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LAND USE ALTERNATIVES TRAFFIC ANALYSIS





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## MEMORANDUM

DATE: March 4, 2019  
TO: Alex Dupey; MIG  
FROM: Scott Mansur, PE, PTOE *Sm*  
Garth Appanaitis, PE  
Jenna Hills, EIT  
SUBJECT: Wilsonville Town Center Plan – Land Use Alternatives Traffic Analysis



The purpose of this memorandum is to summarize the transportation impacts and improvements needed to support future land use alternatives in Wilsonville Town Center. The Town Center is approximately 100 acres and encompasses the properties north of Wilsonville Road within and adjacent to Town Center Loop. Town Center is an important service hub for the Wilsonville community and the region at large. City Hall and other City offices, the Wilsonville Public Library, the Community Center/Senior Center, parks, the post office, and Clackamas Community College are in or near Town Center. The following sections summarize the adopted Comprehensive Plan, additional growth proposed through the Town Center Plan, traffic operations for both the adopted and proposed scenarios, and a proposed transportation network to address circulation and mobility needs for the proposed scenario.

### Study Area

The study area includes the roadway segments within and connecting to Town Center, which is mapped on Figure 1 on the following page. The analysis focused on ten key study area intersections that were selected based on coordination with the City of Wilsonville staff.





Figure 1: Study Area

## Adopted Land Use and Transportation Plan

Wilsonville’s Transportation System Plan (TSP) identifies transportation projects, programs, and strategies to support existing activities and planned growth. The TSP summarizes future land use assumptions that are consistent with the designations in the Comprehensive Plan and existing zoning.<sup>1</sup> These land use designations for the Town Center area, as shown in Figure 2, provide the basis for the current TSP’s assumptions regarding land use and traffic growth during the planning period of 2010-2035.

<sup>1</sup> *Transportation System Plan*. City of Wilsonville. Amended June 2016.

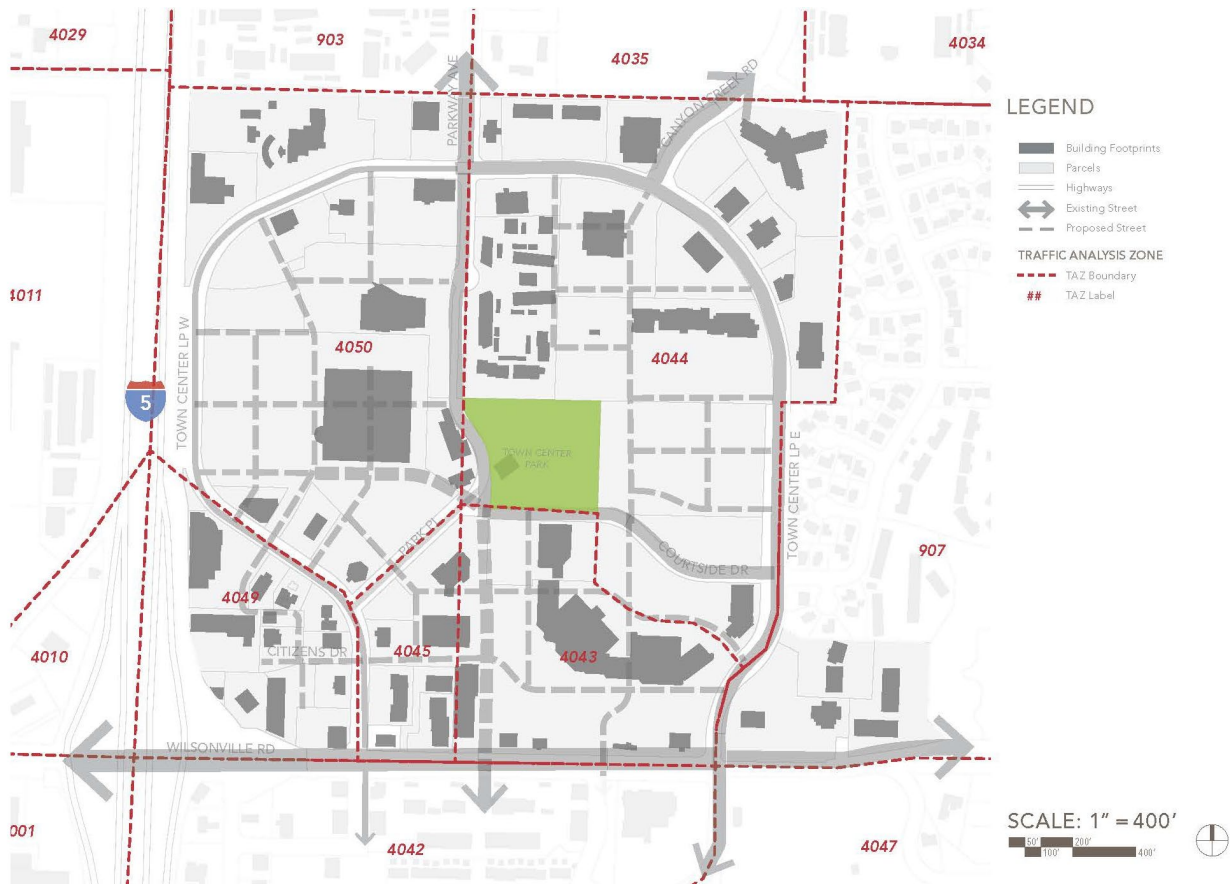


**Figure 2: Comprehensive Plan Designations**

Based on the land use designations, Table 1 lists the anticipated future household and employment growth for the transportation analysis zones (TAZ) that generally represent the Town Center area. The transportation analysis zones are shown on the map in Figure 3. Land use growth maps and estimated land use tables for each TAZ in the City are included in Attachment A.

**Table 1: Wilsonville Town Center Land Use Growth in TSP (2010 to 2035)**

Town Center TAZ	Household Unit Growth	Retail Employee Growth	Non-Retail Employee Growth
4043	0	10	100
4044	10	84	505
4045	20	10	125
4049	0	10	250
4050	0	161	150
<b>Total TSP Growth (2010 to 2035)</b>	<b>30</b>	<b>275</b>	<b>1130</b>
<i>Average Growth Per Year</i>	<i>1.2 Units</i>	<i>11 Employees</i>	<i>45.2 Employees</i>



**Figure 3: Transportation Analysis Zones (TAZ)**

The traffic analysis conducted for the Town Center Plan used the latest traffic data and updated future traffic forecasts consistent with the process used to develop future traffic volumes for the Wilsonville TSP. Projected Horizon Year (2035) future traffic volumes were developed using recent traffic counts (collected in 2016) and were post processed adding the increment of traffic growth from the Wilsonville travel demand model for the remaining years (2016 to 2035).

As listed in Table 1, the five TAZs that generally encompass the Town Center were assumed to include predominately non-retail employee growth (1,130 employees), some retail growth (275 employees), and limited housing (30 units) over the 25 year period. Table 2 summarizes the traffic growth associated with the projected development assumed in the TSP for Town Center. Table 2 lists trips both for the base model of 2010 and future model of 2035. Over the 25-year TSP growth period (2010 to 2035), land use assumptions resulted in 1,264 vehicle trips from the Town Center.

For purposes of the Town Center Plan traffic analysis, linear interpolation was used to calculate the number of trips estimated for the year 2016. The assumed growth in model trips from the year 2016 to the Horizon Year (2035) is the traffic growth that was used in this analysis for adopted land use and transportation policies and is shown at the bottom of Table 2 (960 trips).

This method of calculating the trip growth was used to account for additional growth (in Wilsonville and regionally) that was not present in 2010. Therefore, the increment of model growth from 2016 to 2035 was applied rather than the entire 25-year period to avoid double counting measured (via recent 2016 traffic counts) and projected traffic growth (in the traffic model) for the years 2010-2016. Traffic forecasts were “post processed” following a methodology consistent with NCHRP Report 765.<sup>2</sup>

**Table 2: Wilsonville Town Center TAZ\* Peak Hour TSP Trip Growth**

Scenario	Trips In	Trips Out	Total Town Center Model Trips
TSP 2010 Existing Model Trips	378	256	634
TSP Horizon Year (2035) Projected Model Trips	897	1,001	1,898
TSP 25 Year Projected Growth (2010 to 2035)	519	745	1,264
<b>19 Year Projected Growth (2016 to 2035)</b>	<b>394</b>	<b>566</b>	<b>960</b>

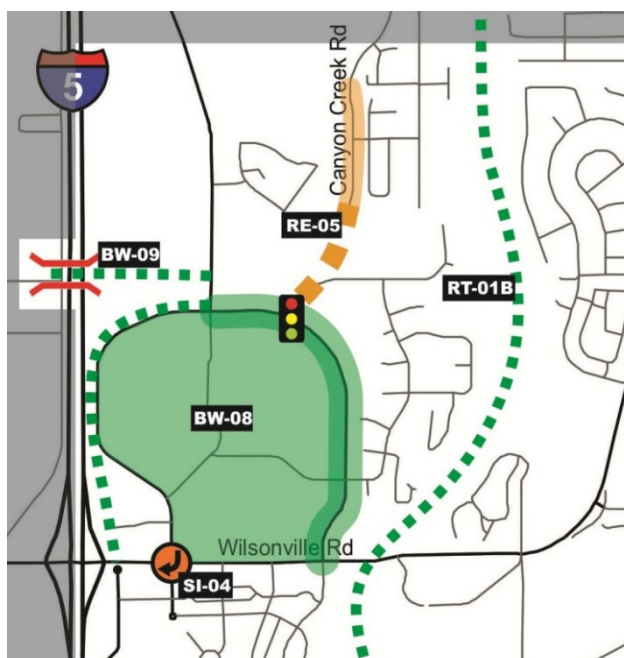
Note: \* Values provided for five TAZ that represent the Town Center Area: 4043, 4044, 4045, 4049, 4050

### TSP High Priority Projects

The City of Wilsonville TSP provides a list of high priority projects necessary to meet the demands of the projected growth through the Horizon Year (2035). There are several projects that impact the Town Center as shown in Figure 4 to the right. These projects are assumed to be completed for purposes of analyzing future Horizon Year (2035) traffic conditions. Details of the TSP projects can be found in Attachment B.

#### RE-05 Canyon Creek Road Extension (Completed)

This project constructed the remaining 3-lane roadway with bike lanes, sidewalks, and transit stop improvements from the prior terminus to Town Center Loop East; project also included realigning a portion of Vlahos Drive (so it intersects Canyon Creek Road) and installing a traffic signal at the Town Center Loop East/Canyon Creek Road intersection.



**Figure 4: TSP High Priority Projects**

<sup>2</sup> Analytical Travel Forecasting Approaches for Project-Level Planning and Design - National Cooperative Highway Research Program Report 765, Transportation Research Board, Washington D.C., 2014.

#### **SI-04 Wilsonville Road/Town Center Loop West Intersection Improvements**

This project intends to widen the north leg of the intersection and install a second dedicated southbound right-turn lane (dual right turn lanes) on Town Center Loop West to Wilsonville Road.

#### **BW-08 Town Center Loop Pedestrian, Bicycle, and Transit Improvements**

This project intends to create more direct multi-modal connections between destinations within Town Center area, improve accessibility to civic uses and transit stops, retrofit sidewalks with curb ramps, highlight crosswalks with colored pavement, and construct other similar treatments that support pedestrian, bicycle, and transit access and circulation; also construct shared-use path along Town Center Loop West from Wilsonville Road to Parkway Avenue; and restripe Town Center Loop East from Wilsonville Road to Parkway Avenue to a three-lane cross-section with bike facilities.

Note: The bike facility improvements on Town Center Loop East have been completed since the 2016 TSP update.

#### **BW-09 Town Center Loop Bike/Pedestrian Bridge**

This project includes constructing a bike/pedestrian bridge over I-5 approximately aligned with Barber Street to improve connectivity of Town Center area with businesses and neighborhoods on west side of I-5; include aesthetic design treatments.

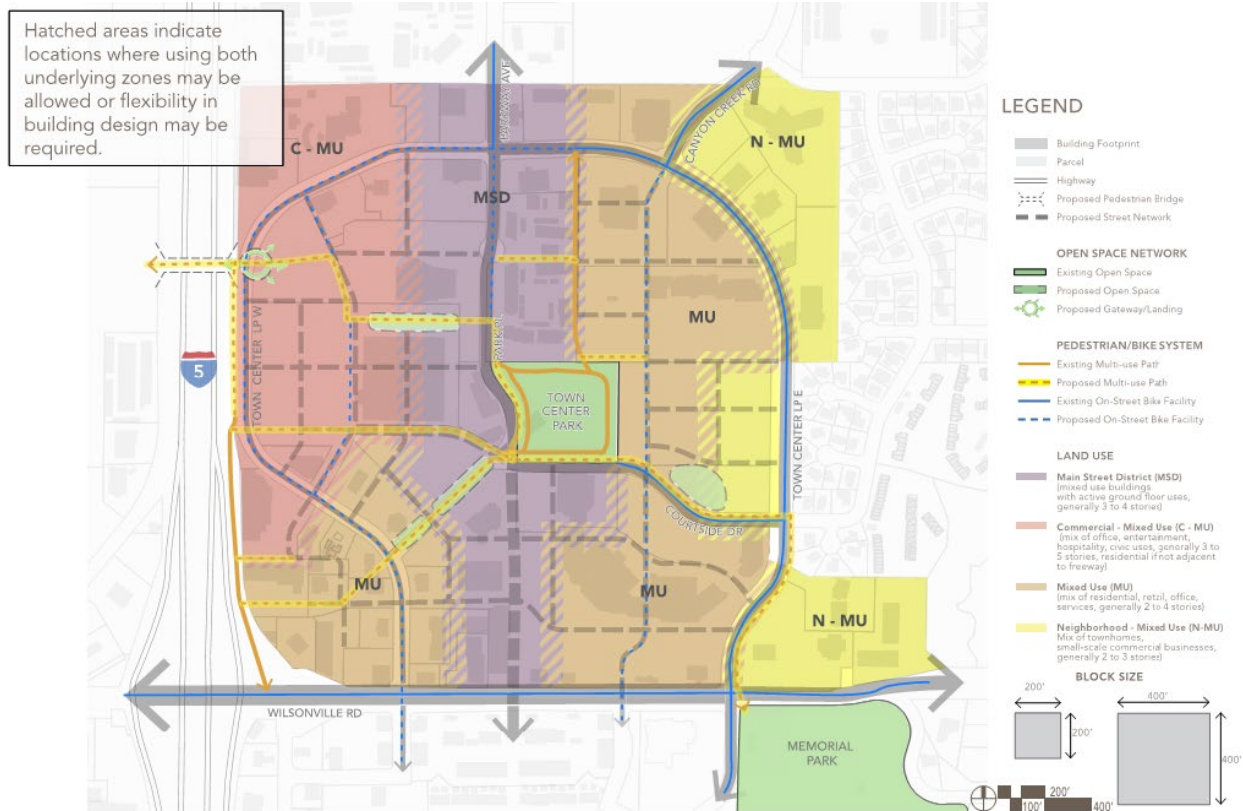
### **Proposed Town Center Plan Land Use Alternative**

The Town Center Plan proposes a new long-term vision for the Town Center area that provides the framework for both new development and redevelopment. The traffic analysis focused on the relative change in trips between the existing land use and the Plan's proposed land use. Figure 5 shows the proposed land use zones, which consist of four zoning types representing a mix of land uses:

- **Main Street.** A walkable and lively main street with a mix of active uses and mostly 3-4 story buildings through the heart of Town Center along Parkway Avenue, which would extend south past Town Center park to Wilsonville Road.
- **Neighborhood-Mixed Use.** Development would be less intense as it approaches Town Center Loop East and the adjacent neighborhoods. Light activity development would include 2-3 story residential and mixed-use development, with neighborhood-serving commercial businesses.
- **Mixed Use.** A variety of mostly 2-4 story buildings throughout Town Center would provide the mix of residential, commercial and office uses. Moderate activity near Wilsonville Road would be commercially focused while the areas near Town Center Park would include more residential and mixed-use buildings.



- Commercial-Mixed Use.** Taller buildings, up to 5 stories, along I-5 and near the future pedestrian bridge landing support the increased level of activity and economic vibrancy desired by community members, including additional employment opportunities, entertainment, and hospitality services. As proposed, residential uses in this area would not be allowed adjacent to I-5.



**Figure 5: Proposed Land Use Zones and Transportation Network Improvements**

Given the proposed land use zones for the Town Center shown in Figure 5, a traffic analysis scenario was developed which looks at full buildout of the proposed land use zones (shown in Table 3). The table shows a potential for more than double the amount of commercial and office square footage, as well as additional housing opportunities, by the time the Town Center is fully built, which is anticipated to be completed after the TSP Horizon Year (2035).

**Table 3: Proposed Square Footage of Full Development in Town Center Plan (Beyond Horizon Year)**

	<b>Commercial <sup>1</sup> (sq. ft.)</b>	<b>Retail <sup>2</sup> (sq. ft.)</b>	<b>Office (sq. ft.)</b>	<b>Residential <sup>3</sup> (units)</b>
Existing	299,238	321,340	178,947	79
Added	391,991	355,200	578,131	1,603
Removed	187,396	305,200	37,078	-
Net New	204,595	50,000	541,053	1,603
<b>Net Total</b>	<b>503,833</b>	<b>371,340</b>	<b>720,000</b>	<b>1,682</b>

<sup>1</sup> Commercial land uses includes a broad category of real estate. For this analysis, commercial land uses are typically larger types of development, such as grocery stores, restaurants, larger retail (non-main street type uses) and entertainment uses.

<sup>2</sup> Retail, as defined for Town Center, are typically smaller scale uses typical of a main street redevelopment pattern.

<sup>3</sup> Residential unit calculations assume units of approximately 750 square feet, although the expectation is that a variety of housing unit sizes (studio, one, two and three bedroom) would be constructed over time. Square footage and housing units were determined using GIS analysis, market feasibility, and proposed zoning district density allowances.

**Note:** Approximately 40 percent of the square footage of developable parcels was removed to accommodate for landscaping new streets, off-street parking (including loading and circulation), public spaces, stormwater retention and treatment.

Table 4 shows the number of trips generated based on the full buildout of the Town Center Plan. This assumes all land use zones and transportation network changes have been made. As shown in the table, the proposed, fully-developed Town Center forecasted approximately 1,746 net new trips to and from the Town Center. This trip estimation is 786 total trips more than what is anticipated in the TSP Horizon Year (2035) trip estimation (960 trips in Table 2). The Horizon Year (2035) land use trip estimation from the adopted TSP accounts for approximately 55% of the estimated full development of the Town Center. To analyze the impact of the completed Town Center, which would generate approximately 1,746 trips, a full development sensitivity analysis was included in this report. The results of that analysis are shown later in the document.

**Table 4: Town Center Plan Full Development Trip Generation (Beyond Horizon Year)**

	<b>Commercial (KSF<sup>1</sup>)</b>	<b>Retail (KSF)</b>	<b>Office (KSF)</b>	<b>Residential (Units)</b>	<b>Total</b>
Net New Development	204.595	50	541.053	1,603	-
Trip Rate <sup>2</sup>	3.79 per KSF	3.79 per KSF	1.01 per KSF	0.62 per unit	-
Net New Trips	775	190	546	994	2,505
Pass-by Reduction (34%) <sup>3</sup>	258	63	-	-	321
Multimodal Reduction (10%) <sup>4</sup>	52	13	55	99	219
Internal Trip Reduction (10%) <sup>5</sup>	52	13	55	99	219
<b>Net New Total Trips</b>	<b>413</b>	<b>101</b>	<b>436</b>	<b>796</b>	<b>1,746</b>

<sup>1</sup> KSF = 1,000 square feet

<sup>2</sup> Trip rates were developed using the ITE 10th Edition Trip Generation. The total square footage for each use was used to determine the rate based on the equation. Commercial and retail use was combined to develop a mixed-use rate.

<sup>3</sup> The pass-by reduction rate was calculated using an average of multiple potential land uses in ITE Trip Generation manual.

<sup>4</sup> Accounts for non-vehicular trips that would be enabled and encouraged based on the vision for a walkable, bikeable Town Center that provides a pleasant environment and ease of access for non-auto modes.

<sup>5</sup> Reduction accounts for trips among uses present in the Town Center that use internal roadways and are not added to external roadways (e.g., Wilsonville Road). The mix of land uses present provides opportunities for travel among the uses (e.g., office to

residential, or residential to retail). Due to the scale and uncertainty of uses, a conservatively low value of 10% was applied, rather than higher rates (20% and above) identified for most combinations of uses in ITE Trip Generation.

However, the analysis needs to determine approximately how much development is expected by the TSP Horizon Year (2035) according to the proposed Town Center Plan land uses. Table 5 shows the total net anticipated land use square footages and residential units for the proposed Plan by the Horizon Year (2035).

**Table 5: Proposed Square Footage of Development in Town Center Plan by 2035**

	<b>Commercial<sup>1</sup> (sq. ft.)</b>	<b>Retail<sup>2</sup> (sq. ft.)</b>	<b>Office (sq. ft.)</b>	<b>Residential<sup>3</sup> (units)</b>
Existing	299,238	321,340	178,947	79
Net New (2035)	130,231	31,858	297,442	881
<b>Net Total</b>	<b>429,469</b>	<b>353,188</b>	<b>476,389</b>	<b>960</b>

<sup>1</sup> Commercial land uses includes a broad category of real estate. For this analysis, commercial land uses are typically larger types of development, such as grocery stores, restaurants, larger retail (non-main street type uses) and entertainment uses.

<sup>2</sup> Retail, as defined for Town Center, are typically smaller scale uses typical of a main street redevelopment pattern.

<sup>3</sup> Residential unit calculations assume units of approximately 750 square feet, although the expectation is that a variety of housing unit sizes (studio, one, two and three bedroom) would be constructed over time. Square footage and housing units were determined using GIS analysis, market feasibility, and proposed zoning district density allowances.

**Note:** Approximately 40 percent of the square footage of developable parcels was removed to accommodate for landscaping new streets, off-street parking (including loading and circulation), public spaces, stormwater retention and treatment.

Table 6 shows the number of trips estimated to be generated by the Town Center Plan by year 2035. As shown in the table, development associated with the proposed land use forecasted approximately 960 net new trips to and from the Town Center by the TSP 2035 Horizon Year.

**Table 6: Town Center Plan Development Trip Generation by 2035**

	<b>Commercial (KSF<sup>1</sup>)</b>	<b>Retail (KSF)</b>	<b>Office (KSF)</b>	<b>Residential (Units)</b>	<b>Total</b>
Net New Development	130.231	31.85	297.44	881	-
Trip Rate <sup>2</sup>	3.79 per KSF	3.79 per KSF	1.01 per KSF	0.62 per unit	-
Net New Trips	494	121	300	546	1,461
Pass-by Reduction (34%) <sup>3</sup>	168	41	-	-	209
Multimodal Reduction (10%) <sup>4</sup>	49	12	30	55	146
Internal Trip Reduction (10%) <sup>5</sup>	49	12	30	55	146
<b>Net New Total Trips</b>	<b>228</b>	<b>56</b>	<b>240</b>	<b>436</b>	<b>960</b>

<sup>1</sup> KSF = 1,000 square feet

<sup>2</sup> Trip rates were developed using the ITE 10th Edition Trip Generation. The total square footage for each use was used to determine the rate based on the equation. Commercial and retail use was combined to develop a mixed-use rate.

<sup>3</sup> The pass-by reduction rate was calculated using an average of multiple potential land uses in ITE Trip Generation manual.

<sup>4</sup> Accounts for non-vehicular trips that would be enabled and encouraged based on the vision for a walkable, bikeable Town Center that provides a pleasant environment and ease of access for non-auto modes.

<sup>5</sup> Reduction accounts for trips among uses present in the Town Center that use internal roadways and are not added to external roadways (e.g., Wilsonville Road). The mix of land uses present provides opportunities for travel among the uses (e.g., office to residential, or residential to retail). Due to the scale and uncertainty of uses, a conservatively low value of 10% was applied, rather than higher rates (20% and above) identified for most combinations of uses in ITE Trip Generation.

## Town Center Plan Transportation Network Improvements

As part of the redevelopment plan, there are several transportation network improvements that are proposed. These improvements change the overall traffic patterns and routes that vehicles would take through Town Center. These changes are shown in Figure 6, described below, and are also show in Attachment D.

- **Wilsonville Road/Town Center Loop W:** Modify the existing traffic signal to eliminate eastbound and westbound left turns, add a landscaped median to the west leg, and improve pedestrian and bicycle safety by adding a median refuge to cross Wilsonville Road.
- **Wilsonville Road/Parkway Ave:** Construct a new intersection that connects the extension of Parkway Avenue to the south with Wilsonville Road. At this intersection install a traffic signal that allows all turning movements and moves eastbound left turn traffic further from the I-5 interchange.
- **Wilsonville Road/Rebekah Street:** Remove the existing traffic signal and restrict the minor street turning movements to be right-in, right-out only by continuing the landscaped median or using space for a pedestrian median with flashers for crossings.
- **Wilsonville Road/Town Center Loop E:** Modify the existing traffic signal to include dual eastbound lefts and modify the north leg to have dual northbound receiving lanes.
- **Town Center Loop W/Park Place:** Remove this intersection for vehicle traffic.



**Figure 6: Proposed Transportation Network Changes**

## Operation Analysis

Operational analysis is the primary tool to understand how traffic is moving through key intersection of the Town Center as development strategies are put in place. Level of service (LOS) ratings and volume-to-capacity (v/c) ratios are two performance measures of intersection operations.

- Level of service (LOS):** A “report card” rating (A through F) based on the average delay experienced by vehicles at the intersection. LOS A, B, and C indicate conditions where traffic moves without significant delays over periods of peak hour travel demand. LOS D and E are progressively worse operating conditions. LOS F represents conditions where average vehicle delay has become excessive and demand has exceeded capacity.

- **Volume-to-capacity (v/c) ratio:** A decimal representation (typically between 0.00 and 1.00) of the proportion of capacity that is being used at a turn movement, approach leg, or intersection. It is determined by dividing the peak hour traffic volume by the hourly capacity of a given intersection or movement. A lower ratio indicates smooth operations and minimal delays. As the ratio approaches 1.00, congestion increases, and performance is reduced. If the ratio is greater than 1.00, the turn movement, approach leg, or intersection is oversaturated and usually results in excessive queues and long delays.

The City of Wilsonville requires the intersections of public streets to meet its minimum acceptable level of service (LOS) standard, which is LOS D (operates with significant delays) for peak periods.<sup>3</sup> Interstate 5 (I-5) is adjacent to the study area boundaries and impacts the functionality of roads within the study area. I-5 is an Oregon Department of Transportation (ODOT) facility classified as an Interstate on the National Highway System and part of the national network as a high clearance, reduction review, freight route. According to the *1999 Oregon Highway Plan (OHP)*, ODOT mobility targets are given as v/c ratios and are based on the highway category, which is 0.90 for peak period for the I-5/Wilsonville Road ramp intersections only.<sup>4,5</sup>

A description of Level of Service (LOS) is provided in Attachment C which includes a list of the delay values (in seconds) that correspond to each LOS designation. For example, the City of Wilsonville’s minimum operating standard, LOS D, has an approximately allowed delay of 25 to 35 seconds for an unsignalized intersection and 35 to 55 seconds for a signalized intersection.

### Scenario Development

As previously shown, the TSP forecasted approximately 960 net new trips to the Town Center from 2016 to 2035. This accounts for approximately 55% of the estimated full buildout of the proposed land uses in the Town Center Plan, which is anticipated to occur beyond the TSP Horizon Year (2035). Based on meeting with City staff, the analysis of the new trips associated with the proposed Town Center Plan will be broken into three scenarios to understand the impact of the proposed changes.<sup>6</sup>

- TSP Horizon Year (2035) Scenario  
(TSP approved growth and transportation network assumptions) – No Build
- TSP Horizon Year (2035) + Town Center Transportation Improvements Scenario  
(TSP land use growth assumptions and Town Center Plan proposed transportation network improvements) – Build

<sup>3</sup> *City of Wilsonville Code*, City of Wilsonville Section 4.140.

<sup>4</sup> *1999 Oregon Highway Plan*, Page 76, Oregon Department of Transportation, 1999.

<sup>5</sup> The typical ODOT mobility target for interchange ramps is a 0.85 v/c ratio. 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 mainline, then the target can be increased to a 0.90 v/c ratio.

<sup>6</sup> Meeting with Zach Weigel, City of Wilsonville, September 20th, 2018.

- Town Center Plan Full Development Buildout [Beyond the Horizon Year] Scenario (Town Center Plan full build growth assumptions beyond 2035 TSP Horizon Year) + Town Center Transportation Improvements Scenario – Full Development

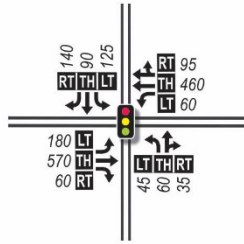
The Horizon Year (2035) No Build and Build scenarios assume that there is no additional Town Center land use growth above and beyond the assumptions projected by the TSP. Given current development pattern in Town Center it is unlikely for the Town Center Plan to be fully built by 2035. Given market and development feasibility analyses conducted for the project, the planning team estimates approximately half the development projects will be constructed by 2035. This conclusion maintains a growth scenario consistent with the land use assumptions in the City’s adopted Transportation System Plan. As traffic patterns and driving habits change, updated traffic analysis will occur, and transportation infrastructure needs will be assessed as development of the Town Center Plan is realized.

The Full Development Buildout scenario used the volumes generated by the potential 1,746 net new trips (or 786 trips above the Horizon Year (2035) TSP projections) of the Town Center Plan.

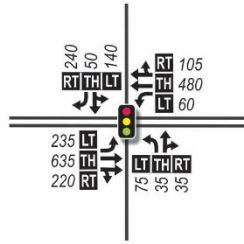
## **TSP Horizon Year (2035) No Build and Build**

The volumes for the two TSP Horizon Year (2035) scenarios with and without the Town Center Plan proposed transportation network improvements can be seen in Figure 7 and Figure 8 on the following pages. As the City undergoes the Wilsonville Road intersection improvements and as Town Center development progresses, additional transportation simulation of the Wilsonville Road corridor should be conducted to determine storage needs and the final intersection footprints.

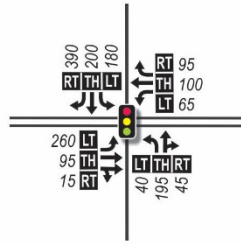
1. Wilsonville Rd. @ Town Center Loop East



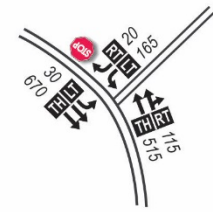
2. Wilsonville Rd. @ Rebekah St.



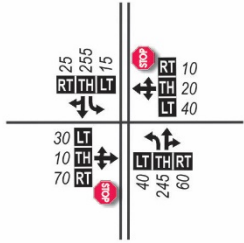
3. Town Center Loop @ Parkway Ave.



4. Town Center Loop West @ Park Place



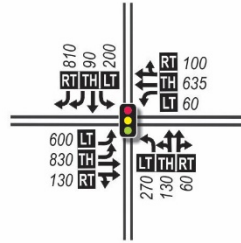
5. Town Center Loop East @ Courtside Dr.



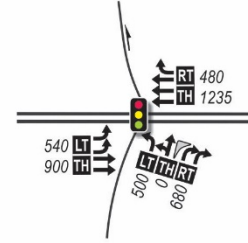
6. Town Center Loop East @ SW Canyon Creek Rd.



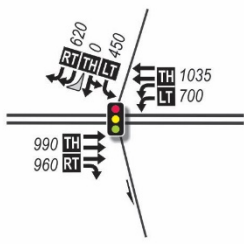
7. Wilsonville Rd. @ Town Center Loop West



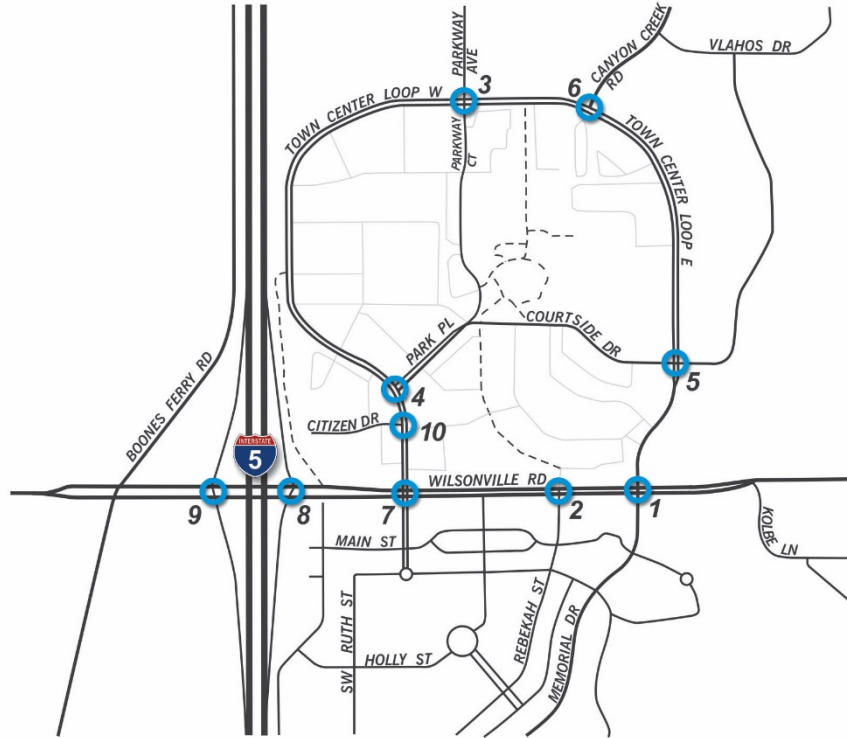
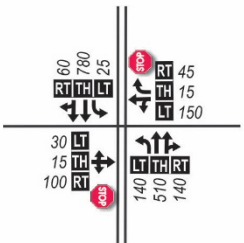
8. Wilsonville Rd. @ I-5 Northbound Ramp



9. Wilsonville Rd. @ I-5 Southbound Ramp



10. Town Center Loop West @ Citizen Dr.



**LEGEND**

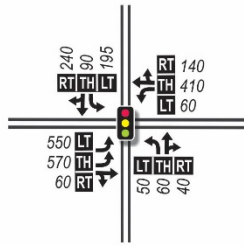
- # - Study Intersection
- Traffic Signal
- Stop Sign
- - Bicycle & Pedestrian Path
- - Internal Roadways
- ← - Lane Configuration
- 000 - PM Peak Hour Traffic Volumes
- LT/TH/RT - Volume Turn Movement (Left-Thru-Right)

No Scale  
DKS

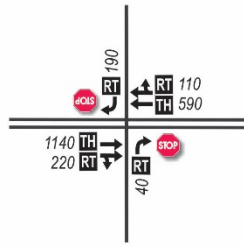
Figure 7: TSP Horizon Year (2035) No Build PM Peak Hour Traffic Volumes



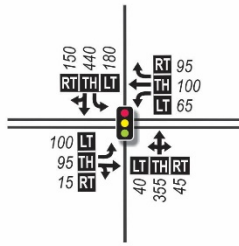
1. Wilsonville Rd. @ Town Center Loop East



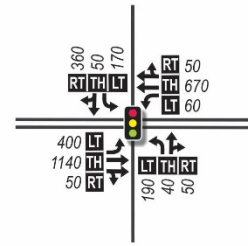
2. Wilsonville Rd. @ Rebekah St.



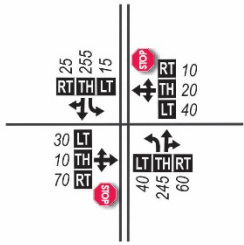
3. Town Center Loop @ Parkway Ave.



4. Wilsonville Rd. @ Parkway Ave.



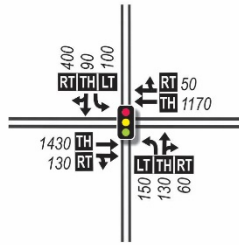
5. Town Center Loop East @ Courtside Dr.



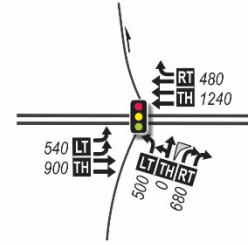
6. Town Center Loop East @ SW Canyon Creek Rd.



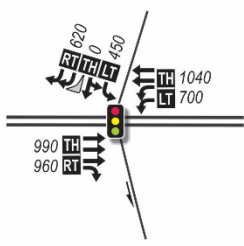
7. Wilsonville Rd. @ Town Center Loop West



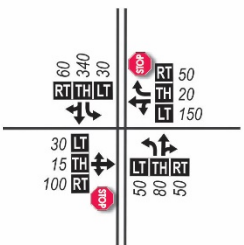
8. Wilsonville Rd. @ I-5 Northbound Ramp



9. Wilsonville Rd. @ I-5 Southbound Ramp



10. Town Center Loop West @ Citizen Dr.



**LEGEND**

- # - Study Intersection
- Traffic Signal Icon - Traffic Signal
- STOP Sign Icon - Stop Sign
- - Bicycle & Pedestrian Path
- - Internal Roadways
- ← - Lane Configuration
- 000 - PM Peak Hour Traffic Volumes
- LT/TH/RT - Volume Turn Movement (Left-Thru-Right)



  
 No Scale  


Figure 8: TSP Horizon Year (2035) Build PM Peak Hour Traffic Volumes

Table 7 shows the intersection operations given the TSP Horizon Year (2035) traffic volumes and TSP transportation network improvements. As shown, the unsignalized intersections along Town Center Loop West at Park Place and Citizen Drive will fail to meet the required LOS D operating standard for the City of Wilsonville. The full Highway Capacity Manual (HCM) analysis reports can be found in Attachment F.

**Table 7: Horizon Year (2035) No Build Intersection Operations**

Intersection	Jurisdiction	Operating Standard/ Mobility Target	PM Peak Hour		
			Delay	LOS	v/c
<b>Signalized</b>					
Wilsonville Road/Town Center Loop E	City of Wilsonville	LOS D	20.8	C	0.53
Wilsonville Road/Rebekah St	City of Wilsonville	LOS D	16.0	B	0.48
Wilsonville Road/Town Center Loop W <sup>1</sup>	City of Wilsonville	LOS D	41.2	D	0.75
Wilsonville Road/ I-5 NB	ODOT	0.90 v/c <sup>2</sup>	27.7	C	0.67
Wilsonville Road/ I-5 SB	ODOT	0.90 v/c <sup>2</sup>	45.1	D	0.87
Town Center Loop West/Parkway Avenue	City of Wilsonville	LOS D	25.5	C	0.47
Town Center Loop East/Canyon Creek Road	City of Wilsonville	LOS D	23.8	C	0.31
<b>Unsignalized</b>					
Town Center Loop West/Park Place	City of Wilsonville	LOS D	<b>60.9</b>	<b>A/F</b>	<b>0.78</b>
Town Center Loop West/Citizen Drive	City of Wilsonville	LOS D	<b>&gt;100</b>	<b>B/F</b>	<b>&gt;1.0</b>
Town Center Loop East/Courtside Drive	City of Wilsonville	LOS D	19.7	A/C	0.24

**Signalized Intersections:**

Delay = Average Stopped Delay per Vehicle (sec)  
 LOS = Level of Service of Intersection  
 v/c = Volume-to-Capacity Ratio of Intersection

**Unsignalized Intersections:**

Delay = Average Stopped Delay per Vehicle (sec) at Worst Movement  
 LOS = Level of Service of Major Street/Minor Street  
 v/c = Volume-to-Capacity Ratio of Worst Movement

**Bold/Highlighted:** Intersection fails to meet Operating Standards/Mobility Target

<sup>1</sup> 2035 TSP operations assumed a high priority project that included dual southbound right turn lanes. See TSP High Priority projects SI-04.

<sup>2</sup> The mobility target for interchanges is typically 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 mainline, then the target can be increased to a 0.90 v/c ratio. Vehicle queues for this scenario were determined not to extend onto the I-5 mainline as part of the City TSP analysis.

It should be noted that the unsignalized intersections along Town Center Loop West at Park Place and Citizen Drive fail to meet the City standard of LOS D due to the high delays on the minor street approach as shown in the table above. According to the Highway Capacity Manual<sup>7</sup>, it is not unusual for an unsignalized intersection to experience level of service E or F

<sup>7</sup> 2000 Highway Capacity Manual, Transportation Research Board, Washington D.C., 2000, Chapters 16 and 17.

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.

However, transportation network changes (i.e. adding the new main street extension), proposed by the Town Center Plan, would remove vehicles on Town Center Loop West and would eliminate the Town Center Loop West/Park Place intersection, improving the operations at the Citizen Drive unsignalized intersection.

As shown in Table 8 given the proposed transportation network improvements in the Town Center Plan, all study intersections will meet operating standards and mobility targets for the Horizon Year (2035). The full Highway Capacity Manual (HCM) analysis reports can be found in Attachment F.

**Table 8: Horizon Year (2035) Build Intersection Operations**

Intersection	Jurisdiction	Operating Standard/ Mobility Target	PM Peak Hour		
			Delay	LOS	v/c
<b>Signalized</b>					
Wilsonville Road/Town Center Loop E	City of Wilsonville	LOS D	39.2	D	0.74
Wilsonville Road/Parkway Avenue <sup>1</sup>	City of Wilsonville	LOS D	40.3	D	0.86
Wilsonville Road/Town Center Loop W	City of Wilsonville	LOS D	36.5	D	0.92
Wilsonville Road/ I-5 NB	ODOT	0.90 v/c <sup>3</sup>	30.0	C	0.66
Wilsonville Road/ I-5 SB	ODOT	0.90 v/c <sup>3</sup>	45.6	D	0.87
Town Center Loop West/Parkway Avenue	City of Wilsonville	LOS D	18.7	B	0.48
Town Center Loop East/Canyon Creek Road	City of Wilsonville	LOS D	25.2	C	0.52
<b>Unsignalized</b>					
Wilsonville Road/Rebekah St	City of Wilsonville	LOS D	15.5	C <sup>2</sup>	0.30
Town Center Loop West/Citizen Drive	City of Wilsonville	LOS D	32.8	A/D	0.55
Town Center Loop East/Courtside Drive	City of Wilsonville	LOS D	18.7	A/C	0.22

**Signalized Intersections:**

Delay = Average Stopped Delay per Vehicle (sec)  
 LOS = Level of Service of Intersection  
 v/c = Volume-to-Capacity Ratio of Intersection

<sup>1</sup>New Intersection

<sup>2</sup>No minor street level of service because this intersection is a right-in, right-out.

<sup>3</sup> The mobility target for interchanges is typically 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 mainline, then the target can be increased to a 0.90 v/c ratio. Vehicle queues for this scenario were determined not to extend onto the I-5 mainline. See Queuing Analysis section of this report.

**Unsignalized Intersections:**

Delay = Average Stopped Delay per Vehicle (sec) at Worst Movement  
 LOS = Level of Service of Major Street/Minor Street  
 v/c = Volume-to-Capacity Ratio of Worst Movement

# Full Development Buildout Sensitivity Analysis (Beyond Horizon Year)

A sensitivity test was completed for the Town Center Plan full development scenario with the transportation network improvements identified in the Plan. Figure 9 shows the traffic volumes and trip distribution assumptions for the full development.

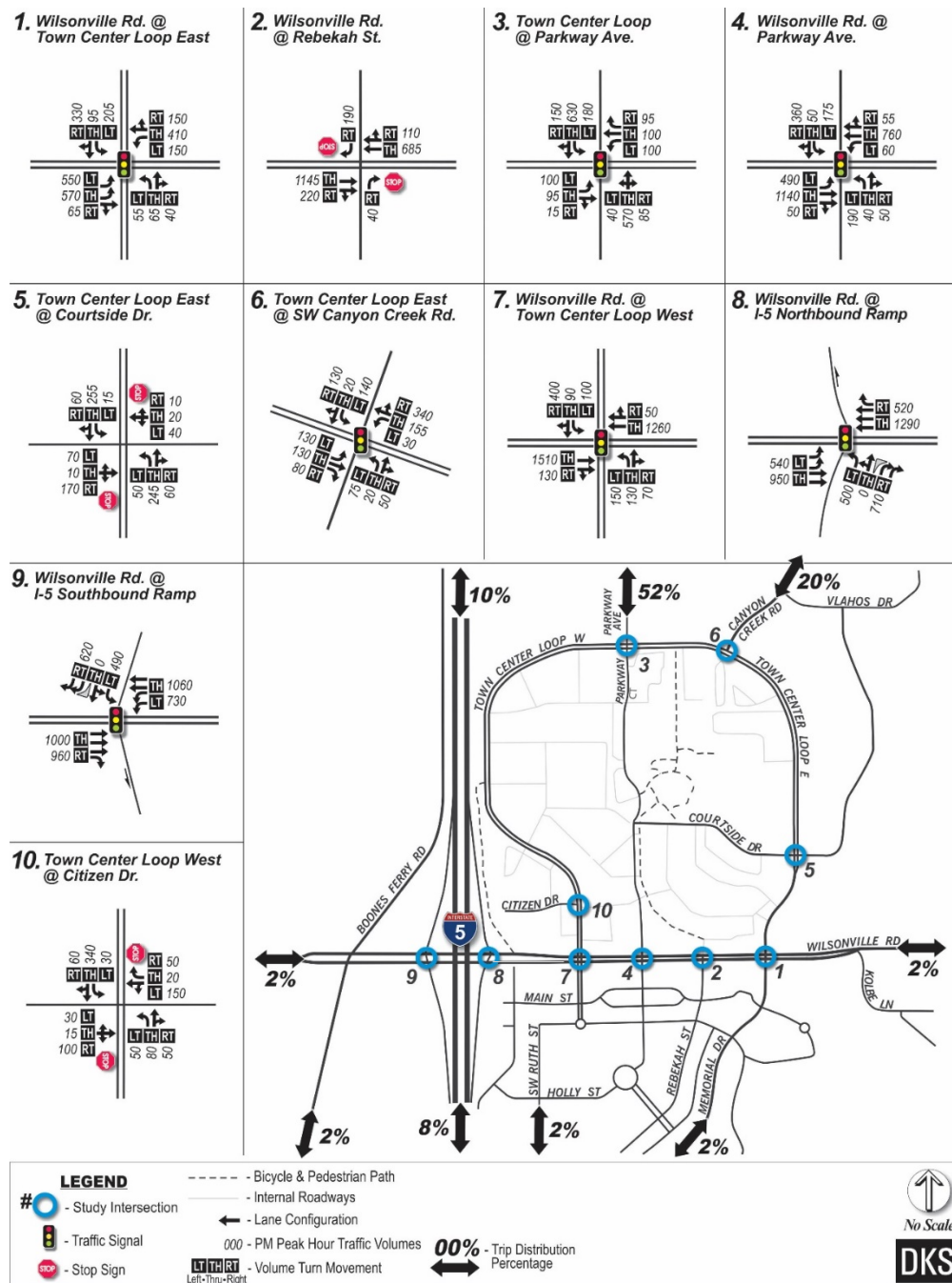


Figure 9: Full Development PM Peak Hour Traffic Volumes (Beyond Horizon Year)

As shown in Table 9, all study intersections would operate within operating standards and meet mobility targets given the proposed transportation network improvements. However, given the proximity of intersections along Wilsonville Road and the traffic operations results (LOS C and D) approaching congested conditions, additional analysis should be conducted through the years to review traffic flow, confirm operations, and evaluate lane configurations. Such analysis (including simulation and queuing analysis) should be conducted to refine project details (including queue storage) during design. The full Highway Capacity Manual (HCM) analysis reports can be found in Attachment F.

**Table 9: Full Development (Beyond Horizon Year) Build Intersection Operations**

Intersection	Jurisdiction	Operating Standard/ Mobility Target	PM Peak Hour		
			Delay	LOS	v/c
<b>Signalized</b>					
Wilsonville Road/Town Center Loop E	City of Wilsonville	LOS D	46.6	D	0.83
Wilsonville Road/Parkway Avenue <sup>1</sup>	City of Wilsonville	LOS D	39.1	D	0.99
Wilsonville Road/Town Center Loop W	City of Wilsonville	LOS D	52.5	D	0.99
Wilsonville Road/ I-5 NB	ODOT	0.85 v/c	25.9	C	0.71
Wilsonville Road/ I-5 SB	ODOT	0.85 v/c	48.6	D	0.88
Town Center Loop West/Parkway Avenue	City of Wilsonville	LOS D	39.0	D	0.77
Town Center Loop East/Canyon Creek Road	City of Wilsonville	LOS D	25.9	C	0.53
<b>Unsignalized</b>					
Wilsonville Road/Rebekah St	City of Wilsonville	LOS D	15.6	C <sup>2</sup>	0.33
Town Center Loop West/Citizen Drive	City of Wilsonville	LOS D	33.3	A/D	0.55
Town Center Loop East/Courtside Drive	City of Wilsonville	LOS D	25.8	A/D	0.55

**Signalized Intersections:**

Delay = Average Stopped Delay per Vehicle (sec)  
 LOS = Level of Service of Intersection  
 v/c = Volume-to-Capacity Ratio of Intersection

<sup>1</sup>New Intersection

<sup>2</sup>No minor street level of service because this intersection is a right-in, right-out.

**Unsignalized Intersections:**

Delay = Average Stopped Delay per Vehicle (sec) at Worst Movement  
 LOS = Level of Service of Major Street/Minor Street  
 v/c = Volume-to-Capacity Ratio of Worst Movement

## Queuing Analysis

Queuing analysis was performed for the PM peak hour through traffic simulations performed in SimTraffic™ and using the Horizon Year (2035) Build volumes. The queuing analysis was performed to determine if the 95th percentile southbound queues at the I-5 interchanges extend back to the I-5 mainline. The 95th percentile queue is the queue length for a given intersection movement that has only a 5% chance of being exceeded during the peak traffic hour. ODOT

simulation protocol<sup>8</sup> was adhered to for this analysis. The queuing report can be found in Attachment G.

**Table 10: PM Peak Hour 95<sup>th</sup> Percentile Queuing (2035 Build)**

Intersection	Movement	Available Storage (feet)	95 <sup>th</sup> Queue Length (feet)
Wilsonville Rd/ I-5 SB	SB Exit Ramp	1,080	475
	EBT	500	400
	WBT	350	175
	WBL	350	250
Wilsonville Rd/ I-5 NB	NB Exit Ramp	1,090	350
	EBT	350	275
	EBL	350	200
	WBT	625	<b>&gt;625</b>
Wilsonville Rd/ Town Center Loop West	EBT	600	<b>&gt;600</b>
Wilsonville Rd/ Parkway Avenue	EBT	400	300
	EBL	390	<b>400</b>
Wilsonville Rd/ Town Center Loop East	EBL	400	325

According to Table 10 above, the queues on the northbound and southbound off-ramps do not extend onto the I-5 mainline in either scenario.

The Wilsonville Road/I-5 Northbound and Wilsonville Road/ Town Center Loop West intersections show queues greater than the available storage. This occurred because the intersections are closely spaced, however, the queues did not spill back and impact other corridor operations.

At Wilsonville Road/Parkway Avenue, the queuing analysis shows the eastbound left turn 95<sup>th</sup> percentile queue at 400 feet, which exceeds the conceptual storage length at 390 feet. It is recommended that the intersection (including the Holly Lane approach) be shifted to the east to provide a minimum of 400 feet left turn storage length to accommodate future queues.

## ODOT Coordination

Traffic patterns and driving habits may change relative to what is expected leading up to the completion of the Town Center Plan. Because of this, updated traffic analysis will be conducted

<sup>8</sup> Chapter 8.3, Analysis Procedures Manual, Oregon Department of Transportation, Updated November 2018.

throughout the development process and transportation infrastructure needs will be assessed through specific transportation impact studies per the City's existing development requirements. If it is found that queuing has become a problem in the I-5 interchange area, ODOT staff<sup>9</sup> and City staff have agreed upon potential mitigations that will assure the eastbound left-turn queuing does not impact interchange operations. The projects listed below provide improvement options that will be further analyzed in the future to determine an appropriate solution to the queuing problems and maintain the Town Center Vision:

- Implementing signal timing enhancements to favor the eastbound movements to limit queuing at the interchange.
- Installing a “queue dump” loop to clear eastbound left-turning traffic off the I-5 ramps.
- Installing a single eastbound left-turn lane on Wilsonville Road at Town Center Loop West or the future Rebekah/Canyon Creek Rd extension.
- Evaluating the use of a roundabout at the new main street intersection rather than a traffic signal.

It should be noted that none of these potential mitigations are part of the City's vision for the Town Center Plan, but are still supported by the City as potentially necessary projects to keep the I-5 interchange area operating efficiently and clear of traffic queues.

## Multimodal Connectivity

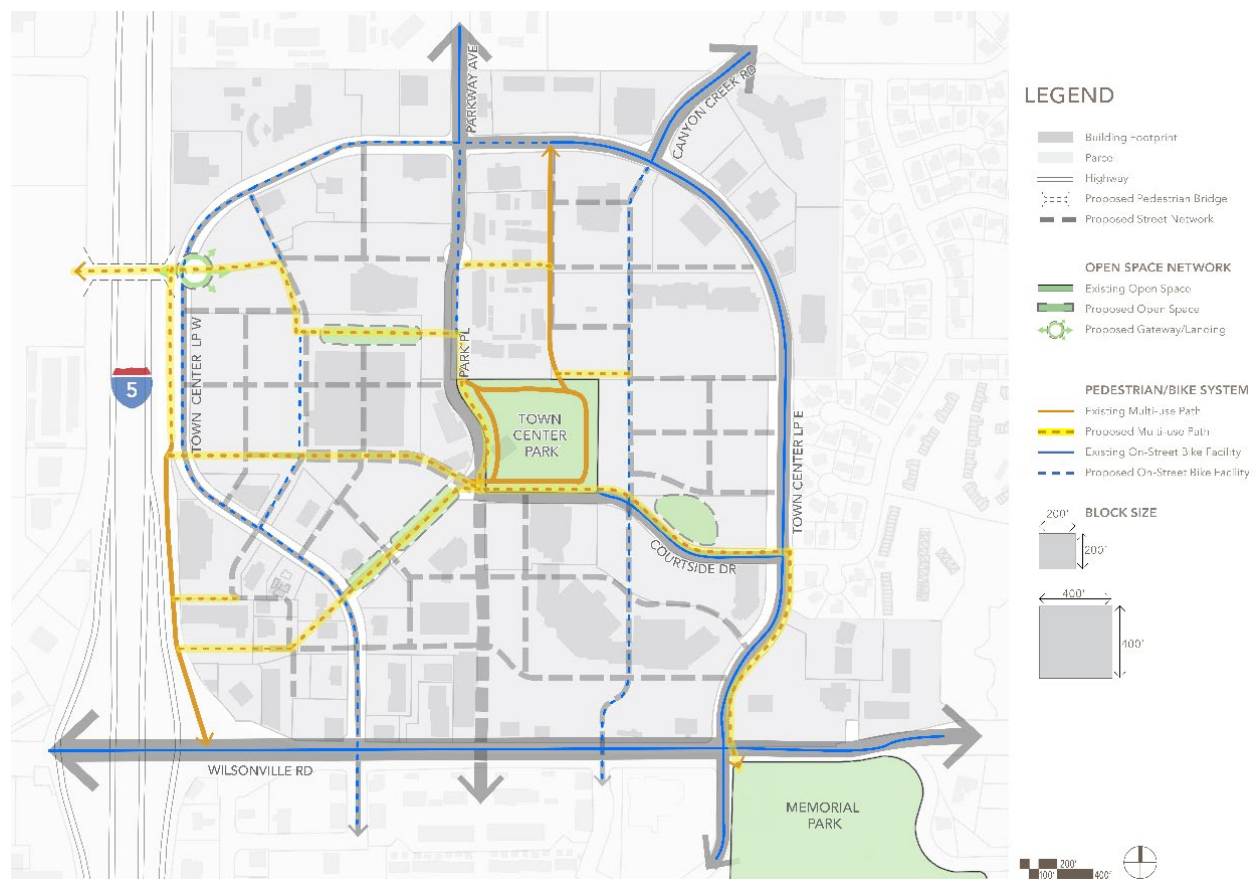
Having a well-connected multimodal system allows a variety of users to travel to, from, and within the Town Center. These potential travelers include, but are not limited to:

- Commuters that travel from adjacent neighborhoods to the Town Center for work;
- Residents within the Town Center that access places of work within the Town Center, near the Town Center, or access transit for other locations; and
- Residents or employees within the town center (or adjoining areas) that visit other uses in the town center for food, shopping, or entertainment.

In order to serve these potential users, the Town Center should provide a well-connected multimodal system. The proposed multimodal system (Figure 10) was reviewed for internal and external connectivity that would enhance and enable transportation options. The proposed multimodal network is shown in Attachment E.

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<sup>9</sup> ODOT staff include John Mackler, Avi Tayar, and Seth Brumley.



**Figure 10: Proposed Multimodal Network**

The proposed multimodal network offers the following enhancements to the existing transportation system:

- Internal connectivity – The proposed multimodal street network would improve the internal connectivity by adding new roads and reducing the block size. These actions would reduce travel distance and provide better network redundancy, reducing the reliance on individual streets. Streets and/or paths would provide a network with multiple routes to comfortably traverse the Town Center in a north-south or east-west direction, or travel between any internal locations. This is a stark contrast to the existing network that provides a single north-south and a single east-west route that bisect the area encompassed by Town Center Loop.
- Improved facilities within Town Center – The proposed system would include additional multi-use paths, bicycle, and pedestrian facilities, providing an enhanced user experience for both commuters and recreational travelers. These facilities would have the potential to both attract visitors from adjacent neighborhoods and enable pedestrian activity between locations in Town Center.

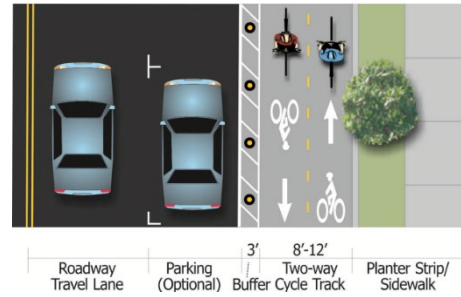


- External connections – The proposed network would include enhanced external connections, allowing travelers to enter or leave Town Center without reliance on a motor vehicle. Key external connections include:
  - The pedestrian bridge on the west edge of Town Center provides connections to neighborhoods east of I-5 and regional transit connections via SMART Central at Wilsonville Station.
  - Improved crossing opportunities on Wilsonville Road along the south edge of Town Center.
  - Trail connections from Town Center to Memorial Park.

The proposed multimodal system will result in a transportation network that supports multimodal activity and transportation options. Residents, employees, and visitors to Town Center would be able to travel between Town Center Park, Memorial Park, and various other destinations within and adjacent to Town Center without reliance on a motor vehicle.

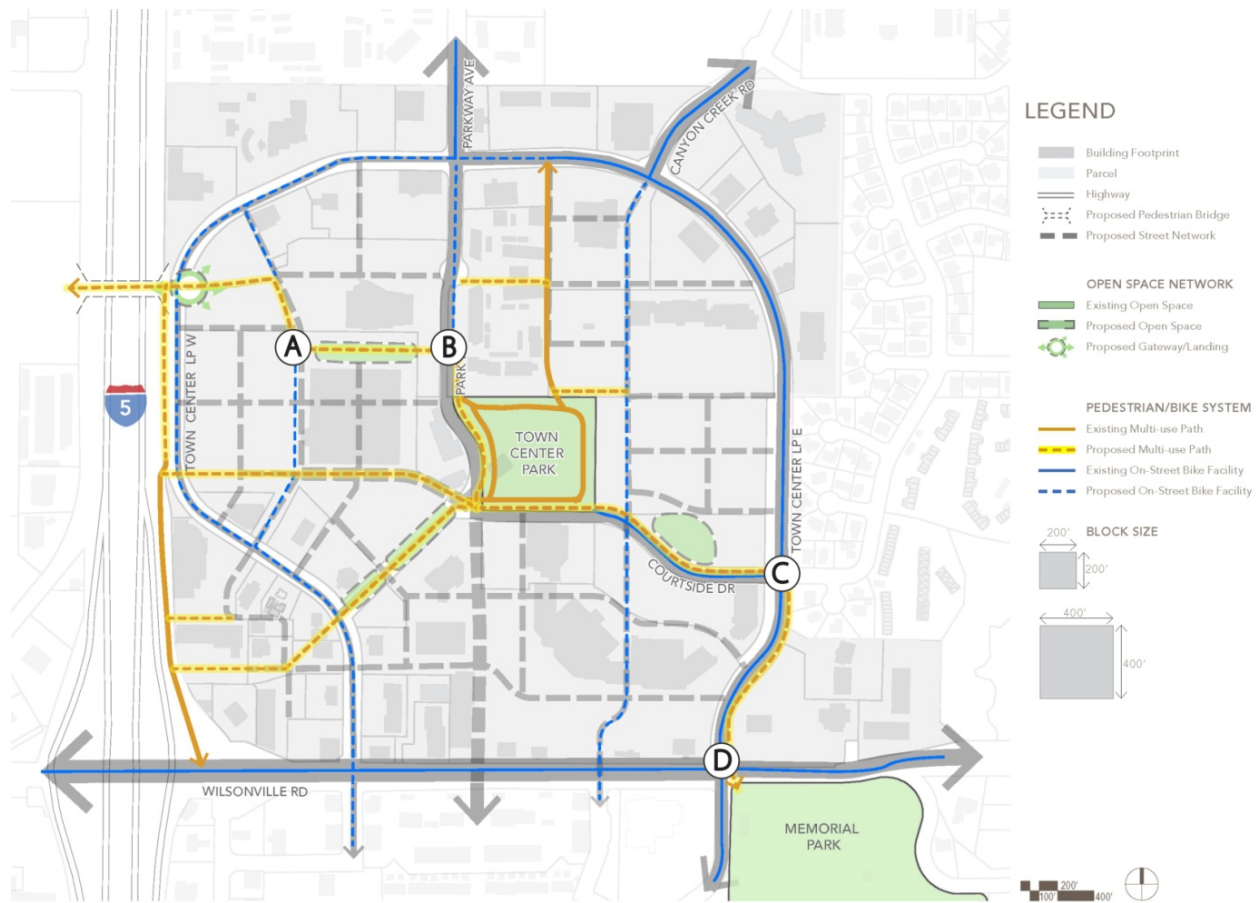
### Cycle Track Treatment

A major non-vehicular improvement outline in the proposed Town Center Plan is a cycle track. As recommended in the City’s TSP, Cycle Tracks are a safe bicycle facility type where additional separation is provided between motor vehicle travel lanes and the bicycle facility. Cycle tracks can be one-way (similar to a buffered bike lane but with a physical separation) or two-way (where both directions are served on the same side of the street). As shown in Figure 11, the TSP standards for a cycle track recommend a 3-foot buffer between the parking or driving lane and the cycle track and the cycle track should be a minimum of 8-feet to and a maximum of 12-feet wide.



**Figure 11: TSP Cycle Track Standards**

A cycle track is proposed as part of the Town Center Plan to connect the planned bicycle and pedestrian bridge over I-5 with Memorial Park to the southeast and the existing multi-use path that connects to Wilsonville Road adjacent to I-5. As shown in Figure 12 on the following page, there are multiple locations where the proposed route would use an existing intersection. Each of these locations will require individual engineering and planning due to different characteristics, including traffic control and expected volumes.



**Figure 12: Cycle Track Key Locations**

As shown, there are four key locations where the cycle track will cross motor vehicle traffic that could use additional modifications to improve safety and operations. Modifications include signing and striping, adding a bicycle signal, or modifying an existing traffic signal to include a bicycle phase. Each location has a unique modification that may be included based on preliminary traffic volumes and expected traffic patterns.<sup>10</sup> Each design treatment will need to be reevaluated as development and redevelopment occurs to assure the right design option is considered.

<sup>10</sup> Any new locations or location not identified in this memo should be analyzed individually to determine to best design for the use.

### Location A – Bridge Landing

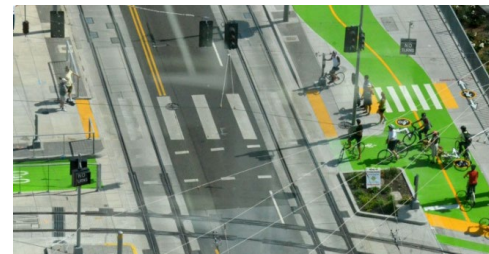
This location is expected to have low traffic volumes and may only require signing and striping at the intersection for the cycle track. Different design elements such as raised crossing or colored pavement to alert drivers to potential conflicts with bicyclist and all-way stop control as shown in the figure to the right could be incorporated into the design.



**Stop Controlled Cycle Track**

### Location B – Parkway Avenue

This location is expected to have higher traffic volumes as it crosses the new main street and may require a bicycle signal that stops vehicles on main street to allow bicycles to cross as shown in the photo to the right. This location would require additional planning and design to identify specific treatment details.



**Bicycle Signal for Cycle Track**

### Location C – Town Center Loop East

This location currently has pedestrian crossing flashing beacon that could be modified to integrate the cycle track. Alternatively, a new signal with a bicycle phase could be install here when warranted by traffic volumes. The photo to the right shows a cycle track crosswalk next to a pedestrian crosswalk.



**Cycle Track Crossing**

### Location D – Wilsonville Road

This location is currently a signalized intersection and could be modified to include a bicycle phase that connects the north/south cycle track on Town Center Loop East to Memorial Park. The photo to the right shows a special bicycle phase at a traffic signal where a designated signal head with LED bicycle red-yellow-green symbols provide traffic control for bicycles to the bicycle facility.



**Bicycle Phase at Traffic Signal**

## Summary

The land use alternatives developed by the Town Center Plan have the following impacts to the City of Wilsonville Transportation System.

- The TSP Horizon Year (2035) TSP land use assumptions resulted in 960 net new p.m. peak hour trips to and from the Town Center; the proposed fully-developed Town Center land use forecasted approximately 1,746 net new trips to and from the Town Center. The TSP Horizon Year (2035) land use trip estimation from the adopted TSP accounts for approximately 55% of the estimated full development of the Town Center. Therefore, a full development buildout sensitivity analysis was included in this report.
- The Town Center Plan proposes a modified street system that improves connectivity and circulation for all modes of travel, including improving the comfort and safety for pedestrian and bicycle travel.
- Modifications to the street system along Wilsonville Road include eliminating eastbound and westbound left turns at Town Center Loop West, constructing a new traffic signal at the proposed Parkway Avenue (Main Street) extension, replacing the existing traffic signal at Rebekah Street with an enhanced pedestrian crossing (pedestrian activated flashing beacon), adding dual eastbound left turns with dual receiving lanes at Town Center Loop E.
- Additional elements along Wilsonville Road will improve the comfort and safety of pedestrian and bicycle travel including modifications to the traffic signal at Town Center Loop West (i.e. reducing travel lane widths and adding a landscaped median to provide pedestrian median refuge to cross Wilsonville Road), adding a new signalized crossing at the new north/south main street, and adding an enhanced pedestrian crossing at Rebekah Street.
- A cycle track is proposed as part of the Town Center redevelopment to connect the planned bicycle and pedestrian bridge over I-5 with Memorial Park to the southeast and the existing multi-use path in the southwest portion of the planning area. Features of the cycle track could include designated bicycle signals when crossing roads with high traffic volumes and bicycle phases in the existing traffic signals at Wilsonville Road/Town Center Loop E.
- Traffic analysis for the study intersections indicate that the proposed changes to the transportation network would support the planned growth for Town Center. Additional transportation simulation of the Wilsonville Road corridor will be needed to determine storage needs and the final intersection footprints as the Town Center development progresses toward full buildout.

# ATTACHMENTS

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Attachment A – Land Use Growth Maps and Estimated Land Use Tables

Attachment B – 2035 Transportation System Plan (TSP) Projects

Attachment C – Level of Service Description

Attachment D – Proposed Town Center Street Improvements

Attachment E – Proposed Town Center Trail Improvements

Attachment F – Highway Capacity Manual (HCM) Analysis Results

Attachment G – Queuing Analysis Report

Attachment H – Wilsonville Road Intersection Improvements

## **Attachment A – Land Use Growth Maps and Estimated Land Use Tables**

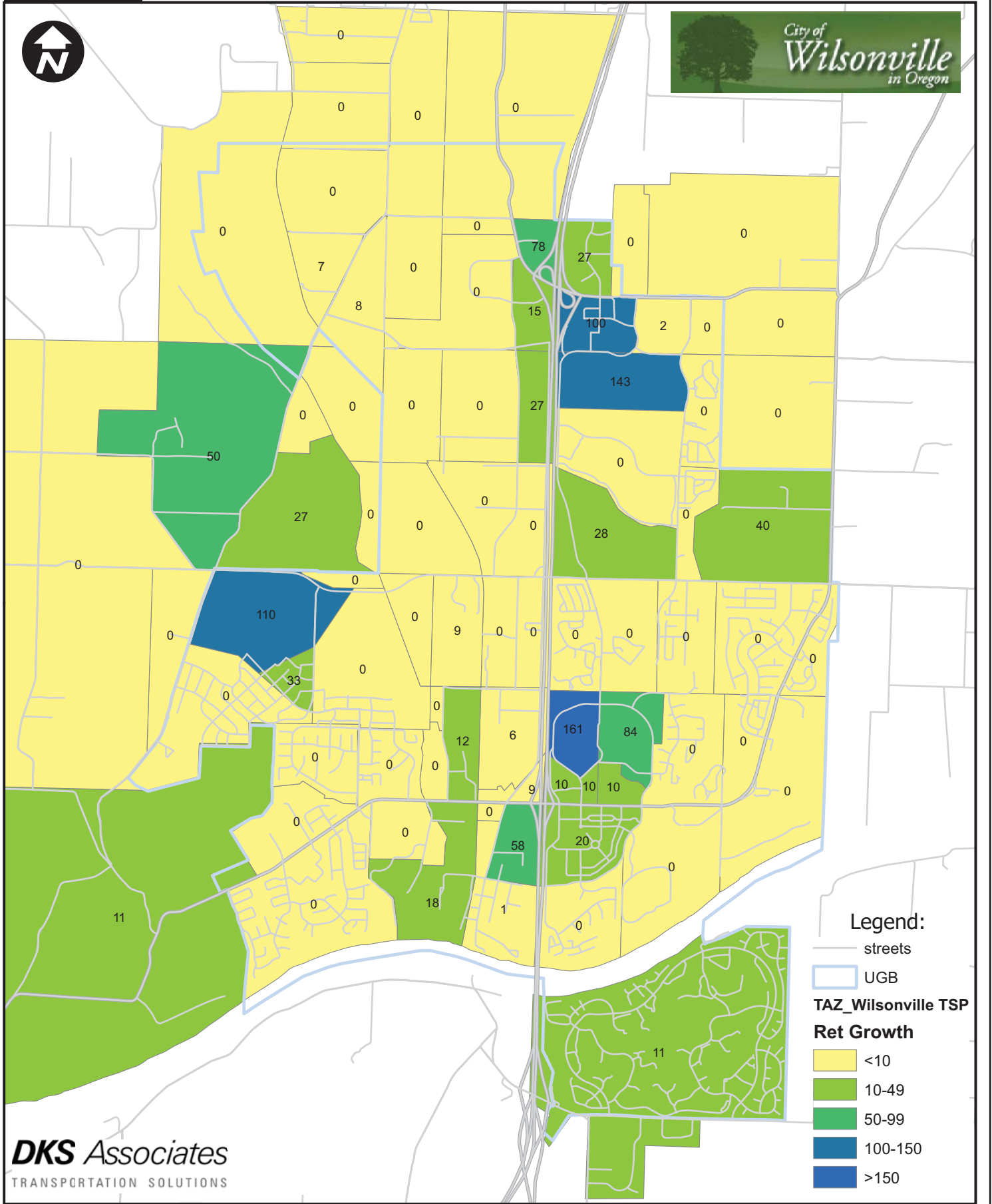


Parcel #	Gross Parcel Area (Sq.ft.)	Net Parcel Area (Sq.ft.)	Avg. Ht*Net Parcel Area	ITE Land Use	Existing Use	Redevelopment Potential (Yes/No)	Built area EXISTING (sq.ft.)	OTHER					Take-offs (Streets, OS & Parking)	Existing Trip Generation			PROPOSED BUILT AREA (Sq.ft.)						Notes									
								Commercial	Retail	Office	Residential	OTHER		Trip Rate	Units	PM Peak	Park/OS	Religious	Civic	Commercial	Office	Retail		Residential								
													0.4																			
31W13CB00100	181,298	N/A	N/A	254	Assisted Living Facility	No	35,897						35,897	N/A	0.22	Beds	11										35,897	residential units of 750 sq.ft. each.				
31W13CB00200	131,829	N/A	N/A	560	Church	No	16,784			16,784				N/A	0.55	KSF	9		16,784													
31W13CB00501	53,101	N/A	N/A	151	New Development (storage facility)	No	28,000			28,000				N/A	0.26	KSF	7					28,000										
31W13CB00500	32,137	19,282	57,847	710	Office	Yes	9,428			9,428				12,855	1.49	KSF	14					28,923							Would require addressing parking			
31W13CB00400	46,812	N/A	N/A	566	Funeral Home	No	9,890			9,890				N/A	0.01	Acre	0		9,890													
31W13CB00300	18,295	10,977	32,932	710	Office	Yes	5,740			5,740				7,318	1.49	KSF	9					6,586							Limited area for larger building			
31W13CB00800	21,722	13,033	39,100	911	Washington Bank	Yes	4,507	4,507						8,689	12.13	KSF	55					7,820							Assumes development partnered with adjacent parcels to accommodate parking			
31W13CB00700	101,793	61,076	183,228	820	Strip Mall	Yes	16,543	16,543						40,717	3.71	KSF	61					36,646			18,323							
31W13CB00600	77,212	46,327	138,981	437	Bowling Building	Yes	26,741	26,741						30,885	1.51	Bowling Lanes	30								13,898	55,592						
													2																			
31W14D 00405	36,663	21,998	43,996	934	McDonald's	Yes	4,750	4,750						14,665	9.85	KSF	47										8,799					
31W14D 00411	47,317	28,390	56,781	932	Sharis	Yes	5,218	5,218						18,927	9.85	KSF	51										11,356					
31W13CC00500	22,831	13,699	27,398		Vacant	Yes	0							9,133	check	KSF	0					13,699					5,480					
31W14D 00212	41,548	24,929	49,858	932	Boston's Pub	Yes	11,504	11,504						16,619	9.85	KSF	113					11,504					4,986					
31W14D 00220	88,879	53,327	106,655		Vacant	Yes	0							35,552	check	KSF	0										10,665			Parcel split for analysis		
31W14D 00220	310,906	186,543	373,087	863	Fry's	Yes	122,540			122,540				124,362	4.50	KSF	551					37,309	111,926			37,309	111,926			residential units of 750 sq.ft. each.		
31W14D 00207	24,814	14,888	29,777	826	Professional services	Yes	4,316			4,316				9,926	2.71	KSF	12									14,888	2,978					
31W14D 00205	24,175	14,505	29,010	826	Professional services	Yes	4,393			4,393				9,670	2.71	KSF	12									14,505						
31W14D 00209	25,374	15,225	30,449	937	Starbucks	Yes	3,109	3,109						10,150	42.80	KSF	133										6,090					
31W14D 00211	34,320	20,592	41,184	934	Retail (Chipotle)	Yes	4,950			4,950				13,728	9.85	KSF	49										8,237					
31W13CC00400	33,650	20,190	40,380	911	Bank of America	Yes	3,390	3,390						13,460	12.13	KSF	41					20,190								Parcel split for analysis		
31W14D 00206	13,759	8,255	16,511	911	Credit Union	Yes	2,905	2,905						5,504	12.13	KSF	35										3,302			Parcel split for analysis		
													3																			
31W14D 00216	24,992	14,995	44,985	565	Day care (Learning Tree)	Yes	6,395			6,395				9,997	12.34	KSF	79					13,495	8,997			13,495						
31W13CC00400	313,457	188,074	564,223	820	various small retail/ strip retail	Yes	65,376			65,376				125,383	3.71	KSF	243										112,845	169,267				
31W13CC00600	42,400	25,440	76,320		Vacant	Yes	0							16,960	check	KSF	0									15,264	22,896	61,056			residential units of 750 sq.ft. each.	
31W14D 00221	53,323	N/A	N/A	813	2 buildings - preschool and retail	No	16,253			16,253				N/A	16.69	KSF	271,263											16,253				
31W14D 00223	147,900	88,740	266,220	444	partial site -- Regal	Yes	37,986			37,986				59,160	3.80	KSF	144										53,244	79,866	133,110			residential units of 750 sq.ft. each.
31W14D 00230	91,924	55,154	165,463	820	commercial	Yes	14,140	14,140						36,769	3.71	KSF	52									33,093	49,639					
31W14D 00206	35,820	21,492	64,475	820	strip commercial (subway)	Yes	14,141	14,141						14,328	3.71	KSF	52											19,343			Parcel split for analysis	
													3																			
31W14D 00227	57,433	34,460	103,379		Vacant	Yes	0							22,973	check	KSF	0										31,014					
31W14D 00104	22,730	13,638	40,914		Vacant	Yes	0							9,092	check	KSF	0		13,638								12,274					
31W14D 00228	47,178	28,307	84,920	710	Office	Yes	6,807	6,807						18,871	1.49	KSF	10										25,476					
31W14D 00229	41,783	25,070	75,209	911	US Bank	Yes	4,319	4,319						16,713	12.13	KSF	52										22,563	7,521				
31W14D 00223	93,933	56,360	169,079		Vacant	Yes	0							37,573	check	KSF	0										50,724	50,724				
31W14D 00226	67,203	40,322	120,965		Vacant	Yes	0							26,881	check	KSF	0										36,290	36,290				
31W14D 00220	238,615	143,169	429,507		Vacant	Yes	0							95,446	check	KSF	0										128,852	128,852				
31W14D 00302	27,151	16,291	48,873	826	Retail/Mattress World	Yes	10,254			10,254				10,861	2.71	KSF	28										14,662					
31W14D 00402	91,043	54,626	163,877	826	Retail/ NW Rugs	Yes	32,100			32,100				36,417	2.71	KSF	87										49,163					
31W14D 00400	67,578	40,547	121,641	710	Commercial/ Guest House	Yes	20,263	20,263						27,031	1.49	KSF	30										36,492					
31W14D 00700	7,956	4,774	14,321	820	Commercial/ office	Yes	1,719	1,719						3,183	5.20	KSF	9										4,296					
31W14D 00600	34,604	20,762	62,287	310	Hotel/lodging	Yes	4,607			4,607				13,842	0.60	Room	24										18,686					
31W14D 00500	45,683	31,978	95,933	820	Strip commercial	Yes	15,190	15,190						13,705	3.71	KSF	56											15,190				
31W14D 00406	28,802	17,281	51,843	820	Commercial/office	Yes	4,276	4,276						11,521	5.20	KSF	22										15,553					
31W14D 00407	11,134	6,681	20,042	820	Commercial/office	Yes	2,332	2,332						4,454	5.20	KSF	12										6,013					
31W14D 00409	21,431	12,858	38,575	#####	Commercial/ Nursery school	Yes	4,933	4,933						8,572	4.46	KSF	22										11,573					
31W14D 90000	14,538	8,723	26,169	820	Commercial/Office	Yes	3,928	3,928						5,815	5.20	KSF	20										7,851					
31W14D 00300	6,132	N/A	N/A		Vacant	no	0							N/A	check	KSF	0															
													2																			
31W13CB00900	50,432	30,259	45,389	816	Commercial (Ace hardware)	Yes	10,643	10,643						20,173	4.84	KSF	52															
31W13CB01100	174,591	104,755	157,132	732	USPS	Yes	28,078	28,078						69,836	11.22	KSF	315											31,426				
31W13CB01200	97,900	N/A	N/A	610	Providence Medical.	No	12,525																									



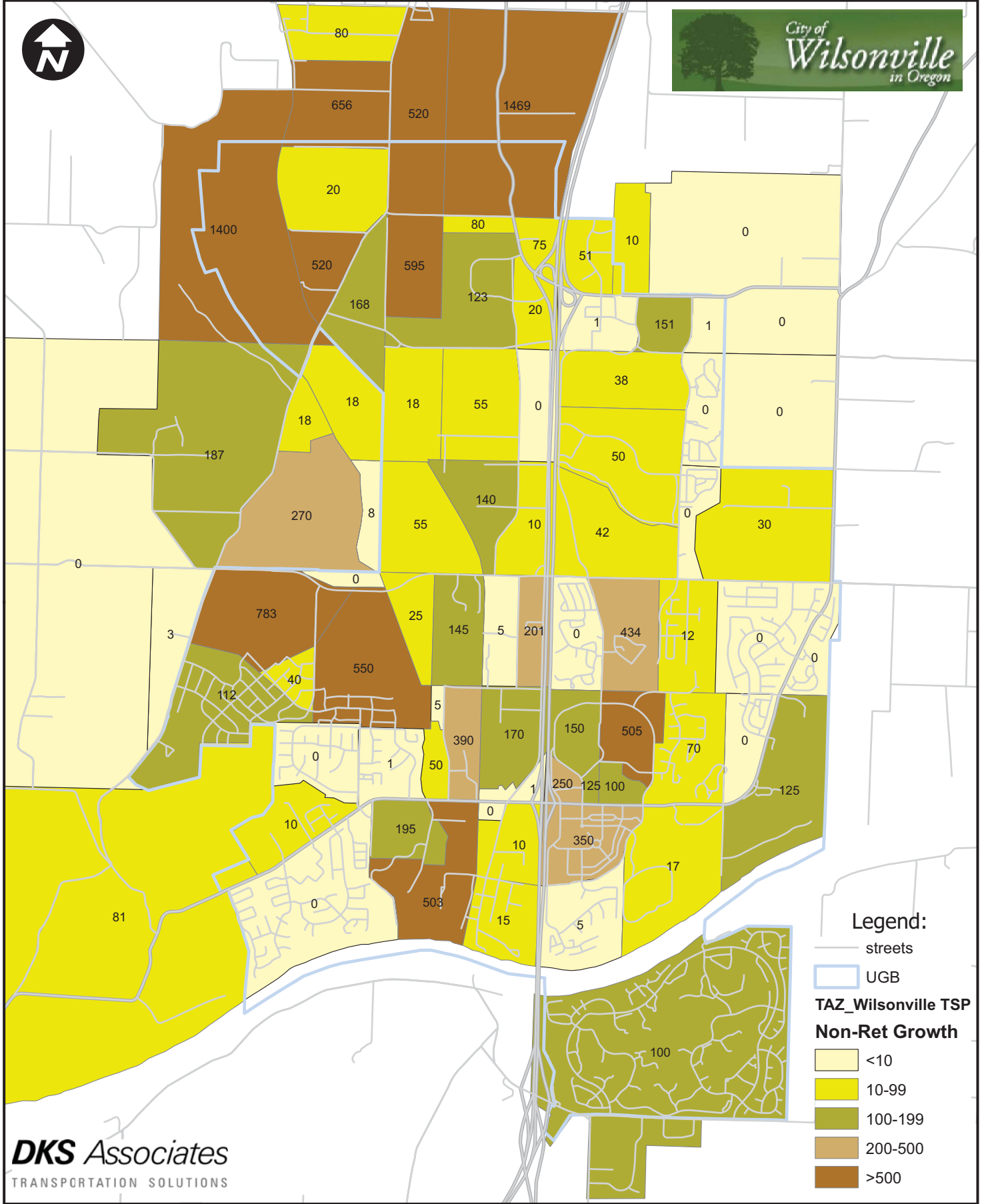
**FIGURE  
B**

# RETAIL EMPLOYMENT GROWTH (2010 TO 2035) BY TRANSPORTATION ANALYSIS ZONE



**FIGURE  
C**

# NON-RETAIL EMPLOYMENT GROWTH (2010 TO 2035) BY TRANSPORTATION ANALYSIS ZONE



## Wilsonville TSP Land Use - Growth by TAZ

TAZ	HH Growth	Ret Growth	Non-Ret Growth
890	122	11	100
894	10	0	0
895	408	110	783
896	200	0	0
900	185	27	270
901	0	0	18
902	0	0	25
903	132	0	0
904	0	28	42
905	1	0	0
906	10	0	0
907	5	0	70
1013	0	0	656
1014	157	0	1,469
1016	13	0	0
1017	0	15	20
1018	3	8	168
1019	21	0	1,400
4000	372	11	81
4001	80	58	10
4002	30	1	15
4003	386	0	195
4004	0	0	0
4005	0	0	5
4006	100	0	0
4007	0	0	50
4008	0	18	503
4009	50	0	1
4010	0	9	1
4011	0	6	170
4012	10	0	10
4013	0	12	390
4014	20	33	40
4015	0	0	0
4016	550	0	550
4017	290	0	112
4018	20	0	3
4022	119	50	187
4023	0	0	8
4024	0	0	18
4025	31	0	18
4026	0	0	55
4027	0	27	0
4028	0	0	55

4029	0	0	201
4030	0	0	10
4031	0	0	5
4032	0	9	145
4033	0	0	140
4034	61	0	12
4035	417	0	434
4036	5	0	0
4037	0	143	38
4038	13	0	0
4039	0	0	50
4040	811	40	30
4041	20	0	0
4042	15	20	350
4043	0	10	100
4044	10	84	505
4045	20	10	125
4046	53	0	125
4047	45	0	17
4048	10	0	0
4049	0	10	250
4050	0	161	150
4051	100	0	5
4135	120	0	520
4136	66	0	80
4137	0	27	51
4138	0	100	1
4139	0	2	151
4140	3	0	1
4141	7	0	0
4142	0	0	123
4143	0	0	80
4144	0	78	75
4145	3	7	520
4146	0	0	595
5002	0	0	20
5005	0	0	10

HH = Households  
 Ret = Retail Employment  
 Non-Ret = Service & Other Employment  
 Growth = 2010 to 2035 difference

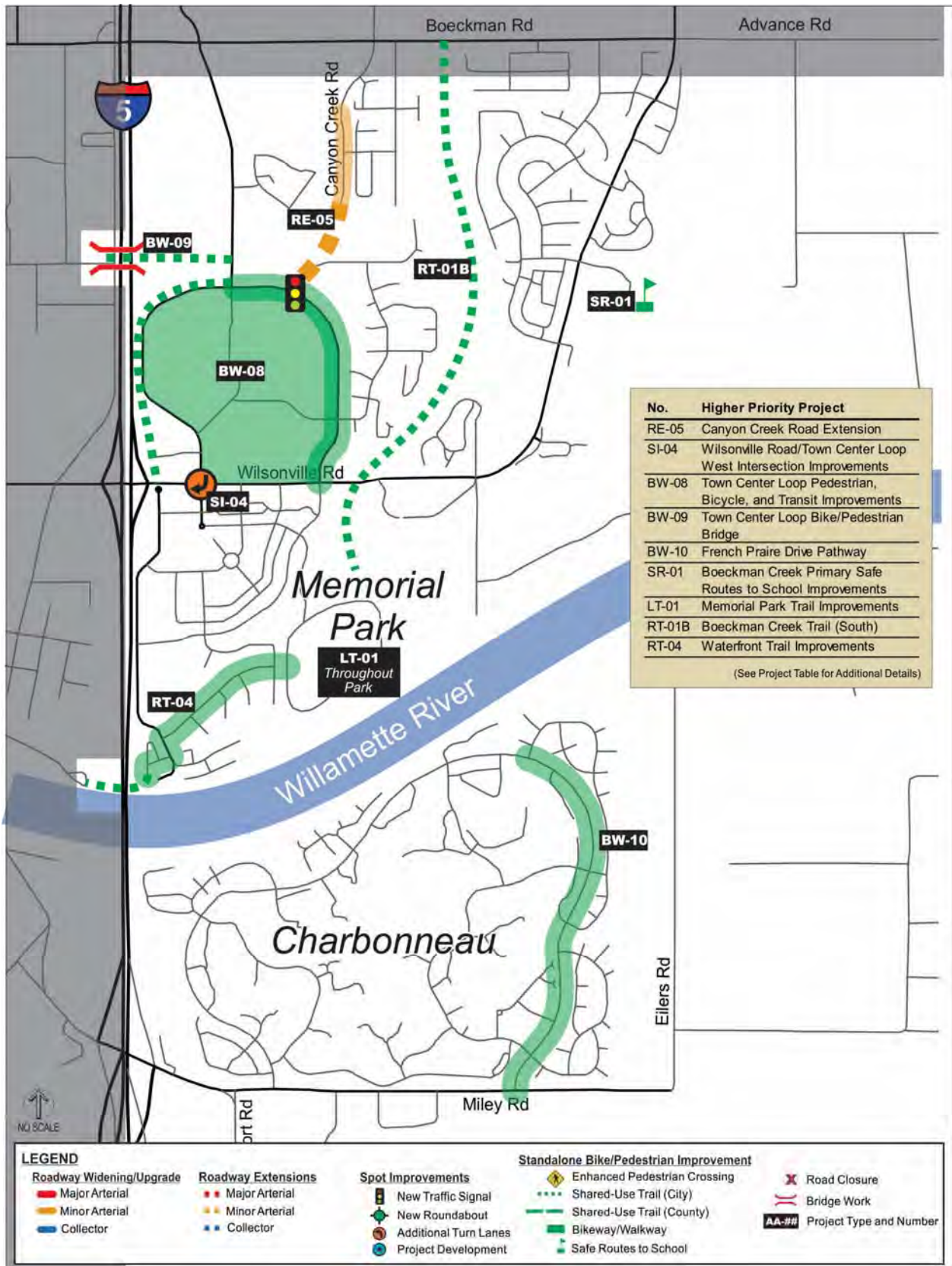
# Attachment B – 2035 TSP Projects



**Table 5-5. Higher Priority Projects (Southeast Quadrant)**

Project	Description	Cost
<b>Roadway Extensions</b>		
RE-05 Canyon Creek Road Extension	Construct remaining 3-lane roadway with bike lanes, sidewalks, and transit stop improvements from existing terminus to Town Center Loop East; project also includes realigning a portion of Vlahos Drive (so it intersects Canyon Creek Road) and installing a traffic signal at the Town Center Loop East/Canyon Creek Road intersection	\$3,500,000
<b>Spot Improvements</b>		
SI-04 Wilsonville Road/Town Center Loop West Intersection Improvements	Widen the north leg of the intersection and install a second southbound right-turn lane (dual lanes)	\$500,000
<b>Standalone Pedestrian and Bicycle Improvements (Bikeways and Walkways)</b>		
BW-08 Town Center Loop Pedestrian, Bicycle, and Transit Improvements	Create more direct connections between destinations within Town Center area, improve accessibility to civic uses and transit stops, retrofit sidewalks with curb ramps, highlight crosswalks with colored pavement, and construct other similar treatments that support pedestrian, bicycle, and transit access and circulation; also construct shared-use path along Town Center Loop West from Wilsonville Road to Parkway Avenue and restripe Town Center Loop East from Wilsonville Road to Parkway Avenue to a three-lane cross-section with bike facilities	\$500,000
BW-09 Town Center Loop Bike/Pedestrian Bridge	Construct bike/pedestrian bridge over I-5 approximately aligned with Barber Street to improve connectivity of Town Center area with businesses and neighborhoods on west side of I-5; include aesthetic design treatments	\$4,000,000
BW-10 French Prairie Drive Pathway	Construct 10-foot wide shared-use path along French Prairie Drive from Country View Lane to Miley Road or reconfigure existing roadway to remove a travel lane in each direction and add bicycle and pedestrian facilities	\$1,140,000
<b>Standalone Pedestrian and Bicycle Improvements (Safe Routes to School)</b>		
SR-01 Boeckman Creek Primary Safe Routes to School Improvements	Construct a bicycle parking shelter near the school and a new 10 to 12-foot bike path on the south side of the existing sidewalk that meanders south of the tree line and connects to the existing marked crosswalk near the school parking lot	\$65,000
<b>Standalone Pedestrian and Bicycle Improvements (Local Trails)</b>		
LT-01 Memorial Park Trail Improvements	Construct trails throughout Memorial Park, including the Memorial Park Center Loop Trail, the River Trail, Kolbe Homestead Trail, and Klein Homestead Trail	\$595,000
<b>Standalone Pedestrian and Bicycle Improvements (Regional Trails)</b>		
RT-01B Boeckman Creek Trail (South)	Construct north-south trail through east Wilsonville following Boeckman Creek, with connections to neighborhoods, parks, and intersecting roads (may need a boardwalk for various sections and would require a comprehensive public process)	\$1,150,000 (Partial Regional funding)
RT-04 Waterfront Trail Improvements	Improve the condition of the shared-use path as it passes underneath the I-5 Boone Bridge by removing the Jersey barriers, installing bollards, widening the trail, adding appropriate pedestrian features such as benches and lighting, and altering the grade of the path underneath the underpass to make it more easily accessible	\$125,000

**FIGURE 5-6. HIGHER PRIORITY PROJECTS (SOUTHEAST QUADRANT)**



## Attachment C – Level of Service 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<sup>1</sup>. The following two sections provide interpretations of the analysis approaches.

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<sup>1</sup> *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	
	$v/c \leq 1.0$	$v/c > 1.0$
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	<b>Free Flow/Insignificant Delays:</b> 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	<b>Stable Operation/Minimal Delays:</b> 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	<b>Stable Operation/Acceptable Delays:</b> 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	<b>Approaching Unstable/Tolerable Delays:</b> 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	<b>Unstable Operation/Significant Delays:</b> Volumes at or near capacity. Vehicles may wait through 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	<b>Forced Flow/Excessive Delays:</b> 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.

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

# Attachment D – Proposed Town Center Street Improvements



\*Road locations are conceptual. Alignment of local roads to be determined and constructed as part of future private development



### LEGEND

- Building Footprint
- Parcel
- Highway
- Proposed Pedestrian Bridge
- Existing Street
- Proposed Street Locations

### OPEN SPACE NETWORK

- Existing Open Space
- Proposed Open Space
- Proposed Gateway/Landing

### STREET HIERARCHY\*

- Local
- Main Street
- Collector
- Minor Arterial
- Major Arterial

### BLOCK SIZE

- 200' x 200'
- 400' x 400'

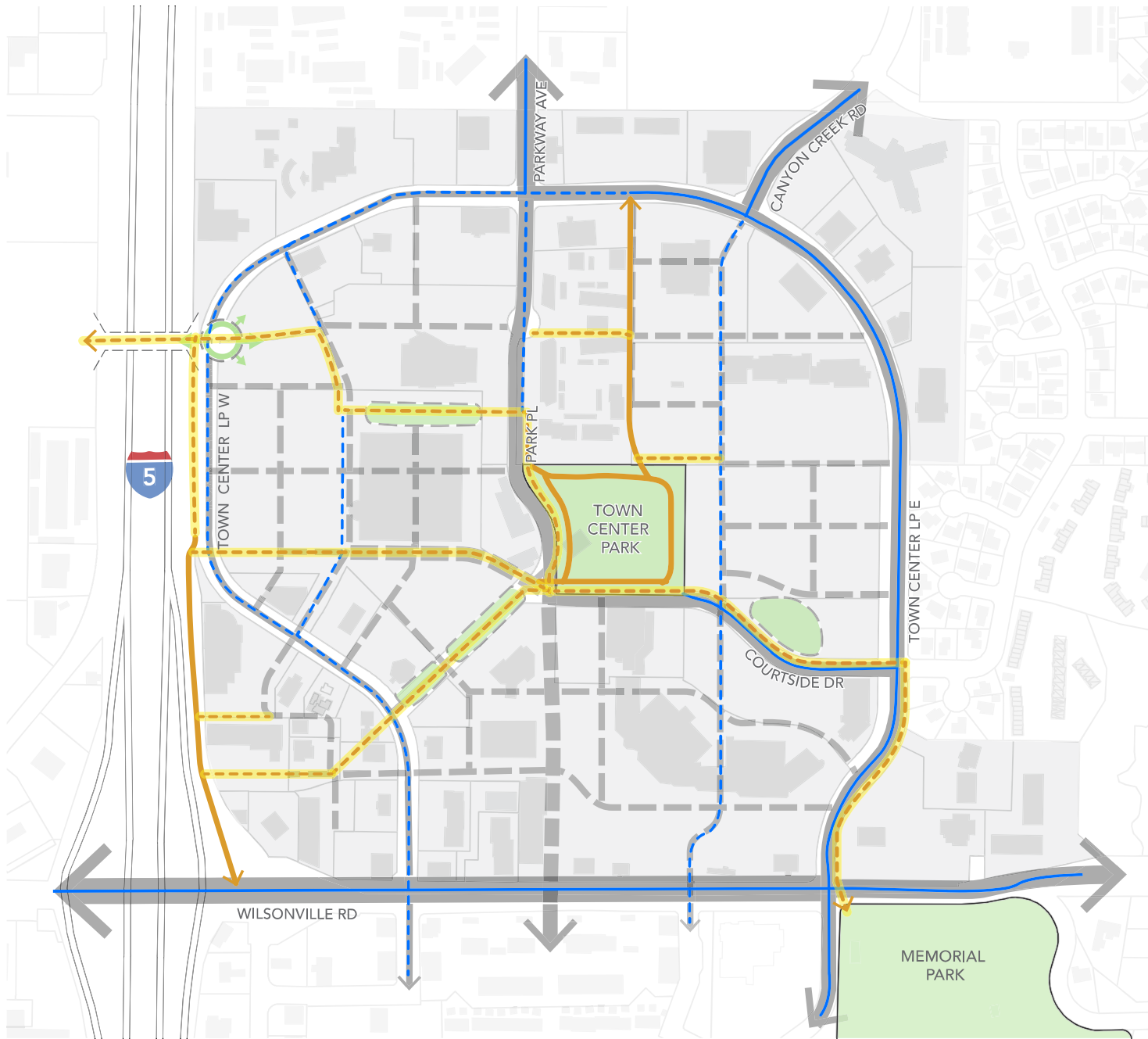
Scale: 0, 100', 200', 400'

North Arrow

# PROPOSED STREET NETWORK

# Attachment E – Proposed Town Center Trail Improvements





**LEGEND**

- Building Footprint
- Parcel
- Highway
- Proposed Pedestrian Bridge
- Proposed Street Network

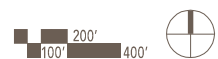
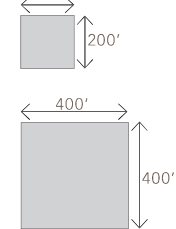
**OPEN SPACE NETWORK**

- Existing Open Space
- Proposed Open Space
- Proposed Gateway/Landing

**PEDESTRIAN/BIKE SYSTEM**

- Existing Multi-use Path
- Proposed Multi-use Path
- Existing On-Street Bike Facility
- Proposed On-Street Bike Facility

**BLOCK SIZE**



**PROPOSED MULTI-MODAL NETWORK**























City of Wilsonville Town Center Plan

## **Attachment F – Highway Capacity Manual (HCM) Analysis Results**



HCM Signalized Intersection Capacity Analysis  
1: Wilsonville Rd & Town Center Loop E

Horizon Year 2035 - No Build  
Wilsonville Town Center

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	180	570	60	60	460	95	45	60	35	125	90	140
Future Volume (vph)	180	570	60	60	460	95	45	60	35	125	90	140
Ideal Flow (vphp)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.5	4.5	4.0	4.5		4.0	4.0		4.0	4.5	4.5
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95		1.00	1.00		1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.95	1.00	0.99		1.00	0.99		1.00	1.00	0.99
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.97		1.00	0.95		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1750	1900	1534	1800	3480		1805	1737		1805	1900	1531
Flt Permitted	0.37	1.00	1.00	0.34	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	683	1900	1534	647	3480		1805	1737		1805	1900	1531
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	188	594	62	62	479	99	47	62	36	130	94	146
RTOR Reduction (vph)	0	0	26	0	11	0	0	25	0	0	0	125
Lane Group Flow (vph)	188	594	37	63	567	0	47	74	0	130	94	21
Confl. Peds. (#/hr)	5		13	13		5	2		5	5		2
Confl. Bikes (#/hr)			2			3						
Heavy Vehicles (%)	3%	0%	0%	0%	0%	3%	0%	2%	3%	0%	0%	4%
Turn Type	pm+pt	NA	Perm	pm+pt	NA		Prot	NA		Prot	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2		2	6								4
Actuated Green, G (s)	74.3	64.9	64.9	66.2	60.8		6.8	9.8		13.4	15.9	15.9
Effective Green, g (s)	74.3	64.9	64.9	66.2	60.8		6.8	9.8		13.4	15.9	15.9
Actuated g/C Ratio	0.68	0.59	0.59	0.60	0.55		0.06	0.09		0.12	0.14	0.14
Clearance Time (s)	4.0	4.5	4.5	4.0	4.5		4.0	4.0		4.0	4.5	4.5
Vehicle Extension (s)	2.5	3.0	3.0	2.5	3.0		2.5	2.5		2.5	2.5	2.5
Lane Grp Cap (vph)	553	1121	905	445	1923		111	154		219	274	221
v/s Ratio Prot	c0.03	c0.31		0.01	0.16		0.03	c0.04		c0.07	c0.05	
v/s Ratio Perm	0.20		0.02	0.08								0.01
v/c Ratio	0.34	0.53	0.04	0.14	0.29		0.42	0.48		0.59	0.34	0.10
Uniform Delay, d1	7.0	13.5	9.5	9.9	13.1		49.7	47.7		45.7	42.3	40.8
Progression Factor	0.90	0.82	1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	0.3	1.7	0.1	0.1	0.4		1.9	1.7		3.6	0.5	0.1
Delay (s)	6.6	12.7	9.6	10.1	13.5		51.6	49.4		49.3	42.9	40.9
Level of Service	A	B	A	B	B		D	D		D	D	D
Approach Delay (s)		11.1			13.2			50.1			44.4	
Approach LOS		B			B			D			D	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			20.8	HCM 2000 Level of Service				C				
HCM 2000 Volume to Capacity ratio			0.53									
Actuated Cycle Length (s)			110.0	Sum of lost time (s)				17.0				
Intersection Capacity Utilization			58.6%	ICU Level of Service				B				
Analysis Period (min)			15									
c	Critical Lane Group											

# HCM Signalized Intersection Capacity Analysis

## 2: Rebekah & Wilsonville Rd

Horizon Year 2035 - No Build  
Wilsonville Town Center



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	235	635	220	60	480	105	75	35	35	140	50	240
Future Volume (vph)	235	635	220	60	480	105	75	35	35	140	50	240
Ideal Flow (vphp)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.5		4.0	4.5		4.0	4.0			4.5	4.5
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00			1.00	1.00
Frbp, ped/bikes	1.00	0.99		1.00	0.99		1.00	0.99			1.00	0.99
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00			1.00	1.00
Frt	1.00	0.96		1.00	0.97		1.00	0.93			1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00			0.96	1.00
Satd. Flow (prot)	1783	3380		1802	3433		1804	1744			1816	1594
Flt Permitted	0.37	1.00		0.31	1.00		0.44	1.00			0.74	1.00
Satd. Flow (perm)	704	3380		581	3433		837	1744			1387	1594
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	240	648	224	61	490	107	77	36	36	143	51	245
RTOR Reduction (vph)	0	22	0	0	12	0	0	29	0	0	0	200
Lane Group Flow (vph)	240	850	0	61	585	0	77	43	0	0	194	45
Confl. Peds. (#/hr)	7		9	9		7	1		2	2		1
Confl. Bikes (#/hr)						2			1			
Heavy Vehicles (%)	1%	2%	0%	0%	2%	0%	0%	0%	0%	1%	0%	0%
Turn Type	pm+pt	NA		pm+pt	NA		Perm	NA		Perm	NA	Perm
Protected Phases	5	2		1	6			8			4	
Permitted Phases	2			6			8		4			4
Actuated Green, G (s)	80.8	71.7		72.1	67.0		20.7	20.7			20.2	20.2
Effective Green, g (s)	80.8	71.7		72.1	67.0		20.7	20.7			20.2	20.2
Actuated g/C Ratio	0.73	0.65		0.66	0.61		0.19	0.19			0.18	0.18
Clearance Time (s)	4.0	4.5		4.0	4.5		4.0	4.0			4.5	4.5
Vehicle Extension (s)	2.5	3.0		2.5	3.0		2.5	2.5			2.5	2.5
Lane Grp Cap (vph)	613	2203		437	2091		157	328			254	292
v/s Ratio Prot	c0.03	0.25		0.01	0.17			0.02				
v/s Ratio Perm	c0.25			0.08			0.09				c0.14	0.03
v/c Ratio	0.39	0.39		0.14	0.28		0.49	0.13			0.76	0.15
Uniform Delay, d1	5.0	8.9		6.8	10.1		39.9	37.2			42.6	37.7
Progression Factor	0.98	0.71		0.78	0.71		1.00	1.00			1.00	1.00
Incremental Delay, d2	0.2	0.4		0.1	0.3		1.8	0.1			12.2	0.2
Delay (s)	5.1	6.8		5.4	7.5		41.7	37.3			54.9	37.9
Level of Service	A	A		A	A		D	D			D	D
Approach Delay (s)		6.4			7.3			39.6			45.4	
Approach LOS		A			A			D			D	

### Intersection Summary

HCM 2000 Control Delay	16.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.48		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	60.3%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis  
 3: Parkway Ave & Town Center Loop W/Town Center Loop E

Horizon Year 2035 - No Build  
 Wilsonville Town Center



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	260	95	15	65	100	95	40	195	45	180	200	390
Future Volume (vph)	260	95	15	65	100	95	40	195	45	180	200	390
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5		4.5	4.5	4.5
Lane Util. Factor	1.00	0.95		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frbp, ped/bikes	1.00	1.00		1.00	1.00	0.98	1.00	0.99		1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.98		1.00	1.00	0.85	1.00	0.97		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1785	3379		1750	1900	1564	1799	1778		1765	1881	1565
Flt Permitted	0.59	1.00		0.68	1.00	1.00	0.63	1.00		0.35	1.00	1.00
Satd. Flow (perm)	1114	3379		1250	1900	1564	1185	1778		646	1881	1565
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	274	100	16	68	105	100	42	205	47	189	211	411
RTOR Reduction (vph)	0	11	0	0	0	72	0	8	0	0	0	276
Lane Group Flow (vph)	274	105	0	68	105	28	42	244	0	189	211	135
Confl. Peds. (#/hr)	1		1	1		1	6		12	12		6
Confl. Bikes (#/hr)												2
Heavy Vehicles (%)	1%	5%	0%	3%	0%	1%	0%	3%	5%	2%	1%	1%
Turn Type	pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA		pm+pt	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2			6		6	8			4		4
Actuated Green, G (s)	55.7	35.7		46.2	30.7	30.7	32.0	27.3		45.3	36.1	36.1
Effective Green, g (s)	55.7	35.7		46.2	30.7	30.7	32.0	27.3		45.3	36.1	36.1
Actuated g/C Ratio	0.51	0.32		0.42	0.28	0.28	0.29	0.25		0.41	0.33	0.33
Clearance Time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5		4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	689	1096		595	530	436	370	441		403	617	513
v/s Ratio Prot	c0.07	0.03		0.02	0.06		0.00	c0.14		c0.06	0.11	
v/s Ratio Perm	c0.13			0.03		0.02	0.03			0.14		0.09
v/c Ratio	0.40	0.10		0.11	0.20	0.06	0.11	0.55		0.47	0.34	0.26
Uniform Delay, d1	16.0	25.9		19.3	30.3	29.1	28.3	36.0		22.3	28.0	27.2
Progression Factor	0.36	0.40		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	1.4	0.1		0.4	0.8	0.3	0.1	5.0		3.9	1.5	1.2
Delay (s)	7.1	10.5		19.6	31.1	29.4	28.5	41.0		26.2	29.5	28.4
Level of Service	A	B		B	C	C	C	D		C	C	C
Approach Delay (s)		8.1			27.6			39.2			28.2	
Approach LOS		A			C			D			C	

Intersection Summary		
HCM 2000 Control Delay	25.5	HCM 2000 Level of Service C
HCM 2000 Volume to Capacity ratio	0.47	
Actuated Cycle Length (s)	110.0	Sum of lost time (s) 18.0
Intersection Capacity Utilization	68.2%	ICU Level of Service C
Analysis Period (min)	15	
c Critical Lane Group		

HCM 2010 TWSC  
 4: Town Center Loop W & Park Place

Horizon Year 2035 - No Build  
 Wilsonville Town Center

Intersection						
Int Delay, s/veh	7					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	165	20	515	115	30	670
Future Vol, veh/h	165	20	515	115	30	670
Conflicting Peds, #/hr	3	7	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	50	-	-	50	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	0	1	3	0	1
Mvmt Flow	174	21	542	121	32	705

Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	1022	339	0	0	663
Stage 1	603	-	-	-	-
Stage 2	419	-	-	-	-
Critical Hdwy	6.84	6.9	-	-	4.1
Critical Hdwy Stg 1	5.84	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-
Follow-up Hdwy	3.52	3.3	-	-	2.2
Pot Cap-1 Maneuver	232	663	-	-	935
Stage 1	509	-	-	-	-
Stage 2	632	-	-	-	-
Platoon blocked, %			-	-	-
Mov Cap-1 Maneuver	223	659	-	-	930
Mov Cap-2 Maneuver	223	-	-	-	-
Stage 1	509	-	-	-	-
Stage 2	609	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	56.1	0	0.4
HCM LOS	F		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	223	659	930
HCM Lane V/C Ratio	-	-	0.779	0.032	0.034
HCM Control Delay (s)	-	-	61.6	10.6	9
HCM Lane LOS	-	-	F	B	A
HCM 95th %tile Q(veh)	-	-	5.6	0.1	0.1

Intersection												
Int Delay, s/veh	4.2											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↕		↕	↕	
Traffic Vol, veh/h	30	10	70	40	20	10	40	245	60	15	255	25
Future Vol, veh/h	30	10	70	40	20	10	40	245	60	15	255	25
Conflicting Peds, #/hr	9	0	10	10	0	9	6	0	7	7	0	6
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	50	-	-	50	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	0	0	6	3	0	25	15	1	4	0	1	0
Mvmt Flow	32	11	74	42	21	11	42	258	63	16	268	26

Major/Minor	Minor2		Minor1		Major1			Major2				
Conflicting Flow All	717	731	298	746	713	305	301	0	0	328	0	0
Stage 1	319	319	-	381	381	-	-	-	-	-	-	-
Stage 2	398	412	-	365	332	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.26	7.13	6.5	6.45	4.25	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.13	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.13	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.354	3.527	4	3.525	2.335	-	-	2.2	-	-
Pot Cap-1 Maneuver	347	351	732	328	360	684	1190	-	-	1243	-	-
Stage 1	697	657	-	639	617	-	-	-	-	-	-	-
Stage 2	632	598	-	652	648	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	310	331	722	273	339	675	1180	-	-	1234	-	-
Mov Cap-2 Maneuver	310	331	-	273	339	-	-	-	-	-	-	-
Stage 1	669	645	-	613	592	-	-	-	-	-	-	-
Stage 2	574	573	-	564	636	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	14.6		19.7		0.9		0.4	
HCM LOS	B		C					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1180	-	-	491	318	1234	-
HCM Lane V/C Ratio	0.036	-	-	0.236	0.232	0.013	-
HCM Control Delay (s)	8.2	-	-	14.6	19.7	8	-
HCM Lane LOS	A	-	-	B	C	A	-
HCM 95th %tile Q(veh)	0.1	-	-	0.9	0.9	0	-

# HCM Signalized Intersection Capacity Analysis

## 6: Canyon Creek Rd & Town Center Loop E

Horizon Year 2035 - No Build  
Wilsonville Town Center



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	90	130	80	30	105	150	75	20	50	105	20	95
Future Volume (vph)	90	130	80	30	105	150	75	20	50	105	20	95
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.5	4.5	4.0	4.5		4.5	4.5		4.5	4.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00	0.97	1.00	0.98		1.00	0.98		1.00	0.98	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00		0.99	1.00	
Frt	1.00	1.00	0.85	1.00	0.91		1.00	0.89		1.00	0.88	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1805	1863	1574	1805	1663		1805	1656		1786	1622	
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.66	1.00		0.71	1.00	
Satd. Flow (perm)	1805	1863	1574	1805	1663		1247	1656		1333	1622	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	95	137	84	32	111	158	79	21	53	111	21	100
RTOR Reduction (vph)	0	0	37	0	45	0	0	39	0	0	75	0
Lane Group Flow (vph)	95	137	47	32	224	0	79	35	0	111	47	0
Confl. Peds. (#/hr)	4		2	2		4			5	5		
Confl. Bikes (#/hr)						3			1			1
Heavy Vehicles (%)	0%	2%	0%	0%	4%	1%	0%	0%	0%	0%	0%	1%
Turn Type	Prot	NA	Perm	Prot	NA		Perm	NA		Perm	NA	
Protected Phases	5	2		1	6			8				4
Permitted Phases			2				8			4		
Actuated Green, G (s)	9.3	56.5	56.5	5.0	52.2		25.5	25.5		25.5	25.5	
Effective Green, g (s)	9.3	56.5	56.5	5.0	52.2		25.5	25.5		25.5	25.5	
Actuated g/C Ratio	0.09	0.56	0.56	0.05	0.52		0.26	0.26		0.26	0.26	
Clearance Time (s)	4.0	4.5	4.5	4.0	4.5		4.5	4.5		4.5	4.5	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	167	1052	889	90	868		317	422		339	413	
v/s Ratio Prot	c0.05	0.07		0.02	c0.13			0.02				0.03
v/s Ratio Perm			0.03				0.06			c0.08		
v/c Ratio	0.57	0.13	0.05	0.36	0.26		0.25	0.08		0.33	0.11	
Uniform Delay, d1	43.4	10.2	9.8	45.9	13.2		29.6	28.3		30.3	28.6	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	4.4	0.3	0.1	2.4	0.7		1.9	0.4		2.6	0.6	
Delay (s)	47.8	10.5	9.9	48.3	13.9		31.5	28.7		32.8	29.1	
Level of Service	D	B	A	D	B		C	C		C	C	
Approach Delay (s)		21.5			17.6			30.2			30.9	
Approach LOS		C			B			C			C	

### Intersection Summary

HCM 2000 Control Delay	23.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.31		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	51.7%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis  
 7: Town Center Lp West/Town Center Loop W & Wilsonville Rd

Horizon Year 2035 - No Build  
 Wilsonville Town Center






















Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	600	830	130	60	635	100	270	130	60	200	90	810
Future Volume (vph)	600	830	130	60	635	100	270	130	60	200	90	810
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.5	4.5		4.0	4.0	4.5
Lane Util. Factor	0.97	0.95		1.00	0.95		*0.95	0.91		1.00	1.00	0.88
Frbp, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	0.96
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.98		1.00	0.98		1.00	0.97		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	0.98		0.95	1.00	1.00
Satd. Flow (prot)	3502	3465		1805	3491		1665	3216		1805	1845	2709
Flt Permitted	0.95	1.00		0.95	1.00		0.95	0.98		0.95	1.00	1.00
Satd. Flow (perm)	3502	3465		1805	3491		1665	3216		1805	1845	2709
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	632	874	137	63	668	105	284	137	63	211	95	853
RTOR Reduction (vph)	0	9	0	0	11	0	0	19	0	0	0	474
Lane Group Flow (vph)	632	1002	0	63	762	0	162	303	0	211	95	379
Confl. Peds. (#/hr)	15		3	3		15	14					14
Heavy Vehicles (%)	0%	1%	6%	0%	1%	0%	3%	3%	0%	0%	3%	1%
Turn Type	Prot	NA		Prot	NA		Split	NA		Split	NA	Perm
Protected Phases	5	2		1	6		8	8		4	4	
Permitted Phases												4
Actuated Green, G (s)	23.4	51.9		7.2	35.7		15.6	15.6		17.8	17.8	17.8
Effective Green, g (s)	23.4	52.4		7.2	36.2		15.6	15.6		18.3	18.3	17.8
Actuated g/C Ratio	0.21	0.48		0.07	0.33		0.14	0.14		0.17	0.17	0.16
Clearance Time (s)	4.0	4.5		4.0	4.5		4.5	4.5		4.5	4.5	4.5
Vehicle Extension (s)	2.5	4.3		2.5	4.3		2.5	2.5		2.5	2.5	2.5
Lane Grp Cap (vph)	744	1650		118	1148		236	456		300	306	438
v/s Ratio Prot	c0.18	0.29		0.03	c0.22		c0.10	0.09		0.12	0.05	
v/s Ratio Perm												c0.14
v/c Ratio	0.85	0.61		0.53	0.66		0.69	0.66		0.70	0.31	0.87
Uniform Delay, d1	41.6	21.2		49.8	31.7		44.9	44.7		43.3	40.3	44.9
Progression Factor	1.00	0.93		1.03	0.95		1.00	1.00		0.99	1.00	0.96
Incremental Delay, d2	7.6	1.4		3.5	2.9		7.4	3.3		6.7	0.4	16.0
Delay (s)	49.1	21.1		54.5	32.9		52.2	48.0		49.7	40.7	59.2
Level of Service	D	C		D	C		D	D		D	D	E
Approach Delay (s)		31.8			34.5			49.4			55.9	
Approach LOS		C			C			D			E	

Intersection Summary		
HCM 2000 Control Delay	41.2	HCM 2000 Level of Service D
HCM 2000 Volume to Capacity ratio	0.75	
Actuated Cycle Length (s)	110.0	Sum of lost time (s) 16.5
Intersection Capacity Utilization	71.8%	ICU Level of Service C
Analysis Period (min)	15	

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis  
8: I-5 NB & Wilsonville Rd

Horizon Year 2035 - No Build  
Wilsonville Town Center

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	540	900	0	0	1235	480	500	0	680	0	0	0
Future Volume (vph)	540	900	0	0	1235	480	500	0	680	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5			4.5	4.5	4.5	4.5	4.5			
Lane Util. Factor	0.97	0.95			0.91	1.00	0.95	0.95	0.88			
Frbp, ped/bikes	1.00	1.00			1.00	0.98	1.00	1.00	1.00			
Flpb, ped/bikes	1.00	1.00			1.00	1.00	1.00	1.00	1.00			
Frt	1.00	1.00			1.00	0.85	1.00	1.00	0.85			
Flt Protected	0.95	1.00			1.00	1.00	0.95	0.95	1.00			
Satd. Flow (prot)	3400	3574			5136	1549	1618	1618	2814			
Flt Permitted	0.95	1.00			1.00	1.00	0.95	0.95	1.00			
Satd. Flow (perm)	3400	3574			5136	1549	1618	1618	2814			
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	557	928	0	0	1273	495	515	0	701	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	243	0	0	204	0	0	0
Lane Group Flow (vph)	557	928	0	0	1273	252	257	258	497	0	0	0
Confl. Peds. (#/hr)	5		23	23		5	2					2
Confl. Bikes (#/hr)						1			2			
Heavy Vehicles (%)	3%	1%	0%	0%	1%	2%	6%	0%	1%	0%	0%	0%
Turn Type	Prot	NA			NA	Perm	Split	NA	custom			
Protected Phases	5	2			6		3	3	8			
Permitted Phases						6						
Actuated Green, G (s)	29.5	72.5			38.5	38.5	28.5	28.5	28.5			
Effective Green, g (s)	29.5	72.5			38.5	38.5	28.5	28.5	28.5			
Actuated g/C Ratio	0.27	0.66			0.35	0.35	0.26	0.26	0.26			
Clearance Time (s)	4.5	4.5			4.5	4.5	4.5	4.5	4.5			
Vehicle Extension (s)	2.3	4.9			4.9	4.9	2.3	2.3	2.3			
Lane Grp Cap (vph)	911	2355			1797	542	419	419	729			
v/s Ratio Prot	c0.16	0.26			c0.25		0.16	0.16	c0.18			
v/s Ratio Perm						0.16						
v/c Ratio	0.61	0.39			0.71	0.46	0.61	0.62	0.68			
Uniform Delay, d1	35.2	8.6			30.9	27.8	35.9	35.9	36.7			
Progression Factor	0.78	0.23			0.99	1.01	1.00	1.00	1.00			
Incremental Delay, d2	2.5	0.4			1.6	1.8	6.6	6.6	2.3			
Delay (s)	29.8	2.4			32.0	30.0	42.5	42.6	39.0			
Level of Service	C	A			C	C	D	D	D			
Approach Delay (s)		12.7			31.5			40.5			0.0	
Approach LOS		B			C			D			A	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			27.7		HCM 2000 Level of Service				C			
HCM 2000 Volume to Capacity ratio			0.67									
Actuated Cycle Length (s)			110.0		Sum of lost time (s)				13.5			
Intersection Capacity Utilization			104.0%		ICU Level of Service				G			
Analysis Period (min)			15									
c	Critical Lane Group											



HCM Signalized Intersection Capacity Analysis  
 9: I-5 SB & Wilsonville Rd

Horizon Year 2035 - No Build  
 Wilsonville Town Center



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑	↑	↑↑	↑↑					↑	↑	↑↑
Traffic Volume (vph)	0	990	960	700	1035	0	0	0	0	450	0	620
Future Volume (vph)	0	990	960	700	1035	0	0	0	0	450	0	620
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.5	4.5	4.5	4.5					4.5	4.5	4.5
Lane Util. Factor		0.91	1.00	0.97	0.95					0.95	0.95	0.88
Frbp, ped/bikes		1.00	0.97	1.00	1.00					1.00	1.00	1.00
Flpb, ped/bikes		1.00	1.00	1.00	1.00					1.00	1.00	1.00
Frt		1.00	0.85	1.00	1.00					1.00	1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00					0.95	0.95	1.00
Satd. Flow (prot)		5085	1542	3467	3505					1698	1698	2656
Flt Permitted		1.00	1.00	0.95	1.00					0.95	0.95	1.00
Satd. Flow (perm)		5085	1542	3467	3505					1698	1698	2656
Peak-hour factor, PHF	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Adj. Flow (vph)	0	1000	970	707	1045	0	0	0	0	455	0	626
RTOR Reduction (vph)	0	0	388	0	0	0	0	0	0	0	0	150
Lane Group Flow (vph)	0	1000	582	707	1045	0	0	0	0	227	228	476
Confl. Peds. (#/hr)	7		8	8		7	1		3	3		1
Confl. Bikes (#/hr)						4						
Heavy Vehicles (%)	0%	2%	2%	1%	3%	0%	0%	0%	0%	1%	0%	7%
Turn Type		NA	Perm	Prot	NA					Split	NA	custom
Protected Phases		2		1	6					7	7	4
Permitted Phases			2									
Actuated Green, G (s)		37.5	37.5	27.5	69.5					31.5	31.5	31.5
Effective Green, g (s)		37.5	37.5	27.5	69.5					31.5	31.5	31.5
Actuated g/C Ratio		0.34	0.34	0.25	0.63					0.29	0.29	0.29
Clearance Time (s)		4.5	4.5	4.5	4.5					4.5	4.5	4.5
Vehicle Extension (s)		4.9	4.9	2.3	4.9					2.3	2.3	2.3
Lane Grp Cap (vph)		1733	525	866	2214					486	486	760
v/s Ratio Prot		0.20		c0.20	0.30					0.13	0.13	c0.18
v/s Ratio Perm			c0.38									
v/c Ratio		0.58	1.11	0.82	0.47					0.47	0.47	0.63
Uniform Delay, d1		29.7	36.2	38.9	10.6					32.3	32.4	34.1
Progression Factor		0.89	0.87	1.63	0.22					1.00	1.00	1.00
Incremental Delay, d2		1.2	69.9	6.0	0.5					3.2	3.2	1.3
Delay (s)		27.6	101.6	69.2	2.8					35.5	35.6	35.4
Level of Service		C	F	E	A					D	D	D
Approach Delay (s)		64.0			29.6			0.0			35.5	
Approach LOS		E			C			A			D	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			45.1			HCM 2000 Level of Service				D		
HCM 2000 Volume to Capacity ratio			0.87									
Actuated Cycle Length (s)			110.0			Sum of lost time (s)			13.5			
Intersection Capacity Utilization			104.0%			ICU Level of Service				G		
Analysis Period (min)			15									
c Critical Lane Group												

**Intersection**

Int Delay, s/veh 100.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕		↕	↕		↕	↕		↕	↕	
Traffic Vol, veh/h	30	15	100	150	15	45	140	510	140	25	780	60
Future Vol, veh/h	30	15	100	150	15	45	140	510	140	25	780	60
Conflicting Peds, #/hr	0	0	1	1	0	0	0	0	6	6	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	0	-	-	85	-	-	80	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	93	93	93	93	93	93	93	93	93	93	93	93
Heavy Vehicles, %	0	0	0	0	0	0	1	2	0	0	1	0
Mvmt Flow	32	16	108	161	16	48	151	548	151	27	839	65

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	1508	1931	453	1413	1888	355	903	0	0	705	0	0
Stage 1	925	925	-	931	931	-	-	-	-	-	-	-
Stage 2	583	1006	-	482	957	-	-	-	-	-	-	-
Critical Hdwy	7.5	6.5	6.9	7.5	6.5	6.9	4.12	-	-	4.1	-	-
Critical Hdwy Stg 1	6.5	5.5	-	6.5	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.5	5.5	-	6.5	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.21	-	-	2.2	-	-
Pot Cap-1 Maneuver	85	67	559	~ 100	71	647	755	-	-	902	-	-
Stage 1	294	351	-	291	348	-	-	-	-	-	-	-
Stage 2	470	321	-	540	339	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	51	52	559	~ 51	55	644	754	-	-	902	-	-
Mov Cap-2 Maneuver	51	52	-	~ 51	55	-	-	-	-	-	-	-
Stage 1	235	340	-	232	277	-	-	-	-	-	-	-
Stage 2	327	255	-	403	329	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	182.4		\$ 827		1.9		0.3	
HCM LOS	F		F					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	754	-	-	137	51	175	902	-	-
HCM Lane V/C Ratio	0.2	-	-	1.138	3.163	0.369	0.03	-	-
HCM Control Delay (s)	11	-	-	182.4	1142.9	37.1	9.1	-	-
HCM Lane LOS	B	-	-	F	F	E	A	-	-
HCM 95th %tile Q(veh)	0.7	-	-	8.9	17.3	1.6	0.1	-	-

**Notes**

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

HCM Signalized Intersection Capacity Analysis  
1: Wilsonville Rd & Town Center Loop E

Horizon Year 2035\_Build  
Wilsonville Town Center



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖↗	↗		↖	↗		↖	↗		↖	↗	
Traffic Volume (vph)	550	570	60	60	410	140	50	60	40	195	90	240
Future Volume (vph)	550	570	60	60	410	140	50	60	40	195	90	240
Ideal Flow (vphp)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.5		4.0	4.5		4.0	4.0		4.0	4.5	
Lane Util. Factor	0.97	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frbp, ped/bikes	1.00	1.00		1.00	0.99		1.00	0.99		1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.99		1.00	0.96		1.00	0.94		1.00	0.89	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	3400	1864		1805	1805		1804	1726		1796	1628	
Flt Permitted	0.95	1.00		0.95	1.00		0.62	1.00		0.69	1.00	
Satd. Flow (perm)	3400	1864		1805	1805		1168	1726		1308	1628	
Peak-hour factor, PHF	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Adj. Flow (vph)	556	576	61	61	414	141	51	61	40	197	91	242
RTOR Reduction (vph)	0	3	0	0	9	0	0	28	0	0	100	0
Lane Group Flow (vph)	556	634	0	61	546	0	51	73	0	197	233	0
Confl. Peds. (#/hr)	5		13	13		5	2		5	5		2
Confl. Bikes (#/hr)			2			3						
Heavy Vehicles (%)	3%	0%	0%	0%	0%	3%	0%	2%	3%	0%	0%	4%
Turn Type	Prot	NA		Prot	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases							8			4		
Actuated Green, G (s)	22.2	61.7		7.1	46.6		9.7	9.7		21.5	21.0	
Effective Green, g (s)	22.2	61.7		7.1	46.6		9.7	9.7		21.5	21.0	
Actuated g/C Ratio	0.20	0.56		0.06	0.42		0.09	0.09		0.20	0.19	
Clearance Time (s)	4.0	4.5		4.0	4.5		4.0	4.0		4.0	4.5	
Vehicle Extension (s)	2.5	3.0		2.5	3.0		2.5	2.5		2.5	2.5	
Lane Grp Cap (vph)	686	1045		116	764		121	152		322	310	
v/s Ratio Prot	c0.16	0.34		0.03	c0.30		0.01	c0.04		0.08	c0.14	
v/s Ratio Perm							0.02			0.04		
v/c Ratio	0.81	0.61		0.53	0.71		0.42	0.48		0.61	0.75	
Uniform Delay, d1	41.9	16.1		49.8	26.2		47.1	47.7		39.8	42.0	
Progression Factor	0.84	1.97		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	5.1	1.9		3.3	5.6		1.7	1.7		2.9	9.4	
Delay (s)	40.2	33.6		53.1	31.8		48.8	49.5		42.7	51.4	
Level of Service	D	C		D	C		D	D		D	D	
Approach Delay (s)		36.6			33.9			49.2			48.1	
Approach LOS		D			C			D			D	

Intersection Summary

HCM 2000 Control Delay	39.2	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	17.0
Intersection Capacity Utilization	83.5%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Intersection												
Int Delay, s/veh	1.4											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↓			↑↓				↑			↑
Traffic Vol, veh/h	0	1140	220	0	590	110	0	0	40	0	0	190
Future Vol, veh/h	0	1140	220	0	590	110	0	0	40	0	0	190
Conflicting Peds, #/hr	7	0	9	9	0	7	1	0	2	2	0	1
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	0	-	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	1	-	-	1	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	99	99	99	99	99	99	99	99	99	99	99	99
Heavy Vehicles, %	1	2	0	0	2	0	0	0	0	1	0	0
Mvmt Flow	0	1152	222	0	596	111	0	0	40	0	0	192

Major/Minor	Major1		Major2		Minor1		Minor2					
Conflicting Flow All	-	0	0	-	-	0	-	-	698	-	-	362
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	-	-	-	6.9	-	-	6.9
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	-	-	-	3.3	-	-	3.3
Pot Cap-1 Maneuver	0	-	-	0	-	-	0	0	388	0	0	641
Stage 1	0	-	-	0	-	-	0	0	-	0	0	-
Stage 2	0	-	-	0	-	-	0	0	-	0	0	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	-	-	-	-	-	-	384	-	-	637
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0	15.5	13.1
HCM LOS			C	B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBT	WBR	SBLn1
Capacity (veh/h)	384	-	-	-	-	637
HCM Lane V/C Ratio	0.105	-	-	-	-	0.301
HCM Control Delay (s)	15.5	-	-	-	-	13.1
HCM Lane LOS	C	-	-	-	-	B
HCM 95th %tile Q(veh)	0.4	-	-	-	-	1.3

# HCM Signalized Intersection Capacity Analysis

## 3: Parkway Ave & Town Center Loop W/Town Center Loop E

Horizon Year 2035\_Build  
Wilsonville Town Center



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	100	95	15	65	100	95	40	355	45	180	440	150
Future Volume (vph)	100	95	15	65	100	95	40	355	45	180	440	150
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5		4.5	4.5	4.5		4.5		4.5	4.5	
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00		1.00		1.00	1.00	
Frbp, ped/bikes	1.00	1.00		1.00	1.00	0.98		1.00		1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00		1.00		1.00	1.00	
Frt	1.00	0.98		1.00	1.00	0.85		0.99		1.00	0.96	
Flt Protected	0.95	1.00		0.95	1.00	1.00		1.00		0.95	1.00	
Satd. Flow (prot)	1785	1779		1750	1900	1564		1803		1764	1793	
Flt Permitted	0.63	1.00		0.69	1.00	1.00		0.91		0.39	1.00	
Satd. Flow (perm)	1191	1779		1263	1900	1564		1656		718	1793	
Peak-hour factor, PHF	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Adj. Flow (vph)	101	96	15	66	101	96	40	359	45	182	444	152
RTOR Reduction (vph)	0	5	0	0	0	72	0	4	0	0	9	0
Lane Group Flow (vph)	101	106	0	66	101	24	0	440	0	182	587	0
Confl. Peds. (#/hr)	1		1	1		1	6		12	12		6
Confl. Bikes (#/hr)												2
Heavy Vehicles (%)	1%	5%	0%	3%	0%	1%	0%	3%	5%	2%	1%	1%
Turn Type	pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA		pm+pt	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2			6		6	8			4		
Actuated Green, G (s)	35.5	29.0		31.5	27.0	27.0		50.8		63.0	63.0	
Effective Green, g (s)	35.5	29.0		31.5	27.0	27.0		50.8		63.0	63.0	
Actuated g/C Ratio	0.32	0.26		0.29	0.25	0.25		0.46		0.57	0.57	
Clearance Time (s)	4.5	4.5		4.5	4.5	4.5		4.5		4.5	4.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0		3.0		3.0	3.0	
Lane Grp Cap (vph)	419	469		381	466	383		764		484	1026	
v/s Ratio Prot	c0.01	0.06		0.01	0.05					0.03	c0.33	
v/s Ratio Perm	c0.06			0.04		0.02		0.27		0.19		
v/c Ratio	0.24	0.23		0.17	0.22	0.06		0.58		0.38	0.57	
Uniform Delay, d1	26.8	31.7		29.1	33.1	31.8		21.7		13.1	14.9	
Progression Factor	0.84	0.84		1.00	1.00	1.00		0.45		1.00	1.00	
Incremental Delay, d2	1.3	1.1		1.0	1.1	0.3		0.6		2.2	2.3	
Delay (s)	23.9	27.7		30.1	34.1	32.1		10.4		15.3	17.2	
Level of Service	C	C		C	C	C		B		B	B	
Approach Delay (s)		25.9			32.4			10.4			16.8	
Approach LOS		C			C			B			B	

### Intersection Summary

HCM 2000 Control Delay	18.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.48		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	88.3%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

# HCM Signalized Intersection Capacity Analysis

## 4: Holly St/Park Pl & Wilsonville Rd

Horizon Year 2035\_Build  
Wilsonville Town Center



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↶	↶↷		↶	↶↷		↶	↷		↶	↷	
Traffic Volume (vph)	400	1140	50	60	670	50	190	40	50	170	50	360
Future Volume (vph)	400	1140	50	60	670	50	190	40	50	170	50	360
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.5		4.0	4.5		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	
Frt	1.00	0.99		1.00	0.99		1.00	0.92		1.00	0.87	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3517		1770	3502		1770	1706		1770	1618	
Flt Permitted	0.95	1.00		0.95	1.00		0.15	1.00		0.70	1.00	
Satd. Flow (perm)	1770	3517		1770	3502		287	1706		1300	1618	
Peak-hour factor, PHF	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Adj. Flow (vph)	404	1152	51	61	677	51	192	40	51	172	51	364
RTOR Reduction (vph)	0	3	0	0	5	0	0	37	0	0	230	0
Lane Group Flow (vph)	404	1200	0	61	723	0	192	54	0	172	185	0
Turn Type	Prot	NA		Prot	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases							2			6		
Actuated Green, G (s)	27.1	47.0		7.4	27.3		39.5	29.4		38.7	29.0	
Effective Green, g (s)	27.1	47.0		7.4	27.3		39.5	29.4		38.7	29.0	
Actuated g/C Ratio	0.25	0.43		0.07	0.25		0.36	0.27		0.35	0.26	
Clearance Time (s)	4.0	4.5		4.0	4.5		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	436	1502		119	869		239	455		498	426	
v/s Ratio Prot	c0.23	c0.34		0.03	0.21		c0.07	0.03		0.03	0.11	
v/s Ratio Perm							c0.21			0.09		
v/c Ratio	0.93	0.80		0.51	0.83		0.80	0.12		0.35	0.43	
Uniform Delay, d1	40.5	27.4		49.6	39.2		27.8	30.5		25.6	33.7	
Progression Factor	0.83	1.70		1.18	0.89		1.00	1.00		0.74	0.32	
Incremental Delay, d2	15.1	1.5		3.3	6.1		17.5	0.5		0.4	2.9	
Delay (s)	48.6	48.0		61.8	41.1		45.2	31.0		19.4	13.7	
Level of Service	D	D		E	D		D	C		B	B	
Approach Delay (s)		48.2			42.7			40.7			15.3	
Approach LOS		D			D			D			B	

### Intersection Summary

HCM 2000 Control Delay	40.3	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.86		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	16.5
Intersection Capacity Utilization	91.4%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

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	30	10	70	40	20	10	40	245	60	15	255	25
Future Vol, veh/h	30	10	70	40	20	10	40	245	60	15	255	25
Conflicting Peds, #/hr	9	0	10	10	0	9	6	0	7	7	0	6
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	50	-	-	50	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	99	99	99	99	99	99	99	99	99	99	99	99
Heavy Vehicles, %	0	0	6	3	0	25	15	1	4	0	1	0
Mvmt Flow	30	10	71	40	20	10	40	247	61	15	258	25

Major/Minor	Minor2		Minor1		Major1			Major2				
Conflicting Flow All	689	702	287	716	684	294	289	0	0	315	0	0
Stage 1	307	307	-	365	365	-	-	-	-	-	-	-
Stage 2	382	395	-	351	319	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.26	7.13	6.5	6.45	4.25	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.13	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.13	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.354	3.527	4	3.525	2.335	-	-	2.2	-	-
Pot Cap-1 Maneuver	363	365	743	344	374	694	1202	-	-	1257	-	-
Stage 1	707	665	-	652	627	-	-	-	-	-	-	-
Stage 2	645	608	-	664	657	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	326	345	733	289	353	685	1196	-	-	1250	-	-
Mov Cap-2 Maneuver	326	345	-	289	353	-	-	-	-	-	-	-
Stage 1	680	654	-	627	603	-	-	-	-	-	-	-
Stage 2	589	584	-	579	646	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	14.1		18.7		0.9		0.4	
HCM LOS	B		C					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1196	-	-	508	334	1250	-
HCM Lane V/C Ratio	0.034	-	-	0.219	0.212	0.012	-
HCM Control Delay (s)	8.1	-	-	14.1	18.7	7.9	-
HCM Lane LOS	A	-	-	B	C	A	-
HCM 95th %tile Q(veh)	0.1	-	-	0.8	0.8	0	-

# HCM Signalized Intersection Capacity Analysis

## 6: Canyon Creek Rd & Town Center Loop E

Horizon Year 2035\_Build  
Wilsonville Town Center



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	90	130	80	30	155	300	75	20	50	205	20	95
Future Volume (vph)	90	130	80	30	155	300	75	20	50	205	20	95
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.5	4.5	4.0	4.5		4.5	4.5		4.5	4.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00	0.97	1.00	0.98		1.00	0.98		1.00	0.98	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00		0.99	1.00	
Frt	1.00	1.00	0.85	1.00	0.90		1.00	0.89		1.00	0.88	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1805	1863	1574	1805	1644		1805	1656		1786	1621	
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.67	1.00		0.71	1.00	
Satd. Flow (perm)	1805	1863	1574	1805	1644		1264	1656		1337	1621	
Peak-hour factor, PHF	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Adj. Flow (vph)	91	131	81	30	157	303	76	20	51	207	20	96
RTOR Reduction (vph)	0	0	35	0	60	0	0	38	0	0	72	0
Lane Group Flow (vph)	91	131	46	30	400	0	76	33	0	207	44	0
Confl. Peds. (#/hr)	4		2	2		4			5	5		
Confl. Bikes (#/hr)						3			1			1
Heavy Vehicles (%)	0%	2%	0%	0%	4%	1%	0%	0%	0%	0%	0%	1%
Turn Type	Prot	NA	Perm	Prot	NA		Perm	NA		Perm	NA	
Protected Phases	5	2		1	6			8				4
Permitted Phases			2				8			4		
Actuated Green, G (s)	9.1	56.6	56.6	4.9	52.4		25.5	25.5		25.5	25.5	
Effective Green, g (s)	9.1	56.6	56.6	4.9	52.4		25.5	25.5		25.5	25.5	
Actuated g/C Ratio	0.09	0.57	0.57	0.05	0.52		0.26	0.26		0.26	0.26	
Clearance Time (s)	4.0	4.5	4.5	4.0	4.5		4.5	4.5		4.5	4.5	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	164	1054	890	88	861		322	422		340	413	
v/s Ratio Prot	c0.05	0.07		0.02	c0.24			0.02			0.03	
v/s Ratio Perm			0.03				0.06			c0.15		
v/c Ratio	0.55	0.12	0.05	0.34	0.46		0.24	0.08		0.61	0.11	
Uniform Delay, d1	43.5	10.1	9.7	46.0	15.0		29.5	28.3		32.9	28.5	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	4.0	0.2	0.1	2.3	1.8		1.7	0.4		7.9	0.5	
Delay (s)	47.5	10.4	9.8	48.3	16.8		31.2	28.7		40.7	29.1	
Level of Service	D	B	A	D	B		C	C		D	C	
Approach Delay (s)		21.4			18.7			30.0			36.5	
Approach LOS		C			B			C			D	

### Intersection Summary

HCM 2000 Control Delay	25.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.52		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	61.0%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			



HCM Signalized Intersection Capacity Analysis  
 7: Town Center Lp West/Town Center Loop W & Wilsonville Rd

Horizon Year 2035\_Build  
 Wilsonville Town Center






























Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑			↑↑		↖	↗		↖	↗	
Traffic Volume (vph)	0	1430	130	0	1170	50	150	130	60	100	90	400
Future Volume (vph)	0	1430	130	0	1170	50	150	130	60	100	90	400
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0		4.0	4.5		3.5	4.0	
Lane Util. Factor		0.95			0.95		1.00	1.00		1.00	1.00	
Frbp, ped/bikes		1.00			1.00		1.00	1.00		1.00	0.97	
Flpb, ped/bikes		1.00			1.00		1.00	1.00		1.00	1.00	
Frt		0.99			0.99		1.00	0.95		1.00	0.88	
Flt Protected		1.00			1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		3507			3546		1752	1773		1805	1603	
Flt Permitted		1.00			1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		3507			3546		1752	1773		1805	1603	
Peak-hour factor, PHF	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Adj. Flow (vph)	0	1444	131	0	1182	51	152	131	61	101	91	404
RTOR Reduction (vph)	0	6	0	0	3	0	0	15	0	0	41	0
Lane Group Flow (vph)	0	1569	0	0	1230	0	152	177	0	101	454	0
Confl. Peds. (#/hr)	15		3	3		15	14					14
Heavy Vehicles (%)	0%	1%	6%	0%	1%	0%	3%	3%	0%	0%	3%	1%
Turn Type		NA			NA		Prot	NA		Prot	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)		53.8			53.8		11.0	32.8		10.4	32.2	
Effective Green, g (s)		54.3			54.3		11.0	32.8		10.9	32.7	
Actuated g/C Ratio		0.49			0.49		0.10	0.30		0.10	0.30	
Clearance Time (s)		4.5			4.5		4.0	4.5		4.0	4.5	
Vehicle Extension (s)		4.3			4.3		3.0	4.3		3.0	4.3	
Lane Grp Cap (vph)		1731			1750		175	528		178	476	
v/s Ratio Prot		c0.45			0.35		c0.09	0.10		0.06	c0.28	
v/s Ratio Perm												
v/c Ratio		0.91			0.70		0.87	0.34		0.57	0.95	
Uniform Delay, d1		25.5			21.6		48.8	30.1		47.3	37.9	
Progression Factor		1.23			0.62		1.00	1.00		0.96	1.01	
Incremental Delay, d2		7.3			1.5		33.6	1.7		4.1	29.9	
Delay (s)		38.6			15.0		82.4	31.8		49.6	68.3	
Level of Service		D			B		F	C		D	E	
Approach Delay (s)		38.6			15.0			54.2			65.1	
Approach LOS		D			B			D			E	

Intersection Summary			
HCM 2000 Control Delay	36.5	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.92		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	92.5%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis  
8: I-5 NB & Wilsonville Rd

Horizon Year 2035\_Build  
Wilsonville Town Center

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	 	 			  	 	 	 	 			
Traffic Volume (vph)	540	900	0	0	1240	480	500	0	680	0	0	0
Future Volume (vph)	540	900	0	0	1240	480	500	0	680	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5			4.5	4.5	4.5	4.5	4.5			
Lane Util. Factor	0.97	0.95			0.91	1.00	0.95	0.95	0.88			
Frbp, ped/bikes	1.00	1.00			1.00	0.98	1.00	1.00	0.98			
Flpb, ped/bikes	1.00	1.00			1.00	1.00	1.00	1.00	1.00			
Frt	1.00	1.00			1.00	0.85	1.00	1.00	0.85			
Flt Protected	0.95	1.00			1.00	1.00	0.95	0.95	1.00			
Satd. Flow (prot)	3400	3574			5136	1549	1618	1618	2750			
Flt Permitted	0.95	1.00			1.00	1.00	0.95	0.95	1.00			
Satd. Flow (perm)	3400	3574			5136	1549	1618	1618	2750			
Peak-hour factor, PHF	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Adj. Flow (vph)	545	909	0	0	1253	485	505	0	687	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	242	0	0	212	0	0	0
Lane Group Flow (vph)	545	909	0	0	1253	243	252	253	475	0	0	0
Confl. Peds. (#/hr)	5		23	23		5	2					2
Confl. Bikes (#/hr)						1			2			
Heavy Vehicles (%)	3%	1%	0%	0%	1%	2%	6%	0%	1%	0%	0%	0%
Turn Type	Prot	NA			NA	Perm	Prot	NA	Perm			
Protected Phases	5	2			6		3	8				
Permitted Phases						6			8			
Actuated Green, G (s)	29.5	72.5			38.5	38.5	28.5	28.5	28.5			
Effective Green, g (s)	29.5	72.5			38.5	38.5	28.5	28.5	28.5			
Actuated g/C Ratio	0.27	0.66			0.35	0.35	0.26	0.26	0.26			
Clearance Time (s)	4.5	4.5			4.5	4.5	4.5	4.5	4.5			
Vehicle Extension (s)	2.3	4.9			4.9	4.9	2.3	2.3	2.3			
Lane Grp Cap (vph)	911	2355			1797	542	419	419	712			
v/s Ratio Prot	c0.16	0.25			c0.24		0.16	0.16				
v/s Ratio Perm						0.16			c0.17			
v/c Ratio	0.60	0.39			0.70	0.45	0.60	0.60	0.67			
Uniform Delay, d1	35.1	8.6			30.7	27.6	35.8	35.8	36.5			
Progression Factor	0.78	0.22			1.10	1.61	1.00	1.00	1.00			
Incremental Delay, d2	2.4	0.4			1.4	1.6	6.3	1.9	2.0			
Delay (s)	29.6	2.3			35.2	45.9	42.0	37.7	38.5			
Level of Service	C	A			D	D	D	D	D			
Approach Delay (s)		12.6			38.2			39.1			0.0	
Approach LOS		B			D			D			A	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			30.0		HCM 2000 Level of Service				C			
HCM 2000 Volume to Capacity ratio			0.66									
Actuated Cycle Length (s)			110.0		Sum of lost time (s)				13.5			
Intersection Capacity Utilization			104.0%		ICU Level of Service				G			
Analysis Period (min)			15									
c	Critical Lane Group											

# HCM Signalized Intersection Capacity Analysis

## 9: I-5 SB & Wilsonville Rd

Horizon Year 2035\_Build  
Wilsonville Town Center



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑	↑	↑↑	↑↑					↑	↑	↑↑
Traffic Volume (vph)	0	990	960	700	1040	0	0	0	0	450	0	620
Future Volume (vph)	0	990	960	700	1040	0	0	0	0	450	0	620
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.5	4.5	4.5	4.5					4.5	4.5	4.5
Lane Util. Factor		0.91	1.00	0.97	0.95					0.95	0.95	0.88
Frbp, ped/bikes		1.00	0.97	1.00	1.00					1.00	1.00	1.00
Flpb, ped/bikes		1.00	1.00	1.00	1.00					1.00	1.00	1.00
Frt		1.00	0.85	1.00	1.00					1.00	1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00					0.95	0.95	1.00
Satd. Flow (prot)		5085	1542	3467	3505					1698	1698	2656
Flt Permitted		1.00	1.00	0.95	1.00					0.95	0.95	1.00
Satd. Flow (perm)		5085	1542	3467	3505					1698	1698	2656
Peak-hour factor, PHF	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Adj. Flow (vph)	0	1000	970	707	1051	0	0	0	0	455	0	626
RTOR Reduction (vph)	0	0	388	0	0	0	0	0	0	0	0	148
Lane Group Flow (vph)	0	1000	582	707	1051	0	0	0	0	227	228	478
Confl. Peds. (#/hr)	7		8	8		7	1		3	3		1
Confl. Bikes (#/hr)						4						
Heavy Vehicles (%)	0%	2%	2%	1%	3%	0%	0%	0%	0%	1%	0%	7%
Turn Type		NA	Perm	Prot	NA					Split	NA	custom
Protected Phases		2		1	6					7	7	4
Permitted Phases			2									
Actuated Green, G (s)		37.5	37.5	27.5	69.5					31.5	31.5	31.5
Effective Green, g (s)		37.5	37.5	27.5	69.5					31.5	31.5	31.5
Actuated g/C Ratio		0.34	0.34	0.25	0.63					0.29	0.29	0.29
Clearance Time (s)		4.5	4.5	4.5	4.5					4.5	4.5	4.5
Vehicle Extension (s)		4.9	4.9	2.3	4.9					2.3	2.3	2.3
Lane Grp Cap (vph)		1733	525	866	2214					486	486	760
v/s Ratio Prot		0.20		c0.20	0.30					0.13	0.13	c0.18
v/s Ratio Perm			c0.38									
v/c Ratio		0.58	1.11	0.82	0.47					0.47	0.47	0.63
Uniform Delay, d1		29.7	36.2	38.9	10.6					32.3	32.4	34.2
Progression Factor		0.89	0.90	1.59	0.40					1.00	1.00	1.00
Incremental Delay, d2		1.3	70.3	6.1	0.6					3.2	3.2	1.3
Delay (s)		27.8	103.0	68.0	4.8					35.5	35.6	35.5
Level of Service		C	F	E	A					D	D	D
Approach Delay (s)		64.8			30.2			0.0			35.5	
Approach LOS		E			C			A			D	

### Intersection Summary

HCM 2000 Control Delay	45.6	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.87		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	13.5
Intersection Capacity Utilization	104.0%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

**Intersection**

Int Delay, s/veh 8.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕		↕	↕			↕			↕	
Traffic Vol, veh/h	30	15	100	150	20	50	50	80	50	30	340	60
Future Vol, veh/h	30	15	100	150	20	50	50	80	50	30	340	60
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	-	-	-	50	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	99	99	99	99	99	99	99	99	99	99	99	99
Heavy Vehicles, %	0	0	1	1	0	0	0	0	6	6	0	0
Mvmt Flow	30	15	101	152	20	51	51	81	51	30	343	61

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	678	668	374	701	673	107	404	0	0	132	0	0
Stage 1	434	434	-	209	209	-	-	-	-	-	-	-
Stage 2	244	234	-	492	464	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.21	7.11	6.5	6.2	4.1	-	-	4.16	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.11	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.11	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.309	3.509	4	3.3	2.2	-	-	2.254	-	-
Pot Cap-1 Maneuver	369	382	674	355	379	953	1166	-	-	1429	-	-
Stage 1	604	585	-	795	733	-	-	-	-	-	-	-
Stage 2	764	715	-	560	567	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	315	354	674	276	351	953	1166	-	-	1429	-	-
Mov Cap-2 Maneuver	315	354	-	276	351	-	-	-	-	-	-	-
Stage 1	576	569	-	758	699	-	-	-	-	-	-	-
Stage 2	670	681	-	451	552	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	15	26	2.3	0.5
HCM LOS	C	D		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1166	-	-	507	276	640	1429	-	-
HCM Lane V/C Ratio	0.043	-	-	0.289	0.549	0.11	0.021	-	-
HCM Control Delay (s)	8.2	0	-	15	32.8	11.3	7.6	0	-
HCM Lane LOS	A	A	-	C	D	B	A	A	-
HCM 95th %tile Q(veh)	0.1	-	-	1.2	3.1	0.4	0.1	-	-

HCM Signalized Intersection Capacity Analysis  
1: Wilsonville Rd & Town Center Loop E

Full Development Build  
Wilsonville Town Center



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔↔	↔		↔	↔		↔	↔		↔	↔	
Traffic Volume (vph)	550	570	65	150	410	147	55	65	40	205	95	330
Future Volume (vph)	550	570	65	150	410	147	55	65	40	205	95	330
Ideal Flow (vphp)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.5		4.0	4.5		4.0	4.0		4.0	4.5	
Lane Util. Factor	0.97	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frbp, ped/bikes	1.00	0.99		1.00	0.99		1.00	0.99		1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.98		1.00	0.96		1.00	0.94		1.00	0.88	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	3400	1861		1805	1801		1804	1731		1796	1610	
Flt Permitted	0.95	1.00		0.95	1.00		0.56	1.00		0.69	1.00	
Satd. Flow (perm)	3400	1861		1805	1801		1070	1731		1297	1610	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	573	594	68	156	427	153	57	68	42	214	99	344
RTOR Reduction (vph)	0	4	0	0	10	0	0	26	0	0	125	0
Lane Group Flow (vph)	573	658	0	156	570	0	57	84	0	214	318	0
Confl. Peds. (#/hr)	5		13	13		5	2		5	5		2
Confl. Bikes (#/hr)			2			3						
Heavy Vehicles (%)	3%	0%	0%	0%	0%	3%	0%	2%	3%	0%	0%	4%
Turn Type	Prot	NA		Prot	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases							8			4		
Actuated Green, G (s)	22.1	50.2		14.4	42.5		10.3	10.3		25.7	25.2	
Effective Green, g (s)	22.1	50.2		14.4	42.5		10.3	10.3		25.7	25.2	
Actuated g/C Ratio	0.20	0.46		0.13	0.39		0.09	0.09		0.23	0.23	
Clearance Time (s)	4.0	4.5		4.0	4.5		4.0	4.0		4.0	4.5	
Vehicle Extension (s)	2.5	3.0		2.5	3.0		2.5	2.5		2.5	2.5	
Lane Grp Cap (vph)	683	849		236	695		121	162		387	368	
v/s Ratio Prot	c0.17	c0.35		0.09	0.32		0.01	c0.05		0.09	c0.20	
v/s Ratio Perm							0.03			0.04		
v/c Ratio	0.84	0.78		0.66	0.82		0.47	0.52		0.55	0.86	
Uniform Delay, d1	42.2	25.2		45.5	30.3		46.7	47.5		36.5	40.8	
Progression Factor	0.83	1.72		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	6.8	5.2		6.1	10.4		2.1	2.1		1.4	18.4	
Delay (s)	42.0	48.4		51.6	40.7		48.8	49.6		37.9	59.2	
Level of Service	D	D		D	D		D	D		D	E	
Approach Delay (s)		45.4			43.0			49.3			52.2	
Approach LOS		D			D			D			D	

Intersection Summary		
HCM 2000 Control Delay	46.6	HCM 2000 Level of Service
HCM 2000 Volume to Capacity ratio	0.83	D
Actuated Cycle Length (s)	110.0	Sum of lost time (s)
Intersection Capacity Utilization	89.4%	17.0
Analysis Period (min)	15	ICU Level of Service
c Critical Lane Group		E

Intersection												
Int Delay, s/veh	1.4											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑			↑↑				↑			↑
Traffic Vol, veh/h	0	1145	220	0	685	110	0	0	40	0	0	190
Future Vol, veh/h	0	1145	220	0	685	110	0	0	40	0	0	190
Conflicting Peds, #/hr	7	0	9	9	0	7	1	0	2	2	0	1
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	0	-	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	1	-	-	1	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	98	98	98	98	98	98	98	98	98	98	98	98
Heavy Vehicles, %	1	2	0	0	2	0	0	0	0	1	0	0
Mvmt Flow	0	1168	224	0	699	112	0	0	41	0	0	194

Major/Minor	Major1		Major2		Minor1		Minor2					
Conflicting Flow All	-	0	0	-	-	0	-	-	707	-	-	414
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	-	-	-	6.9	-	-	6.9
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	-	-	-	3.3	-	-	3.3
Pot Cap-1 Maneuver	0	-	-	0	-	-	0	0	382	0	0	593
Stage 1	0	-	-	0	-	-	0	0	-	0	0	-
Stage 2	0	-	-	0	-	-	0	0	-	0	0	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	-	-	-	-	-	-	379	-	-	589
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0	15.6	14.1
HCM LOS			C	B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBT	WBR	SBLn1
Capacity (veh/h)	379	-	-	-	-	589
HCM Lane V/C Ratio	0.108	-	-	-	-	0.329
HCM Control Delay (s)	15.6	-	-	-	-	14.1
HCM Lane LOS	C	-	-	-	-	B
HCM 95th %tile Q(veh)	0.4	-	-	-	-	1.4

HCM Signalized Intersection Capacity Analysis  
 3: Parkway Ave & Town Center Loop W/Town Center Loop E

Full Development Build  
 Wilsonville Town Center



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	100	95	15	100	100	95	40	570	85	180	630	150
Future Volume (vph)	100	95	15	100	100	95	40	570	85	180	630	150
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5		4.5	4.5	4.5		4.5		4.5	4.5	
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00		1.00		1.00	1.00	
Frbp, ped/bikes	1.00	1.00		1.00	1.00	0.98		0.99		1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00		1.00		1.00	1.00	
Frt	1.00	0.98		1.00	1.00	0.85		0.98		1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00	1.00		1.00		0.95	1.00	
Satd. Flow (prot)	1785	1778		1750	1900	1564		1798		1770	1815	
Flt Permitted	0.67	1.00		0.64	1.00	1.00		0.86		0.23	1.00	
Satd. Flow (perm)	1250	1778		1182	1900	1564		1547		437	1815	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	105	100	16	105	105	100	42	600	89	189	663	158
RTOR Reduction (vph)	0	5	0	0	0	78	0	5	0	0	6	0
Lane Group Flow (vph)	105	111	0	105	105	22	0	726	0	189	815	0
Confl. Peds. (#/hr)	1		1	1		1	6		12	12		6
Confl. Bikes (#/hr)												2
Heavy Vehicles (%)	1%	5%	0%	3%	0%	1%	0%	3%	5%	2%	1%	1%
Turn Type	pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA		pm+pt	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2			6		6	8			4		
Actuated Green, G (s)	31.4	23.9		31.4	23.9	23.9		48.6		65.1	65.1	
Effective Green, g (s)	31.4	23.9		31.4	23.9	23.9		48.6		65.1	65.1	
Actuated g/C Ratio	0.29	0.22		0.29	0.22	0.22		0.44		0.59	0.59	
Clearance Time (s)	4.5	4.5		4.5	4.5	4.5		4.5		4.5	4.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0		3.0		3.0	3.0	
Lane Grp Cap (vph)	393	386		376	412	339		683		404	1074	
v/s Ratio Prot	0.02	c0.06		c0.02	0.06					0.05	c0.45	
v/s Ratio Perm	0.06			0.06		0.01		c0.47		0.23		
v/c Ratio	0.27	0.29		0.28	0.25	0.06		1.06		0.47	0.76	
Uniform Delay, d1	29.8	35.9		29.9	35.7	34.2		30.7		14.8	16.6	
Progression Factor	1.08	1.08		1.00	1.00	1.00		0.73		1.00	1.00	
Incremental Delay, d2	1.6	1.8		1.8	1.5	0.4		43.7		3.9	5.0	
Delay (s)	33.9	40.6		31.7	37.2	34.5		65.9		18.7	21.7	
Level of Service	C	D		C	D	C		E		B	C	
Approach Delay (s)		37.5			34.5			65.9			21.1	
Approach LOS		D			C			E			C	

Intersection Summary			
HCM 2000 Control Delay	39.0	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.77		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	108.6%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

# HCM Signalized Intersection Capacity Analysis

## 4: Holly St/Park Pl & Wilsonville Rd

Full Development Build  
Wilsonville Town Center



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗		↖	↗		↖	↗		↖	↗	
Traffic Volume (vph)	490	1140	50	60	760	55	190	40	50	175	50	360
Future Volume (vph)	490	1140	50	60	760	55	190	40	50	175	50	360
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.5		4.0	4.5		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	
Frbp, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	0.98	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.99		1.00	0.99		1.00	0.92		1.00	0.87	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1805	3583		1770	3564		1805	1705		1805	1623	
Flt Permitted	0.95	1.00		0.95	1.00		0.15	1.00		0.68	1.00	
Satd. Flow (perm)	1805	3583		1770	3564		279	1705		1292	1623	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	516	1200	53	63	800	58	200	42	53	184	53	379
RTOR Reduction (vph)	0	3	0	0	4	0	0	40	0	0	236	0
Lane Group Flow (vph)	516	1250	0	63	854	0	200	55	0	184	196	0
Confl. Peds. (#/hr)	7		3	3		7	4					4
Confl. Bikes (#/hr)												1
Heavy Vehicles (%)	0%	0%	0%	2%	0%	0%	0%	1%	3%	0%	1%	0%
Turn Type	Prot	NA		Prot	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases							2			6		
Actuated Green, G (s)	30.0	50.9		7.4	28.3		35.2	27.2		35.2	27.2	
Effective Green, g (s)	30.0	50.9		7.4	28.3		35.2	27.2		35.2	27.2	
Actuated g/C Ratio	0.27	0.46		0.07	0.26		0.32	0.25		0.32	0.25	
Clearance Time (s)	4.0	4.5		4.0	4.5		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	492	1657		119	916		200	421		450	401	
v/s Ratio Prot	c0.29	0.35		0.04	c0.24		c0.07	0.03		0.03	0.12	
v/s Ratio Perm							c0.25			0.10		
v/c Ratio	1.05	0.75		0.53	0.93		1.00	0.13		0.41	0.49	
Uniform Delay, d1	40.0	24.4		49.6	39.9		33.7	32.2		28.4	35.4	
Progression Factor	1.20	0.31		1.10	0.97		1.00	1.00		0.87	0.70	
Incremental Delay, d2	35.3	0.6		3.5	13.6		63.6	0.6		0.4	3.0	
Delay (s)	83.5	8.0		58.1	52.3		97.3	32.8		25.2	27.9	
Level of Service	F	A		E	D		F	C		C	C	
Approach Delay (s)		30.0			52.7			76.5			27.0	
Approach LOS		C			D			E			C	

### Intersection Summary

HCM 2000 Control Delay	39.1	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.99		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	16.5
Intersection Capacity Utilization	99.5%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			



Intersection												
Int Delay, s/veh	7.6											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↕		↕	↕	
Traffic Vol, veh/h	70	10	170	40	20	10	50	245	60	15	255	60
Future Vol, veh/h	70	10	170	40	20	10	50	245	60	15	255	60
Conflicting Peds, #/hr	9	0	10	10	0	9	6	0	7	7	0	6
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	50	-	-	50	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	0	0	6	3	0	25	15	1	4	0	1	0
Mvmt Flow	74	11	179	42	21	11	53	258	63	16	268	63

Major/Minor	Minor2		Minor1		Major1			Major2				
Conflicting Flow All	759	772	316	840	772	306	337	0	0	328	0	0
Stage 1	338	338	-	403	403	-	-	-	-	-	-	-
Stage 2	421	434	-	437	369	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.26	7.13	6.5	6.45	4.25	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.13	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.13	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.354	3.527	4	3.525	2.335	-	-	2.2	-	-
Pot Cap-1 Maneuver	326	333	715	284	333	683	1153	-	-	1243	-	-
Stage 1	681	644	-	622	603	-	-	-	-	-	-	-
Stage 2	614	585	-	596	624	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	287	310	705	195	310	674	1147	-	-	1236	-	-
Mov Cap-2 Maneuver	287	310	-	195	310	-	-	-	-	-	-	-
Stage 1	646	632	-	590	572	-	-	-	-	-	-	-
Stage 2	551	555	-	428	613	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	21	25.8	1.2	0.4
HCM LOS	C	D		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1147	-	-	483	246	1236	-
HCM Lane V/C Ratio	0.046	-	-	0.545	0.3	0.013	-
HCM Control Delay (s)	8.3	-	-	21	25.8	8	-
HCM Lane LOS	A	-	-	C	D	A	-
HCM 95th %tile Q(veh)	0.1	-	-	3.2	1.2	0	-

# HCM Signalized Intersection Capacity Analysis

## 6: Canyon Creek Rd & Town Center Loop E

Full Development Build  
Wilsonville Town Center



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↑	↗	↖	↗		↖	↗		↖	↗	
Traffic Volume (vph)	130	130	80	30	155	340	75	20	50	140	20	130
Future Volume (vph)	130	130	80	30	155	340	75	20	50	140	20	130
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.5	4.5	4.0	4.5		4.5	4.5		4.5	4.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00	0.97	1.00	0.98		1.00	0.98		1.00	0.98	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00		0.99	1.00	
Frt	1.00	1.00	0.85	1.00	0.90		1.00	0.89		1.00	0.87	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1805	1863	1574	1805	1635		1805	1656		1786	1608	
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.59	1.00		0.71	1.00	
Satd. Flow (perm)	1805	1863	1574	1805	1635		1117	1656		1333	1608	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	137	137	84	32	163	358	79	21	53	147	21	137
RTOR Reduction (vph)	0	0	37	0	74	0	0	39	0	0	102	0
Lane Group Flow (vph)	137	137	47	32	447	0	79	35	0	147	56	0
Confl. Peds. (#/hr)	4		2	2		4			5	5		
Confl. Bikes (#/hr)						3			1			1
Heavy Vehicles (%)	0%	2%	0%	0%	4%	1%	0%	0%	0%	0%	0%	1%
Turn Type	Prot	NA	Perm	Prot	NA		Perm	NA		Perm	NA	
Protected Phases	5	2		1	6			8				4
Permitted Phases			2				8			4		
Actuated Green, G (s)	12.5	56.5	56.5	5.0	49.0		25.5	25.5		25.5	25.5	
Effective Green, g (s)	12.5	56.5	56.5	5.0	49.0		25.5	25.5		25.5	25.5	
Actuated g/C Ratio	0.12	0.56	0.56	0.05	0.49		0.26	0.26		0.26	0.26	
Clearance Time (s)	4.0	4.5	4.5	4.0	4.5		4.5	4.5		4.5	4.5	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	225	1052	889	90	801		284	422		339	410	
v/s Ratio Prot	c0.08	0.07		0.02	c0.27			0.02				0.03
v/s Ratio Perm			0.03				0.07			c0.11		
v/c Ratio	0.61	0.13	0.05	0.36	0.56		0.28	0.08		0.43	0.14	
Uniform Delay, d1	41.4	10.2	9.8	45.9	17.9		29.9	28.3		31.2	28.8	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	4.6	0.3	0.1	2.4	2.8		2.4	0.4		4.0	0.7	
Delay (s)	46.0	10.5	9.9	48.3	20.7		32.3	28.7		35.2	29.4	
Level of Service	D	B	A	D	C		C	C		D	C	
Approach Delay (s)		23.9			22.3			30.6			32.2	
Approach LOS		C			C			C			C	

### Intersection Summary

HCM 2000 Control Delay	25.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.53		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	77.2%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis  
 7: Town Center Lp West/Town Center Loop W & Wilsonville Rd

Full Development Build  
 Wilsonville Town Center



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑			↑↑		↑	↑		↑	↑	
Traffic Volume (vph)	0	1510	130	0	1260	50	150	130	70	100	90	400
Future Volume (vph)	0	1510	130	0	1260	50	150	130	70	100	90	400
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0		4.0	4.5		3.5	4.0	
Lane Util. Factor		0.95			0.95		1.00	1.00		1.00	1.00	
Frbp, ped/bikes		1.00			1.00		1.00	1.00		1.00	0.98	
Flpb, ped/bikes		1.00			1.00		1.00	1.00		1.00	1.00	
Frt		0.99			0.99		1.00	0.95		1.00	0.88	
Flt Protected		1.00			1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		3511			3548		1752	1766		1805	1606	
Flt Permitted		1.00			1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		3511			3548		1752	1766		1805	1606	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	1589	137	0	1326	53	158	137	74	105	95	421
RTOR Reduction (vph)	0	6	0	0	3	0	0	17	0	0	24	0
Lane Group Flow (vph)	0	1720	0	0	1376	0	158	194	0	105	492	0
Confl. Peds. (#/hr)	15		3	3		15	14					14
Heavy Vehicles (%)	0%	1%	6%	0%	1%	0%	3%	3%	0%	0%	3%	1%
Turn Type		NA			NA		Prot	NA		Prot	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)		51.6			51.6		10.0	34.9		10.5	35.4	
Effective Green, g (s)		52.1			52.1		10.0	34.9		11.0	35.9	
Actuated g/C Ratio		0.47			0.47		0.09	0.32		0.10	0.33	
Clearance Time (s)		4.5			4.5		4.0	4.5		4.0	4.5	
Vehicle Extension (s)		2.5			2.5		3.0	2.5		3.0	2.5	
Lane Grp Cap (vph)	1662				1680		159	560		180	524	
v/s Ratio Prot		c0.49			0.39		c0.09	0.11		0.06	c0.31	
v/s Ratio Perm												
v/c Ratio		1.04			0.82		0.99	0.35		0.58	0.94	
Uniform Delay, d1		28.9			24.9		50.0	28.8		47.3	36.0	
Progression Factor		0.86			1.60		1.00	1.00		1.03	1.04	
Incremental Delay, d2		29.7			1.4		69.2	1.7		4.7	26.4	
Delay (s)		54.7			41.3		119.1	30.5		53.4	63.8	
Level of Service		D			D		F	C		D	E	
Approach Delay (s)		54.7			41.3			68.5			62.0	
Approach LOS		D			D			E			E	

Intersection Summary		
HCM 2000 Control Delay	52.5	HCM 2000 Level of Service
HCM 2000 Volume to Capacity ratio	0.99	D
Actuated Cycle Length (s)	110.0	Sum of lost time (s)
Intersection Capacity Utilization	94.8%	12.0
Analysis Period (min)	15	ICU Level of Service
		F

c Critical Lane Group

# HCM Signalized Intersection Capacity Analysis

## 8: I-5 NB & Wilsonville Rd

Full Development Build  
Wilsonville Town Center



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖↗	↑↑			↑↑↑	↖	↖	↖	↖↗			
Traffic Volume (vph)	540	950	0	0	1290	520	500	0	710	0	0	0
Future Volume (vph)	540	950	0	0	1290	520	500	0	710	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5			4.5	4.5	4.5	4.5	4.5			
Lane Util. Factor	0.97	0.95			0.91	1.00	0.95	0.95	0.88			
Frbp, ped/bikes	1.00	1.00			1.00	0.98	1.00	1.00	0.98			
Flpb, ped/bikes	1.00	1.00			1.00	1.00	1.00	1.00	1.00			
Frt	1.00	1.00			1.00	0.85	1.00	1.00	0.85			
Flt Protected	0.95	1.00			1.00	1.00	0.95	0.95	1.00			
Satd. Flow (prot)	3400	3574			5136	1549	1618	1618	2750			
Flt Permitted	0.95	1.00			1.00	1.00	0.95	0.95	1.00			
Satd. Flow (perm)	3400	3574			5136	1549	1618	1618	2750			
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	557	979	0	0	1330	536	515	0	732	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	252	0	0	183	0	0	0
Lane Group Flow (vph)	557	979	0	0	1330	284	257	258	549	0	0	0
Confl. Peds. (#/hr)	5		23	23		5	2					2
Confl. Bikes (#/hr)						1			2			
Heavy Vehicles (%)	3%	1%	0%	0%	1%	2%	6%	0%	1%	0%	0%	0%
Turn Type	Prot	NA			NA	Perm	Prot	NA	Perm			
Protected Phases	5	2			6		3	8				
Permitted Phases						6			8			
Actuated Green, G (s)	29.5	72.5			38.5	38.5	28.5	28.5	28.5			
Effective Green, g (s)	29.5	72.5			38.5	38.5	28.5	28.5	28.5			
Actuated g/C Ratio	0.27	0.66			0.35	0.35	0.26	0.26	0.26			
Clearance Time (s)	4.5	4.5			4.5	4.5	4.5	4.5	4.5			
Vehicle Extension (s)	2.3	4.9			4.9	4.9	2.3	2.3	2.3			
Lane Grp Cap (vph)	911	2355			1797	542	419	419	712			
v/s Ratio Prot	c0.16	0.27			c0.26		0.16	0.16				
v/s Ratio Perm						0.18			c0.20			
v/c Ratio	0.61	0.42			0.74	0.52	0.61	0.62	0.77			
Uniform Delay, d1	35.2	8.8			31.4	28.5	35.9	35.9	37.7			
Progression Factor	0.79	0.27			0.82	0.80	1.00	1.00	1.00			
Incremental Delay, d2	2.4	0.5			1.4	1.7	6.6	2.1	4.9			
Delay (s)	30.1	2.9			27.0	24.6	42.5	38.1	42.6			
Level of Service	C	A			C	C	D	D	D			
Approach Delay (s)		12.7			26.3			41.6			0.0	
Approach LOS		B			C			D			A	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			25.9				HCM 2000 Level of Service		C			
HCM 2000 Volume to Capacity ratio			0.71									
Actuated Cycle Length (s)			110.0				Sum of lost time (s)		13.5			
Intersection Capacity Utilization			105.9%				ICU Level of Service		G			
Analysis Period (min)			15									
c	Critical Lane Group											

# HCM Signalized Intersection Capacity Analysis

## 9: I-5 SB & Wilsonville Rd

Full Development Build  
Wilsonville Town Center



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations		↑↑↑	↑	↑↑	↑↑					↑	↑	↑↑	
Traffic Volume (vph)	0	1000	960	730	1060	0	0	0	0	490	0	620	
Future Volume (vph)	0	1000	960	730	1060	0	0	0	0	490	0	620	
Ideal Flow (vphp)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Total Lost time (s)		4.5	4.5	4.5	4.5					4.5	4.5	4.5	
Lane Util. Factor		0.91	1.00	0.97	0.95					0.95	0.95	0.88	
Frbp, ped/bikes		1.00	0.97	1.00	1.00					1.00	1.00	1.00	
Flpb, ped/bikes		1.00	1.00	1.00	1.00					1.00	1.00	1.00	
Frt		1.00	0.85	1.00	1.00					1.00	1.00	0.85	
Flt Protected		1.00	1.00	0.95	1.00					0.95	0.95	1.00	
Satd. Flow (prot)		5085	1542	3467	3505					1698	1698	2656	
Flt Permitted		1.00	1.00	0.95	1.00					0.95	0.95	1.00	
Satd. Flow (perm)		5085	1542	3467	3505					1698	1698	2656	
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	
Adj. Flow (vph)	0	1031	990	753	1093	0	0	0	0	505	0	639	
RTOR Reduction (vph)	0	0	447	0	0	0	0	0	0	0	0	102	
Lane Group Flow (vph)	0	1031	543	753	1093	0	0	0	0	252	253	537	
Confl. Peds. (#/hr)	7		8	8		7	1		3	3		1	
Confl. Bikes (#/hr)						4							
Heavy Vehicles (%)	0%	2%	2%	1%	3%	0%	0%	0%	0%	1%	0%	7%	
Turn Type		NA	Perm	Prot	NA					Split	NA	custom	
Protected Phases		2		1	6					7	7	4	
Permitted Phases			2										
Actuated Green, G (s)		36.0	36.0	23.5	64.0					37.0	37.0	37.0	
Effective Green, g (s)		36.0	36.0	23.5	64.0					37.0	37.0	37.0	
Actuated g/C Ratio		0.33	0.33	0.21	0.58					0.34	0.34	0.34	
Clearance Time (s)		4.5	4.5	4.5	4.5					4.5	4.5	4.5	
Vehicle Extension (s)		4.9	4.9	2.3	4.9					2.3	2.3	2.3	
Lane Grp Cap (vph)		1664	504	740	2039					571	571	893	
v/s Ratio Prot		0.20		c0.22	0.31					0.15	0.15	c0.20	
v/s Ratio Perm			c0.35										
v/c Ratio		0.62	1.08	1.02	0.54					0.44	0.44	0.60	
Uniform Delay, d1		31.2	37.0	43.2	14.0					28.4	28.5	30.4	
Progression Factor		0.94	1.01	1.57	0.27					1.00	1.00	1.00	
Incremental Delay, d2		1.6	60.3	31.3	0.7					2.5	2.5	0.9	
Delay (s)		30.9	97.6	99.2	4.5					30.9	30.9	31.3	
Level of Service		C	F	F	A					C	C	C	
Approach Delay (s)		63.6			43.2			0.0			31.1		
Approach LOS		E			D			A			C		
<b>Intersection Summary</b>													
HCM 2000 Control Delay			48.6									HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio			0.88										
Actuated Cycle Length (s)			110.0									Sum of lost time (s)	13.5
Intersection Capacity Utilization			105.9%									ICU Level of Service	G
Analysis Period (min)			15										
c Critical Lane Group													

Intersection												
Int Delay, s/veh	8.8											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕		↕	↕		↕	↕		↕	↕	
Traffic Vol, veh/h	30	15	100	150	20	50	50	80	50	30	340	60
Future Vol, veh/h	30	15	100	150	20	50	50	80	50	30	340	60
Conflicting Peds, #/hr	0	0	1	1	0	0	0	0	6	6	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	50	-	-	150	-	-	150	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	99	99	99	99	99	99	99	99	99	99	99	99
Heavy Vehicles, %	0	0	0	0	0	0	1	2	0	0	1	0
Mvmt Flow	30	15	101	152	20	51	51	81	51	30	343	61

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	678	674	375	708	679	113	404	0	0	138	0	0
Stage 1	434	434	-	215	215	-	-	-	-	-	-	-
Stage 2	244	240	-	493	464	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.1	6.5	6.2	4.11	-	-	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	2.209	-	-	2.2	-	-
Pot Cap-1 Maneuver	369	379	676	352	376	945	1160	-	-	1458	-	-
Stage 1	604	585	-	792	729	-	-	-	-	-	-	-
Stage 2	764	711	-	562	567	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	318	353	675	274	350	940	1160	-	-	1451	-	-
Mov Cap-2 Maneuver	318	353	-	274	350	-	-	-	-	-	-	-
Stage 1	577	573	-	753	693	-	-	-	-	-	-	-
Stage 2	671	676	-	455	555	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	14.9	26.3	2.3	0.5
HCM LOS	B	D		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1160	-	-	509	274	634	1451	-	-
HCM Lane V/C Ratio	0.044	-	-	0.288	0.553	0.112	0.021	-	-
HCM Control Delay (s)	8.2	-	-	14.9	33.3	11.4	7.5	-	-
HCM Lane LOS	A	-	-	B	D	B	A	-	-
HCM 95th %tile Q(veh)	0.1	-	-	1.2	3.1	0.4	0.1	-	-

## Attachment G – Queuing Analysis Report

**Intersection: 1: Wilsonville Rd & Town Center Loop E**

Movement	EB	EB	EB	WB	WB	NB	NB	SB	SB
Directions Served	L	L	TR	L	TR	L	TR	L	TR
Maximum Queue (ft)	324	402	401	174	488	143	254	125	1444
Average Queue (ft)	189	212	173	86	360	68	92	119	921
95th Queue (ft)	297	323	339	187	568	136	207	149	1697
Link Distance (ft)		405	405		467		343		1401
Upstream Blk Time (%)		0	0		19		1		28
Queuing Penalty (veh)		1	2		0		0		0
Storage Bay Dist (ft)	300			150		120		100	
Storage Blk Time (%)	0	1		1	41	11	3	34	58
Queuing Penalty (veh)	1	3		4	25	11	2	111	112

**Intersection: 2: Rebekah & Wilsonville Rd**

Movement	EB	EB	WB	WB	NB	SB
Directions Served	T	TR	T	TR	R	R
Maximum Queue (ft)	79	113	423	429	58	1354
Average Queue (ft)	3	6	238	276	27	806
95th Queue (ft)	39	45	485	516	54	1658
Link Distance (ft)	386	386	405	405	393	1334
Upstream Blk Time (%)			2	10		34
Queuing Penalty (veh)			8	34		0
Storage Bay Dist (ft)						
Storage Blk Time (%)						
Queuing Penalty (veh)						

**Intersection: 4: Holly St/Park PI & Wilsonville Rd**

Movement	EB	EB	EB	WB	WB	WB	NB	NB	SB	SB	B26	B25
Directions Served	L	T	TR	L	T	TR	L	TR	L	TR	T	T
Maximum Queue (ft)	410	421	357	175	428	416	175	442	175	325	784	382
Average Queue (ft)	230	112	120	98	377	385	156	285	160	284	498	173
95th Queue (ft)	394	285	258	207	468	457	214	533	223	359	1024	468
Link Distance (ft)		422	422		386	386		388		223	692	349
Upstream Blk Time (%)	0	0	0		40	58		36		65	46	36
Queuing Penalty (veh)	0	3	0		154	227		0		0	0	0
Storage Bay Dist (ft)	400			150			150		150			
Storage Blk Time (%)	1	0		1	73		64	0	4	69		
Queuing Penalty (veh)	5	1		2	44		58	0	15	118		



**Intersection: 7: Town Center Lp West/Town Center Loop W & Wilsonville Rd**

Movement	EB	EB	WB	WB	NB	NB	B12	SB	SB
Directions Served	T	TR	T	TR	L	TR	T	L	TR
Maximum Queue (ft)	708	702	453	457	145	944	151	105	1355
Average Queue (ft)	587	574	371	396	138	795	91	88	1041
95th Queue (ft)	775	755	513	523	161	1187	174	128	1582
Link Distance (ft)	602	602	422	422		838	100		1308
Upstream Blk Time (%)	29	28	5	17		74	72		30
Queuing Penalty (veh)	228	219	33	101		0	0		0
Storage Bay Dist (ft)					120			80	
Storage Blk Time (%)					88	3		33	62
Queuing Penalty (veh)					167	5		161	62

**Intersection: 8: I-5 NB & Wilsonville Rd**

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	NB
Directions Served	L	L	T	T	T	T	T	R	L	LT	R	R
Maximum Queue (ft)	236	242	283	289	646	642	645	300	246	278	354	318
Average Queue (ft)	107	127	184	189	615	597	375	62	142	165	117	104
95th Queue (ft)	188	209	272	273	664	679	703	222	224	259	349	328
Link Distance (ft)	426	426	426	426	602	602	602			1107	1107	
Upstream Blk Time (%)		0			32	13	2					
Queuing Penalty (veh)		0			182	73	9					
Storage Bay Dist (ft)								150	400			400
Storage Blk Time (%)							9	0			1	0
Queuing Penalty (veh)							45	1			3	1

**Intersection: 8: I-5 NB & Wilsonville Rd**

Movement	B51
Directions Served	T
Maximum Queue (ft)	6
Average Queue (ft)	0
95th Queue (ft)	4
Link Distance (ft)	143
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 9: I-5 SB & Wilsonville Rd

Movement	EB	EB	EB	EB	WB	WB	WB	WB	SB	SB	SB	SB
Directions Served	T	T	T	R	L	L	T	T	L	LT	R	R
Maximum Queue (ft)	393	422	360	513	248	255	188	216	267	524	398	362
Average Queue (ft)	249	162	111	158	206	218	86	88	129	169	151	123
95th Queue (ft)	410	366	244	404	237	245	151	165	217	477	389	364
Link Distance (ft)		498	498	498	426	426	426	426		1190		
Upstream Blk Time (%)		1	0	0						1		
Queuing Penalty (veh)		5	0	2						0		
Storage Bay Dist (ft)	300								500		500	500
Storage Blk Time (%)	7	1							0	0	2	0
Queuing Penalty (veh)	23	4							0	2	8	1

Intersection: 9: I-5 SB & Wilsonville Rd

Movement	B118
Directions Served	T
Maximum Queue (ft)	67
Average Queue (ft)	7
95th Queue (ft)	83
Link Distance (ft)	298
Upstream Blk Time (%)	1
Queuing Penalty (veh)	0
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

**Intersection: 23: Boones Ferry Rd & Wilsonville Rd**

Movement	EB	EB	EB	EB	WB	WB	WB	WB	WB	NB	NB	NB
Directions Served	L	T	T	TR	L	L	T	T	R	L	T	R
Maximum Queue (ft)	499	1317	1326	250	375	446	609	589	200	118	203	359
Average Queue (ft)	92	1248	1263	250	173	236	367	375	143	56	102	174
95th Queue (ft)	334	1466	1440	252	312	435	614	603	290	110	179	303
Link Distance (ft)		1276	1276				498	498			987	987
Upstream Blk Time (%)		42	71		0	13	17					
Queuing Penalty (veh)		0	0		0	108	141					
Storage Bay Dist (ft)	450			200	380	380			100	300		
Storage Blk Time (%)		14	27	78	0	1	10	49				
Queuing Penalty (veh)		10	113	289	2	7	38	127				

**Intersection: 23: Boones Ferry Rd & Wilsonville Rd**

Movement	SB	SB	SB
Directions Served	L	L	TR
Maximum Queue (ft)	271	284	525
Average Queue (ft)	131	184	182
95th Queue (ft)	241	295	377
Link Distance (ft)			1022
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)	260	260	
Storage Blk Time (%)	0	2	1
Queuing Penalty (veh)	0	5	6

**Network Summary**

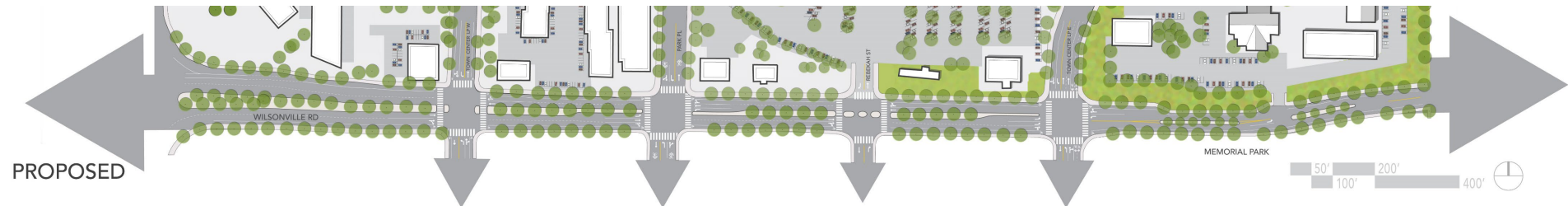
Network wide Queuing Penalty: 3122
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Attachment < – K J gcbj J`YFcUX`bhYfgYWjcb`a dfcj Ya Ybhg

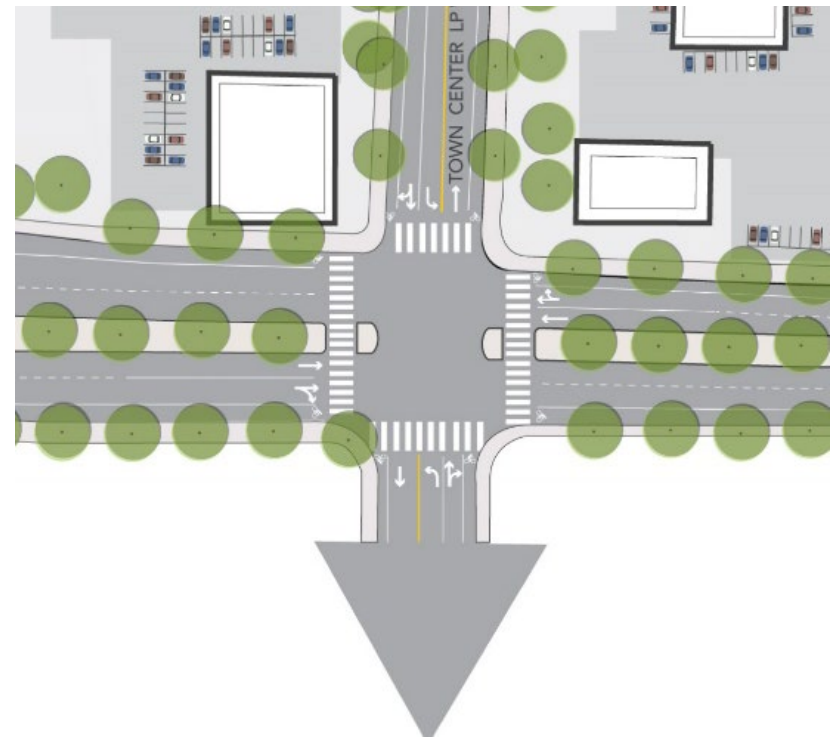


# Wilsonville Road Network Modifications

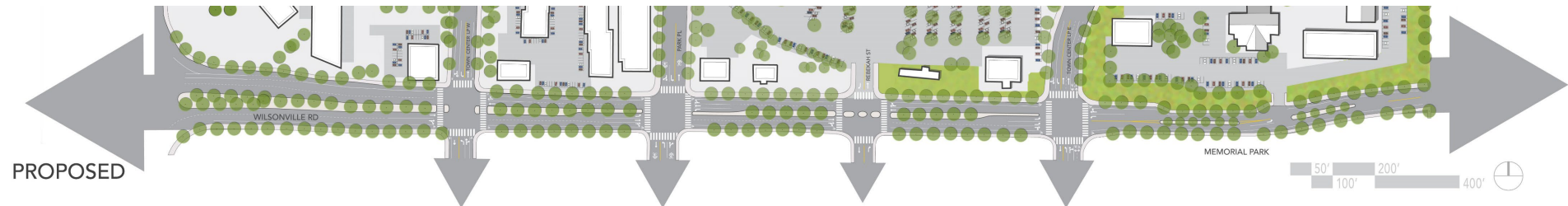


## Wilsonville Road/Town Center Loop West

- Modify signal to eliminate EB/WB left turns
- Improve pedestrian and bicycle safety
- Add landscape median on west leg

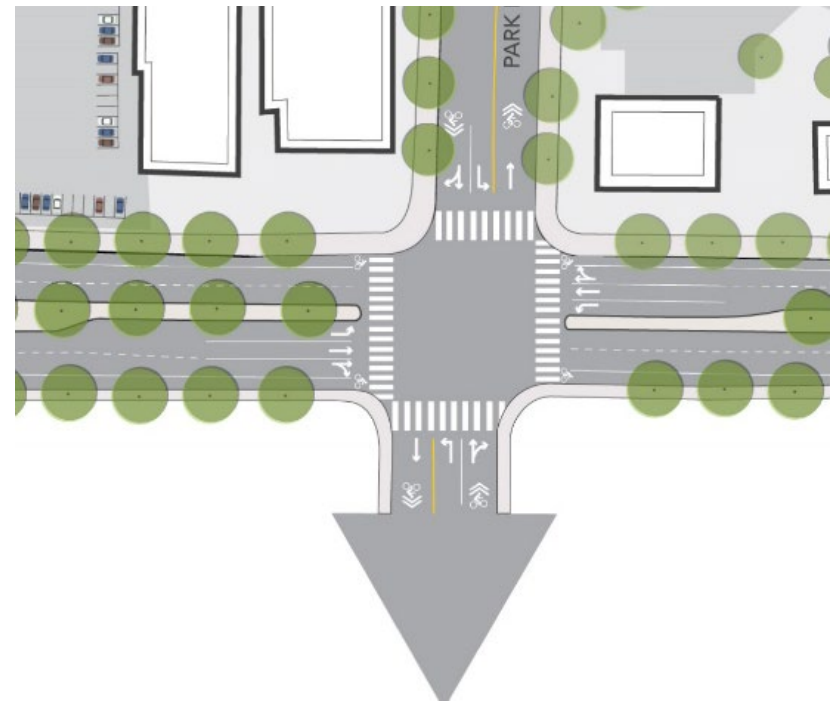


# Wilsonville Road Network Modifications



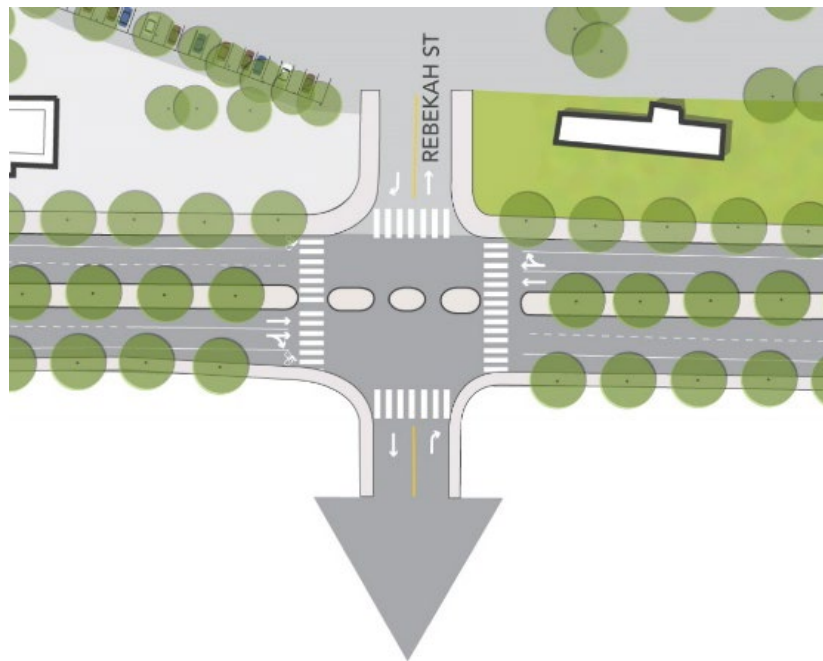
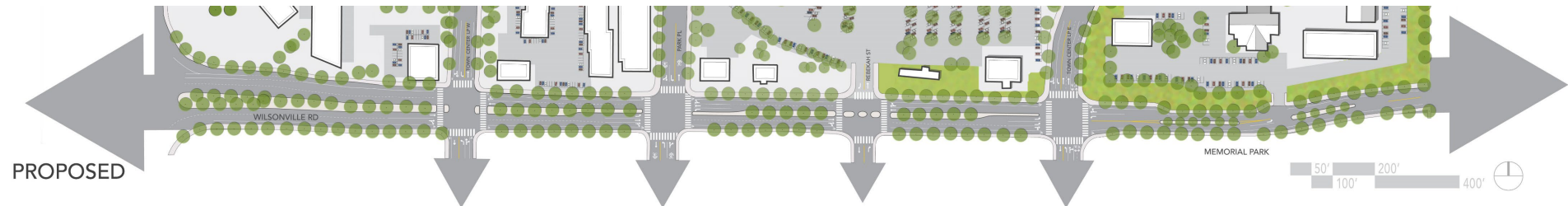
## Wilsonville Road/Park Place

- New signal with left turns
- Circulation changes to connect to Parkway Avenue





# Wilsonville Road Network Modifications

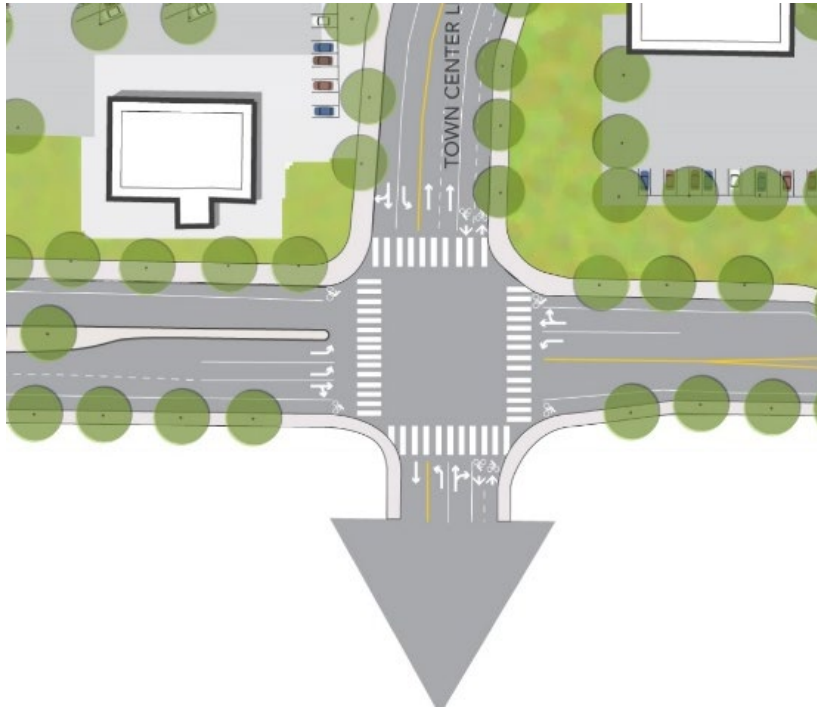
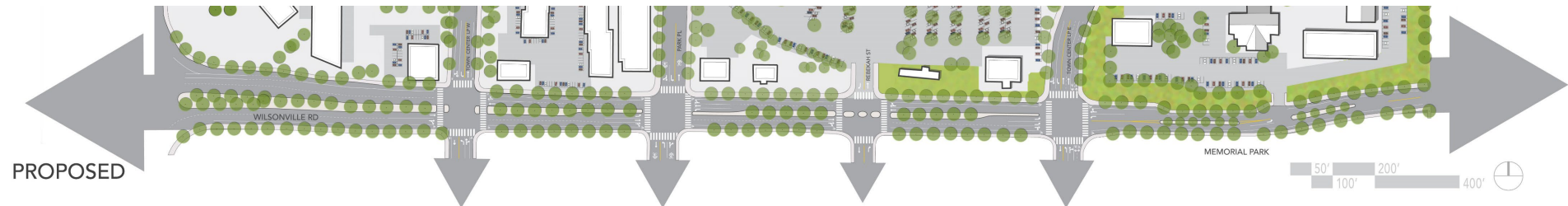


## Wilsonville Road/Rebekah Street

- Remove signal
- Right-in/right-out vehicle movements only
- Enhanced pedestrian/bike crossing
  - Refuge median and flasher
- Add landscape median on west leg



# Wilsonville Road Network Modifications



## Wilsonville Road/Town Center Loop East

- Modify signal
- Dual EB left turns with dual NB receiving lanes

