



High Friction Surface Treatment Applications by Thurston County, Washington

➤ What was the safety issue, problem, or gap?

From 2006 to 2010, Thurston County, Washington experienced 177 fatal and serious injury crashes on the county's road network, of which about 70 percent is rural. Similar to other local road networks, the crashes were not concentrated in specific locations.

The County had been deploying many low-cost safety improvements such as signing, pavement markings, and rumble strips, but there were still sites where these solutions were not feasible. As a result, Thurston County sought another relatively low-cost and proven safety countermeasure with minimal physical impacts to the roadway and surrounding environment.



Source: Scott Davis, Thurston County, Washington

HFST at Thurston County Horizontal Curve Demonstration Site

➤ What were the key challenges that needed to be addressed before the new practice could be implemented?

The County considered high friction surface treatments (HFST), as shown in photo above, in 2012; but the lack of local cost data, staff training, materials, and installation cost, coupled with the agency's lack of experience implementing the treatment, eventually led them to abandon the idea.

However, after learning of the successful HFST application at the Marquette Interchange in Milwaukee, Wisconsin that resulted in a 96 percent crash reduction,¹ the County re-engaged in examining the use of HFST. After applying for and receiving HFST demonstration site funding through the Federal Highway Administration's (FHWA) Every Day Counts 2 (EDC2) initiative, the County prepared for their first HFST installation.

➤ Describe the new practice:

Thurston County developed their HFST implementation strategy consisting of the following objectives:

1. **Identify Partner Agencies.** In this case, the County asked for technical assistance and support from the Washington State Department of Transportation (WSDOT) Local Technical Assistance Program (LTAP) and the FHWA Washington State Division Office.
2. **Consider Proven Safety Countermeasures.** Both Washington State LTAP and FHWA partners expressed an interest to promote HFST on local roads, especially after Thurston County crash data indicated there was a considerable proportion of fatal and serious injury collisions (e.g., wet weather, skidding/out of control collisions) that may be reduced by the implementation of HFST.

¹ Mike Moravec, "High Friction Surface Treatments and High-Crash Horizontal Curves." Arizona Pavements and Materials Conference in Phoenix, Arizona. November 13, 2013. Available at: <http://pavement.engineering.asu.edu/wordpress/wp-content/uploads/2013/12/High-Friction-Surface-Treatments-Mike-Moravec.pdf>.

3. **Use Data-Driven Methods to Develop a List of Candidate Locations.** Crashes were widespread and not concentrated, so Thurston County chose a systemic approach for site selection. The County analyzed their road inventory and crash data provided by the County Road Administration Board,² and concluded that roadway departure crashes coded as skidding/out of control accounted for 27 percent of fatal and severe crashes from 2006 to 2010. This crash type was used to identify locations that may benefit the most from HFST. County staff then investigated crash density, coupled with roadway functional class, which narrowed the number of sites to analyze. Thurston County used FHWA's Systemic Safety Project Selection Tool to identify candidate sites for HFST application by reviewing clustered data, assessing risk factors, and determining threshold values to prioritize sites.³
4. **Identify Funding Opportunities to Explore Innovative Solutions.** Through FHWA's EDC2 initiative, Thurston County secured funds to cover materials and contract installation at one site.
5. **Be Maintainable and Sustainable.** County staff was responsible for maintaining the safety investment and received HFST installation training through the demonstration for future implementations.
6. **Share Efforts with Other Safety Partners.** The County hosted a peer exchange featuring an HFST installation demonstration with representatives of local agencies, industry, the Washington State Department of Transportation, FHWA, and the Western Federal Lands Highway Division attending the event. The demonstration included a manual application of HFST by Thurston County crews, as shown in photo above.
7. **Make Efficient Use of Resources.** Training County work forces on HFST installation techniques allowed for continuous maintenance of future investments and for cost-effective HFST installations at small sites that may be typical of local road applications.



Source: Scott Davis, Thurston County, Washington

Demonstration of HFST Installation using Manual Techniques.

➤ **Key accomplishments, including roadway safety improvements:**

In addition to County staff successfully installing HFST at a third site in October 2014, they have motivated other Washington State counties, including Kitsap, King, and Lewis Counties, to take great interest in HFST through peer exchanges. Both Kitsap and Lewis County now have HFST installations on their respective county road network.

Thurston County is planning to use HFST more frequently and self-install at least one project per year.

➤ **What technical and/or institutional changes resulted from the new practice?**

Thurston County utilized the FHWA's Systemic Safety Tool for the second time as part of a system-wide safety review and is now using the tool for the third time focusing on speed-related collisions in partnership with the Washington State Traffic Safety Commission and the County's Prosecuting Attorney's Office.

➤ **What benefits were realized as a result of the practice?**

There have been no reported collisions at the County's HFST demonstration sites since the installations, though the statistical expected value was about 3 crashes per year. Additionally, since Thurston County trained their work force in HFST installation methods, they have the option to complete implementations and future maintenance without contracting the work.

2 Washington State County Road Administration Board, available at: <https://www.crab.wa.gov/>.

3 FHWA's Systemic Safety Project Selection Tool is available at: <http://safety.fhwa.dot.gov/systemic/>.

FOR MORE INFORMATION

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