

# RESEARCH REVIEW

## Construction closures: all weekend is an alternative to multiple nights

Highway reconstruction and repaving projects are typically conducted at night, closing one lane of traffic at a time. Unfortunately, this maintenance strategy can take weeks or months to complete, monopolizing construction workers and exasperating drivers.

In August 1997, the Washington State Department of Transportation (WSDOT) tested a different schedule of road repair. For repaving, it shut down Interstate 405 between the Sunset Boulevard bridge and the Coal Creek Parkway bridge, south of Bellevue, over two consecutive weekends. A subsequent evaluation of the test's results showed that the weekend closures were successful.

Professors Phillip Dunston and Fred Mannering, civil engineering faculty at the University of Washington, studied the weekend reconstruction experiment. They examined the primary factors that affect highway reconstruction: pavement quality and the impact of road closures on drivers and businesses. They found the following:

- Pavement quality was as good as if the project had been performed over multiple nights, despite heavy rain on one day of the weekend closure.
- Paving costs were lower because of less need for traffic control

and fewer paving set-up costs.

- The opinions of motorists who used I-405 were favorable.
- Most businesses in the area were relatively unaffected.
- General public opinion (indicated in local news reports) was positive.

### Pavement quality

Dunston investigated the pavement quality of the weekend reconstruction project, specifically reviewing three elements: compaction, density, and smoothness. His findings were extremely positive.

"[The WSDOT] can achieve good pavement quality using the weekend closure policy," said Dunston. In comparison to nighttime repaving, "the pavement was just as good when it was applied over the weekend in a shorter time span. However, the contractor spent less time paving and setting up traffic control, meaning that the paving cost was lower [than night paving]," he said. The bottom line is that "consistent quality can be achieved when roads are repaved during the weekend."

The reduction in construction time and the satisfactory quality of the pavement suggest that weekend reconstruction can be more cost effective than the nighttime repavement process.

## Highway usage

Mannering's team received 378 completed surveys from I-405 drivers. Overall, the drivers' responses were quite favorable.

"89 percent of the drivers surveyed preferred total weekend closures as opposed to individual lane closures," said Mannering. "About 93 percent of the surveyed drivers were aware of the [impending] closure in advance. The publicity campaign was very good; few people were surprised by the weekend closure."

About 140 of the respondents wrote their own comments on their surveys. One typical comment read, "This is the way the WSDOT should do road work in the future."

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**"This is the way the WSDOT should do road work in the future."  
—survey respondent**

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In addition to driver surveys, Mannering sent questionnaires to local businesses following the weekend closure. "Of the 30 businesses we surveyed, maybe four said that there was a negative impact," said Mannering. In addition, "two or three businesses reported a positive impact [due to the road closure]."

In general, the businesses were relatively unaffected. "Six percent of the surveyed drivers spent less money shopping because of the road closure," Mannering reported. "Almost every business said that the weekend closure had no noticeable effect."

## Deciding how to close

Despite the project's success, the investigation concluded that weekend closures are not always appropriate. Considerable technical and public input is necessary to determine whether weekend closures should replace more extensive nighttime closures for resurfacing.

To help WSDOT officials decide when weekend closures will be appropriate, the research team developed a three-part checklist. This checklist describes the crucial issues that must be considered to decide between weekend and nighttime closures. Factors include

- the availability of alternative through-routes
  - the need for access to critical facilities such as hospitals
  - local zoning and noise ordinances
  - contractor logistics
  - site conditions, such as the availability of light and day and night temperatures
  - the occurrence and timing of local events
  - the time available to coordinate the work with other projects and to notify the media and public about the planned closures.
- Only with an understanding of

such local conditions and project-specific constraints can this decision be made properly.

## Further information

This study was funded by the Federal Highway Administration, WSDOT, and the Asphalt Paving Association of Washington. WSDOT is scheduled to distribute the final report for this project in fall 1998.

For further information on the I-405 road closure, contact the WSDOT Construction Engineer, Tom Nelson, at (360) 705-7821, or the WSDOT Project Engineer, Kim Henry, at (425) 649-4436.

*Washington State Transportation Center*

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