

# Research Results Digest 293

## TRAINING PROGRAM FOR NIGHT ROAD WORK TO IMPROVE SAFETY AND OPERATIONS

This digest announces the results of NCHRP Project 17-17(2), "Development of Guidelines for Nighttime Road Work to Improve Safety and Operations." The research team (composed of Douglas Mace of The Last Resource and James Bryden, Consultant) developed a self-contained training package to complement *NCHRP Reports 475* and *476*.

### INTRODUCTION

*NCHRP Report 475: A Procedure for Assessing and Planning Nighttime Highway Construction and Maintenance* presented a decision process to assist highway agencies in evaluating night work alternatives against other work schedules, and *NCHRP Report 476: Guidelines for Design and Operation of Nighttime Traffic Control for Highway Maintenance and Construction* provided guidelines for developing a plan for night work that will provide public and worker safety. NCHRP Project 17-17(2) developed a fully self-contained training package to present the procedure and guidelines outlined in *Reports 475* and *476*. This digest describes the training program, which is available as *CRP-CD-50*.

Work zones pose safety problems for both motorists and workers. Although work zones result in significant amounts of congestion and associated delay, lead to accidents and related losses, cause adverse impacts on communities and businesses, and increase driver frustration, the need to construct new highway facilities, preserve existing roadways, and perform maintenance makes work zones unavoidable. Growth in traffic volumes has led many

agencies to defer roadwork activities to off-peak hours to avoid congestion. Nighttime work, however, raises additional safety problems.

The objectives of NCHRP Project 17-17 were to (1) formulate procedures to facilitate making decisions about undertaking nighttime work and (2) develop guidelines for nighttime road work to improve safety and operations. The findings of Project 17-17 are presented in *NCHRP Reports 475* and *476*. *Report 475* outlines a structured decision process that encourages a systematic comparison of alternate traffic control strategies, including traffic control plans, traffic management plans, and work schedule alternatives. It provides a comprehensive, quantitative basis for selecting the most cost-effective plan for ensuring the safety of the public and workers, maintaining capacity, minimizing the impact on the community, and getting the work completed on schedule. Although the original intent of the research was to provide a means of evaluating night work alternatives against other work schedules, there is no reason why this process cannot be used to evaluate alternative traffic control strategies incorporating work schedules for any time of day.

*Report 476* presents guidelines to assist highway agencies in developing and implementing a plan for night work. The guidelines suggest methods that can help maintain the quality of work, ameliorate community complaints, stress the importance of minimum performance standards for traffic control devices, and ensure the quality of these devices. The guidelines are presented in three sections. Section 1 contains information to help the user identify the minimum specification, set-up, and maintenance of each work zone design element—including traffic control devices, barriers, lighting, and other safety features. Section 2 includes information pertaining to the design of traffic control devices, other safety devices, and types of work zone lighting. Section 3 provides guidance for the implementation and operation of night work zones. The guidelines also contain a number of innovative procedures suggested by state DOTs to respond to special nighttime problems, such as control of glare, visibility of workers, and the need to improve conspicuity of traffic control devices.

## TRAINING PROGRAM

The training program consists of five units:

- Introduction,
- Unit 1—Night Work Decision Process and Project Conceptual Design,
- Unit 2—Traffic Control Plan Design,
- Unit 3—Traffic Control Devices and Safety Features, and
- Unit 4—Night Work Operations.

The Introduction Unit provides a general introduction to NCHRP Project 17-17 and an overall summary of the training program. It also includes an overview of basic concepts and principles related to work zone traffic control. Unit 1 presents a decision process for determining whether or not to do night work and discusses project conceptual designs. Unit 2 covers traffic control plan design and includes material on night work concerns and enhancements. Unit 3 is on traffic control devices and safety features, including channelizing and delineation devices, changeable message signs, flagging operations, temporary lighting, etc. Unit 4 covers night work operations, including contractor operational plans, enforcement and police services, and public awareness activities.

Units 1 through 4 each include a number of class problems. Each problem is described in detail in the slides, and possible solutions are generally shown in a subsequent slide. The instructor's notes provide complete information on each problem, as well as a number of suggestions for using the problems to best advantage to demonstrate various concepts and materials to the class and to enable the class to practice the use of the concepts on sample problems.

The training program is designed in a modular format such that each unit can be presented independently or units can be combined for one overall presentation.

The intended audience for this training program includes the following:

- Highway administrators;
- Project planners and designers;
- Others with responsibility for project planning/scheduling;
- Construction and maintenance managers;
- Project supervisors and inspectors; and
- Contractor managers, supervisors, and traffic control staff.

The first three groups above are expected to have the most interest in Units 1 and 2 and the last three groups in Units 3 and 4.

## TRAINING MATERIALS

The *CRP-CD-50* set includes “General Notes for Instructors” and the following items:

- PowerPoint presentations for each unit of instruction along with the MPG files used for each.
- An instructor manual for each unit of instruction along with a copy of each slide with the accompanying instructor notes.
- A student handout that contains a complete set of slides from the PowerPoint presentation in PDF.
- A set of worksheets containing materials needed for the class problems (Units 1, 2, and 3 only).

In addition to the instructor manual, the instructor notes are included with each slide in the PowerPoint presentations.

## FINAL REPORTS AND CRP-CD-50

Copies of *NCHRP Reports 475* and *476* and *CRP-CD-50* are available from:

Transportation Research Board  
Business Office  
500 5th Street, NW  
Washington, DC 20001

and can be ordered or viewed online at:

[www4.trb.org/trb/onlinepubs.nsf/web/crp](http://www4.trb.org/trb/onlinepubs.nsf/web/crp)

(Click on “National Cooperative Highway Research Program” under the “Project Reports” heading.)

## ACKNOWLEDGMENTS

This study was conducted under NCHRP Projects 17-17 and 17-17(2), “Development of Guidelines for Nighttime Road Work to Improve Safety and Operations.” It was guided by NCHRP Project Panel 17-17, chaired by Mr. Mark R. Bortle, with members Mr. William Anderson, Mr. Gregory R. Brinkmeyer, Mr. John M. Carr, Dr. Janice R. Daniel, Ms. Kimberly A. Lariviere, Mr. David McKee, Mr. Thomas N. Notbohm, Mr. Michael Robinson, and Dr. Richard Pain. The final reports and training materials were prepared by Mr. Douglas Mace, The Last Resource, and Mr. James E. Bryden.

These digests are issued in order to increase awareness of research results emanating from projects in the Cooperative Research Programs (CRP). Persons wanting to pursue the project subject matter in greater depth should contact the CRP Staff, Transportation Research Board of the National Academies, 500 Fifth Street, NW, Washington, DC 20001.

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