CHAPTER 5 EFFECTS OF THE PROJECT

This chapter examines the potential effects of the I-405, NE 8th Street to SR 520 Improvement Project on people and the environment. To determine these effects, the I-405 Team conducted 14 different studies and documented their analyses in discipline reports and technical memoranda. These studies were used to develop the effects evaluation presented in this chapter.

Existing I-405/NE 8th Street Interchange

How did WSDOT evaluate effects on the environment?

The WSDOT project team prepared the following discipline reports and technical memoranda. The complete reports (listed below in alphabetical order) are found in Appendices B through O on a compact disk included with this environmental assessment.

- Air Quality (Appendix B)
- Cumulative Effects Analysis (Appendix C)
- Economics (Appendix D)
- Ecosystems (Appendix E)
- Geology and Soils (Appendix F)
- Hazardous Materials (Appendix G)
- Historic, Cultural, and Archaeological Resources (Appendix H)
- Land Use Patterns, Plans, and Policies (Appendix I)
- Noise and Vibration (Appendix J)
- Section 4(f) Resources (Appendix K)
- Social, Public Services, Utilities, and Environmental Justice (Appendix L)
- Transportation (Appendix M)
- Visual Quality (Appendix N)
- Water Resources (Appendix O)

These topics follow guidelines from the National Environmental Policy Act (NEPA) and provide information that satisfies numerous federal, state, and local regulations as described below under *What federal, state, and local laws and regulations govern this project?*

The study area for each discipline report or technical memorandum varied according to the type of resource being

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 element of the overall environment, and provides strategies to avoid or minimize adverse effects to that environment.

What is a technical memorandum?

A technical memorandum fulfills the same role as a discipline report but in a more succinct manner.

evaluated and the potential extent of effects that could result from construction and operation of the project. For example, the analysis of recreational facilities as evaluated in Section 4(f) required WSDOT to collect data on parks within one-quarter mile of the I-405 and SR 520 right-of-way. To assess effects on social characteristics, WSDOT used Census information and the Puget Sound Regional Council's (PSRC) Forecast Analysis Zone data, because these data cover a wider geographic area around I-405 and SR 520.

How did WSDOT use environmental information to improve this project?

What are potential effects?

Potential effects are changes (positive or negative) that could occur as a result of a proposed action. The effects may be ecological, aesthetic, historic, cultural, economic or social. Examples of potential effects include encroachment on wildlife habitat from widening a roadway, improvement of water quality from additional stormwater treatment, and increased noise levels from traffic flow.

Our project team collected data on existing environmental resources, identified places where project construction could have an effect on the environment, and then modified the design to reduce these effects. For example, to reduce effects on wetlands, we overlaid wetland data on the preliminary design plans and made adjustments in the roadway alignment, roadside slopes, and location of stormwater facilities. Our team also made several field visits to examine ways to avoid or minimize effects on streams. We made similar efforts to reduce or avoid adverse effects on visual quality, upland vegetation, noise, and other elements of the environment.

Did some environmental topics show only negligible effects?

After making preliminary design modifications to minimize or avoid effects, we concluded there would be no adverse effects or only negligible adverse effects for some of the disciplines evaluated. These conclusions are summarized below.

Air Quality: Dust and odors may be present during construction, but these effects will be minor and temporary. The project will have no negative effects on regional air quality during operation and will be in compliance with National Ambient Air Quality Standards and Mobile Source Air Toxics requirements.

Cumulative Effects: The cumulative effects analysis focused on air quality, surface water, fish and aquatic resources, and wetlands. This project, in conjunction with other nearby projects, is not expected to have an adverse cumulative effect on any of these resources. The air quality analysis, which is based on traffic forecasts, indicated that carbon monoxide

(CO) levels would be maintained or decreased from existing levels, and no violations of air quality standards would occur. Additionally, analyses indicated that the project's effect on surface water, fish and aquatic resources, and wetlands would be minimal because avoidance and minimization measures, current design requirements, and standard construction practices that protect the environment will be used. Analyses also found that enhanced or retrofitted water quality treatment and/or reduced impervious area (provided by this project and to the extent provided by other projects) would maintain or improve water quality.

Environmental Justice: Project construction will have minor, temporary effects, such as higher noise levels, dust, decreased visual quality, and traffic diversions and delays that could affect people living in, working in, and traveling through the study area. The project will displace some residents and businesses. One of the businesses, a human services provider that serves low-income women, will be relocated within the same neighborhood. The completed project will increase noise levels and change visual quality for some residents. The project will benefit the area population by reducing congestion and improving operations on I-405 and SR 520, and by improving local access to these freeways. Both the positive and negative effects of the project will be experienced equitably by the general public and minority and low-income populations. As such, the project will not have disproportionately high or adverse effects on minority and/or low-income populations.

Geology and Soils: Some of the project improvements are located in geologic hazard areas, including erosion, steep slope, seismic, and soft ground hazard areas. These hazards will be taken into account and planned for accordingly during project design and construction. Once construction is complete and the highway is in use, the project will have no further effects on geology and soils.

Hazardous Materials: Ten properties within the study area either had at one time or still have hazardous materials on site. Most of these sites have been cleaned up or are in the process of being cleaned up. The contamination on these sites is primarily petroleum-contaminated soil and groundwater from underground storage tanks. No substantially contaminated sites are located in the study area. WSDOT will comply with

all applicable environmental rules and regulations, the I-405 Corridor EIS Programmatic Commitments, and the I-405 Corridor Program Record of Decision during project construction. Therefore, the effects from hazardous materials are expected to be few, if any.

Historic, Cultural, and Archaeological Resources: No previously recorded or new archaeological sites were identified in the project's Area of Potential Effects. No historic resources eligible for listing on the National Register of Historic Places were identified. No effects on any historic resources are expected to result from project construction and operation. WSDOT has an Unanticipated Discovery Plan that outlines procedures to be followed in the unlikely event that potential historic properties or human skeletal remains are discovered during construction.

Land Use Patterns, Plans, and Policies: Project construction will result in temporary effects on existing land uses, such as changes to access resulting from detours, partial and total roadway closures, and noise and dust effects associated with construction activities. These effects are expected to be minor, however. The project would permanently convert about 4 acres of private property to public right-of-way, including three residences, 61 businesses, and property currently used for retail access and parking. These acquisitions will not affect the overall existing land use pattern in this area. The project is consistent with City of Bellevue policies, plans, and regulations.

Section 4(f): Section 4(f) resources include publicly owned parks and recreation resources, historic sites, and waterfowl or wildlife refuges. There are 11 publicly owned parks in the study area. No other Section 4(f) resources are present. The project will not require acquisition of any Section 4(f) resource lands, will not impose any temporary use on resource lands, and will have no constructive use effects on any of the identified Section 4(f) resources.

What federal, state, and local laws and regulations govern this project?

The laws and regulations listed in Exhibit 5-1 provide the legal framework for the I-405, NE 8th Street to SR 520 Improvement Project EA. These interrelated laws and regulations give us

thresholds for evaluating how a transportation project might affect each resource and guide our responses.

Exhibit 5-1: Regulatory Framework

Statutes/Regulations/Ordinances	Discipline Reports
Federal	
42 USC 4231 and 40 CFR 1500-1508 National Environmental Policy Act - promotes the desire for a sustainable environment balanced with other essential needs of the present and future. Established a supplemental mandate for federal agencies to consider potential environmental consequences of proposals and to provide the public an opportunity to comment prior to implementation.	All
16 USC 470 (Section 106 National Historic Preservation Act) – requires federal agencies to take into account the effects of their undertakings on historic or potential historic properties, and afford the Advisory Council on Historic Preservation an opportunity to comment.	Social, Public Services, Utilities, and Environmental Justice; Cultural Resources
49 USC 303 Section 4(f) of 1966 DOT Act – preserves the beauty and integrity of public parks and recreation areas, waterfowl and wildlife refuges, and historic sites considered to have national, state, or local significance.	Section 4(f) Resources; Social, Public Services, Utilities, and Environmental Justice
23 USC 109(h) Federal Aid Highway Act – calls for uniform interstate design standards to accommodate traffic forecast in the future 20 years.	Transportation, Social, Public Services, Utilities; and Environmental Justice; Economics
23 USC 128 Highways – provides the community an opportunity for a public hearing at or near the project.	Social, Public Services, Utilities, and Environmental Justice; Economics
23 USC CFR 771 FHWA Right-of-Way and Environment – provides requirements to FHWA to implement NEPA for highway projects.	All
42 USC Safe Water Drinking Act – protects public health by regulating the public drinking water supply including its sources.	Transportation; Geology and Soils; Hazardous Materials
33 USC 1251 Clean Water Act – mandates the identification and protection of waters in each state. Makes it unlawful for any person to discharge pollutants from a point source into navigable waters, unless a permit is obtained.	Water Resources; Ecosystems; Geology and Soils; Cumulative Effects
Endangered Species Act of 1973 – provides for the conservation of endangered and threatened species of fish, wildlife, and plants.	Ecosystems; Cumulative Effects
33 USC 401 (Section 10) Rivers and Harbors Act – provides the process for approvals to construct any bridge, causeway, dam, or dike over or in any port, harbor, canal, navigable river, or other navigable water of the United States.	Ecosystems; Cumulative Effects
16 USC 1451 Coastal Zone Management Act – preserves, protects, develops, and where possible, restores or enhances the resources of the nation's coastal zone.	Ecosystems; Cumulative Effects
15 CFR 923 to 940 Regulations for Coastal Zone Management – requires states to develop a management program that identifies and evaluates coastal resources in need of management or protection by the state.	Ecosystems; Cumulative Effects
16 USC 703-712 Migratory Bird Treaty Act – makes taking, killing, or possessing migratory birds unlawful.	Ecosystems

Exhibit 5-1: Regulatory Framework

Statutes/Regulations/Ordinances	Discipline Reports
16 USC 668a-d Bald and Golden Eagle Protection Act – prohibits any form of possession or taking of bald and golden eagles.	Ecosystems
42 USC 4905-4913 Noise Control Acts – intends an environment free from noise that jeopardizes health or welfare.	Noise and Vibration
23 CFR 772 Noise Abatement – provides procedures for noise studies and noise abatement measures to help protect the public health and welfare, supplies noise abatement criteria, and establishes requirements for information to be given to local officials for use in the planning and design of highways.	Noise and Vibration
42 USC 103 Comprehensive Environmental Response, Compensation, and Liability Act – Superfund Cleanup – addresses abandoned, accidentally spilled, or illegally dumped hazardous waste that pose current or future threats to human health or the environment.	Hazardous Materials
40 CFR Resource Conservation and Recovery Act – provides procedures and standards for hazardous/chemical waste management.	Hazardous Materials
42 USC 7401 Clean Air Act – sets national pollution control standards; allows individual states to have stronger pollution controls.	Air Quality; Cumulative Effects
23 CFR Reimbursement for Utility Relocation - – allows for reimbursement for payment of costs incurred under all Federal Highway Administration (FHWA) utility agreements.	Social, Public Services, Utilities, and Environmental Justice
45 CFR 91 Age Discrimination Act – prohibits discrimination on the basis of age in programs or activities receiving federal financial assistance. The Age Discrimination Act applies to persons of all ages.	Social, Public Services, Utilities, and Environmental Justice
N-4720.6 Civil Rights Restoration Act – prohibits discrimination throughout an entire agency if any part of the agency receives federal financial assistance.	Social, Public Services, Utilities, and Environmental Justice
29 USC Section 504 Rehabilitation Act – prohibits an "otherwise qualified handicapped individual" to be excluded from participation in a program or activity receiving federal financial assistance.	Social, Public Services, Utilities, and Environmental Justice
49 CFR American Disabilities Act – prohibits discrimination and ensures equal opportunity for persons with disabilities in employment, state and local government services, public accommodations, commercial facilities, and transportation.	Social, Public Services, Utilities, and Environmental Justice
42 USC 2000(d) Title VI of Civil Rights Act – prohibits discrimination on the basis of race, color, and national origin in programs and activities receiving federal financial assistance.	Social, Public Services, Utilities, and Environmental Justice
PL 91-646, as amended Uniform Relocation Assistance and Real Property Acquisition Act – assures that the unique circumstances of any displaced person are taken into account and that persons in essentially similar circumstances are accorded equal treatment.	Social, Public Services, Utilities, and Environmental Justice; Economics
President's Executive Order 11990 Wetlands Protection – prohibits adverse effects associated with the destruction or modification of wetlands and new construction in wetlands, wherever practicable.	Ecosystems; Cumulative Effects
U.S. DOT Order 56601A Wetlands – requires federal and state agencies to avoid the adverse effects associated with the destruction or modification of wetlands.	Ecosystems; Cumulative Effects

Exhibit 5-1: Regulatory Framework

Statutes/Regulations/Ordinances	Discipline Reports
President's Executive Order 11988 Floodplain Management – requires federal agencies to avoid to the extent possible the long and short-term adverse effects associated with the occupancy and modification of floodplains and to avoid direct and indirect support of floodplain development where there is a practicable alternative.	Water Resources
President's Executive Order 12898 Environmental Justice – requires each federal agency to identify and address disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations.	Social, Public Services, Utilities, and Environmental Justice
President's Executive Order 13166 Improving Access for those with Limited English Proficiency – requires federal agencies to examine the services they provide, identify any need for services to those with limited English proficiency (LEP), and develop and implement a system to provide access to those services.	Social, Public Services, Utilities, and Environmental Justice
State	
Chapter 197-11 and Chapter 468-12 WAC State Environmental Policy Act – requires the state and local agencies to consider the likely environmental consequence of a proposal before approving or denying the proposal.	Noise and Vibration; Ecosystems; Geology and Soils; Visual Quality; Social, Public Services, Utilities, and Environmental Justice; Land Use Patterns, Plans, and Policies; Cultural Resources
Chapter 70-107 RCW Noise Control – provides the state statutory authority for establishing maximum noise levels permissible in identified environments, and thereby provides use standards relating to the reception of noise within such environments.	Noise and Vibration
RCW 47.40.010 Roadside Improvement and Beautification – declares as a proper highway purpose, the planting and cultivating of any shrubs, trees, hedges, or other domestic or native ornamental growth, the improvement of roadside facilities and view points, and the correction of unsightly conditions, upon the right-of-way of any state highway.	Visual Quality
Chapter 36.70 RCW Growth Strategies Act – guides and regulates the physical development of a county or region through connecting both public and private projects and coordinates their execution.	Land Use Patterns, Plans, and Policies
RCW 36.70A.070 as amended Growth Management Act – guides the development and adoption of comprehensive plans and development regulations for counties and cities.	Ecosystems; Geology and Soils; Land Use Patterns, Plans, and Policies; Cumulative Effects
Chapter 90.48 RCW Water Pollution Control Act – requires the use of all known, available, and reasonable methods by industries and others to prevent and control the pollution of the waters of the State of Washington.	Water Resources; Ecosystems; Geology and Soils; Cumulative Effects
Chapter 173-200 WAC Ground Water Quality Standards – establishes water quality standards for groundwater and applies to all groundwaters of the state that occur in a saturated zone or stratum beneath the surface of land or below a surface water body.	Geology and Soils
Chapter 173-201A WAC Surface Water Quality Standards – establishes water quality standards for surface waters of the State of Washington consistent with public health and public enjoyment of the waters and the propagation and protection of fish, shellfish, and wildlife.	Water Resources; Ecosystems; Cumulative Effects

Exhibit 5-1: Regulatory Framework

Statutes/Regulations/Ordinances	Discipline Reports
Chapter 220-110 WAC Hydraulic Code – establishes regulations for the construction of hydraulic project(s) or performance of other work that will use, divert, obstruct, or change the natural flow or bed of any of the salt or fresh waters of the state, and sets forth procedures for obtaining a hydraulic project approval (HPA).	Water Resources; Ecosystems; Cumulative Effects
Chapter 246-290 WAC Public Water Supplies – defines basic regulatory requirements that protect the health of consumers using public drinking water supplies.	Geology and Soils
WAC 232-12-292 Washington State Bald Eagle Protection Rules – protects and maintains the bald eagle population so that the species is not classified as threatened, endangered, or sensitive in Washington State. Rules promote cooperative efforts to manage eagle habitat needs through a process which is sensitive to landowner goals as well.	Ecosystems
Chapter 90.58 RCW Shoreline Management Act – adopts guidelines for local governments when developing master programs for shorelines of statewide significance.	Ecosystems; Cumulative Effects
Chapter 47.44 RCW Franchises – requires rules to be adopted to provide for a hearing or an opportunity for a hearing with respect to any franchise application involving the construction and maintenance of utilities or other facilities within the highway right-of-way.	Social, Public Services, Utilities, and Environmental Justice
Chapter 468.34 WAC Utility Franchises and Permits – provides the application requirements for franchises and permits.	Social, Public Services, Utilities, and Environmental Justice
Chapter 70-105 RCW Hazardous Waste Management Act – establishes a comprehensive statewide framework for the planning, regulation, control, and management of hazardous waste. The intention of this framework is to prevent pollution and conserve resources of the state.	Hazardous Materials
Chapter 173-303 WAC Dangerous Waste – implements the Hazardous Waste Management Act and provides processes and standards for management of dangerous and extremely hazardous waste.	Hazardous Materials
Chapter 173-360 WAC Underground Storage Tank – addresses the threat posed to human health and the environment by leaking underground storage systems containing petroleum and other regulated substances.	Hazardous Materials
Chapter 70.105D RCW Model Toxics Control Act – raises sufficient funds to clean up all hazardous waste sites and to prevent the creation of future hazards due to improper disposal of toxic wastes into the state's lands and waters.	Geology and Soils; Hazardous Materials
Chapter 173-340 WAC Model Toxics Control Act – addresses the releases of hazardous substances caused by past activities.	Geology and Soils; Hazardous Materials
Chapter 173-326 WAC Commercial Low-level Radioactive Waste – institutes a user permit system and issues site use permits for generators, packagers, or brokers using the Hanford low-level radioactive waste disposal facility.	Hazardous Materials
Governor's Executive Order 89-10 (Protection of Wetlands) – stated goals of the order are no net loss in function and acreage of existing wetlands and an increase in the quality and quantity of wetlands.	Ecosystems; Cumulative Effects
Governor's Executive Order 90-04 Protection of Wetlands – requires rigorous enforcement of agencies' authority to assure wetlands are protected.	Ecosystems; Cumulative Effects

Exhibit 5-1: Regulatory Framework

Statutes/Regulations/Ordinances	Discipline Reports
Governor's Executive Order 93-07 Commitment to Diversity and Equity in Service Delivery and in the Communities of the State – directs all executive agencies and institutions of higher education to initiate actions to integrate the principles of diversity into all facets of workplace community and in the delivery of services to the people of Washington. Reaffirms the commitment to the elimination of all barriers to employment that artificially restrict hiring, promotion, recruitment, and tenure on the basis of any physical, cultural, religious, language, or other status that is not directly related to the performance of a job.	Social, Public Services, Utilities, and Environmental Justice
WSDOT Highway Runoff Manual – guides WSDOT, engineering consultants, and many local agencies in design of stormwater systems for transportation projects.	Water Resources; Cumulative Effects
Local	
Bellevue Community Code 9.12 Sanitation of Lakes and Streams – prohibits material that will cause or tend to cause a polluted condition in lakes and streams.	Water Resources; Cumulative Effects
Bellevue Community Code 20.25H Critical Areas Overlay District – provides requirements for development and activity within critical areas including streams, wetlands, geologic hazards, and special flood hazards.	Water Resources; Geology and Soils; Cumulative Effects
King County Code 20.62 King County Landmarks – protects, enhances, and perpetuates the use of buildings, sites, districts, structures, and objects of historical, cultural, architectural, engineering, geographic, ethnic, and archaeological significance located in King County.	Section 4(f) Resources

Notes:
USC = United States Code
CFR = Code of Federal Regulations
DOT = U.S. Department of Transportation
WAC = Washington Administrative Code
RCW = Regulatory Code of Washington

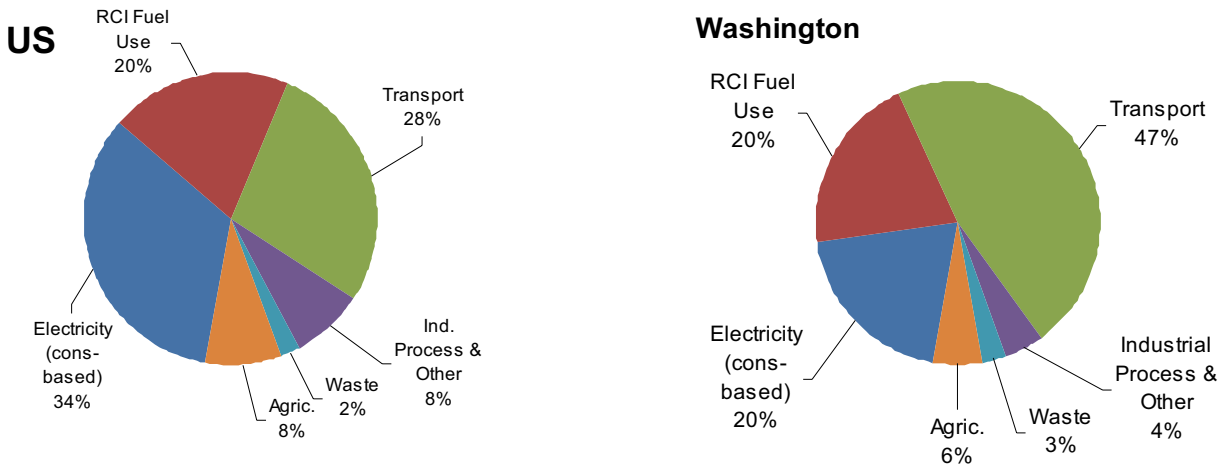
What efforts are underway to reduce greenhouse gas emissions?

Climate-changing greenhouse gases (GHGs) come in several forms. The gases associated with transportation are water vapor, carbon dioxide (CO_2), methane (also known as marsh gas), and nitric oxide (found in dentists' offices as laughing gas). CO_2 makes up the bulk of the emissions from transportation and are the focus of this evaluation. Any process that burns fossil fuel releases carbon dioxide into the air. Vehicles are a significant source of greenhouse gas emissions and contribute to global warming primarily through the burning of gasoline and diesel fuels.

National estimates show that the transportation sector (including on-road, construction, airplanes, and boats)

accounts for almost 30 percent or more of total domestic CO_2 emissions.[8] However, in Washington State, transportation accounts for nearly half of GHG emissions because the state relies heavily on hydropower for electricity generation unlike other states that rely on fossil fuels such as coal, petroleum, and natural gas to generate electricity. The next largest contributors to total gross GHG in Washington are fossil fuel combustion in the residential, commercial, and industrial (RCI) sectors at 20 percent; and in electricity generation facilities, also 20 percent.

Exhibit 5-2: Greenhouse Gas Emissions by Sector, 2005, US and Washington State



Source: Leading the Way: A Comprehensive Approach to Reducing Greenhouse Gases in Washington State, Washington Climate Advisory Team, 2008, page 33.

In February 2007, Governor Gregoire issued Executive Order 07-02 requiring state agencies to find ways to reduce greenhouse gas emissions and adapt to the future that climate change may create. In April 2007, the U.S. Supreme Court ruled that the U.S. Environmental Protection Agency has the

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[8] *This percentage is based on 2004 data from the International Energy Administration and is consistent with 1996 guidelines on greenhouse gas emissions calculations issued by the Intergovernmental Panel on Climate Change.*

authority to regulate greenhouse gas emissions for cars and trucks.

On May 3, 2007, the Washington Legislature passed Senate Bill 6001, which, among other things, adopted Governor Gregoire's climate change goals into state law. The law aims to achieve 1990 greenhouse gas levels by 2020, a 50 percent reduction below 1990 levels by 2030, and more by 2050.

WSDOT is part of the solution. We are aggressively pursuing strategies to address climate change and we recognize our responsibility to support the Governor's initiative. While the goals are clear, we also recognize that technical guidance and regulations to implement these goals are currently in development and will not be sufficiently determined before project environmental documentation is completed for this project.

At this time, the main way to reduce greenhouse gas emissions by transportation is to reduce the amount of fossil fuel consumed by drivers. This can be achieved by three means:

> (1) create more efficient driving conditions (for example, reduce traffic congestion;
>
> (2) introduce more fuel-efficient vehicles; and
>
> (3) reduce the amount of driving (for example, telecommuting, using transit, carpooling, and moving goods and services more efficiently).

As a state, we have made some progress towards each of these three efforts. The Governor and Legislature funded a 16-year plan to meet Washington State's most critical transportation needs. WSDOT and our transportation partners, including city, county, and transit agencies, are in various stages of development on a specific list of projects selected by the Legislature to help move people and goods more efficiently. The revenue is invested in a three-tiered strategy designed to maximize the efficiency of the system:

- Tier 1 – Low-cost/high-return benefits from active traffic management, ramp metering, incident response combined with transportation demand management (including commute trip reduction, park-and-rides, local land use planning).

- Tier 2 – Moderate to higher cost/benefits from improvements in the road network such as adding short lanes to connect interchanges, direct-access ramps for transit and high-occupancy vehicles, and center turn lanes to allow better traffic flow.
- Tier 3 – Higher-cost/corridor-wide benefits from major investments in high-occupancy vehicle (HOV) lanes, high-occupancy tolled (HOT) lanes, transit, commuter rail, general-purpose roadway lanes, interchange modifications, and bus access.

Many of our local, regional, and statewide transportation system improvements and ongoing programs will help to reduce the number of miles that vehicles need to travel each year (typically referred to as vehicle miles traveled, or VMT).[9] In addition, the Governor and Legislature are actively working toward related improvements in land use decision-making and more efficient transportation technology. In 2005 and 2007, the State Legislature mandated vehicles sold in Washington starting with 2009 model years meet updated California emission standards. The new vehicle standards will reduce greenhouse gas emissions and help reduce carbon monoxide and ozone pollutants. Researchers are also working to reduce the carbon content of motor fuel for the future.

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[9] *VMT is typically defined as the number of miles that an average vehicle is estimated to drive each year. However, for transportation projects with set boundaries, VMT can also refer to the aggregate number of miles that all the vehicles travel using the specific roadway use within the specific project area. Per person (or per capita) VMT in Washington is stable at 9,000 miles per person since the 1980s, meaning the number of vehicle miles has grown at roughly the same pace as the number of new residents. Methods of reducing VMT typically target transferring trips from single-occupant vehicles to multiple-person vehicles like carpools, vanpools, and transit.*

5.1 Transportation

The project is not expected to result in substantial, unavoidable, adverse effects on transportation. The I-405, NE 8th Street to SR 520 Improvement Project will increase the number of vehicles able to travel though the study area, reduce travel times, and improve safety by reducing traffic conflicts and the potential for congestion-related accidents

View of a current choke point along northbound I-405 in project area

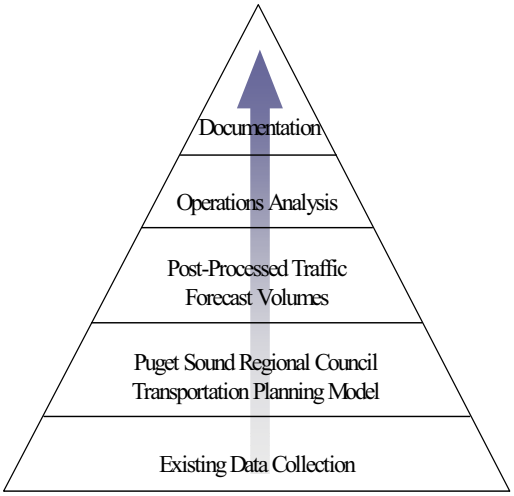
Understanding how existing traffic and transportation conditions will change along I-405 and SR 520 over time is important to commuters, freight operators, and people who live in the region. This section presents the findings of the analysis and explains the traffic conditions along these sections of I-405 and SR 520 in the future with or without the project.

Please refer to the NE 8th Street to SR 520 Improvement Project Transportation Discipline Report in Appendix M for a complete discussion of the traffic analysis.

How did WSDOT evaluate traffic and transportation data for this project?

The project team used actual year 2005 traffic volumes and predicted 2014 and 2030 traffic volumes to assess the existing and future roadway conditions throughout the study area. The actual traffic volumes for the year 2005 represent the existing conditions and came from WSDOT, City of Bellevue, and other local traffic studies. Future traffic volumes were predicted based on the PSRC four-county travel forecast model. This model predicts future freeway travel demand based on the population and employment growth projected and planned for by local jurisdiction's land use plans. The team then used VISSIM microsimulation software to evaluate the freeway and ramp traffic operations for I-405 and SR 520. To analyze the performance of freeway traffic operations, we estimated the number of vehicle trips, person trips, and travel speed. We compared freeway operations both with and without the project.

Traffic Analysis Process



Because the project will change local travel patterns, we also evaluated local street operations. We assessed whether traffic volumes would increase or decrease on local streets and evaluated the intersection level of service (LOS) and delay at 18 signalized intersections in the study area (see Appendix M).

LOS is measured in terms of average delay per vehicle. LOS values range from LOS A, indicating good operating conditions with little or no delay, to LOS F, indicating extreme congestion and long vehicle delays at the intersection (Exhibit 5-3).

Exhibit 5-3: Level of Service Criteria for Signalized Intersections

LOS	Signalized Average Delay per Vehicle (seconds)	Description
A	0 - 10	little or no delay
B	10 - 20	short delays
C	20 - 35	moderate delays
D	35 - 55	long delays
E	55 - 80	very long delays
F	>80	failure - extreme congestion

Source: Transportation Research Board, 2000.

Safety issues were evaluated based on historical accident data for I-405. We looked at the accident rate for the study area and compared it to the overall I-405 corridor. We also evaluated the number and type of accidents that have occurred in the study area to determine the potential causes.

What is traffic like now within the study area?

Northbound I-405

What is the peak hour?
The hour within the morning or afternoon when the maximum demand occurs on a given transportation facility or corridor.

For much of the day, northbound I-405 traffic slows where the NE 8th Street on-ramp traffic conflicts with traffic trying to access the ramps to SR 520. Often, the northbound I-405 general-purpose lanes flow well, but traffic in the right lanes must slow down to accommodate congestion from merging traffic. The average travel speed in the morning peak hour for northbound I-405 between NE 8th Street and SR 520 was 35 to 50 miles per hour (mph) in 2005.

In the afternoon, the traffic weaving conditions worsen because the volumes on northbound I-405 and the on-ramp from NE 8th Street are higher. The average travel speeds for this section of northbound I-405 were 20 to 35 mph during the 2005 afternoon peak hour.

Northbound I-405 traffic merging with traffic from eastbound and westbound NE 8th Street on-ramps

Southbound I-405

In the morning peak hour, southbound I-405 flows well in the study area. In 2005, traffic generally traveled 45 to 60 mph for the section of southbound I-405 from SR 520 to NE 8th Street.

In the afternoon, southbound I-405 experiences the slowest travel speeds in the study area. These slower speeds occur when congestion from the southbound I-405 bottleneck at I-90 backs up into the study area. The southbound I-405 general-purpose lanes between NE 8th Street and NE 4th Street experienced average travel speeds of 10 to 25 mph in the 2005 afternoon peak hour.

Eastbound SR 520

Eastbound SR 520 generally operates well, but traffic does slow down due to weaving traffic in the right lane between the I-405 on-ramps and the off-ramp to 124th Avenue NE. Overall, however, eastbound SR 520 had average travel speeds of 40 to 55 mph during the 2005 morning and afternoon peak hours.

Westbound SR 520

Westbound SR 520 experiences variable speeds in the study area during the morning and afternoon peak hours. Congestion occurs when queues from the Lake Washington floating bridge back up to the study area and block the flow of traffic. Additionally, the right lane of westbound SR 520 sometimes experiences congestion as traffic backs up from the off-ramps to northbound and southbound I-405.

Local Street Traffic

We selected 18 signalized intersections in the City of Bellevue for our analysis of the local street system. In the 2005 morning peak hour, two intersections operated at LOS D, and the remaining intersections operated at LOS C or better. In the afternoon peak hour, three intersections performed at LOS D and the remaining intersections performed at LOS C or better.

Safety

WSDOT conducted a high accident location (HAL) review in 2006, which identified four HALs in the study area:

- Southbound I-405 ramp to eastbound SR 520;
- Westbound SR 520 ramp to northbound I-405;

How is a high accident location (HAL) or a high accident corridor (HAC) determined?

Based on historical accident records, this is an area where an above average number of accidents occur.

- Northbound I-405 off-ramp to eastbound NE 8th Street; and
- Southbound I-405 off-ramp to westbound NE 8th Street.

There are currently no high accident corridors (HACs) in the study area.

How will the completed project affect traffic on I-405 and SR 520?

Please refer to Chapter 6 for a discussion of transportation mitigation measures during project construction and operation.

We anticipate that future population and employment growth in the region will increase freeway travel demand compared to 2005 existing conditions. The I-405, NE 8th Street to SR 520 Improvement Project will reduce congestion and improve operations on I-405, SR 520, and at the I-405/SR 520 interchange. The braided ramps will improve traffic operations by separating the weaving traffic on northbound I-405 between NE 8th Street and SR 520, and on eastbound SR 520 between I-405 and 124th Avenue NE. These improvements will allow more vehicles to travel through the study area. We do not anticipate that the project will generate new trips, but rather that traffic will shift from the local arterials to I-405 and SR 520.

The project will improve access to SR 520 and northbound I-405 by adding a new on-ramp at NE 10th Street. The project will change travel patterns in downtown Bellevue by modifying access to northbound I-405 and SR 520. The NE 8th Street on-ramp to northbound I-405 will be changed to access northbound I-405 only, not SR 520. Vehicles using northbound I-405 to travel to SR 520 will use the NE 4th Street on-ramp or the new NE 10th Street on-ramp.

Exhibit 5-4 shows a comparison of afternoon average travel speeds in the general-purpose lanes with and without the project. We forecast the average travel speeds to improve from about 35 mph to about 60 mph for northbound I-405 in the 2014 afternoon peak hour compared to the No Build Alternative. Travel speeds on eastbound SR 520 and westbound SR 520 will also improve. However, westbound SR 520 will still experience the slowest average travel speeds in the study area during the 2014 afternoon peak hour. Traffic will back up from the Lake Washington floating bridge to the study area and block the flow of traffic. The project will not improve travel times on southbound I-405. We forecast that both the Build Alternative and the No Build Alternative will

have average general-purpose lane travel speeds of 15 to 30 mph.

How will the completed project affect local arterials and streets?

In the 2014 morning and afternoon peak hours, we anticipate that all of the study intersections will perform at LOS D or better with or without the project. The NE 8th Street on-ramp to northbound I-405 will be changed to access northbound I-405 only, and a new NE 10th Street on-ramp to SR 520 will be constructed. As a result there will be less traffic on NE 4th Street, NE 8th Street, and NE 12th Street, but more traffic on NE 10th Street. This is because

Exhibit 5-4: Summary of Future (2014) Freeway Traffic Conditions in the Study Area during the Afternoon Peak Hour

On Northbound I-405	Without the Project	With the Project
At NE 4th to NE 8th		
Vehicles	5,250	5,600
Average Speed (mph)	20-35	45-60
At NE 8th to SR 520		
Vehicles	7,260	7,880
Average Speed (mph)	30-45	45-60
SR 520	**Without the Project**	**With the Project**
Eastbound - I-405 to 124th Avenue NE		
Vehicles	4,660	4,620
Average Speed (mph)	45-60	50-60
Westbound – 124th Avenue NE to I-405		
Vehicles	1,390	2,390
Average Speed (mph)	5-20	10-25

Source: Transportation Discipline Report.

some vehicles leaving downtown Bellevue and traveling to SR 520 will shift from the northbound I-405 on-ramps at NE 8th Street and NE 4th Street to the new NE 10th Street on-

ramp. With less traffic on NE 4th Street, NE 8th Street, and NE 12th Street, the LOS at four intersections will improve in the morning peak, and two intersections will improve in the afternoon peak. With higher traffic volumes on NE 10th Street, the LOS at one intersection will worsen in the afternoon peak. See Exhibit 5-5 for a summary of intersection LOS changes. All other study intersections will operate at the same LOS with or without the project.

Exhibit 5-5: Summary of Future (2014) Changes in Local Street Intersection Operations

	Without Project	With Project
Morning Peak		
NE 8th Street and 112th Avenue NE	D	C
NE 12th Street at 112th Avenue NE	C	B
NE 12th Street at 116th Avenue NE	C	B
Overlake Hospital main entrance and 116th Avenue NE	C	B
Afternoon Peak		
NE 4th Street and NE 116th Avenue	D	C
NE 10th Street at 112th Avenue NE	C	D
Overlake Hospital main entrance and 116th Avenue NE	C	B

How will the completed project affect freight movements?

Within the study area, the project will improve travel times on northbound I-405 and eastbound and westbound SR 520. These improvements will benefit freight movement.

How will the completed project affect safety?

Historically, most crashes on the freeway have been rear-end and sideswipe collisions related to congestion. The Build Alternative will improve safety in the study area by eliminating the weaving maneuvers and reducing stop-and-go traffic compared to the No Build Alternative.

When drivers change lanes to enter or exit the freeway at on- and off-ramps, there is a higher chance of sideswipe crashes.

Removing weaving traffic on northbound I-405 and eastbound SR 520 should reduce the associated sideswipe crashes. This will also decrease the congestion in the study area, which should lower the frequency of rear-end crashes.

The westbound SR 520 to southbound I-405 loop ramp has a design speed of only 20 mph and many vehicles using this ramp have difficulty accelerating quickly enough to merge with southbound traffic. The project will eliminate this merge by creating a dedicated lane for the traffic to enter southbound I-405 from westbound SR 520.

How will the completed project affect transit?

In general, the Build Alternative will improve freeway travel speeds for northbound I-405, eastbound SR 520, and westbound SR 520 in the study area. This will benefit transit and other HOVs traveling on these freeways. With the current No Build Alternative configuration, King County Metro bus routes 232 and 272, and Sound Transit routes 555, 556, 564, and 565 use NE 8th Street to access SR 520 via northbound I-405. With the No Build Alternative, this section of northbound I-405 will experience congestion from weaving traffic for much of the day. With the Build Alternative, these routes will shift to the new northbound I-405 on-ramp at NE 10th Street or NE 4th Street, and enter the braided ramp to access SR 520, thus improving travel time and reliability for these bus routes.

Metro route 167 will also benefit from the northbound I-405 braided ramps between NE 8th Street and SR 520. Route 167 starts in Renton, travels on northbound I-405 to the study area, then travels west on SR 520 to Seattle. This route will improve travel time by using the braided ramps to access SR 520.

How will the completed project affect bicycle and pedestrian facilities?

The project will improve bicycle and pedestrian facilities by constructing bicycle lanes and 12-foot-wide sidewalks along NE 12th Street between 112th Avenue NE and 116th Avenue NE. The City of Bellevue's Pedestrian and Bicycle Transportation Plan identifies the NE 12th Street/Bel-Red Road corridor as a primary bicycle route with bicycle lanes on both sides of the street. The addition of bicycle lanes on NE 12th Street between 112th Avenue NE and 116th Avenue NE

will be an important step towards achieving this plan. Otherwise the project will not have any long-term effects on bicycle or pedestrian facilities.

How will travel be affected during construction?

Temporary lane closures and lane shifts could affect travel during construction. We will coordinate with the city of Bellevue regarding closures of NE 12th Street over I-405 while the existing bridge is removed and replaced. Other arterials will be closed or realigned while the overhead SR 520 work occurs. These roads are:

- Northup Way at 120th Avenue NE;
- 116th Avenue NE underneath SR 520; and
- 130th Avenue NE underneath SR 520.

We anticipate that the traffic effects of these closures will be localized in the immediate Bellevue area. We anticipate full freeway closures will be required at limited times to shift traffic between phases of construction or during the replacement of the bridge across I-405 at NE 12th Street. WSDOT will coordinate with local agencies to prepare a Traffic Management Plan prior to lane closures or making any traffic flow changes.

Construction trucks carrying dirt to and from excavation sites will also affect local Bellevue streets and the freeways. The primary excavation sites will be:

- Along the shoulder on the east side of northbound I-405 between NE 8th Street and SR 520;
- In the median of SR 520 in the vicinity of 124th Avenue NE;
- Along the southern shoulder of eastbound SR 520 under I-405; and
- At stormwater pond sites in the vicinity of the NE 8th Street interchange, SR 520 interchange, and 124th Avenue NE off-ramp.

The primary fill site will be on the south side of SR 520 between 116th Avenue NE and 124th Avenue NE. The truck routes will be determined in the traffic management plan.

What would traffic be like if WSDOT did not build this project?

Without the project, traffic demand on I-405 and SR 520 would continue to increase. By 2014, periods of traffic congestion would increase and travel speeds would generally decrease compared to existing conditions. More drivers would choose to bypass the congestion at the I-405 and SR 520 interchange and use the local streets as an alternate route to avoid congestion and accidents that currently occur. This detour would most likely be chosen by drivers leaving the downtown Bellevue area to travel to locations east and west on SR 520.

Without the project, we forecast that the section of northbound I-405 from NE 4th Street to NE 8th Street would have average travel speeds of 20 to 35 mph during the 2014 afternoon peak hour, and westbound SR 520 would have average travel speeds of 5 to 20 mph during the 2014 afternoon peak hour. Traffic volumes would be most constrained in the year 2030 and beyond. See Appendix M for the results of the 2030 analysis. As traffic volumes increase, weaving and congestion-related accidents will also increase in the study area.

5.2 Noise and Vibration

The project is not expected to result in substantial, unavoidable, adverse effects on noise and vibration. With the project, noise levels will stay the same, decrease, or slightly increase for residents in the study area by the year 2030. An existing noise barrier will be relocated as part of the project. With the relocated barrier, noise levels will not change for residents who currently benefit from the existing barrier.

Existing noise wall along northbound I-405 just south of the SR 520 interchange

Sound is an element of daily life that, when perceived as unpleasant, unwanted, or disturbingly loud, is called noise. The I-405 Team evaluated the potential effects of traffic and construction noise on public health and welfare. Federal regulations (23 CFR 772) and Federal Highway Administration Noise Abatement Criteria (NAC) require a noise analysis for projects that add new through capacity to a highway, or when a highway is realigned. This section summarizes the noise analysis that we used to determine if mitigation measures such as noise barriers are warranted to buffer noise-sensitive areas from the roadway.

Please refer to the NE 8th Street to SR 520 Improvement Project Noise and Vibration Discipline Report in Appendix J for a complete discussion of the noise and vibration analysis.

How did WSDOT evaluate noise and vibration levels for this project?

Noise levels at 45 modeling locations were predicted using the FHWA Traffic Noise Model (TNM) Version 2.5 for existing conditions and for the year 2030 with and without the project. The project team predicted noise levels for the loudest traffic hour of the day (when traffic volumes are high but not congested) to estimate worst-case noise levels. To validate that the model was working properly, the project team took actual noise measurements at 25 of the 45 modeling locations. They found measured and modeled noise levels to be reasonably close (within 0 to 2 decibels).

Once the noise data were modeled for year 2030 conditions, the noise levels were compared to the FHWA and WSDOT NAC. All noise-sensitive locations within the study area are residential, which fall under the NAC for residential areas of 67 A-weighted decibels (dBA) for hourly equivalent sound level (Leq).

What are noise abatement criteria (NAC)?

The FHWA noise abatement criteria specify exterior and interior noise levels for various land use activity categories. For residential and public use buildings or outdoor recreational areas, FHWA defines the NAC at 67 dBA for hourly equivalent sound level (Leq). WSDOT considers a noise impact to occur if predicted noise levels approach within 1 dBA of the NAC, or 66 dBA. If the NAC is approached, met, or exceeded at a noise-sensitive location, noise mitigation must be evaluated.

Construction noise was assessed using EPA reference levels. The analysis was based on noise levels from construction equipment typically used on roadway construction projects. Noise levels were assessed at various distances from the proposed area of construction. Similarly, construction vibration was evaluated based on typical vibration levels for various construction activities for potentially sensitive buildings within close proximity to the project. This analysis was conducted primarily for Overlake Hospital Medical Center and Group Health Cooperative medical facilities.

Vibration can be described in terms of displacement, velocity, or acceleration. Velocity represents the speed of motion at a given moment, and acceleration is the speed's rate of change. The human body responds to the vibration's average speed of motion (velocity). A decibel notation, VdB, is commonly used to measure this speed of motion (vibration velocity level).

How noisy is the study area?

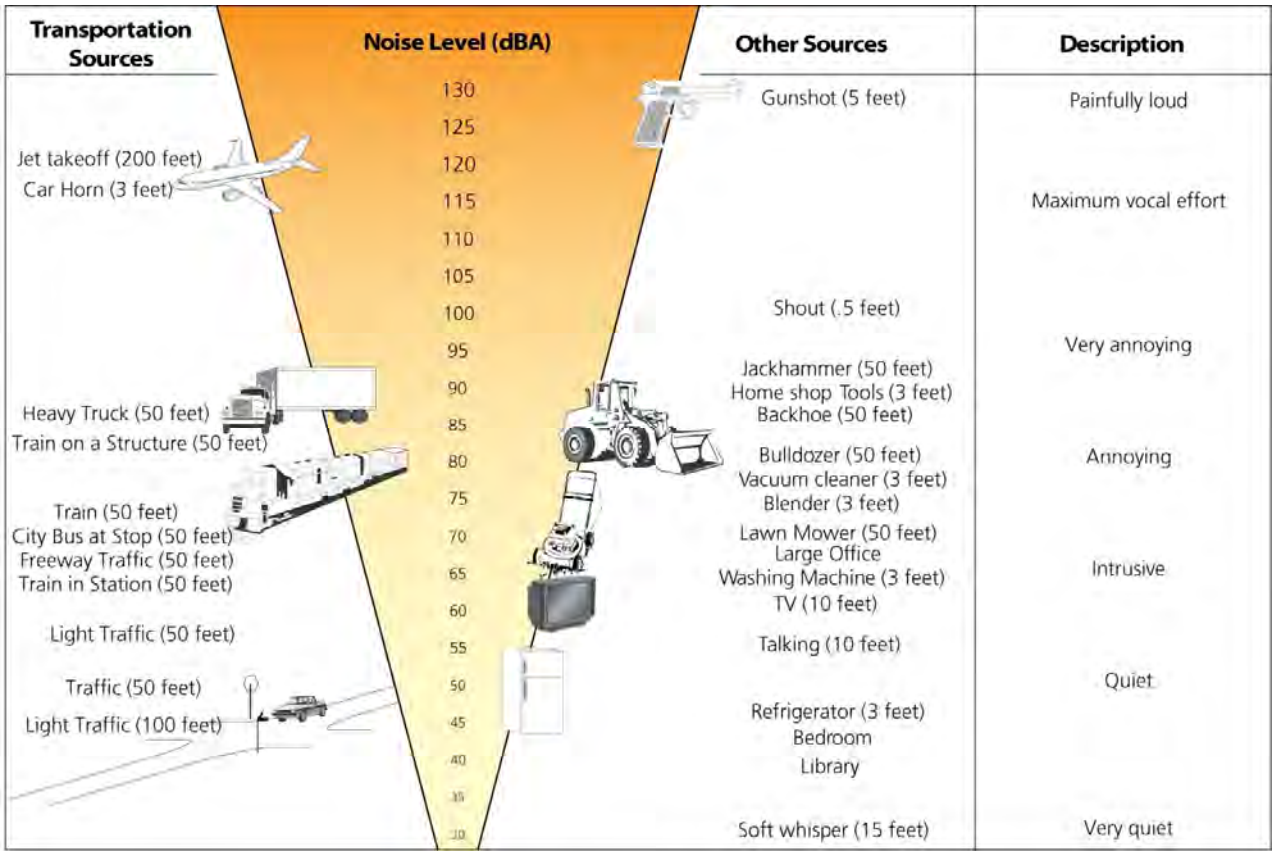
The project team used TNM to model noise levels for existing (2005) conditions in the study area, and levels ranged from 57 to 75 dBA. Exhibit 5-6 illustrates how loud these noise levels are in comparison to noise heard in daily life. Within the study area, noise levels range from suburban outdoor sound levels (50 to 60 dBA) to very noisy levels (above 70 dBA) that are typical of locations within 100 feet of a busy freeway. Modeled noise levels at approximately 107 residences currently approach, meet, or exceed the FHWA NAC of 67 dBA.

Please refer to Chapter 6 for a discussion of noise and vibration mitigation measures during project construction and operation.

How will project construction affect noise levels?

Construction activities will generate noise during the construction period. Typically, construction is carried out in stages, each with its own mix of equipment and noise characteristics.

Exhibit 5-6: Typical Noise Levels



Roadway construction involves clearing, cut and-fill (grading) activities, removing old roadways, importing and compacting fill, paving, and pile driving. The engines from trucks and construction equipment will be the most prevalent noise source at construction sites. However, construction noise will be intermittent. WSDOT will implement various mitigation measures to reduce noise effects during construction. Refer to Chapter 6 for a more detailed discussion of mitigation measures.

How will project construction affect vibration?

Heavy construction equipment and construction activities will create varying levels of vibration. The potential for minor damage to fragile structures is limited to approximately 25 feet from most construction activities and 100 feet from pile driving. Minor vibration may be felt at distances greater than 100 feet, but the construction activities will be short-lived and

there is negligible potential for damage to fragile structures at these distances.

The Overlake Hospital Medical Center and Group Health Cooperative campus east of I-405 could be affected by soil compacting operations, depending upon the type of equipment used. The Overlake Hospital Medical Center campus could also be affected during demolition of the NE 12th Street Bridge and drilling operations between NE 8th Street and NE 12th Street. The Overlake Hospital Medical Center facilities that could potentially be affected are parts of the outpatient surgery at the ground floor of the Northwest Parking Garage and the patient surgery area on the second floor of the Hospital Surgical Pavilion closest to I-405. WSDOT will prepare a vibration monitoring and mitigation plan and coordinate construction activities with adjacent property owners to minimize and avoid potential vibration-related effects, when possible (see Chapter 6 for more detail). All other construction activities will generate lower levels of vibration and will not adversely affect these facilities.

How will noise levels and vibration change after the project is completed?

Noise levels by the year 2030 with the Build Alternative were predicted to stay the same, decrease, or increase less than 3 dBA for all residences in the study area after mitigation. A 3-dBA increase is barely perceptible by the human ear.

With the project, noise levels will approach, meet, or exceed the NAC at 30 modeling locations (representative of the conditions at 137 residences), which includes the 20 modeling locations (representative of 107 residences) that currently exceed the NAC (Exhibit 5-7).

Exhibit 5-7: Numbers of Modeling Locations and Residences that Approach, Meet, or Exceed the NAC

	Modeling Locations	Residences
Existing Conditions	20	107
No Build 2030	21	123
Build 2030	30	137

Note: Four of the residences that would approach the NAC under No Build conditions would be displaced by the Build Alternative.

In places where modeled noise levels approached, met, or exceeded the NAC, we evaluated whether noise mitigation measures could reduce traffic noise substantially enough and meet the requirements for noise barrier construction. This evaluation was based on WSDOT's feasibility and reasonableness criteria. We evaluated a total of nine noise barriers for the project. Three are existing noise barriers and six are new noise barriers. One of the existing noise barriers will be removed to accommodate the new roadway alignment; this noise barrier will be relocated to the east of the new alignment. See Exhibit 5-8 for barrier locations.

What do the terms feasible and reasonable mean?

WSDOT evaluates many factors to determine whether barriers are feasible and reasonable. To be feasible, construction of the barrier must be possible in a location that achieves a noise reduction of at least 7 dBA at one or more receptors (such as residences) and must provide a reduction of at least 5 dBA at most first-row receptors.

WSDOT determines reasonableness based on how many receptors benefit by a reduction in noise of at least 3 dBA, and the barrier's cost-effectiveness.

Exhibit 5-8: Evaluated Noise Barriers

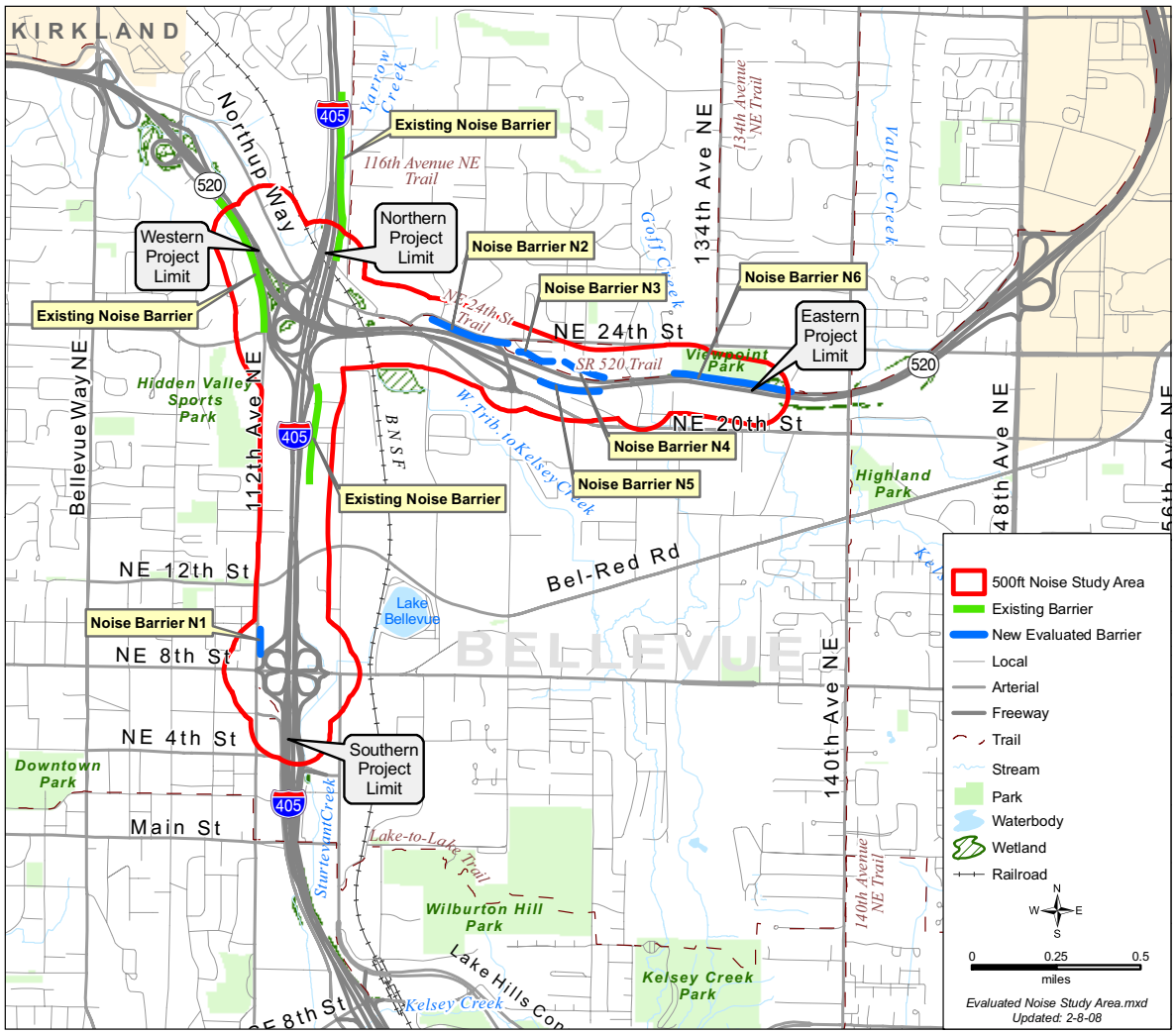
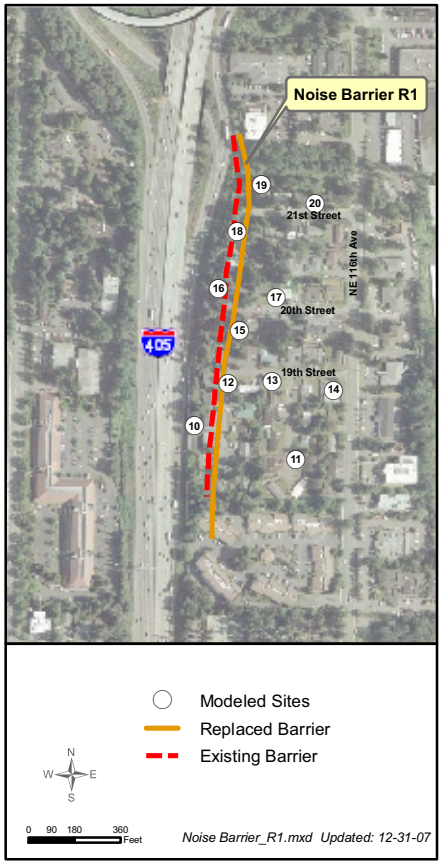


Exhibit 5-9: Relocated Noise Barrier R1



Only the relocated noise barrier, Noise Barrier R1 (Exhibit 5-9), was determined to be reasonable and feasible in reducing noise levels. The barrier is located along northbound I-405, from approximately NE 15th Street to the SR 520 interchange. This relocated noise barrier will maintain noise levels below the NAC at 17 residences that benefit from the existing noise barrier. Even with the relocated noise barrier, noise levels will approach, meet, or exceed the NAC at 99 residences located primarily along SR 520 and on the west side of I-405 at the NE 8th Street interchange.

What would noise levels be like if WSDOT did not build the project?

If the project is not built, noise levels would approach, meet, or exceed the NAC at 21 modeling locations (representative of 123 residences) by the year 2030. This includes the 20 locations (representing 107 residences) that currently approach, meet, or exceed the NAC.

5.3 Communities, Businesses, and Public Services

The project is not expected to result in substantial, unavoidable, adverse effects on communities, businesses, and public services. To construct the I-405, NE 8th Street to SR 520 Improvement Project, three households, one human service agency, and up to 61 small businesses will need to be relocated. WSDOT will provide fair compensation and relocation assistance for these people and businesses. Construction of the project will also have short-term effects on public services and utilities, and may cause temporary minor disruptions in utility service. By reducing congestion on I-405 and SR 520, the project will reduce cut-through traffic in adjacent neighborhoods, which should improve response times for emergency vehicles and access to local businesses.

Overlake Hospital Medical Center and other medical facilities are located adjacent to I-405.

Communities, neighborhoods, and businesses are the heart of an area's social identity and economic vitality. Public services and utilities provide critical services and enhance the quality of life in a community. In this chapter, WSDOT identifies communities, businesses, and the social and public services offered within the study area and evaluates how the proposed project may affect them.

Please refer to the NE 8th Street to SR 520 Improvement Project Economics Discipline Report in Appendix D; the Land Use Patterns, Plans, and Policies Discipline Report in Appendix I; and the Social, Public Services, Utilities, and Environmental Justice Discipline Report in Appendix L for a complete discussion of these analyses.

What economic and social data did WSDOT evaluate for this project?

The economic and social data included population, household, and employment statistics from the 2000 Census; forecasted population data from the Washington Office of Financial Management; income and population data from the 2005 American Community Survey; and major sources of revenue for the City of Bellevue. The social data also included statistics on race, poverty status, disabilities, English proficiency, and age for Census block groups in the study area. We also used demographic information on students enrolled in the Bellevue School District for the 2004-2005 school year to provide a more recent data source. With the help of staff from the City of Bellevue and a visual survey of the study area, we identified and mapped social resources, including community gathering

places, parks, religious institutions, and community centers. We coordinated with staff from the City of Bellevue Division of Neighborhoods to identify formally and informally organized neighborhoods in the study area.

We also developed a public involvement plan to give communities the opportunity to provide input on the project and collect information about how the project may affect people in the study area.

What communities, businesses, and services are located in the study area?

Communities

What is a subarea?

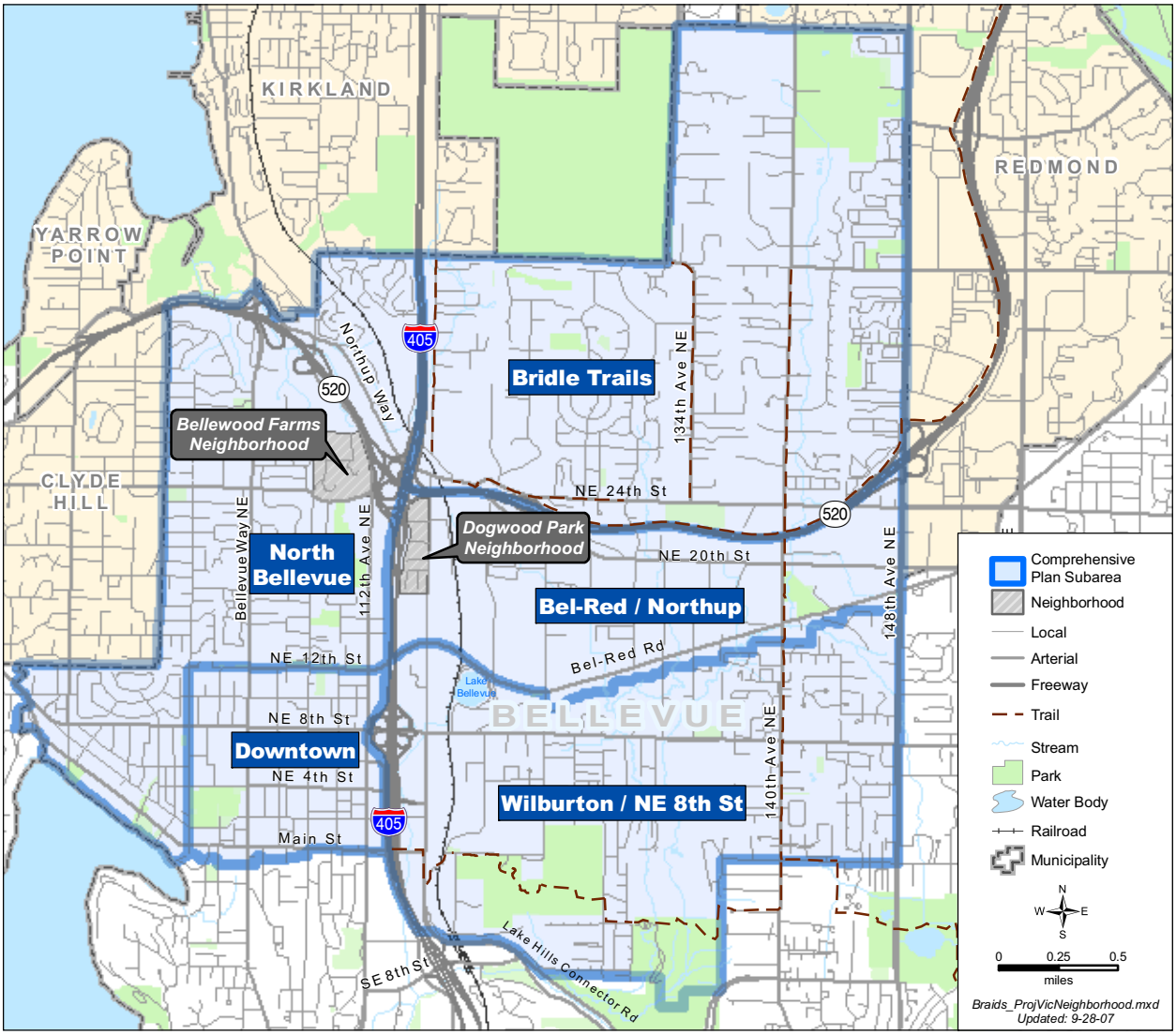
The City of Bellevue divides Bellevue into subareas for planning purposes. We identified five distinct subareas in the study area (Exhibit 5-10). Some of these subareas can be broken down further into neighborhoods.

The five subareas that encompass the study area are the Downtown, Wilburton/NE 8th Street, North Bellevue, Bridle Trails, and Bel-Red/Northrup subareas (Exhibit 5-10). They have diverse communities that have developed over a period of many decades.

The Downtown subarea is the hub of activity for the city of Bellevue, with home and office space and retail and cultural attractions. Because of its easy access to freeways, the Bel-Red/Northup subarea just southeast of the SR 520/I-405 interchange has also developed a strong commercial center with retail, wholesale, and light industrial businesses. The Bel-Red/Northup subarea includes the Dogwood Park neighborhood, which is made up of older residences built in the late 1950s.

According to the City of Bellevue Comprehensive Plan, noise and pollution from traffic on I-405, SR 520, and nearby surface streets have become increasingly intrusive on the lives of people who live in Dogwood Park. In addition, this neighborhood is currently transitioning from residential to commercial because a recent change in zoning to "commercial" allows business use in this neighborhood. Because of this, community cohesion—or access to and linkages that people in neighborhoods have with social resources and their neighbors—has declined in Dogwood Park.

Exhibit 5-10: Subareas and Neighborhoods in the Study Area



The Wilburton/NE 8th Street subarea on the east side of I-405 is a centrally located community with easy access to I-405 and downtown Bellevue. The part of this subarea within the study area includes the Overlake Hospital Medical Center, several car dealerships, and a variety of retail stores.

The other two subareas in the study area are North Bellevue and Bridle Trails. Although the North Bellevue subarea is comprised of primarily offices within our study area, it also includes Bellewood Farms, a residential neighborhood with large single-family homes. Most of the Bridle Trails subarea is known for wooded spaces, large residential lots, and

equestrian activities, but the portion of this subarea that falls within the study area is comprised mainly of office parks.

The residential neighborhoods in the study area appear to have a high level of community cohesion (access to social resources and linkages with neighbors). Several well-maintained parks, community centers, and recreational facilities serve these neighborhoods. There are quiet streets, sidewalks, and bicycle paths that allow residents to access amenities without having to use their cars. The City of Bellevue also provides services to neighborhoods, including staff to support neighborhood organizations and activities, grants for neighborhood improvement projects, and a quarterly neighborhood newsletter.

Businesses

Bellevue is a major trading center within the Puget Sound region and relies heavily on mobility along I-405 and local arterials for the movement of people and goods. In the past two decades, Bellevue's economy has become less dependent on natural resources and more dependent on a diverse mix of industries, of which the retail and service industries are the largest. Employment projections estimate that total jobs in the city will increase from 125,763 jobs in 2000 to 194,908 in 2030.

The I-405, NE 8th Street to SR 520 Improvement Project is located on the eastern edge of Bellevue's central business district. The Overlake Hospital Medical Center and Group Health Cooperative campus is a major regional medical facility that serves as an anchor for medical office uses in the study area. The study area also includes hotels, retail services, and a variety of office and light industrial uses, such as medical offices and labs, storage and wholesale warehouses, distributions centers, and fleet maintenance facilities.

Exhibit 5-11 presents a list of the major employers in the city of Bellevue. This list represents businesses from a variety of sectors illustrating the diverse economy of the city. Each of these businesses is located near a major freeway (either I-405 or I-90), which demonstrates the desire of businesses to locate in an area with good access and mobility for its employees and customers.

Exhibit 5-11: Largest Employers in Bellevue

Employer	Employees
Boeing Shared Services Group	2,800
T-Mobile USA	2,400
Overlake Medical Center	2,200
Bellevue School District	2,000
City of Bellevue	1,600
Verizon Wireless	1,500
Bellevue Community College	1,300
Expedia Inc.	1,300
Symetra	900
Puget Sound Energy	900

Source: City of Bellevue, 2005.

Social and Public Services

Social and public services in the study area include parks and recreational facilities, religious institutions, schools, pedestrian and bicycle facilities, libraries, public transportation facilities, emergency and healthcare facilities, and utilities. Several utilities are located within the proposed project right-of-way, including Puget Sound Energy electrical power lines, Qwest and Verizon telephone lines, and Comcast cable television and internet access lines.

Only three human service agencies operate within the study area. They are the Puget Sound Blood Center, the Washington Women in Need (WWIN), and the YMCA.

How do we define *minority*?

Individuals listed in the 2000 U.S. Census as Black (a person having origins in any of the black racial groups of Africa); Hispanic (a person of Mexican, Puerto Rican, Cuban, Central or South American, or other Spanish culture or origin, regardless of race); Asian American (a person having origins in any of the original peoples of the Far East, Southeast Asia, the Indian subcontinent, or the Pacific Islands); or American Indian/Alaskan Native (a person having origins in any of the original people of North America and who maintains cultural identification through tribal affiliation or community recognition).

Who lives and works in the study area?

The City of Bellevue was home to 104,033 people in the year 2000 and represented 6 percent of the total population in King County according to the 2000 Census data. Bellevue residents are relatively affluent, compared to King County as a whole. According to the U.S. Census Bureau 2005 American Community Survey, the median household income in Bellevue was $69,880, which was higher than the King County median household income of $58,370. (This means that half of households had an income below the median and half had an income above the median.)

According to the 2000 Census data, 25 percent of residents in the study area identified themselves as a minority, and 6 percent of identified themselves as non-white Hispanic or Latino. In addition, 7 percent of residents in the study area are living in households with incomes below the federal poverty line.

Will any properties be acquired?

Please refer to Chapter 6 for a discussion of mitigation measures for communities, businesses, and social services during project construction and operation.

WSDOT will purchase private property to construct this project. There will be full acquisition, partial acquisition, or permanent easements as shown in Exhibit 5-12. The full and partial acquisitions will require the relocation of up to 61 businesses, one human service agency, and three residences. Relocation assistance will be provided in compliance with the Federal Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, as amended. Three households, 14 businesses, and the offices of WWIN, a human service agency, are located in the Dogwood Park neighborhood. Up to 47 small businesses are located in the complexes adjacent to I-405 and just north of Overlake Hospital Medical Center. Most are small businesses with fewer than ten employees.

Will any public services be displaced?

Washington Women in Need Offices

WSDOT will need to relocate WWIN, which serves low-income women, to construct the project. This agency is located in the Dogwood Park neighborhood. WWIN is a non-profit organization that provides funding for education; mental health counseling; medical, dental, and vision care; and health insurance premiums to low-income women in Washington State. WWIN has located a replacement property in the same neighborhood, so there should be minimal effects on its clients.

How will construction activities affect communities, businesses, and services?

Project construction will have short-term effects such as higher noise levels, more dust, decreased visual quality, and increased traffic congestion that could temporarily affect people living, working, and traveling in the study area. WSDOT will work with neighborhood associations and community service providers to inform them of temporary changes in traffic circulation or access.

Exhibit 5-12: Private Property WSDOT Will Need to Acquire to Construct the Project – Sheet 1

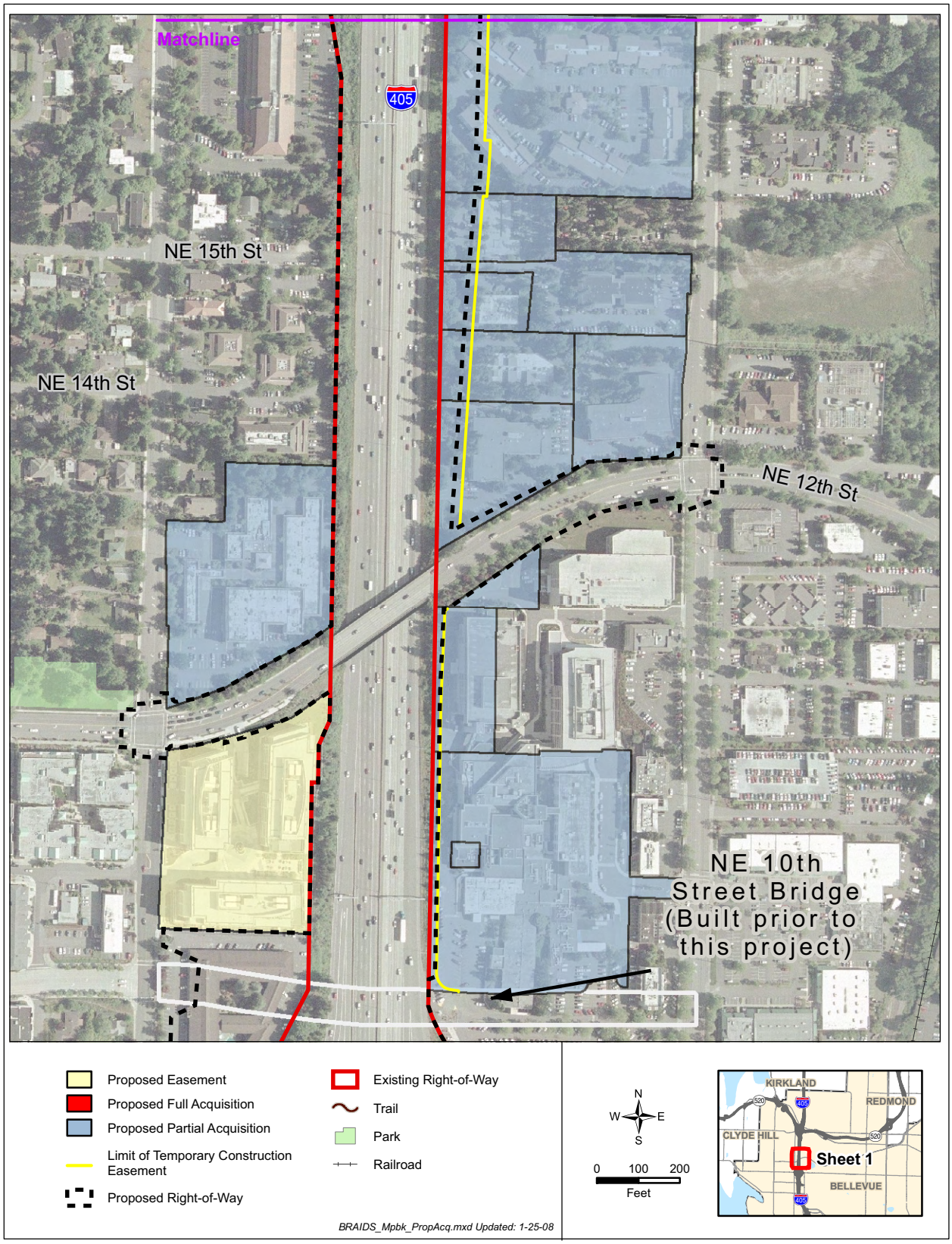


Exhibit 5-12: Private Property WSDOT Will Need to Acquire to Construct the Project – Sheet 2

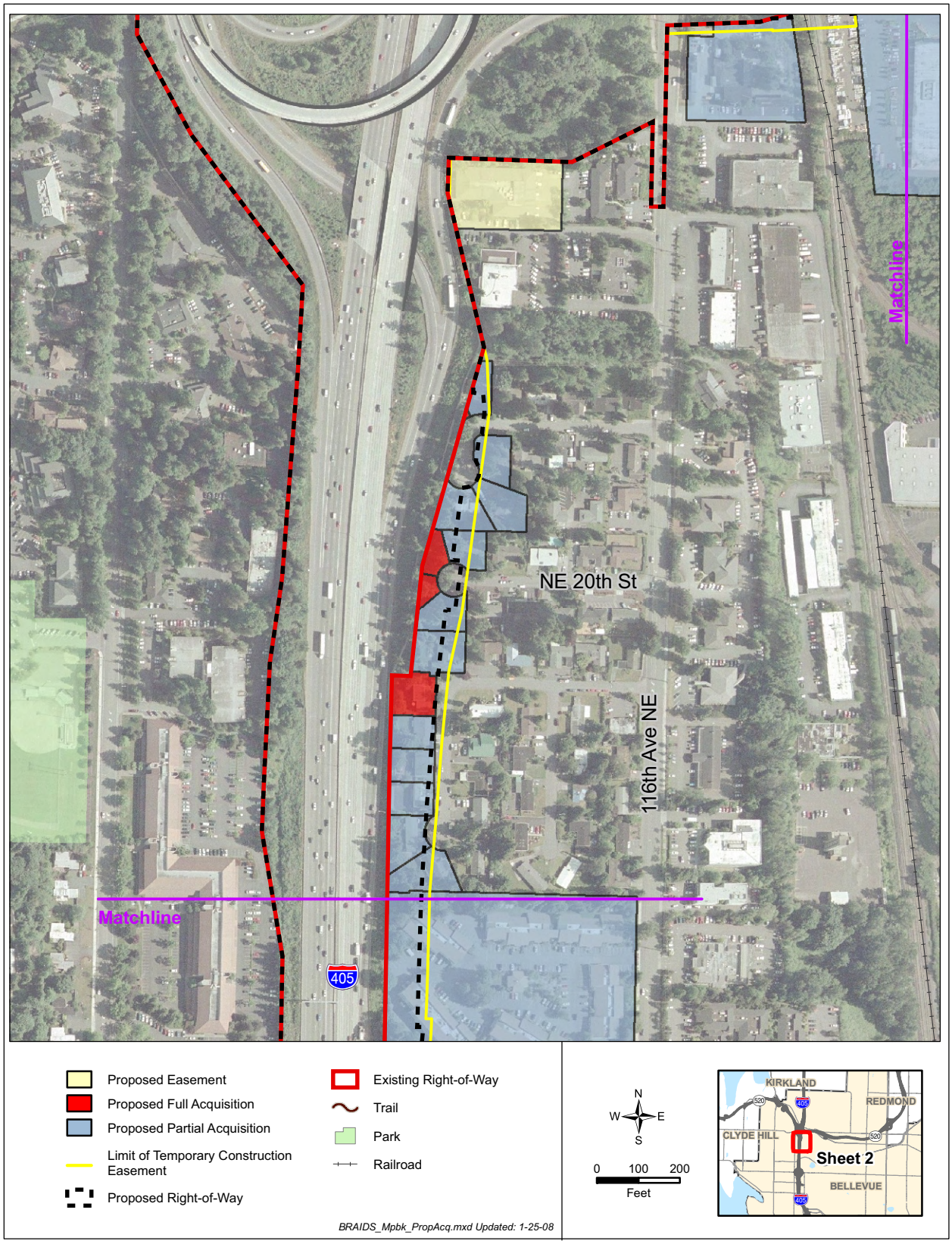
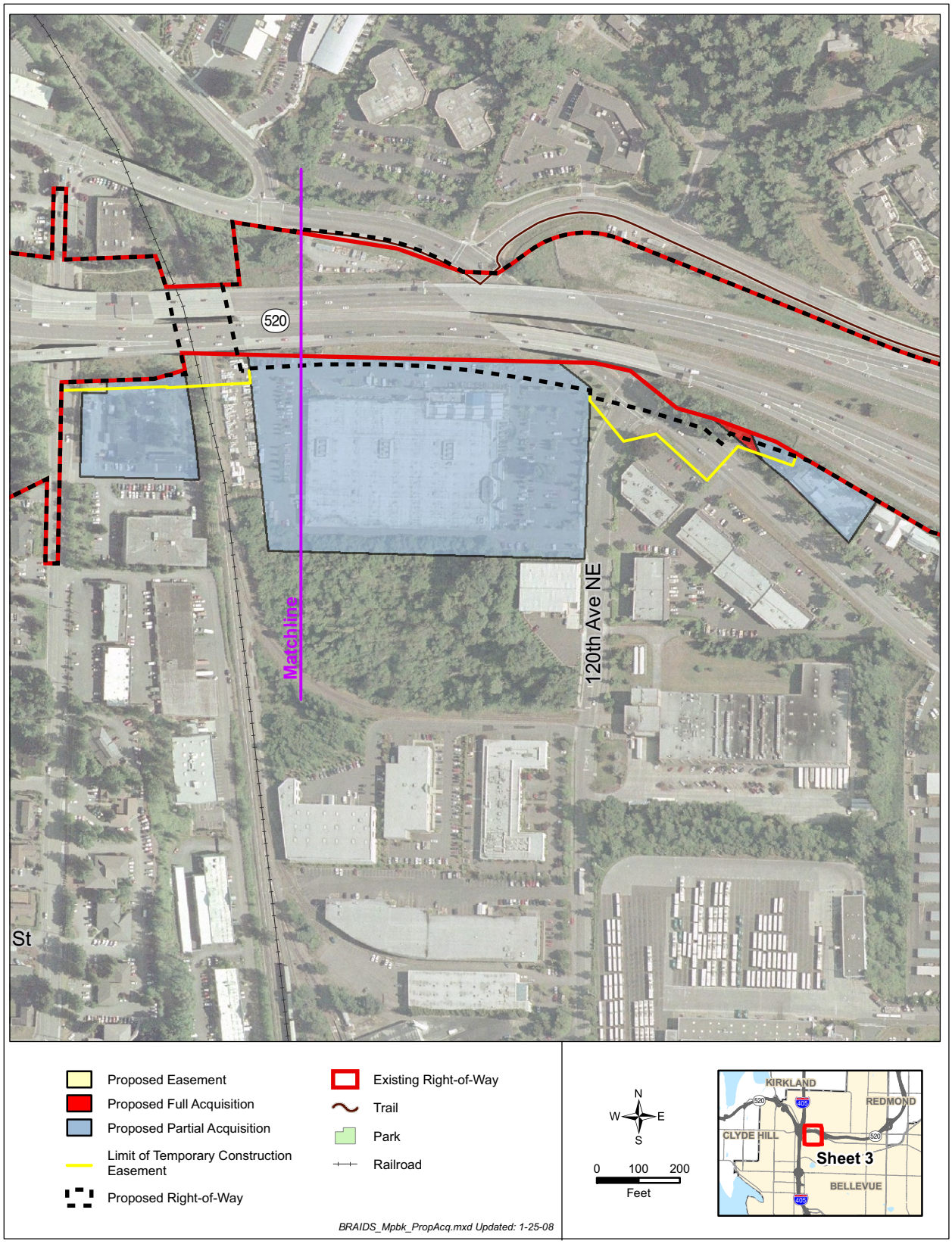


Exhibit 5-12: Private Property WSDOT Will Need to Acquire to Construct the Project – Sheet 3



Communities

Adverse construction-related effects adjacent to the Dogwood Park neighborhood may temporarily affect community cohesion in this neighborhood. Community cohesion in Dogwood Park has already been declining for the past few years because of increases in traffic and zoning changes. Increases in noise and traffic and decreases in air and visual quality during construction may make it less desirable or safe to walk to neighborhood resources or spend time outside and around neighbors.

Businesses

Businesses that are accessed within the study area via I-405 and SR 520 may be temporarily affected if customers choose to avoid the study area because of construction activities. While every effort will be made to maintain parking and access during construction, it is possible that parking and access to some businesses in the vicinity of construction activities will be impeded temporarily.

Public Services

Public services such as emergency response services, police, and school buses could experience slight delays due to project construction activities. However, WSDOT will make every effort to minimize road closures, delays, and detours during construction and will coordinate with public safety, police, and schools in advance of major traffic effects. When possible, temporary closures will be limited to nights or weekends.

Recognizing that the Overlake Hospital Medical Center and Group Health Cooperative campus is located along I-405, WSDOT will communicate with these service providers on construction methods to minimize noise, dust, and vibration effects near patient and surgical facilities. Please refer to the Noise and Vibration and Air Quality discipline reports for additional information.

Utilities

WSDOT has identified 109 potential utility conflicts as a result of project construction. Of the 109 potential conflicts, 51 have probable conflict and may need to be relocated. There may be some service disruptions during relocation, but they will be brief and temporary. There will be no service interruption for the Overlake Hospital Medical Center or Group Health Cooperative.

Generally, if WSDOT owns the property through which the utility crosses, the utility must relocate at its own expense when requested by WSDOT. If a utility owner has an easement that allows it to use property owned by another party, WSDOT will pay for the relocation. WSDOT will coordinate with utility providers to prepare a utility plan that verifies current and potential new locations for utilities, schedules for utility work, and provides detailed descriptions of any service disruptions. WSDOT will also notify neighborhoods of any utility interruptions in advance.

How will the completed project affect communities, businesses, and services?

Traffic and safety on local streets and access to neighborhoods (including the Dogwood Park neighborhood) and recreational facilities will improve after the project is constructed. The project will shift traffic from some of the most congested streets, such as NE 8th Street, to streets with more capacity, such as NE 10th Street. Because the project will improve operations of I-405 and SR 520 in the study area, it will also reduce cut-through traffic on local streets. This will improve safety, cohesion, and livability for the communities in the study area.

Businesses in Bellevue rely heavily on mobility along I-405 and local arterials for the efficient movement of people and goods. The project will help downtown Bellevue to be an area that is convenient and accessible for distributing goods and attractive for potential customers and employees.

The new on-ramp at NE 10th Street will result in an increase in traffic volumes on NE 10th Street and bring the freeway ramps closer to hospital buildings at the Overlake Hospital Medical Center and Group Health Cooperative campus. However, the project will reduce congestion and improve travel times from northbound I-405 to the hospital area. It will also improve travel times from the hospital area to northbound I-405 and to eastbound and westbound SR 520.

How will the project affect minority and low-income populations?

Although the project will have some adverse construction and operational effects, it will not result in disproportionately high and adverse effects on minorities or low-income populations.

Improved transit reliability as a result of better traffic operations on I-405, SR 520, and local streets should benefit some minority and low-income people. National studies show that minorities and low-income people tend to use transit more than the general population.

What would happen to these communities, businesses, and services if WSDOT did not build this project?

As traffic volumes increase, weaving and congestion-related accidents will also increase in the study area. More drivers will bypass the increased congestion at the I-405 and SR 520 interchange and use the local streets as an alternate route. This detour will most likely be chosen by drivers leaving the downtown Bellevue area to travel to locations east and west on SR 520. Response times for public services such as emergency vehicles, police, and school buses would increase as congestion in the area continues to develop.

Noise and pollution from traffic on nearby surface streets will continue to be intrusive on the lives of people who live in the Dogwood Park neighborhood. Economic development in the area will be negatively affected if business owners are reluctant to locate in an area with poor access and mobility for employees and customers. Shoppers may also elect to shop in other areas with easier access and mobility.