

CITY COUNCIL AGENDA ITEM
CITY OF SHORELINE, WASHINGTON

AGENDA TITLE: Adoption of Resolution #201 Adopting the Design the Aurora Corridor Project 145th -165th and Directing Staff to Proceed with Construction Consistent with this Design
DEPARTMENT: Public Works
PRESENTED BY: Kirk McKinley, Aurora Corridor Project Manager
Tim Bevan, CH2M Hill

PROBLEM/ISSUE STATEMENT:

The environmental review for the State Environmental Protection Act (SEPA) requirements for the Aurora Corridor project from 145th to 165th has been completed. The item before you is to adopt the design for the project. At your December 9, 2002 Council meeting, you will be asked to consider Resolution No. 201 which adopts the design for the Aurora Corridor project 145th-165th and directs staff to proceed with construction consistent with this design. Staff is recommending adoption of Alternative A – Modified for design and construction. This action is based on years of extensive public involvement, study and analysis.

BACKGROUND:

On November 23, 2002, Timothy Stewart, the City of Shoreline's SEPA Official signed and approved the Final Environmental Impact Statement (FEIS) for the SR99 Aurora Avenue North Multimodal Corridor Project: North 145th Street to North 165th Street. The FEIS completes the SEPA environmental effort. The SEPA Official has found that there are no significant adverse environmental impacts. The final environmental step is to complete the National Environmental Protection Act (NEPA) review whereby the Federal Highway Administration will issue a Finding of No Significant Impact (FONSI). Prior to issuing the FONSI, federal regulatory agencies must concur with the findings of the biological review that the project has no effect on threatened or endangered species. Once the FONSI is issued, the City can proceed with the design and right-of-way acquisition process.

Attached to this staff report is Resolution No. 201 (Attachment A), which includes two exhibits: Exhibit A is the description of Alternative A - Modified, and Exhibit B is the list of mitigation measures to be utilized and incorporated in the design and implementation of this project. These are in addition to and supplement the "32 Points" that were included in the Council Action on August 23, 1999 approving Resolution No. 156, and accepting the design concept forwarded to you by the Citizens Advisory Task Force (CATF). Attachment B is from the FEIS and compares the operational analysis of the various systems and analysis topics. It provides a quick reference to the differences in the alternatives analyzed. Attachment C is a summary of responses to common comments received during the environmental review process. Attachment D is a

summary of the cost estimates for Alternative A – Modified (these cost estimates will continue to be refined as we move through the design process).

ALTERNATIVES ANALYZED:

The Environmental Analysis and Draft Environmental Impact Statement (EA/DEIS) was issued on July 10, 2002. This document combined the SEPA and NEPA analysis for the SR 99 Aurora Avenue North Multimodal Corridor Project: North 145th Street to North 165th Street into one document. An open house and public hearing was held on this document on August 6, 2002. The public comment period closed on August 16, 2002. The public hearing included testimony from 42 individuals, and 64 written responses were received. Testimony was recorded and a transcript of the hearing is included in Appendix F, as are all comment letters, and written responses to comments. In general, the testimony and written correspondence was closely balanced between those in favor of Alternative A, and those supporting another, or no alternative.

The EA/DEIS analyzed three alternatives: No Build, Alternative A, and Alternative B. The FEIS analyzed one additional alternative: Alternative A – Modified, which is the alternative recommended as the design for the 145th to 165th project in Resolution No. 201. A brief description of the alternatives is provided below. For a full description of the alternatives, please refer to page 2-12 of the FEIS. All of the “build” alternatives include 7 lanes of traffic (two general purpose lanes in each direction, and a Business Access Transit (BAT) lane in each direction, and one center lane for left and u-turn pockets and median), sidewalks, underground utilities, storm water improvements, and lighting. All build alternatives also include two new signalized intersections at 152nd and 165th.

No Build Alternative: Corridor receives no capital investment other than general street maintenance or frontage improvements required with new development.

Alternative A: Total mid-block width is 112 feet from back of sidewalk to back of sidewalk. Each side of the street includes an eight-foot sidewalk, a four-foot amenity zone for landscaping and street furnishings, and a six-inch curb. The 15-foot median has six northbound left/u-turn pockets and five southbound.

Alternative B: Total mid-block width is 102 feet. Each side of street includes a seven-foot sidewalk adjacent to a six-inch curb. Additional left and u-turn openings are provided for a total of eight northbound, and nine southbound.

Alternative A – Modified: Total mid-block width is 110 feet. The sidewalk width has been reduced to 7 feet, and the amenity zone remains at four feet, and a six-inch curb. Additional left and u-turn pockets have been provided for a total of seven northbound and seven southbound. Alternative A – Modified proposes eliminating (until redevelopment of the property) the amenity zone at several locations (Seattle Ski, Care Plus, and Shay’s) to reduce impacts on businesses and parking. This alternative includes a design option for closing the east leg of 160th, or having it remain open to traffic (this is an operational decision that can be made during the design process).

The recommended design (Alternative A – Modified) includes many mitigation items that are detailed in Exhibit B of Resolution No. 201. These include extensive construction mitigation, additional storm water quantity and quality improvement techniques, a monitoring program to address potential neighborhood spillover traffic. Alternative A – Modified has been developed in consultation with the State Department of

Transportation (WSDOT) and has received their support. In addition, WSDOT has reviewed and provided comments that have been incorporated into the FEIS.

FINANCIAL IMPACT:

Funding is included in the adopted Capital Improvement Program to implement the 145th to 165th project. The earliest estimate that the project could be under construction is late 2004. The cost estimates include generous risk, uncertainty and contingency assumptions. Alternative A – Modified includes several cost saving elements such as reducing: the scope and extent of east-west side street improvements, the width of the roadway cross-section to require less right-of-way acquisition, the scope of the Westminster and 155th area improvements, the City share of utility undergrounding, and other reductions based on the Value Engineering Study recommendations. The cost estimates also include a \$5,000 contribution by the City to each property for the conversion to underground service. The current cost estimate for Alternative A – Modified is attached (Attachment D). Attachment D shows a cost of \$19.621 million and lists the assumptions included in this estimate.

RECOMMENDATION

Staff recommends that Council adopt Resolution No. 201, adopting Alternative A - Modified as the design for the Aurora Corridor project, 145th – 165th and directing staff to proceed with construction consistent with this design.

Approved By: City Manager  City Attorney,

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BACKGROUND

The Council received a briefing on the EA/DEIS on August 19, 2002. At this briefing staff summarized the comments and issues addressed in the EA/DEIS.

Since it's incorporation in August, 1995, Shoreline citizens, businesses and Council have identified the need to improve the Aurora Corridor.

Community Visioning

The Community Visioning process undertaken in the spring and summer of 1996 was one of the first steps in defining a community design vision for the City and for Aurora, and for laying a foundation for the development of the Comprehensive Plan . This process included workshops with the community on March 30, 1996, and with the Chamber of Commerce on April 10, 1996 resulted in a report published in August of 1996. This process included many recommendations for Aurora design including: "sidewalks to separate pedestrians and autos, explore medians and boulevards, add trees and other landscaping, make it more attractive, clean-up shabbiness, make it a better place and it will be a more profitable business environment, promote economic development, build HOV lanes".

Comprehensive Plan

The Comprehensive Plan was adopted on November 23, 1998. The process to develop the plan occurred over several years and included over 300 public meetings. A DEIS and FEIS were produced and approved. The environmental process included an analysis of Aurora capacity needs as part of the transportation element. The Comprehensive Plan includes policy direction for the future of Aurora in five different elements of the plan: Introduction, Land Use, Transportation, Economic Development, and Community Design. These are briefly discussed below.

Land Use Element: This element has several goals and policies directed at the Aurora Corridor. Goal LU VIII identifies the need "to redirect the changes in the Aurora Corridor from a commercial strip to distinct center with variety, activity, and interest by: balancing vehicular, transit, and pedestrian needs,...., creating a sense of place..., protecting neighborhoods...".

Transportation Element: This element established a level of service (LOS) standard for the Aurora Corridor not to exceed an average LOS "E". The text in the Transportation Element discusses upgrading Aurora to meet urban standards with curb, gutters, sidewalks, and drainage and traffic flow improvements including potential mitigation by adding right turn lanes at some intersections, and space for u-turns. The Element states that the transportation solution for Aurora should "strike a balance between being a downtown or urban street with defined edges, and slower moving traffic and accommodating a through traffic function that is more typical of a state highway". Policy T17 says to "pursue methods to improve and enhance transit operations on Aurora in Shoreline...continues to function as a primary transit corridor.."

Economic Development Element: This element identifies Aurora as a key commercial corridor, and the need for the transportation infrastructure and amenities to be in place

to support the economic development goals of the City. Policy ED 36 says: “ensure that infrastructure can meet the needs of existing and planned future commercial development including ...transportation”, and ED39 states: “Make improvements to Aurora Avenue so tht is it as a friendly, functional, and attractive street”. The element also calls for undergrounding utilities, making strong pedestrian linkages “within commercial areas and connecting these areas to neighborhoods”. Policy ED42: “Promote the maintenance and development of high quality transportation and transit facilities that serve commercial development”.

Community Design Element: This element includes policy CD44, which states: “Enhance the Aurora Corridor to include gateway improvements, pedestrian amenities, landscaping, cohesive frontage improvements, and a boulevard streetscape design.”

Aurora Corridor Multimodal Pre-Design Study

The Aurora Corridor Multimodal Pre-Design Study was initiated in the summer of 1998 and was completed on August 23, 1999, when the City Council unanimously adopted Resolution No. 156, accepting the design concept of the Citizens Advisory Task Force (CATF). The CATF was a committee appointed by the City Council that included representatives of the business community, Chamber of Commerce, citizens at large, and citizens of neighborhoods along the corridor. This group met 13 times. The Pre-Design process included an Interagency Team of agency stakeholders that also provided input into the study process. This team met five times. The Pre-Design process included three citywide open houses at key points in the process. The final recommendation of the CATF to the City Council included a design concept very similar to Alternative A, and a set of implementation principles called the “32 Points”. These principles were established in response to concerns and issues during the process and are to be utilized in the design process. They include guidance to narrow sidewalks to mitigate land impacts/acquisitions on existing businesses, and other guidance intended to address concerns of the business community.

Property Acquisition and Relocation Policy, Procedures and Guidelines

This document was developed in the winter of 2000/2001 and was approved by the City Council on January 10, 2001 and is intended to provide direction on the acquisition and relocation process and procedures as the Aurora project is implemented. It establishes processes, rights, and procedures for acquisition and relocation. It provides an additional \$5,000 for businesses that are required to relocate and who choose to relocate within Shoreline. The 145th to 165th project does not anticipate requiring the relocation of businesses.

Environmental Assessment/Draft Environmental Impact Statement

The Environmental Analysis and Draft Environmental Impact Statement (EA/DEIS) was issued on July 10, 2002. This document combined the SEPA and NEPA analysis for the SR 99 Aurora Avenue North Multimodal Corridor Project: North 145th Street to North 165th Street into one document. An open house and public hearing was held on this document on August 6, 2002. The public comment period closed on August 16, 2002. The public hearing included testimony from 42 individuals, and 64 written responses were received. Testimony was recorded and a transcript of the hearing is included in Appendix F, as are all comment letters, and written responses to comments. In general,

the testimony and written correspondence was closely balanced between those in favor of Alternative A, and those supporting another, or no alternative.

ALTERNATIVES ANALYSIS

Attachment B includes a useful table that summarizes the differences between the No Build, Alternatives A and B, and how Alternative A has been modified to respond to public testimony and written comments. Please refer to FEIS Appendix F, for the full package of testimony, written comments, and responses to comments. Also, attached to this staff report is a summary of responses to common comments submitted during the environmental process (Attachment C).

Why Some Comments Are Not Reflected in Design

Alternative A – Modified incorporates and responds to many of the comments received during the environmental review process. However, there are some common comments (please refer to Attachment C for more detail) that cannot be incorporated into the design because of engineering standards, cost, or safety reasons. These include the proposals to eliminate the median/retain the center left turn lane, pedestrian bridges, and unsignalized pedestrian crossings. There have also been comments that the cost of the project is too high.

Medians. The WSDOT has repeatedly stated in correspondence, public meetings, and meetings with the Shoreline Merchants Association (SMA) and Concerned Citizens for Shoreline (CCFS) that the project cannot be constructed without a raised center median. WSDOT has design authority for the design of Aurora, and has said that a median is required to obtain design approval. This statement is based on safety, and is supported in WSDOT's Design Manual and in Washington Administrative Code (WAC). There are several potential designs for a solid median including: a solid "jersey barrier" (an example of this design can be viewed on Aurora between N 38th and N 50th in Seattle), solid walls, wide concrete or asphalt islands, or a design similar to Alternative A – Modified which allows left and u-turn movements at focused locations. The other acceptable median designs would allow for left and u-turn movements only at signalized intersections. The median design selected for Alternative A – Modified provides left and u-turn opportunities at 14 locations, six of which are located at unsignalized locations. The Alternative A – Modified design recommends landscaping in the median, and the landscaping would be designed to provide visibility across the median for visibility of businesses.

Pedestrian Bridges or Undercrossings. The need for pedestrians to safely cross Aurora is a major concern. The SMA and CCFS have suggested pedestrian bridges or undercrossings as a solution. There are several reasons that these suggestions are not included in the recommended design. Grade separated pedestrian crossings are very expensive ranging from \$1 to \$2 million for a basic pedestrian bridge to \$3 to \$5 million for a full intersection bridge or underground crossing. Many pedestrians do not use these facilities because they do not feel safe (especially in underground crossings), or inconvenient. Grade separated crossings must comply with Americans with Disabilities Act (ADA) which requires either elevators, or very long ramping structures. The ramping structures block access to properties, interfere with visibility to properties, and require additional acquisition of right-of-way. Alternative A – Modified provides

pedestrian crossing opportunities at signalized intersections (145th, 152nd, 155th, 160th, and 165th). These signals will provide adequate time for pedestrians to cross, and will also provide a four-foot refuge at the median for those pedestrians that may not complete the crossing. The signals will include technology for sight impaired, and may include wheelchair sensors. The City will continue working with WSDOT for future pedestrian signals at locations that can meet signal warrants.

Project Costs are too High. The City has reviewed project estimates and real costs for other Highway 99 projects throughout the region, and finds the cost estimates for the 145th to 165th project to be in the middle of pack, if not a bit lower. The cost comparisons analysis assumed 2002 costs, and were calculated on a per mile basis. Alternative A – Modified has reduced costs by narrowing the right-of-way, limiting impacts to some properties, and by reducing the extent and scope of east-west sidestreet improvements, including 155th and Westminster Way. The cost estimates also include high assumptions for risk, uncertainty and contingencies. Attachment D includes an overview of the cost estimate assumptions for Alternative A – Modified.

STAKEHOLDERS

There has been a consistent group in opposition to various aspects of the Aurora Corridor redesign effort. They have opposed the construction of a landscaped median, the width of the sidewalks, and the amenity zone.

SUMMARY

The Council has been pursuing the reconstruction and improvement of Aurora since incorporation in 1995. The effort began with a visioning process and development of the Comprehensive Plan that provided a vision and policies to improve the corridor. This was followed by the Aurora Corridor Multimodal Pre-Design Study resulting in unanimous adoption of a design concept by the Council in 1999. The City has sought and been awarded funding from County, State, Federal sources for the project. Input from Shoreline citizens and businesses, as well as stakeholder agencies have been continuously included in the process from the beginning. The City has sought and received grant funding for the project, and has included funding for this project in the adopted Capital Improvement Program. The adoption of Resolution No. 201 is the final City action in the project to design and construct improvements to the Aurora Corridor, from 145th to 165th.

RECOMMENDATION

Staff recommends that Council adopt Resolution No. 201, adopting Alternative A-Modified as the design for the Aurora Corridor project, 145th – 165th and directing staff to proceed with construction consistent with this design.

ATTACHMENTS

Attachment A – Resolution No. 201

Exhibit A – Description of Alternative A - Modified

Exhibit B – Mitigation in Aurora FEIS

Attachment B – Table 2-2, Comparison of Operational Impacts

Attachment C – Summary of Responses to Common Comments

Attachment D – Aurora Avenue 145 – 165 Budget Estimate - Draft

PROVIDED UNDER SEPARATE COVER

- Final Environmental Impact Statement, SR 99 – Aurora Avenue North Multimodal Corridor Project: North 145th Street to North 165th Street, Volume 1
- Appendix F, Comments on the Draft EIS and Their Responses, Volume 2

RESOLUTION No. 201

A RESOLUTION OF THE CITY OF SHORELINE, WASHINGTON, ADOPTING THE DESIGN FOR THE AURORA CORRIDOR PROJECT 145TH-165TH AND DIRECTING STAFF TO PROCEED WITH CONSTRUCTION CONSISTENT WITH THIS DESIGN

BE IT RESOLVED BY THE CITY COUNCIL OF THE CITY OF SHORELINE, WASHINGTON, AS FOLLOWS:

Section 1. Recitals.

- A. On November 23, 1998, the City of Shoreline adopted a comprehensive plan under the provisions of Chapter 36.70A RCW that includes the state mandated transportation element; and
- B. The adopted Comprehensive Plan of the City of Shoreline:
- anticipates “Upgrading Aurora Avenue to meet urban standards”,
 - “proposes as a high priority the completion of the sidewalk system on all arterial streets, on school bus routes and in locations demonstrated to need safer facilities”, and
 - Includes a policy to “Pursue methods to improve and enhance transit operations on Aurora in Shoreline...” and
- C. On August 23, 1999, the City of Shoreline adopted Resolution No. 156 accepting the recommendation of the Citizens Advisory Task Force, finding the recommendation in conformance with the Comprehensive Plan, initiating an amendment to the Capital Improvement Program, and directing staff to pursue environmental analysis for improvement projects in the Aurora Corridor.
- D. The City of Shoreline has prepared an Environmental Impact Statement (EIS) under the State Environmental Policy Act (SEPA) that considered the Aurora Corridor Project 14th-165th, impacts, alternatives, mitigation measures, and other conditions and issued the Final Environmental Impact Statement (FEIS) more than seven days prior to action on final design.
- E. The project review required by the Federal National Environmental Policy Act (NEPA) has been integrated with SEPA.
- F. The City of Shoreline, in cooperation with the Washington State Department of Transportation, has conducted extensive public participation and public review of the project.

G. The City conducted a public hearing on the Draft Environmental Impact Statement (DEIS) for the project on August 6, 2002.

H. The City of Shoreline, has considered the FEIS for the project, staff recommendations and public testimony on the action to select a final design for the Aurora Corridor Project 145th-165th at the Council meeting of December 9, 2002 meeting.

Section 2. Findings. The City Council finds that:

- A. The FEIS for this project has been prepared and issued pursuant to Chapter 43.21C RCW.
- B. Public involvement and review of the project and alternatives as discussed by the Staff Report prepared for the Council meeting of December 9, 2002, has been extensive and adequate to ensure a substantial relationship to the public interest, health, safety and welfare.
- C. Alternative A Modified as identified in the FEIS for the Aurora Corridor Project 145th-165th and summarized and depicted in Exhibit A attached hereto is consistent with the City of Shoreline Comprehensive Plan and the State Growth Management Act, Chapter 36.70A RCW.
- D. The FEIS addressed a reasonable range of alternatives including a no action alternative that accomplished the purpose and need for the project.
- E. The FEIS has evaluated all significant environmental impacts associated with the project alternatives.
- F. Construction of Alternative A Modified with the mitigation measures listed in Exhibit B attached hereto and incorporated herein, together with adopted development regulations, will not create significant adverse environmental impacts.

Section 3. Adoption of Design. Alternative A Modified as further amended by the mitigation measures identified in Section 1F. is adopted as the preferred design for the Aurora Corridor Project 145th-165th.

Section 4. Project Construction. The Council directs the staff to proceed with the development of detailed construction plans for Alternative A Modified as supplemented by the mitigation measures identified in Section 1.F, proceed with a formal bid process for recommending award of a contract to construct the Aurora Corridor Project 145th-165th consistent with these plans, obtain all necessary permits and take all other actions necessary to complete construction of this project consistent with this design.

ADOPTED by the City Council this 9th day of December, 2002.

Mayor Scott Jepsen

ATTEST:

Sharon Mattioli, CMC
City Clerk

Description of Alternative A Modified

The Aurora Corridor Project is intended to enhance the safety of all users and improve the economic development potential of the business district while recognizing the regional importance of the Aurora Avenue North in the overall transportation network between North 145th Street and North 165th Street. Alternative A Modified would have a seven-lane configuration. The advantages of the proposed seven-lane configuration are:

- Additional and adequate capacity in the northbound and southbound directions (with added intersection improvements and interconnection between signals)
- Increased safety because a median would control left-turn movements into and out of driveways, thus reducing potential conflict points
- Increased safety because there would be continuous sidewalks and pedestrian lighting, continuous roadway lighting, and pedestrian refuge areas in the center median
- Improved local and regional transit because there would be dedicated northbound and southbound BAT-only lanes
- Improved aesthetics and visual continuity with construction of landscaping, illumination, and pedestrian facilities

Alternative A Modified proposes construction of continuous 7-foot wide sidewalks with an adjacent 4-foot wide amenity zone and 6-inch curb that extends the length of the project area, and seven lanes of traffic (two general-purpose lanes and one continuous Business Access/Transit [BAT] lane northbound and southbound, and one center lane for left/u-turn pockets/median). A typical cross section for this configuration is attached on page 3. The BAT lane would serve transit buses and right-turning general purpose vehicles. Transit buses would be allowed to operate in the BAT lane throughout the entire length of the Aurora Corridor Project area. The BAT lane would also allow general-purpose vehicles entering and existing businesses to accelerate and decelerate in a dedicated lane without affecting the speed of through traffic. This low volume lane would enhance safety by improving access to and from businesses and properties along Aurora Avenue North and also will increase the capacity of the general purpose through lanes by allow in traffic to maintain constant speeds. General purpose vehicles in the BAT lane would be required to turn right at each street intersection.

Left turn/u-turn openings in the raised center median would be provided at signalized intersections at North 145th Street, North 152nd Street, North 155th Street, North 160th Street, and North 165th Street. Additional left turn/u-turn pockets would be provided southbound at Jiffy Lube/The Brake Stop, northbound at North 149th Street, southbound at Seattle Restaurant Supply, northbound at Westover Plaza, northbound at North 163rd Street, and southbound at Vons Square/Sarah's Auto Center. The width of the median at

turn pockets would be 4 feet; left-turn lanes would be shortened at intersections with new left-turn pockets. In addition, dual left-turn lanes would be provided northbound at North 160th Street and eastbound on North 155th Street at Aurora Avenue. The median access concept is shown on page 3.

The project would include installation of new traffic signals at North 165th Street and North 152nd Street and modifications to existing traffic signals located at North 145th Street, North 155th Street, and North 160th Street. Alternative A Modified proposes to close the east leg of the intersection with North 160th Street and Aurora Avenue. The benefits of this option include improved safety for the Interurban trail crossing at North 160th Street, improved signal operations at 160th Street, and restricting potential cut-through traffic at this location. In addition, by closing this leg of the intersection, additional parking can be provided within the right of way for the trail users and local business customers. This alternative also includes a design option that would keep North 160th Street open to through traffic east of Aurora Avenue North.

Additional proposed improvements include constructing curbs and gutters on all sidewalks, planting street trees, and providing other pedestrian amenities. Continuous 7-foot-wide sidewalks would be constructed along both sides of Aurora Avenue North to provide pedestrian walkways that are safe and attractive; sidewalks would be narrowed where building conflicts exist. A 4-foot wide amenity zone would be constructed adjacent to the 6-inch curb – except at interim sidewalk locations, and would serve as a buffer between pedestrians and street traffic. Pedestrian railings would be provided as necessary to protect pedestrians at vertical grade separations, such as along retaining walls.

Alternative A Modified proposes interim sidewalks at three locations to mitigate impacts to properties or businesses. An eight-foot sidewalk with no amenity zone would be constructed in front of the Shay's Restaurant Plaza so that no parking would be impacted at this location. An interim sidewalk of eight-feet with no amenity zone is also proposed in front of the CarePlus facility to allow for emergency vehicle parking. In addition, a seven-foot wide sidewalk with no amenity zone is proposed in front of the Ski Seattle building to avoid impacts to this building.

Bus shelters would be built at specific transit stop locations, and illumination would be added throughout the corridor, both pedestrian scale lighting and consistent roadway lighting. In addition, overhead utilities would be relocated underground. The stormwater drainage system would include a new collection and conveyance system, improved water quality facilities to treat the roadway stormwater collected, and oil-water separators located at high volume intersections including North 145th Street and North 155th Street. In addition, detention facilities would be incorporated in the project, improving stormwater detention for Aurora Avenue runoff.

Mitigation For Aurora 145th-to-165th Project

Transportation

Construction Impacts

Impacts related to the build alternatives will be mitigated to the greatest extent possible through the application of construction best management practices (BMPs), including traffic control plans, construction staging plans, and continual communication and coordination with businesses along the project limits.

Traffic on Aurora Avenue will be notified to use alternate routes during periods of significant disruption or traffic, and regional transit service would be used to provide additional person-movement capacity at these times.

Planning adequate traffic control during design and construction of this project are key to a smooth, successful, and safe construction. Continued public information and opportunities for input will be provided throughout the period of construction.

Partnerships with adjacent businesses will be maintained throughout the construction period to ensure that business access needs are met during construction.

See the following Neighborhood Traffic Impact section for mitigation measures to address neighborhood traffic impacts during construction.

Transit

Coordination with King County Metro and Community Transit will be ongoing throughout the construction period to minimize impacts to transit service. Bus zone relocation or closure will be clearly signed and communicated to transit riders. Temporary stops will be provided in a safe and accessible location, free of conflicts from other traffic and construction activity.

Bicycles and Pedestrians

The following will be considered when developing a traffic control plan for road construction:

- Bicyclists and pedestrians must not be placed into conflict with work site activities because it impedes the work and increases the risk to pedestrian safety.
- Bicyclists and pedestrians must not be put into conflicts with other traffic moving through or around the work area.
- Bicyclists and pedestrians must be provided with a safe and convenient travel way (temporary sidewalk or bike path) that replicates as nearly as possible the qualities of a sidewalk, bikeway, or multipurpose trail.

- Construction flaggers may be provided to facilitate the safe movement of pedestrians and bicyclists through the work zone.
- Provide well-marked detour routes for bicycles and pedestrians that enable direct and safe access to destinations.

Traffic Control Plan

Traffic control plans (TCPs) help ensure a safe and efficient construction operation. Formal TCPs for the construction of Aurora Avenue North will be prepared to ensure that adequate traffic control is provided during the construction phases and to help ensure that access through the construction zone and to businesses will be safe.

Construction Staging Plan

Formal construction plans will be prepared to aid in management of traffic during construction. The primary options for construction staging are shift, detour, and half-width construction. Shift or half-width construction options are usually the preferred methods of construction because they allow business access during construction, and minimize the spread of construction impacts throughout the community. The shift option maintains the existing lane configuration of the roadway to maximize roadway capacity and driver comfort during construction. It is possible only when sufficient right-of-way is available. Half-width construction staging is another option that maintains some service along the roadway during construction. With this option, all of the roadway traffic is placed on one half of the roadway while the other half is under construction. The number of traffic lanes is reduced, and business access is more difficult to provide.

Construction detours for this project are not anticipated, however they might be needed if major structural repair of the entire roadway or extensive underground utility relocation is required. Such detours will be considered only if the following conditions apply:

- There is only moderate and tolerable impact on the local economy and services.
-
- No major controversy is generated by the detour. This includes adverse impacts to neighborhoods.
- Substantial environmental impacts and right-of-way clearance problems are anticipated.
- The cost of maintaining the designated detour route is less than the cost of the half-width construction option.

When detours and lane closures are needed on high-volume multilane highways, they will generally be scheduled to occur during the non-peak daytime and nighttime hours when traffic volumes are at their lowest levels.

Detour routes, when used will be well signed using only appropriate arterial routes.

The sequence of construction will be planned to minimize the length of construction, to keep traffic flowing, to maximize access to properties, and to allow proper pavement construction.

Maintaining Access and Communication

During the course of construction, access to businesses along Aurora Avenue North will be maintained. Temporary access revisions would be well marked and will provide the most direct access to properties possible. One approach for maintaining access while reconstructing driveways will be to construct one-half driveways to enable access using the other half during curing of concrete.

Signing during construction can be divided into two categories, those that are required to identify the worksite and its related conditions and hazards and those that identify business locations and access points that might be obscured during construction.

Owner/tenants along the corridor will be kept informed of construction schedules, schedule changes, and information detailing construction activities.

Neighborhood Traffic Impacts

The City will undertake a neighborhood traffic safety program along the Aurora Corridor. This program includes collecting baseline count information, monitoring traffic impacts, and mitigating impacts if necessary. The City will monitor traffic impacts on adjacent and parallel streets to Aurora during construction and after construction. The program will also include spillover traffic monitoring during construction, with temporary traffic control measures. The counts will eventually be incorporated into the City traffic count program. If a street has traffic growth resulting from the Aurora Project that is documented to exceed a threshold yet to be established, then physical devices may be installed such as traffic circles, diverters, chicanes, or street closures.

Land Use

The City will comply with all applicable permits and approvals to begin construction of the proposed project.

Property acquired for new right-of-way will be purchased by the City at fair market value in accordance with the *Aurora Avenue North Right-of-Way Policies and Procedures Manual* and in accordance with "Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, as amended."

Social

Services

The City will coordinate with public service providers to locate construction and future access points prior to construction. If access points used during construction become ineffective during construction, then the access points will be revised.

As-built drawings from utilities for use in project design and construction will be obtained.

Coordinate with police, fire, ambulance services, and school bus services to keep them apprised of construction activities and detour routes.

To minimize impacts on emergency services, the City and the contractor will inform and update the appropriate City, county, and state police and fire departments of all construction activities that would affect their emergency response procedures. Provisions for emergency vehicle access through the project area would be maintained throughout all phases of construction.

Improving the fire hydrant spacing on the east and west sides of Aurora Avenue would enhance fire protection for all businesses along the corridor by making it less likely that the fire department would have to lay large-diameter hose lines across Aurora Avenue during emergencies. It would also result in less traffic disruption if this eventually were to occur.

Interruptions to utility services will be minimized by coordinating the relocation of utilities with the contractors' schedules and by notifying customers in advance of any service interruption. Measures would be taken to ensure that existing pipelines are adequately protected against potential adverse effects of the settling that might result from compaction.

For utility lines that must be rerouted or relocated, the City and the contractors will work with the affected utility company to coordinate the necessary modifications.

Pedestrian and Bicyclist Facilities

Space will be maintained on the nonconstruction side of Aurora Avenue North for pedestrians and bicycles during construction.

Wider sidewalks will minimize conflicts between pedestrians and bicyclists when bicyclists are on the sidewalk.

Economics

Installing temporary signage will be installed to inform drivers that access to businesses during construction is temporarily changed or restricted and that businesses are open. Notify community through newspaper that businesses are open and identify possible detour routes.

Contractors will be required to submit and receive approval of a construction plan to maintain access for all properties and businesses adjacent to construction activity. Interruptions to businesses will be expected to be minimal.

Property owners will be compensated for the fair market value of property acquired for new right-of-way, in accordance with the *Aurora Avenue North Right-of-Way Policies and Procedures Manual* and the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, as amended.

The City will work with impacted businesses that lose compliant parking spaces to reconfigure the remaining parking area to maximize the number of available parking spaces. Parking lot reconfiguration, where appropriate and necessary, will occur as part of the project. This includes restriping parking areas to maximize the number of parking spaces.

Permanent signage will be installed to direct vehicles to legal u-turn intersections.

Air Quality

Best Management Practices for Fugitive Dust control will be used as outlined in the Association of General Contractor's Fugitive Dust Handbook.

The following mitigation will be implemented:

Using water spray as necessary to prevent visible dust emissions, particularly during demolition of brick or concrete structures by mechanical or explosive methods.

Preventing dust emissions during transport of fill material or topsoil by covering the load, either by wetting down the load or by ensuring adequate freeboard on trucks.

Promptly cleaning up any spills of transported material on public roads by frequently using a street-sweeper machine.

Covering loads of hot asphalt to minimize odors.

Scheduling work tasks to minimize disruption of the existing vehicle traffic on streets in the vicinity of the station sites.

Maintaining all construction machinery engines in good mechanical condition to minimize exhaust emissions.

Noise

Mitigation of Construction Impacts

Construction hours will be limited to the hours allowed by the City's noise ordinance. Construction noise will be reduced with properly sized and maintained mufflers, engine-intake silencers, and engine enclosures, and by turning off idle equipment.

Stationary equipment will be placed as far away from sensitive receptor locations as possible. Where this is infeasible, or where noise impacts are still substantial, portable noise barriers will be placed around the equipment with the opening directed away from the sensitive receptor property.

Although back-up alarms are exempt from the Washington noise ordinance, they are among the most annoying sounds from a construction site. Where feasible, equipment operators should drive forward rather than backward to minimize this noise. Requiring operators to lift rather than drag materials wherever feasible should also reduce the noise generated from material handling.

If construction must occur at night to avoid conflicts with traffic on Aurora Avenue North then a noise variance must be obtained from the City of Shoreline.

Water Quality/Surface Water

The project will include the following stormwater and erosion control measures. Note that these measures are included to meet current federal, state, and city regulations, so they are not considered mitigation measures. In addition, the City of Shoreline has decided to use the

most conservative criteria for designing stormwater detention and flow control facilities. Because these measures are included in the project, additional mitigation measures for stormwater and/or erosion and sedimentation impacts are not necessary.

Measures to reduce the potential for erosion and downstream sedimentation include the following:

Nonstructural measures – Developing and implementing an erosion and sediment control plan; minimizing soil-disturbing activities during the winter wet season; minimizing disturbed areas by clearly marking clearing and grubbing limits; limiting the amount of area that could be disturbed at any one time; maintaining the erosion and sediment control measures, minimizing the transport of sediment onto paved roads; and sweeping paved roads that have sediment deposited on them from construction activities.

Temporary structural measures – Installing temporary silt fences; using catch basin filters; and placing erosion control blankets on steep slopes.

Permanent measures – Placing erosion protection around pipe inlets and outlets (e.g., riprap or concrete headwalls); and planting the pervious areas.

Stormwater flow control and quality treatment measures include the following:

Stormwater quality treatment facilities in each of the three basins – These facilities would be designed to treat the runoff from as much as possible of the pollutant-generating surfaces in the project area in the basin. The stormwater quality treatment facilities would be designed to meet the basic level of treatment required by the SWDM.

Stormwater detention facilities in the Boeing Creek basin – No stormwater detention facilities would be included for this basin, unless the net new impervious area that would be created by this alternative in the basin increases to or exceeds 1,500 square feet. The stormwater detention facilities would be designed based on the requirements in the SMMWW, i.e. the flow duration standard from the SMMWW with release rates estimated based on forested conditions.

Stormwater detention facilities in the Thornton Creek Basin – These facilities would be designed for the stormwater runoff from the net new impervious area. These stormwater detention facilities would also be designed based on the requirements in the SMMWW, i.e. the flow duration standard from the SMMWW with release rates estimated based on forested conditions.

Stormwater detention facilities in the West Lake Washington (Densmore) basin – For each of the three build alternatives, these facilities would be designed for stormwater runoff from all the project area that is in the West Lake Washington (Densmore) basin following City of Seattle standards.

Special oil-control facilities at the two high-use intersections (North 145th Street and North 155th Street).

No additional mitigation measures for erosion/sediment control and stormwater impacts will be used. As part of the city-wide stormwater master planning effort, the City may implement additional stormwater control measures under other projects in order to improve the conditions of the streams in the City.

Wildlife, Fisheries, and Vegetation

No mitigation measures for impacts to wildlife or vegetation are necessary.

Because stormwater detention facilities, stormwater water quality treatment facilities, and erosion and sediment control BMPs would be included in the project, potential impacts to fisheries would be minimized and mitigation measures for fisheries impacts would not be necessary.

Historic and Archaeological Resources

Archaeological Resources

If previously undiscovered archaeological remains are encountered during construction activities, appropriate mitigation measures will be followed to ensure their identification, evaluation, and disposition. If prehistoric archaeological sites are detected during construction, work should be halted in the immediate vicinity of the find.

The Washington State Department of Transportation (WSDOT) has established operational procedures to deal with discoveries of bones during construction. Please see the Historical and Archaeological Resources Discipline Report for a full description of the WSDOT procedures.

Ethnohistorical Resources

No mitigation necessary at this time.

Historic Resources

The historic properties located within the project area are believed to be ineligible for inclusion in the NRHP. Therefore, no mitigation measures are recommended.

Visual Quality

Mitigation is required only for light and glare impacts that could occur during construction. Light and glare impacts will be mitigated by shielding roadway lighting to ensure that light sources are not directly visible from residential areas and local streets. Furthermore, construction adjacent to residential areas will be subject to noise regulations, which are designed to minimize nighttime disturbance.

Hazardous Materials

Mitigation measures for identified potential impacts will include the following:

Acquire additional information regarding the nature and extent of contamination at the identified sites (including depth to groundwater) and the site cleanup status. This information can be obtained through a request to research Ecology site files.

Conduct Initial Site Assessments (ISAs) or transaction screening evaluations for sites located within or adjacent to the project right-of-way. It is recommended that the ISAs include review of historical tax records located in the Puget Sound Archives to assist in identifying former site uses and to assist in locating possible unregistered USTs. If the information available is not sufficient to establish that the cleanup is complete or is not sufficient to prepare a remediation plan and cost estimate, a Preliminary Site Investigation (PSI) may be required. Findings should also be used to help manage liability during right-of-way acquisition.

Locate USTs and fuel lines prior to construction (i.e., at the Chevron, U-Haul, Unocal 76, Texaco locations).

Determine the presence or absence of PCBs in transformers that will be removed during relocation of overhead electrical utilities. Identified PCBs will require management in accordance with applicable regulations.

If necessary, schedule construction activities in concert with any needed cleanup activities to avoid contaminated areas.

Implement construction techniques that minimize disturbance to the subsurface and prevent the transport of possible contaminants to uncontaminated areas. These techniques would address dewatering activities, site grading and excavation, installation of light standards, stormwater pollution prevention, and spill prevention.

Prepare a comprehensive Contingency and Hazardous Substance Management Plan and a worker Health and Safety Plan to minimize the effects of identified and unanticipated hazardous substance impacts from contaminated soil and groundwater.

**Table 2-2
Comparison of Operational Impacts**

No Action Alternative	Alternative A	Alternative A Modified	Alternative B
Transportation			
<ul style="list-style-type: none"> The average vehicle delay for project intersections would be 87.3 with 4 signalized intersections operating at LOS F Traffic volumes along neighborhood streets parallel to Aurora Ave would increase Crash rates would be equal or greater than existing conditions Transit speed and service reliability would deteriorate Pedestrian travel would be unsafe and uncomfortable Uncontrolled and increased volumes would effectively block access across the roadway for trucks and emergency vehicles during peak traffic times 	<ul style="list-style-type: none"> The average vehicle delay for project intersections would improve to 55 seconds with 1 intersection operating at LOS F Alternative A would help reduce the amount of traffic that would divert into neighborhoods Access management treatments can reduce accident rates 26% and property damage rates 40% Transit speed and service reliability would be improved Pedestrian safety would be improved; access is enhanced and comfortable Access to properties will be maintained by locating the median openings at major truck access points 	<ul style="list-style-type: none"> The average vehicle delay for project intersections would improve to 53 seconds with 1 intersection operating at LOS F With the design option, the LOS at N. 160th Street would be "D," similar to Alternatives A and B. Without it the intersection would be at LOS C. Alternative A Modified would help reduce the amount of traffic that would divert into neighborhoods Access management treatments can reduce accident rates the same amount as in Alternative A Transit speed and service reliability would be improved similar to Alternative A Pedestrian safety would be improved similar to Alternative A; access is enhanced but pedestrian comfort is lower than Alternative A More median openings than Alternatives A and A Modified 	<ul style="list-style-type: none"> The average vehicle delay for project intersections would improve the same amount as in Alternative A Alternative B would help reduce the amount of traffic that would divert into neighborhoods Access management treatments can reduce accident rates the same amount as in Alternative A Transit speed and service reliability would be improved similar to Alternative A Pedestrian safety would be improved similar to Alternative A; access is enhanced but pedestrian comfort is lower than Alternative A More median openings than Alternatives A and A Modified
Land Use			
<ul style="list-style-type: none"> No land would be acquired There would be no additional incentives for land use patterns to change 	<ul style="list-style-type: none"> Alternative A would require 0.79 acres of new right-of-way No buildings would be demolished; proposed sidewalks and landscaping would be directly adjacent or in close proximity to several existing buildings Could produce both positive and negative effects on property values 	<ul style="list-style-type: none"> Alternative A Modified would require 0.65 acres of new right-of-way The design option would not change the amount of land that would be acquired. Other land use impacts would be similar to Alternative A 	<ul style="list-style-type: none"> Alternative B would require 0.47 acres of new right-of-way Other land use impacts would be similar to Alternative A
Social			

**Table 2-2
Comparison of Operational Impacts**

No Action Alternative	Alternative A	Alternative A Modified	Alternative B
<ul style="list-style-type: none"> No impacts to recreation facilities Regional and community growth patterns would continue to fluctuate Increased congestion could hinder the provision of public services and increase the need for emergency services due to increased crash rates Unsafe conditions for pedestrians and bicyclists would continue No disproportionate and adverse effects due to the alternatives are expected to impact minority or low-income populations 	<ul style="list-style-type: none"> The capacity and use of Darnell Park would not change under either alternative, but access to it would be slightly improved Would have no direct effect on population growth or demographic growth patterns Minor utility disruptions could occur during construction Emergency vehicle service would be mostly unaffected Substantial improvement for pedestrian safety; no formal bicycle lanes No disproportionate and adverse effects due to the alternatives are expected to impact minority or low-income populations 	<ul style="list-style-type: none"> Same recreation impacts as Alternative A Same regional and community growth impacts as Alternative A Minor utility disruptions could occur during construction Emergency vehicle service would be mostly unaffected except at N. 160th Street; additional median breaks would result in slightly less impact to service times The design option would maintain access for all vehicles at N. 160th Street, including emergency vehicles. Substantial improvement for pedestrian safety; no formal bicycle lanes No disproportionate and adverse effects due to the alternatives are expected to impact minority or low-income populations 	<ul style="list-style-type: none"> Same recreation impacts as Alternative A Same regional and community growth impacts as Alternative A Minor utility disruptions could occur during construction; additional right-of-way might be necessary to accommodate the full width of underground utility vaults. Emergency vehicle service would be mostly unaffected; additional median breaks would result in slightly less impact to service times Improved pedestrian safety; no formal bicycle lanes No disproportionate and adverse effects due to the alternatives are expected to impact minority or low-income populations
Economics			
<ul style="list-style-type: none"> No decrease in property tax revenues Increased congestion would delay the movement of persons, goods, and services Businesses and customers may move to areas with better mobility, less congestion, fewer traffic crashes and more attractive appearance Might reduce the potential for new development 	<ul style="list-style-type: none"> Access to businesses may be less desirable due to the removal of the 2-way left-turn lane; this would be partially offset by the inclusion of left- and u-turn opportunities Alternative A would impact 11 compliant parking stalls after mitigation \$1,067 in property tax losses per year to the City Businesses might experience a modest sales increase due to 	<ul style="list-style-type: none"> Access to businesses may be less desirable due to the removal of the 2-way left-turn lane; would have more turning opportunities than in Alternative A Alternative A Modified would impact 10 compliant parking stalls after mitigation \$868 in property tax losses per year to the City The design option would not affect parking or tax impacts Businesses might experience a 	<ul style="list-style-type: none"> Access to businesses may be less desirable without 2-way left-turn lane; would have more turning opportunities than in other build alternatives Alternative B would impact 6 compliant parking stalls after mitigation \$556 in property tax losses per year to the City Businesses might experience a modest sales increase due to increased mobility; a small

**Table 2-2
Comparison of Operational Impacts**

No Action Alternative	Alternative A	Alternative A Modified	Alternative B
<p>Air Quality</p> <ul style="list-style-type: none"> Traffic delays would increase, causing an increase in vehicle emissions from idling and slow-moving traffic This alternative would not worsen any existing carbon monoxide violations CO concentrations at North 160th Street would be slightly higher in 2020 than Alternatives A and B 	<ul style="list-style-type: none"> increased mobility; a small corresponding sales tax gain could be expected by the City Might make properties more attractive for businesses and new development. 	<ul style="list-style-type: none"> modest sales increase due to increased mobility; a small corresponding sales tax gain could be expected by the City Might make properties more attractive for businesses and new development 	<ul style="list-style-type: none"> corresponding sales tax gain could be expected by the City Might make properties more attractive for businesses and new development.
<p>Noise</p> <ul style="list-style-type: none"> Exterior noise levels in 2020 would increase over existing conditions at two receivers 	<ul style="list-style-type: none"> This alternative would not create new carbon monoxide violations of the National Ambient Air Quality Standards This alternative would not worsen the existing carbon monoxide violation at North 145th Street CO concentrations at North 155th Street in 2020 would be higher than the No Action Alternative 	<ul style="list-style-type: none"> This alternative would not create new carbon monoxide violations of the National Ambient Air Quality Standards This alternative would not worsen the existing carbon monoxide violation at North 145th Street CO concentrations at North 155th and 160th Streets in 2020 would be higher than all the other alternatives With the design option, CO concentrations at North 155th and North 160th Streets would be similar to Alternatives A and B. 	<ul style="list-style-type: none"> This alternative would not create new carbon monoxide violations of the National Ambient Air Quality Standards This alternative would not worsen the existing carbon monoxide violation at North 145th Street CO concentrations at North 155th Street in 2020 would be the same as in Alternative A
<p>Water Quality/Surface Water</p> <ul style="list-style-type: none"> No stormwater detention, treatment or special oil-control 	<ul style="list-style-type: none"> Exterior noise levels in 2020 are the same as the No Action Alternative Interior noise levels in 2020 are well within FHWA standards 	<ul style="list-style-type: none"> Exterior noise levels in 2020 are the same as Alternative A and the No Action Alternative Interior noise levels in 2020 are the same as Alternative A The design option would not affect noise results 	<ul style="list-style-type: none"> Exterior noise levels in 2020 are the same as Alternative A and the No Action Alternative Interior noise levels in 2020 are the same as Alternative A
<ul style="list-style-type: none"> Net new impervious surfaces would change as follows: 		<ul style="list-style-type: none"> Net new impervious surfaces would change as follows: 	
<ul style="list-style-type: none"> Net new impervious surfaces would change as follows: 		<ul style="list-style-type: none"> Net new impervious surfaces would change as follows: 	

**Table 2-2
Comparison of Operational Impacts**

No Action Alternative	Alternative A	Alternative A Modified	Alternative B
<ul style="list-style-type: none"> facilities associated with the roadway would be constructed The pollutant loads in the stormwater runoff from the roadway would continue to be discharged to local streams 	<ul style="list-style-type: none"> +14,500 sf in Boeing Creek Basin +1,100 sf in Thornton Creek Basin no change in W. Lake Washington Basin Detention facilities would attenuate runoff from all newly created impervious surfaces, using "forested land cover" as the assumed pre-existing condition There would be a decrease of 73,000 sf of pollutant-generating impervious surfaces in the Boeing Creek Basin Water quality facilities would provide basic treatment for runoff from all new and replaced pollutant-generating impervious surfaces Detention and quality treatment facilities will meet the requirements of Ecology's new stormwater guidance manual and the current City regulations, whichever is more stringent Due to the increase in impervious surfaces, there will be a very slight but unavoidable increase in the volume of stormwater runoff to the Boeing Creek basin, but this should be minimal and is not expected to have an impact on aquatic habitat Water quality would improve in 	<ul style="list-style-type: none"> +1,200 sf in Boeing Creek Basin +1,100 sf in Thornton Creek Basin no change in W. Lake Washington Basin Detention and treatment facilities would be constructed to similar standards as in Alternative A There would be a decrease of 58,000 sf of pollutant generating impervious surfaces in the Boeing Creek Basin The design option would have an additional 200 square feet of impervious surface and 350 square feet of pollutant generating impervious surfaces Water quality would likely improve in the receiving streams and runoff rates would remain stable Special oil control facilities would be constructed at the two high-use intersections (145th and 155th Streets) 	<ul style="list-style-type: none"> +28,500 sf in Boeing Creek Basin +1,100 sf in Thornton Creek Basin no change in W. Lake Washington Basin Detention and treatment facilities would be constructed to similar standards as in Alternative A There would be a decrease of 47,000 sf of pollutant generating impervious surfaces in the Boeing Creek Basin, which will likely reduce the amount of pollutants generated from these surfaces Water quality would likely improve in the receiving streams Due to the increase in impervious surfaces, there will be a very slight but unavoidable increase in the volume of stormwater runoff to the Boeing Creek basin, but this should be minimal and is not expected to have an impact on aquatic habitat Special oil control facilities would be constructed at the two high-use intersections (145th and 155th Streets)

**Table 2-2
Comparison of Operational Impacts**

No Action Alternative	Alternative A	Alternative A Modified	Alternative B
<ul style="list-style-type: none"> the receiving streams and runoff rates would remain stable Special oil control facilities would be constructed at the two high-use intersections (145th and 155th Streets) 	<ul style="list-style-type: none"> Alternative A would have a greater net increase in impervious surfaces than Alternative A Modified, but there would still be no net effect on wildlife and fisheries Best management practices and water quality and quantity facilities should protect fish from sediment and contaminants in road runoff Vegetation that would be removed provides little habitat 	<ul style="list-style-type: none"> Alternative A will have no net effect on wildlife and fisheries Best management practices and water quality and quantity facilities should protect fish from sediment and contaminants in road runoff Same vegetation impacts as Alternative A There would be no additional impacts from the design option 	<ul style="list-style-type: none"> Alternative B would have a greater net increase in impervious surfaces than both build alternatives, but there would still be no net effect on wildlife and fisheries due to the implementation of water quality and quantity facilities. Same vegetation impacts as Alternative A
Wildlife, Fisheries, and Vegetation			
<ul style="list-style-type: none"> Current impacts to fisheries would continue, with water quality and water volume discharge impacts remaining the predominant concern 	<ul style="list-style-type: none"> Alternative A would have a greater net increase in impervious surfaces than Alternative A Modified, but there would still be no net effect on wildlife and fisheries Best management practices and water quality and quantity facilities should protect fish from sediment and contaminants in road runoff Vegetation that would be removed provides little habitat 	<ul style="list-style-type: none"> Alternative A will have no net effect on wildlife and fisheries Best management practices and water quality and quantity facilities should protect fish from sediment and contaminants in road runoff Same vegetation impacts as Alternative A There would be no additional impacts from the design option 	<ul style="list-style-type: none"> Alternative B would have a greater net increase in impervious surfaces than both build alternatives, but there would still be no net effect on wildlife and fisheries due to the implementation of water quality and quantity facilities. Same vegetation impacts as Alternative A
Historic and Cultural Resources			
<ul style="list-style-type: none"> There would be no impacts to historical properties or archaeological resources 	<ul style="list-style-type: none"> Two properties with reasonable historic associations exist: <ul style="list-style-type: none"> Pershing Interurban Bulkhead Hide-a-Way Tavern Impacts would be limited to right-of-way encroachment Structures lack architectural integrity and merit necessary for state or national historic listing Archaeological sites are unlikely in the project area SHPO has concurred with these findings 	<ul style="list-style-type: none"> Impacts would be limited to right-of-way encroachment (roadway improvements will be closer to the structures than in existing conditions) Impacts would be slightly less than Alternative A due to narrower road right-of-way There would be no additional impacts from the design option 	<ul style="list-style-type: none"> Impacts would be limited to right-of-way encroachment (roadway improvements will be closer to the structures than in existing conditions) Impacts would be slightly less than Alternative A and Alternative A Modified due to narrower road right-of-way
Visual Quality			

**Table 2-2
Comparison of Operational Impacts**

No Action Alternative	Alternative A	Alternative A Modified	Alternative B
<ul style="list-style-type: none"> The visual environment would not change 	<ul style="list-style-type: none"> Would improve the visual intactness and unity of the project area Pedestrians and transit riders would likely have the most positive response to visual improvements Positive impact on visual quality 	<ul style="list-style-type: none"> Would improve the visual intactness and unity of the project area comparable to Alternative A Pedestrians and transit riders would likely have a positive response to visual improvements similar to Alternative A Positive impact on visual quality similar to Alternative A There would be no additional impacts from the design option 	<ul style="list-style-type: none"> Would improve the intactness and unity of the project area to a lesser degree Would have a less positive impact on visual quality than Alternative A and Alternative A Modified
Hazardous Materials			
<ul style="list-style-type: none"> There would be no impacts 	<ul style="list-style-type: none"> Potential construction impacts include releases of contaminants to the environment by ground-disturbing or dewatering activities There is the potential for release to the environment of hazardous substances used or transported during routine operation and maintenance of roadways 	<ul style="list-style-type: none"> Same potential impacts as Alternative A. There would be no additional impacts from the design option 	<ul style="list-style-type: none"> Same potential impacts as Alternative A.

Responses to Controversial Public Comments

This exhibit provides excerpts from Appendix F - Comments on the Draft EIS and Their Responses. Provided are some of the most controversial public comments, along with brief responses which clarify and resolve confusion and misunderstandings regarding the project and the environmental analysis.

Comments: 1-1, 61-77, 63-1 - Narrower sidewalks: These comments address public concern regarding width of sidewalks and how the Interurban Trail might reduce the need for sidewalks.

Response ID: 1

Aurora Avenue through Shoreline is designated as a National Highway System (NHS) route. Therefore, the minimum sidewalk width required is 6 feet. In accordance with RCW 47.24.020(2), "The city or town shall exercise full responsibility for and control over any such street beyond the curbs..." Installing sidewalk with a width greater than 6 feet is at the discretion of the City. Sidewalks as narrow as 5' were proposed as a part of the scoping process for this project. Sidewalks this narrow were not included in the designs of the proposed alternatives because it would require the sidewalk to wind around driveway curb-cuts, bus shelters, light posts, fire hydrants, and other obstacles to maintain five feet of clearance. The City has committed to reducing the sidewalk/amenity zone width along portions of frontage where buildings lie within the proposed right-of-way. This would occur in Alternative A at the Hideaway Card Tavern and Seattle Ski Shop. The Shoreline Municipal Code includes a provision to reduce the front yard setback to zero feet if the right-of-way line is established for a street.

Under current conditions, pedestrians are forced to walk along the shoulder of the roadway where it exists with nothing separating them from traffic. This project has features that would provide a connected, continuous, safe, and pleasant environment for pedestrians. Only a small amount of additional right-of-way is necessary for these improvements. The Interurban Trail is intended to provide regional mobility for bicycles and pedestrians and not necessarily to access businesses along Aurora Avenue North. The Interurban Trail runs diagonal to Aurora and is more than 650' away at North 145th Street. It is intended to provide regional mobility for bicycles and pedestrians while sidewalks along Aurora Avenue would give direct access to local businesses and to transit service.

Comments: 1-3, 23-3, 25-3, 29-5, 50-24, 61-23, 61-28, 61-35, 64g-2 - Parking Impacts: These comments express concern for loss of parking on the public road right-of-way.

Response ID: 3

Despite the lengthy history of use, most of the existing parking areas along the shoulders of Aurora Avenue are either non-compliant spaces according to City code or within or partially within the public right-of-way. This type of uncontrolled shoulder parking endangers both vehicles and pedestrians. Although property owners would not be paid for parking stall losses in or partially in the roadway right-of-way, parking areas may be reconfigured with the assistance of the City in order to mitigate displaced stalls. Remaining parking is determined to be adequate for the businesses. No additional parcels would need to be purchased for the purposes of providing public parking locations. See Chapter 3, Economics in the Final EIS for a description of parking impacts.

Comments: 1-4, 38-50 - U-turns: These comments address public concern that U-turns at left turn pockets might present a safety hazard.

Response ID: 4

Most of the u-turn opportunities would be provided at locations with traffic signals. A separate signal phase would enable comfortable and safe u-turn maneuvers. The medians with left-/u-turn lanes are proposed because the current conditions with a two-way left-turn lane combined with high traffic volumes (+/- 40,000 vehicles per day), high number of driveways and 40 mile per hour traffic speeds make traffic operations and uncontrolled left-turns unsafe. In addition to managing median access points, formal driveway designs would be developed as an additional safety measure. The u-turn radii would be 26-feet (52 outside-to-outside diameter) which would allow u-turns by passenger vehicles and small trucks, SUVs, and vans.

Comments: 1-11, T-67, T-68, 27-2, 37-8 - Cumulative impacts: These comments address public concern that buildings north of North 165th Street may be impacted.

Response ID: 11

The EA/DEIS and FEIS evaluate direct project impacts as well as cumulative impacts. Direct impacts are those caused by the proposed project from North 145th Street to North 165th Street. Cumulative impacts are those caused by the proposed project as well as other past, present, and reasonably foreseeable projects, which includes Aurora Avenue North from North 165th Street to North 205th Street. The discussion of cumulative impacts includes areas that are not a part of the project area for the proposed project. The Aurora Avenue 145th to 165th project would not displace any businesses; however all of the projects considered in the cumulative impacts section combined may result in business displacements given existing design concepts. Table 3-39 in the EA/DEIS shows possible impacts to potentially historic buildings based on the existing pre-preliminary "worst case" design concepts of other projects. It does not account for design refinements and mitigation measures of other projects which are currently unknown.

Comments: 3-1, 34-5, 60-10 - Signals and traffic flow: These comments express public concern that additional traffic signals will impede traffic flow.

Response ID: 19

This project would include the addition of signalized intersections at key locations to improve the spacing of signals and to provide additional pedestrian crossing opportunities. The signals along Aurora Avenue would be timed to improve traffic flow. Coordinating a group of signals improves the traffic flow, speed and capacity of a roadway section.

Comments: 4-1, 19-2, 20-2, 61-4, 61-56, 63-1, 63-6, 64-44, 64j-3 - Cost: These comments address public concern that the cost per mile of \$28 million is too high.

Response ID: 24

The exact cost for this project would depend upon which alternative the City ultimately selects. Also, while making the selection of the preferred alternative, the City will be considering other options for reducing both the cost and environmental impact of the project. The cost estimate for the project in year 2002 dollars is \$26.8 million; this amount is an early, conservative estimate for Alternative A, the most expensive of the three alternatives. This amount includes \$7.5 million for contingency, uncertainty and risk. There is federal, state, and King County money, as well as local City of Shoreline dollars, being used to cover the cost of the project.

Aurora Avenue is a regional transportation corridor which currently carries approximately 40,000 vehicles per day. Aurora Avenue is also a major transit facility. Aurora Avenue has many retail and commercial businesses abutting the roadway. The project must satisfy many objectives

beyond moving automobiles, including improving traffic safety, lighting, transit mobility, cleaning up the clutter along Aurora Avenue and encouraging economic redevelopment. The City believes that the investments are very important and worth while.

Comments: 5-2, 63-59, 63-73 - Bottleneck at North 165th Street: These comments address concern that the termini of the project will result in traffic slow downs as drivers are attempting to merge into the through lanes.

Response ID: 27

The Transportation section of the Final EIS provides a discussion of how traffic transitions would be accommodated at both the south terminus (North 145th Street) and the north terminus (North 165th Street) for the project. No "bottleneck" for traffic would occur due to implementation of any of the project alternatives.

Comments: 10-1, T-50, 38-34, 61-20, 63-56, 63-58 - Increased traffic near North 165th Street: These comments address public concern that installing a traffic signal at 165th would increase cross-traffic and traffic in the neighborhoods.

Response ID: 33

The proposed traffic signal at North 165th Street would allow those people who live in adjacent neighborhoods to safely get onto Aurora Avenue. The signal would also provide a "protected" u-turn for north/south traffic on Aurora Avenue, in addition to allowing pedestrians to safely cross Aurora Avenue. The median would restrict left turns out of adjacent streets unless they are signalized. Little or no traffic diversion onto neighborhood streets as a result of the project alternatives is anticipated. Conditions with the project alternatives would be much improved in comparison to the No Action Alternative in terms of improving traffic and transportation along Aurora Avenue. For additional discussion regarding management of traffic on neighborhood streets, see Response ID: 70.

Comments: 11-1, 14-2, 14-3, T-29, 38-20, 63-44 - BAT lanes unnecessary: These comments address public concern that the BAT lanes will be transit only lanes and might create a safety hazard.

Response ID: 37

The "Business Access and Transit Lanes" are not "transit only lanes". The outside lanes are for right-turning traffic into and out of driveways to adjacent properties and businesses; for right-turns at side-streets, and for buses. These lanes would enable right-turning traffic to make turns into and out of these auxiliary lanes rather than the "through" lanes would be used by higher speed through traffic. The lanes for right-turning traffic would reduce "rear-end" accidents as well as many of the "angle" accidents. Allowing buses to use the right-turn lanes helps by removing buses from higher speed through traffic. These outside lanes for Business Access and Transit use would provide 24-hour safety and operational benefits for traffic that makes right-turns into and out of driveways and side-streets. These lanes would increase the travel and traffic capacity of Aurora by removing slower traffic from higher speed through lanes. Also, these additional right-turns at intersections provide capacity and improvement to intersection levels of service.

The greatest need for traffic capacity would be the northbound direction, which is the peak direction of traffic during the PM peak period, the most congested time of day. However, both southbound and northbound lanes would provide operational and safety benefits, because many driveways and side-streets exist on each side of Aurora Avenue. Also, the extra width of the roadway established by adding these lanes in each direction provides additional width for comfortable u-turns at intersections and mid-block turn locations.

The right-turn and transit lanes in Seattle had some increases in traffic accidents associated with them initially. However, the accidents on the Seattle portion of Aurora Avenue were due to a lack of necessary access safety measures such as center median and safe driveway design. Traffic accidents on Aurora Avenue in Seattle resulted when traffic attempted left-turns from two-way left-turn lanes, crossing three-lanes of traffic. Also, driveways were too frequent and their spacing was uncontrolled and unsafe. The comprehensive designs for the Aurora Avenue alternatives in Shoreline would not result in the same problem as observed on Seattle's Aurora Avenue project because the Shoreline Aurora Avenue design process has had the benefit of observing the Seattle experience and therefore has included access safety measures in the project.

Comments: 11-2, 14-1, 16-4, 19-1, T-18, T-20, T-25, T-39, T-55, T-65,, T-107, T-108, 27-9, 27-16, 29-1, 34-1, 37-3, 37-5, 38-1, 38-7, 38-15, 38-17, 38-18, 38-21, 38-24, 53-5, 61-1, 61-7, 61-12, 62-5, 64-3, 64-18 - EIS segmentation: These comments address public interest in conducting an EIS for a longer portion of Aurora Avenue.

Response ID: 38

Aurora Avenue North was initially studied in a programmatic fashion in the Aurora Corridor Predesign Study to determine a roadway concept that could meet the goals stated in the City's Comprehensive Plan. Environmental impacts for all improvements to the transportation system in Shoreline were evaluated in the EIS for the Comprehensive Plan. The concept developed through the Predesign process, along with specific recommendations from the Citizen's Advisory Task Force (CATF), has been carried forward and refined through further public input to provide the basis for project-level alternatives for the Aurora Avenue 145th to 165th project. The purpose and need for this project is described in Chapter 1 of the FEIS. The project termini and why they are logical is described in Chapter 2. The purpose of the project is to improve the safety of all users on Aurora Avenue from North 145th Street to North 165th Street with improved channelization, access management, and pedestrian amenities, and to improve multimodal mobility. The need is related to issues of safety, social demands, and local and regional transportation such as corridor capacity, transit amenities, and system linkages.

Comments: 12-2, 18-3, 61-26, 61-59, 62-23, 64k-3 - Not enough pedestrians for sidewalks: These comments express public concern that sidewalks are not needed because they believe few pedestrians use Aurora Avenue.

Response ID: 40

The perceived lack of pedestrians along Aurora Avenue is partially due to the dangerous and uncomfortable pedestrian environment. In most areas pedestrians must walk on the shoulder of the roadway close to traffic with spotty and insufficient illumination. This project includes sidewalks that are ADA accessible and can accommodate bus stops, public benches, and light poles.

Under current conditions, pedestrians are forced to walk along the shoulder of the roadway with nothing separating them from traffic. All of the build alternatives have features that would provide a connected, continuous, safe, and pleasant environment for pedestrians, particularly Alternative A and Alternative A Modified. Pedestrian safety would be increased with the inclusion of a 6" vertical curb and the 4' amenity zone includes elements to buffer pedestrians from traffic. Only a small amount of additional right-of-way would be necessary for these improvements.

Comments: 16-1, 29-2, 53-8, 55-7, 55-9, 55-11, 58-1, 58-5, 61-42, 61-45, 63-122, 64-2, 64t-5 - Stormwater requirements: These comments express public concern for improving water quality and interest in stormwater management.

Response ID: 45

Regulations

Additional regulatory requirements and descriptive text has been added to the Water Quality/Surface Water section of the Final EIS.

The City of Shoreline has adopted the *King County Surface Water Design Manual* (SWDM) for development and review of all drainage projects. All drainage designs shall meet the criteria set forth in the SWDM, which includes providing flow control (detention) and stormwater quality treatment for roadway redevelopment projects. Flow control is required when the net increase of impervious surfaces is 1,500 square feet or more. In addition, the City has indicated that the criteria in the Washington State Department of Ecology's 2001 *Stormwater Management Manual for Western Washington* (SMMWW) should also be used in selecting the stormwater flow control and quality treatment measures for the Aurora Corridor Project. The more conservative criteria from the two manuals (SWDM and SMMWW) are to be used. Under either manual, the project meets the description of a roadway redevelopment project.

Actual sizing and design of the stormwater conveyance, detention and treatment system will occur as part of the final design process.

Stormwater Detention

Using the more conservative criteria from both manuals, flow control of stormwater runoff will be required for only the net new impervious surfaces created under each of the three build alternatives (analyses show each of the three build alternatives result in a net increase in impervious surfaces) in the Boeing Creek and Thornton Creek Basins. It is expected these constructed detention system will likely include a series of underground vaults to detain the stormwater flows. Detention facilities are required to be designed based on a continuous hydrologic simulation model, i.e. a computer model that estimates stormwater runoff flows from rainfall occurring across many years and not for just a single design storm. Both manuals agree on the design standard for the flows released from the detention facilities: durations of the flows released from the facility should not exceed the durations estimated for stormwater flows from the same area under predeveloped conditions for the range of flows from 50 percent of the 2-year peak flow up to the full 50-year peak flow. The predeveloped conditions will be forested land cover (a requirement of the SMMWW) for the area where there is a newly created in impervious surfaces. For instance, Alternative A shows a net increase of approximately 14,000 square feet of impervious surfaces. To determine the required detention volumes for this area, a continuous simulation model would be used to predict stormwater runoff from the area using forested land cover as the pre-existing conditions, and impervious surfaces as the post-project conditions. Then, the model would route the series of storms through a detention facility to obtain the required release rates, and the facility would be designed accordingly.

Concrete stormwater vaults are accepted methods of providing storage for flow control (SWDM, 1998), and because stormwater does not reside very long in these vaults, the pH of the stormwater would not likely be affected by the concrete material. Due to the lack of available space to build surface water ponds, underground detention vaults are the most practical method to control stormwater flows from the project area, since the soils in the area are not amenable to infiltration.

Stormwater quality treatment

The SWDM is more stringent for water quality treatment than the SMMWW because it requires all new and redeveloped pollutant-generating impervious surfaces (PGIS) (i.e., surfaces subject to vehicular traffic, such as roads) to be routed through basic quality treatment facilities. The SWDM defines the basic level of stormwater quality treatment as having a goal of removing 80 percent of the total suspended solids (TSS) for a typical rainfall year. For the Aurora project, if the SMMWW were followed for treatment, it would require an enhanced level of treatment (i.e., targeted removal of some metals as well as TSS), but only for the net new PGIS. For each of the Aurora Corridor Project's three build alternatives, there will actually be a reduction of net new PGIS due to the creation of new sidewalks and center landscaped medians, therefore water quality treatment would not be required using the SMMWW as guidance.

The City has expressed a desire to provide treatment for all new, replaced and existing pollutant-generating impervious surfaces within the project area. Currently, stormwater runoff from the roadway surfaces within the project area goes untreated to the Boeing Creek and Thornton Creek, whereas under proposed conditions, stormwater from all the roadway surfaces will receive basic treatment. This would result in a significant reduction of pollutant loadings to the streams. These stormwater treatment facilities would most likely be manufactured stormwater treatment devices such as vortex or gravity-type separators or stormwater filter systems installed in vaults. These facilities are expected to be installed under the roadway and/or sidewalk in the immediate vicinity of the detention facilities. Stormwater treatment devices are typically designed to achieve the target 80 percent removal of total suspended. Actual removal efficiencies of each of these types of constructed facilities vary as described in the literature and the manufacturers data.

Other types of stormwater quality treatment devices would be included in the project design. The storm drain inlets or catch basins would be used to receive storm drainage from the streets, and also provide maintenance access. Catch basins have a sump so that settleable solids and heavier particles from the stormwater runoff can be trapped and then removed manually by maintenance personnel. Pollutants such as nutrients and some heavy metals can also adhere to particulates, which settle out and become trapped in the sumps. The City's maintenance personnel should clean these sumps regularly (literature values suggest annual cleaning of each catch basin) and the trapped pollutants would likely be removed from the system and help to improve the downstream water quality.

At the two high-use intersections (145th and 155th Streets), more advanced treatment systems consisting of special oil/water separators will be used. The SWDM recommends the use of API baffle wall oil water separators, coalescing plate oil/water separators, or catch basin inserts to remove free oil from the surface runoff. These two types of facilities are designed to remove free oil from the stormwater, and generally should be placed in the storm drainage system near the potential source (i.e., high-use intersections or gas stations/vehicle maintenance shops). For the Aurora Avenue 145th to 165th project, these devices would be used to separate oil from the stormwater at the 145th and 155th Street intersections, as they are high use intersections. Stormwater runoff from the street surfaces within areas of high use intersections has a much greater potential to entrain oils and greases from cars that may be leaking the contaminants in the long lines at turn lanes or due to accidents. It is important to note, however that these devices are not intended to remove dissolved petroleum products, or antifreeze which is readily soluble in water. Source control (such as a spill response program after an accident) should help to minimize the potential for these contaminants to enter the storm drain system. Also, oils, gas, and detergents from service stations and/or car cleaning operations are not typically conveyed to the

storm drain system, but to the sanitary sewer system instead. An effective public education program would help to prevent these pollutants from entering the surface waters.

Existing Storm Drainage

Additional text describing the existing drainage system has been added the Final EIS.

Stormwater from the existing Aurora Corridor street surfaces currently flows to both Boeing Creek and Thornton Creek within the City limits. Storm drainage from a small section of the roadway south of North 145th Street flows into the City of Seattle's Densmore drainage basin, which ultimately ends up in Green Lake. The SWDM specifically states that all surface and storm water from a project area must be discharged to the natural location so as not to be diverted onto or away from downstream properties. Therefore, the proposed project design would maintain the existing drainage routes and ultimate discharge locations per the requirements, after the stormwater runoff has been routed through the required treatment and/or flow control systems in accordance with the regulations.

Stormwater from the project area is presently collected and conveyed in a system composed primarily of storm drains and gutters, with only two areas with open ditches (these two areas are located in the vicinity of N 155th Street and Aurora Avenue North). Therefore, the majority of stormwater is captured and conveyed in constructed drainage system with little, if any, opportunity to dissipate over permeable surfaces.

It should be noted that the constructed storm drain system does affect the existing basin boundaries in ways that are not obvious by looking just at the ground surface. In some instances, the ground surface may be sloping in one direction, but the subsurface constructed drainage system may actually convey stormwater runoff in the opposite direction to an ultimate discharge point. One example of this is a storm drain that runs along the east side of one section of Aurora Avenue in an area where the ground next to the road slopes east and drains eventually to a tributary of Thornton Creek. This storm drain collects the stormwater from the east side of the road, but then the storm drain goes west under Aurora and discharges into another storm drain that ultimately discharges to Boeing Creek. As a result, under existing conditions, that section of the east side of Aurora is in the Boeing Creek basin and not in the Thornton Creek basin.

Thornton Creek

Only 4 (four) percent of the total project footprint is located within the Thornton Creek Basin, with the remainder in the Boeing Creek Basin (94 percent) and the City of Seattle's Densmore Basin (2 percent). Less than one acre of street and sidewalk surfaces (approximately 40,000 sf) would be redeveloped in the 7,402-acre Thornton Creek Basin as part of the project design (Thornton Creek Watershed Characterization Report). This represents only 0.012 percent of the entire surface area of the Basin. The proposed work would occur along 152nd Street and 145th Street (on the east side of Aurora Avenue) as part of the proposed project design. The existing and proposed project land coverage within the footprint of the Thornton Creek Basin consists of almost entirely impervious (paved) surfaces. Therefore, the expected change in stormwater runoff volumes and flow rates from pre-existing conditions to post-project conditions would be insignificant, especially in comparison to the total basin contribution. Nevertheless, in accordance with the City of Shoreline's development code, stormwater detention and treatment facilities would be incorporated into the project design for the small sections of roadway that are in the Thornton Creek Basin, even though the stormwater runoff volumes are a very minor contribution to the entire drainage basin. Stormwater runoff from the affected areas of 152nd and 145th Streets is currently untreated, but under the proposed design, water quality treatment would occur.

Surface Water Impacts

The base level for the impact analysis is the No Action Alternative. The impacts caused by the existing conditions within the proposed project area are not addressed as part of this Final EIS. Reducing existing (or past) impacts on the downstream surface waters is not a requirement for this project. Minimizing additional impacts that would be caused by the project is a requirement. As indicated in the FINAL EIS, the City is working on preparing a stormwater master plan. That plan will address how to reduce existing or past impacts on the various receiving waters throughout the City in a way that should result in the most improvement to the receiving waters with the available resources.

Comments: 20-1, T-32, 27-23, 38-3, 61-24, 63-28, 63-112, 64-41, 64-55 - How is capacity improved: These comments address public confusion as to how traffic capacity will be improved.

Response ID: 47

Traffic volumes throughout the Puget Sound region continue to grow, placing an ever-increasing demand on our transportation system. While the regional transit system will provide additional capacity to accept a share of the traffic growth, our state highways and arterial systems will have to bear much of the upcoming growth, and the Aurora corridor is no exception. Maintaining traffic flow and optimizing the system were major goals of the Aurora Avenue 145th to 165th project and are integrated into the improvements.

Capacity for access across Aurora Avenue, as well as movement along the corridor, is addressed in this project. Improvements are provided in the form of additional turn lanes at intersections to separate conflicting movements and would also be provided through improved signal timing plans that move traffic more efficiently. Growth patterns in the region indicate that traffic along Aurora Avenue will grow at a higher rate than traffic across Aurora Avenue. To improve service to cross-street traffic, additional turn lanes are provided to store or queue vehicles more closely to the intersection, which allows more vehicles to move through the intersection in a shorter period of time. In addition to adding lanes to existing signalized intersections, the addition of new signalized intersections along the corridor would provide greater opportunity to traverse Aurora Avenue in a signal-controlled situation, which is safer and more time-efficient for cross-street traffic than unsignalized movements.

The roadway would be expanded by an additional business-access and transit (BAT) lane in each direction. Through much of the corridor this means turning the existing paved shoulder into a traffic lane. The purpose of the new lane is to provide a place for vehicles to turn in and out of businesses without disrupting the mainline traffic flow and for transit vehicles to move through the corridor free of congestion. The business access and transit lane increases both the vehicle capacity and the person capacity of the roadway by helping to improve transit service. The BAT lanes would provide additional right-turn capacity of street intersections. In combination with the BAT lane, the existing two-way, left-turn lane would be converted into a series of focused left-turn and u-turn lanes. Raised curbing between the lanes would eliminate many of the crossing conflicts that occur with the existing two-way left-turn lane. The focused left-turn and u-turn lanes would preserve access to businesses while greatly improving the safety of the roadway. The lane changes that are included with the Aurora Avenue 145th to 165th Project, by providing better separation between through and turning movements, would reduce what is referred to as "traffic turbulence." Traffic turbulence is created when traffic moves at different speeds, causing drivers to react by braking or abruptly changing lanes. Both of these reactions interrupt the traffic flow and degrade traffic operations and service. Removing traffic turning conflict points would allow traffic to operate more efficiently and reliably.

Coordinating the project traffic signals would increase the capacity of Aurora Avenue. The objective of coordination is having good progression along the major route. With coordinated progression, vehicles along the major route would receive a green light as they approach each intersection. With good progression, a group of vehicles (called a platoon) moves continually at a planned optimal speed. Platooning from signals would help create breaks in the major traffic flow to improve the ability to make left and u-turns. Achieving optimal timing progression requires that signals be regularly spaced. Irregular distances between signals can disrupt the platoon and upset efficient traffic flow, resulting in more total delay. The Aurora Avenue 145th to 165th project includes the addition of signalized intersections at key locations to improve the regularity of signals and to provide additional pedestrian crossing opportunities.

In addition to improved signal timing progression and new signals, the Aurora Avenue 145th to 165th project would provide transit signal priority to help minimize transit delay at intersections. Transit currently carries as much as 10 to 15 percent of trips in the corridor during the peak hour in the peak direction of travel. By 2020 this percentage will rise as transit supports a larger share of trips. Transit signal priority works by detecting a transit vehicle prior to the intersection and providing it a green phase as soon as possible once the vehicle reaches the intersection. Reducing transit delay with signal priority would reduce person delay for a large percentage of travelers in the Aurora corridor.

Comments: 20-3, 38-39, 61-73, 64-75 - Sidewalk width and safety: These comments express public concerns regarding the width sidewalks.

Response ID: 48

Aurora Avenue, into and through Shoreline is designated as a National Highway System (NHS) route. Therefore, the minimum sidewalk width required is 6 feet. In accordance with RCW 47.24.020(2), "The city or town shall exercise full responsibility for and control over any such street beyond the curbs..." Installing sidewalk with a width greater than 6 feet is at the discretion of the City.

The alternatives included for evaluation in the EA/DEIS have an 8-foot-wide sidewalk (Alternative A) and a 7-foot-wide sidewalk (Alternative B). Alternative A has a 4-foot-wide amenity zone/buffer separation between the sidewalk and the roadway while Alternative B effectively has no buffer. The Final EIS has included Alternative A Modified, which has a 7-foot sidewalk and a 4-foot amenity zone. The four foot separation from traffic would provide a slight safety advantage for pedestrians because errant vehicles may possibly regain control of their vehicles within the four foot space. Also the buffer would help pedestrians to avoid stepping off the sidewalk and curb into high speed traffic and/or getting hit by overhanging parts of vehicles, such as rear-view mirrors. Other possible safety benefits from the design for Alternative A and A Modified versus B include: clear removal of utilities, poles, and signs from the walking path thus reducing risk that pedestrians walk or stumble over obstructions; also Alternative B would require wheel-chair ramps at driveway aprons which create risk for tripping or loss of control by wheel-chair users. WSDOT agrees that a buffer zone between the travel lanes and sidewalk on this facility would be beneficial for pedestrians.

The principal advantage for the sidewalk/amenity zone design that is included in Alternative A and A Modified is the safety and comfort provided for those who walk along Aurora Avenue. City and community objectives for this project included providing a more comfortable and inviting pedestrian environment to help make the City of Shoreline a more walkable city and thus encourage more walking for access to properties and businesses, and for improved access to transit services. The landscaped amenity zone, the buffer from 40 mile-per-hour traffic, and the continuously level walking surface for the sidewalk (i.e. no ramps at driveway aprons) each

contribute to a more comfortable walking environment for Alternative A and Alternative A Modified, than would be attributable to Alternative B which has essentially no buffer and no landscaping.

Comments: 20-5, T-8, T-14, 27-4, 32-4, 38-8, 38-32, 38-38, 38-40, 38-43, 50-1, 61-64, 61-72, 61-75, 63-17, 64-50, 64-70- Required median: These comments express the public's confusion over whether or not a median is required.

Response ID: 50

The Final EIS has included text to explain that the basis for WSDOT rejection of the two-way, left-turn lane for inclusion in project alternatives is based upon many design and operational considerations and not only to WAC 468.

The Washington State Department of Transportation (WSDOT) has reviewed the traffic conditions for the Aurora Avenue 145th to 165th Streets project and informed the City that this project would require a median for access safety improvement. WSDOT has participated in the planning and design process for Aurora in Shoreline over the past five years and has continually been clear regarding the expectation that a raised median be included as part of the design. WSDOT presented its requirements at many public meetings as well as several City Council Meetings. WSDOT has design approval authority for any designs for improvements to Aurora Avenue and WSDOT has said a median would be required to obtain project design approval.

This corridor experiences a substantial number of accidents due in part to unrestricted access along both sides of Aurora Avenue. Adding a third lane in each direction (whether it is a BAT lane or a general purpose lane) without constructing a raised median with controlled left turns, would exacerbate the problem. A current example of this design is northbound Aurora Avenue through Seattle, between North 115th and North 145th Streets.

Recent collision history highlights an existing safety concern along Aurora Avenue from North 145th Street to North 165th Street. WSDOT's 2002 evaluation of state highways identified three High Accident Locations (HALs) in this section. In 1999, the roadway within the proposed project limits had an existing accident rate of 7.69 accidents per million vehicle miles. In 2000, this rate increased to 8.79 accidents per million vehicle miles. The statewide average for urban principal arterials in 2000 was 2.52, which was down from 2.61 in 1999. Aurora Avenue through Shoreline experiences an accident rate over three times the state average for urban principal arterials. The accident rate for this corridor is going up while the statewide average is going down.

WSDOT's design policy regarding two-way left-turn lanes (TWLTL) is clear. Its Design Manual Chapter 910 - Intersections at Grade (p. 910-7) states in part "Use TWLTL's only in an urban setting where there are no more than two through lanes in each direction." For highways that meet this criterion, WSDOT's Design Manual Chapter 910 stipulates, "The desirable length of a TWLTL is not less than 250 ft." Alternative A (which has the fewest openings of all the build alternatives) proposes intersection openings at North 145th, 149th, 152nd, 155th, 160th, and 165th Streets. The spacing of these intersections leaves little room for TWLTL even if the safety implications of operating such a roadway are ignored. The majority of the length between intersections is needed for left turn pockets.

WAC 468-52-040 defines the access control classification system and standards. Shoreline's section of SR 99 is designated as Class 4 Access. Class 4 reads in part, "Highways in this class are typically distinguished by existing or planned nonrestrictive medians. Restrictive medians may be used as operational conditions warrant to mitigate turning, weaving, and crossing conflicts."

Comments: 23-5, T-17, T-19, T-28, 63-87, 64-13 - Cut-through traffic and safety: These comments express public concern that safety improvements on Aurora will cause an unsafe increase in traffic through the neighborhoods.

Response ID: 55

The project would include frequent left/u-turn breaks to enable easy access to properties. Most of these left/u-turn locations would have signal-protected u-turns. Also, a Business Access/Transit Lane would be provided to help make right turn access to businesses easier and safer for customers.

The City proposes immediate and continuous implementation of its Neighborhood Traffic Safety Program for neighborhood streets adjacent to Aurora Avenue. The City has initiated conducting traffic counts and traffic speed measurements on adjacent streets. During construction and after the project is completed, the City would monitor traffic conditions on neighborhood streets. If traffic conditions on the neighborhood streets warrant action, the City would work with neighborhoods to implement neighborhood traffic and control measures.

Comments: 25-8, 26-4, T-30, T-64, T-71, T-76, T-97, 27-14, 33-2, 34-3, 37-25, 38-5, 38-22, 38-37, 38-41, 53-1, 53-3, 59-7, 61-3, 61-10, 61-71, 62-1, 62-6, 63-66, 64-10, 64-69, 64j-4, 64r-2 - "Alternative C": These comments address a design proposed by the Aurora Merchants Association.

Response ID: 64

The EA/DEIS had no "Alternative C" proposed for analysis. No Alternative C has been included in the Final EIS. A design proposed by the Shoreline Merchants Association which it has named "Alternative C" is understood to include two general purpose lanes southbound and northbound, one Business Access and Transit lane in each direction, a two-way-left-turn lane, underground utilities, pedestrian safety islands and grade-separated pedestrian crossings, street lighting, and 6-foot-wide sidewalks. This concept is nearly identical to Alternative B, except for the two-way-left-turn lane and the grade separated pedestrian crossings. NEPA and SEPA require that a range of reasonable alternatives be examined, but not that all alternatives be examined. In the Final EIS, the City has included three "build" alternatives that represent the range of reasonable designs that would still meet the project's stated purpose and need. In Chapter 2 of the Final EIS, there is a section titled "Alternatives Examined but Rejected" which explains why the design proposed in the comment has been screened out of the final evaluation. Refer to Response ID 50 and 56 for discussion regarding why two-way-left-turn lanes have not been included in the alternatives. Refer to Response ID 293 for discussion regarding why pedestrian grade separations have not been included in the alternatives.

Comment: T-2 - Traffic circles: This comment expresses one citizen's request for considering traffic circles on side streets.

Response ID: 70

The Neighborhood Traffic Safety Program would be utilized to address cut-through traffic issues. The City would undertake a neighborhood traffic safety program along the Aurora Corridor. This program includes collecting baseline count information, monitoring of traffic impacts, and mitigation of the impacts should they be necessary. The City would monitor traffic impacts on adjacent and parallel streets to Aurora Avenue during construction and after construction. The program would also include spillover traffic monitoring during construction, with temporary traffic control measures. The counts would eventually be incorporated into the City traffic count program. If a street has traffic growth resulting from the Aurora Avenue 145th to 165th project that is documented to exceed the threshold, then physical devices may be installed such as traffic circles, diverters, chicanes, or street closures.

Comments: T-3, 32-3 - Reduce sidewalks where buildings would be impacted: These comments express the public's request for reduced sidewalk widths in order to reduce right of way costs where buildings are impacted.

Response ID: 71

As necessary, the sidewalk width would be reduced in order to avoid altering or displacing existing buildings. Seattle Ski and the Hideaway Card Tavern are the two buildings that have the greatest potential for having reduced sidewalk widths in Alternative A. The Aurora Avenue 145th to 165th project would result in no building displacements, including at these two properties. Interim sidewalks would be built in areas where the full width for sidewalk and amenity zone cannot be realized due to building conflicts.

Despite the lengthy history of use, most of the existing parking areas along the shoulder are either non-compliant spaces according to City code or within the public right-of-way. This type of uncontrolled shoulder parking endangers both vehicles and pedestrians. Although property owners would not be paid for parking stall reductions, parking areas may be reconfigured with the assistance of the City in order to mitigate displaced stalls. Remaining parking is judged in the Final EIS to be adequate for the businesses.

Comment: T-27 - Federal grant requirements: This comment expresses public concern that the Federal grant requirements call for the inclusion of BAT lanes.

Response ID: 76

The City grant applications did specifically propose that the Aurora improvements would include BAT lanes (refer to Response ID 37 for more information on BAT lanes). However there are other reasons why the City, the public, and other participating agencies have proposed this concept for inclusion in the Aurora Avenue 145th to 165th project.

During the planning process over the past three years, various concepts for lane use were considered for the outside lanes that could be added to Aurora Avenue. Carpool use of the outside, right-turn lanes was evaluated. The community and City decided against opening the lanes to carpools. The primary use of the lanes is for safe access into and out of properties and businesses, along with providing traffic capacity at intersections with side-streets through provision of right-turn access. Allowing carpools would potentially add a large number of vehicles that would conflict with the vehicles that are attempting to access properties/businesses and side-streets. It would also be difficult to enforce carpool use of the lanes because of the combination of different types of users of the outside lanes.

Other considerations are that with the BAT lane included in the build alternatives, the lane is considered an auxiliary lane, and can be included as part of a "clear zone" for lateral obstructions. Therefore lateral obstructions such as signs and utilities won't have to be located outside the right-of-way, and onto private properties. Another consideration is the design for bus zones. If carpools were allowed in the outside lanes, WSDOT would likely require bus turnouts at bus zones. Bus turnouts would cost a substantial amount of money to construct, and extra right-of-way would be required from businesses on the far side of intersections. These locations are often high value businesses, and this encroachment would cause impacts to these sites. Bus turnouts also cause delays to buses trying to re-enter the traffic lanes, so would be counter-productive to City goals to improve transit performance and use along Aurora Avenue.

Comments: T-46, 37-36, 64-5 - Conflict of interest: These comments express public concern that there might be a conflict of interest with having the consultant develop the environmental documentation.

Response ID: 84

To clarify the content of the comment, CH2M HILL, the consultant under agreement with the City of Shoreline, did prepare the preliminary design and environmental analysis for the proposed action. The preliminary design was required to determine the footprint of the build alternatives and the No Action Alternative. The impacts associated with each alternative could then be disclosed and mitigation measures discussed in the environmental document. In the second paragraph, a reference to and citation of 40 C.F.R. Part 1506.5(c) pertains to NEPA Environmental Impact Statement (EIS) documents. The document under comment is a NEPA Environmental Assessment (EA).

The Consultant is under agreement to complete the environmental and preliminary design phase of the proposed action. They have no decision making authority in the environmental process. The consultant is not required to execute a disclosure statement as suggested by the comment, and no conflict of interest has been identified.

The oversight being exercised by the co-lead agencies (FHWA, WSDOT, and the City of Shoreline) has been sufficient to eliminate any perceived conflict of interest. Through their substantial supervision and oversight, FHWA and WSDOT control the accuracy and scope of the NEPA process and the content of the NEPA documents and that they independently and objectively evaluate the consultant's work.

Comments: T-49, T-82, 38-8, 50-9, 61-54, 61-76, 63-18, 64-51, 64-72 - Speed limit: These comments address public interest regarding the reduction in the speed limit.

Response ID: 86

The current signed speed limit on this portion of Aurora Avenue is 40 miles per hour. The CATF and members of the public, including the SMA, have expressed the preference to reduce the speed limit to 35 miles per hour. The City also supports the reduction of the posted speed limit on Aurora Avenue. Regarding access management classifications, Aurora Avenue has a Class 4 designation, so the design should be generally capable of achieving a posted speed limit of 30-to-35 miles per hour. It is currently not a part of the Aurora Avenue 145th to 165th Project to change the speed limit within the project area. WSDOT will review the posted speed limit based upon the results of free flow spot speed studies. After completion of the project, the City may request WSDOT conduct an evaluation to determine whether the reduction of the posted speed limit is appropriate.

The Secretary of Transportation has authority on setting or approving speed limits in accordance with RCW 46-61.400. Setting or changing speed limits on state highways requires appropriate engineering and traffic investigation, as described in the WSDOT Traffic Manual, Section 6.3, including a speed study, analysis of the highway geometry, and accident history. The speed limit is based on actual vehicular speed (85th percentile speed), rather than regulatory code.

WAC 468-52-040 does not establish the speed limit for state facilities. Speed limit is established by RCW and the Secretary of Transportation and is based on traffic analysis. The purpose of WAC 468-52 is for the implementation of an access control classification system for the regulation and control of vehicular ingress and egress from the state highway system. In referring to the speed limit for a Class 4 facility, WAC 468-52-0400 states, "It is the intent that the design be generally capable of achieving a posted speed limit of thirty to thirty five mph in urbanized areas."

Comments: T-57, 27-17, 34-2, 37-7, 37-19, 55-3, 64-36 - Cumulative storm water impact: These comments express public concern about storm water impacts along Aurora Avenue.

Response ID: 91

This project is required to detain stormwater runoff from 100 percent of the new impervious surfaces it creates and treat stormwater from 140 percent of the total impervious area. From these criteria an assessment has been made as to the effect on downstream receiving waters. Those downstream receiving waters would continue to receive untreated and undetained stormwater runoff from other parts of Aurora Avenue as well as other parts of the City of Shoreline except when other City capital improvement projects are implemented that would change those conditions. The fact that the project's termini do not match up with basin boundaries has no effect on the ability to analyze impacts.

This project would not divert stormwater from one basin to another.

For the purposes of the cumulative impacts analysis, it is worth mentioning projects that the City has planned that would affect Boeing and Thornton Creeks. This discussion has been added to the Final EIS.

Comments: T-72, 37-14, 63-42, 63-48, 64-12, 64-21, 64j-1 - Median impacts: These comments address public concern regarding potential safety and traffic impacts due to the construction of a raised median.

Response ID: 97

The effects of medians are discussed throughout Chapter 3 in the Final EIS.

Raised non-traversable medians remove conflict points from the roadway and focus access to where it is most needed and can be provided more safely with traffic control. As a result, some turning movements which would be made mid-block are made at median openings and at intersections. The impacts of these shifts were accounted for in the traffic analysis.

Research by the National Academies of Science Transportation Research Board (TRB), the Federal Highway Association (FHWA), and Washington State Department of Transportation supports the effectiveness of access management treatments (including raised medians) in supporting improvement of safety and operations.

The alternatives considered in the Final EIS provide adequate u-turn width for passenger vehicles as well as pick-up and delivery trucks.

The City of Shoreline acknowledges the potential for diversion into neighborhoods and would address possible traffic diversion as a result of the Aurora Avenue improvements. See Response ID #26 for discussion of City Neighborhood Traffic Management Program.

Comments: T-83, 60-8 - Capacity reduction: These comments express the public's confusion that BAT lanes would reduce the traffic capacity of Aurora Avenue.

Response ID: 100

The current alignment of Aurora Avenue North from N 145th Street to N 165th Street is two general purpose lanes in each direction and an unrestricted two-way left-turn lane. All of the proposed build alternatives in the Final EIS add one Business Access and Transit (BAT) lane in each direction to the existing alignment (and also install a median with left-turn and u-turn pockets in place of the two-way left-turn lane). Therefore, there is no reduction in capacity in terms of lane reductions. Also, see Response ID 47 for more discussion regarding capacity.

Comments: 27-11, 37-13, 61-33, 63-9, 63-106 - Environmental Justice violation: These comments reflect public misunderstanding that the project might result in a disproportionate adverse impact to low income or minority populations.

Response ID: 117

An environmental justice analysis considers whether there are disproportionate high and adverse impacts to low-income or minority populations. The EA/DEIS and Final EIS determined that this project created no high and adverse impacts. Please see the environmental discussion in the Social section of Chapter 3.

Comments: 27-22, 59-5, 61-41, 62-4, 64-27, 64-87 - Freight mobility impacts: These comments express public concern that safety improvements, such as a raised median might negatively impact freight mobility.

Response ID: 120

Median breaks and turn bays provided in the build alternatives would be designed to accommodate left-turns by semi-trailers (WB-55 design vehicle) and u-turns by passenger vehicles and small trucks. Breaks have been located to correspond with high volume freight movements. Many of the business along Aurora Avenue that require commercial freight deliveries are accessible within 300 feet of side streets. Freight deliveries accessing Aurora Avenue North from I-5 can be re-routed to an alternate freeway exit in order to eliminate the need for a truck to cross oncoming traffic lanes in the current uncontrolled environment (with two-way, left-turn lane) and instead use one of many signalized intersections to make a controlled movement across conflicting traffic and set up for a right turn into and out of a property. The current unsafe practice of trucks using the center lane turn lane for unloading would be curtailed by the construction of the median.

In order to prevent or mitigate the diversion of truck trips into residential neighborhoods, the City may enforce vehicle-type restrictions on certain streets or install physical traffic control devices to discourage trucks from accessing residential streets.

Comment: 37-9 - Aurora Avenue 165th to 205th principal features: This comment addresses public concern that an environmental assessment ought to be completed for the entire three miles of the corridor.

Response ID: 136

The design of alternatives for other portions of Aurora Avenue/SR99 has not been developed beyond about a five percent level. Much more work in defining the best alignment for the alternatives would be needed before reasonable assessment of the amount of impact avoidance and mitigation can be accomplished. The additional time necessary to develop other projects on aurora to the level of design needed to obtain accurate analyses of direct operational environmental impacts would take at least another 6-to-12 months. Also, the City wishes to conduct and complete the Central Shoreline Sub Area Plan before additional work on planning for other projects on Aurora Avenue.

The design of alternatives for the Aurora Avenue 145th to 165th project has been developed to a much greater extent (roughly to a 30 percent completion level), and through that effort potential impacts have been avoided and/or mitigated. The City is ready to proceed with making much needed improvements to this portion of Aurora Avenue. By taking prompt action on this project, the public can gain traffic operations and safety benefits, pedestrian access and safety benefits, transit speed and reliability benefits, along with complementary enhancements to the environment. Each year there are nearly 100 traffic accidents in the project limits, many of these

accidents can be prevented with features that have been included in the two project alternatives. Delay to making improvements that can provide immediate benefits, including reducing the risk of accidents, only for the sake of conducting further studies of other potential projects in Shoreline is not reasonable. The Aurora project has been studied for more than four years. The City of Shoreline includes a long list of transportation projects in its Capital Improvement Program, however high priority projects should not be delayed only so all of those projects can be studied to the same level of detail. The Comprehensive Plan EIS provided a comprehensive analysis of environmental impacts for the whole city including all of the transportation projects. Also, the Aurora Avenue 145th to 165th EA/DEIS and Final EIS has included analyses of cumulative impacts of other projects.

Comments 38-49, 38-51, 61-84 - Safety for U-Turns: These comments address public concern over the safety of U-Turns at intersections and potential conflicts with turns onto cross streets.

Response ID: 156

See the Transportation section of the Final EIS for discussion of accidents and safety for the three alternatives. Under the description of Alternative B's safety, there is brief mention that there would be greater risk of accidents for that alternative due to more median openings and potential conflict points. More discussion has been added to the Final EIS regarding the differences between types of traffic movements and conflicts that result from the alternative designs. Also, discussion of measures to manage the risks of accidents has been added.

Regarding concern for concentrating left turns, this is the problem with two-way, left-turn lanes that is being addressed. With two-way, left-turn lanes, there is no focus for left-turn location. So, therefore, the location where left turns and conflicting movements may occur is unpredictable to drivers. Focusing left and u-turns at fewer locations is being proposed as part of the solution to reduce conflict points and improve overall traffic safety. The u-turn volumes at the focused locations would not be heavy volumes. The locations where u-turns would be heaviest would be at signal-controlled locations. Safe u-turns at uncontrolled locations would require that u-turning vehicles wait for gaps in traffic flows/platoons. The median openings at uncontrolled locations would be located adjacent to driveways at high trip generating land uses, so those openings would serve left turns as well as u-turns.

More discussion about the effects of u-turns at signalized intersections has been added to the Final EIS. Due to the provision of u-turns at signalized intersections, an overlapping green arrow for right turns during left/u-turn signal phases would not be provided. Right-turn-on-red traffic must yield to conflicting through and u-turn movements. Signage would be included in the intersections to alert right-turning drivers. This does have an affect on intersection capacity, and this operation has been simulated and reflected in the Year 2020 LOS results. Also, protective-permissive signal operations will not be used for left- and u-turn signals.

Comment: 60-3 - Two-way left-turn lane safety: This comment expresses one opinion that a two-way left-turn lane is safer than a focused left turn lane for merging traffic.

Response ID: 204

Although some vehicles use a two-way left-turn lane for acceleration to merge into traffic, vehicles are endangered by other vehicles using the two-way left-turn lane in the other direction. U-turns would be able to be made either at intersections where a red light would hold oncoming traffic, or from turn pockets when there are breaks in traffic caused by signal operation. Left-turn access is currently restricted with a traffic curb for approximately 40 percent of the project length. Left-turn access for the two-way, left-turn lane is difficult due to high traffic volumes. Neither pedestrian nor traffic safety would be improved if the two-way left turn lane remains intact. The

median provides a safe refuge for pedestrians when crossing at marked crosswalks. For vehicles, it mitigates unsafe crossing, merging, and diverging conflict points in a high traffic area.

Comments: 63-25, 63-37 - Safety improvements: These comments express public request for clarification on the necessity of safety improvements and the need to balance multiple objectives.

Response ID: 246

The project alternatives have been developed to address a broad set of objectives. These objectives include the State objectives cited: "WSDOT has this corridor as a critical need in its 20-year plan", "is considered a high priority", is "critical to statewide and regional intermodal mobility needs". In addition, other objectives have been addressed such as to provide for transit and pedestrian needs, add person-moving capacity, and improve the aesthetics and image of the street. All of the build alternatives would address all of these objectives in an approach which balances the extent to which objective is met with other objectives such as reducing environmental impacts. All of the build alternatives would provide an increase in vehicular capacity by adding Business Access and Transit lanes, adding lanes at intersections, and reducing vehicle conflicts. They also would improve traffic and pedestrian safety by reducing traffic conflicts including focused left/u-turns lanes, and development of formal driveways and reduced /consolidated driveways, and by providing signals at 152nd Street and 165th Street to enable safer traffic access onto Aurora from side streets and to allow for safer pedestrian crossings. They would support regional intermodal mobility needs by adding bus zone improvements, providing Business Access and Transit lanes, providing sidewalks for improved access to transit, and lighting to improve security for transit riders. They would provide improved pedestrian access by adding sidewalks and lighting, and Alternative A and Alternative A Modified would improve the environment for pedestrians by including a landscaped amenity zone buffer between the sidewalk and the roadway. Other features such as wider than absolute minimum sidewalks ("ADA is 5 feet", while Alternative A includes 8 foot sidewalks, and Alternative A Modified and B has 7 foot sidewalks); landscaping in the median rather than concrete barriers and asphalt ; and undergrounding of utilities address other objectives for the project. Refer to Chapter 1 for information on all objectives for the project. Also, see Appendix B, Relationship to Plans and Projects for more information on the broad extent of objectives to be addressed by the project alternatives, including the 32 points identified by the CATF. One point of clarification regarding Comment 63-25, none of the alternatives include a 17 foot wide planted median. The three build alternatives include 4 foot wide medians adjacent to left turn pockets. The medians are 4' wide for 70 percent of the project length. At locations behind left turn pockets (only 30 percent of the project length); the medians are 15' wide. Even if concrete barriers were used instead, there would be locations behind left turn pockets where the medians would be at least 15' wide (the width of the left turn lane-12', plus the width of a concrete barrier-3').

The three build alternatives provide pedestrian safety improvements that would make the corridor safer for pedestrians. Pedestrian safety improvements along the corridor include continuous sidewalks; pedestrian-scaled lighting; and improved pedestrian crossings including, signalized street crossings and median refuge islands at all pedestrian crossings.

The primary purpose of the median is to provide a safe refuge area along the center of the roadway for vehicles making focused left-turns and u-turns and for pedestrians crossing the roadway. The designs include left/u-turn locations at least every 800 feet. This reduces the amount of potential conflict points and increases safety substantially. Within the project limits, traffic curbs/medians currently block left turns for 38 percent of the length.

Comments: 64-23, 64h-3 - Pedestrian undercrossings and overpasses: These comments address the public's curiosity regarding the elimination of a pedestrian undercrossing or overpass from the alternatives.

Response ID: 293

Grade-separated pedestrian crossings were eliminated from consideration as part of the corridor design based on a combination of cost, right-of-way impacts, impacts to business access, and pedestrian security and comfort.

Pedestrian overpasses were estimated to add \$800,000 to \$1,500,000 per crossing to the project cost compared to at-grade crossings at traffic signals which cost about \$150,000 per intersection.

The Americans with Disabilities Act (ADA) requires that a maximum 8.33 (1:12 slope) percent grade be provided for any pedestrian facility. Access ramp lengths would exceed 200 feet. The long ramps required would increase right-of-way requirements potentially eliminating parking and could block access to businesses. Undercrossings would also create similar problems with additional concerns for pedestrian security and comfort which is an issue for users of the confined underground passage. Undercrossings also have high construction costs.

City of Shoreline
AURORA AVENUE 145 - 165
 Estimate Subtotals
BUDGET ESTIMATE - Draft

Prepare by: CH2M HILL
 Date: Nov-26-2002

Date of Cost Index: 2002

Alternative A Modified (110' Width)

FILE: \\simba\proj\159851\Design\Memo\Estimate\110 Prelim Preferred 10-01-02.xls

I. RIGHT OF WAY		\$2,099,000
II. CONSTRUCTION		
1. Grading/Draining		\$2,150,000
2. Structures		\$410,000.00
3. Surfacing/Paving		\$1,171,000.00
4. Roadside Development		\$2,207,000.00
5. Traffic Services and Safety		\$2,383,000.00
6. Miscellaneous Items (20% of Total)	20.00% of Lines 1-6	\$1,594,000
7. Utility Undergrounding	Seattle City Light Cost not included in this estimate	\$450,000
8. Construction Subtotal - Lines 1 through 6		\$10,365,000
9. Mobilization	10.00% of Line 8	\$1,037,000
10. Subtotal - Lines 7 and 8		\$11,402,000
11. Sales Tax	0.00% of Line 9	\$0
(Assumed to be included in unit prices for local agency projects.)		
12. Construction Total - Lines 10 - 11		\$11,402,000.00
III. DESIGN TOTAL		
13. DESIGN TOTAL (Environmental & Permits, Preliminary Engineering, Final Design, Assist During Bidding)	15.00% of Line 12	\$1,710,000
IV. CONSTRUCTION MANAGEMENT TOTAL		
14. CONSTRUCTION MANAGEMENT TOTAL (Engineering Assistance During Construction, Construction Administration, Inspection)	10.00% of Line 12	\$1,140,000
V. CONTINGENCIES TOTAL		
15. CONTINGENCIES TOTAL (applied to all cost items)	20.00% of Lines I, 12, 13, and 14	\$3,270,200
VI. TOTAL ESTIMATED COST		
16. TOTAL ESTIMATED COST	SUM of Lines I, 12, 13, 14, and 15	\$19,621,200

This cost opinion is in 2002 dollars for Budget Estimate based on preliminary design. The cost does not include escalation, permitting, financial costs or operations and maintenance costs. In addition, there are no costs for the mitigation or remediation associated with the potential discovery of hazardous materials. The Budget cost opinion shown has been prepared for guidance in project evaluation at the time of the estimate. The final costs of the project will depend on actual labor and material costs, actual site conditions, productivity, competitive market conditions, final project scope, final project schedule and other variable factors. As a result, the final project costs will vary from the estimate presented above. Because of these factors, funding needs must be carefully reviewed prior to making specific financial decisions or establishing final budgets.

Assumptions

Construction Unit prices based on recent bid tabs for similar projects
 110-foot cross section
 11.5' sidewalks/amenity zone
 Remove all pavement outside of concrete pannels on Aurora and repave
 Overlay only sidestreets except where widening
 Assume 2.25" average depth for overlay
 Surface changes only (striping, extruded curb) to following locations
 Aurora South of 145th Street curb retruns
 Aurora North of 165th curb returns
 145th Street East of Aurora curb returns
 Westminster Way
 ROW values based on Brent Wilde ROW estimate and revised area takes
 Estimate considered a Class 3 with expected accuracy range of -15% to +30%
 Contingency of 20% to be included to account for unknown conditions and unidentified cost items
 Seattle City Light portion of utility undergrounding cost is not included in this estimate