770	\$572
Spiketon Road (South of Mt. View Avenue)	Curb, gutter, sidewalk one side	\$588,000	1,020	\$576
Total		\$2,841,000		\$1,256

The high pedestrian mitigation costs are a concern for being disproportionate compared to the intersection mitigation costs. The mitigation fee needs to be economically feasible. Pedestrian improvements are to provide walking capacity and safety but their construction provides a substantial portion of the roadway improvement.

INTERSECTION IMPROVEMENTS

Five intersections within the City of Buckley are projected to exceed LOS “D” in 2035 not including intersections along the SR 410 corridor. Appendix B shows the map and table identifying the failing intersections along with the improvements needed to maintain them at a LOS of D or higher.

These intersection improvements include signalization, turn lanes, and traffic operational improvements. The improvements frequently result in LOS higher than level D since half a lane or half a signal cannot be constructed to exactly achieve LOS D.

TABLE 5

Intersection LOS and Improvements

Intersection	2013 LOS	2035 LOS	Improvements	Mitigated LOS
Mundy Loss and 112 th Street East	B	F	Signal, turn lanes, sidewalks	C
North River Road and A Street	B	F	Signal, turn lanes, sidewalks	B
South River Road and Main Street	C	F	Signal, turn lanes, sidewalks	C
Main Street and A Street	C	F	Signal, turn lanes, sidewalks	B
SR 410 and Mundy Loss	B	F	Widen to five lanes, signal	B
SR 410 and Main	B	F	Widen to five lanes, signal	A
SR 410 and SR 165	F	F	Widen to five lanes, signal	C
SR 410 and Chamberlin, Butler, Hinkleman Extension, Jefferson, or Wickersham			New or existing stop controlled streets will require signalization and five lanes to meet LOS "D."	

The identified intersection improvements were determined using PM Peak capacity; however, the school hours, the noon hour, the AM Peak hour and other hours of the day, as well as weekends all have capacity constraints that the improvements will serve. Improvements include traffic signals that provide capacity 24 hours a day. They will serve existing traffic and increasing "through" traffic as well as new traffic associated with growth. Mitigation fair share fee estimates were prepared for the improvements as listed in the table below.

TABLE 6

Intersection Mitigations and Costs

Intersection	Improvements	Mitigation Cost	2013 AWDT	Cost per AWDT
Mundy Loss and 112 th Street East	Signal, turn lanes, sidewalks	\$1,364,000	9,070	\$150
SR 410 and SR 165	Realign SR 165	\$2,114,000	30,590	\$69
South River Road and A Street	Signal, turn lanes, sidewalks	\$797,000	7,160	\$111
South River Road and Main Street	Signal, turn lanes, sidewalks	\$789,000	5,580	\$141
Main Street and A Street	Signal, turn lanes, sidewalks	\$498,000	6,470	\$77
SR 410 and Mundy Loss	Widen to five lanes, signal	\$1,170,000	26,730	\$44
SR 410 and Main	Widen to five lanes, signal	\$1,006,000	26,150	\$38
Total		\$8,054,000		\$618

The intersection trip fee was calculated by dividing the project improvement cost by the total 2013 Average Weekday Daily traffic (AWDT) volume. Utilizing the AWDT as the fair share fee calculation denominator recognizes the multiple service capacities provided by the improvements since all traffic will be using the improvement and other sources such as grants will be funding portions of the improvements. Development traffic is to be charged for their fair share of traffic improvements based on traffic generated by the development.

The total mitigation fee would be the sum of the pedestrian and intersection improvement fees:

Intersections:	\$618
Pedestrian Improvements:	\$20
Total:	\$638

SR 410/SR 165/Ryan Road/South River Road/112th Street East Improvements

The intersection of SR 410 and SR 165 consist of a complex junction of roads. Recently, improvements to 112th Street East have improved the network by realigning it to intersection with SR 165. Currently, the City is planning on realigning SR 165 to realign its intersection with SR 410, which is expected to improve both level of service and safety. Figure 1 depicts the proposed improvements.

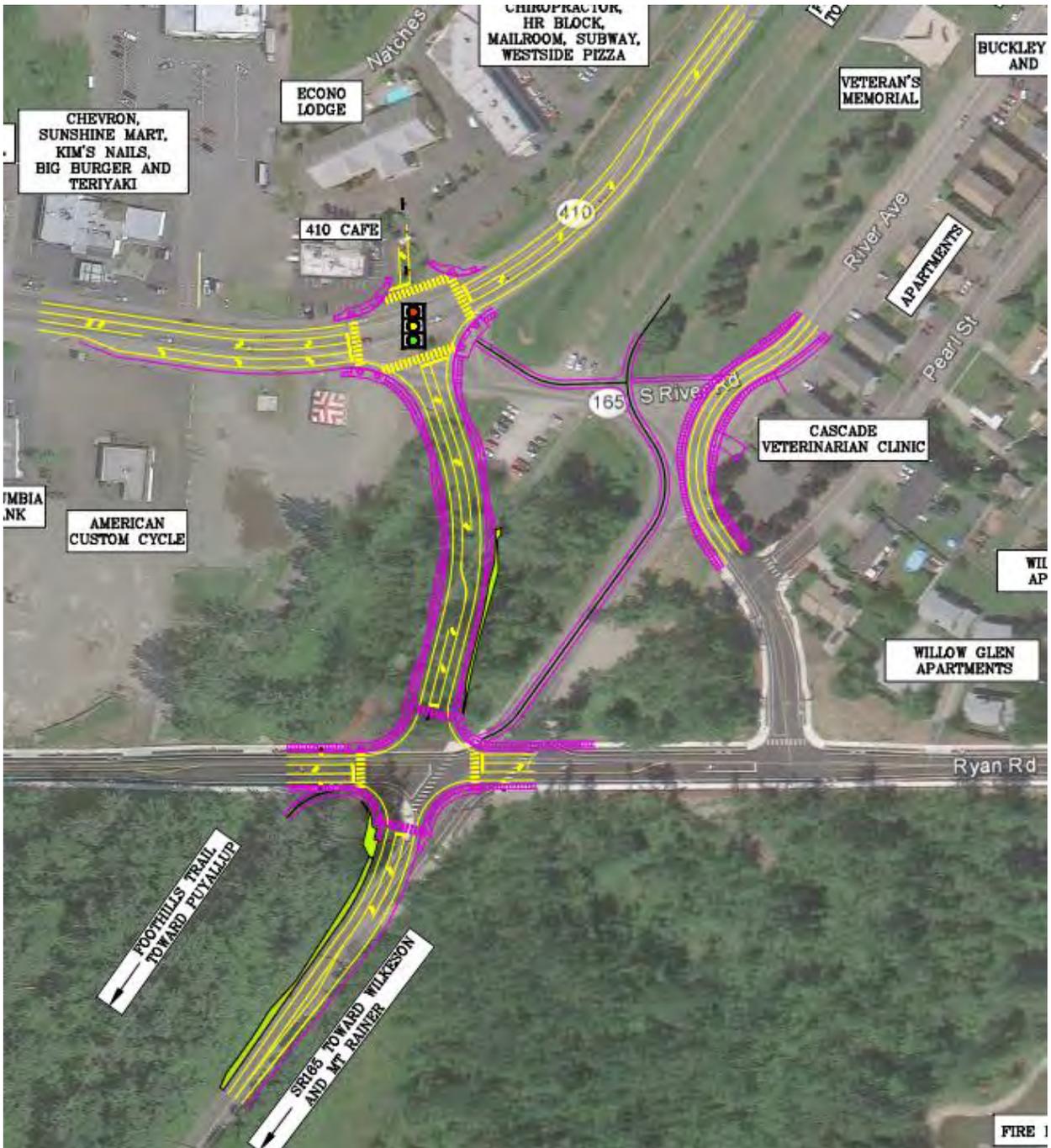


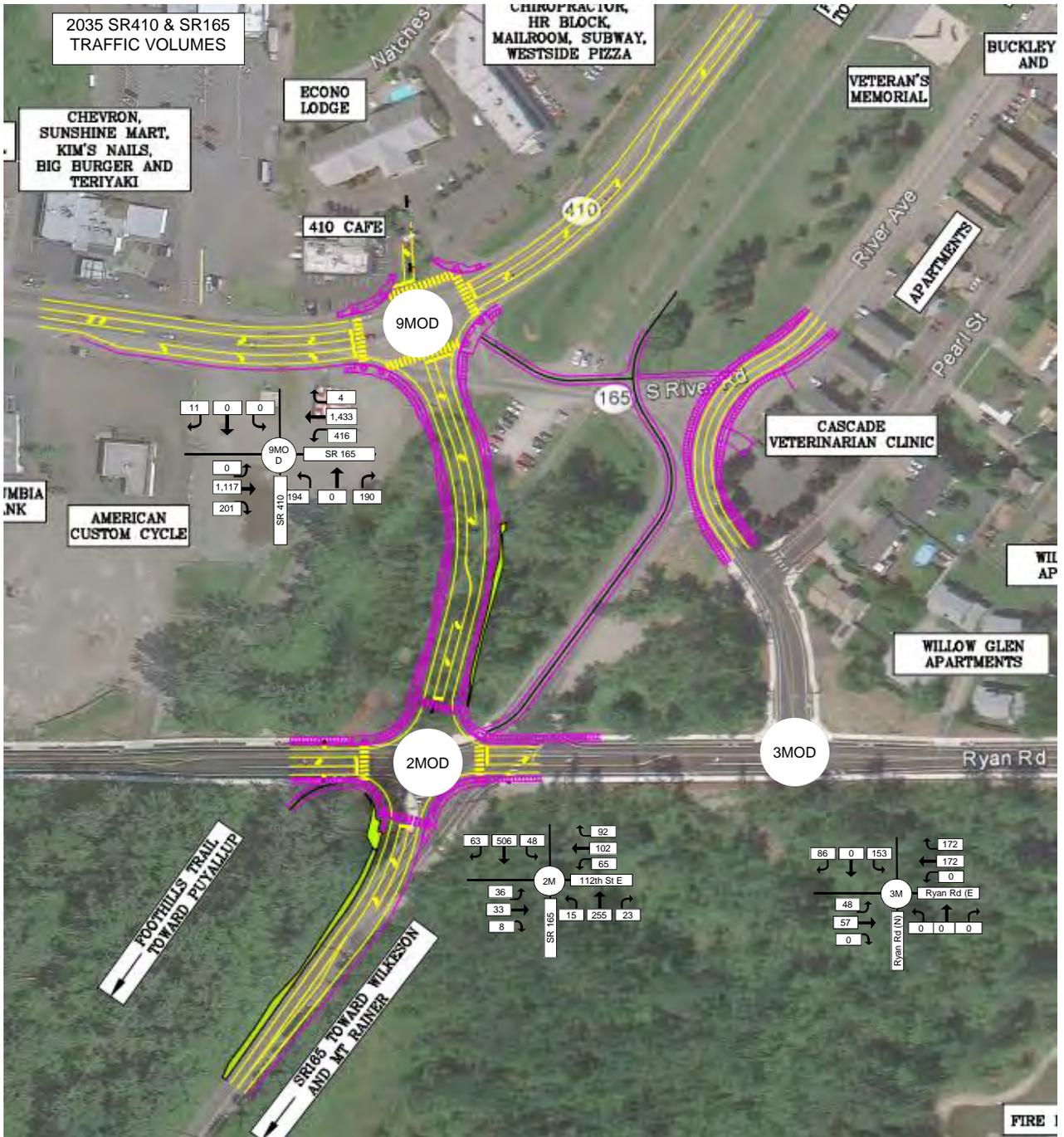
FIGURE 1

Proposed SR 410 and SR 165 Improvements

Other SR 410 Corridor Improvements

SR 410 and Chamberlin, Butler, Hinkleman Extension, Jefferson, and/or Wickersham are facilities where additional planning, design, development, and regional corridor evaluation are needed to determine future improvements. Since the SR 410 corridor is controlled by WSDOT and serves predominantly regional traffic, and since regional traffic impacts substantially exceed those of the City of Buckley, improvements along the SR 410 corridor will be administered by WSDOT with the City of Buckley being a participant along with other jurisdictions in the planning process.

APPENDIX A
VOLUME MAPS



APPENDIX B

LEVEL OF SERVICE ANALYSIS

Intersection

Intersection Delay, s/veh	8.6
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	134	25	12	6	45	2	7	53	5	0	18	81
Peak Hour Factor	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81
Heavy Vehicles, %	2	2	2	6	6	6	2	2	2	0	0	0
Mvmt Flow	165	31	15	7	56	2	9	65	6	0	22	100
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	9.3	8.2	8.3	7.9
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	11%	78%	11%	0%
Vol Thru, %	82%	15%	85%	18%
Vol Right, %	8%	7%	4%	82%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	65	171	53	99
LT Vol	53	25	45	18
Through Vol	5	12	2	81
RT Vol	7	134	6	0
Lane Flow Rate	80	211	65	122
Geometry Grp	1	1	1	1
Degree of Util (X)	0.105	0.268	0.085	0.141
Departure Headway (Hd)	4.701	4.576	4.699	4.163
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	762	785	762	862
Service Time	2.728	2.602	2.73	2.188
HCM Lane V/C Ratio	0.105	0.269	0.085	0.142
HCM Control Delay	8.3	9.3	8.2	7.9
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.4	1.1	0.3	0.5

Notes

- : Volume Exceeds Capacity; \$: Delay Exceeds 300 Seconds; Error : Computation Not Defined

Intersection

Intersection Delay, s/veh 0.9

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Vol, veh/h	0	0	4	9	1	17	3	623	33	31	958	2
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None									
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0	2	2	2	2	2	2
Mvmt Flow	0	0	4	9	1	18	3	677	36	34	1041	2

Major/Minor	Minor2		Minor1			Major1		Major2				
Conflicting Flow All	1821	1830	1042	1814	1813	695	1043	0	0	713	0	0
Stage 1	1110	1110	-	702	702	-	-	-	-	-	-	-
Stage 2	711	720	-	1112	1111	-	-	-	-	-	-	-
Follow-up Headway	3.5	4	3.3	3.5	4	3.3	2.218	-	-	2.218	-	-
Pot Capacity-1 Maneuver	60	77	281	61	79	446	667	-	-	887	-	-
Stage 1	256	287	-	432	443	-	-	-	-	-	-	-
Stage 2	427	435	-	256	287	-	-	-	-	-	-	-
Time blocked-Platoon, %								-	-	-	-	-
Mov Capacity-1 Maneuver	53	70	281	56	71	446	667	-	-	887	-	-
Mov Capacity-2 Maneuver	53	70	-	56	71	-	-	-	-	-	-	-
Stage 1	254	261	-	429	440	-	-	-	-	-	-	-
Stage 2	406	432	-	229	261	-	-	-	-	-	-	-

Approach	SE	NW	NE	SW
HCM Control Delay, s	18	41.3	0	0.3
HCM LOS	C	E		

Minor Lane / Major Mvmt	NEL	NET	NER	NWLn1	SELn1	SWL	SWT	SWR
Capacity (veh/h)	667	-	-	127	281	887	-	-
HCM Lane V/C Ratio	0.005	-	-	0.224	0.015	0.038	-	-
HCM Control Delay (s)	10.424	0	-	41.3	18	9.219	0	-
HCM Lane LOS	B	A		E	C	A	A	
HCM 95th %tile Q(veh)	0.015	-	-	0.811	0.046	0.118	-	-

Notes

~ : Volume Exceeds Capacity; \$: Delay Exceeds 300 Seconds; Error : Computation Not Defined

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	120	730	25	13	540	84	88	21	86	42	28	12
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q, 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	1863	1881	1881	1900	1900	1900	1900	1900	1900	1900
Lanes	1	1	1	1	1	0	0	1	1	0	1	1
Lane Assignment												
Cap, veh/h	157	1013	861	23	744	116	93	13	439	82	37	439
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
Prop Arrive On Green	0.09	0.54	0.54	0.01	0.47	0.47	0.27	0.27	0.27	0.27	0.27	0.27
Ln Grp Delay, s/veh	39.2	13.3	7.4	54.6	0.0	16.6	133.5	0.0	20.6	46.4	0.0	18.8
Ln Grp LOS	D	B	A	D		B	F		C	D		B
Approach Vol, veh/h		893			650			199			84	
Approach Delay, s/veh		16.6			17.3			83.6			42.4	
Approach LOS		B			B			F			D	
Timer:		1	2	3	4	5	6	7	8			
Assigned Phs			2	3	4		6	7	8			
Case No			7.0	2.0	3.0		7.0	2.0	4.0			
Phs Duration (G+Y+Rc), s			23.0	4.9	42.0		23.0	10.2	36.7			
Change Period (Y+Rc), s			4.0	4.0	4.0		4.0	4.0	4.0			
Max Allow Headway (MAH), s			4.9	3.8	5.1		4.9	3.8	5.1			
Max Green (Gmax), s			19.0	4.0	55.0		19.0	12.0	47.0			
Max Q Clear (g_c+I1), s			21.0	2.5	23.3		21.0	6.7	21.7			
Green Ext Time (g_e), s			0.0	0.0	12.0		0.0	0.1	11.0			
Prob of Phs Call (p_c)			1.00	0.22	1.00		1.00	0.91	1.00			
Prob of Max Out (p_x)			1.00	1.00	0.20		1.00	0.22	0.30			
Left-Turn Movement Data												
Assigned Mvmt			5	3			1	7				
Mvmt Sat Flow, veh/h			0	1792			0	1774				
Through Movement Data												
Assigned Mvmt			2		4		6		8			
Mvmt Sat Flow, veh/h			47		1863		135		1589			
Right-Turn Movement Data												
Assigned Mvmt			12		14		16		18			
Mvmt Sat Flow, veh/h			1615		1583		1615		248			
Left Lane Group Data												
Assigned Mvmt		0	5	3	0	0	1	7	0			
Lane Assignment			L+T	L (Prot)			L+T	L (Prot)				
Lanes in Grp		0	1	1	0	0	1	1	0			
Grp Vol (v), veh/h		0	111	13	0	0	72	122	0			
Grp Sat Flow (s), veh/h/ln		0	47	1792	0	0	135	1774	0			
Q Serve Time (g_s), s		0.0	0.0	0.5	0.0	0.0	0.0	4.7	0.0			

Cycle Q Clear Time (g_c), s	0.0	19.0	0.5	0.0	0.0	19.0	4.7	0.0
Perm LT Sat Flow (s_l), veh/h/ln	0	1388	0	0	0	1305	0	0
Shared LT Sat Flow (s_sh), veh/h/ln	0	0	0	0	0	0	0	0
Perm LT Eff Green (g_p), s	0.0	19.0	0.0	0.0	0.0	19.0	0.0	0.0
Perm LT Serve Time (g_u), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Perm LT Q Serve Time (g_ps), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Time to First Blk (g_f), s	0.0	0.5	0.0	0.0	0.0	1.3	0.0	0.0
Serve Time pre Blk (g_fs), s	0.0	0.5	0.0	0.0	0.0	1.3	0.0	0.0
Prop LT Inside Lane (P_L)	0.00	0.81	1.00	0.00	0.00	0.60	1.00	0.00
Lane Grp Cap (c), veh/h	0	106	23	0	0	119	157	0
V/C Ratio (X)	0.00	1.05	0.57	0.00	0.00	0.61	0.78	0.00
Avail Cap (c_a), veh/h	0	106	103	0	0	119	305	0
Upstream Filter (I)	0.00	1.00	1.00	0.00	0.00	1.00	1.00	0.00
Uniform Delay (d1), s/veh	0.0	32.7	34.3	0.0	0.0	25.6	31.2	0.0
Incr Delay (d2), s/veh	0.0	100.8	20.3	0.0	0.0	20.8	8.0	0.0
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	133.5	54.6	0.0	0.0	46.4	39.2	0.0
1st-Term Q (Q1), veh/ln	0.0	1.8	0.2	0.0	0.0	0.9	2.0	0.0
2nd-Term Q (Q2), veh/ln	0.0	3.0	0.1	0.0	0.0	0.7	0.3	0.0
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	1.00	1.00	0.00	0.00	1.00	1.00	0.00
%ile Back of Q (50%), veh/ln	0.0	4.8	0.3	0.0	0.0	1.6	2.3	0.0
%ile Storage Ratio (RQ%)	0.00	0.09	0.09	0.00	0.00	0.06	0.60	0.00
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	1.3	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0
Middle Lane Group Data								
Assigned Mvmt	0	2	0	4	0	6	0	8
Lane Assignment	T							
Lanes in Grp	0	0	0	1	0	0	0	0
Grp Vol (v), veh/h	0	0	0	745	0	0	0	0
Grp Sat Flow (s), veh/h/ln	0	0	0	1863	0	0	0	0
Q Serve Time (g_s), s	0.0	0.0	0.0	21.3	0.0	0.0	0.0	0.0
Cycle Q Clear Time (g_c), s	0.0	0.0	0.0	21.3	0.0	0.0	0.0	0.0
Lane Grp Cap (c), veh/h	0	0	0	1013	0	0	0	0
V/C Ratio (X)	0.00	0.00	0.00	0.74	0.00	0.00	0.00	0.00
Avail Cap (c_a), veh/h	0	0	0	1466	0	0	0	0
Upstream Filter (I)	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00
Uniform Delay (d1), s/veh	0.0	0.0	0.0	12.1	0.0	0.0	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.0	0.0	1.1	0.0	0.0	0.0	0.0
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	0.0	0.0	13.3	0.0	0.0	0.0	0.0
1st-Term Q (Q1), veh/ln	0.0	0.0	0.0	7.9	0.0	0.0	0.0	0.0
2nd-Term Q (Q2), veh/ln	0.0	0.0	0.0	0.3	0.0	0.0	0.0	0.0
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
%ile Back of Q (50%), veh/ln	0.0	0.0	0.0	8.2	0.0	0.0	0.0	0.0

%ile Storage Ratio (RQ%)	0.00	0.00	0.00	0.33	0.00	0.00	0.00	0.00
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Right Lane Group Data

Assigned Mvmt	0	12	0	14	0	16	0	18
Lane Assignment		R		R		R		T+R
Lanes in Grp	0	1	0	1	0	1	0	1
Grp Vol (v), veh/h	0	88	0	26	0	12	0	637
Grp Sat Flow (s), veh/h/ln	0	1615	0	1583	0	1615	0	1837
Q Serve Time (g_s), s	0.0	2.9	0.0	0.5	0.0	0.4	0.0	19.7
Cycle Q Clear Time (g_c), s	0.0	2.9	0.0	0.5	0.0	0.4	0.0	19.7
Prot RT Sat Flow (s_R), veh/h/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prot RT Eff Green (g_R), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prop RT Outside Lane (P_R)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	0.14
Lane Grp Cap (c), veh/h	0	439	0	861	0	439	0	860
V/C Ratio (X)	0.00	0.20	0.00	0.03	0.00	0.03	0.00	0.74
Avail Cap (c_a), veh/h	0	439	0	1246	0	439	0	1236
Upstream Filter (I)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
Uniform Delay (d1), s/veh	0.0	19.6	0.0	7.4	0.0	18.7	0.0	15.1
Incr Delay (d2), s/veh	0.0	1.0	0.0	0.0	0.0	0.1	0.0	1.4
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	20.6	0.0	7.4	0.0	18.8	0.0	16.6
1st-Term Q (Q1), veh/ln	0.0	1.1	0.0	0.2	0.0	0.1	0.0	7.8
2nd-Term Q (Q2), veh/ln	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.3
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
%ile Back of Q (50%), veh/ln	0.0	1.2	0.0	0.2	0.0	0.2	0.0	8.1
%ile Storage Ratio (RQ%)	0.00	0.30	0.00	0.04	0.00	0.04	0.00	0.34
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Intersection Summary

HCM 2010 Ctrl Delay	25.4
HCM 2010 LOS	C

Notes

Intersection												
Intersection Delay, s/veh	10.3											
Intersection LOS	B											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	24	90	96	32	13	40	31	146	6	7	204	46
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles, %	1	1	1	1	1	1	0	0	0	1	1	1
Mvmt Flow	26	97	103	34	14	43	33	157	6	8	219	49
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	10.3	9.1	10.1	10.8
HCM LOS	B	A	B	B

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	17%	11%	38%	3%
Vol Thru, %	80%	43%	15%	79%
Vol Right, %	3%	46%	47%	18%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	183	210	85	257
LT Vol	146	90	13	204
Through Vol	6	96	40	46
RT Vol	31	24	32	7
Lane Flow Rate	197	226	91	276
Geometry Grp	1	1	1	1
Degree of Util (X)	0.276	0.309	0.134	0.372
Departure Headway (Hd)	5.151	4.927	5.281	4.852
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	702	720	683	732
Service Time	3.151	3.024	3.281	2.948
HCM Lane V/C Ratio	0.281	0.314	0.133	0.377
HCM Control Delay	10.1	10.3	9.1	10.8
HCM Lane LOS	B	B	A	B
HCM 95th-tile Q	1.1	1.3	0.5	1.7

Notes

- : Volume Exceeds Capacity; \$: Delay Exceeds 300 Seconds; Error : Computation Not Defined

HCM 2010 Signalized Intersection Capacity Analysis
 3: SR410 & W Main St/E Main St

2013 Volumes Baseline
 9/15/2014

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (veh/h)	21	54	1	123	34	28	5	535	80	46	875	10
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q, 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	1900	1900	1900	1881	1900	1881	1881	1900	1863	1863	1900
Lanes	0	1	0	0	1	0	1	1	0	1	1	0
Lane Assignment												
Cap, veh/h	167	378	6	348	94	61	247	960	143	424	1103	12
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
Prop Arrive On Green	0.27	0.27	0.27	0.27	0.27	0.27	0.60	0.60	0.60	0.60	0.60	0.60
Ln Grp Delay, s/veh	17.4	0.0	0.0	20.4	0.0	0.0	19.2	0.0	9.6	12.6	0.0	16.5
Ln Grp LOS	B			C			B		A	B		B
Approach Vol, veh/h		79			192			645			969	
Approach Delay, s/veh		17.4			20.4			9.7			16.3	
Approach LOS		B			C			A			B	
Timer:		1	2	3	4	5	6	7	8			
Assigned Phs			2		4		6		8			
Case No			6.0		8.0		6.0		8.0			
Phs Duration (G+Y+Rc), s			40.0		20.0		40.0		20.0			
Change Period (Y+Rc), s			4.0		4.0		4.0		4.0			
Max Allow Headway (MAH), s			5.2		5.3		5.2		5.3			
Max Green (Gmax), s			36.0		16.0		36.0		16.0			
Max Q Clear (g_c+I1), s			26.0		3.9		25.6		8.1			
Green Ext Time (g_e), s			7.2		1.2		7.4		0.9			
Prob of Phs Call (p_c)			1.00		1.00		1.00		1.00			
Prob of Max Out (p_x)			0.83		0.06		0.82		0.35			
Left-Turn Movement Data												
Assigned Mvmt			5		7		1		3			
Mvmt Sat Flow, veh/h			610		337		786		930			
Through Movement Data												
Assigned Mvmt			2		4		6		8			
Mvmt Sat Flow, veh/h			1601		1419		1839		352			
Right-Turn Movement Data												
Assigned Mvmt			12		14		16		18			
Mvmt Sat Flow, veh/h			239		23		20		228			
Left Lane Group Data												
Assigned Mvmt		0	5	0	7	0	1	0	3			
Lane Assignment			L		L+T+R		L		L+T+R			
Lanes in Grp		0	1	0	1	0	1	0	1			
Grp Vol (v), veh/h		0	5	0	79	0	48	0	192			
Grp Sat Flow (s), veh/h/ln		0	610	0	1779	0	786	0	1510			
Q Serve Time (g_s), s		0.0	0.4	0.0	0.0	0.0	2.4	0.0	4.1			

HCM 2010 Signalized Intersection Capacity Analysis
 3: SR410 & W Main St/E Main St

2013 Volumes Baseline
 9/15/2014

Cycle Q Clear Time (g_c), s	0.0	24.0	0.0	1.9	0.0	15.2	0.0	6.1
Perm LT Sat Flow (s_l), veh/h/ln	0	610	0	1359	0	786	0	1368
Shared LT Sat Flow (s_sh), veh/h/ln	0	0	0	1900	0	0	0	1881
Perm LT Eff Green (g_p), s	0.0	36.0	0.0	16.0	0.0	36.0	0.0	16.0
Perm LT Serve Time (g_u), s	0.0	12.4	0.0	9.9	0.0	23.2	0.0	14.1
Perm LT Q Serve Time (g_ps), s	0.0	0.4	0.0	0.0	0.0	2.4	0.0	4.1
Time to First Blk (g_f), s	0.0	0.0	0.0	4.8	0.0	0.0	0.0	1.0
Serve Time pre Blk (g_fs), s	0.0	0.0	0.0	1.9	0.0	0.0	0.0	1.0
Prop LT Inside Lane (P_L)	0.00	1.00	0.00	0.28	0.00	1.00	0.00	0.67
Lane Grp Cap (c), veh/h	0	247	0	551	0	424	0	503
V/C Ratio (X)	0.00	0.02	0.00	0.14	0.00	0.11	0.00	0.38
Avail Cap (c_a), veh/h	0	247	0	551	0	424	0	503
Upstream Filter (I)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
Uniform Delay (d1), s/veh	0.0	19.0	0.0	16.8	0.0	12.0	0.0	18.2
Incr Delay (d2), s/veh	0.0	0.2	0.0	0.5	0.0	0.5	0.0	2.2
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	19.2	0.0	17.4	0.0	12.6	0.0	20.4
1st-Term Q (Q1), veh/ln	0.0	0.1	0.0	0.8	0.0	0.4	0.0	2.2
2nd-Term Q (Q2), veh/ln	0.0	0.0	0.0	0.1	0.0	0.1	0.0	0.3
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
%ile Back of Q (50%), veh/ln	0.0	0.1	0.0	0.9	0.0	0.5	0.0	2.5
%ile Storage Ratio (RQ%)	0.00	0.02	0.00	0.06	0.00	0.12	0.00	0.24
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Middle Lane Group Data								
Assigned Mvmt	0	2	0	4	0	6	0	8
Lane Assignment								
Lanes in Grp	0	0	0	0	0	0	0	0
Grp Vol (v), veh/h	0	0	0	0	0	0	0	0
Grp Sat Flow (s), veh/h/ln	0	0	0	0	0	0	0	0
Q Serve Time (g_s), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear Time (g_c), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Lane Grp Cap (c), veh/h	0	0	0	0	0	0	0	0
V/C Ratio (X)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Avail Cap (c_a), veh/h	0	0	0	0	0	0	0	0
Upstream Filter (I)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Uniform Delay (d1), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1st-Term Q (Q1), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2nd-Term Q (Q2), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
%ile Back of Q (50%), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

%ile Storage Ratio (RQ%)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Right Lane Group Data

Assigned Mvmt	0	12	0	14	0	16	0	18
Lane Assignment	T+R				T+R			
Lanes in Grp	0	1	0	0	0	1	0	0
Grp Vol (v), veh/h	0	640	0	0	0	921	0	0
Grp Sat Flow (s), veh/h/ln	0	1839	0	0	0	1859	0	0
Q Serve Time (g_s), s	0.0	12.8	0.0	0.0	0.0	23.6	0.0	0.0
Cycle Q Clear Time (g_c), s	0.0	12.8	0.0	0.0	0.0	23.6	0.0	0.0
Prot RT Sat Flow (s_R), veh/h/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prot RT Eff Green (g_R), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prop RT Outside Lane (P_R)	0.00	0.13	0.00	0.01	0.00	0.01	0.00	0.15
Lane Grp Cap (c), veh/h	0	1103	0	0	0	1116	0	0
V/C Ratio (X)	0.00	0.58	0.00	0.00	0.00	0.83	0.00	0.00
Avail Cap (c_a), veh/h	0	1103	0	0	0	1116	0	0
Upstream Filter (I)	0.00	1.00	0.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d1), s/veh	0.0	7.4	0.0	0.0	0.0	9.5	0.0	0.0
Incr Delay (d2), s/veh	0.0	2.2	0.0	0.0	0.0	7.0	0.0	0.0
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	9.6	0.0	0.0	0.0	16.5	0.0	0.0
1st-Term Q (Q1), veh/ln	0.0	4.6	0.0	0.0	0.0	8.4	0.0	0.0
2nd-Term Q (Q2), veh/ln	0.0	0.7	0.0	0.0	0.0	2.2	0.0	0.0
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
%ile Back of Q (50%), veh/ln	0.0	5.3	0.0	0.0	0.0	10.6	0.0	0.0
%ile Storage Ratio (RQ%)	0.00	0.34	0.00	0.00	0.00	0.23	0.00	0.00
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Intersection Summary

HCM 2010 Ctrl Delay	14.5
HCM 2010 LOS	B

Notes

Intersection												
Intersection Delay, s/veh	5.4											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NEL	NET	NER	SWL	SWT	SWR
Vol, veh/h	18	135	48	24	117	6	40	48	43	4	53	24
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	93	93	93	93	93	93	93	93	93	93	93	93
Heavy Vehicles, %	0	0	0	1	1	1	0	0	0	0	0	0
Mvmt Flow	19	145	52	26	126	6	43	52	46	4	57	26
Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	132	0	0	197	0	0	432	394	171	440	416	129
Stage 1	-	-	-	-	-	-	210	210	-	181	181	-
Stage 2	-	-	-	-	-	-	222	184	-	259	235	-
Follow-up Headway	2.2	-	-	2.209	-	-	3.5	4	3.3	3.5	4	3.3
Pot Capacity-1 Maneuver	1466	-	-	1382	-	-	537	546	878	531	530	926
Stage 1	-	-	-	-	-	-	797	732	-	825	754	-
Stage 2	-	-	-	-	-	-	785	751	-	750	714	-
Time blocked-Platoon, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Capacity-1 Maneuver	1466	-	-	1382	-	-	465	527	878	453	512	926
Mov Capacity-2 Maneuver	-	-	-	-	-	-	465	527	-	453	512	-
Stage 1	-	-	-	-	-	-	785	721	-	813	739	-
Stage 2	-	-	-	-	-	-	690	736	-	650	703	-
Approach	EB			WB			NE			SW		
HCM Control Delay, s	0.7			1.2			13.2			12.2		
HCM LOS	B			B			B			B		
Minor Lane / Major Mvmt	NELn1	EBL	EBT	EBR	WBL	WBT	WBR	SWLn1				
Capacity (veh/h)	579	1466	-	-	1382	-	-	586				
HCM Lane V/C Ratio	0.243	0.013	-	-	0.019	-	-	0.149				
HCM Control Delay (s)	13.2	7.489	0	-	7.654	0	-	12.2				
HCM Lane LOS	B	A	A	-	A	A	-	B				
HCM 95th %tile Q(veh)	0.948	0.04	-	-	0.057	-	-	0.519				
Notes												
~ : Volume Exceeds Capacity; \$: Delay Exceeds 300 Seconds; Error : Computation Not Defined												

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (veh/h)	80	14	16	26	17	78	31	515	20	162	931	82
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q, 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	1900	1900	1900	1900	1900	1881	1881	1881	1863	1863	1900
Lanes	0	1	0	0	1	0	1	1	1	1	1	0
Lane Assignment												
Cap, veh/h	298	48	0	224	133	0	142	1380	1173	535	1238	109
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
Prop Arrive On Green	0.18	0.18	0.00	0.18	0.18	0.00	0.73	0.73	0.73	0.73	0.73	0.73
Ln Grp Delay, s/veh	35.3	0.0	0.0	32.2	0.0	0.0	41.1	6.0	3.3	12.1	0.0	24.1
Ln Grp LOS	D			C			D	A	A	B		C
Approach Vol, veh/h		118			53			708			1468	
Approach Delay, s/veh		35.3			32.2			7.8			22.5	
Approach LOS		D			C			A			C	
Timer:		1	2	3	4	5	6	7	8			
Assigned Phs			2		4		6		8			
Case No			5.0		8.0		6.0		8.0			
Phs Duration (G+Y+Rc), s			70.0		20.0		70.0		20.0			
Change Period (Y+Rc), s			4.0		4.0		4.0		4.0			
Max Allow Headway (MAH), s			5.1		5.3		5.1		5.3			
Max Green (Gmax), s			66.0		16.0		66.0		16.0			
Max Q Clear (g_c+I1), s			62.8		7.8		55.2		4.2			
Green Ext Time (g_e), s			3.0		0.5		9.4		0.6			
Prob of Phs Call (p_c)			1.00		1.00		1.00		1.00			
Prob of Max Out (p_x)			1.00		0.21		0.92		0.03			
Left-Turn Movement Data												
Assigned Mvmt			5		7		1		3			
Mvmt Sat Flow, veh/h			440		1260		765		899			
Through Movement Data												
Assigned Mvmt			2		4		6		8			
Mvmt Sat Flow, veh/h			1881		270		1689		746			
Right-Turn Movement Data												
Assigned Mvmt			12		14		16		18			
Mvmt Sat Flow, veh/h			1599		0		148		0			
Left Lane Group Data												
Assigned Mvmt		0	5	0	7	0	1	0	3			
Lane Assignment			L		L+T		L		L+T			
Lanes in Grp		0	1	0	1	0	1	0	1			
Grp Vol (v), veh/h		0	39	0	118	0	202	0	53			
Grp Sat Flow (s), veh/h/ln		0	440	0	1530	0	765	0	1645			
Q Serve Time (g_s), s		0.0	7.5	0.0	3.6	0.0	13.1	0.0	0.0			

Cycle Q Clear Time (g_c), s	0.0	60.8	0.0	5.8	0.0	25.6	0.0	2.2
Perm LT Sat Flow (s_l), veh/h/ln	0	440	0	1413	0	765	0	1417
Shared LT Sat Flow (s_sh), veh/h/ln	0	0	0	1900	0	0	0	1731
Perm LT Eff Green (g_p), s	0.0	66.0	0.0	16.0	0.0	66.0	0.0	16.0
Perm LT Serve Time (g_u), s	0.0	12.8	0.0	13.8	0.0	53.5	0.0	10.2
Perm LT Q Serve Time (g_ps), s	0.0	7.5	0.0	3.6	0.0	13.1	0.0	0.0
Time to First Blk (g_f), s	0.0	0.0	0.0	0.4	0.0	0.0	0.0	1.3
Serve Time pre Blk (g_fs), s	0.0	0.0	0.0	0.4	0.0	0.0	0.0	1.3
Prop LT Inside Lane (P_L)	0.00	1.00	0.00	0.85	0.00	1.00	0.00	0.60
Lane Grp Cap (c), veh/h	0	142	0	346	0	535	0	357
V/C Ratio (X)	0.00	0.27	0.00	0.34	0.00	0.38	0.00	0.15
Avail Cap (c_a), veh/h	0	142	0	346	0	535	0	357
Upstream Filter (I)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
Uniform Delay (d1), s/veh	0.0	36.4	0.0	32.6	0.0	10.1	0.0	31.3
Incr Delay (d2), s/veh	0.0	4.7	0.0	2.7	0.0	2.0	0.0	0.9
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	41.1	0.0	35.3	0.0	12.1	0.0	32.2
1st-Term Q (Q1), veh/ln	0.0	0.8	0.0	2.3	0.0	2.2	0.0	1.0
2nd-Term Q (Q2), veh/ln	0.0	0.2	0.0	0.3	0.0	0.3	0.0	0.1
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
%ile Back of Q (50%), veh/ln	0.0	1.0	0.0	2.6	0.0	2.5	0.0	1.1
%ile Storage Ratio (RQ%)	0.00	0.26	0.00	0.12	0.00	0.65	0.00	0.21
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Middle Lane Group Data								
Assigned Mvmt	0	2	0	4	0	6	0	8
Lane Assignment	T							
Lanes in Grp	0	1	0	0	0	0	0	0
Grp Vol (v), veh/h	0	644	0	0	0	0	0	0
Grp Sat Flow (s), veh/h/ln	0	1881	0	0	0	0	0	0
Q Serve Time (g_s), s	0.0	12.5	0.0	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear Time (g_c), s	0.0	12.5	0.0	0.0	0.0	0.0	0.0	0.0
Lane Grp Cap (c), veh/h	0	1380	0	0	0	0	0	0
V/C Ratio (X)	0.00	0.47	0.00	0.00	0.00	0.00	0.00	0.00
Avail Cap (c_a), veh/h	0	1380	0	0	0	0	0	0
Upstream Filter (I)	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00
Uniform Delay (d1), s/veh	0.0	4.9	0.0	0.0	0.0	0.0	0.0	0.0
Incr Delay (d2), s/veh	0.0	1.1	0.0	0.0	0.0	0.0	0.0	0.0
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	6.0	0.0	0.0	0.0	0.0	0.0	0.0
1st-Term Q (Q1), veh/ln	0.0	4.5	0.0	0.0	0.0	0.0	0.0	0.0
2nd-Term Q (Q2), veh/ln	0.0	0.4	0.0	0.0	0.0	0.0	0.0	0.0
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
%ile Back of Q (50%), veh/ln	0.0	4.9	0.0	0.0	0.0	0.0	0.0	0.0

%ile Storage Ratio (RQ%)	0.00	0.11	0.00	0.00	0.00	0.00	0.00	0.00
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Right Lane Group Data

Assigned Mvmt	0	12	0	14	0	16	0	18
Lane Assignment		R				T+R		
Lanes in Grp	0	1	0	0	0	1	0	0
Grp Vol (v), veh/h	0	25	0	0	0	1266	0	0
Grp Sat Flow (s), veh/h/ln	0	1599	0	0	0	1837	0	0
Q Serve Time (g_s), s	0.0	0.4	0.0	0.0	0.0	53.2	0.0	0.0
Cycle Q Clear Time (g_c), s	0.0	0.4	0.0	0.0	0.0	53.2	0.0	0.0
Prot RT Sat Flow (s_R), veh/h/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prot RT Eff Green (g_R), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prop RT Outside Lane (P_R)	0.00	1.00	0.00	0.00	0.00	0.08	0.00	0.00
Lane Grp Cap (c), veh/h	0	1173	0	0	0	1347	0	0
V/C Ratio (X)	0.00	0.02	0.00	0.00	0.00	0.94	0.00	0.00
Avail Cap (c_a), veh/h	0	1173	0	0	0	1347	0	0
Upstream Filter (I)	0.00	1.00	0.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d1), s/veh	0.0	3.3	0.0	0.0	0.0	10.3	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.0	0.0	0.0	0.0	13.8	0.0	0.0
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	3.3	0.0	0.0	0.0	24.1	0.0	0.0
1st-Term Q (Q1), veh/ln	0.0	0.1	0.0	0.0	0.0	19.0	0.0	0.0
2nd-Term Q (Q2), veh/ln	0.0	0.0	0.0	0.0	0.0	5.2	0.0	0.0
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
%ile Back of Q (50%), veh/ln	0.0	0.1	0.0	0.0	0.0	24.2	0.0	0.0
%ile Storage Ratio (RQ%)	0.00	0.03	0.00	0.00	0.00	3.13	0.00	0.00
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Intersection Summary

HCM 2010 Ctrl Delay	18.9
HCM 2010 LOS	B

Notes

Intersection

Intersection Delay, s/veh 4.3

Movement	EBL	EBR	NBL	NBR	NEL	NET	NER	SWL	SWT	SWR
Vol, veh/h	57	110	59	7	28	16	1	6	19	43
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	-	None	-	-	None	-	-	None
Storage Length	25	0	0	-	-	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0	-	-	0	-
Grade, %	0	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	92	92	92	92	92	92
Heavy Vehicles, %	1	1	0	0	2	2	2	2	2	2
Mvmt Flow	60	116	62	7	30	17	1	7	21	47

Major/Minor	Major1	Major2	Minor1	Minor2
Conflicting Flow All	69	0 166	0 363	333 141
Stage 1	-	- -	- 261	261 - 68
Stage 2	-	- -	- 102	72 - 270
Follow-up Headway	2.209	- 2.2	- 3.518	4.018 3.318
Pot Capacity-1 Maneuver	1538	- 1424	- 593	587 907
Stage 1	-	- -	- 744	692 - 942
Stage 2	-	- -	- 904	835 - 736
Time blocked-Platoon, %		-	-	
Mov Capacity-1 Maneuver	1538	- 1424	- 532	564 907
Mov Capacity-2 Maneuver	-	- -	- 532	564 - 583
Stage 1	-	- -	- 715	665 - 905
Stage 2	-	- -	- 840	834 - 688

Approach	EB	NB	NE	SW
HCM Control Delay, s	2	0.1	12.2	10.2
HCM LOS			B	B

Minor Lane / Major Mvmt	NELn1	NBL2	NBL	NBR	EBL	EBR	EBR2	SWLn1
Capacity (veh/h)	548	1424	-	-	1538	-	-	772
HCM Lane V/C Ratio	0.089	0.001	-	-	0.039	-	-	0.096
HCM Control Delay (s)	12.2	7.53	0	-	7.436	-	-	10.2
HCM Lane LOS	B	A	A		A			B
HCM 95th %tile Q(veh)	0.293	0.002	-	-	0.122	-	-	0.316

Notes

~ : Volume Exceeds Capacity; \$: Delay Exceeds 300 Seconds; Error : Computation Not Defined

Intersection

Intersection Delay, s/veh 4.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	11	133	15	5	119	39	10	19	9	71	41	7
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None									
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	86	86	86	86	86	86	86	86	86	86	86	86
Heavy Vehicles, %	1	1	1	0	0	0	0	0	0	0	0	0
Mvmt Flow	13	155	17	6	138	45	12	22	10	83	48	8

Major/Minor	Major1	Major2	Minor1	Minor2
Conflicting Flow All	184	0	0	172
Stage 1	-	-	-	-
Stage 2	-	-	-	-
Follow-up Headway	2.209	-	-	2.2
Pot Capacity-1 Maneuver	1397	-	-	1417
Stage 1	-	-	-	-
Stage 2	-	-	-	-
Time blocked-Platoon, %	-	-	-	-
Mov Capacity-1 Maneuver	1397	-	-	1417
Mov Capacity-2 Maneuver	-	-	-	-
Stage 1	-	-	-	-
Stage 2	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.5	0.2	11.6	13.4
HCM LOS			B	B

Minor Lane / Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	593	1397	-	-	1417	-	-	565
HCM Lane V/C Ratio	0.075	0.009	-	-	0.004	-	-	0.245
HCM Control Delay (s)	11.6	7.601	0	-	7.551	0	-	13.4
HCM Lane LOS	B	A	A	-	A	A	-	B
HCM 95th %tile Q(veh)	0.241	0.028	-	-	0.012	-	-	0.956

Notes

~ : Volume Exceeds Capacity; \$: Delay Exceeds 300 Seconds; Error : Computation Not Defined

Intersection

Intersection Delay, s/veh 3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NEL	NET	NER	SWL	SWT	SWR
Vol, veh/h	19	17	4	34	53	5	8	133	12	0	264	33
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None									
Storage Length	100	-	-	100	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	98	98	98	98	98	98	98	98	98	98	98	98
Heavy Vehicles, %	0	0	0	1	1	1	2	2	2	0	0	0
Mvmt Flow	19	17	4	35	54	5	8	136	12	0	269	34

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	474	450	286	455	461	142	303	0	0	148	0	0
Stage 1	286	286	-	158	158	-	-	-	-	-	-	-
Stage 2	188	164	-	297	303	-	-	-	-	-	-	-
Follow-up Headway	3.5	4	3.3	3.509	4.009	3.309	2.218	-	-	2.2	-	-
Pot Capacity-1 Maneuver	504	508	758	517	499	908	1258	-	-	1446	-	-
Stage 1	726	679	-	847	769	-	-	-	-	-	-	-
Stage 2	818	766	-	714	665	-	-	-	-	-	-	-
Time blocked-Platoon, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Capacity-1 Maneuver	457	504	758	498	496	908	1258	-	-	1446	-	-
Mov Capacity-2 Maneuver	457	504	-	498	496	-	-	-	-	-	-	-
Stage 1	721	679	-	841	764	-	-	-	-	-	-	-
Stage 2	751	761	-	692	665	-	-	-	-	-	-	-

Approach	EB			WB			NE			SW		
HCM Control Delay, s	12.6			13			0.4			0		
HCM LOS	B			B								

Minor Lane / Major Mvmt	NEL	NET	NER	EBLn1	EBLn2	WBLn1	WBLn2	SWL	SWT	SWR
Capacity (veh/h)	1258	-	-	457	517	498	513	1446	-	-
HCM Lane V/C Ratio	0.006	-	-	0.028	0.054	0.046	0.138	-	-	-
HCM Control Delay (s)	7.88	0	-	13.1	12.4	12.6	13.1	0	-	-
HCM Lane LOS	A	A	-	B	B	B	B	A	-	-
HCM 95th %tile Q(veh)	0.02	-	-	0.087	0.171	0.146	0.476	0	-	-

Notes

~ : Volume Exceeds Capacity; \$: Delay Exceeds 300 Seconds; Error : Computation Not Defined

Intersection

Intersection Delay, s/veh	9.6
Intersection LOS	A

Movement	SBL	SBR	NWL	NWR	NEL	NET	NER	SWL	SWT	SWR
Vol, veh/h	63	254	0	80	120	37	0	20	43	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	68	276	0	87	130	40	0	22	47	0
Number of Lanes	1	0	0	1	0	1	0	0	1	0

Approach	SB	NW	NE	SW
Opposing Approach			SW	NE
Opposing Lanes	0	0	1	1
Conflicting Approach Left	SW	NE	SB	NW
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NE	SB	NW	SB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	10.1	8	9.8	8.8
HCM LOS	B	A	A	A

Lane	NELn1	NWLn1	SBLn1	SWLn1
Vol Left, %	76%	0%	20%	32%
Vol Thru, %	24%	0%	0%	68%
Vol Right, %	0%	100%	80%	0%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	157	90	317	63
LT Vol	37	0	0	43
Through Vol	0	90	254	0
RT Vol	120	0	63	20
Lane Flow Rate	171	98	345	68
Geometry Grp	1	1	1	1
Degree of Util (X)	0.243	0.118	0.404	0.099
Departure Headway (Hd)	5.121	4.33	4.221	5.182
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	696	822	851	685
Service Time	3.188	2.388	2.262	3.258
HCM Lane V/C Ratio	0.246	0.119	0.405	0.099
HCM Control Delay	9.8	8	10.1	8.8
HCM Lane LOS	A	A	B	A
HCM 95th-tile Q	0.9	0.4	2	0.3

Notes

~ : Volume Exceeds Capacity; \$: Delay Exceeds 300 Seconds; Error : Computation Not Defined

Intersection

Intersection Delay, s/veh 2.9

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Vol, veh/h	0	30	90	90	80	3
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	100	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	80	80	80	80	80	80
Heavy Vehicles, %	0	0	1	1	1	1
Mvmt Flow	0	38	112	112	100	4

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	225	0	169
Stage 1	-	-	169
Stage 2	-	-	38
Follow-up Headway	2.2	-	3.309
Pot Capacity-1 Maneuver	1356	-	878
Stage 1	-	-	863
Stage 2	-	-	987
Time blocked-Platoon, %	-	-	-
Mov Capacity-1 Maneuver	1356	-	878
Mov Capacity-2 Maneuver	-	-	878
Stage 1	-	-	863
Stage 2	-	-	987

Approach	EB	WB	SB
HCM Control Delay, s	0	0	10.3
HCM LOS			B

Minor Lane / Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1356	-	-	-	787
HCM Lane V/C Ratio	-	-	-	-	0.132
HCM Control Delay (s)	0	-	-	-	10.3
HCM Lane LOS	A				B
HCM 95th %tile Q(veh)	0	-	-	-	0.453

Notes

~ : Volume Exceeds Capacity; \$: Delay Exceeds 300 Seconds; Error : Computation Not Defined

Intersection

Intersection Delay, s/veh 5.2

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Vol, veh/h	0	105	101	99	217	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	90	90	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	117	110	108	236	0

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	217	0	164
Stage 1	-	-	-
Stage 2	-	-	-
Follow-up Headway	2.218	-	3.318
Pot Capacity-1 Maneuver	1353	-	881
Stage 1	-	-	-
Stage 2	-	-	-
Time blocked-Platoon, %	-	-	-
Mov Capacity-1 Maneuver	1353	-	881
Mov Capacity-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	12.6
HCM LOS			B

Minor Lane / Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1353	-	-	-	709
HCM Lane V/C Ratio	-	-	-	-	0.333
HCM Control Delay (s)	0	-	-	-	12.6
HCM Lane LOS	A				B
HCM 95th %tile Q(veh)	0	-	-	-	1.46

Notes

~ : Volume Exceeds Capacity; \$: Delay Exceeds 300 Seconds; Error : Computation Not Defined

Intersection

Intersection Delay, s/veh 0

Movement	EBL	EBR	NBL	NBR	SWL	SWR
Vol, veh/h	583	0	0	99	217	748
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Stop	Stop	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	0	100	0
Veh in Median Storage, #	0	-	0	-	0	-
Grade, %	0	-	0	-	0	-
Peak Hour Factor	92	92	90	90	90	90
Heavy Vehicles, %	2	2	2	2	3	3
Mvmt Flow	634	0	0	110	241	831

Major/Minor	Major1	Minor1	Major2
Conflicting Flow All	0	0	0
Stage 1	-	0	-
Stage 2	-	0	-
Follow-up Headway	-	-	-
Pot Capacity-1 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-
Time blocked-Platoon, %	-	-	-
Mov Capacity-1 Maneuver	-	-	-
Mov Capacity-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	EB	NB	SW
HCM Control Delay, s	0	+	0
HCM LOS		-	

Minor Lane / Major Mvmt	NBLn1	EBL	EBR	SWL	SWR
Capacity (veh/h)	+	-	-	-	-
HCM Lane V/C Ratio	+	-	-	-	-
HCM Control Delay (s)	+	-	-	-	-
HCM Lane LOS	+				
HCM 95th %tile Q(veh)	+	-	-	-	-

Notes

~ : Volume Exceeds Capacity; \$: Delay Exceeds 300 Seconds; Error : Computation Not Defined

Intersection

Intersection Delay, s/veh 0

Movement	EBL	EBT	WBT	WBR	SWL	SWR
Vol, veh/h	583	105	101	0	0	748
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Stop	Stop	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	90	90	92	92	90	90
Heavy Vehicles, %	3	3	2	2	3	3
Mvmt Flow	648	117	110	0	0	831

Major/Minor	Major1	Minor1	Major2
Conflicting Flow All	831	0	2243 117 117
Stage 1	-	-	1412 - -
Stage 2	-	-	831 - -
Follow-up Headway	-	-	4.018 3.318 2.227
Pot Capacity-1 Maneuver	-	-	# 42 935 1465
Stage 1	-	-	204 - -
Stage 2	-	-	- - -
Time blocked-Platoon, %	-	-	-
Mov Capacity-1 Maneuver	-	-	# 0 935 1465
Mov Capacity-2 Maneuver	-	-	# 0 - -
Stage 1	-	-	# 0 - -
Stage 2	-	-	# 0 - -

Approach	EB	WB	SW
HCM Control Delay, s	0	+	0
HCM LOS		-	

Minor Lane / Major Mvmt	EBL	EBT	WBLn1	SWL	SWR
Capacity (veh/h)	-	-	+	1465	-
HCM Lane V/C Ratio	-	-	+	-	-
HCM Control Delay (s)	-	-	+	0	-
HCM Lane LOS			+	A	
HCM 95th %tile Q(veh)	-	-	+	0	-

Notes

~ : Volume Exceeds Capacity; \$: Delay Exceeds 300 Seconds; Error : Computation Not Defined

Intersection

Intersection Delay, s/veh 0.4

Movement	EBL	EBR	NEL	NET	SWT	SWR
Vol, veh/h	5	0	0	47	63	0
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	5	0	0	51	68	0

Major/Minor	Minor2	Major1			Major2	
Conflicting Flow All	119	68	68	0	-	0
Stage 1	68	-	-	-	-	-
Stage 2	51	-	-	-	-	-
Follow-up Headway	3.518	3.318	2.218	-	-	-
Pot Capacity-1 Maneuver	877	995	1533	-	-	-
Stage 1	955	-	-	-	-	-
Stage 2	971	-	-	-	-	-
Time blocked-Platoon, %				-	-	-
Mov Capacity-1 Maneuver	877	995	1533	-	-	-
Mov Capacity-2 Maneuver	877	-	-	-	-	-
Stage 1	955	-	-	-	-	-
Stage 2	971	-	-	-	-	-

Approach	EB	NE	SW
HCM Control Delay, s	9.1	0	0
HCM LOS	A		

Minor Lane / Major Mvmt	NEL	NET	EBLn1	SWT	SWR
Capacity (veh/h)	1533	-	877	-	-
HCM Lane V/C Ratio	-	-	0.006	-	-
HCM Control Delay (s)	0	-	9.1	-	-
HCM Lane LOS	A		A		
HCM 95th %tile Q(veh)	0	-	0.019	-	-

Notes

~ : Volume Exceeds Capacity; \$: Delay Exceeds 300 Seconds; Error : Computation Not Defined

Lanes, Volumes, Timings
 3: SR165(River Rd)/SR165 & 112th St E/Ryan Rd

2013 Volumes
 9/15/2014



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	19	17	4	34	53	48	8	133	12	25	264	33
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	100		0	100		0	100		0	100		0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.971			0.926			0.989			0.983	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1845	0	1787	1734	0	1770	1842	0	1770	1831	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1770	1845	0	1787	1734	0	1770	1842	0	1770	1831	0
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		745			456			374			611	
Travel Time (s)		16.9			10.4			8.5			13.9	
Peak Hour Factor	0.92	0.98	0.98	0.98	0.98	0.92	0.98	0.92	0.98	0.92	0.92	0.92
Heavy Vehicles (%)	2%	0%	0%	1%	1%	2%	2%	2%	2%	2%	2%	2%
Adj. Flow (vph)	21	17	4	35	54	52	8	145	12	27	287	36
Shared Lane Traffic (%)												
Lane Group Flow (vph)	21	21	0	35	106	0	8	157	0	27	323	0
Enter Blocked Intersection	No											
Lane Alignment	Left	Left	Right									
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane								Yes			Yes	
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Stop			Stop			Free			Free	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	36.0%
Analysis Period (min)	15
	ICU Level of Service A

Lanes and Geometrics
 3: SR165(River Rd)/SR165 & 112th St E/Ryan Rd

2013 Volumes
 9/15/2014



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	100		0	100		0	100		0	100		0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.971			0.926			0.989			0.983	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1845	0	1787	1734	0	1770	1842	0	1770	1831	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1770	1845	0	1787	1734	0	1770	1842	0	1770	1831	0
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		745			456			374			611	
Travel Time (s)		16.9			10.4			8.5			13.9	

Intersection Summary

Area Type: Other

Intersection

Intersection Delay, s/veh 3.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	19	17	4	34	53	48	8	133	12	25	264	33
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None									
Storage Length	100	-	-	100	-	-	100	-	-	100	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	98	98	98	98	92	98	92	98	92	92	92
Heavy Vehicles, %	2	0	0	1	1	2	2	2	2	2	2	2
Mvmt Flow	21	17	4	35	54	52	8	145	12	27	287	36

Major/Minor

	Minor2	Minor1			Major1			Major2				
Conflicting Flow All	579	532	305	537	544	151	323	0	0	157	0	0
Stage 1	359	359	-	167	167	-	-	-	-	-	-	-
Stage 2	220	173	-	370	377	-	-	-	-	-	-	-
Follow-up Headway	3.518	4	3.3	3.509	4.009	3.318	2.218	-	-	2.218	-	-
Pot Capacity-1 Maneuver	426	456	740	456	448	895	1237	-	-	1423	-	-
Stage 1	659	631	-	837	762	-	-	-	-	-	-	-
Stage 2	782	760	-	652	618	-	-	-	-	-	-	-
Time blocked-Platoon, %								-	-	-	-	-
Mov Capacity-1 Maneuver	356	444	740	432	437	895	1237	-	-	1423	-	-
Mov Capacity-2 Maneuver	356	444	-	432	437	-	-	-	-	-	-	-
Stage 1	655	619	-	832	757	-	-	-	-	-	-	-
Stage 2	679	755	-	618	606	-	-	-	-	-	-	-

Approach

	EB	WB	NB	SB
HCM Control Delay, s	14.3	13.2	0.4	0.6
HCM LOS	B	B		

Minor Lane / Major Mvmt

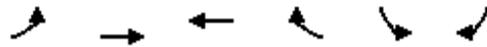
	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1237	-	-	356	443	432	564	1423	-	-
HCM Lane V/C Ratio	0.007	-	-	0.039	0.064	0.054	0.209	0.019	-	-
HCM Control Delay (s)	7.93	-	-	15.5	13.7	13.8	13.1	7.579	-	-
HCM Lane LOS	A			C	B	B	B	A		
HCM 95th %tile Q(veh)	0.02	-	-	0.12	0.204	0.169	0.781	0.058	-	-

Notes

~ : Volume Exceeds Capacity; \$: Delay Exceeds 300 Seconds; Error : Computation Not Defined

Lanes, Volumes, Timings
10: Ryan Rd & River Ave

2013 Volumes
9/15/2014



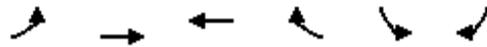
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	25	30	90	90	80	45
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	100			0	0	0
Storage Lanes	1			0	1	0
Taper Length (ft)	25				25	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.932		0.952	
Flt Protected	0.950				0.969	
Satd. Flow (prot)	1805	1900	1753	0	1735	0
Flt Permitted	0.950				0.969	
Satd. Flow (perm)	1805	1900	1753	0	1735	0
Link Speed (mph)		30	30		30	
Link Distance (ft)		456	975		612	
Travel Time (s)		10.4	22.2		13.9	
Peak Hour Factor	0.80	0.80	0.80	0.80	0.80	0.80
Heavy Vehicles (%)	0%	0%	1%	1%	1%	1%
Adj. Flow (vph)	31	38	113	113	100	56
Shared Lane Traffic (%)						
Lane Group Flow (vph)	31	38	224	0	156	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		12	12		12	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15			9	15	9
Sign Control		Free	Free		Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	30.8%
Analysis Period (min)	15
	ICU Level of Service A

Lanes and Geometrics
10: Ryan Rd & River Ave

2013 Volumes
9/15/2014



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)		0%	0%		0%	
Storage Length (ft)	100			0	0	0
Storage Lanes	1			0	1	0
Taper Length (ft)	25				25	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt			0.932		0.952	
Flt Protected	0.950				0.969	
Satd. Flow (prot)	1805	1900	1753	0	1735	0
Flt Permitted	0.950				0.969	
Satd. Flow (perm)	1805	1900	1753	0	1735	0
Link Speed (mph)		30	30		30	
Link Distance (ft)		456	975		612	
Travel Time (s)		10.4	22.2		13.9	

Intersection Summary

Area Type: Other

Intersection

Intersection Delay, s/veh 4.4

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Vol, veh/h	25	30	90	90	80	45
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	100	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	80	80	80	80	80	80
Heavy Vehicles, %	0	0	1	1	1	1
Mvmt Flow	31	38	112	112	100	56

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	225	0	169
Stage 1	-	-	169
Stage 2	-	-	100
Follow-up Headway	2.2	-	3.309
Pot Capacity-1 Maneuver	1356	-	878
Stage 1	-	-	863
Stage 2	-	-	927
Time blocked-Platoon, %	-	-	-
Mov Capacity-1 Maneuver	1356	-	878
Mov Capacity-2 Maneuver	-	-	705
Stage 1	-	-	863
Stage 2	-	-	906

Approach	EB	WB	SB
HCM Control Delay, s	3.5	0	11
HCM LOS			B

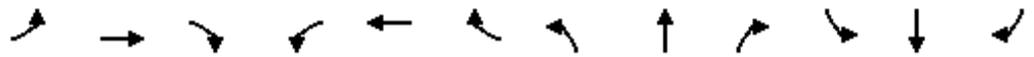
Minor Lane / Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1356	-	-	-	759
HCM Lane V/C Ratio	0.023	-	-	-	0.206
HCM Control Delay (s)	7.717	-	-	-	11
HCM Lane LOS	A				B
HCM 95th %tile Q(veh)	0.071	-	-	-	0.77

Notes

~ : Volume Exceeds Capacity; \$: Delay Exceeds 300 Seconds; Error : Computation Not Defined

Lanes, Volumes, Timings
12: SR165/Driveway & SR410

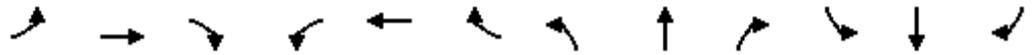
2013 Volumes
9/15/2014



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	583	105	217	748	2	101	0	99	0	0	6
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	150		200	100		0	100		0	25		0
Storage Lanes	1		1	1		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.997	0.850					0.850			0.850	
Flt Protected				0.950			0.950					
Satd. Flow (prot)	1863	1764	1504	1770	1863	0	1770	1583	0	1863	1583	0
Flt Permitted				0.306			0.753					
Satd. Flow (perm)	1863	1764	1504	570	1863	0	1403	1583	0	1863	1583	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		3	103					276			184	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		715			623			611			116	
Travel Time (s)		16.3			14.2			13.9			2.6	
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
Adj. Flow (vph)	0	634	114	236	813	2	110	0	108	0	0	7
Shared Lane Traffic (%)			10%									
Lane Group Flow (vph)	0	645	103	236	815	0	110	108	0	0	7	0
Enter Blocked Intersection	No											
Lane Alignment	Left	Left	Right									
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane				Yes				Yes				
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2		1	2		1	2	
Detector Template	Left	Thru	Right	Left	Thru		Left	Thru		Left	Thru	
Leading Detector (ft)	20	100	20	20	100		20	100		20	100	
Trailing Detector (ft)	0	0	0	0	0		0	0		0	0	
Detector 1 Position(ft)	0	0	0	0	0		0	0		0	0	
Detector 1 Size(ft)	20	6	20	20	6		20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA	Perm	Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8			2			6		
Detector Phase	4	4	4	8	8		2	2		6	6	

Lanes, Volumes, Timings
12: SR165/Driveway & SR410

2013 Volumes
9/15/2014



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Switch Phase												
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
Minimum Split (s)	20.0	20.0	20.0	20.0	20.0		20.0	20.0		20.0	20.0	
Total Split (s)	40.0	40.0	40.0	40.0	40.0		20.0	20.0		20.0	20.0	
Total Split (%)	66.7%	66.7%	66.7%	66.7%	66.7%		33.3%	33.3%		33.3%	33.3%	
Maximum Green (s)	36.0	36.0	36.0	36.0	36.0		16.0	16.0		16.0	16.0	
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5		0.5	0.5		0.5	0.5	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None	None	None	None		Min	Min		Min	Min	
Walk Time (s)	5.0	5.0	5.0	5.0	5.0		5.0	5.0		5.0	5.0	
Flash Dont Walk (s)	11.0	11.0	11.0	11.0	11.0		11.0	11.0		11.0	11.0	
Pedestrian Calls (#/hr)	0	0	0	0	0		0	0		0	0	
Act Effct Green (s)		26.2	26.2	26.2	26.2		9.3	9.3				9.3
Actuated g/C Ratio		0.59	0.59	0.59	0.59		0.21	0.21				0.21
v/c Ratio		0.62	0.11	0.70	0.74		0.37	0.20				0.01
Control Delay		8.7	1.4	20.5	11.3		21.8	0.8				0.0
Queue Delay		0.0	0.0	0.0	0.0		0.0	0.0				0.0
Total Delay		8.7	1.4	20.5	11.3		21.8	0.8				0.0
LOS		A	A	C	B		C	A				A
Approach Delay		7.7			13.4			11.4				0.0
Approach LOS		A			B			B				A

Intersection Summary

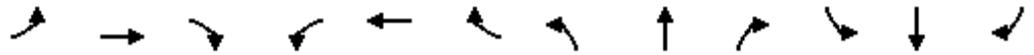
Area Type: Other
 Cycle Length: 60
 Actuated Cycle Length: 44.3
 Natural Cycle: 60
 Control Type: Actuated-Uncoordinated
 Maximum v/c Ratio: 0.74
 Intersection Signal Delay: 11.0
 Intersection Capacity Utilization 67.1%
 Analysis Period (min) 15
 Intersection LOS: B
 ICU Level of Service C

Splits and Phases: 12: SR165/Driveway & SR410



Lanes and Geometrics
 12: SR165/Driveway & SR410

2013 Volumes
 9/15/2014



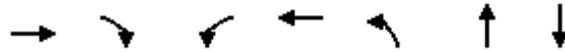
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	150		200	100		0	100		0	25		0
Storage Lanes	1		1	1		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		0.997	0.850					0.850			0.850	
Flt Protected				0.950			0.950					
Satd. Flow (prot)	1863	1764	1504	1770	1863	0	1770	1583	0	1863	1583	0
Flt Permitted				0.306			0.753					
Satd. Flow (perm)	1863	1764	1504	570	1863	0	1403	1583	0	1863	1583	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		3	103					276				184
Link Speed (mph)		30			30			30				30
Link Distance (ft)		715			623			611				116
Travel Time (s)		16.3			14.2			13.9				2.6

Intersection Summary

Area Type: Other

Queues
12: SR165/Driveway & SR410

2013 Volumes
9/15/2014



Lane Group	EBT	EBR	WBL	WBT	NBL	NBT	SBT
Lane Group Flow (vph)	645	103	236	815	110	108	7
v/c Ratio	0.62	0.11	0.70	0.74	0.37	0.20	0.01
Control Delay	8.7	1.4	20.5	11.3	21.8	0.8	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	8.7	1.4	20.5	11.3	21.8	0.8	0.0
Queue Length 50th (ft)	84	0	32	114	26	0	0
Queue Length 95th (ft)	201	13	#160	275	69	0	0
Internal Link Dist (ft)	635			543		531	36
Turn Bay Length (ft)		200	100		100		
Base Capacity (vph)	1427	1236	461	1507	551	789	734
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.45	0.08	0.51	0.54	0.20	0.14	0.01

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

HCM 2010 Computation does not support turning movement with Shared and Exclusive lanes.

HCM 2010 Computation does not support turning movement with Shared and Exclusive lanes.

Two Way Analysis cannot be performed on Signalized Intersection.

Intersection

Intersection Delay, s/veh 3.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	19	17	4	34	53	48	8	133	12	25	264	33
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None									
Storage Length	100	-	-	100	-	-	100	-	-	100	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	98	98	98	98	92	98	92	98	92	92	92
Heavy Vehicles, %	2	0	0	1	1	2	2	2	2	2	2	2
Mvmt Flow	21	17	4	35	54	52	8	145	12	27	287	36

Major/Minor

	Minor2	Minor1			Major1			Major2				
Conflicting Flow All	579	532	305	537	544	151	323	0	0	157	0	0
Stage 1	359	359	-	167	167	-	-	-	-	-	-	-
Stage 2	220	173	-	370	377	-	-	-	-	-	-	-
Follow-up Headway	3.518	4	3.3	3.509	4.009	3.318	2.218	-	-	2.218	-	-
Pot Capacity-1 Maneuver	426	456	740	456	448	895	1237	-	-	1423	-	-
Stage 1	659	631	-	837	762	-	-	-	-	-	-	-
Stage 2	782	760	-	652	618	-	-	-	-	-	-	-
Time blocked-Platoon, %								-	-	-	-	-
Mov Capacity-1 Maneuver	356	444	740	432	437	895	1237	-	-	1423	-	-
Mov Capacity-2 Maneuver	356	444	-	432	437	-	-	-	-	-	-	-
Stage 1	655	619	-	832	757	-	-	-	-	-	-	-
Stage 2	679	755	-	618	606	-	-	-	-	-	-	-

Approach

	EB	WB	NB	SB
HCM Control Delay, s	14.3	13.2	0.4	0.6
HCM LOS	B	B		

Minor Lane / Major Mvmt

	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1237	-	-	356	443	432	564	1423	-	-
HCM Lane V/C Ratio	0.007	-	-	0.039	0.064	0.054	0.209	0.019	-	-
HCM Control Delay (s)	7.93	-	-	15.5	13.7	13.8	13.1	7.579	-	-
HCM Lane LOS	A			C	B	B	B	A		
HCM 95th %tile Q(veh)	0.02	-	-	0.12	0.204	0.169	0.781	0.058	-	-

Notes

~ : Volume Exceeds Capacity; \$: Delay Exceeds 300 Seconds; Error : Computation Not Defined

Intersection

Intersection Delay, s/veh 4.4

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Vol, veh/h	25	30	90	90	80	45
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	100	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	80	80	80	80	80	80
Heavy Vehicles, %	0	0	1	1	1	1
Mvmt Flow	31	38	112	112	100	56

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	225	0	169
Stage 1	-	-	169
Stage 2	-	-	100
Follow-up Headway	2.2	-	3.309
Pot Capacity-1 Maneuver	1356	-	878
Stage 1	-	-	863
Stage 2	-	-	927
Time blocked-Platoon, %	-	-	-
Mov Capacity-1 Maneuver	1356	-	878
Mov Capacity-2 Maneuver	-	-	705
Stage 1	-	-	863
Stage 2	-	-	906

Approach	EB	WB	SB
HCM Control Delay, s	3.5	0	11
HCM LOS			B

Minor Lane / Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1356	-	-	-	759
HCM Lane V/C Ratio	0.023	-	-	-	0.206
HCM Control Delay (s)	7.717	-	-	-	11
HCM Lane LOS	A				B
HCM 95th %tile Q(veh)	0.071	-	-	-	0.77

Notes

~ : Volume Exceeds Capacity; \$: Delay Exceeds 300 Seconds; Error : Computation Not Defined

Intersection												
Intersection Delay, s/veh	35.4											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	0	583	105	217	748	2	101	0	99	0	0	6
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	150	-	200	100	-	-	100	-	-	25	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	634	114	236	813	2	110	0	108	0	0	7
Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	815	0	0	634	0	0	1923	1921	634	1974	1920	814
Stage 1	-	-	-	-	-	-	634	634	-	1286	1286	-
Stage 2	-	-	-	-	-	-	1289	1287	-	688	634	-
Follow-up Headway	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Capacity-1 Maneuver	812	-	-	949	-	-	# 51	67	479	47	67	378
Stage 1	-	-	-	-	-	-	467	473	-	202	235	-
Stage 2	-	-	-	-	-	-	201	235	-	436	473	-
Time blocked-Platoon, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Capacity-1 Maneuver	812	-	-	949	-	-	# 41	50	479	29	50	378
Mov Capacity-2 Maneuver	-	-	-	-	-	-	# 41	50	-	29	50	-
Stage 1	-	-	-	-	-	-	467	473	-	202	177	-
Stage 2	-	-	-	-	-	-	148	177	-	338	473	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	0			2.3			\$ 318			14.7		
HCM LOS							F			B		
Minor Lane / Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2		
Capacity (veh/h)	41	129	812	-	-	949	-	-	0	378		
HCM Lane V/C Ratio	1.785	1.118	-	-	-	0.249	-	-	+	0.017		
HCM Control Delay (s)	\$ 588.4	180.8	0	-	-	10.044	-	-	0	14.7		
HCM Lane LOS	F	F	A			B			A	B		
HCM 95th %tile Q(veh)	7.624	8.365	0	-	-	0.981	-	-	+	0.053		
Notes												
~ : Volume Exceeds Capacity; \$: Delay Exceeds 300 Seconds; Error : Computation Not Defined												

Table 8. Pedestrian Ratings

Multiply Pedestrian Safety Factors and divide by 100 to obtain index:

$$((\text{Ped Type} + \text{Ped Vol}) \times \text{AWDT} \times \text{SW} \times \text{Speed} \times \text{RW}) / 100 = \text{INDEX}$$

Ped Type Factor : Ped Volume Factor:
 is 1.00 plus 1.0 < 10 peds/day
 0.75 if there are handicapped, or 1.1 < 50 peds/day
 school children, or elderly users 1.2 < 100 peds/day

Assumed Horizon Year 2035

Assumed growth factor: 3%

Multiply Factors for rating:		(Add type+volume)		Vehicle Volume	Shoulder Width	Speed Limit	Road Width	Rating
		Ped Type	Ped Volume	(AWDT) ^{1/3}	2(10-SW) Shoulder Factor Range:	(SPD/2) ^{2/3}	(30-RW) ^{1/3}	PROD/100
		1.00 + 0.75 if HC/sch 1.00 - 1.75	Ped Factor Range: 2.00 - 2.95	Volume Factor Range: 10-20	12-18	Speed Factor Range: 4-10	Road Width Range: 1.0 - 2.5	
1	Mundy Loss Rd (South of 112 St SE)	Ped Type	Ped Volume	Vehicle Volume	Shoulder Width	Speed Limit	Road Width	INDEX
	East Shoulder	1	1.1	6,150	0.5	35	21	102
	West Shoulder	1	1.1	6,150	0.5	35	21	102
	2013 Rating	1	1.1	6,150	0.5	35	21	102
	2035 Rating	1.75	1.2	11,780	0.5	35	21	179
Mitigated	2035 Rating	1.75	1.2	11,780	5	35	22	90
2	Mundy Loss Rd (112 St SE - SR410)	Ped Type	Ped Volume	Vehicle Volume	Shoulder Width	Speed Limit	Road Width	INDEX
	East Shoulder	1	1.1	6,220	1.5	35	21	92
	West Shoulder	1	1.1	6,220	1.5	35	21	92
	2013 Rating	1	1.1	6,220	1.5	35	21	92
	2035 Rating	1.75	1.2	11,920	1.5	35	21	161
Mitigated	2035 Rating	1.75	1.2	11,920	5	35	23	87

3	Ryan Road (Spiketon Rd- Levesque Rd)	Ped Type	Ped Volume	Vehicle Volume	Shoulder Width	Speed Limit	Road Width	INDEX
	East Shoulder	1	1.1	2,770	0.5	35	21	79
	West Shoulder	1	1.1	2,770	0.5	35	21	79
	2013 Rating	1	1.1	2,770	0.5	35	21	79
	2035 Rating	1.75	1.2	5,310	0.5	35	21	137
Mitigated	2035 Rating	1.75	1.2	5,310	5	35	21	72
4	Mundy Loss Rd (North of Hinkleman Rd)	Ped Type	Ped Volume	Vehicle Volume	Shoulder Width	Speed Limit	Road Width	INDEX
	East Shoulder	1	1.1	1,600	0.5	35	21	65
	West Shoulder	1	1.1	1,600	0.5	35	21	65
	2013 Rating	1	1.1	1,600	0.5	35	21	65
	2035 Rating	1.75	1.2	3,070	0.5	35	21	114
Mitigated	2035 Rating	1.75	1.2	3,070	5	35	21	60
5	W Mason Rd (Natches - Hinkleman Ext)	Ped Type	Ped Volume	Vehicle Volume	Shoulder Width	Speed Limit	Road Width	INDEX
	North Shoulder	1	1.1	2,500	0.5	35	21	76
	South Shoulder	1	1.1	2,500	5	35	21	40
	2013 Rating	1	1.1	2,500	0.5	35	21	76
	2035 Rating	1.75	1.2	4,790	0.5	35	21	132
Mitigated	2035 Rating	1.75	1.2	4,790	5	35	21	70
6	112 St SE (West of SR165)	Ped Type	Ped Volume	Vehicle Volume	Shoulder Width	Speed Limit	Road Width	INDEX
	North Shoulder	1	1.1	1,700	4	35	21	42
	South Shoulder	1	1.1	1,700	6	35	21	28

	2013 Rating	1	1.1	1,700	4	35	21	42
	2035 Rating	1.75	1.2	3,260	0.5	35	21	117
Mitigated	2035 Rating	1.75	1.2	3,260	5	35	21	61
7	Spiketon Rd (South of Mt View Ave)	Ped Type	Ped Volume	Vehicle Volume	Shoulder Width	Speed Limit	Road Width	INDEX
	East Shoulder	1	1.1	1020	0.5	35	21	56
	West Shoulder	1	1.1	1020	5	35	21	30
	2013 Rating	1	1.1	1020	0.5	35	21	56
	2035 Rating	1.75	1.2	1,950	0.5	35	21	98
Mitigated	2035 Rating	1.75	1.2	1,950	5	35	21	52
8	Collins Rd (Sergeant - Levesque Rd)	Ped Type	Ped Volume	Vehicle Volume	Shoulder Width	Speed Limit	Road Width	INDEX
	East Shoulder	1	1.1	820	0.5	25	21	42
	West Shoulder	1	1.1	820	0.5	25	21	42
	2013 Rating	1	1.1	820	0.5	25	21	42
	2035 Rating	1.75	1.2	1,570	0.5	25	21	73
	2035 Rating	1.75	1.2	2,900	0.5	25	21	90
Mitigated	2035 Rating	1.75	1.2	1,570	5	25	21	38

8	Levesque Rd	Ped Type	Ped Volume	Vehicle Volume	Shoulder Width	Speed Limit	Road Width	INDEX
	East Shoulder	1	1.1	430	0.5	25	21	34
	West Shoulder	1	1.1	430	0.5	25	21	34
	2013 Rating	1	1.1	430	0.5	25	21	34
	2035 Rating	1.75	1.2	820	0.5	25	21	59
Mitigated	2035 Rating	1.75	1.2	820	5	25	21	31

Pedestrian Rating	Level of Service
<40	A
40 –	50 B
50 –	70 C
70 –	90 D
90 –	110 E
>110	F

Intersection												
Intersection Delay, s/veh	13											
Intersection LOS	B											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	257	48	23	11	86	4	13	102	10	0	34	155
Peak Hour Factor	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81
Heavy Vehicles, %	2	2	2	6	6	6	2	2	2	0	0	0
Mvmt Flow	317	59	28	14	106	5	16	126	12	0	42	191
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	16	10.2	10.7	10.8
HCM LOS	C	B	B	B

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	10%	78%	11%	0%
Vol Thru, %	82%	15%	85%	18%
Vol Right, %	8%	7%	4%	82%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	125	328	101	189
LT Vol	102	48	86	34
Through Vol	10	23	4	155
RT Vol	13	257	11	0
Lane Flow Rate	154	405	125	233
Geometry Grp	1	1	1	1
Degree of Util (X)	0.247	0.599	0.198	0.334
Departure Headway (Hd)	5.763	5.324	5.726	5.148
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	620	676	625	695
Service Time	3.819	3.363	3.782	3.2
HCM Lane V/C Ratio	0.248	0.599	0.2	0.335
HCM Control Delay	10.7	16	10.2	10.8
HCM Lane LOS	B	C	B	B
HCM 95th-tile Q	1	4	0.7	1.5

Notes

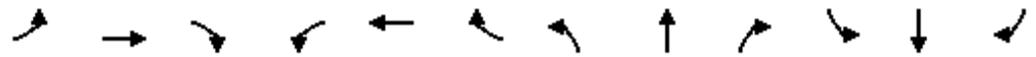
- : Volume Exceeds Capacity; \$: Delay Exceeds 300 Seconds; Error : Computation Not Defined

Two Way Analysis cannot be performed on an All Way Stop Intersection.

Intersection												
Intersection Delay, s/veh	55.7											
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Vol, veh/h	0	0	8	17	2	33	6	1194	63	59	1836	4
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0	2	2	2	2	2	2
Mvmt Flow	0	0	8	18	2	35	7	1298	68	64	1996	4
Major/Minor	Minor2		Minor1			Major1			Major2			
Conflicting Flow All	3490	3505	1998	3475	3473	1332	2000	0	0	1366	0	0
Stage 1	2126	2126	-	1345	1345	-	-	-	-	-	-	-
Stage 2	1364	1379	-	2130	2128	-	-	-	-	-	-	-
Follow-up Headway	3.5	4	3.3	3.5	4	3.3	2.218	-	-	2.218	-	-
Pot Capacity-1 Maneuver	4	6	76	# 4	7	191	286	-	-	503	-	-
Stage 1	66	91	-	189	222	-	-	-	-	-	-	-
Stage 2	184	214	-	66	91	-	-	-	-	-	-	-
Time blocked-Platoon, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Capacity-1 Maneuver	2	5	76	# 3	6	191	286	-	-	503	-	-
Mov Capacity-2 Maneuver	2	5	-	# 3	6	-	-	-	-	-	-	-
Stage 1	59	91	-	169	199	-	-	-	-	-	-	-
Stage 2	133	192	-	59	91	-	-	-	-	-	-	-
Approach	SE		NW			NE			SW			
HCM Control Delay, s	58.2		\$ 3533.9			0.1			0.4			
HCM LOS	F		F									
Minor Lane / Major Mvmt	NEL	NET	NER	NWLn1	SELn1	SWL	SWT	SWR				
Capacity (veh/h)	286	-	-	8	76	503	-	-				
HCM Lane V/C Ratio	0.023	-	-	6.842	0.111	0.127	-	-				
HCM Control Delay (s)	17.881	0	-	\$ 3533.9	58.2	13.2	0	-				
HCM Lane LOS	C	A	-	F	F	B	A	-				
HCM 95th %tile Q(veh)	0.07	-	-	8.312	0.359	0.435	-	-				
Notes												
~ : Volume Exceeds Capacity; \$: Delay Exceeds 300 Seconds; Error : Computation Not Defined												

Lanes, Volumes, Timings
3: Mundy Loss Road & SR 410

2035 Baseline
12/5/2016



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	25	1035	161	230	1399	48	169	40	165	54	80	23
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	100		100	100		0	0		100	0		100
Storage Lanes	1		1	1		0	0		1	0		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850		0.995				0.850			0.850
Flt Protected	0.950			0.950				0.961			0.980	
Satd. Flow (prot)	1770	1863	1583	1787	1872	0	0	1826	1615	0	1862	1615
Flt Permitted	0.950			0.950				0.580			0.566	
Satd. Flow (perm)	1770	1863	1583	1787	1872	0	0	1102	1615	0	1075	1615
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			109		4				168			109
Link Speed (mph)		35		35				30			30	
Link Distance (ft)		680		655				1371			719	
Travel Time (s)		13.2		12.8				31.2			16.3	
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Heavy Vehicles (%)	2%	2%	2%	1%	1%	1%	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	26	1056	164	235	1428	49	172	41	168	55	82	23
Shared Lane Traffic (%)												
Lane Group Flow (vph)	26	1056	164	235	1477	0	0	213	168	0	137	23
Enter Blocked Intersection	No											
Lane Alignment	Left	Left	Right									
Median Width(ft)		12		12				0			0	
Link Offset(ft)		0		0				0			0	
Crosswalk Width(ft)		16		16				16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2		1	2	1	1	2	1
Detector Template	Left	Thru	Right	Left	Thru		Left	Thru	Right	Left	Thru	Right
Leading Detector (ft)	20	100	20	20	100		20	100	20	20	100	20
Trailing Detector (ft)	0	0	0	0	0		0	0	0	0	0	0
Detector 1 Position(ft)	0	0	0	0	0		0	0	0	0	0	0
Detector 1 Size(ft)	20	6	20	20	6		20	6	20	20	6	20
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)		94		94				94			94	
Detector 2 Size(ft)		6		6				6			6	
Detector 2 Type		Cl+Ex		Cl+Ex				Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0		0.0				0.0			0.0	
Turn Type	Prot	NA	Perm	Prot	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases	7	4		3	8			2			6	
Permitted Phases			4				2		2	6		6

Lanes, Volumes, Timings
3: Mundy Loss Road & SR 410

2035 Baseline
12/5/2016

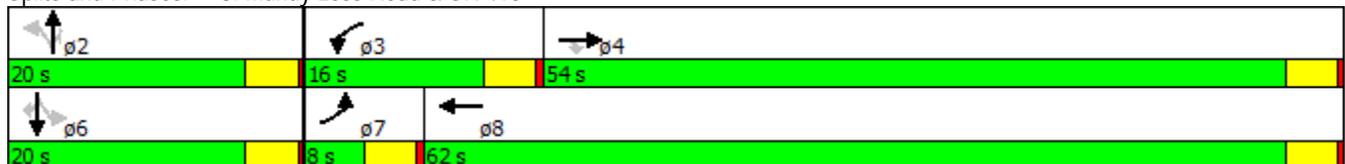


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	7	4	4	3	8		2	2	2	6	6	6
Switch Phase												
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	8.0	20.0	20.0	8.0	20.0		20.0	20.0	20.0	20.0	20.0	20.0
Total Split (s)	8.0	54.0	54.0	16.0	62.0		20.0	20.0	20.0	20.0	20.0	20.0
Total Split (%)	8.9%	60.0%	60.0%	17.8%	68.9%		22.2%	22.2%	22.2%	22.2%	22.2%	22.2%
Maximum Green (s)	4.0	50.0	50.0	12.0	58.0		16.0	16.0	16.0	16.0	16.0	16.0
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5		3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5		0.5	0.5	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag							
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes							
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	None	None	None		Max	Max	Max	Max	Max	Max
Walk Time (s)		5.0	5.0		5.0		5.0	5.0	5.0	5.0	5.0	5.0
Flash Dont Walk (s)		11.0	11.0		11.0		11.0	11.0	11.0	11.0	11.0	11.0
Pedestrian Calls (#/hr)		0	0		0		0	0	0	0	0	0
Act Effct Green (s)	4.0	50.0	50.0	12.0	62.8		16.0	16.0		16.0	16.0	16.0
Actuated g/C Ratio	0.04	0.56	0.56	0.13	0.70		0.18	0.18		0.18	0.18	0.18
v/c Ratio	0.33	1.02	0.18	0.99	1.13		1.09	0.40		0.72	0.06	0.06
Control Delay	53.4	55.0	4.2	96.7	86.2		129.0	8.4		57.5	0.3	0.3
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	53.4	55.0	4.2	96.7	86.2		129.0	8.4		57.5	0.3	0.3
LOS	D	E	A	F	F		F	A		E	A	A
Approach Delay		48.3			87.7		75.8			49.3		
Approach LOS		D			F		E			D		

Intersection Summary

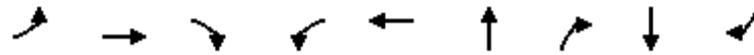
Area Type:	Other
Cycle Length:	90
Actuated Cycle Length:	90
Natural Cycle:	150
Control Type:	Actuated-Uncoordinated
Maximum v/c Ratio:	1.13
Intersection Signal Delay:	70.6
Intersection LOS:	E
Intersection Capacity Utilization	108.0%
ICU Level of Service	G
Analysis Period (min)	15

Splits and Phases: 3: Mundy Loss Road & SR 410



Queues
3: Mundy Loss Road & SR 410

2035 Baseline
12/5/2016



Lane Group	EBL	EBT	EBR	WBL	WBT	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	26	1056	164	235	1477	213	168	137	23
v/c Ratio	0.33	1.02	0.18	0.99	1.13	1.09	0.40	0.72	0.06
Control Delay	53.4	55.0	4.2	96.7	86.2	129.0	8.4	57.5	0.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	53.4	55.0	4.2	96.7	86.2	129.0	8.4	57.5	0.3
Queue Length 50th (ft)	15	~604	14	135	~946	~138	0	74	0
Queue Length 95th (ft)	41	#881	42	#282	#1309	#276	53	#164	0
Internal Link Dist (ft)		600			575	1291		639	
Turn Bay Length (ft)	100		100	100			100		100
Base Capacity (vph)	78	1035	927	238	1307	195	425	191	376
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.33	1.02	0.18	0.99	1.13	1.09	0.40	0.72	0.06

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.

HCM 2010 Signalized Intersection Capacity Analysis
 3: Mundy Loss Road & SR 410

2035 Baseline
 12/5/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	25	1035	161	230	1399	48	169	40	165	54	80	23
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q, 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	1863	1881	1881	1900	1900	1900	1900	1900	1900	1900
Lanes	1	1	1	1	1	0	0	1	1	0	1	1
Lane Assignment												
Cap, veh/h	38	1035	880	239	1207	41	72	0	287	56	62	287
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
Prop Arrive On Green	0.02	0.56	0.56	0.13	0.67	0.67	0.18	0.18	0.18	0.18	0.18	0.18
Ln Grp Delay, s/veh	63.8	53.2	10.0	92.4	0.0	105.7	956.9	0.0	42.4	170.1	0.0	31.4
Ln Grp LOS	E	F	B	F		F	F		D	F		C
Approach Vol, veh/h		1246			1712			381			160	
Approach Delay, s/veh		47.8			103.9			553.7			150.1	
Approach LOS		D			F			F			F	
Timer:		1	2	3	4	5	6	7	8			
Assigned Phs			2	3	4		6	7	8			
Case No			7.0	2.0	3.0		7.0	2.0	4.0			
Phs Duration (G+Y+Rc), s			20.0	16.0	54.0		20.0	5.9	64.1			
Change Period (Y+Rc), s			4.0	4.0	4.0		4.0	4.0	4.0			
Max Allow Headway (MAH), s			4.9	3.8	5.1		4.9	3.8	5.1			
Max Green (Gmax), s			16.0	12.0	50.0		16.0	4.0	58.0			
Max Q Clear (g_c+I1), s			18.0	13.8	52.0		18.0	3.3	62.1			
Green Ext Time (g_e), s			0.0	0.0	0.0		0.0	0.0	0.0			
Prob of Phs Call (p_c)			1.00	1.00	1.00		1.00	0.48	1.00			
Prob of Max Out (p_x)			1.00	1.00	1.00		1.00	1.00	1.00			
Left-Turn Movement Data												
Assigned Mvmt			5	3			1	7				
Mvmt Sat Flow, veh/h			0	1792			0	1774				
Through Movement Data												
Assigned Mvmt			2		4		6		8			
Mvmt Sat Flow, veh/h			0		1863		348		1808			
Right-Turn Movement Data												
Assigned Mvmt			12		14		16		18			
Mvmt Sat Flow, veh/h			1615		1583		1615		62			
Left Lane Group Data												
Assigned Mvmt		0	5	3	0	0	1	7	0			
Lane Assignment			L+T	L (Prot)			L+T	L (Prot)				
Lanes in Grp		0	1	1	0	0	1	1	0			
Grp Vol (v), veh/h		0	213	235	0	0	137	26	0			
Grp Sat Flow (s), veh/h/ln		0	0	1792	0	0	348	1774	0			
Q Serve Time (g_s), s		0.0	0.0	11.8	0.0	0.0	0.0	1.3	0.0			

HCM 2010 Signalized Intersection Capacity Analysis
 3: Mundy Loss Road & SR 410

2035 Baseline
 12/5/2016

Cycle Q Clear Time (g_c), s	0.0	16.0	11.8	0.0	0.0	16.0	1.3	0.0
Perm LT Sat Flow (s_l), veh/h/ln	0	1309	0	0	0	1191	0	0
Shared LT Sat Flow (s_sh), veh/h/ln	0	0	0	0	0	0	0	0
Perm LT Eff Green (g_p), s	0.0	16.0	0.0	0.0	0.0	16.0	0.0	0.0
Perm LT Serve Time (g_u), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Perm LT Q Serve Time (g_ps), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Time to First Blk (g_f), s	0.0	0.0	0.0	0.0	0.0	2.9	0.0	0.0
Serve Time pre Blk (g_fs), s	0.0	0.0	0.0	0.0	0.0	2.9	0.0	0.0
Prop LT Inside Lane (P_L)	0.00	0.81	1.00	0.00	0.00	0.40	1.00	0.00
Lane Grp Cap (c), veh/h	0	72	239	0	0	118	38	0
V/C Ratio (X)	0.00	2.95	0.98	0.00	0.00	1.16	0.69	0.00
Avail Cap (c_a), veh/h	0	72	239	0	0	118	79	0
Upstream Filter (I)	0.00	1.00	1.00	0.00	0.00	1.00	1.00	0.00
Uniform Delay (d1), s/veh	0.0	45.0	38.9	0.0	0.0	37.4	43.7	0.0
Incr Delay (d2), s/veh	0.0	911.9	53.5	0.0	0.0	132.7	20.1	0.0
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	956.9	92.4	0.0	0.0	170.1	63.8	0.0
1st-Term Q (Q1), veh/ln	0.0	1.6	5.2	0.0	0.0	2.7	0.6	0.0
2nd-Term Q (Q2), veh/ln	0.0	18.3	3.5	0.0	0.0	4.3	0.2	0.0
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	1.00	1.00	0.00	0.00	1.00	1.00	0.00
%ile Back of Q (50%), veh/ln	0.0	20.0	8.7	0.0	0.0	7.0	0.8	0.0
%ile Storage Ratio (RQ%)	0.00	0.38	2.19	0.00	0.00	0.26	0.20	0.00
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	35.2	0.0	0.0	0.0	4.8	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.7	0.0	0.0	0.0	0.3	0.0	0.0
Middle Lane Group Data								
Assigned Mvmt	0	2	0	4	0	6	0	8
Lane Assignment	T							
Lanes in Grp	0	0	0	1	0	0	0	0
Grp Vol (v), veh/h	0	0	0	1056	0	0	0	0
Grp Sat Flow (s), veh/h/ln	0	0	0	1863	0	0	0	0
Q Serve Time (g_s), s	0.0	0.0	0.0	50.0	0.0	0.0	0.0	0.0
Cycle Q Clear Time (g_c), s	0.0	0.0	0.0	50.0	0.0	0.0	0.0	0.0
Lane Grp Cap (c), veh/h	0	0	0	1035	0	0	0	0
V/C Ratio (X)	0.00	0.00	0.00	1.02	0.00	0.00	0.00	0.00
Avail Cap (c_a), veh/h	0	0	0	1035	0	0	0	0
Upstream Filter (I)	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00
Uniform Delay (d1), s/veh	0.0	0.0	0.0	20.0	0.0	0.0	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.0	0.0	33.2	0.0	0.0	0.0	0.0
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	0.0	0.0	53.2	0.0	0.0	0.0	0.0
1st-Term Q (Q1), veh/ln	0.0	0.0	0.0	19.8	0.0	0.0	0.0	0.0
2nd-Term Q (Q2), veh/ln	0.0	0.0	0.0	9.6	0.0	0.0	0.0	0.0
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
%ile Back of Q (50%), veh/ln	0.0	0.0	0.0	29.4	0.0	0.0	0.0	0.0

HCM 2010 Signalized Intersection Capacity Analysis
 3: Mundy Loss Road & SR 410

2035 Baseline
 12/5/2016

%ile Storage Ratio (RQ%)	0.00	0.00	0.00	1.18	0.00	0.00	0.00	0.00
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	5.3	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.3	0.0	0.0	0.0	0.0

Right Lane Group Data

Assigned Mvmt	0	12	0	14	0	16	0	18
Lane Assignment		R		R		R		T+R
Lanes in Grp	0	1	0	1	0	1	0	1
Grp Vol (v), veh/h	0	168	0	164	0	23	0	1477
Grp Sat Flow (s), veh/h/ln	0	1615	0	1583	0	1615	0	1870
Q Serve Time (g_s), s	0.0	8.6	0.0	4.6	0.0	1.1	0.0	60.1
Cycle Q Clear Time (g_c), s	0.0	8.6	0.0	4.6	0.0	1.1	0.0	60.1
Prot RT Sat Flow (s_R), veh/h/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prot RT Eff Green (g_R), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prop RT Outside Lane (P_R)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	0.03
Lane Grp Cap (c), veh/h	0	287	0	880	0	287	0	1249
V/C Ratio (X)	0.00	0.59	0.00	0.19	0.00	0.08	0.00	1.18
Avail Cap (c_a), veh/h	0	287	0	880	0	287	0	1249
Upstream Filter (I)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
Uniform Delay (d1), s/veh	0.0	34.0	0.0	9.9	0.0	30.9	0.0	15.0
Incr Delay (d2), s/veh	0.0	8.5	0.0	0.1	0.0	0.5	0.0	90.7
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	42.4	0.0	10.0	0.0	31.4	0.0	105.7
1st-Term Q (Q1), veh/ln	0.0	3.4	0.0	1.5	0.0	0.4	0.0	21.9
2nd-Term Q (Q2), veh/ln	0.0	0.7	0.0	0.0	0.0	0.0	0.0	31.5
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
%ile Back of Q (50%), veh/ln	0.0	4.0	0.0	1.6	0.0	0.5	0.0	53.3
%ile Storage Ratio (RQ%)	0.00	1.01	0.00	0.40	0.00	0.11	0.00	2.20
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	57.1
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3

Intersection Summary

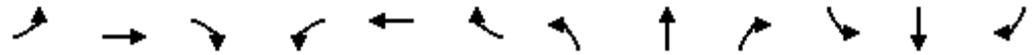
HCM 2010 Ctrl Delay	135.0
HCM 2010 LOS	F

Notes

Two Way Analysis cannot be performed on Signalized Intersection.

Lanes, Volumes, Timings
6: Mundy Loss Road & 112th ST E

2035 Baseline
12/5/2016



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Volume (vph)	61	25	77	46	84	42	59	280	11	13	391	88
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.936			0.967			0.996			0.976	
Flt Protected		0.982			0.987			0.992			0.999	
Satd. Flow (prot)	0	1729	0	0	1795	0	0	1877	0	0	1834	0
Flt Permitted		0.982			0.987			0.992			0.999	
Satd. Flow (perm)	0	1729	0	0	1795	0	0	1877	0	0	1834	0
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		647			701			660			1371	
Travel Time (s)		14.7			15.9			15.0			31.2	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	0%	0%	0%	1%	1%	1%
Adj. Flow (vph)	66	27	83	49	90	45	63	301	12	14	420	95
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	176	0	0	184	0	0	376	0	0	529	0
Enter Blocked Intersection	No	No	No									
Lane Alignment	Left	Left	Right									
Median Width(ft)		0			0			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	66.7%
Analysis Period (min)	15
	ICU Level of Service C

Intersection												
Intersection Delay, s/veh	24.3											
Intersection LOS	C											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	61	25	77	46	84	42	59	280	11	13	391	88
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles, %	1	1	1	1	1	1	0	0	0	1	1	1
Mvmt Flow	66	27	83	49	90	45	63	301	12	14	420	95
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	13.5	14	20.1	34.5
HCM LOS	B	B	C	D

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	17%	37%	27%	3%
Vol Thru, %	80%	15%	49%	79%
Vol Right, %	3%	47%	24%	18%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	350	163	172	492
LT Vol	280	25	84	391
Through Vol	11	77	42	88
RT Vol	59	61	46	13
Lane Flow Rate	376	175	185	529
Geometry Grp	1	1	1	1
Degree of Util (X)	0.649	0.337	0.359	0.859
Departure Headway (Hd)	6.205	6.919	6.995	5.848
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	580	517	512	619
Service Time	4.272	5	5.075	3.907
HCM Lane V/C Ratio	0.648	0.338	0.361	0.855
HCM Control Delay	20.1	13.5	14	34.5
HCM Lane LOS	C	B	B	D
HCM 95th-tile Q	4.7	1.5	1.6	9.6

Notes

- : Volume Exceeds Capacity; \$: Delay Exceeds 300 Seconds; Error : Computation Not Defined

Two Way Analysis cannot be performed on an All Way Stop Intersection.

Lanes, Volumes, Timings
3: SR410 & W Main St/E Main St

2035 Projection
12/5/2016



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations		↕			↕		↕	↕		↕	↕	
Volume (vph)	40	103	2	236	65	54	10	1025	153	88	1677	19
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	100		0	100		0
Storage Lanes	0		0	0		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.998			0.980			0.981			0.998	
Flt Protected		0.986			0.968		0.950			0.950		
Satd. Flow (prot)	0	1870	0	0	1785	0	1787	1845	0	1770	1859	0
Flt Permitted		0.881			0.621		0.043			0.046		
Satd. Flow (perm)	0	1671	0	0	1145	0	81	1845	0	86	1859	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					6			14				1
Link Speed (mph)		30			30			30				30
Link Distance (ft)		466			386			454				1270
Travel Time (s)		10.6			8.8			10.3				28.9
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	0%	0%	0%	1%	1%	1%	1%	1%	1%	2%	2%	2%
Adj. Flow (vph)	42	107	2	246	68	56	10	1068	159	92	1747	20
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	151	0	0	370	0	10	1227	0	92	1767	0
Enter Blocked Intersection	No											
Lane Alignment	Left	Left	Right									
Median Width(ft)		0			0			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru										
Leading Detector (ft)	20	100		20	100		20	100		20	100	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Detector 1 Position(ft)	0	0		0	0		0	0		0	0	
Detector 1 Size(ft)	20	6		20	6		20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex										
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA										
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		

Lanes, Volumes, Timings
3: SR410 & W Main St/E Main St

2035 Projection
12/5/2016



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NEL	NET	NER	SWL	SWT	SWR
Detector Phase	4	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Minimum Split (s)	20.0	20.0		20.0	20.0		20.0	20.0		20.0	20.0	
Total Split (s)	33.0	33.0		33.0	33.0		97.0	97.0		97.0	97.0	
Total Split (%)	25.4%	25.4%		25.4%	25.4%		74.6%	74.6%		74.6%	74.6%	
Maximum Green (s)	29.0	29.0		29.0	29.0		93.0	93.0		93.0	93.0	
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	0.5	0.5		0.5	0.5		0.5	0.5		0.5	0.5	
Lost Time Adjust (s)		0.0			0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)		4.0			4.0		4.0	4.0		4.0	4.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None		Max	Max		Max	Max	
Walk Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Flash Dont Walk (s)	11.0	11.0		11.0	11.0		11.0	11.0		11.0	11.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)		29.0			29.0		93.0	93.0		93.0	93.0	
Actuated g/C Ratio		0.22			0.22		0.72	0.72		0.72	0.72	
v/c Ratio		0.41			1.42		0.18	0.93		1.51	1.33	
Control Delay		47.0			248.2		14.1	29.1		319.3	174.8	
Queue Delay		0.0			0.0		0.0	0.0		0.0	0.0	
Total Delay		47.0			248.2		14.1	29.1		319.3	174.8	
LOS		D			F		B	C		F	F	
Approach Delay		47.0			248.2			29.0			181.9	
Approach LOS		D			F			C			F	

Intersection Summary

Area Type:	Other
Cycle Length:	130
Actuated Cycle Length:	130
Natural Cycle:	130
Control Type:	Actuated-Uncoordinated
Maximum v/c Ratio:	1.51
Intersection Signal Delay:	130.8
Intersection LOS:	F
Intersection Capacity Utilization:	122.5%
ICU Level of Service:	H
Analysis Period (min):	15

Splits and Phases: 3: SR410 & W Main St/E Main St



Queues
3: SR410 & W Main St/E Main St

2035 Projection
12/5/2016



Lane Group	EBT	WBT	NEL	NET	SWL	SWT
Lane Group Flow (vph)	151	370	10	1227	92	1767
v/c Ratio	0.41	1.42	0.18	0.93	1.51	1.33
Control Delay	47.0	248.2	14.1	29.1	319.3	174.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	47.0	248.2	14.1	29.1	319.3	174.8
Queue Length 50th (ft)	110	-419	3	779	-55	-1941
Queue Length 95th (ft)	177	#620	12	#1250	#172	#2209
Internal Link Dist (ft)	386	306		374		1190
Turn Bay Length (ft)			100		100	
Base Capacity (vph)	372	260	57	1323	61	1330
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	0.41	1.42	0.18	0.93	1.51	1.33

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.

HCM 2010 Signalized Intersection Capacity Analysis
 3: SR410 & W Main St/E Main St

2035 Projection
 12/5/2016

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (veh/h)	40	103	2	236	65	54	10	1025	153	88	1677	19
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q, 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	1900	1900	1900	1881	1900	1881	1881	1900	1863	1863	1900
Lanes	0	1	0	0	1	0	1	1	0	1	1	0
Lane Assignment												
Cap, veh/h	120	291	5	229	51	42	55	1145	170	121	1315	15
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
Prop Arrive On Green	0.22	0.22	0.22	0.22	0.22	0.22	0.72	0.72	0.72	0.72	0.72	0.72
Ln Grp Delay, s/veh	43.2	0.0	0.0	151.1	0.0	0.0	72.0	0.0	29.0	93.9	0.0	171.7
Ln Grp LOS	D			F			E		C	F		F
Approach Vol, veh/h		151			370			1237			1859	
Approach Delay, s/veh		43.2			151.1			29.4			167.8	
Approach LOS		D			F			C			F	
Timer:		1	2	3	4	5	6	7	8			
Assigned Phs			2		4		6		8			
Case No			6.0		8.0		6.0		8.0			
Phs Duration (G+Y+Rc), s			97.0		33.0		97.0		33.0			
Change Period (Y+Rc), s			4.0		4.0		4.0		4.0			
Max Allow Headway (MAH), s			5.2		5.3		5.2		5.3			
Max Green (Gmax), s			93.0		29.0		93.0		29.0			
Max Q Clear (g_c+I1), s			95.0		11.3		95.0		31.0			
Green Ext Time (g_e), s			0.0		3.1		0.0		0.0			
Prob of Phs Call (p_c)			1.00		1.00		1.00		1.00			
Prob of Max Out (p_x)			1.00		0.05		1.00		1.00			
Left-Turn Movement Data												
Assigned Mvmt			5		7		1		3			
Mvmt Sat Flow, veh/h			272		381		453		821			
Through Movement Data												
Assigned Mvmt			2		4		6		8			
Mvmt Sat Flow, veh/h			1601		1303		1838		227			
Right-Turn Movement Data												
Assigned Mvmt			12		14		16		18			
Mvmt Sat Flow, veh/h			238		23		21		187			
Left Lane Group Data												
Assigned Mvmt		0	5	0	7	0	1	0	3			
Lane Assignment			L		L+T+R		L		L+T+R			
Lanes in Grp		0	1	0	1	0	1	0	1			
Grp Vol (v), veh/h		0	10	0	151	0	92	0	370			
Grp Sat Flow (s), veh/h/ln		0	272	0	1707	0	453	0	1235			
Q Serve Time (g_s), s		0.0	0.0	0.0	0.0	0.0	18.8	0.0	19.7			

HCM 2010 Signalized Intersection Capacity Analysis
 3: SR410 & W Main St/E Main St

2035 Projection
 12/5/2016

Cycle Q Clear Time (g_c), s	0.0	93.0	0.0	9.3	0.0	93.0	0.0	29.0
Perm LT Sat Flow (s_l), veh/h/ln	0	272	0	1287	0	453	0	1305
Shared LT Sat Flow (s_sh), veh/h/ln	0	0	0	1666	0	0	0	855
Perm LT Eff Green (g_p), s	0.0	93.0	0.0	29.0	0.0	93.0	0.0	29.0
Perm LT Serve Time (g_u), s	0.0	0.0	0.0	0.0	0.0	18.8	0.0	19.7
Perm LT Q Serve Time (g_ps), s	0.0	0.0	0.0	0.0	0.0	18.8	0.0	19.7
Time to First Blk (g_f), s	0.0	0.0	0.0	5.1	0.0	0.0	0.0	0.0
Serve Time pre Blk (g_fs), s	0.0	0.0	0.0	5.1	0.0	0.0	0.0	0.0
Prop LT Inside Lane (P_L)	0.00	1.00	0.00	0.28	0.00	1.00	0.00	0.66
Lane Grp Cap (c), veh/h	0	55	0	416	0	121	0	322
V/C Ratio (X)	0.00	0.18	0.00	0.36	0.00	0.76	0.00	1.15
Avail Cap (c_a), veh/h	0	55	0	416	0	121	0	322
Upstream Filter (I)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
Uniform Delay (d1), s/veh	0.0	65.0	0.0	42.7	0.0	58.3	0.0	53.8
Incr Delay (d2), s/veh	0.0	7.0	0.0	0.5	0.0	35.6	0.0	97.3
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	72.0	0.0	43.2	0.0	93.9	0.0	151.1
1st-Term Q (Q1), veh/ln	0.0	0.3	0.0	4.3	0.0	3.1	0.0	10.9
2nd-Term Q (Q2), veh/ln	0.0	0.1	0.0	0.1	0.0	1.2	0.0	8.7
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
%ile Back of Q (50%), veh/ln	0.0	0.4	0.0	4.3	0.0	4.3	0.0	19.6
%ile Storage Ratio (RQ%)	0.00	0.11	0.00	0.27	0.00	1.10	0.00	1.88
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	12.1
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3
Middle Lane Group Data								
Assigned Mvmt	0	2	0	4	0	6	0	8
Lane Assignment								
Lanes in Grp	0	0	0	0	0	0	0	0
Grp Vol (v), veh/h	0	0	0	0	0	0	0	0
Grp Sat Flow (s), veh/h/ln	0	0	0	0	0	0	0	0
Q Serve Time (g_s), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear Time (g_c), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Lane Grp Cap (c), veh/h	0	0	0	0	0	0	0	0
V/C Ratio (X)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Avail Cap (c_a), veh/h	0	0	0	0	0	0	0	0
Upstream Filter (I)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Uniform Delay (d1), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1st-Term Q (Q1), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2nd-Term Q (Q2), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
%ile Back of Q (50%), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

HCM 2010 Signalized Intersection Capacity Analysis
 3: SR410 & W Main St/E Main St

2035 Projection
 12/5/2016

%ile Storage Ratio (RQ%)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Right Lane Group Data

Assigned Mvmt	0	12	0	14	0	16	0	18
Lane Assignment	T+R			T+R				
Lanes in Grp	0	1	0	0	0	1	0	0
Grp Vol (v), veh/h	0	1227	0	0	0	1767	0	0
Grp Sat Flow (s), veh/h/ln	0	1839	0	0	0	1859	0	0
Q Serve Time (g_s), s	0.0	74.2	0.0	0.0	0.0	93.0	0.0	0.0
Cycle Q Clear Time (g_c), s	0.0	74.2	0.0	0.0	0.0	93.0	0.0	0.0
Prot RT Sat Flow (s_R), veh/h/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prot RT Eff Green (g_R), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prop RT Outside Lane (P_R)	0.00	0.13	0.00	0.01	0.00	0.01	0.00	0.15
Lane Grp Cap (c), veh/h	0	1316	0	0	0	1330	0	0
V/C Ratio (X)	0.00	0.93	0.00	0.00	0.00	1.33	0.00	0.00
Avail Cap (c_a), veh/h	0	1316	0	0	0	1330	0	0
Upstream Filter (I)	0.00	1.00	0.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d1), s/veh	0.0	15.8	0.0	0.0	0.0	18.5	0.0	0.0
Incr Delay (d2), s/veh	0.0	13.2	0.0	0.0	0.0	153.2	0.0	0.0
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	29.0	0.0	0.0	0.0	171.7	0.0	0.0
1st-Term Q (Q1), veh/ln	0.0	30.7	0.0	0.0	0.0	38.8	0.0	0.0
2nd-Term Q (Q2), veh/ln	0.0	4.8	0.0	0.0	0.0	56.6	0.0	0.0
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
%ile Back of Q (50%), veh/ln	0.0	35.5	0.0	0.0	0.0	95.4	0.0	0.0
%ile Storage Ratio (RQ%)	0.00	2.27	0.00	0.00	0.00	2.08	0.00	0.00
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	109.3	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.0

Intersection Summary

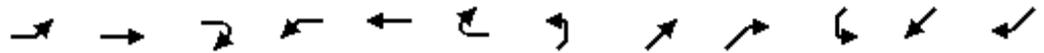
HCM 2010 Ctrl Delay	113.6
HCM 2010 LOS	F

Notes

Two Way Analysis cannot be performed on Signalized Intersection.

Lanes, Volumes, Timings
6: S River Rd/N River Rd & E Main St

2035 Projection
12/5/2016



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations		↕			↕			↕			↕	
Volume (vph)	34	259	92	46	224	11	77	92	82	8	102	46
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.968			0.995			0.956			0.961	
Flt Protected		0.996			0.992			0.985			0.997	
Satd. Flow (prot)	0	1832	0	0	1857	0	0	1789	0	0	1820	0
Flt Permitted		0.996			0.992			0.985			0.997	
Satd. Flow (perm)	0	1832	0	0	1857	0	0	1789	0	0	1820	0
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		386			744			543			1174	
Travel Time (s)		8.8			16.9			12.3			26.7	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	0%	0%	0%	1%	1%	1%	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	37	278	99	49	241	12	83	99	88	9	110	49
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	414	0	0	302	0	0	270	0	0	168	0
Enter Blocked Intersection	No	No	No									
Lane Alignment	Left	Left	Right									
Median Width(ft)		0			0			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Free			Free			Stop			Stop	

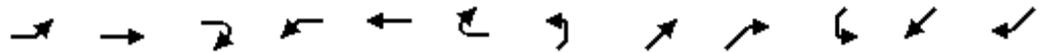
Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	57.3%
Analysis Period (min)	15
	ICU Level of Service B

Intersection												
Intersection Delay, s/veh	19.3											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NEL	NET	NER	SWL	SWT	SWR
Vol, veh/h	34	259	92	46	224	11	77	92	82	8	102	46
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	93	93	93	93	93	93	93	93	93	93	93	93
Heavy Vehicles, %	0	0	0	1	1	1	0	0	0	0	0	0
Mvmt Flow	37	278	99	49	241	12	83	99	88	9	110	49
Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	253	0	0	377	0	0	826	753	328	841	797	247
Stage 1	-	-	-	-	-	-	401	401	-	346	346	-
Stage 2	-	-	-	-	-	-	425	352	-	495	451	-
Follow-up Headway	2.2	-	-	2.209	-	-	3.5	4	3.3	3.5	4	3.3
Pot Capacity-1 Maneuver	1324	-	-	1187	-	-	293	341	718	287	322	797
Stage 1	-	-	-	-	-	-	630	604	-	674	639	-
Stage 2	-	-	-	-	-	-	611	635	-	560	574	-
Time blocked-Platoon, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Capacity-1 Maneuver	1324	-	-	1187	-	-	184	313	718	179	296	797
Mov Capacity-2 Maneuver	-	-	-	-	-	-	184	313	-	179	296	-
Stage 1	-	-	-	-	-	-	607	582	-	650	608	-
Stage 2	-	-	-	-	-	-	447	605	-	393	553	-
Approach	EB			WB			NE			SW		
HCM Control Delay, s	0.7			1.3			64.9			24.5		
HCM LOS	F			A			F			C		
Minor Lane / Major Mvmt	NELn1	EBL	EBT	EBR	WBL	WBT	WBR	SWLn1				
Capacity (veh/h)	304	1324	-	-	1187	-	-	349				
HCM Lane V/C Ratio	0.888	0.028	-	-	0.042	-	-	0.481				
HCM Control Delay (s)	64.9	7.796	0	-	8.165	0	-	24.5				
HCM Lane LOS	F	A	A	-	A	A	-	C				
HCM 95th %tile Q(veh)	8.152	0.085	-	-	0.13	-	-	2.5				
Notes												
~ : Volume Exceeds Capacity; \$: Delay Exceeds 300 Seconds; Error : Computation Not Defined												

Lanes, Volumes, Timings
10: SR410 & Park Ave

2035 Projection
12/5/2016



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations		↕			↕		↗	↖	↗	↗	↖	↖
Volume (vph)	153	27	31	50	33	149	59	987	38	310	1784	157
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	100		100	100		0
Storage Lanes	0		0	0		0	1		1	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.980			0.913				0.850		0.988	
Flt Protected		0.965			0.989		0.950			0.950		
Satd. Flow (prot)	0	1797	0	0	1716	0	1787	1881	1599	1770	1840	0
Flt Permitted		0.320			0.919		0.043			0.092		
Satd. Flow (perm)	0	596	0	0	1594	0	81	1881	1599	171	1840	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		6			65				25		11	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		589			200			1270			240	
Travel Time (s)		13.4			4.5			28.9			5.5	
Peak Hour Factor	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	1%	1%	1%	2%	2%	2%
Adj. Flow (vph)	191	34	39	62	41	186	74	1234	48	388	2230	196
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	264	0	0	289	0	74	1234	48	388	2426	0
Enter Blocked Intersection	No											
Lane Alignment	Left	Left	Right									
Median Width(ft)		0			0			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2	1	1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru	Right	Left	Thru	
Leading Detector (ft)	20	100		20	100		20	100	20	20	100	
Trailing Detector (ft)	0	0		0	0		0	0	0	0	0	
Detector 1 Position(ft)	0	0		0	0		0	0	0	0	0	
Detector 1 Size(ft)	20	6		20	6		20	6	20	20	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2		2	6		

Lanes, Volumes, Timings
10: SR410 & Park Ave

2035 Projection
12/5/2016



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NEL	NET	NER	SWL	SWT	SWR
Detector Phase	4	4		8	8		2	2	2	6	6	
Switch Phase												
Minimum Initial (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Minimum Split (s)	20.0	20.0		20.0	20.0		20.0	20.0	20.0	20.0	20.0	
Total Split (s)	24.0	24.0		24.0	24.0		96.0	96.0	96.0	96.0	96.0	
Total Split (%)	20.0%	20.0%		20.0%	20.0%		80.0%	80.0%	80.0%	80.0%	80.0%	
Maximum Green (s)	20.0	20.0		20.0	20.0		92.0	92.0	92.0	92.0	92.0	
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5	3.5	3.5	3.5	
All-Red Time (s)	0.5	0.5		0.5	0.5		0.5	0.5	0.5	0.5	0.5	
Lost Time Adjust (s)		0.0			0.0		0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)		4.0			4.0		4.0	4.0	4.0	4.0	4.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	None		None	None		Max	Max	Max	Max	Max	
Walk Time (s)	5.0	5.0		5.0	5.0		5.0	5.0	5.0	5.0	5.0	
Flash Dont Walk (s)	11.0	11.0		11.0	11.0		11.0	11.0	11.0	11.0	11.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0	0	0	0	
Act Effct Green (s)		20.0			20.0		92.0	92.0	92.0	92.0	92.0	
Actuated g/C Ratio		0.17			0.17		0.77	0.77	0.77	0.77	0.77	
v/c Ratio		2.54			0.91		1.19	0.86	0.04	2.96	1.72	
Control Delay		741.4			69.8		199.1	17.3	2.0	918.1	344.9	
Queue Delay		0.0			0.0		0.0	0.1	0.0	0.0	0.0	
Total Delay		741.4			69.8		199.1	17.4	2.0	918.1	344.9	
LOS		F			E		F	B	A	F	F	
Approach Delay		741.4			69.8			26.8			424.0	
Approach LOS		F			E			C			F	

Intersection Summary

Area Type:	Other
Cycle Length:	120
Actuated Cycle Length:	120
Natural Cycle:	70
Control Type:	Actuated-Uncoordinated
Maximum v/c Ratio:	2.96
Intersection Signal Delay:	306.0
Intersection LOS:	F
Intersection Capacity Utilization	145.5%
ICU Level of Service	H
Analysis Period (min)	15

Splits and Phases: 10: SR410 & Park Ave



Queues
10: SR410 & Park Ave

2035 Projection
12/5/2016



Lane Group	EBT	WBT	NEL	NET	NER	SWL	SWT
Lane Group Flow (vph)	264	289	74	1234	48	388	2426
v/c Ratio	2.54	0.91	1.19	0.86	0.04	2.96	1.72
Control Delay	741.4	69.8	199.1	17.3	2.0	918.1	344.9
Queue Delay	0.0	0.0	0.0	0.1	0.0	0.0	0.0
Total Delay	741.4	69.8	199.1	17.4	2.0	918.1	344.9
Queue Length 50th (ft)	~342	175	~69	549	4	~422	~2797
Queue Length 95th (ft)	#447	#269	#99	558	10	#527	#2584
Internal Link Dist (ft)	509	120		1190			160
Turn Bay Length (ft)			100		100	100	
Base Capacity (vph)	104	319	62	1442	1231	131	1413
Starvation Cap Reductn	0	0	0	9	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	2.54	0.91	1.19	0.86	0.04	2.96	1.72

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.

HCM 2010 Signalized Intersection Capacity Analysis
10: SR410 & Park Ave

2035 Projection
12/5/2016

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (veh/h)	153	27	31	50	33	149	59	987	38	310	1784	157
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q, 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	1900	1900	1900	1900	1900	1881	1881	1881	1863	1863	1900
Lanes	0	1	0	0	1	0	1	1	1	1	1	0
Lane Assignment												
Cap, veh/h	253	35	0	208	127	0	60	1442	1226	198	1294	114
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
Prop Arrive On Green	0.17	0.17	0.00	0.17	0.17	0.00	0.77	0.77	0.77	0.77	0.77	0.77
Ln Grp Delay, s/veh	62.9	0.0	0.0	44.7	0.0	0.0	251.8	16.2	3.4	495.4	0.0	342.4
Ln Grp LOS	E			D			F	B	A	F		F
Approach Vol, veh/h		225			103			1356			2814	
Approach Delay, s/veh		62.9			44.7			28.6			363.5	
Approach LOS		E			D			C			F	
Timer:		1	2	3	4	5	6	7	8			
Assigned Phs			2		4		6		8			
Case No			5.0		8.0		6.0		8.0			
Phs Duration (G+Y+Rc), s			96.0		24.0		96.0		24.0			
Change Period (Y+Rc), s			4.0		4.0		4.0		4.0			
Max Allow Headway (MAH), s			5.3		5.3		5.3		5.3			
Max Green (Gmax), s			92.0		20.0		92.0		20.0			
Max Q Clear (g_c+I1), s			94.0		21.3		94.0		8.2			
Green Ext Time (g_e), s			0.0		0.0		0.0		1.5			
Prob of Phs Call (p_c)			1.00		1.00		1.00		1.00			
Prob of Max Out (p_x)			1.00		1.00		1.00		0.10			
Left-Turn Movement Data												
Assigned Mvmt			5		7		1		3			
Mvmt Sat Flow, veh/h			142		1185		429		961			
Through Movement Data												
Assigned Mvmt			2		4		6		8			
Mvmt Sat Flow, veh/h			1881		211		1688		761			
Right-Turn Movement Data												
Assigned Mvmt			12		14		16		18			
Mvmt Sat Flow, veh/h			1599		0		148		0			
Left Lane Group Data												
Assigned Mvmt		0	5	0	7	0	1	0	3			
Lane Assignment			L		L+T		L		L+T			
Lanes in Grp		0	1	0	1	0	1	0	1			
Grp Vol (v), veh/h		0	74	0	225	0	388	0	103			
Grp Sat Flow (s), veh/h/ln		0	142	0	1395	0	429	0	1723			
Q Serve Time (g_s), s		0.0	0.0	0.0	13.0	0.0	38.6	0.0	0.0			

HCM 2010 Signalized Intersection Capacity Analysis
 10: SR410 & Park Ave

2035 Projection
 12/5/2016

Cycle Q Clear Time (g_c), s	0.0	92.0	0.0	19.3	0.0	92.0	0.0	6.2
Perm LT Sat Flow (s_l), veh/h/ln	0	142	0	1388	0	429	0	1396
Shared LT Sat Flow (s_sh), veh/h/ln	0	0	0	1282	0	0	0	1716
Perm LT Eff Green (g_p), s	0.0	92.0	0.0	20.0	0.0	92.0	0.0	20.0
Perm LT Serve Time (g_u), s	0.0	0.0	0.0	13.8	0.0	38.6	0.0	0.7
Perm LT Q Serve Time (g_ps), s	0.0	0.0	0.0	13.0	0.0	38.6	0.0	0.0
Time to First Blk (g_f), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.3
Serve Time pre Blk (g_fs), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.3
Prop LT Inside Lane (P_L)	0.00	1.00	0.00	0.85	0.00	1.00	0.00	0.60
Lane Grp Cap (c), veh/h	0	60	0	288	0	198	0	335
V/C Ratio (X)	0.00	1.23	0.00	0.78	0.00	1.96	0.00	0.31
Avail Cap (c_a), veh/h	0	60	0	288	0	198	0	335
Upstream Filter (I)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
Uniform Delay (d1), s/veh	0.0	60.0	0.0	49.9	0.0	46.5	0.0	44.2
Incr Delay (d2), s/veh	0.0	191.8	0.0	12.9	0.0	448.9	0.0	0.5
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	251.8	0.0	62.9	0.0	495.4	0.0	44.7
1st-Term Q (Q1), veh/ln	0.0	1.9	0.0	6.9	0.0	6.2	0.0	2.8
2nd-Term Q (Q2), veh/ln	0.0	3.2	0.0	1.0	0.0	24.7	0.0	0.0
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
%ile Back of Q (50%), veh/ln	0.0	5.1	0.0	8.0	0.0	30.9	0.0	2.9
%ile Storage Ratio (RQ%)	0.00	1.28	0.00	0.37	0.00	7.84	0.00	0.56
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	3.5	0.0	0.0	0.0	47.5	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.3	0.0	0.0	0.0	0.5	0.0	0.0
Middle Lane Group Data								
Assigned Mvmt	0	2	0	4	0	6	0	8
Lane Assignment	T							
Lanes in Grp	0	1	0	0	0	0	0	0
Grp Vol (v), veh/h	0	1234	0	0	0	0	0	0
Grp Sat Flow (s), veh/h/ln	0	1881	0	0	0	0	0	0
Q Serve Time (g_s), s	0.0	53.4	0.0	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear Time (g_c), s	0.0	53.4	0.0	0.0	0.0	0.0	0.0	0.0
Lane Grp Cap (c), veh/h	0	1442	0	0	0	0	0	0
V/C Ratio (X)	0.00	0.86	0.00	0.00	0.00	0.00	0.00	0.00
Avail Cap (c_a), veh/h	0	1442	0	0	0	0	0	0
Upstream Filter (I)	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00
Uniform Delay (d1), s/veh	0.0	9.5	0.0	0.0	0.0	0.0	0.0	0.0
Incr Delay (d2), s/veh	0.0	6.7	0.0	0.0	0.0	0.0	0.0	0.0
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	16.2	0.0	0.0	0.0	0.0	0.0	0.0
1st-Term Q (Q1), veh/ln	0.0	20.9	0.0	0.0	0.0	0.0	0.0	0.0
2nd-Term Q (Q2), veh/ln	0.0	2.7	0.0	0.0	0.0	0.0	0.0	0.0
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
%ile Back of Q (50%), veh/ln	0.0	23.6	0.0	0.0	0.0	0.0	0.0	0.0

HCM 2010 Signalized Intersection Capacity Analysis
10: SR410 & Park Ave

2035 Projection
12/5/2016

%ile Storage Ratio (RQ%)	0.00	0.51	0.00	0.00	0.00	0.00	0.00	0.00
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Right Lane Group Data

Assigned Mvmt	0	12	0	14	0	16	0	18
Lane Assignment		R				T+R		
Lanes in Grp	0	1	0	0	0	1	0	0
Grp Vol (v), veh/h	0	48	0	0	0	2426	0	0
Grp Sat Flow (s), veh/h/ln	0	1599	0	0	0	1837	0	0
Q Serve Time (g_s), s	0.0	0.9	0.0	0.0	0.0	92.0	0.0	0.0
Cycle Q Clear Time (g_c), s	0.0	0.9	0.0	0.0	0.0	92.0	0.0	0.0
Prot RT Sat Flow (s_R), veh/h/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prot RT Eff Green (g_R), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prop RT Outside Lane (P_R)	0.00	1.00	0.00	0.00	0.00	0.08	0.00	0.00
Lane Grp Cap (c), veh/h	0	1226	0	0	0	1408	0	0
V/C Ratio (X)	0.00	0.04	0.00	0.00	0.00	1.72	0.00	0.00
Avail Cap (c_a), veh/h	0	1226	0	0	0	1408	0	0
Upstream Filter (I)	0.00	1.00	0.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d1), s/veh	0.0	3.4	0.0	0.0	0.0	14.0	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.1	0.0	0.0	0.0	328.4	0.0	0.0
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	3.4	0.0	0.0	0.0	342.4	0.0	0.0
1st-Term Q (Q1), veh/ln	0.0	0.3	0.0	0.0	0.0	35.2	0.0	0.0
2nd-Term Q (Q2), veh/ln	0.0	0.0	0.0	0.0	0.0	128.4	0.0	0.0
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
%ile Back of Q (50%), veh/ln	0.0	0.3	0.0	0.0	0.0	163.6	0.0	0.0
%ile Storage Ratio (RQ%)	0.00	0.08	0.00	0.00	0.00	21.20	0.00	0.00
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	254.5	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.4	0.0	0.0

Intersection Summary

HCM 2010 Ctrl Delay	240.2
HCM 2010 LOS	F

Notes

Two Way Analysis cannot be performed on Signalized Intersection.

Lanes, Volumes, Timings
11: N River Rd & N A St & Park Ave

2035 Projection
12/5/2016



Lane Group	EBL	EBR	EBR2	NBL2	NBL	NBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	109	211	92	2	113	13	54	31	2	11	36	82
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	25	0			0	0	0		0	0		0
Storage Lanes	1	1			1	0	0		0	0		0
Taper Length (ft)	25				25		25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.850			0.986			0.997			0.914	
Flt Protected	0.950				0.957			0.970			0.996	
Satd. Flow (prot)	1787	1599	0	0	1793	0	0	1801	0	0	1696	0
Flt Permitted	0.950				0.957			0.970			0.996	
Satd. Flow (perm)	1787	1599	0	0	1793	0	0	1801	0	0	1696	0
Link Speed (mph)	30				30			30			30	
Link Distance (ft)	157				926			1174			283	
Travel Time (s)	3.6				21.0			26.7			6.4	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	1%	1%	1%	0%	0%	0%	2%	2%	2%	2%	2%	2%
Adj. Flow (vph)	115	222	97	2	119	14	59	34	2	12	39	89
Shared Lane Traffic (%)												
Lane Group Flow (vph)	115	319	0	0	135	0	0	95	0	0	140	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Right	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)	12				12			0			0	
Link Offset(ft)	0				0			0			0	
Crosswalk Width(ft)	16				16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	9	15	15	9	15		9	15		9
Sign Control	Free				Free			Stop			Stop	

Intersection Summary

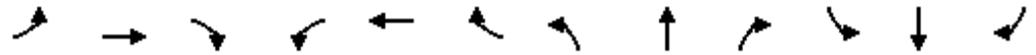
Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	36.8%
Analysis Period (min)	15
	ICU Level of Service A

Intersection										
Intersection Delay, s/veh	6									
Movement	EBL	EBR	NBL	NBR	NEL	NET	NER	SWL	SWT	SWR
Vol, veh/h	109	211	113	13	54	31	2	11	36	82
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	-	None	-	-	None	-	-	None
Storage Length	25	0	0	-	-	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0	-	-	0	-
Grade, %	0	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	92	92	92	92	92	92
Heavy Vehicles, %	1	1	0	0	2	2	2	2	2	2
Mvmt Flow	115	222	119	14	59	34	2	12	39	89
Major/Minor	Major1	Major2	Minor1	Minor2						
Conflicting Flow All	133	0	319	0	694	637	271	648	678	126
Stage 1	-	-	-	-	500	500	-	130	130	-
Stage 2	-	-	-	-	194	137	-	518	548	-
Follow-up Headway	2.209	-	2.2	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Capacity-1 Maneuver	1458	-	1252	-	357	395	768	383	374	924
Stage 1	-	-	-	-	553	543	-	874	789	-
Stage 2	-	-	-	-	808	783	-	541	517	-
Time blocked-Platoon, %	-	-	-	-	-	-	-	-	-	-
Mov Capacity-1 Maneuver	1458	-	1252	-	277	363	768	333	344	924
Mov Capacity-2 Maneuver	-	-	-	-	277	363	-	333	344	-
Stage 1	-	-	-	-	509	500	-	805	787	-
Stage 2	-	-	-	-	692	781	-	463	476	-
Approach	EB	NB	NE	SW						
HCM Control Delay, s	2	0.1	21.9	13.4						
HCM LOS			C	B						
Minor Lane / Major Mvmt	NELn1	NBL2	NBL	NBR	EBL	EBR	EBR2	SWLn1		
Capacity (veh/h)	307	1252	-	-	1458	-	-	570		
HCM Lane V/C Ratio	0.308	0.002	-	-	0.079	-	-	0.246		
HCM Control Delay (s)	21.9	7.88	0	-	7.68	-	-	13.4		
HCM Lane LOS	C	A	A	-	A	-	-	B		
HCM 95th %tile Q(veh)	1.274	0.005	-	-	0.256	-	-	0.962		

Notes
 ~ : Volume Exceeds Capacity; \$: Delay Exceeds 300 Seconds; Error : Computation Not Defined

Lanes, Volumes, Timings
 12: S A St/N A St & E Main St

2035 Projection
 12/5/2016



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Volume (vph)	21	255	29	10	228	75	19	36	17	136	79	13
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.987			0.968			0.968			0.992	
Flt Protected		0.997			0.998			0.987			0.971	
Satd. Flow (prot)	0	1851	0	0	1836	0	0	1815	0	0	1830	0
Flt Permitted		0.997			0.998			0.987			0.971	
Satd. Flow (perm)	0	1851	0	0	1836	0	0	1815	0	0	1830	0
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		744			302			501			926	
Travel Time (s)		16.9			6.9			11.4			21.0	
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Heavy Vehicles (%)	1%	1%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	24	297	34	12	265	87	22	42	20	158	92	15
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	355	0	0	364	0	0	84	0	0	265	0
Enter Blocked Intersection	No	No	No									
Lane Alignment	Left	Left	Right									
Median Width(ft)		0			0			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Free			Free			Stop			Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	50.2%
Analysis Period (min)	15
	ICU Level of Service A

Intersection												
Intersection Delay, s/veh	14.7											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	21	255	29	10	228	75	19	36	17	136	79	13
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	86	86	86	86	86	86	86	86	86	86	86	86
Heavy Vehicles, %	1	1	1	0	0	0	0	0	0	0	0	0
Mvmt Flow	24	297	34	12	265	87	22	42	20	158	92	15
Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	352	0	0	330	0	0	747	738	313	725	711	309
Stage 1	-	-	-	-	-	-	362	362	-	332	332	-
Stage 2	-	-	-	-	-	-	385	376	-	393	379	-
Follow-up Headway	2.209	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.3
Pot Capacity-1 Maneuver	1212	-	-	1241	-	-	332	348	732	343	361	736
Stage 1	-	-	-	-	-	-	661	629	-	686	648	-
Stage 2	-	-	-	-	-	-	642	620	-	636	618	-
Time blocked-Platoon, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Capacity-1 Maneuver	1212	-	-	1241	-	-	252	336	732	294	348	736
Mov Capacity-2 Maneuver	-	-	-	-	-	-	252	336	-	294	348	-
Stage 1	-	-	-	-	-	-	645	614	-	670	640	-
Stage 2	-	-	-	-	-	-	532	613	-	563	603	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	0.6			0.3			18.5			52.1		
HCM LOS							C			F		
Minor Lane / Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1				
Capacity (veh/h)	350	1212	-	-	1241	-	-	322				
HCM Lane V/C Ratio	0.239	0.02	-	-	0.009	-	-	0.823				
HCM Control Delay (s)	18.5	8.031	0	-	7.928	0	-	52.1				
HCM Lane LOS	C	A	A	-	A	A	-	F				
HCM 95th %tile Q(veh)	0.918	0.062	-	-	0.028	-	-	7.031				

Notes
 ~ : Volume Exceeds Capacity; \$: Delay Exceeds 300 Seconds; Error : Computation Not Defined

Lanes, Volumes, Timings
 3: SR165(River Rd)/SR165 & 112th St E/Ryan Rd

2035 Projection
 12/5/2016



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	36	33	8	65	102	10	15	255	23	44	506	63
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	100		0	100		0	100		0	100		0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.971			0.986			0.988			0.983	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1845	0	1787	1853	0	1770	1840	0	1770	1831	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1770	1845	0	1787	1853	0	1770	1840	0	1770	1831	0
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		745			456			374			611	
Travel Time (s)		16.9			10.4			8.5			13.9	
Peak Hour Factor	0.92	0.98	0.98	0.98	0.98	0.92	0.98	0.92	0.98	0.92	0.92	0.92
Heavy Vehicles (%)	2%	0%	0%	1%	1%	2%	2%	2%	2%	2%	2%	2%
Adj. Flow (vph)	39	34	8	66	104	11	15	277	23	48	550	68
Shared Lane Traffic (%)												
Lane Group Flow (vph)	39	42	0	66	115	0	15	300	0	48	618	0
Enter Blocked Intersection	No											
Lane Alignment	Left	Left	Right									
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane								Yes			Yes	
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	53.5%
Analysis Period (min)	15
	ICU Level of Service A

Intersection												
Intersection Delay, s/veh	36.9											
Intersection LOS	E											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	36	33	8	65	102	10	15	255	23	44	506	63
Peak Hour Factor	0.92	0.98	0.98	0.98	0.98	0.92	0.98	0.92	0.98	0.92	0.92	0.92
Heavy Vehicles, %	2	0	0	1	1	2	2	2	2	2	2	2
Mvmt Flow	39	34	8	66	104	11	15	277	23	48	550	68
Number of Lanes	1	1	0	1	1	0	1	1	0	1	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	2	2	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	2	2	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	2	2	2
HCM Control Delay	11.3	12.1	15.7	56.8
HCM LOS	B	B	C	F

Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	100%	0%	100%	0%	100%	0%	100%	0%
Vol Thru, %	0%	92%	0%	80%	0%	91%	0%	89%
Vol Right, %	0%	8%	0%	20%	0%	9%	0%	11%
Sign Control	Stop							
Traffic Vol by Lane	15	278	36	41	65	112	44	569
LT Vol	0	255	0	33	0	102	0	506
Through Vol	0	23	0	8	0	10	0	63
RT Vol	15	0	36	0	65	0	44	0
Lane Flow Rate	15	301	39	42	66	115	48	618
Geometry Grp	7	7	7	7	7	7	7	7
Degree of Util (X)	0.029	0.531	0.09	0.088	0.146	0.235	0.086	1
Departure Headway (Hd)	6.93	6.362	8.245	7.555	7.927	7.35	6.469	5.884
Convergence, Y/N	Yes							
Cap	521	571	441	480	458	494	551	612
Service Time	4.609	4.052	5.881	5.212	5.567	5.007	4.235	3.65
HCM Lane V/C Ratio	0.029	0.527	0.088	0.087	0.144	0.233	0.087	1.01
HCM Control Delay	9.8	16	11.7	10.9	11.9	12.2	9.8	60.4
HCM Lane LOS	A	C	B	B	B	B	A	F
HCM 95th-tile Q	0.1	3.1	0.3	0.3	0.5	0.9	0.3	15.1

Notes

- : Volume Exceeds Capacity; \$: Delay Exceeds 300 Seconds; Error : Computation Not Defined

Two Way Analysis cannot be performed on an All Way Stop Intersection.

Lanes, Volumes, Timings
3: S Naches St & E Mason St

2035 Volumes-Mitigated Intersections

12/5/2016



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Volume (vph)	221	41	20	10	74	10	12	88	8	0	30	134
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.990			0.986			0.990			0.890	
Flt Protected		0.962			0.995			0.994				
Satd. Flow (prot)	0	1774	0	0	1759	0	0	1833	0	0	1691	0
Flt Permitted		0.962			0.995			0.994				
Satd. Flow (perm)	0	1774	0	0	1759	0	0	1833	0	0	1691	0
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		185			139			294			225	
Travel Time (s)		4.2			3.2			6.7			5.1	
Peak Hour Factor	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81
Heavy Vehicles (%)	2%	2%	2%	6%	6%	6%	2%	2%	2%	0%	0%	0%
Adj. Flow (vph)	273	51	25	12	91	12	15	109	10	0	37	165
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	349	0	0	115	0	0	134	0	0	202	0
Enter Blocked Intersection	No	No	No									
Lane Alignment	Left	Left	Right									
Median Width(ft)		0			0			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	44.2%
Analysis Period (min)	15
	ICU Level of Service A

Intersection												
Intersection Delay, s/veh	11											
Intersection LOS	B											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	221	41	20	10	74	10	12	88	8	0	30	134
Peak Hour Factor	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81
Heavy Vehicles, %	2	2	2	6	6	6	2	2	2	0	0	0
Mvmt Flow	273	51	25	12	91	12	15	109	10	0	37	165
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	12.8	9.5	9.8	9.7
HCM LOS	B	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	11%	78%	11%	0%
Vol Thru, %	81%	15%	79%	18%
Vol Right, %	7%	7%	11%	82%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	108	282	94	164
LT Vol	88	41	74	30
Through Vol	8	20	10	134
RT Vol	12	221	10	0
Lane Flow Rate	133	348	116	202
Geometry Grp	1	1	1	1
Degree of Util (X)	0.202	0.485	0.173	0.268
Departure Headway (Hd)	5.458	5.122	5.364	4.877
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	661	707	672	741
Service Time	3.465	3.122	3.373	2.877
HCM Lane V/C Ratio	0.201	0.492	0.173	0.273
HCM Control Delay	9.8	12.8	9.5	9.7
HCM Lane LOS	A	B	A	A
HCM 95th-tile Q	0.8	2.7	0.6	1.1

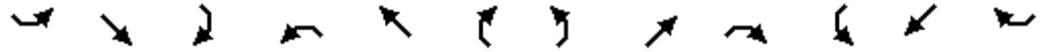
Notes

- : Volume Exceeds Capacity; \$: Delay Exceeds 300 Seconds; Error : Computation Not Defined

Lanes, Volumes, Timings
8: SR 410 & Wheeler Ave

2035 Volumes-Mitigated Intersections

12/5/2016

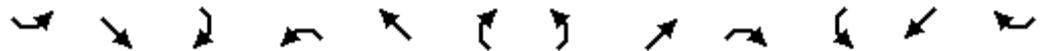


Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations		↕			↕		↕	↕		↕	↕	
Volume (vph)	0	0	7	17	2	33	5	1030	55	51	1583	3
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	100		0	100		0
Storage Lanes	0		0	0		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.865			0.914			0.992				
Flt Protected					0.984		0.950			0.950		
Satd. Flow (prot)	0	1644	0	0	1709	0	1770	1848	0	1770	1863	0
Flt Permitted					0.888		0.032			0.202		
Satd. Flow (perm)	0	1644	0	0	1542	0	60	1848	0	376	1863	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		71			35			8				
Link Speed (mph)		30			30			30				30
Link Distance (ft)		101			244			206				335
Travel Time (s)		2.3			5.5			4.7				7.6
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	2%	2%	2%	2%	2%	2%
Adj. Flow (vph)	0	0	7	18	2	35	5	1120	60	55	1721	3
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	7	0	0	55	0	5	1180	0	55	1724	0
Enter Blocked Intersection	No											
Lane Alignment	Left	Left	Right									
Median Width(ft)		0			0			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru										
Leading Detector (ft)	20	100		20	100		20	100		20	100	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Detector 1 Position(ft)	0	0		0	0		0	0		0	0	
Detector 1 Size(ft)	20	6		20	6		20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex										
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA										
Protected Phases		6			2			4			8	
Permitted Phases	6			2			4			8		

Lanes, Volumes, Timings
8: SR 410 & Wheeler Ave

2035 Volumes-Mitigated Intersections

12/5/2016



Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Detector Phase	6	6		2	2		4	4		8	8	
Switch Phase												
Minimum Initial (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Minimum Split (s)	20.0	20.0		20.0	20.0		20.0	20.0		20.0	20.0	
Total Split (s)	20.0	20.0		20.0	20.0		130.0	130.0		130.0	130.0	
Total Split (%)	13.3%	13.3%		13.3%	13.3%		86.7%	86.7%		86.7%	86.7%	
Maximum Green (s)	16.0	16.0		16.0	16.0		126.0	126.0		126.0	126.0	
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	0.5	0.5		0.5	0.5		0.5	0.5		0.5	0.5	
Lost Time Adjust (s)		0.0			0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)		4.0			4.0		4.0	4.0		4.0	4.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	Min	Min		Min	Min		None	None		None	None	
Walk Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Flash Dont Walk (s)	11.0	11.0		11.0	11.0		11.0	11.0		11.0	11.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)		7.7			7.7		126.1	126.1		126.1	126.1	
Actuated g/C Ratio		0.05			0.05		0.89	0.89		0.89	0.89	
v/c Ratio		0.04			0.47		0.09	0.72		0.16	1.04	
Control Delay		0.6			43.0		5.2	5.6		2.4	44.0	
Queue Delay		0.0			0.0		0.0	0.0		0.0	0.0	
Total Delay		0.6			43.0		5.2	5.6		2.4	44.0	
LOS		A			D		A	A		A	D	
Approach Delay		0.6			43.0			5.6			42.7	
Approach LOS		A			D			A			D	
Queue Length 50th (ft)		0			18		0	207		4	~1702	
Queue Length 95th (ft)		0			64		3	429		14	#2070	
Internal Link Dist (ft)		21			164			126			255	
Turn Bay Length (ft)							100			100		
Base Capacity (vph)		248			204		53	1643		334	1656	
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		0.03			0.27		0.09	0.72		0.16	1.04	

Intersection Summary

Area Type: Other
 Cycle Length: 150
 Actuated Cycle Length: 141.8
 Natural Cycle: 150
 Control Type: Actuated-Uncoordinated
 Maximum v/c Ratio: 1.04
 Intersection Signal Delay: 28.1
 Intersection LOS: C
 Intersection Capacity Utilization 99.9%
 ICU Level of Service F
 Analysis Period (min) 15
 ~ 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.

Splits and Phases: 8: SR 410 & Wheeler Ave

 $\phi 2$	 $\phi 4$
20 s	130 s
 $\phi 6$	 $\phi 8$
20 s	130 s

												
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (veh/h)	0	0	7	17	2	33	5	1030	55	51	1583	3
Number	1	6	16	5	2	12	7	4	14	3	8	18
Initial Q, 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	1900	1900	1900	1900	1900	1863	1863	1900	1863	1863	1900
Lanes	0	1	0	0	1	0	1	1	0	1	1	0
Lane Assignment												
Cap, veh/h	0	0	79	54	9	50	51	1567	84	386	1662	3
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
Prop Arrive On Green	0.00	0.00	0.05	0.05	0.05	0.05	0.89	0.89	0.89	0.89	0.89	0.89
Ln Grp Delay, s/veh	0.0	0.0	64.5	69.3	0.0	0.0	71.3	0.0	3.7	7.0	0.0	39.2
Ln Grp LOS			E	E			E		A	A		F
Approach Vol, veh/h		7			55			1185			1779	
Approach Delay, s/veh		64.5			69.3			4.0			38.2	
Approach LOS		E			E			A			D	
Timer:		1	2	3	4	5	6	7	8			
Assigned Phs			2		4		6		8			
Case No			8.0		6.0		8.0		6.0			
Phs Duration (G+Y+Rc), s			10.9		130.0		10.9		130.0			
Change Period (Y+Rc), s			4.0		4.0		4.0		4.0			
Max Allow Headway (MAH), s			5.5		5.2		5.5		5.2			
Max Green (Gmax), s			16.0		126.0		16.0		126.0			
Max Q Clear (g_c+I1), s			6.8		128.0		2.6		128.0			
Green Ext Time (g_e), s			0.1		0.0		0.2		0.0			
Prob of Phs Call (p_c)			1.00		1.00		1.00		1.00			
Prob of Max Out (p_x)			0.05		1.00		0.00		1.00			
Left-Turn Movement Data												
Assigned Mvmt			5		7		1		3			
Mvmt Sat Flow, veh/h			402		281		0		473			
Through Movement Data												
Assigned Mvmt			2		4		6		8			
Mvmt Sat Flow, veh/h			176		1752		0		1859			
Right-Turn Movement Data												
Assigned Mvmt			12		14		16		18			
Mvmt Sat Flow, veh/h			1012		94		1615		3			
Left Lane Group Data												
Assigned Mvmt		0	5	0	7	0	1	0	3			
Lane Assignment			L+T+R		L				L			
Lanes in Grp		0	1	0	1	0	0	0	1			
Grp Vol (v), veh/h		0	55	0	5	0	0	0	55			
Grp Sat Flow (s), veh/h/ln		0	1590	0	281	0	0	0	473			
Q Serve Time (g_s), s		0.0	3.3	0.0	0.0	0.0	0.0	0.0	5.4			

Cycle Q Clear Time (g_c), s	0.0	4.8	0.0	126.0	0.0	0.0	0.0	31.8
Perm LT Sat Flow (s_l), veh/h/ln	0	1431	0	281	0	0	0	473
Shared LT Sat Flow (s_sh), veh/h/ln	0	0	0	0	0	1900	0	0
Perm LT Eff Green (g_p), s	0.0	6.9	0.0	126.0	0.0	0.0	0.0	126.0
Perm LT Serve Time (g_u), s	0.0	6.3	0.0	0.0	0.0	0.0	0.0	99.6
Perm LT Q Serve Time (g_ps), s	0.0	3.3	0.0	0.0	0.0	0.0	0.0	5.4
Time to First Blk (g_f), s	0.0	1.5	0.0	0.0	0.0	6.9	0.0	0.0
Serve Time pre Blk (g_fs), s	0.0	1.5	0.0	0.0	0.0	0.0	0.0	0.0
Prop LT Inside Lane (P_L)	0.00	0.33	0.00	1.00	0.00	0.00	0.00	1.00
Lane Grp Cap (c), veh/h	0	112	0	51	0	0	0	386
V/C Ratio (X)	0.00	0.49	0.00	0.10	0.00	0.00	0.00	0.14
Avail Cap (c_a), veh/h	0	212	0	51	0	0	0	386
Upstream Filter (I)	0.00	1.00	0.00	1.00	0.00	0.00	0.00	1.00
Uniform Delay (d1), s/veh	0.0	65.9	0.0	70.4	0.0	0.0	0.0	6.8
Incr Delay (d2), s/veh	0.0	3.3	0.0	0.8	0.0	0.0	0.0	0.2
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	69.3	0.0	71.3	0.0	0.0	0.0	7.0
1st-Term Q (Q1), veh/ln	0.0	2.0	0.0	0.2	0.0	0.0	0.0	0.6
2nd-Term Q (Q2), veh/ln	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
%ile Back of Q (50%), veh/ln	0.0	2.1	0.0	0.2	0.0	0.0	0.0	0.6
%ile Storage Ratio (RQ%)	0.00	0.25	0.00	0.05	0.00	0.00	0.00	0.16
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Middle Lane Group Data								
Assigned Mvmt	0	2	0	4	0	6	0	8
Lane Assignment								
Lanes in Grp	0	0	0	0	0	0	0	0
Grp Vol (v), veh/h	0	0	0	0	0	0	0	0
Grp Sat Flow (s), veh/h/ln	0	0	0	0	0	0	0	0
Q Serve Time (g_s), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear Time (g_c), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Lane Grp Cap (c), veh/h	0	0	0	0	0	0	0	0
V/C Ratio (X)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Avail Cap (c_a), veh/h	0	0	0	0	0	0	0	0
Upstream Filter (I)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Uniform Delay (d1), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1st-Term Q (Q1), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2nd-Term Q (Q2), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
%ile Back of Q (50%), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

%ile Storage Ratio (RQ%)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Right Lane Group Data

Assigned Mvmt	0	12	0	14	0	16	0	18
Lane Assignment				T+R		T+R		T+R
Lanes in Grp	0	0	0	1	0	1	0	1
Grp Vol (v), veh/h	0	0	0	1180	0	7	0	1724
Grp Sat Flow (s), veh/h/ln	0	0	0	1846	0	1615	0	1862
Q Serve Time (g_s), s	0.0	0.0	0.0	26.4	0.0	0.6	0.0	126.0
Cycle Q Clear Time (g_c), s	0.0	0.0	0.0	26.4	0.0	0.6	0.0	126.0
Prot RT Sat Flow (s_R), veh/h/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prot RT Eff Green (g_R), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prop RT Outside Lane (P_R)	0.00	0.64	0.00	0.05	0.00	1.00	0.00	0.00
Lane Grp Cap (c), veh/h	0	0	0	1651	0	79	0	1665
V/C Ratio (X)	0.00	0.00	0.00	0.71	0.00	0.09	0.00	1.04
Avail Cap (c_a), veh/h	0	0	0	1651	0	183	0	1665
Upstream Filter (I)	0.00	0.00	0.00	1.00	0.00	1.00	0.00	1.00
Uniform Delay (d1), s/veh	0.0	0.0	0.0	2.2	0.0	64.0	0.0	7.4
Incr Delay (d2), s/veh	0.0	0.0	0.0	1.5	0.0	0.5	0.0	31.7
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	0.0	0.0	3.7	0.0	64.5	0.0	39.2
1st-Term Q (Q1), veh/ln	0.0	0.0	0.0	7.2	0.0	0.2	0.0	34.7
2nd-Term Q (Q2), veh/ln	0.0	0.0	0.0	0.7	0.0	0.0	0.0	14.7
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
%ile Back of Q (50%), veh/ln	0.0	0.0	0.0	7.9	0.0	0.3	0.0	49.4
%ile Storage Ratio (RQ%)	0.00	0.00	0.00	1.13	0.00	0.17	0.00	4.21
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	14.7
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3

Intersection Summary

HCM 2010 Ctrl Delay	25.4
HCM 2010 LOS	C

Notes

HCM 2010 Signalized Intersection Summary
8: SR 410 & Wheeler Ave

2035 Volumes-Mitigated Intersections

12/5/2016

												
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (veh/h)	0	0	7	17	2	33	5	1030	55	51	1583	3
Number	1	6	16	5	2	12	7	4	14	3	8	18
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	190.0	190.0	190.0	190.0	190.0	190.0	186.3	186.3	190.0	186.3	186.3	190.0
Lanes	0	1	0	0	1	0	1	1	0	1	1	0
Cap, veh/h	0	0	79	54	9	50	51	1567	84	386	1662	3
Arrive On Green	0.00	0.00	0.05	0.05	0.05	0.05	0.89	0.89	0.89	0.89	0.89	0.89
Sat Flow, veh/h	0	0	1615	402	176	1012	281	1752	94	473	1859	3
Grp Volume(v), veh/h	0	0	7	55	0	0	5	0	1180	55	0	1724
Grp Sat Flow(s),veh/h/ln	0	0	1615	1590	0	0	281	0	1846	473	0	1862
Q Serve(g_s), s	0.0	0.0	0.6	3.3	0.0	0.0	0.0	0.0	26.4	5.4	0.0	126.0
Cycle Q Clear(g_c), s	0.0	0.0	0.6	4.8	0.0	0.0	126.0	0.0	26.4	31.8	0.0	126.0
Prop In Lane	0.00		1.00	0.33		0.64	1.00		0.05	1.00		0.00
Lane Grp Cap(c), veh/h	0	0	79	112	0	0	51	0	1651	386	0	1665
V/C Ratio(X)	0.00	0.00	0.09	0.49	0.00	0.00	0.10	0.00	0.71	0.14	0.00	1.04
Avail Cap(c_a), veh/h	0	0	183	212	0	0	51	0	1651	386	0	1665
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)	0.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	0.0	64.0	65.9	0.0	0.0	70.4	0.0	2.2	6.8	0.0	7.4
Incr Delay (d2), s/veh	0.0	0.0	0.5	3.3	0.0	0.0	0.8	0.0	1.5	0.2	0.0	31.7
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 Back of Q (50%), veh/ln	0.0	0.0	0.3	2.1	0.0	0.0	0.2	0.0	7.9	0.6	0.0	49.4
Lane Grp Delay (d), s/veh	0.0	0.0	64.5	69.3	0.0	0.0	71.3	0.0	3.7	7.0	0.0	39.2
Lane Grp LOS			E	E			E		A	A		F
Approach Vol, veh/h		7			55			1185				1779
Approach Delay, s/veh		64.5			69.3			4.0				38.2
Approach LOS		E			E			A				D
Timer												
Assigned Phs		6			2			4				8
Phs Duration (G+Y+Rc), s		10.9			10.9			130.0				130.0
Change Period (Y+Rc), s		4.0			4.0			4.0				4.0
Max Green Setting (Gmax), s		16.0			16.0			126.0				126.0
Max Q Clear Time (g_c+1), s		2.6			6.8			128.0				128.0
Green Ext Time (p_c), s		0.2			0.1			0.0				0.0
Intersection Summary												
HCM 2010 Ctrl Delay			25.4									
HCM 2010 LOS			C									
Notes												

Lanes, Volumes, Timings
3: Mundy Loss Road & SR 410

2035 volumes-mitigated
12/5/2016



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	25	1035	161	230	1399	48	169	40	165	54	80	23
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	100		100	100		0	0		100	0		100
Storage Lanes	1		1	1		0	0		1	0		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850		0.995				0.850			0.850
Flt Protected	0.950			0.950				0.961			0.980	
Satd. Flow (prot)	1770	1863	1583	1787	3556	0	0	1826	1615	0	1862	1615
Flt Permitted	0.950			0.950				0.622			0.692	
Satd. Flow (perm)	1770	1863	1583	1787	3556	0	0	1182	1615	0	1315	1615
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			123		7				168			123
Link Speed (mph)		35		35			30			30		30
Link Distance (ft)		680		655			1371			719		
Travel Time (s)		13.2		12.8			31.2			16.3		
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Heavy Vehicles (%)	2%	2%	2%	1%	1%	1%	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	26	1056	164	235	1428	49	172	41	168	55	82	23
Shared Lane Traffic (%)												
Lane Group Flow (vph)	26	1056	164	235	1477	0	0	213	168	0	137	23
Enter Blocked Intersection	No											
Lane Alignment	Left	Left	Right									
Median Width(ft)		12		12			0			0		0
Link Offset(ft)		0		0			0			0		0
Crosswalk Width(ft)		16		16			16			16		16
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2		1	2	1	1	2	1
Detector Template	Left	Thru	Right	Left	Thru		Left	Thru	Right	Left	Thru	Right
Leading Detector (ft)	20	100	20	20	100		20	100	20	20	100	20
Trailing Detector (ft)	0	0	0	0	0		0	0	0	0	0	0
Detector 1 Position(ft)	0	0	0	0	0		0	0	0	0	0	0
Detector 1 Size(ft)	20	6	20	20	6		20	6	20	20	6	20
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)		94		94			94			94		94
Detector 2 Size(ft)		6		6			6			6		6
Detector 2 Type		Cl+Ex		Cl+Ex			Cl+Ex			Cl+Ex		Cl+Ex
Detector 2 Channel												
Detector 2 Extend (s)		0.0		0.0			0.0			0.0		0.0
Turn Type	Prot	NA	Perm	Prot	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases	7	4		3	8			2			6	
Permitted Phases			4				2		2	6		6

Lanes, Volumes, Timings
3: Mundy Loss Road & SR 410

2035 volumes-mitigated

12/5/2016

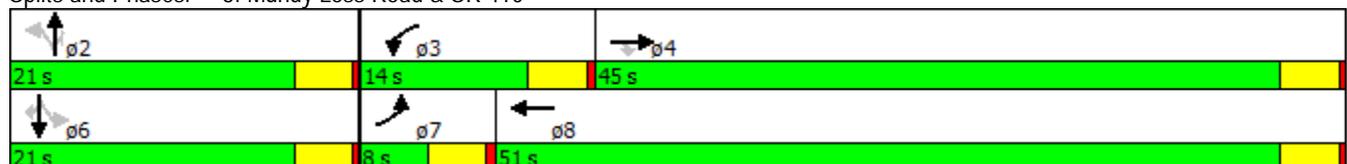


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	7	4	4	3	8		2	2	2	6	6	6
Switch Phase												
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	8.0	20.0	20.0	8.0	20.0		20.0	20.0	20.0	20.0	20.0	20.0
Total Split (s)	8.0	45.0	45.0	14.0	51.0		21.0	21.0	21.0	21.0	21.0	21.0
Total Split (%)	10.0%	56.3%	56.3%	17.5%	63.8%		26.3%	26.3%	26.3%	26.3%	26.3%	26.3%
Maximum Green (s)	4.0	41.0	41.0	10.0	47.0		17.0	17.0	17.0	17.0	17.0	17.0
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5		3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5		0.5	0.5	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag							
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes							
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	None	None	None		Max	Max	Max	Max	Max	Max
Walk Time (s)		5.0	5.0		5.0		5.0	5.0	5.0	5.0	5.0	5.0
Flash Dont Walk (s)		11.0	11.0		11.0		11.0	11.0	11.0	11.0	11.0	11.0
Pedestrian Calls (#/hr)		0	0		0		0	0	0	0	0	0
Act Effct Green (s)	4.0	41.0	41.0	10.0	51.8		17.0	17.0		17.0	17.0	17.0
Actuated g/C Ratio	0.05	0.51	0.51	0.12	0.65		0.21	0.21		0.21	0.21	0.21
v/c Ratio	0.30	1.11	0.19	1.05	0.64		0.85	0.35		0.49	0.05	0.05
Control Delay	45.5	85.0	4.0	112.5	10.8		61.5	7.0		34.7	0.2	0.2
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	45.5	85.0	4.0	112.5	10.8		61.5	7.0		34.7	0.2	0.2
LOS	D	F	A	F	B		E	A		C	A	A
Approach Delay		73.5			24.7		37.5			29.7		
Approach LOS		E			C		D			C		

Intersection Summary

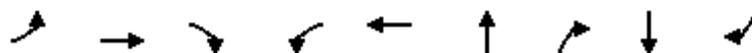
Area Type: Other
 Cycle Length: 80
 Actuated Cycle Length: 80
 Natural Cycle: 90
 Control Type: Actuated-Uncoordinated
 Maximum v/c Ratio: 1.11
 Intersection Signal Delay: 43.7
 Intersection LOS: D
 Intersection Capacity Utilization 95.3%
 ICU Level of Service F
 Analysis Period (min) 15

Splits and Phases: 3: Mundy Loss Road & SR 410



Queues
3: Mundy Loss Road & SR 410

2035 volumes-mitigated
12/5/2016



Lane Group	EBL	EBT	EBR	WBL	WBT	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	26	1056	164	235	1477	213	168	137	23
v/c Ratio	0.30	1.11	0.19	1.05	0.64	0.85	0.35	0.49	0.05
Control Delay	45.5	85.0	4.0	112.5	10.8	61.5	7.0	34.7	0.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	45.5	85.0	4.0	112.5	10.8	61.5	7.0	34.7	0.2
Queue Length 50th (ft)	13	~611	10	~130	174	103	0	61	0
Queue Length 95th (ft)	38	#841	39	#267	324	#223	48	116	0
Internal Link Dist (ft)		600			575	1291		639	
Turn Bay Length (ft)	100		100	100			100		100
Base Capacity (vph)	88	954	871	223	2304	251	475	279	440
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.30	1.11	0.19	1.05	0.64	0.85	0.35	0.49	0.05

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.

HCM 2010 Signalized Intersection Capacity Analysis
 3: Mundy Loss Road & SR 410

2035 volumes-mitigated
 12/5/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	25	1035	161	230	1399	48	169	40	165	54	80	23
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q, 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	1863	1881	1881	1900	1900	1900	1900	1900	1900	1900
Lanes	1	1	1	1	2	0	0	1	1	0	1	1
Lane Assignment												
Cap, veh/h	39	955	811	224	2226	76	81	0	343	63	70	343
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
Prop Arrive On Green	0.02	0.51	0.51	0.13	0.62	0.62	0.21	0.21	0.21	0.21	0.21	0.21
Ln Grp Delay, s/veh	56.8	82.2	10.7	108.7	11.0	11.0	802.6	0.0	32.6	118.1	0.0	25.5
Ln Grp LOS	E	F	B	F	B	B	F		C	F		C
Approach Vol, veh/h		1246			1712			381			160	
Approach Delay, s/veh		72.3			24.4			463.1			104.8	
Approach LOS		E			C			F			F	
Timer:		1	2	3	4	5	6	7	8			
Assigned Phs			2	3	4		6	7	8			
Case No			7.0	2.0	3.0		7.0	2.0	4.0			
Phs Duration (G+Y+Rc), s			21.0	14.0	45.0		21.0	5.8	53.2			
Change Period (Y+Rc), s			4.0	4.0	4.0		4.0	4.0	4.0			
Max Allow Headway (MAH), s			4.9	3.8	5.1		4.9	3.8	5.1			
Max Green (Gmax), s			17.0	10.0	41.0		17.0	4.0	47.0			
Max Q Clear (g_c+I1), s			19.0	12.0	43.0		19.0	3.2	22.1			
Green Ext Time (g_e), s			0.0	0.0	0.0		0.0	0.0	20.6			
Prob of Phs Call (p_c)			1.00	0.99	1.00		1.00	0.44	1.00			
Prob of Max Out (p_x)			1.00	1.00	1.00		1.00	1.00	0.83			
Left-Turn Movement Data												
Assigned Mvmt			5	3			1	7				
Mvmt Sat Flow, veh/h			0	1792			0	1774				
Through Movement Data												
Assigned Mvmt			2		4		6		8			
Mvmt Sat Flow, veh/h			0		1863		329		3617			
Right-Turn Movement Data												
Assigned Mvmt			12		14		16		18			
Mvmt Sat Flow, veh/h			1615		1583		1615		124			
Left Lane Group Data												
Assigned Mvmt		0	5	3	0	0	1	7	0			
Lane Assignment			L+T	L (Prot)			L+T	L (Prot)				
Lanes in Grp		0	1	1	0	0	1	1	0			
Grp Vol (v), veh/h		0	213	235	0	0	137	26	0			
Grp Sat Flow (s), veh/h/ln		0	0	1792	0	0	329	1774	0			
Q Serve Time (g_s), s		0.0	0.0	10.0	0.0	0.0	0.0	1.2	0.0			

HCM 2010 Signalized Intersection Capacity Analysis
 3: Mundy Loss Road & SR 410

2035 volumes-mitigated
 12/5/2016

Cycle Q Clear Time (g_c), s	0.0	17.0	10.0	0.0	0.0	17.0	1.2	0.0
Perm LT Sat Flow (s_l), veh/h/ln	0	1309	0	0	0	1191	0	0
Shared LT Sat Flow (s_sh), veh/h/ln	0	0	0	0	0	0	0	0
Perm LT Eff Green (g_p), s	0.0	17.0	0.0	0.0	0.0	17.0	0.0	0.0
Perm LT Serve Time (g_u), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Perm LT Q Serve Time (g_ps), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Time to First Blk (g_f), s	0.0	0.0	0.0	0.0	0.0	2.9	0.0	0.0
Serve Time pre Blk (g_fs), s	0.0	0.0	0.0	0.0	0.0	2.9	0.0	0.0
Prop LT Inside Lane (P_L)	0.00	0.81	1.00	0.00	0.00	0.40	1.00	0.00
Lane Grp Cap (c), veh/h	0	81	224	0	0	133	39	0
V/C Ratio (X)	0.00	2.62	1.05	0.00	0.00	1.03	0.67	0.00
Avail Cap (c_a), veh/h	0	81	224	0	0	133	89	0
Upstream Filter (I)	0.00	1.00	1.00	0.00	0.00	1.00	1.00	0.00
Uniform Delay (d1), s/veh	0.0	40.0	35.0	0.0	0.0	31.8	38.8	0.0
Incr Delay (d2), s/veh	0.0	762.6	73.7	0.0	0.0	86.3	17.9	0.0
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	802.6	108.7	0.0	0.0	118.1	56.8	0.0
1st-Term Q (Q1), veh/ln	0.0	1.6	4.3	0.0	0.0	2.7	0.5	0.0
2nd-Term Q (Q2), veh/ln	0.0	17.2	4.6	0.0	0.0	3.2	0.2	0.0
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	1.00	1.00	0.00	0.00	1.00	1.00	0.00
%ile Back of Q (50%), veh/ln	0.0	18.9	8.9	0.0	0.0	5.8	0.7	0.0
%ile Storage Ratio (RQ%)	0.00	0.36	2.24	0.00	0.00	0.22	0.18	0.00
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	32.9	2.8	0.0	0.0	1.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.7	0.3	0.0	0.0	0.3	0.0	0.0
Middle Lane Group Data								
Assigned Mvmt	0	2	0	4	0	6	0	8
Lane Assignment				T				T
Lanes in Grp	0	0	0	1	0	0	0	1
Grp Vol (v), veh/h	0	0	0	1056	0	0	0	742
Grp Sat Flow (s), veh/h/ln	0	0	0	1863	0	0	0	1881
Q Serve Time (g_s), s	0.0	0.0	0.0	41.0	0.0	0.0	0.0	20.0
Cycle Q Clear Time (g_c), s	0.0	0.0	0.0	41.0	0.0	0.0	0.0	20.0
Lane Grp Cap (c), veh/h	0	0	0	955	0	0	0	1158
V/C Ratio (X)	0.00	0.00	0.00	1.11	0.00	0.00	0.00	0.64
Avail Cap (c_a), veh/h	0	0	0	955	0	0	0	1158
Upstream Filter (I)	0.00	0.00	0.00	1.00	0.00	0.00	0.00	1.00
Uniform Delay (d1), s/veh	0.0	0.0	0.0	19.5	0.0	0.0	0.0	9.8
Incr Delay (d2), s/veh	0.0	0.0	0.0	62.7	0.0	0.0	0.0	1.2
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	0.0	0.0	82.2	0.0	0.0	0.0	11.0
1st-Term Q (Q1), veh/ln	0.0	0.0	0.0	16.2	0.0	0.0	0.0	7.4
2nd-Term Q (Q2), veh/ln	0.0	0.0	0.0	16.6	0.0	0.0	0.0	0.4
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
%ile Back of Q (50%), veh/ln	0.0	0.0	0.0	32.8	0.0	0.0	0.0	7.8

HCM 2010 Signalized Intersection Capacity Analysis
 3: Mundy Loss Road & SR 410

2035 volumes-mitigated
 12/5/2016

%ile Storage Ratio (RQ%)	0.00	0.00	0.00	1.32	0.00	0.00	0.00	0.32
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	25.3	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.3	0.0	0.0	0.0	0.0

Right Lane Group Data

Assigned Mvmt	0	12	0	14	0	16	0	18
Lane Assignment		R		R		R		T+R
Lanes in Grp	0	1	0	1	0	1	0	1
Grp Vol (v), veh/h	0	168	0	164	0	23	0	735
Grp Sat Flow (s), veh/h/ln	0	1615	0	1583	0	1615	0	1859
Q Serve Time (g_s), s	0.0	7.3	0.0	4.5	0.0	0.9	0.0	20.1
Cycle Q Clear Time (g_c), s	0.0	7.3	0.0	4.5	0.0	0.9	0.0	20.1
Prot RT Sat Flow (s_R), veh/h/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prot RT Eff Green (g_R), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prop RT Outside Lane (P_R)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	0.07
Lane Grp Cap (c), veh/h	0	343	0	811	0	343	0	1145
V/C Ratio (X)	0.00	0.49	0.00	0.20	0.00	0.07	0.00	0.64
Avail Cap (c_a), veh/h	0	343	0	811	0	343	0	1145
Upstream Filter (I)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
Uniform Delay (d1), s/veh	0.0	27.7	0.0	10.6	0.0	25.2	0.0	9.8
Incr Delay (d2), s/veh	0.0	4.9	0.0	0.1	0.0	0.4	0.0	1.2
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	32.6	0.0	10.7	0.0	25.5	0.0	11.0
1st-Term Q (Q1), veh/ln	0.0	2.8	0.0	1.5	0.0	0.3	0.0	7.4
2nd-Term Q (Q2), veh/ln	0.0	0.5	0.0	0.0	0.0	0.0	0.0	0.4
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
%ile Back of Q (50%), veh/ln	0.0	3.3	0.0	1.5	0.0	0.4	0.0	7.7
%ile Storage Ratio (RQ%)	0.00	0.82	0.00	0.39	0.00	0.10	0.00	0.32
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Intersection Summary

HCM 2010 Ctrl Delay	92.9
HCM 2010 LOS	F

Notes

Two Way Analysis cannot be performed on Signalized Intersection.

Lanes, Volumes, Timings
6: Mundy Loss Road & 112th ST E

2035 volumes-mitigated

12/5/2016



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Volume (vph)	61	25	77	46	84	42	59	280	11	13	391	88
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.936			0.967			0.996			0.976	
Flt Protected		0.982			0.987			0.992			0.999	
Satd. Flow (prot)	0	1729	0	0	1795	0	0	1877	0	0	1834	0
Flt Permitted		0.982			0.987			0.992			0.999	
Satd. Flow (perm)	0	1729	0	0	1795	0	0	1877	0	0	1834	0
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		647			701			660			1371	
Travel Time (s)		14.7			15.9			15.0			31.2	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	0%	0%	0%	1%	1%	1%
Adj. Flow (vph)	66	27	83	49	90	45	63	301	12	14	420	95
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	176	0	0	184	0	0	376	0	0	529	0
Enter Blocked Intersection	No	No	No									
Lane Alignment	Left	Left	Right									
Median Width(ft)		0			0			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	66.7%
Analysis Period (min)	15
	ICU Level of Service C

Intersection												
Intersection Delay, s/veh	24.3											
Intersection LOS	C											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	61	25	77	46	84	42	59	280	11	13	391	88
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles, %	1	1	1	1	1	1	0	0	0	1	1	1
Mvmt Flow	66	27	83	49	90	45	63	301	12	14	420	95
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	13.5	14	20.1	34.5
HCM LOS	B	B	C	D

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	17%	37%	27%	3%
Vol Thru, %	80%	15%	49%	79%
Vol Right, %	3%	47%	24%	18%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	350	163	172	492
LT Vol	280	25	84	391
Through Vol	11	77	42	88
RT Vol	59	61	46	13
Lane Flow Rate	376	175	185	529
Geometry Grp	1	1	1	1
Degree of Util (X)	0.649	0.337	0.359	0.859
Departure Headway (Hd)	6.205	6.919	6.995	5.848
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	580	517	512	619
Service Time	4.272	5	5.075	3.907
HCM Lane V/C Ratio	0.648	0.338	0.361	0.855
HCM Control Delay	20.1	13.5	14	34.5
HCM Lane LOS	C	B	B	D
HCM 95th-tile Q	4.7	1.5	1.6	9.6

Notes

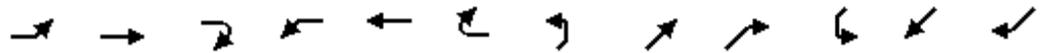
- : Volume Exceeds Capacity; \$: Delay Exceeds 300 Seconds; Error : Computation Not Defined

Two Way Analysis cannot be performed on an All Way Stop Intersection.

Lanes, Volumes, Timings
3: SR410 & W Main St/E Main St

2035 Projection-Mitigated intersections

12/5/2016

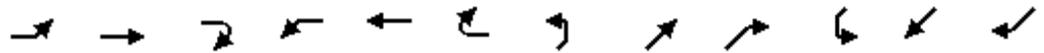


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	40	103	2	236	65	54	10	1025	153	88	1677	19
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	100		0	100		0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.997			0.932			0.981				0.998
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1805	1894	0	1787	1753	0	1787	1845	0	1770	1859	0
Flt Permitted	0.546			0.588			0.040			0.103		
Satd. Flow (perm)	1037	1894	0	1106	1753	0	75	1845	0	192	1859	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		1			27			18				1
Link Speed (mph)		30			30			30				30
Link Distance (ft)		466			386			454				1270
Travel Time (s)		10.6			8.8			10.3				28.9
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	0%	0%	0%	1%	1%	1%	1%	1%	1%	2%	2%	2%
Adj. Flow (vph)	42	107	2	246	68	56	10	1068	159	92	1747	20
Shared Lane Traffic (%)												
Lane Group Flow (vph)	42	109	0	246	124	0	10	1227	0	92	1767	0
Enter Blocked Intersection	No											
Lane Alignment	Left	Left	Right									
Median Width(ft)		12			12			12				12
Link Offset(ft)		0			0			0				0
Crosswalk Width(ft)		16			16			16				16
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru										
Leading Detector (ft)	20	100		20	100		20	100		20	100	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Detector 1 Position(ft)	0	0		0	0		0	0		0	0	
Detector 1 Size(ft)	20	6		20	6		20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex										
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA										
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		

Lanes, Volumes, Timings
3: SR410 & W Main St/E Main St

2035 Projection-Mitigated intersections

12/5/2016



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NEL	NET	NER	SWL	SWT	SWR
Detector Phase	4	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Minimum Split (s)	20.0	20.0		20.0	20.0		20.0	20.0		20.0	20.0	
Total Split (s)	25.0	25.0		25.0	25.0		105.0	105.0		105.0	105.0	
Total Split (%)	19.2%	19.2%		19.2%	19.2%		80.8%	80.8%		80.8%	80.8%	
Maximum Green (s)	21.0	21.0		21.0	21.0		101.0	101.0		101.0	101.0	
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	0.5	0.5		0.5	0.5		0.5	0.5		0.5	0.5	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None		Max	Max		Max	Max	
Walk Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Flash Dont Walk (s)	11.0	11.0		11.0	11.0		11.0	11.0		11.0	11.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)	21.0	21.0		21.0	21.0		101.0	101.0		101.0	101.0	
Actuated g/C Ratio	0.16	0.16		0.16	0.16		0.78	0.78		0.78	0.78	
v/c Ratio	0.25	0.36		1.38	0.41		0.17	0.85		0.62	1.22	
Control Delay	52.2	51.8		243.4	42.5		11.2	17.1		27.7	125.7	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	52.2	51.8		243.4	42.5		11.2	17.1		27.7	125.7	
LOS	D	D		F	D		B	B		C	F	
Approach Delay		51.9			176.1			17.1			120.9	
Approach LOS		D			F			B			F	

Intersection Summary

Area Type:	Other
Cycle Length:	130
Actuated Cycle Length:	130
Natural Cycle:	110
Control Type:	Actuated-Uncoordinated
Maximum v/c Ratio:	1.38
Intersection Signal Delay:	88.1
Intersection LOS:	F
Intersection Capacity Utilization:	115.8%
ICU Level of Service:	H
Analysis Period (min):	15

Splits and Phases: 3: SR410 & W Main St/E Main St

105 s	25 s
105 s	25 s

Queues
3: SR410 & W Main St/E Main St

2035 Projection-Mitigated intersections

12/5/2016



Lane Group	EBL	EBT	WBL	WBT	NEL	NET	SWL	SWT
Lane Group Flow (vph)	42	109	246	124	10	1227	92	1767
v/c Ratio	0.25	0.36	1.38	0.41	0.17	0.85	0.62	1.22
Control Delay	52.2	51.8	243.4	42.5	11.2	17.1	27.7	125.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	52.2	51.8	243.4	42.5	11.2	17.1	27.7	125.7
Queue Length 50th (ft)	31	82	-274	74	2	575	28	-1838
Queue Length 95th (ft)	69	141	#446	137	9	854	#146	#2106
Internal Link Dist (ft)		386		306		374		1190
Turn Bay Length (ft)					100		100	
Base Capacity (vph)	167	306	178	305	58	1437	149	1444
Starvation Cap Reductn	0	0	0	0	0	0	0	4
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	0.36	1.38	0.41	0.17	0.85	0.62	1.23

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.

HCM 2010 Signalized Intersection Capacity Analysis 2035 Projection-Mitigated intersections
 3: SR410 & W Main St/E Main St 12/5/2016

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (veh/h)	40	103	2	236	65	54	10	1025	153	88	1677	19
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q, 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	1900	1900	1881	1881	1900	1881	1881	1900	1863	1863	1900
Lanes	1	1	0	1	1	0	1	1	0	1	1	0
Lane Assignment												
Cap, veh/h	181	300	6	198	154	127	55	1244	185	205	1428	16
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
Prop Arrive On Green	0.16	0.16	0.16	0.16	0.16	0.16	0.78	0.78	0.78	0.78	0.78	0.78
Ln Grp Delay, s/veh	55.4	0.0	49.2	204.4	0.0	50.3	72.0	0.0	16.6	43.6	0.0	121.4
Ln Grp LOS	E		D	F		D	E		B	D		F
Approach Vol, veh/h		151			370			1237			1859	
Approach Delay, s/veh		50.9			152.7			17.1			117.6	
Approach LOS		D			F			B			F	
Timer:		1	2	3	4	5	6	7	8			
Assigned Phs			2		4		6		8			
Case No			6.0		6.0		6.0		6.0			
Phs Duration (G+Y+Rc), s			105.0		25.0		105.0		25.0			
Change Period (Y+Rc), s			4.0		4.0		4.0		4.0			
Max Allow Headway (MAH), s			5.2		4.5		5.2		4.5			
Max Green (Gmax), s			101.0		21.0		101.0		21.0			
Max Q Clear (g_c+I1), s			103.0		14.3		103.0		23.0			
Green Ext Time (g_e), s			0.0		1.3		0.0		0.0			
Prob of Phs Call (p_c)			1.00		1.00		1.00		1.00			
Prob of Max Out (p_x)			1.00		0.48		1.00		1.00			
Left-Turn Movement Data												
Assigned Mvmt			5		7		1		3			
Mvmt Sat Flow, veh/h			272		1287		453		1292			
Through Movement Data												
Assigned Mvmt			2		4		6		8			
Mvmt Sat Flow, veh/h			1601		1859		1838		955			
Right-Turn Movement Data												
Assigned Mvmt			12		14		16		18			
Mvmt Sat Flow, veh/h			238		35		21		787			
Left Lane Group Data												
Assigned Mvmt		0	5	0	7	0	1	0	3			
Lane Assignment			L		L		L		L			
Lanes in Grp		0	1	0	1	0	1	0	1			
Grp Vol (v), veh/h		0	10	0	42	0	92	0	246			
Grp Sat Flow (s), veh/h/ln		0	272	0	1287	0	453	0	1292			
Q Serve Time (g_s), s		0.0	0.0	0.0	4.0	0.0	22.2	0.0	14.3			

HCM 2010 Signalized Intersection Capacity Analysis 2035 Projection-Mitigated intersections
 3: SR410 & W Main St/E Main St 12/5/2016

Cycle Q Clear Time (g_c), s	0.0	101.0	0.0	12.3	0.0	80.4	0.0	21.0
Perm LT Sat Flow (s_l), veh/h/ln	0	272	0	1287	0	453	0	1292
Shared LT Sat Flow (s_sh), veh/h/ln	0	0	0	0	0	0	0	0
Perm LT Eff Green (g_p), s	0.0	101.0	0.0	21.0	0.0	101.0	0.0	21.0
Perm LT Serve Time (g_u), s	0.0	0.0	0.0	12.6	0.0	42.9	0.0	14.3
Perm LT Q Serve Time (g_ps), s	0.0	0.0	0.0	4.0	0.0	22.2	0.0	14.3
Time to First Blk (g_f), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Serve Time pre Blk (g_fs), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prop LT Inside Lane (P_L)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
Lane Grp Cap (c), veh/h	0	55	0	181	0	205	0	198
V/C Ratio (X)	0.00	0.18	0.00	0.23	0.00	0.45	0.00	1.24
Avail Cap (c_a), veh/h	0	55	0	181	0	205	0	198
Upstream Filter (I)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
Uniform Delay (d1), s/veh	0.0	65.0	0.0	54.8	0.0	36.6	0.0	59.8
Incr Delay (d2), s/veh	0.0	7.0	0.0	0.7	0.0	7.0	0.0	144.5
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	72.0	0.0	55.4	0.0	43.6	0.0	204.4
1st-Term Q (Q1), veh/ln	0.0	0.3	0.0	1.3	0.0	2.6	0.0	6.7
2nd-Term Q (Q2), veh/ln	0.0	0.1	0.0	0.0	0.0	0.4	0.0	7.9
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
%ile Back of Q (50%), veh/ln	0.0	0.4	0.0	1.4	0.0	3.0	0.0	14.7
%ile Storage Ratio (RQ%)	0.00	0.11	0.00	0.09	0.00	0.76	0.00	1.51
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	12.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3
Middle Lane Group Data								
Assigned Mvmt	0	2	0	4	0	6	0	8
Lane Assignment								
Lanes in Grp	0	0	0	0	0	0	0	0
Grp Vol (v), veh/h	0	0	0	0	0	0	0	0
Grp Sat Flow (s), veh/h/ln	0	0	0	0	0	0	0	0
Q Serve Time (g_s), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear Time (g_c), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Lane Grp Cap (c), veh/h	0	0	0	0	0	0	0	0
V/C Ratio (X)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Avail Cap (c_a), veh/h	0	0	0	0	0	0	0	0
Upstream Filter (I)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Uniform Delay (d1), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1st-Term Q (Q1), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2nd-Term Q (Q2), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
%ile Back of Q (50%), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

HCM 2010 Signalized Intersection Capacity Analysis 2035 Projection-Mitigated intersections
 3: SR410 & W Main St/E Main St 12/5/2016

%ile Storage Ratio (RQ%)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Right Lane Group Data

Assigned Mvmt	0	12	0	14	0	16	0	18
Lane Assignment		T+R		T+R		T+R		T+R
Lanes in Grp	0	1	0	1	0	1	0	1
Grp Vol (v), veh/h	0	1227	0	109	0	1767	0	124
Grp Sat Flow (s), veh/h/ln	0	1839	0	1894	0	1859	0	1742
Q Serve Time (g_s), s	0.0	58.1	0.0	6.7	0.0	101.0	0.0	8.4
Cycle Q Clear Time (g_c), s	0.0	58.1	0.0	6.7	0.0	101.0	0.0	8.4
Prot RT Sat Flow (s_R), veh/h/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prot RT Eff Green (g_R), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prop RT Outside Lane (P_R)	0.00	0.13	0.00	0.02	0.00	0.01	0.00	0.45
Lane Grp Cap (c), veh/h	0	1429	0	306	0	1444	0	281
V/C Ratio (X)	0.00	0.86	0.00	0.36	0.00	1.22	0.00	0.44
Avail Cap (c_a), veh/h	0	1429	0	306	0	1444	0	281
Upstream Filter (I)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
Uniform Delay (d1), s/veh	0.0	9.7	0.0	48.5	0.0	14.5	0.0	49.2
Incr Delay (d2), s/veh	0.0	6.9	0.0	0.7	0.0	106.9	0.0	1.1
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	16.6	0.0	49.2	0.0	121.4	0.0	50.3
1st-Term Q (Q1), veh/ln	0.0	22.5	0.0	3.3	0.0	39.3	0.0	3.8
2nd-Term Q (Q2), veh/ln	0.0	2.7	0.0	0.1	0.0	42.9	0.0	0.1
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
%ile Back of Q (50%), veh/ln	0.0	25.2	0.0	3.3	0.0	82.2	0.0	3.8
%ile Storage Ratio (RQ%)	0.00	1.65	0.00	0.21	0.00	1.86	0.00	0.39
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	80.7	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.0

Intersection Summary

HCM 2010 Ctrl Delay	84.0
HCM 2010 LOS	F

Notes

Two Way Analysis cannot be performed on Signalized Intersection.

Lanes, Volumes, Timings
6: S River Rd/N River Rd & E Main St

2035 Projection-Mitigated intersections

12/5/2016



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations		↕			↕			↕			↕	
Volume (vph)	34	259	92	46	224	11	77	92	82	8	102	46
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.968			0.995			0.956			0.961	
Flt Protected		0.996			0.992			0.985			0.997	
Satd. Flow (prot)	0	1832	0	0	1857	0	0	1789	0	0	1820	0
Flt Permitted		0.996			0.992			0.985			0.997	
Satd. Flow (perm)	0	1832	0	0	1857	0	0	1789	0	0	1820	0
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		386			744			543			1174	
Travel Time (s)		8.8			16.9			12.3			26.7	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	0%	0%	0%	1%	1%	1%	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	37	278	99	49	241	12	83	99	88	9	110	49
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	414	0	0	302	0	0	270	0	0	168	0
Enter Blocked Intersection	No	No	No									
Lane Alignment	Left	Left	Right									
Median Width(ft)		0			0			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Free			Free			Stop			Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	57.3%
Analysis Period (min)	15
	ICU Level of Service B

Intersection

Intersection Delay, s/veh 19.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NEL	NET	NER	SWL	SWT	SWR
Vol, veh/h	34	259	92	46	224	11	77	92	82	8	102	46
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None									
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	93	93	93	93	93	93	93	93	93	93	93	93
Heavy Vehicles, %	0	0	0	1	1	1	0	0	0	0	0	0
Mvmt Flow	37	278	99	49	241	12	83	99	88	9	110	49

Major/Minor	Major1	Major2	Minor1	Minor2
Conflicting Flow All	253	0	0	377
Stage 1	-	-	-	-
Stage 2	-	-	-	-
Follow-up Headway	2.2	-	-	2.209
Pot Capacity-1 Maneuver	1324	-	-	1187
Stage 1	-	-	-	-
Stage 2	-	-	-	-
Time blocked-Platoon, %	-	-	-	-
Mov Capacity-1 Maneuver	1324	-	-	1187
Mov Capacity-2 Maneuver	-	-	-	-
Stage 1	-	-	-	-
Stage 2	-	-	-	-

Approach	EB	WB	NE	SW
HCM Control Delay, s	0.7	1.3	64.9	24.5
HCM LOS			F	C

Minor Lane / Major Mvmt	NELn1	EBL	EBT	EBR	WBL	WBT	WBR	SWLn1
Capacity (veh/h)	304	1324	-	-	1187	-	-	349
HCM Lane V/C Ratio	0.888	0.028	-	-	0.042	-	-	0.481
HCM Control Delay (s)	64.9	7.796	0	-	8.165	0	-	24.5
HCM Lane LOS	F	A	A		A	A		C
HCM 95th %tile Q(veh)	8.152	0.085	-	-	0.13	-	-	2.5

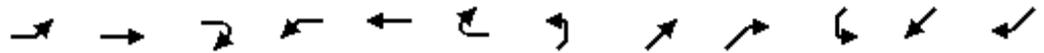
Notes

~ : Volume Exceeds Capacity; \$: Delay Exceeds 300 Seconds; Error : Computation Not Defined

Lanes, Volumes, Timings
10: SR410 & Park Ave

2035 Projection-Mitigated intersections

12/5/2016

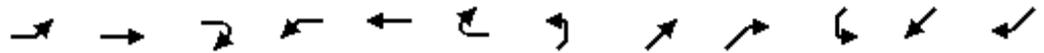


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	153	27	31	50	33	149	59	987	38	310	1784	157
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	50		100	100		100	100		100
Storage Lanes	1		0	1		1	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Frt		0.920				0.850		0.994			0.988	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1805	1748	0	1805	1900	1615	1787	3553	0	1770	3497	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1805	1748	0	1805	1900	1615	1787	3553	0	1770	3497	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		39				186		4			12	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		589			200			1270			406	
Travel Time (s)		13.4			4.5			28.9			9.2	
Peak Hour Factor	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	1%	1%	1%	2%	2%	2%
Adj. Flow (vph)	191	34	39	62	41	186	74	1234	48	388	2230	196
Shared Lane Traffic (%)												
Lane Group Flow (vph)	191	73	0	62	41	186	74	1282	0	388	2426	0
Enter Blocked Intersection	No											
Lane Alignment	Left	Left	Right									
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2	1	1	2		1	2	
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru		Left	Thru	
Leading Detector (ft)	20	100		20	100	20	20	100		20	100	
Trailing Detector (ft)	0	0		0	0	0	0	0		0	0	
Detector 1 Position(ft)	0	0		0	0	0	0	0		0	0	
Detector 1 Size(ft)	20	6		20	6	20	20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Prot	NA		Prot	NA	Perm	Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases						8						

Lanes, Volumes, Timings
10: SR410 & Park Ave

2035 Projection-Mitigated intersections

12/5/2016

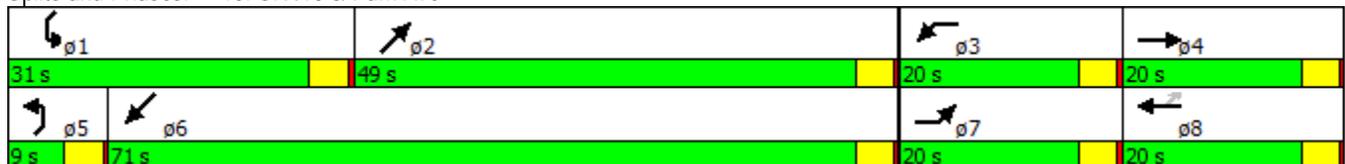


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NEL	NET	NER	SWL	SWT	SWR
Detector Phase	7	4		3	8	8	5	2		1	6	
Switch Phase												
Minimum Initial (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Minimum Split (s)	20.0	20.0		20.0	20.0	20.0	8.0	20.0		8.0	20.0	
Total Split (s)	20.0	20.0		20.0	20.0	20.0	9.0	49.0		31.0	71.0	
Total Split (%)	16.7%	16.7%		16.7%	16.7%	16.7%	7.5%	40.8%		25.8%	59.2%	
Maximum Green (s)	16.0	16.0		16.0	16.0	16.0	5.0	45.0		27.0	67.0	
Yellow Time (s)	3.5	3.5		3.5	3.5	3.5	3.5	3.5		3.5	3.5	
All-Red Time (s)	0.5	0.5		0.5	0.5	0.5	0.5	0.5		0.5	0.5	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Lead/Lag	Lead	Lag		Lead	Lag	Lag	Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None	None	None	Max		None	Max	
Walk Time (s)	5.0	5.0		5.0	5.0	5.0		5.0			5.0	
Flash Dont Walk (s)	11.0	11.0		11.0	11.0	11.0		11.0			11.0	
Pedestrian Calls (#/hr)	0	0		0	0	0		0			0	
Act Effect Green (s)	14.9	16.2		9.2	8.3	8.3	5.0	45.2		26.9	67.1	
Actuated g/C Ratio	0.13	0.15		0.08	0.07	0.07	0.04	0.41		0.24	0.60	
v/c Ratio	0.79	0.25		0.42	0.29	0.64	0.93	0.89		0.91	1.15	
Control Delay	70.4	26.5		57.4	54.0	17.5	136.4	40.3		68.0	97.0	
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	70.4	26.5		57.4	54.0	17.5	136.4	40.3		68.0	97.0	
LOS	E	C		E	D	B	F	D		E	F	
Approach Delay		58.3			31.2			45.5			93.0	
Approach LOS		E			C			D			F	

Intersection Summary

Area Type:	Other
Cycle Length:	120
Actuated Cycle Length:	111.4
Natural Cycle:	150
Control Type:	Actuated-Uncoordinated
Maximum v/c Ratio:	1.15
Intersection Signal Delay:	73.6
Intersection LOS:	E
Intersection Capacity Utilization:	82.8%
ICU Level of Service:	E
Analysis Period (min):	15

Splits and Phases: 10: SR410 & Park Ave



Queues
10: SR410 & Park Ave

2035 Projection-Mitigated intersections

12/5/2016



Lane Group	EBL	EBT	WBL	WBT	WBR	NEL	NET	SWL	SWT
Lane Group Flow (vph)	191	73	62	41	186	74	1282	388	2426
v/c Ratio	0.79	0.25	0.42	0.29	0.64	0.93	0.89	0.91	1.15
Control Delay	70.4	26.5	57.4	54.0	17.5	136.4	40.3	68.0	97.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	70.4	26.5	57.4	54.0	17.5	136.4	40.3	68.0	97.0
Queue Length 50th (ft)	133	22	43	29	0	54	444	272	~1087
Queue Length 95th (ft)	#205	57	78	56	44	#132	485	#393	#1074
Internal Link Dist (ft)		509		120			1190		326
Turn Bay Length (ft)			50		100	100		100	
Base Capacity (vph)	259	302	259	273	391	80	1442	429	2110
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.74	0.24	0.24	0.15	0.48	0.93	0.89	0.90	1.15

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.

HCM 2010 Signalized Intersection Capacity Analysis 2035 Projection-Mitigated intersections
 10: SR410 & Park Ave 12/5/2016

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (veh/h)	153	27	31	50	33	149	59	987	38	310	1784	157
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q, 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	1900	1900	1900	1900	1900	1881	1881	1900	1863	1863	1900
Lanes	1	1	0	1	1	1	1	2	0	1	2	0
Lane Assignment												
Cap, veh/h	220	162	186	93	248	211	76	1376	53	407	1925	167
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
Prop Arrive On Green	0.12	0.20	0.20	0.05	0.13	0.13	0.04	0.38	0.38	0.23	0.57	0.57
Ln Grp Delay, s/veh	75.6	0.0	39.5	62.9	45.7	80.8	149.6	50.2	50.6	77.4	101.5	115.0
Ln Grp LOS	E		D	E	D	F	F	D	D	E	F	F
Approach Vol, veh/h		264			289			1356			2814	
Approach Delay, s/veh		65.6			72.0			55.8			104.0	
Approach LOS		E			E			E			F	
Timer:		1	2	3	4	5	6	7	8			
Assigned Phs		1	2	3	4	5	6	7	8			
Case No		2.0	4.0	2.0	4.0	2.0	4.0	2.0	3.0			
Phs Duration (G+Y+Rc), s		31.0	49.0	10.0	27.6	9.0	71.0	18.3	19.4			
Change Period (Y+Rc), s		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0			
Max Allow Headway (MAH), s		3.8	5.3	3.8	4.5	3.8	5.3	3.8	4.5			
Max Green (Gmax), s		27.0	45.0	16.0	16.0	5.0	67.0	16.0	16.0			
Max Q Clear (g_c+I1), s		27.4	40.0	6.0	6.1	6.9	69.0	14.2	15.3			
Green Ext Time (g_e), s		0.0	5.0	0.1	0.9	0.0	0.0	0.1	0.1			
Prob of Phs Call (p_c)		1.00	1.00	1.00	1.00	0.91	1.00	1.00	1.00			
Prob of Max Out (p_x)		1.00	1.00	0.00	0.07	1.00	1.00	1.00	1.00			
Left-Turn Movement Data												
Assigned Mvmt		1		3		5		7				
Mvmt Sat Flow, veh/h		1774		1810		1792		1810				
Through Movement Data												
Assigned Mvmt			2		4		6		8			
Mvmt Sat Flow, veh/h			3598		809		3381		1900			
Right-Turn Movement Data												
Assigned Mvmt			12		14		16		18			
Mvmt Sat Flow, veh/h			140		928		293		1615			
Left Lane Group Data												
Assigned Mvmt		1	0	3	0	5	0	7	0			
Lane Assignment		L (Prot)		L (Prot)		L (Prot)		L (Prot)				
Lanes in Grp		1	0	1	0	1	0	1	0			
Grp Vol (v), veh/h		388	0	62	0	74	0	191	0			
Grp Sat Flow (s), veh/h/ln		1774	0	1810	0	1792	0	1810	0			
Q Serve Time (g_s), s		25.4	0.0	4.0	0.0	4.9	0.0	12.2	0.0			

HCM 2010 Signalized Intersection Capacity Analysis 2035 Projection-Mitigated intersections
 10: SR410 & Park Ave 12/5/2016

Cycle Q Clear Time (g_c), s	25.4	0.0	4.0	0.0	4.9	0.0	12.2	0.0
Perm LT Sat Flow (s_l), veh/h/ln	0	0	0	0	0	0	0	0
Shared LT Sat Flow (s_sh), veh/h/ln	0	0	0	0	0	0	0	0
Perm LT Eff Green (g_p), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Perm LT Serve Time (g_u), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Perm LT Q Serve Time (g_ps), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Time to First Blk (g_f), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Serve Time pre Blk (g_fs), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prop LT Inside Lane (P_L)	1.00	0.00	1.00	0.00	1.00	0.00	1.00	0.00
Lane Grp Cap (c), veh/h	407	0	93	0	76	0	220	0
V/C Ratio (X)	0.95	0.00	0.67	0.00	0.97	0.00	0.87	0.00
Avail Cap (c_a), veh/h	407	0	246	0	76	0	246	0
Upstream Filter (I)	1.00	0.00	1.00	0.00	1.00	0.00	1.00	0.00
Uniform Delay (d1), s/veh	44.7	0.0	54.8	0.0	56.3	0.0	50.8	0.0
Incr Delay (d2), s/veh	32.7	0.0	8.0	0.0	93.4	0.0	24.8	0.0
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	77.4	0.0	62.9	0.0	149.6	0.0	75.6	0.0
1st-Term Q (Q1), veh/ln	11.5	0.0	1.9	0.0	2.2	0.0	5.7	0.0
2nd-Term Q (Q2), veh/ln	3.7	0.0	0.2	0.0	2.0	0.0	1.5	0.0
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	1.00	0.00	1.00	0.00	1.00	0.00	1.00	0.00
%ile Back of Q (50%), veh/ln	15.2	0.0	2.1	0.0	4.2	0.0	7.2	0.0
%ile Storage Ratio (RQ%)	3.87	0.00	1.03	0.00	1.06	0.00	0.35	0.00
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Middle Lane Group Data								
Assigned Mvmt	0	2	0	4	0	6	0	8
Lane Assignment		T				T		T
Lanes in Grp	0	1	0	0	0	1	0	1
Grp Vol (v), veh/h	0	645	0	0	0	1213	0	41
Grp Sat Flow (s), veh/h/ln	0	1881	0	0	0	1863	0	1900
Q Serve Time (g_s), s	0.0	37.9	0.0	0.0	0.0	67.0	0.0	2.3
Cycle Q Clear Time (g_c), s	0.0	37.9	0.0	0.0	0.0	67.0	0.0	2.3
Lane Grp Cap (c), veh/h	0	719	0	0	0	1061	0	248
V/C Ratio (X)	0.00	0.90	0.00	0.00	0.00	1.14	0.00	0.17
Avail Cap (c_a), veh/h	0	719	0	0	0	1061	0	258
Upstream Filter (I)	0.00	1.00	0.00	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d1), s/veh	0.0	34.1	0.0	0.0	0.0	25.3	0.0	45.4
Incr Delay (d2), s/veh	0.0	16.1	0.0	0.0	0.0	76.2	0.0	0.3
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	50.2	0.0	0.0	0.0	101.5	0.0	45.7
1st-Term Q (Q1), veh/ln	0.0	17.9	0.0	0.0	0.0	30.0	0.0	1.1
2nd-Term Q (Q2), veh/ln	0.0	3.2	0.0	0.0	0.0	22.4	0.0	0.0
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
%ile Back of Q (50%), veh/ln	0.0	21.1	0.0	0.0	0.0	52.5	0.0	1.1

%ile Storage Ratio (RQ%)	0.00	0.47	0.00	0.00	0.00	4.08	0.00	0.31
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	38.1	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.0

Right Lane Group Data

Assigned Mvmt	0	12	0	14	0	16	0	18
Lane Assignment		T+R		T+R		T+R		R
Lanes in Grp	0	1	0	1	0	1	0	1
Grp Vol (v), veh/h	0	637	0	73	0	1213	0	186
Grp Sat Flow (s), veh/h/ln	0	1857	0	1736	0	1811	0	1615
Q Serve Time (g_s), s	0.0	38.0	0.0	4.1	0.0	67.0	0.0	13.3
Cycle Q Clear Time (g_c), s	0.0	38.0	0.0	4.1	0.0	67.0	0.0	13.3
Prot RT Sat Flow (s_R), veh/h/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prot RT Eff Green (g_R), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prop RT Outside Lane (P_R)	0.00	0.08	0.00	0.53	0.00	0.16	0.00	1.00
Lane Grp Cap (c), veh/h	0	710	0	349	0	1031	0	211
V/C Ratio (X)	0.00	0.90	0.00	0.21	0.00	1.18	0.00	0.88
Avail Cap (c_a), veh/h	0	710	0	349	0	1031	0	220
Upstream Filter (I)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
Uniform Delay (d1), s/veh	0.0	34.2	0.0	39.2	0.0	25.3	0.0	50.2
Incr Delay (d2), s/veh	0.0	16.4	0.0	0.3	0.0	89.7	0.0	30.5
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	50.6	0.0	39.5	0.0	115.0	0.0	80.8
1st-Term Q (Q1), veh/ln	0.0	17.7	0.0	1.8	0.0	29.2	0.0	5.5
2nd-Term Q (Q2), veh/ln	0.0	3.2	0.0	0.0	0.0	25.7	0.0	1.8
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
%ile Back of Q (50%), veh/ln	0.0	20.9	0.0	1.9	0.0	54.9	0.0	7.3
%ile Storage Ratio (RQ%)	0.00	0.47	0.00	0.09	0.00	4.26	0.00	1.83
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	45.5	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.0

Intersection Summary

HCM 2010 Ctrl Delay	86.1
HCM 2010 LOS	F

Notes

Two Way Analysis cannot be performed on Signalized Intersection.

Lanes, Volumes, Timings
 11: N River Rd & N A St & Park Ave

2035 Projection-Mitigated intersections

12/5/2016



Lane Group	EBL	EBR	EBR2	NBL2	NBL	NBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	109	211	92	2	113	13	54	31	2	11	36	82
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	25	0			0	0	0		0	0		0
Storage Lanes	1	1			1	0	0		0	0		0
Taper Length (ft)	25				25		25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.850			0.986			0.997			0.914	
Flt Protected	0.950				0.957			0.970			0.996	
Satd. Flow (prot)	1787	1599	0	0	1793	0	0	1801	0	0	1696	0
Flt Permitted	0.950				0.957			0.970			0.996	
Satd. Flow (perm)	1787	1599	0	0	1793	0	0	1801	0	0	1696	0
Link Speed (mph)	30				30			30			30	
Link Distance (ft)	157				926			1174			283	
Travel Time (s)	3.6				21.0			26.7			6.4	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	1%	1%	1%	0%	0%	0%	2%	2%	2%	2%	2%	2%
Adj. Flow (vph)	115	222	97	2	119	14	59	34	2	12	39	89
Shared Lane Traffic (%)												
Lane Group Flow (vph)	115	319	0	0	135	0	0	95	0	0	140	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Right	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)	12				12			0			0	
Link Offset(ft)	0				0			0			0	
Crosswalk Width(ft)	16				16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	9	15	15	9	15		9	15		9
Sign Control	Free				Free			Stop			Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	36.8%
Analysis Period (min)	15
	ICU Level of Service A

Intersection										
Intersection Delay, s/veh	6									
Movement	EBL	EBR	NBL	NBR	NEL	NET	NER	SWL	SWT	SWR
Vol, veh/h	109	211	113	13	54	31	2	11	36	82
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	-	None	-	-	None	-	-	None
Storage Length	25	0	0	-	-	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0	-	-	0	-
Grade, %	0	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	92	92	92	92	92	92
Heavy Vehicles, %	1	1	0	0	2	2	2	2	2	2
Mvmt Flow	115	222	119	14	59	34	2	12	39	89
Major/Minor	Major1		Major2		Minor1			Minor2		
Conflicting Flow All	133	0	319	0	694	637	271	648	678	126
Stage 1	-	-	-	-	500	500	-	130	130	-
Stage 2	-	-	-	-	194	137	-	518	548	-
Follow-up Headway	2.209	-	2.2	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Capacity-1 Maneuver	1458	-	1252	-	357	395	768	383	374	924
Stage 1	-	-	-	-	553	543	-	874	789	-
Stage 2	-	-	-	-	808	783	-	541	517	-
Time blocked-Platoon, %	-	-	-	-	-	-	-	-	-	-
Mov Capacity-1 Maneuver	1458	-	1252	-	277	363	768	333	344	924
Mov Capacity-2 Maneuver	-	-	-	-	277	363	-	333	344	-
Stage 1	-	-	-	-	509	500	-	805	787	-
Stage 2	-	-	-	-	692	781	-	463	476	-
Approach	EB		NB		NE			SW		
HCM Control Delay, s	2		0.1		21.9			13.4		
HCM LOS					C			B		
Minor Lane / Major Mvmt	NELn1	NBL2	NBL	NBR	EBL	EBR	EBR2	SWLn1		
Capacity (veh/h)	307	1252	-	-	1458	-	-	570		
HCM Lane V/C Ratio	0.308	0.002	-	-	0.079	-	-	0.246		
HCM Control Delay (s)	21.9	7.88	0	-	7.68	-	-	13.4		
HCM Lane LOS	C	A	A	-	A	-	-	B		
HCM 95th %tile Q(veh)	1.274	0.005	-	-	0.256	-	-	0.962		

Notes

~ : Volume Exceeds Capacity; \$: Delay Exceeds 300 Seconds; Error : Computation Not Defined

Lanes, Volumes, Timings
 12: S A St/N A St & E Main St

2035 Projection-Mitigated intersections

12/5/2016



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Volume (vph)	21	255	29	10	228	75	19	36	17	136	79	13
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.987			0.968			0.968			0.992	
Flt Protected		0.997			0.998			0.987			0.971	
Satd. Flow (prot)	0	1851	0	0	1836	0	0	1815	0	0	1830	0
Flt Permitted		0.997			0.998			0.987			0.971	
Satd. Flow (perm)	0	1851	0	0	1836	0	0	1815	0	0	1830	0
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		744			302			501			926	
Travel Time (s)		16.9			6.9			11.4			21.0	
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Heavy Vehicles (%)	1%	1%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	24	297	34	12	265	87	22	42	20	158	92	15
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	355	0	0	364	0	0	84	0	0	265	0
Enter Blocked Intersection	No	No	No									
Lane Alignment	Left	Left	Right									
Median Width(ft)		0			0			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Free			Free			Stop			Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	50.2%
Analysis Period (min)	15
	ICU Level of Service A

Intersection

Intersection Delay, s/veh 14.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	21	255	29	10	228	75	19	36	17	136	79	13
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None									
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	86	86	86	86	86	86	86	86	86	86	86	86
Heavy Vehicles, %	1	1	1	0	0	0	0	0	0	0	0	0
Mvmt Flow	24	297	34	12	265	87	22	42	20	158	92	15

Major/Minor

	Major1	Major2	Minor1	Minor2
Conflicting Flow All	352	0	0	330
Stage 1	-	-	-	-
Stage 2	-	-	-	-
Follow-up Headway	2.209	-	-	2.2
Pot Capacity-1 Maneuver	1212	-	-	1241
Stage 1	-	-	-	-
Stage 2	-	-	-	-
Time blocked-Platoon, %	-	-	-	-
Mov Capacity-1 Maneuver	1212	-	-	1241
Mov Capacity-2 Maneuver	-	-	-	-
Stage 1	-	-	-	-
Stage 2	-	-	-	-

Approach

	EB	WB	NB	SB
HCM Control Delay, s	0.6	0.3	18.5	52.1
HCM LOS			C	F

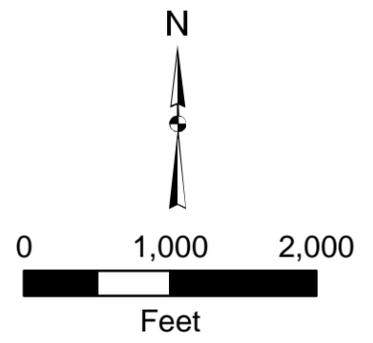
Minor Lane / Major Mvmt

	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	350	1212	-	-	1241	-	-	322
HCM Lane V/C Ratio	0.239	0.02	-	-	0.009	-	-	0.823
HCM Control Delay (s)	18.5	8.031	0	-	7.928	0	-	52.1
HCM Lane LOS	C	A	A	-	A	A	-	F
HCM 95th %tile Q(veh)	0.918	0.062	-	-	0.028	-	-	7.031

Notes

~ : Volume Exceeds Capacity; \$: Delay Exceeds 300 Seconds; Error : Computation Not Defined

APPENDIX C
COLLISION MAP



- Legend**
- Traffic Collisions Count**
- 1 - 2
 - 3 - 5
 - 7 - 9
 - 11 - 13
 - 29 - 44
 - ◆ Bicycle Collisions
 - ◆ Pedestrian Collisions
 - State Highway
 - Roads
 - - - City Limits

CITY OF BUCKLEY

MOTOR VEHICLE COLLISIONS
(2006 - 2011)


 Gray & Osborne, Inc.
 CONSULTING ENGINEERS
 Pg. 206

APPENDIX D
COST ESTIMATES

CITY OF BUCKLEY
SR410 AND MUNDY LOSS RD INTERSECTION IMPROVEMENTS
ENGINEER'S PLANNING LEVEL COST ESTIMATE
August 28, 2014

<u>ITEM NO.</u>	<u>DESCRIPTION</u>	<u>ESTIMATED QUANTITY</u>	<u>UNIT</u>	<u>UNIT PRICE</u>	<u>AMOUNT</u>
1.	Mobilization (10%)	1	LS	\$22,000	\$22,000.00
2.	Locate Existing Utilities	1	LS	\$2,000	\$2,000.00
3.	Removal of Structure and Obstruction	1	LS	\$2,000	\$2,000.00
4.	Clearing and Grubbing	1	LS	\$6,000	\$6,000.00
5.	Excavation, Backfill, and Compaction for Roadway	760	CY	\$20	\$15,200.00
6.	Gravel Borrow Incl. Haul	0	TN	\$20	\$0.00
7.	Catch Basin Type 1	0	EA	\$1,500	\$0.00
8.	Storm Sewer Pipe 12 In. Diam. (Incl. Bedding)	0	LF	\$35	\$0.00
9.	Storm Detention Facilities	1	LS	\$0	\$0.00
10.	Trench Excavation Safety Systems	0	LS	\$5,000	\$0.00
11.	Crushed Surfacing Top Course	430	TN	\$26	\$11,180.00
12.	Crushed Surfacing Base Course	650	TN	\$26	\$16,900.00
13.	HMA	1,430	TN	\$100	\$143,000.00
14.	Fire Hydrant Assembly	0	EA	\$3,000	\$0.00
15.	Landscaping	1	LS	\$0	\$0.00
16.	Temporary Water Pollution/Erosion Control (5%)	1	LS	\$11,000	\$11,000.00
17.	Cement Conc. Sidewalk Ramp	0	EA	\$2,000	\$0.00
18.	Cement Conc. Traffic Curb & Gutter	0	LF	\$15	\$0.00
19.	Cement Conc. Sidewalk	0	SY	\$45	\$0.00
20.	Permanent Signing	1	LS	\$5,000	\$5,000.00
21.	Traffic Signal System	1	LS	\$300,000	\$300,000.00
22.	Illumination System	1	LS	\$26,000	\$26,000.00
23.	Temporary Traffic Control (5%)	1	LS	\$11,000	\$11,000.00
24.	Paint Line	4,590	LF	\$2	\$9,180.00
	Subtotal Base Bid				\$580,460.00
	Sales Tax at 0% per W.S. Revenue Rule No. 171				\$0.00
	Construction Contingencies(20%)				\$116,100.00
	TOTAL CONSTRUCTION COST				\$696,560.00
	Construction Management(15%)				\$104,500.00
	Estimated Design, Environmental Engineering Cost(15%)				\$104,500.00
	TOTAL PROJECT COST				\$906,000.00

Assumptions:

- *Length of Project is Approx. 1530 LF
- *Existing: Road width varies
- *Proposed: Install Traffic Signal
- *Full Depth Pavement Section - 3" HMA, 4" CSTC, 6" CSBC
- *Rebuild Curb Ramps

Prepared by: Rory Cameron

Checked by:

Approved by:

CITY OF BUCKLEY
MUNDY LOSS AND 112TH AVE EAST INTERSECTION IMPROVEMENTS
ENGINEER'S PLANNING LEVEL COST ESTIMATE
August 28, 2014

<u>ITEM NO.</u>	<u>DESCRIPTION</u>	<u>ESTIMATED QUANTITY</u>	<u>UNIT</u>	<u>UNIT PRICE</u>	<u>AMOUNT</u>
1.	Mobilization (10%)	1	LS	\$46,000	\$46,000.00
2.	Locate Existing Utilities	1	LS	\$5,000	\$5,000.00
3.	Removal of Structure and Obstruction	1	LS	\$25,000	\$25,000.00
4.	Clearing and Grubbing	1	LS	\$21,000	\$21,000.00
5.	Excavation, Backfill, and Compaction for Roadway	1,820	CY	\$20	\$36,400.00
6.	Gravel Borrow Incl. Haul	620	TN	\$20	\$12,400.00
7.	Catch Basin Type 1	11	EA	\$1,500	\$16,500.00
8.	Storm Sewer Pipe 12 In. Diam. (Incl. Bedding)	1,615	LF	\$35	\$56,525.00
9.	Storm Detention Facilities	1	LS	\$45,100	\$45,100.00
10.	Trench Excavation Safety Systems	1	LS	\$5,000	\$5,000.00
11.	Crushed Surfacing Top Course	1,020	TN	\$26	\$26,520.00
12.	Crushed Surfacing Base Course	1,530	TN	\$26	\$39,780.00
13.	HMA	1,190	TN	\$100	\$119,000.00
14.	Fire Hydrant Assembly	1	EA	\$3,000	\$3,000.00
15.	Landscaping	1	LS	\$0	\$0.00
16.	Temporary Water Pollution/Erosion Control (5%)	1	LS	\$23,000	\$23,000.00
17.	Cement Conc. Sidewalk Ramp	8	EA	\$2,000	\$16,000.00
18.	Cement Conc. Traffic Curb & Gutter	370	LF	\$15	\$5,550.00
19.	Cement Conc. Sidewalk	206	SY	\$45	\$9,250.00
20.	Permanent Signing	1	LS	\$5,000	\$5,000.00
21.	Traffic Signal Systemt	1	LS	\$300,000	\$300,000.00
22.	Illumination System	1	LS	\$26,000	\$26,000.00
23.	Temporary Traffic Control (5%)	1	LS	\$23,000	\$23,000.00
24.	Paint Line	4,470	LF	\$2	\$8,940.00
	Subtotal Base Bid				\$873,965.00
	Sales Tax at 0% per W.S. Revenue Rule No. 171				\$0.00
	Construction Contingencies(20%)				\$174,800.00
	TOTAL CONSTRUCTION COST				\$1,048,765.00
	Construction Management(15%)				\$157,400.00
	Estimated Design, Environmental Engineering Cost(15%)				\$157,400.00
	TOTAL PROJECT COST				\$1,364,000.00

Assumptions:

*Length of Project is Approx. 1490 LF

*Existing: Road width varies

*Proposed: Widen Existing Road and for turn lanes, overlay, add curb, gutter, and sidewalk, add traffic signal

*Full Depth Pavement Section - 3" HMA, 4" CSTC, 6" CSBC

*Overlay 2"

Prepared by: Rory Cameron

Checked by:

Approved by:

CITY OF BUCKLEY
MAIN ST AND A ST INTERSECTION IMPROVEMENTS
ENGINEER'S PLANNING LEVEL COST ESTIMATE
August 28, 2014

<u>ITEM NO.</u>	<u>DESCRIPTION</u>	<u>ESTIMATED QUANTITY</u>	<u>UNIT</u>	<u>UNIT PRICE</u>	<u>AMOUNT</u>
1.	Mobilization (10%)	1	LS	\$1,000	\$1,000.00
2.	Locate Existing Utilities	1	LS	\$2,000	\$2,000.00
3.	Removal of Structure and Obstruction	1	LS	\$2,000	\$2,000.00
4.	Clearing and Grubbing	1	LS	\$0	\$0.00
5.	Excavation, Backfill, and Compaction for Roadway	0	CY	\$20	\$0.00
6.	Gravel Borrow Incl. Haul	0	TN	\$20	\$0.00
7.	Catch Basin Type 1	0	EA	\$1,500	\$0.00
8.	Storm Sewer Pipe 12 In. Diam. (Incl. Bedding)	0	LF	\$35	\$0.00
9.	Storm Detention Facilities	1	LS	\$0	\$0.00
10.	Trench Excavation Safety Systems	0	LS	\$5,000	\$0.00
11.	Crushed Surfacing Top Course	0	TN	\$26	\$0.00
12.	Crushed Surfacing Base Course	0	TN	\$26	\$0.00
13.	HMA	0	TN	\$100	\$0.00
14.	Fire Hydrant Assembly	0	EA	\$3,000	\$0.00
15.	Landscaping	1	LS	\$0	\$0.00
16.	Temporary Water Pollution/Erosion Control (5%)	1	LS	\$1,000	\$1,000.00
17.	Cement Conc. Sidewalk Ramp	0	EA	\$2,000	\$0.00
18.	Cement Conc. Traffic Curb & Gutter	0	LF	\$15	\$0.00
19.	Cement Conc. Sidewalk	0	SY	\$45	\$0.00
20.	Permanent Signing	1	LS	\$5,000	\$5,000.00
21.	Traffic Signal System	1	LS	\$300,000	\$300,000.00
22.	Illumination System	1	LS	\$6,500	\$6,500.00
23.	Temporary Traffic Control (5%)	1	LS	\$1,000	\$1,000.00
24.	Paint Line	300	LF	\$2	\$600.00
Subtotal Base Bid					\$319,100.00
Sales Tax at 0% per W.S. Revenue Rule No. 171					\$0.00
Construction Contingencies(20%)					\$63,900.00
TOTAL CONSTRUCTION COST					\$383,000.00
Construction Management(15%)					\$57,500.00
Estimated Design, Environmental Engineering Cost(15%)					\$57,500.00
TOTAL PROJECT COST					\$498,000.00

Assumptions:

- *Length of Project is Approx. 100 LF
- *Existing: Road width varies
- *Proposed: Install Traffic Signal
- *Full Depth Pavement Section - 3" HMA, 4" CSTC, 6" CSBC
- *Rebuild Curb Ramps

Prepared by: Rory Cameron

Checked by:

Approved by:

CITY OF BUCKLEY
RIVER AVENUE AND A STREET INTERSECTION IMPROVEMENTS
ENGINEER'S PLANNING LEVEL COST ESTIMATE
August 28, 2014

<u>ITEM NO.</u>	<u>DESCRIPTION</u>	<u>ESTIMATED QUANTITY</u>	<u>UNIT</u>	<u>UNIT PRICE</u>	<u>AMOUNT</u>
1.	Mobilization (10%)	1	LS	\$14,000	\$14,000.00
2.	Locate Existing Utilities	1	LS	\$5,000	\$5,000.00
3.	Removal of Structure and Obstruction	1	LS	\$25,000	\$25,000.00
4.	Clearing and Grubbing	1	LS	\$0	\$0.00
5.	Excavation, Backfill, and Compaction for Roadway	90	CY	\$20	\$1,800.00
6.	Gravel Borrow Incl. Haul	40	TN	\$20	\$800.00
7.	Catch Basin Type 1	0	EA	\$1,500	\$0.00
8.	Storm Sewer Pipe 12 In. Diam. (Incl. Bedding)	0	LF	\$35	\$0.00
9.	Storm Detention Facilities	1	LS	\$0	\$0.00
10.	Trench Excavation Safety Systems	1	LS	\$5,000	\$5,000.00
11.	Crushed Surfacing Top Course	0	TN	\$26	\$0.00
12.	Crushed Surfacing Base Course	0	TN	\$26	\$0.00
13.	HMA	490	TN	\$100	\$49,000.00
14.	Fire Hydrant Assembly	1	EA	\$3,000	\$3,000.00
15.	Landscaping	1	LS	\$5,000	\$5,000.00
16.	Temporary Water Pollution/Erosion Control (5%)	1	LS	\$7,000	\$7,000.00
17.	Cement Conc. Sidewalk Ramp	8	EA	\$2,000	\$16,000.00
18.	Cement Conc. Traffic Curb & Gutter	370	LF	\$15	\$5,550.00
19.	Cement Conc. Sidewalk	206	SY	\$45	\$9,250.00
20.	Permanent Signing	1	LS	\$5,000	\$5,000.00
21.	Traffic Signal System	1	LS	\$300,000	\$300,000.00
22.	Illumination System	1	LS	\$19,500	\$19,500.00
23.	Temporary Traffic Control (5%)	1	LS	\$7,000	\$7,000.00
24.	Paint Line	2,850	LF	\$2	\$5,700.00
	Subtotal Base Bid				\$483,600.00
	Sales Tax at 0% per W.S. Revenue Rule No. 171				\$0.00
	Construction Contingencies(20%)				\$96,800.00
	TOTAL CONSTRUCTION COST				\$580,400.00
	Construction Management(15%)				\$87,100.00
	Estimated Design, Environmental Engineering Cost(15%)				\$87,100.00
	TOTAL PROJECT COST				\$755,000.00

Assumptions:

*Length of Project is Approx. 950 LF

*Existing: Road width varies

*Proposed: Overlay, Restripe for turn lanes, add traffic signal

*Full Depth Pavement Section - 3" HMA, 4" CSTC, 6" CSBC

Prepared by: Rory Cameron

Checked by:

Approved by:

CITY OF BUCKLEY
RIVER AVENUE AND MAIN STREET INTERSECTION IMPROVEMENTS
ENGINEER'S PLANNING LEVEL COST ESTIMATE
August 28, 2014

<u>ITEM NO.</u>	<u>DESCRIPTION</u>	<u>ESTIMATED QUANTITY</u>	<u>UNIT</u>	<u>UNIT PRICE</u>	<u>AMOUNT</u>
1.	Mobilization (10%)	1	LS	\$16,000	\$16,000.00
2.	Locate Existing Utilities	1	LS	\$5,000	\$5,000.00
3.	Removal of Structure and Obstruction	1	LS	\$25,000	\$25,000.00
4.	Clearing and Grubbing	1	LS	\$5,000	\$5,000.00
5.	Excavation, Backfill, and Compaction for Roadway	430	CY	\$20	\$8,600.00
6.	Gravel Borrow Incl. Haul	40	TN	\$20	\$800.00
7.	Catch Basin Type 1	0	EA	\$1,500	\$0.00
8.	Storm Sewer Pipe 12 In. Diam. (Incl. Bedding)	0	LF	\$35	\$0.00
9.	Storm Detention Facilities	1	LS	\$0	\$0.00
10.	Trench Excavation Safety Systems	1	LS	\$5,000	\$5,000.00
11.	Crushed Surfacing Top Course	120	TN	\$26	\$3,120.00
12.	Crushed Surfacing Base Course	180	TN	\$26	\$4,680.00
13.	HMA	520	TN	\$100	\$52,000.00
14.	Fire Hydrant Assembly	1	EA	\$3,000	\$3,000.00
15.	Landscaping	1	LS	\$0	\$0.00
16.	Temporary Water Pollution/Erosion Control (5%)	1	LS	\$8,000	\$8,000.00
17.	Cement Conc. Sidewalk Ramp	8	EA	\$2,000	\$16,000.00
18.	Cement Conc. Traffic Curb & Gutter	370	LF	\$15	\$5,550.00
19.	Cement Conc. Sidewalk	206	SY	\$45	\$9,250.00
20.	Permanent Signing	1	LS	\$5,000	\$5,000.00
21.	Traffic Signal System	1	LS	\$300,000	\$300,000.00
22.	Illumination System	1	LS	\$19,500	\$19,500.00
23.	Temporary Traffic Control (5%)	1	LS	\$8,000	\$8,000.00
24.	Paint Line	2,850	LF	\$2	\$5,700.00
	Subtotal Base Bid				\$505,200.00
	Sales Tax at 0% per W.S. Revenue Rule No. 171				\$0.00
	Construction Contingencies(20%)				\$101,100.00
	TOTAL CONSTRUCTION COST				\$606,300.00
	Construction Management(15%)				\$91,000.00
	Estimated Design, Environmental Engineering Cost(15%)				\$91,000.00
	TOTAL PROJECT COST				\$789,000.00

Assumptions:

- *Length of Project is Approx. 950 LF
- *Existing: Road width varies
- *Proposed: Overlay, Restripe for turn lanes, add traffic signal
- *Full Depth Pavement Section - 3" HMA, 4" CSTC, 6" CSBC
- *Rebuild Curb Ramps

Prepared by: Rory Cameron

Checked by:

Approved by:

CITY OF BUCKLEY
MUNDY LOSS ROAD PEDESTRIAN IMPROVEMENTS-SIDEWALK
ENGINEER'S PLANNING LEVEL COST ESTIMATE
August 8, 2014

<u>ITEM NO.</u>	<u>DESCRIPTION</u>	<u>ESTIMATED QUANTITY</u>	<u>UNIT</u>	<u>UNIT PRICE</u>	<u>AMOUNT</u>
1.	Mobilization (10%)	1	LS	\$32,000	\$32,000.00
2.	Locate Existing Utilities	1	LS	\$5,000	\$5,000.00
3.	Removal of Structure and Obstruction	1	LS	\$25,000	\$25,000.00
4.	Clearing and Grubbing	1	LS	\$43,000	\$43,000.00
5.	Excavation, Backfill, and Compaction for Roadway	950	CY	\$20	\$19,000.00
6.	Gravel Borrow Incl. Haul	570	TN	\$20	\$11,400.00
7.	Catch Basin Type 1	11	EA	\$1,500	\$16,500.00
8.	Storm Sewer Pipe 12 In. Diam. (Incl. Bedding)	1,600	LF	\$35	\$56,000.00
9.	Storm Detention Facilities	1	LS	\$0	\$0.00
10.	Trench Excavation Safety Systems	1	LS	\$5,000	\$5,000.00
11.	Crushed Surfacing Top Course	340	TN	\$26	\$8,840.00
12.	Crushed Surfacing Base Course	500	TN	\$26	\$13,000.00
13.	HMA	280	TN	\$100	\$28,000.00
14.	Fire Hydrant Assembly	4	EA	\$3,000	\$12,000.00
15.	Landscaping	1	LS	\$0	\$0.00
16.	Temporary Water Pollution/Erosion Control (5%)	1	LS	\$16,000	\$16,000.00
17.	Cement Conc. Sidewalk Ramp	4	EA	\$2,000	\$8,000.00
18.	Cement Conc. Traffic Curb & Gutter	1,370	LF	\$15	\$20,550.00
19.	Cement Conc. Sidewalk	761	SY	\$45	\$34,250.00
20.	Permanent Signing	1	LS	\$5,000	\$5,000.00
21.	Illumination System	1	LS	\$45,500	\$45,500.00
22.	Temporary Traffic Control (5%)	1	LS	\$16,000	\$16,000.00
23.	Paint Line	4,110	LF	\$2	\$8,220.00
Subtotal Base Bid					\$428,260.00
Sales Tax at 0% per W.S. Revenue Rule No. 171					\$0.00
Construction Contingencies(20%)					\$85,700.00
TOTAL CONSTRUCTION COST					\$513,960.00
Construction Management(15%)					\$77,100.00
Estimated Design, Environmental Engineering Cost(15%)					\$77,100.00
TOTAL PROJECT COST					\$669,000.00

Assumptions:

*Length of Project is Approx. 3,300 LF

*Existing: 23' wide road

*Proposed: Add median, bike lanes, planter and Sidewalk along project corridor

*Full Depth Pavement Section - 5" HMA, 4" CSTC, 6" CSBC

Wetland work will be included with this construction

Prepared by: Rory Cameron

Checked by:

Approved by:

CITY OF BUCKLEY
 RYAN ROAD PEDESTRIAN IMPROVEMENTS
 ENGINEER'S PRELIMINARY CONTRACT COST ESTIMATE
 UPDATED: 4/28/2014

<u>ITEM NO.</u>	<u>DESCRIPTION</u>	<u>ESTIMATED QUANTITY</u>	<u>UNIT</u>	<u>PRICE</u>	<u>AMOUNT</u>
1.	Minor Changes	1	FA	\$5,000.00	\$5,000.00
2.	Survey	1	LS	\$6,000.00	\$6,000.00
3.	SPCC Plan	1	LS	\$500.00	\$500.00
4.	Mobilization, Cleanup, and Demobilization	1	LS	\$67,000.00	\$67,000.00
5.	Project Temporary Traffic Control	1	LS	\$4,000.00	\$4,000.00
6.	Clearing and Grubbing	1	LS	\$4,000.00	\$4,000.00
7.	Removal of Structure and Obstruction	1	LS	\$2,500.00	\$2,500.00
8.	Unsuitable Excavation Incl. Haul	50	CY	\$50.00	\$2,500.00
9.	Excavation, Backfill, Compaction, and Grading, incl Haul	3,430	CY	\$30.00	\$102,900.00
10.	Gravel Borrow, Incl. Haul	530	TN	\$15.00	\$7,950.00
11.	Locate Existing Utilities	1	LS	\$500.00	\$500.00
12.	Crushed Surfacing Top Course	1,100	TN	\$40.00	\$44,000.00
13.	Crushed Surfacing Base Course	1,100	TN	\$40.00	\$44,000.00
14.	Commercial HMA	610	TN	\$130.00	\$79,300.00
15.	Storm Drainage Pipe, 12"	6,520	LF	\$65.00	\$423,800.00
16.	Catch Basin Type 1	44	EA	\$1,000.00	\$44,000.00
17.	Catch Basin Type 2, 48"	2	EA	\$2,500.00	\$5,000.00
18.	Adjust Valve Box	2	EA	\$250.00	\$500.00
19.	Erosion/Water Pollution Control	1	LS	\$1,500.00	\$1,500.00
20.	Cement Concrete Traffic Curb and Gutter	6,520	LF	\$35.00	\$228,200.00
21.	Cement Concrete Sidewalk	1,070	SY	\$50.00	\$53,500.00
22.	Cement Concrete Driveway	436	SY	\$50.00	\$21,800.00
23.	Cement Concrete Curb Ramp	2	EA	\$2,500.00	\$5,000.00
24.	Plastic Stop Line	0	LF	\$30.00	\$0.00
25.	Edge Line	0	LF	\$1.00	\$0.00
26.	Permanent Signing	1	LS	\$5,000.00	\$5,000.00
27.	Project Documentation	1	LS	\$500.00	\$500.00
Subtotal:					\$1,158,950.00
Sales Tax at 0% per W.S. Revenue Rule No. 171					\$0.00
ESTIMATED CONSTRUCTION COST, SUBTOTAL:					\$1,158,950.00
20% CONTINGENCY					\$231,790.00
TOTAL CONSTRUCTION COST					\$1,390,740.00
Construction Management(15%)					\$208,700.00
Estimated Design, Environmental Engineering Cost(15%)					\$208,700.00
TOTAL PROJECT COST					\$1,808,140.00

Assumptions:

- *Length of Project is Approx. 6,420 LF
- *Existing: 23' wide road
- *Proposed: Add curb gutter and sidewalk to north side of roadway
- *Full Depth Pavement Section - 5" HMA, 4" CSTC, 6" CSBC

Prepared by: Rory Cameron

Checked by:

Approved by:

CITY OF BUCKLEY
SPIKETON AVENUE PEDESTRIAN IMPROVEMENTS-SIDEWALK
ENGINEER'S PLANNING LEVEL COST ESTIMATE
August 8, 2014

<u>ITEM NO.</u>	<u>DESCRIPTION</u>	<u>ESTIMATED QUANTITY</u>	<u>UNIT</u>	<u>UNIT PRICE</u>	<u>AMOUNT</u>
1.	Mobilization (10%)	1	LS	\$33,000	\$33,000.00
2.	Locate Existing Utilities	1	LS	\$5,000	\$5,000.00
3.	Removal of Structure and Obstruction	1	LS	\$25,000	\$25,000.00
4.	Clearing and Grubbing	1	LS	\$12,000	\$12,000.00
5.	Excavation, Backfill, and Compaction for Roadway	1,030	CY	\$20	\$20,600.00
6.	Gravel Borrow Incl. Haul	700	TN	\$20	\$14,000.00
7.	Catch Basin Type 1	12	EA	\$1,500	\$18,000.00
8.	Storm Sewer Pipe 12 In. Diam. (Incl. Bedding)	1,700	LF	\$35	\$59,500.00
9.	Storm Detention Facilities	1	LS	\$34,850	\$34,850.00
10.	Trench Excavation Safety Systems	1	LS	\$5,000	\$5,000.00
11.	Crushed Surfacing Top Course	330	TN	\$26	\$8,580.00
12.	Crushed Surfacing Base Course	490	TN	\$26	\$12,740.00
13.	HMA	280	TN	\$100	\$28,000.00
14.	Fire Hydrant Assembly	1	EA	\$3,000	\$3,000.00
15.	Landscaping	1	LS	\$0	\$0.00
16.	Temporary Water Pollution/Erosion Control (2%)	1	LS	\$7,000	\$7,000.00
17.	Cement Conc. Sidewalk Ramp	0	EA	\$2,000	\$0.00
18.	Cement Conc. Traffic Curb & Gutter	1,700	LF	\$15	\$25,500.00
19.	Cement Conc. Sidewalk	944	SY	\$45	\$42,500.00
20.	Permanent Signing	1	LS	\$5,000	\$5,000.00
21.	Illumination System	1	LS	\$0	\$0.00
22.	Temporary Traffic Control (2%)	1	LS	\$7,000	\$7,000.00
23.	Paint Line	5,100	LF	\$2	\$10,200.00
Subtotal Base Bid					\$376,470.00
Sales Tax at 0% per W.S. Revenue Rule No. 171					\$0.00
Construction Contingencies(20%)					\$75,300.00
TOTAL CONSTRUCTION COST					\$451,770.00
Construction Management(15%)					\$67,800.00
Estimated Design, Environmental Engineering Cost(15%)					\$67,800.00
TOTAL PROJECT COST					\$588,000.00

Assumptions:

*Length of Project is Approx. 3,300 LF

*Existing: 23' wide road

*Proposed: Add median, bike lanes, planter and Sidewalk along project corridor

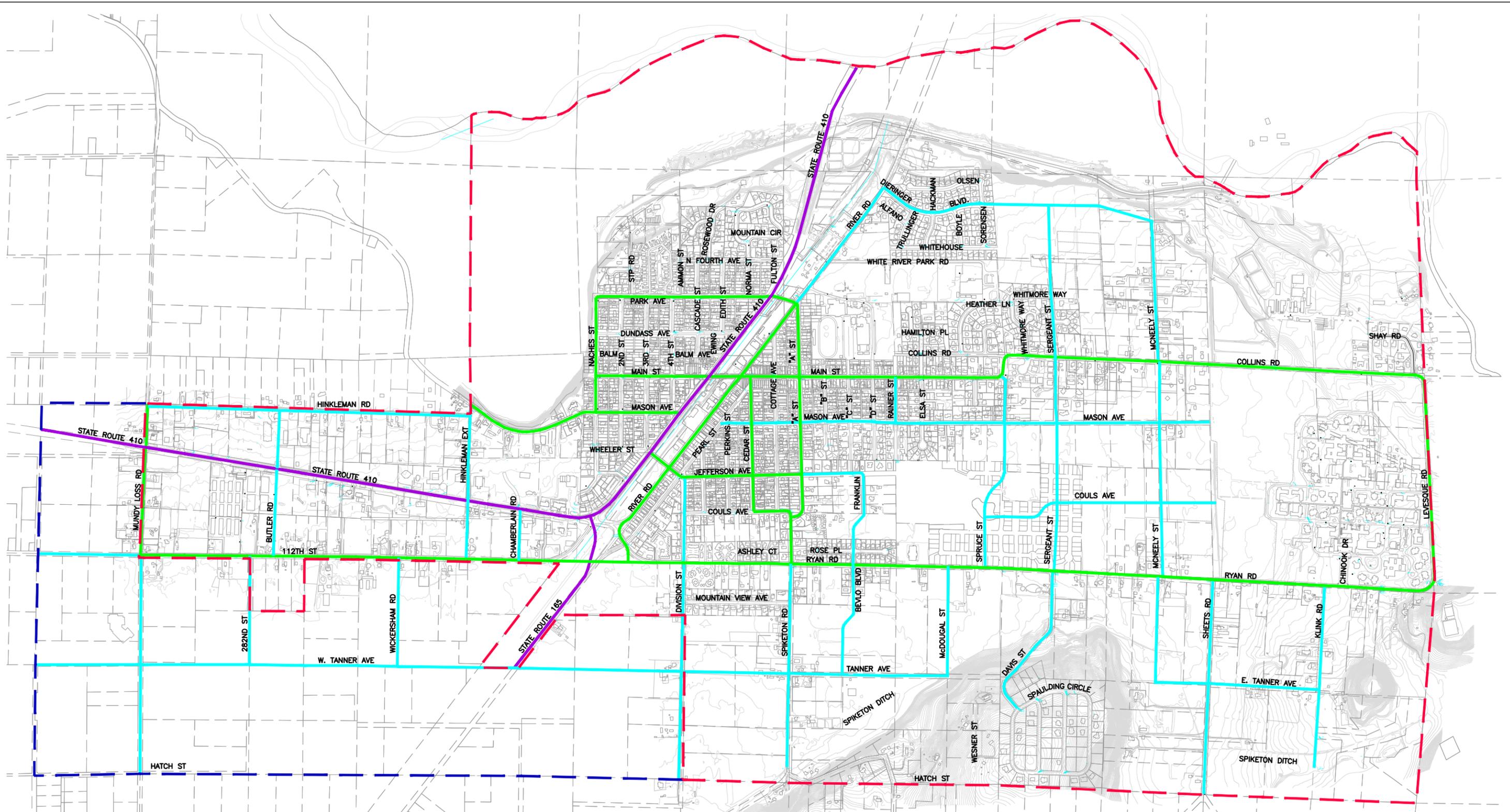
*Full Depth Pavement Section - 5" HMA, 4" CSTC, 6" CSBC

Wetland work will be included with this construction

Prepared by: Rory Cameron

Checked by:

Approved by:



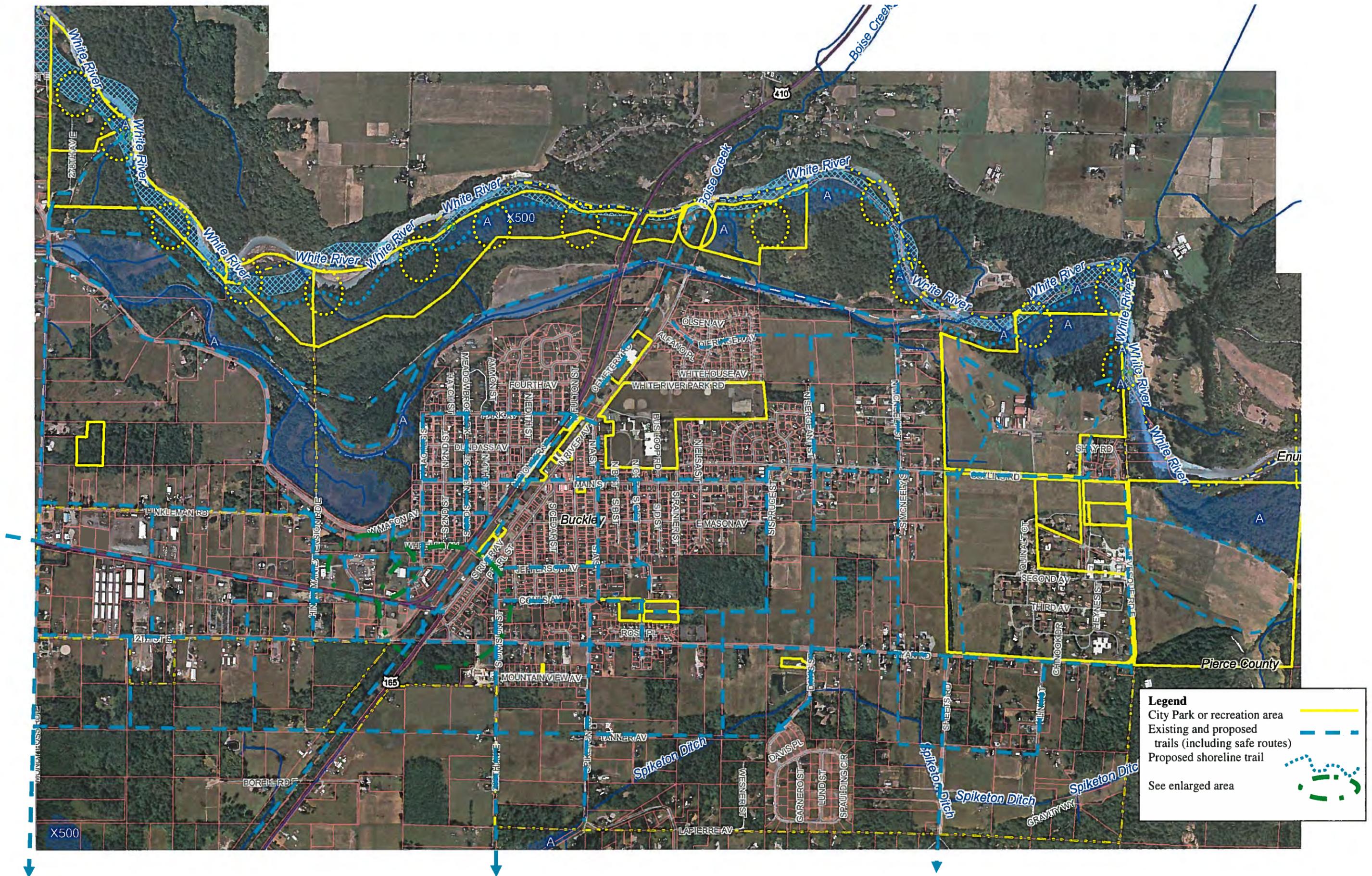
LEGEND

- MAJOR (PRINCIPAL) ARTERIALS —
- MINOR (SECONDARY) ARTERIALS —
- COLLECTOR STREETS —
- CITY BOUNDARY LINE - - -
- UGA - - -



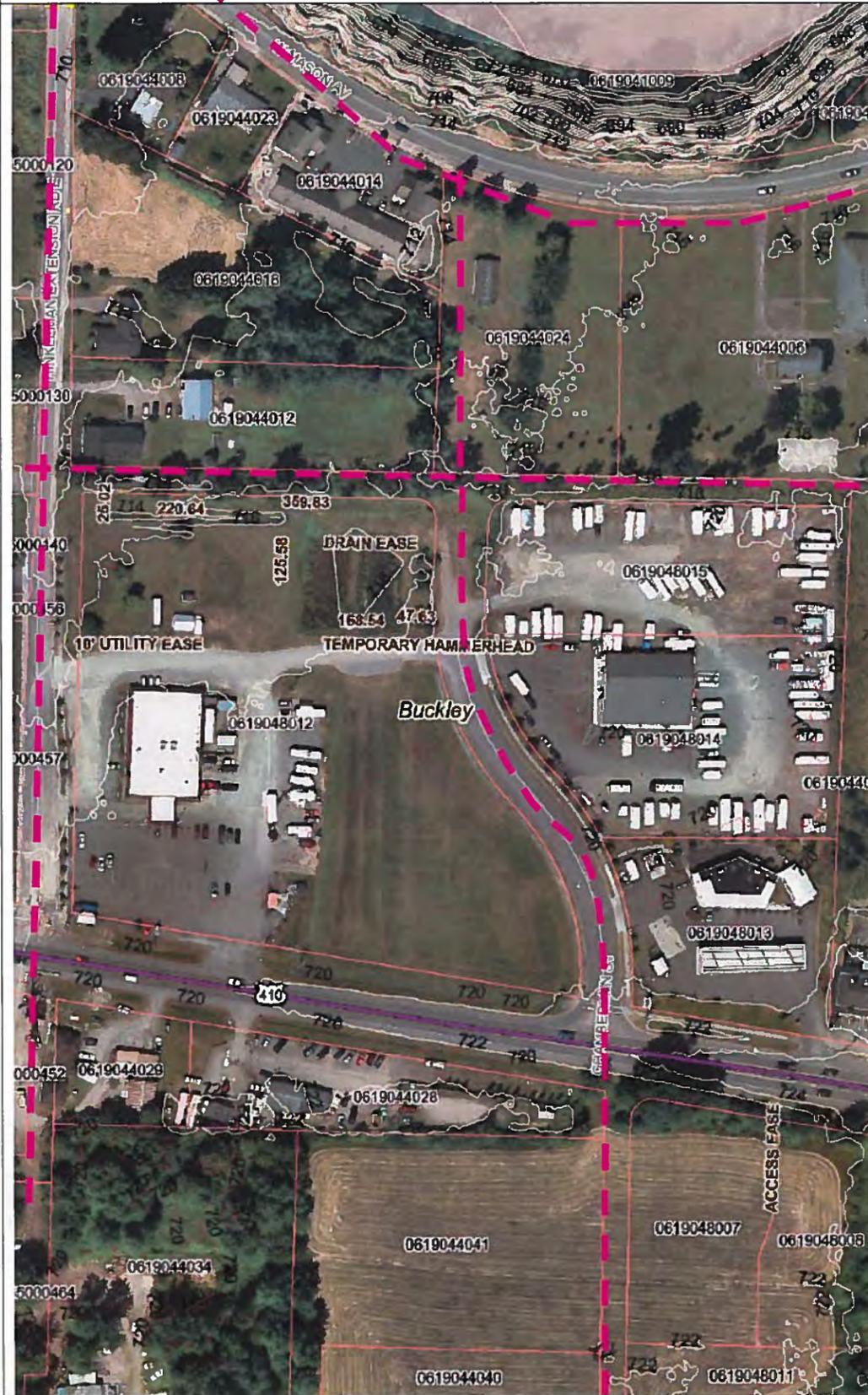
CITY OF BUCKLEY
 FUTURE STREET PLAN
 2016 UPDATE

Gray & Osborne, Inc.
 CONSULTING ENGINEERS



Legend

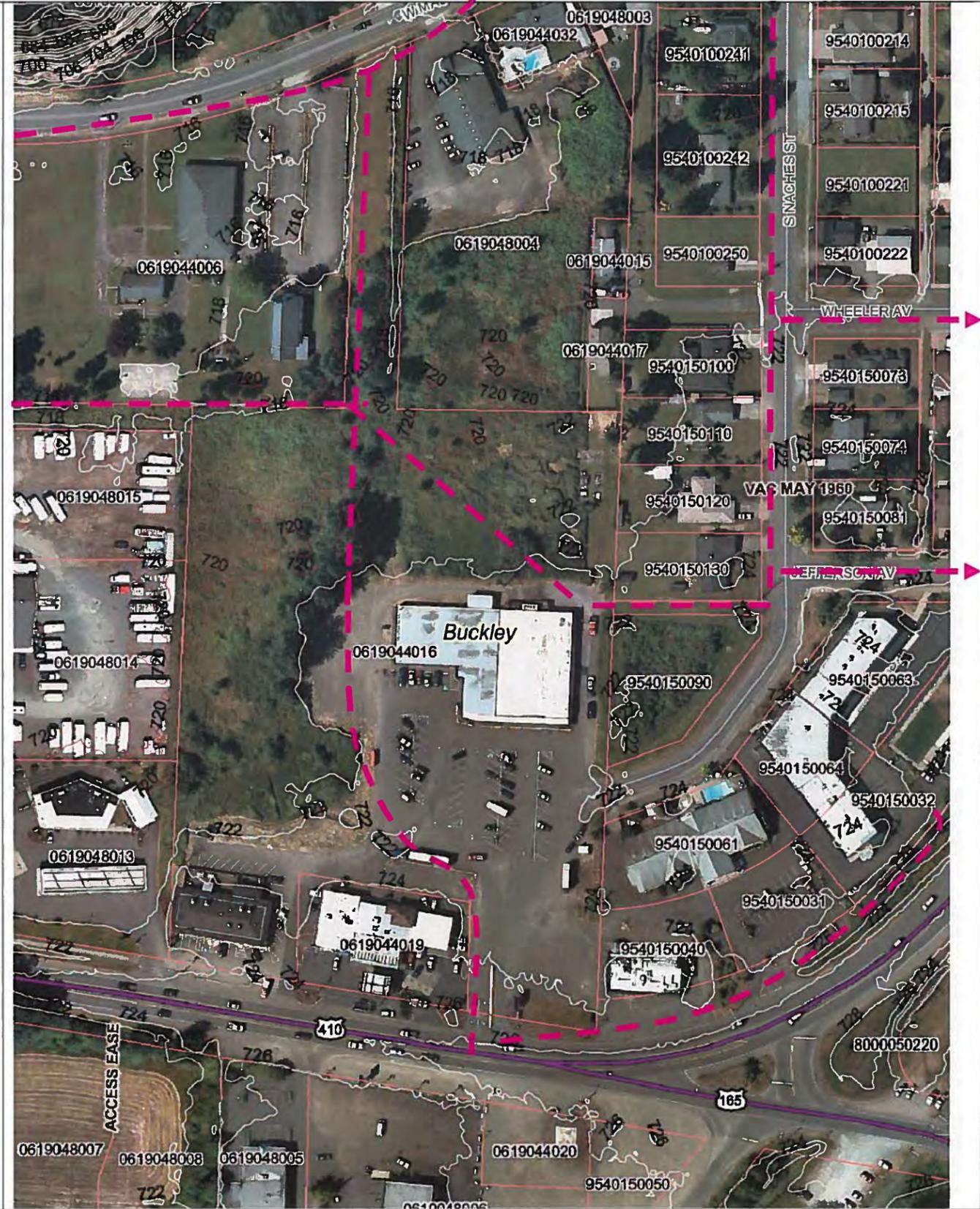
- City Park or recreation area ———
- Existing and proposed trails (including safe routes) - - - - -
- Proposed shoreline trail - · - · -
- See enlarged area - · - · -

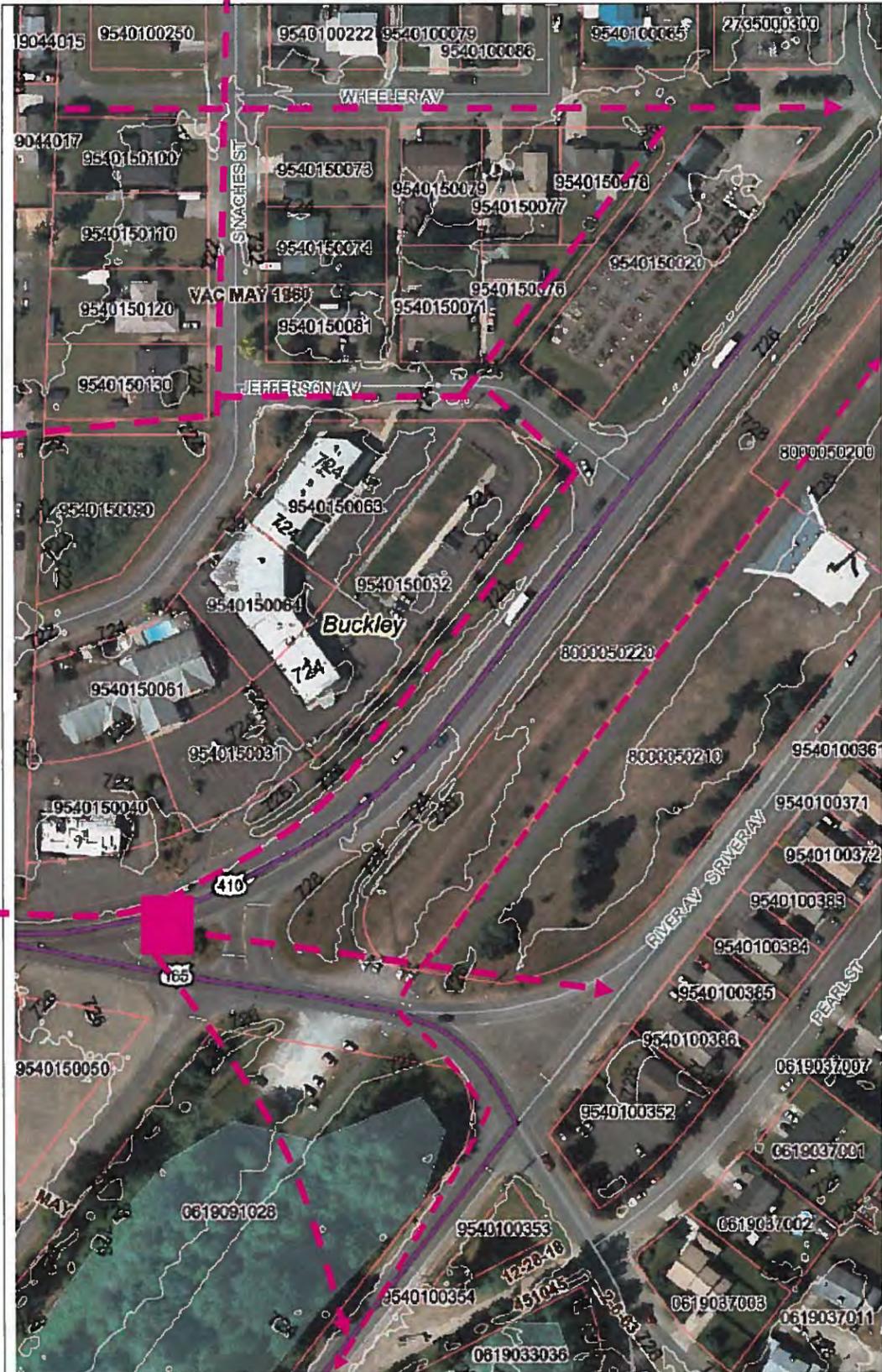


Eagle's area: Use right-of-way to the north to cross to Rose's to the east.

Rose's IGA: continue path from Eagle's area to "flag-pole" of the flag lot. Connect to sidewalk to north and to south. The sidewalk should continue along 410 and Jefferson.

A stretch of land between the north corner of the IGA building and Naches is about 15 feet wide and could be used for a walkway.



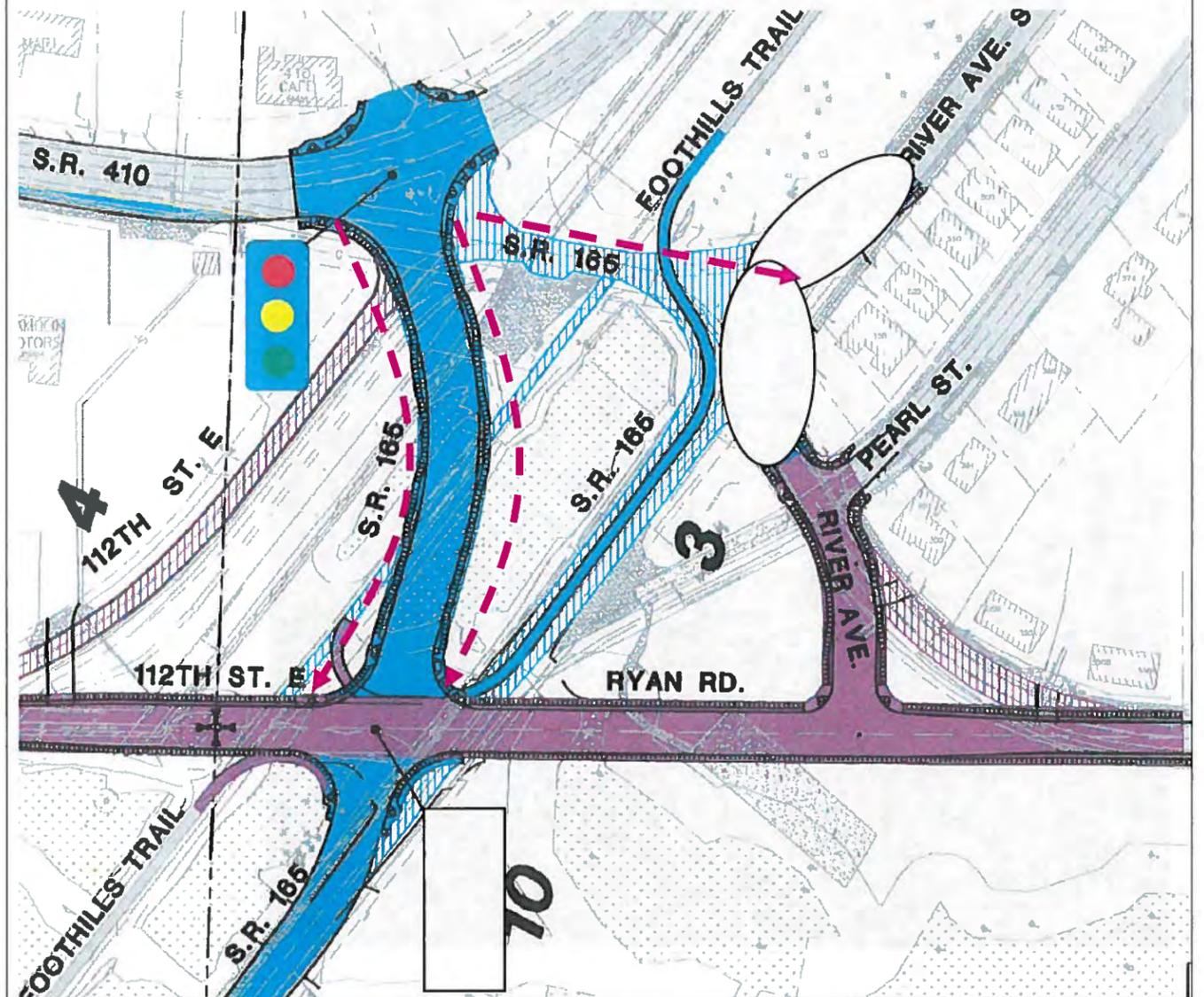


The walkway could be on the highway and connect with a swath of land northwest of the nursery to Wheeler Way. From there, pedestrians could use the cross walk to the youth center.

The trail plan should show the walkway and foothills trail as they will be after phase 2, at the light.

Blue: phase 2
Purple: completed phase 1

The whited-out areas are not part of phase 2 at this time:





CITY COUNCIL AGENDA BILL

City of Buckley
PO Box 1960
Buckley, WA 98321

ITEM INFORMATION			
SUBJECT: ORD No. __-17: Amending the 2017 Budget Cost Impact: N/A Fund Source: N/A Timeline: N/A	Agenda Date: December 12, 2017		AB 17-109
	Department/Committee/Individual	Created	Reviewed
	Mayor Pat Johnson		X
	City Administrator – Dave Schmidt	X	X
	City Attorney – Phil Olbrechts		X
	City Engineer – Dominic Miller		
	City Clerk – Joanne Starr		X
	Finance Dept – Sheila Bazzar		X
	Building Official – Mike Deadmond		
	Fire Dept – Chief Predmore		
	Parks & Rec Dept – Julie Bevaart		
	Planning Dept – Kathy Thompson		
	Police Dept – Chief Arsanto		
	Municipal Court – Jessica Cash		
PW/Utilities – Chris Banks			
Attachments: Ordinance and Exhibit			
<p>SUMMARY STATEMENT: State statutes require that we adopt any amendments prior to the end of the year.</p> <p>Sheila recently finished closeout of the October, 2017 revenues and expenditures and we discovered that several funds needed to be amended for various reasons as outlined in the ordinance.</p>			
COMMITTEE REVIEW AND RECOMMENDATION: A/F/PS 12/5/17			
RECOMMENDED ACTION: MOTION to Approve Ordinance No. __-17 Amending the 2017 Budget.			
RECORD OF COUNCIL ACTION			
<i>Meeting Date</i>	<i>Action</i>	<i>Vote</i>	

CITY OF BUCKLEY, WASHINGTON

ORDINANCE NO. __ - 17

AN ORDINANCE OF THE CITY COUNCIL, OF THE CITY OF BUCKLEY, PIERCE COUNTY, WASHINGTON, AMENDING ORDINANCE NO. 24-16, THE SAME BEING AN ORDINANCE ADOPTING THE ANNUAL BUDGET OF THE CITY OF BUCKLEY, WASHINGTON, FOR THE YEAR 2017, AND APPROPRIATING FUNDS FOR THE ESTIMATED EXPENDITURES.

WHEREAS, The City of Buckley adopted Ordinance number 24-16 adopting the 2017 final budget for the City of Buckley by reference;

WHEREAS, 2017 expenditure projections for Current Expense (Fund 001) are projected to be over by approximately \$80,000 due to costs associated with prosecution, increased land use processing costs and an increase in the City's general liability premium cost; and

WHEREAS, 2017 revenue and expenditures for the Cumulative Reserve Fund (003) are both higher due to a larger than projected Beginning Fund Balance (BFB) and increased interest revenue being transferred to the General Fund (001); and

WHEREAS, 2017 revenue for the Cemetery Operations Fund (004) is higher due to the sale of lots and higher interest earnings and expenditures due to State excise taxes on the lot sales and cemetery lot buybacks that were not anticipated; and

WHEREAS, 2017 expenditure projections for Railroad ROW Maintenance & Development (Fund 008) are projected to be over due to salary and benefit costs associated with maintenance of the railroad right-of-way property; and

WHEREAS, 2017 revenue projections for the Street Operations Fund (Fund 101) are projected to be higher than anticipated due to a higher BFB and increased revenue from right-of-way use permits and expenditures over by approximately \$30,000 due to increased supply costs, street striping, higher City street light costs and professional services for processing right-of-way use permits; and

WHEREAS, 2017 revenue and expenditures for the Street Construction Fund (Fund 102) are both lower due to the delay in implementing the River Avenue Reconstruction Project and failure to get grant funding for the SR410 & Park Avenue Pedestrian Improvement Project; and

WHEREAS, 2017 revenue and expenditure projections for the Transportation Benefit District (TBD) (Fund 103) are both higher with revenue due to a larger BFB after 2016 transfers were delayed and expenditures due to increased costs associated with the recent State Audit and legal fees; and

WHEREAS, 2017 revenue for Fire Station Construction (Fund 134) is lower than projected due to a smaller BFB than anticipated and expenditures higher due to professional service costs associated with the Boundary Line Adjustment completed to correct property line issues between adjacent properties and bond costs associated with refinancing of the Fire Station Construction Bonds; and

WHEREAS, the 2017 revenue and expenditure projections for Natural Gas Operations (Fund 401) are higher than anticipated due to a higher collection of delinquent gas revenue and subsequent payment of local and state taxes on the collections; and

WHEREAS, 2017 expenditure projections for Water/Sewer Operations (Fund 402) are projected to be higher than anticipated due to increased supply costs associated with the new water system treatment facilities and increased State and Local taxes paid on increased revenue; and

WHEREAS, 2017 revenue and expenditure projections for Solid Waste Collection (Fund 403) are both higher than anticipated due to the addition of new customers from residential development and subsequent higher contractual costs; and

WHEREAS, 2017 revenue and expenditure projections for Stormwater Utility Operations (Fund 407) are both higher than anticipated due to the addition of new customers from residential development and higher operational costs associated with professional service costs associated with catch basin cleaning, supplies, public utilities, local and state taxes and DOE permit fees; and

WHEREAS, The City of Buckley, in order to be in compliance with state law and not have any funds go over budget, desires to correct Funds 001, 003, 004, 101, 102, 103, 134, 401, 403 and 407 by adjusting revenues and/or expenditures; and

WHEREAS, the City Council did meet to consider the matter of the 2017 Budget Amendment in a public meeting on December 12, 2017;

NOW THEREFORE, THE CITY COUNCIL OF THE CITY OF BUCKLEY, PIERCE COUNTY, WASHINGTON, DO ORDAIN AS FOLLOWS:

Section 1. Ordinance No. 24-16 and the 2017 Final Budget shall be amended as shown in the summary form attached as Exhibit A.

This ordinance shall be in full force and effect five days after its passage, approval, posting and publication as provided by law. A summary of this Ordinance may be published in lieu of publishing the Ordinance in its entirety.

Introduced, passed, and approved this 12th day of December, 2017.

Pat Johnson, Mayor

ATTEST:

Joanne Starr, City Clerk

APPROVED AS TO FORM:

Phil Olbrechts, City Attorney

PUBLISHED: _____

EFFECTIVE: _____

EXHIBIT A

2017 City Budget Amendment							
Fund	Fund Name	2017 Budgeted Revenue	2017 Amended Revenues	2017 Budgeted Expenditures	2017 Amended Expenditures	2017 Projected Unrestricted End Fund	2017 Amended Unrestricted End Fund
001	General	\$5,248,287	\$5,248,287	\$4,477,109	\$4,500,000	\$771,178	\$748,287
002	Contingency	\$150,263	\$150,263	\$0	\$0	\$150,263	\$150,263
003	Cum Res	\$5,075,081	\$5,089,537	\$75,078	\$83,000	\$5,000,003	\$5,006,537
004	Cemetery	\$13,337	\$19,619	\$2,904	\$4,500	\$10,433	\$15,119
007	Police Res	\$354,147	\$354,147	\$153,000	\$153,000	\$201,147	\$201,147
008	RR ROW	\$216,895	\$216,895	\$100,107	\$103,000	\$116,788	\$113,895
030	Fire Res	\$999,844	\$999,844	\$918,170	\$918,170	\$81,674	\$81,674
035	Park Const	\$141,898	\$141,898	\$31,850	\$31,850	\$110,048	\$110,048
101	Street	\$210,777	\$237,407	\$205,503	\$235,000	\$5,274	\$2,407
102	Arterial	\$1,423,663	\$1,159,711	\$1,273,355	\$925,000	\$150,308	\$234,711
103	TBD	\$97,804	\$131,795	\$97,500	\$99,000	\$304	\$32,795
105	EMS	\$414,095	\$414,095	\$295,950	\$295,950	\$118,145	\$118,145
109	Crim Justice	\$146,338	\$146,338	\$69,000	\$69,000	\$77,338	\$77,338
134	Fire Const	\$221,439	\$217,744	\$5,000	\$30,000	\$216,439	\$187,744
136	Visitor Prom	\$122,503	\$122,503	\$20,453	\$20,453	\$102,050	\$102,050
202	FS Bond	\$350,778	\$350,778	\$300,300	\$300,300	\$50,478	\$50,478
307	Capital Imp	\$675,855	\$675,855	\$558,000	\$558,000	\$117,855	\$117,855
308	Comp Plan	\$312,882	\$312,882	\$116,986	\$116,986	\$195,896	\$195,896
401	NG Oper	\$3,268	\$6,442	\$3,000	\$3,400	\$268	\$3,042
402	Water/Sewer	\$3,550,496	\$3,550,496	\$2,896,662	\$2,950,000	\$653,834	\$600,496
403	Solid Waste	\$931,930	\$984,211	\$917,832	\$950,000	\$14,098	\$34,211
405	Sewer Const	\$2,247,822	\$2,247,822	\$1,265,769	\$1,265,769	\$982,053	\$982,053
406	Water Const	\$631,237	\$631,237	\$594,282	\$594,282	\$36,955	\$36,955
407	Stormwater	\$525,120	\$561,455	\$516,982	\$540,000	\$8,138	\$21,455
408	Storm Const	\$1,122,516	\$1,122,516	\$1,067,085	\$1,067,085	\$55,431	\$55,431
430	Equip Res	\$224,038	\$224,038	\$222,500	\$222,500	\$1,538	\$1,538
631	Muni Trust	\$402,768	\$402,768	\$400,000	\$400,000	\$2,768	\$2,768
701	Ceme Imp	\$170,737	\$170,737	\$1,000	\$1,000	\$169,737	\$169,737
Total		\$25,985,818	\$25,891,320	\$16,585,377	\$16,437,245	\$9,400,441	\$9,454,075



CITY COUNCIL AGENDA BILL

City of Buckley
PO Box 1960
Buckley, WA 98321

ITEM INFORMATION			
SUBJECT: ORD No. __-17: Authorizing the Transfer of Natural Gas Utility Surplus Funds Cost Impact: N/A Fund Source: N/A Timeline: N/A	Agenda Date: December 12, 2017		AB 17-110
	Department/Committee/Individual	Created	Reviewed
	Mayor Pat Johnson		X
	City Administrator – Dave Schmidt	X	X
	City Attorney – Phil Olbrechts		X
	City Engineer – Dominic Miller		
	City Clerk – Joanne Starr		X
	Finance Dept – Sheila Bazzar		X
	Building Official – Mike Deadmond		
	Fire Dept – Chief Predmore		
	Parks & Rec Dept – Julie Bevaart		
	Planning Dept – Kathy Thompson		
	Police Dept – Chief Arsanto		
	Municipal Court – Jessica Cash		
PW/Utilities – Chris Banks			
Attachments: Ordinance and Exhibit			
<p>SUMMARY STATEMENT: As stated in the ordinance findings, RCW 35.37.020 authorizes cities to transfer surplus utility funds from the natural gas utility funds to the current expense fund. In 2014 the City sold its gas utility as authorized by public vote pursuant to Chapter 35.94 RCW, and the proceeds of that sale, as well as most of the money in the natural gas operations fund as well as all money remaining in the natural gas capital project fund, were declared as surplus to the needs of the City’s natural gas utility and transferred to the City’s current expense fund.</p> <p>Since there were still outstanding delinquent accounts the City Council left the operations fund open in order to account for any revenue recovered. As of December 31, 2016 Fund 401 had an ending fund balance of \$4,078.26. This ordinance declares \$3,000 of that remaining balance as surplus to the needs of the natural gas utility and transfers this amount to the City current expense fund.</p>			
COMMITTEE REVIEW AND RECOMMENDATION: Full Council – Budget Process			
RECOMMENDED ACTION: MOTION to Approve Ordinance No. __-17 Authorizing the Transfer of Natural Gas Utility Surplus Funds.			
RECORD OF COUNCIL ACTION			
Meeting Date	Action	Vote	

CITY OF BUCKLEY, WASHINGTON

ORDINANCE NO. ____ - 17

**AN ORDINANCE OF THE CITY OF BUCKLEY, WASHINGTON,
TRANSFERRING SURPLUS GAS UTILITY FUNDS TO THE
CURRENT EXPENSE FUND; PROVIDING FOR SEVERABILITY;
AND ESTABLISHING AN EFFECTIVE DATE.**

WHEREAS, RCW 35.37.020 authorizes cities to transfer surplus utility funds from the natural gas utility fund to the current expense fund; and

WHEREAS, in 2014 the City sold its gas utility as authorized by public vote pursuant to Chapter 35.94 RCW, and the proceeds of that sale, as well as most of the money in the natural gas operations fund and all moneys remaining in the natural gas capital project fund, were declared surplus to the needs of the City's natural gas utility and transferred to the City's General Expense Fund through ORD No. 02-15; and

WHEREAS, due to a significant amount of delinquent accounts the City elected to leave the natural gas operations fund open in order to collect and account for outstanding delinquent utility accounts; and

WHEREAS, the City did receive moneys from outstanding delinquent accounts in 2016 which the City Council desires to declare surplus to the needs of the City's natural gas utility and be transferred to the City's General Expense Fund,

NOW, THEREFORE, THE CITY COUNCIL OF THE CITY OF BUCKLEY, WASHINGTON, DO ORDAIN AS FOLLOWS:

Section 1. That the recitals above are hereby adopted by reference as the City Council's findings of fact, as if fully set forth herein. **\$3,000.00** of the natural gas operations fund for the 2016 fiscal year is hereby transferred to the current expense fund.

Section 2. 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 3. Effective date. This ordinance or a summary thereof consisting of the title shall be published in the official newspaper of the City, and shall take effect and be in full force five (5) days after publication.

Introduced, passed, and approved by at least five members of the Buckley City Council on December 12, 2017.

Mayor Pat Johnson

Attest:

Joanne Starr, City Clerk

APPROVED AS TO FORM:

Phil Olbrechts, City Attorney

PUBLISHED: _____

EFFECTIVE: _____



CITY COUNCIL AGENDA BILL

City of Buckley
PO Box 1960
Buckley, WA 98321

ITEM INFORMATION			
SUBJECT: RES No. 17-__ - Amending Personnel Policy – Revision #17	Agenda Date: December 12, 2017		AB 17-111
	Department/Committee/Individual	Created	Reviewed
	Mayor Pat Johnson		X
	City Administrator – Dave Schmidt	X	X
	City Attorney – Phil Olbrechts		X
	City Engineer – Dominic Miller		
	City Clerk – Joanne Starr		X
	Finance Dept – Sheila Bazzar		
	Building Official – Mike Deadmond		
	Fire Dept – Chief Predmore		
	Parks & Rec Dept – Julie Bevaart		
	Planning Dept – Kathy Thompson		
	Police Dept – Chief Arsanto		
	Municipal Court – Jessica Cash		
PW/Utilities – Chris Banks			
Attachments: Resolution			
<p>SUMMARY STATEMENT: Resolution amending the following provisions of the City Personnel Policy & Procedures Manual:</p> <ul style="list-style-type: none"> • Section 4.06.01 – Amending Employee Rules of Conduct; and • Section 5.04.11 – Adding a new section clarifying City pay periods; and • Section 6.19.02 – Adding a new section related to Health Reimbursement Accounts (HRA); and • Section 6.20.02 – Clarifying terms and eligibility for the City’s Early Retirement Incentive Program (ERIP); and • Section 6.20.03 – Clarifying terms and eligibility for the City’s Early Retirement Incentive Program (ERIP). 			
COMMITTEE REVIEW AND RECOMMENDATION: A/F/PS 12/5/17			
RECOMMENDED ACTION: MOTION to Approve RES No. 17-__ Amending City Personnel Policy & Procedures Manual Revision #17.			
RECORD OF COUNCIL ACTION			
<i>Meeting Date</i>	<i>Action</i>	<i>Vote</i>	

RESOLUTION NO. 17 -__

BUCKLEY, WASHINGTON

A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF BUCKLEY, PIERCE COUNTY, WASHINGTON AMENDING SECTIONS 4.06, 5.04, 6.19 AND 6.20 OF THE “CITY OF BUCKLEY PERSONNEL POLICY AND PROCEDURES MANUAL” TO AMEND EMPLOYEE RULES OF CONDUCT, ADD CLARIFYING CITY PAY PERIODS, ADDING CHANGES TO EMPLOYEE HEALTHCARE AND CLARIFYING TERMS OF THE CITY’S ERIP.

WHEREAS, the City Council adopted the most current version of the “City of Buckley Personnel Policy and Procedures Manual” on May 10, 2016; and

WHEREAS, Section 4.06 provides guidelines for City employees’ rules of conduct; however, the conduct policy “only” clarifies that certain behavior such as disrespect, use of abusive language, intimidation, coercion and interference applies to supervisors and not necessarily to other employees or the public that they serve and the City Council desires to correct this in the policy; and

WHEREAS, the City’s past practice for pay periods have been implemented for many years but never memorialized into policy and the City Council desires to add a new section to clarify this; and

WHEREAS, on December 31, 2017 AWC will no longer be offering the Healthfirst Medical Plan which is the healthcare plan that all City employees except for the Police Guild are under; and

WHEREAS, AWC is offering a next tier plan called the Heathfirst – 250 Plan as a replacement which offers fewer benefits and additional out-of-pocket expenses for employees and their dependents; and

WHEREAS, the City reviewed and evaluated multiple alternatives and concluded that the Healthfirst - 250 Plan was the closest benefit plan to the Healthfirst for both benefit and cost; and

WHEREAS, as a result of the plan providing reduced benefits the monthly premium per employee is lower resulting in a net annual savings of \$22,118 for exempt and hourly employees and \$44,678 for Citywide enrollees; and

WHEREAS, the City desires to mitigate the impact to the employee from reduced benefits and increased out-of-pocket costs by creating individual Health Reimbursement Accounts (HRA) and contributing to these accounts by using the amount saved from the reduction in premiums;

WHEREAS, as a result the City desires to add a new section to the Personnel Policy entitled “Health Retirement Account (HRA) Contribution” and establish conditions and contribution amounts for the HRAs;

WHEREAS, on August 25, 2015 the City Council approved an amendment to the City Personnel Policy adding a new Early Retirement Incentive Program (ERIP) the purpose of which was to provide incentives which encourage eligible employees to retire sooner than they otherwise might have to support City objectives, including replacement of higher salaried employees with lower salaried employees reducing salary and benefit costs, and creating an opportunity where retirement of longer term employees is phased over time assisting the City to better manage the loss of institutional knowledge;

WHEREAS, ERIP eligibility was designed to be governed by an employee’s length of service beginning with 10 years and beyond; however, the adopted language is ambiguous when it comes to interpretation of the amount of eligibility an employee would qualify for after 10 years;

WHEREAS, the City desires to clarify this language through amendments to Sections 6.20.02 and 6.20.03;

NOW THEREFORE BE IT RESOLVED that the City Council of the City of Buckley hereby amends the City of Buckley “Personnel Policy and Procedures Manual” as follows:

Section 1. Section 4.06.01(1) “Rules of Conduct” is hereby amended to read as follows:

1. The occurrence of any of the following is sufficient justification for immediate discharge but is not considered all inclusive:
 - a) Theft, misappropriation or removal of city property or the property of employees, clients or customers.
 - b) Knowing, intentional or repeated falsification of an application for employment or any report, time sheet or city record.
 - c) Soliciting and/or accepting payments, gifts or any item of value for services performed during the regular workday, whether the services are performed on behalf of the city and whether city vehicles or equipment are used.
 - d) Willful alteration, destruction or waste of city property, facilities, records or equipment, wherever located, or the destruction of another employee’s property.
 - e) Using, selling, dispensing, or possessing alcohol (except as specifically authorized by the City), marijuana, illegal drugs, narcotics or other controlled substances on city property or in city vehicles; reporting to work or being impaired and/or under the influence of alcohol, marijuana, narcotics or other controlled substances while on working time, or while on city property or in city vehicles.
 - f) Giving or taking a bribe of any nature as inducement for obtaining or retaining a job or position.
 - g) Serious or repeated disorderly conduct, horseplay or insubordination. Insubordination includes, but is not limited to: neglect of duty, or refusal or failure to obey orders or instructions in the line of duty; public disrespect displayed toward a supervisor or the city while performing work for the city; and abusive language to any supervisor, employee, customers or other persons while working for the city.
 - h) Threatening, intimidating, coercing or interfering with supervisors or other employees and/or customers or other persons while working for the city.
 - i) Deliberate attempts to injure another employee or fighting on city property or during working hours.
 - j) Sleeping during working hours.

k) Unauthorized possession of fire arms, explosives or any dangerous weapons while performing city work or while on city property.

l) Participating in an unauthorized work stoppage or slowdown.

m) Recklessness resulting in a serious accident while on duty, whether on city property or while driving a city vehicle.

n) Repeated unwelcome sexual advances, requests for sexual favors, and other verbal or physical conduct as defined in State and Federal Laws. Sexual harassment includes but is not limited to demands for sexual favors in exchange for employment, retention of job, promotion or other employment benefits.

o) Willful or intentional behavior or remarks based on race, creed, color, national origin, age, sex, marital status, sexual orientation, or the presence of a physical, sensory, or mental disability resulting in discrimination against any employee, customer or member of the general public.

p) Willful infraction of any departmental or city rule, regulation or policy.

Section 2. Section 5.04.11 is hereby added to read as follows:

5.04.11 Pay Periods: Paychecks will be issued on the last business day of the month. Draw checks shall be issued on the fifteenth (15th) of the month.

- Draw day on Saturday or Friday holiday – check issued the preceding City-scheduled workday.

- Draw day on Sunday or Monday holiday – check issued the following City-scheduled workday.

Section 3. Section 6.19.02 is hereby added to read as follows:

6.19.02 Health Reimbursement Account (HRA) Contribution – Unless otherwise specified in bargaining unit agreements, beginning January 1, 2018 the City will activate a Health Reimbursement Account (HRA) for eligible employees. The City will provide annual contributions to each employee’s HRA account according the schedule in the Table below:

HRA Contribution	City Contribution Amount/Employee
Employee	\$1,100
Spouse	\$500
Dependent (2 maximum)	\$250

HRA accounts are being established for each eligible employee to assist with additional out-of-pocket expenses resulting from the change on AWC healthcare benefits taking place January 1, 2018. Therefore contributions to an employee's HRA account are not eligible for any type of payment under the City's Health Insurance Opt-Out Program in Section 6.21. Employees who elect to opt out of dependent(s) coverage under Section 6.21 will "only" be able to receive a cash payment equal to fifty percent (50%) of the premium amount, but no portion of HRA amount.

These HRA contributions are subject to funding by the City Council in the annual budget and the City retains the right to, in its sole discretion, modify, adjust or terminate the contribution amounts for any fiscal year if insufficient funding is provided in the budget, provided however that such change shall not impact the rights or benefits of any employee for the prior fiscal year.

Section 4. Section 6.20.02 is hereby amended to read as follows:

6.20.02 Purpose. The purpose of the City's new Early Retirement Incentive Program (ERIP) is (1) to afford those long term City employees who desire to retire prior to either PERS, LEOFF and/or Social Security Full Retirement Age an opportunity to do so with some financial assistance until eligible for PERS/LEOFF retirement and/or social security benefits, and (2) to encourage some measure of staffing flexibility, consistent with overall City and individual department needs.

The City's Early Retirement Incentive Program (ERIP) is strictly voluntary and provides an insurance incentive that allows an employee to retire early prior to being eligible for Medicare benefits. Under the ERIP employees that have at least 10 years of service with the City shall be eligible for 1 year (12 months) of City paid continuing health care coverage for the employee "only" under COBRA. Employees electing to take early retirement under this program who have more than 10 years of service with the City shall receive an additional 1.5 months of City paid continuing health care coverage (medical, dental & vision) for the employee for every year of service over the 10 year initial threshold, up to the maximum allowed under COBRA which is 36 months, except that City contributions to COBRA under ERIP will cease before the end of the eligible period, if:

- the participant becomes eligible for medical care coverage through another employer; or
- the participant becomes eligible for Medicare benefits; or
- the participant elects coverage through a spouse/domestic partner employed by the City; or
- ~~or~~ the participant dies.

Participation in the City's ERIP provides coverage under the City's insurance plan for medical, vision and dental benefits but does not include an H.R.A. contribution outlined in 6.19.02 above.

Employees electing to participate in the City's ERIP may choose to provide health care coverage for their dependents on a self-pay basis following their termination/retirement from the City.

This program is subject to funding by the City Council in the annual budget and the City retains the right to designate the number of positions to fund annually and the right to deny an application or delay its effective date in the best interests of the City. The City may, in its sole discretion terminate the program at any time or, suspend it for any fiscal year, if insufficient funding is provided in the budget, provided however that such suspension shall not impact the rights or benefits of any employee who has retired under the program in a prior fiscal year.

Section 5. Section 6.20.03 is hereby amended to read as follows:

6.20.03 Long term City employees who retire early due to medical reasons related to a serious health condition prior to either PERS, LEOFF and/or Social Security Full Retirement Age are eligible for the ERIP as outlined in 6.20.02 above. Employees retiring early due to medical reasons who have at least 10 years of service with the City shall be eligible for 1 year (12 months) of City paid continuing health care coverage for the employee "only" under COBRA. Employees who have more than 10 years of service with the City shall receive an additional 1.5 months of City paid continuing health care coverage for the employee for every year of service over the 10 year initial threshold, up to the maximum allowed under COBRA which is 36 months.

Introduced, passed and approved this this 12th day of December, 2017.

Pat Johnson, Mayor

ATTEST:

Joanne Starr, City Clerk

APPROVED AS TO FORM:

City Attorney

POSTED: December ____, 2017



CITY COUNCIL AGENDA BILL

City of Buckley
PO Box 1960
Buckley, WA 98321

ITEM INFORMATION			
SUBJECT: Scope of Work - Design Engineering – River Ave. Reconstruction Project w- Supplement #1 Cost Impact: \$117,040 Fund Source: Fund 102 & TIB Grant Timeline: Immediate	Agenda Date: December 12, 2017		AB17-112
	Department/Committee/Individual	Created	Reviewed
	Mayor Pat Johnson		X
	City Administrator – Dave Schmidt	X	X
	City Attorney – Phil Olbrechts		X
	City Engineer – Dominic Miller	X	X
	City Clerk – Joanne Starr		X
	Finance Dept – Sheila Bazzar		
	Building Official – Mike Deadmond		
	Fire Dept – Chief Predmore		
	Parks & Rec Dept – Ellen Boyd		
	Planning Dept – Kathy Thompson		
	Police Dept – Chief Arsanto		
	Municipal Court – Jessica Cash		
PW/Utilities – Chris Banks		X	
Attachments: Consultant Agreement w/Supplement #1			
<p>SUMMARY STATEMENT: In March, 2017 the City approved the Consultant Agreement for design of the River Avenue Reconstruction for a cost of \$85,550, after receiving approval from TIB. During the design it was identified that additional underground utilities consisting of sewer and water main extensions should be replaced while the street right-of-way was open. In addition it was determined that the street scape cross section improvements should be extended north to the Youth Center parking lot while the project was under construction. Both of these additions resulted in increased design costs.</p> <p>The engineering supplement #1 being presented for consideration increases the overall design cost by \$31,490 for a total of \$117,040.</p>			
COMMITTEE REVIEW AND RECOMMENDATION: None			
RECOMMENDED ACTION: MOTION to Approve the Consultant Agreement Supplement #1 for Design Engineering for River Ave. Reconstruction Project for a Total Cost of \$117,040.			
RECORD OF COUNCIL ACTION			
Meeting Date	Action	Vote	



DATE: March 30, 2017

TO: City of Buckley
P.O. Box 1960

ATTN: Mr. Dave Schmidt
City Administrator

Buckley, WA 98321

FROM: Tani Stafford, P.E.

PROJECT #: 20174.60

SUBJECT: Partially signed Consultant Agreement, River Avenue Improvements, TIB No 6-P-808(013)-1, City of Buckley, WA

WE ARE TRANSMITTING:

- Herewith
- Under Separate Cover

Number of Copies: 1

THE FOLLOWING:

- Prints
- Construction Drawings
- Specifications
- Shop Drawings
- Change Order
- Legal Description
- Letters
- Consultant Agreement

FOR:

- Review & Comment
- Approval
- Signature
- Your Use & Files
- As Requested
- Action Noted Below
- _____
- _____

COMMENTS:

Dave – Attached please find the original partially signed Consultant Agreement for the City of Buckley River Avenue Improvements design, for the City’s review, approval and signature. If the Contract meets with the City’s approval, please have the appropriate official sign and date as needed on the flagged pages. We would like a pdf scan of the fully signed document for our files.

Please call us if you have any questions, we are looking forward to working on this project with the City.

Thanks – Tani

**III
GENERAL REQUIREMENTS**

All aspects of coordination of the work of this AGREEMENT, with outside agencies, groups or individuals shall receive advance approval by the AGENCY. Necessary contacts and meetings with agencies, groups or individuals shall be coordinated through the AGENCY.

The CONSULTANT shall attend coordination, progress and presentation meetings with the AGENCY or such Federal, Community, State, City or County officials, groups or individuals as may be requested by the AGENCY. The AGENCY will provide the CONSULTANT sufficient notice prior to meetings requiring CONSULTANT participation. The minimum number of hours or days notice required shall be agreed to between the AGENCY and the CONSULTANT and shown in Exhibit B attached hereto and made part of this AGREEMENT. The CONSULTANT shall prepare a monthly progress report, in a form approved by the AGENCY, that will outline in written and graphical form the various phases and the order of performance of the work in sufficient detail so that the progress of the work can easily be evaluated. Goals for Disadvantaged Business Enterprises (DBE), Minority Business Enterprises (MBE), and Women-owned Business Enterprises (WBE) if required shall be shown in the heading of this Agreement.

The original copies of all reports, PS&E, and other data furnished to the CONSULTANT by the AGENCY shall be returned. All designs, drawings, specifications, documents, and other work products prepared by the CONSULTANT prior to completion or termination of this AGREEMENT are instruments of service for the PROJECT and are property of the AGENCY. Reuse by the AGENCY or by others acting through or on behalf of the AGENCY of any such instruments of service, not occurring as a part of this PROJECT, shall be without liability of legal exposure to the CONSULTANT.

**IV
TIME FOR BEGINNING AND COMPLETION**

The CONSULTANT shall not begin any work under the terms of this AGREEMENT until authorized in writing by the AGENCY. All work under this AGREEMENT shall be completed by the date shown in the heading of this AGREEMENT under completion date.

The established completion time shall not be extended because of any delays attributable to the CONSULTANT, but may be extended by the AGENCY, in the event of a delay attributable to the AGENCY, or because of unavoidable delays caused by an act of GOD or governmental actions or other conditions beyond the control of the CONSULTANT. A prior supplemental agreement issued by the AGENCY is required to extend the established completion time.

**V
PAYMENT**

The CONSULTANT shall be paid by the AGENCY for completed work and services rendered under this AGREEMENT as provided in Exhibit C attached hereto, and by this reference made part of this AGREEMENT. Such payment shall be full compensation for work performed or services rendered and for all labor, materials, supplies, equipment, and incidentals necessary to complete the work specified in Section II, Scope of Work.

**VI
SUBCONTRACTING**

The AGENCY permits subcontracts for those items of work as shown in Exhibit G to this Agreement. Compensation for this subconsultant work shall be based on the cost factors shown on Exhibit G, attached hereto and by this reference made a part of this AGREEMENT.

The work of the subconsultant shall not exceed its maximum amount payable unless a prior written approval has been issued by the AGENCY.

All reimbursable direct labor, overhead, direct non-salary costs and fixed fee costs for the subconsultant shall be substantiated in the same manner as outlined in Section V. All subcontracts exceeding \$10,000 in cost shall contain all applicable provisions of this AGREEMENT.

The CONSULTANT shall not subcontract for the performance of any work under this AGREEMENT without prior written permission of the AGENCY. No permission for subcontracting shall create, between the AGENCY and subcontractor, any contract or any other relationship.

**VII
EMPLOYMENT**

The CONSULTANT warrants that he/she has not employed or retained any company or person, other than a bona fide employee working solely for the CONSULTANT, to solicit or secure this contract, and that it has not paid or agreed to pay any company or person, other than a bona fide employee working solely for the CONSULTANT, any fee, commission, percentage, brokerage fee, gift, or any other consideration, contingent upon or resulting from the award or making of this contract. For breach or violation of this warrant, the AGENCY shall have the right to annul this AGREEMENT without liability, or in its discretion, to deduct from the AGREEMENT price or consideration or otherwise recover the full amount of such fee, commission, percentage, brokerage fee, gift, or contingent fee.

Any and all employees of the CONSULTANT or other persons while engaged in the performance of any work or services required of the CONSULTANT under this AGREEMENT, shall be considered employees of the CONSULTANT only and not of the AGENCY, and any and all claims that may or might arise under any Worker's Compensation Act on behalf of said employees or other persons while so engaged, and any and all claims made by a third party as a consequence of any act or omission on the part of the CONSULTANTS employees or other persons while so engaged on any of the work or services provided to be rendered herein, shall be the sole obligation and responsibility of the CONSULTANT.

The CONSULTANT shall not engage, on a full or part time basis, or other basis, during the period of the contract, any professional or technical personnel who are, or have been, at any time during the period of the contract, in the employ of the STATE, or the AGENCY, except regularly retired employees, without written consent of the public employer of such person.

**VIII
NONDISCRIMINATION**

The CONSULTANT agrees not to discriminate against any client, employee or applicant for employment or for services because of race, creed, color, national origin, marital status, sex, age or handicap except for a bona fide occupational qualification with regard to, but not limited to the following: employment upgrading, demotion or transfer, recruitment or any recruitment advertising, layoffs or terminations, rates of pay or other forms of compensation, selection for training, rendition of services. The CONSULTANT understands and agrees that if it violates this provision, this AGREEMENT may be terminated by the AGENCY and further that the CONSULTANT shall be barred from performing any services for the AGENCY now or in the future unless a showing is made satisfactory to the AGENCY that discriminatory practices have terminated and that recurrence of such action is unlikely.

During the performance of this AGREEMENT, the CONSULTANT, for itself, its assignees, and successors in interest agrees as follows:

- A. COMPLIANCE WITH REGULATIONS: The CONSULTANT shall comply with the Regulations relative to nondiscrimination in the same manner as in

Federally-assisted programs of the Department of Transportation, Title 49, Code of Federal Regulations, Part 21, as they may be amended from time to time, (hereinafter referred to as the Regulations), which are herein incorporated by reference and made a part of this AGREEMENT.

Executive Orders numbered E.O.70-01 and E.O.66-03 of the Governor of the State of Washington.

**IX
TERMINATION OF AGREEMENT**

- B. **NONDISCRIMINATION:** The CONSULTANT, with regard to the work performed by it during the AGREEMENT, shall not discriminate on the grounds of race, creed, color, sex, age, marital status, national origin or handicap except for a bona fide occupational qualification in the selection and retention of subconsultants, including procurements of materials and leases of equipment. The CONSULTANT shall not participate either directly or indirectly in the discrimination prohibited by Section 21.5 of the Regulations, including employment practices when the contract covers a program set forth in Appendix II of the Regulations.
- C. **SOLICITATIONS FOR SUBCONSULTANTS, INCLUDING PROCUREMENTS OF MATERIALS AND EQUIPMENT:** In all solicitations either by competitive bidding or negotiation made by the CONSULTANT for work to be performed under a subcontract, including procurements of materials or leases of equipment, each potential subconsultant or supplier shall be notified by the CONSULTANT of the CONSULTANTs obligations under this AGREEMENT and the Regulations relative to nondiscrimination on the grounds of race, creed, color, sex, age, marital status, national origin and handicap.
- D. **INFORMATION AND REPORTS:** The CONSULTANT shall provide all information and reports required by the Regulations, or directives issued pursuant thereto, and shall permit access to its books, records, accounts, other sources of information, and its facilities as may be determined by the AGENCY or TIB to be pertinent to ascertain compliance with such Regulations or directives. Where any information required of the CONSULTANT is in the exclusive possession of another who fails or refuses to furnish this information the CONSULTANT shall so certify to the AGENCY, or the TIB as appropriate, and shall set forth what efforts it has made to obtain the information.
- E. **SANCTIONS FOR NONCOMPLIANCE:** In the event of the CONSULTANTs noncompliance with the nondiscrimination provisions of this AGREEMENT, the AGENCY shall impose such sanctions as it or the Transportation Improvement Board may determine to be appropriate, including, but not limited to:
 - 1. Withholding of payments to the CONSULTANT under the AGREEMENT until the CONSULTANT complies, and/or
 - 2. Cancellation, termination or suspension of the AGREEMENT, in whole or in part.
- F. **INCORPORATION OF PROVISIONS:** The CONSULTANT shall include the provisions of paragraphs (A) through (G) in every subcontract, including procurements of materials and leases of equipment, unless exempt by the Regulations or directives issued pursuant thereto. The CONSULTANT shall take such action with respect to any subconsultant or procurement as the AGENCY or the Transportation Improvement Board may direct as a means of enforcing such provisions including sanctions for noncompliance; provided, however, that, in the event a CONSULTANT becomes involved in, or is threatened with, litigation with a subconsultant or supplier as a result of such direction, the CONSULTANT may request the AGENCY to enter into such litigation to protect the interests of the AGENCY, and in addition, the CONSULTANT may request the TIB to enter into such litigation to protect the interests of the TIB.
- G. **UNFAIR EMPLOYMENT PRACTICES:** The CONSULTANT shall comply with RCW 49.60.180 prohibiting unfair employment practices and the

The right is reserved by the AGENCY to terminate this AGREEMENT at any time upon ten days written notice to the CONSULTANT.

In the event this AGREEMENT is terminated by the AGENCY other than for fault on the part of the CONSULTANT, a final payment shall be made to the CONSULTANT as shown in Exhibit F for the type of AGREEMENT used.

No payment shall be made for any work completed after ten days following receipt by the CONSULTANT of the Notice of Termination. If the accumulated payment made to the CONSULTANT prior to Notice of Termination exceeds the total amount that would be due computed as set forth herein above, then no final payment shall be due and the CONSULTANT shall immediately reimburse the AGENCY for any excess paid.

In the event the services of the CONSULTANT are terminated by the AGENCY for fault on the part of the CONSULTANT, the above formula for payment shall not apply. In such an event, the amount to be paid shall be determined by the AGENCY with consideration given to the actual costs incurred by the CONSULTANT in performing the work to the date of termination, the amount of work originally required which was satisfactorily completed to date of termination, whether that work is in a form or a type which is usable to the AGENCY at the time of termination; the cost to the AGENCY of employing another firm to complete the work required and the time which maybe required to do so, and other factors which affect the value to the AGENCY of the work performed at the time of termination. Under no circumstances shall payment made under this subsection exceed the amount which would have been made using the formula set forth in the previous paragraph.

If it is determined for any reason that the CONSULTANT was not in default or that the CONSULTANTs failure to perform is without it or its employees fault or negligence, the termination shall be deemed to be a termination for the convenience of the AGENCY in accordance with the provision of this AGREEMENT.

In the event of the death of any member, partner or officer of the CONSULTANT or any of its supervisory personnel assigned to the project, or, dissolution of the partnership, termination of the corporation, or disaffiliation of the principally involved employee, the surviving members of the CONSULTANT hereby agree to complete the work under the terms of this AGREEMENT, if requested to do so by the AGENCY. The subsection shall not be a bar to renegotiation of the AGREEMENT between the surviving members of the CONSULTANT and the AGENCY, if the AGENCY so chooses.

In the event of the death of any of the parties listed in the previous paragraph, should the surviving members of the CONSULTANT, with the AGENCYs concurrence, desire to terminate this AGREEMENT, payment shall be made as set forth in the second paragraph of this section.

In the event this AGREEMENT is terminated prior to completion, the original copies of all reports and other data, PS&E materials furnished to the CONSULTANT by the AGENCY and documents prepared by the CONSULTANT prior to said termination, shall become and remain the property of the AGENCY and may be used by it without restriction. Such unrestricted use, not occurring as a part of this PROJECT, shall be without liability or legal exposure to the CONSULTANT.

Payment for any part of the work by the AGENCY shall not constitute a waiver by the AGENCY of any remedies of any type it may have against the CONSULTANT for any breach of this AGREEMENT by the CONSULTANT, or for failure of the CONSULTANT to perform work required of it by the AGENCY. Forbearance of any rights under the AGREEMENT will not constitute waiver of entitlement to exercise those rights with respect to any future act or omission by the CONSULTANT.

**X
CHANGES OF WORK**

The CONSULTANT shall make such changes and revisions in the complete work of this AGREEMENT as necessary to correct errors appearing therein, when required to do so by the AGENCY, without additional compensation thereof. Should the AGENCY find it desirable for its own purposes to have previously satisfactorily completed work or parts thereof changed or revised, the CONSULTANT shall make such revisions as directed by the AGENCY. This work shall be considered as Extra Work and will be paid for as herein provided under Section XIV.

**XI
DISPUTES**

Any dispute concerning questions of fact in connection with the work not disposed of by AGREEMENT between the CONSULTANT and the AGENCY shall be referred for determination to the Director of Public Works or AGENCY Engineer, whose decision in the matter shall be final and binding on the parties of this AGREEMENT, provided however, that if an action is brought challenging the Director of Public Works or AGENCY Engineer's decision, that decision shall be subject to the scope of judicial review provided under Washington Case Law.

**XII
VENUE, APPLICABLE LAW AND
PERSONAL JURISDICTION**

In the event that either party deems it necessary to institute legal action or proceedings to enforce any right or obligation under this AGREEMENT, the parties hereto agree that any such action shall be initiated in the Superior Court of the State of Washington, situated in the county the AGENCY is located in. The parties hereto agree that all questions shall be resolved by application of Washington law and that the parties to such action shall have the right of appeal from such decisions of the Superior court in accordance with the laws of the State of Washington. The CONSULTANT hereby consents to the personal jurisdiction of the Superior Court of the State of Washington, situated in the county the AGENCY is located in.

**XIII
LEGAL RELATIONS AND INSURANCE**

The CONSULTANT shall comply with all Federal, State, and local laws and ordinances applicable to the work to be done under this AGREEMENT. This AGREEMENT shall be interpreted and construed in accord with the laws of Washington.

The CONSULTANT shall indemnify and hold the AGENCY and the STATE of Washington, and their officers and employees harmless from and shall process and defend at its own expense all claims, demands, or suits at law or equity arising in whole or in part from the CONSULTANT's negligence or breach of any of its obligations under this AGREEMENT; provided that nothing herein shall require a CONSULTANT to indemnify the AGENCY and the STATE against and hold harmless the AGENCY and the STATE from claims, demands or suits based solely upon the conduct of the AGENCY and the STATE, their agents, officers and employees and provided further that if the claims or suits are caused by or result from the concurrent negligence of (a) the CONSULTANT's agents or employees and (b) the AGENCY and the STATE, their agents, officers and employees, this indemnity provision with respect to (1) claims or suits based upon such negligence, (2) the costs to the AGENCY and the STATE of defending such claims and suits, etc. shall be valid and enforceable only to the extent of the CONSULTANT's negligence or the negligence of the CONSULTANT's agents or employees.

The CONSULTANT's relation to the AGENCY shall be at all times as an independent contractor.

The CONSULTANT specifically assumes potential liability for actions brought by the CONSULTANT's own employees against the AGENCY and, solely for the purpose of this indemnification and defense, the CONSULTANT specifically waives any immunity under the state industrial insurance law, Title 51 RCW. The CONSULTANT recognizes that this waiver was specifically entered into pursuant to the provisions of RCW 4.24.115 and was the subject of mutual negotiation.

Unless otherwise specified in the AGREEMENT, the AGENCY shall be responsible for administration of construction contracts, if any, on the project. Subject to the processing of an acceptable, supplemental agreement, the CONSULTANT shall provide on-call assistance to the AGENCY during contract administration. By providing such assistance, the CONSULTANT shall assume no responsibility for: proper construction techniques, job site safety, or any construction contractor's failure to perform its work in accordance with the contract documents.

The CONSULTANT shall obtain and keep in force during the terms of the AGREEMENT, or as otherwise required, the following insurance with companies or through sources approved by the State Insurance Commissioner pursuant to RCW 48.

Insurance Coverage

A. Worker's compensation and employer's liability insurance as required by the STATE.

B. General commercial liability insurance in an amount not less than a single limit of one million and 00/100 Dollars (\$1,000,000.00) for bodily injury, including death and property damage per occurrence.

Excepting the Worker's Compensation insurance and any professional liability insurance secured by the CONSULTANT, the AGENCY will be named on all certificates of insurance as an additional insured. The CONSULTANT shall furnish the AGENCY with verification of insurance and endorsements required by this AGREEMENT. The AGENCY reserves the right to require complete, certified copies of all required insurance policies at any time.

All insurance shall be obtained from an insurance company authorized to do business in the State of Washington. The CONSULTANT shall submit a verification of insurance as outlined above within 14 days of the execution of this AGREEMENT to the AGENCY. No cancellation of the foregoing policies shall be effective without thirty (30) days prior notice to the AGENCY.

The CONSULTANT's professional liability to the AGENCY shall be limited to the amount payable under this AGREEMENT or one million dollars, whichever is the greater unless modified by Exhibit H. In no case shall the CONSULTANT's professional liability to third parties be limited in any way.

The AGENCY will pay no progress payments under Section V until the CONSULTANT has fully complied with this section. This remedy is not exclusive; and the AGENCY and the STATE may take such other action as is available to them under other provisions of this AGREEMENT, or otherwise in law.

**XIV
EXTRA WORK**

A. The AGENCY may at any time, by written order, make changes within the general scope of the AGREEMENT in the services to be performed.



- B. If any such change causes an increase or decrease in the estimated cost of, or the time required for, performance of any part of the work under this AGREEMENT, whether or not changed by the order, or otherwise affects any other terms and conditions of the AGREEMENT, the AGENCY shall make an equitable adjustment in the (1) maximum amount payable; (2) delivery or completion schedule, or both; and (3) other affected terms and shall modify the AGREEMENT accordingly.
- C. The CONSULTANT must submit any proposal for adjustment (hereafter referred to as proposal) under this clause within 30 days from the date of receipt of the written order. However, if the AGENCY decides that the facts justify it, the AGENCY may receive and act upon a proposal submitted before final payment of the AGREEMENT.
- D. Failure to agree to any adjustment shall be a dispute under the disputes clause. However nothing in this clause shall excuse the CONSULTANT from proceeding with the AGREEMENT as changed.
- E. Notwithstanding the terms and condition of paragraphs (a) and (b) above, the maximum amount payable for this AGREEMENT, shall not be increased or considered to be increased except by specific written supplement to this AGREEMENT.

**XV
ENDORSEMENT OF PLANS**

The CONSULTANT shall place his endorsement on all plans, estimates or any other engineering data furnished by him.

**XVI
TIB AND AGENCY REVIEW**

The AGENCY and TIB shall have the right to participate in the review or examination of the work in progress.

**XVII
CERTIFICATION OF THE
CONSULTANT AND THE AGENCY**

Attached hereto as Exhibit A-1, are the Certifications of the Consultant and the Agency.

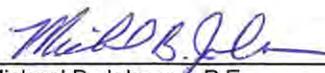
**XVIII
COMPLETE AGREEMENT**

This document and referenced attachments contains all covenants, stipulations and provisions agreed upon by the parties. No agent, or representative of either party has authority to make, and the parties shall not be bound by or be liable for, any statement, representation, promise or agreement not set forth herein. No changes, amendments, or modifications of the terms hereof shall be valid unless reduced to writing and signed by the parties as an amendment to this AGREEMENT.

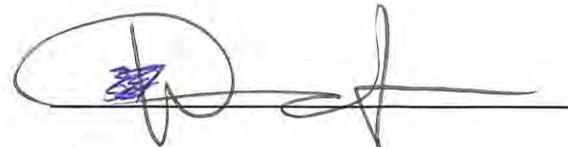
**XIX
EXECUTION AND ACCEPTANCE**

This AGREEMENT may be simultaneously executed in several counterparts, each of which shall be deemed to be an original having identical legal effect. The CONSULTANT does hereby ratify and adopt all statements, representations, warranties, covenants, and agreements contained in the proposal, and the supporting materials submitted by the CONSULTANT, and does hereby accept the AGREEMENT and agrees to all of the terms and conditions thereof.

In witness whereof the parties hereto have executed this AGREEMENT as of the day and year first above written.

By 
Michael B. Johnson, P.E.

Consultant Gray & Osborne, Inc.

By 

City of Buckley

EXHIBIT A-1 Certification of Consultant

Project No. 6-P-808(013)-1	City City of Buckley
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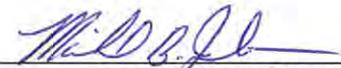
I hereby certify that I am Michael B. Johnson, P.E., a duly authorized representative of the firm of Gray & Osborne, Inc. whose address is 701 Dexter Avenue North, Suite 200, Seattle, Washington 98109, and that neither I nor the above firm I here represent has:

- (a) Employed or retained for a commission, percentage, brokerage, contingent fee or other consideration, any firm or person (other than a bona fide employee working solely for me or the above CONSULTANT) to solicit or secure this contract.
- (b) Agreed, as an express or implied condition for obtaining this contract, to employ or retain the services of a firm or person in connection with carrying out the contract.
- (c) Paid, or agreed to pay, to any firm, organization or person (other than a bona fide employee working solely for me or the above CONSULTANT) any fee, contribution, donation or consideration of any kind for, or in connection with procuring or carrying out the contract; except as here expressly stated (if any):

I further certify that the firm I hereby represent is authorized to do business in the State of Washington and that the firm is in full compliance with requirements of the Board of Professional Registration.

I acknowledge that this certificate is to be available to the Transportation Improvement Board (TIB), in connection with this contract involving participation of TIB funds and is subject to applicable State and Federal laws, both criminal and civil.

3/30/17
 Date


 Signature, Michael B. Johnson, P.E.

Certification of Agency Official

I hereby certify that I am the AGENCY Official of the City of Buckley, Washington and that the above consulting firm or his/her representative has not been required, directly or indirectly as an express or implied condition in connection with obtaining or carrying out this contract to:

- (a) Employ or retain, or agree to employ or retain, any firm or person, or
- (b) Pay or agree to pay to any firm, person or organization, any fee, contribution, donation or consideration of any kind, except as here expressly stated (if any).

I acknowledge that this certificate is to be available to the TIB, in connection with this contract involving participation of TIB funds and is subject to applicable State and Federal laws, both criminal and civil.

4/3/17
 Date

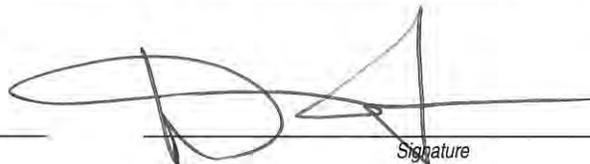

 Signature

EXHIBIT B-1 Scope of Work

CITY OF BUCKLEY RIVER AVENUE IMPROVEMENTS

Project No.

6-P-808(013)-1

Describe the Scope of Work

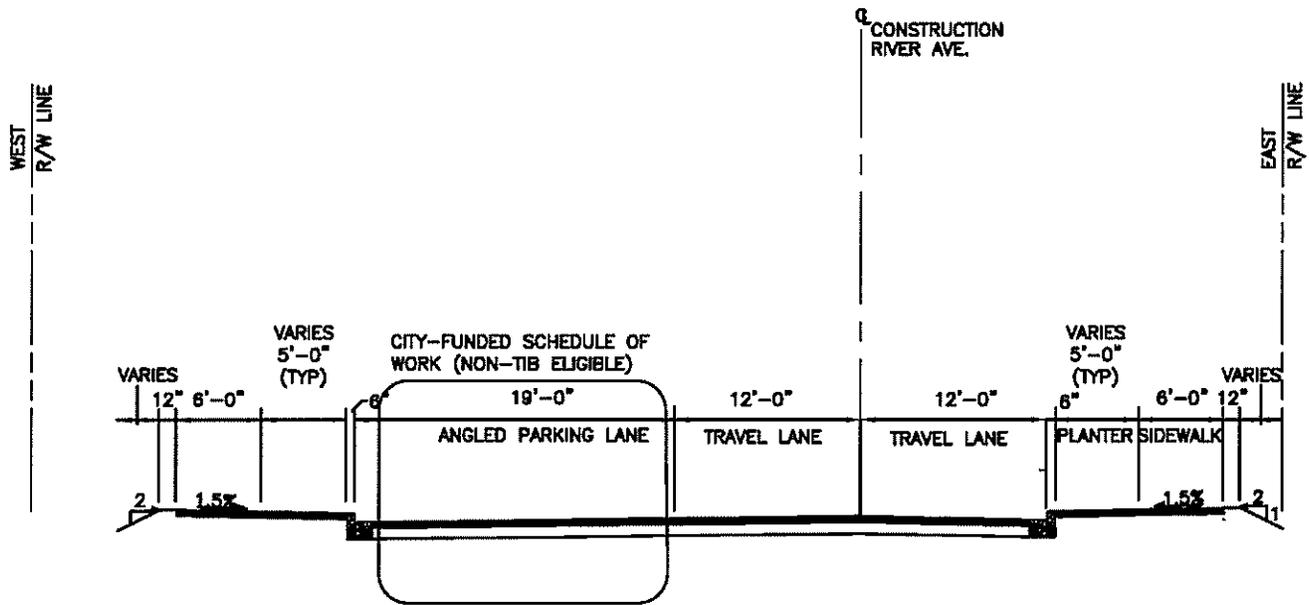
INTRODUCTION

The City of Buckley (AGENCY) desires to employ the services of Gray & Osborne, Inc. (CONSULTANT), a qualified engineering consultant, to assist the AGENCY in the development of improvements to the River Avenue corridor. As such, the CONSULTANT (and its subconsultants) shall provide engineering and related services necessary to prepare preliminary and final plans, specifications, and cost estimates (PS&E) resulting in construction documents for the bid, award, and construction of the following:

Reconstruct and widen approximately 850 linear feet of roadway on River Avenue from the recently completed improvements east of State Route 165 to the northeast side of Jefferson Avenue. The project limits are shown below:



The improvements include two travel lanes, an angle parking lane on the west side of the road, curb, gutter, planting strips, and 6-foot-wide sidewalks on both side. The project includes utility relocation, LED street lighting, channelization and signing. A proposed cross section is shown below:



In addition, the project includes construction of approximately 250 linear feet of sidewalk to fill in the gap between the Jefferson Avenue intersection and the Skate Park. The City plans to construct the project in 2018.

The design of the angle parking improvements is funded by local funds. The remainder of the project is funded by both TIB and local funds. The design fees has been broken into two schedules to track costs.

The engineering and related services contemplated for this phase of the project (design/bid/award) will include topographic survey and mapping, a geotechnical investigation, identifying and mapping existing rights-of-ways, cultural investigation, preparation of environmental documents and regulatory permit applications, developing conceptual, preliminary and final PS&E documents, participating in a public involvement process, coordination with funding and regulatory agencies, as well as utilities, and school district, and assisting the AGENCY, as may be desired, with the bid and award phase.

Additionally, the AGENCY may retain CONSULTANT to provide construction management services at the AGENCY'S option, via an amendment to this Agreement.

Our scope of work is more particularly described below.

SCHEDULE A: RIVER AVENUE IMPROVEMENTS – EXCLUDING ANGLE PARKING (TIB ELIGIBLE)

Task 1 – Project Management

Objective: Provide overall project management of CONSULTANT resources, provide subconsultant management, monitor and manage budget, manage and oversee the schedule of deliverables, manage quality assurance/quality control (QA/QC) program, and provide client contact.

CONSULTANT Responsibilities

1. Contract execution, internal accounting, and auditing.
2. Internal resource management and prioritization of resources.

3. Oversee QA/QC reviews of engineering products to include constructability review, risk management assessment, and identification and pursuit of critical path items.
4. Subconsultant coordination and their contract administration.
5. Preparation of monthly progress reports (to be submitted with monthly invoices).
6. Manage and oversee the schedule of deliverables.

Assumptions

1. CONSULTANT will provide standard CONSULTANT-formatted invoices identifying personnel, hours, subconsultant costs (with itemized bills), and direct costs (mileage, printing, etc.). Invoices will be provided on a monthly basis.
2. CONSULTANT will transmit a monthly progress letter with each monthly invoice.

AGENCY Responsibilities

1. Review and process monthly invoices in a timely fashion.

Deliverables

1. Monthly reports identifying major work items completed during invoice period and identification of any impacts to the schedule of deliverables, scope, and/or budget.
2. Monthly invoices.
3. Original and/or courtesy copies of electronic mail, letters, photographs, subconsultant contracts, etc., applicable to the development of the project.

Task 2 – Survey and Mapping

Objective: Establish vertical and horizontal control on AGENCY approved datum, and acquire topographical features suitable to support the design and mapping of project corridor. Identify existing right-of-way lines on River Avenue, within the project limits, and all intersecting public rights-of-way. Establish approximate property lines based on existing assessor maps. Identify property addresses of adjoining properties, as well as, the owner's name based on county assessor information.

CONSULTANT Responsibilities

1. Research and acquire public records of survey, plat maps, assessor maps, and related survey data as may be available from public agencies (Pierce County and AGENCY) this work includes researching and identifying property owners (of record at county assessor's office) and addresses of property.
2. Establish vertical and horizontal control for survey and mapping at a scale of 1"=20' horizontal and 1"-5' vertical. Datum will be per AGENCY standards/requirements. Coordinate survey work with AGENCY Public Works Department. Provide (set or establish) a minimum of two survey control points for vertical and horizontal control within project area.
3. Call for locates for existing utilities to be field marked prior to field survey.
4. Perform topographical survey of project corridor to include profiling (to 50 feet) of adjacent driveways. Acquire topographical data (including paint marks furnished by locates within right-of-way and approximately 10 feet beyond right-of-way (assuming it is not fenced in and/or property owners refuse access) for mapping and design purposes. Acquire topographical data at all street intersection "legs." Topographical data shall include surface grades, pavement edges, utilities (visually obvious and/or painted surfaces during site survey), utility structures,

hydrants, valves, fences, mailboxes, walls, major trees and significant landscaping, walkways, major grade breaks, and any other pertinent physical features, found in the project area deemed necessary to adequately map the project area for the purpose of designing a project of this nature.

5. Map survey data and show pertinent topographical features and existing right-of-way of River Avenue (within project limits). The map shall be suitable for use in preparing the project plans.

Assumptions

1. AGENCY may elect to notify abutting property owners within the project corridor and alert them of our survey work. The AGENCY will be provided an opportunity to notify property owners and the CONSULTANT shall give the AGENCY a 10-day minimum notice prior to commencing survey on site.
2. Access onto private properties will not be prevented in order to acquire the data described above. Where access is denied, this data shall not be acquired or mapped. CONSULTANT assumes survey can be performed on a continuous basis and not piecemealed due to multiple site visits caused by property owners preventing access.
3. The development and/or recording of a "Record of Survey" is not required or included in this scope of work.
4. AGENCY-approved horizontal and vertical control/datum is available and accessible within 1/4 mile of the project site.
5. It is the intent of the survey and mapping efforts to record and map all pertinent physical features and topography in order to facilitate the design of the project as currently contemplated. Existing utilities abandoned, or "private" utilities that are buried on the site, or unknowingly connect to existing "public systems" will not be shown unless they are discovered during the course of design (record drawings, potholing, unearthed).
6. No right-of-way acquisition, to include title reports, right-of-entry agreements, appraisals, appraisal reviews, market research, legal descriptions, deeds, negotiations or conveyance documents are included in this scope of work.

AGENCY Responsibilities

1. The AGENCY will support survey efforts regarding notification to and inquiries from private property owners.
2. The AGENCY'S Public Works Department will provide to the CONSULTANT any pertinent survey control information they may have in their possession.
3. The AGENCY will specify survey datum to be used for the project.

Deliverables

1. Copy of electronic field data collected for the project as well as copies of any survey notes, calculations, plat maps, assessor maps, etc., pertinent to the project.
2. Hard copy and electronic file of survey mapping products.

Task 3 – Geotechnical

Objective: Provide the services of a qualified geotechnical engineer to provide geotechnical services to include research, visit site, conduct subsurface explorations, analyze soil conditions, and provide design recommendations to assist in the development of the project design, as more particularly described below.

Subconsultant (PanGEO, Inc.) Responsibilities

1. **Site Reconnaissance** – PanGEO will conduct a reconnaissance along the project alignments to observe surface

conditions that could impact the proposed improvements. During the reconnaissance, PanGEO will mark test pit and test borings locations for utility locates (see Item 2, below). PanGEO will coordinate the test pit/boring locations with the AGENCY and CONSULTANT. After completion of our site reconnaissance, PanGEO will prepare an exploration plan for review prior to the test pit excavation.

2. **Subsurface Explorations** – PanGEO will excavate four to six test pits for this project. The actual number of test pits and test pit locations will be determined jointly with the CONSULTANT and the AGENCY on a later date. The test pits will be excavated to a maximum depth of about 6 feet.
3. **Laboratory Tests** – Laboratory tests will be conducted on representative soil samples. Specifically, if appropriate, natural moisture contents and grain size distribution will be conducted. The grain size test results will be used for proper soil classification, and to evaluate if the on-site soils may be used as trench backfill.
4. **Report** – A draft report will be prepared and submitted to the project team for review. The draft report will be revised and finalized once PanGEO receives review comments from the project team. In general, the report will include:
 - A site map with approximate test pit locations;
 - Description of surface and subsurface (soil and groundwater) conditions, including summary test pit logs;
 - Pavement design recommendations, including new pavement sections with full depth reclamation and cement treated base;
 - Subgrade preparation for sidewalk extension to the skate park;
 - PanGEO's opinion regarding the feasibility of using the site soils as trench backfill; and
 - Earthwork recommendations including the suitability of the site soils as structural fill, subgrade preparation, temporary excavation, control of groundwater (if needed), and general earthwork discussions.
5. **Post Report Consultation** – PanGEO will provide post report consultation on an as-needed basis.

Assumptions

1. AGENCY will provide any pertinent existing geotechnical information not previously prepared by PanGEO. PanGEO shall be able to rely on this information for their preliminary review and analysis.
2. CONSULTANT and AGENCY will review geotechnical engineer's letter report and consider/evaluate comments provided by geotechnical engineer in QA/QC reviews/team meetings. PanGEO, Inc. shall attend and participate at 90 percent QA/QC meeting.
3. AGENCY will provide the backhoe and signing for the test pit excavation, to take place during normal working hours, and AGENCY will restore the disturbed shoulder.

AGENCY Responsibilities

1. AGENCY will provide pertinent existing geotechnical information as may be known to exist.
2. AGENCY will provide timely review and comment on the geotechnical engineer's geotechnical report as may be applicable.
3. AGENCY may, at their option, attend and participate in 90 percent QA/QC meeting at which the geotechnical engineer participates.

4. AGENCY will provide the backhoe/signing for the test pit excavation, and restore disturbed shoulder.

Deliverables

1. Geotechnical Report (draft and final).

Task 4 – Project Coordination

Objective: Assist the AGENCY with coordinating the project with the Transportation Improvement Board, and other regulatory (environmental) and/or funding agencies, utilities and/or other significant stakeholders, as may be identified by the City.

CONSULTANT Responsibilities

1. Assist the AGENCY with processing paperwork and adhering to requirements regarding the use and expenditure of any grant funds.
2. Assist AGENCY in the preparation of TIB updated cost estimates for bid authorization and bid award.
3. Coordinate design efforts with utility owners of record regarding the design and future construction of the project.
4. Assist AGENCY in the coordination of this project during the design phase with any other significant “stakeholders” the AGENCY deems necessary.

Task 5 – Environmental Permitting/Cultural Investigation

Objective: Prepare SEPA Checklist, DOE Construction Stormwater General Permit, Cultural Investigation and acquire the various environmental approvals, permits, and environmental clearances necessary to allow construction of the project.

CONSULTANT Responsibilities

1. Prepare and submit draft SEPA checklist and revise the document as necessary before preparing final documents for AGENCY processing.
2. Prepare and submit draft Ecology Construction General Stormwater Permit and revise the documents as necessary before preparing the final draft for AGENCY processing.

Subconsultant (CRC) Responsibilities

CRC will provide the following project components as part of the cultural resources assessment.

Task A – Background Research

CRC will conduct a search of site files recorded at Washington Department of Archaeology and Historic Preservation (DAHP); review of relevant correspondence between the project proponent, stakeholders and DAHP; and, review of pertinent environmental, archaeological, ethnographic and historical information appropriate to the project area from a variety of available resources.

Task B – Tribal Contact

CRC will provide letters for the AGENCY to send to the cultural resources staff of tribes that may have an interest in the project area.

Task C – Field Identification

CRC will provide a field investigation of the project location for identification of archaeological and historical resources and, if necessary, excavation of shovel test probes or other exploratory excavations in environments that might contain buried archaeological deposits. Field methods will be consistent with DAHP guidelines.

Task D – Documentation of Findings

CRC will document and record archaeological and historic sites within the project area, including preparation of Washington State archaeological and/or historic site(s) forms. Documentation will be consistent with DAHP standards.

Task E – Cultural Resources Assessment Report

CRC will prepare a technical memo describing background research, field methods, results of investigations, and management recommendations. The report will provide supporting documentation of findings, including maps and photographs, and will conform to DAHP reporting standards. Report and support materials will be provided electronically.

Assumptions

1. AGENCY will pay all publishing and permit fees.

AGENCY Responsibilities

1. Publish SEPA and publish Department of Ecology Notice of Intent.

Deliverables

1. One hard copy and one electronic copy of the SEPA checklist and Ecology Construction General Stormwater Permit Application.
2. One hard copy and one electronic copy of the cultural investigation report.

Task 6 – Utility Data Acquisition/Storm Analysis

Objective: Acquire record drawings and map information from utility companies known to provide service in the project corridor. Conduct a stormwater analysis (T.I.R.) of the tributary area, and size storm facilities (detention/treatment).

CONSULTANT Responsibilities

1. Provide written requests for all utility companies known to provide utility service in the project area.
2. Review data provided by utility companies and incorporate into design products and future phases of the project as may be applicable.
3. Conduct an hydraulic analysis (T.I.R.) based on review of survey data acquired for this project, and contour maps and surface water comprehensive maps and plans provided by AGENCY. This analysis shall be used to develop hydraulic data to identify treatment and/or detention requirements of surface flows tributary to the River Avenue corridor (within project area).

Assumptions

1. Utility companies will provide requested information in a timely manner.

AGENCY Responsibilities

1. AGENCY to provide maps and pertinent information on existing infrastructure and contour mapping as may be available. AGENCY to provide contour and topographical data from previous aerial mapping as well as any pertinent storm modeling of storm subbasins as may be available.

Deliverables

1. Upon AGENCY request, CONSULTANT will provide copy of any utility infrastructure record drawings or as-built drawings received from utility companies.

Task 7 – Preliminary Design

Objective: Use information generated in Tasks 1 through 6 to develop a preliminary designs for the proposed improvements for the AGENCY’S evaluation, review, and comment.

CONSULTANT Responsibilities

1. Develop a strip map of the project corridor plan view to include survey data and pertinent utility information. Mapping products will be used in development of conceptual design for proposed features to include pavement, concrete curb and gutter, curb ramps, sidewalk, street lights and storm improvements.
2. Develop a detailed cost estimate of the concept design for AGENCY review and comment.
3. Prepare preliminary (60%) plans, specifications and cost estimates for AGENCY and WSDOT review.

Assumptions

1. Strip maps will be prepared at 1"=20' full size and at scale suitable for inclusion in reports.
2. Plan and profile sheets will be at a scale of 1"=20' horizontal and 1"=5' vertical.
3. Specifications will be in WSDOT format referencing the 2016 Standard Specifications.

AGENCY Responsibilities

1. Provide timely review (and comment) of products generated and submitted for this task.

Deliverables

1. One full-size (1"=20') strip map with concept design shown.
2. Two copies of the preliminary (60%) plans, specifications and cost estimates.

Task 8 – Semifinal Design

Objective: Develop design/bid/construction documents to the 90 percent level based on preliminary design documents (60% complete).

1. Prepare and submit project specifications (two copies) to include proposal, contract, and bonding forms. This work assumes project specifications (including Special Provisions) will be based on the WSDOT Standard Specifications for Road, Bridge and Municipal Construction (2016). The AGENCY shall be responsible for reviewing and approving the documents. Prepare and submit updated and detailed engineering construction cost estimate at interval listed above for AGENCY review.

2. Prepare two copies of preliminary plans/drawings (to include special details). The plans will incorporate applicable AGENCY design standards, WSDOT design standards, MUTCD standards, and AASHTO Manual guidelines. Where conflicts exist between standards, the AGENCY will provide direction or request the CONSULTANT's recommendation.

Deliverables

1. Two sets of 90 percent specifications.
2. Two sets of 90 percent project plans. Plan set will include title sheet, index sheet/legend/vicinity map/etc., road and stormwater plan and profile sheets, curb ramp plan, cross-section sheets, typical "street" section sheets, paving (overlay) sheets, channelization and signing plan sheets, illumination plans, TESC sheets, and miscellaneous detail sheets.

Task 9 – Final Design

Objective: Prepare final project plans, specifications, and cost estimates sufficient for bidding and constructing the project.

1. Send final plans and specifications to TIB for their approval to advertise.
2. Prepare and submit final project plans (two copies) to AGENCY to include incorporation of all previous applicable and relevant AGENCY comments. Revise contract documents to incorporate final AGENCY and TIB comments (as applicable).
3. Prepare and submit final project specifications (two copies) to include contract, proposal, bonds, and insurance requirements, per AGENCY review and direction. Incorporate revisions or all previous applicable and relevant AGENCY comments. Prepare final and detailed engineer's construction cost estimate.

Task 10 – Quality Assurance/Quality Control

Objective: Provide QA/QC reviews of engineering products to enhance overall quality of products. Prepare QA/QC review recommendations as further noted below.

1. Conduct three QA/QC reviews at 5 percent (kickoff meeting), 60 percent (preliminary design) and 90 percent (semi-final design) by key design team members to solicit comments, recommendations, and suggestions regarding engineering products, constructability issues, critical path items, risk management, and quality of product. AGENCY will be invited to participate.

Task 11 – Bid and Award Services

Objective: Assist AGENCY in bidding and award services.

1. Prepare bid advertisement(s) for publication for AGENCY review and use.
2. Upon AGENCY authorization and direction, prepare and transmit both electronic and hard copies of bid documents to AGENCY. Prepare and transmit electronic files to the utility companies and plan centers, and TIB. Post bid documents to the Gray & Osborne, Inc. website where they maybe downloaded free of charge by bidders.
3. Prepare and post addenda as needed.

Deliverables

1. Electronic file of all plans and specifications and addenda (as may be applicable) to the AGENCY.
2. Hard copy of plans (four copies, two full size and two half size) and specifications (two copies) and cost estimates

to include any addenda (as may be applicable) to AGENCY.

SCHEDULE B: ANGLE PARKING AND RIGHT-OF-WAY DEDICATION (NON-TIB ELIGIBLE)

Task 13 – Right-of-Way Dedication and Angle Parking Design

This work includes the additional design work needed to incorporate angle parking into the bid documents. It includes ordering title reports, creating legal descriptions/exhibits and creating right-of-way dedication documents for the City-owned property between River Avenue and SR 410, to make room for the wider road cross-section required for angle parking. This work is not TIB eligible.

CONSTRUCTION MANAGEMENT SERVICES

The CONSULTANT shall provide construction management services as may be further desired by the AGENCY and at the AGENCY'S option. If the AGENCY elects to exercise this option, the CONSULTANT shall prepare a scope and fee for this additional work for the AGENCY'S review and approval. Since the extent of this work cannot be reasonably determined at this time, it will be prepared at the completion of the design phase as a contract supplement. The CONSULTANT will also be entitled to subcontract work, for example, material testing services, to a qualified firm as further approved by the AGENCY.

Documents to be Furnished by the Consultant

- One copy each of Bid/Construction Documents, and Cost Estimates for Each Submittal Phase.
- One copy of Engineer's Construction Cost Estimate.
- One electronic copy (PDF) and two hard copies of final bid/construction documents, including bid addenda as applicable.

EXHIBIT C-2 Payment (Cost Plus Fixed Fee)

The CONSULTANT shall be paid by the AGENCY for completed work and services rendered under this AGREEMENT as provided hereinafter. Such payment shall be full compensation for all work performed or services rendered and for all labor, materials, equipment, and incidentals necessary to complete the work specified in Section II, "Scope of Work."

A. Actual Costs

Payment for all consulting services for this project shall be on the basis of the CONSULTANT's actual cost plus a fixed fee. The actual cost shall include direct salary cost, overhead, and direct nonsalary cost.

1. Direct Salary Costs

The direct salary cost is the direct salary paid to principals, professional, technical, and clerical personnel for the time they are productively engaged in work necessary to fulfill the terms of this AGREEMENT.

2. Overhead Costs

Overhead costs are those costs other than direct costs which are included as such on the books of the CONSULTANT in the normal everyday keeping of its books. Progress payments shall be made at the rate shown in the heading of this AGREEMENT, under "Overhead Progress Payment Rate." Total overhead payment shall be based on the method shown in the heading of the AGREEMENT. The three options are explained as follows:

- a. **Actual Cost:** If this method is indicated in the heading of the AGREEMENT, the AGENCY agrees to reimburse the CONSULTANT the actual overhead costs verified by audit, up to maximum amount payable, authorized under this AGREEMENT, when accumulated with all other actual costs.
- b. **Actual Cost Not To Exceed Maximum Percent:** If this method is indicated in the heading of this AGREEMENT, the AGENCY agrees to reimburse the CONSULTANT at the actual overhead rate verified by audit up to the maximum percentage shown in the space provided. Final overhead payment when accumulated with all other actual costs shall not exceed the total maximum amount payable shown in the heading of this AGREEMENT.
- c. **Fixed Rate:** If this method is indicated in the heading of the AGREEMENT, the AGENCY agrees to reimburse the CONSULTANT for overhead at the percentage rate shown. This rate shall not change during the life of the AGREEMENT.

A summary of the CONSULTANT's cost estimate and the overhead computation are attached hereto as Exhibits D and E and by this reference made part of this AGREEMENT. When an actual cost overhead rate or actual cost not to exceed overhead rate is used, the actual overhead rate determined at the end of each fiscal year shall be used for the computation of progress payments during the following year and for retroactively adjusting the previous year's overhead cost to reflect the actual rate.

The CONSULTANT shall advise the AGENCY as soon as possible of the actual overhead rate for each fiscal year and of the actual rate incurred to the date of completion of the work. The AGENCY and/or TIB may perform an audit of the CONSULTANT's books and records at any time during regular business hours to determine the actual overhead rate, if they so desire.

3. Direct Nonsalary Cost

Direct nonsalary costs will be reimbursed at the actual cost to the CONSULTANT applicable to this contract. These charges may include, but are not limited to the following items: travel, printing, long distance telephone, supplies, computer charges, and fees of subconsultants. Air or train travel will only be reimbursed to economy class levels unless otherwise approved by the AGENCY. The billing for nonsalary cost, directly identifiable with the Project, shall be an itemized listing of the charges supported by original bills or legible copies of invoices, expense accounts, and miscellaneous supporting data retained by the CONSULTANT. Copies of the original supporting documents shall be provided to the AGENCY upon request. All of the above charges must be necessary for services to be provided under this AGREEMENT.

4. Fixed Fee

The fixed fee, which represents the CONSULTANT's profit, is shown in the heading of this AGREEMENT under Fixed Fee. This fee is based on the scope of work defined in this AGREEMENT and the estimated man-months required to perform the stated scope of work. In the event a supplemental agreement is entered into for additional work by the CONSULTANT, the supplemental agreement may include provision for the added costs and appropriate additional fee. The fixed fee will be prorated and paid monthly in proportion to the percentage of work completed by the CONSULTANT and reported in the monthly progress reports accompanying the invoices.

Any portion of the fixed fee earned by not previously paid in the progress payments will be cover in the final payment, subject to the provisions of Section IX, Termination of Agreement.

5. Maximum Total Amount Payable

The maximum total amount payable, by the AGENCY to the CONSULTANT under this AGREEMENT, shall not exceed the amount shown in the heading of this AGREEMENT as maximum amount payable, which includes the Fixed Fee, unless a supplemental agreement has been negotiated and executed by the AGENCY prior to incurring any costs in excess of the maximum amount payable.

B. Monthly Progress Payments

The CONSULTANT may submit invoices to the AGENCY for reimbursement of actual costs plus the calculated overhead and fee not more often than once per month during the progress of the work. Such invoices shall be in a format approved by the AGENCY and accompanied by the monthly progress reports required under Section III, General Requirements, of the AGREEMENT. The invoices will be supported by itemized listing and support document for each item including direct salary, direct nonsalary, and allowable overhead costs to which will be added the prorated Fixed Fee.

C. Final Payment

Final Payment of any balance due the CONSULTANT of the gross amount earned will be made promptly upon its verification by the AGENCY after the completion of the work under this AGREEMENT, contingent upon receipt of all PS&E, plans, maps, notes, reports, and other related documents which are required to be furnished under this AGREEMENT. Acceptance of such final payment by the CONSULTANT shall constitute a release of all claims of any nature which the CONSULTANT may have against the AGENCY unless such claims are specifically reserved in writing and transmitted to the AGENCY by the CONSULTANT prior to its acceptance. Said final payment shall not, however, be a bar to any claims that the AGENCY may have against the CONSULTANT or to any remedies the AGENCY may pursue with respect to such claims that the AGENCY may have against the CONSULTANT or to any remedies the AGENCY may pursue with respect to such claims.

D. Inspection of Cost Records

The CONSULTANT and his subconsultants shall keep available for inspection by representatives of the AGENCY and/or TIB, for a period of three years after final payment, the cost records and accounts pertaining to this AGREEMENT. If any litigation, claim, or audit arising out of, in connection with, or related to this contract is initiated before the expiration of the three-year period, the cost records and accounts shall be retained until such litigation, claim, or audit involving the records is completed.

EXHIBIT D-1A
Consultant Fee Determination Summary Sheet
 (Lump Sum, Cost Plus Fixed Fee, Cost per Unit of Work)

Prepared by Tani Stafford, P.E.				Date March 20, 2017	
Project River Avenue Improvements – Schedule A – TIB Eligible					
Direct Salary Cost (DSC)					
Classification	Man Hours		Rate		Cost
Principal-in-Charge	22	x	\$35 to \$55	=	\$1,056
Project Manager	120	x	\$35 to \$55	=	\$5,640
Civil Engineers	244	x	\$24 to \$36	=	\$8,784
Trans./Elec./Struct. Engineer	0	x	\$24 to \$38	=	\$0
Technician/Drafter	16	x	\$15 to \$36	=	\$416
Survey Crew	32	x	\$45 to \$85	=	\$1,760
Environmental Technician/Specialist	0	x	\$25 to \$34	=	\$0
Professional Land Surveyor	16	x	\$34 to \$42	=	\$640
Inspector	0	x	\$23 to \$52	=	\$0
TOTAL DSC					\$18,296
OVERHEAD (OH Cost including Salary Additives)					
OH Rate x DSC or 180% x \$18,296					\$32,933
FIXED FEE (FF)					
FF Rate x DSC or 42% x \$18,296					\$7,684
REIMBURSABLES					
Miscellaneous Expenses (including mileage, photographs, printing, miscellaneous, etc.)					\$899
SUBCONSULTANT COST (including 10% Administrative Overhead)					\$10,988
GRAND TOTAL					\$70,800

EXHIBIT D-1B
Consultant Fee Determination Summary Sheet
 (Lump Sum, Cost Plus Fixed Fee, Cost per Unit of Work)

Prepared by Tani Stafford, P.E.				Date March 20, 2017	
Project River Avenue Improvements – Schedule B – Non TIB Eligible					
Direct Salary Cost (DSC)					
Classification	Man Hours		Rate		Cost
Principal-in-Charge	2	x	\$35 to \$55	=	\$96
Project Manager	24	x	\$31 to \$55	=	\$1,128
Civil Engineers	48	x	\$24 to \$39	=	\$1,728
Trans./Elec./Struct. Engineer	0	x	\$24 to \$38	=	\$0
Technician/Drafter	16	x	\$15 to \$36	=	\$416
Survey Crew	4	x	\$45 to \$86	=	\$220
Environmental Technician/Specialist	0	x	\$25 to \$34	=	\$0
Professional Land Surveyor	16	x	\$34 to \$42	=	\$640
Inspector	0	x	\$23 to \$52	=	\$0
TOTAL DSC					\$4,228
OVERHEAD (OH Cost including Salary Additives)					
OH Rate x DSC or 180% x \$4,228					\$7,610
FIXED FEE (FF)					
FF Rate x DSC or 42% x \$4,228					\$1,776
REIMBURSABLES					
Miscellaneous Expenses (including mileage, photographs, printing, miscellaneous, etc.)					\$1,136
SUBCONSULTANT COST (including 10% Administrative Overhead)					\$0
GRAND TOTAL					\$14,750



EXHIBIT D-2
Consultant Fee Determination Summary Sheet
 (Specific Rates of Pay)
FEE SCHEDULE

Discipline or Job Title	Hourly Rate	Overhead 180%	Profit 42%	Rate Per Hour
AutoCAD/GIS Tech./Engineering Intern	\$15-\$36	\$27.00-\$64.80	\$6.30-\$15.12	\$48.30-\$115.92
Electrical Engineer	\$32-\$56	\$57.60-\$100.80	\$13.44-\$23.52	\$103.04-\$180.32
Structural Engineer	\$31-\$52	\$55.80-\$93.60	\$13.02-\$21.84	\$99.82-\$167.44
Environmental Tech./Specialist	\$25-\$34	\$45.00-\$61.20	\$10.50-\$14.28	\$80.50-\$109.48
Civil Engineer	\$24-\$39	\$43.20-\$70.20	\$10.80-\$16.38	\$77.28-\$125.58
Project Engineer	\$33-\$45	\$59.40-\$81.00	\$13.86-\$18.90	\$106.26-\$144.90
Project Manager	\$31-\$55	\$55.80-\$99.00	\$13.02-\$23.10	\$99.82-\$177.10
Principal-in-Charge	\$35-\$55	\$63.00-\$99.00	\$14.70-\$23.10	\$112.70-\$177.10
Resident Engineer	\$38-\$52	\$68.40-\$93.60	\$15.96-\$21.84	\$122.36-\$167.44
Field Inspector	\$23-\$44	\$41.40-\$79.20	\$9.66-\$18.48	\$74.06-\$141.68
Field Survey Crew (2 Person)	\$45-\$66	\$81.00-\$118.80	\$18.90-\$27.72	\$144.90-\$212.52
Field Survey Crew (3 Person)	\$68-\$90	\$122.40-\$162.00	\$28.56-\$37.80	\$218.96-\$289.80
Professional Land Surveyor	\$34-\$42	\$61.20-\$75.6	\$14.28-\$17.64	\$109.48-\$135.24
Secretary/Word Processor*	N/A	N/A	N/A	N/A

* Secretarial and clerical fees are not billed, but are included in the overhead multiplier listed. The same is true for accounting, bookkeeping, postage, in-house printing up to \$150, word processing, computer use, computer-aided drafting, and telephone and fax costs.

EXHIBIT E-1
Breakdown of Overhead Cost

GRAY & OSBORNE

COMPUTATION OF OVERHEAD MULTIPLIER

Federal, State, and Local Taxes	23.96%
Insurance and Medical	27.07%
Professional Development and Education	1.29%
Vacations and Holidays	14.65%
Administration (Typing, CADD, GIS, Computer)**	41.70%
Rent, Utilities, and Depreciation	15.47%
Office Expenses, Support and Maintenance	9.32%
Travel	1.96%
Retirement.....	8.99%
Incentive Program	35.5%
Facilities Cost of Capital	0.09%
TOTAL:	180.00%

PROFESSIONAL ENGINEERING SERVICES CONTRACT
ENGINEER'S REPRESENTATIVE PAYROLL RATES
THROUGH JUNE 15, 2017*

<u>Employee Classification</u>	<u>Payroll Rates</u>		
AutoCAD/GIS Technician/Engineering Intern	\$15.00	to	\$36.00
Electrical Engineer	\$32.00	to	\$56.00
Structural Engineer	\$31.00	to	\$52.00
Environmental Technician/Specialist	\$25.00	to	\$34.00
Civil Engineer	\$24.00	to	\$39.00
Project Engineer	\$33.00	to	\$45.00
Project Manager	\$31.00	to	\$55.00
Principal-in-Charge	\$35.00	to	\$55.00
Resident Engineer	\$38.00	to	\$52.00
Field Inspector	\$23.00	to	\$44.00
Field Survey Crew (2 Person)**	\$45.00	to	\$66.00
Field Survey Crew (3 Person)**	\$68.00	to	\$90.00
Professional Land Surveyor	\$34.00	to	\$42.00
Secretary/Word Processor**	N/A**		

*Updated annually, together with the overhead.

All actual out-of-pocket expenses incurred directly on the project are added to the billing. The billing is based on direct out-of-pocket expenses; meals, lodging, laboratory testing and transportation. The transportation rate is \$0.54 per mile or the current maximum IRS rate without receipt IRS Section 162(a).

**Administration expenses include secretarial and clerical work; GIS, CADD, and computer equipment; owned survey equipment and tools (stakes, hubs, lath, etc. – Note: mileage billed separately at rate noted); miscellaneous administration tasks; facsimiles; telephone; postage; and printing costs, which are less than \$150.

EXHIBIT F-1
Payment Upon Termination of Agreement
by the Agency Other than for Fault of the Consultant
(Refer to Agreement, Section IX)

Lump Sum Contracts

A final payment shall be made to the CONSULTANT which when added to any payments previously made shall total the same percentage of the Lump Sum Amount as the work completed at the time of termination is to the total work required for the PROJECT. In addition, the CONSULTANT shall be paid for any authorized extra work completed.

Cost Plus Fixed Fee Contracts

A final payment shall be made to the CONSULTANT which when added to any payments previously made, shall total the actual costs plus the same percentage of the fixed fee as the work completed at the time of termination is to the total work required for the PROJECT. In addition, the CONSULTANT shall be paid for any authorized extra work completed.

Specific Rates of Pay Contracts

A final payment shall be made to the CONSULTANT for actual hours charged at the time of termination of this AGREEMENT plus and direct nonsalary costs incurred at the time of termination of this AGREEMENT.

Cost Per Unit of Work Contracts

A final payment shall be made to the CONSULTANT for actual units of work completed at the time of termination of this AGREEMENT.



Transportation Improvement Board
Consultant Supplemental Agreement

Agency City of Buckley

Project Number 6-P-808(013)-1

Project Name River Avenue Improvements

Consulting Firm Gray & Osborne, Inc.

Supplement Phase Supplement for Design Phase

The Local Agency of the City of Buckley desires to supplement the agreement entered into with and executed on April 3, 2017.

All provisions in the basic agreement remain in effect except as expressly modified by this supplement.

This is for non-TIB eligible work. The changes to the agreement are described as follows:

Section II, **SCOPE OF WORK**, is hereby amended to include:

Task 13 – Additional Topographic Survey and Base Map Update

Objective: Survey additional topography on Jefferson Avenue for water and sanitary sewer improvements. Survey additional topography on River Avenue for the Public Works Shop driveway entrance improvements. Survey additional topography on the City-owned parcel between River Avenue and State Route 410, south of River Avenue, for a future park and ride facility.

1. Call for locates for existing utilities to be marked in the field prior to survey.
2. Perform topographical survey of the Jefferson Avenue, River Avenue, and City parcels. Survey paint locates, surface grades, pavement edges, curb, gutter, sidewalk, utilities, major trees, the trail, and any other pertinent physical feature found in the project area needed to map the project area.
3. Update the existing base map to include this additional survey, to include right-of-way research.

Assumption:

1. A Record of Survey is not required or included in this scope.

Task 14 – Water and Sanitary Sewer Improvements on Jefferson Avenue

Objective: Perform additional design work to include the replacement of a sanitary sewer line on Jefferson Avenue and the extension of a waterline on Jefferson Avenue.

1. Include plan/profile sheets and details for the replacement of an existing sanitary sewer line with 12-inch-diameter PVC pipe on Jefferson Avenue between Pearl Street and the Foothills Trail crossing. Include a sewer stub to the south to serve future development in the Rainier Gateway area. Include a side sewer stub to the north to serve a future splash park. Include the extension of a water main on Jefferson Avenue below the footprint of the new intersection at River Avenue and extending west past the Foothills Trail crossing. The new waterline shall be 8-inch ductile iron pipe. Provide water services to serve future development off of Jefferson Avenue.
2. Perform quantity takeoffs and cost estimates for this work to be included in a separate schedule of work, non-TIB eligible.



Transportation Improvement Board
Consultant Supplemental Agreement

3. Write specifications for the water and sanitary sewer improvements to be included in the bid documents. Perform a QA/QC review of the water and sanitary sewer improvements.

Assumption:

1. No new geotechnical or cultural investigation is required for this work.

Task 15 – Angle Parking and Public Works Shop Driveway Improvements, North of Jefferson Avenue on River Avenue

Objective: Expand the proposed improvements to include angle parking on the west side of River Avenue, north of Jefferson Avenue and south of the skate park. Expand the proposed improvements to include the construction of a new cement concrete driveway entrance to the Public Works Shop, on the east side of River Avenue, north of Jefferson Avenue.

1. Include plan/profile sheets for the curb flow line and storm improvements and grading for angle parking north of Jefferson Avenue. Include a plan sheet detailing the construction of the public work shop driveway entrance.
2. Perform quantity takeoffs and cost estimates for this work to be included in Schedule B, non-TIB eligible.

Task 16 – Additional Title Report and Right-of-Way Dedication North of Jefferson

Objective: Create the right-of-way dedication documentation needed for the angle parking/sidewalk improvements on the west side of River Avenue, north of Jefferson Avenue. This work is not TIB eligible.

1. Order a title report of the City-owned property on the northwest corner of River Avenue and Jefferson Avenue.
2. Create a legal description, exhibit, and right-of-way dedication documentation for a strip take on this property.

Assumptions:

1. The recording fee is not included in this scope.

Task 17 – Utility Undergrounding Improvements

1. Objective: Expand the improvements in the bid documents to include joint trenching for utility undergrounding work in the vicinity of River Avenue and Jefferson Avenue. The Schedule 74 Tariff applies for this work.
2. Add PSE trench details, conduit runs, and vault details to the plan set. Add joint trench layout to the plan/profile sheets. Estimate quantities for trench excavation and backfill, conduit, and vaults. Add specifications for vaults to the specifications.
3. Send preliminary and semifinal plans to utility representatives for review and comment. Incorporate comments into the bid set.
4. Coordinate and/or meet with utility representatives to establish the work windows needed by the utilities to perform their work during the construction phase. Add this requirement to the bid documents.
5. Send preliminary plans to all the utilities representatives that have aerial facilities on poles to be removed along with Wave Broadband to allow other utilities to add conduit to the joint trench if needed.



Transportation Improvement Board
Consultant Supplemental Agreement

Assumptions:

1. PSE will determine the difficulties and limits for undergrounding needed to remove the pole on River Avenue, south of Jefferson Avenue and the pole at Jefferson Avenue/River Avenue and underground utilities to the pole north of the skate park driveway.
2. PSE supplies the conduit and vaults. City contractor excavates the trenches, installs the conduit and vaults, backfills, and restores trenches. PSE pulls the new wires and activates them. PSE work is followed by the other utilities to relocate their utilities.
3. PSE will identify what other utilities are on the poles to be removed.
4. City will provide Wave Broadband contact.

Section IV, **TIME FOR BEGINNING AND COMPLETION**, is amended to change the Completion Date

SUPPLEMENTAL COMPLETION DATE Remains the same

Section V, **PAYMENT**, shall be amended as follows as set forth in Exhibit A

MAXIMUM AMOUNT PAYABLE \$117,040

EXHIBIT A			
	Original Agreement	Supplement	Total
Direct Salary Cost	\$22,524	\$9,515	\$32,039
Overhead (including Payroll Additives)	\$40,543	\$17,127	\$57,670
Direct Non-Salary Costs	\$13,023	\$852	\$13,875
Fixed Fee	\$9,460	\$3,996	\$13,456
Total	\$85,550	\$31,490	\$117,040

If you concur with this supplement and agree to the changes as stated above, please sign and date in the appropriate spaces below.

Agency Signature	Date
Consultant Signature <i>Michael B. Johnson</i>	Date <i>11/14/17</i>



CITY COUNCIL AGENDA BILL

City of Buckley
PO Box 1960
Buckley, WA 98321

ITEM INFORMATION			
SUBJECT: Contract – Addendum #1 – City & Foothills Historical Society – Museum Services	Agenda Date: December 12, 2017		AB17-113
	Department/Committee/Individual	Created	Reviewed
	Mayor Pat Johnson		X
	City Administrator – Dave Schmidt	X	X
	City Attorney – Phil Olbrechts		X
	City Engineer – Dominic Miller		
	City Clerk – Joanne Starr		X
	Finance Dept – Sheila Bazzar		
	Building Official – Mike Deadmond		
	Fire Dept – Chief Predmore		
	Parks & Rec Dept – Ellen Boyd		
	Planning Dept – Kathy Thompson		
	Police Dept – Chief Arsanto		
	Municipal Court – Jessica Cash		
	PW/Utilities – Chris Banks		
Attachments: Contract Addendum			
<p>SUMMARY STATEMENT: The most recent contract between the City and the Foothills Historical Society for Museum Services was executed in January, 2003 for a 25 year term. This length of time was requested because most grant funding agencies supporting these types of services require that the applicant demonstrate proof of having control of the facility for at least 25 years for continuity. The current agreement is scheduled to expire in 2027, which is 9 years away.</p> <p>The Foothills Historical Society is attempting to seek funding for many improvements related to the Museum and have asked for an extension to the current agreement to be able to demonstrate this 25 year commitment. The addendum being presented for consideration extends the agreement by an additional 25 years to 2042. In addition the addendum increases the amount of time given to the Foothills Historical Society to remove any and all exhibits and/or material should the City find it necessary to terminate the agreement.</p>			
COMMITTEE REVIEW AND RECOMMENDATION: A/F/PS 12/5/17			
RECOMMENDED ACTION: MOTION to Approve Addendum #1 to the Contract Between the City & Foothills Historical Society for Museum Services.			
RECORD OF COUNCIL ACTION			
<i>Meeting Date</i>	<i>Action</i>	<i>Vote</i>	

First Addendum to Museum Services Agreement

THIS FIRST ADDENDUM to the Museum Services Agreement (“Addendum”) is in addition to (and incorporated therein by this reference) that certain Services Agreement (Agreement) between the City of Buckley (the City), a Washington Municipal corporation, and the Foothills Historical Society, a nonprofit corporation, (“Historical Society”) dated January 1, 2003.

WHEREAS, the City and Historical Society jointly agree to amend the terms of the original agreement in order to extend the agreement by 25 years; and

WHEREAS, the Historical Society has requested that the current Services Agreement be extended by 25 years to satisfy grant funding agency’s requirements for longer term leases/agreements for property and facilities that are being funded through grant dollars; and

WHEREAS, the City desires to continue to promote tourism through maintenance and operation of a Historical Museum owned by the City and desires to support the Historical Society in their efforts to obtain grant funding to further develop the Historical Museum;

NOW THEREFORE, FOR AND IN CONSIDERATION OF the mutual promises, terms and conditions set forth in the Agreement and contained herein, the Parties hereby agree as follows:

1. Amended Paragraph Eleven (11), Term. This Contract shall be for a term of twenty five years, commencing January 1, 2018 and ending December 31, 2042.

2. Amended Paragraph Twenty (20). Default. The occurrence of any one or more of the following events shall be deemed a breach of this Contract:

a. If the Historical Society shall fail to materially or substantially perform any obligation or otherwise breaches any of the covenants or agreements contained herein.

b. If the Historical Society shall make an assignment for the benefit of creditors or shall file a voluntary petition under any bankruptcy act or under any other law for the relief of debtors or if an involuntary petition is filed against Historical Society under any such law and is not dismissed within 30 days after filing.

c. If a receiver is appointed for the property of Historical Society and is not discharged or removed within 30 days.

d. If any department of any government or any officer thereof shall take possession of the business or property of the Historical Society, unless approved by the City.

e. The Historical Society’s failure to operate and maintain the Historical Museum premises as a Historical Museum.

Upon any such occurrence, the City at its option, may terminate this Contract by written notice to

the Historical Society and ~~thirty~~ **ninety** days after such written notice or termination, the Historical Society shall quit and surrender the Historical Museum Premises to the City.

The Historical Society may terminate the lease and quit the premises, after ~~thirty~~ **ninety** days written notice upon the City, in the event the City fails to provide utility services necessary to the operation of the Museum.

If this Contract shall be terminated as herein provided, ~~thirty~~ **ninety** days after the written notice is provided, or at any time thereafter, the City may reenter the Historical Museum Premises and remove any and all persons and property ~~there from~~ by any suitable proceeding at law or otherwise, without liability therefore, ~~and reenter the Historical Museum Premises.~~

3. Effect of Addendum. This First Addendum is in addition to the Museum Service Agreement. The provisions of this First Addendum modify the basic Agreement. Except as otherwise provided herein, each provision of the Agreement shall continue in full force and effect as if this addendum did not exist.

IN WITNESS WHEREOF, the parties have caused this Addendum to be signed and executed this 12th day of December, 2017.

CITY OF BUCKLEY

FOOTHILLS HISTORICAL SOCIETY

Mayor Pat Johnson

Martha Olson, President

Attest/Authenticated

By _____
Joanne Starr, City Clerk

Approved as to Form:

BY _____
Phil Olbrechts, City Attorney



CITY COUNCIL AGENDA BILL

City of Buckley
PO Box 1960
Buckley, WA 98321

ITEM INFORMATION			
SUBJECT: TIB Grant Agreement – Mundy Loss Road Cost Impact: \$173,412 Fund Source: Fund 102 (Street Cap) & Grant Timeline: 2018 - 2019	Agenda Date: December 12, 2017		AB17-114
	Department/Committee/Individual	Created	Reviewed
	Mayor Pat Johnson		X
	City Administrator – Dave Schmidt	X	X
	City Attorney – Phil Olbrechts		X
	City Engineer – Dominic Miller		X
	City Clerk – Joanne Starr		X
	Finance Dept – Sheila Bazzar		
	Building Official – Mike Deadmond		
	Fire Dept – Chief Predmore		
	Parks & Rec Dept – Ellen Boyd		
	Planning Dept – Kathy Thompson		
	Police Dept – Chief Arsanto		
	Municipal Court – Jessica Cash		
PW/Utilities – Chris Banks		X	
Attachments: TIB Grant Agreement			
SUMMARY STATEMENT: Agreement between the City and TIB accepting the \$173,412 grant for reconstruction of Mundy Loss Road from SR410 to 112 th St E. The project includes grinding existing asphalt and overlaying the pavement sections.			
COMMITTEE REVIEW AND RECOMMENDATION: None			
RECOMMENDED ACTION: MOTION to Approve TIB Grant Funding Agreement for Reconstruction of Mundy Loss Road.			
RECORD OF COUNCIL ACTION			
Meeting Date	Action	Vote	



Washington State Transportation Improvement Board



TIB Members

November 17, 2017

Chair
Commissioner Richard Stevens
Grant County

Vice Chair
Mayor Patty Lent
City of Bremerton

Amy Asher
RiverCities Transit

Aaron Butters, P.E.
HW Lochner Inc.

Jeff Carpenter, P.E.
WSDOT

Barbara Chamberlain
WSDOT

Elizabeth Chamberlain
City of Walla Walla

Commissioner Terri Drexler
Mason County

Gary Ekstedt, P.E.
Yakima County

Mayor Glenn Johnson
City of Pullman

John Klekotka, P.E.
Port of Everett

Commissioner Robert Koch
Franklin County

John Koster
County Road Administration Board

Colleen Kuhn
Human Services Council

Mayor Ron Lucas
Town of Steilacoom

Mick Matheson, P.E.
City of Mukilteo

E. Susan Meyer
Spokane Transit Authority

Laura Philpot, P.E.
City of Maple Valley

David Ramsay
Feet First

Martin Snell
Clark County

Mr. Dave Schmidt
City Administrator
City of Buckley
Post Office Box 1960
Buckley, WA 98321-1960

Dear Mr. Schmidt:

Congratulations! We are pleased to announce the selection of your project, FY 2019 Rehabilitation Project, Multiple Locations, TIB project number 2-P-808(005)-1.

Total TIB funds for this project are \$173,412.

Before any work is allowed on this project, you must:

- Verify the information on the Project Funding Status Form, revise if necessary, and sign;
- Sign both copies of the Fuel Tax Grant Distribution Agreement; and
- Return the above items to TIB;

You may only incur reimbursable expenses after you receive approval from TIB.

In accordance with RCW 47.26.084, you must certify full funding by November 17, 2018 or the grant may be terminated. Grants may also be rescinded due to unreasonable project delay as described in WAC 479-05-211.

If you have questions, please contact Greg Armstrong, TIB Project Engineer, at (360) 586-1142 or e-mail GregA@TIB.wa.gov.

Sincerely,

Ashley Probart
Executive Director

Enclosures

Ashley Probart
Executive Director

P.O. Box 40901
Olympia, WA 98504-0901
Phone: 360-586-1140
Fax: 360-586-1165
www.tib.wa.gov



City of Buckley
2-P-808(005)-1
FY 2019 Rehabilitation Project
Multiple Locations

STATE OF WASHINGTON
TRANSPORTATION IMPROVEMENT BOARD
AND
City of Buckley
AGREEMENT

THIS GRANT AGREEMENT (hereinafter "Agreement") for the FY 2019 Rehabilitation Project, Multiple Locations (hereinafter "Project") is entered into by the WASHINGTON STATE TRANSPORTATION IMPROVEMENT BOARD (hereinafter "TIB") and City of Buckley, a political subdivision of the State of Washington (hereinafter "RECIPIENT").

1.0 PURPOSE

TIB hereby grants funds in the amount of \$173,412 for the project specified above, pursuant to terms contained in the RECIPIENT'S Grant Application, supporting documentation, chapter 47.26 RCW, title 479 WAC, and the terms and conditions listed below.

2.0 SCOPE AND BUDGET

The Project Scope and Budget are initially described in RECIPIENT'S Grant Application and incorporated by reference into this Agreement. Scope and Budget will be further developed and refined, but not substantially altered during the Design, Bid Authorization and Construction Phases. Any material alterations to the original Project Scope or Budget as initially described in the Grant Application must be authorized by TIB in advance by written amendment.

3.0 PROJECT DOCUMENTATION

TIB requires RECIPIENT to make reasonable progress and submit timely Project documentation as applicable throughout the Project. Upon RECIPIENT'S submission of each Project document to TIB, the terms contained in the document will be incorporated by reference into the Agreement. Required documents include, but are not limited to the following:

- a) Project Funding Status Form
- b) Bid Authorization Form with plans and engineers estimate
- c) Award Updated Cost Estimate
- d) Bid Tabulations
- e) Contract Completion Updated Cost Estimate with final summary of quantities
- f) Project Accounting History

4.0 BILLING AND PAYMENT

The local agency shall submit progress billings as project costs are incurred to enable TIB to maintain accurate budgeting and fund management. Payment requests may be submitted as often as the RECIPIENT deems necessary, but shall be submitted at least quarterly if billable



amounts are greater than \$50,000. If progress billings are not submitted, large payments may be delayed or scheduled in a payment plan.

5.0 TERM OF AGREEMENT

This Agreement shall be effective upon execution by TIB and shall continue through closeout of the grant or until terminated as provided herein, but shall not exceed 10 years unless amended by the Parties.

6.0 AMENDMENTS

This Agreement may be amended by mutual agreement of the Parties. Such amendments shall not be binding unless they are in writing and signed by persons authorized to bind each of the Parties.

7.0 ASSIGNMENT

The RECIPIENT shall not assign or transfer its rights, benefits, or obligations under this Agreement without the prior written consent of TIB. The RECIPIENT is deemed to consent to assignment of this Agreement by TIB to a successor entity. Such consent shall not constitute a waiver of the RECIPIENT's other rights under this Agreement.

8.0 GOVERNANCE & VENUE

This Agreement shall be construed and interpreted in accordance with the laws of the state of Washington and venue of any action brought hereunder shall be in the Superior Court for Thurston County.

9.0 DEFAULT AND TERMINATION

9.1 NON-COMPLIANCE

a) In the event TIB determines, in its sole discretion, the RECIPIENT has failed to comply with the terms and conditions of this Agreement, TIB shall notify the RECIPIENT, in writing, of the non-compliance.

b) In response to the notice, RECIPIENT shall provide a written response within 10 business days of receipt of TIB's notice of non-compliance, which should include either a detailed plan to correct the non-compliance, a request to amend the Project, or a denial accompanied by supporting details.

c) TIB will provide 30 days for RECIPIENT to make reasonable progress toward compliance pursuant to its plan to correct or implement its amendment to the Project.

d) Should RECIPIENT dispute non-compliance, TIB will investigate the dispute and may withhold further payments or prohibit the RECIPIENT from incurring additional reimbursable costs during the investigation.

9.2 DEFAULT

RECIPIENT may be considered in default if TIB determines, in its sole discretion, that:



- a) RECIPIENT is not making reasonable progress toward correction and compliance.
- b) TIB denies the RECIPIENT's request to amend the Project.
- c) After investigation TIB confirms RECIPIENT'S non-compliance.

TIB reserves the right to order RECIPIENT to immediately stop work on the Project and TIB may stop Project payments until the requested corrections have been made or the Agreement has been terminated.

9.3 TERMINATION

a) In the event of default by the RECIPIENT as determined pursuant to Section 9.2, TIB shall serve RECIPIENT with a written notice of termination of this Agreement, which shall be served in person, by email or by certified letter. Upon service of notice of termination, the RECIPIENT shall immediately stop work and/or take such action as may be directed by TIB.

b) In the event of default and/or termination by either PARTY, the RECIPIENT may be liable for damages as authorized by law including, but not limited to, repayment of grant funds.

c) The rights and remedies of TIB provided in the AGREEMENT are not exclusive and are in addition to any other rights and remedies provided by law.

9.4 TERMINATION FOR NECESSITY

TIB may, with ten (10) days written notice, terminate this Agreement, in whole or in part, because funds are no longer available for the purpose of meeting TIB's obligations. If this Agreement is so terminated, TIB shall be liable only for payment required under this Agreement for performance rendered or costs incurred prior to the effective date of termination.

10.0 USE OF TIB GRANT FUNDS

TIB grant funds come from Motor Vehicle Fuel Tax revenue. Any use of these funds for anything other than highway or roadway system improvements is prohibited and shall subject the RECIPIENT to the terms, conditions and remedies set forth in Section 9. If Right of Way is purchased using TIB funds, and some or all of the Right of Way is subsequently sold, proceeds from the sale must be deposited into the RECIPIENT's motor vehicle fund and used for a motor vehicle purpose.

11.0 INCREASE OR DECREASE IN TIB GRANT FUNDS

At Bid Award and Contract Completion, RECIPIENT may request an increase in the TIB funds for the specific project. Requests must be made in writing and will be considered by TIB and awarded at the sole discretion of TIB. All increase requests must be made pursuant to WAC 479-05-202 and/or WAC 479-01-060. If an increase is denied, the recipient shall be liable for costs incurred in excess of the grant amount. In the event that final costs related to the specific project are less than the initial grant award, TIB funds will be decreased and/or refunded to TIB in a manner that maintains the original ratio between TIB funds and total project costs.



12.0 INDEPENDENT CAPACITY

The RECIPIENT shall be deemed an independent contractor for all purposes and the employees of the RECIPIENT or any of its contractors, subcontractors, and employees thereof shall not in any manner be deemed employees of TIB.

13.0 INDEMNIFICATION AND HOLD HARMLESS

The PARTIES agree to the following:

Each of the PARTIES, shall protect, defend, indemnify, and save harmless the other PARTY, its officers, officials, employees, and agents, while acting within the scope of their employment as such, from any and all costs, claims, judgment, and/or awards of damages, arising out of, or in any way resulting from, that PARTY's own negligent acts or omissions which may arise in connection with its performance under this Agreement. No PARTY will be required to indemnify, defend, or save harmless the other PARTY if the claim, suit, or action for injuries, death, or damages is caused by the sole negligence of the other PARTY. Where such claims, suits, or actions result from the concurrent negligence of the PARTIES, the indemnity provisions provided herein shall be valid and enforceable only to the extent of a PARTY's own negligence. Each of the PARTIES agrees that its obligations under this subparagraph extend to any claim, demand and/or cause of action brought by, or on behalf of, any of its employees or agents. For this purpose, each of the PARTIES, by mutual negotiation, hereby waives, with respect to the other PARTY only, any immunity that would otherwise be available to it against such claims under the Industrial Insurance provision of Title 51 RCW. In any action to enforce the provisions of the Section, the prevailing PARTY shall be entitled to recover its reasonable attorney's fees and costs incurred from the other PARTY. The obligations of this Section shall survive termination of this Agreement.

14.0 DISPUTE RESOLUTION

- a) The PARTIES shall make good faith efforts to quickly and collaboratively resolve any dispute arising under or in connection with this AGREEMENT. The dispute resolution process outlined in this Section applies to disputes arising under or in connection with the terms of this AGREEMENT.
- b) Informal Resolution. The PARTIES shall use their best efforts to resolve disputes promptly and at the lowest organizational level.
- c) In the event that the PARTIES are unable to resolve the dispute, the PARTIES shall submit the matter to non-binding mediation facilitated by a mutually agreed upon mediator. The PARTIES shall share equally in the cost of the mediator.
- d) Each PARTY agrees to compromise to the fullest extent possible in resolving the dispute in order to avoid delays or additional incurred cost to the Project.
- e) The PARTIES agree that they shall have no right to seek relief in a court of law until and unless the Dispute Resolution process has been exhausted.



15.0 ENTIRE AGREEMENT

This Agreement, together with the RECIPIENT'S Grant Application, the provisions of chapter 47.26 Revised Code of Washington, the provisions of title 479 Washington Administrative Code, and TIB Policies, constitutes the entire agreement between the PARTIES and supersedes all previous written or oral agreements between the PARTIES.

16.0 RECORDS MAINTENANCE

The RECIPIENT shall maintain books, records, documents, data and other evidence relating to this Agreement and performance of the services described herein, including but not limited to accounting procedures and practices which sufficiently and properly reflect all direct and indirect costs of any nature expended in the performance of this Agreement. RECIPIENT shall retain such records for a period of six years following the date of final payment. At no additional cost, these records, including materials generated under the Agreement shall be subject at all reasonable times to inspection, review or audit by TIB personnel duly authorized by TIB, the Office of the State Auditor, and federal and state officials so authorized by law, regulation or agreement.

If any litigation, claim or audit is started before the expiration of the six (6) year period, the records shall be retained until all litigation, claims, or audit findings involving the records have been resolved.

Approved as to Form
Attorney General

By:

Signature on file

Guy Bowman
Assistant Attorney General

Lead Agency

Transportation Improvement Board

Chief Executive Officer Date

Executive Director Date

Print Name

Print Name

Small City Preservation Program (SCPP)

Approved Segment Listing

FY 2019 Rehabilitation Program

BUCKLEY

Street	Termini	Repair Length	Repair Width
Mundy Loss Rd	SR410 to 112th St E	1,350 feet	28 feet



Transportation Improvement Board
Project Funding Status Form

Agency: **BUCKLEY**
Project Name: **FY 2019 Rehabilitation Project
Multiple Locations**

TIB Project Number: **2-P-808(005)-1**

Verify the information below and revise if necessary.

Return to:
Transportation Improvement Board
PO Box 40901
Olympia, WA 98504-0901

PROJECT SCHEDULE

	Target Dates
Construction Approval Date	
Contract Bid Award	
Contract Completion	

PROJECT FUNDING PARTNERS

List additional funding partners and amount.

Funding Partners	Amount	Revised Funding
BUCKLEY	9,138	
WSDOT	0	
Federal Funds	0	
TOTAL LOCAL FUNDS	9.138	

Signatures are required from two different agency officials. Return the originally signed form to the TIB office.

Mayor or Public Works Director

Signature

Date

Printed or Typed Name

Title

Financial Officer

Signature

Date

Printed or Typed Name

Title



CITY COUNCIL AGENDA BILL

City of Buckley
PO Box 1960
Buckley, WA 98321

ITEM INFORMATION			
SUBJECT: Cancellation of December 26, 2017 Council Meeting	Agenda Date: December 12, 2017		AB17-115
	Department/Committee/Individual	Created	Reviewed
	Mayor Pat Johnson		X
	City Administrator – Dave Schmidt	X	X
	City Attorney – Phil Olbrechts		X
	City Engineer – Dominic Miller		
	City Clerk – Joanne Starr		X
	Finance Dept – Sheila Bazzar		
	Building Official – Mike Deadmond		
	Fire Dept – Chief Predmore		
	Parks & Rec Dept – Ellen Boyd		
	Planning Dept – Kathy Thompson		
	Police Dept – Chief Arsanto		
	Municipal Court – Jessica Cash		
PW/Utilities – Chris Banks			
Attachments: None			
SUMMARY STATEMENT: Cancellation of 2nd City Council meeting of the month in December due to holiday scheduling and lack of business.			
COMMITTEE REVIEW AND RECOMMENDATION: A/F/PS 11/21/17			
RECOMMENDED ACTION: MOTION to Cancel the December 26, 2017 City Council Meeting.			
RECORD OF COUNCIL ACTION			
<i>Meeting Date</i>	<i>Action</i>	<i>Vote</i>	

D. CONSENT AGENDA

**City Council
November 28, 2017**

Mayor Johnson called the regularly scheduled meeting to order at 7:00 PM.

Upon roll call the following members were present: Sundstrom, S. Burkett, Rose, Tremblay and Leggett. Council member Boyle Barrett arrived at 7:01 PM, and Council member B. Burkett arrived at 7:07 PM. Also in attendance were City Administrator Schmidt, Public Works Utility Superintendent Banks, Finance Director Bazzar, Fire Chief Predmore, Assistant Fire Chief Skogen, City Clerk Starr, Police Chief Arsanto, Assistant Police Chief Northam, Court Administrator Cash and Activities Coordinator Lopez.

Mayor Johnson stated that item number five on the agenda needs to be pulled. **Council member Tremblay moved to approve the agenda with item number five removed. Council member Rose seconded the motion. Motion carried.**

CITIZEN PARTICIPATION

None.

STAFF REPORTS

Fire Chief Predmore stated that item number five was removed from the agenda because they have been in negotiations with AMR and thought they agreed on the agreement but that has recently changed and hopefully this agreement will be coming forward at the December 12th meeting.

Police Chief Arsanto congratulated the Mayor on the election and thanked the outgoing Council members as he enjoyed working with them, and he looks forward to working with the incoming Council members.

City Administrator Schmidt stated that the submitted joint project to TIB was granted and we will be receiving about half for the projects. Also, we got our bond rating back and we have been upgraded to AA status which puts us in the top 90% of the country.

MAIN AGENDA

Appointment of Municipal Court Judge - Freeby:

Mayor Johnson appointed Robert Freeby as the City of Buckley's Municipal Court Judge.

Agreement Municipal Court Judge Services - Freeby:

Council member Tremblay moved to approve the Professional Services Agreement with Robert C. Freeby as the Municipal Court Judge. Council member Rose seconded the motion. Motion carried.

ORD No. 23-17: Adopting Final 2018 Budget:

Council member Boyle Barrett moved to approve ORD No. 23-17 Adopting the 2018 City Budget. Council member S. Burkett seconded the motion. Upon roll call vote, motion carried 6/1.

ORD No. 24-17: Adopting 2018 City Employee Salary Scale:

Council member Rose moved to Approve ORD No. 24-17 Adopting the 2018 City Employee Salary Scale. Council member Boyle Barrett seconded the motion. Upon roll call vote, motion carried 6/1.

CONSENT AGENDA

Council member Boyle Barrett moved to approve the Consent Agenda. Council member Rose seconded the motion. Motion carried.

Approve Minutes of November 14, 2017 City Council Meeting

Claim check numbers 57665 through 57692, in the amount of \$108,758.86, for the period of November 15, 2017 through November 28, 2017 are hereby approved and ordered paid this 28th day of November, 2017.

COMMITTEE REPORTS

Mayor's Report:

Mayor Johnson stated that the Elected Official's Essentials training is going to be in Covington this Saturday, December 2nd. Also, she just got back from North Carolina where she went with AWC for the League of Cities conference. She stated that she came back a day early to make it to Ellen's service on Sunday, and it was a beautiful service.

Administration, Finance & Public Safety:

Council member Rose stated that most topics of discussion were on the agenda this evening. Fire Chief Predmore reported the completion of his Lieutenant process and that he will be adding two new companies in 2018, and a credit card machine has been added to the Police Station.

Transportation & Utilities:

Council member Tremblay stated they will be meeting on December 19th.

Community Services:

Council member Rose stated they will be meeting on December 21st.

Council Member Comments & Good of the Order:

Council member Rose stated that the museum is all decorated and she encouraged everyone to go take a look.

Council member Sundstrom reported on a trip he and his wife took to state offices in Olympia.

Council member Rose moved to adjourn. Council member Tremblay seconded the motion. Motion carried.

With nothing further the meeting was adjourned at 7:35 PM.

Mayor

City Administrator

CITY OF BUCKLEY		Nov 30 2017	TRANSFER VOUCHER	
From Fund #			To Fund #	
NAME	AMOUNT		NAME	
	Bars Number			Bars Number
1	General Fund	\$ 296,425.82	Payroll Fund	
		\$ 135,498.04	Claims Fund	
	597.00.00.10		101 Street & Storm Drain Capital	397.00.00
	597.00.80		7 PD Equip & Maint	397.00.20 St Merge
	597.00.22		3 G F Contingency	397.00.40 St Merge
	597.00.40	\$ 125.00	430 Utility Equip Res	397.00.60
	597.00.65	\$ 468.00	2 Contingency Reserve Fund	397.00.10 St Merge
101	Street Operations	\$ 4,797.00	Payroll Fund	
		\$ 11,202.06	Claims Fund	
	597.00.00	\$ 125.00	430 Utility Equip Res	397.00.10
	597.00.50.30		1 General Fund Insurance Portion	397.60.70
	597.20.00	\$ 1,637.17	1 General Fund Admin	397.60.20
	597.30.00	\$ 3,645.84	102 Street Capital Improvements	397.00.10.50
102	Street Capital Imp	\$ 40,837.15	Payroll Fund	
		\$ 156.75	Claims Fund	
	597.10.00.30	\$ 156.75	1 General Fund Invest Int	397.00.40
	597.10.00.31	\$ 3,676.09	1 General Fund Project Admin	397.60.95
4	Cemetery		Payroll Fund	
			Claims Fund	
	597.00.00	\$ 166.00	430 Utility Equip Res	397.00.20
	597.00.50.30		1 General Fund Insurance Portion	397.60.80 St Merge
105	EMS	\$ 47,560.70	Payroll Fund	
		\$ 3,651.06	Claims Fund	
	597.90.00	\$ 500.00	030/131 Fire Equip/EMS Res	131-397
	597.90.00.40	\$ 125.00	30 Fire/EMS Bunkers	397.10.10
7	PD Maint RES		Payroll Fund	
			Claims Fund	
	597.10.10.50		1 General Fund	397.10.10.50
	597.10.00.20	\$ 1,250.00	307 Capital Improvement	397.10.80.40
8	Railroad ROW	\$ 1,968.54	Payroll Fund	
			Claims Fund	
	597.00.00.45	\$ 541.67	1 General Fund Park	397.50.15 St Merge
	597.00.50.30		1 General Fund Insurance Portion	397.60.81
	597.00.00.46	\$ 83.33	430 Utility Equip Reserve	397.00.70
	597.00.00.47	\$ 833.33	35 Park Construction	397.10.20.20
	597.00.00.48	\$ 2,083.33	307 Capital Improvement	397.10.80.30
	597.00.00.49	\$ 2,916.67	307 Capital Improvement	397.10.80.30

	From Fund #			To Fund #	
	NAME		AMOUNT	NAME	
		Bars Number			Bars Number
109	Criminal Justice			Payroll Fund	
			\$ 12,641.58	Claims Fund	
		597.10.00.20	\$ 4,167.00	7 PD Maint Res	397.00.00
30	Fire Equip& EMS Res			Payroll Fund	
				Claims Fund	
134	Fire Station Const			Payroll Fund	
			\$ 525.14	Claims Fund	
		597.10.00.30	\$ 50.84	202 Invest Int Fire Stat Bond Fund	397.00.40
35	Park Construction			Payroll Fund	
			\$ 234.26	Claims Fund	
		597.10.00.10	\$ 37.68	1 General Fund Invest Int	397.00.40 St Merge
136	Visitor Promo & Dev			Payroll Fund	
			\$ 465.79	Claims Fund	
		597.10.00.10	\$ 72.19	1 General Fund Invest Int	397.00.40
		597.51.00.30		1 General Fund Insurance Portion	397.60.90
		597.52.00.60		1 General Fund Admin	397.60.91
701	Cemetery Improve			Payroll Fund	
				Claims Fund	
307	Capital Imp			Payroll Fund	
			\$ 9,479.71	Claims Fund	
		597.10.00.10	\$ 283.61	1 General Fund Invest Int	397.00.40
		597.10.00.31	\$ 2,108.09	1 General Fund Project Admin	397.60.99
308	Comp Plan Cap Imp		\$ 2,644.50	Payroll Fund	
			\$ 1,020.05	Claims Fund	
			\$ -		
401	Natural Gas			Payroll Fund	
				Claims Fund	
	6.0% Tax	533.10.54	\$ 14.89	1 General Fund Business Tax	316.43
		597.00.00.70		1 General Fund	397.60.93
	From Fund #			To Fund #	
	NAME		AMOUNT	NAME	

	Bars Number			Bars Number	
402	Water Sewer Rev		\$ 74,923.23	Payroll Fund	
			\$ 86,041.73	Claims Fund	
	10.0 % Tax Water	534.10.54	\$ 6,137.64	1 General Fund Business Tax	316.42
	10.0 % Tax Sewer	535.10.54	\$ 15,691.73	1 General Fund Business Tax	316.44
		597.00.00.50	\$ 542.00	1 General Fund Dispatcher	397.00.60
		597.00.00.51	\$ 5,572.75	1 General Fund Admin Water	397.60.10
		597.00.00.52	\$ 5,524.75	1 General Fund Admin Sewer	397.60.10
	W	597.00.00.53		1 General Fund Insurance Portion	397.60.60
	S	597.00.00.55		1 General Fund Insurance Portion	397.60.60
		597.00.00.70	\$ 64,166.67	405 Sewer Improve Fund	397.00.00 St Merge
		597.00.00.80	\$ 13,961.42	406 Water Improve Fund	397.00.00 St Merge
		597.00.00.40	\$ 1,667.00	430 Utility Equip Res	397.00.40
		597.00.90		308 Comp Plan Cap Imp	397.10.60
		535.10.41		1 General Fund Planning	345.81.00
403	Solid Waste		\$ 63,197.46	Payroll Fund	
			\$ 7,954.24	Claims Fund	
	10.0 % Tax	537.10.54	\$ 7,954.24	1 General Fund Business Tax	316.45
		597.00.00.10	\$ 4,589.67	1 General Fund Admin	397.60.40
		597.00.00.55		1 General Fund Insurance Portion	397.60.83
405	Sewer Ext & Replace		\$ 3,198.21	Payroll Fund	
			\$ 3,189.09	Claims Fund	
		597.10.00.31	\$ 3,189.09	1 General Fund Project Admin	397.60.96
406	Water Ext & Replace		\$ 37,705.53	Payroll Fund	
			\$ 3,479.34	Claims Fund	
		597.10.00.31	\$ 3,479.34	1 General Fund Project Admin	397.60.97
407	Storm Drain Op & Maintenance		\$ 14,988.99	Payroll Fund	
			\$ 8,552.67	Claims Fund	
	10 % Tax	531.30.44.01	\$ 4,209.51	1 General Fund Business Tax	316.48
		597.00.00	\$ 834.00	430 Utility Equip Res	397.00.50
		597.00.00.10	\$ 8,348.09	408 Storm Drain Cap	397.00.30 St Merge
		597.00.00.20	\$ 5,105.25	1 General Fund Admin	397.60.40.10
		597.00.00.53		1 General Fund Insurance Portion	397.60.71
		597.00.00.57		1 General Fund Dispatcher	397.60.21
		597.00.75		308 Comp Plan Cap Imp	397.10.70
430	Utility Equip Res			Payroll Fund	
				Claims Fund	
		597.10.00.10	\$ 2.22	1 General Fund Invest Int	397.00.40
	From Fund #			To Fund #	
	NAME		AMOUNT	NAME	

	Bars Number			Bars Number
202	Fire Stat Const Bond Debt Svcs	\$ 205,150.00		Claims Fund
408	Stormwater Cap Project	\$ 3,654.33		Claims Fund
	597.00.10		307	Capital Improvement
	597.10.00.31	\$ 3,757.08	1	General Fund Project Admin
103	TBD	\$ 29.00		Claims Fund
	597.00.00	\$ 3,645.84	101	City Street
	595.30.48	\$ 4,479.17	101	City Street
3	General Fund Contingency			
	597.00.30.00	\$ 2.04	1	General Fund Invest Int
				397.00.45 St Merge
	Total Investment Interest to 202	\$ 50.84		
	Total Investment Interest to 001	\$ 554.49		
	Total Payroll	\$ 443,308.78		
	Total Claims	\$ 623,083.77		
	Total Treasurer checks	\$ 16,928.60		
	Date Approve by Council December 12, 2017			Finance Director Sheila Bazzar, PFO/CMC

E. COMMITTEE REPORTS