

APPENDIX C

Transportation Section,

Chambers Creek Property Master Plan Update

Final SEIS

2.7 TRANSPORTATION

Transportation analysis was performed for the proposed MSP update using forecasts of potential site-generated traffic and future background traffic on nearby roadways. The purpose of the analysis is to provide information about the relative transportation impacts of the various land use components and the cumulative impact of all proposed uses. The analysis focuses on trip generation and trip characteristics of each land use component.

2.7.1 Affected Environment

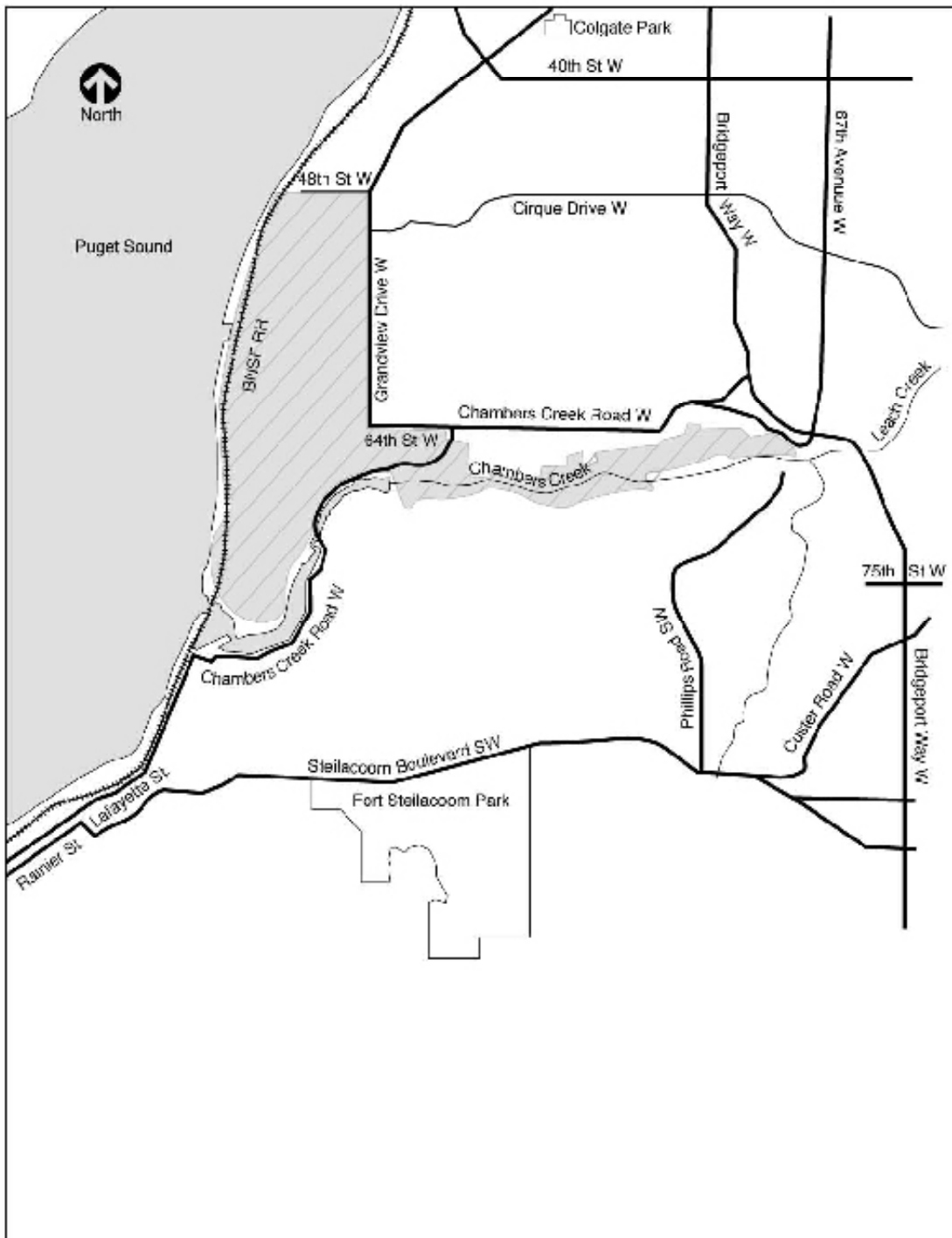
The study area for the transportation analysis is shown in Figure 6.

Roadway Network

64th Street W/Chambers Creek Road/Chambers Lane W is an east-west roadway that provides access from Bridgeport Way W, west to the Chambers Creek Properties and Puget Sound. Between Grandview Drive W and the T-intersection at Chambers Creek Road W, 64th Street W has one lane in each direction with bike lanes on both sides. It has a raised center landscaped median and curb and gutter with sidewalks on both sides. East of this three-legged intersection, the street is called Chambers Creek Road W and has one lane in each direction but no bike lanes. The median is a two-way-left-turn lane with occasional raised islands. The edges are rolled asphalt curb and gutter with gravel shoulders on both sides. Further east the roadway becomes Chambers Lane W where Chambers Creek Road W bends south toward 67th Avenue W. Chambers Lane W has the same lane configuration and edge treatments as Chambers Creek Road. At the T-intersection with 64th Street W, Chambers Creek Road W extends south toward Steilacoom.

Grandview Drive W is a north-south collector arterial that provides access along the western edge of the City of University Place. It connects southwest Tacoma to the Chambers Creek area and provides access to a number of residential neighborhoods. The roadway has one lane in each direction with bike lanes, curb and gutter with sidewalks on both sides. There is intermittent parallel on-street parking in curb pullouts mostly on the west side of the roadway. The section of Grandview Drive W between Cirque Drive W and 64th Street W has a raised center landscaped median with crosswalks and breaks only at intersections with residential streets. Several of the intersections along this roadway are controlled with 15-mph roundabouts including Cirque Drive W and 62nd Street Court W. The posted speed limit is 35 mph except in a school zone north of 40th Street W and at roundabouts.

Figure 6: Transportation Study Area



Source: Heffron Transportation

Bridgeport Way W is the primary north-south arterial providing access through the City of University Place. It extends south from Tacoma at S 19th Street to the City of Lakewood. The roadway has two lanes in each direction with a variety of median and edge-of-roadway treatments. North of 27th Street W, there is no median and the roadway has curb with intermittent gravel shoulders on both sides. South of 27th Street W, there is a raised landscaped median with left-turn pockets at signalized intersections and curb and gutter with sidewalks on both sides. Signalized crosswalks are located between 35th Street W and 37th Street W and between 37th Street W and 40th Street W, south of Cirque Drive W, there is no two-way-center-turn lane and the edge treatment transitions to rolled asphalt curb and gutter with gravel shoulders. The speed varies from 35 mph north of S 35th Street and between Cirque Drive W and 67th Avenue W, to 30 mph between 35th Street W and Cirque Drive and south of 67th Avenue W. There are also bike lanes on both sides of the roadway between 27th Street W and Cirque Drive W.

Cirque Drive W is a primary east-west arterial through the City of University Place. It provides access from Grandview Drive W near Puget Sound through the City of University Place to South Tacoma where the roadway becomes S 56th Street and connects to Interstate-5 (I-5). Its intersections with Grandview Drive W and Alameda Avenue W are controlled as roundabouts; its intersections with Bridgeport Way W and 67th Avenue W are signalized. The roadway has one lane in each direction with a variety of median and edge conditions. East of 67th Avenue W, the roadway has a center two-way left-turn lane, rolled asphalt curb and gutter with gravel shoulders on the south side; concrete curb and gutter with sidewalk on the north side; and bike lanes on both sides. West of 67th Avenue W to Bridgeport Way W, there is concrete curb and gutter with sidewalk on the south side; the sidewalk on the north side is under construction. West of Bridgeport Way W, the center two-way, left-turn lane ends at approximately 83rd Avenue W. The curb and gutter with sidewalk on the south side extends to Sunset Drive W and then transitions to rolled asphalt curb with gravel shoulder. The north side has mostly rolled asphalt curb with a gravel shoulder. At 83rd Avenue W, the pavement widens slightly with approximately 5-foot paved shoulders as well as wider gravel shoulders. At of Bristonwood Drive W, there is a sidewalk on the north side and the paved shoulders are painted as bike lanes. The posted speed limit is 35 mph.

67th Avenue W is a north-south arterial that provides access through the City of University Place north to the City of Fircrest. It ends at Bridgeport Way W to the south near the City of Lakewood. North of Bridgeport Way W, the roadway has two northbound lanes and one southbound lane, and then transitions to one lane in each direction. The center median alternates with a two-way-left-turn lane and a raised landscaped island with left-turn pockets. A bike lane on the east side begins at 62nd Street W with a bike lane on the west side further north. Near Bridgeport Way W, there is a concrete curb and gutter with sidewalk on both sides. North of about 61st Street W, the edge transitions to rolled asphalt curb and gravel shoulders on both sides. North of Cirque Drive W, the roadway primarily has a center two-way, left-turn lane and a few landscaped median islands. The posted speed limit is 35 mph.

40th Street W is an east-west roadway that connects Grandview Drive W through the City of University Place to the City of Fircrest. The roadway ends in Fircrest at Orchard Street (51st Street W). West of Grandview Drive W, it becomes Olympic Boulevard W and turns to the north. It has one lane in each direction and a posted speed limit of 25 mph. The roadway edge varies with intermittent concrete curb and gutter with sidewalk, rolled asphalt curb, and no curb or shoulder. Between Grandview Drive W and Sunset Drive W, a middle and high school is located on the north side of the roadway. There is a 20 mph school zone and on-street parking is permitted near the school on the north side. Near the schools are three marked crosswalks with overhead flashing signals. Approximately 1/4-mile east of Sunset Drive W, is another marked crosswalk with flashing overhead lights. A center two-way, left-turn lane begins at this location and extends east to Bridgeport Way W.

27th Street W is an east-west roadway that connects Grandview Drive W through the City of University Place to the City of Fircrest. Just west of Fircrest, the roadway becomes Regents Boulevard. It has one lane in each direction with a center two-way, left-turn lane and a posted speed limit of 35 mph. Bike lanes are on both sides between Grandview Drive W and Bridgeport Way W. West of Bridgeport Way W, the roadway has concrete curb and gutter with sidewalk for about one block. West of Louise Street W, it transitions to rolled asphalt curb and gutter with gravel shoulders on both sides.

Traffic Volumes

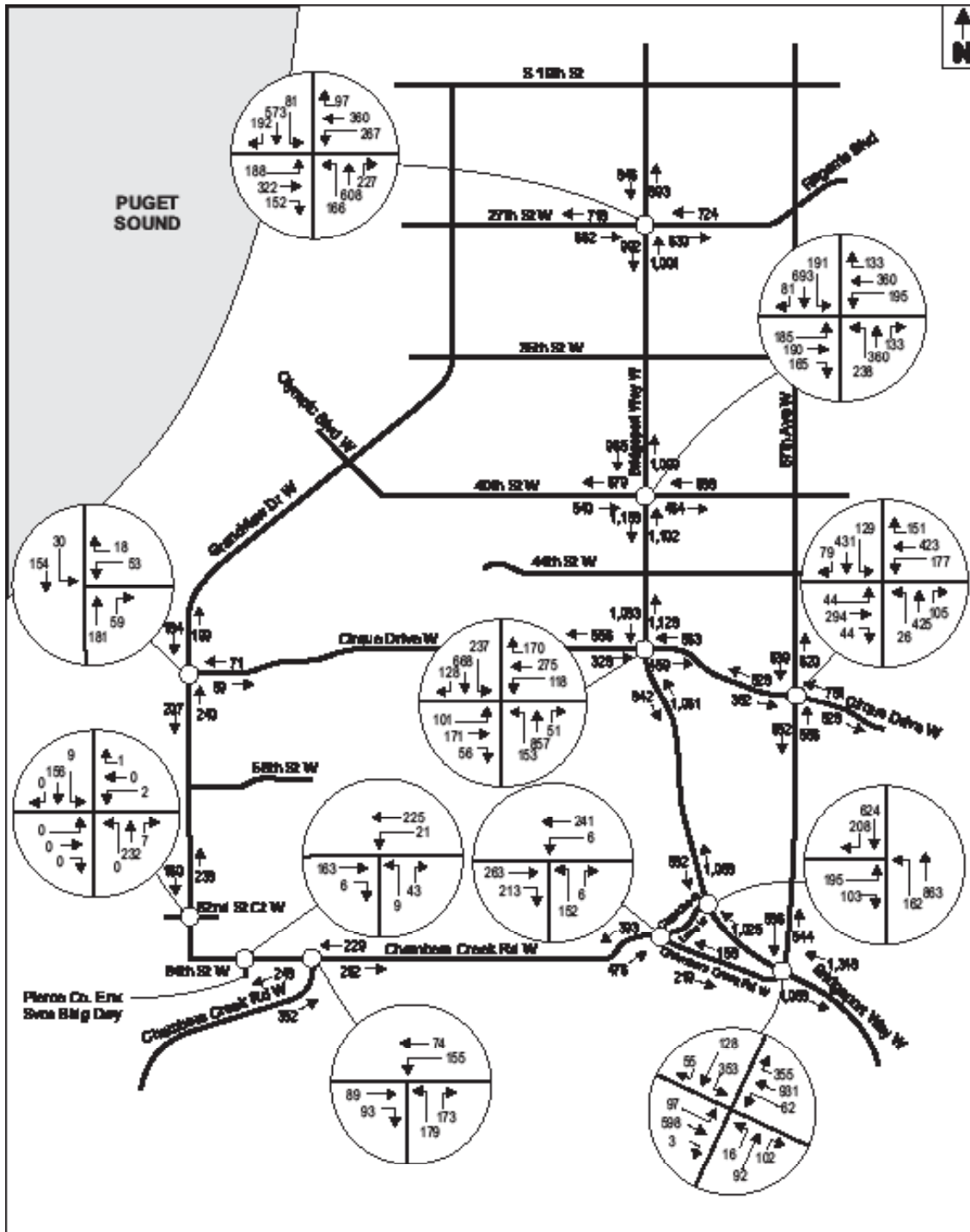
Current traffic volume information was obtained from two sources. Average daily traffic volumes from year 2002 were reported in the *City of University Place Comprehensive Plan* (adopted July 6, 1998, Amended December 6, 2004). Year 2002 average daily traffic volumes for area roadways are summarized in Table 13. Existing weekday PM peak hour traffic volumes were compiled from new PM peak period turning movement counts completed in December 2004. New counts were conducted at eleven study area intersections. A summary of the existing PM peak hour traffic volumes is shown on Figure 7.

Table 13: Year 2002 Average Daily Traffic Volumes

Roadway Segment	Year 2002 Average Daily Traffic Volumes
Chambers Lane southwest of Bridgeport Way	5,946
Chambers Creek Road W northwest of Bridgeport Way W	4,542
Bridgeport Way W southeast of Chambers Lane W	18,439
Bridgeport Way W north of Chambers Lane W	20,338
Bridgeport Way W north of 40th Street W	22,976
Bridgeport Way W south of 27th Street W	21,305
Cirque Drive west of Bridgeport Way	11,013
Cirque Drive east of Grandview Drive	4,694
Cirque Drive east of 67th Avenue W	16,008
Grandview Drive north of Cirque Drive	4,161
Grandview Drive south of Cirque Drive	4,696

Source: *City of University Place Comprehensive Plan* (adopted July 6, 1998, amended December 6, 2004)

Figure 7: Existing PM Peak Hour Traffic Volumes



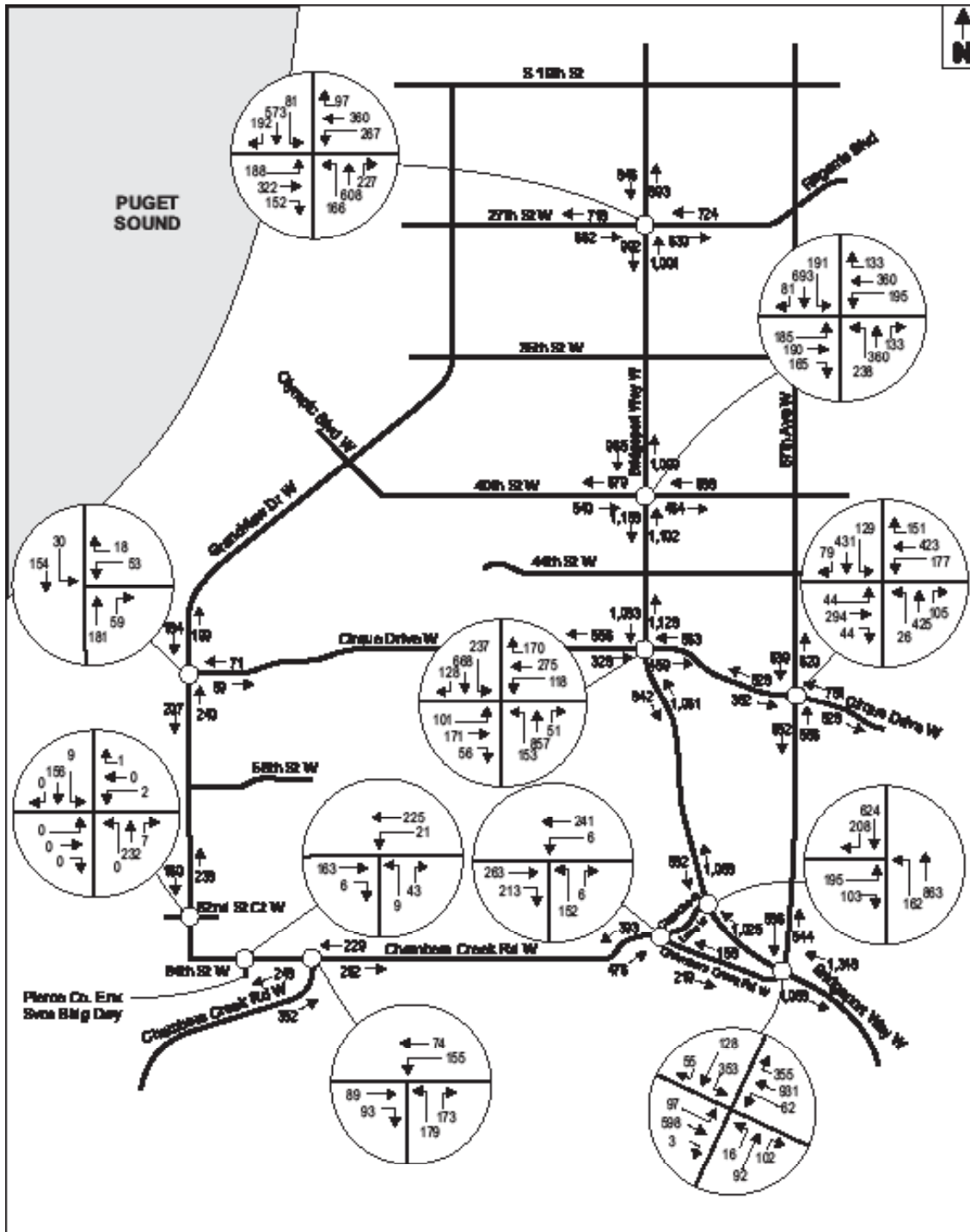
Source: Heffron Transportation

Traffic volumes are expected to grow with increased population and employment. Forecast future traffic volumes throughout the study area were estimated using an annual growth rate combined with estimates of pipeline project traffic provided by City of University Place staff. A compound annual growth rate of 1 percent was applied to the 2002 daily volumes and 2004 PM peak hour traffic volumes. Traffic volumes from proposed developments within the City were then added to the PM peak hour volumes based on traffic assignments and estimates also provided by City of University Place and City of Lakewood staff. Seven pipeline projects were included in the PM peak hour traffic forecasts:

- Lakewood Wal-Mart
- Ketcham Knolls
- UP One Residential Plat
- Covington Glade
- UP Town Center
- Cottages at Peach Creek
- Pemberton Creek

Traffic estimates for the 1997 MSP were added to the 2015 traffic forecasts to represent year 2015 conditions without the MSP update (i.e. future baseline condition). The resulting year 2015 traffic forecasts were used to evaluate traffic operating conditions without the proposed MSP Update. The forecast 2015 PM peak hour traffic volumes without the MSP Update are shown in Figure 8.

Figure 8: Forecast 2015 PM Peak Hour Traffic Volumes—No Action (with Adopted MSP)



Source: Heffron Transportation

Truck Traffic

The commercial mining operations on the Chambers Creek Properties site ceased in December 2003. As a result, the historically high truck volumes in the area along Chambers Creek Road and 64th Street W no longer occur. Recent counts indicate that PM peak period truck volumes along most local-area roadways are typical for residential areas and small cities. Truck volumes along Chambers Lane, 64th Street W and Chambers Creek Road ranged from less than 1% to about 2% of total traffic. Truck volumes on other arterials in the vicinity ranged from less than 1% to about 4%.

Level of Service

The quality of traffic flow is defined by level of service (LOS). This analysis evaluates the proposal's effect on overall roadway capacity to show whether or not new roadways or major widening projects would be needed to accommodate the proposal.

Roadway Level of Service

Level of service criteria for roadway sections is summarized in Table 14. Levels of service for roadway configurations are based on the average daily traffic volume. The volume-to-capacity ratio indicates what portion of the roadway section capacity is used and how much remains for other developments in the study area.

Table 14: Level of Service Criteria for Roadway Sections

Roadway Geometry	Threshold Volume Levels and V/C Ratios						
	Capacity	LOS A	LOS B	LOS C	LOS D	LOS E	LOS F
Volume-to-Capacity Ratio		< 0.24	0.25-0.45	0.46-0.60	0.61-0.75	0.76-1.00	>1.00
Two Lanes	16,000	4,000	6,000	9,000	12,000	16,000	17,500
Three Lanes	20,000	6,500	8,500	12,000	15,000	20,000	22,500
Four Lanes	32,500	12,500	15,000	18,500	25,000	32,500	35,000
Five Lanes	37,000	15,000	17,500	22,500	28,000	37,000	40,000

Sources: JHK & Associates, NCHRP Report 187, *Quick Response Urban Travel Estimation Techniques and Transferable Parameters*, Transportation Research Board, 1978, p.160.
 TRB Circular 212, *Interim Materials on Highway Capacity*, Transportation Research Board, 1980, p.12.
 Australian Road Research Report ARR No. 79, *Signalized Intersections Capacity Guide*, A.J. Miller, 1979, np.

These criteria were used to determine roadway levels of service for the existing conditions and year 2015 conditions with the adopted MSP as shown in Table 15. As shown, all roadways in the site vicinity currently operate at LOS D or better and have some excess capacity to accommodate additional development. By year 2015, background traffic growth as well as traffic generated by the Chambers Creek Properties would use some of this excess capacity. Sections of Bridgeport Way are forecast to degrade to LOS E conditions by year 2015.

Table 15: Daily Level of Service Summary – Existing & Year 2015 with Adopted MSP

Roadway Section	Lanes	Daily Capacity	Existing (2005) Weekday Conditions			Year 2015 With Adopted MSP Conditions		
			ADT ^a	v/c Ratio ^b	LOS ^c	ADT	v/c Ratio	LOS
Grandview Drive								
N/O Cirque Drive	2	16,000	4,290	0.27	B	5,940	0.37	B
S/O Cirque Drive	2	16,000	4,840	0.30	B	7,470	0.47	C
Chambers Creek Road								
S/O 64th Street ^d	2	16,000	6,060	0.38	B	9,130	0.57	C
E/O 64th Street ^d	3	20,000	4,960	0.25	B	10,470	0.52	C
SW/O Chambers Lane ^d	3	20,000	8,780	0.44	B	14,820	0.74	D
SE/O Chambers Lane	2	16,000	4,680	0.29	B	7,070	0.44	B
Cirque Drive								
E/O Grandview Drive	2	16,000	4,840	0.30	B	6,510	0.41	B
W/O Bridgeport Way	3	20,000	11,350	0.57	C	13,900	0.70	D
W/O 67th Avenue W	4	32,500	11,150	0.34	B	14,390	0.44	B
Bridgeport Way								
N/O Cirque Drive W	5	37,000	24,220	0.65	D	30,070	0.81	E
S/O Cirque Drive W	5	37,000	22,700	0.61	D	29,030	0.78	E
S/O Chambers Lane W	5	37,000	19,000	0.51	C	22,370	0.60	C
N/O W 75th Street	5	37,000	26,830	0.73	D	33,100	0.89	E
Chambers Lane W								
SW/O Bridgeport Way	2	16,000	6,130	0.38	B	10,110	0.63	D

a ADT = Average Daily Traffic Volume estimated for 2005 using 2002 counts by City of University Place and 1% annual growth rate.

b v/c Ratio = Volume-to-Capacity Ratio

c LOS = Level of Service

d ADT estimated from 2004 PM peak hour volumes using factor of 10.

N/O "North of"

Source: Heffron Transportation, Inc., 2005

Intersection Level of Service

Level of service for signalized intersections is defined in terms of average delay per vehicle. Delay is a complex measure and is dependant on a number of variables including: signal cycle length, signal phasing, green-time ratio, and lane configuration for each approach. Table 16 shows the level of service criteria for signalized intersections.

Table 16: Level of Service for Signalized Intersections

LOS	Average Delay per Vehicle	General Description
A	Less than 10.1 seconds	Free flow
B	10.1 to 20.0 seconds	Stable flow (slight delays)
C	20.1 to 35.0 seconds	Stable flow (acceptable delays)
D	35.1 to 55.0 seconds	Approaching unstable flow (tolerable delay—occasional wait through more than one signal cycle before proceeding).
E	55.1 to 80.0 seconds	Unstable flow (approaching intolerable delay)
F	Greater than 80.0 seconds	Forced flow (jammed)

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

Table 17 summarizes the existing and estimated year 2015 level-of-service conditions with the adopted MSP at six signalized intersections and five unsignalized intersections in the study area. These level-of-service results assume that no intersection improvements are made. As shown, all five signalized intersections would likely experience additional delay due to increases in background traffic. All but one are expected to operate at LOS E or better. Increases in background traffic are anticipated to degrade operations at the Cirque Drive/Bridgeport Way intersection to LOS F by year 2030 if no intersection improvements are made. Operations at the intersection could be improved to LOS E with the addition of a northbound-to-eastbound right-turn lane and possibly by revised cycle lengths in the corridor.

In year 2015 with the adopted MSP, the northbound turns from Chambers Creek Road to 64th Street W/Chambers Creek Road W would degrade to LOS F. This condition could be mitigated with changes in traffic control (such as with a roundabout or signal) or with additional lane capacity (such as turn lanes and/or acceleration/deceleration lanes). It is anticipated that individual project review and project-level SEPA analysis for each element of the Chambers Creek site would include review of this intersection to determine the best measure and the appropriate timing of an improvement.

Table 17: Existing and Year 2015 PM Peak Hour Intersection Level of Service Summary

	Existing PM Peak Hour		Year 2015 – No Action Adopted MSP	
	LOS ^a	Delay ^b	LOS	Delay
Signalized Intersection				
27th Street W/Bridgeport Way W	D	37.8	E	56.8
40th Street W/Bridgeport Way W	D	38.4	E	74.7
Cirque Drive W/Bridgeport Way W	D	37.5	F	89.8
Bridgeport Way W/Chambers Lane W	B	17.4	C	21.0
Bridgeport Wy W/67th Ave W/Chambers Creek Rd W	C	25.1	D	37.9
Cirque Drive W/67th Avenue W	C	29.0	D	46.7
Stop-sign Controlled Intersections	LOS	Delay	LOS	Delay
64th Street W/Chambers Creek Road W	B	11.4	D	51.9
NB Turns from Chambers Creek Rd W	C	17.9	F	>135
WB Left Turns from Chambers Creek Rd W	A	7.9	A	9.1
Chambers Creek Ln W/Chambers Creek Rd W	A	2.4	C	3.8
NB Turns from Chambers Creek Road W	B	12.9	C	23.5
WB Left Turns from Chambers Ln W	A	8.4	A	9.5
Roundabout Controlled Intersections	LOS	Max V/C^c	LOS	Max V/C
Cirque Drive W/Grandview Drive W	A	0.24	A	0.30
Grandview Dr W/62nd St Ct W/Site Access	A	0.22	C	0.36
64th St W/Pierce Co. Env. Svcs. Bldg Access	A	0.23	B	0.37

a LOS = Level of Service

b Delay = Average delay per vehicle in seconds

c Max V/C = For roundabouts, LOS is determined based on the maximum volume-to-capacity ratio of all movements

Source: Heffron Transportation, Inc., 2005

Safety

Accident data were requested from the City of University Place Police Department. The request was forwarded and fulfilled by the Sheriff's Department Crime Analysis and Information Unit. The most recent available data from 2001 through 2004 were provided for nine of the eleven study-area intersections described previously. Data for two intersections were not available. The accident data are summarized in Table 18.

As shown, there was a wide range in the number of accidents reported at study area intersections. The number ranged from a low of one accident to a high of 101 accidents over the four-year period. The data did not include any information regarding type, cause, severity, exact location (such as at a nearby driveway), or contributing factors. As a result, it is not possible to determine if any unusual safety conditions exist at the study area intersections based on these data.

Based on the total number of accidents, the average number of accidents per year, and the estimated number of accidents per million entering vehicles, the City of University Place should review accident records at five of the study area intersections including:

- Cirque Drive W/Bridgeport Way W
- Cirque Drive W/Grandview Drive W
- 40th Street W/Bridgeport Way W
- Cirque Drive W/67th Avenue W
- Bridgeport Way W/67th Avenue W/ Chambers Creek Road W

These five intersections have reported accidents rates that appear to exceed 1.0 per million entering vehicles, which can indicate unusual safety conditions. It should be noted that none of the intersections have experienced substantial increases in accidents in 2003 or 2004. Therefore, there is no evidence that any recent changes have adversely influenced safety conditions.

Table 18: Accident Data at Vicinity Intersections

Intersection	2001	2002	2003	2004	Total for 4 Years	Avg. Acc. Per Year	Accidents/MEV ^a
Cirque Drive W/Bridgeport Way W	24	30	24	23	101	25.3	2.32
Cirque Drive W/Grandview Drive W	3	1	5	5	14	3.5	1.94
40th Street W/Bridgeport Way W	27	24	23	18	92	23.0	1.91
Cirque Drive W/67th Avenue W	10	8	11	14	43	10.8	1.27
Bridgeport Wy W/67th Ave W/ Chambers Creek Rd W	13	13	12	12	50	12.5	1.23
Bridgeport Way W/Chambers Lane W	10	3	8	5	26	6.5	0.83
64th Street W/Chambers Creek Road W	3	0	0	1	4	1.0	0.36
Grandview Dr W/62nd St Ct W/Site Dwy	0	1	0	0	1	0.3	0.17
Chambers Creek Ln/Chambers Creek Rd	0	0	0	1	1	0.3	0.08
64th St W/Pierce Co. Env. Svcs. Bldg Access	No Data Available				N/A		
27th Street W/Bridgeport Way W	No Data Availabe				N/A		

a MEV = million entering vehicles

Source: Pierce County Sheriff's Department Crime Analysis & Information Unit, February 2005.

Transit

Pierce Transit provides bus service within the study area; Routes 53 and 2 serve the site vicinity. Route 53 provides bus service from downtown Tacoma to Tacoma Mall, University Place and Tacoma Community College. In the vicinity of the Chambers Creek site, it provides service along Cirque Drive W, north along Grandview Drive W, and east on 40th Street W. This route operates on weekdays from approximately 5:45

AM to 9:45 PM, with approximately 30-minute headways (time between consecutive buses) until 6:45 PM and about one-hour headways in the evening. On Saturday, this route operates from approximately 7:30 AM to 11:00 PM and on Sundays from 6:15 AM to 9:30 PM, with headways between 30 minutes and one hour.

Route 2 provides service from downtown Tacoma to Upper Tacoma Shopping District, Bates Technical College Mohler Campus, Martin Luther King, Jr. Library and Tacoma Community College. In the vicinity of the Chambers Creek Properties site, it provides service along Bridgeport Way W, between 19th Street and areas south of Custer Road. On weekdays, the route operates from approximately 5:00 AM to 12:10 AM, with 15-minute headways during peak periods and 30-minute headways during off-peak periods. On Saturday and Sunday, the route operates between the hours of 6:45 AM and 12:10 PM with 30-minute headways.

Pierce Transit's *Transit Development Plan 2005–2010* includes two changes that would improve bus service in the study area. One improvement has been completed: creating a new trunk route by combining Route 27 (South 19th Street) and Route 200 (Bridgeport Way) to form Route 2. This route, described above, provides faster, transfer-free service linking Lakewood and University Place with downtown Tacoma, with more frequent service along Bridgeport Way. The second would provide transit priority treatments along congested roadways, including South 19th Street and Bridgeport Way in the study area, through a partnership between Pierce Transit and the cities of Tacoma, Lakewood and University Place, Pierce County and Washington State Department of Transportation.

Sound Transit is working to implement its commuter rail extension from Tacoma through South Tacoma and on to Lakewood. The commuter rail stations in South Tacoma (at South 56th Street) and Lakewood (in the vicinity of Pacific Highway and 108th Street) would be located outside the study area for this project, but are expected to be used by City of University Place residents and could be used by employees or visitors to the Chambers Creek Properties.

Non-motorized Facilities

As described in the Roadway Network section, many of the streets near the site and throughout the study area have sidewalks. Adjacent to the site on Grandview Drive W, there are sidewalks on both sides of the roadway. In addition, there is a paved trail west of the roadway along the Chambers Creek Properties site. This trail provides north-south access from north of Cirque Drive W to 64th Street W. The trail bends eastward toward the Pierce County Environmental Services Building site and several trails meander through that site. There are sidewalks along 64th Street W from Grandview Drive east to Chambers Creek Road W. A path trail between the Chambers Creek Bridge and 64th Street will be constructed by 2008 in accordance with a previous development agreement between Pierce County and University Place.

Several roadways within the study area have bike lanes. Grandview Drive W has bike lanes on both sides of the roadway south of 27th Street W. There are also bike lanes

along sections of Bridgeport Way W, Cirque Drive W, 67th Avenue W, 27th Street W and 64th Street W.

Rail Transportation

The Burlington Northern Santa Fe Railroad (BNSF) mainline crosses through the Chambers Creek Properties, bisecting its western portion. This rail line carries a high volume of both freight and passenger trains. In 1996 there were an average of 58 trains per day on this line. The *Washington Public Ports Association (WPPA) Rail Capacity Study* (May 19, 2004) indicates there are an average of 47 daily trains per day between Tacoma and Vancouver, Washington. That study indicates volumes are expected to increase to 80 trains per day by year 2025. BNSF and Pierce County are currently negotiating future plans for the rail line, including public safety improvements.

2.7.2 Impacts

Programmatic level impacts of proposed MSP Update uses on Transportation are identified below. Further environmental review will occur at a project-specific level when development permit applications are submitted.

- Increase in trip generation (6% daily weekday, 1% Saturday, and 17% weekday PM peak hour.
- Increased use of roadway capacity, the largest an increase of 1.4% along Chambers Creek Road east of 64th Street.
- Where roadways are approaching capacity, additional traffic from proposed MSP Update uses would be less than 0.5% of capacity.
- Additional traffic would add about five seconds or less to average delay at all study are intersections in 2014. Assuming no improvements are made at intersections where LOS approaches Level F, additional traffic would exacerbate delays at these intersections.
- Transit service would not be adversely impacted.
- Pedestrian access and facilities would be enhanced by implementation of proposed uses.
- Potential safety issues due to increased activities in the vicinity of the BNSF rail mainline are expected to be mitigated by agreement between Pierce County and BNSF.

Trip Generation

Trip generation for the proposed MSP Update was developed based on nationally accepted trip generation rates, as well as on the best available information and assumptions regarding intended activity and employment levels. This section presents trip generation assumptions for each proposed land use element for daily weekday and Saturday conditions, as well as weekday PM peak-hour conditions. Estimates for the adopted MSP were developed for comparison using the same rates. For most elements, trip generation estimates were developed based on rates published in *Trip Generation* (Institute of Transportation Engineers [ITE], 7th Edition, 2003). In some cases, rates developed for the 1997 MSP FEIS were used. The types of uses and the method for estimating trip generation are described below.

North Area

- Golf course, pro shop, clubhouse with restaurant, maintenance facilities, etc.: ITE rates for Golf Course (LU 430) were used and were adjusted for internal trips between lodging, golf, and the clubhouse restaurant where appropriate.
- View restaurants: ITE rates for Quality Restaurant (LU 931) were used.
- Lodging: ITE rates for Hotel and Resort Hotel (LUs 310 and 330) were used and were adjusted for internal trips between lodging, golf, and the clubhouse restaurant where appropriate.
- Central Meadow: The day-to-day trip generation characteristics of the outdoor event space are assumed to be similar to “Open space, public beach, and public access pier,” as described in the 1997 MSP FEIS. However, it is noted that temporary events at the site could also result in short-term traffic impacts. These types of events, which would be classified as temporary civic celebrations are exempted from SEPA review under WAC 197-11-800(14)(c). These activities would, however, need to meet the requirements set forth for special events under the University Place zoning code.

WWTP

- Wastewater treatment plant (WWTP): Rates originally used for the Chambers Creek Properties Master Site Plan FEIS (Pierce County, April 1997) were used.
- Offices: ITE rates for General Office Building (LU 710) were used.

Grandview/64th Street Trail – included in bullet below

- Trails, boardwalks, meadows, picnic/play areas, etc.: ITE rates for Beach Park (LU 415) were used.

Environmental Services

- Environmental education center: Trip generation was estimated from analysis of the Islandwood Environmental Learning Center on Bainbridge Island (*Trip Generation and Peak Parking Demand Analysis – Puget Sound Environmental Learning Center*, Heffron Transportation, Inc., June 28, 1999).
- Environmental institute lab and associated offices: ITE rates for Research and Development Center (LU 760) were used.

South Area

- Arboretum/demonstration garden: ITE rates for Regional Park (LU 417) were used.

Canyon Park Area and Shoreline

- Trails, boardwalks, meadows, picnic/play areas, etc.: ITE rates for Beach Park (LU 415) were used.

Table 19 presents the estimated trip generation for each area of the Chambers Creek Properties. As shown, the proposed MSP Update would increase the total trip generation to and from the site on weekdays and Saturdays, as well as during the weekday PM peak hour. The proposed update would increase weekday daily trip generation by about 6%, Saturday trip generation by about 1%, and weekday PM peak hour trip generation by about 17%. The increase in PM peak hour trip generation is largely due to the additional Environmental Institute and the conference center proposed within the Environmental Services area. Compared to the adopted MSP, the largest reduction in trip generation occurs in the Grandview/64th Street Trail area, primarily due to the relocation of the view restaurant out of this area.

Table 19: Summary of Trip Generation

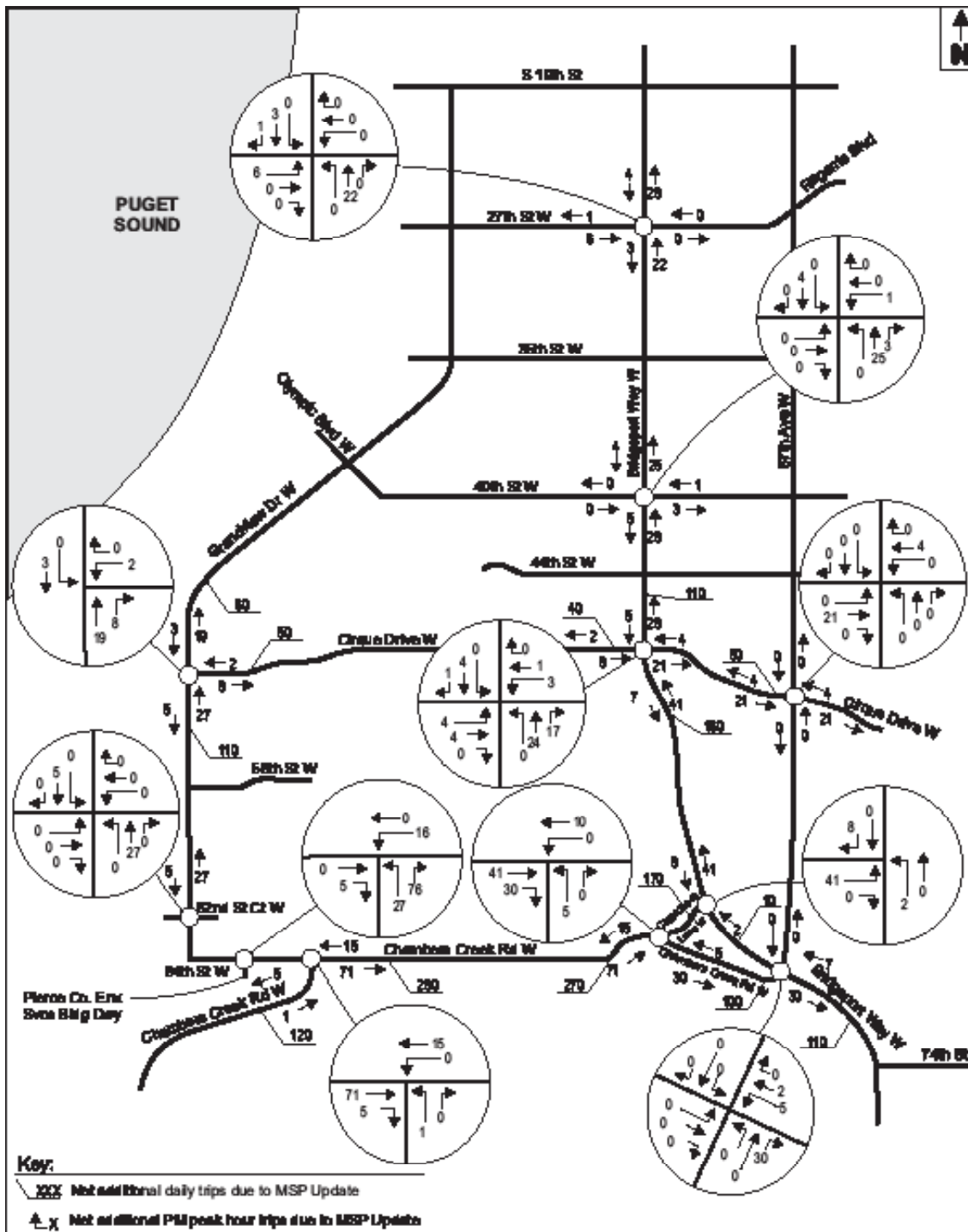
Area	Area Name	Adopted MSP Trip Generation			Proposed MSP Update Trip Generation			Net Change Due to MSP Update		
		Wkdy	Sat.	Wkdy Pk Hr	Wkdy	Sat.	Wkdy Pk Hr	Wkdy	Sat.	Wkdy Pk Hr
1	North Area	2,790	3,780	210	4,060	5,060	283	1,270	1,280	73
2	WWTP	1,200	200	160	1,390	240	180	190	40	20
3	Grandview/64 th St Trail	1,050	1,540	86	50	180	4	1,000	1,360	-82
4	SWM (Eliminated)	220	50	30	0	0	0	-220	-50	-30
5	Environmental Services	1,330	1,190	169	1,450	1,340	302	120	150	133
6	South Area	220	280	51	280	310	61	60	30	10
7	Canyon Park	290	590	30	290	590	30	0	0	0
8	Shoreline	130	290	12	130	290	12	0	0	0
Total Trips		7,230	7,920	748	7,650	8,010	872	420	90	124

Source: Heffron Transportation 2005

The additional weekday daily and PM peak hour trips were assigned to the local area roadway network. The net changes to local traffic volumes (daily and PM peak hour) are shown in Figure 9. Table 20 summarizes the potential traffic impact of the proposed MSP Update on roadway LOS, showing conditions with the adopted MSP for comparison. Traffic from the additional uses included in the proposed update would use a small fraction of the remaining capacity on roadways in the vicinity. The largest impact would occur along Chambers Creek Road (east of 64th Street) where the proposal would use 1.4% of the roadway capacity. Chambers Creek Road is expected to continue to have excess capacity; therefore, this level of impact should not cause this road to operate at unacceptable levels of service.

On roadways where the anticipated 2015 level of service is expected to approach capacity (Bridgeport Way), the additional traffic from the updated MSP would be less than 0.5% of roadway capacity. The use of capacity on these roadways is not expected to degrade the level of service. This analysis shows that the proposal would not require major roadway widening or new roadways. The proposal's impact along these sections would represent less than 1% of all traffic, and would likely not be noticeable.

Figure 9: Daily and PM Peak Hour Traffic Assignment—Net Change due to MSP Update



Source: Heffron Transportation

Table 20: Level of Service Impacts

Roadway Section	Lanes	Daily Capacity	Year 2015 With Adopted MSP Conditions			Year 2015 With MSP Update Conditions		
			ADT ^a	v/c Ratio ^b	LOS ^c	ADT	v/c Ratio	LOS
Grandview Drive								
N/O Cirque Drive	2	16,000	5,940	0.37	B	6,000	0.38	B
S/O Cirque Drive	2	16,000	7,470	0.47	C	7,580	0.47	C
Chambers Creek Road								
S/O 64 th Street ^d	2	16,000	9,130	0.57	C	9,250	0.58	C
E/O 64 th Street ^d	3	20,000	10,470	0.52	C	10,750	0.54	C
SW/O Chambers Lane ^d	3	20,000	14,820	0.74	D	15,090	0.75	D
SE/O Chambers Lane	2	16,000	7,070	0.44	B	7,170	0.45	B
Cirque Drive								
E/O Grandview Drive	2	16,000	6,510	0.41	B	6,560	0.41	B
W/O Bridgeport Way	3	20,000	13,900	0.70	D	13,940	0.70	D
W/O 67 th Avenue W	4	32,500	14,390	0.44	B	14,470	0.45	B
Bridgeport Way								
N/O Cirque Drive W	5	37,000	30,070	0.81	E	30,180	0.82	E
S/O Cirque Drive W	5	37,000	29,030	0.78	E	29,190	0.79	E
S/O Chambers Lane W	5	37,000	22,370	0.60	C	22,380	0.60	C
N/O W 75 th Street	5	37,000	33,100	0.89	E	33,210	0.90	E
Chambers Lane W								
SW/O Bridgeport Way	2	16,000	10,110	0.63	D	10,280	0.64	D

a ADT = Average Daily Traffic Volume estimated for 2005 using 2002 counts by City of University Place and 1% annual growth rate.

b v/c Ratio = Volume-to-Capacity Ratio

c LOS = Level of Service

d ADT estimated from 2004 PM peak hour volumes using factor of 10.

N/O "North of"

Source: Heffron Transportation, Inc., 2005

Additional PM peak hour traffic generated by new uses included in the proposed MSP update would also add some delay to study area intersections. Table 21 summarizes the LOS analysis performed for the proposed update at the eleven study-area intersections. The No Action (conditions with the adopted MSP) LOS results are also presented for comparison.

The additional traffic associated with the Updated MSP would add about 5 seconds or less of average delay to all study area intersections in year 2015. All study area intersections would operate at the same level of service as with the adopted MSP. Two intersections are forecast to operate at LOS F with either the adopted MSP or the MSP Update—Cirque Drive/Bridgeport Way and Chambers Creek Road W/64th Street W. The unsignalized northbound left-turn movement from Chambers Creek Road W to 64th Street W would operate at LOS F with either the adopted MSP or the uses included in the MSP Update. However, the additional traffic associated with uses in the MSP Update would exacerbate delays at this intersection. As described in the *Affected Environment* section, the

signalized intersection at Cirque Drive/Bridgeport Way is also forecast to operate at LOS F with the adopted MSP. The additional traffic from uses included in the update would add a small amount of additional delay (5.6 seconds). However, it should be noted that this analysis assumes that no improvements are made to the intersection before year 2015. This assumption magnifies the delay impacts of traffic added to intersections operating at LOS F. For example, if the intersection were improved with a northbound-to-eastbound right-turn pocket, it would operate at LOS E in 2015 with the adopted MSP. With this as a base condition, the additional project traffic from the MSP update would add less than 3 seconds of average delay.

As mentioned previously, operations at the Chambers Creek Road W/64th Street W intersection could be improved with a roundabout, additional intersection lane channelization or a traffic signal.

As project-level review and permitting occurs with site elements for either the adopted MSP or the MSP Update, Pierce County will coordinate with the City of University Place on the type, timing, and fair share contributions of costs for improvements at these two intersections (Cirque Drive/Bridgeport Way and Chambers Creek Road W/64th Street W).

Table 21: Year 2015 Weekday PM Peak Hour LOS Summary – No Action & MSP Update

	Year 2015 – No Action (Adopted MSP)		Year 2015 with Proposed MSP Update	
	LOS ^a	Delay ^b	LOS	Delay
Signalized Intersection				
27th Street W/Bridgeport Way W	E	56.8	E	57.3
40th Street W/Bridgeport Way W	E	74.7	E	77.1
Cirque Drive W/Bridgeport Way W	F	89.8	F	95.4
Bridgeport Way W/Chambers Lane W	C	21.0	C	21.8
Bridgeport Wy W/67th Ave W/Chambers Creek Rd W	D	37.9	D	38.9
Cirque Drive W/67th Avenue W	D	46.7	D	48.3
Stop-sign Controlled Intersections	LOS	Delay	LOS	Delay
64 th Street W/Chambers Creek Road W	D	51.9	D	61.8
NB Turns from Chambers Creek Rd W	F	>135	F	>175
WB Left Turns from Chambers Creek Rd W	A	9.1	A	9.5
Chambers Creek Ln W/Chambers Creek Rd W	C	3.8	C	4.2
NB Turns from Chambers Creek Road W	C	23.5	D	26.4
WB Left Turns from Chambers Ln W	A	9.5	A	9.8
Roundabout Controlled Intersections	LOS	Max V/C^c	LOS	Max V/C
Cirque Drive W/Grandview Drive W	A	0.30	B	0.33
Grandview Dr W/62nd St Ct W/Site Access	C	0.36	C	0.39
64th St W/Pierce Co. Env. Svcs. Bldg Access	B	0.37	C	0.40

a LOS = Level of Service

b Delay = Average delay per vehicle in seconds

c Max V/C = For roundabouts, LOS is determined based on the maximum volume-to-capacity ratio of all movements

Source: Heffron Transportation, Inc., 2005

Transit Impacts

The proposed update would not adversely affect transit service in the area.

Non-motorized Facility Impacts

Pedestrian facilities, including trails, are part of the proposed circulation system. The project would enhance the pedestrian access and facilities within the site.

Rail Impacts

The proposed MSP Update may increase human use and activities in the vicinity of the BNSF mainline causing safety concerns, as described in the *MSP FEIS, 1997*.

Agreements between Pierce County and BNSF to mitigate these potential impacts are expected to be in place by 2006. No additional impacts from the proposed MSP Update are anticipated.

2.7.3 Mitigation Measures

No specific mitigation would be required to accommodate the proposed MSP Update. The project-level review and permitting that occurs with site elements for either the adopted MSP or the MSP Update will determine mitigation. Pierce County will ensure compliance with the City of University Place Concurrency Management Code, UPMC 22.20 prior to the City's issuance of permits for these site elements.

2.7.4 Unavoidable Significant Adverse Impacts

No unavoidable significant Transportation impacts are expected from the adoption of the proposed MSP Update.