PLANNING COMMISSION

WEDNESDAY, SEPTEMBER 14, 2022

WORK SESSION

4. Frog Pond East and South Master Plan (Pauly) (45 minutes)

PLANNING COMMISSION MEETING
STAFF REPORT

Meeting Date: September 14, 2022	**Subject:** Frog Pond East and South Master Plan **Staff Member:** Daniel Pauly, Planning Manager **Department:** Community Development
Action Required	**Advisory Board/Commission Recommendation**
☐ Motion ☐ Public Hearing Date: ☐ Ordinance 1st Reading Date: ☐ Ordinance 2nd Reading Date: ☐ Resolution ☒ Information or Direction ☐ Information Only ☐ Council Direction ☐ Consent Agenda	☐ Approval ☐ Denial ☐ None Forwarded ☒ Not Applicable **Comments:** N/A
Staff Recommendation: Provide input regarding Frog Pond East and South Master Plan.	
Recommended Language for Motion: N/A	
Project / Issue Relates To:	

☒Council Goals/Priorities: Expand home ownership	☒Adopted Master Plan(s): Frog Pond Area Plan	☐Not Applicable

ISSUE BEFORE PLANNING COMMISSION:
Provide feedback and input on infrastructure analyses and plans for Frog Pond East and South.

EXECUTIVE SUMMARY:
Following designation of the area on the east side of Wilsonville as an urban reserve in 2010, the City adopted the Frog Pond Area Plan in 2015 to set the stage for additional planning and eventual development to meet identified housing needs. Besides the urban reserve area, the Frog Pond Area Plan also established a vision for growth for undeveloped land already within the City's Urban Growth Boundary (UGB) now known as Frog Pond West. In 2017, a Master Plan and implementing zoning code was adopted for Frog Pond West. The Master Plan provided the necessary regulatory framework for the residential neighborhood currently under development north of Boeckman Road and west of Stafford Road.

In 2018, Metro expanded the UGB to include the urban reserve land known as Frog Pond East and South. As part of the Metro Ordinance adopting the UGB expansion, Metro required Wilsonville to complete master planning to make the area development ready, from a regulatory standpoint, by December 2022. Similar to past master planning efforts, such as Villebois and Frog Pond West, this master planning effort will identify the types and locations of the homes, other land uses, parks, open spaces, streets, trails and neighborhood amenities to be built over the next 10-20 years. To support implementation of the plan, the process will also identify water, sewer, stormwater, and transportation infrastructure needs and funding sources.

This will be the Planning Commission's eighth work session on the Frog Pond East and South Master Plan. The previous work sessions and their content were as follows:

Work Session 1-October 2021: Focus on overall project scope and the outreach plan.

Work Session 2-December 2021: Initial feedback on the needs and opportunities for affordable housing and housing variety.

Work Session 3-February 2022: Continuation of the topic of housing needs for more detailed feedback and direction, introduction of the neighborhood commercial evaluation.

Work Session 4-April 2022: Further discussion of the neighborhood commercial center and discussion of the design concepts for development of land use and urban design alternatives.

Work Session 5-June 2022: Review and direction on draft land use alternatives, including mapping the locations of different housing design types and forms (grouped into Type 1, Type 2, and Type 3).

Work Session 6-July 2022: Review of draft preferred land use alternative and direction on land use policies around housing variety.

Work Session 7-August 2022: Direction on criteria for evaluating housing variety policy options and public realm master plan components.

This *Work Session 8* will primarily focus on the Transportation Analysis (Attachment 1) and Infrastructure Technical Memo (Attachment 2). The consultant team will be available to discuss and answer any questions. In addition, the project team will report back on questions about role of Frog Pond West in filling housing needs and the costs of ADUs.

Transportation Analysis and Proposed Infrastructure
The 2015 Frog Pond Area Plan set the vision for all three Frog Pond neighborhoods and thus, included a transportation evaluation that encompassed Frog Pond East and South. Traffic modeling has thus anticipated development of these neighborhoods consistent with the Plan. The attached Transportation Analysis (Attachment 1) refines the prior 2015 evaluation. The Transportation Analysis is based on the maximum potential amount of commercial - to test the system, the analysis assumed 50,000 square feet although the current recommendation is a maximum of 44,000 square feet - and the likely number of dwelling units (1,800) under the preferred land use alternative. As a next step, the information from the preferred land use alternative Transportation Analysis will be used to develop a street project list to include in the infrastructure plan.

Key points of the Transportation Analysis are as follows:

- With recommended improvements and construction of high-priority projects in the Wilsonville and Clackamas County Transportation System Plans (TSPs), level of service will be met at impacted intersections, both nearby and further away in Wilsonville. This includes at I-5 interchanges and the Elligsen/Stafford intersection.

- New round-a-bouts are recommended on Stafford Road at Kahle Road and Brisband Street and on Advance Road at 60th Avenue.

- A median/barrier is recommended on Stafford Road at Frog Pond Lane to prevent traffic from crossing Stafford Road while still allowing most movements to and from Stafford Road into Frog Pond West and Frog Pond East.

- A number of pedestrian crossing amenities are recommended subject to further refinement with public input, including from stakeholders such as the school district.

A separate sensitivity analysis is also planned to test a higher hypothetical dwelling unit count of approximately 2,400 units. This higher dwelling unit amount reflects 20 units per net acre, which is a density prescribed in one of the compliance options in State administrative rules for new urban areas to comply with House Bill 2001 middle housing law. The project team is still analyzing and confirming impact of a higher unit count and will share in a future work session.

Water, Sanitary Sewer Proposed Infrastructure
Similar to the transportation analysis, initial water, sanitary sewer, and stormwater analysis was completed for the 2015 Frog Pond Area Plan. In a June work session, an existing conditions analysis was presented, which included the discussion of existing conditions of the Frog Pond East and South area infrastructure, previously prepared plans, and a review of applicable standards. The Infrastructure Technical Memo (Attachment 2) builds on this previous work and lays out the proposed infrastructure to serve Frog Pond East and South in a manner that meets City standards. Like the Transportation Analysis, the Infrastructure Technical Memo tests the maximum potential amount of commercial and the likely number of dwelling units under the

preferred land use alternative. The infrastructure memo also includes testing for the higher residential unit count of approximately 2,400 for the reasons described above under the Transportation Analysis.

The information from the Infrastructure Technical Memo will be used to estimate infrastructure costs for the Frog Pond East and South Master Plan area. The following are some key points from the proposed infrastructure analysis regarding water and sanitary sewer:

- Key off-site infrastructure planned in the City's existing infrastructure master plans are needed to provide infrastructure capacity to Frog Pond East and South:
    - Water storage capacity: Westside tank northwest of Villebois, anticipated completion 2025.
    - Downstream sanitary sewer capacity: Boeckman Road Sewer Trunk Line, construction planned in 2024. Boeckman Creek sewer interceptor, anticipated completion 2025.
- The exact amount of development that can occur in Frog Pond East and South prior to completion of the key planned off-site infrastructure projects will need further analysis. This may occur either as part of the Master Plan and/or at time of development proposal. Capacity will depend on the amount and timing of development in Frog Pond East and South relative to development in Frog Pond West and elsewhere in the City.
- Not previously identified in an infrastructure master plan, important off-site 12-inch water distribution connections are needed under Boeckman Creek from the end of Frog Pond Lane towards Canyon Creek Road and beneath Meridian Creek just south of Meridian Creek Middle School.
- Due to topography, Frog Pond East and South will require four sanitary sewer lift stations.
- The hypothetical higher density residential land use scenario would not substantially impact or increase costs for the planned framework water system or sanitary sewer system.

Stormwater infrastructure will also be part of the Frog Pond East and South Master Plan. Additional analysis and discussion is needed by the project team prior to presentation of stormwater infrastructure to the Planning Commission. The team plans to bring forward in an upcoming work session.

Follow Up from Past Work Session on Housing Variety

The following are questions from the prior work session regarding housing variety and policy development and responses from the project team. The project team invites the Planning Commission to review this information and ask any additional clarifying questions.

Q: Does the data in the Affordable Housing Analysis, specifically the need for higher-end housing, reflect the development of Frog Pond West?

A: Frog Pond West began developing in 2019 and is not reflected in data presented from 2018. Figure 9 of the Affordable Housing Analysis shows a deficit of 773 units for households making 150% or more of MFI. According to Exhibit 4 in the same report 150% MFI represents a household income of approximately $140,000 which could afford a home of about $770,000. Staff notes increased interest rates are currently making it less affordable, but for consistency will use the data from the Affordable Housing Analysis. A majority of the detached homes in Frog Pond West are selling at or above this price satisfying a large portion of this need. Exact numbers are not known and will not be analyzed until the needs citywide housing needs analysis scheduled in 2023, but based on review of readily available real estate data staff is comfortable saying at least 400-500 units in this price range will be completed in Frog Pond West, likely more. In addition, completion of Clermont in Villebois is expected to produce at least 60-70 additional homes in this price area. At most, the 2018 need for households 150% or more MFI remaining to be satisfied by Frog Pond East and South is 200-300 units. Current draft housing variety policy would allow this to be met.

Q: What is the expected affordability to rent or buy an Accessory Dwelling Unit (ADU) in Frog Pond East and South relative to other unit types?

A: According to the ADU Memo presented to the Commission in February, and reattached here (Attachment 3), the rent for an ADU in Frog Pond West is expected to be from the $1,000's to over $2,000, similar to market-rate apartments of similar size. The memo's analysis predicts the sale price for a for-sale ADU would be $300,000's to $400,000's, similar to the anticipated cost of a for-sale condo or small townhouse.

The project team otherwise continues to develop draft policies and regulations around housing variety that will be discussed at future work sessions. The project team does encourage the Planning Commission to share additional thoughts or questions that have come up around housing variety.

Discussion Questions:

1. What questions or comments does the Commission have about the Transportation Analysis (Attachment 1)?
2. What questions or comments does the Commission have about the Infrastructure Analysis (Attachment 2)?

3. What additional feedback or direction, if any, does the Commission have for the preferred alternative and draft residential variety policies since the prior work session?

EXPECTED RESULTS:
Feedback and direction from the Planning Commission to guide continued development and refinement of the Frog Pond East and South Master Plan on: transportation and other infrastructure and housing variety policy.

TIMELINE:
This is the eighth in a series of work sessions for the Planning Commission. The next work session is planned for October. The Master Plan is scheduled to be completed by December 2022, with some implementation elements extending into early 2023.

CURRENT YEAR BUDGET IMPACTS:
The project is funded by a combination of a $350,000 Metro grant, an $81,000 Oregon DLCD grant, and matching City funds in the form of staff time. $311,000 is budgeted in FY 22/23 to complete the project.

COMMUNITY INVOLVEMENT PROCESS:
The project has a community engagement plan which lays out a robust public engagement program that will include meaningful and impactful involvement of people who identify with historically marginalized communities. The project team recently completed a number of outreach events, results and impacts of which will be shared in an upcoming work session.

POTENTIAL IMPACTS OR BENEFIT TO THE COMMUNITY:
Furthering of the City's Equitable Housing Strategic Plan and Council's goal of affordable home ownership, while creating Wilsonville's next great neighborhoods.

ALTERNATIVES:
The Planning Commission and City Council can continue to direct changes to the draft plan elements. In addition, the Planning Commission and City Council continues to have a number of policy options related to housing variety.

ATTACHMENTS:
1. Transportation Analysis (dated September 7, 2022)
2. Infrastructure Technical Memo (dated September 6, 2022)
3. ADU Memo (dated January 31, 2022)

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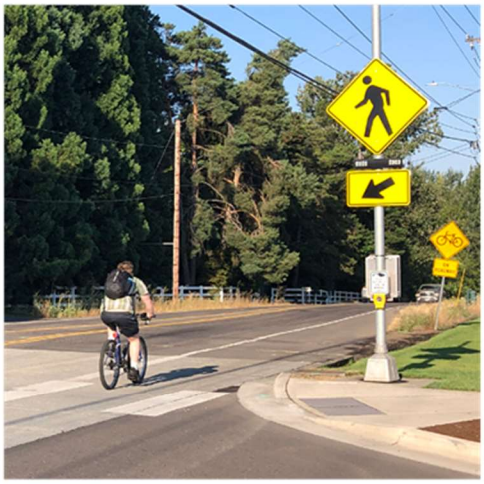
FROG POND EAST & SOUTH MASTER PLAN

TRANSPORTATION ANALYSIS: EXISTING AND FUTURE CONDITIONS

SEPTEMBER 2022



EAST & SOUTH MASTER PLAN

DRAFT

PREPARED FOR THE CITY OF WILSONVILLE

WILSONVILLE
OREGON

PREPARED BY DKS ASSOCIATES

DKS

DRAFT

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DRAFT

This report documents the traffic analysis performed in association with the Frog Pond East & South Master Plan in Wilsonville, Oregon. This report provides a more refined evaluation of the East and South land use as compared to the Frog Pond Area Plan,[1] which was adopted in 2015, and builds on the work of the Frog Pond West Master Plan,[2] which was adopted in 2017.

An executive summary of this transportation analysis is provided below. The following sections of this memorandum document the existing traffic conditions (2022), future baseline and build traffic conditions (2040), and a list of resulting transportation projects. The year 2040 was selected for future analysis to be consistent with the Metro Regional Transportation Plan (RTP) and Wilsonville Travel Demand Model's horizon year.

EXECUTIVE SUMMARY

To determine existing and future transportation conditions for the Frog Pond East and South neighborhoods, a comprehensive traffic analysis was performed. The analysis focused on the major intersections both within the project vicinity and within Wilsonville at large, including the two I-5 interchange areas (i.e., Wilsonville Road and Elligsen Road). The study area includes 15 total intersections, including 4 key gateway intersections to the neighborhoods.

The existing conditions analysis was based on recent 2021 and 2022 traffic counts and existing intersection geometries, while the future analysis was based on traffic forecasts for the 2040 horizon year and improved intersection geometries associated with all High Priority Projects included in Wilsonville's Transportation System Plan (TSP). The future analysis consisted of two scenarios: 2040 Baseline and 2040 Build. The future land use assumptions are consistent with the Metro model, which was used to update the travel demand model for the Build scenario. The 2040 Baseline scenario assumes no additional growth beyond what is currently assumed in the 2040 model and the 2040 Build scenario represents the likely build-out of the study area, which includes up to 1,800 housing units and up to 44,000 square feet of commercial space within the East and South neighborhoods.

The City has also identified a hypothetical higher-density alternative which calls for approximately 2,400 total units in the combined East and South neighborhoods. This higher dwelling unit amount reflects 20 units per net acre, which is a density prescribed in one of the compliance options in State administrative rules for new urban areas to comply with House Bill 2001 middle housing law. The project team is still analyzing and confirming the impact of a hypothetical higher unit count and will incorporate it into a future draft of this Transportation Analysis.

Intersection traffic operations were analyzed for the weekday PM peak hour under the existing and both future scenarios to evaluate if the study intersections meet desired performance levels as required by the City of Wilsonville, Clackamas County, and Oregon Department of Transportation

[1] Frog Pond West Master Plan, City of Wilsonville, July 17, 2017.
[2] Frog Pond Area Plan, City of Wilsonville, November 16, 2015.

(ODOT). All intersections except the Stafford Road/65th Avenue intersection currently meet operating standards and targets. Additional coordination between Clackamas County and City of Wilsonville is recommended regarding the necessary improvements to that intersection to accommodate future Frog Pond development.

In the future 2040 scenarios, all but three of the study intersections are expected to continue to meet standards and targets in the future assuming the completion of the High Priority Projects identified in the TSP. Those three intersections are located along Stafford Road and are the gateway intersections to the Frog Pond East neighborhood and were analyzed as stop controlled intersections. The following transportation improvements are recommended for these intersections.

- **Stafford Road/Kahle Road:** Install a single-lane roundabout
- **Stafford Road/Frog Pond Lane:** Install a raised median to prohibit minor street through and left turns and install an enhanced pedestrian crossing with a center refuge median.
- **Stafford Road/Brisband Street:** Install a single-lane roundabout

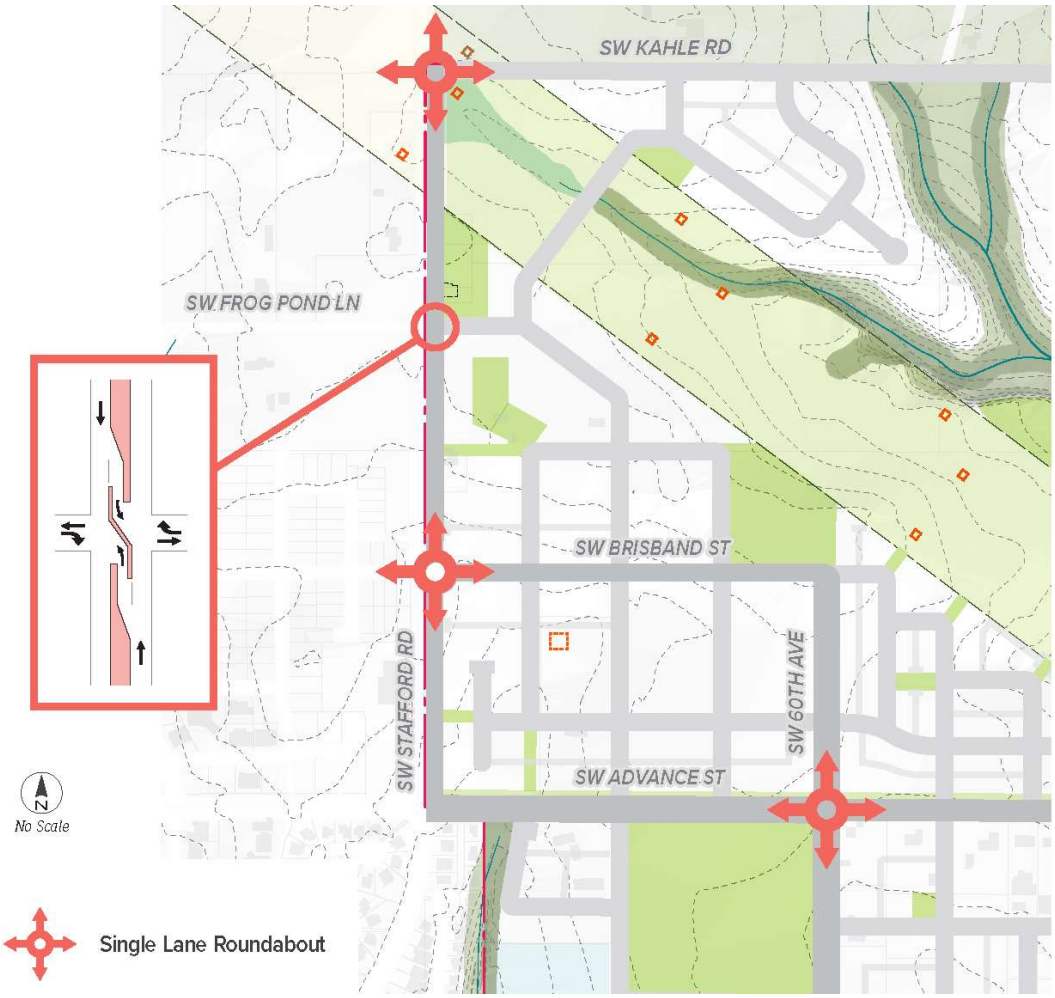


FIGURE 1: RECOMMENDED INTERSECTION IMPROVEMENTS

Additional transportation projects were identified for the East and South neighborhood to enhance safety, which are listed below:

- Install a roundabout at Advance Road/60th Avenue. The installation of a roundabout at this location will create a gateway between the high-speed rural traffic and the new desired slower urban speeds. The roundabout will also provide for slower speeds and improved access to the Frog Pond neighborhoods.

- Install various pedestrian, bicycle, and trail improvements on Stafford Road and Advance Road (shown below).

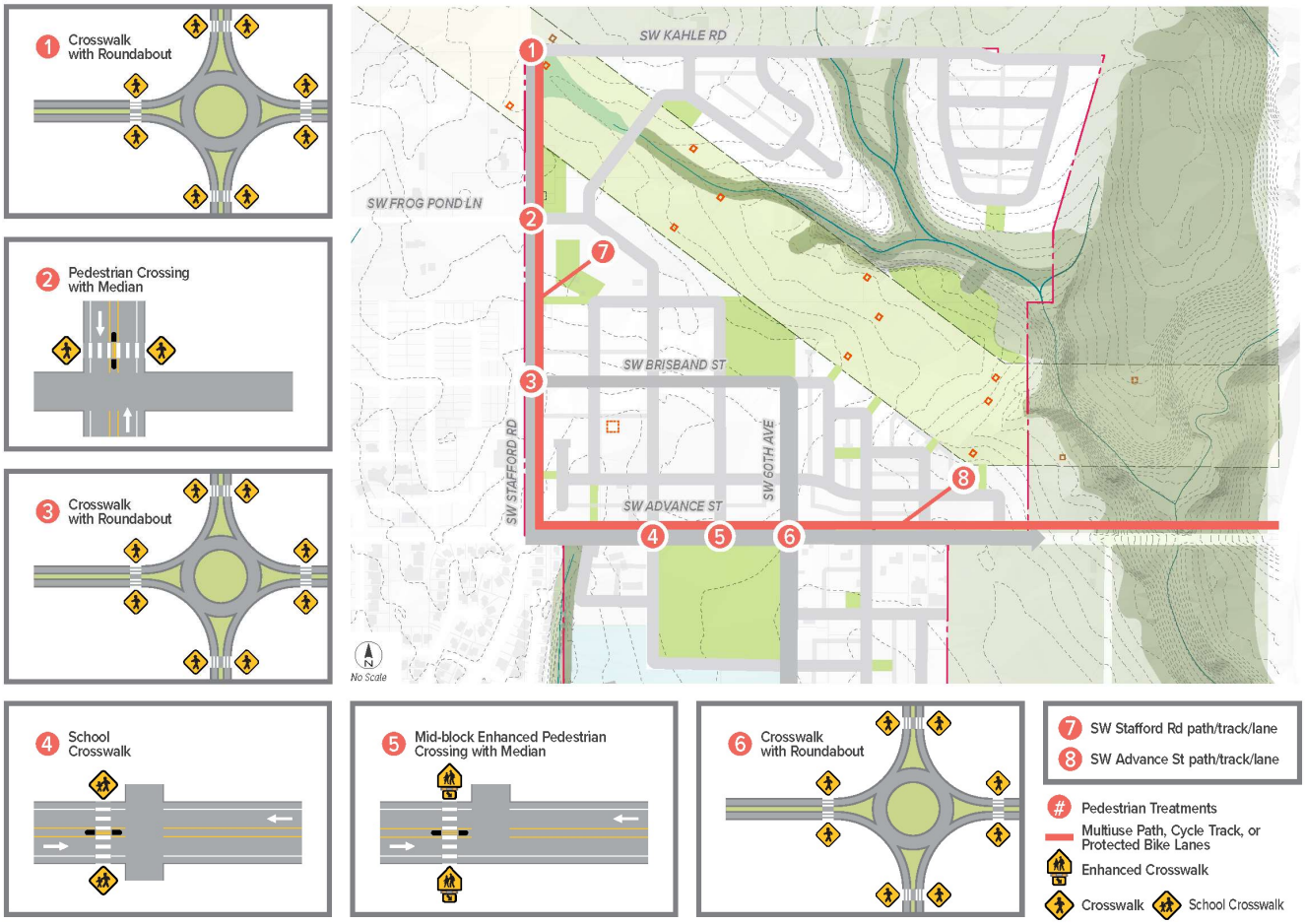


FIGURE 2: RECOMMENDED PEDESTRIAN, BICYCLE, AND TRAIL IMPROVEMENTS

EXISTING TRAFFIC CONDITIONS (2022)

Existing traffic conditions were evaluated for the study area and include traffic volumes; intersection operations; and bike, pedestrian, and trail conditions.

EXISTING TRAFFIC VOLUMES

Traffic counts were collected for the PM peak period (4:00 to 6:00 p.m.) at the following study intersections.[3] The PM peak hour traffic volumes (i.e., the highest hourly volumes during the peak period) are shown in Figure **3** and the traffic counts are provided in the appendix.

- Elligsen Road/I-5 Southbound Ramp
- Elligsen Road/I-5 Northbound Ramp
- Elligsen Road/Parkway Avenue
- Elligsen Road/Parkway Center Drive
- Stafford Road/65th Avenue
- Boeckman Road/Parkway Avenue
- Boeckman Road/Canyon Creek Road
- Boeckman Road-Advance Road/Stafford Road-Wilsonville Road
- Advance Road/60th Avenue
- Stafford Road/Brisband Street
- Stafford Road/Frog Pond Lane
- Stafford Road/Kahle Road
- Wilsonville Road/I-5 Southbound Ramp
- Wilsonville Road/I-5 Northbound Ramp
- Wilsonville Road/Town Center Loop West

INTERSECTION PERFORMANCE MEASURES

Agency mobility standards often require intersections to meet level of service (LOS) or volume-to-capacity (v/c) intersection operation thresholds. Additional operational details are provided in the appendix.

- The intersection LOS is similar to a "report card" rating based upon average vehicle delay. Level of service A, B, and C indicate conditions where traffic moves without significant delays over periods of peak hour travel demand. Level of service D and E are progressively worse operating conditions. Level of service F represents conditions where average vehicle delay has become excessive and demand has exceeded capacity. This condition is typically evident in long queues and delays.

- The volume-to-capacity (v/c) ratio represents the level of saturation of the intersection or individual movement. It is determined by dividing the peak hour traffic volume by the maximum hourly capacity of an intersection or turn movement. When the V/C ratio

[3] The counts were collected on September 22, 2021; September 30, 2021; March 30, 2022; May 18, 2022; and June 7, 2022.

approaches 0.95, operations become unstable and small disruptions can cause the traffic flow to break down, resulting in the formation of excessive queues.

The City of Wilsonville requires all intersections to meet its minimum acceptable level of service (LOS) standard of LOS D for the PM peak period.[4]

Clackamas County requires that, for intersections outside of city limits, signalized and roundabout intersections must meet the volume-to-capacity ratio (v/c) of 0.90 or less and unsignalized intersections must meet the minimum LOS standard of LOS E during the PM peak period.[5]

ODOT specifies a typical mobility target for interchange ramps of a volume-to-capacity ratio (v/c) of 0.85. However, when the interchange vicinity is fully developed and adequate storage is available on the interchange ramp to prevent queues from backing up on the main line, then the target can be increased to a 0.90 v/c ratio.[6] This is the case for both of the I-5 interchange areas in Wilsonville.

EXISTING INTERSECTION OPERATIONS

Intersection operations were analyzed for the PM peak hour to evaluate whether the transportation network currently operates within desired performance levels as required by the City of Wilsonville, Clackamas County, and ODOT. Intersections are the focus of the analysis because they are the controlling bottlenecks of traffic flow and the ability of a roadway system to carry traffic efficiently is nearly always diminished in their vicinity.

The existing PM peak hour intersection operations at the study intersection were determined based on the 6th Edition Highway Capacity Manual methodology.[7] Table 1 lists the estimated average delay (in seconds), level of service (LOS), and volume to capacity (v/c) ratio for each study intersection. As shown, all intersections currently meet operating standards and targets with exception of Stafford Road/65th Avenue, which is within Clackamas County's jurisdiction. Additional coordination between Clackamas County and City of Wilsonville is recommended regarding the necessary improvements at this intersection to accommodate future Frog Pond development.

[4] Policy 5, Wilsonville Transportation System Plan, Amended November 16, 2020.

[5] System Performance Policies, Chapter 5: Transportation System Plan, Clackamas County Comprehensive Plan, Amended January 1, 2022.

[6] Oregon Highway Plan, Action 1F.1, Oregon Department Of Transportation, Amended May 2015.

[7] Highway Capacity Manual, 6th Edition, Transportation Research Board, 2017.

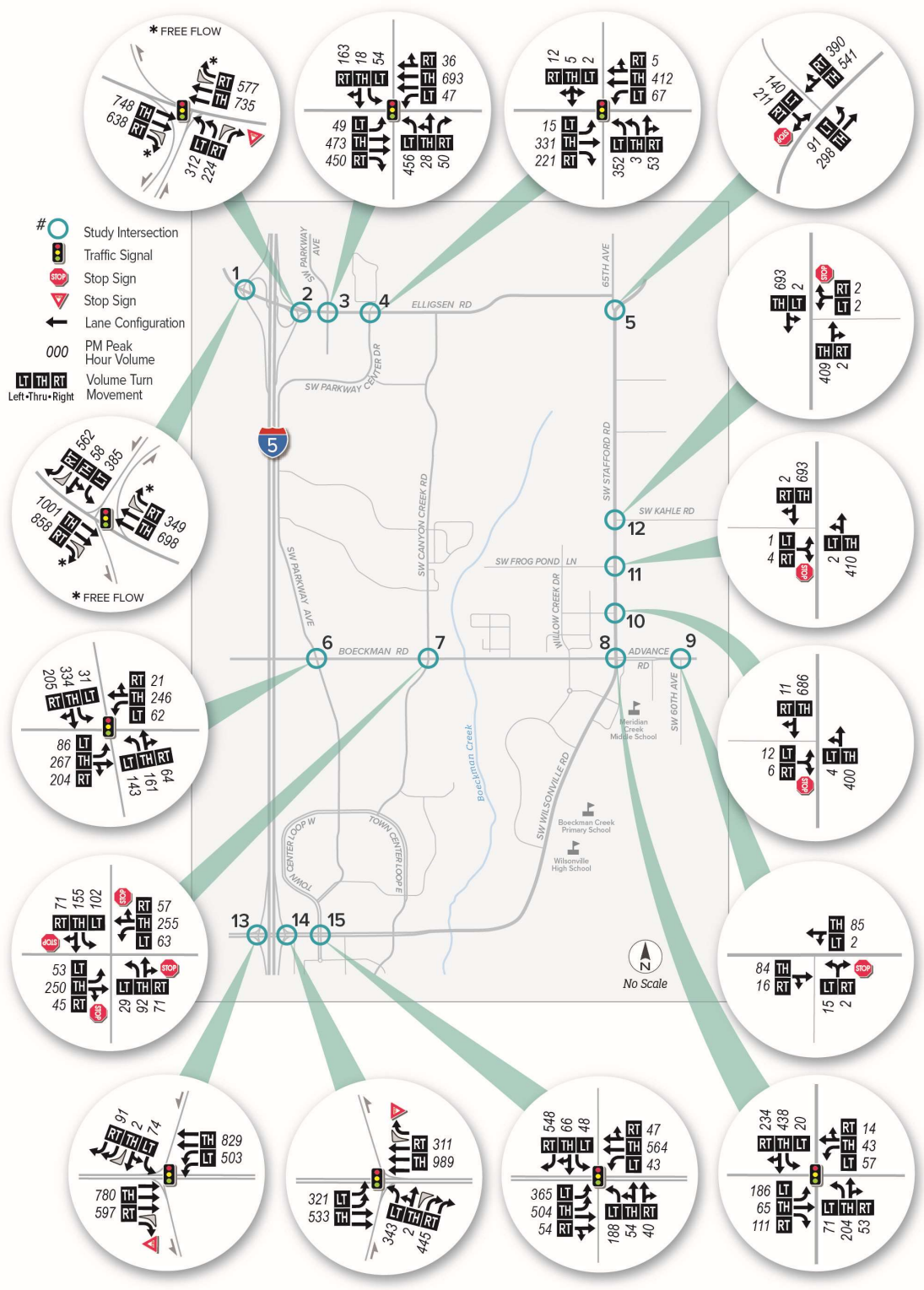


FIGURE 3: EXISTING 2022 TRAFFIC VOLUMES, LANE GEOMETRIES, AND TRAFFIC CONTROL

TABLE 1: EXISTING (2022) INTERSECTION OPERATIONS

INTERSECTION	OPERATING STANDARD	PM PEAK HOUR		
		V/C	DELAY	LOS
SIGNALIZED				
ELLIGSEN RD/I-5 SB RAMPS	v/c ≤ 0.90	0.74	19.5	B
ELLIGSEN RD/I-5 NB RAMPS	v/c ≤ 0.90	0.34	8.4	A
ELLIGSEN RD/PARKWAY AVE	LOS D	0.32	15.9	B
ELLIGSEN RD/PARKWAY CENTER DR	LOS D	0.40	14.9	B
BOECKMAN RD/PARKWAY AVE	LOS D	0.84	25.6	C
STAFFORD RD-WILSONVILLE RD /BOECKMAN RD-ADVANCE RD	LOS D	0.65	17.0	B
WILSONVILLE RD/I-5 SB RAMPS	v/c ≤ 0.90	0.38	19.3	B
WILSONVILLE RD/I-5 NB RAMPS	v/c ≤ 0.90	0.44	16.2	B
WILSONVILLE RD/TOWN CENTER LP WEST	LOS D	0.38	28.1	C
TWO-WAY STOP-CONTROLLED				
STAFFORD RD/65TH AVE	LOS E	>1.20	**>120**	**B/F**
ADVANCE RD/60TH AVE	LOS D	0.03	9.8	A/A
STAFFORD RD/BRISBAND ST	LOS D	0.08	20.9	A/C
STAFFORD RD/FROG POND LN	LOS D	0.02	15.7	A/C
STAFFORD RD/KAHLE RD	LOS D	0.01	16.9	A/C
ALL-WAY STOP-CONTROLLED				
BOECKMAN RD/CANYON CREEK RD	LOS D	0.71	20.3	C

SIGNALIZED INTERSECTION:
Delay = Average Intersection Delay (secs)
v/c = Total Volume-to-Capacity Ratio
LOS = Total Level of Service

TWO-WAY STOP-CONTROLLED INTERSECTION:
Delay = Critical Movement Delay (secs)
v/c = Critical Movement Volume-to-Capacity Ratio
LOS = Critical Levels of Service (Major/Minor Road)

ALL-WAY STOP CONTROLLED INTERSECTION:
Delay = Average Intersection Delay (secs)
v/c = Critical Movement Volume-to-Capacity Ratio
LOS = Total Level of Service

BICYCLE, PEDESTRIAN, AND TRAIL NEEDS

Bicycle, pedestrian, transit, and trail conditions and needs were considered for the study area, with particular emphasis on connectivity to the rest of Wilsonville's neighborhoods, trails, parks, and schools.

The Wilsonville TSP identifies various multimodal improvement projects that are intended to address the deficiencies. Projects within the vicinity of the Frog Pond Area include urban upgrades to Boeckman Road and Stafford Road, which include bike lanes, sidewalks, and transit stop improvements/additions. The TSP also includes a project for new trails through the Frog Pond East and South neighborhoods.

ADVANCE ROAD NEEDS

Additional school safety improvements should be considered on Advance Road near Meridian Creek Middle School. An increase in pedestrian and bicycle traffic to and from the school can be expected with the buildout of the East and South neighborhoods, necessitating pedestrian crossing enhancements on Advance Road.

The urban upgrade improvements on Boeckman Road are currently in the design phase and a separated multi-use path, cycle track, or protected bike lanes are being considered along Boeckman Road. It is desired by the City to extend the identified multimodal improvements on Boeckman Road to the west of Stafford Road along Advance Road fronting the Frog Pond development.

STAFFORD ROAD NEEDS

Pedestrian crossing enhancements on Stafford Road will be needed as the East neighborhood is built out. A significant increase in pedestrian and bicycle trips are expected across Stafford Road between the existing Frog Pond West neighborhood and the planned primary school (in Frog Pond West) to housing and commercial uses in the East neighborhood. Key locations for crossing enhancements would be at Frog Pond Lane and Brisband Street. A signalized crossing already exists at the Stafford Road-Wilsonville Road/Boeckman Road-Advance Road intersection.

Separated pedestrian and bicycle facilities are also desired along Stafford Road since it is a higher speed, higher volume facility. A separated multi-use path, cycle track, or protected bike lanes should be considered along Stafford Road fronting the Frog Pond development on either the west or east side. Given that the majority of the west side of Stafford Road has already gone through development review, the east side of Stafford Road would be the preferred location for a separated pedestrian and bicycle facility.

Recommendations for bicycle and pedestrian projects are listed on page 18 of this memo.

FUTURE BASELINE CONDITIONS (2040)

Future baseline (2040) traffic conditions were evaluated for the study area and include the forecasted baseline traffic volumes and intersection operations. For analysis purposes, the East and South neighborhoods are assumed to experience full build-out by the year 2040.

FUTURE BASELINE TRAFFIC VOLUMES

Future traffic volumes were forecasted for the study intersections using the recently updated travel forecast models developed specifically for Wilsonville. The models apply trip generation and trip distribution data directly taken from the Metro regional travel demand forecast models but add additional detail to better represent local travel conditions and routing within Wilsonville.

Figure 4 shows the PM peak hour traffic volumes for the study intersections based on the Metro model assumptions. As the forecasts are consistent with the current Metro land use assumptions, this scenario is referred to as the 2040 Baseline scenario. This scenario already accounts for some existing homes in the West neighborhood and contains land use assumptions (housing and some employment) in the East and South neighborhoods in 2040.

It should be noted that the Metro model was used for this study because it represents the latest regionally approved land use for Wilsonville and the Region. This model was completed by Metro, in collaboration with the City, after the City's TSP was approved and includes additional land use and transportation network assumptions adopted by Metro after the TSP was adopted.

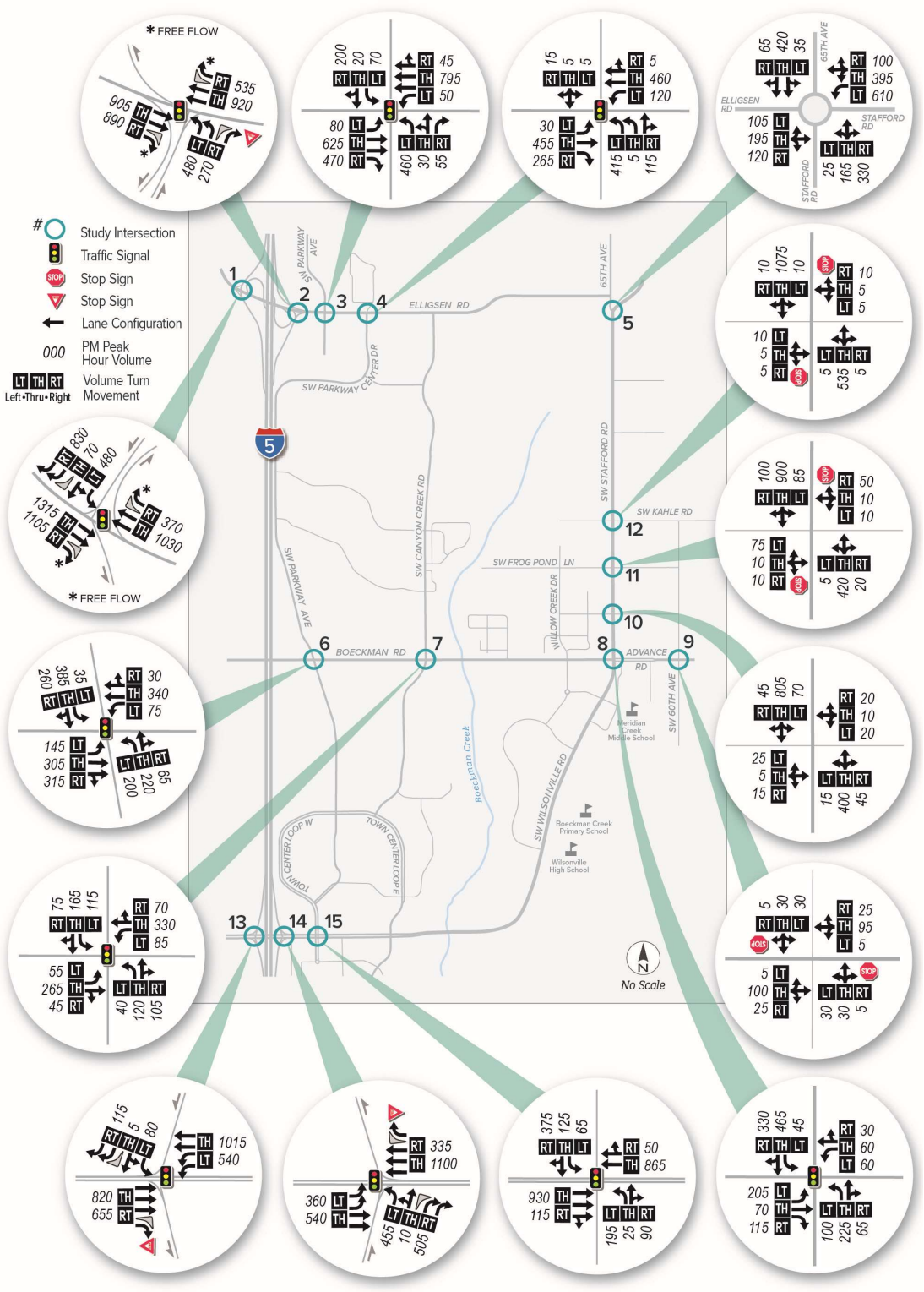


FIGURE 4: BASELINE (2040) TRAFFIC VOLUMES, LANE GEOMETRIES, AND TRAFFIC CONTROL

FUTURE HIGH-PRIORITY TSP PROJECTS

The future baseline scenario assumed improved intersection geometries associated with all High Priority Projects included in Wilsonville's TSP. The High Priority Projects applicable to the Frog Pond study area include the following:

- Addition of a second southbound right turn lane on the I-5 Southbound Off-Ramp at Elligsen Road (SI-07).
- Addition of dual eastbound and westbound through lanes at Boeckman Road/Parkway Avenue intersection (RW-01).
- Installation of traffic signal at Boeckman Road/Canyon Creek Road (UU-01). The City of Wilsonville is currently in the conceptual design phase for this intersection and a roundabout is also under consideration.
- Intersection modifications at Wilsonville Road/Town Center Loop West which including eliminating westbound and eastbound left turns, addition of an eastbound through "trap" lane, and reduction of the northbound and southbound approaches to a left turn lane and shared through-right turn lane (SI-09).
- Installation of a roundabout and combination of the existing intersections of Elligsen Road/65th Avenue and Stafford Road/65th Avenue (SI-03). This intersection is located within Clackamas County and is identified in their TSP but is also referenced in the Wilsonville TSP. For this analysis, the roundabout was evaluated as a partial dual-lane roundabout.

FUTURE BASELINE INTERSECTION OPERATIONS

Intersection traffic operations under the future 2040 Baseline scenario were analyzed for the PM peak hour to evaluate whether the transportation network is expected to remain within desired performance levels as required by the City of Wilsonville, Clackamas County, and ODOT.

Table 2 lists the estimated average delay (in seconds), level of service (LOS), and volume to capacity (v/c) ratio that each study intersection and future access is expected to experience.

As shown, all intersections are expected to meet operating standards and targets under Baseline conditions with exception of the Stafford Road/Kahle Road, Stafford Road/Frog Pond Lane, and Stafford Road/Brisband Street intersections, which were analyzed as key gateways to the Frog Pond East neighborhood.

TABLE 2: FUTURE BASELINE (2040) INTERSECTION OPERATIONS

INTERSECTION	OPERATING STANDARD	PM PEAK HOUR		
		V/C	DELAY	LOS
SIGNALIZED				
ELLIGSEN RD/I-5 SB RAMPS	v/c ≤ 0.90	0.73	18.1	B
ELLIGSEN RD/I-5 NB RAMPS	v/c ≤ 0.90	0.45	9.3	A
ELLIGSEN RD/PARKWAY AVE	LOS D	0.52	24.4	C
ELLIGSEN RD/PARKWAY CENTER DR	LOS D	0.55	16.9	B
BOECKMAN RD/PARKWAY AVE	LOS D	0.82	23.5	C
BOECKMAN RD/CANYON CREEK RD	LOS D	0.57	15.2	B
STAFFORD RD-WILSONVILLE RD /BOECKMAN RD-ADVANCE RD	LOS D	0.79	22.5	C
WILSONVILLE RD/I-5 SB RAMPS	v/c ≤ 0.90	0.40	14.0	B
WILSONVILLE RD/I-5 NB RAMPS	v/c ≤ 0.90	0.52	22.2	C
WILSONVILLE RD/TOWN CENTER LP WEST	LOS D	0.82	44.3	D
TWO-WAY STOP-CONTROLLED				
ADVANCE RD/60TH AVE	LOS D	0.11	11.4	A/B
STAFFORD RD/BRISBAND ST	LOS D	0.49	**72.6**	**A/F**
STAFFORD RD/FROG POND LN	LOS D	>1.20	**>120**	**B/F**
STAFFORD RD/KAHLE RD	LOS D	0.29	**70.3**	**B/F**
ROUNDABOUT				
STAFFORD RD/65TH AVE/ELLIGSEN RD	v/c ≤ 0.90	0.84	17.9	B

SIGNALIZED INTERSECTION:
Delay = Average Intersection Delay (secs)
v/c = Total Volume-to-Capacity Ratio
LOS = Total Level of Service

TWO-WAY STOP-CONTROLLED INTERSECTION:
Delay = Critical Movement Delay (secs)
v/c = Critical Movement Volume-to-Capacity Ratio
LOS = Critical Levels of Service (Major/Minor Road)

ROUNDABOUT INTERSECTION:
Delay = Average Intersection Delay (secs)
v/c = Critical Movement Volume-to-Capacity Ratio
LOS = Total Level of Service

ANTICIPATED BUILD CONDITIONS (2040)

Anticipated build (2040) traffic conditions were evaluated for the study area and include the land use assumptions, anticipated build traffic volumes and intersection operations, and identified transportation improvements.

LAND USE ASSUMPTIONS AND ADJUSTMENTS

As mentioned previously, the 2040 Wilsonville Travel Demand model currently contains housing and job land use assumptions for the Frog Pond East and South neighborhoods. Now that the East and South neighborhood layouts have been further refined, the assumed quantity of housing units and commercial space have been estimated. To best analyze the impact of the estimated full buildout of the East and South neighborhoods, DKS adjusted the Wilsonville Travel Demand Model assumptions for the transportation analysis zones (TAZs) that comprise the Frog Pond East and South neighborhoods to account for a higher number of housing units than what is currently assumed.

Table 3 lists the land use adjustments that were applied to the 2040 Travel Demand Model to emulate the anticipated land use generation for Frog Pond (Build scenario). As shown below, the number of household units for both neighborhoods was increased by 136% and 0 jobs were increased.

TABLE 3: TRAVEL DEMAND MODEL ADJUSTMENTS

	HOUSEHOLDS	JOBS
EAST NEIGHBORHOOD	Increase by 103%	No Change 0%
SOUTH NEIGHBORHOOD	Increase by 225%	No Change 0%
TOTAL	**Increase by 130%**	**No Change 0%**

ANTICIPATED BUILD TRAFFIC VOLUMES

The future 2040 Build traffic volumes were forecasted for the study area using the Wilsonville travel forecast model with the adjustments as previously discussed. Intersection operations were then evaluated to determine how sufficiently the City's future transportation system would support the long-term estimated build-out of the Frog Pond East and South neighborhoods, therefore determining what improvements might be needed. The PM peak hour traffic volumes, lane geometries, and intersection operating conditions are shown in Figure 5.

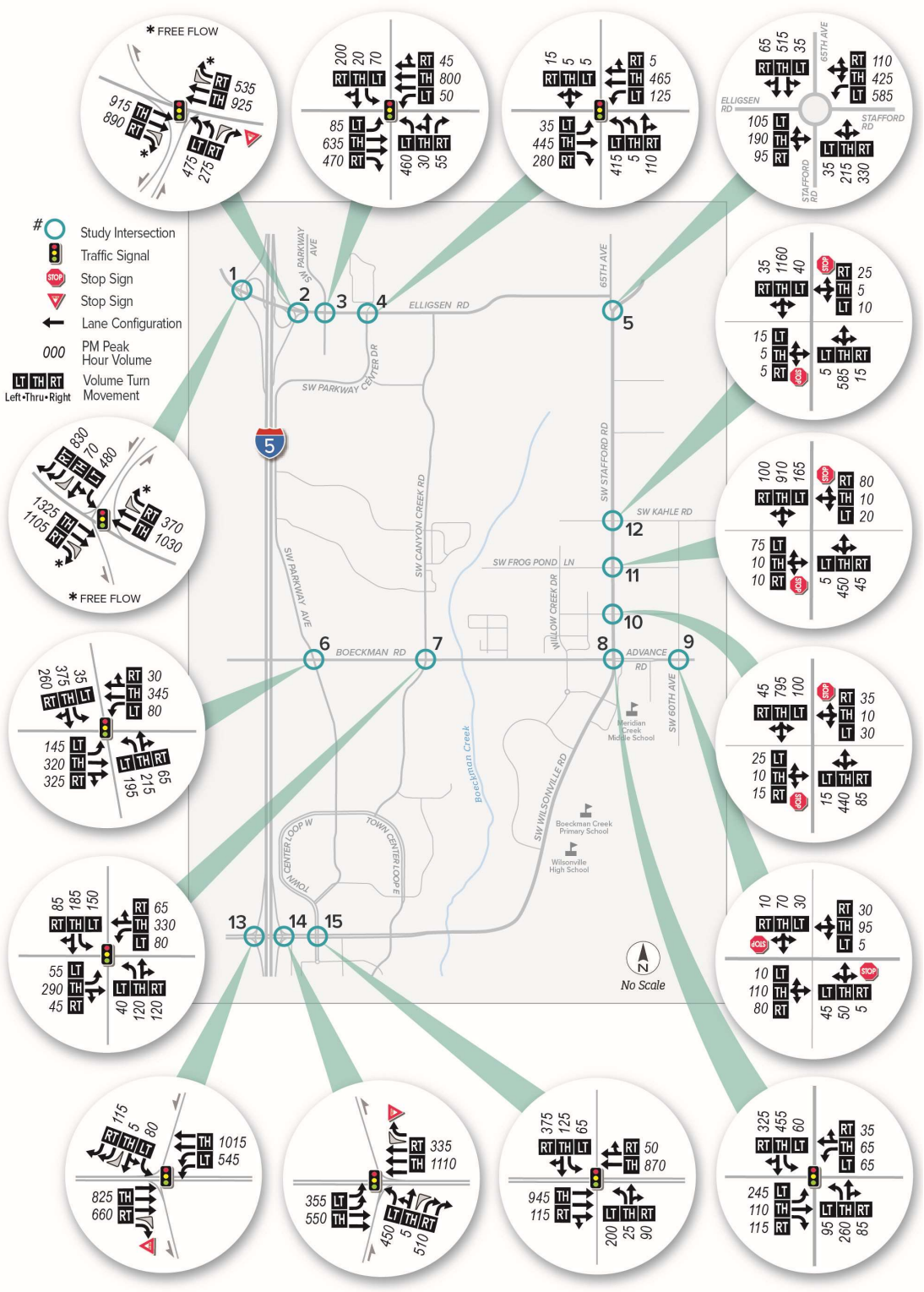


FIGURE 5: BUILD (2040) TRAFFIC VOLUMES, LANE GEOMETRIES, AND TRAFFIC CONTROL

ANTICIPATED BUILD INTERSECTION OPERATIONS

Intersection traffic operations under the future 2040 Build scenario were analyzed for the PM peak hour with the same intersection geometries that were assumed in the Baseline scenario. Table 4 the estimated average delay (in seconds), level of service (LOS), and volume to capacity (v/c) ratio for each study intersection.

TABLE 4: ANTICIPATED BUILD (2040) INTERSECTION OPERATIONS

INTERSECTION	OPERATING STANDARD	PM PEAK HOUR		
		V/C	DELAY	LOS
SIGNALIZED				
ELLIGSEN RD/I-5 SB RAMPS	v/c ≤ 0.90	0.73	18.2	B
ELLIGSEN RD/I-5 NB RAMPS	v/c ≤ 0.90	0.45	9.2	A
ELLIGSEN RD/PARKWAY AVE	LOS D	0.53	24.5	C
ELLIGSEN RD/PARKWAY CENTER DR	LOS D	0.54	16.8	B
BOECKMAN RD/PARKWAY AVE	LOS D	0.81	23.3	C
BOECKMAN RD/CANYON CREEK RD	LOS D	0.60	15.9	B
BOECKMAN RD-ADVANCE RD/ STAFFORD RD-WILSONVILLE RD	LOS D	0.81	22.6	C
WILSONVILLE RD/I-5 SB RAMPS	v/c ≤ 0.90	0.40	14.0	B
WILSONVILLE RD/I-5 NB RAMPS	v/c ≤ 0.90	0.52	22.1	C
WILSONVILLE RD/TOWN CENTER LP WEST	LOS D	0.82	44.1	D
TWO-WAY STOP-CONTROLLED				
ADVANCE RD/60TH AVE	LOS D	0.20	13.2	A/B
STAFFORD RD/BRISBAND ST	LOS D	0.85	**>120**	**A/F**
STAFFORD RD/FROG POND LN	LOS D	>1.20	**>120**	**B/F**
STAFFORD RD/KAHLE RD	LOS D	0.65	**>120**	**B/F**
ROUNDABOUT				
STAFFORD RD/65TH AVE/ ELLIGSEN RD	v/c ≤ 0.90	0.85	21.0	C

SIGNALIZED INTERSECTION:
Delay = Average Intersection Delay (secs)
v/c = Total Volume-to-Capacity Ratio
LOS = Total Level of Service

TWO-WAY STOP-CONTROLLED INTERSECTION:
Delay = Critical Movement Delay (secs)
v/c = Critical Movement Volume-to-Capacity Ratio
LOS = Critical Levels of Service (Major/Minor Road)

ROUNDABOUT INTERSECTION:
Delay = Average Intersection Delay (secs)
v/c = Critical Movement Volume-to-Capacity Ratio
LOS = Total Level of Service

As shown, the unsignalized intersections/accesses along Stafford Road (Kahle Road, Frog Pond Lane, and Brisband Street) are expected to exceed the City's LOS D performance standard. The primary reason is the high through volumes that influence delay experienced by side street vehicles attempting to turn left.

RECOMMENDED TRANSPORTATION IMPROVEMENTS

The three intersections along Stafford Road are located approximately within 800–900 feet from one another. Therefore, the interaction of all improvements at these intersections must be carefully considered due to their proximity. The following projects have therefore been identified to improve the three gateway intersections along Stafford Road to meet the City's level of service D performance standard.

Due to the planned location of the commercial uses off Brisband Street, it is desirable to allow all vehicle turning movements at the Brisband Street intersection to provide full access and connectivity to those land uses. It is also desirable to have a full-access gateway intersection at the far north end of the housing development to function as a gateway between the rural higher speed traffic and urban slower speed traffic and provide safe access to the Frog Pond development. There is a strong desire to preserve the historic Grange building on the northeast corner of Stafford Road/Frog Pond Lane intersection. Turn restrictions could be implemented at the Stafford Road/Frog Pond Lane intersection (restrict minor street through and left turns) to allow access to safe movements (left in, right in and right out). A full access roundabout at Frog Pond Lane would likely require the removal or relocation of the historic Grange building due to the required footprint of the improvement.

If two intersections are improved with roundabouts with a limited access between the two full-access locations, it is likely that many of the residents and drivers familiar with the area would choose to turn left or go through at those improved intersections during the peak periods, particularly with good Collector/Local Street connectivity. Local street connections in both the East and West neighborhoods are planned that would allow sufficient connectivity for vehicles to access the proposed roundabouts Kahle Road or Brisband Street to cross Stafford Road or turn left onto Stafford Road. A discussion on the advantages and disadvantages of roundabouts are provided in a subsequent section.

The recommended improvements are highlighted below.

KAHLE ROAD/STAFFORD ROAD

At this intersection, install a single-lane roundabout with pedestrian island. In addition to meeting capacity needs, the proposed roundabout would improve safety and provide a distinct transition between the rural and urban land use and traffic speeds in the area. The roundabout should include pedestrian medians for enhanced pedestrian crossings.

FROG POND LANE/STAFFORD ROAD

At this intersection, install a raised center median and traffic separator that allows northbound and southbound right and left turns from Stafford Road and minor street

right turns but restricts minor street eastbound and westbound through and left turn movements to and from Frog Pond West and East. The restriction is needed to facilitate safe vehicle and pedestrian/bicycle movements at the intersection and to meet the City's LOS standard. This intersection should include enhanced pedestrian crossings with median breaks for safe and improved pedestrian connectivity.

BRISBAND STREET/STAFFORD ROAD

At this intersection, install a single-lane roundabout. This will require a slight shift of Stafford Road to the east to accommodate the necessary right-of-way. The roundabout should include pedestrian medians for enhanced pedestrian crossings.

60TH AVENUE/ADVANCE ROAD

At this intersection, install a single-lane roundabout. While not a necessary improvement for traffic operating conditions, the proposed roundabout would improve safety and provide a distinct transition between the rural land use with high-speed traffic and urban land use with slower vehicle speeds and the need for multimodal safety in the area.

IMPROVED OPERATING CONDITIONS

The table below shows the intersection operations for the four intersections with the identified transportation improvements in place. As shown, all four intersections will meet the City LOS standard while providing safe multimodal improvements for pedestrian and bicycles.

TABLE 5: ANTICIPATED BUILD (2040) INTERSECTION OPERATIONS - IMPROVEMENTS

INTERSECTION	IMPROVEMENT	OPERATING STANDARD	PM PEAK HOUR		
			V/C	DELAY	LOS
ADVANCE RD/ 60TH AVE	Roundabout	LOS D	0.19	4.3	A
STAFFORD RD/ BRISBAND ST	Roundabout	LOS D	0.78	12.7	B
STAFFORD RD/ FROG POND LN	Two-Way Stop-Controlled with Minor Street Turn Restrictions	LOS D	0.04	18.5	B/C
STAFFORD RD/ KAHLE RD	Roundabout	LOS D	0.99	29.6	D

TWO-WAY STOP-CONTROLLED INTERSECTION:
Delay = Critical Movement Delay (secs)
v/c = Critical Movement Volume-to-Capacity Ratio
LOS = Critical Levels of Service (Major/Minor Road)

ROUNDABOUT INTERSECTION:
Delay = Average Intersection Delay (secs)
v/c = Critical Movement Volume-to-Capacity Ratio
LOS = Total Level of Service

Advantages of Installing a Roundabout

- Roundabouts can reduce delay for side street traffic because no approach is given more priority than another. Therefore, the Kahle Road and Brisband Street intersections would no longer be anticipated to operate at LOS F in the future scenarios.

- Roundabouts can help to slow traffic speeds on the roadway. Typical circulating speeds for a roundabout are 15 – 20 miles per hour (mph), which would help to calm traffic in the vicinity of the Frog Pond development area.

- Converting a stop-controlled intersection to a single-lane roundabout can reduce fatal and injury crashes by 82%.

- Roundabouts reduce the number of conflict points between vehicles and between vehicles and pedestrians/bicycles.

- Roundabouts at Stafford Road/Kahle Road and Advance Road/60th Avenue would provide clear gateways between the rural and urban environments. The Stafford Road/Kahle Road location is under the BPA power line easement and would have underutilized land available to accommodate the larger footprint that roundabouts require.

Disadvantages of Installing a Roundabout

- Because all approaches are treated the same and must yield to traffic within the roundabout, this would introduce delay for traffic on the major approaches (Stafford Road).

- Roundabouts are more difficult for large trucks and agricultural vehicles to navigate and may result in complaints from the freight community and farmers.

- Roundabouts can be difficult for school aged pedestrians and bicyclists to cross because there is no exclusive stop phase (as is provided with a traffic signal). The lack of straight paths and clear turns can also be difficult for the vision impaired.

- Roundabouts require a larger footprint, which would require additional right-of-way dedication or acquisition.

IDENTIFIED PROJECTS

The following lists of transportation projects have been identified through the evaluation of the proposed Frog Pond East and South neighborhoods.

STREET PROJECTS

- Widen Stafford Road to a three-lane cross section (two travel lanes with a center turn lane). Include curb, gutter, sidewalks, landscape strips, and bicycle facilities on both sides. Additionally, acquire the necessary right-of-way to accommodate a five-lane cross section. See sensitivity analysis in next section for explanation.
- Widen Advance Road to a three-lane cross section (two travel lanes with a center turn lane). Include curb, gutter, sidewalks, landscape strips, and bicycle facilities on both sides.
- Construct Local And Neighborhood Collector streets through the East and South neighborhoods consistent with the draft master plan to provide connections to the internal land uses.

INTERSECTION PROJECTS

- Install a single-lane roundabout at Stafford Road/Kahle Road.
- Install a median that restricts minor street left turn and through movements at Stafford Road/Frog Pond Lane.
- Install a single-lane roundabout at Stafford Road/Brisband Street.
- Install a single-lane roundabout at Advance Road/60th Avenue.

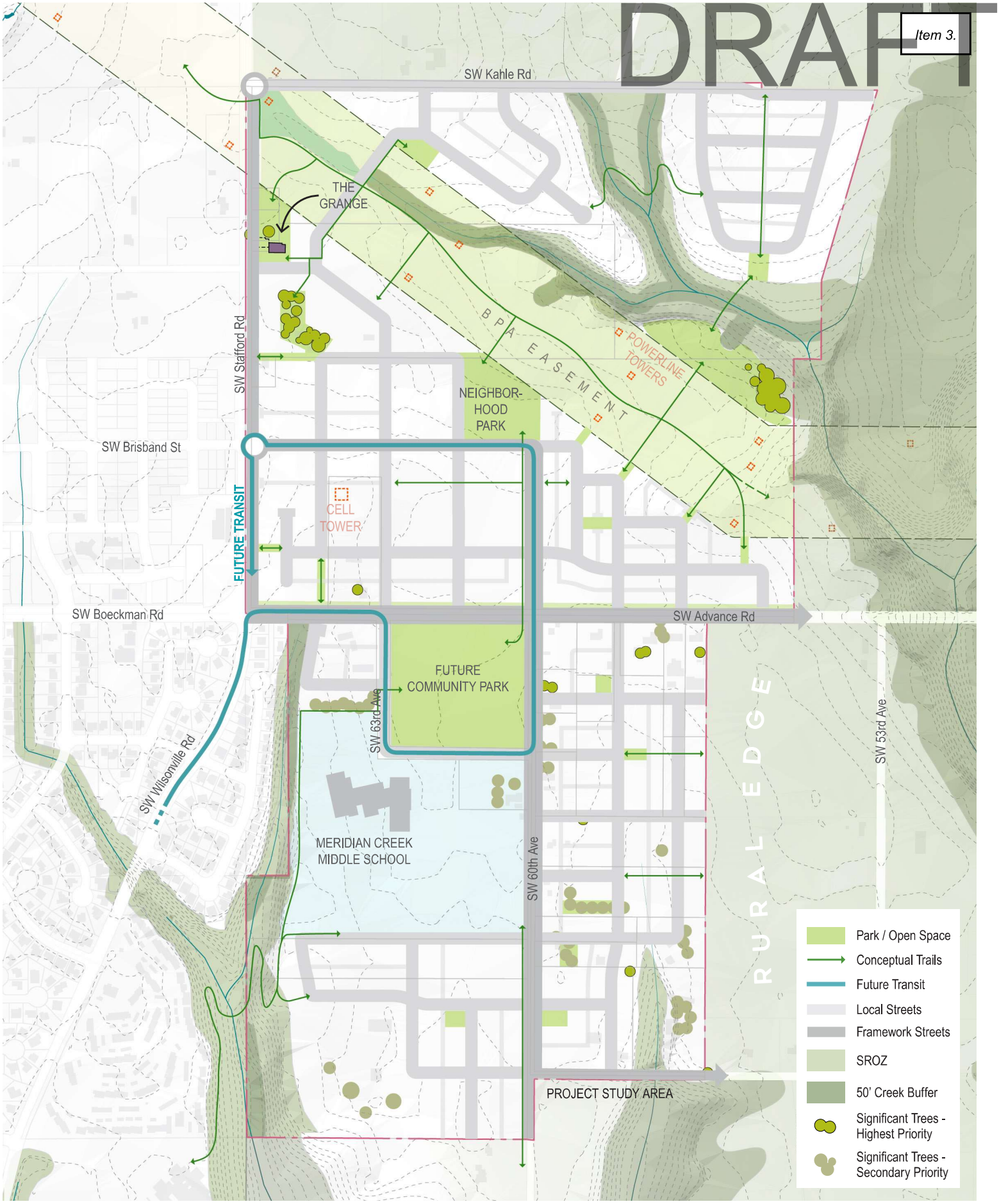
PEDESTRIAN, BICYCLE, AND TRAIL PROJECTS

- Install a mid-block crossing on Advance Road between 60th Avenue and 63rd Avenue to facilitate safe crossings between the future park and East neighborhood. A Rectangular Rapid Flashing Beacon (RRFB) should be added to one of the crossings at either 63rd Avenue, 60th Avenue, or the midblock crossing between them.
- Install a crosswalk with median at the Frog Pond Lane/Stafford Road. It is assumed that additional safe and accessible bicycle and pedestrian crossings will be provided via the identified roundabouts at Kahle Road/Stafford Road and Brisband Street/Stafford Road.
- Extend the planned pedestrian and bicycle facility improvements on Boeckman Road to Advance Road east of Stafford Road. The desired cross section for Boeckman Road is still in the design stage but will likely include a multi-use path, cycle track, or protected bike lanes.
- Construct a separated multi-use path, two-way cycle track, or protected bike lanes along the east side of Stafford Road.
- Construct pedestrian and bicycle trails through the East and South neighborhoods consistent with the draft master plan to provide connections to existing local and regional trails in Wilsonville

DRAFT

APPENDIX

EAST & SOUTH
MASTER PLAN



EAST & SOUTH MASTER PLAN

STREET DEMONSTRATION PLAN - OPT 2

DRAFT 8.02.2022

0' 150' 300' 600'

DRAFT

CONTENTS

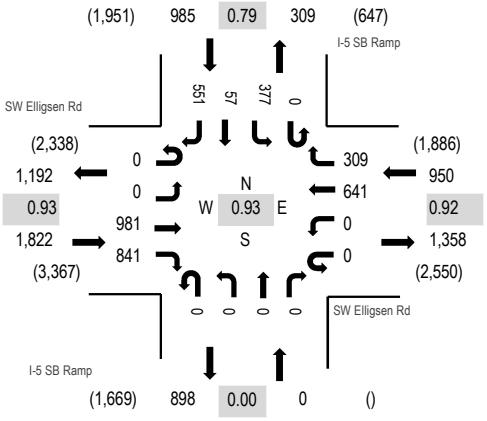
TRAFFIC COUNT DATA

ALL TRAFFIC DATA SERVICES
(303) 216-2439
www.alltrafficdata.net

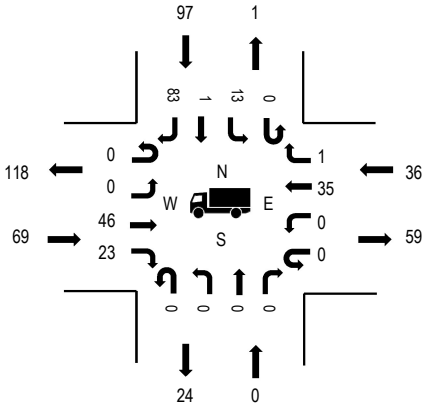
Location: 4 I-5 SB Ramp & SW Elligsen Rd PM
Date: Wednesday, September 22, 2021
Peak Hour: 04:00 PM - 05:00 PM
Peak 15-Minutes: 04:00 PM - 04:15 PM

Peak Hour

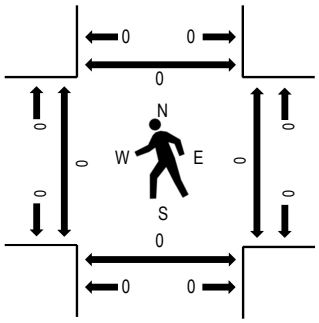
Motorized Vehicles



Heavy Vehicles



Pedestrians



Note: Total study counts contained in parentheses.

	HV%	PHF
EB	3.8%	0.93
WB	3.8%	0.92
NB	0.0%	0.00
SB	9.8%	0.79
All	5.4%	0.93

Traffic Counts - Motorized Vehicles

Interval Start Time	SW Elligsen Rd Eastbound				SW Elligsen Rd Westbound				I-5 SB Ramp Northbound				I-5 SB Ramp Southbound					Rolling Hour
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	Total	
4:00 PM	0	0	74	72	0	0	41	26	0	0	0	0	0	47	8	53	321	3,757
4:05 PM	0	0	92	65	0	0	48	29	0	0	0	0	0	46	10	56	346	3,746
4:10 PM	0	0	97	77	0	0	55	23	0	0	0	0	0	37	13	43	345	3,709
4:15 PM	0	0	65	74	0	0	54	20	0	0	0	0	0	40	5	45	303	3,652
4:20 PM	0	0	76	71	0	0	60	31	0	0	0	0	0	24	8	50	320	3,655
4:25 PM	0	0	67	68	0	0	67	32	0	0	0	0	0	25	6	42	307	3,601
4:30 PM	0	0	108	61	0	0	50	28	0	0	0	0	0	34	0	37	318	3,622
4:35 PM	0	0	86	72	0	0	56	31	0	0	0	0	0	13	0	47	305	3,585
4:40 PM	0	0	86	78	0	0	40	31	0	0	0	0	0	25	1	54	315	3,573
4:45 PM	0	0	75	73	0	0	59	17	0	0	0	0	0	31	1	32	288	3,553
4:50 PM	0	0	71	63	0	0	53	23	0	0	0	0	0	32	3	54	299	3,538
4:55 PM	0	0	84	67	0	0	58	18	0	0	0	0	0	23	2	38	290	3,483
5:00 PM	0	0	78	75	0	0	48	31	0	0	0	0	0	26	6	46	310	3,447
5:05 PM	0	0	85	67	0	0	51	33	0	0	0	0	0	31	2	40	309	
5:10 PM	0	0	87	58	0	0	48	35	0	0	0	0	0	21	3	36	288	
5:15 PM	0	0	75	65	0	0	55	53	0	0	0	0	0	22	0	36	306	
5:20 PM	0	0	65	59	0	0	49	24	0	0	0	0	0	31	0	38	266	
5:25 PM	0	0	76	74	0	0	54	29	0	0	0	0	0	35	5	55	328	
5:30 PM	0	0	65	54	0	0	42	30	0	0	0	0	0	30	6	54	281	
5:35 PM	0	0	69	66	0	0	68	26	0	0	0	0	0	20	7	37	293	
5:40 PM	0	0	72	57	0	0	45	29	0	0	0	0	0	33	10	49	295	
5:45 PM	0	0	54	50	0	0	56	19	0	0	0	0	0	32	6	56	273	
5:50 PM	0	0	53	47	0	0	38	15	0	0	0	0	0	33	9	49	244	
5:55 PM	0	0	54	40	0	0	44	14	0	0	0	0	0	45	5	52	254	
Count Total	0	0	1,814	1,553	0	0	1,239	647	0	0	0	0	0	736	116	1,099	7,204	
Peak Hour	0	0	981	841	0	0	641	309	0	0	0	0	0	377	57	551	3,757	

Traffic Counts - Heavy Vehicles, Bicycles on Road, and Pedestrians/Bicycles on Crosswalk

Interval	Heavy Vehicles					Interval	Bicycles on Roadway					Interval	Pedestrians/Bicycles on Crosswalk				
Start Time	EB	NB	WB	SB	Total	Start Time	EB	NB	WB	SB	Total	Start Time	EB	NB	WB	SB	Total
4:00 PM	9	0	2	6	17	4:00 PM	0	0	0	0	0	4:00 PM	0	0	0	0	0
4:05 PM	10	0	2	6	18	4:05 PM	0	0	0	0	0	4:05 PM	0	0	0	0	0
4:10 PM	2	0	3	8	13	4:10 PM	0	0	0	0	0	4:10 PM	0	0	0	0	0
4:15 PM	2	0	6	10	18	4:15 PM	0	0	0	0	0	4:15 PM	0	0	0	0	0
4:20 PM	5	0	1	6	12	4:20 PM	0	0	0	0	0	4:20 PM	0	0	0	0	0
4:25 PM	6	0	3	7	16	4:25 PM	0	0	0	0	0	4:25 PM	0	0	0	0	0
4:30 PM	6	0	4	7	17	4:30 PM	0	0	0	0	0	4:30 PM	0	0	0	0	0
4:35 PM	1	0	1	9	11	4:35 PM	0	0	0	0	0	4:35 PM	0	0	0	0	0
4:40 PM	10	0	4	11	25	4:40 PM	0	0	0	0	0	4:40 PM	0	0	0	0	0
4:45 PM	7	0	1	7	15	4:45 PM	0	0	0	0	0	4:45 PM	0	0	0	0	0
4:50 PM	5	0	2	12	19	4:50 PM	0	0	0	0	0	4:50 PM	0	0	0	0	0
4:55 PM	6	0	7	8	21	4:55 PM	0	0	1	0	1	4:55 PM	0	0	0	1	1
5:00 PM	4	0	1	7	12	5:00 PM	0	0	0	0	0	5:00 PM	0	0	0	0	0
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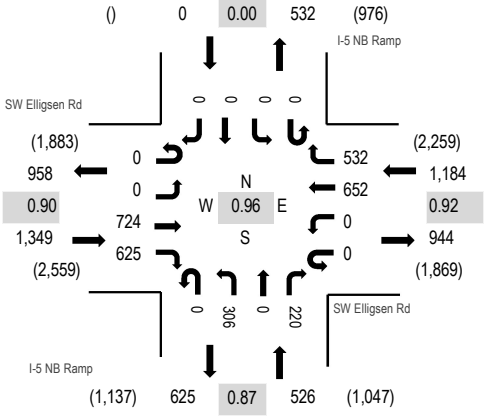
5:15 PM	0	0	2	6	8	5:15 PM	0	0	0	0	0	5:15 PM	0	0	0	0	0
5:20 PM	3	0	4	10	17	5:20 PM	0	0	0	0	0	5:20 PM	0	0	0	0	0
5:25 PM	7	0	2	4	13	5:25 PM	0	0	0	0	0	5:25 PM	0	0	0	0	0
5:30 PM	4	0	2	5	11	5:30 PM	0	0	0	0	0	5:30 PM	0	0	0	0	0
5:35 PM	4	0	5	5	14	5:35 PM	0	0	0	0	0	5:35 PM	0	0	0	0	0
5:40 PM	7	0	2	2	11	5:40 PM	0	0	0	0	0	5:40 PM	0	0	0	0	0
5:45 PM	7	0	1	6	14	5:45 PM	0	0	0	0	0	5:45 PM	0	0	0	0	0
5:50 PM	9	0	3	7	19	5:50 PM	0	0	0	0	0	5:50 PM	0	0	0	0	0
5:55 PM	5	0	3	7	15	5:55 PM	0	0	0	0	0	5:55 PM	0	0	0	0	0
Count Total	125	0	66	166	357	Count Total	0	0	1	0	1	Count Total	0	0	0	1	1
Peak Hour	69	0	36	97	202	Peak Hour	0	0	1	0	1	Peak Hour	0	0	0	1	1

ALL TRAFFIC DATA SERVICES
(303) 216-2439
www.alltrafficdata.net

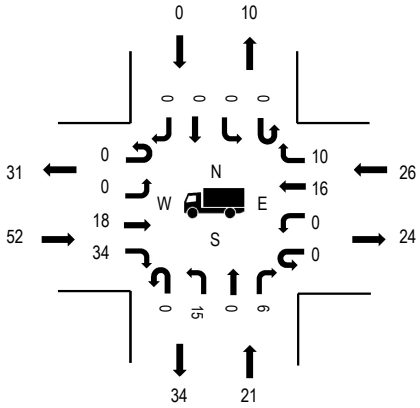
Location: 5 I-5 NB Ramp & SW Elligsen Rd PM
Date: Wednesday, September 22, 2021
Peak Hour: 04:05 PM - 05:05 PM
Peak 15-Minutes: 04:05 PM - 04:20 PM

Peak Hour

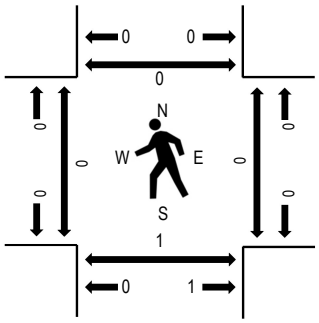
Motorized Vehicles



Heavy Vehicles



Pedestrians



Note: Total study counts contained in parentheses.

	HV%	PHF
EB	3.9%	0.90
WB	2.2%	0.92
NB	4.0%	0.87
SB	0.0%	0.00
All	3.2%	0.96

Traffic Counts - Motorized Vehicles

Interval Start Time	SW Elligsen Rd Eastbound				SW Elligsen Rd Westbound				I-5 NB Ramp Northbound				I-5 NB Ramp Southbound					Rolling Hour
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	Total	
4:00 PM	0	0	76	41	0	0	48	36	0	18	0	18	0	0	0	0	237	3,045
4:05 PM	0	0	76	54	0	0	51	49	0	25	0	21	0	0	0	0	276	3,059
4:10 PM	0	0	58	73	0	0	58	46	0	19	0	16	0	0	0	0	270	3,051
4:15 PM	0	0	70	43	0	0	49	47	0	23	0	16	0	0	0	0	248	3,023
4:20 PM	0	0	60	51	0	0	64	44	0	29	0	16	0	0	0	0	264	3,027
4:25 PM	0	0	53	40	0	0	62	39	0	37	0	22	0	0	0	0	253	3,006
4:30 PM	0	0	64	62	0	0	51	43	0	27	0	30	0	0	0	0	277	3,015
4:35 PM	0	0	42	65	0	0	65	46	0	23	0	17	0	0	0	0	258	2,977
4:40 PM	0	0	53	57	0	0	46	37	0	25	0	13	0	0	0	0	231	2,959
4:45 PM	0	0	59	43	0	0	48	39	0	27	0	17	0	0	0	0	233	2,971
4:50 PM	0	0	74	39	0	0	50	52	0	25	0	21	0	0	0	0	261	2,936
4:55 PM	0	0	58	52	0	0	48	38	0	28	0	13	0	0	0	0	237	2,862
5:00 PM	0	0	57	46	0	0	60	52	0	18	0	18	0	0	0	0	251	2,820
5:05 PM	0	0	58	61	0	0	66	48	0	19	0	16	0	0	0	0	268	
5:10 PM	0	0	52	49	0	0	61	42	0	21	0	17	0	0	0	0	242	
5:15 PM	0	0	51	39	0	0	72	33	0	38	0	19	0	0	0	0	252	
5:20 PM	0	0	59	41	0	0	48	42	0	25	0	28	0	0	0	0	243	
5:25 PM	0	0	66	54	0	0	64	37	0	18	0	23	0	0	0	0	262	
5:30 PM	0	0	63	40	0	0	50	49	0	23	0	14	0	0	0	0	239	
5:35 PM	0	0	48	41	0	0	53	42	0	41	0	15	0	0	0	0	240	
5:40 PM	0	0	67	42	0	0	51	37	0	23	0	23	0	0	0	0	243	
5:45 PM	0	0	47	28	0	0	51	27	0	24	0	21	0	0	0	0	198	
5:50 PM	0	0	55	40	0	0	37	22	0	16	0	17	0	0	0	0	187	
5:55 PM	0	0	56	36	0	0	30	29	0	28	0	16	0	0	0	0	195	
Count Total	0	0	1,422	1,137	0	0	1,283	976	0	600	0	447	0	0	0	0	5,865	
Peak Hour	0	0	724	625	0	0	652	532	0	306	0	220	0	0	0	0	3,059	

Traffic Counts - Heavy Vehicles, Bicycles on Road, and Pedestrians/Bicycles on Crosswalk

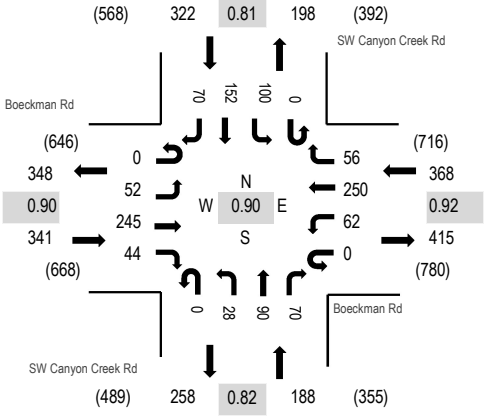
Interval Start Time	Heavy Vehicles					Interval Start Time	Bicycles on Roadway					Interval Start Time	Pedestrians/Bicycles on Crosswalk				
	EB	NB	WB	SB	Total		EB	NB	WB	SB	Total		EB	NB	WB	SB	Total
4:00 PM	7	1	2	0	10	4:00 PM	1	0	0	0	1	4:00 PM	0	0	0	0	0
4:05 PM	4	2	1	0	7	4:05 PM	0	0	0	0	0	4:05 PM	0	0	0	0	0
4:10 PM	2	2	2	0	6	4:10 PM	0	0	0	0	0	4:10 PM	0	0	0	0	0
4:15 PM	3	3	1	0	7	4:15 PM	0	0	0	0	0	4:15 PM	0	0	0	0	0
4:20 PM	7	2	5	0	14	4:20 PM	0	0	0	0	0	4:20 PM	0	0	0	0	0
4:25 PM	4	2	2	0	8	4:25 PM	0	0	0	0	0	4:25 PM	0	0	0	0	0
4:30 PM	7	2	3	0	12	4:30 PM	0	0	0	0	0	4:30 PM	0	0	0	0	0
4:35 PM	2	1	2	0	5	4:35 PM	0	0	0	0	0	4:35 PM	0	0	0	0	0
4:40 PM	6	0	4	0	10	4:40 PM	0	0	0	0	0	4:40 PM	0	0	0	0	0
4:45 PM	6	0	0	0	6	4:45 PM	0	0	0	0	0	4:45 PM	0	0	0	0	0
4:50 PM	6	2	2	0	10	4:50 PM	0	0	0	0	0	4:50 PM	0	1	0	0	1
4:55 PM	4	5	2	0	11	4:55 PM	0	0	0	0	0	4:55 PM	0	0	0	0	0
5:00 PM	1	0	2	0	3	5:00 PM	0	0	0	0	0	5:00 PM	0	0	0	0	0
5:05 PM	4	3	1	0	8	5:05 PM	0	0	0	0	0	5:05 PM	0	0	0	0	0
5:10 PM	3	0	1	0	4	5:10 PM	0	0	0	0	0	5:10 PM	0	0	0	0	0
5:15 PM	1	4	1	0	6	5:15 PM	0	0	0	0	0	5:15 PM	0	1	0	0	1
5:20 PM	2	4	1	0	7	5:20 PM	0	0	0	0	0	5:20 PM	0	0	0	0	0
5:25 PM	4	2	0	0	6	5:25 PM	0	0	1	0	1	5:25 PM	0	0	0	0	0
5:30 PM	7	1	2	0	10	5:30 PM	0	0	0	0	0	5:30 PM	0	0	0	0	0
5:35 PM	5	3	3	0	11	5:35 PM	0	0	0	0	0	5:35 PM	0	0	0	0	0
5:40 PM	4	2	1	0	7	5:40 PM	0	0	0	0	0	5:40 PM	0	0	0	0	0
5:45 PM	3	1	1	0	5	5:45 PM	0	0	0	0	0	5:45 PM	0	0	0	0	0
5:50 PM	4	2	2	0	8	5:50 PM	0	0	0	0	0	5:50 PM	0	0	0	0	0
5:55 PM	3	2	5	0	10	5:55 PM	0	0	0	0	0	5:55 PM	0	0	0	0	0
Count Total	99	46	46	0	191	Count Total	1	0	1	0	2	Count Total	0	2	0	0	2
Peak Hour	52	21	26	0	99	Peak Hour	0	0	0	0	0	Peak Hour	0	1	0	0	1

ALL TRAFFIC DATA SERVICES
(303) 216-2439
www.alltrafficdata.net

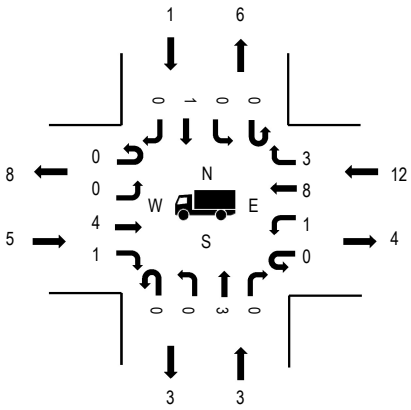
Location: 2 SW Canyon Creek Rd & Boeckman Rd PM
Date: Thursday, September 30, 2021
Peak Hour: 04:45 PM - 05:45 PM
Peak 15-Minutes: 04:50 PM - 05:05 PM

Peak Hour

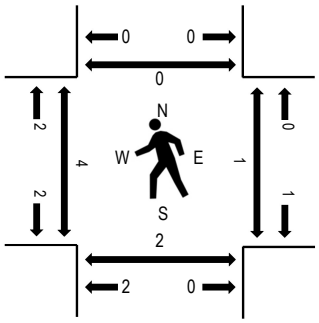
Motorized Vehicles



Heavy Vehicles



Pedestrians



Note: Total study counts contained in parentheses.

	HV%	PHF
EB	1.5%	0.90
WB	3.3%	0.92
NB	1.6%	0.82
SB	0.3%	0.81
All	1.7%	0.90

Traffic Counts - Motorized Vehicles

Interval Start Time	Boeckman Rd Eastbound				Boeckman Rd Westbound				SW Canyon Creek Rd Northbound				SW Canyon Creek Rd Southbound					Rolling Hour
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	Total	
4:00 PM	0	6	17	8	0	11	31	4	0	4	5	2	0	5	9	4	106	1,142
4:05 PM	0	4	22	2	0	4	18	7	0	0	8	6	0	2	9	1	83	1,148
4:10 PM	0	5	21	3	0	3	20	4	0	1	5	5	0	3	15	7	92	1,172
4:15 PM	0	5	14	3	0	2	15	5	0	2	15	6	0	8	7	3	85	1,184
4:20 PM	0	2	28	2	0	4	14	6	0	2	11	4	0	5	15	3	96	1,201
4:25 PM	0	3	19	7	0	7	22	4	0	3	7	4	0	7	9	2	94	1,201
4:30 PM	0	3	23	3	0	8	21	4	0	2	4	5	0	7	5	9	94	1,202
4:35 PM	0	4	22	5	0	2	19	5	0	3	10	1	0	3	13	3	90	1,214
4:40 PM	0	3	19	2	0	6	12	3	0	3	8	4	0	11	14	7	92	1,215
4:45 PM	0	3	18	4	0	1	20	3	0	3	5	3	0	9	9	7	85	1,219
4:50 PM	0	8	12	4	0	5	31	6	0	2	9	5	0	12	16	3	113	1,214
4:55 PM	0	7	25	2	0	6	19	3	0	3	7	8	0	9	13	10	112	1,190
5:00 PM	0	5	22	0	0	2	12	6	0	5	9	11	0	16	15	9	112	1,165
5:05 PM	0	2	27	7	0	8	24	6	0	1	7	3	0	9	10	3	107	
5:10 PM	0	3	21	6	0	8	20	5	0	1	11	4	0	6	12	7	104	
5:15 PM	0	7	19	3	0	4	20	6	0	3	10	7	0	6	14	3	102	
5:20 PM	0	5	14	5	0	7	23	7	0	3	4	5	0	6	11	6	96	
5:25 PM	0	4	19	6	0	7	18	5	0	2	3	3	0	7	16	5	95	
5:30 PM	0	2	25	5	0	3	20	3	0	1	10	7	0	10	11	9	106	
5:35 PM	0	3	21	1	0	6	17	5	0	3	8	5	0	4	17	1	91	
5:40 PM	0	3	22	1	0	5	26	1	0	1	7	9	0	6	8	7	96	
5:45 PM	0	1	21	3	0	7	20	2	0	2	8	6	0	6	2	2	80	
5:50 PM	0	2	16	4	0	5	20	6	0	0	11	2	0	10	10	3	89	
5:55 PM	0	4	19	2	0	6	16	5	0	0	5	3	0	9	14	4	87	
Count Total	0	94	486	88	0	127	478	111	0	50	187	118	0	176	274	118	2,307	
Peak Hour	0	52	245	44	0	62	250	56	0	28	90	70	0	100	152	70	1,219	

Traffic Counts - Heavy Vehicles, Bicycles on Road, and Pedestrians/Bicycles on Crosswalk

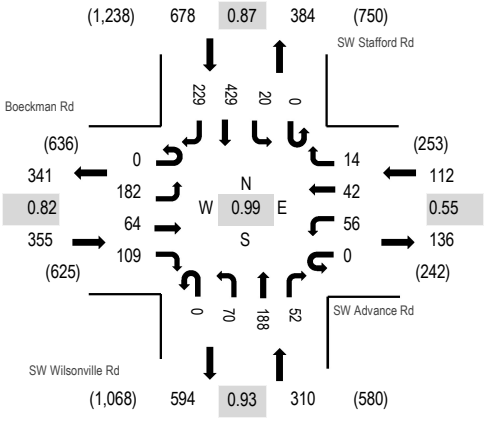
Interval Start Time	Heavy Vehicles					Interval Start Time	Bicycles on Roadway					Interval Start Time	Pedestrians/Bicycles on Crosswalk				
	EB	NB	WB	SB	Total		EB	NB	WB	SB	Total		EB	NB	WB	SB	Total
4:00 PM	0	0	3	0	3	4:00 PM	0	0	0	0	0	4:00 PM	0	0	0	0	0
4:05 PM	0	2	2	0	4	4:05 PM	0	0	0	0	0	4:05 PM	0	0	0	0	0
4:10 PM	1	0	1	0	2	4:10 PM	0	0	0	0	0	4:10 PM	0	2	0	0	2
4:15 PM	1	1	0	1	3	4:15 PM	0	0	0	0	0	4:15 PM	1	2	2	0	5
4:20 PM	0	1	1	0	2	4:20 PM	0	0	0	0	0	4:20 PM	0	0	0	0	0
4:25 PM	1	0	2	0	3	4:25 PM	0	0	0	0	0	4:25 PM	0	0	0	0	0
4:30 PM	1	0	2	0	3	4:30 PM	0	0	0	0	0	4:30 PM	0	2	0	0	2
4:35 PM	0	0	0	0	0	4:35 PM	0	0	0	0	0	4:35 PM	0	0	2	0	2
4:40 PM	0	0	0	0	0	4:40 PM	0	0	0	1	1	4:40 PM	0	0	0	0	0
4:45 PM	0	0	1	0	1	4:45 PM	0	0	0	0	0	4:45 PM	0	0	0	0	0
4:50 PM	0	0	1	0	1	4:50 PM	0	0	0	1	1	4:50 PM	0	0	0	0	0
4:55 PM	0	0	0	0	0	4:55 PM	0	0	0	0	0	4:55 PM	0	0	0	0	0
5:00 PM	1	0	0	0	1	5:00 PM	0	0	0	0	0	5:00 PM	0	1	0	0	1
5:05 PM	1	0	0	0	1	5:05 PM	0	0	0	0	0	5:05 PM	1	0	0	0	1
5:10 PM	1	0	1	0	2	5:10 PM	0	0	0	0	0	5:10 PM	0	0	0	0	0
5:15 PM	0	0	1	1	2	5:15 PM	0	0	0	0	0	5:15 PM	1	0	0	0	1
5:20 PM	2	0	2	0	4	5:20 PM	0	0	0	0	0	5:20 PM	0	1	0	0	1
5:25 PM	0	0	1	0	1	5:25 PM	0	0	0	0	0	5:25 PM	0	0	0	0	0
5:30 PM	0	1	2	0	3	5:30 PM	0	0	0	0	0	5:30 PM	0	0	0	0	0
5:35 PM	0	2	3	0	5	5:35 PM	0	0	0	0	0	5:35 PM	0	0	1	0	1
5:40 PM	0	0	0	0	0	5:40 PM	0	0	0	0	0	5:40 PM	2	0	0	0	2
5:45 PM	0	0	0	0	0	5:45 PM	0	0	0	0	0	5:45 PM	2	0	0	0	2
5:50 PM	0	0	0	0	0	5:50 PM	0	0	0	0	0	5:50 PM	0	1	0	0	1
5:55 PM	0	0	0	0	0	5:55 PM	0	0	0	0	0	5:55 PM	0	0	0	0	0
Count Total	9	7	23	2	41	Count Total	0	0	0	2	2	Count Total	7	9	5	0	21
Peak Hour	5	3	12	1	21	Peak Hour	0	0	0	1	1	Peak Hour	4	2	1	0	7

ALL TRAFFIC DATA SERVICES
(303) 216-2439
www.alltrafficdata.net

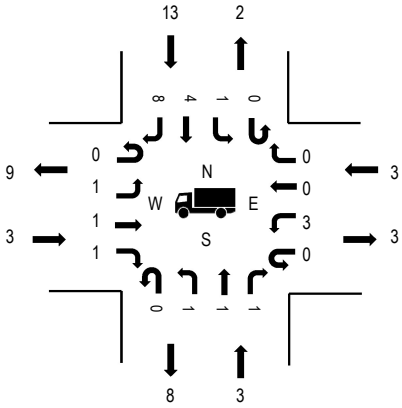
Location: 4 SW Wilsonville Rd & SW Advance Rd PM
Date: Thursday, September 30, 2021
Peak Hour: 04:45 PM - 05:45 PM
Peak 15-Minutes: 05:00 PM - 05:15 PM

Peak Hour

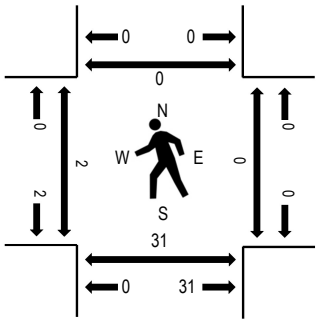
Motorized Vehicles



Heavy Vehicles



Pedestrians



Note: Total study counts contained in parentheses.

	HV%	PHF
EB	0.8%	0.82
WB	2.7%	0.55
NB	1.0%	0.93
SB	1.9%	0.87
All	1.5%	0.99

Traffic Counts - Motorized Vehicles

Interval Start Time	Boeckman Rd Eastbound				SW Advance Rd Westbound				SW Wilsonville Rd Northbound				SW Stafford Rd Southbound					Rolling Hour
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	Total	
4:00 PM	0	11	4	8	0	16	19	12	0	4	14	1	0	5	26	16	136	1,289
4:05 PM	0	16	1	0	0	3	2	3	0	4	20	1	0	2	22	19	93	1,263
4:10 PM	0	17	6	3	0	4	2	6	0	4	16	3	0	0	31	14	106	1,294
4:15 PM	0	10	2	0	0	4	1	3	0	7	14	4	0	0	23	15	83	1,323
4:20 PM	0	20	7	6	0	9	2	5	0	5	13	1	0	0	30	12	110	1,350
4:25 PM	0	12	3	7	0	5	5	3	0	1	18	7	0	3	25	27	116	1,363
4:30 PM	0	11	5	8	0	3	2	0	0	2	10	3	0	1	24	23	92	1,376
4:35 PM	0	18	2	6	0	2	3	2	0	2	14	3	0	3	29	14	98	1,399
4:40 PM	0	11	3	8	0	3	1	4	0	3	14	5	0	1	31	13	97	1,424
4:45 PM	0	15	4	12	0	8	2	0	0	5	17	7	0	0	25	23	118	1,455
4:50 PM	0	15	6	1	0	2	6	2	0	8	15	7	0	2	35	21	120	1,435
4:55 PM	0	16	13	9	0	0	1	2	0	3	9	4	0	1	41	21	120	1,424
5:00 PM	0	19	10	6	0	6	1	0	0	6	16	6	0	2	21	17	110	1,407
5:05 PM	0	12	6	15	0	8	8	5	0	6	15	5	0	1	28	15	124	
5:10 PM	0	23	3	14	0	11	12	2	0	8	15	4	0	2	28	13	135	
5:15 PM	0	14	2	9	0	4	3	1	0	6	14	2	0	3	30	22	110	
5:20 PM	0	7	2	15	0	2	1	0	0	6	22	3	0	1	42	22	123	
5:25 PM	0	13	3	8	0	4	2	0	0	5	19	4	0	2	54	15	129	
5:30 PM	0	15	5	5	0	6	0	0	0	8	16	1	0	2	41	16	115	
5:35 PM	0	16	4	7	0	2	3	2	0	3	16	3	0	2	45	20	123	
5:40 PM	0	17	6	8	0	3	3	0	0	6	14	6	0	2	39	24	128	
5:45 PM	0	7	4	4	0	5	2	2	0	2	13	6	0	0	35	18	98	
5:50 PM	0	13	2	11	0	3	3	0	0	14	11	2	0	3	31	16	109	
5:55 PM	0	8	4	12	0	1	1	0	0	6	15	8	0	1	36	11	103	
Count Total	0	336	107	182	0	114	85	54	0	124	360	96	0	39	772	427	2,696	
Peak Hour	0	182	64	109	0	56	42	14	0	70	188	52	0	20	429	229	1,455	

Traffic Counts - Heavy Vehicles, Bicycles on Road, and Pedestrians/Bicycles on Crosswalk

Interval Start Time	Heavy Vehicles					Interval Start Time	Bicycles on Roadway					Interval Start Time	Pedestrians/Bicycles on Crosswalk				
	EB	NB	WB	SB	Total		EB	NB	WB	SB	Total		EB	NB	WB	SB	Total
4:00 PM	0	0	4	1	5	4:00 PM	0	0	0	0	0	4:00 PM	0	8	0	0	8
4:05 PM	0	0	1	0	1	4:05 PM	0	0	0	0	0	4:05 PM	0	0	0	0	0
4:10 PM	1	2	1	0	4	4:10 PM	0	0	0	0	0	4:10 PM	0	0	0	0	0
4:15 PM	1	1	0	0	2	4:15 PM	0	0	0	0	0	4:15 PM	0	1	0	0	1
4:20 PM	0	4	0	1	5	4:20 PM	0	0	0	0	0	4:20 PM	0	1	0	0	1
4:25 PM	0	1	0	1	2	4:25 PM	0	0	0	0	0	4:25 PM	0	44	0	0	44
4:30 PM	0	0	1	3	4	4:30 PM	0	0	0	0	0	4:30 PM	0	0	0	0	0
4:35 PM	0	0	0	0	0	4:35 PM	0	0	0	0	0	4:35 PM	0	0	0	0	0
4:40 PM	0	0	0	1	1	4:40 PM	0	0	0	0	0	4:40 PM	0	11	0	0	11
4:45 PM	0	0	0	1	1	4:45 PM	0	0	0	0	0	4:45 PM	0	9	0	0	9
4:50 PM	0	0	0	2	2	4:50 PM	0	0	0	0	0	4:50 PM	0	22	0	0	22
4:55 PM	0	1	0	1	2	4:55 PM	0	0	0	0	0	4:55 PM	0	0	0	0	0
5:00 PM	0	0	1	0	1	5:00 PM	0	0	0	0	0	5:00 PM	0	1	0	0	1
5:05 PM	0	0	0	1	1	5:05 PM	0	0	0	0	0	5:05 PM	0	0	0	0	0
5:10 PM	2	0	0	1	3	5:10 PM	0	0	0	0	0	5:10 PM	1	0	0	0	1
5:15 PM	0	0	1	2	3	5:15 PM	0	0	0	0	0	5:15 PM	0	3	0	0	3
5:20 PM	0	0	0	1	1	5:20 PM	0	0	0	0	0	5:20 PM	0	0	0	0	0
5:25 PM	1	0	0	0	1	5:25 PM	0	0	0	0	0	5:25 PM	0	0	0	0	0
5:30 PM	0	2	1	0	3	5:30 PM	0	0	0	0	0	5:30 PM	0	0	0	0	0
5:35 PM	0	0	0	3	3	5:35 PM	0	0	0	0	0	5:35 PM	0	0	0	0	0
5:40 PM	0	0	0	1	1	5:40 PM	0	0	0	0	0	5:40 PM	2	0	0	0	2
5:45 PM	0	0	1	0	1	5:45 PM	0	0	0	0	0	5:45 PM	2	0	0	0	2
5:50 PM	0	0	0	0	0	5:50 PM	0	0	0	0	0	5:50 PM	0	0	0	0	0
5:55 PM	0	0	0	0	0	5:55 PM	0	0	0	0	0	5:55 PM	0	0	0	0	0
Count Total	5	11	11	20	47	Count Total	0	0	0	0	0	Count Total	5	100	0	0	105
Peak Hour	3	3	3	13	22	Peak Hour	0	0	0	0	0	Peak Hour	3	35	0	0	38

ALL TRAFFIC DATA SERVICES
(303) 216-2439
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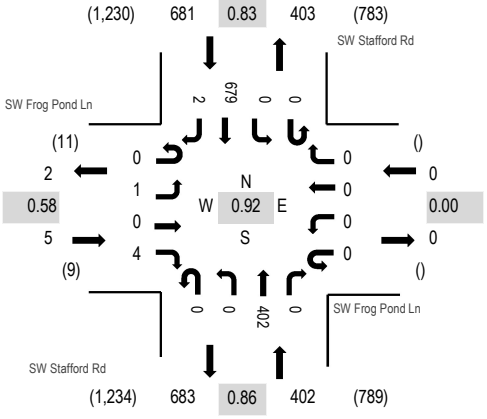
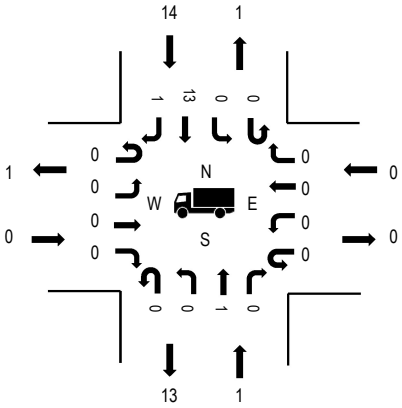
Location: 6 SW Stafford Rd & SW Frog Pond Ln PM
Date: Thursday, September 30, 2021
Peak Hour: 04:45 PM - 05:45 PM
Peak 15-Minutes: 05:20 PM - 05:35 PM

Peak Hour

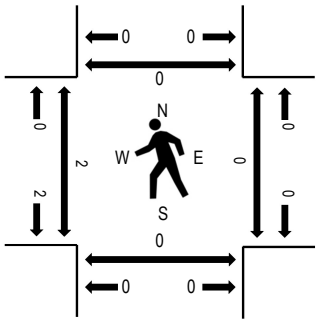
Motorized Vehicles



Heavy Vehicles



Pedestrians



Note: Total study counts contained in parentheses.

	HV%	PHF
EB	0.0%	0.58
WB	0.0%	0.00
NB	0.2%	0.86
SB	2.1%	0.83
All	1.4%	0.92

Traffic Counts - Motorized Vehicles

Interval Start Time	SW Frog Pond Ln Eastbound				SW Frog Pond Ln Westbound				SW Stafford Rd Northbound				SW Stafford Rd Southbound					Rolling Hour
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	Total	
4:00 PM	0	0	0	1	0	0	0	0	0	1	38	0	0	0	47	0	87	971
4:05 PM	0	0	0	0	0	0	0	0	0	0	39	0	0	0	31	0	70	965
4:10 PM	0	0	0	0	0	0	0	0	0	1	33	0	0	0	48	0	82	983
4:15 PM	0	0	0	0	0	0	0	0	0	1	28	0	0	0	41	0	70	988
4:20 PM	0	0	0	0	0	0	0	0	0	1	39	0	0	0	52	0	92	1,004
4:25 PM	0	0	0	1	0	0	0	0	0	0	36	0	0	0	43	0	80	1,011
4:30 PM	0	0	0	1	0	0	0	0	0	2	19	0	0	0	44	1	67	1,036
4:35 PM	0	0	0	0	0	0	0	0	0	0	36	0	0	0	47	1	84	1,060
4:40 PM	0	0	0	0	0	0	0	0	0	0	33	0	0	0	44	0	77	1,064
4:45 PM	0	0	0	0	0	0	0	0	0	0	29	0	0	0	59	0	88	1,088
4:50 PM	0	0	0	2	0	0	0	0	0	0	34	0	0	0	57	0	93	1,084
4:55 PM	0	0	0	1	0	0	0	0	0	0	31	0	0	0	49	0	81	1,066
5:00 PM	0	0	0	0	0	0	0	0	0	0	38	0	0	0	43	0	81	1,057
5:05 PM	0	0	0	1	0	0	0	0	0	0	36	0	0	0	50	1	88	
5:10 PM	0	0	0	0	0	0	0	0	0	0	46	0	0	0	41	0	87	
5:15 PM	0	0	0	0	0	0	0	0	0	0	32	0	0	0	53	1	86	
5:20 PM	0	1	0	0	0	0	0	0	0	0	28	0	0	0	70	0	99	
5:25 PM	0	0	0	0	0	0	0	0	0	0	29	0	0	0	76	0	105	
5:30 PM	0	0	0	0	0	0	0	0	0	0	31	0	0	0	60	0	91	
5:35 PM	0	0	0	0	0	0	0	0	0	0	32	0	0	0	56	0	88	
5:40 PM	0	0	0	0	0	0	0	0	0	0	36	0	0	0	65	0	101	
5:45 PM	0	0	0	0	0	0	0	0	0	1	33	0	0	0	50	0	84	
5:50 PM	0	0	0	1	0	0	0	0	0	0	24	0	0	0	50	0	75	
5:55 PM	0	0	0	0	0	0	0	0	0	0	22	0	0	0	50	0	72	
Count Total	0	1	0	8	0	0	0	0	0	7	782	0	0	0	1,226	4	2,028	
Peak Hour	0	1	0	4	0	0	0	0	0	0	402	0	0	0	679	2	1,088	

Traffic Counts - Heavy Vehicles, Bicycles on Road, and Pedestrians/Bicycles on Crosswalk

Interval Start Time	Heavy Vehicles					Interval Start Time	Bicycles on Roadway					Interval Start Time	Pedestrians/Bicycles on Crosswalk				
	EB	NB	WB	SB	Total		EB	NB	WB	SB	Total		EB	NB	WB	SB	Total
4:00 PM	0	2	0	1	3	4:00 PM	0	0	0	0	0	4:00 PM	0	0	0	0	0
4:05 PM	0	0	0	1	1	4:05 PM	0	0	0	0	0	4:05 PM	0	0	0	0	0
4:10 PM	0	2	0	1	3	4:10 PM	0	0	0	0	0	4:10 PM	0	0	0	0	0
4:15 PM	0	2	0	1	3	4:15 PM	0	0	0	0	0	4:15 PM	0	0	0	0	0
4:20 PM	0	2	0	2	4	4:20 PM	0	0	0	0	0	4:20 PM	0	0	0	0	0
4:25 PM	1	0	0	0	1	4:25 PM	0	0	0	0	0	4:25 PM	0	0	0	0	0
4:30 PM	1	0	0	1	2	4:30 PM	0	0	0	0	0	4:30 PM	0	0	0	0	0
4:35 PM	0	0	0	0	0	4:35 PM	0	0	0	0	0	4:35 PM	0	0	0	0	0
4:40 PM	0	0	0	1	1	4:40 PM	0	0	0	0	0	4:40 PM	0	0	0	0	0
4:45 PM	0	0	0	2	2	4:45 PM	0	0	0	0	0	4:45 PM	0	0	0	0	0
4:50 PM	0	0	0	1	1	4:50 PM	0	0	0	0	0	4:50 PM	0	0	0	0	0
4:55 PM	0	0	0	1	1	4:55 PM	0	0	0	0	0	4:55 PM	0	0	0	0	0
5:00 PM	0	0	0	0	0	5:00 PM	0	0	0	0	0	5:00 PM	0	0	0	0	0
5:05 PM	0	0	0	2	2	5:05 PM	0	0	0	0	0	5:05 PM	0	0	0	0	0
5:10 PM	0	1	0	2	3	5:10 PM	0	0	0	0	0	5:10 PM	0	0	0	0	0
5:15 PM	0	0	0	1	1	5:15 PM	0	0	0	0	0	5:15 PM	0	0	0	0	0
5:20 PM	0	0	0	1	1	5:20 PM	0	0	0	0	0	5:20 PM	0	0	0	0	0
5:25 PM	0	0	0	0	0	5:25 PM	0	0	0	0	0	5:25 PM	0	0	0	0	0
5:30 PM	0	0	0	2	2	5:30 PM	0	0	0	0	0	5:30 PM	0	0	0	0	0
5:35 PM	0	0	0	1	1	5:35 PM	0	0	0	0	0	5:35 PM	0	0	0	0	0
5:40 PM	0	0	0	1	1	5:40 PM	0	0	0	0	0	5:40 PM	2	0	0	0	2
5:45 PM	0	0	0	0	0	5:45 PM	0	0	0	0	0	5:45 PM	2	0	0	0	2
5:50 PM	0	0	0	0	0	5:50 PM	0	0	0	0	0	5:50 PM	0	0	0	0	0
5:55 PM	0	0	0	0	0	5:55 PM	0	0	0	0	0	5:55 PM	0	0	0	0	0
Count Total	2	9	0	22	33	Count Total	0	0	0	0	0	Count Total	4	0	0	0	4
Peak Hour	0	1	0	14	15	Peak Hour	0	0	0	0	0	Peak Hour	2	0	0	0	2

ALL TRAFFIC DATA SERVICES
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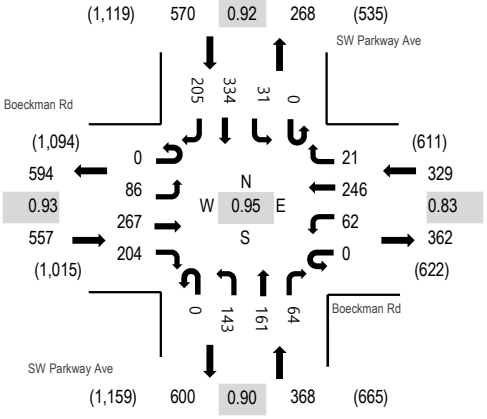
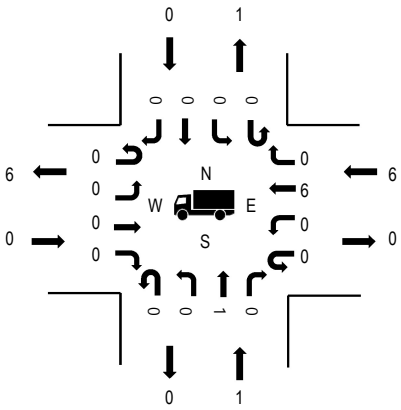
Location: 1 SW Parkway Ave & Boeckman Rd PM
Date: Wednesday, March 30, 2022
Peak Hour: 04:20 PM - 05:20 PM
Peak 15-Minutes: 05:05 PM - 05:20 PM

Peak Hour

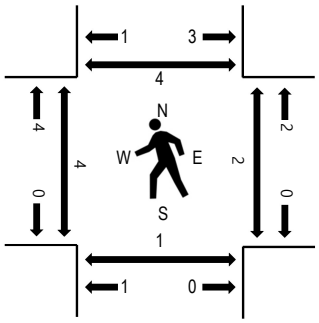
Motorized Vehicles



Heavy Vehicles



Pedestrians



Note: Total study counts contained in parentheses.

	HV%	PHF
EB	0.0%	0.93
WB	1.8%	0.83
NB	0.3%	0.90
SB	0.0%	0.92
All	0.4%	0.95

Traffic Counts - Motorized Vehicles

Interval Start Time	Boeckman Rd Eastbound				Boeckman Rd Westbound				SW Parkway Ave Northbound				SW Parkway Ave Southbound					Rolling Hour
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	Total	
4:00 PM	0	8	17	21	0	4	14	3	0	8	12	7	0	4	29	22	149	1,773
4:05 PM	0	9	20	20	0	1	10	5	0	10	12	5	0	0	29	13	134	1,780
4:10 PM	0	3	19	13	0	5	22	2	0	11	10	5	0	1	30	28	149	1,811
4:15 PM	0	5	16	18	0	4	25	1	0	12	12	2	0	1	35	22	153	1,809
4:20 PM	0	10	27	18	0	4	18	2	0	9	9	4	0	3	28	15	147	1,824
4:25 PM	0	6	20	19	0	3	15	2	0	9	16	5	0	2	26	12	135	1,814
4:30 PM	0	7	13	12	0	5	13	0	0	13	15	4	0	1	37	26	146	1,822
4:35 PM	0	9	33	22	0	6	22	3	0	12	13	6	0	1	27	17	171	1,821
4:40 PM	0	4	23	20	0	1	16	0	0	14	18	9	0	2	29	17	153	1,789
4:45 PM	0	7	23	8	0	3	30	2	0	12	6	7	0	2	25	14	139	1,754
4:50 PM	0	10	22	16	0	9	17	2	0	17	18	3	0	4	24	15	157	1,726
4:55 PM	0	4	18	14	0	7	15	0	0	9	14	4	0	5	25	25	140	1,668
5:00 PM	0	11	15	16	0	5	22	1	0	14	11	5	0	1	34	21	156	1,637
5:05 PM	0	6	22	25	0	4	35	4	0	8	11	7	0	3	20	20	165	
5:10 PM	0	6	16	18	0	7	14	3	0	11	18	5	0	3	34	12	147	
5:15 PM	0	6	35	16	0	8	29	2	0	15	12	5	0	4	25	11	168	
5:20 PM	0	8	16	18	0	6	23	0	0	6	16	6	0	2	25	11	137	
5:25 PM	0	11	13	17	0	6	24	2	0	12	13	2	0	1	22	20	143	
5:30 PM	0	8	20	10	0	3	18	2	0	14	19	2	0	2	29	18	145	
5:35 PM	0	11	15	16	0	8	16	3	0	7	6	6	0	3	30	18	139	
5:40 PM	0	8	17	14	0	10	13	1	0	5	9	3	0	4	21	13	118	
5:45 PM	0	3	13	10	0	6	10	4	0	6	17	2	0	1	26	13	111	
5:50 PM	0	9	8	9	0	5	5	3	0	6	12	0	0	4	25	13	99	
5:55 PM	0	10	13	12	0	1	15	2	0	6	8	8	0	2	21	11	109	
Count Total	0	179	454	382	0	121	441	49	0	246	307	112	0	56	656	407	3,410	
Peak Hour	0	86	267	204	0	62	246	21	0	143	161	64	0	31	334	205	1,824	

Location: 1 SW Parkway Ave & Boeckman Rd PM

Traffic Counts - Heavy Vehicles, Bicycles on Road, and Pedestrians/Bicycles on Crosswalk

Interval Start Time	Heavy Vehicles					Interval Start Time	Bicycles on Roadway					Interval Start Time	Pedestrians/Bicycles on Crosswalk				
	EB	NB	WB	SB	Total		EB	NB	WB	SB	Total		EB	NB	WB	SB	Total
4:00 PM	0	0	0	0	0	4:00 PM	0	0	1	1	2	4:00 PM	0	0	0	0	0
4:05 PM	2	0	0	0	2	4:05 PM	0	0	1	0	1	4:05 PM	0	1	0	0	1
4:10 PM	0	1	0	0	1	4:10 PM	1	0	0	1	2	4:10 PM	0	0	0	0	0
4:15 PM	0	0	0	0	0	4:15 PM	0	0	0	0	0	4:15 PM	0	0	0	1	1
4:20 PM	0	0	2	0	2	4:20 PM	0	0	1	0	1	4:20 PM	0	0	0	0	0
4:25 PM	0	0	0	0	0	4:25 PM	0	1	0	0	1	4:25 PM	0	0	0	0	0
4:30 PM	0	0	1	0	1	4:30 PM	0	0	1	0	1	4:30 PM	0	0	0	0	0
4:35 PM	0	0	1	0	1	4:35 PM	0	0	0	0	0	4:35 PM	0	0	0	0	0
4:40 PM	0	1	1	0	2	4:40 PM	0	0	0	0	0	4:40 PM	1	0	0	0	1
4:45 PM	0	0	1	0	1	4:45 PM	0	0	0	0	0	4:45 PM	0	1	0	1	2
4:50 PM	0	0	0	0	0	4:50 PM	0	0	0	0	0	4:50 PM	0	0	0	0	0
4:55 PM	0	0	0	0	0	4:55 PM	1	0	0	0	1	4:55 PM	1	0	0	1	2
5:00 PM	0	0	0	0	0	5:00 PM	1	0	0	0	1	5:00 PM	2	0	0	2	4
5:05 PM	0	0	0	0	0	5:05 PM	0	0	0	0	0	5:05 PM	0	0	2	0	2
5:10 PM	0	0	0	0	0	5:10 PM	0	0	0	0	0	5:10 PM	0	0	0	0	0
5:15 PM	0	0	0	0	0	5:15 PM	0	0	0	0	0	5:15 PM	0	0	1	0	1
5:20 PM	0	0	0	0	0	5:20 PM	0	0	0	0	0	5:20 PM	0	2	2	0	4
5:25 PM	0	0	0	0	0	5:25 PM	1	0	1	0	2	5:25 PM	0	0	1	0	1
5:30 PM	0	0	0	0	0	5:30 PM	0	0	0	0	0	5:30 PM	0	0	0	0	0
5:35 PM	0	0	0	0	0	5:35 PM	0	0	0	0	0	5:35 PM	2	0	1	2	5
5:40 PM	0	0	0	0	0	5:40 PM	0	0	0	0	0	5:40 PM	0	0	0	0	0
5:45 PM	0	0	0	0	0	5:45 PM	0	0	0	1	1	5:45 PM	0	0	1	1	2
5:50 PM	0	0	0	0	0	5:50 PM	0	0	0	0	0	5:50 PM	0	1	1	1	3
5:55 PM	0	0	2	0	2	5:55 PM	0	0	0	0	0	5:55 PM	0	0	0	0	0
Count Total	2	2	8	0	12	Count Total	4	1	5	3	13	Count Total	6	5	9	9	29
Peak Hour	0	1	6	0	7	Peak Hour	2	1	2	0	5	Peak Hour	4	1	3	4	12

Location: 4 Parkway Center Dr & SW Elligsen Rd PM

ALL TRAFFIC DATA SERVICES
(303) 216-2439
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Location: 4 Parkway Center Dr & SW Elligsen Rd PM

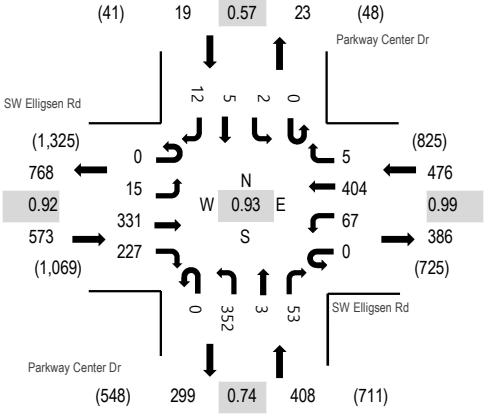
Date: Wednesday, March 30, 2022

Peak Hour: 04:15 PM - 05:15 PM

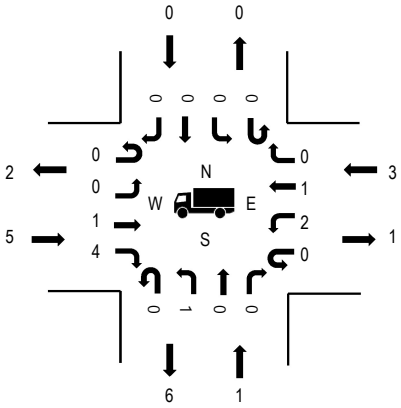
Peak 15-Minutes: 04:30 PM - 04:45 PM

Peak Hour

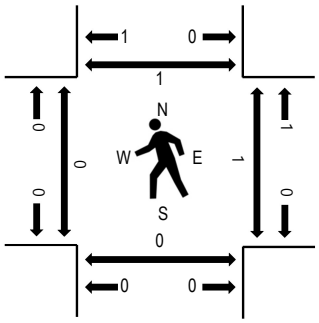
Motorized Vehicles



Heavy Vehicles



Pedestrians



Note: Total study counts contained in parentheses.

	HV%	PHF
EB	0.9%	0.92
WB	0.6%	0.99
NB	0.2%	0.74
SB	0.0%	0.57
All	0.6%	0.93

Traffic Counts - Motorized Vehicles

Interval Start Time	SW Elligsen Rd Eastbound				SW Elligsen Rd Westbound				Parkway Center Dr Northbound				Parkway Center Dr Southbound				Total	Rolling Hour
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right		
4:00 PM	0	0	19	18	0	3	19	0	0	24	0	4	0	0	0	0	87	1,408
4:05 PM	0	1	33	13	0	5	26	0	0	23	0	10	0	0	1	2	114	1,455
4:10 PM	0	0	19	18	0	4	26	0	0	26	0	6	0	0	2	3	104	1,463
4:15 PM	0	0	34	23	0	9	37	0	0	18	0	5	0	0	0	3	129	1,476
4:20 PM	0	1	16	11	0	9	33	0	0	25	1	5	0	0	0	2	103	1,467
4:25 PM	0	2	34	31	0	4	28	0	0	28	0	6	0	0	1	1	135	1,472
4:30 PM	0	0	24	19	0	7	36	1	0	31	1	5	0	1	1	1	127	1,432
4:35 PM	0	0	19	14	0	4	39	1	0	45	0	5	0	0	0	1	128	1,388
4:40 PM	0	0	26	25	0	7	25	0	0	56	0	2	0	0	1	0	142	1,359
4:45 PM	0	1	32	15	0	2	31	0	0	21	1	5	0	0	0	1	109	1,316
4:50 PM	0	3	28	21	0	7	34	1	0	19	0	5	0	1	0	0	119	1,308
4:55 PM	0	0	26	16	0	6	35	0	0	24	0	3	0	0	0	1	111	1,253
5:00 PM	0	3	27	16	0	4	29	1	0	42	0	10	0	0	1	1	134	1,238
5:05 PM	0	3	34	17	0	3	40	1	0	23	0	1	0	0	0	0	122	
5:10 PM	0	2	31	19	0	5	37	0	0	20	0	1	0	0	1	1	117	
5:15 PM	0	3	30	18	0	7	27	0	0	22	1	9	0	0	1	2	120	
5:20 PM	0	1	28	10	0	3	34	1	0	25	0	4	0	0	0	2	108	
5:25 PM	0	6	24	19	0	5	26	0	0	12	1	2	0	0	0	0	95	
5:30 PM	0	0	11	18	0	5	26	0	0	19	1	3	0	0	0	0	83	
5:35 PM	0	4	31	11	0	1	23	0	0	18	0	6	0	0	0	5	99	
5:40 PM	0	1	21	22	0	5	28	0	0	17	0	3	0	0	0	2	99	
5:45 PM	0	1	23	19	0	4	23	0	0	27	0	3	0	0	1	0	101	
5:50 PM	0	1	15	14	0	4	13	0	0	13	0	3	0	0	0	1	64	
5:55 PM	0	3	26	15	0	3	28	0	0	15	0	6	0	0	0	0	96	
Count Total	0	36	611	422	0	116	703	6	0	593	6	112	0	2	10	29	2,646	
Peak Hour	0	15	331	227	0	67	404	5	0	352	3	53	0	2	5	12	1,476	

Location: 4 Parkway Center Dr & SW Elligsen Rd PM

Traffic Counts - Heavy Vehicles, Bicycles on Road, and Pedestrians/Bicycles on Crosswalk

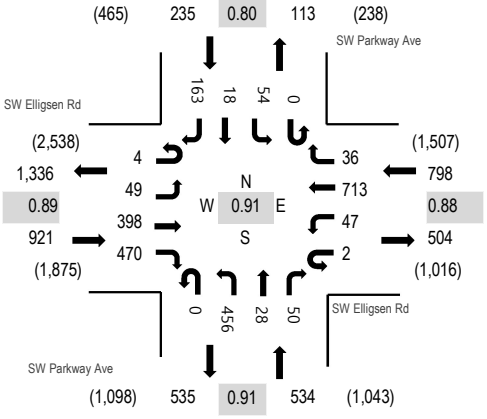
Interval Start Time	Heavy Vehicles					Interval Start Time	Bicycles on Roadway					Interval Start Time	Pedestrians/Bicycles on Crosswalk				
	EB	NB	WB	SB	Total		EB	NB	WB	SB	Total		EB	NB	WB	SB	Total
4:00 PM	0	0	0	0	0	4:00 PM	0	0	0	0	0	4:00 PM	0	0	0	0	0
4:05 PM	0	1	1	0	2	4:05 PM	1	0	0	0	1	4:05 PM	0	0	0	0	0
4:10 PM	0	0	1	0	1	4:10 PM	0	0	0	0	0	4:10 PM	0	1	1	0	2
4:15 PM	0	0	1	0	1	4:15 PM	0	0	0	0	0	4:15 PM	0	0	0	0	0
4:20 PM	0	0	0	0	0	4:20 PM	0	0	0	0	0	4:20 PM	0	0	0	0	0
4:25 PM	0	0	1	0	1	4:25 PM	0	0	0	0	0	4:25 PM	0	0	0	0	0
4:30 PM	1	0	0	0	1	4:30 PM	0	0	0	0	0	4:30 PM	0	0	0	0	0
4:35 PM	1	0	0	0	1	4:35 PM	0	0	0	0	0	4:35 PM	0	0	0	0	0
4:40 PM	1	0	0	0	1	4:40 PM	0	0	0	0	0	4:40 PM	0	0	0	0	0
4:45 PM	0	0	0	0	0	4:45 PM	0	0	0	0	0	4:45 PM	0	0	1	1	2
4:50 PM	0	1	0	0	1	4:50 PM	0	0	0	0	0	4:50 PM	0	0	0	0	0
4:55 PM	0	0	0	0	0	4:55 PM	0	0	0	0	0	4:55 PM	0	0	0	0	0
5:00 PM	1	0	0	0	1	5:00 PM	0	0	0	0	0	5:00 PM	0	0	0	0	0
5:05 PM	1	0	1	0	2	5:05 PM	0	0	0	0	0	5:05 PM	0	0	0	0	0
5:10 PM	0	0	0	0	0	5:10 PM	0	0	0	0	0	5:10 PM	0	0	0	0	0
5:15 PM	1	0	0	0	1	5:15 PM	0	0	0	0	0	5:15 PM	0	0	0	0	0
5:20 PM	3	0	2	0	5	5:20 PM	0	0	0	0	0	5:20 PM	0	0	1	0	1
5:25 PM	4	0	0	0	4	5:25 PM	0	0	0	0	0	5:25 PM	0	0	0	0	0
5:30 PM	1	0	0	0	1	5:30 PM	0	0	0	0	0	5:30 PM	0	0	0	0	0
5:35 PM	1	0	0	0	1	5:35 PM	0	0	0	0	0	5:35 PM	0	0	0	0	0
5:40 PM	0	0	0	0	0	5:40 PM	0	0	0	0	0	5:40 PM	0	0	0	0	0
5:45 PM	1	0	0	0	1	5:45 PM	0	0	0	0	0	5:45 PM	0	0	0	0	0
5:50 PM	1	0	0	0	1	5:50 PM	0	0	0	0	0	5:50 PM	0	0	0	0	0
5:55 PM	2	0	0	0	2	5:55 PM	0	0	0	0	0	5:55 PM	0	0	0	0	0
Count Total	19	2	7	0	28	Count Total	1	0	0	0	1	Count Total	0	1	3	1	5
Peak Hour	5	1	3	0	9	Peak Hour	0	0	0	0	0	Peak Hour	0	0	1	1	2

ALL TRAFFIC DATA SERVICES
(303) 216-2439
www.alltrafficdata.net

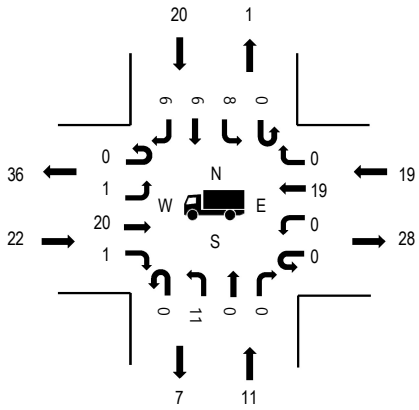
Location: 1 SW Parkway Ave & SW Elligsen Rd PM
Date: Tuesday, June 7, 2022
Peak Hour: 04:00 PM - 05:00 PM
Peak 15-Minutes: 04:00 PM - 04:15 PM

Peak Hour

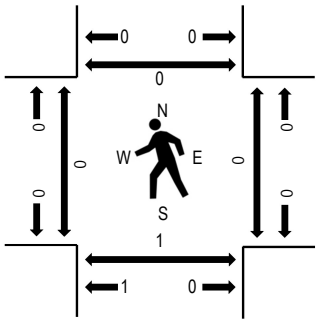
Motorized Vehicles



Heavy Vehicles



Pedestrians



Note: Total study counts contained in parentheses.

	HV%	PHF
EB	2.4%	0.89
WB	2.4%	0.88
NB	2.1%	0.91
SB	8.5%	0.80
All	2.9%	0.91

Traffic Counts - Motorized Vehicles

Interval Start Time	SW Elligsen Rd Eastbound				SW Elligsen Rd Westbound				SW Parkway Ave Northbound				SW Parkway Ave Southbound					Rolling Hour
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	Total	
4:00 PM	0	10	44	50	0	6	52	4	0	44	4	5	0	6	0	12	237	2,488
4:05 PM	0	7	36	56	0	5	56	4	0	42	2	3	0	6	2	17	236	2,463
4:10 PM	1	5	33	42	1	4	61	3	0	40	1	5	0	3	0	15	214	2,464
4:15 PM	0	3	31	30	0	6	63	5	0	38	3	7	0	5	3	18	212	2,479
4:20 PM	1	2	18	34	0	5	63	4	0	41	4	5	0	7	0	18	202	2,487
4:25 PM	0	3	23	30	0	4	64	3	0	42	1	3	0	7	3	17	200	2,463
4:30 PM	0	4	29	32	0	4	68	2	0	38	2	4	0	3	1	12	199	2,472
4:35 PM	1	5	32	32	0	5	69	3	0	34	4	7	0	3	1	9	205	2,471
4:40 PM	0	4	28	41	0	2	54	2	0	30	2	4	0	4	1	10	182	2,454
4:45 PM	1	3	32	44	1	1	51	1	0	37	2	2	0	3	2	12	192	2,467
4:50 PM	0	2	43	42	0	2	54	2	0	36	1	3	0	4	2	10	201	2,475
4:55 PM	0	1	49	37	0	3	58	3	0	34	2	2	0	3	3	13	208	2,439
5:00 PM	0	1	24	28	0	6	71	6	0	41	4	5	0	2	2	22	212	2,402
5:05 PM	0	7	34	46	0	7	68	5	0	39	2	2	0	3	4	20	237	
5:10 PM	0	8	39	46	0	6	65	6	0	33	1	2	0	3	2	18	229	
5:15 PM	0	7	38	52	0	8	51	4	0	29	3	5	0	4	4	15	220	
5:20 PM	0	5	23	33	0	5	51	3	0	31	3	3	0	3	7	11	178	
5:25 PM	0	5	45	44	0	4	53	4	0	29	2	5	0	2	4	12	209	
5:30 PM	0	3	43	32	0	6	51	3	0	40	1	2	0	4	3	10	198	
5:35 PM	0	3	28	37	0	6	43	2	0	46	3	3	0	4	4	9	188	
5:40 PM	0	6	43	34	0	3	45	1	0	42	2	7	0	2	3	7	195	
5:45 PM	0	6	44	46	0	4	40	2	0	36	2	6	0	2	2	10	200	
5:50 PM	0	3	33	31	0	2	39	1	0	31	2	7	0	2	1	13	165	
5:55 PM	0	7	33	37	0	2	35	1	0	35	1	4	0	3	2	11	171	
Count Total	4	110	825	936	2	106	1,325	74	0	888	54	101	0	88	56	321	4,890	
Peak Hour	4	49	398	470	2	47	713	36	0	456	28	50	0	54	18	163	2,488	

Location: 1 SW Parkway Ave & SW Elligsen Rd PM

Traffic Counts - Heavy Vehicles, Bicycles on Road, and Pedestrians/Bicycles on Crosswalk

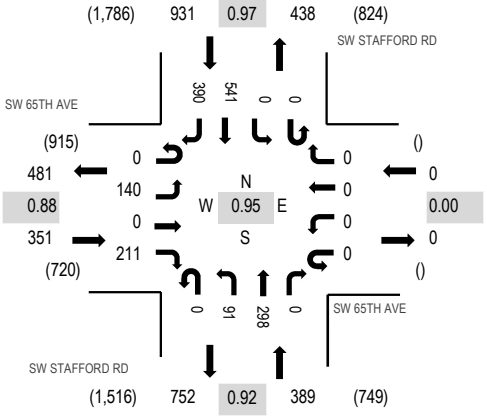
Interval Start Time	Heavy Vehicles					Interval Start Time	Bicycles on Roadway					Interval Start Time	Pedestrians/Bicycles on Crosswalk				
	EB	NB	WB	SB	Total		EB	NB	WB	SB	Total		EB	NB	WB	SB	Total
4:00 PM	4	2	1	0	7	4:00 PM	0	0	0	0	0	4:00 PM	0	0	0	0	0
4:05 PM	1	1	1	3	6	4:05 PM	0	0	0	0	0	4:05 PM	0	0	0	0	0
4:10 PM	2	1	2	0	5	4:10 PM	0	0	0	0	0	4:10 PM	0	0	0	0	0
4:15 PM	2	1	2	3	8	4:15 PM	0	0	0	0	0	4:15 PM	0	0	0	0	0
4:20 PM	4	1	1	2	8	4:20 PM	0	0	0	0	0	4:20 PM	0	0	0	0	0
4:25 PM	1	1	1	3	6	4:25 PM	0	0	0	0	0	4:25 PM	0	0	0	0	0
4:30 PM	1	0	3	2	6	4:30 PM	0	0	0	0	0	4:30 PM	0	0	0	0	0
4:35 PM	2	1	1	1	5	4:35 PM	0	0	0	0	0	4:35 PM	0	0	0	0	0
4:40 PM	0	0	3	2	5	4:40 PM	0	0	0	0	0	4:40 PM	0	0	0	0	0
4:45 PM	2	1	1	1	5	4:45 PM	0	0	0	0	0	4:45 PM	0	0	0	0	0
4:50 PM	2	1	2	1	6	4:50 PM	0	0	0	0	0	4:50 PM	0	0	0	0	0
4:55 PM	1	1	1	2	5	4:55 PM	0	0	0	0	0	4:55 PM	0	1	0	0	1
5:00 PM	0	2	3	0	5	5:00 PM	0	0	0	0	0	5:00 PM	0	0	0	1	1
5:05 PM	0	1	2	1	4	5:05 PM	0	0	0	0	0	5:05 PM	0	0	0	0	0
5:10 PM	0	1	3	1	5	5:10 PM	0	0	0	0	0	5:10 PM	0	0	0	0	0
5:15 PM	0	1	1	1	3	5:15 PM	0	0	0	0	0	5:15 PM	0	0	0	0	0
5:20 PM	0	1	2	1	4	5:20 PM	0	0	0	0	0	5:20 PM	0	0	0	0	0
5:25 PM	0	2	1	0	3	5:25 PM	0	0	0	0	0	5:25 PM	0	0	0	0	0
5:30 PM	0	0	3	1	4	5:30 PM	0	0	0	0	0	5:30 PM	0	0	0	0	0
5:35 PM	0	2	1	1	4	5:35 PM	0	0	0	0	0	5:35 PM	0	0	1	0	1
5:40 PM	0	2	4	1	7	5:40 PM	0	0	0	0	0	5:40 PM	0	0	0	0	0
5:45 PM	0	2	1	1	4	5:45 PM	0	0	0	0	0	5:45 PM	0	0	0	0	0
5:50 PM	0	1	2	1	4	5:50 PM	0	1	0	0	1	5:50 PM	0	0	0	0	0
5:55 PM	0	1	1	1	3	5:55 PM	0	0	0	0	0	5:55 PM	0	0	0	0	0
Count Total	22	27	43	30	122	Count Total	0	1	0	0	1	Count Total	0	1	1	1	3
Peak Hour	22	11	19	20	72	Peak Hour	0	0	0	0	0	Peak Hour	0	1	0	0	1

ALL TRAFFIC DATA SERVICES
(303) 216-2439
www.alltrafficdata.net

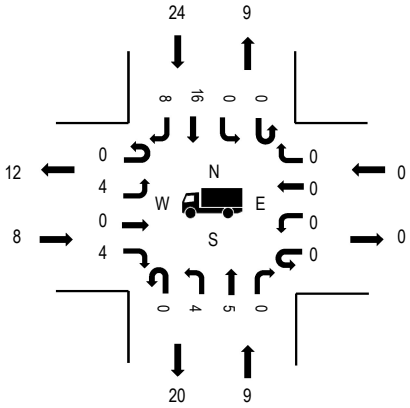
Location: 2 SW STAFFORD RD & SW 65TH AVE PM
Date: Wednesday, May 18, 2022
Peak Hour: 04:00 PM - 05:00 PM
Peak 15-Minutes: 04:10 PM - 04:25 PM

Peak Hour

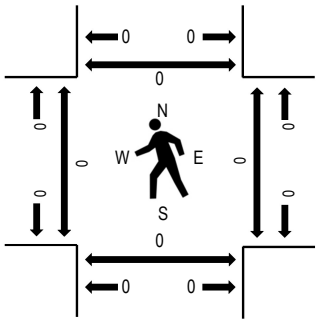
Motorized Vehicles



Heavy Vehicles



Pedestrians



Note: Total study counts contained in parentheses.

	HV%	PHF
EB	2.3%	0.88
WB	0.0%	0.00
NB	2.3%	0.92
SB	2.6%	0.97
All	2.5%	0.95

Traffic Counts - Motorized Vehicles

Interval Start Time	SW 65TH AVE Eastbound				SW 65TH AVE Westbound				SW STAFFORD RD Northbound				SW STAFFORD RD Southbound					Rolling Hour
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	Total	
4:00 PM	0	9	0	9	0	0	0	0	0	13	19	0	0	0	52	37	139	1,671
4:05 PM	0	11	0	21	0	0	0	0	0	9	24	0	0	0	34	36	135	1,659
4:10 PM	0	12	0	16	0	0	0	0	0	8	30	0	0	0	48	38	152	1,666
4:15 PM	0	18	0	13	0	0	0	0	0	1	31	0	0	0	43	42	148	1,657
4:20 PM	0	17	0	13	0	0	0	0	0	12	24	0	0	0	45	31	142	1,652
4:25 PM	0	12	0	27	0	0	0	0	0	5	22	0	0	0	36	28	130	1,651
4:30 PM	0	7	0	17	0	0	0	0	0	8	22	0	0	0	49	35	138	1,652
4:35 PM	0	10	0	30	0	0	0	0	0	7	24	0	0	0	43	21	135	1,644
4:40 PM	0	11	0	13	0	0	0	0	0	4	26	0	0	0	47	34	135	1,670
4:45 PM	0	9	0	16	0	0	0	0	0	8	28	0	0	0	50	31	142	1,656
4:50 PM	0	9	0	23	0	0	0	0	0	9	26	0	0	0	48	25	140	1,622
4:55 PM	0	15	0	13	0	0	0	0	0	7	22	0	0	0	46	32	135	1,604
5:00 PM	0	11	0	18	0	0	0	0	0	8	16	0	0	0	47	27	127	1,584
5:05 PM	0	7	0	21	0	0	0	0	0	7	26	0	0	0	52	29	142	
5:10 PM	0	13	0	16	0	0	0	0	0	12	21	0	0	0	49	32	143	
5:15 PM	0	12	0	22	0	0	0	0	0	5	25	0	0	0	41	38	143	
5:20 PM	0	17	0	13	0	0	0	0	0	15	23	0	0	0	48	25	141	
5:25 PM	0	9	0	14	0	0	0	0	0	8	20	0	0	0	55	25	131	
5:30 PM	0	12	0	26	0	0	0	0	0	7	28	0	0	0	30	27	130	
5:35 PM	0	11	0	25	0	0	0	0	0	10	17	0	0	0	48	50	161	
5:40 PM	0	9	0	25	0	0	0	0	0	8	18	0	0	0	37	24	121	
5:45 PM	0	12	0	26	0	0	0	0	0	14	10	0	0	0	33	13	108	
5:50 PM	0	11	0	15	0	0	0	0	0	7	24	0	0	0	43	22	122	
5:55 PM	0	7	0	17	0	0	0	0	0	4	27	0	0	0	43	17	115	
Count Total	0	271	0	449	0	0	0	0	0	196	553	0	0	0	1,067	719	3,255	
Peak Hour	0	140	0	211	0	0	0	0	0	91	298	0	0	0	541	390	1,671	

Traffic Counts - Heavy Vehicles, Bicycles on Road, and Pedestrians/Bicycles on Crosswalk

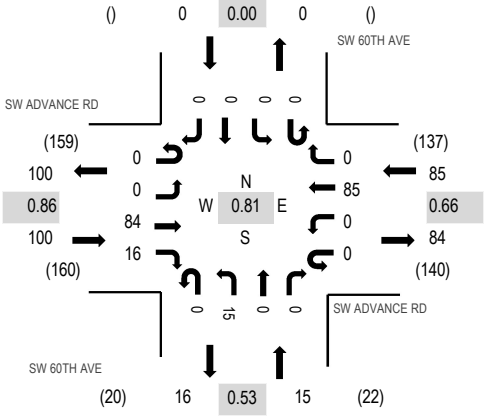
Interval Start Time	Heavy Vehicles					Interval Start Time	Bicycles on Roadway					Interval Start Time	Pedestrians/Bicycles on Crosswalk				
	EB	NB	WB	SB	Total		EB	NB	WB	SB	Total		EB	NB	WB	SB	Total
4:00 PM	1	2	0	2	5	4:00 PM	0	0	0	0	0	4:00 PM	0	0	0	0	0
4:05 PM	0	2	0	2	4	4:05 PM	0	0	0	0	0	4:05 PM	0	0	0	0	0
4:10 PM	0	1	0	2	3	4:10 PM	0	0	0	0	0	4:10 PM	0	0	0	0	0
4:15 PM	0	0	0	4	4	4:15 PM	0	0	0	0	0	4:15 PM	0	0	0	0	0
4:20 PM	0	0	0	0	0	4:20 PM	0	0	0	0	0	4:20 PM	0	0	0	0	0
4:25 PM	1	0	0	1	2	4:25 PM	0	0	0	0	0	4:25 PM	0	0	0	0	0
4:30 PM	0	0	0	3	3	4:30 PM	0	0	0	0	0	4:30 PM	0	0	0	0	0
4:35 PM	2	0	0	2	4	4:35 PM	0	0	0	0	0	4:35 PM	0	0	0	0	0
4:40 PM	0	1	0	2	3	4:40 PM	0	0	0	0	0	4:40 PM	0	0	0	0	0
4:45 PM	0	1	0	1	2	4:45 PM	0	0	0	0	0	4:45 PM	0	0	0	0	0
4:50 PM	4	0	0	0	4	4:50 PM	0	0	0	0	0	4:50 PM	0	0	0	0	0
4:55 PM	0	2	0	5	7	4:55 PM	0	0	0	0	0	4:55 PM	0	0	0	0	0
5:00 PM	0	0	0	2	2	5:00 PM	0	0	0	0	0	5:00 PM	0	0	0	0	0
5:05 PM	0	0	0	2	2	5:05 PM	0	0	0	0	0	5:05 PM	0	0	0	0	0
5:10 PM	0	1	0	2	3	5:10 PM	0	0	0	0	0	5:10 PM	0	0	0	0	0
5:15 PM	1	0	0	3	4	5:15 PM	0	0	0	0	0	5:15 PM	0	0	0	0	0
5:20 PM	0	0	0	0	0	5:20 PM	0	0	0	0	0	5:20 PM	0	0	0	0	0
5:25 PM	0	0	0	2	2	5:25 PM	0	0	0	0	0	5:25 PM	0	0	0	0	0
5:30 PM	0	0	0	0	0	5:30 PM	0	0	0	0	0	5:30 PM	0	0	0	0	0
5:35 PM	0	0	0	0	0	5:35 PM	0	0	0	0	0	5:35 PM	0	0	0	0	0
5:40 PM	0	1	0	0	1	5:40 PM	0	0	0	0	0	5:40 PM	0	0	0	0	0
5:45 PM	0	0	0	0	0	5:45 PM	0	0	0	0	0	5:45 PM	0	0	0	0	0
5:50 PM	0	0	0	0	0	5:50 PM	0	0	0	0	0	5:50 PM	0	0	0	0	0
5:55 PM	0	0	0	0	0	5:55 PM	0	0	0	0	0	5:55 PM	0	0	0	0	0
Count Total	9	11	0	35	55	Count Total	0	0	0	0	0	Count Total	0	0	0	0	0
Peak Hour	8	9	0	24	41	Peak Hour	0	0	0	0	0	Peak Hour	0	0	0	0	0

ALL TRAFFIC DATA SERVICES
(303) 216-2439
www.alltrafficdata.net

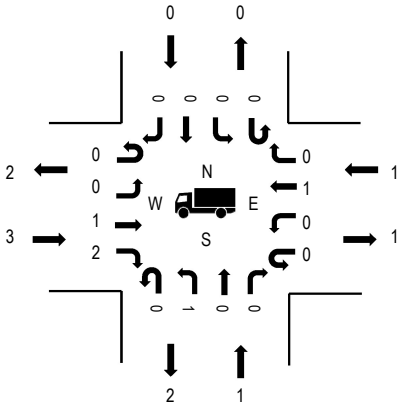
Location: 3 SW 60TH AVE & SW ADVANCE RD PM
Date: Wednesday, May 18, 2022
Peak Hour: 04:20 PM - 05:20 PM
Peak 15-Minutes: 04:40 PM - 04:55 PM

Peak Hour

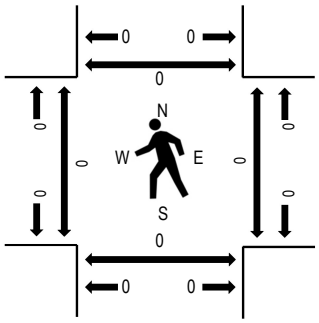
Motorized Vehicles



Heavy Vehicles



Pedestrians



Note: Total study counts contained in parentheses.

	HV%	PHF
EB	3.0%	0.86
WB	1.2%	0.66
NB	6.7%	0.53
SB	0.0%	0.00
All	2.5%	0.81

Traffic Counts - Motorized Vehicles

Interval Start Time	SW ADVANCE RD Eastbound				SW ADVANCE RD Westbound				SW 60TH AVE Northbound				SW 60TH AVE Southbound					Rolling Hour
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	Total	
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	158
4:05 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	179
4:10 PM	0	0	9	0	0	0	6	0	0	1	0	0	0	0	0	0	16	189
4:15 PM	0	0	4	2	0	0	3	0	0	0	0	0	0	0	0	0	9	193
4:20 PM	0	0	12	0	0	0	5	0	0	0	0	0	0	0	0	0	17	200
4:25 PM	0	0	6	2	0	0	3	0	0	3	0	0	0	0	0	0	14	196
4:30 PM	0	0	6	2	0	0	5	0	0	1	0	0	0	0	0	0	14	194
4:35 PM	0	0	5	1	0	0	6	0	0	1	0	0	0	0	0	0	13	193
4:40 PM	0	0	9	1	0	0	9	0	0	4	0	0	0	0	0	0	23	192
4:45 PM	0	0	2	1	0	0	14	0	0	3	0	0	0	0	0	0	20	180
4:50 PM	0	0	6	2	0	0	10	0	0	1	0	0	0	0	0	0	19	164
4:55 PM	0	0	6	1	0	0	6	0	0	0	0	0	0	0	0	0	13	161
5:00 PM	0	0	11	2	0	0	8	0	0	0	0	0	0	0	0	0	21	161
5:05 PM	0	0	5	1	0	0	4	0	0	0	0	0	0	0	0	0	10	
5:10 PM	0	0	10	0	0	0	9	0	0	1	0	0	0	0	0	0	20	
5:15 PM	0	0	6	3	0	0	6	0	0	1	0	0	0	0	0	0	16	
5:20 PM	0	0	6	1	0	0	4	0	0	2	0	0	0	0	0	0	13	
5:25 PM	0	0	3	0	0	0	6	0	0	3	0	0	0	0	0	0	12	
5:30 PM	0	0	8	0	0	0	4	0	0	1	0	0	0	0	0	0	13	
5:35 PM	0	0	5	0	0	0	7	0	0	0	0	0	0	0	0	0	12	
5:40 PM	0	0	5	0	0	0	6	0	0	0	0	0	0	0	0	0	11	
5:45 PM	0	0	0	0	0	0	4	0	0	0	0	0	0	0	0	0	4	
5:50 PM	0	0	10	0	0	0	6	0	0	0	0	0	0	0	0	0	16	
5:55 PM	0	0	6	1	0	0	6	0	0	0	0	0	0	0	0	0	13	
Count Total	0	0	140	20	0	0	137	0	0	22	0	0	0	0	0	0	319	
Peak Hour	0	0	84	16	0	0	85	0	0	15	0	0	0	0	0	0	200	

Traffic Counts - Heavy Vehicles, Bicycles on Road, and Pedestrians/Bicycles on Crosswalk

Interval Start Time	Heavy Vehicles					Interval Start Time	Bicycles on Roadway					Interval Start Time	Pedestrians/Bicycles on Crosswalk				
	EB	NB	WB	SB	Total		EB	NB	WB	SB	Total		EB	NB	WB	SB	Total
4:00 PM	0	0	0	0	0	4:00 PM	0	0	0	0	0	4:00 PM	0	0	0	0	0
4:05 PM	0	0	0	0	0	4:05 PM	0	0	0	0	0	4:05 PM	0	0	0	0	0
4:10 PM	0	0	0	0	0	4:10 PM	0	0	0	0	0	4:10 PM	0	0	0	0	0
4:15 PM	1	0	0	0	1	4:15 PM	1	0	0	0	1	4:15 PM	0	0	0	0	0
4:20 PM	0	0	0	0	0	4:20 PM	0	0	0	0	0	4:20 PM	0	0	0	0	0
4:25 PM	0	1	0	0	1	4:25 PM	0	0	0	0	0	4:25 PM	0	0	0	0	0
4:30 PM	1	0	0	0	1	4:30 PM	0	0	0	0	0	4:30 PM	0	0	0	0	0
4:35 PM	0	0	1	0	1	4:35 PM	0	0	0	0	0	4:35 PM	0	0	0	0	0
4:40 PM	0	0	0	0	0	4:40 PM	0	0	0	0	0	4:40 PM	0	0	0	0	0
4:45 PM	0	0	0	0	0	4:45 PM	0	0	0	0	0	4:45 PM	0	0	0	0	0
4:50 PM	0	0	0	0	0	4:50 PM	0	0	0	0	0	4:50 PM	0	0	0	0	0
4:55 PM	0	0	0	0	0	4:55 PM	0	0	0	0	0	4:55 PM	0	0	0	0	0
5:00 PM	1	0	0	0	1	5:00 PM	0	0	0	0	0	5:00 PM	0	0	0	0	0
5:05 PM	0	0	0	0	0	5:05 PM	0	0	0	0	0	5:05 PM	0	0	0	0	0
5:10 PM	0	0	0	0	0	5:10 PM	0	0	0	0	0	5:10 PM	0	0	0	0	0
5:15 PM	1	0	0	0	1	5:15 PM	0	0	0	0	0	5:15 PM	0	0	0	0	0
5:20 PM	0	0	0	0	0	5:20 PM	0	0	0	0	0	5:20 PM	0	0	0	0	0
5:25 PM	0	0	0	0	0	5:25 PM	1	0	0	0	1	5:25 PM	0	0	0	0	0
5:30 PM	0	0	0	0	0	5:30 PM	0	0	0	0	0	5:30 PM	0	0	0	0	0
5:35 PM	0	0	1	0	1	5:35 PM	0	1	0	0	1	5:35 PM	0	0	0	0	0
5:40 PM	0	0	0	0	0	5:40 PM	0	0	0	0	0	5:40 PM	0	0	0	0	0
5:45 PM	0	0	0	0	0	5:45 PM	0	0	0	0	0	5:45 PM	0	0	0	0	0
5:50 PM	0	0	0	0	0	5:50 PM	0	0	0	0	0	5:50 PM	0	0	0	0	0
5:55 PM	1	0	0	0	1	5:55 PM	0	0	0	0	0	5:55 PM	0	0	0	0	0
Count Total	5	1	2	0	8	Count Total	2	1	0	0	3	Count Total	0	0	0	0	0
Peak Hour	3	1	1	0	5	Peak Hour	0	0	0	0	0	Peak Hour	0	0	0	0	0

ALL TRAFFIC DATA SERVICES
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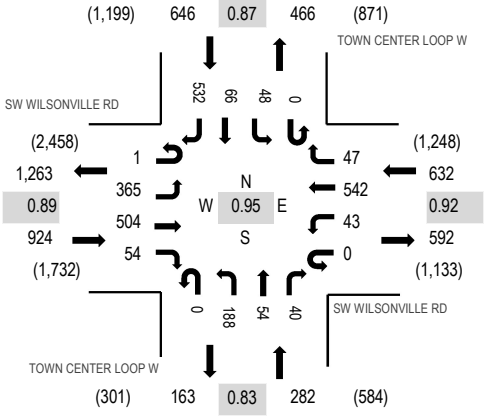
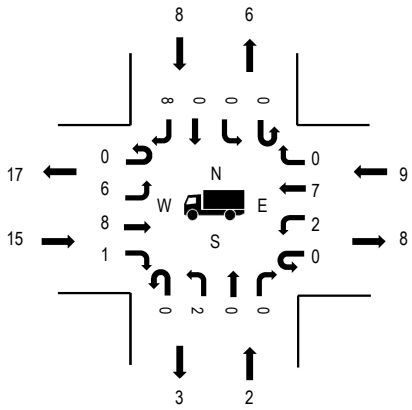
Location: 4 TOWN CENTER LOOP W & SW WILSONVILLE RD PM
Date: Wednesday, May 18, 2022
Peak Hour: 04:05 PM - 05:05 PM
Peak 15-Minutes: 04:35 PM - 04:50 PM

Peak Hour

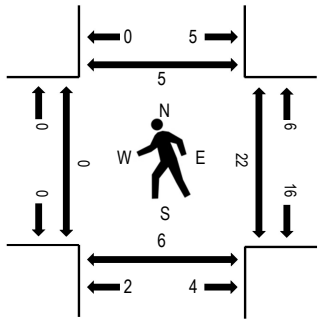
Motorized Vehicles



Heavy Vehicles



Pedestrians



Note: Total study counts contained in parentheses.

	HV%	PHF
EB	1.6%	0.89
WB	1.4%	0.92
NB	0.7%	0.83
SB	1.2%	0.87
All	1.4%	0.95

Traffic Counts - Motorized Vehicles

Interval Start Time	SW WILSONVILLE RD Eastbound				SW WILSONVILLE RD Westbound				TOWN CENTER LOOP W Northbound				TOWN CENTER LOOP W Southbound					Rolling Hour
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	Total	
4:00 PM	0	27	36	3	0	0	50	0	0	15	6	1	0	1	0	27	166	2,446
4:05 PM	0	31	47	5	0	6	44	3	0	10	6	4	0	5	4	60	225	2,484
4:10 PM	0	40	40	2	0	2	24	6	0	13	7	2	0	2	7	36	181	2,468
4:15 PM	0	30	33	2	0	6	44	2	0	20	6	3	0	6	4	50	206	2,463
4:20 PM	0	32	31	2	0	4	52	3	0	16	4	5	0	2	4	39	194	2,450
4:25 PM	0	26	42	3	0	2	42	6	0	12	4	1	0	5	8	54	205	2,458
4:30 PM	0	28	40	6	0	0	38	4	0	22	4	3	0	3	6	58	212	2,454
4:35 PM	0	29	36	7	0	1	58	5	0	16	4	4	0	4	3	45	212	2,445
4:40 PM	0	45	49	2	0	4	40	3	0	17	5	2	0	2	6	35	210	2,417
4:45 PM	0	33	47	5	0	5	59	4	0	15	2	4	0	7	6	42	229	2,396
4:50 PM	0	26	46	7	0	4	38	3	0	19	4	6	0	5	8	36	202	2,386
4:55 PM	0	26	51	9	0	6	42	4	0	13	3	2	0	5	6	37	204	2,352
5:00 PM	1	19	42	4	0	3	61	4	0	15	5	4	0	2	4	40	204	2,317
5:05 PM	0	19	47	3	0	3	37	2	0	24	8	1	0	4	4	57	209	
5:10 PM	0	13	24	3	0	2	50	9	0	23	5	3	0	5	6	33	176	
5:15 PM	0	23	37	3	0	1	54	1	0	20	9	3	0	1	3	38	193	
5:20 PM	0	23	47	8	1	2	51	3	0	20	3	1	0	4	7	32	202	
5:25 PM	0	31	44	3	0	1	36	1	0	19	8	2	0	3	12	41	201	
5:30 PM	0	21	41	3	0	1	52	6	0	17	7	6	0	3	3	43	203	
5:35 PM	0	26	43	2	0	2	48	6	0	7	4	5	1	1	9	30	184	
5:40 PM	0	26	32	10	0	2	38	7	0	20	4	2	0	3	4	41	189	
5:45 PM	0	34	51	2	0	1	44	5	0	19	7	1	0	5	11	39	219	
5:50 PM	0	18	27	1	0	4	50	4	0	15	4	3	0	3	6	33	168	
5:55 PM	0	28	44	5	0	3	35	4	0	7	2	1	0	5	5	30	169	
Count Total	1	654	977	100	1	65	1,087	95	0	394	121	69	1	86	136	976	4,763	
Peak Hour	1	365	504	54	0	43	542	47	0	188	54	40	0	48	66	532	2,484	

Traffic Counts - Heavy Vehicles, Bicycles on Road, and Pedestrians/Bicycles on Crosswalk

Interval Start Time	Heavy Vehicles					Interval Start Time	Bicycles on Roadway					Interval Start Time	Pedestrians/Bicycles on Crosswalk				
	EB	NB	WB	SB	Total		EB	NB	WB	SB	Total		EB	NB	WB	SB	Total
4:00 PM	2	0	0	0	2	4:00 PM	0	0	0	0	0	4:00 PM	0	0	1	0	1
4:05 PM	3	0	0	0	3	4:05 PM	0	0	0	0	0	4:05 PM	0	2	1	1	4
4:10 PM	2	0	0	2	4	4:10 PM	0	0	0	0	0	4:10 PM	0	1	5	0	6
4:15 PM	2	0	0	0	2	4:15 PM	0	0	0	0	0	4:15 PM	0	1	4	0	5
4:20 PM	0	0	2	1	3	4:20 PM	0	0	0	0	0	4:20 PM	0	0	2	2	4
4:25 PM	0	1	0	1	2	4:25 PM	0	0	0	0	0	4:25 PM	0	0	0	0	0
4:30 PM	0	0	0	1	1	4:30 PM	0	0	0	0	0	4:30 PM	0	0	0	0	0
4:35 PM	1	0	0	0	1	4:35 PM	0	0	0	0	0	4:35 PM	0	0	2	0	2
4:40 PM	5	0	2	1	8	4:40 PM	0	0	0	0	0	4:40 PM	0	1	2	1	4
4:45 PM	0	0	2	1	3	4:45 PM	0	0	0	0	0	4:45 PM	0	0	2	0	2
4:50 PM	1	0	0	0	1	4:50 PM	0	0	0	0	0	4:50 PM	0	0	0	0	0
4:55 PM	1	1	2	0	4	4:55 PM	0	0	0	0	0	4:55 PM	0	0	3	2	5
5:00 PM	0	0	1	1	2	5:00 PM	0	0	0	0	0	5:00 PM	0	1	2	0	3
5:05 PM	2	1	2	1	6	5:05 PM	0	0	0	0	0	5:05 PM	0	1	0	0	1
5:10 PM	3	1	2	0	6	5:10 PM	0	0	0	0	0	5:10 PM	0	0	1	0	1
5:15 PM	1	0	1	2	4	5:15 PM	1	0	0	0	1	5:15 PM	0	0	2	0	2
5:20 PM	1	0	2	0	3	5:20 PM	0	0	0	0	0	5:20 PM	0	0	3	0	3
5:25 PM	1	0	1	1	3	5:25 PM	0	0	0	1	1	5:25 PM	0	2	4	0	6
5:30 PM	0	1	0	0	1	5:30 PM	0	0	0	0	0	5:30 PM	0	1	4	1	6
5:35 PM	1	0	0	0	1	5:35 PM	1	0	0	0	1	5:35 PM	0	3	0	1	4
5:40 PM	1	0	0	1	2	5:40 PM	0	0	0	0	0	5:40 PM	0	2	3	1	6
5:45 PM	0	0	0	0	0	5:45 PM	0	0	0	0	0	5:45 PM	0	0	0	0	0
5:50 PM	0	0	0	0	0	5:50 PM	0	0	0	0	0	5:50 PM	0	0	2	1	3
5:55 PM	0	0	1	1	2	5:55 PM	0	0	0	0	0	5:55 PM	0	0	9	3	12
Count Total	27	5	18	14	64	Count Total	2	0	0	1	3	Count Total	0	15	52	13	80
Peak Hour	15	2	9	8	34	Peak Hour	0	0	0	0	0	Peak Hour	0	6	23	6	35

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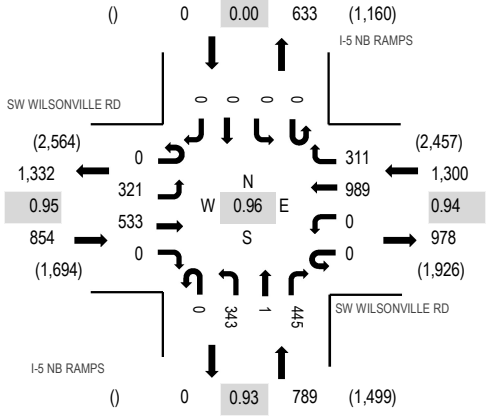
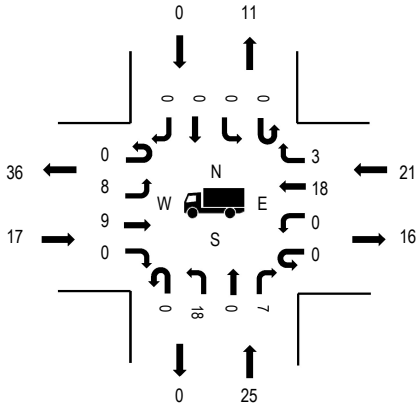
Location: 5 I-5 NB RAMPS & SW WILSONVILLE RD PM
Date: Wednesday, May 18, 2022
Peak Hour: 04:15 PM - 05:15 PM
Peak 15-Minutes: 04:35 PM - 04:50 PM

Peak Hour

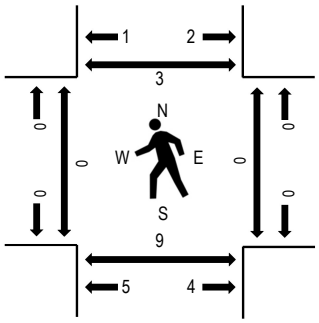
Motorized Vehicles



Heavy Vehicles



Pedestrians



Note: Total study counts contained in parentheses.

	HV%	PHF
EB	2.0%	0.95
WB	1.6%	0.94
NB	3.2%	0.93
SB	0.0%	0.00
All	2.1%	0.96

Traffic Counts - Motorized Vehicles

Interval Start Time	SW WILSONVILLE RD Eastbound				SW WILSONVILLE RD Westbound				I-5 NB RAMPS Northbound				I-5 NB RAMPS Southbound					Rolling Hour
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	Total	
4:00 PM	0	21	40	0	0	0	72	20	0	29	0	23	0	0	0	0	205	2,877
4:05 PM	0	29	57	0	0	0	82	32	0	13	0	38	0	0	0	0	251	2,913
4:10 PM	0	19	49	0	0	0	60	12	0	36	0	31	0	0	0	0	207	2,910
4:15 PM	0	32	44	0	0	0	64	51	0	34	0	43	0	0	0	0	268	2,943
4:20 PM	0	36	28	0	0	0	79	27	0	27	0	38	0	0	0	0	235	2,906
4:25 PM	0	28	42	0	0	0	90	19	0	19	0	35	0	0	0	0	233	2,915
4:30 PM	0	18	48	0	0	0	92	26	0	25	0	35	0	0	0	0	244	2,907
4:35 PM	0	29	40	0	0	0	70	49	0	29	0	47	0	0	0	0	264	2,904
4:40 PM	0	31	53	0	0	0	83	7	0	21	0	41	0	0	0	0	236	2,855
4:45 PM	0	22	51	0	0	0	99	19	0	40	0	34	0	0	0	0	265	2,839
4:50 PM	0	21	51	0	0	0	75	18	0	31	0	39	0	0	0	0	235	2,821
4:55 PM	0	23	53	0	0	0	69	23	0	28	0	38	0	0	0	0	234	2,781
5:00 PM	0	24	45	0	0	0	86	30	0	22	0	34	0	0	0	0	241	2,773
5:05 PM	0	24	48	0	0	0	111	7	0	26	1	31	0	0	0	0	248	
5:10 PM	0	33	30	0	0	0	71	35	0	41	0	30	0	0	0	0	240	
5:15 PM	0	20	31	0	0	0	78	34	0	33	0	35	0	0	0	0	231	
5:20 PM	0	17	58	0	0	0	82	21	0	32	0	34	0	0	0	0	244	
5:25 PM	0	16	50	0	0	0	83	13	0	24	1	38	0	0	0	0	225	
5:30 PM	0	27	44	0	0	0	67	45	0	26	0	32	0	0	0	0	241	
5:35 PM	0	29	51	0	0	0	62	23	0	25	1	24	0	0	0	0	215	
5:40 PM	0	16	41	0	0	0	88	10	0	35	0	30	0	0	0	0	220	
5:45 PM	0	25	53	0	0	0	89	14	0	27	0	39	0	0	0	0	247	
5:50 PM	0	24	35	0	0	0	57	21	0	33	0	25	0	0	0	0	195	
5:55 PM	0	25	63	0	0	0	81	11	0	18	1	27	0	0	0	0	226	
Count Total	0	589	1,105	0	0	0	1,890	567	0	674	4	821	0	0	0	0	5,650	
Peak Hour	0	321	533	0	0	0	989	311	0	343	1	445	0	0	0	0	2,943	

Traffic Counts - Heavy Vehicles, Bicycles on Road, and Pedestrians/Bicycles on Crosswalk

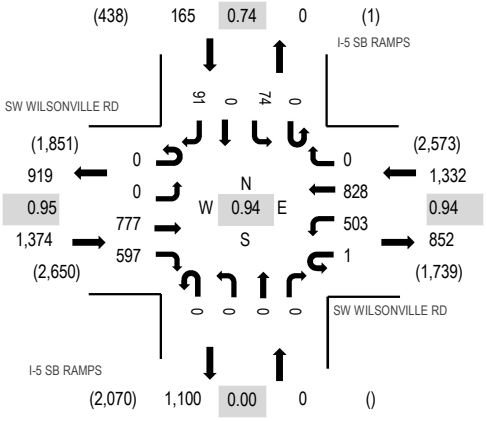
Interval Start Time	Heavy Vehicles					Interval Start Time	Bicycles on Roadway					Interval Start Time	Pedestrians/Bicycles on Crosswalk				
	EB	NB	WB	SB	Total		EB	NB	WB	SB	Total		EB	NB	WB	SB	Total
4:00 PM	3	2	0	0	5	4:00 PM	0	0	0	0	0	4:00 PM	0	0	0	1	1
4:05 PM	3	1	0	0	4	4:05 PM	0	0	0	0	0	4:05 PM	0	1	0	1	2
4:10 PM	3	2	1	0	6	4:10 PM	0	0	0	0	0	4:10 PM	0	0	0	2	2
4:15 PM	2	4	1	0	7	4:15 PM	0	0	0	0	0	4:15 PM	0	0	0	0	0
4:20 PM	3	1	2	0	6	4:20 PM	0	0	0	0	0	4:20 PM	0	1	0	0	1
4:25 PM	1	1	3	0	5	4:25 PM	0	0	0	0	0	4:25 PM	0	0	0	0	0
4:30 PM	0	0	1	0	1	4:30 PM	0	0	0	0	0	4:30 PM	0	0	0	0	0
4:35 PM	0	1	0	0	1	4:35 PM	0	0	0	0	0	4:35 PM	0	0	0	0	0
4:40 PM	5	3	0	0	8	4:40 PM	0	0	0	0	0	4:40 PM	0	3	0	1	4
4:45 PM	1	4	5	0	10	4:45 PM	0	0	0	0	0	4:45 PM	0	4	0	0	4
4:50 PM	1	3	0	0	4	4:50 PM	0	0	0	0	0	4:50 PM	0	0	0	4	4
4:55 PM	2	1	2	0	5	4:55 PM	0	0	0	0	0	4:55 PM	0	1	0	0	1
5:00 PM	0	2	2	0	4	5:00 PM	0	0	0	0	0	5:00 PM	0	2	0	0	2
5:05 PM	1	1	3	0	5	5:05 PM	0	0	0	0	0	5:05 PM	0	0	0	0	0
5:10 PM	1	4	2	0	7	5:10 PM	0	0	0	0	0	5:10 PM	0	0	0	0	0
5:15 PM	2	1	3	0	6	5:15 PM	0	0	0	0	0	5:15 PM	0	2	0	1	3
5:20 PM	0	3	2	0	5	5:20 PM	0	0	0	0	0	5:20 PM	0	1	0	0	1
5:25 PM	0	3	2	0	5	5:25 PM	0	0	0	0	0	5:25 PM	0	2	0	0	2
5:30 PM	1	0	1	0	2	5:30 PM	0	0	0	0	0	5:30 PM	0	1	0	2	3
5:35 PM	2	1	0	0	3	5:35 PM	1	0	0	0	1	5:35 PM	0	3	0	0	3
5:40 PM	2	3	0	0	5	5:40 PM	0	0	0	0	0	5:40 PM	0	3	0	0	3
5:45 PM	2	0	1	0	3	5:45 PM	0	0	0	0	0	5:45 PM	0	1	0	2	3
5:50 PM	0	0	0	0	0	5:50 PM	0	0	0	0	0	5:50 PM	0	0	0	0	0
5:55 PM	0	0	2	0	2	5:55 PM	0	0	0	0	0	5:55 PM	0	1	0	2	3
Count Total	35	41	33	0	109	Count Total	1	0	0	0	1	Count Total	0	26	0	16	42
Peak Hour	17	25	21	0	63	Peak Hour	0	0	0	0	0	Peak Hour	0	11	0	5	16

ALL TRAFFIC DATA SERVICES
(303) 216-2439
www.alltrafficdata.net

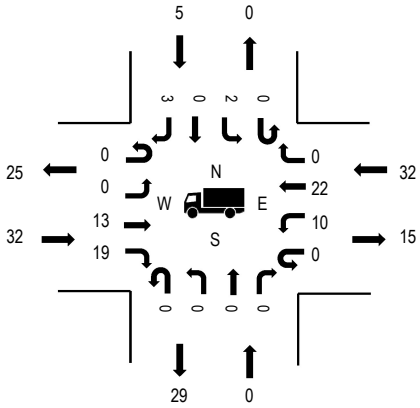
Location: 6 I-5 SB RAMPS & SW WILSONVILLE RD PM
Date: Wednesday, May 18, 2022
Peak Hour: 04:15 PM - 05:15 PM
Peak 15-Minutes: 04:35 PM - 04:50 PM

Peak Hour

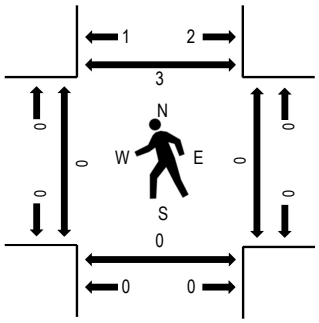
Motorized Vehicles



Heavy Vehicles



Pedestrians



Note: Total study counts contained in parentheses.

	HV%	PHF
EB	2.3%	0.95
WB	2.4%	0.94
NB	0.0%	0.00
SB	3.0%	0.74
All	2.4%	0.94

Traffic Counts - Motorized Vehicles

Interval Start Time	SW WILSONVILLE RD Eastbound				SW WILSONVILLE RD Westbound				I-5 SB RAMPS Northbound				I-5 SB RAMPS Southbound					Rolling Hour
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	Total	
4:00 PM	0	0	72	61	0	40	69	0	0	0	0	0	0	10	0	10	262	2,863
4:05 PM	0	0	73	49	0	38	63	0	0	0	0	0	0	7	0	5	235	2,849
4:10 PM	0	0	67	47	0	32	57	0	0	0	0	0	0	9	0	7	219	2,870
4:15 PM	0	0	65	60	0	27	77	0	0	0	0	0	0	6	0	8	243	2,871
4:20 PM	0	0	56	58	1	48	65	0	0	0	0	0	0	7	0	13	248	2,860
4:25 PM	0	0	77	36	0	51	51	0	0	0	0	0	0	3	0	8	226	2,841
4:30 PM	0	0	56	53	0	37	63	0	0	0	0	0	0	5	0	9	223	2,813
4:35 PM	0	0	71	61	0	45	86	0	0	0	0	0	0	6	0	7	276	2,870
4:40 PM	0	0	76	52	0	48	64	0	0	0	0	0	0	4	0	4	248	2,832
4:45 PM	0	0	65	40	0	47	71	0	0	0	0	0	0	8	0	7	238	2,808
4:50 PM	0	0	55	36	0	33	68	0	0	0	0	0	0	6	0	4	202	2,762
4:55 PM	0	0	77	44	0	42	69	0	0	0	0	0	0	6	0	5	243	2,811
5:00 PM	0	0	68	49	0	44	72	0	0	0	0	0	0	5	0	10	248	2,798
5:05 PM	0	0	70	50	0	44	74	0	0	0	0	0	0	9	0	9	256	
5:10 PM	0	0	41	58	0	37	68	0	0	0	0	0	0	9	0	7	220	
5:15 PM	0	0	54	38	0	52	75	0	0	0	0	0	0	3	0	10	232	
5:20 PM	0	0	66	37	0	44	55	1	0	0	0	0	0	10	0	16	229	
5:25 PM	0	0	51	36	0	38	56	0	0	0	0	0	0	8	0	9	198	
5:30 PM	0	0	88	57	0	38	71	0	0	0	0	0	0	10	0	16	280	
5:35 PM	0	0	63	42	0	33	78	0	0	0	0	0	0	6	0	16	238	
5:40 PM	0	0	60	32	0	44	60	0	0	0	0	0	0	13	0	15	224	
5:45 PM	0	0	48	31	0	27	62	0	0	0	0	0	0	9	0	15	192	
5:50 PM	0	0	70	37	0	45	72	0	0	0	0	0	0	8	0	19	251	
5:55 PM	0	0	60	37	0	35	56	0	0	0	0	0	0	22	0	20	230	
Count Total	0	0	1,549	1,101	1	969	1,602	1	0	0	0	0	0	189	0	249	5,661	
Peak Hour	0	0	777	597	1	503	828	0	0	0	0	0	0	74	0	91	2,871	

Traffic Counts - Heavy Vehicles, Bicycles on Road, and Pedestrians/Bicycles on Crosswalk

Interval Start Time	Heavy Vehicles					Interval Start Time	Bicycles on Roadway					Interval Start Time	Pedestrians/Bicycles on Crosswalk				
	EB	NB	WB	SB	Total		EB	NB	WB	SB	Total		EB	NB	WB	SB	Total
4:00 PM	6	0	2	3	11	4:00 PM	0	0	0	0	0	4:00 PM	1	0	0	2	3
4:05 PM	2	0	0	2	4	4:05 PM	0	0	0	0	0	4:05 PM	0	0	0	2	2
4:10 PM	8	0	4	2	14	4:10 PM	0	0	0	0	0	4:10 PM	0	0	0	0	0
4:15 PM	3	0	2	1	6	4:15 PM	0	0	0	0	0	4:15 PM	0	0	0	0	0
4:20 PM	5	0	5	0	10	4:20 PM	0	0	0	0	0	4:20 PM	0	0	0	0	0
4:25 PM	1	0	1	0	2	4:25 PM	0	0	0	0	0	4:25 PM	0	0	0	0	0
4:30 PM	2	0	1	0	3	4:30 PM	0	0	0	0	0	4:30 PM	0	0	0	0	0
4:35 PM	7	0	0	0	7	4:35 PM	0	0	0	0	0	4:35 PM	0	0	0	1	1
4:40 PM	7	0	7	1	15	4:40 PM	0	0	0	0	0	4:40 PM	0	0	0	0	0
4:45 PM	0	0	3	1	4	4:45 PM	0	0	0	0	0	4:45 PM	0	0	0	2	2
4:50 PM	2	0	5	1	8	4:50 PM	0	0	0	0	0	4:50 PM	1	0	0	1	2
4:55 PM	1	0	1	0	2	4:55 PM	0	0	0	0	0	4:55 PM	0	0	0	0	0
5:00 PM	1	0	2	0	3	5:00 PM	0	0	0	0	0	5:00 PM	0	0	0	0	0
5:05 PM	2	0	1	1	4	5:05 PM	0	0	0	0	0	5:05 PM	0	0	0	0	0
5:10 PM	1	0	4	0	5	5:10 PM	0	0	0	0	0	5:10 PM	0	0	0	1	1
5:15 PM	3	0	4	1	8	5:15 PM	0	0	0	0	0	5:15 PM	0	0	0	0	0
5:20 PM	0	0	4	0	4	5:20 PM	0	0	0	0	0	5:20 PM	0	0	0	0	0
5:25 PM	1	0	0	0	1	5:25 PM	0	0	0	0	0	5:25 PM	0	0	0	0	0
5:30 PM	2	0	1	3	6	5:30 PM	0	0	0	0	0	5:30 PM	0	0	0	2	2
5:35 PM	2	0	1	0	3	5:35 PM	1	0	0	0	1	5:35 PM	0	0	0	0	0
5:40 PM	6	0	3	1	10	5:40 PM	0	0	0	0	0	5:40 PM	0	0	0	0	0
5:45 PM	0	0	0	0	0	5:45 PM	0	0	0	0	0	5:45 PM	0	0	0	2	2
5:50 PM	0	0	0	0	0	5:50 PM	0	0	0	0	0	5:50 PM	0	0	0	1	1
5:55 PM	2	0	2	1	5	5:55 PM	0	0	0	0	0	5:55 PM	0	0	0	1	1
Count Total	64	0	53	18	135	Count Total	1	0	0	0	1	Count Total	2	0	0	15	17
Peak Hour	32	0	32	5	69	Peak Hour	0	0	0	0	0	Peak Hour	1	0	0	5	6

LOS DESCRIPTION

TRAFFIC LEVELS OF SERVICE

Analysis of traffic volumes is useful in understanding the general nature of traffic in an area, but by itself indicates neither the ability of the street network to carry additional traffic nor the quality of service afforded by the street facilities. For this, the concept of level of service has been developed to subjectively describe traffic performance. Level of service can be measured at intersections and along key roadway segments.

Levels of service categories are similar to report card ratings for traffic performance. Intersections are typically the controlling bottlenecks of traffic flow and the ability of a roadway system to carry traffic efficiently is generally diminished in their vicinities. Levels of Service A, B and C indicate conditions where traffic moves without significant delays over periods of peak travel demand. Level of service D and E are progressively worse peak hour operating conditions and F conditions represent where demand exceeds the capacity of an intersection. Most urban communities set level of service D as the minimum acceptable level of service for peak hour operation and plan for level of service C or better for all other times of the day. The Highway Capacity Manual provides level of service calculation methodology for both intersections and arterials[1]. The following two sections provide interpretations of the analysis approaches.

[1] *2000 Highway Capacity Manual*, Transportation Research Board, Washington D.C., 2000, Chapter 16 and 17.

UNSIGNALIZED INTERSECTIONS (Two-Way Stop Controlled)

Unsignalized intersection level of service is reported for the major street and minor street (generally, left turn movements). The method assesses available and critical gaps in the traffic stream which make it possible for side street traffic to enter the main street flow. The 2010 Highway Capacity Manual describes the detailed methodology. It is not unusual for an intersection to experience level of service E or F conditions for the minor street left turn movement. It should be understood that, often, a poor level of service is experienced by only a few vehicles and the intersection as a whole operates acceptably.

Unsignalized intersection levels of service are described in the following table.

Level-of-Service Criteria: Automobile Mode

Control Delay (s/vehicle)	**LOS by Volume-to-Capacity Ratio**	
	***v/c* ≤ 1.0**	***v/c* > 1.0**
0-10	A	F
>10-15	B	F
>15-25	C	F
>25-35	D	F
>35-50	E	F
>50	F	F

Note: The LOS criteria apply to each lane on a given approach and to each approach on the minor street. LOS is not calculated for major-street approaches or for the intersection as a whole

SIGNALIZED INTERSECTIONS

For signalized intersections, level of service is evaluated based upon average vehicle delay experienced by vehicles entering an intersection. Control delay (or signal delay) includes initial deceleration delay, queue move-up time, stopped delay, and final acceleration delay. In previous versions of this chapter of the HCM (1994 and earlier), delay included only stopped delay. As delay increases, the level of service decreases. Calculations for signalized and unsignalized intersections are different due to the variation in traffic control. The 2000 Highway Capacity Manual provides the basis for these calculations.

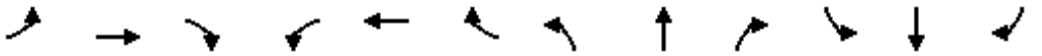
Level of Service	Delay (secs.)	Description
A	<10.00	**Free Flow/Insignificant Delays:** No approach phase is fully utilized by traffic and no vehicle waits longer than one red indication. Most vehicles do not stop at all. Progression is extremely favorable and most vehicles arrive during the green phase.
B	10.1-20.0	**Stable Operation/Minimal Delays:** An occasional approach phase is fully utilized. Many drivers begin to feel somewhat restricted within platoons of vehicles. This level generally occurs with good progression, short cycle lengths, or both.
C	20.1-35.0	**Stable Operation/Acceptable Delays:** Major approach phases fully utilized. Most drivers feel somewhat restricted. Higher delays may result from fair progression, longer cycle lengths, or both. Individual cycle failures may begin to appear at this level, and the number of vehicles stopping is significant.
D	35.1-55.0	**Approaching Unstable/Tolerable Delays:** The influence of congestion becomes more noticeable. Drivers may have to wait through more than one red signal indication. Longer delays may result from some combination of unfavorable progression, long cycle lengths, or high v/c ratios. The proportion of vehicles not stopping declines, and individual cycle failures are noticeable.
E	55.1-80.0	**Unstable Operation/Significant Delays:** Volumes at or near capacity. Vehicles may wait though several signal cycles. Long queues form upstream from intersection. These high delay values generally indicate poor progression, long cycle lengths, and high v/c ratios. Individual cycle failures are a frequent occurrence.
F	>80.0	**Forced Flow/Excessive Delays:** Represents jammed conditions. Queues may block upstream intersections. This level occurs when arrival flow rates exceed intersection capacity, and is considered to be unacceptable to most drivers. Poor progression, long cycle lengths, and v/c ratios approaching 1.0 may contribute to these high delay levels.

Source: *2000 Highway Capacity Manual*, Transportation Research Board, Washington D.C.

EXISTING 2022 HCM REPORTS

HCM 6th Signalized Intersection Summary
1: I-5 SB Ramp & Elligsen Rd

WV Frog Pond East & South Master Plan
Existing 2022



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	1001	858	0	698	349	0	0	0	385	58	562
Future Volume (veh/h)	0	1001	858	0	698	349	0	0	0	385	58	562
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Work Zone On Approach		No			No						No	
Adj Sat Flow, veh/h/ln	0	1826	1856	0	1826	1900				1856	1870	1678
Adj Flow Rate, veh/h	0	1076	0	0	751	0				458	0	547
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93				0.93	0.93	0.93
Percent Heavy Veh, %	0	5	3	0	5	0				3	2	15
Cap, veh/h	0	1740		0	1740					1492	0	600
Arrive On Green	0.00	0.50	0.00	0.00	1.00	0.00				0.42	0.00	0.42
Sat Flow, veh/h	0	3561	1572	0	3561	1610				3534	0	1422
Grp Volume(v), veh/h	0	1076	0	0	751	0				458	0	547
Grp Sat Flow(s),veh/h/ln	0	1735	1572	0	1735	1610				1767	0	1422
Q Serve(g_s), s	0.0	23.5	0.0	0.0	0.0	0.0				9.0	0.0	37.9
Cycle Q Clear(g_c), s	0.0	23.5	0.0	0.0	0.0	0.0				9.0	0.0	37.9
Prop In Lane	0.00		1.00	0.00		1.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	1740		0	1740					1492	0	600
V/C Ratio(X)	0.00	0.62		0.00	0.43					0.31	0.00	0.91
Avail Cap(c_a), veh/h	0	1740		0	1740					1818	0	731
HCM Platoon Ratio	1.00	1.00	1.00	1.00	2.00	2.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	0.00	0.00	0.93	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	18.9	0.0	0.0	0.0	0.0				20.1	0.0	28.5
Incr Delay (d2), s/veh	0.0	1.7	0.0	0.0	0.7	0.0				0.1	0.0	13.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	9.3	0.0	0.0	0.2	0.0				3.6	0.0	14.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	20.6	0.0	0.0	0.7	0.0				20.2	0.0	42.3
LnGrp LOS	A	C		A	A					C	A	D
Approach Vol, veh/h		1076			751						1005	
Approach Delay, s/veh		20.6			0.7						32.3	
Approach LOS		C			A						C	

Timer - Assigned Phs		2		4		6						
Phs Duration (G+Y+Rc), s		56.7		48.3		56.7						
Change Period (Y+Rc), s		5.0		4.0		5.0						
Max Green Setting (Gmax), s		42.0		54.0		42.0						
Max Q Clear Time (g_c+I1), s		25.5		39.9		2.0						
Green Ext Time (p_c), s		5.1		4.4		3.9						

Intersection Summary		
HCM 6th Ctrl Delay		19.5
HCM 6th LOS		B

Notes

User approved volume balancing among the lanes for turning movement.

User approved changes to right turn type.

Unsignalized Delay for [EBR, WBR] is excluded from calculations of the approach delay and intersection delay.

HCM 6th Signalized Intersection Summary
2: I-5 NB Ramp & Elligsen Rd

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↱		↑↑	↱	↰↰		↱			
Traffic Volume (veh/h)	0	748	638	0	735	577	312	0	224	0	0	0
Future Volume (veh/h)	0	748	638	0	735	577	312	0	224	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Work Zone On Approach		No			No			No				
Adj Sat Flow, veh/h/ln	0	1870	1826	0	1870	1870	1826	0	1856			
Adj Flow Rate, veh/h	0	779	0	0	766	0	325	0	0			
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96			
Percent Heavy Veh, %	0	2	5	0	2	2	5	0	3			
Cap, veh/h	0	2800		0	2800		426	0				
Arrive On Green	0.00	1.00	0.00	0.00	1.00	0.00	0.13	0.00	0.00			
Sat Flow, veh/h	0	3647	1547	0	3647	1585	3374	0	1572			
Grp Volume(v), veh/h	0	779	0	0	766	0	325	0	0			
Grp Sat Flow(s),veh/h/ln	0	1777	1547	0	1777	1585	1687	0	1572			
Q Serve(g_s), s	0.0	0.0	0.0	0.0	0.0	0.0	9.8	0.0	0.0			
Cycle Q Clear(g_c), s	0.0	0.0	0.0	0.0	0.0	0.0	9.8	0.0	0.0			
Prop In Lane	0.00		1.00	0.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	0	2800		0	2800		426	0				
V/C Ratio(X)	0.00	0.28		0.00	0.27		0.76	0.00				
Avail Cap(c_a), veh/h	0	2800		0	2800		1253	0				
HCM Platoon Ratio	1.00	2.00	2.00	1.00	2.00	2.00	1.00	1.00	1.00			
Upstream Filter(I)	0.00	0.78	0.00	0.00	0.89	0.00	1.00	0.00	0.00			
Uniform Delay (d), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	44.3	0.0	0.0			
Incr Delay (d2), s/veh	0.0	0.2	0.0	0.0	0.2	0.0	2.9	0.0	0.0			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	0.0	0.1	0.0	0.0	0.1	0.0	4.2	0.0	0.0			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	0.2	0.0	0.0	0.2	0.0	47.2	0.0	0.0			
LnGrp LOS	A	A		A	A		D	A				
Approach Vol, veh/h		779			766			325				
Approach Delay, s/veh		0.2			0.2			47.2				
Approach LOS		A			A			D				

Timer - Assigned Phs		2				6		8				
Phs Duration (G+Y+Rc), s		87.7				87.7		17.3				
Change Period (Y+Rc), s		5.0				5.0		4.0				
Max Green Setting (Gmax), s		57.0				57.0		39.0				
Max Q Clear Time (g_c+I1), s		2.0				2.0		11.8				
Green Ext Time (p_c), s		4.1				4.0		1.5				

Intersection Summary		
HCM 6th Ctrl Delay		8.4
HCM 6th LOS		A

Notes

Unsignalized Delay for [NBR, EBR, WBR] is excluded from calculations of the approach delay and intersection delay.

HCM 6th Signalized Intersection Summary
3: Parkway Ave & Elligsen Rd

WV Frog Pond East & South Master Plan
Existing 2022

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	49	473	450	47	693	36	456	28	50	54	18	163
Future Volume (veh/h)	49	473	450	47	693	36	456	28	50	54	18	163
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1826	1900	1900	1856	1900	1870	1900	1900	1678	1411	1841
Adj Flow Rate, veh/h	54	520	306	52	762	35	523	0	8	59	20	1
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	2	5	0	0	3	0	2	0	0	15	33	4
Cap, veh/h	70	1894	1168	68	2702	124	640	0	289	82	68	3
Arrive On Green	0.07	0.91	0.91	0.07	1.00	1.00	0.18	0.00	0.18	0.05	0.05	0.05
Sat Flow, veh/h	1781	3469	1609	1810	4964	227	3563	0	1610	1598	1332	67
Grp Volume(v), veh/h	54	520	306	52	518	279	523	0	8	59	0	21
Grp Sat Flow(s),veh/h/ln	1781	1735	1609	1810	1689	1814	1781	0	1610	1598	0	1399
Q Serve(g_s), s	3.1	1.9	1.6	3.0	0.0	0.0	14.8	0.0	0.4	3.8	0.0	1.5
Cycle Q Clear(g_c), s	3.1	1.9	1.6	3.0	0.0	0.0	14.8	0.0	0.4	3.8	0.0	1.5
Prop In Lane	1.00		1.00	1.00		0.13	1.00		1.00	1.00		0.05
Lane Grp Cap(c), veh/h	70	1894	1168	68	1838	988	640	0	289	82	0	72
V/C Ratio(X)	0.78	0.27	0.26	0.77	0.28	0.28	0.82	0.00	0.03	0.72	0.00	0.29
Avail Cap(c_a), veh/h	161	1894	1168	267	1838	988	950	0	429	228	0	200
HCM Platoon Ratio	1.67	1.67	1.67	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.94	0.94	0.94	0.90	0.90	0.90	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	48.6	2.2	0.8	48.1	0.0	0.0	41.4	0.0	35.5	49.1	0.0	48.0
Incr Delay (d2), s/veh	15.8	0.3	0.5	15.0	0.3	0.6	3.5	0.0	0.0	11.3	0.0	2.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.7	0.6	0.8	1.6	0.1	0.2	6.8	0.0	0.2	1.8	0.0	0.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	64.4	2.5	1.3	63.1	0.3	0.6	44.9	0.0	35.5	60.4	0.0	50.2
LnGrp LOS	E	A	A	E	A	A	D	A	D	E	A	D
Approach Vol, veh/h		880			849			531			80	
Approach Delay, s/veh		5.9			4.3			44.8			57.7	
Approach LOS		A			A			D			E	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	8.4	62.3		10.4	8.6	62.2		23.9
Change Period (Y+Rc), s	4.5	5.0		5.0	4.5	5.0		5.0
Max Green Setting (Gmax), s	15.5	27.0		15.0	9.5	33.0		28.0
Max Q Clear Time (g_c+I1), s	5.0	3.9		5.8	5.1	2.0		16.8
Green Ext Time (p_c), s	0.1	3.9		0.1	0.0	3.7		2.1

Intersection Summary	
HCM 6th Ctrl Delay	15.9
HCM 6th LOS	B

Notes

User approved volume balancing among the lanes for turning movement.

HCM 6th Signalized Intersection Summary
4: Parkway Center Dr & Elligsen Rd

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	15	331	221	67	412	5	352	3	53	2	5	12
Future Volume (veh/h)	15	331	221	67	412	5	352	3	53	2	5	12
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1900	1900	1870	1856	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	16	356	171	72	443	5	378	3	4	2	5	0
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	0	0	2	3	0	0	0	0	0	0	0	0
Cap, veh/h	706	1158	1182	733	2396	27	480	101	134	13	33	0
Arrive On Green	0.06	1.00	1.00	0.08	0.66	0.66	0.14	0.14	0.14	0.01	0.02	0.00
Sat Flow, veh/h	1810	1900	1584	1767	3656	41	3510	737	982	535	1338	0
Grp Volume(v), veh/h	16	356	171	72	219	229	378	0	7	7	0	0
Grp Sat Flow(s),veh/h/ln	1810	1900	1584	1767	1805	1893	1755	0	1719	1873	0	0
Q Serve(g_s), s	0.3	0.0	0.0	1.3	5.0	5.0	10.9	0.0	0.4	0.4	0.0	0.0
Cycle Q Clear(g_c), s	0.3	0.0	0.0	1.3	5.0	5.0	10.9	0.0	0.4	0.4	0.0	0.0
Prop In Lane	1.00		1.00	1.00		0.02	1.00		0.57	0.29		0.00
Lane Grp Cap(c), veh/h	706	1158	1182	733	1183	1240	480	0	235	47	0	0
V/C Ratio(X)	0.02	0.31	0.14	0.10	0.18	0.19	0.79	0.00	0.03	0.15	0.00	0.00
Avail Cap(c_a), veh/h	805	1158	1182	783	1183	1240	970	0	475	143	0	0
HCM Platoon Ratio	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.95	0.95	0.95	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	6.6	0.0	0.0	4.8	7.1	7.1	43.8	0.0	39.3	50.3	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.7	0.2	0.0	0.3	0.3	1.1	0.0	0.0	0.5	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	0.2	0.1	0.4	1.8	1.9	4.7	0.0	0.2	0.2	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	6.6	0.7	0.2	4.8	7.4	7.4	45.0	0.0	39.3	50.9	0.0	0.0
LnGrp LOS	A	A	A	A	A	A	D	A	D	D	A	A
Approach Vol, veh/h		543			520			385			7	
Approach Delay, s/veh		0.7			7.1			44.8			50.9	
Approach LOS		A			A			D			D	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	12.0	68.0		6.6	7.2	72.8		18.4
Change Period (Y+Rc), s	5.0	5.0		5.5	5.0	5.0		5.0
Max Green Setting (Gmax), s	10.0	40.0		6.5	8.0	42.0		28.0
Max Q Clear Time (g_c+I1), s	3.3	2.0		2.4	2.3	7.0		12.9
Green Ext Time (p_c), s	0.0	0.5		0.0	0.0	0.3		0.3

Intersection Summary		
HCM 6th Ctrl Delay		14.9
HCM 6th LOS		B

Intersection	
Int Delay, s/veh	59.5

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	140	211	91	298	541	390
Future Vol, veh/h	140	211	91	298	541	390
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	175	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	3	2	4	2	3	2
Mvmt Flow	147	222	96	314	569	411

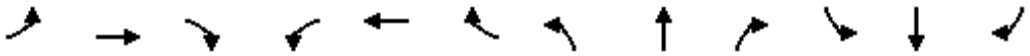
Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1281	775	980	0	-	0
Stage 1	775	-	-	-	-	-
Stage 2	506	-	-	-	-	-
Critical Hdwy	6.43	6.22	4.14	-	-	-
Critical Hdwy Stg 1	5.43	-	-	-	-	-
Critical Hdwy Stg 2	5.43	-	-	-	-	-
Follow-up Hdwy	3.527	3.318	2.236	-	-	-
Pot Cap-1 Maneuver	182	398	696	-	-	-
Stage 1	453	-	-	-	-	-
Stage 2	603	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	157	398	696	-	-	-
Mov Cap-2 Maneuver	157	-	-	-	-	-
Stage 1	390	-	-	-	-	-
Stage 2	603	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	280.3	2.6	0
HCM LOS	F		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	696	-	247	-	-
HCM Lane V/C Ratio	0.138	-	1.496	-	-
HCM Control Delay (s)	11	-	280.3	-	-
HCM Lane LOS	B	-	F	-	-
HCM 95th %tile Q(veh)	0.5	-	21.7	-	-

HCM 6th Signalized Intersection Summary
6: Parkway Ave & Boeckman Rd

WV Frog Pond East & South Master Plan
Existing 2022



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	86	267	204	62	246	21	143	161	64	31	334	205
Future Volume (veh/h)	86	267	204	62	246	21	143	161	64	31	334	205
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		0.97	1.00		0.97	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1870	1900	1900	1885	1900	1900	1900	1900
Adj Flow Rate, veh/h	91	281	183	65	259	18	151	169	51	33	352	191
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0	0	2	0	0	1	0	0	0	0
Cap, veh/h	372	321	209	215	499	35	299	562	170	522	415	225
Arrive On Green	0.05	0.30	0.30	0.04	0.29	0.28	0.08	0.41	0.40	0.03	0.36	0.35
Sat Flow, veh/h	1810	1061	691	1810	1724	120	1810	1381	417	1810	1156	627
Grp Volume(v), veh/h	91	0	464	65	0	277	151	0	220	33	0	543
Grp Sat Flow(s),veh/h/ln	1810	0	1751	1810	0	1844	1810	0	1797	1810	0	1783
Q Serve(g_s), s	2.5	0.0	18.0	1.8	0.0	9.0	3.6	0.0	5.9	0.8	0.0	20.2
Cycle Q Clear(g_c), s	2.5	0.0	18.0	1.8	0.0	9.0	3.6	0.0	5.9	0.8	0.0	20.2
Prop In Lane	1.00		0.39	1.00		0.06	1.00		0.23	1.00		0.35
Lane Grp Cap(c), veh/h	372	0	529	215	0	534	299	0	732	522	0	640
V/C Ratio(X)	0.24	0.00	0.88	0.30	0.00	0.52	0.51	0.00	0.30	0.06	0.00	0.85
Avail Cap(c_a), veh/h	477	0	635	343	0	669	364	0	802	675	0	796
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	17.3	0.0	23.8	19.2	0.0	21.3	15.9	0.0	14.4	14.1	0.0	21.3
Incr Delay (d2), s/veh	0.3	0.0	11.0	0.6	0.0	0.6	1.0	0.0	0.3	0.0	0.0	7.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.0	0.0	8.3	0.7	0.0	3.6	1.3	0.0	2.2	0.3	0.0	8.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	17.5	0.0	34.9	19.8	0.0	21.9	16.9	0.0	14.7	14.2	0.0	29.2
LnGrp LOS	B	A	C	B	A	C	B	A	B	B	A	C
Approach Vol, veh/h		555			342			371			576	
Approach Delay, s/veh		32.0			21.5			15.6			28.3	
Approach LOS		C			C			B			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	9.4	29.7	6.9	25.7	5.9	33.2	7.8	24.8
Change Period (Y+Rc), s	4.0	4.5	4.0	4.5	4.0	4.5	4.0	4.5
Max Green Setting (Gmax), s	8.0	31.5	8.0	25.5	8.0	31.5	8.0	25.5
Max Q Clear Time (g_c+I1), s	5.6	22.2	3.8	20.0	2.8	7.9	4.5	11.0
Green Ext Time (p_c), s	0.1	3.1	0.0	1.1	0.0	1.7	0.0	1.0

Intersection Summary	
HCM 6th Ctrl Delay	25.6
HCM 6th LOS	C

Intersection	
Intersection Delay, s/veh	20.3
Intersection LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	53	250	45	63	255	57	29	92	71	102	155	71
Future Vol, veh/h	53	250	45	63	255	57	29	92	71	102	155	71
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles, %	0	2	2	2	3	5	0	3	0	0	1	0
Mvmt Flow	59	278	50	70	283	63	32	102	79	113	172	79
Number of Lanes	1	1	0	1	1	0	1	1	0	1	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	2	2	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	2	2	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	2	2	2
HCM Control Delay	22.5	23.8	15.2	17
HCM LOS	C	C	C	C

Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	100%	0%	100%	0%	100%	0%	100%	0%
Vol Thru, %	0%	56%	0%	85%	0%	82%	0%	69%
Vol Right, %	0%	44%	0%	15%	0%	18%	0%	31%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	29	163	53	295	63	312	102	226
LT Vol	29	0	53	0	63	0	102	0
Through Vol	0	92	0	250	0	255	0	155
RT Vol	0	71	0	45	0	57	0	71
Lane Flow Rate	32	181	59	328	70	347	113	251
Geometry Grp	7	7	7	7	7	7	7	7
Degree of Util (X)	0.077	0.395	0.131	0.675	0.155	0.708	0.26	0.525
Departure Headway (Hd)	8.627	7.847	8.004	7.415	7.982	7.355	8.257	7.533
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	414	456	446	485	448	489	434	477
Service Time	6.414	5.634	5.782	5.192	5.759	5.131	6.037	5.313
HCM Lane V/C Ratio	0.077	0.397	0.132	0.676	0.156	0.71	0.26	0.526
HCM Control Delay	12.1	15.7	12	24.4	12.2	26.2	13.9	18.4
HCM Lane LOS	B	C	B	C	B	D	B	C
HCM 95th-tile Q	0.2	1.9	0.4	5	0.5	5.5	1	3

HCM 6th Signalized Intersection Summary
8: Wilsonville Rd/Stafford Rd & Boeckman Rd/Advance Rd

WV Frog Pond East & South Master Plan
Existing 2022

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	186	65	111	57	43	14	71	204	53	20	438	234
Future Volume (veh/h)	186	65	111	57	43	14	71	204	53	20	438	234
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.93		0.90	0.90		0.88	1.00		0.97	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1885	1870	1885	1826	1900	1900	1885	1885	1870	1826	1885	1856
Adj Flow Rate, veh/h	188	66	18	58	43	1	72	206	45	20	442	216
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Percent Heavy Veh, %	1	2	1	5	0	0	1	1	2	5	1	3
Cap, veh/h	483	384	297	362	246	6	271	681	149	551	512	250
Arrive On Green	0.12	0.21	0.21	0.05	0.13	0.13	0.05	0.46	0.45	0.02	0.43	0.42
Sat Flow, veh/h	1795	1870	1445	1739	1842	43	1795	1491	326	1739	1195	584
Grp Volume(v), veh/h	188	66	18	58	0	44	72	0	251	20	0	658
Grp Sat Flow(s),veh/h/ln	1795	1870	1445	1739	0	1885	1795	0	1817	1739	0	1778
Q Serve(g_s), s	4.9	1.7	0.6	1.7	0.0	1.2	1.3	0.0	5.2	0.4	0.0	20.0
Cycle Q Clear(g_c), s	4.9	1.7	0.6	1.7	0.0	1.2	1.3	0.0	5.2	0.4	0.0	20.0
Prop In Lane	1.00		1.00	1.00		0.02	1.00		0.18	1.00		0.33
Lane Grp Cap(c), veh/h	483	384	297	362	0	252	271	0	829	551	0	762
V/C Ratio(X)	0.39	0.17	0.06	0.16	0.00	0.17	0.27	0.00	0.30	0.04	0.00	0.86
Avail Cap(c_a), veh/h	555	743	574	409	0	590	308	0	1277	635	0	1251
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	16.9	19.4	19.0	20.5	0.0	22.8	12.5	0.0	10.2	9.6	0.0	15.5
Incr Delay (d2), s/veh	0.4	0.2	0.1	0.2	0.0	0.2	0.4	0.0	0.2	0.0	0.0	3.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.9	0.7	0.2	0.6	0.0	0.5	0.5	0.0	1.8	0.1	0.0	7.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	17.3	19.6	19.1	20.6	0.0	23.1	12.9	0.0	10.4	9.6	0.0	19.1
LnGrp LOS	B	B	B	C	A	C	B	A	B	A	A	B
Approach Vol, veh/h		272			102			323			678	
Approach Delay, s/veh		17.9			21.7			11.0			18.8	
Approach LOS		B			C			B			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	6.8	29.5	11.2	11.9	5.1	31.1	7.0	16.2
Change Period (Y+Rc), s	4.0	4.5	4.5	4.5	4.0	4.5	4.5	4.5
Max Green Setting (Gmax), s	4.0	41.3	9.1	18.1	4.0	41.3	4.1	23.1
Max Q Clear Time (g_c+I1), s	3.3	22.0	6.9	3.2	2.4	7.2	3.7	3.7
Green Ext Time (p_c), s	0.0	3.0	0.1	0.1	0.0	1.0	0.0	0.2

Intersection Summary	
HCM 6th Ctrl Delay	17.0
HCM 6th LOS	B

Intersection	
Int Delay, s/veh	0.9

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	84	16	2	85	15	2
Future Vol, veh/h	84	16	2	85	15	2
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	81	81	81	81	81	81
Heavy Vehicles, %	1	12	0	1	7	0
Mvmt Flow	104	20	2	105	19	2

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	124	0	223	114
Stage 1	-	-	-	-	114	-
Stage 2	-	-	-	-	109	-
Critical Hdwy	-	-	4.1	-	6.47	6.2
Critical Hdwy Stg 1	-	-	-	-	5.47	-
Critical Hdwy Stg 2	-	-	-	-	5.47	-
Follow-up Hdwy	-	-	2.2	-	3.563	3.3
Pot Cap-1 Maneuver	-	-	1475	-	754	944
Stage 1	-	-	-	-	899	-
Stage 2	-	-	-	-	903	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1475	-	753	944
Mov Cap-2 Maneuver	-	-	-	-	753	-
Stage 1	-	-	-	-	899	-
Stage 2	-	-	-	-	902	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.2	9.8
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	771	-	-	1475	-
HCM Lane V/C Ratio	0.027	-	-	0.002	-
HCM Control Delay (s)	9.8	-	-	7.4	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	0.1	-	-	0	-

Intersection	
Int Delay, s/veh	0.4

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	12	6	4	400	686	11
Future Vol, veh/h	12	6	4	400	686	11
Conflicting Peds, #/hr	0	0	2	0	0	2
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	25	0	2	0
Mvmt Flow	13	7	4	435	746	12

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1197	754	760	0	-	0
Stage 1	754	-	-	-	-	-
Stage 2	443	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.35	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.425	-	-	-
Pot Cap-1 Maneuver	207	412	757	-	-	-
Stage 1	468	-	-	-	-	-
Stage 2	651	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	205	411	756	-	-	-
Mov Cap-2 Maneuver	205	-	-	-	-	-
Stage 1	464	-	-	-	-	-
Stage 2	650	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	20.9	0.1	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	756	-	246	-	-
HCM Lane V/C Ratio	0.006	-	0.08	-	-
HCM Control Delay (s)	9.8	0	20.9	-	-
HCM Lane LOS	A	A	C	-	-
HCM 95th %tile Q(veh)	0	-	0.3	-	-

Intersection	
Int Delay, s/veh	0.1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	1	4	2	410	693	2
Future Vol, veh/h	1	4	2	410	693	2
Conflicting Peds, #/hr	0	0	2	0	0	2
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	2	50
Mvmt Flow	1	4	2	446	753	2

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1206	756	757	0	-	0
Stage 1	756	-	-	-	-	-
Stage 2	450	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	205	411	863	-	-	-
Stage 1	467	-	-	-	-	-
Stage 2	647	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	204	410	862	-	-	-
Mov Cap-2 Maneuver	204	-	-	-	-	-
Stage 1	465	-	-	-	-	-
Stage 2	646	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	15.7	0	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	862	-	341	-	-
HCM Lane V/C Ratio	0.003	-	0.016	-	-
HCM Control Delay (s)	9.2	0	15.7	-	-
HCM Lane LOS	A	A	C	-	-
HCM 95th %tile Q(veh)	0	-	0	-	-

Intersection	
Int Delay, s/veh	0.1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	2	2	409	2	2	693
Future Vol, veh/h	2	2	409	2	2	693
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	2	0	0	2
Mvmt Flow	2	2	445	2	2	753

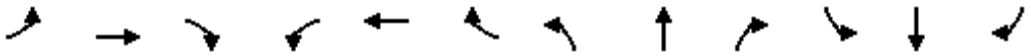
Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1203	446	0	0	447	0
Stage 1	446	-	-	-	-	-
Stage 2	757	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	206	617	-	-	1124	-
Stage 1	649	-	-	-	-	-
Stage 2	467	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	205	617	-	-	1124	-
Mov Cap-2 Maneuver	205	-	-	-	-	-
Stage 1	649	-	-	-	-	-
Stage 2	466	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	16.9	0	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	308	1124	-
HCM Lane V/C Ratio	-	-	0.014	0.002	-
HCM Control Delay (s)	-	-	16.9	8.2	0
HCM Lane LOS	-	-	C	A	A
HCM 95th %tile Q(veh)	-	-	0	0	-

HCM 6th Signalized Intersection Summary
13: I-5 SB Ramp & Wilsonville Rd

WV Frog Pond East & South Master Plan
Existing 2022



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	780	597	503	829	0	0	0	0	74	2	91
Future Volume (veh/h)	0	780	597	503	829	0	0	0	0	74	2	91
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Work Zone On Approach		No			No						No	
Adj Sat Flow, veh/h/ln	0	1870	1856	1870	1856	0				1856	1900	1856
Adj Flow Rate, veh/h	0	830	0	535	882	0				80	0	9
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94				0.94	0.94	0.94
Percent Heavy Veh, %	0	2	3	2	3	0				3	0	3
Cap, veh/h	0	3357		631	3089	0				180	0	155
Arrive On Green	0.00	0.66	0.00	0.12	0.59	0.00				0.05	0.00	0.05
Sat Flow, veh/h	0	5274	1572	3456	3618	0				3534	0	3039
Grp Volume(v), veh/h	0	830	0	535	882	0				80	0	9
Grp Sat Flow(s),veh/h/ln	0	1702	1572	1728	1763	0				1767	0	1520
Q Serve(g_s), s	0.0	7.3	0.0	16.7	13.6	0.0				2.4	0.0	0.3
Cycle Q Clear(g_c), s	0.0	7.3	0.0	16.7	13.6	0.0				2.4	0.0	0.3
Prop In Lane	0.00		1.00	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	3357		631	3089	0				180	0	155
V/C Ratio(X)	0.00	0.25		0.85	0.29	0.00				0.44	0.00	0.06
Avail Cap(c_a), veh/h	0	3357		785	3089	0				610	0	525
HCM Platoon Ratio	1.00	1.00	1.00	0.67	0.67	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	0.00	0.93	0.93	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	7.7	0.0	46.8	5.6	0.0				50.7	0.0	49.7
Incr Delay (d2), s/veh	0.0	0.2	0.0	6.8	0.2	0.0				1.7	0.0	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	2.5	0.0	8.0	5.7	0.0				1.1	0.0	0.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	7.9	0.0	53.5	5.8	0.0				52.4	0.0	49.8
LnGrp LOS	A	A		D	A	A				D	A	D
Approach Vol, veh/h		830			1417						89	
Approach Delay, s/veh		7.9			23.9						52.1	
Approach LOS		A			C						D	

Timer - Assigned Phs	1	2		4		6
Phs Duration (G+Y+Rc), s	24.1	76.3		9.6		100.4
Change Period (Y+Rc), s	4.0	4.0		4.0		4.0
Max Green Setting (Gmax), s	25.0	54.0		19.0		75.0
Max Q Clear Time (g_c+I1), s	18.7	9.3		4.4		15.6
Green Ext Time (p_c), s	1.4	4.4		0.2		4.8

Intersection Summary		
HCM 6th Ctrl Delay		19.3
HCM 6th LOS		B

Notes

User approved volume balancing among the lanes for turning movement.

Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and intersection delay.

HCM 6th Signalized Intersection Summary
14: I-5 NB Ramp & Wilsonville Rd

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	321	533	0	0	989	311	343	2	445	0	0	0
Future Volume (veh/h)	321	533	0	0	989	311	343	2	445	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.97			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Work Zone On Approach		No			No			No				
Adj Sat Flow, veh/h/ln	1870	1870	0	0	1870	1885	1826	1900	1870			
Adj Flow Rate, veh/h	334	555	0	0	1030	0	358	0	180			
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96			
Percent Heavy Veh, %	2	2	0	0	2	1	5	0	2			
Cap, veh/h	407	2822	0	0	3268		463	0	412			
Arrive On Green	0.24	1.00	0.00	0.00	1.00	0.00	0.13	0.00	0.13			
Sat Flow, veh/h	3456	3647	0	0	5274	1598	3478	0	3089			
Grp Volume(v), veh/h	334	555	0	0	1030	0	358	0	180			
Grp Sat Flow(s),veh/h/ln	1728	1777	0	0	1702	1598	1739	0	1545			
Q Serve(g_s), s	10.1	0.0	0.0	0.0	0.0	0.0	10.9	0.0	5.9			
Cycle Q Clear(g_c), s	10.1	0.0	0.0	0.0	0.0	0.0	10.9	0.0	5.9			
Prop In Lane	1.00		0.00	0.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	407	2822	0	0	3268		463	0	412			
V/C Ratio(X)	0.82	0.20	0.00	0.00	0.32		0.77	0.00	0.44			
Avail Cap(c_a), veh/h	785	2822	0	0	3268		949	0	842			
HCM Platoon Ratio	2.00	2.00	1.00	1.00	2.00	2.00	1.00	1.00	1.00			
Upstream Filter(I)	0.97	0.97	0.00	0.00	0.73	0.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	41.0	0.0	0.0	0.0	0.0	0.0	46.1	0.0	43.9			
Incr Delay (d2), s/veh	2.5	0.2	0.0	0.0	0.2	0.0	1.7	0.0	0.4			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	8.9	0.1	0.0	0.0	0.1	0.0	4.8	0.0	2.3			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	43.5	0.2	0.0	0.0	0.2	0.0	47.8	0.0	44.3			
LnGrp LOS	D	A	A	A	A		D	A	D			
Approach Vol, veh/h		889			1030			538				
Approach Delay, s/veh		16.4			0.2			46.6				
Approach LOS		B			A			D				
Timer - Assigned Phs		2			5	6		8				
Phs Duration (G+Y+Rc), s		91.3			16.9	74.4		18.7				
Change Period (Y+Rc), s		4.0			4.0	4.0		4.0				
Max Green Setting (Gmax), s		53.0			25.0	43.0		30.0				
Max Q Clear Time (g_c+I1), s		2.0			12.1	2.0		12.9				
Green Ext Time (p_c), s		6.1			0.9	12.8		1.7				

Intersection Summary	
HCM 6th Ctrl Delay	16.2
HCM 6th LOS	B

Notes

User approved volume balancing among the lanes for turning movement.

Unsignalized Delay for [WBR] is excluded from calculations of the approach delay and intersection delay.

HCM 6th Signalized Intersection Summary
15: Town Center Lp West & Wilsonville Rd

WV Frog Pond East & South Master Plan
Existing 2022

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	365	504	54	43	564	47	188	54	40	48	66	548
Future Volume (veh/h)	365	504	54	43	564	47	188	54	40	48	66	548
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.98	1.00		0.95	1.00		0.92
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1826	1885	1900	1885	1900	1900	1900	1900	1870
Adj Flow Rate, veh/h	384	531	51	45	594	44	198	57	16	51	139	116
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	5	1	0	1	0	0	0	0	2
Cap, veh/h	445	1912	183	57	1648	122	462	181	51	189	199	153
Arrive On Green	0.26	1.00	1.00	0.03	0.49	0.48	0.13	0.13	0.13	0.10	0.10	0.10
Sat Flow, veh/h	3456	3275	314	1739	3377	250	3591	1408	395	1810	1900	1465
Grp Volume(v), veh/h	384	287	295	45	315	323	198	0	73	51	139	116
Grp Sat Flow(s),veh/h/ln	1728	1777	1812	1739	1791	1835	1795	0	1804	1810	1900	1465
Q Serve(g_s), s	11.7	0.0	0.0	2.8	12.0	12.1	5.6	0.0	4.0	2.9	7.8	8.5
Cycle Q Clear(g_c), s	11.7	0.0	0.0	2.8	12.0	12.1	5.6	0.0	4.0	2.9	7.8	8.5
Prop In Lane	1.00		0.17	1.00		0.14	1.00		0.22	1.00		1.00
Lane Grp Cap(c), veh/h	445	1037	1058	57	874	896	462	0	232	189	199	153
V/C Ratio(X)	0.86	0.28	0.28	0.79	0.36	0.36	0.43	0.00	0.31	0.27	0.70	0.76
Avail Cap(c_a), veh/h	534	1037	1058	111	874	896	914	0	459	296	311	240
HCM Platoon Ratio	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.96	0.96	0.96	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	39.9	0.0	0.0	52.8	17.5	17.5	44.2	0.0	43.5	45.4	47.6	47.9
Incr Delay (d2), s/veh	11.0	0.6	0.6	16.0	1.2	1.1	0.5	0.0	0.6	0.6	3.3	5.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.9	0.2	0.2	1.5	5.1	5.2	2.5	0.0	1.9	1.3	3.8	3.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	51.0	0.6	0.6	68.9	18.6	18.7	44.7	0.0	44.1	45.9	50.9	53.4
LnGrp LOS	D	A	A	E	B	B	D	A	D	D	D	D
Approach Vol, veh/h		966			683			271			306	
Approach Delay, s/veh		20.6			22.0			44.5			51.0	
Approach LOS		C			C			D			D	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	7.6	68.2		15.5	18.1	57.7		18.7				
Change Period (Y+Rc), s	4.0	4.5		4.5	4.0	4.5		4.5				
Max Green Setting (Gmax), s	7.0	40.0		17.5	17.0	30.0		28.0				
Max Q Clear Time (g_c+I1), s	4.8	2.0		10.5	13.7	14.1		7.6				
Green Ext Time (p_c), s	0.0	3.9		0.5	0.5	3.5		0.9				

Intersection Summary	
HCM 6th Ctrl Delay	28.1
HCM 6th LOS	C

Notes

User approved volume balancing among the lanes for turning movement.

ID	Software/Method	Intersection	Control Type	LOS	Delay	V/C Ratio
1	Synchro HCM 6th Signal	I-5 SB Ramp & Elligsen Rd	Signal	B	19.5	0.74
2	Synchro HCM 6th Signal	I-5 NB Ramp & Elligsen Rd	Signal	A	8.4	0.34
3	Synchro HCM 6th Signal	Parkway Ave & Elligsen Rd	Signal	B	15.9	0.32
4	Synchro HCM 6th Signal	Parkway Center Dr & Elligsen Rd	Signal	B	14.9	0.40
6	Synchro HCM 6th Signal	Parkway Ave & Boeckman Rd	Signal	C	25.6	0.84
8	Synchro HCM 6th Signal	Wilsonville Rd/Stafford Rd & Boeckman Rd/A	Signal	B	17.0	0.65
13	Synchro HCM 6th Signal	I-5 SB Ramp & Wilsonville Rd	Signal	B	19.3	0.38
14	Synchro HCM 6th Signal	I-5 NB Ramp & Wilsonville Rd	Signal	B	16.2	0.44
15	Synchro HCM 6th Signal	Town Center Lp West & Wilsonville Rd	Signal	C	28.1	0.38

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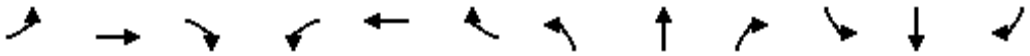
FUTURE BASELINE 2040 HCM REPORTS

HCM 6th Signalized Intersection Summary
1: I-5 SB Ramp & Elligsen Rd

WV Frog Pond East & South Master Plan
Future 2040 Build



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	1315	1105	0	1030	370	0	0	0	480	70	830
Future Volume (veh/h)	0	1315	1105	0	1030	370	0	0	0	480	70	830
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Work Zone On Approach		No			No						No	
Adj Sat Flow, veh/h/ln	0	1826	1856	0	1826	1900				1856	1870	1678
Adj Flow Rate, veh/h	0	1384	0	0	1084	0				558	0	798
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95				0.95	0.95	0.95
Percent Heavy Veh, %	0	5	3	0	5	0				3	2	15
Cap, veh/h	0	2019		0	2019					1208	0	951
Arrive On Green	0.00	0.58	0.00	0.00	1.00	0.00				0.34	0.00	0.34
Sat Flow, veh/h	0	3561	1572	0	3561	1610				3534	0	2784
Grp Volume(v), veh/h	0	1384	0	0	1084	0				558	0	798
Grp Sat Flow(s),veh/h/ln	0	1735	1572	0	1735	1610				1767	0	1392
Q Serve(g_s), s	0.0	29.1	0.0	0.0	0.0	0.0				13.0	0.0	27.8
Cycle Q Clear(g_c), s	0.0	29.1	0.0	0.0	0.0	0.0				13.0	0.0	27.8
Prop In Lane	0.00		1.00	0.00		1.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	2019		0	2019					1208	0	951
V/C Ratio(X)	0.00	0.69		0.00	0.54					0.46	0.00	0.84
Avail Cap(c_a), veh/h	0	2019		0	2019					1447	0	1140
HCM Platoon Ratio	1.00	1.00	1.00	1.00	2.00	2.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	0.00	0.00	0.86	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	15.3	0.0	0.0	0.0	0.0				27.0	0.0	31.9
Incr Delay (d2), s/veh	0.0	1.9	0.0	0.0	0.9	0.0				0.3	0.0	4.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	11.0	0.0	0.0	0.2	0.0				5.4	0.0	9.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	17.2	0.0	0.0	0.9	0.0				27.3	0.0	36.8
LnGrp LOS	A	B		A	A					C	A	D
Approach Vol, veh/h		1384			1084						1356	
Approach Delay, s/veh		17.2			0.9						32.9	
Approach LOS		B			A						C	

Timer - Assigned Phs	2	4	6
Phs Duration (G+Y+Rc), s	65.1	39.9	65.1
Change Period (Y+Rc), s	5.0	4.0	5.0
Max Green Setting (Gmax), s	53.0	43.0	53.0
Max Q Clear Time (g_c+I1), s	31.1	29.8	2.0
Green Ext Time (p_c), s	7.8	6.1	6.4

Intersection Summary	
HCM 6th Ctrl Delay	18.1
HCM 6th LOS	B

Notes

User approved volume balancing among the lanes for turning movement.

User approved changes to right turn type.

Unsignalized Delay for [EBR, WBR] is excluded from calculations of the approach delay and intersection delay.

HCM 6th Signalized Intersection Summary
2: I-5 NB Ramp & Elligsen Rd

WV Frog Pond East & South Master Plan
Future 2040 Build

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↱		↑↑	↱	↰↰		↱			
Traffic Volume (veh/h)	0	905	890	0	920	535	480	0	270	0	0	0
Future Volume (veh/h)	0	905	890	0	920	535	480	0	270	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Work Zone On Approach		No			No			No				
Adj Sat Flow, veh/h/ln	0	1870	1826	0	1870	1870	1826	0	1856			
Adj Flow Rate, veh/h	0	943	0	0	958	0	500	0	0			
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96			
Percent Heavy Veh, %	0	2	5	0	2	2	5	0	3			
Cap, veh/h	0	2598		0	2598		618	0				
Arrive On Green	0.00	1.00	0.00	0.00	1.00	0.00	0.18	0.00	0.00			
Sat Flow, veh/h	0	3647	1547	0	3647	1585	3374	0	1572			
Grp Volume(v), veh/h	0	943	0	0	958	0	500	0	0			
Grp Sat Flow(s),veh/h/ln	0	1777	1547	0	1777	1585	1687	0	1572			
Q Serve(g_s), s	0.0	0.0	0.0	0.0	0.0	0.0	14.9	0.0	0.0			
Cycle Q Clear(g_c), s	0.0	0.0	0.0	0.0	0.0	0.0	14.9	0.0	0.0			
Prop In Lane	0.00		1.00	0.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	0	2598		0	2598		618	0				
V/C Ratio(X)	0.00	0.36		0.00	0.37		0.81	0.00				
Avail Cap(c_a), veh/h	0	2598		0	2598		1253	0				
HCM Platoon Ratio	1.00	2.00	2.00	1.00	2.00	2.00	1.00	1.00	1.00			
Upstream Filter(I)	0.00	0.67	0.00	0.00	0.86	0.00	1.00	0.00	0.00			
Uniform Delay (d), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	41.1	0.0	0.0			
Incr Delay (d2), s/veh	0.0	0.3	0.0	0.0	0.3	0.0	2.6	0.0	0.0			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	0.0	0.1	0.0	0.0	0.1	0.0	6.3	0.0	0.0			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	0.3	0.0	0.0	0.3	0.0	43.7	0.0	0.0			
LnGrp LOS	A	A		A	A		D	A				
Approach Vol, veh/h		943			958			500				
Approach Delay, s/veh		0.3			0.3			43.7				
Approach LOS		A			A			D				

Timer - Assigned Phs		2				6		8				
Phs Duration (G+Y+Rc), s		81.8				81.8		23.2				
Change Period (Y+Rc), s		5.0				5.0		4.0				
Max Green Setting (Gmax), s		57.0				57.0		39.0				
Max Q Clear Time (g_c+I1), s		2.0				2.0		16.9				
Green Ext Time (p_c), s		5.2				5.3		2.3				

Intersection Summary												
HCM 6th Ctrl Delay			9.3									
HCM 6th LOS			A									

Notes

Unsignalized Delay for [NBR, EBR, WBR] is excluded from calculations of the approach delay and intersection delay.

HCM 6th Signalized Intersection Summary
3: Parkway Ave & Elligsen Rd

WV Frog Pond East & South Master Plan
Future 2040 Build

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	80	625	470	50	795	45	460	30	55	70	20	200
Future Volume (veh/h)	80	625	470	50	795	45	460	30	55	70	20	200
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1826	1900	1900	1856	1900	1870	1900	1900	1678	1411	1841
Adj Flow Rate, veh/h	88	687	314	55	874	44	529	0	8	77	22	2
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	2	5	0	0	3	0	2	0	0	15	33	4
Cap, veh/h	111	1839	1142	72	2507	126	640	0	289	103	82	7
Arrive On Green	0.13	1.00	1.00	0.01	0.17	0.17	0.18	0.00	0.18	0.06	0.06	0.06
Sat Flow, veh/h	1781	3469	1609	1810	4940	248	3563	0	1610	1598	1274	116
Grp Volume(v), veh/h	88	687	314	55	597	321	529	0	8	77	0	24
Grp Sat Flow(s),veh/h/ln	1781	1735	1609	1810	1689	1811	1781	0	1610	1598	0	1390
Q Serve(g_s), s	5.0	0.0	0.0	3.2	16.4	16.5	15.0	0.0	0.4	5.0	0.0	1.7
Cycle Q Clear(g_c), s	5.0	0.0	0.0	3.2	16.4	16.5	15.0	0.0	0.4	5.0	0.0	1.7
Prop In Lane	1.00		1.00	1.00		0.14	1.00		1.00	1.00		0.08
Lane Grp Cap(c), veh/h	111	1839	1142	72	1714	919	640	0	289	103	0	90
V/C Ratio(X)	0.79	0.37	0.27	0.76	0.35	0.35	0.83	0.00	0.03	0.75	0.00	0.27
Avail Cap(c_a), veh/h	198	1839	1142	267	1714	919	882	0	399	228	0	199
HCM Platoon Ratio	2.00	2.00	2.00	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.90	0.90	0.90	0.87	0.87	0.87	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	45.3	0.0	0.0	51.3	28.4	28.4	41.5	0.0	35.5	48.3	0.0	46.8
Incr Delay (d2), s/veh	10.6	0.5	0.5	13.2	0.5	0.9	4.7	0.0	0.0	10.3	0.0	1.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.4	0.1	0.2	1.7	7.5	8.2	7.0	0.0	0.2	2.3	0.0	0.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	55.8	0.5	0.5	64.5	28.8	29.3	46.2	0.0	35.5	58.6	0.0	48.3
LnGrp LOS	E	A	A	E	C	C	D	A	D	E	A	D
Approach Vol, veh/h		1089			973			537			101	
Approach Delay, s/veh		5.0			31.0			46.0			56.2	
Approach LOS		A			C			D			E	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	8.7	60.7		11.8	11.1	58.3		23.9
Change Period (Y+Rc), s	4.5	5.0		5.0	4.5	5.0		5.0
Max Green Setting (Gmax), s	15.5	29.0		15.0	11.7	32.8		26.0
Max Q Clear Time (g_c+I1), s	5.2	2.0		7.0	7.0	18.5		17.0
Green Ext Time (p_c), s	0.1	5.1		0.2	0.1	3.6		1.8

Intersection Summary		
HCM 6th Ctrl Delay	24.4	
HCM 6th LOS	C	

Notes

User approved volume balancing among the lanes for turning movement.

HCM 6th Signalized Intersection Summary
4: Parkway Center Dr & Elligsen Rd

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	30	455	265	120	460	5	415	5	115	5	5	15
Future Volume (veh/h)	30	455	265	120	460	5	415	5	115	5	5	15
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1900	1900	1870	1856	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	32	489	190	129	495	5	446	5	13	5	5	0
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	0	0	2	3	0	0	0	0	0	0	0	0
Cap, veh/h	659	1101	1164	586	2267	23	546	72	188	27	27	0
Arrive On Green	0.06	0.77	0.77	0.08	0.62	0.62	0.16	0.16	0.16	0.01	0.03	0.00
Sat Flow, veh/h	1810	1900	1584	1767	3661	37	3510	466	1211	927	927	0
Grp Volume(v), veh/h	32	489	190	129	244	256	446	0	18	10	0	0
Grp Sat Flow(s),veh/h/ln	1810	1900	1584	1767	1805	1893	1755	0	1677	1854	0	0
Q Serve(g_s), s	0.7	9.4	2.2	2.6	6.2	6.3	12.9	0.0	1.0	0.6	0.0	0.0
Cycle Q Clear(g_c), s	0.7	9.4	2.2	2.6	6.2	6.3	12.9	0.0	1.0	0.6	0.0	0.0
Prop In Lane	1.00		1.00	1.00		0.02	1.00		0.72	0.50		0.00
Lane Grp Cap(c), veh/h	659	1101	1164	586	1118	1172	546	0	261	53	0	0
V/C Ratio(X)	0.05	0.44	0.16	0.22	0.22	0.22	0.82	0.00	0.07	0.19	0.00	0.00
Avail Cap(c_a), veh/h	734	1101	1164	590	1118	1172	903	0	431	141	0	0
HCM Platoon Ratio	1.33	1.33	1.33	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.90	0.90	0.90	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	7.5	6.1	2.2	6.5	8.8	8.8	42.9	0.0	37.8	50.2	0.0	0.0
Incr Delay (d2), s/veh	0.0	1.2	0.3	0.1	0.4	0.4	1.2	0.0	0.0	0.6	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	3.2	1.1	0.9	2.4	2.5	5.6	0.0	0.4	0.3	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	7.5	7.3	2.4	6.5	9.3	9.2	44.0	0.0	37.9	50.8	0.0	0.0
LnGrp LOS	A	A	A	A	A	A	D	A	D	D	A	A
Approach Vol, veh/h		711			629			464			10	
Approach Delay, s/veh		6.0			8.7			43.8			50.8	
Approach LOS		A			A			D			D	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	12.8	64.8		7.0	8.6	69.0		20.3				
Change Period (Y+Rc), s	5.0	5.0		5.5	5.0	5.0		5.0				
Max Green Setting (Gmax), s	8.0	44.0		6.5	8.0	44.0		26.0				
Max Q Clear Time (g_c+I1), s	4.6	11.4		2.6	2.7	8.3		14.9				
Green Ext Time (p_c), s	0.0	0.6		0.0	0.0	0.4		0.3				

Intersection Summary	
HCM 6th Ctrl Delay	16.9
HCM 6th LOS	B

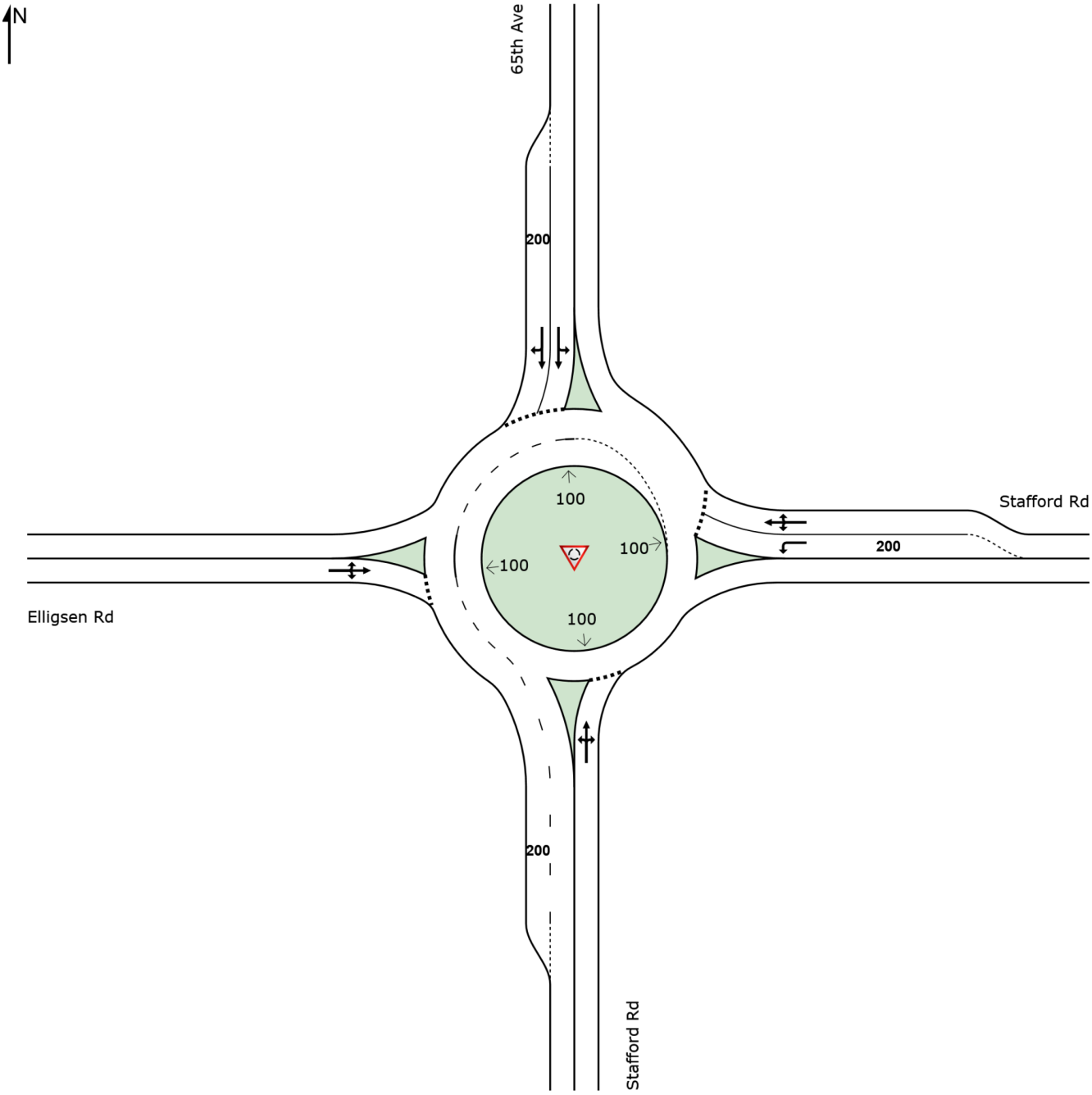
DRAFT

SITE LAYOUT

Site: [Stafford Rd/65th Ave - Baseline (Site Folder: Stafford Rd/65th Ave)]

Site Category: -
Roundabout

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



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Project: S:\Projects\2021\21108-000 (Wilsonville Frog Pond East & South Master Plan)\03_Analysis\Synchro\Wilsonville Frog Pond East & South

MOVEMENT SUMMARY

Site: [Stafford Rd/65th Ave - Baseline (Site Folder: Stafford Rd/65th Ave)]

Site Category: -
Roundabout

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] ft	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed mph
South: Stafford Rd														
3	L2	25	2.0	26	2.0	0.584	12.0	LOS B	5.7	144.1	0.71	0.78	1.02	31.6
8	T1	165	2.0	174	2.0	0.584	12.0	LOS B	5.7	144.1	0.71	0.78	1.02	31.6
18	R2	330	2.0	347	2.0	0.584	12.0	LOS B	5.7	144.1	0.71	0.78	1.02	30.7
Approach		520	2.0	547	2.0	0.584	12.0	LOS B	5.7	144.1	0.71	0.78	1.02	31.0
East: Stafford Rd														
1	L2	610	2.0	642	2.0	0.618	12.0	LOS B	6.7	169.4	0.68	0.73	0.99	29.6
6	T1	395	2.0	416	2.0	0.502	9.4	LOS A	3.3	82.6	0.59	0.52	0.65	33.0
16	R2	100	2.0	105	2.0	0.502	9.4	LOS A	3.3	82.6	0.59	0.52	0.65	32.0
Approach		1105	2.0	1163	2.0	0.618	10.8	LOS B	6.7	169.4	0.64	0.64	0.84	30.9
North: 65th Ave														
7	L2	35	2.0	37	2.0	0.707	24.6	LOS C	5.1	128.3	0.84	1.10	1.76	27.0
4	T1	420	2.0	442	2.0	0.707	23.3	LOS C	5.1	128.3	0.81	1.03	1.57	27.7
14	R2	65	2.0	68	2.0	0.340	13.1	LOS B	1.4	34.8	0.73	0.78	0.91	30.4
Approach		520	2.0	547	2.0	0.707	22.1	LOS C	5.1	128.3	0.80	1.00	1.50	28.0
West: Elligsen Rd														
5	L2	105	2.0	111	2.0	0.839	37.2	LOS D	8.1	206.5	0.90	1.36	2.49	23.2
2	T1	195	2.0	205	2.0	0.839	37.2	LOS D	8.1	206.5	0.90	1.36	2.49	23.2
12	R2	120	2.0	126	2.0	0.839	42.9	LOS D	8.1	206.5	0.90	1.36	2.49	22.7
Approach		420	2.0	442	2.0	0.839	38.8	LOS D	8.1	206.5	0.90	1.36	2.49	23.0
All Vehicles		2565	2.0	2700	2.0	0.839	17.9	LOS B	8.1	206.5	0.73	0.86	1.28	28.7

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
Delay Model: HCM Delay Formula (Geometric Delay is not included).
Queue Model: HCM Queue Formula.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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HCM 6th Signalized Intersection Summary
6: Parkway Ave & Boeckman Rd

WV Frog Pond East & South Master Plan
Future 2040 Build

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	145	305	315	75	340	30	200	220	65	35	385	260
Future Volume (veh/h)	145	305	315	75	340	30	200	220	65	35	385	260
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.97	0.99		0.96	1.00		0.99	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1870	1900	1900	1885	1900	1900	1900	1900
Adj Flow Rate, veh/h	153	321	105	79	358	24	211	232	57	37	405	247
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0	0	2	0	0	1	0	0	0	0
Cap, veh/h	330	554	177	282	563	38	330	706	173	575	468	286
Arrive On Green	0.09	0.21	0.20	0.05	0.17	0.16	0.09	0.48	0.48	0.03	0.42	0.42
Sat Flow, veh/h	1810	2664	853	1810	3371	225	1810	1457	358	1810	1104	673
Grp Volume(v), veh/h	153	215	211	79	188	194	211	0	289	37	0	652
Grp Sat Flow(s),veh/h/ln	1810	1805	1712	1810	1777	1819	1810	0	1814	1810	0	1777
Q Serve(g_s), s	4.8	7.5	7.8	2.5	6.9	7.0	4.3	0.0	6.9	0.8	0.0	23.5
Cycle Q Clear(g_c), s	4.8	7.5	7.8	2.5	6.9	7.0	4.3	0.0	6.9	0.8	0.0	23.5
Prop In Lane	1.00		0.50	1.00		0.12	1.00		0.20	1.00		0.38
Lane Grp Cap(c), veh/h	330	375	356	282	297	304	330	0	879	575	0	754
V/C Ratio(X)	0.46	0.57	0.59	0.28	0.63	0.64	0.64	0.00	0.33	0.06	0.00	0.87
Avail Cap(c_a), veh/h	369	580	550	395	571	584	374	0	913	727	0	894
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	21.3	25.1	25.3	23.1	27.3	27.4	14.7	0.0	11.2	11.1	0.0	18.5
Incr Delay (d2), s/veh	0.8	1.0	1.2	0.4	1.7	1.7	2.6	0.0	0.3	0.0	0.0	8.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.9	3.1	3.0	1.0	2.9	3.0	1.6	0.0	2.4	0.3	0.0	10.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	22.1	26.1	26.5	23.5	29.0	29.0	17.2	0.0	11.5	11.1	0.0	26.9
LnGrp LOS	C	C	C	C	C	C	B	A	B	B	A	C
Approach Vol, veh/h		579			461			500			689	
Approach Delay, s/veh		25.2			28.1			13.9			26.1	
Approach LOS		C			C			B			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	10.3	33.9	7.6	18.6	6.1	38.1	10.5	15.8
Change Period (Y+Rc), s	4.0	4.5	4.0	4.5	4.0	4.5	4.0	4.5
Max Green Setting (Gmax), s	6.3	34.9	8.0	22.1	8.0	34.9	8.0	22.1
Max Q Clear Time (g_c+I1), s	6.3	25.5	4.5	9.8	2.8	8.9	6.8	9.0
Green Ext Time (p_c), s	0.1	3.8	0.0	1.5	0.0	2.4	0.0	1.4

Intersection Summary	
HCM 6th Ctrl Delay	23.5
HCM 6th LOS	C

HCM 6th Signalized Intersection Summary
7: Canyon Creek Rd & Boeckman Rd

WV Frog Pond East & South Master Plan
Future 2040 Build

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	55	265	45	85	330	70	40	120	105	115	165	75
Future Volume (veh/h)	55	265	45	85	330	70	40	120	105	115	165	75
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	0.99		0.99	0.99		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1900	1870	1870	1870	1856	1826	1900	1856	1900	1900	1885	1900
Adj Flow Rate, veh/h	61	294	42	94	367	69	44	133	76	128	183	63
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	0	2	2	2	3	5	0	3	0	0	1	0
Cap, veh/h	335	481	69	414	478	90	345	205	117	390	307	106
Arrive On Green	0.05	0.30	0.29	0.06	0.32	0.30	0.04	0.19	0.17	0.08	0.23	0.22
Sat Flow, veh/h	1810	1600	229	1781	1518	285	1810	1103	630	1810	1328	457
Grp Volume(v), veh/h	61	0	336	94	0	436	44	0	209	128	0	246
Grp Sat Flow(s),veh/h/ln	1810	0	1828	1781	0	1803	1810	0	1733	1810	0	1786
Q Serve(g_s), s	1.0	0.0	6.9	1.6	0.0	9.5	0.9	0.0	4.9	2.5	0.0	5.4
Cycle Q Clear(g_c), s	1.0	0.0	6.9	1.6	0.0	9.5	0.9	0.0	4.9	2.5	0.0	5.4
Prop In Lane	1.00		0.13	1.00		0.16	1.00		0.36	1.00		0.26
Lane Grp Cap(c), veh/h	335	0	550	414	0	568	345	0	323	390	0	412
V/C Ratio(X)	0.18	0.00	0.61	0.23	0.00	0.77	0.13	0.00	0.65	0.33	0.00	0.60
Avail Cap(c_a), veh/h	581	0	1388	631	0	1369	609	0	997	573	0	1027
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	10.9	0.0	13.1	10.2	0.0	13.5	14.0	0.0	16.5	13.2	0.0	15.0
Incr Delay (d2), s/veh	0.3	0.0	1.1	0.3	0.0	2.2	0.2	0.0	2.2	0.5	0.0	1.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	0.0	2.3	0.5	0.0	3.2	0.3	0.0	1.9	0.9	0.0	1.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	11.1	0.0	14.2	10.5	0.0	15.7	14.1	0.0	18.6	13.7	0.0	16.4
LnGrp LOS	B	A	B	B	A	B	B	A	B	B	A	B
Approach Vol, veh/h		397			530			253			374	
Approach Delay, s/veh		13.7			14.8			17.9			15.4	
Approach LOS		B			B			B			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	7.6	12.1	6.7	17.1	5.6	14.0	6.1	17.7
Change Period (Y+Rc), s	4.0	4.5	4.0	4.5	4.0	4.5	4.0	4.5
Max Green Setting (Gmax), s	8.0	24.5	8.0	32.5	8.0	24.5	8.0	32.5
Max Q Clear Time (g_c+I1), s	4.5	6.9	3.6	8.9	2.9	7.4	3.0	11.5
Green Ext Time (p_c), s	0.1	0.7	0.1	1.3	0.0	0.8	0.0	1.7

Intersection Summary	
HCM 6th Ctrl Delay	15.2
HCM 6th LOS	B

HCM 6th Signalized Intersection Summary
8: Wilsonville Rd/Stafford Rd & Boeckman Rd/Advance Rd

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	205	70	115	60	60	30	100	225	65	45	465	330
Future Volume (veh/h)	205	70	115	60	60	30	100	225	65	45	465	330
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.92		0.90	0.87		0.85	1.00		0.98	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1885	1870	1885	1826	1900	1900	1885	1885	1870	1826	1885	1856
Adj Flow Rate, veh/h	207	71	20	61	61	8	101	227	56	45	470	308
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Percent Heavy Veh, %	1	2	1	5	0	0	1	1	2	5	1	3
Cap, veh/h	427	358	275	307	175	23	238	728	180	589	516	338
Arrive On Green	0.13	0.19	0.19	0.05	0.11	0.10	0.05	0.50	0.49	0.03	0.49	0.48
Sat Flow, veh/h	1795	1870	1436	1739	1607	211	1795	1452	358	1739	1062	696
Grp Volume(v), veh/h	207	71	20	61	0	69	101	0	283	45	0	778
Grp Sat Flow(s),veh/h/ln	1795	1870	1436	1739	0	1817	1795	0	1810	1739	0	1758
Q Serve(g_s), s	6.8	2.3	0.8	2.2	0.0	2.5	2.0	0.0	6.6	0.9	0.0	28.9
Cycle Q Clear(g_c), s	6.8	2.3	0.8	2.2	0.0	2.5	2.0	0.0	6.6	0.9	0.0	28.9
Prop In Lane	1.00		1.00	1.00		0.12	1.00		0.20	1.00		0.40
Lane Grp Cap(c), veh/h	427	358	275	307	0	198	238	0	907	589	0	854
V/C Ratio(X)	0.48	0.20	0.07	0.20	0.00	0.35	0.42	0.00	0.31	0.08	0.00	0.91
Avail Cap(c_a), veh/h	490	624	479	336	0	424	252	0	1069	629	0	1038
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	21.6	24.1	23.5	26.1	0.0	29.2	15.3	0.0	10.5	8.9	0.0	16.9
Incr Delay (d2), s/veh	0.6	0.2	0.1	0.2	0.0	0.8	0.9	0.0	0.2	0.0	0.0	10.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.7	1.0	0.3	0.9	0.0	1.1	0.7	0.0	2.3	0.3	0.0	12.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	22.3	24.3	23.6	26.3	0.0	30.0	16.2	0.0	10.7	8.9	0.0	27.3
LnGrp LOS	C	C	C	C	A	C	B	A	B	A	A	C
Approach Vol, veh/h		298			130			384			823	
Approach Delay, s/veh		22.8			28.3			12.1			26.3	
Approach LOS		C			C			B			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	7.5	38.4	13.2	11.7	6.3	39.5	7.4	17.5
Change Period (Y+Rc), s	4.0	4.5	4.5	4.5	4.0	4.5	4.5	4.5
Max Green Setting (Gmax), s	4.0	41.3	11.2	16.0	4.0	41.3	4.1	23.1
Max Q Clear Time (g_c+I1), s	4.0	30.9	8.8	4.5	2.9	8.6	4.2	4.3
Green Ext Time (p_c), s	0.0	3.0	0.1	0.1	0.0	1.1	0.0	0.2

Intersection Summary	
HCM 6th Ctrl Delay	22.5
HCM 6th LOS	C

Intersection	
Int Delay, s/veh	4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	5	100	25	5	95	25	30	30	5	30	30	5
Future Vol, veh/h	5	100	25	5	95	25	30	30	5	30	30	5
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	0	1	12	0	1	0	7	0	0	0	0	0
Mvmt Flow	6	111	28	6	106	28	33	33	6	33	33	6

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	134	0	0	139	0	0	289	283	125	289	283	120
Stage 1	-	-	-	-	-	-	137	137	-	132	132	-
Stage 2	-	-	-	-	-	-	152	146	-	157	151	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.17	6.5	6.2	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.17	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.17	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.563	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	1463	-	-	1457	-	-	653	629	931	667	629	937
Stage 1	-	-	-	-	-	-	854	787	-	876	791	-
Stage 2	-	-	-	-	-	-	839	780	-	850	776	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1463	-	-	1457	-	-	619	624	931	632	624	937
Mov Cap-2 Maneuver	-	-	-	-	-	-	619	624	-	632	624	-
Stage 1	-	-	-	-	-	-	851	784	-	872	788	-
Stage 2	-	-	-	-	-	-	796	777	-	806	773	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.3	0.3	11.4	11.3
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	638	1463	-	-	1457	-	-	644
HCM Lane V/C Ratio	0.113	0.004	-	-	0.004	-	-	0.112
HCM Control Delay (s)	11.4	7.5	0	-	7.5	0	-	11.3
HCM Lane LOS	B	A	A	-	A	A	-	B
HCM 95th %tile Q(veh)	0.4	0	-	-	0	-	-	0.4

Intersection	
Int Delay, s/veh	4.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	25	5	15	20	10	20	15	400	45	70	805	45
Future Vol, veh/h	25	5	15	20	10	20	15	400	45	70	805	45
Conflicting Peds, #/hr	0	0	0	0	0	0	2	0	0	0	0	2
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0	10	0	0	0	2	0
Mvmt Flow	27	5	16	22	11	22	16	435	49	76	875	49

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1562	1570	902	1554	1570	460	926	0	0	484	0	0
Stage 1	1054	1054	-	492	492	-	-	-	-	-	-	-
Stage 2	508	516	-	1062	1078	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.1	6.5	6.2	4.2	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.29	-	-	2.2	-	-
Pot Cap-1 Maneuver	92	112	339	93	112	605	706	-	-	1089	-	-
Stage 1	276	305	-	562	551	-	-	-	-	-	-	-
Stage 2	551	538	-	273	297	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	70	93	338	74	93	605	705	-	-	1089	-	-
Mov Cap-2 Maneuver	70	93	-	74	93	-	-	-	-	-	-	-
Stage 1	267	260	-	545	534	-	-	-	-	-	-	-
Stage 2	504	521	-	218	253	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	72.6	56.3	0.3	0.7
HCM LOS	F	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	705	-	-	99	122	1089	-	-
HCM Lane V/C Ratio	0.023	-	-	0.494	0.445	0.07	-	-
HCM Control Delay (s)	10.2	0	-	72.6	56.3	8.6	0	-
HCM Lane LOS	B	A	-	F	F	A	A	-
HCM 95th %tile Q(veh)	0.1	-	-	2.2	2	0.2	-	-

Intersection	
Int Delay, s/veh	36.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	75	10	10	10	10	50	5	420	20	85	900	100
Future Vol, veh/h	75	10	10	10	10	50	5	420	20	85	900	100
Conflicting Peds, #/hr	0	0	0	0	0	0	2	0	0	0	0	2
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	2	10
Mvmt Flow	82	11	11	11	11	54	5	457	22	92	978	109

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1730	1708	1035	1706	1751	468	1089	0	0	479	0	0
Stage 1	1219	1219	-	478	478	-	-	-	-	-	-	-
Stage 2	511	489	-	1228	1273	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.1	6.5	6.2	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	~ 70	92	284	73	87	599	648	-	-	1094	-	-
Stage 1	223	255	-	572	559	-	-	-	-	-	-	-
Stage 2	549	553	-	220	241	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	~ 46	71	284	51	67	599	647	-	-	1094	-	-
Mov Cap-2 Maneuver	~ 46	71	-	51	67	-	-	-	-	-	-	-
Stage 1	220	199	-	566	553	-	-	-	-	-	-	-
Stage 2	484	547	-	156	188	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	$ 610.5	45.1	0.1	0.7
HCM LOS	F	E		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	647	-	-	53	163	1094	-	-
HCM Lane V/C Ratio	0.008	-	-	1.948	0.467	0.084	-	-
HCM Control Delay (s)	10.6	0	-	$ 610.5	45.1	8.6	0	-
HCM Lane LOS	B	A	-	F	E	A	A	-
HCM 95th %tile Q(veh)	0	-	-	10.1	2.2	0.3	-	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Int Delay, s/veh	1.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	10	5	5	5	5	10	5	535	5	10	1075	10
Future Vol, veh/h	10	5	5	5	5	10	5	535	5	10	1075	10
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0	0	2	0	0	2	0
Mvmt Flow	11	5	5	5	5	11	5	582	5	11	1168	11

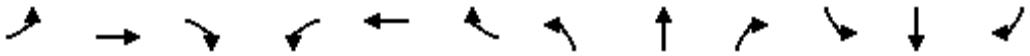
Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1799	1793	1174	1796	1796	585	1179	0	0	587	0	0
Stage 1	1196	1196	-	595	595	-	-	-	-	-	-	-
Stage 2	603	597	-	1201	1201	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.1	6.5	6.2	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	63	82	236	63	81	515	600	-	-	998	-	-
Stage 1	229	262	-	494	496	-	-	-	-	-	-	-
Stage 2	489	495	-	228	260	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	56	78	236	56	77	515	600	-	-	998	-	-
Mov Cap-2 Maneuver	56	78	-	56	77	-	-	-	-	-	-	-
Stage 1	226	254	-	488	490	-	-	-	-	-	-	-
Stage 2	468	489	-	211	252	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	70.3	43.5	0.1	0.1
HCM LOS	F	E		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	600	-	-	76	115	998	-	-
HCM Lane V/C Ratio	0.009	-	-	0.286	0.189	0.011	-	-
HCM Control Delay (s)	11.1	0	-	70.3	43.5	8.6	0	-
HCM Lane LOS	B	A	-	F	E	A	A	-
HCM 95th %tile Q(veh)	0	-	-	1	0.7	0	-	-

HCM 6th Signalized Intersection Summary
13: I-5 SB Ramp & Wilsonville Rd

WV Frog Pond East & South Master Plan
Future 2040 Build



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	820	655	540	1015	0	0	0	0	80	5	115
Future Volume (veh/h)	0	820	655	540	1015	0	0	0	0	80	5	115
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Work Zone On Approach		No			No						No	
Adj Sat Flow, veh/h/ln	0	1870	1856	1870	1856	0				1856	1900	1856
Adj Flow Rate, veh/h	0	863	0	568	1068	0				88	0	13
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95				0.95	0.95	0.95
Percent Heavy Veh, %	0	2	3	2	3	0				3	0	3
Cap, veh/h	0	3331		644	3086	0				184	0	158
Arrive On Green	0.00	0.65	0.00	0.37	1.00	0.00				0.05	0.00	0.05
Sat Flow, veh/h	0	5274	1572	3456	3618	0				3534	0	3039
Grp Volume(v), veh/h	0	863	0	568	1068	0				88	0	13
Grp Sat Flow(s),veh/h/ln	0	1702	1572	1728	1763	0				1767	0	1520
Q Serve(g_s), s	0.0	7.8	0.0	16.9	0.0	0.0				2.7	0.0	0.4
Cycle Q Clear(g_c), s	0.0	7.8	0.0	16.9	0.0	0.0				2.7	0.0	0.4
Prop In Lane	0.00		1.00	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	3331		644	3086	0				184	0	158
V/C Ratio(X)	0.00	0.26		0.88	0.35	0.00				0.48	0.00	0.08
Avail Cap(c_a), veh/h	0	3331		817	3086	0				610	0	525
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	0.00	0.88	0.88	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	8.0	0.0	33.4	0.0	0.0				50.7	0.0	49.6
Incr Delay (d2), s/veh	0.0	0.2	0.0	8.3	0.3	0.0				1.9	0.0	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	2.7	0.0	6.2	0.1	0.0				1.2	0.0	0.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	8.2	0.0	41.6	0.3	0.0				52.6	0.0	49.9
LnGrp LOS	A	A		D	A	A				D	A	D
Approach Vol, veh/h		863			1636						101	
Approach Delay, s/veh		8.2			14.6						52.3	
Approach LOS		A			B						D	

Timer - Assigned Phs	1	2		4		6
Phs Duration (G+Y+Rc), s	24.5	75.8		9.7		100.3
Change Period (Y+Rc), s	4.0	4.0		4.0		4.0
Max Green Setting (Gmax), s	26.0	53.0		19.0		75.0
Max Q Clear Time (g_c+I1), s	18.9	9.8		4.7		2.0
Green Ext Time (p_c), s	1.6	4.6		0.3		6.3

Intersection Summary		
HCM 6th Ctrl Delay		14.0
HCM 6th LOS		B

Notes

User approved volume balancing among the lanes for turning movement.

Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and intersection delay.

HCM 6th Signalized Intersection Summary
14: I-5 NB Ramp & Wilsonville Rd

WV Frog Pond East & South Master Plan
Future 2040 Build

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	360	540	0	0	1100	335	455	10	505	0	0	0
Future Volume (veh/h)	360	540	0	0	1100	335	455	10	505	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.99			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Work Zone On Approach		No			No			No				
Adj Sat Flow, veh/h/ln	1870	1870	0	0	1870	1885	1826	1900	1870			
Adj Flow Rate, veh/h	375	562	0	0	1146	0	481	0	264			
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96			
Percent Heavy Veh, %	2	2	0	0	2	1	5	0	2			
Cap, veh/h	446	2680	0	0	3006		602	0	541			
Arrive On Green	0.26	1.00	0.00	0.00	0.59	0.00	0.17	0.00	0.17			
Sat Flow, veh/h	3456	3647	0	0	5274	1598	3478	0	3124			
Grp Volume(v), veh/h	375	562	0	0	1146	0	481	0	264			
Grp Sat Flow(s),veh/h/ln	1728	1777	0	0	1702	1598	1739	0	1562			
Q Serve(g_s), s	11.3	0.0	0.0	0.0	13.1	0.0	14.6	0.0	8.4			
Cycle Q Clear(g_c), s	11.3	0.0	0.0	0.0	13.1	0.0	14.6	0.0	8.4			
Prop In Lane	1.00		0.00	0.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	446	2680	0	0	3006		602	0	541			
V/C Ratio(X)	0.84	0.21	0.00	0.00	0.38		0.80	0.00	0.49			
Avail Cap(c_a), veh/h	723	2680	0	0	3006		1043	0	937			
HCM Platoon Ratio	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	0.97	0.97	0.00	0.00	0.23	0.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	39.7	0.0	0.0	0.0	12.0	0.0	43.6	0.0	41.1			
Incr Delay (d2), s/veh	3.3	0.2	0.0	0.0	0.1	0.0	1.5	0.0	0.4			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	4.3	0.1	0.0	0.0	4.7	0.0	6.3	0.0	3.2			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	43.0	0.2	0.0	0.0	12.1	0.0	45.2	0.0	41.5			
LnGrp LOS	D	A	A	A	B		D	A	D			
Approach Vol, veh/h		937			1146			745				
Approach Delay, s/veh		17.3			12.1			43.9				
Approach LOS		B			B			D				
Timer - Assigned Phs		2			5	6		8				
Phs Duration (G+Y+Rc), s		87.0			18.2	68.8		23.0				
Change Period (Y+Rc), s		4.0			4.0	4.0		4.0				
Max Green Setting (Gmax), s		52.0			23.0	42.0		33.0				
Max Q Clear Time (g_c+I1), s		2.0			13.3	15.1		16.6				
Green Ext Time (p_c), s		6.1			0.9	12.3		2.4				

Intersection Summary	
HCM 6th Ctrl Delay	22.2
HCM 6th LOS	C

Notes

User approved volume balancing among the lanes for turning movement.

Unsignalized Delay for [WBR] is excluded from calculations of the approach delay and intersection delay.

HCM 6th Signalized Intersection Summary
15: Town Center Lp West & Wilsonville Rd

WV Frog Pond East & South Master Plan
Future 2040 Build

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	930	115	0	865	50	195	25	90	65	125	375
Future Volume (veh/h)	0	930	115	0	865	50	195	25	90	65	125	375
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.97	1.00		0.99	1.00		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	0	1870	1870	0	1885	1900	1885	1900	1900	1900	1900	1870
Adj Flow Rate, veh/h	0	979	106	0	911	49	205	26	39	68	132	353
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	2	2	0	1	0	1	0	0	0	0	2
Cap, veh/h	0	1396	151	0	1031	55	237	370	555	96	208	557
Arrive On Green	0.00	0.10	0.10	0.00	0.30	0.29	0.13	0.54	0.54	0.05	0.46	0.46
Sat Flow, veh/h	0	4841	505	0	3545	186	1795	681	1021	1810	448	1198
Grp Volume(v), veh/h	0	713	372	0	473	487	205	0	65	68	0	485
Grp Sat Flow(s),veh/h/ln	0	1702	1773	0	1791	1845	1795	0	1701	1810	0	1646
Q Serve(g_s), s	0.0	22.3	22.4	0.0	27.7	27.7	12.3	0.0	2.0	4.1	0.0	24.6
Cycle Q Clear(g_c), s	0.0	22.3	22.4	0.0	27.7	27.7	12.3	0.0	2.0	4.1	0.0	24.6
Prop In Lane	0.00		0.28	0.00		0.10	1.00		0.60	1.00		0.73
Lane Grp Cap(c), veh/h	0	1017	530	0	535	551	237	0	925	96	0	765
V/C Ratio(X)	0.00	0.70	0.70	0.00	0.88	0.88	0.87	0.00	0.07	0.71	0.00	0.63
Avail Cap(c_a), veh/h	0	1331	693	0	700	721	237	0	925	156	0	765
HCM Platoon Ratio	1.00	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	0.95	0.95	0.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	44.8	44.9	0.0	36.7	36.8	46.8	0.0	12.0	51.2	0.0	22.3
Incr Delay (d2), s/veh	0.0	0.9	1.7	0.0	9.8	9.5	26.9	0.0	0.1	9.2	0.0	4.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	10.3	10.9	0.0	13.2	13.6	7.3	0.0	0.8	2.1	0.0	10.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	45.7	46.5	0.0	46.5	46.3	73.7	0.0	12.1	60.4	0.0	26.3
LnGrp LOS	A	D	D	A	D	D	E	A	B	E	A	C
Approach Vol, veh/h		1085			960			270			553	
Approach Delay, s/veh		46.0			46.4			58.9			30.5	
Approach LOS		D			D			E			C	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	9.3	63.8		36.9	18.0	55.1		36.9
Change Period (Y+Rc), s	4.0	4.5		4.5	4.0	4.5		4.5
Max Green Setting (Gmax), s	5.3	45.5		42.5	14.0	40.5		42.5
Max Q Clear Time (g_c+I1), s	6.1	4.0		24.4	14.3	26.6		29.7
Green Ext Time (p_c), s	0.0	0.2		3.8	0.0	1.5		2.7

Intersection Summary		
HCM 6th Ctrl Delay		44.3
HCM 6th LOS		D

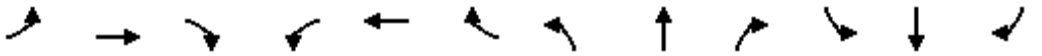
ID	Software/Method	Intersection	Control Type	LOS	Delay	V/C Ratio
1	Synchro HCM 6th Signal	I-5 SB Ramp & Elligsen Rd	Signal	B	18.1	0.73
2	Synchro HCM 6th Signal	I-5 NB Ramp & Elligsen Rd	Signal	A	9.3	0.45
3	Synchro HCM 6th Signal	Parkway Ave & Elligsen Rd	Signal	C	24.4	0.52
4	Synchro HCM 6th Signal	Parkway Center Dr & Elligsen Rd	Signal	B	16.9	0.55
6	Synchro HCM 6th Signal	Parkway Ave & Boeckman Rd	Signal	C	23.5	0.82
7	Synchro HCM 6th Signal	Canyon Creek Rd & Boeckman Rd	Signal	B	15.2	0.57
8	Synchro HCM 6th Signal	Wilsonville Rd/Stafford Rd & Boeckman Rd/	Signal	C	22.5	0.79
13	Synchro HCM 6th Signal	I-5 SB Ramp & Wilsonville Rd	Signal	B	14.0	0.40
14	Synchro HCM 6th Signal	I-5 NB Ramp & Wilsonville Rd	Signal	C	22.2	0.52
15	Synchro HCM 6th Signal	Town Center Lp West & Wilsonville Rd	Signal	D	44.3	0.82

DRAFT

ANTICIPATED BUILD 2040 HCM REPORTS

HCM 6th Signalized Intersection Summary
1: I-5 SB Ramp & Elligsen Rd

WV Frog Pond East & South Master Plan
Future 2040 Build



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	1325	1105	0	1030	370	0	0	0	480	70	830
Future Volume (veh/h)	0	1325	1105	0	1030	370	0	0	0	480	70	830
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Work Zone On Approach		No			No						No	
Adj Sat Flow, veh/h/ln	0	1826	1856	0	1826	1900				1856	1870	1678
Adj Flow Rate, veh/h	0	1395	0	0	1084	0				558	0	798
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95				0.95	0.95	0.95
Percent Heavy Veh, %	0	5	3	0	5	0				3	2	15
Cap, veh/h	0	2019		0	2019					1208	0	951
Arrive On Green	0.00	0.58	0.00	0.00	1.00	0.00				0.34	0.00	0.34
Sat Flow, veh/h	0	3561	1572	0	3561	1610				3534	0	2784
Grp Volume(v), veh/h	0	1395	0	0	1084	0				558	0	798
Grp Sat Flow(s),veh/h/ln	0	1735	1572	0	1735	1610				1767	0	1392
Q Serve(g_s), s	0.0	29.5	0.0	0.0	0.0	0.0				13.0	0.0	27.8
Cycle Q Clear(g_c), s	0.0	29.5	0.0	0.0	0.0	0.0				13.0	0.0	27.8
Prop In Lane	0.00		1.00	0.00		1.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	2019		0	2019					1208	0	951
V/C Ratio(X)	0.00	0.69		0.00	0.54					0.46	0.00	0.84
Avail Cap(c_a), veh/h	0	2019		0	2019					1447	0	1140
HCM Platoon Ratio	1.00	1.00	1.00	1.00	2.00	2.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	0.00	0.00	0.86	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	15.3	0.0	0.0	0.0	0.0				27.0	0.0	31.9
Incr Delay (d2), s/veh	0.0	2.0	0.0	0.0	0.9	0.0				0.3	0.0	4.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	11.1	0.0	0.0	0.2	0.0				5.4	0.0	9.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	17.3	0.0	0.0	0.9	0.0				27.3	0.0	36.8
LnGrp LOS	A	B		A	A					C	A	D
Approach Vol, veh/h		1395			1084						1356	
Approach Delay, s/veh		17.3			0.9						32.9	
Approach LOS		B			A						C	

Timer - Assigned Phs	2	4	6
Phs Duration (G+Y+Rc), s	65.1	39.9	65.1
Change Period (Y+Rc), s	5.0	4.0	5.0
Max Green Setting (Gmax), s	53.0	43.0	53.0
Max Q Clear Time (g_c+I1), s	31.5	29.8	2.0
Green Ext Time (p_c), s	7.8	6.1	6.4

Intersection Summary	
HCM 6th Ctrl Delay	18.2
HCM 6th LOS	B

Notes

User approved volume balancing among the lanes for turning movement.

User approved changes to right turn type.

Unsignalized Delay for [EBR, WBR] is excluded from calculations of the approach delay and intersection delay.

HCM 6th Signalized Intersection Summary
2: I-5 NB Ramp & Elligsen Rd

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↱		↑↑	↱	↰↰		↱			
Traffic Volume (veh/h)	0	915	890	0	925	535	475	0	275	0	0	0
Future Volume (veh/h)	0	915	890	0	925	535	475	0	275	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Work Zone On Approach		No			No			No				
Adj Sat Flow, veh/h/ln	0	1870	1826	0	1870	1870	1826	0	1856			
Adj Flow Rate, veh/h	0	953	0	0	964	0	495	0	0			
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96			
Percent Heavy Veh, %	0	2	5	0	2	2	5	0	3			
Cap, veh/h	0	2603		0	2603		613	0				
Arrive On Green	0.00	1.00	0.00	0.00	1.00	0.00	0.18	0.00	0.00			
Sat Flow, veh/h	0	3647	1547	0	3647	1585	3374	0	1572			
Grp Volume(v), veh/h	0	953	0	0	964	0	495	0	0			
Grp Sat Flow(s),veh/h/ln	0	1777	1547	0	1777	1585	1687	0	1572			
Q Serve(g_s), s	0.0	0.0	0.0	0.0	0.0	0.0	14.8	0.0	0.0			
Cycle Q Clear(g_c), s	0.0	0.0	0.0	0.0	0.0	0.0	14.8	0.0	0.0			
Prop In Lane	0.00		1.00	0.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	0	2603		0	2603		613	0				
V/C Ratio(X)	0.00	0.37		0.00	0.37		0.81	0.00				
Avail Cap(c_a), veh/h	0	2603		0	2603		1253	0				
HCM Platoon Ratio	1.00	2.00	2.00	1.00	2.00	2.00	1.00	1.00	1.00			
Upstream Filter(I)	0.00	0.67	0.00	0.00	0.85	0.00	1.00	0.00	0.00			
Uniform Delay (d), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	41.2	0.0	0.0			
Incr Delay (d2), s/veh	0.0	0.3	0.0	0.0	0.3	0.0	2.6	0.0	0.0			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	0.0	0.1	0.0	0.0	0.1	0.0	6.2	0.0	0.0			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	0.3	0.0	0.0	0.3	0.0	43.8	0.0	0.0			
LnGrp LOS	A	A		A	A		D	A				
Approach Vol, veh/h		953			964			495				
Approach Delay, s/veh		0.3			0.3			43.8				
Approach LOS		A			A			D				

Timer - Assigned Phs	2				6		8					
Phs Duration (G+Y+Rc), s	81.9				81.9		23.1					
Change Period (Y+Rc), s	5.0				5.0		4.0					
Max Green Setting (Gmax), s	57.0				57.0		39.0					
Max Q Clear Time (g_c+I1), s	2.0				2.0		16.8					
Green Ext Time (p_c), s	5.3				5.4		2.3					

Intersection Summary	
HCM 6th Ctrl Delay	9.2
HCM 6th LOS	A

Notes

Unsignalized Delay for [NBR, EBR, WBR] is excluded from calculations of the approach delay and intersection delay.

HCM 6th Signalized Intersection Summary
3: Parkway Ave & Elligsen Rd

WV Frog Pond East & South Master Plan
Future 2040 Build

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	85	635	470	50	800	45	460	30	55	70	20	200
Future Volume (veh/h)	85	635	470	50	800	45	460	30	55	70	20	200
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1826	1900	1900	1856	1900	1870	1900	1900	1678	1411	1841
Adj Flow Rate, veh/h	93	698	314	55	879	44	529	0	8	77	22	2
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	2	5	0	0	3	0	2	0	0	15	33	4
Cap, veh/h	117	1839	1142	72	2492	124	640	0	289	103	82	7
Arrive On Green	0.13	1.00	1.00	0.01	0.17	0.17	0.18	0.00	0.18	0.06	0.06	0.06
Sat Flow, veh/h	1781	3469	1609	1810	4941	247	3563	0	1610	1598	1274	116
Grp Volume(v), veh/h	93	698	314	55	600	323	529	0	8	77	0	24
Grp Sat Flow(s),veh/h/ln	1781	1735	1609	1810	1689	1811	1781	0	1610	1598	0	1390
Q Serve(g_s), s	5.3	0.0	0.0	3.2	16.5	16.6	15.0	0.0	0.4	5.0	0.0	1.7
Cycle Q Clear(g_c), s	5.3	0.0	0.0	3.2	16.5	16.6	15.0	0.0	0.4	5.0	0.0	1.7
Prop In Lane	1.00		1.00	1.00		0.14	1.00		1.00	1.00		0.08
Lane Grp Cap(c), veh/h	117	1839	1142	72	1703	913	640	0	289	103	0	90
V/C Ratio(X)	0.79	0.38	0.27	0.76	0.35	0.35	0.83	0.00	0.03	0.75	0.00	0.27
Avail Cap(c_a), veh/h	204	1839	1142	267	1703	913	882	0	399	228	0	199
HCM Platoon Ratio	2.00	2.00	2.00	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.89	0.89	0.89	0.87	0.87	0.87	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	44.9	0.0	0.0	51.3	28.6	28.6	41.5	0.0	35.5	48.3	0.0	46.8
Incr Delay (d2), s/veh	10.2	0.5	0.5	13.2	0.5	0.9	4.7	0.0	0.0	10.3	0.0	1.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.5	0.1	0.2	1.7	7.5	8.2	7.0	0.0	0.2	2.3	0.0	0.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	55.1	0.5	0.5	64.5	29.1	29.5	46.2	0.0	35.5	58.6	0.0	48.3
LnGrp LOS	E	A	A	E	C	C	D	A	D	E	A	D
Approach Vol, veh/h		1105			978			537			101	
Approach Delay, s/veh		5.1			31.2			46.0			56.2	
Approach LOS		A			C			D			E	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	8.7	60.7		11.8	11.4	58.0		23.9				
Change Period (Y+Rc), s	4.5	5.0		5.0	4.5	5.0		5.0				
Max Green Setting (Gmax), s	15.5	29.0		15.0	12.0	32.5		26.0				
Max Q Clear Time (g_c+I1), s	5.2	2.0		7.0	7.3	18.6		17.0				
Green Ext Time (p_c), s	0.1	5.1		0.2	0.1	3.6		1.8				

Intersection Summary	
HCM 6th Ctrl Delay	24.5
HCM 6th LOS	C

Notes

User approved volume balancing among the lanes for turning movement.

HCM 6th Signalized Intersection Summary
4: Parkway Center Dr & Elligsen Rd

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	35	445	280	125	465	5	415	5	110	5	5	15
Future Volume (veh/h)	35	445	280	125	465	5	415	5	110	5	5	15
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1900	1900	1870	1856	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	38	478	206	134	500	5	446	5	13	5	5	0
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	0	0	2	3	0	0	0	0	0	0	0	0
Cap, veh/h	659	1100	1164	587	2254	23	546	72	188	27	27	0
Arrive On Green	0.06	0.77	0.77	0.08	0.62	0.62	0.16	0.16	0.16	0.01	0.03	0.00
Sat Flow, veh/h	1810	1900	1584	1767	3662	37	3510	466	1211	927	927	0
Grp Volume(v), veh/h	38	478	206	134	246	259	446	0	18	10	0	0
Grp Sat Flow(s),veh/h/ln	1810	1900	1584	1767	1805	1893	1755	0	1677	1854	0	0
Q Serve(g_s), s	0.8	9.1	2.4	2.8	6.4	6.4	12.9	0.0	1.0	0.6	0.0	0.0
Cycle Q Clear(g_c), s	0.8	9.1	2.4	2.8	6.4	6.4	12.9	0.0	1.0	0.6	0.0	0.0
Prop In Lane	1.00		1.00	1.00		0.02	1.00		0.72	0.50		0.00
Lane Grp Cap(c), veh/h	659	1100	1164	587	1111	1165	546	0	261	53	0	0
V/C Ratio(X)	0.06	0.43	0.18	0.23	0.22	0.22	0.82	0.00	0.07	0.19	0.00	0.00
Avail Cap(c_a), veh/h	727	1100	1164	590	1111	1165	903	0	431	141	0	0
HCM Platoon Ratio	1.33	1.33	1.33	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.90	0.90	0.90	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	7.4	6.1	2.2	6.5	9.0	9.0	42.9	0.0	37.8	50.2	0.0	0.0
Incr Delay (d2), s/veh	0.0	1.1	0.3	0.1	0.5	0.4	1.2	0.0	0.0	0.6	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	3.1	1.2	0.9	2.5	2.6	5.6	0.0	0.4	0.3	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	7.4	7.2	2.5	6.6	9.4	9.4	44.0	0.0	37.9	50.8	0.0	0.0
LnGrp LOS	A	A	A	A	A	A	D	A	D	D	A	A
Approach Vol, veh/h		722			639			464			10	
Approach Delay, s/veh		5.9			8.8			43.8			50.8	
Approach LOS		A			A			D			D	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	12.8	64.8		7.0	9.0	68.6		20.3
Change Period (Y+Rc), s	5.0	5.0		5.5	5.0	5.0		5.0
Max Green Setting (Gmax), s	8.0	44.0		6.5	8.0	44.0		26.0
Max Q Clear Time (g_c+I1), s	4.8	11.1		2.6	2.8	8.4		14.9
Green Ext Time (p_c), s	0.0	0.6		0.0	0.0	0.4		0.3

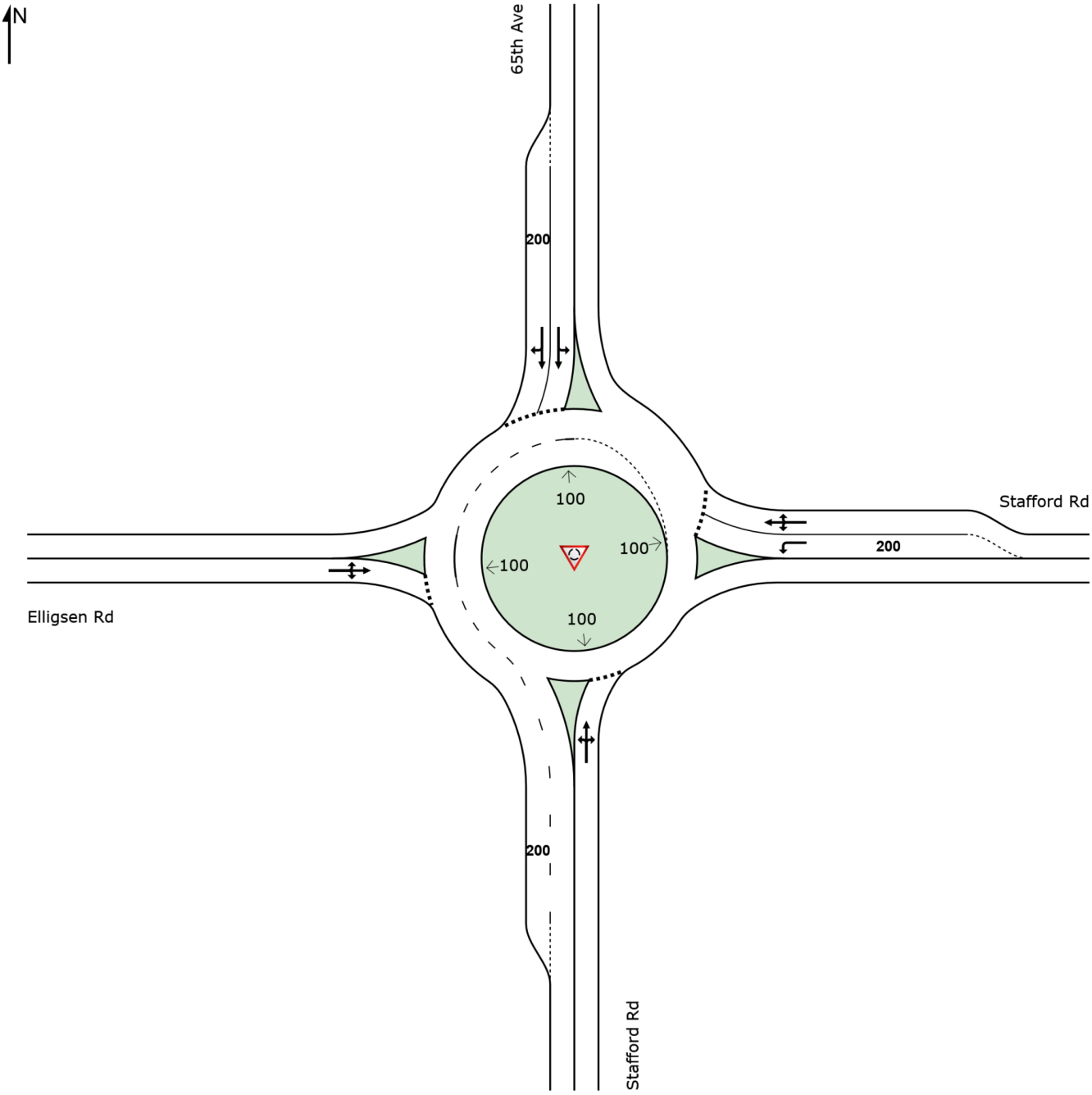
Intersection Summary	
HCM 6th Ctrl Delay	16.8
HCM 6th LOS	B

SITE LAYOUT

Site: [Stafford Rd/65th Ave - Build (Site Folder: Stafford Rd/65th Ave)]

Site Category: -
Roundabout

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



Organisation: DKS ASSOCIATES | Licence: PLUS / Enterprise | Created: Tuesday, August 23, 2022 1:56:54 PM
Project: S:\Projects\2021\21108-000 (Wilsonville Frog Pond East & South Master Plan)\03_Analysis\Synchro\Wilsonville Frog Pond East & South

MOVEMENT SUMMARY

Site: [Stafford Rd/65th Ave - Build (Site Folder: Stafford Rd/65th Ave)]

Site Category: -
Roundabout

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] ft	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed mph
South: Stafford Rd														
3	L2	35	2.0	37	2.0	0.648	13.8	LOS B	7.8	199.0	0.77	0.89	1.22	30.8
8	T1	215	2.0	226	2.0	0.648	13.8	LOS B	7.8	199.0	0.77	0.89	1.22	30.8
18	R2	330	2.0	347	2.0	0.648	13.8	LOS B	7.8	199.0	0.77	0.89	1.22	30.0
Approach		580	2.0	611	2.0	0.648	13.8	LOS B	7.8	199.0	0.77	0.89	1.22	30.3
East: Stafford Rd														
1	L2	585	2.0	616	2.0	0.628	12.8	LOS B	6.8	173.3	0.72	0.84	1.15	29.3
6	T1	425	2.0	447	2.0	0.575	11.4	LOS B	5.2	132.0	0.67	0.74	0.98	32.0
16	R2	110	2.0	116	2.0	0.575	11.4	LOS B	5.2	132.0	0.67	0.74	0.98	31.1
Approach		1120	2.0	1179	2.0	0.628	12.1	LOS B	6.8	173.3	0.70	0.79	1.06	30.5
North: 65th Ave														
7	L2	35	2.0	37	2.0	0.848	37.8	LOS D	8.6	218.1	0.90	1.38	2.56	23.3
4	T1	515	2.0	542	2.0	0.848	33.9	LOS C	8.6	218.1	0.87	1.26	2.21	24.6
14	R2	65	2.0	68	2.0	0.408	14.8	LOS B	1.8	45.4	0.75	0.83	1.04	29.7
Approach		615	2.0	647	2.0	0.848	32.1	LOS C	8.6	218.1	0.86	1.22	2.11	25.0
West: Elligsen Rd														
5	L2	105	2.0	111	2.0	0.831	38.0	LOS D	7.4	188.3	0.91	1.34	2.44	23.0
2	T1	190	2.0	200	2.0	0.831	38.0	LOS D	7.4	188.3	0.91	1.34	2.44	23.0
12	R2	95	2.0	100	2.0	0.831	43.8	LOS D	7.4	188.3	0.91	1.34	2.44	22.5
Approach		390	2.0	411	2.0	0.831	39.4	LOS D	7.4	188.3	0.91	1.34	2.44	22.9
All Vehicles		2705	2.0	2847	2.0	0.848	21.0	LOS C	8.6	218.1	0.78	0.99	1.53	27.7

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
Delay Model: HCM Delay Formula (Geometric Delay is not included).
Queue Model: HCM Queue Formula.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

HCM 6th Signalized Intersection Summary
6: Parkway Ave & Boeckman Rd

WV Frog Pond East & South Master Plan
Future 2040 Build

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	145	320	325	80	345	30	195	215	65	35	375	260
Future Volume (veh/h)	145	320	325	80	345	30	195	215	65	35	375	260
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		0.96	1.00		0.99	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1870	1900	1900	1885	1900	1900	1900	1900
Adj Flow Rate, veh/h	153	337	119	84	363	24	205	226	56	37	395	246
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0	0	2	0	0	1	0	0	0	0
Cap, veh/h	332	540	187	276	571	38	332	697	173	575	460	287
Arrive On Green	0.09	0.21	0.20	0.05	0.17	0.16	0.09	0.48	0.47	0.03	0.42	0.41
Sat Flow, veh/h	1810	2605	901	1810	3375	222	1810	1454	360	1810	1094	681
Grp Volume(v), veh/h	153	231	225	84	190	197	205	0	282	37	0	641
Grp Sat Flow(s),veh/h/ln	1810	1805	1701	1810	1777	1820	1810	0	1814	1810	0	1775
Q Serve(g_s), s	4.7	8.1	8.4	2.7	6.9	7.0	4.2	0.0	6.7	0.8	0.0	22.8
Cycle Q Clear(g_c), s	4.7	8.1	8.4	2.7	6.9	7.0	4.2	0.0	6.7	0.8	0.0	22.8
Prop In Lane	1.00		0.53	1.00		0.12	1.00		0.20	1.00		0.38
Lane Grp Cap(c), veh/h	332	374	352	276	300	308	332	0	870	575	0	747
V/C Ratio(X)	0.46	0.62	0.64	0.30	0.63	0.64	0.62	0.00	0.32	0.06	0.00	0.86
Avail Cap(c_a), veh/h	373	586	552	386	577	591	380	0	923	730	0	903
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	21.1	25.1	25.3	22.7	26.9	27.0	14.5	0.0	11.2	11.1	0.0	18.4
Incr Delay (d2), s/veh	0.7	1.2	1.4	0.5	1.6	1.6	2.0	0.0	0.3	0.0	0.0	7.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.9	3.3	3.3	1.1	2.9	3.0	1.5	0.0	2.3	0.3	0.0	9.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	21.9	26.3	26.8	23.1	28.5	28.6	16.4	0.0	11.5	11.1	0.0	26.2
LnGrp LOS	C	C	C	C	C	C	B	A	B	B	A	C
Approach Vol, veh/h		609			471			487			678	
Approach Delay, s/veh		25.4			27.6			13.6			25.3	
Approach LOS		C			C			B			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	10.1	33.3	7.8	18.4	6.0	37.4	10.4	15.8
Change Period (Y+Rc), s	4.0	4.5	4.0	4.5	4.0	4.5	4.0	4.5
Max Green Setting (Gmax), s	8.0	34.9	8.0	22.1	8.0	34.9	8.0	22.1
Max Q Clear Time (g_c+I1), s	6.2	24.8	4.7	10.4	2.8	8.7	6.7	9.0
Green Ext Time (p_c), s	0.1	4.0	0.0	1.6	0.0	2.3	0.0	1.4

Intersection Summary	
HCM 6th Ctrl Delay	23.3
HCM 6th LOS	C

HCM 6th Signalized Intersection Summary
7: Canyon Creek Rd & Boeckman Rd

WV Frog Pond East & South Master Plan
Future 2040 Build

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	55	290	45	80	330	65	40	120	120	150	185	85
Future Volume (veh/h)	55	290	45	80	330	65	40	120	120	150	185	85
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	0.99		0.99	1.00		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1900	1870	1870	1870	1856	1826	1900	1856	1900	1900	1885	1900
Adj Flow Rate, veh/h	61	322	42	89	367	63	44	133	87	167	206	74
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	0	2	2	2	3	5	0	3	0	0	1	0
Cap, veh/h	321	478	62	375	474	81	345	198	130	418	337	121
Arrive On Green	0.05	0.30	0.28	0.06	0.31	0.30	0.04	0.19	0.18	0.10	0.26	0.25
Sat Flow, veh/h	1810	1620	211	1781	1542	265	1810	1042	682	1810	1312	471
Grp Volume(v), veh/h	61	0	364	89	0	430	44	0	220	167	0	280
Grp Sat Flow(s),veh/h/ln	1810	0	1831	1781	0	1807	1810	0	1724	1810	0	1783
Q Serve(g_s), s	1.1	0.0	8.0	1.6	0.0	9.9	0.9	0.0	5.4	3.2	0.0	6.3
Cycle Q Clear(g_c), s	1.1	0.0	8.0	1.6	0.0	9.9	0.9	0.0	5.4	3.2	0.0	6.3
Prop In Lane	1.00		0.12	1.00		0.15	1.00		0.40	1.00		0.26
Lane Grp Cap(c), veh/h	321	0	541	375	0	555	345	0	328	418	0	458
V/C Ratio(X)	0.19	0.00	0.67	0.24	0.00	0.77	0.13	0.00	0.67	0.40	0.00	0.61
Avail Cap(c_a), veh/h	553	0	1286	582	0	1269	595	0	946	587	0	1018
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	11.6	0.0	14.2	11.1	0.0	14.4	14.4	0.0	17.2	12.6	0.0	15.0
Incr Delay (d2), s/veh	0.3	0.0	1.5	0.3	0.0	2.4	0.2	0.0	2.4	0.6	0.0	1.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	0.0	2.8	0.5	0.0	3.4	0.3	0.0	2.1	1.1	0.0	2.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	11.8	0.0	15.6	11.4	0.0	16.7	14.6	0.0	19.6	13.2	0.0	16.3
LnGrp LOS	B	A	B	B	A	B	B	A	B	B	A	B
Approach Vol, veh/h		425			519			264			447	
Approach Delay, s/veh		15.1			15.8			18.8			15.2	
Approach LOS		B			B			B			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	8.7	12.7	6.7	17.4	5.7	15.7	6.2	18.0
Change Period (Y+Rc), s	4.0	4.5	4.0	4.5	4.0	4.5	4.0	4.5
Max Green Setting (Gmax), s	9.0	24.5	8.0	31.5	8.0	25.5	8.0	31.5
Max Q Clear Time (g_c+I1), s	5.2	7.4	3.6	10.0	2.9	8.3	3.1	11.9
Green Ext Time (p_c), s	0.2	0.8	0.1	1.4	0.0	1.0	0.0	1.6

Intersection Summary	
HCM 6th Ctrl Delay	15.9
HCM 6th LOS	B

HCM 6th Signalized Intersection Summary
8: Wilsonville Rd/Stafford Rd & Boeckman Rd/Advance Rd

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	245	110	115	65	65	35	95	260	85	60	455	325
Future Volume (veh/h)	245	110	115	65	65	35	95	260	85	60	455	325
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.92		0.90	0.87		0.84	1.00		0.97	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1885	1870	1885	1826	1900	1900	1885	1885	1870	1826	1885	1856
Adj Flow Rate, veh/h	247	111	24	66	66	12	96	263	74	61	460	301
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Percent Heavy Veh, %	1	2	1	5	0	0	1	1	2	5	1	3
Cap, veh/h	446	376	290	299	154	28	235	681	192	534	506	331
Arrive On Green	0.15	0.20	0.20	0.05	0.10	0.09	0.05	0.48	0.48	0.04	0.48	0.47
Sat Flow, veh/h	1795	1870	1442	1739	1512	275	1795	1406	396	1739	1063	695
Grp Volume(v), veh/h	247	111	24	66	0	78	96	0	337	61	0	761
Grp Sat Flow(s),veh/h/ln	1795	1870	1442	1739	0	1787	1795	0	1802	1739	0	1758
Q Serve(g_s), s	8.2	3.6	1.0	2.4	0.0	2.9	2.0	0.0	8.5	1.3	0.0	28.6
Cycle Q Clear(g_c), s	8.2	3.6	1.0	2.4	0.0	2.9	2.0	0.0	8.5	1.3	0.0	28.6
Prop In Lane	1.00		1.00	1.00		0.15	1.00		0.22	1.00		0.40
Lane Grp Cap(c), veh/h	446	376	290	299	0	181	235	0	873	534	0	837
V/C Ratio(X)	0.55	0.30	0.08	0.22	0.00	0.43	0.41	0.00	0.39	0.11	0.00	0.91
Avail Cap(c_a), veh/h	511	617	476	321	0	370	250	0	1053	563	0	1027
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	21.7	24.3	23.2	26.7	0.0	30.2	15.5	0.0	11.7	9.4	0.0	17.4
Incr Delay (d2), s/veh	0.8	0.3	0.1	0.3	0.0	1.2	0.8	0.0	0.3	0.1	0.0	10.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.3	1.5	0.3	1.0	0.0	1.3	0.7	0.0	3.0	0.4	0.0	12.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	22.5	24.6	23.3	26.9	0.0	31.4	16.3	0.0	12.0	9.5	0.0	27.7
LnGrp LOS	C	C	C	C	A	C	B	A	B	A	A	C
Approach Vol, veh/h		382			144			433			822	
Approach Delay, s/veh		23.1			29.4			13.0			26.3	
Approach LOS		C			C			B			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	7.4	38.1	14.8	11.3	6.8	38.7	7.7	18.4
Change Period (Y+Rc), s	4.0	4.5	4.5	4.5	4.0	4.5	4.5	4.5
Max Green Setting (Gmax), s	4.0	41.3	12.9	14.3	4.0	41.3	4.1	23.1
Max Q Clear Time (g_c+I1), s	4.0	30.6	10.2	4.9	3.3	10.5	4.4	5.6
Green Ext Time (p_c), s	0.0	2.9	0.2	0.1	0.0	1.4	0.0	0.3

Intersection Summary	
HCM 6th Ctrl Delay	22.6
HCM 6th LOS	C

Intersection	
Int Delay, s/veh	5.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	10	110	80	5	95	30	45	50	5	30	70	10
Future Vol, veh/h	10	110	80	5	95	30	45	50	5	30	70	10
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	0	1	12	0	1	0	7	0	0	0	0	0
Mvmt Flow	11	122	89	6	106	33	50	56	6	33	78	11

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	139	0	0	211	0	0	368	340	167	355	368	123
Stage 1	-	-	-	-	-	-	189	189	-	135	135	-
Stage 2	-	-	-	-	-	-	179	151	-	220	233	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.17	6.5	6.2	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.17	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.17	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.563	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	1457	-	-	1372	-	-	579	585	882	604	564	933
Stage 1	-	-	-	-	-	-	801	748	-	873	789	-
Stage 2	-	-	-	-	-	-	811	776	-	787	716	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1457	-	-	1372	-	-	505	577	882	550	556	933
Mov Cap-2 Maneuver	-	-	-	-	-	-	505	577	-	550	556	-
Stage 1	-	-	-	-	-	-	794	741	-	865	785	-
Stage 2	-	-	-	-	-	-	718	772	-	717	710	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.4	0.3	13.2	12.9
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	551	1457	-	-	1372	-	-	575
HCM Lane V/C Ratio	0.202	0.008	-	-	0.004	-	-	0.213
HCM Control Delay (s)	13.2	7.5	0	-	7.6	0	-	12.9
HCM Lane LOS	B	A	A	-	A	A	-	B
HCM 95th %tile Q(veh)	0.7	0	-	-	0	-	-	0.8

Intersection	
Int Delay, s/veh	11.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	25	10	15	30	10	35	15	440	85	100	795	45
Future Vol, veh/h	25	10	15	30	10	35	15	440	85	100	795	45
Conflicting Peds, #/hr	0	0	0	0	0	0	2	0	0	0	0	2
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0	10	0	0	0	2	0
Mvmt Flow	27	11	16	33	11	38	16	478	92	109	864	49

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1690	1711	891	1676	1689	524	915	0	0	570	0	0
Stage 1	1109	1109	-	556	556	-	-	-	-	-	-	-
Stage 2	581	602	-	1120	1133	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.1	6.5	6.2	4.2	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.29	-	-	2.2	-	-
Pot Cap-1 Maneuver	75	92	344	76	94	557	713	-	-	1013	-	-
Stage 1	257	288	-	519	516	-	-	-	-	-	-	-
Stage 2	503	492	-	253	280	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	50	69	343	52	71	557	712	-	-	1013	-	-
Mov Cap-2 Maneuver	50	69	-	52	71	-	-	-	-	-	-	-
Stage 1	248	224	-	502	499	-	-	-	-	-	-	-
Stage 2	443	476	-	179	218	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	137.6	133	0.3	1
HCM LOS	F	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	712	-	-	73	96	1013	-	-
HCM Lane V/C Ratio	0.023	-	-	0.744	0.849	0.107	-	-
HCM Control Delay (s)	10.2	0	-	137.6	133	9	0	-
HCM Lane LOS	B	A	-	F	F	A	A	-
HCM 95th %tile Q(veh)	0.1	-	-	3.5	4.7	0.4	-	-

Intersection	
Int Delay, s/veh	121.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	75	10	10	20	10	80	5	450	45	165	910	100
Future Vol, veh/h	75	10	10	20	10	80	5	450	45	165	910	100
Conflicting Peds, #/hr	0	0	0	0	0	0	2	0	0	0	0	2
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	2	10
Mvmt Flow	82	11	11	22	11	87	5	489	49	179	989	109

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1977	1952	1046	1937	1982	514	1100	0	0	538	0	0
Stage 1	1404	1404	-	524	524	-	-	-	-	-	-	-
Stage 2	573	548	-	1413	1458	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.1	6.5	6.2	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	~ 47	65	280	50	62	564	642	-	-	1040	-	-
Stage 1	175	208	-	540	533	-	-	-	-	-	-	-
Stage 2	508	520	-	173	196	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	~ 19	35	280	24	33	564	641	-	-	1040	-	-
Mov Cap-2 Maneuver	~ 19	35	-	24	33	-	-	-	-	-	-	-
Stage 1	173	113	-	534	527	-	-	-	-	-	-	-
Stage 2	416	514	-	82	107	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	$ 2017.7	$ 318.8	0.1	1.3
HCM LOS	F	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	641	-	-	22	86	1040	-	-
HCM Lane V/C Ratio	0.008	-	-	4.694	1.39	0.172	-	-
HCM Control Delay (s)	10.7	0	-	$ 2017.7	$ 318.8	9.2	0	-
HCM Lane LOS	B	A	-	F	F	A	A	-
HCM 95th %tile Q(veh)	0	-	-	13.1	9.1	0.6	-	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Int Delay, s/veh	4.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	15	5	5	10	5	25	5	585	15	40	1160	35
Future Vol, veh/h	15	5	5	10	5	25	5	585	15	40	1160	35
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0	0	2	0	0	2	0
Mvmt Flow	16	5	5	11	5	27	5	636	16	43	1261	38

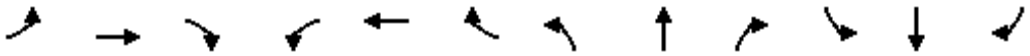
Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	2036	2028	1280	2025	2039	644	1299	0	0	652	0	0
Stage 1	1366	1366	-	654	654	-	-	-	-	-	-	-
Stage 2	670	662	-	1371	1385	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.1	6.5	6.2	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	43	58	204	43	57	476	540	-	-	944	-	-
Stage 1	184	217	-	459	466	-	-	-	-	-	-	-
Stage 2	450	462	-	182	213	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	32	48	204	33	47	476	540	-	-	944	-	-
Mov Cap-2 Maneuver	32	48	-	33	47	-	-	-	-	-	-	-
Stage 1	181	181	-	452	459	-	-	-	-	-	-	-
Stage 2	413	455	-	143	178	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	188.1	82.1	0.1	0.3
HCM LOS	F	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	540	-	-	42	87	944	-	-
HCM Lane V/C Ratio	0.01	-	-	0.647	0.5	0.046	-	-
HCM Control Delay (s)	11.7	0	-	188.1	82.1	9	0	-
HCM Lane LOS	B	A	-	F	F	A	A	-
HCM 95th %tile Q(veh)	0	-	-	2.4	2.1	0.1	-	-

HCM 6th Signalized Intersection Summary
13: I-5 SB Ramp & Wilsonville Rd

WV Frog Pond East & South Master Plan
Future 2040 Build



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	825	660	545	1015	0	0	0	0	80	5	115
Future Volume (veh/h)	0	825	660	545	1015	0	0	0	0	80	5	115
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Work Zone On Approach		No			No						No	
Adj Sat Flow, veh/h/ln	0	1870	1856	1870	1856	0				1856	1900	1856
Adj Flow Rate, veh/h	0	868	0	574	1068	0				88	0	13
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95				0.95	0.95	0.95
Percent Heavy Veh, %	0	2	3	2	3	0				3	0	3
Cap, veh/h	0	3323		650	3086	0				184	0	158
Arrive On Green	0.00	0.65	0.00	0.38	1.00	0.00				0.05	0.00	0.05
Sat Flow, veh/h	0	5274	1572	3456	3618	0				3534	0	3039
Grp Volume(v), veh/h	0	868	0	574	1068	0				88	0	13
Grp Sat Flow(s),veh/h/ln	0	1702	1572	1728	1763	0				1767	0	1520
Q Serve(g_s), s	0.0	7.9	0.0	17.1	0.0	0.0				2.7	0.0	0.4
Cycle Q Clear(g_c), s	0.0	7.9	0.0	17.1	0.0	0.0				2.7	0.0	0.4
Prop In Lane	0.00		1.00	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	3323		650	3086	0				184	0	158
V/C Ratio(X)	0.00	0.26		0.88	0.35	0.00				0.48	0.00	0.08
Avail Cap(c_a), veh/h	0	3323		817	3086	0				610	0	525
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	0.00	0.88	0.88	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	8.1	0.0	33.2	0.0	0.0				50.7	0.0	49.6
Incr Delay (d2), s/veh	0.0	0.2	0.0	8.5	0.3	0.0				1.9	0.0	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	2.7	0.0	6.3	0.1	0.0				1.2	0.0	0.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	8.3	0.0	41.7	0.3	0.0				52.6	0.0	49.9
LnGrp LOS	A	A		D	A	A				D	A	D
Approach Vol, veh/h		868			1642						101	
Approach Delay, s/veh		8.3			14.7						52.3	
Approach LOS		A			B						D	

Timer - Assigned Phs	1	2		4		6
Phs Duration (G+Y+Rc), s	24.7	75.6		9.7		100.3
Change Period (Y+Rc), s	4.0	4.0		4.0		4.0
Max Green Setting (Gmax), s	26.0	53.0		19.0		75.0
Max Q Clear Time (g_c+I1), s	19.1	9.9		4.7		2.0
Green Ext Time (p_c), s	1.6	4.7		0.3		6.3

Intersection Summary		
HCM 6th Ctrl Delay		14.0
HCM 6th LOS		B

Notes

User approved volume balancing among the lanes for turning movement.

Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and intersection delay.

HCM 6th Signalized Intersection Summary
14: I-5 NB Ramp & Wilsonville Rd

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	355	550	0	0	1110	335	450	5	510	0	0	0
Future Volume (veh/h)	355	550	0	0	1110	335	450	5	510	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.99			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Work Zone On Approach		No			No			No				
Adj Sat Flow, veh/h/ln	1870	1870	0	0	1870	1885	1826	1900	1870			
Adj Flow Rate, veh/h	370	573	0	0	1156	0	473	0	287			
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96			
Percent Heavy Veh, %	2	2	0	0	2	1	5	0	2			
Cap, veh/h	441	2686	0	0	3022		596	0	536			
Arrive On Green	0.26	1.00	0.00	0.00	0.59	0.00	0.17	0.00	0.17			
Sat Flow, veh/h	3456	3647	0	0	5274	1598	3478	0	3124			
Grp Volume(v), veh/h	370	573	0	0	1156	0	473	0	287			
Grp Sat Flow(s),veh/h/ln	1728	1777	0	0	1702	1598	1739	0	1562			
Q Serve(g_s), s	11.2	0.0	0.0	0.0	13.1	0.0	14.3	0.0	9.2			
Cycle Q Clear(g_c), s	11.2	0.0	0.0	0.0	13.1	0.0	14.3	0.0	9.2			
Prop In Lane	1.00		0.00	0.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	441	2686	0	0	3022		596	0	536			
V/C Ratio(X)	0.84	0.21	0.00	0.00	0.38		0.79	0.00	0.54			
Avail Cap(c_a), veh/h	723	2686	0	0	3022		1043	0	937			
HCM Platoon Ratio	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	0.97	0.97	0.00	0.00	0.26	0.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	39.9	0.0	0.0	0.0	11.8	0.0	43.7	0.0	41.6			
Incr Delay (d2), s/veh	3.0	0.2	0.0	0.0	0.1	0.0	1.5	0.0	0.5			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	4.3	0.1	0.0	0.0	4.7	0.0	6.2	0.0	3.5			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	42.9	0.2	0.0	0.0	11.9	0.0	45.2	0.0	42.1			
LnGrp LOS	D	A	A	A	B		D	A	D			
Approach Vol, veh/h		943			1156			760				
Approach Delay, s/veh		17.0			11.9			44.0				
Approach LOS		B			B			D				
Timer - Assigned Phs		2			5	6		8				
Phs Duration (G+Y+Rc), s		87.1			18.0	69.1		22.9				
Change Period (Y+Rc), s		4.0			4.0	4.0		4.0				
Max Green Setting (Gmax), s		51.0			23.0	42.0		33.0				
Max Q Clear Time (g_c+I1), s		2.0			13.2	15.1		16.3				
Green Ext Time (p_c), s		6.3			0.9	12.5		2.5				

Intersection Summary	
HCM 6th Ctrl Delay	22.1
HCM 6th LOS	C

Notes

User approved volume balancing among the lanes for turning movement.

Unsignalized Delay for [WBR] is excluded from calculations of the approach delay and intersection delay.

HCM 6th Signalized Intersection Summary
15: Town Center Lp West & Wilsonville Rd

WV Frog Pond East & South Master Plan
Future 2040 Build

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	945	115	0	870	50	200	25	90	65	125	375
Future Volume (veh/h)	0	945	115	0	870	50	200	25	90	65	125	375
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.97	1.00		0.99	1.00		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	0	1870	1870	0	1885	1900	1885	1900	1900	1900	1900	1870
Adj Flow Rate, veh/h	0	995	106	0	916	49	211	26	39	68	132	349
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	2	2	0	1	0	1	0	0	0	0	2
Cap, veh/h	0	1408	150	0	1038	56	247	369	553	96	207	546
Arrive On Green	0.00	0.10	0.10	0.00	0.30	0.30	0.14	0.54	0.54	0.05	0.46	0.46
Sat Flow, veh/h	0	4850	498	0	3546	185	1795	681	1021	1810	452	1195
Grp Volume(v), veh/h	0	723	378	0	475	490	211	0	65	68	0	481
Grp Sat Flow(s),veh/h/ln	0	1702	1775	0	1791	1845	1795	0	1701	1810	0	1646
Q Serve(g_s), s	0.0	22.6	22.7	0.0	27.8	27.8	12.6	0.0	2.0	4.1	0.0	24.6
Cycle Q Clear(g_c), s	0.0	22.6	22.7	0.0	27.8	27.8	12.6	0.0	2.0	4.1	0.0	24.6
Prop In Lane	0.00		0.28	0.00		0.10	1.00		0.60	1.00		0.73
Lane Grp Cap(c), veh/h	0	1024	534	0	538	555	247	0	922	96	0	753
V/C Ratio(X)	0.00	0.71	0.71	0.00	0.88	0.88	0.85	0.00	0.07	0.71	0.00	0.64
Avail Cap(c_a), veh/h	0	1362	710	0	716	738	253	0	922	156	0	753
HCM Platoon Ratio	1.00	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	0.94	0.94	0.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	44.8	44.9	0.0	36.6	36.6	46.3	0.0	12.1	51.2	0.0	22.9
Incr Delay (d2), s/veh	0.0	0.8	1.6	0.0	9.3	9.1	23.3	0.0	0.1	9.2	0.0	4.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	10.4	11.0	0.0	13.2	13.6	7.3	0.0	0.8	2.1	0.0	10.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	45.7	46.5	0.0	45.9	45.7	69.6	0.0	12.2	60.4	0.0	27.0
LnGrp LOS	A	D	D	A	D	D	E	A	B	E	A	C
Approach Vol, veh/h		1101			965			276			549	
Approach Delay, s/veh		46.0			45.8			56.1			31.2	
Approach LOS		D			D			E			C	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	9.3	63.6		37.1	18.6	54.3		37.1				
Change Period (Y+Rc), s	4.0	4.5		4.5	4.0	4.5		4.5				
Max Green Setting (Gmax), s	9.3	44.5		43.5	15.0	38.5		43.5				
Max Q Clear Time (g_c+I1), s	6.1	4.0		24.7	14.6	26.6		29.8				
Green Ext Time (p_c), s	0.0	0.2		3.9	0.0	1.4		2.8				

Intersection Summary	
HCM 6th Ctrl Delay	44.1
HCM 6th LOS	D

ID	Software/Method	Intersection	Control Type	LOS	Delay	V/C Ratio
1	Synchro HCM 6th Signal	I-5 SB Ramp & Elligsen Rd	Signal	B	18.2	0.73
2	Synchro HCM 6th Signal	I-5 NB Ramp & Elligsen Rd	Signal	A	9.2	0.45
3	Synchro HCM 6th Signal	Parkway Ave & Elligsen Rd	Signal	C	24.5	0.53
4	Synchro HCM 6th Signal	Parkway Center Dr & Elligsen Rd	Signal	B	16.8	0.54
6	Synchro HCM 6th Signal	Parkway Ave & Boeckman Rd	Signal	C	23.3	0.81
7	Synchro HCM 6th Signal	Canyon Creek Rd & Boeckman Rd	Signal	B	15.9	0.60
8	Synchro HCM 6th Signal	Wilsonville Rd/Stafford Rd & Boeckman Rd/	Signal	C	22.6	0.81
13	Synchro HCM 6th Signal	I-5 SB Ramp & Wilsonville Rd	Signal	B	14.0	0.40
14	Synchro HCM 6th Signal	I-5 NB Ramp & Wilsonville Rd	Signal	C	22.1	0.52
15	Synchro HCM 6th Signal	Town Center Lp West & Wilsonville Rd	Signal	D	44.1	0.82

RECOMMENDED IMPROVEMENTS HCM REPORTS

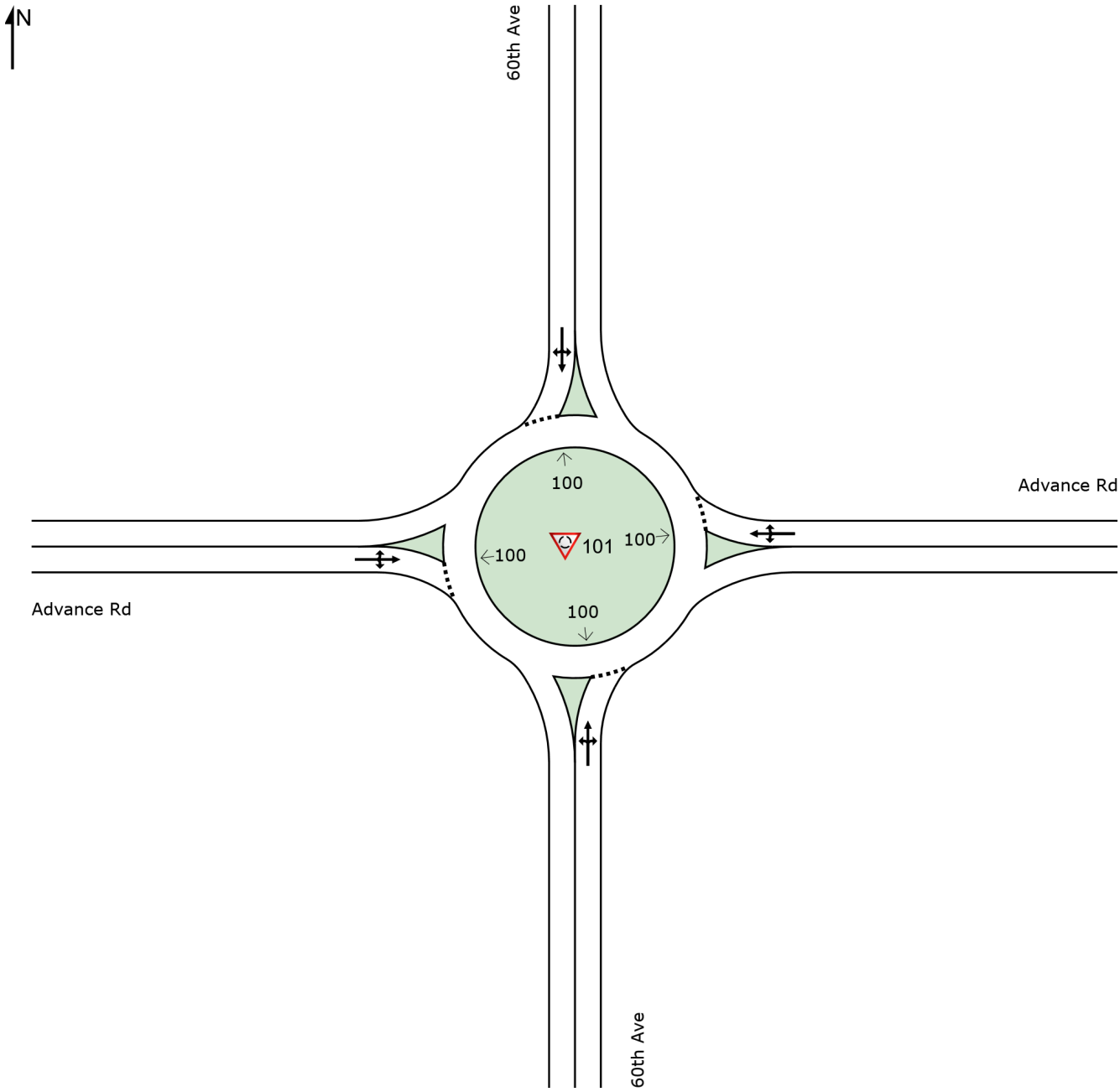
DRAFT

SITE LAYOUT

Site: 101 [Advance Rd/60th Ave (Site Folder: East & South Master Plan - Future 2040 Mitigation)]

Site Category: (None)
Roundabout

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



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Project: S:\Projects\2021\21108-000 (Wilsonville Frog Pond East & South Master Plan)\03_Analysis\Mitigation_Final_\WV FP East & South - Final Roundabout Alternatives.sip9

MOVEMENT SUMMARY

Site: 101 [Advance Rd/60th Ave (Site Folder: East & South Master Plan - Future 2040 Mitigation)]

Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] ft	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed mph
South: 60th Ave														
3	L2	45	7.0	50	7.0	0.099	4.2	LOS A	0.4	10.9	0.32	0.18	0.32	34.4
8	T1	50	0.0	56	0.0	0.099	3.9	LOS A	0.4	10.9	0.32	0.18	0.32	37.1
18	R2	5	0.0	6	0.0	0.099	3.9	LOS A	0.4	10.9	0.32	0.18	0.32	37.8
Approach		100	3.2	111	3.2	0.099	4.0	LOS A	0.4	10.9	0.32	0.18	0.32	35.9
East: Advance Rd														
1	L2	5	0.0	6	0.0	0.119	4.0	LOS A	0.5	13.7	0.27	0.14	0.27	40.8
6	T1	95	1.0	106	1.0	0.119	4.0	LOS A	0.5	13.7	0.27	0.14	0.27	37.2
16	R2	30	0.0	33	0.0	0.119	4.0	LOS A	0.5	13.7	0.27	0.14	0.27	39.4
Approach		130	0.7	144	0.7	0.119	4.0	LOS A	0.5	13.7	0.27	0.14	0.27	37.8
North: 60th Ave														
7	L2	30	0.0	33	0.0	0.105	4.0	LOS A	0.5	11.8	0.32	0.18	0.32	39.4
4	T1	70	0.0	78	0.0	0.105	4.0	LOS A	0.5	11.8	0.32	0.18	0.32	37.7
14	R2	10	0.0	11	0.0	0.105	4.0	LOS A	0.5	11.8	0.32	0.18	0.32	33.6
Approach		110	0.0	122	0.0	0.105	4.0	LOS A	0.5	11.8	0.32	0.18	0.32	37.7
West: Advance Rd														
5	L2	10	0.0	11	0.0	0.191	4.6	LOS A	0.9	23.3	0.28	0.15	0.28	34.8
2	T1	110	1.0	122	1.0	0.191	4.7	LOS A	0.9	23.3	0.28	0.15	0.28	36.2
12	R2	80	12.0	89	12.0	0.191	5.0	LOS A	0.9	23.3	0.28	0.15	0.28	32.3
Approach		200	5.4	222	5.4	0.191	4.8	LOS A	0.9	23.3	0.28	0.15	0.28	34.5
All Vehicles		540	2.7	600	2.7	0.191	4.3	LOS A	0.9	23.3	0.29	0.16	0.29	36.2

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
Delay Model: HCM Delay Formula (Geometric Delay is not included).
Queue Model: HCM Queue Formula.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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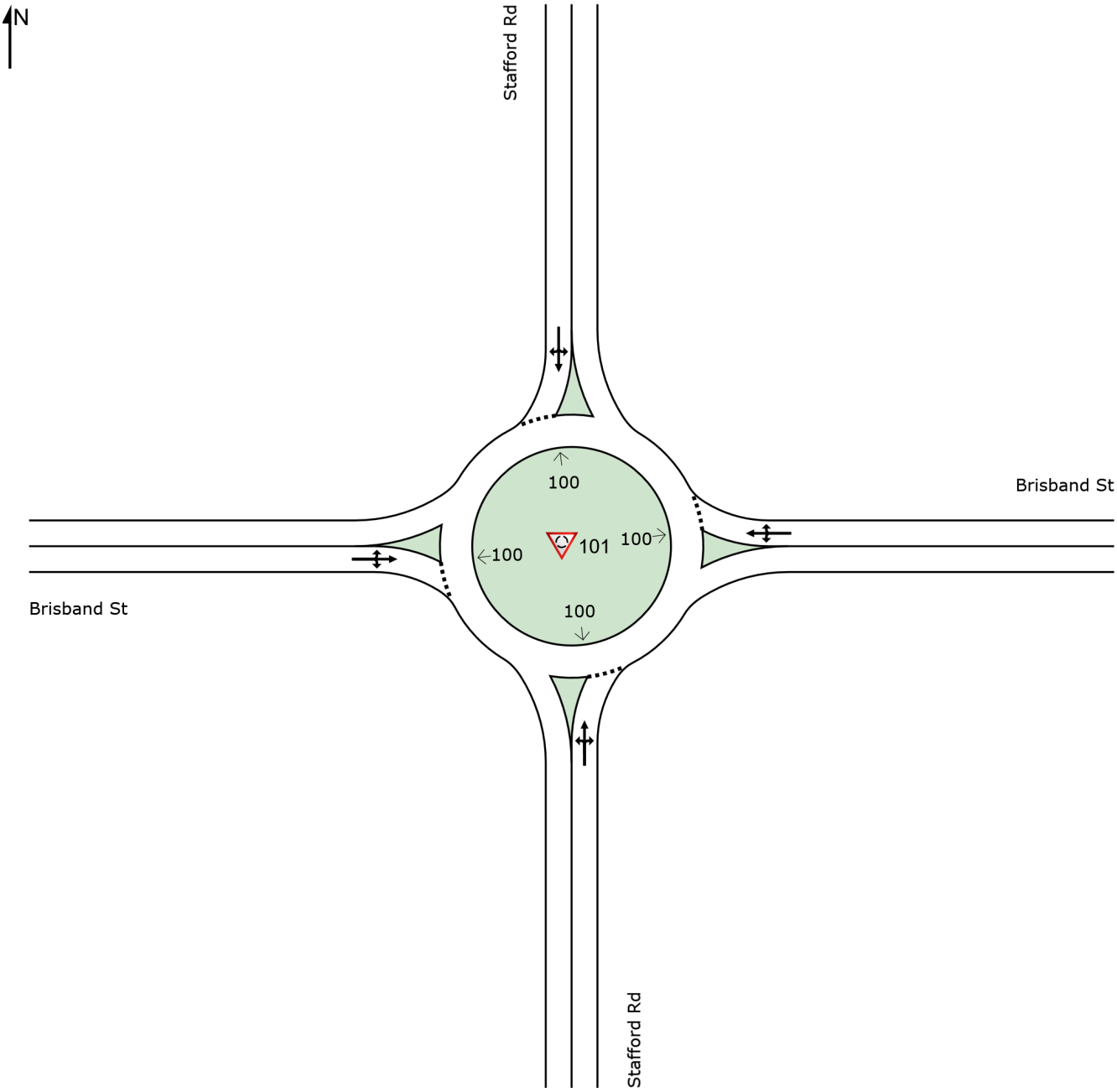
SITE LAYOUT

Site: 101 [Stafford Rd/Brisband St (Site Folder: East & South Master Plan - Future 2040 Mitigation)]

Site Category: (None)
Roundabout

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



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Project: S:\Projects\2021\21108-000 (Wilsonville Frog Pond East & South Master Plan)\03_Analysis\Mitigation_Final_\WV FP East & South - Final Roundabout Alternatives.sip9

MOVEMENT SUMMARY

Site: 101 [Stafford Rd/Brisband St (Site Folder: East & South Master Plan - Future 2040 Mitigation)]

Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] ft	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed mph
South: Stafford Rd														
3	L2	15	10.0	16	10.0	0.494	8.9	LOS A	3.4	85.7	0.51	0.35	0.51	33.2
8	T1	440	0.0	463	0.0	0.494	8.6	LOS A	3.4	85.7	0.51	0.35	0.51	35.8
18	R2	85	0.0	89	0.0	0.494	8.6	LOS A	3.4	85.7	0.51	0.35	0.51	36.5
Approach		540	0.3	568	0.3	0.494	8.6	LOS A	3.4	85.7	0.51	0.35	0.51	35.8
East: Brisband St														
1	L2	45	0.0	47	0.0	0.125	5.8	LOS A	0.5	13.0	0.55	0.49	0.55	38.0
6	T1	15	0.0	16	0.0	0.125	5.8	LOS A	0.5	13.0	0.55	0.49	0.55	34.9
16	R2	35	0.0	37	0.0	0.125	5.8	LOS A	0.5	13.0	0.55	0.49	0.55	36.8
Approach		95	0.0	100	0.0	0.125	5.8	LOS A	0.5	13.0	0.55	0.49	0.55	37.1
North: Stafford Rd														
7	L2	100	0.0	105	0.0	0.780	16.1	LOS C	10.8	273.4	0.66	0.35	0.66	33.1
4	T1	780	2.0	821	2.0	0.780	16.1	LOS C	10.8	273.4	0.66	0.35	0.66	31.6
14	R2	45	0.0	47	0.0	0.780	16.1	LOS C	10.8	273.4	0.66	0.35	0.66	28.8
Approach		925	1.7	974	1.7	0.780	16.1	LOS C	10.8	273.4	0.66	0.35	0.66	31.6
West: Brisband St														
5	L2	50	0.0	53	0.0	0.168	9.4	LOS A	0.6	16.0	0.68	0.68	0.68	31.1
2	T1	15	0.0	16	0.0	0.168	9.4	LOS A	0.6	16.0	0.68	0.68	0.68	32.3
12	R2	15	0.0	16	0.0	0.168	9.4	LOS A	0.6	16.0	0.68	0.68	0.68	30.3
Approach		80	0.0	84	0.0	0.168	9.4	LOS A	0.6	16.0	0.68	0.68	0.68	31.2
All Vehicles		1640	1.0	1726	1.0	0.780	12.7	LOS B	10.8	273.4	0.60	0.37	0.60	33.1

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
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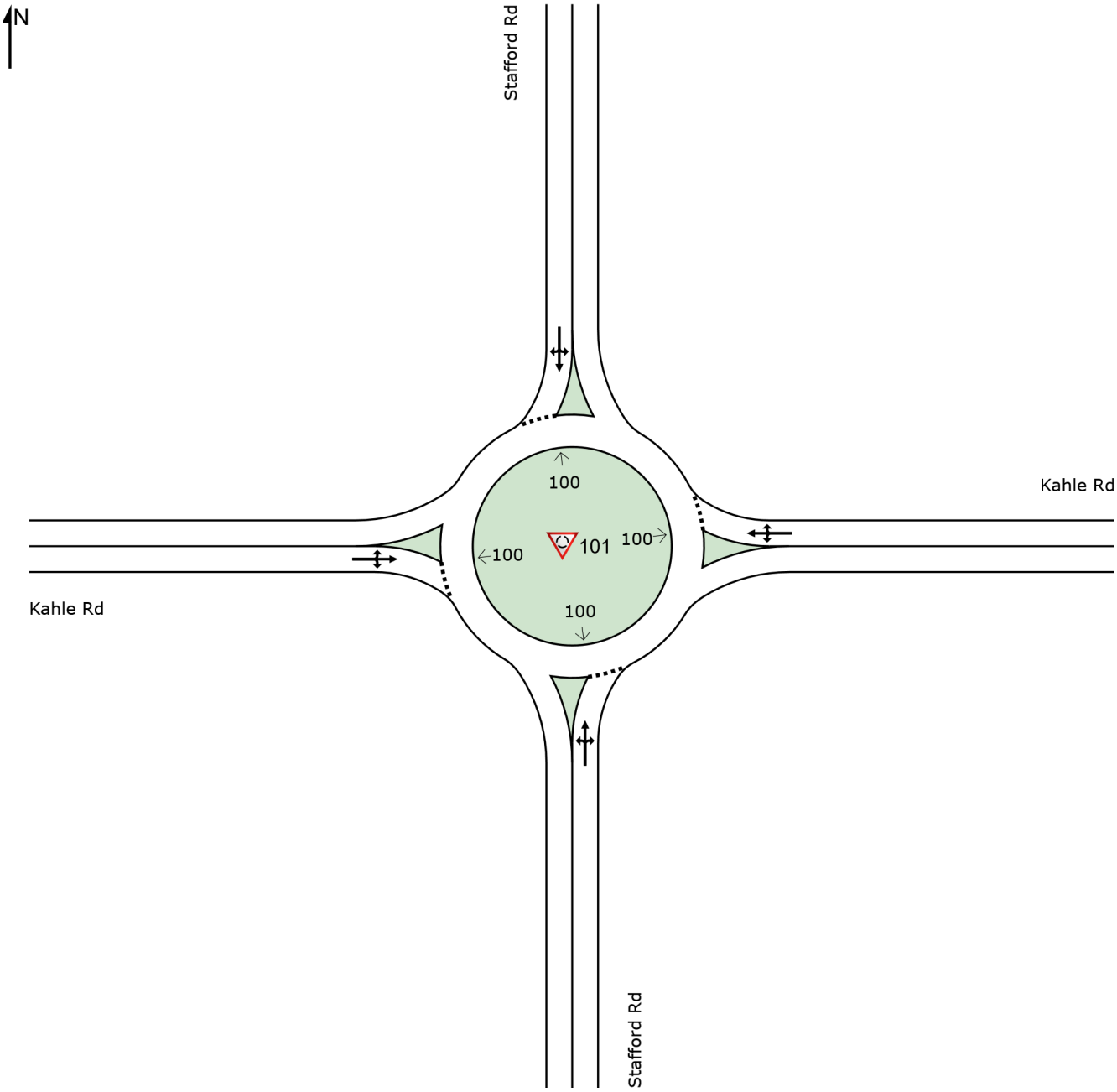
Roundabout Capacity Model: US HCM 6.
Delay Model: HCM Delay Formula (Geometric Delay is not included).
Queue Model: HCM Queue Formula.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

SITE LAYOUT

Site: 101 [Stafford Rd/Kahle Rd (Site Folder: East & South Master Plan - Future 2040 Mitigation)]

Site Category: (None)
Roundabout

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



Organisation: DKS ASSOCIATES | Licence: PLUS / Enterprise | Created: Tuesday, August 23, 2022 12:43:03 PM
Project: S:\Projects\2021\21108-000 (Wilsonville Frog Pond East & South Master Plan)\03_Analysis\Mitigation_Final_\WV FP East & South - Final Roundabout Alternatives.sip9

MOVEMENT SUMMARY

Site: 101 [Stafford Rd/Kahle Rd (Site Folder: East & South Master Plan - Future 2040 Mitigation)]

Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] ft	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed mph
South: Stafford Rd														
3	L2	5	0.0	5	0.0	0.489	8.2	LOS A	3.4	86.9	0.42	0.25	0.42	33.6
8	T1	535	2.0	563	2.0	0.489	8.3	LOS A	3.4	86.9	0.42	0.25	0.42	35.7
18	R2	15	0.0	16	0.0	0.489	8.2	LOS A	3.4	86.9	0.42	0.25	0.42	36.7
Approach		555	1.9	584	1.9	0.489	8.3	LOS A	3.4	86.9	0.42	0.25	0.42	35.7
East: Kahle Rd														
1	L2	15	0.0	16	0.0	0.074	5.8	LOS A	0.3	7.3	0.58	0.52	0.58	38.6
6	T1	10	0.0	11	0.0	0.074	5.8	LOS A	0.3	7.3	0.58	0.52	0.58	35.4
16	R2	25	0.0	26	0.0	0.074	5.8	LOS A	0.3	7.3	0.58	0.52	0.58	37.4
Approach		50	0.0	53	0.0	0.074	5.8	LOS A	0.3	7.3	0.58	0.52	0.58	37.3
North: Stafford Rd														
7	L2	40	0.0	42	0.0	0.993	41.1	LOS E	126.9	3219.2	1.00	0.58	1.33	24.4
4	T1	1160	2.0	1221	2.0	0.993	41.1	LOS E	126.9	3219.2	1.00	0.58	1.33	23.6
14	R2	35	0.0	37	0.0	0.993	41.1	LOS E	126.9	3219.2	1.00	0.58	1.33	22.0
Approach		1235	1.9	1300	1.9	0.993	41.1	LOS E	126.9	3219.2	1.00	0.58	1.33	23.6
West: Kahle Rd														
5	L2	65	0.0	68	0.0	0.231	13.9	LOS B	0.8	21.0	0.78	0.78	0.78	29.0
2	T1	10	0.0	11	0.0	0.231	13.9	LOS B	0.8	21.0	0.78	0.78	0.78	30.0
12	R2	5	0.0	5	0.0	0.231	13.9	LOS B	0.8	21.0	0.78	0.78	0.78	28.3
Approach		80	0.0	84	0.0	0.231	13.9	LOS B	0.8	21.0	0.78	0.78	0.78	29.1
All Vehicles		1920	1.8	2021	1.8	0.993	29.6	LOS D	126.9	3219.2	0.81	0.49	1.03	26.6

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
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LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
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Roundabout Capacity Model: US HCM 6.
Delay Model: HCM Delay Formula (Geometric Delay is not included).
Queue Model: HCM Queue Formula.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Intersection	
Int Delay, s/veh	1.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	10	0	0	80	5	475	45	165	915	100
Future Vol, veh/h	0	0	10	0	0	80	5	475	45	165	915	100
Conflicting Peds, #/hr	0	0	0	0	0	0	2	0	0	0	0	2
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	0	-	-	0	200	-	-	200	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	2	10
Mvmt Flow	0	0	11	0	0	87	5	516	49	179	995	109

Major/Minor	Minor2		Minor1			Major1				Major2		
Conflicting Flow All	-	-	1052	-	-	541	1106	0	0	565	0	0
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy	-	-	6.2	-	-	6.2	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	3.3	-	-	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	0	0	278	0	0	545	639	-	-	1017	-	-
Stage 1	0	0	-	0	0	-	-	-	-	-	-	-
Stage 2	0	0	-	0	0	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	-	-	278	-	-	545	638	-	-	1017	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	18.5	12.9	0.1	1.3
HCM LOS	C	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	638	-	-	278	545	1017	-	-
HCM Lane V/C Ratio	0.009	-	-	0.039	0.16	0.176	-	-
HCM Control Delay (s)	10.7	-	-	18.5	12.9	9.3	-	-
HCM Lane LOS	B	-	-	C	B	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.1	0.6	0.6	-	-

DRAFT

Technical Memorandum

Date: September 6, 2022

Project: Wilsonville Frog Pond East and South Master Plan

To: Andrew Parish – APG/MIG
Joe Dills – APG/MIG

From: Mike Carr, PE – Murraysmith
Julia King, EIT – Murraysmith
Joshua Owens, PE – Murraysmith

Re: Proposed Infrastructure Plans - Water, Wastewater, Stormwater Systems

Introduction

This technical memorandum provides a summary of new water, wastewater, and stormwater infrastructure necessary for the development of Wilsonville Frog Pond East and South areas, to be documented in the area's Master Plan. Analyses were performed to estimate sizes and propose layouts of the proposed systems, using applicable City standards for the systems. The planned infrastructure will also be used for cost estimates and preparation of infrastructure funding strategies.

Background

In 2015, the Frog Pond Area Plan (FPAP) was adopted by the City of Wilsonville. The Frog Pond area consists of three separate neighborhoods: West, East, and South. A master plan for Frog Pond West was developed in 2017 and development in Frog Pond West began soon after. Based on current information from the City, it is estimated that 80% of the parcels in Frog Pond West are currently, or soon to be, under development.

In 2018, the Frog Pond East and South areas were brought into the regional Urban Growth Boundary (UGB). The City initiated master planning in 2020. To date, the master plan process has prepared a draft preferred land use plan. The preferred alternative identifies residential uses of varied housing types, a neighborhood commercial area, streets and trails, and parks and open space. For the purpose of this infrastructure analysis, the plan is assumed to include 1,800 total housing units in the combined East and South neighborhoods. Infrastructure plans were developed for the preferred alternative and are further described in the individual sections below.

The City has also identified a higher-density scenario which calls for 2,384 total units (20 units per net residential acre) in the combined East and South neighborhoods. This scenario represents a very robust buildout of housing, especially middle housing. Infrastructure needs for the higher-

density alternative were estimated to determine the difference in needs between the two alternative plans. These are also described below.

Proposed Water System

The water purveyor for the Frog Pond area is the City of Wilsonville. The City's *Water System Master Plan* (WSMP), adopted September 6, 2012, is the current basis for domestic water and fire system planning within the Frog Pond East and South. The recommendations provided in the 2015 FPAP for water system improvements still apply for the recommended development concepts for Frog Pond East and South. These areas will be extensions of water pressure Zone B which operates in an elevation range from 100 feet to 285 feet and has a hydraulic grade of 400 feet.

Distribution System

Figure 1 shows the proposed preliminary water system layout for the East and South neighborhoods, including off-site improvements needed to serve the area. The existing 12-inch waterline in Boeckman Road is the primary backbone connection for Frog Pond East and South to the City's water supply and storage system. A looped system consisting of 12-inch and 8-inch distribution mains is proposed for supply of domestic water to Frog Pond East and South. The 12-inch main network provides a redundant capacity of 1,500 gallons per minute (gpm) for fire flow to all areas. In accordance with City Public Works Standards, 12-inch mains are also required for the commercial main street area proposed along Brisband Road in Frog Pond East. For all residential zones, 8-inch mains are required, with all lines interconnected as a network to minimize dead ends.

The plan calls for new 12-inch waterlines extending north in Stafford Road and east in Advance Road to extend the distribution system into Frog Pond East and South, connecting to the existing 12-inch waterlines in Boeckman Road and Advance Road. Additional points of connection will also be made to proposed waterlines planned to be installed in Frog Pond Lane and Brisband Road as part of the Frog Pond West development.

The northernmost neighborhoods in Frog Pond East along SW Kahle Road need to be connected to the City's existing water system with a 12-inch loop that connects to the south side of the BPA easement in two locations, one being a connection at the intersection of Stafford Road and SW Kahle Roads, and the other to the 12-inch waterline in the commercial main street. The loop could be constructed across the BPA easement either in the proposed road extending northeast from Frog Pond Lane, or it could cross the BPA easement further to the east via the proposed pedestrian bridge over the main fork of the Newland Creek. The decision on where to route the loop will depend on what areas are developed first and whether the pedestrian bridge is built. In either scenario the 12-inch mainline along SW Stafford Road and SW Kahle Road will be required.

The WSMP recommended two additional connections to the existing distribution system to reliably serve Frog Pond East and South through buildout. The first is a 12-inch connection to the Canyon Creek Road waterline via a crossing of Boeckman Creek at the west end of Frog Pond Lane, for connection to the Stafford Road waterline in conjunction with development in Frog Pond East.

The second is a crossing of Meridian Creek with a 12-inch main, south of the Meridian Creek Middle School, installed in conjunction with development of Frog Pond South. Both creek crossings are assumed to be below grade directionally drilled pipelines; however, they may be installed on future pedestrian bridges where under consideration by the City.

Storage System

The WSMP identified an overall water storage deficiency in the City which will be further increased by development in Frog Pond East and South. The WSMP proposed a 3.0-million-gallon West Side Tank and 24-inch transmission main project to provide sufficient storage for the City. The City has this project budgeted in the City's current 5-Year Capital Improvement Program, with design expected to begin in FY2022/23. The project is anticipated to be completed in 2025.

The extent of the storage deficiency and its impact on development of Frog Pond East and South is unknown at this time, since the WSMP is 10 years old and significant development has occurred in the City in that period. Additional analysis may be conducted to determine what, if any, impact any development in Frog Pond East and South prior to implementation of the new water tank would have on the existing water system and its customers.

The water system layout and sizing is primarily dependent on the street network to distribute fire flow to the designated land use types. Given the higher-density scenario using the same land use pattern and street plan, it is estimated that waterline sizes and costs would remain the same as with the preferred water system layout.

Proposed Wastewater System

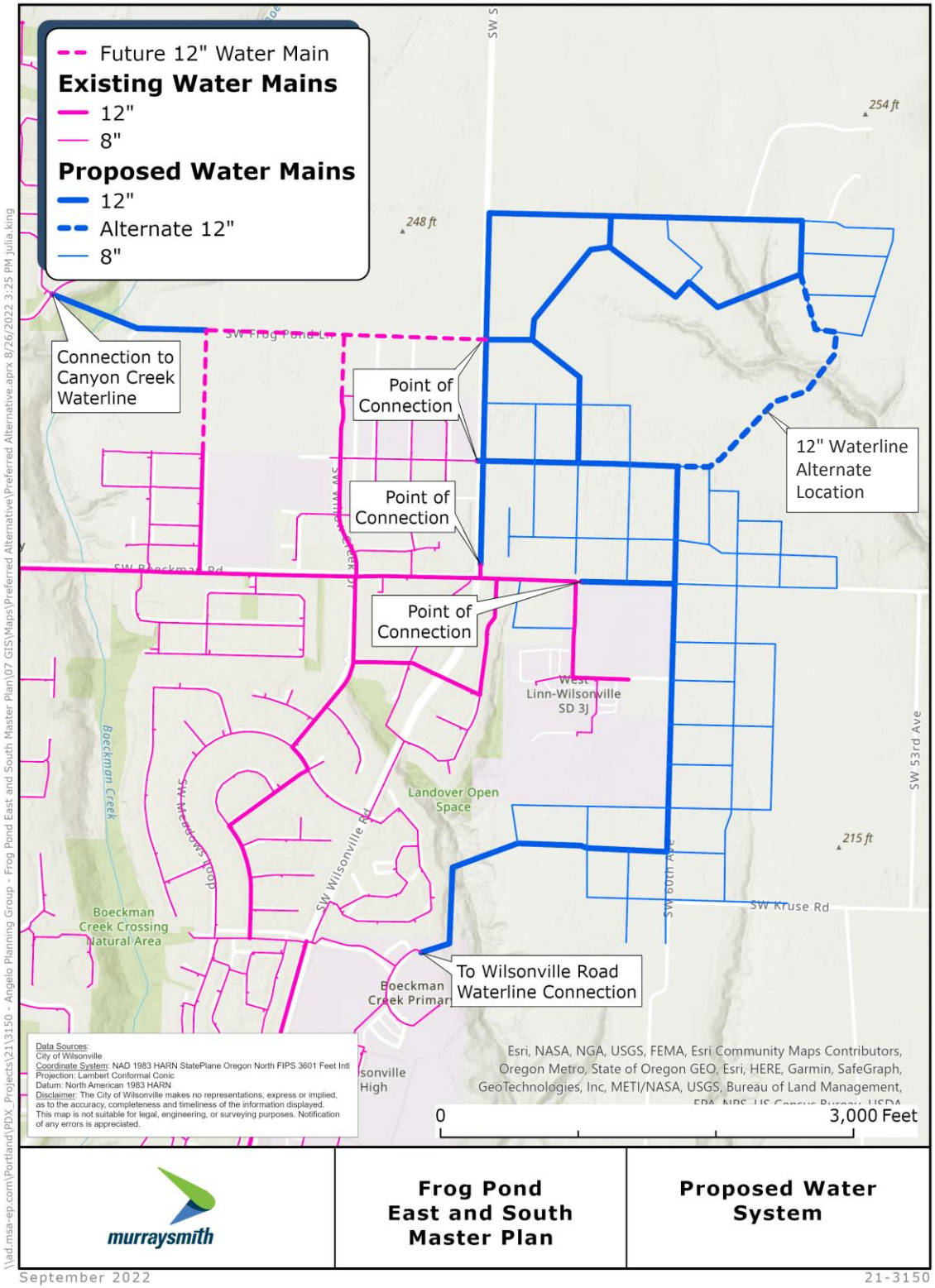
The City of Wilsonville will provide sanitary sewer service for the Frog Pond East and South area as an extension of the City's existing collection system. The City's *Wastewater Collection System Master Plan* (WCSMP), adopted in 2014, is the current basis for wastewater system planning within the City. The 2015 FPAP and subsequent studies provide the specific framework for wastewater system planning in the Frog Pond East and South area, along with design criteria from the 2017 Public Works Standards.

Figure 2 shows the proposed preliminary wastewater system layout for the Frog Pond East and South neighborhoods.

The area was divided into five sewer basins, one for each of the four lift stations required and one that flows by gravity out of the Frog Pond area. Basin peak flows were calculated using preliminary land use data provided by MIG and unit flow values determined from the WCSMP. Residences were assumed to have 2.48 people per unit and an average sewer production rate of 67 gallons per person per day. Commercial sectors were assumed to generate 1,000 gallons per acre per day and schools were estimated to generate 25 gallons per day per person. Average dry weather flows were used with a peaking factor of 2 to estimate the peak dry weather flows. Wet weather flows were estimated to have an infiltration and inflow rate of 1,800 gallons per acre per day over the entire basin. Detailed calculations can be found in Appendix A.

DRAFT

Figure 1 – Preliminary Water System Layout



Each basin was analyzed for both the preferred housing scenario of 1,800 total units, and the higher-density scenario of 2,384 total units. The four lift station basins will each require an 8-inch gravity pipe to convey wastewater to the lift station at an assumed slope of 0.5%, and a 4-inch force main discharge to the downstream basin. These requirements are the same for both housing scenarios. Table 1 shows the peak wet weather flow for each lift station basin and the required pipe sizes.

Table 1 - Lift Station Basins

Basin	Total Peak Flow for 1,800 Units (cfs)	Total Peak Flow for 1,800 Units (gpm)	Total Peak Flow for 2,384 Units (gpm)	Recommended Lift Station Design Capacity (gpm)	Force Main Size (in)	Gravity Sewer Size (in)
LS1	0.130	58	70	135	4	8
LS2	0.159	71	86	135	4	8
LS3	0.123	55	67	135	4	8
LS4	0.489	220	260	260	4	8

Table 1 shows that the recommended capacity for LS1, LS2 and LS3 lift stations is 135 gpm, which is the minimum size required to meet design criteria for 4-inch sewage force mains. This is the same for both housing scenarios. Capacity of LS4 would increase somewhat, from 220 gpm in the preferred scenario, to 260 gpm in the higher-density scenario. This change is estimated to be relatively insignificant in the overall cost of constructing the wastewater facilities for LS4 basin.

The main trunk traveling north to south on SW Stafford Road conveys sewage from both lift station 1 and 2 and a portion of the gravity basin. This pipe has the capacity to carry both housing density scenarios at an 8-inch size; however, this pipe is identified in the WCSMP as a 12-inch line for future extension to the north.

Extension of the Boeckman Road Trunk Sewer east on Advance Road is needed to convey sewage from both Lift Stations 3 and 4 and a portion of the gravity basin. A 10-inch size is required to provide capacity necessary for both housing density scenarios.

All wastewater from Frog Pond East and South is to be conveyed to the wastewater treatment plant through connection to the existing Boeckman Road Trunk Sewer, which flows west to the existing Boeckman Creek Interceptor Sewer and the Memorial Park Pump Station. The Boeckman Road Trunk Sewer is being upsized to 18-inch diameter as part of improvements to Boeckman Road, including Boeckman Dip Bridge, with completion anticipated for 2024.

The Boeckman Creek Interceptor Sewer is a 12-inch to 18-inch diameter pipe extending from Boeckman Road to the Memorial Park Pump Station. Capacity of the Boeckman Interceptor was determined to be sufficient for full buildout of Frog Pond West but will be insufficient to serve full build-out of Frog Pond East and South. The WCSMP recommends the Boeckman Creek Interceptor

Sewer be upsized for buildout of Frog Pond East and South. The City is currently planning to upsize the Boeckman Interceptor in conjunction with a regional trail in the creek corridor. Design of the project will begin in 2022, with construction anticipated to be completed in the fall of 2025.

Though the Boeckman Creek Interceptor will not have sufficient capacity for full buildout of Frog Pond East and South, there will be some capacity available for initial development in the area, depending on how much capacity has been taken up by Frog Pond West. A specific amount has not been calculated. With the Frog Pond West area nearing full development, it is recommended the City reevaluate the remaining capacity in the downstream Boeckman Creek system to estimate how many new dwelling units in Frog Pond East and South can be reliably connected before the planned interceptor improvements are complete.

The WCSMP estimated that the sewer line on SW Kahle Road would need to be a 10-inch pipeline; however based on updated loading conditions, calculations show an 8-inch pipe will be adequate to convey the flow from the areas tributary to the Kahle Road sewer line.

Proposed Stormwater System

<<To Follow - Stormwater Infrastructure Plan is still in development as of September 6, 2022>>

References

Angelo Planning Group. (2015). *Frog Pond Area Plan.*

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Keller Associates. (2012). *Water System Master Plan.*

Murraysmith. (2014). *Wastewater Collection System Master Plan.*

Murraysmith. (2021). *Findings of HB 2001 Sensitivity Analysis.*

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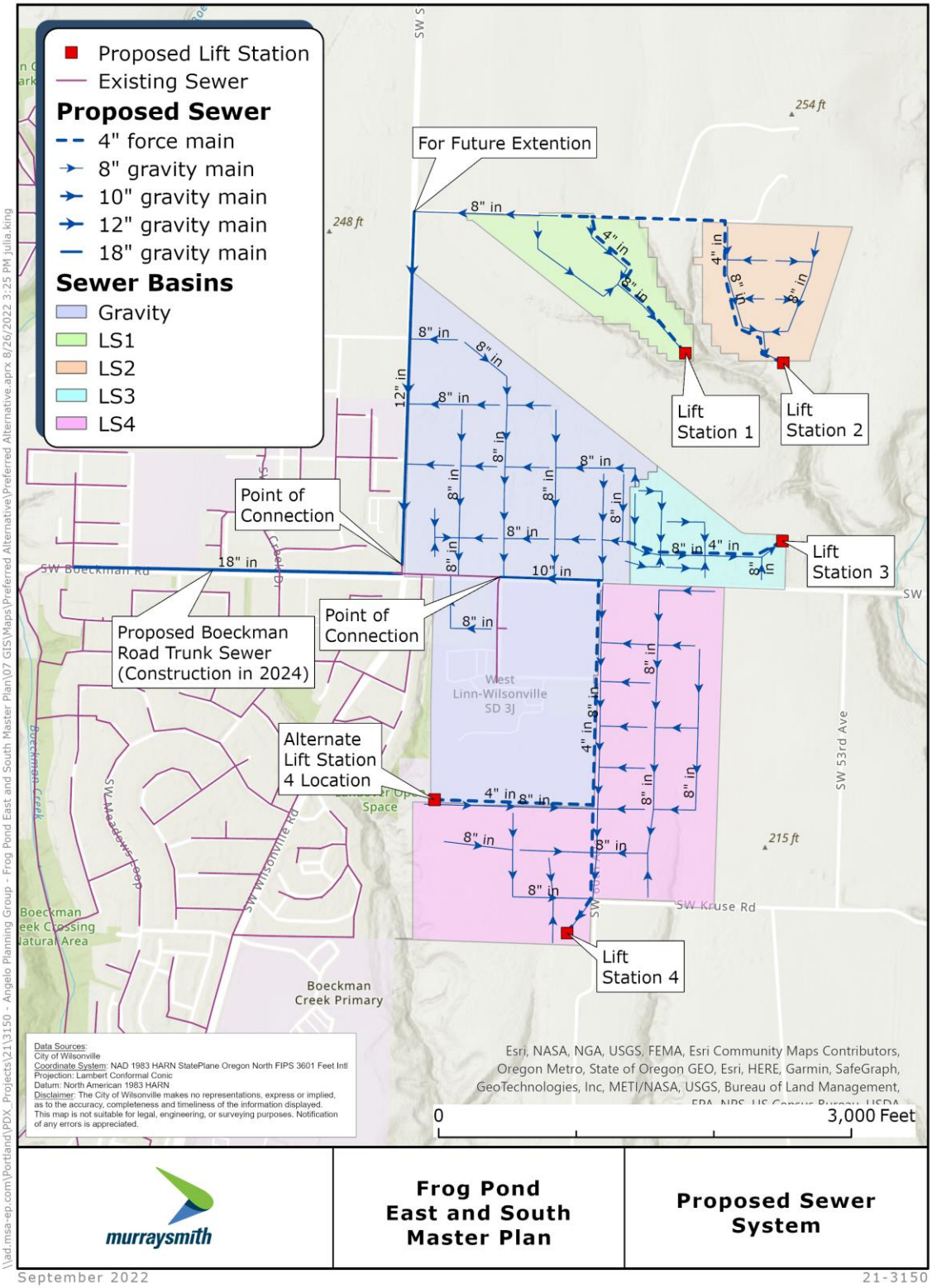
Figure 2 – Preliminary Wastewater System Layout



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Appendix A

Project: 21-3150 Frog Pond Master Plan
Date: 8/26/2022
Author: JK
Decription: Frog Pond East and South sewer basin land use and flow calculations for 1,800 total residential units

Assumptions		
Category	Average Sewer GPD	
Person	67	gallons/person/day
Commercial	1000	gallons/acre/day
School	25	gallons/person/day
I&I	1800	gallons/acre/day

Gravity Pipe Assumptions	
Slope	0.005
Manning's n	0.013

Diameter	Max Flow in Pipe (cfs)
4	0.135
6	0.398
8	0.857
10	1.553

Basin	Total Area (ac)	MF Units	SFA Units	SFD Units	Total Residentital Units	Commecial Area (ac)	School Area (ac)	School Students and Employees	Park/Street Area (ac)	Residential Area (ac)
Gravity	105.0	174	308	274	756	4.9	27.1	1305	27.9	45.0
LS1	18.1	0	63	93	155	0.0	0.0	0	0.4	17.7
LS2	20.7	0	86	111	197	0.0	0.0	0	1.0	19.7
LS3	15.4	0	72	84	156	0.0	0.0	0	1.4	14.0
LS4	76.7	48	212	276	536	0.0	0.0	0	25.1	51.6
Totals	235.9	222	740	837	1,800	4.9	27.1	1305	55.9	148.0

Basin	Average Dry Weather Flow (gpm)	Peak Average Dry Weather Flow (gpm)	Peak I&I Flow (gpm)	Total Peak Flow (gpm)	Total Peak Flow (cfs)	Force Main Size (in)	Force Main Velocity	Does Gravity Flow fit in 8in	Does Gravity Flow fit in 10 in
Gravity	96.6	193.3	131.3	324.5	0.723	N/A	N/A	Yes	Yes
LS1	17.9	35.9	22.6	58.5	0.130	4	1.49	Yes	Yes
LS2	22.7	45.4	25.8	71.2	0.159	4	1.82	Yes	Yes
LS3	18.0	36.0	19.2	55.2	0.123	4	1.41	Yes	Yes
LS4	61.8	123.6	95.9	219.5	0.489	4	5.61	Yes	Yes

Trunk	Total Peak Flow (cfs)	Does Gravity Flow fit in 8in	Does Gravity Flow fit in 10in
SW Stafford Road Trunk (cfs)	0.651	Yes	Yes
Boeckman Trunk Extension (cfs)	0.974	Pipe Overcapacity	Yes

Project: 21-3150 Frog Pond Master Plan
Date: 8/26/2022
Author: JK
Decription: Frog Pond East and South sewer basin land use and flow calculations for 2,384 total residential units

Flow Assumptions		
Category	Average Sewer GPD	
Person	67	gallons/person/day
Commercial	1000	gallons/acre/day
School	25	gallons/person/day
I&I	1800	gallons/acre/day

Pipe Assumptions	
Slope	0.005
Manning's n	0.013

Diameter	Max Flow in Pipe (cfs)
4	0.135
6	0.398
8	0.857
10	1.553

Basin	Residential Units (32% increase)	Commercial Area	School Students and Employees
Gravity	1,001	4.9	1305
LS1	206	0.0	0
LS2	261	0.0	0
LS3	207	0.0	0
LS4	709	0.0	0
Total	2,384	4.9	1305

Basin	Average Dry Weather Flow (gpm)	Peak Average Dry Weather Flow (gpm)	Peak I&I Flow (gpm)	Total Peak Flow (gpm)	Total Peak Flow (cfs)	Force Main Size (in)	Force Main Velocity	Does Gravity Flow fit in 8in	Does Gravity Flow fit in 10in
Gravity	124.9	249.9	131.3	381.1	0.849	N/A	N/A	Yes	Yes
LS1	23.7	47.5	22.6	70.1	0.156	4	1.79	Yes	Yes
LS2	30.1	60.1	25.8	86.0	0.192	4	2.19	Yes	Yes
LS3	23.8	47.7	19.2	66.9	0.149	4	1.71	Yes	Yes
LS4	81.9	163.7	95.9	259.7	0.579	4	6.63	Yes	Yes

Trunk	Total Peak Flow (cfs)	Does Gravity Flow fit in 8in	Does Gravity Flow fit in 10in
SW Stafford Road Trunk (cfs)	0.772	Yes	Yes
Boeckman Trunk Extension (cfs)	1.152	Pipe Overcapacity	Yes

ECONorthwest
ECONOMICS · FINANCE · PLANNING

DATE: January 31, 2022
TO: Dan Pauly, Kim Rybold, City of Wilsonville
FROM: Becky Hewitt, Kaitlin La Bonte, Ariel Kane ECONorthwest
SUBJECT: Frog Pond East and South Accessory Dwelling Units Memorandum

Section 1. Introduction

Accessory Dwelling Units (ADUs) offer an opportunity to seamlessly integrate additional, smaller units within neighborhoods while staying with traditional single-family development and financing models. There are many reasons why people may be interested in building or living in ADUs. For residents, ADUs tend to be a more affordable flexible housing option. For homeowners, ADUs provide opportunities to house family members or earn additional income. As ADUs grow in popularity and recognition, many jurisdictions are considering ways to encourage ADU development.

In bringing the Frog Pond East and South areas into the Urban Growth Boundary (UGB), Metro required that the city explore ways to encourage the construction of ADUs in the expansion area. In Frog Pond East and South, the challenges to encouraging ADU development are different from infill development scenarios. Strategies to promote ADU development in an infill context typically focus on facilitating development for homeowners. In a greenfield development context such as Frog Pond, the City's strategies should focus on ways to influence homebuilders' floorplans to encourage building ADUs at the time of construction or encouraging home and lot designs that provide opportunities for ADU additions later.

This memorandum is intended to assist the City of Wilsonville in planning for residential development in Frog Pond East and South in a way that would be supportive of ADU development in the planning area's residential neighborhoods. Using available survey data and stakeholder interviews, this memorandum provides some insight into the likely demand and market for ADUs in the region and describes ways to City could facilitate ADU development as the planning area is built out.

Section 2. Who do ADUs serve?

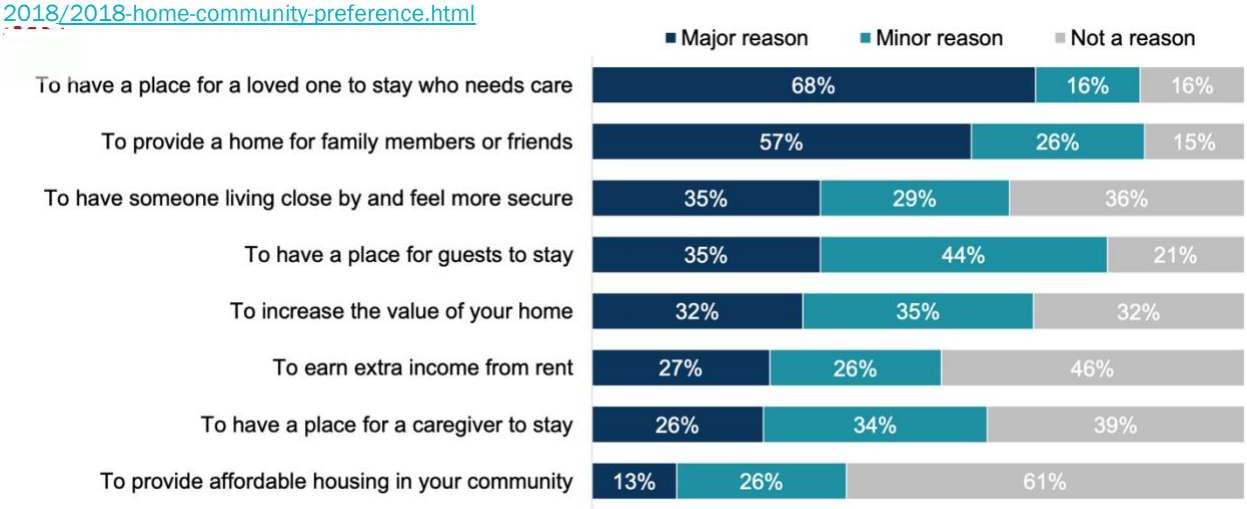
Who wants ADUs and why?

A 2018 American Association of Retired Persons (AARP) Home and Community Preferences Survey[1] found that 33% of adults aged 18 and older who did not have an ADU on their property would consider adding an ADU (27% unsure). As shown in Exhibit 1, of those who would consider adding an ADU, having a place for a loved one to stay who needs care was a major

[1] This survey was conducted by NORC at the University of Chicago with funding from AARP in March and April 2018. 2,287 participants completed the survey, the final total of the national sample was 1,947.

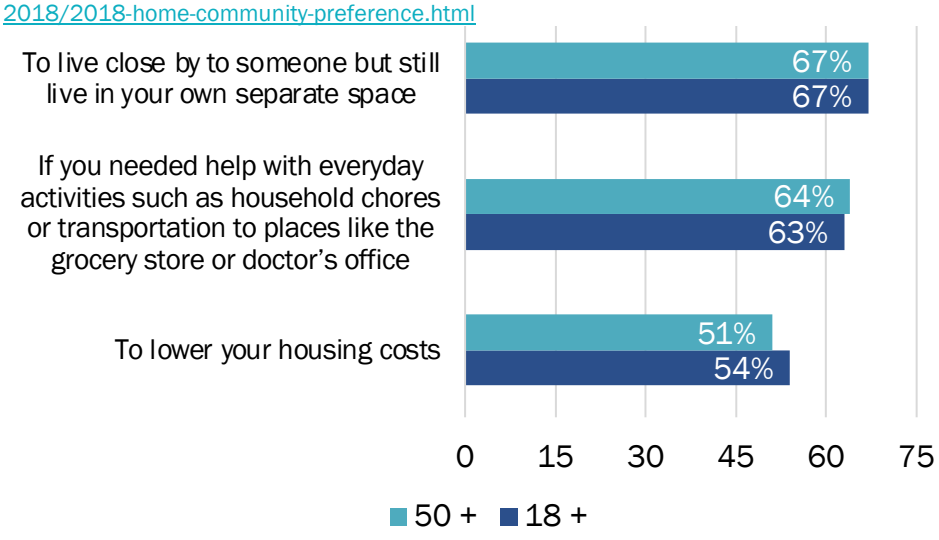
reason for 68% of respondents; providing a home for family members or friends was a major reason for 57%.

Exhibit 1. Major Reasons for Considering Building an ADU
Source: 2018 AARP Home and Community Preferences Survey, www.aarp.org/research/topics/community/info-2018/2018-home-community-preference.html



Out of the adults surveyed, 67% said they would consider living in an ADU to live close to someone but still have their own space, 63% said they would consider it if they needed help with everyday activities, and 54% said they could consider it to lower their housing costs. This is shown in Exhibit 2.

Exhibit 2. Top Three Reasons for Considering Living in an ADU by Age Group
Source: 2018 AARP Home and Community Preferences Survey, www.aarp.org/research/topics/community/info-2018/2018-home-community-preference.html

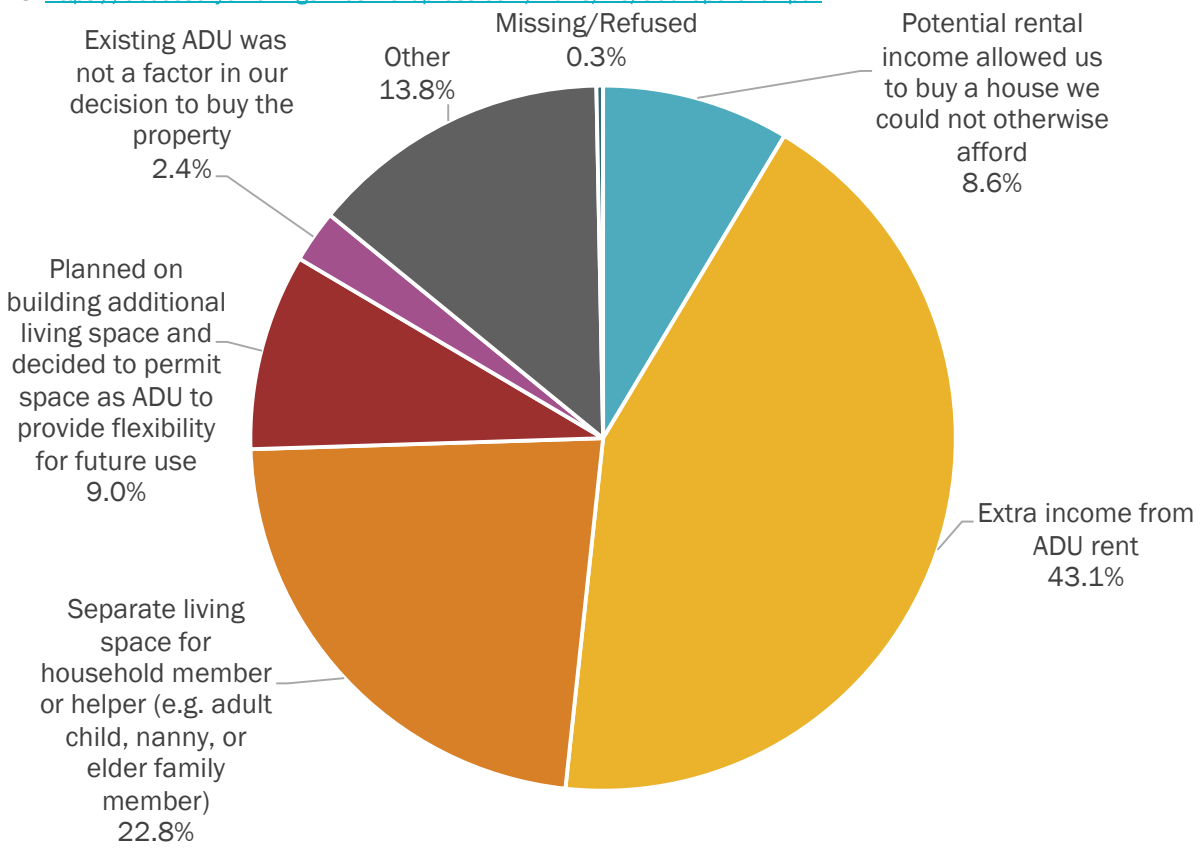


In a 2013 survey of Portland, Eugene, and Ashland homeowners with existing ADUs, 43% of Portland respondents said that the extra income from ADU rent was a primary reason for

building an ADU or for purchasing a property with an existing ADU. Other reasons are shown in Exhibit 3.

Exhibit 3. Portland Homeowners primary reason for building an ADU or purchasing the property with an existing ADU.

Source: Accessory Dwelling Unit Survey for Portland, Eugene, and Ashland, Oregon Final Methodology and Data Report, 2013 https://accessorydwellings.files.wordpress.com/2013/10/adureportfrev.pdf



What might an ADU rent for in Frog Pond East and South?

In the 2013 survey of Portland property owners with ADUs, the mean rental income received was between $811 and $880 (Exhibit 4). While these rents are now well out of date, the range of rents is worth noting: from as little as $385 per month, to as much as $1,800 per month.

Exhibit 4. Portland Rent Received Monthly for ADU, 2013
Source: Accessory Dwelling Unit Survey for Portland, Eugene, and Ashland, Oregon Final Methodology and Data Report, 2013 https://accessorydwellings.files.wordpress.com/2013/10/adureportfrev.pdf

	N	Minimum	Maximum	Mean	Std. Deviation
How much rent do you receive monthly for.your ADU?	143	$385	$1,800	$880.20	$239.42
If rent includes utilities, how much is the rent without utilities?	78	$200	$1,700	$811.85	$248.09

Based on analysis of recent ADU listings in Portland, Milwaukie, Canby, Oregon City, Beaverton and Hillsboro, ADU rents were generally between $1,050 and $2,000 per month. Rents varied by structure type, number of bedrooms and unit size, with the average rent overall being $1,540. Detached ADUs tended to have higher rents, with smaller footprints. Basement ADU rents tended to be lower, at an average of $1,275 (see Exhibit 5).

Exhibit 5. ADU Rents in Portland Metro Area by Structure and Bedroom
Source: ECONorthwest Analysis of Craigslist, Apartments.com data, 2021

Structure	Bedrooms	Most rent for	Average Rent	Most units are
Attached	Studio	$1,475	$1,475	500 SF
	1 Bedroom	$1,450 - $1,625	$1,540	650 - 800 SF
	2 Bedrooms	$1,595	$1,595	610 SF
	Overall	$1,450 - $1,625	$1,540	500 - 800 SF
Basement	Studio	$1,350 - $1,450	$1,400	500 - 750 SF
	1 Bedroom	$1,050 - $1,250	$1,150	500 - 1,500 SF
	Overall	$1,050 - $1,400	$1,275	500 - 1,500 SF
Detached	Studio	$1,450	$1,450	450 SF
	2 Bedrooms	$1,500 - $2,000	$1,700	750 - 950 SF
	Overall	$1,450 - $2,000	$1,650	500 - 950 SF
Overall	Studio	$1,350 - $1,475	$1,430	500 - 600 SF
	1 Bedroom	$1,050 - $1,625	$1,350	350 - 800 SF
	2 Bedrooms	$1,500 - $2,000	$1,690	600 - 750 SF
	Overall	$1,050 - $2,000	$1,540	500 - 1,000 SF

Overall, while the variability is high due to a small set of observations spread across a wide area in many different forms and ages of homes, this suggests that ADU rents might be similar to rents for newer market-rate apartments.

What might an ADU sell for in Frog Pond East and South?

Some ADUs are sold separately from the main home as condominiums rather than being rented out or managed by the owner of the main home. These sales transactions are difficult to isolate, and there are no known examples in Wilsonville or surrounding areas. Examples of new construction small, detached condominium units in Portland have mostly sold for $300,000 to

$400,000—roughly 60-70% of the sale price of the main house on the same lot where both were new construction. Given this pattern and the estimated sale prices for new homes in the Frog Pond area with larger lots generally being between $600,000 and $800,000, the price range for ADUs in the Frog Pond area may be similar to that seen in Portland. This is also similar to the pricing for newer two- to three-bedroom condominium units in Wilsonville.

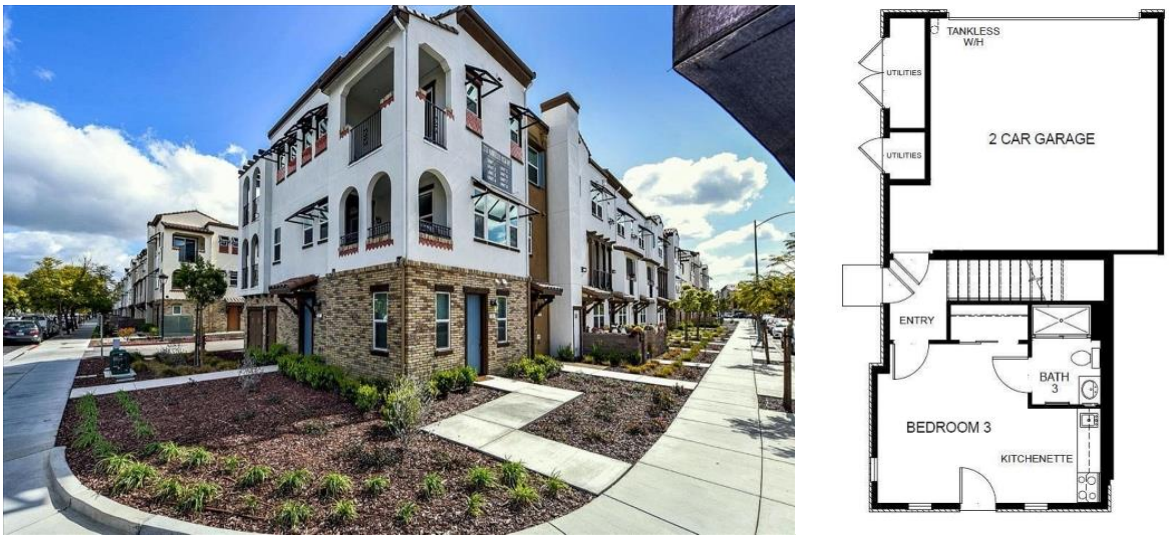
Section 3. Opportunities and Barriers for ADU development

Regulatory Barriers

The City of Wilsonville recently updated its ADU regulations to comply with state and regional requirements. ECONorthwest reviewed the current regulations to identify any requirements that could still create challenges for ADU construction in Frog Pond East and South. The primary code standards identified as potential obstacles included:

- Lot coverage and setback standards in several existing residential zones may limit the ability to build detached ADUs.
- ADUs are not allowed for townhouses (unless those townhouses meet the single-family minimum lot size). Some developers have created floor plans for townhouses with ADUs that can be sold separately and some with a flexible ground-floor space with separate entrance that can either be used as a home office or an ADU. This model is not currently allowed in Wilsonville, but could be appropriate for portions of Frog Pond East and South.

Exhibit 6: Example of townhouse with ADU / ground floor flexible space
Source: Redfin.com



Financial and Other Factors

ECONorthwest interviewed several homebuilders who are likely to develop portions of Frog Pond East and South when master planning is complete. Some indicated interest in building ADUs. They noted several factors that will influence their decision-making about whether or not to include ADUs in their floor plans:

- When building detached ADUs with single-family homes, this can require a larger lot and push the price-point for the home above what most households can afford. (Providing flexibility for ADUs on lot coverage and setback standards could help address this concern to some extent.)
- Being able to sell the ADU separately helps keep the cost down for both units. One developer's model has been to sell all units with a three-year owner occupancy requirement, including the ADUs, to ensure that they are not used as investment properties. (Another Metro requirement for Frog Pond East and South is that the City ensure that any future homeowners associations will not require owner occupancy of homes that have accessory dwelling units. This could preclude this aspect of the model, and may, ironically, discourage building ADUs for some builders.)
- Local fees are an important factor in whether developers will build ADUs. (Wilsonville does not charge SDCs for ADUs.)

Section 4. ADU Strategies

Regulatory strategies:

- Providing greater flexibility on lot coverage and setbacks for detached ADUs could make it easier to add them to a lot with less effect on the size or location of the main home.
- Allowing ADUs with townhouses (regardless of lot size) in areas where higher density is appropriate could expand opportunities to add ADUs.
- Wilsonville already allows land divisions for ADUs to be sold on a separate lot from the main home, which is mostly applicable to detached ADUs, but could be an incentive for homebuilders along with the lack of SDC fees.
- Allowing larger ADUs (the current limit is 800 square feet) could make the existing financial and regulatory incentives stronger, but would also make them even more similar to two-unit cluster housing, which is also allowed.

Financial strategies:

- The primary financial incentive that has been used to encourage ADU production is waiver of SDCs. As noted above, Wilsonville already has this option in place, and has for many years.

- Establishing a set of pre-approved building plans for homes and townhouses with ADUs, or other similar measures to streamline the review process for development, could make some difference to homebuilders. However, with a greenfield development, there are many other review and permitting processes that will tend to take longer than the building permit review, meaning that streamlining one part of the process is likely to have a minimal impact.
- A marketing approach in which the City would help direct media attention to new homes built with ADUs could provide some incentive for builders, who would benefit from the free publicity, though the City would have to approach this carefully to avoid the appearance of bias towards a particular developer.

Section 5. Conclusions and Next Steps

ADUs in Frog Pond East and South could provide additional options for small rental and/or for-sale units at price-points similar to multifamily housing but at a neighborhood scale. This makes them an important part of the mix in this area, particularly if opportunities for multifamily development in the area are limited. Past surveys suggest that people value ADUs for intergenerational households, flexible space for guests or family members, and for rental income that can help them afford their own housing costs. These factors primarily apply when ADUs are owned along with the main home and managed by the homeowner, but this may or may not be the case when ADUs can also be sold as separate units. Subsequent additional outreach will gather additional information about community perspectives and preferences which could also influence the City's approach to ADUs.

Frog Pond East and South's greenfield context means that encouraging ADU construction in Frog Pond East and South will require influencing large professional homebuilders rather than individual homeowners. The City already has many important incentives in place, including exempting ADUs from SDCs and allowing land divisions to split them from the main house. While the City has seen little ADU production, this may be a factor of private restrictions that prohibit ADUs in some areas of Wilsonville. These restrictions are no longer allowed, and will not constrain ADUs in Frog Pond East and South.

Removing subtler regulatory obstacles including lot coverage, setbacks, and allowing ADUs with townhouses could help address some of the considerations that homebuilders noted would affect their interest in developing homes with ADUs. Metro's requirement that the City prevent homeowners' associations from requiring owner occupancy for units with ADUs could inadvertently serve as a deterrent to one model of building homes with ADUs that is intended to prevent the homes from becoming investor properties. The City may want to explore with Metro whether this condition could be modified to allow a temporary restriction to owner occupancy for a certain period after initial construction.