

Appendix 2

Transportation Impact Analysis

City of Federal Way



Federal Way City Center

Transportation Impact Analysis

June 20, 2006

Prepared by



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Federal Way City Center Transportation Impact Analysis

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June 20, 2006

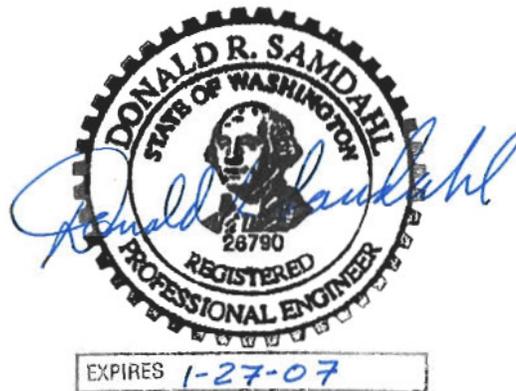


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Introduction

This study describes the transportation impacts associated with the development of the Federal Way City Center (FWCC) project located in Federal Way, WA. This study assesses the expected impact of the proposed land use changes in the City Center planning area on the City's transportation systems, including roadways and intersections, transit, bicycles, and pedestrian facilities, and identifies actions and improvements to mitigate the impacts. The study follows the Transportation Impact Analysis (TIA) guidelines from the City of Federal Way Public Works Department dated June 2004. Individual development projects proposed within the FWCC planning area may be required to provide additional analysis of the specific impact of their project on the transportation system as directed by the Director of Public Works.

Outline of Study

This study analyzes existing conditions (2004) and the short-term (2009) and longer-term (2014) impacts of the three FWCC project alternatives. The existing traffic operations (Base Year) and transportation systems are described for the AM peak, PM peak, and Saturday peak hour periods. Future traffic operations are described for two action (Alternatives 1 and 2) and one no-action (Alternative 3) alternative for 2009 and 2014 for the AM peak, PM peak, and Saturday peak hour periods. The year 2009 was selected to correspond to the City's 6-year Transportation Improvement Program (TIP)¹ and to Phase 1 of the Federal Way City Center's development (see the *City Center Planned Action Environmental Impact Statement*, Jones and Stokes, Incorporated, 2005, for further details). The year 2014 represents the completion of proposed development based on the City of Federal Way's *City Center Market Analysis* (Eco Northwest 2002). The 2009 analysis provides a detailed description of the expected transportation impacts and proposed mitigation of the proposed alternatives. The 2014 analysis provides a more generalized description of future transportation impacts associated with the FWCC plan. A technical appendix to this document provides details about the scope of work, assumptions, and analysis results for this study. Additional technical information is available on compact disc from the City of Federal Way.

Project Description

The proposed FWCC will develop an urbanized central core within Federal Way containing a mix of land uses including housing, retail, and civic uses. Chapter 7 (Page vii-1) of the City of Federal Way Comprehensive Plan (2002) describes the principal purposes of the FWCC as to:

- Create an identifiable downtown that is the social and economic focus of the City;
- Strengthen the City as a whole by providing for long-term growth in employment and housing;
- Promote housing opportunities close to employment;

¹ Projects from the updated 2005-2010 TIP were applied to the 2009 model year.

- Support development of an extensive regional transportation system;
- Reduce dependency on automobiles;
- Consume less land with urban development;
- Maximize the benefit of public investment in infrastructure and services;
- Reduce costs of and time required for permitting;
- Provide a central gathering place for the community; and
- Improve the quality of urban design for all developments.

This vision will be carried out by encouraging a compact form of development that will mix retail, commercial, and residential land uses. The FWCC transit center and the FWCC Park & Ride will be a key component of the planning area, supported by a high level of non-motorized facilities, amenities, and transit services that will reduce dependency on the automobile and provide transportation choices. Further information on the FWCC and its role in the City's development plans are found in Chapter 7 of the City of Federal Way Comprehensive Plan (2002) and the City Center Planned Action EIS (Jones and Stokes, Incorporated, 2005).

Site Location

Figure 1 illustrates the FWCC planning area for this analysis. The planning area, the subject of this analysis, is a subset of the area designated in the City Center Core and Frame (2002 City of Federal Way Comprehensive Plan Chapter 7), which included areas west and east of the planning area. The study area analyzed represents the area surrounding the new FWCC transit center, the focal point of the area's development. The planning area is centered along both sides of S 320 Street and 20 Avenue S, forming three distinct blocks areas that include the Hillside Plaza shopping area and school district offices, SeaTac Plaza and SeaTac Village, and the Commons at Federal Way (formerly the SeaTac Mall). The boundaries of the planning area are S 312 Street (north), S 324 Street (south), Pacific Highway S/SR-99 (west) and 23 Avenue S (east). The area is divided into three blocks to allow the detailed analysis of land uses and future development.

- Block 1 consists of the northern portion of the project area and is bounded on the north by S 312 Street, on the west by Pacific Highway South, on the south by South 316 Street and on the east by 23 Avenue S.
- Block 2 is located in the central portion of the project area and is bounded on the north by S 316 Street, on the west by Pacific Highway South, on the south by S 320 Street and on the east by 23 Avenue S.
- Block 3 is located in the southern portion of the project area and consists mainly of The Commons at Federal Way (formerly SeaTac Mall). Block 3 is bounded on the north by S 320 Street, on the west by Pacific Highway South, on the south by S 324 Street and on the east by 23 Avenue S.

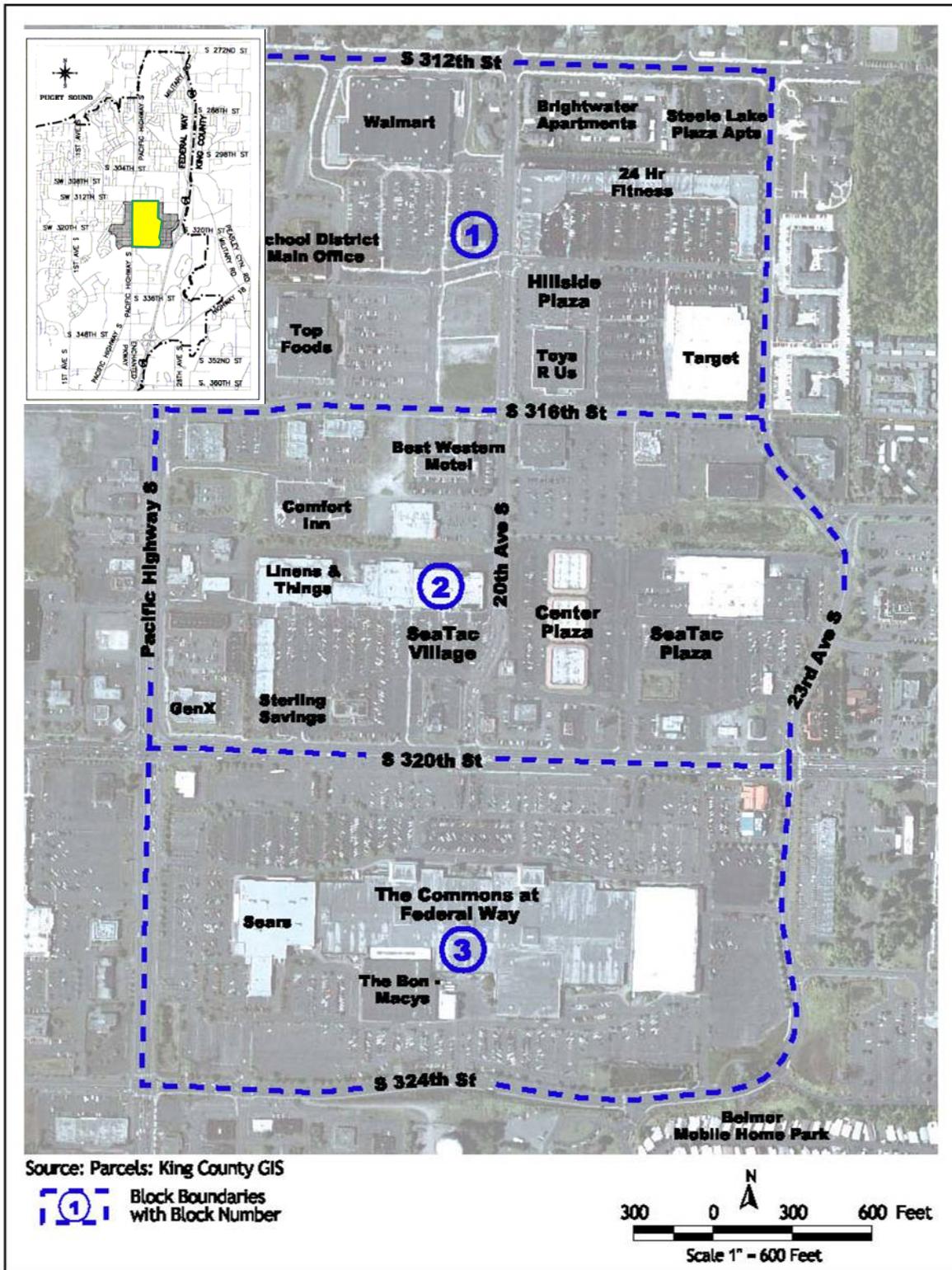


Figure 1. Location Map



Existing Land Use

The existing land uses are primarily retail and service businesses. As the principal retail center of Federal Way, the area includes many of the City’s main shopping areas including: The Commons at Federal Way (SeaTac Mall), SeaTac Village, Center Plaza, SeaTac Plaza, and Hillside Plaza. Principal retailers in the area include Sears, Bon-Macy’s, Target, and Wal-Mart. Other activities in the area include hotels, office space, and a variety restaurants and eateries.

Table 1 describes the make up of the FWCC. The existing land uses within the City Center include a mix of office, retail, and other uses, with little residential development. Much of the remaining area is devoted to surface parking.

Table 1. FWCC Land Uses – January 2002

	Commercial (retail, office, restaurant, services)	Residential	Hotel
Block 1	538,224 sf	190 units	--
Block 2	500,221 sf	N/A	230 rooms
Block 3	850,469 sf	N/A	--
Total	1,888,914 sf	190 units	230 rooms

Source: Federal Way City Center Planned Action EIS, Jones and Stokes, Inc. 2005. Referencing King County, WA. Parcel Viewer, Accessed 12-18-2003.

Proposed Land Use

The FWCC is proposed as a mixed-use development that will provide the variety of land uses needed to create an urban center within the City of Federal Way. Table 2 describes the assumed mix of land uses applied in this analysis for each of the three block areas. The two action alternatives assume the same amount of intensified development within the FWCC area, but differ in the location of growth throughout the planning area. Alternative 1 would concentrate development near S 320 Street (Blocks 2 and 3), while Alternative 2 would distribute the growth throughout FWCC plan area. The No Action alternative (Alternative 3) assumes only the future growth identified in the Chapter 7 of the *City of Federal Way Comprehensive Plan (2002)*.

Table 2. Proposed Development 2004-2009

	No Action			Alternative 1			Alternative 2		
	Block 1	Block 2	Block 3	Block 1	Block 2	Block 3	Block 1	Block 2	Block 3
Retail (sf)	34,395	41,697	34,041	67,500	202,500	180,000	153,000	153,000	144,000
Office (sf)	20,554	17,128	6,859	37,500	112,500	60,000	81,000	81,000	48,000
Lodging (rooms)	0	0	0	60	180	120	132	132	96
Residential (units)	23	31	31	75	225	150	165	165	120
Civic (sf)	0	0	0	0	0	0	0	0	0
Other (sf)	3,664	3,022	1,210	0	0	0	0	0	0
Structured Parking (stalls)	0	0	0	0	150	300	175	0	240

Source: Federal Way City Center Planned Action EIS, Jones & Stokes, Incorporated, 2005.

Table 3 lists the amount of expected development for each alternative within the FWCC between 2010 and 2014. Overall growth for the action alternatives (Alternative 1 and 2) is identical with Alternative 1 concentrating the growth in Blocks 1 and 2 and Alternative 2 balancing the growth between the three blocks.

Table 3. Proposed Development 2010-2014

	No Action			Alternative 1			Alternative 2		
	Block 1	Block 2	Block 3	Block 1	Block 2	Block 3	Block 1	Block 2	Block 3
Retail (sf)	22,602	27,400	22,371	45,000	135,000	120,000	102,000	102,000	96,000
Office (sf)	23,962	19,982	8,002	25,000	75,000	40,000	54,000	54,000	32,000
Lodging (rooms)	0	0	0	40	120	80	88	88	64
Residential (units)	28	39	34	50	150	100	110	110	80
Civic (sf)	0	0	0	0	50,000	50,000	50,000	50,000	0
Other (sf)	4,275	3,526	1,412	0	0	0	0	0	0
Structured Parking (stalls)	0	0	0	0	100	200	0	175	160

Source: Federal Way City Center Planned Action EIS, Jones & Stokes, Incorporated, 2005.

Each of these land use alternatives were assigned to the City of Federal Way's Transportation Analysis Zone (TAZs) for the development of the traffic forecasting model in EMME/2. The land use, zone structure map, and the assumptions used in the traffic modeling are located in the Technical Appendix B.

Approved Projects in the Vicinity

The TIA includes the expected impacts of approved projects in the vicinity of the FWCC area as part of the baseline assumptions to the traffic model. Three projects were identified for inclusion in the scope of work:

- The Christian Faith Center, a recently approved development of a church and school on S 336th Street between Highway 99 and Interstate 5, will include a 4,500-seat sanctuary/auditorium, with meeting spaces, a bookstore, and offices; and a school building with recreation facilities and play fields.
- The Federal Way Transit Center was assumed as part of the baseline model assumptions along with the S 317 Street transit/HOV ramps that connect to I-5.
- The final project, the “Triangle Study” was not complete at the time of this report. The study is primarily designed to improve safety and efficiency of the area where of Interstate-5, SR-18, SR 161 interact with S 348 Street in Federal Way.

Scope of Impact Analysis

The TIA describes the impacts of the existing and future transportation system. The existing analysis describes area traffic volumes, traffic operations, traffic safety, and transit service for the AM, PM and Saturday peak hours. The future conditions analysis includes the cumulative impacts of traffic increases associated with the each alternative, general traffic growth (background traffic) and traffic associated with other development projects and improvements. The future year analysis also assumes the completion of projects within the City of Federal Way’s 2005-2010 6-year TIP. Appendix A includes the scope of work for the project.

Study Intersections

Under the City’s direction a two-tier process was used to identify the scope of the study intersections for the FWCC analysis. The first tier of this analysis followed the procedure described in the City of Federal Way’s *Guidelines for the Preparation of Transportation Impact Analyses* (June 2004). The first tier includes existing and future transportation facilities affected by 10 or more trips in both directions during the evening PM peak hour and 100 or more trips during other the AM and Saturday peak hours. Appendix C provides the results of this analysis. The second tier reviewed the results from the level of service and the volume-to-capacity ratio analyses conducted for the intersections identified in the first tier to identify the existing and future locations likely to exceed the City’s minimum acceptable level of service standard (LOS E or better with a volume/capacity ratio of less than 1.00 for signalized intersections). Additional intersections were added by the consultant as a result of refinements to the traffic model and at the direction of the City staff.

Table 4 lists the study intersections within the area. A total of 27 intersections analyzed for existing (2004) and future (2009). The AM peak hour analyzed 10 intersections, the PM peak hour analyzed 22 intersections, and the Saturday peak hour analyzed 14

intersections. These intersections were analyzed for existing and future conditions to describe the impact of the FWCC plan on the transportation system. Throughout this document the results of the PM peak hour analysis are reported first, the AM peak hour second, and Saturday peak hour last.

Table 4. Study Intersections

	PM Peak	AM Peak	SAT Peak
S 272 St & Pacific Hwy S (City of Kent)	X	X	X
S 272 St & I-5 SB southbound Ramp (WSDOT)	X	X	X
S 272 St & I-5 NB northbound Ramp (WSDOT)	X	X	X
S 272 St & Military Rd S (City of Kent)	X	X	X
S 288th St & Pacific Hwy S	X		
S 288th St & Military Rd S	X		
S Dash Point Rd & Pacific Hwy S		X	
S 312 St & Pacific Hwy S	X		X
S 312 St & 28 Av S	X		
S 316 St & Pacific Hwy S			X
SW 320 St & 21 Av SW		X	
S 320 St & 1 Av S	X	X	X
S 320 St & Pacific Hwy S	X		X
S 320 St & 20 Av S			X
S 320 St & 23 Av S	X		X
S 320 St & I-5 SB southbound Ramp (WSDOT)	X	X	X
S 320 St & I-5 NB northbound Ramp (WSDOT)			X
S 320 St & Military Rd S (Unincorporated King County)	X		
S 324 St & Pacific Hwy S	X		X
SW 336 St & 21 Av SW	X		
S 336 St & Pacific Hwy S	X	X	
SW 340 St & Hoyt Rd SW	X	X	X
SW Campus Dr & 1 Av S	X		
S 348 St & Pacific Hwy S	X		
SW 356 St & 21 Av SW	X		
S 356 St & Pacific Hwy S	X		
S 356 St & Enchanted Pkwy S	X		
Number of Intersections Analyzed	22	10	14

Definition of Impact

The City of Federal Way follows the Highway Capacity Manual (HCM) methodology to calculate the impact of a project on area intersections. Level of Service (LOS) is a measure of the quality of traffic operations at an intersection. LOS uses an A to F scale, with LOS A representing minimal traffic delays and LOS F representing severe

congestion and long delays. The LOS is measured using the average control delay of the intersection and is reported for the overall intersection for signalized intersections and all-way stops, and for the worst movement of unsignalized intersections. Table 5 describes the LOS for signalized and unsignalized intersections.

Table 5. Level of Service Definitions

LOS	Signalized Delay per Vehicle (sec/veh)	Unsignalized Delay per Vehicle (sec/veh)
A	0-10	0-10
B	>10-20	>10-15
C	>20-35	>15-25
D	>35-55	>25-35
E	>55-80	>35-50
F	>80	>50

Source: Highway Capacity Manual (HCM 2000, Transportation Research Board)

The HCM methodology also calculates volume to capacity ratio to express the extent an intersection is below or above its theoretic capacity. The HCM methodology uses the volume to capacity of the critical movements of the intersection to provide an overall v/c measure (X_c).

The City of Federal Way's *Guidelines for the Preparation of Transportation Impact Analyses* establishes analysis thresholds to define an impact requiring mitigation. The City uses a combined threshold that defines an impact as: (1) intersections operating at worse than LOS E for signalized and all-way stop controlled intersections and/or (2) an overall volume/capacity ratio (X_c) of equal to or greater than 1.0, as calculated by the Highway Capacity Manual methodology. For unsignalized intersections other than all-way stops, an impact occurs when the lane volume/capacity ratio for any lane group must be equal to or greater than the 1.0 standard.

Inventory of Existing and Planned Transportation System

This section describes the existing and planned major transportation systems within the planning area, including the roadway system, traffic volumes, intersection operations, collision data, transit services, and bicycle and pedestrian facilities.

Roadway Facilities

The main component of the transportation system is the roadway system. This section describes the base year (2004) roadway system including the functional classification, system description, right-of-way, traffic volumes, intersection operations (level of service), and collision history.

Functional Classification

Figure 2 shows the functional classification of the Federal Way arterial system within the planning area. Table 6 describes the general definition of the functional classification found in Chapter 3 of the *City of Federal Way Comprehensive Plan* (2003 revision).

Table 6. Characteristics of Functional Classifications of Streets

Road Classification	Number of Lanes	Right-of-way Width ¹		Expected Daily Traffic
		Existing Code	Posted Speed	
Interstate/Freeways	4+ (varies)	Varies	60 mph	30,000+
Principal Arterial	2 to 7	68' to 124'	35-50 mph	5,000+
Minor Arterial	2 to 5	68' to 106'	30-40 mph	5,000-35,000
Principal Collector	2 to 5	68' to 100'	25-35 mph	5,000-25,000
Minor Collector	2 to 3	60' to 80'	25-35 mph	1,000-5,000
Local Street	2	36' to 66'	25-35 mph	up to 1,000

Source: *Federal Way City Center Comprehensive Plan 2003 revision (Chapter 3), page III-30.*

System Description

The City of Federal Way roadway system serves both local and regional roles providing access to residents and businesses as well as connections to adjacent and regional destinations. Primary roadways and intersections within the planning area are described below:

- Interstate 5 is the primary north-south interstate freeway in western Washington. I-5 has five travel lanes north of S 320 Street and four lanes south of S 320 Street, with a posted speed limit of 60 mph. Study intersections connecting with the I-5 ramps include the northbound and southbound ramps at S 320 Street, the S 317 Street direct access ramps and at S 272 Street.
- Pacific Highway S. (SR-99) is a five to seven lane principal arterial connecting Federal Way with the City of Tacoma to the south and the City of Kent to the north. The posted speed limit is 40 mph. Study intersections along SR-99 include S 272 Street, S Dash Point Rd, S 312 Street, S 316 Street, S 320 Street, S 324 Street, S 336 Street, S 348 Street, and S 356 Street.

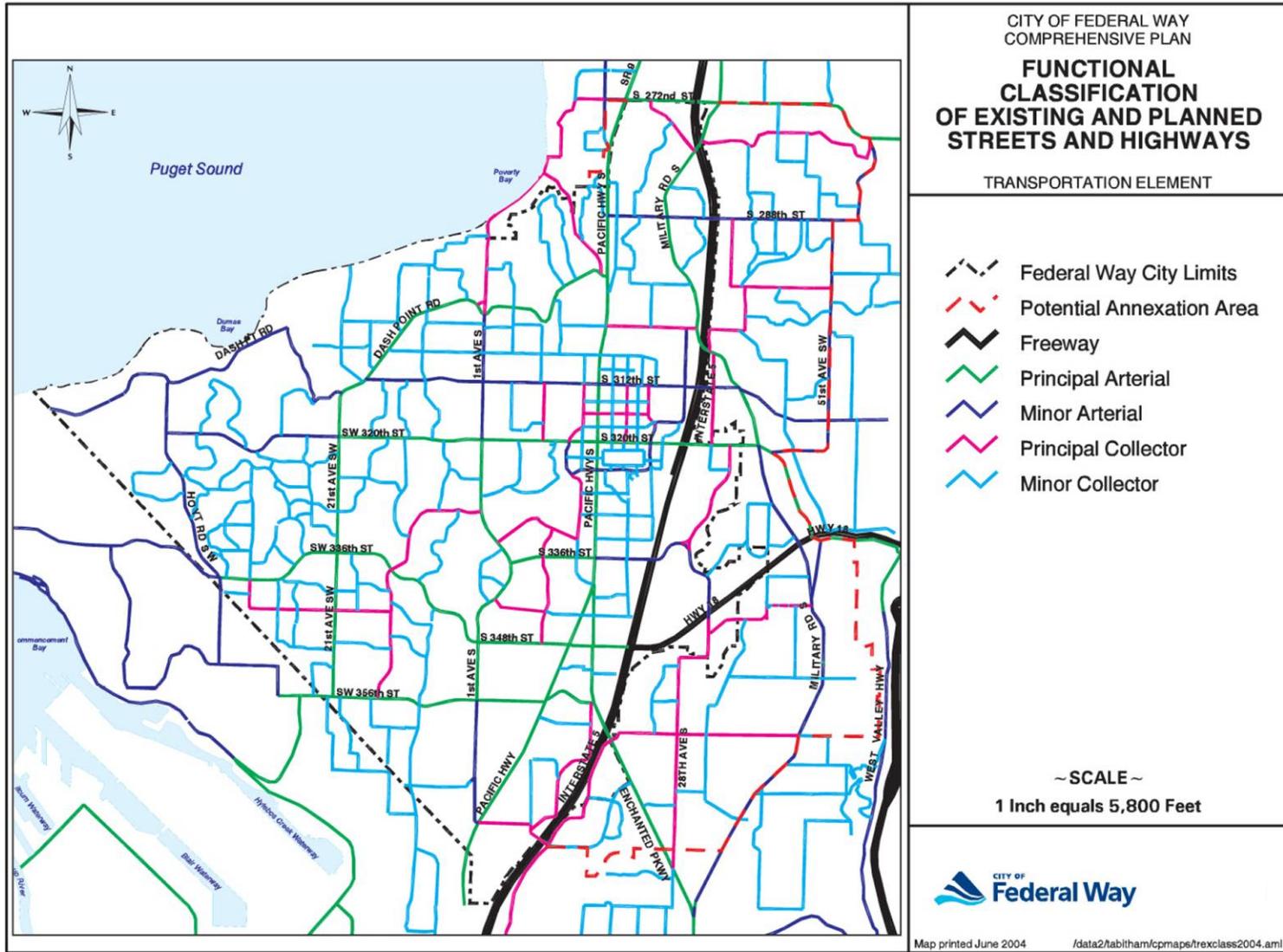


Figure 2. Functional Classification



- S 272 Street a principal arterial that connects Pacific Highway S to Interstate 5 and SR-516. Study intersections along S 272 include Pacific Highway S, I-5 ramps, and Military Road S.
- S 320 Street is a principal arterial with 5 to 7 travel lanes. The roadway connects I-5 with SR-99 to the west and Military Road/Peasley Canyon Road to the east. Study intersections along S 320 Street include 1 Avenue S, Pacific Highway S, 21 Avenue S, 23 Avenue S, I-5 ramps, and Military Road.
- S 356th Street is a principal arterial that provides a connection between the City of Tacoma and I-5 and SR-18. Study intersection on S 356th Street includes 21st Avenue SW, Pacific Highway S, and Enchanted Parkway S.

Right-of-Way

The Federal Way Municipal Code (Section 13-161.11) describes right-of-way as “...dedicated or conveyed to the public or a unit of government, the primary purpose of which is the movement of vehicles and/or pedestrians and providing for access to adjacent parcels, with the secondary purpose of providing space for utility lines and appurtenances and other devices and facilities benefiting the public.”

The Chapter 3 (Figure III-3) of the *City of Federal Way Comprehensive Plan* (2003 revision) develops a network of “City Center” roadways that meet the higher level of amenities for the FWCC planning area (Figure 3). The need for wider sidewalks, bicycle lanes, street lighting, and street trees resulted in the City designating specific standards for FWCC roadways. Table 7 lists the required and the typical amounts of right-of-way found on major roadways within the FWCC planning area.

Table 7. Right-of-Way for Major Area Streets

Roadway	Required FWCC right-of-way	Existing right-of-way
Pacific Highway S. (SR-99)	120 feet	100-140 feet
S 324 Street	96 feet	66 feet
S 320 Street	100 feet	100-140 feet
S 316 Street	74 feet	60 feet
S 312 Street	85 feet	60-85 feet
20 Avenue S	60 feet	60 feet
23 Avenue S	85 feet	80-82 feet

Source: King County Assessor 2003

As seen in the table, Pacific Highway S, S 324 Street, S 316 Street, S 312 Street and 23 Avenue S all have inadequate right-of-way. In addition, the FWCC Pan calls for a number of internal roadways (see Figure 10) to create smaller blocks that will improve the grid network and improve the access for pedestrians and vehicles. These internal grid roads noted as Q in Figure 3 require 70 feet of Right of Way with two vehicle lanes, 12 feet of sidewalks, and on street parking. Right-of-way dedication and street improvements shall be a component of the development submittal phase of a proposed project within the FWCC.

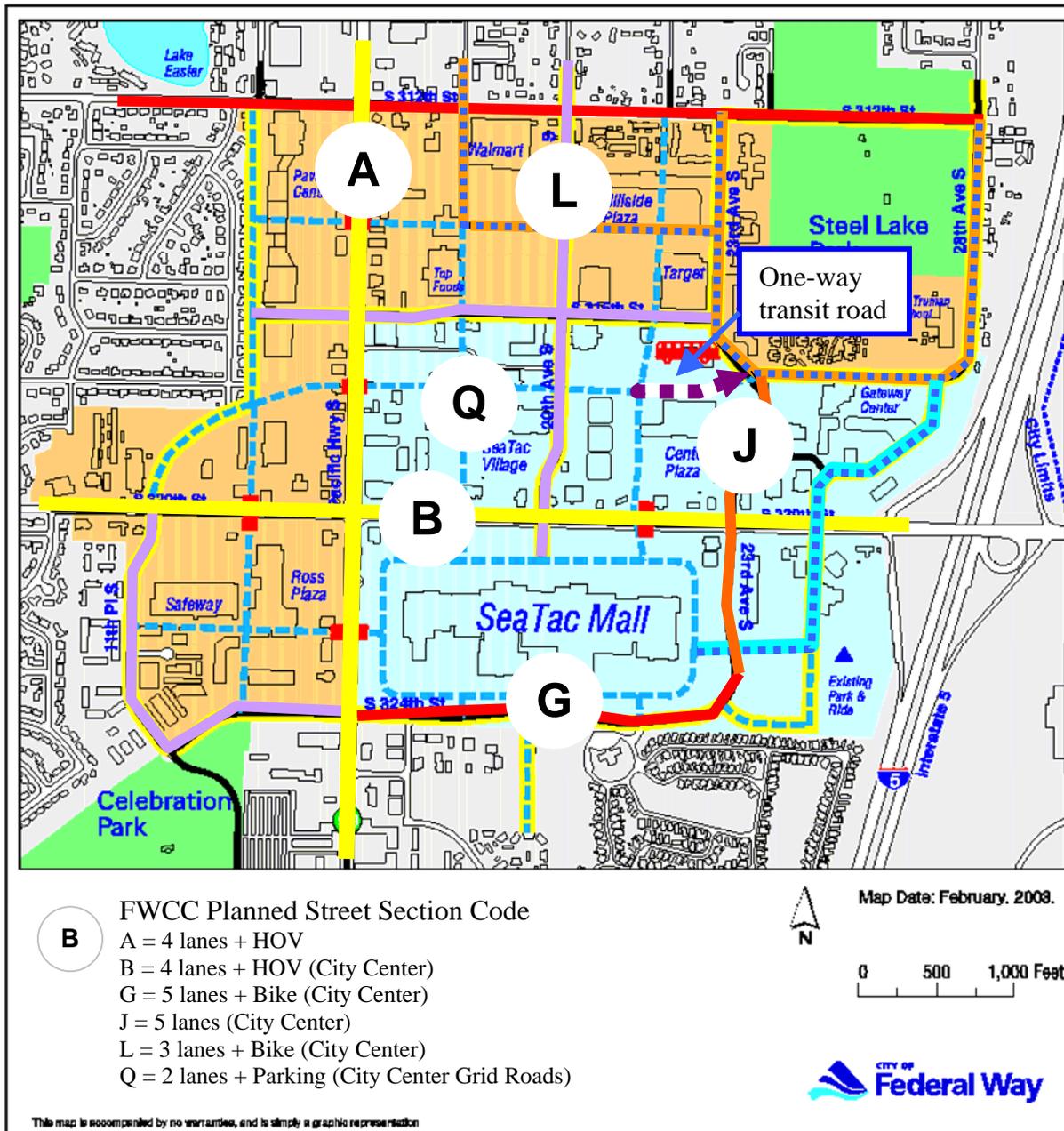


Figure 3. Proposed FWCC Street Network



Base Year (2004) Volumes

Recent traffic counts were used to establish the 2003-04 base year traffic volumes for the study (for purposes of the study, 2004 and 2003 volumes were assumed to be identical since the city performed the 2003 counts in November and December of 2003.). Traffic counts from the City's database were supplemented by additional counts conducted in late-2003 through the summer of 2004. For all counts, the reported peak hour represents the highest single peak hour traffic count taken over a two-hour period. Appendix D summarizes the traffic counts used in this study. Based on observations of historical traffic volumes and discussions with City Staff, traffic counts that were older than 2003, were factored using a historical rate to approximate 2004 count levels. For PM counts, a TGR of 2.5% per year for 2001 counts and a TGR of 1.1% per year for 2002 counts were used to factor counts to 2004. For AM and Saturday counts, a 2% per year TGR was used.

The observed peak hour for the three time periods occur between the following hours:

- PM peak hour between 4 and 6 p.m.
- AM peak hour between 7 and 9 a.m.
- Saturday peak hour between 11 a.m. and 1 p.m.

Figures 4 to 6 display the 2004 PM, AM and Saturday peak hour traffic counts.

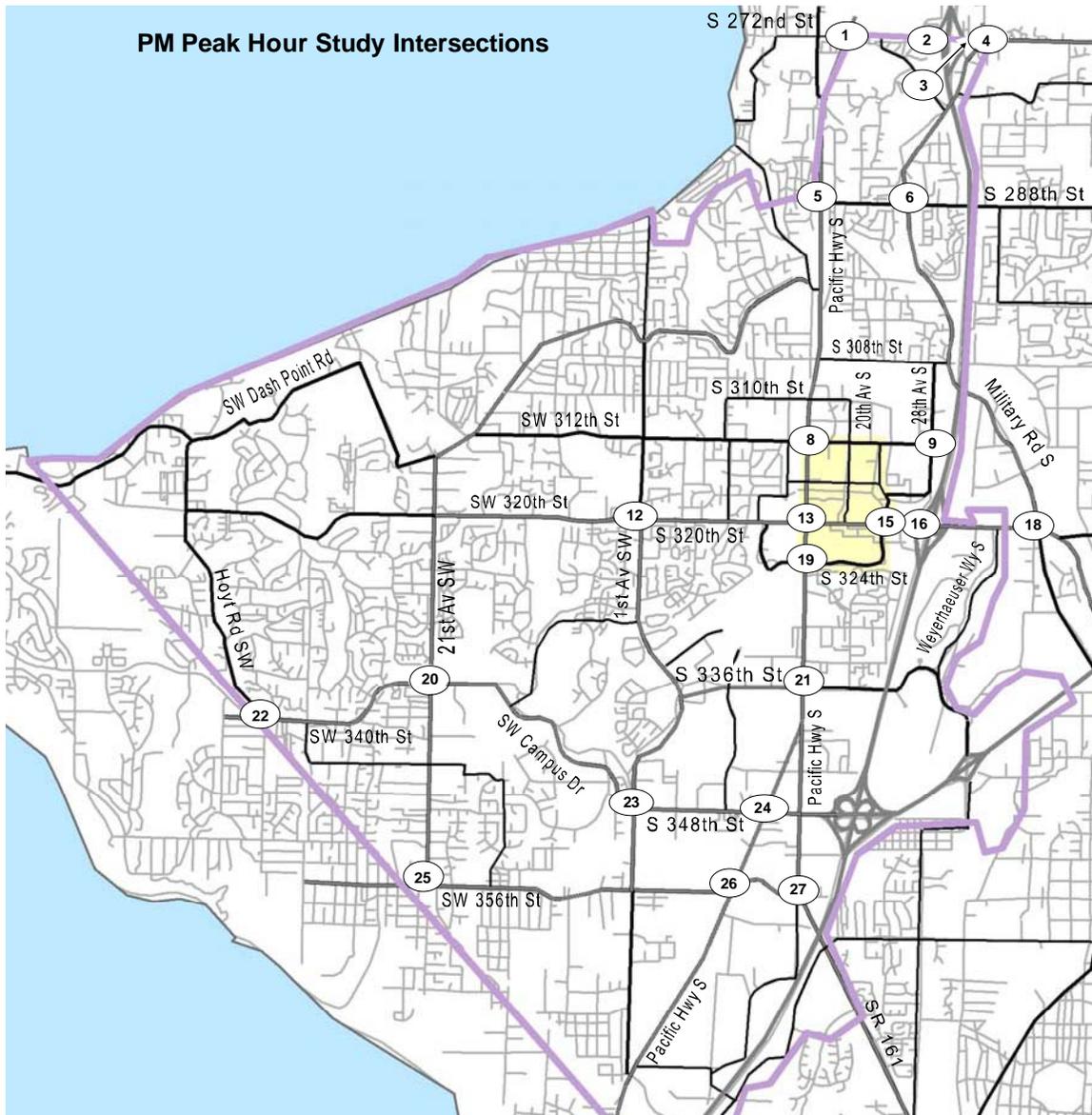


Figure 4. Existing PM Volumes



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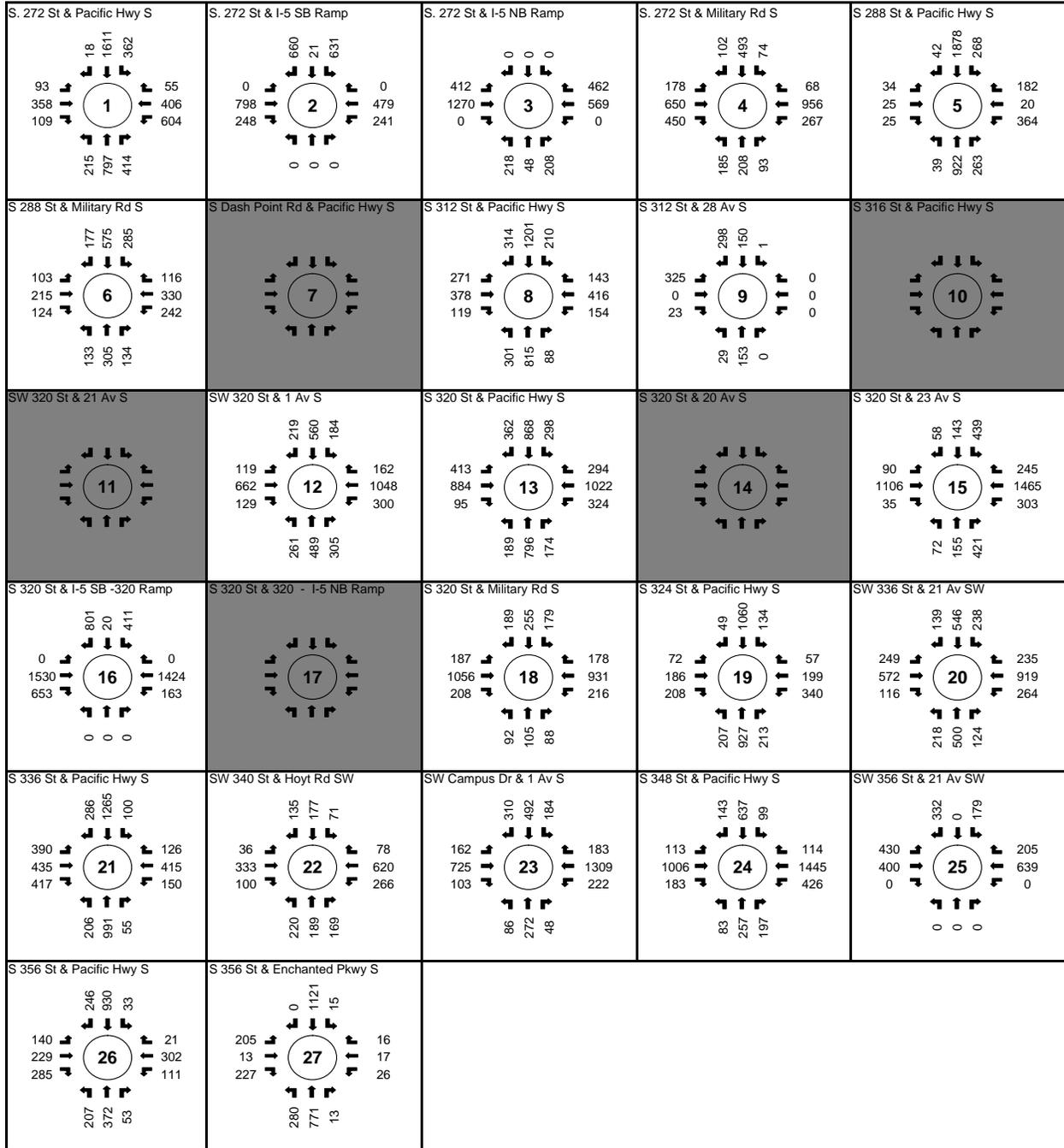


Figure 4. Existing PM Volumes



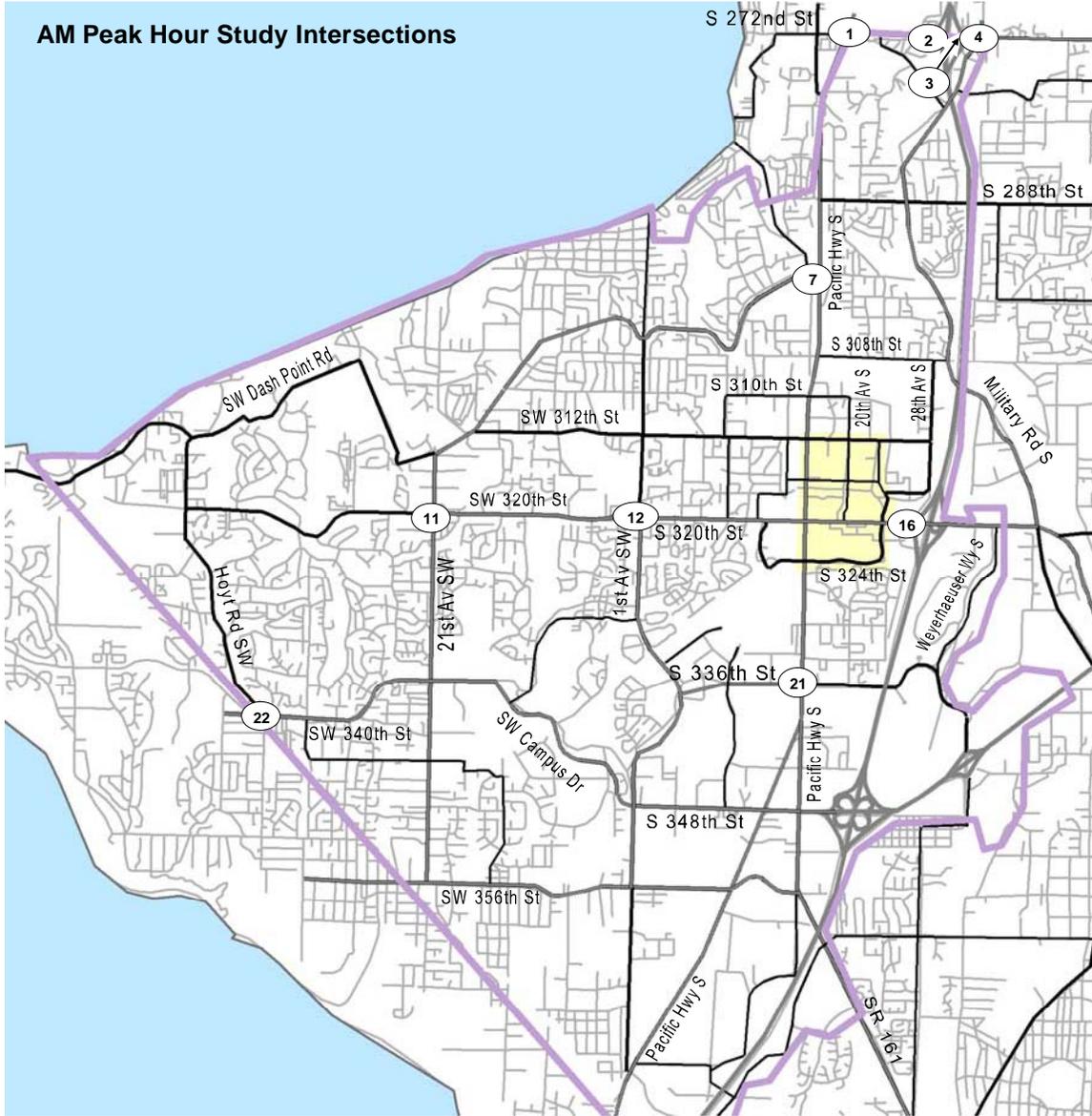


Figure 5. Existing AM Volumes



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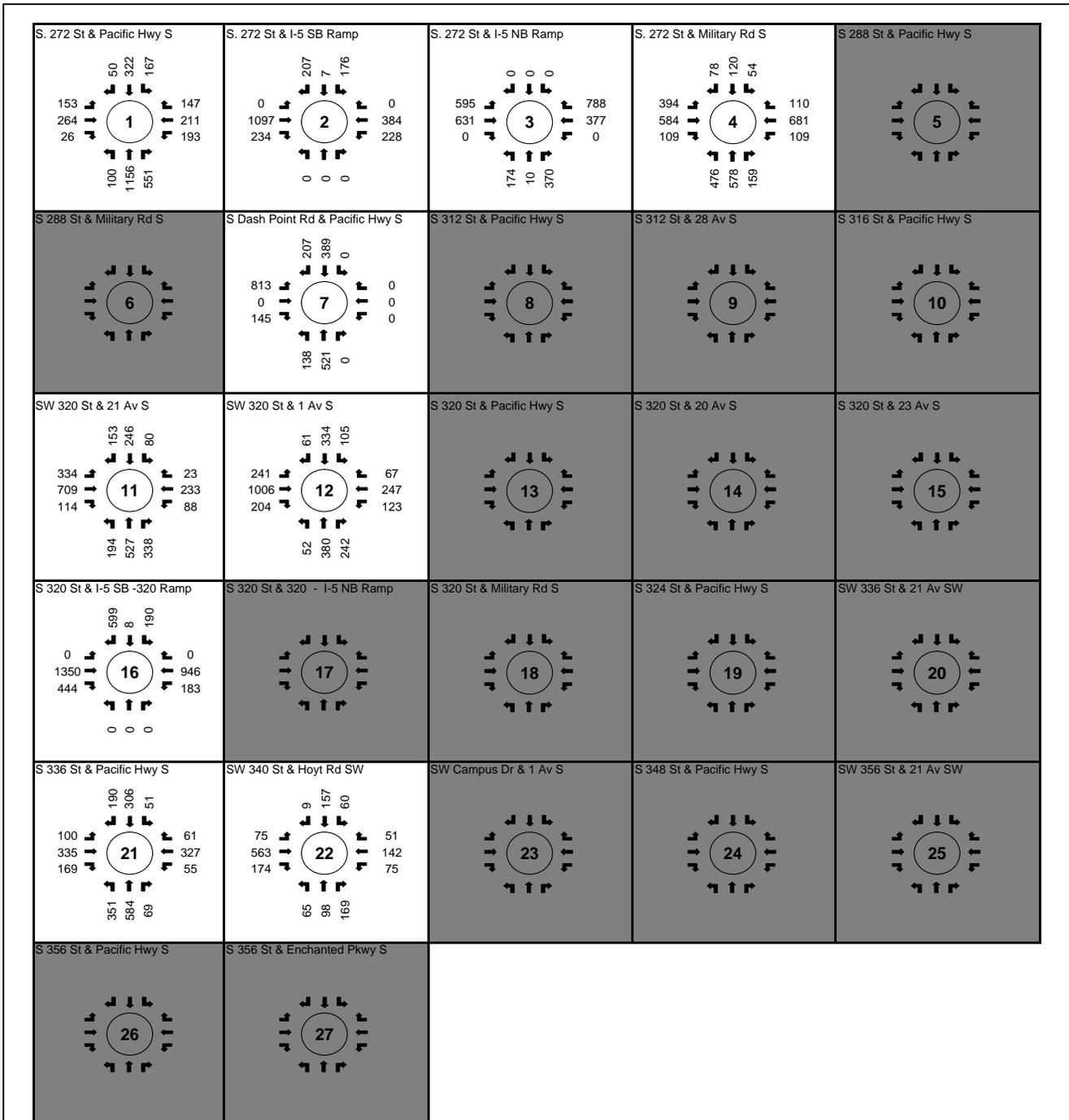


Figure 5. Existing AM Volumes



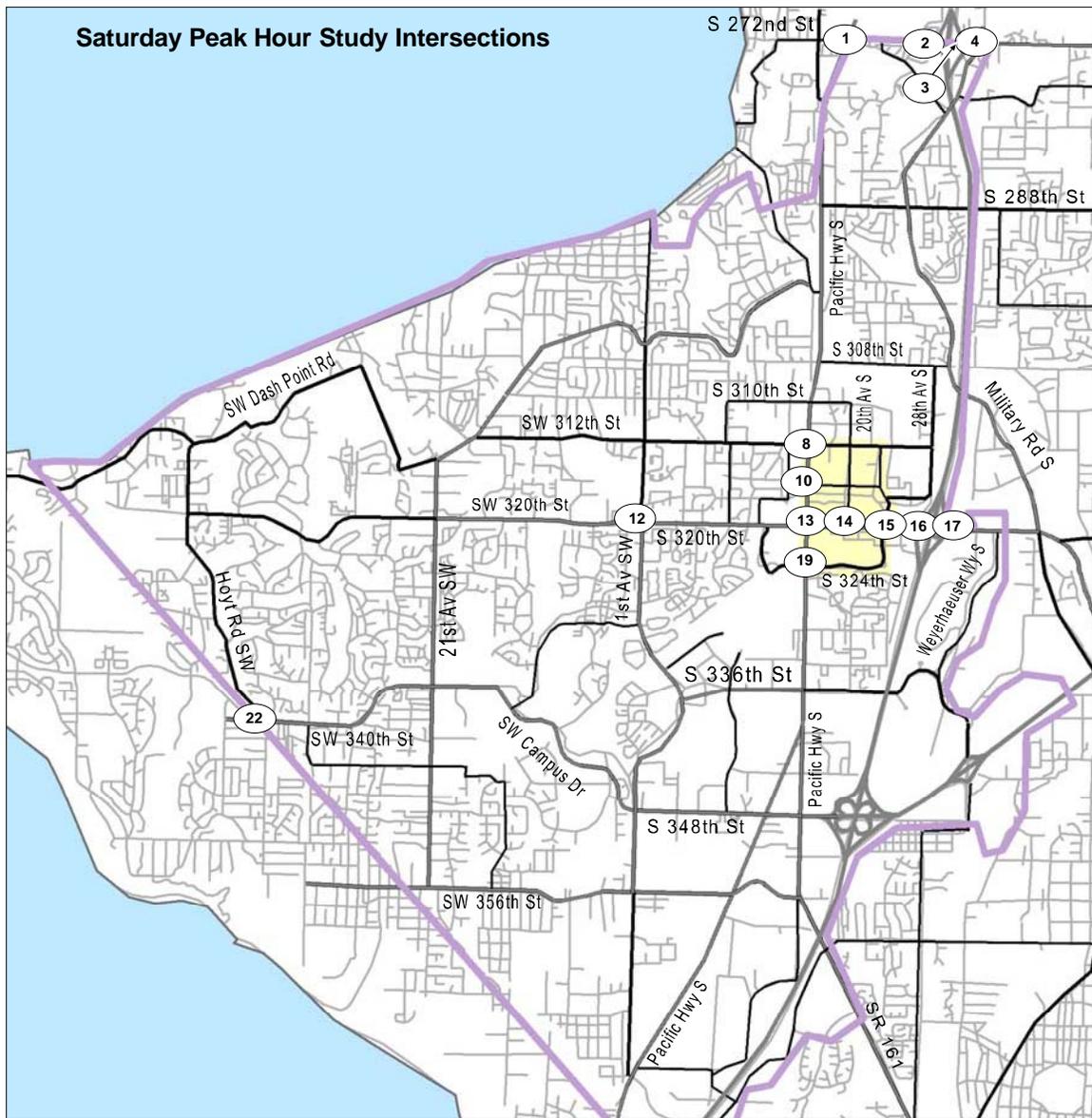


Figure 6. Existing Saturday Volumes



Federal Way City Center Transportation Impact Analysis

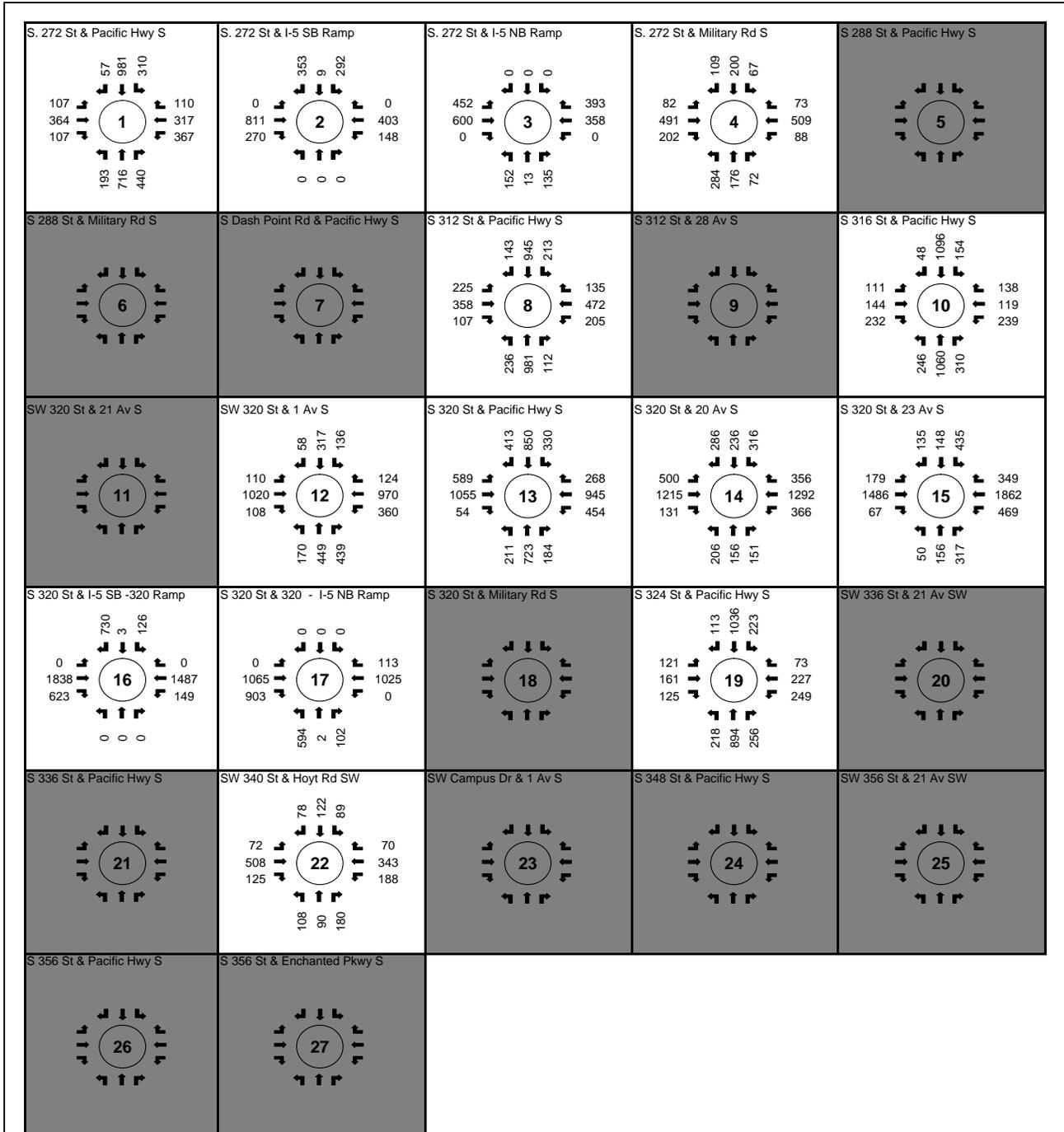


Figure 6. Existing Saturday Volumes



Existing Traffic Operations

Analysis of the PM, AM and Saturday peak hours used the Synchro 6.0 analysis software to report the Highway Capacity Manual intersection operations for each study intersection. The City considers intersections to be operating at an acceptable LOS if operations are LOS E or better and its v/c ratios are less than 1.0 for the critical movements of the intersection. Table 8 lists the existing LOS operation for the PM, AM and Saturday peak hour for each of the study intersections applicable to that period. The reported intersection operations use existing signal timing and phasing plans as identified by the City of Federal Way. Optimizing the signal phasing and timing could improve the LOS and v/c results. Appendix E contains the 2004 HCM intersection analysis sheets for the PM, AM and Saturday peak hours.

Table 8. 2004 Intersection Operations PM Peak, AM Peak, and Saturday Peak

Intersection	PM Peak		AM Peak		Saturday Peak	
	LOS ¹	V/C ²	LOS	V/C	LOS	V/C
1. S 272 St & Pacific Hwy S	F	1.29	E	1.01	E	0.97
2. S 272 St & I-5 southbound Ramp	E	1.07	C	0.85	C	0.69
3. S 272 St & I-5 northbound Ramp	C	0.97	E	1.13	C	0.72
4. S 272 St & Military Rd S	F	1.26	F	1.22	D	0.76
5. S 288th St & Pacific Hwy S	D	0.89				
6. S 288th St & Military Rd S	D	0.74				
7. S Dash Point Rd & Pacific Hwy S			C	0.47		
8. S 312 St & Pacific Hwy S	E	0.92			E	0.93
9. S 312 St & 28 Av S	C	0.67 ³				
10. S 316 St & Pacific Hwy S					F	1.16
11. SW 320 St & 21 Av SW			E	1.00		
12. SW 320 St & 1 Av S	F	1.06	E	1.01	F	1.18
13. S 320 St & Pacific Hwy S	D	0.79			D	0.92
14. S 320 St & 20 Av S					F	1.76
15. S 320 St & 23 Av S	C	0.85			F	1.09
16. S 320 St & I-5 southbound Ramp	C	0.92	C	0.74	D	0.99
17. S 320 St & I-5 northbound Ramp					C	0.75
18. S 320 St & Military Rd S	D	0.85				
19. S 324 St & Pacific Hwy S	D	0.68			D	0.88
20. SW 336 St & 21 Av SW	E	0.94				
21. S 336 St & Pacific Hwy S	E	1.15	D	0.70		
22. SW 340 St & Hoyt Rd SW	C	0.85	B	0.63	B	0.62
23. SW Campus Dr & 1 Av S	E	1.05				
24. S 348 St & Pacific Hwy S	D	0.92				
25. SW 356 St & 21 Av SW	C	0.75				
26. S 356 St & Pacific Hwy S	D	0.89				
27. S 356 St & Enchanted Pkwy S	D	0.78				

¹LOS reflects the overall operation of the intersection based on the Highway Capacity Manual 2000 methodology

²V/C is the combined volume/capacity of the critical movements of the intersection as identified as the X_c in the HCM 2000 methodology

³Maximum v/c ratio at all-way stop-controlled unsignalized intersection.

PM Peak Hour Deficiencies – Six intersections exceed the City’s deficiency threshold in 2004. These intersections either operate at worse than LOS E and/or have a volume to capacity ratio equal to or higher than 1.00. Three of the deficient intersections are located along S 272 Street along the border with the City of Kent. Other deficient intersection locations include SW 320 Street & 1 Avenue S, S 336 St & Pacific Highway S, and SW Campus Drive & 1 Avenue S.

AM Peak Hour Deficiencies – Five of the study intersections exceed the City’s deficiency threshold in 2004. These intersections either operate at worse than LOS E and/or have a volume to capacity ratio equal to or higher than 1.00. The areas with the deficient locations include the S 272 Street corridor at the intersections at the I-5 northbound ramp, I-5 southbound ramp, and Military Road S, and the S 320 Street corridor at the intersections of 1 Avenue S and 21 Avenue SW.

Saturday Peak Hour Deficiencies – Four of the Saturday study intersections exceed the City’s deficiency threshold in 2004. These intersections either operate at worse than LOS E and/or have a volume to capacity ratio equal to or higher than 1.00. These intersections are concentrated around the FWCC area at intersections along Pacific Highway S and S 320 Street. Weekend retail activity at these locations is likely to contribute to the high traffic at these intersections.

Parking

The existing number of parking stalls reflects the more auto-oriented development pattern of the current land uses. Table 9 describes the number of existing parking spaces in the Federal Way City Center area. Using the three blocks described in Figure 1, Block 1 has 2,960 spaces, Block 2 has 2,760 spaces, and Block 3 has 3,240 for a total of 8,960 spaces.

Table 9. Existing Parking Supply by Block

Area	Parking
Block 1	2,960 stalls
Block 2	2,760 stalls
Block 3	3,240 stalls
Total	8,960 stalls

Source: Jones and Stokes Associates.

Table 10 describes the number of spaces City Code requires for each existing land use. Approximately 5,900 stalls are required under the parking requirements. When compared with the existing parking supply, there are approximately 3,000 extra parking spaces than required by City standards.

Table 10. Existing Parking Requirements

Land Use	Parking Code Requirement	Existing Development	Required Parking
Civic Uses	Case by case	0 sf	0 stalls
Hotel	1 per room	230 rooms	230 stalls
Office	1 per 300 sf	344,610 sf	1,149 stalls
Other (1)	1 per 1000 sf	14,400 sf	15 stalls
Residential	1.7 per unit	190 units	323 stalls
Retail	1 per 300 sf	1,268,000 sf	4,227 stalls
Total			5,944 stalls

Source: Jones and Stokes Associates.

(1) Parking for Other land use assumed at 1 per 1000 sf.

Collision Data

Review of historical collision data provides an indication of the location and severity of incidents at intersections and along corridors. Historical analysis is useful in understanding the typical types of collisions that occur at a particular location; however, the data may not be indicative of future collision rates or causes. A number of factors can contribute to collisions including:

- Traffic congestion (ability to maneuver)
- Driver skills (driver age and experience)
- Driver behavior (speeding, aggressiveness, driving while intoxicated)
- Roadway geometrics (sight distance)
- Weather conditions (rain, glare, snow)
- Nature (animals, fallen trees)
- Vehicle condition, equipment and maintenance (brakes, tires)
- Roadway condition (pavement condition)

Three years (2000-2002) of collision data were analyzed to identify overall trends within Federal Way. Appendix F summarizes the collision data for study intersections and for corridors.

High Collision Locations Rate

The City requires the identification of high collision locations, both for corridors and individual intersections. The Transportation Impact Analysis Guidelines (June 24, 2004 - Page 5) define high collision locations as follows:

- A collision rate of more than 1.0 collisions per million entering vehicles at an intersection.

- A collision rate of more than 10.0 collisions per million vehicle miles on a roadway segment.

Table 11 identifies the study intersections that exceed the 1.0 collision per million entering vehicles. Eighteen of the 32 intersections exceed the 1.0 collision per million entering vehicles. The highest location is at Military Road S / S 288 Street that averaged 2.38 collisions per million entering vehicles between 2000 and 2002.

Table 12 identifies the roadway corridors that exceed the City’s standard of 10.0 collisions per million vehicle miles on a roadway segment. All but one of the study corridors exceeds the 10.0 collisions per million vehicle mile standard.

The City of Federal Way, in general, attributes the majority of collisions to congestion at roadways and intersections (City of Federal Way Comprehensive Plan, 2003 revision, Page III-7). The congestion related delay at intersections can result in driver risk-taking in order to attempt to reduce wait times. Improving vehicle mobility, reducing conflict points, and reducing vehicle delay may reduce some types of collision along the corridor. The City traffic engineering department monitors collision data and corrects roadway and intersection issues that could contribute to higher collision rates at specific locations.

Table 11. 2000-2002 Intersection Collision Rates

Intersection	Total Collisions	Collision Rate
Military Rd S / S 288 St	82	2.38
SR 99 / S 312 St	122	2.25
SR 99 / S 348 St	137	2.14
SR 99 / S 272 St	113	1.88
SW 336 St / 21 Av SW	87	1.73
SR 99 / S 320 St	149	1.72
SR 99 / S 316 St	75	1.63
SR 161 / SR 18	136	1.54
Hoyt Rd SW / SW 340 St	31	1.44
SR 99 / S 288 St	79	1.42
S 320 St / southbound I-5 Ramps	84	1.42
SR 99 / S 324 St	76	1.37
SR 99 / S 304 St	58	1.34
S 320 St / 20 Ave S	69	1.29
SR 99 / S Dash Point Rd	61	1.25
S 320 St / 23 Ave S	88	1.22
SR 99 / S 336 St	64	1.1
S 356 St / 21 Av SW	37	1.01

Table 12. 2000-2002 Corridor Collision Rates

Corridor	Volumes	Length	Collision Rate
S 348 St (SR 99 to 16 Avenue S)	332	0.21	37.09
S 288 St (SR 99 to Military Road S)	241	0.52	36.56
S 272 St (SR 99 to Military Road S)	492	1	24.3
S 312 St (SR 99 to 28 Avenue S)	229	0.75	24.16
SR 99 (S 272 Street to S 356 Street)	2496	5.24	16.57
S 320 St (SR 99 to Military Road S)	837	1.4	14.06
S 304 St (SR 99 to Military Road S)	88	0.79	11.64
Military Rd (S 272 Street to S 328 Street)	407	3.83	7.2

Future Conditions Analysis

This section describes the methodology and assumptions used to forecast the 2009 and 2014 horizon years used in this analysis. The future forecasts include assumed traffic growth rates, changes to the roadway network, and planned major developments that affect the FWCC and study intersections.

Forecasting Model Development

Forecasts of future growth for the PM peak hour used an updated version of the City's 2002 EMME/2 traffic forecasting model to determine the future traffic volumes on area roadways and at the study intersections.

The PM peak hour EMME/2 model was calibrated using updated traffic information including traffic counts, an expanded analysis zone system, and changes in the roadway network. Traffic counts were updated to bring counts to the 2003/2004 base year. The model was expanded from a 220-zone to a 250-zone system to include potential annexation areas of the City. Other street network and land use changes were also incorporated to bring the model up to 2004 conditions. Appendix B includes the model validation results.

For the PM peak hour, the EMME/2 model forecasts the expected PM Peak hour traffic levels based the trip generation and assignment for each of the three land use alternatives.

Table 13. Assumed Annual Traffic Growth Rates 2004-2009

Analysis Period	Annual Growth Rate	Source
PM Peak Hour	0.0% to 6.1%	FWCC EMME/2 Traffic Model
AM Peak Hour	1.5%	City of Federal Way
Saturday Peak Hour	1.1%	City of Federal Way

For the PM peak hour, the average traffic growth rate along study intersection approaches is 3.3% per year with a range within one standard deviation of 0.8% to 5.7%. For the AM peak hour, the City requested the application of a 1.5% background growth rate to approximate the expected growth between 2004 and 2009 and a 1.1% growth rate for the Saturday peak hour.

Roadway Improvements Assumptions

Within the study area, there are a number of planned transportation improvements to increase roadway capacity and to improve mobility. The 2009 baseline forecasts assumes projects identified in the City of Federal Way's 2005-2010 Transportation Improvement Program (Table 14 and Figure 7) and two State Interchange improvements.²

The 2005-2010 TIP reflects improvements needed to meet the City's LOS threshold for operations. City staff develops an annual update of improvements that establishes the funding needs and priorities for the next six years. All TIP improvements at intersections and roadway locations were included in the model and the intersection analysis. Improvements listed in the 2005-2010 TIP include:

- Adding HOV lanes
- Installing raised median
- Installing street illumination
- Extending roadways
- Adding turn lanes
- Installing traffic signal
- Installing sidewalks

²The 2005-2010 TIP was assumed in the analysis of 2009 conditions.

Table 14. 2005-2010 Transportation Improvement Program

Map ID	Location	Description
1	City Center Access	Design Study, Environmental analysis
2	SR 99 HOV Lanes Phase 2: S 324 St - S 340 St	Add HOV lanes, left-turn lanes on 324, 2nd northbound left-turn lane @ 336, install raised median
3	SR 99 HOV Lanes Phase 3: S 284 St - SR 509	Add HOV lanes, 2nd southbound left-turn lane and rechannelized westbound approach for 2 nd westbound left-turn lane @ 288, install raised median, signal @ SR 509 @ Redondo Way S with interconnect to 11 PI S
4	S 348 St: 9 Ave S - SR 99	Add HOV lanes, 2nd northbound left-turn lane on SR 99, install raised median, underground utilities
5	S 320 St @ 1 Ave S	Add 2nd northbound, westbound, and southbound left-turn lanes, westbound right-turn lanes, widen 1 Ave S to 5 lanes to S 316 St
6	S 356 St: 1 Ave S - SR 99	Widen to 5 lanes, bike lanes, sidewalks, illumination
7	S 320 St: 8 Ave S - SR 99	Add HOV lanes, install raised median, underground utilities, illumination
8	S 348 St @ 1 Ave S	Add westbound, southbound right-turn lanes, 2nd eastbound, westbound left-turn lanes
9	S 336 St @ 1 Wy S	Add westbound right-turn lane, signal modifications, extend southbound left-turn lane
10	10 Ave SW / SW 344 St: SW Campus Dr - 21 Ave SW	Extend 3-lane collectors, sidewalks, street lights
11	1 Ave S: S 320 St - S 330 St	Install raised median, improve access at 328 th
12	S 320 St @ 20 Ave S	Add 2nd left-turn lanes eastbound, westbound
13	21 Ave SW / SW 357 St: SW 356 St - 22nd Ave SW	Extend 2-lane collector, signal modifications
14	SR 99 HOV Lanes Phase 4: SR 509 – S 312 St	Add HOV lanes, install raised median
15	SR 18 @ SR 161	Add eastbound, westbound right-turn lanes, 3rd westbound left-turn lane, 2nd northbound right-turn lane, add 3rd lane on SR 161 southbound to S 352nd St
16	S 336 St @ 9 Ave S	Signal modifications
17	SW 312 St: 1 Ave S - SR 509	Widen to 3 lanes, bike lanes, sidewalks, street lights
18	S 320 St @ I-5	Add 2nd left-turn lane, 3rd right-turn lane on southbound off-ramp, widen S 320 St under crossing to 7 lanes.
19	S 356 St: SR 99 - SR 161	Widen to 5 lanes, bike lanes, sidewalks, illumination
20	S 304 St @ 28 Ave S	Add northbound right-turn lane, signal
21	S 352nd St: SR 99 - SR 161	Extend 3 lane principal collector and signal at SR-99
22	SW 320 St @ 21 Ave SW	Interconnect to 26 Ave SW with the addition of a 2nd westbound left-turn lane
23	S 320 St: 1 Ave S - 8 Ave S	Add HOV lanes, install raised median Design phase
24	Military Rd S: S Star Lake Rd - S 288 St	Widen to 5 lanes, sidewalks, street lights
25	SW 320 St @ 47 Ave SW	Install traffic signal
26	S 312 St @ 28 Ave S	Add southbound right-turn lane
27	21 Ave S from S 318 St to S 320 St	Extends 2-lane grid street with on-street parking
28	SW 336 Wy / SW 340 St: 26 PI SW - Hoyt Rd	Widen to 5 lanes
29	Westway Neighborhood	Add Crime Prevention Street Lights through out the Neighborhood of Westway
30	S 314 St: 20 Ave S - 23rd Ave S	Install sidewalks, ADA ramps, curbs & gutter, pedestrian improvements
31	1 Ave S: S 292nd St - S 312 St	Shoulder improvements

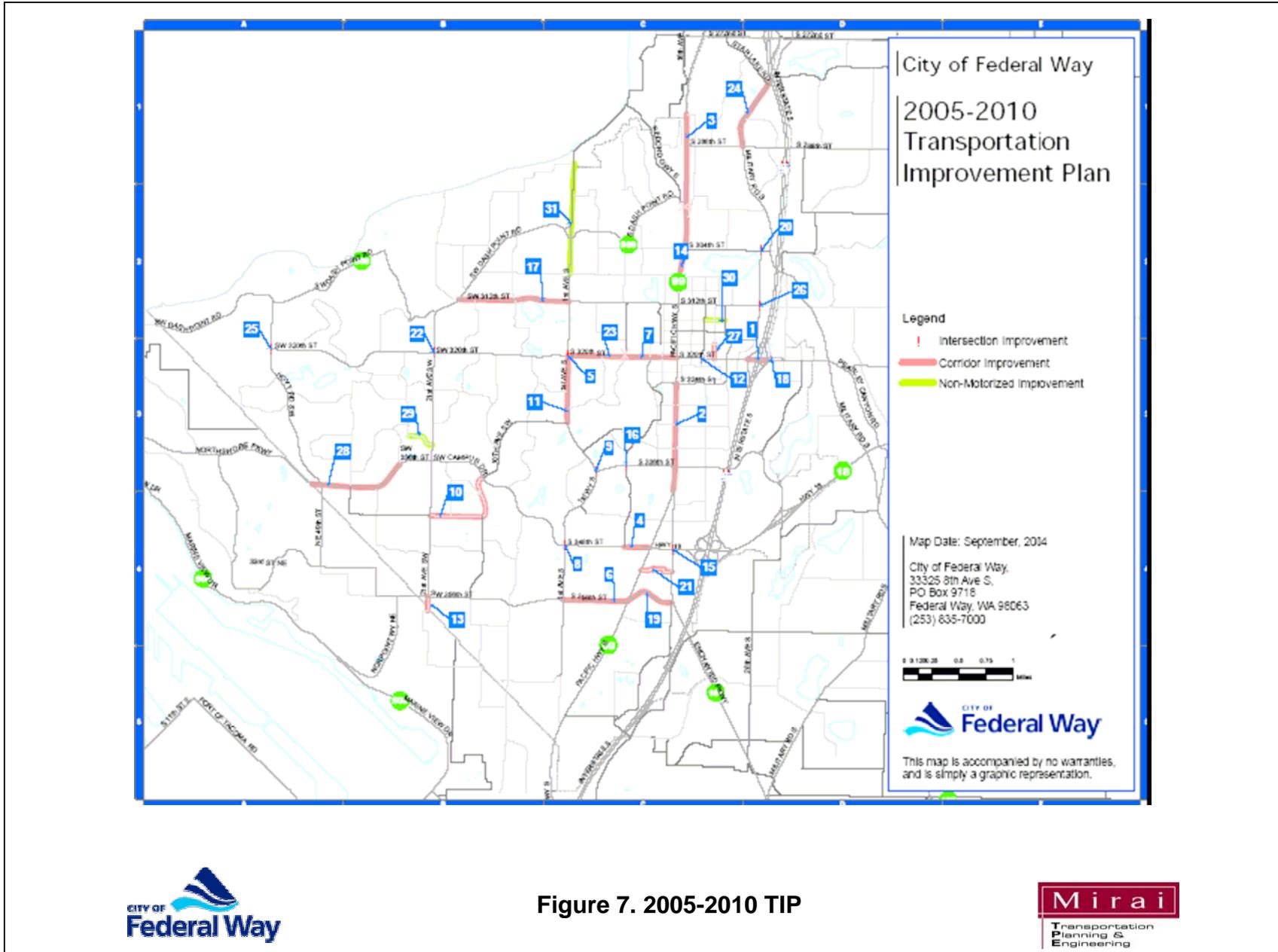


Figure 7. 2005-2010 TIP



Transit Services

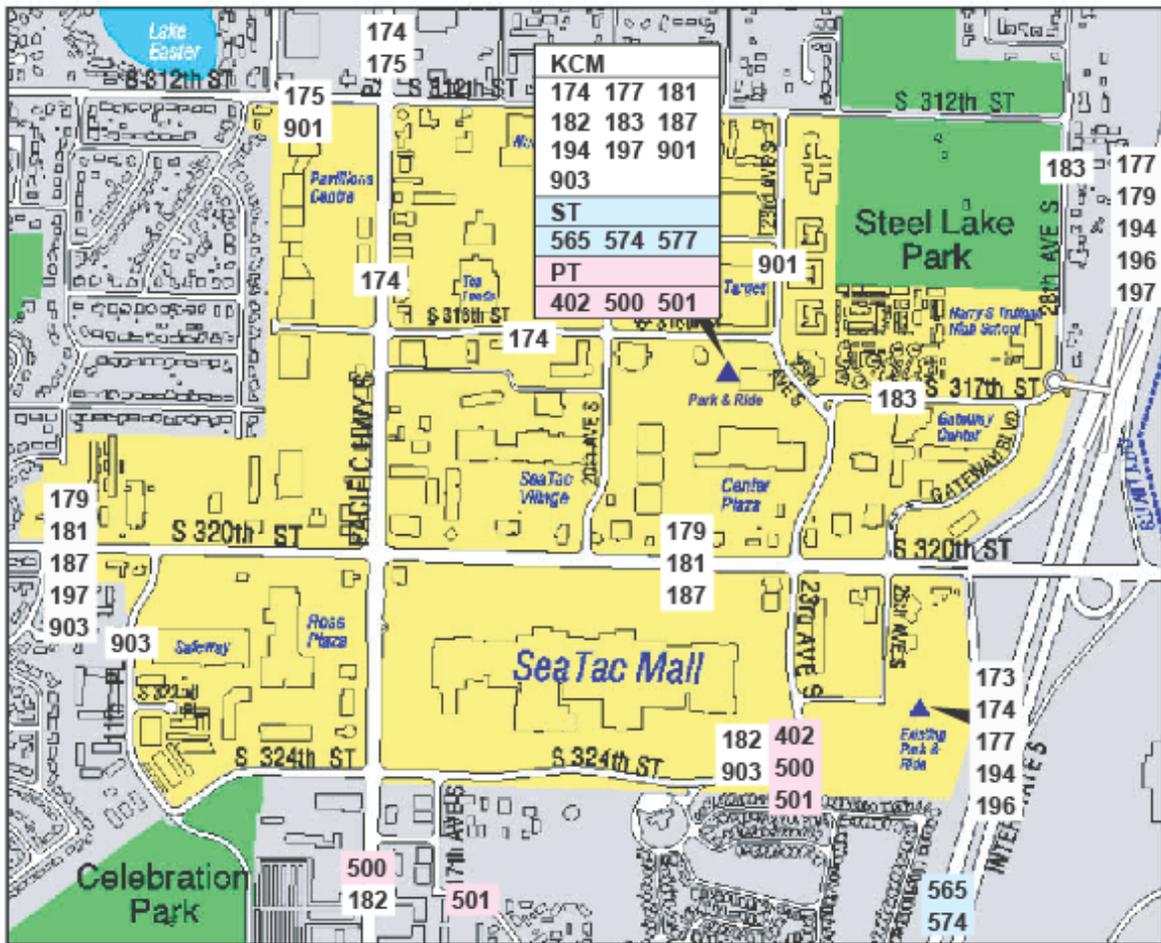
Federal Way is served by a number of transit providers including King County Metro, Pierce County Transit, and Sound Transit. Figure 8 indicates the primary transit routes that serve the planning area.

For more updated information on individual routes please visit the King County Web site at: http://transit.metrokc.gov/tops/bus/neighborhoods/federal_way.html

In the vicinity of the FWCC, there is frequent transit service with 23 routes serving the area during weekday hours with service as frequent four times per hour. Midday and Weekend service levels are lower.

The hub of transit service is the Federal Way Transit Center and Garage located between S 316 Street and S 317 Street, west of 23 Avenue S. The transit center includes a HOV direct access ramp for bus and carpool access between the HOV lanes on I-5 at S 317 Street. The new ramp allows buses and carpools to avoid the congested S 320 Street/ I-5 interchange. The Transit Center serves the freeway-oriented bus routes King County Metro Routes 177, 194, 197; and Sound Transit Routes 565, 574 and 577. Other transit routes at the Transit Center include King County Metro Routes 174, 181, 182, 183, 187, 565, 574, 577, 901, and 903 as well as Pierce Transit Routes 402, 500, and 501. The other major transit facility within the FWCC vicinity is the S. Federal Way Park & Ride facility at 23rd Ave S & S 323rd Street. Routes 173, 174, 177, 194, and 196 serve the park and ride facility. Other area park and ride facilities include the South Federal Way Park & Ride located on S 348th Street and the Twin Lakes Park and Ride lot located on SW 344th Street. The location and size of all area park and ride lots is shown Figure 9.

Dart Services are provided on King County Metro routes 901 and 903 for weekday, Saturday and Sunday Service. Route 949 is Metro Boeing Service at the S. Federal Way Park & Ride 23rd Ave S & S 323rd Street.



-  City Center Boundary
-  City Center
-  Park
-  King County Metro
-  Sound Transit
-  Pierce Transit

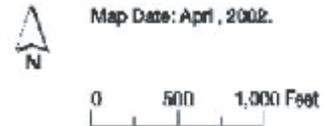


Figure 8. Existing Transit Services



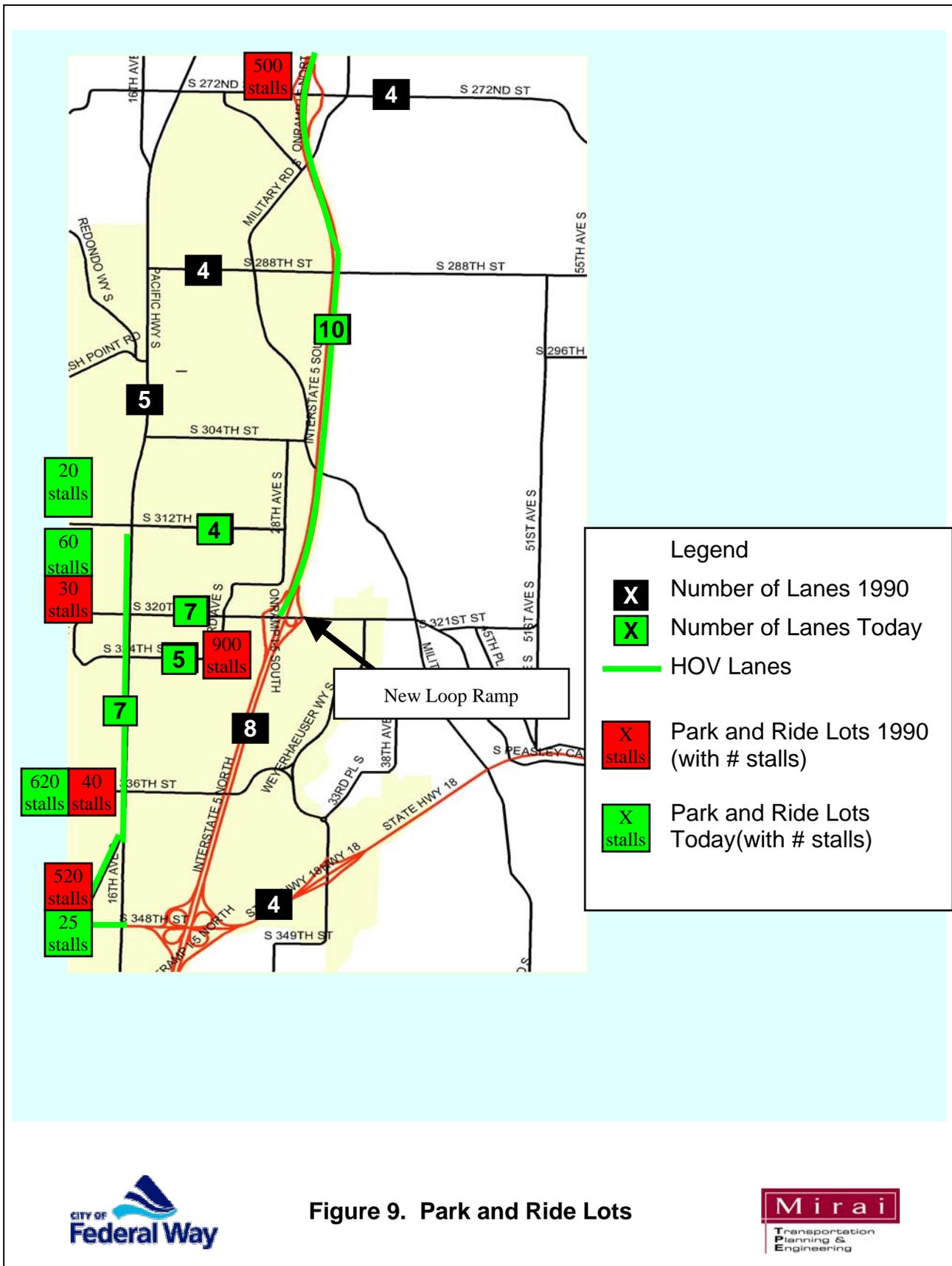


Figure 9. Park and Ride Lots



Pedestrian Facilities

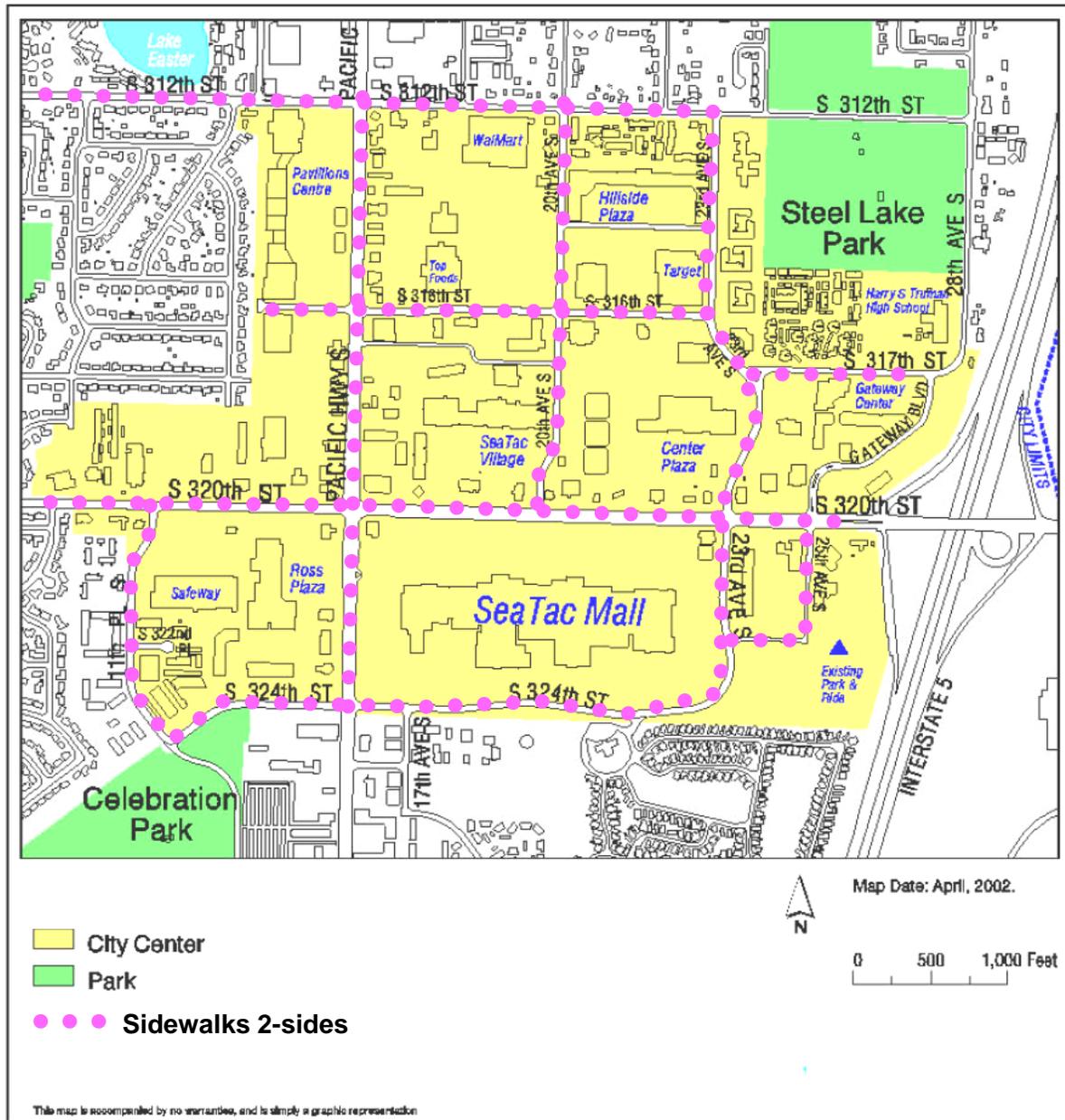
Figure 10 shows the existing pedestrian facilities within the FWCC planning area. Sidewalks generally occur along both sides of the street system connecting retail areas with adjacent neighborhoods and parks. Major impediments to pedestrians include crossing of major roadways of substantial width and vehicle traffic, such as S 320 Street at Pacific Highway S. Additionally, existing large blocks with limited connections within the FWCC are deterrents to heavy pedestrian usage.

Figure 12 illustrates conceptual locations for new sidewalks (along roadways) and crosswalk locations within the completed FWCC based on the 2002 *City of Federal Way Comprehensive Plan* (Chapter 7). The proposed street network would divide the area's large blocks with a new grid network that would increase pedestrian access and convenience within the FWCC and to surrounding areas. The *City of Federal Way Comprehensive Plan* (2003 revision, Chapter 3) includes roadway design standards specific to the FWCC to provide higher quality pedestrian facilities. These standards will require roadways to be constructed with 8-12 foot wide sidewalks, street lighting, and to provide street trees and other amenities such as benches and furniture. The plan also identifies potential pedestrian over crossing locations on S 320 Street and Pacific Highway S that would allow improved pedestrian access within the FWCC.

Bicycle Facilities

Figure 11 shows the existing bicycle facilities within and adjacent to the FWCC planning area. The facilities indicated vary from striped shoulder areas to marked bicycle lanes.

Figure 12 indicates the planned bicycle network within the FWCC planning area. The network would develop bicycle lanes along S 316 Street, 20 Avenue S, S 324 Street and Gateway Boulevard connecting to the existing and future park and ride lot facilities, area parks, and the Bonneville Power Administration utility corridor trail. This level of development is assumed within the Comprehensive Plan for all three alternatives considered.

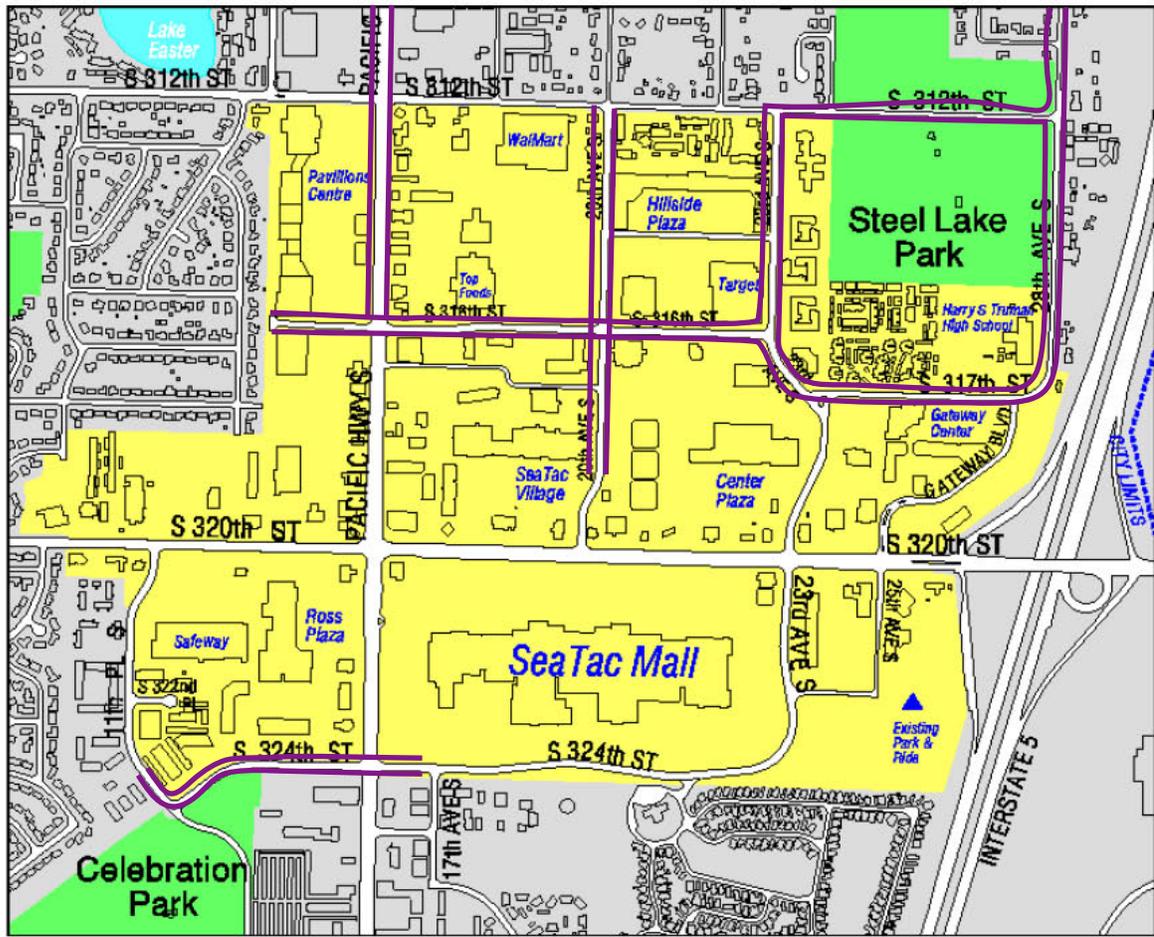


Source: City of Federal Way Comprehensive Plan - 2002



Figure 10. Existing Pedestrian Facilities





- City Center
- Park
- Striped Shoulder/Bicycle Lane

Map Date: April, 2002.

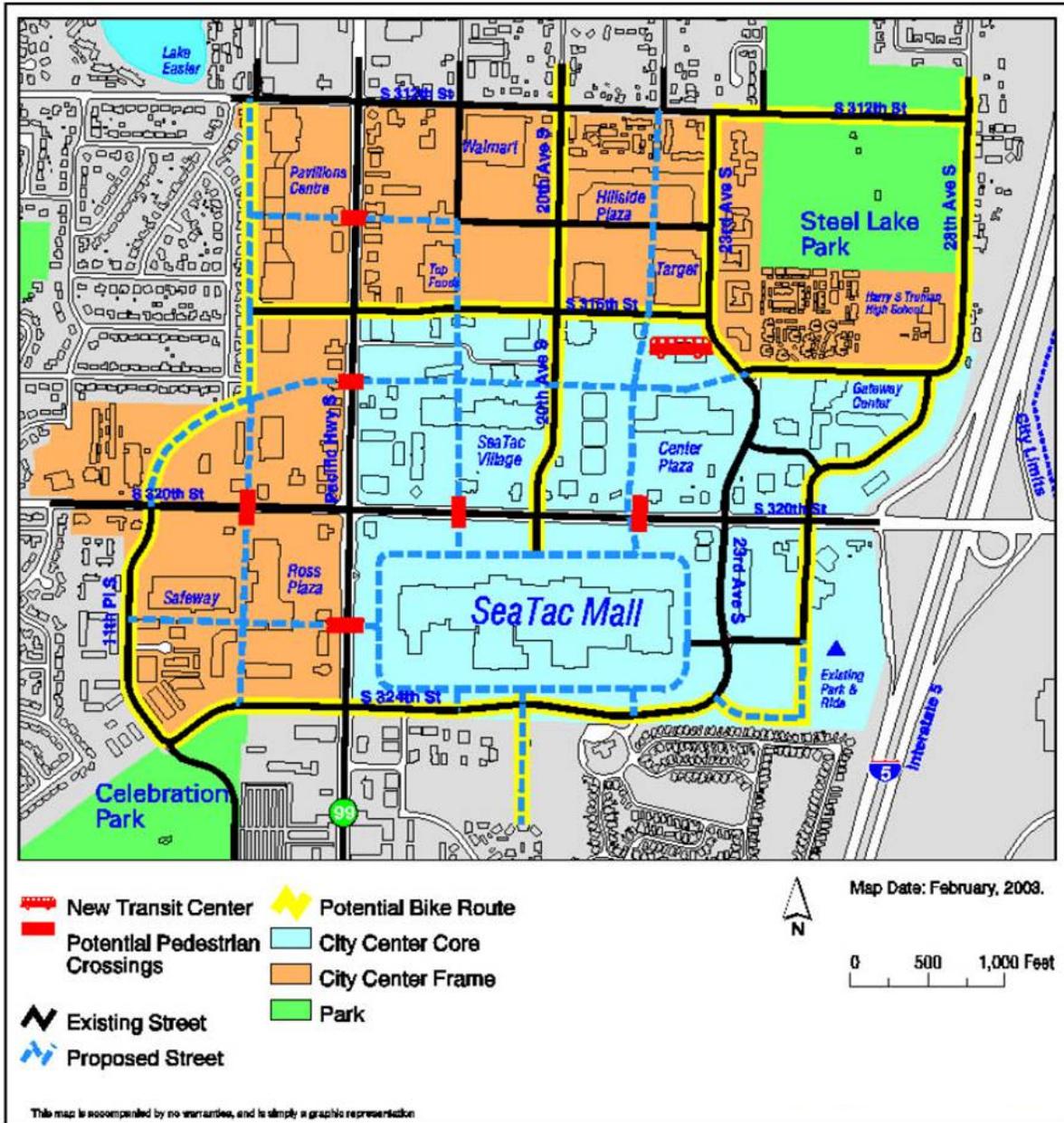
N

0 500 1,000 Feet



Figure 11. Existing Bicycle Facilities





Source: City of Federal Way Comprehensive Plan - 2002



Figure 12. Future Pedestrian and Bicycle Facilities



Impacts of Alternatives - 2009

This section documents the impact of the FWCC alternatives on the surrounding roadway network and at study intersections. The section describes the number of trips associated with the development of the FWCC (Trip Generation), assigns the traffic to the street network (trip distribution and assignment), and assesses the impact of the project alternatives on intersection operations, traffic safety, pedestrian and bicycle systems, and transit operations.

Trip Generation

Trip generation rates for the PM peak hour trip were developed in conjunction with the EMME2 model and are based on regional studies, local experience and calibration of the EMME2 model. The Institute of Transportation Engineers (ITE) trip generation rates (*Trip Generation*, 7th Edition) were used to estimate trip generation for the AM and Saturday peak hour Federal Way City Center land use/development scenarios for 2009. The ITE trip generation rates used for the Federal Way City Center land use/development scenario analysis are compiled in Table 15. The ITE PM peak hour rates have been included for comparison only.

Table 15: ITE Trip Generation Rates for Federal Way City Center

Land Use Description:	Single Family Housing	Multi Family Housing	Retail	Finance, Insurance, Real Estate	Others	Lodging
ITE Category:	SF Detached	Apartment	Shopping Center	General Office	Industrial Park	Hotel
ITE Code:	210	220	820	710	130	310
independent variable:	d.u.	d.u.	ksf	Ksf	ksf	rooms
Weekday A.M. Peak						
average trip gen rate	0.75	0.51	1.03	1.55	0.84	0.56
enter/exit	.25/.75	.20/.80	.61/.39	.88/.12	.82/.18	.61/.39
Weekday P.M. Peak						
average trip gen rate	1.01	0.62	3.75	1.49	0.86	0.59
enter/exit	.63/.37	.65/.35	.48/.52	.17/.83	.21/.79	.53/.47
Saturday Peak						
average trip gen rate	0.94	0.52	4.97	0.41	0.35	0.72
enter/exit	.54/.46	.54/.46	.52/.48	.54/.46	.32/.68	.56/.44

Source: ITE, *Trip Generation*, 7th Edition 2004

- "SF" = single-family; "du" = dwelling units; "ksf" = thousands of gross square feet
- PM Trip Rates used for comparison purposes only with EMME2 model output.

Table 16 summarizes the FWCC growth in trip generation (2004-2009). The PM peak hour volumes were based on the EMME/2 traffic model and the AM and Saturday use ITE rates. The estimates for the 2009 No Action (Alt 3) represents around a 10% growth in peak trips compared with 2004 conditions. Growth in the PM peak hour between 2004 and 2009 is approximately 40%, compared with 7% for the no action alternative. The AM peak hour trips for 2009 Alts 1 and 2 represents a 60% increase compared with 2004 conditions, while the Saturday trips are around 40-45% higher.

Table 16: Summary of Peak Hour Trip Generation for Federal Way City Center (2004-2009)

Time Period	2004	2009 Alternative 1 increase from 2004	2009 Alternative 2 increase from 2004	2009 Alternative 3 (No Action) increase from 2004
AM peak hour	2,078	1,220	1,220	233
Saturday peak hour	6,713	2,816	2,816	613
PM peak hour	6,363	2,727	2,522	442

Source: Institute of Transportation Engineers (ITE) Trip Generation, 7th Edition (2004) for AM and Saturday Peak hour. The PM peak hour trips are based on the EMME/2 model origins and destinations from FWCC TAZs.

Modal Split

Assumption of modal splits are included in the transportation model for the future alternatives based upon the expected land use, jobs-to-housing balance and availability of transportation alternatives such as high capacity transit services. Application of these assumptions lowered the number of vehicle trips that would occur during the peak hour.

No Action (Alternative 3)

The No Action alternative represents the expected growth in the planning area without the planned FWCC. This alternative would follow existing development patterns. Roadway and transit improvements listed in the Transportation Improvement Program (TIP) are assumed to occur under this alternative.

Traffic Growth

Forecasts of the PM peak hour were completed using the EMME/2 transportation model. The model uses the 2009 land uses to estimate future traffic levels and to assign the volumes to the roadway network. Use of the model allows traffic to be redistributed, responding to new capacity from roadway improvements or drivers seeking new routes in order to avoid intersections with high delays. The EMME/2 forecasted volumes were post-processed using UFOSET software to distribute traffic volumes at intersections. The software uses existing traffic volumes to evaluate turning movements and then assigns forecasted trips to these movements and balances intersection volumes. For the No Action alternative (Alternative 3), the trip generation and distribution were based on the expected development in the planning area without the land use and zoning changes assumed in the development of the FWCC. Final PM

peak hour volumes included the addition of the Christian Faith Center trips. Appendix G includes tables that show the PM peak hour post-processed traffic volumes for 2009.

The AM and Saturday peak hour forecasts use the traffic growth factors to estimate an expected 2009 background traffic. General background growth for the AM peak hours was assumed at 1.5% per year and for the Saturday peak hours was assumed at 1.1% per year. The FWCC trip generation for each alternative was assigned and added to the background traffic, along with the Christian Faith Center volumes, to provide an estimate of 2009 volumes. Appendix G includes tables that detail the 2009 forecasts for the AM and Saturday peak hours.

Traffic Volumes

Figures 13-15 show the 2009 traffic volumes for the PM peak, AM peak and Saturday peak at each of the study intersections. The growth in traffic for the No Action alternative assumes the scheduled roadway improvements from the 2005-2010 TIP.

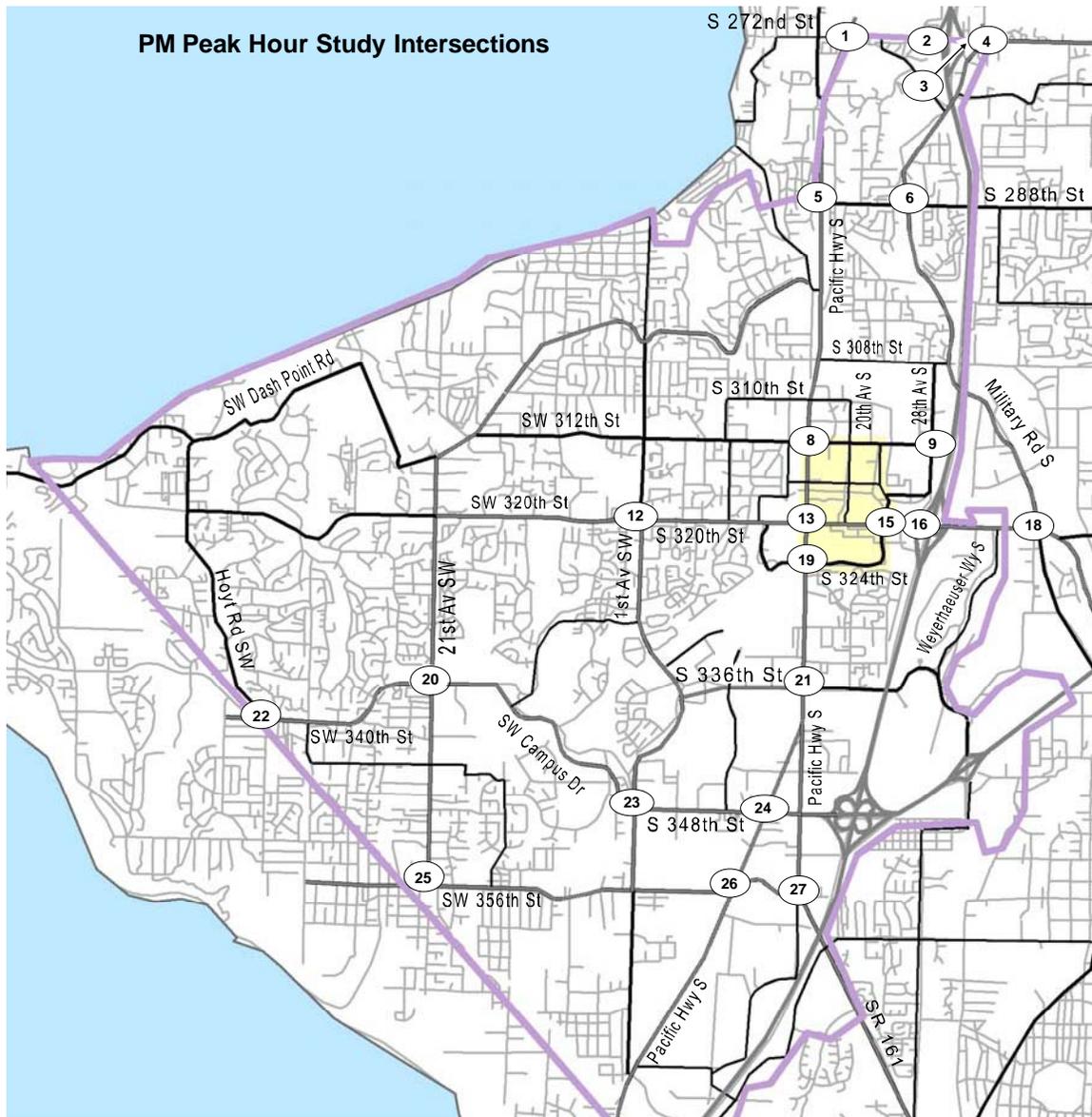


Figure 13. 2009 No Action PM Peak Turning Volumes



Federal Way City Center Transportation Impact Analysis

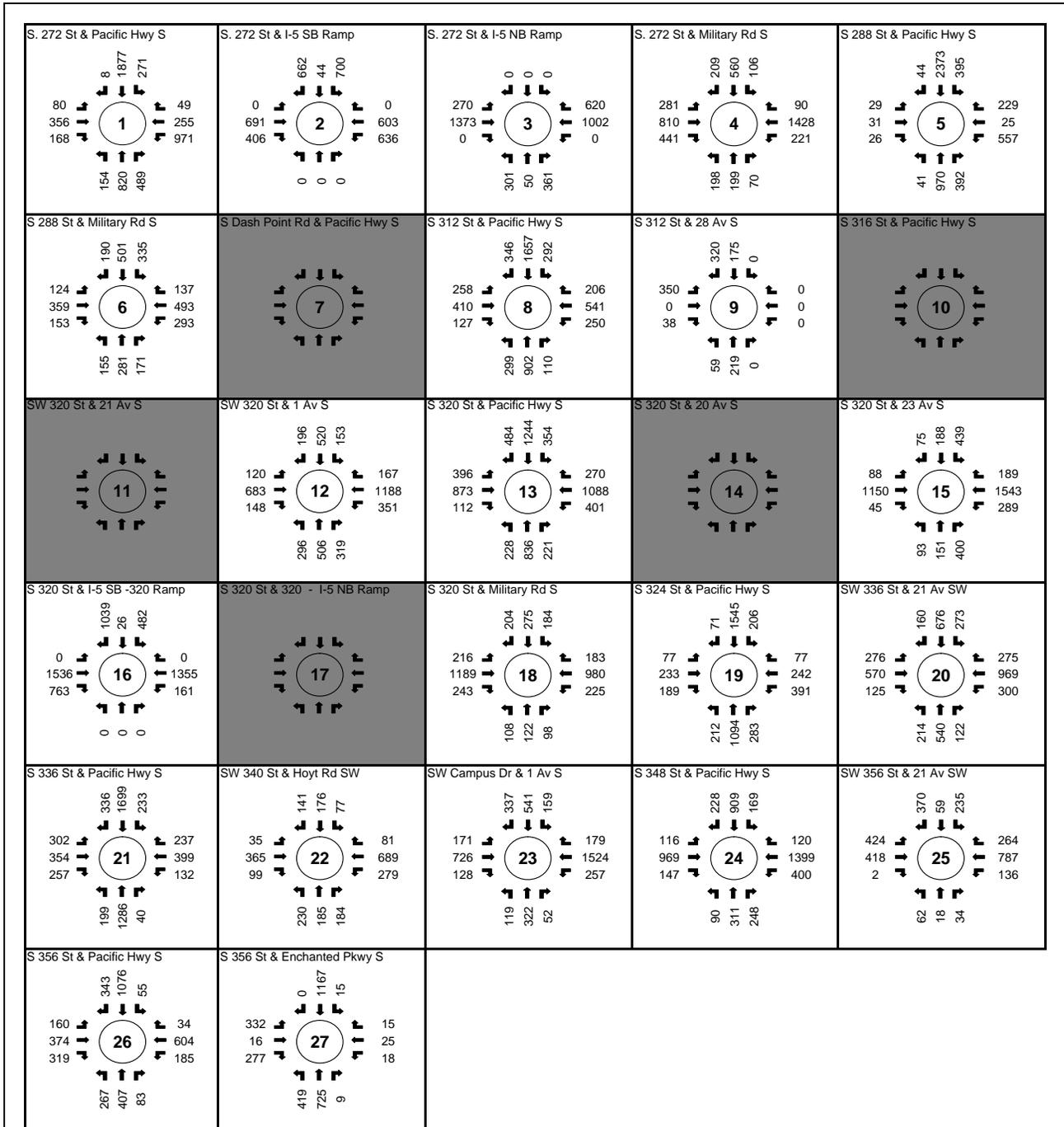


Figure 13. 2009 No Action PM Peak Turning Volumes



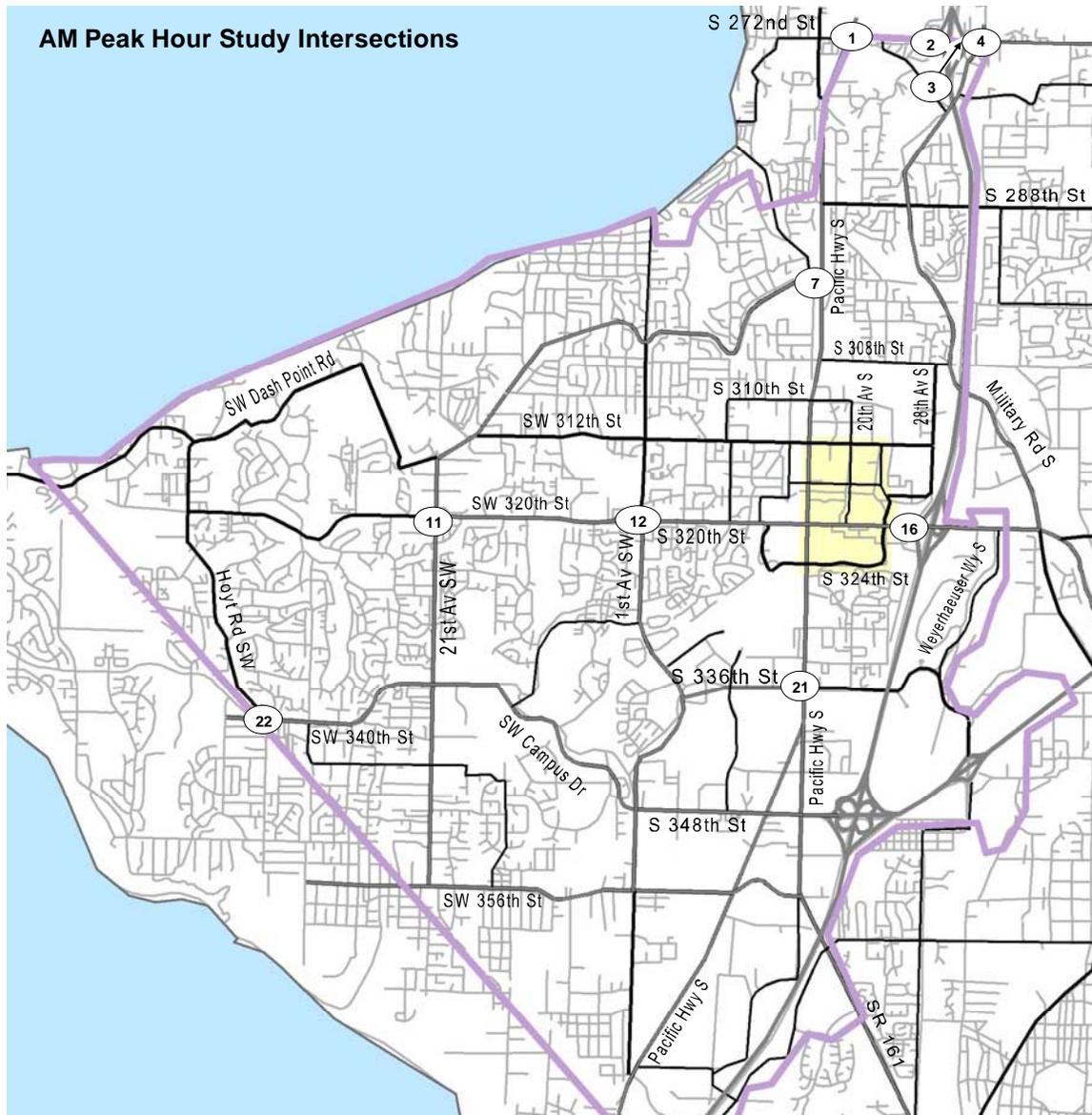


Figure 14. 2009 No Action AM Peak Turning Volumes



Federal Way City Center Transportation Impact Analysis

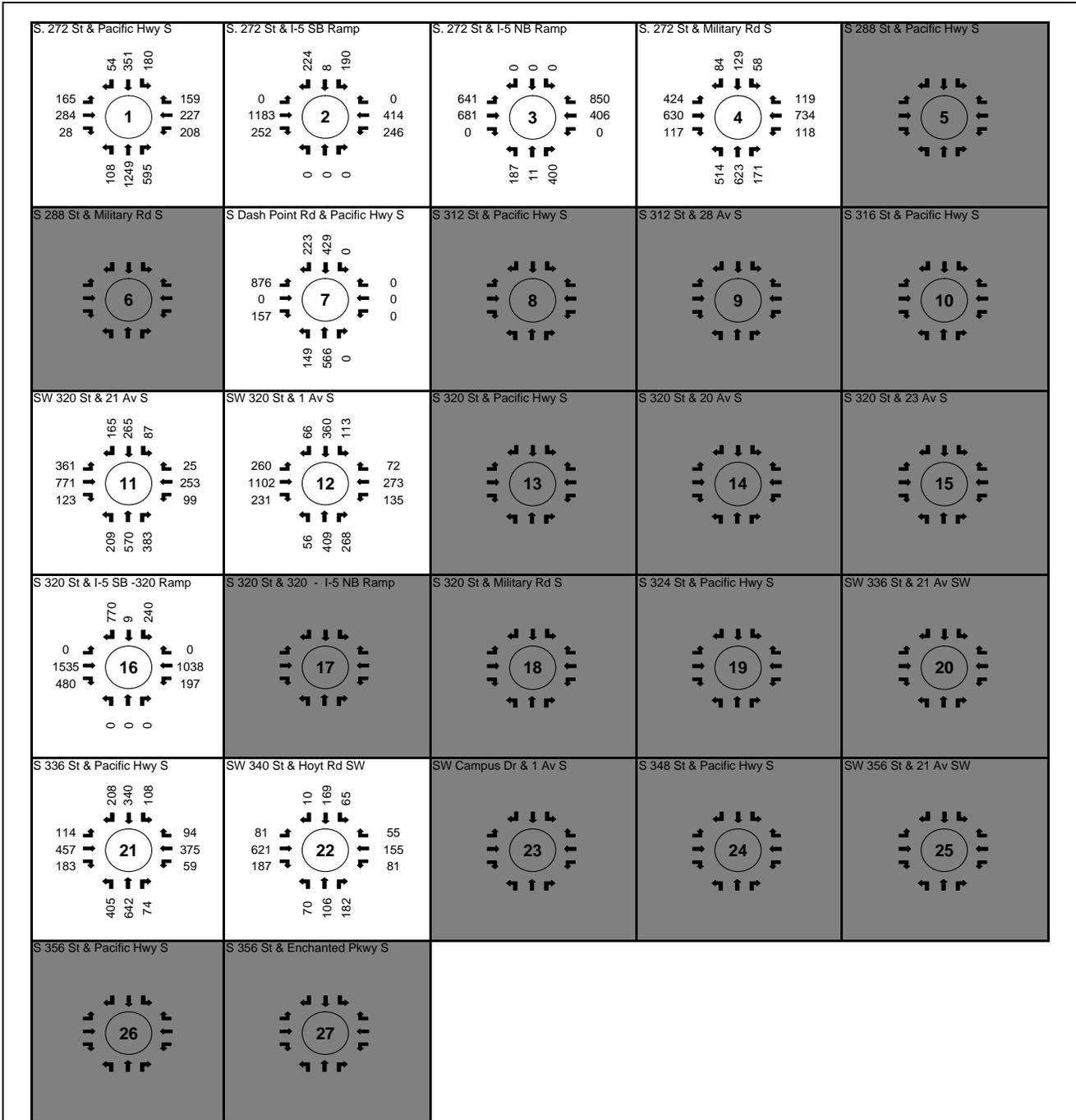


Figure 14. 2009 No Action AM Peak Turning Volumes



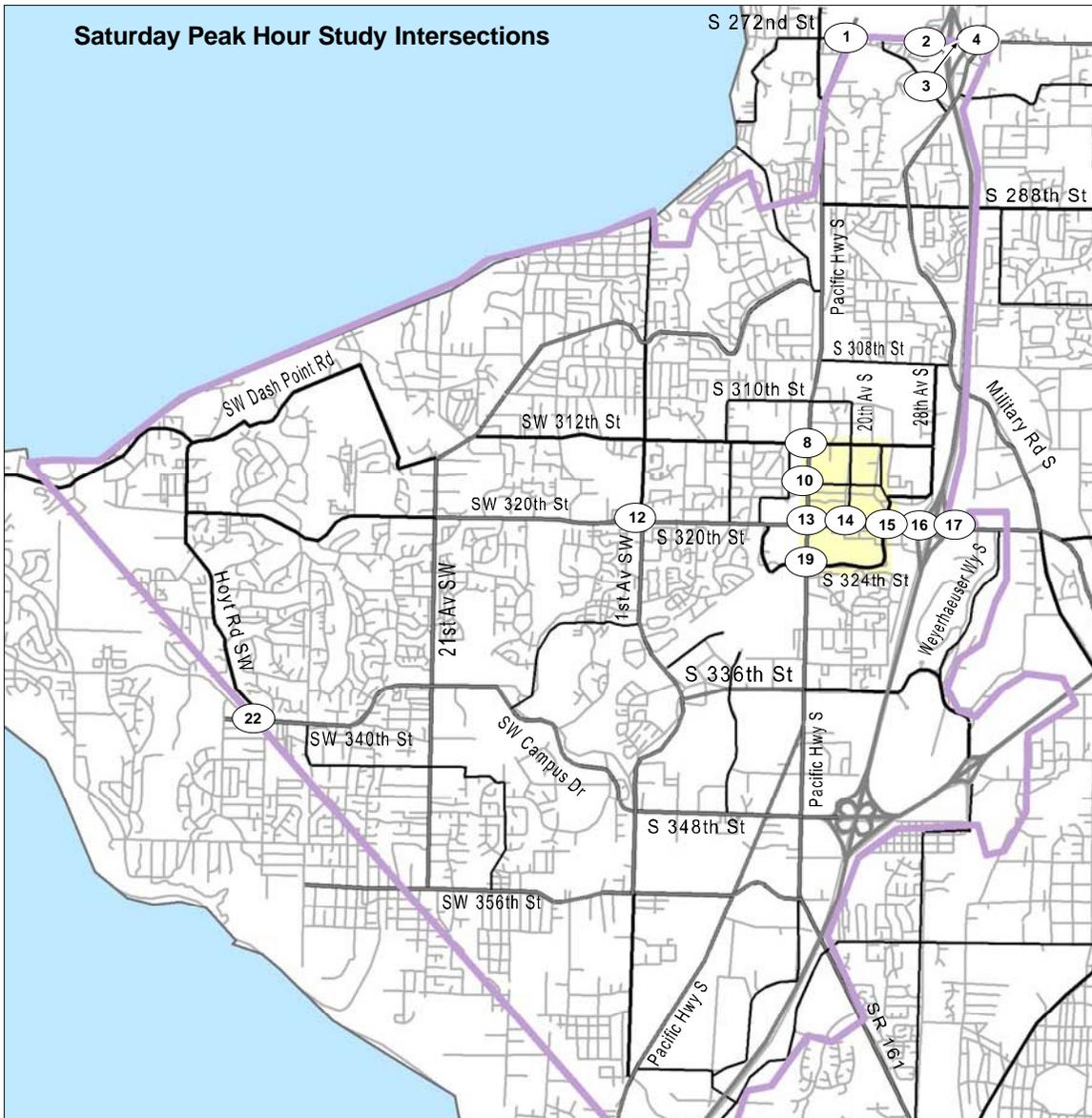


Figure 15. 2009 No Action Saturday Peak Turning Volumes



Federal Way City Center Transportation Impact Analysis

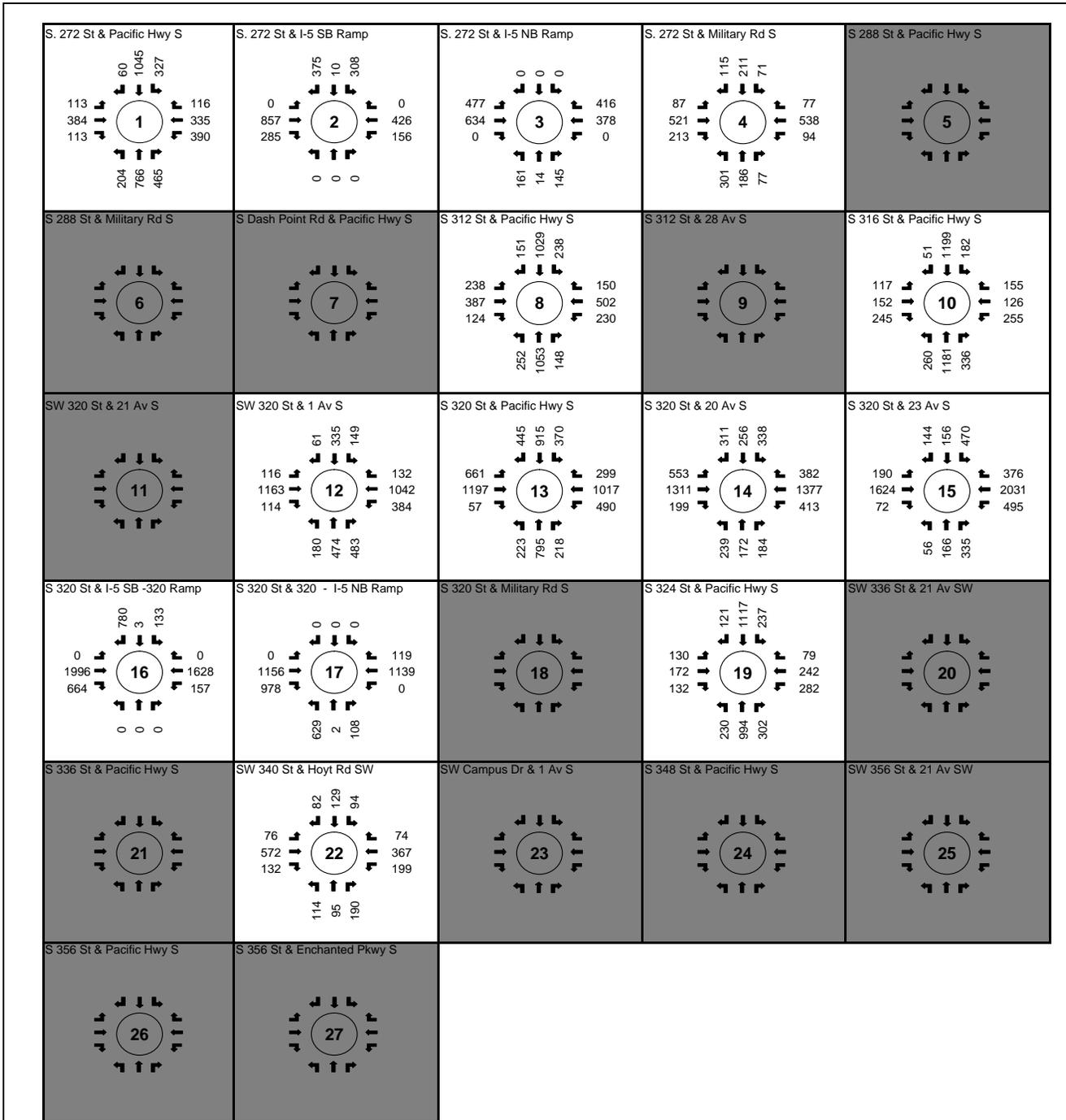


Figure 15. 2009 No Action Saturday Peak Turning Volumes



2009 No Action Traffic Operations

The AM, PM and Saturday study intersections were analyzed using the Synchro 6.0 (Build 6.12) analysis software. Table 17 lists the LOS operation for the PM, AM and Saturday peak hour for each of the study intersections analyzed for that period. These intersection operation results assume the completion of the 2005-2010 Transportation Improvement Program, and existing signal timing and phasing as provided by the City of Federal Way. Appendix H contains the No Action (Alternative 3) 2009 HCM intersection analysis sheets for the PM, AM and Saturday peak hours.

Table 17. 2009 Traffic Operations No Action (Alternative 3)

Intersection	PM Peak		AM Peak		Saturday Peak	
	LOS ¹	V/C ²	LOS	V/C	LOS	V/C
1. S 272 St & Pacific Hwy S	F	1.10*	C	0.71	D	0.77
2. S 272 St & I-5 southbound Ramp	F	1.02*	C	0.73	C	0.62
3. S 272 St & I-5 northbound Ramp	C	0.92	E	1.08*	B	0.67
4. S 272 St & Military Rd S	F	1.24*	F	1.09*	D	0.63
5. S 288th St & Pacific Hwy S	D	0.82				
6. S 288th St & Military Rd S	C	0.78				
7. S Dash Point Rd & Pacific Hwy S			C	0.50		
8. S 312 St & Pacific Hwy S	E	1.05*			D	0.86
9. S 312 St & 28 Av S – unsignalized	B	0.64 ³				
10. S 316 St & Pacific Hwy S					D	0.89
11. SW 320 St & 21 Av SW			D	0.76		
12. S 320 St & 1 Av S	D	0.81	C	0.77	D	0.85
13. S 320 St & Pacific Hwy S	D	0.92			D	0.92
14. S 320 St & 20 Av S					E	1.14*
15. S 320 St & 23 Av S	D	0.77			F	0.95*
16. S 320 St & I-5 southbound Ramp	C	0.78	C	0.68	C	0.84
17. S 320 St & I-5 northbound Ramp					B	0.68
18. S 320 St & Military Rd S	D	0.96				
19. S 324 St & Pacific Hwy S	D	0.86			D	0.77
20. SW 336 St & 21 Av SW	E	0.99				
21. S 336 St & Pacific Hwy S	D	1.03*	C	0.68		
22. SW 340 St & Hoyt Rd SW	C	0.63	B	0.52	B	0.55
23. SW Campus Dr & 1 Av S	E	0.96				
24. S 348 St & Pacific Hwy S	D	0.87				
25. SW 356 St & 21 Av SW	C	0.85				
26. S 356 St & Pacific Hwy S	C	0.87				
27. S 356 St & Enchanted Pkwy S	D	0.82				

¹LOS reflects the overall operation of the intersection based on the Highway Capacity Manual 2000 methodology

²V/C is the combined volume/capacity of the critical movements of the intersection as identified as the X_c in the HCM 2000 methodology.

³Maximum v/c ratio at all-way stop-controlled unsignalized intersection.

*Results from HCM2000 Signals (version 4.1f)

2009 No Action Deficiencies

This section describes the 2009 No action alternative deficiencies. The City of Federal Way defines the minimum acceptable level of service as LOS E or better with a volume/capacity ratio of less than 1.00 for signalized intersections. Intersections operating below this threshold are deficient.

PM peak hour Deficiencies – Five intersections exceed the City’s deficiency threshold in 2009. Deficient intersections are focused along Pacific Highway S and along S 272 Street, where growth in regional traffic is expected to affect intersection operations during the PM peak hour.

AM peak hour Deficiencies – Two of the study intersections exceed the City’s deficiency threshold in 2009. The areas with the deficient locations are along S 272 Street at the I-5 northbound ramp and Military Road S intersections.

Saturday peak hour Deficiencies – Two of the Saturday study intersections exceed the City’s deficiency threshold in 2009 under the No Action Alternative. These intersections are located in the heart of the FWCC at the intersections of S 320 Street & 20 Avenue S and S 320 Street & 23 Avenue S. Weekend retail activity at these locations is likely to contribute to the high traffic levels observed at these intersections.

Parking Requirement

Table 18 describes the increase in parking requirements for the No Action alternative above the existing parking requirements shown in Table 10. These increases assume full development by the year 2014. A total of 7,485 spaces would be required to meet the proposed Alternative 3 land uses. The number of spaces represents the City’s Parking Code requirement and may be reduced through shared parking arrangements or transportation demand management programs. This reduction could vary from 10% to 20%.

Table 18. Additional Parking Required for Alternative 3 at Buildout

Land Use	Parking Code Requirement	Proposed Development	Required Parking (1)
Civic Uses	Case by case	0 sf	0 stalls
Hotel	1 per room	0 rooms	0 stalls
Office	1 per 300 sf	104,440 sf	348 stalls
Other	1 per 1000 sf	0 sf	0
Residential	1.7 per unit	270 units	459 stalls
Retail	1 per 300 sf	220,270 sf	734 stalls
Total Additional			1,541 stalls
Total Parking			7,485 stalls

Source: Jones and Stokes Associates 2005.

(1) These parking demands may be 10% to 20% less based on shared parking.

Traffic Safety Impact

As the amount of traffic increases within the area, the probability of traffic collisions would be expected to increase. The *City of Federal Way Comprehensive Plan* (2003 revision, Chapter 3, page III-7) identifies that congestion is a primary factor in collision rates. While the No Action alternative would increase the number of trips at high collision locations, the number of trips associated with this alternative make up only a small proportion of the entering trips.

Transit Service Impact

The No Action alternative would support increased transit services and accessibility described in the *City of Federal Way Comprehensive Plan* (2002 revision, Chapter 7). These actions would increase transit service levels and envisions increasing jobs and housing opportunities within the FWCC to create a transit-oriented community.

Pedestrian Accessibility

The *City of Federal Way Comprehensive Plan* (2002 revision, Chapter 7) identifies a number of roadway and pedestrian improvements to occur as part of the development in the project area (see Figure 12). Improvements include sidewalks and pedestrian corridors, addition of the grid street system, pedestrian crossings (potentially elevated) of major roadways and inclusion of pedestrian elements such as street furniture, covered transit stops, and pedestrian-scale lighting.

Bicycle Mobility Impact

Chapter 7 of the 2002 *City of Federal Way Comprehensive Plan* (see Figure 12) identifies bicycle facilities planned for the City Center area. These bicycle facilities would connect major destinations and would increase the mobility of bicyclists within the project area. New development under the No Action Alternative would increase demand for bicycle facilities in the project area. Because development levels are expected to be less compared to Alternatives 1 or 2, impacts on bicycle facilities demand would be correspondingly less. Under the No Action Alternative, impacts associated with individual development proposals in this area would continue to be individually reviewed through the SEPA review process and decisions about the need for bicycle facilities would be made on a case-by-case basis.

Proposed Mitigation

Table 19 identifies proposed mitigation for the No Action alternative to meet the City's or responsible jurisdiction's LOS threshold. Intersections along S 272 Street are controlled by the City of Kent or King County and are mitigated based on the jurisdictions LOS threshold requirements. Appendix I contains the intersection analysis sheets for the PM, AM and Saturday peak hours for intersections mitigated under the No Action alternative.

Projects identified as CIP are those projects currently identified in the City's 2009-2020 Capital Improvement Program. Projects identified as TSM are Traffic System Management improvements identified by the City as part of their City Center Access Study for 2030 improvements.

**Table 19. No Action Proposed Mitigation
PM Peak Hour**

ID	Intersection	Mitigated		Improvements
		LOS	v/c	
1	S 272 St & Pacific Hwy S	F	1.10*	No mitigation proposed (1)
2	S 272 St & I-5 southbound Ramp	F	1.02*	No mitigation proposed (1)
4	S 272 St & Military Rd S	F	1.24*	No mitigation proposed (2)
8	S 312 St & Pacific Hwy S	D	0.95	Add 2nd northbound left turn lane (CIP 01-05)
21	S 336 St & Pacific Hwy S	D	0.92	Optimized signal timing

AM Peak Hour

ID	Intersection	Mitigated		Improvements
		LOS	v/c	
3	S 272 St & I-5 northbound Ramp	E	1.08*	No mitigation proposed (1)
4	S 272 St & Military Rd S	F	1.09*	No mitigation proposed (2)

SATURDAY Peak Hour

ID	Intersection	Mitigated		Improvements
		LOS	v/c	
14	S 320 St & 20 Av S	D	0.95	Southbound and northbound right turn lanes (TSM 2)
15	S 320 St & 23 Av S	E	0.92*	Add second northbound right turn lane. (TSM 3)

*Results from HCM2000 Signals (version 4.1f)

(1) The City of Kent exempts intersections along Highways of Statewide Significance from their LOS threshold

(2) King County requires mitigation of intersections that receive 30 trips in an hour and 20% of the proposed new trips and exceeds LOS F. Less than 2% of project trips access the King County intersection of Military Road/272nd Street.

Alternative 1

This section describes the traffic impacts associated with Alternative 1. The section describes the trip generation, distribution and assignment, the 2009 turning volumes, transportation impacts and recommended mitigation.

Trip Generation, Distribution, and Assignment

Alternative 1 focuses development in Blocks 2 and 3 within the Federal Way City Center. Under this alternative, development would be concentrated along S 320 Street. PM peak hour trip distribution and assignment were completed using the Federal Way EMME/2 model. AM and Saturday distribution and assignment follow existing area traffic patterns. Figures 16 to 18 show the trip distribution for the 2009 under Alternative 1 for the PM, AM and Saturday peak hours.

Traffic Volumes

Figures 19 to 21 show the 2009 turning movement volumes for each study intersection for Alternative 1 for the PM, AM and Saturday peak hours.

2009 Alternative 1 Traffic Operations

The AM, PM and Saturday study intersections were analyzed using the Synchro 6.0 analysis software. The City considers intersections to be operating at an acceptable LOS if operations are LOS E or better and its v/c ratios are less than 1.0 for the critical movements of the intersection. Table 20 lists the LOS operation for the PM, AM and Saturday peak hour for Alternative 1. These intersection operations are based on existing signal timing and phasing as provided by the City of Federal Way. Appendix J contains the Alternative 1 intersection analysis sheets for the 2009 PM, AM and Saturday peak hours.

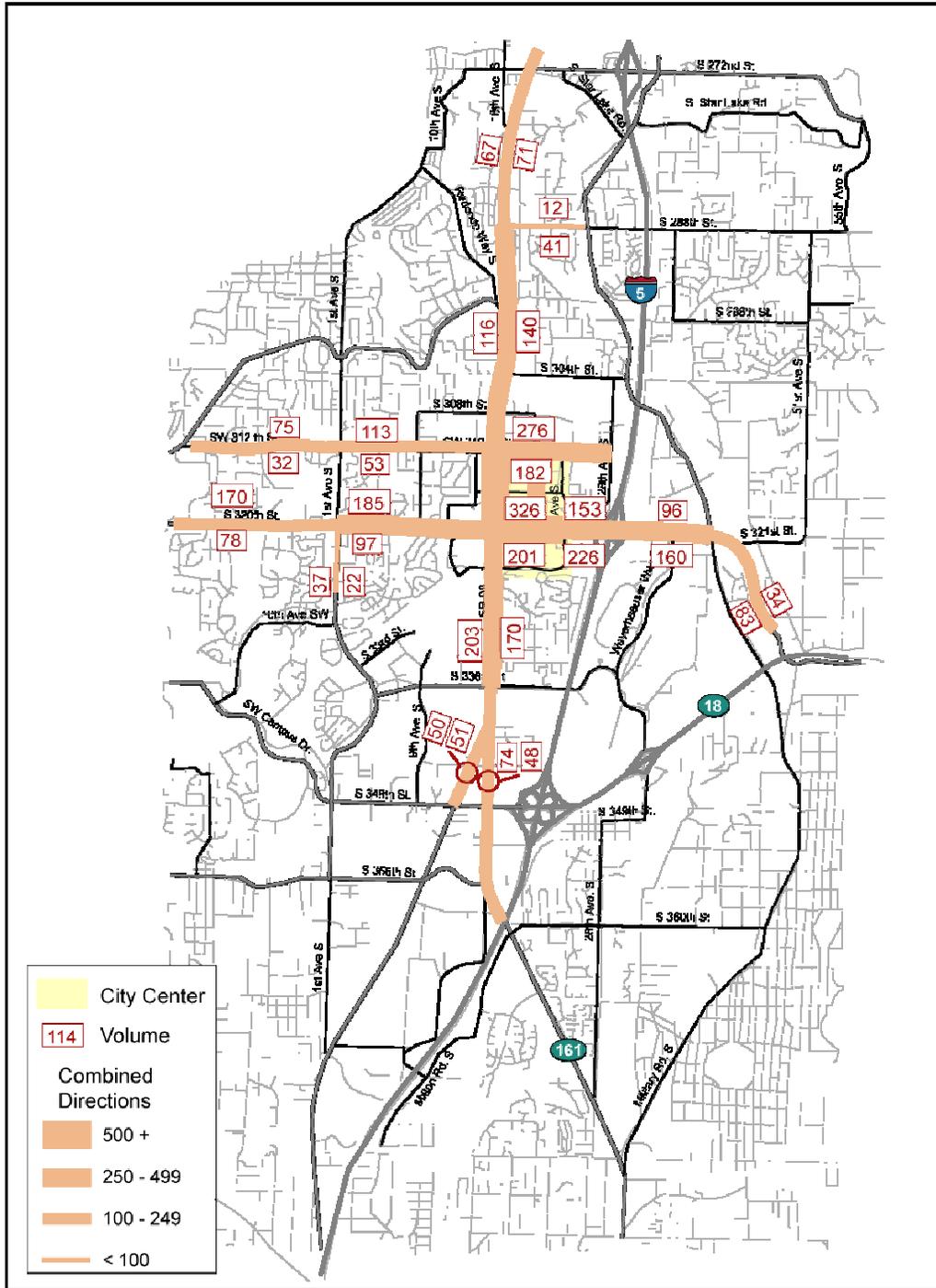


Figure 16. 2009 Alternative 1 PM Peak Trip Distribution



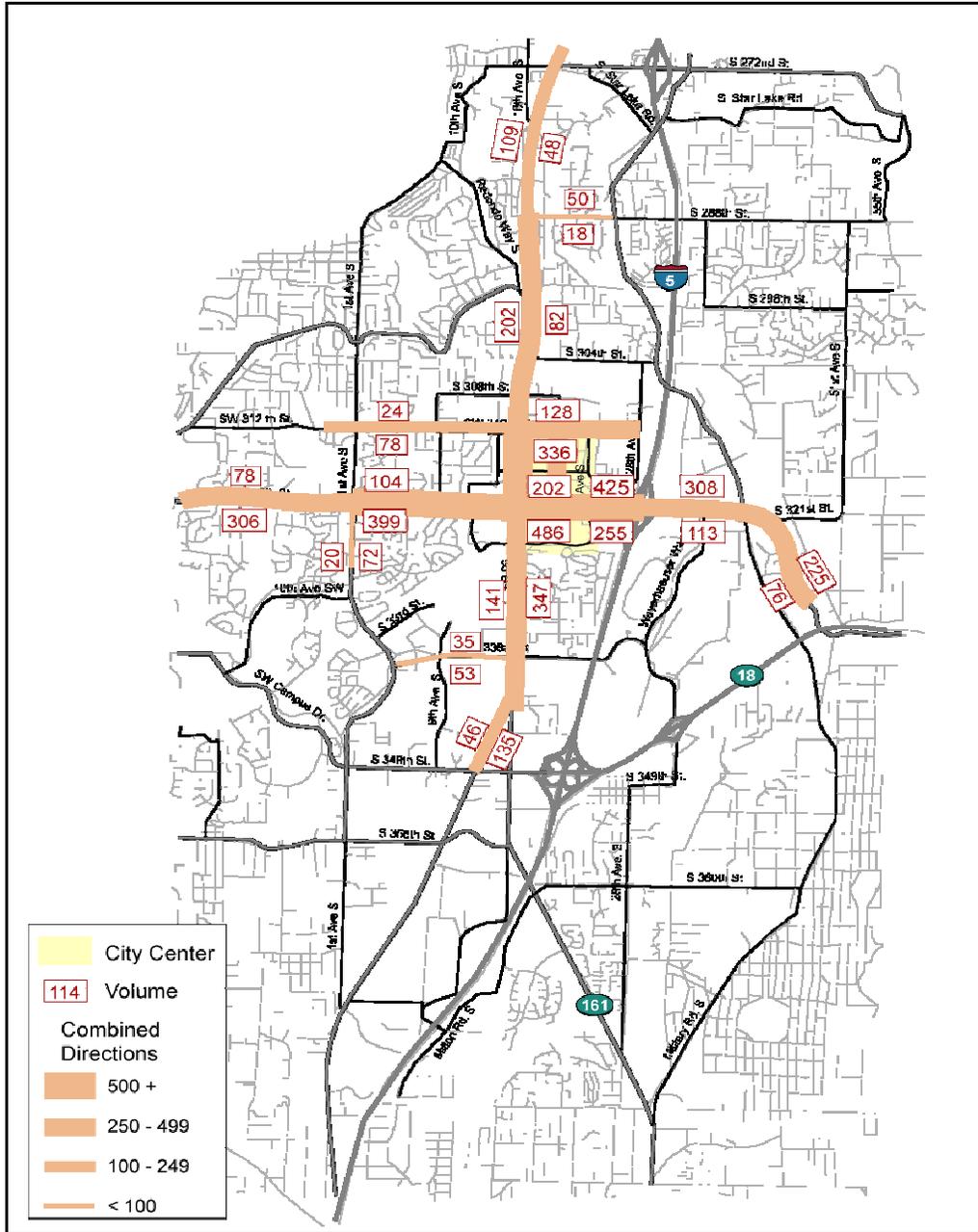


Figure 18. 2009 Alternative 1 Saturday Peak Trip Distribution



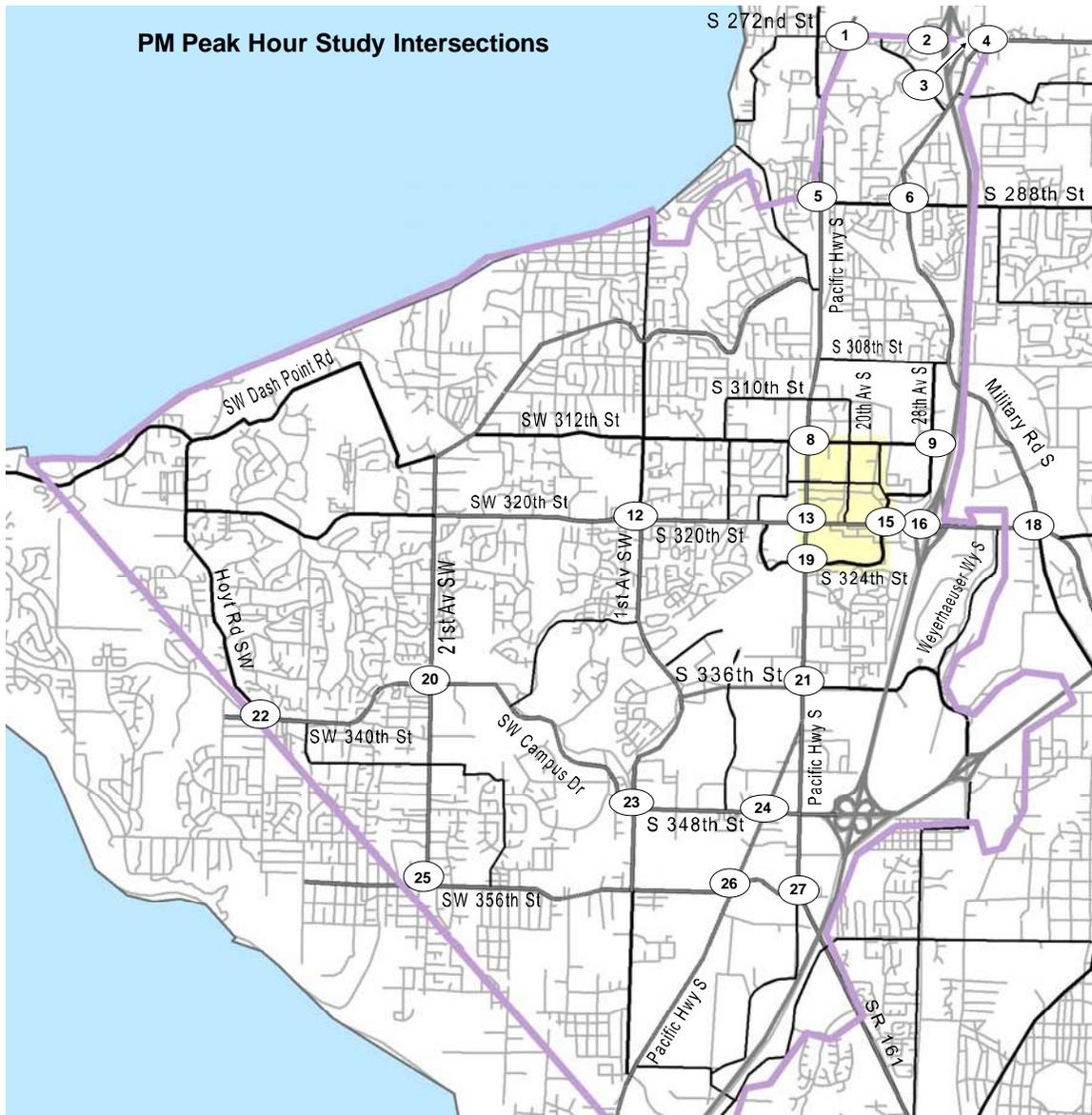


Figure 19. 2009 Alternative 1 PM Peak Turning Volumes



Federal Way City Center Transportation Impact Analysis

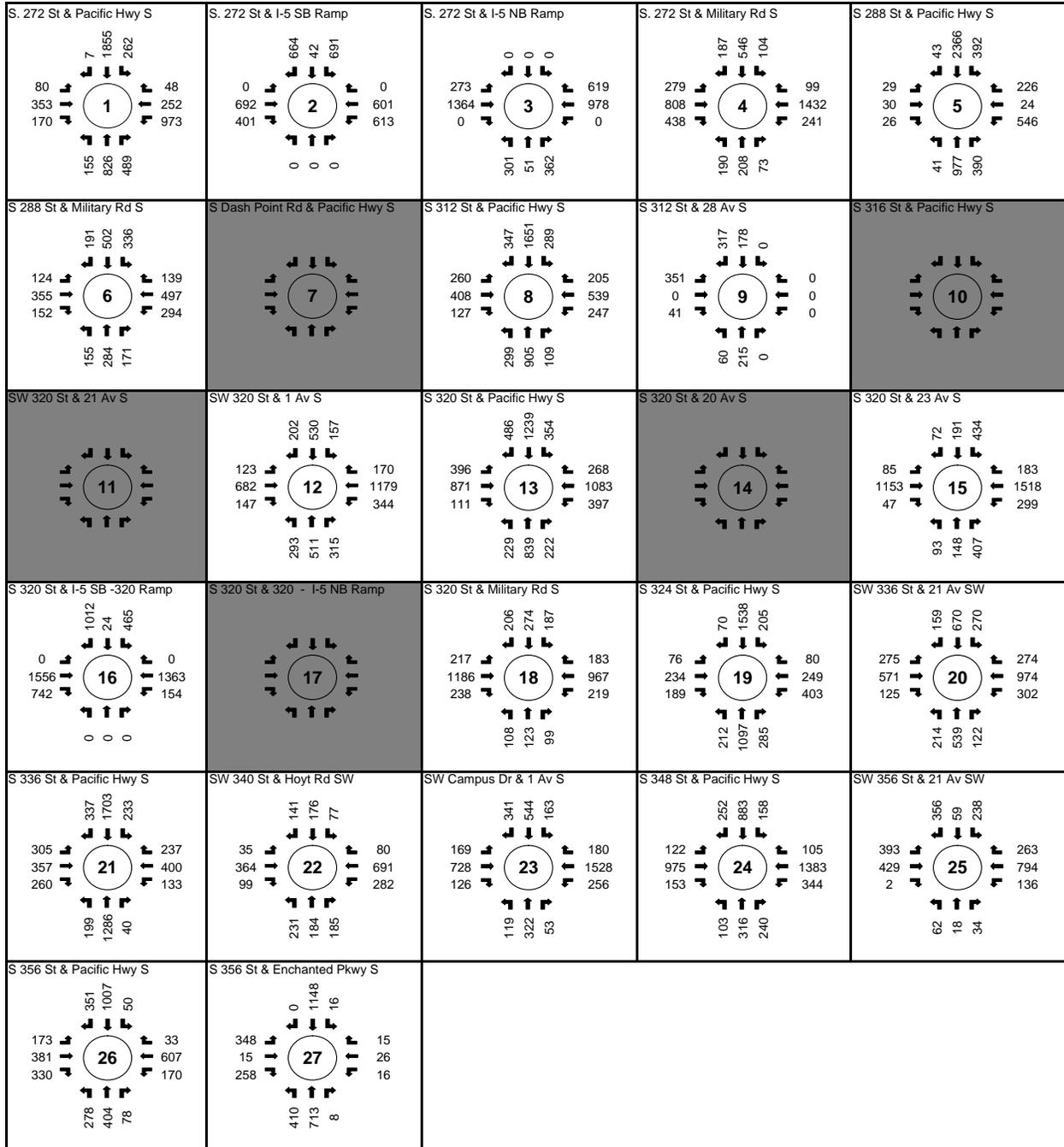


Figure 19. 2009 Alternative 1 PM Peak Turning Volumes



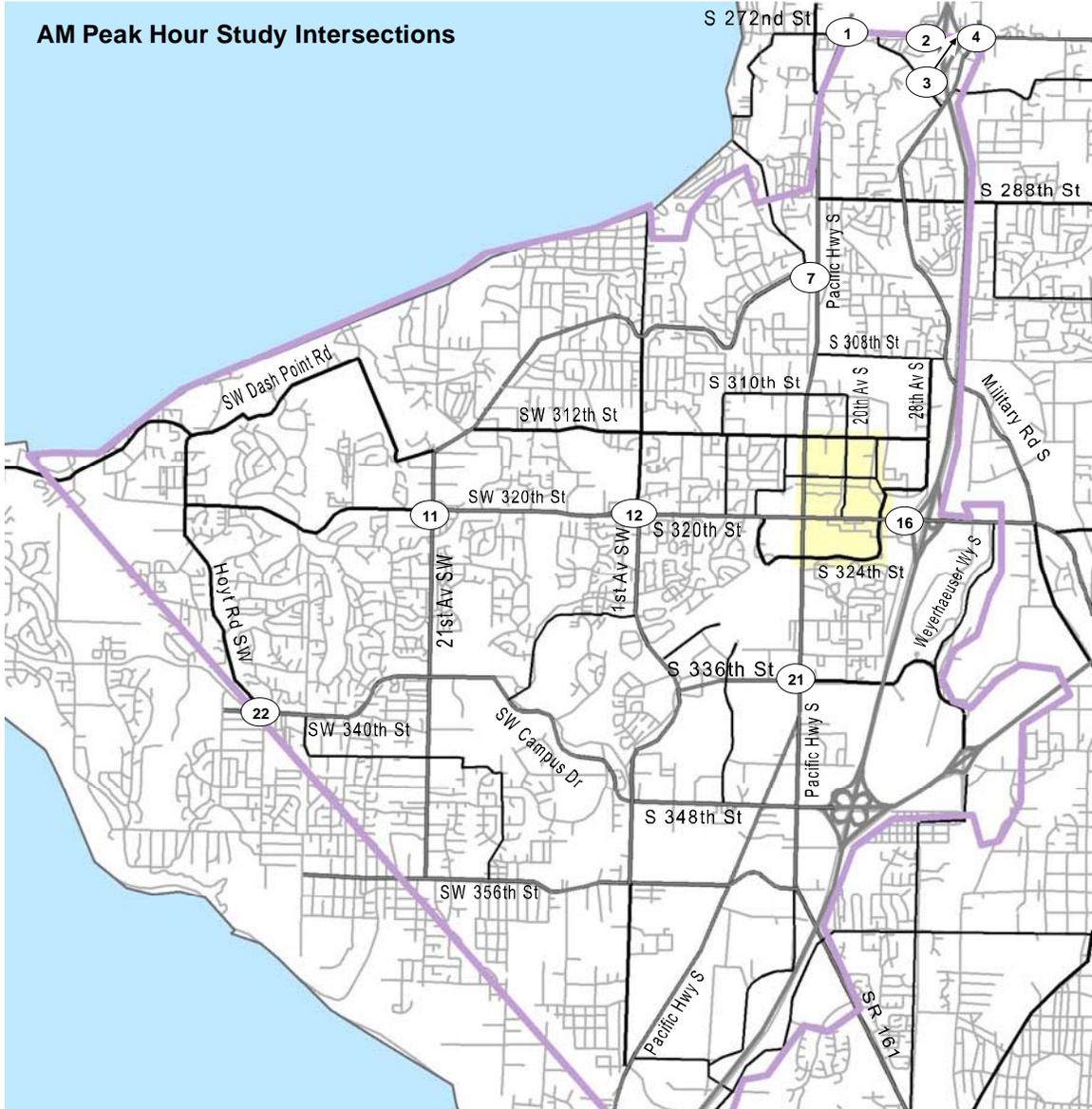


Figure 20. 2009 Alternative 1 AM Peak Turning Volumes



Federal Way City Center Transportation Impact Analysis

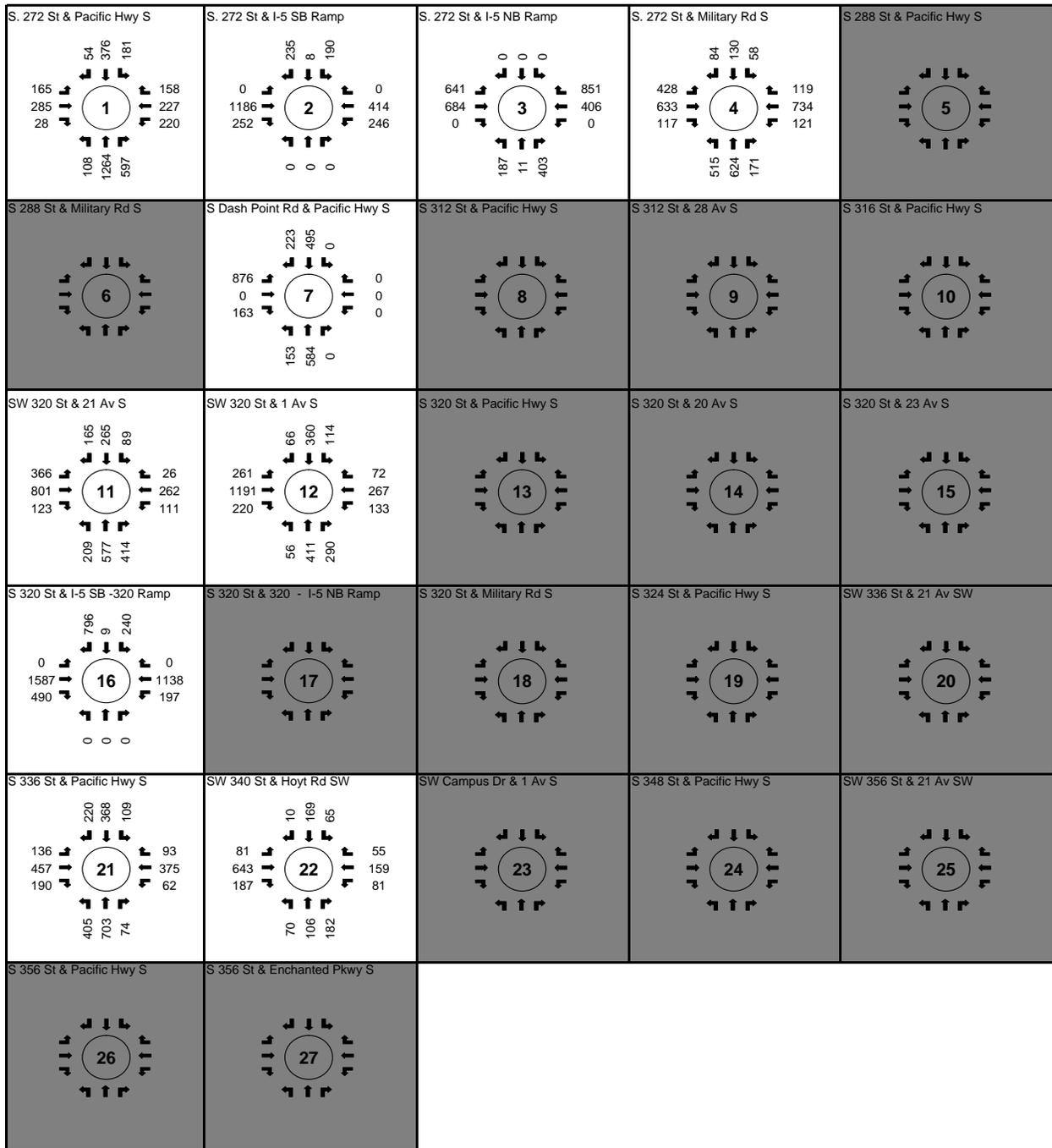


Figure 20. 2009 Alternative 1 AM Peak Turning Volumes



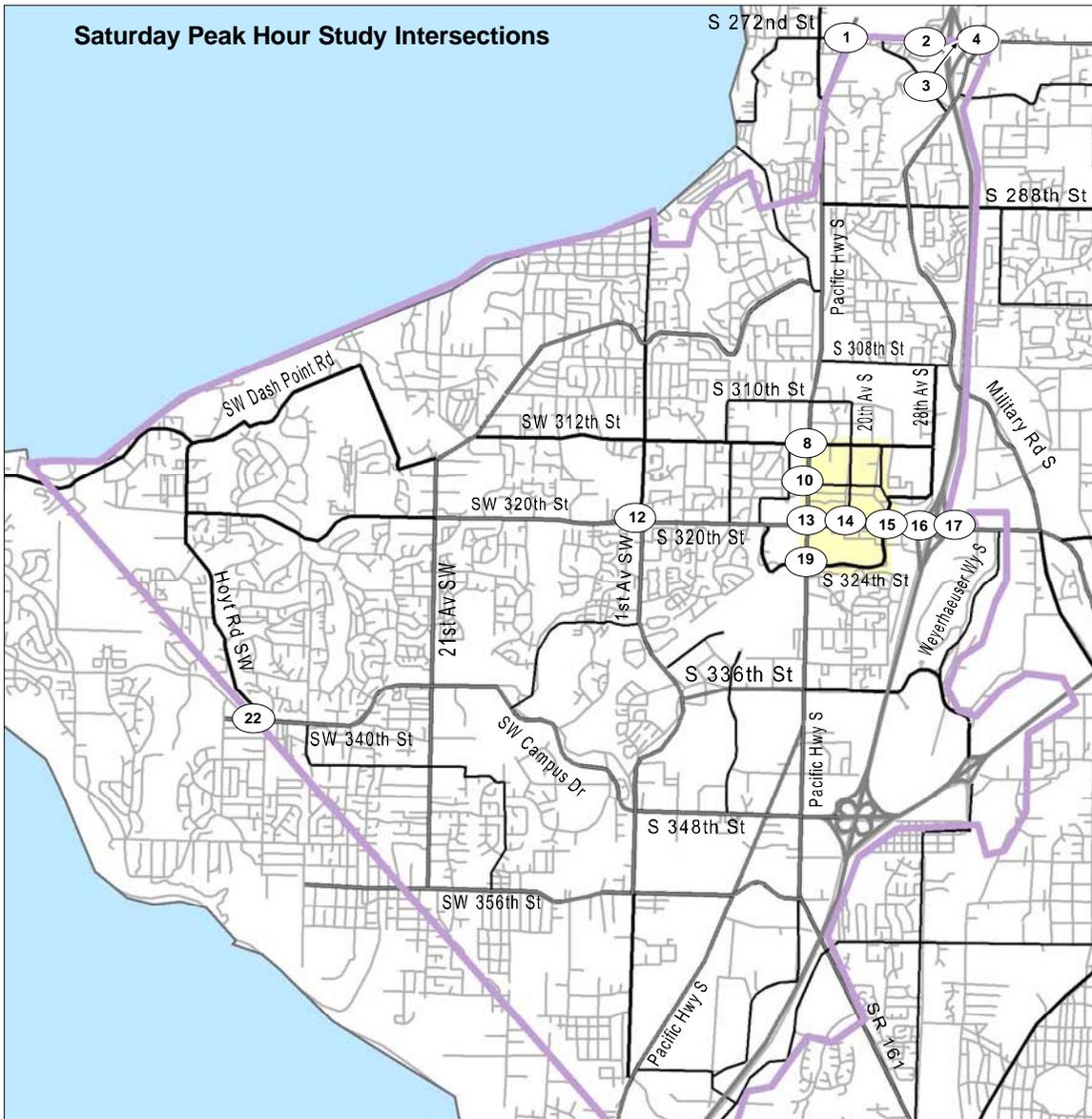


Figure 21. 2009 Alternative 1 Saturday Peak Turning Volumes



Federal Way City Center Transportation Impact Analysis

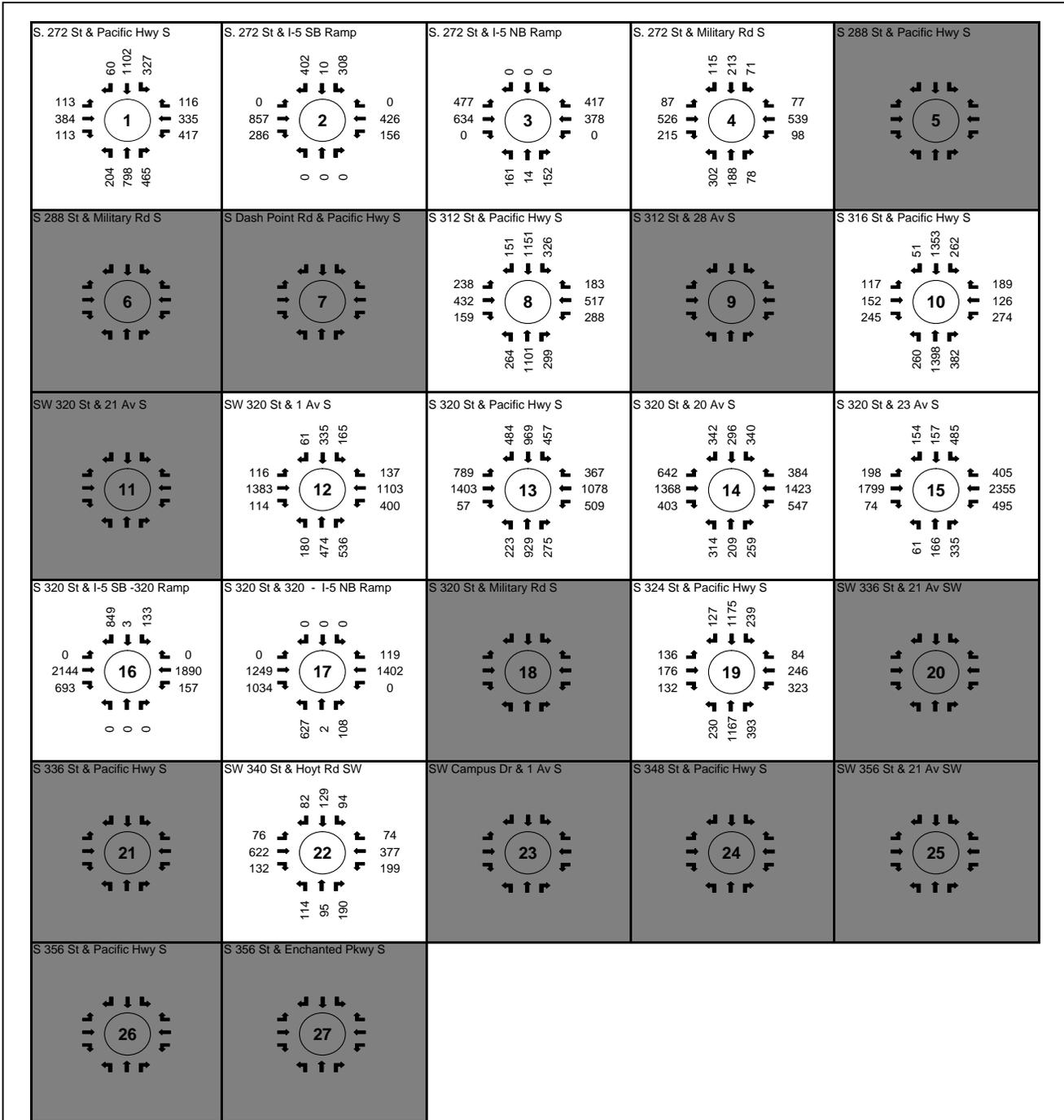


Figure 21. 2009 Alternative 1 Saturday Peak Turning Volumes



Table 20. 2009 Alternative 1 Intersection Operations

Intersection	PM Peak		AM Peak		Saturday Peak	
	LOS ¹	V/C ²	LOS	V/C	LOS	V/C
1. S 272 St & Pacific Hwy S	F	1.09*	D	0.71	D	0.79
2. S 272 St & I-5 southbound Ramp	F	1.00*	C	0.73	C	0.62
3. S 272 St & I-5 northbound Ramp	C	0.92	E	1.09*	B	0.67
4. S 272 St & Military Rd S	F	1.22*	F	1.10*	D	0.63
5. S 288th St & Pacific Hwy S	D	0.81				
6. S 288th St & Military Rd S	C	0.78				
7. S Dash Point Rd & Pacific Hwy S			C	0.52		
8. S 312 St & Pacific Hwy S	E	1.05*			D	0.99
9. S 312 St & 28 Av S	B	0.65 ³				
10. S 316 St & Pacific Hwy S					E	1.05*
11. SW 320 St & 21 Av SW			D	0.78		
12. S 320 St & 1 Av S	D	0.82	D	0.81	D	0.98
13. S 320 St & Pacific Hwy S	D	0.91			F	1.00*
14. S 320 St & 20 Av S					F	1.35*
15. S 320 St & 23 Av S	D	0.76			F	1.04*
16. S 320 St & I-5 southbound Ramp	C	0.78	C	0.72	C	0.92
17. S 320 St & I-5 northbound Ramp					B	0.72
18. S 320 St & Military Rd S	D	0.96				
19. S 324 St & Pacific Hwy S	D	0.87			D	0.87
20. SW 336 St & 21 Av SW	E	0.99				
21. S 336 St & Pacific Hwy S	D	1.04*	C	0.69		
22. SW 340 St & Hoyt Rd SW	C	0.63	B	0.53	C	0.57
23. SW Campus Dr & 1 Av S	E	0.97				
24. S 348 St & Pacific Hwy S	D	0.80				
25. SW 356 St & 21 Av SW	C	0.84				
26. S 356 St & Pacific Hwy S	C	0.84				
27. S 356 St & Enchanted Pkwy S	D	0.83				

¹LOS reflects the overall operation of the intersection based on the Highway Capacity Manual 2000 methodology

²V/C is the combined volume/capacity of the critical movements of the intersection as identified as the X_c in the HCM 2000 methodology.

³Maximum v/c ratio at all-way stop-controlled unsignalized intersection.

*Results from HCM2000 Signals (version 4.1f)

2009 Alternative 1 Deficiencies

This section describes the 2009 Alternative 1 deficiencies. The City of Federal Way defines the minimum acceptable level of service as LOS E or better with a volume/capacity ratio of less than 1.00 for signalized intersections. Intersections operating below this threshold are deficient

PM Peak Hour Deficiencies – Five intersections exceed the City’s deficiency threshold in 2009 for Alternative 1. Deficient intersections are focused along S 272 Street and Pacific Highway S, where growth in regional traffic is expected to affect intersection operations during the PM peak hour.

AM Peak Hour Deficiencies – Two of the study intersections exceed the City’s deficiency threshold in 2009 for Alternative 1. The deficient intersections are located at I-5 northbound Ramp and Military Road S along S 272 Street.

Saturday Peak Hour Deficiencies – Four of the Saturday study intersections exceed the City’s deficiency threshold in 2009 for Alternative 1. These intersections are focused around the FWCC area, at S 316 Street and S 320 Street on Pacific Highway S, and at the intersections at 20 Avenue S and 23rd Avenue S on S 320 Street. Weekend retail activity at these locations is likely to contribute to the high traffic at these intersections.

Parking Requirements

Table 21 describes the increase in parking requirement for the Alternative 1 above the existing code requirements shown in Figure 10. These increases assume full development by the year 2014. A total of 11,486 spaces would be required to meet existing and future lane uses. The parking requirements estimate the number of spaces required for the proposed mix of uses assumed for Alternative 1. Compared with Alternative 3, the City’s parking code would require approximately 4,000 additional spaces for Alternative 1. These spaces may be provided on the site or as part of parking garages assumed as part of the FWCC development. The actual parking requirement for an individual development may be reduced through shared parking arrangements or transportation demand management programs. This reduction could vary from 10% to 20%.

Table 21. Additional Parking Required for Alternative 1 at Buildout

Land Use	Parking Code Requirement	Proposed Development	Additional Required Parking (1)	Increase over Alternative 3
Civic Uses	Case by case	100,000 sf	Unknown	Unknown
Hotel	1 per room	600 rooms	600 stalls	600 stalls
Office	1 per 300 sf	350,000 sf	1,167 stalls	819 stalls
Other	1 per 1000 sf	0 sf	0 stalls	0 stalls
Residential	1.7 per unit	750 units	1,275 stalls	816 stalls
Retail	1 per 300 sf	750,000 sf	2,500 stalls	1,766 stalls
Total Additional			5,542 stalls	4,001 stalls
Total Parking			11,486 stalls	

Source: Jones and Stokes Associates, 2005.
 These parking demands may be 10% to 20% less based on shared parking.

Traffic Safety Impact

As the amount of traffic increases within the area, the probability of traffic collisions would be expected to increase. The *City of Federal Way Comprehensive Plan* (2003 revision, Chapter 3, page III-7) identifies that congestion is a primary factor in collision rates. Alternative 1 would increase the number of trips at high collision locations, the number of trips associated with this alternative make up only a small proportion of the entering trips. In addition, roadway improvements designed to reduce congestion may lower congestion-associated collisions.

Transit Service Impact

Alternative 1 would provide a high level of urban development and amenities in immediate proximity to the new 312th Street Transit Center. Under the alternative, a large proportion of development would be concentrated along S 320 Street, near the transit center, providing a high number of potential transit users who may be able to walk to the Transit Center. Expected residents of the FWCC would likely include transit users and may result in increased ridership demand at the transit center.

Pedestrian Accessibility

The *City of Federal Way Comprehensive Plan* (2002 revision, Chapter 7) identifies a number of roadway and pedestrian improvements to occur as part of development of the project area (see Figure 12). Alternative 1 concept of a pedestrian-oriented, mixed-use center would encourage use of these facilities, as residents would be able to easily access retail and service locations within a short walking distance.

Bicycle Mobility Impact

Chapter 7 of the 2002 *City of Federal Way Comprehensive Plan* (see Figure 12) identifies bicycle facilities planned for the City Center area. These bicycle facilities would connect major destinations and would increase the mobility of bicyclists within the project area. New development under Alternative 1 would increase the demand for bicycle facilities in the project area. Impacts associated with development permitted through the Planned Action Ordinance would be addressed as described in the Additional Mitigation described on page 94.

Proposed Mitigation

Alternative 1 would increase the density and activity within the FWCC core. The increased density could increase traffic congestion; however, these increases may be offset by reduced vehicle travel demand resulting from mixed-use development, improvements to pedestrian facilities, and improved transit services. Based on the LOS analysis, the following additional improvements (those beyond improvements identified for Alternative 3) would be required under Alternative 1 to meet the City's LOS threshold. Table 22 identifies the intersection location, the LOS and v/c ratio, and

suggested mitigation for each intersection. Appendix K contains the intersection analysis sheets for the 2009 PM, AM and Saturday peak hours for intersections mitigated in Alternative 1.

**Table 22. Alternative 1 Mitigation
PM PEAK**

2009 - Alternative 1

ID	Intersection	Mitigated		Improvements over Alt 3
		LOS	v/c	
1	S 272 St & Pacific Hwy S	F	1.09*	No mitigation proposed (1)
2	S 272 St & I-5 southbound Ramp	E	1.00*	No mitigation proposed (1)
4	S 272 St & Military Rd S	F	1.22*	No mitigation proposed (2)
8	S 312 St & Pacific Hwy S	D	0.95	Alternative 3 mitigation (CIP 01-05)
21	S 336 St & Pacific Hwy S	D	0.93	Optimize signal timing

AM Peak Hour

2009 - Alternative 1

ID	Intersection	Mitigated		Improvements
		LOS	v/c	
3	S 272 St & I-5 northbound Ramp	E	1.09*	No mitigation proposed (1)
4	S 272 St & Military Rd S	F	1.10*	No mitigation proposed (2)

SATURDAY

2009 - Alternative 1

ID	Intersection	Mitigated		Improvements over Alt 3
		LOS	v/c	
10	S 316 St & Pacific Hwy S	D	0.92	Eastbound right turn lane (TSM 12)
13	S 320 St & Pacific Hwy S	E	0.96	Northbound right turn lane
14	S 320 St & 20 Av S	D	0.99	Alternative 3 mitigation (TSM 2)
15	S 320 St & 23 Av S	E	0.92	Alternative 3 mitigation (TSM 3) plus westbound right turn lane

**Results from HCM2000 Signals (version 4.1f)*

(1) The City of Kent exempts intersections along Highways of Statewide Significance from their LOS threshold

(2) King County requires mitigation of intersections that receive 30 trips in an hour and 20% of the proposed new trips and exceeds LOS F. Less than 2% of project trips access the King County intersection of Military Road/272nd Street.

Alternative 2

This section describes the traffic impacts associated with Alternative 2. The section describes the trip generation, distribution and assignment, the 2009 turning volumes, transportation impacts and recommended mitigation.

Trip Generation, Distribution, and Assignment

Alternative 2 accounts for the same level of development within the Federal Way City Center as Alternative 1, but spreads this development throughout the FWCC area. The trip distribution and assignment were completed using the City's EMME/2 model. AM and Saturday distribution and assignment follow existing area traffic patterns. Figures 22 to 24 show the trip distribution for the 2009 under Alternative 2 for the PM, AM and Saturday peak hours.

Traffic Volumes

Figures 25 to 27 show the 2009 turning movement volumes for each study intersection for Alternative 2 for the PM, AM and Saturday peak hours. Traffic volumes for the PM peak hour are based on the model results. AM and Saturday volumes were estimated based upon an annual growth rate.

2009 Alternative 2 Traffic Operations

The AM, PM and Saturday study intersections were analyzed using the Synchro 6.0 (Build 6.12) analysis software. The City considers intersections to be operating at an acceptable LOS if operations are LOS E or better and its v/c ratios are less than 1.0 for the critical movements of the intersection. Table 23 lists the LOS operation for the PM, AM and Saturday peak hour for Alternative 2. These intersection operations are based on existing signal timing and phasing as provided by the City of Federal Way. Appendix L contains the Alternative 2 intersection analysis sheets for the 2009 PM, AM and Saturday peak hours.

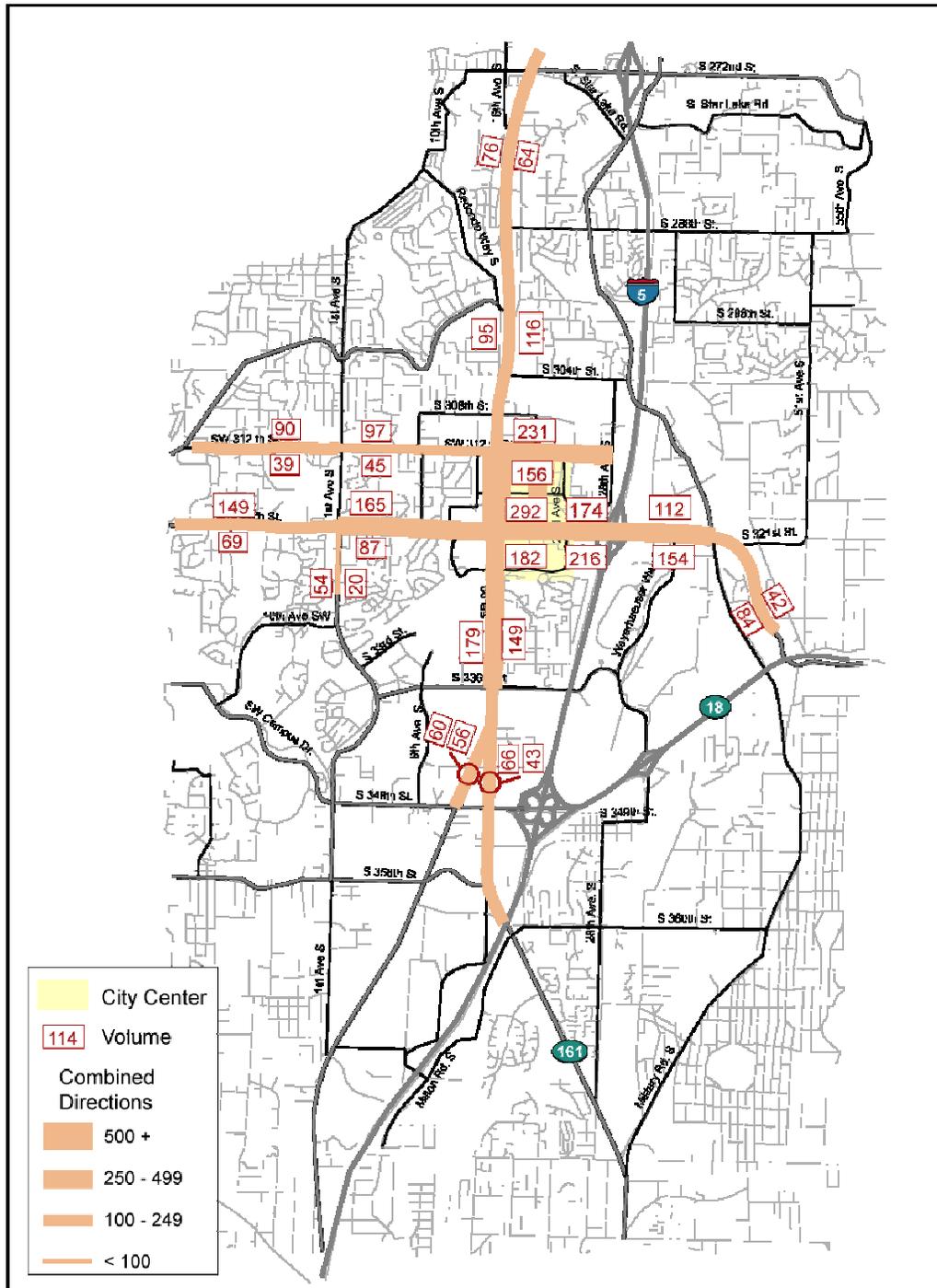


Figure 22. 2009 Alternative 2 PM Peak Trip Distribution Volumes



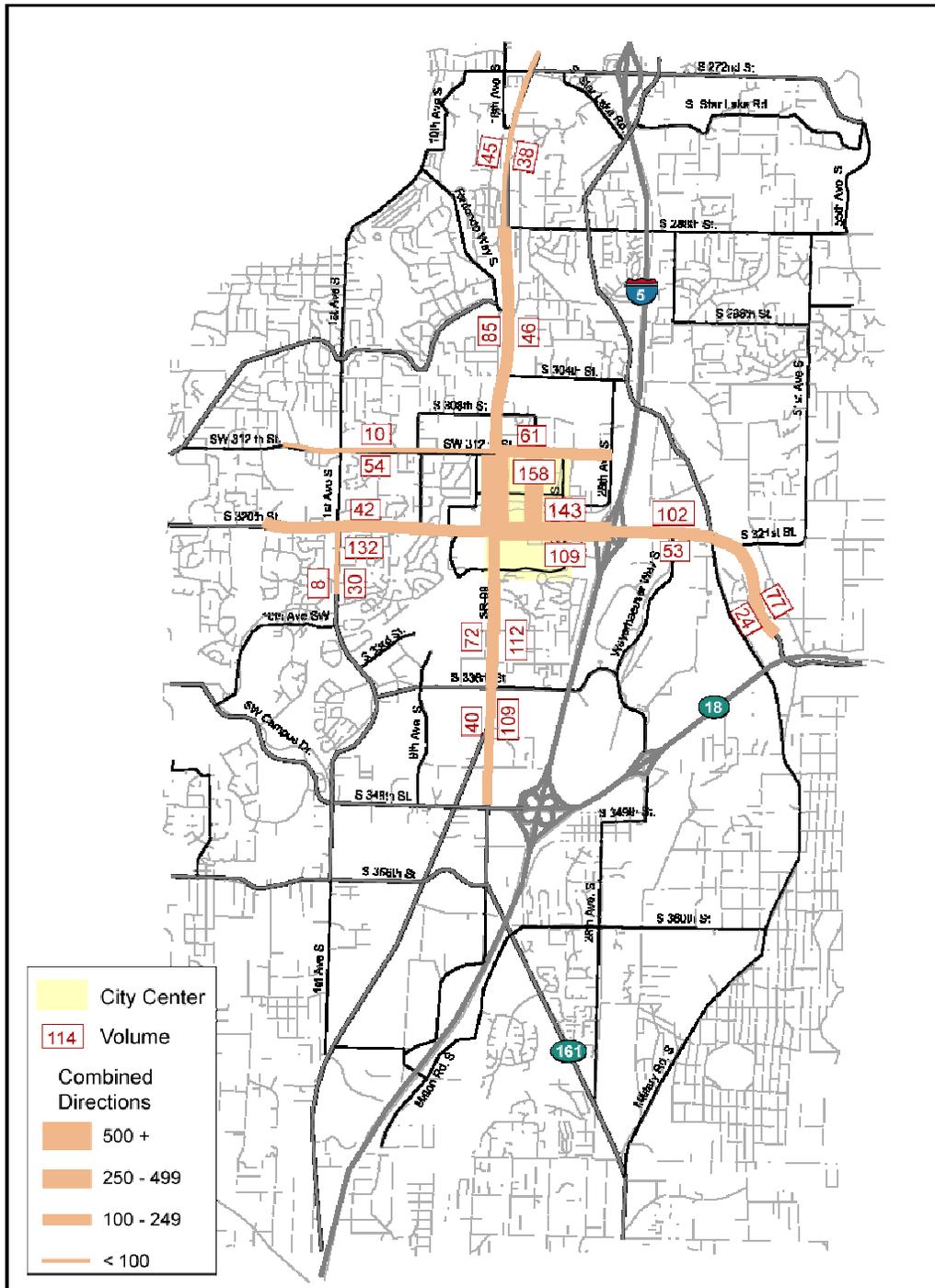


Figure 23. 2009 Alternative 2 AM Peak Trip Distribution



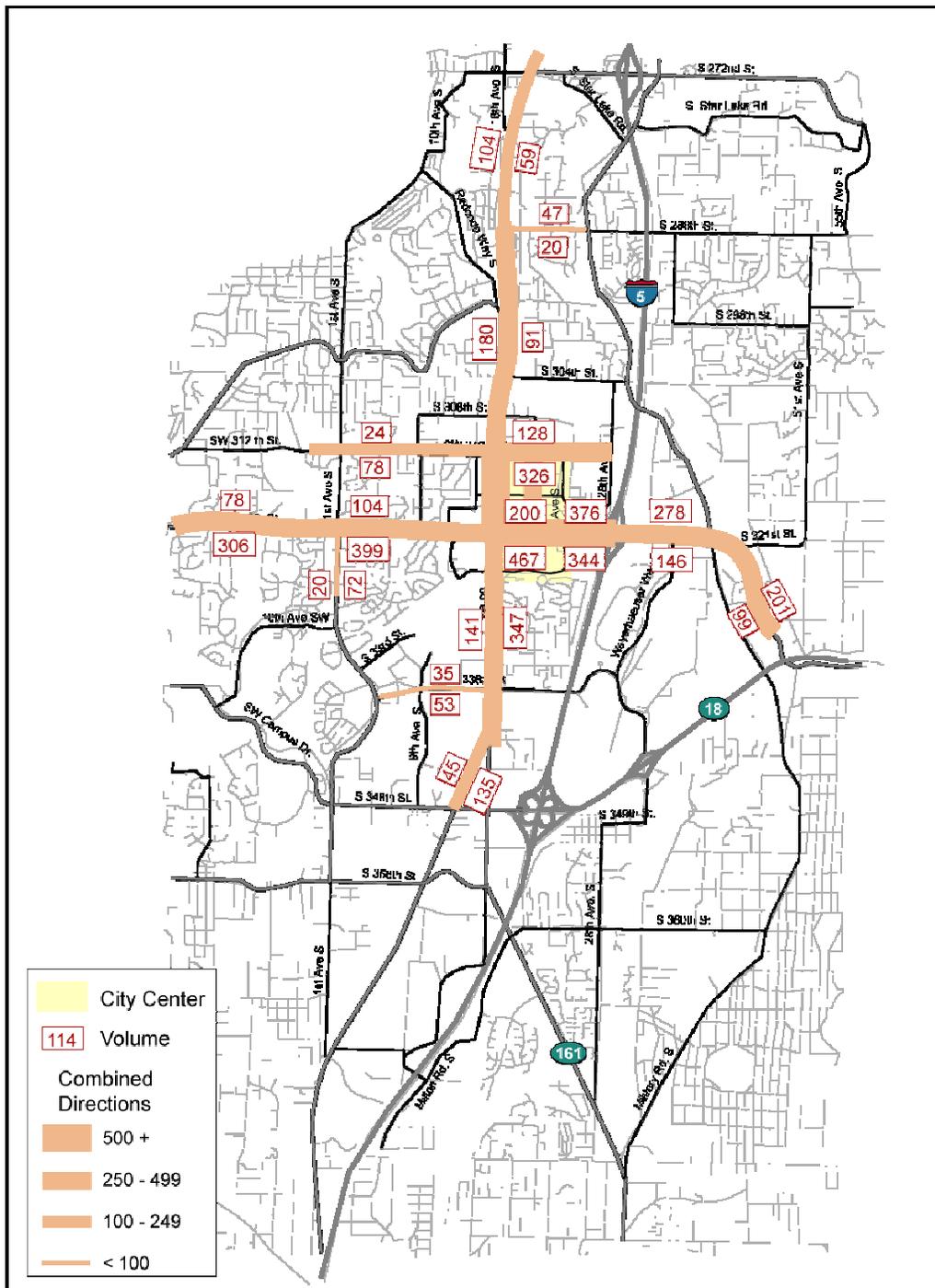


Figure 24. 2009 Alternative 2 Saturday Peak Trip Distribution



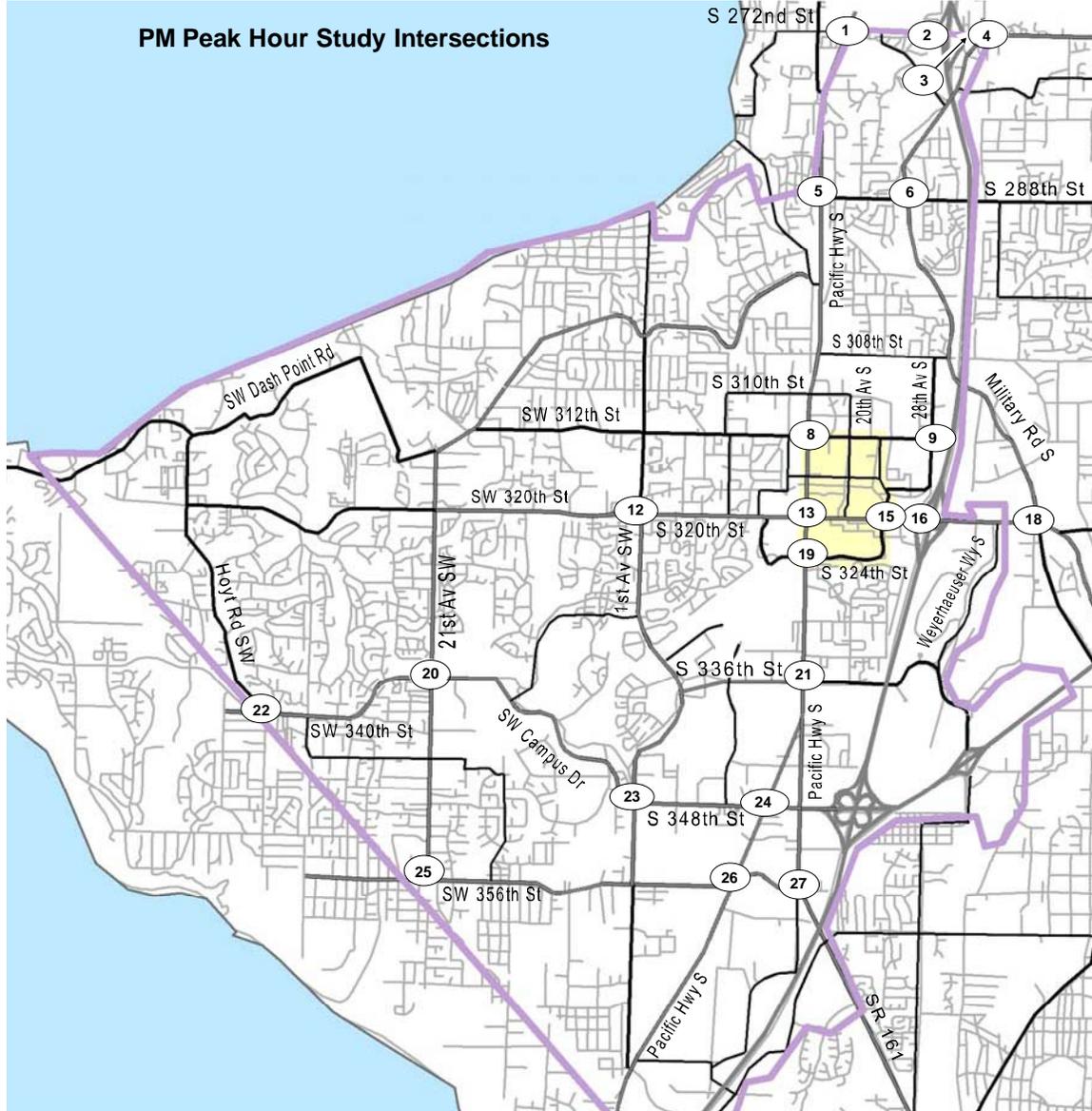


Figure 25. 2009 Alternative 2 PM Peak Turning Volumes



Federal Way City Center Transportation Impact Analysis

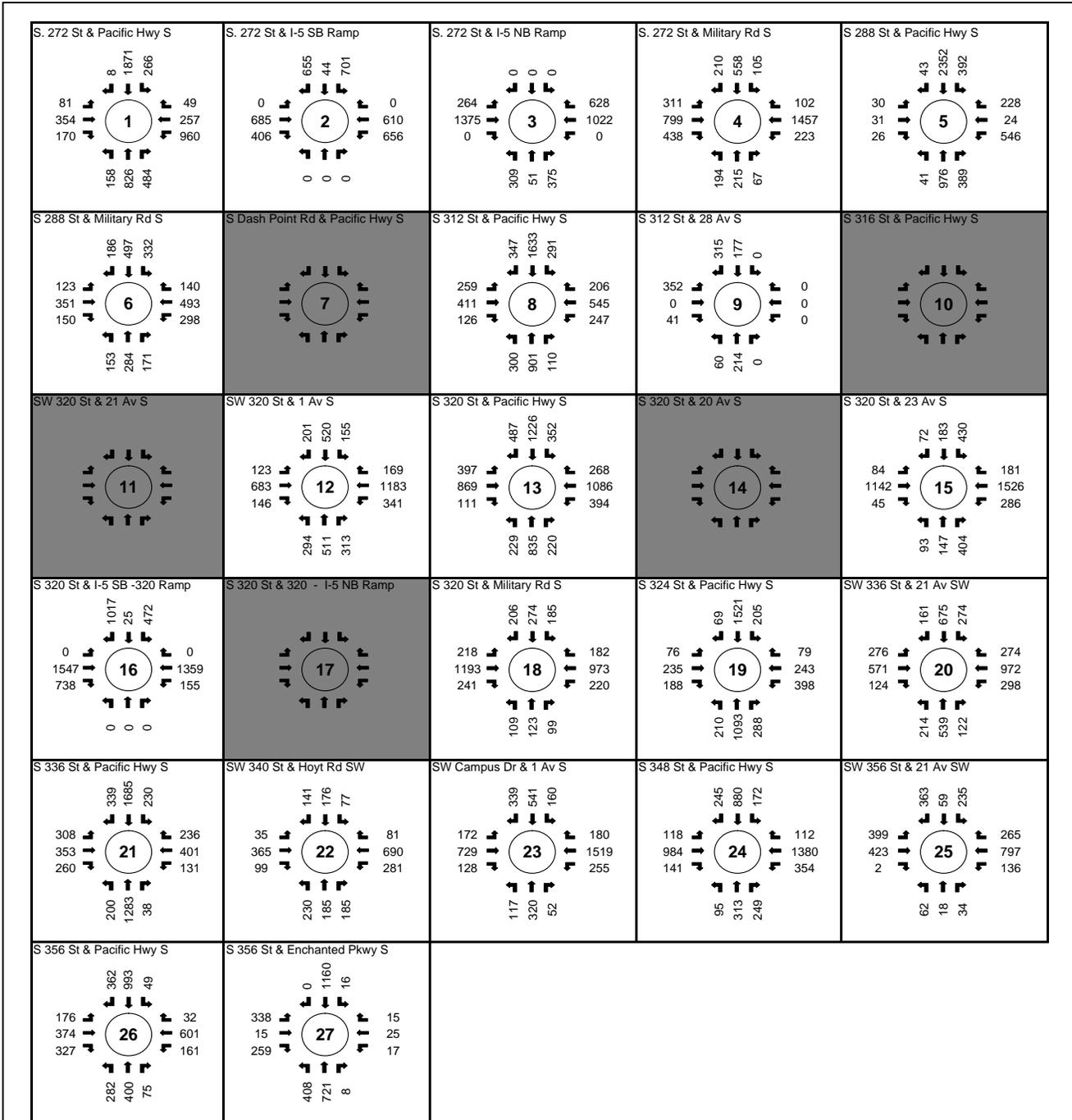


Figure 26. 2009 Alternative 2 PM Peak Turning Volumes



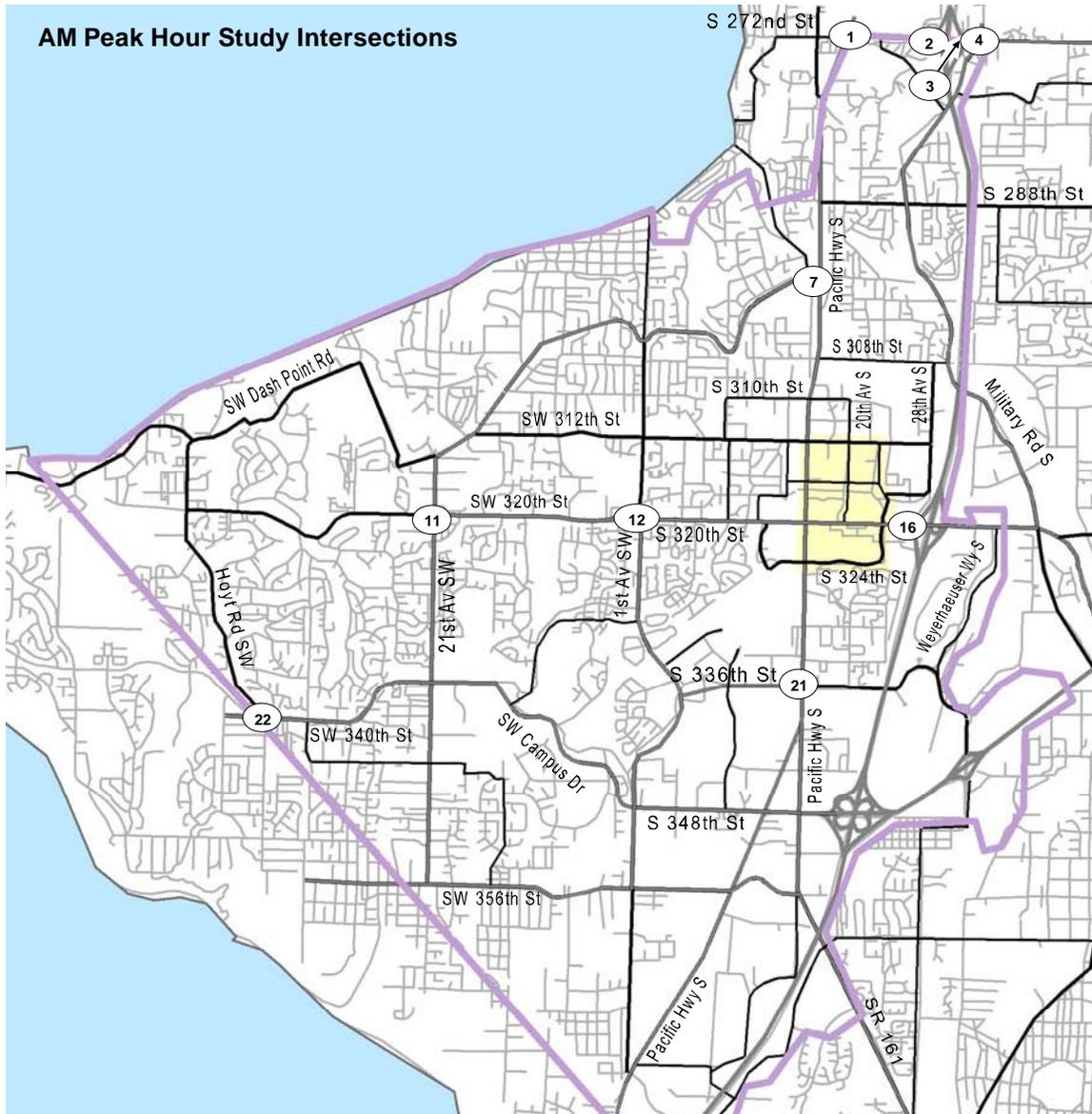


Figure 26. 2009 Alternative 2 AM Peak Turning Volumes



Federal Way City Center Transportation Impact Analysis

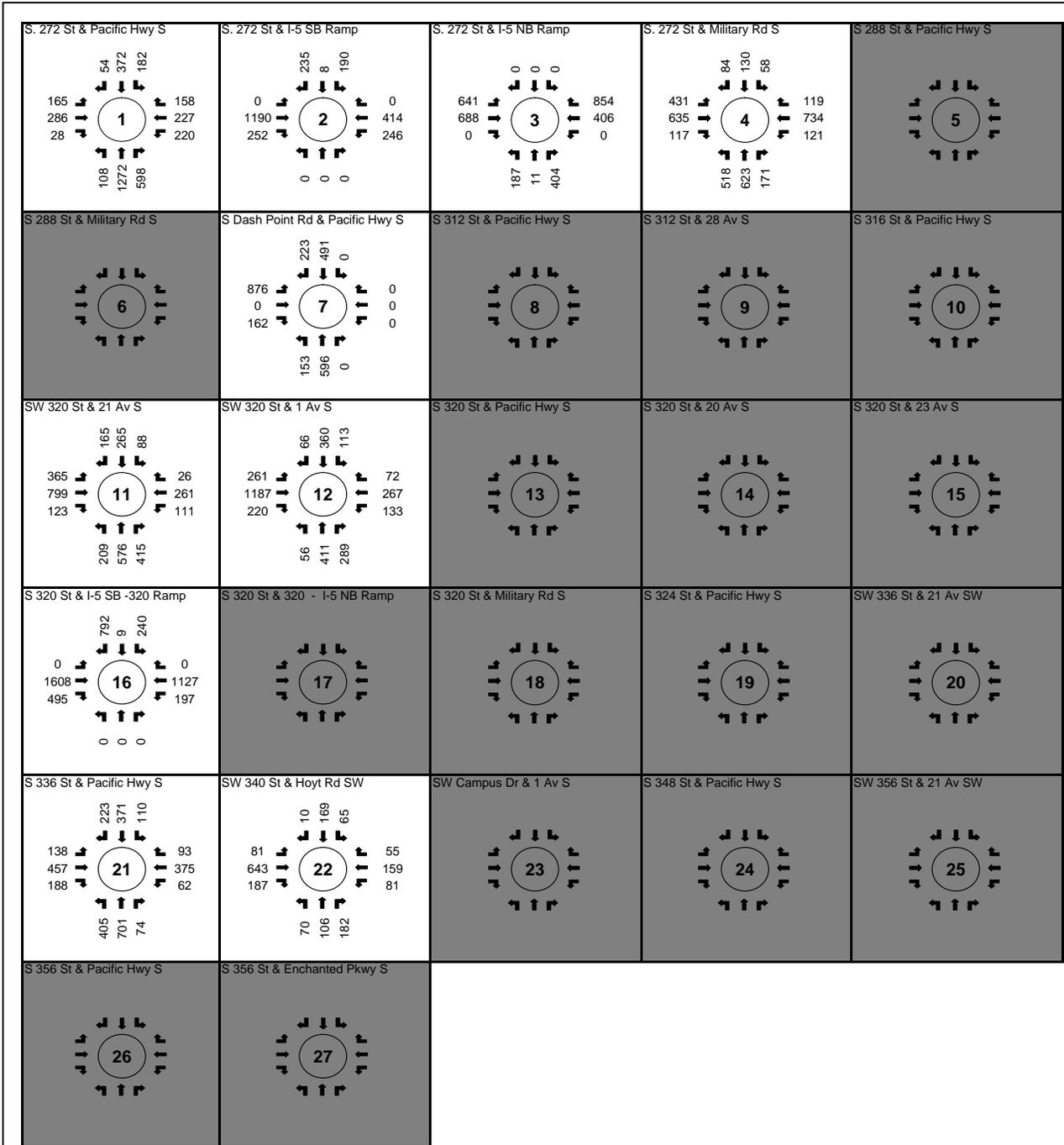


Figure 26. 2009 Alternative 2 AM Peak Turning Volumes



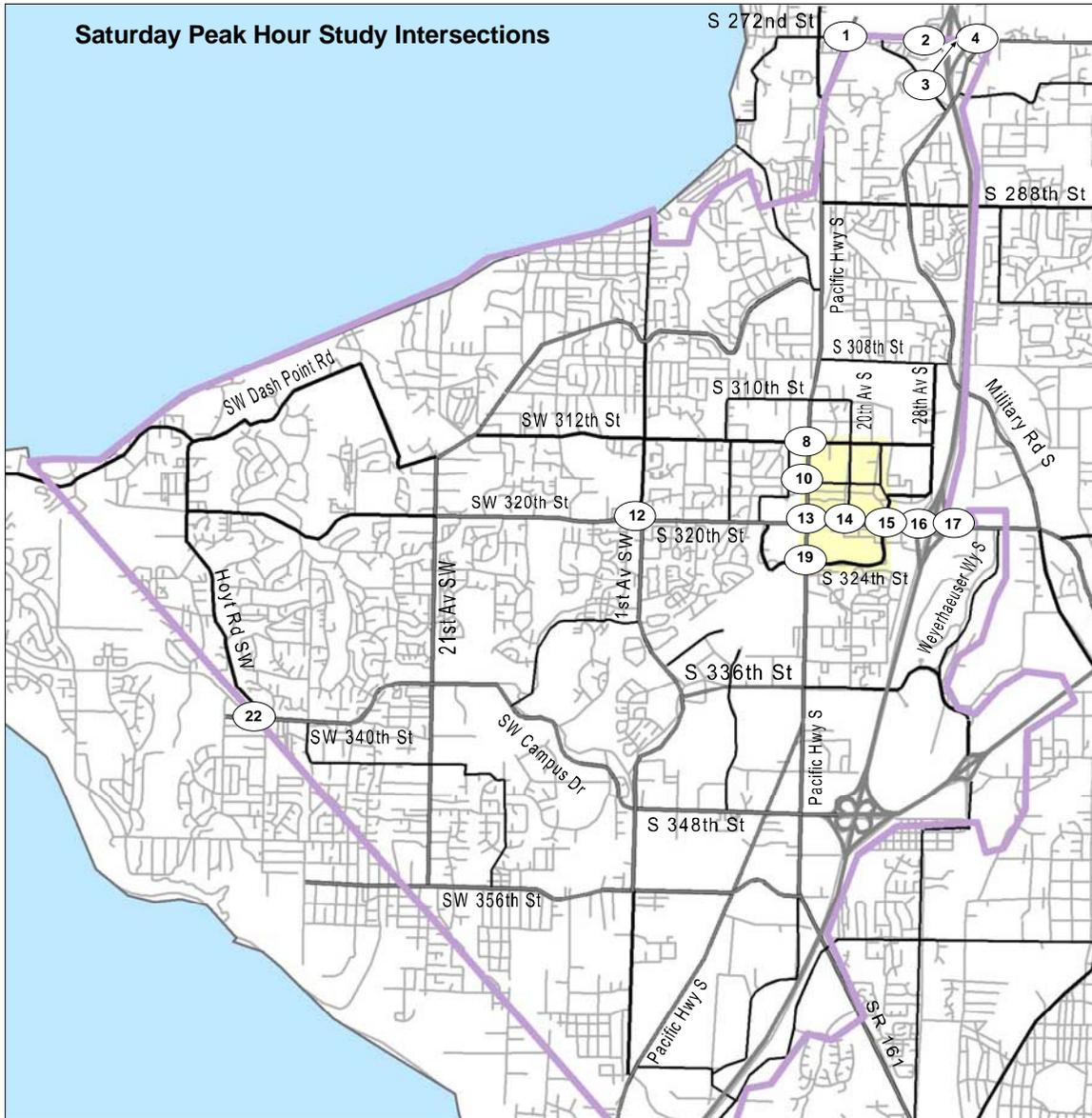


Figure 27. 2009 Alternative 2 Saturday Peak Turning Volumes



Federal Way City Center Transportation Impact Analysis

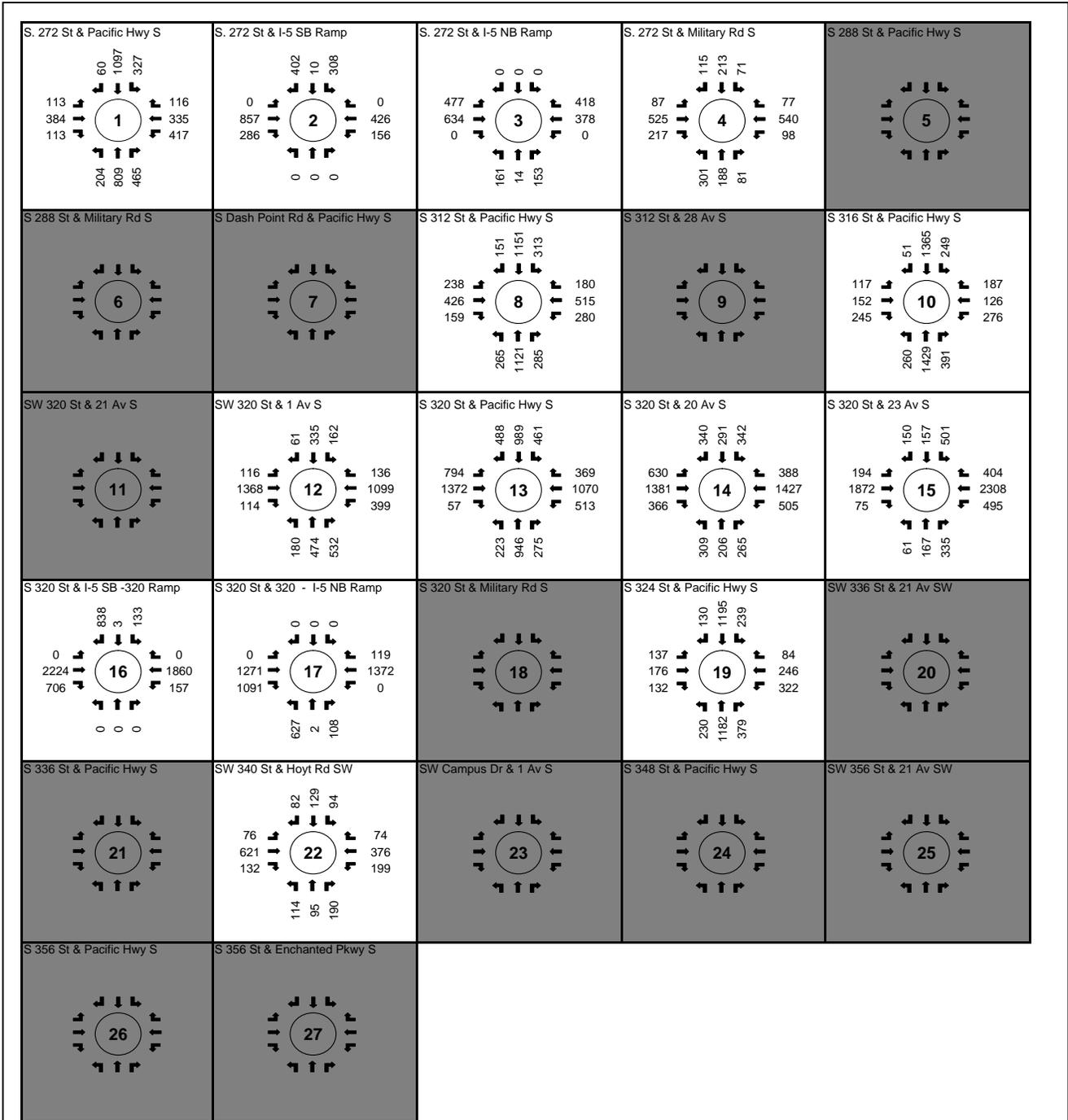


Figure 27. 2009 Alternative 2 Saturday Peak Turning Volumes



Table 23. 2009 Alternative 2 Intersection Operations

Intersection	PM Peak		AM Peak		Saturday Peak	
	LOS ¹	V/C ²	LOS	V/C	LOS	V/C
1. S 272 St & Pacific Hwy S	F	1.09*	D	0.71	D	0.75
2. S 272 St & I-5 southbound Ramp	F	1.03*	C	0.73	C	0.62
3. S 272 St & I-5 northbound Ramp	C	0.85	E	1.09*	B	0.67
4. S 272 St & Military Rd S	F	1.27*	F	1.10*	D	0.63
5. S 288th St & Pacific Hwy S	D	0.81				
6. S 288th St & Military Rd S	C	0.77				
7. S Dash Point Rd & Pacific Hwy S			C	0.52		
8. S 312 St & Pacific Hwy S	E	1.05*			D	0.98
9. S 312 St & 28 Av S	B	0.65 ³				
10. S 316 St & Pacific Hwy S					E	1.06*
11. SW 320 St & 21 Av SW			D	0.78		
12. S 320 St & 1 Av S	D	0.81	D	0.81	D	0.97
13. S 320 St & Pacific Hwy S	D	0.91			F	1.01*
14. S 320 St & 20 Av S					F	1.47*
15. S 320 St & 23 Av S	D	0.76			F	1.05*
16. S 320 St & I-5 southbound Ramp	C	0.78	C	0.71	C	0.94
17. S 320 St & I-5 northbound Ramp					B	0.76
18. S 320 St & Military Rd S	D	0.96				
19. S 324 St & Pacific Hwy S	D	0.86			D	0.87
20. SW 336 St & 21 Av SW	E	0.99				
21. S 336 St & Pacific Hwy S	D	1.05*	C	0.69		
22. SW 340 St & Hoyt Rd SW	C	0.63	B	0.53	C	0.57
23. SW Campus Dr & 1 Av S	E	0.96				
24. S 348 St & Pacific Hwy S	D	0.80				
25. SW 356 St & 21 Av SW	C	0.84				
26. S 356 St & Pacific Hwy S	C	0.83				
27. S 356 St & Enchanted Pkwy S	D	0.82				

¹LOS reflects the overall operation of the intersection based on the Highway Capacity Manual 2000 methodology

²V/C is the combined volume/capacity of the critical movements of the intersection as identified as the X_c in the HCM 2000 methodology.

³Maximum v/c ratio at all-way stop-controlled unsignalized intersection.

*Results from HCM2000 Signals (version 4.1f)

2009 Alternative 2 Deficiencies

This section describes the 2009 Alternative 2 deficiencies. The City of Federal Way defines the minimum acceptable level of service as LOS E or better with a volume/capacity ratio of less than 1.00 for signalized intersections. Intersections operating below this threshold are deficient.

PM Peak Hour Deficiencies – Five intersections exceed the City’s deficiency threshold in 2009 for Alternative 2. Deficient intersections are focused along S 272 Street and Pacific Highway S, where growth in regional traffic is expected to affect intersection operations during the PM peak hour.

AM Peak Hour Deficiencies – Two of the study intersections exceed the City’s deficiency threshold in 2009 for Alternative 2. The deficient intersections are located at I-5 northbound Ramp and Military Road S along S 272 Street.

Saturday Peak Hour Deficiencies – Four of the Saturday study intersections exceed the City’s deficiency threshold in 2009 for Alternative 2. These intersections are focused around the FWCC area, at S 316 Street and S 320 Street on Pacific Highway S, and at the intersections at 20 Avenue S and 23rd Avenue S on S 320 Street. Weekend retail activity at these locations is likely to contribute to the high traffic at these intersections.

Parking Requirement

Table 24 describes the increase in parking requirement for the Alternative 2 above the existing code requirements shown in Figure 10. A total of 11,486 spaces would be required to meet existing and future lane uses (same as Alternative 1). The parking requirements estimate the number of spaces required for the proposed mix of uses assumed for Alternative 2. Compared with Alternative 3, the City’s parking code would require approximately 4,000 additional spaces for Alternative 2. These spaces may be provided on the site or as part of parking garages assumed as part of the FWCC development. The actual parking requirement for an individual development may be reduced through shared parking arrangements or transportation demand management programs. This reduction could vary from 10% to 20%.

Table 24. Additional Parking Required for Alternative 2 at Buildout

Land Use	Parking Code Requirement	Proposed Development	Additional Required Parking (1)	Increase over Alternative 3
Civic Uses	Case by case	100,000 sf	Unknown	Unknown
Hotel	1 per room	600 rooms	600 stalls	600 stalls
Office	1 per 300 sf	350,000 sf	1,167 stalls	819 stalls
Other	1 per 1000 sf	0 sf	0 stalls	0 stalls
Residential	1.7 per unit	750 units	1,275 stalls	816 stalls
Retail	1 per 300 sf	750,000 sf	2,500 stalls	1,766 stalls
Total Additional			5,542 stalls	4,001 stalls
Total Parking			11,486 stalls	

Source: Jones and Stokes Associates, 2005.

(1) These parking demands may be 10% to 20% less based on shared parking.

Traffic Safety Impact

As the amount of traffic increases within the area, the probability of traffic collisions would be expected to increase. The *City of Federal Way Comprehensive*

Plan (2003 revision, Chapter 3, page III-7) identifies that congestion is a primary factor in collision rates. Alternative 2 would increase the number of trips at high collision locations, the number of trips associated with this alternative make up only a small proportion of the entering trips. Improvements associated with traffic improvement would reduce congestion and the congestion-associated collisions.

Transit Service Impact

Alternative 2 would provide a high level of urban development and amenities in area near the new 312th Street Transit Center. Under the alternative, development would occur throughout the FWCC, providing a high number of potential transit users who may walk to the Transit Center. Expected residents of the FWCC would likely include transit users.

Pedestrian Accessibility

The *City of Federal Way Comprehensive Plan* (2002 revision, Chapter 7) identifies a number of roadway and pedestrian improvements to occur as part of future development (see Figure 12). Alternative 2 concept of a pedestrian-oriented, mixed-use center would encourage use of these facilities, as residents would be able to easily access retail and service locations within a short walking distance.

Bicycle Mobility Impact

Chapter 7 of the 2002 *City of Federal Way Comprehensive Plan* (see Figure 12) identifies bicycle facilities planned for the City Center area. These bicycle facilities would connect major destinations and would increase the mobility of bicyclists within the project area. New development under Alternative 2 would increase the demand for bicycle facilities in the project area. Impacts associated with development permitted through the Planned Action Ordinance would be addressed as described in the Additional Mitigation described on page 94.

Proposed Mitigation

Alternative 2 would increase the density and activity within the FWCC core, but would spread out the impact throughout the FWCC area. The increased density could increase traffic congestion; however, these increases may be offset by reduced vehicle travel demand resulting from mixed-use development, improvements to pedestrian facilities, and improved transit services. Based on the LOS analysis, the following additional improvements (those beyond improvements identified for Alternative 3) would be required under Alternative 2 to meet the City's LOS threshold. Table 25 identifies the intersection location, the LOS and v/c ratio and the suggested mitigation for each intersection. Appendix M contains the intersection analysis sheets for the 2009 PM, AM and Saturday peak hours for intersections mitigated in Alternative 2.

**Table 25. Alternative 2 Mitigation
PM PEAK****2009 - Alternative 2**

ID	Intersection	Mitigated		Improvements over Alt 3
		LOS	v/c	
1	S 272 St & Pacific Hwy S	F	1.09*	No mitigation proposed (1)
2	S 272 St & I-5 southbound Ramp	F	1.00*	No mitigation proposed (1)
4	S 272 St & Military Rd S	F	1.22*	No mitigation proposed (2)
8	S 312 St & Pacific Hwy S	D	0.95	Alternative 3 mitigation (CIP 01-05)
21	S 336 St & Pacific Hwy S	D	0.93	Optimize signal timing

AM Peak Hour**2009 - Alternative 2**

ID	Intersection	Mitigated		Improvements
		LOS	v/c	
3	S 272 St & I-5 northbound Ramp	E	1.09*	No mitigation proposed (1)
4	S 272 St & Military Rd S	F	1.10*	No mitigation proposed (2)

SATURDAY**2009 - Alternative 2**

ID	Intersection	Mitigated		Improvements over Alt 3
		LOS	v/c	
10	S 316 St & Pacific Hwy S	C	0.92	Eastbound right turn lane (TSM 12)
13	S 320 St & Pacific Hwy S	E	0.94*	Northbound right turn lane
14	S 320 St & 20 Av S	D	0.98	Alternative 3 mitigation (TSM 2)
15	S 320 St & 23 Av S	E	0.93	Alternative 3 mitigation (TSM 3) plus westbound right turn lane

*Results from HCM2000 Signals (version 4.1f)

(1) The City of Kent exempts intersections along Highways of Statewide Significance from their LOS threshold

(2) King County requires mitigation of intersections that receive 30 trips in an hour and 20% of the proposed new trips and exceeds LOS F. Less than 2% of project trips access the King County intersection of Military Road/272nd Street.

2014 Forecasts

The 2014 forecasts are intended to provide an initial look at the traffic operations and impacts of each of the FWCC alternatives. This analysis will describe the forecasting methodology, describe expected roadway volumes for Alternatives 1-3 and identify locations where traffic growth may impact City's intersections. Because this is a longer range forecast, only roadway volumes are reported. In addition, specific mitigation measures are not included. The City has proposed to conduct a 2009 analysis of building construction and traffic growth to verify the status of the FWCC development and to update the traffic forecasts for 2014.

Forecast Methodology

Forecasts of the PM peak hour were completed using the EMME/2 transportation model. The model compares the 2009 and 2014 land uses to estimate future traffic levels and to assign the volumes to the roadway network. The model was used to identify the 2009-2014 growth in background traffic and the 2009-2014 growth in trips from the FWCC site.

The AM and Saturday peak hour forecasts use the 2004-2009 traffic growth factors to estimate an expected 2014 background traffic. General background growth for the AM peak hour is assumed at 1.5% per year and 1.1% for the Saturday peak hour. The FWCC trip generation for each alternative was assigned and added to the 2009 base volumes and 2009-2014 background growth traffic to provide an estimate of 2014 volumes. Appendix N includes the 2014 forecasted volumes for the PM, AM and Saturday peak hours.

Roadway Improvement Assumptions

Only one roadway improvement project based on the CIP was added to the baseline model for 2014. This project would construct a roadway connection between S 312th Street at 14th Avenue S and S 320th Street at 11th Place S.

Trip Generation

Table 26 summarizes the growth in trip generation from 2009 to 2014. The 2014 forecasts include two options for a "Civic Center" resulting in a range of values for the trip generation. The first civic center option would develop a convention center facility that would be primarily be used for special events, expositions, and activities. The second civic center option would be a daily-use facility, which would feature daily activities and programs. The second option would be expected to have higher daily and peak hour trip generation.

The estimates of growth for the 2009-2014 No Action (Alt 3) represents 70-90% of the growth expected from 2004-2009 as shown in Table 16. Alternatives 1 and 2 have the same trip generation. The range of trip generation reflects the two options for the Civic

Center land use described above. The PM and Saturday peak hour trip growth is slightly lower than the growth during the 2004- 2009 time period. The AM trips represent 77% of the previous five-year growth.

Table 26: Summary of Trip Generation for Federal Way City Center (2010-2014)

Time Period	2014 Alternative 1 increase from 2009 Alt 1*	2014 Alternative 2 increase from 2009 Alt 2*	2014 Alternative 3 increase from 2009 Alt 3
AM peak hour	919-1,073	919-1,073	214
Saturday peak hour	2,537-2,552	2,537-2,552	437
PM peak hour	2,360 – 2,370	2,360-2,370	419

* Range of trip generation reflects two options for the Civic Center land use.

Source: ITE Trip Generation, 7th Edition

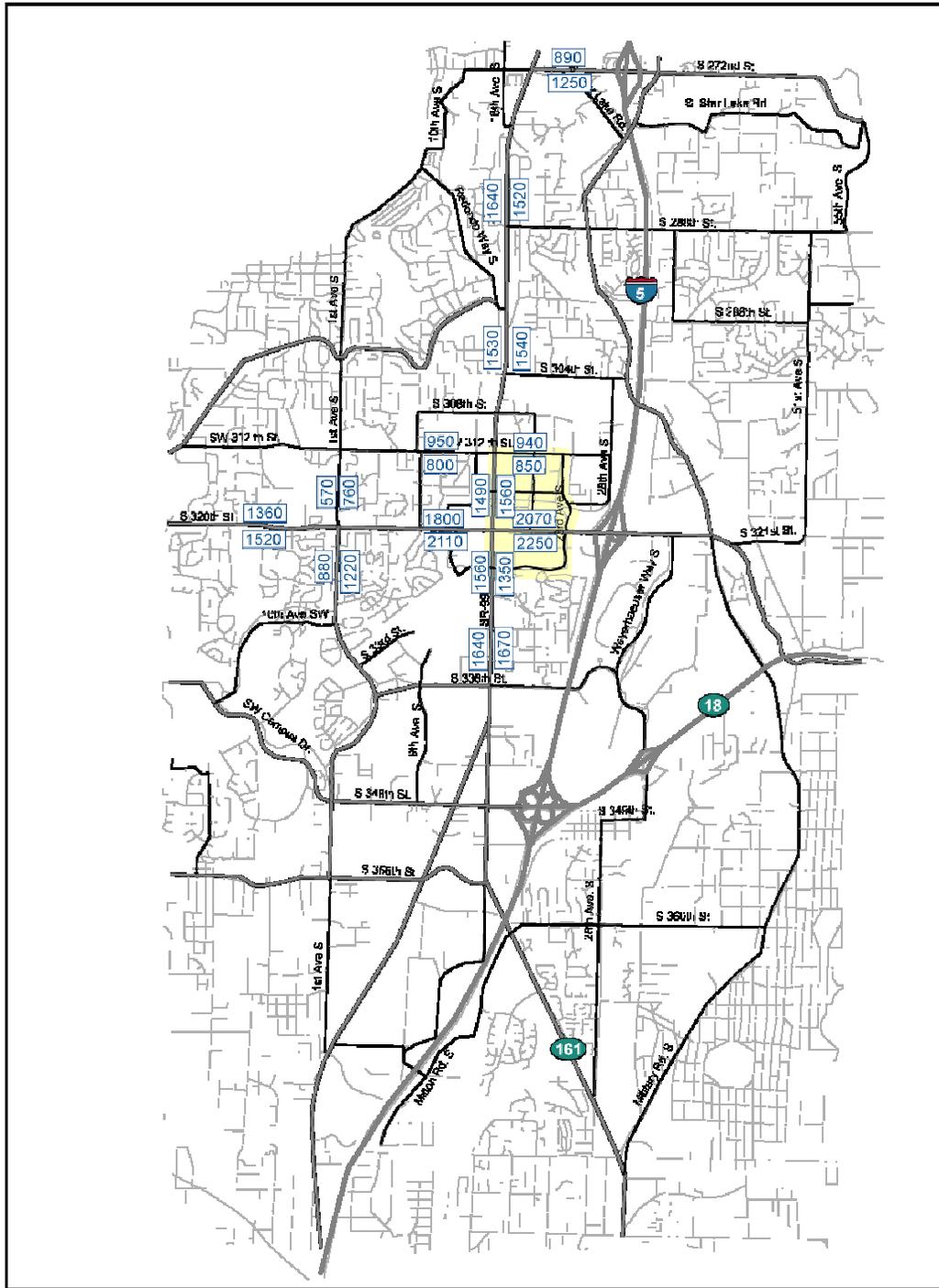
Trip Distribution and Assignment

Trip distribution and assignment were assumed to remain similar to 2009. The PM peak hour distribution was calculated using the EMME/2 model. The AM and Saturday trip distribution used the 2009 distribution of trips to assign the 2014 traffic growth on the network.

2014 No Action Traffic Volumes

Figures 28 to 30 show the expected 2014 traffic volumes on selected roadways for the No Action Alternative (Alternative 3) for the PM, AM and Saturday peak hours. The volumes indicate higher traffic levels on area streets and roadways that may result in increased congestion at major intersections.

The majority of traffic growth would be from 2009-2014 background growth associated with regional traffic and future development not associated with the FWCC. The FWCC No Action alternative adds only low levels of traffic to area roadways. Based on the trip generation, approximately 420 new PM peak hour trips would be added to area roadways. Impacts from the FWCC planning area are generally low, with the added 2009-2014 FWCC traffic growth accounting for less than 5% of traffic volumes at intersections.



City Center
 600 Volume



Figure 30. 2014 Volumes – Saturday Peak Hour – No Action



2014 Alternative 1 Traffic Volumes

Figures 31 to 33 show the expected 2014 traffic volumes on selected roadways for the Alternative 1 during the PM, AM and Saturday peak hours. Because the land uses are concentrated along the S 320 Street corridor, the project trips generated for Alternative 1 would impact primarily intersections along this corridor.

PM Peak Hour

During the PM peak hour, the primary impact of Alternative 1 would be on roadways near and within the FWCC planning area. During the PM peak hour, the alternative would add nearly 2,400 total trips to area roadways, concentrated on S 320 Street and Pacific Highway S. The following intersections would be impacted by the alternative:

- S 320 St & Pacific Hwy S (1260 additional trips)
- S 336 St & Pacific Hwy S (910 additional trips)
- S 348th St & Pacific Hwy S (870 additional trips)
- S 324 St & Pacific Hwy S (780 additional trips)
- S 320 St & Military Rd S (750 additional trips)
- S 320 St & 23 Av S (740 additional trips)

AM Peak Hour

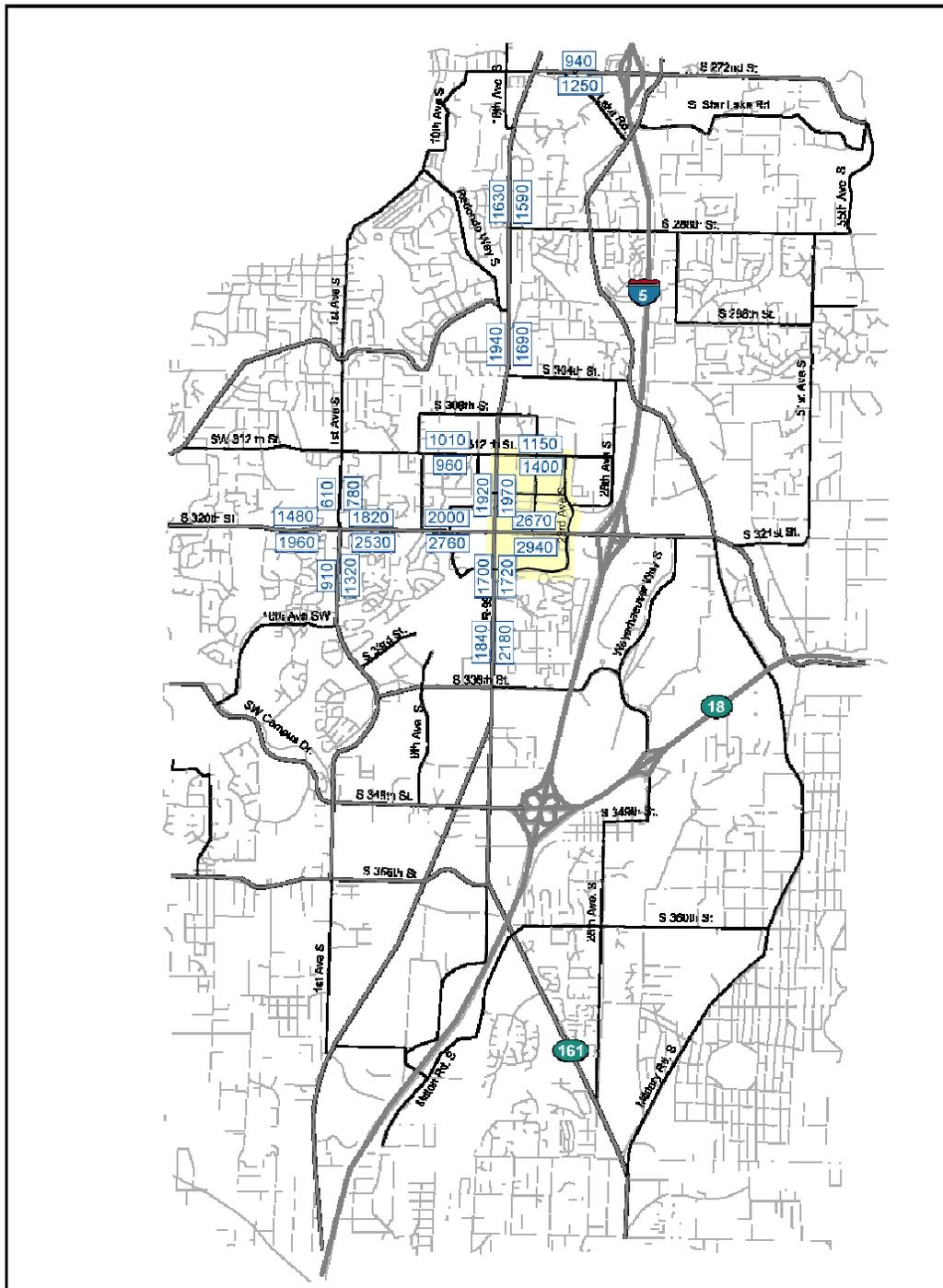
During the AM peak hour, Alternative 1 volumes would be on roadways near and within the FWCC planning area. During the AM peak hour, nearly 1,100 trips to area roadways would be added, concentrated on roads near the FWCC, especially on S 320 Street. Intersections that would see the greatest impact from the alternative would be:

- S 320 St & I-5 southbound - 320 Ramp (510 additional trips)
- S 320 St & 1 Av S (380 additional trips)
- S 336 St & Pacific Hwy S (370 additional trips)
- S 272 St & Pacific Highway S (340 additional trips)

Saturday Peak Hour

Alternative 1 would add 2,500 trips to area roadways, mainly within and adjacent to the FWCC. The following intersections would see the greatest impact from the alternative during the Saturday peak hour:

- S 320 St & Pacific Hwy S (1370 additional trips)
- S 320 St & 20 Av S (1220 additional trips)
- S 320 St & 23 Av S (980 additional trips)
- S 312 St & Pacific Hwy S (910 additional trips)
- S 320 St & I-5 southbound - 320 Ramp (870 additional trips)
- S 316 St & Pacific Hwy S (850 additional trips)



City Center
 600 Volume



Figure 33. 2014 Volumes – Saturday Peak Hour – Alternative 1



2014 Alternative 2 Traffic Volumes

Figures 34 to 36 show the expected 2014 traffic volumes on selected roadways for the Alternative 2 for the PM, AM and Saturday peak hours. The project trips generated for Alternative 2 are assumed identical to Alternative 1, but assume that development is spread throughout the FWCC area.

PM Peak Hour

During the PM peak hour, the primary impact of Alternative 2 would be on roadways near and within the FWCC planning area. During the PM peak hour, the alternative would add nearly 2,400 trips to area roadways, concentrated on roads near the FWCC. The following intersections would see the greatest impact from the alternative:

- S 320 St & Pacific Hwy S (1180 additional trips)
- S 336 St & Pacific Hwy S (880 additional trips)
- S 348th St & Pacific Hwy S (860 additional trips)
- S 324 St & Pacific Hwy S (740 additional trips)
- S 320 St & Military Rd S (700 additional trips)
- S 320 St & 23 Av S (670 additional trips)

AM Peak Hour

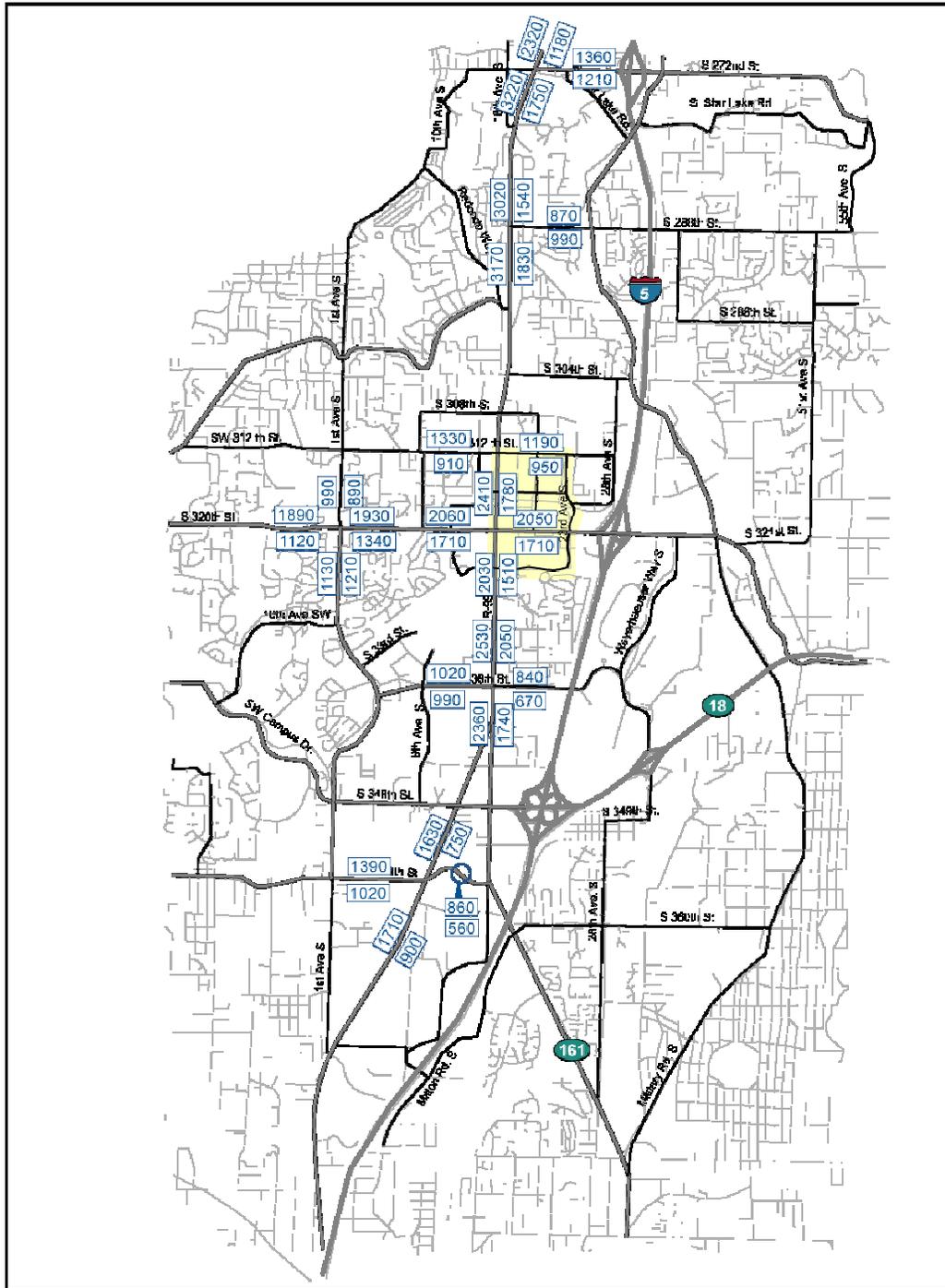
During the AM peak hour, Alternative 2 volumes would be on roadways near and within the FWCC planning area. During the AM peak hour, the alternative would add nearly 1,100 trips to area roadways, concentrated on roads near the FWCC. Intersections that would see the greatest impact from the alternative would be:

- S 320 St & I-5 southbound - 320 Ramp (520 additional trips)
- S 320 St & 1 Av S (380 additional trips)
- S 336 St & Pacific Hwy S (370 additional trips)
- S 272 St & Pacific Highway S (340 additional trips)

Saturday Peak Hour

Alternative 2 would add 2,500 trips to area roadways, mainly within and adjacent to the FWCC. The following intersections would see the greatest impact from the alternative during the Saturday peak hour:

- S 320 St & Pacific Hwy S (1370 additional trips)
- S 320 St & 20 Av S (1160 additional trips)
- S 320 St & 23 Av S (1010 additional trips)
- S 320 St & I-5 southbound - 320 Ramp (910 additional trips)
- S 312 St & Pacific Hwy S (890 additional trips)
- S 316 St & Pacific Hwy S (880 additional trips)

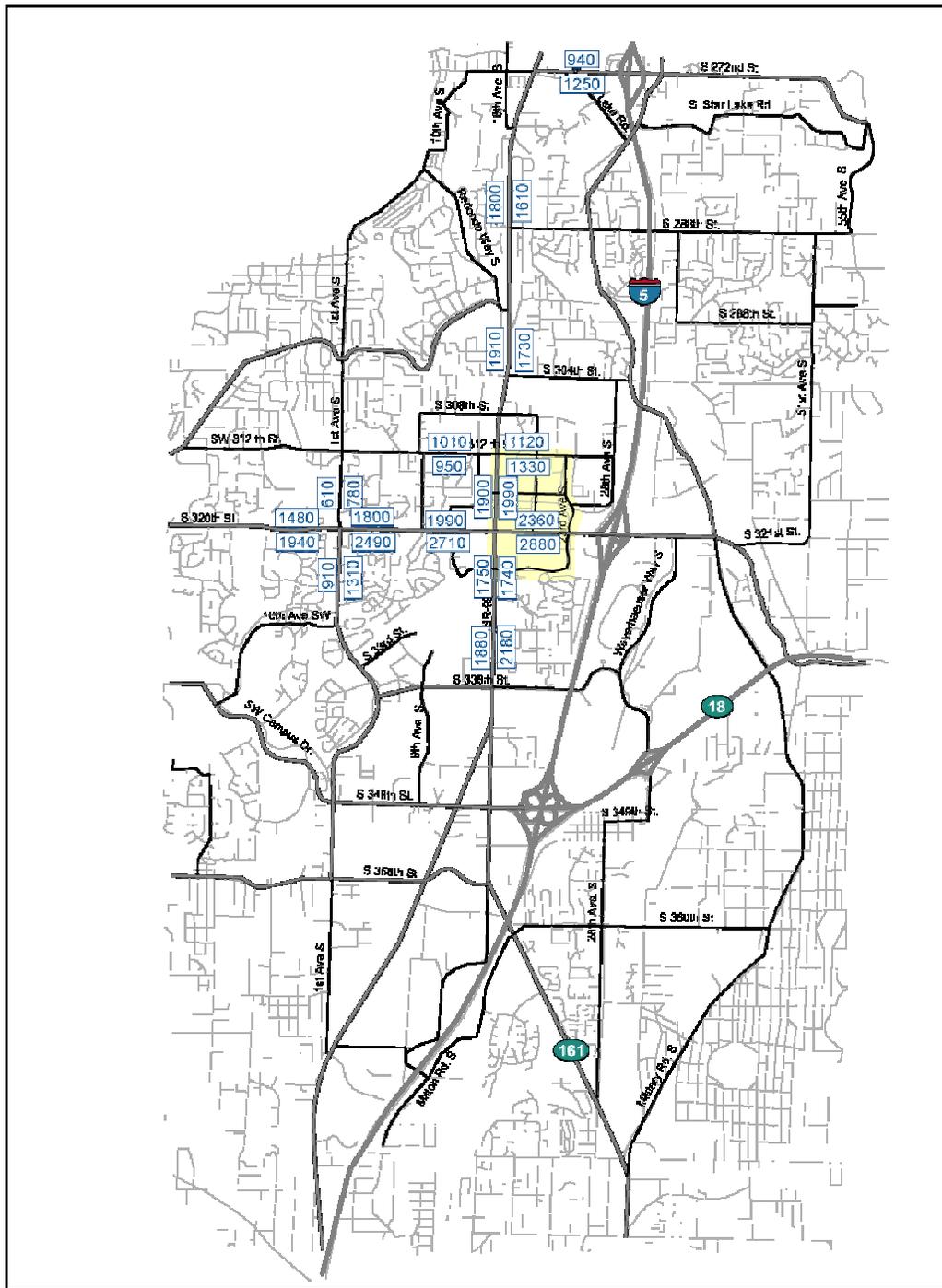


City Center
600 Volume



Figure 34. 2014 Volumes – PM Peak Hour – Alternative 2





City Center
 Volume



Figure 36. 2014 Volumes – Saturday Peak Hour – Alternative 2



Mitigation

Mitigation for the FWCC project identifies the actions necessary to meet the City's LOS threshold for study intersections. The mitigation in this section is divided into PM Peak, AM Peak, and Saturday peak hours to isolate the impacts of each of these intersection locations. The specific level of mitigation necessary for any particular future development project will be determined during the City's project review and based on an analysis of site access. However, only mitigation measures included in this EIS and incorporated into the City Council-approved Planned Action Ordinance will be required to address off-site impacts. The specific dollar amount of any required mitigation contribution will be on the basis of proportional impacts at rates to be determined by City Council. All mitigation measures suggested in this report are subject to the review and approval of City staff and the Federal Way City Council.

Mitigation Cost Assumptions

The following assumptions were used to estimate the costs of mitigation improvements. For purposes of this analysis, costs were factored using a 3.0% annual growth rate to estimate 2009 costs.

Table 27. Mitigation Cost Assumptions

Improvement	2009 \$
Construction	
1. Widening in City Center or on state highways	\$89/SF
2. Widening in other commercial zones	\$76/SF
3. Widening elsewhere	\$63/SF
4. Shoulder widening	\$13/SF
5. Lighting	\$66/LF
6. Signal Pole Relocation	\$69,000/EA
7. Retaining Wall	\$127/SF
8. New Signal	\$228,000/EA
9. Mobilization	8.0% of construction
Right of Way	
1. Right of way	\$44/SF
2. Parcel purchase	Market Value
3. Parking stalls loss	\$5,000/EA
Project Development	
1. Permitting	5% of construction
2. Contingency	30% of construction
3. Design	25% of construction
4. Construction Eng	15% of construction
5. Stormwater	20% of construction

Costs estimates developed in consultation with the City of Federal Way Department of Public Works. 2004 to 2009 assumed 3% annual growth factor for the cost for construction and materials.

Mitigation Improvements

Mitigation improvements for this study were based on projects identified by the City through their capital improvement planning process and other area planning projects.

Sources of mitigation improvements for the intersections include:

- *2009-2020 Capital Improvement Plan (CIP)*
- *2030 City Center Access Study (2005) – Traffic Systems Management (TSM) Projects*

Other mitigation improvements were based on the results of the LOS analysis. These improvements include: signal optimization and addition of turn lanes. All mitigation improvements were identified for feasibility and reviewed by City staff.

In some cases, mitigation actions may not be feasible, reasonable, or desirable. In these cases, mitigation may require changes in current policies or result in undesired consequences, such as long vehicle delays or pedestrians access issues. While there may be actions that could bring an intersection to the City's LOS threshold, investigation of these mitigation actions fall outside the scope of this analysis and would require policy changes by the City or State to implement. Examples of these types of mitigation include:

- The cycle length to extend beyond a 120 second cycle
- Relocation or removal of businesses
- Triple turn lanes at major intersections
- Additional through lanes on a major thoroughfare
- Conversion of HOV lanes to be used for general purpose travel on Saturdays
- Limits on turning movements at an intersection (no left turn)
- Development of parallel travel routes
- Changes to physical topography

All mitigation measures suggested in this report are recommended actions, subject to the review and approval of City staff, and adoption by City Council.

Comparison of Alternatives

The following section provides a comparison of the mitigation needed for the No Action and Action alternatives. For each study period, mitigation improvements are provided along with an estimated 2009 cost. Costs indicated reflect costs calculated in the 2009-2020 Capital Improvement Plan or were estimated based on the project cost assumptions provided by the City. Estimated costs include right-of-way purchases necessary to develop the roadway to meet the *City of Federal Way Comprehensive*

Plan (2003 revision, Chapter 3) Planned Street Sections (Figure III-3). All costs represent the cost of construction, right-of-way acquisition, and design and engineering. The costs do not include environmental mitigation, utility improvements or relocation, or financing.

The mitigation for Alternatives 1 and 2 represents improvements that are needed, in addition, to the No Action (Alternative 3) improvements.

PM Peak Hour

For the PM peak hour, improvements would be needed to meet the City’s LOS standard for the No Action alternative. Optimization of signal timing is assumed to occur as part of future City signal coordination activities. No further improvements are required during the PM peak hour for Alternative 1 and 2. Table 28 indicates the PM peak hour improvements identified for the three alternatives.

Table 28. PM Peak Hour 2009 Mitigation

ID	Intersection	Improvement	2009 Cost (\$ x1000)
PM Alternative 3 – No Action			
8	S 312 St & Pacific Hwy S	Add 2nd northbound left turn lane (CIP 01-05)	\$ 2,080 ^a
21	S 336 St & Pacific Hwy S	Optimize signal timing	0
		Alternative 3 Total	\$ 2,080
PM Alternative 1 – Additional Mitigation^b			
8	S 312 St & Pacific Hwy S	No Additional Improvements Required ^b	0
21	S 336 St & Pacific Hwy S	No Additional Improvements Required ^b	0
		Alternative 1 Additional Mitigation^b	\$ 0
PM Alternative 2 – Additional Mitigation^b			
8	S 312 St & Pacific Hwy S	No Additional Improvements Required ^b	0
21	S 336 St & Pacific Hwy S	No Additional Improvements Required ^b	0
		Alternative 2 Additional Mitigation^b	\$ 0

^a Estimate provided by the City of Federal Way factored to 2009.

^b In addition, No Action (Alternative 3) mitigation improvements would be required for this alternative.

The final mitigation improvements for the FWCC would be reviewed and adopted by City Council. As identified in this study, Alternatives 1 and 2 would require no additional mitigation over actions needed for the No Action alternative. The No Action mitigation would be approximately \$2.1 million. FWCC development may be required to fund a proportional share of the No Action Alternative improvements.

AM Peak Hour

As shown in Table 29, no additional mitigation is required for the AM peak hour, assuming the completion of the PM peak hour mitigation indicated in Table 28.

Table 29. AM Peak Hour 2009 Mitigation

ID	Intersection	Improvement	2009 Cost (\$x1000)
AM Alternative 3 Mitigation			
	No mitigation required		
		Alternative 3 Total	\$ 0
AM Alternative 1 Additional Mitigation			
	No mitigation required		
		Alternative 1 Additional Mitigation	\$ 0
AM Alternative 2 Additional Mitigation			
	No mitigation required		
		Alternative 2 Additional Mitigation	\$ 0

Saturday Peak Hour

Table 30 lists the Saturday peak hour mitigation improvements. The City's *Guidelines for the Preparation of Transportation Impact Analyses (June 2004)* does not specifically address mitigation for the Saturday peak hour. The City Council would need to make a policy decision on whether the Guidelines apply to time periods outside of the PM peak hour. Assuming mitigation is necessary, the identified improvements for the FWCC would be reviewed and adopted by City Council. As identified in this study, the Saturday peak hour analysis assumes the completion of the PM peak hour improvements indicated above.

Tables 28-30 indicate planning level cost estimates for roadway improvements and right-of-way acquisition to meet the City of Federal Way's Planned Street Sections described in the *City of Federal Way Comprehensive Plan (2003 revision, Chapter 3)*. In some cases, right-of-way acquisition is minor, with impacts to a small portion of undeveloped parcels. In others, acquiring the right-of-way may result in a full parcel takes as the acquisition would adversely impact the existing business. Final determination of the need for full parcel takes will depend on the benefit of the improvement, the ability to deviate from the City Planned Street Section, and consideration of alternatives such as centerline relocation and other planned roadway improvement projects.

Most of the Saturday mitigation would be required for the No Action alternative. Two options are provided for construction of the northbound right turn lane at S. 320th Street and 20th Avenue S intersection. The first option relocates a proposed sidewalk to the west of a future but permitted building, eliminating the need for a full building take. The second option purchases the building and constructs the sidewalk within the roadway right-of-way. The difference between the two options is estimated at \$2.6 million. The

range of costs for the No Action alternative would be approximately \$2.5 million to \$5.2 million. Alternatives 1 and 2 would require \$3.2 million of additional improvements amounting to a total (including Alternative 3) of approximately \$5.7-\$8.4 million.

Table 30. Saturday Peak Hour 2009 Mitigation

ID	Intersection	Improvement	2009 Cost (\$x1000)
Saturday Alternative 3 Mitigation			
14	S 320 St & 20 Av S	Northbound right turn lane (TSM 2) Option 1	521
		Northbound right turn lane (TSM 2) Option 2	3,170
		Southbound right turn lane	1,029
15	S 320 St & 23 Av S	Second northbound right turn lane. (TSM 3)	1,003
Alternative 3 Total			\$ 2,553-5,202
Saturday Alternative 1 Additional Mitigation*			
10	S 316 St & Pacific Hwy S	Eastbound right turn lane (TSM 12)	\$ 717
13	S 320 St & Pacific Hwy S	Northbound right turn lane	729
14	S 320 St & 20 Av S	No Additional Improvements Required	0
15	S 320 St & 23 Av S	Westbound right turn lane	1,737
Alternative 1 Additional Mitigation*			\$ 3,183
Saturday Alternative 2 Additional Mitigation*			
10	S 316 St & Pacific Hwy S	Eastbound right turn lane (TSM 12)	\$ 717
13	S 320 St & Pacific Hwy S	Northbound right turn lane	729
14	S 320 St & 20 Av S	No Additional Improvements Required	0
15	S 320 St & 23 Av S	Westbound right turn lane	1,737
Alternative 2 Additional Mitigation*			\$ 3,183

*In addition, No Action (Alternative 3) mitigation improvements would be required for this alternative.

Timing of Implementation

Mitigation improvements for the area will depend on the location and rate of development within the FWCC. In addition, the timing of projects will depend also on the whether Saturday projects will be mitigated to the PM Peak hour thresholds. PM peak hour improvements are the highest priority, because Saturday and AM peak hour analyses assumed the completion of the PM peak hour projects.

All projects identified for the selected FWCC alternative will be needed by 2010 to meet the City's transportation threshold for the expected level of development. Table 31 shows the expected intersection operations after completion activities. With the improvements, intersections within the jurisdiction of the City of Federal Way will meet the LOS E and less than 1.0 volume-to-capacity threshold.

Table 31. Intersection Operations by Peak Hour with Mitigation

PM PEAK		Alternative 3		Alternative 1		Alternative 2	
		Mitigated		Mitigated		Mitigated	
ID	Intersection	LOS	v/c	LOS	v/c	LOS	v/c
1	S 272 St & Pacific Hwy S	F	1.10 ^{1,3}	F	1.09 ^{1,3}	F	1.09 ^{1,3}
2	S 272 St & I-5 southbound Ramp	F	1.02 ^{1,3}	F	1.00 ^{1,3}	F	1.00 ^{1,3}
4	S 272 St & Military Rd S	F	1.24 ^{1,3}	F	1.22 ^{1,3}	F	1.22 ^{1,3}
8	S 312 St & Pacific Hwy S	D	0.95	D	0.95	D	0.95
21	S 336 St & Pacific Hwy S	D	0.92	D	0.93	D	0.93

AM PEAK		Alternative 3		Alternative 1		Alternative 2	
		Mitigated		Mitigated		Mitigated	
ID	Intersection	LOS	v/c	LOS	v/c	LOS	v/c
3	S. 272 St & I-5 northbound Ramp (WSDOT)	E	1.08 ^{1,3}	E	1.09 ^{1,3}	E	1.09 ^{1,3}
4	S. 272 St & Military Rd S (City of Kent)	F	1.09 ^{1,3}	F	1.10 ^{1,3}	F	1.10 ^{1,3}

SATURDAY PEAK		Alternative 3		Alternative 1		Alternative 2	
		Mitigated		Mitigated		Mitigated	
ID	Intersection	LOS	v/c	LOS	v/c	LOS	v/c
10	S 316 St & Pacific Hwy S	-- ²	-- ²	D	0.92	C	0.92
13	S 320 St & Pacific Hwy S	-- ²	-- ²	E	0.96	E	0.94 ¹
14	S 320 St & 20 Av S	D	0.95	D	0.99	D	0.99
15	S 320 St & 23 Av S	E	0.92 ¹	E	0.92	E	0.93

1. Results from HCM2000 Signals (version 4.1f)
2. Meets City's threshold without mitigation
3. Does not trigger other jurisdictions threshold for mitigation

Additional Mitigation

The mitigation identified in this analysis is focused on the roadway improvements necessary to meet the expected travel demand on area roadways associated with the proposed development in the project area. Development will also need to meet the requirements of applicable codes at the time of application. Such requirements might include the dedication of right-of-way, installing curbs gutters and sidewalks, drainage improvements, and other requirements of the City. Additional mitigation may be required for individual development applications within the project area in order to reduce area traffic impacts or improve on-site circulation and to meet City and State requirements for Commute Trip Reduction and Transportation Demand Management. Actions to be considered include:

On-site improvements – Driveway and circulation actions to minimize impact on area roadways. Actions may include management of access points, traffic control measures, construction of internal roadways, pedestrian and bicycle improvements, and connections to adjacent developments.

Non Motorized mode improvements – Mitigation may be required per site specific and land use development proposals to address pedestrian, bicycle, and transit improvements to support the plans, policies, and goals as noted within the *City of*

Federal Way Comprehensive Plan City Center Element (2002, Chapter 7) and Transportation Element (2003, Chapter 3).

Grid Roadway Development – Part of the City Center Plan is to develop a number of internal roadways (see Figure 11 in Appendix 2) to create smaller blocks that will improve the grid network and improve the access for pedestrians and vehicles. Right-of-way dedication and street improvements shall be a component of the development submittal phase of a proposed project within the project area. Roadways within the project area must meet specific “City Center” design standards as specified in the Transportation Element (Chapter 3) of the *City of Federal Way Comprehensive Plan* (2003 revision, Figure III-3)

Right-of-way Dedication – Right-of-way dedication and frontage improvements may be required in conjunction with proposed developments. Roadways within the project area must meet specific “City Center” design standards as specified in the Transportation Element (Chapter 3) of the *City of Federal Way Comprehensive Plan* (2003 revision, Figure III-3).

Transportation Demand Management (TDM) – TDM actions can be used to reduce the impact of the project and as a mitigation action. These actions may include provision of transit passes to tenants and employees, ridesharing programs, priority carpool parking, and guaranteed ride home programs. TDM actions are designed to primarily address commute trips and may not be applicable as mitigation for all developments.

Table III-13 (page 60) of the *City of Federal Way Comprehensive Plan (2003 revision, Chapter 3, Transportation Element)* stratifies various TDM alternatives by their functional grouping and potential effectiveness, implementation difficulties, and expected cost effectiveness. These strategies include: Telecommuting, Parking Pricing and Subsidy Removal, Compressed Work Week, Employer-Based Management, and Parking Supply Strategies.

Based upon the above, the following are a list of recommended mitigation measures that can be considered in conjunction with individual development projects within the project area:

1. Encourage voluntary expansion of the CTR Program to employers of less than 100 employees. The encouragement by employers may be as diverse as subsidized bus passes, car pool space priority, bike racks, shower facilities, van pools, car pool information access, telecommuting, variable work hours, etc.
2. Encourage the formation and expansion of area-wide ride-sharing programs. Such programs operate with little direct cost to the City and are highly cost-effective.
3. Support the enhancement of Park and Ride facilities and transit centers to supplement the regional system, either directly through physical development or enhancements or indirectly through development conditions where employer vans are required to shuttle employees to Park and Ride facilities or transit centers.

4. Facilitate enhancements to the HOV system. This may include the dedication of property for HOV lanes, construction of arterial HOV lanes within existing City ROW, and priority treatments for buses at traffic signals. At the very least, where feasible, opportunities to enhance access to the State system of HOV lanes should be considered.
5. Achieve increased densities and mix of uses to support public transportation, decrease trip generation and parking impacts.
6. Encourage facilities (shelters, loading spaces, etc) to accommodate City Center shuttle service in association with development projects, together with enhanced pedestrian and bicycle access and security.
7. Improve pedestrian and bicycle access to bus routes and transit centers. This can be a requirement of subdivision, development, and redevelopment. The City may need to acquire easements and construct trail connections. Development incentives could be granted for providing such amenities that are pedestrian, bike, and transit friendly. While bicycle, pedestrian, and bus transit services and facilities may be desirable for other reasons; they should not be looked on as highly cost-effective strategies to the exclusion of those actions listed above.

Neighborhood Traffic Control – Development within the project area may be required to include actions to reduce the impact of cut through traffic on residential areas. Examples of neighborhood traffic control actions include: turn restrictions, speed controls, traffic enforcement, and parking restrictions.

The following mitigation recommended shall support the following *City of Federal Way Comprehensive Plan* (2003 revision) Transportation Element (Chapter 3):

Minimize through traffic on residential streets by maximizing through travel opportunities on arterial and collector streets.

Employ traffic calming measures in neighborhoods (where feasible) where traffic volumes and speeds on local streets consistently exceed reasonable levels.

Improve safety on residential streets by:

- a. Reducing street widths while maintaining on-street parking.
- b. Increasing separation between sidewalks and streets.
- c. Reducing design speeds to discourage speeding.
- d. Limiting the length of straight streets to discourage speeding.
- e. Discouraging the use of four-legged intersections.

Keep through traffic to state routes and arterials. Discourage the use of local or neighborhood streets for through movements (unless part of an overall process of creating a street grid).

Parking – Mitigation actions that reduce the parking requirements within the project area should be encouraged. Examples include shared parking, employee parking programs, parking time restrictions, paid parking programs. Shared parking strategies focus on looking at opportunities where adjacent uses have parking demand profiles that can support the sharing of a smaller amount of parking spaces. For example, an office building with an 8 AM to 5 PM demand could share its parking with evening dominated uses such as restaurants, or a cinema. A parking demand study, which shows the hourly parking demand profiles for adjacent uses and the potential for joint parking opportunities within a mixed-use development, can be used to reduce the number of parking spaces.

In addition, contained in the above TDM mitigation are strategies that overlap with parking mitigation plans for development. A development may propose a plan and management system to the City for approval upon submittal of the development permit. Those items may contain the following in support of the City of Federal Way and state Commute Trip Reduction (CTR) requirements:

ALTERNATIVE MODE SUPPORT MEASURES

Public education and promotion may increase the effectiveness of these other strategies up to 3%.

Area-wide Ride matching Services – May result in a 0.1-3.6% reduction in vehicle miles traveled (VMT) and an up to 2.5% VMT reduction in transit services. Reductions in parking required may be calculated on the basis of these lower trip-generation rates.

Vanpool Service – May result in an up to 8.3% in commute VMT, as well as a reduction in transit and vanpool fares up to 2.5%. Reductions in parking required may be calculated on the basis of these lower trip-generation rates.

Non-Motorized Modes plan and implementation – May result in an up to 0-2% regional VMT reduction. Reductions in parking required may be calculated on the basis of these lower trip-generation rates.

HOV Facilities – May result in an up to 1.5% VMT reduction and 0.2% vehicle trip reduction. Reductions in parking required may be calculated on the basis of these lower trip-generation rates.

On site development of Park and Ride program – May result in up to 0-0.5% VMT reduction. Reductions in parking required may be calculated on the basis of these lower trip-generation rates.

EMPLOYER-BASED TDM MEASURES

Parking mitigation -- Monetary incentives may result in an up to 8-18% trip reduction at site. Reductions in parking required may be calculated on the basis of these lower trip-generation rates.

Alternative Work Schedules – May result in as much as a 1% regional VMT reduction. Reductions in parking required may be calculated on the basis of these lower trip-generation rates.

Commute Support Programs – May result in up to 0.1-2.0% regional VMT reduction. Reductions in parking required may be calculated on the basis of these lower trip-generation rates.

Parking Management – May result in up to a 20 to 30% reduction in SOV trips to/from the site. Reductions in parking required may be calculated on the basis of these lower trip-generation rates.

Telecommuting – Up to 10% commute VMT reduction. Reductions in parking required may be calculated on the basis of these lower trip-generation rates.

OTHER STRATEGIES

Parking Tax – May result in up to a 1 to 5% reduction in regional VMT and trip generation, but requires City Council and/or legislative action. Reductions in parking required may be calculated on the basis of these lower trip-generation rates.

Development Parking Impact Mitigation – Requires Council approval to allow for payment of parking-mitigation funds towards long term investments in structured parking solutions in lieu of full parking requirement. Reductions in parking required may be calculated on the basis of these lower trip-generation rates.

Mixed Land Use/Jobs Housing Balance – May result in VMT reductions up to 10%. Parking stall credit is given based on overlapping shared usage of mixed facility, per City Code provisions.

Transit-Oriented and Pedestrian-Friendly Design – Site and building design that encourages transit usage and/or walking may reduce overall parking requirement. Requires design review and staff approval.

Employment Center Density - Achievement of sufficient density within the City Center to constitute a regional employment center may reduce SOV work trips to individual development projects by up to 50%. Parking stall reductions may also apply to developments.

Other Parking Management Plans – May mitigate 1 to 5% region-wide VMT, provided enforcement issues are addressed in the mitigation plan.