
City of Snohomish

Transportation Plan Update

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INTRODUCTION

The development of the City of Snohomish Transportation Plan Update was commissioned by the City Council in May 2004 to provide an update to the adopted 1995 City of Snohomish Transportation Plan for addressing future land use growth and transportation needs to support the expected growth. This Transportation Plan update also provides a supplement to the City's current Six-Year Transportation Capital Facilities Plan and recommends the adoption of a Traffic Impact Fee Program based on the report findings. The plan update will assist the City in maintaining their development and concurrency objectives for the short term and long-range land use plans.

Purpose for the Transportation Plan Update

The purpose for the development of the City of Snohomish Transportation Plan Update is to provide an updated plan to the existing City Transportation Plan by identifying and evaluating the transportation improvement plans for the City through the years 2010 and 2030. The plan is needed to satisfy Growth Management Act (GMA) requirements and to update the City's transportation improvement projects funding program. The funding program will be supplemented by the proposed adoption of a transportation impact fee program to assist in funding projects that will accommodate traffic growth associated with the future land use development of the City and its arterial system. The findings of this plan update will provide the City with documentation and justification for application of funding grants for transportation improvement projects, and a guideline for prioritizing the transportation needs to maintain level of service standards to support the City's land use plans.

Study Area

The transportation plan update area evaluated in this report primarily includes the City limits and the City's Urban Growth Area (UGA), which is located primarily north (Bickford Subarea) and west of the City. The UGA portions not located within current City limits are approximately bounded by 52nd Street SE to the north, 87th Avenue SE to the west, Airport Way to the south, and the East City Limit to the east. **Figure 1** depicts the general study area evaluated in the transportation plan update.

GMA Requirements

The Growth Management Act (GMA) adopted by the State of Washington in 1990 set specific requirements for the transportation element of a city's comprehensive plan to ensure that a balanced approach is taken towards land use development and transportation. GMA requires linkages among the land use and transportation and capital facility elements of a comprehensive plan to ensure that a city's transportation system can support the expected growth and development, and that the needed transportation improvements are affordable for the community. In addition, the city must adopt specific standards about the acceptable levels of congestion on its arterial street system; these standards are called level of service (LOS) standards.

Transportation Plan Development Methodology

The transportation plan update development process included an initial inventory of the existing arterial street system and an analysis of the current conditions. Traffic count data was obtained from the City of Snohomish and Washington State Department of Transportation (WSDOT), and supplemented by new 24-hour directional and p.m. peak hour turn movement traffic counts at the City's identified study intersections.

Coordination with the City of Snohomish Public Works and Planning Departments was conducted to identify current and planned land use conditions, and potential transportation improvement projects expected with the development of buildout conditions for inclusion into the future Year 2030 arterial network.

Future traffic forecasts (distribution and assignments) were developed based on the following:

- Trip generation estimates for the City's current land use plan within the City and UGA undeveloped areas
- Existing traffic flow patterns in the study area
- Regional demographic forecasts developed by the Puget Sound Regional Council (PSRC)
- Primary access routes within the City to the regional arterial system including SR-2 and SR-9

The level of service (LOS) analysis was conducted for future traffic volumes using existing intersection channelization and traffic control to identify transportation deficiencies and the improvements needed to improve the intersections to the City's adopted LOS standards. The capacity analysis assumes that the development buildout of the UGA, under the current land use plan, will occur by year 2030.

The identified transportation improvements were then prioritized to develop a Transportation Facilities Plan to supplement the City's Six-Year Transportation Improvement Plan (TIP) and provide the basis for development of the Traffic Impact Fee.

Level of Service

Levels of service provide a measurement of the quality of service provided by the transportation system. The Growth Management Act requires the establishment of a level of service standard as a guideline for evaluating the performance of the existing transportation system. It is also used to determine whether transportation improvements or services will be available to serve proposed development at the time of development or within six years of the development. This requirement is called Concurrency. If services that will operate at the adopted level of service standard will not be concurrent with a proposed development, then either funding for the improvements must be identified or the development cannot be granted approval as proposed. The level of service standard and findings may also be used to program transportation funding priorities of planned improvements.

Evaluating the transportation arterial system, particularly at intersections, is typically described in terms of congestion, which can be measured by average vehicle delay or travel speed, vehicular density, or volume-to-capacity ratio.

The volume-to-capacity ratio (V/C) is the ratio of existing or forecasted traffic volumes to the traffic capacity of the roadway or intersection. The level of service analysis conducted for existing and future conditions at the City's critical intersections were based on average vehicle delay and the methodology outlined in the 2000 Updated Highway Capacity Manual (HCM2000), Special Report 209, Transportation Research Board. In accordance with the Highway Capacity Manual, facilities are rated with a value between LOS A and F, with LOS A being free flow and LOS F being forced flow or over-capacity conditions. Geometric characteristics and conflicting traffic movements are taken into consideration when determining LOS values. A summarized description for the various levels of service as outlined in the HCM2000 is shown in **Table 1**.

Table 1
Level of Service Description

Level of Service	General Description	Average Delay at Intersections*	
		Signalized	Unsignalized
A	Free flow conditions. Vehicles have minimal or no delay at the intersection. V/C = 0.0 to 0.60	≤10	≤10
B	Stable traffic flow. Some minor delay may be experienced at intersections. V/C = 0.61 to 0.70	>10 and ≤20	>10 and ≤15
C	Stable traffic flow. Average delay can be expected at intersections with occasional signal cycle failure. V/C = 0.71 to 0.80	>20 and ≤35	>15 and ≤25
D	Traffic flow becoming unstable with noticeable traffic congestion. Delay is longer than average but generally tolerable. Cycle failure becoming noticeable. V/C = 0.81 to 0.90	>35 and ≤55	>25 and ≤35
E	Unstable traffic flow conditions. High delay can be expected with frequent cycle failure occurrence. Many agencies view this as the limit of tolerable or acceptable delay. V/C = 0.91 to 1.0	>55 and ≤80	>35 and ≤50
F	Forced traffic flow conditions. Delay is unacceptable to most drivers due to exceeded intersection capacity. V/C = 1.0 or greater	>80	>50

*Delay is measured in terms of seconds per vehicle.

The 1995 Snohomish Comprehensive Plan currently adopts a system-wide link level of service standard (LOS E) based on previous Snohomish County methodology that allowed for LOS E for all roadways. However, the operation of the City's street network is based on the function at its key intersections, primarily with the access to the adjacent State highways of SR-2 and SR-9 via Avenue D and 2nd Street. Therefore, it is recommended that an intersection-based LOS "D" be adopted as the City's adopted level of service standard for the City's arterial/arterial intersections, while retaining LOS "E" for the State highway intersections to be in compliance with State requirements and standards for Highways of Statewide Significance (HSS).

EXISTING CONDITIONS

Functional Classification

The analysis of the arterial street system on a system wide basis included a review of the existing average daily and p.m. peak hour traffic volumes, and a review of the City's existing functional classification map (see **Figure 1**).

The functional classification map describes the general use and operational characteristics for the various sections of the City arterial system. The four main classifications currently used by the City of Snohomish are Major Arterials, Minor Arterials, Collector Arterials, and Local Streets. In general, the descriptions for these roadway types are adequate for the street types existing in the City of Snohomish.

The classifications of roadways within the City were reviewed based upon the existing and future traffic demand of the arterial system. The majority of roadway classifications are consistent with future traffic use and should be retained. However, with the projected volumes estimated in this update, there are four current Collector Arterials that could be reclassified as Minor Arterials based on the future traffic volumes estimated. The existing collector arterial links that are recommended for reclassification to Minor Arterials include:

- 30th Street from Bickford Avenue to Park Avenue
- 15th Street from Bickford Avenue to Avenue D
- 10th Street from Avenue D to Maple Avenue
- 2nd Street from Lincoln Avenue to SR-2

As development occurs within the City, the existing street system should be reviewed periodically to determine the primary purpose of the roadway, the future volumes, and the spacing between similar use roadways. Future revisions to the functional classification system may be necessary if conditions change. The designation of these roadways will provide the framework to guide City and developer capacity improvements to accommodate the future traffic demands. The roadways would also be monitored for accessibility from adjacent properties and levels of service to ensure the capacity, efficiency, and safety of the local and regional arterial system. **Figure 2** depicts the proposed Functional Classification map for the City's arterial system.

Recognizing the corridors that are expected to carry the majority of traffic will allow the City to start planning for the preservation of right-of-way and management of the access locations to these corridors to maintain higher capacity conditions.

Traffic Volumes

Traffic volume data was collected for the City arterial system from Snohomish County Public Works Department and the Washington State Department of Transportation (WSDOT). The traffic data was supplemented with new traffic counts conducted in June 2004 at the critical intersections identified by the City for level of service analyses. Additionally, 24-hour vehicle counts were also conducted at several gateway corridors into the City.

A total of ten study intersections were identified as a part of this update. The study intersections included:

1. Avenue D/1st Street
2. Avenue D/Bonneville Street
3. Avenue D/13th Street
4. Avenue D/15th Street
5. Avenue A/2nd Street
6. 2nd Street/Maple Avenue
7. 2nd Street/Pine Avenue
8. Maple Avenue/Pine Avenue
9. Pine Avenue/10th Street
10. Bickford Avenue/Fobes Road/30th Street

The existing year 2004 average daily traffic (ADT) and p.m. peak hour bi-directional traffic volumes for the study area are represented in **Figures 3** and **4**, respectively. The daily traffic volumes were estimated from the new intersection counts and the City's historic p.m. peak hour volumes assuming a K-factor of 10.5 for all approaches. The K-factor represents the percentage of daily vehicles occurring during the peak hour of the day (typically p.m. peak). **Figure 5** depicts the p.m. peak hour turn movement volumes at the ten study intersections.

To obtain future 2030 average daily traffic volumes, the K-factor was increased to 11.3 based on the projected p.m. peak hour and average daily trip generation. All 2010 volumes were interpolated from the future 2030 volumes assuming straight-line growth from existing 2004 volumes.

EXISTING (2004) LEVEL OF SERVICE

The level of service for the ten critical study intersections was analyzed under existing conditions for the p.m. peak hour of the intersection. Intersection level of service analyses are typically conducted for the p.m. peak hour since the traffic conditions usually represent the worst case scenario in terms of traffic volumes through an intersection or along the arterial street sections. All level of service (LOS) analysis calculations utilize the methodology outlined in the 2000 *Highway Capacity Manual*, Special Report 209, Transportation Research Board and Synchro 6.0 (Build 6.12) support software.

Table 2 summarizes the results of the LOS analysis conducted for the ten intersections under Year 2004 traffic conditions. **Figure 6** depicts the existing level of service results.

Table 2
2004 Level of Service Summary

Intersection	Traffic Control	LOS*	Delay (sec/veh)
Avenue D @ 1 st Street	All-Way Stop	F	>50
Avenue A @ 2 nd Street	Two-Way Stop	E	45.3
Maple Avenue @ 2 nd Street	Signal	B	12.0
Pine Avenue @ 2 nd Street	Signal	B	10.2
Pine Avenue @ Maple Avenue	All-Way Stop	C	17.6
Pine Avenue @ 10 th Street	All-Way Stop	B	12.8
Avenue D @ Bonneville Street	Signal	B	15.1
Avenue D @ 13 th Street	Signal	B	17.1
Avenue D @ 15 th Street	All-Way Stop	E	48.4
Bickford Ave @ Fobes Rd/30 th Street	Two-Way Stop	C	20.5
*LOS reported for the worst case turn movement at unsignalized intersections			

The City's current Comprehensive Plan adopts LOS E as the standard for arterial links within the City, although City intersections evaluated for the supporting Transportation Element shows intersections and intersection service grades. The results of the level of service analysis indicate that all of the intersections currently meet City LOS standards with the exception of the Avenue D and 1st Street intersection that currently operates at LOS F. However, it has been the City's policy to accept LOS F at this intersection as a means of regulating traffic volumes into the City via this gateway. It is the intent of the City to direct external traffic entering the City to use the SR-9 and 2nd Street interchange as the primary gateway into the City.

LAND USE AND TRAFFIC VOLUME FORECASTS

Land Use and Trip Generation Projections

The land use projections used to determine the future year 2030 traffic volumes within the City were based on the City's current land use plans as coordinated with City of Snohomish Public Works and Planning Departments. The land use plan assumptions includes:

- Single-Family Residential Housing at one unit per 7,500 square feet
- Single-Family Residential Housing (Coordinated with Cemetery Creek Trunk Sewer Feasibility Plan for TAZ 11, 28, and 29)
- Multi-Family Residential (18 units per acre)
- General Office (Floor Area Ratio of 30% of Gross Property)
- General Light Industrial (Floor Area Ratio of 30% of Gross Property)
- Specialty Retail (Floor Area Ratio of 30% of Gross Property and 25% Pass-By Factor)
- Big Box Retail – TAZ 26 (Floor Area Ratio of 30% of Gross Property and Average Rates for ITE Big Box Uses and 25% Pass-By Factor)

The City/UGA study area was subdivided into 29 traffic analysis zones (TAZ) for determining trip generation and distribution. The traffic zones developed for use in estimating future traffic is attached in **Appendix A** of this report.

Trip generation calculations were then conducted for each TAZ based on trip rates published in the Institute of Transportation Engineers (ITE) *Trip Generation* manual, 7th Edition, September 2003. A summary of the TAZ assumptions and trip generation is also shown in **Appendix A**. The trip generation assumes full buildout of the City by the forecast year 2030.

A total of approximately 77,676 average daily trips (ADT) and 7,041 p.m. peak hour trips (3,208 inbound and 3,833 outbound) were estimated for the development buildout of the study area.

Traffic volume forecasts for the short-term scenario year 2010 were estimated using a linear progression between 2004 existing traffic volumes to the long-term horizon year of 2030 assuming buildout of the City within that time frame.

Transportation Network and Trip Distribution Assumptions

Trip distribution of the projected year 2030 trip generation was assigned to the existing transportation roadway system to conduct the capacity analysis and determine intersection and corridor deficiencies. The distribution methodology used to assign future trips generated by future traffic growth is based on the Puget Sound Regional Council Year 2030 Traffic Model projections for the City of Snohomish vicinity. Internal trips generated within the City were assumed at approximately 25 percent for residential land uses, 15 percent for general office and industrial land uses, 65 percent for specialty retail, and 40 percent for big box retail land uses to account for trip that would not impact regional access corridors.

In general, the distribution indicates that approximately 14 percent of the City's future traffic growth volumes are destined to the east via 2nd Street (11%) and Three Lakes Road (3%), 6.5 percent north on Maple Avenue, 23 percent north on SR-9, 13 percent north on Bickford Avenue, 1.5 percent to the west via Lowell-Snohomish River Road, 37 percent south on SR-9 and Avenue D/Airport Way, and 5 percent to the south on Lincoln Avenue.

FUTURE TRAFFIC CONDITIONS – YEAR 2010 AND 2030

Traffic Forecasts and Impacts

Year 2010

The forecast traffic volumes for the future year 2010 based on traffic growth estimates are depicted in **Figures 7** and **8** for the year 2010 daily and peak hour traffic conditions, respectively. The projected turning movement volumes at the study intersections for 2010 are shown in **Figure 9**. The level of service analysis conducted for the year 2010 conditions at the critical arterial intersections was performed for the p.m. peak hour assuming existing traffic control and channelization. The results of the LOS analysis are summarized in **Table 3**. The summary also indicates the resulting level of service with the implementation of improvements needed to attain intersection LOS D conditions as proposed for adoption. The 2010 level of service results are also depicted in **Figure 10**.

**Table 3
Year 2010 Level of Service Summary**

Intersection	Traffic Control	LOS*	Delay (sec/veh)
Avenue D @ 1 st Street	All-Way Stop	F	>50
Signalize	Signal	B	16.3
Avenue A @ 2 nd Street	Two-Way Stop	F	>50
Signalize, Add NB and SB left turn lanes	Signal	A	8.9
Maple Avenue @ 2 nd Street	Signal	B	15.6
Optimize signal timing	Signal	B	13.1
Pine Avenue @ 2 nd Street	Signal	B	10.8
No revisions needed	Signal	B	10.8
Pine Avenue @ Maple Avenue	All-Way Stop	D	25.5
No revisions needed	All-Way Stop	D	25.5
Pine Avenue @ 10 th Street	All-Way Stop	C	18.2
No revisions needed	All-Way Stop	C	18.2
Avenue D @ Bonneville Street	Signal	C	23.5
Optimize signal timing	Signal	C	21.0
Avenue D @ 13 th Street	Signal	C	27.3
Optimize signal timing	Signal	B	15.9
Avenue D @ 15 th Street	All-Way Stop	F	>50
Signalize, Add EB and SB left turn lanes	Signal	B	14.7
Bickford Ave @ Fobes Rd/30 th Street	Two-Way Stop	F	>50
Signalize, Add EB and WB left turn lanes	Signal	A	6.5
*LOS reported for the worst case turn movement at unsignalized intersections			

The level of service analysis indicates that four of the study intersections will continue to or deteriorate to LOS F conditions by year 2010. The four intersections at Avenue D/1st Street, Avenue A/2nd Street, Avenue D/15th Street, and Bickford Avenue/Fobes Road/30th Street would each require the addition of a traffic signal and channelization improvements to obtain acceptable level of service, with the exception of Avenue D/1st Street, which does not require additional channelization. To obtain the acceptable LOS D conditions under Year 2010 traffic volume conditions at the three remaining deficient intersections would require the following channelization improvements along with new signalization:

- The intersection of Avenue A/2nd Street would require the addition of northbound and southbound exclusive left turn lanes to obtain LOS A conditions by 2010.
- The intersection of Avenue D/15th Street requires the addition of a southbound exclusive left turn lane by 2010 to obtain LOS B.
- The intersection of Bickford Avenue/Fobes Road/30th Street would require the addition of eastbound and westbound exclusive left turn lanes by 2010 to obtain LOS A conditions.

The remaining study intersections would operate at LOS D or better under existing traffic control and channelization with minor signal timing revisions to optimize traffic flow.

The level of service analysis indicates that all but two of the critical study intersections would deteriorate to LOS E or LOS F conditions under the signal timing, traffic control and channelization conditions (with improvements) assumed for the year 2010. The intersections of Avenue A/2nd Street, Maple Avenue/2nd Street, Pine Avenue/2nd Street, Avenue D/13th Street, and Avenue D/15th Street would only need to optimize signal timing to obtain or retain acceptable level of service (LOS D or better). The new signals at the intersections of Avenue A/2nd Street and Avenue D/15th Street as needed by year 2010 will be sufficient to maintain service levels in 2030.

The intersection of Pine Avenue/Maple Avenue would require the addition of a southbound right turn lane on Pine Street and exclusive left turn lanes on both Maple Street approaches to obtain an acceptable level of service.

The intersection of Pine Avenue/10th Street would require the installation of a traffic signal and conversion of all four approaches to include an exclusive left turn lane and a through-right lane to obtain adequate traffic operations and level of service.

The Avenue D/Bonneville Street intersection will require an eastbound left only lane and an additional northbound and southbound through lane to obtain LOS D conditions based on the projected traffic volumes through the intersection in year 2030.

The intersection of Bickford Avenue/Fobes Road/30th Street will need an additional northbound through lane and would need to convert the existing southbound right turn only lane to a through-right lane by year 2030 to achieve acceptable LOS D standards for the intersection.

The intersection of Avenue D/1st Street is projected to operate at LOS E by year 2030 with signalization installed in 2010. To obtain LOS D conditions at this location would require additional capacity with added travel lanes (i.e., turn pockets or through lanes). However, since it is the City's desire to minimize capacity improvements at this intersection, and to retain the potential for pedestrian oriented development along 1st Street that is associated with an overall downtown improvement plan, then no additional widening is recommended at this time to maintain shorter walking distances at intersections within the future pedestrian corridor.

PROPOSED TRANSPORTATION SYSTEM IMPROVEMENTS

The City does not currently have any transportation system capacity improvements identified in their Comprehensive Plan. Future projects identified only include maintenance and overlay projects for the existing roadways.

All study intersections were evaluated using existing channelization and traffic control to determine the buildout scenario traffic growth impacts and the capacity improvements needed to obtain the proposed City level of service standard of LOS D by year 2030. Based on the results of the existing and future level of service analysis, the estimated cost for the recommended improvements, and the projected traffic volumes impacted at the specific intersections, the proposed transportation system improvements to attain adequate LOS standards were prioritized and described below.

Priority No. 1*Avenue A and 2nd Street Intersection*

2010 Improvements: Add traffic signal and northbound and southbound left turn lanes.

2030 Improvements: Optimize signal timing

This intersection is projected to deteriorate to LOS F under the year 2010 traffic volume projections with existing traffic control and channelization. The recommended improvements to meet the projected traffic demand include the addition of a traffic signal, exclusive northbound and southbound left turn lanes on Avenue A, and associated drainage and curb improvements. The signalization and channelization improvements will improve the 2010 level of service to LOS A. With the additional traffic projected by year 2030, a LOS C will be maintained so no additional capacity improvements are necessary. However, the signal timing and phasing should be reviewed and optimized to maximize efficiency under the future traffic conditions.

Project Cost Estimate: \$500,000

Priority No. 2*Avenue D and 15th Street Intersection*

2010 Improvements: Add traffic signal and southbound left turn lane

2030 Improvements: Optimize signal timing

This intersection is projected to measure LOS F under the year 2010 traffic volume projections with existing traffic control and channelization. The recommended improvements to meet the projected traffic demand include the addition of a traffic signal and an exclusive southbound left turn lane on Avenue D, and associated drainage and curb improvements. Signalization of this location will require review of the intersection configuration details for alignment issues and consideration of the northbound traffic movement from Avenue D to SR-9, which is currently served by a separated road section that branches off Avenue D prior to its intersection with 15th Street. The signalization and channelization improvements will improve the 2010 level of service to LOS B. The additional traffic projected by year 2030, will result in a LOS E. Therefore, the signal timing and phasing should be revised to obtain LOS D by maximizing the signal operation and efficiency under the future traffic conditions.

Project Cost Estimate: \$797,000

Priority No. 3

Bickford Avenue and Fobes Road/30th Street

2010 Improvements: Add traffic signal and eastbound and westbound left turn lanes

2030 Improvements: Add additional northbound through lane and convert southbound right turn lane to a through-right lane. Optimize signal timing

This intersection is projected to be at LOS F under the year 2010 traffic volume projections with existing traffic control (stop sign) and channelization. The recommended improvements to meet the projected traffic demand include the addition of a traffic signal, exclusive eastbound and westbound left turn lanes on Fobes Road and 30th Street, respectively, and associated drainage and curb improvements. The signalization and channelization improvements will improve the 2010 level of service to LOS A. With the additional traffic projected by year 2030, this intersection will deteriorate to LOS F. Additional capacity improvements will be needed to meet the adopted LOS D standards. The recommended improvements to meet year 2030 traffic volume projections include an additional northbound through lane and conversion of the southbound right turn only lane to a through-right lane. The signal timing and phasing should be reviewed and optimized to accommodate the capacity improvements. These 2030 improvements will improve the 2030 level of service to LOS C under the future traffic conditions.

Project Cost Estimate: \$725,000 (2010) and \$905,000 (2030)

Priority No. 4

Avenue D and 1st Street Intersection

2010 Improvements: Add traffic signal

2030 Improvements: Optimize signal timing

This intersection is unsignalized and currently operates at LOS F under existing conditions. This intersection is the City of Snohomish's most congested intersection due to its direct connection to SR-9 via Airport Way. The recommended improvements at this intersection are being delayed due to the impending development of a Historic District Streetscape Plan. The improvement recommended at this location to meet LOS D standards would be the installation of a traffic signal and drainage and curb improvements only. These improvements would result in an LOS B under the 2010 traffic volume projections without any channelization improvements. With a traffic signal, the intersection is expected to deteriorate to LOS E by year 2030; however, since the City is in the planning stages for the 1st Street Corridor, no additional widening is recommended until the Historic District Streetscape Plan is completed. Signal review and optimization should be conducted and monitored at the intersection following installation.

Project Cost Estimate: \$507,000

Priority No. 5*Avenue D and Bonneville Street Intersection*

2010 Improvements: Optimize signal timing.

2030 Improvements: Add eastbound left turn lane and construct additional northbound and southbound through lanes

This intersection is projected to remain at LOS C under the year 2010 traffic volume projections with optimization of the existing signal timing and channelization but would deteriorate to LOS F by year 2030 without additional capacity improvements. The recommended improvements to meet the projected traffic demand in 2030 include the addition of an exclusive eastbound left turn lane on Bonneville Street, an additional through lane on Avenue D through the intersection, and associated drainage and curb improvements. Right-of-way acquisition will be required for to accommodate and align the eastbound left turn lane. The additional channelization improvements will improve the 2030 level of service to LOS D. The signal timing and phasing should be reviewed and optimized to correspond with the volume increases and added capacity.

Project Cost Estimate: \$1,468,000

Priority No. 6*Maple Avenue and 2nd Street Intersection*

2010 Improvements: Optimize signal timing.

2030 Improvements: Optimize signal timing.

This intersection is projected to remain at LOS B conditions in the 2010 under existing signalization and channelization. It is recommended that the signal optimization be reviewed to maintain efficient traffic flow operations as traffic growth continues. Under the existing signal timing and phasing, the intersection level of service may deteriorate to LOS E and signal optimization will be necessary to improve the intersection to LOS C based on the 2030 traffic volume projections.

Project Cost Estimate: None

Priority No. 7*Pine Avenue and 2nd Street Intersection*

2010 Improvements: Optimize signal timing

2030 Improvements: Optimize signal timing

This intersection is projected to remain at LOS B in the 2010 with the existing signalization and channelization. Similar to the Maple Avenue/2nd Street intersection (Priority No. 6), it is recommended that the signal optimization be reviewed to maintain efficient traffic flow operations as traffic growth continues. Using the existing signal timing and phasing, the

intersection level of service may deteriorate to LOS C by 2030 and signal optimization should be reviewed again to meet the 2030 traffic volume demand.

Project Cost Estimate: None

Priority No. 8

Pine Avenue and 10th Street Intersection

2010 Improvements: None identified

2030 Improvements: Add traffic signal and convert northbound left-thru lane to left-turn only and convert right-turn only lane to right-thru lane.

This intersection will continue to operate at LOS C conditions with the projected year 2010 traffic volumes under existing 4-way stop control and current channelization. Therefore, no improvements are needed or recommended to meet the 2010 traffic demand. By year 2030, the intersection is projected to deteriorate to LOS F and additional capacity improvements will be needed to meet the future traffic growth. It is recommended that the intersection include a new traffic signal and conversion of the existing channelization (through-left and right-turn only) to an exclusive left turn only lane and a through-right lane for each approach of the intersection. These improvements are expected to improve the intersection to LOS B under the future traffic conditions.

Project Cost Estimate: \$1,393,000

Priority No. 9

Pine Avenue and Maple Avenue Intersection

2010 Improvements: None identified.

2030 Improvements: Add left turn only lanes on the Maple Avenue approaches and a right turn only lane on the southbound approach of Pine Avenue

This intersection will continue to operate at LOS D conditions with the projected year 2010 traffic volumes with the existing 4-way stop control and current channelization. Therefore, no improvements are needed or recommended to meet the 2010 traffic demand. By year 2030, the intersection is projected to deteriorate to LOS F, and additional capacity improvements will be needed to meet the future traffic growth. Exclusive left turn lanes should be constructed on the Maple Avenue approaches and an exclusive right turn lane added on the southbound approach of Pine Avenue. These improvements are expected to improve the level of service to LOS D under the future traffic volumes and current 4-way stop control.

Project Cost Estimate: \$366,000

TRANSPORTATION IMPROVEMENT PROGRAM

The estimated costs for the proposed signalization and channelization improvements recommended within the City and UGA totals approximately \$6,661,000. The transportation improvement program to incorporate into the City Comprehensive Plan and to supplement the City's current 6-Year Transportation Improvement Plan (TIP) is summarized in **Table 5** for an expected 25-year development implementation period.

**Table 5
Proposed Transportation Improvement Program**

Improvement Project	Implementation Year	Grant Share	Grant Type	Impact Fees	Total
1. Avenue A/2 nd Street Signal and Channelization	2006	\$25,000	TIB-AIP	\$475,000	\$500,000
2. Avenue D/15 th Street Signal and Channelization	2007	\$39,850	TIB-AIP	\$757,150	\$797,000
3. Bickford/Fobes/30 th Street Signal and Channelization-Phase 1	2008	\$36,250	SafeTEA -STP	\$688,750	\$725,000
4. Avenue D/1 st Street	2009	\$25,350	TIB-AIP	\$481,650	\$507,000
5. Bickford/Fobes/30 th Street NB and SB Capacity-Phase 2	2011-2030	\$45,250	SafeTEA -STP	\$859,750	\$905,000
6. Pine Avenue/Maple Avenue	2011-2030	\$18,300	TIB-AIP	\$347,700	\$366,000
7. Pine Avenue/10 th Street	2011-2030	\$69,650	TIB-AIP	\$1,323,350	\$1,393,000
8. Avenue D/Bonneville Street Channelization and NB and SB Capacity	2011-2030	\$73,400	TIB-AIP	\$1,394,600	\$1,468,000
25-Year Totals		\$333,050		\$6,327,950	\$6,661,000
Cost Totals per Year		\$13,322		\$253,118	\$266,440

Approximately 5 percent of the funding for the proposed implementation plan to supplement the 6-Year TIP plan would be collected from sources including state and federal programs combined with local arterial improvement funds, which could be collected through taxes, grants, special districts, loans, and private revenue totaling approximately \$333,050 within 25 years or sooner. This total equates to an annual average total of \$13,322 obtained from non-local funding sources.

Private revenues would be collected for the remaining amount (\$6,327,950) through impact fees or contributions through frontage and access improvements in accordance with the City's

development standards and the provisions of the Growth Management Act. The detailed cost estimates and supporting implementation program worksheets are attached in **Appendix D** of this report.

TRANSPORTATION IMPACT FEE PROGRAM

The City of Snohomish currently does not have an adopted traffic impact fee to provide an additional resource for collecting funds for transportation improvement projects. The State Impact Fee statutes allow the City to impose fees as a means of obtaining funding for transportation improvement projects which would allow the transportation system to remain concurrent with the City's adopted level of service standards as new growth and development occurs. Although these fees would provide a source of financing for projects, it would not act as the sole source of funding. Specific principles must be established when impact fees are authorized by an ordinance. These principles include the following:

- Impact fees shall be imposed on new development only for transportation system improvement that is directly related to the new development.
- Impact fees shall not exceed an equitable share of the cost of system improvements that directly relate to the new development.
- Impact fees shall be used for system improvements that directly benefit new developments and mitigate their adverse traffic impacts.

New development is required to pay their proportionate share of traffic impacts based on the amount of traffic generated. Therefore, the City of Snohomish could establish a fee schedule based on the amount of new trips generated by new growth or development. This transportation plan update recommends that the determination of trips generated by new development will be based on the trip determination methodology established by the current edition of the Institute of Transportation Engineers' *Trip Generation* report.

This study has identified a total trip generation of 7,041 new p.m. peak hour trips associated with the buildout of the City land use plan over the next 25 years or approximately 282 new p.m. peak hour trips per year.

The total projected cost of \$6,661,000 was estimated for the supplemented programmatic implementation program, all of which can be associated with improvement projects needed to support the City's traffic growth volumes and thus could be collected through traffic impact fees.

The priorities identified for the proposed improvement projects was used to develop the 6-year project costs for the City's 2005-2010 Transportation Improvement Program. The estimated costs for the top four projects shown in **Table 5** that include improvements at Avenue A/2nd Street, Avenue D/15th Street, Bickford Avenue/Fobes Road/30th Street-Phase 1, and Avenue D/1st Street total \$2,529,000, of which \$2,402,550 could be collected from traffic impact fees

with the remaining \$126,450 to be obtained from grant funding. With a total of 7,041 p.m. peak hour trips generated throughout the 25-year buildout period, an average of 282 new p.m. peak hour trips is expected through new development per year. Therefore, a total of 1,690 new p.m. peak hour trips (282 trips per year x 6 years) are estimated to occur during the next 6-year period (2005-2010).

The transportation improvement project costs and the p.m. peak hour trips generated due to expected growth within the City of Snohomish in the next six-year period results in a calculated overall traffic impact fee of approximately \$1,422 (\$2,402,550 / 1,690 trips) for each new p.m. peak hour trip generated by new developments within the City. Since this determination assumes a 5 percent probability of obtaining grants for the proposed improvements, it is recommended that the impact fee considered for adoption be in the range of \$1,422 to \$1,496 per p.m. peak hour trip generated by development. These fees are proportionately comparable if not lower than other agency impact fees. The final impact fee schedule would be subject to review and adoption by the City of Snohomish based on its philosophy for encouraging economic growth and development.

For comparison purposes, **Table 6** shows a summary of other jurisdictions that have adopted traffic impact fees on a “pay and go” cost per trip basis, although some also have options based on specific land use type and square footage of the new development proposed.

Table 6
Traffic Impact Fee Comparisons

Jurisdiction	Cost Basis	Impact Fees	Comments
Bothell	PM Peak Trip	\$2,191	Option of using floor area per land use type or this base value.
Kenmore	PM Peak Trip	\$2,017	N/a
Marysville	PM Peak Trip	\$1,542	Considering increase to approximately \$2,500 per PM trip.
Arlington	PM Peak Trip	\$1,038	Option of calculating on a proportionate share basis per TIP projects.
Edmonds	PM Peak Trip	\$764	Fees actually based on land use type and area but calculated from this base value.
Snohomish County	ADT	\$166-337	Inside the County UGA
	ADT	\$183-368	Outside the County UGA

Many other jurisdictions also incorporate the use of traffic impact fees, however; they are not on a trip fee basis, rather a land use and floor area basis or vehicle trip length basis. These methods rely heavily on traffic modeling and are much more complicated in terms of staff review, land use category determinations, applicable floor area, and trip credit determination among others factors and are not recommended for the City of Snohomish.