

Proposed Build Alternative



Exhibit 3-1

CHAPTER 3 - PERMANENT EFFECTS & MITIGATION

What's in Chapter 3?

Chapter 3 identifies permanent project effects and proposed mitigation. Only affected elements of the environment are discussed. Energy, fisheries, wildlife, habitat, hazardous materials, and cultural resources will not be permanently affected by the project and are therefore not discussed in this chapter.

1 How would the project change access for vehicles, transit, and freight?

How would vehicle access change?

The project would change access as shown in Exhibit 3-1 by improving connections to local streets and SR 519 by:

- Building an undercrossing to eliminate vehicle and rail conflicts near S. Atlantic Street.
- Adding an SR 99 southbound on-ramp and northbound off-ramp near S. King Street.
- Providing new frontage roads.
- Improving Colorado Avenue S.
- Reconfiguring intersections along S. Atlantic Street between Alaskan Way S. and Utah Avenue S.

New Undercrossing

A new undercrossing would be built just north of S. Atlantic Street to carry traffic underneath the tail track when trains block S. Atlantic Street. While primarily designed for freight, the undercrossing would be open to all vehicles. Due to the location of the undercrossing, S. Royal Brougham Way would be permanently closed under SR 99 east of Alaskan Way S. Also, when the undercrossing is occupied, southbound traffic on Alaskan Way S. wanting to continue to E. Marginal Way S. would need to divert to First Avenue S. at S. Atlantic Street and reach E. Marginal Way S. via S. Hanford Street.

New Ramps Near S. King Street

The new SR 99 ramps near S. King Street would improve access for vehicles traveling on SR 99 to or from downtown. The ramps would provide another option for travelers on

What is the tail track?

The tail track is a single railroad track that connects the BNSF Seattle International Gateway (SIG) Railyard on the east side of SR 99 to the Whatcom Railyard located west of SR 99. The tail track is used to assemble and sort railroad cars for both railyards.

SR 99 to enter or exit the south and central downtown areas, reducing demand for the Columbia and Seneca Street ramps.

Frontage Roads

Northbound and southbound frontage roads would be built parallel to SR 99 to provide access between Alaskan Way S. and E. Marginal Way S. The northbound frontage road would also provide vehicle holding for ferry traffic bound for the Seattle Ferry Terminal.

Improving Colorado Avenue S.

Colorado Avenue S. south of S. Atlantic Street would be improved to separate freight and vehicle traffic. The changes to Colorado Avenue S. are intended to provide a clear and reliable freight path while also continuing to preserve access to adjacent properties.

Reconfigured Intersections along S. Atlantic Street

S. Atlantic Street would be improved between Alaskan Way S. and Utah Avenue S. Reconfigured intersections on S. Atlantic Street would be located at the new U-shaped undercrossing, new Alaskan Way S. frontage roads, Colorado Avenue S., and Utah Avenue S.

How would vehicle access to the ferry terminal change?

Access to the Seattle Ferry Terminal at Colman Dock would be provided from northbound Alaskan Way S. Vehicles traveling west on S. Royal Brougham Way or S. Atlantic Street would travel on a northbound Alaskan Way S. frontage road that would connect to two-way Alaskan Way S. near S. King Street. SR 99 traffic heading to or from the Seattle Ferry Terminal would be able to access the ferry via the new ramps near S. King Street. Ferry traffic would continue north to Yesler Way and enter the terminal, except during peak periods when overflow traffic is held in a new remote holding area.

The new remote holding area will be located along the east side of SR 99 between S. Royal Brougham Way and S. King Street. Access to ferry holding would be provided via the northbound Alaskan Way S. frontage road and would connect to two-way Alaskan Way S. near S. King Street at a signalized intersection. Ferry traffic would share Alaskan Way S. with general purpose traffic as it does today.

Access would not change for vehicles heading north after leaving the Seattle Ferry Terminal. The signal at Alaskan Way and

Yesler Way would be timed to allocate for ferry traffic exiting the terminal.

How would transit access change?

The project would provide additional access for transit to both the south and central downtown areas via the new ramps near S. King Street. Buses traveling to and from the south via SR 99 currently enter and exit downtown using the ramps at Seneca and Columbia Streets. The new ramps would provide an option for these routes to instead access downtown farther south near S. King Street.

King County Metro Transit may or may not choose to adjust routes to use the new ramps. If Metro does decide to adjust routes, transit coverage could be expanded to include a larger portion of the downtown area, particularly the Pioneer Square area. Bus travel times to most areas would remain similar to the No Build Alternative, depending on the rider's final destination. Bus travel times to areas near Pioneer Square could decrease, though travel times for riders bound for areas toward the north end of downtown might increase because buses would enter downtown farther south.

How would freight access change?

The project would improve freight connections, particularly between Terminal 46, the SIG Railyard, and SR 519, which connects with I-90 and I-5. The new northbound and southbound ramps near S. King Street would provide improved access; however, an even bigger improvement for freight would be the addition of the undercrossing just north of S. Atlantic Street. The U-shaped undercrossing would allow freight traffic to travel to areas east and west of the tail track when it is occupied. This would improve traffic operations affected by vehicle and rail conflicts compared to existing conditions.

Freight trucks heading north on E. Marginal Way S. would have a freight-only connection to Colorado Avenue S. that would lead directly to the SIG Railyard. This would be an improvement for both freight and general purpose traffic traveling on Colorado Avenue S., because freight and general purpose traffic would be separated.

How would railroad access change?

Rail operations would remain similar to today. The project would relocate the tail track to the west of its current location.

What is the 2030 No Build Alternative?

We know it is highly unlikely that the viaduct would remain operational until 2030. However, we studied what traffic would be like if the existing facility were operational in 2030 because it provides a baseline that can be compared with traffic conditions for the proposed Build Alternative.

The 2030 No Build Alternative takes into account future population growth and other funded transportation projects, such as the SR 519 Intermodal Access Project Phase 2.

Why are freight connections and movements important considerations?

SR 99, Alaskan Way S., and E. Marginal Way S. are important freight routes that provide direct access to the Port of Seattle and the Duwamish Manufacturing and Industrial Center, which is a major hub for international and interstate freight in the Puget Sound region.

Bicycle and Pedestrian Facilities



The track would extend north from the SIG Railyard to the vicinity of S. King Street.

How would access change for bicyclists and pedestrians?

Bicycle and pedestrian facilities would be improved in several locations. Shared-use bicycle and pedestrian facilities are shown in Exhibit 3-2. Exhibit 3-3 shows what the design of the facility could look like on the east side of SR 99 between S. Royal Brougham Way and Railroad Way S. Bike lanes would be widened on Alaskan Way S., E. Marginal Way S., and S. Atlantic Street and would be added on the northbound and southbound Alaskan Way S. frontage roads. These facilities provide a link for bicycles and pedestrians between West Seattle and downtown Seattle, and between the Seattle waterfront and the Mountains to Sound Greenway Trail.

Facilities between S. Holgate Street and S. Atlantic Street would include a 5-foot-wide bike lane on both sides of E. Marginal Way S./Alaskan Way S. A minimum 8-foot-wide sidewalk would also be provided for pedestrians on the west side of the street.

Between S. Atlantic Street and S. Royal Brougham Way, 5 foot-wide bike lanes and shared-use paths would be provided on both northbound and southbound Alaskan Way S. The bike lane and shared-use path on the northbound Alaskan Way S. frontage road would cross under SR 99 and connect to the existing shared-use path on the east side of Alaskan Way S. near S. King Street.

Bicycles and pedestrians traveling east and west on S. Atlantic Street would be able to use an 8-foot-wide sidewalk in the new undercrossing just north of S. Atlantic Street to connect between the stadium area and the waterfront while the tail track is occupied. The undercrossing would be almost four city blocks in length, or about 1,100 feet.

As part of the Mountains to Sound Greenway Trail, a 10- to 12-foot-wide bicycle and pedestrian path would be added to the north side of S. Atlantic Street between First Avenue S. and Alaskan Way S. Connecting to the Mountains to Sound Greenway Trail will ultimately provide access to this larger trail system, which will cross I-90 to locations east of Seattle.

Design for Bike/Pedestrian Facility

ROMA Design Group

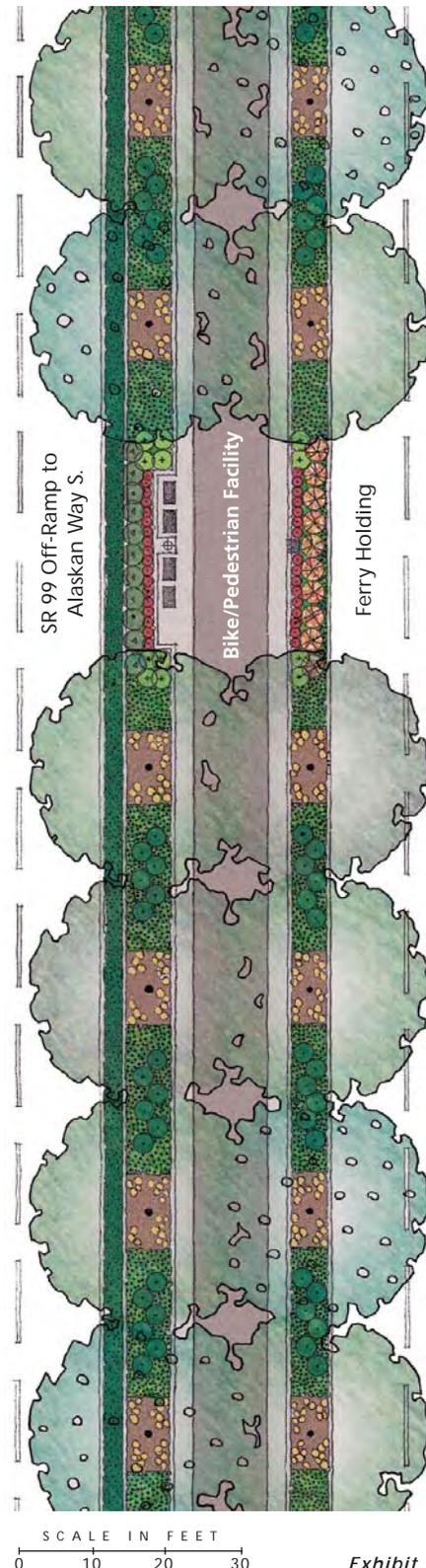


Exhibit 3-3

How would access to the stadiums and event center change?

New on- and off-ramps to SR 99 would be provided near S. King Street in addition to the existing SR 99 on- and off-ramps on First Avenue S. at Railroad Way S. This would improve vehicle access in the stadium area.

2 How would the project affect traffic?

How would traffic patterns and volumes on SR 99 change with the project?

Mainline SR 99 and ramp volumes in the project area would change with the project, due to the addition of new ramps

2030 No Build Alternative

SR 99 MAINLINE VOLUMES
AM/PM Peak

RAMP VOLUMES
AM/PM Peak

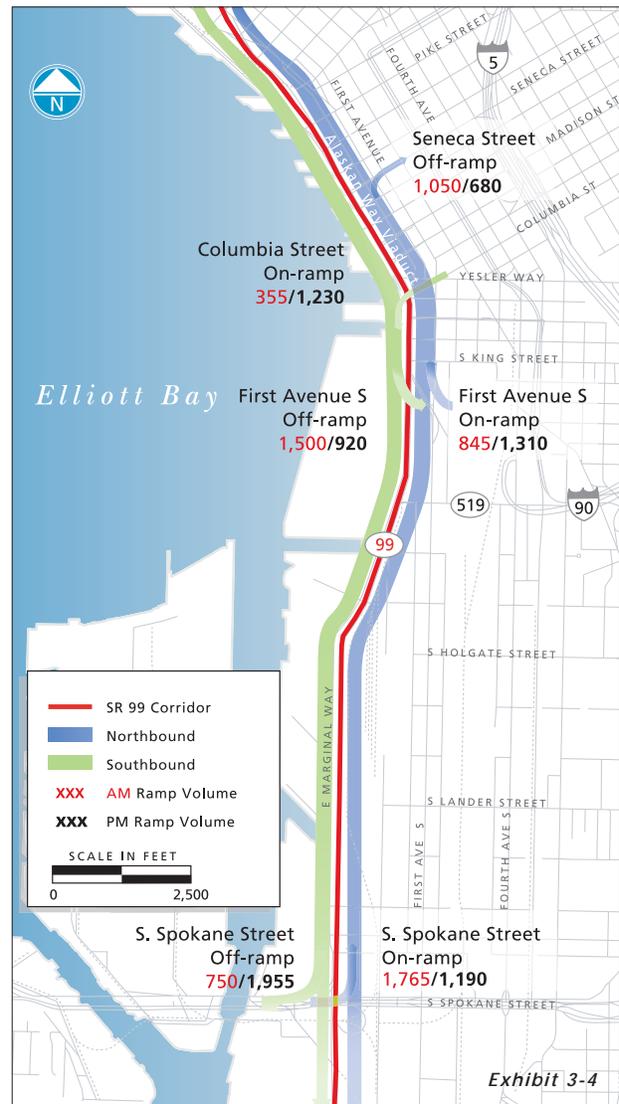
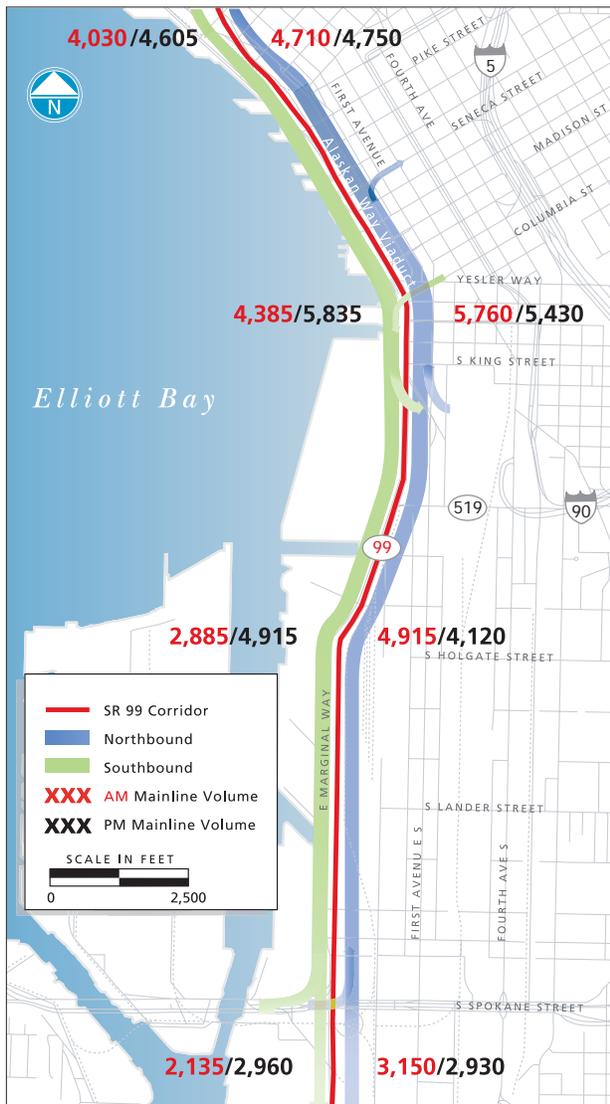


Exhibit 3-4

near S. King Street. These new ramps would improve downtown access for vehicles traveling to or from locations south of downtown Seattle, such as West Seattle. Traffic volumes at the Columbia and Seneca Street ramps would decrease because drivers traveling to or from downtown could exit closer to their destinations. For example, for the 2030 Build Alternative, ramp volumes during the PM peak period at Seneca Street and Columbia Street are expected to decrease by 10 percent and 15 percent, respectively, as shown in Exhibits 3-4 and 3-5.

What are the AM and PM peak hours?

The AM and PM peak hours are the periods when traffic is heaviest during the morning and late afternoon commutes. On SR 99, the AM peak hour occurs from 8:00 to 9:00 a.m. and the PM peak hour occurs from 5:00 to 6:00 p.m.

In addition, north of the S. King Street ramps, mainline SR 99 traffic volumes with the Build Alternative are expected to be

2030 Build Alternative

SR 99 MAINLINE VOLUMES
AM/PM Peak

RAMP VOLUMES
AM/PM Peak

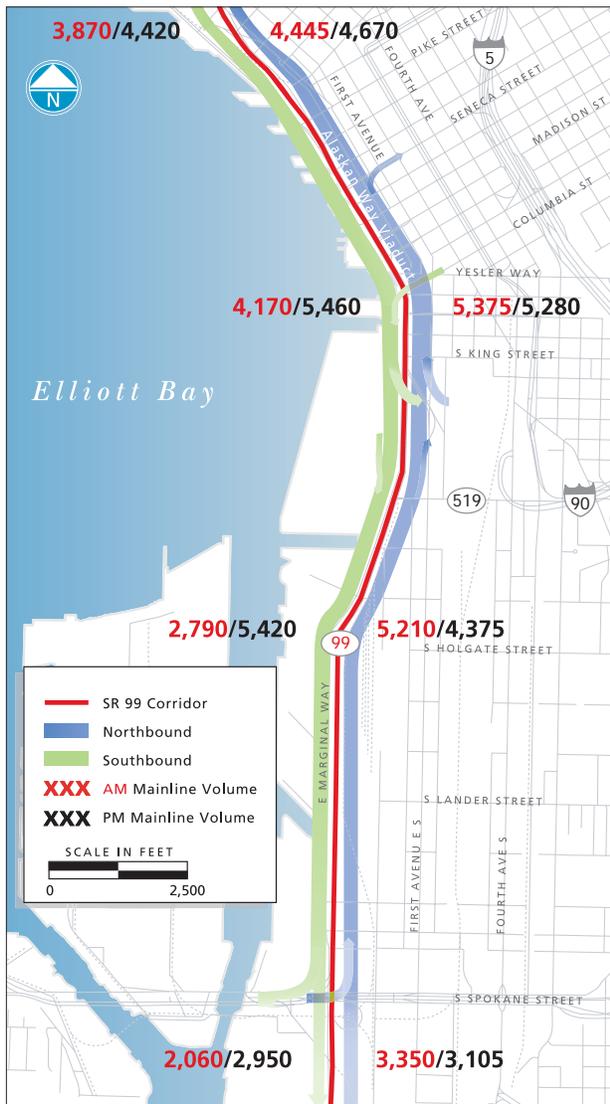


Exhibit 3-5

lower than for the No Build Alternative because some of the traffic that currently uses the Seneca and Columbia ramps to access downtown would divert to the new ramps at S. King Street. In the PM peak hour for the 2030 Build Alternative, northbound traffic north of S. King Street is estimated to decrease by 5 percent, and southbound traffic is estimated to decrease by 10 percent.

Mainline SR 99 volumes in the south end of the project area are expected to increase because the new ramps near S. King Street would likely attract additional traffic away from parallel arterial routes such as First and Fourth Avenues S. In the PM peak hour for the 2030 Build Alternative, northbound traffic south of S. King Street is estimated to increase by about 5 percent, and southbound traffic is estimated to increase by 10 percent.

In addition, the Build Alternative provides a new undercrossing that would allow traffic to avoid vehicle delays caused when the BNSF tail track is occupied. SR 99 mainline and ramp operations would not be noticeably affected when the tail track is occupied and vehicles are using the undercrossing.

The trends described above for the 2030 Build Alternative are similar for the year 2012, when construction is completed and the Build Alternative is expected to be fully operational. The main difference is that traffic volumes are expected to be lower than in the year 2030.

How would travel speeds change on SR 99?

Expected travel speeds north and south of S. King Street for both the 2030 No Build and Build Alternatives are shown in Exhibits 3-6 and 3-7.

Exhibit 3-6

SR 99 AM Peak Hour Speeds

Shown as miles per hour (mph)

	2030 No Build Alternative	2030 Build Alternative
SOUTHBOUND		
North of Stadium Area	40	40
South of Stadium Area	50	45
NORTHBOUND		
South of Stadium Area	50	40
North of Stadium Area	40	40

*Exhibit 3-7***SR 99 PM Peak Hour Speeds***Shown as miles per hour (mph)*

	2030 No Build Alternative	2030 Build Alternative
SOUTHBOUND		
North of Stadium Area	30	40
South of Stadium Area	45	40
NORTHBOUND		
South of Stadium Area	50	45
North of Stadium Area	20	40

North of the stadium area, travel speeds are expected to be similar during the AM peak hour and are expected to improve during the PM peak hour. SR 99 traffic volumes north of the stadium area would be lower because of the new ramps located near S. King Street. The new ramps would help to improve traffic flow, especially in the northbound direction during the PM peak hour, when most traffic is using SR 99 to leave downtown.

South of the stadium area, travel speeds on SR 99 are forecasted to decrease during both the AM and PM peak hours due to increased traffic volumes. The traffic volumes would be higher because the new ramps near S. King Street would improve access and draw traffic that currently uses E. Marginal Way S. and First Avenue S. Additional vehicles that would otherwise use parallel arterial routes such as First and Fourth Avenues S. are also expected to use the SR 99 mainline to reach their destinations.

The trends described above for the 2030 Build Alternative are similar for the year 2012, when construction is completed and the Build Alternative is expected to be fully operational. The main difference is that traffic volumes are expected to be lower than in the year 2030, so travel speeds may be slightly higher than those shown above.

How would intersections be affected?

The Build Alternative includes new traffic signals and changes to the street grid that are expected to improve traffic conditions. Congested intersections that are expected to operate poorly during the PM peak hour with the 2030 No Build and Build Alternatives are identified in Exhibit 3-8. The First Avenue S. and S. Royal Brougham Way intersection is expected to operate better with the 2030 Build Alternative than it would with the No Build Alternative.

Appendix F Transportation Discipline Report

Appendix F contains supporting traffic information that explains how the traffic analysis was conducted for this project and documents the conclusions contained within the text of this EA.

Exhibit 3-8 shows that with the tail track open, three intersections in the transportation study area would operate poorly with the 2030 No Build Alternative (First Avenue S. and S. Royal Brougham Way, First Avenue S. and S. Atlantic Street, and Colorado Avenue S. and S. Atlantic Street). For the Build Alternative, two intersections would operate poorly in the year 2030 (First Avenue S. and S. Atlantic Street, and Colorado Avenue S. and S. Atlantic Street).

What are congested intersections?

For the traffic analysis conducted for this project, congested intersections are intersections that cause drivers considerable delay. A driver might wait one minute or more to get through a traffic signal at a congested intersection.

Congested Intersections

2030 NO BUILD ALTERNATIVE
PM Peak – Rail Operations Not Blocking
S. Atlantic Street

2030 BUILD ALTERNATIVE
PM Peak – Rail Operations Not Blocking
S. Atlantic Street

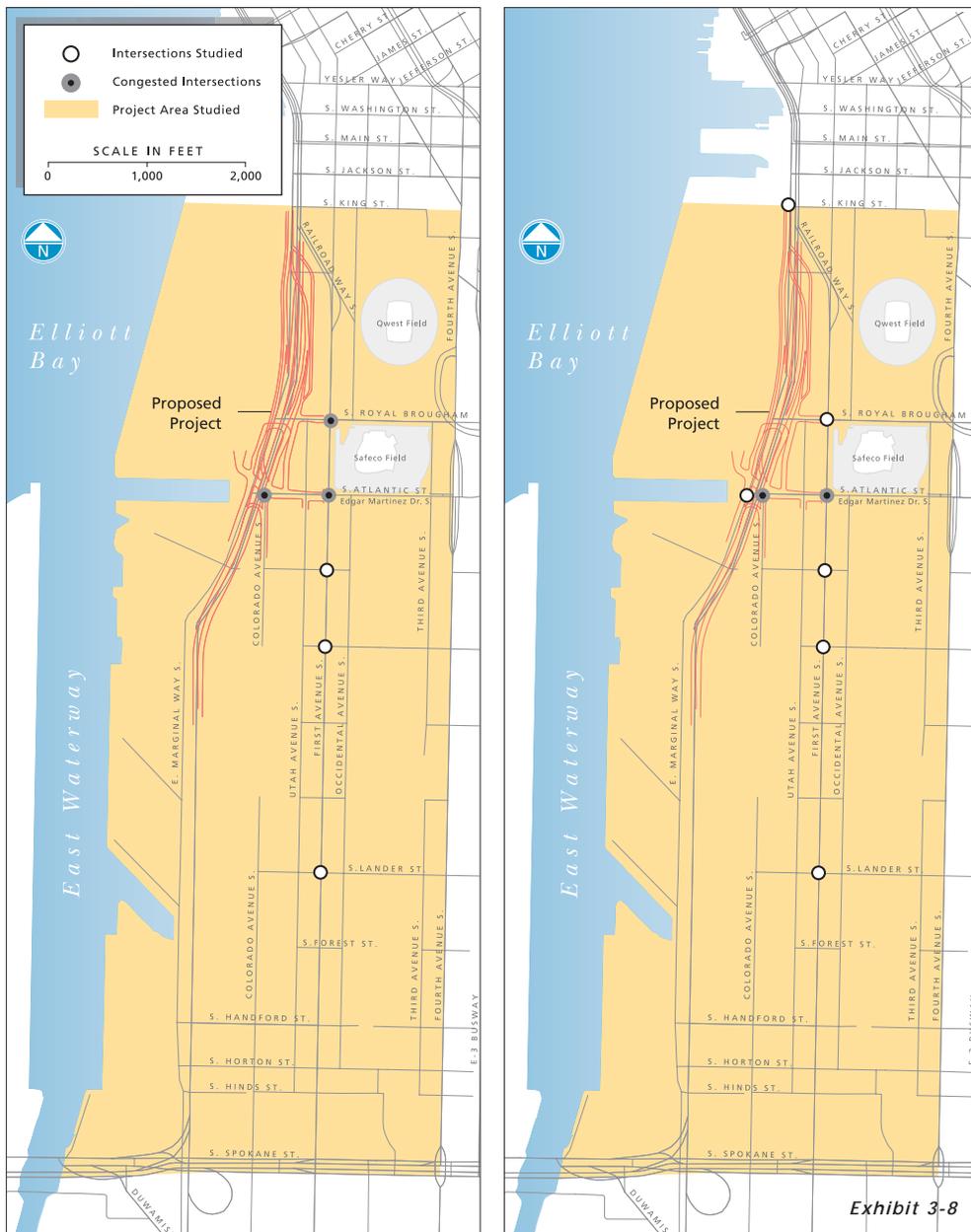


Exhibit 3-8

The new U-shaped undercrossing would provide continuous access across the tail track, which is not possible today or under future baseline conditions. The new undercrossing would result in a complex set of intersections at the convergence of E. Marginal Way S., Terminal 46, Alaskan Way S., Colorado Avenue S., and S. Atlantic Street. Especially long traffic signal cycle lengths, as much as 165 to 220 seconds, would be needed to accommodate all movements at this location. As a result, average vehicle delays at this location are expected to be relatively high. However, overall conditions are expected to improve relative to existing conditions given the continuous access across the tail track.

The First Avenue S. and S. Atlantic Street intersection would operate poorly in the year 2030 whether or not the tail track is occupied. Overall, intersections in the project area are expected to operate better with the 2030 Build Alternative than with the No Build Alternative.

The trends described above for the 2030 Build Alternative are similar for the year 2012, when construction is completed and the Build Alternative is expected to be fully operational. The main difference is that traffic volumes are expected to be lower in 2012 than in the year 2030, so the intersections will function with fewer delays.

Traffic Queues

Traffic flows throughout the project area would be stable with the project. However, travelers may experience delays and queues at the following locations:

- **Utah Avenue S. and S. Atlantic Street** – During the PM peak hour, vehicles traveling northbound on Utah Avenue S. may experience long queues and delays when turning right onto S. Atlantic Street. With high traffic volumes on S. Atlantic Street, northbound vehicles stopped at the stop sign would have few opportunities to turn right and enter the traffic stream. Some drivers would likely divert to the First Avenue S. and S. Massachusetts Street intersection to avoid these long queues and delays, particularly when the tail track is occupied.
- **Colorado Avenue S. and S. Atlantic Street** – During the AM peak hour, trucks traveling from Colorado Avenue S. into the undercrossing would experience some queues and delays. This is primarily caused by the large number of Port of Seattle trucks that are expected to travel between Terminal 46 and the North SIG Railyard in the year 2030. The signal system for this location must provide for not only movements that occur specifically at this intersection, but also for those at the adjacent E. Marginal

Way S./Terminal 46 driveway/S. Atlantic Street intersection as well. The signal system includes provisions to accommodate rail crossings on the BNSF tail track while diverting traffic to the new undercrossing. As a result, even under moderately congested conditions, such as during the PM peak hour, travelers would face delays at this location as the traffic signal cycles through all necessary signal phases. Delays would be substantially greater without these improvements under the No Build Alternative.

- **Undercrossing** – Traffic in the undercrossing may queue during both the morning and evening peak hours due to high traffic volumes. During the AM peak hour, overall vehicle volumes are not expected to be very high, but a large percentage of the vehicles using the undercrossing would be trucks. Because trucks are much longer than typical passenger vehicles, queues would form with fewer vehicles. During the PM peak hour, overall traffic volumes are expected to be higher. However, queues are anticipated to be similar to the AM peak hour.
- **Alaskan Way S. between S. King Street and Yesler Way** During the PM peak hour, northbound vehicles on Alaskan Way S. turning left onto Yesler Way to access the Seattle Ferry Terminal would likely experience queues and delays while ferry vessels load and unload. This may cause upstream delays on S. King Street.
- **S. Atlantic Street and First Avenue S.** – During both the AM and PM peak hours, vehicles heading west on S. Atlantic Street would experience some delay due to the high volume of vehicles turning left to head southbound on First Avenue S. The queue from the westbound left turn pocket is expected to spill into the through lane and impede drivers wishing to travel westbound or make right turns onto First Avenue S.

Even with queues and delays anticipated at the locations described above, the transportation system is expected to operate better and with fewer congested locations with the Build Alternative than the No Build Alternative.

How would the project affect roadway safety?

The Build Alternative would improve roadway safety over existing conditions. All drivers in the surrounding area would benefit from the improved seismic safety provided by the new roadway. The new SR 99 structure would be designed to last for 75 years and built to withstand most earthquakes that are likely to occur in the area. The new SR 99 roadway would also have wider shoulders compared to the existing facility, which would improve safety for vehicles compared to existing conditions. As part of project design, WSDOT will consult and coor-

dinate with the City of Seattle in all safety-related decisions affecting City streets and sidewalks to ensure that they meet City standards. All signage will follow FHWA's *Manual on Uniform Traffic Control Devices*.

Adding ramps near S. King Street increases the number of conflict points that travelers along SR 99 will experience, potentially increasing accident rates in the future. However, the benefits of the new ramps and increased shoulder widths are considered to outweigh the potential for conflicts at ramp locations.

For pedestrian safety, sidewalks and paths would remain along Alaskan Way S. and the nearby surface streets. Sidewalks and paths would not be located directly adjacent to the SR 99 mainline. The tail track would be located to the east of the mixed-use path on the west side of SR 99. The additional bike lanes and improved pedestrian facilities on surface streets would reduce the potential for conflicts between vehicles and bicycles and pedestrians.

How would traffic during special events at the stadiums and event center be affected?

During stadium and event center events, such as Seahawks and Mariners games, the project is not expected to make traffic circulation and operations worse than existing conditions. Traffic flow during events is managed by the Seattle Police Department. Access to and from the stadium area would be improved with the addition of the new S. King Street ramps.

Safeco Field, Qwest Field, and Qwest Field Event Center have prepared transportation management plans to reduce and manage the traffic and parking demand associated with events. Measures developed in these transportation management plans, such as pedestrian improvements, high-occupancy vehicle (HOV) incentives, and transit service, help control and improve event traffic.

In addition to vehicle traffic, there is a high level of pedestrian traffic during events. The project would provide pedestrian and bicycle facilities that are similar to or better than the existing conditions along Alaskan Way S. and adjacent surface streets, as described in Question 1 of this chapter.

3 How would economic conditions in surrounding areas be affected?

The project is located within two business districts, the Duwamish Manufacturing and Industrial Center (which includes South of Downtown [SODO]) and the south end of Pioneer Square. General economic effects and benefits associated with the project include improved access between SR 99 and local streets, and improved access for freight between existing industrial areas, Terminal 46, and the SIG Railyard. Access improvements to Terminal 46 would diminish freight truck and rail conflicts and improve travel times between existing industrial areas, which contribute to the cost of transporting goods and materials. Improved freight connections and enhanced mobility would increase business efficiency and decrease the costs due to congestion.

Business employees and customers would experience changes in parking availability in the area. The project would remove approximately 1,267 parking spaces, as shown in Exhibits 3-9 and 3-10. The majority of the parking spaces that would be removed are off-street pay spaces. About 418 free long-term spaces would be removed. South of S. Atlantic Street, there is free parking with 1- and 2-hour limits along First Avenue S. In addition, several blocks of free parking with no time limits are currently located near the project south of S. Massachusetts Street on Utah Avenue S. and Occidental Avenue S.

The City of Seattle's policy is to provide enough parking for mobility and economic needs, while limiting parking to encourage people to use other modes of transportation. The City manages on-street parking according to the goals and policies listed in Seattle's Comprehensive Plan section C-3; specifically, goal TG18 and policy T42 are applicable to this project. These policies state that the primary purpose of arterials is to move people and goods, and short-term parking only needs to be replaced when there is a concentrated substantial loss. Generally the City does not replace long-term free parking. The City does not have a policy for replacing long-term off-street parking. The changes to parking that would result from the project are consistent with City policy.

What is on-street parking?

There are two types of on-street parking, short-term and long-term. On-street short-term parking includes metered spaces, time-restricted public parking spaces (such as 1-hour parking and loading zones), bus/taxi zones, and spaces reserved for police parking. On-street long-term parking includes unmetered, unrestricted on-street public parking spaces.

What is off-street parking?

Off-street parking includes parking garages and lots where people pay to park. Most off-street parking is privately owned and operated.

*Exhibit 3-9***Project Parking Effects**

	Parking Spaces Removed
On-street short-term	29
On-street long-term	418
Off-street	820
Total	1,267

The affected off-street pay parking is located on two properties, the Washington-Oregon Shippers Cooperative Association (WOSCA) property and a property just east of the viaduct between S. Atlantic Street and S. Royal Brougham Way. WSDOT purchased these properties in 2007 for use by the Alaskan Way Viaduct Program. The 820 off-street pay parking spaces on these properties will not be available during construction of the S. Massachusetts Street to Railroad Way S. Electrical Line Relocation Project. The S. Holgate Street to S. King Street Viaduct Replacement Project would permanently change these areas to a transportation facility and reduce the total supply of parking in the area.

Many pay lots in the area are underutilized. According to the Puget Sound Regional Council¹, about 37 percent of the off-street parking spaces in the stadium area are used on an average non-event weekday. This means that on an average weekday, about 4,100 off-street parking spaces are available within a quarter-mile of the project. However, during events, paid parking spaces are often very full. As a result, a large number of event attendees currently use other modes such as Metro buses and the Sounder commuter train.

¹ PSRC 2007

A new development project with Home Plate, located near S. Atlantic Street and First Avenue S., will add about 800 parking spaces by 2010; 300 spaces would be designated for events, and 500 spaces would be for the development's occupants. The Home Plate spaces will increase the parking inventory in the area, but these new spaces are not included in the available parking counts for this project.

Because off-street pay lots are generally underused in the stadium area, parking spaces are not anticipated to be difficult to find on typical days. In addition, there is free or metered on-street parking on the streets surrounding the project area. With about 418 on-street long-term spaces removed from under the viaduct and along Alaskan Way S., some drivers who currently park for free all day may need to look for on-

Parking Permanently Removed



Exhibit 3-10

street long-term parking several streets away or would need to pay to park. Additionally, removing 1,267 total parking spaces in the stadium area could make it more difficult to find parking during an event at the stadiums or the event center. Many businesses near the stadiums and event center already offer their lots for paid parking during events. This is one example of how the private market would adjust to the demand.

The loss of 29 short-term, metered spaces would decrease local government revenues from parking by about \$72,500 per year.

Surrounding businesses could be affected by reduced parking if their customers and employees have to pay or park farther away. However, off-street pay lots are generally underused in the stadium area and parking spaces are not anticipated to be difficult to find on typical days. In addition, there is free or metered on-street parking on the streets surrounding the project area. Therefore, businesses are not expected to lose patrons.

4 How would the project affect properties located in the area?

A total of seven properties would be affected by partial property acquisitions and/or utility easements. All of the properties required are zoned for industrial or industrial/commercial uses and are primarily used for terminal operations, warehouses, or parking. None of the acquisitions or easements require residents, businesses, or their employees to be relocated.

The following acquisitions and/or utility easements would be needed:

- Three partial property acquisitions would be needed for the roadway alignment. Permanent utility easements would also be required on two of these parcels.
- Four parcels would be affected by permanent utility easements only.

The three partial property acquisitions would total approximately 2.09 acres. The permanent utility easements would affect about 1.31 acres.

The partial property acquisitions shown in Exhibit 3-11 consist of narrow strips of Port of Seattle land on Pier 36 and Terminal 46, and a narrow strip of Pyramid Alehouse property parallel to the east side of SR 99. Some parking spaces on these partially acquired parcels would be removed, but existing

Appendix G Technical Memoranda

Appendix G contains technical memoranda that support conclusions discussed in this EA:

- *Alternative Description and Construction*
- *Archaeological Resources*
- *Economics*
- *Environmental Justice*
- *Geology and Soils*
- *Hazardous Materials*
- *Historic Resources*
- *Land Use and Shorelines*
- *Noise and Vibration*
- *Parks and Recreation*
- *Public Involvement*
- *Public Services and Utilities*
- *Relocations*
- *Social Resources*
- *Visual Quality*
- *Water Resources*

Properties Partially Acquired

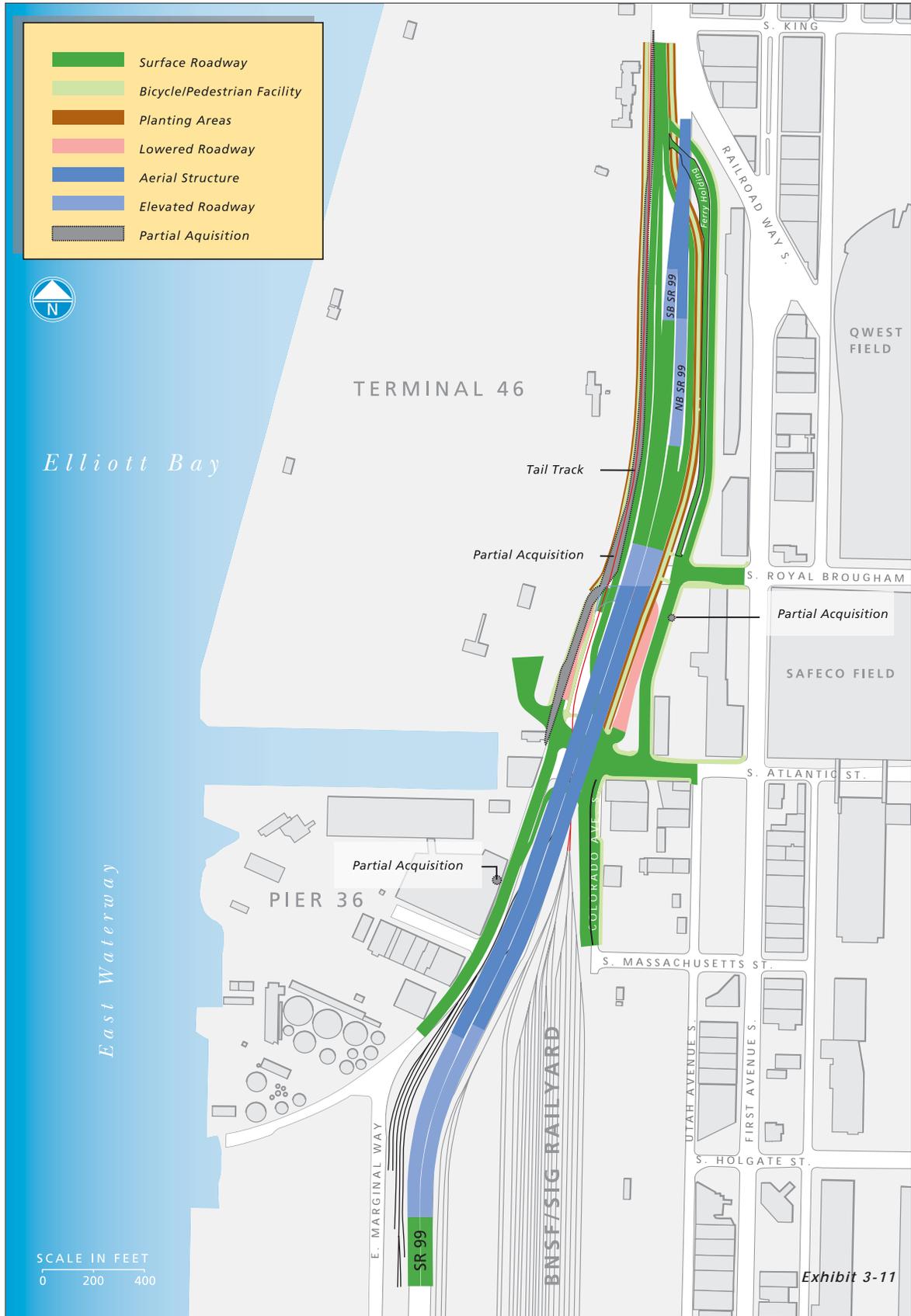


Exhibit 3-11

buildings on these properties would not be altered, and current functions on the remaining portions would not be affected.

The permanent utility easements are located on Port of Seattle land south of S. Massachusetts Street, Pier 36, Terminal 46, the Pyramid Alehouse parking lot, Fortune Warehouse, and a small piece of vacant BNSF land. They are not expected to affect long-term property use. The purpose of the easements is to allow utility providers limited rights to a specific portion of property that is owned by someone else. The utility easements would allow the utility providers to maintain or upgrade their lines.

How would these effects be mitigated?

Compensation for parcel acquisitions, including easements, would be provided at fair market value and would comply with the Federal Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, as amended. We would work with affected property owners to minimize the amount of disruption caused by the project.

5 What is Section 106, and how does it affect the way we evaluate historic and archaeological resources?

Section 106 of the National Historic Preservation Act requires agencies to consider the effects of federal actions to historic properties. In compliance with Section 106 requirements, we have consulted and will continue to consult with the State Historic Preservation Officer (SHPO), tribes, and other interested parties in developing mitigation measures. As part of our consultation with the SHPO, we will do the following:

- Develop a Memorandum of Agreement regarding how we will address effects to historic resources.
- Develop resource-specific agreements to document and mitigate effects. The project has already begun documenting known historic effects to the viaduct.

Depending on the type of resource, mitigation of adverse effects will be developed on a case-by-case basis with the SHPO. When the parties agree on how the adverse effects will be resolved, a Memorandum of Agreement will be signed and implemented. The draft Memorandum of Agreement is included in Appendix H.

No permanent effects to archaeological resources are expected. Potential construction effects to archaeological resources are discussed in Question 12 of Chapter 4.

Appendix B Potential Mitigation Measures

Appendix B Appendix B lists the potential mitigation measures being considered for this project.

Section 4(f) and Protection of Historic Resources

Section 4(f) is a provision of federal law pertaining only to transportation projects that requires project proponents to carefully consider protection of resources identified as Section 4(f) resources. These include public parks and recreation land and historic resources listed in or eligible for the National Register of Historic Places.

The viaduct itself is eligible for listing in the National Register of Historic Places and is protected as a Section 4(f) resource. It is one of the resources included in the Draft Section 4(f) Evaluation found at the end of this document on page 130. The attachments are provided in *Appendix D, Draft Section 4(f) Parts A, B, and C*.

6 How would the project affect historic resources?

The project would demolish the southern portion of the Alaskan Way Viaduct, which has been determined to be eligible for listing in the National Register of Historic Places. The existing on- and off-ramps at First Avenue S. near Railroad Way S. would remain, with the same effects and benefits as they have today.

The new SR 99 structure would generally have a minimal effect on historic resources in the area, because it would occupy approximately the same footprint as the existing Alaskan Way Viaduct, and therefore would not displace or otherwise disturb any historic resources. The structure would be located southwest of the Pioneer Square National Register historic district and local preservation district in an area that is largely occupied by railyards, parking lots, and industrial buildings.

When the project is completed, tenants of the Bemis Building (located near the viaduct on S. Atlantic Street) may experience increased traffic congestion nearby. This building, a former bag factory built in 1904, is eligible for the National Register of Historic Places. Both north- and southbound access to the Bemis Building loading dock will be maintained on Colorado Avenue S.

How would these effects be mitigated?

A Memorandum of Agreement is being developed to ensure that adverse effects to historic resources, as defined by Section 106, are avoided, minimized, or mitigated. The draft Memorandum of Agreement is included in Appendix H.

Before any demolition is done, we will document the viaduct with photos and a narrative history that describes its role in Seattle's history, in accordance with Historic American Engineering Record (HAER) standards. Photos taken for HAER could be displayed at public venues around Seattle.

7 What other elements of the environment were evaluated, and what were the results?

Elements of the environment discussed in this question include noise, air quality, climate change, views, land use, parks and recreation, neighborhoods, low-income and minority populations, police and fire services, water resources, endangered species, and soils. These elements are discussed together in this section because the project would cause minor, if any, permanent effects to these elements of the environment.

Would noise levels change?

Noise levels in the project area are typical of urban and major downtown metropolitan areas. Typical urban and city noise levels range from 65 to 80 dBA. Without the project, the peak traffic noise levels in 2030 are expected to increase by 1 to 2 dBA. With the project, noise levels are expected to remain the same or decrease by 1 to 2 dBA. These minor changes in noise levels would barely be perceptible to most people.

Traffic noise levels currently approach or exceed the exterior FHWA noise abatement criterion of 67 dBA at three of the sites modeled along First Avenue S. between Railroad Way S. and S. King Street. These sites represent 235 current and planned residential units and two outdoor dining areas. Noise levels would remain the same or decrease slightly with the project at these sites. Traffic noise in the area is primarily generated by the high traffic volumes on surface streets. Because the high traffic volumes will generate noise regardless of any project effects, mitigation is not feasible.

Would air quality change?

Under the Clean Air Act, the U.S. Environmental Protection Agency (EPA) has established the National Ambient Air Quality Standards (NAAQS). The NAAQS specify maximum concentrations for carbon monoxide (CO), particulate matter less than 10 micrometers in size (PM₁₀), particulate matter less than 2.5 micrometers in size (PM_{2.5}), ozone, sulfur dioxide, lead, and nitrogen dioxide.

Areas that once did not meet the NAAQS but have since demonstrated attainment are classified as maintenance areas. The project is located entirely within a CO maintenance area, and the area just south of the existing viaduct is a PM₁₀ maintenance area. Future pollutant concentrations for CO and particulate matter with the project are estimated to be below the NAAQS.

In accordance with FHWA guidelines, the annual mobile source air toxics (MSAT) pollutant burdens (in tons per year) were calculated for six pollutants that were previously (prior to the 2007 EPA Final Rule) classified as priority MSAT. To assess potential project effects, pollutant levels for these six MSAT were compared to existing and future conditions with and without the project. Future MSAT levels are predicted to be lower than existing levels with or without the project.

What is a dBA?

Sound levels are expressed on a logarithmic scale in units called decibels (dB). A-weighted decibels (dBA) are the commonly used frequency that measures sound at levels that people can hear.

To the human ear, a 1- to 3-dBA change is hard to distinguish, but a 5-dBA change in noise levels is readily noticeable. A 10-dBA decrease would sound like the noise level has been cut in half.

What is a noise abatement criterion?

The noise abatement criterion is the standard defined by FHWA that noise levels should meet. If noise levels exceed the abatement criterion, FHWA may require mitigation to reduce noise, if reasonable and feasible.

What are Mobile Source Air Toxics (MSAT)?

To help protect air quality, the U.S. Environmental Protection Agency (EPA) identified a group of 21 pollutants as mobile source air toxics (MSAT) in a 2001 final rule, Control of Emissions of Hazardous Air Pollutants from Mobile Sources (66 FR 17235). From the list of 21, EPA identified six priority MSAT. These are benzene, formaldehyde, acetaldehyde, diesel particulate matter/diesel exhaust organic gases, acrolein, and 1,3-butadiene.

In 2007, EPA finalized a rule to reduce hazardous air pollutants from mobile sources. However, EPA has not yet established regulatory concentration targets for relevant MSAT appropriate for use in the project development process.

Traffic flow improvements will reduce emissions from idling vehicles and improve air quality. No exceedances of the NAAQS are anticipated, and MSAT pollutant emissions will decrease over time, hence no adverse air quality effects are expected and no mitigation measures are needed.

How would the project address climate change?

The Intergovernmental Panel on Climate Change defines adaptation as the “adjustment in natural or human systems in response to actual or expected climatic stimuli or their effects, which moderates harm or exploits beneficial opportunities.” Furthermore, the Panel concluded that adaptation will be necessary to address effects resulting from the warming that is already unavoidable due to past emissions. The effectiveness of any specific adaptation requires consideration of the expected value of the avoided damages against the costs of implementing the adaptation strategy.

Governor Gregoire committed the state to preparing for and adapting to the effects of climate change as part of Executive Order 07-02. A new focus sheet entitled “Preparing for Impacts” is available online at:

<http://www.ecy.wa.gov/climatechange/index.htm>.

The focus sheet provides a brief summary of the key areas that Washington State is likely to experience over the next 50 years:

- Increased temperature (heat waves, poor air quality).
- Changes in volume and timing of precipitation (reduced snowpack, increased erosion, flooding).
- Ecological effects of change (spread of disease, altered plant and animal habitats, human health and well-being).
- Sea-level rise, coastal erosion.

The S. Holgate Street to S. King Street Viaduct Replacement Project is being designed to last 75 years. The project has incorporated features as part of its standard design that would provide greater resilience and function with the potential effects brought on by climate change. These include detention and treatment Best Management Practices (BMPs) to treat stormwater and improve the water quality, and adding landscaping with vegetation that is suitable for the urban environment.

The project will help reduce greenhouse gas emissions by creating a more efficient route for some drivers, and decreasing

Appendix E Air Quality

Supporting information about air quality standards and conditions with the Build Alternative can be found in Appendix E, Air Quality Discipline Report.

Appendix E also contains additional information about greenhouse gases and climate change.

What are greenhouse gases?

Climate-changing greenhouse gases come in several forms. The gases associated with transportation are water vapor, carbon dioxide (CO₂), methane (also known as marsh gas), and nitric oxide (found in dentists’ offices as laughing gas). CO₂ makes up the bulk of the emissions from transportation and is the focus of this evaluation. Any process that burns fossil fuel releases CO₂ into the air. Vehicles are a significant source of greenhouse gas emissions and contribute to global warming primarily through the burning of gasoline and diesel fuels.

traffic volumes and vehicle delays at the Columbia and Seneca Street ramps. The vehicle capacity of SR 99 will not increase. The U-shaped undercrossing would decrease the amount of idle time for traffic and freight trucks when rail operations block traffic. The project would create smoother driving and minimize stop and go conditions, which could reduce fuel consumption and greenhouse gas emissions. Emissions from vehicles are a significant source of greenhouse gases and contribute to climate change. The project would also improve pedestrian and bicycle facilities, hence making these emission-free transportation modes more attractive.

How would the project affect views?

Views from the new SR 99 roadway would not be substantially different than views from the existing viaduct. Motorists traveling northbound would still experience panoramic views of the downtown skyline. Views of the stadiums and SODO area for southbound motorists would improve somewhat with the new roadway configuration, because these views would no longer be blocked by the upper roadway. Since the new roadway has some at-grade sections, views to the northeast of Elliott Bay and the Olympic Mountains are likely to be more obstructed by stacked shipping containers and other Port of Seattle structures.

Views toward the new SR 99 roadway would also not be substantially different than views toward the existing viaduct. Like the existing viaduct, the new roadway would lie beneath the line of sight from public areas on the upper levels of the stadiums (Safeco Field and Qwest Field) where people are able to see Elliott Bay, the Kitsap Peninsula, and the Olympic Mountains. Views from the portion of the Pioneer Square neighborhood that is south of S. King Street include the elevated viaduct, which contrasts with the materials, scale, and character of this historic area. The lower portions of the new roadway would be less intrusive than the existing viaduct.

Views from surface streets near SR 99 are likely to be similarly affected by the new roadway as they are by the existing viaduct, except for the view down S. Royal Brougham Way, which would feature a retaining wall as the terminus of the view. The stacked shipping containers and cranes at Terminal 46 would continue to be the dominant skyline feature.

Long-term effects are not expected because once the project is built, views from and toward the new SR 99 structure would be similar to views from and toward the existing Alaskan Way



View of the viaduct at S. Royal Brougham Way and First Avenue S.

Viaduct. Additionally, the project will be designed to fit in with the surrounding visual environment to the extent practicable. During design, WSDOT will work with the City of Seattle and other stakeholders to develop design standards for project elements such as signs, lighting, columns, walls, barriers, fencing, railings, plantings, and paving.

Would land uses be affected?

The project would affect land uses in much the same way as the existing viaduct, with traffic noise, exhaust, and visual concerns like view blockage and shadow. The project would not change land use designations or the City's Stadium Transition Area Overlay District, which allows uses that are complementary to event activities near the stadiums.

The project would require acquisition of approximately 2.09 acres of land that is zoned for industrial and industrial/commercial uses, which is currently used for terminal operations, warehouses, and parking. These acquisitions would consist of narrow strips of Port of Seattle owned property that is parallel to the west side of SR 99, and a narrow strip from the Pyramid Alehouse property parallel to the east side of SR 99, as shown previously in Exhibit 3-11. Some on-street and off-street parking spaces on privately owned property would also be removed from use as a result of the project.

Although the project would convert a small amount of property from industrial and industrial/commercial uses to transportation use, these partial property acquisitions would be small compared to the amount of similar land available in the area. Additionally, these partial acquisitions are not expected to change current uses on the remainder of the affected properties. No mitigation measures would be needed.

Would any park or recreational facilities be affected?

The project area is home to some of the most popular public facilities in the city, including viewpoints (Jack Perry Memorial Viewpoint), trails (Mountains to Sound Greenway Trail and Waterfront Bicycle/Pedestrian Facility), and large event venues (Safeco Field, Qwest Field, and Qwest Field Event Center).

Southbound access to Jack Perry Memorial Viewpoint would change slightly, as vehicles would need to navigate the reconfigured intersection at S. Atlantic Street to reach the viewpoint off of Alaskan Way S. Noise reaching the viewpoint from the new Alaskan Way S. roadway is likely to decrease slightly compared to existing conditions.

What is the Stadium Transition Area Overlay District

As part of the City of Seattle's Comprehensive Plan, the Stadium Transition Area Overlay District allows complementary uses around the Safeco and Qwest Field facilities. The district's provisions and development standards are intended to contribute to a safer pedestrian environment for those attending events and permit a mix of uses that support the pedestrian-oriented character of the area as well as the surrounding industrial zone (Chapter 23.74 of the Seattle Municipal Code).

The project includes changes and improvements to bicycle and pedestrian facilities, which were described in Question 1 of this chapter. Because park or recreation facilities would not be adversely affected by the project, mitigation measures are not needed.

How would neighborhoods be affected?

Although it is wider in places than the existing viaduct, the new SR 99 roadway would not result in many day-to-day changes to areas adjacent to SR 99. Access to Pioneer Square and the SODO area would be improved by the new northbound off-ramp and southbound on-ramp, which could benefit local businesses. Population and employment along SR 99 would change very little, if at all, as a result of the project.

Neighborhood cohesion can be affected by several factors, including acquisition of property, loss of jobs, reduction in parking, and whether the project would alter the community connections, either physically or by separating residents from their resources. Relatively small amounts of property would need to be acquired, and some very small portions of parcels would be needed for utility easements, but no jobs would be displaced as a result of property acquisitions. An estimated 1,267 parking spaces would be permanently removed from the project area. Because off-street pay lots are generally underused in the stadium area, parking spaces are not anticipated to be difficult to find on typical days. Over 4,100 off-street parking stalls are located within several blocks of the project area, with even more stalls available in the greater stadium area. In addition, several blocks of free parking with no time limits are currently located near the project south of S. Massachusetts Street on Utah Avenue S. and Occidental Avenue S.

Closing S. Royal Brougham Way immediately east of SR 99 and rerouting traffic from both directions of E. Marginal Way S./Alaskan Way S. through S. Atlantic Street would change the existing street network and links to existing community facilities and services, but would not limit access to neighborhood resources.

Once construction is completed, neighborhood effects are likely to be short-term as people adjust to the changes in the transportation infrastructure. To help with this transition, WSDOT will conduct community outreach and communication activities prior to the opening of the new facilities to educate and prepare people for changes in their community. WSDOT's prior community outreach efforts are discussed in

Appendix B. Because the project would not result in a loss of neighborhood cohesion, no mitigation measures are needed.

Would low-income or minority populations be affected?

Government agencies use a combination of laws, policies, and an executive order called Environmental Justice (Executive Order 12898, issued 1994) to identify and address effects to low-income residents, minorities, the elderly, and those with disabilities.

Less than 800 people reside in the project area. The population is slightly more racially diverse than the rest of Seattle, though few households have limited English proficiency. Most residents are adults, and almost half live alone. Household income in this area is substantially below the city's median, and almost half of the population lives at or below the poverty level. Annual surveys also document a substantial homeless population in the downtown Seattle area. One social service provider, St. Martin de Porres Shelter, is located in the project area. Several other social service providers operate shelters and support outlets near the project area.

The revised flow of traffic through the new interchange at S. Atlantic Street would change access to the St. Martin de Porres Shelter. Many of the overnight visitors at the shelter are transported to and from the facility by an agency van from downtown Seattle. The van would need to drive a slightly longer, more circuitous route compared to the existing route along Alaskan Way S.

An estimated 30 to 40 percent of the nighttime visitors, however, walk to and from the shelter. Access to the facility by these clients would change slightly compared to current conditions. However, the proposed design maintains pedestrian walkways and improves crosswalks, which would provide pedestrians a safe travel route to St. Martin de Porres Shelter and the U.S. Coast Guard facilities.

Project effects also include permanent loss of long-term parking used for car camping by homeless persons. Other long-term parking is available throughout the Duwamish industrial area. Efforts would be made to inform social service providers and people who live out of vehicles of proposed changes to parking.

Once construction is completed, most effects to low-income and minority populations are likely to be short-term as people and service providers adjust to the changes in the transporta-

tion infrastructure. To help with this transition, WSDOT will conduct community outreach and communication activities prior to the opening of the new facilities to educate and prepare people for changes in their community. With mitigation, the project will not have a high or disproportionate effect on low-income or minority populations.

Would police and fire services be affected?

Police and fire services would primarily be affected by changes in traffic patterns within the project area. The intersection at S. Atlantic Street, the split northbound and southbound lanes of Alaskan Way S., and the new undercrossing could potentially increase travel times to certain destinations. On the other hand, the undercrossing would provide an alternate route for all traffic when railroad operations block S. Atlantic Street. This enhancement and the new access ramps to and from SR 99 at S. King Street would improve access and maintain or improve response time for both emergency and non-emergency services.

Although Fire Station No. 5 is outside the project area (near the Seattle Ferry Terminal at the foot of Madison Street), it is an important emergency service facility. The proposed project would not degrade traffic conditions along the waterfront, so it is not expected to affect operations at this fire station.

Because any potential for adverse effects to police and fire services would be minor, no mitigation measures are needed.

Would utilities be affected?

Operational effects to utilities are not expected since the project will be designed to avoid or minimize effects and adequate access to utilities will be maintained for maintenance purposes.

How would water resources be affected?

The project area has been developed for over a hundred years and is assumed to be covered with 100 percent impervious surfaces. Stormwater runoff from the project area currently discharges directly into Elliott Bay and the Duwamish River's east waterway. Additionally, approximately 60 percent of the stormwater runoff from the project area is combined with sanitary sewer flows in the City of Seattle and King County wastewater conveyance systems for treatment at the West Point Wastewater Treatment Plant prior to discharge into Puget Sound. During heavy rains, stormwater in the combined sewer

system is sometimes discharged directly to Elliott Bay as a combined sewer overflow.

The project would improve how stormwater is managed and reduce pollutants such as total suspended solids (TSS), zinc, and copper, which are carried in stormwater runoff. This would help to improve the quality of runoff from the project area that discharges to Elliott Bay and the combined sewer system compared to existing conditions.

The project would manage stormwater by separating portions of it from the combined sewer system and providing basic water quality treatment BMPs, as defined in the 2006 WSDOT *Highway Runoff Manual*, or detention BMPs as required prior to discharge. The project would retrofit reconstructed surface streets and SR 99 with water quality BMPs to treat runoff from the project area. Treatment BMPs would be used in areas where stormwater discharges into the Duwamish River's East Waterway or Elliott Bay, and detention BMPs would be used in areas that drain to the combined sewer system. Although the final BMPs have not been designed, the types of treatment BMPs being considered for these areas include wet vaults or StormFilters with ZPG™ media. Other BMPs that achieve basic treatment include bioinfiltration swales, sand filters, filter strips, wetponds, bioretention/rain gardens, and other types of facilities. The project would reduce the volume of stormwater diverted into the combined sewer system. This would reduce the annual volume of water and associated pollutants conveyed to the West Point Wastewater Treatment Plant, and therefore reduce the amount of treated effluent discharged to Puget Sound from the West Point Wastewater Treatment Plant outfall.

The pollutant loading to the Duwamish River's East Waterway, Elliott Bay, and Puget Sound from these discharges would be substantially reduced compared to existing conditions (No Build), as shown in Exhibit 3-12. The reduced pollutant load would have a benefit to water quality and also a long-term benefit to nearshore sediments by reducing annual pollutant load collected in the sediments. Because the project would result in a net benefit to the environment, improving both water quality and nearshore sediments as compared to existing conditions, no mitigation is needed.

What is a BMP?

A Best Management Practice (BMP) is an action or structure that reduces or prevents pollution from entering the stormwater or treats stormwater to reduce possible degradation of water quality.

Exhibit 3-12**Reduction of Annual Pollutant Loading**

Receiving Water	Pollutant	Percent Reduction
Duwamish River/Elliott Bay	TSS	77%
	Total Copper	51%
	Dissolved Copper	15%
	Total Zinc	58%
	Dissolved Zinc	32%
Puget Sound ¹	TSS	18%
	Total Copper	18%
	Dissolved Copper	18%
	Total Zinc	18%
	Dissolved Zinc	18%

¹ Discharged at the West Point Wastewater Treatment Plant outfall

Note: Additional information on annual pollutant loading can be found in Appendix G, Water Resources Technical Memorandum.

Would endangered species be affected?

Consultation under Section 7 of the Endangered Species Act (ESA) has found that the project “may affect, but is not likely to adversely affect” listed species. Stormwater runoff from the project could carry pollutants, which might affect species listed under ESA. However, the project is expected to benefit water quality by reducing the pollutant load in the stormwater runoff compared to existing conditions.

Species listed or proposed for listing under ESA who have suitable habitat in the Puget Sound area are the bald eagle, coastal-Puget Sound bull trout, Puget Sound Chinook salmon, Puget Sound steelhead, leatherback sea turtle, southern resident killer whale, humpback whale, and Steller sea lion. The project is not located near suitable habitat for these species; however, juvenile salmon are located in nearby water bodies. The project is not likely to adversely affect any listed species.

How would soil be affected?

Soil in the project area mainly consists of loose fill, soft sediment, sand, and gravel over dense glacial deposits. Extensive dredging and filling occurred in the area south of downtown Seattle between 1895 and the early 1900s. In the project area, 5 to 50 feet of fill was placed along E. Marginal Way S. and Alaskan Way S. These soils are not strong and could liquefy during an earthquake.

For the new SR 99 structure to meet current earthquake standards, the soils on which the project is built need to be strengthened. We plan to strengthen these soils by mixing them with cement-like materials through a combination of processes such as deep soil mixing, jet grouting, and stone columns. This would be done along the length of the project within an area about 50 to 100 feet wide and up to 100 feet

What is Section 7 of the Endangered Species Act?

Section 7 provides guidance for consultation with the U.S. Fish and Wildlife Service and National Marine Fisheries Service. Section 7 requires federal agencies to:

- Identify listed species in the project vicinity.
- Determine if any listed species would be adversely affected by the project.
- Protect listed species in the project area.
- Ensure that funding, permitting, and project actions would not destroy critical habitat or jeopardize the existence of listed species.

What is liquefaction?

Liquefaction is what can happen to loose soils when shaking motion from an earthquake causes the soils to turn into a quicksand-like material. This can cause foundations to fail.

deep. Similar ground improvement techniques or drilled concrete shafts would stabilize the soil for the retained fill sections. These improvements would add density to the soil, which would make it a stronger material.

The project includes building retaining walls where there are cut and fill sections. Some soil would be permanently removed where the alignment is cut below grade, such as for the new undercrossing, and soil would be added in fill sections where the alignment is transitioning to an elevated structure. Constructing the project would be a benefit because the new structures would be designed to withstand effects to soils (such as liquefaction) associated with most earthquakes. The ground improvement installed for the new structure would also partially protect adjacent utilities and other structures from soil movement due to liquefaction in the event of an earthquake.

Would the project generate any hazardous materials?

The completed project would not generate any hazardous materials. To prevent migration of contaminants in shallow groundwater, the project could install controlled-density fill or trench dams at intervals along utility corridors where contamination is suspected.

8 What are cumulative effects, and does the project have any?

What are cumulative effects?

Cumulative effects result from the total effects of a proposed project, when added to other past, present, and reasonably foreseeable future projects or actions. They may be partly caused by the proposed project, but they may also be caused by other projects. Cumulative effects are studied so that the public, decision-makers, and project proponents take time to consider the “big picture” effects a project could have on the community and environment.

The best way to describe cumulative effects is to give an example of what they are. On its own, the S. Holgate Street to S. King Street Viaduct Replacement Project would affect the surrounding area in several ways. For example, during construction, the number of lanes available on SR 99 would be reduced. By itself, this effect may not be considered substantial. However, other major construction projects are planned in the nearby area, such as the SR 519 Intermodal Access Project Phase 2 and the S. Spokane Street Viaduct Widening. These projects could also require detours during the early

stages of the S. Holgate Street to S. King Street Viaduct Replacement Project. Collectively, these projects could have a short-term cumulative effect on area traffic and transit if adequate upfront planning and coordination does not occur.

What cumulative effects are expected once the project is built?

Most of the possible undesirable cumulative effects that could occur in the surrounding area would occur during construction. These construction-related cumulative effects are discussed in Chapter 4, Question 14 of this EA. Once the project is built, it would result in very few cumulative effects, and most of these possible effects would be positive rather than negative.

The cumulative effect of the S. Holgate Street to S. King Street Viaduct Replacement Project combined with other planned projects described below would improve and strengthen the overall transportation network in the SODO and Duwamish industrial area. Planned projects in the area include:

- **Sound Transit Link Light Rail** – Central Link is expected to be operational from Seattle-Tacoma International Airport to Westlake Station (in downtown Seattle) by 2010, with joint operations with buses in the Downtown Seattle Transit Tunnel.
- **SR 519 Intermodal Access Project Phase 2** – This project will connect a westbound off-ramp from I-5 and I-90 to the current S. Atlantic Street Overpass. Improvements at the intersections of First Avenue S./S. Atlantic Street will also be made. Additionally, a grade-separated crossing at S. Royal Brougham Way will be built to eliminate conflicts between cars, nonmotorized traffic, and trains.
- **Mountains to Sound Greenway Pro-Parks Project** – The SR 519 Intermodal Access Project Phase 2 includes a Greenway trail connection. The missing link from SR 519 downtown to the beginning of the Mountains to Sound/I-90 Trail on Beacon Hill would also be completed.
- **Spokane Street Viaduct Phase 1** – This project includes widening the upper roadway between SR 99 and First Avenue S.
- **Spokane Street Viaduct Phase 3, Fourth Avenue S. Loop Ramp** – This project includes building an east-bound loop ramp that would touch down on Fourth Avenue S. south of S. Spokane Street.

Cumulative project effects

Supporting information about cumulative effects is included in *Appendix G, Technical Memoranda* and **Section 7.1 of Appendix F, the Transportation Discipline Report**.

- **S. Lander Street Overcrossing Project** – A bridge structure would be built over the BNSF railroad tracks to touch down at First and Fourth Avenues S., ultimately providing a roadway that is no longer affected by railroad operations.
- **Home Plate Development** – This project site is located west of First Avenue S. between S. Atlantic Street and S. Massachusetts Street. The project would redevelop the entire site to include a mix of office, retail, and restaurant uses. The development would include approximately 300 parking spaces designated for events, which is the same number of event parking spaces that exist today, and 500 spaces for the development’s occupants.
- **Port of Seattle Terminal 46 and Terminal 30** – The Port of Seattle projects an increased volume of container processing at these terminals. Terminal 30 is in the process of being converted from a cruise ship terminal to a container terminal.
- **Downtown Seattle Transit Corridor** – This includes maintaining the existing transit-only corridor on Third Avenue.
- **King County Metro Transit Now Service Changes and RapidRide Corridors** – King County Metro has planned service improvements that will substantially improve transit’s ability to accommodate increased ridership. This plan includes RapidRide services that provide high-frequency service and bus priority improvements to highly traveled routes within King County Metro’s service area. It also includes improved service on high-ridership routes and new peak and midday service in newly developing residential areas, and creates service partnerships with major employers throughout the region.
- **Transit Agency Six-Year Plans** – Other regional capital projects include park-and-ride expansions, direct access facilities, HOV lane construction, and other improvements.

These transportation improvements described above would benefit all travelers, but several have been designed to improve freight movements in the area. This project, combined with the SR 519 Intermodal Access Project Phase 2, would create an east-west corridor at S. Royal Brougham Way and S. Atlantic Street, which would improve conditions for all vehicles by eliminating existing vehicle/rail conflicts.

Once these and other proposed projects are constructed in the surrounding area, they would cumulatively improve:

- Roadway safety for all drivers.
- Roadway operations and mobility for general purpose traffic, freight, and transit.
- Nonmotorized connections for bicyclists and pedestrians.

Other cumulative benefits may accrue once these planned projects in the area are constructed. These benefits likely include:

- Improved quality of stormwater discharges to the Duwamish River and Elliott Bay. The quality of storm water discharges to area water bodies would improve as stormwater treatment technologies are incorporated into project designs.
- Improved utility infrastructure due to utility enhancements and upgrades.
- Improved east-west connections for all traffic, especially freight and emergency and public service vehicles across S. Atlantic Street.
- Improved mobility for all drivers due to reduced vehicle and rail conflicts.

Over the past several years, the SODO area north of S. Atlantic Street has experienced several redevelopment projects due in part to the construction of Safeco and Qwest Fields and the Qwest Field Event Center. Specific planned projects in the area include redeveloping a portion of Qwest Field's north parking lot, a planned mixed-use development on the WOSCA site west of Qwest Field, and the planned Home Plate mixed-use project and parking. Improved connections near the stadiums could benefit revitalization in surrounding areas. However, the stadium area has experienced increasing development over the previous several years.

9 What are indirect effects, and does the project have any?

An indirect effect is a reasonably foreseeable effect that may be caused by a project but would occur in the future or outside of the project area. The S. Holgate Street to S. King Street Viaduct Replacement Project would result in very few, if any, indirect effects, and most of these possible effects would be positive rather than negative. This project's indirect effects are limited because it's a replacement project, rather than a new roadway or highway expansion project. The project would replace failing infrastructure critical to the city and

state. Once built, the project would remove a significant risk to the stability of Seattle’s transportation infrastructure and the state’s highway system.

This project would maintain and not increase existing roadway capacity. The replaced roadway would continue to provide the infrastructure required to connect and support many well-established land uses. These land uses include the industrial development associated with the Port of Seattle and the SODO district, area railroads, Safeco and Qwest Fields, the Qwest Field Event Center, and the densely developed Seattle neighborhoods that SR 99 connects. The project would improve access to the surrounding commercial and industrial businesses, benefiting adjacent land uses.

While this project’s roadway and safety improvements may be a benefit to existing or future revitalization efforts in nearby areas, it’s important to note that large-scale redevelopment as a result of this project is not likely, because the project represents only one of many ongoing improvements underway in Seattle.

Other potential indirect benefits of this project include those associated with properties adjacent to areas where soils would be strengthened and stabilized. These properties may indirectly benefit from a reduced risk of lateral spreading in the case of an earthquake. Similarly, properties close to those where hazardous materials would be removed as part of project construction may also indirectly benefit from the cleanup effort because it would eliminate the potential for contaminants to migrate.