CHAPTER 4 DESCRIPTION OF THE PROPOSED PROJECT

What is the intent of the Tukwila to Renton Project?

WSDOT is proposing to construct the I-405, Tukwila to Renton Improvement Project (I-5 to SR 169 – Phase 2), referred to as the Tukwila to Renton Project, to relieve congestion. Relieving congestion will benefit the public by:

- Lowering the number of accidents thus improving safety.
- Increasing overall speeds through this section of freeway.
- Improving response times for emergency service vehicles using I-405.
- Improving access to and from I-405 and local circulation.

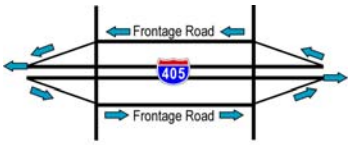
The Tukwila to Renton Project extends approximately four miles along I-405, from I-5 to SR 169, and approximately two miles along SR 167, from I-405 to SW 43rd Street. The project adds capacity to both I-405 and SR 167; improves the SR 181 and SR 169 interchanges; reconstructs the SR 167 interchange consisting of a split-diamond interchange at Lind Avenue and Talbot Road with connecting frontage roads, general-purpose direct-connector ramp from I-405 to SR 167 southbound, and high-occupancy vehicle (HOV) direct-connector ramps from SR 167 northbound to I-405 northbound and from I-405 southbound to SR 167 southbound. These improvements are detailed in the following section.

What are the details of the Tukwila to Renton Project?

The Tukwila to Renton Project improvements are described from west to east (northbound) along the study area on the following pages. These improvements are also illustrated on Exhibits 4-1 through 4-15.

What is a split-diamond interchange?

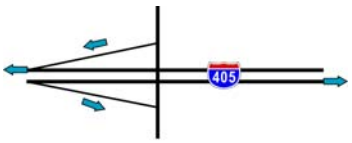
This interchange type consists of two half-diamond interchanges at arterials. These are connected by two, one-way frontage roads. Traffic enters and exits the freeway at the two arterials, creating an elongated diamond configuration as shown.



Split Diamond

What is a half-diamond interchange?

It is an interchange where traffic exits or enters the freeway in one direction. This creates a triangular or half-diamond configuration as shown.



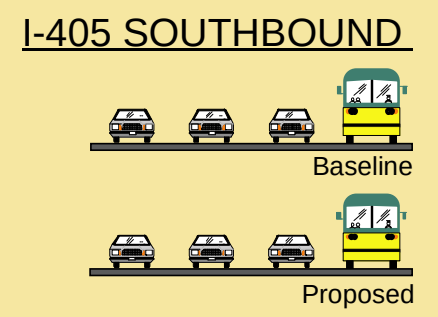
Half Diamond

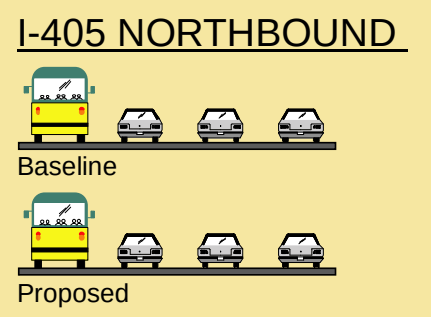
Exhibit 4-1: Project Features, Sheet 1

I-405 from I-5 to SR 181

For this portion of the project, WSDOT will:

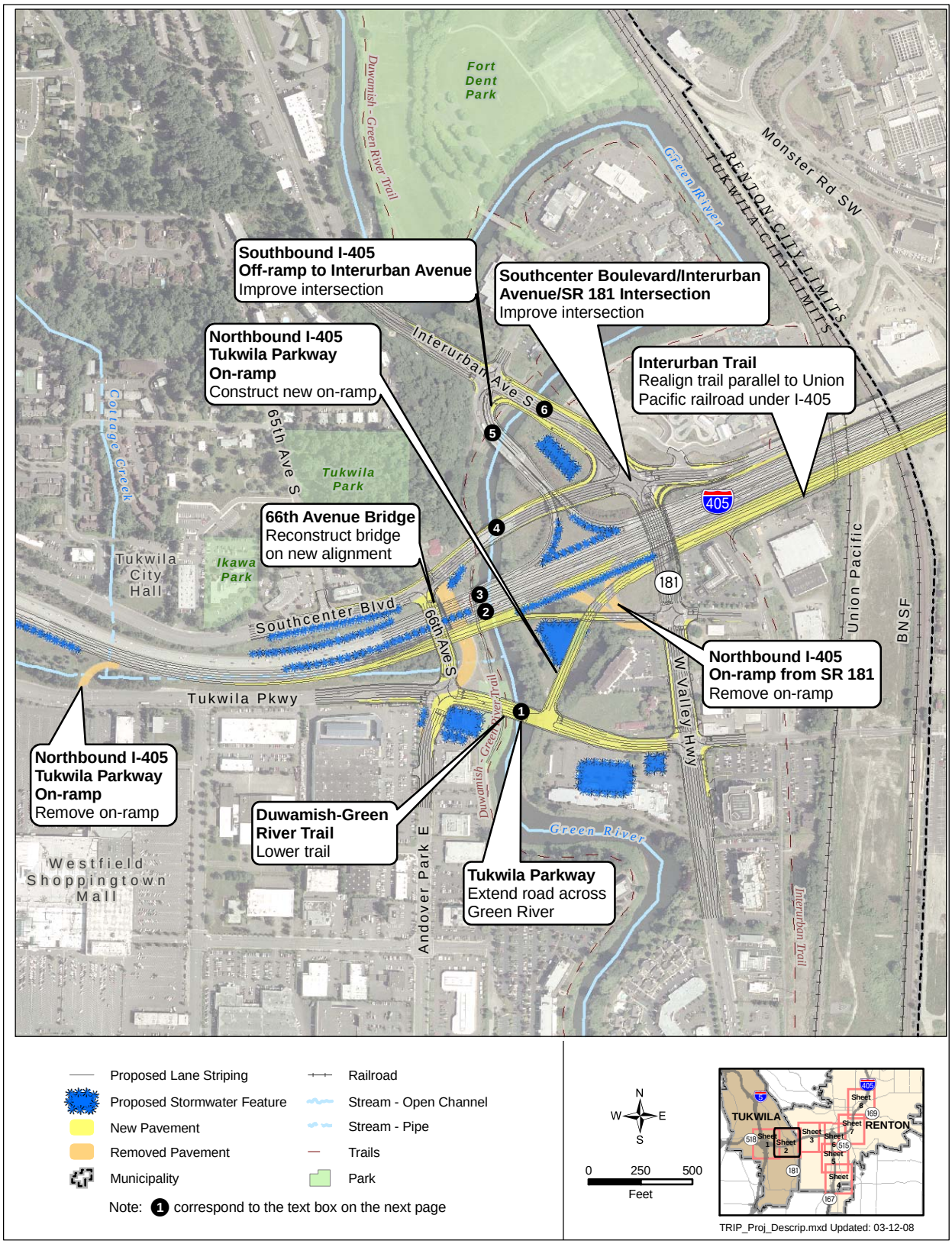
- Remove the existing northbound I-405 Tukwila Parkway on-ramp. See Exhibits 4-2 and 4-3 for where the project will provide a new on-ramp.
- Realign I-405 mainline slightly to the south beginning just west of the existing northbound I-405 Tukwila Parkway on-ramp to the SR 181 interchange as shown in Exhibits 4-1 and 4-2.





The project will not change capacity along this section

Exhibit 4-2: Project Features, Sheet 2



I-405 at SR 181 Interchange

WSDOT designed the improvements in Exhibits 4-2 and 4-3 to improve freeway and local travel in this area. WSDOT will:

- Improve the SR 181 interchange:
  - Remove the existing SR 181 on-ramp to northbound I-405.
  - Extend Tukwila Parkway from the intersection with 66th Avenue east over the Green River to SR 181.
  - Construct new northbound I-405 on-ramp from Tukwila Parkway just east of the new crossing over the Green River (replaces the two existing on-ramps).
  - Reconstruct the 66th Avenue S bridge over I-405 on a new alignment to the west and reconstruct the intersections with Southcenter Boulevard and Tukwila Parkway.
  - Reconstruct the off-ramp from northbound I-405 to SR 181.
  - Improve local arterials within the interchange area such as Southcenter Boulevard and Interurban Avenue.
- Reconstruct five bridges and build one new bridge over the Green River.
- Lower the Duwamish-Green River Trail.
- Reconstruct the I-405 structures over SR 181.
- Realign the Interurban Trail.

What bridge construction will occur over the Green River?

❶ Tukwila Parkway Bridge (new)

❷ Northbound I-405 Bridge

❸ Southbound I-405 Bridge

❹ Southcenter Boulevard Bridge

❺ Off-Ramp Bridge from southbound I-405.

❻ Interurban Avenue Bridge

See Exhibit 4-2 for the bridge locations.

Exhibit 4-3: SR 181 Interchange Improvements

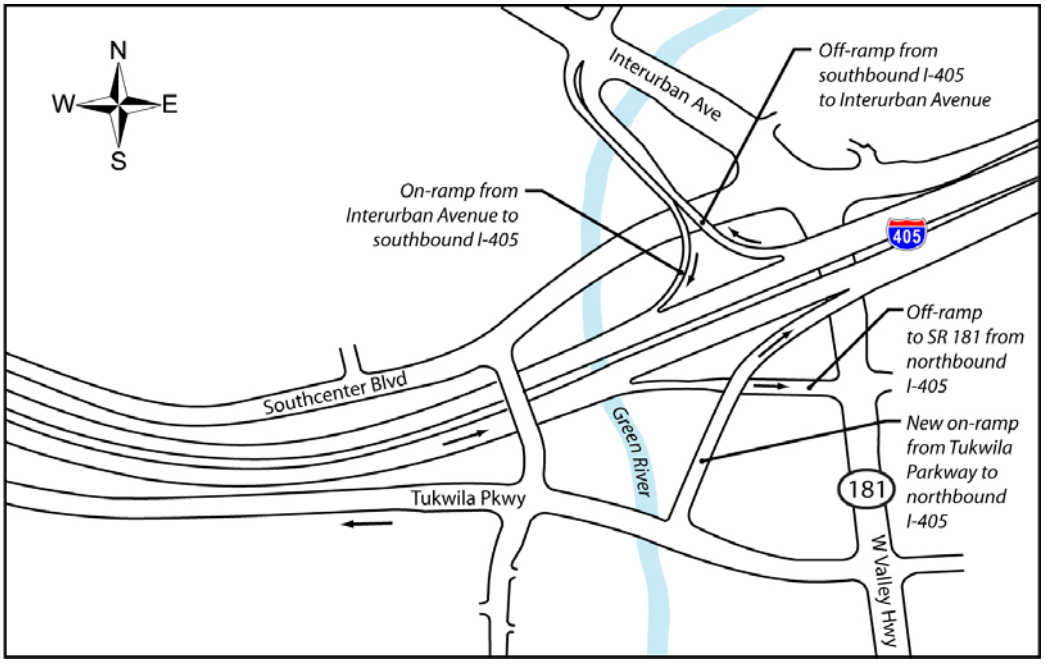
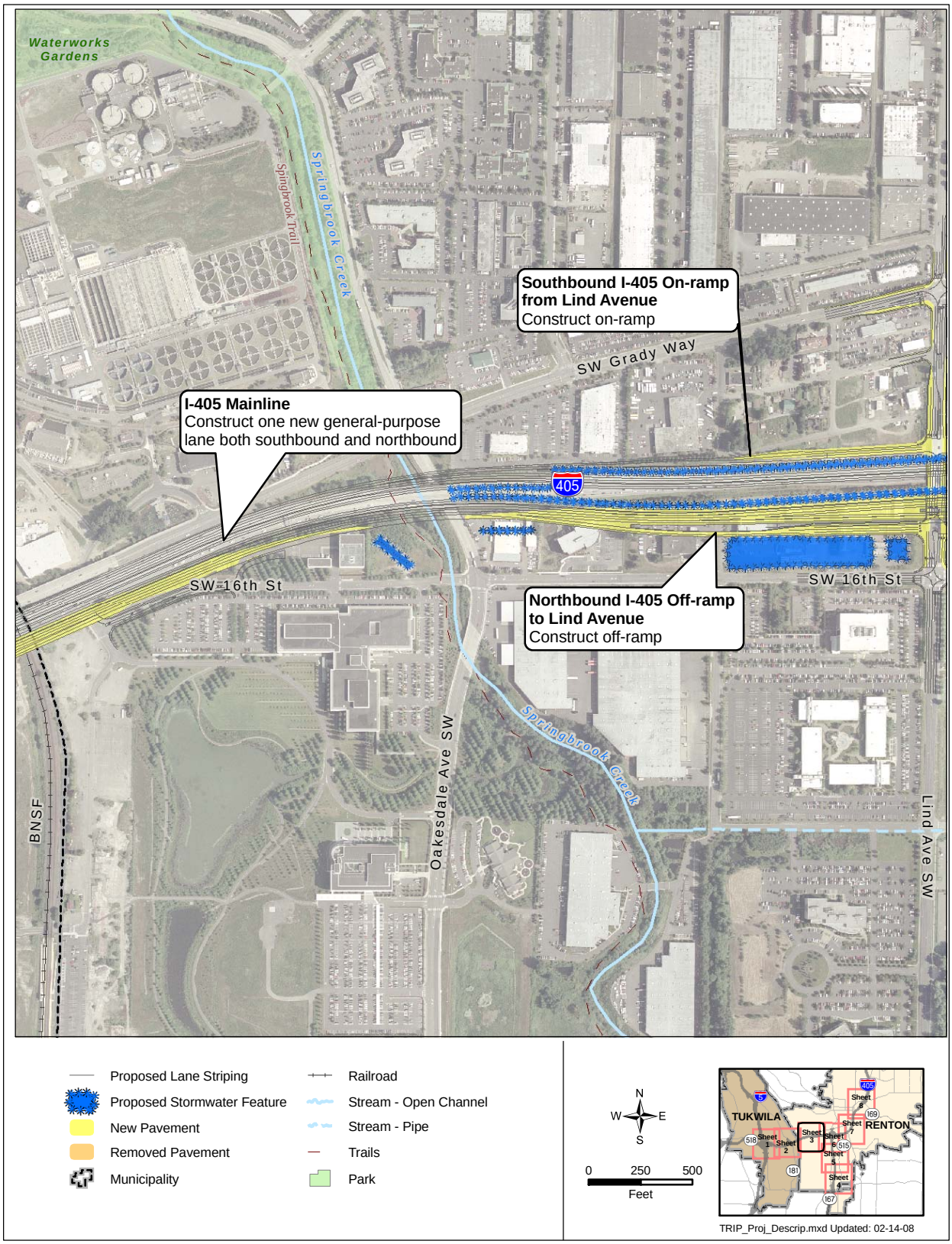


Exhibit 4-4: Project Features, Sheet 3



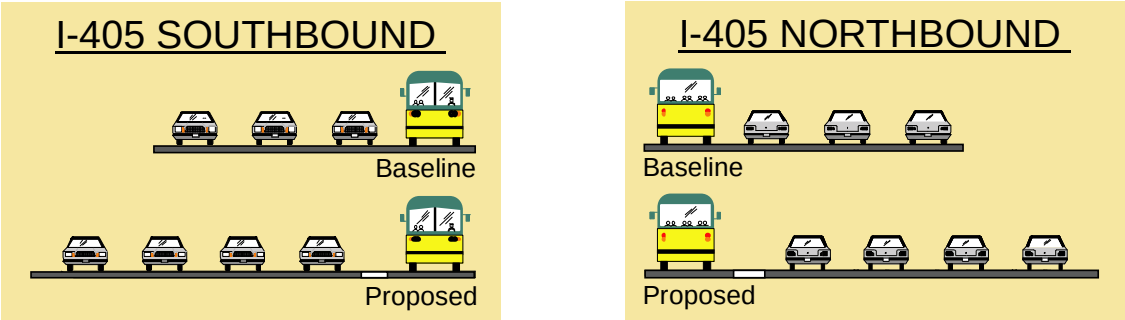
I-405 from East of SR 181 to SR 167 Interchange

From the SR 181 interchange east, WSDOT will realign I-405 to the south. This will:

- Provide a smooth transition onto the new Springbrook Creek/Oakesdale Avenue bridge that was constructed under the Renton Nickel Improvement Project.
- Minimize effects on SW Grady Way and businesses north of I-405.

In addition to realigning I-405, WSDOT will:

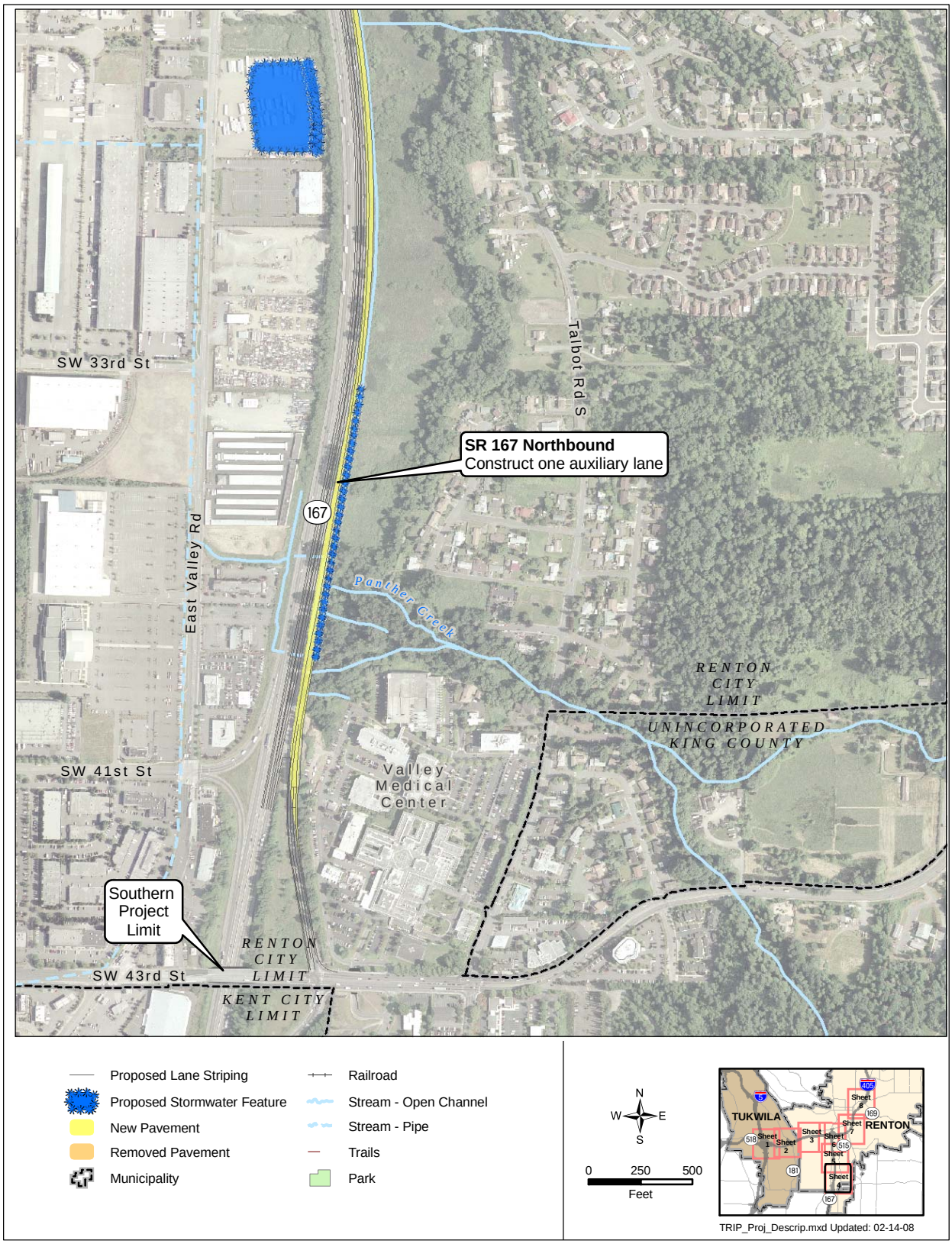
- Construct one additional general-purpose lane in both directions on I-405 from SR 181 through SR 167.
- Stripe lanes to provide a buffer between HOV and general-purpose lanes along I-405.



Project improvements will add capacity to I-405 for both southbound and northbound traffic and will provide a buffer between the HOV lane and the general-purpose lanes

- Stripe the bridges over Springbrook Creek/Oakesdale Avenue to provide five lanes in both directions.
- Reconstruct I-405 structures over the Burlington Northern Santa Fe (BNSF) and Union Pacific railroads.
- Construct a half-diamond interchange at Lind Avenue (see sidebar on page 4-1).

Exhibit 4-5: Project Features, Sheet 4



SR 167 from SW 43rd Street On-ramp North to SW 27th Street

In this area, WSDOT will:

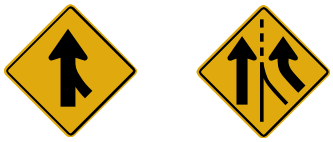
- Construct an auxiliary lane on northbound SR 167 from SW 43rd Street to SW 27th Street.
- Stripe lanes to provide a buffer between HOV and general-purpose lanes along northbound SR 167.

As shown on Exhibit 4-5, the new northbound lane will be added north of the SW 43rd Street on-ramp. This will improve the ability of traffic to merge onto SR 167 and increase capacity along this stretch. To minimize effects on the streams and wetlands along SR 167, WSDOT has used retaining walls instead of fill slopes.

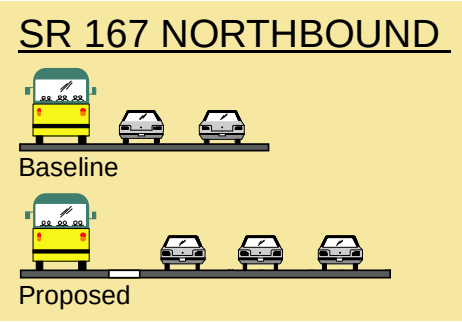
What is an auxiliary lane?

An auxiliary lane is a lane added between interchanges—from one on-ramp to the next off-ramp. It is dedicated to traffic entering and leaving the freeway and provides motorists with more time and extra room to accelerate or decelerate and merge when getting on and off the freeway.

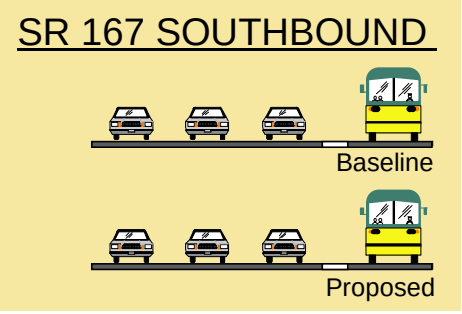
The signs below show how an auxiliary lane changes how an on-ramp operates.



Existing Proposed

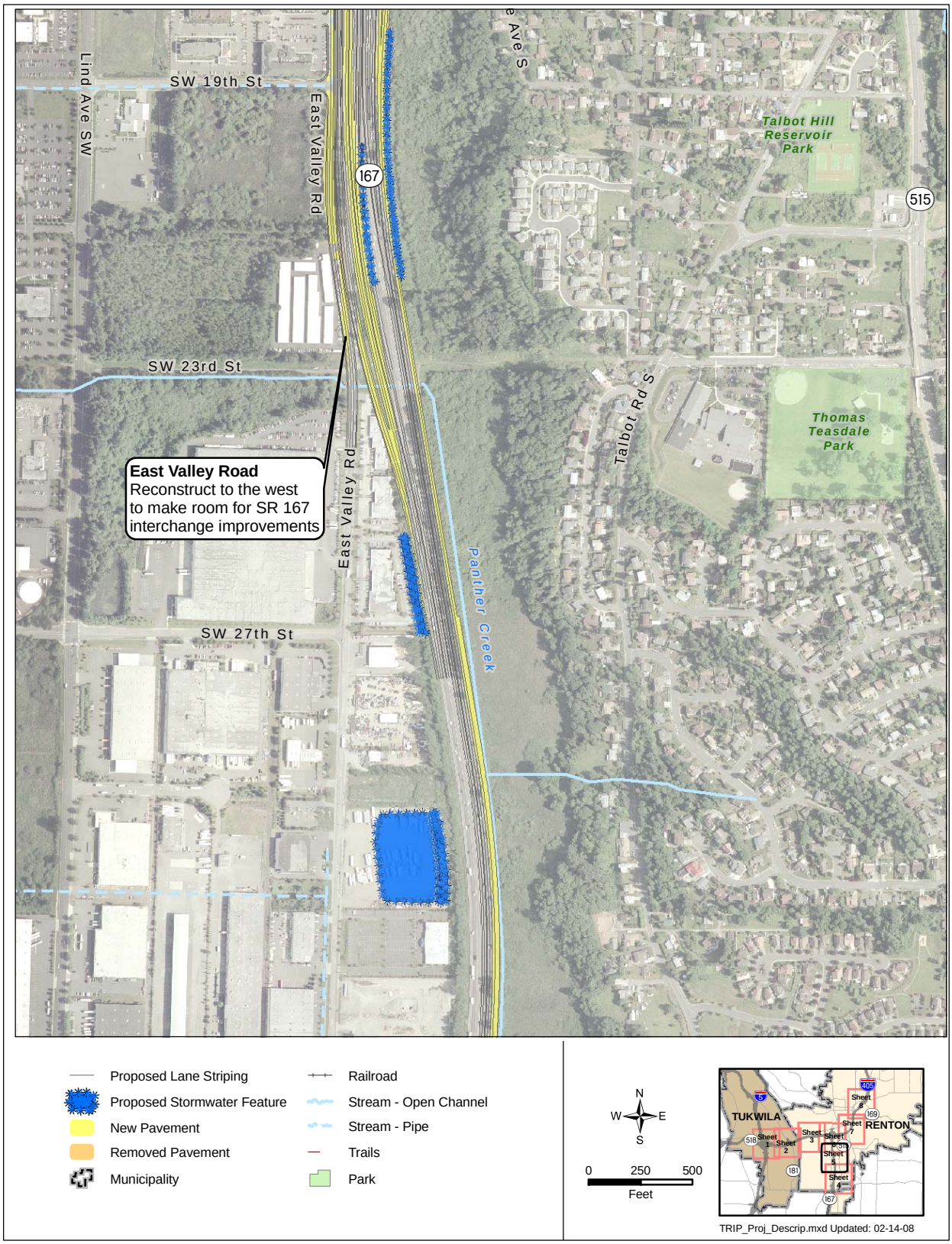


Project improvements will add capacity to northbound SR 167 and will provide a buffer between the HOV lane and the general-purpose lanes



The project will not change capacity on the southbound lanes of SR 167

Exhibit 4-6: Project Features, Sheet 5

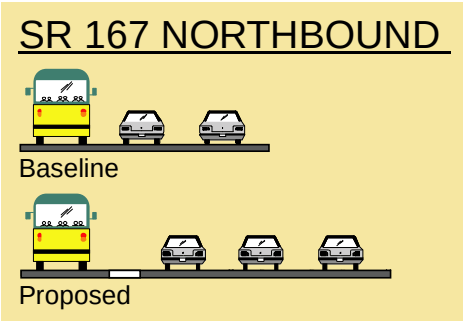


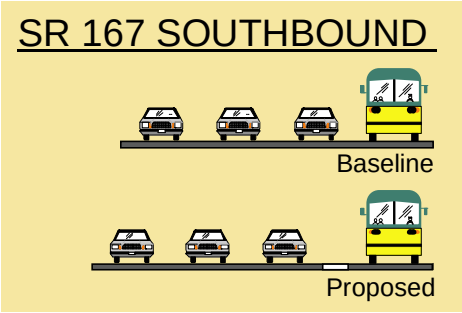
SR 167 from SW 27th Street to I-405

Along this section of SR 167, the project will:

- Reconstruct SR 167 between SW 27th Street and I-405 to accommodate the reconstructed SR 167 interchange as shown on Exhibits 4-7 to 4-9.
- Reconstruct East Valley Road to the west of its current alignment between SW 23rd Street and SW 16th Street to accommodate the reconstructed SR 167 interchange.
- Stripe lanes to provide a buffer between HOV and general-purpose lanes along SR 167.
- Construct an auxiliary lane on northbound SR 167 from SW 27th Street to I-405.

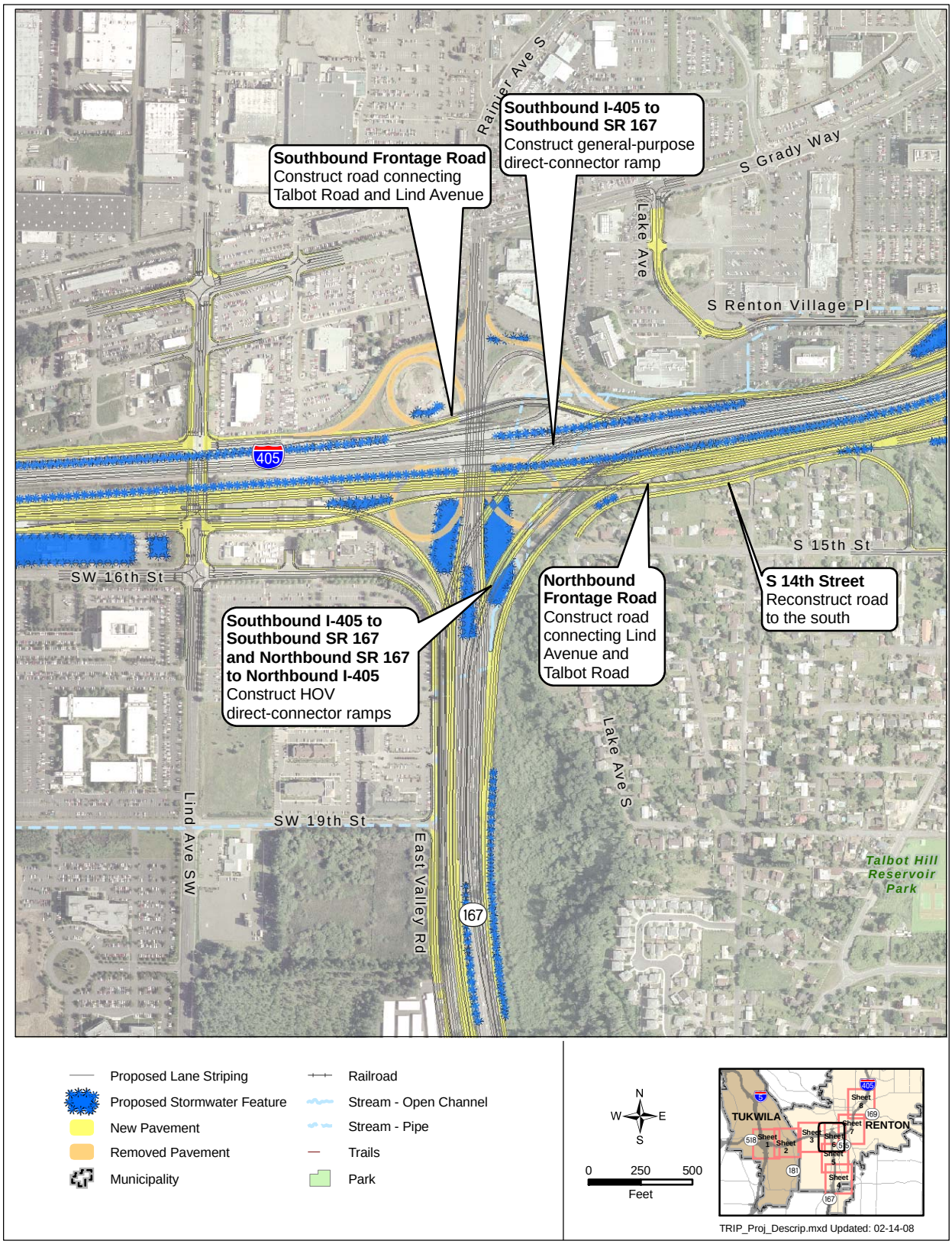
WSDOT has designed the improvements in this area to the west as much as possible to minimize effects on the Panther Creek wetlands while also limiting the effects on businesses west of SR 167. To further minimize the area needed to accommodate the improvements, the new southbound I-405 to southbound SR 167 direct-connector ramp will be built over local street and freeway improvements as shown on Exhibit 4-9. WSDOT also used design features such as retaining walls to minimize the area needed for improvements.





Project improvements will add capacity to northbound SR 167 and will provide a buffer between the HOV lane and the general-purpose lanes in both the northbound and southbound directions of SR 167

Exhibit 4-7: Project Features, Sheet 6



I-405 Interchange with SR 167

Within the I-405/SR 167 interchange, the project will improve freeway to freeway access and local access.

Freeway to Freeway Access

To improve access, WSDOT will:

- Construct a general-purpose direct-connector ramp from southbound I-405 to southbound SR 167, replacing the existing loop ramp.
- Reconstruct exterior ramps from northbound I-405 to southbound SR 167 and from northbound SR 167 to northbound I-405, replacing the existing ramps. This project will also add a general-purpose lane to both ramps.
- Construct HOV direct-connector ramps from southbound I-405 to southbound SR 167 and from northbound SR 167 to northbound I-405.
- Maintain existing loop ramp from northbound SR 167 to southbound I-405.

Exhibit 4-8 focuses on the freeway to freeway interchange improvements and Exhibit 4-9 presents how these improvements will look.

Exhibit 4-8: Freeway to Freeway Ramps in Reconstructed I-405/SR 167 Interchange

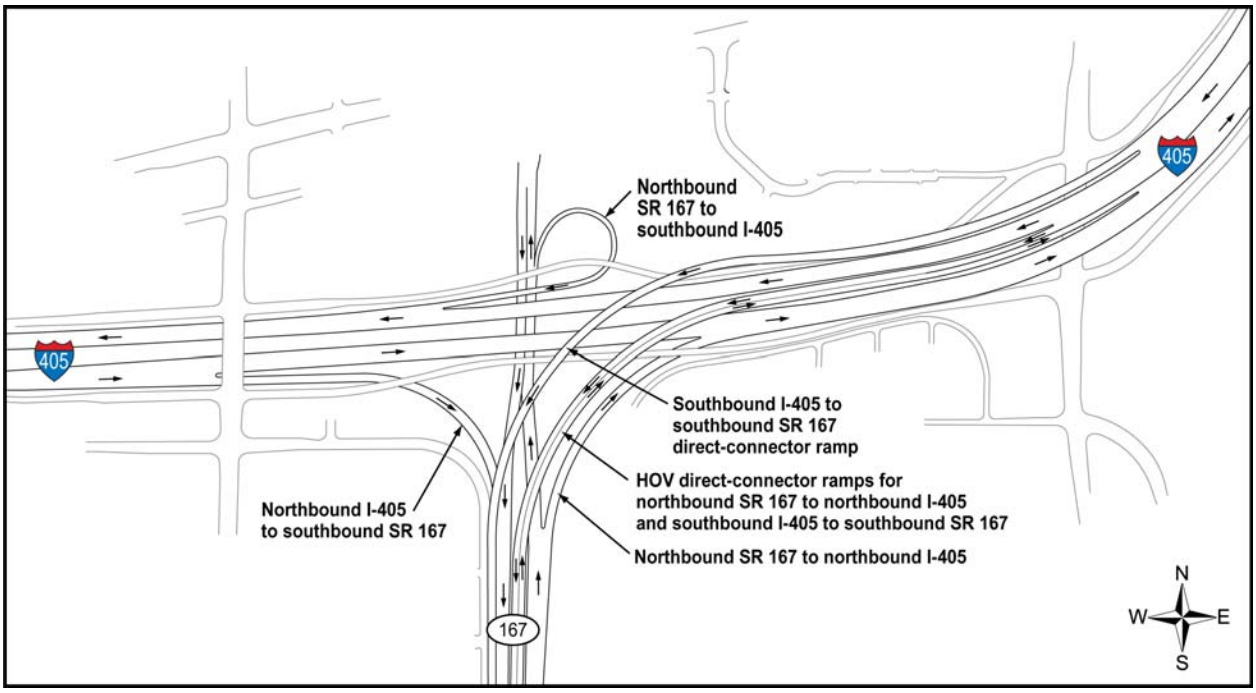


Exhibit 4-9: Rendering of I-405/SR 167 Interchange Improvements

Local Access

WSDOT will improve local access at the SR 167 interchange. The improvements will:

- Construct a split-diamond interchange at Lind Avenue and Talbot Road (SR 515). See Exhibits 4-10 and 4-11.
- Construct southbound and northbound frontage roads connecting Lind Avenue and Talbot Road. The southbound frontage road will reuse the existing I-405 to SR 167 southbound bridge.
- Reconstruct the Lind Avenue bridge over I-405.
- Reconstruct the I-405 structures over Talbot Road.
- Improve local street intersections.
- Provide new connection to Grady Way from S Renton Village Place.

Exhibit 4-10: Split-Diamond Interchange at Lind Avenue and Talbot Road

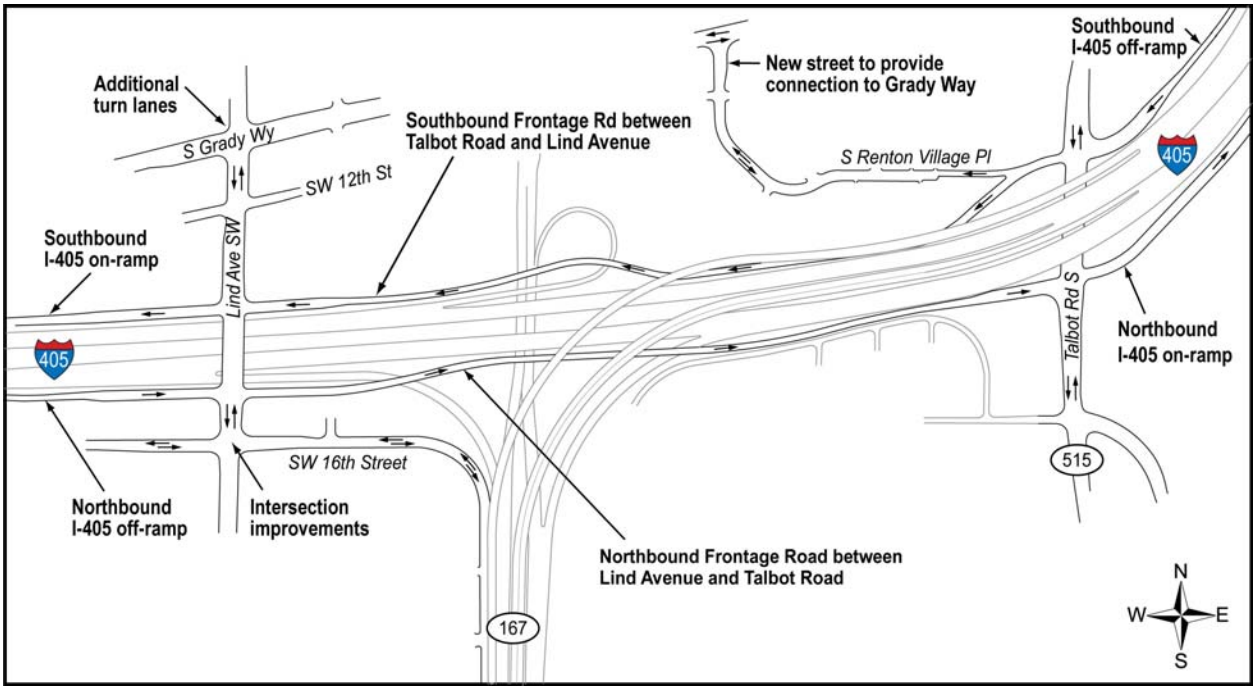
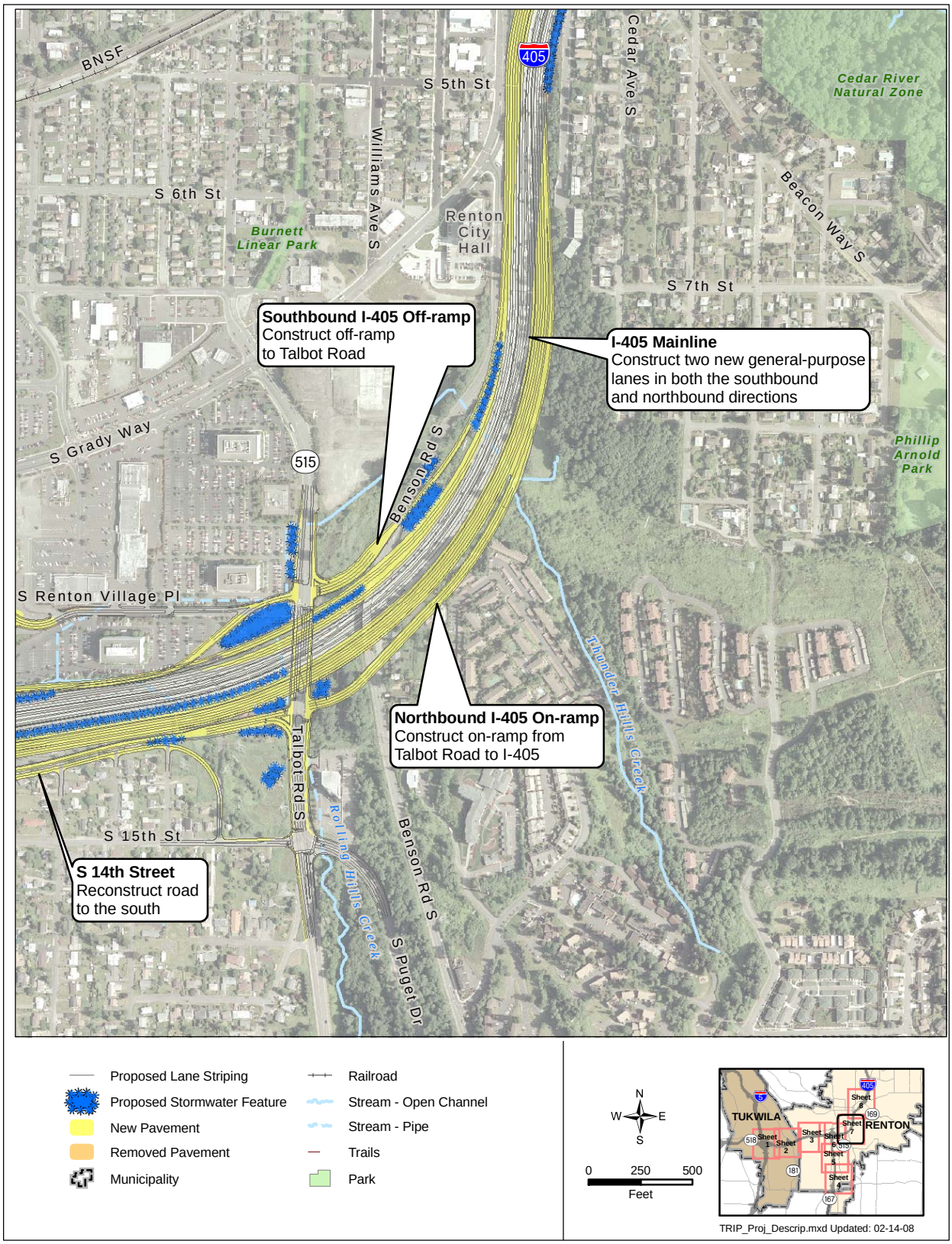


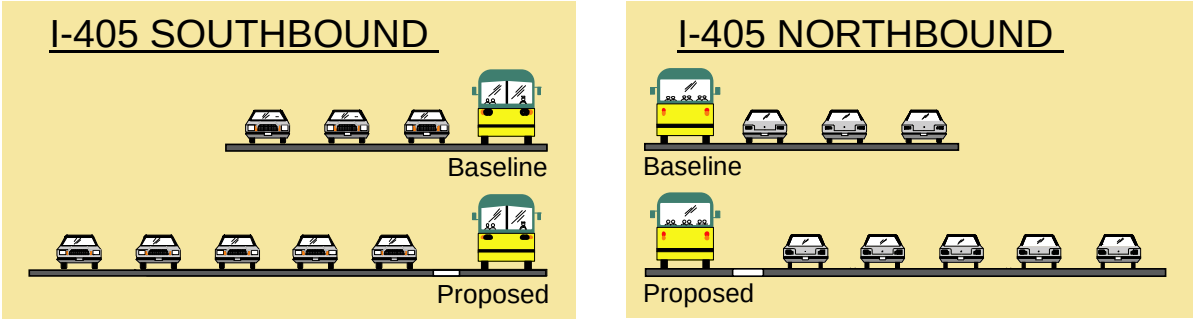
Exhibit 4-11: Project Features, Sheet 7



I-405 from East of SR 167 Interchange to North of S 5th Street

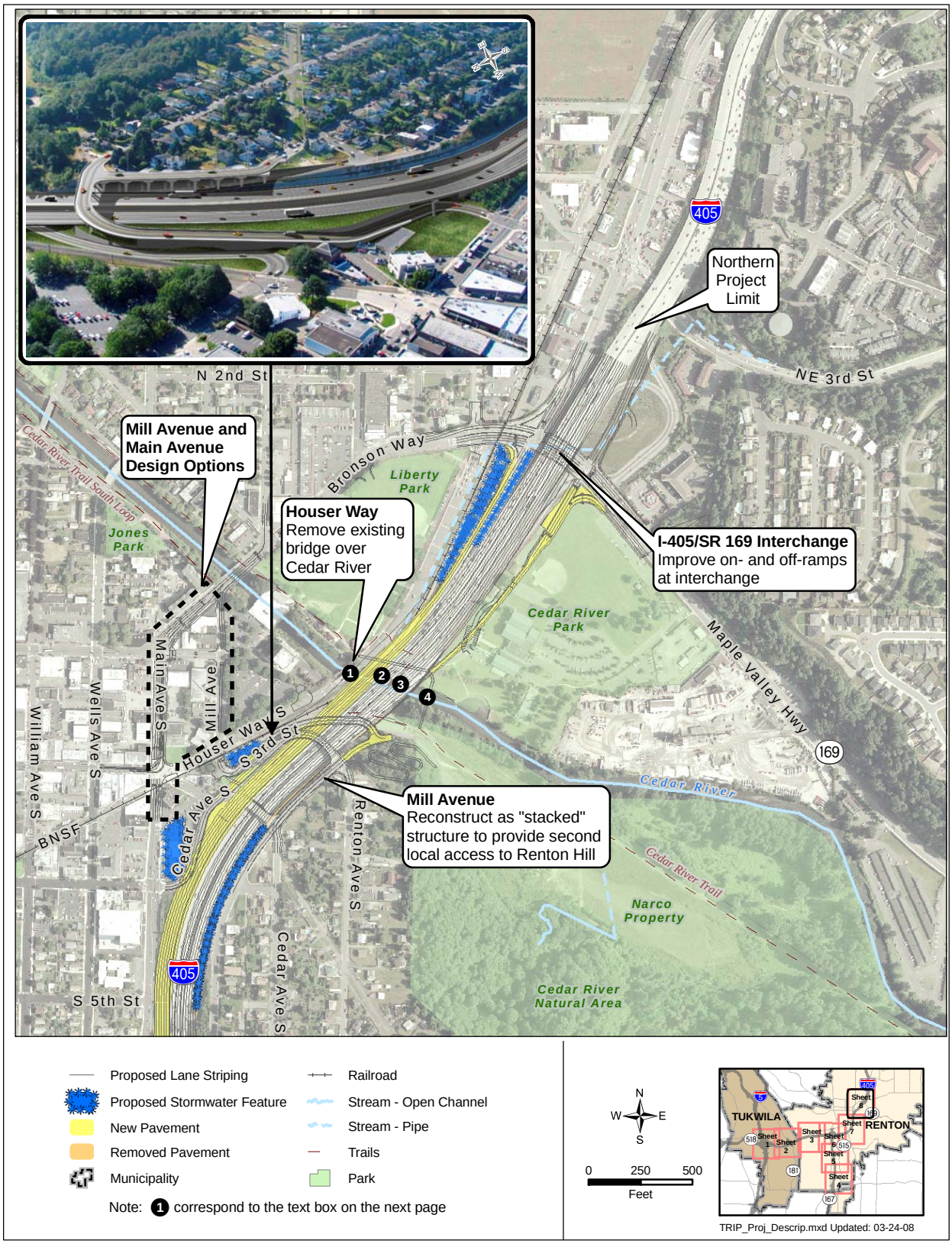
For the section of I-405 that extends from the SR 167 interchange past Renton City Hall as shown on Exhibit 4-11, WSDOT will:

- Construct two additional lanes in both directions on I-405 from SR 167 through SR 169.
- Stripe lanes to provide a buffer between HOV and general-purpose lanes along I-405.
- Construct a new half-diamond interchange at Talbot Road as shown on Exhibit 4-10.
- Reconstruct S 14th Street south of its existing location.



Project improvements will add capacity to I-405 for both southbound and northbound traffic and will provide a buffer between the HOV lane and the general-purpose lanes

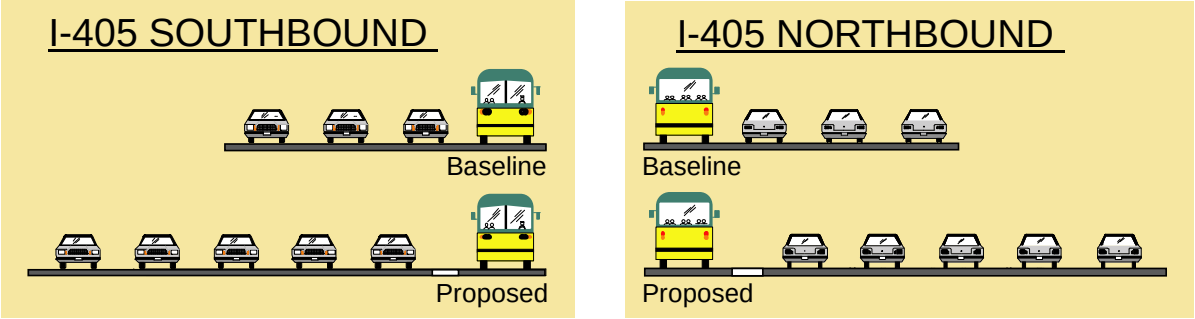
Exhibit 4-12: Project Features, Sheet 8



I-405 from S 5th Street to SR 169

This last portion of the Tukwila to Renton Project crosses the Cedar River to the SR 169 interchange. In this section, WSDOT will:

- Construct two additional lanes in both directions on I-405 from SR 167 through SR 169.
- Stripe lanes to provide a buffer between HOV and general-purpose lanes along I-405.



Project improvements will add capacity to I-405 for both southbound and northbound traffic and will provide a buffer between the HOV lane and the general-purpose lanes

- Cantilever the I-405 structures over Main Avenue.
- Reconstruct three bridges over the Cedar River: southbound I-405, northbound I-405, and a pedestrian bridge.
- Relocate the Burlington Northern Santa Fe railroad bridge.
- Close Houser Way south of the Cedar River north to Bronson Way and remove the bridge over the Cedar River.
- Reroute northbound traffic to Bronson Way, which will be striped to accommodate the new traffic pattern.
- Reconstruct two local street accesses to Renton Hill.

To accommodate the I-405 improvements, the Tukwila to Renton Project also required rerouting traffic from Houser Way and changing access to Renton Hill. These improvements are discussed on the following pages.

What bridge construction will occur over the Cedar River?

❶ Burlington Northern Santa Fe Railroad Bridge

❷ Southbound I-405 Bridge

❸ Northbound I-405 Bridge

❹ Pedestrian Bridge

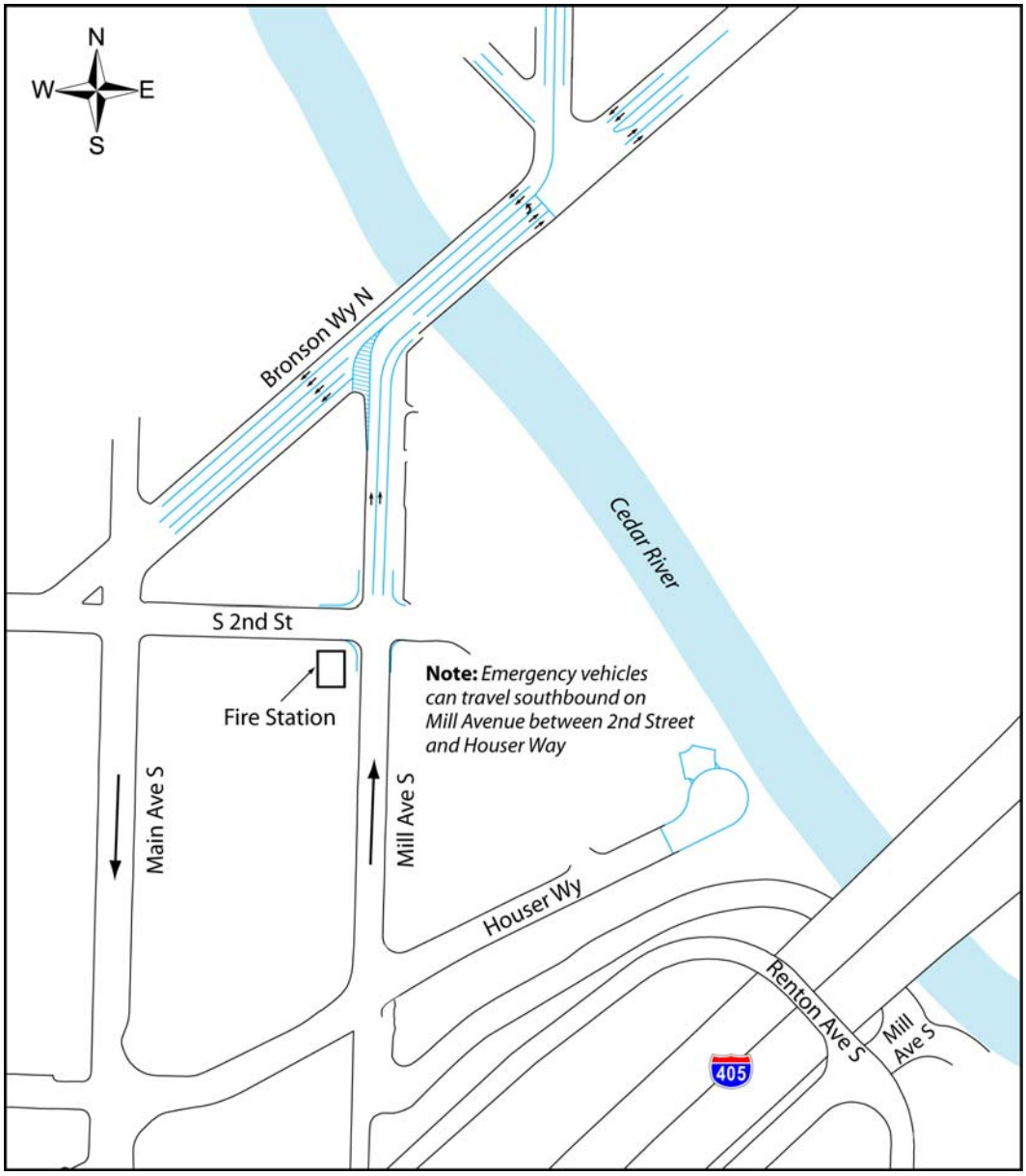
See Exhibit 4-12 for the bridge locations.

Mill Avenue and Main Avenue Design Options

To accommodate widening I-405 over the Cedar River, the Houser Way bridge will be closed. WSDOT worked closely with the City of Renton to develop the most acceptable and feasible solution for redirecting traffic coming from south of Houser Way. For northbound traffic within Renton south of the Cedar River, two design options are being considered:

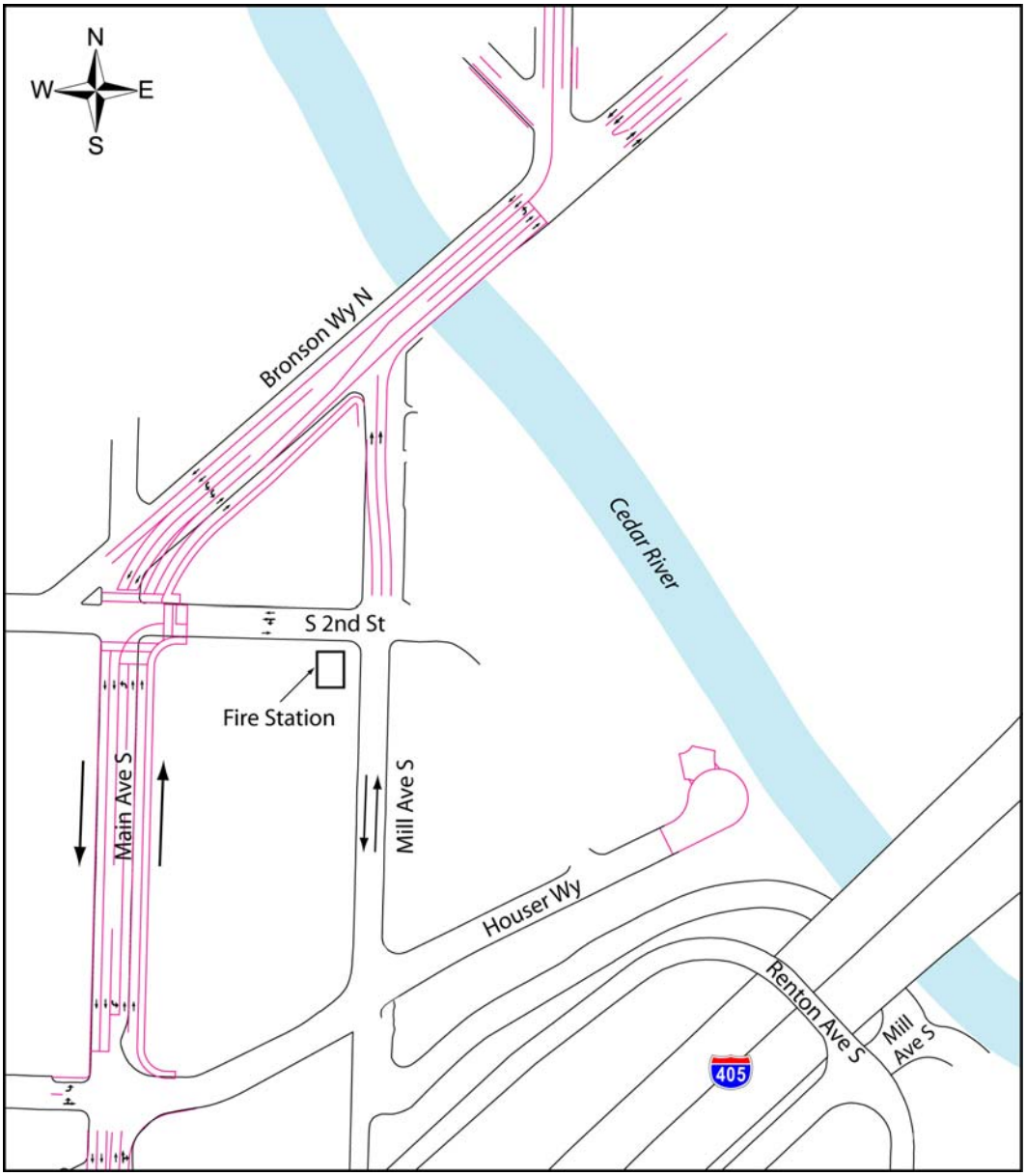
- The first option stripes Mill Avenue as a one-way street to provide two lanes northbound from the intersection of Houser Way and Mill Avenue to Bronson Way (see Exhibit 4-13).

Exhibit 4-13: Mill Avenue Design Option for Local Access to Bronson Way



- The second option leaves Mill Avenue as a two-way street up to the intersection with 2nd Street where it will be striped for one-way traffic northbound and reconfigures Main Avenue, a one-way street southbound, to provide two-way traffic. Main Avenue would be widened and striped for two-way traffic to provide access from the south to Bronson Way (see Exhibit 4-14).

Exhibit 4-14: Main Avenue Design Option for Local Access to Bronson Way

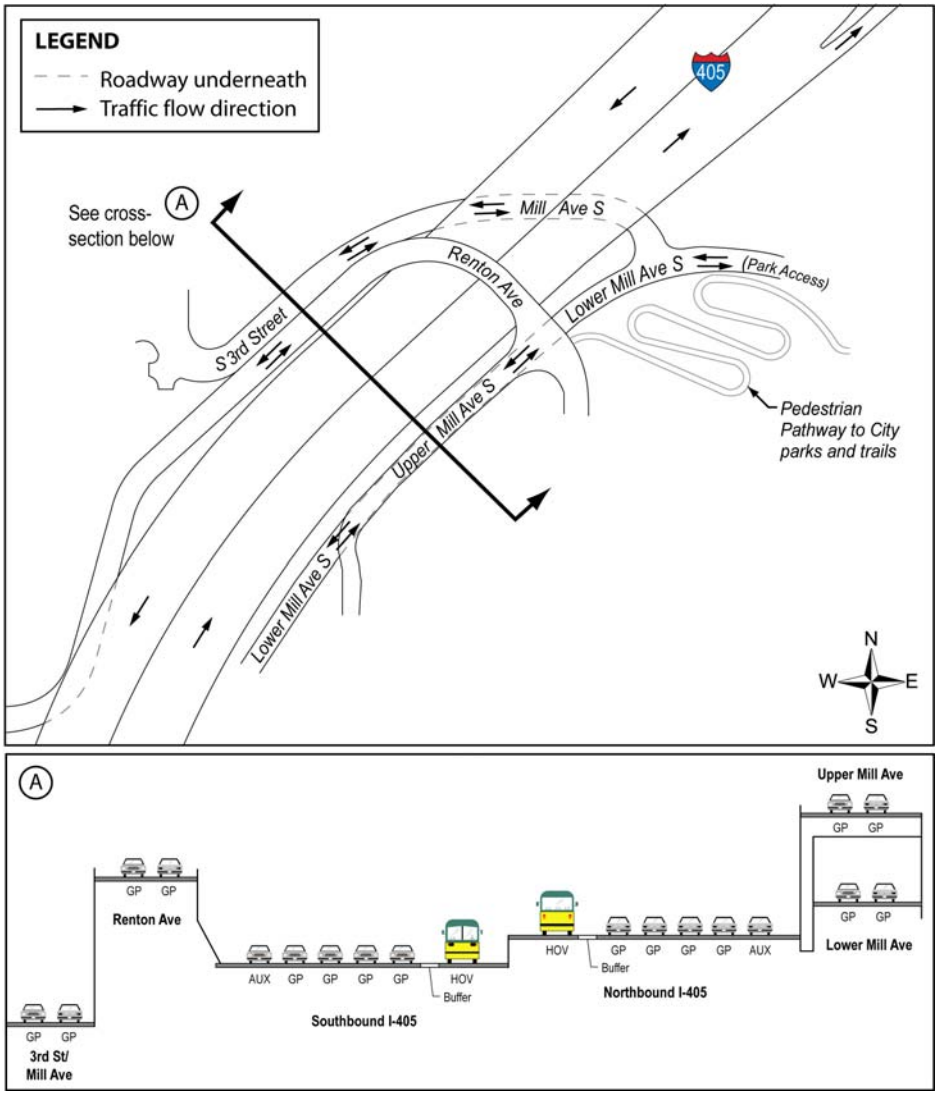


Changes to Renton Hill Access

As shown in the inset on Exhibit 4-12, the Renton Hill Access will be changed to accommodate the widening of I-405. These changes are detailed in Exhibit 4-15 below. WSDOT will:

- Reconstruct the Renton Avenue bridge over I-405 and realign the north end to intersect with Main Avenue rather than Houser Way as it currently does.
- Reconstruct Mill Avenue as a stacked structure that also provides access to Renton Hill.
- Remove the existing Cedar Avenue bridge.
- Construct a pedestrian pathway connecting residents on Renton Hill to the City's parks and trails.

Exhibit 4-15: New Local Access for Renton Hill



What benefits will this project provide?

The Tukwila to Renton Project will provide city-wide and regional benefits. These benefits include reduced congestion at the areas currently considered chokepoints in the study area, such as the I-405/SR 167 interchange; shorter periods of congestion during peak commuter travel hours; and improved freight movement. With the improvements in place, average freeway speeds will increase in 2014 by roughly 10 to 15 miles per hour over speeds without the project. The increase in speed and capacity will enhance the ability of emergency response teams to reach destinations via I-405 and SR 167. The new HOV direct-connector ramps within the I-405/SR 167 interchange will save travel time for transit and HOVs and improve the efficiency of the HOV lanes as those using the lanes will not be required to merge back into general-purpose traffic to travel between the two highways.

What is a High Accident Corridor?

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

A major benefit will be the improvements in safety realized by this project. With the added capacity, congestion-related accidents will be reduced. The project also improves roadway geometrics and reduces the number of conflict points at the interchanges along this section of I-405. Since these improvements address many of the issues that currently result in accidents, it is expected that this section of freeway will no longer be considered a High Accident Corridor. The project will also improve safety by reducing the frequency and severity of accidents related to merging into the HOV lanes. This is accomplished by limiting access to the HOV lanes to defined merge points and adding a four-foot-wide striped buffer that separates the HOV lanes from the general-purpose lanes. In addition, with the HOV direct-connector ramps at the I-405/SR 167 interchange, HOV traffic will not have to cross general-purpose traffic to reach exits to travel between I-405 and SR 167.

An additional benefit will be an improvement in surface water management and water quality. Although the project will add impervious surfaces, the project will provide detention and water quality treatment for 154 acres, which is more than twice the impervious area added by this project. With these systems in place, flow rates in streams and rivers are expected to improve, benefiting overall surface water management and improving surface water quality.

The Tukwila to Renton Project will directly affect ecosystems. However, some of these effects are beneficial. The ecosystems will benefit from the stormwater treatment facilities and from the mitigation provided for affected areas. The proposed mitigation will improve the quality of the environment over present conditions.

The project will benefit the community by creating a new pedestrian facility that will run from the Renton Hill Neighborhood down to the Cedar River. The new facility will be east of I-405, across from the existing Freeway Park, and will improve access to the Tri-Park area for residents of the Renton Hill Neighborhood.

What is the Tri-Park area?

The Tri-Park area concept emerged as a result of planning between WSDOT and the City of Renton as a precursor to planning the I-405 improvements adjacent to the City of Renton water supply system (pumps, wells, and transmission facilities); and Liberty and Cedar River Parks, Cedar River Trail, and the Narco property. The concept integrates Liberty and Cedar River Parks and the Narco property into one large complex. This design scheme assumed redeveloping both existing parks, realigning the trail, developing the Narco site with sports fields, and acquiring an additional property to develop baseball fields.

This project will also benefit the community by building two noise barriers along the I-405 corridor in Renton. One of these walls will be in front of the Berkshire Apartments and the other will be in front of the Renton Hill Neighborhood. These walls will reduce the level of freeway noise for the people living in these areas.

How will this project incorporate community design preferences?

WSDOT has worked with the affected cities within the I-405 corridor to develop visual guidelines, CSS, that establish the community design preferences used to design the project features. These guidelines have been incorporated into the Urban Design Criteria (UDC), adopted by WSDOT. The Tukwila to Renton Project is being planned, developed, and designed according to these guidelines. The UDC is the primary guideline followed to produce the intended form, function, and appearance of each I-405 feature and element. It integrates community values, urban design enhancements, and WSDOT standards for the I-405 Program. The I-405 Team will use the UDC as a guideline for preliminary engineering, landscaping, and aesthetic treatment of the highway corridor. For example, the theme trees designate by each city (Cedar for Renton and Hazelnut for Tukwila) will be used in the landscaping within these jurisdictions. These guidelines will be further developed into final engineering and project specific design criteria. The selected I-405 theme of "Culture, Nature, and Progress," with nature being the dominant theme, will be carried into corridor-wide and local I-405 designs.

How will stormwater be managed?

Stormwater from the project will be managed for both quality and peak flows using currently accepted BMPs. The I-405 Team has designed the stormwater management facilities to comply with the following guidelines and procedures:

- WSDOT Highway Runoff Manual (HRM) M 31-16
- WSDOT Hydraulics Manual M 23-03

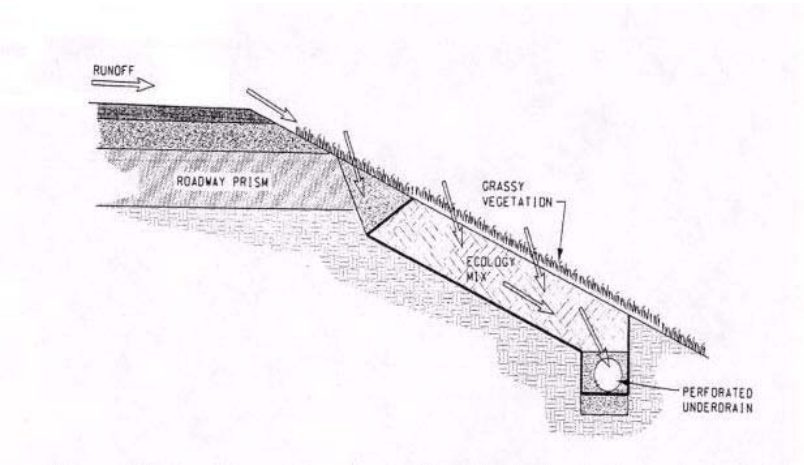
What are the guidelines for stormwater management facilities?

As a minimum, water quality treatment will be provided for an area equal to the new impervious surfaces created on the project. Impervious surfaces, such as pavement, are those that do not allow water to penetrate into the ground. Stormwater from new impervious surfaces or an equal area will be controlled in detention facilities. This process allows water to be held (detained) and thus released at rates that are equal to existing conditions.

Stormwater Treatment Facilities

The project will add approximately 58 acres of new impervious surface within the study area, most of which will be within the Springbrook Creek basin. This project will treat runoff from approximately 154 acres of impervious surface. Approximately 64 acres of this treated impervious surface will be provided by retrofit of existing untreated pavement.

The project will use BMPs that the HRM lists as enhanced treatment facilities. In most of the study area, ecology embankments will be used to capture runoff from the edge of the pavement and provide water quality treatment. Ecology embankments, as shown below, also serve to convey treated runoff to receiving waters or to flow control facilities as required. Exhibits 4-1, 4-2, 4-4, 4-5, 4-6, 4-7, 4-11, and 4-12 show where stormwater facilities will be built for this project.



Ecology Embankment Cross-section

Drainage Collection and Conveyance

Some changes to existing drainage will be necessary to provide flow control and water quality treatment to address

the new impervious area added by the project and the existing retrofitted impervious area. However, existing storm drainage systems will be kept to the greatest extent possible and existing flow patterns will be maintained. Where roadway widening affects drainage ditches or culverts that convey water from adjacent properties, the project design will assure that existing conveyance capacities are maintained.

How will the project be constructed and implemented?

The Tukwila to Renton Project will use different methods to construct the various project elements. The main approaches to construction for this project are described below.

At-grade Construction

At-grade construction, which occurs on the same elevation as the existing lanes, will be staged to minimize traffic delays and detours. One method would shift lanes toward the median. WSDOT then would place a concrete barrier to provide a work zone outside of the roadway. A second method would build the entire new section, then shift traffic to the new portion and reconstruct the existing section. Staging allows construction to occur safely without closing lanes for the duration of construction.

Bridge Construction

Bridge construction will generally occur in multiple stages to minimize traffic delays and detours. The following describes a typical staging approach for bridge construction on I-405 that will be used where practicable. As the first step, traffic is shifted toward the I-405 median, and the existing lanes and shoulders are narrowed slightly. This approach allows widening of the existing structure or construction of the new bridge, depending on the design, to occur on the outside of the roadway. Next, traffic is shifted onto the new bridge area. If the bridge is being replaced rather than simply widened, the old structure is demolished after traffic is shifted to the new bridge.

Road Closures

Some road closures will be necessary to construct various improvements. WSDOT will notify local agencies, public services, utilities, and the general public prior to any

temporary road closures and will clearly mark detour routes. As much as possible, closures will be scheduled during times that will have the least impact on the traveling public.

Traffic Control

WSDOT will work with local agencies to develop detours as needed during construction. Prior to starting construction, WSDOT will develop a traffic control plan. The plan's primary objectives will be to provide a safe facility, to streamline the construction schedule, and to minimize reductions to existing traffic capacity. To lessen effects on traffic, the duration of activities will be minimized and reductions in capacity will be limited and will be targeted to a period when they will have the least effect.

What is the construction schedule?

Because the I-405 Corridor Program master plan configuration is very expensive, WSDOT will implement the improvements in phases as funding becomes available. The Tukwila to Renton Project represents Phase 2 for this section of I-405. This environmental assessment assumes a baseline condition where the Phase 1 improvements, Renton Nickel Improvement Project, have been completed prior to the start of Phase 2.

Construction of the entire Tukwila to Renton Project is expected to be spread over several years as funding becomes available. For this reason, construction activity will not be constant throughout the entire study area and the duration will vary depending on the improvement being constructed.

The first element of the Tukwila to Renton Project that is proposed for construction is the SR 515 Interchange Project. This portion is funded through the 2005 Transportation Partnership Account (TPA). This Tukwila to Renton project element will construct a half-diamond interchange on I-405 at Talbot Road (SR 515). Construction of this element is scheduled to begin in autumn of 2008. The remaining elements of the Tukwila to Renton Project are unfunded at this time.

To complete the master plan for I-405 from I-5 to SR 169, additional work will need to be accomplished in this area.

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