



Existing Conditions

From this...  To this...

Design Visualization

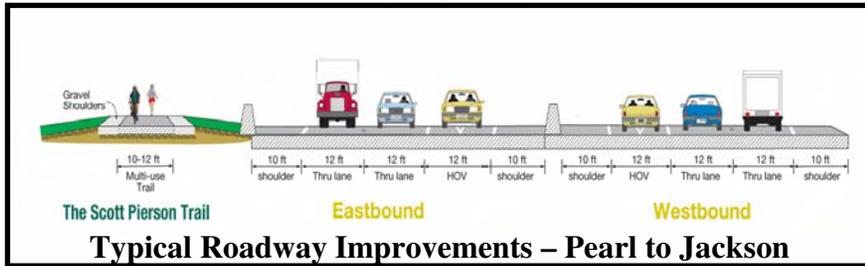
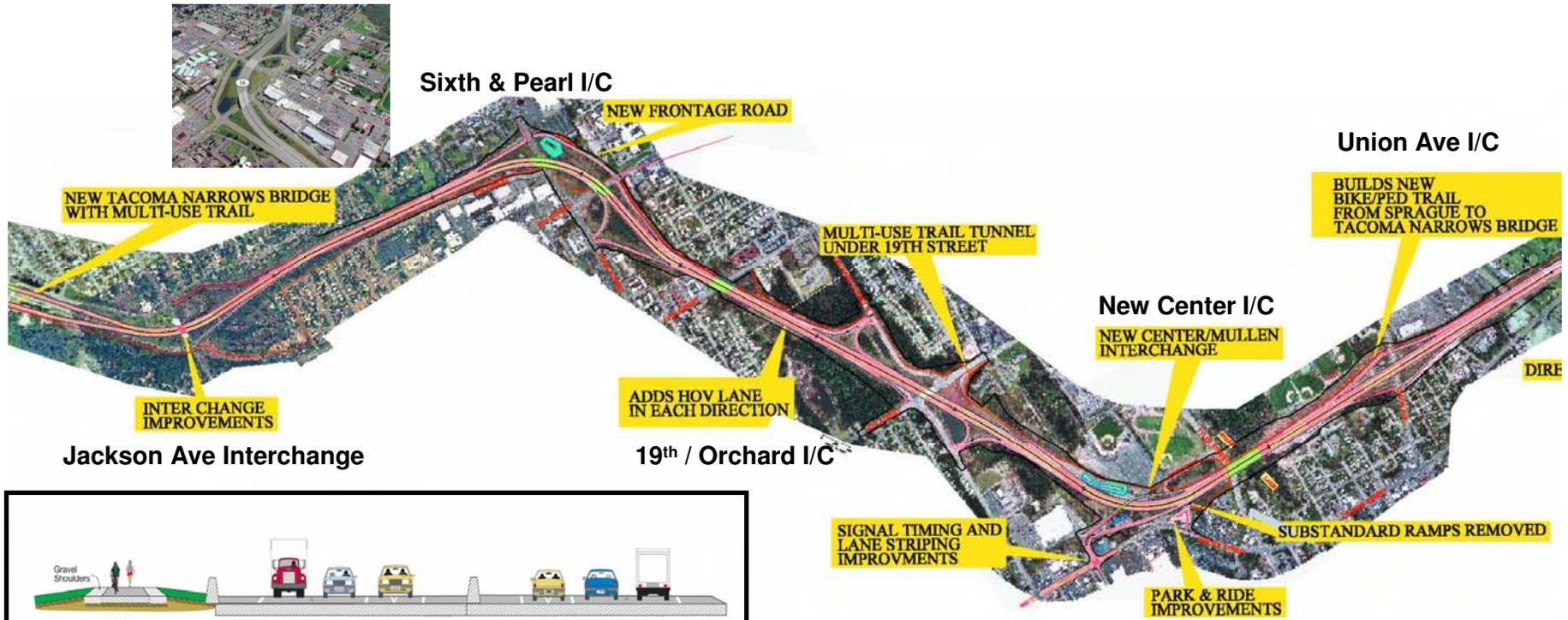
SR 16 – Union Ave to Jackson Ave – HOV

This project reconstructs and widens State Route 16 for HOV lanes and other improvements from Milepost 0.85 to Milepost 4.67 in Tacoma, Washington. The project provides approximately 23 miles of new and reconstructed travel lanes. This figure is comprised of approximately 7.5 miles of new HOV and 15.5 miles of additional general-purpose lanes, auxiliary lanes for merging and exiting, and multilane on/off-ramps, including the new Center Street Interchange and local street tie-ins.

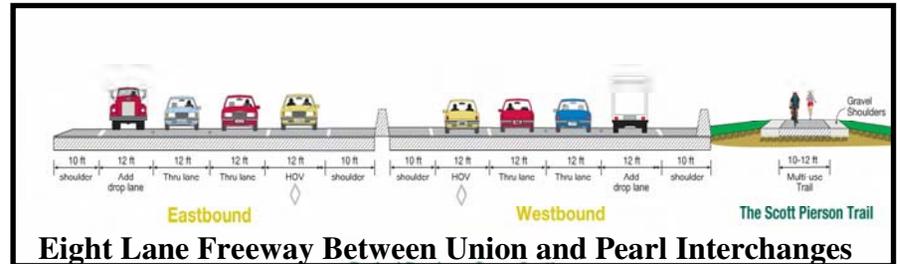
Additional project features include:

- New Center Street Interchange; removal of existing substandard ramps.
- Improves on/off-ramps; widens on-ramps to 2–3 lanes with HOV bypass and ramp meters.
- New SR 16 westbound lanes between 19th Street and Pearl Street.
- New parallel bridges at South 12th Street, 6th Avenue, and Pearl Street for WB lanes.
- Widens Snake Lake bridges.
- New frontage road connecting Sixth and Pearl Streets.
- Completes large segment of the Highway 16 Multiuse Trail.
- Provides noise barrier walls at two locations.
- Builds multiple stormwater treatment facilities.

SR 16 – Union Ave to Jackson Ave – HOV

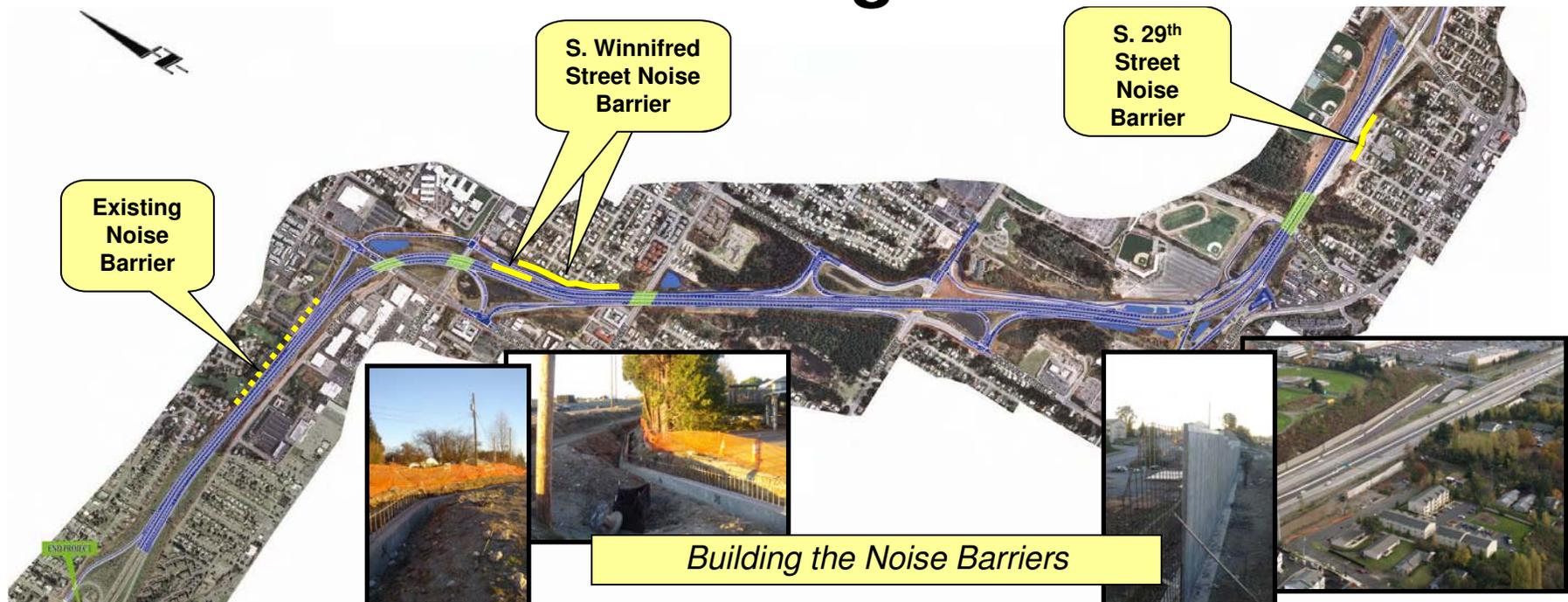


When complete in 2007, the SR 16 Union to Jackson freeway will be six lanes, providing one HOV and two general-purpose “through” lanes in each direction. Much of the route will also be improved with additional fourth lanes running along the outside for entering and exiting traffic to merge and exit the freeway without interfering with through lane travelers. This will go far to reduce accidents and roadway congestion.



This project provides much more than HOV lanes. SR 16 is basically reconstructed, with an improved mainline curve built near Cheney Stadium for improved travel speeds, as well as a new interchange at Center Street. All on-ramps will be widened from typically one lane to two or three lanes, with HOV bypasses at ramp meters. Many city street intersections are improved with increased lane capacity coinciding with widened on- and off-ramps.

SR 16 – Union Ave to Jackson Ave – HOV Noise Mitigation



This project provides two barrier wall systems to reduce traffic noise at adjacent residential areas. The locations are along the westbound exit to Sixth Avenue and along the eastbound right of way near the Union Avenue exit. Proper barrier placement is critical to obtain the highest possible noise reductions. At the Sixth Avenue vicinity, the freeway is on higher ground than the adjacent residences. To most effectively reduce traffic noise at the Sixth Avenue location, part of the barrier will be constructed along the freeway shoulder, and a larger section will be built near the right of way boundary. A noise analysis conducted during the Design stage confirmed the recommendations for noise barriers set forth in the FEIS, while also specifying the optimum locations and elevations of the tops of walls.

A total of 29,116 square feet of noise walls will be constructed during the Union to Jackson Nickel Project for a total cost of approximately \$1,043,400.

SR 16 – Union Ave to Jackson Ave – HOV Wetland Mitigation

Although a total of 5.66 acres of wetland will be impacted by this project, only a portion (29%) of these impacts will actually result in the physical loss of wetland area.

Wetland impact by type resulting from the SR 16 Union Avenue to Jackson Avenue project:

Impact Type	Impact (SF)	Impact (Acres)	Percentage of Total Impact
Permanent	70,868	1.63	29%
Temporary	35,719	0.82	14%
Shading	21,318	0.49	9%
Stormwater Designation	118,484	2.72	48%
Total Impacts	246,389	5.66	100%

Wetland enhancement/preservation proposed for Ecology regulated wetlands for the SR 16 project:

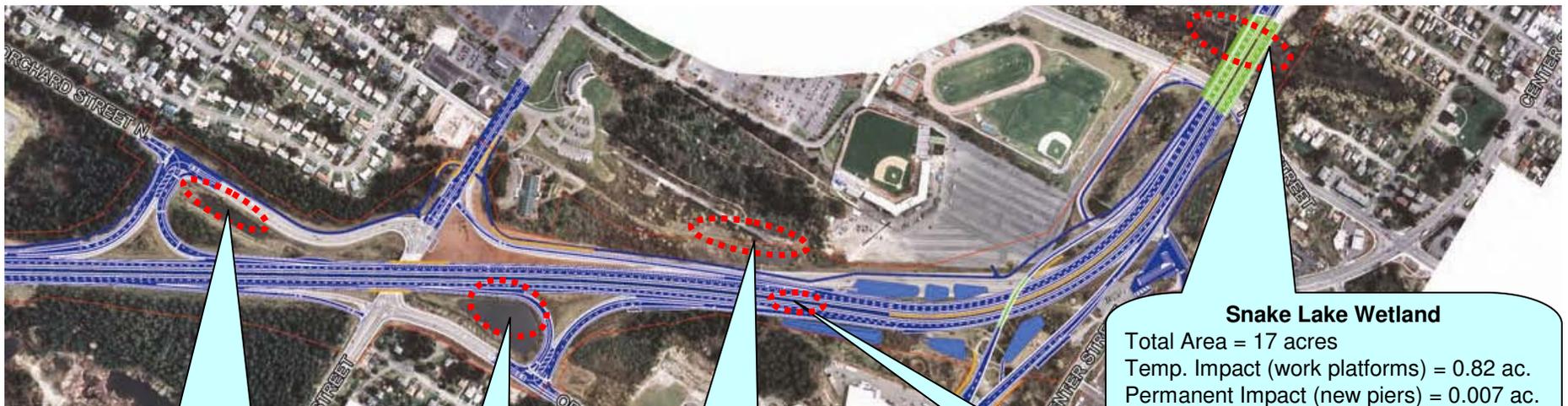
Impacts by Wetland Category	Wetland Preservation / Enhancement Ratio (Based on Mitigation of Category II Wetland)
Category III Wetlands A, B, & C	Approx 3.75:1
Category II Wetland JJ	15:1
Totals	Average 6.2:1

The estimated total cost for Wetlands Mitigation is \$2.5 Million.

SR 16 – Union Ave to Jackson Ave – HOV

Wetland Mitigation

Impacted wetlands are shown in the photo below. Wetlands A, B, & C at the 19th Street / Orchard Street Interchange were built in 1990, when the interchange was constructed. At the time, the ponds served as both on-site compensatory mitigation for 2.73 acres of wetland impacts as well as providing for the detention of stormwater runoff. Perpetual preservation of the sites would prove very difficult, due to the proposed linear widening in the Union to Jackson project. As part of the current project mitigation, two of these ponds (A and C) will no longer be designated as wetlands. WSDOT must mitigate for this loss in designation as well as for the actual physical filling impacts caused by the project. These ponds will continue to operate as stormwater mitigation facilities.



Wetland "C"
 Total Area = 1.46 ac.
 Physical Impact = 0 ac.
 To be designated as
 Stormwater Treatment
 Facility = 1.46 ac.

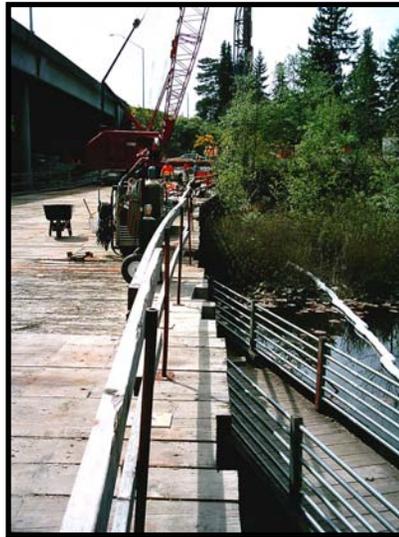
Wetland "B"
 Total Area = 0.65 ac.
 Physical Impact = 0.12 ac.
 Wetland designation will remain.

Wetland "A"
 Total Area = 2.30 ac.
 Physical Impact = 0.51 ac.
 To be designated as Stormwater
 Treatment Facility = 0.73 ac.

Wetland "JJ"
 Total Area = 1.15 ac.
 Physical Impact = 0.99 ac.

Snake Lake Wetland
 Total Area = 17 acres
 Temp. Impact (work platforms) = 0.82 ac.
 Permanent Impact (new piers) = 0.007 ac.
 Permanent Impact (shading) = 0.49 ac.
 Total Impacts = 1.32 acres

SR 16 – Union Ave to Jackson Ave – HOV Wetland Mitigation

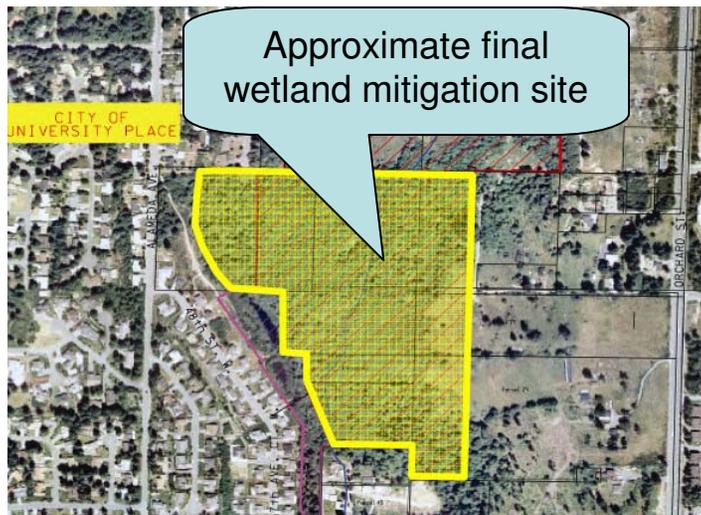


This project impacts 5.66 acres of wetlands. Project designs minimize impacts by using steep fill embankments or retaining walls, where feasible. Shown above, the Snake Lake bridge widening employs the use of temporary work trestles to protect the environment during construction. Unavoidable impacts at this wetland include the placement of 12 new bridge columns necessary to support the widening of the freeway bridges above.

The U.S. Army Corps of Engineers has jurisdiction over 4.18 acres of the impact areas. The City of Tacoma and the Washington State Department of Ecology has jurisdiction over the entire 5.66 acres of impact.

This project experienced many environmental challenges, and was actually delayed significantly while wetlands mitigation solutions were developed and agreed upon by multiple agencies. Agencies involved with mitigation plans and permitting of this project include Department of Ecology, U.S. Army Corp of Engineers, and the cities of Tacoma and University Place.

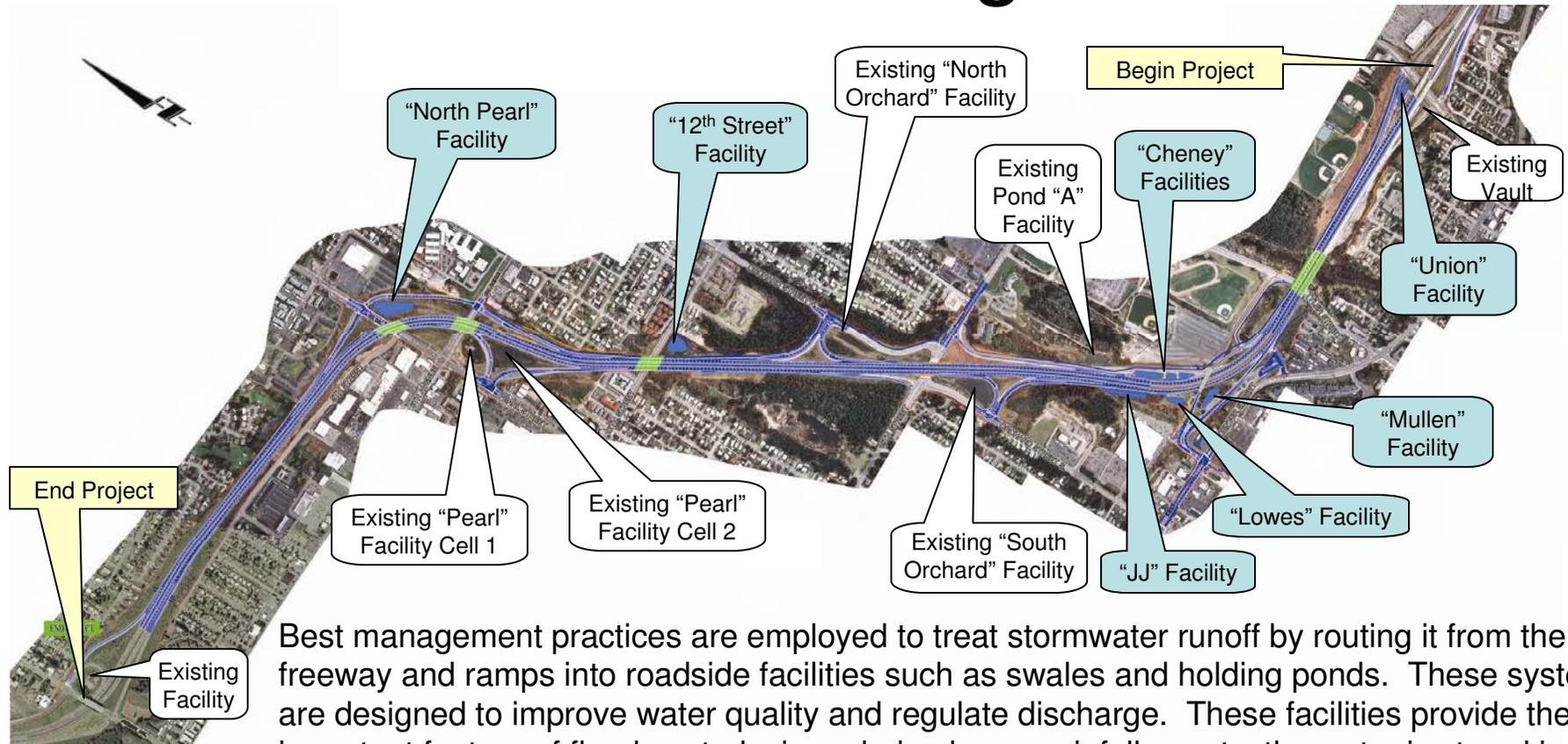
SR 16 – Union Ave to Jackson Ave – HOV Wetland Mitigation



This wetland mitigation proposal will enhance and preserve wetlands off-site, but within the same drainage basin. WSDOT was required to replace and enhance wetlands near the SR 16 corridor to make up for affecting 5.66 acres of wetlands adjacent to the highway.

Working with environmental resource agencies, WSDOT identified a 52-acre site in University Place for wetlands development within the same Leach Creek Watershed as the SR 16 corridor. The City of Tacoma issued WSDOT a permit that would allow WSDOT to replace the affected SR 16 wetlands with a wetlands site outside the city boundaries. WSDOT environmental staff, project engineers, and resource agency scientists believed developing the site into wetlands was the only viable option for the SR 16 project mitigation, due to the amount of mitigation required and the lack of space with the SR 16 corridor. WSDOT worked with the property owners to secure possession and use of 35.75 of the 52 acres to accommodate tight project delivery demands prior to fall 2006. The proposed preservation site is a large wetland complex that is associated with Leach Creek, a tributary of Chambers Creek, which flows into Puget Sound. Proposed preservation/enhancement ratios fall short of those outlined in the alternative mitigation policies used as guidance for the mitigation plan. To accommodate for additional mitigation, WSDOT, after discussions with the Washington State Department of Ecology, has agreed to participate in a partnership with the City of University Place for the acquisition, design, and construction of a stormwater management facility adjacent to this site. The 35.75 acres acquired by WSDOT realized a total cost of \$1,975,000.

SR 16 – Union Ave to Jackson Ave – HOV Stormwater Mitigation



Best management practices are employed to treat stormwater runoff by routing it from the freeway and ramps into roadside facilities such as swales and holding ponds. These systems are designed to improve water quality and regulate discharge. These facilities provide the important feature of flood control, since during heavy rainfall events, the water is stored in holding areas and released gradually back into the environment.

The in-place cost for stormwater mitigation for this project totals \$5,926,000. This figure includes costs reported for storm sewer and erosion control and planting, as well as individual pond facilities. A total impervious area of 84.95 acres is treated by the new and existing stormwater facilities, resulting in an average cost of \$1.60 per square foot of impervious area treated. Individual facility costs and associated treatment areas for the new ponds are reported on the following slides.

SR 16 – Union Ave to Jackson Ave – HOV Stormwater Mitigation

Project designs utilized existing right of way to provide areas for stormwater management. The SR 16 mainline curve is realigned for improved travel speeds. Portions of the old roadway will be removed providing new space to build the Cheney ponds.

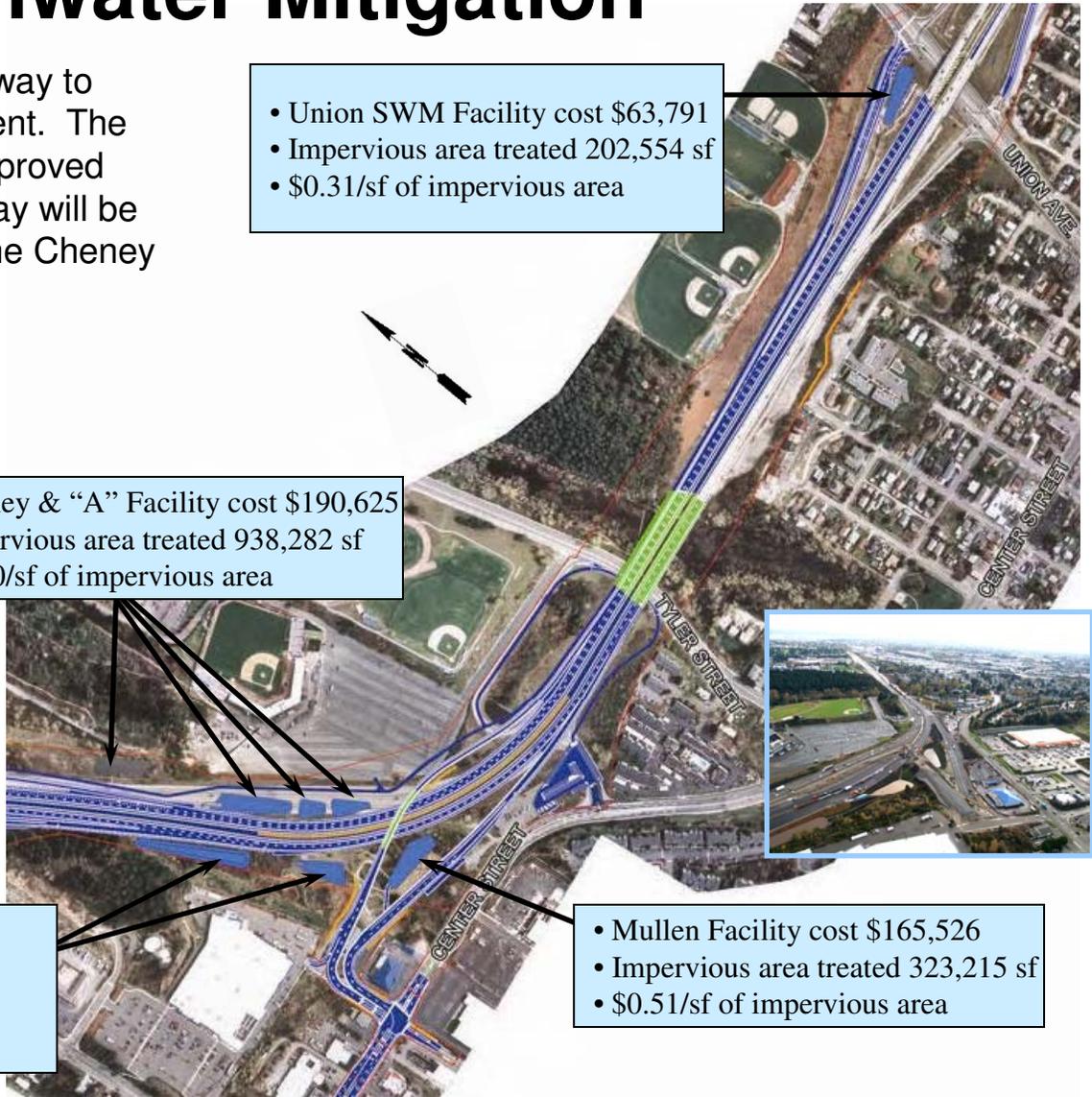
The Lowes and Mullen Stormwater Management Facilities are constructed along the eastbound roadside and between the new Center Street I/C ramps; an effective use of space.

- Union SWM Facility cost \$63,791
- Impervious area treated 202,554 sf
- \$0.31/sf of impervious area

- Cheney & “A” Facility cost \$190,625
- Impervious area treated 938,282 sf
- \$0.20/sf of impervious area



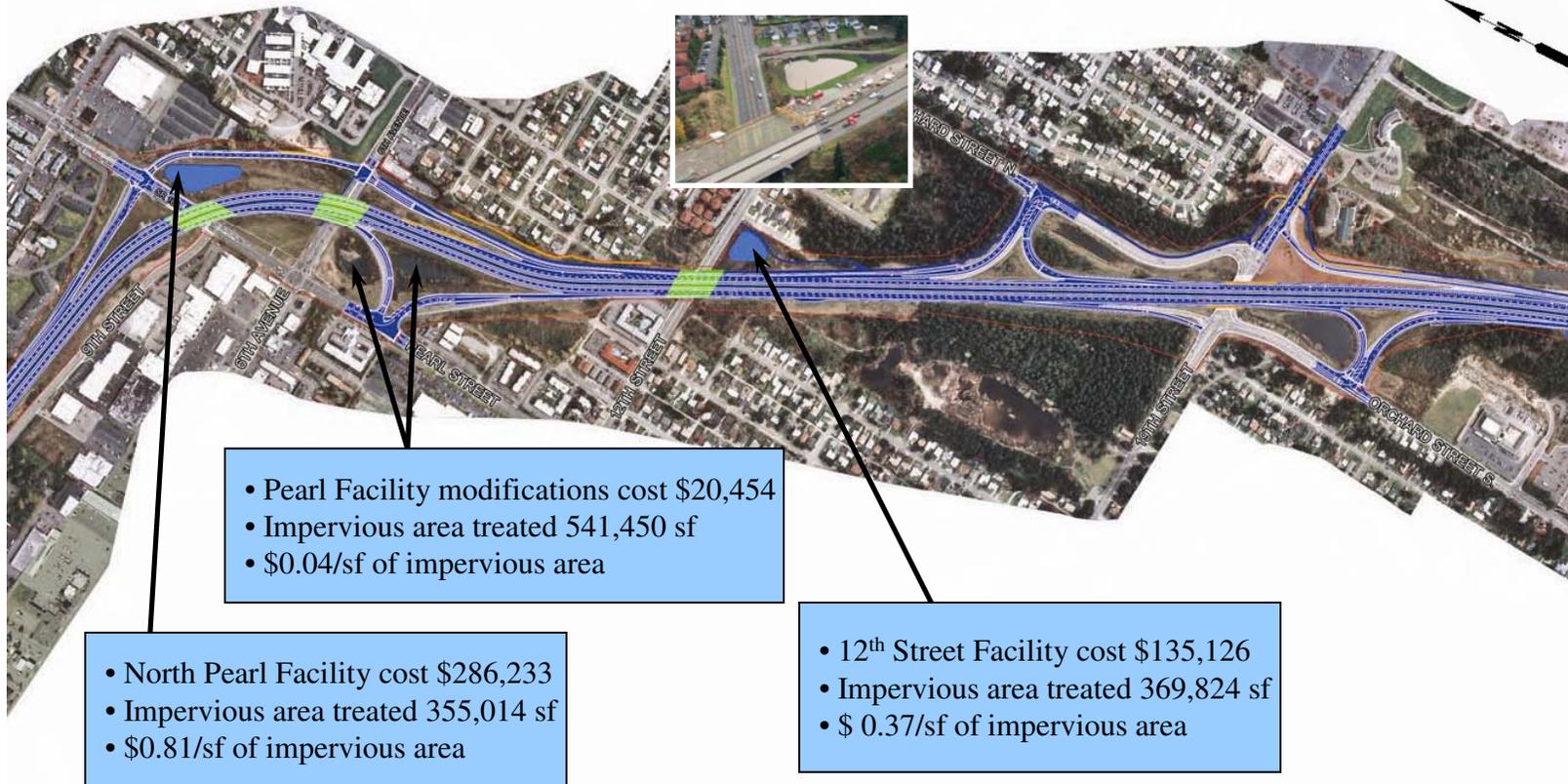
- Lowes / JJ Facility cost \$56,433
- Impervious area treated 298,386 sf
- \$0.19/sf of impervious area



- Mullen Facility cost \$165,526
- Impervious area treated 323,215 sf
- \$0.51/sf of impervious area



SR 16 – Union Ave to Jackson Ave – HOV Stormwater Mitigation



Much of this segment of the Union to Jackson Nickel Project provides a completely new westbound travel corridor, 3–4 lanes wide, parallel to the existing freeway with new bridges spanning 12th, 6th, and Pearl Streets. Along with the existing ponds at the Pearl Interchange, the new 12th Street and North Pearl Stormwater Management Facilities shown above treat highway runoff from this larger impervious surface created by the widening.

SR 16 – Union Ave to Jackson Ave – HOV Context Sensitive Solutions



Retaining Wall Designs

WSDOT engaged local community members and their elected local and regional representatives to come up with ideas to meet design challenges. This wall design was a result of local input. The Architect from the Bridge and Structures Office developed the wall designs with input from the local community. This wall is along the new frontage road constructed at the 6th Avenue off-ramp. The frontage road will allow traffic heading north on Pearl Street to avoid the 6th/Pearl intersection.

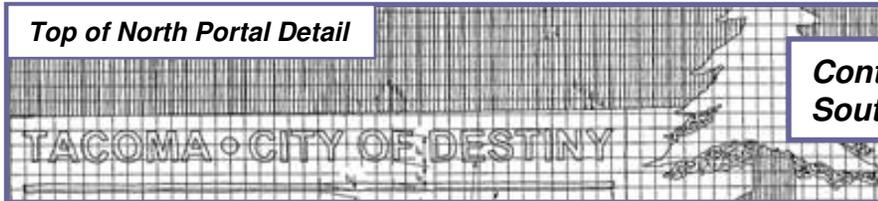
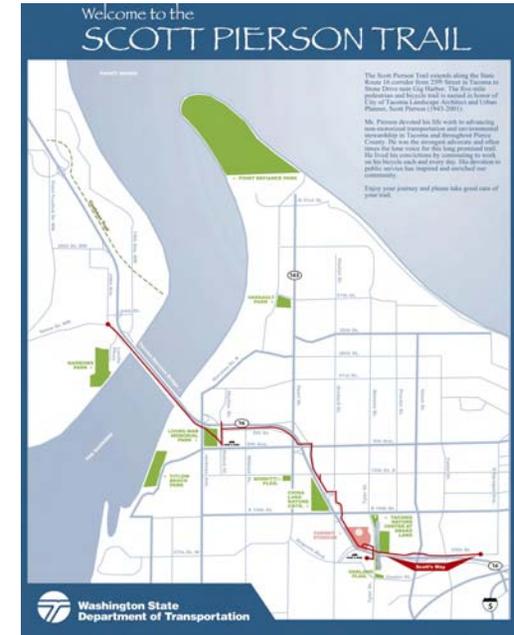
WSDOT developed criteria for wall designs such that cost would be minimally above the typical costs for wall fascia treatment, such as random board finish.



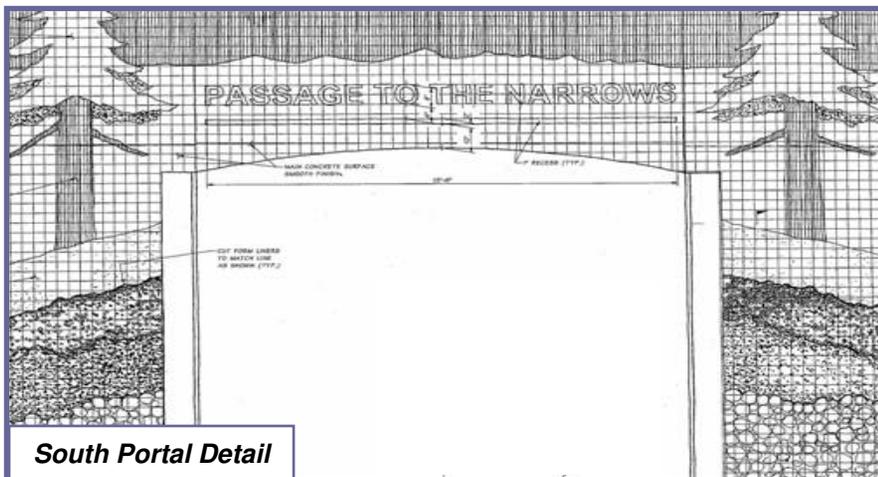
SR 16 – Union Ave to Jackson Ave – HOV Context Sensitive Solutions

Working with the Community and Bicycle Groups

WSDOT worked with local community members and the Tacoma Wheelmen's Association to develop the SR 16 Trail "kiosk" sign shown at right. Alex Young, prior to his retirement as the Architect in WSDOT's Bridge and Structures Office, prepared several designs that will be applied on retaining walls within the project. With input from the local community, Alex developed the 19th Street Tunnel portal designs shown below. The designs reflect local geology and will greet travelers with the words "Passage to the Narrows" and "Tacoma City of Destiny." The trail will pass under South 19th Street via the tunnel.



Contract Plan Details of South 19th Street Tunnel



Commemorating the SR 16 Trail to Scott Pierson

Scott Pierson was an advocate for bicycle travel. Prior to his passing, Scott was a Planner for the City of Tacoma, and he helped WSDOT develop trail concepts early in the study phase of the SR 16 projects in Tacoma. The sign shown above will be placed at the newly constructed Center Street Park and Ride lot where the trail will make a local connection. The sign shows a map of the trail as well as connections to local streets.

SR 16 – Union Ave to Jackson Ave – HOV Cost Summary

Phase Costs	
Preliminary Engineering	\$6.04M
Right of Way	\$6.69M
Construction	\$59.31M
Total	\$72.04M

Mitigation Costs		
Mitigation Elements	All-in Mitigation Cost (*)	% of Total Project Cost
Noise	\$1.04M	1.4%
Wetland	\$2.50M	3.5%
Stormwater	\$5.93M	8.2%
Subtotal of Mitigation Elements	\$9.47M	13.1%
All Other Items	\$62.57M	
Total	\$72.04M	

(*) All-in cost includes allocation of preliminary engineering, right of way, and construction cost.



1.4%

Noise – \$1.04M



8.2%

Stormwater – \$5.93M



3.5%

Wetland – \$2.50M