Salmon Creek Interchange Project

Environmental Assessment

Final

Air Quality Discipline Report

May 2009

Prepared for:
Washington State Department of Transportation
11018 NE 51st Circle, Vancouver, Washington 98661

Washington State Department of Transportation

And
Clark County Department of Public Works
1300 Franklin Street, Vancouver, Washington 98660

Prepared by:
Washington State Department of Transportation
Environmental Affairs Office
Air Quality and Noise Program
15700 Dayton Avenue North, P.O. Box 330310
Seattle, WA 98133-9710

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The final discipline reports for the Salmon Creek Interchange Project were completed in April, May, and June 2007. These reports were reevaluated in November 2008. The data in these reports is based on the project's level of design at that time. Although the design had changed between the initial completion and the revision of the Air Quality Discipline Report, it was determined that the air quality model did not need to be rerun because the future traffic had not changed. Since the completion of the discipline reports, the project design has progressed, which has resulted in slight modifications to some analysis contained in the reports. The most current data and analysis was used to complete the environmental assessment (EA) to evaluate the project's effects. Therefore, some data and analysis presented in the EA may differ from what was presented in the discipline reports.

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LIST OF ACRONYMS

AADT	Average Annual Daily Traffic
ADT	average daily traffic
ADA	Americans with Disabilities Act
AQMA	Air Quality Maintenance Area
CAA	Clean Air Act
CFR	Code of Federal Regulations
CO	carbon monoxide
EMIT	Easy Mobile Inventory Tool
EPA	Environmental Protection Agency
FHWA	Federal Highway Administration
HC	hydrocarbons
I-5	Interstate 5
I-205	Interstate 205
IRIS	Integrated Risk Information System
LOS	level of service
MSAT	Mobile Source Air Toxics
MTP	Metropolitan Transportation Plan
NAAQS	National Ambient Air Quality Standards
NCHRP	National Cooperative Highway Research Program
NO_X	oxides of nitrogen
$PM_{2.5}$	particulate matter with a diameter of 2.5 microns or less
PM_{10}	particulate matter with a diameter of 10 microns or less
ppm	parts per million
RTC	Regional Transportation Council
SIP	State Implementation Plan
SWCAA	Southwest Clean Air Agency
TIP	Transportation Improvement Program
TSP	total suspended particulates
VMT	Vehicle Mile Traveled
WAC	Washington Administrative Code
WASIST	Washington State's Intersection Screening Tool
WDOE	Washington State Department of Ecology
WSDOT	Washington State Department of Transportation
WSU	Washington State University

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SUMMARY

What is the purpose of this study?

This study evaluates the effects on air quality of a new interchange configuration in Vancouver Washington. The Salmon Creek Interchange Project is located north of Vancouver, Washington in unincorporated Clark County. The project area is where Interstate 205 (I-205) splits south from Interstate 5 (I-5) just north of NE 139th Street, and I-5 (Exhibit 1).

Because the project is located in a maintenance area for carbon monoxide (CO), we are required to evaluate this pollutant to determine if we are in compliance with regional and project level conformity in accordance with state and federal air quality regulations. Although this area is also designated as a maintenance area of 1-hour ozone, due to US Environmental Protection Agency's (EPA) recent updates to the Clean Air Act (CAA), conformity regulations no longer apply.

Mobile Source Air Toxic (MSAT) emissions were evaluated on a regional level according to Federal Highway Administration's (FHWA's) *Interim Guidance on Air Toxic Analysis*. Under the Proposed Build Alternative scenario in the opening year (2017), we expect lower MSAT emissions in the study area compared to the No Build Alternative scenario. These lower levels are due to reduced Average Annual Daily Traffic (AADT) and EPA's national MSAT control programs targeting vehicle fuels, engines, and exhaust systems. A slight increase would occur under the 2030 Proposed Build Alternative compared to the No Build Alternative. This is because 2030 traffic volumes are projected to be higher for the Proposed Build Alternative due to improved traffic operations. However, both the Proposed Build Alternative and No Build Alternative MSAT emission rates are predicted to be lower than the existing conditions (2005). In general, we expect MSAT levels to decrease over time due to nationally mandated cleaner vehicles and fuels.

How is the air quality study conducted?

In this study, the Washington State Department of Transportation (WSDOT) calculated CO emissions at intersections expected to have long delays. The quantity of CO was calculated for the existing year and future years using current Southwest Regional Transportation Council (RTC) Mobile 6 emissions factors and standardized Environmental Protection Agency (EPA) modeling procedures. We compared the results to the CO limits allowed under Federal and State regulations (National Ambient Air Quality Standards, or NAAQS) to see if any levels exceed these regulations.

What are the results of the study?

This project meets both regional and project level conformity in accordance with state and federal regulations. In addition, no intersections would exceed the CO levels established in the NAAQS.

- The project satisfies regional conformity as it is included in the conforming Metropolitan Transportation Plan (MTP) and Transportation Improvement Plan.
- The project also meets project level conformity requirements based on hot spot air quality modeling for selected intersections.
- Both 1-hour and 8-hour averaged CO concentrations would be below the NAAQS in the existing year (2005), in the year of phase 1 opening (2013), in the year of opening (2017), and in the horizon year (2030) for the constructed project at all modeled intersections.

- Because the project would not cause any new, nor contribute to any existing exceedance of the NAAQS, it conforms to the State Implementation Plan (SIP) for CO. It would also not delay the timely attainment of any standard.
- Construction activities would result in temporary emissions of pollutants (CO, NO_X [oxides of nitrogen] and particulate matter), including dust and odors. Best management practices for dust abatement would be used during construction to reduce dust emissions.
- Project effects and mitigation measures are summarized in Table 1.
- Alternative 1 is the Proposed Build Alternative and Alternative 2 is the No Build Alternative.

Table 1. Summary of Project Effects and Mitigation

Alternative	Construction Effects	Operation Effects	Mitigation Measures
2005 Existing	None	Worst-case 8-hour CO concentrations would be 8.0 parts per million (ppm). Worst-case 1-hour CO concentration would be 10.1 ppm	None required because there would be no project action.
2013 Alternative 1	Construction activities would result in temporary emissions of pollutants.	Worst-case 8-hour CO concentrations would be 7.1 ppm. Worst-case 1-hour CO concentration would be 8.9 ppm	Use of best management practices during construction would control particulate emissions. No mitigation is required during operation.
2013 Alternative 2	None	Worst-case 8-hour CO concentrations would be 7.4 ppm. Worst-case 1-hour CO concentration would be 9.3 ppm	None required because there would be no project action.
2017 Alternative 1	Construction activities would result in temporary emissions of pollutants.	Worst-case 8-hour CO concentrations would be 6.6 ppm. Worst-case 1-hour CO concentration would be 8.1 ppm	Use of best management practices during construction would control particulate emissions. No mitigation is required during operation.
2017 Alternative 2	None	Worst-case 8-hour CO concentrations would be 6.7 ppm. Worst-case 1-hour CO concentration would be 8.3 ppm	None required because there would be no project action.
2030 Alternative 1	Construction activities would result in temporary emissions of pollutants.	Worst-case 8-hour CO concentrations would be 6.0 ppm. Worst-case 1-hour CO concentration would be 7.3 ppm	Use of best management practices during construction would control particulate emissions. No mitigation is required during operation
2030 Alternative 2	None	Worst-case 8-hour CO concentrations would be 6.2 ppm. Worst-case 1-hour CO concentration would be 7.5 ppm	None required because there would be no project action.

1.0 INTRODUCTION

1.1 Project Vicinity

The project is located north of Vancouver, Washington in unincorporated Clark County (Exhibit 1). The freeway system in the area includes I-205, which splits south from I-5 just north of NE 139th Street. I-205 extends southeast through Clark County and crosses over the Columbia River into Oregon near the Portland International Airport. I-205 continues south and rejoins I-5 south of Portland, Oregon. The I-5 corridor extends south into Vancouver, Washington and across the Columbia River, through downtown Portland and across the Willamette River.

1.2 Project Study Area

The Salmon Creek Interchange Project study area (see Exhibit 2) is bounded by NE 129th Street to the south, the NE 179th Interchange of I-5 to the north, NW 2nd Court to the west and NE 29th Avenue to the east. The project study area encompasses two interstate highway systems (I-5 and I-205). Land uses within the project study area include residential (both single family homes and multifamily complexes), commercial and retail services, light industrial or manufacturing, and the Legacy Hospital on the east side of I-205.

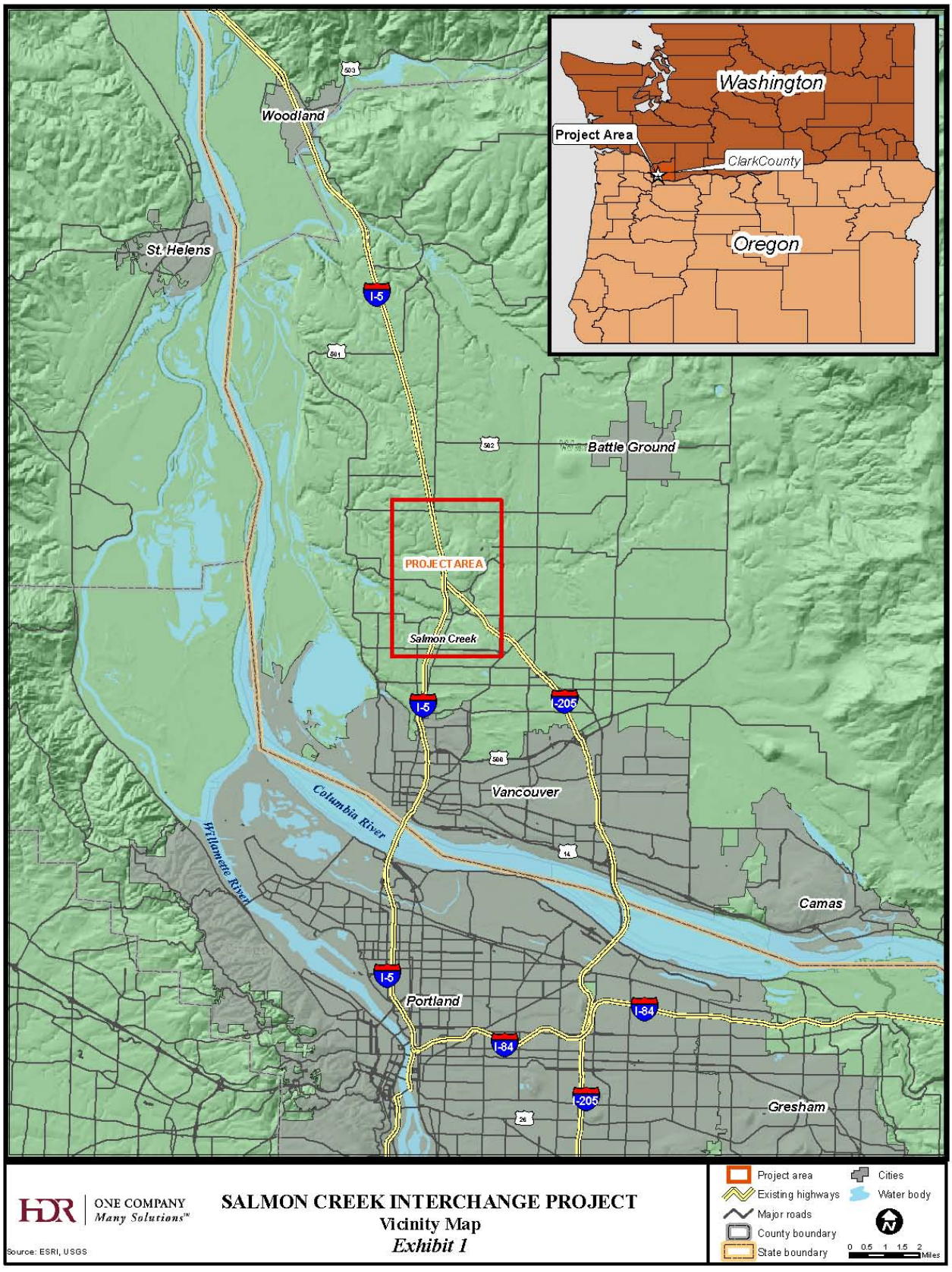
1.3 Project Limits

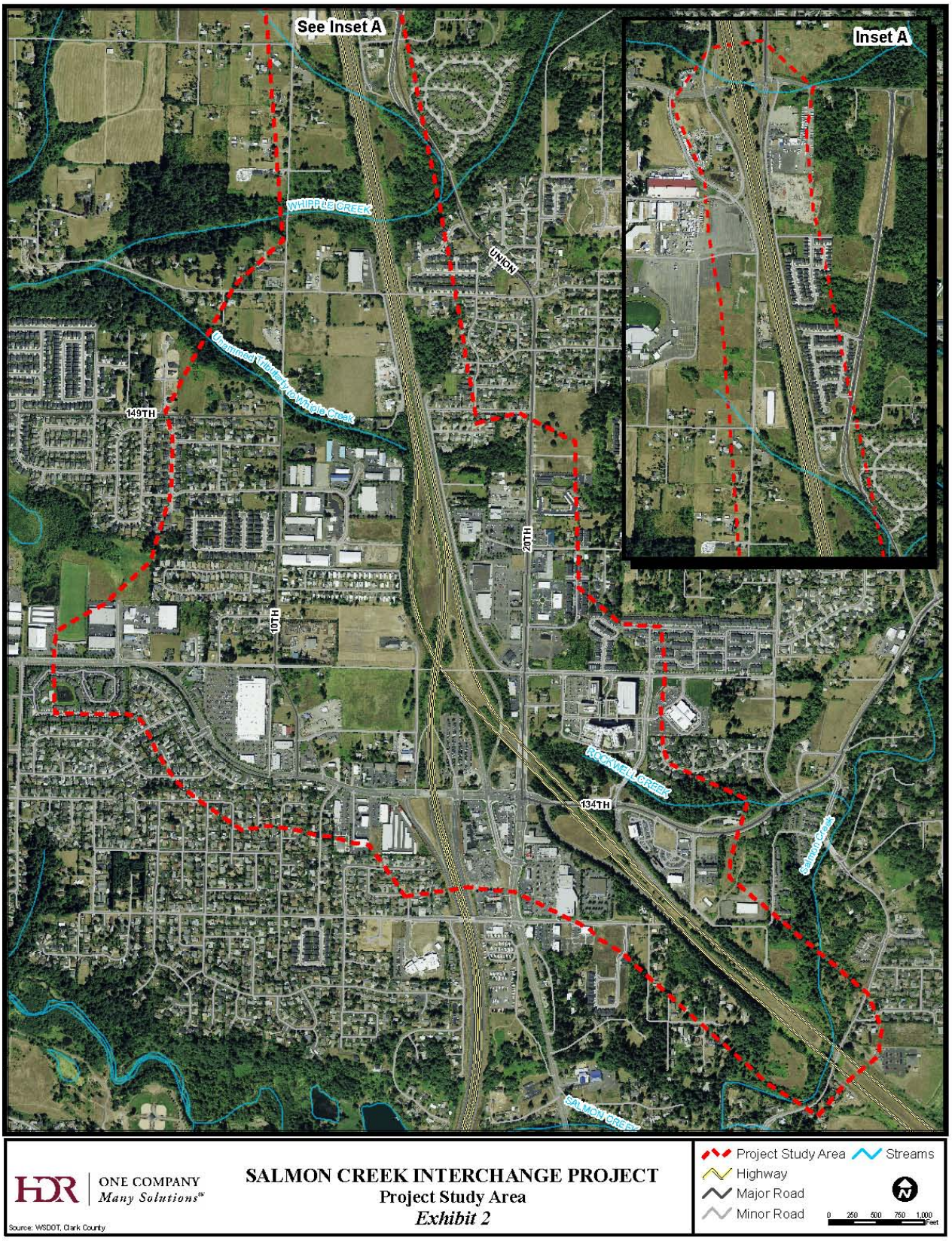
The northernmost limit of the project is located approximately at I-5 milepost 10.6. The southernmost limit of the project is located approximately at I-205 milepost 36.1. The latitude and longitude of the approximate center of the project is 22 39' 23 W and 45 43' 50 N respectively. The project is located in Township 3N, Range 1E, and Sections 14, 15, 22, 23, 24, 25, 26, and 27.

1.4 Existing Roadway Configuration

The existing Salmon Creek Interchange at NE 134th Street is an arterial interchange located at the junction of I-5 and I-205. Full movements are provided to and from NE 134th Street and I-5 and I-205. The interchange is an integral part of several transportation systems, including the I-5 and I-205 corridors. These corridors are heavily utilized by motorists and serve as major freight and regional commute routes. The existing Salmon Creek Interchange serves a large portion of central and west Clark County, including the north Salmon Creek, Mount Vista, and north Hazel Dell areas, as well as the Vancouver campus of Washington State University (WSU).

NE 134th Street is a multilane arterial roadway with numerous at-grade signalized intersections spaced in close proximity to each other.


Washington
Project Area
ClarkCounty
Oregon
Woodland
St. Helens
I-5
Battle Ground
PROJECT AREA
Salmon Creek
I-205
Vancouver
Columbia River
Willamette River
Camas
Portland
I-84
Gresham
HDR
ONE COMPANY
Many Solutions™
Source: ESRI, USGS
SALMON CREEK INTERCHANGE PROJECT
Vicinity Map
Exhibit 1
Project area
Existing highways
Major roads
County boundary
State boundary
Cities
Water body
N
0 0.5 1 1.5 2
Miles


See Inset A
Inset A
WHIPPLE CREEK
UNION
Unnamed Tributary to Whipple Creek
149TH
10TH
20TH
ROCKWELL CREEK
134TH
Salmon Creek
SALMON CREEK
HDR | ONE COMPANY Many Solutions®
Source: WSDOT, Clark County
SALMON CREEK INTERCHANGE PROJECT
Project Study Area
Exhibit 2
Project Study Area
Highway
Major Road
Minor Road
Streams
0 250 500 750 1,000 Feet

1.5 The Proposed Build Alternative

The Salmon Creek Interchange Project, also referred to as the Proposed Build Alternative, is proposed to be built in two phases to allow the project to be built as funding becomes available. It is anticipated that funding for Phase 1 of the Salmon Creek Interchange project would come from a combination of state and local transportation funds and federal grants. Phase 2 is unfunded; however, Phase 2 improvements are implicit in the County's Capital Facilities Plan and State of Washington Transportation Plan.

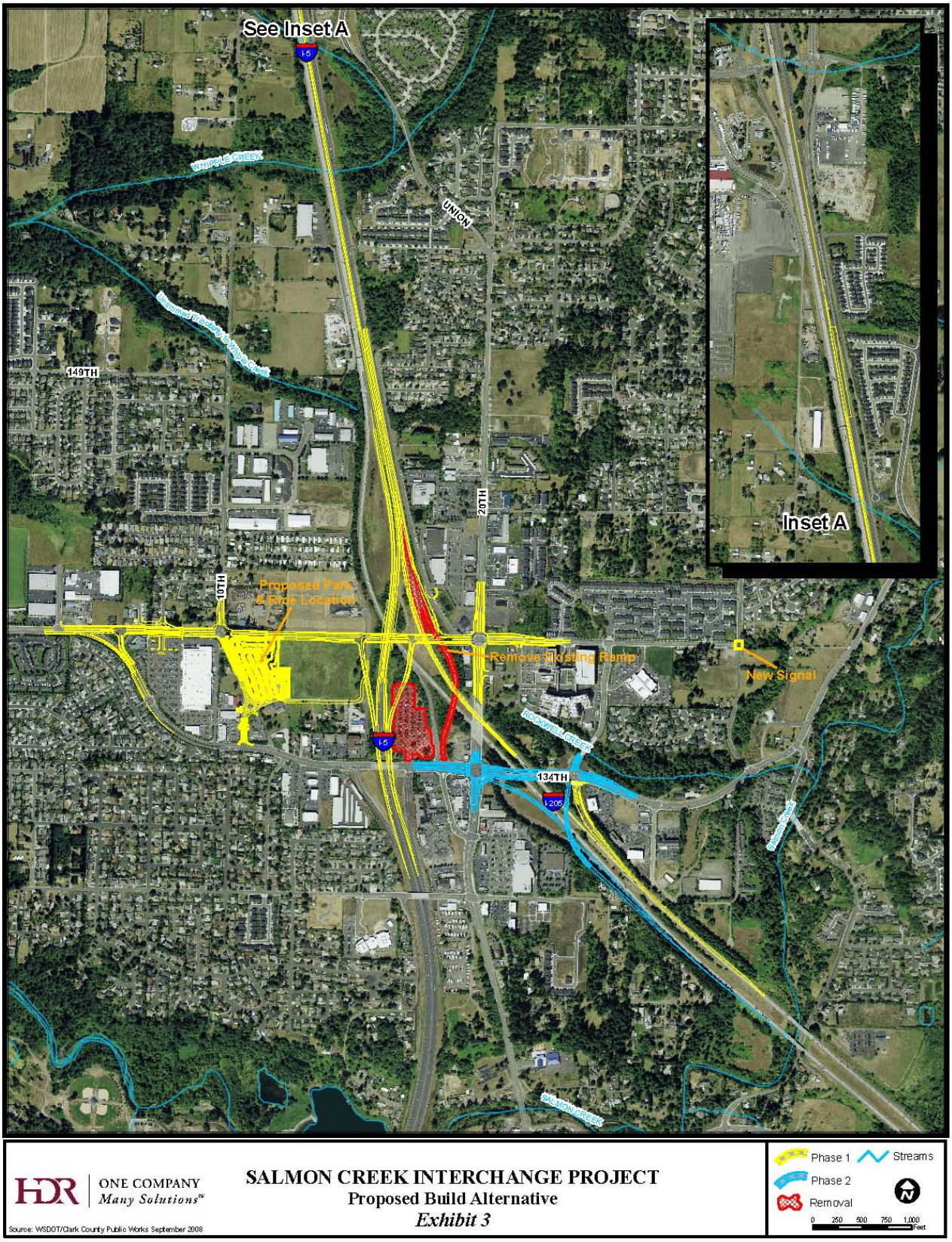
The time estimated for Phase 1 construction completion is approximately 3.5 years (2013). Phase 2 construction is expected to begin in 2015 and last approximately 2.5 years (2017), provided funding becomes available. The following subsections describe Phase 1 and Phase 2 improvements. Exhibit 3 provides a map of the proposed Phase 1 and Phase 2 improvements.

1.5.1 Phase 1 Improvements

1.5.1.1 Interstate Improvements

Phase 1 improvements to I-5 and I-205 would include the following components:

- A new interchange at NE 139th Street and I-5 would be constructed over I-5 and I-205.
- The on-ramp from NE 134th Street to I-5/I-205 northbound would be removed and relocated to NE 139th Street. The existing I-205 southbound off-ramp and northbound Highway 99 legs would remain. The NE 134th Street westbound right-turn lane at the intersection would be removed as the northbound on-ramp would be demolished.
- The existing I-205 northbound off-ramp to NE 134th Street would be widened to provide a two-lane off-ramp with an exit only auxiliary lane on I-205 northbound.
- A new I-5 northbound auxiliary lane from the I-205 merge area to an auxiliary lane approaching the NE 179th Street interchange would be constructed in the existing median of I-5.
- A new I-5 bridge over I-205 southbound would be constructed and would be wide enough to accommodate the expansion of I-5 to three lanes in both directions in the future.
- Northbound I-205 would be realigned to the west at NE 139th Street to accommodate vertical clearance requirements with NE 139th Street.


See Inset A
WHIPPLE CREEK
UNION
149TH
20TH
10TH
Proposed Park & Ride Location
Remove Existing Ramp
New Signal
I-5
134TH
I-205
Inset A
Phase 1
Phase 2
Removal
Streams
0 250 500 750 1,000 Feet
HDR ONE COMPANY Many Solutions
Source: WSDOT/Clark County Public Works September 2008
SALMON CREEK INTERCHANGE PROJECT
Proposed Build Alternative
Exhibit 3

1.5.1.2 Local Roadway Improvements

Improvements to the local roadway system associated with Phase 1 of the project would include:

- The C-Tran Park-and-Ride would be relocated from NE 134th Street to a new location near the SE corner of NE 139th Street and NE 10th Avenue. Riders would access the Park-and-Ride from NE 136th Street. Buses would access the Park-and-Ride from NE 139th Street. The associated frontage along NE 136th Street would be improved. The signal at the existing Park-and-Ride location across from the I-5 northbound off-ramp at NE 134th Street would be modified.
- NE 139th Street would be widened to a minimum of two lanes in each direction with bike lanes, a sidewalk on the south side, and a median from NE Tenney Road to the main driveway entrance of Legacy Hospital (west of 23rd Avenue). A new segment of NE 139th Street from NE 10th Avenue to NE 20th Avenue, which passes over I-5 and I-205, would be constructed on walls and structure and contain the necessary channelization. New signals would be installed on NE 139th Street at the intersections of NE Tenney Road, NE 10th Avenue, and NE 29th Avenue.
- NE 20th Avenue and NE 139th Street would be redesigned with double left turn lanes and right turn lanes in all directions. The existing traffic signal would be replaced to accommodate the additional lanes at this intersection.
- NE 139th Street and NE Tenney Road would be redesigned to a signalized modified "T" configuration with NE 139th Street being the main through route. The eastbound NE 139th Street traffic would have a two-lane slip lane to NE Tenney Road.
- NE 16th Avenue would be realigned to the west to accommodate the I-5 southbound on-ramp from NE 139th Street.
- Access from NE 17th Avenue to NE 139th Street would be closed with the construction of the onramp from NE 139th Street to I-205 northbound. Access to the commercial property between NE 17th Avenue and NE 20th Avenue would be from NE 20th Avenue. Residential traffic would use NE 150th Street to travel from NE 20th Avenue to NE 17th Avenue.
- NE 10th Avenue would be widened from NE 134th Street to NE 141st Street to one lane in each direction bike lanes, sidewalks, and turn lanes at the signalized intersection of NE 10th Avenue and NE 139th Street. A roundabout would be at the intersection of NE 10th Avenue and NE 136th Street. Modifications would be made to the curb return from NE 134th Street westbound to NE 10th Avenue northbound.

1.5.2 Phase 2 Improvements

1.5.2.1 Interchange Improvements

A new southbound on-ramp from NE 134th Street at NE 23rd Avenue to I-205 southbound and a northbound NE 20th Ave to southbound I-205 slip ramp would be constructed as part of the Phase 2 improvements. A slip ramp is a ramp where vehicles do not have to stop or yield to enter the ramp (i.e., No signal, stop sign, or yield sign is located at the ramp/cross-road intersection). The existing slip ramp I-205 southbound from NE 134th Street would be removed.

1.5.2.2 Local Roadway Improvements

Phase 2 improvements to the local roadway system would include the following:

- NE 134th Street from NE 20th Avenue to NE 23rd Avenue would be widened.
- The NE 134th Street/NE 20th Avenue intersection would be improved.

1.6 The No Build Alternative

The No Build Alternative is defined as actions that would occur should the Proposed Build Alternative not occur. These are conditions that currently exist, as well as programmed and funded projects within the project study area (Exhibit 2). The No Build Alternative includes ongoing routine maintenance and short term minor construction necessary for continued operation of existing WSDOT and Clark County transportation facilities and minor safety improvements, as required, within the project study area.

1.7 Foreseeable Projects

A foreseeable project includes past, present, or other reasonably foreseeable funded projects within the project study area and funded or unfunded projects adjacent to the project study area that, together with the proposed project, may have a cumulative effect on the environment. These include:

- Widening of I-5 to three through traffic lanes in each direction from NE 134th Street to I-205's merge.
- Auxiliary lanes on I-5 between the I-205 merge and NE 179th Street, and between NE 179th Street and SR 502/I-5 interchange
- Widening of I-205 to three traffic lanes in each direction south of NE 134th Street.
- Completing the I-5/139th Street "diamond interchange" by moving the current I-205 southbound off-ramp to 134th Street over to I-5 and having it intersect NE 139th Street at the same location as the southbound on-ramp to I-5, and realigning the northbound on-ramp to I-5/I-205 to opposite the northbound off-ramp from I-5.
- Widening the Phase 1 proposed northbound off-ramp to 139th Street to three lanes: two left-turn lanes, and one right-turn lane.
- NE Hwy 99, 119th Street from NE 122nd Street, Bridge Replacement (project received bridge replacement funding and was completed in late summer 2008).
- Upgrades to existing traffic signals and signal coordination (equipment upgrades and/or signal interconnections) along NE/NW 139th Street and Skyview High School, NW 2nd Avenue, NE 3rd Avenue, NE 20th Avenue, and NE 23rd Avenue; Tenney Road at NE 136th Street/Fred Meyer and at NE 10th Avenue; NE 134th Street at NE 27th Avenue, NE 29th Avenue, and NE Salmon Creek Avenue; Highway 99/NE 20th Avenue at Safeway; and Highway 99 at NE 129th Street.
- New signals are anticipated to be installed at the following locations prior to Phase 1: NW 21st Avenue at NW Bliss Road/Hathaway, NW 139th Street at NW 11th Avenue, NW Bliss Road at NW 36th Avenue, existing WSU entrance and Salmon Creek Avenue, and the proposed new WSU entrance onto Salmon Creek Avenue.
- I-205–Mill Plain Exit–112th Connector: This project would provide a direct connection to NE 112th Avenue from the off-ramp of northbound I-205 to westbound Mill Plain Boulevard. The addition to the existing northbound I-205 off-ramp to westbound Mill Plain Boulevard would give drivers a direct connection to NE 112th Avenue, completely bypassing Mill Plain Boulevard. This project is now under construction with an expected completion date of late 2009.
- I-205–Mill Plain Interchange to NE 18th Street: Stage 1 would construct a segment of a new off-ramp that would eventually connect I-205 to NE 18th Street, and would be included with the construction of the I-205–Mill Plain–112th Connector project, which began construction in June 2008. Stage 2 would construct a partial interchange at I-205/NE 18th Street, and would include a system of grade-separated on- and off-ramps between Mill Plain Boulevard and NE 18th Street.

- I-5–SR 501 Ridgefield Replacement Interchange: This project would improve safety and mobility by replacing the existing I-5 interchange at SR 501 in Ridgefield, widening SR 501 to two lanes in each direction and adding new turn lanes at the interchange, making improvements to the SR 501/56th Place and Pioneer Street/ 65th Avenue intersections, and adding bike lanes and sidewalks for pedestrian travel. Project design, environmental analysis and right of way acquisition would be complete in 2010.
- SR 502–Widening from I-5 to Battle Ground: This project would widen SR 502 from two to four lanes from I-5 east into the city of Battle Ground. Construction is currently scheduled to begin in 2012.
- I-5/99th C-TRAN Park-and Ride: completed in late 2007.
- Completion of the Pioneer Street extension from 65th Avenue in Ridgefield to NE 10th Avenue (also known as 85th Avenue in Ridgefield; completion expected 2012).
- Widening of 10th Avenue between NE 141st Street to NE 149th Street to one lane in each direction, center turn lane, sidewalks, bike lanes, and planter strips (anticipated construction start date is 2015). A separate environmental review process would occur for this project.
- 179th Street improvements from NE 10th Avenue to 29th Avenue. This project would construct a principal arterial - 2 travel lanes each direction, center turn lane or median, bike lanes, sidewalks, and planter (anticipated construction start date is 2016). A separate environmental review process would occur for this project.
- Construction of a new interchange on I-5 at SR-502, near 219th Street (completed fall 2008).
- Washington State University Campus Expansion: Anticipated completion year is 2028.
- Commercial development at former Waste Management site: Anticipated completion date is unknown at this time.

1.8 Methods

Air quality conformity regulations require that a project in a maintenance area conform to the National Ambient Air Quality Standards (NAAQS) for certain pollutants. For this project, the quantity of carbon monoxide (CO) was identified and compared to the NAAQS.

Not all intersections require modeling. According to federal regulations (40 CFR 93), only very congested intersections that are at Level of Service (LOS) D, E, or F or would be LOS D, E, or F as a result of project operation require quantitative analysis.

An air quality screening tool called Washington State's Intersection Screening Tool (WASIST) determines the dispersed levels of CO in an area. This screening tool uses EPA approved Mobile 6 tailpipe emission factors and runs the nationally required dispersion model CAL3QHC in the background. Inputs into the program include volume of vehicles, the timing of the signal, the amount of CO emitted by vehicles at certain speeds, the characteristics of the surrounding land use, and other variables. Traffic information used in the program uses the heaviest or peak volume information to give a "worst case scenario" CO level.

The program calculates CO levels at receptors (locations where people are likely to be walking or standing, such as sidewalks or bus stops). This quantity is then added to the background level of CO present in many urban areas from other sources. This provides the amount of CO that a person would be exposed to at a heavily congested intersection. This is then compared to the NAAQS (see Exhibit 4 for intersections evaluated for this project).

If the modeled quantity of CO at the intersections is below NAAQS, then the project meets project level conformity. If the modeled quantity is above NAAQS, but the Proposed Build Alternative scenario is below the No Build Alternative, the project still conforms. However, if the No Build Alternative CO levels are lower than the Proposed Build Alternative levels, then the project does not conform and we must be identify ways to move traffic more smoothly through the problem area and modify the project. See Appendix A for a detailed description of air quality modeling methodology, including how specific intersections were selected for modeling.

This report has been prepared using guidance provided in the WSDOT Environmental Procedures Manual (2008).

1.9 Project Setting in Relation to National Ambient Air Quality Standards

Federal regulations require projects that might have an effect on certain air pollutants to demonstrate they conform to NAAQS. These standards were established to protect human health and welfare. Some areas have CO or 1-hour ozone levels that exceed the NAAQS. These are called nonattainment areas.

Maintenance areas are areas that previously did not meet the NAAQS, but, with air quality improvement, currently do not exceed them. The Salmon Creek Interchange is located within maintenance areas for carbon monoxide and 8-hour ozone. Under current regulation, certain transportation projects in CO nonattainment and maintenance areas must meet conformity requirements. However, because of EPA's change of focus to the 8-hour ozone standard, 1-hour ozone maintenance areas do not need to be studied for conformity. The Clark County area is currently in compliance with the federal 8-hour ozone standard.

The project area contains major arterials and several highways, with many traffic signals where vehicles will be stationery for a period of time. During peak times or periods of heavy traffic volumes, mobility may be affected. At these times, the CO levels would be at the highest levels during the day and may become concentrated.

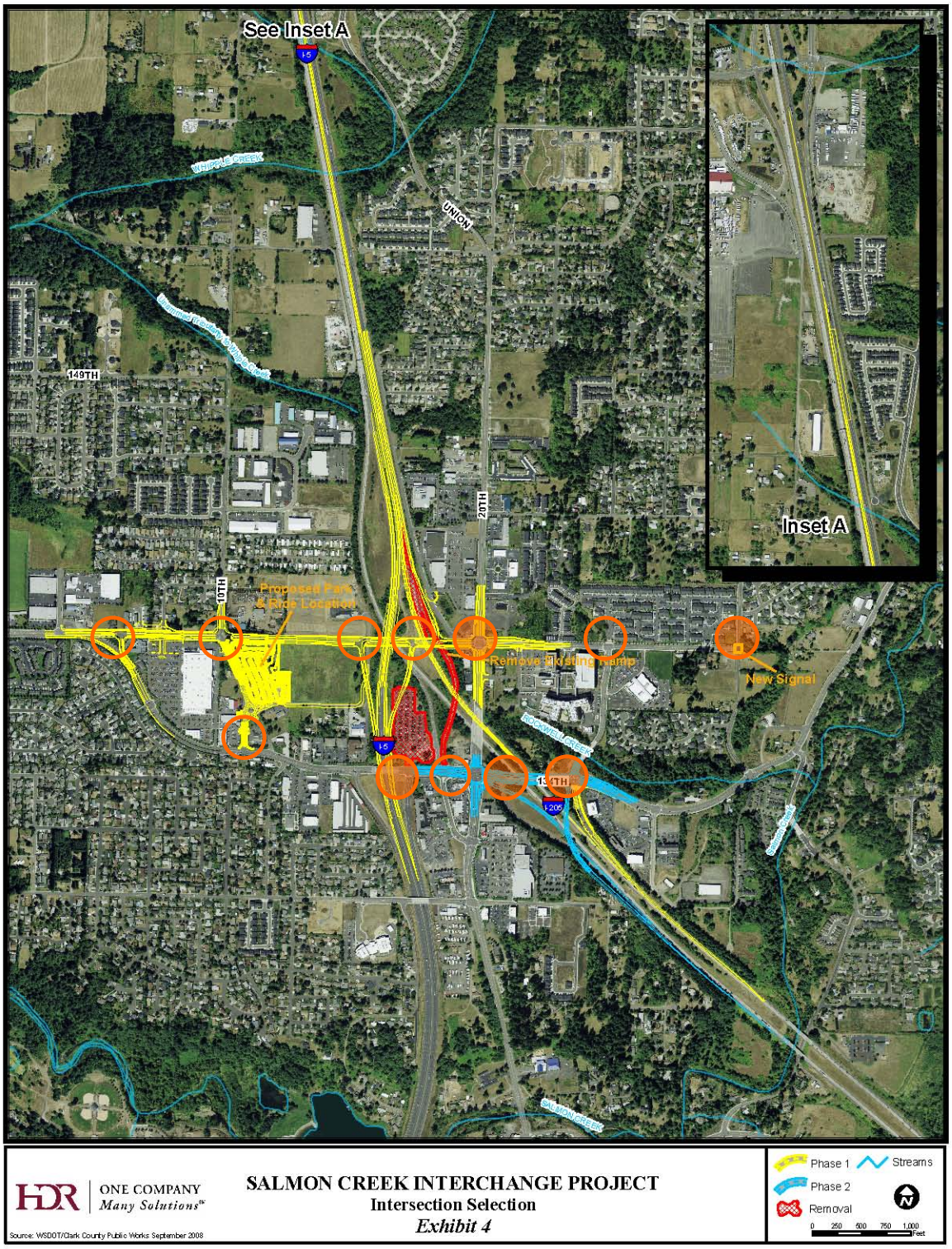
Projects within CO nonattainment and maintenance areas must demonstrate conformity to the NAAQS (Washington Department of Ecology [WDOE] 2000). Conformity is demonstrated in two ways:

- Regional Conformity: A regionally-significant project is included in a region-wide air quality modeling effort to demonstrate the maintenance area as a whole would conform to the NAAQS.
- Project-Level Conformity: Project carbon monoxide emissions must be evaluated or quantified near traffic signals in areas where people are outside, such as on sidewalks or bus stops.

Conformity is demonstrated when the following three conditions are met:

- The project would not cause or contribute to any new violation of any NAAQS.
- The project does not increase the frequency or severity of any existing violation of any NAAQS.
- The project does not delay timely attainment of the NAAQS.

Projects that do not meet regional and project level conformity may not be implemented.



Intersection at LOS D, E or F in Existing, Year of Opening or Horizon (hot spot analysis required for 3 worst intersections).

Intersection at LOS A, B or C in Existing, Year of Opening and Horizon Year (no hot spot analysis required).

1.9.1 Regulations and Air Quality Agencies

Several agencies regulate the air quality in the project area: the U.S. Environmental Protection Agency (EPA), Washington Department of Ecology (WDOE), and the Southwest Clean Air Agency (SWCAA). These agencies regulate the concentrations of pollutants in the air, and emissions from pollutant sources. EPA air quality standards govern unless a local agency has adopted more stringent standards.

SWCAA has responsibility for all outdoor air pollution sources within five counties, except for automobiles, chemical paper and pulp mills, and aluminum reduction plants. The agency governs activities or emissions from a number of sources such as wood stove, outdoor and agricultural burning, and industrial sources of air pollution.

Existing air quality is measured and monitored by WDOE and SWCAA to determine whether an area is maintaining air quality that meets the required standards.

Clark County addresses air quality in county codes, but does not directly regulate air quality standards or traffic sources of air pollution. The county maintains and enhances air quality through the local permitting process and defers to the SWCAA on matters of stationary air pollution, and supports the regional transportation planning agency (Southwest Washington Regional Transportation Council or RTC) in the reduction of mobile sources of air pollution.

1.9.2 Agency Coordination and Regional Conformity

This air quality analysis was developed in coordination with the RTC, which is responsible for long range transportation planning for the metropolitan area of Clark County. The Metropolitan Transportation Plan (MTP) is developed by RTC through a coordinated process between local jurisdictions to develop regional solutions to transportation needs.

RTC is also responsible for administering the Transportation Improvement Program (TIP), a 3-year priority list of federally-funded transportation projects to be built in Clark County. The TIP must be consistent with the MTP and meet clean air standards. To obtain federal funds a project must be included in the TIP.

The air quality horizon year for this analysis was determined in coordination with RTC's long-range planning year of 2030. During 2005, RTC began the transition to a 2030 planning year, adopted in late 2005. The 2030 traffic data is also available for air quality modeling. Traffic volumes used for this analysis were determined by WSDOT in coordination with RTC's current planning efforts based on their 2004 Comprehensive Plan for land use traffic generation.

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2.0 AFFECTED ENVIRONMENT

2.1 Project Area

The Salmon Creek Interchange is surrounded primarily by commercial and residential areas. Commercial areas occur closest to the I-5 and I-205 interchange and other major streets, though there are one or two pockets of residential sections in this area. Most of the residential areas are located away from the interchange and major intersections.

Localized air quality evaluation considers locations where people would be using sidewalks, parks, bus stops, or other gathering areas near an intersection. Sidewalks are located adjacent to all of the intersections in this project. The library near the intersection of NE Tenney Road and NE 139th Street has a summer outdoor reading program. There are no parks, schoolyards, or other outdoor human use areas in the vicinity of the intersections.

Currently, the major intersections in the project area operate during peak times at LOS A, B, or C, except for NE 134th at the I-5 northbound ramp during the evening peak. During the heaviest evening traffic, this intersection would be at LOS F. This means only one intersection has inferior air quality in the project area and it occurs in the evening. This is due to long delays and traffic volumes at this location.

This does not necessarily mean CO levels exceed NAAQS, but this intersection would be more likely than others to exceed them.

2.2 Existing Air Quality

The evaluation of existing air quality is based on ambient air quality data collected and published by the EPA. In general, air quality monitoring stations are located where air quality problems have been identified in the past. Currently, the air quality in the project vicinity is generally good.

Sources of pollutants in the Vancouver area include wood burning, businesses, industries, and vehicular traffic. Wood burning produces particulate matter (PM_{10} [particulate matter with a diameter of 10 microns or less] and $PM_{2.5}$ [particulate matter with a diameter of 2.5 microns or less]), which is more prevalent during winter due to home heating with wood fireplaces and woodstoves.

Vehicular traffic is responsible for most of the CO emissions in the area. Other pollutants from traffic include the ozone precursors hydrocarbons and nitrogen oxides. Vehicle exhaust also emits particulate matter.

Monitors of these pollutants are present in the project vicinity. The closest monitors to the project are as follow:

- The nearest monitors for CO are located at Atlas and Cox Upholstery at 2101 4th Plain Blvd., and at 7701 NE Hwy 99. In the past 10 years only one exceedance occurred in 1999. In the past three years CO levels have been well below the 1- and 8-hour standards (EPA, 2005).
- The nearest ozone monitors are located at the Mt. View School at 1500 SE Blairmount Drive in Vancouver, and at the Hockinson School at 19912 NE 164th St. in Clark County. Since 1994 there has been no exceedance of the 1- or 8-hour standards (EPA, 2005).
- The nearest monitoring station for PM_{10} is at the Moose Lodge at 8205 E. 4th Plain Blvd. in Vancouver. There was one exceedance of PM_{10} at this location in 1999 (EPA, 2005).

- The nearest monitoring station for $PM_{2.5}$ is at the Moose Lodge at 8205 E. 4th Plain Blvd. in Vancouver. There have been no exceedances since monitoring for this pollutant began in this location in 1998 (EPA, 2005).

It is unlikely that CO levels at any project intersections currently exceed air quality standards, with the exception of the one intersection mentioned previously (NE 134th at the I-5 northbound ramp) during the evening peak traffic.

2.3 Project Area Terrain Features and Meteorology

Project area meteorology is similar to conditions in the Puget Sound region. The marine climate is characterized by fall rains beginning in October and lasting until spring. Rainfall averages 4 to 9 inches monthly during the winter. Snow occurs occasionally in the region and temperatures can drop 10 to 20 degrees Fahrenheit. Winds usually originate from the south and southwest.

During spring and summer, high pressure systems become more frequent. Temperatures during the day average 70 to 80 degrees Fahrenheit. Rainfall averages drop to 1 inch monthly from July to September. Winds during summer usually originate from the north and northwest.

Temperature inversions occur in the area during fall and winter, which can trap pollutants and cause health problems for some people.

The project area terrain contains flat areas and areas of rolling terrain; however, there are no major topographic features that would cause polluted air to become trapped in the area.

For descriptions of climate effects, pollutants, and pollutant health effects, please see Appendix B.

3.0 EFFECTS

3.1 Direct Effects

3.1.1 Temporary

Major construction activities would include demolition of pavement and bridge structures, earthwork, new bridge construction, and new paving. Equipment to be used for construction would include pile driving equipment, truck cranes, vibratory oscillator, dump trucks, loaders, excavators, and typical paving equipment such as graders, asphalt pavers, and rollers.

Minor PM_{10} emissions may be associated with project construction, particularly for earthwork or demolition activities. PM_{10} emissions can vary from day to day, depending on the level of activity, specific operations, and weather conditions. PM_{10} emissions depend on soil moisture, silt content of soil, wind speed, and amount and type of equipment operating. Larger dust particles settle near the source, while fine particles are dispersed over greater distances from the construction site.

PM_{10} from construction activities is noticeable if uncontrolled. Mud and particulates from trucks are also noticeable if construction trucks are routed through residential neighborhoods. Mitigation measures would be in place during construction to ensure compliance with SWCAA's regulations, which require the control of dust during construction and prevention of deposition of mud on paved streets.

Burning would not be allowed in the project area, so there would be no contribution of particulate matter from burning.

In addition to particulate emissions, heavy trucks and construction equipment powered by gasoline and diesel engines generate CO and NO_X in exhaust emissions. If construction traffic reduces the speed of other vehicles in the area, emissions from traffic would increase slightly while those vehicles are delayed. These emissions would be temporary, limited to the immediate area surrounding the construction site, and would contribute a small amount compared with automobile traffic in the project area.

Odors may be detected by people near asphalt paving operations. These odors would be temporary and would decrease with increased distance from the source. We do not anticipate using asphalt or gravel plants on this project.

3.1.2 Permanent

Table 2 shows the maximum CO concentrations at each modeled intersection for the 1-hour and 8-hour concentrations.

Table 2. CO Concentration Results

Alternatives	Intersections									
	NE 139th at 20th Ave		NE 134th at 20th Ave		NE 134th at 23rd Ave		NE 134th at I-5 NB Off Ramp		NE 139th at 29th Ave	
Averaging Time	8 hour	1 hour	8 hour	1 hour	8 hour	1 hour	8 hour	1 hour	8 hour	1 hour
Existing 2005	4.8	5.5	8.0	10.1	7.2	9.0	7.4	9.3	4.1	4.6
2013 No Build	6.0	7.3	7.4	9.3	6.9	8.6	6.4	7.9	4.5	5.2
2013 Proposed Build	6.1	7.4	7.1	8.9	6.8	8.4	5.7	6.8	4.3	4.9
2017 No Build	5.7	6.8	6.7	8.3	6.4	7.9	5.7	6.9	4.5	5.2
2017 Proposed Build	5.6	6.7	6.2	7.6	6.6	8.1	5.2	6.2	4.3	4.9
2030 No Build	5.1	6.0	6.2	7.5	5.9	7.2	5.2	6.2	4.3	4.8
2030 Proposed Build	5.2	6.1	5.7	6.9	6.0	7.3	5.0	5.8	4.0	4.5

Note: Values are in ppm. The 1-hour NAAQS for CO is 35 ppm. The 8-hour NAAQS for CO is 9 ppm

All modeled intersections are below NAAQS; therefore, project level conformity has been demonstrated.

For the carbon monoxide WASIST Model Outputs, please see Appendix C.

Predicted worst-case operational CO concentrations for the Proposed Build Alternative under the 2017 year of opening and 2030 horizon year indicated no exceedance of the 1-hour average NAAQS for CO of 35 ppm or the 8-hour average NAAQS for CO of 9 ppm at any receptor location.

Predicted worst-case operational CO concentrations for the No Build Alternative under the 2017 year of opening and 2030 horizon year indicated no exceedance of the 1-hour average NAAQS for CO of 35 ppm or the 8-hour average NAAQS for CO of 9 ppm at any receptor location.

3.2 Indirect Effects

3.2.1 Temporary

Traffic delays caused by detours or lane closures could temporarily increase CO emissions within a construction zone. In addition, if construction trucks travel during peak traffic hours, the trucks can contribute to temporary increases in emissions.

3.2.2 Permanent

Traffic volumes used for this air quality analysis incorporate anticipated traffic generated from planned development, including other known road improvement projects in the project area for future years. Therefore, this analysis includes the indirect effects of the project and other traffic growth associated with the project. No new traffic would be diverted to this location from other sources as a result of project operation.

3.3 Cumulative Effects

3.3.1 Temporary

The anticipated effects from project construction activities would not substantially lower local air quality conditions. The effects of operational conditions are not predicted to cause exceedance in any relevant air quality standards; therefore, air quality in the project vicinity would not be substantially affected by the cumulative effects of this project.

3.3.2 Permanent

Traffic volumes used for this air quality analysis incorporate anticipated traffic generated from planned development, including other known road improvement projects in the project area for current and future years. Therefore, this analysis includes the cumulative effects of the project and other traffic growth associated with the project.

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4.0 MITIGATION OR PROJECT CHANGES AS A RESULT OF AIR QUALITY

The results of this air quality study indicate that no exceedance of the NAAQS would occur as a result of project implementation. In addition, the overall project level air quality would improve in comparison to the No Build Alternative because the delay time at a majority of intersections affected by the project is improved. Many intersections are well below the standards and they would remain the same.

4.1 Alternative No. 1: Proposed Build Alternative

4.1.1 Operation

Mitigation is not required for this project because localized CO concentrations would be below the NAAQS after project construction.

4.1.2 Construction

Construction effects would be reduced by incorporating mitigation measures into the construction specifications for the project. Possible mitigation measures that may be implemented during construction to ensure compliance with SWCAA's regulations to control PM_{10}, deposition of particulate matter, and be a good neighbor include:

- Wetting materials in trucks, or providing adequate freeboard (space from the top of the material to the top of the truck) would reduce PM_{10} and deposition of particulates during transportation.
- Removing particulate matter deposited on paved, public roads would reduce mud on area roadways and prevent soil from being windblown.
- Providing wheel washers to remove mud and soil from vehicles exiting the construction site would prevent tracking and dispersion of particulates.
- Spraying exposed soil with water- or dust-suppressing palliatives would reduce PM_{10} emissions from soil disturbance and wind erosion.
- Scheduling and routing construction trucks to reduce delays to traffic during peak travel times would reduce secondary effects caused by reduced speeds and delays.
- Maintaining as many open lanes as possible during construction would reduce idling.
- Placing gravel/quarry spall aprons at entrances to construction areas and gravelling construction roads would reduce track-out and airborne dust.
- Covering disturbed soil with appropriate BMPs within the time frames specified in the WSDOT Standard Specifications Manual would protect soil from wind erosion.
- Constructing the project in accordance with the operating requirements as detailed within the equipments operating and maintenance manual.

4.2 Alternative No. 2: No Build Alternative

4.2.1 Operation

No mitigation is required because the project would not be constructed under this alternative.

4.2.2 Construction

No mitigation measures would be necessary as there would be no construction phase under this alternative.

5.0 CONFORMITY DETERMINATION

The project is located within a maintenance area for CO and, therefore, must show that existing air quality can be maintained for at least 10 years. The State Implementation Plan (SIP) is the mechanism for meeting this goal. Transportation plans, programs, and projects must comply with the SIP's emission budgets for CO.

The project is included in RTC's current conforming regional Metropolitan Transportation model for CO; therefore, it meets regional conformity requirements.

The project must also be included in the TIP to receive federal funding. The TIP is a 3-year priority list of federally-funded transportation projects, and includes a listing of all other transportation projects that utilize state and local funding. The TIP must be consistent with the MTP and meet CO NAAQS.

The project must also comply with project-level conformity criteria of the Federal Conformity Rule, and with WAC Chapter 173-420. Local CO concentrations for the existing, year of opening, and project horizon year were modeled to be below the 1-hour and 8-hour NAAQS for CO; therefore, the project would not cause any new, nor contribute to the frequency or severity of any existing exceedance of the NAAQS.

The project level hot spot analysis used the latest planning assumptions. Traffic and growth assumptions used in the regional model by the RTC (and the hot spot analysis) used Mobile 6 factors, the latest emissions estimation model available.

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6.0 SUMMARY

This study evaluated the effects on air quality of a new interchange configuration designed to improve mobility and safety, and bring transportation facilities into compliance with state and local standards.

This project meets both regional and project level air quality conformity in accordance with state and federal regulations.

- The project satisfies regional conformity as it is included in the conforming MTP. The project was included in the 2004 - 2006 TIP for design, and would have to be updated in the TIP prior to construction.
- The project meets project level conformity requirements based on hot spot air quality modeling for selected intersections.
- Both 1-hour and 8-hour averaged CO concentrations would be below NAAQS in the existing year (2005), the year of opening (2017), and the horizon year (2030) for the constructed project at all modeled intersections.
- Because the project would not cause any new, nor contribute to any existing exceedance of the NAAQS, it would conform to the SIP for CO. It would also not delay the timely attainment of any standard.

Construction activities would result in temporary emissions of pollutants including dust and odors. Best management practices for dust abatement would be used during construction to reduce dust emissions.

No mitigation is required for project operation because the project conforms to both regional and local air quality requirements.

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7.0 REFERENCES

Environmental Protection Agency (EPA)
2005 AirData

Washington Department of Ecology (WDOE)
2000 1999 Air Quality Trends in Washington. Olympia, Washington, 2000.

Washington State Department of Transportation (WSDOT)
2008 Environmental Procedures Manual. Olympia, Washington, 2008.

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