CHAPTER 5

The Environment: What's There Now, Project Effects, and Mitigation

This chapter presents an analysis of the potential effects of the Kirkland Nickel Project on people and the environment. Scientists and planners from the project team conducted more than 20 different studies and summarized their analysis in Discipline Reports to illustrate how the project might affect the area. They used this information as a baseline for examining changes that can occur as a result of constructing improvements to I-405.

The following discipline reports were prepared for the project. The complete discipline reports are found in Appendices F through Z on a CD included with this Environmental Assessment:

- Air Quality
- Cumulative Effects
- Economics
- Energy
- Environmental Justice
- Fish, Aquatic Habitat, and Threatened and Endangered Species
- Geology, Soils, and Groundwater
- Hazardous Materials and Wastes
- Historic, Cultural, and Archaeological Resources
- Land Use Patterns
- Land Use Plans and Policies
- Noise
- Public Services and Utilities
- Section 4(f) Evaluation
- Social Elements
- Surface Water and Floodplains

Entrance to Spinney Homestead Park

Landslide slope south of SR 522

What is a Discipline Report?

A discipline report focuses on an environmental topic (discipline) of concern, such as wildlife, noise, water quality, or other built or natural resources. It presents an analysis of the environment with respect to that discipline, how the project may affect that environment, and offers recommendations on how best to avoid or minimize adverse effects to that environment.

- Transportation
- Visual Quality
- Water Quality
- Wetlands
- Wildlife, Habitat, and Upland Threatened and Endangered Species

The study area for each discipline report varied, depending on the geographic extent of the potential effects being evaluated and the type of data needed for the analysis. For example, the analysis of recreational facilities required WSDOT to collect data on parks within one-quarter mile of the I-405 right of way. To assess effects on social characteristics, however, WSDOT used Census information and the Puget Sound Regional Council's Forecast Analysis Zone data because these data include a wider geographic area around I-405.

How was environmental information used to improve the project?

Once the project team collected the environmental baseline data, team members met with the roadway designers to identify places where project construction could have an effect on the environment. For example, to reduce effects to wetlands, WSDOT overlaid wetland locations on the preliminary design plans and made adjustments in the roadway alignment, roadside slopes, and location of stormwater facilities. They made several field visits to examine culvert crossings along the corridor and to propose ways of modifying the grading plan to avoid the need to extend culverts, and to minimize or avoid effects to streams. The project team also used information about a wellhead protection area in Kirkland to modify the location of stormwater discharge points to avoid potential effects on water quality. They made similar efforts to reduce or avoid effects to visual quality, vegetation, geological features, and noise.

What are potential effects?

Potential effects are impacts or changes that could occur as a result of a proposed action. The effects may be ecological, aesthetic, historic, cultural, economic, social, or health-related. Examples might include the encroachment upon nearby wildlife that occurs from widening a roadway; the improvement of fish passage from retrofitting a blocked culvert; or how increased noise levels from traffic flow might affect nearby residents.

How were potential effects evaluated?

After making modifications to minimize or avoid effects, WSDOT again compared the project design to the baseline conditions. This comparison enabled us to determine environmental, social, and economic changes that would

result from constructing and operating the Kirkland Nickel Project. For example, scientists evaluated what could happen to water quality both during and after construction. Economists examined the effects of property acquisitions on social and economic conditions. Other findings included:

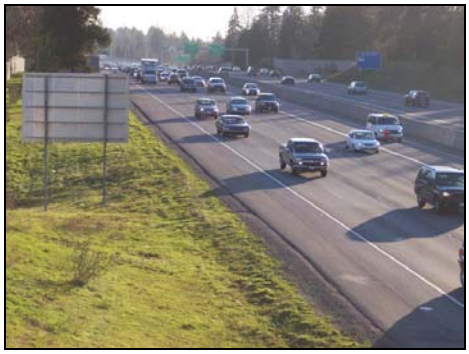
- Traffic will increase in the I-405 Corridor whether the project is constructed or not. The Kirkland Nickel Project will improve mobility and safety and provide additional capacity by adding general-purpose lanes as discussed in Chapter 4, Description of the Project.
- The estimated energy consumption with the operation of the Kirkland Nickel Project will make up a very small portion of the overall amount of fuel consumed annually by Washington State commuters.
- There are no farmlands affected by the project. Consequently, this topic was not addressed in this document.

Team members evaluated these and other aspects of the environment and documented these issues in separate discipline reports. The results of these analyses are summarized in this chapter.

For a cross reference of how discipline reports were grouped in this EA with respect to the NEPA Elements of the Environment, see Appendix C.

5.1 Traffic and Transportation

The I-405 Corridor serves as an important transportation thoroughfare for the region. Increased traffic is a result of growth of the regional economy and associated changes in employment and population. Understanding how existing traffic and transportation conditions will change over time is important to many people within the region. WSDOT has assessed the data for both the proposed project and the No Build Alternative to provide an accurate depiction of how traffic conditions along I-405 will look in the future.



Congestion on I-405

How were the data for the Kirkland Nickel Project evaluated?

A travel demand forecasting model, consistent with the Puget Sound Regional Council's forecasts, was used to provide information about future year volumes on I-405. WSDOT reviewed the results of these forecasts for consistency with the cities of Kirkland, Bellevue, and Bothell; King County Metro, Sound Transit, Snohomish County, Community Transit; and the Puget Sound Regional Council. A microsimulation model was subsequently used to analyze freeway operations.

Please refer to the Kirkland Nickel Project Transportation Discipline Report in Appendix F (on CD) for a complete discussion of the traffic analysis.

What is traffic like now along the freeway and what will happen in the future?

On a typical weekday, 191,000 vehicles currently travel along the I-405 Corridor in the Kirkland Nickel Project area. Some 99,000 of these vehicles travel southbound and 92,000 travel northbound. After the project is constructed, the traffic models predict that 211,000 vehicles will travel through the area in 2014 and 239,000 vehicles in 2030. If the project is not constructed, the flow of traffic will be constrained, which means that not all drivers wishing to travel on I-405 will be able to do so. If the project is not constructed, 11,000 fewer drivers will be able to use this part of I-405 in 2014; and 16,000 fewer in 2030.

During the peak period, I-405 in this section commonly experiences bumper-to-bumper and stop-and-go traffic, slower vehicle speeds, and more rear-end collisions. The

usual morning peak hour for I-405 traffic congestion lasts from 7 AM to 8 AM; in the evening the greatest congestion occurs from 4 PM to 5 PM. The times of highest traffic congestion are usually when people are traveling to and from work. As congestion has increased in the region, it has extended these peak periods to the point that congestion commonly lasts for several hours in both the morning and evening. Benefits of the Kirkland Nickel Project will be realized by increasing roadway capacity and reducing bottlenecks that contribute to congestion (Exhibit 5-1).

The following paragraphs give a snapshot of traffic conditions today and how they will look in the future on this part of I-405.

Southbound in the Morning

Today

The typical southbound morning peak hour has between 5,600 to 6,300 vehicles in the general-purpose lanes and another 700 to 1,000 vehicles in the HOV lane. General-purpose traffic is so congested that average speeds are only about 45 miles per hour with frequent stop-and-go conditions. Traffic in the HOV lane tends to move at the posted limit, 60 miles per hour. Exhibits 5-2 and 5-3 present a comparison between morning conditions for the Build and No Build general-purpose lane volumes and average speeds in general-purpose and HOV lanes.

No Build Alternative in 2014

If we build nothing, during the peak hour there will be between 5,100 and 6,400 vehicles in the general-purpose lanes and 210 to 520 vehicles in the HOV lane. The decrease in the number of vehicles in the HOV lane is attributed to a traffic model assumption that HOV lane eligibility will change from two-persons-per-vehicle (2+) to three-persons-per-vehicle (3+) by 2014. The average speed in the general-purpose lanes will drop to about 35 miles per hour, with frequent stop-and-go conditions. The average HOV speed will remain at about 60 miles per hour.

Exhibit 5-1
Traffic Conditions Today

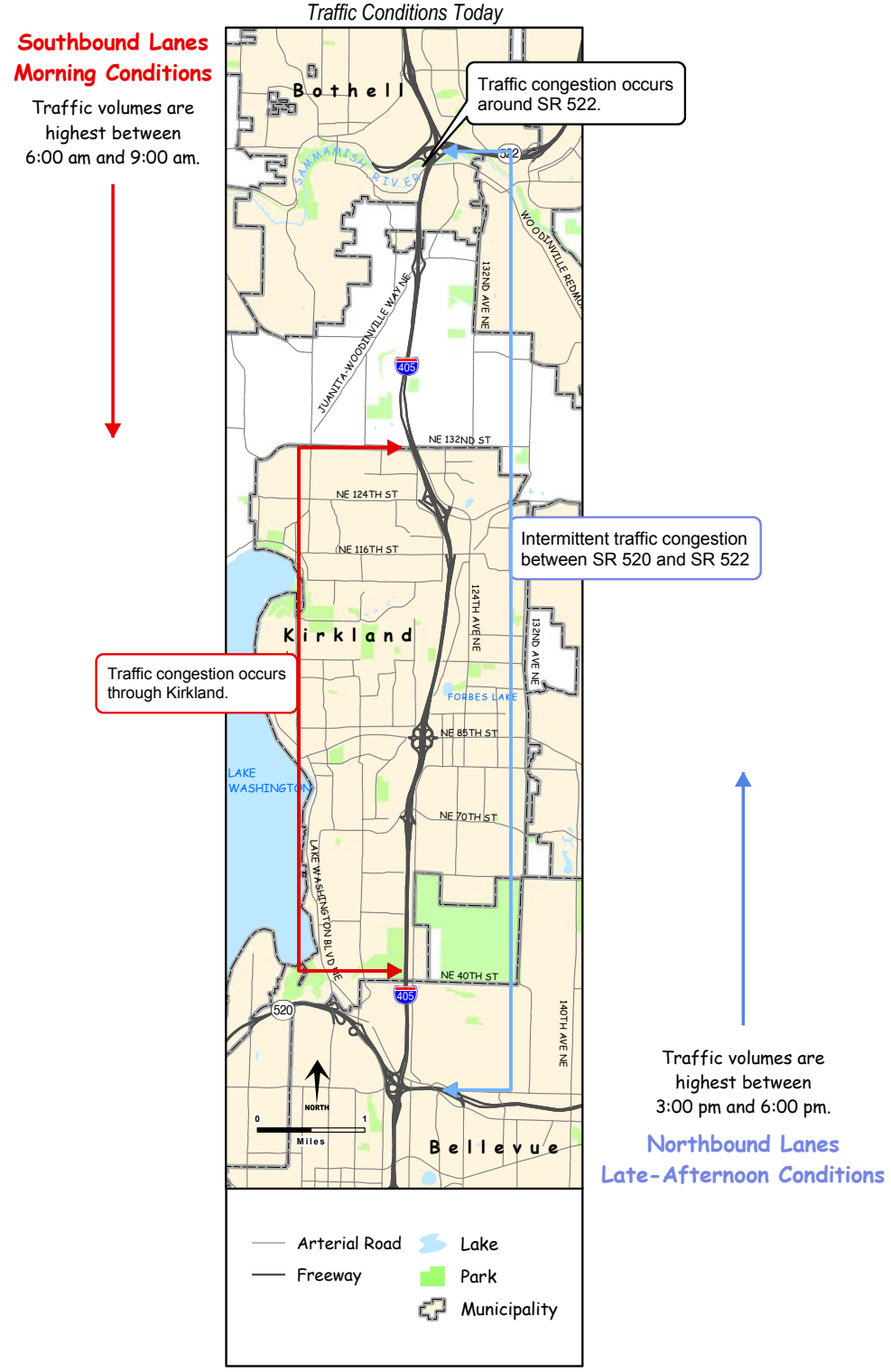


Exhibit 5-2
General-purpose Vehicles Traveling Through the Corridor
During the Morning Peak Hour

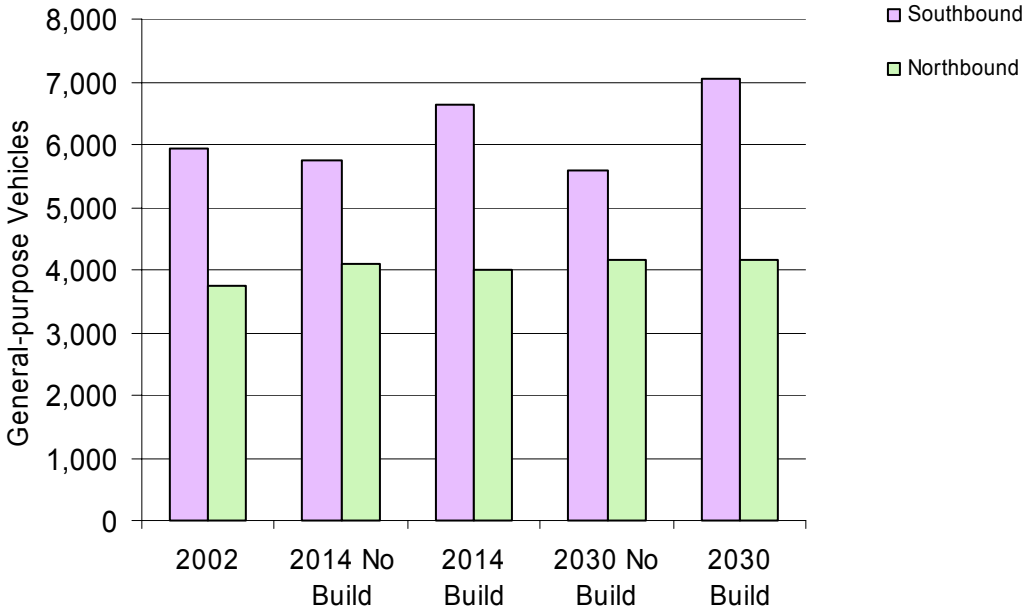
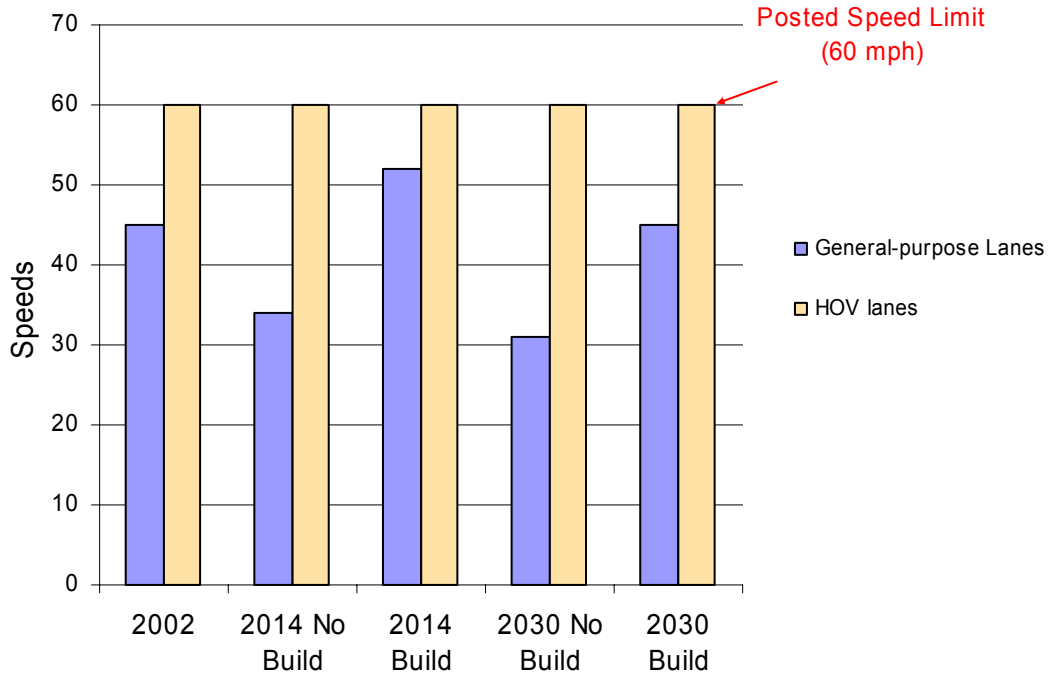


Exhibit 5-3
Southbound Travel Speeds
During the Morning Peak Hour



Build Alternative in 2014

The Kirkland Nickel Project will not eliminate traffic congestion 2014, but traffic conditions will be much better than if the project is not built. For example, with improvements, southbound I-405 volumes during the evening peak hour will increase by 500 to 900 vehicles per hour in the general-purpose lanes and average speeds will increase by more than 5 miles per hour. The HOV lane traffic volume and average speed will be similar to 2014 No Build conditions.

The proposed project reduces both the duration and extent of traffic congestion, especially through Kirkland.

No Build Alternative in 2030

In 2030, southbound morning peak-hour traffic conditions will be similar to that in 2014. The average speed in the general-purpose lanes will decrease to almost 30 miles per hour.

Build Alternative in 2030

In 2030, southbound peak period traffic conditions will be about 1,500 vehicles per hour greater in the general-purpose lanes than if the project is not built; speeds will be about 15 miles per hour higher. HOV lane traffic will continue to have an average speed of 60 miles per hour.

Northbound in the Evening

Today

Current northbound evening peak period traffic congestion is noticeably worse than during the morning southbound peak period. Traffic ranges between 5,300 and 6,500 vehicles per hour in the general-purpose lanes, and the average speed is just over 35 miles per hour. Use of the HOV lane is also higher than in the morning southbound peak period, but vehicle speeds are generally at the posted limit, 60 miles per hour. Exhibits 5-4 and 5-5 present a comparison between morning conditions for the Build and No Build general-purpose lane volumes and average speeds in general-purpose and HOV lanes.

Exhibit 5-4

General-purpose Vehicles Traveling Through the Corridor During the Evening Peak Hour

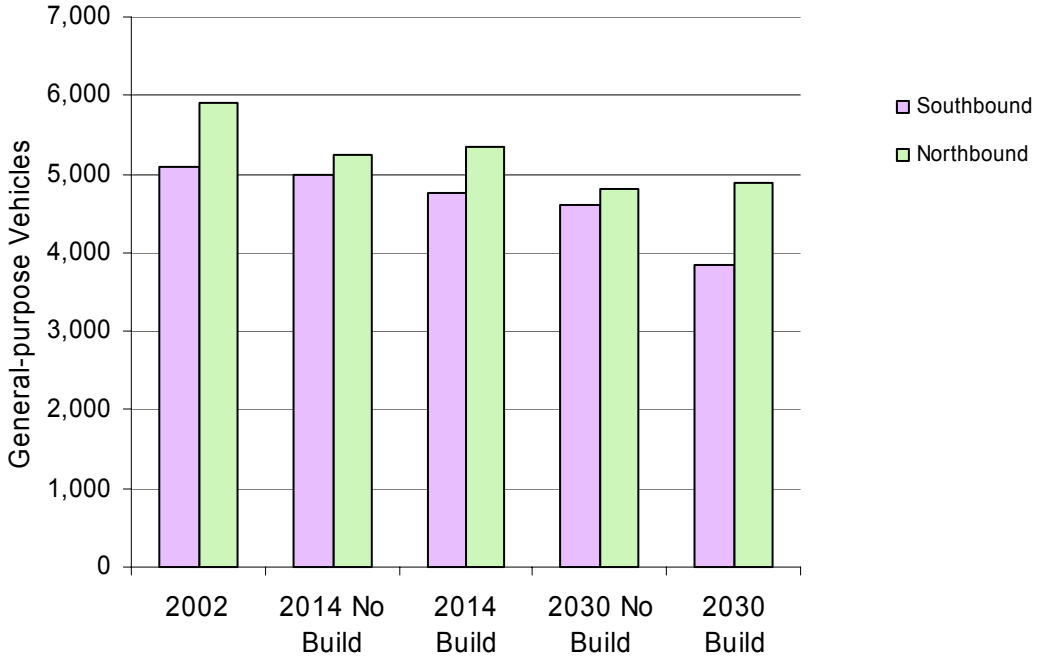
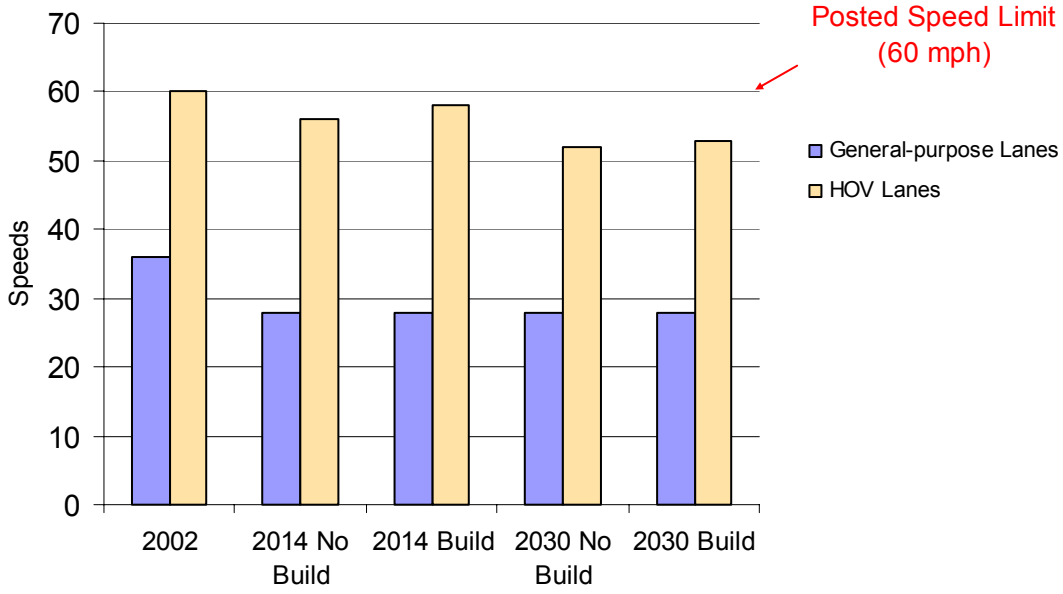


Exhibit 5-5

Northbound Travel Speeds During the Evening Peak Hour



No Build Alternative 2014

If we build nothing, the northbound peak-period congestion will continue to worsen. Most notably, the average vehicle speed in the general-purpose lanes will drop below 30 miles per hour. In addition, our models show that traffic will become increasingly slower as far south as I-90. HOV lane traffic will become somewhat slower with the average vehicle speed decreasing to about 55 miles per hour.

Build Alternative 2014

The only northbound mainline improvements to I-405 in the project area will occur between NE 70th Street and NE 124th Street, about 2.8 miles. In this area, there will be little difference between the Build and No Build alternatives. General-purpose, peak-period traffic will have an average speed below 30 miles per hour, and the average HOV lane speed will be about 55 miles per hour.

No Build Alternative 2030

Conditions in the general-purpose lanes will be similar to those in 2014, with an average speed below 30 miles per hour. The HOV lane peak hour traffic will increase by 250 to 300 vehicles compared with 2014 conditions; however, average speeds will drop to almost 50 miles per hour.

Build Alternative 2030

As noted above, the length of the northbound mainline lane addition is so short that traffic conditions will be only slightly better than the No Build conditions. The short-term benefits identified for 2014 will be mostly overcome by increased traffic volumes in 2030. Additional improvements to I-405 must be implemented to accommodate 2030 traffic volumes.

What about the reverse commute?

The northbound morning and southbound evening commutes, referred to as the reverse commutes, are currently free flowing through the Kirkland Nickel Project area. Northbound morning traffic will remain free flowing with either the No Build or the proposed project. However, the southbound evening commute will become worse with either the No Build or Build alternatives because of backups on SR 520. The serious traffic conditions that occur in this area cannot be alleviated without substantially greater changes to the freeway system (e.g., additional lanes and rapid transit improvements),

such as those proposed in other regional plans (see Chapter 3, Developing the Alternatives).

At the southbound off-ramp to NE 70th Street, WSDOT will add a new right-turn lane approximately 350 feet long that will provide additional vehicle queuing space so that vehicles will not back up onto I-405.

After WSDOT reconstructs the NE 116th Street interchange as a half single point urban interchange, traffic operations will be greatly improved. Today, there are long delays and vehicle queues during both the morning and evening commutes. The morning peak period routinely has delays of several minutes for westbound vehicles on NE 116th Street. Without improvements to the interchange, these delays will continue to get longer. The half single point urban interchange will also reduce delays and queues for eastbound vehicles at both the interchange and at the 120th Avenue NE/NE 116th Street intersection. With reconstruction of the interchange, year 2014 morning peak-period delays are projected to be less than a minute.

How does the project affect freight movements?

The peak-period congestion benefits will also apply to freight traffic. Because the majority of freight moves during off-peak hours, having more lanes available for general-purpose traffic in these time periods will improve traffic conditions for freight.

What safety improvements will be included in the Kirkland Nickel Project?

In the Kirkland section of I-405, the accident rate is 1.03 accidents per million vehicle miles, which is less than the average rate for the whole corridor of 1.48 million vehicle miles. During congested hours when there is bumper-to-bumper traffic, driver inattentiveness is a major cause of accidents. The Kirkland Nickel Project will increase freeway capacity and reduce congestion so that the number of accidents per vehicle mile will go down.

Despite the relatively low accident rate, the section of I-405 within the project area has 11 identified high-accident locations based on WSDOT's *2004 High Accident Review*. The project includes improvements that will reduce the accident rate at these high accident locations (Exhibit 5-6):

- At the northbound off-ramp at the NE 85th Street interchange, WSDOT will add a traffic signal to give more time for vehicles from the off-ramp to move onto NE 85th Street. The northbound off-ramp will be lengthened to prevent vehicle queues from backing up onto I-405.
- Where the southbound off-ramp to NE 85th Street merges with local traffic, WSDOT will rebuild approximately 200 feet of the off-ramp so that it will intersect with the NE 85th Street westbound through lanes at an angle closer to 90 degrees.

How does the project affect pedestrians and bicyclists?

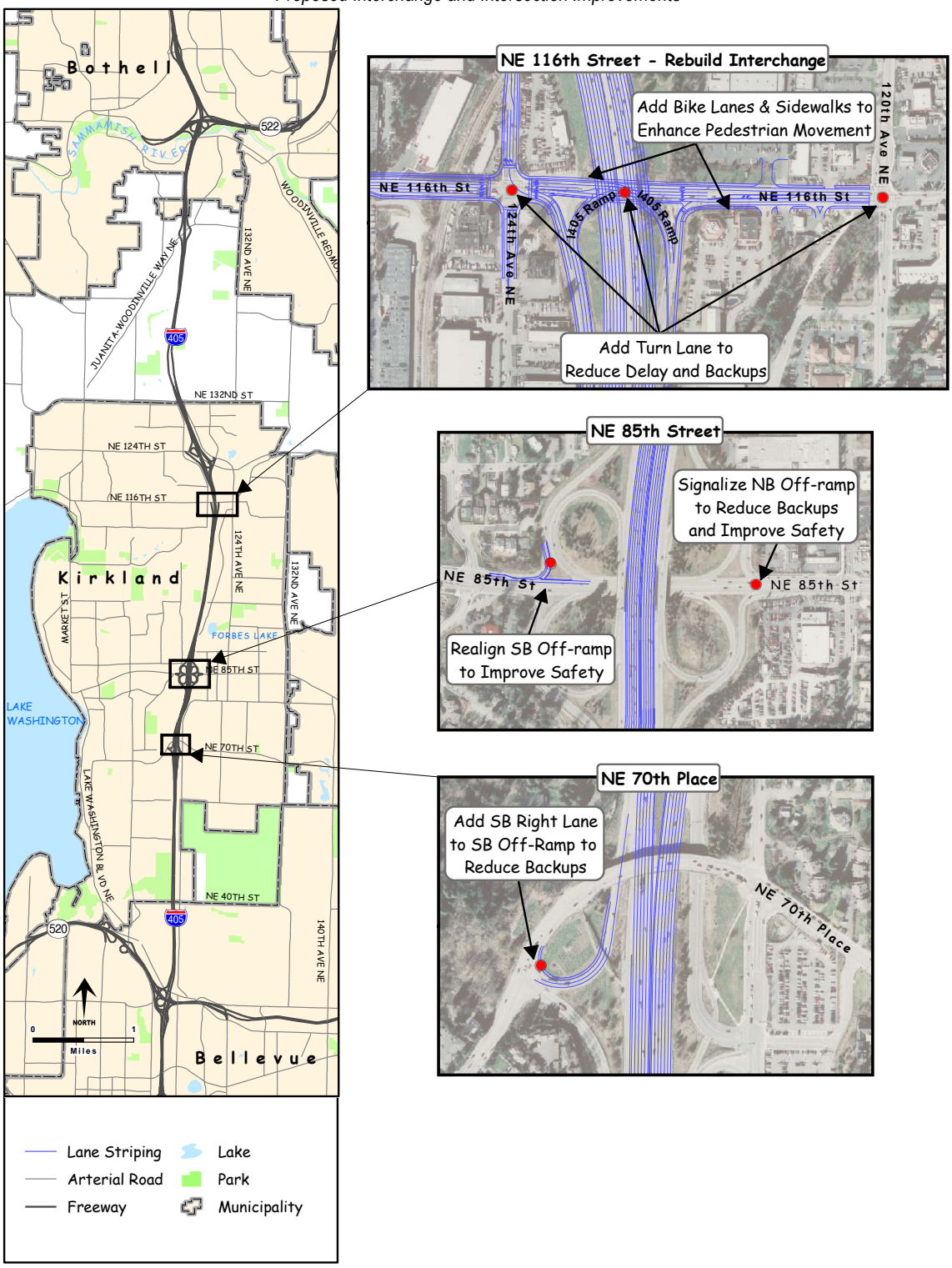
Pedestrians and bicyclists will benefit from the sidewalks and bicycle lanes that will be built along the NE 116th Street crossing beneath I-405. Currently, neither pedestrian traffic nor bicycle lanes are located on the south side of NE 116th Street between 120th Street NE and the east side of the interchange. These additions will greatly improve safety and accessibility for pedestrians and cyclists who wish to cross from one side of the freeway to the other.

How will construction activities affect the project area?

Mainline I-405 lanes may be shifted or re-aligned for widening or reconstruction. To accommodate these improvements, traffic lanes will be closed for short periods of time during the night and on weekends. These closures will be limited to the Kirkland Nickel Project area. The contractor will be required to prepare a traffic management plan prior to making any changes that will affect traffic flow, and the public and service providers will be notified before any changes are made. Further details on specific requirements of this traffic management plan are described below, as well as in the Kirkland Nickel Project Transportation Discipline Report in Appendix F.

Exhibit 5-6

Proposed Interchange and Intersection Improvements



What measures are proposed to avoid or minimize effects on traffic during construction?

- The contractor will prepare a traffic management plan (TMP) prior to making any changes to the traffic flow. The public, school districts, and emergency service providers will be informed of the changes ahead of time through a public information process.
- Prior to and during construction, WSDOT will implement strategies to manage the demand on transportation infrastructure. These transportation demand management (TDM) strategies will form an important part of the construction management program and will be aimed at increasing public awareness and participation in HOV travel.

5.2 Noise

Noise is sound that is perceived as unpleasant, unwanted, or disturbingly loud. Noise levels are a consideration in transportation projects because noise from construction activities and operation of a roadway can affect daily life. When roadway systems expand to add vehicle capacity, noise levels generally increase, which can interfere with conversations, work and family activities, and sleep. Prolonged or heightened exposure to noise can also result in hearing loss. The project team is working alongside local agencies and the public to evaluate and address traffic noise, ultimately lessening noise effects from the freeway.

Measuring noise in the project area

How were noise levels evaluated for the Kirkland Nickel Project?

WSDOT uses the Federal Highway Administration (FHWA) Traffic Noise Model to estimate traffic noise levels. To evaluate levels in the area, WSDOT obtained actual field measurements of current noise levels and current traffic volumes. We used the Traffic Noise Model to compare these data and to make noise projections for the future.

Please refer to the Kirkland Nickel Project Noise Discipline Report in Appendix G (on CD) for a complete discussion of the noise analysis.

How noisy is the project area?

WSDOT measured noise levels at 110 sensitive receptor sites. From these measurements and modeling data, WSDOT concluded that current noise levels in the project area range between 51 and 75 dBA. Further, current noise levels at 25 of the 110 sites either approach or exceed the FHWA noise abatement criteria of 67 dBA. According to WSDOT noise policy, "approaching FHWA noise abatement criteria" means 66 dBA. These 25 sites represent about 283 residences and other noise-sensitive uses.

What is FHWA's noise abatement criteria?

If future noise levels with a project are predicted to approach or exceed the FHWA noise criteria at a sensitive receptor, then mitigation is evaluated at the receptor. For residences, the criteria is 67 dBA.

How will project construction and operation affect noise?

Construction will be completed in phases, with each phase having its own noise characteristics depending on the types of equipment being used. Roadway construction, for instance, will involve clearing, cut-and-fill (grading), removing old pavement, importing fill, and paving.

What are sensitive receptors?

Sensitive receptors represent all land use activity categories where the FHWA noise abatement criteria specify exterior and interior noise levels. Land use activity categories include residences, recreation areas, hotels, schools, churches, libraries, and hospitals.

For the duration of the project, the most prevalent source of noise will be from engines. The loudest noises will be from high-impact equipment, such as jack hammers and pile drivers (if allowed by resource agencies).

How will the completed project affect noise levels?

WSDOT compared future traffic noise levels to the FHWA noise abatement criteria[1] to estimate traffic noise impacts for the proposed project. For all locations that exceeded the FHWA criteria, the effectiveness of noise walls to reduce the noise was evaluated. Exhibit 5-7 on the following page shows a comparison of noise levels for today, the proposed project in 2030, and the No Build Alternative.

To include a noise wall in a project, the wall must meet criteria for both feasibility and reasonability. To be feasible, a noise wall must be constructible to achieve a noise reduction of at least 7 dBA at one or more sensitive receptors, and a reduction of at least 5 dBA at most of the first row of sensitive receptors. To be reasonable, the wall must both be wanted by the sensitive receptors that would benefit from the wall and must be cost-effective, by benefiting a sufficient number of sensitive receptors to justify the cost of the wall. The allowable cost per benefited receptor is established in WSDOT policy and depends on the level of traffic noise.

How loud are the noises we hear every day?

Soft whisper from 15 feet
30 dBA

Television from 10 feet
60 dBA

Freeway traffic from 50 feet
70 dBA

City bus from 50 feet
80 dBA

Jet airliner from 200 feet
120 dBA

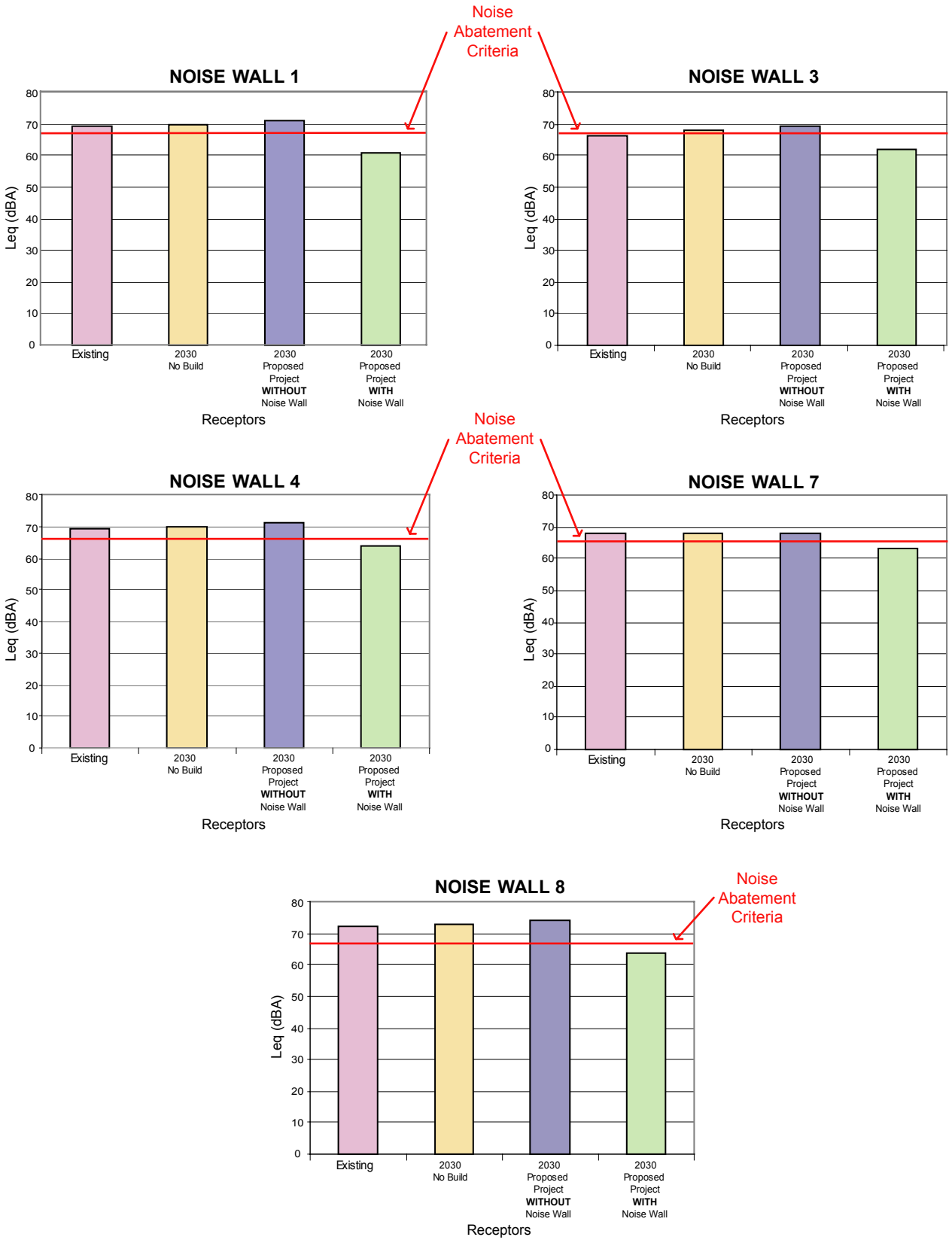
Severe noise impacts occur when traffic noise levels exceed 75 dBA at sensitive receptors or when predicted future noise levels exceed existing levels by 15 dBA or more as a result of the project. With the proposed noise walls, no predicted levels would exceed 75 dBA and no increases of 15 dBA or greater would occur. Consequently, the project would not cause any severe noise impacts.

For the Build Alternative, modeling indicates that without the recommended walls noise levels will approach or exceed the noise abatement criteria at 38 sites representing an equivalent of 365 residences. Noise levels at 25 of these 38 sites currently approach or exceed the FHWA criteria. The Build Alternative includes construction of several noise walls that would substantially reduce noise levels at 19 of the 38 sites predicted to approach or exceed the noise abatement criteria; however,

[1] The FHWA noise abatement criteria are the noise levels that, if needed, require the evaluation of mitigation. For residences, the level is 67 dBA.

Exhibit 5-7

Noise Levels



I-405 at NE 60th Street, where a new noise wall will be constructed.

noise levels at four of the 19 benefited sites would continue to approach or exceed the criteria. As a result, with the proposed noise walls, noise levels at 21 sites will continue to approach or exceed the abatement criteria. At these sites, noise walls and other noise abatement measures were evaluated, but they would not be feasible or reasonable. None of the noise impacts at the 21 remaining sites would be severe (exceeding 75 dBA) under WSDOT's criteria.

What measures are proposed to avoid or minimize noise effects during construction?

To reduce construction noise at nearby receptors, the following measures will be incorporated into construction plans and specifications:

- Erecting noise berms and barriers prior to other construction activities to provide noise shielding;
- Limiting the noisiest construction activities, such as pile driving (if allowed by resource agencies), to between 7 AM and 10 PM to reduce construction noise levels during sensitive nighttime hours;
- Outfitting construction equipment engines with adequate mufflers, intake silencers, and engine enclosures to reduce their noise by 5 to 10 dBA (US EPA, 1971);
- Turning off construction equipment during prolonged periods of nonuse to eliminate noise;
- Requiring contractors to maintain all equipment and train their equipment operators in good practices to reduce noise levels;
- Locating stationary equipment away from receiving properties to decrease noise;
- Constructing temporary noise barriers or curtains around stationary equipment that must be located close to residences, to decrease noise levels at nearby sensitive receptors;
- Requiring resilient bed liners in dump trucks to be loaded on site during nighttime hours; and
- Requiring contractors to use OSHA-approved ambient sound-sensing backup alarms that could reduce disturbances from backup alarms during quieter periods.

Exhibit 5-9: Noise Wall Locations

Identifier	Location	Approximate Length (feet)	Approximate Height (feet)
New noise walls to be constructed			
NW1	Along the eastern edge of the I-405 right of way along the NE 160th Street northbound on-ramp to 118th Avenue NE	1,280	20
NW3	Along the western edge of the I-405 right of way between NE 132nd Street and 113th Avenue NE	1,680	18
NW4	Along the western edge of the I-405 right of way between the north end of the existing wall west of I-405 in the NE 95th Street vicinity and NE 100th Street	920	16
NW7	Along the eastern edge of the I-405 right of way between NE 80th Street and the off-ramp to NE 85th Street	735	20
NW8	Along the eastern edge of the I-405 right of way between NE 60th Street and the existing noise wall south of NE 67th Place	500	18
Noise walls to be relocated			
NW2	Along the western edge of the I-405 right of way between NE 144th Street and the vicinity of NE 149th Street	1,565	16
NW5	Along the eastern edge of the I-405 right of way beginning at the end of the northbound 85th Street on-ramp and ending at NE 97th Street.	1,325	16
NW6	In the vicinity of the receptor at 11638 NE 92nd Street on the west side of I-405	390	16-20
NW9	Along the western edge of the I-405 right of way between NE 53rd Street and NE 65th Street	700	8

Exhibit 5-8
Location of New or Relocated Noise Walls

What measures are proposed to avoid or minimize noise effects during operation?

New noise walls will be constructed at five locations provided that adjacent residents agree and that wall construction is feasible from an engineering perspective (noise wall locations are shown in Exhibits 5-8 and 5-9). Four existing noise walls will be relocated at or closer to the right of way.

5.3 Land Use Patterns

Land use planning helps to create and maintain vital communities with close-knit neighborhoods, a sustainable economy, protected natural systems, and an efficient public infrastructure. Balancing transportation and other land use needs through planning helps communities realize their visions. Local land use directly influences traffic patterns, which, in turn, help shape the project design and development.

Kirkland townhouses under construction

How do communities in the project area influence where to locate businesses and residences?

Many municipalities plan for growth at the citywide and neighborhood level. Citywide plans provide overall policy guidance for future development and address topics such as land use, housing, parks and open space, public infrastructure, and the environment. Neighborhood plans allow for a detailed examination of issues affecting smaller geographic areas within the municipality. The cities of Kirkland, Bellevue, and Bothell, as well as King County, have comprehensive plans that describe how their neighborhoods should evolve over time. Those same neighborhoods depend daily on the freeway, transit, and connecting arterial transportation systems that serve them. For these reasons, it is important that the Kirkland Nickel Project be consistent with community plans.

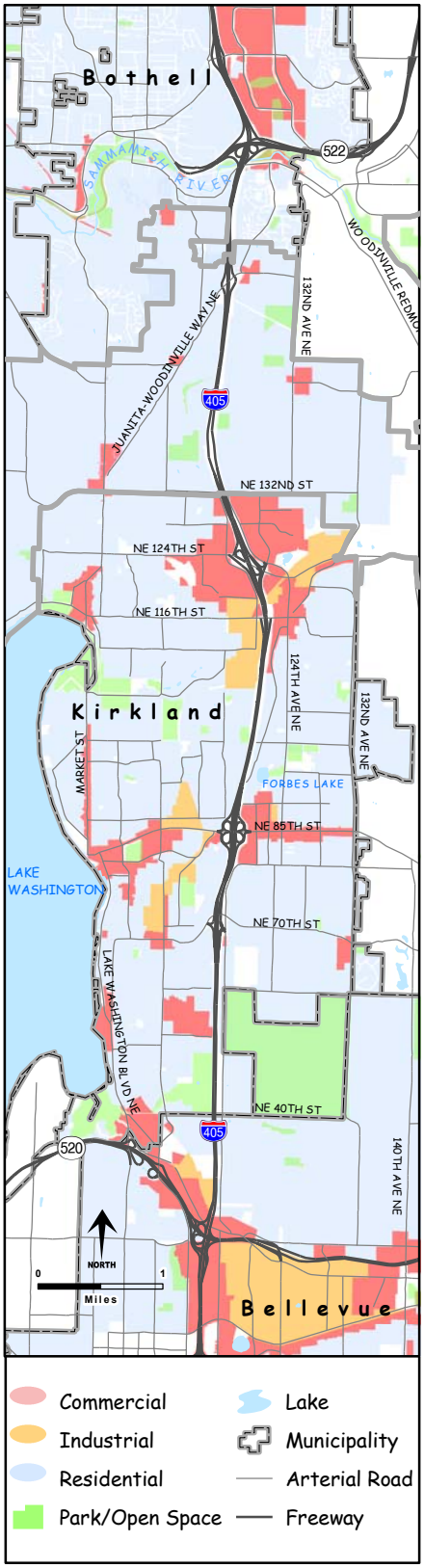
Please refer to the Kirkland Nickel Project Land Use Plans and Policies and Land Use Patterns discipline reports in Appendices H and I (on CD) for a complete discussion of land use analysis.

As shown in Exhibit 5-10, the communities have planned for commercial land uses to occur at the I-405 interchanges. This is because visibility, ease of access, and volume of pass-by traffic are important factors to many businesses.

People in residential areas, however, desire low volumes of traffic on their streets. Higher commuter or cut-through traffic volumes on residential streets can create traffic congestion, noise, air quality, safety, and parking issues within neighborhoods.

Park-and-Ride facility near NE 116th Street

Exhibit 5-10
Land Use Patterns



How can traffic patterns affect businesses and residences?

Changing traffic patterns can have positive or negative effects on business success and residential appeal. The types of businesses in a commercial area may change in response to changing traffic patterns and accessibility. For example, a service station and a professional office require different traffic patterns and accessibility.

Land use activity in a residential area that experiences a high level of traffic may eventually change to a higher intensity use (i.e., multi-family, commercial, or a mix of the two). This type of change, however, can be influenced by other factors including economics, political climate, zoning, and comprehensive plan designations.

How will the Kirkland Nickel Project affect the location of businesses and residences in the project area?

A beneficial effect on the existing land use in the project area will occur as a result of transportation system improvements. WSDOT expects that the widening of I-405 will alleviate some of the vehicular congestion on adjacent local streets. Easier access and better traffic flow on I-405 will encourage commuters to use the freeway instead of seeking alternative routes on local streets.

5.4 Communities, Neighborhoods, and Businesses

Communities, neighborhoods, and businesses are the heart of a region's social identity and economic vitality. Studying the social and economic effects of the Kirkland Nickel Project is important to maintaining the area's unique characteristics, as well as nurturing its living and business environments.

Local commuters

What types of data were analyzed for the project?

WSDOT conducted analyses of regional and community growth, employment, housing, and the local business environment. In addition, we also evaluated potential project effects on minority and low-income populations, such as changes in travel patterns, accessibility to community facilities, or availability of affordable housing.

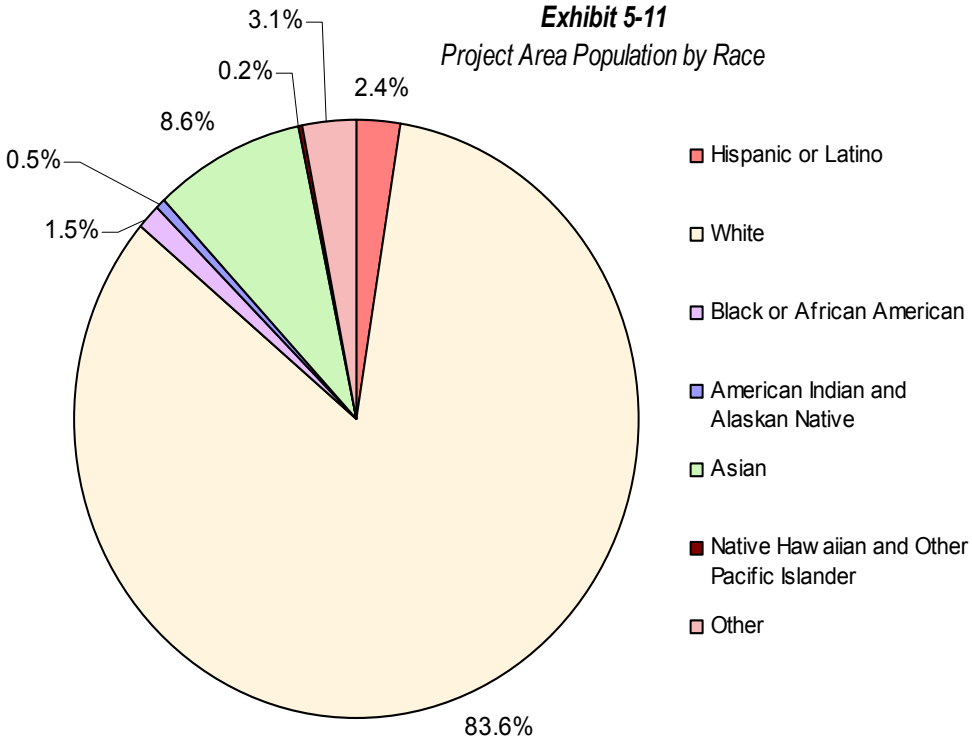
Data from the 2000 Census were used to describe current socioeconomic characteristics of the population. Information tabulated by the Puget Sound Regional Council's forecast analysis zones was used to typify historical and projected characteristics. Since the size and shape of Census tracts and forecast analysis zones are irregular, the width of the study area on either side of I-405 varied to some extent.

Please refer to the Kirkland Nickel Project Economics, Environmental Justice, and Social Elements discipline reports in Appendices J, K, and L, respectively (on CD), for a complete discussion of these analyses.

Who lives in the project area?

The population within the Kirkland Nickel Project area is becoming more diverse. While the people are predominantly white, more racial diversity is apparent today than in 1990. In 1990, approximately 7 percent of the population was non-white, compared to about 17 percent in 2000 (see Exhibit 5-11). This increased diversity provides the foundation for the interesting and healthy communities that surround the project area.

Exhibit 5-11
Project Area Population by Race



What community and social services are found in these communities?

The cities of Bellevue, Kirkland, and Bothell support formal and informal community organizations that encourage citizen participation. Organizations such as neighborhood groups, youth service providers, business associations, social and recreational organizations, and service groups are all part of the community. The City of Kirkland Parks and Community Services Department provides a variety of recreational programs including the Senior Center, classes for adults and children at the North Kirkland Community Center, and maintenance of the ballfields. The City of Bothell Recreation Section provides a variety of recreational opportunities including structured classes, teen events, adult sports, and youth camps.

Two of the notably larger community facilities in the project area are the Peter Kirk Park in Kirkland and the Park at Bothell Landing in Bothell. Both provide a venue for a range of social activities including senior centers, teen centers, performance centers, community celebrations, concerts, and recreational activities.

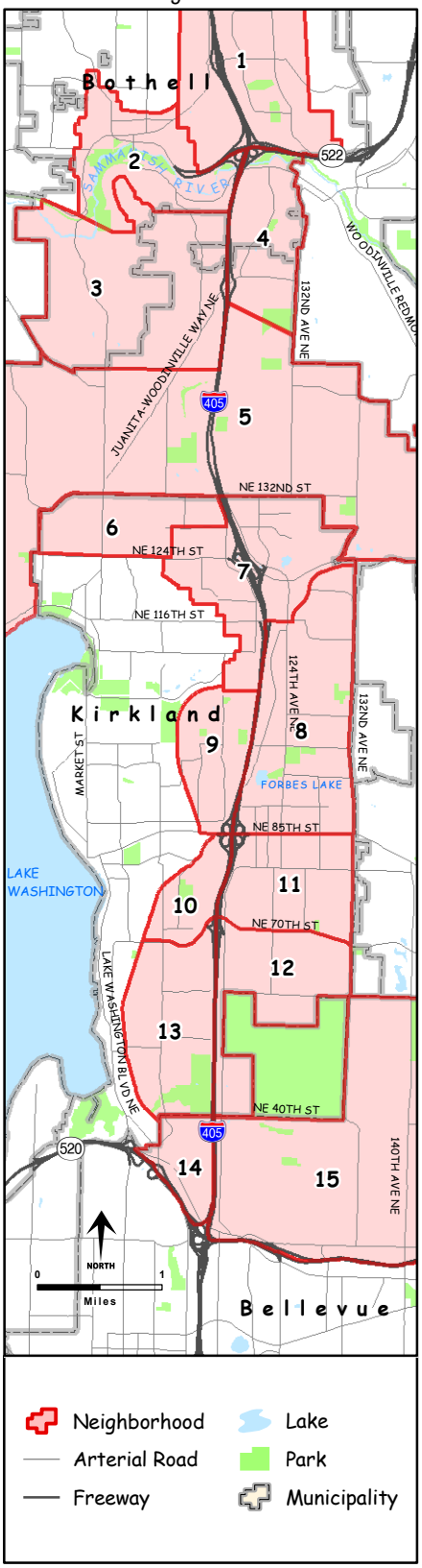
Neighborhoods

Fifteen neighborhoods, located within four jurisdictions, are adjacent to the I-405 mainline. Shown in Exhibits 5-12 and 5-13, they include:

Exhibit 5-12: Kirkland Nickel Project Neighborhoods

	Neighborhood	Jurisdiction
1	North Creek/ 195th	Bothell
2	Downtown/ 190th/ Riverfront	Bothell
3	Waynita/Simonds/ Norway	Bothell
4	Brickyard/ Queensgate	Bothell
5	Kingsgate/ North Juanita	King County
6	North Juanita	Kirkland
7	Totem Lake	Kirkland
8	North Rose Hill	Kirkland
9	Highlands	Kirkland
10	Everest	Kirkland
11	South Rose Hill	Kirkland
12	Bridle Trails	Kirkland
13	Central Houghton	Kirkland
14	North Bellevue	Bellevue
15	Bridle Trails	Bellevue

Exhibit 5-13
Neighborhoods



These neighborhoods include churches, schools, developed recreational facilities and undeveloped open space. There are pedestrian and bicycle facilities on several streets adjacent to and spanning I-405, including three bridges over I-405 for non-

motorized and emergency vehicle use only (NE 60th Street, NE 80th Street, and NE 100th Street).

Population

Most of the rapid population growth in the Kirkland Nickel Project area occurred during the 1970s and 1980s. During that time, employment, the number of households, and traffic volumes increased dramatically. More recently, the project area has experienced relatively slow population growth, a trend that is expected to continue because much of the land is already developed. Exhibit 5-14 shows historical and projected population in the project area.

HEADLINES THROUGH THE YEARS

Census Count Gives Kirkland and Vicinity Substantial Gain
Eastside Journal
May 1, 1930

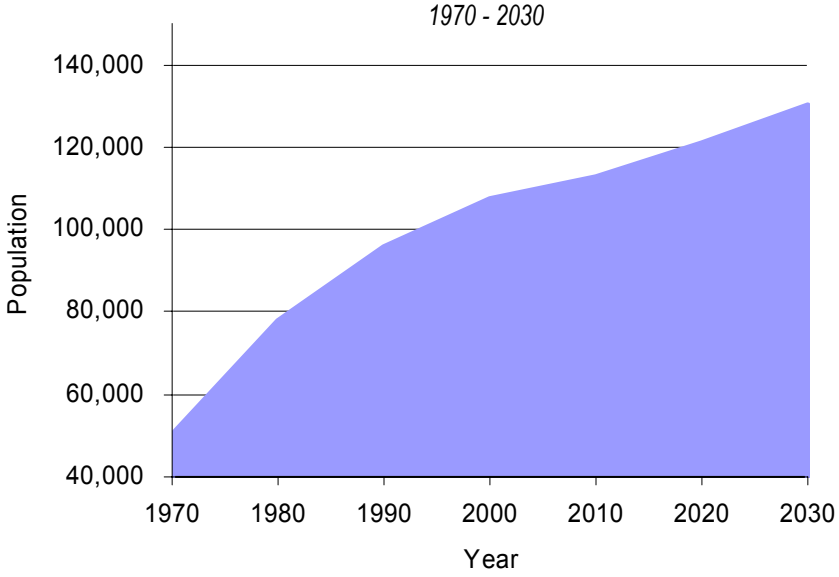
Kirkland Doubles Population in Decade to 4,500
Eastside Journal
June 8, 1950

East Side Population May Zoom to 300,000
Eastside Journal
September 3, 1959

Kirkland Gains 249 Residents Over 15,000 City Estimate
Eastside Journal
March 10, 1971

I-405 Dedication Scheduled November 5
Eastside Journal
October 29, 1969

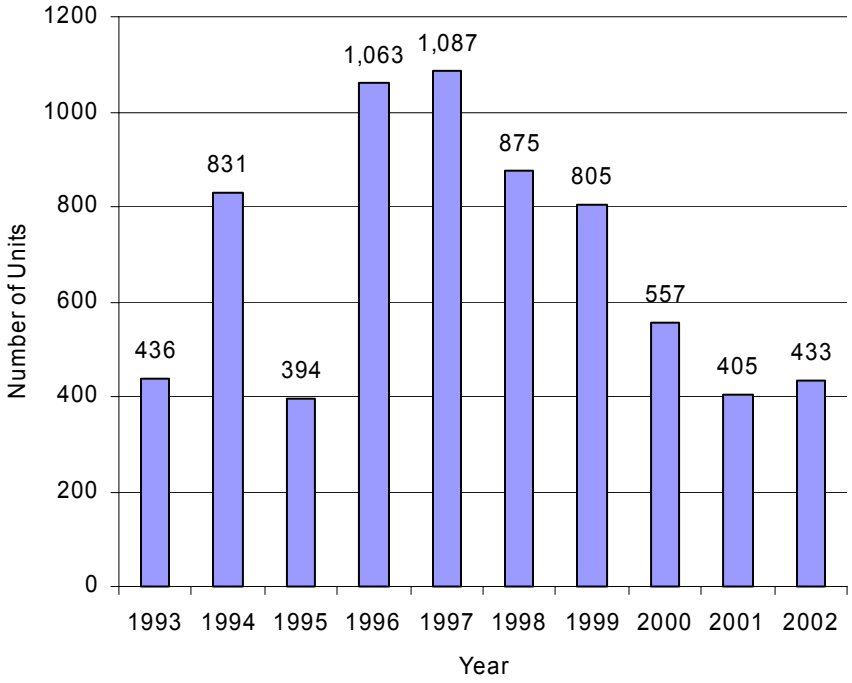
Exhibit 5-14
Population Growth in the Area: 1970 - 2030



Housing

Housing changes for Census tracts (approximately one mile on either side) between 1993 and 2002 indicate that nearly 9,000 new residential units were permitted within the Kirkland Nickel Project area. Given the current zoning regulations and availability of land, the area has the capacity for over 28,500 new housing units, including single- and multi-family residential, and multi-use residential (Exhibit 5-15).

Exhibit 5-15
Housing Units Authorized by Permit

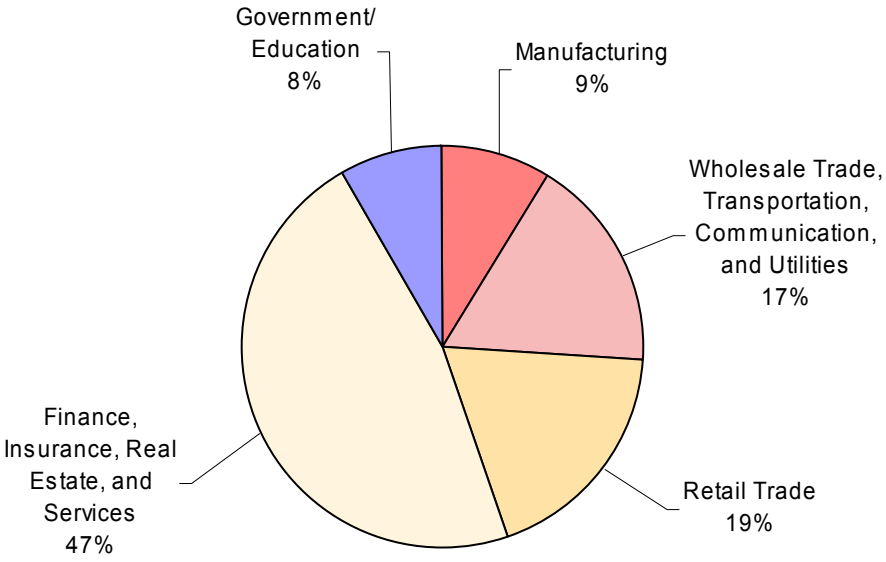


Business and Employment

The principal economic areas potentially affected by the Kirkland Nickel Project include the Finn Hill, Juanita, and Kingsgate neighborhoods of unincorporated King County; and the cities of Bellevue, Kirkland, Woodinville, Bothell, and Redmond. Combined, the five cities served as home to firms employing 255,000 employees in 2002, or 16 percent of the Central Puget Sound region's total employment (King, Kitsap, Pierce, and Snohomish counties). Commercial activity in these cities is dominated by activity in the Finance, Insurance, Real Estate and Services sector (FIRES) of the economy, but the affected cities also support a wide range of retail activity in Kirkland and Woodinville, and a regional retail destination in Bellevue immediately to the south of the Kirkland Nickel Project area. Exhibit 5-16 shows the share of employment per major sector for the project area. The relative shares of employment by sector are generally similar to King County as a whole, with a slightly greater emphasis on FIRES.

Exhibit 5-16

Employment by Sector in the Project Area: 2000



How will the project affect communities, neighborhoods, and businesses?

The Kirkland Nickel Project will have minor effects on communities and people within the project area, and most of these effects will be beneficial. The Context Sensitive Solutions design principles to be used will help make the project fit aesthetically with the community. Periods of congestion will be shortened in the Kirkland area and the reconfiguration of the interchange at NE 116th Street will make it operate more efficiently. Improvements to the northbound and southbound off-ramps at NE 85th Street will make merging with local traffic safer.

Communities and neighborhoods

WSDOT's analysis shows that community integrity will remain intact during operation of the Kirkland Nickel Project because neighborhoods in the vicinity of I-405 are already well established. Access to community facilities and recreational areas will remain unchanged. Pedestrian and bicycle facilities

will also remain unaffected except for improvements at the NE 116th Street interchange.

Minority and low-income populations

The Kirkland Nickel Project will not have disproportionately high and adverse effects on minority or low-income populations, or resources/services that are especially important to a minority and/or low-income populations. The details of WSDOT's analysis can be found in the Kirkland Nickel Project Environmental Justice Discipline Report found in Appendix I on CD.

WSDOT conducted numerous outreach efforts to reach minority, low-income, and other special groups to convey information about the Kirkland Nickel Project. WSDOT did this outreach, also known as "environmental justice" outreach to ensure that the project would not disproportionately affect minority or low-income populations. Most minority and/or low-income residents who provided feedback were glad that action will be taken to improve traveling conditions on I-405.

Most minority and/or low-income residents that were contacted for this study used I-405 to get to work or to access public services. They found traveling difficult when the freeway was congested. In general, these residents:

- Appreciated that WSDOT reached out to contact them;
- Seemed pleased that something was being done to improve traffic congestion on I-405;
- Recognized that there was a traffic problem and that it affected their daily lives—congestion on I-405 frequently made them late for appointments for essential services such as health care, and for more routine activities such as grocery trips;
- Expressed concern over potential interruptions in bus service and that comfortable bus trips were a major concern;
- Acknowledged that I-405 congestion and subsequent delays were less important in their lives when compared to other economic concerns.

Businesses

The project will have modest, positive effects on access to the commercial areas through year 2014. However, the overall

What is environmental justice?

The term *environmental justice* is relatively new; however, the issues related to the concept have been in public discussion for decades. Essentially, environmental justice is the simple, common sense notion that the negative environmental effects of projects should not disproportionately burden low income or minority communities. Executive Order 12898, issued by President Clinton in 1994, provides that "each Federal agency shall make achieving environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority and low-income populations."

accessibility benefits will stabilize beyond 2014 as traffic volumes continue to increase. The project will have long-term, indirect benefits to the local economy because of improved mobility throughout the corridor.

How will communities, neighborhoods, and businesses be affected by construction activities?

Construction of the Kirkland Nickel Project is expected to last up to six years; however, construction activity in any one location will take substantially less time. Construction will pose some minor inconveniences because of localized travel delays, changes in some business access, possible parking reductions, and traffic re-routing. Access to some businesses may become slightly more difficult during construction of the NE 116th Street interchange, causing some customers temporarily to go elsewhere or postpone their trips. Some travelers may choose alternate routes to avoid construction activity. These detours and delays will be of short duration and highly localized; they will not affect social interaction or the economic vitality within local neighborhoods or the project area.

Will existing properties be acquired or displaced?

Right of Way and Easements

Although most of the Kirkland Nickel Project will be constructed in existing right of way, WSDOT will need to acquire property and easements in several areas (see Exhibits 5-17 and 5-18). These areas are adjacent to:

- The Brickyard Park-and-Ride and the west side of I-405 at NE 145th Street;
- In the vicinity of the NE 116th Street interchange; and
- Near East Riverside Drive in Bothell.

In total, WSDOT will need to acquire approximately 5.28 acres for right of way and stormwater runoff detention ponds for the project. In addition, property will be acquired for wetlands mitigation at three or more locations.

Brickyard Park-and-Ride

WSDOT will acquire 2.1 acres of property near the Brickyard Park-and-Ride from King County Metro to construct a new southbound on-ramp from NE 160th Street and a detention

pond. The land is currently vacant and is partially covered by a wetland. A full acquisition and relocation of one residence will be necessary for the construction of a detention pond.

NE 116th Street Interchange

In the vicinity of the I-405 and NE 116th Street interchange, WSDOT will acquire approximately 0.75 acres of property from twelve property owners along NE 116th Street west of the interchange. The purpose of these acquisitions will be to widen and add turn lanes on NE 116th Street and 120th Avenue NE. Full acquisition and relocation of a transmission repair service may be necessary. Partial acquisitions and easements of narrow strips of property will be necessary from the other eleven parcels; these acquisitions will not affect the operations of those businesses during construction or operation. The partial acquisitions are small and will not change site use with respect to local land use code. On the east side of the interchange, the widening of NE 116th Street will take place within existing City of Kirkland right of way; WSDOT will not acquire additional property at this location.

NE 116th Street and 120th Avenue NE, where widening of turn lanes will require some property acquisitions

East Riverside Drive

A full acquisition and relocation of one residence will be necessary in the vicinity of Riverside Drive. Easements will be necessary from the other five properties in this area.

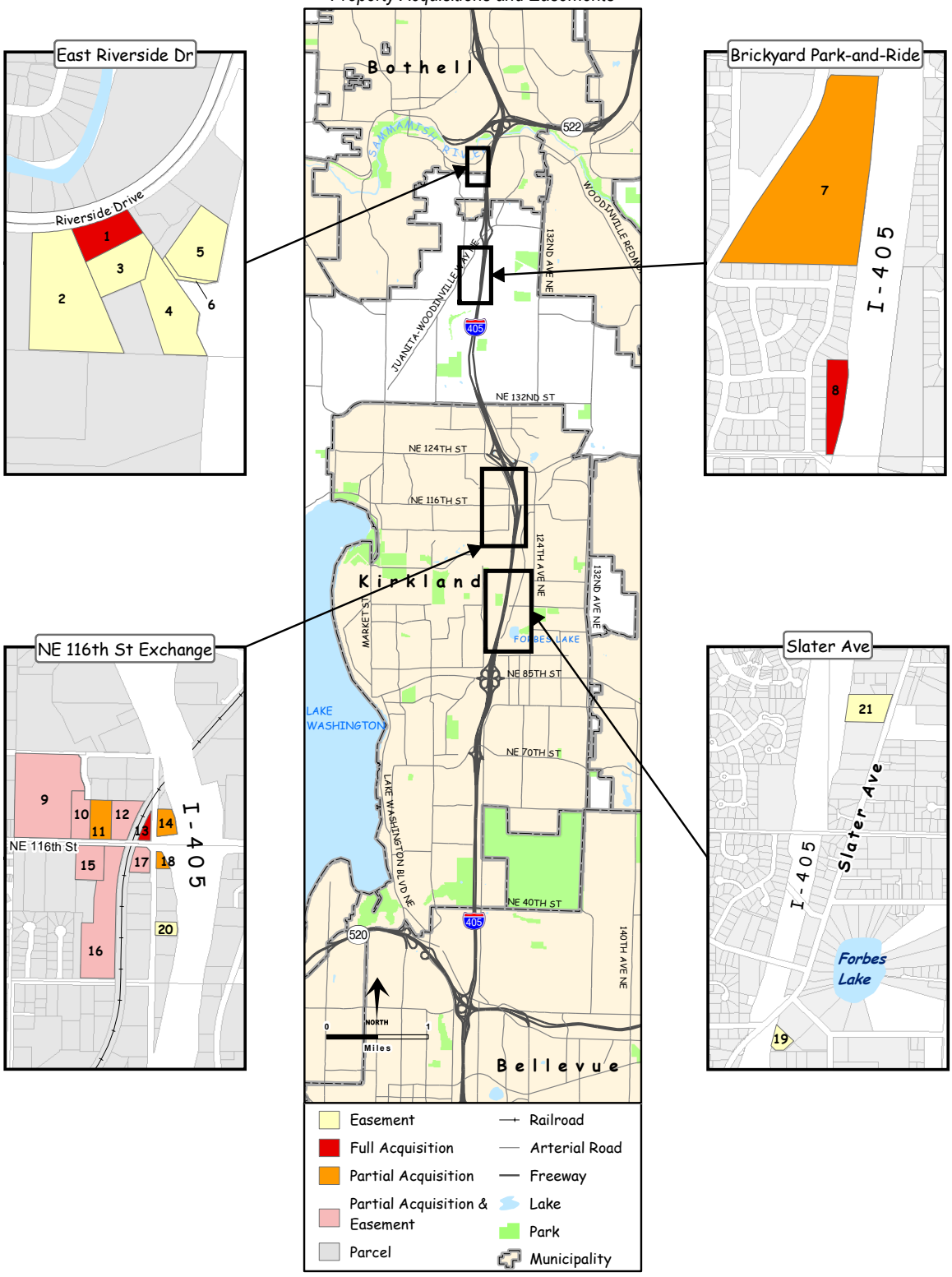
WSDOT will also acquire 7.6 acres of land for wetlands mitigation and enter into a Memorandum of Agreement with the City of Kirkland to use 4.5 acres of city property for wetland mitigation.

Exhibit 5-17: Property Acquisitions and Easements

No.	Purpose of Acquisition or Easement	Current Land Use	Parcel Size (sq. ft.)	Acquisition Area (sq. ft.)	Easement Area (sq. ft.)
1	Detention Pond	Residential	40,042	40,042	NA
2	Temporary Construction Easement	Residential	143,748	NA	1,923
3	Detention Pond	Residential	53,583	NA	2,864
4	Detention Pond	Residential	74,052	NA	6,175
5	Temporary Construction Easement	Residential	63,395	NA	4,611
6	Temporary Construction Easement	Vacant	4,500	NA	2,785
7	Detention Pond Roadway Slopes	Future Park-and-Ride Expansion	794,099	91,940	NA
8	Detention Pond	Residential	65,340	65,340	NA
9	Roadway Widening	Light Industrial	460,865	1,375	13,735
10	Roadway Widening and Subterranean Easement	Vacant	81,893	2,463	6,442
11	Roadway Widening	Commercial	73,616	4,162	1,804
12	Roadway Widening	Commercial	81,000	3,489	2,455
13	Roadway Widening	Transmission Shop	17,000	17,000	NA
14	Roadway Widening	Car Dealership	41,726	321	NA
15	Roadway Widening	Car Dealership	86,528	135	162
16	Roadway Widening	Commercial	296,505	2,018	956
17	Roadway Widening	Commercial	42,361	1,344	4,510
18	Roadway Widening and Temporary Construction Easement	Truck Refueling	14,240	401	NA
19	Noise Wall	Costco Parking Lot	32,050	NA	7,958
20	Temporary Construction Easement	Commercial	27,300	NA	6,234
21	Temporary Construction Easement	Vacant	111,514	NA	1,113
22	Wetland Mitigation[1]	Wooded	215,819		215,819[2]
23	Wetland Mitigation[1]	Lawn	136,495	136,495	
24 and 25	Wetland Mitigation[1]	Wooded	202,118	202,118	

[1] See Exhibit 5-40 for the location of these sites.
[2] City of Kirkland property.

Exhibit 5-18
Property Acquisitions and Easements



What measures are proposed to avoid or minimize effects to communities, neighborhoods and businesses during construction?

To reduce the effects of construction activities on neighborhoods and businesses, the following measures will be incorporated into construction plans and specifications.

Communities and neighborhoods

- The contractor will be required to prepare and implement a traffic management plan (TMP). If local streets must be temporarily closed during construction, detour routes will be provided and clearly marked with signs.
- The contractor will coordinate with the school districts before construction. The TMP will be implemented and coordinated with all emergency services organizations prior to any construction activity.
- The contractor will coordinate with utility providers prior to construction to identify conflicts and resolve the conflicts prior to or during construction.

Freight movement in the I-405 Corridor

Businesses

Construction Interference

- The contractor will be required to maintain access to businesses throughout the construction period.
- Because it can be difficult to determine whether a business is open, or how to access the site during the construction period, the contractor will make provisions for posting appropriate signs to communicate the necessary information to potential customers.
- The contractor will keep daytime street closures to a minimum.

Displacements

- In those situations where it is necessary to acquire property, WSDOT will conform to the requirements set forth in accordance with the Federal Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, as amended and implemented by FHWA under 49 CFR Part 24, and according to Chapter 468-100 WAC Uniform Relocation and

What is the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970?

On January 2, 1971, Public Law 91-646, the "Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970," (Uniform Act) was signed into law. The Uniform Relocation Act provides important protections and assistance for people affected by federally-funded projects. This law was enacted by Congress to ensure that people whose real property is acquired, or who move as a result of projects receiving federal funds, will be treated fairly and equitably and will receive assistance in moving from the property they occupy.

Assistance and Real Property Acquisition. This will ensure just compensation of all properties and have a minimal effect on the current owners and residents. Relocation resources are available, without discrimination, to all eligible residential and business relocates.

- WSDOT will prepare a relocation plan in advance of actual displacements. Additional information will be collected, possibly through property owner interviews, to identify the specific needs of any business that will be relocated.

5.5 Recreational and Cultural Resources

Citizens appreciate recreational resources because they help to improve the quality of life within our communities. Public spaces that are enjoyable, accessible, and diverse in their social and recreational functions enrich minds, bodies, and spirits.

Likewise, cultural and historic resources provide an important link to the past while establishing meaningful connections to lives today. They serve as memories and symbols of a community's accomplishments and represent the distinctive architectural, landscape, and engineering designs of our region.

Cycling in the project area

Please refer to Appendix M (on CD) for a complete discussion of historic, cultural, and archaeological resources analyses. In addition, Appendix N provides an evaluation of Section 4(f) resources.

What recreational, historic, and cultural resources are located within the project area and how will they be affected?

WSDOT identified nearby recreational, historic, cultural, and archaeological resources within the Kirkland Nickel Project. No historic or cultural resources were found that could be affected by the project. However, four recreational resources (parks) were identified that were close enough to the proposed project to be evaluated for effects from construction or operation as part of Section 4(f) and Section 6(f) analysis. Exhibit 5-19 depicts these four parks, the agencies that own them, and the types of recreational activities offered. Exhibit 5-20 shows the locations of the parks on a regional map.

Below we have provided a description of each park, as well as a description of the closest construction activities. Our evaluation shows that there will be no effects to the parks.

What is Section 4(f)?

Section 4(f) of the US Department of Transportation (USDOT) Act of 1966 49 USC 303 provides that the proposed use of any land from a major publicly-owned park, recreational area, wildlife and waterfowl refuge, or any important historic site, will not be approved by the USDOT unless a determination is made that there is no feasible and prudent alternative to the use of land from that property. The Act also requires that the proposed action include all possible planning to minimize harm that may result from such use.

Exhibit 5-20
Recreational and Historic Resources

Exhibit 5-19: Recreational Resources in the Project Area

	Park	Jurisdiction	Facility Type
1	Kingsgate	King County	Trail
2	Edith Moulton	King County	Park (Closed)
3	Spinney Homestead	Kirkland	Playfields, Picnic Area, Playground
4	Watershed	Kirkland	Undeveloped Open Space

What are the characteristics of local parks and will they be affected by the project?

To understand whether recreational activities may be disrupted as a result of the Kirkland Nickel Project, we examined the specific characteristics of the four parks adjacent to the project area. In addition, we identified the construction activities that will take place near the parks. Finally, we looked for long-term impacts to the parks once the project was complete, such as noise increases.

Kingsgate Park (1) is a 7-acre, King County park located on the east side of I-405. This area is characterized by dense, native deciduous and evergreen trees and offers hiking trails. The western boundary borders the I-405 right of way. An inside southbound travel lane will be constructed approximately 250 feet from this park. The park is buffered from I-405 by trees and distance, and there will be no change to the visual experience or acoustic conditions for hikers in the park.

Edith Moulton Park (2) is a 26-acre King County park located west of I-405. The park is largely undeveloped on its west, north, and east sides. This undeveloped area is characterized by dense, native deciduous and evergreen trees. A short portion of the east boundary is adjacent to the I-405 right of way. The remaining east boundary borders multi-family and single-family housing. An inside southbound travel lane will be constructed approximately 450 feet from this park. Because of distance, the developed area of the park—consisting of open lawn, picnic area, and picnic shelter—is well buffered from I-405, both visually and acoustically.

Spinney Homestead Park (3) is a developed 6.5-acre City of Kirkland park. Recreation facilities include a children's playground, pathways, open lawn area, as well as on-site parking. A large earth berm with dense deciduous and evergreen trees is located between the freeway shoulder and the park. This berm blocks the view to I-405 from the park. A southbound travel lane will be constructed approximately 125 feet from the park at its closest location. Some of the vegetation in the WSDOT right of way will be removed; however, the earth berm and many of the trees and shrubs will remain and continue to separate I-405 from the park. Traffic-generated noise will increase slightly, but not to a discernable level.

Watershed Park (4) is a 66-acre City of Kirkland park with an eastern boundary adjacent to the I-405 right of way. The park is largely undeveloped woodland that offers hiking trails. On the I-405 mainline, a southbound travel lane will be constructed approximately 65 feet from this park. Trees on the I-405 right of way will be removed during construction to make room for the added lane. However, construction will not affect trees in the park. The park is well vegetated; the hiking trails will continue to be screened visually from I-405. Traffic-generated noise will increase slightly, but not to a discernable level, and there will be no change to the visual experience for hikers within the park.

What is Section 6(f)?

Section 6(f) of the Land and Water Conservation Act (LWCFA) concerns transportation projects that propose impacts, or the permanent conversion, of outdoor recreation property that was acquired or developed with LWCFA grant assistance which in Washington is distributed by the Interagency Committee for Outdoor Recreation. The Act prohibits the conversion of property acquired or developed with these grants to a non-recreational purpose without the approval of the National Park Service.

What historic, cultural, and archaeological resources are located in the project area?

Through their archival research, project historians identified one above-ground historical resource within the project area.

The Shaw House, which appears to meet National Register of Historic Places (NRHP) eligibility Criterion A (for its association with economic growth during the early Twentieth Century) and Criterion C as an example of the Craftsman bungalow style.

A field survey also conducted as part of the Section 106 analysis revealed no additional buildings with physical integrity of historic significance.

Project archaeologists walked the project area and shovel tested landforms along the I-405 right of way. No buried archaeological resources were found; we do not expect to encounter them during construction.

What is Section 106?

Section 106 of the Historic Properties Act requires federal agencies to account for the effects of their undertakings on historic properties and to afford the Advisory Council on Historic Preservation an opportunity to comment. FHWA and WSDOT also seek to ensure that each tribe has the opportunity to identify and address any concerns regarding identification and evaluation of cultural resources and potential effects of the undertaking upon such resources.

Shaw House (eligible for the NRHP)

Will any historic, cultural, and archaeological resources be affected by the Kirkland Nickel Project?

The Shaw House is located sufficiently far from the site and is buffered by vegetation on local terrain so that it will not be affected by the project.

Though we do not expect to encounter archaeological resources during the project, WSDOT will prepare an Unanticipated Discovery Plan for the project that the contractor will be required to follow. This will avoid or minimize effects to historic, cultural, and archaeological resources.

Letters of concurrence regarding the area of potential effects and on the effects analysis from the Washington State Historic Preservation Office are included in Appendix D.

5.6 Public Services and Utilities

Public services and utilities are an important consideration during the planning and construction of transportation projects because they affect the quality of human life. They allow people to live in a safer environment and enjoy a higher standard of living. If these services were to be interrupted, discontinued, or altered, such unanticipated inconveniences or emergencies could affect work schedules, daily activities, and other routine activities.

City of Kirkland Fire Department in action

Please refer to the Kirkland Nickel Project Public Services and Utilities Discipline Report in Appendix O (on CD) for a complete discussion of public services and utilities analysis.

How were public services and utilities identified and analyzed for the Kirkland Nickel Project?

WSDOT evaluated the changes in travel times associated with construction and future operation of the project. This information was used to determine whether the project would affect response times of emergency vehicles, travel for school buses, and people accessing other public services, such as medical clinics.

WSDOT conducted a review of existing utility locations and compared them against the proposed project footprint. Any potential conflicts were noted and described by type and quantity. With this data, we determined where potential utility service disruptions and access problems might occur.

What public services and utilities are located in the project area?

Public services and utilities within the Kirkland Nickel Project area are provided by a mix of local, regional, public, and private entities. Locations of public services are presented in Exhibit 5-21 and listed below.

Police – The cities of Kirkland and Bothell, the King County Sheriff's Office, and the Washington State Patrol provide police protection to residents in this area.

Fire and Emergency Medical Services – Providers include the City of Kirkland Fire Department, the City of Bothell Fire Department, King County Fire District 41, and Woodinville Fire and Life Safety.

Exhibit 5-21
Public Services

School Districts – The Northshore and Lake Washington school districts provide public education in the project area, supplemented by private educational institutions.

Transit Services – King County Metro Transit, Community Transit, and Sound Transit provide regional and local bus service along I-405 through the project area, including service to park-and-ride facilities. Five park-and-rides directly serve the project area. Vanpool service is provided by King County Metro and Community Transit.

Healthcare Services – Six hospitals and health clinics serve the project area. Combined, their services range from emergency Level IV Trauma to mental health and chemical dependency treatment.

Utilities – Water, sewer, solid waste service, storm sewer, electric power, gas, fuel, phone, and cable telecommunications are provided within the area. These utilities are transmitted by both above- and below-ground lines.

How will public services and utilities be affected?

WSDOT determined that the Kirkland Nickel Project will have positive benefits to public services by improving response times for emergency vehicles. By adding a southbound lane, 10-20 percent more vehicles will be able to travel during the morning commute by 2014. The addition of the one northbound lane will also improve traffic flow during the early evening commute.

Overall, improved traffic flow will reduce response times for emergency vehicles, increase transit reliability, and make travel easier for individuals who use I-405 to get to public service provider locations.

Will any public services be displaced?

A park-and-ride lot located at the intersection of NE 116th Street and 120th Avenue NE will need to be removed. This park-and-ride lot, which has a current capacity for 24 vehicles, is located on WSDOT property. WSDOT has allowed temporary use of this property by King County Metro; the lot will not be replaced.

Will the project cause any utility disruptions?

The Kirkland Nickel Project will have temporary and minor effects on utilities; any probable utility conflicts will be resolved, typically by relocation of the utility prior to construction. Relocation will be at the expense of the utility operator. All known utilities in the project right of way operate under an agreement with WSDOT that allows for their relocation at the expense of the utility provider.

Utility relocation in the project area

Will construction activities affect the area?

How construction activities will affect neighbors and commuters is always a concern of WSDOT. However, effects on services are expected to be minor during construction of the Kirkland Nickel Project. Travelers through the area can expect minor delays; transit, school buses, and emergency response vehicles may also experience temporary route detours during some construction phases.

What measures are proposed to avoid or minimize effects to public services and utilities during construction?

WSDOT will coordinate several efforts with the contractor prior to and during construction of the project. These efforts will ensure that:

- The contractor will prepare and implement a traffic management plan (TMP). Signs will be posted to show detour routes if periods of closure are needed.
- Coordination with the school districts will occur before construction. The TMP will be implemented and coordinated with all emergency services providers prior to any construction activity.
- Coordination with utility service providers will identify conflicts and resolve them prior to or during construction.
- Prior to removal of the park-and-ride facility at NE 116th Street and 112th Avenue NE, signs will be posted at the lot to announce closure, and the location of nearby lots will be identified.
- Potential utility conflicts within WSDOT right of way will be relocated at the utility's expense prior to construction.

5.7 Visual Quality

When a person views the environment during an everyday commute or on a first-time trip to the city, the visual characteristics strongly influence responses—positive and negative. Research has shown that most people will generally agree on which views have high or low visual quality. This chapter describes how WSDOT studied the visual quality of the Kirkland Nickel Project area and examined how construction and operations will affect the views found within these local communities.

NE 160th Street southbound on-ramp

How were visual resources identified and evaluated for the project?

WSDOT conducted a visual impact assessment that evaluated both negative and positive visual effects of the project on the area's visual resources. These visual resources were identified based on a field reconnaissance of the I-405 Corridor, review of existing aerial photographs and review of proposed design plans for the project. The visual resources were evaluated using a subjective evaluation of three criteria: vividness, intactness, and unity. These "artistic" criteria are prominent in landscapes perceived as having high visual quality. Proposed project improvements were then incorporated into the views looking toward and from I-405 to determine visual quality after project construction. The visual effects were based on the degree of change between the existing visual quality and the visual.

Please refer to the Kirkland Nickel Project Visual Quality Discipline Report in Appendix P (on CD) for a complete discussion of visual qualityy analysis.

What are the visual resources located in the project area?

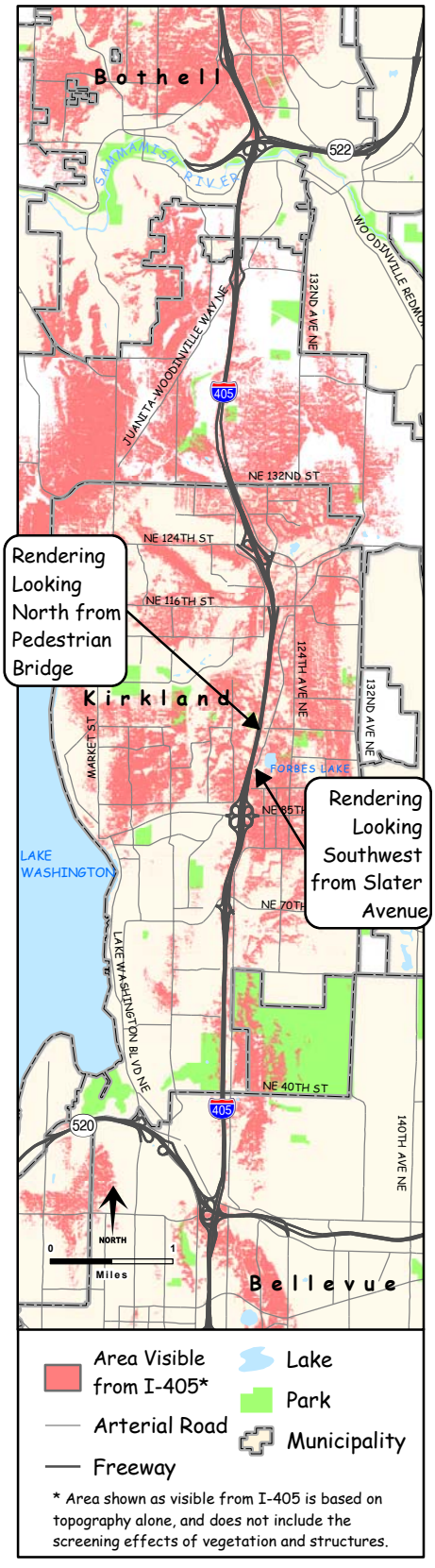
The Kirkland Nickel Project consists of an urban and suburban landscape with some roadside elements of natural vegetation providing isolated wooded landscape elements. Much of the right of way between interchanges has trees and other vegetation along the right of way. Generally, the land on either side of I-405 is developed as single-family residential neighborhoods interspersed with parks, schools, and churches. In many areas, houses and/or apartment buildings directly abut the I-405 right of way. The areas around the

How is visual quality determined?

The project team determined the visual quality of existing views using three criteria.

- Vividness is the memorability of landscape components as they combine in striking and distinctive visual patterns.
- Intactness is the visual integrity of the natural and human landscape and its freedom from encroaching elements.
- Unity is the visual coherence and compositional harmony of the landscape considered as a whole (FHWA, 1981).

Exhibit 5-22
Area Visible from I-405



interchanges are typically developed with a mix of commercial and light industrial land uses as well as multi-family residences.

The existing viewshed[1] is the area visible from I-405 (see Exhibit 5-22). Evaluators considered how the Kirkland Nickel Project will affect views looking from I-405 and toward I-405.

Currently, vegetation and structures screen many views looking both from and toward I-405. Vegetation along the right of way, particularly trees, provides an important visual screen between the roadway and adjacent lands. Visibility also decreases with distance. The freeway is visible from some locations near the roadway on cross streets, and there is greater visibility at the interchanges.

How will people be affected by visual changes as a result of the project?

Both roadway users and neighbors will experience changes in the visual resources in the vicinity of the I-405 and NE 116th Street interchange, which will be reconfigured and reconstructed. However, the widening of NE 116th Street and the reconfiguration of the interchange do not represent a substantial change to the existing landscape of commercial strip development and light industrial uses near the interchange.

I-405 users

Freeway users will experience minor changes in their visual environment as a result of the project. Exhibit 5-23 shows how the freeway will likely look to a freeway user at I-405 northbound at NE 100th Street. The effects on visual quality will include slight increases in urbanization and encroachment, e.g., additional pavement, traffic lanes, signs, and other transportation-related structures. Further, some of the existing roadside vegetation, including many medium to large trees, will be cleared for construction.

[1] The landscape that can be directly seen from a viewpoint or along a transportation corridor

The project includes provisions for maintaining the natural vegetation in areas where construction will not be occurring, and planting new vegetation to buffer constructed elements. Overall, the effect on freeway users will be low.

I-405 neighbors

The Kirkland Nickel Project will not affect the visual quality experienced by most I-405 neighbors. Roadway facilities are not visible from most of the surrounding neighborhoods; where they can be seen, a noise wall is usually the structure that is visible. Exhibit 5-24 shows how the freeway will look to neighbors on Slater Avenue NE where the noise wall will be moved to the edge of the right of way. Overall, few neighbors will experience noticeable changes in the visual environment.

How will project construction activities affect views?

Removing vegetation will create temporary effects on I-405 users and neighbors during construction, increasing visibility looking toward and away from the freeway. In addition, the necessary construction equipment, barricades, lights, and signs will add complexity to what freeway users and some neighbors will see.

What measures are proposed to avoid or minimize effects to visual quality during construction?

- The contractor will follow the I-405 Context Sensitive Solutions (CSS) criteria being developed. Where local terrain and placement of light poles allow, the contractor will reduce light and glare effects by shielding roadway lighting and using downcast lighting so light sources will not be directly visible from residential areas and local streets.
- The contractor will restore (revegetate) construction areas in phases rather than waiting for the entire project to be completed.

Exhibit 5-23
I-405 at NE 100th Street, looking north from pedestrian bridge

Before

After

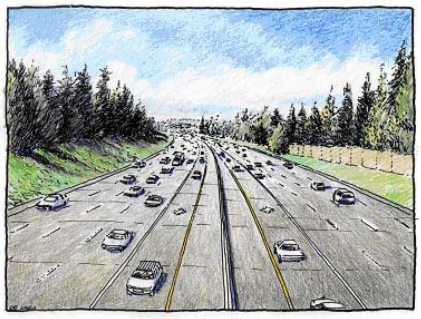


Exhibit 5-24
Looking southwest from Slater Avenue NE

Before

After