

# References

---

## Chapter 1. Purpose and Need for East Link Project

- American Public Transportation Association. 2008. 2007 Public Transportation Fact Book. <http://www.apta.com/research/stats/factbook/index.cfm>, last accessed May 1, 2008.
- City of Bellevue. 2004. *Downtown Subarea Plan*.
- City of Bellevue. 2007. *Bel-Red Corridor Project Final Environmental Impact Statement*.
- City of Redmond. 2005. *Downtown Neighborhood Plan*.
- City of Redmond. 2007. *Overlake Neighborhood Plan Final Supplemental Environmental Impact Statement*.
- City of Seattle. 2007a. Building in Downtown Seattle. Downtown Development Project Overview Map.
- City of Seattle. 2007b. Seattle Transportation and Analysis Zone (STAZ) Data.
- Federal Highway Administration (FHWA). 2004. *I-90 Two Way Transit and HOV Operations Project Record of Decision*. FHWA-WA-EIS-3-01-F. September 2004.
- Federal Transit Administration (FTA) and Federal Highway Administration (FHWA). 2005. *Integration of Planning and NEPA Processes*. February 22, 2005.
- King County. 2007. King County Metro Transit Automated Vehicle Locator Data. 2007.
- King, Emil. Planner with the City of Bellevue, Personal communication on new and future development in Bellevue. May 2008.
- Puget Sound Council of Governments (PSCOG; now Puget Sound Regional Council). 1981. *Light Rail Element: A Feasibility Assessment*.
- Puget Sound Regional Council (PSRC). 1995. *Vision 2020 1995 Update*. May 1995.
- Puget Sound Regional Council (PSRC). 2001. *Destination 2030: Metropolitan Transportation Plan for the Central Puget Sound Region*. Available at: <http://www.psrc.org/projects/mtp/d2030plan.htm>. May 24, 2001.
- Puget Sound Regional Council (PSRC). 2002a. *Central Puget Sound Regional Growth Centers Report – Bellevue*.
- Puget Sound Regional Council (PSRC). 2002b. *Central Puget Sound Urban Centers Report – Overlake Manufacturing/Industrial Center*.
- Puget Sound Regional Council (PSRC). 2002c. *Central Puget Sound Regional Growth Centers Report – Redmond*.
- Puget Sound Regional Council (PSRC). 2006. *2006 Sub-County (Small Area) Forecasts of Population and Employment, Central Puget Sound Region* (Released October 26, 2006). Available at: <http://www.psrc.org/data/forecasts/index.htm>.
- Puget Sound Regional Council (PSRC). 2008. *Vision 2040. 2008 Update*. April, 2008. <http://psrc.org/projects/vision/index.htm>, accessed May 2008.
- Sound Transit. 1996a. *Regional Transit Long-Range Vision*.
- Sound Transit. 1996b. *Sound Move – The Ten-Year Regional Transit System Plan*. May 1996.
- Sound Transit. 2005. *Regional Transit Long-Range Plan*. July 2005.
- Sound Transit. 2006. *East Corridor High Capacity Transit Mode Analysis History*. August 2006.
- Sound Transit. 2008. *Sound Transit Ridership Model Output*. 2008
- Transit Cooperative Research Program. 2003. *Transit Capacity and Quality of Service Manual*. 2nd Edition. Report 100. Washington, DC.
- Washington State Department of Transportation (WSDOT). 2004. *Amendment to the 1976 I-90 Memorandum Agreement*. Available in Sound Transit (2006), Appendix B.
- Washington State Department of Transportation (WSDOT). 2006. *I-90 Travel Analysis, Preliminary Data and Discussion: Report to the Sound Transit Board of Directors*. April 27, 2006.
- Washington State Department of Transportation (WSDOT) and Sound Transit. 2002. *Trans-Lake Washington Study*. 2002.
- Washington State Department of Transportation (WSDOT) and Sound Transit. 2004. *I-90 Two Way Transit and HOV Operations: Volume I, Final Environmental Impact Statement*. May 21, 2004.

U.S. Department of Commerce, Bureau of the Census (U.S. Bureau of the Census). 2000. United States Census 2000. Washington, D.C.

## Chapter 2. Alternatives Considered

King County Metro. 2006. *TransitNow Program*. November 2006.

Sound Transit. 1996. *Sound Move – The Ten-Year Regional Transit System Plan*. May 1996.

Sound Transit. 2006a. *Environmental Scoping Information Report*. September 1, 2006.

Sound Transit. 2006b. *Sound Transit Board Briefing Book, Light Rail Alternatives*. November 2006.

Sound Transit. 2006c. *East Link Alternatives Evaluation Report, Seattle to Bellevue to Redmond*. December 2006.

Sound Transit. 2006d. *Scoping Summary Report*. December 2006.

Sound Transit, 2008. *Sound Transit 2 Planning: Sustainability Assessment of Sound Transit 2 Plan*. September 18, 2008.

Washington State Department of Transportation (WSDOT). 1976. *Memorandum Agreement*. Signed by City of Seattle, City of Mercer Island, City of Bellevue, King County Metro, and Washington State Highway Commission.

Washington State Department of Transportation (WSDOT). 2004. *Amendment to the 1976 I-90 Memorandum Agreement*. Available in Sound Transit (2006), Appendix B.

## Chapter 3. Transportation Environment and Consequences

City of Bellevue. 2007. *Bel-Red Corridor Project Final Environmental Impact Statement*. Bellevue, Washington. July 2007.

City of Redmond. 2007. *Overlake Neighborhood Plan Final Supplemental Environmental Impact Statement*.

King County Metro. 2007. *King County Metro Transit Park-and-Ride Utilization Report, Second Quarter 2007*. July 2007.

King County Metro. 2008. Automatic Passenger Counter Data: Average weekday daily passenger loads across Lake Washington February 9 through May 30, 2008. February, 2008.

King County Metro. 2008. Personal Communication. E-mail from Robin Anderson, Senior Transportation Planner at King County Metro, to CH2M HILL staff regarding Mercer Island Park-and-Ride utilization. February 25, 2008.

Korve, H. W., J. I. Farran, D. M. Mansel, H. S. Levinson, T. Chira-Chavala, and D. R. Ragland. 1996. *TCRP Report 17: Integration of Light Rail Transit into City Streets*. Transportation Research Board of the National Academies. Washington, D.C.

Port of Seattle. 2008. Eastside Rail Corridor. <http://www.portseattle.org/business/realestate/eastsiderail.shtml>. Last accessed September 5, 2008.

Puget Sound Regional Council (PSRC). 2007. *Vision 2040 Final Environmental Impact Statement*. April 2008.

Sound Transit. 2002. *Central Link Light Rail Transit Initial Segment Project Environmental Assessment*. February 2002

Sound Transit. 2006. North Link Final Supplemental EIS. March, 2006

Sound Transit. 2007. *East Link Transit Integration Plan*.

Transit Cooperative Research Program. 2003. *Transit Capacity and Quality of Service Manual*.

Transportation Research Board (TRB). 1999. "Light Rail Service, Vehicular and Pedestrian Safety." *TCRP Research Results Digest 34*. Transportation Research Board of the National Academies. Washington DC. July 1999

Transportation Research Board (TRB). 2000. *Highway Capacity Manual*.

U.S. Department of Transportation Federal Transit Administration and Sound Transit. *Central Link Light Rail Transit Project Environmental Assessment Initial Segment*. February 2002.

Washington State Department of Transportation (WSDOT). 2005. *Washington Transportation Plan Update: Freight Movement*. December 2005.

Washington State Department of Transportation (WSDOT). 2006. Interstate 90 Center Roadway Study. July 2006.

Washington State Department of Transportation (WSDOT), 2007. Roadway average daily traffic volume data, 2006. <http://www.wsdot.gov/Northwest/TrafficVolume/RampAndRoadway2006.htm> Accessed 2007.

Washington State Department of Transportation (WSDOT). 2008. WSDOT 95% Reliable Travel Times.

[www.wsdot.wa.gov/Traffic/Seattle/TravelTimes/reliability](http://www.wsdot.wa.gov/Traffic/Seattle/TravelTimes/reliability). Last accessed September 5, 2008.

Washington State Department of Transportation (WSDOT) and Sound Transit. 2004. *I-90 Two Way Transit and HOV Operations: Volume I, Final Environmental Impact Statement*. May 21, 2004.

## Chapter 4. Affected Environment and Environmental Consequences

### 4.1 Acquisitions, Displacements, and Relocations

City of Bellevue. 2007. *Bel-Red Corridor Project Final Environmental Impact Statement*. Bellevue, WA. July 2007.

Colliers International. 2007a. *The Knowledge Report: Eastside Office*. Second Quarter 2007.

Colliers International. 2007b. *The Knowledge Report: Eastside Industrial*. Second Quarter 2007.

GVA Kidder Matthews. 2007. *Seattle Real Estate Market Review: Retail, Mid-Year 2007*.

Northwest Multiple Listing Service (MLS). 2007. Northwest MLS. Available at: [http://sea.themlsonline.com/?r=28ddaa0fd14f9ea9&gclid=CMYfxprp\\_44CFQbFXgodrmsAvA](http://sea.themlsonline.com/?r=28ddaa0fd14f9ea9&gclid=CMYfxprp_44CFQbFXgodrmsAvA). Updated daily. Accessed October 3, 2007.

### 4.2 Land Use

City of Bellevue. 2006. *City of Bellevue Comprehensive Plan: Volume 2, Subarea Plans and Transportation Facility Plans*. Bellevue, WA.

City of Mercer Island. 2005. *Comprehensive Plan of the City of Mercer Island*. Mercer Island, WA.

City of Redmond. 2006. *Redmond Comprehensive Plan*. Redmond, WA.

City of Seattle. 1998. *Seattle Station Area Planning, Market Analysis, and Development Strategies*. Seattle, WA.

City of Seattle. 2005. *Seattle's Comprehensive Plan: Toward a Sustainable Seattle*. Seattle, WA.

King County. 2004. *King County Comprehensive Plan*. Updated July 25, 2005.

Overlake Hospital Medical Center. 2005. *Overlake Hospital Medical Center Master Plan*. Bellevue, WA.

Puget Sound Regional Council (PSRC). 1995. *Vision 2020 1995 Update*. May 1995.

Puget Sound Regional Council (PSRC). 2001. *Destination 2030: Metropolitan Transportation Plan for the Central Puget Sound Region*. Available at: [www.psrc.org](http://www.psrc.org). May 24, 2001.

Transit Cooperative Research Program (TCRP). 1996. *Development near Transit: An International Perspective*. Available at: [http://onlinepubs.trb.org/onlinepubs/tcrp/tcrp\\_rpt\\_16-4.pdf](http://onlinepubs.trb.org/onlinepubs/tcrp/tcrp_rpt_16-4.pdf). Accessed June 21, 2007.

### 4.3 Economics

Bureau of Labor Statistics. 2007. Unemployment Data. Available at: <http://www.bls.gov/data/home.htm>. Accessed August 20, 2007.

Cervero, R. 2004. *Development in the United States: Experiences, Challenges, and Prospects*. TCRP Report 102. Transit Cooperative Research Program, Transportation Research Board of the National Academies, Washington, D.C.

CH2M HILL. 2007a. *Sound Transit East Link Project, Transportation Discipline Report*. Prepared for Sound Transit. December 2007.

CH2M HILL. 2007b. *Construction Impact Report*. Table: Percent Construction Mat Equip.xls spreadsheet. Prepared for Sound Transit. October 2007.

City of Bellevue. 2007. 2007-2008 Preliminary Budget. Available at: <http://www.ci.bellevue.wa.us/budgets.htm>. Accessed August 7, 2007.

City of Mercer Island. 2007. 2007-2008 Budget. Available at: <http://www.ci.mercer-island.wa.us/Page.asp?NavID=671>. Accessed August 7, 2007.

City of Redmond. 2007. 2007-2008 Adopted Budget. Available at: <http://www.ci.redmond.wa.us/insidecityhall/finance/budget/0708adoptedindex.asp>. Accessed August 7, 2007.

City of Seattle. 2007a. 2007 Adopted and 2008 Endorsed Budget. Available at: <http://www.seattle.gov/financedepartment/0708adoptedbudget/default.htm>. Accessed August 7, 2007.

City of Seattle. 2007b. Seattle Transportation and Analysis Zone (STAZ) Data.

King County Department of Assessments. 2007. Available at: <http://www.metrokc.gov/Assessor/AnnualReport/2005/TaxStats/05CompareState.pdf>. Accessed September 26, 2007.

Minnesota IMPLAN Group, Inc. 2007. *Construction Multipliers for King, Snohomish and Pierce Counties*.

Peterson et al. 2006. *Freight Movements on Washington State Highways: Comparison of Results 1993 to 2003*.

Pflum, E.K. 2004. Employment Density in the Puget Sound Region. Available at: [http://evans.washington.edu/research/psclinic/pdf/03-04dp/employment\\_density\\_KP.pdf](http://evans.washington.edu/research/psclinic/pdf/03-04dp/employment_density_KP.pdf). Accessed September 26, 2007.

Puget Sound Regional Council (PSRC). 2006. *2006 Sub-County (Small Area) Forecasts of Population and Employment, Central Puget Sound Region* (Released October 26th, 2006). Available at: <http://www.psrc.org/data/forecasts/index.htm>. Accessed May 17, 2007.

Sommers, P. 2003. *Regional Industry Growth Patterns: Trends in Bellevue, the Seattle Central Business District, and the Rest of King County*. Technical Memorandum for the City of Bellevue.

Sound Transit. 2007. *Summary of Estimated ST2 Program Costs and Revenues*.

Washington State Department of Transportation (WSDOT). 2005. *Washington Transportation Plan Update: Freight Movement*. December 2005.

Washington State Department of Transportation (WSDOT). 2007. *Managing and Reducing Congestion in Puget Sound: Performance Audit*. October 2007. Available at: <http://www.sao.wa.gov/reports/auditreports/auditreportfiles/ar1000006.pdf>. Accessed on: October 25, 2007.

#### 4.4 Social Impacts, Community Facilities, and Neighborhoods

U.S. Census Bureau. 2000. Data sets downloaded from Census American Factfinder. Available at: <http://factfinder.census.gov/home/saff/main.html?lang=en>. Accessed September 2007.

American Public Transportation Association. 2008. *2007 Public Transportation Fact Book*. <http://www.apta.com/research/stats/factbook/index.cfm>. Last accessed May 1, 2008.

#### 4.5 Visual and Aesthetic Resources

Federal Highway Administration (FHWA). 1981. *Visual Impact Assessment for Highway Projects*. Office of Environmental Policy. March 1981.

#### 4.6 Air Quality

Bradley, M.J., & Associates. 2007. *Comparison of Energy Use & Emissions from Different Transportation Modes*. Accessed via web on May 2007. Available at: <http://www.buses.org/files/ComparativeEnergy.pdf>.

California Department of Transportation. 1979. Caltrans CALINE3 – A Versatile Dispersion Model for Predicting Air Pollutant Levels Near Highways and Arterial Streets. November 1979.

Cervero, Robert. 2008. *Effects of TOD on Housing Parking and Travel*. TCRP Report 128. August 1, 2008.

Climate Registry. 2008. General Reporting Protocol, Version 1.1. Available at: <http://www.theclimateregistry.org/downloads/GRP.pdf>. Accessed on May 30, 2008.

Federal Highway Administration (FHWA). 2006. *Transportation Conformity Guidance for Qualitative Hot-Spot Analyses in PM2.5 and PM10 Nonattainment and Maintenance Areas*. March 2006.

King County Metro. 2007 Active Fleet Summary

KJS Associates, Inc. 1995. *Guidebook for Conformity: Air Quality Assistance for Nonattainment Areas*. Final Draft Report. May 1995.

Munkers, Joy. 2008. Community Transit representative. Personal communications with Kevin Murphy/CH2M HILL on April 25, 2008.

Puget Sound Regional Council (PSRC). 2001. *Destination 2030: Metropolitan Transportation Plan for the Central Puget Sound Region*. Available at: [www.psrc.org](http://www.psrc.org). May 24, 2001.

Puget Sound Regional Council (PSRC). 2005. *2005-2007 Regional Transportation Improvement Program*. October 2005.

Puget Sound Clean Air Agency (PSCAA). 2007. *2006 Air Quality Data Summary*. Available at [www.pscleanair.org](http://www.pscleanair.org).

RSMeans Building Construction Cost Data, 65<sup>th</sup> Annual Edition. Construction Publishers & Consultants, Kingston, MA. 2007.

Sacramento Air Quality Management District. *Road Construction Emissions Model Version 5.2*. 2007.

South Coast Air Quality Management District (SCAQMD). 1993. *California Environmental Quality Act (CEQA) Air Quality Handbook*.

Speis, Bill. 2004. Pierce Transit representative. Personal communications with Kevin Murphy/CH2M HILL on April 28, 2008.



Urban Land Institute, 2008. *Growing Cooler: the Evidence on Urban Development and Climate Change*. Washington, D.C., 2008

U.S. Bureau of Transportation Statistics. 2004. *National Transportation Statistics 2003*. Table 4-49. March 2004. Available at [http://www.bts.gov/publications/national\\_transportation\\_statistics/2003/index.html](http://www.bts.gov/publications/national_transportation_statistics/2003/index.html).

U.S. Department of Energy (DOE). 2007. *Transportation Energy Data Book*, Version 26. Available at: <http://cta.ornl.gov/data/index.shtml>. Accessed on May 27, 2008.

U.S. Environmental Protection Agency (EPA). 2003. U.S. EPA Mobile6: Mobile Source Emission Factor Model. August 2003.

U.S. Environmental Protection Agency (EPA). 2007a. About Air Toxics website. EPA Office of Air and Radiation. Available at <http://www.epa.gov/ttn/atw/allabout.html>. Accessed June 6, 2007.

U.S. Environmental Protection Agency (EPA). 2007b. Six Common Air Pollutants website. EPA Office of Air and Radiation. Available at <http://www.epa.gov/air/urbanair/>. Accessed October 11, 2007.

U.S. Environmental Protection Agency (EPA). 2007c. Six Common Air Pollutants website. EPA Office of Air and Radiation. Available at <http://www.epa.gov/air/data/geosel.html>. NAAQS standard.

U.S. Environmental Protection Agency (EPA). 2008. <http://www.epa.gov/solar/energy-resources/calculator.html>. Accessed August 27, 2008.

Washington Department of Community, Trade and Economic Development. 2007. Available at: <http://www.cted.wa.gov>. Accessed April 2008.

Washington State Department of Transportation (WSDOT). 2005. Washington State Intersection Screening Tool. WASIST Version 1.0. October 2005.

## 4.7 Noise and Vibration

Federal Transit Administration (FTA). 2006. *Transit Noise and Vibration Impact Assessment*. Report FTA-VA-90-1003-06. May 2006.

Washington State Department of Transportation (WSDOT). 2006. *Traffic Noise Abatement Policy and Procedures*. March 2006.

Wilson, Ihrig & Associates Inc. 2007. *Sound Transit Kinkysharyo LRV Force Density Level Memorandum*. November 30, 2007.

National Institute of Occupational Safety Health Association (NIOSHA). 1998. *Publication No. 98-126, Occupational Noise Exposure*, June 1998.

U.S. Environmental Protection Agency (EPA). 1974. *Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety*, " EPA/ONAC 550/9-74-004. March, 1974.

## 4.8 Ecosystem Resources

City of Bellevue. 2008. Representatives attendance at East Link Resource Agency Meeting on March 4, 2008.

Fisher, L. 2007. Biologist with the Washington State Department of Fish and Wildlife. Personal communication on the status of construction windows on Lake Washington. November 17, 2007.

Hobbs, M. 2007. Friends of Marymoor Park, Redmond, WA. Personal communication. April 23, 2007.

Hruby, T. 2004. *Washington State Wetland Rating System for Western Washington Revised*. Publication 04-06-025. Washington State Department of Ecology. August 2004.

Kerwin, J. 2001. *Salmon and Steelhead Habitat Limiting Factors Report for the Lake Washington Watershed*, WRIA 8. Washington Conservation Commission, Olympia, WA.

U.S. Army Corps of Engineers (USACE). 2001. *Streamlined Endangered Species Act Consultation: Programmatic Biological Evaluation, Phase 1*. Updated work windows for Lake Washington. Seattle District, Regulatory Branch, Seattle Washington.

U.S. Fish and Wildlife Service (USFWS). 2007. *National Bald Eagle Management Guidelines*. U.S. Fish and Wildlife Service, Washington, D.C.

Washington Department of Fish and Wildlife (WDFW). 2007. Priority Habitat and Species Database. Available at: <http://wdfw.wa.gov/hab/phslist.htm>. Accessed 2007.

Washington Department of Fish and Wildlife (WDFW). 2001. *Priority Habitat and Species Management Recommendations: Volume IV, Birds*. Bald Eagle (*Haliaeetus leucocephalus*). Available at: <http://wdfw.wa.gov/hab/phs/vol4/birdrecs.htm>.

## 4.9 Water Resources

City of Bellevue. 2002. As-Built Survey, City of Bellevue Storm Drain System. Utilities Department, Engineering Division, System Planning and Mapping, April 24, 2002.

City of Bellevue. 2007a. *Bel-Red Corridor Project Final Environmental Impact Statement*. Bellevue, WA. July 2007.

City of Bellevue. 2007b. Drainage Basin Maps and Facts. Available at: [http://www.bellevuewa.gov/drain\\_basin\\_map.htm](http://www.bellevuewa.gov/drain_basin_map.htm). Accessed August 27, 2007.

Horizon Systems Corporation (Horizon). 2007. National Hydrography Dataset Plus. Available at: <http://www.horizon-systems.com/nhdplus/>. Accessed August 27, 2007.

Johnson, R. 2007. Seattle Public Utilities. Personal communication. June 7, 2007.

King County. 2007a. Streams Water Quality Data. Available at: <http://dnr.metrokc.gov/wlr/waterres/streamsdata/>. Accessed August 27, 2007.

King County. 2007b. Hydrologic Information Center. Available at: <http://dnrp.metrokc.gov/wlr/waterres/hydrology/>. Accessed August 27, 2007.

King County. 2004. Impervious/Impacted Surface Interpretation. Available at: <http://www.metrokc.gov/gis/sdc/raster/landcover/MultispectralClassificationAndProductsSpecification.s.doc>. Accessed October 22, 2007.

Parametrix. 2007. *Federal Emergency Management Agency Letter of Map Revision – Lower Bear Creek*. Prepared for the Washington State Department of Transportation. August 2007.

United States Geological Survey (USGS). National Water Information System. Available at: <http://waterdata.usgs.gov/nwis>. Accessed August 27, 2007.

Washington State Department of Ecology (Ecology). 2005. *Stormwater Management Manual for Western Washington*. Olympia, WA. February 2005.

Washington State Department of Ecology (Ecology). 2004. 2004 Water Quality 303(d) List for Cedar/Sammamish Water Resource Inventory Area (WRIA) 8. Available at: <http://www.ecy.wa.gov/services/gis/maps/wria/303d/w8-303d.pdf>. Accessed August 27, 2007.

Washington State Department of Transportation (WSDOT). 2006. *Highway Runoff Manual*. Publication M31-16. Olympia, WA.

Watson, R. 2007. City of Bellevue Utilities Department. Personal communication. March 9, 2007.

## 4.10 Energy Impacts

California Department of Transportation (CALTRANS). 1983. *Energy and Transportation Systems*. July 1983.

Federal Highway Administration (FHWA). 2007. Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU). Available at: <http://www.fhwa.dot.gov/safetealu/index.htm>. Accessed November 16, 2007.

Puget Sound Energy. 2006 *Annual Report*. Available at: <http://www.pse.com>. Accessed November 15, 2007.

Seattle City Light. 2006. *2006 Annual Report: Defining Stewardship*. Seattle, WA.

U.S. Department of Energy (DOE). 2007. *Transportation Energy Data Book, Version 26*. Available at: <http://cta.ornl.gov/data/index.shtml>. Accessed on May 27, 2008.

Washington State Department of Community Trade and Economic Development (CTED). 2007. *2007 Biennial Energy Report*. Available at: [http://www.cted.wa.gov/portal/alias\\_cted/lang\\_en/tabID\\_542/DesktopDefault.aspx](http://www.cted.wa.gov/portal/alias_cted/lang_en/tabID_542/DesktopDefault.aspx). Accessed November 15, 2007.

## 4.11 Geology and Soils

American Association of State Highway and Transportation Officials (AASHTO). 2006. *Guide Specifications for LRFD Seismic Bridge Design, Subcommittee for Seismic Effects on Bridges, T-3, March 2007 for new bridges* and the FHWA Manual titled *Seismic Retrofitting Manual for Highway Structures*. December 2006.

Booth, D.B., K.A. Troost, A.P. Wisher, compilers. 2006. *Geologic Map of King County*. GeoMapNW.

City of Bellevue. 2005. City of Bellevue GIS Information.

City of Bellevue. 2007. City of Bellevue GIS Information.

City of Redmond. 2007. City of Redmond GIS Information.

City of Seattle. 2002. City of Seattle GIS Information.

City of Seattle. 2007. City of Seattle GIS Information.

Jacobs Associates. 2007. *Sound Transit East Corridor HCT, Draft Summary Geotechnical Report for Preliminary Route Selection*. Submitted to CH2M HILL. June 26, 2007.

King County. 2006. King County GIS Information.

Natural Resources Conservation Service (NRCS). 2007. Web Soil Survey. Available at: <http://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx>. Accessed September 2007.

Troost, K.G., and A.P. Wisher. 2006. Geologic Map of Mercer Island, Washington. City of Mercer Island and GeoMapNW.

Troost, K.G., D.B. Booth, A.P. Wisher, and S.A. Shimel. 2005. *The Geologic Map of Seattle – A Progress Report*. USGS Open File Report 2005-1252, Version 1.0.

United States Geological Survey (USGS). 2007. Quaternary fault and fold database for the United States. Available at: <http://earthquakes.usgs.gov/regional/qfaults/>. Accessed September 2007.

## 4.12 Hazardous Materials

City of Redmond. 2004. *Bear Creek Parkway Supplemental Draft Environmental Impact Statement*. Redmond, WA. March 2004.

Dalton, Olmsted and Fuglevand, Inc. 1994. *Ground-Water Monitoring Wells and Soil-Gas Probe Results, Desimone Property, 1614 Bellevue Way SE, Bellevue, WA*. November 1, 1994.

EMCON Northwest, Inc. 1994. *Independent Remedial Action Report, Former UNOCAL Service Station 4384, Bellevue, Washington*. January 11, 1994.

ENSR Corporation. 2006. *First Semester Groundwater Monitoring Report, 2006, Former Unocal Service Station 0587, Bellevue, Washington*. ENSR Corporation, Redmond, WA. June 28, 2006

Environmental Data Resources, Inc. 2007. *Sound Transit East Link, King WA. Inquiry number 01854411.1r*. Environmental Data Resources, Inc. Milford, CT. February 15, 2007.

Environmental Resolutions, Inc. 2006a. *Confirmation Boring Report, Former Exxon Station 7-0337, 1960 148th Avenue Northeast, Redmond Washington*. September 22, 2006.

Environmental Resolutions, Inc. 2006b. *Exxon Mobil Oil Corporation Groundwater Monitoring Report*. November 7, 2006.

Floyd Snider. 2007. *Results of 2006 Groundwater Sampling, Shops at First Street, 100 108th Avenue Northeast, Bellevue, WA*. Floyd Snider, Seattle, WA. January 12, 2007.

Floyd Snider McCarthy, Inc. 2003. *Cleanup Action Report, Shops at First Street*. Floyd Snider McCarthy, Inc., Seattle, WA. December 22, 2003.

Golder Associates, Inc. 2004. *Phase II Environmental Site Assessment for 10610 NE 8th Street Site, Superblock Project, Bellevue, Washington*. November 1, 2004.

Hart Crowser. 1990. *Diesel Tank Remediation, Eastside Disposal, Bellevue, Washington*. Hart Crowser, Seattle, WA. June 21, 1990.

Hart Crowser. 1997. *Limited Phase II Soil and Groundwater Assessment, Bellevue Way Cleaners, 103 Bellevue Way, Bellevue, Washington*. Hart Crowser, Seattle, WA. March 14, 1997.

Hart Crowser. 2001. *Supplemental Groundwater Monitoring Well Installation, Capri Property (Bellevue Way PCE Plume), Bellevue, WA*. Hart Crowser, Seattle, WA. October 26, 2001.

Hart Crowser. 2005. *Groundwater Monitoring Results for February 2005, Capri Foods and Proposed Safeway Project Site*. Hart Crowser, Seattle, WA. March 17, 2005.

Marsh Industrial Research. 1996. *Update on Site Assessment and Clean-Up from Previous Tank Removal at 1021 118th Ave SE*. Marsh Industrial Research, Fircrest, WA. October 7, 1996.

Maul Foster Alongi. 2003. *2002 Remediation System Performance Report, Former Unocal Service Station 0587, Bellevue, WA*. Maul Foster Alongi, Seattle, WA. January 28, 2003.

O'Sullivan Omega. 1993. *Independent Action Cleanup Report, Eastside Disposal, 969 118th Ave SE*. O'Sullivan Omega, Seattle, WA. September 16, 1993.

PES Environmental, Inc. 2006. *Site Characterization Report Bellevue and Main Property, Bellevue, Washington*. August 17, 2006.

SCS Engineers. 2006. *Annual Groundwater Monitoring Report, Former Hollywood Cleaners, Overlake Village Shopping Center, TCP Identification No. NW0584*. SCS Engineers, Bellevue WA. January 23, 2006.

Seattle-King County Department of Public Health. 1995. Letter to Tom Dunkin, Dunkin and Bush Painting, Inc., regarding site hazard assessment of Dunkin & Bush Property, 17343 NE 70th St, Redmond, WA. Letter dated January 25, 1995.

Washington State Department of Ecology (Ecology). 2004. Letter to Mr. John Morris II, Davey Tree Service, regarding Davey Tree Service, 1021 118th Avenue SE, Underground Storage Tank #3016, changing site status from "Unknown" to "Reported Cleaned Up". Letter dated May 12, 2004.

Washington State Department of Ecology (Ecology). 2002. *Professional Certification Confirming Environmental Remedial Action by Farallon Consulting, L.L.C., Cleaning*



Center of Redmond, 15796 Redmond Way, Redmond, WA. December 3, 2002.

Washington State Department of Transportation (WSDOT). 2007. *Environmental Procedures Manual*. Publication M31-11. Section 447, Hazardous Materials. April 2007.

### 4.13 Electromagnetic Fields

Brecher, A. 1995. *A White Paper On: Health Effects from Electric and Magnetic Fields (EMF) and Radio-Frequency Radiation (RFR) Associated with Transportation Systems: An Emerging Cross-Modal Issue*. USDOT/RSPA/Volpe Center, Cambridge, MA.

LTK Engineering Services. 2006. *Sound Transit Link Light Rail Project North Link Hi-Lo Mitigation EMI Report*. Report Number LTK.ST.0406.001. Seattle, WA. April 2006.

### 4.14 Public Services

Bellevue School District. 2007. Schools Directory. Available at: <http://www.bsd405.org/Default.aspx?tabid=178>. Accessed September 10, 2007.

City of Bellevue. 2007. Bellevue Fire Stations. Available at: [http://www.ci.bellevue.wa.us/fire\\_stations.htm](http://www.ci.bellevue.wa.us/fire_stations.htm). Accessed September 4, 2007.

City of Mercer Island. 2007. Fire and EMS Operations. Available at: <http://www.ci.mercer-island.wa.us/Page.asp?NavID=2055>. Accessed September 4, 2007.

City of Redmond. 2007. City Maps - Public Safety. Available at: <http://www.ci.redmond.wa.us/cityservices/citymaps.asp>. Accessed September 4, 2007.

City of Seattle. 1999. *Staying on Track: Review of Public Safety and Security on Light Rail Systems*. Seattle Strategic Planning Office.

Lake Washington School District. 2007. Schools. Available at: <http://www.lwsd.org/Schools/Pages/default.aspx>. Accessed September 10, 2007.

Liggett, R., A. Loukaltou-Sidens, and H. Iseki. 2002. *The Geography of Transit Crime: Documentation and Evaluation of Crime Incidence On and Around the Green Line Stations in Los Angeles*.

Mercer Island School District. 2007. Schools. Available at: <http://www.misd.k12.wa.us/schools/>. Accessed September 10, 2007.

National Fire Protection Association (NFPA). 2007. *NFPA 130: Standard for Fixed Guideway Transit Systems*. 2007 Edition.

Seattle Fire Department. 2007. Fire Stations. Available at: <http://www.seattle.gov/fire/firestations/stations.htm>.

Seattle Police Department. 2007. Crime Stats. Available at: <http://www.seattle.gov/police/crime/stats.htm>. Accessed September 12, 2007.

Seattle School District. 2007. Schools. Available at: [http://www.seattleschools.org/area/m\\_schools/index.dxml](http://www.seattleschools.org/area/m_schools/index.dxml). Accessed September 10, 2007.

Sound Transit. 2007a. Sound Transit. 2007b. *Transit Service Integration Plan*.

Sound Transit. 2007c. *Fire/Life Safety Report Mount Baker and First Hill Tunnels Final Draft Report*.

*University Link Safety and Security Management Plan, SSMP 2007*.

Tubbs, C. 2007. Deputy Chief, Mercer Island Fire Department, Mercer Island, WA. Personal communication. December 5, 2007.

Washington Association of Sheriffs and Police Chiefs. 2007. Crime Statistics. Available at: <http://www.waspc.org/index.php?c=Crime%20Statistics>. Accessed September 12, 2007.

### 4.15 Utilities

CH2MHILL. 2007. *Sound Transit East Link Project. Utilities Technical Memorandum*. Prepared for Sound Transit. September 25, 2007.

### 4.16 Historic and Archaeological Resources

Greengo, R.E. 1966. Archaeological Site Survey Form for 45KI8. On file at State Department of Archaeology and Historic Preservation, Olympia, Washington.

Hanscom, D.W. 1979. Justice William White House, National Register of Historic Places nomination. On file at State Department of Archaeology and Historic Preservation, Olympia, WA.

Hardy, N. 2001. *Historic Downtown Redmond Walking Tour*. Redmond Historical Society and Eastside Heritage Center, Redmond, WA.

Krafft, K. 1991. Frederick W. Winters, National Register of Historic Places nomination. On file at State Department of Archaeology and Historic Preservation, Olympia, WA.

Kreisman, L. 1979. Will H. Thompson House, National Register of Historic Places nomination. On file at State Department of Archaeology and Historic Preservation, Olympia, WA.



Lee, G., and S. Mathison. 1978. United States Immigration Station and Assay Office, National Register of Historic Places nomination. On file at State Department of Archaeology and Historic Preservation, Olympia, WA.

Phelps, M. 1978. *Public Works in Seattle: A Narrative History*. Kingsport Press, Seattle, WA.

Schniewind, A.P., R. Baird, and D.P. Kronkright. 1996. *Rescuing Dudley Carter's Goddess of the Forest*. 1996 Wooden Artifacts Group of the American Institute for Conservation Postprints, Norfolk, Virginia. Available at: [http://aic.stanford.edu/sg/wag/1996/WAG\\_96\\_schniewind.pdf](http://aic.stanford.edu/sg/wag/1996/WAG_96_schniewind.pdf). Accessed 19 March 2007.

Soderberg, L. 1980. Mount Baker Ridge Tunnel, HAER Inventory form.

#### 4.17 Parkland and Open Space

Recreation and Conservation Office (RCO). 2004. *Manual 7: Funded Projects, policies and the Project Agreements*. March 17, 2004.

Recreation and Conservation Office (RCO). 2008. Projects receiving RCO funds were located in the RCO web base maps, <http://www.rco.wa.gov/maps/>. July 30, 2008.

USDOT Letter to WSDOT on the Consideration of the I-90 Trail as a transportation facility, November 25, 2002.

See references in 4.2, Land Use, for listings of Comprehensive Plans for Seattle, Mercer Island, Bellevue, Redmond and King County.

### Chapter 5. Cumulative Impacts

City of Bellevue. 2006. *City of Bellevue Comprehensive Plan*. Bellevue, WA.

City of Bellevue. 2007. *Bel-Red Corridor Subarea Plan*. Bellevue, WA.

City of Redmond. 2006. *Redmond Comprehensive Plan*. Redmond, WA.

Council on Environmental Quality (CEQ). 1997. *Considering Cumulative Effects Under the National Environmental Policy Act*. Council on Environmental Quality, Executive Office of the President, Washington, D.C.

Council on Environmental Quality (CEQ). 2005. *Guidance on the Consideration of Past Actions in Cumulative Effects Analysis*. Memorandum from James L. Connaughton, Chairman, CEQ, to heads of federal

agencies. Council on Environmental Quality, Executive Office of the President, Washington, D.C.

Federal Highway Administration. 2003. *Interim Guidance: Questions and Answers Regarding the Consideration of Indirect and Cumulative Impacts in the NEPA Process*. Federal Highway Administration, Washington, D.C.

ICF Consulting. 2005. *Executive Order 13274 Indirect and Cumulative Impacts Work Group Draft Baseline Report*. Transportation Infrastructure Streamlining Task Force, U.S. Department of Transportation, Washington, D.C.

National Cooperative Highway Research Program (NCHRP). 2006. *Indirect and Cumulative Impact Analysis*. NCHRP Project 25-25, Task 11. Report prepared by Megan Stanley, PB Consult, for the American Association of State Highway and Transportation Officials (AASHTO) Standing Committee on the Environment. National Cooperative Highway Research Program, Transportation Research Board, Washington, D.C.

Puget Sound Regional Council (PSRC). 1995. *Vision 2020 1995 Update*. May 1995.

Puget Sound Regional Council (PSRC). 2001. *Destination 2030: Metropolitan Transportation Plan for the Central Puget Sound Region*. Available at: [www.psrc.org](http://www.psrc.org). May 24, 2001.

U.S. Environmental Protection Agency (EPA). 1999. *Consideration of Cumulative Impacts in EPA Review of NEPA Documents*. Publication 315-R-99-002. U.S. Environmental Protection Agency, Office of Federal Activities, Washington, D.C.

U.S. Environmental Protection Agency (EPA). 2008. <http://www.epa.gov/solar/energy-resources/calculator.html>. Accessed August 27, 2008.

Puget Sound Energy. 2007. *Integrated Resource Plan*.

Seattle City Light. 2006. *Integrated Resource Plan*.

Urban Land Institute. 2008. *Growing Cooler: the Evidence on Urban Development and Climate Change*. Washington, D.C.

Washington State Department of Ecology (DOE). 2007. *UW Climate Impacts Group*. King County News Release. June 28, 2007.

## Chapter 6, Alternatives Evaluation

City of Bellevue. 2003. *City of Bellevue Downtown Implementation Plan*. Bellevue, WA. June 2003.

City of Bellevue. 2007. *Bel-Red Corridor Project Final Environmental Impact Statement*. Bellevue, WA. July 2007.

Puget Sound Regional Council (PSRC). 1995. *Vision 2020. 1995 Update*. May 1995.

Puget Sound Regional Council (PSRC). 2001. *Destination 2030: Metropolitan Transportation Plan for the Central Puget Sound Region*. Available at: [www.psrc.org](http://www.psrc.org). May 24, 2001.

Sound Transit. 2005. *Regional Transit Long-Range Plan*. July 2005.

# List of Preparers

---

## A2.1 Public Agencies

### Federal Transit Administration (FTA)

John Witmer, Community Planner  
B.S., Economics, University of Kansas (1984)  
M.P.A., University of Washington (1990)

### Washington State Department of Transportation

Paul Krueger, Environmental Review  
I-90 Corridor and Sound Transit Environmental  
Manager  
B.A., Art History, Beloit College (1992)  
M.L.A., Landscape Architecture, University of  
Washington (1996)

## A2.2 Sound Transit

Brooke Belman, Community Outreach  
Program Manager  
B.A., History, University of Georgia (1997)

Don Billen, Project Manager  
B.A., Peace and Global Studies, Earlham College  
(1989)  
M.P.A., Master of Public Administration, University  
of Washington (1996)  
M.S., Transportation Engineering, University of  
Washington (1997)

Elma A. Borbe, Environmental Planner  
B.A. Community, Environment and Planning,  
University of Washington (1987)  
M.U.P. Master of Urban Planning, University of  
Washington (1992)

Sue Comis, Project Manager  
B.A., Psychology, Reed College (1975)  
M.U.P., Master of Urban Planning, University of  
Washington (1980)

James Irish, Link Environmental Manager  
B.A., Philosophy, State University of New York  
(1977)  
M.L.A., Landscape Architecture, University of  
Washington (1989)

Brant Lyerla, Project Development Coordinator  
B.A., Architecture, Washington University in St.  
Louis (1993)

M.B.A., Information Systems Management, Baylor  
University (1994)

M.S., Transportation Engineering, University of  
Washington, (2003)

Steve Kennedy, Senior Environmental Planner  
B.A., Urban Studies, Occidental College (1972)  
M.U.P., Urban Planning, University of Oregon  
(1978)

Ann Mueller, Community Outreach Coordinator,  
AICP  
B.S. Applied Behavioral Sciences, UC Davis (1993)  
M.U.P. Master of Urban Planning, University of  
California Los Angeles (1996)

Leonard McGhee, Project Manager  
B.A., Social Science, University of California, Irvine  
(1976)  
B.A., Social Ecology, University of California, Irvine  
(1976)  
M.U.P., Urban Planning, California State Polytechnic  
University, Pomona (1983)

Andrea Tull, Senior Planner  
B.A. English, University of Washington  
B.A. Political Science, University of Washington  
M.P.A., Master of Public Administration, University  
of Washington

Michael Williams, Link Project Development  
Manager  
B.A., Public Administration, San Diego State  
University (1977)  
M.U.P. Masters of Urban Planning, University of  
Washington (1980)

Tom Wilson, PE. Link Right-of-Way Engineer  
BA Washington State University 1988

## A2.3 Sound Transit Consultants

### Bolima Drafting

Kelly McGee, CAD Manager  
B.S., Psychology (1993)

### CH2M HILL (Primary Consultant for EIS)

Donald G. Anderson  
B.S., Civil Engineering (1966)  
M.S., Civil Engineering (Geotechnical) (1968)  
Ph.D., Civil Engineering (Geotechnical) (1974)

Mark Assam, Environmental Justice  
B.S., Biology/Botany (1990)

Mary Beth Baxter, Air Quality  
B.A., Chemistry (1988)

Chuck Blair, Ecosystems  
B.S., Wildlife Ecology (1975)  
M.S., Ecology (1978)

Rachel Chang, Hazardous Materials  
B.S., Biomedical Engineering (1989)  
M.S., Environmental Engineering (1991)

Josh Cooper, Economics/Energy  
B.A., Economics (2005)

Jeff Crisafulli, Editor  
B.A., English (1991)

Sharon Feldman, Senior Review/EIS Technical  
Review  
B.S., Soil Science (1983)  
M.S., Geology and Soils (1989)

Nicole Gaudette, Visual Resources  
B.A., Physical Geography (1995)

Craig Grandstrom, Transportation  
B.S., Civil Engineering (1999)

Mark Greenig, Visual Impacts and Aesthetics  
B.S., Landscape Architecture (1978)  
M.U.P., Urban Planning (1985)

Dave Hedglin, Cost Estimating  
A.A., Construction Management (1981)  
A.S., Arts and Sciences (1973)

Gretchen Honan, Wetlands  
B.A., Physical Geography (1980)  
M.A. Marine Policy (1989)

Maya Hunnewell, Cumulative Impacts  
B.S., Government and Legal Studies (2001)  
M.P.A., Public Administration (2006)

Steve Kambol, Project Manager  
B.S., Civil Engineering (1975)  
M.S., Transportation Engineering (1977)  
M.A., History (1981)

Katina Kapantais, Ecosystems  
B.A., Ornithology (1999)  
M.S., Environmental Science (2004)

Arjun KC, Water Resources  
B.S., Civil Engineering (2001)  
M.S., Environmental Engineering Science (2003)

Mark Keller, Quality Manager  
B.A., Political Science (1968)

Jodi Ketelsen, Purpose and Need/Planning  
Manager/Cumulative Impacts  
B.S., Landscape Architecture (1989)  
MCPL, City Planning (1994)  
MLAR, Landscape Architecture (1994)

Jitka Kotelenska, Geographic Information System  
Mapping  
B.A., Geology and Anthropology (1999)  
M.S., Geography (2005)

Diane Morin, Geographic Information System  
Mapping  
BA, Environmental Science (2003)

Sandra Schwabel McGinnis, Geology  
B.S., Environmental and Engineering Geology (1995)

Alisa Moffat, Relocations and Acquisitions/Utilities  
B.A., Environmental Studies (1999)  
M.S., Environmental Science (2004)

Thomas Mudayankavil, Civil Design Lead, Segment  
A, B, C  
B.S., Civil Engineering (1986)  
M.S., Civil Engineering (1992)

Mark Mullins, Ecosystems Resources  
B.S., Biology (1989)  
M.S., Fish and Wildlife Management (1991)

Bob Pearson, Electromagnetic Fields  
M.S., Remote Sensing of Natural Resources (1971)  
Ph.D., Remote Sensing of Natural Resources (1973)

Dan Pitzler, Economics/Energy  
B.A., Economics (1982)  
M.A., Resource Economics (1985)

Kurt Playstead, Economics  
B.S., Economics (1994)  
M.B.A. (2004)

Tom Rigert, Editor  
B.S., Physics (1967)  
M.S., Solid State Physics (1970)

Rob Rodland, Land Use/Neighborhoods/Public  
Services/Environmental Justice  
B.A., Geography (2000)

Rene Rodriguez, GIS  
B.A., GIS and Spatial Analysis (2004)

Gery Rudolph, Graphics  
General Equivalency Diploma (GED) (1980)

King Sampaco, Geotechnical Lead  
B.S., Civil Engineering (1983)  
M.S., Geotechnical Engineering (1988)  
Ph.D., Geotechnical Engineering (1996)



Robin Senner, Cumulative Impacts  
B.A., Biology (1968)  
Ph.D., Public Policy (2004)

Pete Sturtevant, Water Resources  
B.S., Biology (1971)  
M.S., Water Resources Management/Civil Engineering (1974)

Randy Whitman, Aquatic Resources  
B.S., Fisheries Sciences (1976)  
M.S., Fisheries Sciences (1987)

Alene Wilson, Parklands/Public and Agency  
Involvement/Section 4(f)/6(f)  
B.A., Economics (2000)

Dan Winstanley, Project Controls  
B.S., Geology (1977)  
M.S., Hydrogeology (1985)

### **Entech Engineering**

Michelle Jones, Air Quality  
B.S., Civil Engineering (1992)

### **Grijalva Engineering**

Gabe Grijalva, Civil Design Lead, Segment D, E  
B.S., Civil Engineering (1984)

### **Historical Research Associates, Inc. (HRA)**

Gail Thompson, Historic Properties and Cultural  
Resources  
B.A., Anthropology (1969)  
M.A., Anthropology (1971)  
Ph.D., Anthropology (1978)

Ann Gillespie, Historic Properties  
MA, History/Historic Preservation (2006)

Gretchen Kaehler, Archaeology and Paleontology  
B.A., Anthropology (1993)  
M.A., Anthropology (2002)

### **Harris Miller Miller & Hanson, Inc. (HMMH)**

Lance Meister, Noise and Vibration  
B.S., Civil Engineering, Temple University (1994)

### **IBI Group**

Phil Klinkon, Architectural Design Lead  
B.S., Architecture (1984)

### **INCA Engineering**

Chuck Hathaway, Right-of-Way Lead  
B.S., Civil Engineering (1967)

Jeff Juel, Utilities Lead  
B.S., Civil Engineering (1986)

### **Jacobs & Associates**

Carol Ravano, Geotechnical and Ecology  
B.S., Civil Engineering (1983)  
M.S., Civil/Geotechnical Engineering (1984)

### **Michael Minor and Associates**

Michael Minor, President (Noise)  
B.A., Physics, Whitman College (1988)  
B.A., Mathematics, Whitman College (1988)

### **Parsons Transportation Group**

Keith Anderson, Maintenance Facility Lead  
B.S., Civil Engineering (1975)

Frank Delizza, Systems Lead  
B.S., Electrical Engineering (1975)

John Feng, Ventilation Lead  
B.S., Mechanical Engineering (1980)

Winn Frank, Operations Lead  
B.S., Business Administration (1964)  
M.S., Business Administration (1972)

Roger Koester, Engineering Lead  
B.S., Civil Engineering (1964)

Randy Walker  
B.S., Civil Engineering (1980)

### **PRR**

Nicole Kistler  
B.S., Environmental Geography (1995)  
M.S., Landscape Architecture (2002)

Rita Brogan  
B.S., Editorial Journalism (1972)  
M.S., Communications (1975)

# List of Recipients

---

## A3.1 Federal Agencies

- Advisory Council on Historic Preservation
- Federal Aviation Administration
- Federal Emergency Management Agency
- Federal Highway Administration
- Federal Motor Carrier Safety Administration
- Federal Railroad Administration Region 8
- Transportation Security Administration US Homeland Security
- National Oceanic and Atmospheric Administration
- National Park Service
- U.S. Army Corps of Engineers
- U.S. Bureau of Indian Affairs
- U.S. Coast Guard
- U.S. Department of Commerce
- U.S. Department of Fish and Wildlife
- U.S. Department of the Interior
- U.S. Environmental Protection Agency (Region 10)

## A3.2 Tribes

- Muckleshoot Tribe
- Snoqualmie Tribe
- Suquamish Tribe
- Tulalip Tribe
- Yakama Tribe
- Duwamish Tribe

## A3.3 State Agencies

- Washington State Department of Community Trade and Economic Development
- Washington State Department of Ecology
- Washington State Department of Fish and Wildlife
- Washington State Department of Health
- Washington State Department of Natural Resources Interagency Committee for Outdoor Recreation
- Washington State Department of Social and Health Services
- Washington State Department of Archaeology and Historic Preservation
- Washington State Office of the Attorney General
- Washington State Parks and Recreation Commission
- Washington State Patrol

- Washington State Office of Governor
- Washington State House of Representatives
- Washington State Joint Transportation Committee
- Washington State Senate
- Washington State Utilities and Transportation Commission

## A3.4 Regional Agencies

- Port of Seattle
- Puget Sound Clean Air Agency
- Puget Sound Regional Council

## A3.5 County Agencies

- King County
- Pierce County
- Snohomish County

## A3.6 Transit Agencies

- Community Transit
- Everett Transit
- King County Metro Transit
- Pierce Transit

## A3.7 Cities

- City of Bellevue
- City of Clyde Hill
- City of Issaquah
- City of Kirkland
- City of Medina
- City of Mercer Island
- City of Redmond
- City of Seattle
- Town of Beaux Arts Village

## A3.8 Libraries

- APTA Information Center
- Bellevue Community College Library
- King County Library System
  - Bellevue Regional Library
  - Mercer Island Public Library
  - Newport Way Library
  - Library Connection at Crossroads
  - Redmond Regional Library
- Library Municipal Research and Services of Washington

- Seattle Public Library History Department
- Seattle Public Library Branches
  - International District /Chinatown Branch Library
  - Douglas Truth Branch Library
- University of Washington Libraries
- Washington State Department of Transportation Library
- Washington State Library
- Washington Talking Book and Braille Library

### A3.9 Railroads and Rail Service

- Burlington Northern Santa Fe Railroad

### A3.10 Schools and Community Centers

- Bellevue School District
- Bellevue Community College
- Mercer Island School District
- Lake Washington School District No. 414
- City of Bellevue Community Centers
- City of Mercer Island Community Center
- City of Redmond Community Centers
- City of Seattle Community Centers
  - International District/Chinatown Community Center
  - Garfield Community Center
  - Yesler Community Center
- City of Seattle Neighborhood Service Centers
  - Downtown Service Center
  - Central Service Center
  - Southeast Service Center
- Seattle Public Schools

### A3.11 Utilities

- AT&T Long Distance
- Cascade Water Alliance
- Comcast
- DNRP – Wastewater Treatment Division
- Electric Lightwave, Inc.
- Ledcor Technical Services / 360 Network
- Level 3
- MCI Worldcom
- Metromedia Fiber Optic
- Olympic Pipeline
- Puget Sound Energy
- Qwest
- Seattle City Light

- Seattle Public Utilities
- Sprint
- XO Communications
- Verizon

### A3.12 Business and Community Organizations

- Ames Lake Community Club
- Asian Counseling and Referral Services
- Bellecrest Neighborhood Association
- Bellevue Chamber of Commerce
- Bellevue Downtown Association
- Bellevue Neighborhood Network North
- Chinese Information Service Center
- Coalition for Effective Transportation Alternatives
- Concord Hill Homeowners
- Crossroads Community Center
- Downtown Seattle Association
- East Lake Sammamish Community Association
- Eastside Transportation Association
- enterpriseSeattle
- Grass Lawn Neighborhood Association
- Greater Redmond Transportation Mgmt. Assn.
- Greater Seattle Chamber of Commerce
- Issaquah Chamber of Commerce
- Jackson Place Community Council
- Judkins Park Community Council
- Kimberlee Park Homeowners
- King County Housing Authority
- Kirkland Chamber of Commerce
- Lake Heights Community Club
- Master Builders Association
- Mercer Island Chamber of Commerce
- Minority Executive Director's Coalition
- Mount Baker Community Club
- Newport Hills Community Club
- Puget Sound Partnership
- Greater Redmond Chamber of Commerce
- Redmond Ridge Residential Owners Association
- Somerset Community Association
- Southeast District Council
- Squire Park Community Council
- Suburban Cities Association
- Surrey Downs Community Club
- Transportation Choices Coalition
- Washington Environmental Council
- West Bellevue Community Club
- Wilburton Community Association
- Woodridge Community Association

## Acronyms and Glossary

---

### Acronyms

#### East Link Project Alternatives

##### Segment A. Interstate 90

A1, I-90 Alternative

##### Segment B. South Bellevue

B1, Bellevue Way  
B2A, 112th SE At-Grade  
B2E, 112th SE Elevated  
B3, 112th SE Bypass  
B7, BNSF

##### Segment C. Downtown Bellevue

C1T, Bellevue Way Tunnel  
C2T, 106th NE Tunnel  
C3T, 108th NE Tunnel  
C4A, Couplet  
C7E, 112th NE Elevated  
C8E, 110th NE Elevated

##### Segment D. Bel-Red/Overlake

D2A, NE 16th At-Grade  
D2E, NE 16th Elevated  
D3, NE 20th  
D5, SR 520

##### Segment E. Downtown Redmond

E1, Redmond Way  
E2, Marymoor  
E4, Leary Way

#### East Link Stations

##### Segment A. Interstate 90

Rainier  
Mercer Island

##### Segment B. South Bellevue

South Bellevue  
SE 8th  
118th

##### Segment C. Downtown Bellevue

Old Bellevue  
Bellevue Transit Center  
East Main  
Hospital  
Ashwood/Hospital

##### Segment D. Bel-Red/Overlake

124th  
130th  
Overlake Village  
Overlake Transit Center

##### Segment E. Downtown Redmond

Redmond Town Center  
SE Redmond  
Redmond Transit Center

#### East Link Maintenance Facilities

MF1, 116th  
MF2, BNSF  
MF3, SR 520  
MF5, SE Redmond

### General Acronyms and Abbreviations

AASHTO	American Association of State Highway and Transportation Officials
ADA	Americans with Disabilities Act
ADT	Average Daily Traffic
AM	morning
ANSI	American National Standards Institute
APE	Area of Potential Effect
AQMA	Air Quality Maintenance Area
ASC	Ambulatory Surgery Center
AST	above-ground storage tank
ASTM	American Society for Testing and Materials
AWSC	all-way stop-controlled
AWD	average weekday
AWT	average wait time
BIA	Bureau of Indian Affairs
BMP	best management practice
Btu	British thermal unit
CAA	Clean Air Act
CAFÉ	corporate average fuel economy
CCTV	closed-circuit television
CEQ	Council on Environmental Quality



CEQA	California Environmental Quality Act	FAA	Federal Aviation Administration
CFR	Code of Federal Regulations	FAQ	frequently asked question
cfs	cubic feet per second	FAZ	Forecast Analysis Zone
CH <sub>4</sub>	methane	Final EIS	Final Environmental Impact Statement
CNG	compressed natural gas	FEMA	Federal Emergency Management Agency
CO	carbon monoxide	FFGA	Full Funding Grant Agreement
CO <sub>2</sub>	carbon dioxide	FHWA	Federal Highway Administration
CO <sub>2e</sub>	carbon dioxide equivalent	FLSC	Fire/Life Safety Committee
CPP	Countywide Planning Policy	FIRES	finance, insurance, real estate, and services
CPR	cardiopulmonary resuscitation	FR	<i>Federal Register</i>
CPTED	Crime Prevention Through Environmental Design	ft	feet
CT	Community Transit	FTA	Federal Transit Administration
CTED	Washington State Department of Community, Trade, and Economic Development		
CWA	Clean Water Act	g/gal	gallons of gasoline
DAHP	Washington Department of Archaeology and Historic Preservation	GHG	greenhouse gas
		GIS	geographic information system
dB	decibel	GMA	Growth Management Act
dba	A-weighted decibel	GWP	global warming potential
DC	direct current		
DOE	U.S. Department of Energy	HAC	high-accident corridor
DPM	diesel particulate matter	HAL	high-accident location
Draft EIS	Draft Environmental Impact Statement	HCT	high-capacity transit
		HFC	hydrofluorocarbon
DRO	diesel-range organics	HGM	hydrogeomorphic classification
DSHS	Department of Social and Health Services	Horizon	Horizon Systems Corporation
		HOT	high-occupancy toll
		HOV	high-occupancy vehicle
		HPA	Hydraulic Project Approval
		HVAC	heating ventilation and air conditioning
EIA	Energy Information Administration	Hz	Hertz
Ecology	Washington State Department of Ecology	HUD	Department of Housing and Urban Development
Ecology Manual	<i>Stormwater Management Manual for Western Washington</i> (Washington State Department of Ecology, 2005)		
EIS	Environmental Impact Statement	I-90	Interstate 90
EMF	electromagnetic field	I-405	Interstate 405
EMI	electromagnetic interference	IPCC	Intergovernmental Panel on Climate Change
EO	Executive Order		
EPA	United States Environmental Protection Agency	JRPC	Joint Regional Policy Committee
ERIC	Eastside Refugee and Immigrant Coalition	KCM	King County Metro
		KOP	key observation point
ESA	Endangered Species Act	kV	kilovolt
		lb	pound
		lb/day	pounds per day

Ldn	24-hour, time-averaged, A-weighted sound level (day-night)	O <sub>3</sub>	ozone
Leq	equivalent continuous sound level	OCS	overhead catenary system
LID	low-impact development	OHWM	ordinary high water mark
Lm	maximum noise level	ORO	oil-range organics
Lmax	maximum noise level	PCB	polychlorinated biphenyl
LOS	Level of Service	PCE	perchloroethylene (tetrachloroethene)
LWCF	Land and Water Conservation Fund	PFC	perfluorocarbon
		PGIS	pollutant-generating impervious surface
MA	Memorandum Agreement	PHS	Priority Habitat and Species
MBTA	Migratory Bird Treaty Act	PM	afternoon, particulate matter
METRO	King County Metro	PM <sub>2.5</sub>	particulate matter 2.5 microns or less in size
mpg	miles per gallon		
MPO	Metropolitan Planning Organization	PM <sub>10</sub>	particulate matter 10 microns or less in size
MOA	Memorandum of Agreement	ppm	parts per million
mph	miles per hour	PPV	peak particle velocity
MRI	magnetic resonance imaging	PSCAA	Puget Sound Clean Air Agency
MSA	Magnuson-Stevens Fishery Conservation and Management Act	PSCOG	Puget Sound Council of Governments
		PSRC	Puget Sound Regional Council
MSAT	mobile source air toxic		
MTCA	Model Toxics Control Act	RCO	Washington State Recreation and Conservation Office
MTP	Metropolitan Transportation Plan	RCW	Revised Code of Washington
MVM	million vehicle miles	RFFA	reasonably foreseeable future action
NAAQS	National Ambient Air Quality Standards	RHL	Redmond Historic Landmark
NEPA	National Environmental Policy Act	rms	root mean square
		ROD	Record of Decision
NFPA	National Fire Protection Association	ROG	reactive organic gases
		RTA	Regional Transit Authority
NHPA	National Historic Preservation Act	RTIP	regional transportation improvement program
NIOSHA	National Institute for Occupational Safety and Health	RTP	regional transportation plan
		RTPO	Regional Transportation Planning Organization
NMFS	National Marine Fisheries Service		
NOA	Notice of Availability	SAFETEA-LU	Safe, Accountable, Flexible and Efficient Transportation Equity Act: A Legacy for Users
NOI	Notice of Intent		
NO <sub>2</sub>	nitrogen dioxide	SCAQMD	South Coast Air Quality Management District
N <sub>2</sub> O	nitrous oxide		
No <sub>x</sub>	oxides of nitrogen	SEM	sequential excavation mining
NPDES	National Pollutant Discharge Elimination System	SEPA	State Environmental Policy Act
		SHPO	State Historic Preservation Office
NPS	National Park Service		
NRHP	National Register of Historic Places	SIP	State Implementation Plan
		SL	Seattle Landmark

SMC	Seattle Municipal Code	WAC	Washington Administrative Code
SMP	Shoreline Master Program	WASIST	Washington State Intersection Screening Tool
SF <sub>6</sub>	sulfur hexafluoride	WDFW	Washington Department of Fish and Wildlife
SO <sub>2</sub>	sulfur dioxide	WDNR	Washington Department of Natural Resources
Sound Transit	Central Puget Sound Regional Transit Authority	WHR	Washington Heritage Register
sq ft	square feet	WPZ	wellhead protection zone
SR	state route	WSDOT	Washington State Department of Transportation
SSMP	safety and security management plan	WTCU	wholesale trade, transportation services, communication, and utilities sector
ST2	Sound Transit 2		
SWPPP	stormwater pollution prevention plan		
TCP	traditional cultural property		
TCRP	Transit Cooperative Research Program		
TCQSM	<i>Transit Capacity and Quality of Service Manual</i>		
TESCP	temporary erosion and sediment control plan		
TIP	Transportation Improvement Plan		
TMDL	total daily maximum load		
TNM	traffic noise model		
TPH	total petroleum hydrocarbon		
TPSS	traction power substation		
TRB	Transportation Research Board		
TSM	transportation systems management		
TSP	total suspended particulates		
TWSC	two-way stop-controlled		
µg/m <sup>3</sup>	micograms per cubic meter		
USACE	United States Army Corps of Engineers		
U.S.C.	United States Code		
USDOE	United States Department of Energy		
USDOT	United States Department of Transportation		
USFWS	United State Fish and Wildlife Service		
USGS	United States Geological Survey		
UST	underground storage tank		
v/c	volume to capacity ratio		
VdB	vibration decibel		
VHT	vehicle hours traveled		
VMT	vehicle miles traveled		
VOC	volatile organic compound		

## Glossary of Terms

**Access Time.** The time required to walk, bike, or drive from the origin of the trip (for example, from home) to a (boarding) transit stop, plus the waiting time based on the frequency of transit service, and/or the transfer time and the walking or driving time from the transit (de-boarding) stop to the destination. For auto trips, it is the time required to walk to and from parking places, and delays within parking facilities, if any.

**Accessibility.** The ease by which an individual can reach desired activities in any location by use of the transportation system.

**Air Pollutant (also, Air Contaminant).** Smoke, dust, fumes, or odors in the ambient air that have potential for harmful effects.

**Air Quality Maintenance Area (AQMA).** An area having the potential to violate a federal or state ambient air quality standard, based on expected growth and development in the area.

**Alignment.** Horizontal geometric elements, which define the location of the light rail track or roadway.

**Alluvium.** An unconsolidated, terrestrial sediment composed of sorted or unsorted sand, gravel, and clay that have been deposited by water.

**Alternative R-8A.** The preferred alternative outcome of a 1998 study initiated by Sound Transit to study two-way transit and high-occupancy vehicle (HOV) lanes on I-90. The preferred alternative (R-8A) called for the construction of HOV lanes on the outside roadways and the dedication of the center roadway for future high-capacity transit operations.

**Annualized Capital Cost.** A one-time capital cost converted into an annual value that incorporates both the depreciation on the capital item and the foregone interest on the money invested in the project.

**Archaeological Sensitivity Zone.** An area where the potential for finding an archaeological resource is high.

**Area Source.** A general classification of the origin of an air pollutant (e.g., park-and-ride lots are area sources of CO emissions).

**Arterial.** A major thoroughfare used mainly for through traffic rather than access to adjacent property. Arterials generally have greater traffic-carrying capacity than collector or local streets and are designed for continuously moving traffic.

**Artifact.** Any portable object used and/or modified by civilization (particularly during prehistoric times).

**At-Grade.** Term used to express that a feature, such as a rail track or crosswalk, and a roadway meet at the same elevation.

**At-Grade Crossing.** Any intersection of two or more flows of traffic at the same elevation (possibly involving more than one mode of transportation), such as road crossings by light rail.

**Atmospheric Stability.** A measure of the capacity of the ambient air to disperse air pollutants.

**Attainment Area.** An Attainment Area is an area considered to have air quality as good as or better than the national ambient air quality standards for specific pollutants as defined in the Clean Air Act.

**Average Annual Megawatt.** The average hourly demand for or supply of electricity measured in megawatts over a year.

**Average Daily Traffic (ADT).** The total volume of traffic during a given time period divided by the number of days in that time period, representative of average traffic in a one-day time period.

**Average Time (also, Exposure Time).** The duration of exposure to a given concentration of an air contaminant, specified in ambient air quality standards (e.g., the two national standards of 9 parts per million and 35 parts per million specify averaging times of 8 hours and 1 hour).

**Average Wait Time (AWT).** Average time spent by passengers at a station or bus stop waiting for transit service.



**Average Weekday (AWD).** A measurement of average conditions during one weekday, i.e., Monday through Friday.

**A-Weighted Sound Level (dBA).** To approximate the way humans interpret sound, a filter circuit with frequency characteristics similar to the human hearing system is built into sound measurement equipment. Measurements with this filter enacted are referred to as A-weighted sound levels, expressed in dBA. (See Decibel.)

**Background Concentration.** The pollutant level that would exist at a site in the absence of air pollution sources in the neighborhood of the site (different from Modeled Concentration).

**Baseline Energy Consumption.** Energy consumption, usually for a no-build alternative, that is used as a reference against which energy consumption for a build alternative is compared.

**Before Present.** An archaeological term that considers radiocarbon dating at a specified point in time before A.D. Because the "present" time changes, standard practice is to use January 1, 1950, as the arbitrary origin of the age scale.

**Boarding.** Term describing the arrival of passengers onto a bus or transit vehicle.

**Boarding Trips.** A trip on a transit line or group of lines where each boarding of a transit vehicle is considered the start of a new trip. Number of trips boarding (entering) transit vehicles, regardless of whether the trip involves a transfer from another transit vehicle. A fare may or may not be collected for each boarding trip, depending on whether a transfer is used.

**British Thermal Unit (Btu).** An energy unit equal to the quantity of heat required to raise the temperature of 1 pound of water 1 degree Fahrenheit. One therm equals 1,000,000 Btu.

**Capacity, Person.** The maximum number of persons that can be carried past a given location during a given time period under specified operating conditions without unreasonable delay, hazard, or restriction. Usually measured in terms of persons per hour.

**Capacity, Roadway.** The maximum hourly rate at which persons or vehicles can reasonably be expected to traverse a point or uniform section of a lane or roadway during a given time period under prevailing roadway and traffic conditions.

**Capacity, Vehicle.** The maximum number of vehicles that can be accommodated in a given time by a transit or highway facility.

**Capital Costs.** Nonrecurring costs required to construct transit systems, including costs of right-of-way, facilities, rolling stock, power distribution and the associated administrative and design costs, and financing charges during construction.

**Carbon Monoxide (CO).** A colorless, odorless, tasteless gas, and one of the criteria air pollutants released from automobile exhaust.

**Car Pool.** A group of passengers and drivers organized to use one automobile on a regular basis, riding together, for the same trip purpose (generally the work trip).

**Cathodic Protection.** Cathodic protection is an effective method of preventing stress-corrosion cracking. It is a technique used to control the corrosion of a metal surface by making that surface the cathode or terminal that transports the current.

**Census Tract.** A Census tract is a small subdivision of an urban area used by the U.S. Census Bureau to identify population and housing statistics. Census blocks are subdivisions of census tracts and are the smallest unit of census geography for which the Census Bureau collects data. The boundaries of census blocks are generally streets or other notable physical features and often correspond to a city block. A census block group is a combination of census blocks, typically encompassing two to four city blocks. The Census collects some information at the block level, some at the block group level, and some at the tract level.

**Channelization.** The use of traffic markings or islands to direct traffic into certain paths. For example, a "channelized" intersection directs portions of traffic into a left turn lane through the use of roadway islands or striping that

separates the turn lane from traffic going straight.

**Circulation.** The free movement or passage of a vehicle, pedestrian, bicycle, or other transportation mode through a given area.

**Concentration (also, level).** A measure of the air pollutant in the ambient air, having the units of mass per volume.

**Conformity.** A process that ensures federal funding and approval goes to transportation activities consistent with federal air quality goals. The Federal Highway Administration and the Federal Transit Administration jointly determine that specific regions meet air quality standards.

**Construction Energy.** In transportation analysis, the energy used to build stations, terminals, roadbeds, trackbeds, tunnels, vehicles, and other equipment and facilities. Construction energy includes the energy content of materials and the energy used to haul and place them.

**Construction Staging Area.** During construction, a site temporarily used for materials or equipment storage, assembly, or other temporary, construction-related activities.

**Corridor.** A general path from one point to another; the East Link study corridor begins in Seattle and travels to Redmond.

**Couplet.** A place where a two-way street changes temporarily into a one-way paired set of streets.

**Criteria Air Pollutants.** Those air pollutants which have been recognized by the EPA as potentially harmful and for which standards have been set to protect the public health and welfare. The criteria air pollutants are carbon monoxide, sulfur dioxide, particulates, nitrogen dioxide, ozone, hydrocarbons and lead.

**D2 Roadway.** In Seattle, an HOV ramp onto I-90 between Downtown Seattle and Rainier Avenue.

**Day Night Sound Level (Ldn).** Ldn, also abbreviated DNL, is a 24-hour equivalent continuous sound level (Leq), but with a 10-dB penalty assessed to noise events occurring at night. Nighttime is defined as 10 p.m. to 7 a.m. This strongly weights Ldn toward nighttime

noise because most people are more easily annoyed by noise during the nighttime hours when background noise is lower and most people are sleeping.

**Decibel.** The unit used to measure the loudness of noise.

**Displacement.** A property acquisition that would require removing an existing use.

**Disturbed Habitat.** A habitat in which naturally occurring ecological processes and species interactions have been significantly disrupted by the direct or indirect results of human presence and activity.

**Drop-Off Zone.** A station that provides temporary loading and unloading facilities for autos and/or buses. The station may be combined with feeder bus stations.

**Ecologically Sensitive Area.** An area, valued locally for its rare or sensitive habitat, existing in a relatively undisturbed, natural state and supporting indigenous species.

**Elasticity.** In economic analysis, the sensitivity of the demand or supply of a commodity to changes in another variable (e.g., the price elasticity of gasoline is the ratio of the percent change in consumption to percent change in price).

**Elevated Guideway.** A guideway that is positioned above the normal activity level (e.g., elevated structure for light rail to cross over a street).

**Emission.** Particulate, gaseous, noise, or electromagnetic byproducts of the transit system or vehicle.

**Emission Control.** Method by which emissions are governed in an effort to minimize the pollutants and/or noise emitted.

**Emission Inventory.** A listing by emission source of the amounts of air pollutants released into the atmosphere (generally, in tons or kilograms per day).

**Emission Source.** The origin of an air pollutant (e.g., automobiles and trucks are sources of carbon monoxide, hydrocarbons, and nitrogen oxides).

**Emission Standards.** A limitation on the release of an air contaminant into the ambient air (e.g., the federal government limits carbon monoxide, hydrocarbon, and oxides of nitrogen (NO<sub>x</sub>) emissions per mile of travel in new automobiles).

**Endangered Species.** According to the Federal Endangered Species Act of 1973, an endangered species is any species in danger of extinction throughout all or a significant portion of its range, other than an insect determined by the Secretary of the Interior to constitute a pest whose protection under the provisions of this act would present an overwhelming and overriding risk to man.

**Energy Factor.** A number that when multiplied by the appropriate usage units (e.g., vehicle miles, tons, dollars), yields a measure of energy consumption (e.g., 0.5 gallon per vehicle mile x 10 miles = 5.0 gallons consumed for propulsion).

**Energy System.** The network of major and minor routes, vehicles, facilities, and other energy-consuming entities that are considered in energy analysis.

**Equity.** The incidence of fairness and the distribution of benefits, costs, and impacts among population subgroups except as defined for subareas per allocations set out in Sound Move.

**Equivalent Level (Leq).** Leq is a measure of sound energy over a period of time. It is referred to as the equivalent sound level because it is equivalent to the level of a steady sound which, over a referenced duration and location, has the same A-weighted sound energy as the fluctuating sound.

**Express Service.** Transit service where a very limited number of stops are made.

**Facilities Energy (also, Station Energy).** A portion of the operational energy that includes the energy to operate parking lots, administration buildings, and other facilities. It does not include propulsion or maintenance energy.

**Facility.** The means by which a transportation mode is provided. For example, a sidewalk is a facility for pedestrians as is a highway is a facility for vehicles.

**Fare.** The authorized amount (cash or token) paid or the valid transfer or pass, presented for a transit ride.

**Fare Box.** A device that accepts and, in some cases, registers coins and tokens used by passengers as payment for rides.

**Fare Structure.** The methodology of determining the fare that a passenger pays for service.

**Feeder Bus Station.** A station that provides lateral bus transportation service for riders to transfer to a light rail mode.

**Feeder Service.** Local transit service that feeds trunkline (usually faster and at higher capacity) transit service.

**Fixed Route.** Transit service provided on a repetitive, fixed-schedule basis along a specific route with transit vehicles stopping to pick and deliver passengers to specific locations.

**Forest or Woodland Habitat.** A habitat type generally dominated by Douglas fir, western red cedar, and western hemlock, frequently with a hardwood understory. The ground cover is generally lush. Birds and small mammals abound, and larger mammals are common in large stands.

**Frequency, Vehicle.** Time rate of vehicle arrivals at a station stop or along a transit line.

**Full Acquisition.** A type of property encroachment that would require the acquisition of the full parcel and displace the current use.

**General-Purpose Lane.** Term to describe a traffic lane on a highway that can be used by all types of vehicles including single occupant autos, carpools, trucks and motorcycles.

**Grade Separated.** Parallel or crossing lines of traffic that are vertically or horizontally physically separated from each other and do not share a common intersection.

**Greenhouse Gases (GHG).** Greenhouse gases include CO<sub>2</sub>, methane (CH<sub>4</sub>), O<sub>3</sub>, water vapor, nitrous oxide (N<sub>2</sub>O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF<sub>6</sub>). These gas emissions are collectively leading to the greenhouse effect,

trapping the sun's solar rays and leading to an increase in Earth temperature.

**Ground-Borne Noise.** Noise that is transmitted through the ground, typically reported in decibels.

**Ground-Borne Vibration.** A small but rapidly fluctuating motion transmitted through the ground, typically reported as velocity or acceleration.

**Guideway.** Specifically designed way traversed by transit vehicles constrained to the way.

**Habitat Function.** Terrestrial plant communities, wetlands, and aquatic systems such as streams provide a variety of functions in the environment. For instance, depending on the condition and location of a wetland, wetland functions may include water quality improvement, groundwater recharge, nutrient and sediment filtering, and habitat for a variety of animals, as well as education and recreation opportunities for people – the habitat function is one of several functions potentially performed by wetlands. Similarly, terrestrial and aquatic systems each also may perform many functions. When they provide habitat for animals, they are said to be performing or providing a “habitat function.”

**Habitat Value.** The value of plant community's function as determined by the habitat's ability to support the needs of biological species. High-value habitats are those that support or may support threatened, endangered, and/or sensitive species as determined by the federal, state, and local jurisdictions.

**Headway.** The headway between vehicles in public transit systems is the amount of time (usually in minutes) that elapses between two vehicles passing the same point traveling in the same direction on a given route.

**High-Capacity Transit (HCT).** A system of public transportation services within an urbanized region operating principally on exclusive rights-of-way, examples include light rail transit or express buses on exclusive bus ways and their supporting services.

**High-Occupancy Vehicle (HOV).** Any passenger vehicle that meets or exceeds a certain predetermined minimum number of passengers,

for example, more than two or three people per automobile. Typically includes carpools with two or more people, vanpools, and buses.

**Hours of Service.** The number of hours during the day between the start and end of service on a transit route, also known as the service span.

**Hydrocarbon (HC).** Nonmethane hydrocarbon that contributes to the formation of photochemical oxidants (commonly known as smog), primarily ozone.

**Impedance Value.** A factor used to weight the time spent waiting for transit. Often computed as 2.1 times the in-vehicle time.

**Indirect Energy.** A term used to denote all energy inputs for the construction, operation, and maintenance of a system.

**Indirect Source.** An entity that does not directly emit pollutants but attracts emission sources such as automobiles and trucks. Shopping centers, stadiums, and highways are examples of indirect sources.

**Induced Trips.** Trips generated because of the construction of a new (transportation) facility. (Different from Shifted Trips).

**Integration with Other Modes.** Method by which a transit system interfaces with other modes of transportation.

**Interchange.** The system of interconnecting ramps between two or more intersecting roadways or guideways that are grade separated.

**Interim Terminus.** A station where the project would operate until the next portion of the project can be built. The terminus would typically include a station with tail tracks extending beyond the station for layover of trains.

**Interslab Subduction Zone.** Interslab subduction zone is the zone between the earth's crustal plates. This zone is the source of large earthquakes off the coast of Washington.

**Joint Development.** Opportunities for the development or redevelopment of adjacent parcels (in station areas) in a manner which would support both the transit investment and



the community objectives through the use of both public and private funds.

**Kilowatt (kW).** A unit of electrical energy.

**Kilowatt-hour (kWh).** One kilowatt of energy used over one hour.

**Key Observation Point (KOP).** A view location used to describe existing visual conditions and to analyze

**Lacustrine soils.** A soil that has been formed in a lake bed.

**Land Development Pattern.** The use, types, and intensity of development. Land development patterns affect trip demand, average trip length, and therefore, energy consumption.

**Landscaped Habitat.** A habitat in urban areas having limited native species. Vegetation generally consists of mowed lawns and exotic trees and bushes.

**Ldn.** The day/night average noise level.

**Leq.** The equivalent steady-state sound level that, in a specified time period, would contain the same acoustic energy as the varying sound level during the same period; considers volume capacity, travel speeds and delay.

**Leq(h).** The hourly value of Leq.

**Level of Service (LOS).** A qualitative measure that represents the collective factors of travel under a particular volume condition. A measure of traffic congestion.

**Light Rail Transit (also Light Rail).** A mode of mass transportation comprising light rail vehicles, which travel on steel tracks and are powered by electricity from overhead wires. This mode is characterized by its ability to operate in both at-grade and/or grade-separated environments.

**Line Source.** A general classification of the origin of an air pollutant (e.g., highways and other roads are line sources of carbon monoxide emissions).

**Link.** Sound Transit's light rail system.

**Load Factor.** The average ratio of passengers to seats, during some specified period of operation of a public transit route.

**Local Service.** A type of transit operation involving frequent stops and consequent low speeds, the purpose of which is to deliver and pick up transit passengers as close to their destinations or origins as possible.

**Locally Preferred Alternative (LPA).** Following the publication of a Draft EIS, the Sound Transit Board identifies a preferred alternative, consisting of routes and station preferences. This is known as a "locally" preferred alternative because FTA has not yet selected a preferred alternative.

**Maintenance Area.** Maintenance areas are geographic areas with a history of nonattainment of National Ambient Air Quality Standards (NAAQS) but which now consistently meet NAAQS.

**Maintenance Energy.** A portion of operational energy that is applied to repair and maintenance of vehicles and buildings in the system. It does not include propulsion or facilities energy.

**Median Track Alignment.** In rail operations, a type of alignment where tracks are positioned in the median on the street, as opposed to being positioned on one side of the street.

**Megawatt (MW).** 1,000,000 watts.

**Microgram per Cubic Meter ( $\mu\text{g}/\text{m}^3$ ).** A unit of concentration equal to one thousandth of a gram per cubic meter.

**Minimum Operable Segment (MOS).** A shorter segment of the project route that could be successfully operated on an interim or long-term basis if necessary, and could be extended at a later time.

**Minimum Turn Radius.** Generally assumed to be the minimum horizontal turn radius (tightest curve).

**Minority Residents.** Those persons who, in responding to the 1990 U.S. Census, indicated their race to be something other than "White" or reported entries that the Bureau of the Census categorized as something other than "White."

**Mobility.** The ease of continuous movement along the transportation system.

**Mobility Limited.** As defined for 1990 U.S. Census data, persons who had a health

condition (physical and/or mental) that had lasted for 6 or more months and which made it difficult to go outside the home alone.

**Mode.** A particular form or method of travel, such as pedestrian, bicycle, automobile, bus, or light rail.

**Mode Share.** The percentage of travelers that travel either by SOV, HOV, or transit modes on a given roadway facility.

**Mode Split.** Forecast of proportion of total person-trips that would use each of the various modes of transportation that include transit and cars.

**Model Toxics Control Act (MTCA).** The Model Toxics Control Act Cleanup Regulation, WAC 173-340, implements the Model Toxics Control Act, RCW 70.105D, which addresses strict requirements for site discovery and reporting, site assessments, and site remediation. Most important, the regulation defines standard methods used to assess whether a site is contaminated or clean.

**Modeled Concentration.** An air pollutant level, excluding the background level, predicted by a model (see Background Concentrations).

**National Ambient Air Quality Standards (NAAQS).** Federal limits on levels of atmospheric contamination necessary to protect the public from adverse effects on health (primary standards) and welfare (secondary standards).

**National Historic Preservation Act of 1966 (NHRA).** The act that established the National Register of Historic Places and State Historic Preservation program and set forth guidelines and regulations for environmental review of projects involving federal funding.

**National Register of Historic Places (NRHP).** The official list of the nation's cultural resources determined to be worthy of preservation; the register is maintained by the National Park Service.

**Network.** A system of real or hypothetical interconnecting links that forms the configuration of transit routes and stops which constitute the total system.

**Nonattainment Area.** An area designated by the EPA as presently violating the National Ambient Air Quality Standards, based on archival air quality data.

**NO<sub>x</sub>.** Oxides of nitrogen (nitrogen oxide and nitrogen dioxide). The pollutants released during high-temperature combustion of fossil fuels such as diesel.

**Off-Peak.** Those periods of the day when demand for transit service is not at a maximum.

**Open Field Habitat.** A habitat characterized by various species of perennial and annual grasses, forbs, small and large birds, small mammals, and snakes. This habitat is especially important in providing nesting sites and food for various song and predatory birds.

**Operating Costs.** Recurring costs incurred in operating transit systems, including wages and salaries, maintenance of facilities and equipment, fuel, supplies, employee benefits, insurance, taxes, and other administrative costs. Amortization of facilities and equipment is not included.

**Operating Revenue.** The gross income from operation of the transit system including fares, charter income, concessions, advertising, etc. Does not include interest from securities, non-recurring income from sale of capital assets, etc.

**Operational Energy.** The energy used for vehicle propulsion, facilities, and maintenance for a specified period, usually one year.

**Originating Ride (or Trip).** A one-way trip taken on a transit line or group of lines, where a transfer from one line to another is not considered to be the start of a new trip.

**Overhead Catenary System (OCS).** Electrical transmission poles and lines that supply power to the light rail system.

**Ozone.** A gas consisting of three oxygen atoms formed in reactions of nonmethane hydrocarbons and nitrogen oxides in the presence of sunlight. Ozone is one of the Criteria Air Pollutants.

**Palustrine Wetland.** Freshwater wetlands dominated by trees, shrubs, and emergent vegetation.

**Park-and-Ride Lot.** A lot that provides parking for patrons of a transit facility.

**Parking Utilization.** The number of parking spaces being utilized at a given location, it is calculated as the total number of parking spaces occupied divided by the total parking supply at a given location.

**Partial Acquisition.** A property that would be partially acquired in order to build and operate the light rail.

**Pasquill Stability Class.** A category of atmospheric stability ranging from Class A (extremely unstable conditions) to Class F (moderately stable conditions).

**Passenger Load/Passenger Load LOS.** The number of passengers on a transit unit (vehicle or train) at a specified point.

**Passenger Mile.** A measure of travel equivalent to one passenger traveling one mile.

**Patronage.** The number of person-trips carried by a transit system over a specified time period.

**Peak Hour.** The hour of the day in which the maximum demand for service is experienced, accommodating the largest number of automobile or transit patrons.

**Peak Particle Velocity (PPV).** Specifications for allowable levels of vibration from blasting, pile-driving, and other construction processes with the potential of causing building damage are almost always expressed in terms of peak particle velocity since this is thought to be well correlated with maximum stresses in buildings. Peak particle velocity is the instantaneous positive or negative peak in the vibration signal.

**Peak Period.** A time period or periods when travel activity is at its heaviest.

**Pedestrian Level of Service (LOS).** An overall measure of walking conditions on a route, path, or facility.

**Person Demand.** The number of persons that use a specific roadway or highway facility thus creating a demand for usage of the facility, it is often compared to roadway capacity to determine the level of congestion.

**Person Throughput.** The amount of persons that can pass a point on a roadway or pass

through an intersection over a specified period of time.

**Person Trip.** A trip from a point of origin to a destination made by a person by any travel mode. Within transit, transfers are not counted. That is, a person traveling from home to work on a bus with one transfer creates only one-person trip.

**Photochemical Oxidants (Smog).** Gaseous pollutants formed from reactions of non-methane hydrocarbons and nitrogen oxides (NO<sub>x</sub>) in the presence of sunlight (e.g., ozone).

**Platform Hours.** Elapsed time from when a transit bus or train pulls out of the garage into service to when it returns to the garage after completing its service.

**Point Source.** A general classification of the origin of an air or water pollutant, usually characterized as smokestacks or outfalls.

**Pollutant-Generating Impervious Surface (PGIS).** Impervious surfaces considered to be a significant source of pollutants in stormwater runoff. Such surfaces include those subject to vehicular use, industrial activities (as defined in the Ecology Manual), or storage of erodible or leachable materials, wastes, or chemicals, and which receive direct rainfall or the run-on or blow-in of rainfall.

**Polychlorinated Biphenyl (PCB).** Hazardous environmental pollutants upon which the federal government has placed additional controls regulating disposal.

**Potentially Affected Area.** This is defined differently by each technical discipline. It includes the area that could be affected by the alternatives.

**Poverty-Level Household.** As used for 2000 U.S. Census data, the average poverty threshold for a family of four persons was \$17,603 in 2000. The defined family poverty level threshold varied by total number of family members, number of children under 18 years, and number of persons over age 65. For a detailed discussion of the poverty definition, see U.S. Bureau of the Census, *Current Population Reports, Series P-60, No. 171, Poverty in the United States: 1988 and 1989*.

**Power.** The time rate of energy use.

**Preferred Alternative.** Following publication of the Draft EIS, the Sound Transit Board identifies a preferred alternative including route and station options. The Final EIS further evaluates the preferred alternative as well as other alternatives.

**Propulsion Energy (also, Direct Energy).** In transportation analysis, a portion of operational energy that includes fuels and electricity to propel vehicles and provide lighting, heating, and air conditioning within them.

**Pulsing.** The coordinated arrival and departure of buses on a number of different bus lines at a transit center to facilitate transferring of passengers among those bus lines. Usually, local feeder bus lines are scheduled to arrive at the transit center just ahead of the trunkline bus or train and then depart just after the trunkline bus or train.

**Queue.** A line of vehicles, bicycles, or persons waiting to be served by the system in which the flow rate from the front of the queue determines the average speed within the queue. Slowly moving vehicles or people joining the rear of the queue are usually considered part of the queue. The internal queue dynamics can involve starts and stops. A faster-moving line of vehicles is often referred to as a moving queue or a platoon.

**Radial System.** A network of transit lines that meet in the downtown area.

**Region.** The four-county Puget Sound Regional Council region, including King, Pierce, Snohomish, and Kitsap Counties.

**Reliability.** How often transit service is provided as promised; affects waiting time, consistency of passenger arrivals from day to day, total trip time, and loading levels.

**Representative Alignment.** The East Link general alignment that consists of Alternatives A1, B2E, C8E, D3, E1.

**Right-of-Way.** The corridor (horizontal and vertical space) owned by the transit agency for the transportation way.

**Riparian Habitat.** A habitat type associated with stream and lake margins and characterized

by dense vegetation consisting primarily of willow, alder, and cottonwood species, supporting a wide variety of waterfowl, songbirds, amphibians, and small mammals.

**Route.** The course followed by a transit vehicle as a part of the transit system.

**Route Miles.** The length of a route measured in miles between its end points.

**Runoff.** The rainwater that directly leaves an area in surface drainage, as opposed to the amount that seeps out as groundwater.

**Screenline.** A screenline is an imaginary line across a section of freeways or arterials. Screenlines are often used in traffic analyses to determine how much volume is entering or exiting a particular area.

**Section 10.** Section 10 of the Rivers and Harbors Act of 1899 established authority to issue permits for obstructions or alterations of any navigable waters of the United States. This permit program is administered by the U.S. Army Corps of Engineers.

**Section 106.** Section 106 of the National Historic Preservation Act of 1966 established a procedure to review the potential effects on cultural resources by projects receiving federal funds.

**Section 4(f).** Section 4(f) of the Department of Transportation Act restricts the United States Department of Transportation's approval of projects affecting the following properties: publicly owned land from a public park, recreation area, or wildlife and waterfowl refuge, or any land from a significant historic site.

**Section 404.** Section 404 of the Clean Water Act is a permit program administered by USACE under guidelines by EPA to protect the nation's waters from dredged and fill sources.

**Section 6(f).** Section 6(f) of the Land and Water Conservation Act of 1965 established restrictions on, and replacement requirements for, the use of land acquired with funds authorized under the Land and Water Conservation Fund Act.

**Section 9.** Section 9 of the Rivers and Harbors Act of 1899, established authority to issue permits for bridges and causeways across any navigable waters of the United States – Section 9



Permits are administered by the U.S. Coast Guard.

**Segment.** This refers to the five sections of the East Link Project, as defined in Chapter 2 of the Draft EIS.

**Sensitive Receptor (Auditory).** A local area or site that supports activities easily disrupted by audio intrusions or distractions, such as a park, school, historic landmark, or residential neighborhood.

**Sensitive View.** A view that is identified by local jurisdictions as requiring protection.

**Sensitivity Analysis.** A “what-if” type of analysis to determine the sensitivity of the outcomes to changes in parameters; if a small change in a parameter results in relatively large changes in the outcomes, the outcomes are said to be sensitive to that parameter.

**Service Frequency/Frequency.** The number of transit units (vehicles or trains) on a given route or line, moving in the same direction, that pass a given point within a specified interval of time, usually 1 hour.

**Side-Track Alignment.** In rail operations, a type of alignment where the tracks are positioned on one side of the street, as opposed to being positioned in the median of the street.

**Signal Phasing.** A group of three traffic signal timed intervals (green, yellow, red) that are assigned to an independent traffic movement or combination of movements.

**Signal Preemption.** Traffic signal options that may modify normal traffic signal phasing for preferential treatment of transit vehicles.

**Signal Progression.** A series of traffic signals timed and coordinated to optimize the flow of selected traffic movements.

**Smog.** See Photochemical Oxidants.

**Social Interaction.** Intra-neighborhood communication and circulation using street, sidewalk, and bikeway connections between residential areas and community facilities, retail businesses, and employment centers. Also includes verbal interaction and telecommunications facilities.

**Sounder.** Sound Transit’s commuter rail system, which will travel from Everett to Lakewood, through Seattle.

**Sound Transit 2 (ST2).** A package of HCT investments in the regional transit system, adopted in May 2007, which included light rail as the mode choice for the East Corridor on I-90.

**Staging Area.** Section of land near a construction site designated for equipment and truck storage, maintenance, and warm up prior to engagement in construction activities.

**State Implementation Plan (SIP).** A plan required of each state by the Clean Air Act that describes how the state will attain and maintain the National Ambient Air Quality Standards.

**Stormwater Detention.** The temporary storage of stormwater runoff and subsequent release at a slower rate.

**Stormwater Treatment.** Stormwater ponds and underground vaults are used to remove sediments and dissolved metals from stormwater. They collect sediments on the bottom of the pond or vault, where maintenance workers can clean them out on a regular basis.

**Straddle Bent.** Light rail guideway support that extends across the width of the street.

**Subarea.** A unique portion of the Regional Transit Authority taxing district, one of five as defined in Sound Move (Snohomish County, North King County, East King County, South King County, and Pierce County).

**Subduction Zone.** An area where one crustal plate is descending below another. The Puget Sound area is close to a subduction zone, which is formed by the Juan de Fuca plate descending below the North American plate. This action can cause significant seismic activity.

**Terminal.** The terminating point of transportation routes with transfer facilities and, often, amenities for passenger convenience.

**Terminus.** A transit station located at the end of a transit (including light rail) line.

**Threatened Species.** According to the Federal Endangered Species Act of 1973, any species that is likely to become an endangered species



within the foreseeable future throughout all or a significant portion of its range.

**Through Route.** Interconnected transit lines in the downtown area, or a transit center, that allow buses (or trains) entering downtown or the transit center on one line to pass through and exit on another line. This eliminates the need to turn transit vehicles around downtown or at the transit center and allows some passengers to continue without transferring.

**Title 23, Code of Federal Regulations, Part 771 (23 CFR Part 771) (Revised 1987).** Federal Highway Administration and Federal Transit Administration regulations governing the preparation of environmental impact statements and related documents.

**Title 23, Code of Federal Regulations, Part 777 (23 CFR Part 777) (Revised 1980).** Federal Highway Administration (FHWA) and FTA regulations providing policy and procedures for evaluation and mitigation for impacted, privately owned wetlands.

**Total Maximum Daily Loads (TMDL).** For 303(d)-listed water bodies, TMDLs are developed by Ecology for the pollutants that exceed water quality standards as a means for ultimately attaining the standards.

**Total Suspended Particulates (TSP).** Air pollutants that consist of solid particles (dust, lead, salts, etc.) suspended in the atmosphere. TSP is a criteria air pollutant.

**Total Suspended Solids (TSS).** Organic and inorganic particles that are entrained within and carried by water. The particles are typically sand, silt, and clay, but may include pebbles and larger rocks in fast-flowing water.

**Total Travel Time.** The total elapsed time between trip beginning and end, including travel, terminal, and waiting time.

**Traction Power Substation.** Electrical station that provides the power needed to drive the trains. The substations are housed in either standalone structures, or within transit stations, typically within or adjacent to the right-of-way. The substations would typically be built about one and a half miles apart.

**Transfer Ratio.** The number of boarding trips divided by originating trips.

**Transfer Time.** The elapsed trip time required to change between modes (e.g., bus to light rail) or to transfer between routes of the same mode (e.g., bus to bus).

**Transfer.** The portion of a trip between two connecting transit lines, both of which are used for completion of the trip.

**Transit.** A transportation system principally for moving people in an urban area and made available to the public usually through paying a fare.

**Transit Center.** A station with shelters where a large number of transit vehicles and passengers can be brought together with safety and convenience.

**Transit-Oriented Development.** The Transportation Research Board provides several definitions of transit-oriented development that emphasize high-quality walking environments, mixed land uses, and high-density developments linked to transit. Generally, transit agencies agree that what constitutes a transit-oriented development is a pattern of dense, diverse, pedestrian-friendly land uses, near transit nodes that, under the right conditions, translates into higher transit patronage.

**Transit Service Reliability.** Reliability is defined as the degree to which transit service can be counted on for consistent, on-time performance.

**Transit Street Classification System.** The City of Seattle's system for designating certain streets as being important for transit. This is part of the city's overall street classification system.

**Transportation Corridor (also, Corridor).** The group of travel movements (or travel flows) between two or more locations. A corridor may have components, or subcorridors. A corridor includes all facilities, transit and highway, that may be used to accommodate the specified travel movement.

**Transportation Systems Management (TSM).** Incorporates relatively low-cost approaches to improving mobility without constructing major

new transportation facilities. TSM generally emphasizes smaller physical improvements and operational changes such as intersection improvements, minor widenings, traffic engineering actions, operational changes such as queue jumps or queue bypass lanes for buses, expanded bus service, transit centers, and improved transit access.

**Travel Time (in vehicle).** The time required to travel between two points, not including terminal or waiting time.

**Trip.** The one-way movement of one person between his origin and his destination, including transfers and the walk to and from the means of transportation.

**Trip Demand.** The number and type (public or private origin and destination) of trips measured, calculated, or forecasted in a specified area having a given land development pattern. Trip demand also depends on prevailing economic, behavioral, and attitudinal conditions.

**Trip Length.** The number of miles per trip. This is usually an average number for a specified trip type, area and analysis year.

**Turn Pocket.** Term used to describe a traffic lane that separates turning vehicles from thru lanes. For example, a left-turn pocket is also commonly known as a left-turn lane.

**Unity.** In visual analysis, the visual coherence and compositional harmony of the landscape.

**Use of Section 4(f) Land.** According to regulations of the U.S. Department of Transportation, use of Section 4(f) land is defined as: (1) acquisition of title or easement to land, or (2) in unusual circumstances, serious indirect impacts, such as increase in noise, visual intrusion, or access obstruction.

**Vehicle Hours Traveled (VHT).** The total vehicle hours expended traveling on the roadway network in a specified area during a specified time period.

**Vehicle Mile.** An amount of travel equivalent to one vehicle traveling one mile.

**Vehicle Miles Traveled (VMT).** The total number of vehicle miles traveled within a

specific geographic area over a given period of time.

**Vehicle Occupancy.** The number of persons per vehicle. Usually an average number for a specified trip type, area and analysis year.

**Vehicle Throughput.** The number of vehicles, usually on a highway, that get through a screenline over a short time period such as an hour.

**Vent (also Remote Vent).** Vent structures provide emergency ventilation and access for tunnel sections, and are often located adjacent to station entrances. Vents that are not adjacent to the station are called "remote vents." Surface vent buildings enclose the vent and include an exhaust and intake in the roof, a fan room, and space for electrical and communications equipment.

**Vibration Propagation.** The transfer of vibration through soil or other media.

**Vibration Propagation Test.** A test that provides an estimate of vibration levels as a function of distance from a vibration source, in this case the light rail vehicle. Tests are done on the surface to evaluate propagation at-grade, or at the bottom of a bore hole for tunnel routes.

**Vibration Velocity.** Vibration velocity is the basic measure of ground-borne vibration. It is a measure of the rate at which particles in the ground are oscillating relative to the equilibrium point.

**Vibration Velocity Level.** It is generally accepted that, over the frequency range important for ground-borne vibration from transit systems, human response to vibration is best correlated to the root-mean square (rms) vibration velocity. In this report, rms vibration velocity is always expressed as decibels relative to 1 micro-inch per second.

**Viewer Sensitivity:** The extent of the viewer's concern for a particular view or viewshed. Viewer sensitivity to the viewed environment is classified as low, average, or high.

**Visual Amenity.** An object or element (such as buildings or vegetation) that enhances the visual character of a view or area.

**Visual Character.** Visual character is an impartial description of the landscape in terms of dominance, scale, diversity, and continuity. Visual character-defining environments and features include landforms, vegetation, land uses, transportation facilities, overhead utilities, open spaces, water bodies, designated viewpoints, and views to the visual environment.

**Visual Encroachment.** The imposition of an object, or objects, on a view such that the view is disrupted, obstructed, or otherwise modified from its original state.

**Visual Quality.** Visual quality is an assessment of the visual character and is categorized as low, medium, or high, as follows:

- **Low Visual Quality.** Areas that have low visual quality may have features that seem visually out of place, lack visual coherence, do not have compositional harmony, and contain eyesores.
- **Medium Visual Quality.** These areas can be generally pleasant appearing, but may lack distinctiveness, memorability, drama, and compositional harmony, or may simply be very common and ordinary landscapes.
- **High Visual Quality.** These areas may be memorable, distinctive, unique (in a positive way), intact natural or park-like areas or urban areas with strong and consistent architectural and urban design features.

**Volume to Capacity (v/c) Ratio.** The ratio of demand flow rate to capacity for a highway or arterial facility; a v/c ratio below 1.0 means that traffic volumes are below the capacity of the roadway, when identified as greater than 1.0, the traffic volume has theoretically exceeded the carrying capacity of the roadway.

**Washington State Department of Ecology 303(d) List.** The federal Clean Water Act (CWA), adopted in 1972, requires states to restore their waters to be “fishable and swimmable.” The CWA established a process to identify and clean up polluted waters. Every 2 years, all states are required to prepare a list of water bodies that do not meet water quality standards. This list is called the 303(d) list because the process is described in Section 303(d) of the CWA.