

## Minimizing the Impacts of Highway Construction and Maintenance on the Traveling Public

As congestion continues to increase on Oregon highways, drivers are faced with longer delays due to construction and maintenance activities on the state highway system. These activities are necessary to preserve and modernize our state's transportation infrastructure. However, the adverse impacts of these activities on the traveling public have become a major consideration when scheduling construction and maintenance work.

Since most highway congestion occurs during weekday commute hours, the Oregon Department of Transportation (ODOT) has shifted a significant portion of its urban construction and maintenance work to nighttime and weekend hours. As congestion and mobility issues become increasingly important to suburban and rural areas of the state, we can expect to see more of these activities shifting to evenings and weekends as well.



Two recent research reports and a joint Federal Highway Administration (FHWA)/ODOT workshop highlight this shift in philosophy and demonstrate how transportation agencies such as ODOT are transitioning their construction and maintenance program to minimize adverse impacts on the traveling public.

One report, published in May 2003 by the ODOT Research Unit, focuses on the criteria ODOT utilizes to aid the decision making process for shifting construction and maintenance activities to nighttime hours. This report entitled [Selection Criteria For Using Nighttime Construction and Maintenance Operations](#) includes a software tool that aids decision makers in stepping through the major considerations that weigh daytime versus nighttime work.

A report, by the Federal Highway Administration (FHWA), entitled [Full Road Closure for Work Zone Operations - A Cross-Cutting Study](#), profiles highway projects in 6 states, including Oregon, where a highway was completely closed during the major construction phase of the project to expedite the schedule and lessen the impacts on the public. This report was published by FHWA in August 2003 and prominently features a recent ODOT project which resurfaced 33 lane miles of I-84 between I-5 and I-205 using full closure.

Lastly, in October 2003 FHWA held a workshop at Oregon State University (OSU) with ODOT and local agency staff entitled "Making Work Zones Work Better." This workshop was part of a national tour by FHWA aimed at state transportation agencies. The goal of the workshop was to engage public agencies in aggressively anticipating and mitigating congestion caused by highway work zones.

*Some highlights from the previously mentioned research reports and FHWA workshop are presented below.*

## Nighttime Construction & Maintenance Operations

The May 2003 ODOT study revealed that daytime lane closures have become a serious problem in Oregon. Many highways are already at or near capacity during daylight hours. Daytime lane closures to accommodate construction and maintenance activities only add to the congestion problem.



The problem is not limited to urban, metropolitan areas. Daytime lane closures in rural and suburban areas during seasonal peaks in traffic volumes have also led to adverse impacts on the level of service for highways leading to and from popular tourist and recreational areas. Because of this, more maintenance and construction activities now occur at night in order to counter the disruption of daytime traffic congestion.

Nighttime maintenance and construction eliminates the daytime disruption of traffic. However, this also raises a new set of factors and concerns, such as: cost, productivity, quality, noise, human factors, safety, public awareness, and lighting. In deference to the motoring public and business concerns, ODOT has used, and continues to use, nighttime operations for

maintenance and construction activities on many of its high-volume highways. However, decision making for using nighttime operations is currently subjective and relies on judgment without the benefit of analytical data and/or evaluation criteria. The purpose of the ODOT research project was to develop criteria for when nighttime operations would be feasible and develop a basic software tool that would step decision makers through the process of weighing daytime versus nighttime operations.

The study concluded that there were 7 critical factors that ODOT considers when weighing nighttime versus daytime work. Of those 7 factors, as shown in the table below, safety, congestion, and quality of work are clearly the most important in determining whether nighttime work is preferred.

Factor	Characteristics
Safety	Crash frequency and Fatality frequency
Congestion	Congestion * User costs = \$
Quality	International Roughness Index, composite pay factor, and Overall Condition Index
Public Relations	Local impact- including business impact and noise
Worker Condition	Performance levels
Productivity	Daily paving productivity
Scheduling	Availability of personnel, materials and equipment

The importance of these factors are reflected in the software tool developed by Oregon State University (OSU) as part of the research effort. This tool is available on CD-ROM to anyone who requests a copy of the report from the ODOT Research office. The report and software tool are also available on the ODOT Research website at <http://www.odot.state.or.us/tddresearch/>

## Full Road Closure for Work Zone Operations

An August 2003 study noted how full road closures are being successfully used across the country to address mobility and congestion issues associated with major highway construction projects. One such project cited in the FHWA study was the repaving of I-84 from I-5 to I-205 in Portland.

As one of the most heavily traveled highways in the state, the I-84 corridor in Portland had seen significant rutting and pavement distress from over 20 years of high traffic volumes and heavy commercial vehicle traffic. A rehabilitation project originally planned for 2005 was accelerated to take advantage of available project funding.

To carry out the accelerated schedule, ODOT employed an innovative strategy to manage traffic during construction. The agency decided that full closure of the highway on two consecutive August weekends was the best option for adequately managing traffic for the major construction phase of the project. That decision led to increased mobility and safety for the traveling public as impacts were limited to two consecutive weekends rather than 32 nights of paving work during off-peak hours.

Public sentiment concerning the use of full closure for rehabilitation work on I-84 was overwhelmingly positive. ODOT logged more than 50 phone calls and email messages from travelers and citizens who were pleased with the way the project was handled. In fact, ODOT did not receive a single complaint from the public concerning the project, which project management personnel noted is very unusual for a project of this size.

The FHWA study concluded that full road closures have become a successful tool for minimizing adverse impacts to mobility and congestion in work zones. While a full closure

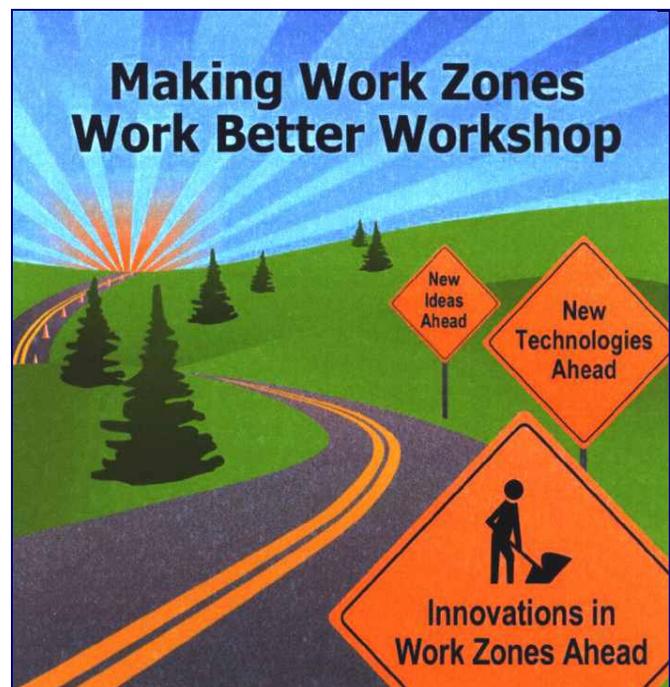


approach may not be the appropriate solution for every work zone, there are many situations where this approach can be an effective solution in reducing exposure and risk to the traveling public. In many cases, the benefits far outweigh the negatives as many full closure projects have resulted in increased productivity, reduced project duration, enhanced safety, and significant cost savings. The FHWA report entitled [Full Road Closure for Work Zone Operations – A Cross-Cutting Study](http://ops.fhwa.dot.gov/wz) can be accessed through FHWA’s Workzone Mobility website at <http://ops.fhwa.dot.gov/wz>

### Making Work Zones Work Better

As part of its ongoing outreach to state transportation agencies, FHWA organized a series of workshops aimed at state transportation officials involved in work zone safety and management. Oregon’s workshop took place October 2-3, 2003 on the OSU campus in Corvallis.

The main focus of the workshop was to promote the use of new practices, technologies, and products that have the potential to reduce congestion and crashes in and around work zones. The workshop featured several breakout sessions where participants heard presentations from national experts on work zone issues and then brainstormed what types of innovations could be applied in Oregon.



Those participating in the workshop deemed it a success and came away with new tools for possible application in Oregon work zones. FHWA is maintaining a comprehensive website highlighting

the national workshops and work zone tools presented by its *Work Zone Mobility Team* that is touring the country. For more information, visit the FHWA Work Zone Mobility website at <http://ops.fhwa.dot.gov/wz/index.asp>

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