ENVIRONMENTAL IMPACT STATEMENT ADDENDUM

Quendall Terminals

Renton, Washington

October 2012

prepared by

City of Renton
Department of Community and Economic Development

Denis Law
Mayor

City of Renton

Department of Community and Economic Development
C.E."Chip"Vincent, Administrator

October 19, 2012

Dear Reader:

Attached is a copy of the Environmental Impact Statement Addendum (EIS Addendum) for the Quendall Terminals mixed use development. The proposal is located adjacent to Lake Washington on 21.46 acres of Commercial/Office/Residential (COR) zoned property. The EIS Addendum evaluates potential impacts resulting from a new Preferred Alternative. Following the issuance of the Draft EIS (issued December 2010) a Preferred Alternative was voluntarily developed by the applicant based on additional agency and community input (particularly from the U.S. Environmental Protection Agency, EPA), and continued input and coordination with the City.

Similar to Alternatives 1 and 2 in the DEIS, the Preferred Alternative is intended to be a mixed-use development. The Preferred Alternative would contain 21,600 square feet of retail space, 9,000 square feet of restaurant and 692 residential units.

In November 2009, Campbell Mathewson of Century Pacific, L.P. submitted a Land Use Master Application (LUA09-151) for Environmental Review, Master Site Plan Review, Binding Site Plan, and Shoreline Substantial Development Permit. The City of Renton Environmental Review Committee issued a Determination of Significance (DS) on February 15, 2010. On April 27, 2010, a public scoping meeting was held to receive written and oral comments on the proposed scope of study for the EIS. On December 10, 2010 the DEIS was issued and a 30 day public comment period was held. This comment period was extended twice for 15 days to eventually end on February 9, 2011. Following the comment period the project was placed on hold, until the creation of the Preferred Alternative, after which the project was taken off hold on June 27, 2012.

Many of the redevelopment assumptions included in the DEIS would remain the same under the Preferred Alternative; such as, Earth, Environmental Health, Land and Shoreline Use, and Energy – Greenhouse Gas Emissions. As a result of these similarities the environmental analysis associated with those assumptions would remain the same. However, for those assumptions that have been modified under the Preferred Alternative, the updated analysis is included in the provided EIS Addendum. These elements include, Critical Areas, Aesthetics/View, Parks and Recreation, Transportation, Cultural Resources and Relationship to Plans and Policies.

Written public comment on the EIS Addendum will be accepted for a 30-day review period, starting on Friday, October 19, 2012, and ending at 5:00 p.m. November 19, 2012. Written comments should be addressed to: Vanessa Dolbee, Senior Planner; Planning Division, 6th floor Renton City Hall; 1055 South Grady Way; Renton, WA 98057.

Following the public comment period, the City will prepare and issue a Final Environmental Impact Statement (FEIS) that will include responses to the comments received during the public comment period and any additional analysis necessary to adequately evaluate the proposal. The City will then issue a Mitigation Document which will set forth the necessary conditions to diminish or eliminate environmental impacts as one portion of the approval of the Proposed Action.

If you have any question or require clarification of the above, please contact Vanessa Dolbee, Senior Planner, at (425) 430-7314.

The City of Renton appreciates your interest and participation.

For the Environmental Review Committee,

Gregg Zimmerman

Gregg Zimmerman, P.E.
Public Works Administrator

FACT SHEET

PROJECT TITLE **Quendall Terminals Redevelopment Project**

PROPONENT/APPLICANT Century Pacific, L.P.

LOCATION The approximately 21.5-acre Quendall Terminals site is located in the northern portion of the City of Renton, within the Southwest ¼ of Section 29, Township 24 North, Range 5 East, King County. The site includes an approximately 20.3-acre Main Property along Lake Washington, and an approximately 1.2-acre Isolated Property to the northeast.

PROPOSED ACTION The Proposed Actions for the Quendall Terminals Redevelopment Project include:

- Master Plan approval from the City;
- Binding Site Plan approval from the City;
- Shoreline Substantial Development Permit approval from the City;
- Other local, state, and federal permit approvals for construction and redevelopment; and,
- Construction and operation of the Quendall Terminals Redevelopment Project.

ENVIRONMENTAL REVIEW/ALTERNATIVES

The Quendall Terminals site has received a Superfund designation from the U.S. Environmental Protection Agency (EPA) and will undergo cleanup/remediation under the oversight of the EPA prior to redevelopment. Potential impacts to the environment associated with cleanup/remediation activities will be addressed through the separate EPA process. The impact analyses in this EIS Addendum, which solely addresses impacts that may occur due to post-cleanup redevelopment of the Quendall Terminals site, assume an existing/baseline condition subsequent to cleanup/remediation.

To date, one environmental review document under the State Environmental Policy Act (SEPA) has been issued for public review and comment by the City of Renton on the Quendall Terminals Redevelopment Project: a Draft EIS issued in December 2010. That document is available for review at the King County library system, Renton public libraries.

This document is an Addendum to the 2010 DEIS. According to the SEPA Rules (WAC 197-11-600 and 197-11-706), an Addendum is an environmental document that is used to provide additional information or analysis that does not substantially change the analysis of significant impacts and alternatives in an existing environmental document. Preparation of an Addendum is appropriate when a proposal has been modified and the changes are not expected to result in new significant adverse impacts. The Preferred Alternative analyzed in this EIS Addendum reflects updates to the EIS redevelopment alternatives analyzed in the Draft EIS, as summarized below.

Draft EIS – December 2010

The 2010 DEIS addressed the probable significant adverse impacts that could occur as a result of the approval by the City of a Master Plan, Binding Site Plan, Shoreline Substantial Development Permit; other local, state and federal permits; and, potential future redevelopment activities through build-out in 2015.

Two redevelopment alternatives and the No-Action Alternative were addressed in the DEIS.

Preferred Alternative (Subject of this EIS Addendum)

Subsequent to the issuance of the DEIS, a Preferred Alternative was voluntarily developed by the applicant and the applicant's technical team based on additional agency/community input (particularly from the U.S. Environmental Protection Agency, EPA), and continued input and coordination with the City of Renton.

Similar to Alternatives 1 and 2 in the DEIS, the Preferred Alternative is intended to be a compact, urban mixed-use development. The project is planned to ensure that future redevelopment is compatible with the environmental remediation effort at the site that is currently underway. It is also intended to meet the applicant's objectives (see DEIS page 2-8 for a list of these objectives).

In many respects, redevelopment under the Preferred Alternative would be similar to that described in the DEIS for the redevelopment alternatives, particularly Alternative 2. For example, the following full build-out (for environmental review purposes, build-out is assumed to be 2015) redevelopment assumptions for the Preferred Alternative are similar to those described in the DEIS for Alternative 2:

- Retail/Restaurant Uses *(21,600 sq. ft. retail/9,000 sq. ft. restaurant)*
- Office Uses *(none)*
- Residential Units *(692 units)*

- Maximum Building Heights *(64 ft.)*
- Anticipated Site Population *(1,108 residents*)
- Anticipated Site Employment *(50 employees)*
- Access/Parking *(1,337 parking spaces)*
- Landscape Design *(shoreline restoration + native and ornamental plantings in the upland area)*
- Grading *(53,000–133,000 CY of fill)*
- Utilities *(sewer and water from City of Renton; stormwater per the City of Renton Amendments to the 2009 KCSWDM)*

The redevelopment assumptions under the applicant's Preferred Alternative that have been modified from those described in the DEIS for Alternative 2 include:

- Shoreline Setback *(100-ft. min. increased setback)*
- Setbacks from Adjacent *Properties (north: 38–95 ft.; south: 40–200 ft.)*
- View Corridors *(Street "B" corridor enlarged)*
- Building Height Modulation *(4-story buildings along S. property line; 5- to 6-story buildings elsewhere)*
- Open Space and Related Areas *(10.6 acres)*
- Building Design *(more brick, stucco, masonry, and precast concrete, and less metal siding)*
- Emergency Access Road *(in the western portion of the site)*

The Proposed Actions evaluated in this EIS Addendum are the same actions as those contemplated in the DEIS. Potential environmental impacts under the Preferred Alternative are addressed in this EIS Addendum and compared to DEIS Alternatives 1 and 2. This EIS Addendum, together with the DEIS, comprehensively analyze the environmental impacts of the Proposed Actions.

LEAD AGENCY City of Renton

SEPA RESPONSIBLE OFFICIAL City of Renton, Environmental Review Committee
Dept. of Community & Economic Development,
Planning Division
1055 S Grady Way
Renton, WA 98057

EIS CONTACT PERSON

Vanessa Dolbee, Senior Planner
Dept. of Community & Economic Development,
Planning Division
1055 S Grady Way
Renton, WA 98057
Phone: (425) 430-7314

PERMITS AND APPROVALS

Preliminary investigation indicates that the following permits and/or approvals could be required or requested for the Proposed Actions. Additional permits/approvals may be identified during the review process associated with specific development projects.

<u>Agencies with Jurisdiction</u>

- ***Federal***
  - CERCLA Remediation (for site cleanup/remediation prior to redevelopment)

- ***State of Washington***
  - Dept. of Ecology, Construction Stormwater General Permit
  - Dept. of Ecology, NPDES Stormwater Discharge Permit
  - Dept. of Fish and Wildlife, Hydraulic Project Approval

- ***City of Renton***
  - Master Site Plan Approval
  - Shoreline Substantial Development Permit
  - Construction Permits
  - Building Permits
  - Development Permits
  - Binding Site Plan
  - Site Plan Review
  - Utility Approvals
  - Property Permits & Licenses

EIS ADDENDUM AUTHORS AND PRINCIPAL CONTRIBUTORS

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Seattle, WA 98101

Transportation
Transportation Engineering Northwest
816 Sixth Street S
Kirkland, WA 98033

PREVIOUS ENVIRONMENTAL DOCUMENTS

Per WAC 197-11-620, this EIS Addendum addends the *Quendall Terminals DEIS (*December, 2010). This Addendum together with the DEIS comprehensively address the environmental impacts of the Proposed Actions.

LOCATION OF BACKGROUND INFORMATION

Background material and supporting documents are available at the office of:

EA|Blumen
720 Sixth Street S, Suite 100
Kirkland, WA 98033

City of Renton
Vanessa Dolbee, Senior Planner
Department of Community & Economic Development,
Planning Division
1055 S Grady Way
Renton, WA 98057

DATE OF EIS ADDENDUM ISSUANCE

October 19, 2012

DATE EIS ADDENDUM COMMENTS ARE DUE

November 19, 2012, 5:00 PM

AVAILABILITY OF THE EIS ADDENDUM

Copies of the EIS Addendum have been distributed to agencies, organizations and individuals noted on the Distribution List contained in **Appendix A** to this document. The EIS Addendum is also available for review on the City of Renton website at http://www.rentonwa.gov/ and at the following King County Library system Renton public libraries:

Renton Main Library
100 Mill Avenue S
Renton, WA 98057

Renton Highlands Library
2902 NE 12th Street
Renton, WA 98056

A limited number of printed copies may be purchased at the City of Renton's Finance Department (1st Floor of City Hall for $25 per hard copy or $10.00 per CD, plus any postage (if mailed).

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ACRONYMS

ADA	Americans with Disabilities Act
AOC	Administrative Order of Consent
BMP	Best Management Practice
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
COR	Commercial, Office, Residential Zoning Designation
CY	Cubic Yards
DAHP	Washington State Department of Archaeology and Historic Preservation
DEIS	Draft Environmental Impact Statement
DNAPL	Dense, Non-Aqueous Phase Liquid
EB	Eastbound
ECOLOGY	Washington State Department of Ecology
EIS	Environmental Impact Statement
EPA	Environmental Protection Agency
FS	Feasibility Study
GHG	Greenhouse Gas
IBC	International Building Code
ITE	Institute of Transportation Engineers
KCSWDM	King County Storm Water Drainage Manual
LEED	Leadership in Energy and Environmental Design
LOS	Level of Service
MTCA	Model Toxics Control Act
$MTCO^2e$	Metric Ton Carbon Dioxide Equivalent
NB	Northbound
NPDES	National Pollutant Discharge Elimination System
NPL	National Priorities List
OHWM	Ordinary High Water Mark
PSE	Puget Sound Energy
R-10	Residential, 10 Units per Acre Zoning Designation
RI	Remedial Investigation
RMC	Renton Municipal Code
ROD	Record of Decision
SB	Southbound
SEPA	State Environmental Policy Act
SMP	Shoreline Master Program
TDM	Transportation Demand Management
TESCP	Temporary Erosion and Sedimentation Control Plan
TIP	Transportation Improvement Program
WAC	Washington Administrative Code
WB	Westbound
WSDOT	Washington State Department of Transportation

CHAPTER I

SUMMARY

CHAPTER 1

SUMMARY

1.1 INTRODUCTION

This chapter provides a summary of the Quendall Terminals Redevelopment Project EIS Addendum. It briefly describes the project history and the Preferred Alternative, and provides an overview of probable significant environmental impacts, mitigation measures, and significant unavoidable adverse impacts of the Preferred Alternative. See **Chapter 2** of this EIS Addendum for a more detailed description of the Preferred Alternative; **Chapter 3** for updated information and analysis; and, **Chapter 4** for a comparison of potential environmental impacts, mitigation measures, and significant unavoidable adverse impacts under the Preferred Alternative to those under DEIS Alternatives 1 and 2.

This document is an Addendum to the Draft EIS (DEIS) that was prepared for the Quendall Terminals Redevelopment Project (December 2010). According to the SEPA Rules (WAC 197-11-600 and 197-11-706), an Addendum is an environmental document that is used to provide additional information or analysis that does not substantially change the analysis of significant impacts and alternatives in an existing environmental document. Preparation of an Addendum is appropriate when a proposal has been modified and the changes are not expected to result in new significant adverse impacts.

The DEIS evaluated two redevelopment alternatives and their environmental impacts and associated mitigation measures. Subsequent to the issuance of the DEIS, a Preferred Alternative was developed by the applicant based on additional agency/community input (particularly from the U.S. Environmental Protection Agency, EPA), and input and continued coordination with the City of Renton. Many of the redevelopment assumptions under the Preferred Alternative would be similar to those described in the DEIS for the redevelopment alternatives, in particular Alternative 2. Similar to DEIS Alternatives 1 and 2, the Preferred Alternative is intended to be a compact urban mixed-use development with a mix of residential, retail, and restaurant uses, and would be planned to ensure that future redevelopment is compatible with the environmental remediation effort that is currently underway at the site. The Preferred Alternative is intended to meet the applicant's objectives (see DEIS page 2-8 for a list of these objectives).

Despite these similarities, certain redevelopment assumptions under the Preferred Alternative have been modified from those described in the DEIS. Based on those redevelopment assumptions, the following environmental analyses in the DEIS largely would not change.

- Earth
- Environmental Health
- Land and Shoreline Use
- Energy – Greenhouse Gas Emissions

As described above, many of the redevelopment assumptions would remain the same under the Preferred Alternative, and as a result, the environmental analysis associated with those assumptions would also remain the same. However, for those assumptions that have been modified under the Preferred Alternative, an updated analysis for the associated environmental elements is provided in this EIS Addendum, including the following:

- Critical Areas
- Aesthetics/Views
- Parks and Recreation
- Transportation
- Cultural Resources
- Relationship to Plans and Policies

1.2 PREFERRED ALTERNATIVE

Based on information provided in the DEIS, as well as comments from EPA, and input and continued coordination with the City of Renton, the applicant has voluntarily developed a Preferred Alternative for analysis in this EIS Addendum.

Many aspects of the Preferred Alternative would be similar to Alternative 2 in the DEIS, including the following areas:

- Retail/Restaurant Uses *(21,600 sq. ft. retail/9,000 sq. ft. restaurant)*
- Office Uses *(none)*
- Residential Units *(692 units)*
- Maximum Building Heights *(64 ft.)*
- Anticipated Site Population *(1,108 residents*)
- Anticipated Site Employment *(50 employees)*
- Access/Parking *(1,337 parking spaces)*
- Landscape Design *(shoreline restoration + native and ornamental plantings in the upland area)*
- Grading *(53,000–133,000 CY of fill)*
- Utilities *(sewer and water from City of Renton; stormwater per City of Renton Amendments to the 2009 KCSWDM)*

The following redevelopment assumptions have been modified from those described in the DEIS under Alternatives 1 and 2, based on the comments from EPA, and input and continued coordination with the City of Renton:

- Shoreline Setback *(100-ft. min. increased setback)*
- Setbacks from Adjacent *Properties (north: 38–95 ft.; south: 40–200 ft.)*
- View Corridors *(Street “B” corridor enlarged)*
- Building Height Modulation *(4-story buildings along south property line; 5- to 6-story buildings elsewhere)*
- Open Space and Related Areas *(10.6 acres)*
- Building Design *(more brick, stucco, masonry, and precast concrete, and less metal siding)*
- Emergency Access Road *(in the western portion of the site)*

See **Chapter 2** of this EIS Addendum for further details on the Preferred Alternative.

1.3 SUMMARY OF IMPACTS, MITIGATION MEASURES, AND SIGNIFICANT UNAVOIDABLE ADVERSE IMPACTS

The following list summarizes the impacts, mitigation measures, and significant unavoidable adverse impacts that would potentially result from the Preferred Alternative analyzed in this EIS

Addendum. “Proposed” mitigation measures are those actions which the applicant has proposed at this point in time (and could become part of the Mitigation Agreement with the City) and/or are required by code, laws or local, state and federal regulations. “Possible” mitigation measures are actions that could be undertaken, but are not necessary to mitigate significant impacts, and are above and beyond those proposed by the applicant.

Earth

Impacts

Redevelopment under the Preferred Alternative would result in potential earth-related impacts that would be similar to those analyzed in the DEIS, including impacts associated with construction (i.e. erosion/sedimentation and ground settlement associated with site clearing and grading, installation of utilities and construction of building foundations), disturbance of geologic hazards, and interception of groundwater. No additional earth-related impacts would be anticipated.

Mitigation Measures

Proposed Mitigation Measures

During Construction

- A temporary erosion and sedimentation control plan (TESCP), including Best Management Practices (BMPs) for erosion and sedimentation control, would be implemented, per the City of Renton Amendments to the 2009 King County Surface Water Design Manual (KCSWDM) adopted by the City of Renton. This plan would include the following measures:

  - All temporary (and/or permanent) devices used to collect stormwater runoff would be directed into tightlined systems that would discharge to an approved stormwater facility.

  - Soils to be reused at the site during construction would be stockpiled or stored in such a manner to minimize erosion from the stock pile. Protective measures could include covering with plastic sheeting and the use of silt fences around pile perimeters.

  - During construction, silt fences or other methods, such as straw bales, would be placed along surface water runoff collection areas in proximity to Lake Washington and the adjacent wetlands to reduce the potential of sediment discharge into these waters. In addition, rock check dams would be established along roadways during construction.

  - Temporary sedimentation traps or detention facilities would be installed to provide erosion and sediment transport control during construction.

- A geotechnical engineer would review the grading and TESCP plans prior to final plan design to ensure that erosion and sediment transport hazards are addressed during and following construction. As necessary, additional erosion mitigation measures could be required in response to specific design plans.

- Site preparation for roadways, utilities and structures, and the placement and compaction of structural fill would be based upon the recommendations of a geotechnical engineer.

- Temporary excavation dewatering would be conducted if groundwater is encountered during excavation and construction activities. Such dewatering activities would be conducted in a manner that would minimize potential impacts due to settlement.

- Structural fill would be placed to control the potential for settlement of adjacent areas; adjacent structures/areas would be monitored to verify that no significant settlement occurs.

- Deep foundation systems (such as piles or aggregate piers) would be installed and/or ground improvements would be made to minimize potential damage from soil settlement, consolidation, spreading and liquefaction.

- If deep foundation systems (such as piles or aggregate piers) are used to support structures, the following measures would be implemented:

  - Measures would be employed to ensure that the soil cap (should it be installed) would not be affected and that installation of the piles/piers would not mobilize contamination that would be contained by the cap. Such measures could include: installation of surface casing through the contaminated zone; installation of piles composed of impermeable materials (steel or cast-in-place concrete) using soil displacement methods; the use of pointed tip piles to prevent carry down of contamination; and, the use of ground improvement technologies, such as in-place densification or compaction grouting.

  - A pile vibration analysis and vibration monitoring would be conducted during pile installation in order to ensure that impacts due to vibration do not occur.

  - Suitable pile and pile hammer types would be matched to the subsurface conditions to achieve the required penetrations with minimal effort to reduce potential vibration. Potential pile types could include driven open-end steel pipe piles, driven closed-end steel pipe piles, or driven cast-in-place concrete piles. Potential hammer types could include percussion hammers or vibratory hammers.

  - Suitable hammer and pile cushion types would be used for the specific conditions to reduce potential noise. A typical hammer employs the use of a heavy impact hammer that is controlled by a lead, which is in turn supported by a crane.

  - Pile installation would occur during regulated construction hours.

- Fill soils would be properly placed and cuts would be used to reduce the potential for landslide impacts during (and after) construction.

- The appropriate management of contaminated soils that could be disturbed and groundwater that could be encountered during redevelopment of the site would be addressed through the cleanup/remediation process and by institutional control requirements overseen by EPA (see Section 3.3, Environmental Health in the DEIS, for details).

Following Construction

- A permanent stormwater control system would be installed in accordance with the City of Renton Amendments to the 2009 KCSWDM adopted by City of Renton.

- Offshore outfall locations for stormwater discharge from the permanent stormwater control system would be equipped with energy dissipation structures or other devices to prevent erosion of the lake bottom.

- All buildings would be designed in accordance with the 2009 IBC (or the applicable design codes that are in effect at the time of construction) to address the potential for seismic impacts.

- The majority of the site would be covered with impervious surfaces following redevelopment. Permanent landscaping would be provided to reduce the potential for erosion and sedimentation with redevelopment.

Other Possible Mitigation Measures

- Flexible utility connections could be employed to minimize the risk of damage to the lines due to differential settlement between structures and underground utilities.

Significant Unavoidable Adverse Impacts

There would be a risk of ground motion impacts and landslides beneath Lake Washington adjacent to the site during a seismic event; however, such impacts would occur with or without the proposed redevelopment. There are no significant unavoidable earth-related impacts that cannot be mitigated.

Critical Areas

Impacts

Redevelopment under the Preferred Alternative would have a slightly smaller development footprint, but similar features to DEIS Alternatives 1 and 2 (particularly DEIS Alternative 2). This alternative would maintain a 100-foot minimum setback from the Lake Washington shoreline, as compared to the 50-foot minimum setback under DEIS Alternatives 1 and 2. As a result, The Preferred Alternative would be anticipated to have slightly less impacts on wetlands and wildlife habitat than DEIS Alternatives 1 and 2. As the restored habitat along the lakeshore develops over time, this area would provide slightly more potential screening of the wetland and lakeshore habitats from impacts from operation of the project, including lighting impacts, as compared to DEIS Alternatives 1 and 2. However, given the urban context of the area, impacts from noise, lighting, and other disturbance would not likely be substantially different than under DEIS Alternatives 1 and 2.

Mitigation Measures

Proposed Mitigation Measures

During Construction

- A TESCP, including BMPs for erosion and sedimentation control, would be implemented during construction, per the City of Renton Amendments to the 2009 King County KCSWDM adopted by the City of Renton (see Section 3.1, Earth in the DEIS, and Appendix D to the DEIS for details). Implementation of this plan would prevent or limit impacts to the lake and shoreline wetlands from erosion and sedimentation.

Following Construction

- Proposed redevelopment would avoid direct impacts to the retained/re-established/expanded wetlands onsite.

- Re-established/expanded wetlands would be retained in an open space tract that includes required buffers and a riparian habitat enhancement area.

- Proposed buildings would be setback a minimum of 100 feet from the ordinary high water mark (OHWM), consistent with the City of Renton's 2011 Shoreline Master Program. The shoreline area would accommodate future wetlands, as well as buffers and setbacks. Final, detailed plans for the re-establishment of wetlands and their buffers onsite will be developed in coordination with EPA prior to redevelopment

- A permanent stormwater control system would be installed consistent with the requirements of the City of Renton Amendments to the 2009 KCSWDM adopted by the City of Renton. The system would collect and convey stormwater runoff to Lake Washington via a tight-lined system. Water quality treatment would be provided for runoff from pollution-generating surfaces to prevent water quality impacts to the lake and shoreline wetlands.

- Native plant species would be included within landscaping of the redeveloped upland area on the Main Property to the extent feasible, and could provide some limited habitat benefits to native wildlife species.

- Introduction of noxious weeds or invasive species would be avoided to the extent practicable in areas re-vegetated as part of the proposed redevelopment. Together with the native species planted, this would help limit the unnecessary spread of invasive species that could adversely affect the suitability of open space habitats on site and in the vicinity for wildlife.

- A publicly accessible, unpaved trail is proposed through the shoreline area that would include interpretive wetland viewpoints.

- The proposed redevelopment would include design elements to minimize the potential adverse affects of artificial lighting on wetland and riparian habitats. These include directing lighting downward and away from these habitats or adjacent properties, and could include shielding of lights, use of low-pressure sodium lights, or minimizing the use of reflective glazing materials in building design, as feasible.

Other Possible Mitigation Measures

- Trenching for utilities and stormwater outfalls could be incorporated into site grading associated with remediation efforts to limit or prevent later disturbance of re-vegetated areas.

- Upland areas on the Main Property could be temporarily re-vegetated following site remediation, depending on the timing of redevelopment.

Significant Unavoidable Adverse Impacts

There are no significant unavoidable adverse impacts to critical areas that cannot be mitigated.

Environmental Health

Impacts

Redevelopment under the Preferred Alternative would result in potential environmental health-related impacts that would be similar to those under DEIS Alternatives 1 and 2, including potential impacts associated with exposure to contaminated soils during project construction, as well as exposure to potential vapors from volatile contaminants in the subsurface during project operation. No additional environmental health-related impacts would be expected.

Mitigation Measures

Proposed Mitigation Measures

- Redevelopment of the site is being coordinated with the cleanup/remediation process, and would be conducted consistent with the requirements in the final cleanup remedy selected and overseen by EPA, and with any associated institutional controls.

- The appropriate management of contaminated soils that could be disturbed and groundwater that could be encountered during redevelopment of the site would be addressed through the cleanup/remediation process and by institutional control requirements overseen by EPA. As necessary, lightweight fill materials, special capping requirements, vapor barriers and other measures would be implemented to ensure that unacceptable exposures to contaminated soils, groundwater, or vapors would not occur.

- Institutional controls would be followed to prevent the alteration of the soil cap without EPA approval, and to prevent the use of on-site groundwater for any purpose.

- An Operations, Maintenance, and Monitoring Plan would be implemented to prevent the excavation of soils, installation of utilities, or other site disturbances without prior EPA approval.

- As necessary, personal protection equipment for workers would be used and special handling and disposal measures followed during construction activities to prevent contact with hazardous materials and substances.

- Living/working areas on the Main Property would be separated from soil/groundwater contaminants by under-building garages; institutional controls would also be implemented to prevent exposure to unacceptable vapors.

Other Possible Mitigation Measures

- Planned utilities (including the main utility corridors) could be installed as part of the planned remedial action so that disturbance of the soil cap and underlying contaminated soils/groundwater would not be necessary subsequent to capping of the Main Property.

- Personal protection measures and special training should be provided for City of Renton staff that provides inspection during construction and maintenance following construction in areas of the site that could generate contaminated soils or groundwater.

- Buried utilities and public roads serving the site development could be placed in clean fill material (with the utilities in a trench with sufficient width and depth of 3 to 4 feet below the invert of the utility), along with an acceptable barrier to prevent recontamination of the clean fill material, in order to protect the utility from contamination and to allow future maintenance of the road or utility lines.

Significant Unavoidable Adverse Impacts

There are no significant unavoidable adverse environmental health-related impacts that cannot be mitigated.

Energy – Greenhouse Gas Emissions

Impacts

Redevelopment under the Preferred Alternative would result in potential energy and greenhouse gas (GHG)-related impacts that would be similar to or less than those under DEIS Alternatives 1 and 2. No further energy/GHG-related impacts would be anticipated.

Mitigation Measures

Other Possible Mitigation Measures

- Development could incorporate low-impact/sustainable design features into the design of proposed buildings on the site to reduce the demand for energy and reduce the amount of GHG emissions. Such features have not been identified at this time, but could include architectural design features; sustainable building materials; use of energy efficient products; natural drainage/green roof features; use of native plants in landscaping; and/or, other design features.

Significant Unavoidable Adverse Impacts

Development on the Quendall Terminals site would result in an increase in demand for energy and an increase in GHG emissions relative to existing conditions, similar to any major development. The proposed redevelopment would include features that would reduce GHG emissions and climate change impacts (i.e. the compact, mixed-use nature of the proposed development would reduce vehicular trips). Therefore, the direct and indirect impacts of GHG emissions and energy use under the Preferred Alternative would not be expected to be significant.

Land and Shoreline Use

Impacts

Redevelopment under the Preferred Alternative would result in potential land and shoreline use-related impacts (i.e. height/bulk/scale and increased activity-level impacts on adjacent land uses) that would be similar to or less than those under DEIS Alternatives 1 and 2 (in particular DEIS Alternative 2) Impacts on the shoreline would be less than under the DEIS redevelopment alternatives, as the shoreline setback would be increased. No further land or shoreline use impacts would be anticipated. Build-out of the project could occur in phases, in accordance with market demand. An extension of the 5-year time limit for non-phased projects could be requested by the applicant (i.e. via the Master Plan approval process [RMC 4-9-200J.2.a]).

Mitigation Measures

Proposed Mitigation Measures

- New driveways, landscaping, surface parking areas and proposed building setback areas would provide a buffer between proposed buildings and adjacent land uses.

- Proposed landscaping, particularly along the north and south boundaries of the Main Property, would provide a partial visual screen between proposed buildings and adjacent uses (see Figure 2-**7**, Preliminary Landscape Plan - Alternative 1 in the DEIS).

- Architectural features (i.e. roof slope, façade modulation, building materials, etc.) would be incorporated into the design of each building and are intended to enhance the compatibility between the proposed development and surrounding land uses (see **Figures 2-4** and **2-5** for representative architectural elevations of the Preferred Alternative, and Section 3.7, Aesthetics/Views in the DEIS and **Chapter 2** of this EIS Addendum, for further information on proposed building and site design).

- Building heights would be modulated to reduce potential height/bulk/scale impacts on adjacent development (i.e. Barbee Mill). The buildings located adjacent to the southern property lines would be 4-stories high; those in the northern portion of the site would be 5 stories high; and, those in the western, eastern, and central portions of the site would be 5 to 6 stories high.

- A fire mitigation/impact fee would be paid for the proposed development at the time of building permit issuance or as required by the Renton Municipal Code to help offset the impacts of the project on the City's emergency services.

Significant Unavoidable Adverse Impacts

Redevelopment under the Preferred Alternative would result in the conversion of the approximately 21.5-acre Quendall Terminals site from a vacant, partially vegetated area to a new mixed-use development with an associated increase in building density and activity levels. There are no significant unavoidable adverse land use-related impacts that cannot be mitigated.

Aesthetics/Views

Impacts

Under the Preferred Alternative, proposed redevelopment would alter the existing visual character of the site from a predominantly open, vegetated landscape to a more densely developed mixed-use development, similar to DEIS Alternatives 1 and 2. However, the proposed building modulation across the site would provide lower building heights on the north and south edges of the site (particularly adjacent to the Barbee Mill development) and would also provide enhanced view opportunities towards Lake Washington as compared to the DEIS Alternatives. The larger view corridor (Street "B") would also provide for greater views of Lake Washington and Mercer Island. Therefore, potential aesthetic and view-related impacts would be anticipated to be similar to or less than those under the DEIS redevelopment alternatives, and no further aesthetics or view-related impacts would be anticipated.

Mitigation Measures

Proposed Mitigation Measures

- Building design would include a variety of details and materials that are intended to create a human scale and provide a visually interesting streetscape and façade, such as horizontal plan modulation, projecting vertical elements, and alternating façade materials and details.

- Street-level, under-building parking areas would be concealed from sidewalks and streets by retail and offices uses along certain façades. Where this parking extends to the exterior of the building, elements, such as architectural façade components, trellises, berms and landscaping, would be used for screening.

- Public view corridors toward Lake Washington are proposed along the main east/west roadway onsite (Street "B") and along the private driveways at the north and south ends of the site. Public views of the lake would also be possible from the publically accessible trail in the shoreline restoration area in the western portion of the Main Property. Additional views of the lake would be provided for project residents from semi-private landscaped courtyard areas between the new buildings onsite.

- New landscaping would be provided in the upland area of the Main Property that is intended to enhance the visual character of the site. Landscaping would include new trees, shrubs, and groundcovers of various sizes and species.

- A landscaped edge along the north and south boundaries of the site would provide a buffer and partial visual screen between new development on the site and adjacent properties.

- The natural vegetation in shoreline restoration areas on the Main Property and on the Isolated Property would be retained with proposed site development.

- Exterior building lighting, parking lot lighting, and pedestrian lighting would be directed downward and away from surrounding buildings and properties to minimize the impacts to adjacent uses.

- Building setbacks would be maximized adjacent to Lake Washington and along the south site boundaries, to enhance the aesthetic character of development and retain views of Lake Washington.

- Building height modulation would be provided across the site to enhance the aesthetic character of development and retain some views of Lake Washington.

- No surface parking would be located at the terminus of Street “B” in order to enhance the aesthetic character of the development, particularly from the shoreline trail.

- During final building design, maximum building heights 100 feet from the Lake Washington ordinary high water mark (OHWM) would be reduced to one half of the maximum height allowed by the COR zone (125 feet allowed height x ½ = 62.5 feet), consistent with the City of Renton’s 2011 Shoreline Management Program, which would help maintain views toward the lake.

Other Possible Mitigation Measures

- The amount of required parking could be reduced, relocated or redesigned (i.e. though implementation of transportation demand management measures or other means) so that additional areas of the street-level, under-building parking could be setback from the exterior of the building, particularly along Streets “A”, “C” and the lake side of the development. This would allow other uses, including retail, restaurant, commercial and residential uses, and plaza areas to occupy these areas and potentially enhance the aesthetic character at the ground level.

- Reflectivity of glazing materials, as well as the use of shading devices, could be considered as part of the façade design in order to minimize the potential glare impacts to surrounding uses.

- Design features such as: public art, special landscape treatment, additional open space/plazas, landmark building form, special paving/pedestrian scale lighting, or prominent architectural features could be provided as part of development to further enhance the gateway/landmark features on the site.

- Vertical and/or horizontal modulation should be provided along the west or lake side of the buildings to provide a human scale and breakup the larger structures which would be adjacent to the shoreline area and pedestrian environment.

Significant Unavoidable Adverse Impacts

Redevelopment under the Preferred Alternative would change the site from its existing open, partially vegetated condition to a new mixed-use development. The proposed building height and bulk would generally be similar to surrounding uses (Seahawks Headquarters and Training Facility and proposed Hawk's Landing Hotel), but greater than other uses in the area (Barbee Mill development). However, with proposed building setbacks, landscaping and building modulation across the site, no significant impacts would be anticipated.

Certain views across the site towards Lake Washington and Mercer Island would be obstructed under the Preferred Alternative. However, the proposed larger view corridor and proposed building modulation would provide for some views across the site, and significant impacts would not be anticipated.

Parks and Recreation

Impacts

Redevelopment under the Preferred Alternative would result in potential impacts to parks and recreation facilities that would be similar to or slightly greater than those under DEIS Alternatives 1 and 2. The Preferred Alternative would provide approximately 10.6 acres of open space and related area (including natural public open space areas comprised of a shoreline trail and associated natural areas; and, other areas comprised of street level landscaping landscaped courtyards, sidewalks, paved plazas, and the natural areas in the Isolated Property; see **Table 4.7-1** for details). The Preferred Alternative would provide approximately one acre less of open space and related areas than under DEIS Alternatives 1 and 2; however, the Preferred Alternative would provide slightly more shoreline restoration areas than the DEIS redevelopment alternatives. No additional impacts to parks and recreation facilities would be anticipated.

Mitigation Measures

Proposed Mitigation Measures

Public Open Space and Related Areas/Fees[1]

- A parks mitigation/impact fee would be paid for each multifamily unit in the proposed development at the time of building permit issuance to help offset the impacts of the project on City parks and recreation facilities. Park mitigation/impact fees would be determined at the time of building permit issuance and in accordance with the City of Renton Municipal Code.

[1] Hours of public access would need to meet park standards of sunrise to sunset to count toward public recreation.

- Approximately 10.6 acres of open space and related areas would be provided on the site that would be visually and physically accessible to the public, including the shoreline trail and natural open space areas along the shoreline.

- Frontage improvements, including sidewalks, would be provided along the west side of Lake Washington Boulevard and Ripley Lane N along the site. These sidewalks could connect to sidewalks to the north and south, which connect to other pedestrian facilities in the area.

- Public parking for the proposed shoreline trail would likely be provided in the same general area as the retail/restaurant parking; the applicant would specifically identify this parking prior to site plan approval.

- Signage, detours, and safety measures would be put in place to detour bicyclist from using the Lake Washington Loop trail at the time of construction.

- The connection between the proposed shoreline trail and Lake Washington Boulevard would be enhanced by providing wider sidewalks (i.e. 15-foot wide) that are part of public rights-of-way along the Street "B" corridor.

Measures to Improve Semi-Private Recreation Access for Residents

- Semi-private landscaped courtyards on top of the parking garages would be provided as shared open space for residents of the site. These areas would help to meet the demand for passive recreation facilities from project residents.

- Street level landscaping, plazas and sidewalks would be provided. These areas would help meet the project's demand for passive recreation facilities.

Other Possible Mitigation Measures

Public Open Space and Related Areas[2]

- The hours of use of the proposed shoreline trail could be extended to sunrise to sunset and public parking could be provided, consistent with other City of Renton parks, in order to meet the requirements for public access.

- Additional open space could be provided onsite for active recreation (i.e. frisbee, softball, etc.). A portion of the proposed surface parking on site (i.e. adjacent to the shoreline) could be converted to facilities for active recreation.

- A lighted crosswalk across Lake Washington Boulevard could be provided in order to connect to the May Creek Trail on the east side of the Boulevard.

- The proposed shoreline trail and other recreation areas could be enhanced with site amenities, such as tables, litter receptacles, benches, interpretive signage, etc.

[2] Ibid.

- The proposed shoreline trail could connect to the Barbee Mill residential development to the south.

Measures to Improve Semi-Private Recreation Access for Residents

- Shared roof gardens and indoor amenity space (i.e. gyms, common rooms, etc.) could be provided as part of the project.

Significant Unavoidable Adverse Impacts

Residents of the proposed development would use nearby parks and recreation facilities, including Gene Coulon Memorial Park and Kennydale Beach Park, which are already at or exceeding capacity in the summer. Demand from project residents would contribute to the existing capacity issues at these parks.

Transportation

Impacts

Redevelopment under the Preferred Alternative would generate new vehicle trips on and in the vicinity of the Quendall Terminals site, including a net total of approximately 5,656 daily, 435 AM peak hour, and 530 PM peak hour vehicular trips at full-build-out in 2015. The Preferred Alternative would result in approximately 128 fewer daily trips, 8 fewer AM peak hour trips, and 11 fewer PM peak hour trips than DEIS Alternative 2. As a result, transportation impacts associated with the Preferred Alternative would be anticipated to similar to, but less than those analyzed for DEIS Alternative 2.

Mitigation Measures

Based upon the results of the transportation analysis of future intersection operations, general key findings include:

- There exists today and will be in the future a moderate to high level of background traffic that travels in the vicinity of the site area given approved and other planned pipeline projects.

- The existing transportation network with and without I-405 Improvements would adequately accommodate the Preferred Alternative at full build-out in 2015, with the additional required/proposed transportation improvements (listed below)

Proposed Mitigation Measures

Level of Service / Queuing

With I-405 Improvements – Preferred Alternative

The following improvements (in addition to the planned I-405 Improvements) would be necessary under the Preferred Alternative to mitigate off-site impacts:

- **Lake Washington Boulevard between Barbee Mill Access (N 43rd Street) and Ripley Lane N.** Extend the planned eastbound and westbound through lanes by WSDOT beyond and through the Barbee Mill access intersection. This would result in two through lanes in each direction on Lake Washington Boulevard from the I-405 interchange past the Barbee Mill access (NE 43rd Street). Ultimately, the City of Renton will determine the best configuration given ongoing coordination with WSDOT on the adjacent interchange design, the Port of Seattle (owner of the vicinity rail right-of-way), and adjacent private development.

- **Intersection #3 – Ripley Lane N/Lake Washington Boulevard.** Construct a southbound left-turn lane at this signalized intersection (signal assumed as an I-405 Improvement).

<u>Without I-405 Improvements – Preferred Alternative</u>

Without the planned I-405 Improvements, the following improvements would be necessary under the Preferred Alternative to mitigate off-site impacts:

- **Install Traffic Signals.** Install traffic signals at the intersections of the I-405 NB and SB ramp intersections, as well as at the intersection of Ripley Lane N/Lake Washington Boulevard.

- **Intersection #1 - I-405 NB Ramps/NE 44th Street.** Widen the southbound and northbound approaches so that a separate left turn lane and shared thru-right turn lane is provided on both legs of the intersection. The final configuration of the intersection with the additional widening improvements would be coordinated with WSDOT.

- **Intersection #3 - Ripley Lane N/Lake Washington Boulevard.** Widen the westbound approach to include a separate right turn-only lane.

- **Lake Washington Boulevard between Barbee Mill Access (N 43rd Street) and I-405 SB Ramps.** Construct additional channelization improvements between the Barbee Mill access and the I-405 SB ramps. Alternatively, additional eastbound and westbound lanes could be constructed to provide additional queue storage created by the traffic signals required at the SB ramp and Ripley Lane along Lake Washington Boulevard. Ultimately, the City of Renton will determine the best configuration given ongoing coordination with WSDOT on the adjacent interchange design, the Port of Seattle (owner of the vicinity rail right-of-way), and adjacent private development.

See Appendix H to the DEIS for detailed level of service worksheets for the mitigation measures outlined above to meet the City of Renton and WSDOT standards.

Non-Motorized Transportation

- Infrastructure improvements within the site would include full curbs, gutters, and sidewalks, as well as frontage improvements (curb, gutter, and sidewalk) along the west side of Lake Washington Boulevard and Ripley Lane N in front of the project site. Provisions for safe pedestrian circulation could encourage future transit usage when planned public transit becomes available.

- A pedestrian trail is proposed onsite along the shoreline that would be accessible to the public and would connect to Lake Washington Boulevard through the internal site sidewalk system.

Lake Washington Boulevard Corridor Impacts

- To mitigate traffic impacts to the Lake Washington Boulevard corridor south of the development, the applicant would install traffic calming treatments on Lake Washington Boulevard south of N 41st Street to encourage primary trips generated by the project to utilize the I-405 corridor. Although the City of Renton has no adopted residential traffic management program, arterial calming measures could include treatments that create either horizontal or vertical deflection for drivers. Such treatments could include, but are not limited to chicanes, serpentine raised curb sections, raised median treatments, speed tables, and speed humps.

City of Renton Mitigation/Impact Fees

- In addition to the project-specific mitigation measures described above, a traffic mitigation/impact fee would be paid for the proposed development at the time of building permit issuance to help offset the impacts of the project on the City's roadways. Traffic mitigation/impact fees would be determined at the time of building permit issuance and in accordance with the City of Renton Municipal Code.

Parking

- The proposed parking supply under the Preferred Alternative would meet the minimum off-street parking requirements of the City of Renton.

Fire Apparatus Access

- A fire access road is proposed to be located in the western portion of the site. This road would be approximately 20 feet wide, and would be surfaced in crushed rock or grass-crete to support the weight of fire apparatus.

Other Possible Mitigation Measures

Level of Service/Queuing

- Implementation of Transportation Demand Management (TDM) measures could reduce the number of vehicle trips and thus provide some benefit to improving LOS and queuing impacts at study intersections.

Public Transportation

- In order to promote a multimodal transportation network, redevelopment on the Quendall Terminals site could include site amenities (i.e. planting strip, street lighting, etc.) and access to future transit zones on Lake Washington Boulevard and at the I-405/NE 44th Street interchange to encourage and accommodate public transportation access in the future (future potential public transportation in the vicinity could include Bus Rapid

Transit on I-405 planned by Sound Transit and WSDOT with a flyer stop at the I-405/NE 44th Street interchange).

Non-Motorized Transportation

- A paved bicycle lane could be provided along the east side of Ripley Lane to mitigate potential conflicts between bicycles and the Quendall Terminals site access point on Ripley Lane.

Parking

- Shared parking agreements between on-site uses and implementation of transportation demand management (TDM) measures for proposed residential uses could be implemented to potentially reduce parking demand during peak periods, thereby reducing the necessary parking supply.

Significant Unavoidable Adverse Impacts

There are no significant unavoidable adverse transportation-related impacts that cannot be mitigated.

Cultural Resources

Impacts

Under the Preferred Alternative, certain construction activities onsite (i.e. clearing and grading of the upland area, construction of deep building foundations, and excavation of utilities) could require excavation into the soil cap (should it be installed) and could result in an inadvertent discovery of cultural resources. While it is unlikely that cultural resources would be encountered as part of construction activities on the site, a monitoring plan and inadvertent discovery plan would be implemented for the Preferred Alternative in the event that any cultural resources are encountered (see the Mitigation Measures discussion for further details). As a result, no significant impacts to cultural resources would be anticipated with redevelopment under the Preferred Alternative.

Mitigation Measures

Proposed Mitigation Measures

- Limited and focused cultural resource monitoring would be conducted during construction activities on the site (clearing and grading of the upland portion, construction of deep building foundations, excavation of utilities and establishment/expansion of wetland and riparian areas). A monitoring plan and inadvertent discovery plan would be developed as part of the Preferred Alternative (see **Appendix F** for a copy of the proposed monitoring plan and inadvertent discovery plan).

- In the unlikely event that ground disturbing or other activities do result in the inadvertent discovery of archaeological deposits, construction activities would be halted in the immediate area and the Washington State Department of Archaeology and Historic

Preservation (DAHP) would be contacted. Work would be halted until such time as further investigation and appropriate consultation is concluded.

- In the unlikely event of the inadvertent discovery of human remains, construction would be halted in the area, the discovery would be covered and secured against further disturbance and contact would be made with law enforcement personnel, DAHP and authorized representatives of the concerned Indian tribes.

Significant Unavoidable Adverse Impacts

There are no significant unavoidable adverse impacts on cultural resources that cannot be mitigated.

CHAPTER 2

DESCRIPTION OF PREFERRED ALTERNATIVE

CHAPTER 2

DESCRIPTION OF THE PREFERRED ALTERNATIVE

This chapter of the Quendall Terminals Redevelopment Project EIS Addendum provides: 1) a summary of the environmental review documents (Washington State Environmental Policy Act - SEPA documents) issued for the project to date; 2) a summary of the Proposed Actions analyzed in the December 2010 Draft EIS (DEIS); 3) a listing of the elements of the environment analyzed in the DEIS; 4) a summary of the process to define the applicant's Preferred Alternative; 5) a brief description of the Preferred Alternative and how the Preferred Alternative relates to the redevelopment alternatives in the DEIS; 6) discussion of the intent of an Addendum under the SEPA and why it is being prepared; 7) discussion of the environmental review and ongoing planning and decision-making process after this EIS Addendum; and, 8) a detailed discussion of the features of the Preferred Alternative. Key concepts related to this EIS Addendum are presented below in question and answer format.

2.1 Background

Q1. What environmental review documents have been issued for the Quendall Terminals Redevelopment Project to date?

A1. To date, one environmental review document under SEPA has been issued for public review and comment by the City of Renton for the Quendall Terminals Redevelopment Project: a DEIS issued in December 2010.

DEIS - A DEIS for the Quendall Terminals Redevelopment Project was issued by the City of Renton in 2010. The DEIS addressed the probable significant adverse impacts that could occur as a result of approval by the City of Renton of a Master Plan, Binding Site Plan, Shoreline Substantial Development Permit; approval of other local, state, and federal permits; and, potential future redevelopment activities through build-out in 2015.

At the time the DEIS was prepared and issued, a preferred Master Plan for the site had not been determined. Accordingly, two redevelopment alternatives and the No-Action Alternative were addressed in the DEIS: Alternative 1 - mixed-use redevelopment, including 800 multifamily residential units, 245,000 sq. ft. of office space, 21,600 sq. ft. of retail space, and 9,000 sq. ft. of restaurant space; Alternative 2 - mixed-use development, including 708 multifamily residential units, 21,600 sq. ft. of retail space, and 9,000 sq. ft. of restaurant space (no office uses would be provided under this alternative); No Action Alternative - no new mixed-use development would occur on the site at this time, cleanup/remediation activities associated with the site's status as a Superfund site by U.S. Environmental Protection Agency (EPA) would still occur.

Q2. What are the Proposed Actions analyzed in the DEIS and in this EIS Addendum?

A2. The applicant (Century Pacific, L.P.) and the City of Renton (City) identified the following Proposed Actions for the site in the DEIS that would be necessary to implement the redevelopment:

- Master Plan approval from the City;
- Binding Site Plan approval from the City;
- Shoreline Substantial Development Permit approval from the City;
- Other local, state, and federal permit approvals for construction and redevelopment; and,
- Construction and operation of the Quendall Terminals Redevelopment Project.

The Proposed Actions evaluated in this EIS Addendum are the same actions as those contemplated in the December 2010 DEIS.

Q3. What elements of the environment were evaluated in the Draft EIS?

A3. The *Quendall Terminals Redevelopment Project DEIS* (December 2010) contained environmental analyses of the elements of the environment listed below; based on the public scoping process conducted February-April 2010. Technical reports were prepared for several of these elements and are appended to the DEIS.

- Earth
- Critical Areas
- Environmental Health
- Energy – Greenhouse Gas Emissions
- Land and Shoreline Use
- Relationship to Plans, Policies, and Regulations
- Aesthetics/Views
- Parks and Recreation
- Transportation/Traffic

Q4. What was the process to define the Preferred Alternative described and analyzed in this EIS Addendum?

A4. On December 10, 2010, the Quendall Terminals DEIS was issued. Following the comment period(s) on the DEIS, preparation of the FEIS commenced. On March 4, 2011, the City of Renton placed the Quendall Terminals EIS process "on hold", pending receipt of a letter from EPA clarifying their comments on the environmental baseline (post-clean up conditions) assumptions presented in the DEIS. On March 13, 2012, the City received a letter from EPA clarifying their comments on the environmental baseline assumptions (see **Appendix B**). In the letter, EPA indicated that they (EPA) can require more stringent environmental standards (i.e. mitigation ratios, and larger shoreline and wetland buffers and setbacks) if they are in place at the time the Record of Decision (ROD) is developed for the site cleanup/remediation. EPA said that the more stringent requirements do not need to be articulated in the Quendall Terminals EIS, because they are not specifically known at present. Based on current regulations and standards (i.e. the *City of Renton Shoreline Master Program*, 2011), the wetland buffers and shoreline setback areas would be larger than assumed in the DEIS under the EIS alternatives. EPA suggested that the City identify a 100-foot area from the Lake Washington shoreline, extending along the entire site shoreline, which would be designated as an area for future wetlands, as well as buffers and setbacks.

In response to the letter from EPA, comments from other agencies and the public, and input and coordination with the City, the applicant voluntarily created a new redevelopment alternative (their Preferred Alternative). This alternative would be similar to DEIS Alternatives 1 and 2, but would maintain a 100-foot minimum setback from the shoreline onsite (the ultimate plans for the shoreline restoration area will be developed in coordination with EPA). This alternative is also intended to address height/bulk/scale, view, and other design concerns identified by public comments received during the DEIS public comment period.

Q5. What is the Preferred Alternative and how does it relate to the redevelopment alternatives in the 2010 Draft EIS?

A5. As indicated above, based on information provided in the DEIS, as well as comments from agencies and the public, and input and coordination with the City, the applicant prepared a Preferred Alternative for analysis in this EIS Addendum. Similar to the redevelopment alternatives described in the DEIS, the Preferred Alternative is intended to be a compact, urban mixed-use development. The project is planned to ensure that future redevelopment is compatible with the environmental remediation effort at the site that is currently underway. The Preferred Alternative is intended to be consistent with the applicant's (Century Pacific's) objectives listed on DEIS page 2-8; see Question 2 in this Chapter for a list of the Proposed Actions.

In many respects, redevelopment under the Preferred Alternative would be similar to the redevelopment alternatives in the DEIS (particularly DEIS Alternative 2), including the following areas:

- Retail/Restaurant Uses
- Office Uses (none)
- Residential Units
- Maximum Building Heights
- Anticipated Site Population
- Anticipated Site Employment
- Access/Parking
- Landscape Design
- Grading
- Utilities

The following redevelopment assumptions for the Preferred Alternative have been modified from those described for Alternatives 1 and 2 in the DEIS:

- Shoreline Setback
- Setbacks from Adjacent Properties
- View Corridors
- Building Height Modulation
- Open Space and Related Areas
- Building Design
- Emergency Access Road

Table 2-1 compares the characteristics of assumed redevelopment under the Preferred Alternative with redevelopment under DEIS Alternatives 1 and 2.

Table 2-1
COMPARISON OF 2010 DEIS ALTERNATIVES & 2012 PREFERRED ALTERNATIVE

	2010 DEIS - Alternative 1	2010 DEIS – Alternative 2	2012 EIS Addendum-Preferred Alternative
Retail/Restaurant Uses	21,600 sq. ft. retail/9,000 sq. ft. restaurant	21,600 sq. ft. retail/9,000 sq. ft. restaurant	21,600 sq. ft. retail/9,000 sq. ft. restaurant
Office Uses	245,000 sq. ft.	0	0
Residential Units	800 units[1]	708 units[1]	692 units[1]
Open Space & Related Areas[2]	11.7 acres[2]	11.8 acres[2]	10.6 acres[2]
Parking	Approx. 2,171 spaces[3]	Approx. 1,364 spaces[3]	Approx. 1,337 spaces[3]
Shoreline Setback	50 ft. min.	50 ft. min.	100 ft min.
Shoreline Restoration Area	3.4 acres	3.5 acres	3.7 acres
Setbacks from Adjacent Properties	North: 40–310 ft.[4] South: 45–95 ft.[4]	North: 144–192 ft.[4] South: 40–380 ft.[4]	North: 38–95 ft.[4] South: 40–200 ft.[4]
Maximum Building Height	77 ft.	67 ft.	64 ft.
Site Population	1,300 residents	1,132 residents	1,108 residents
Site Employment	1,050 employees	50 employees	50 employees
Grading	53,000–133,000 CY fill	53,000–133,000 CY fill	53,000–133,000 CY fill
View Corridors	View corridors along Street "B," and driveways/parking areas at N. and S. ends of site	View corridors along Street "B" and driveways/parking areas at N. and S. ends of site	Larger view corridors along Street "B"; view corridors along driveways/parking areas at N. and S. ends of site
Utilities	Sewer and water from City; stormwater mgmt. per 2009 KCSWDM	Sewer and water from City; stormwater mgmt. per 2009 KCSWDM	Sewer and water from City; stormwater mgmt. per 2009 KCSWDM
Emergency Access Road	No	No	Yes

Source: Quendall Terminals Redevelopment Project DEIS, 2010 and Lance Mueller, 2012

Note: For environmental review purposes, full build-out of the project is assumed to occur by 2015. However, actual build-out will be subject to the timing of cleanup remediation of the site, and market conditions.

[1] Residential data represents the total number of residential units on the site.

[2] For purposes of this EIS Addendum, open space includes: paved plazas, sidewalks, natural areas, landscaped areas, and unpaved trails. These areas may or may not meet the City's standards, regulations, and procedures for open space.

[3] Parking data represents the total number of parking spaces on the site.[4] Setbacks are measured from the property line to the nearest proposed structure.

Q6. What is an EIS Addendum and why is it being prepared?

A6. According to the SEPA Rules (WAC 197-11-600 and 197-11-706), an Addendum is an environmental document used to provide additional information or analysis that does not substantially change the analysis of significant impacts and alternatives in an existing environmental document. Preparation of an Addendum is appropriate when a proposal has been modified and the changes are not expected to result in any new significant adverse impacts. An Addendum may be used at any time in the SEPA process. WAC 197-11-625 identifies the procedures that shall be followed during the preparation of an EIS Addendum, including the following:

- An Addendum shall clearly identify the proposal for which it is written and the environmental document it adds to or modifies.

- An agency is not required to prepare a draft Addendum.

- An Addendum for a DEIS shall be circulated to recipients of the initial DEIS under WAC 197-11-455.

- Agencies are encouraged to circulate an Addendum to interested persons. Unless otherwise provided in these rules, however, agencies are not required to circulate an Addendum.

An EIS Addendum is being prepared for the Quendall Terminals Redevelopment Project because the Preferred Alternative includes relatively minor modifications to the redevelopment alternatives described and analyzed in the DEIS. These minor modifications are not anticipated to result in any new significant unavoidable adverse impacts.

Q7. What will occur after the issuance of this EIS Addendum?

A7. Although not required, a 30-day public comment period will follow issuance of the EIS Addendum; written comments can be submitted during this 30-day period (see the **Fact Sheet** in this EIS Addendum for more information). Public and agency comments received on this EIS Addendum, as well as the comments received during the previous comment periods on the DEIS, will be included in a FEIS. Responses to all applicable comments will be provided in the FEIS.

Q8. What will occur after the issuance of the FEIS?

A8. The DEIS, this EIS Addendum, and the FEIS will be used as tools by the City (along with other considerations, analyses, and public input) in their decision-making process on the Quendall Terminals Redevelopment Project. This process is summarized below.

Subsequent to the issuance of the FEIS, City staff will review the proposed project and associated information/analysis, and issue recommendations related to the proposed Master Site Plan, Binding Site Plan, and Shoreline Substantial Development Permit. A public hearing before the City's Hearing Examiner will be held to consider the proposed plans and shoreline permit. Decisions will be rendered by the City of Renton on the project. The shoreline permit will be filed with the Washington State Department of

Ecology. Pursuant to RMC 4-8-110(E)(4), appeals of an FEIS shall be made within 20 days of the publication of the final decision.

2.2 Site Description

The approximately 21.5-acre Quendall Terminals site is located in the northern portion of the City of Renton. The junction of Interstate Highways 405 and 90 is located approximately 3.5 miles to the northeast of the site (see **Figure 2-1**). The site includes the approximately 20.3-acre Main Property, located adjacent to Lake Washington, and an approximately 1.2-acre Isolated Property, to the northeast of the Main Property, across Ripley Lane N (see **Figure 2-2**). The Main Property is located at 4350 Lake Washington Boulevard and is generally bounded by Lake Washington on the west; a Puget Sound Energy easement and the Seahawks Headquarters and Training Facility on the north; railroad right-of-way, Lake Washington Boulevard and Ripley Lane N on the east; and, the Barbee Mill residential development on the south. The adjacent Isolated Property is generally bounded by Ripley Lane N on the north and west; and, the southbound Interstate 405 off-ramp on the south and east. The site is presently vacant.

Background

The Quendall Terminals site is the location of a former creosote manufacturing facility and has been contaminated with coal tar, pitch, creosote, and other hazardous chemicals (see the following sections in the DEIS for details: Chapter 2 – Site History, Section 3.3, Environmental Health, and Appendix D). As a result of this prior contamination, cleanup of the site is required under federal and state law.

The Washington State Department of Ecology (Ecology) initially served as the lead regulatory agency for overseeing cleanup of the site. An earlier remedial investigation (RI) report and a draft risk assessment/focused feasibility study (FS) were completed for the site, under the oversight of Ecology in 1997 and 2004, respectively. In 2005, Ecology requested that EPA take the lead for overseeing further cleanup activities at the site. EPA subsequently assumed the role of lead agency, and in 2006, the site was added to EPA's Superfund[1] National Priorities List. In September 2006, the property owners entered into an Administrative Order on Consent (AOC) with EPA, which set forth the requirements for completion of an RI/FS and risk assessment. The RI/FS and risk assessment reports, which are currently being prepared by the property owners and EPA, characterize the nature and extent of contamination and potential risks associated with exposure to site contamination, and evaluate alternative remedies that could be implemented to mitigate contaminant exposures. After the updated RI/FS and risk assessment reports are developed, a Proposed Plan identifying the steps to be taken to ensure that the Quendall Terminals site will be protective of human health and the environment will be provided for public review. After EPA reviews all public comments, it will issue a Record of Decision (ROD) specifying the final cleanup and mitigation plan for the site. EPA currently anticipates that

[1] Superfund is the name given to the federal environmental program established to address sites requiring cleanup under Federal law. It is also the name of the fund established by the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) of 1980, as amended, that can be used by EPA to perform site cleanup work. The Superfund program allows the EPA to compel responsible parties to perform cleanups or to perform cleanups itself and then seek reimbursement from responsible parties for EPA's cleanup costs.

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City of Renton Boundary

Not to Scale

North

Source: Google Maps, 2010

EA | BLUMEN

Figure 2-1
Regional Map

Quendall Terminals
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---- City of Renton City Limits

Not to Scale

North

Source: EA|Blumen, Google Maps, 2010

EA | BLUMEN

Figure 2-2
Vicinity Map

the ROD will be issued in 2014; EPA and the responsible parties will subsequently enter into an agreement for implementation of the remedy.

The *Quendall Terminals Redevelopment Project DEIS* (2010) briefly summarized the history of the site and the site's current conditions; referred to the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) process and its regulatory requirements; and, discussed protocols and institutional controls that will ultimately set out requirements and compliance methods for construction and long-term redevelopment. The DEIS impact analyses assumed an existing/baseline condition subsequent to cleanup/remediation (that is, the condition of the site after remediation has been accomplished). Therefore, only the probable significant environmental impacts and applicable mitigation measures related to redevelopment of the site under Alternatives 1 and 2 were addressed in the DEIS; potential impacts associated with cleanup/remediation activities will be addressed through the separate EPA process (see DEIS Section 3.3, Environmental Health, and Appendix D for details).

Similar to the DEIS, the analyses in this EIS Addendum assumes an existing/baseline condition subsequent to cleanup/remediation. The probable significant environmental impacts and applicable mitigation measures related to redevelopment of the site with the applicant's Preferred Alternative are addressed in this document, and compared to the impacts/mitigation measures with the DEIS redevelopment alternatives. Based upon the March 13, 2012 letter from EPA (see **Appendix B**), EPA considers that the baseline assumptions from the DEIS are reasonable give the expected general outcome of the ROD, with the exception of those related to the shoreline setback and wetland buffers. The baseline assumptions used in the DEIS were based on the *Renton Shoreline Management Plan* (1983) in place at the time complete applications for the project were submitted to the City, and other relevant information described in Appendix E to the DEIS. In 2011, the City's Shoreline Management Plan was updated, and more stringent shoreline setbacks and wetland buffers established. EPA has indicated that final mitigation/restoration requirements will be based on the regulations in place at the time EPA issues their ROD for the cleanup.

According to current regulations and standards, the wetland and shoreline restoration areas would be larger than those assumed in the DEIS. As suggested by EPA, a 100-foot minimum setback from the shoreline is assumed in this EIS Addendum under the Preferred Alternative; all other baseline assumptions are the same as those represented in the DEIS (see the following section on Shoreline Setbacks, and Chapter 3 – Critical Areas and Environmental Health for further details).

2.3 Preferred Alternative

Subsequent to issuance of the DEIS, the applicant formulated their Preferred Alternative. The Preferred Alternative is based on information provided in the DEIS, comments from agencies and the public, input and continued coordination between the applicant and the City, and, additional analysis and master planning. The Preferred Alternative is based on relatively minor modifications to the DEIS redevelopment alternatives (see **Figure 2-3** and **2-4** for an illustration of the proposed site plan and ground level plan under the Preferred Alternative). Under the Preferred Alternative, the majority of the development assumptions would be similar to those analyzed under DEIS Alternatives 1 and 2 (particularly DEIS Alternative 2), including:

- Retail/Restaurant Space *(21,600 sq. ft. retail/9,000 sq. ft. restaurant)*
- Office Space *(none)*

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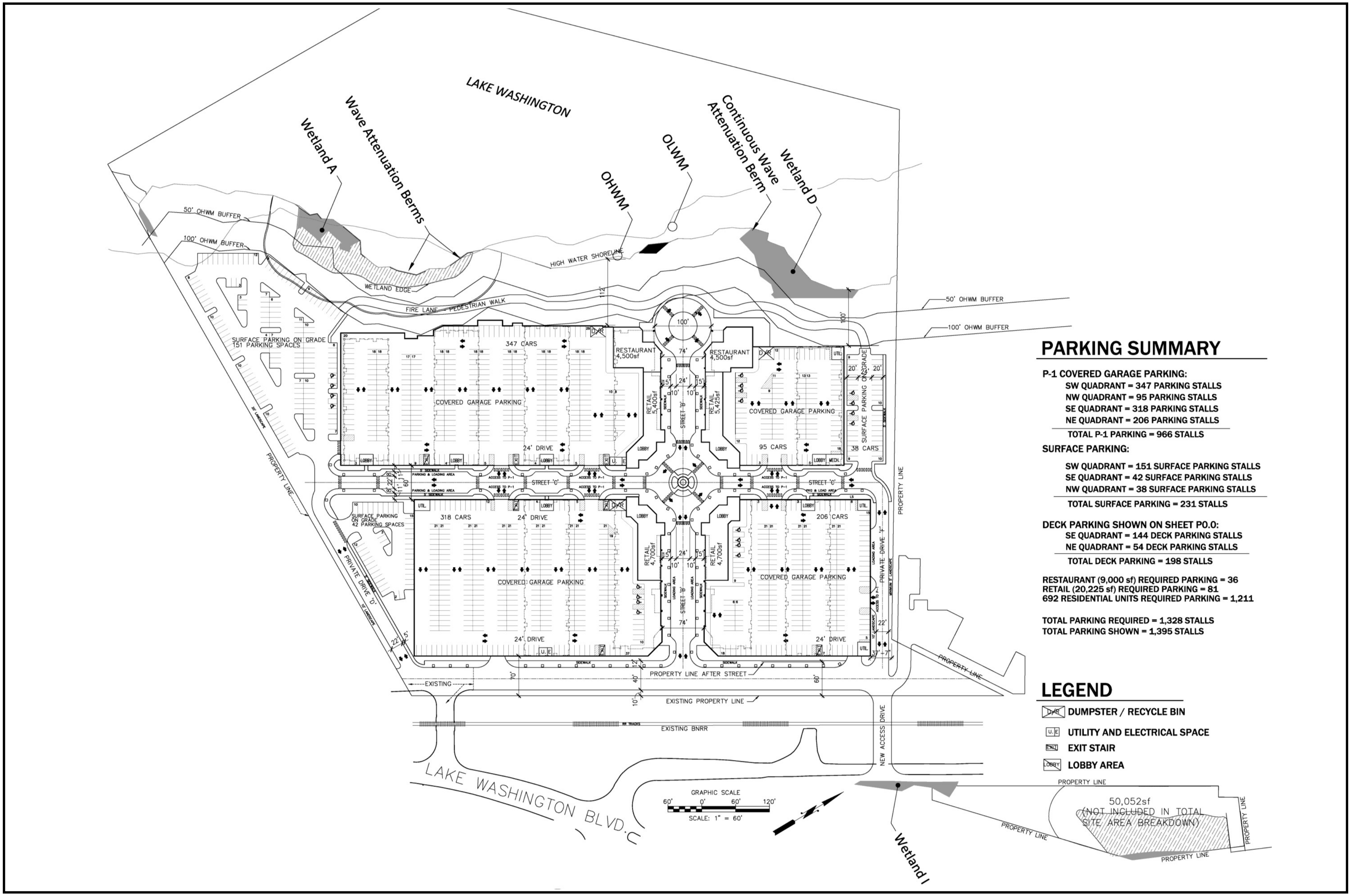
Source: Lance Mueller & Associates, 2012

EA | BLUMEN

Figure 2-3

Site Plan—Preferred Alternative



Source: Lance Mueller & Associates, 2012

EA | BLUMEN

Figure 2-4

Ground Level Plan—Preferred Alternative

- Residential Units *(692 units)*
- Maximum Building Heights *(64 ft.)*
- Anticipated Site Population *(1,108 residents)*
- Anticipated Site Employment *(50 employees*)
- Parking/Access *(1,337 parking spaces)*
- Landscape Design *(shoreline restoration + native and ornamental planting in the upland area)*
- Grading *(53,000–133,000 CY of fill*)
- Utilities *(sewer and water from City of Renton; stormwater per City of Renton Amendments to the 2009 KCSWDM)*

The following redevelopment assumptions for the Preferred Alternative have been modified from those described for Alternatives 1 and 2 in the DEIS:

- Shoreline Setback *(100-ft. min. increased setback)*
- Setbacks from Adjacent Properties *(north: 38-95 ft.; south 40-200 ft.)*
- View Corridors *(Street "B" corridor enlarged)*
- Building Height Modulation *(4-story buildings along south property line; 5- to 6- story buildings elsewhere)*
- Open Space and Related Areas *(10.6 acres*)
- Building Design *(more brick, stucco, masonry, and precast concrete, and less metal siding)*
- Emergency Access Road *(in western portion of the site)*

Below are further descriptions of the modifications under the Preferred Alternative.

Shoreline Setback

In response to the May 2012 letter from EPA, comments from Ecology and the public, and input and continued coordination with the City, the applicant voluntarily created a new redevelopment alternative (their Preferred Alternative) that maintains a 100-foot minimum/150-foot maximum setback from the shoreline onsite (versus the 50-foot minimum/225-foot maximum shoreline setback under the DEIS alternatives). The minimum setback is consistent with EPA's recommendation and the *City of Renton Shoreline Master Program* (2011). The shoreline restoration area under the Preferred Alternative would total approximately 3.7 acres, versus the 3.4 to 3.5 acres under DEIS Alternatives 1 and 2. This area would accommodate future wetlands, as well as buffers and setbacks, similar to under the DEIS alternatives (see DEIS figures 2-6 and 2-11). The ultimate, detailed plans for the shoreline restoration area under the Preferred Alternative will be developed in coordination with EPA.

Setbacks from Adjacent Properties

Building setbacks from adjacent properties under the Preferred Alternative would vary somewhat from those under DEIS Alternatives 1 and 2. Setbacks from the northern property line under the Preferred Alternative would range from approximately 95 feet adjacent to the five-story building in the northwestern portion of the site to approximately 38 feet adjacent to the one-story parking structure in the northeastern portion of the site. The minimum setback along this property line would be similar to DEIS Alternative 1, but less than DEIS Alternative 2. The maximum setback would be less than DEIS Alternatives 1 and 2. Setbacks from the southern property line under the Preferred Alternative would range from approximately 40 feet adjacent to the one-story parking garage in the southeastern portion of the site to approximately 200 feet adjacent to the four-story building in the southwestern portion of the site. The minimum setback along this property line would be similar to DEIS Alternatives 1 and 2; the maximum setback would be greater than DEIS Alternative 1, but less than DEIS Alternative 2 (see **Table 2-1** and **Figure 2-3**).

View Corridors

Several comments on the DEIS related to impacts on views to and from Lake Washington and Mercer Island with redevelopment under Alternatives 1 and 2. With the applicant's Preferred Alternative, certain view corridors through the site (i.e. along Street "B") would be larger than under the DEIS redevelopment alternatives; others would be similar to under DEIS Alternative 2.

The view corridor along Street "B", the main east/west street proposed through the site, would be approximately 74 feet wide under the Preferred Alternative (including the 44-foot wide street and two 15-foot wide sidewalks on either side of the street within an 80-foot dedicated public right-of-way; see **Figure 2-3**). This corridor would be 8 feet wider than the approximately 66-foot wide corridor under DEIS Alternatives 1 and 2 (see DEIS Figures 2-4 and 2-9). **Chapter 3** contains visual simulations from a new viewpoint on Lake Washington Boulevard through this corridor and Section 4.7, **Aesthetics/Views**, provides additional analysis of potential impacts to views with the Preferred Alternative.

The view corridors along the southern boundary of the site would be maximized under the Preferred Alternative, similar to under DEIS Alternative 2. Surface parking areas proposed in the southwestern portion of the site would help maintain existing views toward Lake Washington and Mercer Island from the Barbee Mill development to the south. As noted above, building setbacks from the southern property line under the Preferred Alternative would range from 40 to 200 feet along the southern property line. Under DEIS Alternative 1, building setbacks from the southern property line would range from 45 to 95 feet, and under DEIS Alternative 2 they would range from 95 to 380 feet. **Chapter 3** contains visual simulations from viewpoints in the Barbee Mill development and Section 4.7, **Aesthetics/Views**, provides additional analysis of potential impacts to views with the Preferred Alternative.

Building Height Modulation

Concerns about potential height, bulk and scale impacts of the Quendall Terminals project on adjacent uses (particularly on the Barbee Mill development to the south) were raised in the comments on the DEIS. To address these comments, building heights have been modulated across the site under the Preferred Alternative. The buildings in the southern portion of the site would be 4-stories high (3 stories over one story of parking). Buildings located in the northern portion of the site would be 5 stories high (4 stories over one story of parking); and, those in the western, eastern, and central portions of the site would be 5 to 6 stories high (4 to 5 stories over one story of parking). The maximum building height would be approximately 64 feet, slightly less than under DEIS Alternative 2. During final design, maximum building heights 100 feet from the Lake Washington ordinary high water mark (OHWM) would be reduced to one half of the maximum height allowed by the COR zone (125 feet allowed height x ½ = 62.5 feet), consistent with the City of Renton Shoreline Management Program (2011); maximum building height in this area under DEIS Alternatives 1 and 2 would be 77 and 67 feet, respectively (see **Figures 2-5, 2-6** and **2-7** for representative building elevations).

Open Space and Related Areas

Approximately 10.6 acres of open space and related areas would be provided under the Preferred Alternative, as compared to approximately 11.7 to 11.8 acres under DEIS Alternatives 1 and Alternative 2, respectively. This reduction in open space and related areas under the Preferred Alternative is primarily due to the elimination of one of the semi-private courtyards located above the parking structures. The courtyard area was removed in order to accommodate additional building area proximate to Lake Washington (see **Figure 2-4** and Section 4.8, **Parks and Recreation**, for details).

Building Design

The design of the buildings in the Quendall Terminals Mixed-Use Redevelopment Project has continued to evolve under the Preferred Alternative, based on input from the City and community, as well as changing market conditions. Ten buildings ranging in size from 46,200 to 88,000 square feet are proposed under the Preferred Alternative, versus 9 buildings ranging from 94,600 to 209,000 square feet under DEIS Alternative 1, and 9 buildings ranging from 77,000 to 112,800 square feet under DEIS Alternative 2. Similar to DEIS Alternatives 1 and 2, proposed redevelopment with the Preferred Alternative would represent a compact, urban form, with a consistent design concept throughout the site (see **Figures 2-5** through **2-9** for conceptual elevations and renderings of the Preferred Alternative).

The proposed design of the buildings is intended to be coordinated through a variety of details and materials, and provide a human scale with visually interesting streetscapes and facades (see DEIS pages 3-15 and 3-16 for details). Exterior building materials would resemble those under the DEIS redevelopment alternatives; however, more brick, stucco, masonry, and precast concretes, and less metal siding would likely be incorporated into the buildings under the Preferred Alternative (see **Figures 2-5** through **2-9**). The bases of the parking structure are also proposed to have grids to support vines to create “green walls” (see **Figure 2-10** for a representative section including the proposed “green walls”).

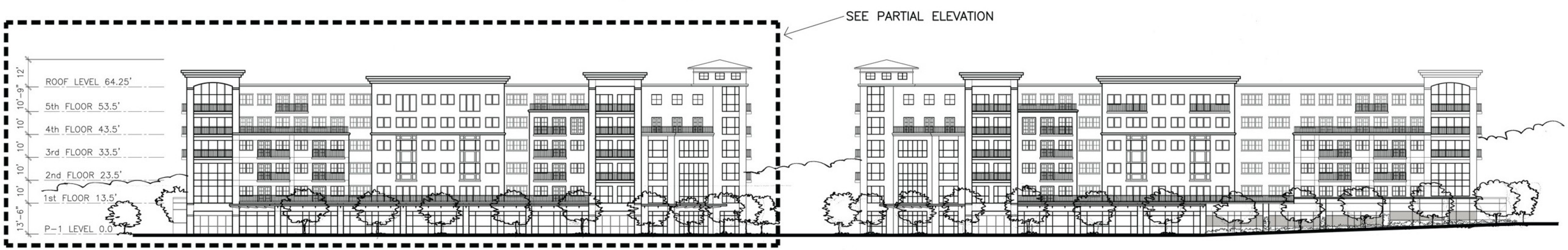
Emergency Access Road

Based on comments from the City of Renton Fire Department on the DEIS, an emergency access road is proposed to be located in the western portion of the site under the Preferred Alternative that is intended to meet the City’s requirements for fire access (see **Figure 2-3**). This road would be approximately 20 feet wide, and would be surfaced in crushed rock or grass-crete to support emergency vehicles. The road would also serve as a pedestrian facility that would be accessible to the public during reasonable hours (anticipated to be from 10 AM to dusk). Similar to under DEIS Alternatives 1 and 2, interpretive wetland viewpoints would be included in the design of the emergency access road/pedestrian facility. The road/trail would also meet ADA guidelines, and would link to the site’s upland internal circulation system (sidewalks), which would connect to Lake Washington Boulevard.

BUILDING NW 1

PARTIAL SOUTH ELEVATION

GRAPHIC SCALE 12' 0' 12' 24' SCALE: 1" = 12'



BUILDING NW 1

BUILDING NE 1

SOUTH ELEVATION

GRAPHIC SCALE 30' 0' 30' 60' SCALE: 1" = 30'

Source: Lance Mueller & Associates, 2012

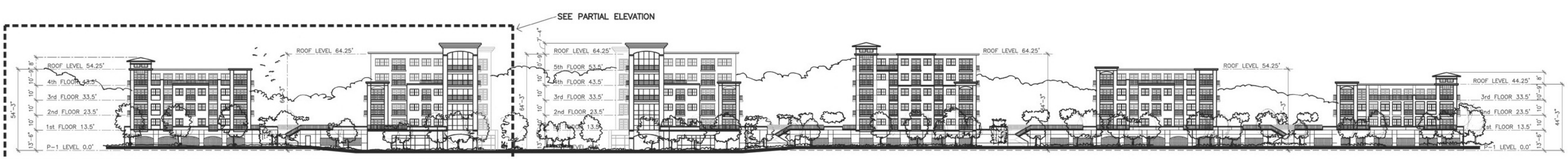
Figure 2-5

Representative South Building Elevations—Preferred Alternative

BUILDING NW 2 BUILDING NW 1

PARTIAL WEST ELEVATION FROM LAKE WASHINGTON

GRAPHIC SCALE
12' 0' 12' 24'
SCALE: 1" = 12'



BUILDING NW 2 BUILDING NW 1 BUILDING SW 1 BUILDING SW 2 BUILDING SW 3 BUILDING SW 4

OVERALL WEST ELEVATION FROM LAKE WASHINGTON

GRAPHIC SCALE
30' 0' 30' 60'
SCALE: 1" = 30'

Source: Lance Mueller & Associates, 2012

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Figure 2-6
Representative West Building Elevations—Preferred Alternative

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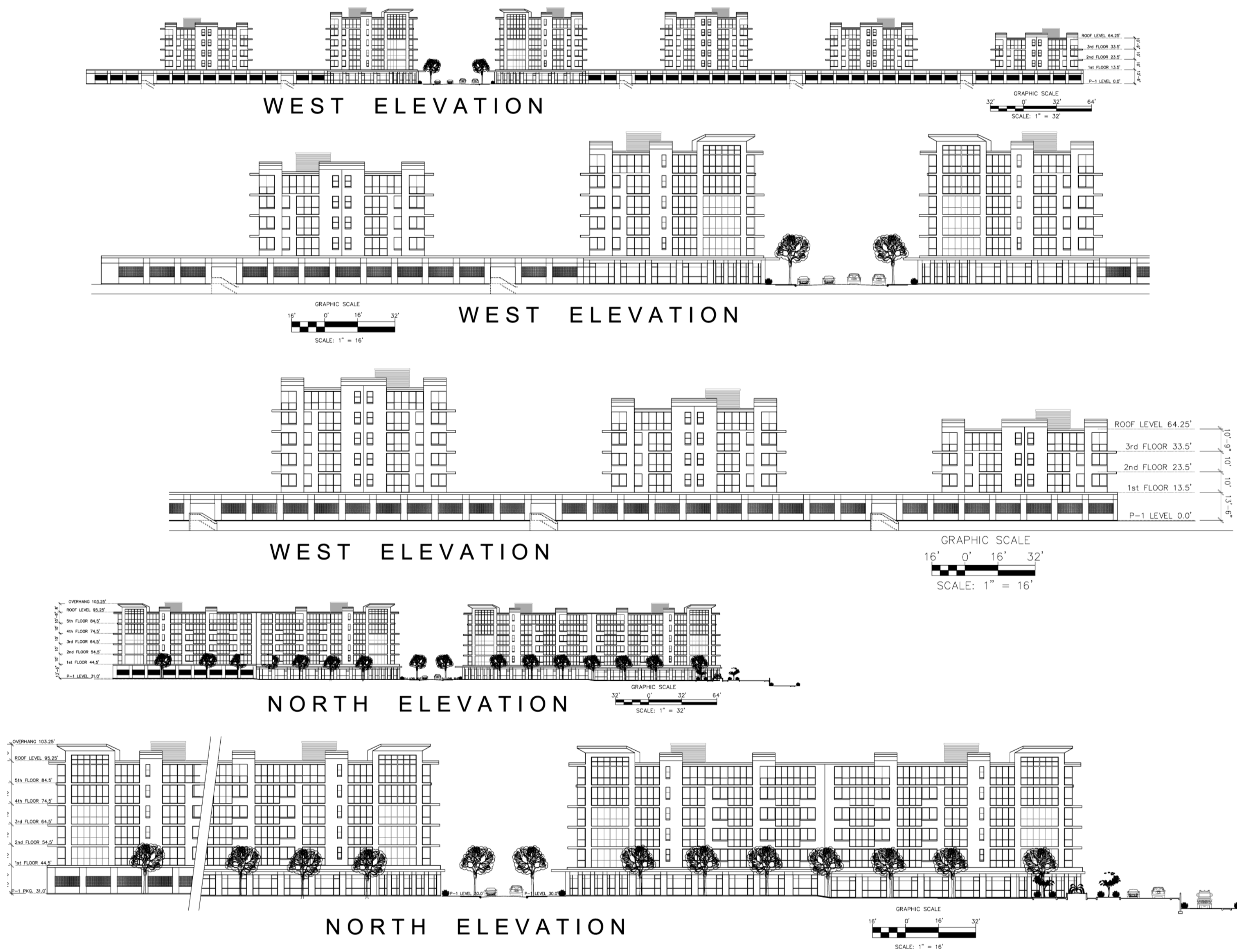

Source: Lance Mueller & Associates, 2012

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Figure 2-7
North and West Building Elevations – Preferred Alternative

Source: *Lance Mueller & Associates, 2012*

Figure 2-8

Conceptual East View from Lake Washington – Preferred Alternative

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Source: Lance Mueller & Associates, 2012

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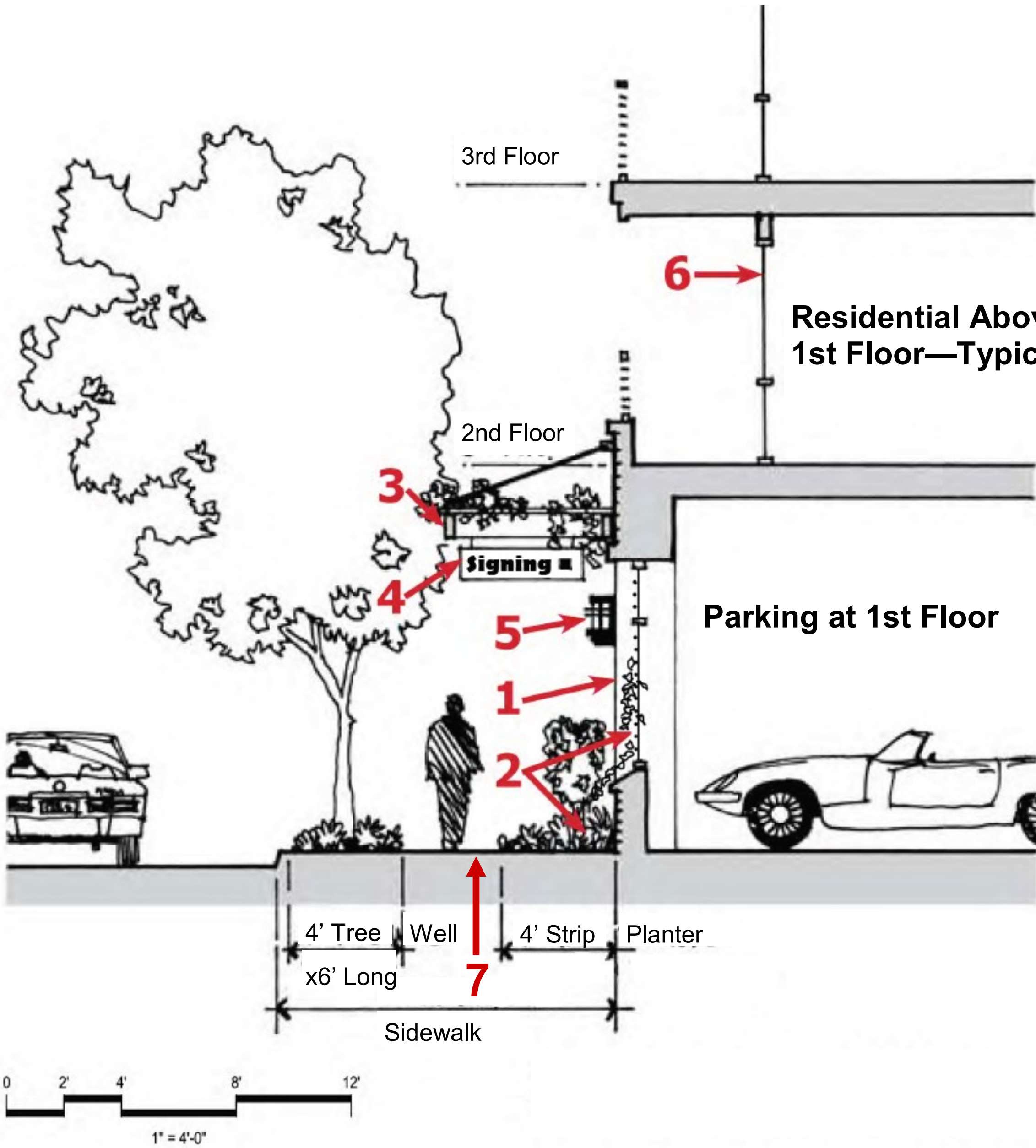
Figure 2-9
Conceptual West View from Central Roundabout – Preferred Alternative



Notes on Pedestrian Features:

1. Facades are sidewalk oriented in architecturally articulated punched openings.
    a. Ground level facades are defined with facade materials from a limited palette of brick, stone, and stained concrete. Vary the base façade materials for visual interest.
2. Screen openings to parking with both architectural grillwork and hedge landscaping strips. Reduce size of opening with raised sill behind landscaping. Encourage vines to grow in grillwork.
3. Provide steel trellis with landscaping as a pedestrian feature, final design TBD.
4. Include a coordinated tenant signing program as a pedestrian feature, final design TBD.
5. Exterior lighting system to include scale appropriate sconce lighting fixtures at ground level facades.
6. Provide facade modulation and material change to distinguish upper floors from the ground floor.
7. Sidewalks are from articulated concrete and have a pedestrian friendly width with tree wells.
    a. Sidewalk benches and other furniture are part of the pedestrian experience (not shown here).

Source: Lance Mueller and Associates, 2012

BLUMEN

Figure 2-10
"Green Wall" Façade Section - Preferred Alternative

CHAPTER 3

UPDATED INFORMATION AND ANALYSIS

CHAPTER 3

UPDATED AND ADDITIONAL INFORMATION AND ANALYSIS

INTRODUCTION

This chapter of the EIS Addendum summarizes updated and additional information and analyses prepared since publication of the Draft EIS (DEIS) in the following areas: Critical Areas, Aesthetics/Views, Relationship to Plans and Policies, Transportation, and Cultural Resources.

3.1 Critical Areas

Comments were received from U.S. Environmental Protection Agency (EPA), Washington Department of Ecology (Ecology) and the general public on the environmental (post-clean up) assumptions presented in the DEIS. On March 4, 2011, the City of Renton placed the Quendall Terminals EIS process “on hold”, pending receipt of another letter from EPA clarifying their comments on the environmental baseline assumptions. On March 13, 2012, the City received a letter from EPA clarifying their comments on these assumptions (see **Appendix B**).

In response to the letter from EPA, comments from Ecology and the public, and input and coordination with the City, the applicant voluntarily created a new redevelopment alternative (their Preferred Alternative) that would maintain a 100-foot minimum/150-foot maximum setback from the shoreline onsite (versus the 50-foot minimum/225-foot maximum shoreline setback under the DEIS alternatives). The minimum setback under the Preferred Alternative is consistent with EPA’s recommendation and the City’s 2011 Shoreline Master Program. The shoreline restoration area under the Preferred Alternative would total approximately 3.7 acres, versus the 3.4 to 3.5 acres under DEIS Alternatives 1 and 2, respectively. This area would accommodate future wetlands, as well as buffers and setbacks, similar to under the DEIS alternatives (see DEIS figures 2-6 and 2-11). Final, detailed plans for the shoreline restoration area under the Preferred Alternative will be developed in coordination with EPA.

Lighting Impacts

In response to agency and public comments on the DEIS regarding potential lighting impacts on wetland and riparian habitat along Lake Washington, additional critical areas analysis was conducted for this EIS Addendum. Potential human-disturbance related impacts to wildlife associated with wetland and riparian habitats would include increased artificial lighting, particularly during morning and late afternoon/evening hours during the winter.

Although the topic has received increased research attention in recent years, understanding the effects of artificial night lighting on ecological systems, such as wetlands and lakeshore habitats, is still limited. It is acknowledged that increases in ambient light can alter the behavioral ecology of a variety of organisms, from changes in orientation, as well as attraction or repulsion from the altered light environment. These in turn may affect foraging, reproduction, migration, and communication.

Potential impacts from artificial lighting from the proposed redevelopment should be considered in the context of the urbanized setting along this portion of Lake Washington, as well as the longer term land use history of the Quendall Terminals site. Residential development currently extends south from the project site, including the relatively recent Barbee Mill development to the south of the site, as well as more established residences along the shore further to the south. The Seattle Seahawks Headquarters and Training Facility is immediately north of the project, and additional residences line the shoreline further to north for a considerable distance. Therefore, the impacts of artificial lighting from the proposed redevelopment would represent an incremental addition to lighting along the shoreline in this area and would not be considered a significant impact.

Moreover, cleanup and remediation work on the site would involve the removal of existing wetland and upland communities that are impaired by past contamination and capping of the site. Following remediation, wetland and riparian communities along the shoreline of the site would be newly established prior to redevelopment. Impacts to the developing wetland and riparian habitats would be minimized with implementation of appropriate mitigation. In addition, as the buffer areas develop, they would help screen the wetland and shoreline habitats from the development and associated lighting (see **Appendix C** for further information).

Mitigation Measures

Mitigation measures were identified in the DEIS to address potential impacts to critical areas; for the most part these measures would also apply to the Preferred Alternative. The following additional mitigation measure would be provided to minimize potential impacts of artificial lighting on wetland and riparian habitats. See **Chapter 1** for the complete list of critical area-related mitigation measures.

- The proposed redevelopment would include design elements to minimize the potential adverse affects of artificial lighting on wetland and riparian habitats. These include directing lighting downward and away from these habitats or adjacent properties, and may include shielding of lights, use of low-pressure sodium lights, or minimizing the use of reflective glazing materials in building design, as feasible.

Significant Unavoidable Adverse Impacts

There are no significant adverse impacts on critical areas from artificial lighting that could not be mitigated.

3.2 Aesthetics/Views

Several comments on the DEIS questioned the methods used and visual simulations generated for the DEIS visual analysis. Other comments on the DEIS related to the specific impacts on views to and from Lake Washington and beyond with redevelopment under DEIS Alternatives 1 and 2. In particular, views from the Barbee Mill residential development and Mercer Island to and through the site were of concern. This section provides further description of the methods used to prepare the visual simulation. The section also includes visual simulations of the Preferred Alternative from six key viewpoints, and analyses of the visual impacts of the project on views from these viewpoints.

Visual Analysis Methods

Viewpoints

Six key viewpoints were selected for the visual analysis in this EIS Addendum. These viewpoints consist of public locations, including public streets, sidewalks, and a public park, and represent the views that were mentioned most frequently by commentators on the DEIS. Five of these viewpoints were also analyzed in the DEIS (Viewpoints 1, 4, 7, 8, and 9); Viewpoint 11 is a new viewpoint from Lake Washington Boulevard N. The viewpoints are listed in **Table 3.2-1** and shown in **Figure 3.2-1**.

Table 3.2-1
VIEWPOINT LOCATION

Viewpoint	Description
Viewpoint 1	Clarke Beach Park, Mercer Island - Looking East
Viewpoint 4	Southbound I-405 Off-Ramp – Looking West
Viewpoint 7	Lake Washington Boulevard – Looking Northwest
Viewpoint 8	Barbee Mill Residential Development - Looking Northwest
Viewpoint 9	Barbee Mill Residential Development – Looking North
Viewpoint 11	Lake Washington Boulevard – Looking West

Source: EA|Blumen, 2012

Building Massing

Based on the selected viewpoints, visual simulations of proposed site development under the Preferred Alternative were prepared using the same methods employed in the DEIS (see DEIS page 3.7-3 for details on these methods). For purposes of the visual analysis, preliminary building massing concepts are portrayed in the simulations, based on information provided by the applicant’s architect. These simulations are expected to be representative of the building location, massing, and form that are proposed to occur on site. They do not represent the exact details of the proposed buildings (i.e. roof lines, façade modulation, building materials, fenestration, etc.) or proposed landscaping, as the specific design of the project has not been determined at this stage of the evaluation process.

Quendall Terminals
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Not to Scale

Source: The Portico Group, 2012

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Figure 3.2-1

Viewpoint Location Map

The visual simulation show dashed yellow lines, which represent the maximum development envelope which could be built on the site under the site's current Commercial/Office/Residential (COR) zoning classification. These dashed lines represent the site's maximum allowed building height (125 feet) and required building setbacks. Based on the current (2011) SMP and comments received from the EPA, a minimum shoreline setback of 100 feet is assumed.

Several of the DEIS comments raised questions about the building heights assumed in the visual analysis. These building heights were based on building elevations provided by the applicant's architect. The elevations showed a maximum building height to the roof level of 77 feet for DEIS Alternative 1 and 67 feet for Alternative 2, taking into account an approximately 31.5-foot ground elevation. The same approach was used for building heights used in the visual analysis for this EIS Addendum; a maximum building height of approximately 64 feet is assumed for the Preferred Alternative.

Photographic and Simulation Methods

The photographic and simulation methods used to prepare the visual simulations for this EIS Addendum are similar to those used for the DEIS. A rigorous process was followed to ensure the accuracy of the simulations of the Preferred Alternative, as briefly described below (see DEIS page 3.7-3 for details).

Photographs of existing views of the Quendall Terminals site were taken from the selected viewpoints. Digital files were set up in Adobe Photoshop to build the views from the selected viewpoints. The foreground of each photograph was then separated into different "layers" from the background. Based on the building massing concepts described above, simulations of the buildings under the Quendall Terminals Preferred Alternative were generated for each viewpoint using Autodesk 3D Studio Max software. Camera locations of each simulation were registered using a combination of field measurements, existing terrain and survey data, and GIS information. Lens types and field of view settings were matched within the software to the type used for each viewpoint. Proportions of building massing concepts were adjusted to the proportions of the photographs. The resulting simulations, which represent the proposed building massing, were then inserted into the prepared existing condition photograph between the foreground and background layers.

As mentioned above, comments on the DEIS questioned the accuracy of the visual simulations, in particular indicating that the heights of the proposed buildings under DEIS Alternatives 1 and 2 appeared to be too low relative to surrounding buildings (i.e. in Barbee Mill). To address these comments, the accuracy of the existing 3d model and camera's alignments were reconfirmed. A perspective illustration was also created to demonstrate that the simulations accurately depict views from the selected viewpoints (see **Figure 3.2-2)**. This illustration shows the view of the proposed development from Mercer Island (Viewpoint 1) and incorporates a 125-foot high scale, broken into 10-foot increments, that extends along the shoreline, through the center of the site, and along the site's rear property line. As shown by the illustration, the massing of buildings in Barbee Mill (assumed to be 36 feet) coincides with floors 3 and 4 in the Preferred Alternative. Thus, while it may appear that the proposed buildings under DEIS Alternatives 1 and 2, and the Preferred Alternative are out of scale, perspective-wise they are not.

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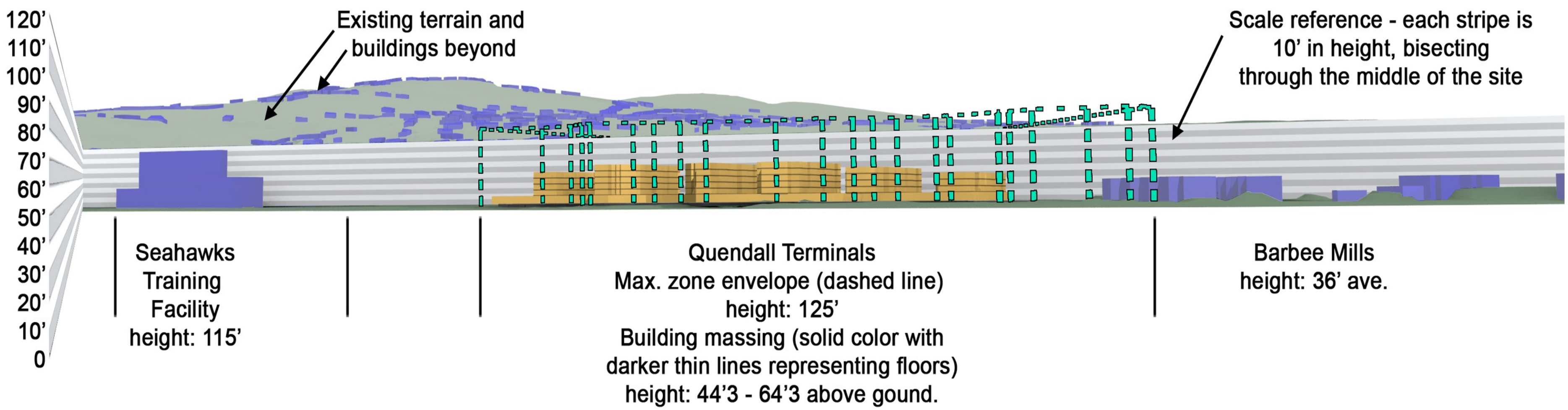

Source: The Portico Group, 2012

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Figure 3.2-2

Illustration of Perspective in Simulations

Visual Analysis

Following is a description of the existing views to the site from the viewpoints selected for the visual analysis. Descriptions of the views from these viewpoints with redevelopment under the Preferred Alternative are also provided.

View Point 1

As described on DEIS page 3.7-8, from Viewpoint 1 – Clarke Beach Park, City of Mercer Island – Looking East, the existing view includes Lake Washington in the foreground and mid-ground, and the Quendall Terminals site, Seahawks Headquarters and Training Facility, and Barbee Mill residential development in the background. Additional views of residential development and forested areas in the Kennydale Neighborhood and the City of Newcastle are available in the background, on the hillside beyond the Quendall Terminals site (see **Figure 3.2-3**).

With the Preferred Alternative, the developed view would include new 4- to 6-story mixed use buildings on the Quendall Terminals site. Proposed development would be located in the central portion of the background view and would be lower in height, but greater in overall scale than the adjacent Seahawks Headquarters and Training Facility, and greater in height and scale than the Barbee Mill Residential development. Views of the Kennydale Neighborhood and City of Newcastle would remain in the background. The visual character from this viewpoint would reflect a continuation of existing development along the shoreline area, and a more densely developed environment (see **Figure 3.2-3**).

Views toward the site with the Preferred Alternative would be similar to DEIS Alternative 2 in terms of building density/view preservation. However, with the Preferred Alternative, the proposed building heights would be stepped across the site; lower buildings would be located adjacent to Barbee Mill (4 stories) and to the Seahawks Headquarters (5 stories), and higher buildings (5 to 6 stories) would be located elsewhere onsite.

View Point 4

As described on DEIS page 3.7-13, from Viewpoint 4 – Southbound I-405 Off-Ramp – Looking West, the existing view includes Ripley Lane N, existing vegetation in the City of Renton right-of-way, railroad tracks, and existing trees and vegetation on the Quendall Terminals site. Views of Mercer Island and partial views of Lake Washington are also available in the background from this location (see **Figure 3.2-4**).

With the Preferred Alternative, proposed 6-story mixed-use buildings, associated roadways, landscaping, and landscaped courtyards on the Quendall Terminals site would alter the existing view. The character from this viewpoint would change from predominantly open, vegetated landscape to a more densely developed mixed-use development. A portion of the existing views of Mercer Island and Lake Washington would be blocked by proposed development; however, some views of the island would be possible over the buildings (see **Figure 3.2-4**).

Views toward the site with the Preferred Alternative would be similar to DEIS Alternative 2 in terms of building density. However, slightly more of Mercer Island would be visible due to the building height modulation under the Preferred Alternative.

Existing Conditions

Preferred Alternative

Source: The Portico Group, 2012

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Figure 3.2-3
Viewpoint Location #1

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Existing Conditions

Preferred Alternative

Source: The Portico Group, 2012

EA | BLUMEN

Figure 3.2-4

Viewpoint Location #4

View Point 7

As described on DEIS page 3.7-16, from Viewpoint 7 – Lake Washington Boulevard – Looking Northwest, the existing view contains vegetation in the City of Renton right-of-way adjacent to Lake Washington Boulevard, the existing railroad tracks, a residence located in the Barbee Mill residential development, and a street light pole in the foreground and mid-ground. Existing trees on the Quendall Terminals site are located in the background, beyond the Barbee Mill residential development (see **Figure 3.2-5**).

With the Preferred Alternative, proposed 4-story buildings on the Quendall Terminals site would be located prominently in the field of view, and would alter the visual character from a predominantly open site to a densely developed area. Proposed buildings would be located in proximity to the existing Barbee Mill residential development (ranging from approximately 40 to 200 feet from the property line, and would be substantially greater in density, and somewhat greater in height than the existing residential buildings - existing buildings at Barbee Mill are up to 3 stories high (see **Figure 3.2-5**).

Views toward the site under the Preferred Alternative would be similar to DEIS Alternative 2 in terms of density of development and building setbacks. However, the Preferred Alternative would include lower buildings (4 stories) than DEIS Alternatives 1 and 2 (7- and 6-story buildings, respectively) adjacent to Barbee Mill.

View Point 8

As described on DEIS page 3.7-19, from Viewpoint 8 – Barbee Mill Residential Development – Looking Northwest, the existing view includes a vacant lot associated with the Barbee Mill residential development, street light poles, and sidewalks in the foreground and mid-ground. Residences in the Barbee Mill development are located in the background; existing trees on the Quendall Terminals site and partial views of Mercer Island are located further in the background, beyond the existing residences (see **Figure 3.2-6**).

With the Preferred Alternative, proposed 4-story development on the Quendall Terminals site would be visible in the mid-ground, and would frame the view with more dense development. Proposed buildings would be located adjacent to existing residential development on the Barbee Mill site. Development on the Quendall Terminals site would partially obstruct the view towards Mercer Island; however, the majority of the view between the Quendall Terminals and Barbee Mill sites would remain (see **Figure 3.2-6**).

Views toward Mercer Island would be better preserved under the Preferred Alternative than under DEIS Alternatives 1. This would largely be due to the currently proposed building height modulation, and building setbacks. However, views toward Mercer Island would be best preserved under DEIS Alternative 2, as little alteration in existing views from this viewpoint would occur under this alternative.

Existing Conditions

Preferred Alternative

Source: The Portico Group, 2012

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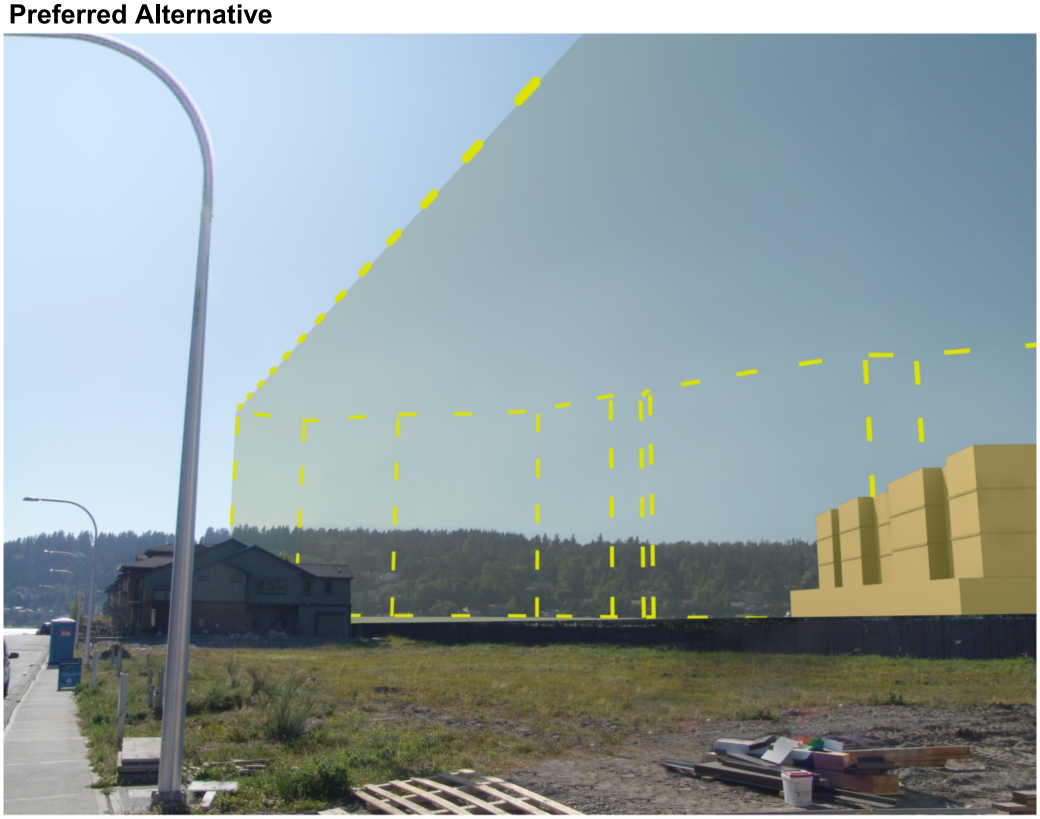
Figure 3.2-5
Viewpoint Location #7

Existing Conditions

Preferred Alternative



Source: The Portico Group, 2012

EA BLUMEN

Figure 3.2-6
Viewpoint Location #8

View Point 9

As described on DEIS page 3.7-19, from Viewpoint 9 – Barbee Mill Residential Development – Looking North, the current view is comprised of the Barbee Mill residential development access roadway, sidewalks, street light poles, and a currently vacant lot at Barbee Mill in the foreground and mid-ground. In the background is a fence/wall located on the existing property line and existing trees on the Quendall Terminals site; partial views of Mercer Island are available in the background between the existing trees (see **Figure 3.2-7**).

With the Preferred Alternative, proposed mixed-use development on the Quendall Terminals site would dominate the field of view from this location. Proposed development would change the character from this viewpoint and would reflect an increase in development density. Proposed buildings would be located in proximity to the Barbee Mill site. Partial views of Mercer Island would continue to be provided from this location (see **Figure 3.2-7**).

Views to the site under the Preferred Alternative would be similar to under DEIS Alternative 2 in terms of building density, setbacks adjacent to Barbee Mill, and view blockage. However, building heights would be lower in this portion of the site with the Preferred Alternative.

View Point 11

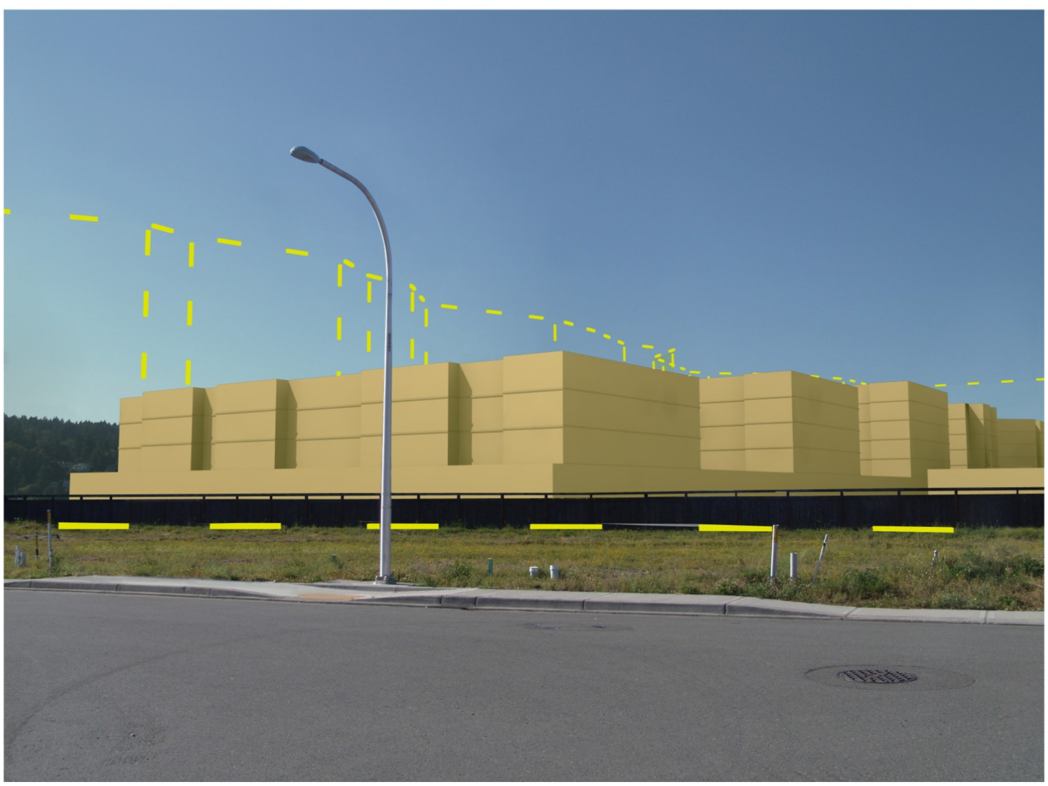
From Viewpoint 11 – Lake Washington Boulevard – Looking West, the existing view includes the guard rail, power pole, and existing vegetation in the foreground. The Quendall Terminals site is visible through the vegetation in the mid-ground. Filtered views of Lake Washington and Mercer Island are available in the background **(see Figure 3.2-8)**.

For this EIS Addendum, views with the Preferred Alternative are shown with and without the vegetation in the Lake Washington Boulevard right-of-way. Vegetation would likely be removed with planned improvements to this street (see DEIS pages 3.9-5 and 3.9-6 and Appendix H for details on these improvements). With the Preferred Alternative, proposed 6-story mixed-use buildings, associated roadways, landscaping, and landscaped courtyards on the Quendall Terminals site would alter the existing view. The character from this viewpoint would change from filtered views of Lake Washington and Mercer Island to a more densely developed mixed-use development. Views along the proposed Street “B” corridor would be preserved with proposed development **(see Figure 3.2-8)**.

Views to the site under the Preferred Alternative would be similar to under DEIS Alternative 2 in terms of development density and building heights. However, under the Preferred Alternative, the proposed Street “B” corridor would be wider than under DEIS Alternatives 1 and 2 (approximately 74 feet wide versus 66 feet wide), which would provide greater opportunities for views of the lake and island.

Existing Conditions

Preferred Alternative



Source: The Portico Group, 2012

EA | BLUMEN

Figure 3.2-7
Viewpoint Location #9

Existing Conditions

Preferred Alternative (vegetation removed)

Preferred Alternative (vegetation retained)

Source: The Portico Group, 2012

EA | BLUMEN

Figure 3.2-8

Viewpoint Location #11

3.3 Relationship to Plans and Policies

Shoreline Master Program

The 1983 *City of Renton Shoreline Master Program* (SMP) was in effect at the time that complete applications were submitted to the City of Renton for the Quendall Terminals project. DEIS Alternatives 1 and 2 would be consistent with the 1983 SMP.

In November 2011 (subsequent to issuance of the *Quendall Terminals Redevelopment Project DEIS*), the Washington State Department of Ecology approved Renton's updated SMP and the plan went into effect. The Lake Washington shoreline along the Quendall Terminals Main Property is designated as a Shoreline of Statewide Significance and is in the Shoreline High Intensity Overlay District in the 2011 SMP. The objective of this overlay district is to:

> *…provide opportunities for large-scale office and commercial employment centers as well as multifamily residential use and public services. This district provides opportunities for water-dependent and water-oriented uses while protecting existing ecological functions and restoring ecological functions in areas that have been previously degraded. Development may also provide for public use and/or community use, especially access to and along the shoreline.*

The 2011 SMP also requires a minimum building setback of 100 feet adjacent to the shoreline in this overlay district.

Discussion: Although the 1983 SMP was in effect at the time complete applications were submitted on Quendall Terminals, the proposed redevelopment would meet the objectives of the current Shoreline High Intensity Overlay District. The Preferred Alternative would consist of a large-scale, mixed use development including multifamily residential and commercial uses. Cleanup and restoration of the site, a Superfund site, would occur prior to redevelopment. It is the applicant's intention that the Preferred Alternative would adhere to the minimum shoreline setback requirement in the 2011 SMP. A 100-foot shoreline setback has been established along the entire shoreline onsite in which future wetlands, as well as buffers and setbacks, would be established (see **Figure 2-3**). A public trail is proposed in the shoreline area to provide opportunities for access along the shoreline. Final, detailed plans for the shoreline restoration area will be developed in coordination with EPA.

Parks, Recreation, and Natural Areas Plan

The City of Renton's 2003 *Park, Recreation and Open Space Implementation Plan* and the 2009 *Comprehensive Plan, Capital Facilities Element* were in place at the time complete applications were submitted for the Quendall Terminals project. In November 2011 (subsequent to issuance of the *Quendall Terminals Redevelopment Project DEIS*), the City of Renton adopted the *City of Renton Parks, Recreation, and Natural Areas Plan*. This plan provides a 20-year vision for parks, recreation facilities and programming, and natural areas; and, identifies policies, implementation strategies, and an investment program to enhance and sustain parks, recreation and natural areas as critical elements of a livable community.

As part of the *City of Renton Parks, Recreation and Natural Areas Plan,* the City also completed a *Community Needs Assessment* (May 2011) that was intended to identify system-wide recommendations for improvements to parks, recreation facilities, and natural areas. As part of the assessment, LOS calculations were conducted based on the existing LOS standards at the time and existing park system inventory. According to these calculations, the City had a total park and open space deficit of approximately 555 acres and an existing LOS of 13.95 acres per 1,000 population. By 2030, the City would have a deficit of approximately 1,093 acres. As a result, the City determined that there was a current and projected future deficit in park and open space areas based on the existing LOS standards.

The 2011 Plan includes updated proposed park acreage standards for the city-wide park system. These standards represent overall levels of facilities that the City seeks to achieve on a city-wide basis and are not intended to be implemented on a project-specific basis. The 2011 plan proposes a minimum total of 11.21 acres of parks and natural areas per 1,000 population as the standard. This updated standard represent a reduction from the prior adopted standard in the *2003 Park, Recreation and Open Space Implementation Plan*, which totaled 18.58 acres per 1,000 population. The 2011 Plan recognizes that most of the largest natural area sites are already within public ownership and additional acquisitions within the city limits are likely to be smaller targeted purchases.

In addition, the 2011 Plan includes recommendations for each community planning area. Following are the recommendations for the Kennydale Community Planning Area, in which the Quendall Terminals site is located:

- Expand access to the May Creek Greenway.
- Enhance the existing park sites in the area, including Kennydale Beach Park and Kennydale Lions Park.
- Provide two additional neighborhood parks in the area, including one on the west side of I-405 and one on the east side of I-405 and north of the May Creek Greenway.

Discussion: Similar to DEIS Alternatives 1 and 2, the Preferred Alternative would include open space and related areas onsite to help meet the demand for passive recreation from project residents and employees, but not the demand for active recreation facilities. Approximately 10.6 acres of open space and related area would be provided. The open space and other areas may or may not meet the City's standards, regulations, and procedures for open space. A public trail is proposed in the shoreline area to provide opportunities for access along the shoreline. The applicant would also pay park and recreation impact fees, in accordance with the provisions of the 2011 Plan or as required by the City of Renton Municipal Code, to help offset the impacts of the project on park and recreation facilities, open space, and trails (see Section 4.8, **Parks and Recreation**, for further information).

3.4 Transportation

In response to transportation-related comments on the DEIS, an *Updated Transportation Report* was prepared for this EIS Addendum, including the following additional information and analysis:

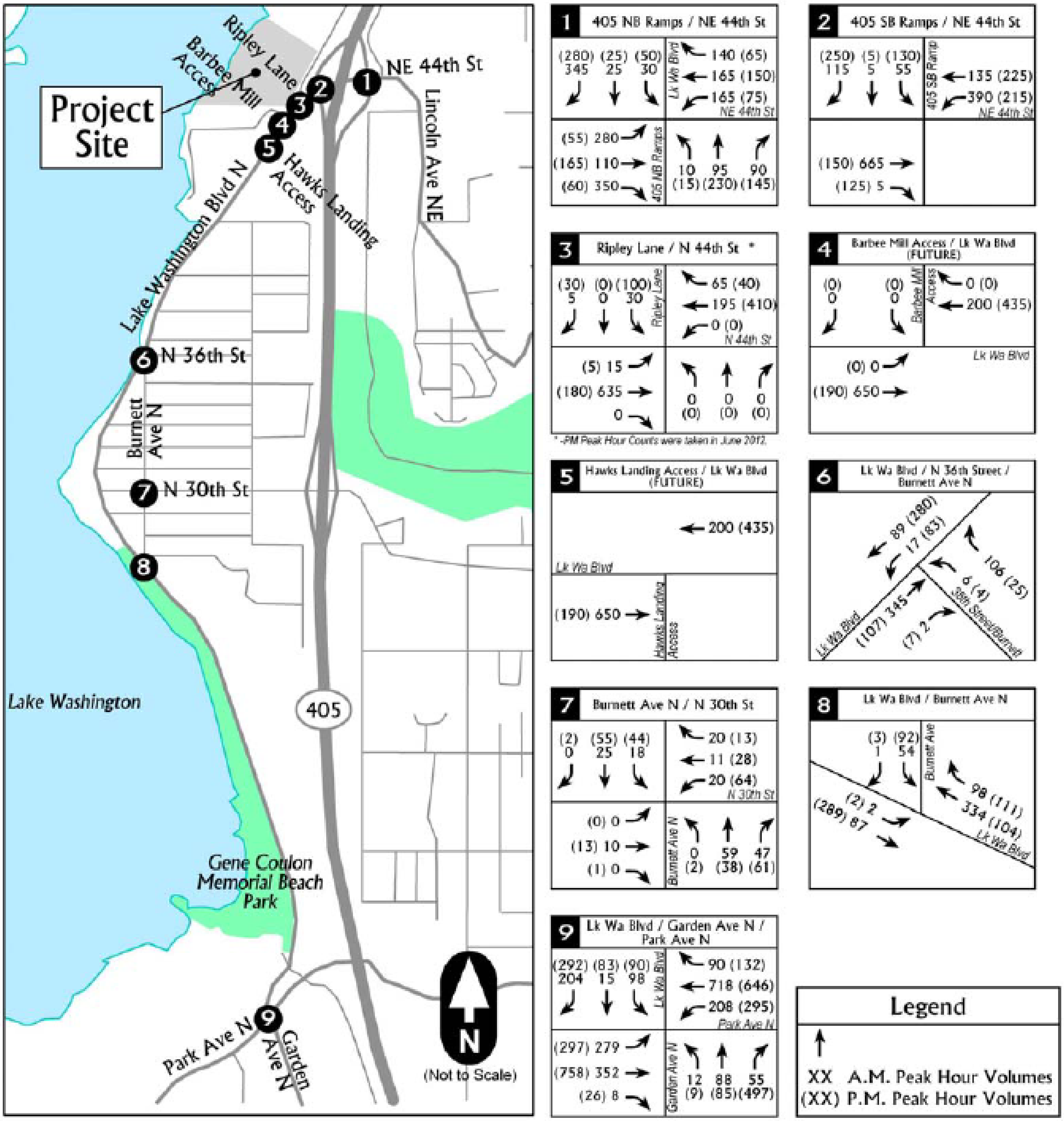
- New traffic counts at Study Intersection #3 (Ripley Lane/NE 44th Street), and revised traffic analysis at this location and adjacent study intersections based on the traffic counts that indicated increased demand on discrete intersection movements.
- Updated level of service (LOS) analysis at Study Intersection #9 (Lake Washington Boulevard/Park Avenue N (Garden Avenue) that reflects planned improvements by the City of Renton.
- A LOS summary table that illustrates the affects of the potential mitigation measures.
- A figure which illustrates the conceptual channelization improvements that would be required along Lake Washington Boulevard as a result of the project, if the project is built prior to regional improvements within the I-405 corridor.

The potential transportation impacts under the Preferred Alternative are assumed to be similar to the impacts under DEIS Alternatives 1 and 2, as described in the Impacts section below (see **Appendix E** for details).

Affected Environment

The DEIS included a discussion of existing transportation conditions at the time that document was published (December 2010), including: existing traffic volumes, intersection LOS, public transportation services, non-motorized transportation facilities, and planned transportation improvements (see DEIS Section 3.9, Transportation, and Appendix H for details). Following issuance of the DEIS, updated traffic counts were taken at Intersection #3 (Ripley Lane/NE 44th Street) in June 2012 to calibrate historical data. The updated existing peak hour traffic volumes for Study Intersection #3 (as well as the 2010 counts for the other study intersections) are illustrated in **Figure 3.4-1**.

Based on the new traffic counts for Study Intersection #3, the existing peak hour intersection LOS analysis was updated for affected intersections. As shown in **Table 3.4-1**, the existing LOS levels would remain as described in the DEIS (see DEIS Table 3.9-1); however, the average delay would change at certain intersections (i.e. a slight increase in delay at Study Intersections #2 and #3, and a slight decrease in delay at Study Intersection #1).



Source: Transportation Engineering NorthWest, 2012

Figure 3.4-1
Existing Peak Hour Traffic Volumes

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Table 3.4-1
EXISTING 2009/2010 PEAK HOUR INTERSECTION LOS

AM Peak Hour				
Int.#	**Unsignalized Intersections**	**LOS**	**Delay**	**V/C**
1	Lake Wa Blvd (I-405 NB Ramps)/NE 44th St	E	48	-
2	I-405 SB Ramps/NE 44th St	SB-F	>100	2.32
3	Ripley Lane/NE 44th St	SB-D	26	0.20
6	Lk Wa Blvd/N 36th St	B	11	-
7	N 30th Street/Burnett Ave N	A	8	-
8	Lk Wa Blvd/Burnett Ave N	B	13	-
Int.#	**Signalized Intersections**	**LOS**	**Delay**	**V/C**
9	Lake Wa Blvd-Garden Ave N/Park Ave N	B	17	0.66
PM Peak Hour				
Int.#	**Unsignalized Intersections**	**LOS**	**Delay**	**V/C**
1	Lake Wa Blvd (I-405 NB Ramps)/NE 44th St	C	18	-
2	I-405 SB Ramps/NE 44th St	SB-C	22	0.61
3	Ripley Lane/NE 44th St	SB-C	18	0.32
6	Lk Wa Blvd/N 36th St	A	10	-
7	N 30th Street/Burnett Ave N	A	8	-
8	Lk Wa Blvd/Burnett Ave N	A	10	-
Int.#	**Signalized Intersections**	**LOS**	**Delay**	**V/C**
9	Lake Wa Blvd (Garden Ave N)/Park Ave N	C	26	0.81

Source: TENW, 2012.

In addition, following issuance of the DEIS, further clarification was provided regarding the City of Renton's planned transportation improvement project for a portion of Lake Washington Boulevard. The City of Renton's 2010-2015 *Transportation Improvement Program* (TIP) identifies the Lake Washington Boulevard/Park Avenue N (Garden Avenue N) intersection (Study Intersection #9) project in the vicinity of the site. This project includes minor widening and reconfiguration to provide dual eastbound left turn lanes. The improvements to Study Intersection #9 are included in the updated analysis of transportation impacts under DEIS Alternatives 1, as described below.

Impacts

Following is an updated transportation impacts analysis with the Quendall Terminals DEIS Alternative 1. This section describes the LOS impacts, traffic queuing, and site access and circulation assumed at the 2015 build-out. The public transportation, non-motorized transportation and parking impacts for DEIS Alternative 1 are expected to be the same as described in the DEIS (see DEIS Section 3.9, Transportation, and Appendix H). As part of the updated analysis, all trips from the City's 2015 EMME Travel Model were removed from the roadway network except for trips under the Without I-405 Improvements scenario, which assumed a 15 percent background growth. Turning movements of trips from Barbee Mill, Hawks Landing and the Kennydale Apartment projects were added to the roadway network at each off-site intersection under both scenarios to determine the 2015 baseline forecasts as projected in original traffic studies prepared for these entitled developments.

As described on DEIS page 3.9-6, DEIS Alternative 1 was used in the transportation analysis as a conservative “worst-case” scenario due to the fact that this alternative would include higher density development (more residential units and office space) and would generate more vehicular trips than DEIS Alternative 2. DEIS Alternative 1 is also used in the analysis for this EIS Addendum in order to provide a conservative “worst-case” scenario and consistency with the DEIS. The Preferred Alternative would result in approximately 128 fewer daily trips, 8 fewer AM peak hour trips, and 11 fewer PM. peak hour trips than DEIS Alternative 2. As such, the relative impacts to traffic operations within the study area from the Preferred Alternative would be very similar, but slightly less than those under DEIS Alternative 2 (see **Appendix E** for details).

Intersection LOS Impacts

As a result of the new traffic counts that were taken for this EIS Addendum, as well as the associated updated calculations for existing LOS conditions and clarifications on the planned improvements to Study Intersection #9, updates to the LOS analysis for DEIS Alternative 1 were conducted. **Table 3.4-2** summarizes the updated LOS in 2015 with and without the DEIS Alternative 1, without I-405 improvements. **Figures 3.4-2** and **3.4-3** illustrate the traffic volumes in 2015 with and without DEIS Alternative 1, without I-405 improvements.

As shown in **Table 3.4-2**, Study Intersection #1 and #2 (southbound) would continue to operate at LOS F under Alternative 1 in 2015 without I-405 improvements. Operations at the following intersections would change relative to the analysis for the DEIS Alternatives (see DEIS Table 3.9-2 and 3.9-3 for further details on the DEIS Alternatives):

- Study Intersections #3 and #5 delay would slightly decrease; however, the LOS levels at both of these intersections would continue to remain the same as analyzed in the DEIS.
- Study Intersection #9 would improve from LOS D (AM peak hour) and LOS F (PM peak hour) to LOS C (AM peak hour) and LOS D (PM peak hour).

Table 3.4-3 summarizes the updated LOS impacts in 2015 with and without DEIS Alternative 1, with improvements to I-405. **Figures 3.4-4** and **3.4-5** illustrate the peak hour traffic volumes in 2015 with and without DEIS Alternative 1, with the I-405 improvements.

As shown in **Table 3.4-3**, based on the updated analysis, Study Intersection #9 would improve from LOS F in the DEIS to LOS C (AM peak hour) and LOS D (PM peak hour); all study intersections would be anticipated to operate at LOS D or better in 2015 under the Preferred Alternative with improvements to I-405.

Queuing Analysis

An update to the queuing analysis along Lake Washington Boulevard was conducted for this EIS Addendum. As shown in **Table 3.4-4**, queues would increase as compared to the DEIS analysis, and excessive southbound queues would continue to be expected at the stop-controlled Ripley Lane intersection without I-405 Improvements in 2015. However, no queuing conflicts would be expected on Lake Washington Boulevard.

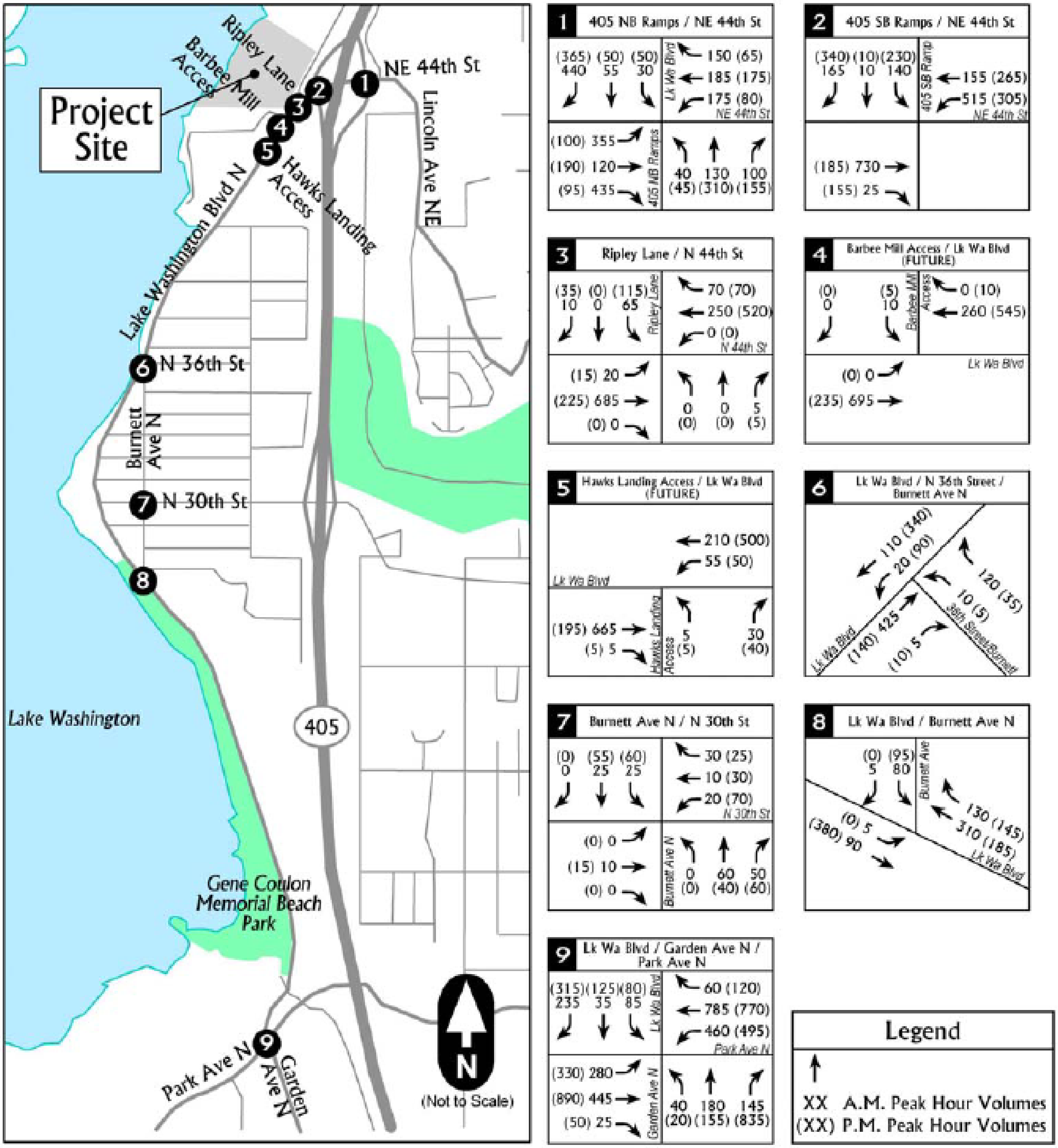
Table 3.4-2
2015 INTERSECTION LOS - WITH AND WITHOUT DEIS ALTERNATIVE 1
WITHOUT I-405 IMPROVEMENTS

Int.#	Intersection	2015 Without Project (Baseline/No Action)			2015 With DEIS Alternative 1		
		LOS	Delay	V/C	LOS	Delay	V/C
AM Peak Hour							
Unsignalized Intersections							
1	Lake Wa Blvd (I-405 NB Ramps)/NE 44th St	F	>100	-	F	>100	-
2	I-405 SB Ramps/NE 44th St	SB-F	>100	-	SB-F	>100	-
3	Ripley Lane/NE 44th St	SB-E	36	0.42	SB-F	>100	-
4	Lake Wa Blvd/Barbee Mill Access	SB-C	20	0.04	SB-D	28	0.59
5	Lake Wa Blvd/Hawks Landing Access	NB-C	16	0.10	NB-C	19	0.13
6	Lk Wa Blvd/N 36th St	B	12	-	C	18	-
7	N 30th Street/Burnett Ave N	A	8	-	A	8	-
8	Lk Wa Blvd/Burnett Ave N	B	11	-	B	13	-
Signalized Intersection							
9	Lake Wa Blvd-Garden Ave N/Park Ave N	C	27	0.68	C	29	0.68
PM Peak Hour							
Unsignalized Intersections							
1	Lake Wa Blvd (I-405 NB Ramps)/NE 44th St	F	65	-	F	>100	-
2	I-405 SB Ramps/NE 44th St	SB-F	>100	-	SB-F	>100	-
3	Ripley Lane/NE 44th St	SB-D	27	0.50	SB-F	>100	-
4	Lake Wa Blvd/Barbee Mill Access	SB-B	15	0.01	SB-C	25	0.57
5	Lake Wa Blvd/Hawks Landing Access	NB-B	10	0.06	NB-B	12	0.09
6	Lk Wa Blvd/N 36th St	B	11	-	C	21	-
7	N 30th Street/Burnett Ave N	A	8	-	A	9	-
8	Lk Wa Blvd/Burnett Ave N	B	12	-	B	14	-
Signalized Intersection							
9	Lake Wa Blvd-Garden Ave N/Park Ave N	D	49	0.95	D	55	0.92

Source: TENW, 2012.

Notes:

1. Analysis based on Synchro results using HCM 2000 control delays and LOS with optimized phasing/ timing systems for signalized intersections.
2. Lake Washington Blvd and NE 44th Street assumed to be east-west.



Source: Transportation Engineering NorthWest, 2012

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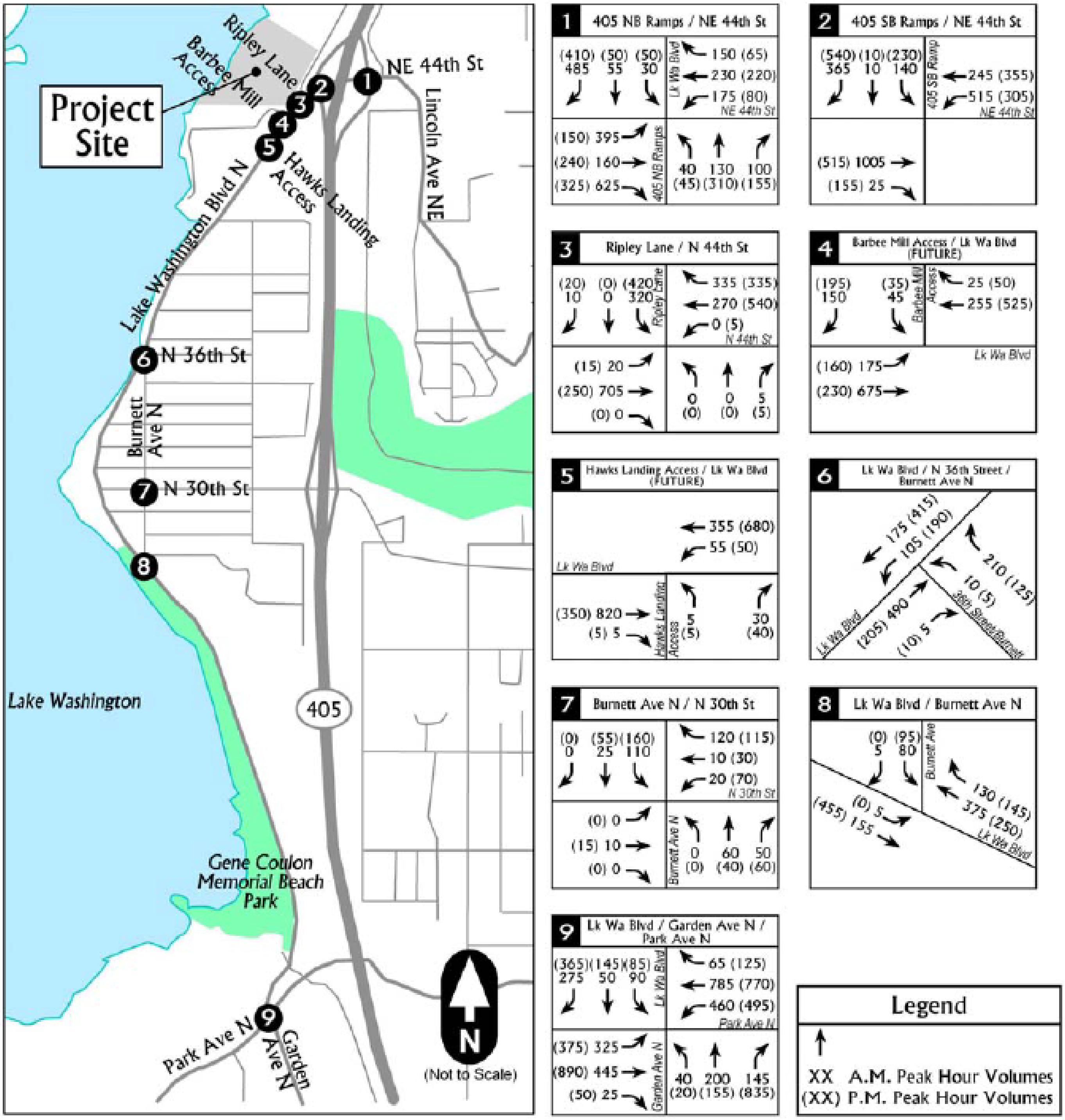
Figure 3.4-2

2015 Baseline/No Action Peak Hour Traffic Volumes
(without I-405 Improvements)



Source: Transportation Engineering NorthWest, 2012

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Figure 3.4-3

2015 DEIS Alternative 1 Peak Hour Traffic Volumes
(without I-405 Improvements)

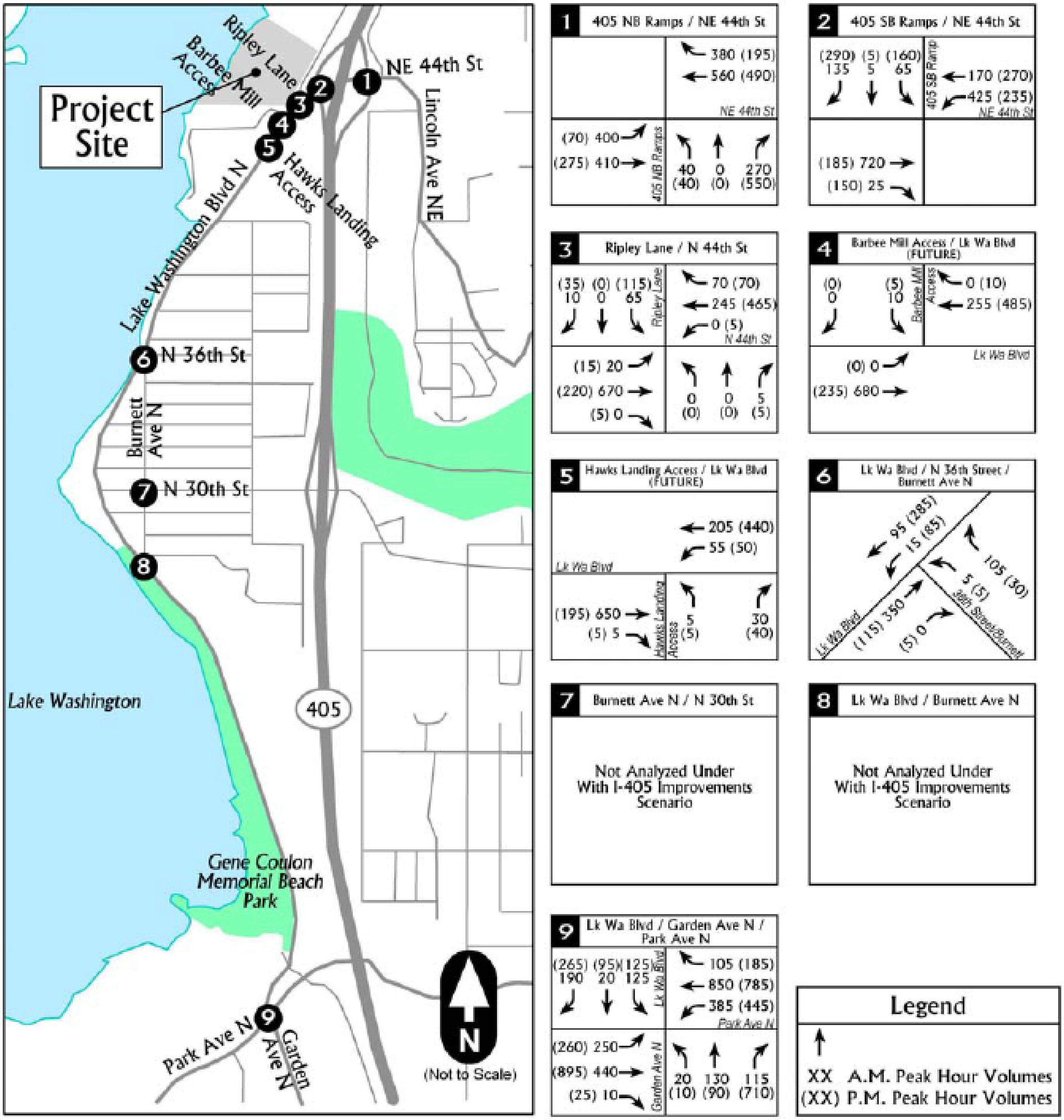
Table 3.4-3
2015 INTERSECTION LOS - WITH AND WITHOUT DEIS ALTERNATIVE 1 WITH I-405 IMPROVEMENTS -

Int.#	Intersection	2015 Without Project (Baseline/No Action)			2015 With DEIS Alternative 1		
		LOS	Delay	V/C	LOS	Delay	V/C
AM Peak Hour							
Unsignalized Intersections							
4	Lake Wa Blvd/Barbee Mill Access	SB-C	16	0.02	SB-D	32	0.53
5	Lake Wa Blvd/Hawks Landing Access	NB-C	21	0.02	NB-D	25	0.03
6	Lk Wa Blvd/N 36th Street	A	10	-	B	11	-
7	N 30th Street/Burnett Ave N	Not Analyzed Under With I-405 Improvements Scenario					
8	Lk Wa Blvd/Burnett Ave N						
Signalized Intersection							
1	Lake Wa Blvd (I-405 NB Ramps)/NE 44th St	A	10	0.42	B	18	0.59
2	I-405 SB Ramps/NE 44th Street	B	15	0.39	C	22	0.53
3	Ripley Lane/NE 44th Street	B	20	0.61	C	26	0.66
9	Lake Wa Blvd-Garden Ave N/Park Ave N	C	23	0.62	C	24	0.67
PM Peak Hour							
Unsignalized Intersections							
4	Lake Wa Blvd/Barbee Mill Access	SB-C	16	0.02	SB-D	25	0.46
5	Lake Wa Blvd/Hawks Landing Access	NB-C	17	0.02	NB-C	21	0.02
6	Lk Wa Blvd/N 36th Street	A	10	-	B	11	-
7	N 30th Street/Burnett Ave N	Not Analyzed Under With I-405 Improvements Scenario					
8	Lk Wa Blvd/Burnett Ave N						
Signalized Intersection							
1	Lake Wa Blvd (I-405 NB Ramps)/NE 44th St	B	13	0.20	B	17	0.40
2	I-405 SB Ramps/NE 44th Street	B	13	0.19	C	24	0.47
3	Ripley Lane/NE 44th Street	B	17	0.51	C	26	0.76
9	Lake Wa Blvd-Garden Ave N/Park Ave N	D	39	0.86	D	39	0.87

Source: TENW, 2012.

Notes:

1. Analysis based on Synchro results using HCM 2000 control delays and LOS with optimized phasing/ timing systems for signalized intersections.
2. Lake Washington Blvd and NE 44th Street assumed to be east-west.



Source: Transportation Engineering NorthWest, 2012

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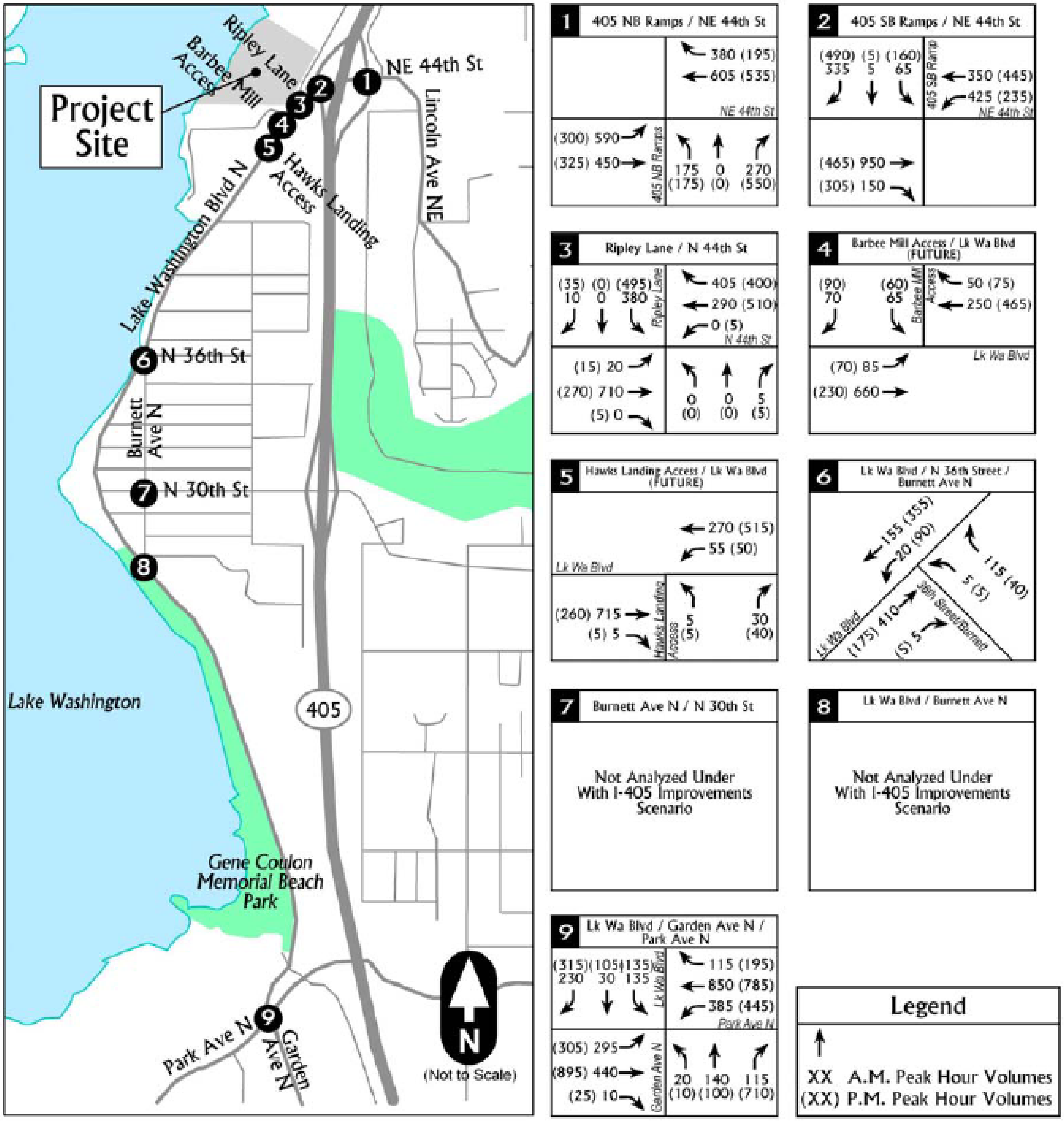
Figure 3.4-4

2015 Baseline/No Action Peak Hour Traffic Volumes (with I-405 Improvements)



Source: Transportation Engineering NorthWest, 2012

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Figure 3.4-5

2015 DEIS Alternative 1 Peak Hour Traffic Volumes
(with I-405 Improvements)

Table 3.4-4
2015 QUEUES - DEIS ALTERNATIVE 1
WITHOUT I-405 IMPROVEMENTS

Intersection	Movement	95th Percentile Queue (ft) AM	PM
Ripley Lane / Lake Washington Blvd.			
	EB Left	25	25
	SB Left/Right	800	900
Barbee Mill Access (NE 43rd St) / Lake Washington Blvd.			
	EB Left	25	25
	SB Thru	100	75
Hawks Landing Access / Lake Washington Blvd.			
	WB Left	25	25

Source: TENW, 2012

As shown in **Table 3.4-5,** with I-405 improvements, queues would generally decrease in 2015, as compared to the DEIS analysis. However, southbound queues would still be expected at the Ripley Lane intersection, and queues on Lake Washington Boulevard at the Ripley Lane intersection are expected to extend beyond adjacent intersections.

Table 3.4-5
2015 QUEUES - DEIS ALTERNATIVE 1
WITH I-405 IMPROVEMENTS

Intersection	Movement	95th Percentile Queue (ft) AM	PM
I-405 SB Ramps / Lake Washington Blvd.			
	EB Thru	125	125
Ripley Lane / Lake Washington Blvd.			
	EB Left	25	25
	EB Thru	250	225
	WB Thru	125	400
	WB Rt	50	25
	SB Left/Right	350	450
Barbee Mill Access (NE 43rd St) / Lake Washington Blvd.			
	EB Left	25	25
	SB Thru	50	50
Hawks Landing Access / Lake Washington Blvd.			
	WB Left	25	25

Source: TENW, 2012

Site Access and Circulation

No changes to the DEIS site access and circulation analysis for Study Intersection #4 would be anticipated. Updates to the site access and circulation analysis for Study Intersection #3 are summarized below.

2015 Without I-405 Improvements Operations/Queuing

Intersection #3 – Ripley Lane N/Lake Washington Boulevard. Under DEIS Alternative 1 at site access Intersection #3 – Ripley Lane N at Lake Washington Boulevard, the 95th percentile queue for the southbound left/right movements are estimated to be approximately 800 to 900 feet during the AM and PM peak hours in 2015 (as compared to 700 to 800 feet in the DEIS). Queues on Lake Washington Boulevard for vehicles entering the site are not expected to conflict with adjacent intersections. The LOS for the stop-controlled southbound approach would be expected to be LOS F.

2015 With I-405 Improvements Operations/Queuing

Intersection #3 – Ripley Lane N/Lake Washington Boulevard. Under DEIS Alternative 1 at site access Intersection #3 – Ripley Lane at Lake Washington Blvd, the 95th percentile queue for the westbound through movement is estimated at approximately 400 feet during the PM peak hour. This estimated queue on Lake Washington Blvd would likely extend through the adjacent intersection. In addition, the southbound queue on Ripley Lane is estimated to be 350 feet during the AM peak hour and 450 feet during the PM peak hour in 2015, assuming I-405 improvements. With the proposed mitigation of providing an additional southbound approach lane on Ripley Lane, this queue is estimated to be reduced to 200 feet or less during either the AM peak or PM peak hours. The LOS for the signalized intersection is expected to be LOS C/D.

Preferred Alternative

As described in **Chapter 2**, the Preferred Alternative would be similar to DEIS Alternatives 1 and 2- particularly DEIS Alternative 2 – in terms of development assumptions. Based on the proposed land use breakdown, the Preferred Alternative is estimated to generate a net total of approximately 5,656 daily, 435 AM peak hour (104 entering, 331 exiting), and 530 PM peak hour (340 entering and 190 exiting) vehicular trips. This alternative would result in approximately 128 fewer daily trips, 8 fewer AM peak hour trips, and 11 fewer PM peak hour trips than DEIS Alternative 2. As such, the relative impacts to traffic operations within the study areas under the Preferred Alternative would be expected to be similar to, but slightly less that under DEIS Alternative 2. Proposed mitigation to address traffic and parking impacts identified in the DEIS would also apply to the Preferred Alternative.

Mitigation Measures

The DEIS identified transportation mitigation measures that would be necessary to mitigate potential transportation impacts under Alternatives 1 and 2 with and without planned I-405 improvements. Based on the updated analysis provided in this EIS Addendum, the mitigation measures identified in the DEIS would still apply, with the following additional proposed mitigation measure and clarification to the mitigation measure for Study Intersection #1, without I-405 improvements (strike-through indicates those measures or portions of measures that have been eliminated; underline indicates new or portions of new measures that are included as part of the Preferred Alternative. See **Chapter 1** for the complete list of transportation-related mitigation measures):

- To mitigate traffic impacts to the Lake Washington Boulevard corridor south of the development, the applicant would install traffic calming treatments on Lake Washington

Boulevard south of N 41st Street to encourage primary trips generated by the project to utilize the I-405 corridor. Although the City of Renton has no adopted residential traffic management program, arterial calming measures could include treatments that create either horizontal or vertical deflection for drivers. Such treatments could include, but are not limited to chicanes, serpentine raised curb sections, raised median treatments, speed tables, and speed humps.

- **Intersection #1 - I-405 NB Ramps/NE 44th Street.** Widen the southbound and northbound approaches so that a separate left turn lane and shared thru-right turn lane is provided on both legs of the intersection. The final configuration of the intersection with the additional widening improvements would be coordinated with WSDOT.

(See **Chapter 1** of this EIS Addendum for the complete list of transportation-related mitigation measures.)

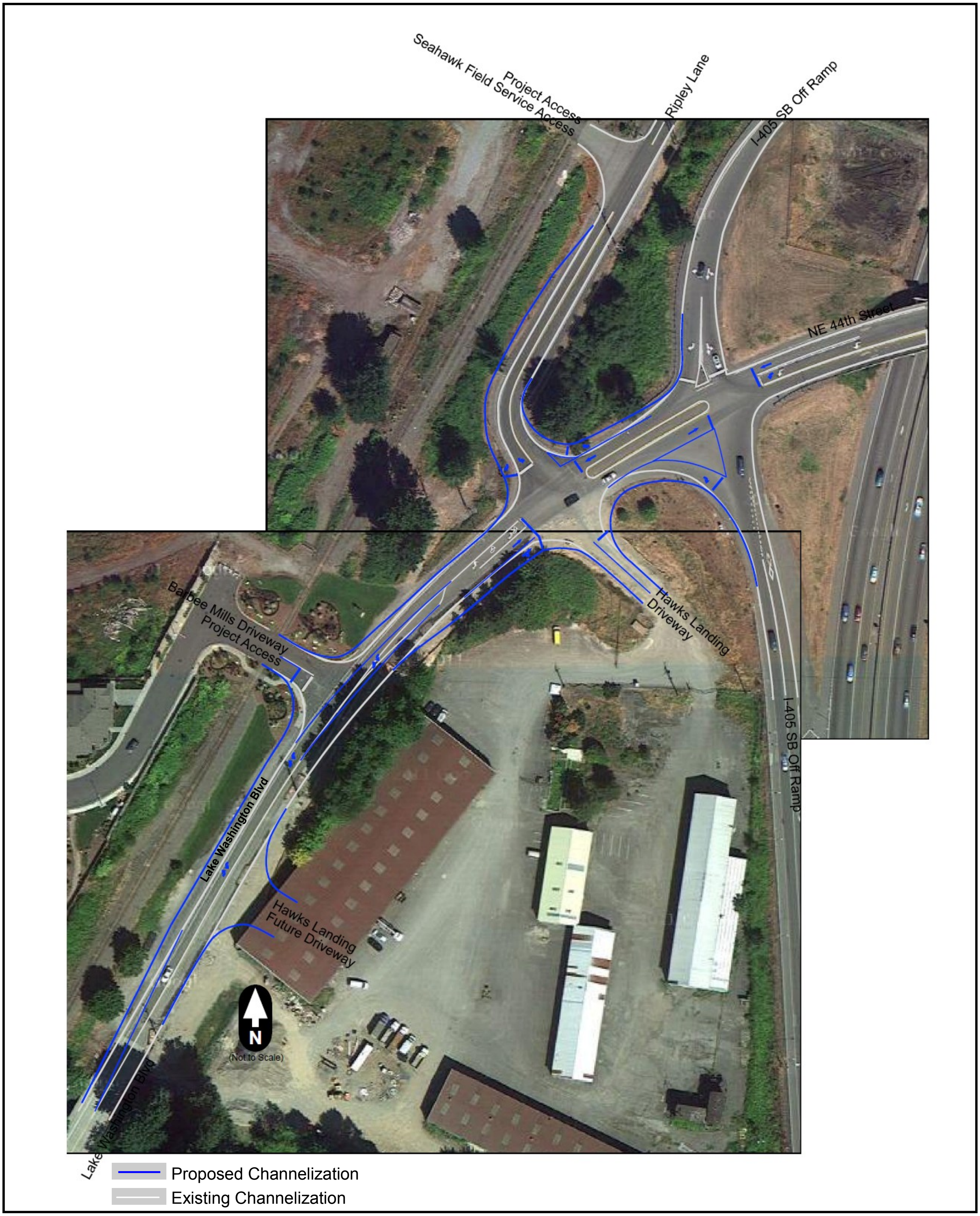
In addition, an analysis was conducted to illustrate the LOS differences under Alternative 1 in 2015 with and without the proposed mitigation described above, without I-405 improvements. As shown in the **Table 3.4-6**, study intersections forecast to operate at LOS F would improve to LOS E or better with proposed mitigation outlined above.

Table 3.4-6
2015 INTERSECTION LOS - DEIS ALTERNATIVE 1
WITH PROPOSED MITIGATION, WITHOUT I-405 IMPROVEMENTS

Int.#	Intersection	2015 DEIS Alternative 1, without Mitigation			2015 DEIS Alternative 1, with Mitigation		
		LOS	Delay	V/C	LOS	Delay	V/C
A.M. Peak Hour							
1	Lake Wa Blvd (I-405 NB Ramps)/NE 44th St	F	>100	-	C	28	1.03
2	I-405 SB Ramps/NE 44th Street	SB-F	>100	-	E	78	1.03
3	Ripley Lane/NE 44th Street	SB-F	>100	-	B	12	0.61
P.M. Peak Hour							
1	Lake Wa Blvd (I-405 NB Ramps)/NE 44th St	F	>100	-	B	17	0.62
2	I-405 SB Ramps/NE 44th Street	SB-F	>100	-	C	25	0.86
3	Ripley Lane/NE 44th Street	SB-F	>100	-	B	14	0.77

Source: TENW, 2012.
Notes:
1. Analysis based on Synchro results using HCM 2000 control delays and LOS with optimized phasing/timing systems for signalized intersections.
2. Lake Washington Blvd and NE 44th Street assumed to be east-west.

A conceptual channelization exhibit was also created to illustrate the improvements that would be required along Lake Washington Boulevard as a result of the project, if the project is built prior to regional improvements within the I-405 corridor (see **Figure 3.4-6**).



Source: Transportation Engineering NorthWest, 2012

EA | BLUMEN

Figure 3.4-6

Lake Washington Boulevard Conceptual Channelization Improvements (without I-405 Improvements)

3.5 Cultural Resources

Cultural resources was not included as an element of the environment analyzed in the DEIS, because during scoping of the EIS, construction and operation of the proposed Quendall Terminals redevelopment was not anticipated to result in significant impacts on such resources. Comments were received from the Washington State Department of Archaeology and Historic Preservation (DAHP) on the DEIS indicating that the Renton area has a history of archaeological finds during construction projects, and requesting that an analysis of cultural resources be included in the Quendall Terminals EIS. This section summarizes existing cultural resource conditions on and in the vicinity of the Quendall Terminals site, evaluates potential impacts to these resources under the Preferred Alternative, and identifies appropriate mitigation measures. The section is based on the *Cultural Resources Assessment* (June 2012) prepared by Cultural Resources Consultants, Inc. (see **Appendix F**).

Affected Environment

Site History

The Quendall Terminals site is located along the shoreline of Lake Washington. The shoreline area has fluctuated over the past 7,000 years as a result of large earthquakes and associated landslides, including a large area, which includes the project site, which was uplifted approximately 1,000 years ago during an earthquake. Intact pre-earthquake cultural deposits, protected from erosion by the cap of landslide debris and silts, could lie inland of the modern shoreline.

Historic maps show that the site area was either inundated or subject to periodic flooding and scouring prior to the construction of the Lake Washington Ship Canal, and also subject to the erosional effects of the meandering southward of the May Creek channel. The 1864-1920 May Creek meanders would have cut through the site City Water Line Easement; south of the Quendall Pond and immediately east and south of the South Detention Pond (see DEIS Figure 2-3). Historic newspaper accounts also describe archaeological remains exposed at the mouth of May Creek in 1917 following the post-Ship Canal drop in lake levels. In 1917, the May Creek channel would have cut through the south portion of the site and the creek delta would have been located approximately 35 meters east of the modern shoreline.

Numerous named geographic features are located in the site area, including descriptive names for geographic features, resource procurement sites, villages, and names associated with mystical events. May Creek is recorded as sbal't ("a place where things are dried"), which referred to a fish processing station. Until around 1855, the Subaltuabs, a coastal Salish group, inhabited this village, which consisted of two to three houses; however, no houses are noted in this location on the 1865 survey maps.

The area was later named "May Creek" for an early homesteader, and the project site was part of a homestead patented to Jeremiah Sullivan in 1874. The May homestead was located on a parcel that was later part of Colman's property immediately north of the Barbee Lumber Company, which may place the homestead within the site. Prior to1916, a shingle mill occupied the upland area of the site. Quendall Station (named for Lake Washington Mill owner William Kendall) was established in 1916 as part of the Lake Washington beltline, and is shown on the Northern Pacific Railway roster in 1922 and 1947.

From 1917 to 1969 the site area was used by Republic Creosoting Company (later Reilly Tar and Chemical Corporation) to process creosote. Tar feedstock was typically transported to the facility onsite from Lake Union and unloaded from tankers or barges at a t-dock that extended out into Lake Washington. The feedstock was unloaded into two two-million gallon above-ground storage tanks. The remnants of this dock and wharf are located onsite within the Area of Potential Effect (APE) along the Lake Washington shoreline.

In the early 1970s, the site was sold to Quendall Terminals and has been used intermittently to store diesel, crude and waste oils, as well as a log sorting and storage yard. A small brick building, a sewer pump station and a shack were located on the site. The brick building (the Quendall Station house) was reportedly used as an office building for the logging company.
Much of the project site is presently covered with fill, which generally consists of a mixture of silt, sand, gravel, and wood debris with scattered foundry slag and brick and metal fragments (see DEIS Section 3.1, Earth and Appendix D for details). Known fill events occurred west of the pre-1916 shoreline following the lowering of Lake Washington; between 1920 and 1936 associated with the diversion of May Creek and backfilling of its former channel; and, in 1983 when approximately three feet of sawdust was placed over the entire site.

Cultural Resource Investigation Results

Previous Investigations

A landform subject to periodic flood events and channel drift would not be assumed to contain intact, significant cultural deposits. However, intact, pre-earthquake cultural deposits, protected from erosion by the cap of landslide debris and silts, might lie inland of the modern shoreline.

In 1997, a cultural resource survey was conducted on and in the vicinity of the Quendall Terminals site. Archaeologists dug 12 shovel test pits in the upland area, one of which was located within the current Quendall Terminals site boundaries. All of the shovel tests were negative for cultural deposits, although an item tentatively identified as fire-modified rock was recorded in a shovel test excavated to the east of the site on the Pan Abode Cedar Homes property. One of the shovel tests identified a small charcoal deposit at 90-100 centimeters below the surface. Soils in the eastern portion of the site were interpreted as remnant alluvial deposits from May Creek, while those in the western portion were described as beach deposits associated with the Lake Washington shoreline.

Current Investigation

Field investigations were conducted as part of the cultural resources assessment for this EIS Addendum. A pedestrian survey was conducted based on maps of the site; no subsurface testing was undertaken due to known soil contaminants. Ground exposures, cut banks and cleared areas were inspected as available. All examined areas showed signs of disturbance. Upland areas are covered with a mixture of wood debris and gravels, while the shoreline had push piles of fill, wood chips, gravels and riprap, and large sections of armoring over fill. A series of low canals or ditches, ponds and cobble dikes radiate from the northeastern portion of the site to the western shoreline. In addition to the remnant log beds, log piles, ruins of a structure interpreted to be truck scales, monitoring wells, concrete pads, and plywood sheds, collections of waste barrels were observed. No evidence of the pre-contact deposits, homestead, shingle mill, or creosote storage tanks was identified.

Based on background information, the areas of the site with higher probability to contain intact archaeological deposits include the margins of the old channels of May Creek, the delta of the 1920 channel, the margins of the 1920 marsh, and areas adjacent to the 1864 shoreline. Cultural deposits in these locations may include items or features associated with the following:

- Pre-contact fisheries (weirs, traps, smokehouses, and drying racks);
- Pre-contact habitation (fire-modified rock, charcoal, post molds, depressions, lithic debitage – sharp-edged waste material left over from stone tool creation, and formal processing and hunting tools);
- Historic industry (wharves, piers, docks, pilings, and machinery), historic habitation (house foundations and household refuse), and/or historic transportation (rail line, trestles, road bed and bridge foundations).

Due to the type and intensity of site modification conducted in the historic era and the geologic history of the landform, intact pre-contact deposits would not be expected to be at or near the surface, but would be anticipated to be several meters below ground-level. Intact historic-era deposits related to early homesteading would not be expected to be visible on the surface within the site for the same reasons. However, background research indicates that late historic-era deposits related to creosote production, the lumber industry and railroads are likely to be present onsite

As part of the current cultural resources assessment, three structures on the site were recorded, including two wooden dock/wharf features (presumed to be associated with the creosote plant, and the Quendall station house (a small, flat-roofed brick structure). None of these structures is considered to be architecturally remarkable or a significant cultural resource (see **Appendix E** for a copies of forms that have been submitted to DAHP).

Impacts

Site cleanup and remediation activities on the Quendall Terminals site is expected to include the placement of a sediment cap over the upland portion and shoreline of the Main Property. As part of redevelopment activities associated with the Preferred Alternative, the sediment cap could be disturbed by construction activity on the site, including:

- Clearing and grading activities in the upland portion of the Main Property;
- Construction of deep building foundations (i.e. piles) and other ground improvements required for structural support;
- Excavation activities for underground utilities; and,

The construction activities identified above would result in excavations below the sediment cap and could result in the inadvertent discovery of cultural resources. While it is unlikely that cultural resources would be encountered as part of construction activities on the site, a monitoring plan and inadvertent discovery plan would be prepared for the Preferred Alternative in the event that any cultural resources are encountered (see to the Mitigation Measures section for details).

In addition, required/proposed institutional controls would be enforced to prevent alteration of the sediment cap (beyond the items indicated above) during redevelopment of the site. These institutional controls would also limit the possibility for further inadvertent encounters with potential cultural resources. As a result, no significant impacts to cultural resources would be anticipated with redevelopment under the Preferred Alternative.

Mitigation Measures

The following proposed measures have been identified to mitigate any potential cultural resource impacts that could occur with construction and operation of the Quendall Terminals project. They are underlined, as they are new measures identified since issuance of the DEIS.

Proposed Mitigation Measures

- Limited and focused cultural resource monitoring would be conducted during construction activities on the site (clearing and grading of the upland portion, construction of deep building foundations, and excavation for utilities). A monitoring plan and inadvertent discovery plan would be developed and implemented for the Preferred Alternative (see **Appendix F** for the proposed monitoring plan and inadvertent discovery plan).

- In the unlikely event that ground disturbing or other activities result in the inadvertent discovery of archaeological deposits, construction activities would be halted in the immediate area, and (DAHP) would be contacted. Work would be halted until such time as further investigation and appropriate consultation is concluded.

- In the unlikely event of the inadvertent discovery of human remains, construction would be halted in the area; the discovery would be covered and secured against further disturbance; and, contact would be made with law enforcement personnel, DAHP and authorized representatives of the concerned Indian tribes.

Significant Unavoidable Adverse Impacts

There are no significant unavoidable adverse cultural resource-related impacts that cannot be mitigated.

CHAPTER 4

COMPARISON OF ENVIRONMENTAL IMPACTS

CHAPTER 4

COMPARISON OF ENVIRONMENTAL IMPACTS

This document is an Addendum to the Draft EIS (December 2010) that was prepared for the Quendall Terminals Redevelopment Project. The Draft EIS (DEIS) evaluated two development alternatives, their environmental impacts and associated mitigation measures. Information contained in that document is hereby incorporated by reference.

According to the SEPA Rules[1], an Addendum is an environmental document used to provide additional information or analysis that does not substantially change the analysis of significant impacts in the existing environmental document. The DEIS alternatives and Preferred Alternative need not be identical, but must have similar elements that provide a basis for comparing environmental consequences[2].

The overall level of development under the Preferred Alternative is no greater than that identified under the DEIS Alternatives and the potential for environmental impacts would be similar in level and type to those identified in the DEIS. Therefore, the Preferred Alternative does not substantially change the analysis of significant impacts in the DEIS and the DEIS provides the basis for comparing environmental conditions.

Scope of the EIS Addendum

As described in **Chapter 2**, many of the redevelopment assumptions under the Preferred Alternative would be similar to those described for the DEIS redevelopment alternatives (particularly DEIS Alternative 2). Similar to DEIS Alternatives 1 and 2, the Preferred Alternative is intended to be a compact, urban mixed-use development. The project is planned to ensure that future redevelopment is compatible with the environmental remediation effort at the site that is currently underway. The Preferred Alternative is intended to be consistent with the applicant's (Century Pacific's) objectives, as defined in the DEIS.

However, despite these similarities, certain redevelopment assumptions under the Preferred Alternative have been modified from those described in the DEIS (see **Chapter 2** for details). Based on those redevelopment assumptions that are similar and those assumptions that have been modified under the Preferred Alternative, the following environmental analyses in the DEIS largely would not change:

- Earth
- Environmental Health
- Energy/Greenhouse Gases
- Land and Shoreline Use

[1] WAC 197-11-706
[2] RCW 43.41C.034

This EIS Addendum provides an updated environmental analysis for those environmental impacts that have changed as a result of the Preferred Alternative redevelopment assumptions, as well as new analysis for cultural resources. The following environmental elements have been updated as part of this EIS Addendum (see **Chapter 3** for the updated analysis of each environmental element):

- Critical Areas
- Relationship to Plans and Policies
- Aesthetics/Views
- Parks and Recreation
- Transportation
- Cultural Resources

Each element of the environment analyzed in this chapter contains information on the following: a description of existing conditions; a brief summary of environmental impacts identified in the DEIS; a comparison of environmental conditions under the Preferred Alternative with those identified under the DEIS redevelopment alternatives; a list of any additional/modified mitigation measures for the Preferred Alternative (compared to those identified in the DEIS); and, a comparison of significant unavoidable adverse impacts identified for the Preferred Alternative with those identified in the DEIS.

4.1 EARTH

This section of the EIS Addendum compares the probable significant earth-related impacts from the Preferred Alternative to those from DEIS Alternatives 1 and 2. As appropriate, new/modified mitigation measures are identified.

4.1.1 Affected Environment

The topography of the Quendall Terminals site is relatively flat with a gentle slope from east to west of 0 to 5 percent; slopes increase along the shoreline area of the site, adjacent to Lake Washington. Fill soils range from one to ten feet thick across the site and are the thickest in the northwest corner of the site. Alluvium deposits are located below the fill layer. Lacustrine deposits underlie the Deep Alluvium.

Three aquifer zones are located beneath the site: a Shallow Aquifer (two to ten feet below the ground surface), a Deep Aquifer (35 to 140 feet below the ground surface), and an Artesian Aquifer (180 feet below the ground surface).

The site has been mapped as an area of high seismic hazard and moderate to high liquefaction hazard. Potential hazards at the site could include ground motion response, liquefaction, seismically induced landslides and lateral spreading.

4.1.2 Impacts

2010 Draft EIS

Proposed redevelopment under DEIS Alternatives 1 and 2 would require approximately 53,000 to 133,000 cubic yards of fill). Site disturbance during construction activities could result in increased potential for erosion and sedimentation of on-site wetlands and Lake Washington; however with implementation of a temporary erosion and sedimentation control plan per City of Renton requirements, no significant impacts would be anticipated.

Redevelopment would require limited cut and fill for installation of underground utilities. This grading could impact the integrity of the soil caps that will likely be installed during site cleanup/remediation efforts. Institutional controls will be defined in the final remediation plans to ensure that the soil caps would remain intact during excavation for the redevelopment.

Potential impacts to on-site structures could also occur during seismic events due to ground motion, liquefaction and lateral spreading. All structures would be constructed to the most current International Building Code (IBC) to address potential effects of seismic events and significant impacts would not be anticipated.

Redevelopment under DEIS Alternatives 1 and 2 would result in an increase in the amount of impervious surface area onsite, as well as an associated increase in stormwater runoff rates, which could result in erosion at proposed stormwater outfalls at the lake. Outfall locations would be equipped with energy dissipation structures or other devices to prevent erosion of the lake bottom. The increase in impervious surfaces on the site would also decrease the potential for infiltration of rainwater to underlying aquifers. However, the majority of the recharge for these aquifers is from off-site sources to the east and significant impacts would not be anticipated.

2012 EIS Addendum

Construction activities for the Preferred Alternative would be similar to those described for DEIS Alternatives 1 and 2, and would require approximately 53,000 to 133,000 cubic yards of fill during site preparation activities. Grading activities and the installation of underground utilities could impact the integrity of the soil cap installed during site cleanup/remediation; however, institutional controls will be defined in the final remediation plans to ensure that the soil cap would remain intact during redevelopment. Site disturbance during construction could also result in increased potential for erosion and sedimentation of onsite wetlands and Lake Washington. A temporary erosion and sedimentation control plan (TESCP would be implemented during construction per City of Renton requirements, and no significant impacts would be anticipated.

Potential impacts from geologic hazards would be similar to those described for DEIS Alternatives 1 and 2, including potential erosion hazards, landslide hazards, and seismic hazards. Mitigation measures such as the implementation of TESCP, design of buildings in accordance with the most current IBC, and the implementation of deep foundation systems would reduce potential impacts from geologic hazards.

Similar to DEIS Alternatives 1 and 2, under the Preferred Alternative, the majority of the site would be covered with impervious surfaces and limited infiltration would occur on the site. As a result, recharge of the shallow aquifer would be reduced at the site; however, the majority of the recharge originates from off-site sources and no significant impacts to aquifer recharge would be anticipated.

4.1.3 Conclusion

Redevelopment under the Preferred Alternative would result in earth-related impacts that would be similar to those analyzed in the DEIS, including impacts associated with construction (site clearing and grading, installation of utilities and construction of building foundations), geologic hazards and groundwater. No additional earth-related impacts would be anticipated.

4.1.4 Mitigation Measures

Mitigation measures were identified in the DEIS to address potential earth-related impacts; these measures would also apply to the Preferred Alternative. Because no additional significant earth-related impacts were identified with the Preferred Alternative, no changes to the DEIS mitigation measures would be necessary. See **Chapter 1** for the complete list of earth-related mitigation measures.

4.1.5 Significant Unavoidable Adverse Impacts

There would be a risk of ground motion impacts and landslides beneath Lake Washington adjacent to the site during a seismic event; however, such impacts would occur with or without the proposed redevelopment. There are no significant unavoidable earth-related impacts that cannot be mitigated.

4.2 CRITICAL AREAS

This section of the EIS Addendum compares the probable significant impacts to critical areas from the Preferred Alternative to those from DEIS Alternatives 1 and 2. As appropriate, new/modified mitigation measures are identified.

4.2.1 Affected Environment

Prior to remediation and cleanup, the Quendall Terminals site is generally comprised of existing vegetation (trees, shrubs, grasses, etc.), as well as wetlands and riparian habitat. Shrub and forested areas are primarily located along the western portions of the site. Riparian habitat is present along the shoreline of Lake Washington.

Ten existing wetlands, totaling approximately 0.9 acres, have been identified and delineated on the site, including eight on the Main Property and two on the Isolated Property. Four of the wetlands on the Main Property are slope and/or lake-fringe wetlands associated with Lake Washington. The remaining four wetlands are depressional wetlands which are not associated with other surface waters and were originally constructed as wastewater and/or stormwater control facilities. Wetlands on the Isolated Property are depressional and slope wetlands that were created through grading and road construction and receive stormwater from adjacent impervious surfaces. Per the City of Renton, the existing wetlands on the site are classified as Category 1 (two wetlands), Category 2 (three wetlands), and Category 3 (five wetlands).

As part of site cleanup/remediation, the entire Main Property would likely be capped with soil, which would result in the fill of all existing wetlands and elimination of riparian habitat on the site. The two wetlands on the Isolated Property would not be impacted by cleanup/remediation. Certain wetlands on the Main Property would be re-established/expanded and riparian habitat would be re-created/enhanced through the implementation of a Shoreline Restoration Plan. Three wetlands along the shoreline would be re-established, and two of those wetlands would also be expanded to mitigate for wetland fill on the remainder of the site. Wetland/riparian buffer areas would also be re-vegetated along the Lake Washington shoreline following remediation.

4.2.2 Impacts

2010 Draft EIS

Proposed redevelopment under DEIS Alternatives 1 and 2 would not result in any direct impacts to re-established/expanded wetlands on the site. A portion of buffer of Wetland D would be reduced to 25 feet; however, other portions of the buffer would be expanded to provide compensatory areas as allowed by the City of Renton. New buildings would be setback a minimum of 50 feet from the shoreline, as required by the *City of Renton Shoreline Master Program* (1983). With the proposed redevelopment, the Shoreline Restoration Area would largely remain intact. A publically accessible trail with interpretive viewpoints would be included within a portion of the shoreline area. The upland portion of the Main Property would be covered in buildings, paved areas and landscaping, providing habitat for certain wildlife species adapted to urban environments.

Three stormwater outfalls would be constructed within the shoreline areas. These outfalls would be located to avoid direct impacts to wetlands and would be designed to prevent erosion/siltation during construction and operation. The stormwater system would be designed in accordance with the City of Renton amendments to the 2009 King County Surface Water Design Manual adopted by the City of Renton, and would contain and convey the 25-year peak flows from developed conditions for on-site tributary areas. No upstream tributary areas would drain to the project site or the proposed stormwater control system, and therefore no severe flooding or erosion would be expected from potential overflow from a 100-year storm event. As a result, no significant impacts to the on-site wetlands from erosion or sedimentation deposition would be anticipated.

Proposed construction and redevelopment could cause indirect impacts to on-site wetlands, riparian habitat, and lake habitat related to hydrologic conditions (in the case of the wetlands) and potential for erosion and sediment deposition (particularly during construction). Significant impacts, including to salmonid fish in the lake, would not be expected with implementation of a TESCP during construction activities and the installation of a permanent stormwater control system, as required by the City of Renton.

2012 EIS Addendum

Similar to DEIS Alternatives 1 and 2, the Preferred Alternative would not result in any direct impacts to re-established/expanded wetlands on the site. The Preferred Alternative would maintain a 100-foot minimum setback from the shoreline onsite (versus the 50-foot minimum shoreline setback under the DEIS alternatives). The minimum setback would be consistent with the EPA's recommendations and the City's 2011 Shoreline Master Program. The Shoreline Restoration Area under the Preferred Alternative would total approximately 3.7 acres, as compared to the 3.4 to 3.5 acres under DEIS Alternatives 1 and 2. This area would accommodate future wetlands, as well as buffers and setbacks. The final, detailed plans for the Shoreline Restoration Area will be developed in coordination with EPA. With the proposed redevelopment, the Shoreline Restoration Area would largely remain intact. An emergency access road/public trail would be located in this area.

Similar to DEIS Alternatives 1 and 2, stormwater outfalls would be constructed within the shoreline area. These outfalls would be located to avoid direct impacts to wetlands and would be designed to prevent erosion/siltation during construction and operation.

Proposed construction and redevelopment could cause indirect impacts to on-site wetlands, riparian habitat, and lake habitat related to hydrologic conditions, and potential for erosion and sediment deposition. With installation of temporary and permanent stormwater control systems similar to under DEIS Alternatives 1 and 2, no significant impacts to these critical areas would be expected.

Redevelopment under the Preferred Alternative would have a slightly smaller development footprint and similar site features to the DEIS Alternatives (particularly DEIS Alternative 2) and would be anticipated to have slightly less impacts to wetland and wildlife habitat than DEIS Alternatives 1 and 2. As the restored habitat along the lakeshore develops over time, the added shoreline setback would provide slightly more potential screening of the wetland and lakeshore habitats from lighting impacts as compared to DEIS Alternatives 1 and 2. However, given the urban context of the area, impacts from noise, lighting, and other disturbance would not likely be significantly different from those under DEIS Alternatives 1 and 2.

4.2.3 Conclusion

Redevelopment under the Preferred Alternative would result in potential impacts to critical areas that would be similar to those analyzed in the DEIS, including impacts associated with construction (site grading) and operation (hydrologic conditions, noise, lighting, and other disturbance). No additional impacts to critical areas would be anticipated.

4.2.4 Mitigation Measures

Mitigation measures were identified in the DEIS to address potential impacts to critical areas; for the most part these measures would also apply to the Preferred Alternative. Following are changes to the "Proposed" mitigation measures listed in the DEIS. Strike-through indicates those measures or portions of measures that have been eliminated; underline indicates new or portions of new measures that are included as part of the Preferred Alternative. See **Chapter 1** for the complete list of critical area-related mitigation measures.

- ~~Wetland buffer areas would meet or exceed the minimum City-required buffers for Wetlands A, D and H (the Wetland D buffer would meet the City's requirement through buffer averaging). Wetland I and J would also be provided with buffers that meet or exceed City requirements.~~

- Proposed buildings would be setback a minimum of 100 feet from the OHWM consistent with the current *City of Renton's Shoreline Master Program* (2011). The shoreline area would accommodate future wetlands, as well as buffers and setbacks. Final, detailed plans for the re-establishment of wetlands and their buffers onsite will be developed in coordination with U.S. Environmental Protection Agency (EPA) prior to redevelopment

- A publicly accessible, unpaved trail ~~would be provided~~ is proposed through the shoreline area that would include interpretive wetland viewpoints.

- The proposed redevelopment would include design elements to minimize the potential adverse affects of artificial lighting on wetland and riparian habitats. These include directing lighting downward and away from these habitats or adjacent properties, and could include shielding of lights, use of low-pressure sodium lights, or minimizing the use of reflective glazing materials in building design, as feasible.

4.2.5 Significant Unavoidable Adverse Impacts

There are no significant unavoidable impacts to critical areas that cannot be mitigated.

4.3 ENVIRONMENTAL HEALTH

This section of the EIS Addendum compares the probable significant environmental health-related impacts from the Preferred Alternative to those from DEIS Alternatives 1 and 2. As appropriate, new/modified mitigation measures are identified.

4.3.1 Affected Environment

From 1916 to 2008, various industrial activities, including creosote manufacturing, petroleum product storage, and log sorting/storage, occurred on the Quendall Terminals site and have resulted in the release of various contaminants into the soil and groundwater. From the 1980s through 2005, the Washington State Department of Ecology (Ecology) provided oversight for the remediation/cleanup of the site under the Model Toxics Control Act (MTCA). In 2005, Ecology requested that the United States Environmental Protection Agency (EPA) assume the responsibility for directing and overseeing the remediation and the property was added to EPA's Superfund National Priorities List (NPL).

In September 2006, the property owners (Altino Properties and JH Baxter and Company) entered into an Administrative Order on Consent (AOC) with EPA that required them to complete a remedial investigation (RI) and feasibility study (FS). The RI/FS is intended to comprehensively evaluate environmental conditions on the site and review various remediation options, from which EPA will choose a preferred cleanup remedy.

According to the Draft RI, contamination on the site consists of chemicals of potential concern that are adhered to soil particles, dissolved into water, or concentrated as dense, non-aqueous phase liquid (DNAPL) in the subsurface. Large areas of soil contamination are located on the east side of the site. Groundwater contamination in the Shallow Aquifer beneath the site underlies a majority of the site, while contamination of the Deep Aquifer primarily occurs under the western portion of the site.

4.3.2 Impacts

2010 Draft EIS

Prior to redevelopment under DEIS Alternatives 1 and 2, the Quendall Terminals site will likely be capped with soil during site cleanup/remediation, which will limit the potential for exposure to underlying contaminants. Redevelopment of the site is being coordinated with the cleanup/remediation process and would be conducted consistent with the requirements in the final cleanup remedy that is selected and overseen by EPA, and with any associated institutional controls.

Redevelopment on the site, including the installation of deep foundations (i.e. piles) and utilities, could generate contaminated soil and/or groundwater to which workers and City staff inspectors could be exposed. City staff that maintains utilities could also be exposed to contaminated soils/groundwater. Volatile contaminants in the subsurface could generate vapors that could intrude into utility trenches and above-grade structures. With separation of living/working areas from contaminants by the soil cap and under-building parking, as well as the implementation of institutional controls specified during site remediation, no significant impacts would be anticipated.

2012 EIS Addendum

Construction activities under the Preferred Alternative are assumed to be similar to those described for DEIS Alternatives 1 and 2, and deep foundation supports (such as piles) would likely be required. The construction of deep foundations, as well as excavations for utilities, could generate contaminated soils or groundwater to which workers could be exposed. Personal protection equipment for workers would be utilized, as well as special handling and disposal measures following constructions activities to prevent contact with hazardous materials and substances. Personal protection measures and special training could also be provided to City of Renton staff that provides inspections and maintenance following construction activities.

Similar to DEIS Alternatives 1 and 2, there would also be the potential for volatile contaminants in the subsurface to generate vapors that could intrude into utility trenches and above-grade structures. The separation of living/working areas from the contaminants by the soil cap and under-building garage, as well as the implementation of potential institutional control measures would ensure that future building inhabitants would not be exposed to unacceptable vapors, and no significant impacts would be anticipated.

4.3.3 Conclusion

Redevelopment under the Preferred Alternative would result in potential environmental health-related impacts that would be similar to those under DEIS Alternatives 1 and 2, including impacts associated with construction/excavation exposure to contaminated soils, as well as potential vapors from volatile contaminants in the subsurface. No additional environmental health-related impacts would be expected.

4.3.4 Mitigation Measures

Mitigation measures were identified in the DEIS to address potential environmental health-related impacts; these measures would also apply to the Preferred Alternative. Because no additional significant environmental health-related impacts were identified for the Preferred Alternative, no changes to the DEIS mitigation measures would be necessary. See **Chapter 1** for the complete list of environmental health-related mitigation measures.

4.3.5 Significant Unavoidable Adverse Impacts

There are no significant adverse environmental health-related impacts that cannot be mitigated.

4.4 ENERGY – GREENHOUSE GAS EMISSIONS

This section of the EIS Addendum compares the probable significant energy – greenhouse gas (GHG) emission impacts from the Preferred Alternative to those from DEIS Alternatives 1 and 2. As appropriate, new/modified mitigation measures are identified.

4.4.1 Affected Environment

GHGs, such as carbon dioxide, methane, and nitrous oxide, are emitted by both natural processes and human activities, and trap heat in the atmosphere. In turn, the accumulation of GHG in the atmosphere affects the earth's temperature. One source of GHG emissions is fossil fuels used to produce power used by consumers for electrical power and home heating needs. Puget Sound Energy (PSE) is one of three electrical service providers for the City of Renton and provides service to the Quendall Terminals site and vicinity. The majority of PSE's power comes from hydro-electric and natural gas sources. The Quendall Terminals site is currently vacant and does not contain any structures or facilities that would consume energy or emit GHG emissions.

The Washington State Department of Ecology (Ecology) provides guidance for calculating and analyzing GHG emissions for projects. In June 2010, Ecology issued guidelines, including guidance regarding the types of GHG emissions that should be calculated; a description of how to determine if emissions surpass a threshold of "significance"; and a description of different types of mitigation measures. After closure of the public comment period on the guidelines, Ecology issued a statement indicating that significant changes would be required to the guidelines before they were issued. The revised guidelines were not available at the time of the issuance of the 2010 DEIS.

4.4.2 Impacts

2010 Draft EIS

Proposed redevelopment under DEIS Alternatives 1 and 2 would result in an increase in GHG emissions relative to the existing conditions due to the increase in building density and site population. Redevelopment under Alternative 1 would result in an estimated 1,297,536 $MTCO^2e$ in lifespan GHG emissions, and redevelopment under Alternative 2 would result in an estimated 860,434 $MTCO^2e$ in lifespan GHG emissions.

New development under DEIS Alternatives 1 and 2 would utilize energy in the form of electricity for heating, cooling, lighting and other energy demands, and natural gas for heating and cooking. New development would result in an increase in energy usage when compared to existing conditions. However, Leadership in Energy and Environmental Design (LEED) building techniques and other energy conservation methods could be incorporated into the design of the development which would lower the energy demands associated with the site.

For the purposes of comparison, GHG emissions for the Preferred Alternative have been calculated using the King County GHG Emissions Spreadsheet Model that was utilized in the DEIS.

Similar to DEIS Alternatives 1 and 2, redevelopment under the Preferred Alternative would result in an increase in GHG emissions when compared to the existing conditions. **Table 4.4-1** provides a summary of the potential estimated GHG emissions that could result from the construction and operation with redevelopment under the Preferred Alternative.

Table 4.4-1
ESTIMATED GHG EMISSIONS – PREFERRED ALTERNATIVE

Source	Square Footage	Embodied Emissions $MTCO_2e$	Energy Emissions $MTCO_2e$	Transportation Emissions $MTCO_2e$	Lifespan Emissions $MTCO_2e$
Residential	692	22,836	247,044	530,072	799,952
Office	0	0	0	0	0
Retail	21,600	842.4	12,463.2	5,335.2	18,640.8
Restaurant	9,000	351	17,946	5,049	23,346
Estimated Total GHG Emissions		**24,029.4**	**277,453.2**	**540,456.2**	**841,938.8**

Source: EA|Blumen, 2012
1 Indicates the total number of residential units
* The numbers in this table differ slightly from the GHG Emissions Worksheet (see **Appendix D**) due to rounding.

As shown in **Table 4.4-1**, GHG emissions under the Preferred Alternative would be lower than under the DEIS Alternatives (841,938 $MTCO_2e$ lifespan emissions under the Preferred Alternative versus 1,297.536 and 860,434 under DEIS Alternatives 1 and 2, respectively). A majority of the emissions would be from residential development on the site. These calculations have not taken into account any potential effects to reduce the carbon footprint of the redevelopment, such as LEED building techniques, vehicle trip reductions through building a walkable community, or other energy conservation measures.

Energy usage under the Preferred Alternative would be similar to under DEIS Alternatives 1 and 2, and would primarily include electricity and natural gas. Electricity would be used for heating, cooling, lighting, and other energy demands; natural gas would be used primarily for heating and cooking. PSE would continue to provide electricity and natural gas service to the site. LEED building techniques and other energy conservation measures could be incorporated into the final development and would lower the energy demands associated with redevelopment.

4.4.3 Conclusion

Redevelopment under the Preferred Alternative would result in potential energy and GHG-related impacts that would be similar to or less than those under DEIS Alternatives 1 and 2. No further energy/GHG-related impacts would be anticipated.

4.4.4 Mitigation Measures

Mitigation measures were identified in the DEIS to address potential GHG emissions and energy usage; these measures would also apply to the Preferred Alternative. Because no additional significant GHG/energy-related impacts were identified with the Preferred Alternative, no changes to the DEIS mitigation measures would be necessary. See **Chapter 1** for the complete list of GHG/energy-related mitigation measures.

4.4.5 Significant Unavoidable Adverse Impacts

Development on the Quendall Terminals site would result in an increase in demand for energy and an increase in GHG emissions relative to existing conditions, similar to any major development. However, the direct and indirect impacts of GHG emissions and energy use under the Preferred Alternative would be similar to or less than those analyzed for the DEIS Alternatives (particularly Alternative 2) and would not be expected to be significant. The proposed redevelopment would include features that would reduce GHG emissions and climate change impacts (i.e. the compact, mixed-use nature of the proposed development would reduce vehicular trips).

4.5 LAND AND SHORELINE USE/RELATIONSHIP TO PLANS AND POLICIES

This section of the EIS Addendum compares the probable significant land and shoreline use impacts from the Preferred Alternative to those from DEIS Alternatives 1 and 2. As appropriate, new/modified mitigation measures are identified.

4.5.1 Affected Environment

The Quendall Terminals Main Property is currently vacant and unused, and includes two small buildings, a sewer pump station, a wharf, and a dock. The site was historically used for industrial operations dating back to 1917, including creosote manufacturing, diesel fuel and oil storage operations, and log sorting and storage. As described in Section 4.3, **Environmental Health**, historic industrial operations on the site have resulted in a variety of contamination issues, and cleanup of the site is currently being overseen by the EPA.

Land uses in the vicinity of the Main Property include the Seahawks Headquarters and Training Facility and multifamily/single family residences to the north; Seahawks Way/Ripley Lane, the Isolated Property, I-405 and the site of the Hawk's Landing potential hotel/retail/restaurant development to the east; the Barbee Mill residential development to the south; and, Lake Washington to the west.

The Comprehensive Plan and zoning designation for the Main Property is Commercial/Office/Residential (COR), which is intended to provide opportunities for large-scale commercial, office, retail, and multifamily residential projects. The Lake Washington shoreline along the Main Property is classified as a Shoreline of Statewide Significance, and is in the Shoreline High Intensity Overlay District in the 2011 SMP. The objective of this overlay district, in part, is to provide opportunities for large-scale office and commercial employment centers as well as multifamily residential use and public services.

The Quendall Terminals Isolated Property is vacant and generally comprised of existing vegetation and wetlands. Similar to the Main Property, the Comprehensive Plan and zoning designation for the Isolated Property is COR.

The zoning of the properties surrounding the site is also COR, with the exception of the Barbee Mill property to the south, which has been rezoned to R-10 (residential, 10 dwelling units per acre).

4.5.2 Impacts

2010 Draft EIS

Redevelopment under DEIS Alternatives 1 and 2 would occur in nine buildings on the site with approximately 708 to 800 residential units, 21,600 square feet of retail uses, 9,000 square feet of restaurant uses, and 1,364 to 2,171 parking spaces; DEIS Alternative 1 would also include approximately 245,000 square feet of office uses (see **Table 2-1** for a summary of redevelopment under DEIS Alternatives 1 and 2).

Site preparation and construction of buildings and infrastructure would result in temporary construction-related impacts to adjacent land uses over the build-out period, including air emissions, noise, and increased traffic from construction vehicles/equipment. Due to the temporary nature of construction and required compliance with City of Renton construction requirements, no significant impacts would be anticipated.

Redevelopment under the DEIS Alternatives would convert the site from its current vacant, vegetated state to a new mixed-use development, and would restore a Superfund site to a productive new use. New development would result in increased on-site population and associated increases in activity levels onsite (i.e. noise and traffic). In general, these activity levels would be greater than the adjacent residential uses to the south (Barbee Mill), but similar to commercial uses to the north (Seahawks Headquarters and Training Facility) and existing and planned commercial and hotel uses to the east (proposed Hawk's Landing hotel and commercial uses east of I-405). Activity levels would generally be consistent with the existing urban character of the area and no significant impacts would be anticipated.

The proposed buildings on the site would be up to approximately 67 feet (Alternative 2) or 80 feet (Alternative 1) in height and would range from approximately 77,000 to 112,800 square feet (Alternative 2) or 94,600 to 209,000 square feet (Alternative 1). The proposed height and bulk would be greater than adjacent development to the south; however, they would be generally similar to the surrounding commercial and planned hotel buildings to the north and east. Existing off-site features (i.e. roadways and PSE easement), as well as proposed on-site features (i.e. building setbacks, driveways, parking areas, and landscaping) would provide buffers between proposed buildings and adjacent land uses. Architectural features would be included that would be intended to enhance the compatibility with surrounding uses. The proposed development would also be consistent with the type and size of development contemplated in the COR land use/zoning classification and the current Shoreline High Intensity Overlay District. As a result, no significant land use compatibility impacts would be anticipated.

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As described in **Chapter 2** of this EIS Addendum, the majority of the redevelopment assumptions for the Preferred Alternative would be similar to those analyzed under DEIS Alternatives 1 and 2 (in particular DEIS Alternative 2), including the types of land uses and general level of development on the site such as number of residential units, restaurant and retail space, parking, site population and maximum building heights. Certain redevelopment assumptions have been modified from those described for the DEIS Alternatives, including shoreline setback, setbacks from adjacent properties, view corridors, building height modulation, open space and related areas, building design, and emergency access road/pedestrian facility (see **Table 2-1** for a summary and comparison of the Preferred Alternative and DEIS Alternatives 1 and 2).

A 5-year time limit is typically required by the City for non-phased Master Plan projects. Build-out of the Quendall Terminals project could occur in phases, in accordance with market demand, and an extension of the 5-year time limit could be requested by the applicant via the Master Plan approval process (RMC 4-9-200J.2.a). The extension would require identification of clearly defined phases and specific time limits for each phase and a determination of eligibility for any extension of the time limits.

Construction

Due to the similar levels of redevelopment, construction-related impacts under the Preferred Alternative would generally be similar to under DEIS Alternatives 1 and 2. Redevelopment would result in temporary construction-related impacts to adjacent land uses over the build-out period and could include emissions from construction vehicles and equipment; increased dust associated with construction activities; vibration associated with construction; increased noise levels; and, increased traffic associated with construction vehicles and workers. No significant land use impacts would be anticipated due to the temporary nature of construction and the compliance with applicable City of Renton regulations.

Operation

Redevelopment under the Preferred Alternative would restore the Quendall Terminals site to a productive use subsequent to cleanup/remediation. The site would be converted from its current vacant, partially vegetated state to include a mixture of residential, retail, restaurant and open space uses, and associated infrastructure. The Preferred Alternative would include a similar level/mix of redevelopment to the DEIS Alternatives (particularly Alternative 2). **Table 4.5-1** provides a summary and comparison of the site uses under the Preferred Alternative and DEIS Alternatives.

Table 4.5-1
SITE AREA BREAK DOWN

Site Uses	DEIS Alternative 1 (acres)	DEIS Alternative 2 (acres)	Preferred Alternative (acres)
Built Areas (Impervious Areas)			
Building footprints	5.0	4.1	4.3
Paved rights-of-way, roads, pedestrian/bike paths	4.2	3.9	4.0
Surface parking areas	1.4	2.7	3.3[3]
Paved plazas	0.2	0.1	0
Subtotal	**10.8**	**10.8**	**11.6**
Vegetated Areas (Pervious Areas)			
Natural areas[1]	4.4[1]	4.4[1]	4.5[1]
Landscaped areas	6.0	6.1	4.9
Unpaved trails	0.2	0.3	0.5
Subtotal	**10.6**	**10.8**	**9.9**
Total	**21.5[2]**	**21.5[2]**	**21.5**

Source: Lance Mueller Architects, 2010, 2012
[1] Includes the adjacent 1.2-acre Isolated Property to the northeast that is part of the site.
[2] Totals differ from sums of subtotals due to rounding.
[3] Includes approximately 1.3 acres of parking deck area (2-level parking structure).

Similar to DEIS Alternatives 1 and 2, redevelopment under the Preferred Alternative would result in an increase in activity levels (i.e. noise, traffic, etc. associated with increased site population) on the site. Overall activity levels would be generally consistent with the existing urban character of the site area, and no significant land use impacts would be anticipated.

Redevelopment under the Preferred Alternative would be similar in height and bulk to DEIS Alternative 2, since the maximum building height would be approximately 64 feet. However, modifications have been made to the Preferred Alternative to enhance the compatibility with adjacent uses. For example, building heights would be modulated to include 4-story buildings at the southern portion of the site, 5-story buildings at the northern portion, and 5-6-story buildings in the western, eastern and central portions of the site.

Proposed building setbacks from adjacent properties have also been modified under the Preferred Alternative and would vary somewhat from DEIS Alternatives 1 and 2. Setbacks from the northern property line under the Preferred Alternative would range from approximately 95 feet adjacent to the five-story building in the northwestern portion of the site to approximately 38 feet adjacent to the one-story parking structure in the northeastern portion of the site. The minimum setback along this property line would be similar to DEIS Alternative 1, but less than DEIS Alternative 2. The maximum setback would be less than DEIS Alternatives 1 and 2. Setbacks from the southern property line under the Preferred Alternative would range from approximately 40 feet adjacent to the one-story parking garage in the southeastern portion of the site to approximately 200 feet adjacent to the four-story building in the southwestern portion of the site. The minimum setback along this property line would be similar to DEIS Alternatives 1 and 2; the maximum setback would be greater than DEIS Alternative 1, but less than DEIS Alternative 2 (see **Table 2-1** and **Figure 2-3**). The proposed height, bulk, and setbacks of the Preferred Alternative would be consistent with the existing urban character of the area and applicable City of Renton requirements, and no significant land use impacts would be anticipated.

Due to the similar level and mix of redevelopment on the site, it is anticipated that potential indirect/cumulative impacts would be similar to those described in the DEIS for Alternatives 1 and 2. These impacts would include a contribution to cumulative residential and employment growth, a cumulative increase in traffic in the site vicinity (see Section 4.9, **Transportation**, for further details), and an increased demand for retail goods and services. Overall, no significant indirect land use impacts would be anticipated.

Proposed redevelopment under the Preferred Alternative would generally be consistent with applicable plans, policies and regulations, particularly with the increased building setbacks and building height modulation that have been incorporated into this alternative relative to DEIS Alternatives 1 and 2. As part of the permit review process, further evaluation would be performed by the City to determine whether the Preferred Alternative is fully consistent with all of the COR land use/zoning classification goals and requirements, including those regarding project design.

4.5.3 Conclusion

Redevelopment under the Preferred Alternative would result in potential land and shoreline use-related impacts that would be similar to or less than those under the DEIS Alternatives (in particular DEIS Alternative 2). No further land or shoreline use impacts would be anticipated.

4.5.4 Mitigation Measures

Mitigation measures were identified in the DEIS to address potential land use impacts; for the most part these measures would also apply to the Preferred Alternative. Following are changes to the “Proposed” mitigation measures listed in the DEIS. Strike-through indicates those measures or portions of measures that have been eliminated; underline indicates new or portions of new measures included as part of the Preferred Alternative. See **Chapter 1** for the complete list of land use-related mitigation measures.

- Building heights would be modulated to reduce potential height/bulk/scale impacts on adjacent development (i.e. Barbee Mill). The buildings located adjacent to the southern property lines would be 4-stories high; those in the northern portion of the site would be 5 stories high; and, those in the western, eastern, and central portions of the site would be 5 to 6 stories high.

4.5.5 Significant Unavoidable Adverse Impacts

Redevelopment under the Preferred Alternative would result in the conversion of the approximately 21.5-acre Quendall Terminals site from a vacant, partially vegetated area to a new mixed-use development with an associated increase in building density and activity levels. There are no significant unavoidable adverse land use impacts that cannot be mitigated.

4.6 AESTHETICS/VIEWS

This section of the EIS Addendum compares the probable significant impacts on aesthetics and views from the Preferred Alternative to those from DEIS Alternatives 1 and 2. As appropriate, new/modified mitigation measures are identified.

4.6.1 Affected Environment

The aesthetic character of the Quendall Terminals Main Property is open and partially vegetated. An existing, brick-clad structure, a shack, and a sewer pump station are located along the western edge of the site and a wooden wharf and dock are located along the western edge. The remainder of the site is comprised of existing natural vegetation, including trees, grasses, shrubs and herbs, as well as unpaved roadways. Subsequent to cleanup/remediation activities (which would occur with or without the project), the existing vegetation and structures would be removed, with the exception of the sewer pump station. A soil cap would be likely placed on the upland and shoreline areas and would raise the property approximately two- to three feet. The Isolated Property is generally comprised of existing trees, vegetation and wetlands, and would remain in this condition with site cleanup/remediation.

The visual character of the area to the north of the Quendall Terminals site is primarily characterized by the Seahawks Headquarters and Training Facility, which includes three football fields and an approximately 200,000-square foot training facility building. The area further to the north is primarily comprised of low-rise multifamily and single family residences. The area to the east is characterized by Ripley Lane, vegetated areas and I-405; further to the east are commercial and multifamily residences, as well as the site of a proposed hotel. To the south of the site is the Barbee Mill residential development which includes two- to three-story single family residences; further to the south are additional single family residences. The area to the west of the site is characterized by Lake Washington.

The site contains no existing sources of light and glare. Shadows on the site are primarily cast from mature trees located in the western and southern portions of the site. Lighting and glare conditions in the site vicinity are typical of an urban environment and generally include interior/exterior building lighting, parking lot lighting, street lighting and vehicular headlights.

4.6.2 Impacts

2010 Draft EIS

Proposed redevelopment of the Quendall Terminals site would change the aesthetic character from an open, partially vegetated property to a new mixed-use development with nine buildings, roadways, parking areas, and open space/landscaping. Buildings would range from 94,600 to 209,000 square feet under Alternative 1 and from 77,000 to 112,800 square feet under Alternative 2. Building heights would be seven stories under Alternative 1 and six stories under Alternative 2. Redevelopment on the site is intended to be aesthetically pleasing and high quality, and would represent a compact, urban form with a consistent design concept throughout the site. Buildings on the site would be greater in height and bulk than the adjacent Barbee Mill development, but would be similar to the Seahawks Headquarters and Training Facility and the planned Hawk's Landing development.

View corridors and viewing areas are proposed onsite, consistent with the City of Renton's Comprehensive Plan policies. View corridors would be provided along the main east/west public roadway (Street "B") and along private driveways at the north and south ends of the site. Additional views towards Lake Washington would be provided for residents on the site in the semi-private courtyards. The proposed trail along the shoreline would also include viewing areas for residents and the community.

Visual simulations were prepared as part of the DEIS. As shown by the simulations, redevelopment on the Quendall Terminals site would block or partially block views toward Lake Washington from certain viewpoints. View corridors would be provided along the east/west roadway and at the north and south end of the site. In general, visual impacts under Alternative 2 would be less than under Alternative 1.

Proposed redevelopment would add new sources of light, glare, and shadows at the site. New light and glare sources would be similar to existing sources on adjacent uses (i.e. building lighting, street lighting, and vehicular lighting); however, the general light and glare levels would be higher. Proposed buildings on the site would also create shadows that would extend onto certain on-site outdoor areas; however, these shadows would not impact off-site uses.

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As described in **Chapter 2** of this EIS Addendum, the majority of the redevelopment assumptions for the Preferred Alternative would be similar to those analyzed under the DEIS redevelopment alternatives (in particular DEIS Alternative 2). Proposed mixed-use buildings, associated roadways, landscaping, and landscaped courtyards on the Quendall Terminals site would alter the existing visual character of the site similar to DEIS Alternative 2. However, certain redevelopment assumptions have been modified from those described for the DEIS Alternatives, including, view corridors, building height modulation, and building design (see **Table 2-1** for a summary and comparison of the Preferred Alternative to DEIS Alternatives 1 and 2). These modified redevelopment assumptions would generally improve aesthetic and view conditions when compared to the DEIS Alternatives.

Building heights under the Preferred Alternative have been modulated across the site, as compared to DEIS Alternatives 1 and 2. The buildings in the southern portion of the site would be 4-stories high (3 stories over one story of parking). Buildings located in the northern portion of the site would be 5 stories high (4 stories over one story of parking); and, those in the western, eastern, and central portions of the site would be 5 to 6 stories high (4 to 5 stories over one story of parking). The maximum building height would be approximately 64 feet, similar to under DEIS Alternative 2. The modulated buildings heights under the Preferred Alternative would place the shortest buildings adjacent to the south property line (and adjacent Barbee Mill development), while the tallest buildings would be placed centrally on the site to minimize any potential impacts to adjacent uses. During final design, maximum building heights 100 feet from the Lake Washington ordinary high water mark (OHWM) would be reduced to one half of the maximum height allowed by the COR zone (125 feet allowed height x ½ = 62.5 feet), consistent with the City of Renton Shoreline Management Program (2011); maximum building height in this area under DEIS Alternatives 1 and 2 would be 77 and 67 feet, respectively.

The proposed design of the buildings in the Quendall Terminals Mixed-Use Redevelopment Project has also continued to evolve under the Preferred Alternative, based on input from the City and community. Ten buildings ranging in size from 46,200 to 88,000 square feet are proposed under the Preferred Alternative, versus 9 buildings ranging from 94,600 to 209,000 square feet under DEIS Alternative 1, and 9 buildings ranging from 77,000 to 112,800 square feet under DEIS Alternative 2. Similar to the DEIS Alternatives, the Preferred Alternative would represent a compact, urban form, with a consistent design concept throughout the site. The proposed design of the buildings is intended to be coordinated through a variety of details and materials, and provide a human scale with visually interesting streetscapes and facades (see DEIS pages 3-15 and 3-16 for details). Exterior building materials would resemble those under the DEIS redevelopment alternatives; however, more brick, stucco, masonry, and precast concretes, and less metal siding would likely be incorporated into the buildings under the Preferred Alternative (see **Figure 2-4**). The bases of the parking structure are also proposed to have grids to support vines to create "green walls."

New sources of light, glare, and shadows with the Preferred Alternative would be similar to with DEIS Alternatives 1 and 2.

Visual Analysis

Several comments on the DEIS related to impacts on views to and from Lake Washington and Mercer Island with redevelopment under Alternatives 1 and 2. With proposed redevelopment under the Preferred Alternative, certain view corridors through the site would be larger than under the DEIS Alternatives 1 and 2. The view corridor along Street "B", the main east/west street proposed through the site, would be approximately 74 feet wide under the Preferred Alternative, 8 feet wider than under the DEIS Alternatives. View corridors along the southern boundary of the site would also be maximized under the Preferred Alternative, similar to under DEIS Alternative 2. These larger view corridors under the Preferred Alternative would allow for greater views through the site towards Lake Washington versus those included as part of the DEIS Alternatives. Building height modulation is also proposed under the Preferred Alternative that would increase view opportunities.

Viewpoints

Six key viewpoints were selected for the visual analysis of the Preferred Alternative in this EIS Addendum. These viewpoints consist of public locations, including public streets, sidewalks, and a public park, and represent the views that were mentioned most frequently by commentators on the DEIS. Five of these viewpoints were also analyzed in the DEIS (Viewpoints 1, 4, 7, 8, and 9); Viewpoint 11 is a new viewpoint from Lake Washington Boulevard N (see **Table 3.2-1** and **Figure 3.2-1** for further details on the viewpoint locations).

In general, under the Preferred Alternative, proposed mixed-use buildings, associated roadways, landscaping, and landscaped courtyards on the Quendall Terminals site would alter views to and through the site, similar to DEIS Alternative 2. However, the larger view corridor at Street "B" and proposed building height modulation would allow for greater views of Lake Washington and Mercer Island from certain viewpoints (see Section 3.2, **Aesthetics/Views**, for a further description of the visual analysis for each individual viewpoint).

4.6.3 Conclusion

Redevelopment under the Preferred Alternative would result in potential aesthetic and view-related impacts that would be similar to or less than those under the DEIS Alternatives (in particular DEIS Alternative 2), due in part to the larger proposed view corridor, building height modulation, and building design measures. No further aesthetics or view impacts would be anticipated.

4.6.4 Mitigation Measures

Mitigation measures were identified in the DEIS to address potential aesthetic and view-related impacts; for the most part these measures would also apply to the Preferred Alternative. Following are changes to the "Proposed" and "Other Possible" mitigation measures listed in the DEIS. Strike-through indicates those measures or portions of measures that have been eliminated; underline indicates new or portions of new measures that are included as part of the Preferred Alternative. See **Chapter 1** for the complete list of aesthetic and view-related mitigation measures.

Proposed Mitigation Measures

- <u>Exterior building lighting, parking lot lighting, and pedestrian lighting would be directed downward and away from surrounding buildings and properties to minimize the impacts to adjacent uses</u>.
- <u>Building setbacks would be maximized adjacent to Lake Washington and along the south site boundary, to enhance the aesthetic character of development and retain views of Lake Washington</u>.
- <u>Building height modulation would be provided across the site to enhance the aesthetic character of development and retain some views of Lake Washington</u>.
- <u>No surface parking would be located at the terminus of Street "B" in order to enhance the aesthetic character of the development, particularly from the shoreline trail</u>.
- <u>During final building design, maximum building heights 100 feet from the Lake Washington ordinary high water mark (OHWM) would be reduced to one half of the maximum height allowed by the COR zone (125 feet allowed height x ½ = 62.5 feet), consistent with the City of Renton Shoreline Management Program (2011), which would help maintain views toward the lake.</u>

Other Possible Mitigation Measures

- Vertical and/or horizontal modulation should be provided along the west or lake side of the buildings to provide a human scale and breakup the larger structures which would be adjacent to the shoreline area and pedestrian environment.
- ~~Building heights along the shoreline could be reduced to maintain views of Lake Washington.~~

4.6.5 Significant Unavoidable Adverse Impacts

Similar to the DEIS redevelopment alternatives (particularly DEIS Alternative 2), redevelopment under the Preferred Alternative would change the site from its existing open, partially vegetated condition to a new mixed-use development. The proposed building height and bulk would be generally similar to surrounding uses (Seahawks Headquarters and Training Facility and proposed Hawk's Landing Hotel), but greater than other uses in the area (Barbee Mill development). However, with proposed building setbacks, and building height modulation across the site, no significant impacts would be anticipated.

Certain views across the site towards Lake Washington and Mercer Island would be obstructed under the Preferred Alternative. However, the proposed provision of view corridors and building modulation would allow for some views through the site, and significant impacts would not be anticipated.

4.7 PARKS AND RECREATION

This section of the EIS Addendum compares the probable significant parks and recreation impacts from the Preferred Alternative to those DEIS Alternatives 1 and 2. As appropriate, new/modified mitigation measures are identified.

4.7.1 Affected Environment

The Quendall Terminals site is currently vacant and contains no park or recreation facilities, including shoreline access. The City of Renton is the primary provider of parks and recreation services within the City. For park planning purposes, the City of Renton is divided into ten planning areas and the Quendall Terminals site is located at the north end of the Kennydale Community Planning Area. Existing park and recreation areas that are provided in this area include: Kennydale Beach Park, Kennydale Lions Park, and May Creek Greenway. Two parks in the site vicinity (Gene Coulon Memorial Park and Kennydale Beach Park) are already at or exceeding visitor capacity in the summer time (City of Renton Parks Dept., 2010).

At the time that complete applications for the Quendall Terminals Redevelopment Project were submitted, the City of Renton's *Park, Recreation and Open Space Implementation Plan* (2003) and the *Comprehensive Plan, Capital Facilities Element* (2009) were in effect. These plans described the existing park, recreation and open space areas in the city, and established level of service (LOS) standards for park and recreation facilities. According to the plans, the City had a park and open space deficit of 414.12 acres, as well as needs for all types of active recreation facilities, with the exception of swimming pools. The existing total park land LOS was 13.77 acres per 1,000 population and the adopted park land LOS standard was 18.58 acres per 1,000 population. As such, there was a deficit of 4.81 acres per 1,000 population based on the adopted standards (see DEIS Table 3.8-2 for a summary of park and recreation LOS).

There are several bicycle and pedestrian facilities within the vicinity of the Quendall Terminals site, including Lake Washington Boulevard, NE 44th Street, and Ripley Lane N. Ripley Lane N also provides a connection to the Lake Washington Loop Trail. Two new proposed trail and bicycle routes are also proposed in the *Renton Trails and Bicycle Master Plan (2009)* which would serve the Quendall Terminals site: a future rails-trails corridor on the Railroad right-of-way parallel to Lake Washington Boulevard, and a pedestrian-only trail that would connected to the May Creek Greenway.

Provisions in the 1983 City of Renton Shoreline Master Program (SMP), in effect at the time complete applications on the project were submitted, related to public access along the shoreline and encouraged leaving space for trails, non-motorized bike paths and/or other means of public use.

2011 Parks, Recreation, and Natural Areas Plan

Subsequent to the issuance of the DEIS, on November 7, 2011, the *Parks, Recreation, and Natural Areas Plan* was adopted by the City Council. This plan presents a 20-year vision for parks, recreation facilities, and programming and natural areas; and, identifies policies, implementation strategies, and an investment program to enhance and sustain parks, recreation and natural areas as critical elements of a livable community (see Section 3.3, **Parks and Recreation**, for further details on the 2011 *Parks, Recreation, and Natural Areas Plan)*.

4.7.2 Impacts

2010 Draft EIS

Redevelopment under DEIS Alternatives 1 and 2 would generate increases in on-site population and employees, which would result in associated increases in demands on park and recreation facilities in the vicinity of the Quendall Terminals site. Parks and recreation facilities that would be most likely to receive the increased demand would include May Creek Greenway, Kennydale Lions Park, Kennydale Beach Park, and Gene Coulon Memorial Park. The latter two parks are currently at or exceeding their capacity during the summer and redevelopment under DEIS Alternatives 1 and 2 would further contribute to these capacity issues. Additional parks and recreation facilities could be needed in the City of Renton based on the City's LOS standards and the increased population on the site.

Under DEIS Alternatives 1 and 2, open space and related areas would be provided on the site that would help meet the demand for passive recreation facilities from project residents and employees. However, the demand for active recreation facilities would not be satisfied onsite. Approximately 11.7 to 11.8 acres of open space and related areas would be provided on the Quendall Terminals site under DEIS Alternatives 1 and 2 respectively, including paved plazas, natural areas, landscape areas, unpaved trails and sidewalks. Approximately 3.4 acres of natural open space area would be visually and physically accessible to the general public at certain times of day, including the natural shoreline area and the proposed shoreline trail. These open space and related areas may or may not meet the City's standards, regulations and procedures for open space.

The provision of a publically accessible trail within the natural open space along the shoreline would be consistent with the City's 1983 SMP regulations

The project applicant would also be required to pay park and recreation mitigation/impact fees at the time of building permit issuance. These fees would help to offset the impacts of proposed new residential development on park and recreation facilities, open space, and trails.

2012 EIS Addendum

Similar to DEIS Alternatives 1 and 2, the Preferred Alternative would result in increases in on-site population and employees, which would result in associated increases in demands on park and recreation facilities in the site vicinity, and would contribute to capacity issues at Kennydale Beach Park and Gene Coulon Memorial Park during the summer. Additional parks and recreation facilities could be needed in the City of Renton based on the City's LOS standards and the increased population on the site.

The Preferred Alternative would include open space and related areas onsite to help meet the demand for passive recreation from project residents and employees, but not the demand for active recreation facilities. Approximately 10.6 acres of open space and related area would be provided, approximately one acre less than under DEIS Alternatives 1 and 2. However, the Preferred Alternative would provide slightly more natural open space area than the DEIS redevelopment alternatives (see **Table 4.7-1**). These open space and related areas may or may not meet the City's standards, regulations, and procedures for open space. Similar to DEIS Alternatives 1 and 2, a publically accessible trail is proposed within the natural open space area along the shoreline. The applicant would also pay park and recreation impact fees to help offset the impacts of the project on park and recreation facilities, open space, and trails.

Table 4.7-1
ON-SITE OPEN SPACE AND RELATED AREAS[1] COMPARISON

	DEIS Alternative 1	DEIS Alternative 2	Preferred Alternative
Natural Public Open Space Areas (Proposed Public Recreation Access)			
Natural Areas Along Shoreline Trail[2]	3.2 acres	3.2 acres	3.2 acres
Shoreline Trail[2]	0.2 acres	0.3 acres	0.5 acres
SUB-TOTAL	3.4 acres	3.5 acres	3.7 acres
Other Areas			
Street-Level Landscaping - *in proposed dedicated right-of-way* - *not in proposed dedicated right-of-way*	 0.3 acres 1.4 acres	 0.3 acres 1.8 acres	 0.1 acres 1.5 acres
Landscaped Courtyards	4.3 acres	4.1 acres	2.7 acres
Sidewalks - *in proposed dedicated right-of-way* - *not in proposed dedicated right-of-way*	 0.6 acres 0.3 acres	 0.6 acres 0.2 acres	 1.3 acres 0.1 acres
Paved Plazas - *in proposed dedicated right-of-way* - *not in proposed dedicated right-of-way*	 0.0 acres 0.2 acres	 0.0 acres 0.1 acres	 0.0 acres 0.0 acres
Other – Isolated Property	1.2 acres	1.2 acres	1.2 acres
SUB-TOTAL	8.3 acres	8.3 acres	6.9 acres
TOTAL	**11.7 acres**	**11.8 acres**	**10.6 acres**

Source: Lance Mueller, 2012.
[1]These open space and other areas may or may not meet the City's standards, regulations, and procedures for open space.
[2]Hours of public access would need to meet park standards of sunrise to sunset to count toward public recreation.

4.7.3 Conclusion

Redevelopment under the Preferred Alternative would result in potential impacts to parks and recreation facilities that would be similar to or slightly greater than those under DEIS Alternatives 1 and 2 (approximately 10.6 acres of open space and related area would be provided, approximately one acre less than under DEIS Alternatives 1 and 2; however, the Preferred Alternative would provide slightly more natural open space area than the DEIS redevelopment alternatives). No additional impacts to parks and recreation facilities would be anticipated.

4.7.4 Mitigation Measures

Mitigation measures were identified in the DEIS to address potential impacts to parks and recreation facilities; for the most part these measures would also apply to the Preferred Alternative. Following are changes to the "Proposed" and "Other Possible" mitigation measures listed in the DEIS. Strike-through indicates those measures or portions of measures that have been eliminated; underline indicates new or portions of new measures that are included as part of the Preferred Alternative. See **Chapter 1** for the complete list of park and recreation-related mitigation measures.

Proposed Mitigation Measures

- A parks mitigation/impact fee would be paid for each multifamily unit in the proposed development at the time of building permit issuance to help offset the impacts of the project on City parks and recreation facilities. Park mitigation/impact fees would be determined at the time of building permit issuance and in accordance with the City of Renton Municipal Code.
- Approximately 10.6 acres of public open space and related areas would be provided on the site that would be visually and physically accessible to the public, including the shoreline trail and natural open space areas along the shoreline.
- The connection between the proposed shoreline trail and Lake Washington Boulevard would be enhanced by providing wider sidewalks (i.e. 15-foot wide) that are part of the public right-of-way along the Street "B" corridor.

Other Possible Mitigation Measures

- The hours of use of the proposed shoreline trail could be extended to sunrise to sunset and public parking could be provided, consistent with other City of Renton parks, in order to meet the requirements for public access.
- Additional open space could be provided onsite for active recreation (i.e. frisbee, softball, etc.). A portion of the proposed surface parking on site (i.e. adjacent to the shoreline) could be converted to facilities for active recreation.
- A lighted crosswalk across Lake Washington Boulevard could be provided in order to connect to the May Creek Trail on the east side of the Boulevard.
- The proposed shoreline trail and other recreation areas could be enhanced with site amenities such as tables, litter receptacles, benches, interpretive signage, etc.
- The proposed shoreline trail could connect to the Barbee Mill residential development to the south.

4.7.5 Significant Unavoidable Adverse Impacts

Residents of the proposed development would use nearby parks and recreation facilities, including Gene Coulon Memorial Park and Kennydale Beach Park, which are already at or exceeding capacity in the summer. Demand from project residents would contribute to the existing capacity issues at these parks.

4.8 TRANSPORTATION

This section of the EIS Addendum compares the probable significant transportation impacts from the Preferred Alternative to those from DEIS Alternatives 1 and 2. As appropriate, new/modified mitigation measures are identified.

4.8.1 Affected Environment

Roadways adjacent to the Quendall Terminals site include Lake Washington Boulevard, Ripley Lane N and NE 44th Street. All of these streets would be used to access potential redevelopment on the site.

As part of the transportation analysis, nine study intersections were analyzed (see Figure 3 in **Appendix E** for a map of the study intersections), including:

1. Lake Washington Boulevard (I-405 NB ramps) / NE 44th Street
2. I-405 SB ramps / NE 44th Street
3. Lake Washington Boulevard / Ripley Lane N
4. Lake Washington Boulevard / Barbee Mill Access (N 43rd Street)
5. Lake Washington Boulevard / Hawk's Landing Access (future intersection)
6. Lake Washington Boulevard / N 36th Street / Burnett Avenue N
7. N 30th Street / Burnett Avenue N (without I-405 Improvements Scenario only)
8. Lake Washington Boulevard / Burnett Avenue N (without I-405 Improvements Scenario only)
9. Lake Washington Boulevard / Park Avenue N / Garden Avenue N

The DEIS included a discussion of existing transportation conditions at the time the document was published (December 2010), including: existing traffic volumes, intersection LOS, public transportation services, non-motorized transportation facilities, and planned transportation improvements (see DEIS Section 3.9, Transportation, and Appendix H for details). Following issuance of the DEIS, updated traffic counts were taken at Intersection #3 (Ripley Lane/NE 44th Street) in June 2012.

Based on the new traffic counts for Study Intersection #3, the traffic analysis was updated for this location, as well as adjacent study intersections based on the traffic counts that indicated increased demands on discrete intersection movements. The existing peak hour intersection level of service (LOS) analysis was also updated for affected intersections. The existing LOS levels would remain as described in the DEIS (see DEIS Table 3.9-1 and **Table 3.4-1** in this EIS Addendum); however, the average delay would change at certain intersections (i.e. a slight increase in delay at Study Intersections #2 and #3, and a slight decrease in delay at Study Intersection #1).

No public transit service is currently provided in the site vicinity. The closest transit service is available via a dial-a-ride service area and fixed route service in the vicinity of the NE 30th Street interchange and I-405.

Non-motorized transportation facilities in the area include striped bike lanes on Lake Washington Boulevard, as well as a 4-5 foot paved shoulder on the east and west side of the street. There are no non-motorized facilities on the site. The existing railroad corridor to the east of the site was recently purchased by the Port of Seattle and identified as a future "rails to trails" planned trail. A future trail is also planned along May Creek to the southeast of the site.

The DEIS also identified future planned transportation improvements in the vicinity by the City of Renton and WSDOT. As described in **Appendix E** and **Section 3.4** to this EIS Addendum, following issuance of the DEIS, further clarification was provided regarding the City of Renton's planned transportation improvement project for a portion of Lake Washington Boulevard. The City of Renton's 2010-2015 *Transportation Improvement Program* (TIP) identifies the Lake Washington Boulevard/Park Avenue N (Garden Avenue N) intersection (Study Intersection #9) project in the vicinity of the site. This project includes minor widening and reconfiguration to provide dual eastbound left turn lanes.

4.8.2 Impacts

2010 Draft EIS

The DEIS analyzed potential transportation impacts that could occur with redevelopment under DEIS Alternatives 1 and 2, including intersection LOS impacts, queuing impacts, site access and circulation impacts, public transportation impacts, non-motorized transportation impacts, and parking impacts. Based on the updated affected environment discussion provided in **Appendix E** and **Section 3.4**, the analysis of the DEIS transportation impacts was also updated as part of this EIS Addendum, including an updated analysis of the LOS impacts, traffic queuing, and site access and circulation with Quendall Terminals DEIS Alternative 1. The public transportation, non-motorized transportation and parking impacts for DEIS Alternative 1 are expected to be the same as described in the DEIS (see DEIS Section 3.9, Transportation, and Appendix H).

Intersection LOS Impacts

Based on the new traffic counts that were taken for this EIS Addendum, as well as the associated updated calculations for existing LOS conditions and clarifications on the planned improvements to Study Intersection #9, updates to the LOS analysis for DEIS Alternative 1 were conducted.

As described in **Appendix E** and **Section 3.4**, Study Intersections #1 and #2 (southbound) would continue to operate at LOS F under Alternative 1 in 2015 without I-405 improvements. Operations at the following intersections would change relative to the analysis in the DEIS (see DEIS Table 3.9-2 and 3.9-3 for further details on the DEIS Alternatives):

- Study Intersections #3 and #5 delay would slightly decrease; however, the LOS levels at these intersections would continue to remain the same as analyzed in the DEIS.
- Study Intersection #9 would improve from LOS D (AM peak hour) and LOS F (PM peak hour) to LOS C (AM peak hour) and LOS D (PM peak hour).

Under Alternative 1 in 2015 with I-405 improvements, Study Intersection #9 would improve from LOS F in the DEIS to LOS C (AM peak hour) and LOS D (PM peak hour); all study intersections would be anticipated to operate at LOS D or better.

Queuing Analysis

An update to the queuing analysis along Lake Washington Boulevard was conducted for this EIS Addendum. Queues would increase as compared to the DEIS analysis, and excessive southbound queues would continue to be expected at the stop-controlled Ripley Lane intersection without I-405 Improvements in 2015. However, no queuing conflicts would be expected on Lake Washington Boulevard.

Under DEIS Alternative 1 in 2015 with I-405 improvements, queues would generally decrease as compared to the DEIS analysis. However, southbound queues would still be expected at the Ripley Lane intersection, and queues on Lake Washington Boulevard at the Ripley Lane intersection are expected to extend beyond adjacent intersections (see **Appendix E** and **Section 3.4** for details).

Site Access and Circulation

An analysis of site access and circulation was included as part of the DEIS. No changes to the DEIS site access and circulation analysis for Study Intersection #4 would be anticipated based on updated analysis in this EIS Addendum. Updates to the site access and circulation analysis for Study Intersection #3 are summarized below.

2015 Without I-405 Improvements Operations/Queuing

Intersection #3 – Ripley Lane N / Lake Washington Boulevard. Under DEIS Alternative 1 at site access Intersection #3 – Ripley Lane N at Lake Washington Boulevard, the 95th percentile queue for the southbound left/right movements are estimated to be approximately 800 to 900 feet during the AM and PM peak hours in 2015 (compared to 700 to 800 feet in the DEIS). Queues on Lake Washington Boulevard for vehicles entering the site are not expected to conflict with adjacent intersections. The LOS for the stop-controlled southbound approach would be expected to be LOS F.

2015 With I-405 Improvements Operations/Queuing

Intersection #3 – Ripley Lane N / Lake Washington Boulevard. Under DEIS Alternative 1 at site access Intersection #3 – Ripley Lane at Lake Washington Blvd, the 95th percentile queue for the westbound through movement is estimated at approximately 400 feet during the PM peak hour. This estimated queue on Lake Washington Blvd would likely extend through the adjacent intersection. In addition, the southbound queue on Ripley Lane is estimated to be 350 feet during the AM peak hour and 450 feet during the PM peak hour in 2015, assuming I-405 improvements. With the proposed mitigation of providing an additional southbound approach lane on Ripley Lane, this queue is estimated to be reduced to 200 feet or less during either the AM peak or PM peak hours. The LOS for the signalized intersection is expected to be LOS C/D.

2012 EIS Addendum

Subsequent to publication of the DEIS, the applicant developed a Preferred Alternative for Quendall Terminals. The Preferred Alternative described and analyzed in this EIS Addendum comprises nearly the same level and type of development as Alternative 2 – Lower Density Alternative originally evaluated in the transportation study for the *Quendall Terminals Redevelopment Project DEIS*. The following paragraphs identify the program components of the Preferred Alternative, estimated trip generation, other site elements, and the conclusions of the relative impacts of this alternative as compared to DEIS Alternative 2.

The Preferred Alternative would include construction of 692 multifamily units, 20,225 square feet of retail, 9,000 square feet of restaurant space and parking for 1,337 vehicles. Average trip rates for Apartments (ITE land use code 220), Shopping Center (ITE land use code 820), and High-Turnover (Sit-Down) Restaurant were used as the basis for estimating vehicular trips that would be generated by this alternative.

A net total of approximately 5,656 daily, 435 AM peak hour (104 entering, 331 exiting), and 530 PM peak hour vehicular trips (340 entering and 190 exiting) would be generated at 2015 full buildout conditions under the Preferred Alternative. The Preferred Alternative would result in approximately 128 fewer daily trips, 8 fewer AM peak hour trips, and 11 fewer PM peak hour trips than DEIS Alternative 2. As such, the relative impacts to traffic operations within the study area would be very similar, but slightly less than under DEIS Alternative 2 (see **Appendix E** and **Section 3.4** for details).

4.8.3 Conclusion

Redevelopment under the Preferred Alternative would generate new vehicle trips on and in the vicinity of the Quendall Terminals site that would be similar to, but less that those analyzed in the DEIS for Alternative 2. As a result, transportation impacts associated with the Preferred Alternative would be anticipated to be less than those analyzed for DEIS Alternative 2.

4.8.4 Mitigation Measures

Mitigation measures were identified in the DEIS to address potential transportation-related impacts; for the most part these measures would also apply to the Preferred Alternative. Following are changes to the “Proposed” mitigation measures listed in the DEIS. Strike-through indicates those measures or portions of measures that have been eliminated; underline indicates new or portions of new measures that are included as part of the Preferred Alternative. See **Chapter 1** for a complete list of transportation-related mitigation measures.

Without I-405 Improvements – Preferred Alternative

- **Intersection #1 - I-405 NB Ramps/NE 44th Street.** Widen the southbound and northbound approaches so that a separate left turn lane and shared thru-right turn lane is provided on both legs of the intersection. The final configuration of the intersection with the additional widening improvements would be coordinated with WSDOT.

Fire Apparatus Access

- ~~Fire access would be provided per Renton Municipal Code, or City approved alternative fire protection measures could be proposed by the applicant.~~

- A fire access road is proposed to be located in the western portion of the site. This road would be approximately 20 feet wide, and would be surfaced in crushed rock or grass-crete to support the weight of fire apparatus.

Lake Washington Boulevard Corridor Impacts

- To mitigate traffic impacts to the Lake Washington Boulevard corridor south of the development, the applicant would install traffic calming treatments on Lake Washington Boulevard south of N 41st Street to encourage primary trips generated by the project to utilize the I-405 corridor. Although the City of Renton has no adopted residential traffic management program, arterial calming measures could include treatments that create either horizontal or vertical deflection for drivers. Such treatments could include, but are not limited to chicanes, serpentine raised curb sections, raised median treatments, speed tables, and speed humps.

City of Renton Mitigation/Impact Fees

- In addition to the project-specific mitigation measures described above, a traffic mitigation/impact fee would be paid for the proposed development at the time of building permit issuance to help offset the impacts of the project on the City's roadways. Traffic mitigation/impact fees would be determined at the time of building permit issuance and in accordance with the City of Renton Municipal Code.

4.8.5 Significant Unavoidable Adverse Impacts

Under the Preferred Alternative, there are no significant unavoidable transportation-related impacts that cannot be mitigated.

4.9 CULTURAL RESOURCES

Cultural resources was not included as an element of the environment analyzed in the DEIS, because during scoping of the EIS, construction and operation of the proposed Quendall Terminals redevelopment was not anticipated to result in significant impacts on such resources. Comments were received from the Washington State Department of Archaeology and Historic Preservation (DAHP) on the DEIS requesting that an analysis of cultural resources be included in the Quendall Terminals EIS. In response to these comments, a *Cultural Resources Assessment* (June 2012) was prepared by Cultural Resources Consultants, Inc. for this EIS Addendum (see **Appendix F**).

4.9.1 Affected Environment

The Quendall Terminals site is located along the shoreline of Lake Washington. Numerous named geographic features are located near the project area and these include descriptive names for geographic features, resource procurement sites, villages, and names associated with mystical events. Until ca. 1855, the Subaltuabs, a coastal Salish group, inhabited this village, which consisted of two to three houses; however, no houses are noted in the location on the 1865 survey maps.

From 1917 to present day, the area was used for a variety of industrial operations, including creosote processing; diesel, crude and waste oil storage; and, as a log sorting and storage yard. A small brick building, a sewer pump station, and a shack were located on the site. The brick building (the Quendall Station house) was reportedly used as an office building for the logging company. None of these structures is considered to be architecturally remarkable or a significant cultural resource.

Based on background information, areas of the site and vicinity with a higher probability to contain intact archaeological deposits include the margins of the old channels of May Creek, the delta of the 1920 channel, the margins of the 1920 marsh, and areas adjacent to the 1864 shoreline. Due to the type and intensity of site modification conducted in the historic era and the geologic history of the landform, intact pre-contact deposits would not be expected to be at or near the surface, but would be anticipated to be several meters below ground-level. Intact historic-era deposits related to early homesteading would not be expected to be visible on the surface within the project area for the same reasons. However, background research indicates that late historic-era deposits related to creosote production, the lumber industry, and railroads are likely to be present on the site

See **Section 3.5** and **Appendix F** of this EIS Addendum for further details on existing cultural resource conditions.

4.9.2 Impacts

Under the Preferred Alternative, certain construction activities onsite (i.e. clearing and grading of the upland area, construction of deep building foundations, and excavation of utilities) may require excavations into the sediment cap and could result in an inadvertent discovery of cultural resources. While it is unlikely that cultural resources would be encountered as part of construction activities on the site, a monitoring plan and inadvertent discovery plan would be implemented for the Preferred Alternative in the event that any cultural resources are encountered (see the Mitigation Measures discussion for further details). As a result, no significant impacts to cultural resources would be anticipated with redevelopment under the Preferred Alternative.

See **Section 3.5** and **Appendix F** for further details on cultural resource impacts.

4.9.3 Mitigation Measures

The following measures have been identified to mitigate any potential cultural resource impacts that could occur with construction and operation of the Quendall Terminals project. They are underlined, as they are new measures identified since issuance of the DEIS.

- Limited and focused cultural resource monitoring would be conducted during construction activities on the site (i.e. clearing and grading of the upland area, construction of deep building foundations, and excavation of utilities). A monitoring plan and inadvertent discovery plan would be implemented for the Preferred Alternative (see **Appendix F** for a copy of the proposed monitoring plan and inadvertent discovery plan).

- In the unlikely event that ground disturbing or other activities result in the inadvertent discovery of archaeological deposits, construction activities would be halted in the immediate area and the Washington State Department of Archaeology and Historic Preservation (DAHP) would be contacted. Work would be halted until such time as further investigation and appropriate consultation is concluded.

- In the unlikely event of the inadvertent discovery of human remains, construction would be halted in the area, the discovery would be covered and secured against further disturbance and contact would be made with law enforcement personnel, DAHP, and authorized representatives of the concerned Indian tribes.

4.9.4 Significant Unavoidable Adverse Impacts

There are no significant unavoidable adverse impacts on cultural resources that cannot be mitigated.

REFERENCES

REFERENCES

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APPENDICES

APPENDIX A

EIS ADDENDUM DISTRIBUTION LIST & PARTIES OF RECORD

DISTRIBUTION LIST

Quendall Terminals – EIS Addendum

Federal Agencies

U.S. Army Corps of Engineers, Seattle District Office, Attn: SEPA Reviewer
Environmental Protection Agency, Attn: Linda Priddy, Project Manager
National Oceanic and Atmospheric Administration (NOAA) Fisheries
U.S. Department of Fish and Wildlife, Attn: Roger Tabor

Tribes

Muckleshoot Indian Tribe, Fisheries Department, Attn: Karen Walter or SEPA Reviewer
Muckleshoot Cultural Resources Program, Attn: Ms. Melissa Calvert
Duwamish Tribal Office

State Agencies

Department of Ecology, Environmental Review Section
Department of Fish and Wildlife (WDFW), Attn: Larry Fisher
Department of Transportation (WSDOT) Northwest Region, Attn: Ramin Pazooki
Department of Archaeology and Historic Preservation, Attn: Gretchen Kaehler
Department of Natural Resources, Attn: Boyd Powers

Regional Agencies

Puget Sound Clean Air Agency, Attn: SEPA Coordinator
Puget Sound Regional Council, Attn: Rick Olson, Director, Government Relations and Comm.

Local Agencies

King County Wastewater Treatment Division, Environmental Planning – OAP
King County Department of Transportation, Attn: Harold S. Taniguchi, Director
King County Development and Environmental Services, Attn: SEPA Section
Metro Transit, Attn: Gary Kriedt, Senior Environmental Planner
City of Newcastle, Attn: Steve Roberge, Director of Community Development
City of Kent, Attn: Fred Satterstrom, Acting Community Development Director
City of Tukwila, Attn: Steve Lancaster, Responsible Official
City of Bellevue, Planning and Community Development, Attn: Janna Steedman
City of Mercer Island, Attn: Tim Stewart, Development Services Director
Puget Sound Energy, Attn: Cody Olson, Municipal Liaison Manager
Seattle Public Utilities, Attn: SEPA Coordinator

Newspapers

Seattle Times – *notice of application only*
Puget Sound Business Journal – *notice of application only*
Renton Reporter – *publication paper*

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APPENDIX B

LETTER FROM EPA

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 10
1200 Sixth Avenue, Suite 900
Seattle, WA 98101-3140

OFFICE OF
ENVIRONMENTAL CLEANUP

March 13, 2012

Vanessa Dolbee
Senior Planner
Department of Community & Economic Development
City of Renton
Renton City Hall - 6th Floor
1055 South Grady Way
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425.430.7314

Subject: EIS "On Hold" Notice
Quendall Terminals, LUA09-151, ECF, SA-M, SM, BSP

Dear Ms. Dolbee:

This letter responds to the City of Renton's letter dated December 21, 2011, and supplements EPA's prior correspondence concerning the DEIS for Quendall Terminals. The City of Renton asked EPA if the environmental baseline (post-clean-up conditions)[1] included in the DEIS is reasonable given the expected general outcome of the ROD. As indicated in our prior correspondence, EPA will not select a final remedy until it issues the ROD, likely in 2014, and until the ROD is issued, EPA cannot say with certainty what cleanup actions will be required and what the post-clean-up site conditions will be. With that in mind, EPA has reviewed the environmental baseline to identify assumptions that do not appear consistent with the expected general outcome of the ROD.

The post-clean-up conditions assumed in this DEIS were developed using the 1983 Renton Shoreline Management Plan and other relevant information as described in Appendix E of the DEIS. It is EPA's position, that the Agency can require more stringent environmental standards, such as greater mitigation ratios, larger buffers and setbacks, if they are in place at the time the ROD is developed. This may result in larger or higher quality wetlands and shoreline restoration. These more stringent requirements do not need to be articulated in this EIS because they are specifically unknown at present. Final mitigation/restoration requirements will be established based on the regulations in place at the time EPA issues its Record of Decision for the Quendall cleanup. Based on even current regulations and standards, the wetland and shoreline restoration areas would be larger than depicted in DEIS Figures 2-6 and 2-11.

[1] Post-clean-up conditions specifically means "post-remediation/post-NRD restoration conditions".

Because the size and location of the wetlands as well as the setbacks and buffers will not be finally determined until the ROD is issued, EPA suggests the City identify a 100 foot area, extending from the shoreline, 100 feet landward along the entire shoreline, that would be designated as future wetlands as well as buffers and setbacks. Note that EPA has directed Quendall, in the Feasibility Study, to also assume a 100 foot area along the shoreline landward as reserved for habitat for the purposes of evaluating and selecting a remedy for the Quendall Site.

If the environmental baseline is modified to reflect these assumptions, EPA believes the environmental baseline would be reasonable given the expected general outcome of the ROD and that the City should proceed with the DEIS process for Quendall redevelopment.

Sincerely,

Lynda Priddy

Lynda Priddy
Remedial Project Manager

cc: Campbell Mathewson, Century Pacific, L.P.
Altino Properties, Inc., and J.H. Baxter & Co. / Owner(s)
EPAParty(ies) of Record
EA I Blumen
Cara Steiner-Riley, EPA ORC-158

APPENDIX C

CRITICAL AREAS MEMO

Raedeke Associates, Inc.

Wetland Science
Wildlife Ecology
Landscape Architecture

MEMORANDUM

July 9, 2012

To:	Ms. Gretchen Brunner, EA/Blumen
From:	Rick Lundquist, Raedeke Associates, Inc.
RE:	Port Quendall — Addendum to Draft EIS: Response to Public Comments and Analysis of Preferred Alternative (R.A.I. No. 2010-014-004)

Per your request, the purpose of this memorandum is (1) to respond to public comments on the Draft EIS for the Port Quendall re-development project relating to wetlands and plants and animals, and (2) provide an analysis of a new Preferred Alternative, compared with project alternatives discussed in the Draft EIS. In particular, the response to public comments will address the comment from the Muckleshoot Indian Tribe Fisheries Division (dated January 25, 2011) and the City of Mercer Island (dated January 20, 2011) regarding lighting impacts from the proposed development on wetland and riparian habitat along Lake Washington, and recommended mitigation measures.

RESPONSE TO COMMENTS ON LIGHTING IMPACTS

Impacts

Potential human-disturbance related impacts to wildlife associated with wetland and riparian habitats on site include those related to increased artificial light associated with urban development. These include some artificial lighting during morning and late afternoon or evening hours, particularly during the winter. At full build-out, ambient light (from exterior lighting of buildings, walkways, roads, and traffic) is expected to increase over post-remediation conditions, as well as the existing condition of the abandoned site.

Although the topic has received increased research attention in recent years, understanding of the effects of artificial night lighting on behavioral community ecology of wildlife species and on ecological systems, such as wetlands and lakeshore habitats, is still limited. It is acknowledged that increases in ambient light can alter the behavioral ecology of a variety of organisms, including both invertebrates and vertebrates, from changes in orientation, as well as attraction or repulsion from the altered light environment. These in turn may affect foraging, reproduction, migration, and communication (Longcore and Rich 2004).

For example, many insects, such as moths, may be attracted to artificial lighting, and they may be subject to increased mortality. Some faster flying bat species may in turn congregate near lights to forage on the concentration of insects. Other, slower-flying bat species may avoid the lights, where increased food availability may be offset by increased risk of predation by owls. Similar relationships occur among other vertebrate groups, where some species may be adversely affected by artificial lighting and others may benefit. Artificial lighting may also alter the duration of light and dark, or photoperiod, experienced by plants. However, published information on the affects of artificial lighting on plants in natural settings is relatively limited. In aquatic systems, artificial lighting may affect foraging patterns of invertebrates and amphibians. Some fish species are attracted to artificial lighting, whereas others avoid foraging in lighted areas (Longcore and Rich 2001, 2004).

Impacts of artificial lighting from the proposed redevelopment should be considered in the context of the urbanized setting along this portion of Lake Washington, as well as the longer term land use history of the project site. Residential development stretches south from the project site, including the relatively recent development adjacent to the site, as well as more established residences along the shore farther south. The Seahawks headquarters and training facility lies to the north of the project, and additional residences line the shoreline farther north for a considerable distance. Thus, the impacts of artificial lighting represent an incremental addition to lighting along the shoreline in this area and are not considered significant.

Moreover, remediation work that would precede the proposed development involves removal of existing wetland and upland communities that are impaired by past contamination and capping the site. Following remediation, wetland and riparian communities along the shore on the project site would be newly established, prior to redevelopment. Impacts to the developing habitats can be minimized with appropriate mitigation. In addition, as the buffer areas develop, they would help screen the wetland and shoreline habitats from the development and associated lighting.

Mitigation

The proposed development would include design elements to minimize the potential adverse affects of artificial lighting on wetland and riparian habitats. These include directing lights downward and away from these habitats or adjacent properties, and may include shielding of lights, use of low-pressure sodium lights, or minimizing the use of reflective glazing materials in building design, as feasible.

ANALYSIS OF PREFERRED ALTERNATIVE

The Preferred Alternative would entail a similar mixed-use development to that under Alternatives 1 and 2 (particularly Alternative 2) on the project site, but would maintain a larger setback from the on-site shoreline, consistent with the City's 2011 Shoreline Master Program. The shoreline habitat restoration area, encompassing the re-established/expanded wetlands and their buffers along the lake shore, would encompass a larger area (approximately 128,900 square feet), as this alternative would maintain a 100-foot minimum shoreline setback from the delineated Ordinary High Water Mark (OHWM), as required by the City, compared with a 50-foot minimum setback for Alternatives 1 and 2. Thus, more native habitat would develop along the shoreline of Lake Washington following remediation.

As under Alternatives 1 and 2, no direct wetland impacts would occur under the Preferred Alternative. The wetlands along the lake would be reestablished and expanded in a similar fashion as the other development alternatives within a somewhat larger shoreline restoration area. No development would occur within the isolated eastern part of the site east of Lake Washington Blvd., thus no impacts would occur to Wetlands I and J, as under Alternatives 1 and 2.

The expanded riparian habitat restoration area along the shoreline would afford Wetlands A and D a minimum effective buffer that generally exceeds a minimum 50 feet. Buffer averaging would be proposed where necessary to compensate for buffer encroachments. This riparian area also includes an expanded trail that can also serve as an unpaved emergency fire lane. The ultimate plans for the shoreline restoration area under the Preferred Alternative will be developed in coordination with EPA.

The Preferred Alternative is assumed to include similar temporary and permanent storm drainage systems and erosion control features as Alternatives 1 and 2. Thus, similar to these alternatives we would not expect substantial indirect impacts to on-site wetlands and the lake under the Preferred Alternative from stormwater runoff during construction and operation of the project.

With a slightly smaller development footprint and similar site features such as the public trail, the redevelopment under The Preferred Alternative is expected to result in slightly less impacts to wetland and wildlife habitat as under Alternatives 1 and 2. As the restored habitat along the lakeshore develops over time, the added shoreline setback would provide slightly more potential screening of the wetland and lakeshore habitats from lighting impacts, compared with Alternatives 1 and 2. Given the urban context, however, impacts from disturbance and noise would not likely be significantly different from those under Alternatives 1 and 2.

Thank you for the opportunity to prepare this information. If you have any questions, comments, or need additional information, I am available at 206-525-8122 or via email at rwlundquist@raedeke.com.

LITERATURE CITED

Longcore, T., and C. Rich. 2001. A review of the ecological effects of road reconfiguration and expansion on coastal wetland ecosystems. The Urban Wildlands Group, Inc., Los Angeles, CA. November 14, 2001.

Longcore, T., and C. Rich. 2004. Ecological light pollution. Frontiers in Ecology and the Environment 2(4): 191-198.

APPENDIX D

GREENHOUSE GAS WORKSHEETS

Quendall Terminals - Preferred Alternative

Section I: Buildings

Type (Residential) or Principal Activity (Commercial)	# Units	Square Feet (in thousands of square feet)	Emissions Per Unit or Per Thousand Square Feet (MTCO2e) Embodied	Energy	Transportation	**Lifespan Emissions (MTCO2e)**
Single-Family Home............................	0		98	672	792	**0**
Multi-Family Unit in Large Building	692		33	357	766	**799741**
Multi-Family Unit in Small Building	0		54	681	766	**0**
Mobile Home.......................................	0		41	475	709	**0**
Education		0.0	39	646	361	**0**
Food Sales		0.0	39	1,541	282	**0**
Food Service		9.0	39	1,994	561	**23344**
Health Care Inpatient		0.0	39	1,938	582	**0**
Health Care Outpatient		0.0	39	737	571	**0**
Lodging		0.0	39	777	117	**0**
Retail (Other Than Mall).......................		21.6	39	577	247	**18636**
Office		0.0	39	723	588	**0**
Public Assembly		0.0	39	733	150	**0**
Public Order and Safety		0.0	39	899	374	**0**
Religious Worship		0.0	39	339	129	**0**
Service		0.0	39	599	266	**0**
Warehouse and Storage		0.0	39	352	181	**0**
Other		0.0	39	1,278	257	**0**
Vacant		0.0	39	162	47	**0**

Section II: Pavement.........................

Pavement..		0.00				**0**

Total Project Emissions: **841720**

APPENDIX E

UPDATED TRANSPORTATION REPORT

Quendall Terminals
EIS Addendum
Renton, WA

Updated Transportation Impact Study

October 1, 2012

Prepared for:

EA|Blumen
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Prepared by:

Transportation Engineering NorthWest, LLC

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EXECUTIVE SUMMARY

In response to transportation-related comments on the DEIS, the transportation report for the *Quendall Terminals* project has been updated for the EIS Addendum. In particular, the following are included in the analysis.

- New traffic counts at Study Intersection #3 (Ripley Lane/NE 44th Street), and revised traffic analysis at this location and adjacent study intersections based on the traffic counts that indicated increased demand on discrete intersection movements.
- Updated level of service (LOS) analysis at Study Intersection #9 (Lake Washington Boulevard/Park Avenue N (Garden Avenue) that reflects planned improvements by the City of Renton.
- A LOS summary table that illustrates the affects of potential mitigation measures.
- A figure which illustrates the conceptual channelization improvements that would be required along Lake Washington Boulevard as a result of the project if the project is built prior to regional improvements within the I-405 corridor.

The potential transportation impacts under the applicant's Preferred Alternative are also discussed in this updated report.

This report documents an evaluation of transportation impacts associated with development of the *Quendall Terminals* site in Renton, WA. The proposed development would consist of the following:

- **2015 DEIS Alternative 1 (The Original Application)** includes the construction of 800 multifamily units, 21,600 square feet of retail, 245,000 square feet of office, 9,000 square feet of restaurant space and parking for 2,171 vehicles. Vehicular access would be provided via a new access drive onto Ripley Lane and the extension of NE 43rd Street (existing Barbee Mill access).

In addition to the 2015 DEIS Alternative 1 above, the following alternatives were analyzed as part of this project:

- **2015 DEIS Alternative 2 (Lower Density Alternative)** includes the construction of 708 multifamily units, 21,600 square feet of retail, 9,000 square feet of restaurant space and parking for 1,362 vehicles. Vehicular access would be provided via a new access drive onto Ripley Lane and the extension of NE 43rd Street (existing Barbee Mill access). *Note: A Preferred Alternative was developed by the applicant for this EIS Addendum. A separate section at the end of this study addresses the relative impacts of the Preferred Alternative given its similarities to Alternative 2.*

- **2015 DEIS Alternative 3 (No Action Alternative, No Development).** This is the Baseline Alternative with no development on-site.

The development alternatives were tested under a future transportation network in 2015 with and without the planned I-405 improvements at the I-405/NE 44th Street interchange. The I-405 Improvements assumed in this analysis included:

- Reconfiguring the NE 44th Street interchange into a tight-diamond configuration.
- Relocating both NB and SB ramps with additional through and turn-lanes.
- Addition of traffic signals at both NB and SB ramp intersections.

- Addition of a traffic signal at the Ripley Lane/Lake Washington Boulevard intersection.

Detailed trip generation estimates of development and transportation forecasts throughout the study area were prepared for future baseline conditions without the proposed development and with the proposed development in 2015 (the assumed year of buildout). Impacts were evaluated at 9 off-site study intersections under the without I-405 Improvements future scenario and 7 off-site study intersections under the with I-405 Improvements future scenario.

Conclusions

There exists today and will be in the future a moderate to high level of background traffic that travels in the vicinity of the site. With the existing transportation network and I-405 Improvements by 2015, the development alternatives could be accommodated; however, implementation of some additional site access transportation improvements would be necessary. Without I-405 Improvements by 2015, additional interchange ramp improvements would be needed to support the development alternatives as well as site access improvements.

Additional baseline transportation improvements and project mitigation measures are identified in the *Mitigation Measures* section of this report.

INTRODUCTION

This study summarizes transportation impacts associated with the proposed *Quendall Terminals* redevelopment project. The study documents transportation impacts associated with the EIS redevelopment alternatives of this site, including:

- Assessment of existing conditions through field reconnaissance and review of existing planning documents.
- Estimation of weekday vehicular a.m. and p.m. peak hour trips and daily trips generated by the EIS alternatives.
- Assignment of weekday a.m. and p.m. peak hour project trips onto the existing roadway network in the immediate vicinity.
- Evaluation of a.m. and p.m. peak level of service (LOS) impacts at 9 off-site study intersections.
- Assessment of site access and circulation issues.
- Analysis of public transportation and nonmotorized transportation impacts.
- Identification of mitigation measures to maintain acceptable levels of mobility and safety

Project Description

The project site is generally bounded by Ripley Lane to the east, Lake Washington Boulevard to the southeast, and Lake Washington to the west. A project site vicinity map is shown in **Figure 1**. The proposed development would consist of the following (conceptual site plan for DEIS Alternative 1 is provided in **Figure 2**):

- **2015 DEIS Alternative 1 (The Original Application)** includes the construction of 800 multifamily units, 21,600 square feet of retail, 245,000 square feet of office, 9,000 square feet of restaurant space and parking for 2,171 vehicles. Vehicular access would be provided via a new access drive onto Ripley Lane and the extension of NE 43rd Street (existing Barbee Mill access).

In addition to the 2015 DEIS Alternative 1 described above, the following alternatives were analyzed as part of this project:

- **2015 DEIS Alternative 2 (Lower Density Alternative)** includes the construction of 708 multifamily units, 21,600 square feet of retail, 9,000 square feet of restaurant space and parking for 1,362 vehicles. Vehicular access would be provided via a new access drive onto Ripley Lane and the existing Barbee Mill access on Lake Washington Boulevard, similar to Alternative 1. *Note: A Preferred Alternative was developed by the applicant for this EIS Addendum. A separate section at the end of this study addresses the relative impacts of the Preferred Alternative given its similarities to Alternative 2 that was evaluated in the Quendall Terminals DRAFT Environmental Impact Statement.*
- **2015 (No Action Alternative, No Development).** This is the Baseline Alternative with no development assumed on-site at this time.

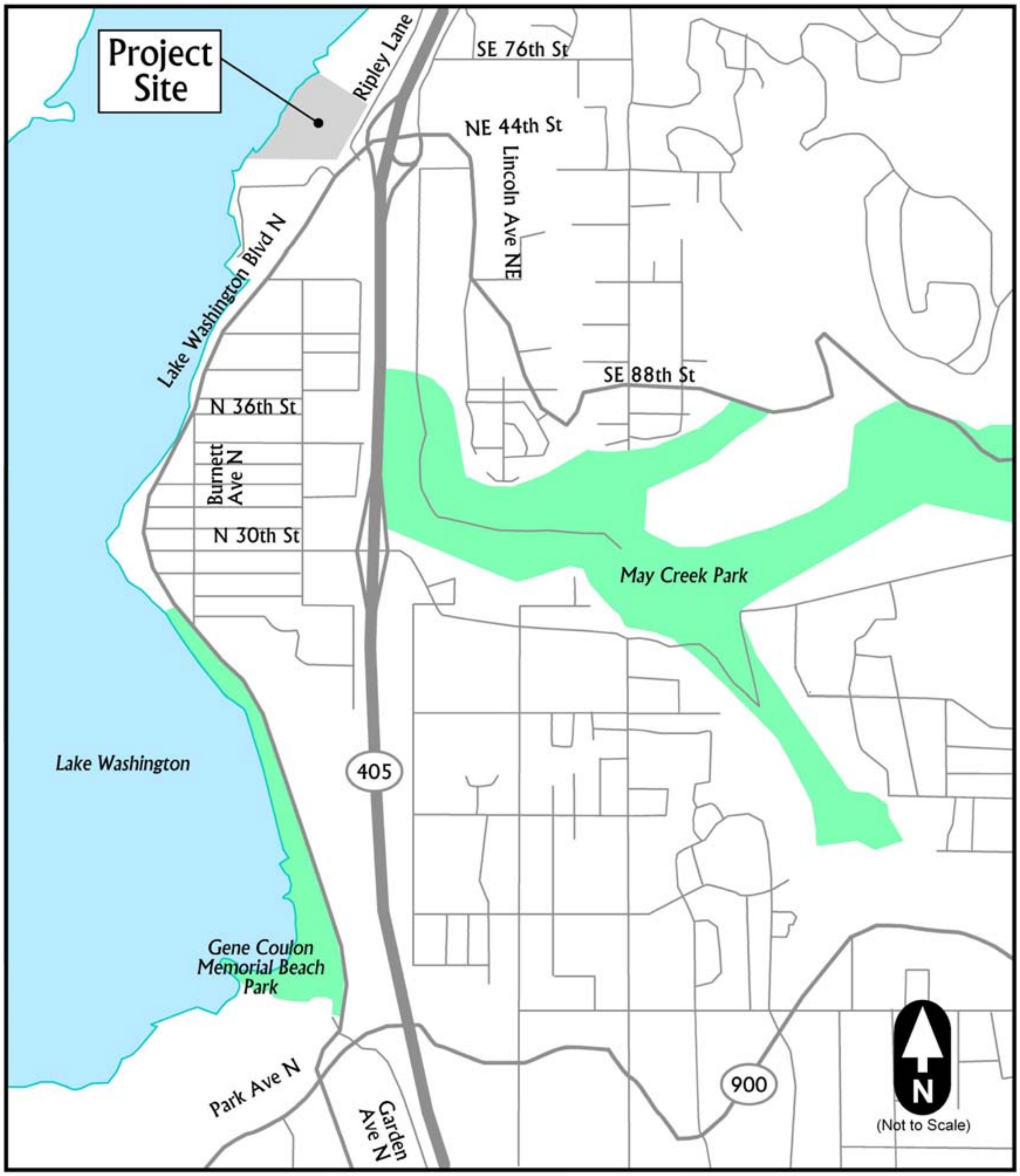

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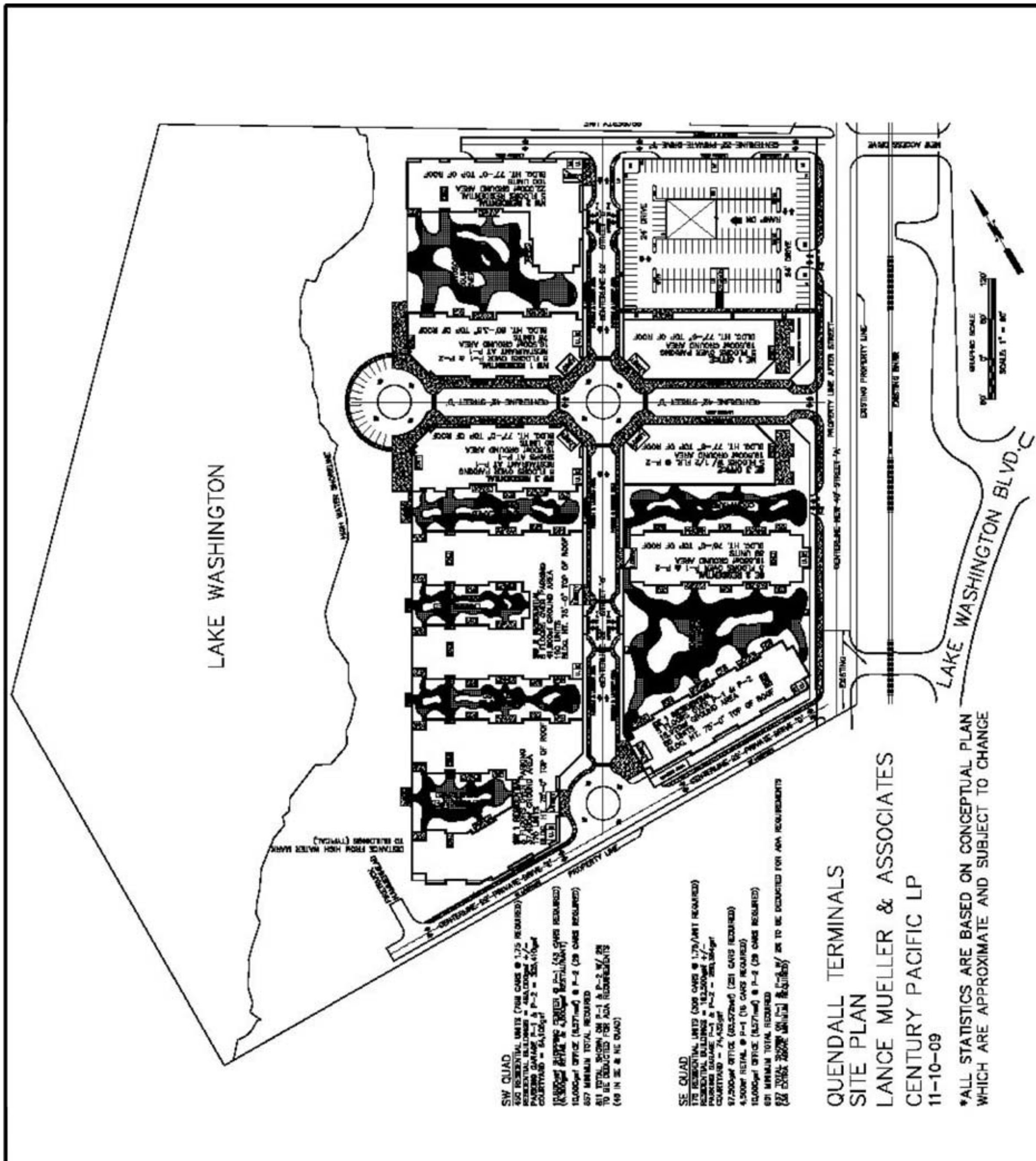
Figure 1
Project Site Vicinity

Quendall Terminals EIS Addendum

Renton, WA

June 12, 2012



Transportation Engineering NorthWest, LLC	Figure 2 DEIS Alternative 1 Site Plan	Quendall Terminals EIS Addendum Renton, WA June 12, 2012

EXISTING CONDITIONS

This section describes existing transportation system conditions in the study area. It includes an inventory of existing roadway conditions, intersection traffic control, traffic volumes, intersection levels of service, public transportation services, nonmotorized transportation facilities, and planned roadway improvements.

Roadway Conditions

The following paragraphs describe existing arterial roadways that would be used as major routes for site access. Roadway characteristics are described in terms of facility type, number of lanes, posted speed limits and shoulder types and widths.

Lake Washington Boulevard is classified as a collector arterial between N Park Drive and I-405. Travel lanes are 11 feet in width with 5-foot bike lanes on both side of the street. A paved 4-foot shoulder exists on the west side of the street and is designated for pedestrians. No parking is allowed on either side of the street. The posted speed limit is 25 mph.

NE 44th Street between the NB and SB I-405 ramp intersections is classified as a collector arterial. Travel lanes are 13-14 feet in width. On the approaches to the I-405 overpass paved shoulders exists on both sides of the street. No parking is allowed on either side of the street.

Ripley Lane is a local access street with two 11 foot travel lanes in each direction. A paved 5 foot shoulder exists on the west side of the street. No parking is allowed on either side of the street. The posted speed limit is 25 mph.

Intersection Traffic Control and Channelization

Based on estimated trip distribution under the 2015 year network scenarios (with and without I-405 Improvements), up to nine study intersections were analyzed, including:

1. Lake Washington Boulevard (I-405 NB ramps) / NE 44th Street
2. I-405 SB ramps / NE 44th Street
3. Lake Washington Boulevard / Ripley Lane
4. Lake Washington Boulevard / Barbee Mill Access (N 43rd Street)
5. Lake Washington Boulevard / Hawks Landing Access (future intersection)
6. Lake Washington Boulevard / N 36th Street / Burnett Avenue N
7. N 30th Street / Burnett Ave N (without I-405 Improvements Scenario only)
8. Lk Wa Blvd / Burnett Ave N (without I-405 Improvements Scenario only)
9. Lk Wa Blvd / Park Ave N / Garden Ave N

Figure 3 identifies the locations of the 9 off-site study intersections. Existing intersection channelization and traffic control are illustrated in **Figure 4** for all study intersections.

Existing Traffic Volumes

Peak hour traffic volumes represent the highest hourly volume of vehicles passing through an intersection during a typical 7-9 a.m. and 4-6 p.m. weekday peak periods. Peak period turning movement counts at study intersections were conducted in 2009, 2010 and 2012. **Figure 5** summarizes the existing a.m. and p.m. peak period turning movements at all study intersections.

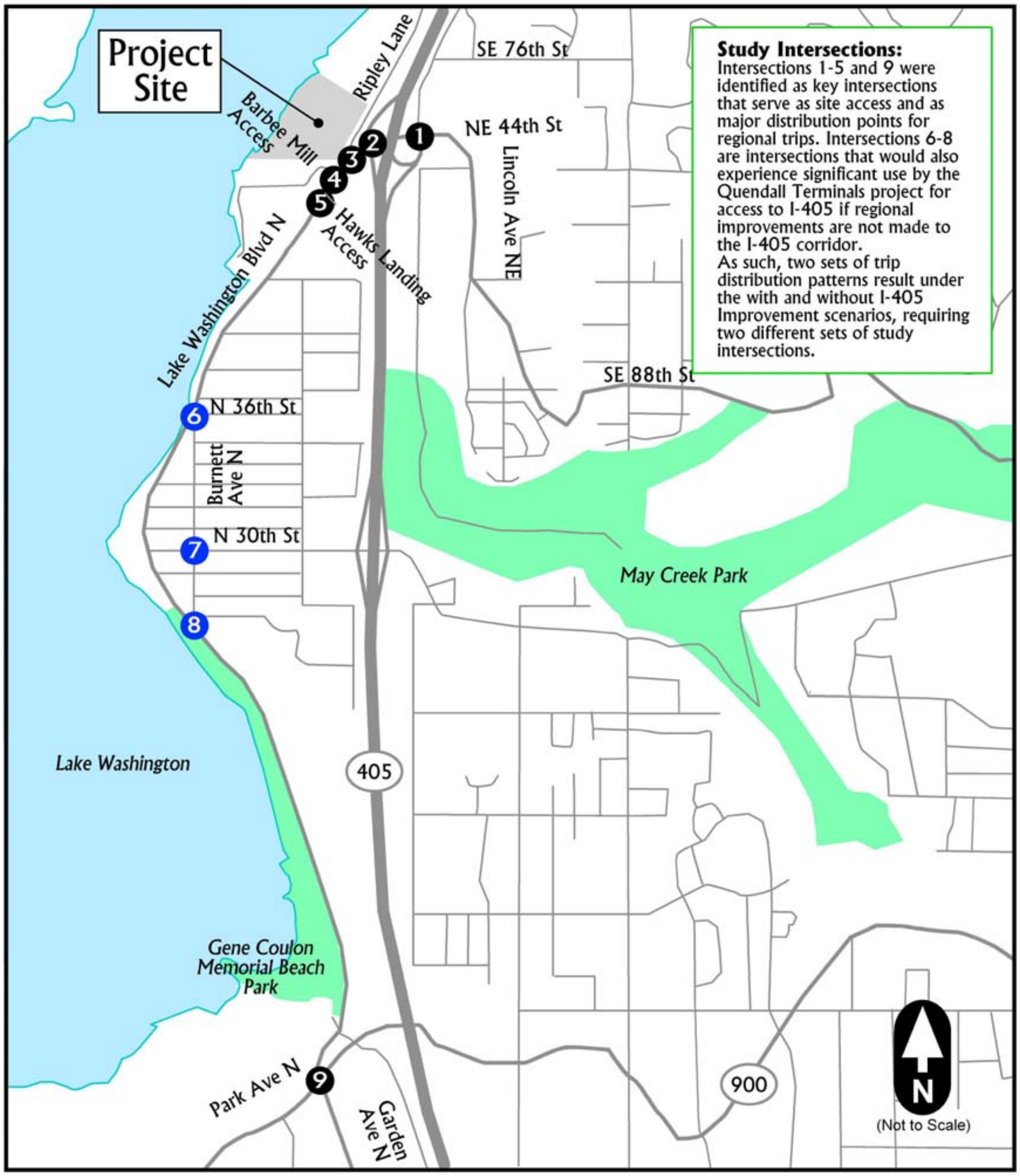


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Figure 3
Study Intersection Locations

Quendall Terminals EIS Addendum

Renton, WA

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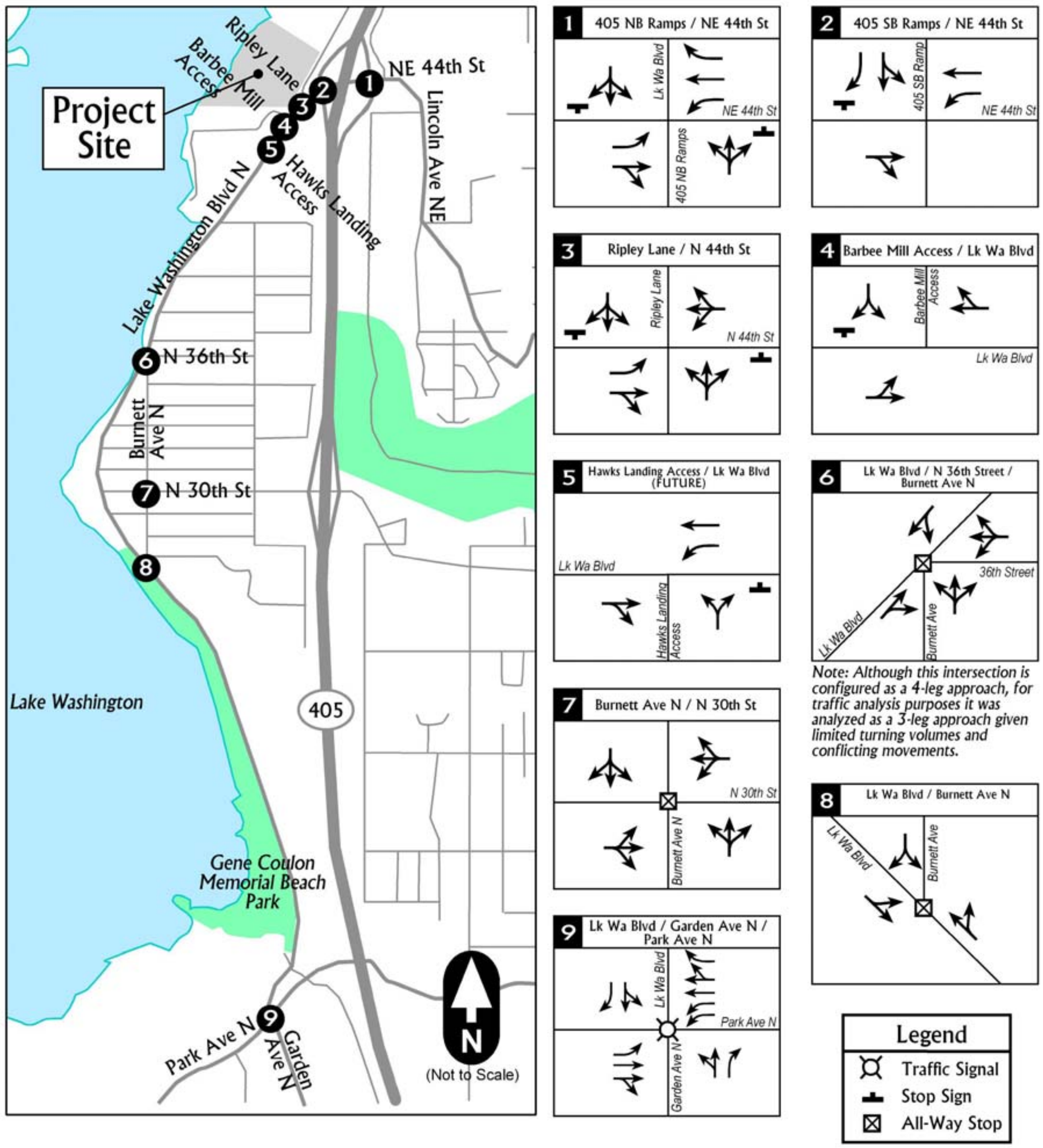

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Figure 4
Existing Channelization and Traffic Control

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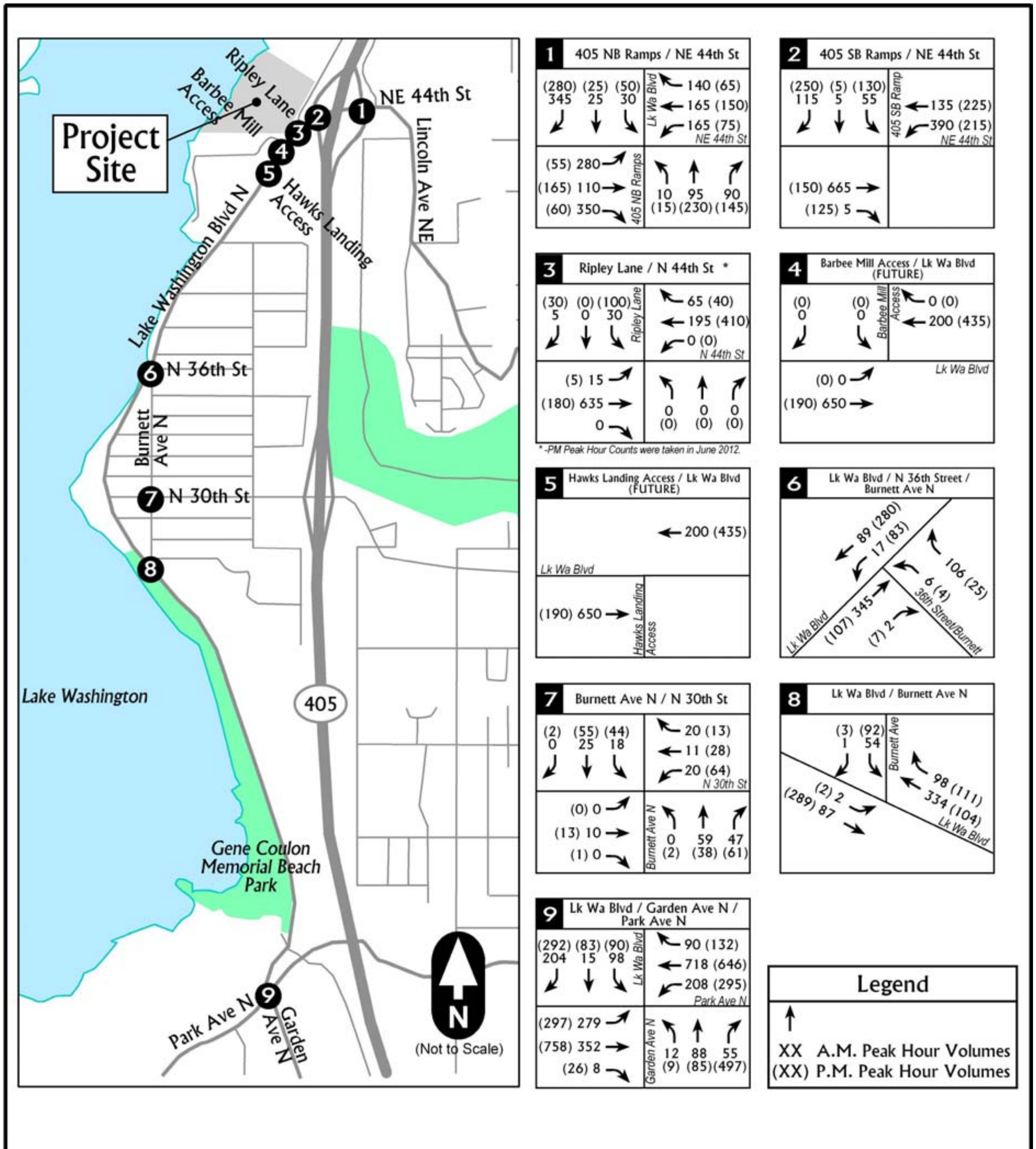

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Figure 5
Existing Peak Hour Traffic Volumes

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Existing traffic counts at study intersections 1-5 were obtained from the *Quendall Terminals Traffic Impact Analysis* dated November 2009. Existing traffic counts at study intersections 6-9 were conducted in June 2010, and again at Intersection 3 in June 2012 by All Traffic Data (ATD) to calibrate historical data.

Intersection Level of Service

Level of service (LOS) serves as an indicator of the quality of traffic flow at an intersection or road segment. The LOS grading ranges from A to F, such that LOS A is assigned when minimal delays are present and low volumes are experienced. LOS F indicates long delays, heavy volumes, and increased traffic congestion. **Table 1** summarizes the criteria for the delay range for each level of service at signalized and unsignalized intersections. The methods used to calculate the levels of service are described in the updated *2000 Highway Capacity Manual* (Special Report 209, Transportation Research Board). The measure of effectiveness for signalized intersections is average control delay, defined as the total time vehicles are stopped at an intersection approach during a specified time period divided by the number of vehicles departing from the approach in the same time period.

Level of service for signalized intersections is defined in terms of control delay, which is a measure of driver discomfort, frustration, and increased travel time. The delay experienced by a motorist is made of up a number of factors that relate to traffic control, geometries, traffic demand, and incidents. Total control delay is the difference between the travel time actually experienced and the *reference travel time* that would result during base conditions (i.e., the absence of traffic control, geometric delay, any incidents, or as a result other vehicles). LOS F at signalized intersections is often considered unacceptable to most drivers, but does not automatically imply that the intersection is over capacity. Jammed conditions could occur on one or all approaches, with periods of long delays and drivers waiting for multiple signal cycles to progress through the intersection. The City of Renton does not have a formally adopted level of service standard, but measures level of service on a travel time basis. For the purposes of the traffic impact analysis, LOS E was assumed as the threshold at signalized intersections.

For unsignalized intersections, a level of service and estimate of average control delay is determined for each minor or controlled movement based upon a sequential analysis of gaps in the major traffic streams and conflicting traffic movements. In addition, given that unsignalized intersections create different driver expectations and congestion levels than signalized intersections, their delay criteria are lower. Control delay at unsignalized intersections include deceleration delay, queue move-up time, stopped delay in waiting for an adequate gap in flows through the intersection, and final acceleration delay.

Table 1: Level of Service Criteria for Signalized and Unsignalized Intersections

	Signalized Intersection	*Unsignalized Intersection*
Level of Service	**Delay Range (sec)**	**Delay Range (sec)**
A	≤ 10	≤ 10
B	> 10 to ≤ 20	> 10 to ≤ 15
C	> 20 to ≤ 35	> 15 to ≤ 25
D	> 35 to ≤ 55	> 25 to ≤ 35
E	> 55 to ≤ 80	> 35 to ≤ 50
F	≥ 80	≥ 50

Source: "Highway Capacity Manual", Special Report 209, Transportation Research Board, 2000, Update.

Synchro 6, Traffic Signal Coordination Software program was used to develop network scenarios in evaluating level of service analysis at the study intersections. Signal cycle lengths and splits were optimized to assume adjustments in optimum performance over time. Use of the *Synchro 6* software program was consistent with the *2000 Highway Capacity Manual.*

Table 2 highlights existing 2009/2010 a.m. and p.m. peak hour levels of service at study area intersections. During the a.m. peak hour, Intersection #1 – Lk Wa Blvd (I-405 NB ramps) / NE 44th Street operates at LOS E and the southbound movement at Intersection #2 – I-405 SB ramps / NE 44th Street operates at LOS F. During the p.m. peak hour, all intersections operate at LOS C or better. Detailed level of service summary sheets are provided in **Appendix A**.

Table 2: Existing 2009-2010 Peak Hour Intersection Level of Service

A.M. Peak Hour				
Int.#	**Unsignalized Intersections**	**LOS**	**Delay**	**V/C**
1	Lake Wa Blvd (I-405 NB Ramps)/NE 44th St	E	48	-
2	I-405 SB Ramps/NE 44th Street	SB-F	>100	2.32
3	Ripley Lane/NE 44th Street	SB-D	26	0.20
6	Lk Wa Blvd/N 36th Street	B	11	-
7	N 30th Street/Burnett Ave N	A	8	-
8	Lk Wa Blvd/Burnett Ave N	B	13	-
Int.#	**Signalized Intersections**	**LOS**	**Delay**	**V/C**
9	Lake Wa Blvd-Garden Ave N/Park Ave N	B	17	0.66
P.M. Peak Hour				
Int.#	**Unsignalized Intersections**	**LOS**	**Delay**	**V/C**
1	Lake Wa Blvd (I-405 NB Ramps)/NE 44th St	C	18	-
2	I-405 SB Ramps/NE 44th Street	SB-C	22	0.61
3	Ripley Lane/NE 44th Street	SB-C	18	0.32
6	Lk Wa Blvd/N 36th Street	A	10	-
7	N 30th Street/Burnett Ave N	A	8	-
8	Lk Wa Blvd/Burnett Ave N	A	10	-
Int.#	**Signalized Intersections**	**LOS**	**Delay**	**V/C**
9	Lake Wa Blvd (Garden Ave N)/Park Ave N	C	26	0.81

Note: Analysis based on Synchro results using HCM 2000 control delays and LOS.
Unsignalized intersections show LOS and control delays for the worst directional movement.

Public Transportation Services

No public transit service is currently provided in the project site vicinity. The closest transit service in the vicinity is provided via a dial-a-ride service area and fixed route service in the vicinity of the NE 30th Street interchange and I-405.

Nonmotorized Transportation Facilities

Nonmotorized transportation facilities in the area include striped bike lanes on Lake Washington Boulevard. Lake Washington Boulevard also includes a paved 4-5 foot shoulder on the west side of the street designated for pedestrians. There are no nonmotorized transportation facilities on the project site. The existing railroad corridor to the east of the site was recently purchased by the Port of Seattle. The City's recently adopted *Renton Trails and Bicycle Master Plan, 2009* identifies this rail corridor near this site as a future "rails to trails" planned trail.

Planned Transportation Improvements

The section identifies planned transportation improvements for roadways and intersections that would be impacted by trips generated by the proposed development. They have been identified in planning documents for the City of Renton and WSDOT. While these improvements are identified as "planned", they have yet to receive full funding and therefore, timing of such improvements is unknown at this time.

The City of Renton's *2010-2015 Transportation Improvement Program (TIP)* identified the following transportation improvement in the study area that affects study intersections:

- **Lake Washington Blvd. at Park Ave N/Garden Ave N.** This project includes minor widening and reconfiguration to provide dual eastbound left turn lanes.

WSDOT has identified improvements to the I-405/NE 44th interchange as part of the *I-405 Renton to Bellevue Project (SR 169 to I-90).* The improvements to the I-405/NE 44th interchange include:

- Reconfiguring the NE 44th Street interchange into a tight-diamond configuration.
- Relocating both NB and SB ramps with additional through and turn-lanes.
- Addition of traffic signals at both NB and SB ramp intersections.
- Addition of a traffic signal at Ripley Lane/Lake Washington Boulevard. *While widening of NE 44th Street west of Ripley Lane is identified in the latest I-405 IMPROVEMENTS drawing, this widening assumes it extends approximately 100 feet west of Ripley Lane and therefore, no channelization capacity was assumed to occur at this intersection.*

TRANSPORTATION IMPACTS

The following section describes transportation impacts of the 2015 buildout EIS alternatives of the *Quenall Terminals* site on the surrounding arterial network. The discussion includes baseline transportation network assumptions, baseline travel demand forecasts, new trips generated by the alternatives, distribution and assignment of new project trips, review of intersection level of service impacts, an evaluation of site access and circulation issues, and an analysis of public transportation and nonmotorized transportation impacts. As a worst case scenario, the land use associated with Alternative 1 was used in the analysis as this alternative generates the highest number of vehicle trips.

Baseline Transportation Network Assumptions

The future baseline transportation networks were based upon consistency with planned infrastructure in the study area. Two future 2015 baseline transportation networks were included in the analysis. The two future baseline evaluation scenarios included with and without planned improvements at the I-405/NE 44th Street interchange.

Baseline Travel Demand Forecasts

Baseline travel demand forecasts were prepared for 2015 using land use and travel demand forecasting information from the City of Renton. The following paragraphs outline, in further detail the transportation forecast and refinement process used for the *Quendall Terminals* DEIS.

City of Renton 2015 EMME Model

The most appropriate travel demand forecasting tool available at the time of the study was the City of Renton 2015 EMME Travel Model. The City's model was recently completed in May 2010 and calibrated to 2008 existing conditions. The model contained the most up to date information on land use forecasts for the study area, the City of Renton, and surrounding vicinity, and evaluated future networks with and without I-405 Improvements.

Model Refinement and Manual Forecast Adjustments

Two future year forecast scenarios were reviewed by TENW as generated by the City of Renton 2015 EMME Travel Model. The specific transportation analysis zone (TAZ) for *Quendall Terminals* within the City's EMME model accounted for a majority of trips assigned to the roadway network. This TAZ consisted of the following future development projects that are planned or in the pipeline:

- Quendall Terminals,
- Barbee Mill,
- Hawks Landing, and
- Other vicinity background traffic growth.

Note: The background growth accounted for 15 percent of all trips assigned to this TAZ (which assumes a 2 to 3 percent annual background growth rate between 2009/2010 to 2015).

Under both future scenarios (with and without the I-405 Improvement projects), all trips from the City's EMME model were removed from the roadway network except for trips under the Without I-405 Improvements scenario, which assumed the 15 percent background growth. Turning movements of trips from Barbee Mill, Hawks Landing, and the Kennydale Apartment projects were added to the roadway network at each off-site study intersection under both future scenarios to determine 2015 baseline forecasts as projected in original traffic studies prepared for these entitled developments. **Figures 6 and 7** illustrate the trip distribution assumptions associated with this new pipeline development without and with I-405 Improvements.

For *Quendall Terminals*, existing turning movement counts conducted at all off-site study intersections during p.m. peak hours were used as "existing 2009 or 2010 conditions." Comparing the 2008 and 2015 assignments from the City's EMME model assuming two future network scenarios (Without and With Regional I-405 Improvements), Fratar approximation factors were developed, applied, and calibrated into a Fratar spreadsheet model. The Fratar model was then used to adjust traffic forecasts associated with the two future networks to estimate the redistribution of future background traffic level associated with intersection and arterial improvements. 2015 baseline forecasts under the With I-405 Improvements scenario determined that a negative or stabilized growth between existing conditions and baseline forecasts with a majority of traffic utilizing I-405 and traffic diminishing or stabilizing on side streets.

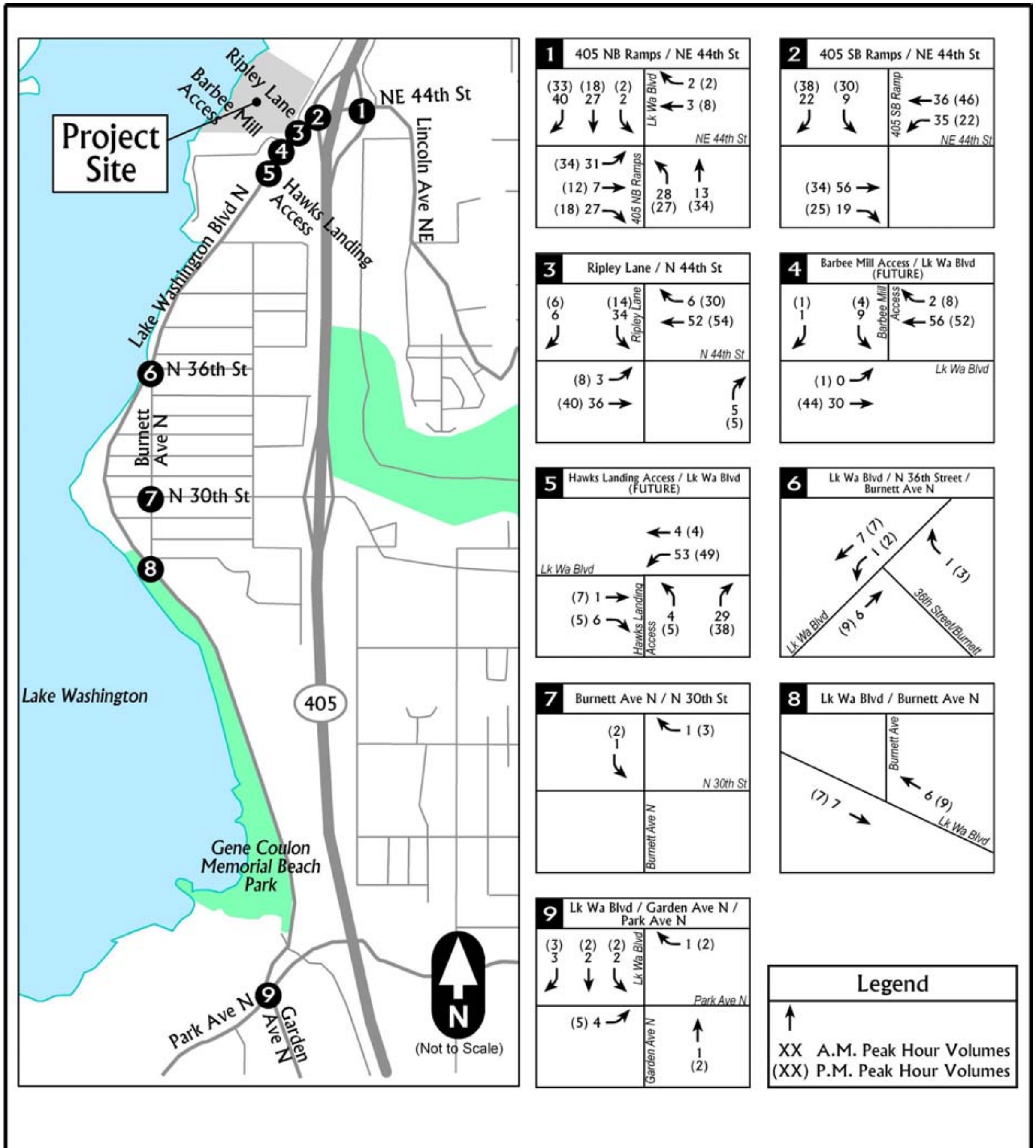

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Figure 6
Pipeline Development Peak Hour Traffic Volumes (Without I-405 Improvments)

Quendall Terminals EIS Addendum
Renton, WA
August 28, 2012

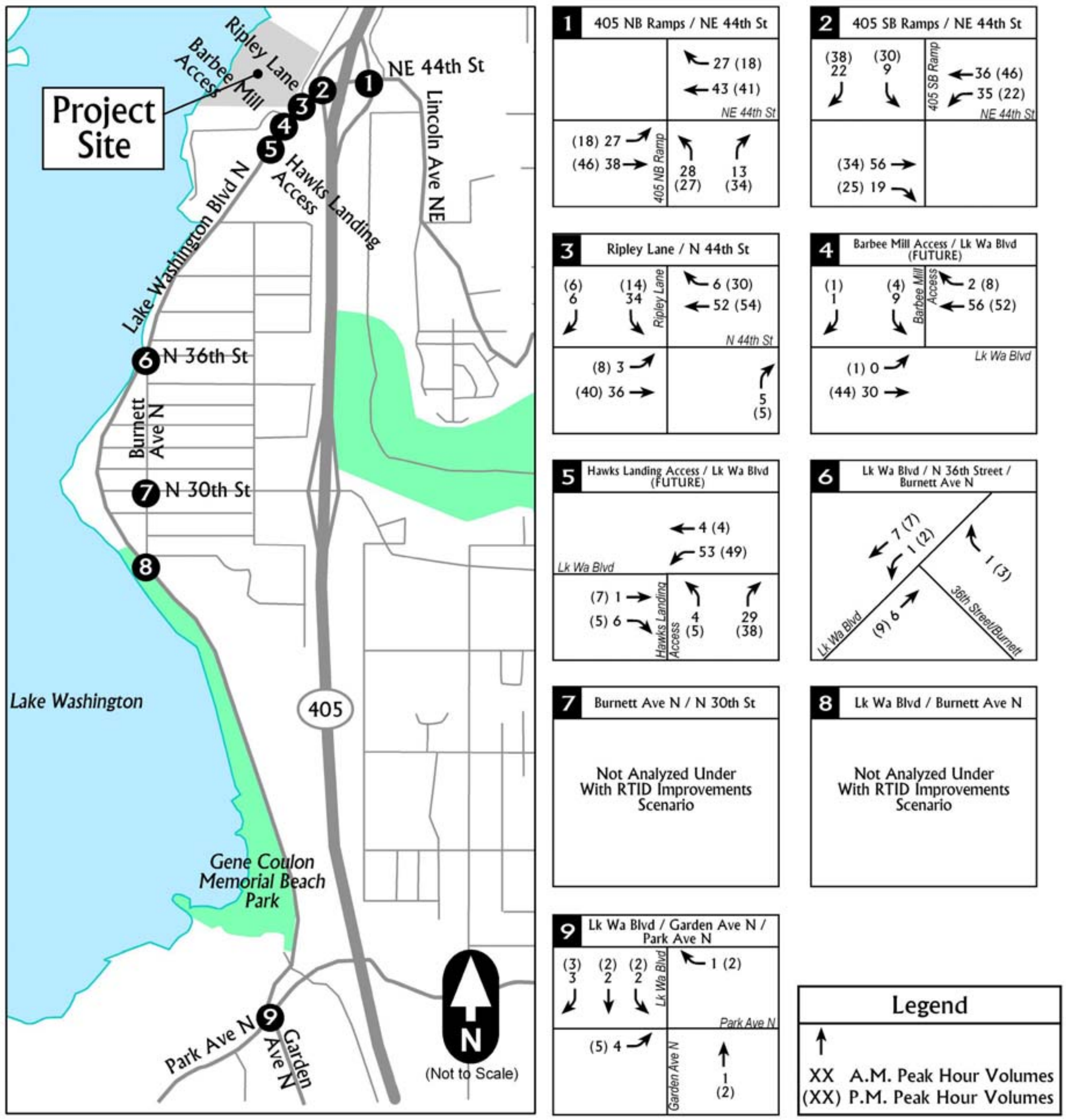

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Figure 7
Pipeline Development Peak Hour Traffic Volumes (With I-405 Improvments)

Quendall Terminals EIS Addendum
Renton, WA
August 28, 2012

Given the shift in background traffic levels forecasted to occur on Lake Washington Boulevard and other vicinity arterial streets with and without I-405 Improvements, no adjustments to original traffic assignments for pipeline projects were made as regional shifts are forecast to be significant and account for any fluctuations in distribution from these minor pipeline projects.

Intersection-Level Baseline Traffic Forecasts

At the intersection level, a Fratar growth factoring process using successive approximations was used to forecast future interchange intersection turning movements[1]. First published in the 1954 *Highway Research Board Proceedings*, by Thomas J. Fratar, this forecasting distribution method is recognized by the transportation planning/engineering industry as an accepted practice and has been applied successfully on many transportation planning and engineering projects. Originally developed to distribute interzonal vehicular trips at a regional or subarea level, the process was later adapted for use in forecasting intersection turning movements. The objective of the successive approximation method is to determine the most logical distribution of vehicle trips expected through an intersection, given future conditions of regional development or redistribution of traffic related to infrastructure investment.

The procedure is not concerned with the specific techniques and processes used in regional land use and travel demand estimation, which must be prepared regardless of the method used for estimating future trip distributions through an intersection. The procedure does require that arterial-level regional or local forecasts be available to factor the relative changes in traffic entering and leaving a particular intersection or interchange system in a future forecast year.

Steps used to estimate the distribution of forecast trips include the following:

1. Identify relative growth factors between existing and future year conditions for all entering and exiting approaches of an intersection.
2. Distribute the total trips from each entering/exiting approach among the various movements in proportion to the attractiveness of each movement as indicated by variations in growth factors of each intersection leg.
3. The first distribution step produces two tentative results for each intersection turning movement. These tentative pairs are averaged to obtain the first approximation.
4. For each intersection approach, the sum of the first approximation volume is divided into the total volume of each intersection leg to obtain a first approximation growth factor, which will be used in the computation of a second approximation process.
5. The original movements for each intersection leg are then distributed into turning movements again in proportion to the turning movements and growth factors obtained in the first approximation process. These volumes are then averaged again, and the process is repeated until conformity or an intersection balance is reached often around 3 or 4 successive distribution estimations are completed. However, to ensure uniformity, the spreadsheet model developed to forecast turning movements uses 10 successive distribution runs prior to generation of a final turning movement estimate.

The resultant a.m. and p.m. peak hour turning movement forecasts at all study intersections in 2015 are provided in **Appendix B**.

1 *Forecasting Distribution of Interzonal Vehicular Trips by Successive Approximations*, Highway Research Board Proceedings, Thomas J, Fratar, 1954, pages 376-384.

Trip Generation of Development

Project trip generation was estimated for DEIS Alternative 1 and DEIS Alternative 2. Trip generation rates compiled by the Institute of Transportation Engineers (ITE) *Trip Generation,* 8th Edition, 2008, were used to estimate daily, a.m. and p.m. peak hour vehicular trip generation with redevelopment of the site. In response to DEIS scoping comments, the City of Renton requested that trip rates generated by residential uses be factored by 10 percent to account for no existing public transit services or commercial businesses in the immediate site vicinity. As such, the trip generation assumptions presented below should be considered conservative.

In addition, average pass-by rates for the proposed retail uses identified in the ITE *Trip Generation Handbook 2nd Edition*, June 2004 were used. Reductions from the gross trip generation of the proposed uses were taken to account for internal captured trips within the site. Internal trips are made by people making multiple stops within a development without generating new trips onto the adjacent street system. The internal trip reductions were based on the methodology established in the ITE *Trip Generation Handbook*. Specific assumptions and methodologies for each redevelopment alternative are summarized below.

2015 DEIS Alternative 1 –The Original Application

2015 DEIS Alternative 1 (The Original Application) would include the construction of 800 multifamily units, 21,600 square feet of retail, 245,000 square feet of office, 9,000 square feet of restaurant space and parking for 2,171 vehicles. For trip generation estimation, the proposed multifamily residential units would likely include both rental apartments and condominiums. As the breakdown of these units is unknown at this time, the trip generation rate associated with Apartments was used as this represents a conservative trip generation rate. As such, average trip rates for Apartments (ITE land use code 220), Shopping Center (ITE land use code 820), General Office Building (ITE Land use code 710), and High-Turnover (Sit-Down) Restaurant were used as the basis for estimating vehicular trips.

As shown in **Table 3**, a net total of approximately 9,000 daily, 865 a.m. peak hour (445 entering, 420 exiting), and 950 p.m. peak hour vehicular trips (440 entering and 510 exiting) would be generated at 2015 full buildout conditions under DEIS Alternative 1.

Table 3: 2015 DEIS Alternative 1 (The Original Application) Project Trip Generation

Land Use	ITE Land Use Code [1]	Size [2]	A.M. Peak			P.M. Peak			Daily Trip Generation
			Enter	Exit	Total	Enter	Exit	Total	
Apartments	220	800 DU	82	326	408	322	174	496	5,320
10% Factor on Residential Uses			*8*	*32*	*40*	*32*	*16*	*48*	*536*
Retail	820	21,600 square feet GLA	13	9	22	40	41	81	928
Office	710	245,000 square feet GFA	334	46	380	62	303	365	2,697
Restaurant	932	9,000 square feet GFA	54	50	104	59	41	100	1,144
2015 Full Buildout Gross Trip Generation			**491**	**463**	**954**	**515**	**575**	**1,090**	**10,625**
Less Internal Trips [3]			*-22*	*-22*	*-44*	*-45*	*-45*	*-90*	*-1,152*
Less Pass-By Trips [3]			*-24*	*-20*	*-44*	*-28*	*-21*	*-49*	*-491*
2015 Full Buildout Net Trip Generation			**445**	**421**	**866**	**442**	**509**	**951**	**8,982**

1. Trip rates based on ITE *Trip Generation Manual*, 8th Edition, 2008.
2. DU is Dwelling Unit, GFA is Gross Floor Area, and GLA is Gross Leasable Area.
3. Internal and pass-by determined based upon documented average rates from ITE Trip Generation Handbook, June 2004.

2015 DEIS Alternative 2 – Lower Density Alternative

2015 DEIS Alternative 2 (Lower Density Alternative) would include the construction of 708 multifamily units, 21,600 square feet of retail, 9,000 square feet of restaurant space and parking for 1,362 vehicles. Average trip rates for Apartments (ITE land use code 220), Shopping Center (ITE land use code 820), and High-Turnover (Sit-Down) Restaurant were used as the basis for estimating vehicular trips.

As shown in **Table 4**, a net total of approximately 5,800 daily, 445 a.m. peak hour (105 entering, 340 exiting), and 540 p.m. peak hour vehicular trips (350 entering and 190 exiting) would be generated at 2015 full buildout conditions under DEIS Alternative 2.

Table 4: 2015 DEIS Alternative 2 (Lower Density Alternative) Project Trip Generation

Land Use	ITE Land Use Code [1]	Size [2]	A.M. Peak			P.M. Peak			Daily Trip Generation
			Enter	Exit	Total	Enter	Exit	Total	
Apartments	220	708 DU	72	289	361	285	154	439	4,708
10% Factor on Residential Uses			*7*	*28*	*35*	*28*	*14*	*42*	*475*
Retail	820	21,600 square feet GLA	13	9	22	40	41	81	928
Restaurant	932	9,000 square feet GFA	54	50	104	59	41	100	1,144
2015 Partial Buildout Gross Trip Generation			**146**	**376**	**522**	**412**	**250**	**662**	**7,255**
Less Internal Trips [3]			*-18*	*-18*	*-36*	*-35*	*-35*	*-70*	*-952*
Less Pass-By Trips [3]			*-23*	*-20*	*-43*	*-29*	*-22*	*-51*	*-519*
2015 Partial Buildout Net Trip Generation			**105**	**338**	**443**	**348**	**193**	**541**	**5,784**

1. Trip rates based on ITE *Trip Generation Manual*, 8th Edition, 2008.
2. DU is Dwelling Unit, GFA is Gross Floor Area, and GLA is Gross Leasable Area.
3. Internal and pass-by determined based upon documented average rates from ITE Trip Generation Handbook, June 2004.

2015 DEIS Alternative 3 – No Action Alternative Trip Generation

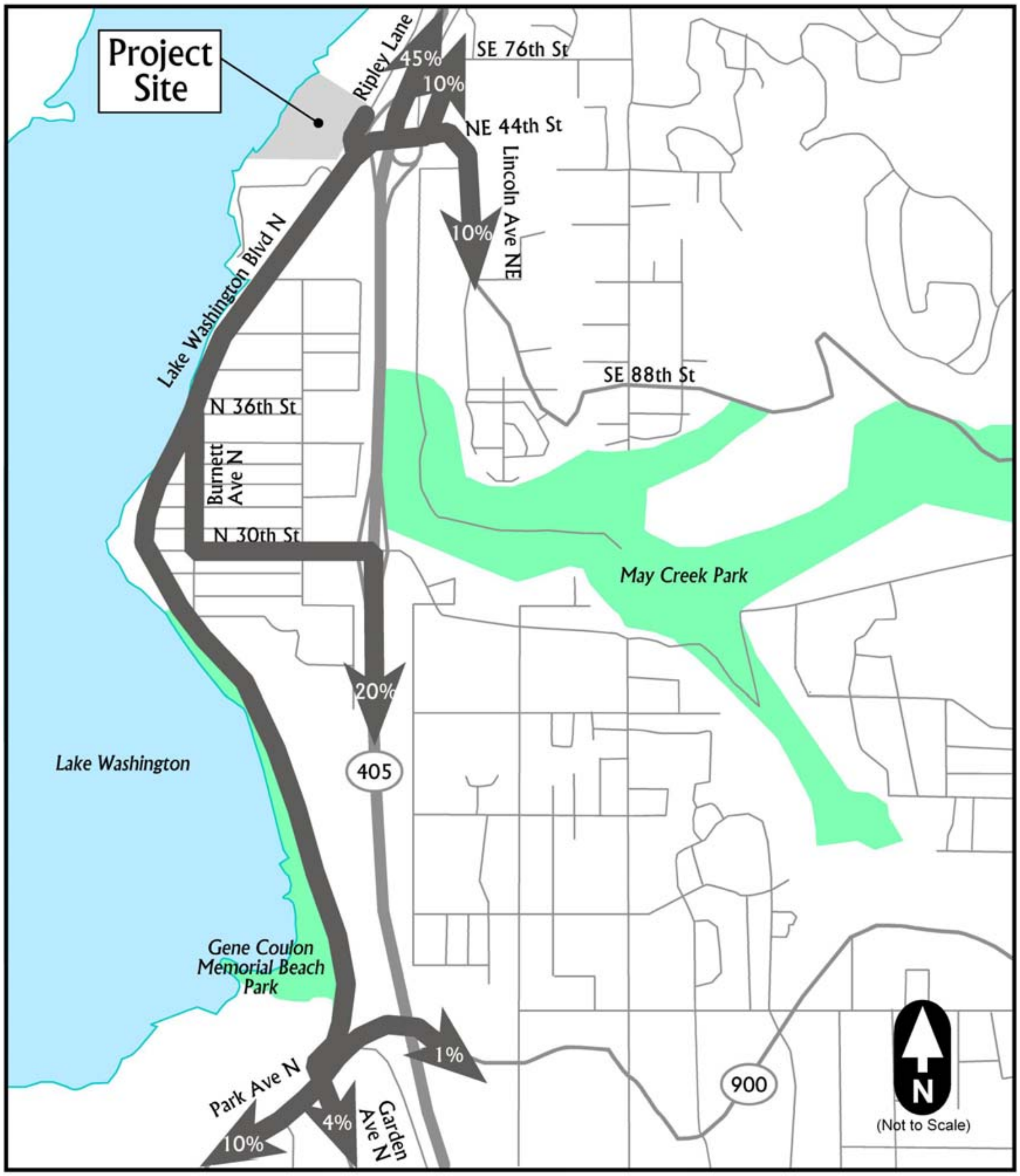
Alternative 3 (No Action) assumes no new development on the site would occur. No trip generation adjustments or assumptions were made for Alternative 3. Alternative 3 reflects the 2015 No Action Baseline Condition.

Trip Distribution and Assignment

For the 2015 DEIS Alternative 1 without I-405 Improvements, project trip distribution was based upon a review of a select zone assignment from the City of Renton EMME Model. Peak hour traffic volumes generated by DEIS Alternative 1 would be generally distributed as follows (distribution shown in **Figure 8** and project-generated trip assignments shown in **Figure 9**):

- 20 percent to the south on I-405 via Lake Washington Blvd, Burnett Ave N, N 30th Street.
- 45 percent to the north on I-405 via NE 44th Street
- 15 percent to the south on Lake Washington Blvd (south of Burnett Ave N).
- 10 percent to the north on Lake Washington Blvd (north of NE 44th Street)
- 10 percent to the east via Lincoln Ave NE.

Given significant freeway/interchange congestion forecasted at the I-405/NE 44th Street interchange without I-405 Improvements, traffic assignments to/from the south of the site are not forecasted to utilize the adjacent interchange, but instead access I-405 at NE 30th Street and travel on other parallel corridors.



Transportation Engineering NorthWest, LLC

Figure 8
Project Trip Distribution Without I-405 Improvements

Quendall Terminals EIS Addendum
Renton, WA
June 12, 2012

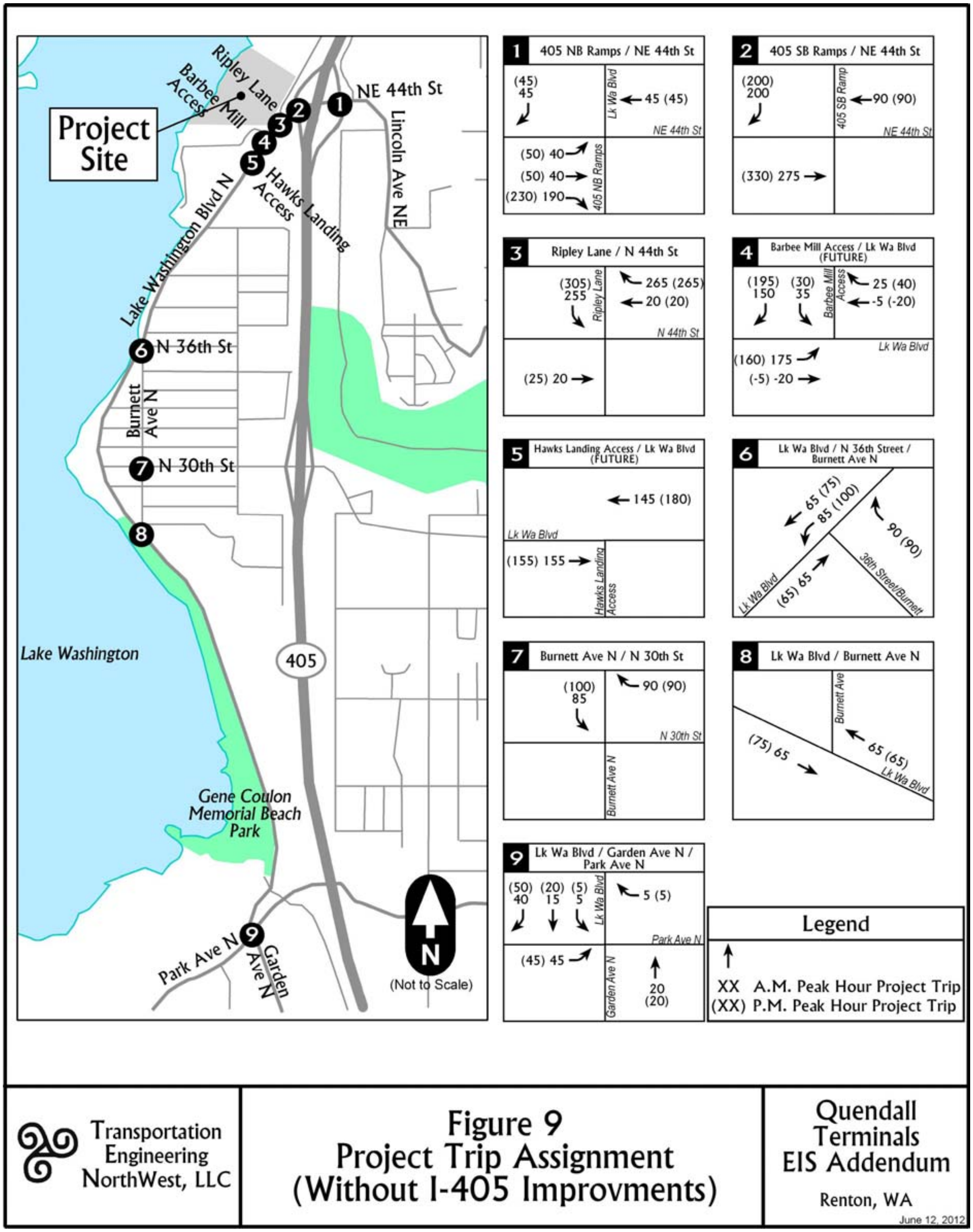


Figure 9
Project Trip Assignment
(Without I-405 Improvments)

For 2015 DEIS Alternative 1 with I-405 Improvements, trip distribution was also based upon a review of a select zone assignment from the City of Renton EMME Travel Demand Model. With I-405 improvements, significant congestion relief is forecasted to occur on I-405 and parallel routes, shifting site-generated traffic back onto the I-405 corridor and the NE 44th Street interchange. Previous diversions of site-generated traffic to both parallel north-south arterials and corridors east of the freeway are reduced to only those origin-destination pairs estimated to occur to the Coal Creek Parkway corridor, Newcastle, and east Renton. Thus, peak hour traffic volumes generated by DEIS Alternative 1 would be generally distributed as follows (distribution shown in **Figure 10** and peak hour project-generated trip assignment shown in **Figure 11**):

- 30 percent to the south on I-405 via NE 44th Street.
- 45 percent to the north on I-405 via NE 44th Street.
- 15 percent to the south on Lake Washington Blvd (south of project site).
- 5 percent to the north on Lake Washington Blvd (north of NE 44th Street).
- 5 percent to the east via Lincoln Ave NE.

As a result of the above-described trip distribution, Intersection #7 - N 30th Street/Burnett Avenue N and #8 - Lake Washington Boulevard/Burnett Avenue are analyzed for the "Without I-405 Improvements" scenario.

Intersection Level of Service Impacts

This section summarizes level of service impacts under DEIS Alternative 1 (The Original Application) and the Baseline Condition (DEIS No Action Alternative). In addition, a sensitivity analysis was conducted under DEIS Alternative 2 (Lower Density Alternative) to determine if under reduced development different transportation improvements were needed. Given existing and future baseline transportation needs of the I-405/NE 44th Street interchange and vicinity (i.e., limited infrastructure to support new development), baseline transportation improvements and mitigation needs of site development under either Alternative would be the same.

Alternative 1 (The Original Application) LOS Impacts

Table 5 summarizes level of service impacts under 2015 DEIS Alternative 1 without I-405 improvements. **Figures 12** and **13** summarize peak hour traffic volumes without (Baseline/No Action) and with the The Original Application (DEIS Alternative 1) in 2015 without I-405 improvements used in the LOS analysis. The following three intersections are expected to operate at LOS E/F under 2015 conditions without I-405 improvements:

- Intersection #1 – Lake Washington Blvd (I-405 NB Ramps) at NE 44th Street (LOS F with or without the development during a.m. and p.m. peak hours).
- Intersection #2 – I-405 SB Ramps) at NE 44th Street (southbound movement at LOS F with or without the development during a.m. and p.m. peak hours).
- Intersection #3 – Ripley Lane / Lake Washington Blvd (southbound movement: LOS E/F with or without the project during the a.m. peak hour, LOS F with the project only during the p.m. peak hour).

Detailed level of service summary sheets are provided in **Appendix A** for all 2015 scenarios.

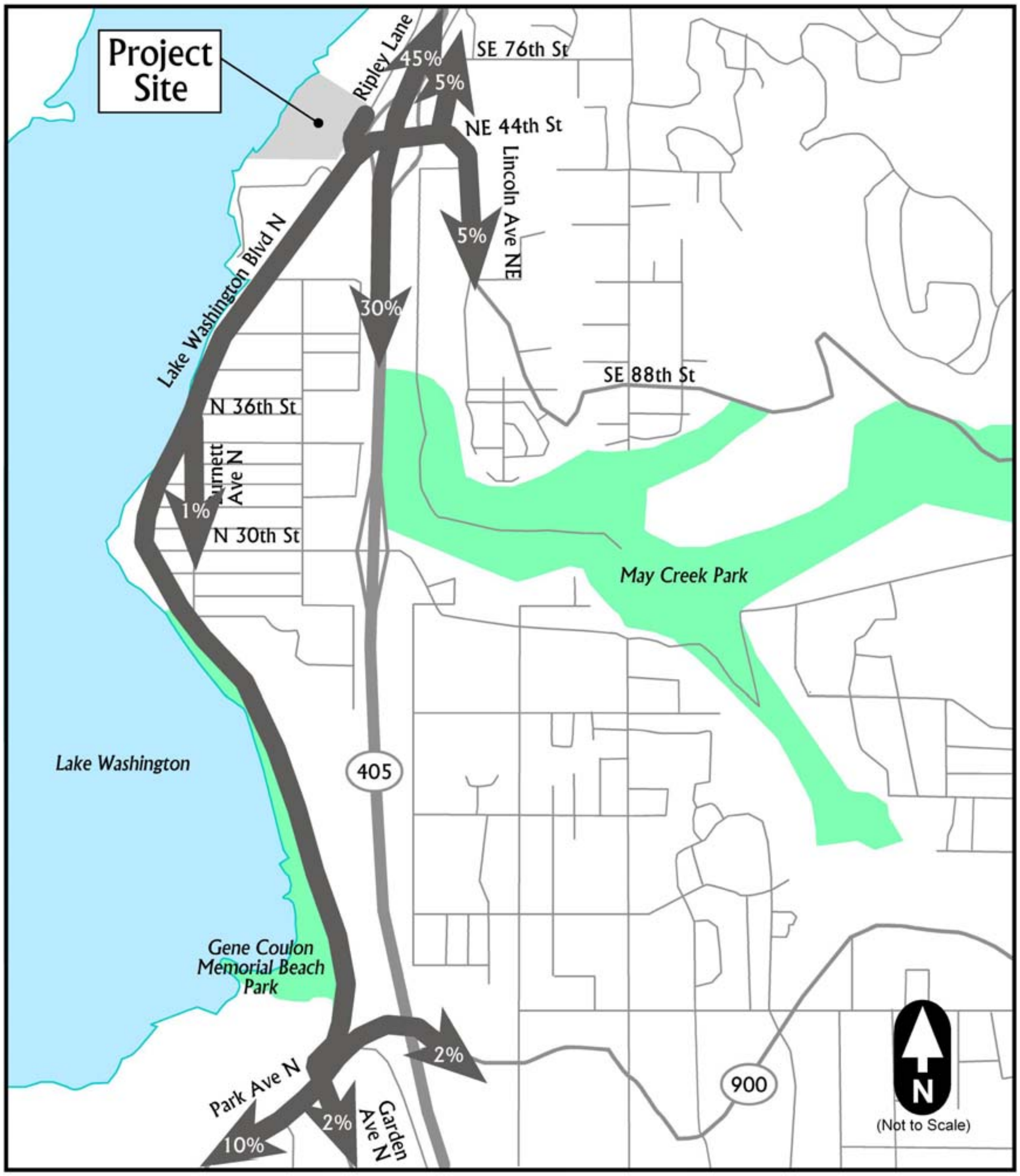


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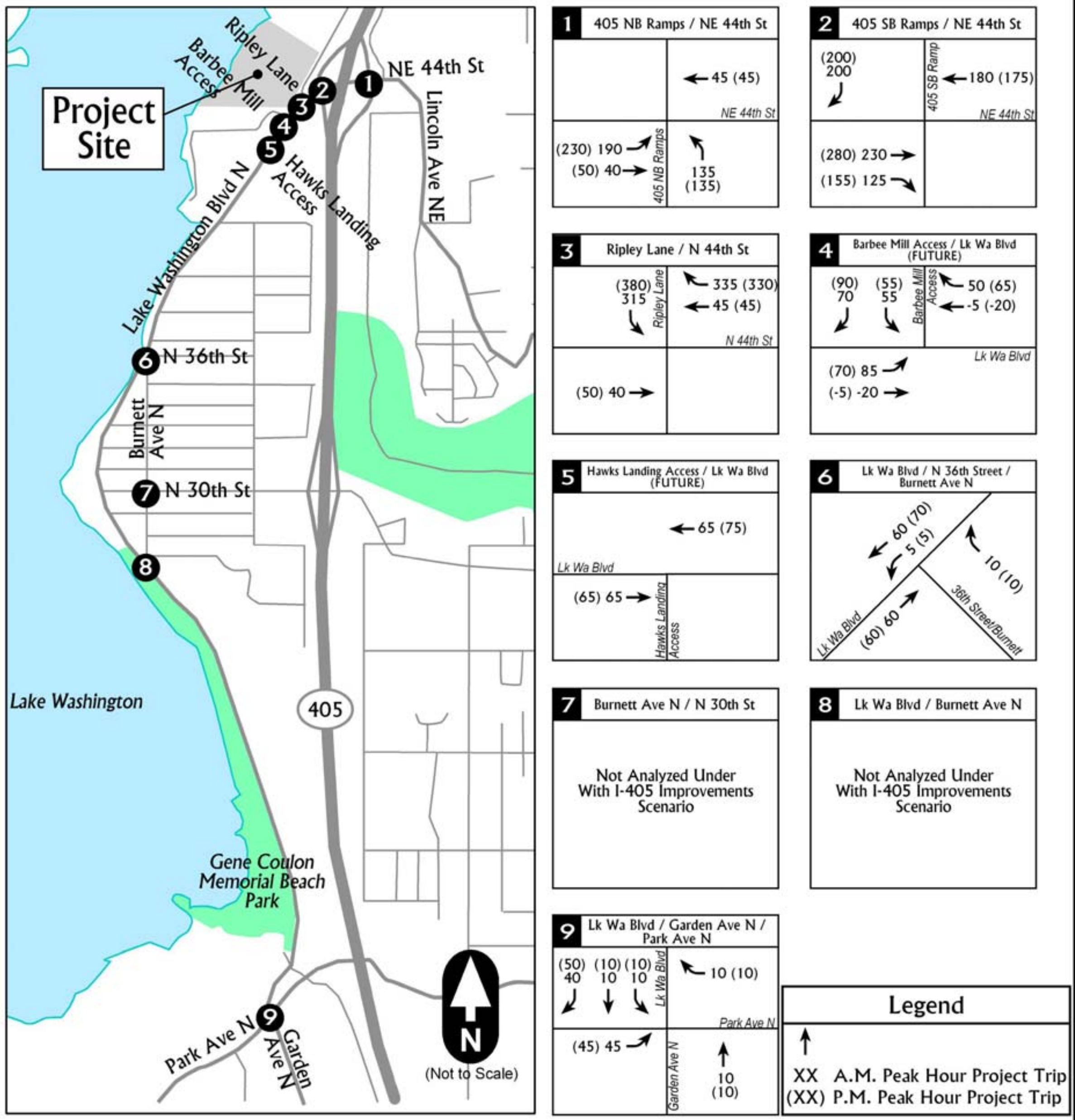
Figure 10
Project Trip Distribution With I-405 Improvements

Quendall Terminals EIS Addendum

Renton, WA

June 12, 2012



Transportation Engineering NorthWest, LLC

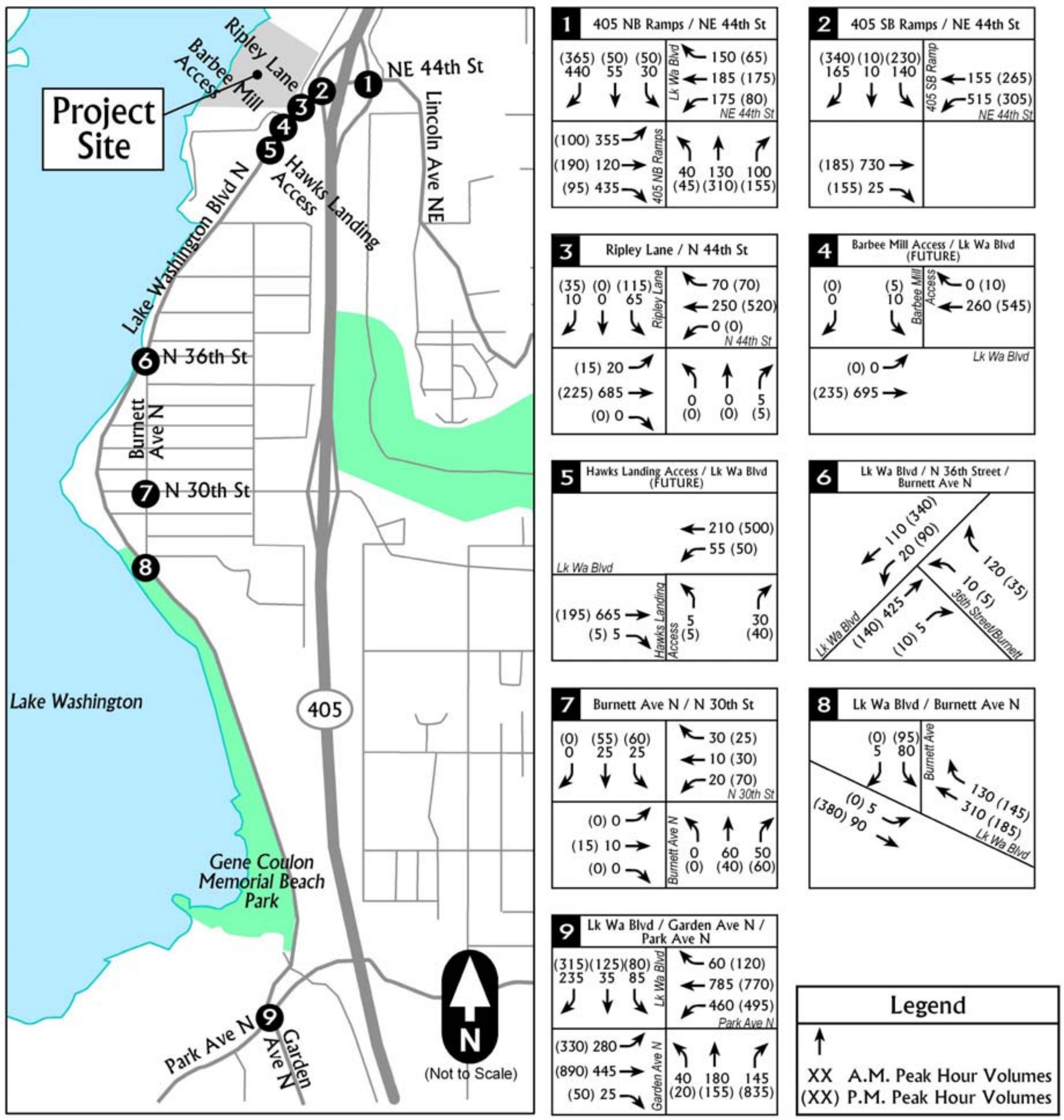
Figure 11
Project Trip Assignment
(With I-405 Improvments)

Quendall Terminals EIS Addendum
Renton, WA
June 12, 2012

Table 5: 2015 Intersection Level of Service Impacts with DEIS Alternative 1 (Without I-405 Improvements)

Int.#	Intersection	2015 Without Project (Baseline/No Action)			2015 With DEIS Alternative 1 (The Original Application)		
		LOS	Delay	V/C	LOS	Delay	V/C
A.M. Peak Hour							
Unsignalized Intersections							
1	Lake Wa Blvd (I-405 NB Ramps)/NE 44th St	F	>100	-	F	>100	-
2	I-405 SB Ramps/NE 44th Street	SB-F	>100	-	SB-F	>100	-
3	Ripley Lane/NE 44th Street	SB-E	36	0.42	SB-F	>100	-
4	Lake Wa Blvd/Barbee Mill Access	SB-C	20	0.04	SB-D	28	0.59
5	Lake Wa Blvd/Hawks Landing Access	NB-C	16	0.10	NB-C	19	0.13
6	Lk Wa Blvd/N 36th Street	B	12	-	C	18	-
7	N 30th Street/Burnett Ave N	A	8	-	A	8	-
8	Lk Wa Blvd/Burnett Ave N	B	11	-	B	13	-
Signalized Intersection							
9	Lake Wa Blvd-Garden Ave N/Park Ave N	C	27	0.68	C	29	0.68
P.M. Peak Hour							
Unsignalized Intersections							
1	Lake Wa Blvd (I-405 NB Ramps)/NE 44th St	F	65	-	F	>100	-
2	I-405 SB Ramps/NE 44th Street	SB-F	>100	-	SB-F	>100	-
3	Ripley Lane/NE 44th Street	SB-D	27	0.50	SB-F	>100	-
4	Lake Wa Blvd/Barbee Mill Access	SB-B	15	0.01	SB-C	25	0.57
5	Lake Wa Blvd/Hawks Landing Access	NB-B	10	0.06	NB-B	12	0.09
6	Lk Wa Blvd/N 36th Street	B	11	-	C	21	-
7	N 30th Street/Burnett Ave N	A	8	-	A	9	-
8	Lk Wa Blvd/Burnett Ave N	B	12	-	B	14	-
Signalized Intersection							
9	Lake Wa Blvd-Garden Ave N/Park Ave N	D	49	0.95	D	55	0.92

Notes:
1. Analysis based on Synchro results using HCM 2000 control delays and LOS with optimized phasing/timing systems for signalized intersections.
2. Lake Washington Blvd and NE 44th Street assumed to be east-west.



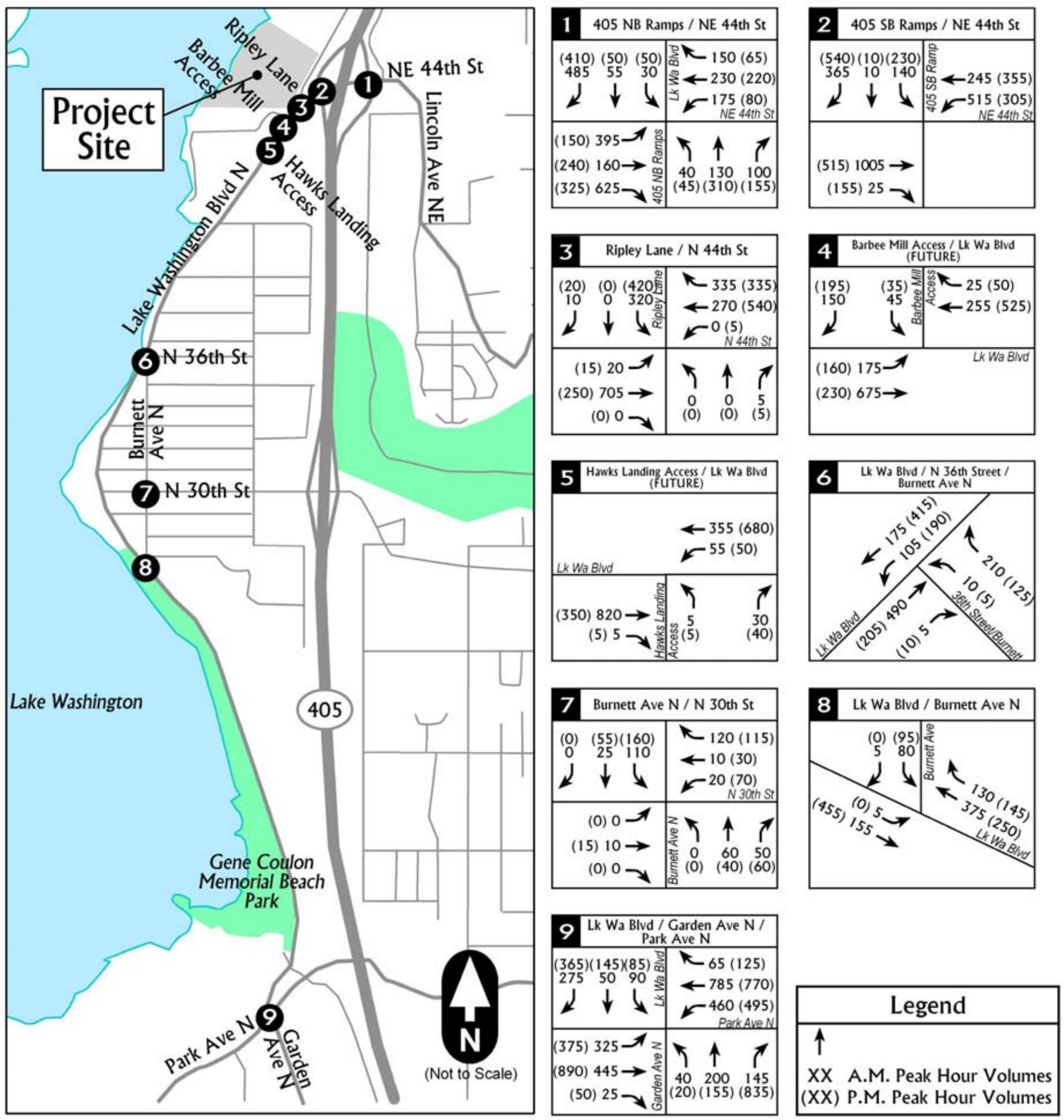
Transportation Engineering NorthWest, LLC

Figure 12
2015 Baseline/No Action Peak Hour Traffic Volumes (Without I-405 Improvements)

Quendall Terminals EIS Addendum

Renton, WA

October 1, 2012



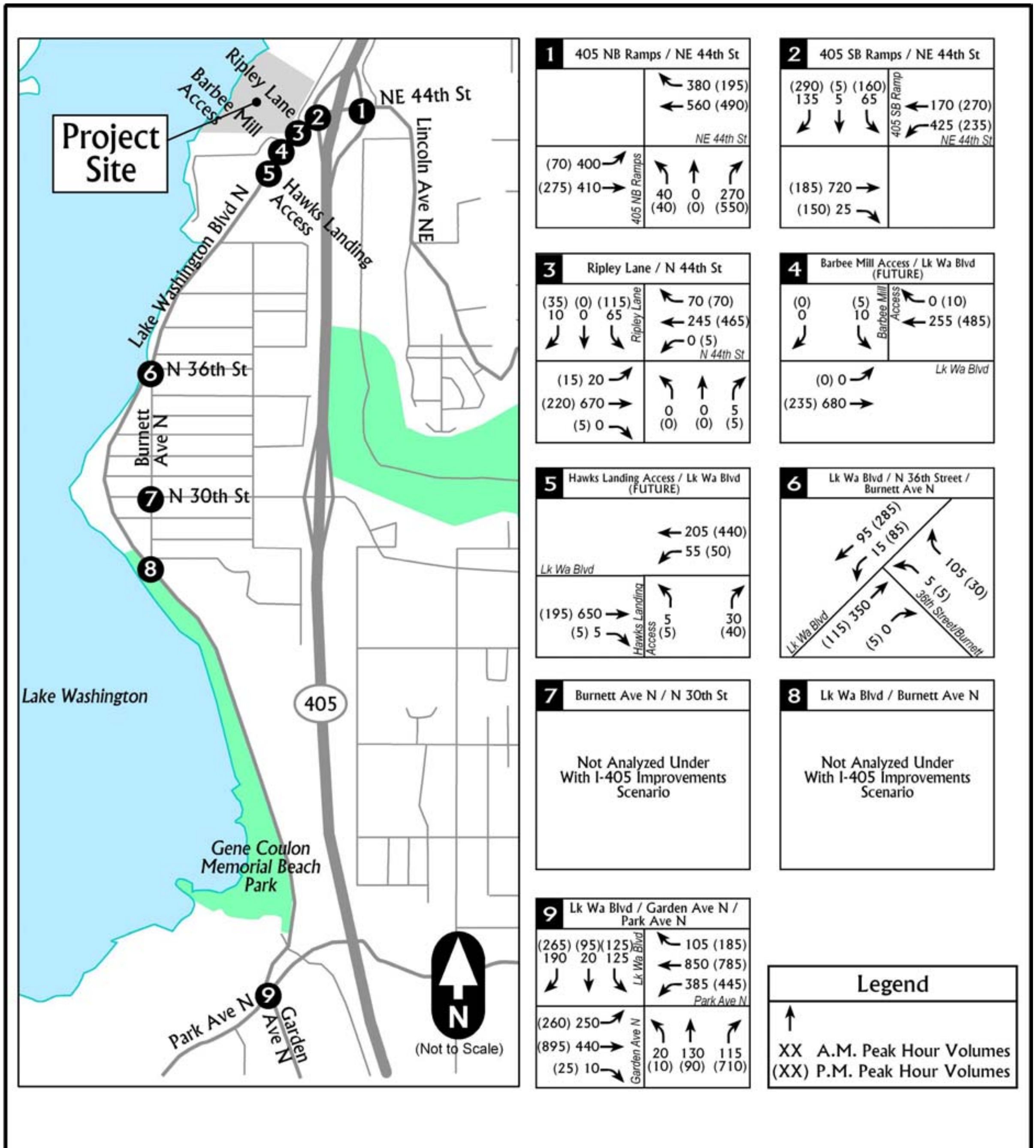
Transportation Engineering NorthWest, LLC	Figure 13 2015 DEIS Alternative 1 Peak Hour Traffic Volumes (Without I-405 Improvements)	Quendall Terminals EIS Addendum Renton, WA August 28, 2012

Table 6 summarizes level of service impacts under 2015 full buildout conditions with I-405 Improvements. **Figures 14** and **15** summarize peak hour traffic volumes used in the LOS analysis without and with the proposed development in 2015 with I-405 Improvements. All study intersections are projected to operate at LOS D or better with Alternative 1 and with I-405 Improvements.

Table 6: 2015 Intersection Level of Service Impacts With DEIS Alternative 1 With I-405 Improvements

Int.#	Intersection	2015 Without Project (Baseline/No Action)			2015 With DEIS Alternative 1 (The Original Application)		
		LOS	Delay	V/C	LOS	Delay	V/C
A.M. Peak Hour							
Unsignalized Intersections							
4	Lake Wa Blvd/Barbee Mill Access	SB-C	16	0.02	SB-D	32	0.53
5	Lake Wa Blvd/Hawks Landing Access	NB-C	21	0.02	NB-D	25	0.03
6	Lk Wa Blvd/N 36th Street	A	10	-	B	11	-
7	N 30th Street/Burnett Ave N	Not Analyzed Under With I-405 Improvements Scenario					
8	Lk Wa Blvd/Burnett Ave N						
Signalized Intersection							
1	Lake Wa Blvd (I-405 NB Ramps)/NE 44th St	A	10	0.42	B	18	0.59
2	I-405 SB Ramps/NE 44th Street	B	15	0.39	C	22	0.53
3	Ripley Lane/NE 44th Street	B	20	0.61	C	26	0.66
9	Lake Wa Blvd-Garden Ave N/Park Ave N	C	23	0.62	C	24	0.67
P.M. Peak Hour							
Unsignalized Intersections							
4	Lake Wa Blvd/Barbee Mill Access	SB-C	16	0.02	SB-D	25	0.46
5	Lake Wa Blvd/Hawks Landing Access	NB-C	17	0.02	NB-C	21	0.02
6	Lk Wa Blvd/N 36th Street	A	10	-	B	11	-
7	N 30th Street/Burnett Ave N	Not Analyzed Under With I-405 IMPROVEMENTS Scenario					
8	Lk Wa Blvd/Burnett Ave N						
Signalized Intersection							
1	Lake Wa Blvd (I-405 NB Ramps)/NE 44th St	B	13	0.20	B	17	0.40
2	I-405 SB Ramps/NE 44th Street	B	13	0.19	C	24	0.47
3	Ripley Lane/NE 44th Street	B	17	0.51	C	26	0.76
9	Lake Wa Blvd-Garden Ave N/Park Ave N	D	39	0.86	D	39	0.87

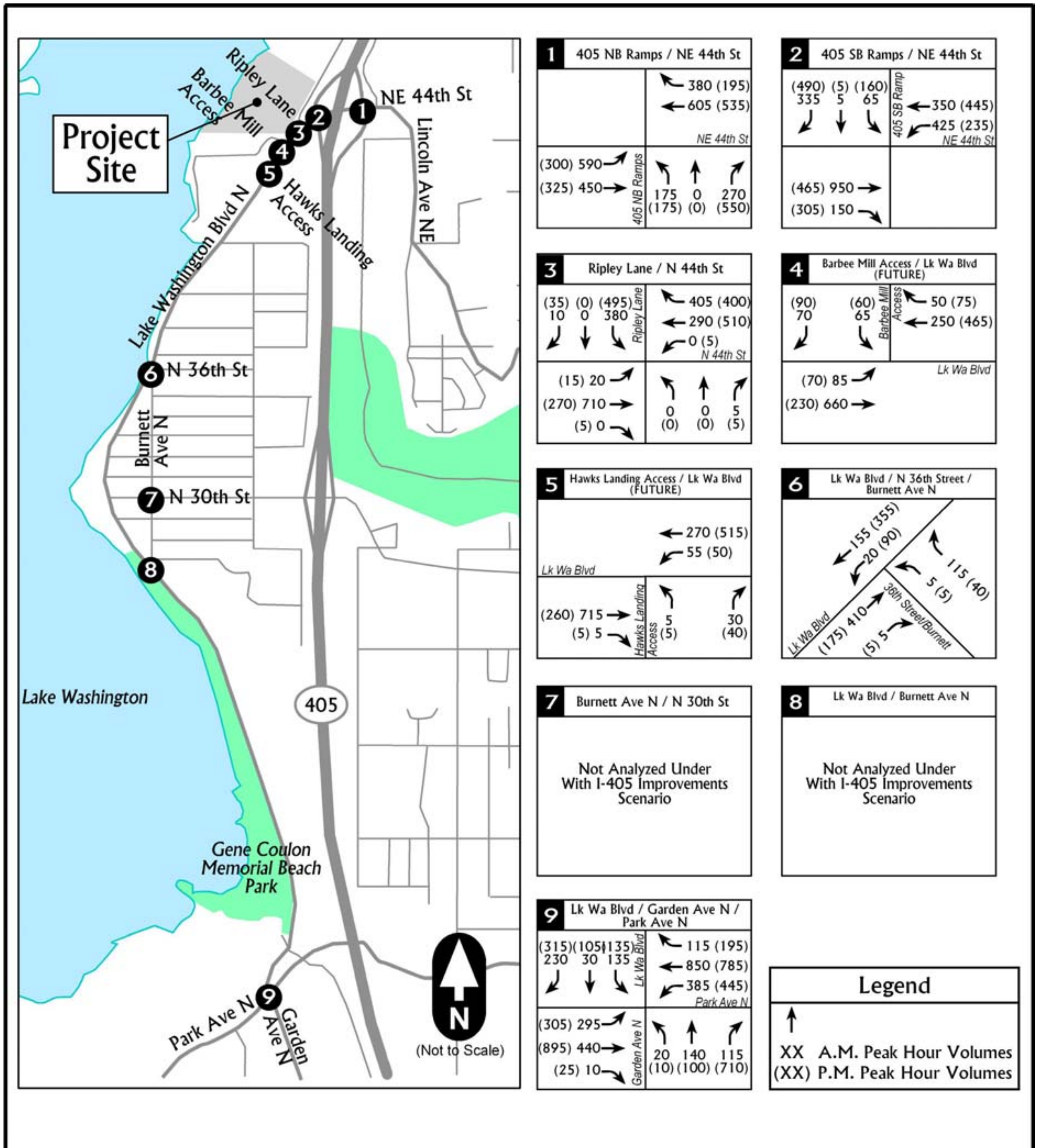
Notes:
1. Analysis based on Synchro results using HCM 2000 control delays and LOS with optimized phasing/ timing systems for signalized intersections.
2. Lake Washington Blvd and NE 44th Street assumed to be east-west.



Transportation Engineering NorthWest, LLC

Figure 14
2015 Baseline/No Action Peak Hour Traffic Volumes (With I-405 Improvements)

Quendall Terminals EIS Addendum
Renton, WA
August 28, 2012



Transportation Engineering NorthWest, LLC

Figure 15
2015 DEIS Alternative 1
Peak Hour Traffic Volumes
(With I-405 Improvements)

Quendall Terminals EIS Addendum
Renton, WA
August 28, 2012

Queuing Analysis

A queuing analysis was completed along Lake Washington Boulevard between the I-405 SB ramps (Intersection #2) and the proposed Hawks Landing site access (Intersection #5). The queue analysis included 2015 conditions with DEIS Alternative 1 (The Original Application) for both with and without I-405 Improvements. The reported queue lengths are 95th percentile queues (queuing conditions that cover 95 percent of reported conditions) based on results from the *Synchro 6* and *HCS 2000* traffic software packages. The following summarize 2015 queues without and with I-405 Improvements. As shown in **Table 7**, excessive southbound queues (in the range of 800 to 900 feet that would block key site access intersections) are expected at the stop controlled Ripley Lane intersection under the without I-405 Improvements scenario during the a.m. and p.m. peak hours. However, no queuing conflicts are expected on Lake Washington Boulevard.

Table 7: 2015 Queues Without I-405 Improvements – DEIS Alternative 1 (The Original Application)

		95th Percentile Queue (ft)	
Intersection	Movement	AM	PM
Ripley Lane / Lake Washington Blvd.			
	EB Left	25	25
	SB Left/Right	800	900
Barbee Mill Access (NE 43rd St) / Lake Washington Blvd.			
	EB Left	25	25
	SB Thru	100	75
Hawks Landing Access / Lake Washington Blvd.			
	WB Left	25	25

As shown in **Table 8**, with I-405 Improvements southbound queues would still be expected at the Ripley Lane intersection (signalized) during the a.m. and p.m. peak hours. In addition, queues on Lake Washington Blvd at the Ripley Lane intersection are expected to extend beyond adjacent intersections.

Table 8: 2015 Queues With I-405 Improvements – DEIS Alternative 1 (The Original Application)

		95th Percentile Queue (ft)	
Intersection	Movement	AM	PM
I-405 SB Ramps / Lake Washington Blvd.			
	EB Thru	125	125
Ripley Lane / Lake Washington Blvd.			
	EB Left	25	25
	EB Thru	250	225
	WB Thru	125	400
	WB Rt	50	25
	SB Left/Right	350	450
Barbee Mill Access (NE 43rd St) / Lake Washington Blvd.			
	EB Left	25	25
	SB Thru	50	50
Hawks Landing Access / Lake Washington Blvd.			
	WB Left	25	25

Site Access and Circulation

Vehicular access to the *Quendall Terminals* site would be provided via a new access drive onto Ripley Lane and the extension of NE 43rd Street (existing Barbee Mill access). As part of the site access and circulation analysis, the two intersections on Lake Washington Boulevard that would provide access to the site (Barbee Mill Access (N 43rd Street) and Ripley Lane) were analyzed in terms of LOS and queuing. The analysis assumed two scenarios: without and with I-405 Improvements.

2015 Without I-405 Improvements Operations/Queuing

The without I-405 Improvements scenario assumed existing channelization at both the Ripley Lane/Lake Washington Blvd and the Barbee Mill access (NE 43rd Street)/Lake Washington Boulevard intersections.

Intersection #3 - Ripley Lane/Lake Washington Blvd

Under DEIS Alternative 1 (The Original Application), the site access intersection of #3 – Ripley Lane at Lake Washington Blvd, the 95th percentile queue for the southbound left/right movements are estimated at approximately 800 to 900 feet during the a.m. and p.m. peak hours. Queues on Lake Washington Boulevard for vehicles entering the site are not expected to conflict with adjacent intersections. The LOS for the stop controlled southbound approach is expected to be LOS F.

Intersection #4 – Barbee Mill Access (N 43rd Street)/Lake Washington Blvd

Under DEIS Alternative 1 (The Original Application), the site access intersection of #4 – Barbee Mill Access (NE 43rd Street) at Lake Washington Blvd, the 95th percentile queue for the southbound through movement is estimated at approximately 75 to 100 feet during the a.m. and p.m. peak hours. The LOS for the stop controlled southbound movement is expected to be LOS C/D. This determination is predicated on the assumption that balance for left turn demand from the site would occur between this egress and the signalized intersection at Ripley Lane onto Lake Washington Boulevard. Restriction of left turns from this driveway may be necessary to force all demand to I-405 leaving the site to exit via the Ripley Lane signalized intersection with Lake Washington Boulevard.

Queues on Lake Washington Boulevard for vehicles entering the site are not forecasted to conflict with adjacent intersections; however, given demand for northbound left turns from Lake Washington Boulevard into the Barbee Mill Access (NE 43rd Street), a separate left turn lane would be warranted for safety reasons. Given close proximity to the Hawks Landing access of roughly 125 feet south of the existing Barbee Mill Access (NE 43rd Street), a continuous two-way left turn lane would be warranted that extends from the left turn lane at Ripley Lane south of the Hawks Landing access driveway. Alternatively, the construction of additional through lanes on Lake Washington Boulevard could be installed to resolve level of service issues along this roadway segment and mitigate this conflict potential. Ultimately, the City of Renton will determine the best configuration given ongoing coordination with WSDOT on the adjacent interchange design, the Port of Seattle (the owner of the vicinity rail right-of-way), and adjacent private development.

2015 With I-405 Improvements Operations/Queuing

Under the with I-405 Improvements scenario, the Ripley Lane/Lake Washington Blvd intersection was assumed to be signalized and the Barbee Mill access (N 43rd Street)/Lake Washington Boulevard assumed existing channelization.

Intersection #3 - Ripley Lane/Lake Washington Blvd

Under DEIS Alternative 1 (The Original Application), the site access intersection of #3 – Ripley Lane at Lake Washington Blvd, the 95th percentile queue for the westbound through movement is estimated at approximately 400 feet during p.m. peak hour. This estimated queue on Lake Washington Blvd would likely extend through the adjacent intersection. In addition, the southbound queue on Ripley Lane is estimated to be 350 feet during the a.m. peak hour and 450 feet during the p.m. peak hour assuming the I-405 Improvement scenario only. With project mitigation of providing an additional southbound approach lane on Ripley, this queue is estimated to be reduced to 200 feet or less during either the a.m. peak or p.m. peak hour. The LOS for the signalized intersection is expected to be LOS C/D.

Intersection #4 – Barbee Mill Access (NE 43rd Street)/Lake Washington Blvd

Under the DEIS Alternative 1 (The Original Application), the site access intersection of #4 – Barbee Mill Access (NE 43rd Street) at Lake Washington Blvd, the 95th percentile queue for the southbound through movement is estimated at approximately 50 feet during the a.m. and p.m. peak hours. The LOS for the stop controlled southbound movement is expected to be LOS D. This determination is predicated on the assumption that balance for left turn demand from the site would occur between this egress and the signalized intersection at Ripley Lane onto Lake Washington Boulevard. Restriction of left turns from this driveway may be necessary to force all demand to I-405 leaving the site to exit via the Ripley Lane unsignalized intersection with Lake Washington Boulevard.

Queues on Lake Washington Boulevard for vehicles entering the site are not forecasted to conflict with adjacent intersections; however, given demand for left turns from Lake Washington Boulevard into the Barbee Mill Access (NE 43rd Street), a separate left turn lane would be warranted for safety reasons. Given close proximity to the Hawks Landing access of roughly 125 feet south of the existing Barbee Mill Access (NE 43rd Street), a continuous two-way left turn lane would be warranted that extends from the left turn lane at Ripley Lane south of the Hawks Landing access driveway. Alternatively, the construction of additional through lanes on Lake Washington Boulevard could be installed to resolve level of service issues along this roadway segment and mitigate this conflict potential. Ultimately, the City of Renton will determine the best configuration given ongoing coordination with WSDOT on the adjacent interchange design, the Port of Seattle (the owner of the vicinity rail right-of-way), and adjacent private development.

Public Transportation Impacts

It is assumed that the proposed development would be occupied by residents and employees who rely primarily on personal automobiles for their means of transportation, based on its location near the outer edge of the urbanized area. However, since the City of Renton is growing at a relatively rapid pace, and in order to promote a multimodal transportation network, the proponent could work with King County Metro Transit and Sound Transit to provide for site amenities and access to future transit zones on Lake Washington Boulevard and at the I-405/NE 44th Street Interchange to encourage and accommodate public transportation access. Future potential public transportation in the vicinity could include Bus Rapid Transit on I-405 planned by Sound Transit and WSDOT with a flyer stop at the I-405/NE 44th Street Interchange.

Nonmotorized Transportation Impacts

Increases in population on the site would increase the use of nonmotorized facilities within the site and vicinity. Infrastructure improvements within the site would include full curbs, gutters, and sidewalks as well as frontage improvements along the west side of Lake Washington Boulevard and Ripley Lane in front of the development site. A pedestrian trail is also proposed along the shoreline that would be accessible to the public.

Parking Impacts

Table 9 summarizes minimum off-street parking requirements based on City of Renton Municipal Code for the proposed mix of land uses. As shown, a total of 2,153 stalls and 1,362 stalls, respectively, under DEIS Alternatives 1 and 2 would be required under City code. Given proposed construction of 2,171 and 1,362 stalls, respectively, proposed parking supply by the applicant would meet minimum City code.

Table 9: Parking Code Requirements

Land Use	Size	Code Rate	Required Off-Street Parking (stalls)
DEIS Alternative 1			
Retail	21,600 sf	4 stalls/1,000 sf	87
Multifamily Residential	800 units	1.75 stalls/DU	1,400
Restaurant	9,000 sf	4 stalls/1,000 sf	36
Office[1]	210,000	3 stalls/1,000 sf (net)	630
		Total	2,153 stalls
		Proposed	2,171 stalls
		Surplus/(Deficit)	+18 stalls
DEIS Alternative 2			
Retail	21,600 sf	4 stalls/1,000 sf	87
Multifamily Residential	708 units	1.75 stalls/DU	1,239
Restaurant	9,000 sf	4 stalls/1,000 sf	36
		Total	1,362 stalls
		Proposed	1,362 stalls
		Surplus/(Deficit)	0 stalls

DU – Dwelling unit. sf – square- feet.
1 – Parking code requirements for office is based on net leasable area not gross square footage of Office use.

In addition to review of minimum City code requirements, a parking demand analysis was completed of DEIS Alternative 1 using ITE's *Parking Generation, 3rd Edition*, (2004). As shown in **Appendix C**, peak demand for parking on-site is estimated at 2,107 stalls on a typical weekday and 1,251 stalls on a typical weekend assuming all uses have peak demands at the same time. Parking demand for each land use however, typically peaks at different times throughout the day. For example, peak demand for residential parking occurs during overnight hours when most residents are on-site, while other daytime uses can peak at various times throughout daylight hours (proposed commercial uses typically all peak around noon on a typical day). As such, shared parking could occur between residential and commercial uses resulting in parking demand between 350 stalls and 281 stalls less on a typical weekday and weekend day, respectively. This demand would range between 20 percent and 55 percent less than proposed supply on a weekday and weekend day, respectively. Similar parking relationships would occur under the Alternative 2 buildout scenario.

MITIGATION MEASURES

The analysis conducted for the EIS Addendum studied vehicular trip generation, impacts on levels of service at nine off-site study intersections, public transportation services, nonmotorized transportation facilities, and site access, safety, and circulation issues. The following measures have been identified in order to mitigate project traffic impacts to the vicinity arterial roadway network and provide adequate levels of circulation and mobility to the project site:

Based upon the results of the comprehensive analysis of future intersection operations, general key findings include:

- There exists today and will be in the future a moderate to high level of background traffic that travels in the vicinity of the site area given approved and other planned pipeline projects.
- The existing transportation network with I-405 Improvements would adequately accommodate the 2015 full buildout development alternative; however additional transportation improvements (noted below) would be necessary. Under the without I-405 Improvements scenario, the 2015 full buildout development alternative could also be accommodated with additional transportation improvements (noted below).

Level of Service/Queuing

<u>With I-405 Improvements - 2015 DEIS Alternative 1 (The Original Application) or 2015 DEIS Alternative 2 (Lower Density Alternative)</u>

The following improvements (in addition to the planned I-405 Improvements) would be necessary under the 2015 DEIS Alternative 1 (The Original Application) or 2015 DEIS Alternative 2 (Lower Density Alternative) to mitigate off-site impacts:

- **Lake Washington Blvd (between Barbee Mill Access (NE 43rd Street) and Ripley Lane.** Extend the planned eastbound and westbound through lanes by WSDOT beyond and through the Barbee Mill Access intersection. This would result in two through lanes in each direction on Lake Washington Blvd from the I-405 interchange past the Barbee Mill Access (NE 43rd Street). Ultimately however, the City of Renton will determine the best configuration given ongoing coordination with WSDOT on the adjacent interchange design, the Port of Seattle (the owner of the vicinity rail right-of-way), and adjacent private development.
- **Intersection #3 – Ripley Lane / Lake Washington Blvd.** Construct a southbound left-turn lane at this signalized intersection (signal assumed as an I-405 Improvement).

Without I-405 Improvements - 2015 DEIS Alternative 1 (The Original Application) or 2015 DEIS Alternative 2 (Lower Density Alternative)

Without the planned I-405 Improvements, the following improvements would be necessary under the 2015 DEIS Alternative 1 (The Original Application) or 2015 DEIS Alternative 2 (Lower Density Alternative) to mitigate off-site impacts:

- **Install Traffic Signals.** Install traffic signals at the intersections of the I-405 NB and SB ramp intersections as well as at the intersection of Ripley Lane/Lake Washington Blvd.
- **Intersection #1 - I-405 NB Ramps/NE 44th Street.** Widen the southbound and northbound approaches so that a separate left turn lane and shared thru-right turn lane is provided on both legs of the intersection. The final configuration of the intersection with the additional widening improvements would be coordinated with WSDOT
- **Intersection #3 - Ripley Lane / Lake Washington Blvd.** Widen the westbound approach to include a separate right turn-only lane (see **Appendix D**).
- **Lake Washington Blvd (between Barbee Mill Access (NE 43rd Street) and I-405 SB Ramps.** Construct additional channelization improvements between the Barbee Mill Access and the I-405 SB ramps. Alternatively, additional eastbound and westbound lanes could be constructed to provide additional queue storage created by the traffic signals required at the SB ramp and Ripley Lane along Lake Washington Boulevard. Ultimately, the City of Renton will determine the best configuration given ongoing coordination with WSDOT on the adjacent interchange design, the Port of Seattle (the owner of the vicinity rail right-of-way), and adjacent private development (see **Appendix D**).

Appendix A contains detailed level of service worksheets of the mitigation elements outlined above to meet City of Renton and WSDOT standards. **Table 10** summarizes level of service estimates with and without project mitigation identified above for this scenario in 2015 with DEIS Alternative 1. As shown, study intersections forecast to operate at LOS F without project would improve to LOS E or better with project mitigation outlined above.

Table 10: 2015 Intersection Level of Service Impacts with DEIS Alternative 1 and Project Mitigation (Without I-405 Improvements)

Int.#	Intersection	2015 With Alternative 1 (The Application)			2015 With Alternative 1 with Project Mitigation (The Application)		
		LOS	Delay	V/C	LOS	Delay	V/C
A.M. Peak Hour							
1	Lake Wa Blvd (I-405 NB Ramps)/NE 44th St	F	>100	-	C	28	1.03
2	I-405 SB Ramps/NE 44th Street	SB-F	>100	-	E	78	1.03
3	Ripley Lane/NE 44th Street	SB-F	>100	-	B	12	0.61
P.M. Peak Hour							
1	Lake Wa Blvd (I-405 NB Ramps)/NE 44th St	F	>100	-	B	17	0.62
2	I-405 SB Ramps/NE 44th Street	SB-F	>100	-	C	25	0.86
3	Ripley Lane/NE 44th Street	SB-F	>100	-	B	14	0.77

1. Analysis based on Synchro results using HCM 2000 control delays and LOS with optimized phasing/timing systems for signalized intersections.
2. Lake Washington Blvd and NE 44th Street assumed to be east-west.

Nonmotorized/Frontage Improvements

Infrastructure improvements within the site would include full curbs, gutters, and sidewalks as well as frontage improvements along the west side of Lake Washington Boulevard and Ripley Lane in front of the development site. A pedestrian trial is also proposed along the shoreline that would be accessible to the public. Provision for safe pedestrian circulation could encourage future transit usage when planned pubic transit becomes available.

Lake Washington Boulevard Corridor Impacts

To mitigate traffic impacts to the Lake Washington Boulevard corridor south of the development, the applicant would install traffic calming treatments on Lake Washington Boulevard prior to North 41st Street to encourage primary trips generated by the project to utilize the I-405. Although the City has no adopted residential traffic management program, arterial calming measures could include such treatments that create either horizontal or vertical deflection for drivers. Such treatments include, but are not limited to, chicanes, serpentine raised curb sections, raised median treatments, speed tables, and speed humps.

Public Transportation

Since the City of Renton is growing at a relatively rapid pace, and in order to promote a multimodal transportation network, the proponent may wish to work with King County Metro Transit and Sound Transit to provide for site amenities and access to future transit zones on Lake Washington Boulevard and at the I-405/NE 44th Street Interchange to encourage and accommodate public transportation access. Future potential public transportation in the vicinity could include Bus Rapid Transit on I-405 planned by Sound Transit and WSDOT with a flyer stop at the I-405/NE 44th Street Interchange.

Parking Impacts

Proposed parking supply would meet minimum off-street requirements per City code under either DEIS Alternative 1 or DEIS Alternative 2. Shared parking agreements between on-site uses and implementation of transportation demand management (TDM) measures (for proposed office and residential uses) have the potential to reduce parking demand during peak periods, thereby reducing the necessary parking supply.

City of Renton Impact Fees

In addition, to project specific mitigation outlined above, the project proponent would pay Transportation Impact Fees (Per Renton Resolution No. 3100) at the time of building permit issuance to contribute its proportional share towards transportation system improvement needs in Renton. Traffic impact fees paid by development would be used to proportionally mitigate the project's traffic impacts at planned transportation improvements in the vicinity. Implementation of TDM measures could also reduce the number of vehicle trips, reduce project mitigation fees, and provide some additional benefit to improving LOS and queuing impacts at study intersections.

Significant Unavoidable Adverse Impacts

There would be no significant unavoidable adverse transportation impacts with the proposed development evaluated on the *Quendall Terminals* site. Transportation improvements identified above are expected to mitigate project traffic impacts to the vicinity arterial roadway and intersection network.

PREFERRED ALTERNATIVE

Subsequent to publication of the DEIS, the applicant developed a Preferred Alternative for Quendall Terminals. The Preferred Alternative described and analyzed in the EIS Addendum comprises nearly the same level and type of buildout as Alternative 2 – Lower Density Alternative originally evaluated in the transportation study for the *Quendall Terminals DEIS*. The following paragraphs identify the program components of the Preferred Alternative, estimated trip generation, other site elements of the Preferred Alternative, and the conclusions of the relative impacts of this alternative in the context of impacts evaluated and disclosed for DEIS Alternative 2.

The 2015 Preferred Alternative would include the construction of 692 multifamily units, 20,225 square feet of retail, 9,000 square feet of restaurant space and parking for 1,337 vehicles. Average trip rates for Apartments (ITE land use code 220), Shopping Center (ITE land use code 820), and High-Turnover (Sit-Down) Restaurant were used as the basis for estimating vehicular trips that would be generated by this alternative. As shown in **Table 11**, a net total of approximately 5,656 daily, 435 a.m. peak hour (104 entering, 331 exiting), and 530 p.m. peak hour vehicular trips (340 entering and 190 exiting) would be generated at 2015 full buildout conditions under the Preferred Alternative. As shown, the Preferred Alternative would result in approximately 128 fewer daily trips, 8 fewer a.m. peak hour trips, and 11 fewer p.m. peak hour trips than DEIS Alternative 2. As such, the relative impact to traffic operations within the study area would be very similar, but slightly less than those disclosed and evaluated under DEIS Alternative 2.

Furthermore, as the proposed program for the Preferred Alternative (including proposed land use mix, buildout levels, and parking supply) is similar to Alternative 2 – Lower Density Alternative, project mitigation to address traffic and parking impacts identified in this updated study for Alternative 2 would also apply to the Preferred Alternative.

Table 11: 2015 Preferred Alternative Project Trip Generation

Land Use	ITE Land Use Code [1]	Size [2]	A.M. Peak			P.M. Peak			Daily Trip Generation
			Enter	Exit	Total	Enter	Exit	Total	
Apartments	220	692 DU	70	282	352	278	150	428	4,605
10% Factor on Residential Uses			*8*	*28*	*36*	*28*	*15*	*43*	*460*
Retail	820	20,225 sf GLA	12	8	20	37	38	75	868
Restaurant	932	9,000 sf GFA	54	50	104	59	41	100	1,144
2015 Preferred Alternative Gross Trip Generation			**144**	**368**	**512**	**462**	**244**	**686**	**7,077**
Less Internal Trips [3]			*-17*	*-17*	*-34*	*-33*	*-33*	*-66*	*-906*
Less Pass-By Trips [3]			*-23*	*-20*	*-43*	*-29*	*-21*	*-50*	*-515*
2015 Preferred Alternative Net Trip Generation			**104**	**331**	**435**	**340**	**190**	**530**	**5,656**
2015 Partial Buildout Net Trip Generation			*105*	*338*	*443*	*348*	*193*	*541*	*5,784*
Difference in Preferred Alternative Compared to Alternative 2 – Partial Buildout			**-1**	**-7**	**-8**	**-8**	**-3**	**-11**	**-128**

1. Trip rates based on ITE *Trip Generation Manual*, 8th Edition, 2008.
2. DU is Dwelling Unit, GFA is Gross Floor Area, and GLA is Gross Leasable Area.
3. Internal and pass-by determined based upon documented average rates from ITE Trip Generation Handbook, June 2004.

Appendix A

Intersection Level of Service Summary Sheets

Existing Conditions

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	280	110	350	165	165	140	10	95	90	30	25	345
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Hourly flow rate (vph)	318	125	398	188	188	159	11	108	102	34	28	392

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	NB 1	SB 1
Volume Total (vph)	318	523	188	188	159	222	455
Volume Left (vph)	318	0	188	0	0	11	34
Volume Right (vph)	0	398	0	0	159	102	392
Hadj (s)	0.53	-0.50	0.53	0.03	-0.67	-0.10	-0.47
Departure Headway (s)	8.8	7.7	9.1	8.6	3.2	8.4	7.2
Degree Utilization, x	0.78	1.12	0.48	0.45	0.14	0.52	0.91
Capacity (veh/h)	403	470	373	392	1121	404	485
Control Delay (s)	34.9	103.3	19.0	17.3	5.5	20.1	47.8
Approach Delay (s)	77.4		14.4			20.1	47.8
Approach LOS	F		B			C	E

Intersection Summary			
Delay	48.2		
HCM Level of Service	E		
Intersection Capacity Utilization	80.6%	ICU Level of Service	D
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	0	665	5	390	135	0	0	0	0	55	5	115
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Hourly flow rate (vph)	0	782	6	459	159	0	0	0	0	65	6	135
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												9
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	159			788			1932	1862	785	1862	1865	159
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	159			788			1932	1862	785	1862	1865	159
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			45			100	100	100	0	82	85
cM capacity (veh/h)	1427			831			21	33	396	31	32	884

Direction, Lane #	EB 1	WB 1	WB 2	SB 1
Volume Total	788	459	159	206
Volume Left	0	459	0	65
Volume Right	6	0	0	135
cSH	1700	831	1700	89
Volume to Capacity	0.46	0.55	0.09	2.32
Queue Length 95th (ft)	0	86	0	469
Control Delay (s)	0.0	14.5	0.0	705.5
Lane LOS		B		F
Approach Delay (s)	0.0	10.8		705.5
Approach LOS				F

Intersection Summary			
Average Delay	94.3		
Intersection Capacity Utilization	70.2%	ICU Level of Service	C
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	15	635	0	0	195	65	0	0	0	30	0	5
Peak Hour Factor	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83
Hourly flow rate (vph)	18	765	0	0	235	78	0	0	0	36	0	6
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	313			765			1081	1114	765	1075	1075	274
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	313			765			1081	1114	765	1075	1075	274
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.2	6.6	6.3
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.6	4.1	3.4
p0 queue free %	99			100			100	100	100	81	100	99
cM capacity (veh/h)	1247			853			193	207	406	187	208	744

Direction, Lane #	EB 1	EB 2	WB 1	NB 1	SB 1
Volume Total	18	765	313	0	42
Volume Left	18	0	0	0	36
Volume Right	0	0	78	0	6
cSH	1247	1700	1700	1700	210
Volume to Capacity	0.01	0.45	0.18	0.00	0.20
Queue Length 95th (ft)	1	0	0	0	18
Control Delay (s)	7.9	0.0	0.0	0.0	26.4
Lane LOS	A			A	D
Approach Delay (s)	0.2		0.0	0.0	26.4
Approach LOS				A	D

Intersection Summary			
Average Delay	1.1		
Intersection Capacity Utilization	43.4%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Volume (veh/h)	0	650	200	0	0	0
Peak Hour Factor	0.83	0.83	0.83	0.83	0.83	0.83
Hourly flow rate (vph)	0	783	241	0	0	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	241				1024	241
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	241				1024	241
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	100
cM capacity (veh/h)	1326				263	803

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	783	241	0
Volume Left	0	0	0
Volume Right	0	0	0
cSH	1326	1700	1700
Volume to Capacity	0.00	0.14	0.00
Queue Length 95th (ft)	0	0	0
Control Delay (s)	0.0	0.0	0.0
Lane LOS			A
Approach Delay (s)	0.0	0.0	0.0
Approach LOS			A

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	37.5%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Stop			Stop	Stop	
Volume (vph)	345	2	17	89	6	106
Peak Hour Factor	0.82	0.82	0.82	0.82	0.82	0.82
Hourly flow rate (vph)	421	2	21	109	7	129

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total (vph)	423	129	137
Volume Left (vph)	0	21	7
Volume Right (vph)	2	0	129
Hadj (s)	0.05	0.10	-0.54
Departure Headway (s)	4.4	4.8	4.6
Degree Utilization, x	0.52	0.17	0.18
Capacity (veh/h)	784	709	693
Control Delay (s)	12.2	8.8	8.6
Approach Delay (s)	12.2	8.8	8.6
Approach LOS	B	A	A

Intersection Summary			
Delay	10.9		
HCM Level of Service	B		
Intersection Capacity Utilization	32.7%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	0	10	0	20	11	20	0	59	47	18	25	0
Peak Hour Factor	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81
Hourly flow rate (vph)	0	12	0	25	14	25	0	73	58	22	31	0

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	12	63	131	53
Volume Left (vph)	0	25	0	22
Volume Right (vph)	0	25	58	0
Hadj (s)	0.00	-0.12	-0.18	0.17
Departure Headway (s)	4.4	4.2	3.9	4.4
Degree Utilization, x	0.01	0.07	0.14	0.06
Capacity (veh/h)	784	821	886	804
Control Delay (s)	7.4	7.5	7.6	7.7
Approach Delay (s)	7.4	7.5	7.6	7.7
Approach LOS	A	A	A	A

Intersection Summary			
Delay	7.6		
HCM Level of Service	A		
Intersection Capacity Utilization	25.2%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Stop			Stop
Volume (vph)	54	1	334	98	2	87
Peak Hour Factor	0.78	0.78	0.78	0.78	0.78	0.78
Hourly flow rate (vph)	69	1	428	126	3	112

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total (vph)	71	554	114
Volume Left (vph)	69	0	3
Volume Right (vph)	1	126	0
Hadj (s)	0.25	-0.09	0.04
Departure Headway (s)	5.6	4.2	4.7
Degree Utilization, x	0.11	0.64	0.15
Capacity (veh/h)	573	855	729
Control Delay (s)	9.3	14.2	8.5
Approach Delay (s)	9.3	14.2	8.5
Approach LOS	A	B	A

Intersection Summary			
Delay	12.9		
HCM Level of Service	B		
Intersection Capacity Utilization	33.5%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0		4.0	4.0		4.0	4.0
Lane Util. Factor	1.00	0.95		0.97	0.91	0.91		1.00	1.00		1.00	1.00
Frt	1.00	1.00		1.00	1.00	0.85		1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.99	1.00		0.96	1.00
Satd. Flow (prot)	1687	3362		3400	3357	1427		1782	1524		1803	1599
Flt Permitted	0.95	1.00		0.95	1.00	1.00		0.95	1.00		0.68	1.00
Satd. Flow (perm)	1687	3362		3400	3357	1427		1708	1524		1277	1599
Volume (vph)	279	352	8	208	718	90	12	88	55	98	15	204
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	303	383	9	226	780	98	13	96	60	107	16	222
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	187
Lane Group Flow (vph)	303	392	0	226	780	98	0	109	60	0	123	35
Heavy Vehicles (%)	7%	7%	7%	3%	3%	3%	6%	6%	6%	1%	1%	1%
Turn Type	Prot			Prot		Free	Perm		Over	Perm		Perm
Protected Phases	7	4		3	8			2	3		6	
Permitted Phases						Free	2			6		6
Actuated Green, G (s)	15.1	24.3		6.8	16.0	51.3		8.2	6.8		8.2	8.2
Effective Green, g (s)	15.1	24.3		6.8	16.0	51.3		8.2	6.8		8.2	8.2
Actuated g/C Ratio	0.29	0.47		0.13	0.31	1.00		0.16	0.13		0.16	0.16
Clearance Time (s)	4.0	4.0		4.0	4.0			4.0	4.0		4.0	4.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	497	1593		451	1047	1427		273	202		204	256
v/s Ratio Prot	c0.18	0.12		0.07	c0.23				0.04			
v/s Ratio Perm						0.07		0.06			c0.10	0.02
v/c Ratio	0.61	0.25		0.50	0.74	0.07		0.40	0.30		0.60	0.14
Uniform Delay, d1	15.6	8.0		20.7	15.8	0.0		19.3	20.1		20.0	18.5
Progression Factor	1.00	1.00		1.00	1.00	1.00		1.00	1.00		1.00	1.00
Incremental Delay, d2	2.1	0.1		0.9	2.9	0.1		1.0	0.8		5.0	0.2
Delay (s)	17.7	8.1		21.6	18.7	0.1		20.3	20.9		25.0	18.8
Level of Service	B	A		C	B	A		C	C		C	B
Approach Delay (s)		12.3			17.7			20.5			21.0	
Approach LOS		B			B			C			C	

Intersection Summary			
HCM Average Control Delay	16.8	HCM Level of Service	B
HCM Volume to Capacity ratio	0.66		
Actuated Cycle Length (s)	51.3	Sum of lost time (s)	12.0
Intersection Capacity Utilization	59.1%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	55	165	60	75	150	65	15	230	145	50	25	280
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Hourly flow rate (vph)	57	172	62	78	156	68	16	240	151	52	26	292

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	NB 1	SB 1
Volume Total (vph)	57	234	78	156	68	406	370
Volume Left (vph)	57	0	78	0	0	16	52
Volume Right (vph)	0	63	0	0	68	151	292
Hadj (s)	0.52	-0.17	0.53	0.03	-0.67	-0.20	-0.43
Departure Headway (s)	8.1	7.4	8.3	7.7	3.2	6.3	6.2
Degree Utilization, x	0.13	0.48	0.18	0.34	0.06	0.71	0.63
Capacity (veh/h)	405	439	377	406	1121	544	541
Control Delay (s)	11.1	15.8	11.9	13.4	5.2	23.3	19.3
Approach Delay (s)	14.9		11.2			23.3	19.3
Approach LOS	B		B			C	C

Intersection Summary			
Delay	17.8		
HCM Level of Service	C		
Intersection Capacity Utilization	68.7%	ICU Level of Service	C
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	0	150	125	215	225	0	0	0	0	130	5	250
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Hourly flow rate (vph)	0	155	129	222	232	0	0	0	0	134	5	258
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												9
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	232			284			1026	894	219	894	959	232
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	232			284			1026	894	219	894	959	232
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			83			100	100	100	41	98	68
cM capacity (veh/h)	1348			1285			125	234	826	229	214	812

Direction, Lane #	EB 1	WB 1	WB 2	SB 1
Volume Total	284	222	232	397
Volume Left	0	222	0	134
Volume Right	129	0	0	258
cSH	1700	1285	1700	651
Volume to Capacity	0.17	0.17	0.14	0.61
Queue Length 95th (ft)	0	16	0	104
Control Delay (s)	0.0	8.4	0.0	22.4
Lane LOS		A		C
Approach Delay (s)	0.0	4.1		22.4
Approach LOS				C

Intersection Summary			
Average Delay	9.5		
Intersection Capacity Utilization	44.9%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	5	180	5	5	410	40	0	0	0	100	0	30
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Hourly flow rate (vph)	5	186	5	5	423	41	0	0	0	103	0	31
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	464			191			683	673	188	649	655	443
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	464			191			683	673	188	649	655	443
tC, single (s)	4.1			4.1			7.3	6.7	6.4	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.7	4.2	3.5	3.5	4.0	3.3
p0 queue free %	100			100			100	100	100	73	100	95
cM capacity (veh/h)	1108			1377			324	355	817	379	381	612

Direction, Lane #	EB 1	EB 2	WB 1	NB 1	SB 1
Volume Total	5	191	469	0	134
Volume Left	5	0	5	0	103
Volume Right	0	5	41	0	31
cSH	1108	1700	1377	1700	415
Volume to Capacity	0.00	0.11	0.00	0.00	0.32
Queue Length 95th (ft)	0	0	0	0	34
Control Delay (s)	8.3	0.0	0.1	0.0	17.7
Lane LOS	A		A	A	C
Approach Delay (s)	0.2		0.1	0.0	17.7
Approach LOS				A	C

Intersection Summary			
Average Delay	3.1		
Intersection Capacity Utilization	42.1%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Volume (veh/h)	0	135	500	0	0	0
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Hourly flow rate (vph)	0	139	515	0	0	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	515				655	515
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	515				655	515
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	100
cM capacity (veh/h)	1061				434	563

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	139	515	0
Volume Left	0	0	0
Volume Right	0	0	0
cSH	1061	1700	1700
Volume to Capacity	0.00	0.30	0.00
Queue Length 95th (ft)	0	0	0
Control Delay (s)	0.0	0.0	0.0
Lane LOS			A
Approach Delay (s)	0.0	0.0	0.0
Approach LOS			A

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	29.6%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Stop			Stop	Stop	
Volume (vph)	107	7	83	280	4	25
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	113	7	87	295	4	26

Direction, Lane #	EB 1	EB 2	WB 1	NB 1
Volume Total (vph)	115	5	382	31
Volume Left (vph)	0	0	87	4
Volume Right (vph)	2	5	0	26
Hadj (s)	-0.01	-0.70	0.06	-0.49
Departure Headway (s)	4.8	4.1	4.3	4.5
Degree Utilization, x	0.15	0.01	0.45	0.04
Capacity (veh/h)	733	847	827	716
Control Delay (s)	7.5	5.9	10.8	7.7
Approach Delay (s)	7.4		10.8	7.7
Approach LOS	A		B	A

Intersection Summary			
Delay	9.8		
HCM Level of Service	A		
Intersection Capacity Utilization	36.0%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	0	13	1	64	28	13	2	38	61	44	55	2
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Hourly flow rate (vph)	0	14	1	69	30	14	2	41	66	47	59	2

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	15	113	109	109
Volume Left (vph)	0	69	2	47
Volume Right (vph)	1	14	66	2
Hadj (s)	-0.04	0.05	-0.36	0.09
Departure Headway (s)	4.5	4.4	4.0	4.4
Degree Utilization, x	0.02	0.14	0.12	0.13
Capacity (veh/h)	758	764	868	779
Control Delay (s)	7.6	8.2	7.5	8.1
Approach Delay (s)	7.6	8.2	7.5	8.1
Approach LOS	A	A	A	A

Intersection Summary			
Delay	7.9		
HCM Level of Service	A		
Intersection Capacity Utilization	31.3%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Stop	Stop		Stop	
Volume (vph)	2	289	104	111	92	3
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Hourly flow rate (vph)	2	318	114	122	101	3

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total (vph)	320	236	104
Volume Left (vph)	2	0	101
Volume Right (vph)	0	122	3
Hadj (s)	0.00	-0.31	0.17
Departure Headway (s)	4.4	4.2	5.3
Degree Utilization, x	0.40	0.28	0.15
Capacity (veh/h)	788	813	619
Control Delay (s)	10.3	8.9	9.3
Approach Delay (s)	10.3	8.9	9.3
Approach LOS	B	A	A

Intersection Summary			
Delay	9.6		
HCM Level of Service	A		
Intersection Capacity Utilization	28.7%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0		4.0	4.0		4.0	4.0
Lane Util. Factor	1.00	0.95		0.97	0.91	0.91		1.00	1.00		1.00	1.00
Frt	1.00	0.99		1.00	1.00	0.85		1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00		1.00	1.00		0.97	1.00
Satd. Flow (prot)	1770	3521		3433	3390	1441		1873	1599		1834	1599
Flt Permitted	0.95	1.00		0.95	1.00	1.00		0.97	1.00		0.79	1.00
Satd. Flow (perm)	1770	3521		3433	3390	1441		1821	1599		1478	1599
Volume (vph)	297	758	26	295	646	132	9	85	497	90	83	292
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	306	781	27	304	666	136	9	88	512	93	86	301
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	244
Lane Group Flow (vph)	306	808	0	304	666	136	0	97	512	0	179	57
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	1%	1%	1%	1%	1%	1%
Turn Type	Prot			Prot		Free	Perm		Over	Perm		Perm
Protected Phases	7	4		3	8			2	3		6	
Permitted Phases						Free	2			6		6
Actuated Green, G (s)	25.2	18.7		25.4	18.9	69.2		13.1	25.4		13.1	13.1
Effective Green, g (s)	25.2	18.7		25.4	18.9	69.2		13.1	25.4		13.1	13.1
Actuated g/C Ratio	0.36	0.27		0.37	0.27	1.00		0.19	0.37		0.19	0.19
Clearance Time (s)	4.0	4.0		4.0	4.0			4.0	4.0		4.0	4.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	645	951		1260	926	1441		345	587		280	303
v/s Ratio Prot	0.17	c0.23		0.09	0.20				c0.32			
v/s Ratio Perm						0.09		0.05			c0.12	0.04
v/c Ratio	0.47	0.85		0.24	0.72	0.09		0.28	0.87		0.64	0.19
Uniform Delay, d1	16.9	23.9		15.2	22.7	0.0		24.0	20.4		25.9	23.6
Progression Factor	1.00	1.00		1.00	1.00	1.00		1.00	1.00		1.00	1.00
Incremental Delay, d2	0.6	7.2		0.1	2.7	0.1		0.4	13.4		4.7	0.3
Delay (s)	17.5	31.1		15.3	25.5	0.1		24.5	33.8		30.6	23.9
Level of Service	B	C		B	C	A		C	C		C	C
Approach Delay (s)		27.4			19.5			32.3			26.4	
Approach LOS		C			B			C			C	

Intersection Summary			
HCM Average Control Delay	25.5	HCM Level of Service	C
HCM Volume to Capacity ratio	0.81		
Actuated Cycle Length (s)	69.2	Sum of lost time (s)	12.0
Intersection Capacity Utilization	71.9%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

2015 Without Project (Without RTID Improvements)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	355	120	435	175	185	150	40	130	100	30	55	440
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	386	130	473	190	201	163	43	141	109	33	60	478

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	NB 1	SB 1
Volume Total (vph)	386	603	190	201	163	293	571
Volume Left (vph)	386	0	190	0	0	43	33
Volume Right (vph)	0	473	0	0	163	109	478
Hadj (s)	0.53	-0.51	0.53	0.03	-0.67	-0.02	-0.46
Departure Headway (s)	9.1	8.1	9.6	9.1	3.2	8.8	7.8
Degree Utilization, x	0.98	1.36	0.51	0.51	0.14	0.72	1.23
Capacity (veh/h)	386	452	359	377	1121	398	461
Control Delay (s)	70.0	196.9	21.0	20.1	5.5	31.1	145.4
Approach Delay (s)	147.4		16.1			31.1	145.4
Approach LOS	F		C			D	F

Intersection Summary			
Delay	102.5		
HCM Level of Service	F		
Intersection Capacity Utilization	88.1%	ICU Level of Service	E
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	0	730	25	515	155	0	0	0	0	140	10	165
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	793	27	560	168	0	0	0	0	152	11	179
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												9
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	168			821			2190	2095	807	2095	2109	168
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	168			821			2190	2095	807	2095	2109	168
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			31			100	100	100	0	30	79
cM capacity (veh/h)	1415			808			6	16	385	17	16	873

Direction, Lane #	EB 1	WB 1	WB 2	SB 1
Volume Total	821	560	168	342
Volume Left	0	560	0	152
Volume Right	27	0	0	179
cSH	1700	808	1700	34
Volume to Capacity	0.48	0.69	0.10	10.02
Queue Length 95th (ft)	0	143	0	Err
Control Delay (s)	0.0	18.8	0.0	Err
Lane LOS		C		F
Approach Delay (s)	0.0	14.5		Err
Approach LOS				F

Intersection Summary			
Average Delay	1815.7		
Intersection Capacity Utilization	86.7%	ICU Level of Service	E
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	20	685	0	0	250	70	0	0	5	65	0	10
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	22	745	0	0	272	76	0	0	5	71	0	11
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	348			745			1109	1136	745	1103	1098	310
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	348			745			1109	1136	745	1103	1098	310
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.2	6.6	6.3
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.6	4.1	3.4
p0 queue free %	98			100			100	100	99	60	100	98
cM capacity (veh/h)	1211			868			183	200	418	176	201	710

Direction, Lane #	EB 1	EB 2	WB 1	NB 1	SB 1
Volume Total	22	745	348	5	82
Volume Left	22	0	0	0	71
Volume Right	0	0	76	5	11
cSH	1211	1700	1700	418	196
Volume to Capacity	0.02	0.44	0.20	0.01	0.42
Queue Length 95th (ft)	1	0	0	1	47
Control Delay (s)	8.0	0.0	0.0	13.7	35.8
Lane LOS	A			B	E
Approach Delay (s)	0.2		0.0	13.7	35.8
Approach LOS				B	E

Intersection Summary			
Average Delay	2.6		
Intersection Capacity Utilization	53.6%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Volume (veh/h)	0	695	260	0	10	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	755	283	0	11	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	283				1038	283
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	283				1038	283
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				96	100
cM capacity (veh/h)	1280				258	761

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	755	283	11
Volume Left	0	0	11
Volume Right	0	0	0
cSH	1280	1700	258
Volume to Capacity	0.00	0.17	0.04
Queue Length 95th (ft)	0	0	3
Control Delay (s)	0.0	0.0	19.6
Lane LOS			C
Approach Delay (s)	0.0	0.0	19.6
Approach LOS			C

Intersection Summary			
Average Delay	0.2		
Intersection Capacity Utilization	46.6%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	665	5	55	210	5	30
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	723	5	60	228	5	33
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			728		1073	726
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			728		1073	726
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			93		98	92
cM capacity (veh/h)			880		229	428

Direction, Lane #	EB 1	WB 1	WB 2	NB 1
Volume Total	728	60	228	38
Volume Left	0	60	0	5
Volume Right	5	0	0	33
cSH	1700	880	1700	381
Volume to Capacity	0.43	0.07	0.13	0.10
Queue Length 95th (ft)	0	5	0	8
Control Delay (s)	0.0	9.4	0.0	15.5
Lane LOS		A		C
Approach Delay (s)	0.0	1.9		15.5
Approach LOS				C

Intersection Summary			
Average Delay	1.1		
Intersection Capacity Utilization	52.0%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Stop			Stop	Stop	
Volume (vph)	425	5	20	110	10	120
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	462	5	22	120	11	130

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total (vph)	467	141	141
Volume Left (vph)	0	22	11
Volume Right (vph)	5	0	130
Hadj (s)	0.04	0.10	-0.52
Departure Headway (s)	4.5	4.9	4.8
Degree Utilization, x	0.58	0.19	0.19
Capacity (veh/h)	779	697	669
Control Delay (s)	13.5	9.0	8.9
Approach Delay (s)	13.5	9.0	8.9
Approach LOS	B	A	A

Intersection Summary			
Delay	11.8		
HCM Level of Service	B		
Intersection Capacity Utilization	37.5%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	0	10	0	20	10	30	0	60	50	25	25	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	11	0	22	11	33	0	65	54	27	27	0

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	11	65	120	54
Volume Left (vph)	0	22	0	27
Volume Right (vph)	0	33	54	0
Hadj (s)	0.00	-0.20	-0.19	0.18
Departure Headway (s)	4.3	4.1	3.9	4.4
Degree Utilization, x	0.01	0.07	0.13	0.07
Capacity (veh/h)	789	842	887	803
Control Delay (s)	7.4	7.4	7.5	7.7
Approach Delay (s)	7.4	7.4	7.5	7.7
Approach LOS	A	A	A	A

Intersection Summary			
Delay	7.5		
HCM Level of Service	A		
Intersection Capacity Utilization	26.2%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Stop			Stop
Volume (vph)	80	5	310	130	5	90
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	87	5	337	141	5	98

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total (vph)	92	478	103
Volume Left (vph)	87	0	5
Volume Right (vph)	5	141	0
Hadj (s)	0.22	-0.13	0.04
Departure Headway (s)	5.4	4.2	4.7
Degree Utilization, x	0.14	0.55	0.13
Capacity (veh/h)	603	850	728
Control Delay (s)	9.3	12.2	8.4
Approach Delay (s)	9.3	12.2	8.4
Approach LOS	A	B	A

Intersection Summary			
Delay	11.2		
HCM Level of Service	B		
Intersection Capacity Utilization	35.6%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.97	0.95		0.97	0.91	0.91		0.95	0.95	0.95	0.95	1.00
Frt	1.00	0.99		1.00	1.00	0.85		1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.99	1.00	0.95	0.98	1.00
Satd. Flow (prot)	3273	3347		3400	3357	1427		1688	1447	1698	1749	1599
Flt Permitted	0.95	1.00		0.95	1.00	1.00		0.94	1.00	0.95	0.86	1.00
Satd. Flow (perm)	3273	3347		3400	3357	1427		1601	1447	1698	1538	1599
Volume (vph)	280	445	25	460	785	60	40	180	145	85	35	235
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	304	484	27	500	853	65	43	196	158	92	38	255
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	159
Lane Group Flow (vph)	304	511	0	500	853	65	0	239	158	63	67	96
Heavy Vehicles (%)	7%	7%	7%	3%	3%	3%	6%	6%	6%	1%	1%	1%
Turn Type	Prot			Prot		Free	Prot		Over	Prot		Perm
Protected Phases	7	4		3	8		5	2	3	1	6	
Permitted Phases						Free						6
Actuated Green, G (s)	10.1	15.6		14.0	19.5	66.9		18.3	14.0	3.0	25.3	25.3
Effective Green, g (s)	10.1	15.6		14.0	19.5	66.9		18.3	14.0	3.0	25.3	25.3
Actuated g/C Ratio	0.15	0.23		0.21	0.29	1.00		0.27	0.21	0.04	0.38	0.38
Clearance Time (s)	4.0	4.0		4.0	4.0			4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	494	780		712	978	1427		438	303	76	591	605
v/s Ratio Prot	0.09	c0.15		0.15	c0.25				0.11	c0.04	0.01	
v/s Ratio Perm						0.05		c0.15			0.04	0.06
v/c Ratio	0.62	0.66		0.70	0.87	0.05		0.55	0.52	0.83	0.11	0.16
Uniform Delay, d1	26.6	23.2		24.5	22.5	0.0		20.8	23.5	31.7	13.5	13.8
Progression Factor	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	2.3	2.0		3.1	8.6	0.1		1.4	1.6	49.7	0.1	0.1
Delay (s)	28.9	25.2		27.7	31.2	0.1		22.1	25.1	81.4	13.6	13.9
Level of Service	C	C		C	C	A		C	C	F	B	B
Approach Delay (s)		26.6			28.5			23.3			24.9	
Approach LOS		C			C			C			C	

Intersection Summary			
HCM Average Control Delay	26.8	HCM Level of Service	C
HCM Volume to Capacity ratio	0.69		
Actuated Cycle Length (s)	66.9	Sum of lost time (s)	12.0
Intersection Capacity Utilization	61.6%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	100	190	95	80	175	65	45	310	155	50	50	365
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Hourly flow rate (vph)	104	198	99	83	182	68	47	323	161	52	52	380

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	NB 1	SB 1
Volume Total (vph)	104	297	83	182	68	531	484
Volume Left (vph)	104	0	83	0	0	47	52
Volume Right (vph)	0	99	0	0	68	161	380
Hadj (s)	0.52	-0.22	0.53	0.03	-0.67	-0.15	-0.43
Departure Headway (s)	9.3	8.5	9.7	9.2	3.2	7.8	7.4
Degree Utilization, x	0.27	0.70	0.22	0.47	0.06	1.15	0.99
Capacity (veh/h)	382	412	363	375	1121	464	484
Control Delay (s)	14.4	28.1	14.3	18.7	5.2	117.2	66.7
Approach Delay (s)	24.6		14.9			117.2	66.7
Approach LOS	C		B			F	F

Intersection Summary			
Delay	62.5		
HCM Level of Service	F		
Intersection Capacity Utilization	69.1%	ICU Level of Service	C
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	0	185	155	305	265	0	0	0	0	230	10	340
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Hourly flow rate (vph)	0	191	160	314	273	0	0	0	0	237	10	351
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												9
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	273			351			1353	1173	271	1173	1253	273
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	273			351			1353	1173	271	1173	1253	273
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			74			100	100	100	0	92	55
cM capacity (veh/h)	1302			1214			53	144	773	137	129	770

Direction, Lane #	EB 1	WB 1	WB 2	SB 1
Volume Total	351	314	273	598
Volume Left	0	314	0	237
Volume Right	160	0	0	351
cSH	1700	1214	1700	282
Volume to Capacity	0.21	0.26	0.16	2.12
Queue Length 95th (ft)	0	26	0	1114
Control Delay (s)	0.0	9.0	0.0	545.9
Lane LOS		A		F
Approach Delay (s)	0.0	4.8		545.9
Approach LOS				F

Intersection Summary			
Average Delay	214.3		
Intersection Capacity Utilization	59.4%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	15	225	0	0	520	70	0	0	5	115	0	35
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Hourly flow rate (vph)	15	232	0	0	536	72	0	0	5	119	0	36
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	608			232			871	871	232	840	835	572
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	608			232			871	871	232	840	835	572
tC, single (s)	4.1			4.1			7.3	6.7	6.4	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.7	4.2	3.5	3.5	4.0	3.3
p0 queue free %	98			100			100	100	99	57	100	93
cM capacity (veh/h)	980			1330			235	269	771	278	298	518

Direction, Lane #	EB 1	EB 2	WB 1	NB 1	SB 1
Volume Total	15	232	608	5	155
Volume Left	15	0	0	0	119
Volume Right	0	0	72	5	36
cSH	980	1700	1700	771	312
Volume to Capacity	0.02	0.14	0.36	0.01	0.50
Queue Length 95th (ft)	1	0	0	1	65
Control Delay (s)	8.7	0.0	0.0	9.7	27.4
Lane LOS	A			A	D
Approach Delay (s)	0.5		0.0	9.7	27.4
Approach LOS				A	D

Intersection Summary			
Average Delay	4.3		
Intersection Capacity Utilization	53.5%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Volume (veh/h)	0	185	560	10	5	0
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Hourly flow rate (vph)	0	191	577	10	5	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	588				773	582
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	588				773	582
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				99	100
cM capacity (veh/h)	997				370	516

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	191	588	5
Volume Left	0	0	5
Volume Right	0	10	0
cSH	997	1700	370
Volume to Capacity	0.00	0.35	0.01
Queue Length 95th (ft)	0	0	1
Control Delay (s)	0.0	0.0	14.9
Lane LOS			B
Approach Delay (s)	0.0	0.0	14.9
Approach LOS			B

Intersection Summary			
Average Delay	0.1		
Intersection Capacity Utilization	40.1%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	145	5	50	515	5	40
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Hourly flow rate (vph)	149	5	52	531	5	41
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			155		786	152
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			155		786	152
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			96		99	95
cM capacity (veh/h)			1420		351	899

Direction, Lane #	EB 1	WB 1	WB 2	NB 1
Volume Total	155	52	531	46
Volume Left	0	52	0	5
Volume Right	5	0	0	41
cSH	1700	1420	1700	766
Volume to Capacity	0.09	0.04	0.31	0.06
Queue Length 95th (ft)	0	3	0	5
Control Delay (s)	0.0	7.6	0.0	10.0
Lane LOS		A		B
Approach Delay (s)	0.0	0.7		10.0
Approach LOS				B

Intersection Summary			
Average Delay	1.1		
Intersection Capacity Utilization	37.1%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Stop			Stop	Stop	
Volume (vph)	140	10	90	340	5	35
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	147	11	95	358	5	37

Direction, Lane #	EB 1	EB 2	WB 1	NB 1
Volume Total (vph)	151	7	453	42
Volume Left (vph)	0	0	95	5
Volume Right (vph)	4	7	0	37
Hadj (s)	-0.02	-0.70	0.06	-0.50
Departure Headway (s)	4.9	4.2	4.3	4.7
Degree Utilization, x	0.21	0.01	0.55	0.06
Capacity (veh/h)	718	826	814	670
Control Delay (s)	8.0	6.1	12.4	8.0
Approach Delay (s)	7.9		12.4	8.0
Approach LOS	A		B	A

Intersection Summary			
Delay	11.1		
HCM Level of Service	B		
Intersection Capacity Utilization	43.8%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	0	15	0	70	30	25	0	40	60	60	55	0
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Hourly flow rate (vph)	0	16	0	75	32	27	0	43	65	65	59	0

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	16	134	108	124
Volume Left (vph)	0	75	0	65
Volume Right (vph)	0	27	65	0
Hadj (s)	0.00	-0.01	-0.36	0.12
Departure Headway (s)	4.6	4.4	4.0	4.5
Degree Utilization, x	0.02	0.17	0.12	0.15
Capacity (veh/h)	727	765	849	763
Control Delay (s)	7.7	8.3	7.6	8.3
Approach Delay (s)	7.7	8.3	7.6	8.3
Approach LOS	A	A	A	A

Intersection Summary			
Delay	8.1		
HCM Level of Service	A		
Intersection Capacity Utilization	33.2%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Stop	Stop		Stop	
Volume (vph)	0	380	185	145	95	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	413	201	158	103	0

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total (vph)	413	359	103
Volume Left (vph)	0	0	103
Volume Right (vph)	0	158	0
Hadj (s)	0.00	-0.26	0.20
Departure Headway (s)	4.6	4.4	5.8
Degree Utilization, x	0.53	0.44	0.17
Capacity (veh/h)	752	784	545
Control Delay (s)	12.7	10.9	10.0
Approach Delay (s)	12.7	10.9	10.0
Approach LOS	B	B	A

Intersection Summary			
Delay	11.6		
HCM Level of Service	B		
Intersection Capacity Utilization	31.9%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.97	0.95		0.97	0.91	0.91		1.00	1.00	0.95	0.95	1.00
Frt	1.00	0.99		1.00	1.00	0.85		1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.99	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	3511		3433	3390	1441		1870	1599	1698	1787	1599
Flt Permitted	0.95	1.00		0.95	1.00	1.00		0.99	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3433	3511		3433	3390	1441		1870	1599	1698	1787	1599
Volume (vph)	330	890	50	495	770	120	20	155	835	80	125	315
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	340	918	52	510	794	124	21	160	861	82	129	325
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	176	0	0	281
Lane Group Flow (vph)	340	970	0	510	794	124	0	181	685	82	129	44
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	1%	1%	1%	1%	1%	1%
Turn Type	Prot			Prot		Free	Split		pt+ov	Split		Perm
Protected Phases	7	4		3	8		2	2	2 3	6	6	
Permitted Phases						Free						6
Actuated Green, G (s)	15.3	24.0		16.0	24.7	89.0		21.0	37.0	12.0	12.0	12.0
Effective Green, g (s)	15.3	24.0		16.0	24.7	89.0		21.0	37.0	12.0	12.0	12.0
Actuated g/C Ratio	0.17	0.27		0.18	0.28	1.00		0.24	0.42	0.13	0.13	0.13
Clearance Time (s)	4.0	4.0		4.0	4.0			4.0		4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	590	947		617	941	1441		441	665	229	241	216
v/s Ratio Prot	0.10	c0.28		0.15	0.23			0.10	c0.43	0.05	c0.07	
v/s Ratio Perm						0.09						0.03
v/c Ratio	0.58	1.02		0.83	0.84	0.09		0.41	1.03	0.36	0.54	0.20
Uniform Delay, d1	33.9	32.5		35.2	30.3	0.0		28.8	26.0	35.0	35.9	34.2
Progression Factor	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.4	35.6		8.9	7.0	0.1		0.6	42.9	1.0	2.3	0.5
Delay (s)	35.2	68.1		44.1	37.3	0.1		29.4	68.9	36.0	38.2	34.7
Level of Service	D	E		D	D	A		C	E	D	D	C
Approach Delay (s)		59.5			36.5			62.0			35.7	
Approach LOS		E			D			E			D	

Intersection Summary			
HCM Average Control Delay	49.6	HCM Level of Service	D
HCM Volume to Capacity ratio	0.95		
Actuated Cycle Length (s)	89.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	94.5%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

2015 With Alternative 1 (Without RTID Improvements)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	395	160	625	175	230	150	40	130	100	30	55	485
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	429	174	679	190	250	163	43	141	109	33	60	527

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	NB 1	SB 1
Volume Total (vph)	429	853	190	250	163	293	620
Volume Left (vph)	429	0	190	0	0	43	33
Volume Right (vph)	0	679	0	0	163	109	527
Hadj (s)	0.53	-0.52	0.53	0.03	-0.67	-0.02	-0.47
Departure Headway (s)	9.3	8.2	9.7	9.2	3.2	9.0	8.0
Degree Utilization, x	1.11	1.95	0.51	0.64	0.14	0.74	1.38
Capacity (veh/h)	398	443	358	380	1121	390	455
Control Delay (s)	108.0	455.9	21.3	25.9	5.5	33.4	205.3
Approach Delay (s)	339.5		18.9			33.4	205.3
Approach LOS	F		C			D	F

Intersection Summary			
Delay	208.6		
HCM Level of Service	F		
Intersection Capacity Utilization	104.6%	ICU Level of Service	G
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	0	1005	25	515	245	0	0	0	0	140	10	365
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	1092	27	560	266	0	0	0	0	152	11	397
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												9
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	266			1120			2696	2492	1106	2492	2505	266
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	266			1120			2696	2492	1106	2492	2505	266
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			10			0	100	100	0	0	48
cM capacity (veh/h)	1303			624			0	3	258	4	3	770

Direction, Lane #	EB 1	WB 1	WB 2	SB 1
Volume Total	1120	560	266	560
Volume Left	0	560	0	152
Volume Right	27	0	0	397
cSH	1700	624	1700	15
Volume to Capacity	0.66	0.90	0.16	38.55
Queue Length 95th (ft)	0	276	0	Err
Control Delay (s)	0.0	41.2	0.0	Err
Lane LOS		E		F
Approach Delay (s)	0.0	27.9		Err
Approach LOS				F

Intersection Summary			
Average Delay	2243.2		
Intersection Capacity Utilization	101.2%	ICU Level of Service	G
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	20	705	0	0	270	335	0	0	5	320	0	10
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	22	766	0	0	293	364	0	0	5	348	0	11
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	658			766			1296	1467	766	1291	1285	476
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	658			766			1296	1467	766	1291	1285	476
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.2	6.6	6.3
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.6	4.1	3.4
p0 queue free %	98			100			100	100	99	0	100	98
cM capacity (veh/h)	930			852			135	126	406	130	154	571

Direction, Lane #	EB 1	EB 2	WB 1	NB 1	SB 1
Volume Total	22	766	658	5	359
Volume Left	22	0	0	0	348
Volume Right	0	0	364	5	11
cSH	930	1700	1700	406	133
Volume to Capacity	0.02	0.45	0.39	0.01	2.69
Queue Length 95th (ft)	2	0	0	1	809
Control Delay (s)	9.0	0.0	0.0	14.0	834.6
Lane LOS	A			B	F
Approach Delay (s)	0.2		0.0	14.0	834.6
Approach LOS				B	F

Intersection Summary			
Average Delay	165.6		
Intersection Capacity Utilization	68.8%	ICU Level of Service	C
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Volume (veh/h)	175	675	255	25	45	150
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	190	734	277	27	49	163
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	304				1405	291
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	304				1405	291
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	85				63	78
cM capacity (veh/h)	1256				132	753

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	924	304	212
Volume Left	190	0	49
Volume Right	0	27	163
cSH	1256	1700	361
Volume to Capacity	0.15	0.18	0.59
Queue Length 95th (ft)	13	0	90
Control Delay (s)	3.5	0.0	28.3
Lane LOS	A		D
Approach Delay (s)	3.5	0.0	28.3
Approach LOS			D

Intersection Summary			
Average Delay	6.4		
Intersection Capacity Utilization	81.9%	ICU Level of Service	D
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	820	5	55	355	5	30
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	891	5	60	386	5	33
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			897		1399	894
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			897		1399	894
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			92		96	90
cM capacity (veh/h)			761		144	343

Direction, Lane #	EB 1	WB 1	WB 2	NB 1
Volume Total	897	60	386	38
Volume Left	0	60	0	5
Volume Right	5	0	0	33
cSH	1700	761	1700	286
Volume to Capacity	0.53	0.08	0.23	0.13
Queue Length 95th (ft)	0	6	0	11
Control Delay (s)	0.0	10.1	0.0	19.5
Lane LOS		B		C
Approach Delay (s)	0.0	1.4		19.5
Approach LOS				C

Intersection Summary			
Average Delay	1.0		
Intersection Capacity Utilization	55.7%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Stop			Stop	Stop	
Volume (vph)	490	5	105	175	10	210
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	533	5	114	190	11	228

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total (vph)	538	304	239
Volume Left (vph)	0	114	11
Volume Right (vph)	5	0	228
Hadj (s)	0.04	0.14	-0.55
Departure Headway (s)	5.1	5.5	5.5
Degree Utilization, x	0.76	0.47	0.36
Capacity (veh/h)	538	623	592
Control Delay (s)	22.6	13.2	11.6
Approach Delay (s)	22.6	13.2	11.6
Approach LOS	C	B	B

Intersection Summary			
Delay	17.5		
HCM Level of Service	C		
Intersection Capacity Utilization	64.7%	ICU Level of Service	C
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	0	10	0	20	10	120	0	60	50	110	25	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	11	0	22	11	130	0	65	54	120	27	0

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	11	163	120	147
Volume Left (vph)	0	22	0	120
Volume Right (vph)	0	130	54	0
Hadj (s)	0.00	-0.42	-0.19	0.25
Departure Headway (s)	4.7	4.1	4.3	4.7
Degree Utilization, x	0.01	0.19	0.14	0.19
Capacity (veh/h)	701	817	800	733
Control Delay (s)	7.8	8.1	8.0	8.8
Approach Delay (s)	7.8	8.1	8.0	8.8
Approach LOS	A	A	A	A

Intersection Summary			
Delay	8.3		
HCM Level of Service	A		
Intersection Capacity Utilization	36.4%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Stop			Stop
Volume (vph)	80	5	375	130	5	155
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	87	5	408	141	5	168

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total (vph)	92	549	174
Volume Left (vph)	87	0	5
Volume Right (vph)	5	141	0
Hadj (s)	0.22	-0.10	0.04
Departure Headway (s)	5.7	4.3	4.8
Degree Utilization, x	0.15	0.65	0.23
Capacity (veh/h)	561	827	715
Control Delay (s)	9.7	15.0	9.2
Approach Delay (s)	9.7	15.0	9.2
Approach LOS	A	B	A

Intersection Summary			
Delay	13.2		
HCM Level of Service	B		
Intersection Capacity Utilization	39.0%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.97	0.95		0.97	0.91	0.91		0.95	0.95	0.95	0.95	1.00
Frt	1.00	0.99		1.00	1.00	0.85		1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.99	1.00	0.95	0.98	1.00
Satd. Flow (prot)	3273	3347		3400	3357	1427		1689	1447	1698	1760	1599
Flt Permitted	0.95	1.00		0.95	1.00	1.00		0.99	1.00	0.95	0.98	1.00
Satd. Flow (perm)	3273	3347		3400	3357	1427		1689	1447	1698	1760	1599
Volume (vph)	325	445	25	460	785	65	40	200	145	90	50	275
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	353	484	27	500	853	71	43	217	158	98	54	299
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	261
Lane Group Flow (vph)	353	511	0	500	853	71	0	260	158	74	78	38
Heavy Vehicles (%)	7%	7%	7%	3%	3%	3%	6%	6%	6%	1%	1%	1%
Turn Type	Prot			Prot		Free	Split		pt+ov	Split		Perm
Protected Phases	7	4		3	8		2	2	2 3	6	6	
Permitted Phases						Free						6
Actuated Green, G (s)	10.7	18.0		14.4	21.7	72.2		14.7	29.1	9.1	9.1	9.1
Effective Green, g (s)	10.7	18.0		14.4	21.7	72.2		14.7	29.1	9.1	9.1	9.1
Actuated g/C Ratio	0.15	0.25		0.20	0.30	1.00		0.20	0.40	0.13	0.13	0.13
Clearance Time (s)	4.0	4.0		4.0	4.0			4.0		4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	485	834		678	1009	1427		344	583	214	222	202
v/s Ratio Prot	0.11	c0.15		0.15	c0.25			c0.15	0.11	0.04	c0.04	
v/s Ratio Perm						0.05						0.02
v/c Ratio	0.73	0.61		0.74	0.85	0.05		0.76	0.27	0.35	0.35	0.19
Uniform Delay, d1	29.4	24.0		27.1	23.7	0.0		27.1	14.4	28.8	28.9	28.2
Progression Factor	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	5.4	1.3		4.2	6.6	0.1		9.1	0.3	1.0	1.0	0.4
Delay (s)	34.8	25.4		31.3	30.3	0.1		36.2	14.7	29.8	29.8	28.7
Level of Service	C	C		C	C	A		D	B	C	C	C
Approach Delay (s)		29.2			29.2			28.1			29.1	
Approach LOS		C			C			C			C	

Intersection Summary			
HCM Average Control Delay	29.0	HCM Level of Service	C
HCM Volume to Capacity ratio	0.68		
Actuated Cycle Length (s)	72.2	Sum of lost time (s)	12.0
Intersection Capacity Utilization	65.1%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	150	240	325	80	220	65	45	310	155	50	50	410
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Hourly flow rate (vph)	156	250	339	83	229	68	47	323	161	52	52	427

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	NB 1	SB 1
Volume Total (vph)	156	589	83	229	68	531	531
Volume Left (vph)	156	0	83	0	0	47	52
Volume Right (vph)	0	339	0	0	68	161	427
Hadj (s)	0.52	-0.39	0.53	0.03	-0.67	-0.15	-0.45
Departure Headway (s)	9.5	8.6	10.2	9.7	3.2	8.5	8.2
Degree Utilization, x	0.41	1.41	0.24	0.62	0.06	1.26	1.22
Capacity (veh/h)	375	428	350	364	1121	429	443
Control Delay (s)	17.8	220.6	15.1	25.7	5.2	160.6	142.7
Approach Delay (s)	178.1		19.7			160.6	142.7
Approach LOS	F		C			F	F

Intersection Summary			
Delay	137.7		
HCM Level of Service	F		
Intersection Capacity Utilization	88.5%	ICU Level of Service	E
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	0	515	155	305	355	0	0	0	0	230	10	540
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Hourly flow rate (vph)	0	531	160	314	366	0	0	0	0	237	10	557
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												9
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	366			691			1889	1606	611	1606	1686	366
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	366			691			1889	1606	611	1606	1686	366
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			65			100	100	100	0	83	19
cM capacity (veh/h)	1204			909			6	70	498	63	62	684

Direction, Lane #	EB 1	WB 1	WB 2	SB 1
Volume Total	691	314	366	804
Volume Left	0	314	0	237
Volume Right	160	0	0	557
cSH	1700	909	1700	172
Volume to Capacity	0.41	0.35	0.22	4.68
Queue Length 95th (ft)	0	39	0	Err
Control Delay (s)	0.0	11.0	0.0	Err
Lane LOS		B		F
Approach Delay (s)	0.0	5.1		Err
Approach LOS				F

Intersection Summary			
Average Delay	3697.9		
Intersection Capacity Utilization	76.7%	ICU Level of Service	D
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	15	250	0	5	540	335	0	0	5	420	0	20
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Hourly flow rate (vph)	15	258	0	5	557	345	0	0	5	433	0	21
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	902			258			1049	1201	258	1034	1028	729
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	902			258			1049	1201	258	1034	1028	729
tC, single (s)	4.1			4.1			7.3	6.7	6.4	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.7	4.2	3.5	3.5	4.0	3.3
p0 queue free %	98			100			100	100	99	0	100	95
cM capacity (veh/h)	762			1301			180	169	746	204	227	421

Direction, Lane #	EB 1	EB 2	WB 1	NB 1	SB 1
Volume Total	15	258	907	5	454
Volume Left	15	0	5	0	433
Volume Right	0	0	345	5	21
cSH	762	1700	1301	746	209
Volume to Capacity	0.02	0.15	0.00	0.01	2.17
Queue Length 95th (ft)	2	0	0	1	884
Control Delay (s)	9.8	0.0	0.1	9.9	578.1
Lane LOS	A		A	A	F
Approach Delay (s)	0.6		0.1	9.9	578.1
Approach LOS				A	F

Intersection Summary			
Average Delay	160.2		
Intersection Capacity Utilization	90.9%	ICU Level of Service	E
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Volume (veh/h)	160	230	525	50	35	195
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Hourly flow rate (vph)	165	237	541	52	36	201
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	593				1134	567
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	593				1134	567
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	83				81	62
cM capacity (veh/h)	993				189	527

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	402	593	237
Volume Left	165	0	36
Volume Right	0	52	201
cSH	993	1700	414
Volume to Capacity	0.17	0.35	0.57
Queue Length 95th (ft)	15	0	87
Control Delay (s)	4.9	0.0	24.7
Lane LOS	A		C
Approach Delay (s)	4.9	0.0	24.7
Approach LOS			C

Intersection Summary			
Average Delay	6.4		
Intersection Capacity Utilization	75.6%	ICU Level of Service	D
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	350	5	50	680	5	40
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Hourly flow rate (vph)	361	5	52	701	5	41
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			366		1168	363
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			366		1168	363
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			96		98	94
cM capacity (veh/h)			1187		207	686

Direction, Lane #	EB 1	WB 1	WB 2	NB 1
Volume Total	366	52	701	46
Volume Left	0	52	0	5
Volume Right	5	0	0	41
cSH	1700	1187	1700	545
Volume to Capacity	0.22	0.04	0.41	0.09
Queue Length 95th (ft)	0	3	0	7
Control Delay (s)	0.0	8.2	0.0	12.2
Lane LOS		A		B
Approach Delay (s)	0.0	0.6		12.2
Approach LOS				B

Intersection Summary			
Average Delay	0.8		
Intersection Capacity Utilization	45.8%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Stop			Stop	Stop	
Volume (vph)	205	10	190	415	5	125
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	216	11	200	437	5	132

Direction, Lane #	EB 1	EB 2	WB 1	NB 1
Volume Total (vph)	219	7	637	137
Volume Left (vph)	0	0	200	5
Volume Right (vph)	4	7	0	132
Hadj (s)	-0.01	-0.70	0.08	-0.57
Departure Headway (s)	5.5	4.8	4.8	5.4
Degree Utilization, x	0.33	0.01	0.84	0.20
Capacity (veh/h)	627	717	743	621
Control Delay (s)	9.9	6.6	28.0	9.7
Approach Delay (s)	9.8		28.0	9.7
Approach LOS	A		D	A

Intersection Summary			
Delay	21.4		
HCM Level of Service	C		
Intersection Capacity Utilization	61.4%	ICU Level of Service	B
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
7: 30th Street & Burnett Ave

8/29/2012

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	0	15	0	70	30	115	0	40	60	160	55	0
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Hourly flow rate (vph)	0	16	0	75	32	124	0	43	65	172	59	0

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	16	231	108	231
Volume Left (vph)	0	75	0	172
Volume Right (vph)	0	124	65	0
Hadj (s)	0.00	-0.26	-0.36	0.17
Departure Headway (s)	5.0	4.5	4.4	4.8
Degree Utilization, x	0.02	0.29	0.13	0.31
Capacity (veh/h)	644	750	757	712
Control Delay (s)	8.1	9.3	8.1	9.9
Approach Delay (s)	8.1	9.3	8.1	9.9
Approach LOS	A	A	A	A

Intersection Summary			
Delay	9.3		
HCM Level of Service	A		
Intersection Capacity Utilization	44.3%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Stop	Stop		Stop	
Volume (vph)	0	455	250	145	95	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	495	272	158	103	0

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total (vph)	495	429	103
Volume Left (vph)	0	0	103
Volume Right (vph)	0	158	0
Hadj (s)	0.00	-0.22	0.20
Departure Headway (s)	4.7	4.6	6.2
Degree Utilization, x	0.65	0.55	0.18
Capacity (veh/h)	737	759	509
Control Delay (s)	16.2	13.1	10.5
Approach Delay (s)	16.2	13.1	10.5
Approach LOS	C	B	B

Intersection Summary			
Delay	14.3		
HCM Level of Service	B		
Intersection Capacity Utilization	35.9%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.97	0.95		0.97	0.91	0.91		0.95	0.95	0.95	0.95	1.00
Frt	1.00	0.99		1.00	1.00	0.85		0.91	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00		1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	3511		3433	3390	1441		1622	1519	1698	1787	1599
Flt Permitted	0.95	1.00		0.95	1.00	1.00		1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3433	3511		3433	3390	1441		1622	1519	1698	1787	1599
Volume (vph)	375	890	50	495	770	125	20	155	835	85	145	365
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	387	918	52	510	794	129	21	160	861	88	149	376
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	327
Lane Group Flow (vph)	387	970	0	510	794	129	0	454	588	88	149	49
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	1%	1%	1%	1%	1%	1%
Turn Type	Prot			Prot		Free	Split		pt+ov	Split		Perm
Protected Phases	7	4		3	8		2	2	2 3	6	6	
Permitted Phases						Free						6
Actuated Green, G (s)	18.5	31.1		17.0	29.6	111.4		32.9	49.9	14.4	14.4	14.4
Effective Green, g (s)	18.5	31.1		17.0	29.6	111.4		32.9	49.9	14.4	14.4	14.4
Actuated g/C Ratio	0.17	0.28		0.15	0.27	1.00		0.30	0.45	0.13	0.13	0.13
Clearance Time (s)	4.0	4.0		4.0	4.0			4.0		4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	570	980		524	901	1441		479	680	219	231	207
v/s Ratio Prot	0.11	c0.28		c0.15	0.23			c0.28	0.39	0.05	c0.08	
v/s Ratio Perm						0.09						0.03
v/c Ratio	0.68	0.99		0.97	0.88	0.09		0.95	0.86	0.40	0.65	0.24
Uniform Delay, d1	43.7	40.0		47.0	39.2	0.0		38.4	27.7	44.5	46.1	43.6
Progression Factor	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	3.2	25.9		32.3	10.1	0.1		28.1	11.1	1.2	6.1	0.6
Delay (s)	46.9	65.9		79.3	49.3	0.1		66.5	38.8	45.8	52.1	44.2
Level of Service	D	E		E	D	A		E	D	D	D	D
Approach Delay (s)		60.5			55.5			50.9			46.3	
Approach LOS		E			E			D			D	

Intersection Summary			
HCM Average Control Delay	54.7	HCM Level of Service	D
HCM Volume to Capacity ratio	0.92		
Actuated Cycle Length (s)	111.4	Sum of lost time (s)	16.0
Intersection Capacity Utilization	87.6%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

2015 With Alternative 1 with Mitigation

(Without RTID Improvements)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	0.88		1.00	1.00	0.85	1.00	0.93		1.00	0.87	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1640		1770	1863	1583	1641	1614		1770	1612	
Flt Permitted	0.59	1.00		0.13	1.00	1.00	0.19	1.00		0.51	1.00	
Satd. Flow (perm)	1105	1640		251	1863	1583	331	1614		958	1612	
Volume (vph)	395	160	625	175	230	150	40	130	100	30	55	485
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	429	174	679	190	250	163	43	141	109	33	60	527
RTOR Reduction (vph)	0	260	0	0	0	72	0	39	0	0	358	0
Lane Group Flow (vph)	429	593	0	190	250	91	43	211	0	33	229	0
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	10%	10%	10%	2%	2%	2%
Turn Type	Perm			Perm		Perm	Perm			Perm		
Protected Phases		4			8			2			6	
Permitted Phases	4			8		8	2			6		
Actuated Green, G (s)	36.1	36.1		36.1	36.1	36.1	20.9	20.9		20.9	20.9	
Effective Green, g (s)	36.1	36.1		36.1	36.1	36.1	20.9	20.9		20.9	20.9	
Actuated g/C Ratio	0.56	0.56		0.56	0.56	0.56	0.32	0.32		0.32	0.32	
Clearance Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	614	911		139	1035	879	106	519		308	518	
v/s Ratio Prot		0.36			0.13			0.13			c0.14	
v/s Ratio Perm	0.39			c0.76		0.06	0.13			0.03		
v/c Ratio	0.70	0.65		1.37	0.24	0.10	0.41	0.41		0.11	0.44	
Uniform Delay, d1	10.5	10.1		14.4	7.4	6.8	17.2	17.2		15.5	17.4	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	3.5	1.7		204.1	0.1	0.1	11.1	2.4		0.7	2.7	
Delay (s)	14.0	11.7		218.6	7.5	6.9	28.3	19.6		16.2	20.2	
Level of Service	B	B		F	A	A	C	B		B	C	
Approach Delay (s)		12.5			73.9			20.9			20.0	
Approach LOS		B			E			C			B	

Intersection Summary			
HCM Average Control Delay	28.2	HCM Level of Service	C
HCM Volume to Capacity ratio	1.03		
Actuated Cycle Length (s)	65.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	99.9%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	4.0	4.0						4.0	4.0
Lane Util. Factor		1.00	1.00	1.00	1.00						1.00	1.00
Frt		1.00	0.85	1.00	1.00						1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00						0.96	1.00
Satd. Flow (prot)		1881	1599	1770	1863						1762	1568
Flt Permitted		1.00	1.00	0.05	1.00						0.96	1.00
Satd. Flow (perm)		1881	1599	87	1863						1762	1568
Volume (vph)	0	1005	25	515	245	0	0	0	0	140	10	365
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	1092	27	560	266	0	0	0	0	152	11	397
RTOR Reduction (vph)	0	0	6	0	0	0	0	0	0	0	0	354
Lane Group Flow (vph)	0	1092	21	560	266	0	0	0	0	0	163	43
Heavy Vehicles (%)	1%	1%	1%	2%	2%	2%	0%	0%	0%	3%	3%	3%
Turn Type			Perm	pm+pt						Perm		Perm
Protected Phases		4		3	8						6	
Permitted Phases			4	8						6		6
Actuated Green, G (s)		81.7	81.7	125.7	125.7						16.3	16.3
Effective Green, g (s)		81.7	81.7	125.7	125.7						16.3	16.3
Actuated g/C Ratio		0.54	0.54	0.84	0.84						0.11	0.11
Clearance Time (s)		4.0	4.0	4.0	4.0						4.0	4.0
Vehicle Extension (s)		3.0	3.0	3.0	3.0						3.0	3.0
Lane Grp Cap (vph)		1025	871	522	1561						191	170
v/s Ratio Prot		0.58		c0.29	0.14							
v/s Ratio Perm			0.01	c0.61							0.09	0.03
v/c Ratio		1.07	0.02	1.07	0.17						0.85	0.25
Uniform Delay, d1		34.1	15.8	51.7	2.3						65.7	61.3
Progression Factor		1.00	1.00	1.00	1.00						1.00	1.00
Incremental Delay, d2		47.2	0.0	60.3	0.1						35.6	3.6
Delay (s)		81.4	15.8	112.0	2.3						101.3	64.8
Level of Service		F	B	F	A						F	E
Approach Delay (s)		79.8			76.7			0.0			75.5	
Approach LOS		E			E			A			E	

Intersection Summary			
HCM Average Control Delay	77.8	HCM Level of Service	E
HCM Volume to Capacity ratio	1.03		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	99.7%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0		4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95			1.00	1.00		1.00		1.00	1.00	
Frt	1.00	1.00			1.00	0.85		0.86		1.00	0.85	
Flt Protected	0.95	1.00			1.00	1.00		1.00		0.95	1.00	
Satd. Flow (prot)	1770	3539			1881	1599		1644		1626	1455	
Flt Permitted	0.53	1.00			1.00	1.00		1.00		0.75	1.00	
Satd. Flow (perm)	989	3539			1881	1599		1644		1291	1455	
Volume (vph)	20	705	0	0	270	335	0	0	5	320	0	10
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	22	766	0	0	293	364	0	0	5	348	0	11
RTOR Reduction (vph)	0	0	0	0	0	241	0	3	0	0	6	0
Lane Group Flow (vph)	22	766	0	0	293	123	0	2	0	348	5	0
Heavy Vehicles (%)	2%	2%	2%	1%	1%	1%	0%	0%	0%	11%	11%	11%
Turn Type	Perm					Perm	Perm			Perm		
Protected Phases		4			8			2			6	
Permitted Phases	4					8	2			6		
Actuated Green, G (s)	13.5	13.5			13.5	13.5		18.5		18.5	18.5	
Effective Green, g (s)	13.5	13.5			13.5	13.5		18.5		18.5	18.5	
Actuated g/C Ratio	0.34	0.34			0.34	0.34		0.46		0.46	0.46	
Clearance Time (s)	4.0	4.0			4.0	4.0		4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0			3.0	3.0		3.0		3.0	3.0	
Lane Grp Cap (vph)	334	1194			635	540		760		597	673	
v/s Ratio Prot		c0.22			0.16			0.00			0.00	
v/s Ratio Perm	0.02					0.08				c0.27		
v/c Ratio	0.07	0.64			0.46	0.23		0.00		0.58	0.01	
Uniform Delay, d1	9.0	11.2			10.4	9.5		5.8		7.9	5.8	
Progression Factor	1.00	1.00			1.00	1.00		1.00		1.00	1.00	
Incremental Delay, d2	0.1	1.2			0.5	0.2		0.0		4.1	0.0	
Delay (s)	9.1	12.4			10.9	9.7		5.8		12.0	5.8	
Level of Service	A	B			B	A		A		B	A	
Approach Delay (s)		12.3			10.3			5.8			11.8	
Approach LOS		B			B			A			B	

Intersection Summary			
HCM Average Control Delay	11.5	HCM Level of Service	B
HCM Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	40.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	50.5%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	0.91		1.00	1.00	0.85	1.00	0.95		1.00	0.87	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1787	1719		1770	1863	1583	1787	1787		1787	1630	
Flt Permitted	0.57	1.00		0.18	1.00	1.00	0.36	1.00		0.36	1.00	
Satd. Flow (perm)	1070	1719		337	1863	1583	677	1787		669	1630	
Volume (vph)	150	240	325	80	220	65	45	310	155	50	50	410
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	156	250	339	83	229	68	47	323	161	52	52	427
RTOR Reduction (vph)	0	84	0	0	0	41	0	22	0	0	219	0
Lane Group Flow (vph)	156	505	0	83	229	27	47	462	0	52	260	0
Heavy Vehicles (%)	1%	1%	1%	2%	2%	2%	1%	1%	1%	1%	1%	1%
Turn Type	Perm			Perm		Perm	Perm			Perm		
Protected Phases		4			8			2			6	
Permitted Phases	4			8		8	2			6		
Actuated Green, G (s)	27.9	27.9		27.9	27.9	27.9	34.1	34.1		34.1	34.1	
Effective Green, g (s)	27.9	27.9		27.9	27.9	27.9	34.1	34.1		34.1	34.1	
Actuated g/C Ratio	0.40	0.40		0.40	0.40	0.40	0.49	0.49		0.49	0.49	
Clearance Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	426	685		134	743	631	330	871		326	794	
v/s Ratio Prot		c0.29			0.12			c0.26			0.16	
v/s Ratio Perm	0.15			0.25		0.02	0.07			0.08		
v/c Ratio	0.37	0.74		0.62	0.31	0.04	0.14	0.53		0.16	0.33	
Uniform Delay, d1	14.8	17.9		16.8	14.4	12.9	9.9	12.4		10.0	11.0	
Progression Factor	1.12	1.09		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.4	3.4		8.3	0.2	0.0	0.9	2.3		1.0	1.1	
Delay (s)	17.1	23.0		25.1	14.7	12.9	10.8	14.7		11.0	12.1	
Level of Service	B	C		C	B	B	B	B		B	B	
Approach Delay (s)		21.8			16.6			14.4			12.0	
Approach LOS		C			B			B			B	

Intersection Summary			
HCM Average Control Delay	16.7	HCM Level of Service	B
HCM Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	70.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	81.6%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0		4.0	4.0						4.0	4.0
Lane Util. Factor		1.00		1.00	1.00						1.00	1.00
Frt		0.97		1.00	1.00						1.00	0.85
Flt Protected		1.00		0.95	1.00						0.95	1.00
Satd. Flow (prot)		1841		1787	1881						1813	1615
Flt Permitted		1.00		0.27	1.00						0.95	1.00
Satd. Flow (perm)		1841		502	1881						1813	1615
Volume (vph)	0	515	155	305	355	0	0	0	0	230	10	540
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	0	531	160	314	366	0	0	0	0	237	10	557
RTOR Reduction (vph)	0	18	0	0	0	0	0	0	0	0	0	376
Lane Group Flow (vph)	0	673	0	314	366	0	0	0	0	0	247	181
Heavy Vehicles (%)	0%	0%	0%	1%	1%	1%	0%	0%	0%	0%	0%	0%
Turn Type				Perm						Perm		Perm
Protected Phases		4			8						6	
Permitted Phases				8						6		6
Actuated Green, G (s)		41.3		41.3	41.3						20.7	20.7
Effective Green, g (s)		41.3		41.3	41.3						20.7	20.7
Actuated g/C Ratio		0.59		0.59	0.59						0.30	0.30
Clearance Time (s)		4.0		4.0	4.0						4.0	4.0
Vehicle Extension (s)		3.0		3.0	3.0						3.0	3.0
Lane Grp Cap (vph)		1086		296	1110						536	478
v/s Ratio Prot		0.37			0.19							
v/s Ratio Perm				c0.63							0.14	0.11
v/c Ratio		0.62		1.06	0.33						0.46	0.38
Uniform Delay, d1		9.3		14.4	7.3						20.1	19.5
Progression Factor		1.00		1.06	1.02						1.00	1.00
Incremental Delay, d2		1.1		67.5	0.2						2.8	2.3
Delay (s)		10.3		82.7	7.6						22.9	21.8
Level of Service		B		F	A						C	C
Approach Delay (s)		10.3			42.3			0.0			22.2	
Approach LOS		B			D			A			C	

Intersection Summary			
HCM Average Control Delay	24.7	HCM Level of Service	C
HCM Volume to Capacity ratio	0.86		
Actuated Cycle Length (s)	70.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	76.7%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0		4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95			1.00	1.00		1.00		1.00	1.00	
Frt	1.00	1.00			1.00	0.85		0.86		1.00	0.85	
Flt Protected	0.95	1.00			1.00	1.00		1.00		0.95	1.00	
Satd. Flow (prot)	1805	3610			1844	1568		1405		1752	1568	
Flt Permitted	0.27	1.00			1.00	1.00		1.00		0.75	1.00	
Satd. Flow (perm)	507	3610			1839	1568		1405		1385	1568	
Volume (vph)	15	250	0	5	540	335	0	0	10	420	0	20
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	15	258	0	5	557	345	0	0	10	433	0	21
RTOR Reduction (vph)	0	0	0	0	0	216	0	6	0	0	12	0
Lane Group Flow (vph)	15	258	0	0	562	129	0	4	0	433	9	0
Heavy Vehicles (%)	0%	0%	0%	3%	3%	3%	17%	17%	17%	3%	3%	3%
Turn Type	Perm			Perm		Perm	Perm			Perm		
Protected Phases		4			8			2			6	
Permitted Phases	4			8		8	2			6		
Actuated Green, G (s)	15.0	15.0			15.0	15.0		17.0		17.0	17.0	
Effective Green, g (s)	15.0	15.0			15.0	15.0		17.0		17.0	17.0	
Actuated g/C Ratio	0.38	0.38			0.38	0.38		0.42		0.42	0.42	
Clearance Time (s)	4.0	4.0			4.0	4.0		4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0			3.0	3.0		3.0		3.0	3.0	
Lane Grp Cap (vph)	190	1354			690	588		597		589	666	
v/s Ratio Prot		0.07						0.00			0.01	
v/s Ratio Perm	0.03				c0.31	0.08				c0.31		
v/c Ratio	0.08	0.19			0.81	0.22		0.01		0.74	0.01	
Uniform Delay, d1	8.1	8.4			11.2	8.5		6.6		9.6	6.7	
Progression Factor	1.00	1.00			1.00	1.00		1.00		1.00	1.00	
Incremental Delay, d2	0.2	0.1			7.3	0.2		0.0		8.0	0.0	
Delay (s)	8.2	8.5			18.6	8.7		6.7		17.6	6.7	
Level of Service	A	A			B	A		A		B	A	
Approach Delay (s)		8.5			14.8			6.7			17.1	
Approach LOS		A			B			A			B	

Intersection Summary			
HCM Average Control Delay	14.3	HCM Level of Service	B
HCM Volume to Capacity ratio	0.77		
Actuated Cycle Length (s)	40.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	69.0%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

2015 Without Project (With RTID Improvements)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0		4.0	4.0	4.0			
Lane Util. Factor	0.97	0.95			0.91		1.00	0.95	0.95			
Frt	1.00	1.00			0.94		1.00	0.85	0.85			
Flt Protected	0.95	1.00			1.00		0.95	1.00	1.00			
Satd. Flow (prot)	3433	3539			4775		1641	1395	1395			
Flt Permitted	0.95	1.00			1.00		0.95	1.00	1.00			
Satd. Flow (perm)	3433	3539			4775		1641	1395	1395			
Volume (vph)	400	410	0	0	560	385	40	0	270	0	0	0
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	435	446	0	0	609	418	43	0	293	0	0	0
RTOR Reduction (vph)	0	0	0	0	166	0	0	124	124	0	0	0
Lane Group Flow (vph)	435	446	0	0	861	0	43	22	23	0	0	0
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	10%	10%	10%	2%	2%	2%
Turn Type	Prot						Split		Perm			
Protected Phases	7	4			8		2	2				
Permitted Phases									2			
Actuated Green, G (s)	14.0	42.8			24.8		9.2	9.2	9.2			
Effective Green, g (s)	14.0	42.8			24.8		9.2	9.2	9.2			
Actuated g/C Ratio	0.23	0.71			0.41		0.15	0.15	0.15			
Clearance Time (s)	4.0	4.0			4.0		4.0	4.0	4.0			
Vehicle Extension (s)	3.0	3.0			3.0		3.0	3.0	3.0			
Lane Grp Cap (vph)	801	2524			1974		252	214	214			
v/s Ratio Prot	c0.13	0.13			c0.18		c0.03	0.02				
v/s Ratio Perm									0.02			
v/c Ratio	0.54	0.18			0.44		0.17	0.10	0.11			
Uniform Delay, d1	20.2	2.8			12.6		22.1	21.9	21.9			
Progression Factor	0.53	0.09			0.62		1.00	1.00	1.00			
Incremental Delay, d2	2.6	0.1			0.6		0.3	0.2	0.2			
Delay (s)	13.3	0.4			8.4		22.4	22.1	22.1			
Level of Service	B	A			A		C	C	C			
Approach Delay (s)		6.8			8.4			22.1			0.0	
Approach LOS		A			A			C			A	

Intersection Summary			
HCM Average Control Delay	9.8	HCM Level of Service	A
HCM Volume to Capacity ratio	0.42		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	46.4%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0		4.0	4.0					4.0	4.0	4.0
Lane Util. Factor		0.91		0.97	0.95					0.95	0.95	1.00
Frt		0.99		1.00	1.00					1.00	1.00	0.85
Flt Protected		1.00		0.95	1.00					0.95	0.96	1.00
Satd. Flow (prot)		5110		3433	3539					1665	1679	1568
Flt Permitted		1.00		0.95	1.00					0.95	0.96	1.00
Satd. Flow (perm)		5110		3433	3539					1665	1679	1568
Volume (vph)	0	720	25	425	170	0	0	0	0	65	5	135
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	783	27	462	185	0	0	0	0	71	5	147
RTOR Reduction (vph)	0	6	0	0	0	0	0	0	0	0	0	121
Lane Group Flow (vph)	0	804	0	462	185	0	0	0	0	37	39	26
Heavy Vehicles (%)	1%	1%	1%	2%	2%	2%	0%	0%	0%	3%	3%	3%
Turn Type				Prot						Split		Prot
Protected Phases		4		3	8					6	6	6
Permitted Phases												
Actuated Green, G (s)		28.3		9.0	31.7					10.7	10.7	10.7
Effective Green, g (s)		28.3		9.0	31.7					10.7	10.7	10.7
Actuated g/C Ratio		0.47		0.15	0.53					0.18	0.18	0.18
Clearance Time (s)		4.0		4.0	4.0					4.0	4.0	4.0
Vehicle Extension (s)		3.0		3.0	3.0					3.0	3.0	3.0
Lane Grp Cap (vph)		2410		515	1870					297	299	280
v/s Ratio Prot		c0.16		c0.13	0.05					0.02	c0.02	0.02
v/s Ratio Perm												
v/c Ratio		0.33		0.90	0.10					0.12	0.13	0.09
Uniform Delay, d1		9.9		25.0	7.0					20.7	20.7	20.6
Progression Factor		0.37		0.67	0.27					1.00	1.00	1.00
Incremental Delay, d2		0.3		19.4	0.1					0.2	0.2	0.1
Delay (s)		4.0		36.1	2.0					20.9	20.9	20.7
Level of Service		A		D	A					C	C	C
Approach Delay (s)		4.0			26.4			0.0			20.8	
Approach LOS		A			C			A			C	

Intersection Summary			
HCM Average Control Delay	14.8	HCM Level of Service	B
HCM Volume to Capacity ratio	0.39		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	39.9%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0		4.0			4.0	
Lane Util. Factor	1.00	1.00			1.00	1.00		1.00			1.00	
Frt	1.00	1.00			1.00	0.85		0.86			0.98	
Flt Protected	0.95	1.00			1.00	1.00		1.00			0.96	
Satd. Flow (prot)	1770	1863			1881	1599		1644			1611	
Flt Permitted	0.95	1.00			1.00	1.00		1.00			0.96	
Satd. Flow (perm)	1770	1863			1881	1599		1644			1611	
Volume (vph)	20	670	0	0	245	70	0	0	5	65	0	10
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	22	728	0	0	266	76	0	0	5	71	0	11
RTOR Reduction (vph)	0	0	0	0	0	76	0	5	0	0	9	0
Lane Group Flow (vph)	22	728	0	0	266	0	0	0	0	0	73	0
Heavy Vehicles (%)	2%	2%	2%	1%	1%	1%	0%	0%	0%	11%	11%	11%
Turn Type	Prot					NA	Split			Split		
Protected Phases	7	4			8		1	1		2	2	
Permitted Phases												
Actuated Green, G (s)	5.6	28.3			31.7	0.0		0.8			5.9	
Effective Green, g (s)	5.6	28.3			31.7	0.0		0.8			5.9	
Actuated g/C Ratio	0.09	0.47			0.53	0.00		0.01			0.10	
Clearance Time (s)	4.0	4.0			4.0			4.0			4.0	
Vehicle Extension (s)	3.0	3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)	165	879			994	0		22			158	
v/s Ratio Prot	0.01	c0.39			c0.14			c0.00			c0.05	
v/s Ratio Perm												
v/c Ratio	0.13	0.83			0.27	0.00		0.00			0.46	
Uniform Delay, d1	25.0	13.7			7.8	30.0		29.2			25.6	
Progression Factor	1.00	1.00			0.72	1.00		1.00			1.00	
Incremental Delay, d2	0.4	8.9			0.6	0.0		0.1			2.1	
Delay (s)	25.3	22.6			6.3	30.0		29.3			27.7	
Level of Service	C	C			A	C		C			C	
Approach Delay (s)		22.7			11.5			29.3			27.7	
Approach LOS		C			B			C			C	

Intersection Summary			
HCM Average Control Delay	19.8	HCM Level of Service	B
HCM Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	52.8%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Volume (veh/h)	0	680	255	0	10	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	739	277	0	11	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)			236			
pX, platoon unblocked	0.93				0.93	0.93
vC, conflicting volume	277				1016	277
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	221				1018	221
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				96	100
cM capacity (veh/h)	1251				246	764

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	739	277	11
Volume Left	0	0	11
Volume Right	0	0	0
cSH	1251	1700	246
Volume to Capacity	0.00	0.16	0.04
Queue Length 95th (ft)	0	0	3
Control Delay (s)	0.0	0.0	20.3
Lane LOS			C
Approach Delay (s)	0.0	0.0	20.3
Approach LOS			C

Intersection Summary			
Average Delay	0.2		
Intersection Capacity Utilization	45.8%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	650	5	55	205	5	30
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	707	5	60	223	5	33
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)				355		
pX, platoon unblocked					0.98	
vC, conflicting volume			712		1052	709
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			712		1053	709
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			93		98	93
cM capacity (veh/h)			892		231	437

Direction, Lane #	EB 1	WB 1	WB 2	NB 1	NB 2
Volume Total	712	60	223	5	33
Volume Left	0	60	0	5	0
Volume Right	5	0	0	0	33
cSH	1700	892	1700	231	437
Volume to Capacity	0.42	0.07	0.13	0.02	0.07
Queue Length 95th (ft)	0	5	0	2	6
Control Delay (s)	0.0	9.3	0.0	21.0	13.9
Lane LOS		A		C	B
Approach Delay (s)	0.0	2.0		14.9	
Approach LOS				B	

Intersection Summary			
Average Delay	1.1		
Intersection Capacity Utilization	51.2%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Stop			Stop	Stop	
Volume (vph)	350	0	15	95	5	105
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	380	0	16	103	5	114

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total (vph)	380	120	120
Volume Left (vph)	0	16	5
Volume Right (vph)	0	0	114
Hadj (s)	0.00	0.04	-0.56
Departure Headway (s)	4.3	4.6	4.5
Degree Utilization, x	0.46	0.15	0.15
Capacity (veh/h)	814	737	733
Control Delay (s)	10.9	8.5	8.2
Approach Delay (s)	10.9	8.5	8.2
Approach LOS	B	A	A

Intersection Summary			
Delay	9.9		
HCM Level of Service	A		
Intersection Capacity Utilization	31.9%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	0	10	0	20	10	20	0	60	45	20	25	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	11	0	22	11	22	0	65	49	22	27	0

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	11	54	114	49
Volume Left (vph)	0	22	0	22
Volume Right (vph)	0	22	49	0
Hadj (s)	0.00	-0.16	-0.26	0.11
Departure Headway (s)	4.3	4.1	3.8	4.3
Degree Utilization, x	0.01	0.06	0.12	0.06
Capacity (veh/h)	799	843	912	826
Control Delay (s)	7.4	7.4	7.4	7.5
Approach Delay (s)	7.4	7.4	7.4	7.5
Approach LOS	A	A	A	A

Intersection Summary			
Delay	7.4		
HCM Level of Service	A		
Intersection Capacity Utilization	25.3%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Stop	Stop		Stop	
Volume (vph)	0	5	5	0	0	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	5	5	0	0	0

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total (vph)	5	5	0
Volume Left (vph)	0	0	0
Volume Right (vph)	0	0	0
Hadj (s)	0.00	0.00	0.00
Departure Headway (s)	3.9	3.9	3.9
Degree Utilization, x	0.01	0.01	0.00
Capacity (veh/h)	915	916	911
Control Delay (s)	6.9	6.9	6.9
Approach Delay (s)	6.9	6.9	0.0
Approach LOS	A	A	A

Intersection Summary			
Delay	6.9		
HCM Level of Service	A		
Intersection Capacity Utilization	6.7%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.97	0.95		0.97	0.91	0.91		0.95	0.95	0.95	0.95	1.00
Frt	1.00	1.00		1.00	1.00	0.85		1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.99	1.00	0.95	0.96	1.00
Satd. Flow (prot)	3433	3527		3433	3390	1441		1775	1519	1698	1724	1599
Flt Permitted	0.95	1.00		0.95	1.00	1.00		0.99	1.00	0.95	0.96	1.00
Satd. Flow (perm)	3433	3527		3433	3390	1441		1775	1519	1698	1724	1599
Volume (vph)	250	440	10	385	850	105	20	130	115	125	20	190
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	272	478	11	418	924	114	22	141	125	136	22	207
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	179
Lane Group Flow (vph)	272	489	0	418	924	114	0	163	125	77	81	28
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	1%	1%	1%	1%	1%	1%
Turn Type	Prot			Prot		Free	Split		pt+ov	Split		Perm
Protected Phases	7	4		3	8		5	5	5 3	6	6	
Permitted Phases						Free						6
Actuated Green, G (s)	9.6	18.0		12.7	21.1	63.3		8.1	20.8	8.5	8.5	8.5
Effective Green, g (s)	9.6	18.0		12.7	21.1	63.3		8.1	20.8	8.5	8.5	8.5
Actuated g/C Ratio	0.15	0.28		0.20	0.33	1.00		0.13	0.33	0.13	0.13	0.13
Clearance Time (s)	4.0	4.0		4.0	4.0			4.0		4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	521	1003		689	1130	1441		227	499	228	232	215
v/s Ratio Prot	0.08	c0.14		0.12	c0.27			c0.09	0.08	0.05	c0.05	
v/s Ratio Perm						0.08						0.02
v/c Ratio	0.52	0.49		0.61	0.82	0.08		0.72	0.25	0.34	0.35	0.13
Uniform Delay, d1	24.7	18.8		23.0	19.3	0.0		26.5	15.5	24.8	24.9	24.1
Progression Factor	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.9	0.4		1.5	4.7	0.1		10.3	0.3	0.9	0.9	0.3
Delay (s)	25.7	19.2		24.5	24.0	0.1		36.8	15.8	25.7	25.8	24.4
Level of Service	C	B		C	C	A		D	B	C	C	C
Approach Delay (s)		21.5			22.3			27.7			25.0	
Approach LOS		C			C			C			C	

Intersection Summary			
HCM Average Control Delay	23.0	HCM Level of Service	C
HCM Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	63.3	Sum of lost time (s)	12.0
Intersection Capacity Utilization	59.3%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0		4.0	4.0	4.0			
Lane Util. Factor	0.97	0.95			0.91		1.00	0.95	0.95			
Frt	1.00	1.00			0.96		1.00	0.85	0.85			
Flt Protected	0.95	1.00			1.00		0.95	1.00	1.00			
Satd. Flow (prot)	3467	3574			4879		1787	1519	1519			
Flt Permitted	0.95	1.00			1.00		0.95	1.00	1.00			
Satd. Flow (perm)	3467	3574			4879		1787	1519	1519			
Volume (vph)	70	245	0	0	470	175	40	0	515	0	0	0
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	73	255	0	0	490	182	42	0	536	0	0	0
RTOR Reduction (vph)	0	0	0	0	87	0	0	227	227	0	0	0
Lane Group Flow (vph)	73	255	0	0	585	0	42	41	41	0	0	0
Heavy Vehicles (%)	1%	1%	1%	2%	2%	2%	1%	1%	1%	0%	0%	0%
Turn Type	Prot						Split		Perm			
Protected Phases	7	4			8		2	2				
Permitted Phases									2			
Actuated Green, G (s)	13.0	42.8			25.8		9.2	9.2	9.2			
Effective Green, g (s)	13.0	42.8			25.8		9.2	9.2	9.2			
Actuated g/C Ratio	0.22	0.71			0.43		0.15	0.15	0.15			
Clearance Time (s)	4.0	4.0			4.0		4.0	4.0	4.0			
Vehicle Extension (s)	3.0	3.0			3.0		3.0	3.0	3.0			
Lane Grp Cap (vph)	751	2549			2098		274	233	233			
v/s Ratio Prot	0.02	c0.07			c0.12		0.02	c0.03				
v/s Ratio Perm									0.03			
v/c Ratio	0.10	0.10			0.28		0.15	0.18	0.18			
Uniform Delay, d1	18.8	2.7			11.1		22.0	22.1	22.1			
Progression Factor	1.16	0.66			0.63		1.00	1.00	1.00			
Incremental Delay, d2	0.3	0.1			0.3		0.3	0.4	0.4			
Delay (s)	22.1	1.8			7.2		22.3	22.5	22.5			
Level of Service	C	A			A		C	C	C			
Approach Delay (s)		6.3			7.2			22.5			0.0	
Approach LOS		A			A			C			A	

Intersection Summary			
HCM Average Control Delay	12.6	HCM Level of Service	B
HCM Volume to Capacity ratio	0.20		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	37.0%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0		4.0	4.0					4.0	4.0	4.0
Lane Util. Factor		0.91		0.97	0.95					0.95	0.95	1.00
Frt		0.93		1.00	1.00					1.00	1.00	0.85
Flt Protected		1.00		0.95	1.00					0.95	0.96	1.00
Satd. Flow (prot)		4838		3467	3574					1715	1725	1615
Flt Permitted		1.00		0.95	1.00					0.95	0.96	1.00
Satd. Flow (perm)		4838		3467	3574					1715	1725	1615
Volume (vph)	0	185	150	215	270	0	0	0	0	130	5	290
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	0	191	155	222	278	0	0	0	0	134	5	299
RTOR Reduction (vph)	0	122	0	0	0	0	0	0	0	0	0	227
Lane Group Flow (vph)	0	224	0	222	278	0	0	0	0	68	71	72
Heavy Vehicles (%)	0%	0%	0%	1%	1%	1%	0%	0%	0%	0%	0%	0%
Turn Type				Prot						Split		Prot
Protected Phases		4		3	8					6	6	6
Permitted Phases												
Actuated Green, G (s)		12.8		20.8	27.6					14.4	14.4	14.4
Effective Green, g (s)		12.8		20.8	27.6					14.4	14.4	14.4
Actuated g/C Ratio		0.21		0.35	0.46					0.24	0.24	0.24
Clearance Time (s)		4.0		4.0	4.0					4.0	4.0	4.0
Vehicle Extension (s)		3.0		3.0	3.0					3.0	3.0	3.0
Lane Grp Cap (vph)		1032		1202	1644					412	414	388
v/s Ratio Prot		c0.05		c0.06	0.08					0.04	0.04	c0.04
v/s Ratio Perm												
v/c Ratio		0.22		0.18	0.17					0.17	0.17	0.18
Uniform Delay, d1		19.5		13.7	9.5					18.0	18.1	18.1
Progression Factor		0.59		0.41	1.04					1.00	1.00	1.00
Incremental Delay, d2		0.4		0.3	0.2					0.2	0.2	0.2
Delay (s)		12.0		6.0	10.1					18.2	18.3	18.4
Level of Service		B		A	B					B	B	B
Approach Delay (s)		12.0			8.3			0.0			18.3	
Approach LOS		B			A			A			B	

Intersection Summary			
HCM Average Control Delay	12.7	HCM Level of Service	B
HCM Volume to Capacity ratio	0.19		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	32.1%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0		4.0			4.0	
Lane Util. Factor	1.00	1.00			1.00	1.00		1.00			1.00	
Frt	1.00	1.00			1.00	0.85		0.86			0.97	
Flt Protected	0.95	1.00			1.00	1.00		1.00			0.96	
Satd. Flow (prot)	1805	1900			1845	1568		1405			1721	
Flt Permitted	0.95	1.00			1.00	1.00		1.00			0.96	
Satd. Flow (perm)	1805	1900			1845	1568		1405			1721	
Volume (vph)	15	225	0	0	520	70	0	0	5	115	0	35
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	15	232	0	0	536	72	0	0	5	119	0	36
RTOR Reduction (vph)	0	0	0	0	0	39	0	5	0	0	21	0
Lane Group Flow (vph)	15	232	0	0	536	33	0	0	0	0	134	0
Heavy Vehicles (%)	0%	0%	0%	3%	3%	3%	17%	17%	17%	3%	3%	3%
Turn Type	Prot					Perm	Split			Split		
Protected Phases	7	4			8		1	1		2	2	
Permitted Phases						8						
Actuated Green, G (s)	6.0	12.8			27.6	27.6		0.8			9.6	
Effective Green, g (s)	6.0	12.8			27.6	27.6		0.8			9.6	
Actuated g/C Ratio	0.10	0.21			0.46	0.46		0.01			0.16	
Clearance Time (s)	4.0	4.0			4.0	4.0		4.0			4.0	
Vehicle Extension (s)	3.0	3.0			3.0	3.0		3.0			3.0	
Lane Grp Cap (vph)	181	405			849	721		19			275	
v/s Ratio Prot	c0.01	0.12			c0.29			c0.00			c0.08	
v/s Ratio Perm						0.02						
v/c Ratio	0.08	0.57			0.63	0.05		0.00			0.49	
Uniform Delay, d1	24.5	21.1			12.3	8.9		29.2			23.0	
Progression Factor	1.00	1.00			0.66	0.46		1.00			1.00	
Incremental Delay, d2	0.2	5.8			3.4	0.1		0.1			1.4	
Delay (s)	24.7	26.9			11.6	4.2		29.3			24.3	
Level of Service	C	C			B	A		C			C	
Approach Delay (s)		26.8			10.7			29.3			24.3	
Approach LOS		C			B			C			C	

Intersection Summary			
HCM Average Control Delay	16.8	HCM Level of Service	B
HCM Volume to Capacity ratio	0.51		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	49.2%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Volume (veh/h)	0	235	485	10	5	0
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Hourly flow rate (vph)	0	242	500	10	5	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)			236			
pX, platoon unblocked	0.78				0.78	0.78
vC, conflicting volume	510				747	505
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	376				678	369
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				98	100
cM capacity (veh/h)	936				330	534

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	242	510	5
Volume Left	0	0	5
Volume Right	0	10	0
cSH	936	1700	330
Volume to Capacity	0.00	0.30	0.02
Queue Length 95th (ft)	0	0	1
Control Delay (s)	0.0	0.0	16.1
Lane LOS			C
Approach Delay (s)	0.0	0.0	16.1
Approach LOS			C

Intersection Summary			
Average Delay	0.1		
Intersection Capacity Utilization	36.1%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	195	5	50	440	5	40
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Hourly flow rate (vph)	201	5	52	454	5	41
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)				355		
pX, platoon unblocked					0.81	
vC, conflicting volume			206		760	204
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			206		706	204
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			96		98	95
cM capacity (veh/h)			1359		318	842

Direction, Lane #	EB 1	WB 1	WB 2	NB 1	NB 2
Volume Total	206	52	454	5	41
Volume Left	0	52	0	5	0
Volume Right	5	0	0	0	41
cSH	1700	1359	1700	318	842
Volume to Capacity	0.12	0.04	0.27	0.02	0.05
Queue Length 95th (ft)	0	3	0	1	4
Control Delay (s)	0.0	7.8	0.0	16.5	9.5
Lane LOS		A		C	A
Approach Delay (s)	0.0	0.8		10.3	
Approach LOS				B	

Intersection Summary			
Average Delay	1.2		
Intersection Capacity Utilization	33.2%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Stop			Stop	Stop	
Volume (vph)	115	5	85	285	5	30
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	121	5	89	300	5	32

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total (vph)	126	389	37
Volume Left (vph)	0	89	5
Volume Right (vph)	5	0	32
Hadj (s)	0.01	0.08	-0.49
Departure Headway (s)	4.4	4.2	4.5
Degree Utilization, x	0.15	0.45	0.05
Capacity (veh/h)	799	838	712
Control Delay (s)	8.2	10.7	7.8
Approach Delay (s)	8.2	10.7	7.8
Approach LOS	A	B	A

Intersection Summary			
Delay	9.9		
HCM Level of Service	A		
Intersection Capacity Utilization	36.4%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	0	15	0	65	30	20	0	40	60	45	55	0
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Hourly flow rate (vph)	0	16	0	70	32	22	0	43	65	48	59	0

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	16	124	108	108
Volume Left (vph)	0	70	0	48
Volume Right (vph)	0	22	65	0
Hadj (s)	0.03	0.04	-0.33	0.12
Departure Headway (s)	4.6	4.4	4.0	4.5
Degree Utilization, x	0.02	0.15	0.12	0.13
Capacity (veh/h)	743	765	853	767
Control Delay (s)	7.7	8.2	7.6	8.2
Approach Delay (s)	7.7	8.2	7.6	8.2
Approach LOS	A	A	A	A

Intersection Summary			
Delay	8.0		
HCM Level of Service	A		
Intersection Capacity Utilization	31.8%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Stop	Stop		Stop	
Volume (vph)	0	295	115	110	90	5
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	321	125	120	98	5

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total (vph)	321	245	103
Volume Left (vph)	0	0	98
Volume Right (vph)	0	120	5
Hadj (s)	0.03	-0.26	0.19
Departure Headway (s)	4.5	4.3	5.3
Degree Utilization, x	0.40	0.29	0.15
Capacity (veh/h)	780	803	613
Control Delay (s)	10.5	9.0	9.3
Approach Delay (s)	10.5	9.0	9.3
Approach LOS	B	A	A

Intersection Summary			
Delay	9.8		
HCM Level of Service	A		
Intersection Capacity Utilization	27.5%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.97	0.95		0.97	0.91	0.91		0.95	0.95	0.95	0.95	1.00
Frt	1.00	1.00		1.00	1.00	0.85		0.90	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00		1.00	1.00	0.95	0.99	1.00
Satd. Flow (prot)	3433	3525		3433	3390	1441		1585	1504	1681	1756	1583
Flt Permitted	0.95	1.00		0.95	1.00	1.00		1.00	1.00	0.95	0.99	1.00
Satd. Flow (perm)	3433	3525		3433	3390	1441		1585	1504	1681	1756	1583
Volume (vph)	260	895	25	445	785	185	10	90	710	125	95	265
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	268	923	26	459	809	191	10	93	732	129	98	273
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	238
Lane Group Flow (vph)	268	949	0	459	809	191	0	329	506	111	116	35
Turn Type	Prot			Prot		Free	Split		pt+ov	Split		Perm
Protected Phases	7	4		3	8		2	2	2 3	6	6	
Permitted Phases						Free						6
Actuated Green, G (s)	15.0	25.1		15.3	25.4	87.9		20.1	35.4	11.4	11.4	11.4
Effective Green, g (s)	15.0	25.1		15.3	25.4	87.9		20.1	35.4	11.4	11.4	11.4
Actuated g/C Ratio	0.17	0.29		0.17	0.29	1.00		0.23	0.40	0.13	0.13	0.13
Clearance Time (s)	4.0	4.0		4.0	4.0			4.0		4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	586	1007		598	980	1441		362	606	218	228	205
v/s Ratio Prot	0.08	c0.27		0.13	c0.24			c0.21	0.34	0.07	c0.07	
v/s Ratio Perm						0.13						0.02
v/c Ratio	0.46	0.94		0.77	0.83	0.13		0.91	0.83	0.51	0.51	0.17
Uniform Delay, d1	32.8	30.7		34.6	29.2	0.0		33.0	23.6	35.6	35.6	34.1
Progression Factor	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.6	16.3		5.9	5.8	0.2		25.6	9.7	1.9	1.8	0.4
Delay (s)	33.4	46.9		40.5	34.9	0.2		58.6	33.3	37.5	37.4	34.5
Level of Service	C	D		D	C	A		E	C	D	D	C
Approach Delay (s)		44.0			32.1			43.3			35.8	
Approach LOS		D			C			D			D	

Intersection Summary			
HCM Average Control Delay	38.5	HCM Level of Service	D
HCM Volume to Capacity ratio	0.86		
Actuated Cycle Length (s)	87.9	Sum of lost time (s)	16.0
Intersection Capacity Utilization	77.4%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

2015 With Alternative 1 (With RTID Improvements)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0		4.0	4.0	4.0			
Lane Util. Factor	0.97	0.95			0.91		1.00	0.95	0.95			
Frt	1.00	1.00			0.94		1.00	0.85	0.85			
Flt Protected	0.95	1.00			1.00		0.95	1.00	1.00			
Satd. Flow (prot)	3433	3539			4791		1641	1395	1395			
Flt Permitted	0.95	1.00			1.00		0.95	1.00	1.00			
Satd. Flow (perm)	3433	3539			4791		1641	1395	1395			
Volume (vph)	590	450	0	0	605	380	175	0	270	0	0	0
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	641	489	0	0	658	413	190	0	293	0	0	0
RTOR Reduction (vph)	0	0	0	0	121	0	0	120	121	0	0	0
Lane Group Flow (vph)	641	489	0	0	950	0	190	26	26	0	0	0
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	10%	10%	10%	2%	2%	2%
Turn Type	Prot						Split		Perm			
Protected Phases	7	4			8		2	2				
Permitted Phases									2			
Actuated Green, G (s)	24.0	57.7			29.7		14.3	14.3	14.3			
Effective Green, g (s)	24.0	57.7			29.7		14.3	14.3	14.3			
Actuated g/C Ratio	0.30	0.72			0.37		0.18	0.18	0.18			
Clearance Time (s)	4.0	4.0			4.0		4.0	4.0	4.0			
Vehicle Extension (s)	3.0	3.0			3.0		3.0	3.0	3.0			
Lane Grp Cap (vph)	1030	2553			1779		293	249	249			
v/s Ratio Prot	c0.19	0.14			c0.20		c0.12	0.02				
v/s Ratio Perm									0.02			
v/c Ratio	0.62	0.19			0.53		0.65	0.10	0.11			
Uniform Delay, d1	24.1	3.6			19.7		30.5	27.5	27.5			
Progression Factor	1.00	1.00			0.60		1.00	1.00	1.00			
Incremental Delay, d2	2.8	0.2			1.0		4.9	0.2	0.2			
Delay (s)	26.9	3.8			12.8		35.4	27.7	27.7			
Level of Service	C	A			B		D	C	C			
Approach Delay (s)		16.9			12.8			30.7			0.0	
Approach LOS		B			B			C			A	

Intersection Summary			
HCM Average Control Delay	17.8	HCM Level of Service	B
HCM Volume to Capacity ratio	0.59		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	56.7%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0		4.0	4.0					4.0	4.0	4.0
Lane Util. Factor		0.91		0.97	0.95					0.95	0.95	1.00
Frt		0.98		1.00	1.00					1.00	1.00	0.85
Flt Protected		1.00		0.95	1.00					0.95	0.96	1.00
Satd. Flow (prot)		5031		3433	3539					1665	1679	1568
Flt Permitted		1.00		0.95	1.00					0.95	0.96	1.00
Satd. Flow (perm)		5031		3433	3539					1665	1679	1568
Volume (vph)	0	950	150	425	350	0	0	0	0	65	5	335
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	1033	163	462	380	0	0	0	0	71	5	364
RTOR Reduction (vph)	0	26	0	0	0	0	0	0	0	0	0	235
Lane Group Flow (vph)	0	1170	0	462	380	0	0	0	0	37	39	129
Heavy Vehicles (%)	1%	1%	1%	2%	2%	2%	0%	0%	0%	3%	3%	3%
Turn Type				Prot						Split		Prot
Protected Phases		4		3	8					6	6	6
Permitted Phases												
Actuated Green, G (s)		25.5		11.0	32.5					26.5	26.5	26.5
Effective Green, g (s)		25.5		11.0	32.5					26.5	26.5	26.5
Actuated g/C Ratio		0.34		0.15	0.43					0.35	0.35	0.35
Clearance Time (s)		4.0		4.0	4.0					4.0	4.0	4.0
Vehicle Extension (s)		3.0		3.0	3.0					3.0	3.0	3.0
Lane Grp Cap (vph)		1711		504	1534					588	593	554
v/s Ratio Prot		c0.23		c0.13	0.11					0.02	0.02	c0.08
v/s Ratio Perm												
v/c Ratio		0.68		0.92	0.25					0.06	0.07	0.23
Uniform Delay, d1		21.3		31.5	13.5					16.0	16.1	17.1
Progression Factor		0.49		1.00	1.00					1.00	1.00	1.00
Incremental Delay, d2		1.6		24.0	0.4					0.0	0.0	0.2
Delay (s)		12.1		55.5	13.9					16.1	16.1	17.3
Level of Service		B		E	B					B	B	B
Approach Delay (s)		12.1			36.7			0.0			17.1	
Approach LOS		B			D			A			B	

Intersection Summary			
HCM Average Control Delay	21.4	HCM Level of Service	C
HCM Volume to Capacity ratio	0.53		
Actuated Cycle Length (s)	75.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	47.2%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0		4.0			4.0	
Lane Util. Factor	1.00	0.95			1.00	1.00		1.00			1.00	
Frt	1.00	1.00			1.00	0.85		0.86			1.00	
Flt Protected	0.95	1.00			1.00	1.00		1.00			0.95	
Satd. Flow (prot)	1770	3539			1881	1599		1644			1627	
Flt Permitted	0.95	1.00			1.00	1.00		1.00			0.95	
Satd. Flow (perm)	1770	3539			1881	1599		1644			1627	
Volume (vph)	20	710	0	0	290	405	0	0	5	380	0	10
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	22	772	0	0	315	440	0	0	5	413	0	11
RTOR Reduction (vph)	0	0	0	0	0	249	0	5	0	0	1	0
Lane Group Flow (vph)	22	772	0	0	315	191	0	0	0	0	423	0
Heavy Vehicles (%)	2%	2%	2%	1%	1%	1%	0%	0%	0%	11%	11%	11%
Turn Type	Prot					Perm	Split			Split		
Protected Phases	7	4			8		1	1		2	2	
Permitted Phases						8						
Actuated Green, G (s)	4.0	25.5			32.5	32.5		0.8			21.7	
Effective Green, g (s)	4.0	25.5			32.5	32.5		0.8			21.7	
Actuated g/C Ratio	0.05	0.34			0.43	0.43		0.01			0.29	
Clearance Time (s)	4.0	4.0			4.0	4.0		4.0			4.0	
Vehicle Extension (s)	3.0	3.0			3.0	3.0		3.0			3.0	
Lane Grp Cap (vph)	94	1203			815	693		18			471	
v/s Ratio Prot	c0.01	c0.22			c0.17			c0.00			c0.26	
v/s Ratio Perm						0.12						
v/c Ratio	0.23	0.64			0.39	0.28		0.00			0.90	
Uniform Delay, d1	34.0	20.9			14.5	13.7		36.7			25.6	
Progression Factor	1.00	1.00			0.61	0.45		1.00			1.00	
Incremental Delay, d2	1.3	2.6			1.3	0.9		0.1			19.4	
Delay (s)	35.3	23.5			10.1	7.1		36.8			45.0	
Level of Service	D	C			B	A		D			D	
Approach Delay (s)		23.9			8.4			36.8			45.0	
Approach LOS		C			A			D			D	

Intersection Summary			
HCM Average Control Delay	22.5	HCM Level of Service	C
HCM Volume to Capacity ratio	0.66		
Actuated Cycle Length (s)	75.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	54.6%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Volume (veh/h)	85	660	250	50	65	70
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	92	717	272	54	71	76
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)			236			
pX, platoon unblocked	0.88				0.88	0.88
vC, conflicting volume	326				1201	299
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	238				1227	208
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	92				56	90
cM capacity (veh/h)	1176				162	741

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	810	326	147
Volume Left	92	0	71
Volume Right	0	54	76
cSH	1176	1700	272
Volume to Capacity	0.08	0.19	0.54
Queue Length 95th (ft)	6	0	74
Control Delay (s)	2.0	0.0	32.6
Lane LOS	A		D
Approach Delay (s)	2.0	0.0	32.6
Approach LOS			D

Intersection Summary			
Average Delay	5.0		
Intersection Capacity Utilization	73.5%	ICU Level of Service	D
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	715	5	55	270	5	30
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	777	5	60	293	5	33
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)				355		
pX, platoon unblocked					0.94	
vC, conflicting volume			783		1193	780
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			783		1205	780
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			93		97	92
cM capacity (veh/h)			840		179	399

Direction, Lane #	EB 1	WB 1	WB 2	NB 1	NB 2
Volume Total	783	60	293	5	33
Volume Left	0	60	0	5	0
Volume Right	5	0	0	0	33
cSH	1700	840	1700	179	399
Volume to Capacity	0.46	0.07	0.17	0.03	0.08
Queue Length 95th (ft)	0	6	0	2	7
Control Delay (s)	0.0	9.6	0.0	25.7	14.8
Lane LOS		A		D	B
Approach Delay (s)	0.0	1.6		16.4	
Approach LOS				C	

Intersection Summary			
Average Delay	1.0		
Intersection Capacity Utilization	54.6%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Stop			Stop	Stop	
Volume (vph)	410	0	20	155	5	115
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	446	0	22	168	5	125

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total (vph)	446	190	130
Volume Left (vph)	0	22	5
Volume Right (vph)	0	0	125
Hadj (s)	0.00	0.04	-0.57
Departure Headway (s)	4.5	4.8	4.8
Degree Utilization, x	0.55	0.25	0.17
Capacity (veh/h)	781	718	664
Control Delay (s)	12.8	9.4	8.8
Approach Delay (s)	12.8	9.4	8.8
Approach LOS	B	A	A

Intersection Summary			
Delay	11.3		
HCM Level of Service	B		
Intersection Capacity Utilization	39.0%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	0	10	0	20	10	25	0	60	45	25	25	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	11	0	22	11	27	0	65	49	27	27	0

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	11	60	114	54
Volume Left (vph)	0	22	0	27
Volume Right (vph)	0	27	49	0
Hadj (s)	0.00	-0.20	-0.26	0.12
Departure Headway (s)	4.3	4.1	3.8	4.3
Degree Utilization, x	0.01	0.07	0.12	0.06
Capacity (veh/h)	795	847	907	821
Control Delay (s)	7.4	7.4	7.4	7.6
Approach Delay (s)	7.4	7.4	7.4	7.6
Approach LOS	A	A	A	A

Intersection Summary			
Delay	7.4		
HCM Level of Service	A		
Intersection Capacity Utilization	25.9%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Stop	Stop		Stop	
Volume (vph)	0	0	0	0	0	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	0	0	0	0

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total (vph)	0	0	0
Volume Left (vph)	0	0	0
Volume Right (vph)	0	0	0
Hadj (s)	0.00	0.00	0.00
Departure Headway (s)	3.9	3.9	3.9
Degree Utilization, x	0.00	0.00	0.00
Capacity (veh/h)	917	917	917
Control Delay (s)	6.9	6.9	6.9
Approach Delay (s)	0.0	0.0	0.0
Approach LOS	A	A	A

Intersection Summary			
Delay	0.0		
HCM Level of Service	A		
Intersection Capacity Utilization	0.0%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.97	0.95		0.97	0.91	0.91		0.95	0.95	0.95	0.95	1.00
Frt	1.00	1.00		1.00	1.00	0.85		1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.99	1.00	0.95	0.95	1.00
Satd. Flow (prot)	3433	3527		3433	3390	1441		1776	1519	1698	1698	1599
Flt Permitted	0.95	1.00		0.95	1.00	1.00		0.99	1.00	0.95	0.95	1.00
Satd. Flow (perm)	3433	3527		3433	3390	1441		1776	1519	1698	1698	1599
Volume (vph)	295	440	10	385	850	115	20	140	115	135	0	260
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	321	478	11	418	924	125	22	152	125	147	0	283
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	245
Lane Group Flow (vph)	321	489	0	418	924	125	0	174	125	74	73	38
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	1%	1%	1%	1%	1%	1%
Turn Type	Prot			Prot		Free	Split		pt+ov	Split		Perm
Protected Phases	7	4		3	8		2	2	2 3	6	6	
Permitted Phases						Free						6
Actuated Green, G (s)	10.2	19.8		13.0	22.6	67.4		9.5	22.5	9.1	9.1	9.1
Effective Green, g (s)	10.2	19.8		13.0	22.6	67.4		9.5	22.5	9.1	9.1	9.1
Actuated g/C Ratio	0.15	0.29		0.19	0.34	1.00		0.14	0.33	0.14	0.14	0.14
Clearance Time (s)	4.0	4.0		4.0	4.0			4.0		4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	520	1036		662	1137	1441		250	507	229	229	216
v/s Ratio Prot	c0.09	0.14		0.12	c0.27			c0.10	0.08	c0.04	0.04	
v/s Ratio Perm						0.09						0.02
v/c Ratio	0.62	0.47		0.63	0.81	0.09		0.70	0.25	0.32	0.32	0.18
Uniform Delay, d1	26.8	19.5		25.0	20.5	0.0		27.6	16.3	26.4	26.3	25.8
Progression Factor	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	2.2	0.3		2.0	4.5	0.1		8.2	0.3	0.8	0.8	0.4
Delay (s)	29.0	19.9		27.0	25.0	0.1		35.7	16.6	27.2	27.2	26.2
Level of Service	C	B		C	C	A		D	B	C	C	C
Approach Delay (s)		23.5			23.4			27.7			26.5	
Approach LOS		C			C			C			C	

Intersection Summary			
HCM Average Control Delay	24.3	HCM Level of Service	C
HCM Volume to Capacity ratio	0.67		
Actuated Cycle Length (s)	67.4	Sum of lost time (s)	16.0
Intersection Capacity Utilization	61.6%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0		4.0	4.0	4.0			
Lane Util. Factor	0.97	0.95			0.91		1.00	0.95	0.95			
Frt	1.00	1.00			0.96		1.00	0.85	0.85			
Flt Protected	0.95	1.00			1.00		0.95	1.00	1.00			
Satd. Flow (prot)	3467	3574			4882		1787	1519	1519			
Flt Permitted	0.95	1.00			1.00		0.95	1.00	1.00			
Satd. Flow (perm)	3467	3574			4882		1787	1519	1519			
Volume (vph)	300	325	0	0	535	195	175	0	550	0	0	0
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	312	339	0	0	557	203	182	0	573	0	0	0
RTOR Reduction (vph)	0	0	0	0	94	0	0	228	229	0	0	0
Lane Group Flow (vph)	312	339	0	0	666	0	182	58	58	0	0	0
Heavy Vehicles (%)	1%	1%	1%	2%	2%	2%	1%	1%	1%	0%	0%	0%
Turn Type	Prot						Split		Perm			
Protected Phases	7	4			8		2	2				
Permitted Phases									2			
Actuated Green, G (s)	24.8	47.8			19.0		14.2	14.2	14.2			
Effective Green, g (s)	24.8	47.8			19.0		14.2	14.2	14.2			
Actuated g/C Ratio	0.35	0.68			0.27		0.20	0.20	0.20			
Clearance Time (s)	4.0	4.0			4.0		4.0	4.0	4.0			
Vehicle Extension (s)	3.0	3.0			3.0		3.0	3.0	3.0			
Lane Grp Cap (vph)	1228	2441			1325		363	308	308			
v/s Ratio Prot	c0.09	0.09			c0.14		c0.10	0.04				
v/s Ratio Perm									0.04			
v/c Ratio	0.25	0.14			0.50		0.50	0.19	0.19			
Uniform Delay, d1	16.0	3.9			21.5		24.8	23.1	23.1			
Progression Factor	1.00	1.00			0.72		1.00	1.00	1.00			
Incremental Delay, d2	0.5	0.1			1.2		1.1	0.3	0.3			
Delay (s)	16.5	4.0			16.6		25.9	23.4	23.4			
Level of Service	B	A			B		C	C	C			
Approach Delay (s)		10.0			16.6			24.0			0.0	
Approach LOS		B			B			C			A	

Intersection Summary			
HCM Average Control Delay	17.2	HCM Level of Service	B
HCM Volume to Capacity ratio	0.40		
Actuated Cycle Length (s)	70.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	44.6%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0		4.0	4.0					4.0	4.0	4.0
Lane Util. Factor		0.91		0.97	0.95					0.95	0.95	1.00
Frt		0.94		1.00	1.00					1.00	1.00	0.85
Flt Protected		1.00		0.95	1.00					0.95	0.95	1.00
Satd. Flow (prot)		4879		3467	3574					1715	1724	1615
Flt Permitted		1.00		0.95	1.00					0.95	0.95	1.00
Satd. Flow (perm)		4879		3467	3574					1715	1724	1615
Volume (vph)	0	465	305	235	445	0	0	0	0	160	5	490
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	0	479	314	242	459	0	0	0	0	165	5	505
RTOR Reduction (vph)	0	157	0	0	0	0	0	0	0	0	0	184
Lane Group Flow (vph)	0	636	0	242	459	0	0	0	0	83	87	321
Heavy Vehicles (%)	0%	0%	0%	1%	1%	1%	0%	0%	0%	0%	0%	0%
Turn Type				Prot						Split		Prot
Protected Phases		4		3	8					6	6	6
Permitted Phases												
Actuated Green, G (s)		19.8		13.7	28.6					34.5	34.5	34.5
Effective Green, g (s)		19.8		13.7	28.6					34.5	34.5	34.5
Actuated g/C Ratio		0.25		0.17	0.36					0.43	0.43	0.43
Clearance Time (s)		4.0		4.0	4.0					4.0	4.0	4.0
Vehicle Extension (s)		3.0		3.0	3.0					3.0	3.0	3.0
Lane Grp Cap (vph)		1208		594	1278					740	743	696
v/s Ratio Prot		c0.13		c0.07	0.13					0.05	0.05	c0.20
v/s Ratio Perm												
v/c Ratio		0.53		0.41	0.36					0.11	0.12	0.46
Uniform Delay, d1		26.0		29.5	18.9					13.6	13.6	16.1
Progression Factor		1.10		1.00	1.00					1.00	1.00	1.00
Incremental Delay, d2		1.1		2.1	0.8					0.1	0.1	0.5
Delay (s)		29.8		31.6	19.7					13.7	13.7	16.6
Level of Service		C		C	B					B	B	B
Approach Delay (s)		29.8			23.8			0.0			15.9	
Approach LOS		C			C			A			B	

Intersection Summary			
HCM Average Control Delay	23.5	HCM Level of Service	C
HCM Volume to Capacity ratio	0.47		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	49.3%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0		4.0			4.0	
Lane Util. Factor	1.00	1.00			1.00	1.00		1.00			1.00	
Frt	1.00	1.00			1.00	0.85		0.86			0.99	
Flt Protected	0.95	1.00			1.00	1.00		1.00			0.96	
Satd. Flow (prot)	1805	1895			1844	1568		1405			1747	
Flt Permitted	0.95	1.00			1.00	1.00		1.00			0.96	
Satd. Flow (perm)	1805	1895			1840	1568		1405			1747	
Volume (vph)	15	270	5	5	510	400	0	0	5	495	0	35
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	15	278	5	5	526	412	0	0	5	510	0	36
RTOR Reduction (vph)	0	1	0	0	0	265	0	5	0	0	3	0
Lane Group Flow (vph)	15	282	0	0	531	147	0	0	0	0	543	0
Heavy Vehicles (%)	0%	0%	0%	3%	3%	3%	17%	17%	17%	3%	3%	3%
Turn Type	Prot			Perm		Perm	Split			Split		
Protected Phases	7	4			8		1	1		2	2	
Permitted Phases				8		8						
Actuated Green, G (s)	4.9	19.8			28.6	28.6		0.8			29.7	
Effective Green, g (s)	4.9	19.8			28.6	28.6		0.8			29.7	
Actuated g/C Ratio	0.06	0.25			0.36	0.36		0.01			0.37	
Clearance Time (s)	4.0	4.0			4.0	4.0		4.0			4.0	
Vehicle Extension (s)	3.0	3.0			3.0	3.0		3.0			3.0	
Lane Grp Cap (vph)	111	469			658	561		14			649	
v/s Ratio Prot	c0.01	0.15						c0.00			c0.31	
v/s Ratio Perm					c0.29	0.09						
v/c Ratio	0.14	0.60			0.81	0.26		0.00			0.84	
Uniform Delay, d1	35.5	26.6			23.2	18.2		39.2			22.9	
Progression Factor	1.00	1.00			0.77	0.63		1.00			1.00	
Incremental Delay, d2	0.6	5.6			9.3	1.0		0.1			9.2	
Delay (s)	36.1	32.2			27.2	12.4		39.3			32.1	
Level of Service	D	C			C	B		D			C	
Approach Delay (s)		32.4			20.8			39.3			32.1	
Approach LOS		C			C			D			C	

Intersection Summary			
HCM Average Control Delay	26.2	HCM Level of Service	C
HCM Volume to Capacity ratio	0.76		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	73.7%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Volume (veh/h)	70	230	465	75	60	90
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Hourly flow rate (vph)	72	237	479	77	62	93
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)			236			
pX, platoon unblocked	0.73				0.73	0.73
vC, conflicting volume	557				899	518
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	397				863	344
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	92				72	82
cM capacity (veh/h)	862				221	517

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	309	557	155
Volume Left	72	0	62
Volume Right	0	77	93
cSH	862	1700	336
Volume to Capacity	0.08	0.33	0.46
Queue Length 95th (ft)	7	0	58
Control Delay (s)	2.9	0.0	24.5
Lane LOS	A		C
Approach Delay (s)	2.9	0.0	24.5
Approach LOS			C

Intersection Summary			
Average Delay	4.6		
Intersection Capacity Utilization	63.9%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	260	5	50	515	5	40
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Hourly flow rate (vph)	268	5	52	531	5	41
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)				355		
pX, platoon unblocked					0.77	
vC, conflicting volume			273		905	271
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			273		876	271
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			96		98	95
cM capacity (veh/h)			1284		238	773

Direction, Lane #	EB 1	WB 1	WB 2	NB 1	NB 2
Volume Total	273	52	531	5	41
Volume Left	0	52	0	5	0
Volume Right	5	0	0	0	41
cSH	1700	1284	1700	238	773
Volume to Capacity	0.16	0.04	0.31	0.02	0.05
Queue Length 95th (ft)	0	3	0	2	4
Control Delay (s)	0.0	7.9	0.0	20.5	9.9
Lane LOS		A		C	A
Approach Delay (s)	0.0	0.7		11.1	
Approach LOS				B	

Intersection Summary			
Average Delay	1.0		
Intersection Capacity Utilization	37.1%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Stop			Stop	Stop	
Volume (vph)	175	5	90	355	5	40
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	184	5	95	374	5	42

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total (vph)	189	468	47
Volume Left (vph)	0	95	5
Volume Right (vph)	5	0	42
Hadj (s)	0.02	0.07	-0.51
Departure Headway (s)	4.5	4.3	4.8
Degree Utilization, x	0.24	0.56	0.06
Capacity (veh/h)	773	820	656
Control Delay (s)	8.9	12.6	8.2
Approach Delay (s)	8.9	12.6	8.2
Approach LOS	A	B	A

Intersection Summary			
Delay	11.3		
HCM Level of Service	B		
Intersection Capacity Utilization	46.5%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	0	15	0	65	30	25	0	40	60	50	55	0
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Hourly flow rate (vph)	0	16	0	70	32	27	0	43	65	54	59	0

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	16	129	108	113
Volume Left (vph)	0	70	0	54
Volume Right (vph)	0	27	65	0
Hadj (s)	0.03	0.02	-0.33	0.13
Departure Headway (s)	4.6	4.4	4.0	4.5
Degree Utilization, x	0.02	0.16	0.12	0.14
Capacity (veh/h)	739	766	848	764
Control Delay (s)	7.7	8.3	7.6	8.2
Approach Delay (s)	7.7	8.3	7.6	8.2
Approach LOS	A	A	A	A

Intersection Summary			
Delay	8.0		
HCM Level of Service	A		
Intersection Capacity Utilization	32.4%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Stop	Stop		Stop	
Volume (vph)	0	365	175	110	90	5
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	397	190	120	98	5

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total (vph)	397	310	103
Volume Left (vph)	0	0	98
Volume Right (vph)	0	120	5
Hadj (s)	0.03	-0.20	0.19
Departure Headway (s)	4.6	4.5	5.7
Degree Utilization, x	0.51	0.38	0.16
Capacity (veh/h)	756	775	560
Control Delay (s)	12.2	10.2	9.8
Approach Delay (s)	12.2	10.2	9.8
Approach LOS	B	B	A

Intersection Summary			
Delay	11.1		
HCM Level of Service	B		
Intersection Capacity Utilization	31.2%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.97	0.95		0.97	0.91	0.91		0.95	0.95	0.95	0.95	1.00
Frt	1.00	1.00		1.00	1.00	0.85		0.90	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00		1.00	1.00	0.95	0.99	1.00
Satd. Flow (prot)	3433	3525		3433	3390	1441		1592	1504	1681	1756	1583
Flt Permitted	0.95	1.00		0.95	1.00	1.00		1.00	1.00	0.95	0.99	1.00
Satd. Flow (perm)	3433	3525		3433	3390	1441		1592	1504	1681	1756	1583
Volume (vph)	305	895	25	445	785	195	10	100	710	135	105	315
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	314	923	26	459	809	201	10	103	732	139	108	325
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	281
Lane Group Flow (vph)	314	949	0	459	809	201	0	333	512	120	127	44
Turn Type	Prot			Prot		Free	Split		pt+ov	Split		Perm
Protected Phases	7	4		3	8		2	2	2 3	6	6	
Permitted Phases						Free						6
Actuated Green, G (s)	15.0	25.1		15.4	25.5	88.6		20.1	35.5	12.0	12.0	12.0
Effective Green, g (s)	15.0	25.1		15.4	25.5	88.6		20.1	35.5	12.0	12.0	12.0
Actuated g/C Ratio	0.17	0.28		0.17	0.29	1.00		0.23	0.40	0.14	0.14	0.14
Clearance Time (s)	4.0	4.0		4.0	4.0			4.0		4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	581	999		597	976	1441		361	603	228	238	214
v/s Ratio Prot	0.09	c0.27		0.13	c0.24			c0.21	0.34	0.07	c0.07	
v/s Ratio Perm						0.14						0.03
v/c Ratio	0.54	0.95		0.77	0.83	0.14		0.92	0.85	0.53	0.53	0.21
Uniform Delay, d1	33.6	31.1		34.9	29.5	0.0		33.5	24.1	35.7	35.7	34.1
Progression Factor	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.0	17.4		5.9	5.9	0.2		28.5	10.8	2.2	2.3	0.5
Delay (s)	34.7	48.6		40.8	35.4	0.2		62.0	34.9	37.8	38.0	34.5
Level of Service	C	D		D	D	A		E	C	D	D	C
Approach Delay (s)		45.1			32.3			45.6			36.0	
Approach LOS		D			C			D			D	

Intersection Summary			
HCM Average Control Delay	39.4	HCM Level of Service	D
HCM Volume to Capacity ratio	0.87		
Actuated Cycle Length (s)	88.6	Sum of lost time (s)	16.0
Intersection Capacity Utilization	78.4%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Appendix B

Traffic Volume Forecasts

Quendall Terminals
2015 AM Peak Hour Traffic Volume Forecasts
Without RTID I-405 Improvements

	Enter	Exit	Total
Quendall Project Vols	445	421	866
Quendall Passby Vols	24	20	44

Alternative 1 (incudes 10% increase in apartment trips)

Intersection: I-405 NB Ramps / Lake Washington Blvd
Scenario: Master Use Plan
Analysis Year: 2015
Time Period: PM Peak
Intersection Code: 1
Analyst: JGT
Checked by: MJR
Date of Completion: 8/28/2012
Count Source: TIA
2015 to 2009 Factor: 0.8571

Notes	Southbound						Westbound						Northbound						Eastbound						
	Enter	Exit	Total				Enter	Exit					Enter	Exit					Enter	Exit					
2008 Calibration Year	625	485	1,110				114	126	240				420	161	581				308	695	1,003				
2015 Baseline Forecast Year	375	327	702				114	145	259				271	277	548				290	300	590				
Fratar Approximation Factor			**1.15**						**1.07**						**1.15**						**1.15**				
	North Approach						East Approach						South Approach						West Approach						
	Left	Thru	Right	In	Out	Total	Left	Thru	Right	In	Out	Total	Left	Thru	Right	In	Out	Total	Left	Thru	Right	In	Out	Total	
2009 Existing Conditions	30	25	345	400	515	915	165	165	140	470	230	700	10	95	90	195	540	735	280	110	350	740	520	1,260	**1,805**
2015 Baseline Year	30	30	400	460	590	1,050	175	180	150	505	245	750	10	115	100	225	615	840	325	115	410	850	590	1,440	**2,040**
Barbee Mills			3					1					0						21	5	16				**46**
Kennydale Apartments	2	27	35						2					13					9						
Hawks Landing			2					2					28						1	2	11				**46**
Pipeline Projects-Subtotal	2	27	40	69	46	115	0	3	2	5	9	14	28	13	0	41	54	95	31	7	27	65	71	136	**180**
2015 Adjusted Baseline with Pipeline	**30**	**55**	**440**	**525**	**635**	**1,160**	**175**	**185**	**150**	**510**	**250**	**760**	**40**	**130**	**100**	**270**	**665**	**935**	**355**	**120**	**435**	**910**	**665**	**1,575**	**2,215**
Passby Distribution				**0%**	**0%**	**0%**				**0%**	**0%**	**0%**				**0%**	**0%**	**0%**				**0%**	**0%**	**0%**	**0**
Passby Traffic Volumes				**0**	**0**	**0**				**0**	**0**	**0**				**0**	**0**	**0**				**0**	**0**	**0**	**0**
Project Trip Distribution			10%	**10%**	**10%**	**20%**		10%		**10%**	**10%**	**20%**				**0%**	**45%**	**45%**	10%	10%	45%	**65%**	**20%**	**85%**	**1**
Project Traffic Volumes			45	**45**	**40**	**85**		45		**45**	**40**	**85**				**0**	**190**	**190**	40	40	190	**270**	**90**	**360**	**360**
2015 with Full Buildout	**30**	**55**	**485**	**570**	**675**	**1,245**	**175**	**230**	**150**	**555**	**290**	**845**	**40**	**130**	**100**	**270**	**855**	**1,125**	**395**	**160**	**625**	**1,180**	**755**	**1,935**	**2,575**

Intersection: I-405 SB Ramps / Lake Washington Blvd
Scenario: Master Use Plan
Analysis Year: 2015
Time Period: PM Peak
Intersection Code: 2
Analyst: JGT
Checked by: MJR
Date of Completion: 8/28/2012
Count Source: TIA
2015 to 2009 Factor: 0.8571

Notes	Southbound						Westbound						Northbound						Eastbound						
	Enter	Exit	Total				Enter	Exit					Enter	Exit					Enter	Exit					
2008 Calibration Year	502	0	502				695	308	1,003				0	607	607				293	575	868				
2015 Baseline Forecast Year	863	0	863				300	290	590				0	555	555				283	600	883				
Fratar Approximation Factor			**1.62**						**1.15**						**1.15**						**1.01**				
	North Approach						East Approach						South Approach						West Approach						
	Left	Thru	Right	In	Out	Total	Left	Thru	Right	In	Out	Total	Left	Thru	Right	In	Out	Total	Left	Thru	Right	In	Out	Total	
2009 Existing Conditions	55	5	115	175	0	175	390	135	0	525	720	1,245	0	0	0	0	400	400	0	665	5	670	250	920	**1,370**
2015 Baseline Year	130	10	145	285	0	285	480	120	0	600	805	1,405	0	0	0	0	495	495	0	675	5	680	265	945	**1,565**
Barbee Mills			4					4												42	1				**51**
Kennydale Apartments	9						35																		
Hawks Landing			18					32												14	18				**82**
Pipeline Projects-Subtotal	9	0	22	31	0	31	35	36	0	71	65	136	0	0	0	0	54	54	0	56	19	75	58	133	**177**
2015 Adjusted Baseline with Pipeline	**140**	**10**	**165**	**315**	**0**	**315**	**515**	**155**	**0**	**670**	**870**	**1,540**	**0**	**0**	**0**	**0**	**550**	**550**	**0**	**730**	**25**	**755**	**320**	**1,075**	**1,740**
Passby Distribution				**0%**	**0%**	**0%**				**0%**	**0%**	**0%**				**0%**	**0%**	**0%**				**0%**	**0%**	**0%**	**0**
Passby Traffic Volumes				**0**	**0**	**0**				**0**	**0**	**0**				**0**	**0**	**0**				**0**	**0**	**0**	**0**
Project Trip Distribution			45%	**45%**	**0%**	**45%**		20%		**20%**	**65%**	**85%**				**0%**	**0%**	**0%**		65%		**65%**	**65%**	**130%**	**1**
Project Traffic Volumes			200	**200**	**0**	**200**		90		**90**	**275**	**365**				**0**	**0**	**0**		275		**275**	**290**	**565**	**565**
2015 with Full Buildout	**140**	**10**	**365**	**515**	**0**	**515**	**515**	**245**	**0**	**760**	**1,145**	**1,905**	**0**	**0**	**0**	**0**	**550**	**550**	**0**	**1,005**	**25**	**1,030**	**610**	**1,640**	**2,305**

Quendall Terminals

2015 AM Peak Hour Traffic Volume Forecasts

Without RTID I-405 Improvements

Intersection: Ripley Lane / Lake Washington Blvd — **Intersection Code:** 3 — **Count Source:** TIA
Scenario: Master Use Plan — **Analyst:** JGT — **2015 to 2009 Factor:** 0.8571
Analysis Year: 2015 — **Checked by:** MJR
Time Period: PM Peak — **Date of Completion:** 8/28/2012

Notes	Southbound						Westbound						Northbound						Eastbound						
	Enter	Exit	Total				Enter	Exit					Enter	Exit					Enter	Exit					
2008 Calibration Year	1	1	2				575	293	868				1	1	2				287	574	861				
2015 Baseline Forecast Year	1	1	2				600	283	883				1	1	2				283	601	884				
Fratar Approximation Factor			**1.00**			**FLAG**			**1.01**						**1.00**			**FLAG**			**1.02**				
	North Approach						East Approach						South Approach						West Approach						
	Left	Thru	Right	In	Out	Total	Left	Thru	Right	In	Out	Total	Left	Thru	Right	In	Out	Total	Left	Thru	Right	In	Out	Total	
2009 Existing Conditions	30	0	5	35	80	115	0	195	65	260	665	925	0	0	0	0	0	0	15	635	0	650	200	850	**945**
2015 Baseline Year	30	0	5	35	80	115	0	200	65	265	680	945	0	0	0	0	0	0	15	650	0	665	205	870	**965**
Barbee Mills	34		3					2	6										1	9					**55**
Hawks Landing			3					50							5				2	27					**87**
Pipeline Projects-Subtotal	34	0	6	40	9	49	0	52	6	58	75	133	0	0	5	5	0	5	3	36	0	39	58	97	**142**
2015 Adjusted Baseline with Pipeline	**65**	**0**	**10**	**75**	**90**	**165**	**0**	**250**	**70**	**320**	**755**	**1,075**	**0**	**0**	**5**	**5**	**0**	**5**	**20**	**685**	**0**	**705**	**260**	**965**	**1,105**
Passby Distribution				**0%**	**0%**	**0%**				**0%**	**0%**	**0%**				**0%**	**0%**	**0%**	0%			**0%**	**0%**	**0%**	**0**
Passby Traffic Volumes				**0**	**0**	**0**				**0**	**0**	**0**				**0**	**0**	**0**	0	0		**0**	**0**	**0**	**0**
Project Trip Distribution	60%		0%	**60%**	**60%**	**120%**		5%	60%	**65%**	**65%**	**130%**				**0%**	**0%**	**0%**	0%	5%		**5%**	**5%**	**10%**	**1**
Project Traffic Volumes	255		0	**255**	**265**	**520**		20	265	**285**	**275**	**560**				**0**	**0**	**0**	0	20		**20**	**20**	**40**	**560**
2015 with Full Buildout	**320**	**0**	**10**	**330**	**355**	**685**	**0**	**270**	**335**	**605**	**1,030**	**1,635**	**0**	**0**	**5**	**5**	**0**	**5**	**20**	**705**	**0**	**725**	**280**	**1,005**	**1,665**

Intersection: Lake Washington Blvd / Barbee Mills Access — **Intersection Code:** 4 — **Count Source:** TIA
Scenario: Master Use Plan — **Analyst:** JGT — **2015 to 2009 Factor:** 0.8571
Analysis Year: 2015 — **Checked by:** MJR
Time Period: PM Peak — **Date of Completion:** 8/28/2012

Notes	Southbound						Westbound						Northbound						Eastbound						
	Enter	Exit	Total				Enter	Exit					Enter	Exit					Enter	Exit					
2008 Calibration Year	1	1	2				574	287	861				1	1	2				287	574	861				
2015 Baseline Forecast Year	1	1	2				601	283	884				1	1	2				283	601	884				
Fratar Approximation Factor			**1.00**			**FLAG**			**1.02**						**1.00**			**FLAG**			**1.02**				
	North Approach						East Approach						South Approach						West Approach						
	Left	Thru	Right	In	Out	Total	Left	Thru	Right	In	Out	Total	Left	Thru	Right	In	Out	Total	Left	Thru	Right	In	Out	Total	
2009 Existing Conditions	0	0	0	0	0	0	0	200	0	200	650	850	0	0	0	0	0	0	0	650	0	650	200	850	**851**
2015 Baseline Year	0	0	0	0	0	0	0	205	0	205	665	870	0	0	0	0	0	0	0	665	0	665	205	870	**870**
Barbee Mills	9		1					3	2										0	1					**16**
Hawks Landing								53												29					**82**
Pipeline Projects-Subtotal	9	0	1	10	2	12	0	56	2	58	39	97	0	0	0	0	0	0	0	30	0	30	57	87	**98**
2015 Adjusted Baseline with Pipeline	**10**	**0**	**0**	**10**	**0**	**10**	**0**	**260**	**0**	**260**	**705**	**965**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**695**	**0**	**695**	**260**	**955**	**965**
Passby Distribution	75%		25%	**100%**	**100%**	**200%**			25%	**25%**	**75%**	**100%**				**0%**	**0%**	**0%**	75%			**75%**	**25%**	**100%**	**2**
Passby Traffic Volumes	15		5	**20**	**25**	**45**		-5	5	**0**	**-5**	**-5**				**0**	**0**	**0**	20	-20		**0**	**0**	**0**	**20**
Project Trip Distribution	5%		35%	**40%**	**40%**	**80%**			5%	**5%**	**5%**	**10%**				**0%**	**0%**	**0%**	35%			**35%**	**35%**	**70%**	**1**
Project Traffic Volumes	20		145	**165**	**175**	**340**			20	**20**	**20**	**40**				**0**	**0**	**0**	155			**155**	**145**	**300**	**340**
2015 with Full Buildout	**45**	**0**	**150**	**195**	**200**	**395**	**0**	**255**	**25**	**280**	**720**	**1,000**	**0**	**0**	**0**	**0**	**0**	**0**	**175**	**675**	**0**	**850**	**405**	**1,255**	**1,325**

Quendall Terminals

2015 AM Peak Hour Traffic Volume Forecasts

Without RTID I-405 Improvements

Intersection: Lake Washington Blvd / Hawks Landing Access **Intersection Code:** 5 **Count Source:** TIA
Scenario: Master Use Plan **Analyst:** JGT **2015 to 2009 Factor:** 0.8571
Analysis Year: 2015 **Checked by:** MJR
Time Period: PM Peak **Date of Completion:** 8/28/2012

Notes	Southbound						Westbound						Northbound						Eastbound						
	Enter	Exit	Total				Enter	Exit					Enter	Exit					Enter	Exit					
2008 Calibration Year	1	1	2				574	287	861				1	1	2				287	574	861				
2015 Baseline Forecast Year	1	1	2				601	283	884				1	1	2				283	601	884				
Fratar Approximation Factor			**1.02**						**1.02**						**1.00**		FLAG				**1.02**				
	North Approach						East Approach						South Approach						West Approach						
	Left	Thru	Right	In	Out	Total	Left	Thru	Right	In	Out	Total	Left	Thru	Right	In	Out	Total	Left	Thru	Right	In	Out	Total	
2009 Existing Conditions	0	0	0	0	0	0	0	200	0	200	650	850	0	0	0	0	0	0	0	650	0	650	200	850	**851**
2015 Baseline Year	0	0	0	0	0	0	0	205	0	205	665	870	0	0	0	0	0	0	0	665	0	665	205	870	**870**
Barbee Mills								4												1					**5**
Hawks Landing							53						4		29						6				**92**
Pipeline Projects-Subtotal	0	0	0	0	0	0	53	4	0	57	30	87	4	0	29	33	59	92	0	1	6	7	8	15	**97**
2015 Adjusted Baseline with Pipeline	**0**	**0**	**0**	**0**	**0**	**0**	**55**	**210**	**0**	**265**	**695**	**960**	**5**	**0**	**30**	**35**	**60**	**95**	**0**	**665**	**5**	**670**	**215**	**885**	**970**
Passby Distribution				**0%**	**0%**	**0%**				**0%**	**0%**	**0%**				**0%**	**0%**	**0%**				**0%**	**0%**	**0%**	**0**
Passby Traffic Volumes				**0**	**0**	**0**				**0**	**0**	**0**				**0**	**0**	**0**				**0**	**0**	**0**	**0**
Project Trip Distribution				**0%**	**0%**	**0%**		35%		**35%**	**35%**	**70%**				**0%**	**0%**	**0%**		35%		**35%**	**35%**	**70%**	**1**
Project Traffic Volumes				**0**	**0**	**0**		145		**145**	**155**	**300**				**0**	**0**	**0**		155		**155**	**145**	**300**	**300**
2015 with Full Buildout	**0**	**0**	**0**	**0**	**0**	**0**	**55**	**355**	**0**	**410**	**850**	**1,260**	**5**	**0**	**30**	**35**	**60**	**95**	**0**	**820**	**5**	**825**	**360**	**1,185**	**1,270**

Intersection: N 36th St / Lake Washington Blvd **Intersection Code:** 6 **Count Source:** ATDS - 6/8/2010 Count
Scenario: Master Use Plan **Analyst:** JGT **2015 to 2010 Factor:** 0.7143
Analysis Year: 2015 **Checked by:** MJR
Time Period: PM Peak **Date of Completion:** 8/28/2012

Notes	Southbound						Westbound						Northbound						Eastbound						
	Enter	Exit	Total				Enter	Exit					Enter	Exit					Enter	Exit					
2008 Calibration Year	1	1	2				324	217	541				71	250	321				223	317	540				
2015 Baseline Forecast Year	1	1	2				432	216	648				67	169	236				241	439	680				
Fratar Approximation Factor			**1.00**		FLAG				**1.17**						**1.15**						**1.22**				
	North Approach						East Approach						South Approach						West Approach						
	Left	Thru	Right	In	Out	Total	Left	Thru	Right	In	Out	Total	Left	Thru	Right	In	Out	Total	Left	Thru	Right	In	Out	Total	
2010 Existing Conditions	0	0	0	0	0	0	17	89	0	106	451	557	6	0	106	112	19	131	0	345	2	347	95	442	**565**
2015 Baseline Year	0	0	0	0	0	0	20	105	0	125	540	665	10	0	120	130	25	155	0	420	5	425	115	540	**680**
Barbee Mills							0	4							0					1					**5**
Hawks Landing							1	3							1					5					**10**
Pipeline Projects-Subtotal	0	0	0	0	0	0	1	7	0	8	7	15	0	0	1	1	1	2	0	6	0	6	7	13	**15**
2015 Adjusted Baseline with Pipeline	**0**	**0**	**5**	**5**	**5**	**10**	**20**	**110**	**0**	**130**	**545**	**675**	**10**	**0**	**120**	**130**	**25**	**155**	**5**	**425**	**5**	**435**	**125**	**560**	**700**
Passby Distribution				**0%**	**0%**	**0%**				**0%**	**0%**	**0%**				**0%**	**0%**	**0%**				**0%**	**0%**	**0%**	**0**
Passby Traffic Volumes				**0**	**0**	**0**				**0**	**0**	**0**				**0**	**0**	**0**				**0**	**0**	**0**	**0**
Project Trip Distribution				**0%**	**0%**	**0%**	20%	15%		**35%**	**35%**	**70%**			20%	**20%**	**20%**	**40%**		15%		**15%**	**15%**	**30%**	**1**
Project Traffic Volumes				**0**	**0**	**0**	85	65		**150**	**155**	**305**			90	**90**	**85**	**175**		65		**65**	**65**	**130**	**305**
2015 with Full Buildout	**0**	**0**	**5**	**5**	**5**	**10**	**105**	**175**	**0**	**280**	**700**	**980**	**10**	**0**	**210**	**220**	**110**	**330**	**5**	**490**	**5**	**500**	**190**	**690**	**1,005**

Quendall Terminals
2015 AM Peak Hour Traffic Volume Forecasts
Without RTID I-405 Improvements

Intersection: N 30th St / Burnett Ave
Scenario: Master Use Plan
Analysis Year: 2015
Time Period: PM Peak

Intersection Code: 7
Analyst: JGT
Checked by: MJR
Date of Completion: 8/28/2012

Count Source: ATDS - 6/8/2010 Count
2015 to 2010 Factor: 0.7143

Notes	Southbound						Westbound						Northbound						Eastbound						
	Enter	Exit	Total				Enter	Exit					Enter	Exit					Enter	Exit					
2008 Calibration Year	216	114	330				148	226	374				52	81	133				1	1	2				
2015 Baseline Forecast Year	95	76	171				77	101	178				67	67	134				1	1	2				
Fratar Approximation Factor			**1.15**						**1.15**						**1.01**						**1.00**			**FLAG**	
	North Approach						East Approach						South Approach						West Approach						
	Left	Thru	Right	In	Out	Total	Left	Thru	Right	In	Out	Total	Left	Thru	Right	In	Out	Total	Left	Thru	Right	In	Out	Total	
2010 Existing Conditions	18	25	0	43	79	122	20	11	20	51	75	126	0	59	47	106	45	151	0	10	0	10	11	21	**210**
2015 Baseline Year	25	25	0	50	90	140	20	10	30	60	85	145	0	60	50	110	45	155	0	10	0	10	10	20	**230**
Barbee Mills																									**0**
Hawks Landing	1								1																**2**
Pipeline Projects-Subtotal	1	0	0	1	1	2	0	0	1	1	1	2	0	0	0	0	0	0	0	0	0	0	0	0	**2**
2015 Adjusted Baseline with Pipeline	**25**	**25**	**0**	**50**	**90**	**140**	**20**	**10**	**30**	**60**	**85**	**145**	**0**	**60**	**50**	**110**	**45**	**155**	**0**	**10**	**0**	**10**	**10**	**20**	**230**
Passby Distribution				**0%**	**0%**	**0%**				**0%**	**0%**	**0%**				**0%**	**0%**	**0%**				**0%**	**0%**	**0%**	**0**
Passby Traffic Volumes				**0**	**0**	**0**				**0**	**0**	**0**				**0**	**0**	**0**				**0**	**0**	**0**	**0**
Project Trip Distribution	20%			**20%**	**20%**	**40%**			20%	**20%**	**20%**	**40%**				**0%**	**0%**	**0%**				**0%**	**0%**	**0%**	**0**
Project Traffic Volumes	85			**85**	**90**	**175**			90	**90**	**85**	**175**				**0**	**0**	**0**				**0**	**0**	**0**	**175**
2015 with Full Buildout	**110**	**25**	**0**	**135**	**180**	**315**	**20**	**10**	**120**	**150**	**170**	**320**	**0**	**60**	**50**	**110**	**45**	**155**	**0**	**10**	**0**	**10**	**10**	**20**	**405**

Intersection: Lake Washington Blvd / Burnett Ave
Scenario: Master Use Plan
Analysis Year: 2015
Time Period: PM Peak

Intersection Code: 8
Analyst: JGT
Checked by: MJR
Date of Completion: 8/28/2012

Count Source: ATDS - 6/8/2010 Count
2015 to 2010 Factor: 0.7143

Notes	Southbound						Westbound						Northbound						Eastbound						
	Enter	Exit	Total				Enter	Exit					Enter	Exit					Enter	Exit					
2008 Calibration Year	81	52	133				283	323	606				1	1	2				322	283	605				
2015 Baseline Forecast Year	67	67	134				421	521	942				1	1	2				477	339	816				
Fratar Approximation Factor			**1.01**						**1.48**						**1.00**			**FLAG**			**1.30**				
	North Approach						East Approach						South Approach						West Approach						
	Left	Thru	Right	In	Out	Total	Left	Thru	Right	In	Out	Total	Left	Thru	Right	In	Out	Total	Left	Thru	Right	In	Out	Total	
2010 Existing Conditions	2	87	0	89	335	424	54	0	1	55	100	155	0	334	98	432	141	573	0	0	0	0	0	0	**576**
2015 Baseline Year	5	85	0	90	310	400	80	0	5	85	135	220	0	305	130	435	165	600	0	0	0	0	0	0	**610**
Barbee Mills		4												1											**5**
Hawks Landing		3												5											**8**
Pipeline Projects-Subtotal	0	7	0	7	6	13	0	0	0	0	0	0	0	6	0	6	7	13	0	0	0	0	0	0	**13**
2015 Adjusted Baseline with Pipeline	**5**	**90**	**0**	**95**	**315**	**410**	**80**	**0**	**5**	**85**	**135**	**220**	**0**	**310**	**130**	**440**	**170**	**610**	**0**	**0**	**0**	**0**	**0**	**0**	**620**
Passby Distribution				**0%**	**0%**	**0%**				**0%**	**0%**	**0%**				**0%**	**0%**	**0%**				**0%**	**0%**	**0%**	**0**
Passby Traffic Volumes				**0**	**0**	**0**				**0**	**0**	**0**				**0**	**0**	**0**				**0**	**0**	**0**	**0**
Project Trip Distribution		15%		**15%**	**15%**	**30%**				**0%**	**0%**	**0%**		15%		**15%**	**15%**	**30%**				**0%**	**0%**	**0%**	**0**
Project Traffic Volumes		65		**65**	**65**	**130**				**0**	**0**	**0**		65		**65**	**65**	**130**				**0**	**0**	**0**	**130**
2015 with Full Buildout	**5**	**155**	**0**	**160**	**380**	**540**	**80**	**0**	**5**	**85**	**135**	**220**	**0**	**375**	**130**	**505**	**235**	**740**	**0**	**0**	**0**	**0**	**0**	**0**	**750**

Quendall Terminals
2015 AM Peak Hour Traffic Volume Forecasts
Without RTID I-405 Improvements

Intersection: Lake Washington Blvd / Garden Ave N / Park Ave N
Scenario: Master Use Plan
Analysis Year: 2015
Time Period: PM Peak

Intersection Code: 9
Analyst: JGT
Checked by: MJR
Date of Completion: 8/28/2012

Count Source: ATDS - 6/8/2010 Count
2015 to 2010 Factor: 0.7143

Notes	Southbound			Westbound			Northbound			Eastbound		
	Enter	Exit	Total	Enter	Exit	Total	Enter	Exit	Total	Enter	Exit	Total
2008 Calibration Year	710	683	1,393	1,291	1,726	3,017	329	209	538	1,562	1,274	2,836
2015 Baseline Forecast Year	945	601	1,546	1,615	2,412	4,027	805	576	1,381	1,862	1,540	3,402
Fratar Approximation Factor			**1.09**			**1.29**			**2.34**			**1.17**

	North Approach						East Approach						South Approach						West Approach						
	Left	Thru	Right	In	Out	Total	Left	Thru	Right	In	Out	Total	Left	Thru	Right	In	Out	Total	Left	Thru	Right	In	Out	Total	
2010 Existing Conditions	98	15	204	317	457	774	208	718	90	1,016	505	1,521	12	88	55	155	231	386	279	352	8	639	934	1,573	**2,127**
2015 Baseline Year	85	35	230	350	515	865	460	785	60	1,305	675	1,980	40	180	145	365	520	885	275	445	25	745	1,055	1,800	**2,765**
Barbee Mills	1	1	2																1						**5**
Hawks Landing	1	1	1						1					1					3						**8**
Pipeline Projects-Subtotal	2	2	3	7	6	13	0	0	1	1	2	3	0	1	0	1	2	3	4	0	0	4	3	7	**13**
2015 Adjusted Baseline with Pipeline	**85**	**35**	**235**	**355**	**520**	**875**	**460**	**785**	**60**	**1,305**	**675**	**1,980**	**40**	**180**	**145**	**365**	**520**	**885**	**280**	**445**	**25**	**750**	**1,060**	**1,810**	**2,775**
Passby Distribution				**0%**	**0%**	**0%**				**0%**	**0%**	**0%**				**0%**	**0%**	**0%**				**0%**	**0%**	**0%**	**0**
Passby Traffic Volumes				**0**	**0**	**0**				**0**	**0**	**0**				**0**	**0**	**0**				**0**	**0**	**0**	**0**
Project Trip Distribution	1%	4%	10%	**15%**	**15%**	**30%**			1%	**1%**	**1%**	**2%**		4%		**4%**	**4%**	**8%**	10%			**10%**	**10%**	**20%**	**0**
Project Traffic Volumes	5	15	40	**60**	**70**	**130**			5	**5**	**5**	**10**		20		**20**	**15**	**35**	45			**45**	**40**	**85**	**130**
2015 with Full Buildout	**90**	**50**	**275**	**415**	**590**	**1,005**	**460**	**785**	**65**	**1,310**	**680**	**1,990**	**40**	**200**	**145**	**385**	**535**	**920**	**325**	**445**	**25**	**795**	**1,100**	**1,895**	**2,905**

Quendall Terminals
2015 PM Peak Hour Traffic Volume Forecasts
Without RTID I-405 Improvements

	Enter	Exit	Total
Quendall Project Vols	442	509	951
Quendall Passby Vols	28	21	49

Alternative 1 (incudes 10% increase in apartment trips)

Intersection: I-405 NB Ramps / Lake Washington Blvd
Scenario: Master Use Plan
Analysis Year: 2015
Time Period: PM Peak
Intersection Code: 1
Analyst: JGT
Checked by: MJR
Date of Completion: 8/28/2012
Count Source: TIA
2015 to 2009 Factor: 0.8571

Notes	Southbound						Westbound						Northbound						Eastbound						
	Enter	Exit	Total				Enter	Exit					Enter	Exit					Enter	Exit					
2008 Calibration Year	625	485	1,110				114	126	240				420	161	581				308	695	1,003				
2015 Baseline Forecast Year	375	327	702				114	145	259				271	277	548				290	300	590				
Fratar Approximation Factor			**1.15**						**1.07**						**1.15**						**1.15**				
	North Approach						East Approach						South Approach						West Approach						
	Left	Thru	Right	In	Out	Total	Left	Thru	Right	In	Out	Total	Left	Thru	Right	In	Out	Total	Left	Thru	Right	In	Out	Total	
2009 Existing Conditions	50	25	280	355	350	705	75	150	65	290	360	650	15	230	145	390	160	550	55	165	60	280	445	725	**1,315**
2015 Baseline Year	50	30	330	410	405	815	80	165	65	310	385	695	20	275	155	450	185	635	65	180	75	320	515	835	**1,490**
Barbee Mills			9					6					1						3	10	3				**32**
Kennydale Apartments	2	18	22						2					34					30						
Hawks Landing			2					2					26						1	2	15				**48**
Pipeline Projects-Subtotal	2	18	33	53	70	123	0	8	2	10	14	24	27	34	0	61	36	97	34	12	18	64	68	132	**188**
2015 Adjusted Baseline with Pipeline	**50**	**50**	**365**	**465**	**475**	**940**	**80**	**175**	**65**	**320**	**395**	**715**	**45**	**310**	**155**	**510**	**225**	**735**	**100**	**190**	**95**	**385**	**585**	**970**	**1,680**
Passby Distribution				**0%**	**0%**	**0%**				**0%**	**0%**	**0%**				**0%**	**0%**	**0%**				**0%**	**0%**	**0%**	**0**
Passby Traffic Volumes				**0**	**0**	**0**				**0**	**0**	**0**				**0**	**0**	**0**				**0**	**0**	**0**	**0**
Project Trip Distribution			10%	**10%**	**10%**	**20%**		10%		**10%**	**10%**	**20%**				**0%**	**45%**	**45%**	10%	10%	45%	**65%**	**20%**	**85%**	**1**
Project Traffic Volumes			45	**45**	**50**	**95**		45		**45**	**50**	**95**				**0**	**230**	**230**	50	50	230	**330**	**90**	**420**	**420**
2015 with Full Buildout	**50**	**50**	**410**	**510**	**525**	**1,035**	**80**	**220**	**65**	**365**	**445**	**810**	**45**	**310**	**155**	**510**	**455**	**965**	**150**	**240**	**325**	**715**	**675**	**1,390**	**2,100**

Intersection: I-405 SB Ramps / Lake Washington Blvd
Scenario: Master Use Plan
Analysis Year: 2015
Time Period: PM Peak
Intersection Code: 2
Analyst: JGT
Checked by: MJR
Date of Completion: 8/28/2012
Count Source: TIA
2015 to 2009 Factor: 0.8571

Notes	Southbound						Westbound						Northbound						Eastbound						
	Enter	Exit	Total				Enter	Exit					Enter	Exit					Enter	Exit					
2008 Calibration Year	502	0	502				695	308	1,003				0	607	607				293	575	868				
2015 Baseline Forecast Year	863	0	863				300	290	590				0	555	555				283	600	883				
Fratar Approximation Factor			**1.31**						**1.15**						**1.15**						**1.01**				
	North Approach						East Approach						South Approach						West Approach						
	Left	Thru	Right	In	Out	Total	Left	Thru	Right	In	Out	Total	Left	Thru	Right	In	Out	Total	Left	Thru	Right	In	Out	Total	
2009 Existing Conditions	130	5	250	385	0	385	215	225	0	440	280	720	0	0	0	0	345	345	0	150	125	275	475	750	**1,100**
2015 Baseline Year	200	10	300	510	0	510	285	220	0	505	350	855	0	0	0	0	425	425	0	150	130	280	520	800	**1,295**
Barbee Mills			22					16												16	2				**56**
Kennydale Apartments	30						22																		
Hawks Landing			16					30												18	23				**87**
Pipeline Projects-Subtotal	30	0	38	68	0	68	22	46	0	68	64	132	0	0	0	0	47	47	0	34	25	59	84	143	**195**
2015 Adjusted Baseline with Pipeline	**230**	**10**	**340**	**580**	**0**	**580**	**305**	**265**	**0**	**570**	**415**	**985**	**0**	**0**	**0**	**0**	**470**	**470**	**0**	**185**	**155**	**340**	**605**	**945**	**1,490**
Passby Distribution				**0%**	**0%**	**0%**				**0%**	**0%**	**0%**				**0%**	**0%**	**0%**				**0%**	**0%**	**0%**	**0**
Passby Traffic Volumes				**0**	**0**	**0**				**0**	**0**	**0**				**0**	**0**	**0**				**0**	**0**	**0**	**0**
Project Trip Distribution			45%	**45%**	**0%**	**45%**		20%		**20%**	**65%**	**85%**				**0%**	**0%**	**0%**		65%		**65%**	**65%**	**130%**	**1**
Project Traffic Volumes			200	**200**	**0**	**200**		90		**90**	**330**	**420**				**0**	**0**	**0**		330		**330**	**290**	**620**	**620**
2015 with Full Buildout	**230**	**10**	**540**	**780**	**0**	**780**	**305**	**355**	**0**	**660**	**745**	**1,405**	**0**	**0**	**0**	**0**	**470**	**470**	**0**	**515**	**155**	**670**	**895**	**1,565**	**2,110**

Quendall Terminals
2015 PM Peak Hour Traffic Volume Forecasts
Without RTID I-405 Improvements

Intersection: Ripley Lane / Lake Washington Blvd — **Intersection Code:** 3 — **Count Source:** TIA
Scenario: Master Use Plan — **Analyst:** MJR — **2015 to 2012 Factor:** 0.4286
Analysis Year: 2015 — **Checked by:** MJR
Time Period: PM Peak — **Date of Completion:** 6/12/2012

Notes	Southbound						Westbound						Northbound						Eastbound						
	Enter	Exit	Total				Enter	Exit					Enter	Exit					Enter	Exit					
2008 Calibration Year	1	1	2				575	293	868				1	1	2				287	574	861				
2015 Baseline Forecast Year	1	1	2				600	283	883				1	1	2				283	601	884				
Fratar Approximation Factor			1.00			FLAG			1.01						1.00			FLAG			1.02				
	North Approach						East Approach						South Approach						West Approach						
	Left	Thru	Right	In	Out	Total	Left	Thru	Right	In	Out	Total	Left	Thru	Right	In	Out	Total	Left	Thru	Right	In	Out	Total	
2012 Existing Conditions	101	0	28	129	45	174	0	409	38	447	282	729	0	0	1	1	1	2	7	180	1	188	437	625	765
2015 Baseline Year	100	0	30	130	45	175	0	465	40	505	285	790	0	0	0	0	0	0	5	185	0	190	495	685	825
Barbee Mills	14		3					8	30										6	4					65
Hawks Landing			3					46							5				2	36					92
Pipeline Projects-Subtotal	14	0	6	20	38	58	0	54	30	84	59	143	0	0	5	5	0	5	8	40	0	48	60	108	157
2015 Adjusted Baseline with Pipeline	**115**	**0**	**35**	**150**	**85**	**235**	**0**	**520**	**70**	**590**	**345**	**935**	**0**	**0**	**5**	**5**	**0**	**5**	**15**	**225**	**0**	**240**	**555**	**795**	**985**
Passby Distribution				**0%**	**0%**	**0%**				**0%**	**0%**	**0%**				**0%**	**0%**	**0%**				**0%**	**0%**	**0%**	**0**
Passby Traffic Volumes				**0**	**0**	**0**				**0**	**0**	**0**				**0**	**0**	**0**				**0**	**0**	**0**	**0**
Project Trip Distribution	60%		0%	**60%**	**60%**	**120%**		5%	60%	**65%**	**65%**	**130%**				**0%**	**0%**	**0%**	0%	5%		**5%**	**5%**	**10%**	**1**
Project Traffic Volumes	305		0	**305**	**265**	**570**		20	265	**285**	**330**	**615**				**0**	**0**	**0**	0	25		**25**	**20**	**45**	**615**
2015 with Full Buildout	**420**	**0**	**35**	**455**	**350**	**805**	**0**	**540**	**335**	**875**	**675**	**1,550**	**0**	**0**	**5**	**5**	**0**	**5**	**15**	**250**	**0**	**265**	**575**	**840**	**1,600**

Intersection: Lake Washington Blvd / Barbee Mills Access — **Intersection Code:** 4 — **Count Source:** TIA
Scenario: Master Use Plan — **Analyst:** JGT — **2015 to 2009 Factor:** 0.8571
Analysis Year: 2015 — **Checked by:** MJR
Time Period: PM Peak — **Date of Completion:** 8/28/2012

Notes	Southbound						Westbound						Northbound						Eastbound						
	Enter	Exit	Total				Enter	Exit					Enter	Exit					Enter	Exit					
2008 Calibration Year	1	1	2				574	287	861				1	1	2				287	574	861				
2015 Baseline Forecast Year	1	1	2				601	283	884				1	1	2				283	601	884				
Fratar Approximation Factor			1.00			FLAG			1.02						1.00			FLAG			1.02				
	North Approach						East Approach						South Approach						West Approach						
	Left	Thru	Right	In	Out	Total	Left	Thru	Right	In	Out	Total	Left	Thru	Right	In	Out	Total	Left	Thru	Right	In	Out	Total	
2009 Existing Conditions	0	0	0	0	0	0	0	437	0	437	188	625	0	0	0	0	0	0	0	188	0	188	437	625	626
2015 Baseline Year	0	0	0	0	0	0	0	495	0	495	190	685	0	0	0	0	0	0	0	190	0	190	495	685	685
Barbee Mills	4		1					3	8										1	6					23
Hawks Landing								49												38					87
Pipeline Projects-Subtotal	4	0	1	5	9	14	0	52	8	60	48	108	0	0	0	0	0	0	1	44	0	45	53	98	110
2015 Adjusted Baseline with Pipeline	**5**	**0**	**0**	**5**	**10**	**15**	**0**	**545**	**10**	**555**	**240**	**795**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**235**	**0**	**235**	**545**	**780**	**795**
Passby Distribution	25%		75%	**100%**	**100%**	**200%**			75%	**75%**	**25%**	**100%**				**0%**	**0%**	**0%**	25%			**25%**	**75%**	**100%**	**2**
Passby Traffic Volumes	5		15	**20**	**25**	**45**		-20	20	**0**	**0**	**0**				**0**	**0**	**0**	5	-5		**0**	**-5**	**-5**	**20**
Project Trip Distribution	5%		35%	**40%**	**40%**	**80%**			5%	**5%**	**5%**	**10%**				**0%**	**0%**	**0%**	35%			**35%**	**35%**	**70%**	**1**
Project Traffic Volumes	25		180	**205**	**175**	**380**			20	**20**	**25**	**45**				**0**	**0**	**0**	155			**155**	**180**	**335**	**380**
2015 with Full Buildout	**35**	**0**	**195**	**230**	**210**	**440**	**0**	**525**	**50**	**575**	**265**	**840**	**0**	**0**	**0**	**0**	**0**	**0**	**160**	**230**	**0**	**390**	**720**	**1,110**	**1,195**

Quendall Terminals
2015 PM Peak Hour Traffic Volume Forecasts
Without RTID I-405 Improvements

Intersection: Lake Washington Blvd / Hawks Landing Access
Scenario: Master Use Plan
Analysis Year: 2015
Time Period: PM Peak

Intersection Code: 5
Analyst: JGT
Checked by: MJR
Date of Completion: 8/28/2012

Count Source: TIA
2015 to 2009 Factor: 0.8571

Notes	Southbound						Westbound						Northbound						Eastbound						
	Enter	Exit	Total				Enter	Exit					Enter	Exit					Enter	Exit					
2008 Calibration Year	1	1	2				574	287	861				1	1	2				287	574	861				
2015 Baseline Forecast Year	1	1	2				601	283	884				1	1	2				283	601	884				
Fratar Approximation Factor			**1.02**						**1.02**						**1.00**			**FLAG**			**1.02**				
	North Approach						East Approach						South Approach						West Approach						
	Left	Thru	Right	In	Out	Total	Left	Thru	Right	In	Out	Total	Left	Thru	Right	In	Out	Total	Left	Thru	Right	In	Out	Total	
2009 Existing Conditions	0	0	0	0	0	0	0	437	0	437	188	625	0	0	0	0	0	0	0	188	0	188	437	625	**626**
2015 Baseline Year	0	0	0	0	0	0	0	495	0	495	190	685	0	0	0	0	0	0	0	190	0	190	495	685	**685**
Barbee Mills								4												7					**11**
Hawks Landing							49						5		38						5				**97**
Pipeline Projects-Subtotal	0	0	0	0	0	0	49	4	0	53	45	98	5	0	38	43	54	97	0	7	5	12	9	21	**108**
2015 Adjusted Baseline with Pipeline	**0**	**0**	**0**	**0**	**0**	**0**	**50**	**500**	**0**	**550**	**235**	**785**	**5**	**0**	**40**	**45**	**55**	**100**	**0**	**195**	**5**	**200**	**505**	**705**	**795**
Passby Distribution				**0%**	**0%**	**0%**				**0%**	**0%**	**0%**				**0%**	**0%**	**0%**				**0%**	**0%**	**0%**	**0**
Passby Traffic Volumes				**0**	**0**	**0**				**0**	**0**	**0**				**0**	**0**	**0**				**0**	**0**	**0**	**0**
Project Trip Distribution				**0%**	**0%**	**0%**		35%		**35%**	**35%**	**70%**				**0%**	**0%**	**0%**		35%		**35%**	**35%**	**70%**	**1**
Project Traffic Volumes				**0**	**0**	**0**		180		**180**	**155**	**335**				**0**	**0**	**0**		155		**155**	**180**	**335**	**335**
2015 with Full Buildout	**0**	**0**	**0**	**0**	**0**	**0**	**50**	**680**	**0**	**730**	**390**	**1,120**	**5**	**0**	**40**	**45**	**55**	**100**	**0**	**350**	**5**	**355**	**685**	**1,040**	**1,130**

Intersection: N 36th St / Lake Washington Blvd
Scenario: Master Use Plan
Analysis Year: 2015
Time Period: PM Peak

Intersection Code: 6
Analyst: JGT
Checked by: MJR
Date of Completion: 8/28/2012

Count Source: ATDS - 6/8/2010 Count
2015 to 2010 Factor: 0.7143

Notes	Southbound						Westbound						Northbound						Eastbound						
	Enter	Exit	Total				Enter	Exit					Enter	Exit					Enter	Exit					
2008 Calibration Year	1	1	2				324	217	541				71	250	321				223	317	540				
2015 Baseline Forecast Year	1	1	2				432	216	648				67	169	236				241	439	680				
Fratar Approximation Factor			**1.00**			**FLAG**			**1.17**						**1.15**						**1.22**				
	North Approach						East Approach						South Approach						West Approach						
	Left	Thru	Right	In	Out	Total	Left	Thru	Right	In	Out	Total	Left	Thru	Right	In	Out	Total	Left	Thru	Right	In	Out	Total	
2010 Existing Conditions	0	0	0	0	0	0	83	280	0	363	132	495	4	0	25	29	90	119	0	107	7	114	284	398	**506**
2015 Baseline Year	0	0	0	0	0	0	90	335	0	425	160	585	5	0	30	35	100	135	0	130	10	140	340	480	**600**
Barbee Mills							1	3							2					5					**11**
Hawks Landing							1	4							1					4					**10**
Pipeline Projects-Subtotal	0	0	0	0	0	0	2	7	0	9	12	21	0	0	3	3	2	5	0	9	0	9	7	16	**21**
2015 Adjusted Baseline with Pipeline	**0**	**0**	**0**	**0**	**0**	**0**	**90**	**340**	**0**	**430**	**175**	**605**	**5**	**0**	**35**	**40**	**100**	**140**	**0**	**140**	**10**	**150**	**345**	**495**	**620**
Passby Distribution				**0%**	**0%**	**0%**				**0%**	**0%**	**0%**				**0%**	**0%**	**0%**				**0%**	**0%**	**0%**	**0**
Passby Traffic Volumes				**0**	**0**	**0**				**0**	**0**	**0**				**0**	**0**	**0**				**0**	**0**	**0**	**0**
Project Trip Distribution				**0%**	**0%**	**0%**	20%	15%		**35%**	**35%**	**70%**			20%	**20%**	**20%**	**40%**		15%		**15%**	**15%**	**30%**	**1**
Project Traffic Volumes				**0**	**0**	**0**	100	75		**175**	**155**	**330**			90	**90**	**100**	**190**		65		**65**	**75**	**140**	**330**
2015 with Full Buildout	**0**	**0**	**0**	**0**	**0**	**0**	**190**	**415**	**0**	**605**	**330**	**935**	**5**	**0**	**125**	**130**	**200**	**330**	**0**	**205**	**10**	**215**	**420**	**635**	**950**

Quendall Terminals

2015 PM Peak Hour Traffic Volume Forecasts

Without RTID I-405 Improvements

Intersection: N 30th St / Burnett Ave
Scenario: Master Use Plan
Analysis Year: 2015
Time Period: PM Peak

Intersection Code: 7
Analyst: JGT
Checked by: MJR
Date of Completion: 8/28/2012

Count Source: ATDS - 6/8/2010 Count
2015 to 2010 Factor: 0.7143

Notes	Southbound						Westbound						Northbound						Eastbound						
	Enter	Exit	Total				Enter	Exit					Enter	Exit					Enter	Exit					
2008 Calibration Year	216	114	330				148	226	374				52	81	133				1	1	2				
2015 Baseline Forecast Year	95	76	171				77	101	178				67	67	134				1	1	2				
Fratar Approximation Factor			**1.15**						**1.15**						**1.01**						**1.00**			**FLAG**	
	North Approach						East Approach						South Approach						West Approach						
	Left	Thru	Right	In	Out	Total	Left	Thru	Right	In	Out	Total	Left	Thru	Right	In	Out	Total	Left	Thru	Right	In	Out	Total	
2010 Existing Conditions	44	55	2	101	51	152	64	28	13	105	118	223	2	38	61	101	120	221	0	13	1	14	32	46	**321**
2015 Baseline Year	60	55	0	115	60	175	70	30	20	120	135	255	0	40	60	100	125	225	0	15	0	15	30	45	**350**
Barbee Mills	1								2																**3**
Hawks Landing	1								1																**2**
Pipeline Projects-Subtotal	2	0	0	2	3	5	0	0	3	3	2	5	0	0	0	0	0	0	0	0	0	0	0	0	**5**
2015 Adjusted Baseline with Pipeline	**60**	**55**	**0**	**115**	**65**	**180**	**70**	**30**	**25**	**125**	**135**	**260**	**0**	**40**	**60**	**100**	**125**	**225**	**0**	**15**	**0**	**15**	**30**	**45**	**355**
Passby Distribution				**0%**	**0%**	**0%**				**0%**	**0%**	**0%**				**0%**	**0%**	**0%**				**0%**	**0%**	**0%**	**0**
Passby Traffic Volumes				**0**	**0**	**0**				**0**	**0**	**0**				**0**	**0**	**0**				**0**	**0**	**0**	**0**
Project Trip Distribution	20%			**20%**	**20%**	**40%**			20%	**20%**	**20%**	**40%**				**0%**	**0%**	**0%**				**0%**	**0%**	**0%**	**0**
Project Traffic Volumes	100			**100**	**90**	**190**			90	**90**	**100**	**190**				**0**	**0**	**0**				**0**	**0**	**0**	**190**
2015 with Full Buildout	**160**	**55**	**0**	**215**	**155**	**370**	**70**	**30**	**115**	**215**	**235**	**450**	**0**	**40**	**60**	**100**	**125**	**225**	**0**	**15**	**0**	**15**	**30**	**45**	**545**

Intersection: Lake Washington Blvd / Burnett Ave
Scenario: Master Use Plan
Analysis Year: 2015
Time Period: PM Peak

Intersection Code: 8
Analyst: JGT
Checked by: MJR
Date of Completion: 8/28/2012

Count Source: ATDS - 6/8/2010 Count
2015 to 2010 Factor: 0.7143

Notes	Southbound						Westbound						Northbound						Eastbound						
	Enter	Exit	Total				Enter	Exit					Enter	Exit					Enter	Exit					
2008 Calibration Year	81	52	133				283	323	606				1	1	2				322	283	605				
2015 Baseline Forecast Year	67	67	134				421	521	942				1	1	2				477	339	816				
Fratar Approximation Factor			**1.01**						**1.48**						**1.00**			**FLAG**			**1.30**				
	North Approach						East Approach						South Approach						West Approach						
	Left	Thru	Right	In	Out	Total	Left	Thru	Right	In	Out	Total	Left	Thru	Right	In	Out	Total	Left	Thru	Right	In	Out	Total	
2010 Existing Conditions	92	0	3	95	113	208	0	104	111	215	381	596	0	0	0	0	0	0	2	289	0	291	107	398	**601**
2015 Baseline Year	95	0	0	95	145	240	0	175	145	320	470	790	0	0	0	0	0	0	0	375	0	375	175	550	**790**
Barbee Mills								5												3					**8**
Hawks Landing								4												4					**8**
Pipeline Projects-Subtotal	0	0	0	0	0	0	0	9	0	9	7	16	0	0	0	0	0	0	0	7	0	7	9	16	**16**
2015 Adjusted Baseline with Pipeline	**95**	**0**	**0**	**95**	**145**	**240**	**0**	**185**	**145**	**330**	**475**	**805**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**380**	**0**	**380**	**185**	**565**	**805**
Passby Distribution				**0%**	**0%**	**0%**				**0%**	**0%**	**0%**				**0%**	**0%**	**0%**				**0%**	**0%**	**0%**	**0**
Passby Traffic Volumes				**0**	**0**	**0**				**0**	**0**	**0**				**0**	**0**	**0**				**0**	**0**	**0**	**0**
Project Trip Distribution				**0%**	**0%**	**0%**		15%		**15%**	**15%**	**30%**				**0%**	**0%**	**0%**		15%		**15%**	**15%**	**30%**	**0**
Project Traffic Volumes				**0**	**0**	**0**		65		**65**	**75**	**140**				**0**	**0**	**0**		75		**75**	**65**	**140**	**140**
2015 with Full Buildout	**95**	**0**	**0**	**95**	**145**	**240**	**0**	**250**	**145**	**395**	**550**	**945**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**455**	**0**	**455**	**250**	**705**	**945**

Quendall Terminals
2015 PM Peak Hour Traffic Volume Forecasts
Without RTID I-405 Improvements

Intersection: Lake Washington Blvd / Garden Ave N / Park Ave N
Scenario: Master Use Plan
Analysis Year: 2015
Time Period: PM Peak

Intersection Code: 9
Analyst: JGT
Checked by: MJR
Date of Completion: 8/28/2012

Count Source: ATDS - 6/8/2010 Count
2015 to 2010 Factor: 0.7143

Notes	Southbound						Westbound						Northbound						Eastbound						
	Enter	Exit	Total				Enter	Exit					Enter	Exit					Enter	Exit					
2008 Calibration Year	710	683	1,393				1,291	1,726	3,017				329	209	538				1,562	1,274	2,836				
2015 Baseline Forecast Year	945	601	1,546				1,615	2,412	4,027				805	576	1,381				1,862	1,540	3,402				
Fratar Approximation Factor			**1.09**						**1.29**						**1.67**						**1.17**				
	North Approach						East Approach						South Approach						West Approach						
	Left	Thru	Right	In	Out	Total	Left	Thru	Right	In	Out	Total	Left	Thru	Right	In	Out	Total	Left	Thru	Right	In	Out	Total	
2010 Existing Conditions	90	83	292	465	514	979	295	646	132	1,073	1,345	2,418	9	85	497	591	404	995	297	758	26	1,081	947	2,028	**3,210**
2015 Baseline Year	80	125	310	515	580	1,095	495	770	120	1,385	1,805	3,190	20	135	835	990	670	1,660	325	890	50	1,265	1,100	2,365	**4,155**
Barbee Mills	1	1	1						1					1					3						**8**
Hawks Landing	1	1	2						1					1					2						**8**
Pipeline Projects-Subtotal	2	2	3	7	9	16	0	0	2	2	2	4	0	2	0	2	2	4	5	0	0	5	3	8	**16**
2015 Adjusted Baseline with Pipeline	**80**	**125**	**315**	**520**	**585**	**1,105**	**495**	**770**	**120**	**1,385**	**1,805**	**3,190**	**20**	**135**	**835**	**990**	**670**	**1,660**	**330**	**890**	**50**	**1,270**	**1,105**	**2,375**	**4,165**
Passby Distribution				**0%**	**0%**	**0%**				**0%**	**0%**	**0%**				**0%**	**0%**	**0%**				**0%**	**0%**	**0%**	**0**
Passby Traffic Volumes				**0**	**0**	**0**				**0**	**0**	**0**				**0**	**0**	**0**				**0**	**0**	**0**	**0**
Project Trip Distribution	1%	4%	10%	**15%**	**15%**	**30%**			1%	**1%**	**1%**	**2%**		4%		**4%**	**4%**	**8%**	10%			**10%**	**10%**	**20%**	**0**
Project Traffic Volumes	5	20	50	**75**	**70**	**145**			5	**5**	**5**	**10**		20		**20**	**20**	**40**	45			**45**	**50**	**95**	**145**
2015 with Full Buildout	**85**	**145**	**365**	**595**	**655**	**1,250**	**495**	**770**	**125**	**1,390**	**1,810**	**3,200**	**20**	**155**	**835**	**1,010**	**690**	**1,700**	**375**	**890**	**50**	**1,315**	**1,155**	**2,470**	**4,310**

Quendall Terminals

2015 AM Peak Hour Traffic Volume Forecasts
With RTID I-405 Improvements

	Enter	Exit	Total
Quendall Project Vols	445	421	866
Quendall Passby Vols	24	20	44

Alternative 1 (incudes 10% increase in apartment trips)

Intersection: I-405 NB Ramps / Lake Washington Blvd
Intersection Code: 1
Count Source: TIA
Scenario: Master Use Plan
Analyst: JGT
2015 to 2009 Factor: 0.8571
Analysis Year: 2015
Checked by: MJR
Time Period: PM Peak
Date of Completion: 8/28/2012

Notes	Southbound						Westbound						Northbound						Eastbound						
	Enter	Exit	Total				Enter	Exit					Enter	Exit					Enter	Exit					
2008 Calibration Year	625	485	1,110				114	126	240				420	161	581				308	695	1,003				
2015 Baseline Forecast Year	550	587	1,137				137	253	390				683	134	817				160	558	718				
Fratar Approximation Factor			**1.02**						**1.54**						**1.35**						**1.00**			**FLAG**	
	North Approach						East Approach						South Approach						West Approach						
	Left	Thru	Right	In	Out	Total	Left	Thru	Right	In	Out	Total	Left	Thru	Right	In	Out	Total	Left	Thru	Right	In	Out	Total	
2009 Existing Conditions	30	25	345	400	515	915	165	165	140	470	230	700	10	95	90	195	540	735	280	110	350	740	520	1,260	**1,805**
2015 Baseline Year	0	0	0	0	730	730	0	515	355	870	625	1,495	10	0	255	265	0	265	375	370	0	745	525	1,270	**1,880**
Barbee Mills			0					4					0						16	26	0				**46**
Kennydale Apartments								35	27						13					9					
Hawks Landing			0					4					28						11	3	0				**46**
Pipeline Projects-Subtotal	0	0	0	0	54	54	0	43	27	70	51	121	28	0	13	41	0	41	27	38	0	65	71	136	**176**
2015 Adjusted Baseline with Pipeline	**0**	**0**	**0**	**0**	**780**	**780**	**0**	**560**	**380**	**940**	**680**	**1,620**	**40**	**0**	**270**	**310**	**0**	**310**	**400**	**410**	**0**	**810**	**600**	**1,410**	**2,060**
Passby Distribution				**0%**	**0%**	**0%**				**0%**	**0%**	**0%**				**0%**	**0%**	**0%**				**0%**	**0%**	**0%**	**0**
Passby Traffic Volumes				**0**	**0**	**0**				**0**	**0**	**0**				**0**	**0**	**0**				**0**	**0**	**0**	**0**
Project Trip Distribution			0%	**0%**	**45%**	**45%**		10%		**10%**	**10%**	**20%**	30%			**30%**	**0%**	**30%**	45%	10%	0%	**55%**	**40%**	**95%**	**1**
Project Traffic Volumes			0	**0**	**190**	**190**		45		**45**	**40**	**85**	135			**135**	**0**	**135**	190	40	0	**230**	**180**	**410**	**410**
2015 with Full Buildout	**0**	**0**	**0**	**0**	**970**	**970**	**0**	**605**	**380**	**985**	**720**	**1,705**	**175**	**0**	**270**	**445**	**0**	**445**	**590**	**450**	**0**	**1,040**	**780**	**1,820**	**2,470**

Intersection: I-405 SB Ramps / Lake Washington Blvd
Intersection Code: 2
Count Source: TIA
Scenario: Master Use Plan
Analyst: JGT
2015 to 2009 Factor: 0.8571
Analysis Year: 2015
Checked by: MJR
Time Period: PM Peak
Date of Completion: 8/28/2012

Notes	Southbound						Westbound						Northbound						Eastbound						
	Enter	Exit	Total				Enter	Exit					Enter	Exit					Enter	Exit					
2008 Calibration Year	502	0	502				695	308	1,003				0	607	607				293	575	868				
2015 Baseline Forecast Year	279	0	279				558	160	718				0	538	538				30	169	199				
Fratar Approximation Factor			**1.00**			**FLAG**			**1.00**			**FLAG**			**1.00**			**FLAG**			**1.00**			**FLAG**	
	North Approach						East Approach						South Approach						West Approach						
	Left	Thru	Right	In	Out	Total	Left	Thru	Right	In	Out	Total	Left	Thru	Right	In	Out	Total	Left	Thru	Right	In	Out	Total	
2009 Existing Conditions	55	5	115	175	0	175	390	135	0	525	720	1,245	0	0	0	0	400	400	0	665	5	670	250	920	**1,370**
2015 Baseline Year	55	5	115	175	0	175	390	135	0	525	720	1,245	0	0	0	0	400	400	0	665	5	670	250	920	**1,370**
Barbee Mills			4					4												42	1				**51**
Kennydale Apartments	9						35																		
Hawks Landing			18					32												14	18				**82**
Pipeline Projects-Subtotal	9	0	22	31	0	31	35	36	0	71	65	136	0	0	0	0	54	54	0	56	19	75	58	133	**177**
2015 Adjusted Baseline with Pipeline	**65**	**5**	**135**	**205**	**0**	**205**	**425**	**170**	**0**	**595**	**785**	**1,380**	**0**	**0**	**0**	**0**	**455**	**455**	**0**	**720**	**25**	**745**	**305**	**1,050**	**1,545**
Passby Distribution				**0%**	**0%**	**0%**				**0%**	**0%**	**0%**				**0%**	**0%**	**0%**				**0%**	**0%**	**0%**	**0**
Passby Traffic Volumes				**0**	**0**	**0**				**0**	**0**	**0**				**0**	**0**	**0**				**0**	**0**	**0**	**0**
Project Trip Distribution			45%	**45%**	**0%**	**45%**		40%		**40%**	**55%**	**95%**				**0%**	**30%**	**30%**		55%	30%	**85%**	**85%**	**170%**	**2**
Project Traffic Volumes			200	**200**	**0**	**200**		180		**180**	**230**	**410**				**0**	**125**	**125**		230	125	**355**	**380**	**735**	**735**
2015 with Full Buildout	**65**	**5**	**335**	**405**	**0**	**405**	**425**	**350**	**0**	**775**	**1,015**	**1,790**	**0**	**0**	**0**	**0**	**580**	**580**	**0**	**950**	**150**	**1,100**	**685**	**1,785**	**2,280**

Quendall Terminals

2015 AM Peak Hour Traffic Volume Forecasts

With RTID I-405 Improvements

Intersection: Ripley Lane / Lake Washington Blvd **Intersection Code:** 3 **Count Source:** TIA
Scenario: Master Use Plan **Analyst:** JGT **2015 to 2009 Factor:** 0.8571
Analysis Year: 2015 **Checked by:** MJR
Time Period: PM Peak **Date of Completion:** 8/28/2012

Notes	Southbound						Westbound						Northbound						Eastbound						
	Enter	Exit	Total				Enter	Exit					Enter	Exit					Enter	Exit					
2008 Calibration Year	1	1	2				575	293	868				1	1	2				287	574	861				
2015 Baseline Forecast Year	1	1	2				169	30	199				1	1	2				30	169	199				
Fratar Approximation Factor			1.00			FLAG			1.00			FLAG			1.00			FLAG			1.00			FLAG	
	North Approach						East Approach						South Approach						West Approach						
	Left	Thru	Right	In	Out	Total	Left	Thru	Right	In	Out	Total	Left	Thru	Right	In	Out	Total	Left	Thru	Right	In	Out	Total	
2009 Existing Conditions	30	0	5	35	80	115	0	195	65	260	665	925	0	0	0	0	0	0	15	635	0	650	200	850	**945**
2015 Baseline Year	30	0	5	35	80	115	0	195	65	260	665	925	0	0	0	0	0	0	15	635	0	650	200	850	**945**
Barbee Mills	34		3					2	6										1	9					**55**
Hawks Landing			3					50							5				2	27					**87**
Pipeline Projects-Subtotal	34	0	6	40	9	49	0	52	6	58	75	133	0	0	5	5	0	5	3	36	0	39	58	97	**142**
2015 Adjusted Baseline with Pipeline	**65**	**0**	**10**	**75**	**90**	**165**	**0**	**245**	**70**	**315**	**740**	**1,055**	**0**	**0**	**5**	**5**	**0**	**5**	**20**	**670**	**0**	**690**	**255**	**945**	**1,085**
Passby Distribution				**0%**	**0%**	**0%**				**0%**	**0%**	**0%**				**0%**	**0%**	**0%**	0%			**0%**	**0%**	**0%**	**0**
Passby Traffic Volumes				**0**	**0**	**0**				**0**	**0**	**0**				**0**	**0**	**0**	0	0		**0**	**0**	**0**	**0**
Project Trip Distribution	75%			**75%**	**75%**	**150%**		10%	75%	**85%**	**85%**	**170%**				**0%**	**0%**	**0%**	0%	10%		**10%**	**10%**	**20%**	**2**
Project Traffic Volumes	315			**315**	**335**	**650**		45	335	**380**	**355**	**735**				**0**	**0**	**0**	0	40		**40**	**45**	**85**	**735**
2015 with Full Buildout	**380**	**0**	**10**	**390**	**425**	**815**	**0**	**290**	**405**	**695**	**1,095**	**1,790**	**0**	**0**	**5**	**5**	**0**	**5**	**20**	**710**	**0**	**730**	**300**	**1,030**	**1,820**

Intersection: Lake Washington Blvd / Barbee Mills Access **Intersection Code:** 4 **Count Source:** TIA
Scenario: Master Use Plan **Analyst:** JGT **2015 to 2009 Factor:** 0.8571
Analysis Year: 2015 **Checked by:** MJR
Time Period: PM Peak **Date of Completion:** 8/28/2012

Notes	Southbound						Westbound						Northbound						Eastbound						
	Enter	Exit	Total				Enter	Exit					Enter	Exit					Enter	Exit					
2008 Calibration Year	1	1	2				574	287	861				1	1	2				287	574	861				
2015 Baseline Forecast Year	1	1	2				169	30	199				1	1	2				30	169	199				
Fratar Approximation Factor			1.00			FLAG			1.00			FLAG			1.00			FLAG			1.00			FLAG	
	North Approach						East Approach						South Approach						West Approach						
	Left	Thru	Right	In	Out	Total	Left	Thru	Right	In	Out	Total	Left	Thru	Right	In	Out	Total	Left	Thru	Right	In	Out	Total	
2009 Existing Conditions	0	0	0	0	0	0	0	200	0	200	650	850	0	0	0	0	0	0	0	650	0	650	200	850	**851**
2015 Baseline Year	0	0	0	0	0	0	0	200	0	200	650	850	0	0	0	0	0	0	0	650	0	650	200	850	**850**
Barbee Mills	9		1					3	2										0	1					**16**
Hawks Landing								53												29					**82**
Pipeline Projects-Subtotal	9	0	1	10	2	12	0	56	2	58	39	97	0	0	0	0	0	0	0	30	0	30	57	87	**98**
2015 Adjusted Baseline with Pipeline	**10**	**0**	**0**	**10**	**0**	**10**	**0**	**255**	**0**	**255**	**690**	**945**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**680**	**0**	**680**	**255**	**935**	**945**
Passby Distribution	75%		25%	**100%**	**100%**	**200%**			25%	**25%**	**75%**	**100%**				**0%**	**0%**	**0%**	75%			**75%**	**25%**	**100%**	**2**
Passby Traffic Volumes	15		5	**20**	**25**	**45**		-5	5	**0**	**-5**	**-5**				**0**	**0**	**0**	20	-20		**0**	**0**	**0**	**20**
Project Trip Distribution	10%		15%	**25%**	**25%**	**50%**			10%	**10%**	**10%**	**20%**				**0%**	**0%**	**0%**	15%			**15%**	**15%**	**30%**	**1**
Project Traffic Volumes	40		65	**105**	**110**	**215**			45	**45**	**40**	**85**				**0**	**0**	**0**	65			**65**	**65**	**130**	**215**
2015 with Full Buildout	**65**	**0**	**70**	**135**	**135**	**270**	**0**	**250**	**50**	**300**	**725**	**1,025**	**0**	**0**	**0**	**0**	**0**	**0**	**85**	**660**	**0**	**745**	**320**	**1,065**	**1,180**

Quendall Terminals
2015 AM Peak Hour Traffic Volume Forecasts
With RTID I-405 Improvements

Intersection: Lake Washington Blvd / Hawks Landing Access | **Intersection Code:** 5 | **Count Source:** TIA
Scenario: Master Use Plan | **Analyst:** JGT | **2015 to 2009 Factor:** 0.8571
Analysis Year: 2015 | **Checked by:** MJR
Time Period: PM Peak | **Date of Completion:** 8/28/2012

Notes	Southbound						Westbound						Northbound						Eastbound						
	Enter	Exit	Total				Enter	Exit					Enter	Exit					Enter	Exit					
2008 Calibration Year	1	1	2				574	287	861				1	1	2				287	574	861				
2015 Baseline Forecast Year	1	1	2				169	30	199				1	1	2				30	169	199				
Fratar Approximation Factor			**1.00**			**FLAG**			**1.00**			**FLAG**			**1.00**			**FLAG**			**1.00**			**FLAG**	
	North Approach						East Approach						South Approach						West Approach						
	Left	Thru	Right	In	Out	Total	Left	Thru	Right	In	Out	Total	Left	Thru	Right	In	Out	Total	Left	Thru	Right	In	Out	Total	
2009 Existing Conditions	0	0	0	0	0	0	0	200	0	200	650	850	0	0	0	0	0	0	0	650	0	650	200	850	**851**
2015 Baseline Year	0	0	0	0	0	0	0	200	0	200	650	850	0	0	0	0	0	0	0	650	0	650	200	850	**850**
Barbee Mills								4												1					**5**
Hawks Landing							53						4		29						6				**92**
Pipeline Projects-Subtotal	0	0	0	0	0	0	53	4	0	57	30	87	4	0	29	33	59	92	0	1	6	7	8	15	**97**
2015 Adjusted Baseline with Pipeline	**0**	**0**	**0**	**0**	**0**	**0**	**55**	**205**	**0**	**260**	**680**	**940**	**5**	**0**	**30**	**35**	**60**	**95**	**0**	**650**	**5**	**655**	**210**	**865**	**950**
Passby Distribution				**0%**	**0%**	**0%**				**0%**	**0%**	**0%**				**0%**	**0%**	**0%**				**0%**	**0%**	**0%**	**0**
Passby Traffic Volumes				**0**	**0**	**0**				**0**	**0**	**0**				**0**	**0**	**0**				**0**	**0**	**0**	**0**
Project Trip Distribution				**0%**	**0%**	**0%**		15%		**15%**	**15%**	**30%**				**0%**	**0%**	**0%**		15%		**15%**	**15%**	**30%**	**0**
Project Traffic Volumes				**0**	**0**	**0**		65		**65**	**65**	**130**				**0**	**0**	**0**		65		**65**	**65**	**130**	**130**
2015 with Full Buildout	**0**	**0**	**0**	**0**	**0**	**0**	**55**	**270**	**0**	**325**	**745**	**1,070**	**5**	**0**	**30**	**35**	**60**	**95**	**0**	**715**	**5**	**720**	**275**	**995**	**1,080**

Intersection: N 36th St / Lake Washington Blvd | **Intersection Code:** 6 | **Count Source:** ATDS - 6/8/2010 Count
Scenario: Master Use Plan | **Analyst:** JGT | **2015 to 2010 Factor:** 0.7143
Analysis Year: 2015 | **Checked by:** MJR
Time Period: PM Peak | **Date of Completion:** 8/28/2012

Notes	Southbound						Westbound						Northbound						Eastbound						
	Enter	Exit	Total				Enter	Exit					Enter	Exit					Enter	Exit					
2008 Calibration Year	1	1	2				324	217	541				71	250	321				223	317	540				
2015 Baseline Forecast Year	1	1	2				130	16	146				13	39	52				23	103	126				
Fratar Approximation Factor			**1.00**			**FLAG**			**1.00**			**FLAG**			**1.00**			**FLAG**			**1.00**			**FLAG**	
	North Approach						East Approach						South Approach						West Approach						
	Left	Thru	Right	In	Out	Total	Left	Thru	Right	In	Out	Total	Left	Thru	Right	In	Out	Total	Left	Thru	Right	In	Out	Total	
2010 Existing Conditions	0	0	0	0	0	0	17	89	0	106	451	557	6	0	106	112	19	131	0	345	2	347	95	442	**565**
2015 Baseline Year	0	0	0	0	0	0	15	90	0	105	450	555	5	0	105	110	15	125	0	345	0	345	95	440	**560**
Barbee Mills							0	4							0					1					**5**
Hawks Landing							1	3							1					5					**10**
Pipeline Projects-Subtotal	0	0	0	0	0	0	1	7	0	8	7	15	0	0	1	1	1	2	0	6	0	6	7	13	**15**
2015 Adjusted Baseline with Pipeline	**0**	**0**	**5**	**5**	**5**	**10**	**15**	**95**	**0**	**110**	**455**	**565**	**5**	**0**	**105**	**110**	**15**	**125**	**5**	**350**	**0**	**355**	**105**	**460**	**580**
Passby Distribution				**0%**	**0%**	**0%**				**0%**	**0%**	**0%**				**0%**	**0%**	**0%**				**0%**	**0%**	**0%**	**0**
Passby Traffic Volumes				**0**	**0**	**0**				**0**	**0**	**0**				**0**	**0**	**0**				**0**	**0**	**0**	**0**
Project Trip Distribution				**0%**	**0%**	**0%**	1%	14%		**15%**	**16%**	**31%**			2%	**2%**	**1%**	**3%**		14%		**14%**	**14%**	**28%**	**0**
Project Traffic Volumes				**0**	**0**	**0**	5	60		**65**	**70**	**135**			10	**10**	**5**	**15**		60		**60**	**60**	**120**	**135**
2015 with Full Buildout	**0**	**0**	**5**	**5**	**5**	**10**	**20**	**155**	**0**	**175**	**525**	**700**	**5**	**0**	**115**	**120**	**20**	**140**	**5**	**410**	**0**	**415**	**165**	**580**	**715**

Quendall Terminals
2015 AM Peak Hour Traffic Volume Forecasts
With RTID I-405 Improvements

Intersection: N 30th St / Burnett Ave
Scenario: Master Use Plan
Analysis Year: 2015
Time Period: PM Peak

Intersection Code: 7
Analyst: JGT
Checked by: MJR
Date of Completion: 8/28/2012

Count Source: ATDS - 6/8/2010 Count
2015 to 2010 Factor: 0.7143

Notes	Southbound						Westbound						Northbound						Eastbound						
	Enter	Exit	Total				Enter	Exit					Enter	Exit					Enter	Exit					
2008 Calibration Year	216	114	330				148	226	374				52	81	133				1	1	2				
2015 Baseline Forecast Year	90	76	166				146	144	290				58	73	131				1	1	2				
Fratar Approximation Factor			1.00			FLAG			1.00			FLAG			1.00			FLAG			1.00			FLAG	
	North Approach						East Approach						South Approach						West Approach						
	Left	Thru	Right	In	Out	Total	Left	Thru	Right	In	Out	Total	Left	Thru	Right	In	Out	Total	Left	Thru	Right	In	Out	Total	
2010 Existing Conditions	18	25	0	43	79	122	20	11	20	51	75	126	0	59	47	106	45	151	0	10	0	10	11	21	**210**
2015 Baseline Year	20	25	0	45	80	125	20	10	20	50	75	125	0	60	45	105	45	150	0	10	0	10	10	20	**210**
Barbee Mills																									**0**
Hawks Landing	1								1																**2**
Pipeline Projects-Subtotal	1	0	0	1	1	2	0	0	1	1	1	2	0	0	0	0	0	0	0	0	0	0	0	0	**2**
2015 Adjusted Baseline with Pipeline	**20**	**25**	**0**	**45**	**80**	**125**	**20**	**10**	**20**	**50**	**75**	**125**	**0**	**60**	**45**	**105**	**45**	**150**	**0**	**10**	**0**	**10**	**10**	**20**	**210**
Passby Distribution				**0%**	**0%**	**0%**				**0%**	**0%**	**0%**				**0%**	**0%**	**0%**				**0%**	**0%**	**0%**	**0**
Passby Traffic Volumes				**0**	**0**	**0**				**0**	**0**	**0**				**0**	**0**	**0**				**0**	**0**	**0**	**0**
Project Trip Distribution	1%			**1%**	**1%**	**2%**			1%	**1%**	**1%**	**2%**				**0%**	**0%**	**0%**				**0%**	**0%**	**0%**	**0**
Project Traffic Volumes	5			**5**	**5**	**10**			5	**5**	**5**	**10**				**0**	**0**	**0**				**0**	**0**	**0**	**10**
2015 with Full Buildout	**25**	**25**	**0**	**50**	**85**	**135**	**20**	**10**	**25**	**55**	**80**	**135**	**0**	**60**	**45**	**105**	**45**	**150**	**0**	**10**	**0**	**10**	**10**	**20**	**220**

Intersection: Lake Washington Blvd / Burnett Ave
Scenario: Master Use Plan
Analysis Year: 2015
Time Period: PM Peak

Intersection Code: 8
Analyst: JGT
Checked by: MJR
Date of Completion: 8/28/2012

Count Source: ATDS - 6/8/2010 Count
2015 to 2010 Factor: 0.7143

Notes	Southbound						Westbound						Northbound						Eastbound						
	Enter	Exit	Total				Enter	Exit					Enter	Exit					Enter	Exit					
2008 Calibration Year	81	52	133				283	323	606				1	1	2				322	283	605				
2015 Baseline Forecast Year	73	58	131				77	75	152				1	1	2				76	77	153				
Fratar Approximation Factor			1.00			FLAG			1.00			FLAG			1.00			FLAG			1.00			FLAG	
	North Approach						East Approach						South Approach						West Approach						
	Left	Thru	Right	In	Out	Total	Left	Thru	Right	In	Out	Total	Left	Thru	Right	In	Out	Total	Left	Thru	Right	In	Out	Total	
2010 Existing Conditions	2	87	0	89	335	424	54	0	1	55	100	155	0	334	98	432	141	573	0	0	0	0	0	0	**576**
2015 Baseline Year	0	85	0	85	335	420	55	0	0	55	100	155	0	335	100	435	140	575	0	0	0	0	0	0	**575**
Barbee Mills		4												1											**5**
Hawks Landing		3												5											**8**
Pipeline Projects-Subtotal	0	7	0	7	6	13	0	0	0	0	0	0	0	6	0	6	7	13	0	0	0	0	0	0	**13**
2015 Adjusted Baseline with Pipeline	**0**	**90**	**0**	**90**	**340**	**430**	**55**	**0**	**0**	**55**	**100**	**155**	**0**	**340**	**100**	**440**	**145**	**585**	**0**	**0**	**0**	**0**	**0**	**0**	**585**
Passby Distribution				**0%**	**0%**	**0%**				**0%**	**0%**	**0%**				**0%**	**0%**	**0%**				**0%**	**0%**	**0%**	**0**
Passby Traffic Volumes				**0**	**0**	**0**				**0**	**0**	**0**				**0**	**0**	**0**				**0**	**0**	**0**	**0**
Project Trip Distribution		14%		**14%**	**14%**	**28%**				**0%**	**0%**	**0%**		14%		**14%**	**14%**	**28%**				**0%**	**0%**	**0%**	**0**
Project Traffic Volumes		60		**60**	**60**	**120**				**0**	**0**	**0**		60		**60**	**60**	**120**				**0**	**0**	**0**	**120**
2015 with Full Buildout	**0**	**150**	**0**	**150**	**400**	**550**	**55**	**0**	**0**	**55**	**100**	**155**	**0**	**400**	**100**	**500**	**205**	**705**	**0**	**0**	**0**	**0**	**0**	**0**	**705**

Quendall Terminals

2015 AM Peak Hour Traffic Volume Forecasts

With RTID I-405 Improvements

Intersection: Lake Washington Blvd / Garden Ave N / Park Ave N
Scenario: Master Use Plan
Analysis Year: 2015
Time Period: PM Peak

Intersection Code: 9
Analyst: JGT
Checked by: MJR
Date of Completion: 8/28/2012

Count Source: ATDS - 6/8/2010 Count
2015 to 2010 Factor: 0.7143

Notes	Southbound						Westbound						Northbound						Eastbound						
	Enter	Exit	Total				Enter	Exit					Enter	Exit					Enter	Exit					
2008 Calibration Year	710	683	1,393				1,291	1,726	3,017				329	209	538				1,562	1,274	2,836				
2015 Baseline Forecast Year	882	567	1,449				1,520	2,616	4,136				704	291	995				1,744	1,375	3,119				
Fratar Approximation Factor			**1.03**						**1.32**						**1.73**						**1.09**				
	North Approach						East Approach						South Approach						West Approach						
	Left	Thru	Right	In	Out	Total	Left	Thru	Right	In	Out	Total	Left	Thru	Right	In	Out	Total	Left	Thru	Right	In	Out	Total	
2010 Existing Conditions	98	15	204	317	457	774	208	718	90	1,016	505	1,521	12	88	55	155	231	386	279	352	8	639	934	1,573	**2,127**
2015 Baseline Year	125	20	185	330	480	810	385	850	105	1,340	680	2,020	20	130	115	265	415	680	245	440	10	695	1,055	1,750	**2,630**
Barbee Mills	1	1	2																1						**5**
Hawks Landing	1	1	1						1					1					3						**8**
Pipeline Projects-Subtotal	2	2	3	7	6	13	0	0	1	1	2	3	0	1	0	1	2	3	4	0	0	4	3	7	**13**
2015 Adjusted Baseline with Pipeline	**125**	**20**	**190**	**335**	**485**	**820**	**385**	**850**	**105**	**1,340**	**680**	**2,020**	**20**	**130**	**115**	**265**	**415**	**680**	**250**	**440**	**10**	**700**	**1,060**	**1,760**	**2,640**
Passby Distribution				**0%**	**0%**	**0%**				**0%**	**0%**	**0%**				**0%**	**0%**	**0%**				**0%**	**0%**	**0%**	**0**
Passby Traffic Volumes				**0**	**0**	**0**				**0**	**0**	**0**				**0**	**0**	**0**				**0**	**0**	**0**	**0**
Project Trip Distribution	2%	2%	10%	**14%**	**14%**	**28%**			2%	**2%**	**2%**	**4%**		2%		**2%**	**2%**	**4%**	10%			**10%**	**10%**	**20%**	**0**
Project Traffic Volumes	10	10	40	**60**	**65**	**125**			10	**10**	**10**	**20**		10		**10**	**10**	**20**	45			**45**	**40**	**85**	**125**
2015 with Full Buildout	**135**	**30**	**230**	**395**	**550**	**945**	**385**	**850**	**115**	**1,350**	**690**	**2,040**	**20**	**140**	**115**	**275**	**425**	**700**	**295**	**440**	**10**	**745**	**1,100**	**1,845**	**2,765**

Quendall Terminals
2015 PM Peak Hour Traffic Volume Forecasts
With RTID I-405 Improvements

	Enter	Exit	Total
Quendall Project Vols	442	509	951
Quendall Passby Vols	28	21	49

Alternative 1 (incudes 10% increase in apartment trips)

Intersection: I-405 NB Ramps / Lake Washington Blvd
Scenario: Master Use Plan
Analysis Year: 2015
Time Period: PM Peak
Intersection Code: 1
Analyst: JGT
Checked by: MJR
Date of Completion: 8/28/2012
Count Source: TIA
2015 to 2009 Factor: 0.8571

Notes	Southbound						Westbound						Northbound						Eastbound						
	Enter	Exit	Total				Enter	Exit					Enter	Exit					Enter	Exit					
2008 Calibration Year	625	485	1,110				114	126	240				420	161	581				308	695	1,003				
2015 Baseline Forecast Year	550	587	1,137				137	253	390				683	134	817				160	558	718				
Fratar Approximation Factor			1.02						1.54						1.35						1.00			FLAG	
	North Approach						East Approach						South Approach						West Approach						
	Left	Thru	Right	In	Out	Total	Left	Thru	Right	In	Out	Total	Left	Thru	Right	In	Out	Total	Left	Thru	Right	In	Out	Total	
2009 Existing Conditions	50	25	280	355	350	705	75	150	65	290	360	650	15	230	145	390	160	550	55	165	60	280	445	725	**1,315**
2015 Baseline Year	0	0	0	0	225	225	0	450	175	625	745	1,370	15	0	515	530	0	530	50	230	0	280	465	745	**1,435**
Barbee Mills			0					15					1						3	13	0				**32**
Kennydale Apartments								22	18						34					30					
Hawks Landing			0					4					26						15	3	0				**48**
Pipeline Projects-Subtotal	0	0	0	0	36	36	0	41	18	59	80	139	27	0	34	61	0	61	18	46	0	64	68	132	**184**
2015 Adjusted Baseline with Pipeline	**0**	**0**	**0**	**0**	**265**	**265**	**0**	**490**	**195**	**685**	**825**	**1,510**	**40**	**0**	**550**	**590**	**0**	**590**	**70**	**275**	**0**	**345**	**530**	**875**	**1,620**
Passby Distribution				**0%**	**0%**	**0%**				**0%**	**0%**	**0%**				**0%**	**0%**	**0%**				**0%**	**0%**	**0%**	**0**
Passby Traffic Volumes				**0**	**0**	**0**				**0**	**0**	**0**				**0**	**0**	**0**				**0**	**0**	**0**	**0**
Project Trip Distribution			0%	**0%**	**45%**	**45%**		10%		**10%**	**10%**	**20%**	30%			**30%**	**0%**	**30%**	45%	10%	0%	**55%**	**40%**	**95%**	**1**
Project Traffic Volumes			0	**0**	**230**	**230**		45		**45**	**50**	**95**	135			**135**	**0**	**135**	230	50	0	**280**	**180**	**460**	**460**
2015 with Full Buildout	**0**	**0**	**0**	**0**	**495**	**495**	**0**	**535**	**195**	**730**	**875**	**1,605**	**175**	**0**	**550**	**725**	**0**	**725**	**300**	**325**	**0**	**625**	**710**	**1,335**	**2,080**

Intersection: I-405 SB Ramps / Lake Washington Blvd
Scenario: Master Use Plan
Analysis Year: 2015
Time Period: PM Peak
Intersection Code: 2
Analyst: JGT
Checked by: MJR
Date of Completion: 8/28/2012
Count Source: TIA
2015 to 2009 Factor: 0.8571

Notes	Southbound						Westbound						Northbound						Eastbound						
	Enter	Exit	Total				Enter	Exit					Enter	Exit					Enter	Exit					
2008 Calibration Year	502	0	502				695	308	1,003				0	607	607				293	575	868				
2015 Baseline Forecast Year	279	0	279				558	160	718				0	538	538				30	169	199				
Fratar Approximation Factor			1.00			FLAG			1.00			FLAG			1.00			FLAG			1.00			FLAG	
	North Approach						East Approach						South Approach						West Approach						
	Left	Thru	Right	In	Out	Total	Left	Thru	Right	In	Out	Total	Left	Thru	Right	In	Out	Total	Left	Thru	Right	In	Out	Total	
2009 Existing Conditions	130	5	250	385	0	385	215	225	0	440	280	720	0	0	0	0	345	345	0	150	125	275	475	750	**1,100**
2015 Baseline Year	130	5	250	385	0	385	215	225	0	440	280	720	0	0	0	0	345	345	0	150	125	275	475	750	**1,100**
Barbee Mills			22					16												16	2				**56**
Kennydale Apartments	30						22																		
Hawks Landing			16					30												18	23				**87**
Pipeline Projects-Subtotal	30	0	38	68	0	68	22	46	0	68	64	132	0	0	0	0	47	47	0	34	25	59	84	143	**195**
2015 Adjusted Baseline with Pipeline	**160**	**5**	**290**	**455**	**0**	**455**	**235**	**270**	**0**	**505**	**345**	**850**	**0**	**0**	**0**	**0**	**390**	**390**	**0**	**185**	**150**	**335**	**560**	**895**	**1,295**
Passby Distribution				**0%**	**0%**	**0%**				**0%**	**0%**	**0%**				**0%**	**0%**	**0%**				**0%**	**0%**	**0%**	**0**
Passby Traffic Volumes				**0**	**0**	**0**				**0**	**0**	**0**				**0**	**0**	**0**				**0**	**0**	**0**	**0**
Project Trip Distribution			45%	**45%**	**0%**	**45%**		40%		**40%**	**55%**	**95%**				**0%**	**30%**	**30%**		55%	30%	**85%**	**85%**	**170%**	**2**
Project Traffic Volumes			200	**200**	**0**	**200**		175		**175**	**280**	**455**				**0**	**155**	**155**		280	155	**435**	**375**	**810**	**810**
2015 with Full Buildout	**160**	**5**	**490**	**655**	**0**	**655**	**235**	**445**	**0**	**680**	**625**	**1,305**	**0**	**0**	**0**	**0**	**545**	**545**	**0**	**465**	**305**	**770**	**935**	**1,705**	**2,105**

Quendall Terminals
2015 PM Peak Hour Traffic Volume Forecasts
With RTID I-405 Improvements

Intersection: Ripley Lane / Lake Washington Blvd
Scenario: Master Use Plan
Analysis Year: 2015
Time Period: PM Peak
Intersection Code: 3
Analyst: MJR
Checked by: MJR
Date of Completion: 8/28/12
Count Source: TIA
2015 to 2009 Factor: 0.4286

Notes	Southbound						Westbound						Northbound						Eastbound						
	Enter	Exit	Total				Enter	Exit					Enter	Exit					Enter	Exit					
2008 Calibration Year	1	1	2				575	293	868				1	1	2				287	574	861				
2015 Baseline Forecast Year	1	1	2				169	30	199				1	1	2				30	169	199				
Fratar Approximation Factor			1.00			FLAG			1.00			FLAG			1.00			FLAG			1.00			FLAG	
	North Approach						East Approach						South Approach						West Approach						
	Left	Thru	Right	In	Out	Total	Left	Thru	Right	In	Out	Total	Left	Thru	Right	In	Out	Total	Left	Thru	Right	In	Out	Total	
2012 Existing Conditions	101	0	28	129	45	174	0	409	38	447	282	729	0	0	1	1	1	2	7	180	1	188	437	625	765
2015 Baseline Year	100	0	30	130	45	175	0	410	40	450	280	730	0	0	0	0	0	0	5	180	0	185	440	625	765
Barbee Mills	14		3					8	30										6	4					65
Hawks Landing			3					46							5				2	36					92
Pipeline Projects-Subtotal	14	0	6	20	38	58	0	54	30	84	59	143	0	0	5	5	0	5	8	40	0	48	60	108	157
2015 Adjusted Baseline with Pipeline	**115**	**0**	**35**	**150**	**85**	**235**	**0**	**465**	**70**	**535**	**340**	**875**	**0**	**0**	**5**	**5**	**0**	**5**	**15**	**220**	**0**	**235**	**500**	**735**	**925**
Passby Distribution				**0%**	**0%**	**0%**				**0%**	**0%**	**0%**				**0%**	**0%**	**0%**				**0%**	**0%**	**0%**	**0**
Passby Traffic Volumes				**0**	**0**	**0**				**0**	**0**	**0**				**0**	**0**	**0**				**0**	**0**	**0**	**0**
Project Trip Distribution	75%			**75%**	**75%**	**150%**		10%	75%	**85%**	**85%**	**170%**				**0%**	**0%**	**0%**	0%	10%		**10%**	**10%**	**20%**	**2**
Project Traffic Volumes	380			**380**	**330**	**710**		45	330	**375**	**430**	**805**				**0**	**0**	**0**	0	50		**50**	**45**	**95**	**805**
2015 with Full Buildout	**495**	**0**	**35**	**530**	**415**	**945**	**0**	**510**	**400**	**910**	**770**	**1,680**	**0**	**0**	**5**	**5**	**0**	**5**	**15**	**270**	**0**	**285**	**545**	**830**	**1,730**

Intersection: Lake Washington Blvd / Barbee Mills Access
Scenario: Master Use Plan
Analysis Year: 2015
Time Period: PM Peak
Intersection Code: 4
Analyst: JGT
Checked by: MJR
Date of Completion: 8/28/2012
Count Source: TIA
2015 to 2009 Factor: 0.8571

Notes	Southbound						Westbound						Northbound						Eastbound						
	Enter	Exit	Total				Enter	Exit					Enter	Exit					Enter	Exit					
2008 Calibration Year	1	1	2				574	287	861				1	1	2				287	574	861				
2015 Baseline Forecast Year	1	1	2				169	30	199				1	1	2				30	169	199				
Fratar Approximation Factor			1.00			FLAG			1.00			FLAG			1.00			FLAG			1.00			FLAG	
	North Approach						East Approach						South Approach						West Approach						
	Left	Thru	Right	In	Out	Total	Left	Thru	Right	In	Out	Total	Left	Thru	Right	In	Out	Total	Left	Thru	Right	In	Out	Total	
2009 Existing Conditions	0	0	0	0	0	0	0	437	0	437	188	625	0	0	0	0	0	0	0	188	0	188	437	625	626
2015 Baseline Year	0	0	0	0	0	0	0	435	0	435	190	625	0	0	0	0	0	0	0	190	0	190	435	625	625
Barbee Mills	4		1					3	8										1	6					23
Hawks Landing								49												38					87
Pipeline Projects-Subtotal	4	0	1	5	9	14	0	52	8	60	48	108	0	0	0	0	0	0	1	44	0	45	53	98	110
2015 Adjusted Baseline with Pipeline	**5**	**0**	**0**	**5**	**10**	**15**	**0**	**485**	**10**	**495**	**240**	**735**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**235**	**0**	**235**	**485**	**720**	**735**
Passby Distribution	25%		75%	**100%**	**100%**	**200%**			75%	**75%**	**25%**	**100%**				**0%**	**0%**	**0%**	25%			**25%**	**75%**	**100%**	**2**
Passby Traffic Volumes	5		15	**20**	**25**	**45**		-20	20	**0**	**0**	**0**				**0**	**0**	**0**	5	-5		**0**	**-5**	**-5**	**20**
Project Trip Distribution	10%		15%	**25%**	**25%**	**50%**			10%	**10%**	**10%**	**20%**				**0%**	**0%**	**0%**	15%			**15%**	**15%**	**30%**	**1**
Project Traffic Volumes	50		75	**125**	**110**	**235**			45	**45**	**50**	**95**				**0**	**0**	**0**	65			**65**	**75**	**140**	**235**
2015 with Full Buildout	**60**	**0**	**90**	**150**	**145**	**295**	**0**	**465**	**75**	**540**	**290**	**830**	**0**	**0**	**0**	**0**	**0**	**0**	**70**	**230**	**0**	**300**	**555**	**855**	**990**

Quendall Terminals
2015 PM Peak Hour Traffic Volume Forecasts
With RTID I-405 Improvements

Intersection: Lake Washington Blvd / Hawks Landing Access | **Intersection Code:** 5 | **Count Source:** TIA
Scenario: Master Use Plan | **Analyst:** JGT | **2015 to 2009 Factor:** 0.8571
Analysis Year: 2015 | **Checked by:** MJR
Time Period: PM Peak | **Date of Completion:** 8/28/2012

Notes	Southbound						Westbound						Northbound						Eastbound						
	Enter	Exit	Total				Enter	Exit					Enter	Exit					Enter	Exit					
2008 Calibration Year	1	1	2				574	287	861				1	1	2				287	574	861				
2015 Baseline Forecast Year	1	1	2				169	30	199				1	1	2				30	169	199				
Fratar Approximation Factor			**1.00**			**FLAG**			**1.00**			**FLAG**			**1.00**			**FLAG**			**1.00**			**FLAG**	
	North Approach						East Approach						South Approach						West Approach						
	Left	Thru	Right	In	Out	Total	Left	Thru	Right	In	Out	Total	Left	Thru	Right	In	Out	Total	Left	Thru	Right	In	Out	Total	
2009 Existing Conditions	0	0	0	0	0	0	0	437	0	437	188	625	0	0	0	0	0	0	0	188	0	188	437	625	**626**
2015 Baseline Year	0	0	0	0	0	0	0	435	0	435	190	625	0	0	0	0	0	0	0	190	0	190	435	625	**625**
Barbee Mills								4												7					**11**
Hawks Landing							49						5		38						5				**97**
Pipeline Projects-Subtotal	0	0	0	0	0	0	49	4	0	53	45	98	5	0	38	43	54	97	0	7	5	12	9	21	**108**
2015 Adjusted Baseline with Pipeline	**0**	**0**	**0**	**0**	**0**	**0**	**50**	**440**	**0**	**490**	**235**	**725**	**5**	**0**	**40**	**45**	**55**	**100**	**0**	**195**	**5**	**200**	**445**	**645**	**735**
Passby Distribution				**0%**	**0%**	**0%**				**0%**	**0%**	**0%**				**0%**	**0%**	**0%**				**0%**	**0%**	**0%**	**0**
Passby Traffic Volumes				**0**	**0**	**0**				**0**	**0**	**0**				**0**	**0**	**0**				**0**	**0**	**0**	**0**
Project Trip Distribution				**0%**	**0%**	**0%**		15%		**15%**	**15%**	**30%**				**0%**	**0%**	**0%**		15%		**15%**	**15%**	**30%**	**0**
Project Traffic Volumes				**0**	**0**	**0**		75		**75**	**65**	**140**				**0**	**0**	**0**		65		**65**	**75**	**140**	**140**
2015 with Full Buildout	**0**	**0**	**0**	**0**	**0**	**0**	**50**	**515**	**0**	**565**	**300**	**865**	**5**	**0**	**40**	**45**	**55**	**100**	**0**	**260**	**5**	**265**	**520**	**785**	**875**

Intersection: N 36th St / Lake Washington Blvd | **Intersection Code:** 6 | **Count Source:** ATDS - 6/8/2010 Count
Scenario: Master Use Plan | **Analyst:** JGT | **2015 to 2010 Factor:** 0.7143
Analysis Year: 2015 | **Checked by:** MJR
Time Period: PM Peak | **Date of Completion:** 8/28/2012

Notes	Southbound						Westbound						Northbound						Eastbound						
	Enter	Exit	Total				Enter	Exit					Enter	Exit					Enter	Exit					
2008 Calibration Year	1	1	2				324	217	541				71	250	321				223	317	540				
2015 Baseline Forecast Year	1	1	2				130	16	146				13	39	52				23	103	126				
Fratar Approximation Factor			**1.00**			**FLAG**			**1.00**			**FLAG**			**1.00**			**FLAG**			**1.00**			**FLAG**	
	North Approach						East Approach						South Approach						West Approach						
	Left	Thru	Right	In	Out	Total	Left	Thru	Right	In	Out	Total	Left	Thru	Right	In	Out	Total	Left	Thru	Right	In	Out	Total	
2010 Existing Conditions	0	0	0	0	0	0	83	280	0	363	132	495	4	0	25	29	90	119	0	107	7	114	284	398	**506**
2015 Baseline Year	0	0	0	0	0	0	85	280	0	365	130	495	5	0	25	30	90	120	0	105	5	110	285	395	**505**
Barbee Mills							1	3							2					5					**11**
Hawks Landing							1	4							1					4					**10**
Pipeline Projects-Subtotal	0	0	0	0	0	0	2	7	0	9	12	21	0	0	3	3	2	5	0	9	0	9	7	16	**21**
2015 Adjusted Baseline with Pipeline	**0**	**0**	**0**	**0**	**0**	**0**	**85**	**285**	**0**	**370**	**145**	**515**	**5**	**0**	**30**	**35**	**90**	**125**	**0**	**115**	**5**	**120**	**290**	**410**	**525**
Passby Distribution				**0%**	**0%**	**0%**				**0%**	**0%**	**0%**				**0%**	**0%**	**0%**				**0%**	**0%**	**0%**	**0**
Passby Traffic Volumes				**0**	**0**	**0**				**0**	**0**	**0**				**0**	**0**	**0**				**0**	**0**	**0**	**0**
Project Trip Distribution				**0%**	**0%**	**0%**	1%	14%		**15%**	**16%**	**31%**			2%	**2%**	**1%**	**3%**		14%		**14%**	**14%**	**28%**	**0**
Project Traffic Volumes				**0**	**0**	**0**	5	70		**75**	**70**	**145**			10	**10**	**5**	**15**		60		**60**	**70**	**130**	**145**
2015 with Full Buildout	**0**	**0**	**0**	**0**	**0**	**0**	**90**	**355**	**0**	**445**	**215**	**660**	**5**	**0**	**40**	**45**	**95**	**140**	**0**	**175**	**5**	**180**	**360**	**540**	**670**

Quendall Terminals
2015 PM Peak Hour Traffic Volume Forecasts
With RTID I-405 Improvements

Intersection: N 30th St / Burnett Ave
Scenario: Master Use Plan
Analysis Year: 2015
Time Period: PM Peak
Intersection Code: 7
Analyst: JGT
Checked by: MJR
Date of Completion: 8/28/2012
Count Source: ATDS - 6/8/2010 Count
2015 to 2010 Factor: 0.7143

Notes	Southbound						Westbound						Northbound						Eastbound						
	Enter	Exit	Total				Enter	Exit					Enter	Exit					Enter	Exit					
2008 Calibration Year	216	114	330				148	226	374				52	81	133				1	1	2				
2015 Baseline Forecast Year	90	76	166				146	144	290				58	73	131				1	1	2				
Fratar Approximation Factor			**1.00**			**FLAG**			**1.00**			**FLAG**			**1.00**			**FLAG**			**1.00**			**FLAG**	
	North Approach						East Approach						South Approach						West Approach						
	Left	Thru	Right	In	Out	Total	Left	Thru	Right	In	Out	Total	Left	Thru	Right	In	Out	Total	Left	Thru	Right	In	Out	Total	
2010 Existing Conditions	44	55	2	101	51	152	64	28	13	105	118	223	2	38	61	101	120	221	0	13	1	14	32	46	**321**
2015 Baseline Year	45	55	0	100	55	155	65	30	15	110	120	230	0	40	60	100	120	220	0	15	0	15	30	45	**325**
Barbee Mills	1								2																**3**
Hawks Landing	1								1																**2**
Pipeline Projects-Subtotal	2	0	0	2	3	5	0	0	3	3	2	5	0	0	0	0	0	0	0	0	0	0	0	0	**5**
2015 Adjusted Baseline with Pipeline	**45**	**55**	**0**	**100**	**60**	**160**	**65**	**30**	**20**	**115**	**120**	**235**	**0**	**40**	**60**	**100**	**120**	**220**	**0**	**15**	**0**	**15**	**30**	**45**	**330**
Passby Distribution				**0%**	**0%**	**0%**				**0%**	**0%**	**0%**				**0%**	**0%**	**0%**				**0%**	**0%**	**0%**	**0**
Passby Traffic Volumes				**0**	**0**	**0**				**0**	**0**	**0**				**0**	**0**	**0**				**0**	**0**	**0**	**0**
Project Trip Distribution	1%			**1%**	**1%**	**2%**			1%	**1%**	**1%**	**2%**				**0%**	**0%**	**0%**				**0%**	**0%**	**0%**	**0**
Project Traffic Volumes	5			**5**	**5**	**10**			5	**5**	**5**	**10**				**0**	**0**	**0**				**0**	**0**	**0**	**10**
2015 with Full Buildout	**50**	**55**	**0**	**105**	**65**	**170**	**65**	**30**	**25**	**120**	**125**	**245**	**0**	**40**	**60**	**100**	**120**	**220**	**0**	**15**	**0**	**15**	**30**	**45**	**340**

Intersection: Lake Washington Blvd / Burnett Ave
Scenario: Master Use Plan
Analysis Year: 2015
Time Period: PM Peak
Intersection Code: 8
Analyst: JGT
Checked by: MJR
Date of Completion: 8/28/2012
Count Source: ATDS - 6/8/2010 Count
2015 to 2010 Factor: 0.7143

Notes	Southbound						Westbound						Northbound						Eastbound						
	Enter	Exit	Total				Enter	Exit					Enter	Exit					Enter	Exit					
2008 Calibration Year	81	52	133				283	323	606				1	1	2				322	283	605				
2015 Baseline Forecast Year	73	58	131				77	75	152				1	1	2				76	77	153				
Fratar Approximation Factor			**1.00**			**FLAG**			**1.00**			**FLAG**			**1.00**			**FLAG**			**1.00**			**FLAG**	
	North Approach						East Approach						South Approach						West Approach						
	Left	Thru	Right	In	Out	Total	Left	Thru	Right	In	Out	Total	Left	Thru	Right	In	Out	Total	Left	Thru	Right	In	Out	Total	
2010 Existing Conditions	92	0	3	95	113	208	0	104	111	215	381	596	0	0	0	0	0	0	2	289	0	291	107	398	**601**
2015 Baseline Year	90	0	5	95	110	205	0	105	110	215	380	595	0	0	0	0	0	0	0	290	0	290	110	400	**600**
Barbee Mills								5												3					**8**
Hawks Landing								4												4					**8**
Pipeline Projects-Subtotal	0	0	0	0	0	0	0	9	0	9	7	16	0	0	0	0	0	0	0	7	0	7	9	16	**16**
2015 Adjusted Baseline with Pipeline	**90**	**0**	**5**	**95**	**110**	**205**	**0**	**115**	**110**	**225**	**385**	**610**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**295**	**0**	**295**	**120**	**415**	**615**
Passby Distribution				**0%**	**0%**	**0%**				**0%**	**0%**	**0%**				**0%**	**0%**	**0%**				**0%**	**0%**	**0%**	**0**
Passby Traffic Volumes				**0**	**0**	**0**				**0**	**0**	**0**				**0**	**0**	**0**				**0**	**0**	**0**	**0**
Project Trip Distribution				**0%**	**0%**	**0%**		14%		**14%**	**14%**	**28%**				**0%**	**0%**	**0%**		14%		**14%**	**14%**	**28%**	**0**
Project Traffic Volumes				**0**	**0**	**0**		60		**60**	**70**	**130**				**0**	**0**	**0**		70		**70**	**60**	**130**	**130**
2015 with Full Buildout	**90**	**0**	**5**	**95**	**110**	**205**	**0**	**175**	**110**	**285**	**455**	**740**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**365**	**0**	**365**	**180**	**545**	**745**

Quendall Terminals
2015 PM Peak Hour Traffic Volume Forecasts
With RTID I-405 Improvements

Intersection: Lake Washington Blvd / Garden Ave N / Park Ave N **Intersection Code:** 9 **Count Source:** ATDS - 6/8/2010 Count
Scenario: Master Use Plan **Analyst:** JGT **2015 to 2010 Factor:** 0.7143
Analysis Year: 2015 **Checked by:** MJR
Time Period: PM Peak **Date of Completion:** #######

Notes	Southbound						Westbound						Northbound						Eastbound						
	Enter	Exit	Total				Enter	Exit					Enter	Exit					Enter	Exit					
2008 Calibration Year	710	683	1,393				1,291	1,726	3,017				329	209	538				1,562	1,274	2,836				
2015 Baseline Forecast Year	882	567	1,449				1,520	2,616	4,136				704	291	995				1,744	1,375	3,119				
Fratar Approximation Factor			**1.03**						**1.32**						**1.36**						**1.09**				
	North Approach						East Approach						South Approach						West Approach						
	Left	Thru	Right	In	Out	Total	Left	Thru	Right	In	Out	Total	Left	Thru	Right	In	Out	Total	Left	Thru	Right	In	Out	Total	
2010 Existing Conditions	90	83	292	465	514	979	295	646	132	1,073	1,345	2,418	9	85	497	591	404	995	297	758	26	1,081	947	2,028	**3,210**
2015 Baseline Year	125	95	260	480	530	1,010	445	785	185	1,415	1,730	3,145	10	90	710	810	565	1,375	255	895	25	1,175	1,055	2,230	**3,880**
Barbee Mills	1	1	1						1					1					3						**8**
Hawks Landing	1	1	2						1					1					2						**8**
Pipeline Projects-Subtotal	2	2	3	7	9	16	0	0	2	2	2	4	0	2	0	2	2	4	5	0	0	5	3	8	**16**
2015 Adjusted Baseline with Pipeline	**125**	**95**	**265**	**485**	**535**	**1,020**	**445**	**785**	**185**	**1,415**	**1,730**	**3,145**	**10**	**90**	**710**	**810**	**565**	**1,375**	**260**	**895**	**25**	**1,180**	**1,060**	**2,240**	**3,890**
Passby Distribution				**0%**	**0%**	**0%**				**0%**	**0%**	**0%**				**0%**	**0%**	**0%**				**0%**	**0%**	**0%**	**0**
Passby Traffic Volumes				**0**	**0**	**0**				**0**	**0**	**0**				**0**	**0**	**0**				**0**	**0**	**0**	**0**
Project Trip Distribution	2%	2%	10%	**14%**	**14%**	**28%**			2%	**2%**	**2%**	**4%**		2%		**2%**	**2%**	**4%**	10%			**10%**	**10%**	**20%**	**0**
Project Traffic Volumes	10	10	50	**70**	**65**	**135**			10	**10**	**10**	**20**		10		**10**	**10**	**20**	45			**45**	**50**	**95**	**135**
2015 with Full Buildout	**135**	**105**	**315**	**555**	**600**	**1,155**	**445**	**785**	**195**	**1,425**	**1,740**	**3,165**	**10**	**100**	**710**	**820**	**575**	**1,395**	**305**	**895**	**25**	**1,225**	**1,110**	**2,335**	**4,025**

Appendix C

Parking Demand Analysis

Parking Demand Forecasts - Quendall Terminals

Alternative 1

Weekday Peak Parking Demand (ITE Rates)

Forecast Weekday Peak Parking Demand (ITE Rates)

LU	Size	ITE Parking Rate[1]	Demand
Office	210,000	3.44	722
Restaurant (High-Turn Over Sit-Down)	9,000	16.1	145
Mid-Rise Apt	800	1.46	1,168
Retail	21,600	3.35	72
			2,107
Proposed Supply			2,171
Surplus or (Deficit)			64
Shared Analysis - Available space from residential units is assumed at 30% of peak evening demand per ULI, Shared Parking, 2nd Edition, 2005.			*350*
Surplus or (Deficit) with Shared Parking Consideration			414

Weekend Peak Parking Demand (ITE Rates)

Forecast Weekend Peak Parking Demand (ITE Rates)

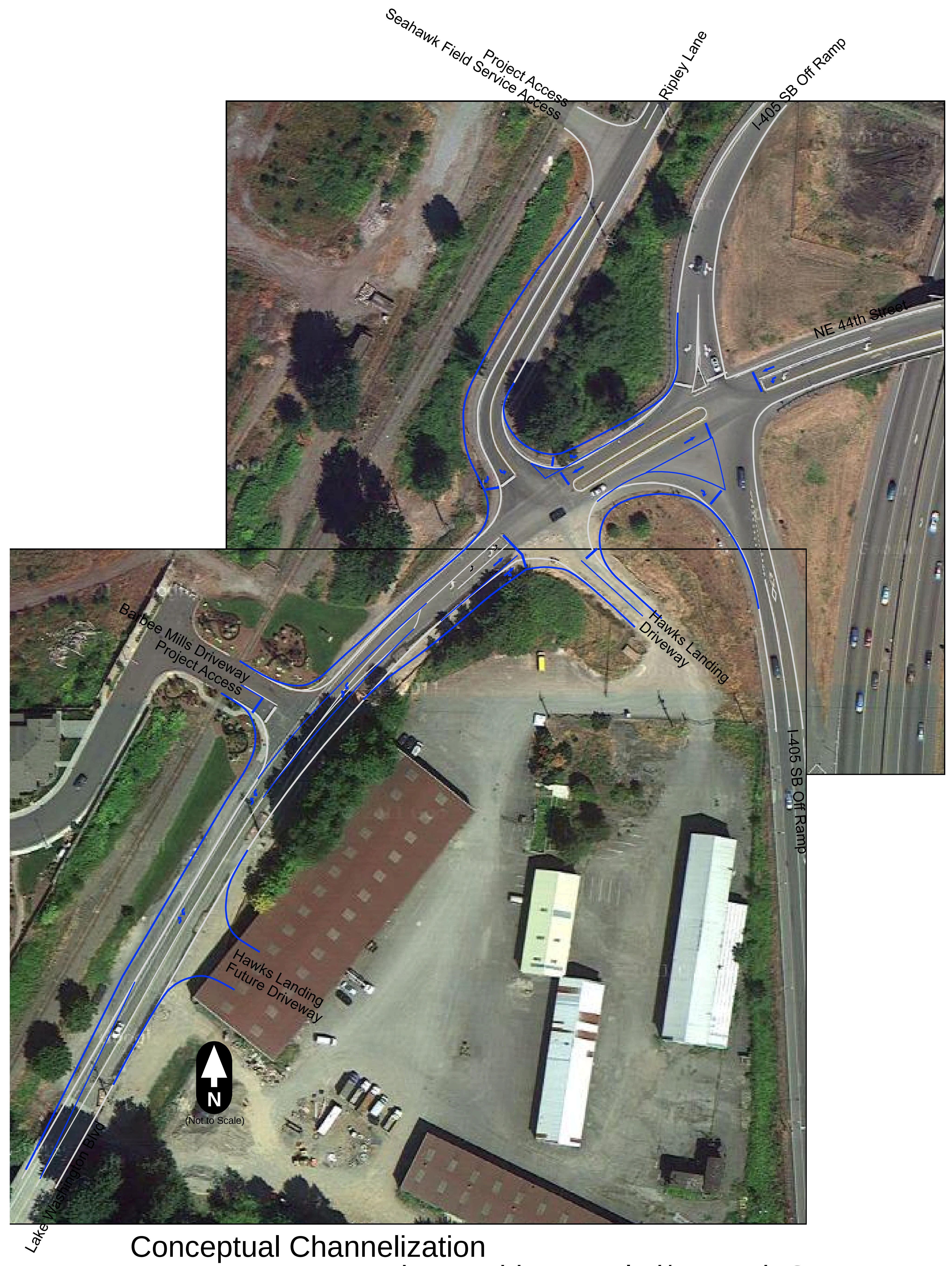
LU	Size	ITE Parking Rate[1]	Demand
Office[2]	210,000	0.25	53
Restaurant (High-Turn Over Sit-Down)	9,000	20.6	185
Mid-Rise Apt	800	1.17	936
Retail	21,600	3.56	77
			1,251
Proposed Supply			2,171
Surplus or (Deficit)			920
Shared Analysis			*281*
Surplus or (Deficit) with Shared Parking Consideration			1,201

1 - Parking Generation, 3rd Edition, ITE, 2004.

2 - For Office uses on a weekend, no surveys were reported by ITE. However, some level of parking demand occurs at office uses on weekend periods, albeit on a signficiantly reduced level. As such, a nominal demand for parking was assumed for these uses on a weekend period that would coincide with other peak commercial and residential uses.

Appendix D

Lake Washington Blvd./NE 44th Street Conceptual Channelization Exhibit



Conceptual Channelization
Improvements on Lake Washington Blvd/NE 44th Street
Approach to I-405 Interchange
Quendall Terminals Project

APPENDIX F

CULTURAL RESOURCES REPORT

Cultural Resource Consultants, Inc.

TECHNICAL MEMO 1204I-2

DATE: June 28, 2012

TO: Gretchen Brunner
EA/Blumen

FROM: Glenn D. Hartmann, Principal Investigator

RE: Cultural Resources Assessment for the Quendall Terminals Redevelopment Project, Renton, King County, WA

The attached short report form constitutes our final report for the above referenced project. A small brick building, identified as the Quendall station house, and two dock/wharf remnants were recorded. Please contact our office should you have any questions about our findings and/or recommendations.

435 Ericksen Avenue NE, Suite 103
PO Box 10668, Bainbridge Island, WA 98110
Phone 206 855-9020 - info@crcwa.com

CULTURAL RESOURCES REPORT COVER SHEET

Author: Katherine M. Kelly

Title of Report: Cultural Resources Assessment for the Quendall Terminals Redevelopment Project, Renton, King County, WA

Date of Report: June 28, 2012

County (ies): King Sections: 29, 32 Township: 24 North Range: 05 East
Quad: Mercer Island Acres: 21.5 acres

CD Submitted? ☒ Yes ☐ No PDF of Report? ☒

Does this replace a draft? ☐ Yes ☒ No

Archaeological Sites/Isolates Found or Amended? ☒ Yes ☐ No

TCP(s) found? ☐ Yes ☒ No

Does this report fulfill a DAHP permit requirement? ☐ Yes # ☒ No

DAHP Archaeological Site #:

REPORT CHECK LIST

Report should contain the following items:

- Clear objectives and methods
- A summary of the results of the survey
- A report of where the survey records and data are stored
- A research design that:
  - Details survey objectives
  - Details specific methods
  - Details expected results
  - Details area surveyed including map(s) and legal locational information
  - Details how results will be incorporated into the planning process

Please submit reports unbound. Please be sure that any electronic version of a report submitted to DAHP has all of its figures, graphics, appendices, attachments, correspondence, cover sheet, etc., compiled into one single PDF file. Please check that all digital files display correctly when opened.

Management Summary

Cultural Resource Consultants, Inc. was contracted by EA/Blumen to conduct a review of pertinent environmental, archaeological, ethnographic, and historical information; and relevant correspondence between the project proponent, stakeholders and DAHP for the purposes of developing a monitoring plan for the proposed Quendall Terminals Redevelopment Project in Renton, King County, Washington. Archaeologists conducted a brief reconnaissance of the project area. Survey resulted in the identification of a previously unrecorded brick railroad station house and two remnant dock/wharf structures, which are not considered historically significant. Recommendations include focused and limited archaeological monitoring for the project; attached is a proposed monitoring plan and an inadvertent discovery protocol.

1. Administrative Data

Report Title: Cultural Resources Assessment for the Quendall Terminals Redevelopment Project, Renton, King County, WA

Author: Katherine M. Kelly

Report Date: June 28, 2012

Location: The project is located at 4350 Lake Washington Blvd in Renton, King County, Washington (Figure 1).

Legal Description: The project is located in Sections 29 and 32, Township 23 North, Range 05 East, Willamette Meridian.

USGS 7.5' Topographic Map (s): Mercer Island, WA (1994)

Total Area Involved: 21.5 acres

Objective (Research Design): This assessment was developed with the goal of ensuring that no cultural resources are disturbed during construction of the proposed project and to determine the potential for any, as yet, unrecorded cultural resources within the project area. CRC's work was intended, in part, to assist in addressing state regulations pertaining to the identification and protection of cultural resources (e.g., RCW 27.44, RCW 27.53), and compliance with Section 106 of NHPA. The Archaeological Sites and Resources Act (RCW 27.53) prohibits knowingly disturbing archaeological sites without a permit from the Washington Department of Archaeology and Historic Preservation (DAHP), and the Indian Graves and Records Act (RCW 27.44) prohibits knowingly disturbing Native American or historic graves. Under Section 106, agencies involved in a federal undertaking must take into account the undertaking's potential effects to historic properties (36 CFR 800.16(l)(1)).

This assessment utilized a research design that considered previous studies, the magnitude and nature of the undertaking, the nature and extent of potential effects on historic properties, and the likely nature and location of historic properties within the area of potential effects (APE), as well as other applicable laws, standards, and guidelines (per 36CFR800.4 (b)(1)).

Assessment methods included a of review of the 1997 cultural resources survey report for the project (Bowden et al. 1997), project plans, related reports, and other information, in order to estimate the potential for as yet unidentified cultural resources.

Project Background: The developer is proposing to construct a mixed-use development located at 4350 Lake Washington Blvd (Figure 2). The 21.5 acre project, located within the Shoreline High Intensity Overlay District, is zoned Commercial/Office/Residential. The applicants preferred alternative divides the project into seven lots, four of which would contain four- to six-story mixed-use buildings with residential units, retail, and restaurant space. For purposes of this assessment, the APE for this project is understood to be that of the mixed-use development project described above.

The Quendall Terminals site has received a Superfund designation from the U.S. Environmental Protection Agency (EPA) and will undergo cleanup/remediation prior to redevelopment, under the oversight of the EPA. Potential impacts associated with cleanup/remediation activities will be addressed through the separate EPA process.

Previously Unrecorded Cultural Resources Identified and Recorded: Yes [x] No [ ]
A previously unrecorded brick railroad station house and two remnant dock/wharf structures are within the project boundary.

2. Background Research

Background research conducted in June 2012.

Archival Sources Checked:

DAHP WISAARD	There are no previously recorded archaeological sites in the project area. The DAHP files check was conducted in June 2012.
Web Soil Survey	Soils mapped in the APE consist of Bellingham silt loam with 0 to 2 percent slopes and Norma sandy loam with 0 to 2 percent slopes. Bellingham silt loam is derived of alluvium and is located in depressions and drainage ways. Norma sandy loam is derived of alluvium and is located on floodplains (NRCS 2012).
Library	[x] Various historical, archaeological, and ethnographic references, multiple historical records (e.g., GLO maps), and in CRC's library.
Historical Society	[x] Northern Pacific Railway Historical Association Research Collection

Contextual Overview: As noted in Bowden et al. (1997), in the Statewide Archaeological Predictive Model, and in a letter from DAHP staff (Appendix) the proposed project is in an area with a high likelihood to contain intact archaeological deposits; however, the project area could not be adequately tested due to the presence of fill, impervious surfaces, and contaminated sediments.

The following summary is derived from Bowden et al. (1997) and the Draft Environmental Impact Statement (DEIS 2010). Information provided in the following section is from these two sources, unless otherwise indicated. This summary is intended to provide a framework for CRC's archaeological expectations for this project and a context for the proposed monitoring plan.

A. The geomorphology of the landform. The fill soils range from one to ten feet thick across the entire site and are thinnest along the southern and eastern boundaries of the Main Property and thickest in the northwest corner of the Main Property. Shallow alluvium (interbedded sand, clay, and peat) associated with the May Creek delta lies under this fill, to depths of 25 to 40 feet; the thinner portion of this is at the southeastern portion of the project. Deeper alluvium associated with an older May Creek channel occurs from depths of 30 and 40 feet to 127 and 135 feet; this deposit is underlain by lacustrine sediments associated with Lake Washington.

The Lake Washington shoreline has fluctuated over the past 7,000 years (Karlin and Abella 1992, 1993; Major 2008) as a result of large earthquakes and associated landslides. A large area, which includes the project, was uplifted approximately 1,000 years ago during an earthquake. Bowden et al. (1997) posited that intact, pre-earthquake cultural deposits, protected from erosion by the cap of landslide debris and silts, might lie inland of the modern shoreline.

Historic maps show that the project area was either inundated or subject to periodic flooding and scouring prior to the construction of the Lake Washington Ship Canal and also subject to the erosional effects of the meandering southward of the May Creek channel (GLO 1865; Metsker 1927, 1936; Kroll 1958; USGS 1973) (Figure 3). The 1864 - 1920 May Creek meanders would have cut through the project's City Water Line Easement; south of the Quendall Pond; and just east and south of the South Detention Pond, west of a marsh indicated on the 1920 maps (see Figure 3).

Historic newspaper accounts describe archaeological remains exposed at the mouth of May Creek in 1917 following the post-Ship Canal drop in lake levels (Carter 1917). In 1917, the May Creek channel would have cut through the southern portion of the project; the creek delta would have been located south of the South Detention Pond, approximately 35 meters east of the modern shoreline.

B. The cultural context of the landform. T.T. Waterman (2001) recorded numerous named geographic features near the project area; these include descriptive names for geographic features, resource procurement sites, village (or habitation sites), and names associated with mystical events. May Creek is recorded as *šbal't* ("a place where things are dried") which referred to a fish processing station. Until ca. 1855, the *Subaltuabs*, a Coast Salish group, inhabited this village, which consisted of two to three houses; however, no houses are noted in the location on the 1865 survey maps (Paige 1856; Waterman 1922; Duwamish et al. 1933; Lane 1975; Ruby and Brown 1992). CRC contacted local tribes for additional information about the project area (see Attachments), which did not result in any new data.

The area was later named "May Creek" for an early homesteader (Meany 1923). The project site was part of a homestead patented to Jeremiah Sullivan in 1874, later deeded to James Colman in

1876 (ATSDR 2006). The May homestead was located on a parcel later part of Colman's property just north of the Barbee Lumber Company (EHC 2012), which may place the homestead within the project area. Prior to 1916, a shingle mill occupied the upland area of the site; the property was deeded to Peter Reilly in 1916 (ATSDR 2006). Quendall Station (named for Lake Washington Mill owner William Kendall) was established in 1916, as a part of the Lake Washington beltline, and shows on the Northern Pacific Railway roster in 1922 and 1947 (NPRHA 2012).

The area was used by the Republic Creosoting Company (later Reilly Tar and Chemical Corporation) to process creosote from 1917 – 1969. Tar feedstock was typically transported to the facility onsite from Lake Union and unloaded from tankers or barges at a t-dock that extended out into Lake Washington or at a shorter, near-shore pier. The feedstock was unloaded into two two-million gallon, above-ground storage tanks. (Remnants of this dock and a wharf are located within the APE along the Lake Washington shoreline). A notation in *Washington: A Guide to the Evergreen State* describes "a huddle of black sheds and creosote tanks between the lake and the tracks of the Northern Pacific Railway" (WPA 1941).

In the early 1970s, the site was sold to Quendall Terminals. It has been used intermittently to store diesel, crude and waste oils and as a log sorting and storage yard. Bowden et al. (1997) reported a small brick building, a sewer pump station and a shack on the eastern edge of the Main Property. The brick building (the Quendall Station house) was reportedly used as an office building for the logging company (William Parent, personal communication, June 14, 2012).

Much of the landform is presently covered with fill, which generally consists of a mixture of silt, sand, gravel and wood debris with scattered foundry slag and brick and metal fragments. Known fill events occurred west of the pre-1916 shoreline following the lowering of Lake Washington; between 1920 and 1936 associated with the diversion of May Creek and backfilling of its former channel; and in 1983, when approximately three feet of sawdust was placed over the entire site.

C. The results of the 1997 archaeological survey. A landform subject to periodic flood events and channel drift would not be assumed to contain intact, significant cultural deposits. However, Bowden et al. (1997) posited that intact, pre-earthquake cultural deposits, protected from erosion by the cap of landslide debris and silts, might lie inland of the modern shoreline.

In 1997, archaeologists excavated 12 shovel tests in the upland area, one of which was located within the current project's boundaries (Bowden et al. 1997:16). All shovel tests were negative for cultural deposits; however, an item tentatively identified as fire-modified rock was found in a shovel test excavated to the east of the project on the Pan Abode Cedar Homes Property. The single shovel test excavated in 1997, which is within the 2012 project area, identified a small charcoal deposit at 90 – 100 centimeters below the surface. Soils in the eastern portion of the project were interpreted as remnant alluvial deposits from May Creek; while those in the western portion were described as beach deposits associated with the Lake Washington shoreline.

D. The nature of the undertaking. Site remediation anticipates the placement of a cap over the upland portion of the Main Property and along the shoreline. This cap could be disturbed by: a) clearing and grading in the upland portion of the Main Property; b) construction of a deep building foundation (i.e. piles) and other ground improvements required for structural support, c) excavation for utilities; and d) establishment and/or expansion of wetland and riparian areas (shoreline and/or upland). Institutional controls will be required to prevent alteration of the cap during redevelopment. With the exception of these four instances, the undertaking is unlikely to cause effects to intact, significant cultural deposits, should any exist within the project.

Archaeological Expectations. Based on the background information, areas with a higher probability to contain intact archaeological deposits include the margins of the old channels of May Creek, the delta of the 1920 channel; the margins of the 1920 marsh; and areas adjacent to the 1864 shoreline. Cultural deposits in this location may include items or features associated with a) precontact fisheries (weirs, traps, smokehouses, drying racks); b) precontact habitation (fire-modified rock, charcoal, post molds, depressions, lithic debitage, and formal processing and hunting tools); c) historic industry (wharves, piers, docks, pilings, machinery; foundations, trash); historic habitation (house foundations, household refuse) or historic transportation (rail line; trestles; road beds, bridge foundations).

Because of the type and intensity of landscape modification conducted in the historic era and the geologic history of the landform, intact precontact deposits would not be expected to be at or near the surface, but rather would be anticipated to be one to several meters below ground-level (Bowden et al. 1997). This position is supported by the 1997 fieldwork (Bowden et al. 1997) and the results of other archaeological studies conducted in the vicinity (e.g. Greengo 1966; Chatters 1981, 1988; Larson 1988; Lewarch et al. 1994, 1995; Forsman and Larson 1995; Lorenz 1976; Robinson 1982a, 1982b).

Intact historic-era deposits related to early homesteading would not be expected to be visible on the surface within the project area for the same reasons; however, background research indicates that late historic-era deposits related to creosote production; the lumber industry and railroad are likely to be present on the landscape.

3. Fieldwork

Field investigations were conducted by Katherine M. Kelly and Sonja Kassa; notes and photographs are on file at CRC. The project was not staked or flagged. The survey method consisted of a pedestrian survey using maps provided by the client. No subsurface testing was conducted due to known soil contaminates; ground exposures, cut banks and cleared areas were inspected as available.

The landscape was much as described in the reference documents, all examined areas showed signs of disturbance. Upland areas are covered with a mixture of wood debris and gravels, while the shoreline had push piles of fill, wood chips, gravels and riprap and large sections of armoring (riprap and logs or manufactured fiber netting) over fill (Figures 4 - 8). Gravel roads and gravel-covered clearings were found throughout. A series of low canals or ditches, ponds and cobble dikes radiated from the northeastern portion of the site to the western shoreline (Figure 9). Remnant asphalt surfaces are also present in this section. In addition to the remnant log beds, archaeologists also observed log piles, the ruins of a structure interpreted to be truck scales, monitoring wells and/or utility connections, concrete pads, plywood sheds, concrete "ecoblocks," collections of waste barrels, and trash scatters (Figures 10 - 13). No evidence of the precontact deposits, homestead, shingle mill, or creosote storage tanks were identified.

Total Area Examined: 21.5 acres.

Areas not examined: None.

Date of Survey: June 14, 2012

Weather and Surface Visibility: Weather conditions were clear and mild.

4. Results

Cultural Resources Identified: Three structures were recorded: two wooden dock/wharf features (presumed to be associated with the creosote plant); and the Quendall station house, a small, flat-roofed brick structure (Figures 14 - 16). The dock/wharf features, which are likely associated with the former creosote facility, are in ruin. Per prevailing DAHP guidelines, these have been recorded as historic-era archaeological sites on Washington State archeological inventory forms. The Quendall station house, although associated with the Northern Pacific Railway, is not architecturally remarkable. It has been recorded on a Washington State historic property inventory form. None of these sites is considered to be a significant cultural resource; all forms have been submitted to DAHP.

Project Conclusions, Findings and Recommendations: Much of the proposed undertaking is unlikely to cause effects to intact, significant cultural deposits, should any exist within the project. There are four instances that may require excavation below the assumed cap installed during remediation. These are:

- Clearing and grading in the upland portion of the Main Property.
- Construction of a deep building foundation (i.e. piles) and other ground improvements required for structural support.

It is CRC's recommendation that limited and focused cultural resource monitoring be conducted during these activities. A proposed monitoring plan and an inadvertent discovery plan are attached.

In the unlikely event that ground disturbing or other activities do result in the inadvertent discovery of archaeological deposits, work should be halted in the immediate area and contact made with the DAHP in Olympia. Work should be halted until such time as further investigation and appropriate consultation is concluded. In the unlikely event of the inadvertent discovery of human remains, work should be immediately halted in the area, the discovery covered and secured against further disturbance, and contact effected with law enforcement personnel, DAHP and authorized representatives of the concerned Indian tribes.

No historic properties affected [ ]
Historic properties affected [x]
No adverse effect to historic properties [x]
Adverse effect to historic properties [ ]

Attachments:

Figures [x]
Photographs [x]
Other [x] Copy of letter from DAHP to CED, Associate Planner
[x] Copies of letters sent by CRC to cultural resources staff at the Duwamish Tribe, Muckleshoot Indian Tribe, and Puyallup Tribe of Indians.
[x] Proposed Monitoring Plan
[x] Proposed Inadvertent Discovery Protocol
[x] Historic Inventory Report, Quendall Station
[x] Archaeological Site Inventory Form, Historic Wharf Structures

5. Limitations of this Assessment

No cultural resources study can wholly eliminate uncertainty regarding the potential for prehistoric sites, historic properties or traditional cultural properties to be associated with a project. The information presented in this report is based on professional opinions derived from our analysis and interpretation of available documents, records, literature, and information identified in this report, and on our field investigation and observations as described herein. Conclusions and recommendations presented apply to project conditions existing at the time of our study and those reasonably foreseeable. The data, conclusions, and interpretations in this report should not be construed as a warranty of subsurface conditions described in this report. They cannot necessarily apply to site changes of which CRC is not aware and has not had the opportunity to evaluate.

6. References

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7. Figures

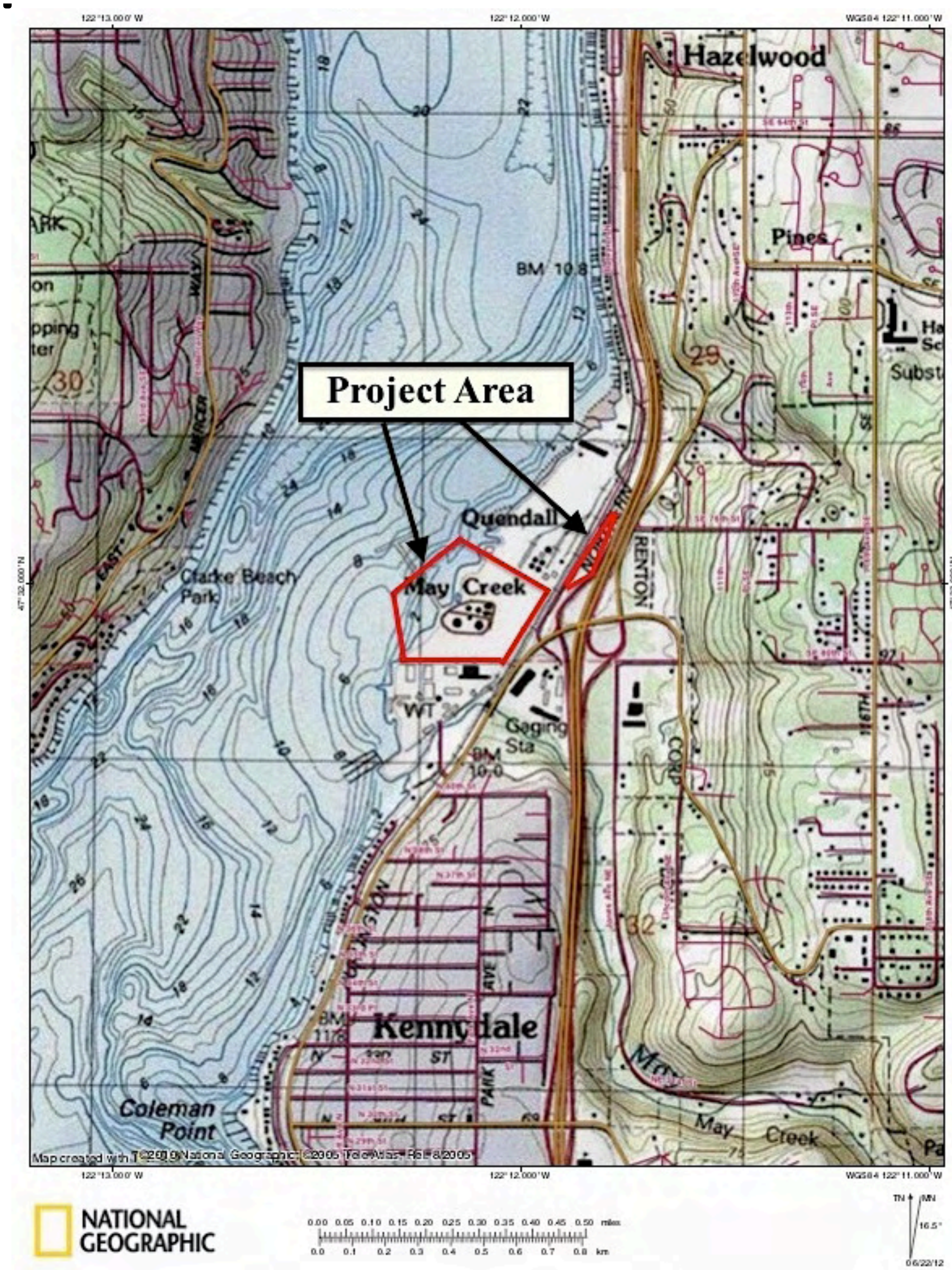

Figure 1. Location of the project shown on portion of the USGS Mercer Island, WA 7.5' USGS quadrangle.

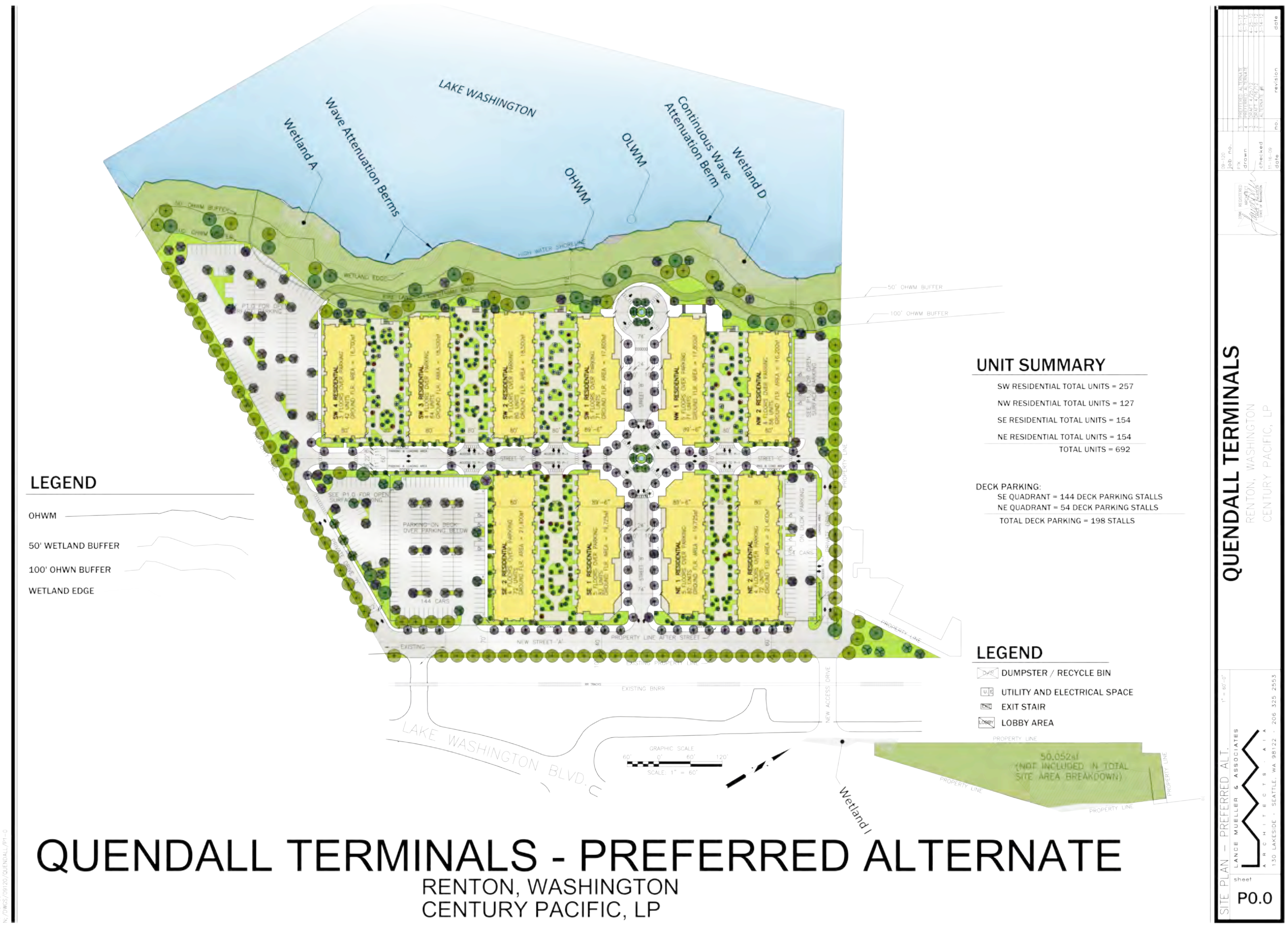

Figure 2. Proposed project applicants preferred alternative.

Figure 3. Map illustrating historic geomorphology of the project vicinity (from Bowden et al. 1997:5). Bowden's map identifies historic shorelines (1864, 1920); May Creek channels (1864, 1920, 1997); and the 1920 location of a

marsh. Note also the T-Dock on the shoreline in the approximate middle of the project. The white polygons indicate the project area.

Figure 4. Ground covered with large wood chips.

Figure 5. Ground covered with gravel (former road).


Figure 6. Milled lumber in two-track road.


Figure 7. Push piles or stockpiled material, two-track road at shoreline.

Figure 8. Shoreline stabilization structures. Note chained large woody debris, riprap and gravel.

Figure 9. Example of the series of canals and retaining ponds found in the northern and western part of the project.

Figure 10. Approximately three-foot tall steel "log beds". There are at least three sets of these on the property.

Figure 11. Structure interpreted as industrial (logging) scales, located at eastern edge of property.

Figure 12. Small structure (perhaps a pump house) located at the eastern edge of the property near the scales (see Figure 8).

Figure 13. Plywood structure, with intact door and sliding window. Appears to have served as an office. Located at the southern edge of the property.

Figure 14. Wooden waterfront structure interpreted to be the remnants of a wharf, located approximately 0.3 miles north of the May Creek outlet.

Figure 15. Wooden waterfront structure interpreted to be the remnants of a wharf, located approximately 0.3 miles north of the May Creek outlet.

Figure 16. The Quendall station, also used as an office by the logging company.

Table 1. Cultural resource sites recorded within one miles of the APE.

Site Number	Site Name	DAHP Site Type	NRHP/WHR Status	Potential Project Impacts
KI00814	Floating Dry Docks YFD 48 and 51	Historic Maritime Properties, Submerged Other (1948)	Potentially Eligible	None. Docks removed in 2008
	Northern Pacific Railroad Trestle (Burling Northern and Santa Fe Railroad Trestle)	Transportation - Rail-Related (1904)	Not eligible	None

Table 2. Cultural resource surveys conducted within one miles of the APE.

Report Citation	Author	Date
Cultural Resource Assessment Jag Development. (NADB 1339768)	Bowden, B.	1997
Cultural Resources Inventory of the Proposed Light Lanes Project. (NADB 1339887)	Juell, K. E.	2001
Letter to Jay Brueggeman Regarding Final Ripley Lane Pipeline Excavation Project (CIP #200799) Archaeological Resources Monitoring. (NADB 1341932)	Murphy, L. R.	2003
Archaeological Inventory Survey Report Lake Washington Floating Dry Docks. (NADB 1351684)	Major, M.	2008
Archaeological Assessment, City of Renton Hawk's Landing Project, Renton (NADB 1353785)	Kanaby, K. M.	2009

8. Attachments

STATE OF WASHINGTON

DEPARTMENT OF ARCHAEOLOGY & HISTORIC PRESERVATION

1063 S. Capitol Way, Suite 106 • Olympia, Washington 98501
Mailing address: PO Box 48343 • Olympia, Washington 98504-8343
(360) 586-3065 • Fax Number (360) 586-3067 • Website: www.dahp.wa.gov

February 9, 2011

Ms. Vanessa Dolbee
Associate Planner
CED
1055 South Grady Way
Renton, WA 98057

In future correspondence please refer to:
Log: 020911-10-KI
Property: Quendall Terminals LUA09-151, EIS, ECF. BSP, SA, *Draft EIS Quendell Terminals*
Re: Archaeology-Draft EIS Comments

Dear Ms. Dolbee:

Thank you for contacting the Washington State Department of Archaeology and Historic Preservation (DAHP). The above referenced project has been reviewed on behalf of the State Historic Preservation Officer. . The Renton area has a history of archaeological finds during construction project. The Draft EIS does not address cultural resources. Cultural resources should be addressed as part of the Affected Environments section. There is ethnographic evidence that a precontact Duwamish village was present in the project area and an Indian trail leading to the project area and vicinity is shown on historic maps. In addition, the project area is depicted in the Statewide Archaeological Predictive Model as having the highest probability for containing precontact archaeological resources. A cultural resources survey of the project are and vicinity conducted in 1997 by Larson Anthropological/Archaeological Services, was unable to adequately survey the project area because of the presence of fill and impervious surfaces.

Please be aware that archaeological sites are protected from knowing disturbance on both public and private lands in Washington States. Both RCW 27.44 and RCW 27.53.060 require that a person obtain a permit from our Department before excavating, removing, or altering Native American human remains or archaeological resources in Washington. Failure to obtain a permit is punishable by civil fines and other penalties under RCW 27.53.095, and by criminal prosecution under RCW 27.53.090.

Chapter 27.53.095 RCW allows the Department of Archaeology and Historic Preservation to issue civil penalties for the violation of this statute in an amount up to five thousand dollars, in addition to site restoration costs and investigative costs. Also, these remedies do not prevent concerned tribes from undertaking civil action in state or federal court, or law enforcement agencies from undertaking criminal investigation or prosecution. Chapter 27.44.050 RCW allows the affected Indian Tribe to undertake civil action apart from any criminal prosecution if burials are disturbed.

We request that cultural resources be addressed, by a professional archaeologist or environmental or cultural resources firm that has professional archaeologists on staff, as part of the final EIS. Mitigation measure may consist of professional archaeological monitoring under a monitoring and inadvertent discovery plan approved by DAHP and the Tribes, and/or further survey using heavy machinery that can penetrate fill soils and impervious surfaces.

If further survey is the chosen mitigation, DAHP will need to see the original survey report in addition to the summarized version of the survey that will become part of the EIS.

All survey should be completed prior to construction activities. Archaeological survey in tandem with construction work has not proven to be an effective means of protecting cultural resources and has led to violations of RCW 27.53 on other projects.

Complete cultural resources survey reports must be sent to DAHP and the affected Tribes prior to the final EIS, and prior to any ground disturbing activities commencing, on any part of the project. Archaeological site inventory forms, if applicable, must be submitted to DAHP in advance of the final report, and Smithsonian trinomials (site numbers) must be incorporated into the final report text.

Thank you for the opportunity to review and comment.

Sincerely,

Gretchen A Ka

Gretchen Kaehler
Assistant State Archaeologist
(360) 586-3088
gretchen.kaehler@dahp.wa.gov

cc. Laura Murphy, Archaeologist, Muckleshoot Tribe
Cecile Hansen, Chairwoman, Duwamish Tribe
Phil LeTourneau, King County Historic Preservation Program
Dennis Lewarch, Archaeologist, Suquamish Tribe

Cultural Resource Consultants, Inc.

June 11, 2012

Duwamish Tribe
Cecile Hansen, Chairwoman
4705 W Marginal Way SW
Seattle, WA 98106-1514

Re: Cultural Resources Assessment for the Quendall Terminals Redevelopment Project, Renton, King County, WA

Dear Ms. Hansen:

I am writing to inform you of a cultural resources assessment for the above referenced project. Cultural Resource Consultants, Inc. (CRC) is conducting this assessment at the request of EA/Blumen. The project is located in Section 29, Township 24 North, Range 5 East Willamette Meridian in Renton, King County, Washington.

EA/Bluman is requesting a cultural resources assessment for the Quendall Termainals Redevelopment Project located in the northern portion of the City of Renton, King County. The site includes an approximately 20.3-acre Main Property along Lake Washington, and an approximately 1.2-acre Isolated Property to the northeast. The Main Property is generally bordered by a Puget Sound Energy easement and the Seattle Seahawks Training Facility to the north, the Railroad right-of-way, Lake Washington Boulevard and Ripley Lane N to the east, the Barbee Mill residential development to the south and Lake Washington to the west. The Isolated Property is generally bounded by Ripley Lane N to the west, and the southbound I-405 off-ramp to the east and south.

CRC is in the process of reviewing available information. Background research will include a site files search at the Washington State Department of Archaeology and Historic Preservation (DAHP), review of previously recorded cultural resource reports, and review of pertinent published literature and ethnographies. Results of our investigations will be presented in a technical memo.

We are aware that not all information is contained within published sources. Should the Tribe have additional information to support our assessment, we would very much like to include it in our study. Please contact me should you wish to provide any comments. I appreciate your assistance in this matter and look forward to hearing from you.

Sincerely,

Glenn D. Hartmann
President/Principal Investigator

PO BOX 10668, BAINBRIDGE ISLAND, WA 98110
PHONE 206.855.9020 - info@crcwa.com

Cultural Resource Consultants, Inc.

June 11, 2012

Muckleshoot Indian Tribe
Laura Murphy, Archaeologist/Cultural Resources
39015 172nd Ave SE
Auburn, WA 98092

Re: Cultural Resources Assessment for the Quendall Terminals Redevelopment Project, Renton, King County, WA

Dear Ms. Murphy:

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EA/Bluman is requesting a cultural resources assessment for the Quendall Termainals Redevelopment Project located in the northern portion of the City of Renton, King County. The site includes an approximately 20.3-acre Main Property along Lake Washington, and an approximately 1.2-acre Isolated Property to the northeast. The Main Property is generally bordered by a Puget Sound Energy easement and the Seattle Seahawks Training Facility to the north, the Railroad right-of-way, Lake Washington Boulevard and Ripley Lane N to the east, the Barbee Mill residential development to the south and Lake Washington to the west. The Isolated Property is generally bounded by Ripley Lane N to the west, and the southbound I-405 off-ramp to the east and south.

CRC is in the process of reviewing available information. Background research will include a site files search at the Washington State Department of Archaeology and Historic Preservation (DAHP), review of previously recorded cultural resource reports, and review of pertinent published literature and ethnographies. Results of our investigations will be presented in a technical memo.

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Sincerely,

Glenn D. Hartmann
President/Principal Investigator

PO Box 10668, Bainbridge Island, WA 98110
Phone 206.855.9020 - info@crcwa.com

Cultural Resource Consultants, Inc.

June 11, 2012

Puyallup Tribe of Indians
Brandon Reynon, Cultural Resources
3009 East Portland Ave
Tacoma, WA 98404

Re: Cultural Resources Assessment for the Quendall Terminals Redevelopment Project, Renton, King County, WA

Dear Mr. Reynon:

I am writing to inform you of a cultural resources assessment for the above referenced project. Cultural Resource Consultants, Inc. (CRC) is conducting this assessment at the request of EA/Blumen. The project is located in Section 29, Township 24 North, Range 5 East Willamette Meridian in Renton, King County, Washington.

EA/Bluman is requesting a cultural resources assessment for the Quendall Termainals Redevelopment Project located in the northern portion of the City of Renton, King County. The site includes an approximately 20.3-acre Main Property along Lake Washington, and an approximately 1.2-acre Isolated Property to the northeast. The Main Property is generally bordered by a Puget Sound Energy easement and the Seattle Seahawks Training Facility to the north, the Railroad right-of-way, Lake Washington Boulevard and Ripley Lane N to the east, the Barbee Mill residential development to the south and Lake Washington to the west. The Isolated Property is generally bounded by Ripley Lane N to the west, and the southbound I-405 off-ramp to the east and south.

CRC is in the process of reviewing available information. Background research will include a site files search at the Washington State Department of Archaeology and Historic Preservation (DAHP), review of previously recorded cultural resource reports, and review of pertinent published literature and ethnographies. Results of our investigations will be presented in a technical memo.

We are aware that not all information is contained within published sources. Should the Tribe have additional information to support our assessment, we would very much like to include it in our study. Please contact me should you wish to provide any comments. I appreciate your assistance in this matter and look forward to hearing from you.

Sincerely,

Glenn D. Hartmann
President/Principal Investigator

PO Box 10668, Bainbridge Island, WA 98110
Phone 206.855.9020 - info@crcwa.com

PROPOSED MONITORING PLAN
FOR THE QUENDALL TERMINALS REDEVELOPMENT PROJECT,
RENTON, KING COUNTY, WASHINGTON

The Project Proponent is proposing to construct a mixed-use development located at 4350 Lake Washington Blvd in Renton. The 21.5 acre project, located within the Shoreline High Intensity Overlay District, is zoned Commercial/Office/Residential. The applicants preferred alternative divides the project into seven lots, four of which would contain four- to six-story mixed-use buildings with residential units, retail, and restaurant space. The Quendall Terminals site has received a Superfund designation from the U.S. Environmental Protection Agency (EPA) and will undergo cleanup/remediation prior to redevelopment, under the oversight of the EPA.

On-Site Monitoring

Archaeological monitoring would entail having an archaeologist present during construction excavation below-fill to observe subsurface conditions and identify any buried archaeological materials that may be encountered. Monitoring will be performed either by a "professional archaeologist" (RCW 27.53.030 (8)) or under the supervision of a professional archaeologist.

Prior to any ground-disturbing project activities, construction personnel will meet with the archaeological monitor for a brief cultural resources orientation.

The monitoring archaeologist would stand in close proximity to construction equipment in order to view subsurface deposits as they are exposed, and would be in close communication with equipment operators to ensure adequate opportunity for observation and documentation. Archaeological monitoring will seek to identify potential buried surfaces, anthropogenic sediments, and archaeological features such as shell middens, hearths, or artifact-bearing strata. The monitoring archaeologist will inspect project excavations and the recovered sediments for indications of such archaeological resources. The archaeologist will be provided the opportunity to screen excavated sediments and matrix samples when this is judged useful to the identification process. It is not expected that modern fill (e.g., imported culturally-sterile construction fill) or glacial till sediments would be included in screening procedures. Excavated spoils may be examined in the course of monitoring. If cultural materials are observed in spoils piles, it is expected that these would be removed for examination and that the opportunity to screen spoil sediments would be available.

Archaeological monitoring of construction excavation will proceed until it can be determined with a greater level of confidence that human remains or other cultural resources are not likely to be impacted by construction excavation of the project. The archaeologist will conduct monitoring until native and fill deposits can be confidently isolated and identified based on observed sedimentary exposures. Upon completion of the monitoring, the archaeologist will prepare a report on the methods and results of the work, and recommendations for any necessary additional archaeological investigations, illustrated with maps, drawings, and photographs as appropriate.

Contingency Plan

In accordance with RCW 27.44 Indian Graves and Records Act, RCW 27.53 Archaeological Sites and Resources, RCW 68.50 Human Remains, and RCW 68.60, Abandoned and historic cemeteries and historic graves, the following protocols will be followed in the event that archaeological materials and/or human remains are discovered:

Procedures Upon Discovery of Potential or Actual Cultural Resources

1. Upon discovery of a potential or actual archaeological site, or cultural resources as defined by RCW 27.44 Indian Graves and Records Act, and RCW 27.53 Archaeological Sites and Resources, the Project Proponent, their employees, contractors and sub-contractors shall:

(a) Immediately cease or halt ground disturbing, construction, or other activities around the area of the discovery and secure the area with a perimeter of not less than thirty (30) feet until all procedures are completed and the parties agree that activities can resume. If such a perimeter would materially impact agency functions mandated by law, related to health, safety or environmental concerns, then the secured area shall be of a size and extent practicable to provide maximum protection to the resource under the circumstances. Project activities that are not ground disturbing may continue outside the secured perimeter around the findings. No one shall excavate any findings and all findings will be left in place, undisturbed and without analysis, until consultation with DAHP and the Tribe regarding a final disposition of the findings has been completed. In accordance with RCW 27.53.060, no one shall knowingly remove or collect any archaeological objects without obtaining a permit.

(b) Notify the Local Government Archaeologist at DAHP and the Tribes of the discovery as soon as possible, but in any event, no later than (24) hours of the discovery. If human remains are found, the Project Proponent shall follow notification procedures specified below (see “Human Remains and Associated Funerary Objects”).

(c) Arrange for the parties to conduct a joint viewing of the discovery within (48) forty-eight hours of the notification, or at the earliest possible time thereafter, the Project Proponent or their authorized representative shall arrange for the archaeologist to attend the joint viewing. After the joint viewing, taking into account any recommendations of the Tribe(s), DAHP, and the archaeologist, the parties shall discuss the potential significance, if any, of the discovery.

(d) Consult with the Tribes and DAHP on the transfer and final disposition of artifacts. Until the Tribe has a repository that meets the standards of curation established 36 CFR Part 79, artifacts shall be curated using an institution or organization that meets curation standards, selected through consultation with the Tribe.

Inadvertent Discovery of Human Skeletal Remains on Non-Federal and Non-Tribal Land in the State of Washington (RCWs 68.50.645, 27.44.055, and 68.60.055)

2. If ground-disturbing activities encounter human skeletal remains during the course of construction, then all activity must cease that may cause further disturbance to those remains and the area of the find must be secured and protected from further disturbance. In addition, the finding of human skeletal remains must be reported to the King County Coroner's Office and King County Sheriff's Office in the most expeditious manner possible. The remains should not be touched, moved, or further disturbed.

3. The King County Coroner's Office will assume jurisdiction over the human skeletal remains and make a determination of whether those remains are forensic or non-forensic. If the county coroner determines the remains are non-forensic, then they will report that finding to the Department of Archaeology and Historic Preservation (DAHP) who will then take jurisdiction over the remains and report them to the appropriate cemeteries and affected tribes. The State Physical Anthropologist will make a determination of whether the remains are Indian or Non-Indian and report that finding to any appropriate cemeteries and the affected tribes. The DAHP will then handle all consultation with the affected parties as to the future preservation, excavation, and disposition of the remains.

4. DAHP will handle all consultation with the affected parties as to the future preservation, excavation, and disposition of the remains if there is no federal agency involved.

Confidentiality of Information

5. The Project Proponent or its authorized representative recognizes that archaeological properties are of a sensitive nature and sites where cultural resources are discovered can become targets of vandalism and illegal removal activities. The Project Proponent or its authorized representative shall keep and maintain as confidential all information regarding any discovered cultural resources, particularly the location of known or suspected archaeological property, and exempt all such information from public disclosure consistent with RCW 42.17.300.

6. The Project Proponent or its authorized representative shall make its best efforts to ensure that all records indicating the location of known or suspected archaeological properties are permanently secured and confidential.

7. The Project Proponent or its authorized representative shall ensure that its personnel, contractors, and permittees keep the discovery of any found or suspected human remains, other cultural items, and potential historic properties confidential, including but not limited to, refraining such persons from contacting the media or any third party or otherwise sharing information regarding the discovery with any member of the public. The Project Proponent or its authorized representative shall require its personnel, contractors and permittees to immediately notify the Lead Representative of the Project Proponent or its authorized representative of any inquiry from the media or public. The Project Proponent or its authorized representative shall immediately notify DAHP of any inquiries it receives. Prior to any public information release, The Project Proponent or its authorized representative, DAHP, and the Tribe(s) shall concur on

the amount of information, if any, to be released to the public, any third party, and the media and the procedures for such a release, to the extent permitted by law.

Lead Representative and Primary Contact

8. The lead representatives and primary contacts of each party under this plan are as identified below. The parties may identify other specific personnel before the commencement of any particular project element as the contacts.

EA/Blumen
720 Sixth Street S, Suite 100
Kirkland, WA 90833
Primary Contact: Gretchen Brunner, 425-284-5401

Duwamish Tribe
4705 W Marginal Way SW
Seattle, WA 98106-1514
Lead Representative: Cecile Hansen, Chairwoman, 206-431-1582

Muckleshoot Indian Tribe
39015 172nd Ave SE
Auburn, WA 98092
Lead Representative: Laura Murphy, 253-939-3311

Puyallup Tribe of Indians
3009 East Portland Avenue
Tacoma, WA 98404
Lead Representative: Herman Dillon Sr., Tribal Council Chairman, 253-573-7828

Washington Department of Archaeology and Historic Preservation
PO Box 48343
Olympia, WA 98504-8343
Lead Representative: Allyson Brooks, State Historic Preservation Officer, 360-586-3066
Primary Contact: Gretchen Kaehler, Local Government Archaeologist, 360-586-3088
Primary Contact for Human Remains: Guy Tasa, State Physical Anthropologist, 360-586-3534

King County Medical Examiner's Office
325 – 9th Avenue, Box 359792
Seattle, WA 98104
Lead Representative: Richard Harruff, MD, PhD, Chief Medical Examiner, 206-731-3232

King County Sheriff's Office
516 Third Ave Room, W-116
Seattle, WA 98104
Lead Representative: Steven D. Strachan, Sheriff, 206-296-4155

PROPOSED INADVERTANT DISCOVERY PROTOCOL FOR THE QUENDALL TERMINALS REDEVELOPMENT PROJECT, RENTON, KING COUNTY, WASHINGTON

In accordance with RCW 27.44 Indian Graves and Records Act, RCW 27.53 Archaeological Sites and Resources, RCW 68.50 Human Remains, and RCW 68.60, Abandoned and historic cemeteries and historic graves, the following protocols will be followed in the event that archaeological materials and/or human remains are discovered:

1. If any the Project Proponent and/or employees, contractors or subcontractors suspects the inadvertent discovery of a cultural resource, all ground disturbing, construction or other activities around the immediate area of the discovery shall cease. A cultural resource may include an archaeological or historical resource.

> An **archaeological resource** is defined in RCW 27.53.040 as:
> All sites, objects, structures, artifacts, implements, and locations of prehistorical or archaeological interest, whether previously recorded or still unrecognized, including, but not limited to, those pertaining to prehistoric and historic American Indian or aboriginal burials, campsites, dwellings, and habitation sites, including rock shelters and caves, their artifacts and implements of culture such as projectile points, arrowheads, skeletal remains, grave goods, basketry, pestles, mauls and grinding stones, knives, scrapers, rock carvings and paintings, and other implements and artifacts of any material that are located in, on, or under the surface of any lands or waters owned by or under the possession, custody, or control of the state of Washington or any county, city, or political subdivision of the state are hereby declared to be archaeological resources.
>
> A **historical resource** is defined in RCW 27.53.030 (11):
> ... mean[ing] those properties which are listed in or eligible for listing in the Washington State Register of Historic Places (Washington Heritage Register [WHR]) (RCW 27.34.220) or the National Register of Historic Places (NRHP) as defined in the National Historic Preservation Act of 1966 (Title 1, Sec. 101, Public Law 89-665; 80 Stat. 915; 16 U.S.C. Sec. 470) as now or hereafter amended.
>
> Cultural resources may qualify for the WHR and/or the NRHP listing if they are intact, aged at least 50 years old, and at least one of the following:
> A. Are associated with events that have made a significant contribution to the broad patterns of our history; or
> B. Are associated with the lives of persons significant in our past; or
> C. Embody the distinctive characteristics of a type, period, or method of construction or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or
> D. Have yielded, or may be likely to yield, information important in prehistory or history.

2. Upon discovery of a cultural resource, the Project Proponent shall secure the area with a perimeter of not less than thirty (30) feet until all procedures are completed and the parties agree

that activities can resume. If such a perimeter would materially impact agency functions mandated by law, related to health, safety or environmental concerns, then the secured area shall be of a size and extent practicable to provide maximum protection to the resource under the circumstances. Work in the immediate area will not resume until all procedures are completed and the parties agree that activities can resume.

3. A qualified archaeologist, in coordination with the DAHP, will evaluate all inadvertently discovered cultural resources that may be considered eligible for listing in the National Register of Historic Places (NRHP) and recommend whether the cultural resource is eligible for listing in the NRHP. If the discovery is considered eligible, the DAHP and the concerned Indian Tribe(s) will consult to determine appropriate treatment, including but not limited to, photography, mapping, sampling, etc.

4. The Project Proponent shall ensure that its appropriate personnel, contractors and permittees follow procedures stipulated in this protocol and treat all human remains, cultural items and potential historic properties with respect.

Human Remains and Associated Funerary Objects

5. In accordance with "Inadvertent Discovery of Human Skeletal Remains on Non-Federal and Non-Tribal Land in the State of Washington" (RCWs 68.50.645, 27.44.055, and 68.60.055), if ground-disturbing activities encounter human skeletal remains during the course of construction, then all activity must cease that may cause further disturbance to those remains and the area of the find must be secured and protected from further disturbance. In addition, the finding of human skeletal remains must be reported to the King County Coroner's Office and King County Sheriff's Office in the most expeditious manner possible. The remains should not be touched, moved, or further disturbed.

6. The King County Coroner's Office will assume jurisdiction over the human skeletal remains and make a determination of whether those remains are forensic or non-forensic. If the county coroner determines the remains are non-forensic, then they will report that finding to the DAHP who will then take jurisdiction over the remains and report them to the appropriate cemeteries and affected tribes. The State Physical Anthropologist will make a determination of whether the remains are Indian or Non-Indian and report that finding to any appropriate cemeteries and the affected tribes. The DAHP will then handle all consultation with the affected parties as to the future preservation, excavation, and disposition of the remains.

7. DAHP will handle all consultation with the affected parties as to the future preservation, excavation, and disposition of the remains if there is no federal agency involved.

Confidentiality of Information

8. All involved parties shall make its best efforts to ensure that its appropriate personnel, contractors, and permittees keep the discovery of all inadvertent discoveries confidential, including but not limited to, refraining from contacting the media or any third party or otherwise sharing information regarding the discovery with any member of the public. Prior to any release,

the Project Proponent concerned Tribe(s), and the DAHP, shall concur on the amount of information, if any, to be released to the public, any third party, and the media and the procedures for such a release, to the extent permitted by law.

Lead Representative and Primary Contact

EA/Blumen
720 Sixth Street S, Suite 100
Kirkland, WA 90833
Primary Contact: Gretchen Brunner, 425-284-5401

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