



Hearing Examiner MEETING Agenda

April 14, 2025 at 6:00 PM

City Hall Council Chambers – 210 W. 6th Ave and Virtual

https://us06web.zoom.us/webinar/register/WN_H88sRFYMQ62cwZGoQdzbXA

1. CALL TO ORDER

Roll Call/Pledge of Allegiance

2. PROCEDURAL INFORMATION

3. PUBLIC HEARING

a. Preliminary Plat (SUB-2024-0013), "Desert Sands"

4. ADJOURNMENT



COMMUNITY PLANNING DEPARTMENT

STAFF REPORT AND RECOMMENDATION TO THE HEARING EXAMINER

FILE No: SUB-2024-0013

Staff Report Date: April 7, 2025

Public Hearing Date and Location: April 14, 2025

Report Prepared By: Steve Donovan, Planning Manager

Report Reviewed By: Matt Halitsky, Senior Planner

Summary Recommendation: The City of Kennewick RECOMMENDS that Preliminary Plat SUB-2024-0013 be APPROVED with conditions.

Summary of Proposal: A 14.23-acre Preliminary Plat consisting of 153 lots and 3 tracts. The project will consist of single-family residences.

Proposal Location: The proposal is located 11292 W Clearwater Avenue. Parcel Number 1-0188-4BP-5063-024.

Legal Description: See Exhibit 2

Property Owner: N44 DESERTSAND, LLC
4618 S Reed Street
Kennewick, WA 99337

Applicant: Knutzen Engineering
Attn: Paul Knutzen
5401 Ridgeline Drive, Suite 160
Kennewick, WA 99338

Engineer: Same as Above

Approval Criteria:

1. Comprehensive Plan – Land Use
2. KMC Title 18 – Zoning
3. KMC Title 17 – Subdivisions
4. KMC Section 5.56 – Public Works Construction Standards
5. Washington State Environmental Policy Act

Preliminary Plat Key Application Processing Dates:

Pre-Application/Feasibility Meeting	N/A
Application Submittal	December 9, 2024
Determination of Completeness Issued	January 7, 2025
Notice of Application	January 7, 2025
Property Posting Sign	January 7, 2025
City Department Review Meeting	N/A
SEPA Threshold Determination Issued	February 24, 2025

SEPA Appeal Period Ends	March 10, 2025
Date of Published Notice of Public Hearing	March 30, 2025
Date of Posting Hearing Notice On-Site	March 24, 2025
Date of Mailed Notice of Public Hearing	March 24, 2025
Public Hearing Date	April 14, 2025

Exhibits:

1. Staff Report
2. Legal Description
3. Draft Pre Plat Drawing
4. Geotechnical Engineering Report
5. Traffic Impact Analysis
6. SEPA Determination
7. Notice of Public Hearing Affidavit, Mailing List and Notice
8. Public Works Comments
9. Traffic Engineering Division Comments
10. Traffic, Planning and GIS Plat Comments
11. Kennewick Irrigation District Comments
12. Benton Clean Air Agency
13. State of Washington Department of Ecology Comments
14. Bonneville Power Administration Comments
15. Benton County Assessor's Comments
16. Kennewick School District Comments

Staff Analysis of Proposal & Discussion:**Preliminary Plat:**

The proposed Preliminary Plat, SUB-2024-0013, is a request to subdivide 14.23 acres into 153 lots and 3 tracts. The applicant is proposing the subdivision be developed in 3 phases.

A Preliminary Plat is the first step in subdivision process for subdivisions with more than nine (9) lots and is an approval for overall lot layout and compliance with land use regulations. A Final Plat is required for preliminary plats and is the last phase in the subdivision process and must be recorded prior to the creation of individual lots.

Proposed plats are subject to the processing requirements of KMC 17.10 – Platting and the design requirements of KMC 17.20 – Design and Construction. Final plat approval is based on the Preliminary Plat conditions of approval. A civil permit with a detailed review of street, utility and stormwater construction standards, and street and utility construction or bonding for incomplete work is required prior the final plat approval.

Property History:

The City annexed the property on January 4, 1995 by adopting Ordinance 3603. On April 18, 2023 the property's zoning was changed from Commercial, Community (CC) to Residential, High (RH) by adopting Ordinance 6018.

Density/Lot Size:

Per the Table of Residential Development Standards (KMC 18.12.010 A.2) the maximum density for the RH Zone is 27 units per acre. The minimum lot size proposed is 1,800 SF, the largest lot is 7,554 SF and the average lot size is 2,413 SF. The proposed density for the development is 10.8 units/acre.

Setbacks:

The applicant has not proposed any deviations from the required setbacks. The RH Zone has the following setback requirements:

- Front: 15-feet
- Garage: 20-feet
- Side: 5-feet
- Rear: 15-feet

Traffic:

The City's traffic engineer has reviewed the applicant's Traffic Impact Analysis. Specific conditions of approval for road construction requirements and traffic impact fees have been submitted by the Traffic Engineering Division, see Exhibit 9.

Traffic Impact Fees for single-family dwellings are due at the time the building permit is issued or at the closing of sale if a Recording of Covenant is provided.

A mid-block pedestrian crossing is required between W 9th Place and W Clearwater Avenue. A right turn lane into the development off of W Clearwater Avenue is required. Additionally, a Secondary Emergency Vehicle Access is required during the construction of the development, see Exhibit 10.

Storm Water:

Residential sub-divisions shall be designed to the standards in the Storm Water Management Manual for Eastern Washington (SMMEW) and COK Standard Specification Section 5-9, see Exhibit 8.

Streets & Utilities:

The developer will be required to construct the proposed roads, sidewalks, streetlights, storm drainage, and designate sidewalk and utility easements all in conformance with the latest City of Kennewick (COK) Standard Specifications and details, see Exhibit 8.

Critical Areas:

The site had areas that were mapped as slopes greater than 15%. Mass grading has taken place and the slopes no longer exist. The applicant submitted a Preliminary Geotechnical Investigation Report, the development is subject to the recommendations of that report, see Exhibit 4.

No other critical areas are designated on-site.

A cultural resource survey was submitted; no known historic properties or artifacts are anticipated to be disturbed. The Washington State Historic Preservation Officer should be notified if an artifact is discovered.

Grading:

Grading of the site was permitted by a previously approved Grading Permit. Additional site preparation will be subject to the recommendations of the

Parks:

The proposed development is subject KMC Chapter 3.90, which establishes a park impact fee. The applicant may submit proposals for credit toward the park impact fees pursuant to KMC 3.90.080. The proposed development is within Service Area 1 and is subject to the park impact fees listed in KMC 3.90.160 for Single-Family Units. Park impact fees are due prior to issuance of the Certificate of Occupancy.

Common Area Maintenance:

A maintenance agreement for common open space, tracts, private streets, and shared driveways will be required to be approved by the City Attorney and recorded against the property. Per KMC 18.45.100, a Homeowner's/Property Owner Association are required for maintenance and management of open space, tracts, common areas, and private roads.

Schools:

The Kennewick School District provided a comment letter stating that the development is within the busing zones of Desert Hills Middle School, Amon Creek Elementary and Kamiakin High School. Additionally, the letter states that the Kennewick School District has the capacity to add students at all levels and at the three schools, see Exhibit 16.

Kennewick Irrigation District:

The proposed development is within the boundary of the Kennewick Irrigation District (KID) but is designated non-irrigable, see Exhibit 11.

Bonneville Power Administration:

The Bonneville Power Administration (BPA) will need to approve activities that take place within the easement. An existing BPA transmission line runs through the northeast corner of the site, see Exhibit 14.

Surrounding Property:

To the west is property zoned Commercial, Community (CC) and vacant property/open space in the City of Richland. To the north there is additional vacant/open space land in the City of Richland. The property to the east is vacant and zoned CC and RH. The RH property does have current subdivision applications for it. The property to the south is zoned CC and has either commercial development or is vacant.

Provisions for Public Health, Safety, and Welfare:

Staff Comment: It is Staff's opinion that appropriate provisions have been made for, but not limited to, the public health, safety, and general welfare, for open spaces, drainage ways, streets or roads, alleys, public sidewalks, utility easements and other public ways, transit stops, potable water supplies, sanitary wastes, parks and recreation areas, playgrounds, schools and school grounds, and the proposed subdivision has considered all other relevant facts and other planning features that assure safe walking conditions for students who walk to and from school.

Comprehensive Plan:

Staff is of the opinion that this request is consistent with and generally conforms to the City's Comprehensive Plan, and it will implement, goals and policies of the Comprehensive Plan. Particularly the following:

CRITICAL AREAS AND SHORELINE GOALS + POLICIES:

GOAL 1: *"Protect the public and personal property from the effects of landslides, steep slope failures, erosion or flooding."*

POLICY 1: *"Continue to classify, designate and protect geologically hazardous areas in the critical areas ordinance."*

GOAL 2: *"Protect the unique environment of the critical areas and shoreline."*

POLICY 1: *"Protect critical areas and the shoreline using the Critical Areas Ordinance and the Shoreline Master Plan."*

POLICY 2: *"Use Best Available Science (BAS) to protect critical areas and shorelines and their environmental functions."*

GOAL 3: *“Regulate or mitigate activities in or adjacent to critical areas or the shoreline to avoid adverse environmental impacts.”*

Staff Comment: The applicant submitted critical areas studies, future development will be subject to the recommendations of the studies and KMC Chapter 18.62 – Critical Areas – Geologically Hazardous Areas.

RESIDENTIAL GOALS + POLICIES:

RESIDENTIAL GOAL 2: *“Provide appropriate public facilities supporting residential areas.”*

POLICY 1: *“Ensure provision of parks, schools, drainage, transit, water, sanitation, infrastructure, and pedestrian in new residential developments.”*

Staff Comment: The proposed development will be connected to City water and sewer utilities.

RESIDENTIAL GOAL 3: *“Promote a variety of residential densities with a minimum density target of 3 units per acre as averaged throughout the urban area.”*

POLICY 1: *“Establish and implement maximum densities in the City’s residential zoning categories.”*

Staff Comment: The proposed development has a density of 10.8 units/acre, which is a density greater than the majority of the housing developments in the City.

HOUSING GOALS + POLICIES:

GOAL 1: *“Support and develop a variety of housing types and densities to meet the diverse needs of the population.”*

Staff Comment: The development will consist of small lot single-family residence (townhomes) and standard single-family residences. Both of these housing types have the potential to meet the needs of the City’s population.

The City of Kennewick hereby RECOMMENDS the following conditions of approval for Preliminary Plat SUB-2024-0013:

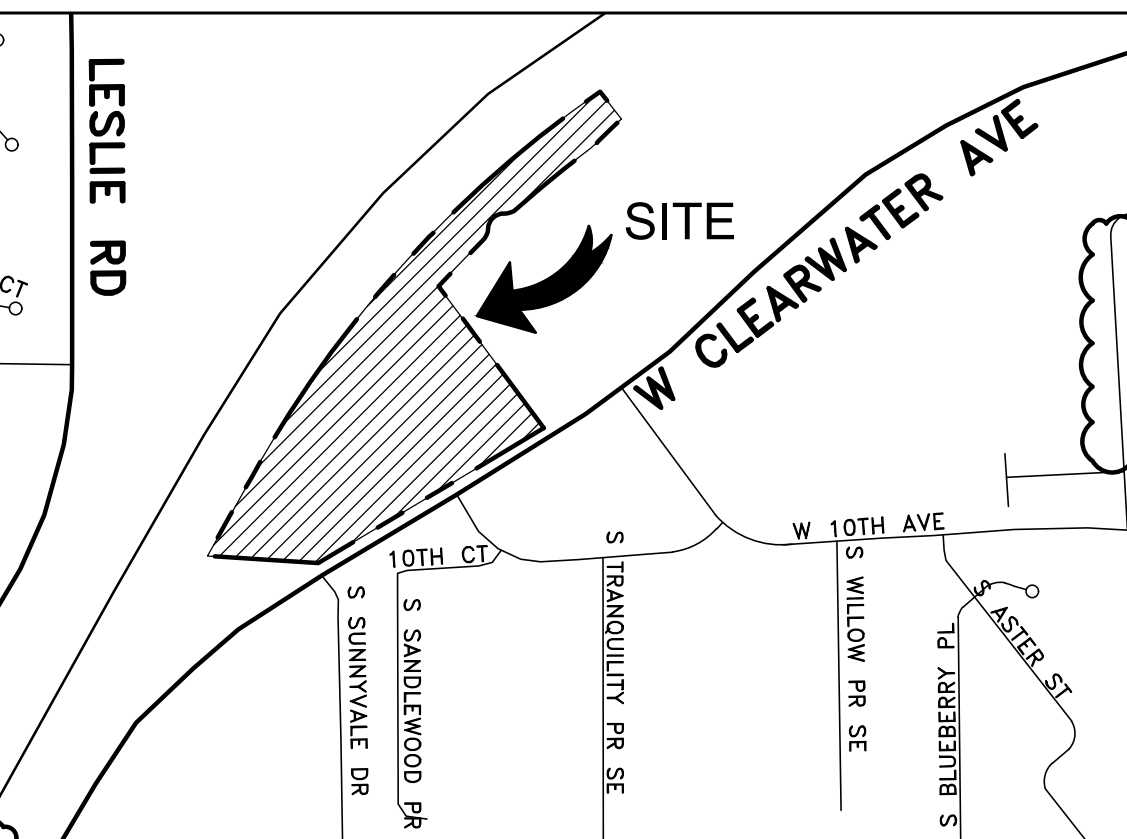
1. Comply with City of Kennewick regulatory controls, policies and codes, including the Single-family Residential and Multi-Family Design Standards.
2. All fees required by the City shall be paid prior to the approval of the final plat.
3. The development shall be in conformance with the Preliminary Plat Drawing shown in Exhibit 3 and comments in Exhibit 10.
4. Execute a written agreement to the satisfaction of the City Attorney which will allow the City to make arrangements for maintenance of the common areas, open spaces, private roads, access driveways, and landscaped areas should the Homeowner’s Association fail or refuse to maintain these areas. The arrangement must be recorded prior to the first building permit being issued.
5. Comply with the Public Works memorandum dated January 14, 2025 (Exhibit 8).
6. Comply with Traffic Engineering Division Conditions dated January 24, 2025 (Exhibit 9).
7. Comply with Kennewick Irrigation District letter dated January 21, 2025 (Exhibit 11).
8. Comply with the Benton Clean Air Agency Comments, dated January 7, 2025 (Exhibit 12).

9. Comply with the State of Washington Department of Ecology Comments, dated January 21, 2025
10. Comply with the Bonneville Power Administration Comments, dated January 9, 2025 (Exhibit 14).
11. Comply with the proposed critical area mitigation in the Preliminary Geotechnical Investigation Report, Clearwater North Development, dated June 30, 2023 (Exhibit 4).
12. Provide dust control method(s) such as hydro seeding for all areas of the site that are disturbed.
13. The plat is subject to applicable requirements of KMC Chapter 3.90 – Impact Fees for Parks, Open Space, and Recreation Facilities.
14. Provide a landscaping plan for the internal streets, along W Clearwater Avenue and tracts/open space. Bonding for incomplete landscaping in common areas shall be required prior to Final Plat Approval.
15. Pursuant to KMC 17.10.070, Preliminary Plat SUB-2024-0013 expires 5 years from the approval date, the City can grant an extension however an extension needs to be applied for before the Preliminary Plat expires.

THAT PORTION OF CITY OF KENNEWICK BINDING SITE PLAN RECORDED IN VOLUME 1 OF SURVEYS AT PAGE 5063, UNDER AUDITOR'S FILE NUMBER 2018-026507, RECORDS OF BENTON COUNTY, WASHINGTON , MORE PARTICULARLY DESCRIBED AS FOLLOWS: BEGINNING AT THE SOUTHEAST CORNER OF LOT 1 OF SAID SURVEY; THENCE NORTH $86^{\circ}17'01''$ WEST ALONG THE SOUTHERLY LINE THEREOF A DISTANCE OF 355.39 FEET TO THE SOUTHWEST CORNER OF SAID LOT 1; THENCE NORTH $29^{\circ}20'07''$ EAST ALONG THE NORTHWESTERLY LINE THEREOF A DISTANCE OF 283.81 FET TO THE BEGINNING OF A NON-TANGENT CURVE CONCAVE TO THE SOUTHEAST HAVING A RADIUS OF 3640.37 FEET AND FROM WHICH THE CHORD BEARS NORTH $42^{\circ}04'21''$ EAST A DISTANCE OF 1665.62 FEET; THENCE NORTHEASTERLY ALONG THE ARC OF SAID CURVE, AND ALONG SAID NORTHWESTERLY LINE, THROUGH A CENTRAL ANGLE OF $26^{\circ}25'58''$ A DISTANCE OF 1680.50FEET TO THE NORTHEASTERLY MARGIN OF THE BONNEVILLE POWER ADMINISTRATION RIGHT-OF-WAY; THENCE SOUTH $38^{\circ}11'10''$ EAST, ALONG SAID MARGIN, A DISTANCE OF 150.29 FEET TO THE BEGINNING OF A NON-TANGENT CURVE CONCAVE TO THE SOUTHEAST HAVING A RADIUS OF 3490.37 FEET AND FROM WHICH THE CHORD BEARS SOUTH $48^{\circ}56'09''$ WEST A DISTANCE OF 791.62 FEET; THENCE, LEAVING SAID MARGIN, SOUTHWESTERLY ALONG THE ARC OF SAID CURVE THROUGH A CENTRAL ANGLE OF $13^{\circ}01'22''$ A DISTANCE OF 793.33 FEET; THENCE SOUTH $36^{\circ}37'15''$ EAST A DISTANCE OF 544.44 FEET TO THE SOUTHEASTERLY LINE OF SAID SURVEY; THENCE SOUTH $59^{\circ}05'57''$ WEST, ALONG SAID LINE, A DISTANCE OF 345.43 FEET; THENCE SOUTH $59^{\circ}05'52''$ WEST. ALONG SAID LINE, A DISTANCE OF 495.19 FEET TO THE POINT OF BEGINNING. SEE SURVEY 5810. (BOUNDARY LINE ADJUSTMENT AF#2023-006860, 04/14/2023).



S.E. 1/4 OF SEC. 01, T.08, R.28E, W.M., CITY OF KENNEWICK, BENTON COUNTY, WA

VICINITY MAP

LEGAL DESCRIPTION

THAT PORTION OF CITY OF KENNEWICK BINDING SITE PLAN RECORDED IN VOLUME 1 OF SURVEYS AT PAGE 5063, UNDER AUDITOR'S FILE NUMBER 2018-026507, RECORDS OF BENTON COUNTY, WASHINGTON, MORE PARTICULARLY DESCRIBED AS FOLLOWS: BEGINNING AT THE SOUTHEAST CORNER OF LOT 1 OF SAID SURVEY, THENCE NORTH 86°17'01" WEST ALONG THE SOUTHWESTERLY LINE THEREOF A DISTANCE OF 358.39 FEET TO THE SOUTHWEST CORNER OF SAID LOT 1; THENCE NORTH 29°20'07" EAST ALONG THE NORTHWESTERLY LINE THEREOF A DISTANCE OF 283.81 FEET TO THE BEGINNING OF A NON-TANGENT CURVE CONCAVE TO THE SOUTHEAST HAVING A RADIUS OF 3640.37 FEET AND FROM WHICH THE CHORD BEARS NORTH 42°04'21" EAST A DISTANCE OF 668.62 FEET; THENCE NORTHWESTERLY ALONG THE ARC OF SAID CURVE, AND LONG SAID NORTHWESTERLY LINE, THROUGH A CENTRAL ANGLE OF 26°26'58" A DISTANCE OF 1680.50 FEET TO THE NORTHEASTERLY MARGIN OF THE BONNEVILLE POWER ADMINISTRATION RIGHT-OF-WAY; THENCE SOUTH 38°11'10" EAST, ALONG SAID MARGIN, A DISTANCE OF 150.29 FEET TO THE BEGINNING OF A NON-TANGENT CURVE CONCAVE TO THE SOUTHEAST HAVING A RADIUS OF 490.37 FEET AND FROM WHICH THE CHORD BEARS NORTH 48°56'09" WEST A DISTANCE OF 791.62 FEET; THENCE, LEAVING SAID MARGIN, SOUTHWESTERLY ALONG THE ARC OF SAID CURVE THROUGH A CENTRAL ANGLE OF 13°01'22" A DISTANCE OF 793.33 FEET; THENCE SOUTH 36°37'15" EAST A DISTANCE OF 544.44 FEET TO THE SOUTHEASTERLY LINE OF SAID SURVEY; THENCE SOUTH 59°05'57" WEST, ALONG SAID LINE, A DISTANCE OF 544.44 FEET TO THE SOUTHWEST CORNER OF SAID SAID LINE, A DISTANCE OF 459.19 FEET TO THE POINT OF BEGINNING. SEE SURVEY 5810. (BOUNDARY LINE ADJUSTMENT AT#2023-006860, 04/14/2023).

CONTACT INFO

OWNER/DEVELOPER:
NORTH 44 HOMES, LLC
ATTN: BRAD BEAUCHAMP
4618 S REED ST
KENNEWICK, WA. 99337
PHONE:(509)308-6556

SURVEYOR:
AHBL
ATTN: JOHN BECKER
5804 RD 90, SUITE H
PASCO, WA. 99301
PHONE:(509)380-5883

ENGINEER:
KNUTZEN ENGINEERING
ATTN: PAUL KNUTZEN
5401 RIDGELINE DRIVE
SUITE 160
KENNEWICK, WA. 99338
PHONE:(509)222-0959

BASIS OF BEARINGS

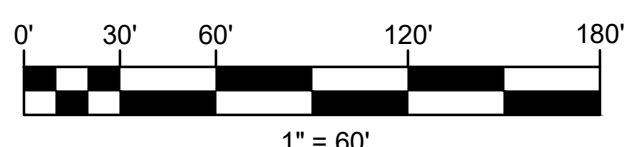
NAD 1983/11
WASHINGTON STATE PLANE SOUTH PROJECTION, BASED ON GPS
OBSERVATIONS USING WSRN AND GEOID 2012A. UNITS OF
MEASUREMENT ARE US SURVEY FEET. VERIFIED AGAINST CITY OF
KENNEWICK CONTROL POINTS K0905, K0917 AND K0918

VERTICAL DATUM

CITY OF KENNEWICK NAVD 88. HOLDING CITY BENCHMARK K0918
ELEVATION OF 596.74

TRACT USAGES

TRACT "A"	FUTURE RESIDENTIAL DEVELOPMENT
TRACT "B"	NEIGHBORHOOD MONUMENT
TRACT "C"	UNKNOWN AT THIS TIME



CALL 811
2 BUSINESS DAYS
BEFORE YOU DIG

A1	PRELIMINARY PLAT
	SCALE: 1" = 60'-0"

SCALE: 1" = 60'-0"



KNUTZEN
ENGINEERING

5401 RIDGELINE DR.
SUITE 160
KENNEWICK, WA 99338
1-509-222-0959
www.knutzenengineering.com

No.	REVISIONS	DATE	DESIGN	CHNO	APPD
1	CITY COMMENTS	01/28/25	NB	RAM	PTK

PRELIMINARY PLAT

NORTH 44

DESERT SANDS

11292 W CLEARWATER AVE, KENNEWICK, WA 99336

APPROVAL		
DESIGN	NJB	12/09/24
CHECKED	RAM	12/09/24
APPROVED	PTK	12/09/24

SCALE: AS NOTED

CADFILE: 24068PP0

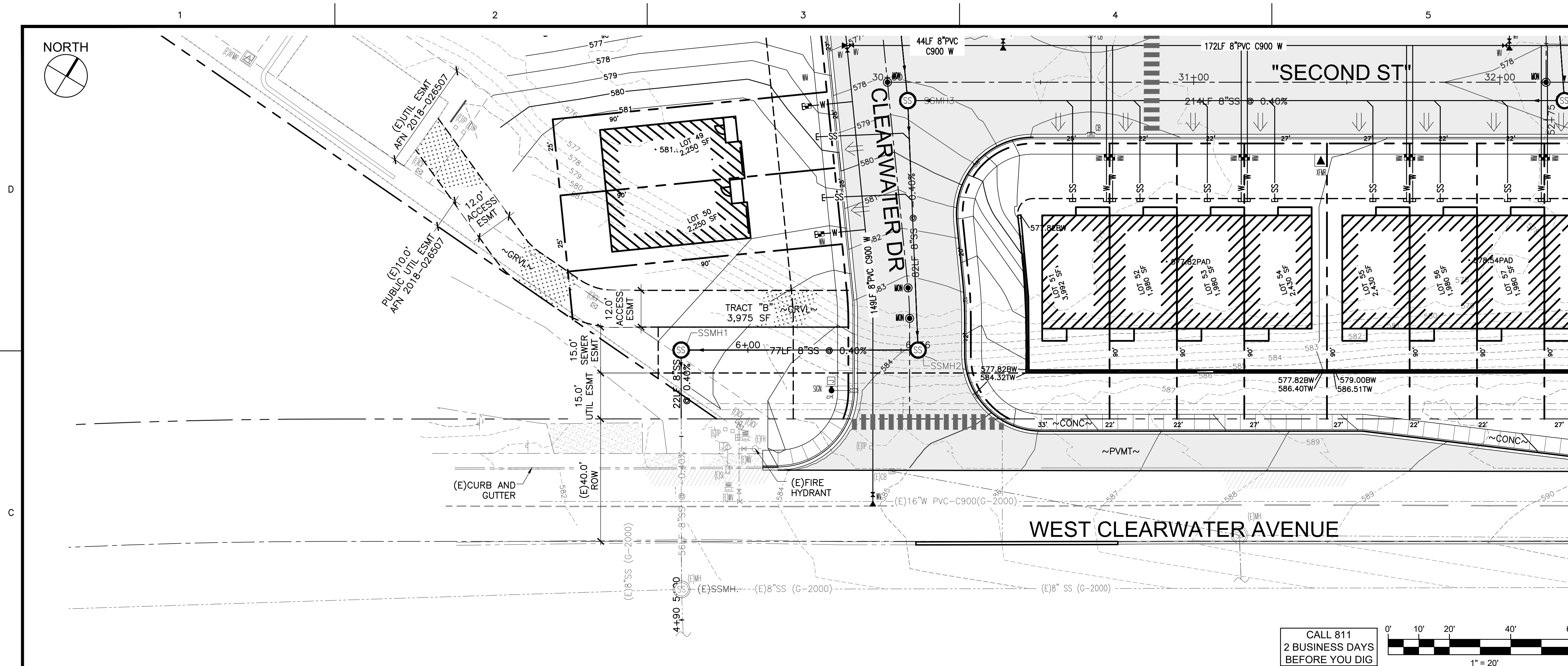
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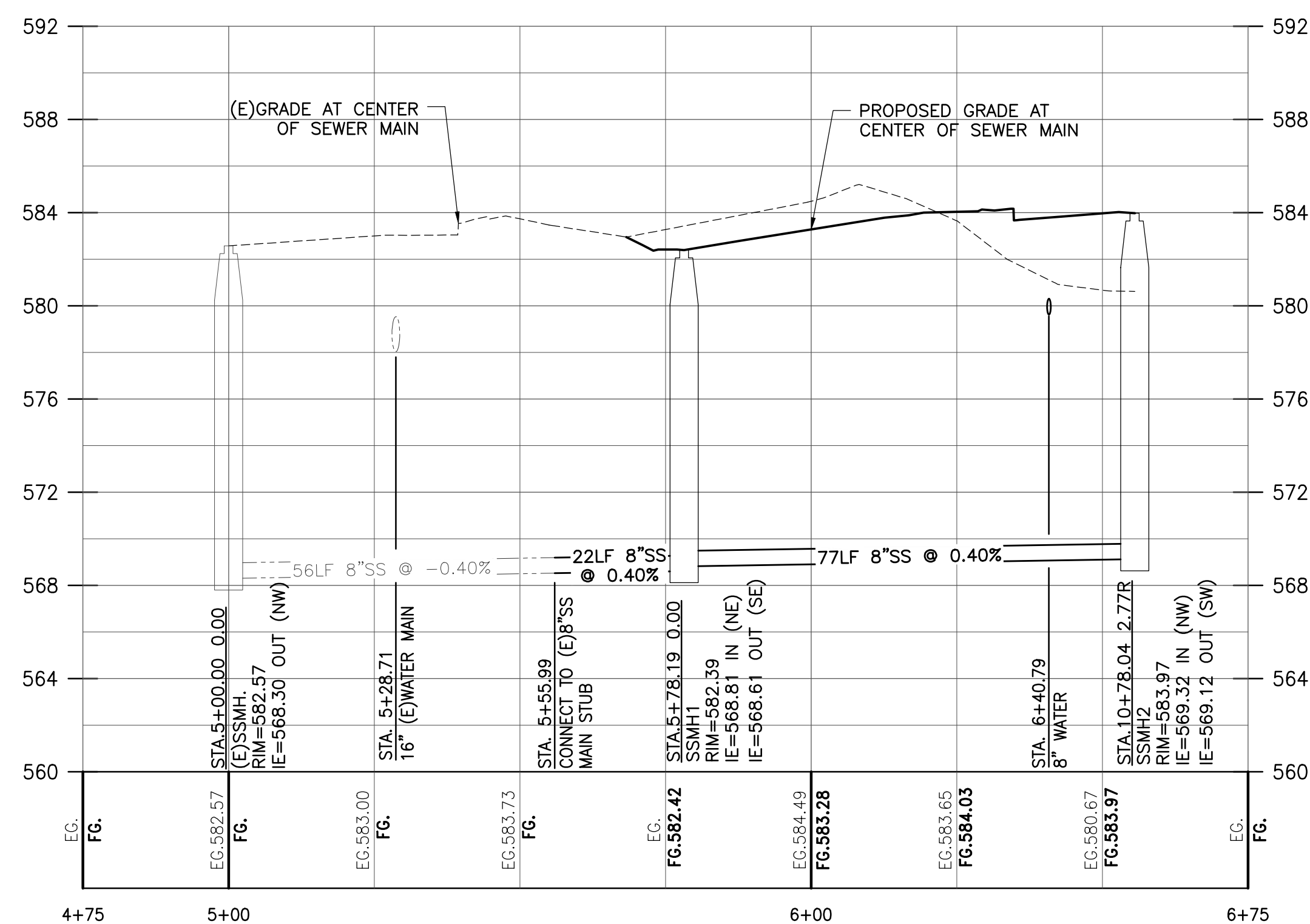
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DWG. No.

PP01



C1	SEWER MAIN PLAN
	SCALE: 1" = 20'-0"



A1	SEWER MAIN PROFILE
	SCALE: HORZ 1" = 20'-0" VERT 1" = 2'-0"

KEY NOTES

- | | |
|----|---|
| 1 | MEET AND MATCH EXISTING |
| 2 | WIDEN ROAD, PER CITY STD DWG 2-- |
| 3 | COMMERCIAL DRIVEWAY ENTRANCE, PER CITY STD DWG 2-9 /10 |
| 4 | CURB AND GUTTER, PER CITY STD DETAIL 2-9 1/10 |
| 5 | SIDEWALK, PER CITY STD DETAIL 2-9 3/10 |
| 6 | REPAIR ASPHALT, PER CITY STD DETAIL 2-6 |
| 7 | SIDEWALK ASPHALT RAMP, PER CITY STD DETAIL 2-11 |
| 8 | ACCESSIBLE RAMP, PER CITY STD DETAIL 2-10 /4 |
| 9 | MONUMENT IN CAP, PER CITY STD DETAIL 2-7 |
| 10 | WATER SERVICE TAP, PER CITY STD DETAIL 4-- |
| 11 | WATER SERVICE STUB, PER CITY STD DETAIL 4-- |
| 12 | TEMPORARY BLOW OFF ASSEMBLY, PER CITY STD DETAIL 4-1 /2 |
| 13 | AIR RELIEF VALVE, PER CITY STD DETAIL 4-8 |
| 14 | CUT IN 8"x6" TEE WITH 6" GATE VALVE AND THRUST BLOCK, PER CITY STD DETAILS 4-5, 4-6 AND 4-9 |
| 15 | 8"x6" TEE WITH 6" GATE VALVE AND THRUST BLOCK, PER CITY STD DETAIL 4-6 AND 4-9 |
| 16 | 45° BEND WITH THRUST BLOCK, PER CITY STD DETAIL 4-6 |
| 17 | FIRE HYDRANT WITH BOLLARD PROTECTION, PER CITY STD DETAIL 4-4 |
| 18 | SEWER MANHOLE, PER CITY STD DETAILS 3-2 1/2 AND 3-3 |
| 19 | SEWER SERVICE STUB, PER CITY STD DETAILS 3-6 AND 3-7 |
| 20 | SEWER CLEAN OUT TO GRADE, PER CITY STD DETAILS 3-1 |
| 21 | WYE CONNECTION |
| 22 | THE SEWER LINE INTO EXISTING SEWER STUB, CONTRACTOR TO VERIFY INVERT AND LOCATION, PER CITY STD DETAIL 3-7 |
| 23 | CATCH BASIN IN CURB, PER CITY STD DETAIL 5-1 1/2 AND 5-2 |
| 24 | STORM MANHOLE, PER CITY STD DETAIL 5-5 1/2 |
| 25 | ____ 0'x____ 0'x____ 0'DEEP ROCK POCKET, WITH ____ LF OF 18"POD CONNECTED TO ____ LF OF 18"SD INLET WITH TEES AND ELBOWS, PER CITY STD DETAIL 5-6 |
| 26 | CONNECT NEW GAS MAIN TO EXISTING, FIELD LOCATE, COORDINATE WITH GAS COMPANY FOR DETAILS |
| 27 | TRENCH AND INSTALL CONDUIT AND VAULTS FOR (POWER~ SERVICE, COORDINATE WORK WITH POWER COMPANY) GRV~ |

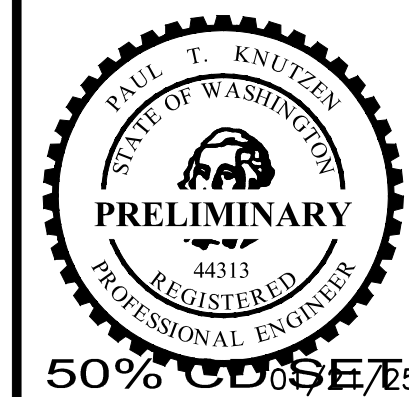
~ (E) PVMT ~
 ~ (E) CONC ~
 ~ (E) LS ~
 ~ (E) UNDEVELOPED ~
 ~ GRVL ~ ~ H. PVMT ~
 ~ PLAY PVMT ~ ~ H. CONC ~
 ~ PVMT ~ ~ LS ~
 ~ CONC ~ ~ LAWN ~

KENNEWICK SIGNATURE BLOCK

OWNER	APPROVED	DATE
CITY OF KENNEWICK PUBLIC WORKS		

NOTES

1. SEE SHEET C001 FOR GENERAL NOTES AND LEGEND.
2. SEE SHEET C003 FOR SURVEY INFORMATION.
3. SEE SHEET C005 FOR DEMOLITION AND EROSION CONTROL AND CONSTRUCTION STAGING INFORMATION.
4. SEE SHEETS C100 FOR OVERALL PHASING PLAN.
5. SEE SHEETS C200 FOR OVERALL SITE PLAN.
6. SEE SHEETS C301 FOR STRIPING, SIGNAGE AND ILLUMINATION INFORMATION.
7. DIMENSIONS ARE TO FACE OF CURB, UNLESS NOTED OTHERWISE. FIELD VERIFY ALL MEASUREMENTS AND INVERTS PRIOR TO START OF WORK.
8. A SEALED EXPANSION JOINT MATERIAL SHALL BE USED AT JOINTS WHERE NEW CONCRETE ABUTS EXISTING CONCRETE (TYP).
9. UTILITIES TO BE INSTALLED PER CITY STD DWG 1-3 UNLESS NOTED OTHERWISE.
10. SEE SHEET C501 FOR ROAD SECTIONS.
11. ALL UNDERGROUND UTILITIES ON THE SITE MAY NOT BE SHOWN. FIELD LOCATE AND VERIFY ALL UNDERGROUND UTILITIES. COORDINATE ALL RELOCATION WORK WITH THE APPROPRIATE UTILITY COMPANY AND/OR OWNER PRIOR TO ANY EXCAVATION WORK.
12. FIELD VERIFY ALL MEASUREMENTS AND INVERTS PRIOR TO START OF WORK. IMMEDIATELY NOTIFY ARCHITECT OF DISCREPANCIES BEFORE WORK COMMENCES.
13. REFER TO SHEET C501 FOR UTILITY STANDARD NOTES.



NOT FOR CONSTRUCTION
SEWER MAIN PLAN AND PROFILE

NORTH 44
DESERT SANDS PHASE 1
11292 W CLEARWATER AVE, KENNEWICK, WA 99336

APPROVAL		
DESIGN	JAW	01/21/25
CHECKED	RAM	01/21/25
APPROVED	PTK	01/21/25

SCALE: AS NOTED

CADFILE: 24068C01.1

JOB No.	REV.
24068	0

DWG. No.

C201



Preliminary Geotechnical Investigation Report Clearwater North Development Parcels:

**101884BP5063001 101884BP5063002
101884BP5063004 101884BP5063004
101884BP5063005 101884BP5063006
101884BP5063007 101884BP5063008
101884BP5063009 101884BP5063010**

Kennewick, Washington

June 30, 2023

Submitted To:

Tom Solbrack
Crimson Hills Development
2555 Highway 24
Othello, WA99344

Prepared By:
Applus, Inc
2011 Hagen Rd
Richland, WA

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FIGURES

Figure 1: Site Vicinity Map

Figure 2: Preliminary Site Plan

Figure 3: Soil Classification Chart

APPENDIX A

Test Pits TP-1 through TP-47

CERTIFICATE OF ENGINEER

***Geotechnical Investigation Report
Clearwater North Development
Kennewick, Washington***

The technical information and data contained in this report were prepared by, or under the direction and supervision of the undersigned, whose seal, as a professional engineer licensed to practice as such, is affixed below.

Prepared by:

Benjamin P. Staehr, PE
Principal Geotechnical Engineer



1.0 INTRODUCTION

1.1 Project Description and Background Information

Applus, Inc. is pleased to present this Preliminary Geotechnical Investigation Report for the grading of lots, and apartments complex within Parcels 101884BP5063001 through 101884BP5063010, in Kennewick, WA. The location of the site is shown in Figure 1, Vicinity Map and preliminary site plan is provided in Figure 2, Preliminary Site Plan. This parcel consists of approximately 64 acres of undeveloped land that we understand you intend on levelling for commercial lots, residential subdivisions and apartment developments.

The site consists of mostly undisturbed ground with a small areas of dumped concrete debris in the center of the parcel. It is bordered by W Clearwater Avenue along to the south property line, commercial properties to the east and west, and BNSF railroad ROW along north property line.

This report presents the results of our geotechnical investigation of this site. It includes a review of the site geology, a description of site soils and subsurface profile, and geotechnical recommendations and specifications for site grading and construction of building foundations consistent with International Building Code requirements.

1.2 Scope of Services

Our scope of services for this project included the following:

- **Geologic Literature Review:** Relevant, readily-available geologic information on the site and surrounding area was reviewed for information regarding geologic conditions at or near the site.
- **Site Exploration:** Forty seven exploration test pits were excavated at the site to assess the soil conditions and to obtain representative soil samples for laboratory testing.
- **Laboratory Testing:** Soil testing included index properties testing, sieve analyses, and proctor testing as required.
- **Geotechnical Engineering Analysis:** Data collected during the site exploration, literature research, and laboratory testing were analyzed to develop project-specific geotechnical design and construction recommendations for the project.
- **Report Preparation:** This geotechnical report contains the results of our work including information as it relates to the following:
 - Site exploration and laboratory test results
 - Soil/rock conditions and subsurface profile
 - Earthwork and site preparation recommendations
 - Site grading and soil placement recommendations
 - Slope design and construction recommendations
 - Foundation subgrade soil preparation recommendations
 - Allowable soil bearing capacities and maximum foundation bearing pressures
 - Foundation wall design parameters and design earth pressures
 - Pavement and slab-on-grade recommendations

-
- International Building Code (IBC) 2018 seismic design parameters
 - General site grading and drainage control requirements
- **Geotechnical Construction Observation:** This report includes the outline of basic geotechnical requirements for construction observation and documentation to be performed during the construction process.

2.0 SITE INVESTIGATION

2.1 Literature Review

Information about the basic geology of the Pasco Basin was obtained from Lindsey (1996) and a discussion of the underlying Miocene-age basalt bedrock structure was provided from Reidel (et al., 1994). Information about the geologic setting of the site comes from many years of exploration work throughout Richland, West Richland, and Kennewick and from correlating the site data with regional geologic conditions.

2.2 Field Investigation

The subsurface investigation of this site included excavation of forty-seven exploration test pits at locations shown on Figure 2.

The test pits were excavated with a tracked excavator on May 3, 2023. In general, the test pits encountered grayish brown, damp, medium dense, silty fine sands, with weak reaction to diluted HCL from surface to depths between 0 to 5 feet below grade, at which point the sands transitioned to dense and became dry with strong reaction to diluted HCL. The test pit logs, provided in Appendix A (TP-1 through TP-47), include detailed descriptions of the subsurface soil types and condition.

2.3 Laboratory Testing and Analysis

Soil samples were collected from various test pits at different elevations for gradation analysis and proctor testing. All soil samples were classified under the Unified Soil Classification System (USCS). The soil descriptions were prepared according to the Burmister Classification System.

3.0 SITE CONDITIONS

3.1 Surface Conditions and Lot Slopes

The property is similar to stabilized dunes, with high and low spots and undulations throughout. A Bonneville Power Administration right-of-way (BPA ROW) bisects the property. Various trails and access roadways exist across the property. The southeast corner of the property appears to have been cleared at some point, as well as some central portions that show signs of borrow material being removed. Small areas of dumped construction debris exist at the center of the property.

3.2 Site Soils

Our site explorations revealed mostly silt and sand deposits consistent with the mapped outburst flood sands and silts.

3.3 Regional and Local Geology

We reviewed the WADNR Geologic map of the Richland 1:100,000 Quadrangle (Riedel, et al.), 1994. The site is classified as outburst flood deposits, silt and sand (Qfs₃). The Qfs₃ deposits are described as lacustrine silt and fine sand and fluvial coarse to fine sand.

Based on our explorations in the area we interpret that the site soils are consistent with outburst flood deposits, silt and sand (Pleistocene). More recent eolian activity has created various undulations across the property.

4.0 PRELIMINARY GEOTECHNICAL DESIGN RECOMMENDATIONS

At this time, the proposed use of the property will be two separate phases of residential developments east of the BPA ROW, with 3 commercial lots and a possible apartment development to the west of the ROW. We understand that your intention is to mass grade the property and begin development with the first of the residential subdivisions.

This report is considered preliminary and will provide recommendations for mass grading of fill soils to support general residential and commercial development. Specific investigation for stormwater facilities within the developments, as well as special requirements for apartment buildings exceeding 2-stories in height, as well as specific bearing requirements for commercial construction will require additional geotechnical work.

4.1 Foundation Configuration

Building foundations should be extended through any loose or fill soils on site and founded on competent native site soils or structural fills below.

4.2 Site Preparation

Clear and grub all cut and fill areas of all surface vegetation and either use as landscape fill or haul offsite. Remove all roots and organic material, loose or soft soil, and old topsoil from all areas to receive fill soils, pavement, foundations, driveways, etc.

4.3 Earthwork

4.3.1 Excavations

Excavation of the surface silty fine sand soils can be accomplished with a tracked excavator, dozer, or large scraper that is amenable to mass grading.

A maximum slope of 1V:2.0H (vertical to horizontal) is recommended for all unsupported excavation sidewalls in the sandy soil at the site. Any trenching or excavation over 4.0 feet bgs requires either the previously-mentioned side slopes or shoring and bracing of the excavation.

This information on slope protection is based on Occupational Safety and Health Administration (OSHA) regulations and is provided entirely as a service to our Client. Under no circumstances should the Client or their contractors or subcontractors interpret this information to mean, or otherwise imply, that Applus, Inc. assumes responsibility for construction site safety and/or temporary slope stability, or the contractor activities. Such responsibility is not implied and should not be inferred.

4.3.2 Site Grading

All excavated materials will be kept on site and used as backfill to level the site. All soil fill placed is considered to be structural fill that must be placed and compacted to the specifications listed in the following section 4.4.4 Structural Fill.

All site grading shall be performed according to Appendix J: Grading of the 2018 International Building Code or specific recommendations included in this report.

4.3.3 Cut and Fill Slopes

All finish slopes shall be graded to a maximum slope of 1V:2H. All fill slopes shall be constructed from the base upward by compacting the soil in layers, overbuilding the slope, and then finish grading to a maximum slope of 1V:2H. Temporary soil cuts should not exceed four feet unless approved by the geotechnical engineer and plans are made for providing immediate permanent structural support.

4.3.4 Structural Fill

For structural fill, use existing onsite soil or imported granular soil. The onsite soil can be used as structural fill provided it is free of organics, it is installed in maximum 12-inch-loose lifts and it is compacted in place. Structural fill soil shall not contain cobbles or clasts exceeding 4-inches in diameter. Backfill soil next to the foundations shall be classified as primarily sand and gravel with no boulders or clasts exceeding 3 inches in diameter.

Imported fill should be well graded between coarse and fine with a maximum particle size of 1 inch and contain no deleterious materials. Imported fill should have a less than 20 percent by weight passing the No. 200 sieve. Imported soil fill shall be approved for use by a geotechnical engineer and soil compaction criteria shall be established for the specific material.

All structural fill shall be installed in 12-inch, maximum loose lifts, it shall be moisture conditioned to within +/- 2 percent of optimum moisture content and it shall be compacted to at least 95 percent of its maximum dry density as determined by the modified proctor test using ASTM International (ASTM) D1557 or per onsite specification and approval by the geotechnical engineer.

A minimum of 1 test per 4,000 square feet of compacted area will be required per lift placed. If failing tests are encountered, more tests will be required to ensure proper placement of fill materials.

Vibratory roller compactors or wheel roller compaction equipment will produce the best soil compaction results at this site. It is possible to compact soils with the use of scrapers to wheel roll the material in-place. Means, method, and sequence of compaction is at the discretion of the earthwork contractor.

4.4 Foundations

4.4.1 Design

Buildings can be supported on conventional spread footings. All footings should be supported on properly prepared subgrade in native soils or on structural fill as discussed in the previous paragraphs. Footing subgrade soil shall be inspected,

tested, and approved by a licensed engineer prior to pouring the footings. If ongoing inspections and testing are performed during mass grading, the engineer of record can approve all fill soils within the specific development with no additional footing or subgrade inspections required. This is assuming that all construction will be standard light frame construction not exceeding 2-stories in height. All buildings should be constructed according to current IRC and IBC standards.

The minimum widths of the continuous wall footings shall be consistent with current IRC and IBC standards. The bottom exterior of all footings shall be at least 24 inches below the lowest adjacent exterior grade for frost protection.

Applus recommends using a maximum soil bearing pressure of 1,500 pounds per square foot (psf) for all footings that bear on the near-surface, or sandy soil consistent with current IBC standards. Please note that this allowable soil bearing pressure assumes a minimum confinement depth, or depth of burial, of 2.0 feet bgs.

The use of 1,500 psf for allowable bearing pressure is dependent on full confinement of footings. Confinement in this case is defined as full burial of all footings to a minimum of 2.0 feet below the nearest adjacent surface ON ALL SIDES. If footings are not confined (i.e., the inside of exterior footings, or strip footings within a crawl space poured directly on grade and left unburied), allowable bearing pressure should be reduced to 750 psf.

An assessment of loading on the foundation system by the designer, architect, or structural engineer is required to verify that the footing sizes comply with the previously-mentioned requirements and the footings are correctly proportioned for the specified bearing capacity.

For consideration of short period seismic and wind pressures, the allowable footing bearing pressure values provided in this section may be increased by one-third. Use a dynamic bearing capacity of 2,000 lb/ft² when sizing footings for transient forces. For lateral forces, use a friction coefficient of 0.3 between the base of the footings and the underlying subgrade soil.

4.4.2 Settlement

Settlement estimates are based on subgrade soils, footing depth, footing size, and loading on footings. If soils are properly prepared according to the recommendations in this report and all buildings are constructed according to applicable building code, settlement of buildings should not be a concern. If buildings are constructed that exceed the listed allowable bearing pressures, including footings that are not properly confined, the risk of differential and overall settlement will significantly increase.

4.4.3 Foundation Backfill

The clear space around the exterior of all foundations and between the stem walls and footing trenches shall be backfilled in lifts and compacted to a minimum of 92 percent of maximum dry density per ASTM D1557, or per onsite inspection and approval by the geotechnical engineer. Care must be taken with the backfilling operation to provide foundation subgrade soil confinement pressure and to help limit infiltration and future settlement around the foundation.

4.4.4 Foundation Walls and Lateral Earth Pressure

For the design of elevated stem walls and garage foundation walls, use the data in the following Table 1:

Table 1: Native Soil Design Parameters

Assumed Soil Density	=	100 lb/ft ³
Assumed Soil Internal Friction Angle	=	30 degrees
Coefficient of At-Rest Earth Pressure,	K_o =	0.50
At-Rest Earth Pressure Equivalent Fluid Density	=	50.0 lb/ft ³
Coefficient of Active Earth Pressure,	K_a =	0.33
Active Earth Pressure Equivalent Fluid Density	=	33.3 lb/ft ³
Coefficient of Passive Earth Pressure,	K_p =	3.00
Passive Earth Pressure Equivalent Fluid Density	=	300 lb/ft ³

All foundation walls must be backfilled with compacted soil to fully mobilize the passive earth resistance. Backfill placed within 3 feet of foundation walls should be placed in maximum 12-inch, loose lifts and compacted to at least 92 percent of the maximum dry density, as determined by ASTM D1557.

4.4.5 Seismic Design Criteria

The soil profile at the site consists of silty sand surface soil underlain by medium dense silty fine sand followed by dense sandy gravels. This soil profile conforms to a seismic design "Site Class D", stiff soil. For this site, use the following seismic design parameters found in the following Table 2:

Table 2: ASCE/SEI 7-16 Seismic Design Parameters

	Short Period	1 sec
Maximum Credible Earthquake Acceleration	$S_s = 0.431$	$S_1 = 0.163$
Site Class	C	
Site Coefficient	$F_a = 1.455$	$F_v = 2.273$
Adjusted Spectral Acceleration	$S_{MS} = 0.627$	$S_{M1} = 0.372$
Design Response Acceleration	$S_{DS} = 0.418$	$S_{D1} = 0.248$
Design Peak Ground Acceleration	0.188 g	

The presence of elevated groundwater and fine sands present a potential hazard via liquefaction during seismic shaking. The site is listed as low to moderate potential for liquefaction based on the WSDNR maps. We evaluated nearby well logs and find that groundwater depth is approximately 70 feet below grade. Based on the soil profile and depth to groundwater, we find that the liquefaction hazard for this site to be low.

4.5 Slabs on Grade

Slabs-on-grade should be supported on subgrade soils prepared as described in **Section 4.3.2 Site Grading** subsection of this report. Clean crushed rock, at least 4 inches thick and compacted into place should be placed throughout the planned slab areas and over the exposed native soils. We recommend that all floor slabs be underlain by at least four inches of free-draining gravel with less than three percent by

weight of the material passing Sieve No. 200 for use as a capillary break. A suitable vapor barrier, such as heavy plastic sheeting (6-mil minimum), should be placed over the capillary break material. An additional 2-inch thick moist sand layer may be used to cover the vapor barrier. This sand layer is optional and is intended to protect the vapor barrier membrane during construction.

5.0 FINAL SITE GRADING AND EROSION CONTROL

The ground surface adjacent to buildings shall slope away from the slab, stem walls, or foundation walls at 5 percent for a minimum distance of 10 feet from the structure per the requirements of the IBC, or an alternative drainage method shall be designed into the site drainage plan. Landscaping and lot grading should consider drainage requirements of the building and prevent ponding of water near the structures or in landscaped areas. All impervious surfaces shall be sloped to drain into an approved catch basin and piped to an appropriate infiltration system on-site.

All final slope surfaces should be moisture conditioned and compacted with a track dozer or some other compaction method that will work on the slope to achieve a smooth slope with a maximum slope angle of 1V:2H. A maximum slope of 1V:3H should be used if the slope will be maintained in grass and mowed. Finish soil slopes that are steeper than 1V:3H require some form of erosion protection to prevent water erosion at the surface in the event of an irrigation or domestic water line break. Erosion protection of these slopes should be designed into the final landscaping plan for the lot. Several options exist for slope protection and erosion control including but not limited to the following:

- The slope can be planted with drought-resistant plants (desert landscape) and watered with drip irrigation systems or light hand watering.
- Erosion control blankets or geotextile can be utilized along with sparsely-placed suitable vegetation. The erosion control blanket provides more immediate slope protection with the vegetation and will aid in long-term stability.
- The slope can be covered with a landscape fabric and then covered with decorative gravel, cobble, or rock.

Existing slopes that are undisturbed and covered with native desert vegetation are all less than 1V:3H and do not require any form of erosion control. We recommend hydroseeding of the parcel upon completion of grading to stabilize the sandy soils from wind erosion.

6.0 SITE DRAINAGE AND STORMWATER INFILTRATION

No specific stormwater infiltration analysis was performed at this site. If specific site infiltration rates are required further explorations will be necessary.

We generally recommend roof drains to prevent concentration of stormwater runoff near foundations, however this is at the discretion of the owner. We would recommend that any stormwater or roof drains be routed away from the building to an appropriate collection area.

7.0 CONSTRUCTION OBSERVATION AND ENGINEERING INSPECTIONS

Geotechnical engineering construction observation is required during construction to monitor earthwork, soil, and groundwater conditions and to document the geotechnical aspects of constructing the building. Construction observation will allow us to identify unexpected soil or

groundwater conditions that were not identified in our site explorations and will allow us to adjust our geotechnical recommendations as required.

This project will require several onsite inspection visits by the geotechnical engineer to observe field conditions and verify the following items:

- Geotechnical engineering review of the building construction plans.
- Geotechnical engineering observation and approval of site grading, soil placement, and compaction.
- Geotechnical engineering inspection, testing, and approval of the building foundation subgrade soil conditions.
- Geotechnical engineering inspection and documentation of the backfill around foundation and stem walls.
- Geotechnical engineering inspection and documentation of any stormwater collection and infiltration system.
- Geotechnical engineering approval of final site grading.

8.0 REFERENCES

Lindsey, K.A. (1996). *The Miocene to Pliocene Ringold Formation and Associated Deposits of the Ancestral Columbia River System, South-Central Washington and North-Central Oregon*. Washington Department of Natural Resources, Division of Geology and Earth Resources, Open-File Report 96-8, 45 p., 4 Appendices.

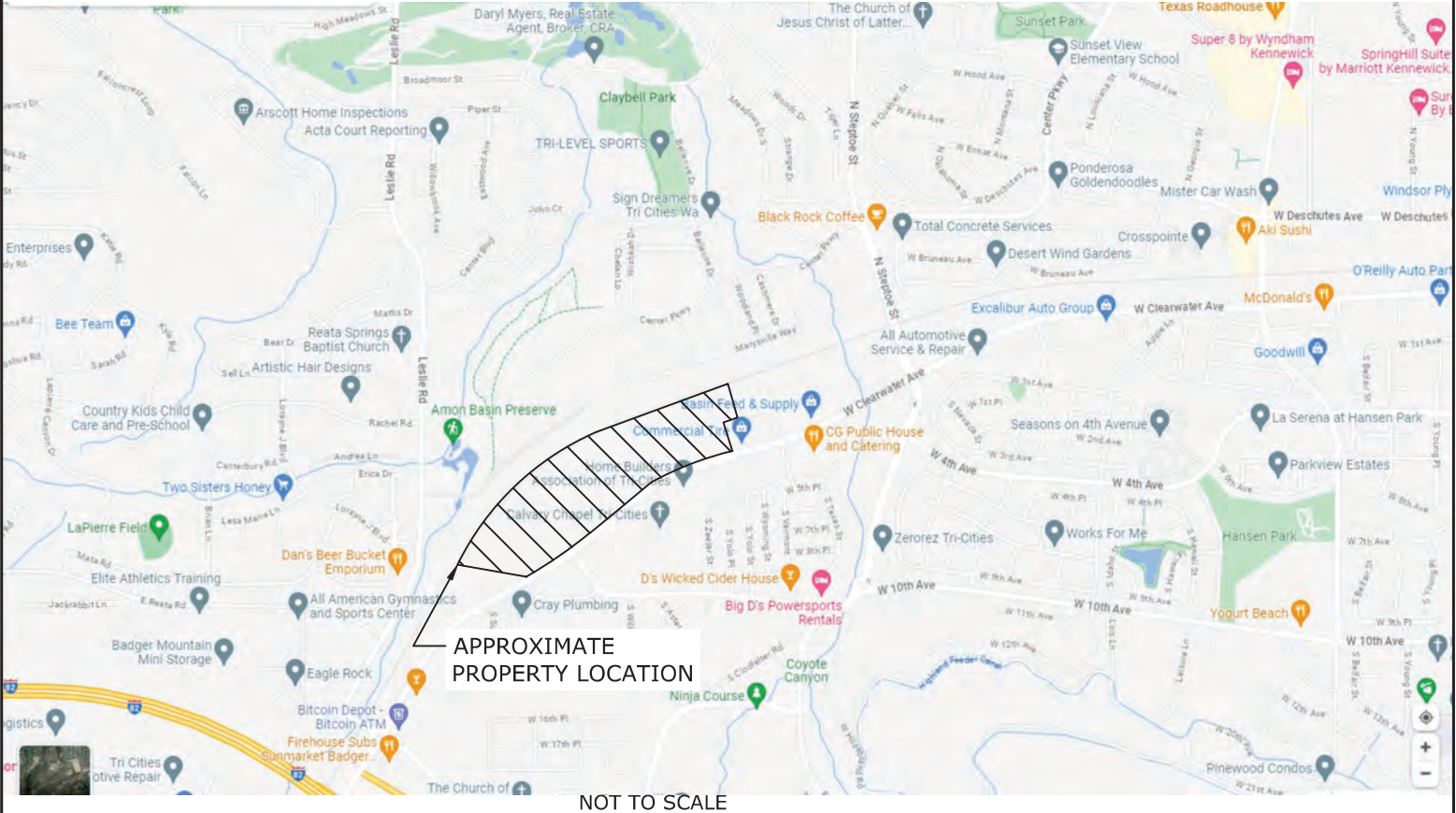
Reidel, S.P., N.P., Campbell, K.R. Fecht, and K.A. Lindsey (1994). *Late Cenozoic Structure and Stratigraphy of South-Central Washington*. Bulletin 80, Washington Division of Geology and Earth Resources, Washington Department of Natural Resources

FIGURES

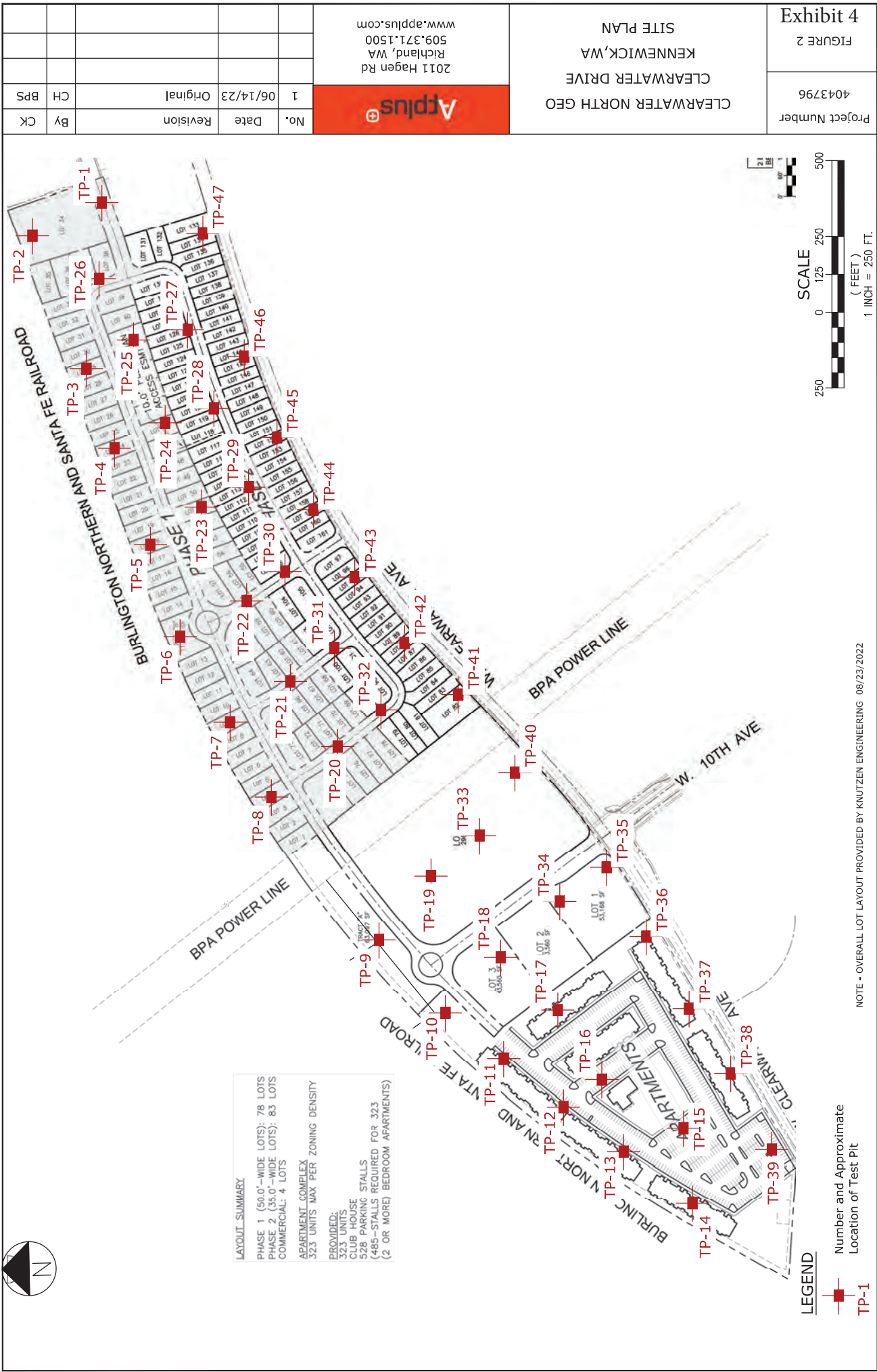
Figure 1: Vicinity Map

Figure 2: Preliminary Site Plan

Figure 3: Soil Classification Chart



Project Number	CLEARWATER NORTH GEO CLEARWATER DRIVE KENNEWICK, WA VICINITY MAP		No.	Date	Revision	By	CK
4043796			1	06/14/23	Original	CH	BPS
Figure 1		2011 Hagen Rd Richland, WA 509.371.1500 www.applus.com					



UNIFIED SOIL CLASSIFICATION SYSTEM Exhibit 4

MAJOR DIVISIONS			GROUP SYMBOL	GROUP NAME
COARSE - GRAINED SOILS MORE THAN 50 % RETAINED ON NO. 200 SIEVE	GRAVEL MORE THAN 50 % OF COARSE FRACTION RETAINED ON NO. 4 SIEVE	CLEAN GRAVEL	GW	WELL-GRADED, FINE TO COARSE GRAVEL
			GP	POORLY-GRADED GRAVEL
		GRAVEL WITH FINES	GM	SILTY GRAVEL
			GC	CLAYEY GRAVEL
	SAND MORE THAN 50 % OF COARSE FRACTION PASSES NO. 4 SIEVE	CLEAN SAND	SW	WELL-GRADED SAND, FINE TO COARSE SAND
			SP	POORLY GRADED SAND
		SAND WITH FINES	SM	SILTY SAND
			SC	CLAYEY SAND
FINE - GRAINED SOILS MORE THAN 50 % PASSES NO. 200 SIEVE	SILT AND CLAY LIQUID LIMIT LESS THAN 50 %	INORGANIC	ML	SILT
			CL	CLAY
		ORGANIC	OL	ORGANIC SILT, ORGANIC CLAY
	SILT AND CLAY LIQUID LIMIT 50 % OR MORE	INORGANIC	MH	SILT OF HIGH PLASTICITY, ELASTIC SILT
			CH	CLAY OF HIGH PLASTICITY, FAT CLAY
		ORGANIC	OH	ORGANIC CLAY, ORGANIC SILT
			HIGHLY ORGANIC SOILS	

NOTES:

- 1) Field classification is based on visual examination of soil in general accordance with ASTM D 2488-93.
- 2) Soil classification using laboratory tests is based on ASTM D 2488-93.
- 3) Descriptions of soil density or consistency are based on interpretation of blowcount data, visual appearance of soils, and/or test data.

SOIL MOISTURE MODIFIERS:

- Dry - Absence of moisture, dusty, dry to the touch
- Damp - No visible water, leaves hand dry.
- Moist - Leaves water or mud on hand.
- Wet - Visible free water or saturated, usually soil is obtained from below water table

Project Number 4043796	CLEARWATER NORTH GEO CLEARWATER DR KENNEWICK, WA USCS		No.	Date	Revision	By	CK
			1	06/14/23	Original	CH	BPS
Figure 3		2011 Hagen Rd Richland, WA 509.371.1500 www.applus.com					

APPENDIX A

Test Pits TP-1 through TP-47

PROJECT NUMBER 4043796	EXCAVATION DATE 5/3/2022	COORDINATES 46,206325,-119,249970
PROJECT NAME Clearwater North Geo		COORD SYS GPS
CLIENT Sunny Hill Development		SURFACE ELEVATION 575 ft.
ADDRESS Clearwater Drive, Kennewick, WA	EXCAVATION METHOD Deere 160 G LC	LOGGED BY CH
	TOTAL DEPTH 10.0 feet	CHECKED BY BPS

COMMENTS

Depth (ft)	Material Description	Graphic Log	USCS	Blow Count	Samples	Laboratory Test	Penetration Resistance
							0 60
1	Medium dense, grayish brown (10 YR), dry, Silty f SAND No reaction to diluted HCL		SM				
2							
3							
4							
5							
6	Medium dense, grayish brown (10 YR), dry, Silty f SAND Weak reaction to diluted HCL		SM				
7							
8							
9							
10							
	Test pit terminated at 10.0 ft. on 05/3/23				Sample collected		

PROJECT NUMBER 4043796	EXCAVATION DATE 5/3/2023	COORDINATES 46,206895,-119,250235
PROJECT NAME Clearwater North Geo		COORD SYS GPS
CLIENT Sunny Hill Development		SURFACE ELEVATION 563 ft.
ADDRESS Clearwater Drive, Kennewick, WA	EXCAVATION METHOD Deere 160 G LC	LOGGED BY CH
	TOTAL DEPTH 10.0 feet	CHECKED BY BPS

COMMENTS

Depth (ft)	Material Description	Graphic Log	USCS	Blow Count	Samples	Laboratory Test	Penetration Resistance
							0 60
1	Medium dense, grayish brown (10 YR), dry, Silty f SAND Weak reaction to diluted HCL		SM				
2							
3							
4							
5	Dense, grayish brown (10 YR), dry, Silty f SAND Weak reaction to diluted HCL		SM				
6							
7							
8							
9							
10	Test pit terminated at 10.0 ft. on 05/3/23						

PROJECT NUMBER 4043796	EXCAVATION DATE 5/3/2023	COORDINATES 46,206549,-119,251815
PROJECT NAME Clearwater North Geo		COORD SYS GPS
CLIENT Sunny Hill Development		SURFACE ELEVATION 574 ft.
ADDRESS Clearwater Drive, Kennewick, WA	EXCAVATION METHOD Deere 160 G LC	LOGGED BY CH
	TOTAL DEPTH 10.0 feet	CHECKED BY BPS

COMMENTS

Depth (ft)	Material Description	Graphic Log	USCS	Blow Count	Samples	Laboratory Test	Penetration Resistance
							0 60
1	Medium dense, grayish brown (10 YR), dry, Silty f SAND Weak reaction to diluted HCL		SM				
2							
3							
4							
5							
6	Medium dense, grayish brown (10 YR), dry, Silty f SAND Weak reaction to diluted HCL		SM				
7							
8							
9							
10							
	Test pit terminated at 10.0 ft. on 05/3/23						

PROJECT NUMBER 4043796	EXCAVATION DATE 5/3/2023	COORDINATES 46,206379,-119,252900
PROJECT NAME Clearwater North Geo		COORD SYS GPS
CLIENT Sunny Hill Development		SURFACE ELEVATION 577 ft.
ADDRESS Clearwater Drive, Kennewick, WA	EXCAVATION METHOD Deere 160 G LC	LOGGED BY CH
	TOTAL DEPTH 10.0 feet	CHECKED BY BPS

COMMENTS

Depth (ft)	Material Description	Graphic Log	USCS	Blow Count	Samples	Laboratory Test	Penetration Resistance
							0 60
1	Medium dense, grayish brown (10 YR), damp, Silty f SAND Weak reaction to diluted HCL		SM				
2							
3							
4							
5	Medium dense, grayish brown (10 YR), dry, Silty f SAND Weak reaction to diluted HCL		SM				
6					Sample collected		
7							
8							
9							
10	Test pit terminated at 10.0 ft. on 05/3/23						

PROJECT NUMBER 4043796	EXCAVATION DATE 5/3/2023	COORDINATES 46,206159,-119,253920
PROJECT NAME Clearwater North Geo		COORD SYS GPS
CLIENT Sunny Hill Development		SURFACE ELEVATION 573 ft.
ADDRESS Clearwater Drive, Kennewick, WA	EXCAVATION METHOD Deere 160 G LC	LOGGED BY CH
	TOTAL DEPTH 10.0 feet	CHECKED BY BPS

COMMENTS

Depth (ft)	Material Description	Graphic Log	USCS	Blow Count	Samples	Laboratory Test	Penetration Resistance
							0 60
1	Medium dense, grayish brown (10 YR), dry, Silty f SAND Strong reaction to diluted HCL		SM				
2							
3							
4							
5							
6	Dense, grayish brown (10 YR), dry, Silty f SAND Strong reaction to diluted HCL		SM				
7							
8							
9					Sample collected		
10	Test pit terminated at 10.0 ft. on 05/3/23						

PROJECT NUMBER 4043796	EXCAVATION DATE 5/3/2023	COORDINATES 46,206101,-119,253208
PROJECT NAME Clearwater North Geo		COORD SYS GPS
CLIENT Sunny Hill Development		SURFACE ELEVATION 570 ft.
ADDRESS Clearwater Drive, Kennewick, WA	EXCAVATION METHOD Deere 160 G LC	LOGGED BY CH
	TOTAL DEPTH 10.0 feet	CHECKED BY BPS

COMMENTS

Depth (ft)	Material Description	Graphic Log	USCS	Blow Count	Samples	Laboratory Test	Penetration Resistance
							0 60
1	Medium dense, grayish brown (10 YR), damp, Silty f SAND Weak reaction to diluted HCL		SM				
2							
3							
4							
5							
6	Dense, grayish brown (10 YR), dry, Silty f SAND Weak reaction to diluted HCL		SM				
7							
8							
9							
10	Test pit terminated at 10.0 ft. on 05/3/23						

PROJECT NUMBER 4043796	EXCAVATION DATE 5/3/2023	COORDINATES 46,205873,-119,254358
PROJECT NAME Clearwater North Geo		COORD SYS GPS
CLIENT Sunny Hill Development		SURFACE ELEVATION 575 ft.
ADDRESS Clearwater Drive, Kennewick, WA	EXCAVATION METHOD Deere 160 G LC	LOGGED BY CH
	TOTAL DEPTH 11.0 feet	CHECKED BY BPS

COMMENTS

Depth (ft)	Material Description	Graphic Log	USCS	Blow Count	Samples	Laboratory Test	Penetration Resistance
							0 60
1	Medium dense, grayish brown (10 YR), damp, Silty f SAND Strong reaction to diluted HCL		SM				
2							
3					Sample collected		
4	Dense, grayish brown (10 YR), dry, Silty f SAND Strong reaction to diluted HCL		SM				
5							
6							
7			SM				
8	Dense, Olive brown (2.5 Y), dry, Silty f SAND Weak reaction to diluted HCL						
9							
10							
11	Test pit terminated at 11.0 ft. on 05/3/23				Sample collected		

PROJECT NUMBER 4043796	EXCAVATION DATE 5/3/2023	COORDINATES 46,205641,-119,255269
PROJECT NAME Clearwater North Geo		COORD SYS GPS
CLIENT Sunny Hill Development		SURFACE ELEVATION 568 ft.
ADDRESS Clearwater Drive, Kennewick, WA	EXCAVATION METHOD Deere 160 G LC	LOGGED BY CH
	TOTAL DEPTH 10.0 feet	CHECKED BY BPS

COMMENTS

Depth (ft)	Material Description	Graphic Log	USCS	Blow Count	Samples	Laboratory Test	Penetration Resistance
							0 60
1	Medium dense, grayish brown (10 YR), damp, Silty f SAND Weak reaction to diluted HCL		SM				
2							
3							
4	Dense, grayish brown (10 YR), dry, Silty f SAND Weak reaction to diluted HCL		SM				
5							
6							
7							
8							
9							
10	Test pit terminated at 10.0 ft. on 05/3/23						

PROJECT NUMBER 4043796	EXCAVATION DATE 5/3/2023	COORDINATES 46,204866,-119,257115
PROJECT NAME Clearwater North Geo		COORD SYS GPS
CLIENT Sunny Hill Development		SURFACE ELEVATION 547 ft.
ADDRESS Clearwater Drive, Kennewick, WA	EXCAVATION METHOD Deere 160 G LC	LOGGED BY CH
	TOTAL DEPTH 10.0 feet	CHECKED BY BPS

COMMENTS

Depth (ft)	Material Description	Graphic Log	USCS	Blow Count	Samples	Laboratory Test	Penetration Resistance
							0 60
1	Medium dense, grayish brown (10 YR), dry, Silty f SAND Weak reaction to diluted HCL		SM				
2							
3							
4							
5	Dense, grayish brown (10 YR), dry, Silty f SAND Weak reaction to diluted HCL		SM				
6							
7							
8							
9							
10	Test pit terminated at 10.0 ft. on 05/3/23						

PROJECT NUMBER 4043796	EXCAVATION DATE 5/3/2023	COORDINATES 46,204444,-119,257947
PROJECT NAME Clearwater North Geo		COORD SYS GPS
CLIENT Sunny Hill Development		SURFACE ELEVATION 544 ft.
ADDRESS Clearwater Drive, Kennewick, WA	EXCAVATION METHOD Deere 160 G LC	LOGGED BY CH
	TOTAL DEPTH 10.0 feet	CHECKED BY BPS

COMMENTS

Depth (ft)	Material Description	Graphic Log	USCS	Blow Count	Samples	Laboratory Test	Penetration Resistance
							0 60
1	Medium dense, grayish brown (10 YR), dry, Silty f SAND Weak reaction to diluted HCL		SM				
2							
3							
4	Dense, grayish brown (10 YR), dry, Silty f SAND Strong reaction to diluted HCL		SM				
5							
6							
7							
8							
9							
10	Test pit terminated at 10.0 ft. on 05/3/23						

PROJECT NUMBER 4043796	EXCAVATION DATE 5/3/2023	COORDINATES 46,204085,-119,258612
PROJECT NAME Clearwater North Geo		COORD SYS GPS
CLIENT Sunny Hill Development		SURFACE ELEVATION 559 ft.
ADDRESS Clearwater Drive, Kennewick, WA	EXCAVATION METHOD Deere 160 G LC	LOGGED BY CH
	TOTAL DEPTH 10.0 feet	CHECKED BY BPS

COMMENTS

Depth (ft)	Material Description	Graphic Log	USCS	Blow Count	Samples	Laboratory Test	Penetration Resistance
							0 60
1	Medium dense, grayish brown (10 YR), damp, Silty f SAND Weak reaction to diluted HCL		SM				
2							
3							
4	Dense, grayish brown (10 YR), dry, Silty f SAND Strong reaction to diluted HCL		SM				
5							
6							
7							
8							
9							
10	Test pit terminated at 10.0 ft. on 05/3/23						

PROJECT NUMBER 4043796	EXCAVATION DATE 5/3/2023	COORDINATES 46,203697,-119,259304
PROJECT NAME Clearwater North Geo		COORD SYS GPS
CLIENT Sunny Hill Development		SURFACE ELEVATION 572 ft.
ADDRESS Clearwater Drive, Kennewick, WA	EXCAVATION METHOD Deere 160 G LC	LOGGED BY CH
	TOTAL DEPTH 10.0 feet	CHECKED BY BPS

COMMENTS

Depth (ft)	Material Description	Graphic Log	USCS	Blow Count	Samples	Laboratory Test	Penetration Resistance
							0 60
1	Medium dense, grayish brown (10 YR), damp, Silty f SAND Weak reaction to diluted HCL		SM				
2							
3							
4	Dense, grayish brown (10 YR), dry, Silty f SAND Strong reaction to diluted HCL		SM				
5							
6							
7							
8							
9							
10	Test pit terminated at 10.0 ft. on 05/3/23				Sample collected		

PROJECT NUMBER 4043796	EXCAVATION DATE 5/3/2023	COORDINATES 46,203276,-119,259905
PROJECT NAME Clearwater North Geo		COORD SYS GPS
CLIENT Sunny Hill Development		SURFACE ELEVATION 574 ft.
ADDRESS Clearwater Drive, Kennewick, WA	EXCAVATION METHOD Deere 160 G LC	LOGGED BY CH
	TOTAL DEPTH 10.0 feet	CHECKED BY BPS

COMMENTS

Depth (ft)	Material Description	Graphic Log	USCS	Blow Count	Samples	Laboratory Test	Penetration Resistance
							0 60
1	Medium dense, grayish brown (10 YR), dry, Silty f SAND Weak reaction to diluted HCL		SM				
2							
3							
4	Dense, grayish brown (10 YR), dry, Silty f SAND Strong reaction to diluted HCL		SM				
5							
6							
7							
8							
9							
10	Test pit terminated at 10.0 ft. on 05/3/23						

PROJECT NUMBER 4043796	EXCAVATION DATE 5/3/2023	COORDINATES 46,202767,-119,260637
PROJECT NAME Clearwater North Geo		COORD SYS GPS
CLIENT Sunny Hill Development		SURFACE ELEVATION 563 ft.
ADDRESS Clearwater Drive, Kennewick, WA	EXCAVATION METHOD Deere 160 G LC	LOGGED BY CH
	TOTAL DEPTH 10.0 feet	CHECKED BY BPS

COMMENTS

Depth (ft)	Material Description	Graphic Log	USCS	Blow Count	Samples	Laboratory Test	Penetration Resistance
							0 60
1	Medium dense, grayish brown (10 YR), dry, Silty f SAND Weak reaction to diluted HCL		SM				
2							
3							
4							
5							
6	Dense, grayish brown (10 YR), dry, Silty f SAND Weak reaction to diluted HCL		SM				
7							
8							
9							
10	Test pit terminated at 10.0 ft. on 05/3/23						

PROJECT NUMBER 4043796	EXCAVATION DATE 5/3/2023	COORDINATES 46,201509,-119,260859
PROJECT NAME Clearwater North Geo		COORD SYS GPS
CLIENT Sunny Hill Development		SURFACE ELEVATION 581 ft.
ADDRESS Clearwater Drive, Kennewick, WA	EXCAVATION METHOD Deere 160 G LC	LOGGED BY CH
	TOTAL DEPTH 9.0 feet	CHECKED BY BPS

COMMENTS

Depth (ft)	Material Description	Graphic Log	USCS	Blow Count	Samples	Laboratory Test	Penetration Resistance
							0 60
1	Medium dense, grayish brown (10 YR), damp, Silty f SAND Weak reaction to diluted HCL		SM				
2							
3							
4							
5	Dense, grayish brown (10 YR), dry, Silty f SAND Strong reaction to diluted HCL		SM				
6							
7							
8							
9	Test pit terminated at 9.0 ft. on 05/3/23						

PROJECT NUMBER 4043796	EXCAVATION DATE 5/3/2023	COORDINATES 46,201986,-119,260196
PROJECT NAME Clearwater North Geo		COORD SYS GPS
CLIENT Sunny Hill Development		SURFACE ELEVATION 585 ft.
ADDRESS Clearwater Drive, Kennewick, WA	EXCAVATION METHOD Deere 160 G LC	LOGGED BY CH
	TOTAL DEPTH 10.0 feet	CHECKED BY BPS

COMMENTS

Depth (ft)	Material Description	Graphic Log	USCS	Blow Count	Samples	Laboratory Test	Penetration Resistance
							0 60
1	Medium dense, grayish brown (10 YR), damp, Silty f SAND Weak reaction to diluted HCL		SM				
2							
3							
4							
5							
6	Dense, grayish brown (10 YR), dry, Silty f SAND Strong reaction to diluted HCL		SM				
7							
8							
9							
10	Test pit terminated at 10.0 ft. on 05/3/23						

PROJECT NUMBER 4043796	EXCAVATION DATE 5/3/2023	COORDINATES 46,202430,-119,259445
PROJECT NAME Clearwater North Geo		COORD SYS GPS
CLIENT Sunny Hill Development		SURFACE ELEVATION 590 ft.
ADDRESS Clearwater Drive, Kennewick, WA	EXCAVATION METHOD Deere 160 G LC	LOGGED BY CH
	TOTAL DEPTH 10.0 feet	CHECKED BY BPS

COMMENTS

Depth (ft)	Material Description	Graphic Log	USCS	Blow Count	Samples	Laboratory Test	Penetration Resistance
							0 60
1	Medium dense, grayish brown (10 YR), dry, Silty f SAND Weak reaction to diluted HCL		SM				
2							
3							
4							
5	Dense, grayish brown (10 YR), dry, Silty f SAND Strong reaction to diluted HCL		SM				
6							
7							
8							
9							
10	Test pit terminated at 10.0 ft. on 05/3/23						

PROJECT NUMBER 4043796	EXCAVATION DATE 5/3/2023	COORDINATES 46,203057,-119,258919
PROJECT NAME Clearwater North Geo		COORD SYS GPS
CLIENT Sunny Hill Development		SURFACE ELEVATION 583 ft.
ADDRESS Clearwater Drive, Kennewick, WA	EXCAVATION METHOD Deere 160 G LC	LOGGED BY CH
	TOTAL DEPTH 10.0 feet	CHECKED BY BPS

COMMENTS

Depth (ft)	Material Description	Graphic Log	USCS	Blow Count	Samples	Laboratory Test	Penetration Resistance
							0 60
1	Medium dense, grayish brown (10 YR), dry, Silty f SAND Weak reaction to diluted HCL		SM				
2	Medium dense, grayish brown (10 YR), dry, Silty v-f SAND Strong reaction to diluted HCL		SM				
3							
4	Dense, grayish brown (10 YR), dry, Silty f SAND Strong reaction to diluted HCL		SM				
5							
6							
7							
8							
9							
10	Test pit terminated at 10.0 ft. on 05/3/23						

PROJECT NUMBER 4043796	EXCAVATION DATE 5/3/2023	COORDINATES 46,203610,-119,258010
PROJECT NAME Clearwater North Geo		COORD SYS GPS
CLIENT Sunny Hill Development		SURFACE ELEVATION 560 ft.
ADDRESS Clearwater Drive, Kennewick, WA	EXCAVATION METHOD Deere 160 G LC	LOGGED BY CH
	TOTAL DEPTH 9.5 feet	CHECKED BY BPS

COMMENTS

Depth (ft)	Material Description	Graphic Log	USCS	Blow Count	Samples	Laboratory Test	Penetration Resistance
							0 60
1	Medium dense, grayish brown (10 YR), damp, Silty f SAND Weak reaction to diluted HCL		SM				
2							
3							
4							
5	Dense, grayish brown (10 YR), dry, Silty f SAND Strong reaction to diluted HCL		SM				
6							
7							
8							
9							
	Test pit terminated at 9.5 ft. on 05/3/23						

PROJECT NUMBER 4043796	EXCAVATION DATE 5/3/2023	COORDINATES 46,204291,-119,256381
PROJECT NAME Clearwater North Geo		COORD SYS GPS
CLIENT Sunny Hill Development		SURFACE ELEVATION 563 ft.
ADDRESS Clearwater Drive, Kennewick, WA	EXCAVATION METHOD Deere 160 G LC	LOGGED BY CH
	TOTAL DEPTH 11.0 feet	CHECKED BY BPS

COMMENTS

Depth (ft)	Material Description	Graphic Log	USCS	Blow Count	Samples	Laboratory Test	Penetration Resistance
							0 60
1	Medium dense, grayish brown (10 YR), damp, Silty f SAND Weak reaction to diluted HCL		SM				
2							
3							
4							
5							
6							
7	Dense, grayish brown (10 YR), dry, Silty v-f SAND Strong reaction to diluted HCL		SM		Sample collected		
8							
9	Dense, grayish brown (10 YR), dry, Silty v-f SAND Strong reaction to diluted HCL		SM				
10							
11	Test pit terminated at 11.0 ft. on 05/3/23						

PROJECT NUMBER 4043796	EXCAVATION DATE 5/3/2023	COORDINATES 46,204654,-119,255564
PROJECT NAME Clearwater North Geo		COORD SYS GPS
CLIENT Sunny Hill Development		SURFACE ELEVATION 566 ft.
ADDRESS Clearwater Drive, Kennewick, WA	EXCAVATION METHOD Deere 160 G LC	LOGGED BY CH
	TOTAL DEPTH 9.0 feet	CHECKED BY BPS

COMMENTS

Depth (ft)	Material Description	Graphic Log	USCS	Blow Count	Samples	Laboratory Test	Penetration Resistance
							0 60
1	Medium dense, grayish brown (10 YR), dry, Silty f SAND Weak reaction to diluted HCL		SM				
2							
3							
4							
5							
6	Dense, grayish brown (10 YR), dry, Silty f SAND Weak reaction to diluted HCL		SM				
7							
8							
9	Test pit terminated at 9.0 ft. on 05/3/23						

PROJECT NUMBER 4043796	EXCAVATION DATE 5/3/2023	COORDINATES 46,204921,-119,254689
PROJECT NAME Clearwater North Geo		COORD SYS GPS
CLIENT Sunny Hill Development		SURFACE ELEVATION 577 ft.
ADDRESS Clearwater Drive, Kennewick, WA	EXCAVATION METHOD Deere 160 G LC	LOGGED BY CH
	TOTAL DEPTH 9.0 feet	CHECKED BY BPS

COMMENTS

Depth (ft)	Material Description	Graphic Log	USCS	Blow Count	Samples	Laboratory Test	Penetration Resistance
							0 60
1	Medium dense, grayish brown (10 YR), damp, Silty f SAND Weak reaction to diluted HCL		SM				
2							
3							
4							
5							
6							
7							
8							
9	Test pit terminated at 9.0 ft. on 05/3/23						

PROJECT NUMBER 4043796	EXCAVATION DATE 5/3/2023	COORDINATES 46,205307,-119,253680
PROJECT NAME Clearwater North Geo		COORD SYS GPS
CLIENT Sunny Hill Development		SURFACE ELEVATION 581 ft.
ADDRESS Clearwater Drive, Kennewick, WA	EXCAVATION METHOD Deere 160 G LC	LOGGED BY CH
	TOTAL DEPTH 9.5 feet	CHECKED BY BPS

COMMENTS

Depth (ft)	Material Description	Graphic Log	USCS	Blow Count	Samples	Laboratory Test	Penetration Resistance
							0 60
1	Medium dense, grayish brown (10 YR), damp, Silty f SAND Weak reaction to diluted HCL		SM				
2							
3							
4							
5	Dense, grayish brown (10 YR), dry, Silty f SAND Strong reaction to diluted HCL		SM				
6							
7							
8							
9							
	Test pit terminated at 9.5 ft. on 05/3/23						

PROJECT NUMBER 4043796	EXCAVATION DATE 5/3/2023	COORDINATES 46,205649,-119,252699
PROJECT NAME Clearwater North Geo		COORD SYS GPS
CLIENT Sunny Hill Development		SURFACE ELEVATION 585 ft.
ADDRESS Clearwater Drive, Kennewick, WA	EXCAVATION METHOD Deere 160 G LC	LOGGED BY CH
	TOTAL DEPTH 9.0 feet	CHECKED BY BPS

COMMENTS

Depth (ft)	Material Description	Graphic Log	USCS	Blow Count	Samples	Laboratory Test	Penetration Resistance
							0 60
1	Medium dense, grayish brown (10 YR), damp, Silty f SAND Weak reaction to diluted HCL		SM				
2							
3	Dense, grayish brown (10 YR), dry, Silty f SAND Strong reaction to diluted HCL		SM				
4							
5							
6							
7							
8							
9	Test pit terminated at 9.0 ft. on 05/3/23						

PROJECT NUMBER 4043796	EXCAVATION DATE 5/3/2023	COORDINATES 46,205962,-119,251670
PROJECT NAME Clearwater North Geo		COORD SYS GPS
CLIENT Sunny Hill Development		SURFACE ELEVATION 582 ft.
ADDRESS Clearwater Drive, Kennewick, WA	EXCAVATION METHOD Deere 160 G LC	LOGGED BY CH
	TOTAL DEPTH 9.0 feet	CHECKED BY BPS

COMMENTS

Depth (ft)	Material Description	Graphic Log	USCS	Blow Count	Samples	Laboratory Test	Penetration Resistance
							0 60
1	Medium dense, grayish brown (10 YR), damp, Silty f SAND Weak reaction to diluted HCL		SM				
2							
3	Dense, grayish brown (10 YR), dry, Silty f SAND Strong reaction to diluted HCL		SM				
4							
5							
6							
7	Dense, grayish brown (10 YR), dry, Silty f SAND, trace m sand Strong reaction to diluted HCL		SM		Sample collected		
8							
9	Test pit terminated at 9.0 ft. on 05/3/23						

PROJECT NUMBER 4043796	EXCAVATION DATE 5/3/2023	COORDINATES 46,206138,-119,250721
PROJECT NAME Clearwater North Geo		COORD SYS GPS
CLIENT Sunny Hill Development		SURFACE ELEVATION 583 ft.
ADDRESS Clearwater Drive, Kennewick, WA	EXCAVATION METHOD Deere 160 G LC	LOGGED BY CH
	TOTAL DEPTH 8.0 feet	CHECKED BY BPS

COMMENTS

Depth (ft)	Material Description	Graphic Log	USCS	Blow Count	Samples	Laboratory Test	Penetration Resistance
							0 60
1	Medium dense, grayish brown (10 YR), dry, Silty f SAND Weak reaction to diluted HCL		SM				
2							
3							
4							
5							
6							
7							
8	Test pit terminated at 8.0 ft. on 05/3/23						
9							

PROJECT NUMBER 4043796	EXCAVATION DATE 5/4/2023	COORDINATES 46,205518,-119,251404
PROJECT NAME Clearwater North Geo		COORD SYS GPS
CLIENT Sunny Hill Development		SURFACE ELEVATION 583 ft.
ADDRESS Clearwater Drive, Kennewick, WA	EXCAVATION METHOD Deere 160 G LC	LOGGED BY CH
	TOTAL DEPTH 9.5 feet	CHECKED BY BPS

COMMENTS

Depth (ft)	Material Description	Graphic Log	USCS	Blow Count	Samples	Laboratory Test	Penetration Resistance
							0 60
1	Medium dense, grayish brown (10 YR), damp, Silty f SAND Weak reaction to diluted HCL		SM				
2	Dense, grayish brown (10 YR), dry, Silty f SAND Weak reaction to diluted HCL		SM				
3							
4							
5							
6							
7							
8					Sample collected		
9							
	Test pit terminated at 9.5 ft. on 05/4/23.						

PROJECT NUMBER 4043796	EXCAVATION DATE 5/4/2023	COORDINATES 46,205312,-119,252381
PROJECT NAME Clearwater North Geo		COORD SYS GPS
CLIENT Sunny Hill Development		SURFACE ELEVATION 585 ft.
ADDRESS Clearwater Drive, Kennewick, WA	EXCAVATION METHOD Deere 160 G LC	LOGGED BY CH
	TOTAL DEPTH 9.5 feet	CHECKED BY BPS

COMMENTS

Depth (ft)	Material Description	Graphic Log	USCS	Blow Count	Samples	Laboratory Test	Penetration Resistance
							0 60
1	Medium dense, grayish brown (10 YR), dry, Silty f SAND Weak reaction to diluted HCL		SM				
2							
3							
4							
5							
6							
7							
8							
9							
10	Test pit terminated at 10.0 ft. on 05/4/23.						

PROJECT NUMBER 4043796	EXCAVATION DATE 5/4/2023	COORDINATES 46,205058,-119,253326
PROJECT NAME Clearwater North Geo		COORD SYS GPS
CLIENT Sunny Hill Development		SURFACE ELEVATION 580 ft.
ADDRESS Clearwater Drive, Kennewick, WA	EXCAVATION METHOD Deere 160 G LC	LOGGED BY CH
	TOTAL DEPTH 10.0 feet	CHECKED BY BPS

COMMENTS

Depth (ft)	Material Description	Graphic Log	USCS	Blow Count	Samples	Laboratory Test	Penetration Resistance
							0 60
1	Medium dense, grayish brown (10 YR), dry, Silty f SAND Weak reaction to diluted HCL		SM				
2							
3							
4							
5							
6	Dense, grayish brown (10 YR), dry, Silty f SAND Strong reaction to diluted HCL		SM				
7							
8							
9					Sample collected		
10	Test pit terminated at 10.0 ft. on 05/4/23.						

PROJECT NUMBER 4043796	EXCAVATION DATE 5/4/2023	COORDINATES 46,204757,-119,254411
PROJECT NAME Clearwater North Geo		COORD SYS GPS
CLIENT Sunny Hill Development		SURFACE ELEVATION 578 ft.
ADDRESS Clearwater Drive, Kennewick, WA	EXCAVATION METHOD Deere 160 G LC	LOGGED BY CH
	TOTAL DEPTH 10.0 feet	CHECKED BY BPS

COMMENTS

Depth (ft)	Material Description	Graphic Log	USCS	Blow Count	Samples	Laboratory Test	Penetration Resistance
							0 60
1	Medium dense, grayish brown (10 YR), dry, Silty f SAND Weak reaction to diluted HCL		SM				
2							
3							
4							
5							
6	Dense, grayish brown (10 YR), dry, Silty f SAND Strong reaction to diluted HCL		SM				
7							
8							
9					Sample collected		
10	Test pit terminated at 10.0 ft. on 05/4/23.						

PROJECT NUMBER 4043796	EXCAVATION DATE 5/4/2023	COORDINATES 46,204281,-119,255214
PROJECT NAME Clearwater North Geo		COORD SYS GPS
CLIENT Sunny Hill Development		SURFACE ELEVATION 567 ft.
ADDRESS Clearwater Drive, Kennewick, WA	EXCAVATION METHOD Deere 160 G LC	LOGGED BY CH
	TOTAL DEPTH 10.0 feet	CHECKED BY BPS

COMMENTS

Depth (ft)	Material Description	Graphic Log	USCS	Blow Count	Samples	Laboratory Test	Penetration Resistance
							0 60
1	Medium dense, grayish brown (10 YR), dry, Silty f SAND Weak reaction to diluted HCL		SM				
2							
3	Dense, grayish brown (10 YR), dry, Silty f SAND Strong reaction to diluted HCL		SM				
4							
5							
6							
7							
8							
9							
10	Test pit terminated at 10.0 ft. on 05/4/23.						

PROJECT NUMBER 4043796	EXCAVATION DATE 5/4/2023	COORDINATES 46,203882,-119,255970
PROJECT NAME Clearwater North Geo		COORD SYS GPS
CLIENT Sunny Hill Development		SURFACE ELEVATION 575 ft.
ADDRESS Clearwater Drive, Kennewick, WA	EXCAVATION METHOD Deere 160 G LC	LOGGED BY CH
	TOTAL DEPTH 10.0 feet	CHECKED BY BPS

COMMENTS

Depth (ft)	Material Description	Graphic Log	USCS	Blow Count	Samples	Laboratory Test	Penetration Resistance
							0 60
1	Medium dense, grayish brown (10 YR), dry, Silty f SAND Weak reaction to diluted HCL		SM				
2							
3	Dense, grayish brown (10 YR), dry, Silty f SAND Weak reaction to diluted HCL		SM				
4							
5							
6							
7							
8							
9							
10	Test pit terminated at 10.0 ft. on 05/4/23.						

PROJECT NUMBER 4043796	EXCAVATION DATE 5/4/2023	COORDINATES 46,203196,-119,257255
PROJECT NAME Clearwater North Geo		COORD SYS GPS
CLIENT Sunny Hill Development		SURFACE ELEVATION 560 ft.
ADDRESS Clearwater Drive, Kennewick, WA	EXCAVATION METHOD Deere 160 G LC	LOGGED BY CH
	TOTAL DEPTH 9.0 feet	CHECKED BY BPS

COMMENTS

Depth (ft)	Material Description	Graphic Log	USCS	Blow Count	Samples	Laboratory Test	Penetration Resistance
							0 60
1	Medium dense, grayish brown (10 YR), dry, Silty f SAND Weak reaction to diluted HCL		SM				
2	Medium dense, grayish brown (10 YR), damp, Silty f SAND Strong reaction to diluted HCL		SM				
3							
4							
5					Sample collected		
6	Dense, grayish brown (10 YR), damp, Silty f SAND Strong reaction to diluted HCL		SM				
7							
8							
9	Test pit terminated at 9.0 ft. on 05/4/23.						

PROJECT NUMBER 4043796	EXCAVATION DATE 5/4/2023	COORDINATES 46,202813,-119,258237
PROJECT NAME Clearwater North Geo		COORD SYS GPS
CLIENT Sunny Hill Development		SURFACE ELEVATION 579 ft.
ADDRESS Clearwater Drive, Kennewick, WA	EXCAVATION METHOD Deere 160 G LC	LOGGED BY CH
	TOTAL DEPTH 10.0 feet	CHECKED BY BPS

COMMENTS

Depth (ft)	Material Description	Graphic Log	USCS	Blow Count	Samples	Laboratory Test	Penetration Resistance
							0 60
1	Medium dense, grayish brown (10 YR), dry, Silty f SAND Weak reaction to diluted HCL		SM				
2	Medium dense, grayish brown (10 YR), damp, Silty f SAND Weak reaction to diluted HCL		SM				
3							
4							
5	Dense, grayish brown (10 YR), dry, Silty f SAND Strong reaction to diluted HCL		SM				
6							
7	Dense, grayish brown (10 YR), dry, Silty v-f SAND Strong reaction to diluted HCL		SM				
8							
9							
10	Test pit terminated at 9.0 ft. on 05/4/23.						

PROJECT NUMBER 4043796	EXCAVATION DATE 5/4/2023	COORDINATES 46,202264,-119,257566
PROJECT NAME Clearwater North Geo		COORD SYS GPS
CLIENT Sunny Hill Development		SURFACE ELEVATION 576 ft.
ADDRESS Clearwater Drive, Kennewick, WA	EXCAVATION METHOD Deere 160 G LC	LOGGED BY CH
	TOTAL DEPTH 10.0 feet	CHECKED BY BPS

COMMENTS

Depth (ft)	Material Description	Graphic Log	USCS	Blow Count	Samples	Laboratory Test	Penetration Resistance
							0 60
1	Medium dense, grayish brown (10 YR), damp, Silty f SAND No reaction to diluted HCL		SM				
2							
3							
4							
5							
6	Dense, grayish brown (10 YR), dry, Silty v-f SAND Strong reaction to diluted HCL		SM				
7							
8							
9							
10	Test pit terminated at 10.0 ft. on 05/4/23.						

PROJECT NUMBER 4043796	EXCAVATION DATE 5/4/2023	COORDINATES 46,201959,-119,258394
PROJECT NAME Clearwater North Geo		COORD SYS GPS
CLIENT Sunny Hill Development		SURFACE ELEVATION 586 ft.
ADDRESS Clearwater Drive, Kennewick, WA	EXCAVATION METHOD Deere 160 G LC	LOGGED BY CH
	TOTAL DEPTH 10.0 feet	CHECKED BY BPS

COMMENTS

Depth (ft)	Material Description	Graphic Log	USCS	Blow Count	Samples	Laboratory Test	Penetration Resistance
							0 60
1	Medium dense, grayish brown (10 YR), damp, Silty f SAND No reaction to diluted HCL		SM				
2							
3							
4							
5	Dense, grayish brown (10 YR), dry, Silty f SAND No reaction to diluted HCL		SM		Sample collected		
6							
7							
8							
9							
10							
	Test pit terminated at 10.0 ft. on 05/4/23.						

PROJECT NUMBER 4043796	EXCAVATION DATE 5/4/2023	COORDINATES 46,201586,-119,259190
PROJECT NAME Clearwater North Geo		COORD SYS GPS
CLIENT Sunny Hill Development		SURFACE ELEVATION 589 ft.
ADDRESS Clearwater Drive, Kennewick, WA	EXCAVATION METHOD Deere 160 G LC	LOGGED BY CH
	TOTAL DEPTH 9.0 feet	CHECKED BY BPS

COMMENTS

Depth (ft)	Material Description	Graphic Log	USCS	Blow Count	Samples	Laboratory Test	Penetration Resistance
							0 60
1	Medium dense, grayish brown (10 YR), damp, Silty f SAND No reaction to diluted HCL		SM				
2							
3							
4							
5	Dense, grayish brown (10 YR), dry, Silty f SAND Weak reaction to diluted HCL		SM				
6					Sample collected		
7							
8							
9	Test pit terminated at 9.0 ft. on 05/4/23.						

PROJECT NUMBER 4043796	EXCAVATION DATE 5/4/2023	COORDINATES 46,201284,-119,259990
PROJECT NAME Clearwater North Geo		COORD SYS GPS
CLIENT Sunny Hill Development		SURFACE ELEVATION 586 ft.
ADDRESS Clearwater Drive, Kennewick, WA	EXCAVATION METHOD Deere 160 G LC	LOGGED BY CH
	TOTAL DEPTH 10.0 feet	CHECKED BY BPS

COMMENTS

Depth (ft)	Material Description	Graphic Log	USCS	Blow Count	Samples	Laboratory Test	Penetration Resistance
							0 60
1	Medium dense, grayish brown (10 YR), damp, Silty f SAND Weak reaction to diluted HCL		SM				
2							
3							
4							
5							
6	Dense, grayish brown (10 YR), dry, Silty f SAND Strong reaction to diluted HCL		SM				
7							
8							
9							
10							
	Test pit terminated at 10.0 ft. on 05/4/23.						

PROJECT NUMBER 4043796	EXCAVATION DATE 5/4/2023	COORDINATES 46,200836,-119,260704
PROJECT NAME Clearwater North Geo		COORD SYS GPS
CLIENT Sunny Hill Development		SURFACE ELEVATION 589 ft.
ADDRESS Clearwater Drive, Kennewick, WA	EXCAVATION METHOD Deere 160 G LC	LOGGED BY CH
	TOTAL DEPTH 10.0 feet	CHECKED BY BPS

COMMENTS

Depth (ft)	Material Description	Graphic Log	USCS	Blow Count	Samples	Laboratory Test	Penetration Resistance
							0 60
1	Medium dense, grayish brown (10 YR), damp, Silty f SAND Weak reaction to diluted HCL		SM				
2							
3							
4							
5							
6							
7							
8							
9							
10	Test pit terminated at 10.0 ft. on 05/4/23.						

PROJECT NUMBER 4043796	EXCAVATION DATE 5/4/2023	COORDINATES 46,202913,-119,256220
PROJECT NAME Clearwater North Geo		COORD SYS GPS
CLIENT Sunny Hill Development		SURFACE ELEVATION 576 ft.
ADDRESS Clearwater Drive, Kennewick, WA	EXCAVATION METHOD Deere 160 G LC	LOGGED BY CH
	TOTAL DEPTH 11.0 feet	CHECKED BY BPS

COMMENTS

Depth (ft)	Material Description	Graphic Log	USCS	Blow Count	Samples	Laboratory Test	Penetration Resistance
							0 60
1	Medium dense, grayish brown (10 YR), damp, Silty f SAND Weak reaction to diluted HCL		SM				
2							
3							
4							
5							
6							
7							
8							
9							
10							
11	Test pit terminated at 11.0 ft. on 05/4/23.						

PROJECT NUMBER 4043796	EXCAVATION DATE 5/4/2023	COORDINATES 46,203326,-119,255531
PROJECT NAME Clearwater North Geo		COORD SYS GPS
CLIENT Sunny Hill Development		SURFACE ELEVATION 579 ft.
ADDRESS Clearwater Drive, Kennewick, WA	EXCAVATION METHOD Deere 160GLC	LOGGED BY CH
	TOTAL DEPTH 10.0 feet	CHECKED BY BPS

COMMENTS

Depth (ft)	Material Description	Graphic Log	USCS	Blow Count	Samples	Laboratory Test	Penetration Resistance
							0 60
1	Medium dense, grayish brown (10 YR), damp, Silty f SAND Weak reaction to diluted HCL		SM				
2							
3							
4							
5	Dense, grayish brown (10 YR), damp, Silty f SAND Strong reaction to diluted HCL		SM				
6							
7							
8							
9							
10	Test pit terminated at 10.0 ft. on 05/4/23.						

PROJECT NUMBER 4043796	EXCAVATION DATE 5/4/2023	COORDINATES 46,203774,-119,254858
PROJECT NAME Clearwater North Geo		COORD SYS GPS
CLIENT Sunny Hill Development		SURFACE ELEVATION 577 ft.
ADDRESS Clearwater Drive, Kennewick, WA	EXCAVATION METHOD Deere 160 G LC	LOGGED BY CH
	TOTAL DEPTH 9.0 feet	CHECKED BY BPS

COMMENTS

Depth (ft)	Material Description	Graphic Log	USCS	Blow Count	Samples	Laboratory Test	Penetration Resistance
							0 60
1	Medium dense, grayish brown (10 YR), damp, Silty f SAND Weak reaction to diluted HCL		SM				
2							
3							
4							
5							
6	Dense, grayish brown (10 YR), damp, Silty f SAND Strong reaction to diluted HCL		SM				
7							
8							
9	Test pit terminated at 9.0 ft. on 05/4/23.						

PROJECT NUMBER 4043796	EXCAVATION DATE 5/4/2023	COORDINATES 46,204238,-119,254093
PROJECT NAME Clearwater North Geo		COORD SYS GPS
CLIENT Sunny Hill Development		SURFACE ELEVATION 573 ft.
ADDRESS Clearwater Drive, Kennewick, WA	EXCAVATION METHOD Deere 160 G LC	LOGGED BY CH
	TOTAL DEPTH 10.0 feet	CHECKED BY BPS

COMMENTS

Depth (ft)	Material Description	Graphic Log	USCS	Blow Count	Samples	Laboratory Test	Penetration Resistance
							0 60
1	Medium dense, grayish brown (10 YR), damp, Silty f SAND Weak reaction to diluted HCL		SM				
2							
3							
4							
5							
6	Dense, grayish brown (10 YR), damp, Silty f SAND Strong reaction to diluted HCL		SM		Sample collected		
7							
8							
9							
10	Test pit terminated at 10.0 ft. on 05/4/23.						

PROJECT NUMBER 4043796	EXCAVATION DATE 5/4/2023	COORDINATES 46,204660,-119,253199
PROJECT NAME Clearwater North Geo		COORD SYS GPS
CLIENT Sunny Hill Development		SURFACE ELEVATION 577 ft.
ADDRESS Clearwater Drive, Kennewick, WA	EXCAVATION METHOD Deere 160 G LC	LOGGED BY CH
	TOTAL DEPTH 10.0 feet	CHECKED BY BPS

COMMENTS

Depth (ft)	Material Description	Graphic Log	USCS	Blow Count	Samples	Laboratory Test	Penetration Resistance
							0 60
1	Medium dense, grayish brown (10 YR), dry, Silty f SAND Weak reaction to diluted HCL		SM				
2							
3							
4							
5							
6	Dense, grayish brown (10 YR), damp, Silty f SAND Strong reaction to diluted HCL		SM				
7							
8							
9							
10	Test pit terminated at 10.0 ft. on 05/4/23.						

PROJECT NUMBER 4043796	EXCAVATION DATE 5/4/2023	COORDINATES 46,204865,-119,252299
PROJECT NAME Clearwater North Geo		COORD SYS GPS
CLIENT Sunny Hill Development		SURFACE ELEVATION 581 ft.
ADDRESS Clearwater Drive, Kennewick, WA	EXCAVATION METHOD Deere 160 G LC	LOGGED BY CH
	TOTAL DEPTH 10.0 feet	CHECKED BY BPS

COMMENTS

Depth (ft)	Material Description	Graphic Log	USCS	Blow Count	Samples	Laboratory Test	Penetration Resistance
							0 60
1	Medium dense, grayish brown (10 YR), dry, Silty f SAND Weak reaction to diluted HCL		SM				
2							
3							
4							
5							
6	Dense, grayish brown (10 YR), dry, Silty f SAND Strong reaction to diluted HCL		SM				
7							
8							
9							
10	Test pit terminated at 10.0 ft. on 05/4/23.						

PROJECT NUMBER 4043796	EXCAVATION DATE 5/4/2023	COORDINATES 46,204996,-119,251392
PROJECT NAME Clearwater North Geo		COORD SYS GPS
CLIENT Sunny Hill Development		SURFACE ELEVATION 581 ft.
ADDRESS Clearwater Drive, Kennewick, WA	EXCAVATION METHOD Deere 160 G LC	LOGGED BY CH
	TOTAL DEPTH 10.0 feet	CHECKED BY BPS

COMMENTS

Depth (ft)	Material Description	Graphic Log	USCS	Blow Count	Samples	Laboratory Test	Penetration Resistance
							0 60
1	Medium dense, olive brown (2.5 Y), damp, Silty f SAND Weak reaction to diluted HCL		SM				
2							
3							
4	Dense, olive brown (2.5Y), dry, Silty f SAND Strong reaction to diluted HCL		SM		Sample collected		
5							
6							
7							
8							
9							
10	Test pit terminated at 10.0 ft. on 05/4/23.						

PROJECT NUMBER 4043796	EXCAVATION DATE 5/4/2023	COORDINATES 46,205240,-119,249973
PROJECT NAME Clearwater North Geo		COORD SYS GPS
CLIENT Sunny Hill Development		SURFACE ELEVATION 575 ft.
ADDRESS Clearwater Drive, Kennewick, WA	EXCAVATION METHOD Deere 160 G LC	LOGGED BY CH
	TOTAL DEPTH 10.0 feet	CHECKED BY BPS

COMMENTS

Depth (ft)	Material Description	Graphic Log	USCS	Blow Count	Samples	Laboratory Test	Penetration Resistance
							0 60
1	Medium dense, olive brown (2.5 Y), damp, Silty f SAND, trace f black sand Weak reaction to diluted HCL		SM				
2	Dense, olive brown (2.5Y), dry, Silty f SAND Strong reaction to diluted HCL		SM				
3							
4							
5							
6							
7							
8							
9							
10	Test pit terminated at 10.0 ft. on 05/4/23.						

Transportation Impact Analysis

Clearwater Commercial Binding Site Plan

Kennewick, Washington

Prepared for:

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Mr. John Michel
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February 17, 2016

EXECUTIVE SUMMARY

PURPOSE

Mr. Solbrack and Mr. Michel propose a subdivision of commercial property in the City of Kennewick. For the purpose of this analysis, it is assumed that development of the overall property will occur in three phases. Based on the City's direction, the tip generation is based on the best and highest use for the zoning. No specific development is proposed at this time. This Transportation Impact Analysis is required by the City for the Binding Site Plan (of several large disconnected lots). The site is located on the north and south sides of W Clearwater Avenue, between Leslie Road and S Clodfelter Road, in Benton County, in the southeast ¼ and southwest ¼ of Section 1, Township 8 North, and Range 28 East of the Willamette Meridian. The Michel and Solbrack Binding Site Plan proposal would develop a site with approximately 85 acres. The project proposes to access W Clearwater Avenue through the existing W Clearwater Avenue/W 10th Avenue and W Clearwater Avenue/Clearwater Drive/S Utah Street intersections. Also, three new driveways will access onto W Clearwater Avenue. One driveway will be added with each phase. Phase 1 of this project is projected to be completed in 2021, with full build out anticipated by 2036. This report analyzes the traffic impacts generated by the completed development.

CONCLUSIONS

The findings of the Traffic Impact Analysis are listed below:

1. The site access will be limited to the proposed private driveway and roadways as illustrated in Figure 2. They will be built to private standards as they provide internal access only. All access points on W Clearwater Avenue will be spaced greater than 155 feet from center line to centerline.
2. No public improvements may be necessary until the 2021. With no specific development proposed, the need for mitigation is dependent upon substantial site development and background growth, both of which are market driven. The proposed mitigation is based on site development with high density and continued background growth.
3. Development of the individual lots are subject to City Transportation Impact Fees (TIF). The fees are due at time of occupancy. Therefore all TIF will be paid by future owner/builders of the individual lots at the time of construction.
4. The development should contribute to a WSDOT project for re-striping of E Badger Road from the WB I-82 off ramp to provide a left turn acceleration lane for the WB to SB movement.
5. To mitigate the Phase 2 and 3 impacts and background growth at the E Badger Road/I-82 WB off and on-ramp intersection, E Badger Road should be restriped with a left turn acceleration lane and second southbound through lane. The westbound off-ramp should be widened to provide a 300 foot long right-turn lane address the high number of right turn volume.
6. Traffic in the area will continue to increase with or without the proposal due to a background annual growth rate of 2.0%.

7. As parcels develop, infill of missing sections of sidewalk will be necessary
8. The in-process trips are based on the City of Kennewick's developments referred to as: a *General Office Building* at W Clearwater Avenue/W 10th Avenue, *Kadlec Clinic*, *The Ridge at Hansen Park* Subdivision, and *Kennewick School District Middle School #5*.
9. All but two of the studied intersections will operate at an acceptable level of service (LOS) in 2021 with the proposed development. Without the project, in 2021, the W Clearwater Avenue/Clearwater Drive/S Utah Street intersection will fall to LOS E. With the project, in 2021, the intersections of W Clearwater Avenue/Clearwater Drive/S Utah Street and the W Clearwater Avenue/W 10th Avenue fail (LOS F). The LOS on both intersection can be mitigated to a level of service that meets the City of Kennewick standards.
10. The W Clearwater Avenue/W 10th Avenue intersection with Phase 1 traffic impact should be mitigated with either a roundabout or a traffic signal. The roundabout is the City of Kennewick's preferred alternative, but construction costs can be very expensive, often three times the cost of a signal. The installation of a traffic signal will operate better if W 10th Avenue's intersection with W Clearwater Avenue is relocated approximately 300 feet to the west.
11. In 2036 with Phase 1, with or without Phase 2 and 3, the intersections of W Clearwater Avenue/Clearwater Drive/S Utah Street and W Clearwater Avenue/W 10th Avenue will fail (LOS F) due to background growth. With the Phase 1 mitigation, the W Clearwater Avenue/W 10th Avenue intersection will operate within City of Kennewick LOS standards. In addition to these two intersections, the E Badger Road/I-82 WB off and on-ramp intersection will fail (LOS F). With additional mitigation at the W Clearwater Avenue/Clearwater Drive/S Utah Street intersection and the E Badger Road/I-82 WB off and on-ramp intersection, each intersection will meet City LOS standards.
12. To mitigate the Phase 2 and 3 impact at the E Badger Road/I-82 WB off and on-ramp intersection E Badger Road should be restriped with a left turn acceleration lane and second southbound through lane. The westbound off-ramp should be widened to provide a 225 foot long right-turn lane. This right-turn lane is needed to address background growth and to a small share, the development impacts.
13. Site accesses between lots 5/6 (intersection number 5), 7/8 (intersection number 6) and 14/15 (intersection 7) will be at LOS F due to the left turn movement delay. They should operate safely because intersections a short distance away with either traffic signals or roundabouts provide other routes for traffic to make left turns onto W Clearwater Avenue.
14. To mitigate the Phase 2 and 3 impacts at W Clearwater Avenue/Clearwater Drive/S Utah Street an applicant has three options:
 - a. Install a traffic signal with double left turns southbound, a right turn lane on the westbound approach, and signal interconnection with the traffic signals to the east.
 - b. Install a roundabout at the intersection with a large dedication from lots 11 and 12, assuming right of way is not available from the private property at the southwest and southeast corners.
 - c. Install a new access point between lots 9 and 10 across from an access driveway for lots 14 and 15 on the south. This access point could be either a signal or roundabout.

15. The turn lane analysis was completed using City of Kennewick Traffic Impact Analysis Study Requirements and the WSDOT Design Manual Left-turn Storage and Right-turn Lane Guidelines. Right turn lanes will be needed at:
 - a. W Clearwater Avenue at the intersection with W 10th Avenue if a signal is installed for both the east and westbound approach.
 - b. W Clearwater Avenue at site access 5 for the westbound approach for Phase 2 and 3 traffic.
 - c. W Clearwater Avenue at Clearwater Drive for the westbound approach for Phase 2 and 3 traffic.
16. The roundabout at the intersection of E Badger Road/Leslie Road/W Clearwater Avenue does have adequate capacity for the new project trips (2021), projected annual growth, and Phase 2 and 3 trips in the 2036 design year.
17. The collision history was reviewed. The W Clearwater Avenue/N and S Columbia Center Boulevard intersection exceeds the critical accident rate. The remaining study intersections are below the critical accident rate. The apparent collision pattern the project may impact are associated with eastbound rear end collisions. This can be mitigated with signal operation upgrades associated with signal timing and advance detection of eastbound traffic.
18. There is no public transit within typical walking distance of the project site. In the immediate vicinity of the project there are sidewalks and striped shoulders, but no bike lanes.
19. If Phase 2 and 3 proceed as proposed, many pedestrian trips will be generated between the lots along the extension of Clearwater Drive. These pedestrian trips should be provided walkways along Clearwater Drive.
20. Sight distance at the proposed site driveways was reviewed and verified to meet AASHTO requirements for stopping and intersection sight distance. No sight distance issues are anticipated at the future site access points.

RECOMMENDATIONS

The following recommendations are based on the TIA conclusions:

The future realignment of W 10th Avenue and the extension of Clearwater Drive should include sidewalks as the lots develop. All sidewalks and driveways will be constructed to meet current Americans with Disabilities Act (ADA) standards.

As parcels develop, infill of missing sections of sidewalk will be necessary along their frontage. The sidewalk and associated driveways will need to be constructed to meet current ADA standards.

Design site access points to follow AASHTO requirements for stopping and intersection sight distance. Do not install objects within the sight distance triangle that would block the driver's view entering or exiting the sites at any new access point.

For Phase 2 and 3, the development shall provide contribution to WSDOT for the restriping of E Badger Road from the vicinity of the westbound ramp terminal to Wiser Parkway. This is to accommodate a left turn acceleration lane from the westbound ramp terminal to southbound E Badger Road and add a southbound through lane on E Badger Road within the WSDOT limited access area.

To mitigate 2036 site development impacts and background growth, the E Badger Road/I-82 WB off and on ramp, the development should widen the WB ramp off ramp to include a 300 foot long right turn lane. A proportionate cost sharing program should be developed for mitigation.

Install a roundabout or a traffic signal at the W 10th Avenue intersection with W Clearwater Avenue with Phase 1 of the development. The location of the intersection can remain in the current location with a roundabout, but with a traffic signal, relocation of the W 10th Avenue intersection with W Clearwater Avenue will provide better sight distance and room for queuing on W 10th Avenue.

Accept LOS F for site accesses between lots 5/6 (intersection number 5), 7/8 (intersection number 6) and 14/15 (intersection 7) because intersections a short distance away with either traffic signals or roundabouts provide safe alternative routes to make left turns onto W Clearwater Avenue.

For Phase 2 and 3, the development should fund a roundabout on W Clearwater Avenue at a new private road connection between lots 9/10 and cross from a driveway for lots 14/15. ,

For Phase 1, the development should fund advance detection on the eastbound approach of W Clearwater Avenue at N and S Columbia Center Boulevard and update signal timing to address rear end collisions.

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- A. TRIP GENERATION AND IN-PROCESS TRIPS
- B. TRAFFIC COUNTS
- C. LEVEL OF SERVICE
- D. CAPACITY CALCULATIONS
- E. ACCIDENT DATA ANALYSIS
- F LEFT TURN TREATMENT ANALYSIS

INTRODUCTION

The purpose of this study is to determine the impacts of the traffic generated by the Michel and Solbrack Binding Site Plan, proposed approximately 85 acre phased development, on the surrounding roadway infrastructure. This site is shown on the vicinity map (Figure 1). This study will determine if mitigation is required to keep the roadways operating safely and at capacity levels acceptable under the current City of Kennewick code. This report documents the findings and conclusions of a Transportation Impact Analysis (TIA) conducted for a proposed binding site plan (Figure 2) application for property located in Benton County, in the City of Kennewick, Washington.

SCOPE OF STUDY

This study documents the existing and proposed conditions, traffic data, safety analysis, and capacity in accordance with the requirements of City of Kennewick TIA Guidelines.

The scope of the traffic study was refined in phone conversations and email correspondence with City of Kennewick and Washington State Department of Transportation (WSDOT) staff. The study area is shown on Figures 3-11. The following intersections were identified for analysis:

- *E Badger Road/I-82 EB off and on-ramps*
- *E Badger Road/I-82 WB off and on-ramps*
- *E Badger Road/Leslie Road/W Clearwater Avenue roundabout*
- *W Clearwater Avenue/W 10th Avenue intersection*
- *W Clearwater Avenue/Clearwater Drive/S Utah Street intersection*
- *W Clearwater Avenue/Steptoe Street/S Clodfelter Street intersection*
- *W Clearwater Avenue/N and S Columbia Center Boulevard intersection*
- *W Clearwater Avenue Driveways (three new access points)*

This TIA is prepared for submission to the City of Kennewick. Traffic related components addressed in this report are consistent with the City TIA guideline requirements. The components are:

- *Study purpose and objectives.*
- *Project description, existing and proposed land uses, and site characteristics.*
- *Study area description, surrounding land use, street system characteristics, transit service, pedestrian and bicycle facilities, and pending funded transportation system improvements.*
- *Future project and non-project generated traffic volumes, capacity analysis, trip generation, trip distribution, and trip assignment.*
- *Safety analysis of the existing and future conditions.*
- *Recommendations for mitigation of traffic impacts and conclusions.*

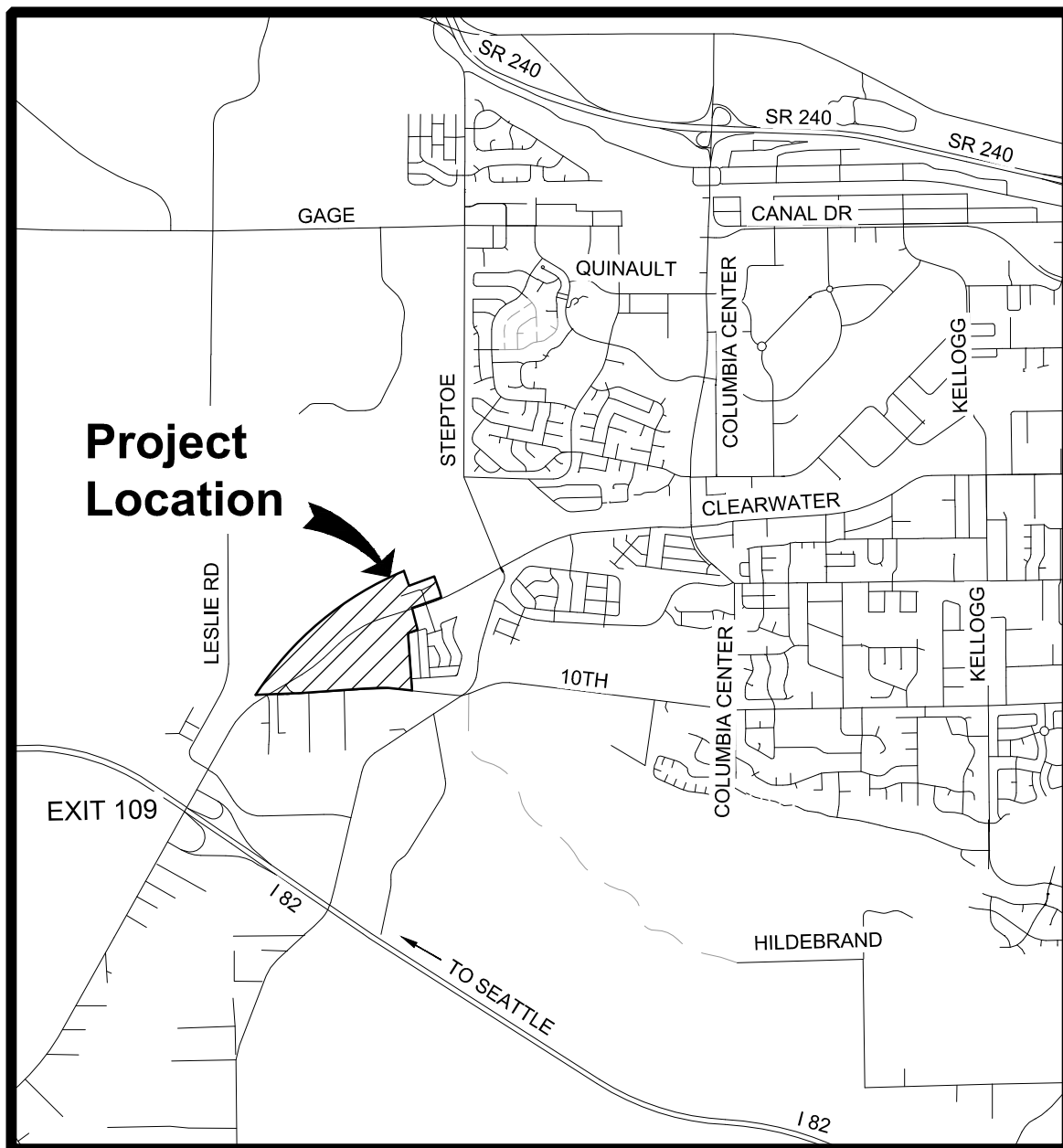


FIGURE 1



6115 Burden Blvd, Suite E
Pasco, WA 99301-8930
509/547-5119
360/695-3488
509/547-5129 fax
Internet: www.hdjdg.com

Vicinity Map

Clearwater Commercial Binding Site Plan

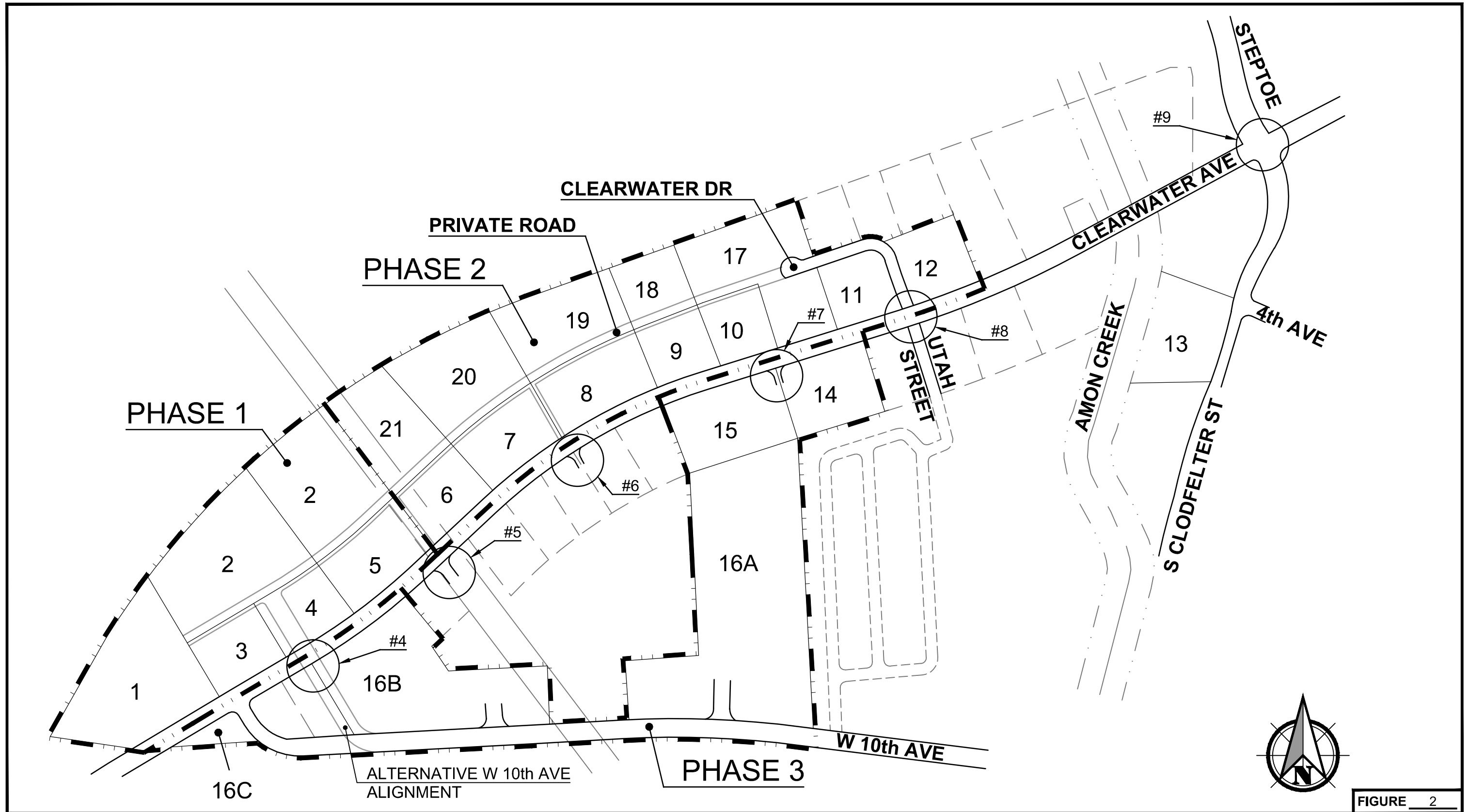


FIGURE 2

HDJ
DESIGN GROUP
engineers | landscape architects | planners | surveyors

6115 Burden Blvd, Suite E
Pasco, WA 99301-8930
509/547-5119
360/695-3488
509/547-5129 fax
Internet: www.hdjdg.com

Site Plan

Clearwater Commercial Binding Site Plan

EXISTING CONDITIONS

The existing infrastructure and operational traffic conditions in the vicinity of the site were documented. Roadway conditions were studied to confirm that the roadway is currently operating in a safe and efficient manner. The study area (Figures 3-11) and the impacted intersections were defined based on consultation with the City of Kennewick and WSDOT staff prior to starting the TIA.

EXISTING INFRASTRUCTURE

Land Uses

The land uses surrounding the site are documented to help identify the site location and to provide reference for any discussion of conditions that might impact the adjacent properties. The land uses surrounding the site are shown in Table 1.

**Table 1
Land Use Around The Site**

North of Site	
Zoning (County)	GMA
Description	Agriculture
Existing Use	Vacant

West of Site	
Zoning (Richland)	NOS and PPF
Description	Natural Open Space and Parks and Public Facilities
Existing Use	Residential and Vacant

S I T E	<table> <tr> <th colspan="2">East of Site</th></tr> <tr> <td>Zoning (City)</td><td>IL and R</td></tr> <tr> <td>Description</td><td>Light Industrial and Residential</td></tr> <tr> <td>Existing Use</td><td>Light Industrial and Residential</td></tr> </table>	East of Site		Zoning (City)	IL and R	Description	Light Industrial and Residential	Existing Use	Light Industrial and Residential
East of Site									
Zoning (City)	IL and R								
Description	Light Industrial and Residential								
Existing Use	Light Industrial and Residential								

South of Site	
Zoning (County)	General Commercial, Urban Growth Area Residential and Light Industrial
Description	See above
Existing Use	Residential and Vacant

The site is zoned for Commercial Community – CC. The approximate 85 acre site is a combination of developed parcels, approved but not yet built-out parcels, and vacant parcels.

Existing Roadways

The existing arterial roadway providing access to the site is W Clearwater Avenue.

Data was gathered on the intersections of: E Badger Road/I-82 EB off and on-ramps, E Badger Road/I-82 WB off and on-ramps, E Badger Road/Leslie Road/W Clearwater Avenue, W Clearwater Avenue/W 10th Avenue, W Clearwater Avenue/Clearwater Drive/S Utah Street, W Clearwater Avenue/Steptoe Street/S Clodfelter Street, and W Clearwater Avenue/N and S Columbia Center Boulevard, for the purpose of capacity analysis of the existing roadway system. The pertinent information regarding these roadways is tabulated in Table 2.

Table 2
Existing Roadway Information

Roadway Name	Classification	Speed Limit	Lane Configuration	
			Current	Sidewalks/Bike Lanes
E Badger Road (south of I-82)	Major Collector	50*	2-3 Lanes	No sidewalks and no bike lanes
E Badger Road (north of I-82)	Minor Arterial	50*	3-5 Lanes	No sidewalks and no bike lanes
Leslie Road	Minor Arterial	40	3-4 Lanes	Some sidewalk and no bike lanes
W Clearwater Avenue	Minor Arterial	45	4-5 Lanes	Sidewalk and no bike lanes
W 10 th Avenue	Minor Arterial	25	2 Lanes	No sidewalk and no bike lanes
Clearwater Drive	not classified	25	2 Lanes (unstriped)	No sidewalk and no bike lanes
S Utah Street	not classified	25	2 Lanes (unstriped)	Some sidewalk and no bike lanes
Steptoe Street	Principal Arterial	40	4-5 Lanes (divided)	Sidewalk and bike lanes
S Clodfelter Street	Principal Arterial	50	2 Lanes	Sidewalk and bike lanes
N Columbia Center Boulevard	Principal Arterial	35	5-7 Lanes	Sidewalk and no bike lanes
S Columbia Center Boulevard	Minor Arterial	40	5 Lanes	Sidewalk and no bike lanes

*assumed no record found.

Major Intersections and Traffic Control

The intersections in the vicinity of the site have been identified through communication with City of Kennewick and WSDOT staff. The intersections are:

- *E Badger Road/I-82 EB off and on-ramps*
- *E Badger Road/I-82 WB off and on-ramps*
- *E Badger Road/Leslie Road/W Clearwater Avenue roundabout*
- *W Clearwater Avenue/W 10th Avenue intersection*

- *W Clearwater Avenue/Clearwater Drive/S Utah Street intersection*
- *W Clearwater Avenue/Stephoe Street/S Clodfelter Street intersection*
- *W Clearwater Avenue/N and S Columbia Center Boulevard intersection*

The information shown in Table 3 was gathered and is relevant to the analysis of the capacity of the intersection. The information shown below is the existing geometrics and traffic control at the study intersections.

Table 3
Major Intersections and Traffic Control

Intersection:	<i>E Badger Road/I-82 EB off and on-ramps</i>			
Weekday PM Hour:	4:00 to 5:00			
Leg:	NB	SB	WB	EB
Control:	Unc	Unc	Stop	NA
Number of Lanes:	1	1	1	NA

Intersection:	<i>E Badger Road/I-82 WB off and on-ramps</i>			
Weekday PM Hour:	4:30 to 5:30			
Leg:	NB	SB	WB	EB
Control:	Unc	Unc	Stop	NA
Number of Lanes:	1	2	1	NA

Intersection:	<i>E Badger Road / Leslie Road / W Clearwater Avenue Roundabout</i>			
Weekday PM Hour:	4:30 to 5:30			
Leg:	NB	SB	WB	EB
Control:	Yield/RA	Yield/RA	Yield/RA	Yield/RA
Number of Lanes:	2	2	2	2

Intersection:	<i>W Clearwater Avenue / W 10th Avenue Intersection</i>			
Weekday PM Hour:	4:30 to 5:30			
Leg:	NB	SB	WB	EB
Control:	Unc	Unc	Stop	NA
Number of Lanes:	2	2	1	NA

Intersection:	<i>W Clearwater Avenue / Clearwater Drive / S Utah Street Intersection</i>			
Weekday PM Hour:	4:30 to 5:30			
Leg:	NB	SB	WB	EB
Control:	Stop	Stop	Unc	Unc
Number of Lanes:	1	1	2	2

Intersection:	<i>W Clearwater Avenue / Steptoe Street / S Clodfelter Street Intersection</i>			
Weekday PM Hour:	4:30 to 5:30			
Leg:	NB	SB	WB	EB
Control:	Sig	Sig	Sig	Sig
Number of Lanes:	4	4	3	3

Intersection:	<i>W Clearwater Avenue / N and S Columbia Center Boulevard Intersection</i>			
Weekday PM Hour:	4:30 to 5:30			
Leg:	NB	SB	WB	EB
Control:	Sig	Sig	Sig	Sig
Number of Lanes:	4	4	5	3

Yield/RA = Yield controlled at a Roundabout

Sig = Signal Controlled

Stop = Stop Controlled

Unc = Uncontrolled

NA = Not Applicable

The project area is defined as the vicinity of the site encompassed by these intersections. The operation of two of the intersections is controlled by signalization, one by a roundabout, with the remaining by stop control. Table 3 refers to the type of existing control and the number of approach lanes for each leg of the intersection. The lane configuration for all intersections is shown in Figure 3.

TRAFFIC VOLUMES

Existing traffic volume data is the basis for the analysis of the capacity and safety of the roadway. The *in-process* traffic is the traffic generated by approved projects that have yet to be completed. The trips from the in-process developments are in addition to the existing traffic volumes. Background traffic growth was estimated for the five (5) year (2021) and twenty (20) year (2036) build out periods.

Existing Traffic

Traffic volume data was gathered for the study intersections. During the month of November 2015, HDJ Design Group retained: *All Traffic Data Services, Inc.*, to collect the traffic data at the studied intersections. All traffic counts were conducted during the weekday PM (4:00-6:00) peak hours (Appendix B). The peak hour volumes for the studied intersections are shown in Figure 4.

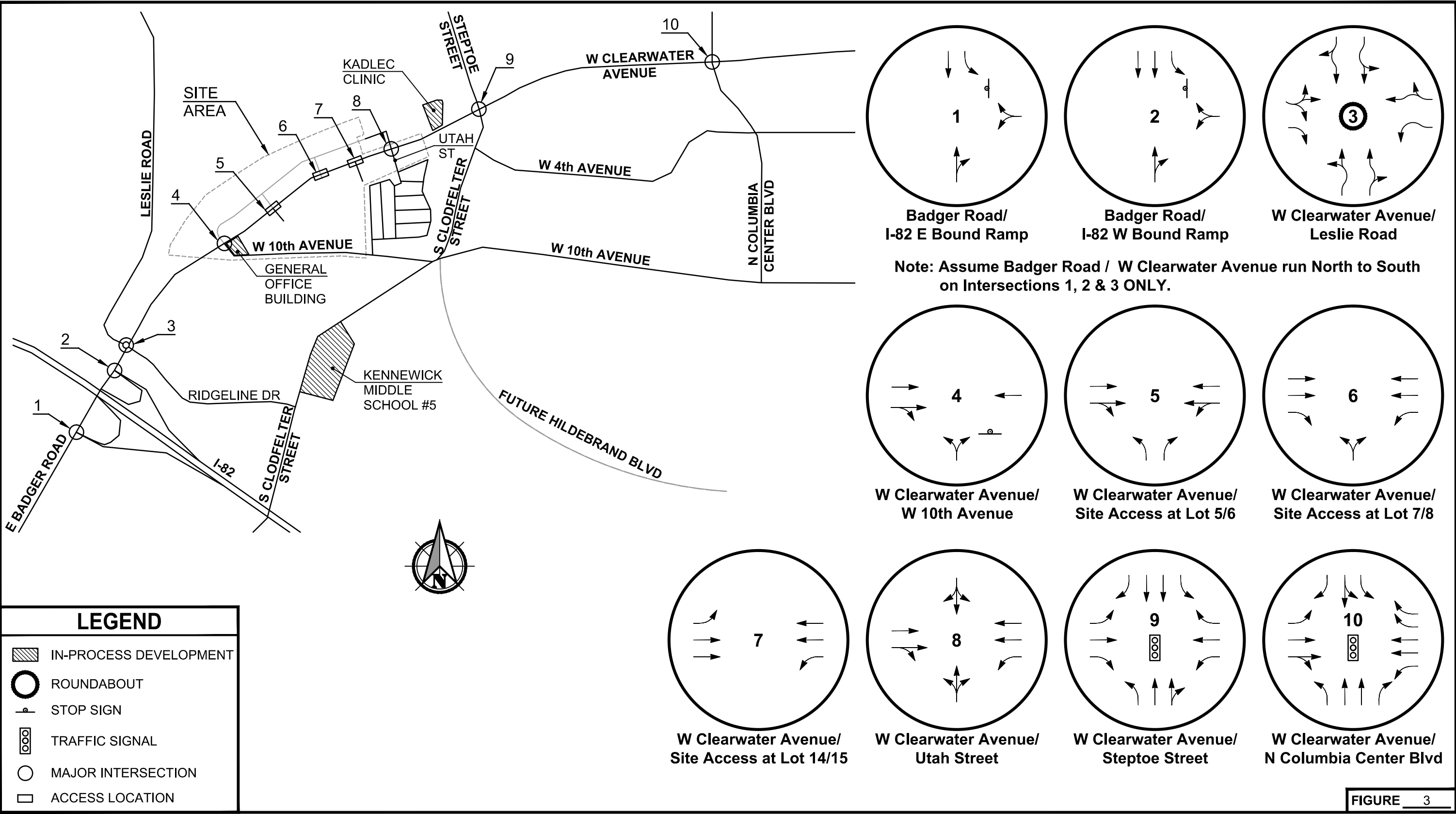
In-Process Traffic

In-process trips from recently approved projects were requested from the City of Kennewick. A General Office Building on Lot #16B, Kadlec Clinic, The Ridge at Hansen Park Subdivision, and the Kennewick School District Middle School #5, are the projects sending trips through the study area. The in-process trips are included to account for future traffic on the surrounding roadways. In-process trips are included in Appendix A and shown in Figure 5.

It is not known when this project will be complete or when the in-process trips will impact the roadway network. For this analysis, it is assumed Phase 1 will be completed by 2021, with Phase 2 and 3, and the in-process projects being completed by the 2036 design horizon year, which is used for the future conditions.

Background Traffic

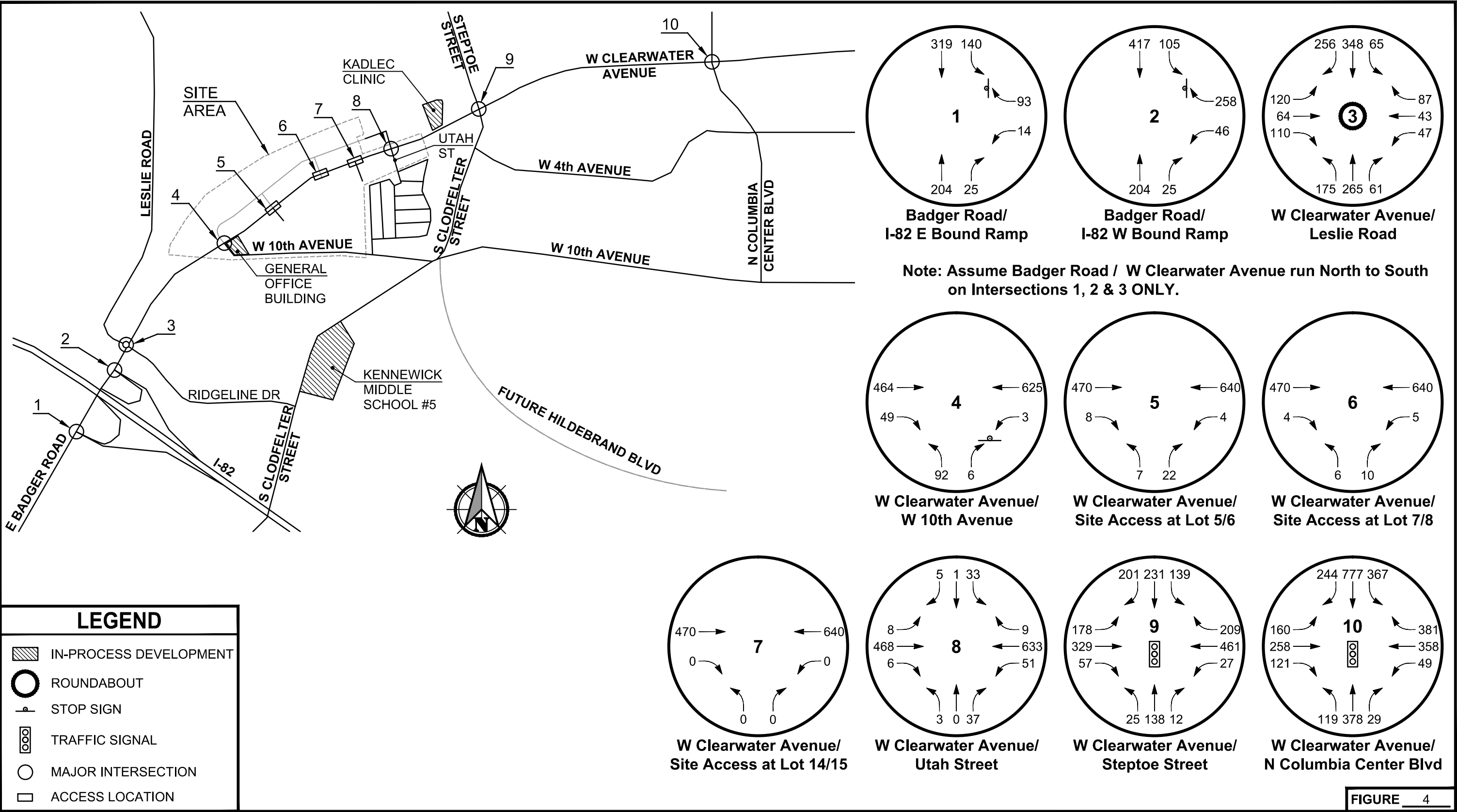
A 2.0% annual growth rate was used to account for background increase of traffic in the area of the site based on discussions with City staff.



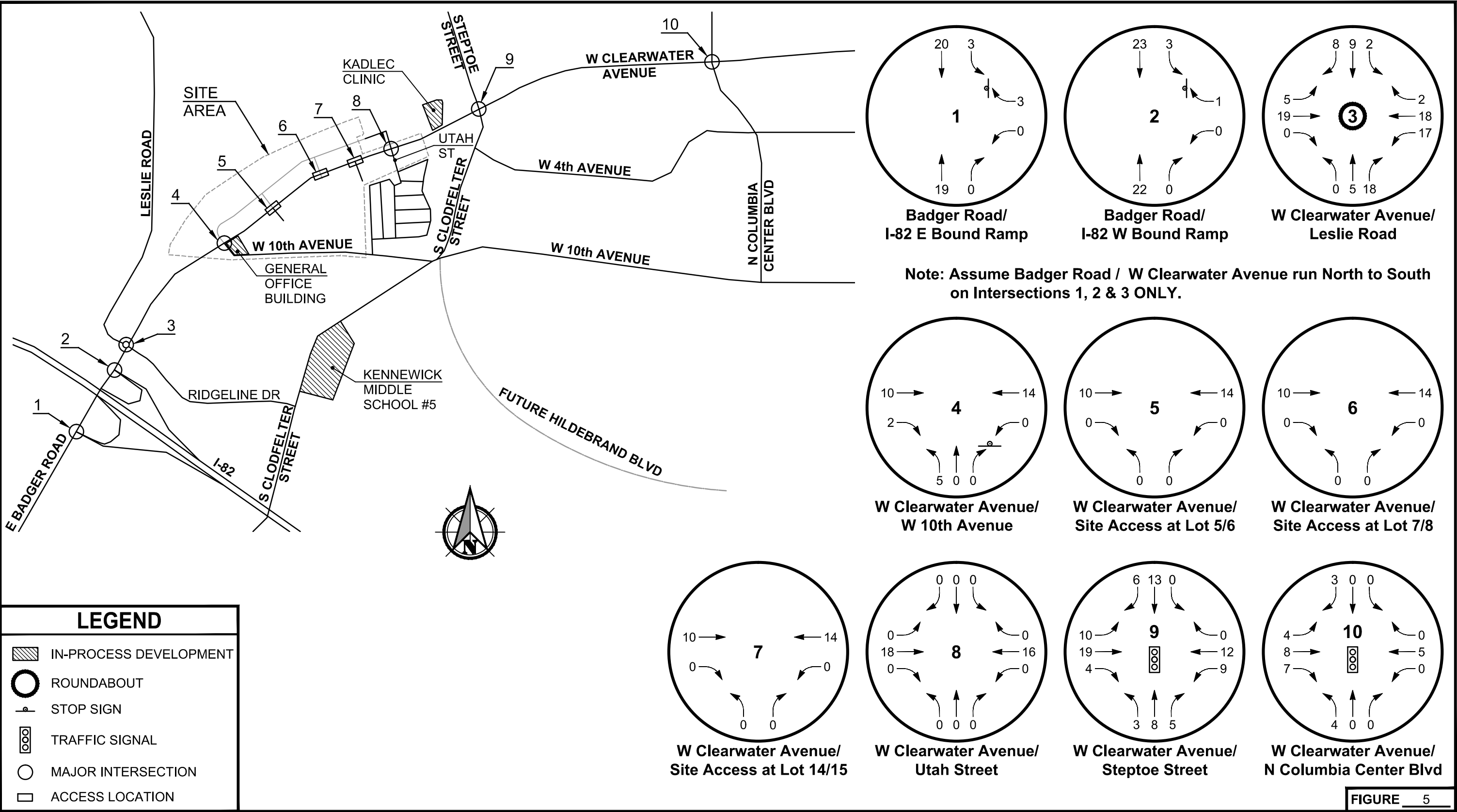


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Existing Lane Configuration
Clearwater Commercial Binding Site Plan



Existing PM Peak Hour Traffic Volume
Clearwater Commercial Binding Site Plan





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PM Peak Hour In-Process Trips

Clearwater Commercial Binding Site Plan

PROPOSED CONDITIONS

The Michel and Solbrack Binding Site Plan development will add traffic to the roadway system. Where the project is located, the size of the project, and when it will be completed are all important elements that need to be considered to determine the impacts of this proposal on safety and capacity. It is also important to examine how the project will operate with the existing transportation system, estimate how much new traffic it will generate, and predict where traffic generated by the site will be distributed. The Transportation Impact Analysis (TIA) for the Binding Site Plan is required by the City as a condition to further subdivide the large lots in a manner that allows for traffic mitigation.

PROJECT DESCRIPTION

The Michel and Solbrack site has approximately 85 acres of developable land with no specific development proposed. To allow future development, the city has required a TIA to plan for the mitigation necessary to address potential impacts. The site is located on the north and south sides of W Clearwater Avenue, between Leslie Road and S Clodfelter Road, in the southeast ¼ and southwest ¼ of Section 1, Township 8 North, Range 28 East of the Willamette Meridian, in Benton County, in the City of Kennewick. For analysis purposes the development is proposed to be developed in three phases with the trip generation being based on the best and highest use for the current zoning. The first phase of this project is projected to be complete in 2021, with the remaining phases complete by 2036.

Access

Properly located access points are essential to allow for the safe and orderly movement of traffic in and out of a site. The primary accesses will be the W Clearwater Avenue/W 10th Avenue intersection and W Clearwater Avenue/Clearwater Drive/S Utah Street intersection. Secondary access will be provided at three new driveways onto W Clearwater Avenue. The access points are shown on Figure 2 in relation to the proposed lots. They are also illustrated in Figures 3-11.

The project proposes to extend Clearwater Drive as a private street that is intended for internal access to the abutting properties only. This also true of driveways/private roads that connect to W Clearwater Avenue at W 10th Avenue, between lots 5 and 6, lots 7 and 8, and lots 14 and 15.

All lot access will be directed to the private streets or the proposed access points. No additional driveways are proposed for Clearwater Avenue. The spacing of proposed access points is greater than 155 feet City minimum from centerline to center line on W Clearwater Avenue.

TRIP GENERATION AND DISTRIBUTION

Trip Generation

Trip generation estimates were prepared for the proposed development (Appendix A). For the purposes of this study, the ITE Trip Generation Manual, 9th Edition was used to determine trips from the site. Average rates for the land uses were used to determine the project generated trips for a development of this size, using various land use codes assigned to each lot, along with the anticipated size of the proposed building. The new trips generated by the project are shown in Table 4.

HDJ's land use planner provided land use assumptions based upon City input for this proposal. The best and highest use for the land, not just specialty retail, is the basis for this analysis. Based upon HDJ experience, building sizes have been noted, taking into consideration: zoning, similar settings, single story buildings, and percent of land coverage with setback rules. A large anchor store was assumed, a Home Improvement Super Store. A "big box" was chosen, as it has the best available data in the ITE Trip Generation Manual.

The phasing plan is a typical scenario with the anchor stores in Phase 1. Phase 2, contains the office uses, with restaurants to follow, and medical office buildings (MOB) in Phase 3, all as the market allows. Phase 1 is assumed to be complete in the first five (5) years, Phase 2 and 3 in twenty (20) years.

The trip generation is for the PM peak makes use of both pass-by and internal capture trips based on consultation with the City of Kennewick and the very preliminary land use planning. The internal capture rate (10%) is based on the attraction between office and retail, and retail to retail, within walking distance on the north side of W Clearwater Avenue. City staff commented that internal capture rates should be below 13%. The current land use proposal is based on the "highest and best use" and not on specific proposal, thus the rate should reflect the uncertainty of the ultimate development.

The new trips were further reviewed for both internal and pass-by trips. The total number of new trips for the proposed development were reduced by internal and pass-by trips to determine the net new trips. The net new trips generated by the project are shown in Table 5.

The trip generation was reviewed with City staff.

Table 4
Trip Generation

Land Use:	Home Improvement Superstore (Code 862)	
Independent Variable:	1,000 Sq Ft	
Size:	145	
Weekday ADT	4,457	
Total Peak Hour Trips:	AM	PM
In	123	166
Out	93	172
Total:	216	338
Lots 1, 2, 3 and 4		

Land Use:	Supermarket Grocery (Code 850)	
Independent Variable:	1,000 Sq Ft	
Size:	40.20	
Weekday ADT	4,110	
Total Peak Hour Trips:	AM	PM
In	85	194
Out	52	187
Total:	137	381
Lot 2		

Land Use:	Specialty Retail (Code 826)	
Independent Variable:	1,000 Sq Ft	
Size:	21.52	
Weekday ADT	954	
Total Peak Hour Trips:	AM	PM
In	71	26
Out	77	33
Total:	148	59
Lot 5		

Land Use:	Fast Food w/Drive Thru w/Seating (Code 934)	
Independent Variable:	1,000 Sq Ft	
Size:	7.5	
Weekday ADT	7,413	
Total Peak Hour Trips:	AM	PM
In	346	254
Out	333	235
Total:	679	489
Lot 6		

Land Use:	Specialty Retail (Code 826)	
Independent Variable:	1,000 Sq Ft	
Size:	19.39	
Weekday ADT	859	
Total Peak Hour Trips:	AM	PM
In	64	23
Out	69	29
Total:	133	53
Lot 7		

Land Use:	Specialty Retail (Code 826)	
Independent Variable:	1,000 Sq Ft	
Size:	24.81	
Weekday ADT	1,100	
Total Peak Hour Trips:	AM	PM
In	81	30
Out	88	38
Total:	169	68
Lot 8		

Land Use:	Specialty Retail (Code 826)	
Independent Variable:	1,000 Sq Ft	
Size:	13.53	
Weekday ADT	600	
Total Peak Hour Trips:	AM	PM
In	44	16
Out	48	21
Total:	92	37
Lot 9		

Land Use:	Specialty Retail (Code 826)	
Independent Variable:	1,000 Sq Ft	
Size:	13.87	
Weekday ADT	615	
Total Peak Hour Trips:	AM	PM
In	46	17
Out	49	3
Total:	95	13
Lot 10		

Land Use:	Fast Food w/Drive Thru w/Seating (Code 934)	
Independent Variable:	1,000 Sq Ft	
Size:	5.77	
Weekday ADT	5,725	
Total Peak Hour Trips:	AM	PM
In	267	196
Out	257	181
Total:	524	377
Lot 11		

Land Use:	Fast Food w/Drive Thru w/Seating (Code 934)	
Independent Variable:	1,000 Sq Ft	
Size:	7.0	
Weekday ADT	6,896	
Total Peak Hour Trips:	AM	PM
In	322	236
Out	309	218
Total:	631	455
Lot 12		

Land Use:	General Office Building (Code 710)	
Independent Variable:	1,000 Sq Ft	
Size:	13.54	
Weekday ADT	149	
Total Peak Hour Trips:	AM	PM
In	19	3
Out	3	17
Total:	22	20
Lot 13		

Land Use:	Quality Restaurant (Code 931)	
Independent Variable:	1,000 Sq Ft	
Size:	22.59	
Weekday ADT	2,032	
Total Peak Hour Trips:	AM	PM
In	14	113
Out	5	56
Total:	19	169
Lot 14		

Land Use:	Specialty Retail (Code 826)	
Independent Variable:	1,000 Sq Ft	
Size:	32.86	
Weekday ADT	1,456	
Total Peak Hour Trips:	AM	PM
In	108	39
Out	117	50
Total:	225	89
Lot 15		

Land Use:	Medical Dental Office Building (Code 720)	
Independent Variable:	1,000 Sq Ft	
Size:	111.46	
Weekday ADT	4,027	
Total Peak Hour Trips:	AM	PM
In	218	112
Out	58	303
Total:	276	415
Lot 16A		

Land Use:	Medical Dental Office Building (Code 720)	
Independent Variable:	1,000 Sq Ft	
Size:	62.81	
Weekday ADT	2,269	
Total Peak Hour Trips:	AM	PM
In	123	63
Out	33	171
Total:	156	234
Lot 16B		

Land Use:	Medical Dental Office Building (Code 720)	
Independent Variable:	1,000 Sq Ft	
Size:	4.16	
Weekday ADT	150	
Total Peak Hour Trips:	AM	PM
In	8	4
Out	2	11
Total:	10	15
Lot 16C		

Land Use:	General Office Building (Code 710)	
Independent Variable:	1,000 Sq Ft	
Size:	26.57	
Weekday ADT	293	
Total Peak Hour Trips:	AM	PM
In	36	7
Out	5	33
Total:	41	40
Lot 17		

Land Use:	General Office Building (Code 710)	
Independent Variable:	1,000 Sq Ft	
Size:	13.19	
Weekday ADT	145	
Total Peak Hour Trips:	AM	PM
In	18	3
Out	2	16
Total:	20	19
Lot 18		

Land Use:	General Office Building (Code 710)	
Independent Variable:	1,000 Sq Ft	
Size:	29.37	
Weekday ADT	324	
Total Peak Hour Trips:	AM	PM
In	40	7
Out	5	36
Total:	45	43
Lot 19		

Land Use:	General Office Building (Code 710)	
Independent Variable:	1,000 Sq Ft	
Size:	33.80	
Weekday ADT	373	
Total Peak Hour Trips:	AM	PM
In	46	9
Out	6	42
Total:	52	51
Lot 20		

Land Use:	General Office Building (Code 710)	
Independent Variable:	1,000 Sq Ft	
Size:	26.84	
Weekday ADT	296	
Total Peak Hour Trips:	AM	PM
In	37	7
Out	5	33
Total:	42	40
Lot 21		

Table 5
Net New Trip Generation

Land Use	Varies
Independent Variable	Varies
Size	Varies
Total Peak Hour Trips	PM
In	662
Out	988
Total	1,650

Trip Distribution

The trip distribution is based on link volumes on the arterial at the edge of the study area. HDJ summed the average daily traffic (ADT) from each link with the arrows (2012 volumes are from the Benton-Franklin Council of Governments data) and then divided each link volume by the total for a percent of trips from the development on each link. The trip distribution was reviewed and revised based on City staff input.

Site generated trips and distribution are shown in Figure 7.

PROPOSED INFRASTRUCTURE

Roadways and Intersections

The City of Kennewick has two large transportation improvement projects in-process in the area.

The “Steptoe Street Extensions Phase 3A – Hildebrand Boulevard Extension” realigns the “Five Corners” (S Clodfelter Road, W 10th Avenue, and W Hildebrand Road) intersection into a series of “tee” intersections, with a two-lane roundabout at the Steptoe Street and W 10th Avenue intersection.

The “Steptoe Street Extension and Hildebrand Boulevard Extension Phase 3B” interim project, extends W Hildebrand Road to the east and realigns S Clodfelter Road into a “tee” intersection with Hildebrand Boulevard.

The projects are anticipated to be completed within five (5) years.

WSDOT has noted concern with the E Badger Road/WB I-82 ramp intersection and sites the need for future roundabouts. The roundabout project is not funded and funding does not appear available in the planning horizon year of 2036. WSDOT does have plans for re-striping of E Badger Road to provide a westbound to southbound left turn acceleration lane to address impacts of development in the vicinity. WSDOT also notes the need for a second southbound through lane on E Badger Road between the I-82 WB off ramp and Wiser Parkway. No details were provided on the scope, schedule, or budget of the widening.

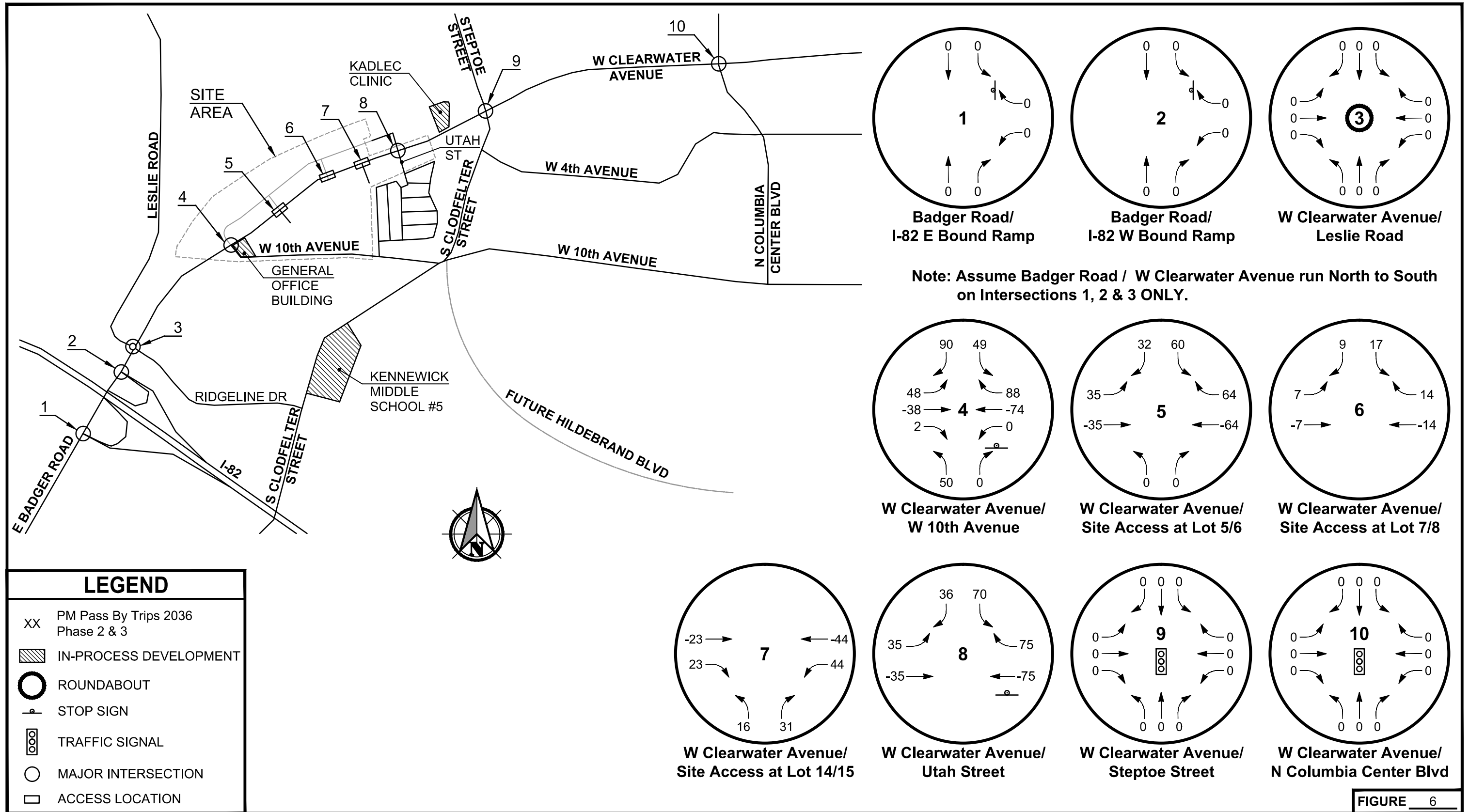


FIGURE 6

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PM Peak Hour Pass-by Trips
Clearwater Commercial Binding Site Plan

CAPACITY ANALYSIS

DESCRIPTION

Traffic operations were assessed in terms of level of service (LOS). LOS is a concept that was developed by transportation engineers to qualify the level of operation of intersections and roadways (Highway Capacity Manual, Reference 1). LOS measures are classified in grades “A” through “F” indicating a range of operation. LOS “A” signifies the best level of operation, while “F” represents the worst.

LOS at un-signalized intersections is quantified in terms of average delay per vehicle. A LOS “A” reflects full freedom of operation for a driver while a LOS “F” represents operational failure. The criteria is based on the theory of gap acceptance for side street stop sign controlled approaches. A detailed description of LOS criteria is provided in Appendix C.

Generally, LOS “D” is considered the threshold of acceptable operation for existing signalized and roundabout intersections. The City of Kennewick’s policy on LOS was used in this Traffic Impact Analysis. Per this policy, LOS “D” in the peak hour is considered the minimum acceptable operation at existing signalized and roundabout intersections and for the five year design horizon for new signalized and roundabout intersections. LOS “E” and at times LOS “F”, is acceptable for un-signalized minor street approaches.

For roundabouts, average control delay was used to measure the LOS of an intersection. With a LOS A for delay of 10 seconds or less, LOS B for delay of 10 to 15 seconds, LOS C for delay of 15 to 25 seconds, LOS D for delay of 25 to 35 seconds, LOS E for delay of 35 to 50 seconds, and LOS F for delay over 50 seconds.

ANALYSIS METHODOLOGY

Traffic impacts were estimated to determine the extent of change in traffic conditions caused by the development of this project. In order to make this determination, the following assumptions were employed:

- *The first phase of the proposed development is projected to be built-out and in operation in 2021, with the remaining phases complete and in operation by 2036.*
- *Existing background traffic on the study area’s major roadways will grow by 2.0% per year.*
- *Traffic generation estimates for the project have been prepared for a five (5) year (2021) and 20 year (2036) build-out period. These estimates were prepared for the weekday PM hour of the surrounding street system.*
- *Geometric design changes at the major intersections, and background traffic volumes on the surrounding street system have been determined prior to adding the traffic impacts of the proposed project. This was done to establish a baseline for measurement of the incremental impact of the project at the time*

of its development. Background traffic volume estimates were prepared for both the five (5) year and 20 year build out period.

- *Cumulative traffic impacts of the proposed project were then determined by superimposing the project-generated traffic onto the background PM peak traffic and then analyzed.*
- *Roadway improvements have been addressed at appropriate intersections to maintain acceptable levels of operation. This procedure was conducted for non-project and project-related impacts.*

The current LOS at the study area's intersections that have been evaluated for the previously defined PM peak hours. The calculations can be found in Appendix D. The findings are listed in Table 6.

LEVEL OF SERVICE ANALYSIS

Existing Conditions

Table 6
Estimated Existing (2015) Level Of Service
For Study Area Intersections

INTERSECTION (critical movement for STOP controlled intersection)	Existing Level of Service		
	PM Peak Hour		
	LOS	Delay (sec)	Volume /Capacity
E Badger Road / I-82 EB off and on-ramps – (EB left turn)	B	12.0	–
E Badger Road / I-82 WB off and on-ramps – (WB left turn)	C	18.4	–
E Badger Road / Leslie Road, / W Clearwater Avenue – (intersection average)	A	2.2	–
W Clearwater Avenue / W 10 th Avenue intersection – (NB left turn)	C	22.8	–
W Clearwater Avenue / Clearwater Drive / S Utah Street – (SB left)	D	30.4	–
W Clearwater Avenue / Steptoe Street/S Clodfelter Street – (intersection average)	C	24.6	0.84
W Clearwater Avenue / N and S Columbia Center Boulevard – (intersection average)	C	21.0	0.66

As shown in Table 6, all studied intersections currently do operate at an acceptable level of service according to the City of Kennewick Level of Service Standards.

2021 Design Year Conditions

Table 7
Estimated 2021 Level Of Service
For Study Area Intersections

INTERSECTION <i>(critical movement for STOP controlled intersections)</i>	2021 Weekday PM Level of Service					
	W/O Project			With Project		
	LOS	Delay (sec)	Volume / Capacity	LOS	Delay (sec)	Volume / Capacity
E Badger Road / I-82 EB off and on-ramps – (EB left turn)	B	12.8	–	B	13.7	–
E Badger Road / I-82 WB off and on-ramps – (WB left turn)	C	23.2	–	D	33.5	–
E Badger Road / Leslie Road / W Clearwater Avenue – (intersection average)	A	2.3	–	A	2.5	–
W Clearwater Avenue / W 10 th Avenue intersection – (NB left turn)	C	22.9 1	–	F	696.1	–
W Clearwater Avenue / Clearwater Drive / S Utah Street – (SB left turn)	E	37.2	–	F	58.6	–
W Clearwater Avenue / Steptoe Street/S Clodfelter Street – (intersection average)	C	25.1	0.87	C	26.2	0.90
W Clearwater Avenue / N and S Columbia Center Boulevard – (intersection average)	C	22.3	0.75	C	23.6	0.78

* With project includes Phase 1 only.

Table 7 shows that the estimated 2021 level of service conditions for the major intersections are within the City of Kennewick LOS standards, with the exception of W Clearwater Avenue/W 10th Avenue and W Clearwater Avenue/Clearwater Drive/S Utah Street intersections, which will fail with the project.

The failures are due to the heavy east/west traffic on W Clearwater Avenue, limiting the opportunities for left turning traffic from W 10th Avenue and Clearwater Drive/S Utah Street to enter onto W Clearwater Avenue.

Design year traffic volumes without and with the project are shown in Figures 8 and 9 respectively.

2021 Design Year Project Mitigation

The project impact analysis is based on the best and highest land use and phasing assumptions that concentrates development near the W Clearwater Avenue/W 10th Avenue intersection. The 2021 mitigation assumes both substantial development is proposed, but that background growth has occurred in the next five (5) years. The site access is recommended to be aligned with W 10th Avenue so that the highest trip generator will be focused at an existing intersection.

W Clearwater Avenue and W 10th Avenue Intersection

The proposed Phase 1, big box retail center with adjacent retail land that uses the intersection for site access, will require mitigation to address the very high delay and long queues on the future north leg of the intersection into the development. At the City's direction, a roundabout was analyzed as the preferred traffic control device as well as a traffic signal with axillary lanes. A roundabout will operate at a LOS A, using SIDRA Intersection version 6.1 for the analysis. This includes two (2) lanes entering onto W Clearwater Avenue and a one leg approach onto W 10th Avenue from the development side (north leg) of the intersection.

Based on PM peak hour volumes, a peak hour signal warrant was met. A traffic signal was also analyzed as an alternative with a high level of service LOS B. It would include turn lanes on all the approaches including right turn lanes onto westbound W Clearwater Avenue.

W Clearwater Avenue and W 10th Avenue Intersection Location

The existing W Clearwater Avenue/W 10th Avenue intersection has geometric constraints that limit sight distance and queuing storage on W 10th Avenue. An alternative alignment has been proposed as shown on Figure 2 with W 10th Avenue intersecting with W Clearwater Avenue approximately 300 feet east of the current location. This provides a longer straight tangent after the horizontal curve on W 10th Avenue prior to intersecting with W Clearwater Avenue, providing room for northbound left turn queueing. It should improve sight distance for northbound W 10th Avenue drivers to view W Clearwater Avenue traffic. If a roundabout or signal is installed, sight distance is not as critical and relocation not as necessary. If a roundabout is installed the queue storage requirement on northbound W 10th Avenue at Clearwater is significantly shorter and thus, relocation of the intersection is not necessary. The alternative location reduces the conflict with the W 10th Court intersection has with the W 10th Avenue/W Clearwater Avenue intersection. The 200 foot spacing between the intersection of W 10th Avenue/W Clearwater Avenue and W 10th Avenue/W 10th Court is a concern if a traffic signal is installed as it conflicts with left turn lane for W 10th Avenue at W Clearwater Avenue. With a roundabout the 200 foot spacing is not as critical. Thus, the intersection relocation is only recommended if a traffic signal is the preferred traffic control device.

The most important considerations on the decision to relocate the intersection will be based on impacts to the adjacent property and increase in cost of construction. If a roundabout is the preferred traffic controlled alternative, the right of way impacts at both the current and alternative location should be analyzed, but appear to be neutral.

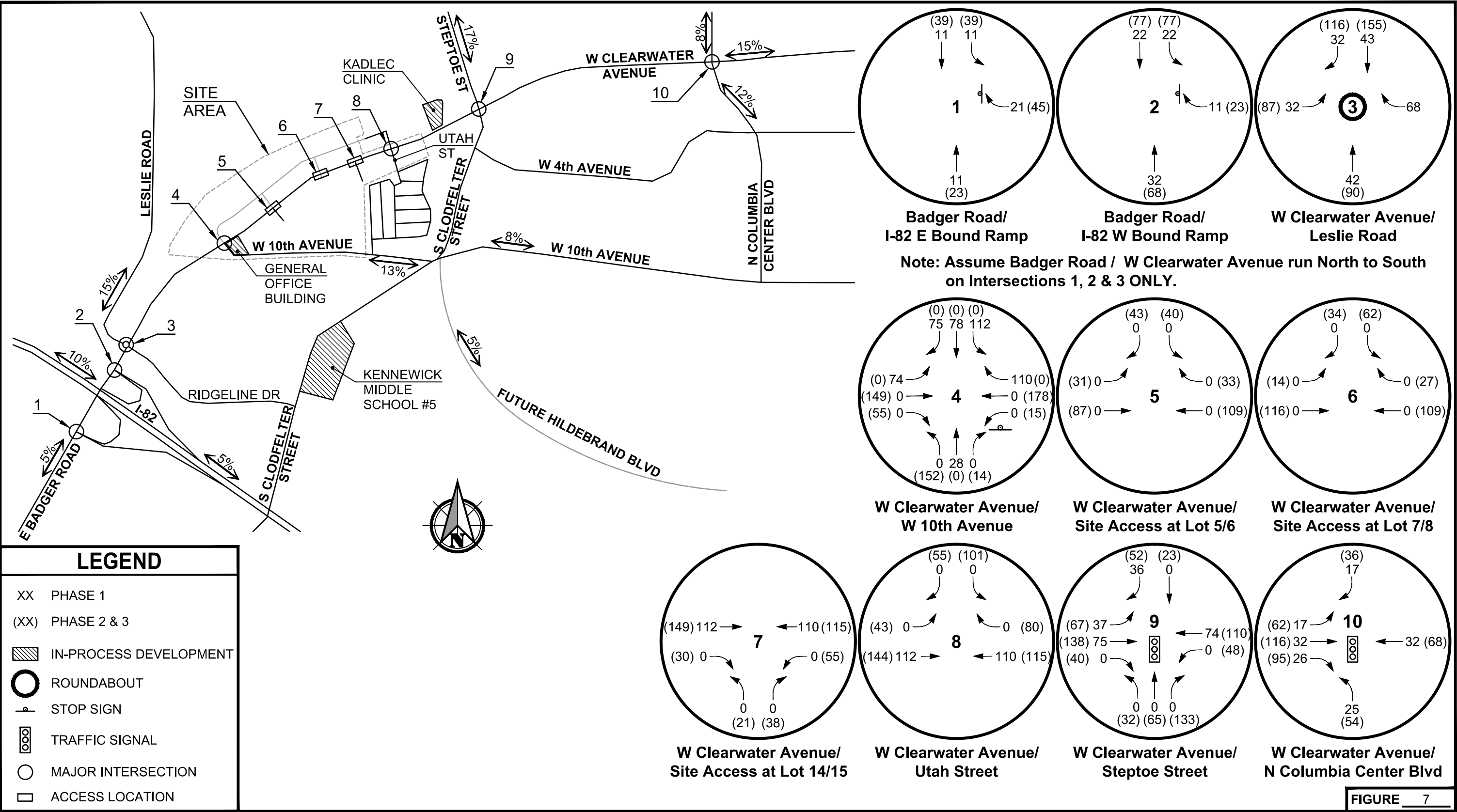
A roundabout will operate at a very high level of service to address the 2021 traffic volumes assuming a big box development and additional adjacent land use. A traffic signal with left and right turn lanes on three of four approaches will also operate acceptably.

The roundabout is the City's preferred alternative, but construction costs of roundabouts can be as high as three times that of a traffic signal. The City of Kennewick believes the initial costs of a roundabout may be 1.25 to 1.5 times the cost of a traffic signal. Traffic signal have much higher maintenance and societal costs. Maintenance can cost \$5,000 per signal per year where roundabouts are a fraction of this cost. The safety benefit of a roundabout compared to a traffic signal is substantial and the lower societal costs associated with preventing collisions (cost to society) are well documented. The delay and queue lengths for roundabouts are much shorter than for traffic signals. If a traffic signal requires right and left turn lanes, and if relocation of the

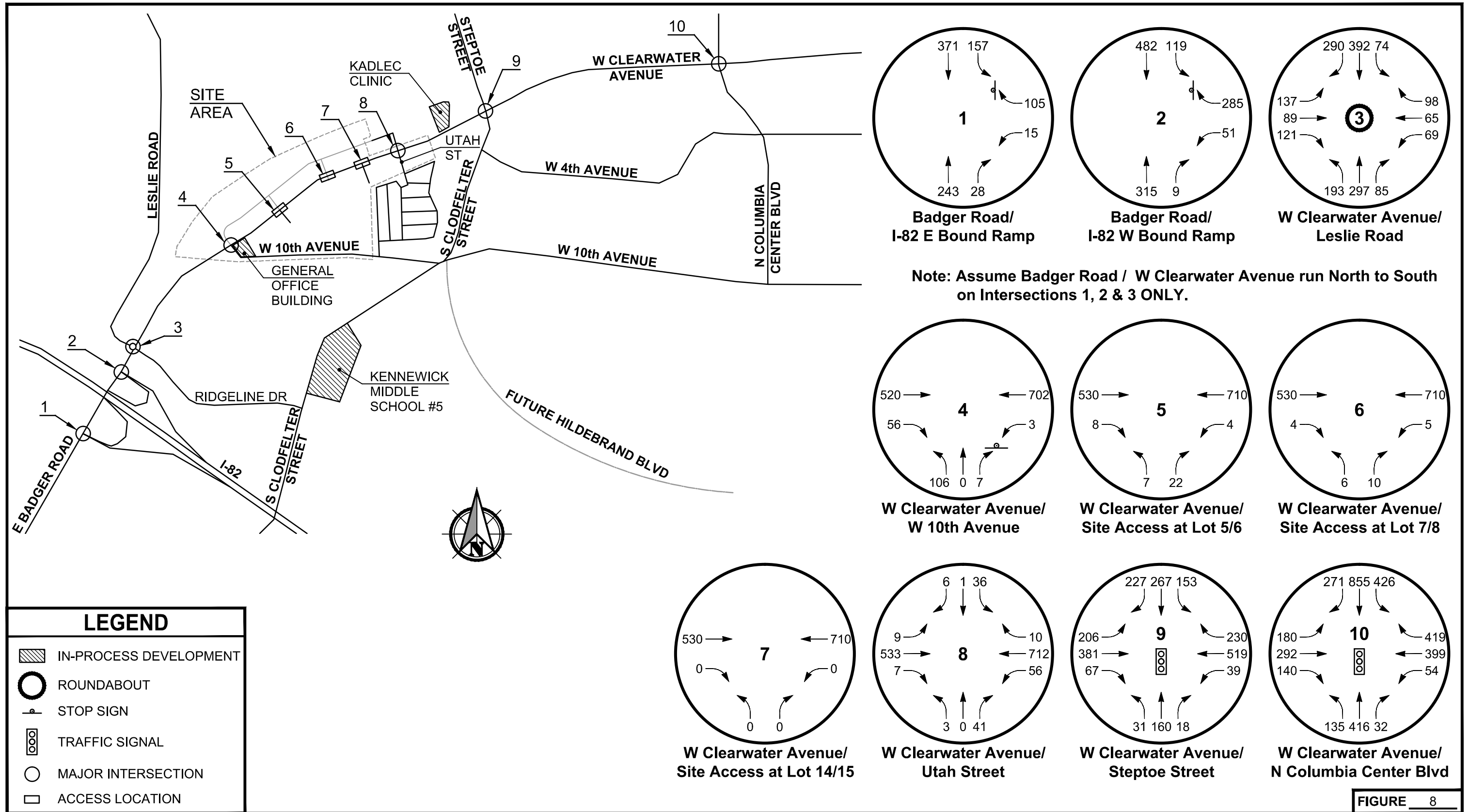
intersection is needed, then construction cost of a signal may not be significantly lower than the roundabout. Thus, a roundabout is the recommended traffic control method.

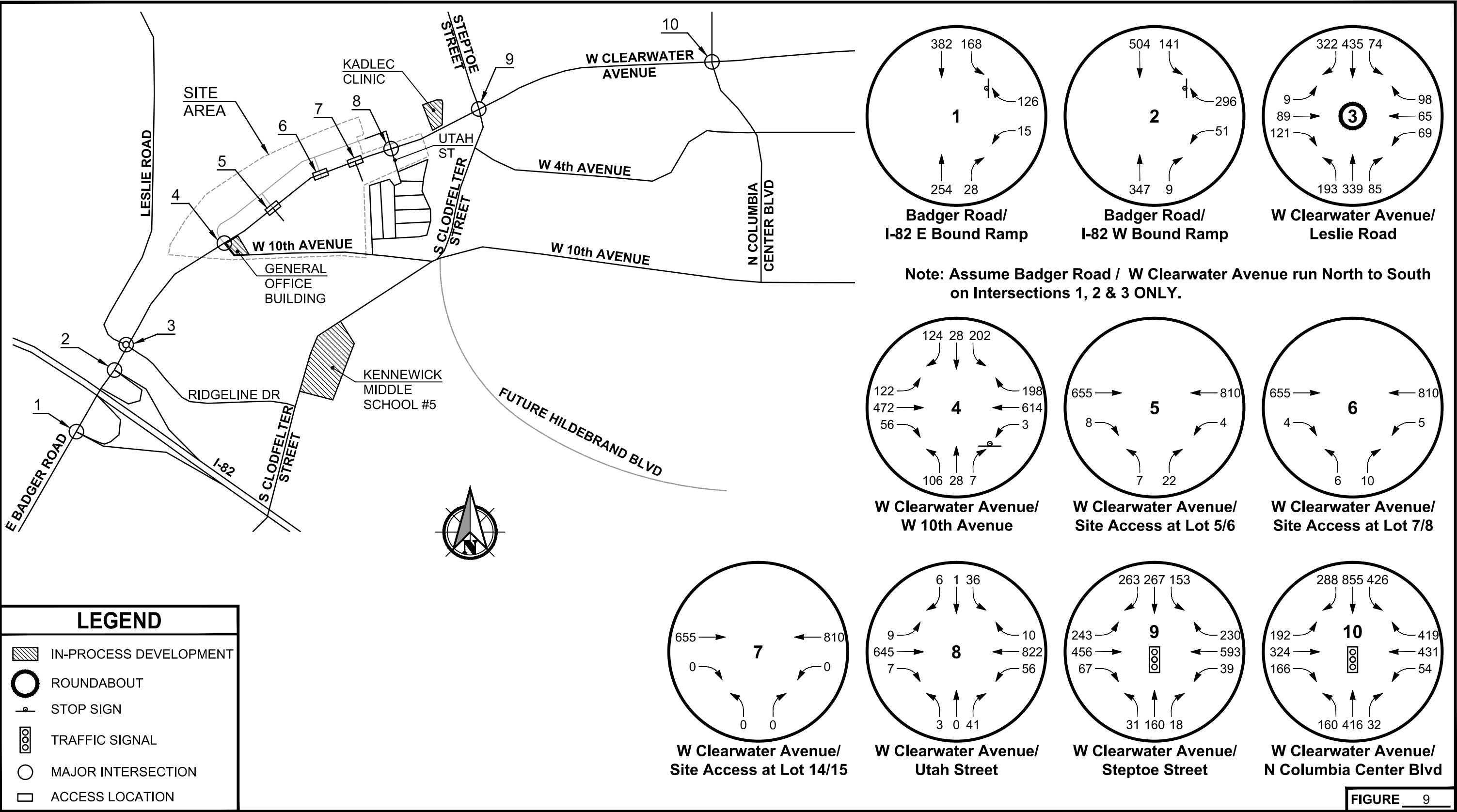
W Clearwater Avenue/Clearwater Drive/S Utah Street Intersection

The intersection falls below the City LOS standard of “E” for unsignalized intersections with or without the project due to background growth on W Clearwater Avenue. With a left turn lane striped on the southbound approach, the delay for the southbound approach will be less than 60 seconds. Adding the left turn lane, the sight distance is met, the volume/capacity is 0.39, and the 95% queue length is estimated at below 40 feet. As the volume on the critical movement is low (33 PM peak hour southbound left turns), no other mitigation is recommended at this time.



Site Generated PM Trips and Distribution
Clearwater Commercial Binding Site Plan





2036 Design Year Conditions

Table 8
Estimated 2036 Level Of Service
For Study Area Intersections

INTERSECTION <i>(critical movement for STOP controlled intersection)</i>	2036 Weekday PM Level of Service					
	W/O Project			With Project		
	<i>LOS</i>	<i>Delay (sec)</i>	<i>Volume / Capacity</i>	<i>LOS</i>	<i>Delay (sec)</i>	<i>Volume / Capacity</i>
E Badger Road / I-82 EB off and on-ramps – (EB left turn)	C	19.6	–	D	27.1	–
E Badger Road / I-82 WB off and on-ramps – (WB left turn)	F	228.7	–	F	508.3	–
E Badger Road / Leslie Road / W Clearwater Avenue – (intersection average)	A	3.2	–	A	4.2	–
W Clearwater Avenue / W 10 th Avenue intersection – (SB left turn)	F	*	*	F	*	*
W Clearwater Avenue / Access at Lot 5/6 intersection – (SB left turn)	N/A			F	631.6	–
W Clearwater Avenue / Access at Lot 7/8 intersection – (SB left turn)	N/A			F	323.1	–
W Clearwater Avenue / Access at Lot 14/15 intersection – (SB left turn)	N/A			F	144.6	–
W Clearwater Avenue / Clearwater Drive / S Utah Street – (SB left turn)	F	317.2	1.07	F	*	*
W Clearwater Avenue / Steptoe Street/S Clodfelter Street – (intersection average)	D	35.4	0.75	D	41.4	0.86
W Clearwater Avenue / N and S Columbia Center Boulevard – (intersection average)	D	47.7	0.89	E	54.8	0.95

*Delay and V/C are too great to be calculated.

Table 8 shows that the 2036 level of service conditions for the major intersections are, and are not within the City of Kennewick LOS standards.

In 2036 Phase 1 development is assumed complete.

The intersection of W Clearwater Avenue/Clearwater Drive/S Utah Street and will fail (LOS F). As in 2021, the failures are due to the heavy east/west traffic on W Clearwater Avenue, limiting the opportunities for left turning traffic from W 10th Avenue and Clearwater Drive/S Utah Street to enter onto W Clearwater Avenue.

The E Badger Road/I-82 WB off and on-ramp intersection will fail (LOS F). This failure is due to the heavy north and south through traffic on E Badger Road.

The W Clearwater Avenue/Access at Lot 5/6, W Clearwater Avenue/Access at Lot 7/8, and W Clearwater Avenue/Access at Lot 14/15 will also fail (LOS F). As with the other intersections, the failures are due to the heavy east/west traffic on W Clearwater Avenue, limiting the opportunities for left turning traffic to enter onto W Clearwater Avenue.

2036 Design Year Project Mitigation

Phase 2 and 3 of the site plan are the estimated best and highest land use assumed for the Binding Site Plan. The 2036 mitigation assumes both build out of the site plan and background 2% annual growth has occurred. The assumed land use is estimated to generate a tremendous number of trips distributed to the studied intersections. The following mitigation is proposed for the intersection with the LOS below City standard.

E Badger Road/I-82 WB off and on-ramps

WSDOT has proposed several projects for this intersection that include:

- Striping a left turn acceleration lane on southbound E Badger Road. This provides for a two stage turn so that westbound traffic turning south does not need to wait for a gap in both directions.
- Widening E Badger Road from the I-82 WB off and on-ramp to Wiser Parkway. WSDOT suggests a proportionate share based on the development impact. It appears the widening can be accomplished with the restriping to add a left turn acceleration lane on southbound E Badger Road. This mitigation will improve the level of service, but does not meet the City standard of LOS E.

With widening of the westbound off-ramp to provide a 225 foot long right turn lane, the LOS is still F, but the delay for the westbound approach is less than 60 seconds. The 95% queue length is estimated at below 100 feet. Because the volume on the critical movement is low, 66 in the PM peak hour for the westbound left turns, the recommendation is to accept the LOS F.

Based on WSDOT's comment of impacts from other developments in Benton County off Wiser Parkway, this intersection will likely need additional traffic control. WSDOT's preferred alternative is a roundabout, but no funding is available, and no proportionate share program is in place for this project or for the developments in the County.

To mitigate the Phase 2 and 3 impacts, it is recommended that the project contribute toward restriping E Badger Road with a left turn acceleration lane and add a second southbound through lane from the I-82 WB off ramp to Wiser Parkway. Also, widen the WB off-ramp to provide a right turn lane with 225 feet of queue storage. Background growth generates a higher need for the right turn lane than the development. WSDOT standards call for a minimum right turn lane of 300 feet. If a proportionate share program was developed for this public improvement, this would be the most equitable funding process.

W Clearwater Avenue/W 10th Avenue Intersection

Assuming the roundabout or signal mitigation is installed in Phase 1 of the development, only minor mitigation will be necessary for this intersection. With the trips from Phase 2 and 3 and the background growth, the intersection, with a roundabout operates at LOS B, with an additional southbound right turn lane. With a traffic signal that includes right and left turn lanes on all approaches, it operates at LOS C.

W Clearwater Avenue/S Utah Street Intersection/Clearwater Drive

With or without trips from Phase 2 and 3 of the development, this intersection falls below the City LOS standard. Based on the confined right-of-way with the southeast and southwest corners being built-out, a traffic signal is the preferred alternative because it meets peak hour warrants and has a LOS within City standards. It does have complications that include the need to interconnect to the adjacent signal for signal coordination, a double left turn is needed to meet the 2036 volumes and driveways for lots 11 and 12 may need to be restricted to right in and right out.

A roundabout was given consideration as an alternative to a traffic signal. For a double lane roundabout, an inscribed diameter of the travel way is 120 feet or more. To maintain the current alignment of W Clearwater Avenue, a substantial amount of right-of-way is needed from properties on all four corners. With the southwest and southeast properties owned by owners other than the applicant, dedication of right-of-way is not assured. Shifting the centerline of W Clearwater Avenue 33 feet to the north at the S Utah Street intersection, appears to eliminate the need for right-of-way from property to the south, but requires a disproportionate right-of-way dedication from the applicant. These property impacts will seriously compromise the commercial viability of the adjacent lots. It is not clear if there is enough frontage along lots 11 and 12 to allow the taper for the offset roundabout. For these reasons a roundabout is not recommended.

Another alternative was considered, installing a roundabout at a new access point between lots 9/10, across from a new access to lot 15. See Figure 12 for roundabout alternatives at W Clearwater Avenue and S Utah Street. This location is not restricted by lack of right-of-way and provides better access to the lots 14/15 and possibly 16. The applicant and City should consider this alternative if the City requires a roundabout.

Site Access between Lots 5/6, 7/8, and 14/15 Intersections with W Clearwater Avenue

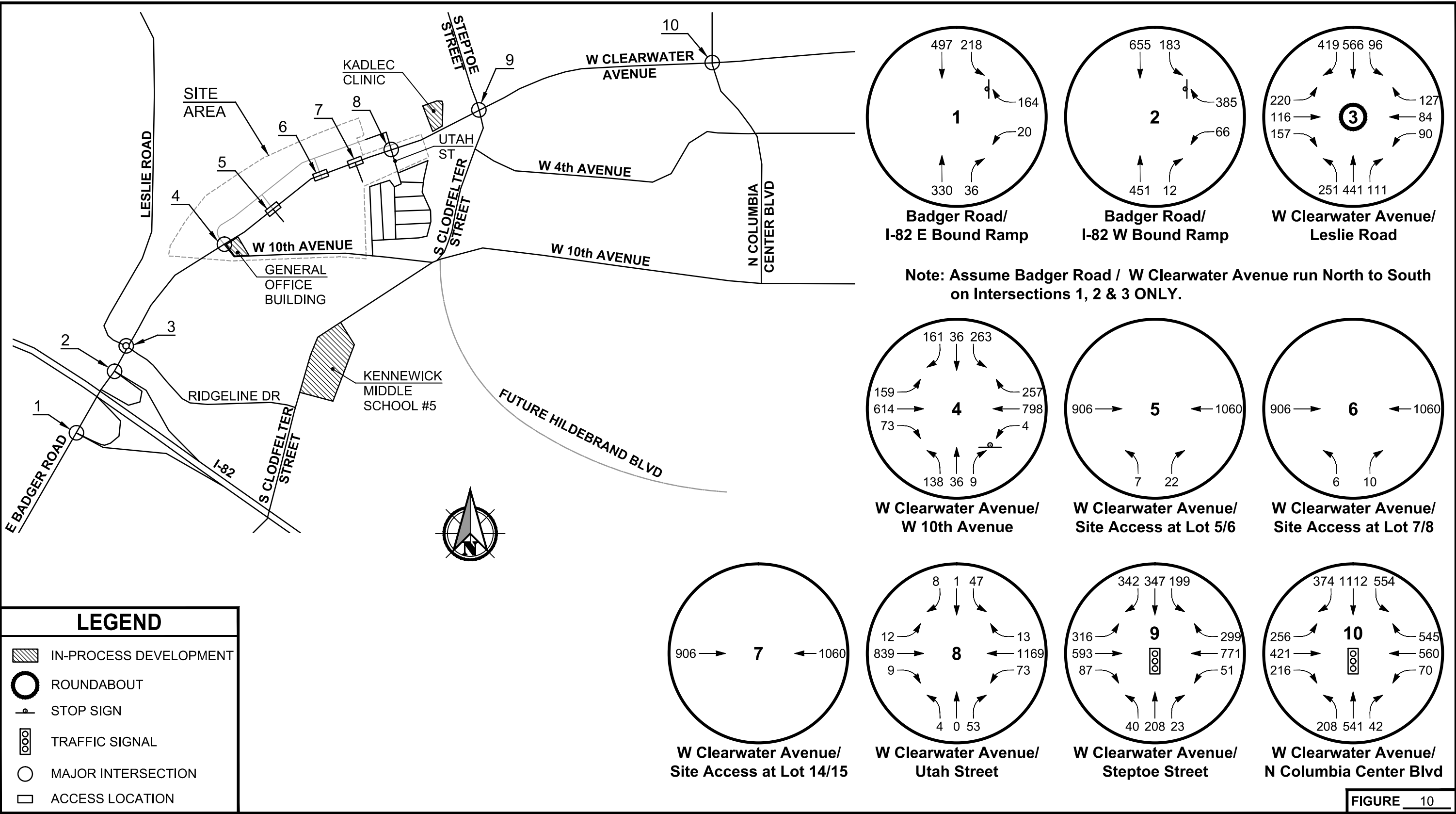
Site access between lots 5/6, lots 7/8, and lots 14/15 all fall below the City's LOS standard due to the delay to the left turn movements. In all cases the volume of the left turn movement is low and for site access intersections between lots 5/6 and 7/8, alternative access is available for the left turn. By 2036, the driveways will be within a quarter mile of a roundabout or traffic signal that provide alternative access and a high level of service. Thus no mitigation is recommended.

Table 9
Mitigated Estimated 2036 Level Of Service with Project
For Study Area Intersections

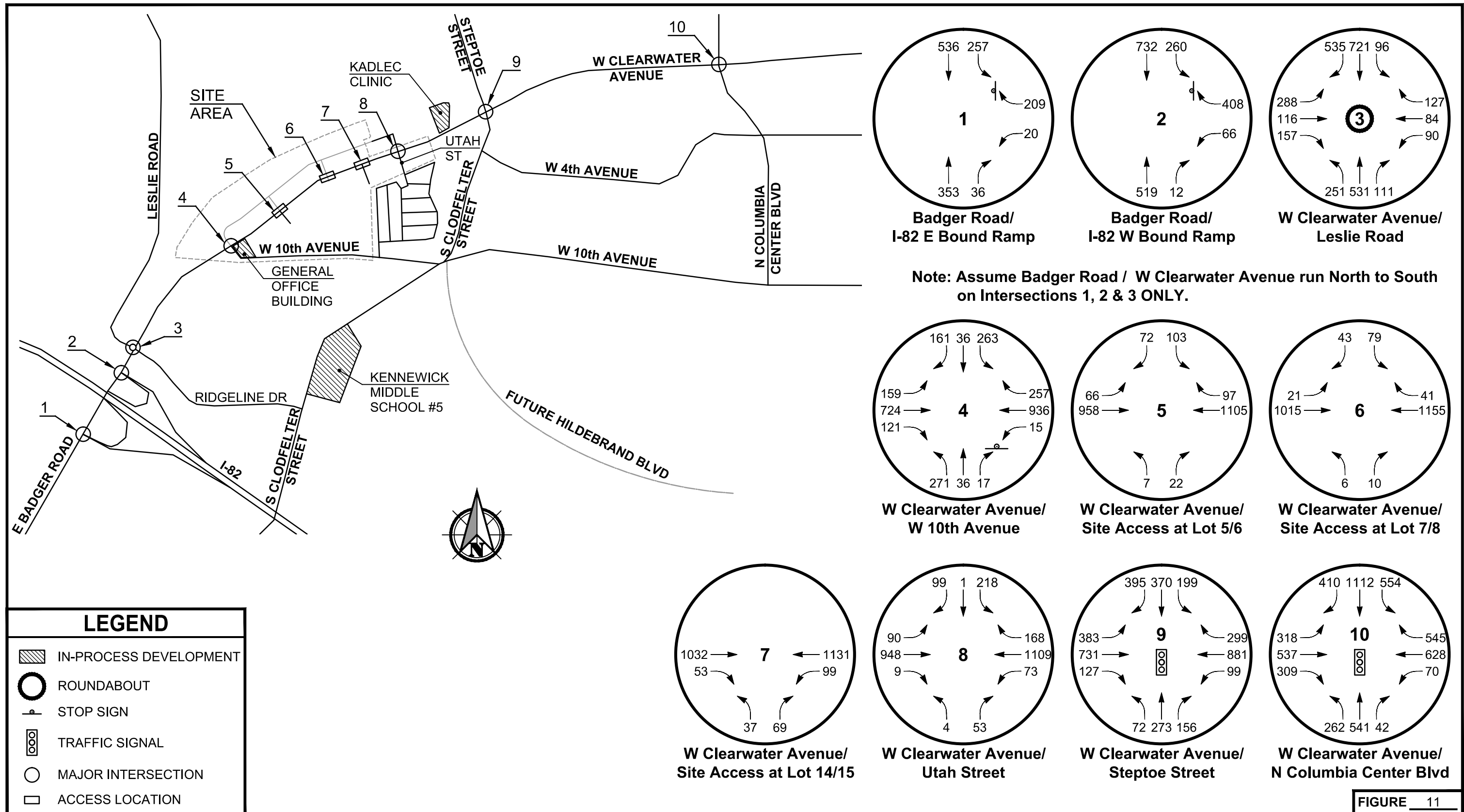
INTERSECTION (critical movement for STOP controlled intersections)	2036 Weekday PM Level of Service					
	W/O Mitigation			With Mitigation		
	LOS	Delay (sec)	Volume / Capacity	LOS	Delay (sec)	Volume / Capacity
E Badger Road / I-82 EB off and on-ramps – (EB left turn)	D	26.1	–	D	26.1	–
Type of Mitigation – Do Nothing						
E Badger Road / I-82 WB off and on-ramps – (WB left turn)	F	508.3	–	E	44.8	–
Type of Mitigation – Right turn lane						
E Badger Road / Leslie Road / W Clearwater Avenue – (intersection average)	A	4.5	–	A	4.5	–
Type of Mitigation – Do Nothing						
W Clearwater Avenue / W 10 th Avenue intersection – (SB left turn)	F	*	*	C	19.8	0.6814
Type of Mitigation – Signal Alternative						
W Clearwater Avenue / W 10 th Avenue intersection – (SB left turn)	F	*	*	A	5.5	
Type of Mitigation – Roundabout Alternative						
W Clearwater Avenue / Access at Lot 5/6 intersection – (SB left turn)	F	631.6	–	F	552.3	–
Type of Mitigation – WB right turn lane						
W Clearwater Avenue / Access at Lot 7/8 intersection – (SB left turn)	F	323.1	–	F	323.1	–
Type of Mitigation – Do Nothing						
W Clearwater Avenue / Access at Lot 14/15 intersection – (SB left turn)	F	144.6	–	F	144.6	–
Type of Mitigation – Do Nothing						
W Clearwater Avenue / Clearwater Drive / S Utah Street – (SB left turn)	F	*	*	B	13.7	0.550
Type of Mitigation – Signal						
W Clearwater Avenue / Clearwater Drive / S Utah Street – (SB left turn)	F	*	*	A	5.5	
Type of Mitigation – Roundabout						
W Clearwater Avenue / Steptoe Street / S Clodfelter Street – (intersection average)	D	41.4	0.88	D	43.6	0.88
Type of Mitigation – Do Nothing						
W Clearwater Avenue / N and S Columbia Center Boulevard – (intersection average)	D	54.8	0.96	E	57.5	0.96
Type of Mitigation – Do Nothing						

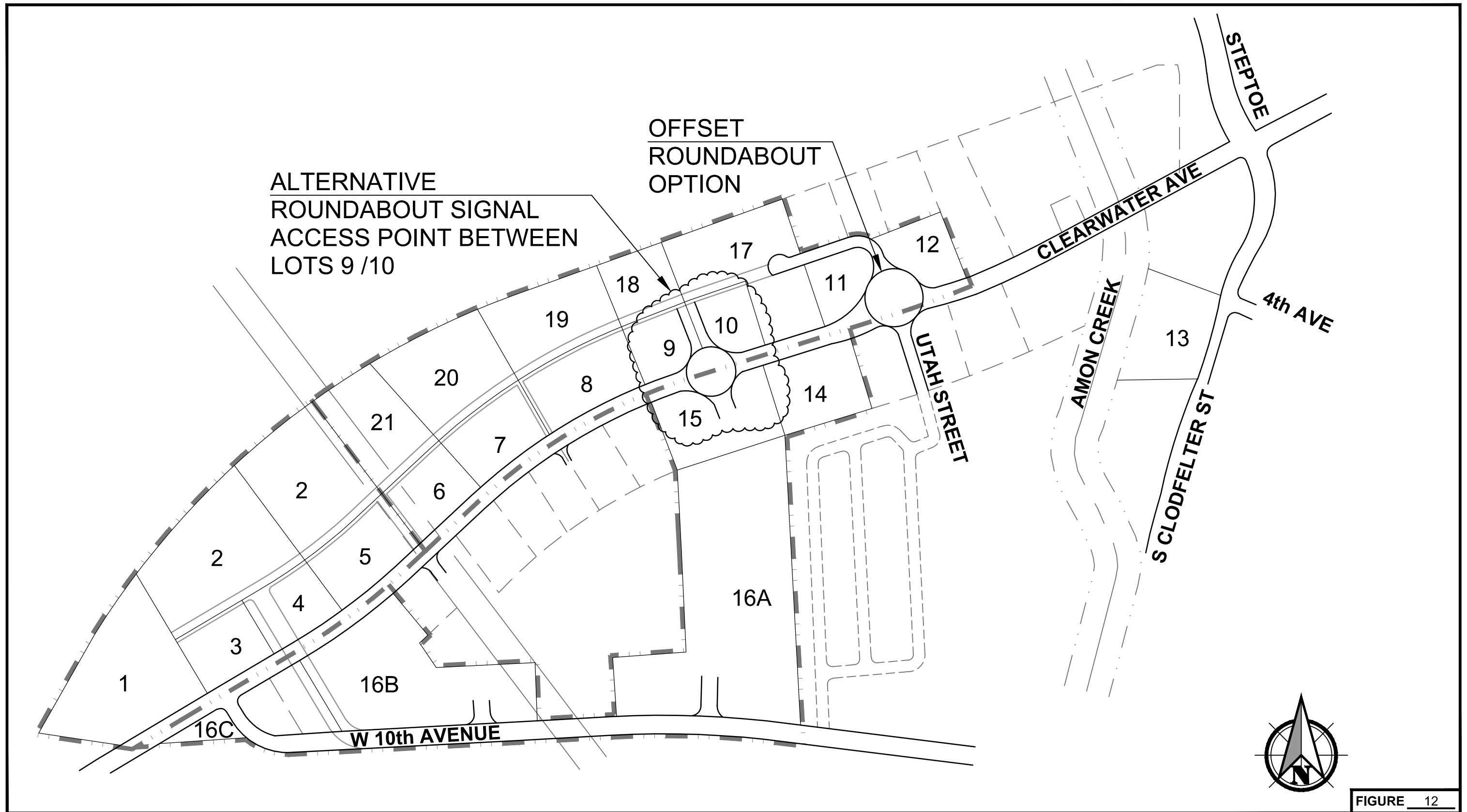
*Delay and V/C are too great to be calculated.

Design year traffic volumes without and with Phase 2 and 3 are shown in Figures 10 and 11 respectively.



2036 PM Peak Volumes Without Phase 2 & 3
Clearwater Commercial Binding Site Plan





HDJ
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Alternate Access Plan
Clearwater Commercial Binding Site Plan

SAFETY ANALYSIS

LEFT TURN STORAGE ANALYSIS

The need for left and right turns was evaluated at the studied intersections. Left turn lanes can be justified based on either safety or capacity. The capacity analysis identifies the need for left turn lanes at stop controlled or signalized legs of an intersection. Safety is usually the major justification for left turn lanes on uncontrolled legs of an intersection. The previous section, discussing intersection capacity, would identify any left turn needs at stop controlled or signalized legs of the intersections.

The criteria for the analysis of turn lanes at intersection legs are based on the *City Traffic Impacts Analysis Study Requirements* Right/Left Turn Lane Warrants (City streets) and the WSDOT Design Manual for Left-turn Storage Guidelines (I-82 ramps): Two-lane Unsignalized Intersections (Exhibit 1310-7a). The analysis for the City intersections and results are shown in Tables 10 and 11. No restrictive geometrics require a left-turning vehicles to slow greatly below the speed of through traffic on any of the study roadways.

**Table 10
City Left Turn Warrants - 2021**

Intersection	>50 PM peak turns without project	>50 PM peak turns with project
W Clearwater Avenue/W 10 th Avenue	Yes – NB Only	Yes – NB/SB/EB

For the 2036 analysis it assume all intersections have left turn lanes built with Phase 1.

RIGHT-TURN TREATMENT ANALYSIS

The criteria for the analysis of turn lanes at intersection legs are based on the *City Traffic Impacts Analysis Study Requirements* Right/Left Turn Lane Warrants (City streets) and the WSDOT Design Manual Right-turn Lane Guidelines (I-82 ramps). WSDOT guidance notes: Right-turn movements influence intersection capacity even though there is not a conflict between right-turning vehicles and opposing traffic. Right-turn lanes might be needed to maintain efficient intersection operation. Use the following to determine when to consider right-turn lanes at unsignalized intersections:

- When the right turn volume exceeds 50 right turn vehicles in any hour.
- For two-lane roadways and for multilane roadways with a posted speed of 45 mph or above, when recommended by Exhibit 1310-11.

Table 11
City Right Turn Warrants - 2021

Intersection	>50 PM peak turns without project	>50 PM peak turns with project
W Clearwater Avenue/W 10 th Avenue	Yes – EB	Yes – EB/WB
W Clearwater Avenue/Clearwater Drive/S Utah Street	No	No

Table 12
City Right Turn Warrants - 2036

Intersection	>50 PM peak turns without project	>50 PM peak turns with project
W Clearwater Avenue/W 10 th Avenue	Yes – EB	Yes – EB/WB
W Clearwater Avenue/Access #5	No	Yes – WB
W Clearwater Avenue/Access #6	No	No
W Clearwater Avenue/Access #7	No	No
W Clearwater Avenue/Clearwater Drive/S Utah Street	No	Yes – WB

The E Badger Road/I-82 intersection was analyzed using WSDOT Exhibit 1310-11. Only the E Badger Road/I-82 EB on-ramp, 2036 without and with project, analysis recommended consideration of a right-turn pocket. All of the other conditions noted radius only, which is the existing condition.

The analysis for the City intersections and results are shown in Tables 12 and 13. See Appendix F for Exhibit 1310-11 graphic, for the right-turn lane analysis, without and with project.

Recommend 12 foot wide right turn lanes and length based City of Kennewick standards at the following site access points:

- Site access #4 (W 10th Avenue) westbound and eastbound 200 feet long with a 100 foot taper.
- Site access #5 (between lots 5/6) westbound 100 feet long with a 100 foot taper.
- Site access #8 (S Utah Street and Clearwater Drive) westbound 200 foot long with a 100 foot taper. If an access point is installed between lots 9/10 with a roundabout, a right turn lanes is still needed.

The queue length was checked for all studied intersections for both Phase 1 (2021) and with Phase 2 and 3 (2036). The 2036 analysis assume Phase 1 development and mitigation is complete.

The queue length tables list the available storage, intersections with queue lengths, including those exceeding existing left turn storage: Table 13 is for existing (2015) traffic, Table 14 for 2021 with project, Table 15 for 2036 with project (without mitigation), and Table 16 for 2036 with mitigation.

Table 13
Queue Length Analysis – (2015)

Intersection	Direction of travel	Left turn pocket length	Queue length	Adequate
E Badger Road/EB I-82 on-ramp	SB	80'	25'	Yes
E Badger Road/EB I-82 off-ramp	WB	None	25'	No
E Badger Road/WB I-82 on-ramp	SB	130'	25'	Yes
E Badger Road/WB I-82 off-ramp	WB	None	100'	No
W Clearwater Avenue/W 10 th Avenue	NB	None	50'	No
W Clearwater Avenue/W 10 th Avenue	WB	None	0	Yes
W Clearwater Avenue/Clearwater Drive/S Utah Street	NB	None	25'	No
W Clearwater Avenue/Clearwater Drive/S Utah Street	WB	TWLTL	25'	No
W Clearwater Avenue/Steptoe Street/C Clodfelter Street	EB	310'	100'	Yes
W Clearwater Avenue/Steptoe Street/C Clodfelter Street	NB	215'	25'	Yes
W Clearwater Avenue/Steptoe Street/C Clodfelter Street	WB	305'	25'	Yes
W Clearwater Avenue/Steptoe Street/C Clodfelter Street	SB	220'	75'	Yes
W Clearwater Avenue/N and S Columbia Center Boulevard	EB	160'	75'	Yes
W Clearwater Avenue/N and S Columbia Center Boulevard	NB	80'	75'	Yes
W Clearwater Avenue/N and S Columbia Center Boulevard	WB	135'	25'	Yes
W Clearwater Avenue/N and S Columbia Center Boulevard	SB	200'	200'	Yes

Table 14
Queue Length Analysis (2021) – with project

Intersection	Direction of travel	Left turn pocket length	Queue length	Adequate
E Badger Road/EB I-82 on-ramp	SB	80'	25'	Yes
E Badger Road/EB I-82 off-ramp	WB	None	25'	No
E Badger Road/WB I-82 on-ramp	SB	130'	25'	Yes
E Badger Road/WB I-82 off-ramp	WB	None	125'	No
W Clearwater Avenue/W 10 th Avenue	NB	None	50'	No
W Clearwater Avenue/W 10 th Avenue	WB	None	0	Yes
W Clearwater Avenue/Clearwater Drive/S Utah Street	NB	None	25'	No
W Clearwater Avenue/Clearwater Drive/S Utah Street	WB	TWLTL	25'	Yes
W Clearwater Avenue/Steptoe Street/C Clodfelter Street	EB	310'	100'	Yes
W Clearwater Avenue/Steptoe Street/C Clodfelter Street	NB	215'	25'	Yes
W Clearwater Avenue/Steptoe Street/C Clodfelter Street	WB	305'	75'	Yes
W Clearwater Avenue/Steptoe Street/C Clodfelter Street	SB	220'	100'	Yes
W Clearwater Avenue/N and S Columbia Center Boulevard	EB	160'	75'	Yes
W Clearwater Avenue/N and S Columbia Center Boulevard	NB	80'	100'	No
W Clearwater Avenue/N and S Columbia Center Boulevard	WB	135'	25'	Yes
W Clearwater Avenue/N and S Columbia Center Boulevard	SB	200'	225'	No

Table 15
Queue Length Analysis (2036) – with project without mitigation

Intersection	Direction of travel	Left turn pocket length	Queue length	Adequate with Mitigation
E Badger Road/EB I-82 off-ramp	SB	120'	25'	Yes
E Badger Road/EB I-82 off-ramp	WB		100'	Yes
E Badger Road/WB I-82 on-ramp	SB	80'	25'	Yes
E Badger Road/WB I-82 off-ramp	WB	2,200'	1000'	Yes
W Clearwater Avenue/W 10 th Avenue	WB	None	0	Yes
W Clearwater Avenue/W 10 th Avenue	EB	None		
W Clearwater Avenue/Clearwater Drive/S Utah Street	NB	None	50'	No
W Clearwater Avenue/Clearwater Drive/S Utah Street	SB	None	1500'	No
W Clearwater Avenue/Clearwater Drive/S Utah Street	EB-WB	TWLTL	25'	Yes
W Clearwater Avenue/Steptoe Street/C Clodfelter Street	EB	310'	350'	No
W Clearwater Avenue/Steptoe Street/C Clodfelter Street	NB	215'	75'	Yes
W Clearwater Avenue/Steptoe Street/C Clodfelter Street	WB	305'	75'	Yes
W Clearwater Avenue/Steptoe Street/C Clodfelter Street	SB	220'	150'	Yes
W Clearwater Avenue/N and S Columbia Center Boulevard	EB	160'	350'	No
W Clearwater Avenue/N and S Columbia Center Boulevard	NB	80'	400'	No
W Clearwater Avenue/N and S Columbia Center Boulevard	WB	135'	75'	Yes
W Clearwater Avenue/N and S Columbia Center Boulevard	SB	200'	360'	No

Table 16
Queue Length Analysis (2036) – with project with mitigation

Intersection	Direction of travel	Left turn pocket length	Queue length	Adequate with Mitigation
E Badger Road/EB I-82 off-ramp	EB	120'	25'	Yes
E Badger Road/EB I-82 off-ramp	WB		100'	Yes
E Badger Road/WB I-82 on-ramp	SB	80'	25'	Yes
E Badger Road/WB I-82 off-ramp	WB	225'	225'	Yes
W Clearwater Avenue/W 10 th Avenue	WB	None	0	Yes
W Clearwater Avenue/W 10 th Avenue	EB	None		
W Clearwater Avenue/Clearwater Drive/S Utah Street	SB	200	325	No
W Clearwater Avenue/Clearwater Drive/S Utah Street	WB	TWLTL	25'	No
W Clearwater Avenue/Steptoe Street/C Clodfelter Street	EB	310'	350'	No
W Clearwater Avenue/Steptoe Street/C Clodfelter Street	NB	215'	25'	Yes
W Clearwater Avenue/Steptoe Street/C Clodfelter Street	WB	305'	75'	Yes
W Clearwater Avenue/Steptoe Street/C Clodfelter Street	SB	220'	100'	Yes
W Clearwater Avenue/N and S Columbia Center Boulevard	EB	160'	325'	No
W Clearwater Avenue/N and S Columbia Center Boulevard	NB	80'	400'	No
W Clearwater Avenue/N and S Columbia Center Boulevard	WB	135'	75'	Yes
W Clearwater Avenue/N and S Columbia Center Boulevard	SB	200'	360'	No

Left turn storage length is a significant consideration with signalized primary access points at W Clearwater Avenue/W 10th Avenue and W Clearwater Avenue/S Utah Street intersections. If a traffic signal is used as mitigation, double left turn lanes will be needed for southbound and northbound at W 10th Avenue and the site access driveway. With a roundabout, a southbound right turn slip lane can be used with a left-through lane.

At the W Clearwater Avenue/S Utah Street/Clearwater Drive intersection, double left turn lanes will be needed for the southbound approach with a traffic signal installed as mitigation to address the 325 foot long single lane queue. With a roundabout, the queue length is considerably shorter (100 feet), but a right turn slip lane is recommended.

COLLISION ANALYSIS

Three plus years of collision data (01/2012 to 08/2015) was requested and obtained from the Washington State Department of Transportation (WSDOT). The analysis is based on the assumption that a collision rate less than the critical collision rate (1.0) for the intersection is typically considered to be within acceptable parameters. A collision rate above the critical rate is worthy of further examination. The results of the accident analysis are shown in Table 15.

Table 17
Collision Analysis For Study Intersections
(01/2012-08/2015)

1. E Badger Road/I-82 EB off and on-ramps
2. E Badger Road/I-82 WB off and on-ramps
3. E Badger Road/Leslie Road/W Clearwater Avenue roundabout
4. W Clearwater Avenue/W 10th Avenue intersection
5. W Clearwater Avenue/S Utah Street/Clearwater Drive intersection
6. W Clearwater Avenue/Steptoe Street/S Clodfelter Street intersection
7. W Clearwater Avenue/N and S Columbia Center Boulevard intersection

COLLISION TYPE	1	2	3	4	5	6	7
Rear-end	0	5	1	3	1	4	15
Entering at angle	0	0	5	1	0	1	8
Sideswipe	0	0	4	0	0	0	5
Approach turn	0	2	1	0	1	11	17
Motorcycle overturn	0	0	0	0	0	0	0
Same Direction – All Others	0		0	0	0	1	0
Fixed Object	0	1	1	0	0	0	0
TOTAL COLLISIONS	0	8	12	4	2	17	44
CRITICAL RATE	1.0	1.0	1.0	1.0	1.0	1.0	1.0
COLLISION RATE	0	0.66	0.67	0.28	0.15	0.95	1.23

The intersection of W Clearwater Avenue/N and S Columbia Center Boulevard exceeds the critical accident rate of 1.0. This intersection had 44 collisions total. Of the total collisions, 39 were property damage only, 5 were possible injury, and none with serious injury. There were no fatal injury accidents within the study area during the study timeframe.

A collision diagram was prepared for the W Clearwater Avenue/N and S Columbia Center Boulevard intersection with the intent of identifying trends. The rear-end collision involving eastbound traffic appears to be a trend that the proposed project may have a negative impact on. But with signal timing upgrades, and advanced detection upgrades, these collisions should be correctable and the impacts mitigated.

The collision data, calculation of collision rates and the collision diagrams are in Appendix E.

TRANSIT, PEDESTRIAN, AND BICYCLE FACILITIES

Ben Franklin Transit provides bus service to the greater Tri-City urban area. The closest transit route is along W 10th Avenue and N and S Columbia Center Boulevard (Route 48), approximately two miles from the project site.

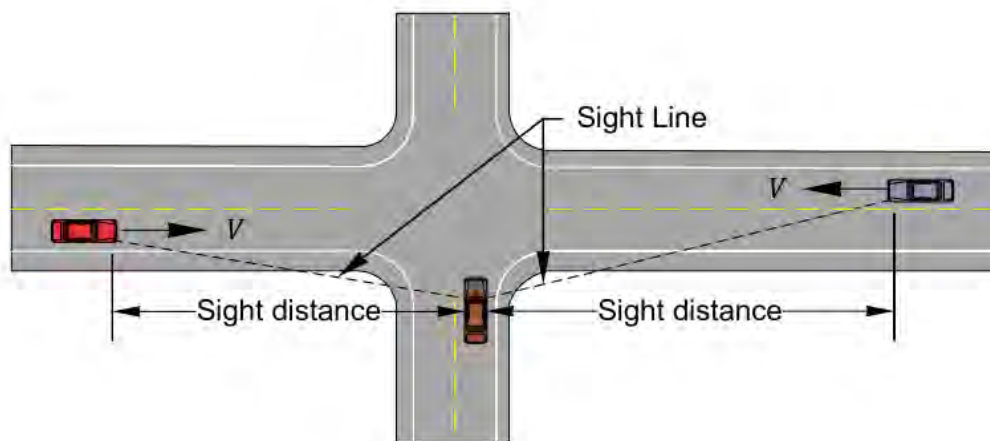
Pedestrian activity to and from the site is anticipated to be moderate. The bulk of walking distance activity will come from the existing subdivisions to the southeast of the development. There is adequate existing sidewalk to serve the pedestrian traffic between the subdivisions and the proposal. Where new sidewalk is conditioned, the sidewalk and driveways shall be constructed to meet current Americans with Disability Act (ADA) standards.

Bicycle activity to and from the site is anticipated to be moderate. There are few bike lanes on roadways analyzed for this project. The Regional Bicycle and Pedestrian Transportation Plan was reviewed for future bicycle improvements. Both W Clearwater Avenue and W 10th Avenue have been noted as “open house preferred routes” but there are currently no plans to expand the bicycle lane system onto either roadway. No bicycle improvements are recommended for this project.

SIGHT DISTANCE AT SITE ACCESS LOCATIONS

The proposed site accesses onto W Clearwater Avenue currently have more than 500 feet of sight distance to the north and south. Below is a typical sight distance triangle for the access driveways onto W Clearwater Avenue. This exceeds stopping and intersection sight distances for AASHTO based on the approaching speed of vehicles.

No sight distance issues are anticipated with these site access points. As none of the access points currently exist, when the project and the associated access points are constructed, they will need to meet the AASHTO sight distance requirements. The final design should assure the sight distance triangle remains unrestricted.



STUDY CONCLUSIONS

The findings of the Traffic Impact Analysis are listed below:

1. The site access will be limited to the proposed private driveway and roadways as illustrated in Figure 2. They will be built to private standards as they provide internal access only. All access points on W Clearwater Avenue will be spaced greater than 155 feet from center line to centerline.
2. No public improvements may be necessary until the 2021. With no specific development proposed, the need for mitigation is dependent upon substantial site development and background growth, both of which are market driven. The proposed mitigation is based on site development with high density and continued background growth.
3. Development of the individual lots are subject to City Transportation Impact Fees (TIF). The fees are due at time of occupancy. Therefore all TIF will be paid by future owner/builders of the individual lots at the time of construction.
4. The development should contribute to a WSDOT project for re-striping of E Badger Road from the WB I-82 off ramp to provide a left turn acceleration lane for the WB to SB movement.
5. To mitigate the Phase 2 and 3 impacts and background growth at the E Badger Road/I-82 WB off and on-ramp intersection, E Badger Road should be restriped with a left turn acceleration lane and second southbound through lane. The westbound off-ramp should be widened to provide a 300 foot long right-turn lane address the high number of right turn volume.
6. Traffic in the area will continue to increase with or without the proposal due to a background annual growth rate of 2.0%.
7. As parcels develop, infill of missing sections of sidewalk will be necessary
8. The in-process trips are based on the City of Kennewick's developments referred to as: a *General Office Building* at W Clearwater Avenue/W 10th Avenue, *Kadlec Clinic*, *The Ridge at Hansen Park* Subdivision, and *Kennewick School District Middle School #5*.
9. All but two of the studied intersections will operate at an acceptable level of service (LOS) in 2021 with the proposed development. Without the project, in 2021, the W Clearwater Avenue/S Utah Street/Clearwater Drive intersection will fall to LOS E. With the project, in 2021, the intersections of W Clearwater Avenue/S Utah Street/Clearwater Drive and the W Clearwater Avenue/W 10th Avenue fail (LOS F). The LOS on both intersection can be mitigated to a level of service that meets the City of Kennewick standards.
10. The W Clearwater Avenue/W 10th Avenue intersection with Phase 1 traffic impact should be mitigated with either a roundabout or a traffic signal. The roundabout is the City of Kennewick's preferred alternative, but construction costs can be very expensive, often three times the cost of a signal. The installation of a traffic signal will operate better if W

10th Avenue's intersection with W Clearwater Avenue is relocated approximately 300 feet to the west.

11. In 2036 with Phase 1, with or without Phase 2 and 3, the intersections of W Clearwater Avenue/S Utah Street/Clearwater Drive and W Clearwater Avenue/W 10th Avenue will fail (LOS F) due to background growth. With the Phase 1 mitigation, the W Clearwater Avenue/W 10th Avenue intersection will operate within City of Kennewick LOS standards. In addition to these two intersections, the E Badger Road/I-82 WB off and on-ramp intersection will fail (LOS F). With additional mitigation at the W Clearwater Avenue/S Utah Street/Clearwater Drive intersection and the E Badger Road/I-82 WB off and on-ramp intersection, each intersection will meet City LOS standards.
12. To mitigate the Phase 2 and 3 impact at the E Badger Road/I-82 WB off and on-ramp intersection E Badger Road should be restriped with a left turn acceleration lane and second southbound through lane. The westbound off-ramp should be widened to provide a 225 foot long right-turn lane. This right-turn lane is needed to address background growth and to a small share, the development impacts.
13. Site accesses between lots 5/6 (intersection number 5), 7/8 (intersection number 6) and 14/15 (intersection 7) will be at LOS F due to the left turn movement delay. They should operate safely because intersections a short distance away with either traffic signals or roundabouts provide other routes for traffic to make left turns onto W Clearwater Avenue.
14. To mitigate the Phase 2 and 3 impacts at W Clearwater Avenue/S Utah Street/Clearwater Drive an applicant has three options:
 - a. Install a traffic signal with double left turns southbound, a right turn lane on the westbound approach, and signal interconnection with the traffic signals to the east.
 - b. Install a roundabout at the intersection with a large dedication from lots 11 and 12, assuming right of way is not available from the private property at the southwest and southeast corners.
 - c. Install a new access point between lots 9 and 10 across from an access driveway for lots 14 and 15 on the south. This access point could be either a signal or roundabout.
15. The turn lane analysis was completed using City of Kennewick Traffic Impact Analysis Study Requirements and the WSDOT Design Manual Left-turn Storage and Right-turn Lane Guidelines. Right turn lanes will be needed at:
 - a. W Clearwater Avenue at the intersection with W 10th Avenue if a signal is installed for both the east and westbound approach.
 - b. W Clearwater Avenue at site access 5 for the westbound approach for Phase 2 and 3 traffic.
 - c. W Clearwater Avenue at Clearwater Drive for the westbound approach for Phase 2 and 3 traffic.
16. The roundabout at the intersection of E Badger Road/Leslie Road/W Clearwater Avenue does have adequate capacity for the new project trips (2021), projected annual growth, and Phase 2 and 3 trips in the 2036 design year.

17. The collision history was reviewed. The W Clearwater Avenue/N and S Columbia Center Boulevard intersection exceeds the critical accident rate. The remaining study intersections are below the critical accident rate. The apparent collision pattern the project may impact are associated with eastbound rear end collisions. This can be mitigated with signal operation upgrades associated with signal timing and advance detection of eastbound traffic.
18. There is no public transit within typical walking distance of the project site. In the immediate vicinity of the project there are sidewalks and striped shoulders, but no bike lanes.
19. If Phase 2 and 3 proceed as proposed, many pedestrian trips will be generated between the lots along the extension of Clearwater Drive. These pedestrian trips should be provided walkways along Clearwater Drive.
20. Sight distance at the proposed site driveways was reviewed and verified to meet AASHTO requirements for stopping and intersection sight distance. No sight distance issues are anticipated at the future site access points.

PROJECT-RELATED IMPROVEMENTS

The following recommendations are based on the TIA conclusions:

The future realignment of W 10th Avenue and the extension of Clearwater Drive should include sidewalks as the lots develop. All sidewalks and driveways will be constructed to meet current Americans with Disabilities Act (ADA) standards.

As parcels develop, infill of missing sections of sidewalk will be necessary along their frontage. The sidewalk and associated driveways will need to be constructed to meet current ADA standards.

Design site access points to follow AASHTO requirements for stopping and intersection sight distance. Do not install objects within the sight distance triangle that would block the driver's view entering or exiting the sites at any new access point.

For Phase 2 and 3, the development shall provide contribution to WSDOT for the restriping of E Badger Road from the vicinity of the westbound ramp terminal to Wiser Parkway. This is to accommodate a left turn acceleration lane from the westbound ramp terminal to southbound E Badger Road and add a southbound through lane on E Badger Road within the WSDOT limited access area.

To mitigate 2036 site development impacts and background growth, the E Badger Road/I-82 WB off and on ramp, the development should widen the WB ramp off ramp to include a 300 foot long right turn lane. A proportionate cost sharing program should be developed for mitigation.

Install a roundabout or a traffic signal at the W 10th Avenue intersection with W Clearwater Avenue with Phase 1 of the development. The location of the intersection can remain in the current location with a roundabout, but with a traffic signal, relocation of the W 10th Avenue intersection with W Clearwater Avenue will provide better sight distance and room for queuing on W 10th Avenue.

Accept LOS F for site accesses between lots 5/6 (intersection number 5), 7/8 (intersection number 6) and 14/15 (intersection 7) because intersections a short distance away with either traffic signals or roundabouts provide safe alternative routes to make left turns onto W Clearwater Avenue.

For Phase 2 and 3, the development should fund a roundabout on W Clearwater Avenue at a new private road connection between lots 9/10 and cross from a driveway for lots 14/15. ,

For Phase 1, the development should fund advance detection on the eastbound approach of W Clearwater Avenue at N and S Columbia Center Boulevard and update signal timing to address rear end collisions.

REFERENCES

1. *Highway Capacity Manual*, 2000 Transportation Research Board, National Research Council.
2. *Trip Generation Manual*, Eighth Edition, 2003, Institute of Transportation Engineers.
3. *Manual on Uniform Traffic Control Devices*, 2009 Edition, Federal Highway Administration.
4. *City of Kennewick Transportation Impact Analysis (TIA) Study Requirements*, May 8, 2014, City of Kennewick Engineering Division
5. *Traffic Access and Impact Study for Site Development, A Recommended Practice*, 1991, Institute of Transportation Engineers.
6. *A Policy on The Geometric Design of Highways and Streets*, 1994, American Association of State Highway Transportation Officials.
7. *WSDOT Highway Design Manual*, July 2013, Washington State Department of Transportation.
8. *Roundabout: An Informational Guide*, June 2000, Federal Highway Administration.

Appendix A – Trip Generation and In-process Trips

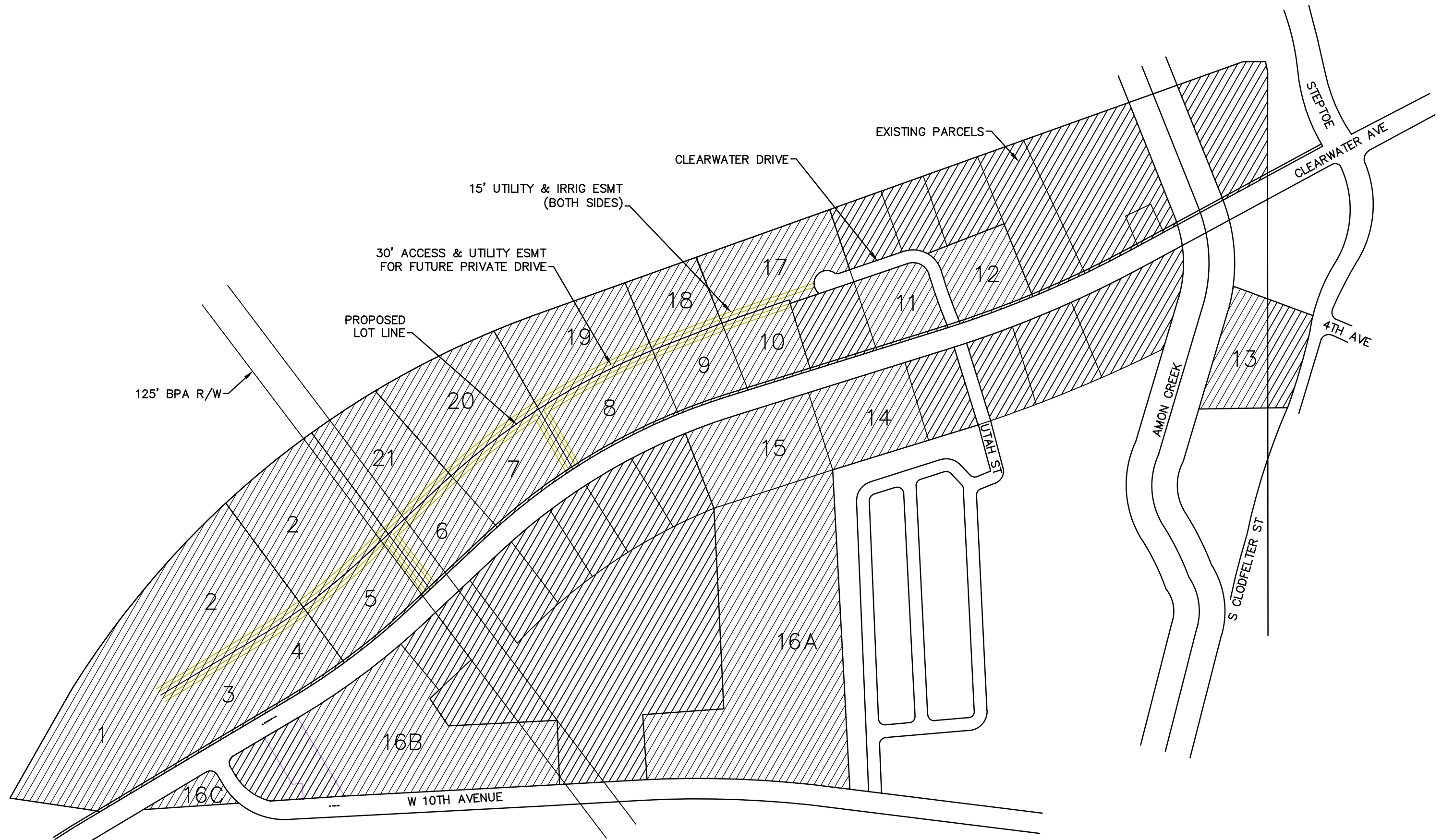
Clearwater Commercial Binding Site Plan - Trip Generation
Land use assumption for reasonable best and highest land use.

Lot #	Lot SF	Assumed Building SF	% applied	Assumed use
1,2,3 and 4	725,620	145,124	20%	Big Box
2	223,323	40,198	18%	Grocery
5	119,549	21,519	18%	Retail
6	93,380	14,941	16%	Fast Food
7	107,711	19,388	18%	Retail
8	137,852	24,813	18%	Retail
9	84,554	13,529	16%	Retail
10	86,675	13,868	16%	Retail
11	72,143	11,543	16%	Fast Food
12	86,871	13,899	16%	Fast Food
13	84,646	13,543	16%	Office
14	125,513	22,592	18%	Restaurant
15	182,579	32,864	18%	Retail
16A	557,276	111,455	20%	MOB
16B	348,963	62,813	18%	MOB
16C	26,020	4,163	16%	MOB
17	147,623	26,572	18%	Office
18	82,405	13,185	16%	Office
19	163,184	29,373	18%	Office
20	187,790	33,802	18%	Office
21	149,099	26,838	18%	Office

Cleanwater Commercial Binding Site Plan - Trip Generation

Trip Generation by land

Internal Capture										Pass-by			Net Total					
Lot #	Lot SF	Percent Lot covered	Building SF	Assumed use	Land Use Code	ADT	AM Peak	PM Peak	PM Peak Trips in	PM Peak Trips out	Internal Capture of 22% - In	Internal Capture reduction of 22% - Out	ITE Percent reduction in PM due to Pass-by Trips	PM Pass-by entering	PM Pass-by exiting	Net PM In	Net PM Out	
1,2,3 and 4	725,620	0.2	145,124	Big Box	862	4,457	216	338	166	172	129	134	48%	62	64	67	70	
2	223,323	0.18	40,198	Grocery	850	4,110	137	381	194	187	151	146	36%	54	53	97	95	
5	119,549	0.18	21,519	Retail	826	954	147	58	26	33	20	26				20	26	
6	93,380	0.16	14,941	Fast Food	934	739	679	489	254	235	198	183	50%	99	92	99	92	
7	107,711	0.18	19,388	Retail	826	859	133	53	23	29	18	23				18	23	
8	137,852	0.18	24,813	Retail	826	1,100	170	67	30	38	23	30				23	30	
9	84,554	0.16	13,529	Retail	826	600	93	37	16	21	12	16				12	16	
10	86,675	0.16	13,868	Retail	826	615	95	38	17	21	13	16				13	16	
11	72,143	0.16	11,543	Fast Food	934	5,725	524	377	196	181	153	141	50%	76	71	76	71	
12	86,871	0.16	13,899	Fast Food	934	6,896	631	455	236	218	184	170	50%	92	85	92	85	
13	84,646	0.16	13,543	Office	710	149	21	20	3	17						3	17	
14	125,513	0.18	22,592	Restaurant	931	2,032	18	169	113	56	88	44	44%	50	25	38	19	
15	182,579	0.18	32,864	Retail	826	1,456	225	89	39	50	30	39				30	39	
16A	557,276	0.2	111,455	MOB	720	4,027	276	415	112	303	87	236				87	236	
16B	348,963	0.18	62,813	MOB	720	2,269	156	234	63	171						63	171	
16C	26,020	0.16	4,163	MOB	720	150	10	15	4	11						4	11	
17	147,623	0.18	26,572	Office	710	293	41	40	7	33	5	26				5	26	
18	82,405	0.16	13,185	Office	710	145	21	20	3	16	2	12				2	12	
19	163,184	0.18	29,373	Office	710	324	46	44	7	36	5	28				5	28	
20	187,790	0.18	33,802	Office	710	373	53	50	9	33	7	26				7	26	
21	149,099	0.18	26,838	Office	710	296	42	40	7	33	5	26				5	26	
											1,894						771	1,132
											1,525						1,903	
											3,429						Net Total Trips	
											3,734							
											37,569							



ITE Trip Generation

Trip Generation Based on Weighted Average Rates

HDJ Design Group

General			
Land Use Code	Home Improvement Superstore - 9th Ed		
Independent Variable	1000 Sq Ft		
Size (X)		145	
Land Use Code		862	

Date: 10/22/2015 Analyst: Sharar Project: Clearwater Commercial

	In	Out	Total
Average Weekday	2,229	2,229	4,457
New Trips	2,229	2,229	4,457
Weekday AM Peak	123	93	216
New Trips	123	93	216
Weekday PM peak	166	172	338
New Trips	166	172	338

Per Trip Generation Manual, 9th Edition for 145,124 sq building - Lots 1, 2, 3 & 4

Analysis Period	Weekday		
Average Rate	Rate		Trips
	30.74		4457
Entering / Exiting			
% Entering	50%		2229
% Exiting	50%		2229
New Trips			
% internal	0		
% pass by			
		In	Out
Total Trips		2229	2229
Internal Trips		0	0
Passby Trips	0	0	0
New Trips		2229	2229

Analysis Period	Weekday AM Peak for adjacent streets		
Average Rate	Rate		Trips
	1.49		216
Entering / Exiting			
% Entering	57%		123
% Exiting	43%		93
New Trips			
% internal	0		
% pass by			
		In	Out
Total Trips		123	93
Internal Trips		0	0
Passby Trips		0	0
New Trips		123	93

Analysis Period	Weekday PM peak for adjacent streets		
Average Rate	Rate		Trips
	2.33		338
Entering / Exiting			
% Entering	49%		166
% Exiting	51%		172
New Trips			
% internal	0		
% pass by			
		In	Out
Total Trips		166	172
Internal Trips		0	0
Passby Trips		0	0
New Trips		166	172

ITE Trip Generation

Trip Generation Based on Weighted Average Rates

HDJ Design Group

General			
Land Use Code	Supermarket		
Independent Variable	1,000 Sq Ft		
Size (X)		40.2	
Land Use Code		850	

Date: 10/22/2015 Analyst: Sharar Project: Clearwater Commercial

	In	Out	Total
Average Weekday	2,055	2,055	4,110
New Trips	2,055	2,055	4,110
Weekday AM Peak	85	52	137
New Trips	85	52	137
Weekday PM peak	194	187	381
New Trips	194	187	381

Per Trip Generation Manual, 9th Edition for 40,198 sq building - Lot 2

Analysis Period	Weekday		
Average Rate	Rate		Trips
	102.24		4110
Entering / Exiting			
% Entering	50%		2055
% Exiting	50%		2055
New Trips			
% internal	0		
% pass by	0		
		In	Out
Total Trips		2055	2055
Internal Trips		0	0
Passby Trips	0	0	0
New Trips		2055	2055

Analysis Period	Weekday AM Peak for adjacent streets		
Average Rate	Rate		Trips
	3.4		137
Entering / Exiting			
% Entering	62%		85
% Exiting	38%		52
New Trips			
% internal			
% pass by			
		In	Out
Total Trips		85	52
Internal Trips		0	0
Passby Trips		0	0
New Trips		85	52

Analysis Period	Weekday PM peak for adjacent streets		
Average Rate	Rate		Trips
	9.48		381
Entering / Exiting			
% Entering	51%		194
% Exiting	49%		187
New Trips			
% internal			
% pass by			
		In	Out
Total Trips		194	187
Internal Trips		0	0
Passby Trips		0	0
New Trips		194	187

ITE Trip Generation

Trip Generation Based on Weighted Average Rates

HDJ Design Group

General			
Land Use Code	Specialty Retail (sf) 9th Edition		
Independent Variable	1,000 Sq Ft		
Size (X)		21.52	
Land Use Code		826	

Date: 10/22/2015 Analyst: Sharar Project: Clearwater Commercial

	In	Out	Total
Average Weekday	477	477	954
New Trips	477	477	954
Weekday AM Peak	71	77	147
New Trips	71	77	147
Weekday PM peak	26	33	58
New Trips	26	33	58

Per Trip Generation Manual, 9th Edition for 21,519 sq building - Lot 5

Analysis Period	Weekday		
Average Rate	Rate		Trips
	44.32		954
Entering / Exiting			
% Entering	50%		477
% Exiting	50%		477
New Trips			
% internal	0		
% pass by	0		
		In	Out
Total Trips		477	477
Internal Trips		0	0
Passby Trips	0	0	0
New Trips		477	477

Analysis Period	Weekday AM Peak for adjacent streets		
Average Rate	Rate		Trips
	6.84		147
Entering / Exiting			
% Entering	48%		71
% Exiting	52%		77
New Trips			
% internal			
% pass by			
		In	Out
Total Trips		71	77
Internal Trips		0	0
Passby Trips		0	0
New Trips		71	77

Analysis Period	Weekday PM peak for adjacent streets		
Average Rate	Rate		Trips
	2.71		58
Entering / Exiting			
% Entering	44%		26
% Exiting	56%		33
New Trips			
% internal			
% pass by			
		In	Out
Total Trips		26	33
Internal Trips		0	0
Passby Trips		0	0
New Trips		26	33

ITE Trip Generation

Trip Generation Based on Weighted Average Rates

HDJ Design Group

General			
Land Use Code	FF Rest w/DrvThrhg with seating		
Independent Variable	1,000 Sq Ft		
Size (X)		14,941	
Land Use Code		934	

Date: 10/22/2015 Analyst: Sharar Project: Clearwater Commercial

	In	Out	Total
Average Weekday	3,706	3,706	7,413
New Trips	3,706	3,706	7,413
Weekday AM Peak	346	333	679
New Trips	346	333	679
Weekday PM peak	254	235	489
New Trips	254	235	489

Per Trip Generation Manual, 9th Edition for 14,941 sq building - Lot 6

Analysis Period	Weekday		
Average Rate	Rate		Trips
	496.12		7413
Entering / Exiting			
% Entering	50%		3706
% Exiting	50%		3706
New Trips			
% internal	0		
% pass by			
		In	Out
Total Trips		3706	3706
Internal Trips		0	0
Passby Trips	0	0	0
New Trips		3706	3706

Analysis Period	Weekday AM Peak for adjacent streets		
Average Rate	Rate		Trips
	45.42		679
Entering / Exiting			
% Entering	51%		346
% Exiting	49%		333
New Trips			
% internal			
% pass by			
		In	Out
Total Trips		346	333
Internal Trips		0	0
Passby Trips		0	0
New Trips		346	333

Analysis Period	Weekday PM peak for adjacent streets		
Average Rate	Rate		Trips
	32.7		489
Entering / Exiting			
% Entering	52%		254
% Exiting	48%		235
New Trips			
% internal			
% pass by			
		In	Out
Total Trips		254	235
Internal Trips		0	0
Passby Trips		0	0
New Trips		254	235

ITE Trip Generation

Trip Generation Based on Weighted Average Rates

HDJ Design Group

General			
Land Use Code	Specialty Retail (sf) 9th Edition		
Independent Variable	1,000 Sq Ft		
Size (X)		19.39	
Land Use Code		826	

Date: 10/22/2015 Analyst: Sharar Project: Clearwater Commercial

	In	Out	Total
Average Weekday	430	430	859
New Trips	430	430	859
Weekday AM Peak	64	69	133
New Trips	64	69	133
Weekday PM peak	23	29	53
New Trips	23	29	53

Per Trip Generation Manual, 9th Edition for a 19,388 sf building - Lot 7

Analysis Period	Weekday		
Average Rate	Rate		Trips
	44.32		859
Entering / Exiting			
% Entering	50%		430
% Exiting	50%		430
New Trips			
% internal	0		
% pass by	0		
		In	Out
Total Trips		430	430
Internal Trips		0	0
Passby Trips	0	0	0
New Trips		430	430

Analysis Period	Weekday AM Peak for adjacent streets		
Average Rate	Rate		Trips
	6.84		133
Entering / Exiting			
% Entering	48%		64
% Exiting	52%		69
New Trips			
% internal	0		
% pass by	0		
		In	Out
Total Trips		64	69
Internal Trips		0	0
Passby Trips		0	0
New Trips		64	69

Analysis Period	Weekday PM peak for adjacent streets		
Average Rate	Rate		Trips
	2.71		53
Entering / Exiting			
% Entering	44%		23
% Exiting	56%		29
New Trips			
% internal	0		
% pass by	0		
		In	Out
Total Trips		23	29
Internal Trips		0	0
Passby Trips		0	0
New Trips		23	29

ITE Trip Generation

Trip Generation Based on Weighted Average Rates

HDJ Design Group

General			
Land Use Code	Specialty Retail (sf) 9th Edition		
Independent Variable	1,000 Sq Ft		
Size (X)		24.81	
Land Use Code		826	

Date: 10/22/2015 Analyst: Sharar Project: Clearwater Commercial

	In	Out	Total
Average Weekday	550	550	1,100
New Trips	550	550	1,100
Weekday AM Peak	81	88	170
New Trips	81	88	170
Weekday PM peak	30	38	67
New Trips	30	38	67

Per Trip Generation Manual, 9th Edition for a 24,813 sf building - Lot 8

Analysis Period	Weekday		
Average Rate	Rate		Trips
	44.32		1100
Entering / Exiting			
% Entering	50%		550
% Exiting	50%		550
New Trips			
% internal	0		
% pass by	0		
		In	Out
Total Trips		550	550
Internal Trips		0	0
Passby Trips	0	0	0
New Trips		550	550

Analysis Period	Weekday AM Peak for adjacent streets		
Average Rate	Rate		Trips
	6.84		170
Entering / Exiting			
% Entering	48%		81
% Exiting	52%		88
New Trips			
% internal	0		
% pass by	0		
		In	Out
Total Trips		81	88
Internal Trips		0	0
Passby Trips		0	0
New Trips		81	88

Analysis Period	Weekday PM peak for adjacent streets		
Average Rate	Rate		Trips
	2.71		67
Entering / Exiting			
% Entering	44%		30
% Exiting	56%		38
New Trips			
% internal	0		
% pass by	0		
		In	Out
Total Trips		30	38
Internal Trips		0	0
Passby Trips		0	0
New Trips		30	38

ITE Trip Generation

Trip Generation Based on Weighted Average Rates

HDJ Design Group

General			
Land Use Code	Specialty Retail (sf) 9th Edition		
Independent Variable	1,000 Sq Ft		
Size (X)		13.53	
Land Use Code		826	

Date: 10/22/2015 Analyst: Sharar Project: Clearwater Commercial

	In	Out	Total
Average Weekday	300	300	600
New Trips	300	300	600
Weekday AM Peak	44	48	93
New Trips	44	48	93
Weekday PM peak	16	21	37
New Trips	16	21	37

Per Trip Generation Manual, 9th Edition for a 13,529 sf building - Lot 9

Analysis Period	Weekday		
Average Rate	Rate		Trips
	44.32		600
Entering / Exiting			
% Entering	50%		300
% Exiting	50%		300
New Trips			
% internal	0		
% pass by	0		
		In	Out
Total Trips		300	300
Internal Trips		0	0
Passby Trips	0	0	0
New Trips		300	300

Analysis Period	Weekday AM Peak for adjacent streets		
Average Rate	Rate		Trips
	6.84		93
Entering / Exiting			
% Entering	48%		44
% Exiting	52%		48
New Trips			
% internal	0		
% pass by	0		
		In	Out
Total Trips		44	48
Internal Trips		0	0
Passby Trips		0	0
New Trips		44	48

Analysis Period	Weekday PM peak for adjacent streets		
Average Rate	Rate		Trips
	2.71		37
Entering / Exiting			
% Entering	44%		16
% Exiting	56%		21
New Trips			
% internal	0		
% pass by	0		
		In	Out
Total Trips		16	21
Internal Trips		0	0
Passby Trips		0	0
New Trips		16	21

ITE Trip Generation

Trip Generation Based on Weighted Average Rates

HDJ Design Group

General			
Land Use Code	Specialty Retail (sf) 9th Edition		
Independent Variable	1,000 Sq Ft		
Size (X)		13.87	
Land Use Code		826	

Date: 10/22/2015 Analyst: Sharar Project: Clearwater Commercial

	In	Out	Total
Average Weekday	307	307	615
New Trips	307	307	615
Weekday AM Peak	46	49	95
New Trips	46	49	95
Weekday PM peak	17	21	38
New Trips	17	21	38

Per Trip Generation Manual, 9th Edition for a 13,868 sf building - Lot 10

Analysis Period	Weekday		
Average Rate	Rate		Trips
	44.32		615
Entering / Exiting			
% Entering	50%		307
% Exiting	50%		307
New Trips			
% internal	0		
% pass by	0		
		In	Out
Total Trips		307	307
Internal Trips		0	0
Passby Trips	0	0	0
New Trips		307	307

Analysis Period	Weekday AM Peak for adjacent streets		
Average Rate	Rate		Trips
	6.84		95
Entering / Exiting			
% Entering	48%		46
% Exiting	52%		49
New Trips			
% internal	0		
% pass by	0		
		In	Out
Total Trips		46	49
Internal Trips		0	0
Passby Trips		0	0
New Trips		46	49

Analysis Period	Weekday PM peak for adjacent streets		
Average Rate	Rate		Trips
	2.71		38
Entering / Exiting			
% Entering	44%		17
% Exiting	56%		21
New Trips			
% internal	0		
% pass by	0		
		In	Out
Total Trips		17	21
Internal Trips		0	0
Passby Trips		0	0
New Trips		17	21

ITE Trip Generation

Trip Generation Based on Weighted Average Rates

HDJ Design Group

General			
Land Use Code	FF Rest w/DrvThrhg with seating		
Independent Variable	1,000 Sq Ft		
Size (X)		11.54	
Land Use Code		934	

Date: 10/22/2015 Analyst: Sharar Project: Clearwater Commercial

	In	Out	Total
Average Weekday	2,863	2,863	5,725
New Trips	1,431	1,431	2,863
Weekday AM Peak	267	257	524
New Trips	267	257	524
Weekday PM peak	196	181	377
New Trips	196	181	377

Per Trip Generation Manual, 9th Edition for 11,543 sq building - Lot 11

Analysis Period	Weekday		
Average Rate	Rate		Trips
	496.12		5725
Entering / Exiting			
% Entering	50%		2863
% Exiting	50%		2863
New Trips			
% internal	0		
% pass by	50		
		In	Out
Total Trips		2863	2863
Internal Trips		0	0
Passby Trips	0	1431	1431
New Trips		1431	1431

Analysis Period	Weekday AM Peak for adjacent streets		
Average Rate	Rate		Trips
	45.42		524
Entering / Exiting			
% Entering	51%		267
% Exiting	49%		257
New Trips			
% internal	0		
% pass by	0		
		In	Out
Total Trips		267	257
Internal Trips		0	0
Passby Trips		0	0
New Trips		267	257

Analysis Period	Weekday PM peak for adjacent streets		
Average Rate	Rate		Trips
	32.7		377
Entering / Exiting			
% Entering	52%		196
% Exiting	48%		181
New Trips			
% internal	0		
% pass by	0		
		In	Out
Total Trips		196	181
Internal Trips		0	0
Passby Trips		0	0
New Trips		196	181

ITE Trip Generation

Trip Generation Based on Weighted Average Rates

HDJ Design Group

General			
Land Use Code	FF Rest w/DrvThrhg with seating		
Independent Variable	1,000 Sq Ft		
Size (X)		13.9	
Land Use Code		934	

Date: 10/22/2015 Analyst: Sharar Project: Clearwater Commercial

	In	Out	Total
Average Weekday	3,448	3,448	6,896
New Trips	1,724	1,724	3,448
Weekday AM Peak	322	309	631
New Trips	322	309	631
Weekday PM peak	236	218	455
New Trips	236	218	455

Per Trip Generation Manual, 9th Edition for 13,899 sq building - Lot 12

Analysis Period	Weekday		
Average Rate	Rate		Trips
	496.12		6896
Entering / Exiting			
% Entering	50%		3448
% Exiting	50%		3448
New Trips			
% internal	0		
% pass by	50		
		In	Out
Total Trips		3448	3448
Internal Trips		0	0
Passby Trips	0	1724	1724
New Trips		1724	1724

Analysis Period	Weekday AM Peak for adjacent streets		
Average Rate	Rate		Trips
	45.42		631
Entering / Exiting			
% Entering	51%		322
% Exiting	49%		309
New Trips			
% internal	0		
% pass by	0		
		In	Out
Total Trips		322	309
Internal Trips		0	0
Passby Trips		0	0
New Trips		322	309

Analysis Period	Weekday PM peak for adjacent streets		
Average Rate	Rate		Trips
	32.7		455
Entering / Exiting			
% Entering	52%		236
% Exiting	48%		218
New Trips			
% internal	0		
% pass by	0		
		In	Out
Total Trips		236	218
Internal Trips		0	0
Passby Trips		0	0
New Trips		236	218

ITE Trip Generation

Trip Generation Based on Weighted Average Rates

HDJ Design Group

General			
Land Use Code	General Office Building (sf)		
Independent Variable	1,000 Sq Ft		
Size (X)		13.54	
Land Use Code		710	

Date: 10/22/2015 Analyst: Sharar Project: Clearwater Commercial

	In	Out	Total
Average Weekday	75	75	149
New Trips	37	37	75
Weekday AM Peak	19	3	21
New Trips	19	3	21
Weekday PM peak	3	17	20
New Trips	3	17	20

Per Trip Generation Manual, 9th Edition for 13,543 sq building - Lot 13

Analysis Period	Weekday		
Average Rate	Rate		Trips
	11.03		149
Entering / Exiting			
% Entering	50%		75
% Exiting	50%		75
New Trips			
% internal	0		
% pass by	50		
		In	Out
Total Trips		75	75
Internal Trips		0	0
Passby Trips	0	37	37
New Trips		37	37

Analysis Period	Weekday AM Peak for adjacent streets		
Average Rate	Rate		Trips
	1.56		21
Entering / Exiting			
% Entering	88%		19
% Exiting	12%		3
New Trips			
% internal	0		
% pass by	0		
		In	Out
Total Trips		19	3
Internal Trips		0	0
Passby Trips		0	0
New Trips		19	3

Analysis Period	Weekday PM peak for adjacent streets		
Average Rate	Rate		Trips
	1.49		20
Entering / Exiting			
% Entering	17%		3
% Exiting	83%		17
New Trips			
% internal	0		
% pass by	0		
		In	Out
Total Trips		3	17
Internal Trips		0	0
Passby Trips		0	0
New Trips		3	17

ITE Trip Generation

Trip Generation Based on Weighted Average Rates

HDJ Design Group

General			
Land Use Code	Quality Restaurant		
Independent Variable	1,000 Sq Ft		
Size (X)		22.59	
Land Use Code		931	

Date: 10/22/2015 Analyst: Sharar Project: Clearwater Commercial

	In	Out	Total
Average Weekday	1,016	1,016	2,032
New Trips	569	569	1,138
Weekday AM Peak	14	5	18
New Trips	14	5	18
Weekday PM peak	113	56	169
New Trips	113	56	169

Per Trip Generation Manual, 9th Edition for 22,592 sq building - Lot 14

Analysis Period	Weekday		
Average Rate	Rate		Trips
	89.95		2032
Entering / Exiting			
% Entering	50%		1016
% Exiting	50%		1016
New Trips			
% internal	0		
% pass by	44		
		In	Out
Total Trips		1016	1016
Internal Trips		0	0
Passby Trips	0	447	447
New Trips		569	569

Analysis Period	Weekday AM Peak for adjacent streets		
Average Rate	Rate		Trips
	0.81		18
Entering / Exiting			
% Entering	75%		14
% Exiting	25%		5
New Trips			
% internal	0		
% pass by	0		
		In	Out
Total Trips		14	5
Internal Trips		0	0
Passby Trips		0	0
New Trips		14	5

Analysis Period	Weekday PM peak for adjacent streets		
Average Rate	Rate		Trips
	7.49		169
Entering / Exiting			
% Entering	67%		113
% Exiting	33%		56
New Trips			
% internal	0		
% pass by	0		
		In	Out
Total Trips		113	56
Internal Trips		0	0
Passby Trips		0	0
New Trips		113	56

ITE Trip Generation

Trip Generation Based on Weighted Average Rates

HDJ Design Group

General			
Land Use Code	Specialty Retail (sf) 9th Edition		
Independent Variable	1,000 Sq Ft		
Size (X)		32.86	
Land Use Code		826	

Date: 10/22/2015 Analyst: Sharar Project: Clearwater Commercial

	In	Out	Total
Average Weekday	728	728	1,456
New Trips	728	728	1,456
Weekday AM Peak	108	117	225
New Trips	108	117	225
Weekday PM peak	39	50	89
New Trips	39	50	89

Per Trip Generation Manual, 9th Edition for a 32,864 sf building - Lot 15

Analysis Period	Weekday		
Average Rate	Rate		Trips
	44.32		1456
Entering / Exiting			
% Entering	50%		728
% Exiting	50%		728
New Trips			
% internal	0		
% pass by	0		
		In	Out
Total Trips		728	728
Internal Trips		0	0
Passby Trips	0	0	0
New Trips		728	728

Analysis Period	Weekday AM Peak for adjacent streets		
Average Rate	Rate		Trips
	6.84		225
Entering / Exiting			
% Entering	48%		108
% Exiting	52%		117
New Trips			
% internal	0		
% pass by	0		
		In	Out
Total Trips		108	117
Internal Trips		0	0
Passby Trips		0	0
New Trips		108	117

Analysis Period	Weekday PM peak for adjacent streets		
Average Rate	Rate		Trips
	2.71		89
Entering / Exiting			
% Entering	44%		39
% Exiting	56%		50
New Trips			
% internal	0		
% pass by	0		
		In	Out
Total Trips		39	50
Internal Trips		0	0
Passby Trips		0	0
New Trips		39	50

ITE Trip Generation

Trip Generation Based on Weighted Average Rates

HDJ Design Group

General			
Land Use Code	Medical Dental Office Bldg (sf)		
Independent Variable	1,000 Sq Ft		
Size (X)		111.46	
Land Use Code		720	

Date: 10/22/2015 Analyst: Sharar Project: Clearwater Commercial

	In	Out	Total
Average Weekday	2,014	2,014	4,027
New Trips	2,014	2,014	4,027
Weekday AM Peak	218	58	276
New Trips	218	58	276
Weekday PM peak	112	303	415
New Trips	112	303	415

Per Trip Generation Manual, 9th Edition for 111,455 sq building - Lot 16A

Analysis Period	Weekday		
Average Rate	Rate		Trips
	36.13		4027
Entering / Exiting			
% Entering	50%		2014
% Exiting	50%		2014
New Trips			
% internal	0		
% pass by	0		
		In	Out
Total Trips		2014	2014
Internal Trips		0	0
Passby Trips	0	0	0
New Trips		2014	2014

Analysis Period	Weekday AM Peak for adjacent streets		
Average Rate	Rate		Trips
	2.48		276
Entering / Exiting			
% Entering	79%		218
% Exiting	21%		58
New Trips			
% internal	0		
% pass by	0		
		In	Out
Total Trips		218	58
Internal Trips		0	0
Passby Trips		0	0
New Trips		218	58

Analysis Period	Weekday PM peak for adjacent streets		
Average Rate	Rate		Trips
	3.72		415
Entering / Exiting			
% Entering	27%		112
% Exiting	73%		303
New Trips			
% internal	0		
% pass by	0		
		In	Out
Total Trips		112	303
Internal Trips		0	0
Passby Trips		0	0
New Trips		112	303

ITE Trip Generation

Trip Generation Based on Weighted Average Rates

HDJ Design Group

General			
Land Use Code	Medical Dental Office Bldg (sf)		
Independent Variable	1,000 Sq Ft		
Size (X)		62.81	
Land Use Code		720	

Date: 10/22/2015 Analyst: Sharar Project: Clearwater Commercial

	In	Out	Total
Average Weekday	1,135	1,135	2,269
New Trips	1,135	1,135	2,269
Weekday AM Peak	123	33	156
New Trips	123	33	156
Weekday PM peak	63	171	234
New Trips	63	171	234

Per Trip Generation Manual, 9th Edition for 62,813 sq building - Lot 16B

Analysis Period	Weekday		
Average Rate	Rate		Trips
	36.13		2269
Entering / Exiting			
% Entering	50%		1135
% Exiting	50%		1135
New Trips			
% internal	0		
% pass by	0		
		In	Out
Total Trips		1135	1135
Internal Trips		0	0
Passby Trips	0	0	0
New Trips		1135	1135

Analysis Period	Weekday AM Peak for adjacent streets		
Average Rate	Rate		Trips
	2.48		156
Entering / Exiting			
% Entering	79%		123
% Exiting	21%		33
New Trips			
% internal	0		
% pass by	0		
		In	Out
Total Trips		123	33
Internal Trips		0	0
Passby Trips		0	0
New Trips		123	33

Analysis Period	Weekday PM peak for adjacent streets		
Average Rate	Rate		Trips
	3.72		234
Entering / Exiting			
% Entering	27%		63
% Exiting	73%		171
New Trips			
% internal	0		
% pass by	0		
		In	Out
Total Trips		63	171
Internal Trips		0	0
Passby Trips		0	0
New Trips		63	171

ITE Trip Generation

Trip Generation Based on Weighted Average Rates

HDJ Design Group

General			
Land Use Code	Medical Dental Office Bldg (sf)		
Independent Variable	1,000 Sq Ft		
Size (X)		4.16	
Land Use Code		720	

Date: 10/22/2015 Analyst: Sharar Project: Clearwater Commercial

	In	Out	Total
Average Weekday	75	75	150
New Trips	75	75	150
Weekday AM Peak	8	2	10
New Trips	8	2	10
Weekday PM peak	4	11	15
New Trips	4	11	15

Per Trip Generation Manual, 9th Edition for 4,163 sq building - Lot 16C

Analysis Period	Weekday		
Average Rate	Rate		Trips
	36.13		150
Entering / Exiting			
% Entering	50%		75
% Exiting	50%		75
New Trips			
% internal	0		
% pass by	0		
		In	Out
Total Trips		75	75
Internal Trips		0	0
Passby Trips	0	0	0
New Trips		75	75

Analysis Period	Weekday AM Peak for adjacent streets		
Average Rate	Rate		Trips
	2.48		10
Entering / Exiting			
% Entering	79%		8
% Exiting	21%		2
New Trips			
% internal	0		
% pass by	0		
		In	Out
Total Trips		8	2
Internal Trips		0	0
Passby Trips		0	0
New Trips		8	2

Analysis Period	Weekday PM peak for adjacent streets		
Average Rate	Rate		Trips
	3.72		15
Entering / Exiting			
% Entering	27%		4
% Exiting	73%		11
New Trips			
% internal	0		
% pass by	0		
		In	Out
Total Trips		4	11
Internal Trips		0	0
Passby Trips		0	0
New Trips		4	11

ITE Trip Generation

Trip Generation Based on Weighted Average Rates

HDJ Design Group

General			
Land Use Code	General Office Building (sf)		
Independent Variable	1,000 Sq Ft		
Size (X)		26.57	
Land Use Code		710	

Date: 10/22/2015 Analyst: Sharar Project: Clearwater Commercial

	In	Out	Total
Average Weekday	147	147	293
New Trips	147	147	293
Weekday AM Peak	36	5	41
New Trips	36	5	41
Weekday PM peak	7	33	40
New Trips	7	33	40

Per Trip Generation Manual, 9th Edition for 26,572 sq building - Lot 17

Analysis Period	Weekday		
Average Rate	Rate		Trips
	11.03		293
Entering / Exiting			
% Entering	50%		147
% Exiting	50%		147
New Trips			
% internal	0		
% pass by	0		
		In	Out
Total Trips		147	147
Internal Trips		0	0
Passby Trips	0	0	0
New Trips		147	147

Analysis Period	Weekday AM Peak for adjacent streets		
Average Rate	Rate		Trips
	1.56		41
Entering / Exiting			
% Entering	88%		36
% Exiting	12%		5
New Trips			
% internal	0		
% pass by	0		
		In	Out
Total Trips		36	5
Internal Trips		0	0
Passby Trips		0	0
New Trips		36	5

Analysis Period	Weekday PM peak for adjacent streets		
Average Rate	Rate		Trips
	1.49		40
Entering / Exiting			
% Entering	17%		7
% Exiting	83%		33
New Trips			
% internal	0		
% pass by	0		
		In	Out
Total Trips		7	33
Internal Trips		0	0
Passby Trips		0	0
New Trips		7	33

ITE Trip Generation

Trip Generation Based on Weighted Average Rates

HDJ Design Group

General			
Land Use Code	General Office Building (sf)		
Independent Variable	1,000 Sq Ft		
Size (X)		13.19	
Land Use Code		710	

Date: 10/22/2015 Analyst: Sharar Project: Clearwater Commercial

	In	Out	Total
Average Weekday	73	73	145
New Trips	73	73	145
Weekday AM Peak	18	2	21
New Trips	18	2	21
Weekday PM peak	3	16	20
New Trips	3	16	20

Per Trip Generation Manual, 9th Edition for 13,185 sq building - Lot 18

Analysis Period	Weekday		
Average Rate	Rate		Trips
	11.03		145
Entering / Exiting			
% Entering	50%		73
% Exiting	50%		73
New Trips			
% internal	0		
% pass by	0		
		In	Out
Total Trips		73	73
Internal Trips		0	0
Passby Trips	0	0	0
New Trips		73	73

Analysis Period	Weekday AM Peak for adjacent streets		
Average Rate	Rate		Trips
	1.56		21
Entering / Exiting			
% Entering	88%		18
% Exiting	12%		2
New Trips			
% internal	0		
% pass by	0		
		In	Out
Total Trips		18	2
Internal Trips		0	0
Passby Trips		0	0
New Trips		18	2

Analysis Period	Weekday PM peak for adjacent streets		
Average Rate	Rate		Trips
	1.49		20
Entering / Exiting			
% Entering	17%		3
% Exiting	83%		16
New Trips			
% internal	0		
% pass by	0		
		In	Out
Total Trips		3	16
Internal Trips		0	0
Passby Trips		0	0
New Trips		3	16

ITE Trip Generation

Trip Generation Based on Weighted Average Rates

HDJ Design Group

General			
Land Use Code	General Office Building (sf)		
Independent Variable	1,000 Sq Ft		
Size (X)		29.37	
Land Use Code		710	

Date: 10/22/2015 Analyst: Sharar Project: Clearwater Commercial

	In	Out	Total
Average Weekday	162	162	324
New Trips	162	162	324
Weekday AM Peak	40	5	46
New Trips	40	5	46
Weekday PM peak	7	36	44
New Trips	7	36	44

Per Trip Generation Manual, 9th Edition for 29,373 sq building - Lot 19

Analysis Period	Weekday		
Average Rate	Rate		Trips
	11.03		324
Entering / Exiting			
% Entering	50%		162
% Exiting	50%		162
New Trips			
% internal	0		
% pass by	0		
		In	Out
Total Trips		162	162
Internal Trips		0	0
Passby Trips	0	0	0
New Trips		162	162

Analysis Period	Weekday AM Peak for adjacent streets		
Average Rate	Rate		Trips
	1.56		46
Entering / Exiting			
% Entering	88%		40
% Exiting	12%		5
New Trips			
% internal	0		
% pass by	0		
		In	Out
Total Trips		40	5
Internal Trips		0	0
Passby Trips		0	0
New Trips		40	5

Analysis Period	Weekday PM peak for adjacent streets		
Average Rate	Rate		Trips
	1.49		44
Entering / Exiting			
% Entering	17%		7
% Exiting	83%		36
New Trips			
% internal	0		
% pass by	0		
		In	Out
Total Trips		7	36
Internal Trips		0	0
Passby Trips		0	0
New Trips		7	36

ITE Trip Generation

Trip Generation Based on Weighted Average Rates

HDJ Design Group

General			
Land Use Code	General Office Building (sf)		
Independent Variable	1,000 Sq Ft		
Size (X)		33.8	
Land Use Code		710	

Date: 10/22/2015 Analyst: Sharar Project: Clearwater Commercial

	In	Out	Total
Average Weekday	186	186	373
New Trips	186	186	373
Weekday AM Peak	46	6	53
New Trips	46	6	53
Weekday PM peak	9	42	50
New Trips	9	42	50

Per Trip Generation Manual, 9th Edition for 33,802 sq building - Lot 20

Analysis Period	Weekday		
Average Rate	Rate		Trips
	11.03		373
Entering / Exiting			
% Entering	50%		186
% Exiting	50%		186
New Trips			
% internal	0		
% pass by	0		
		In	Out
Total Trips		186	186
Internal Trips		0	0
Passby Trips	0	0	0
New Trips		186	186

Analysis Period	Weekday AM Peak for adjacent streets		
Average Rate	Rate		Trips
	1.56		53
Entering / Exiting			
% Entering	88%		46
% Exiting	12%		6
New Trips			
% internal	0		
% pass by	0		
		In	Out
Total Trips		46	6
Internal Trips		0	0
Passby Trips		0	0
New Trips		46	6

Analysis Period	Weekday PM peak for adjacent streets		
Average Rate	Rate		Trips
	1.49		50
Entering / Exiting			
% Entering	17%		9
% Exiting	83%		42
New Trips			
% internal	0		
% pass by	0		
		In	Out
Total Trips		9	42
Internal Trips		0	0
Passby Trips		0	0
New Trips		9	42

ITE Trip Generation

Trip Generation Based on Weighted Average Rates

HDJ Design Group

General			
Land Use Code	General Office Building (sf)		
Independent Variable	1,000 Sq Ft		
Size (X)		26.84	
Land Use Code		710	

Date: 10/22/2015 Analyst: Sharar Project: Clearwater Commercial

	In	Out	Total
Average Weekday	148	148	296
New Trips	148	148	296
Weekday AM Peak	37	5	42
New Trips	37	5	42
Weekday PM peak	7	33	40
New Trips	7	33	40

Per Trip Generation Manual, 9th Edition for 26,838 sq building - Lot 21

Analysis Period	Weekday		
Average Rate	Rate		Trips
	11.03		296
Entering / Exiting			
% Entering	50%		148
% Exiting	50%		148
New Trips			
% internal	0		
% pass by	0		
		In	Out
Total Trips		148	148
Internal Trips		0	0
Passby Trips	0	0	0
New Trips		148	148

Analysis Period	Weekday AM Peak for adjacent streets		
Average Rate	Rate		Trips
	1.56		42
Entering / Exiting			
% Entering	88%		37
% Exiting	12%		5
New Trips			
% internal	0		
% pass by	0		
		In	Out
Total Trips		37	5
Internal Trips		0	0
Passby Trips		0	0
New Trips		37	5

Analysis Period	Weekday PM peak for adjacent streets		
Average Rate	Rate		Trips
	1.49		40
Entering / Exiting			
% Entering	17%		7
% Exiting	83%		33
New Trips			
% internal	0		
% pass by	0		
		In	Out
Total Trips		7	33
Internal Trips		0	0
Passby Trips		0	0
New Trips		7	33

Clearwater Commercial Binding Site Plan - Trip Generation
Trip Generation by land

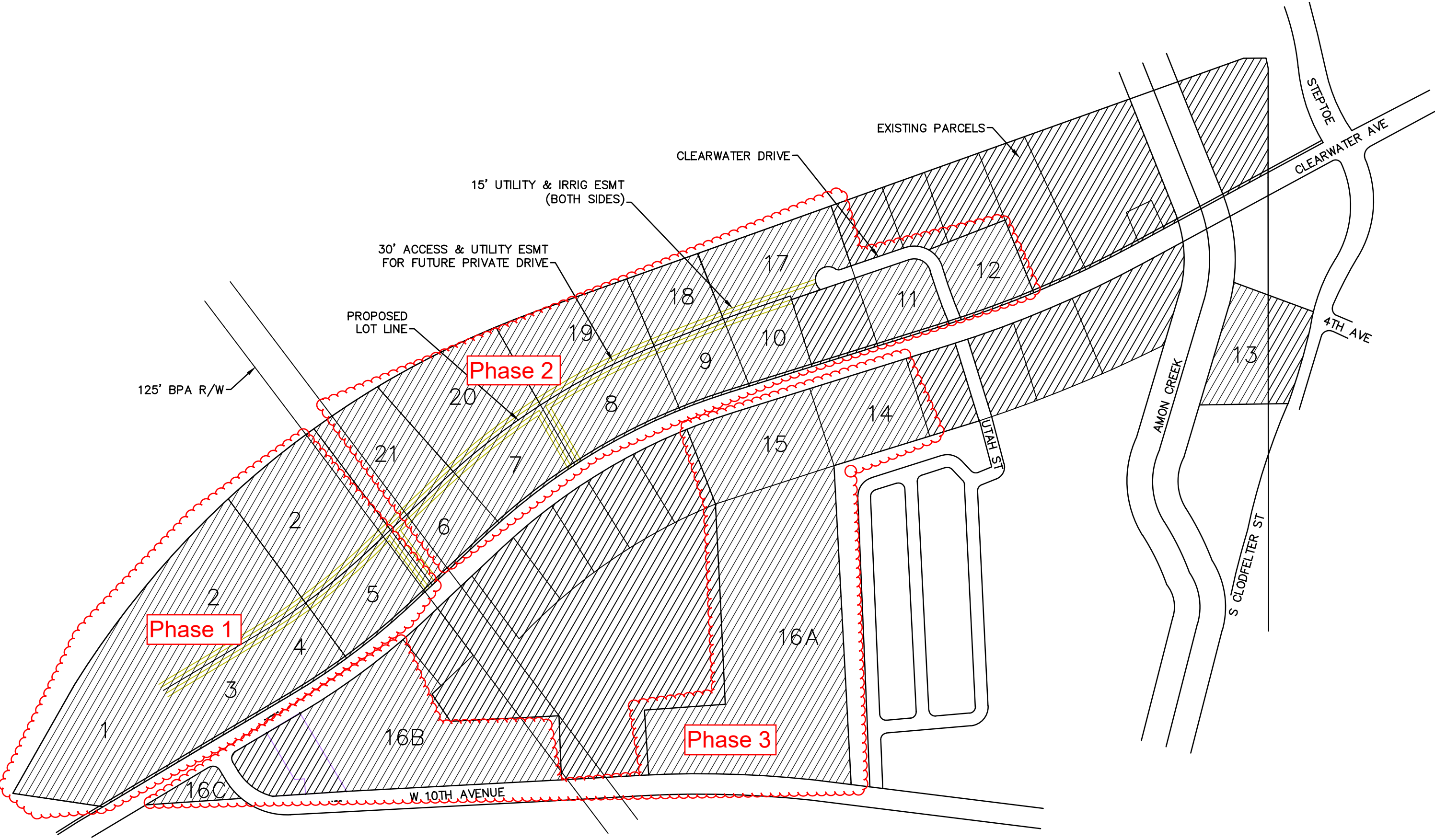
											Internal Capture		Pass-by			Net Total	
Lot #	Lot SF	Percent Lot covered	Building SF	Assumed use	Land Use Code	ADT	AM Peak	PM Peak	PM Peak Trips in	PM Peak Trips out	Internal Capture reduction of 22% - In	Internal Capture reduction of 22% - Out	ITE Percent reduction in PM due to Pass-by Trips	PM Pass-by entering	PM Pass-by exiting	Net PM In	Net PM out
1,2,3 and 4	725,620	0.2	145,124	Big Box	862	4,457	216	338	166	172	129	134	48%	62	64	67	70
2	223,323	0.18	40,198	Grocery	850	4,110	137	381	194	187	151	146	36%	54	53	97	93
5	119,549	0.18	21,519	Retail	826	954	147	58	26	33	20	26				20	26
6	93,380	0.16	14,941	Fast Food	934	739	679	489	254	235	198	183	50%	99	92	99	92
7	107,711	0.18	19,388	Retail	826	859	133	53	23	29	18	23				18	23
8	137,852	0.18	24,813	Retail	826	1,100	170	67	30	38	23	30				23	30
9	84,554	0.16	13,529	Retail	826	600	93	37	16	21	12	16				12	16
10	86,675	0.16	13,868	Retail	826	615	95	38	17	21	13	16				13	16
11	72,143	0.16	11,543	Fast Food	934	5,725	524	377	196	181	153	141	50%	76	71	76	71
12	86,871	0.16	13,899	Fast Food	934	6,896	631	455	236	218	184	170	50%	92	85	92	85
13	84,646	0.16	13,543	Office	710	149	21	20	3	17						3	17
14	125,513	0.18	22,592	Restaurant	931	2,032	18	169	113	56	88	44	44%	50	25	38	19
15	182,579	0.18	32,864	Retail	826	1,456	225	89	39	50	30	39				30	39
16A	557,276	0.2	111,455	MOB	720	4,027	276	415	112	303	87	236				87	236
16B	348,963	0.18	62,813	MOB	720	2,269	156	234	63	171						63	171
16C	26,020	0.16	4,163	MOB	720	150	10	15	4	11						4	11
17	147,623	0.18	26,572	Office	710	293	41	40	7	33	5	26				5	26
18	82,405	0.16	13,185	Office	710	145	21	20	3	16	2	12				2	12
19	163,184	0.18	29,373	Office	710	324	46	44	7	36	5	28				5	28
20	187,790	0.18	33,802	Office	710	373	53	50	9	33	7	26				7	26
21	149,099	0.18	26,838	Office	710	296	42	40	7	33	5	26				5	26
			696,024			37,569	3,734	3,429	1,525	1,894						771	1,132

Net Total Trips

1,903

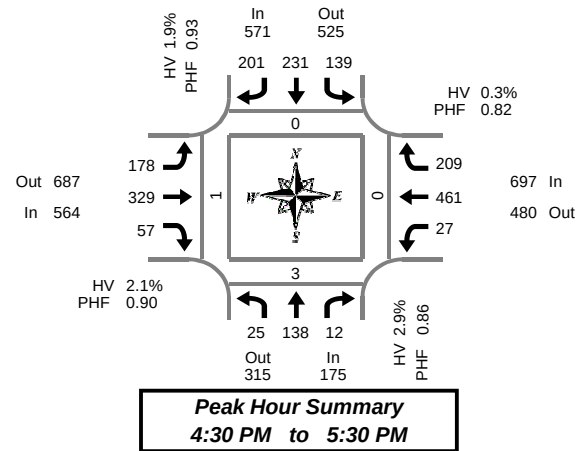
Clearwater Commercial Binding Site Plan - Trip Generation
Land use assumption for reasonable best and highest land use.

Lot #	Lot SF	Assumed Building SF	% applied	Assumed use
1,2,3 and 4	725,620	145,124	20%	Big Box
2	223,323	40,198	18%	Grocery
5	119,549	21,519	18%	Retail
6	93,380	14,941	16%	Fast Food
7	107,711	19,388	18%	Retail
8	137,852	24,813	18%	Retail
9	84,554	13,529	16%	Retail
10	86,675	13,868	16%	Retail
11	72,143	11,543	16%	Fast Food
12	86,871	13,899	16%	Fast Food
13	84,646	13,543	16%	Office
14	125,513	22,592	18%	Restaurant
15	182,579	32,864	18%	Retail
16A	557,276	111,455	20%	MOB
16B	348,963	62,813	18%	MOB
16C	26,020	4,163	16%	MOB
17	147,623	26,572	18%	Office
18	82,405	13,185	16%	Office
19	163,184	29,373	18%	Office
20	187,790	33,802	18%	Office
21	149,099	26,838	18%	Office



Appendix B – Traffic Counts

Total Vehicle Summary



Stepoe St & W Clearwater Ave

Tuesday, November 17, 2015

4:00 PM to 6:00 PM

15-Minute Interval Summary

4:00 PM to 6:00 PM

Interval Start Time	Northbound Stepoe St				Southbound Stepoe St				Eastbound W Clearwater Ave				Westbound W Clearwater Ave				Interval Total	Pedestrians Crosswalk			
	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes		North	South	East	West
4:00 PM	2	20	2	0	42	61	48	0	40	89	25	0	6	90	41	0	466	0	0	0	0
4:15 PM	5	32	4	0	25	56	40	0	42	96	17	0	3	100	45	0	465	1	0	1	0
4:30 PM	10	34	4	0	37	47	46	0	48	78	9	0	3	104	49	0	469	0	0	0	0
4:45 PM	6	41	4	0	33	66	54	0	45	88	23	0	8	96	45	0	509	0	3	0	1
5:00 PM	3	37	4	0	39	58	51	0	41	88	13	0	10	147	56	0	547	0	0	0	0
5:15 PM	6	26	0	0	30	60	50	0	44	75	12	0	6	114	59	0	482	0	0	0	0
5:30 PM	7	39	1	0	27	49	44	0	35	75	11	0	8	112	47	0	455	0	0	0	0
5:45 PM	5	33	4	0	20	37	31	0	47	71	9	0	4	89	33	0	383	0	0	0	0
Total Survey	44	262	23	0	253	434	364	0	342	660	119	0	48	852	375	0	3,776	1	3	1	1

Peak Hour Summary

4:30 PM to 5:30 PM

By Approach	Northbound Stepoe St				Southbound Stepoe St				Eastbound W Clearwater Ave				Westbound W Clearwater Ave				Total	Pedestrians Crosswalk			
	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes		North	South	East	West
Volume	175	315	490	0	571	525	1,096	0	564	687	1,251	0	697	480	1,177	0	2,007	0	3	0	1
%HV	2.9%				1.9%				2.1%				0.3%				1.5%				
PHF	0.86				0.93				0.90				0.82				0.92				

By Movement	Northbound Stepoe St				Southbound Stepoe St				Eastbound W Clearwater Ave				Westbound W Clearwater Ave				Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
Volume	25	138	12	175	139	231	201	571	178	329	57	564	27	461	209	697	2,007
%HV	8.0%	2.2%	0.0%	2.9%	1.4%	1.3%	3.0%	1.9%	1.1%	2.7%	1.8%	2.1%	0.0%	0.4%	0.0%	0.3%	1.5%
PHF	0.63	0.84	0.75	0.86	0.89	0.88	0.93	0.93	0.93	0.93	0.62	0.90	0.68	0.78	0.89	0.82	0.92

Rolling Hour Summary

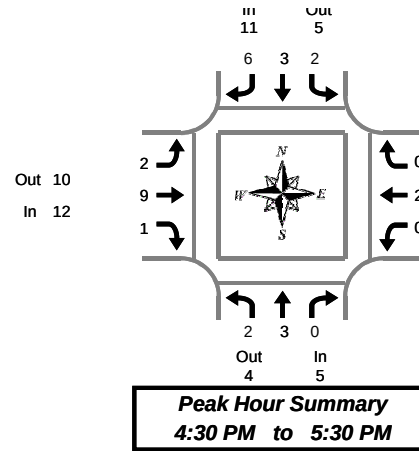
4:00 PM to 6:00 PM

Interval Start Time	Northbound Stepoe St				Southbound Stepoe St				Eastbound W Clearwater Ave				Westbound W Clearwater Ave				Interval Total	Pedestrians Crosswalk			
	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes		North	South	East	West
4:00 PM	23	127	14	0	137	230	188	0	175	351	74	0	20	390	180	0	1,909	1	3	1	1
4:15 PM	24	144	16	0	134	227	191	0	176	350	62	0	24	447	195	0	1,990	1	3	1	1
4:30 PM	25	138	12	0	139	231	201	0	178	329	57	0	27	461	209	0	2,007	0	3	0	1
4:45 PM	22	143	9	0	129	233	199	0	165	326	59	0	32	469	207	0	1,993	0	3	0	1
5:00 PM	21	135	9	0	116	204	176	0	167	309	45	0	28	462	195	0	1,867	0	0	0	0

Heavy Vehicle Summary



Clay Carney
(503) 833-2740



Stepoe St & W Clearwater Ave

Tuesday, November 17, 2015

4:00 PM to 6:00 PM

Heavy Vehicle 15-Minute Interval Summary

4:00 PM to 6:00 PM

Interval Start Time	Northbound Stepoe St				Southbound Stepoe St				Eastbound W Clearwater Ave				Westbound W Clearwater Ave				Interval Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
4:00 PM	0	1	0	1	3	2	3	8	1	6	2	9	0	2	0	2	20
4:15 PM	0	3	0	3	0	1	2	3	1	3	0	4	0	0	0	0	10
4:30 PM	0	1	0	1	0	0	1	1	1	1	0	2	0	1	0	1	5
4:45 PM	2	1	0	3	1	1	2	4	1	5	1	7	0	1	0	1	15
5:00 PM	0	1	0	1	1	2	3	6	0	2	0	2	0	0	0	0	9
5:15 PM	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	1
5:30 PM	0	0	0	0	0	0	1	1	2	1	0	3	0	1	0	1	5
5:45 PM	0	0	0	0	0	0	0	0	3	1	0	4	0	1	0	1	5
Total Survey	2	7	0	9	5	6	12	23	9	20	3	32	0	6	0	6	70

Heavy Vehicle Peak Hour Summary

4:30 PM to 5:30 PM

By Approach	Northbound Stepoe St				Southbound Stepoe St				Eastbound W Clearwater Ave				Westbound W Clearwater Ave				Total
	In	Out	Total		In	Out	Total		In	Out	Total		In	Out	Total		
Volume	5	4	9		11	5	16		12	10	22		2	11	13		30
PHF	0.18				0.23				0.20				0.17				0.21

By Movement	Northbound Stepoe St				Southbound Stepoe St				Eastbound W Clearwater Ave				Westbound W Clearwater Ave				Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
Volume	2	3	0	5	2	3	6	11	2	9	1	12	0	2	0	2	30
PHF	0.25	0.15	0.00	0.18	0.17	0.25	0.25	0.23	0.10	0.23	0.13	0.20	0.00	0.17	0.00	0.17	0.21

Heavy Vehicle Rolling Hour Summary

4:00 PM to 6:00 PM

Interval Start Time	Northbound Stepoe St				Southbound Stepoe St				Eastbound W Clearwater Ave				Westbound W Clearwater Ave				Interval Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
4:00 PM	2	6	0	8	4	4	8	16	4	15	3	22	0	4	0	4	50
4:15 PM	2	6	0	8	2	4	8	14	3	11	1	15	0	2	0	2	39
4:30 PM	2	3	0	5	2	3	6	11	2	9	1	12	0	2	0	2	30
4:45 PM	2	2	0	4	2	3	6	11	3	9	1	13	0	2	0	2	30
5:00 PM	0	1	0	1	1	2	4	7	5	5	0	10	0	2	0	2	20

Peak Hour Summary

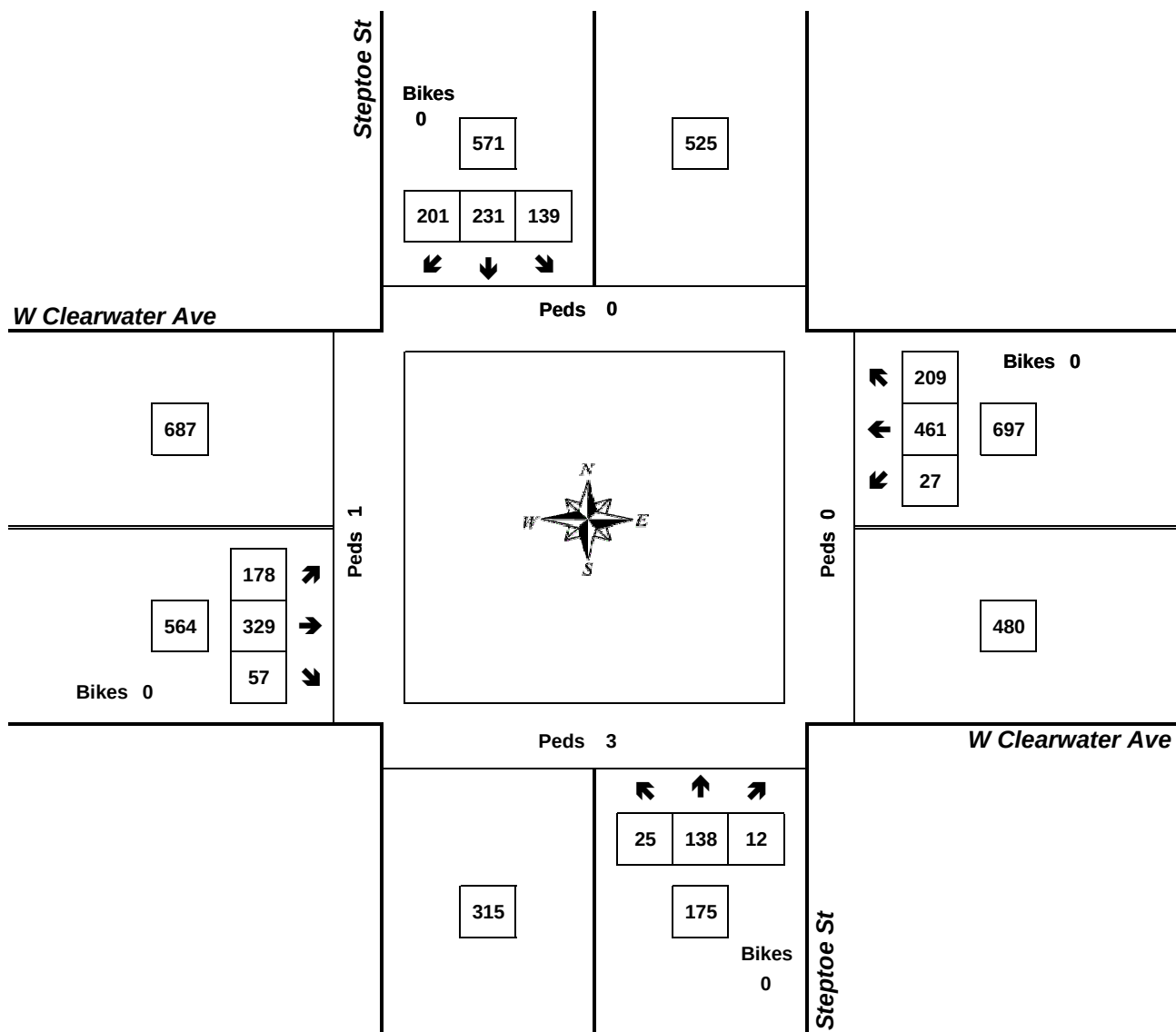


Clay Carney
(503) 833-2740

Steptoe St & W Clearwater Ave

4:30 PM to 5:30 PM

Tuesday, November 17, 2015



Approach	PHF	HV%	Volume
EB	0.90	2.1%	564
WB	0.82	0.3%	697
NB	0.86	2.9%	175
SB	0.93	1.9%	571
Intersection	0.92	1.5%	2,007

Count Period: 4:00 PM to 6:00 PM

Total Vehicle Summary

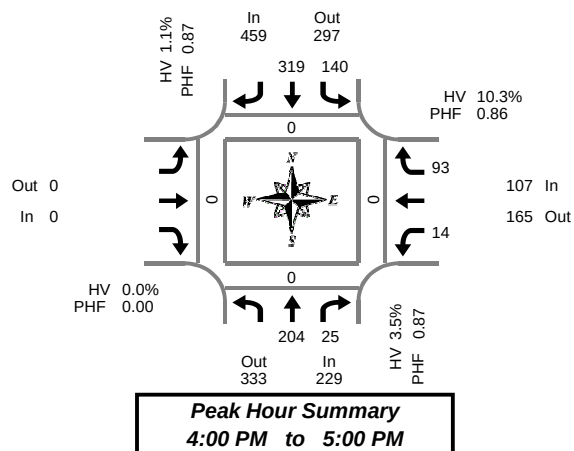


Clay Carney
(503) 833-2740

Badger Rd & I-84 EB Ramp

Tuesday, November 17, 2015

4:00 PM to 6:00 PM



15-Minute Interval Summary

4:00 PM to 6:00 PM

Interval Start Time	Northbound Badger Rd			Southbound Badger Rd			Eastbound I-84 EB Ramp			Westbound I-84 EB Ramp			Interval Total	Pedestrians Crosswalk			
	T	R	Bikes	L	T	Bikes			Bikes	L	R	Bikes		North	South	East	West
4:00 PM	58	8	0	38	94	0			0	0	27	0	225	0	0	0	0
4:15 PM	46	7	0	27	73	0			0	6	25	0	184	0	0	0	0
4:30 PM	52	6	0	43	75	0			0	4	25	0	205	0	0	0	0
4:45 PM	48	4	0	32	77	0			0	4	16	0	181	0	0	0	0
5:00 PM	60	4	0	43	81	0			0	8	18	0	214	0	0	0	0
5:15 PM	31	2	0	30	83	0			0	4	26	0	176	0	0	0	0
5:30 PM	43	2	0	30	83	0			0	3	22	0	183	0	0	0	0
5:45 PM	42	4	0	23	76	0			0	1	19	0	165	0	0	0	0
Total Survey	380	37	0	266	642	0			0	30	178	0	1,533	0	0	0	0

Peak Hour Summary

4:00 PM to 5:00 PM

By Approach	Northbound Badger Rd			Southbound Badger Rd			Eastbound I-84 EB Ramp			Westbound I-84 EB Ramp			Total	Pedestrians Crosswalk			
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total		North	South	East	West
Volume	229	333	562	459	297	756	0	0	0	107	165	272	795	0	0	0	0
%HV	3.5%			1.1%			0.0%			10.3%			3.0%				
PHF	0.87			0.87			0.00			0.86			0.88				

By Movement	Northbound Badger Rd			Southbound Badger Rd			Eastbound I-84 EB Ramp			Westbound I-84 EB Ramp			Total
	T	R	Total	L	T	Total			Total	L	R	Total	
Volume	204	25	229	140	319	459			0	14	93	107	795
%HV	NA	3.4%	4.0%	2.1%	0.6%	NA	NA	NA	0.0%	21.4%	8.6%	10.3%	3.0%
PHF	0.88	0.78	0.87	0.81	0.85	0.87			0.00	0.58	0.86	0.86	0.88

Rolling Hour Summary

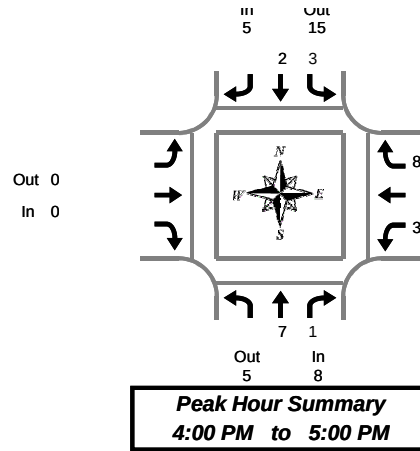
4:00 PM to 6:00 PM

Interval Start Time	Northbound Badger Rd			Southbound Badger Rd			Eastbound I-84 EB Ramp			Westbound I-84 EB Ramp			Interval Total	Pedestrians Crosswalk			
	T	R	Bikes	L	T	Bikes			Bikes	L	R	Bikes		North	South	East	West
4:00 PM	204	25	0	140	319	0			0	14	93	0	795	0	0	0	0
4:15 PM	206	21	0	145	306	0			0	22	84	0	784	0	0	0	0
4:30 PM	191	16	0	148	316	0			0	20	85	0	776	0	0	0	0
4:45 PM	182	12	0	135	324	0			0	19	82	0	754	0	0	0	0
5:00 PM	176	12	0	126	323	0			0	16	85	0	738	0	0	0	0

Heavy Vehicle Summary



Clay Carney
(503) 833-2740



Badger Rd & I-84 EB Ramp

Tuesday, November 17, 2015

4:00 PM to 6:00 PM

Heavy Vehicle 15-Minute Interval Summary

4:00 PM to 6:00 PM

Interval Start Time	Northbound Badger Rd			Southbound Badger Rd			Eastbound I-84 EB Ramp			Westbound I-84 EB Ramp			Interval Total
	T	R	Total	L	T	Total			Total	L	R	Total	
4:00 PM	3	0	3	2	0	2			0	0	3	3	8
4:15 PM	1	0	1	0	2	2			0	1	0	1	4
4:30 PM	1	1	2	1	0	1			0	1	2	3	6
4:45 PM	2	0	2	0	0	0			0	1	3	4	6
5:00 PM	2	0	2	0	0	0			0	1	0	1	3
5:15 PM	0	0	0	1	2	3			0	0	1	1	4
5:30 PM	0	0	0	0	0	0			0	1	0	1	1
5:45 PM	0	0	0	1	1	2			0	0	1	1	3
Total Survey	9	1	10	5	5	10			0	5	10	15	35

Heavy Vehicle Peak Hour Summary

4:00 PM to 5:00 PM

By Approach	Northbound Badger Rd			Southbound Badger Rd			Eastbound I-84 EB Ramp			Westbound I-84 EB Ramp			Total
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	
Volume	8	5	13	5	15	20	0	0	0	11	4	15	24
PHF	0.33			0.25			0.00			0.34			0.33

By Movement	Northbound Badger Rd			Southbound Badger Rd			Eastbound I-84 EB Ramp			Westbound I-84 EB Ramp			Total
	T	R	Total	L	T	Total			Total	L	R	Total	
Volume	7	1	8	3	2	5			0	3	8	11	24
PHF	0.35	0.25	0.33	0.25	0.17	0.25			0.00	0.25	0.40	0.34	0.33

Heavy Vehicle Rolling Hour Summary

4:00 PM to 6:00 PM

Interval Start Time	Northbound Badger Rd			Southbound Badger Rd			Eastbound I-84 EB Ramp			Westbound I-84 EB Ramp			Interval Total
	T	R	Total	L	T	Total			Total	L	R	Total	
4:00 PM	7	1	8	3	2	5			0	3	8	11	24
4:15 PM	6	1	7	1	2	3			0	4	5	9	19
4:30 PM	5	1	6	2	2	4			0	3	6	9	19
4:45 PM	4	0	4	1	2	3			0	3	4	7	14
5:00 PM	2	0	2	2	3	5			0	2	2	4	11

Peak Hour Summary

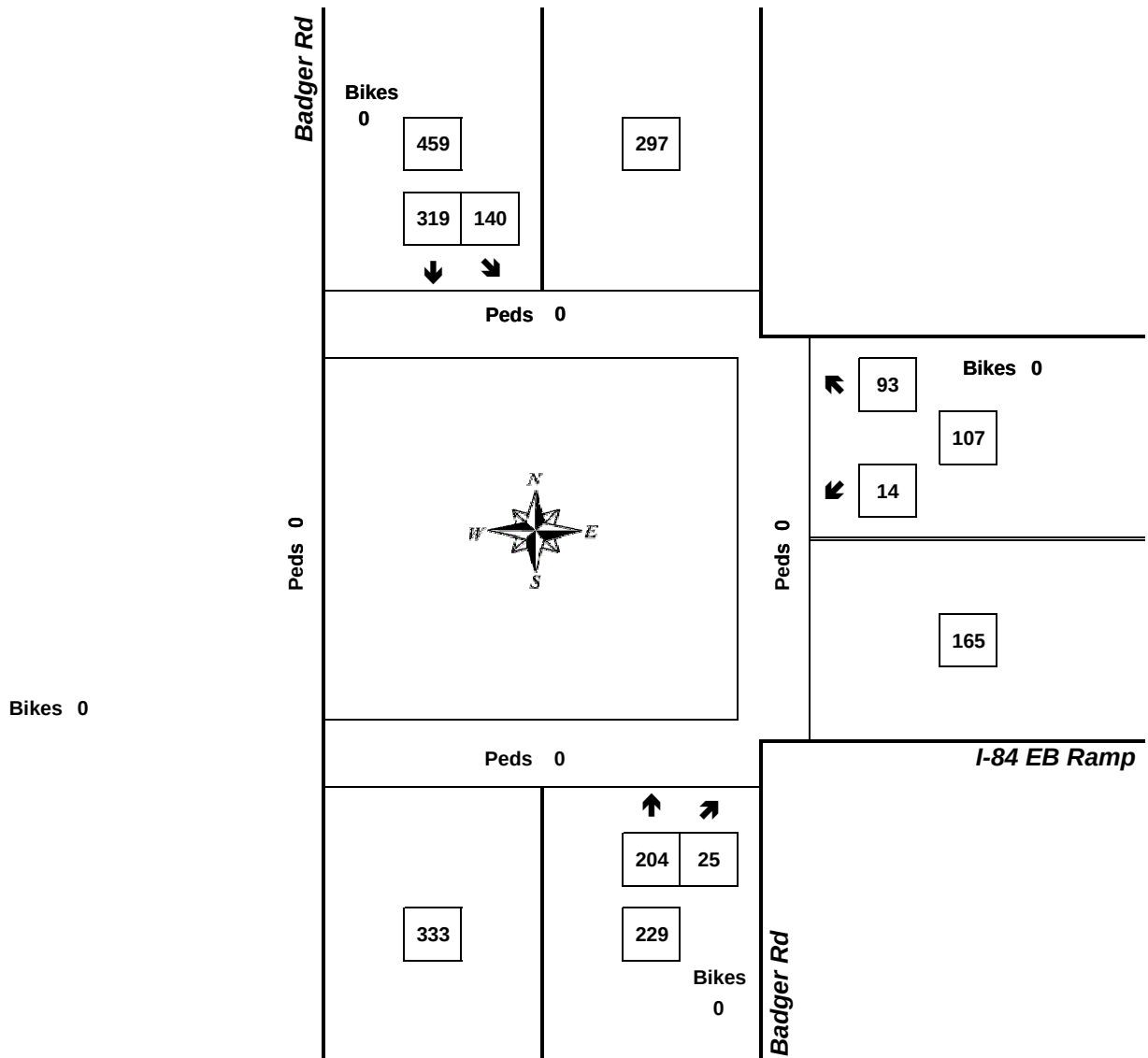


Clay Carney
(503) 833-2740

Badger Rd & I-84 EB Ramp

4:00 PM to 5:00 PM

Tuesday, November 17, 2015



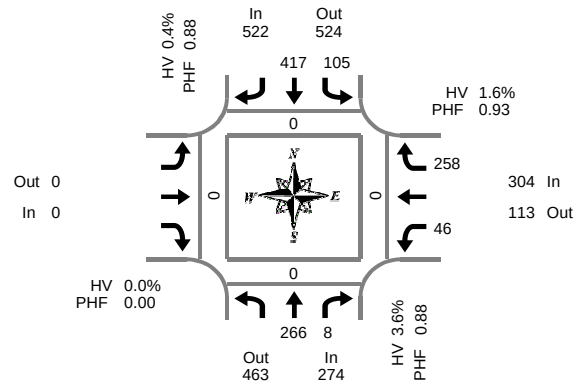
Approach	PHF	HV%	Volume
EB	0.00	0.0%	0
WB	0.86	10.3%	107
NB	0.87	3.5%	229
SB	0.87	1.1%	459
Intersection	0.88	3.0%	795

Count Period: 4:00 PM to 6:00 PM

Total Vehicle Summary



Clay Carney
(503) 833-2740



Badger Rd & I-84 WB Ramp

Tuesday, November 17, 2015

4:00 PM to 6:00 PM

Peak Hour Summary
4:30 PM to 5:30 PM

15-Minute Interval Summary

4:00 PM to 6:00 PM

Interval Start Time	Northbound Badger Rd				Southbound Badger Rd				Eastbound I-84 WB Ramp				Westbound I-84 WB Ramp				Interval Total	Pedestrians Crosswalk			
	T	R	Bikes		L	T					Bikes		L		R	Bikes		North	South	East	West
4:00 PM	87	1	0		19	121					0		10		48	0	286	0	0	0	0
4:15 PM	69	2	0		23	90					0		12		65	0	261	0	0	0	0
4:30 PM	75	2	0		18	113					0		4		70	0	282	0	0	0	0
4:45 PM	60	2	0		23	94					0		15		67	0	261	0	0	0	0
5:00 PM	77	1	0		37	111					0		13		56	0	295	0	0	0	0
5:15 PM	54	3	0		27	99					0		14		65	0	262	0	0	0	0
5:30 PM	65	1	0		18	108					0		7		52	0	251	0	0	0	0
5:45 PM	59	2	0		18	90					0		10		41	0	220	0	0	0	0
Total Survey	546	14	0		183	826					0		85		464	0	2,118	0	0	0	0

Peak Hour Summary

4:30 PM to 5:30 PM

By Approach	Northbound Badger Rd				Southbound Badger Rd				Eastbound I-84 WB Ramp				Westbound I-84 WB Ramp				Total	Pedestrians Crosswalk			
	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes		North	South	East	West
Volume	274	463	737	0	522	524	1,046	0	0	0	0	0	304	113	417	0	1,100	0	0	0	0
%HV	3.6%				0.4%				0.0%				1.6%				1.5%				
PHF	0.88				0.88				0.00				0.93				0.93				

By Movement	Northbound Badger Rd				Southbound Badger Rd				Eastbound I-84 WB Ramp				Westbound I-84 WB Ramp				Total
	T	R	Total		L	T	Total				Total		L		R	Total	
Volume	266	8	274		105	417	522				0		46		258	304	1,100
%HV	NA	3.4%	12.5%	3.6%	1.0%	0.2%	NA	0.4%	NA	NA	NA	0.0%	2.2%	NA	1.6%	1.6%	1.5%
PHF	0.86	0.67	0.88		0.71	0.92	0.88				0.00		0.77		0.92	0.93	0.93

Rolling Hour Summary

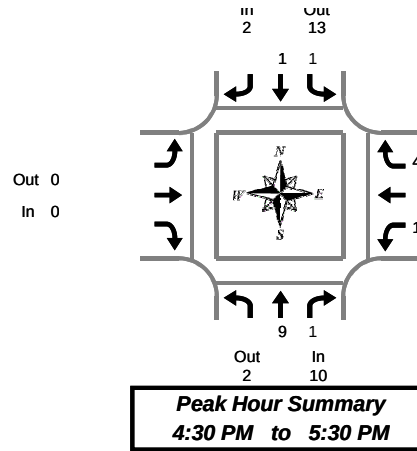
4:00 PM to 6:00 PM

Interval Start Time	Northbound Badger Rd				Southbound Badger Rd				Eastbound I-84 WB Ramp				Westbound I-84 WB Ramp				Interval Total	Pedestrians Crosswalk			
	T	R	Bikes		L	T					Bikes		L		R	Bikes		North	South	East	West
4:00 PM	291	7	0		83	418					0		41		250	0	1,090	0	0	0	0
4:15 PM	281	7	0		101	408					0		44		258	0	1,099	0	0	0	0
4:30 PM	266	8	0		105	417					0		46		258	0	1,100	0	0	0	0
4:45 PM	256	7	0		105	412					0		49		240	0	1,069	0	0	0	0
5:00 PM	255	7	0		100	408					0		44		214	0	1,028	0	0	0	0

Heavy Vehicle Summary



Clay Carney
(503) 833-2740



Badger Rd & I-84 WB Ramp

Tuesday, November 17, 2015

4:00 PM to 6:00 PM

Heavy Vehicle 15-Minute Interval Summary

4:00 PM to 6:00 PM

Interval Start Time	Northbound Badger Rd			Southbound Badger Rd			Eastbound I-84 WB Ramp			Westbound I-84 WB Ramp			Interval Total
	T	R	Total	L	T	Total			Total	L	R	Total	
4:00 PM	8	0	8	0	3	3			0	0	1	1	12
4:15 PM	1	0	1	1	2	3			0	0	1	1	5
4:30 PM	3	0	3	1	0	1			0	0	1	1	5
4:45 PM	4	0	4	0	0	0			0	0	2	2	6
5:00 PM	1	1	2	0	0	0			0	0	0	0	2
5:15 PM	1	0	1	0	1	1			0	1	1	2	4
5:30 PM	0	0	0	0	0	0			0	0	1	1	1
5:45 PM	1	0	1	0	1	1			0	0	2	2	4
Total Survey	19	1	20	2	7	9			0	1	9	10	39

Heavy Vehicle Peak Hour Summary

4:30 PM to 5:30 PM

By Approach	Northbound Badger Rd			Southbound Badger Rd			Eastbound I-84 WB Ramp			Westbound I-84 WB Ramp			Total
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	
Volume	10	2	12	2	13	15	0	0	0	5	2	7	17
PHF	0.21			0.07			0.00			0.25			0.19

By Movement	Northbound Badger Rd			Southbound Badger Rd			Eastbound I-84 WB Ramp			Westbound I-84 WB Ramp			Total
	T	R	Total	L	T	Total			Total	L	R	Total	
Volume	9	1	10	1	1	2			0	1	4	5	17
PHF	0.19	0.25	0.21	0.13	0.05	0.07			0.00	0.25	0.25	0.25	0.19

Heavy Vehicle Rolling Hour Summary

4:00 PM to 6:00 PM

Interval Start Time	Northbound Badger Rd			Southbound Badger Rd			Eastbound I-84 WB Ramp			Westbound I-84 WB Ramp			Interval Total
	T	R	Total	L	T	Total			Total	L	R	Total	
4:00 PM	16	0	16	2	5	7			0	0	5	5	28
4:15 PM	9	1	10	2	2	4			0	0	4	4	18
4:30 PM	9	1	10	1	1	2			0	1	4	5	17
4:45 PM	6	1	7	0	1	1			0	1	4	5	13
5:00 PM	3	1	4	0	2	2			0	1	4	5	11

Peak Hour Summary

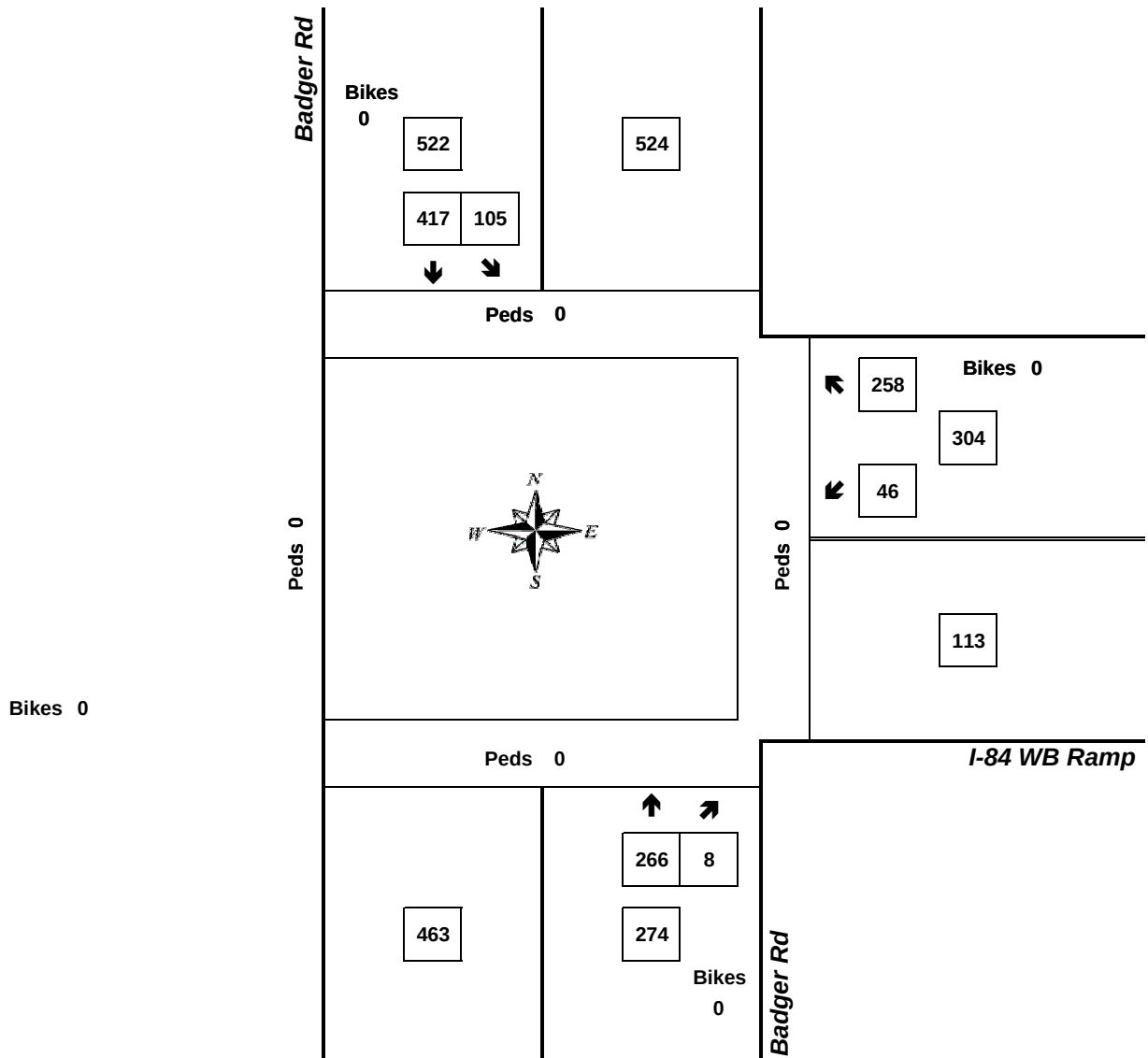


Clay Carney
(503) 833-2740

Badger Rd & I-84 WB Ramp

4:30 PM to 5:30 PM

Tuesday, November 17, 2015

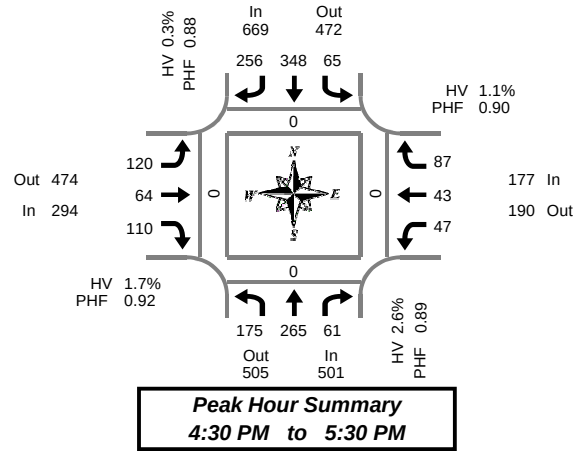


Approach	PHF	HV%	Volume
EB	0.00	0.0%	0
WB	0.93	1.6%	304
NB	0.88	3.6%	274
SB	0.88	0.4%	522
Intersection	0.93	1.5%	1,100

Count Period: 4:00 PM to 6:00 PM

Exhibit 5

Total Vehicle Summary



Badger Rd & Clearwater Ave

Tuesday, November 17, 2015

4:00 PM to 6:00 PM

15-Minute Interval Summary

4:00 PM to 6:00 PM

Interval Start Time	Northbound Badger Rd				Southbound Badger Rd				Eastbound Clearwater Ave				Westbound Clearwater Ave				Interval Total	Pedestrians Crosswalk			
	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes		North	South	East	West
4:00 PM	43	74	13	0	22	83	46	0	43	11	36	0	19	0	30	0	420	0	0	0	0
4:15 PM	42	77	11	0	18	75	62	0	31	8	23	0	12	6	13	0	378	1	1	1	1
4:30 PM	44	81	16	0	15	80	52	0	28	12	40	0	8	11	24	0	411	0	0	0	0
4:45 PM	44	63	14	0	15	83	54	0	35	13	23	0	8	13	20	0	385	0	0	0	0
5:00 PM	43	66	20	0	20	94	75	0	26	21	28	0	21	8	20	0	442	0	0	0	0
5:15 PM	44	55	11	0	15	91	75	0	31	18	19	0	10	11	23	0	403	0	0	0	0
5:30 PM	40	63	8	0	12	88	59	0	33	7	33	0	4	9	19	0	375	0	0	0	0
5:45 PM	26	54	11	0	9	72	50	0	36	11	17	0	14	9	10	0	319	1	0	0	0
Total Survey	326	533	104	0	126	666	473	0	263	101	219	0	96	67	159	0	3,133	2	1	1	1

Peak Hour Summary

4:30 PM to 5:30 PM

By Approach	Northbound Badger Rd				Southbound Badger Rd				Eastbound Clearwater Ave				Westbound Clearwater Ave				Total	Pedestrians Crosswalk			
	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes		North	South	East	West
Volume	501	505	1,006	0	669	472	1,141	0	294	474	768	0	177	190	367	0	1,641	0	0	0	0
%HV	2.6%				0.3%				1.7%				1.1%				1.3%				
PHF	0.89				0.88				0.92				0.90				0.93				

By Movement	Northbound Badger Rd				Southbound Badger Rd				Eastbound Clearwater Ave				Westbound Clearwater Ave				Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
Volume	175	265	61	501	65	348	256	669	120	64	110	294	47	43	87	177	1,641
%HV	1.1%	3.0%	4.9%	2.6%	0.0%	0.3%	0.4%	0.3%	3.3%	1.6%	0.0%	1.7%	2.1%	0.0%	1.1%	1.1%	1.3%
PHF	0.99	0.82	0.76	0.89	0.81	0.93	0.85	0.88	0.86	0.76	0.69	0.92	0.56	0.83	0.91	0.90	0.93

Rolling Hour Summary

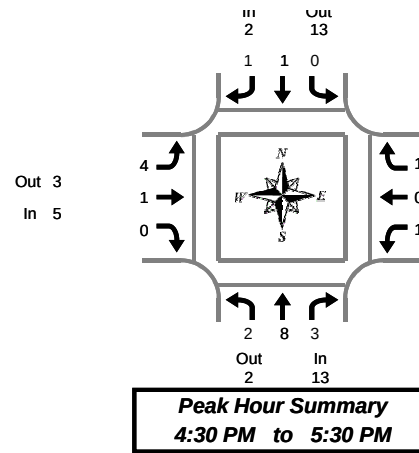
4:00 PM to 6:00 PM

Interval Start Time	Northbound Badger Rd				Southbound Badger Rd				Eastbound Clearwater Ave				Westbound Clearwater Ave				Interval Total	Pedestrians Crosswalk			
	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes		North	South	East	West
4:00 PM	173	295	54	0	70	321	214	0	137	44	122	0	47	30	87	0	1,594	1	1	1	1
4:15 PM	173	287	61	0	68	332	243	0	120	54	114	0	49	38	77	0	1,616	1	1	1	1
4:30 PM	175	265	61	0	65	348	256	0	120	64	110	0	47	43	87	0	1,641	0	0	0	0
4:45 PM	171	247	53	0	62	356	263	0	125	59	103	0	43	41	82	0	1,605	0	0	0	0
5:00 PM	153	238	50	0	56	345	259	0	126	57	97	0	49	37	72	0	1,539	1	0	0	0

Heavy Vehicle Summary



Clay Carney
(503) 833-2740



Badger Rd & Clearwater Ave

Tuesday, November 17, 2015

4:00 PM to 6:00 PM

Heavy Vehicle 15-Minute Interval Summary

4:00 PM to 6:00 PM

Interval Start Time	Northbound Badger Rd				Southbound Badger Rd				Eastbound Clearwater Ave				Westbound Clearwater Ave				Interval Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
4:00 PM	1	5	1	7	0	2	0	2	2	1	0	3	0	0	3	3	15
4:15 PM	1	0	1	2	1	1	1	3	3	0	0	3	1	0	0	1	9
4:30 PM	0	4	0	4	0	0	0	0	1	1	0	2	0	0	0	0	6
4:45 PM	1	3	1	5	0	0	1	1	2	0	0	2	0	0	1	1	9
5:00 PM	0	1	1	2	0	0	0	0	0	0	0	0	1	0	0	1	3
5:15 PM	1	0	1	2	0	1	0	1	1	0	0	1	0	0	0	0	4
5:30 PM	1	1	0	2	1	0	0	1	0	1	1	2	0	1	1	2	7
5:45 PM	1	1	1	3	1	1	0	2	1	0	0	1	0	0	0	0	6
Total Survey	6	15	6	27	3	5	2	10	10	3	1	14	2	1	5	8	59

Heavy Vehicle Peak Hour Summary

4:30 PM to 5:30 PM

By Approach	Northbound Badger Rd			Southbound Badger Rd			Eastbound Clearwater Ave			Westbound Clearwater Ave			Total
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	
Volume	13	2	15	2	13	15	5	3	8	2	4	6	22
PHF	0.25			0.10			0.16			0.13			0.18

By Movement	Northbound Badger Rd				Southbound Badger Rd				Eastbound Clearwater Ave				Westbound Clearwater Ave				Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
Volume	2	8	3	13	0	1	1	2	4	1	0	5	1	0	1	2	22
PHF	0.17	0.22	0.25	0.25	0.00	0.08	0.13	0.10	0.17	0.13	0.00	0.16	0.25	0.00	0.08	0.13	0.18

Heavy Vehicle Rolling Hour Summary

4:00 PM to 6:00 PM

Interval Start Time	Northbound Badger Rd				Southbound Badger Rd				Eastbound Clearwater Ave				Westbound Clearwater Ave				Interval Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
4:00 PM	3	12	3	18	1	3	2	6	8	2	0	10	1	0	4	5	39
4:15 PM	2	8	3	13	1	1	2	4	6	1	0	7	2	0	1	3	27
4:30 PM	2	8	3	13	0	1	1	2	4	1	0	5	1	0	1	2	22
4:45 PM	3	5	3	11	1	1	1	3	3	1	1	5	1	1	2	4	23
5:00 PM	3	3	3	9	2	2	0	4	2	1	1	4	1	1	1	3	20

Peak Hour Summary

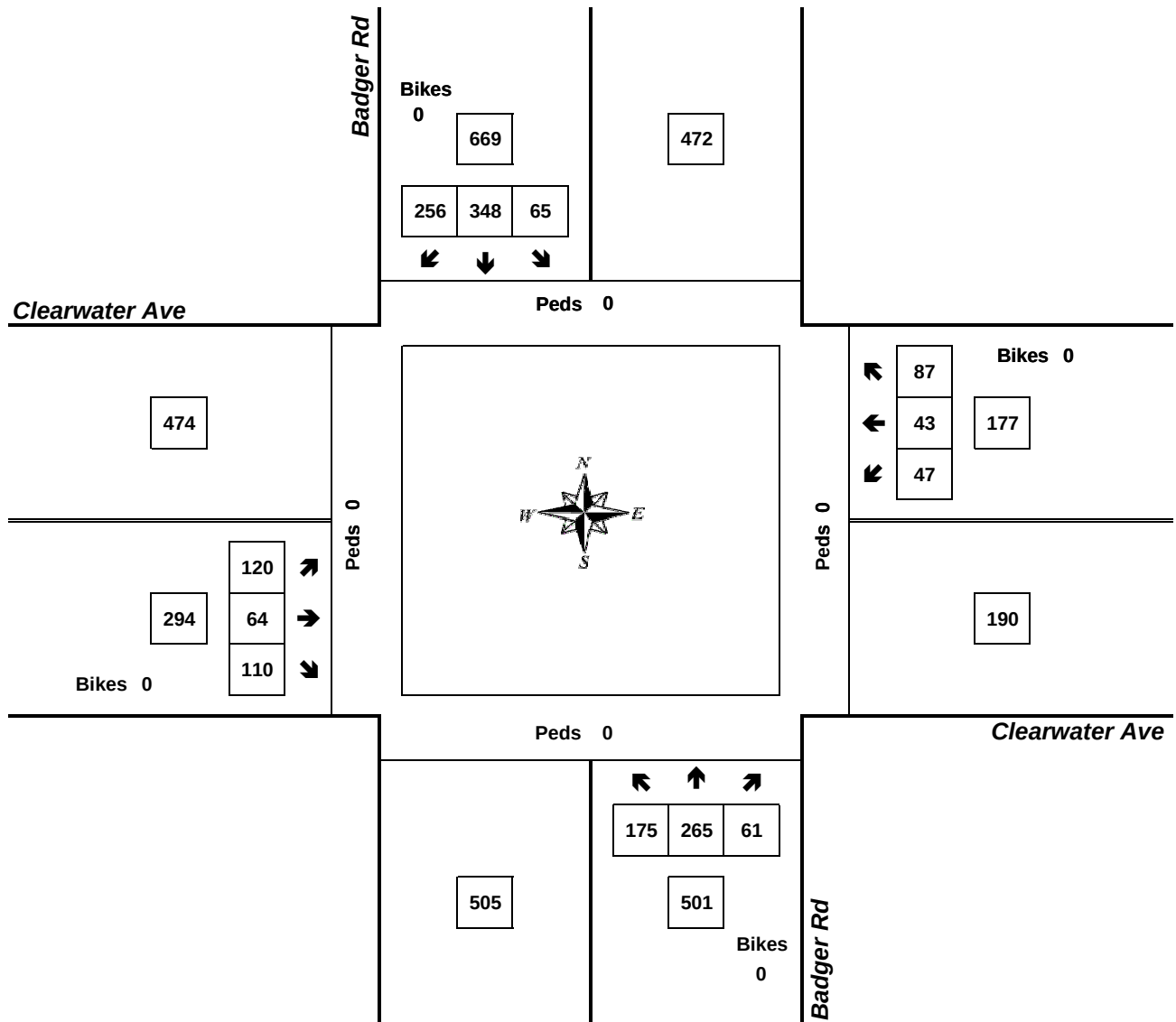


Clay Carney
(503) 833-2740

Badger Rd & Clearwater Ave

4:30 PM to 5:30 PM

Tuesday, November 17, 2015



Approach	PHF	HV%	Volume
EB	0.92	1.7%	294
WB	0.90	1.1%	177
NB	0.89	2.6%	501
SB	0.88	0.3%	669
Intersection	0.93	1.3%	1,641

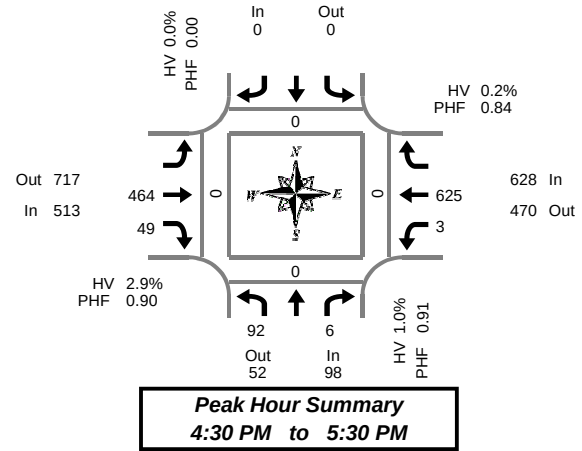
Count Period: 4:00 PM to 6:00 PM

Exhibit 5

Total Vehicle Summary



Clay Carney
(503) 833-2740



W 10th Ave & W Clearwater Ave

Tuesday, November 17, 2015

4:00 PM to 6:00 PM

15-Minute Interval Summary

4:00 PM to 6:00 PM

Interval Start Time	Northbound W 10th Ave				Southbound W 10th Ave				Eastbound W Clearwater Ave				Westbound W Clearwater Ave				Interval Total	Pedestrians Crosswalk			
	L	R	Bikes				Bikes		T	R	Bikes		L	T		Bikes		North	South	East	West
4:00 PM	42	1	0				0		136	15	0		1	127		0	322	0	0	0	0
4:15 PM	28	1	0				0		122	7	0		1	132		0	291	0	0	0	0
4:30 PM	19	2	0				0		126	17	0		3	132		0	299	0	0	0	0
4:45 PM	24	1	0				0		120	15	0		0	145		0	305	0	0	0	0
5:00 PM	24	1	0				0		112	9	0		0	188		0	334	0	0	0	0
5:15 PM	25	2	0				0		106	8	0		0	160		0	301	0	0	0	0
5:30 PM	17	2	0				0		108	13	0		1	152		0	293	0	0	0	0
5:45 PM	13	1	1				0		101	7	0		2	115		0	239	0	0	0	0
Total Survey	192		11	1			0		931	91	0		8	1,151		0	2,384	0	0	0	0

Peak Hour Summary

4:30 PM to 5:30 PM

By Approach	Northbound W 10th Ave				Southbound W 10th Ave				Eastbound W Clearwater Ave				Westbound W Clearwater Ave				Total	Pedestrians Crosswalk			
	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes		North	South	East	West
Volume	98	52	150	0	0	0	0	0	513	717	1,230	0	628	470	1,098	0	1,239	0	0	0	0
%HV	1.0%				0.0%				2.9%				0.2%				1.4%				
PHF	0.91				0.00				0.90				0.84				0.93				

By Movement	Northbound W 10th Ave				Southbound W 10th Ave				Eastbound W Clearwater Ave				Westbound W Clearwater Ave				Total
	L	R	Total				Total		T	R	Total		L	T		Total	
Volume	92	6	98				0		464	49	513		3	625		628	1,239
%HV	1.1%	NA	0.0%	1.0%	NA	NA	NA	0.0%	NA	2.6%	6.1%	2.9%	0.0%	0.2%	NA	0.2%	1.4%
PHF	0.92		0.75	0.91			0.00		0.92	0.72	0.90		0.25	0.83		0.84	0.93

Rolling Hour Summary

4:00 PM to 6:00 PM

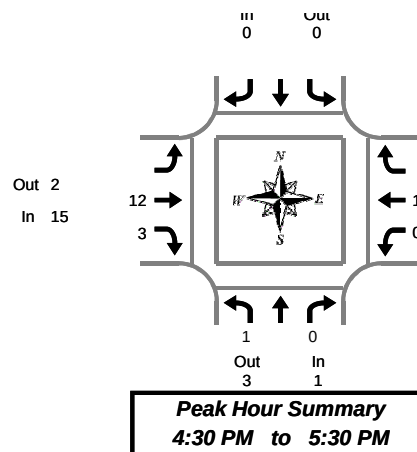
Interval Start Time	Northbound W 10th Ave				Southbound W 10th Ave				Eastbound W Clearwater Ave				Westbound W Clearwater Ave				Interval Total	Pedestrians Crosswalk			
	L	R	Bikes				Bikes		T	R	Bikes		L	T		Bikes		North	South	East	West
4:00 PM	113	5	0				0		504	54	0		5	536		0	1,217	0	0	0	0
4:15 PM	95	5	0				0		480	48	0		4	597		0	1,229	0	0	0	0
4:30 PM	92	6	0				0		464	49	0		3	625		0	1,239	0	0	0	0
4:45 PM	90	6	0				0		446	45	0		1	645		0	1,233	0	0	0	0
5:00 PM	79	6	1				0		427	37	0		3	615		0	1,167	0	0	0	0

Exhibit 5

Heavy Vehicle Summary



Clay Carney
(503) 833-2740



W 10th Ave & W Clearwater Ave

Tuesday, November 17, 2015

4:00 PM to 6:00 PM

Heavy Vehicle 15-Minute Interval Summary

4:00 PM to 6:00 PM

Interval Start Time	Northbound W 10th Ave				Southbound W 10th Ave				Eastbound W Clearwater Ave			Westbound W Clearwater Ave				Interval Total
	L		R	Total				Total	T	R	Total	L	T		Total	
4:00 PM	0		0	0				0	8	0	8	0	2		2	10
4:15 PM	2		0	2				0	4	0	4	0	2		2	8
4:30 PM	0		0	0				0	3	2	5	0	0		0	5
4:45 PM	0		0	0				0	7	1	8	0	1		1	9
5:00 PM	0		0	0				0	1	0	1	0	0		0	1
5:15 PM	1		0	1				0	1	0	1	0	0		0	2
5:30 PM	0		0	0				0	1	0	1	0	0		0	1
5:45 PM	0		0	0				0	3	0	3	0	2		2	5
Total Survey	3		0	3				0	28	3	31	0	7		7	41

Heavy Vehicle Peak Hour Summary

4:30 PM to 5:30 PM

By Approach	Northbound W 10th Ave				Southbound W 10th Ave				Eastbound W Clearwater Ave			Westbound W Clearwater Ave				Total
	In	Out	Total		In	Out	Total		In	Out	Total	In	Out	Total		
Volume	1	3	4		0	0	0		15	2	17	1	12	13		17
PHF	0.13				0.00				0.22			0.06				0.18

By Movement	Northbound W 10th Ave				Southbound W 10th Ave				Eastbound W Clearwater Ave			Westbound W Clearwater Ave				Total
	L		R	Total				Total	T	R	Total	L	T		Total	
Volume	1		0	1				0	12	3	15	0	1		1	17
PHF	0.13		0.00	0.13				0.00	0.20	0.25	0.22	0.00	0.06		0.06	0.18

Heavy Vehicle Rolling Hour Summary

4:00 PM to 6:00 PM

Interval Start Time	Northbound W 10th Ave				Southbound W 10th Ave				Eastbound W Clearwater Ave			Westbound W Clearwater Ave				Interval Total
	L		R	Total				Total	T	R	Total	L	T		Total	
4:00 PM	2		0	2				0	22	3	25	0	5		5	32
4:15 PM	2		0	2				0	15	3	18	0	3		3	23
4:30 PM	1		0	1				0	12	3	15	0	1		1	17
4:45 PM	1		0	1				0	10	1	11	0	1		1	13
5:00 PM	1		0	1				0	6	0	6	0	2		2	9

Peak Hour Summary



Clay Carney
(503) 833-2740

W 10th Ave & W Clearwater Ave

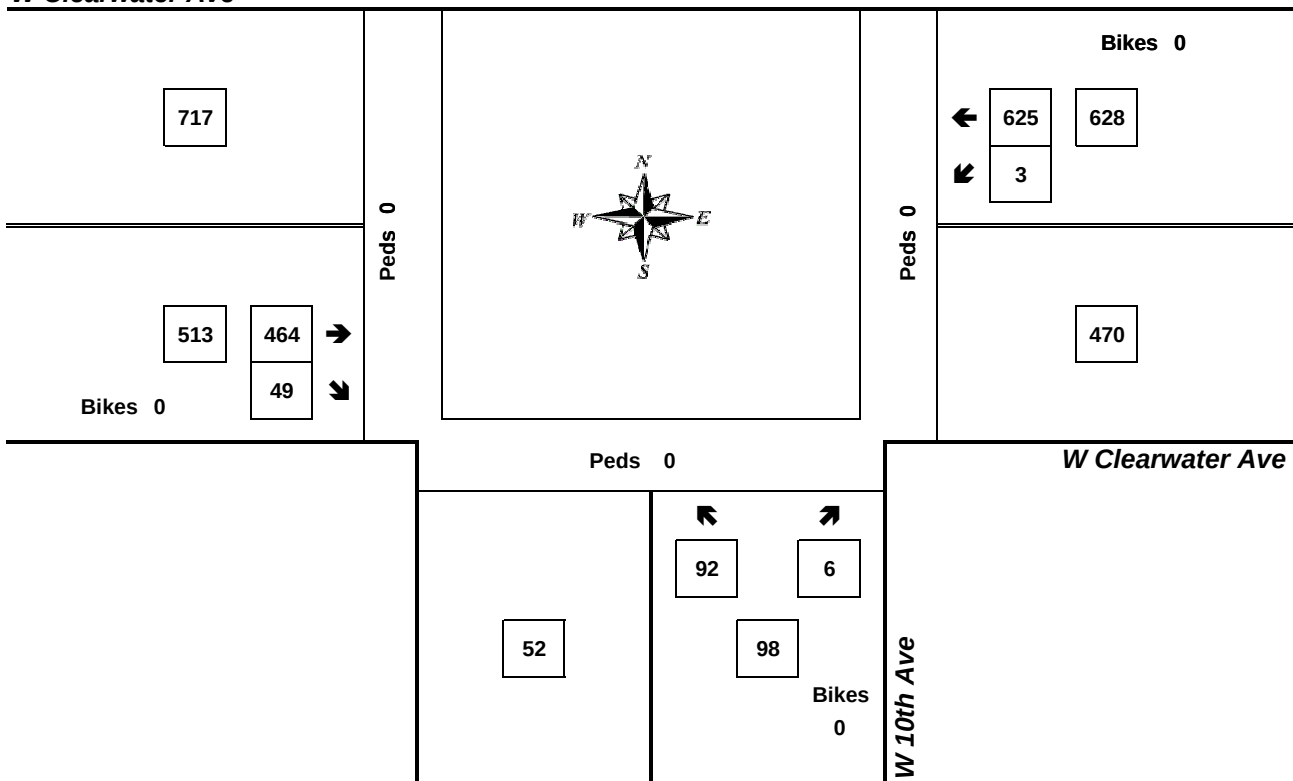
4:30 PM to 5:30 PM

Tuesday, November 17, 2015

Bikes
0

W Clearwater Ave

Peds 0



Approach	PHF	HV%	Volume
EB	0.90	2.9%	513
WB	0.84	0.2%	628
NB	0.91	1.0%	98
SB	0.00	0.0%	0
Intersection	0.93	1.4%	1,239

Count Period: 4:00 PM to 6:00 PM

Total Vehicle Summary

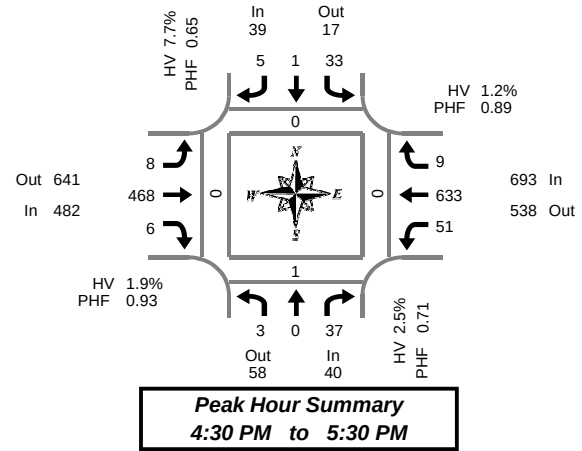


Clay Carney
(503) 833-2740

S Utah St & W Clearwater Ave

Tuesday, November 17, 2015

4:00 PM to 6:00 PM



15-Minute Interval Summary

4:00 PM to 6:00 PM

Interval Start Time	Northbound S Utah St				Southbound S Utah St				Eastbound W Clearwater Ave				Westbound W Clearwater Ave				Interval Total	Pedestrians Crosswalk			
	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes		North	South	East	West
4:00 PM	0	0	11	0	4	0	2	0	0	136	3	0	8	130	3	0	297	0	0	0	0
4:15 PM	1	0	8	0	6	0	1	0	4	128	0	0	14	129	3	0	294	0	0	0	0
4:30 PM	1	0	11	0	10	0	2	0	4	117	3	0	13	137	3	0	301	0	0	0	0
4:45 PM	1	0	13	0	7	0	0	0	4	126	0	0	14	151	3	0	319	0	1	0	0
5:00 PM	0	0	4	0	12	0	3	0	0	116	2	0	12	181	2	0	332	0	0	0	0
5:15 PM	1	0	9	0	4	1	0	0	0	109	1	0	12	164	1	0	302	0	0	0	0
5:30 PM	1	0	4	0	3	0	0	0	0	113	2	0	10	150	2	0	285	0	0	0	0
5:45 PM	1	0	7	0	3	0	0	0	0	112	0	0	9	116	0	0	248	0	0	0	0
Total Survey	6	0	67	0	49	1	8	0	12	957	11	0	92	1,158	17	0	2,378	0	1	0	0

Peak Hour Summary

4:30 PM to 5:30 PM

By Approach	Northbound S Utah St				Southbound S Utah St				Eastbound W Clearwater Ave				Westbound W Clearwater Ave				Total	Pedestrians Crosswalk			
	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes		North	South	East	West
Volume	40	58	98	0	39	17	56	0	482	641	1,123	0	693	538	1,231	0	1,254	0	1	0	0
%HV	2.5%				7.7%				1.9%				1.2%				1.7%				
PHF	0.71				0.65				0.93				0.89				0.94				

By Movement	Northbound S Utah St				Southbound S Utah St				Eastbound W Clearwater Ave				Westbound W Clearwater Ave				Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
Volume	3	0	37	40	33	1	5	39	8	468	6	482	51	633	9	693	1,254
%HV	0.0%	0.0%	2.7%	2.5%	9.1%	0.0%	0.0%	7.7%	37.5%	1.3%	0.0%	1.9%	2.0%	0.2%	66.7%	1.2%	1.7%
PHF	0.75	0.00	0.71	0.71	0.69	0.25	0.42	0.65	0.50	0.93	0.50	0.93	0.91	0.87	0.75	0.89	0.94

Rolling Hour Summary

4:00 PM to 6:00 PM

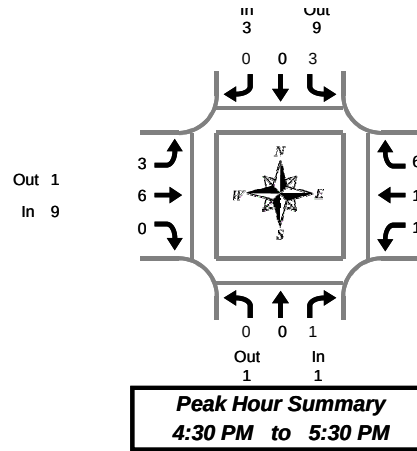
Interval Start Time	Northbound S Utah St				Southbound S Utah St				Eastbound W Clearwater Ave				Westbound W Clearwater Ave				Interval Total	Pedestrians Crosswalk			
	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes		North	South	East	West
4:00 PM	3	0	43	0	27	0	5	0	12	507	6	0	49	547	12	0	1,211	0	1	0	0
4:15 PM	3	0	36	0	35	0	6	0	12	487	5	0	53	598	11	0	1,246	0	1	0	0
4:30 PM	3	0	37	0	33	1	5	0	8	468	6	0	51	633	9	0	1,254	0	1	0	0
4:45 PM	3	0	30	0	26	1	3	0	4	464	5	0	48	646	8	0	1,238	0	1	0	0
5:00 PM	3	0	24	0	22	1	3	0	0	450	5	0	43	611	5	0	1,167	0	0	0	0

Exhibit 5

Heavy Vehicle Summary



Clay Carney
(503) 833-2740



S Utah St & W Clearwater Ave

Tuesday, November 17, 2015

4:00 PM to 6:00 PM

Heavy Vehicle 15-Minute Interval Summary

4:00 PM to 6:00 PM

Interval Start Time	Northbound S Utah St				Southbound S Utah St				Eastbound W Clearwater Ave				Westbound W Clearwater Ave				Interval Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
4:00 PM	0	0	0	0	1	0	1	2	0	8	0	8	0	2	2	4	14
4:15 PM	0	0	0	0	0	0	0	0	3	4	0	7	0	2	1	3	10
4:30 PM	0	0	0	0	0	0	0	0	2	1	0	3	0	0	2	2	5
4:45 PM	0	0	0	0	1	0	0	1	1	5	0	6	0	1	2	3	10
5:00 PM	0	0	1	1	1	0	0	1	0	0	0	0	1	0	1	2	4
5:15 PM	0	0	0	0	1	0	0	1	0	0	0	0	0	0	1	1	2
5:30 PM	0	0	1	1	0	0	0	0	0	2	0	2	0	0	1	1	4
5:45 PM	0	0	1	1	0	0	0	0	0	4	0	4	0	1	0	1	6
Total Survey	0	0	3	3	4	0	1	5	6	24	0	30	1	6	10	17	55

Heavy Vehicle Peak Hour Summary

4:30 PM to 5:30 PM

By Approach	Northbound S Utah St				Southbound S Utah St				Eastbound W Clearwater Ave				Westbound W Clearwater Ave				Total
	In	Out	Total		In	Out	Total		In	Out	Total		In	Out	Total		
Volume	1	1	2		3	9	12		9	1	10		8	10	18		21
PHF	0.13				0.25				0.13				0.22				0.18

By Movement	Northbound S Utah St				Southbound S Utah St				Eastbound W Clearwater Ave				Westbound W Clearwater Ave				Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
Volume	0	0	1	1	3	0	0	3	3	6	0	9	1	1	6	8	21
PHF	0.00	0.00	0.13	0.13	0.25	0.00	0.00	0.25	0.13	0.12	0.00	0.13	0.25	0.06	0.30	0.22	0.18

Heavy Vehicle Rolling Hour Summary

4:00 PM to 6:00 PM

Interval Start Time	Northbound S Utah St				Southbound S Utah St				Eastbound W Clearwater Ave				Westbound W Clearwater Ave				Interval Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
4:00 PM	0	0	0	0	2	0	1	3	6	18	0	24	0	5	7	12	39
4:15 PM	0	0	1	1	2	0	0	2	6	10	0	16	1	3	6	10	29
4:30 PM	0	0	1	1	3	0	0	3	3	6	0	9	1	1	6	8	21
4:45 PM	0	0	2	2	3	0	0	3	1	7	0	8	1	1	5	7	20
5:00 PM	0	0	3	3	2	0	0	2	0	6	0	6	1	1	3	5	16

Peak Hour Summary

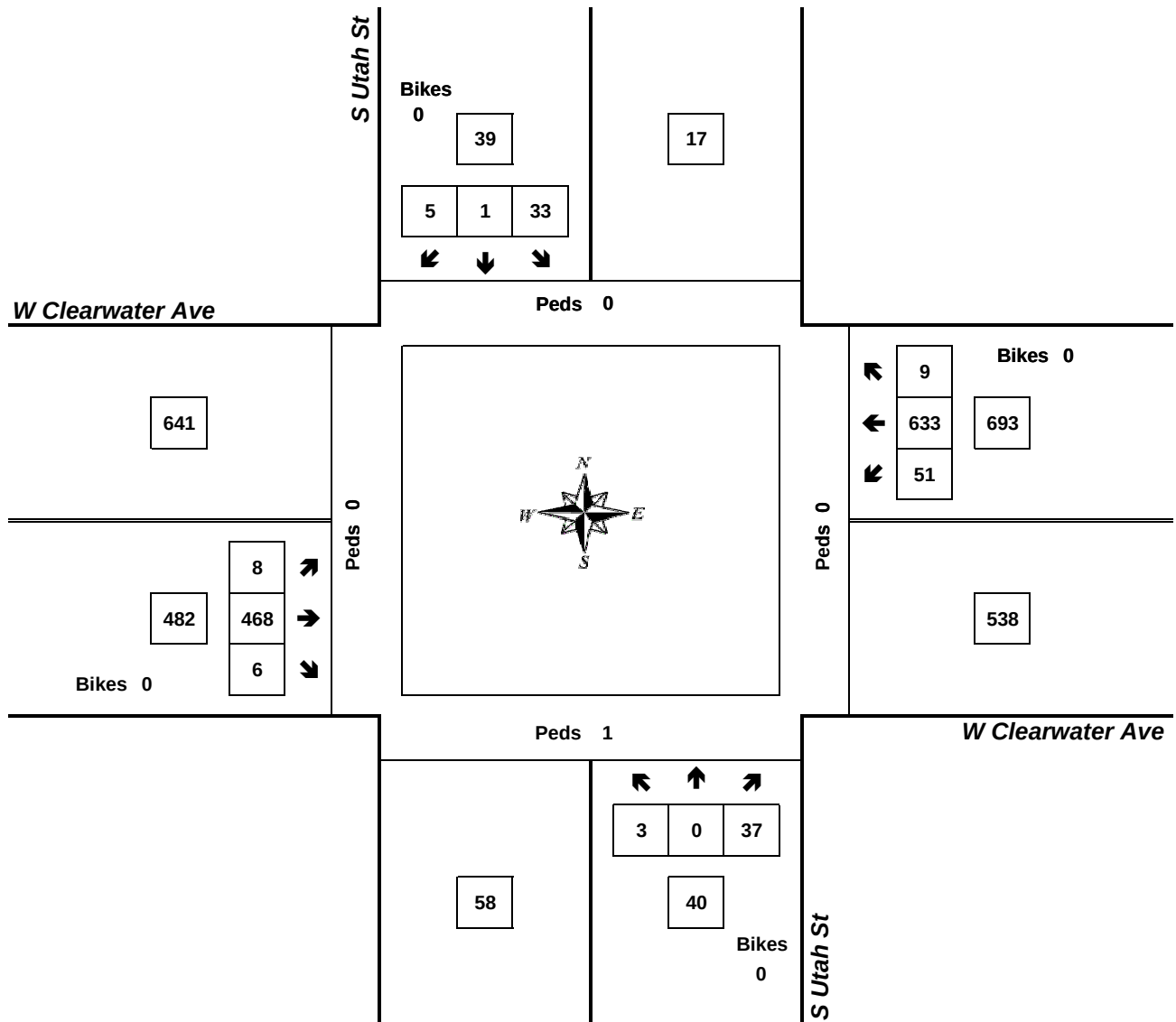


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S Utah St & W Clearwater Ave

4:30 PM to 5:30 PM

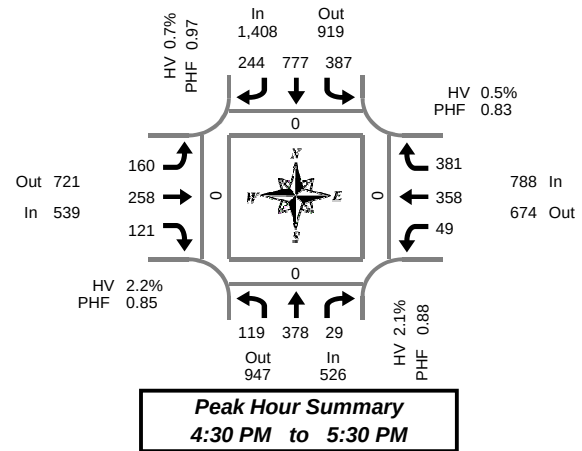
Tuesday, November 17, 2015



Approach	PHF	HV%	Volume
EB	0.93	1.9%	482
WB	0.89	1.2%	693
NB	0.71	2.5%	40
SB	0.65	7.7%	39
Intersection	0.94	1.7%	1,254

Count Period: 4:00 PM to 6:00 PM

Total Vehicle Summary



Columbia Center Blvd & Clearwater Ave

Tuesday, November 17, 2015

4:00 PM to 6:00 PM

15-Minute Interval Summary

4:00 PM to 6:00 PM

Interval Start Time	Northbound Columbia Center Blvd				Southbound Columbia Center Blvd				Eastbound Clearwater Ave				Westbound Clearwater Ave				Interval Total	Pedestrians Crosswalk			
	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes		North	South	East	West
4:00 PM	19	115	5	0	106	172	49	0	39	68	19	0	6	90	48	0	736	0	0	0	0
4:15 PM	35	120	4	0	96	170	49	0	51	74	18	0	16	74	91	0	798	0	0	0	0
4:30 PM	29	113	7	0	96	190	55	0	40	60	24	0	10	68	62	0	754	0	0	0	0
4:45 PM	27	75	6	0	105	198	61	0	44	71	32	0	15	76	104	0	814	0	0	0	0
5:00 PM	29	92	12	0	88	184	67	0	45	79	34	0	16	105	116	0	867	0	0	0	0
5:15 PM	34	98	4	0	98	205	61	0	31	48	31	0	8	109	99	0	826	0	0	0	0
5:30 PM	22	114	3	0	82	155	54	0	35	56	17	0	17	67	81	0	703	0	0	0	0
5:45 PM	16	53	7	0	101	127	47	0	39	62	14	0	8	69	85	0	628	0	0	0	0
Total Survey	211	780	48	0	772	1,401	443	0	324	518	189	0	96	658	686	0	6,126	0	0	0	0

Peak Hour Summary

4:30 PM to 5:30 PM

By Approach	Northbound Columbia Center Blvd				Southbound Columbia Center Blvd				Eastbound Clearwater Ave				Westbound Clearwater Ave				Total	Pedestrians Crosswalk			
	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes		North	South	East	West
Volume	526	947	1,473	0	1,408	919	2,327	0	539	721	1,260	0	788	674	1,462	0	3,261	0	0	0	0
%HV	2.1%				0.7%				2.2%				0.5%				1.1%				
PHF	0.88				0.97				0.85				0.83				0.94				

By Movement	Northbound Columbia Center Blvd				Southbound Columbia Center Blvd				Eastbound Clearwater Ave				Westbound Clearwater Ave				Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
Volume	119	378	29	526	387	777	244	1,408	160	258	121	539	49	358	381	788	3,261
%HV	0.0%	2.6%	3.4%	2.1%	0.5%	1.0%	0.0%	0.7%	2.5%	2.3%	1.7%	2.2%	0.0%	0.3%	0.8%	0.5%	1.1%
PHF	0.88	0.84	0.60	0.88	0.92	0.95	0.91	0.97	0.89	0.82	0.89	0.85	0.77	0.82	0.82	0.83	0.94

Rolling Hour Summary

4:00 PM to 6:00 PM

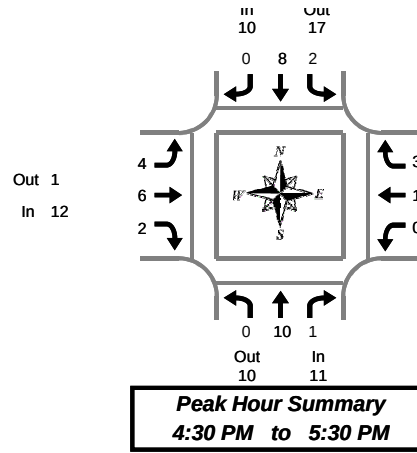
Interval Start Time	Northbound Columbia Center Blvd				Southbound Columbia Center Blvd				Eastbound Clearwater Ave				Westbound Clearwater Ave				Interval Total	Pedestrians Crosswalk			
	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes		North	South	East	West
4:00 PM	110	423	22	0	403	730	214	0	174	273	93	0	47	308	305	0	3,102	0	0	0	0
4:15 PM	120	400	29	0	385	742	232	0	180	284	108	0	57	323	373	0	3,233	0	0	0	0
4:30 PM	119	378	29	0	387	777	244	0	160	258	121	0	49	358	381	0	3,261	0	0	0	0
4:45 PM	112	379	25	0	373	742	243	0	155	254	114	0	56	357	400	0	3,210	0	0	0	0
5:00 PM	101	357	26	0	369	671	229	0	150	245	96	0	49	350	381	0	3,024	0	0	0	0

Exhibit 5

Heavy Vehicle Summary



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Columbia Center Blvd & Clearwater Ave

Tuesday, November 17, 2015

4:00 PM to 6:00 PM

Heavy Vehicle 15-Minute Interval Summary

4:00 PM to 6:00 PM

Interval Start Time	Northbound Columbia Center Blvd				Southbound Columbia Center Blvd				Eastbound Clearwater Ave				Westbound Clearwater Ave				Interval Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
4:00 PM	0	0	0	0	2	2	1	5	1	4	2	7	0	1	1	2	14
4:15 PM	1	3	0	4	1	1	1	3	1	0	1	2	0	0	1	1	10
4:30 PM	0	1	1	2	1	1	0	2	0	1	0	1	0	0	0	0	5
4:45 PM	0	1	0	1	0	2	0	2	2	3	2	7	0	1	1	2	12
5:00 PM	0	1	0	1	1	3	0	4	2	1	0	3	0	0	0	0	8
5:15 PM	0	7	0	7	0	2	0	2	0	1	0	1	0	0	2	2	12
5:30 PM	0	3	0	3	1	2	0	3	1	0	0	1	0	1	1	2	9
5:45 PM	0	1	0	1	2	0	1	3	0	1	0	1	0	0	0	0	5
Total Survey	1	17	1	19	8	13	3	24	7	11	5	23	0	3	6	9	75

Heavy Vehicle Peak Hour Summary

4:30 PM to 5:30 PM

By Approach	Northbound Columbia Center Blvd			Southbound Columbia Center Blvd			Eastbound Clearwater Ave			Westbound Clearwater Ave			Total
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	
Volume	11	10	21	10	17	27	12	1	13	4	9	13	37
PHF	0.25			0.25			0.27			0.25			0.29

By Movement	Northbound Columbia Center Blvd				Southbound Columbia Center Blvd				Eastbound Clearwater Ave				Westbound Clearwater Ave				Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
Volume	0	10	1	11	2	8	0	10	4	6	2	12	0	1	3	4	37
PHF	0.00	0.23	0.25	0.25	0.13	0.29	0.00	0.25	0.25	0.30	0.17	0.27	0.00	0.25	0.25	0.25	0.29

Heavy Vehicle Rolling Hour Summary

4:00 PM to 6:00 PM

Interval Start Time	Northbound Columbia Center Blvd				Southbound Columbia Center Blvd				Eastbound Clearwater Ave				Westbound Clearwater Ave				Interval Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
4:00 PM	1	5	1	7	4	6	2	12	4	8	5	17	0	2	3	5	41
4:15 PM	1	6	1	8	3	7	1	11	5	5	3	13	0	1	2	3	35
4:30 PM	0	10	1	11	2	8	0	10	4	6	2	12	0	1	3	4	37
4:45 PM	0	12	0	12	2	9	0	11	5	5	2	12	0	2	4	6	41
5:00 PM	0	12	0	12	4	7	1	12	3	3	0	6	0	1	3	4	34

Peak Hour Summary

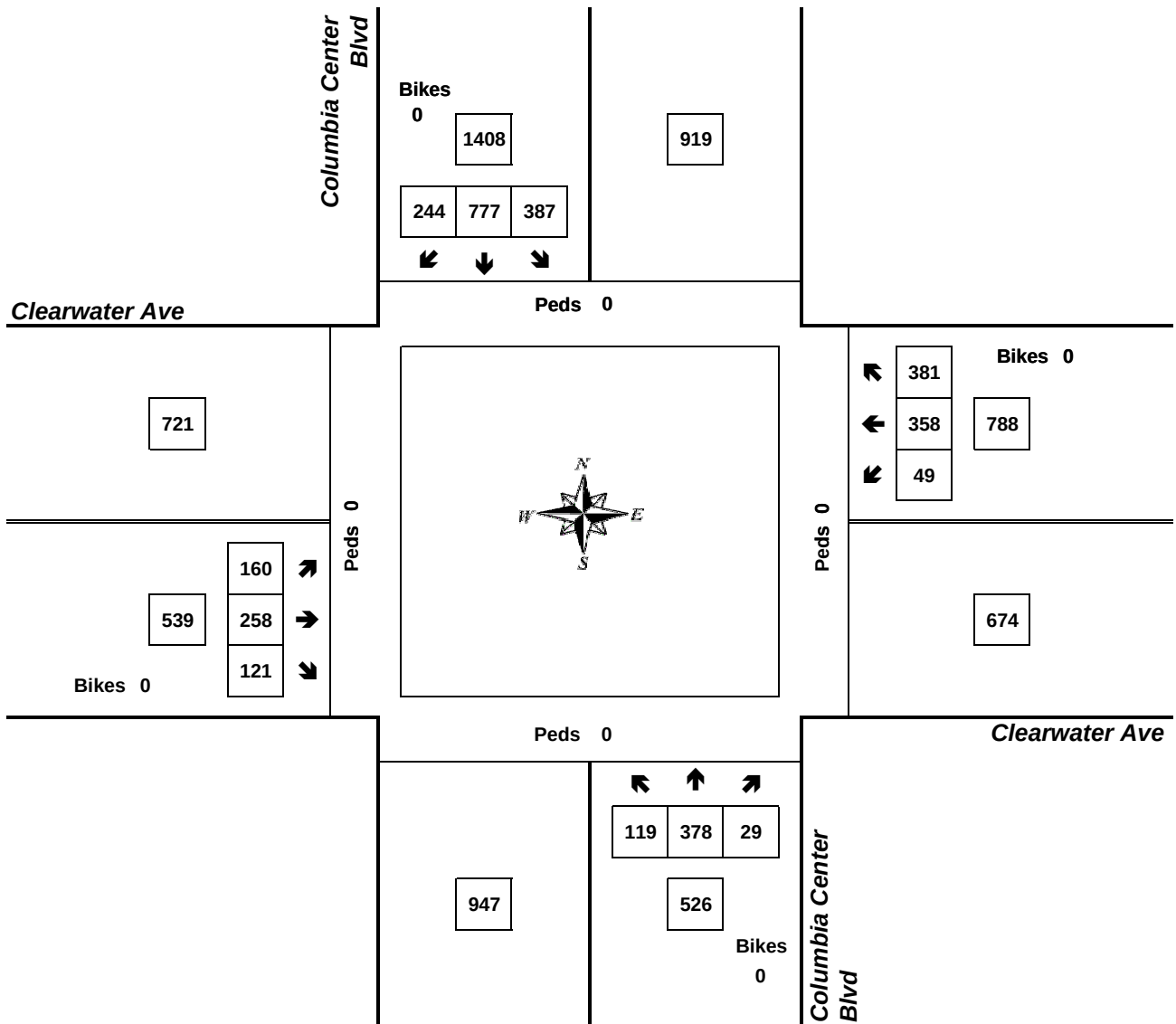


Clay Carney
(503) 833-2740

Columbia Center Blvd & Clearwater Ave

4:30 PM to 5:30 PM

Tuesday, November 17, 2015



Approach	PHF	HV%	Volume
EB	0.85	2.2%	539
WB	0.83	0.5%	788
NB	0.88	2.1%	526
SB	0.97	0.7%	1,408
Intersection	0.94	1.1%	3,261

Count Period: 4:00 PM to 6:00 PM

Appendix C – Level of Service

APPENDIX C

LEVEL OF SERVICE FOR SIGNALIZED INTERSECTION

Level of service for signalized intersections is defined in terms of average control delay. Control delay includes initial deceleration delay, queue move-up time, stop delay and final acceleration delay. Specifically, level-of-service (LOS) criteria are stated in terms of the average control delay per vehicle for a 15-min analysis period. The criteria are given in table below. Delay may be measured in the field or estimated using procedures presented later in this chapter. Delay is a complex measure and is dependent upon a number of variable, including the quality of progression, the cycle length, the green ratio, and the v/c ratio for the lane group in question.

LOS A describes operations with very low control delay, up to 10 sec per vehicle. This level of service occurs when progression is extremely favorable and most vehicles arrive during the green phase. Most vehicles do not stop at all. Short cycle lengths may also contribute to low delay.

LOS B describes operations with delay greater than 10 and up to 20 sec per vehicle. This level generally occurs with good progression, short cycle lengths, or both. More vehicles stop than with LOS A, causing higher levels of average delay.

LOS C describes operations with delay greater than 20 and up to 35 sec per vehicle. These higher delays may result from fair progression, longer cycle lengths, or both. Individual cycle failures may begin to appear at this level. The number of vehicles stopping is significant at this level, though many still pass through the intersection without stopping.

LOS D describes operations with delay greater than 35 and up to 55 sec per vehicle. At level D, the influence of congestion becomes more noticeable. Longer delays may result from some combination of unfavorable progression, long cycle lengths, or high v/c ratios. Many vehicles stop, and the proportion of vehicles not stopping declines. Individual cycle failures are noticeable.

LOS E describes operations with delay greater than 55 and up to 80 sec per vehicle. This level is considered by many agencies to be the limit of acceptable delay. These high delay values generally indicate poor progression, long cycle lengths, and high v/c ratios. Individual cycle failures are frequent occurrences.

LOS F describes operations with delay in excess of 80 sec per vehicle. This level, considered to be unacceptable to most drivers, often occurs with oversaturation, that is, when arrival flow rates exceed the capacity of the intersection. It may also occur at high v/c ratios below 1.0 with many individual cycle failures. Poor progression and long cycle lengths may also be a major contributing cause to such delay levels.

Level-of-Service Criteria
for Signalized Intersections

LEVEL OF SERVICE	STOPPED DELAY PER VEHICLE (SEC)
A	≤ 10.0
B	< 10.0 and ≤ 20.0
C	< 20.0 and ≤ 35.0
D	> 35.0 and ≤ 55.0
E	> 55.0 and ≤ 80.0
F	> 80.0

Source: "Highway Capacity Manual" Special Report No. 209, Transportation Research Board, National Research Council, Washington, D.C., 1985, updated December 1997.

LOS1997, 1/24/02

LEVEL OF SERVICE CRITERIA FOR STOP CONTROLLED INTERSECTIONS

The level of service for Stop Sign controlled intersections is based of Tables 10-7 and 10-38 for two-way and all-way stop controlled, respectively, from the December 1997 update of the 1985 Highway Capacity Manual as listed below:

Level of Service	Average Control Delay (sec/veh)
A	≤ 10
B	> 10 and $15 \leq$
C	> 15 and $25 \leq$
D	> 25 and $35 \leq$
E	> 35 and $50 \leq$
F	> 50

Source: "Highway Capacity Manual" Special Report No. 209, Transportation Research Board, National Research Council, Washington, D. C., 1985, updated December 1997, 2000.

1/24/02

Appendix D – Capacity Calculations

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 Impact Analysis Report
 Level Of Service

Intersection	Base			Future			Change in
	LOS	Del/ Veh	V/ C	LOS	Del/ Veh	V/ C	
# 1 I-82 EB Ramps/ Badger Rd	B	12.8	0.000	B	13.7	0.000	+ 0.908 D/V
# 2 I-82 WB Ramps/Badger Rd	C	23.2	0.000	D	33.5	0.000	+10.339 D/V
# 3 Leslie Rd/ Clearwater Blvd	A	2.3	0.000	A	2.5	0.000	+ 0.000 V/C
# 4 W 10th Ave/ Clearwater Blvd	C	22.9	0.000	F	696.1	0.000	+673.207 D/V
# 7 Utah St-Clearwater Dr/ Clearwa	E	37.2	0.000	F	58.6	0.000	+21.354 D/V
# 8 Steptoe St/ Clearwater Blvd	C	25.1	0.862	C	26.2	0.894	+ 1.126 D/V
# 9 Columbia Ctr Blvd/Clearwater B	C	22.3	0.739	C	23.6	0.775	+ 1.286 D/V

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Level Of Service Computation Report
2000 HCM Unsignalized Method (Future Volume Alternative)
*****
Intersection #1 I-82 EB Ramps/ Badger Rd
*****
Average Delay (sec/veh):      3.4      Worst Case Level Of Service: B[ 13.7]
*****
Street Name:      Badger Rd      I-82 EB Ramps
Approach:      North Bound      South Bound      East Bound      West Bound
Movement:      L - T - R      L - T - R      L - T - R      L - T - R
-----|-----|-----|-----|-----|
Control:      Uncontrolled      Uncontrolled      Stop Sign      Stop Sign
Rights:      Include      Include      Include      Include
Lanes:      0 0 0 1 0      1 0 1 0 0      0 0 0 0 0      0 0 1! 0 0
-----|-----|-----|-----|-----|
Volume Module:  >> Count Date: 17 Nov 2015 << PM Peak Hour
Base Vol:      0 204 25 140 319 0 0 0 0 14 0 93
Growth Adj:  1.10 1.10 1.10 1.10 1.10 1.10 1.10 1.10 1.10 1.10 1.10 1.10
Initial Bse:   0 224 28 154 351 0 0 0 0 15 0 102
Added Vol:     0 11 0 11 11 0 0 0 0 0 0 21
In Process:    0 19 0 3 20 0 0 0 0 0 0 3
Initial Fut:   0 254 28 168 382 0 0 0 0 15 0 126
User 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
PHF Adj:       0.88 0.88 0.88 0.88 0.88 0.88 0.88 0.88 0.88 0.88 0.88 0.88
PHF Volume:    0 289 31 191 434 0 0 0 0 18 0 144
Reduct Vol:    0 0 0 0 0 0 0 0 0 0 0 0
FinalVolume:   0 289 31 191 434 0 0 0 0 18 0 144
Critical Gap Module:
Critical Gap:  xxxxx xxxx xxxxx 4.1 xxxx xxxxx xxxxx xxxx xxxxx 6.4 6.5 6.2
FollowUpTim:  xxxxx xxxx xxxxx 2.2 xxxx xxxxx xxxxx xxxx xxxxx 3.5 4.0 3.3
-----|-----|-----|-----|-----|
Capacity Module:
Cnflct Vol:  xxxx xxxx xxxxx 320 xxxx xxxxx xxxx xxxx xxxxx 1121 1121 305
Potent Cap.: xxxx xxxx xxxxx 1251 xxxx xxxxx xxxx xxxx xxxxx 230 208 740
Move Cap.:   xxxx xxxx xxxxx 1251 xxxx xxxxx xxxx xxxx xxxxx 203 176 740
Volume/Cap:  xxxx xxxx xxxxx 0.15 xxxx xxxxx xxxx xxxx xxxxx 0.09 0.00 0.19
-----|-----|-----|-----|-----|
Level Of Service Module:
2Way95thQ:   xxxx xxxx xxxxx 0.5 xxxx xxxxx xxxx xxxx xxxxx xxxx xxxx xxxxx
Control Del: xxxxx xxxx xxxxx 8.4 xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
LOS by Move: * * * A * * * * * * * * *
Movement:    LT - LTR - RT LT - LTR - RT LT - LTR - RT LT - LTR - RT
Shared Cap.: xxxx xxxx xxxxx xxxx xxxx xxxxx xxxx xxxx xxxxx xxxx 575 xxxxx
SharedQueue: xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx 1.1 xxxxx
Shrd ConDel: xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx 13.7 xxxxx
Shared LOS:   * * * * * * * * * * * * * * * B *
ApproachDel:  xxxxxx xxxxxx xxxxxx 13.7
ApproachLOS:  * * * * * B
*****
Note: Queue reported is the number of cars per lane.
*****

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Level Of Service Computation Report
2000 HCM Unsignalized Method (Future Volume Alternative)
*****
Intersection #2 I-82 WB Ramps/Badger Rd
*****
Average Delay (sec/veh):      9.5      Worst Case Level Of Service: D[ 33.5]
*****
Street Name:      Badger Rd      I-82 WB Ramps
Approach:      North Bound      South Bound      East Bound      West Bound
Movement:      L - T - R      L - T - R      L - T - R      L - T - R
-----|-----|-----|-----|-----|
Control:      Uncontrolled      Uncontrolled      Stop Sign      Stop Sign
Rights:      Include      Include      Include      Include
Lanes:      0 0 0 1 0      1 0 1 0 0      0 0 0 0 0      0 0 1! 0 0
-----|-----|-----|-----|-----|
Volume Module: >> Count Date: 17 Nov 2015 << PM Peak Hour
Base Vol:      0 266      8 105 417      0 0 0 0      46 0 258
Growth Adj: 1.10 1.10 1.10 1.10 1.10 1.10 1.10 1.10 1.10 1.10 1.10 1.10
Initial Bse: 0 293      9 116 459      0 0 0 0      51 0 284
Added Vol: 0 32      0 22 22      0 0 0 0      0 0 11
In Process: 0 22      0 3 23      0 0 0 0      0 0 1
Initial Fut: 0 347      9 141 504      0 0 0 0      51 0 296
User 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
PHF Adj: 0.93 0.93 0.93 0.93 0.93 0.93 0.93 0.93 0.93 0.93 0.93 0.93
PHF Volume: 0 373      9 151 542      0 0 0 0      54 0 318
Reduct Vol: 0 0      0 0 0      0 0 0 0      0 0 0
FinalVolume: 0 373      9 151 542      0 0 0 0      54 0 318
Critical Gap Module:
Critical Gap:xxxxx xxxx xxxxx 4.1 xxxx xxxxx xxxxx xxxx xxxxx 6.4 6.5 6.2
FollowUpTim:xxxxx xxxx xxxxx 2.2 xxxx xxxxx xxxxx xxxx xxxxx 3.5 4.0 3.3
-----|-----|-----|-----|-----|
Capacity Module:
Cnflct Vol: xxxx xxxx xxxxx 382 xxxx xxxxx xxxx xxxx xxxxx 1221 1221 377
Potent Cap.: xxxx xxxx xxxxx 1187 xxxx xxxxx xxxx xxxx xxxxx 200 181 674
Move Cap.: xxxx xxxx xxxxx 1187 xxxx xxxxx xxxx xxxx xxxxx 181 158 674
Volume/Cap: xxxx xxxx xxxxx 0.13 xxxx xxxxx xxxx xxxx xxxxx 0.30 0.00 0.47
-----|-----|-----|-----|-----|
Level Of Service Module:
2Way95thQ: xxxx xxxx xxxxx 0.4 xxxx xxxxx xxxx xxxx xxxxx xxxx xxxx xxxxx
Control Del:xxxxx xxxx xxxxx 8.5 xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
LOS by Move: * * * A * * * * * * *
Movement: LT - LTR - RT LT - LTR - RT LT - LTR - RT LT - LTR - RT
Shared Cap.: xxxx xxxx xxxxx xxxx xxxx xxxxx xxxx xxxx xxxxx xxxx 482 xxxxx
SharedQueue:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx 6.8 xxxxx
Shrd ConDel:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx 33.5 xxxxx
Shared LOS: * * * * * * * * * * * D *
ApproachDel: xxxxxx xxxxxx xxxxxx 33.5
ApproachLOS: * * * D
*****
Note: Queue reported is the number of cars per lane.
*****

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                        Level Of Service Computation Report
                      FHWA Roundabout Method (Future Volume Alternative)
*****
Intersection #3 Leslie Rd/ Clearwater Blvd
*****
Average Delay (sec/veh):      2.5      Level Of Service: A
*****
Street Name:      Clearwater Blvd      Leslie Rd
Approach:      North Bound      South Bound      East Bound      West Bound
Movement:      L - T - R      L - T - R      L - T - R      L - T - R
-----|-----|-----|-----|-----|
Control:      Yield Sign      Yield Sign      Yield Sign      Yield Sign
Lanes:      2      2      2      2
-----|-----|-----|-----|-----|
Volume Module: >> Count Date: 17 Nov 2015 << PM Peak Hour
Base Vol:      175 265 61 65 348 256 120 64 110 47 43 87
Growth Adj: 1.10 1.10 1.10 1.10 1.10 1.10 1.10 1.10 1.10 1.10 1.10 1.10
Initial Bse: 193 292 67 72 383 282 132 70 121 52 47 96
Added Vol:      0 42 0 0 43 32 32 0 0 0 0 0
In Process:      0 5 18 2 9 8 5 19 0 17 18 2
Initial Fut: 193 339 85 74 435 322 169 89 121 69 65 98
User 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
PHF Adj:      0.93 0.93 0.93 0.93 0.93 0.93 0.93 0.93 0.93 0.93 0.93 0.93
PHF Volume:      207 364 92 79 468 346 182 96 130 74 70 105
Reduct Vol:      0 0 0 0 0 0 0 0 0 0 0 0
Reduced Vol:      207 364 92 79 468 346 182 96 130 74 70 105
PCE 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
MLF 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
FinalVolume:      207 364 92 79 468 346 182 96 130 74 70 105
-----|-----|-----|-----|-----|
PCE Module:
AutoPCE:      207 364 92 79 468 346 182 96 130 74 70 105
TruckPCE:      0 0 0 0 0 0 0 0 0 0 0 0
ComboPCE:      0 0 0 0 0 0 0 0 0 0 0 0
BicyclePCE:      0 0 0 0 0 0 0 0 0 0 0 0
AdjVolume:      207 364 92 79 468 346 182 96 130 74 70 105
-----|-----|-----|-----|-----|
Delay Module: >> Time Period: 0.25 hours <<
CircVolume:      357 351 620 753
MaxVolume:      2167 2171 1977 1882
PedVolume:      0 0 0 0
AdjMaxVol:      2167 2171 1977 1882
ApproachVol:      662 892 408 249
ApproachDel:      2.4 2.8 2.3 2.2
Queue:      1.3 2.1 0.8 0.5

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-----
Level Of Service Computation Report
2000 HCM Unsignalized Method (Future Volume Alternative)
*****
Intersection #4 W 10th Ave/ Clearwater Blvd
*****
Average Delay (sec/veh): 138.6 Worst Case Level Of Service: F[696.1]
*****
Street Name: W 10th Ave Clearwater Blvd
Approach: North Bound South Bound East Bound West Bound
Movement: L - T - R L - T - R L - T - R L - T - R
-----|-----|-----|-----|
Control: Stop Sign Stop Sign Uncontrolled Uncontrolled
Rights: Include Include Include Include
Lanes: 1 0 0 1 0 1 0 0 1 0 1 0 1 0 1 1 0 1 0 1 1
-----|-----|-----|-----|
Volume Module: >> Count Date: 17 Nov 2015 << PM Peak Hour
Base Vol: 92 0 6 0 0 0 0 464 49 3 625 0
Growth Adj: 1.10 1.10 1.10 1.10 1.10 1.10 1.10 1.10 1.10 1.10 1.10 1.10
Initial Bse: 101 0 7 0 0 0 0 510 54 3 688 0
Added Vol: 0 28 0 112 28 75 74 0 0 0 0 110
In Process/: 5 0 0 90 0 49 48 -38 2 0 -74 88
Initial Fut: 106 28 7 202 28 124 122 472 56 3 614 198
User 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
PHF Adj: 0.93 0.93 0.93 0.93 0.93 0.93 0.93 0.93 0.93 0.93 0.93 0.93
PHF Volume: 114 30 7 217 30 133 131 508 60 4 660 213
Reduct Vol: 0 0 0 0 0 0 0 0 0 0 0 0
FinalVolume: 114 30 7 217 30 133 131 508 60 4 660 213
Critical Gap Module:
Critical Gp: 7.1 6.5 6.2 7.1 6.5 6.2 4.1 xxxx xxxxx 4.1 xxxx xxxxx
FollowUpTim: 3.5 4.0 3.3 3.5 4.0 3.3 2.2 xxxx xxxxx 2.2 xxxx xxxxx
-----|-----|-----|-----|
Capacity Module:
Cnflct Vol: 1122 1650 508 1486 1497 330 873 xxxx xxxxx 568 xxxx xxxxx
Potent Cap.: 185 100 569 104 124 716 782 xxxx xxxxx 1014 xxxx xxxxx
Move Cap.: 102 83 569 64 103 716 782 xxxx xxxxx 1014 xxxx xxxxx
Volume/Cap: 1.12 0.36 0.01 3.37 0.29 0.19 0.17 xxxx xxxx 0.00 xxxx xxxx
-----|-----|-----|-----|
Level Of Service Module:
2Way95thQ: 7.4 xxxx xxxxx 22.7 xxxx xxxxx 0.6 xxxx xxxxx 0.0 xxxx xxxxx
Control Del: 204.6 xxxx xxxxx 1201 xxxx xxxxx 10.5 xxxx xxxxx 8.6 xxxx xxxxx
LOS by Move: F * * F * * B * * A * *
Movement: LT - LTR - RT LT - LTR - RT LT - LTR - RT LT - LTR - RT
Shared Cap.: xxxx xxxx 99 xxxx xxxx 341 xxxx xxxx xxxxx xxxx xxxxx
SharedQueue: xxxxx xxxx 1.5 xxxxx xxxx 2.5 xxxxx xxxx xxxxx 0.0 xxxx xxxxx
Shrd ConDel: xxxxx xxxx 61.9 xxxxx xxxx 24.9 xxxxx xxxx xxxxx 8.6 xxxx xxxxx
Shared LOS: * * F * * C * * * A * *
ApproachDel: 169.6 696.1 xxxxxx xxxxxx
ApproachLOS: F F * *
*****
Note: Queue reported is the number of cars per lane.
*****

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Level Of Service Computation Report
2000 HCM Unsignalized Method (Future Volume Alternative)
*****
Intersection #7 Utah St-Clearwater Dr/ Clearwater Blvd.
*****
Average Delay (sec/veh):      2.3      Worst Case Level Of Service: F[ 58.6]
*****
Street Name:      Utah St-Clearwater Dr      Clearwater Blvd
Approach:      North Bound      South Bound      East Bound      West Bound
Movement:      L - T - R      L - T - R      L - T - R      L - T - R
-----|-----|-----|-----|-----|
Control:      Stop Sign      Stop Sign      Uncontrolled      Uncontrolled
Rights:      Include      Include      Include      Include
Lanes:      0 0 1! 0 0      1 0 0 1 0      1 0 1 1 0      1 0 1 1 0
-----|-----|-----|-----|-----|
Volume Module: >> Count Date: 17 Nov 2015 << PM Peak Hour
Base Vol:      3 0 37      33 1 5      8 468 6      51 633 9
Growth Adj: 1.10 1.10 1.10 1.10 1.10 1.10 1.10 1.10 1.10 1.10 1.10 1.10
Initial Bse: 3 0 41      36 1 6      9 515 7      56 696 10
Added Vol: 0 0 0      0 0 0      0 112 0      0 110 0
In Process: 0 0 0      0 0 0      0 18 0      0 16 0
Initial Fut: 3 0 41      36 1 6      9 645 7      56 822 10
User 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
PHF Adj: 0.94 0.94 0.94 0.94 0.94 0.94 0.94 0.94 0.94 0.94 0.94 0.94
PHF Volume: 4 0 43      39 1 6      9 686 7      60 875 11
Reduct Vol: 0 0 0      0 0 0      0 0 0      0 0 0
FinalVolume: 4 0 43      39 1 6      9 686 7      60 875 11
Critical Gap Module:
Critical Gp: 7.5 6.5 6.9 7.5 6.5 6.9 4.1 xxxx xxxxx 4.1 xxxx xxxxx
FollowUpTim: 3.5 4.0 3.3 3.5 4.0 3.3 2.2 xxxx xxxxx 2.2 xxxx xxxxx
-----|-----|-----|-----|-----|
Capacity Module:
Cnflct Vol: 1266 1713 346 1361 1711 443 885 xxxx xxxxx 693 xxxx xxxxx
Potent Cap.: 128 91 655 109 92 568 773 xxxx xxxxx 912 xxxx xxxxx
Move Cap.: 118 84 655 96 85 568 773 xxxx xxxxx 912 xxxx xxxxx
Volume/Cap: 0.03 0.00 0.07 0.40 0.01 0.01 0.01 xxxx xxxx 0.07 xxxx xxxx
-----|-----|-----|-----|-----|
Level Of Service Module:
2Way95thQ: xxxx xxxx xxxxx 1.6 xxxx xxxxx 0.0 xxxx xxxxx 0.2 xxxx xxxxx
Control Del:xxxxx xxxx xxxxx 66.0 xxxx xxxxx 9.7 xxxx xxxxx 9.2 xxxx xxxxx
LOS by Move: * * * F * * A * * A * *
Movement: LT - LTR - RT LT - LTR - RT LT - LTR - RT LT - LTR - RT
Shared Cap.: xxxx 489 xxxxx xxxx xxxx 291 xxxx xxxx xxxxx xxxx xxxx xxxxx
SharedQueue:xxxxx 0.3 xxxxx xxxxx xxxx 0.1 xxxxx xxxx xxxxx xxxxx xxxx xxxxx
Shrd ConDel:xxxxx 13.1 xxxxx xxxxx xxxx 17.7 xxxxx xxxx xxxxx xxxxx xxxx xxxxx
Shared LOS: * B * * * C * * * *
ApproachDel: 13.1 58.6 xxxxxx xxxxxx
ApproachLOS: B F * *
*****
Note: Queue reported is the number of cars per lane.
*****

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-----
Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)
*****
Intersection #8 Steptoe St/ Clearwater Blvd
*****
Cycle (sec):          0          Critical Vol./Cap.(X):          0.894
Loss Time (sec):      12 (Y+R=4.0 sec) Average Delay (sec/veh):      26.2
Optimal Cycle:        94          Level Of Service:          C
*****
Street Name:          Steptoe St          Clearwater Blvd
Approach:             North Bound          South Bound          East Bound          West Bound
Movement:             L - T - R          L - T - R          L - T - R          L - T - R
-----|-----|-----|-----|
Control:              Prot+Permit          Prot+Permit          Prot+Permit          Prot+Permit
Rights:               Include              Include              Include              Include
Min. Green:           12  22  0          12  22  0          18  30  0          12  30  0
Lanes:                1  0  2  0  1          1  0  2  0  1          1  0  1  1  0          1  0  2  0  1
-----|-----|-----|-----|
Volume Module: >> Count Date: 17 Nov 2015 << PM Peak Hour
Base Vol:             25  138  12  139  231  201  178  329  57  27  461  209
Growth Adj:           1.10 1.10  1.10  1.10 1.10  1.10 1.10 1.10  1.10 1.10 1.10  1.10
Initial Bse:           28  152  13  153  254  221  196  362  63  30  507  230
Added Vol:             0   0   0   0   0   36   37  75   0   0   74   0
In Process:           3   8   5   0  13   6   10  19   4   9  12   0
Initial Fut:           31  160  18  153  267  263  243  456  67  39  593  230
User 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
PHF Adj:              0.92 0.92  0.92  0.92 0.92  0.92 0.92 0.92  0.92 0.92 0.92  0.92
PHF Volume:           33  174  20  166  290  286  264  496  73  42  645  250
Reduct Vol:           0   0   0   0   0   0   0   0   0   0   0   0
Reduced Vol:          33  174  20  166  290  286  264  496  73  42  645  250
PCE 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
MLF 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
FinalVolume:          33  174  20  166  290  286  264  496  73  42  645  250
-----|-----|-----|-----|
Saturation Flow Module:
Sat/Lane:             1900 1900  1900  1900 1900  1900 1900 1900  1900 1900 1900  1900
Adjustment:           0.95 0.95  0.85  0.95 0.95  0.85 0.95 0.93  0.93 0.95 0.95  0.85
Lanes:               1.00 2.00  1.00  1.00 2.00  1.00 1.00 1.74  0.26 1.00 2.00  1.00
Final Sat.:          1805 3610  1615  1805 3610  1615 1805 3089  452 1805 3610  1615
-----|-----|-----|-----|
Capacity Analysis Module:
Vol/Sat:             0.02 0.05  0.01  0.09 0.08  0.18  0.15 0.16  0.16  0.02 0.18  0.15
Crit Moves:          ****              ****              ****
Green/Cycle:          0.39 0.23  0.23  0.39 0.23  0.23  0.54 0.36  0.36  0.47 0.32  0.32
Volume/Cap:           0.08 0.21  0.05  0.33 0.34  0.76  0.54 0.44  0.44  0.09 0.56  0.48
Uniform Del:          17.8 29.0  27.9  19.1 30.0  33.5  13.3 22.6  22.6  13.9 26.5  25.8
IncremntDel:          0.1  0.1   0.1   0.4  0.2   8.5   1.2  0.2   0.2   0.1  0.6   0.7
InitQueuDel:          0.0  0.0   0.0   0.0  0.0   0.0   0.0  0.0   0.0   0.0  0.0   0.0
Delay 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
Delay/Veh:            17.9 29.1  28.0  19.5 30.2  42.0  14.5 22.8  22.8  14.0 27.1  26.5
User DelAdj:          1.00 1.00  1.00  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
AdjDel/Veh:           17.9 29.1  28.0  19.5 30.2  42.0  14.5 22.8  22.8  14.0 27.1  26.5
LOS by Move:          B   C   C   B   C   D   B   C   C   B   C   C
HCM2kAvgQ:            1   2   0   4   4   9   6   7   7   1   9   6
*****

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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)
*****
Intersection #9 Columbia Ctr Blvd/Clearwater Blvd
*****
Cycle (sec):          0          Critical Vol./Cap.(X):          0.775
Loss Time (sec):      12 (Y+R=4.0 sec) Average Delay (sec/veh):      23.6
Optimal Cycle:        61          Level Of Service:          C
*****
Street Name:          Columbia Ctr Blvd          Clearwater Blvd
Approach:              North Bound          South Bound          East Bound          West Bound
Movement:              L - T - R          L - T - R          L - T - R          L - T - R
-----|-----|-----|-----|
Control:              Split Phase          Split Phase          Permit+Prot          Permit+Prot
Rights:                Include          Include          Include          Include
Min. Green:            0 0 0          0 0 0          0 0 0          0 0 0
Lanes:                 1 0 2 1 0          1 1 1 0 1          1 0 1 1 0          1 0 2 0 2
-----|-----|-----|-----|
Volume Module: >> Count Date: 17 Nov 2015 <<
Base Vol:             119 378 29 387 777 244 160 258 121 49 358 381
Growth Adj:           1.10 1.10 1.10 1.10 1.10 1.10 1.10 1.10 1.10 1.10 1.10 1.10
Initial Bse:          131 416 32 426 855 268 176 284 133 54 394 419
Added Vol:             25 0 0 0 0 17 17 32 26 0 32 0
In Process:           4 0 0 0 0 3 4 8 7 0 5 0
Initial Fut:          160 416 32 426 855 288 197 324 166 54 431 419
User 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
PHF Adj:              0.94 0.94 0.94 0.94 0.94 0.94 0.94 0.94 0.94 0.94 0.94 0.94
PHF Volume:           170 442 34 453 909 307 210 344 177 57 458 446
Reduct Vol:           0 0 0 0 0 0 0 0 0 0 0 0
Reduced Vol:          170 442 34 453 909 307 210 344 177 57 458 446
PCE 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
MLF 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
FinalVolume:          170 442 34 453 909 307 210 344 177 57 458 446
-----|-----|-----|-----|
Saturation Flow Module:
Sat/Lane:             1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900
Adjustment:           0.95 0.90 0.90 0.93 0.93 0.85 0.41 0.90 0.90 0.32 0.95 0.75
Lanes:                1.00 2.79 0.21 1.00 2.00 1.00 1.00 1.32 0.68 1.00 2.00 2.00
Final Sat.:           1805 4764 366 1776 3552 1615 770 2264 1162 616 3610 2842
-----|-----|-----|-----|
Capacity Analysis Module:
Vol/Sat:              0.09 0.09 0.09 0.25 0.26 0.19 0.27 0.15 0.15 0.09 0.13 0.16
Crit Moves:          ****          ****
Green/Cycle:          0.12 0.12 0.12 0.33 0.33 0.33 0.40 0.29 0.29 0.31 0.20 0.20
Volume/Cap:           0.78 0.76 0.76 0.77 0.78 0.58 0.43 0.52 0.52 0.18 0.63 0.78
Uniform Del:          26.0 25.9 25.9 18.4 18.4 16.9 17.4 18.1 18.1 19.0 22.2 23.0
IncremntDel:          15.9 5.6 5.6 2.2 2.2 1.6 0.6 0.5 0.5 0.3 1.7 6.6
InitQueuDel:          0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0
Delay 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
Delay/Veh:            41.8 31.6 31.6 20.6 20.6 18.5 18.1 18.6 18.6 19.2 24.0 29.6
User DelAdj:          1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
AdjDel/Veh:           41.8 31.6 31.6 20.6 20.6 18.5 18.1 18.6 18.6 19.2 24.0 29.6
LOS by Move:          D C C C C B B B B C C
HCM2kAvgQ:            5 5 5 10 10 6 3 5 5 1 5 7
*****

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 Impact Analysis Report
 Level Of Service

Intersection	Base Del/ V/ LOS Veh C	Future Del/ V/ LOS Veh C	Change in
# 1 I-82 EB Ramps/ Badger Rd	C 19.9 0.000	D 26.1 0.000	+ 6.147 D/V
# 2 I-82 WB Ramps/Badger Rd	F 228.7 0.000	F 508.3 0.000	+279.593 D/V
# 3 Leslie Rd/ Clearwater Blvd	A 3.2 0.000	A 4.2 0.000	+ 0.000 V/C
# 4 W 10th Ave/ Clearwater Blvd	F OVRFL 0.000	F OVRFL 0.000	+ 0.000 D/V
# 5	A 0.0 0.000	F 631.6 0.000	+631.570 D/V
# 6	A 0.0 0.000	F 323.1 0.000	+323.102 D/V
# 7	A 0.0 0.000	F 144.6 0.000	+144.590 D/V
# 8 Utah St-Clearwater Dr/ Clearwa	F 317.2 0.000	F OVRFL 0.000	+4719.040 D/
# 9 Steptoe St/ Clearwater Blvd	D 35.4 0.754	D 41.4 0.862	+ 6.028 D/V
# 10 Columbia Ctr Blvd/Clearwater B	D 47.7 0.895	D 54.8 0.951	+ 7.084 D/V

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Level Of Service Computation Report
2000 HCM Unsignalized Method (Base Volume Alternative)
*****
Intersection #1 I-82 EB Ramps/ Badger Rd
*****
Average Delay (sec/veh):      4.4      Worst Case Level Of Service: C[ 19.9]
*****
Street Name:      Badger Rd      I-82 EB Ramps
Approach:      North Bound      South Bound      East Bound      West Bound
Movement:      L - T - R      L - T - R      L - T - R      L - T - R
-----|-----|-----|-----|-----|
Control:      Uncontrolled      Uncontrolled      Stop Sign      Stop Sign
Rights:      Include      Include      Include      Include
Lanes:      0 0 0 1 0      1 0 1 0 0      0 0 0 0 0      0 0 1! 0 0
-----|-----|-----|-----|-----|
Volume Module: >> Count Date: 1 Jan 2021 << PM Peak Hour
Base Vol:      0 254 28      168 382      0      0 0      0      15 0 126
Growth Adj: 1.30 1.30 1.30 1.30 1.30 1.30 1.30 1.30 1.30 1.30 1.30 1.30
Initial Bse: 0 330 36      218 497      0      0 0      0      20 0 164
User 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
PHF Adj: 0.88 0.88 0.88 0.88 0.88 0.88 0.88 0.88 0.88 0.88 0.88 0.88
PHF Volume: 0 375 41      248 564      0      0 0      0      22 0 186
Reduct Vol: 0 0 0      0 0      0      0 0      0      0 0 0
FinalVolume: 0 375 41      248 564      0      0 0      0      22 0 186
-----|-----|-----|-----|-----|
Critical Gap Module:
Critical Gp:xxxxx xxxxx xxxxx 4.1 xxxxx xxxxx xxxxx xxxxx xxxxx 6.4 6.5 6.2
FollowUpTim:xxxxx xxxxx xxxxx 2.2 xxxxx xxxxx xxxxx xxxxx xxxxx 3.5 4.0 3.3
-----|-----|-----|-----|-----|
Capacity Module:
Cnflct Vol: xxxxx xxxxx xxxxx 417 xxxxx xxxxx xxxxx xxxxx xxxxx 1457 1457 396
Potent Cap.: xxxxx xxxxx xxxxx 1153 xxxxx xxxxx xxxxx xxxxx xxxxx 144 131 658
Move Cap.: xxxxx xxxxx xxxxx 1153 xxxxx xxxxx xxxxx xxxxx xxxxx 120 103 658
Volume/Cap: xxxxx xxxxx xxxxx 0.22 xxxxx xxxxx xxxxx xxxxx xxxxx 0.18 0.00 0.28
-----|-----|-----|-----|-----|
Level Of Service Module:
2Way95thQ: xxxxx xxxxx xxxxx 0.8 xxxxx xxxxx xxxxx xxxxx xxxxx xxxxx xxxxx xxxxx xxxxx
Control Del:xxxxx xxxxx xxxxx 9.0 xxxxx xxxxx xxxxx xxxxx xxxxx xxxxx xxxxx xxxxx xxxxx
LOS by Move: * * * A * * * * * * * * * * *
Movement: LT - LTR - RT LT - LTR - RT LT - LTR - RT LT - LTR - RT
Shared Cap.: xxxxx xxxxx xxxxx xxxxx xxxxx xxxxx xxxxx xxxxx xxxxx xxxxx 446 xxxxx
SharedQueue:xxxxxx xxxxx xxxxx xxxxx xxxxx xxxxx xxxxx xxxxx xxxxx xxxxx 2.4 xxxxx
Shrd ConDel:xxxxxx xxxxx xxxxx xxxxx xxxxx xxxxx xxxxx xxxxx xxxxx xxxxx 19.9 xxxxx
Shared LOS: * * * * * * * * * * * * * * * * * C
ApproachDel: xxxxxx xxxxxx xxxxxx 19.9
ApproachLOS: * * * * * C
*****
Note: Queue reported is the number of cars per lane.
*****

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-----
                        Level Of Service Computation Report
                2000 HCM Unsignalized Method (Future Volume Alternative)
*****
Intersection #1 I-82 EB Ramps/ Badger Rd
*****
Average Delay (sec/veh):      5.9      Worst Case Level Of Service: D[ 26.1]
*****
Street Name:      Badger Rd      I-82 EB Ramps
Approach:      North Bound      South Bound      East Bound      West Bound
Movement:      L - T - R      L - T - R      L - T - R      L - T - R
-----|-----|-----|-----|-----|
Control:      Uncontrolled      Uncontrolled      Stop Sign      Stop Sign
Rights:      Include      Include      Include      Include
Lanes:      0 0 0 1 0      1 0 1 0 0      0 0 0 0 0      0 0 1! 0 0
-----|-----|-----|-----|-----|
Volume Module: >> Count Date: 1 Jan 2021 << PM Peak Hour
Base Vol:      0 254 28 168 382 0 0 0 0 15 0 126
Growth Adj: 1.30 1.30 1.30 1.30 1.30 1.30 1.30 1.30 1.30 1.30 1.30 1.30
Initial Bse: 0 330 36 218 497 0 0 0 0 20 0 164
Added Vol: 0 23 0 39 39 0 0 0 0 0 0 45
In Process: 0 0 0 0 0 0 0 0 0 0 0 0
Initial Fut: 0 353 36 257 536 0 0 0 0 20 0 209
User 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
PHF Adj: 0.88 0.88 0.88 0.88 0.88 0.88 0.88 0.88 0.88 0.88 0.88 0.88
PHF Volume: 0 401 41 293 609 0 0 0 0 22 0 237
Reduct Vol: 0 0 0 0 0 0 0 0 0 0 0 0
FinalVolume: 0 401 41 293 609 0 0 0 0 22 0 237
Critical Gap Module:
Critical Gap:xxxxx xxxx xxxxx 4.1 xxxx xxxxx xxxxx xxxx xxxxx 6.4 6.5 6.2
FollowUpTim:xxxxx xxxx xxxxx 2.2 xxxx xxxxx xxxxx xxxx xxxxx 3.5 4.0 3.3
-----|-----|-----|-----|-----|
Capacity Module:
Cnflct Vol: xxxx xxxx xxxxx 443 xxxx xxxxx xxxx xxxx xxxxx 1616 1616 422
Potent Cap.: xxxx xxxx xxxxx 1128 xxxx xxxxx xxxx xxxx xxxxx 115 105 636
Move Cap.: xxxx xxxx xxxxx 1128 xxxx xxxxx xxxx xxxx xxxxx 92 78 636
Volume/Cap: xxxx xxxx xxxx 0.26 xxxx xxxx xxxx xxxx xxxx 0.24 0.00 0.37
-----|-----|-----|-----|-----|
Level Of Service Module:
2Way95thQ: xxxx xxxx xxxxx 1.0 xxxx xxxxx xxxx xxxx xxxxx xxxx xxxx xxxxx
Control Del:xxxxx xxxx xxxxx 9.3 xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
LOS by Move: * * * A * * * * * * *
Movement: LT - LTR - RT LT - LTR - RT LT - LTR - RT LT - LTR - RT
Shared Cap.: xxxx xxxx xxxxx xxxx xxxx xxxxx xxxx xxxx xxxxx xxxx 423 xxxxx
SharedQueue:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx 4.0 xxxxx
Shrd ConDel:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx 26.1 xxxxx
Shared LOS: * * * * * * * * * * * D *
ApproachDel: xxxxxx xxxxxx xxxxxx 26.1
ApproachLOS: * * * D
*****
Note: Queue reported is the number of cars per lane.
*****

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-----
Level Of Service Computation Report
2000 HCM Unsignalized Method (Base Volume Alternative)
*****
Intersection #2 I-82 WB Ramps/Badger Rd
*****
Average Delay (sec/veh): 59.8 Worst Case Level Of Service: F[228.7]
*****
Street Name: Badger Rd I-82 WB Ramps
Approach: North Bound South Bound East Bound West Bound
Movement: L - T - R L - T - R L - T - R L - T - R
-----|-----|-----|-----|
Control: Uncontrolled Uncontrolled Stop Sign Stop Sign
Rights: Include Include Include Include
Lanes: 0 0 0 1 0 1 0 1 0 0 0 0 0 0 0 0 0 0 1! 0 0
-----|-----|-----|-----|
Volume Module: >> Count Date: 1 Jan 2021 << PM Peak Hour
Base Vol: 0 347 9 141 504 0 0 0 0 51 0 296
Growth Adj: 1.30 1.30 1.30 1.30 1.30 1.30 1.30 1.30 1.30 1.30 1.30 1.30
Initial Bse: 0 451 12 183 655 0 0 0 0 66 0 385
User 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
PHF Adj: 0.93 0.93 0.93 0.93 0.93 0.93 0.93 0.93 0.93 0.93 0.93 0.93
PHF Volume: 0 485 13 197 705 0 0 0 0 71 0 414
Reduct Vol: 0 0 0 0 0 0 0 0 0 0 0 0
FinalVolume: 0 485 13 197 705 0 0 0 0 71 0 414
-----|-----|-----|-----|
Critical Gap Module:
Critical Gp:xxxxx xxxx xxxxx 4.1 xxxx xxxxx xxxxx xxxx xxxxx 6.4 6.5 6.2
FollowUpTim:xxxxx xxxx xxxxx 2.2 xxxx xxxxx xxxxx xxxx xxxxx 3.5 4.0 3.3
-----|-----|-----|-----|
Capacity Module:
Cnflct Vol: xxxx xxxx xxxxx 498 xxxx xxxxx xxxx xxxx xxxxx 1590 1590 491
Potent Cap.: xxxx xxxx xxxxx 1077 xxxx xxxxx xxxx xxxx xxxxx 120 109 581
Move Cap.: xxxx xxxx xxxxx 1077 xxxx xxxxx xxxx xxxx xxxxx 103 89 581
Volume/Cap: xxxx xxxx xxxxx 0.18 xxxx xxxxx xxxx xxxx xxxxx 0.69 0.00 0.71
-----|-----|-----|-----|
Level Of Service Module:
2Way95thQ: xxxx xxxx xxxxx 0.7 xxxx xxxxx xxxx xxxx xxxxx xxxx xxxx xxxxx
Control Del:xxxxx xxxx xxxxx 9.1 xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
LOS by Move: * * * A * * * * * * * * *
Movement: LT - LTR - RT LT - LTR - RT LT - LTR - RT LT - LTR - RT
Shared Cap.: xxxx xxxx xxxxx xxxx xxxx xxxxx xxxx xxxx xxxxx xxxx 345 xxxxx
SharedQueue:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx 24.8 xxxxx
Shrd ConDel:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx 229 xxxxx
Shared LOS: * * * * * * * * * * * * * * *
ApproachDel: xxxxxx xxxxxx xxxxxx 228.7
ApproachLOS: * * * * * * * * * * *
*****
Note: Queue reported is the number of cars per lane.
*****

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-----
Level Of Service Computation Report
2000 HCM Unsignalized Method (Future Volume Alternative)
*****
Intersection #2 I-82 WB Ramps/Badger Rd
*****
Average Delay (sec/veh): 121.9 Worst Case Level Of Service: F[508.3]
*****
Street Name: Badger Rd I-82 WB Ramps
Approach: North Bound South Bound East Bound West Bound
Movement: L - T - R L - T - R L - T - R L - T - R
-----|-----|-----|-----|
Control: Uncontrolled Uncontrolled Stop Sign Stop Sign
Rights: Include Include Include Include
Lanes: 0 0 0 1 0 1 0 1 0 0 0 0 0 0 0 0 0 0 1! 0 0
-----|-----|-----|-----|
Volume Module: >> Count Date: 1 Jan 2021 << PM Peak Hour
Base Vol: 0 347 9 141 504 0 0 0 0 51 0 296
Growth Adj: 1.30 1.30 1.30 1.30 1.30 1.30 1.30 1.30 1.30 1.30 1.30 1.30
Initial Bse: 0 451 12 183 655 0 0 0 0 66 0 385
Added Vol: 0 68 0 77 77 0 0 0 0 0 0 23
PasserByVol: 0 0 0 0 0 0 0 0 0 0 0 0
Initial Fut: 0 519 12 260 732 0 0 0 0 66 0 408
User 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
PHF Adj: 0.93 0.93 0.93 0.93 0.93 0.93 0.93 0.93 0.93 0.93 0.93 0.93
PHF Volume: 0 558 13 280 787 0 0 0 0 71 0 438
Reduct Vol: 0 0 0 0 0 0 0 0 0 0 0 0
FinalVolume: 0 558 13 280 787 0 0 0 0 71 0 438
Critical Gap Module:
Critical Gap:xxxxx xxxx xxxxx 4.1 xxxx xxxxx xxxxx xxxx xxxxx 6.4 6.5 6.2
FollowUpTim:xxxxx xxxx xxxxx 2.2 xxxx xxxxx xxxxx xxxx xxxxx 3.5 4.0 3.3
-----|-----|-----|-----|
Capacity Module:
Cnflct Vol: xxxx xxxx xxxxx 571 xxxx xxxxx xxxx xxxx xxxxx 1912 1912 564
Potent Cap.: xxxx xxxx xxxxx 1012 xxxx xxxxx xxxx xxxx xxxxx 76 69 529
Move Cap.: xxxx xxxx xxxxx 1012 xxxx xxxxx xxxx xxxx xxxxx 60 50 529
Volume/Cap: xxxx xxxx xxxx 0.28 xxxx xxxx xxxx xxxx xxxx 1.20 0.00 0.83
-----|-----|-----|-----|
Level Of Service Module:
2Way95thQ: xxxx xxxx xxxxx 1.1 xxxx xxxxx xxxx xxxx xxxxx xxxx xxxx xxxxx
Control Del:xxxxx xxxx xxxxx 9.9 xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
LOS by Move: * * * A * * * * * * *
Movement: LT - LTR - RT LT - LTR - RT LT - LTR - RT LT - LTR - RT
Shared Cap.: xxxx xxxx xxxxx xxxx xxxx xxxxx xxxx xxxx xxxxx xxxx 251 xxxxx
SharedQueue:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx 37.4 xxxxx
Shrd ConDel:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx 508 xxxxx
Shared LOS: * * * * * * * * * * * F *
ApproachDel: xxxxxx xxxxxx xxxxxx 508.3
ApproachLOS: * * * F
*****
Note: Queue reported is the number of cars per lane.
*****

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-----
                        Level Of Service Computation Report
                      FHWA Roundabout Method (Base Volume Alternative)
*****
Intersection #3 Leslie Rd/ Clearwater Blvd
*****
Average Delay (sec/veh):      3.2      Level Of Service: A
*****
Street Name:      Clearwater Blvd      Leslie Rd
Approach:      North Bound      South Bound      East Bound      West Bound
Movement:      L - T - R      L - T - R      L - T - R      L - T - R
-----|-----|-----|-----|
Control:      Yield Sign      Yield Sign      Yield Sign      Yield Sign
Lanes:      2      2      2      2
-----|-----|-----|-----|
Volume Module: >> Count Date: 1 Jan 2021 << PM Peak Hour
Base Vol:      193 339 85 74 435 322 169 89 121 69 65 98
Growth Adj: 1.30 1.30 1.30 1.30 1.30 1.30 1.30 1.30 1.30 1.30 1.30 1.30
Initial Bse: 251 441 111 96 566 419 220 116 157 90 84 127
User 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
PHF Adj: 0.93 0.93 0.93 0.93 0.93 0.93 0.93 0.93 0.93 0.93 0.93 0.93
PHF Volume: 270 474 119 103 608 450 236 124 169 96 91 137
Reduct Vol: 0 0 0 0 0 0 0 0 0 0 0 0
Reduced Vol: 270 474 119 103 608 450 236 124 169 96 91 137
PCE 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
MLF 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
FinalVolume: 270 474 119 103 608 450 236 124 169 96 91 137
-----|-----|-----|-----|
PCE Module:
AutoPCE: 270 474 119 103 608 450 236 124 169 96 91 137
TruckPCE: 0 0 0 0 0 0 0 0 0 0 0 0
ComboPCE: 0 0 0 0 0 0 0 0 0 0 0 0
BicyclePCE: 0 0 0 0 0 0 0 0 0 0 0 0
AdjVolume: 270 474 119 103 608 450 236 124 169 96 91 137
-----|-----|-----|-----|
Delay Module: >> Time Period: 0.25 hours <<
CircVolume: 464 457 808 980
MaxVolume: 2090 2095 1842 1718
PedVolume: 0 0 0 0
AdjMaxVol: 2090 2095 1842 1718
ApproachVol: 862 1162 530 324
ApproachDel: 2.9 3.8 2.7 2.6
Queue: 2.1 3.6 1.2 0.7

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-----
                        Level Of Service Computation Report
                    FHWA Roundabout Method (Future Volume Alternative)
*****
Intersection #3 Leslie Rd/ Clearwater Blvd
*****
Average Delay (sec/veh):      4.2      Level Of Service: A
*****
Street Name:      Clearwater Blvd      Leslie Rd
Approach:      North Bound      South Bound      East Bound      West Bound
Movement:      L - T - R      L - T - R      L - T - R      L - T - R
-----|-----|-----|-----|
Control:      Yield Sign      Yield Sign      Yield Sign      Yield Sign
Lanes:      2      2      2      2
-----|-----|-----|-----|
Volume Module: >> Count Date: 1 Jan 2021 << PM Peak Hour
Base Vol:      193 339 85      74 435 322      169 89 121      69 65 98
Growth Adj:      1.30 1.30 1.30      1.30 1.30 1.30      1.30 1.30 1.30      1.30 1.30 1.30
Initial Bse:      251 441 111      96 566 419      220 116 157      90 84 127
Added Vol:      0 90 0      0 155 116      68 0 0      0 0 0
PasserByVol:      0 0 0      0 0 0      0 0 0      0 0 0
Initial Fut:      251 531 111      96 721 535      288 116 157      90 84 127
User 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
PHF Adj:      0.93 0.93 0.93      0.93 0.93 0.93      0.93 0.93 0.93      0.93 0.93 0.93
PHF Volume:      270 571 119      103 775 575      309 124 169      96 91 137
Reduct Vol:      0 0 0      0 0 0      0 0 0      0 0 0
Reduced Vol:      270 571 119      103 775 575      309 124 169      96 91 137
PCE 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
MLF 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
FinalVolume:      270 571 119      103 775 575      309 124 169      96 91 137
-----|-----|-----|-----|
PCE Module:
AutoPCE:      270 571 119      103 775 575      309 124 169      96 91 137
TruckPCE:      0 0 0      0 0 0      0 0 0      0 0 0
ComboPCE:      0 0 0      0 0 0      0 0 0      0 0 0
BicyclePCE:      0 0 0      0 0 0      0 0 0      0 0 0
AdjVolume:      270 571 119      103 775 575      309 124 169      96 91 137
-----|-----|-----|-----|
Delay Module: >> Time Period: 0.25 hours <<
CircVolume:      537      457      975      1150
MaxVolume:      2037      2095      1722      1596
PedVolume:      0      0      0      0
AdjMaxVol:      2037      2095      1722      1596
ApproachVol:      959      1453      603      324
ApproachDel:      3.3      5.5      3.2      2.8
Queue:      2.6      6.3      1.6      0.8

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-----
                        Level Of Service Computation Report
                2000 HCM Unsignalized Method (Base Volume Alternative)
*****
Intersection #4 W 10th Ave/ Clearwater Blvd
*****
Average Delay (sec/veh): OVERFLOW      Worst Case Level Of Service: F[xxxxx]
*****
Street Name:                W 10th Ave                Clearwater Blvd
Approach:      North Bound      South Bound      East Bound      West Bound
Movement:      L - T - R      L - T - R      L - T - R      L - T - R
-----|-----|-----|-----|-----|
Control:      Stop Sign      Stop Sign      Uncontrolled      Uncontrolled
Rights:      Include      Include      Include      Include
Lanes:      0 0 1! 0 0      0 0 1! 0 0      1 0 1 1 0      1 0 1 1 0
-----|-----|-----|-----|-----|
Volume Module: >> Count Date: 1 Jan 2021 << PM Peak Hour
Base Vol:      106 28 7 202 28 124 122 472 56 3 614 198
Growth Adj: 1.30 1.30 1.30 1.30 1.30 1.30 1.30 1.30 1.30 1.30 1.30 1.30
Initial Bse: 138 36 9 263 36 161 159 614 73 4 798 257
User 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
PHF Adj: 0.93 0.93 0.93 0.93 0.93 0.93 0.93 0.93 0.93 0.93 0.93 0.93
PHF Volume: 148 39 10 282 39 173 171 660 78 4 858 277
Reduct Vol: 0 0 0 0 0 0 0 0 0 0 0 0
FinalVolume: 148 39 10 282 39 173 171 660 78 4 858 277
-----|-----|-----|-----|-----|
Critical Gap Module:
Critical Gp: 7.5 6.5 6.9 7.5 6.5 6.9 4.1 xxxx xxxxx 4.1 xxxx xxxxx
FollowUpTim: 3.5 4.0 3.3 3.5 4.0 3.3 2.2 xxxx xxxxx 2.2 xxxx xxxxx
-----|-----|-----|-----|-----|
Capacity Module:
Cnflct Vol: 1497 2183 369 1696 2084 568 1135 xxxx xxxxx 738 xxxx xxxxx
Potent Cap.: 86 46 634 61 54 471 623 xxxx xxxxx 877 xxxx xxxxx
Move Cap.: 0 34 634 0 39 471 623 xxxx xxxxx 877 xxxx xxxxx
Volume/Cap: xxxx 1.17 0.02 xxxx 1.01 0.37 0.27 xxxx xxxx 0.00 xxxx xxxx
-----|-----|-----|-----|-----|
Level Of Service Module:
2Way95thQ: xxxx xxxx xxxxx xxxx xxxx xxxxx 1.1 xxxx xxxxx 0.0 xxxx xxxxx
Control Del:xxxxx xxxx xxxxx xxxxx xxxx xxxxx 12.9 xxxx xxxxx 9.1 xxxx xxxxx
LOS by Move: * * * * * B * * A * *
Movement: LT - LTR - RT LT - LTR - RT LT - LTR - RT LT - LTR - RT
Shared Cap.: xxxx 0 xxxxx xxxx 0 xxxxx xxxx xxxx xxxxx xxxx xxxx xxxxx
SharedQueue:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
Shrd ConDel:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
Shared LOS: * * * * * * * * *
ApproachDel: xxxxxx xxxxxx xxxxxx xxxxxx
ApproachLOS: F F * *
*****
Note: Queue reported is the number of cars per lane.
*****

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-----
Level Of Service Computation Report
2000 HCM Unsignalized Method (Future Volume Alternative)
*****
Intersection #4 W 10th Ave/ Clearwater Blvd
*****
Average Delay (sec/veh): OVERFLOW Worst Case Level Of Service: F[xxxxx]
*****
Street Name: W 10th Ave Clearwater Blvd
Approach: North Bound South Bound East Bound West Bound
Movement: L - T - R L - T - R L - T - R L - T - R
-----|-----|-----|-----|-----|
Control: Stop Sign Stop Sign Uncontrolled Uncontrolled
Rights: Include Include Include Include
Lanes: 0 0 1! 0 0 0 0 1! 0 0 1 0 1 1 0 1 0 1 1 0
-----|-----|-----|-----|-----|
Volume Module: >> Count Date: 1 Jan 2021 << PM Peak Hour
Base Vol: 106 28 7 202 28 124 122 472 56 3 614 198
Growth Adj: 1.30 1.30 1.30 1.30 1.30 1.30 1.30 1.30 1.30 1.30 1.30 1.30
Initial Bse: 138 36 9 263 36 161 159 614 73 4 798 257
Added Vol: 133 0 8 0 0 0 0 110 48 11 138 0
PasserByVol: 0 0 0 0 0 0 0 0 0 0 0 0
Initial Fut: 271 36 17 263 36 161 159 724 121 15 936 257
User 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
PHF Adj: 0.93 0.93 0.93 0.93 0.93 0.93 0.93 0.93 0.93 0.93 0.93 0.93
PHF Volume: 291 39 18 282 39 173 171 778 130 16 1007 277
Reduct Vol: 0 0 0 0 0 0 0 0 0 0 0 0
FinalVolume: 291 39 18 282 39 173 171 778 130 16 1007 277
Critical Gap Module:
Critical Gp: 7.5 6.5 6.9 7.5 6.5 6.9 4.1 xxxx xxxxx 4.1 xxxx xxxxx
FollowUpTim: 3.5 4.0 3.3 3.5 4.0 3.3 2.2 xxxx xxxxx 2.2 xxxx xxxxx
-----|-----|-----|-----|-----|
Capacity Module:
Cnflct Vol: 1739 2500 454 1927 2426 642 1283 xxxx xxxxx 908 xxxx xxxxx
Potent Cap.: 57 29 559 41 33 422 547 xxxx xxxxx 758 xxxx xxxxx
Move Cap.: 0 20 559 0 22 422 547 xxxx xxxxx 758 xxxx xxxxx
Volume/Cap: xxxx 1.99 0.03 xxxx 1.78 0.41 0.31 xxxx xxxx 0.02 xxxx xxxx
-----|-----|-----|-----|-----|
Level Of Service Module:
2Way95thQ: xxxx xxxx xxxxx xxxx xxxx xxxxx 1.3 xxxx xxxxx 0.1 xxxx xxxxx
Control Del:xxxxx xxxx xxxxx xxxxx xxxx xxxxx 14.5 xxxx xxxxx 9.9 xxxx xxxxx
LOS by Move: * * * * * B * * A * *
Movement: LT - LTR - RT LT - LTR - RT LT - LTR - RT LT - LTR - RT
Shared Cap.: xxxx 0 xxxxx xxxx 0 xxxxx xxxx xxxx xxxxx xxxx xxxx xxxxx
SharedQueue:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
Shrd ConDel:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
Shared LOS: * * * * * * * * * * * * * * *
ApproachDel: xxxxxx xxxxxx xxxxxx xxxxxx
ApproachLOS: F F * *
*****
Note: Queue reported is the number of cars per lane.
*****

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-----
                        Level Of Service Computation Report
                2000 HCM Unsignalized Method (Base Volume Alternative)
*****
Intersection #5
*****
Average Delay (sec/veh):      0.0      Worst Case Level Of Service: A[ 0.0]
*****
Approach:      North Bound      South Bound      East Bound      West Bound
Movement:      L - T - R      L - T - R      L - T - R      L - T - R
-----|-----|-----|-----|
Control:      Stop Sign      Stop Sign      Uncontrolled      Uncontrolled
Rights:      Include      Include      Include      Include
Lanes:      0 0 1! 0 0      0 0 1! 0 0      1 0 1 1 0      1 0 1 1 0
-----|-----|-----|-----|
Volume Module: >> Count Date: 1 Jan 2021 << PM Peak
Base Vol:      0 0 0      0 0 0      0 697 0      0 815 0
Growth Adj:  1.30 1.30 1.30 1.30 1.30 1.30 1.30 1.30 1.30 1.30 1.30 1.30
Initial Bse:  0 0 0      0 0 0      0 906 0      0 1060 0
User 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
PHF Adj:     0.93 0.93 0.93 0.93 0.93 0.93 0.93 0.93 0.93 0.93 0.93 0.93
PHF Volume:   0 0 0      0 0 0      0 974 0      0 1139 0
Reduct Vol:   0 0 0      0 0 0      0 0 0      0 0 0
FinalVolume:  0 0 0      0 0 0      0 974 0      0 1139 0
-----|-----|-----|-----|
Critical Gap Module:
Critical Gp:  6.8 6.5 6.9 6.8 6.5 6.9 xxxxx xxxx xxxxx xxxxx xxxx xxxxx
FollowUpTim:  3.5 4.0 3.3 3.5 4.0 3.3 xxxxx xxxx xxxxx xxxxx xxxx xxxxx
-----|-----|-----|-----|
Capacity Module:
Cnflct Vol:  1544 2114 487 1626 2114 570 xxxxx xxxx xxxxx xxxxx xxxx xxxxx
Potent Cap.: 108 51 532 95 51 470 xxxxx xxxx xxxxx xxxxx xxxx xxxxx
Move Cap.:   108 51 532 95 51 470 xxxxx xxxx xxxxx xxxxx xxxx xxxxx
Volume/Cap:  0.00 0.00 0.00 0.00 0.00 0.00 xxxxx xxxx xxxxx xxxxx xxxx xxxxx
-----|-----|-----|-----|
Level Of Service Module:
2Way95thQ:   xxxxx xxxxx xxxxx xxxxx xxxxx xxxxx xxxxx xxxxx xxxxx xxxxx xxxxx xxxxx
Control Del: xxxxx xxxxx xxxxx xxxxx xxxxx xxxxx xxxxx xxxxx xxxxx xxxxx xxxxx xxxxx
LOS by Move:  * * * * * * * * * * * * * * * * * * * * * *
Movement:    LT - LTR - RT LT - LTR - RT LT - LTR - RT LT - LTR - RT
Shared Cap.: xxxxx 0 xxxxx xxxxx 0 xxxxx xxxxx xxxxx xxxxx xxxxx xxxxx xxxxx
SharedQueue: xxxxx xxxxx xxxxx xxxxx xxxxx xxxxx xxxxx xxxxx xxxxx xxxxx xxxxx xxxxx
Shrd ConDel: xxxxx xxxxx xxxxx xxxxx xxxxx xxxxx xxxxx xxxxx xxxxx xxxxx xxxxx xxxxx
Shared LOS:   * * * * * * * * * * * * * * * * * * * * * *
ApproachDel:  xxxxxx xxxxxx xxxxxx xxxxxx
ApproachLOS:   * * * * *
*****
Note: Queue reported is the number of cars per lane.
*****

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-----
Level Of Service Computation Report
2000 HCM Unsignalized Method (Future Volume Alternative)
*****
Intersection #5
*****
Average Delay (sec/veh): 46.4 Worst Case Level Of Service: F[631.6]
*****
Approach: North Bound South Bound East Bound West Bound
Movement: L - T - R L - T - R L - T - R L - T - R
-----|-----|-----|-----|
Control: Stop Sign Stop Sign Uncontrolled Uncontrolled
Rights: Include Include Include Include
Lanes: 0 0 1! 0 0 0 0 1! 0 0 1 0 1 1 0 1 0 1 1 0
-----|-----|-----|-----|
Volume Module: >> Count Date: 1 Jan 2021 << PM Peak
Base Vol: 0 0 0 0 0 0 0 0 697 0 0 815 0
Growth Adj: 1.30 1.30 1.30 1.30 1.30 1.30 1.30 1.30 1.30 1.30 1.30 1.30
Initial Bse: 0 0 0 0 0 0 0 0 906 0 0 1060 0
Added Vol: 0 0 0 43 0 40 31 87 0 0 109 33
Passby: 0 0 0 60 0 32 35 -35 0 0 -64 64
Initial Fut: 0 0 0 103 0 72 66 958 0 0 1105 97
User 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
PHF Adj: 0.93 0.93 0.93 0.93 0.93 0.93 0.93 0.93 0.93 0.93 0.93 0.93
PHF Volume: 0 0 0 111 0 77 71 1030 0 0 1188 104
Reduct Vol: 0 0 0 0 0 0 0 0 0 0 0 0
FinalVolume: 0 0 0 111 0 77 71 1030 0 0 1188 104
Critical Gap Module:
Critical Gp: 7.5 6.5 6.9 6.8 6.5 6.9 4.1 xxxx xxxxx xxxxx xxxx xxxxx
FollowUpTim: 3.5 4.0 3.3 3.5 4.0 3.3 2.2 xxxx xxxxx xxxxx xxxx xxxxx
-----|-----|-----|-----|
Capacity Module:
Cnflct Vol: 1766 2464 515 1897 2412 646 1292 xxxx xxxxx xxxx xxxx xxxxx
Potent Cap.: 54 31 510 63 33 419 543 xxxx xxxxx xxxx xxxx xxxxx
Move Cap.: 40 27 510 56 29 419 543 xxxx xxxxx xxxx xxxx xxxxx
Volume/Cap: 0.00 0.00 0.00 1.97 0.00 0.18 0.13 xxxx xxxx xxxx xxxx xxxxx
-----|-----|-----|-----|
Level Of Service Module:
2Way95thQ: xxxx xxxx xxxxx xxxx xxxx xxxxx 0.4 xxxx xxxxx xxxx xxxx xxxxx
Control Del:xxxxx xxxx xxxxx xxxxx xxxx xxxxx 12.6 xxxx xxxxx xxxxx xxxx xxxxx
LOS by Move: * * * * * B * * * * *
Movement: LT - LTR - RT LT - LTR - RT LT - LTR - RT LT - LTR - RT
Shared Cap.: xxxx 0 xxxxx xxxx 88 xxxxx xxxx xxxx xxxxx xxxx xxxx xxxxx
SharedQueue:xxxxx xxxx xxxxx xxxxx 16.8 xxxxx xxxx xxxx xxxxx xxxxx xxxx xxxxx
Shrd ConDel:xxxxx xxxx xxxxx xxxxx 632 xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
Shared LOS: * * * * * F * * * * *
ApproachDel: xxxxxx 631.6 xxxxxx xxxxxx
ApproachLOS: * F * * *
*****
Note: Queue reported is the number of cars per lane.
*****

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-----
Level Of Service Computation Report
2000 HCM Unsignalized Method (Base Volume Alternative)
*****
Intersection #6
*****
Average Delay (sec/veh):      0.0      Worst Case Level Of Service: A[ 0.0]
*****
Approach:      North Bound      South Bound      East Bound      West Bound
Movement:      L - T - R      L - T - R      L - T - R      L - T - R
-----|-----|-----|-----|
Control:      Stop Sign      Stop Sign      Uncontrolled      Uncontrolled
Rights:      Include      Include      Include      Include
Lanes:      0 0 1! 0 0      0 0 1! 0 0      1 0 1 1 0      1 0 1 1 0
-----|-----|-----|-----|
Volume Module: >> Count Date: 1 Jan 2021 << PM Peak
Base Vol:      0 0 0      0 0 0      0 697 0      0 815 0
Growth Adj: 1.30 1.30 1.30 1.30 1.30 1.30 1.30 1.30 1.30 1.30 1.30 1.30
Initial Bse: 0 0 0      0 0 0      0 906 0      0 1060 0
User 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
PHF Adj: 0.93 0.93 0.93 0.93 0.93 0.93 0.93 0.93 0.93 0.93 0.93 0.93
PHF Volume: 0 0 0      0 0 0      0 974 0      0 1139 0
Reduct Vol: 0 0 0      0 0 0      0 0 0      0 0 0
FinalVolume: 0 0 0      0 0 0      0 974 0      0 1139 0
-----|-----|-----|-----|
Critical Gap Module:
Critical Gp: 6.8 6.5 6.9 6.8 6.5 6.9 xxxxx xxxx xxxxx xxxxx xxxx xxxxx
FollowUpTim: 3.5 4.0 3.3 3.5 4.0 3.3 xxxxx xxxx xxxxx xxxxx xxxx xxxxx
-----|-----|-----|-----|
Capacity Module:
Cnflct Vol: 1544 2114 487 1626 2114 570 xxxxx xxxx xxxxx xxxxx xxxx xxxxx
Potent Cap.: 108 51 532 95 51 470 xxxxx xxxx xxxxx xxxxx xxxx xxxxx
Move Cap.: 108 51 532 95 51 470 xxxxx xxxx xxxxx xxxxx xxxx xxxxx
Volume/Cap: 0.00 0.00 0.00 0.00 0.00 0.00 xxxxx xxxx xxxxx xxxxx xxxx xxxxx
-----|-----|-----|-----|
Level Of Service Module:
2Way95thQ: xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
Control Del: xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
LOS by Move: * * * * * * * * * * * * * * * *
Movement: LT - LTR - RT LT - LTR - RT LT - LTR - RT LT - LTR - RT
Shared Cap.: xxxxx 0 xxxxx xxxxx 0 xxxxx xxxxx xxxxx xxxxx xxxxx xxxxx xxxxx
SharedQueue: xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxxx xxxxx
Shrd ConDel: xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxxx xxxxx
Shared LOS: * * * * * * * * * * * * * * * *
ApproachDel: xxxxxx xxxxxx xxxxxx xxxxxx
ApproachLOS: * * * *
*****
Note: Queue reported is the number of cars per lane.
*****

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-----
Level Of Service Computation Report
2000 HCM Unsignalized Method (Future Volume Alternative)
*****
Intersection #6
*****
Average Delay (sec/veh):      16.9      Worst Case Level Of Service: F[323.1]
*****
Approach:      North Bound      South Bound      East Bound      West Bound
Movement:      L - T - R      L - T - R      L - T - R      L - T - R
-----|-----|-----|-----|
Control:      Stop Sign      Stop Sign      Uncontrolled      Uncontrolled
Rights:      Include      Include      Include      Include
Lanes:      0 0 1! 0 0      0 0 1! 0 0      1 0 1 1 0      1 0 1 1 0
-----|-----|-----|-----|
Volume Module: >> Count Date: 1 Jan 2021 << PM Peak
Base Vol:      0 0 0      0 0 0      0 697 0      0 815 0
Growth Adj: 1.30 1.30 1.30 1.30 1.30 1.30 1.30 1.30 1.30 1.30 1.30 1.30
Initial Bse: 0 0 0      0 0 0      0 906 0      0 1060 0
Added Vol: 0 0 0      62 0 34      14 116 0      0 109 27
Passby: 0 0 0      17 0 9      7 -7 0      0 -14 14
Initial Fut: 0 0 0      79 0 43      21 1015 0      0 1155 41
User 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
PHF Adj: 0.93 0.93 0.93 0.93 0.93 0.93 0.93 0.93 0.93 0.93 0.93 0.93
PHF Volume: 0 0 0      85 0 46      23 1092 0      0 1241 44
Reduct Vol: 0 0 0      0 0 0      0 0 0      0 0 0
FinalVolume: 0 0 0      85 0 46      23 1092 0      0 1241 44
Critical Gap Module:
Critical Gp: 7.5 6.5 6.9 6.8 6.5 6.9 4.1 xxxx xxxxx xxxxx xxxx xxxxx
FollowUpTim: 3.5 4.0 3.3 3.5 4.0 3.3 2.2 xxxx xxxxx xxxxx xxxx xxxxx
-----|-----|-----|-----|
Capacity Module:
Cnflct Vol: 1757 2422 546 1854 2400 643 1285 xxxx xxxxx xxxx xxxx xxxxx
Potent Cap.: 55 33 487 67 34 421 546 xxxx xxxxx xxxx xxxx xxxxx
Move Cap.: 48 31 487 65 32 421 546 xxxx xxxxx xxxx xxxx xxxxx
Volume/Cap: 0.00 0.00 0.00 1.31 0.00 0.11 0.04 xxxx xxxx xxxx xxxx xxxxx
-----|-----|-----|-----|
Level Of Service Module:
2Way95thQ: xxxx xxxx xxxxx xxxx xxxx xxxxx 0.1 xxxx xxxxx xxxx xxxx xxxxx
Control Del:xxxxx xxxx xxxxx xxxxx xxxx xxxxx 11.9 xxxx xxxxx xxxxx xxxx xxxxx
LOS by Move: * * * * * B * * * * *
Movement: LT - LTR - RT LT - LTR - RT LT - LTR - RT LT - LTR - RT
Shared Cap.: xxxx 0 xxxxx xxxx 92 xxxxx xxxx xxxx xxxxx xxxx xxxx xxxxx
SharedQueue:xxxxx xxxx xxxxx xxxxx 9.9 xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
Shrd ConDel:xxxxx xxxx xxxxx xxxxx 323 xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
Shared LOS: * * * * * F * * * * *
ApproachDel: xxxxxx 323.1 xxxxxx xxxxxx
ApproachLOS: * F * *
*****
Note: Queue reported is the number of cars per lane.
*****

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-----
Level Of Service Computation Report
2000 HCM Unsignalized Method (Base Volume Alternative)
*****
Intersection #7
*****
Average Delay (sec/veh):      0.0      Worst Case Level Of Service: A[ 0.0]
*****
Approach:      North Bound      South Bound      East Bound      West Bound
Movement:      L - T - R      L - T - R      L - T - R      L - T - R
-----|-----|-----|-----|
Control:      Stop Sign      Stop Sign      Uncontrolled      Uncontrolled
Rights:      Include      Include      Include      Include
Lanes:      0 0 1! 0 0      0 0 1! 0 0      1 0 1 1 0      1 0 1 1 0
-----|-----|-----|-----|
Volume Module: >> Count Date: 1 Jan 2021 << PM Peak
Base Vol:      0 0 0      0 0 0      0 697 0      0 815 0
Growth Adj: 1.30 1.30 1.30 1.30 1.30 1.30 1.30 1.30 1.30 1.30 1.30 1.30
Initial Bse: 0 0 0      0 0 0      0 906 0      0 1060 0
User 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
PHF Adj: 0.93 0.93 0.93 0.93 0.93 0.93 0.93 0.93 0.93 0.93 0.93 0.93
PHF Volume: 0 0 0      0 0 0      0 974 0      0 1139 0
Reduct Vol: 0 0 0      0 0 0      0 0 0      0 0 0
FinalVolume: 0 0 0      0 0 0      0 974 0      0 1139 0
-----|-----|-----|-----|
Critical Gap Module:
Critical Gp: 6.8 6.5 6.9 6.8 6.5 6.9 xxxxx xxxx xxxxx xxxxx xxxx xxxxx
FollowUpTim: 3.5 4.0 3.3 3.5 4.0 3.3 xxxxx xxxx xxxxx xxxxx xxxx xxxxx
-----|-----|-----|-----|
Capacity Module:
Cnflct Vol: 1544 2114 487 1626 2114 570 xxxxx xxxxx xxxxx xxxxx xxxxx xxxxx
Potent Cap.: 108 51 532 95 51 470 xxxxx xxxxx xxxxx xxxxx xxxxx xxxxx
Move Cap.: 108 51 532 95 51 470 xxxxx xxxxx xxxxx xxxxx xxxxx xxxxx
Volume/Cap: 0.00 0.00 0.00 0.00 0.00 0.00 xxxxx xxxxx xxxxx xxxxx xxxxx xxxxx
-----|-----|-----|-----|
Level Of Service Module:
2Way95thQ: xxxxx xxxxx xxxxx xxxxx xxxxx xxxxx xxxxx xxxxx xxxxx xxxxx xxxxx xxxxx
Control Del: xxxxx xxxxx xxxxx xxxxx xxxxx xxxxx xxxxx xxxxx xxxxx xxxxx xxxxx xxxxx
LOS by Move: * * * * * * * * * * * * * * * *
Movement: LT - LTR - RT LT - LTR - RT LT - LTR - RT LT - LTR - RT
Shared Cap.: xxxxx 0 xxxxx xxxxx 0 xxxxx xxxxx xxxxx xxxxx xxxxx xxxxx xxxxx
SharedQueue: xxxxx xxxxx xxxxx xxxxx xxxxx xxxxx xxxxx xxxxx xxxxx xxxxx xxxxx xxxxx
Shrd ConDel: xxxxx xxxxx xxxxx xxxxx xxxxx xxxxx xxxxx xxxxx xxxxx xxxxx xxxxx xxxxx
Shared LOS: * * * * * * * * * * * * * * * *
ApproachDel: xxxxxx xxxxxx xxxxxx xxxxxx
ApproachLOS: * * * *
*****
Note: Queue reported is the number of cars per lane.
*****

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-----
Level Of Service Computation Report
2000 HCM Unsignalized Method (Future Volume Alternative)
*****
Intersection #7
*****
Average Delay (sec/veh):      6.8      Worst Case Level Of Service: F[144.6]
*****
Approach:      North Bound      South Bound      East Bound      West Bound
Movement:      L - T - R      L - T - R      L - T - R      L - T - R
-----|-----|-----|-----|
Control:      Stop Sign      Stop Sign      Uncontrolled      Uncontrolled
Rights:      Include      Include      Include      Include
Lanes:      0 0 1! 0 0      0 0 1! 0 0      1 0 1 1 0      1 0 1 1 0
-----|-----|-----|-----|
Volume Module: >> Count Date: 1 Jan 2021 << PM Peak
Base Vol:      0 0 0      0 0 0      0 697 0      0 815 0
Growth Adj: 1.30 1.30 1.30 1.30 1.30 1.30 1.30 1.30 1.30 1.30 1.30 1.30
Initial Bse: 0 0 0      0 0 0      0 906 0      0 1060 0
Added Vol: 21 0 38      0 0 0      0 149 30      55 115 0
Passby: 16 0 31      0 0 0      0 -23 23      44 -44 0
Initial Fut: 37 0 69      0 0 0      0 1032 53      99 1131 0
User 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
PHF Adj: 0.93 0.93 0.93 0.93 0.93 0.93 0.93 0.93 0.93 0.93 0.93 0.93
PHF Volume: 40 0 74      0 0 0      0 1110 57      106 1216 0
Reduct Vol: 0 0 0      0 0 0      0 0 0      0 0 0
FinalVolume: 40 0 74      0 0 0      0 1110 57      106 1216 0
Critical Gap Module:
Critical Gp: 6.8 6.5 6.9 7.5 6.5 6.9 xxxxx xxxxx xxxxx 4.1 xxxxx xxxxx
FollowUpTim: 3.5 4.0 3.3 3.5 4.0 3.3 xxxxx xxxxx xxxxx 2.2 xxxxx xxxxx
-----|-----|-----|-----|
Capacity Module:
Cnflct Vol: 1959 2567 583 1983 2595 608 xxxxx xxxxx xxxxx 1167 xxxxx xxxxx
Potent Cap.: 57 26 460 37 25 444 xxxxx xxxxx xxxxx 606 xxxxx xxxxx
Move Cap.: 49 22 460 27 21 444 xxxxx xxxxx xxxxx 606 xxxxx xxxxx
Volume/Cap: 0.81 0.00 0.16 0.00 0.00 0.00 xxxxx xxxxx xxxxx 0.18 xxxxx xxxxx
-----|-----|-----|-----|
Level Of Service Module:
2Way95thQ: xxxxx xxxxx xxxxx xxxxx xxxxx xxxxx xxxxx xxxxx xxxxx 0.6 xxxxx xxxxx
Control Del: xxxxx xxxxx xxxxx xxxxx xxxxx xxxxx xxxxx xxxxx xxxxx 12.2 xxxxx xxxxx
LOS by Move: * * * * * * * * * * B * *
Movement: LT - LTR - RT LT - LTR - RT LT - LTR - RT LT - LTR - RT
Shared Cap.: xxxxx 118 xxxxx xxxxx 0 xxxxx xxxxx xxxxx xxxxx xxxxx xxxxx xxxxx
SharedQueue: xxxxx 6.3 xxxxx xxxxx xxxxx xxxxx xxxxx xxxxx xxxxx xxxxx xxxxx
Shrd ConDel: xxxxx 145 xxxxx xxxxx xxxxx xxxxx xxxxx xxxxx xxxxx xxxxx xxxxx
Shared LOS: * F * * * * * * * * * *
ApproachDel: 144.6 xxxxxxx xxxxxxx xxxxxxx
ApproachLOS: F * * *
*****
Note: Queue reported is the number of cars per lane.
*****

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-----
                        Level Of Service Computation Report
                2000 HCM Unsignalized Method (Base Volume Alternative)
*****
Intersection #8 Utah St-Clearwater Dr/ Clearwater Blvd.
*****
Average Delay (sec/veh):      9.2      Worst Case Level Of Service: F[317.2]
*****
Street Name:      Utah St-Clearwater Dr      Clearwater Blvd
Approach:      North Bound      South Bound      East Bound      West Bound
Movement:      L - T - R      L - T - R      L - T - R      L - T - R
-----|-----|-----|-----|-----|
Control:      Stop Sign      Stop Sign      Uncontrolled      Uncontrolled
Rights:      Include      Include      Include      Include
Lanes:      0 0 1! 0 0      0 0 1! 0 0      1 0 1 1 0      1 0 1 1 0
-----|-----|-----|-----|-----|
Volume Module: >> Count Date: 1 Jan 2021 << PM Peak Hour
Base Vol:      3 0 41      36 1 6      9 645 7 56 822 10
Growth Adj: 1.30 1.30 1.30 1.30 1.30 1.30 1.30 1.30 1.30 1.30 1.30 1.30
Initial Bse: 4 0 53      47 1 8      12 839 9 73 1069 13
User 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
PHF Adj: 0.94 0.94 0.94 0.94 0.94 0.94 0.94 0.94 0.94 0.94 0.94 0.94
PHF Volume: 4 0 57      50 1 8      12 892 10 77 1137 14
Reduct Vol: 0 0 0      0 0 0      0 0 0 0 0 0
FinalVolume: 4 0 57      50 1 8      12 892 10 77 1137 14
-----|-----|-----|-----|-----|
Critical Gap Module:
Critical Gp: 7.5 6.5 6.9 7.5 6.5 6.9 4.1 xxxx xxxxx 4.1 xxxx xxxxx
FollowUpTim: 3.5 4.0 3.3 3.5 4.0 3.3 2.2 xxxx xxxxx 2.2 xxxx xxxxx
-----|-----|-----|-----|-----|
Capacity Module:
Cnflct Vol: 1646 2227 451 1770 2225 575 1151 xxxx xxxxx 902 xxxx xxxxx
Potent Cap.: 67 44 561 54 44 466 615 xxxx xxxxx 762 xxxx xxxxx
Move Cap.: 58 38 561 44 38 466 615 xxxx xxxxx 762 xxxx xxxxx
Volume/Cap: 0.07 0.00 0.10 1.13 0.04 0.02 0.02 xxxx xxxx 0.10 xxxx xxxx
-----|-----|-----|-----|-----|
Level Of Service Module:
2Way95thQ: xxxx xxxx xxxxx xxxx xxxx xxxxx 0.1 xxxx xxxxx 0.3 xxxx xxxxx
Control Del:xxxxx xxxx xxxxx xxxxx xxxx xxxxx 11.0 xxxx xxxxx 10.3 xxxx xxxxx
LOS by Move: * * * * * B * * B * *
Movement: LT - LTR - RT LT - LTR - RT LT - LTR - RT LT - LTR - RT
Shared Cap.: xxxx 353 xxxxx xxxx 50 xxxxx xxxx xxxx xxxxx xxxx xxxx xxxxx
SharedQueue:xxxxx 0.6 xxxxx xxxxx 5.3 xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
Shrd ConDel:xxxxx 17.3 xxxxx xxxxx 317 xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
Shared LOS: * C * * * F * * * * *
ApproachDel: 17.3 317.2 xxxxxx xxxxxx
ApproachLOS: C F * *
*****
Note: Queue reported is the number of cars per lane.
*****

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-----
Level Of Service Computation Report
2000 HCM Unsignalized Method (Future Volume Alternative)
*****
Intersection #8 Utah St-Clearwater Dr/ Clearwater Blvd.
*****
Average Delay (sec/veh): 579.2 Worst Case Level Of Service: F[5036.3]
*****
Street Name: Utah St-Clearwater Dr Clearwater Blvd
Approach: North Bound South Bound East Bound West Bound
Movement: L - T - R L - T - R L - T - R L - T - R
-----|-----|-----|-----|-----|
Control: Stop Sign Stop Sign Uncontrolled Uncontrolled
Rights: Include Include Include Include
Lanes: 0 0 1! 0 0 0 0 1! 0 0 1 0 1 1 0 1 0 1 1 0
-----|-----|-----|-----|-----|
Volume Module: >> Count Date: 1 Jan 2021 << PM Peak Hour
Base Vol: 3 0 41 36 1 6 9 645 7 56 822 10
Growth Adj: 1.30 1.30 1.30 1.30 1.30 1.30 1.30 1.30 1.30 1.30 1.30 1.30
Initial Bse: 4 0 53 47 1 8 12 839 9 73 1069 13
Added Vol: 0 0 0 101 0 55 43 144 0 0 115 80
In Process: 0 0 0 70 0 36 35 -35 0 0 -75 75
Initial Fut: 4 0 53 218 1 99 90 948 9 73 1109 168
User 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
PHF Adj: 0.94 0.94 0.94 0.94 0.94 0.94 0.94 0.94 0.94 0.94 0.94 0.94
PHF Volume: 4 0 57 232 1 105 95 1008 10 77 1179 179
Reduct Vol: 0 0 0 0 0 0 0 0 0 0 0 0
FinalVolume: 4 0 57 232 1 105 95 1008 10 77 1179 179
Critical Gap Module:
Critical Gp: 7.5 6.5 6.9 7.5 6.5 6.9 4.1 xxxx xxxxx 4.1 xxxx xxxxx
FollowUpTim: 3.5 4.0 3.3 3.5 4.0 3.3 2.2 xxxx xxxxx 2.2 xxxx xxxxx
-----|-----|-----|-----|-----|
Capacity Module:
Cnflct Vol: 1949 2717 509 2118 2632 679 1358 xxxx xxxxx 1018 xxxx xxxxx
Potent Cap.: 40 21 515 29 24 399 513 xxxx xxxxx 690 xxxx xxxxx
Move Cap.: 22 15 515 21 17 399 513 xxxx xxxxx 690 xxxx xxxxx
Volume/Cap: 0.19 0.00 0.11 11.27 0.08 0.26 0.19 xxxx xxxx 0.11 xxxx xxxx
-----|-----|-----|-----|-----|
Level Of Service Module:
2Way95thQ: xxxx xxxx xxxxx xxxx xxxx xxxxx 0.7 xxxx xxxxx 0.4 xxxx xxxxx
Control Del:xxxxx xxxx xxxxx xxxxx xxxx xxxxx 13.6 xxxx xxxxx 10.9 xxxx xxxxx
LOS by Move: * * * * * B * * B * *
Movement: LT - LTR - RT LT - LTR - RT LT - LTR - RT LT - LTR - RT
Shared Cap.: xxxx 201 xxxxx xxxx 29 xxxxx xxxx xxxx xxxxx xxxx xxxx xxxxx
SharedQueue:xxxxx 1.2 xxxxx xxxxx 41.7 xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
Shrd ConDel:xxxxx 30.5 xxxxx xxxxx 5036 xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
Shared LOS: * D * * F * * * * *
ApproachDel: 30.5 5036.3 xxxxxx xxxxxx
ApproachLOS: D F * *
*****
Note: Queue reported is the number of cars per lane.
*****

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-----
Level Of Service Computation Report
2000 HCM Operations Method (Base Volume Alternative)
*****
Intersection #9 Steptoe St/ Clearwater Blvd
*****
Cycle (sec):          120          Critical Vol./Cap.(X):          0.754
Loss Time (sec):      12 (Y+R=4.0 sec) Average Delay (sec/veh):      35.4
Optimal Cycle:        71          Level Of Service:          D
*****
Street Name:          Steptoe St          Clearwater Blvd
Approach:             North Bound          South Bound          East Bound          West Bound
Movement:             L - T - R          L - T - R          L - T - R          L - T - R
-----|-----|-----|-----|
Control:              Permit+Prot          Permit+Prot          Permit+Prot          Permit+Prot
Rights:               Include          Include          Include          Include
Min. Green:           0 0 0          0 0 0          0 0 0          0 0 0
Lanes:                1 0 2 0 1          1 0 2 0 1          1 0 1 1 0          1 0 2 0 1
-----|-----|-----|-----|
Volume Module: >> Count Date: 1 Jan 2021 << PM Peak Hour
Base Vol:             31 160 18 153 267 263 243 456 67 39 593 230
Growth Adj:           1.30 1.30 1.30 1.30 1.30 1.30 1.30 1.30 1.30 1.30 1.30 1.30
Initial Bse:          40 208 23 199 347 342 316 593 87 51 771 299
User 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
PHF Adj:              0.92 0.92 0.92 0.92 0.92 0.92 0.92 0.92 0.92 0.92 0.92 0.92
PHF Volume:           44 226 25 216 377 372 343 644 95 55 838 325
Reduct Vol:           0 0 0 0 0 0 0 0 0 0 0 0
Reduced Vol:          44 226 25 216 377 372 343 644 95 55 838 325
PCE 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
MLF 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
FinalVolume:          44 226 25 216 377 372 343 644 95 55 838 325
-----|-----|-----|-----|
Saturation Flow Module:
Sat/Lane:             1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900
Adjustment:           0.29 0.95 0.85 0.68 0.95 0.85 0.40 0.93 0.93 0.23 0.95 0.85
Lanes:                1.00 2.00 1.00 1.00 2.00 1.00 1.00 1.74 0.26 1.00 2.00 1.00
Final Sat.:           545 3610 1615 1285 3610 1615 766 3088 454 433 3610 1615
-----|-----|-----|-----|
Capacity Analysis Module:
Vol/Sat:              0.08 0.06 0.02 0.17 0.10 0.23 0.45 0.21 0.21 0.13 0.23 0.20
Crit Moves:          ****          ****          ****
Green/Cycle:          0.17 0.12 0.12 0.36 0.31 0.31 0.59 0.49 0.49 0.41 0.31 0.31
Volume/Cap:           0.26 0.54 0.14 0.40 0.34 0.75 0.60 0.43 0.43 0.18 0.75 0.65
Uniform Del:          49.1 50.0 47.6 33.0 32.3 37.5 33.8 19.7 19.7 32.9 37.3 35.9
IncramntDel:          0.8 1.4 0.3 0.5 0.2 6.4 1.8 0.2 0.2 0.3 2.9 3.1
InitQueueDel:         0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0
Delay 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
Delay/Veh:            50.0 51.4 48.0 33.5 32.5 43.9 35.6 19.9 19.9 33.2 40.3 39.0
User DelAdj:          1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
AdjDel/Veh:           50.0 51.4 48.0 33.5 32.5 43.9 35.6 19.9 19.9 33.2 40.3 39.0
LOS by Move:          D D D C C D D B B C D D
HCM2kAvgQ:            2 5 1 6 6 14 9 9 9 1 16 11
*****
Note: Queue reported is the number of cars per lane.
*****

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                        Level Of Service Computation Report
                2000 HCM Operations Method (Future Volume Alternative)
*****
Intersection #9 Steptoe St/ Clearwater Blvd
*****
Cycle (sec):          120          Critical Vol./Cap.(X):          0.862
Loss Time (sec):      12 (Y+R=4.0 sec)  Average Delay (sec/veh):      41.4
Optimal Cycle:        117          Level Of Service:          D
*****
Street Name:          Steptoe St          Clearwater Blvd
Approach:              North Bound          South Bound          East Bound          West Bound
Movement:              L - T - R          L - T - R          L - T - R          L - T - R
-----|-----|-----|-----|
Control:                Permit+Prot          Permit+Prot          Permit+Prot          Permit+Prot
Rights:                  Include          Include          Include          Include
Min. Green:              0      0      0          0      0      0          0      0      0          0      0      0
Lanes:                   1  0  2  0  1          1  0  2  0  1          1  0  1  1  0          1  0  2  0  1
-----|-----|-----|-----|
Volume Module: >> Count Date: 1 Jan 2021 << PM Peak Hour
Base Vol:                31  160      18      153  267      263      243  456      67      39  593      230
Growth Adj:              1.30  1.30      1.30      1.30  1.30      1.30      1.30  1.30      1.30      1.30  1.30      1.30
Initial Bse:              40  208      23      199  347      342      316  593      87      51  771      299
Added Vol:                32  65      133          0  23      53          67  138      40      48  110      0
PasserByVol:              0      0      0          0      0      0          0      0      0          0      0      0
Initial Fut:              72  273      156      199  370      395      383  731      127      99  881      299
User 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
PHF Adj:                  0.92  0.92      0.92      0.92  0.92      0.92      0.92  0.92      0.92      0.92  0.92      0.92
PHF Volume:               79  297      170      216  402      429      416  794      138      107  957      325
Reduct Vol:               0      0      0          0      0      0          0      0      0          0      0      0
Reduced Vol:              79  297      170      216  402      429      416  794      138      107  957      325
PCE 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
MLF 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
FinalVolume:              79  297      170      216  402      429      416  794      138      107  957      325
-----|-----|-----|-----|
Saturation Flow Module:
Sat/Lane:                1900  1900      1900      1900  1900      1900      1900  1900      1900      1900  1900      1900
Adjustment:              0.33  0.95      0.85      0.65  0.95      0.85      0.44  0.93      0.93      0.18  0.95      0.85
Lanes:                   1.00  2.00      1.00      1.00  2.00      1.00      1.00  1.70      0.30      1.00  2.00      1.00
Final Sat.:              632  3610      1615      1227  3610      1615      827  3008      523      344  3610      1615
-----|-----|-----|-----|
Capacity Analysis Module:
Vol/Sat:                  0.12  0.08      0.11      0.18  0.11      0.27      0.50  0.26      0.26      0.31  0.27      0.20
Crit Moves:              ****          ****          ****
Green/Cycle:              0.24  0.16      0.16      0.37  0.30      0.30      0.58  0.45      0.45      0.42  0.30      0.30
Volume/Cap:              0.35  0.51      0.65      0.44  0.38      0.89      0.73  0.58      0.58      0.36  0.89      0.68
Uniform Del:             45.3  45.9      47.1      34.7  33.4      40.4      36.2  24.4      24.4      41.6  40.4      37.2
IncremntDel:             1.0  0.7      5.7      0.6  0.2      18.9      4.6  0.6      0.6      0.8  9.8      3.9
InitQueuDel:             0.0  0.0      0.0      0.0  0.0      0.0      0.0  0.0      0.0      0.0  0.0      0.0
Delay 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
Delay/Veh:               46.3  46.7      52.8      35.3  33.6      59.3      40.8  25.0      25.0      42.3  50.2      41.1
User DelAdj:             1.00  1.00      1.00      1.00  1.00      1.00      1.00  1.00      1.00      1.00  1.00      1.00
AdjDel/Veh:             46.3  46.7      52.8      35.3  33.6      59.3      40.8  25.0      25.0      42.3  50.2      41.1
LOS by Move:             D      D      D          D      C      E          D      C      C          D      D      D
HCM2kAvgQ:                3      6      7          6      6      19      12      14      14          3      21      11
*****

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Level Of Service Computation Report
2000 HCM Operations Method (Base Volume Alternative)
*****
Intersection #10 Columbia Ctr Blvd/Clearwater Blvd
*****
Cycle (sec):          120          Critical Vol./Cap.(X):          0.895
Loss Time (sec):      12 (Y+R=4.0 sec) Average Delay (sec/veh):      47.7
Optimal Cycle:        120          Level Of Service:              D
*****
Street Name:          Columbia Ctr Blvd          Clearwater Blvd
Approach:              North Bound          South Bound          East Bound          West Bound
Movement:              L - T - R          L - T - R          L - T - R          L - T - R
-----|-----|-----|-----|
Control:              Split Phase          Split Phase          Permit+Prot          Permit+Prot
Rights:                Include          Include          Include          Include
Min. Green:            0      0      0          0      0      0          0      0      0          0      0      0
Lanes:                 1  0  2  1  0          1  1  1  0  1          1  0  1  1  0          1  0  2  0  2
-----|-----|-----|-----|
Volume Module: >> Count Date: 1 Jan 2021 << PM Peak Hour
Base Vol:             160  416  32  426  855  288  197  324  166  54  431  419
Growth Adj:           1.30  1.30  1.30  1.30  1.30  1.30  1.30  1.30  1.30  1.30  1.30  1.30
Initial Bse:          208  541  42  554  1112  374  256  421  216  70  560  545
User 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
PHF Adj:              0.94  0.94  0.94  0.94  0.94  0.94  0.94  0.94  0.94  0.94  0.94  0.94
PHF Volume:           221  575  44  589  1182  398  272  448  230  75  596  579
Reduct Vol:           0      0      0          0      0      0          0      0      0          0      0      0
Reduced Vol:          221  575  44  589  1182  398  272  448  230  75  596  579
PCE 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
MLF 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
FinalVolume:          221  575  44  589  1182  398  272  448  230  75  596  579
-----|-----|-----|-----|
Saturation Flow Module:
Sat/Lane:             1900  1900  1900  1900  1900  1900  1900  1900  1900  1900  1900  1900
Adjustment:           0.95  0.90  0.90  0.93  0.93  0.85  0.42  0.90  0.90  0.16  0.95  0.75
Lanes:                1.00  2.79  0.21  1.00  2.00  1.00  1.00  1.32  0.68  1.00  2.00  2.00
Final Sat.:           1805  4764  366  1776  3552  1615  805  2265  1161  310  3610  2842
-----|-----|-----|-----|
Capacity Analysis Module:
Vol/Sat:              0.12  0.12  0.12  0.33  0.33  0.25  0.34  0.20  0.20  0.24  0.17  0.20
Crit Moves:           ****          ****          ****          ****
Green/Cycle:          0.14  0.14  0.14  0.37  0.37  0.37  0.41  0.33  0.33  0.31  0.23  0.23
Volume/Cap:           0.90  0.89  0.89  0.90  0.90  0.67  0.67  0.61  0.61  0.34  0.73  0.90
Uniform Del:          51.0  50.9  50.9  35.7  35.7  31.6  41.8  34.0  34.0  45.8  43.0  45.1
IncramntDel:          32.3  13.2  13.2  5.9  6.1  2.9  4.4  1.0  1.0  0.9  3.4  15.7
InitQueueDel:         0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0
Delay 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
Delay/Veh:            83.3  64.1  64.1  41.6  41.8  34.5  46.2  35.0  35.0  46.7  46.4  60.8
User DelAdj:          1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00
AdjDel/Veh:           83.3  64.1  64.1  41.6  41.8  34.5  46.2  35.0  35.0  46.7  46.4  60.8
LOS by Move:          F      E      E      D      D      C      D      C      C      D      D      E
HCM2kAvgQ:            11  11  11  25  25  13  9  11  11  2  12  15
*****
Note: Queue reported is the number of cars per lane.
*****

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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)
*****
Intersection #10 Columbia Ctr Blvd/Clearwater Blvd
*****
Cycle (sec):          120          Critical Vol./Cap.(X):          0.951
Loss Time (sec):      12 (Y+R=4.0 sec) Average Delay (sec/veh):      54.8
Optimal Cycle:        180          Level Of Service:          D
*****
Street Name:          Columbia Ctr Blvd          Clearwater Blvd
Approach:              North Bound          South Bound          East Bound          West Bound
Movement:              L - T - R          L - T - R          L - T - R          L - T - R
-----|-----|-----|-----|
Control:              Split Phase          Split Phase          Permit+Prot          Permit+Prot
Rights:                Include          Include          Include          Include
Min. Green:            0 0 0          0 0 0          0 0 0          0 0 0
Lanes:                 1 0 2 1 0          1 1 1 0 1          1 0 1 1 0          1 0 2 0 2
-----|-----|-----|-----|
Volume Module: >> Count Date: 1 Jan 2021 << PM Peak Hour
Base Vol:             160 416 32 426 855 288 197 324 166 54 431 419
Growth Adj:           1.30 1.30 1.30 1.30 1.30 1.30 1.30 1.30 1.30 1.30 1.30 1.30
Initial Bse:           208 541 42 554 1112 374 256 421 216 70 560 545
Added Vol:             54 0 0 0 0 36 62 116 93 0 68 0
In Process:            0 0 0 0 0 0 0 0 0 0 0 0
Initial Fut:           262 541 42 554 1112 410 318 537 309 70 628 545
User 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
PHF Adj:               0.94 0.94 0.94 0.94 0.94 0.94 0.94 0.94 0.94 0.94 0.94 0.94
PHF Volume:           279 575 44 589 1182 437 338 571 329 75 668 579
Reduct Vol:            0 0 0 0 0 0 0 0 0 0 0 0
Reduced Vol:           279 575 44 589 1182 437 338 571 329 75 668 579
PCE 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
MLF 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
Final Volume:          279 575 44 589 1182 437 338 571 329 75 668 579
-----|-----|-----|-----|
Saturation Flow Module:
Sat/Lane:              1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900
Adjustment:            0.95 0.90 0.90 0.93 0.93 0.85 0.48 0.90 0.90 0.18 0.95 0.75
Lanes:                 1.00 2.79 0.21 1.00 2.00 1.00 1.00 1.27 0.73 1.00 2.00 2.00
Final Sat.:            1805 4764 366 1776 3552 1615 918 2166 1245 336 3610 2842
-----|-----|-----|-----|
Capacity Analysis Module:
Vol/Sat:               0.15 0.12 0.12 0.33 0.33 0.27 0.37 0.26 0.26 0.22 0.19 0.20
Crit Moves:            ****          ****          ****
Green/Cycle:           0.16 0.16 0.16 0.34 0.34 0.34 0.42 0.35 0.35 0.28 0.21 0.21
Volume/Cap:            0.98 0.76 0.76 0.97 0.98 0.79 0.76 0.76 0.76 0.38 0.89 0.98
Uniform Del:           50.3 48.4 48.4 39.0 39.1 35.7 41.8 34.8 34.8 0.0 46.1 47.2
IncrementDel:          46.6 4.3 4.3 15.1 15.8 7.7 7.4 3.0 3.0 1.2 12.3 30.9
InitQueueDel:          0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0
Delay 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
Delay/Veh:             96.8 52.7 52.7 54.1 54.9 43.5 49.2 37.8 37.8 1.2 58.4 78.0
User DelAdj:           1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
AdjDel/Veh:            96.8 52.7 52.7 54.1 54.9 43.5 49.2 37.8 37.8 1.2 58.4 78.0
LOS by Move:           F D D D D D D D D A E E
HCM2kAvgQ:             15 10 10 28 28 16 12 17 17 3 16 17
*****

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Level Of Service Computation Report
2000 HCM Unsignalized Method (Future Volume Alternative)
*****
Intersection #2 I-82 WB Ramps/Badger Rd
*****
Average Delay (sec/veh):      5.0      Worst Case Level Of Service: C[ 16.1]
*****
Street Name:      Badger Rd      I-82 WB Ramps
Approach:      North Bound      South Bound      East Bound      West Bound
Movement:      L - T - R      L - T - R      L - T - R      L - T - R
-----|-----|-----|-----|-----|
Control:      Uncontrolled      Uncontrolled      Stop Sign      Stop Sign
Rights:      Include      Include      Include      Include
Lanes:      0 0 0 1 0      1 0 2 0 0      0 0 0 0 0      1 0 0 0 1
-----|-----|-----|-----|-----|
Volume Module: >> Count Date: 17 Nov 2015 << PM Peak Hour
Base Vol:      0 266 8 105 417 0 0 0 0 46 0 258
Growth Adj: 1.10 1.10 1.10 1.10 1.10 1.10 1.10 1.10 1.10 1.10 1.10 1.10
Initial Bse: 0 293 9 116 459 0 0 0 0 51 0 284
Added Vol: 0 32 0 22 22 0 0 0 0 0 0 11
In Process: 0 22 0 3 23 0 0 0 0 0 0 1
Initial Fut: 0 347 9 141 504 0 0 0 0 51 0 296
User 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
PHF Adj: 0.93 0.93 0.93 0.93 0.93 0.93 0.93 0.93 0.93 0.93 0.93 0.93
PHF Volume: 0 373 9 151 542 0 0 0 0 54 0 318
Reduct Vol: 0 0 0 0 0 0 0 0 0 0 0 0
FinalVolume: 0 373 9 151 542 0 0 0 0 54 0 318
Critical Gap Module:
Critical Gp:xxxxx xxxx xxxxx 4.1 xxxx xxxxx xxxxx xxxx xxxxx 6.4 xxxx 6.2
FollowUpTim:xxxxx xxxx xxxxx 2.2 xxxx xxxxx xxxxx xxxx xxxxx 3.5 xxxx 3.3
-----|-----|-----|-----|-----|
Capacity Module:
Cnflct Vol: xxxx xxxx xxxxx 382 xxxx xxxxx xxxx xxxx xxxxx 950 xxxx 377
Potent Cap.: xxxx xxxx xxxxx 1187 xxxx xxxxx xxxx xxxx xxxxx 291 xxxx 674
Move Cap.: xxxx xxxx xxxxx 1187 xxxx xxxxx xxxx xxxx xxxxx 263 xxxx 674
Volume/Cap: xxxx xxxx xxxx 0.13 xxxx xxxx xxxx xxxx xxxx 0.21 xxxx 0.47
-----|-----|-----|-----|-----|
Level Of Service Module:
2Way95thQ: xxxx xxxx xxxxx 0.4 xxxx xxxxx xxxx xxxx xxxxx 0.8 xxxx 2.5
Control Del:xxxxx xxxx xxxxx 8.5 xxxx xxxxx xxxxx xxxx xxxxx 22.3 xxxx 15.0
LOS by Move: * * * A * * * * * C * C
Movement: LT - LTR - RT LT - LTR - RT LT - LTR - RT LT - LTR - RT
Shared Cap.: xxxx xxxx xxxxx xxxx xxxx xxxxx xxxx xxxx xxxxx xxxx xxxx xxxxx
SharedQueue:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
Shrd ConDel:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
Shared LOS: * * * * * * * * * * * * * * *
ApproachDel: xxxxxx xxxxxx xxxxxx 16.1
ApproachLOS: * * * C
*****
Note: Queue reported is the number of cars per lane.
*****

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Level Of Service Computation Report
2000 HCM Unsignalized Method (Future Volume Alternative)
*****
Intersection #2 I-82 WB Ramps/Badger Rd
*****
Average Delay (sec/veh):      7.2      Worst Case Level Of Service: C[ 24.3]
*****
Street Name:      Badger Rd      I-82 WB Ramps
Approach:      North Bound      South Bound      East Bound      West Bound
Movement:      L - T - R      L - T - R      L - T - R      L - T - R
-----|-----|-----|-----|-----|
Control:      Uncontrolled      Uncontrolled      Stop Sign      Stop Sign
Rights:      Include      Include      Include      Include
Lanes:      0 0 0 1 0      1 0 2 0 0      0 0 0 0 0      0 0 1! 0 0
-----|-----|-----|-----|-----|
Volume Module: >> Count Date: 17 Nov 2015 << PM Peak Hour
Base Vol:      0 266 8 105 417 0 0 0 0 46 0 258
Growth Adj: 1.10 1.10 1.10 1.10 1.10 1.10 1.10 1.10 1.10 1.10 1.10 1.10
Initial Bse: 0 293 9 116 459 0 0 0 0 51 0 284
Added Vol: 0 32 0 22 22 0 0 0 0 0 0 11
In Process: 0 22 0 3 23 0 0 0 0 0 0 1
Initial Fut: 0 347 9 141 504 0 0 0 0 51 0 296
User 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
PHF Adj: 0.93 0.93 0.93 0.93 0.93 0.93 0.93 0.93 0.93 0.93 0.93 0.93
PHF Volume: 0 373 9 151 542 0 0 0 0 54 0 318
Reduct Vol: 0 0 0 0 0 0 0 0 0 0 0 0
FinalVolume: 0 373 9 151 542 0 0 0 0 54 0 318
Critical Gap Module:
Critical Gp:xxxxx xxxx xxxxx 4.1 xxxx xxxxxx xxxxxx xxxx xxxxxx 6.4 6.5 6.2
FollowUpTim:xxxxx xxxx xxxxxx 2.2 xxxx xxxxxx xxxxxx xxxx xxxxxx 3.5 4.0 3.3
-----|-----|-----|-----|-----|
Capacity Module:
Cnflct Vol: xxxx xxxx xxxxxx 382 xxxx xxxxxx xxxx xxxx xxxxxx 950 1221 377
Potent Cap.: xxxx xxxx xxxxxx 1187 xxxx xxxxxx xxxx xxxx xxxxxx 291 181 674
Move Cap.: xxxx xxxx xxxxxx 1187 xxxx xxxxxx xxxx xxxx xxxxxx 263 158 674
Volume/Cap: xxxx xxxx xxxx 0.13 xxxx xxxx xxxx xxxx xxxx 0.21 0.00 0.47
-----|-----|-----|-----|-----|
Level Of Service Module:
2Way95thQ: xxxx xxxx xxxxxx 0.4 xxxx xxxxxx xxxx xxxx xxxxxx xxxx xxxx xxxxxx
Control Del:xxxxx xxxx xxxxxx 8.5 xxxx xxxxxx xxxxxx xxxx xxxxxx xxxxxx xxxx xxxxxx
LOS by Move: * * * A * * * * * * * * *
Movement: LT - LTR - RT LT - LTR - RT LT - LTR - RT LT - LTR - RT
Shared Cap.: xxxx xxxx xxxxxx xxxx xxxx xxxxxx xxxx xxxx xxxxxx xxxx 548 xxxxxx
SharedQueue:xxxxx xxxx xxxxxx xxxxxx xxxx xxxxxx xxxxxx xxxx xxxxxx xxxxxx 5.1 xxxxxx
Shrd ConDel:xxxxx xxxx xxxxxx xxxxxx xxxx xxxxxx xxxxxx xxxx xxxxxx xxxxxx 24.3 xxxxxx
Shared LOS: * * * * * * * * * * * * * C *
ApproachDel: xxxxxx xxxxxx xxxxxx 24.3
ApproachLOS: * * * C
*****
Note: Queue reported is the number of cars per lane.
*****

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-----
                        Level Of Service Computation Report
                      FHWA Roundabout Method (Future Volume Alternative)
*****
Intersection #4 W 10th Ave/ Clearwater Blvd
*****
Average Delay (sec/veh):      3.9      Level Of Service: A
*****
Street Name:                  W 10th Ave                      Clearwater Blvd
Approach:                     North Bound                    South Bound                    East Bound                    West Bound
Movement:                     L - T - R                      L - T - R                      L - T - R                      L - T - R
-----|-----|-----|-----|-----|
Control:                       Yield Sign                    Yield Sign                    Yield Sign                    Yield Sign
Lanes:                         1                      1                      2                      2
-----|-----|-----|-----|-----|
Volume Module: >> Count Date: 17 Nov 2015 << PM Peak Hour
Base Vol:      92    0    6    0    0    0    0    464    49    3    625    0
Growth Adj:    1.10 1.10 1.10 1.10 1.10 1.10 1.10 1.10 1.10 1.10 1.10 1.10
Initial Bse:   101    0    7    0    0    0    0    510    54    3    688    0
Added Vol:      0   28    0   112   28   75   74    0    0    0    0   110
In Process/:    5    0    0    90    0   49   48  -38    2    0  -74   88
Initial Fut:   106   28    7   202   28  124   122  472   56    3   614   198
User 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
PHF Adj:       0.93 0.93 0.93 0.93 0.93 0.93 0.93 0.93 0.93 0.93 0.93 0.93
PHF Volume:    114   30    7   217   30   133   131  508   60    4   660   213
Reduct Vol:     0    0    0    0    0    0    0    0    0    0    0    0
Reduced Vol:   114   30    7   217   30   133   131  508   60    4   660   213
PCE 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
MLF 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
FinalVolume:   114   30    7   217   30   133   131  508   60    4   660   213
-----|-----|-----|-----|-----|
PCE Module:
AutoPCE:       114   30    7   217   30   133   131  508   60    4   660   213
TruckPCE:       0    0    0    0    0    0    0    0    0    0    0    0
ComboPCE:       0    0    0    0    0    0    0    0    0    0    0    0
BicyclePCE:     0    0    0    0    0    0    0    0    0    0    0    0
AdjVolume:     114   30    7   217   30   133   131  508   60    4   660   213
-----|-----|-----|-----|-----|
Delay Module: >> Time Period: 0.25 hours <<
CircVolume:      856                      777                      251                      275
MaxVolume:       738                      780                      2243                     2226
PedVolume:        0                      0                      0                      0
AdjMaxVol:       738                      780                      2243                     2226
ApproachVol:     151                      381                      699                      876
ApproachDel:      6.1                      8.9                      2.3                      2.7
Queue:           0.8                      2.7                      1.3                      1.9

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-----
Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)
*****
Intersection #4 W 10th Ave/ Clearwater Blvd
*****
Cycle (sec):          100          Critical Vol./Cap.(X):          0.534
Loss Time (sec):      0 (Y+R=4.0 sec) Average Delay (sec/veh):      25.4
Optimal Cycle:        40          Level Of Service:          C
*****
Street Name:          W 10th Ave          Clearwater Blvd
Approach:              North Bound          South Bound          East Bound          West Bound
Movement:              L - T - R          L - T - R          L - T - R          L - T - R
-----|-----|-----|-----|
Control:                Permitted          Permitted          Prot+Permit          Prot+Permit
Rights:                 Include          Include          Include          Include
Min. Green:             0 0 0          0 0 0          0 0 0          0 0 0
Lanes:                  1 0 0 1 0          1 0 0 1 0          0 1 0 1 1          0 1 0 1 1
-----|-----|-----|-----|
Volume Module: >> Count Date: 17 Nov 2015 << PM Peak Hour
Base Vol:              92 0 6          0 0 0          0 464 49          3 625 0
Growth Adj:            1.10 1.10 1.10 1.10 1.10 1.10 1.10 1.10 1.10 1.10 1.10 1.10
Initial Bse:           101 0 7          0 0 0          0 510 54          3 688 0
Added Vol:              0 28 0          112 28 75          74 0 0          0 0 110
In Process/:           5 0 0          90 0 49          48 -38 2          0 -74 88
Initial Fut:           106 28 7          202 28 124          122 472 56          3 614 198
User 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
PHF Adj:               0.93 0.93 0.93 0.93 0.93 0.93 0.93 0.93 0.93 0.93 0.93 0.93
PHF Volume:            114 30 7          217 30 133          131 508 60          4 660 213
Reduct Vol:             0 0 0          0 0 0          0 0 0          0 0 0
Reduced Vol:           114 30 7          217 30 133          131 508 60          4 660 213
PCE 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
MLF 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
FinalVolume:           114 30 7          217 30 133          131 508 60          4 660 213
-----|-----|-----|-----|
Saturation Flow Module:
Sat/Lane:              1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900
Adjustment:            0.50 0.97 0.97 0.70 0.88 0.88 0.93 0.93 0.93 0.98 0.92 0.92
Lanes:                 1.00 0.81 0.19 1.00 0.18 0.82 0.41 1.59 1.00 0.01 1.99 1.00
Final Sat.:            950 1493 352 1334 307 1361 725 2806 1766 19 3461 1740
-----|-----|-----|-----|
Capacity Analysis Module:
Vol/Sat:               0.12 0.02 0.02 0.16 0.10 0.10 0.18 0.18 0.03 0.19 0.19 0.12
Crit Moves:            ****          ****          ****
Green/Cycle:           0.30 0.30 0.30 0.30 0.30 0.30 0.68 0.34 0.34 0.70 0.36 0.36
Volume/Cap:            0.39 0.07 0.07 0.53 0.32 0.32 0.30 0.53 0.10 0.28 0.53 0.34
Uniform Del:           27.5 24.7 24.7 28.9 26.8 26.8 7.4 26.7 22.6 17.2 25.6 23.6
IncrmntDel:            0.9 0.0 0.0 1.4 0.4 0.4 0.1 0.4 0.0 0.1 0.3 0.1
InitQueuDel:           0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0
Delay 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
Delay/Veh:             28.4 24.7 24.7 30.3 27.2 27.2 7.5 27.1 22.6 17.3 25.9 23.7
User DelAdj:           1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
AdjDel/Veh:            28.4 24.7 24.7 30.3 27.2 27.2 7.5 27.1 22.6 17.3 25.9 23.7
LOS by Move:           C C C C C C A C C B C C
HCM2kAvgQ:              3 1 1 6 4 4 4 9 1 4 9 5
*****

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-----
Level Of Service Computation Report
2000 HCM Unsignalized Method (Future Volume Alternative)
*****
Intersection #2 I-82 WB Ramps/Badger Rd
*****
Average Delay (sec/veh):      11.9      Worst Case Level Of Service: E[ 44.8]
*****
Street Name:      Badger Rd      I-82 WB Ramps
Approach:      North Bound      South Bound      East Bound      West Bound
Movement:      L - T - R      L - T - R      L - T - R      L - T - R
-----|-----|-----|-----|-----|
Control:      Uncontrolled      Uncontrolled      Stop Sign      Stop Sign
Rights:      Include      Include      Include      Include
Lanes:      0 0 0 1 0      1 0 2 0 0      0 0 0 0 0      1 0 0 0 1
-----|-----|-----|-----|-----|
Volume Module: >> Count Date: 1 Jan 2021 << PM Peak Hour
Base Vol:      0 347 9 141 504 0 0 0 0 51 0 296
Growth Adj: 1.30 1.30 1.30 1.30 1.30 1.30 1.30 1.30 1.30 1.30 1.30 1.30
Initial Bse: 0 451 12 183 655 0 0 0 0 66 0 385
Added Vol: 0 68 0 77 77 0 0 0 0 0 0 23
PasserByVol: 0 0 0 0 0 0 0 0 0 0 0 0
Initial Fut: 0 519 12 260 732 0 0 0 0 66 0 408
User 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
PHF Adj: 0.93 0.93 0.93 0.93 0.93 0.93 0.93 0.93 0.93 0.93 0.93 0.93
PHF Volume: 0 558 13 280 787 0 0 0 0 71 0 438
Reduct Vol: 0 0 0 0 0 0 0 0 0 0 0 0
FinalVolume: 0 558 13 280 787 0 0 0 0 71 0 438
Critical Gap Module:
Critical Gap:xxxxx xxxx xxxxx 4.1 xxxx xxxxx xxxxx xxxx xxxxx 6.4 xxxx 6.2
FollowUpTim:xxxxx xxxx xxxxx 2.2 xxxx xxxxx xxxxx xxxx xxxxx 3.5 xxxx 3.3
-----|-----|-----|-----|-----|
Capacity Module:
Cnflct Vol: xxxx xxxx xxxxx 571 xxxx xxxxx xxxx xxxx xxxxx 1518 xxxx 564
Potent Cap.: xxxx xxxx xxxxx 1012 xxxx xxxxx xxxx xxxx xxxxx 132 xxxx 529
Move Cap.: xxxx xxxx xxxxx 1012 xxxx xxxxx xxxx xxxx xxxxx 104 xxxx 529
Volume/Cap: xxxx xxxx xxxxx 0.28 xxxx xxxxx xxxx xxxx xxxxx 0.68 xxxx 0.83
-----|-----|-----|-----|-----|
Level Of Service Module:
2Way95thQ: xxxx xxxx xxxxx 1.1 xxxx xxxxx xxxx xxxx xxxxx 3.5 xxxx 8.4
Control Del:xxxxx xxxx xxxxx 9.9 xxxx xxxxx xxxxx xxxx xxxxx 93.9 xxxx 36.8
LOS by Move: * * * A * * * * * F * E
Movement: LT - LTR - RT LT - LTR - RT LT - LTR - RT LT - LTR - RT
Shared Cap.: xxxx xxxx xxxxx xxxx xxxx xxxxx xxxx xxxx xxxxx xxxx xxxx xxxxx
SharedQueue:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
Shrd ConDel:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
Shared LOS: * * * * * * * * * * * * * * *
ApproachDel: xxxxxx xxxxxx xxxxxx 44.8
ApproachLOS: * * * E
*****
Note: Queue reported is the number of cars per lane.
*****

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-----
Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)
*****
Intersection #4 W 10th Ave/ Clearwater Blvd
*****
Cycle (sec):          100          Critical Vol./Cap.(X):          0.681
Loss Time (sec):      0 (Y+R=4.0 sec) Average Delay (sec/veh):      19.8
Optimal Cycle:        58          Level Of Service:          B
*****
Street Name:          W 10th Ave          Clearwater Blvd
Approach:             North Bound          South Bound          East Bound          West Bound
Movement:             L - T - R          L - T - R          L - T - R          L - T - R
-----|-----|-----|-----|
Control:              Permitted          Permitted          Prot+Permit          Prot+Permit
Rights:               Include          Include          Include          Include
Min. Green:           0 0 0          0 0 0          0 0 0          0 0 0
Lanes:                1 0 0 1 0          1 0 0 1 0          1 0 1 1 1          1 0 1 1 1
-----|-----|-----|-----|
Volume Module: >> Count Date: 1 Jan 2021 << PM Peak Hour
Base Vol:             106 28 7 202 28 124 122 472 56 3 614 198
Growth Adj:           1.30 1.30 1.30 1.30 1.30 1.30 1.30 1.30 1.30 1.30 1.30 1.30
Initial Bse:           138 36 9 263 36 161 159 614 73 4 798 257
Added Vol:             133 0 8 0 0 0 0 110 48 11 138 0
PasserByVol:          0 0 0 0 0 0 0 0 0 0 0 0
Initial Fut:           271 36 17 263 36 161 159 724 121 15 936 257
User 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
PHF Adj:               0.93 0.93 0.93 0.93 0.93 0.93 0.93 0.93 0.93 0.93 0.93 0.93
PHF Volume:           291 39 18 282 39 173 171 778 130 16 1007 277
Reduct Vol:            0 0 0 0 0 0 0 0 0 0 0 0
Reduced Vol:           291 39 18 282 39 173 171 778 130 16 1007 277
PCE 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
MLF 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
FinalVolume:           291 39 18 282 39 173 171 778 130 16 1007 277
-----|-----|-----|-----|
Saturation Flow Module:
Sat/Lane:              1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900
Adjustment:            0.51 0.95 0.95 0.69 0.88 0.88 0.95 0.93 0.93 0.95 0.92 0.92
Lanes:                 1.00 0.68 0.32 1.00 0.18 0.82 1.00 2.00 1.00 1.00 2.00 1.00
Final Sat.:            975 1231 578 1311 307 1361 1805 3534 1767 1805 3494 1747
-----|-----|-----|-----|
Capacity Analysis Module:
Vol/Sat:               0.30 0.03 0.03 0.22 0.13 0.13 0.09 0.22 0.07 0.01 0.29 0.16
Crit Moves:           ****          ****          ****
Green/Cycle:           0.44 0.44 0.44 0.44 0.44 0.44 0.56 0.54 0.54 0.44 0.42 0.42
Volume/Cap:            0.68 0.07 0.07 0.49 0.29 0.29 0.49 0.41 0.14 0.05 0.68 0.37
Uniform Del:           22.5 16.3 16.3 20.1 18.1 18.1 14.9 13.6 11.4 15.6 23.4 19.8
IncremntDel:           4.5 0.0 0.0 0.7 0.2 0.2 1.1 0.1 0.0 0.1 1.0 0.1
InitQueuDel:           0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0
Delay 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
Delay/Veh:             26.9 16.3 16.3 20.8 18.3 18.3 15.9 13.7 11.4 15.7 24.4 19.9
User DelAdj:           1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
AdjDel/Veh:            26.9 16.3 16.3 20.8 18.3 18.3 15.9 13.7 11.4 15.7 24.4 19.9
LOS by Move:           C B B C B B B B B B C B
HCM2kAvgQ:              8 1 1 7 4 4 4 7 2 0 14 6
*****

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                        Level Of Service Computation Report
                    FHWA Roundabout Method (Future Volume Alternative)
*****
Intersection #4 W 10th Ave/ Clearwater Blvd
*****
Average Delay (sec/veh):      5.5      Level Of Service: A
*****
Street Name:                  W 10th Ave                      Clearwater Blvd
Approach:                     North Bound                    South Bound                    East Bound                    West Bound
Movement:                     L - T - R                      L - T - R                      L - T - R                      L - T - R
-----|-----|-----|-----|-----|
Control:                      Yield Sign                    Yield Sign                    Yield Sign                    Yield Sign
Lanes:                        1                      2                      2                      2
-----|-----|-----|-----|-----|
Volume Module: >> Count Date: 1 Jan 2021 << PM Peak Hour
Base Vol:    106  28    7  202  28  124  122  472    56    3  614  198
Growth Adj:  1.30 1.30  1.30 1.30 1.30 1.30 1.30 1.30 1.30 1.30 1.30 1.30
Initial Bse:  138  36    9  263  36  161  159  614    73    4  798  257
Added Vol:   133   0    8    0   0    0    0  110    48   11  138    0
PasserByVol:   0   0    0    0   0    0    0   0     0    0   0     0
Initial Fut:  271  36   17  263  36  161  159  724   121   15  936  257
User 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
PHF Adj:      0.93 0.93  0.93 0.93 0.93 0.93 0.93 0.93 0.93 0.93 0.93 0.93
PHF Volume:   291  39   18  282  39  173  171  778   130   16 1007  277
Reduct Vol:    0   0    0    0   0    0    0   0     0    0   0     0
Reduced Vol:  291  39   18  282  39  173  171  778   130   16 1007  277
PCE 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
MLF 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
FinalVolume:  291  39   18  282  39  173  171  778   130   16 1007  277
-----|-----|-----|-----|-----|
PCE Module:
AutoPCE:      291  39   18  282  39  173  171  778   130   16 1007  277
TruckPCE:      0   0    0    0   0    0    0   0     0    0   0     0
ComboPCE:      0   0    0    0   0    0    0   0     0    0   0     0
BicyclePCE:     0   0    0    0   0    0    0   0     0    0   0     0
AdjVolume:     291  39   18  282  39  173  171  778   130   16 1007  277
-----|-----|-----|-----|-----|
Delay Module: >> Time Period: 0.25 hours <<
CircVolume:   1231                      1314                      338                      501
MaxVolume:    535                      1478                      2181                      2063
PedVolume:     0                       0                       0                       0
AdjMaxVol:    535                      1478                      2181                      2063
ApproachVol:   349                      495                      1078                      1299
ApproachDel:   18.4                     3.7                       3.3                       4.7
Queue:         4.7                      1.5                       2.9                       4.9

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-----
Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)
*****
Intersection #8 Utah St-Clearwater Dr/ Clearwater Blvd.
*****
Cycle (sec):          100          Critical Vol./Cap.(X):          0.550
Loss Time (sec):      0 (Y+R=4.0 sec) Average Delay (sec/veh):      13.7
Optimal Cycle:        51          Level Of Service:          B
*****
Street Name:          Utah St-Clearwater Dr          Clearwater Blvd
Approach:              North Bound          South Bound          East Bound          West Bound
Movement:              L - T - R          L - T - R          L - T - R          L - T - R
-----|-----|-----|-----|
Control:              Prot+Permit          Prot+Permit          Prot+Permit          Prot+Permit
Rights:                Include          Include          Include          Include
Min. Green:            0 0 0          0 0 0          0 0 0          0 0 0
Lanes:                1 0 0 1 0          1 0 0 1 0          1 0 1 1 0          1 0 1 1 1
-----|-----|-----|-----|
Volume Module: >> Count Date: 1 Jan 2021 << PM Peak Hour
Base Vol:              3 0 41          36 1 6          9 645          7 56 822          10
Growth Adj: 1.30 1.30 1.30 1.30 1.30 1.30 1.30 1.30 1.30 1.30 1.30 1.30
Initial Bse:           4 0 53          47 1 8          12 839          9 73 1069          13
Added Vol:             0 0 0          101 0 55          43 144          0 0 115          80
In Process:            0 0 0          70 0 36          35 -35          0 0 -75          75
Initial Fut:           4 0 53          218 1 99          90 948          9 73 1109          168
User 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
PHF Adj:               0.94 0.94 0.94 0.94 0.94 0.94 0.94 0.94 0.94 0.94 0.94 0.94
PHF Volume:            4 0 57          232 1 105          95 1008          10 77 1179          179
Reduct Vol:            0 0 0          0 0 0          0 0 0          0 0 0          0
Reduced Vol:           4 0 57          232 1 105          95 1008          10 77 1179          179
PCE 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
MLF 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
FinalVolume:           4 0 57          232 1 105          95 1008          10 77 1179          179
-----|-----|-----|-----|
Saturation Flow Module:
Sat/Lane:              1900 1900 1900          1900 1900 1900          1900 1900 1900          1900 1900 1900
Adjustment: 0.95 1.00 0.85 0.95 0.85 0.85 0.95 0.95 0.95 0.95 0.93 0.93
Lanes:                1.00 0.00 1.00 1.00 0.01 0.99 1.00 1.98 0.02 1.00 2.00 1.00
Final Sat.: 1805 0 1615 1805 21 1598 1805 3572 34 1805 3538 1769
-----|-----|-----|-----|
Capacity Analysis Module:
Vol/Sat:              0.00 0.00 0.04 0.13 0.07 0.07 0.05 0.28 0.28 0.04 0.33 0.10
Crit Moves:           ****          ****          ****          ****
Green/Cycle: 0.01 0.00 0.06 0.30 0.29 0.29 0.70 0.61 0.61 0.70 0.61 0.61
Volume/Cap: 0.23 0.00 0.55 0.47 0.23 0.23 0.27 0.46 0.46 0.19 0.55 0.17
Uniform Del: 43.0 0.0 45.4 28.3 27.2 27.2 7.4 10.6 10.6 6.3 11.6 8.6
IncremntDel: 6.4 0.0 6.2 0.7 0.3 0.3 0.4 0.2 0.2 0.2 0.3 0.0
InitQueuDel: 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0
Delay Adj:            1.00 0.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Delay/Veh:            49.3 0.0 51.6 29.0 27.4 27.4 7.8 10.8 10.8 6.5 11.9 8.6
User DelAdj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
AdjDel/Veh: 49.3 0.0 51.6 29.0 27.4 27.4 7.8 10.8 10.8 6.5 11.9 8.6
LOS by Move:          D A D C C C A B B A B A
HCM2kAvgQ:            0 0 3 6 3 3 1 9 9 1 11 2
*****

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Level Of Service Computation Report
2000 HCM Unsignalized Method (Future Volume Alternative)
*****
Intersection #5
*****
Average Delay (sec/veh): 40.6 Worst Case Level Of Service: F[552.3]
*****
Approach: North Bound South Bound East Bound West Bound
Movement: L - T - R L - T - R L - T - R L - T - R
-----|-----|-----|-----|
Control: Stop Sign Stop Sign Uncontrolled Uncontrolled
Rights: Include Include Include Include
Lanes: 0 0 1! 0 0 0 0 1! 0 0 1 0 1 1 0 1 0 1 1 1
-----|-----|-----|-----|
Volume Module: >> Count Date: 1 Jan 2021 << PM Peak
Base Vol: 0 0 0 0 0 0 0 0 697 0 0 815 0
Growth Adj: 1.30 1.30 1.30 1.30 1.30 1.30 1.30 1.30 1.30 1.30 1.30 1.30
Initial Bse: 0 0 0 0 0 0 0 0 906 0 0 1060 0
Added Vol: 0 0 0 43 0 40 31 87 0 0 109 33
Passby: 0 0 0 60 0 32 35 -35 0 0 -64 64
Initial Fut: 0 0 0 103 0 72 66 958 0 0 1105 97
User 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
PHF Adj: 0.93 0.93 0.93 0.93 0.93 0.93 0.93 0.93 0.93 0.93 0.93 0.93
PHF Volume: 0 0 0 111 0 77 71 1030 0 0 1188 104
Reduct Vol: 0 0 0 0 0 0 0 0 0 0 0 0
FinalVolume: 0 0 0 111 0 77 71 1030 0 0 1188 104
Critical Gap Module:
Critical Gp: 7.5 6.5 6.9 6.8 6.5 6.9 4.1 xxxx xxxxx xxxxx xxxx xxxxx
FollowUpTim: 3.5 4.0 3.3 3.5 4.0 3.3 2.2 xxxx xxxxx xxxxx xxxx xxxxx
-----|-----|-----|-----|
Capacity Module:
Cnflct Vol: 1766 2464 515 1845 2360 594 1292 xxxx xxxxx xxxx xxxx xxxxx
Potent Cap.: 54 31 510 68 36 453 543 xxxx xxxxx xxxx xxxx xxxxx
Move Cap.: 41 27 510 61 31 453 543 xxxx xxxxx xxxx xxxx xxxxx
Volume/Cap: 0.00 0.00 0.00 1.81 0.00 0.17 0.13 xxxx xxxx xxxx xxxx xxxxx
-----|-----|-----|-----|
Level Of Service Module:
2Way95thQ: xxxx xxxx xxxxx xxxx xxxx xxxxx 0.4 xxxx xxxxx xxxx xxxx xxxxx
Control Del:xxxxx xxxx xxxxx xxxxx xxxx xxxxx 12.6 xxxx xxxxx xxxxx xxxx xxxxx
LOS by Move: * * * * * B * * * * *
Movement: LT - LTR - RT LT - LTR - RT LT - LTR - RT LT - LTR - RT
Shared Cap.: xxxx 0 xxxxx xxxx 95 xxxxx xxxx xxxx xxxxx xxxx xxxx xxxxx
SharedQueue:xxxxx xxxx xxxxx xxxxx 16.1 xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
Shrd ConDel:xxxxx xxxx xxxxx xxxxx 552 xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
Shared LOS: * * * * * F * * * * *
ApproachDel: xxxxxx 552.3 xxxxxx xxxxxx
ApproachLOS: * F * * *
*****
Note: Queue reported is the number of cars per lane.
*****

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-----
Level Of Service Computation Report
FHWA Roundabout Method (Future Volume Alternative)
*****
Intersection #8 Utah St-Clearwater Dr/ Clearwater Blvd.
*****
Average Delay (sec/veh):      5.5      Level Of Service: A
*****
Street Name:      Utah St-Clearwater Dr      Clearwater Blvd
Approach:      North Bound      South Bound      East Bound      West Bound
Movement:      L - T - R      L - T - R      L - T - R      L - T - R
-----|-----|-----|-----|-----|
Control:      Yield Sign      Yield Sign      Yield Sign      Yield Sign
Lanes:      1      1      2      2
-----|-----|-----|-----|-----|
Volume Module: >> Count Date: 1 Jan 2021 << PM Peak Hour
Base Vol:      3      0      41      36      1      6      9      645      7      56      822      10
Growth Adj:      1.30      1.30      1.30      1.30      1.30      1.30      1.30      1.30      1.30      1.30      1.30      1.30
Initial Bse:      4      0      53      47      1      8      12      839      9      73      1069      13
Added Vol:      0      0      0      101      0      55      43      144      0      0      115      80
In Process:      0      0      0      70      0      36      35      -35      0      0      -75      75
Initial Fut:      4      0      53      218      1      99      90      948      9      73      1109      168
User 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
PHF Adj:      0.94      0.94      0.94      0.94      0.94      0.94      0.94      0.94      0.94      0.94      0.94      0.94
PHF Volume:      4      0      57      232      1      105      95      1008      10      77      1179      179
Reduct Vol:      0      0      0      0      0      0      0      0      0      0      0      0
Reduced Vol:      4      0      57      232      1      105      95      1008      10      77      1179      179
PCE 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
MLF 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
FinalVolume:      4      0      57      232      1      105      95      1008      10      77      1179      179
-----|-----|-----|-----|-----|
PCE Module:
AutoPCE:      4      0      57      232      1      105      95      1008      10      77      1179      179
TruckPCE:      0      0      0      0      0      0      0      0      0      0      0      0
ComboPCE:      0      0      0      0      0      0      0      0      0      0      0      0
BicyclePCE:      0      0      0      0      0      0      0      0      0      0      0      0
AdjVolume:      4      0      57      232      1      105      95      1008      10      77      1179      179
-----|-----|-----|-----|-----|
Delay Module: >> Time Period: 0.25 hours <<
CircVolume:      1335      1261      311      100
MaxVolume:      479      519      2200      2352
PedVolume:      0      0      0      0
AdjMaxVol:      479      519      2200      2352
ApproachVol:      61      338      1113      1436
ApproachDel:      8.6      19.0      3.3      3.9
Queue:      0.4      4.7      3.0      4.5

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-----
Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)
*****
Intersection #4 W 10th Ave/ Clearwater Blvd
*****
Cycle (sec):          60          Critical Vol./Cap.(X):          0.551
Loss Time (sec):      12 (Y+R=4.0 sec) Average Delay (sec/veh):      12.6
Optimal Cycle:        41          Level Of Service:          B
*****
Street Name:          W 10th Ave          Clearwater Blvd
Approach:              North Bound          South Bound          East Bound          West Bound
Movement:              L - T - R          L - T - R          L - T - R          L - T - R
-----|-----|-----|-----|
Control:                Permitted          Permitted          Prot+Permit          Prot+Permit
Rights:                 Include          Include          Include          Include
Min. Green:             0 0 0          0 0 0          0 0 0          0 0 0
Lanes:                  1 0 0 1 0          1 0 0 1 0          1 0 1 1 0          1 0 1 1 0
-----|-----|-----|-----|
Volume Module: >> Count Date: 17 Nov 2015 << PM Peak Hour
Base Vol:              92 0 6          0 0 0          0 464 49          3 625 0
Growth Adj:            1.10 1.10 1.10 1.10 1.10 1.10 1.10 1.10 1.10 1.10 1.10 1.10
Initial Bse:           101 0 7          0 0 0          0 510 54          3 688 0
Added Vol:              0 24 0          98 25 66          64 0 0          0 0 96
In Process/:           5 0 0          76 0 41          41 -31 2          0 -61 75
Initial Fut:           106 24 7          174 25 107          105 479 56          3 627 171
User 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
PHF Adj:               0.93 0.93 0.93 0.93 0.93 0.93 0.93 0.93 0.93 0.93 0.93 0.93
PHF Volume:            114 26 7          187 27 115          113 515 60          4 674 184
Reduct Vol:            0 0 0          0 0 0          0 0 0          0 0 0
Reduced Vol:           114 26 7          187 27 115          113 515 60          4 674 184
PCE 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
MLF 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
FinalVolume:           114 26 7          187 27 115          113 515 60          4 674 184
-----|-----|-----|-----|
Saturation Flow Module:
Sat/Lane:              1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900
Adjustment:            0.66 0.97 0.97 0.74 0.88 0.88 0.95 0.93 0.93 0.95 0.92 0.92
Lanes:                 1.00 0.78 0.22 1.00 0.19 0.81 1.00 1.79 0.21 1.00 1.57 0.43
Final Sat.:            1256 1443 397 1408 316 1352 1805 3181 371 1805 2745 749
-----|-----|-----|-----|
Capacity Analysis Module:
Vol/Sat:               0.09 0.02 0.02 0.13 0.09 0.09 0.06 0.16 0.16 0.00 0.25 0.25
Crit Moves:            ****          ****          ****
Green/Cycle:           0.24 0.24 0.24 0.24 0.24 0.24 0.63 0.55 0.55 0.45 0.45 0.45
Volume/Cap:            0.38 0.07 0.07 0.55 0.35 0.35 0.28 0.29 0.29 0.01 0.55 0.55
Uniform Del:           19.0 17.6 17.6 19.9 18.9 18.9 5.8 7.2 7.2 9.0 12.2 12.2
IncrmntDel:            0.8 0.1 0.1 1.9 0.5 0.5 0.4 0.1 0.1 0.0 0.4 0.4
InitQueuDel:           0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0
Delay 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
Delay/Veh:             19.8 17.7 17.7 21.9 19.4 19.4 6.1 7.3 7.3 9.0 12.7 12.7
User DelAdj:           1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
AdjDel/Veh:           19.8 17.7 17.7 21.9 19.4 19.4 6.1 7.3 7.3 9.0 12.7 12.7
LOS by Move:           B B B C B B A A A A B B
HCM2kAvgQ:              2 1 1 4 2 2 1 3 3 0 7 7
*****

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-----
Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)
*****
Intersection #7 Utah St-Clearwater Dr/ Clearwater Blvd.
*****
Cycle (sec):          60          Critical Vol./Cap.(X):          0.351
Loss Time (sec):      12 (Y+R=4.0 sec) Average Delay (sec/veh):      5.9
Optimal Cycle:        32          Level Of Service:          A
*****
Street Name:          Utah St-Clearwater Dr          Clearwater Blvd
Approach:              North Bound          South Bound          East Bound          West Bound
Movement:              L - T - R          L - T - R          L - T - R          L - T - R
-----|-----|-----|-----|
Control:              Permitted          Permitted          Prot+Permit          Prot+Permit
Rights:                Include          Include          Include          Include
Min. Green:            0 0 0          0 0 0          0 0 0          0 0 0
Lanes:                 0 0 1! 0 0          0 0 1! 0 0          1 0 1 1 0          1 0 1 1 0
-----|-----|-----|-----|
Volume Module: >> Count Date: 17 Nov 2015 << PM Peak Hour
Base Vol:              3 0 37          33 1 5          8 468          6 51 633          9
Growth Adj: 1.10 1.10 1.10 1.10 1.10 1.10 1.10 1.10 1.10 1.10 1.10 1.10
Initial Bse:           3 0 41          36 1 6          9 515          7 56 696          10
Added Vol:              0 0 0          0 0 0          0 98          0 0 96          0
In Process:            0 0 0          0 0 0          0 18          0 0 16          0
Initial Fut:           3 0 41          36 1 6          9 631          7 56 808          10
User 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
PHF Adj:               0.94 0.94 0.94 0.94 0.94 0.94 0.94 0.94 0.94 0.94 0.94 0.94
PHF Volume:            4 0 43          39 1 6          9 671          7 60 860          11
Reduct Vol:            0 0 0          0 0 0          0 0          0 0 0          0
Reduced Vol:           4 0 43          39 1 6          9 671          7 60 860          11
PCE 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
MLF 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
FinalVolume:           4 0 43          39 1 6          9 671          7 60 860          11
-----|-----|-----|-----|
Saturation Flow Module:
Sat/Lane:              1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900
Adjustment:            0.85 1.00 0.85 0.70 0.70 0.70 0.95 0.95 0.95 0.95 0.95 0.95
Lanes:                 0.08 0.00 0.92 0.85 0.02 0.13 1.00 1.98 0.02 1.00 1.98 0.02
Final Sat.:            121 0 1495 1130 34 171 1805 3569 37 1805 3559 44
-----|-----|-----|-----|
Capacity Analysis Module:
Vol/Sat:               0.03 0.00 0.03 0.03 0.03 0.03 0.01 0.19 0.19 0.03 0.24 0.24
Crit Moves:           ****          ****          ****
Green/Cycle: 0.10 0.00 0.10 0.10 0.10 0.10 0.61 0.60 0.60 0.77 0.69 0.69
Volume/Cap: 0.30 0.00 0.30 0.35 0.35 0.35 0.02 0.31 0.31 0.10 0.35 0.35
Uniform Del: 25.2 0.0 25.2 25.3 25.3 25.3 4.5 6.0 6.0 2.0 3.9 3.9
IncrmntDel: 1.1 0.0 1.1 1.6 1.6 1.6 0.0 0.1 0.1 0.1 0.1 0.1
InitQueuDel: 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0
Delay Adj: 1.00 0.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Delay/Veh: 26.2 0.0 26.2 27.0 27.0 27.0 4.6 6.1 6.1 2.0 3.9 3.9
User DelAdj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
AdjDel/Veh: 26.2 0.0 26.2 27.0 27.0 27.0 4.6 6.1 6.1 2.0 3.9 3.9
LOS by Move: C A C C C C A A A A A A
HCM2kAvgQ: 1 0 1 1 1 1 0 3 3 0 4 4
*****

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Level Of Service Computation Report
2000 HCM Unsignalized Method (Future Volume Alternative)
*****
Intersection #2 I-82 WB Ramps/Badger Rd
*****
Average Delay (sec/veh):    10.2    Worst Case Level Of Service: E[ 38.0]
*****
Street Name:                Badger Rd                I-82 WB Ramps
Approach:                   North Bound                South Bound                East Bound                West Bound
Movement:                   L - T - R                L - T - R                L - T - R                L - T - R
-----|-----|-----|-----|-----|
Control:                     Uncontrolled                Uncontrolled                Stop Sign                Stop Sign
Rights:                       Include                Include                Include                Include
Lanes:                        0  0  1  1  0                1  0  2  0  0                0  0  0  0  0                1  0  0  0  1
-----|-----|-----|-----|-----|
Volume Module: >> Count Date: 1 Jan 2021 << PM Peak Hour
Base Vol:                    0  343    9    138  501    0    0    0    0    51    0    294
Growth Adj: 1.30 1.30 1.30 1.30 1.30 1.30 1.30 1.30 1.30 1.30 1.30 1.30
Initial Bse: 0  446   12    179  651    0    0    0    0    66    0    382
Added Vol:    0   87    0     94   94    0    0    0    0    0    0    29
PasserByVol:  0    0    0     0    0    0    0    0    0    0    0    0
Initial Fut:  0  533   12    273  745    0    0    0    0    66    0    411
User 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
PHF Adj:      0.93 0.93 0.93 0.93 0.93 0.93 0.93 0.93 0.93 0.93 0.93 0.93
PHF Volume:   0  573   13    294  801    0    0    0    0    71    0    442
Reduct Vol:   0    0    0     0    0    0    0    0    0    0    0    0
FinalVolume:  0  573   13    294  801    0    0    0    0    71    0    442
Critical Gap Module:
Critical Gp:xxxxx xxxx xxxxx 4.1 xxxx xxxxx xxxxx xxxx xxxxx 6.8 xxxx 6.9
FollowUpTim:xxxxx xxxx xxxxx 2.2 xxxx xxxxx xxxxx xxxx xxxxx 3.5 xxxx 3.3
-----|-----|-----|-----|-----|
Capacity Module:
Cnflct Vol: xxxx xxxx xxxxx 586 xxxx xxxxx xxxx xxxx xxxxx 1568 xxxx 293
Potent Cap.: xxxx xxxx xxxxx 999 xxxx xxxxx xxxx xxxx xxxxx 104 xxxx 710
Move Cap.:   xxxx xxxx xxxxx 999 xxxx xxxxx xxxx xxxx xxxxx 80 xxxx 710
Volume/Cap:  xxxx xxxx xxxxx 0.29 xxxx xxxxx xxxx xxxx xxxxx 0.89 xxxx 0.62
-----|-----|-----|-----|-----|
Level Of Service Module:
2Way95thQ:  xxxx xxxx xxxxx 1.2 xxxx xxxxx xxxx xxxx xxxxx 4.6 xxxx 4.4
Control Del:xxxxx xxxx xxxxx 10.1 xxxx xxxxx xxxxx xxxx xxxxx 161.7 xxxx 18.1
LOS by Move:  *    *    *    B    *    *    *    *    *    F    *    C
Movement:     LT - LTR - RT    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT
Shared Cap.:  xxxx xxxx xxxxx xxxx xxxx xxxxx xxxx xxxx xxxxx xxxx xxxx xxxxx
SharedQueue:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
Shrd ConDel:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
Shared LOS:   *    *    *    *    *    *    *    *    *    *    *    *
ApproachDel:  xxxxxx                xxxxxx                xxxxxx                38.0
ApproachLOS:  *                    *                    *                    E
*****
Note: Queue reported is the number of cars per lane.
*****

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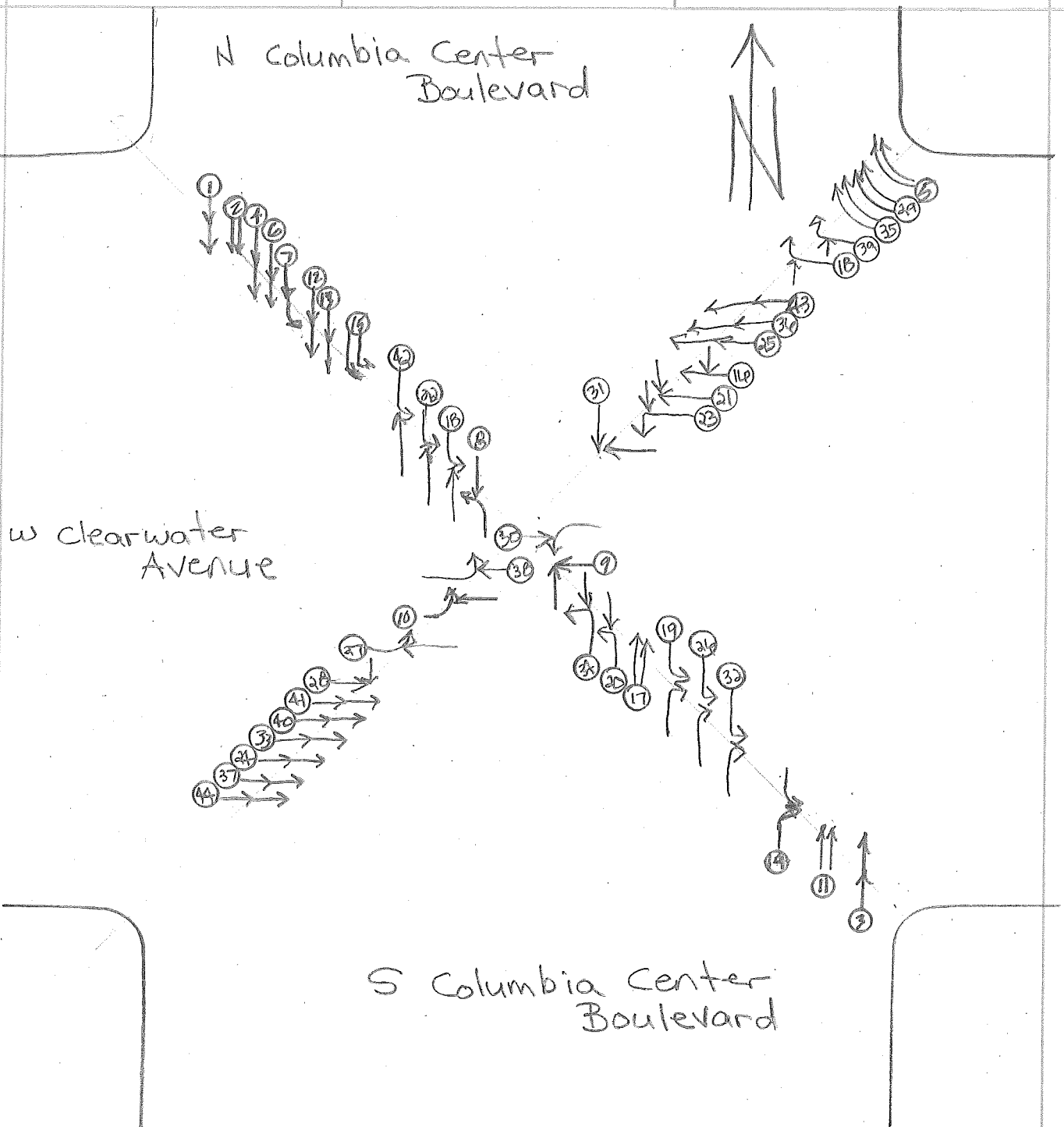
-----
Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)
*****
Intersection #4 W 10th Ave/ Clearwater Blvd
*****
Cycle (sec):          110          Critical Vol./Cap.(X):          0.835
Loss Time (sec):      12 (Y+R=4.0 sec)  Average Delay (sec/veh):      27.8
Optimal Cycle:        89          Level Of Service:          C
*****
Street Name:          W 10th Ave          Clearwater Blvd
Approach:             North Bound          South Bound          East Bound          West Bound
Movement:             L - T - R          L - T - R          L - T - R          L - T - R
-----|-----|-----|-----|
Control:              Permitted          Permitted          Prot+Permit          Prot+Permit
Rights:               Include          Include          Include          Include
Min. Green:           0 0 0 0          0 0 0 0          0 0 0 0          0 0 0 0
Lanes:                1 0 0 1 0          1 0 0 1 0          1 0 1 1 0          1 0 1 1 0
-----|-----|-----|-----|
Volume Module: >> Count Date: 1 Jan 2021 << PM Peak Hour
Base Vol:             106 24 7 174 25 107 105 479 56 3 627 171
Growth Adj:           1.30 1.30 1.30 1.30 1.30 1.30 1.30 1.30 1.30 1.30 1.30 1.30
Initial Bse:           138 31 9 226 33 139 137 623 73 4 815 222
Added Vol:             152 0 14 0 0 0 0 149 55 15 178 0
PasserByVol:           0 0 0 0 0 0 0 0 0 0 0 0
Initial Fut:           290 31 23 226 33 139 137 772 128 19 993 222
User 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
PHF Adj:               0.93 0.93 0.93 0.93 0.93 0.93 0.93 0.93 0.93 0.93 0.93 0.93
PHF Volume:           312 34 25 243 35 150 147 830 137 20 1068 239
Reduct Vol:           0 0 0 0 0 0 0 0 0 0 0 0
Reduced Vol:           312 34 25 243 35 150 147 830 137 20 1068 239
PCE 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
MLF 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
FinalVolume:           312 34 25 243 35 150 147 830 137 20 1068 239
-----|-----|-----|-----|
Saturation Flow Module:
Sat/Lane:             1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900
Adjustment:           0.56 0.94 0.94 0.72 0.88 0.88 0.95 0.93 0.93 0.95 0.92 0.92
Lanes:                1.00 0.57 0.43 1.00 0.19 0.81 1.00 1.72 0.28 1.00 1.63 0.37
Final Sat.:           1072 1022 757 1370 316 1352 1805 3032 502 1805 2870 642
-----|-----|-----|-----|
Capacity Analysis Module:
Vol/Sat:              0.29 0.03 0.03 0.18 0.11 0.11 0.08 0.27 0.27 0.01 0.37 0.37
Crit Moves:          ****          ****
Green/Cycle:           0.35 0.35 0.35 0.35 0.35 0.35 0.58 0.52 0.52 0.47 0.45 0.45
Volume/Cap:           0.84 0.09 0.09 0.51 0.32 0.32 0.60 0.52 0.52 0.08 0.84 0.84
Uniform Del:           33.0 24.2 24.2 28.4 26.3 26.3 20.3 17.4 17.4 16.1 26.9 26.9
IncrcmntDel:           15.0 0.1 0.1 0.9 0.3 0.3 4.1 0.3 0.3 0.1 4.1 4.1
InitQueueDel:          0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0
Delay 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
Delay/Veh:             47.9 24.2 24.2 29.3 26.6 26.6 24.4 17.6 17.6 16.3 31.0 31.0
User DelAdj:           1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
AdjDel/Veh:            47.9 24.2 24.2 29.3 26.6 26.6 24.4 17.6 17.6 16.3 31.0 31.0
LOS by Move:           D C C C C C C B B B C C
HCM2kAvgQ:             12 1 1 7 5 5 4 11 11 0 23 23
*****

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Appendix E – Accident Data Analysis

22-141 50 SHEETS
22-142 100 SHEETS
22-144 200 SHEETS



Collisions 1/2012 - 8/2015

PRIMARY TRAFFICWAY	INTERSECTING TRAFFICWAY	DIST FROM REF PT	COMPASS DIRECTION FROM REFERENCE POINT	REFERENCE POINT NAME	MILE POST	REPORT NUMBER	DATE	TIME	MOST SEVERE INJURY TYPE	# I J	# F T	# A H	# S S	# P E D S	B I K E	JUNCTION RELATIONSHIP
CLEARWATER	STEPTOE					E353916	09/02/2014	14:47	No Injury	0	0	2	0	0	0	At Intersection and Related
LESLIE RD		96	S	W CLEARWATER AVE		E219625	01/08/2013	19:37	No Injury	0	0	2	0	0	0	Circulating Roundabout
LESLIE RD	LESLIE					E420321	04/24/2015	14:28	No Injury	0	0	2	0	0	0	Traffic Calming Circle
LESLIE RD	W CLEARWATER AVE					E192586	09/13/2012	12:30	Possible Injury	1	0	2	0	0	0	Exiting Roundabout
LESLIE RD	W CLEARWATER AVE					E454732	08/23/2015	14:05	Possible Injury	1	0	2	0	0	0	Exiting Roundabout
N COLUMBIA CENTER BLVD		319.1	N	W CLEARWATER AVE		E154929	02/15/2012	15:39	No Injury	0	0	3	0	0	0	Intersection Related but Not at Intersection
N COLUMBIA CENTER BLVD	W CLEARWATER AVE					E315111	03/14/2014	15:41	No Injury	0	0	3	0	0	0	At Intersection and Related
N COLUMBIA CENTER BLVD	W CLEARWATER AVE					E406939	03/07/2015	12:20	No Injury	0	0	2	0	0	0	At Intersection and Related
N COLUMBIA CENTER BLVD	W CLEARWATER AVE					E205070	11/09/2012	08:30	Possible Injury	1	0	2	0	0	0	At Intersection and Related
N COLUMBIA CENTER BLVD	W CLEARWATER AVE					E243401	04/23/2013	10:59	No Injury	0	0	2	0	0	0	At Intersection and Related
N COLUMBIA CENTER BLVD	W CLEARWATER AVE					E292840	12/11/2013	16:29	No Injury	0	0	3	0	0	0	At Intersection and Related
N COLUMBIA CENTER BLVD	W CLEARWATER AVE					E330793	05/23/2014	14:30	No Injury	0	0	2	0	0	0	At Intersection and Related
N COLUMBIA CENTER BLVD	W CLEARWATER AVE					E386783	12/19/2014	12:35	No Injury	0	0	2	0	0	0	At Driveway within Major Intersection
N COLUMBIA CENTER BLVD	W CLEARWATER AVE					E422267	05/04/2015	13:08	No Injury	0	0	2	0	0	0	At Intersection and Related
N COLUMBIA CENTER BLVD	W CLEARWATER AVE					E312872	03/07/2014	14:20	No Injury	0	0	2	0	0	0	At Intersection and Related
N COLUMBIA CENTER BLVD	W CLEARWATER AVE					E385791	12/18/2014	09:35	No Injury	0	0	2	0	0	0	At Intersection and Related
N COLUMBIA CENTER BLVD	W CLEARWATER AVE					E263041	08/13/2013	16:51	No Injury	0	0	2	0	0	0	At Intersection and Related
N COLUMBIA CENTER BLVD	W CLEARWATER AVE					E422230	04/27/2015	15:20	No Injury	0	0	2	0	0	0	At Intersection and Related
N COLUMBIA CENTER BLVD	W CLEARWATER AVE					E434613	06/17/2015	12:41	No Injury	0	0	2	0	0	0	At Intersection and Related
N COLUMBIA CENTER BLVD	W CLEARWATER AVE					E209255	11/27/2012	20:33	No Injury	0	0	2	0	0	0	At Intersection and Related
N COLUMBIA CENTER BLVD	W CLEARWATER AVE					E252230	06/20/2013	21:42	No Injury	0	0	2	0	0	0	At Intersection and Related
N COLUMBIA CENTER BLVD	W CLEARWATER AVE					E268482	08/29/2013	15:35	No Injury	0	0	3	0	0	0	At Intersection and Related
N COLUMBIA CENTER BLVD	W CLEARWATER AVE					E327865	05/13/2014	14:01	No Injury	0	0	2	0	0	0	At Intersection and Related
N COLUMBIA CENTER BLVD	W CLEARWATER AVE					E426218	05/01/2015	13:17	No Injury	0	0	2	0	0	0	At Intersection and Related
N STEPTOE ST	W CLEARWATER AVE					E406937	03/05/2015	12:08	No Injury	0	0	2	0	0	0	At Intersection and Related
N STEPTOE ST	W CLEARWATER AVE					E266251	08/25/2013	18:45	No Injury	0	0	2	0	0	0	At Intersection and Related
S COLUMBIA CENTER BLVD	N COLUMBIA CENTER BLVD					E434609	06/16/2015	13:40	No Injury	0	0	2	0	0	0	At Intersection and Related
S COLUMBIA CENTER BLVD	W CLEARWATER AVE					E227244	02/16/2013	12:45	No Injury	0	0	2	0	0	0	At Intersection and Related
S COLUMBIA CENTER BLVD	W CLEARWATER AVE					E190380	09/03/2012	21:48	Possible Injury	2	0	3	0	0	0	At Intersection and Related
S COLUMBIA CENTER BLVD	W CLEARWATER AVE					E217511	12/29/2012	20:42	No Injury	0	0	2	0	0	0	At Intersection and Related
STEPTOE ST	CLEARWATER AVE					E247518	05/29/2013	15:58	Possible Injury	1	0	2	0	0	0	At Intersection and Related
W CLEARWATER AVE		200	SW	N STEPTOE		E408941	03/15/2015	12:54	No Injury	0	0	2	0	0	0	Intersection Related but Not at Intersection
W CLEARWATER AVE		200	SW	W 10TH AVE		E426235	05/20/2015	06:21	No Injury	0	0	2	0	0	0	Intersection Related but Not at Intersection
W CLEARWATER AVE		60	NE	W 10TH AVE		E348888	08/12/2014	18:22	No Injury	0	0	3	0	0	0	Intersection Related but Not at Intersection
W CLEARWATER AVE	LESLIE RD					E152807	02/06/2012	17:58	No Injury	0	0	2	0	0	0	Circulating Roundabout
W CLEARWATER AVE	LESLIE RD					E304433	01/30/2014	17:58	No Injury	0	0	2	0	0	0	Exiting Roundabout
W CLEARWATER AVE	LESLIE RD					E184593	08/04/2012	14:34	No Injury	0	0	2	0	0	0	Entering Roundabout
W CLEARWATER AVE	LESLIE RD					E237929	04/09/2013	18:30	Possible Injury	1	0	2	0	0	0	Entering Roundabout
W CLEARWATER AVE	LESLIE RD					E292836	12/12/2013	06:58	No Injury	0	0	2	0	0	0	Entering Roundabout
W CLEARWATER AVE	LESLIE RD					E406949	03/10/2015	06:07	No Injury	0	0	2	0	0	0	Entering Roundabout

Exhibit 5

FIRST COLLISION TYPE / OBJECT STRUCK	VEHICLE 1 ACTION	VEHICLE 2 ACTION	MV DRIVER CONT CIRC 1 UNIT 1	MV DRIVER CONT CIRC 1 UNIT 2	VEH 1 COMP DIR FROM	VEH 1 COMP DIR TO	VEH 2 COMP DIR FROM	VEH 2 COMP DIR TO
From opposite direction - one left turn - one straight	Making Left Turn	Going Straight Ahead	Inattention	None	North	East	South	North
From same direction - both going straight - both moving - sideswipe	Changing Lanes	Going Straight Ahead	Did Not Grant RW to Vehicle	None	Northeast	Southwest	Northeast	Southwest
From same direction - both going straight - both moving - sideswipe	Other*	Other*	Did Not Grant RW to Vehicle	None	West	East	West	East
Same direction -- both turning right -- both moving -- sideswipe	Making Right Turn	Making Right Turn	Improper Turn	None	North	West	North	West
From same direction - one right turn - one straight	Making Left Turn	Going Straight Ahead	Over Center Line	None	West	East	West	East
From same direction - both going straight - one stopped - rear-end	Going Straight Ahead	Stopped for Traffic	Follow Too Closely	None	North	South	North	Vehicle Stopped
From same direction - both going straight - both moving - sideswipe	Going Straight Ahead	Slowing	Inattention	None	South	North	South	North
From same direction - both going straight - one stopped - rear-end	Going Straight Ahead	Stopped at Signal or Stop Sign	Inattention	None	South	North	Vehicle Stopped	Vehicle Stopped
From same direction - both going straight - one stopped - rear-end	Going Straight Ahead	Stopped for Traffic	Follow Too Closely	None	North	South	North	Vehicle Stopped
Same direction -- both turning right -- one stopped -- sideswipe	Making Right Turn	Stopped for Traffic	Did Not Grant RW to Vehicle	None	East	North	East	Vehicle Stopped
From same direction - both going straight - one stopped - rear-end	Going Straight Ahead	Stopped for Traffic	Inattention	None	North	South	North	Vehicle Stopped
From same direction - one left turn - one straight	Making Left Turn	Going Straight Ahead	Improper Turn	None	North	East	North	East
From opposite direction - one left turn - one straight	Making Left Turn	Going Straight Ahead	Did Not Grant RW to Vehicle	None	South	West	North	South
Entering at angle	Merging (Entering Traffic)	Going Straight Ahead	Inattention	None	East	West	South	North
From opposite direction - one left turn - one straight	Making Left Turn	Going Straight Ahead	Did Not Grant RW to Vehicle	None	West	North	East	West
Entering at angle	Changing Lanes	Going Straight Ahead	Inattention	None	South	North	South	North
From same direction - both going straight - one stopped - rear-end	Going Straight Ahead	Stopped at Signal or Stop Sign	Inattention	None	North	South	North	Vehicle Stopped
From same direction - both going straight - one stopped - rear-end	Going Straight Ahead	Stopped for Traffic	Inattention	None	North	South	North	Vehicle Stopped
From opposite direction - one left turn - one right turn	Making Right Turn	Making Left Turn	Did Not Grant RW to Vehicle	None	South	East	North	East
Same direction -- both turning right -- both moving -- sideswipe	Making Left Turn	Making Left Turn	None	Improper Turn	North	East	North	East
Entering at angle	Going Straight Ahead	Going Straight Ahead	Did Not Grant RW to Vehicle	None	East	West	North	South
From same direction - both going straight - one stopped - sideswipe	Overtaking and Passing	Stopped at Signal or Stop Sign	Disregard Stop and Go Light	None	South	North	Vehicle Stopped	Vehicle Stopped
From opposite direction - one left turn - one straight	Going Straight Ahead	Making Left Turn	Failing to Signal	None	South	North	North	East
Entering at angle	Making Right Turn	Going Straight Ahead	Did Not Grant RW to Vehicle	None	East	North	South	North
From opposite direction - one left turn - one straight	Making Left Turn	Going Straight Ahead	Inattention	None	North	East	North	North
From opposite direction - one left turn - one straight	Making Left Turn	Going Straight Ahead	Did Not Grant RW to Vehicle	None	North	East	South	North
From opposite direction - one left turn - one right turn	Making Right Turn	Making Left Turn	Did Not Grant RW to Vehicle	None	South	East	North	East
From opposite direction - one left turn - one straight	Making Left Turn	Going Straight Ahead	Inattention	None	South	West	North	South
Entering at angle	Going Straight Ahead	Going Straight Ahead	Disregard Stop and Go Light	None	East	West	North	South
From opposite direction - one left turn - one straight	Going Straight Ahead	Making Left Turn	Disregard Stop and Go Light	None	South	North	North	East
From opposite direction - one left turn - one straight	Making Left Turn	Going Straight Ahead	Did Not Grant RW to Vehicle	None	North	East	South	North
From same direction - both going straight - both moving - rear-end	Going Straight Ahead	Going Straight Ahead	Inattention	None	West	East	West	East
From same direction - both going straight - both moving - rear-end	Going Straight Ahead	Slowing	Inattention	None	West	East	West	East
From same direction - both going straight - one stopped - rear-end	Going Straight Ahead	Stopped for Traffic	Inattention	None	East	West	East	Vehicle Stopped
Entering at angle	Making Left Turn	Going Straight Ahead	Did Not Grant RW to Vehicle	None	North	East	East	West
From same direction - both going straight - both moving - sideswipe	Changing Lanes	Going Straight Ahead	Inattention	None	West	East	West	East
From same direction - both going straight - one stopped - rear-end	Going Straight Ahead	Stopped for Traffic	Follow Too Closely	None	East	West	East	Vehicle Stopped
Entering at angle	Going Straight Ahead	Going Straight Ahead	Did Not Grant RW to Vehicle	None	Southeast	Northwest	Southwest	Northeast
Entering at angle	Changing Lanes	Going Straight Ahead	Inattention	None	North	West	East	West
Entering at angle	Merging (Entering Traffic)	Making Left Turn	Did Not Grant RW to Vehicle	None	South	North	West	North

FIRST IMPACT LOCATION (Effective for City, County, Misc 1/1/2010; State Routes indefinite)	
Lane of Primary Trafficway	
Lane of Primary Trafficway	
Lane of Primary Trafficway	
Intersecting Trafficway (WITH Intent to Access)	
Lane of Primary Trafficway	
Lane of Primary Trafficway	
Lane of Primary Trafficway	
Lane of Primary Trafficway	
Lane of Primary Trafficway	
Intersecting Trafficway (WITH Intent to Access)	
Lane of Primary Trafficway	
Lane of Primary Trafficway	
Lane of Primary Trafficway	
Lane of Primary Trafficway	
Lane of Primary Trafficway	
Intersecting Trafficway (WITH Intent to Access)	
Lane of Primary Trafficway	
Lane of Primary Trafficway	
Lane of Primary Trafficway	
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Lane of Primary Trafficway	

Exhibit 5

PRIMARY TRAFFICWAY	INTERSECTING TRAFFICWAY	DIST FROM REF PT	COMPASS DIRECTION FROM REFERENCE POINT	REFERENCE POINT NAME	MILE POST	REPORT NUMBER	DATE	TIME	MOST SEVERE INJURY TYPE	# I J	# F T	# A S	# V H S	# P E D S	# B I K	JUNCTION RELATIONSHIP
W CLEARWATER AVE	LESLIE RD					E314637	03/15/2014	15:27	No Injury	0	0	2	0	0	0	Exiting Roundabout
W CLEARWATER AVE	LESLIE RD					E268479	08/29/2013	16:15	No Injury	0	0	1	0	0	0	Circulating Roundabout
W CLEARWATER AVE	N COLUMBIA CENTER BLVD					E353917	09/01/2014	23:30	No Injury	0	0	2	0	0	0	At Intersection and Related
W CLEARWATER AVE	N COLUMBIA CENTER BLVD					E107002	05/26/2011	15:00	No Injury	0	0	2	0	0	0	At Intersection and Related
W CLEARWATER AVE	N COLUMBIA CENTER BLVD					E386787	12/21/2014	17:48	Possible Injury	1	0	3	0	0	0	At Intersection and Related
W CLEARWATER AVE	N COLUMBIA CENTER BLVD					E372921	11/07/2014	18:04	No Injury	0	0	2	0	0	0	At Intersection and Related
W CLEARWATER AVE	N COLUMBIA CENTER BLVD					E227749	02/20/2013	19:47	No Injury	0	0	2	0	0	0	At Intersection and Related
W CLEARWATER AVE	N COLUMBIA CENTER BLVD					E281148	10/30/2013	19:18	Possible Injury	2	0	2	0	0	0	At Intersection and Related
W CLEARWATER AVE	N COLUMBIA CENTER BLVD					E326081	04/30/2014	15:10	No Injury	0	0	2	0	0	0	At Intersection and Related
W CLEARWATER AVE	N COLUMBIA CENTER BLVD					E273549	09/29/2013	00:38	No Injury	0	0	2	0	0	0	At Intersection and Related
W CLEARWATER AVE	N COLUMBIA CENTER BLVD					E394678	01/19/2015	19:14	Possible Injury	2	0	2	0	0	0	At Intersection and Related
W CLEARWATER AVE	N COLUMBIA CENTER BLVD					E284798	10/29/2013	13:14	No Injury	0	0	2	0	0	0	At Intersection and Related
W CLEARWATER AVE	N COLUMBIA CENTER BLVD					3159954	10/17/2013	12:55	No Injury	0	0	2	0	0	0	At Intersection and Related
W CLEARWATER AVE	N COLUMBIA CENTER BLVD					E275180	09/30/2013	18:11	No Injury	0	0	2	0	0	0	At Intersection and Related
W CLEARWATER AVE	N COLUMBIA CENTER BLVD					E346286	07/25/2014	11:53	No Injury	0	0	2	0	0	0	At Intersection and Related
W CLEARWATER AVE	N STEPTOE ST					E406953	03/11/2015	16:50	No Injury	0	0	2	0	0	0	At Intersection and Related
W CLEARWATER AVE	N STEPTOE ST					E432340	06/06/2015	09:12	No Injury	0	0	2	0	0	0	At Intersection and Related
W CLEARWATER AVE	N STEPTOE ST					E432300	06/04/2015	13:11	No Injury	0	0	2	0	0	0	At Intersection and Related
W CLEARWATER AVE	N STEPTOE ST					E390275	01/04/2015	22:19	No Injury	0	0	2	0	0	0	At Intersection and Related
W CLEARWATER AVE	N STEPTOE ST					E436720	06/24/2015	18:21	No Injury	0	0	2	0	0	0	At Intersection and Related
W CLEARWATER AVE	N STEPTOE ST					E408928	03/13/2015	13:45	No Injury	0	0	2	0	0	0	At Intersection and Related
W CLEARWATER AVE	N STEPTOE ST					E435502	06/18/2015	14:52	No Injury	0	0	2	0	0	0	At Intersection and Related
W CLEARWATER AVE	N STEPTOE ST					E443053	07/14/2015	05:50	No Injury	0	0	2	0	0	0	At Intersection and Related
W CLEARWATER AVE	S CLODFELTER RD					3162898	11/24/2010	17:39	No Injury	0	0	2	0	0	0	At Intersection and Related
W CLEARWATER AVE	S COLUMBIA CENTER BL					3163092	06/06/2012	14:59	No Injury	0	0	2	0	0	0	At Intersection and Related
W CLEARWATER AVE	S COLUMBIA CENTER BLVD					E253763	06/30/2013	10:14	No Injury	0	0	2	0	0	0	At Intersection and Related
W CLEARWATER AVE	S COLUMBIA CENTER BLVD					3159925	10/03/2014	14:20	No Injury	0	0	2	0	0	0	At Intersection and Related
W CLEARWATER AVE	S COLUMBIA CENTER BLVD					E211866	12/06/2012	15:20	No Injury	0	0	3	0	0	0	At Intersection and Related
W CLEARWATER AVE	S COLUMBIA CENTER BLVD					E388659	12/26/2014	14:24	No Injury	0	0	2	0	0	0	At Intersection and Related
W CLEARWATER AVE	S COLUMBIA CENTER BLVD					E358276	09/18/2014	15:25	No Injury	0	0	2	0	0	0	At Intersection and Related
W CLEARWATER AVE	S COLUMBIA CENTER BLVD					E375018	11/14/2014	14:50	No Injury	0	0	2	0	0	0	At Intersection and Related
W CLEARWATER AVE	S COLUMBIA CENTER BLVD					E337933	06/26/2014	15:41	No Injury	0	0	2	0	0	0	At Intersection and Related
W CLEARWATER AVE	S UTAH ST					E166849	04/26/2012	07:36	No Injury	0	0	2	0	0	0	At Intersection and Related
W CLEARWATER AVE	STEPTOE					E379199	11/21/2014	16:17	No Injury	0	0	2	0	0	0	At Intersection and Related
W CLEARWATER AVE	STEPTOE					E400262	02/11/2015	10:34	No Injury	0	0	2	0	0	0	At Intersection and Related
W CLEARWATER AVE	STEPTOE					E390262	12/31/2014	13:28	Possible Injury	1	0	2	0	0	0	At Intersection and Related
W CLEARWATER AVE	W 10TH AVE					E356583	09/11/2014	17:23	No Injury	0	0	2	0	0	0	At Intersection and Related
W CLEARWATER AVE	W 10TH AVE					E227748	02/20/2013	15:01	No Injury	0	0	2	0	0	0	At Intersection and Related
W CLEARWATER DR	S UTAH ST					3331045	04/26/2012	11:05	Serious Injury	2	0	2	0	0	0	At Driveway within Major Intersection
082LX10894					0.01	E413857	03/31/2015	15:06	No Injury	0	0	2	0	0	0	At Intersection and Related

FIRST COLLISION TYPE / OBJECT STRUCK	VEHICLE 1 ACTION	VEHICLE 2 ACTION	MV DRIVER CONT CIRC 1 UNIT 1	MV DRIVER CONT CIRC 1 UNIT 2	VEH 1 COMP DIR FROM	VEH 1 COMP DIR TO	VEH 2 COMP DIR FROM	VEH 2 COMP DIR TO
From same direction - one left turn - one straight	Making Left Turn	Going Straight Ahead	Other	None	South	West	South	North
Curb, Raised Traffic Island or Raised Median Curb	Going Straight Ahead		Under Influence of Alcohol		East	West		
From opposite direction - one left turn - one straight	Making Left Turn	Going Straight Ahead	Did Not Grant RW to Vehicle	None	East	South	West	East
From same direction - both going straight - one stopped - rear-end	Going Straight Ahead	Stopped at Signal or Stop Sign	Driver Distractions Outside Vehicle	None	West	East	West	Vehicle Stopped
From same direction - both going straight - one stopped - rear-end	Stopped at Signal or Stop Sign	Going Straight Ahead	None	Other	Vehicle Stopped	Vehicle Stopped	East	West
From opposite direction - one left turn - one right turn	Making Right Turn	Making Left Turn	Did Not Grant RW to Vehicle	None	South	East	North	East
From opposite direction - one left turn - one straight	Making Left Turn	Going Straight Ahead	Did Not Grant RW to Vehicle	None	West	North	East	West
Entering at angle	Going Straight Ahead	Going Straight Ahead	Inattention	None	West	East	North	South
Same direction -- both turning right -- both moving -- sideswipe	Making Right Turn	Making Right Turn	Other	Other	East	North	East	North
From opposite direction - one left turn - one straight	Making Left Turn	Going Straight Ahead	Inattention	None	East	South	West	East
Entering at angle	Going Straight Ahead	Going Straight Ahead	Inattention	None	East	West	North	South
From opposite direction - one left turn - one right turn	Making Left Turn	Making Right Turn	Inattention	None	West	North	East	North
From same direction - both going straight - one stopped - rear-end	Going Straight Ahead	Stopped at Signal or Stop Sign	Follow Too Closely	None	West	East	Vehicle Backing	Vehicle Stopped
From opposite direction - one left turn - one straight	Going Straight Ahead	Making Left Turn	Disregard Stop and Go Light	None	South	North	North	East
Same direction -- both turning right -- both moving -- rear end	Making Right Turn	Making Right Turn	Follow Too Closely	None	East	North	East	North
From opposite direction - one left turn - one straight	Making Left Turn	Going Straight Ahead	Did Not Grant RW to Vehicle	None	North	East	South	North
From opposite direction - one left turn - one straight	Making Left Turn	Going Straight Ahead	None	None	West	North	East	West
From same direction - both going straight - one stopped - rear-end	Going Straight Ahead	Stopped at Signal or Stop Sign	Follow Too Closely	None	West	East	Vehicle Stopped	Vehicle Stopped
From same direction - both going straight - one stopped - rear-end	Slowing	Stopped at Signal or Stop Sign	None	None	North	South	Vehicle Stopped	Vehicle Stopped
From opposite direction - one left turn - one straight	Going Straight Ahead	Making Left Turn	Did Not Grant RW to Vehicle	None	East	West	West	North
From opposite direction - one left turn - one straight	Making Left Turn	Going Straight Ahead	Inattention	None	West	North	East	West
Entering at angle	Making Right Turn	Going Straight Ahead	Exceeding Reas. Safe Speed	None	East	North	North	South
From opposite direction - one left turn - one straight	Making Left Turn	Going Straight Ahead	Did Not Grant RW to Vehicle	None	West	North	East	West
From same direction - all others	Going Straight Ahead	Going Straight Ahead	Exceeding Reas. Safe Speed	None	East	West	East	West
From same direction - both going straight - one stopped - rear-end	Going Straight Ahead	Stopped for Traffic	Driver Operating Handheld Telephone	None	West	East	West	Vehicle Stopped
From opposite direction - one left turn - one straight	Making Left Turn	Going Straight Ahead	Inattention	None	West	North	East	West
Entering at angle	Making Right Turn	Going Straight Ahead	Did Not Grant RW to Vehicle	None	East	North	South	North
From same direction - both going straight - one stopped - rear-end	Going Straight Ahead	Stopped for Traffic	Follow Too Closely	None	West	East	West	Vehicle Stopped
From same direction - both going straight - one stopped - rear-end	Going Straight Ahead	Stopped for Traffic	Follow Too Closely	None	West	East	Vehicle Stopped	Vehicle Stopped
From opposite direction - one left turn - one straight	Making Left Turn	Going Straight Ahead	Did Not Grant RW to Vehicle	None	North	East	South	North
From same direction - both going straight - one stopped - rear-end	Going Straight Ahead	Stopped at Signal or Stop Sign	Inattention	None	East	West	East	Vehicle Stopped
From same direction - both going straight - one stopped - rear-end	Going Straight Ahead	Stopped at Signal or Stop Sign	Inattention	None	West	East	West	Vehicle Stopped
From opposite direction - one left turn - one straight	Making Left Turn	Going Straight Ahead	Did Not Grant RW to Vehicle	None	East	South	West	East
From same direction - both going straight - both moving - rear-end	Going Straight Ahead	Slowing	Follow Too Closely	None	West	East	West	East
From opposite direction - one left turn - one straight	Making Left Turn	Going Straight Ahead	Did Not Grant RW to Vehicle	None	West	North	East	West
From opposite direction - one left turn - one straight	Making Left Turn	Going Straight Ahead	Did Not Grant RW to Vehicle	None	North	East	South	North
From same direction - both going straight - one stopped - rear-end	Going Straight Ahead	Stopped for Traffic	Follow Too Closely	None	East	West	East	Vehicle Stopped
Entering at angle	Making Right Turn	Going Straight Ahead	Did Not Grant RW to Vehicle	None	South	East	West	East
From same direction - both going straight - one stopped - rear-end	Going Straight Ahead	Stopped for Traffic	Inattention	None	South	North	South	Vehicle Stopped
From opposite direction - one left turn - one straight	Making Left Turn	Going Straight Ahead	Did Not Grant RW to Vehicle	None	East	South	West	East

Exhibit 5

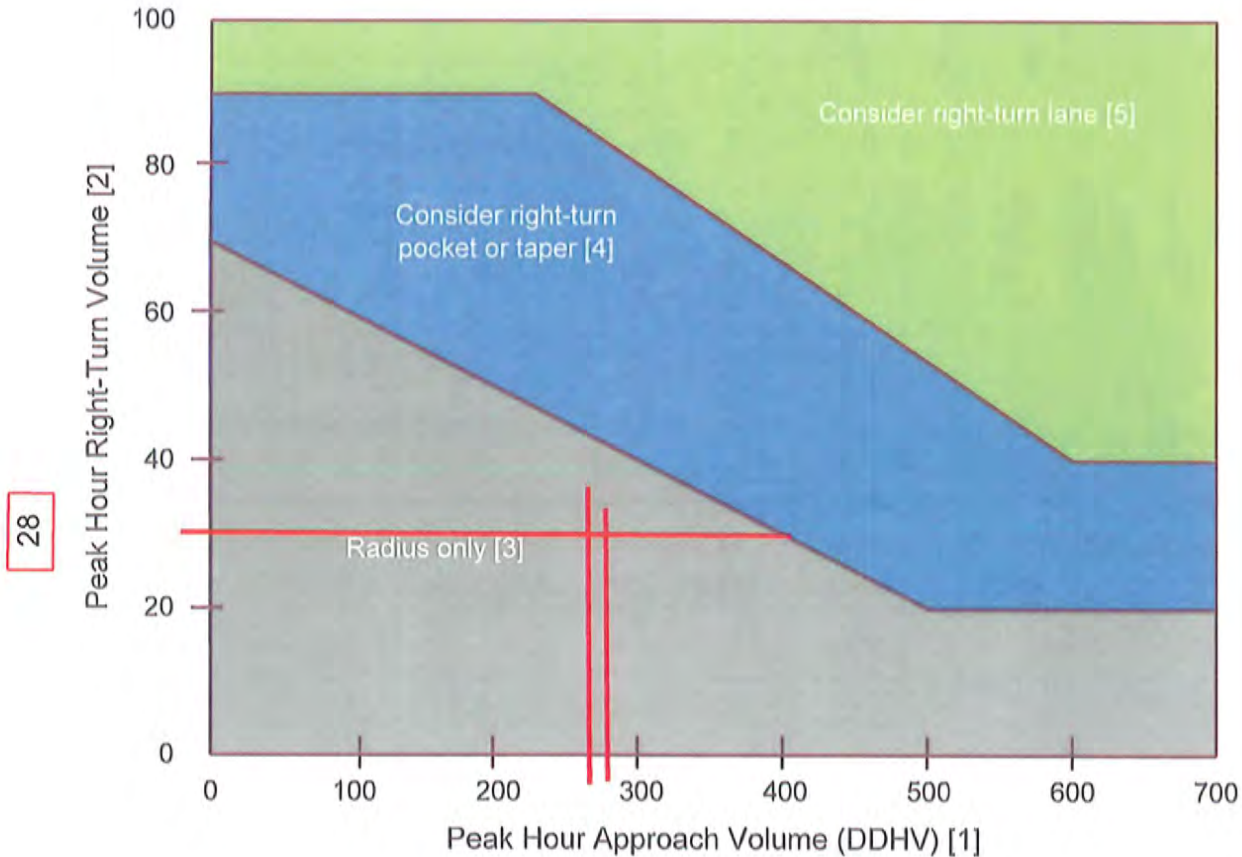
PRIMARY TRAFFICWAY	INTERSECTING TRAFFICWAY	DIST FROM REF PT	COMPASS DIRECTION FROM REFERENCE POINT	REFERENCE POINT NAME	MILE POST	REPORT NUMBER	DATE	TIME	MOST SEVERE INJURY TYPE	# I J	# F T	# V S	# P H D S	# B I E K	JUNCTION RELATIONSHIP
082LX10894					0.25	E194056	09/21/2012	09:10	No Injury	0	0	2	0	0	At Intersection and Related
082R110944					0.47	E417207	04/17/2015	17:31	No Injury	0	0	2	0	0	At Intersection and Related
082R110944					0.47	E445518	07/22/2015	09:03	Possible Injury	1	0	2	0	0	At Intersection and Related
082R110944					0.47	E362317	10/03/2014	15:05	No Injury	0	0	2	0	0	At Intersection and Related
082R110944					0.47	E263471	08/15/2013	13:25	No Injury	0	0	2	0	0	At Intersection and Related
082R110944					0.47	E286865	11/20/2013	15:30	No Injury	0	0	2	0	0	At Intersection and Related
082S510874					0.50	3290940	11/29/2013	08:53	No Injury	0	0	1	0	0	At Intersection and Related

FIRST COLLISION TYPE / OBJECT STRUCK	VEHICLE 1 ACTION	VEHICLE 2 ACTION	MV DRIVER CONT CIRC 1 UNIT 1	MV DRIVER CONT CIRC 1 UNIT 2	VEH 1 COMP DIR FROM	VEH 1 COMP DIR TO	VEH 2 COMP DIR FROM	VEH 2 COMP DIR TO
From opposite direction - one left turn - one straight	Making Left Turn	Going Straight Ahead	Did Not Grant RW to Vehicle	None	Northeast	Southeast	Southwest	Northeast
From same direction - both going straight - one stopped - rear-end	Going Straight Ahead	Stopped at Signal or Stop Sign	Follow Too Closely	None	East	West	Vehicle Stopped	Vehicle Stopped
From same direction - both going straight - one stopped - rear-end	Starting in Traffic Lane	Stopped at Signal or Stop Sign	Other	None	Vehicle Stopped	West	East	Vehicle Stopped
From same direction - both going straight - one stopped - rear-end	Going Straight Ahead	Stopped at Signal or Stop Sign	Follow Too Closely	None	East	West	Vehicle Stopped	Vehicle Stopped
From same direction - both going straight - one stopped - rear-end	Slowing	Stopped at Signal or Stop Sign	Follow Too Closely	None	East	West	Vehicle Stopped	Vehicle Stopped
Same direction -- both turning right -- both moving -- rear end	Making Right Turn	Making Right Turn	Inattention	None	East	North	East	North
Guardrail - Face	Merging (Entering Traffic)		Exceeding Reas. Safe Speed		East	West		

FIRST IMPACT LOCATION (Effective for City, County, Misc 1/1/2010; State Routes indefinite)	
Lane 1 LX Decreasing Milepost	
Lane 1 Off Ramp Decreasing Milepost Side of Mainline	
Lane 1 Off Ramp Decreasing Milepost Side of Mainline	
Lane 1 Off Ramp Decreasing Milepost Side of Mainline	
Lane 1 Off Ramp Decreasing Milepost Side of Mainline	
Lane 1 Off Ramp Decreasing Milepost Side of Mainline	
Right Shoulder On Ramp Decreasing Milepost Side of Mainline	

Appendix F – Left and Right Turn Treatment Analysis

E Badger Road/I-82 EB on-ramp
2021 without and with project



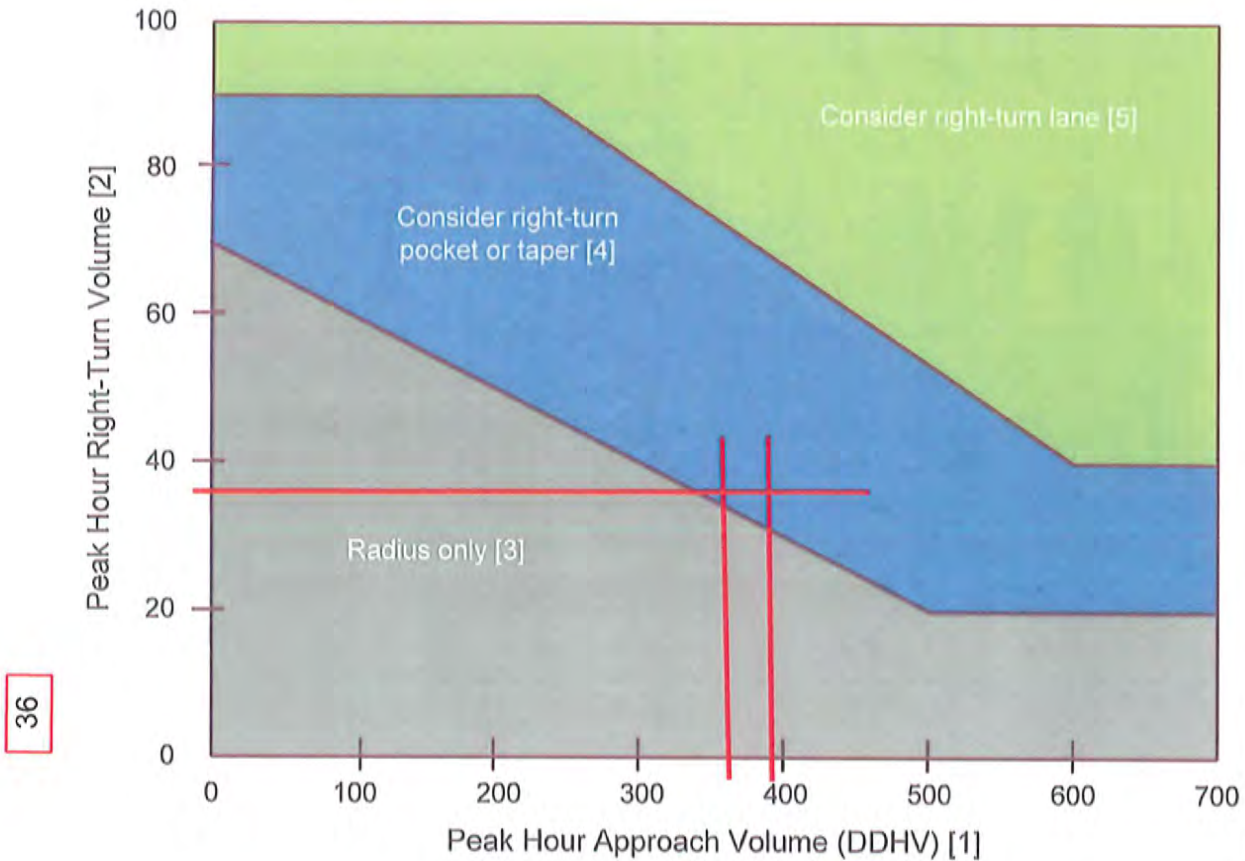
243 + 28 = 271
without project

252 + 28 = 280
with project

Notes:

- [1] For two-lane highways, use the peak hour DDHV (through + right-turn).
For multilane, high-speed highways (posted speed 45 mph or above), use the right-lane peak hour approach volume (through + right-turn).
- [2] When all three of the following conditions are met, reduce the right-turn DDHV by 20:
- The posted speed is 45 mph or below
 - The right-turn volume is greater than 40 VPH
 - The peak hour approach volume (DDHV) is less than 300 VPH
- [3] For right-turn corner design, see [Exhibit 1310-6](#).
- [4] For right-turn pocket or taper design, see [Exhibit 1310-12](#).
- [5] For right-turn lane design, see [Exhibit 1310-13](#).

Right-Turn Lane Guidelines
Exhibit 1310-11



$$328 + 36 = 364$$

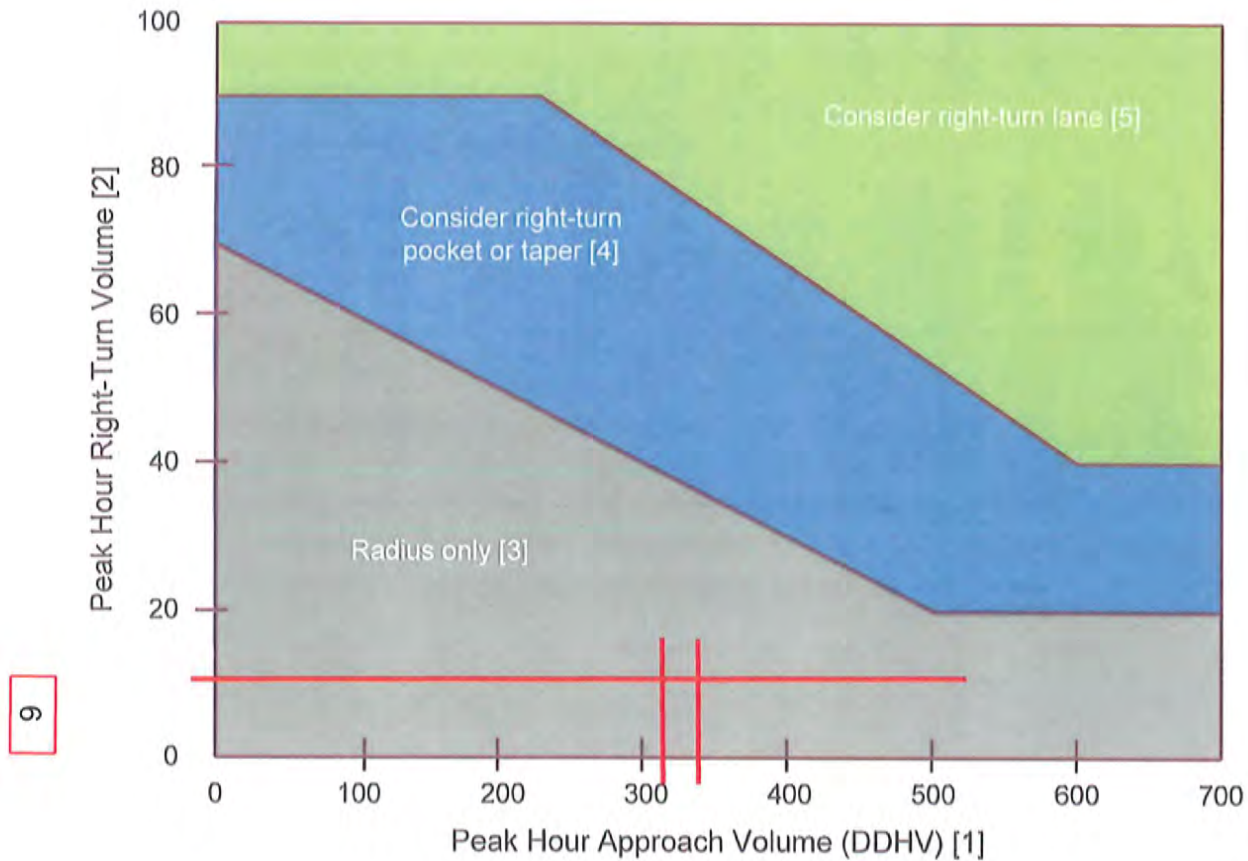
$$357 + 36 = 393$$

Notes:

- [1] For two-lane highways, use the peak hour DDHV (through + right-turn).
For multilane, high-speed highways (posted speed 45 mph or above), use the right-lane peak hour approach volume (through + right-turn).
- [2] When all three of the following conditions are met, reduce the right-turn DDHV by 20:
 - The posted speed is 45 mph or below
 - The right-turn volume is greater than 40 VPH
 - The peak hour approach volume (DDHV) is less than 300 VPH
- [3] For right-turn corner design, see [Exhibit 1310-6](#).
- [4] For right-turn pocket or taper design, see [Exhibit 1310-12](#).
- [5] For right-turn lane design, see [Exhibit 1310-13](#).

Right-Turn Lane Guidelines
Exhibit 1310-11

E Badger Road/I-82 WB on-ramp
2021 without and with project



$$315 + 9 = 324$$

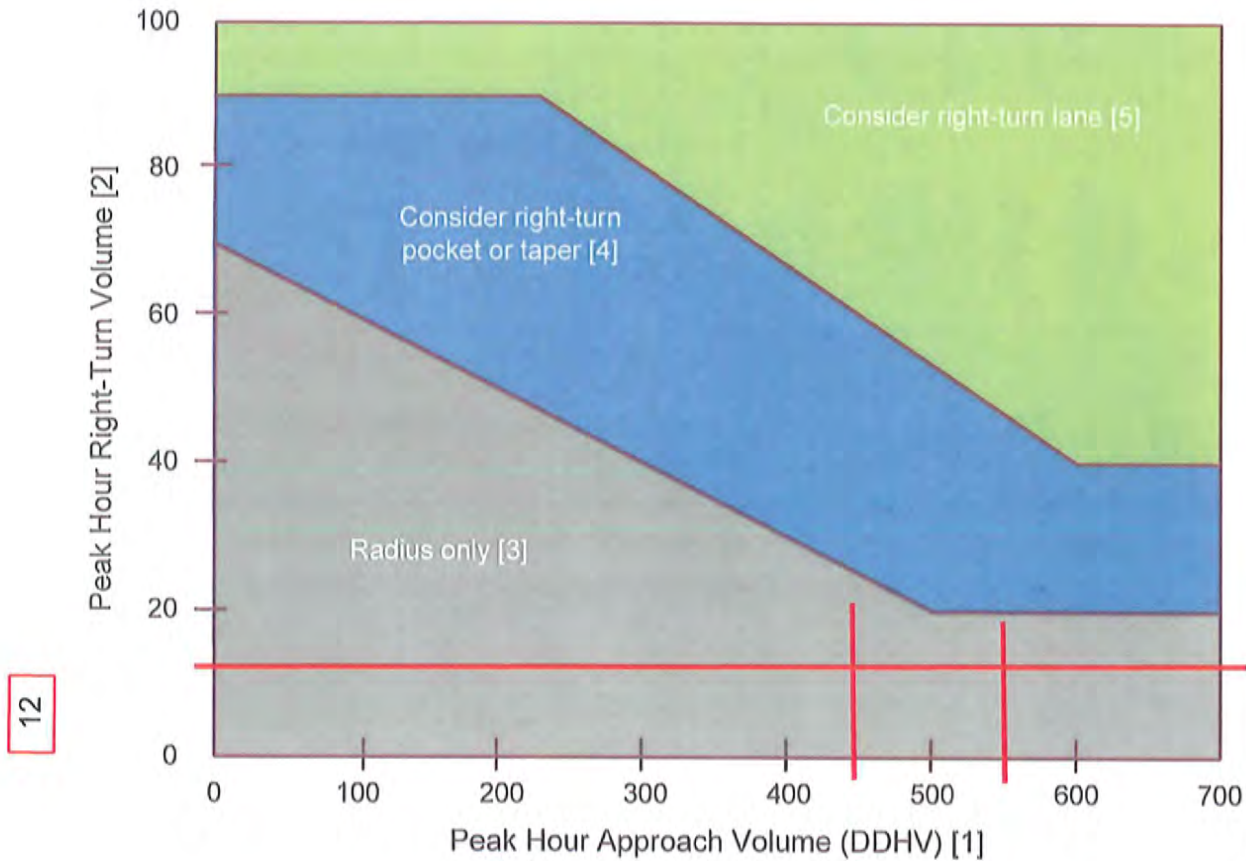
$$343 + 9 = 352$$

Notes:

- [1] For two-lane highways, use the peak hour DDHV (through + right-turn).
For multilane, high-speed highways (posted speed 45 mph or above), use the right-lane peak hour approach volume (through + right-turn).
- [2] When all three of the following conditions are met, reduce the right-turn DDHV by 20:
 - The posted speed is 45 mph or below
 - The right-turn volume is greater than 40 VPH
 - The peak hour approach volume (DDHV) is less than 300 VPH
- [3] For right-turn corner design, see [Exhibit 1310-6](#).
- [4] For right-turn pocket or taper design, see [Exhibit 1310-12](#).
- [5] For right-turn lane design, see [Exhibit 1310-13](#).

Right-Turn Lane Guidelines
Exhibit 1310-11

E Badger Road/I-82 WB on-ramp
2036 without and with project



$446 + 12 = 364$

$553 + 12 = 364$

Notes:

- [1] For two-lane highways, use the peak hour DDHV (through + right-turn).
For multilane, high-speed highways (posted speed 45 mph or above), use the right-lane peak hour approach volume (through + right-turn).
- [2] When all three of the following conditions are met, reduce the right-turn DDHV by 20:
- The posted speed is 45 mph or below
 - The right-turn volume is greater than 40 VPH
 - The peak hour approach volume (DDHV) is less than 300 VPH
- [3] For right-turn corner design, see [Exhibit 1310-6](#).
- [4] For right-turn pocket or taper design, see [Exhibit 1310-12](#).
- [5] For right-turn lane design, see [Exhibit 1310-13](#).

Right-Turn Lane Guidelines
Exhibit 1310-11



**CITY OF KENNEWICK
DETERMINATION OF NON-SIGNIFICANCE**

FILE/PROJECT NUMBER: ED-2024-0028

DESCRIPTION OF PROPOSAL: A 14.23-acre, 153 lot single-family townhome lot preliminary plat.

PROPOSER: Knutzen Engineering, c/o Robert McLeod, 5401 Ridgeline Drive, Suite 160, Kennewick, WA 99338

LOCATION OF PROPOSAL, INCLUDING STREET ADDRESS, IF ANY: 11292 W Clearwater Avenue

LEAD AGENCY: City of Kennewick

DETERMINATION: The City of Kennewick has determined that this proposal does not have a probable significant adverse impact on the environment. An Environmental Impact Statement (EIS) will not be required under RCW 43.21C.030(2)(c). This decision was made after review of a completed environmental checklist and other information on file with the City. This information is available to the public on request. Application for other required permits may require further review under SEPA procedures.

- ☒ There is no comment period for this DNS.
- ☐ This DNS is issued after using the optional DNS process in WAC 197-11-355. There is no further comment period on the DNS.
- ☐ This DNS is issued under 197-11-340(2); the City will not act on this proposal for fifteen days from the date below. Comments must be submitted by _____. After the review period has elapsed, all comments received will be evaluated and the DNS will be retained, modified, or withdrawn as required by SEPA regulations.

RESPONSIBLE OFFICIAL: Anthony Muai, AICP

POSITION/TITLE: Planning Director

ADDRESS: 210 W 6th Ave., P.O. Box 6108, Kennewick, WA 99336

PHONE: (509) 585-4386

☐ Changes, modifications and/or additions to the checklist have been made on the attached Environmental Checklist Review.

This DNS is subject to the attached conditions:

- ☒ No conditions.
- ☐ See attached condition(s).

Date: February 24, 2025

Signature: 

Appeal: An appeal of this determination must be submitted to the Community Planning Department within fourteen (14) calendar days after the date issued (2/24/25), no later than **4:30 p.m. on March 10, 2025**. This appeal must be written and make specific factual objections to the City's threshold determination. Appeals shall be conducted in conformance with Section 4.12.090(9) of the Kennewick Municipal Code and the required fees pursuant to the City's adopted Fee Schedule shall be paid at time of appeal submittal.

Copies of this DNS were mailed to:

Dept. of Ecology
WA Dept. of Fish & Wildlife
WSDOT
Yakama Nation
CTUIR
ED-2024-0028 File



NOTICE OF MAILING

I, Steve Donovan, on 3/24, 2025
mailed 12 copies of NPH
for SUB-2024-0013
to surrounding properties within 300 feet
as shown on the attached list.


Signature

37

MICHEL FAMILY LLC
17002 S GRANDVIEW LN
KENNEWICK WA 99338

37

C2 MANAGEMENT GROUP LLC
11257 W CLEARWATER AVE, STE 130
KENNEWICK WA 99336

37

C2 MANAGEMENT GROUP LLC
12802 S COTTONWOOD CREEK BLVD
KENNEWICK WA 99338

37

ACME PEST & SPRAY LLC
PO BOX 5478
WEST RICHLAND WA 99353

37

ROBERT A STAFFORD
11911 W CLEARWATER AVE
KENNEWICK WA 99338

37

STRIZHAKS HAVEN RANCH LLC
105609 E WISER PKWY
KENNEWICK WA 99338

37

FIDINO ENTERPRISES LLC
35 LOUISIANA ST, UNIT A120
KENNEWICK WA 99336

37

ISAAC T & APRIL E BEDFORD
1007 S SUNNYVALE DRIVE
KENNEWICK WA 99338

37

VIVIANA SANCHEZ
1103 S SANDLEWOOD PR SE
KENNEWICK WA 99338

37

RICARDO GARCIA
1008 S SUNNYVALE DR
KENNEWICK WA 99337

37

ZULEMA URQUIETA
1103 S SUNNYVALE DRIVE
KENNEWICK WA 99338

37

SPENCER TRUSTEES CHARLES W &
KARLEEN
1104 S SUNNYVALE DR
KENNEWICK WA 99338



NOTICE OF PUBLIC HEARING – APRIL 14, 2025, 6:00 P.M.

Proposal: A 14.23-acre, 153 lot and three tract Preliminary Plat at 11292 W Clearwater Avenue. The project will consist of standard single-family lots and townhome lots. The site is zoned Residential, High (RH). The file number is SUB-2024-0013. **PLAT MAP ON BACK**

Open Record Hearing: The City of Kennewick Hearing Examiner will conduct an open record hearing at **6:00 p.m. on April 14, 2025 at 210 W 6th Avenue, City Hall Council Chambers**. The meeting will be conducted in a hybrid format, which allows in person or virtual participation. To participate in the meeting virtually, use the link found at www.go2kennewick.com/244/Hearing-Examiner.

Environmental Documents and/or Studies Applicable to this Proposal: A Determination of Non-significance, ED-2024-0028, was issued on February 24, 2025.

Determination of Completeness: The application was determined complete on January 7, 2025 for processing.

Project Permits Associated with this Proposal: Civil

Preliminary Determination of Regulations Used for Project Mitigation: Title 18 (Zoning), Title 17 (Subdivision), Title 4 (Administrative Procedures) of the Kennewick Municipal Code and the land use policies contained in the Kennewick Comprehensive Plan.

Estimated Date of Decision: Within 10 business days of the Hearing Date of April 14, 2025.

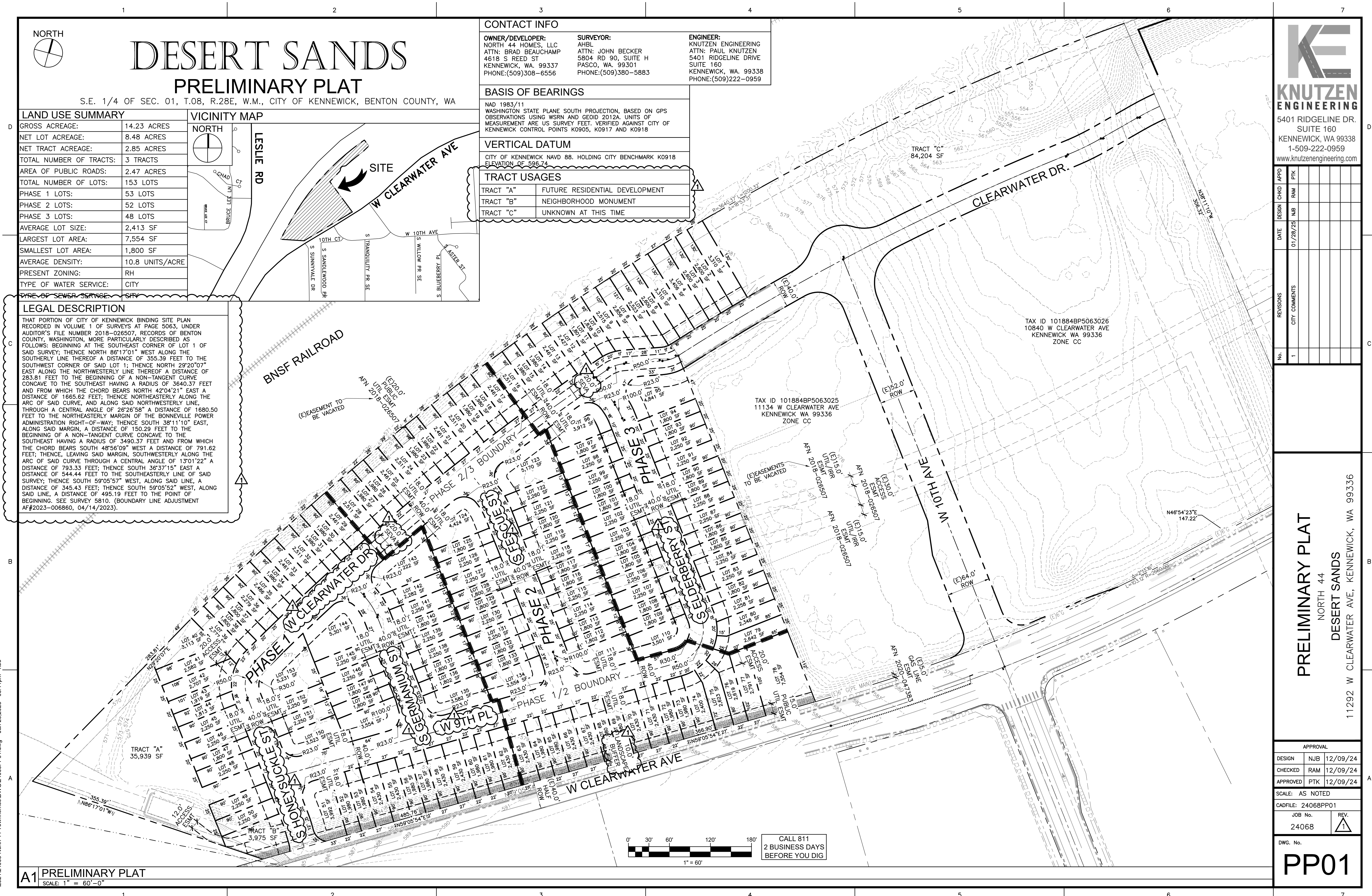
To Receive Notification of the Decision: Contact the Development Services Division at 210 W. 6th Avenue, Kennewick, WA 99336 or via telephone at (509) 585-4280.

Appeal: Any person aggrieved by the decision of the Kennewick Hearing Examiner on this proposal may appeal to the Superior Court of Benton County within twenty-one (21) days of the date of decision.

Steve Donovan, Planning Manager

The City of Kennewick welcomes full participation in public meetings by all citizens. No qualified individual with a disability shall be excluded or denied the benefit of participating in such meetings. If you wish to use auxiliary aids or require assistance to comment at this public meeting, please contact Steve Donovan at (509) 585-4361 or through the Washington Relay Service Center TTY by dialing 711, at least ten days prior to the date of the meeting to make arrangements for special needs.

210 W. 6th Avenue / PO Box 6108, Kennewick, WA 99336





MEMORANDUM

PUBLIC WORKS DEPARTMENT

To: Steve Donovan, Planning Manager
 From: Kristin Stowe, Development Review Supervisor
 Date: January 14, 2025
 Re: Public Works Utility Comments
 Project: SUB-2024-0013 – Desert Sands

1. Civil plans shall show any proposed phasing for construction and the type of building use and number of floors.
2. Civil drawings shall include only the infrastructure proposed with each phase of the project. Design engineer has the option of showing adjacent phases in a lighter line style to assure clarity for review, permitting, and construction.
3. As part of all residential development construction plans, there shall be a separate schematic drawing which, at a minimum, shows the power source(s), wiring diagram, streetlight pole spacing, and street permanent signing per City of Kennewick (COK) Standard Specifications. Combine signing, striping, and illumination plans onto the same drawing with other elements left off.
4. Developer will be required to provide construction of roads, sidewalks, streetlights, storm drainage, and designate sidewalk and utility easements, all in conformance with the latest COK Standard Specifications and Details.
5. The maximum street grade per KMC 5.56.275 is 12%. Show grades on the street centerline profile.
6. Permanent structures shall not be located over City of Kennewick (COK) utilities, or within any easement. For easement vacation questions, contact Scott Szendre at (509) 585-4446.
7. W Clearwater Ave has a Pavement Condition Index (PCI) rating equal to or above 75, therefore any trenching done on pavement with a PCI rating of 75 or over will require a minimum 25-foot wide patch the full width of each travel lane or shoulder disturbed, if approved by the Public Works Director.
8. There are two existing 8-inch water mains stubbed to the site from the 16-inch water main located in W Clearwater Ave., see COK Record Drawing G-2000.
9. A comprehensive water plan needs to be approved by the City for the entire plat prior to approval of Phase 1 construction plans. Comprehensive Plan can be submitted with the Preliminary Civil Plan review.
10. Water and sewer services to be constructed per City of Kennewick (COK) Detail 3-6.
11. When a property is developed that has an existing water service(s), or mainline stubbed and development will not utilize the existing service or stub, the developer contractor shall expose the water main and remove the abandoned corporation stop and install a plug, or remove the abandoned valve and install a blind flange per COK Standard 4-3.01.

PUBLIC WORKS DEPARTMENT

1010 S. Chemical Drive * PO Box 6108* Kennewick, WA 99336-0108
 509-585-4419 * 509-585-4451 Fax

12. Provide 15-foot wide easements or tracts centered over all water mains outside of the right-of-way. These easements must extend to 5 feet behind blow offs, water meters, fire hydrants, or other fixtures.
13. The Developer shall provide and install one metered water service for each proposed dwelling or building at their own expense per COK Standard Detail 3-6. The meter shall be placed as close to the main line as possible (not in a driveway or parking area) per KMC 14.12.080.
14. Provide backflow prevention assemblies on the building side of the water meter for commercial, multi-story, and sprinklered buildings per KMC 15.41.070.
15. Provide water lines and hydrants as required by Fire Department to meet fire protection.
16. Design Fire Line connections to serve buildings per COK Standard Drawing 4-25.
17. Provide a "fire flow requirement" signature block on the civil plans. Fire flow block will call out the type of construction material to for the building, the required fire flow and duration based on that type of construction, a fire sprinkler indication, any reduction in fire flow as allowed by the IFC, and the net required fire flow remaining.
18. On private development projects, all hydrants within 100-feet of the project limits shall be updated to current standards per COK Standard Specification 4-5.01.
19. Looping may be required based on hydraulic need to support maximum required fire flow at minimum residuals (per NFPA), as well as ensure sufficient turn over for water quality. If the applicant can demonstrate required fire flow is met, and water quality turnover is achieved, looping may not be required.
20. Potable water is available for irrigation purposes and will be provided by the COK. Irrigation systems feeds will be connected downstream of the potable water (no separate irrigation meters) with an approved backflow device reviewed by the COK Cross Connect Specialist.
21. There are three existing 8-inch sewer mains stubbed to the site from the 8-inch sewer main located in W Clearwater Ave., see COK Record Drawing G-2000.
22. A comprehensive sewer plan needs to be approved by the City for the entire plat prior to approval of Phase 1 construction plans. Comprehensive Plan can be submitted with the Preliminary Civil Plan review.
23. Every proposed dwelling shall be separately connected with the public sewer, unless such connection is six inch diameter sewer pipe or larger per KMC 14.22.030(10).
24. Provide 15-foot wide easements or tracts centered over all sewer mains outside of the right-of-way.
25. Provide a Comprehensive Stormwater plan for the subdivision per KMC 14.28.045, City Standard Specifications Section 5-9 and Storm Management Manual of Eastern Washington (SMMEW).
26. Storm Design must include erosion control and conveyance of the upstream storm flow through the site as well as overflows at low points and the effect on downstream capacity. Infiltration tests are required at the location and depth of the planned infiltration structures along with a soils log to 5 feet below that point. Surface infiltration is the preferred method (ponds). All underground infiltration structures must be designed and installed to meet the Washington State Underground Injection Control (UIC) Rule. Provide an assessment of the design against the UIC pretreatment requirements. Provide UIC registration numbers on the plans prior seeking the City's signature. Stormwater infiltration structures serving the public right of way shall be installed in a dedicated tract to be maintained by the HOA or Owner. Contact Martin Nelson at (509) 585-4306 with any questions.
27. All plans showing existing utilities shall call out the Record Drawing set number that installed the utilities. All plans need to clearly identify the size and type of water/sewer utility that is

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being proposed or connected to (i.e. "Existing 8-inch Water" or similar). Label private lines "Private".

28. All required infrastructure improvements must be substantially completed prior to Final Plat approval per KMC17.10.260 (2).
29. Any off site tracts, easements, or agreements required for the project shall be submitted with the civil plans for review. Before a permit can be issued for the project, a copy shall be provided to the Public Works Department. The Auditor File Number shall be added to the Final Record Drawings submitted at the end of construction.
30. This site will require a separate Public Works Construction permit. You may apply for this by submitting the information below for Civil Plan Review through the City of Kennewick's [Citizen Self Service Portal](#):
 - a. PDF copy of the Application for Civil Review and Storm Report.
 - b. One full size (24"x36") PDF copy of the construction plans.
31. Construct all projects using current City Survey Data. After project completion, Record Drawings showing improvements made on the property will be required prior to acceptance of the construction permit(s). For detailed information on Kennewick Survey Data and Record Drawings go to COK website at <https://www.go2kennewick.com/314/Civil-Plan-Review>.

PUBLIC WORKS DEPARTMENT

1010 S. Chemical Drive * PO Box 6108* Kennewick, WA 99336-0108
509-585-4419 * 509-585-4451 Fax

**MEMORANDUM****Traffic Engineering Division**

To: Steve Donovan, Planning Manager
From: Kevin Biersner, Assistant Traffic Engineer
Date: January 24, 2025
Re: Traffic Engineering Comments for 11292 W Clearwater Ave
Project: SUB-2024-0013

Project Description

11292 W Clearwater Ave is proposing a new 154 Multi-Family development with new city streets.

KMC 13.16 Transportation Impact Fees

1. The Transportation Impact Fee (TIF) is a one-time charge for direct impacts caused by the traffic generated from the proposed development and used to pay for transportation projects needed to address said impacts. The TIF amendment on June 5 2018 (effective June 14 2018) created Traffic Impact Fee Districts, which allows fees be remitted to projects congruent with the area where the impact is realized.
2. The 2024 District 1 Traffic Impact Fee for 154 Multi-Family dwelling units is \$907.76 per dwelling unit. The total TIF is estimated to be \$139,795.04.
3. The final fee will be assessed at the building permit for the structure as designed and is due prior to Certificate of Occupancy.

Traffic Operations

This proposed development is within the area of the Development Agreement for the December 5, 2017, Clearwater Commercial Binding Site Plan # 2017-037197. Section 4.3.2 that may be triggered by the proposed development.

1. Traffic Signal at 10th and Clearwater. The proposed development will contribute trips to this intersection and the combined trips of this development and the development to the east of it may trigger the 150 trips resulting in the installation of a new signal.

2. Proposed access on W Clearwater Ave will be right-in-right-out only.
3. Based on the proposed 154 dwelling units the city request a dedicated right turn and deceleration lane for the proposed access on Clearwater Ave. The turn pocket will need to be 205' including a 100' taper.
 - a. A trip generation and distribution analysis can be completed to determine the total number of turns.
4. Dual-Face Concrete Curb will need to connect to the existing curb to the west and extend 50 feet beyond the planned access to the east. See COK 2-9 sheet 2 of 10 for details.

Proposed Roadway

1. Please refer to KMC 5.56.275(1)'s roadway centerline requirements.

5.56.275: - Street Radii and Grade.



(1) Local Streets: Unless otherwise approved by the Deputy Director of Public Works, local streets shall be constructed with centerline radii which meet the following standards. On minor loop streets and cul-de-sac streets, where the street makes a 90-degree plus or minus five-degree turn, the minimum centerline radius shall be 50 feet. On all other minor loop street and cul-de-sac street curves, the minimum centerline radius shall be 150 feet. On all local through streets, other than minor loop streets, as determined by the Deputy Director of Public Works, the minimum centerline radius shall be 200. Unless otherwise approved by the Deputy Director of Public Works, the maximum grade on local streets shall be 12 percent.

2. Please refer to KMC Standard Drawing No. 2-8 for intersection design guidelines.
3. Please refer to the table below for the design rate of vertical curvature, K, values for vertical curves at the proposed roadway design speed.

Table 3-34. Design Controls for Crest Vertical Curves Based on Stopping Sight Distance

Design Speed (km/h)	Metric		U.S. Customary	
	Stopping Sight Distance (m)	Rate of Vertical Curvature, K ^a		Rate of Vertical Curvature, K ^a
		Calculated	Design	
20	20	0.6	1	15
30	35	1.9	2	20
40	50	3.8	4	25
50	65	6.4	7	30
60	85	11.0	11	35
70	105	16.8	17	40
80	130	25.7	26	45
90	160	38.9	39	50
100	185	52.0	52	55
110	220	73.6	74	60
120	250	95.0	95	65
130	285	123.4	124	70
				75
				80

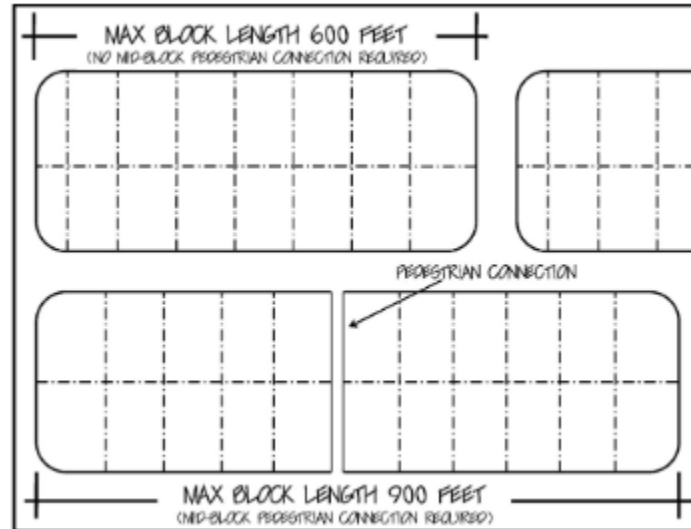
^a Rate of vertical curvature, K, is the length of curve per percent algebraic difference in intersecting grades (A), $K = L/A$.

Table 3-36. Design Controls for Sag Vertical Curves

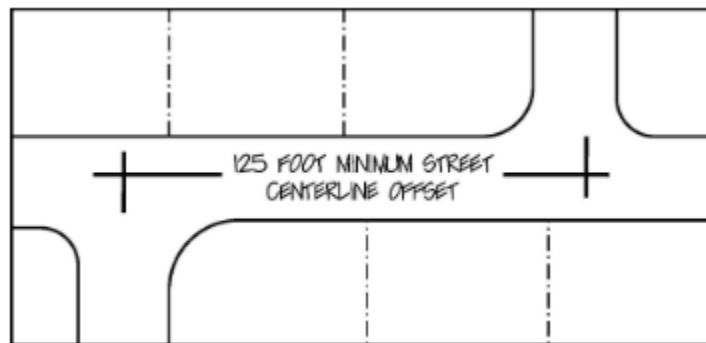
Design Speed (km/h)	Metric		U.S. Customary	
	Stopping Sight Distance (m)	Rate of Vertical Curvature, K ^a		Rate of Vertical Curvature, K ^a
		Calculated	Design	
20	20	2.1	3	15
30	35	5.1	6	20
40	50	8.5	9	25
50	65	12.2	13	30
60	85	17.3	18	35
70	105	22.6	23	40
80	130	29.4	30	45
90	160	37.6	38	50
100	185	46.6	45	55
110	220	54.4	55	60
120	250	62.8	63	65
130	285	72.7	73	70
				75
				80

^a Rate of vertical curvature, K, is the length of curve (m) per percent algebraic difference intersecting grades (A), $K = L/A$.

4. Please note that sightline setback triangles are required for all intersections per KMC 13.12.020(5) No view obstruction(s) between 36 inches and 90 inches above the roadway surface for both sides of the setback triangles, except as allowed in Section 13.12.020(6).
5. KMC 17.20.010(2)(a) – Streets greater than 1,200 feet in continuous uninterrupted length will need traffic calming measure. Provide adequate right-of-way for traffic calming device.
6. KMC 17.20.010(3)(b) – Mid-block pedestrian crossings



7. KMC 17.20.010(2)(I) – Residential streets shall be aligned at the center line or be offset a minimum of 125' while intersection with arterial or collector streets shall have a minimum centerline offset of 300'.



Right of Way and Easement

1. The proposed internal streets will be functionally classified Local Street. Per KMC 5.56.65 and per Development Agreement for Clearwater Commercial Binding Site Plan # 2017-037197 full width street improvements are required per City of Kennewick Standard Drawing 2-1.
2. Dedicate the proposed internal streets to the City. The proposed development's license land surveyor will need to verify the right of way dedication to satisfy the roadway's minimum width based functional classification per City of Kennewick Standard Drawing 2-1.
3. Record 18' public sidewalk, utility and irrigation easement along the proposed internal public streets per City of Kennewick Standard Drawing 2-1.
4. Please note that if joint or shared driveways will require recorded mutual Access Easement with the AFN shown on the plans.

5. Record 15' public sidewalk, utility and irrigation easement along W Clearwater Ave per City of Kennewick Standard Drawing 2-4.

Proposed Driveways

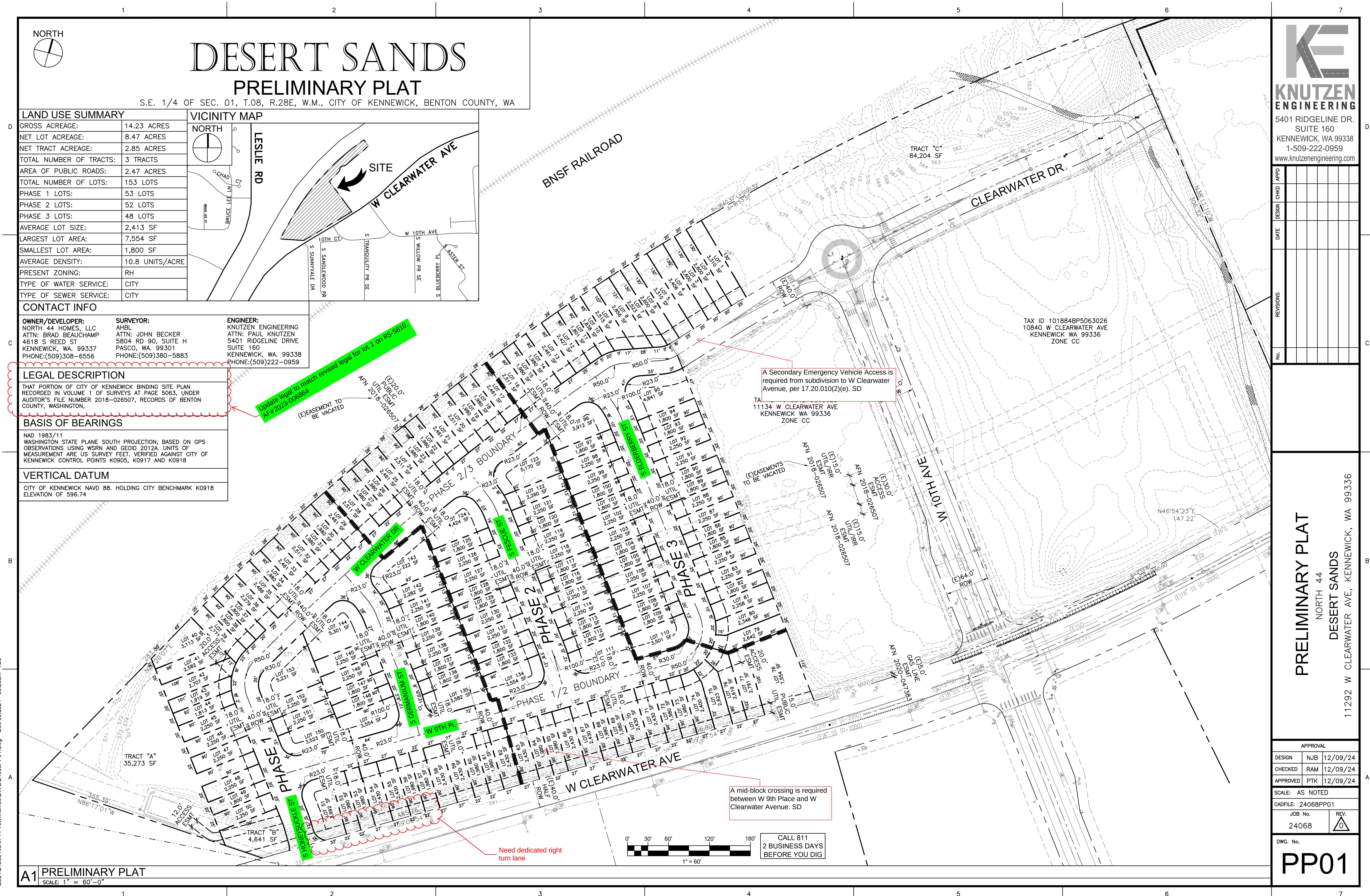
1. New driveway to be constructed to City of Kennewick standards.
2. Sight triangles need to follow COK code 18.27.060(3).

American Disability Act (ADA) Compliance

1. All proposed and existing pedestrian facilities within the public right of way and easement, including but not limited to driveways, sidewalks, curb ramps, etc, shall be ADA compliant.

Street Lights

1. Existing street lights along W Clearwater Ave will need to be brought up to current city standards. W Clearwater Ave is classified a Minor Arterial.
2. See COK std. dwg. 6-2 for specifications.
3. New streets located within the development are classified as residential streets. Street lights will need to be installed per section 6 of City of Kennewick's standard specifications.
4. Roadway light plan sheet needs to include call-outs for power source, meter locations, junction boxes conduits and street light locations.





2015 South Ely Street
Kennewick, WA 99337
Customer Service 509-586-9111
Business 509-586-6012
FAX 509-586-7663
www.kid.org

January 21, 2025

Steve Donovan, AICP, Planning Manager
City of Kennewick - Development Services Division
PO Box 6108
Kennewick, WA 99336

Subject: Review Comments for Desert Sands Preliminary Plat (SUB-2024-0013)

Dear Mr. Donovan:

This letter provides Kennewick Irrigation District (KID) review comments for the Preliminary Plat of Desert Sands (City of Kennewick Application SUB-2024-0013) submitted by North 44 Homes, LLC ("Applicant")¹ to divide an 14.23-acre parcel into 153 lots. The property is generally located at 11292 West Clearwater Avenue, Kennewick, in the Southeast Quarter of Section 1, Township 8 North, Range 28 East, W.M. The parent parcel(s) are listed as follows:

- Parcel #: 101884BP5063024 (14.23 **non-irrigable** acres)

The property identified on the proposed Preliminary plat is located within the boundaries of KID. The property within this Preliminary plat is not classified as irrigable land. Accordingly, KID provides the following comments to be included as required conditions of approval by the legislative authority under RCW 58.17.310(2):

- 1) *The plat shall include the following irrigation easements consistent with KID requirements:*
 - a. *On all lots within the plat, dedicate to KID an irrigation easement 10 feet in width, or five (5) feet in width if adjacent to a utility easement, located along the road frontage or access easements of each lot. An irrigation easement may be included within the 'sidewalk and utility' easement if one is proposed, denoting the easement as a "Sidewalk, Utility, and Irrigation Easement."*

KID requests the following additional conditions of Preliminary plat approval:

- 2) *The following fees for review must be paid prior to KID signature on the Final Plat:*
 - a. *A Preliminary Plat review fee (at the time of application, fee is **\$175.00**).*
 - b. *Fees are subject to change and depend on the date the Final Plat is submitted for final approval.*

¹ Reference to the "Applicant" throughout this comment letter shall refer to the property owner and/or developer of the proposed plat.

- 3) *Please include the following irrigation title block on future final plat phases related to the proposed preliminary plat:*
- a. *I HEREBY CERTIFY THAT THE PROPERTY DESCRIBED HEREON IS LOCATED WITHIN THE BOUNDARIES OF THE KENNEWICK IRRIGATION DISTRICT BUT THAT THIS PROPERTY IS NOT CLASSIFIED AS IRRIGABLE LAND AND IS NOT ENTITLED TO IRRIGATION WATER UNDER THE EXISTING OPERATING RULES AND REGULATIONS OF THIS DISTRICT. I FURTHER CERTIFY THAT THE IRRIGATION EASEMENTS SHOWN ON THIS FINAL PLAT ARE ADEQUATE TO SERVE ALL LOTS SHOWN HEREON PER THE REQUIREMENTS OF RCW 58.17.310.*
- 4) *All subdivisions of land are required to be approved by the KID Board of Directors during a KID Board Meeting. KID Board Meetings are regularly scheduled on the first and third Tuesdays of each month. All conditions must be completed prior to submittal to KID for final approval. The submittal for final approval must be received by KID a minimum of one week prior to a regularly scheduled Board Meeting to be considered at that meeting. This change can potentially extend the approval process by a minimum of one week.*

If you have any questions regarding these comments, please contact me at the address/phone number listed above.

Sincerely,



Ben Woodard, P.E.
Engineering & Operations Manager



BENTON CLEAN AIR AGENCY

January 7, 2025

Re: SUB-2024-0013 and ED-2024-0028

Steve Donovan, AICP
Community Planning
PO Box 6108
Kennewick, WA 99336

Applicant/Proponent: Knutzen Engineering
Attn: Robert McLeod
5401 Ridgeline Dr, Ste. 160
Kennewick, WA 99338

Dear Mr. Donovan:

It has come to our attention that you are reviewing a proposal for the above named applicant in which a parcel or parcels will be disturbed for development. Because these activities may cause possible fugitive dust emissions, we would like to take this opportunity to provide information to ensure that the applicant takes reasonable steps to control the dust from his/her project.

The Benton Clean Air Agency (BCAA) requires the applicant submit a Proof of Contact: Soil Destabilization Notification for this project prior to any excavation/construction taking place. This will insure that the proponent has the ability and resources to control fugitive dust emissions that may be created as a result of construction activities. This will also inform them of the regulations and requirements of the BCAA. Additionally, a written dust control plan must be developed and maintained for all soil destabilization projects, and must be readily available upon request by the BCAA. Part of this plan is submitting the name of at least one person for the project so that the BCAA has a point of contact should we receive any dust complaints from the project. The Soil Destabilization Notification form can be found and submitted on our website, www.bentoncleanair.org.

Thank you for the opportunity to comment on this proposal. If you have any questions, or would like further information on this subject, please contact us at (509) 783-1304.

Sincerely,

Deon Steichen

Deon Steichen
Inspector



**STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY**

Central Region Office

1250 West Alder St., Union Gap, WA 98903-0009 • 509-575-2490

January 21, 2025

Steve Donovan
Kennewick Development Services
PO Box 6108
Kennewick, WA 99336

RE: 202500056; ED-2024-0028

Dear Steve Donovan:

Thank you for the opportunity to comment on the Pre-Threshold Consultation for the Desert Sands preliminary plat. We have reviewed the environmental checklist and have the following comment.

Water Quality Program

Project with Potential to Discharge Off-Site

If your project anticipates disturbing ground with the potential for stormwater discharge off-site, the NPDES Construction Stormwater General Permit is recommended. This permit requires that the SEPA checklist fully disclose anticipated activities including building, road construction and utility placements. Obtaining a permit may take 38-60 days.

The permit requires that a Stormwater Pollution Prevention Plan (Erosion Sediment Control Plan) shall be prepared and implemented for all permitted construction sites. These control measures must be able to prevent soil from being carried into surface water and storm drains by stormwater runoff. Permit coverage and erosion control measures must be in place prior to any clearing, grading, or construction.

In the event that an unpermitted Stormwater discharge does occur off-site, it is a violation of Chapter 90.48 RCW, Water Pollution Control and is subject to enforcement action.

More information on the stormwater program may be found on Ecology's [stormwater website](#). Please submit an application or contact **Lloyd Stevens Jr.** at the Dept. of Ecology, (509) 571-3866, with questions about this permit.

City of Kennewick Development Services
January 21, 2025
Page 2 of 2

Sincerely,



Amber Johnson
SEPA Coordinator
Central Region Office
509-723-5677
crosepacoordinator@ecy.wa.gov

From: [Castle,Angela C \(CONTR\) - TERR-PASCO](#)
To: [Steve Donovan](#)
Cc: [Kinch,James L \(BPA\) - TERR-BELL-1](#)
Subject: RE: SUB-2024-0013 and ED-2024-0028
Date: Thursday, January 9, 2025 8:47:14 AM
Attachments: [image001.png](#)
[image003.png](#)

In reply refer to:

Tract Nos.: ABH-16-AR-1P1

Line Names: Franklin – Badger Canyon No. 1

Structure Nos. 29/2

Steve,

Bonneville Power Administration (BPA) has had the opportunity to review preliminary plat at 11292 W Clearwater Avenue and its relationship to BPA's transmission line easements this plan impacts.

BPA easements are taken with certain restrictions on the underlying land. In order to maintain operation and safety criteria, all activities planned within the BPA easement need to be approved by BPA prior to their occurrence. Activities that block maintenance crews (such as the installation of fences) or safety concerns (such as buildings, driveways, utilities, or small structures) need to be addressed prior to construction in order to avoid later modification, at the landowner's expense.

In addition, BPA needs the opportunity to review the location of proposed roads to ascertain whether or not the clearance here allows for safe passage of vehicles (per National Electric Safety Code). This process takes up to 9 months to complete and is typically initiated by a land use application that the developer or landowner submits to BPA.

Whether or not this property is subdivided and/or this plat approved, the owner will need to submit a land use application, the associated application fee and acquire a Land Use Agreement from BPA, along with the county's building permit for any portion of the owner's development plans that lie within BPA's easement.

If you have any questions regarding this request or need additional information, please feel free to contact BPA Realty Specialist, Luke Kinch at (509) 468-3095 or by email at JLKinch@bpa.gov.

Thank you for the opportunity to review this application.

Thank You

Angela Castle

(Contractor) Actalent

Realty Technician II

BPA, TERR

ACCastle@BPA.gov

From: [Castle,Angela C \(CONTR\) - TERR-PASCO](#)
To: [Steve Donovan](#)
Cc: [Kinch,James L \(BPA\) - TERR-BELL-1](#)
Subject: RE: SUB-2024-0013 and ED-2024-0028
Date: Monday, January 13, 2025 3:49:35 PM
Attachments: [image001.png](#)
[image003.png](#)

Steve,

I believed we have covered this area under our case number 20230259 for an LUA. I sent over the letter of interest to you but I wanted to clarify that we have worked together on this. After Luke and I looked at this one, I don't think we need to do any more unless there are changes to the BPA right of way plans in Land Use Agreement 20230259. Let me know if you need anything else on this.

Thank You

Angela Castle

(Contractor) Actalent

Realty Technician II

BPA, TERR

ACCastle@BPA.gov

O: 509-544-4747 C: 564-236-5124

2211 N Commercial Ave

Pasco WA 99301

From: Steve Donovan <Steve.Donovan@ci.kennewick.wa.us>

Sent: Tuesday, January 7, 2025 9:36 AM

To: Ashley M. Morton <AshleyMorton@ctuir.org>; Ben Franklin Transit - Kevin Sliger <ksliger@bft.org>; Benton Clean Air Authority - Rob Rodger <rob.rodger@bentoncleanair.org>; Benton Clean Air Authority - Tyler Thompson <tyler.thompson@bentoncleanair.org>; Benton Clean Air John Lyle <john.lyle@bentoncleanair.org>; Benton County Assessor - Segregations <Segregations@co.benton.wa.us>; Benton Franklin Health Dept. - Erin Hockaday <erint@bfhd.wa.gov>; Benton Franklin Health Dept.- Jack Howard <Jack.howard@bfhd.wa.gov>; Benton PUD - engineering services <engservice@bentonpud.org>; Benton PUD - Jeff Vosahlo <vosahloj@bentonpud.org>; Benton PUD Chad Brooks <brooksc@bentonpud.org>; Benton PUD Evan Edwards <edwardse@bentonpud.org>; Benton PUD Shanna Everson <eversons@bentonpud.org>; Benton PUD Tina Glines <glinest@bentonpud.org>; Rodgers,Deborah (CONTR) - TERR-TRI CITIES RMHQ <dxrodgers@bpa.gov>; Cummings,Nicole M (BPA) - TERR-TRI CITIES RMHQ <NMCummings@bpa.gov>; Castle,Angela C (CONTR) - TERR-PASCO <ACCastle@bpa.gov>; BPUD - Angela Richman (richmana@bentonpud.org) <richmana@bentonpud.org>; Cascade Gas James Thomas <james.thomas@cngc.com>; Cascade Natural Gas <roger.johnson@cngc.com>; Casey Barney <Casey_Barney@Yakama.com>; Charter - Junior Campos <junior.campos@charter.com>; Columbia Irrigation District

From: [Segregations](#)
To: [Steve Donovan](#)
Subject: RE: SUB-2024-0013 and ED-2024-0028
Date: Tuesday, January 7, 2025 10:18:02 AM
Attachments: [image002.png](#)
[image004.png](#)
[image001.png](#)

Hi Steve,

The one thing I noticed is on the Preliminary Plat it states the owner as "North 44 Homes LLC", we currently have the owner as "N44 Desertsand LLC". The plat will need to reflect the current and correct owner on the final plat.

Other than that, this looks good, on our end.

Thank you,



Kimberly Schultz
Office Assistant II
Benton County Assessor's Office
Kennewick: (509) 735-2394 (ext. 2518)
kimberly.schultz@co.benton.wa.us

From: Steve Donovan <Steve.Donovan@ci.kennewick.wa.us>

Sent: Tuesday, January 7, 2025 9:36 AM

To: Ashley M. Morton <AshleyMorton@ctuir.org>; Ben Franklin Transit - Kevin Sliger <ksliger@bft.org>; rob.rodger@bentoncleanair.org; Benton Clean Air Authority - Tyler Thompson <tyler.thompson@bentoncleanair.org>; john.lyle@bentoncleanair.org; Segregations <segregations@co.benton.wa.us>; Benton Franklin Health Dept. - Erin Hockaday <erint@bfhd.wa.gov>; Benton Franklin Health Dept.- Jack Howard <Jack.howard@bfhd.wa.gov>; Benton PUD - engineering services <engservice@bentonpud.org>; Benton PUD - Jeff Vosahlo <vosahloj@bentonpud.org>; Benton PUD Chad Brooks <brooksc@bentonpud.org>; Benton PUD Evan Edwards <edwardse@bentonpud.org>; Benton PUD Shanna Everson <eversons@bentonpud.org>; Benton PUD Tina Glines <glinest@bentonpud.org>; BPA - Deborah Rodgers <dxrodders@bpa.gov>; BPA - Nicole Cummings <NMCummings@bpa.gov>; BPA- Angela Castle <ACCastle@BPA.gov>; BPUD - Angela Richman (richmana@bentonpud.org) <richmana@bentonpud.org>; Cascade Gas James Thomas <james.thomas@cngc.com>; Cascade Natural Gas <roger.johnson@cngc.com>; Casey Barney <Casey_Barney@Yakama.com>; Charter - Junior Campos <junior.campos@charter.com>; Columbia Irrigation District <cid@columbiairrigation.com>; Dept of Archaeology and Historic Preservation (sepa@dahp.wa.gov) <sepa@dahp.wa.gov>; Dustin Fisk - Kennewick School District (dustin.fisk@ksd.org) <dustin.fisk@ksd.org>; Greg Wendt <Greg.Wendt@co.benton.wa.us>; Jessica Lally <Jessica_Lally@Yakama.com>; KID Development <development@kid.org>; Michelle Mercer <Michelle.Mercer@co.benton.wa.us>; Mike Beck - Spectrum <Mike.Beck@charter.com>; Mike Stevens - (mstevens@ci.richland.wa.us) <mstevens@ci.richland.wa.us>; Noah Oliver <Noah_Oliver@Yakama.com>; Patricia Tollison <Patricia.m.tollison@usps.gov>; Spectrum <Ryan.Sams@charter.com>; US Army Corps of Engineers - Seattle



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Exhibit 16

March 21, 2025

Steve Donovan, AICP
City of Kennewick
Community Planning/Planning Manager

Re: Desert Sands Subdivision SUB-2024-0013

Mr. Donovan,

This memo is in regard to your request for the Kennewick School District #17 to submit comments for the following:

SUB-2024-0013. Located at 11292 W. Clearwater Avenue, Kennewick, WA.

The boundary schools for this development are Amon Creek Elementary (Bussing Zone), Desert Hills Middle School (Bussing Zone) and Kamiakin High School (Bussing Zone).

The Kennewick School District has a Ten-Year Plan in place that forecasts future growth. It is impossible to know exactly where pockets of growth may occur, but the District works closely with the City of Kennewick and Benton County to make sure that we own property near projected areas of growth. Having property near potential growth areas allows us to add schools where the students are living, and to avoid additional bussing or redistricting of our boundaries. We do occasionally have to redistrict to keep our schools within our preferred enrollment numbers.

The Kennewick School District has the capacity to add students at all levels and at the three schools mentioned in this letter. Forecasted growth in additional boundary areas of the Kennewick School District makes it difficult to know if any redistricting could result because of this proposed development.

Residential development has had a significant impact on public utility capacity (i.e. City of Kennewick, Kennewick Irrigation District, etc.), roads, and traffic. The impact on utility and road infrastructure directly and indirectly affects our schools and students. The District expects the level of current utility capacity to District facilities to be maintained. We request the city to ensure that developers are contributing toward utility infrastructure development and upgrades, safe walking routes, safe crosswalks, including flashing beacons, etc. Given likelihood of this development having students of all ages, and that it falls in the bussing zone for two of the three schools, the Kennewick School District would like to request that considerations are made for school bus access and pick-up/drop-off zones.

Sincerely,

Ryan Jones