Research Note

From the WSDOT Research Office
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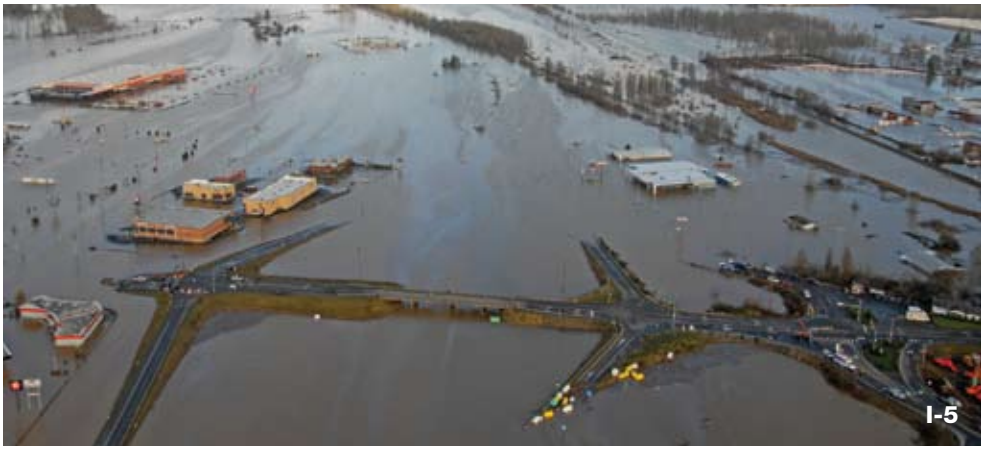
Washington State Department of Transportation

"Companies in Spokane suffered similar losses from the closures as those incurred in the Puget Sound Region."


I-5

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I-90

Storm-Related Closures of I-5 and I-90: Freight Transportation Economic Impact Assessment Report

In December 2007, floodwaters covered I-5 in Chehalis, Washington for four days blocking a primary route for freight movement in the north-south corridor. Just weeks later, heavy snowfall caused avalanches and unstable conditions on I-90 resulting in closure of this critical east-west freight route for five days.

Winter 2007-08

A New Methodology and Approach

In an effort to obtain a more complete picture of the statewide economic impacts of the highway closures than is typically available through traditional economic impact assessment methods, WSDOT contracted with Washington State University's Social and Economic Sciences Research Center (SESRC) to conduct survey research and economic analysis of the two storm-related events. WSDOT staff and SESRC researchers worked together to design and develop a new economic assessment methodology that would provide the state's citizens and decision-makers with a reality-based, comprehensive analysis of the effects of the closures on the state's freight industry and the economy as a whole.

Economic Impact Analysis: Methods and Data Sources

To effectively estimate the economic impact of the I-5 and I-90 winter closures, WSDOT and WSU developed a multi-phased analytic approach, involving: (1) direct survey of the trucking industry and freight-dependent sectors; (2) estimation of business losses suffered by the trucking industry and freight-dependent sectors; (3) estimation of direct impacts on the economic output of the trucking industry and freight-dependent sectors; and (4) estimation of the total economic impacts for the state, including indirect and induced impacts, as well as impacts on output, employment, personal income and state sales tax receipts.

WSU's SESRC surveyed firms statewide in February and March, 2008. The SESRC randomly sampled owners and operators of trucking firms registered in the state, including for-hire trucking companies as well as companies that operate private fleets whose primary business is in one of the state's freight-dependent industry sectors. A total of 2,758 surveys were received and analyzed.

WSDOT used the survey results to inform the state's input-output economic model, IMPLAN, which estimated the ripple effects of the closures as they spread throughout the economy. The IMPLAN model was used to estimate the total economic impacts of the I-5 and I-90 closures, including the cascading effects of the closures (direct, indirect, and induced impacts).

A distributional impact analysis was also conducted to describe who was impacted by the closures, where the impacts were, and what the intensities of the impacts were. This analysis helped generate additional understanding of the economic impacts of the closure. In fact, in assessing the impacts of the highway closures on the state as a whole, the study found that the closures had far-reaching effects which were experienced fairly equally statewide. For example, companies in Spokane suffered similar losses from the closures as those incurred by firms in the Puget Sound region.

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What the Research Showed: Economic Impact Analysis Findings

The total loss identified due to the two corridor closures was almost $75 million. More than $47 million of the total loss is from the I-5 closure, with almost $28 million from the I-90 closure. Employment loss, defined as estimated job loss for one year following the economically disruptive event, was 460 jobs. Sales tax revenues lost are estimated at $3.81 million, and reduction in personal income is estimated at $23.15 million. The study also examined the distributional impacts of the closures by region, finding that businesses in all regions of the state were affected by the highway closures to a similar degree of severity. The coastal counties experienced relatively more severe impacts to businesses and the economy during the I-5 closure, including the effects of the closures of 65 other roadways in the area.

The study's finding should be considered conservative, due to the following factors: (1) when the survey was conducted in February-March 2008, some survey respondents had not completed documenting their storm-related costs, consequently, the full incremental costs of closure may not be encompassed by the reported numbers; (2) because data was not available for out-of-state trucking firms, business losses for Washington companies that use these firms are understated; (3) this study does not include local business economic impacts related to the closures, unless they were caused by disruption of the freight systems; and (4) loss due to automobile delays and the costs associated with such delays were not included in the study.

In addition to the quantitative analysis of economic impacts of the two highway closures, the report also presents qualitative information on the impacts to businesses and communities. Four case studies and comments received from businesses and local government representatives convey a fully-rounded picture of what organizations were dealing with as they worked to maintain business operations during the closures.

Lessons Learned and Recommendations Going Forward

Communicating with the truck and freight industry

WSDOT devoted considerable time and energy to communicating with affected businesses and communities during and after the closures including a new approach to target information specifically to freight shippers and carriers. The communication efforts have yielded an action list of operational and policy recommendations for the agency to consider:

• ***Information and communication system upgrades are needed to communicate the road conditions.*** During the I-5 closure, WSDOT instituted the email alert system, which reached 900 contacts. By the time of the I-90 closure, nearly 3,000 contacts were included on the distribution list. With the addition of the Washington and AmericanTrucking Associations, an estimated 10,000 contacts can be reached through the freight notification system. Freight messages were sent several times each day to provide maps, updates on road conditions, and information on safe and legal detours for trucks. Information technology systems that provide reliable, robust, real-time information are a critical part of the state's ability to communicate with the freight industry during extraordinary events, and investment in these systems is needed to ensure they are fully functional during weather emergencies and other crises.

• ***More timely information.*** During the highway closures, the freight companies heavily used WSDOT's Web site, and relied upon that site more than general information provided by the media. While the information placed on WSDOT's Web site was accurate and detailed, companies need more timely and predictive information on road conditions, closures, and truck detours.

• ***More cameras to provide real-time information.*** "A picture says a thousand words" and WSDOT's ability to obtain robust, real-time information and convey it out to the freight industry was aided by the cameras on I-90 and the temporary cameras placed on I-5. This on-site information was especially helpful to freight dispatchers, who were able to monitor ongoing progress.

• ***Continue innovative communications strategies and use of social media tools.*** WSDOT used the agency's social media tools such as Flickr to publish photos, YouTube to publish video, and Blogger to help tell the story of how bad the winter storms were. WSDOT also provided information via trucker satellite radio stations. To communicate directly with truck drivers, WSDOT crews and the State Patrol hand delivered truck detour fliers along the routes. WSDOT also called truck stops with updates and drove variable message signs throughout area truck stops to let truck drivers know that the closure would be lengthy. Making extra efforts to reach truck drivers and freight companies through these new tools was helpful and should be continued for future disruptions.

Develop parking plan

A parking plan for trucks stranded on the pass and along the highways would be useful. Truck drivers need parking for federally-required 10-hour rest periods after 11 hours of driving. When truck drivers can't find designated parking, they park on freeway ramps, along the road shoulder, and at weigh stations creating safety hazards. Improving truck parking would improve roadway safety by decreasing the number of trucks parked illegally and by providing truck drivers a safe and legal place to park when they become fatigued.

More state support and investment for maintenance activities

The December 2007 flood caused approximately $18 million in damage to state high-

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ways. During the I-90 closure, WSDOT crews worked around the clock to clear the highway of snow and avalanche danger. More snow and ice requires more labor, equipment, and materials to provide safer road conditions. Rising costs for deicer materials, coupled with the increased usage and the exceptional labor hours required for the I-90 response, resulted in a $9.1 million overage in actual expenditures versus planned expenditures for winter 2007-2008. A supplemental snow and ice budget amount of $3.25 million was granted by the Legislature and signed into law by the Governor. Additional investment in the state's snow and ice program is needed.

Use of detour routes to I-5

When I-5 was closed because of the February 1996 storm, WSDOT detoured trucks along SR 7 and US 12. However, these two-lane routes run through several rural communities, and concerns were expressed by some in those communities about the noise, safety hazards, and road damage resulting from the additional traffic. As a result, and due to the limited capacity on these routes, WSDOT decided not to make these routes available as primary detours during the 2007 I-5 closure, relying instead on the Interstate system as the designated detour route. The SR 7 and US 12 routes were made available for trucks carrying emergency supplies and perishable items, but implementing the distinction between "emergency" and "nonemergency" shipments proved problematic on the ground. To enable use of these routes in the future, the state will need to take several actions, including working with local communities and developing plans on when, how, and where to provide detours on local roads; conducting a highway capacity assessment; and developing written protocols for which classifications of freight will be allowed to use the route and with what priority. This information should be made available to freight carriers well in advance of closures. Clarification of responsibilities for enforcing detour use, and clear roles and responsibilities across agencies is also needed.

Mitigating Chehalis River Flooding: Chehalis River Basin Flood Program

There is a long history of past efforts related to flooding of the Chehalis River and its tributaries. The most recent work is a federal study that was initiated in 1998 by the US Army Corps of Engineers ("Corps"). The study resulted in a recommendation to build a flood-control project at Centralia and Chehalis. The project received federal authorization in 2007 and is currently being re-evaluated using the most recent flood data. With the flooding experienced last winter, the Washington State Legislature and Governor Gregoire provided $50 million to begin addressing flooding issues and implementing flood hazard mitigation projects throughout the basin. The funding includes $2.5 million for the newly formed Chehalis River Basin Flood Control Authority to conduct a basin-wide study, with the remainder intended to provide the non-federal match for the Corps project. For the future, collaborative efforts between the Flood Authority, State and Corps of Engineers will focus on basin-wide solutions that provide flood protection and prevent economic loss for all the basin communities as well as I-5.

I-90 Snoqualmie Pass East Improvement Project

In 1996 WSDOT initiated the Hyak to Ellensburg Corridor Study, to identify problems and conceptualize solutions for I-90 on the eastern side of Snoqualmie Pass. The identified Preferred Alternative for the I-90 Snoqualmie Pass East Project will add an additional lane in each direction, for a total of six lanes along the 15-mile stretch from Hyak to Easton. Along with the lane expansion, areas for vehicles to chain up will also be lengthened and the sharp curves around Lake Keechelus will be reduced to increase sight-distance. The project also provides for extensive reengineering of the snowshed, culverts, and bridges to decrease avalanche and rock slide danger and mitigate the road closures caused by such events. Funding for the initial 5-mile phase of the project from Hyak to Keechelus Dam has been approved and the Final Environmental Impact Statement has been completed. The first phase of construction will begin in 2009, with heavy construction commencing in fall of 2010. The second phase of the project addressing the remaining ten miles from Keechelus Dam to Easton is still awaiting funding.

"An estimated 10,000 contacts can be reached through the freight notification system."

Contact Information:

Storm-Related Closures of I-5 and I-90: Freight Transportation Economic Impact Assessment Report
WA-RD #: 708.1
http://www.wsdot.wa.gov/research/reports/fullreports/708.1.pdf

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