

PRACTICAL DESIGN AT WORK — DESIGN



Completed I-5 auxiliary lane in Lakewood.



Washington State
Department of Transportation

I-5 Auxiliary Lane, Lakewood

Background

The Interstate 5 corridor near Joint Base Lewis-McChord (JBLM) has become known for growing traffic volumes and increasing hours of congestion. To address this issue, the city of Lakewood and JBLM worked with WSDOT to identify innovative and cost-effective measures each agency could take to help unlock the gridlock for drivers. One specific problem area was the southbound I-5 exit to Berkeley Street. The off-ramp did not have the capacity to manage the high volumes of exiting traffic. Drivers waiting to exit would end up sitting in the right southbound lane of I-5. Not only was this an unsafe situation for drivers, it created a bottleneck and reduced the highway's capacity. Collision data collected between 2008 and 2013 revealed that 75 percent of all collisions on southbound I-5 between Thorne Lane and Berkeley Street were rear end collisions. The majority of collisions occurred during peak travel times, when the highway was already congested.

Original plan

WSDOT's original plan was to convert the right shoulder of southbound I-5 into a "hard shoulder running lane" between Thorne Lane and Berkeley Street. The shoulder would be available for this use for a limited number of hours each day, when traffic demands at the exit were at their highest. The shoulder also needed to accommodate bicycle traffic. Because of operational restrictions inherent in a hard-



Auxiliary lane, Berkeley Street.

shoulder running operation, the shoulder would require installing, monitoring and operating overhead dynamic signs that would tell motorists when the shoulder was open or closed. Due to limited pavement depth on the shoulder, it would need to be removed and replaced with greater pavement depth to support traffic.

Practical design solution

WSDOT ultimately chose to build a southbound auxiliary lane between Thorne Lane and Berkeley Street, instead of implementing hard shoulder running between the two exits. The lane increased the number of southbound I-5 lanes from three to four between the two interchanges, giving drivers more room to merge on and off I-5 along that busy stretch of highway.

The auxiliary lane also eliminated the need for instructional signing, close traffic monitoring, and ongoing maintenance and personnel costs to operate and maintain the signs. Crews replaced the existing shoulder with pavement appropriate for full-time traffic use, and widened it to accommodate



I-5 auxiliary lane under construction.

bicycles. Widths of both the auxiliary lane and shoulder were designed to be narrower than standards to avoid negatively affecting protected memorial trees along the highway. This design was implemented only after engineers conducted a safety analysis and determined the narrower lane and shoulder would not significantly increase risks to motorists. Because the lane is open 24 hours a day, 7 days a week, it also eliminated any driver confusion. For the driver, the expectation was managed: the auxiliary lane is always open.

Results

Community coordination: WSDOT and the city of Lakewood identified a two-part improvement to help move traffic more efficiently and safely at the exit. WSDOT would provide more capacity between Thorne Lane and Berkeley Street, while Lakewood would reconfigure the ramp terminus by adding a second left-turn lane and building more capacity by widening the Freedom Bridge overpass. Both agencies secured federal grants to fund the improvements. WSDOT



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received a TIGER III grant from the US Department of Transportation, and the city of Lakewood received a grant from the Department of Defense Office of Economic Adjustment. This two-part improvement is only one of several ongoing improvements funded by grants.

WSDOT met with the Tacoma Wheelman's Bicycle Club to discuss the changes to the shoulders between Thorne Lane and Berkeley Street. Engineers were able to provide enough shoulder width so bicycles could remain on I-5.

Safety: The new auxiliary lane gives southbound I-5 drivers a dedicated lane

to exit at Berkeley Street, and improves traffic flow on I-5 during peak commute hours. WSDOT will continue to monitor the auxiliary lane to see how this improvement affects traffic flow on southbound I-5.

Economic Vitality: From DuPont to Tacoma, military and civilian contractors commuting to JBLM benefit from the new auxiliary lane during the morning and afternoon commutes with reduced travel times and fewer collisions on the freeway. The Berkeley Street interchange is one of two access points to the Tillicum neighborhood in the city of Lakewood. Businesses along Union Avenue in Tillicum benefit from the high volumes of

breakfast and lunch traffic from military personnel. Reducing congestion along the I-5 corridor near JBLM directly benefits many communities and local businesses in DuPont and Lakewood.

Cost: WSDOT avoided about \$300,000 of expenses by eliminating dynamic overhead signing, which would have been required had WSDOT built the hard running shoulder. WSDOT also saved staff time and maintenance costs that would have been incurred by operating and maintaining the signs. The cost of added depth of pavement was the same as the practical design plan.