I-405, Tukwila to Renton Improvement Project
(I-5 to SR 169 – Phase 2)

INTERSTATE 405 Corridor Program
Congestion Relief & Bus Rapid Transit Projects

VISUAL QUALITY TECHNICAL MEMORANDUM

December 2007

Washington State Department of Transportation

U.S. Department of Transportation
Federal Highway Administration

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Summary

The I-405, Tukwila to Renton Improvement Project (I-5 to SR 169 – Phase 2), referred to as the Tukwila to Renton Project, will permanently affect visual character for both I-405 users and neighbors. The project will affect visual quality compared to the baseline condition. The baseline condition is the existing condition after construction of the I-405, Renton Nickel Improvement Project, I-5 to SR 169. Most of the effects will vary depending upon the extent of development, the primary viewer group, and the viewer group's sensitivity at a given key viewpoint. Two viewpoints show an increase in visual quality and eleven viewpoints show a decrease in visual quality. Viewpoints with positive effects are +0.16 and +0.34. Viewpoints with negative effects range from -0.17 to -1.58, and of these, two viewpoints were reduced from "average" to "low" and four from "moderately low" to "low" as discussed in the section, Potential Effects. No indirect effects on visual quality are anticipated.

The primary changes to I-405 that will affect visual quality will generally be caused by the following improvements from west to east (northbound) as follows:

- Five reconstructed bridges and one new bridge over the Green River and three reconstructed bridges and one relocated bridge over the Cedar River.
- Southbound and northbound frontage roads (elevated structures) connecting Talbot Road (SR 515) and Lind Avenue.
- General-purpose direct-connector ramp from southbound I-405 to southbound SR 167 at the I-405/SR 167 interchange.
- HOV direct-connector ramps from southbound I-405 to southbound SR 167 and from northbound SR 167 to northbound I-405 at the I-405/SR 167 interchange.
- Two additional general-purpose lanes in both directions on I-405 from SR 167 through SR 169 and the associated retaining wall (below the reconstructed S 14th Street in Talbot Hill Neighborhood), requiring demolition of 13 single-family homes.
- An on-ramp to northbound I-405 from Talbot Road requiring demolition of two apartment buildings.
- Main Avenue design option would reconfigure the road for two-way traffic to provide access to Bronson Way, if chosen instead of the Mill Avenue design option. The reconfiguration of Main Avenue and the associated street improvements would require demolishing several buildings on the east side of the street. The Mill Avenue design option would not likely affect visual quality because it only involves striping the existing lanes for one-way traffic.

These changes will affect freeway traveler viewer groups (e.g., local, commuter, and tourist traffic on I-405) who have views from the road and freeway neighbor viewer groups (e.g., residents, pedestrians, trail users, local traffic, and commuters on arterial and collector roads) who have views toward the road.

Most of the project elements, such as elevated structures, retaining walls, signs, ramps, bridges, and other structural elements, will be constructed outside the existing right-of-way (ROW) and will require additional ROW acquisition. In some cases, existing topography and vegetation will screen the project from potential viewers. In these cases, effects to visual quality will be minor. However, where the project is not screened and where project elements are extensive (e.g., new elevated structures, retaining walls, lanes), effects on visual quality will be negative for freeway neighbors, having the highest viewer sensitivity, frequency, and duration.

New sources of overhead lighting, shade, and shadowing will occur in the study area. Additional traffic will increase light and glare from vehicles using the highway. Also, new luminaires associated with the new and reconstructed bridges will increase light. Increased shadow and shade will primarily occur at new and reconstructed bridges, elevated structures, and cantilevered roadways.

WSDOT has worked with the affected cities to develop visual guidelines for the I-405 corridor and has incorporated Context Sensitive Solutions into the Urban Design Criteria. These guidelines will provide unity and cohesiveness for the project and help mitigate the project's potential effects.

Project Description

WSDOT is proposing to construct the I-405, Tukwila to Renton Improvement Project (I-5 to SR 169 – Phase 2), referred to as the Tukwila to Renton Project, to relieve congestion. Relieving congestion will benefit the public by:

- Lowering the number of accidents, thus improving safety.
- Increasing overall speeds through this section of freeway.
- Improving response times for emergency service vehicles using I-405.
- Improving access to and from I-405 and local circulation.

The Tukwila to Renton Project extends approximately four and one-half miles along I-405, from I-5 to SR 169, and approximately two miles along SR 167, from I-405 to SW 43rd Street. The project adds capacity to both I-405 and SR 167; improves the SR 181 and SR 169 interchanges; reconstructs the SR 167 interchange consisting of general-purpose direct-connector ramp from southbound I-405 to southbound SR 167, HOV direct-connector ramps from northbound SR 167 to northbound I-405 and from southbound I-405 to southbound SR 167, and a split-diamond interchange at Lind Avenue and Talbot Road with connecting frontage roads. These improvements represent the second phase of the I-405 Corridor Program for this portion of I-405. The first phase consists of improvements in the Renton Nickel Improvement Project, which is considered as the baseline condition for the Tukwila to Renton Project.

The analysis in this technical memorandum describes the baseline conditions, how the project may affect those conditions, and what measures will be taken to mitigate effects. To understand what improvements are being proposed as part of this project, the following presents the main features of the Build Alternative followed by a brief explanation of the No Build Alternative.

Build Alternative

The Tukwila to Renton Project improvements from west to east (northbound) along the study area are as follows:

I-405 from I-5 to SR 181 Interchange

- Remove the existing northbound I-405 Tukwila Parkway on-ramp.
- Realign I-405 mainline slightly to the south beginning just west of the existing northbound I-405 Tukwila Parkway on-ramp to the SR 181 interchange.
- Improve the SR 181 interchange:
  - Remove the existing SR 181 on-ramp to northbound I-405.
  - Extend Tukwila Parkway from the intersection with 66th Avenue east over the Green River to SR 181.
  - Construct new northbound I-405 on-ramp from Tukwila Parkway just east of the new crossing over the Green River (replaces the two existing on-ramps).

- Reconstruct the 66th Avenue S bridge over I-405 on a new alignment to the west and reconstruct the intersections with Southcenter Boulevard and Tukwila Parkway.
  - Reconstruct the off-ramp from northbound I-405 to SR 181.
  - Improve local arterials within the interchange area such as Southcenter Boulevard and Interurban Avenue.
- Reconstruct five bridges and build one new bridge over the Green River.
- Lower the Duwamish-Green River Trail.
- Reconstruct the I-405 structures over SR 181.
- Realign the Interurban Trail.

I-405 from East of SR 181 to SR 167 Interchange

- Realign I-405 to provide a smooth transition onto the new Springbrook Creek/Oakesdale Avenue bridge that was constructed under the Renton Nickel Improvement Project.
- Construct one additional general-purpose lane in each direction on I-405 from SR 181 through SR 167.
- Stripe lanes to provide a buffer between HOV and general-purpose lanes along I-405.
- Reconstruct the I-405 structures over the Burlington Northern Santa Fe (BNSF) and Union Pacific railroads.
- Stripe the bridges over Springbrook Creek/Oakesdale Avenue for five lanes in both directions.

SR 167 from I-405 to SW 43rd Street On-ramp

- Construct an auxiliary lane on northbound SR 167 from SW 43rd Street to I-405.
- Stripe lanes to provide a buffer between HOV and general-purpose lanes along SR 167.
- Reconstruct SR 167 between SW 27th Street and I-405 to accommodate the reconstructed SR 167 interchange.
- Reconstruct East Valley Road to the west of its current alignment between SW 23rd Street and SW 16th Street to accommodate the reconstructed SR 167 interchange.

I-405 Interchange with SR 167

The interchange improvements affect both freeway to freeway access and local access.

Freeway to Freeway Access

- Construct a general-purpose direct-connector ramp from southbound I-405 to southbound SR 167, replacing the existing loop ramp.

- Reconstruct exterior ramps from northbound I-405 to southbound SR 167 and from northbound SR 167 to northbound I-405, replacing the existing ramps. This project will also add a general-purpose lane to both ramps.
- Construct HOV direct-connector ramps from southbound I-405 to southbound SR 167 and from northbound SR 167 to northbound I-405.
- Maintain existing loop ramp from northbound SR 167 to southbound I-405.

Local Access

Shift local access between I-405 and Renton from SR 167 to the Lind Avenue/Talbot Road split diamond interchange. WSDOT will:

- Construct a new half-diamond interchange at Lind Avenue.
- Construct a new half-diamond interchange at SR 515 (Talbot Road).
- Construct southbound and northbound frontage roads connecting Lind Avenue to Talbot Road.
- Remove exterior ramps to/from SR 167 north of I-405 and loop ramps south of I-405.
- Reconstruct the Lind Avenue bridge over I-405.
- Reconstruct I-405 structures over Talbot Road.
- Improve local street intersections.
- Provide new connection to Grady Way from S Renton Village Place.

I-405 from East of SR 167 Interchange to North of SR 169

- Construct two additional general-purpose lanes in each direction on I-405 from SR 167 through SR 169.
- Stripe lanes to provide a buffer between HOV and general-purpose lanes along I-405.
- Reconstruct S 14th Street south of its existing location.
- Cantilever the I-405 structures over Main Avenue.
- Reconstruct three bridges over the Cedar River: southbound and northbound I-405 and a pedestrian bridge.
- Relocate the BNSF railroad bridge over the Cedar River west of its current alignment.
- Close off Houser Way as a cul-de-sac just south of the Cedar River and remove the bridge over the river. Northbound traffic will be rerouted via Bronson Way, which will be striped to accommodate the new traffic pattern. Two options are being considered for northbound traffic between Houser Way and Bronson Way. The first option stripes Mill Avenue as a one-way street to provide two lanes northbound from the intersection of Houser Way and Mill Avenue to Bronson Way. Emergency vehicles will still be allowed to travel southbound on Mill Avenue from 2nd Street to Houser Way. The second option leaves Mill Avenue as a two-way street up to the intersection with 2nd Street where it will be striped

for one-way traffic northbound and reconfigures Main Avenue, a one-way street southbound, for two-way traffic. Main Avenue would be widened and striped for two-way traffic to provide access from the south to Bronson Way.

- Reconstruct the two local street accesses to Renton Hill. Two local access points will be maintained by reconstructing the Renton Avenue bridge over I-405 and reconstructing Mill Avenue as a stacked structure that also provides access to Renton Hill. The existing Cedar Avenue bridge will be removed.
- Construct a pedestrian pathway from Renton Hill to City parks and trails.

No Build Alternative

The No Build Alternative assumes that the improvements associated with the Renton Nickel Improvement Project are constructed as does the baseline condition. Only routine activities such as road maintenance, repair, and safety improvements would be expected to take place between 2014 and 2030. This alternative does not include improvements that would increase roadway capacity or reduce congestion beyond baseline conditions. For these reasons, it does not satisfy the project's purpose to reduce congestion on I-405 between I-5 in Tukwila and SR 169 in Renton. The No Build Alternative has been evaluated in this technical memorandum as a comparison for the effects associated with the Build Alternative.

Baseline Conditions

Study Area

The area studied in this visual quality assessment is called the viewshed. The viewshed is defined as all the surface areas visible from an observer's viewpoint.[1] This applies to views looking toward and away from I-405 and SR 167 without regard for how vegetation and structures screen views. A viewshed may be larger or smaller than project limits because geography and built and natural features determine what can and cannot be seen. Exhibit 1 shows the viewshed.

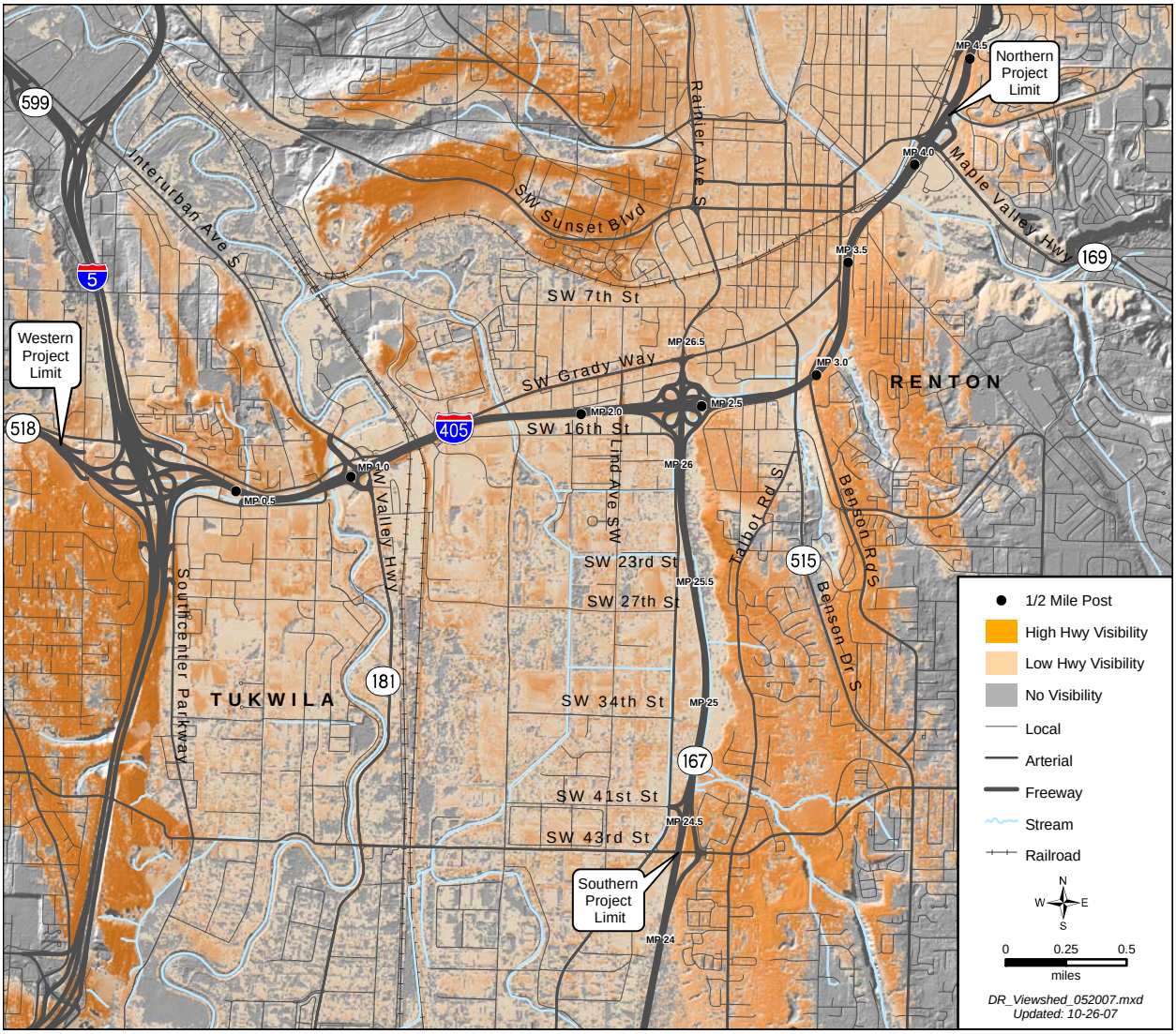

Exhibit 1: Viewshed

[1] *Environmental Procedures Manual*, WSDOT, 2005

For this project, the viewshed is larger than the project limits because I-405 can be seen from locations far beyond the project limits in some places. The viewshed was adapted from the Visual Resources Expertise Report prepared for the *I-405 Corridor Program Final EIS and Record of Decision* (EIS). For the Tukwila to Renton Project, the viewshed was further refined to reflect a range of high visibility and low visibility areas as seen in Exhibit 1. The areas determined to be visible from I-405, as shown in Exhibit 1, are based solely on topography and do not take into account how vegetation and structures can screen views. The darker the orange, the more highway can be seen from that location. Typically, if an area or a feature can be seen from the project, a viewer located in that area or near the feature can also see the project. This assessment of baseline conditions considered both views looking toward and views from the project. The baseline conditions assume that the Renton Nickel Improvement Project is constructed.

Regulations and Guidance

Both FHWA and WSDOT mandate evaluations of visual effects (Appendix A), including aesthetics and light and glare, during project development. The WSDOT Environmental Policy Manual contains policies for conducting visual quality assessments. The WSDOT 1996 Roadside Classification Plan[2] (RCP) provides roadside policies and includes guidelines for treatment of roadsides and serves as the basis for roadside planning, design, construction, and maintenance activities. WSDOT has also adopted the Uniform Design Criteria (UDC), which will be applied to this project. The UDC is the primary guideline followed to produce the intended form, function, and appearance of each I-405 feature and element. It integrates community values, urban design enhancements, and WSDOT standards for the I-405 Program. The criteria also encompass the context sensitive solutions (CSS) developed by WSDOT and the cities within the I-405 corridor. The I-405 Team will use the UDC as a guideline for preliminary engineering, landscaping, and aesthetic treatment of the highway corridor. These guidelines will be further developed into final engineering and project specific design criteria. Other applicable state regulations include Washington's Highway Beautification Act (RCW 47.040.010) and the Open Space Land Preservation Act (RCW 84.34).

Requirements for visual quality protection in association with freeway systems and other transportation facilities are also contained in certain federal programs. These programs include: the Transportation Equity Act for the 21st Century; the Safe, Accountable, Flexible and Efficient Transportation Equity Act of 2003; the Highway Beautification Act of 1965; Historic Preservation Act of 1966; and the U.S. Department of Transportation Act, Section 4(f).

In addition, the National Environmental Policy Act (NEPA) requires that due consideration be given to certain environmental issues—including aesthetics and visual quality—in evaluating applicable projects. The Washington State Environmental Policy Act (SEPA) requires a similar process be followed for applicable state and local actions.

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[2] *The Roadside Classification Plan*, WSDOT, 1996

WSDOT determined that the methodology and criteria followed for the project's visual quality assessment satisfied these state and federal requirements. In addition, the comprehensive plans for each municipality with jurisdiction in the study area were examined to gain an understanding of future land uses and urban design goals. These are described in more detail in the *Land Use Discipline Report* for this project.

Visual Character of the Study Area

The western project limit begins west of the I-405/I-5 interchange in Tukwila and crosses the industrial valley through Renton. The general character of the landscape ranges from urban to rural throughout the study area. Important regional landforms including the Cascade Mountains, Mount Rainier, and the Olympic Mountains can be seen from hill tops within the study area (e.g., Renton Hill and Talbot Hill neighborhoods) if not from the project itself. The RCP classifies the section of I-405 from milepost 0.00 to 5.80 as semiurban where it passes through Tukwila and Renton. SR 167, from milepost 25.50 to 27.00, at Renton, is classified as urban. However, the presence of the Panther Creek wetlands at the SR 167 interchange, which extends south along the majority of the SR 167 study area, is indicative of a rural landscape classification as defined by the RCP.

For this project, the study area was divided into three geographical sections. The west project section begins at the I-405/I-5 interchange in Tukwila, and extends generally eastward to the I-405/SR 167 interchange. The south section extends south from the I-405/SR 167 interchange to the southern project limit at SW 43rd Street. The east section extends generally northward from the I-405/SR 167 interchange to the northern project limit just north of SR 169 in Renton.

Exhibit 2 shows land uses and character. Several urban parks provide areas of natural vegetation, as do the vegetated buffers for the Green River, Springbrook Creek, and Panther Creek drainages. Some natural vegetation and landscaping also occurs within parts of the highway ROW.

In the west section (moving east from the I-405/I-5 interchange), I-405 passes through the Westfield Shoppingtown Mall (Southcenter) area of Tukwila. This area is predominantly commercial with some single-family residential neighborhoods and multifamily developments on the north side of I-405 that are out of view. The majority of highway through the west section is either "on-grade" or elevated on "fill" embankments. Views toward and from the roadway in this area are limited by topography. The views open up at the Green River bridge and the I-405 bridge over SR 181 interchange with increased visibility of the industrial valley and Boeing Longacres Industrial Park.

View looks west toward Westfield Shoppingtown Mall in the west section

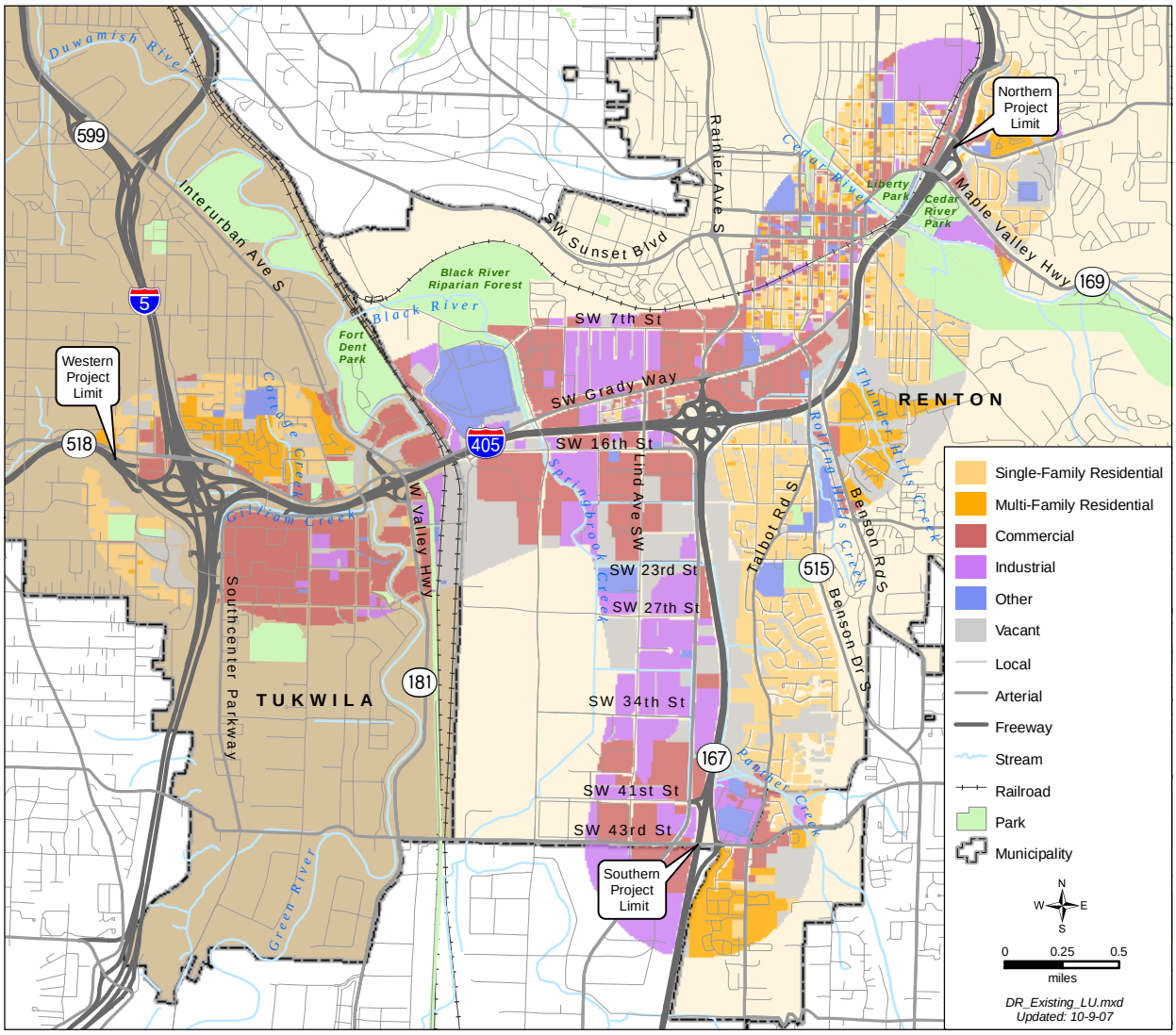

Exhibit 2: Land Use and Character

Passing to Renton, views are primarily of commercial and industrial areas. The cloverleaf interchange at SR 167 provides increased visibility of single-family residences on Talbot Hill and commercial development in downtown Renton.

In the south section (moving south from the SR 167 interchange toward SW 43rd Street), SR 167 freeway users have views that are characterized by industrial and commercial areas of Renton to the west. The majority of highway through the south section is elevated on "fill" embankments. The views toward the east are characterized by natural vegetation in the Panther Creek wetlands and the single-family residences atop the Talbot Hill Neighborhood.

View looks northeast toward SR 167 (Talbot Hill Neighborhood in background) in the south section

In the east section (moving north from the I-405/SR 167 interchange toward SR 169), freeway users see views characterized by single-family residential neighborhoods on Talbot Hill to the southeast. Views toward the north look across the flatter, industrial areas of south Renton. The majority of highway through the east section is comprised of a combination of cut slopes and retaining walls on the eastern edge of road. Fill slopes and elevated structures comprise the majority of the western edge of road. From the Benson Road overpass, I-405 curves due north with filtered views of single-family and multifamily residences in the Renton Hill and South Renton neighborhoods.

View looks southeast toward Renton Hill Neighborhood in the east section

Neighboring residential areas with direct views of I-405 include the northern facing slope of Talbot Hill and the western facing slope of Renton Hill (east section). Fill areas (embankments), structures, and interchanges are visible, especially to immediate freeway neighbors in these areas. However, topography, vegetation, and structures generally limit views of I-405 in the study area and subsequently many neighboring residential areas do not have direct views of the highway facilities. These facilities can be seen primarily from cross streets or interchanges perpendicular to I-405 where screening is limited. The I-405 mainline is also visible from several bridges over the freeway that link the commercial, industrial, and residential areas on the north and south sides of the mainline. These bridges are 61st Avenue, 66th Avenue, Lind Avenue, Benson Road, Renton Avenue, and Cedar Avenue. Also, SR 167 is visible from the bridge at SW 43rd Street.

Throughout the study area, I-405 passes through urban and semiurban land uses. Roadside vegetation screens some views that are away from the immediate corridor. In general, where little or no screening is present, views from I-405 consist primarily of commercial areas with a mix of single-family residential neighborhoods, vacant areas, and light industrial areas. Most areas along the freeway are developed up to the I-405 ROW, with houses, apartment buildings, and commercial buildings. These neighboring structures receive some visual screening from vegetation within the I-405 ROW.

Visual Quality of the Study Area

Exhibit 3 shows the locations and directions of the viewpoints. Nine of these viewpoints represent views toward I-405 and SR 167 and three represent views from I-405 or SR 167 as shown in Appendix B.

The views were described in terms of their baseline visual quality. A qualitative visual quality rating of 1 to 7 was given to each view according to the characteristics of vividness, intactness, and unity (7=very high; 6=high; 5=moderately high; 4=average; 3=moderately low; 2=low, and; 1=very low to non-existent). The visual quality assessment matrices used to rate the baseline conditions for these viewpoints are in Appendix C.

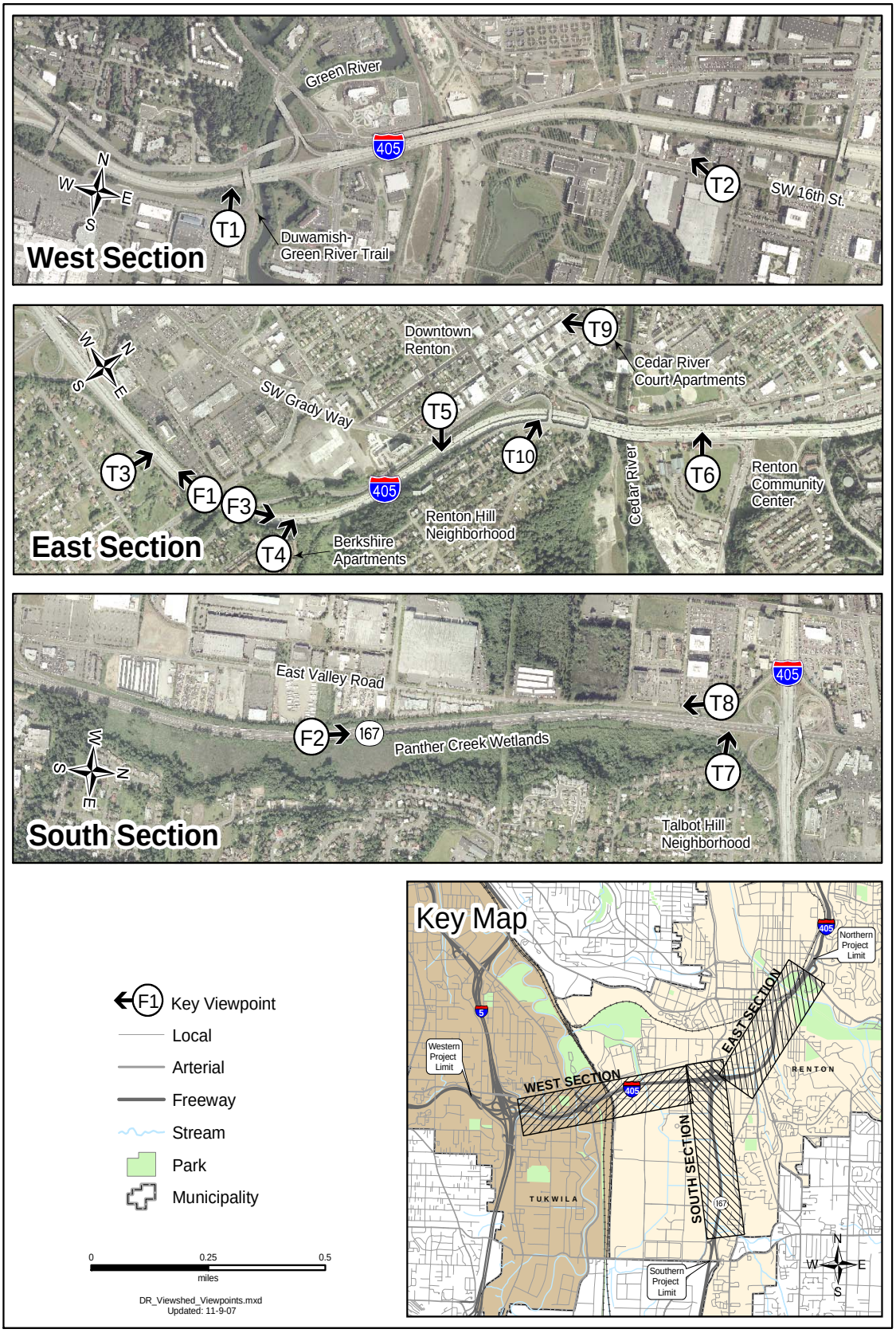

Exhibit 3: Viewpoint Locations

Key Viewpoints From the Road

(See Appendix B for viewpoints and Appendix C for the visual quality assessment matrix.)

Viewpoint F1

(visual quality rating: 3.75)

Located within the east section, this view looks west from southbound I-405 toward Talbot Hill (left-hand side of photo) and downtown Renton (right-hand side of photo). Commuters comprise the primary viewer group for this viewpoint. For this viewpoint, the road is in the foreground and vegetation and residences on Talbot Hill can be seen in the background. On clear days, Mt. Rainier can be seen in the background. Vividness is moderately low and both intactness and unity are average. The overall visual quality rates as 3.75, or moderately low.

Viewpoint F2

(visual quality rating: 3.75)

Located within the south section, this view looks north from northbound SR 167 toward I-405 and downtown Renton. Freeway users consisting of local traffic and commuters form the primary viewer groups. These viewers look across the WSDOT roadway embankment toward the Panther Creek wetlands. The area within the ROW consists of large black cottonwood and willow trees that screen the wetland from the freeway. Vividness is low and both intactness and unity are average. The overall visual quality rates as 3.75, or moderately low.

Viewpoint F3

(visual quality rating: 3.75)

Located within the east section, this view looks northeast toward Renton Hill from I-405. Freeway users consisting of local traffic and commuters are the primary viewer groups. These viewers look toward the vegetated slope of Renton Hill. The area within the ROW consists of large native trees and shrubs that screen the Renton Hill Neighborhood. Vividness is moderately low and both intactness and unity are average. Overall visual quality rates as 3.75, or moderately low.

Key Viewpoints Toward the Road

(See Appendix B for viewpoints and Appendix C for the visual quality assessment matrix.)

Viewpoint T1

(visual quality rating: 3.92)

Located within the west section, this view looks north from the Duwamish-Green River Trail (foreground) toward the I-405 bridge over the Green River (middleground, center). This location is primarily viewed by trail users (e.g., pedestrians, bicyclists, etc.). Vividness is moderately low and both intactness and unity are average. Overall visual quality rates as 3.92, or moderately low.

Viewpoint T2

(visual quality rating: 3.33)

Located within the west section, this view looks northwest from a bus stop on SW 16th Street. SW 16th Street is visible in the foreground and The Shuttle Express and the University of Phoenix (beyond the trees) buildings are in the middleground. These buildings and vegetation screen views of the I-405 corridor (background). This location is primarily viewed by employees and pedestrians traveling along SW 16th Street and waiting for the bus. Vividness is low; intactness is moderately low; and unity is average. Overall visual quality rates as 3.33, or moderately low.

Viewpoint T3

(visual quality rating: 3.75)

Located within the east section, this view looks north from Whitworth Avenue S in the Talbot Hill Neighborhood. This location is primarily viewed by single-family residents and local traffic. Whitworth Avenue S (foreground), an existing I-405 noise wall (middleground), and downtown Renton (background) can be seen from this viewpoint. On clear days, the Cascade Mountain Range can be seen from this viewpoint. Vividness is moderately low and both intactness and unity are average. Overall visual quality rates as 3.75, or moderately low.

Viewpoint T4

(visual quality rating: 2.67)

Located within the east section, this view looks northeast from the Berkshire Apartment Complex. This location is primarily viewed by multifamily residents. The parking lot and apartment building (foreground) screen views of downtown Renton (background). Vividness is low and both intactness and unity are moderately low. Overall visual quality rates as 2.67, or low.

Viewpoint T5

(visual quality rating: 3.42)

Located within the east section, this view looks south from a multifamily residential building located at the intersection of S Grady Way and Main Avenue S. Main Avenue S (foreground) and the I-405 ROW consisting of retaining walls and a sparsely vegetated embankment can be seen (middleground). The vegetated slopes of Renton Hill (background) can be seen beyond the retaining wall. This location is primarily viewed by residents and local traffic. Vividness and unity are moderately low and intactness is average. Overall visual quality rates as 3.42, or moderately low.

Viewpoint T6

(visual quality rating: 2.92)

Located within the east section, this view looks northwest from the Renton Community/Carco Center. The entry to the Community Center (foreground), parking lot (middleground), and the

I-405 ROW (middleground) can be seen from this viewpoint. The tall concrete retaining wall (+/- 25 feet high) for I-405 obstructs views of downtown Renton (background) and the horizon line from this viewpoint. This location is primarily viewed by visitors to the Community Center. Vividness is low and both intactness and unity are moderately low. Overall visual quality rates as 2.92, or low.

Viewpoint T7

(visual quality rating: 4.25)

Located within the south section, this view looks west from the Talbot Hill Neighborhood. A residential yard (foreground), the I-405/SR 167 interchange (middleground), and expansive views of the vegetated foothills in Tukwila/Burien (background) can be seen on the horizon from this viewpoint. On clear days, the Olympic Mountain Range can be seen. This location is primarily viewed by residents. Vividness is moderately low; intactness is average; and unity is moderately high. Overall visual quality rates as 4.25, or average.

Viewpoint T8

(visual quality rating: 3.75)

Located within the south section, this view looks southeast from the East Valley Road. The primary viewer groups are local traffic and visitors accessing hotels in the vicinity. In the foreground and middleground, viewers see East Valley Road and the sloped SR 167 ROW (left-hand side of photo). The slope limits views of SR 167 and beyond. Mature maple street trees associated with the East Valley Office Center can be seen (right-hand side of photo). Vividness is moderately low and both intactness and unity are average. The overall visual quality rates as 3.75, or moderately low.

Viewpoint T9

(visual quality rating: 2.17)

Located within the east section, this view looks south from the Cedar River Court Apartments. The primary viewer groups are residents of the apartment building and local traffic. In the foreground and middleground, viewers see local businesses in downtown Renton and in the background, viewers see residences on Renton Hill. Vividness, intactness, and unity are all low. The overall visual quality rates as 2.17, or low.

Viewpoint T10

(visual quality rating: 4.25)

Located within the east section, this view looks northwest in the vicinity of Beacon Way South and Cedar Avenue South on Renton Hill. The primary viewer groups are residents and local traffic. In the foreground, viewers see the guardrail above southbound I-405. In the middleground, viewers see buildings in downtown Renton and in the background, viewers see Skyway Hill and a filtered view of the south end of Lake Washington. Vividness, intactness, and unity are all average. The overall visual quality rates as 4.25, or average.

Viewer Sensitivity in the Study Area

The viewer sensitivity for the study area was adopted from the programmatic EIS. The EIS categorized viewers as either "Freeway Users" (view from road) or "Freeway Neighbors" (view toward road).

Freeway Users (view from road)

The viewer groups likely to have views from the road are local, commuter, freight, and tourist traffic. Tourists and vehicle passengers (non drivers) have the highest viewer sensitivity but low view frequency. Local traffic experiences this view more frequently and is considered moderately sensitive as the viewers are sensitive to any changes to their usual view. Commuters and freight, accustomed to and perhaps indifferent to the view by repetition, have lower viewer sensitivity. All individual views from the roadway typically last a relatively short time due to the movement of the viewer; however, view duration varies with the time of day, season, and weather conditions.

Freeway Neighbors (view toward road)

The viewer groups that have views toward the road generally take in a wider vista, with the highway being a component of the larger landscape. Views toward the roadway are from adjacent residential and commercial areas and from travelers on arterials and local roads. Within the study area, the principal groups likely to view the project and exhibit high viewer sensitivity include:

- Persons engaged in recreation at existing park and trail sites
- Residents of predominantly single-family areas
- Residents of predominantly multifamily areas (with correspondingly taller structures)

These viewers are more sensitive to changes in their view because they experience the view more frequently and for relatively longer periods. Viewer groups likely to exhibit moderate or low viewer sensitivity include the following, listed in order of decreasing sensitivity:

- Travelers on arterial and local roads
- Employees and visitors in existing office and hotel centers in the urban cores of each city
- Employees and visitors in existing commercial, distribution, transportation, and industrial businesses

These groups are concentrated primarily in the city centers.

Potential Effects

Temporary Visual Quality Effects

The most noticeable temporary changes to the visual character throughout the study area would result primarily from the following:

- Constructing falsework, the temporary structures used for constructing/replacing some of the bridges within the study area.
- Demolishing existing structures such as buildings and bridges.
- Excavating and removing vegetation outside the existing roadway.
- Stockpiling materials and establishing staging areas for equipment and other materials.
- Operating construction equipment of all sizes including hauling trucks, earthworking heavy equipment, and cranes.
- Placing temporary erosion and control measures such as plastic sheeting, sandbags, and straw.
- Placing temporary traffic or construction signs and temporary retaining or screening walls.
- Placing temporary barriers to separate traffic from roadway widening construction.

Medium- and heavy-duty construction and demolition equipment will affect visual quality because they will disrupt the view. Construction lights will increase light and glare when work is performed at night.

Residential viewers with the highest sensitivity to changes in visual quality will be those most affected by construction activities that occur outside of the existing ROW. Notably, construction activities will temporarily affect visual quality for single family and multi-family residents living near the following activities:

- Demolition of two apartment buildings at Berkshire Apartments.
- Construction of general-purpose direct-connector ramp and HOV direct-connector ramps and reconstruction of S 14th Street in the Talbot Hill Neighborhood.
- Main Avenue design option reconfiguration in downtown Renton if selected instead of the Mill Avenue design option for providing access to Bronson Way.

Permanent Effects on Structures, Vegetation, and Views

No Build Alternative

No views will change as a result of the No Build Alternative.

Build Alternative

The project will permanently change the visual character for both I-405 users and neighbors and affect visual quality compared to the baseline condition. Most of the effects will vary depending upon factors such as the extent of development, the primary viewer group, and the viewer group's sensitivity at a given key viewpoint. The viewer groups who have the highest sensitivity to the project's permanent visual quality effects are the same ones who have the highest sensitivity to *temporary* visual quality effects as described earlier.

Most of the project elements, such as retaining walls, signs, bridges, and other structural elements, will be constructed outside the existing ROW and will require additional ROW acquisition. In some cases, existing topography and vegetation will screen the project from potential viewers. In this case, effects to visual quality are minor. However, where the project is not screened and where the project elements are extensive (e.g., new elevated structures, retaining walls, lanes), effects to visual quality are more significant.

The visual scale, degree of encroachment, and design of the individual project elements such as retaining walls, bridges, and associated elements (e.g., abutments, bents, girders) determine the degree of effect. Project element(s) that are out of scale with, or encroach upon the existing visual character will negatively affect overall visual quality. Conversely, careful design of individual elements in conformance with the UDC for aesthetics, context, and continuity with the corridor will improve cohesiveness and may have a positive effect on overall visual quality.

Opening or blocking existing views will also affect visual quality. Where the project opens views of the freeway, the effect will be negative. Conversely, where the project opens views of the horizon line and territorial views of Lake Washington and the Cascade Mountain range, the effect will be positive.

Removing vegetation within or beyond the existing ROW to accommodate the new traffic lanes (particularly stands of medium to large trees) will also negatively affect visual quality.

The primary changes to I-405 that will affect visual quality will generally be caused by the following improvements from west to east (northbound) as follows:

- Five reconstructed bridges and one new bridge over the Green River and three reconstructed bridges and one relocated bridge over the Cedar River.
- Southbound and northbound frontage roads (elevated structures) connecting Talbot Road (SR 515) and Lind Avenue.
- General-purpose direct-connector ramp from southbound I-405 to southbound SR 167 at the I-405/SR 167 interchange.
- HOV direct-connector ramps from southbound I-405 to southbound SR 167 and from northbound SR 167 to northbound I-405 at the I-405/SR 167 interchange.
- Two additional general-purpose lanes in both directions on I-405 from SR 167 through SR 169 and the associated retaining wall (below the reconstructed S 14th Street in Talbot Hill Neighborhood), requiring demolition of 13 single-family homes.

- An on-ramp to northbound I-405 from Talbot Road and associated retaining walls requiring demolition of two apartment buildings.
- Main Avenue design option would reconfigure the road for two-way traffic to provide access to Bronson Way, if chosen instead of the Mill Avenue design option. The reconfiguration of Main Avenue and the associated street improvements would require demolishing several buildings on the east side of the street. The Mill Avenue design option would not likely affect visual quality because it only involves striping the existing lanes for one-way traffic.

Analysis of Viewpoints from the Road

This section describes and rates changes to views toward the road that result from the project (See Appendix B for viewpoint simulations and Appendix C for the visual quality assessment matrices).

Viewpoint F1
(visual quality rating: 3.00)

This view simulation conceptually shows the project elements that will extend beyond the existing WSDOT ROW looking from southbound I-405. Freeway viewers will see the following (from right):

- General-purpose direct-connector ramp from southbound I-405 to southbound SR 167.
- Widened southbound I-405.
- HOV direct-connector ramps from southbound I-405 to southbound SR 167 and from northbound SR 167 to northbound I-405.
- Widened northbound I-405.
- Northbound frontage road between Lind Avenue and Talbot Road and retaining wall for the reconstructed S 14th Street.

These improvements will be constructed to UDC guidelines.

The increased width of the road, grade separation structures, and loss of roadside vegetation and mature poplar trees (at the base of Talbot Hill) will all contribute to increase the visual scale of the project. The project will have a negative effect on visual quality, decreasing the rating from 3.75 to 3.00 (moderately low).

Viewpoint F2
(visual quality rating: 3.50)

This view simulation conceptually shows the project elements that will be constructed within the existing WSDOT ROW looking from northbound SR 167. Freeway viewers will see a new auxiliary lane on northbound SR 167 and a mix of evergreen and deciduous trees as per the Panther Creek Watershed Rehabilitation Plan (see *Ecosystems Discipline Report* for more information).

The increased width of the road will encroach into the Panther Creek wetlands, requiring mature black cottonwood trees to be removed. The project will have a slight negative effect on visual quality, decreasing the rating from 3.75 to 3.50 (moderately low).

Viewpoint F3
(visual quality rating: 3.33)

This view simulation conceptually shows the project elements that will extend beyond the existing WSDOT ROW looking from northbound I-405. Freeway viewers will see the new terraced retaining wall (with landscaping) built to accommodate two additional general-purpose lanes on northbound I-405 and an on-ramp to northbound I-405 from Talbot Road. The retaining wall and landscaping will be constructed to UDC guidelines.

The roadway widening and retaining walls will increase the visual scale of the project and reduce roadside area without blending back into the surrounding landscape. Plantings will screen and reduce the visual scale of the retaining walls but overall, the project will have a negative effect on visual quality, decreasing the rating from 3.75 (moderately low) to 3.33 (moderately low).

Analysis of Viewpoints toward the Road

This section describes and rates changes to views toward the road that will result from the project (See Appendix B for viewpoint simulations and Appendix C for the visual quality assessment matrices).

Viewpoint T1
(visual quality rating: 2.92)

This view simulation conceptually shows the project elements that will extend beyond the existing WSDOT ROW looking north. Trail viewers will see the new Tukwila Parkway bridge over the Green River, the lowered Duwamish-Green River Trail, and a stormwater facility behind a chain link fence. A mix of evergreen and deciduous native and ornamental shrubs will be planted around the stormwater facility. The retaining wall, bridge, abutments, and landscaping will be constructed to UDC guidelines.

The visual scale and dominance of the new bridge will obscure the scenic river views in the foreground and territorial views of the vista in the background. The project will have a negative effect on visual quality, decreasing the rating from 3.92 (moderately low) to 2.92 (low).

Viewpoint T2
(visual quality rating: 3.67)

This view simulation conceptually shows the project elements that will extend beyond the existing WSDOT ROW looking northwest toward the northbound I-405 lanes. The project will demolish the University of Phoenix and Shuttle Express buildings to add one lane in both directions on I-405 and reconstruct the I-405/SR 167 interchange. Pedestrian and employee viewers will see a fence and mix of evergreen and deciduous native and ornamental trees and shrubs in conformance with the UDC.

Plantings will give the roadside a more natural, unified appearance and will screen I-405 from SW 16th Street. The project will have a slight positive effect on visual quality, increasing the rating from 3.33 to 3.67 (moderately low).

Viewpoint T3
(visual quality rating: 2.75)

This view simulation conceptually shows the project elements that will extend beyond the existing WSDOT ROW looking north toward I-405. Residents of the Talbot Hill Neighborhood will see a noise wall (in conformance with UDC guidelines) and the reconstructed S 14th Street where residences at the base of the hill once stood. The noise wall will block views of downtown Renton and the horizon line beyond.

The project will have a negative effect on visual quality, decreasing the rating from 3.75 (moderately low) to 2.75 (low).

Viewpoint T4
(visual quality rating: 2.08)

This view simulation conceptually shows the project elements that will extend beyond the existing WSDOT ROW looking northeast from the Berkshire Apartment Complex. The project will demolish two apartment buildings to construct a retaining wall that will accommodate two additional general-purpose lanes in both directions on I-405 and an on-ramp from Talbot Road (not visible). A twenty-foot-high noise wall (in conformance with UDC guidelines) will be constructed above that.

The noise barrier height and placement will further eliminate vegetation and reduce the foreground viewshed. The project will have a negative effect on visual quality, decreasing the rating from 2.67 (low) to 2.08 (low).

Viewpoint T5
(visual quality rating: 2.58)

This view simulation conceptually shows the project elements looking south from a multi-family residential building on Main Avenue S. Residents and local traffic viewers will see I-405 cantilever out over Main Avenue S and a new retaining wall built to accommodate two new general-purpose lanes on southbound I-405. The retaining walls, elevated structures, and landscaping will be constructed to UDC guidelines.

The visual scale and dominance of the elevated roadway will obscure the vista and block vegetated views of Renton Hill. The project will have a negative effect on visual quality, decreasing the rating from 3.42 (moderately low) to 2.58 (low).

Viewpoint T6
(visual quality rating: 2.75)

This view simulation conceptually shows the project elements that will extend beyond the existing WSDOT ROW looking northwest from the Renton Community/Carco Center entrance. Viewers attending the center will see (from far to near) the new retaining wall built to accommodate two general-purpose lanes on northbound I-405, the well building access road, an

elevated structure for the new off-ramp to SR 169, and a reconfigured parking lot. A mix of evergreen and deciduous native and ornamental shrubs will be planted at the base of the retaining wall. The retaining wall, elevated structure, and landscaping will be constructed to UDC guidelines.

The visual scale and dominance of the elevated structure will encroach upon this viewpoint. The project will have a negative effect on visual quality, decreasing the rating from 2.92 to 2.75 (low).

Viewpoint T7
(visual quality rating: 2.92)

This view simulation conceptually shows the project elements within the existing WSDOT ROW looking west from Talbot Hill neighborhood. Residents and local traffic will see the new elevated structure for the HOV direct-connector ramp between southbound I-405 to southbound SR 167 and northbound SR 167 to northbound I-405, and a mix of evergreen and deciduous native and ornamental shrubs will be planted around the stormwater facility. The elevated structure and landscaping will be constructed to UDC guidelines.

The elevated structure will encroach on the vista and block territorial views. The project will have a negative effect on visual quality, decreasing the rating from 4.25 (average) to 2.92 (low).

Viewpoint T8
(visual quality rating: 2.17)

This view simulation conceptually shows the project elements that will extend beyond the existing WSDOT ROW looking southeast from the East Valley Road. Visitors and local traffic will see the widened SR 167, the southbound I-405 to southbound SR 167 general-purpose direct-connector ramp, and the reconstructed East Valley Road. The ramp and landscaping will be constructed to UDC guidelines.

The scale and dominance of the elevated structure will block views of natural vegetation within the Panther Creek wetlands and the horizon line. Also, reconstructing East Valley Road will remove mature oak street trees. The project will have a negative effect on visual quality, decreasing the rating from 3.75 (moderately low) to 2.17 (low).

Viewpoint T9
(Main Avenue design option visual quality rating: 2.33)
(Mill Avenue design option visual quality rating: 2.17)

This view simulation conceptually shows the project elements that will extend beyond the existing WSDOT ROW looking south from the Cedar River Court Apartments should the Main Avenue design option for access to Bronson Way be selected. Residents and local traffic will see a reconfigured Main Avenue that will be widened and striped for two-way traffic to provide access to Bronson Way. To reconfigure this street, several buildings will be demolished and the remaining lots will be stabilized with erosion control seeding with the exception of the parking lot.

Views of downtown Renton and Renton Hill will be opened up. The Main Avenue design option, if selected, will have a slight positive effect on visual quality, with an increase from 2.17 to 2.33 (low).

The baseline condition for viewpoint T9 shows that the proposed visual quality will remain unchanged for the Mill Avenue design option because no existing buildings would be demolished (existing lanes would be striped for one-way traffic). The Mill Avenue design option, if selected, will have no effect on visual quality, remaining at 2.17 (low).

Viewpoint T10
(visual quality rating: 2.92)

This view simulation conceptually shows the new noise wall that will be constructed within the existing WSDOT ROW. Residents and local traffic on Renton Hill will see two, 20-foot-high noise walls (in conformance with UDC guidelines) at the lower Mill Avenue connection to Renton Hill.

The scale and dominance of the noise wall in the foreground is an encroachment that significantly blocks views of downtown Renton. The project will have a negative effect on visual quality, decreasing the rating from 4.25 (average) to 2.92 (low).

Viewpoint Rating Summary

Exhibit 4 summarizes the criteria used to determine the potential effects to visual quality for these 13 viewpoints discussed above. These ratings were determined based on the visual quality assessment matrices in Appendix C. Visual quality ratings range from 1 through 7. Generally, a score of 1 is considered very low, and a score of 7 is considered very high. Two viewpoints show an increase in visual quality and eleven viewpoints show a decrease in visual quality. Viewpoints with negative effects have changes in ratings that range from -0.17 to -1.58. The viewpoints with positive effects have rating changes of +0.16 to +0.34.

Exhibit 4: Potential Visual Quality Effects Summary

View Point	Existing Visual Quality	Potential Visual Quality	Change in Visual Quality	Primary Viewer Group(s)	Viewer Sensitivity	Frequency	Type/ Duration	Visual Quality Effect
Views From the Road								
F1	3.75	3.00	-0.75	I-405 Travelers	Low	High	Moving/short	Negative
F2	3.75	3.50	-0.25	I-405 Travelers	Low	High	Moving/short	Negative
F3	3.75	3.33	-0.42	I-405 Travelers	Low	High	Moving/short	Negative
Views Toward the Road								
T1	3.92	2.92	-1.00	Pedestrians	Moderate	Moderate	Moving	Negative
T2	3.33	3.67	+0.34	Employees, Pedestrians	Low	Moderate	Moderate	Positive
T3	3.75	2.75	-1.00	Residents[1], Local Traffic	High	High	Stationary	Negative
T4	2.67	2.08	-0.59	Residents[2]	High	High	Stationary	Negative
T5	3.42	2.58	-0.84	Residents[2], Local Traffic	High	High	Stationary/Moving	Negative
T6	2.92	2.75	-0.17	Visitors	Moderate	Moderate	Moderate	Negative
T7	4.25	2.92	-1.33	Residents[1]	High	High	Stationary	Negative
T8	3.75	2.17	-1.58	Visitors, Local Traffic	Low	Moderate	Moving/Short	Negative
T9 (Main Avenue[3])	2.17	2.33	+0.16	Residents[2], Local Traffic	High	High	Stationary/Moving	Positive
T9 (Mill Avenue[3])	2.17	2.17	0.00	Residents[2], Local Traffic	High	High	Stationary/Moving	No Effect
T10	4.25	2.92	-1.33	Residents[1] Local Traffic	High	High	Stationary/Moving	Negative

[1] Single-family, [2] Multifamily; [3] one of two design options to provide access to Bronson Way for local northbound traffic

New Sources of Shadow, Glare, or Light

No Build Alternative

No new sources of shadow, glare, or light would be introduced in the study area.

Build Alternative

The project will add traffic capacity to the freeway system, which will increase light and glare from vehicles using the highways throughout the study area. New sources of overhead lighting, shade, and shadowing in the study area will occur at the following locations:

- The project will include full illumination and new sources of light and glare are anticipated throughout the study area.
- New and reconstructed bridges within the study area will increase shadow and shade. New sources of light are also anticipated because the new bridges will have luminaires. These changes will be noticeable to people using the Duwamish-Green River Trail, Interurban Trail, and Cedar River Trail.
- The southbound I-405 to southbound SR 167 general-purpose direct-connector ramp will increase shadow and shade for local traffic and pedestrians on East Valley Road.

- The new elevated structures for the HOV direct-connector ramps from southbound I-405 to southbound SR 167 and from northbound SR 167 to northbound I-405 will have luminaires creating new sources of light for residences on Talbot Hill.
- The new cantilevered roadway over Main Avenue will increase shadow and shade. This will affect the local traffic in this area.
- The elevated structure for the new off-ramp to SR 169 will increase shadow and shade for Renton Community/Carco Center visitors who use the northwest entrance parking lot.

Indirect Effects on Visual Quality

Although development interest in these areas may increase slightly as a result of improved mobility on I-405, this is not anticipated to have any indirect effects on visual quality.

Measures to Avoid or Minimize Project Effects

Measures to Avoid and Minimize Effects

WSDOT has actively pursued ways to protect and preserve important elements in the natural and built environments within the study area and to preserve the integrity of the area's neighborhoods. Consequently, this approach has benefited the area's visual resources as well. The intent to protect and preserve natural resources, has influenced how WSDOT designed the project elements. WSDOT incorporated specific design features to avoid or minimize potential negative project effects as described below.

I-405, I-5 to SR 167

Three design features have been incorporated into the project design for this area to minimize and avoid visual effects on the east side of the Green River resulting from extending Tukwila Parkway and constructing the new on-ramp to northbound I-405. Portions of the new on-ramp for Tukwila Parkway will be built as a bridge structure rather than on fill. This will occur where the new extension of Tukwila Parkway crosses over the Nelson Side Channel, which is between the Green River and SR 181, as well as where the road crosses over the reconstructed northbound I-405 off-ramp to SR 181. This design minimizes the project's effects on the Nelson Side Channel, and its mature forested vegetation. Additional design features that minimize encroachment on this wetland are retaining walls that will be used along the extension of Tukwila Parkway east of the Green River to SR 181 and along the northbound I-405 to SR 181 off-ramp. The retaining walls for Tukwila Parkway east of the river will avoid the need to move or demolish the barn on the James Nelsen House property immediately north of this road extension.

SR 167, I-405 to SW 43rd Street

WSDOT incorporated several design features for widening SR 167 and adding direct connector ramps between I-405 and SR 167 that minimized visual effects to the Panther Creek wetlands, a valuable visual resource with mature vegetation. First, WSDOT designed "stacked" freeway ramps to minimize the width required for the interchange. Second, widening at the interchange and south to SW 27th Street occurs as far west as possible to minimize effects to the Panther Creek wetlands. Third, retaining walls will be used along SR 167 and East Valley Road to minimize effects to vegetation west of the freeway as well.

I-405, SR 167 to SR 169

WSDOT plans to use retaining walls in areas adjacent to both Thunder Hills Creek and Rolling Hills Creek to minimize visual effects to both streams. Large retaining walls will be tiered with vegetation incorporated to soften their appearance and minimize visual effects.

Within the area of the Renton Hill Neighborhood, widening will occur to the north and west which will minimize visual effects to this area, which is already restricted by the "S" curves. Also, in this area, WSDOT has designed the widening to the southbound I-405 mainline to

cantilever over Main Avenue and to be built over Renton Avenue to avoid the need to encroach on the neighborhood, which minimizes visual effects as well.

Unavoidable Adverse Effects

Guidelines from the WSDOT RCP and UDC for the I-405 corridor will be applied to mitigate any unavoidable negative visual effects caused by this project. For improvement projects such as this, the RCP requires roadside restoration within the ROW throughout the project limits. For this project, disturbed areas will be restored to a treatment level 2 per the RCP, with the following guidelines applied where appropriate and practicable:

- Minimize site disturbances to protect native plant communities and specimen trees.
- Restore roadside character with trees (conifers up to 4 feet in height and deciduous trees up to 1 inch in diameter) and shrub seedlings.
- Locate plantings to enhance views of natural features.
- Select vegetation and design planting density to achieve blending with adjacent land use.

If areas are expected to be disturbed by future corridor improvements within 10 years after project completion, temporary erosion control type plantings will be used. In other areas within the project construction limits, additional plantings may be installed where future corridor improvements will not affect the plantings within 10 years.

UDC implements CSS policy for the I-405 Corridor and provides another layer of mitigation for unavoidable negative effects caused by the project. In some instances, guidelines from UDC are redundant with those found in the RCP. The major project elements will have the following UDC guidelines applied where appropriate and practicable:

- Ensure visual unity and consistency throughout the I-405 corridor. This includes defining the appearance and style of built elements, such as lighting, paving, railings, signs, bridges, structures (and associated elements), and walls around bridges. The guidelines address the use of aesthetic treatments in the corridor, including the process for selecting and locating architectural treatments.
- Enhance the architectural design of project features such as retaining walls including terracing to reduce apparent height, using a consistent design vocabulary throughout the corridor, applying texture to the concrete surfaces to reduce apparent scale, and applying pigmented sealer for uniform color and to limit the effects of graffiti and to aid in reducing reflective glare.
- Shield roadway light fixtures to minimize glare and ambient light spillover into adjacent residential areas.
- Minimize clearing for construction, preserving existing stands of mature trees where possible.
- Screen views of the roadway, elevated structures, retaining walls, noise walls, and other project features from areas with high viewer sensitivity.

- Grade slopes to blend with the natural topography by softening slope transitions.
- Follow the guidelines in the RCP to blend the project into the adjacent land uses, while creating a unified experience for the freeway traveler.

For this project, the UDC guidelines will be applied to local street bridges over the I-405 corridor at (from south to north): 66th Avenue, Lind Avenue, and Renton Avenue. UDC guidelines will also be applied to the I-405 bridges at (from south to north): Green River, SR 181, BNSF and UP railroads, SR 167, Talbot Road, Cedar River, and SR 169. Also, UDC guidelines will be applied where I-405 cantilevers out over Main Avenue.

Acronyms and Abbreviations

BNSF	Burlington Northern Santa Fe Railway
CSS	context sensitive solutions
EA	environmental assessment
EIS	environmental impact statement
FHWA	Federal Highway Administration
HOV	high-occupancy vehicle
I	Interstate
NEPA	National Environmental Policy Act
RCP	Roadside Classification Plan
RCW	Revised Code of Washington
ROW	right-of-way
SEPA	Washington State Environmental Policy Act
SR	State Route
UDC	Uniform Design Criteria
UP	Union Pacific Railway
WSDOT	Washington State Department of Transportation

Glossary

background	In a visual analysis, this distance zone is where surfaces of landforms lose detail distinctions and the emphasis is on outline or edge. The background becomes an effective backdrop against which foreground and middleground is more clearly seen (>1.0 mile).
foreground	In a visual analysis, this distance zone is where the viewer has impressions of immediate details and intensity of color is at a maximum. This area can be designated with clarity and simplicity not possible for the middleground and background because the observer is a direct participant (0 to 0.25 mile).
intactness	The visual integrity of the natural and human-built landscape and its freedom from encroaching elements. High intactness means that the landscape is free of eyesores and is not broken up by features that are out of place.
landscape unit	Places or districts with clear landform or landcover boundaries that form an outdoor area with similar visual character and visual continuity. For example, a landscape unit can be a single neighborhood, or several neighborhoods combined.
middleground	In a visual analysis, this distance zone is where the parts of the landscape can be seen to join together, where hills become a range or trees make a forest. This is also where manmade changes may be revealed as resting upon the landscape, or where conflicts of form, color, shape, or scale show up (0.25 to 1.0 mile).
mitigation	An effort to: (1) avoid the impact altogether by not taking a certain action or parts of an action; (2) minimize the impact by limiting the magnitude of the action and its implementation, by using technology or by taking affirmative steps; (3) rectify the impact by repairing, rehabilitating, or restoring the affected environment; (4) reduce or eliminate the impact over time by preservation and maintenance operations; (5) compensate for the impact by replacing, enhancing or providing substitute resources or environments; and/or (6) monitor the impact and taking appropriate corrective measures.
scale	Within the context of a visual analysis, the apparent size relationships between landscape components or features and their surroundings.
semi-urban landscape	Landscape characterized by intermixed built and natural or naturalized elements, with built elements prevailing.

simulation	An illustration based on photographs from selected viewpoints that portrays proposed project features and changes to the visual condition.
study area	The area specifically evaluated for environmental effects.
topography	The physical features of a geographic area taken collectively; especially, the variations in elevation of the earth's surface.
unity	The visual coherence and compositional harmony of the landscape when considered as a whole. High unity frequently reflects the careful design of individual human components and their relationship in the landscape.
urban landscape	A landscape characterized predominantly by built elements.
view	That which can be seen either from or toward the transportation facility.
viewer awareness	The degree to which a viewer notices the landscape.
viewer exposure	How many people see something from a particular viewpoint and over what duration they see it. View duration considers how often viewers observe the view, the frequency of views, and whether the viewers or the objects are stationary or moving.
viewer groups	Groups of people who are differentiated from others by their viewing characteristics or visual response to a landscape feature. For example, local park users are one class of viewer, and are likely to have a different visual response to a landscape feature than people viewing the same feature from an industrial setting.
viewer location	A description of where the viewer is relative to the resource or landscape feature based on viewer position, distance to resource, and direction. Position is typically categorized as superior (looking down at the resource), normal (looking level at the resource), or inferior (looking up at the resource). Distance to the visual resource is categorized as foreground, middleground, and background. View direction is identified by cardinal direction (north, south, east, or west).
viewer response	A positive or negative measure of how people react to changes in what they see.
viewer sensitivity	The degree to which people respond to what they see. A viewer with high sensitivity to a particular view will respond strongly to any change in the view. Viewer sensitivity does not imply support for or opposition to a proposed change in the view.
viewers	People who have views of the project or resource. Viewers are usually discussed in terms of general categories of activities, such as resident, boater, jogger, or motorist. See also: “viewer groups.”

viewpoint	The position or location of the viewer.
viewshed	The area that can be seen from a given viewpoint or group of viewpoints; it is also that area from which that viewpoint or group of viewpoints can be seen.
visual assessment unit	The visible portion of the landscape unit that contains the transportation facility.
visual character	The visual patterns formed by everything that can be seen and how those patterns fit together in the visible landscape. The description of character considers dominance, scale, diversity, and continuity to further define the visible landscape.
visual corridor	The changing views along the facility experienced by users.
visual effect	The degree of change in visual resources and the viewer response to those changes caused by facility development and operations.
visual quality	A subjective measure of the character of the visual resource. The many factors that contribute to a landscape's visual quality are grouped under intactness, unity, and vividness.
visual quality assessment matrix	An evaluation tool that assigns a numeric rating to physical aspects of the viewshed.
visual resources	The collection of all features and things that can be seen in an area.
vividness	Describes how the landscape elements combine to form a colorful, striking, or otherwise memorable composition.

References

GIS data sources

Exhibit 1

All data from base data referenced below.

Exhibit 2

King County Standard GIS Data Disk, extract June 2006:

2004 Cities with annexations.

2005 Open Water.

2006 Parks in King County. Data updated by I-405 staff to match data from cities of Renton and Tukwila.

2005 Streams and Rivers. Data updated by I-405 staff to match fieldwork, 2002 LiDAR, and orthorectified aerial photography.

2005 Trails in King County. Data updated by I-405 staff to match fieldwork, 2002 LiDAR and orthorectified aerial photography.

Exhibit 3

David Evans and Associates, Inc.

2007 Point layer for view analysis locations.

All data from base data referenced below.

Base Data

All GIS exhibits contain one or more of the following as base layers:

Geographic Data Technology, Inc. (GDT),

2005 GDT – Dynamap Transportation. April 2005.

King County Standard GIS Data Disk, extract June 2006:

2004 Cities with annexations.

2005 Open Water.

2006 Parks in King County. Data updated by I-405 staff to match data from cities of Renton and Tukwila.

2005 Streams and Rivers. Data updated by I-405 staff to match fieldwork, 2002 LiDAR, and orthorectified aerial photography.

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2005 I-405, Renton Nickel Improvement Project Visual Quality Discipline Report. Prepared by DMJM Harris.

2003 Environmental Procedures Manual M31-11; Section 459 Visual Impacts, Light and Glare. 2003.

2001 I-405 Corridor Program NEPA/SEPA Draft Environmental Impact Statement, Draft Visual Resources Expertise Report. Revised August 2001. Prepared by David Evans and Associates, Inc. (DEA).

1996 Roadside Classification Plan.

Appendix A: Visual Quality Methodology

Overview of the FHWA Visual Quality Assessment Method

The Federal Highway Administration's (FHWA) *Visual Impact Assessment for Highway Projects* (FHWA-HI-88-054) method was used to evaluate visual quality for the I-405, Tukwila to Renton Improvement Project (I-5 to SR 169 – Phase 2) referred to as the Tukwila to Renton Project. This method was developed to assess the visual impacts from highway projects for environmental assessments (EA) and environmental impact statements (EIS). To ensure that the potential effects to visual quality and aesthetics resulting from a transportation project are adequately and objectively considered, the FHWA method uses both quantitative and qualitative analyses to remove subjectivity and provide a basis for comparison. The quantitative analysis assigns numerical values to describe the physical attributes of the landscape character using professionally accepted terminology. The qualitative analysis explains the project and supports these numerical values.

This report used a six-step evaluation process to apply the FHWA method in the following sequence:

1. Establish the project's visual limits (viewshed and landscape units).
2. Determine who (viewer groups) has views of the project and the viewer sensitivity.
3. Assess the existing landscape (visual character) and identify key views "from" and "toward" the project.
4. Determine and evaluate visual effects to key views during (construction) and after the project (operation) and effects on light, shadow, and glare.
5. Describe the potential visible effects to the study area and its surroundings that would result from the project.
6. Identify mitigation measures to offset visual effects.

The method uses vividness, intactness, and unity as measures to evaluate and discuss visual quality. Each of these three measures receives a rating on a scale of 1 to 7, with 7 being the highest or most desirable. For vividness, a rating of 7 indicates a high degree of vividness. For intactness, a rating of 7 indicates a landscape that is highly intact and contains no encroachments. For unity, a rating of 7 represents a landscape with a coherent, harmonious visual pattern. To determine an overall visual quality numerical value, the analyst averages the three values for vividness, intactness, and unity.

Visual Assessment Information Collection

As a first step, WSDOT reviewed community planning documents and United States Geological Survey and geographic information system maps to identify baseline and proposed conditions. Views or routes were identified that are designated by code or in planning documents as

requiring special consideration because of their scenic value. With this information as a base, WSDOT visited the entire study area several times to develop qualitative and quantitative assessments and to describe baseline conditions.

The landscape architect compared the project's engineering plans and documents to existing conditions and planning documents. Please note that this report will use the proposed Renton Nickel Improvement Project as the baseline condition for visual quality assessment. Other relevant documents that were reviewed included the *I-405, Visual Resources Expertise Report*, the Programmatic Corridor EIS, the I-405, Renton Nickel Improvement Project EA, and other reports prepared for the Tukwila to Renton Improvement Project.

WSDOT used a visual quality assessment matrix to prepare the quantitative evaluation of project effects. This matrix, developed for conducting visual quality assessments, was adapted from the WSDOT 2004 *Environmental Procedures Manual*.

Viewpoint Selection

Viewpoint simulations were used to depict the greatest change resulting from the project and the effect on the identified viewer groups. The following criteria were used to select viewpoints:

1. The view represents the visual effect for the identified sensitive viewer groups.
2. The view represents moderate to high changes to visual quality or character of scenic views, historic buildings, designated viewpoints, or view corridors and is a location where there are sensitive viewer groups.
3. The viewpoints will represent more views toward than from the study area.
4. The view represents a substantial portion of the roadway study area.
5. The view represents where the greatest change to visual quality from the project is anticipated.

The landscape architect conducted field reconnaissance of the study area, reviewed existing aerial photographs and proposed design plans, coordinated with WSDOT, and reviewed the local land use plans and policies to determine viewpoint locations. For this report, the study area was divided into three geographical sections (instead of landscape units) to facilitate viewpoint selection.

Appendix B: Selected Viewpoints Showing Baseline and Proposed Conditions

Viewpoints From the Road

Viewpoint F1 – Baseline

Viewpoint F1 – Proposed

Viewpoint F2 – Baseline

Viewpoint F2 – Proposed

Viewpoint F3 – Baseline

Viewpoint F3 – Proposed

Viewpoints Toward the Road

Viewpoint T1 – Baseline

Viewpoint T1 – Proposed

Viewpoint T2 – Baseline

Viewpoint T2 – Proposed

Viewpoint T3 – Baseline

Viewpoint T3 – Proposed

Viewpoint T4 – Baseline

Viewpoint T4 – Proposed

Viewpoint T5 – Baseline

Viewpoint T5 – Proposed

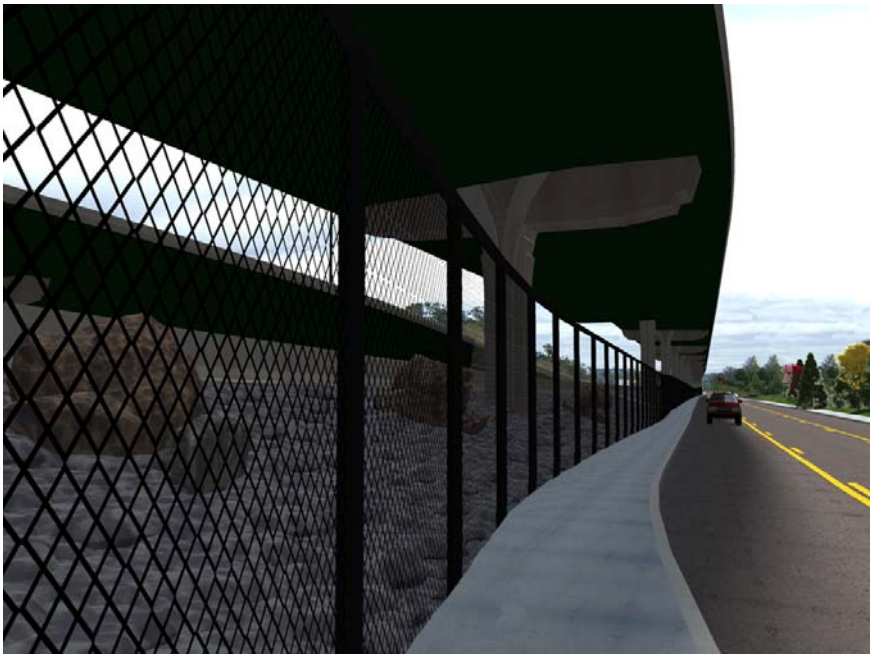
Viewpoint T6 – Baseline

Viewpoint T6 – Proposed

Viewpoint T7 – Baseline

Viewpoint T7 – Proposed

Viewpoint T8 – Baseline



Viewpoint T8 – Proposed

Viewpoint T9 – Baseline

Viewpoint T9 – Proposed
Main Avenue Design Option

Viewpoint T10 – Baseline

Viewpoint T10 – Proposed

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Appendix C: Visual Quality Assessment Matrices

Tukwila to Renton Improvement Project

VISUAL QUALITY ASSESSMENT

5/1/2007 **Prepared by: Jon Gage**

Views From Road

	VIEWPOINT NUMBER	F1	F1	F2	F2	F3	F3
	(E=existing, P=proposed)	E	P	E	P	E	P
	LAND	4	4	3	3	4	3
	WATER	1	1	1	1	1	1
VIVIDNESS	VEGETATION	4	2	4	3	5	4
	Manmade	4	5	3	3	3	4
	AVERAGE	**3.25**	**3.00**	**2.75**	**2.50**	**3.25**	**3.00**
	DEVELOPMENT	4	3	4	3	4	3
INTACTNESS	ENCROACHMENT	4	3	5	5	4	3
	AVERAGE	**4.00**	**3.00**	**4.50**	**4.00**	**4.00**	**3.00**
UNITY	OVERALL	**4.00**	**3.00**	**4.00**	**4.00**	**4.00**	**4.00**
***TOTAL VISUAL QUALITY**		**3.75**	**3.00**	**3.75**	**3.50**	**3.75**	**3.33**
	VIEWPOINT NUMBER	**F1**	**F1**	**F2**	**F2**	**F3**	**F3**
	(E=existing, P=proposed)	**E**	**P**	**E**	**P**	**E**	**P**

*Total Visual Quality is the average of the averaged values for vividness, intactness and unity for each viewpoint

Evaluation Scale

VIVIDNESS	INTACTNESS (DEVELOPMENT)	INTACTNESS (ENCROACHMENT)	UNITY
7 = VERY HIGH	7 = NO DEVELOPMENT TO NON-EXISTEN	7 = NO ENCROACHMENT TO NON-EXISTENT	7 - VERY HIGH
6 = HIGH	6= LITTLE DEVELOPMENT	6= LITTLE ENCROACHMENT	6 - HIGH
5 = MODERATELY HIGH	5 = SOME DEVELOPMENT	5 = SOME ENCROACHMENT	5 - MODERATELY HIGH
4 = AVERAGE	4 = AVERAGE LEVEL OF DEVELOPMENT	4 = AVERAGE LEVEL OF ENCROACHMENT	4 - AVERAGE
3 = MODERATELY LOW	3 = MODERATELY HIGH DEVELOPMENT	3 = MODERATELY HIGH ENCROACHMENT	3 - MODERATELY LOW
2 = LOW	2 = HIGH LEVEL OF DEVELOPMENT	2 = HIGH LEVEL OF ENCROACHMENT	2 - LOW
1 = VERY LOW TO NON-EXISTENT	1 = VERY HIGH LEVEL OF DEVELOPMEN	1 = VERY HIGH LEVEL OF ENCROACHMENT	1 - VERY LOW

Tukwila to Renton Improvement Project

VISUAL QUALITY ASSESSMENT

5/1/2007 **Prepared by: Jon Gage**

Views Toward Road

	VIEWPOINT NUMBER (E=existing, P=proposed)	T1 E	T1 P	T2 E	T2 P	T3 E	T3 P	T4 E	T4 P	T5 E	T5 P	T6 E	T6 P	T7 E	T7 P	T8 E	T8 P	T9 E
	LAND	4	3	2	2	4	4	2	2	4	3	3	3	5	3	4	2	3
	WATER	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
VIVIDNESS	VEGETATION	4	4	3	4	4	3	2	1	4	2	3	3	5	5	4	2	3
	Manmade	3	4	4	3	4	5	3	3	4	5	4	4	4	4	4	5	3
	AVERAGE	**3.25**	**3.25**	**2.50**	**2.50**	**3.25**	**3.25**	**2.00**	**1.75**	**3.25**	**2.75**	**2.75**	**2.75**	**3.75**	**3.25**	**3.25**	**2.50**	**2.50**
	DEVELOPMENT	4	3	4	4	4	2	3	3	4	2	3	2	4	3	4	2	2
INTACTNESS	ENCROACHMENT	5	2	3	3	4	2	3	2	4	2	3	3	4	2	4	2	2
	AVERAGE	**4.50**	**2.50**	**3.50**	**3.50**	**4.00**	**2.00**	**3.00**	**2.50**	**4.00**	**2.00**	**3.00**	**2.50**	**4.00**	**2.50**	**4.00**	**2.00**	**2.00**
UNITY	OVERALL	**4.00**	**3.00**	**4.00**	**5.00**	**4.00**	**3.00**	**3.00**	**2.00**	**3.00**	**3.00**	**3.00**	**3.00**	**5.00**	**3.00**	**4.00**	**2.00**	**2.00**
***TOTAL VISUAL QUALITY**		**3.92**	**2.92**	**3.33**	**3.67**	**3.75**	**2.75**	**2.67**	**2.08**	**3.42**	**2.58**	**2.92**	**2.75**	**4.25**	**2.92**	**3.75**	**2.17**	**2.17**
	VIEWPOINT NUMBER (E=existing, P=proposed)	**T1 E**	**T1 P**	**T2 E**	**T2 P**	**T3 E**	**T3 P**	**T4 E**	**T4 P**	**T5 E**	**T5 P**	**T6 E**	**T6 P**	**T7 E**	**T7 P**	**T8 E**	**T8 P**	**T7 E**

*Total Visual Quality is the average of the averaged values for vividness, intactness and unity for each viewpoint

Evaluation Scale

VIVIDNESS	INTACTNESS (DEVELOPMENT)	INTACTNESS (ENCROACHMENT)	UNITY
7 = VERY HIGH	7 = NO DEVELOPMENT TO NON-EXISTENT	7 = NO ENCROACHMENT TO NON-EXISTENT	7 - VERY HIGH
6 = HIGH	6= LITTLE DEVELOPMENT	6= LITTLE ENCROACHMENT	6 - HIGH
5 = MODERATELY HIGH	5 = SOME DEVELOPMENT	5 = SOME ENCROACHMENT	5 - MODERATELY HIGH
4 = AVERAGE	4 = AVERAGE LEVEL OF DEVELOPMENT	4 = AVERAGE LEVEL OF ENCROACHMENT	4 - AVERAGE
3 = MODERATELY LOW	3 = MODERATELY HIGH DEVELOPMENT	3 = MODERATELY HIGH ENCROACHMENT	3 - MODERATELY LOW
2 = LOW	2 = HIGH LEVEL OF DEVELOPMENT	2 = HIGH LEVEL OF ENCROACHMENT	2 - LOW
1 = VERY LOW TO NON-EXISTENT	1 = VERY HIGH LEVEL OF DEVELOPMENT	1 = VERY HIGH LEVEL OF ENCROACHMENT	1 - VERY LOW