

Work Zone Wonders

SHRP Work Zone Safety Devices

Although motorists face the greatest danger of injury or death in construction zones, maintenance workers are justified in worrying about their own safety as well. As seen from "A Study Concerning Drivers' Attitudes...", motorists are often unaware of their speed when they enter construction zones, and often feel they are slowing down when in fact they aren't. Maintenance workers need some type of device to alert drivers to dangers beyond the ordinary signing.

To help reduce the risk to both workers and drivers, the Strategic Highway Research Program (SHRP) conducted a national design competition for new work zone safety devices. Ideas to come out of this competition included the Infrared Intrusion Alarm, the flashing stop/slow paddle, and the portable speed bump.



Rated best by maintenance workers, the Infrared Intrusion Alarm works by sounding aloud (120-decibel) siren whenever a vehicle strays into a work zone, giving maintenance workers four to seven seconds warning to clear the work area. The alarm has: A detector with an infrared "eye"; an orange safety cone with a reflective sock; and a receiver with a siren.

The detector is light weight and can be set up in seconds. The detector is placed at the edge of the road at the end of the work zone taper. An orange safety cone with a reflective sock is placed on the opposite end of the closed lane. The siren, which communicates with the detector by radio, is placed near the maintenance workers. When an errant

vehicle enters the closed lane and breaks the beam, the siren sounds.

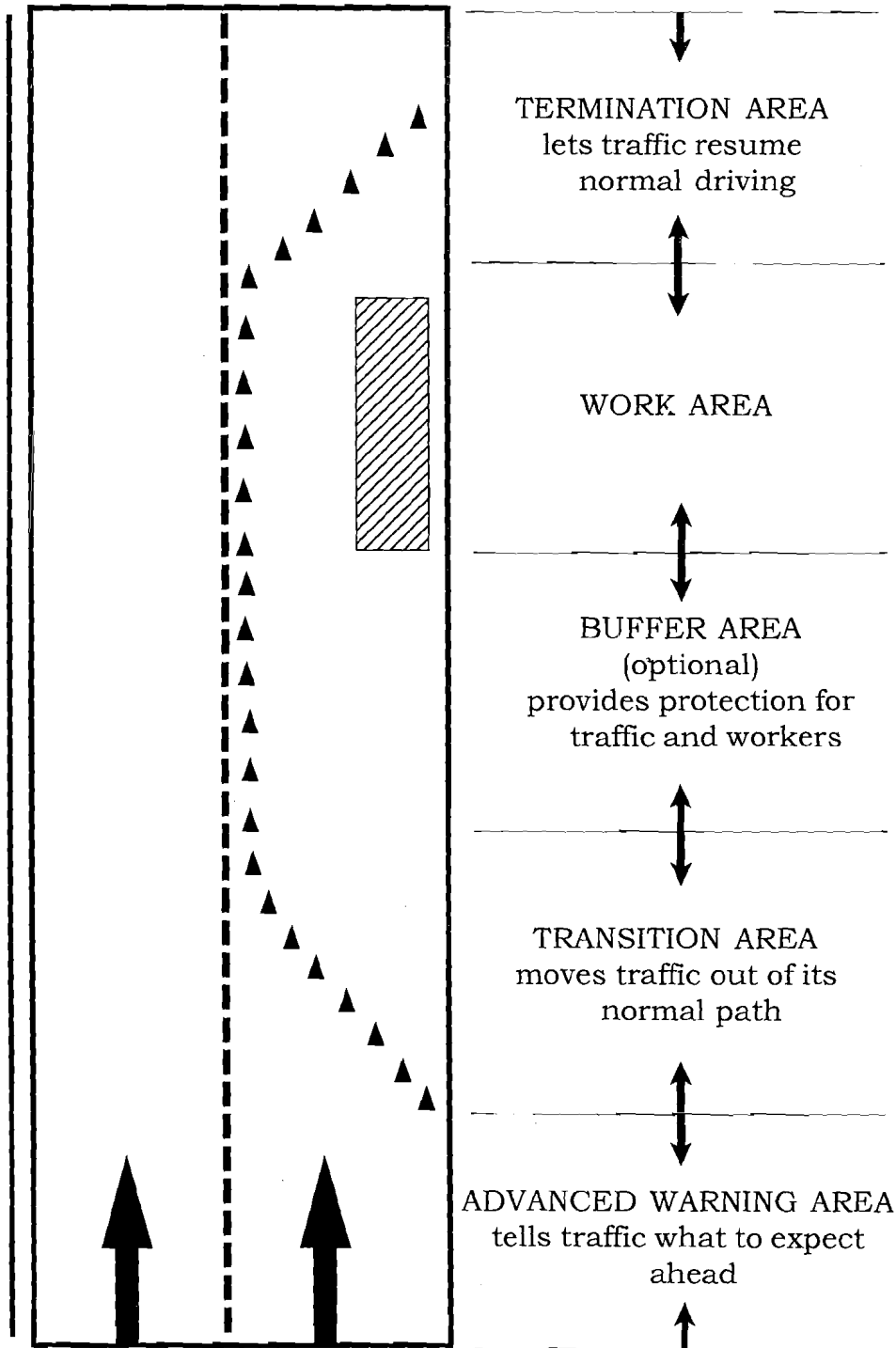
See insert for your chance to win an Infrared Intrusion Alarm for your municipality!

Source: Tribal Roads, Montana LTAP, Vol. 1, Issue 3, 1993

Local Technical Assistance/Technology Transfer
Center

Five Parts of a Traffic Control Zone

The traffic control zone is the distance between the first advance warning sign and the point beyond the work area where traffic is no longer affected. Below is a diagram showing the five parts of a traffic control zone.



Excerpted from *Work Zone Safety*,
produced by Institute for Transportation Research and Education

When should you replace that old cone?

Acceptable

The conical shape should remain clearly identifiable with no significant distortion and must be free standing in its normal position. The surface is free of punctures and abrasions. The surface is free of asphalt splatter, cement slurry or other material and will readily respond to washing. The reflective bands, if required, have little or no loss of reflectivity, with only minor tears and scratches.

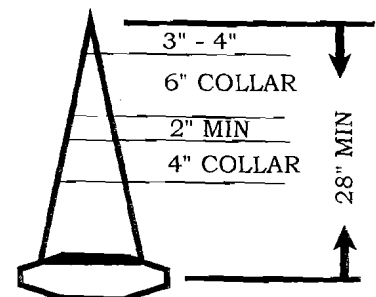
Marginal

The surface has some asphalt splatterings or cement slurry and may not be readily cleaned due to abrasion and discoloration. The reflective bands, if required, have numerous tears and scratches, but are free of large areas of residue or missing material.

Unacceptable

Punctures and large areas of staining asphalt splatter or cement slurry make these an unlikely candidate for improvement. Large areas of missing or stained reflective material make the cone unacceptable.

Excerpted from *Quality Standards for Work Zone Traffic Control Devices* by American Traffic Safety Services Association.



For night and/or higher speed
roadways (>45 mph)

Seven Principles of Planning Work Zone Traffic Control

- 1) Keep the motorist's respect and the agency's credibility. Don't lie to the public.
- 2) If work is not in progress, or a hazard is not there; take down, fold over, or cover signs.
- 3) If there is no need for traffic channelling devices...remove them.
- 4) Do not tell drivers to expect a hazard that is not there. If you do, they may not believe other signs and devices used on the project.
- 5) Do not assume that drivers and pedestrians will see or recognize the workers or hazards in the work area.
- 6) Maintain the controls as if every driver were approaching the area for the first time.
- 7) Understand the philosophy of good work area traffic control, so you can perform your work with a minimum of exposure to traffic. Watch for problems and any damaged or missing devices.

Workzone safety is everybody's responsibility - contractors, highway personnel, and local officials alike.

Concept provided by Vermont Local Roads News, Vermont LTAP, 1993

WORK ZONE SAFETY MINI WORKSHOPS

Program Manager, Chris Ahmadjian, is available for training of your employees at a convenient location in your town. These workshops include:

"Work Zone Safety Basics"
"Case Studies"
"Developing a Work Zone Safety Plan For Your Town"

These are best scheduled in the morning. They run about 2-3 hours and are free of charge. Please call to request a custom roadshow for your community; 413-545-2604.

BAYSTATE ROADS CALENDAR

SURFACE TREATMENTS

March 31	Northampton
April 1	Plymouth
April 2	Westford
April 3	Worcester

EXCAVATION SAFETY

April 21 & 22	Amherst Water Treatment Facility
April 23 & 24	Attleboro Water Treatment Facility

CULVERT INSPECTION

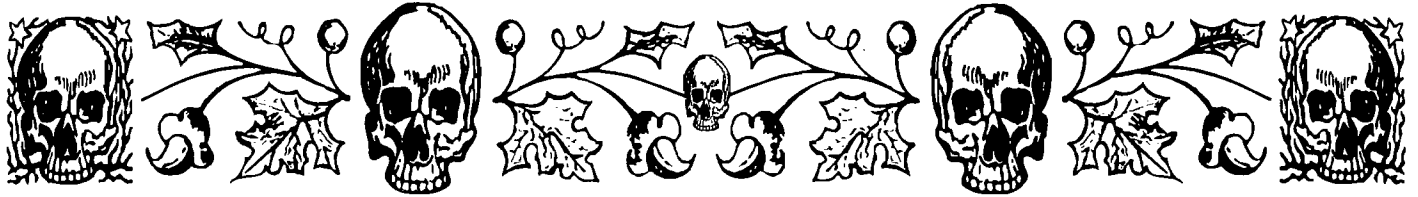
May 12 & 13	Westboro
May 14 & 15	Northampton

CREATING AN IMAGE

March 3	Northampton
March 5	Southborough
March 10	Taunton
March 12	Andover



Danger in the Highway Work Area



While working in a highway work zone, one would expect that a greater chance for injury or death would come from the fastest moving vehicles near the worker - such an assumption is not wrong. Workers must stay alert to fast-moving traffic in the lanes adjacent to the work area, especially if there is no physical divider such as a concrete barrier. However, this is not the only danger to highway personnel in work zones. A recent study completed by several labor union safety organizations and John Hopkins University focused on accidents within the work area that are not caused by intrusion from the highway traffic stream.

What is the greatest danger to highway workers from within the work zone?

This study shows that the greatest danger for laborers is a dump truck. More than half of the lives lost during the study period were the result of dump-truck accidents. Highway worker deaths totaled 125 in 1995. Of the dump-truck deaths caused by backing where there was an Occupational Safety Health Administration (OSHA) investigation, 56 percent of the trucks **did not have an operational backup beeper.**

Keep in mind that the number of fatalities, 125, were highway workers. Certainly, this is an alarming number, but during the same study period there were an additional 771 fatalities of vehicle occupants and pedestrians by the National Highway Traffic Safety Administration for accidents in the vicinity of high-

way work zones. This article is not intended to take away from the importance of good traffic control for highway drivers and pedestrians; however, the labor study findings reveal that more attention is needed for equipment movement within the work area. As part of this study, subcontractor Graham/Migletz Inc. of Independence, Missouri, completed a project to show how internal traffic control plans need to be developed and followed to minimize the need for backing and other hazardous movements, and/or to make them as safe as possible.

Safety Devices Suggested...

The labor study produced some intervention devices that allow the truck-spotter to more effectively communicate with the drivers of a backing truck. A significant number of the backing accidents occurred when someone was watching, but was unable to communicate with the driver quickly enough to stop the truck. One device created is a sounding unit that hangs on the window of the truck. The spotter has a transmitter to activate the sounding of the unit and alert the driver when to stop. Originally, the device could be constructed from off-the-shelf items, but these standard products are no longer available. In Spring of 1998, a new transmitter developed by George King, Safe-Lite Systems, Inc. Newton, PA, 18940, (215) 968-9296, will provide the driver with a warning signal for avoiding contact in the path of a backing vehicle. More elaborate devices will allow the spot-

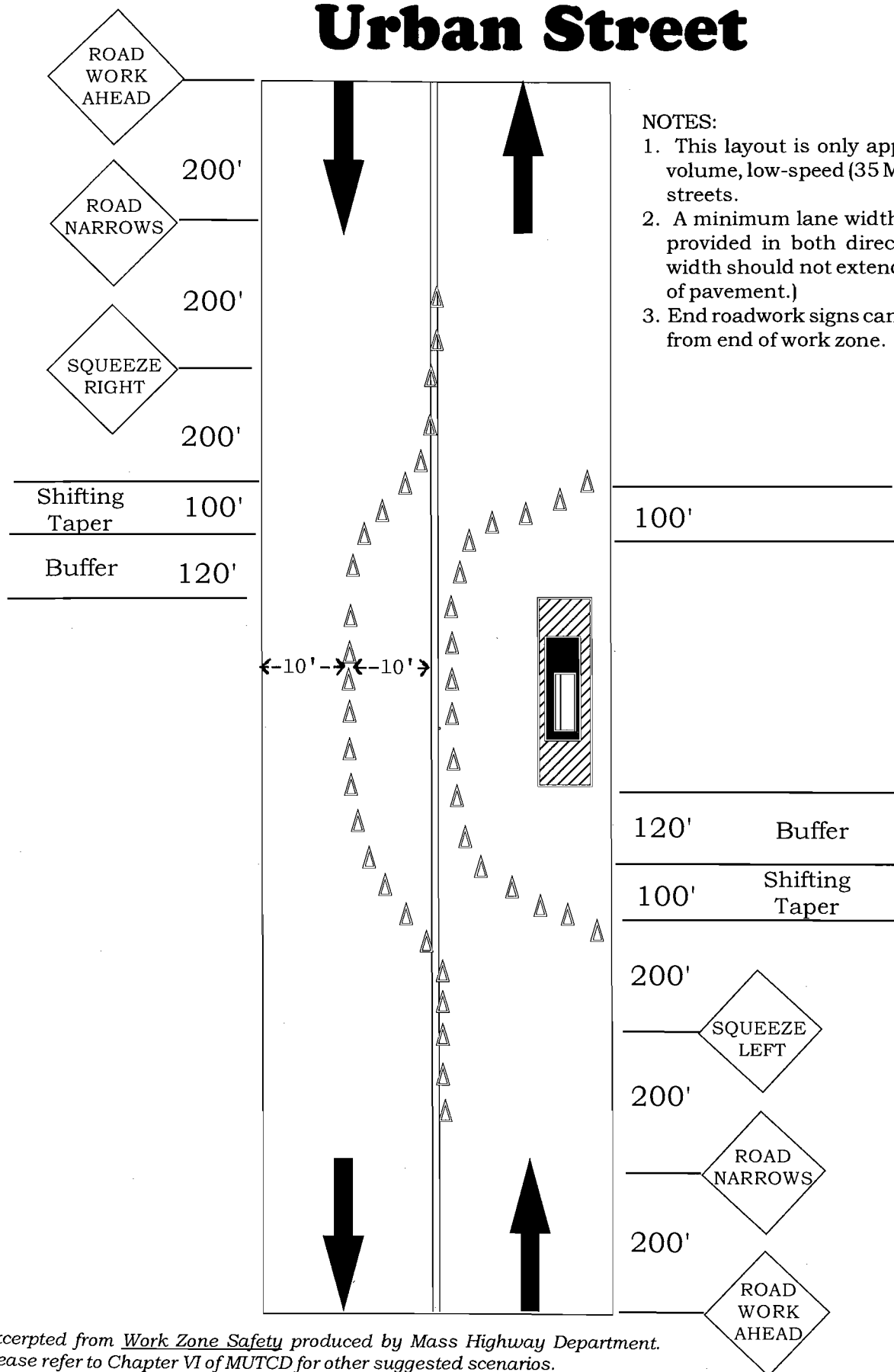
ter to actually lock the brakes of the backing truck when danger occurs.

Another example of a device coming from the labor study is a sleeve to place over a standard traffic cone to call attention to overhead power lines. Seventeen percent of dump-truck fatalities were the result of hitting overhead power-lines with the truck bed up. The sleeve is a strong, yellow-green plastic covering with wording and electrical symbols pointing upward. Thus, the special cones can be placed under the power lines so a driver and the spotter can be continually reminded of the overhead danger.

Another product of the study is an instructional package for training highway workers to avoid dangers in the work area. It will be ready in a few months and should be of much interest for Local Technical Assistance Program (LTAP) training sessions. The labor study was completed by the Laborers' International Union of North America, Laborers' Health and Safety Fund of North America, and the John Hopkins University, a cooperative effort between labor, management, government, and academia since each has a strong interest and responsibility for the safety of highway workers.

**The goal is to
send every
highway
worker home
safely at the
close of each
day!**

Work in Travel Lane on a Minor Urban Street



NOTES:

1. This layout is only appropriate for low-volume, low-speed (35 MPH or less) urban streets.
2. A minimum lane width of 10' should be provided in both directions. (The lane width should not extend beyond the edge of pavement.)
3. End roadwork signs can also be used 200' from end of work zone.

Excerpted from *Work Zone Safety* produced by Mass Highway Department.
Please refer to Chapter VI of MUTCD for other suggested scenarios.



videos and publications



WORK ZONE SAFETY - VIDEOS

ST-113	Traffic Control for Short Term Work Zones, Parts 1-5
ST-136	Work Zone Safety for Rural Local Agencies
ST-140	Advance Warning (Flashing) Arrow Panels; Barrier Delineation in Work Zones: The Well Defined Path
ST-149	Work Zone Safety Concepts
PA-101	Work Zone Traffic Control - Tort Liability for Local Officials
ST-162	Highway Work Zone Safety: The Basics
ST-165	New Work Zone Safety Devices

WORKZONE SAFETY - PUBLICATIONS

TRA-24C	Design and Operation of Work Zone Traffic Control (Handout)
SAF-56	Maintenance Work Zone Safety Devices Development and Evaluation
TRA-09	Speed Control Through Work Zones: Techniques Evaluation & Implementation
TRA-13	Work Zone Traffic Management Synthesis: Use of Rumble Strips in Work Zones
TRA-21	Work Zone Traffic Control for Local Streets
TRA-29	Selection and Application of Flashing Arrow Panels
TRA-31	Barrier Delineation Treatment Used in Work Zones
SAF-75	Innovative Devices for Safer Work Zones
SAF-76	Development & Implementation of Traffic Control Plans for Highway Work Zones
TRA-46	Work Zone Safety - Guidelines for Mass. Municipalities & Contractors
TRA-48	Work Zone Traffic Control - Information Catalog
SAF-79	National Conference on Work Zone Safety
TRA-54	Lighted Guidance Devices: Intelligent Work Zone Traffic Control
TRA-59	Work Zone Safety Guidelines for Construction, Maintenance & Utility Operation
SAF-92	Quality Standards for Work Zone Traffic Control Devices

NEW VIDEOS

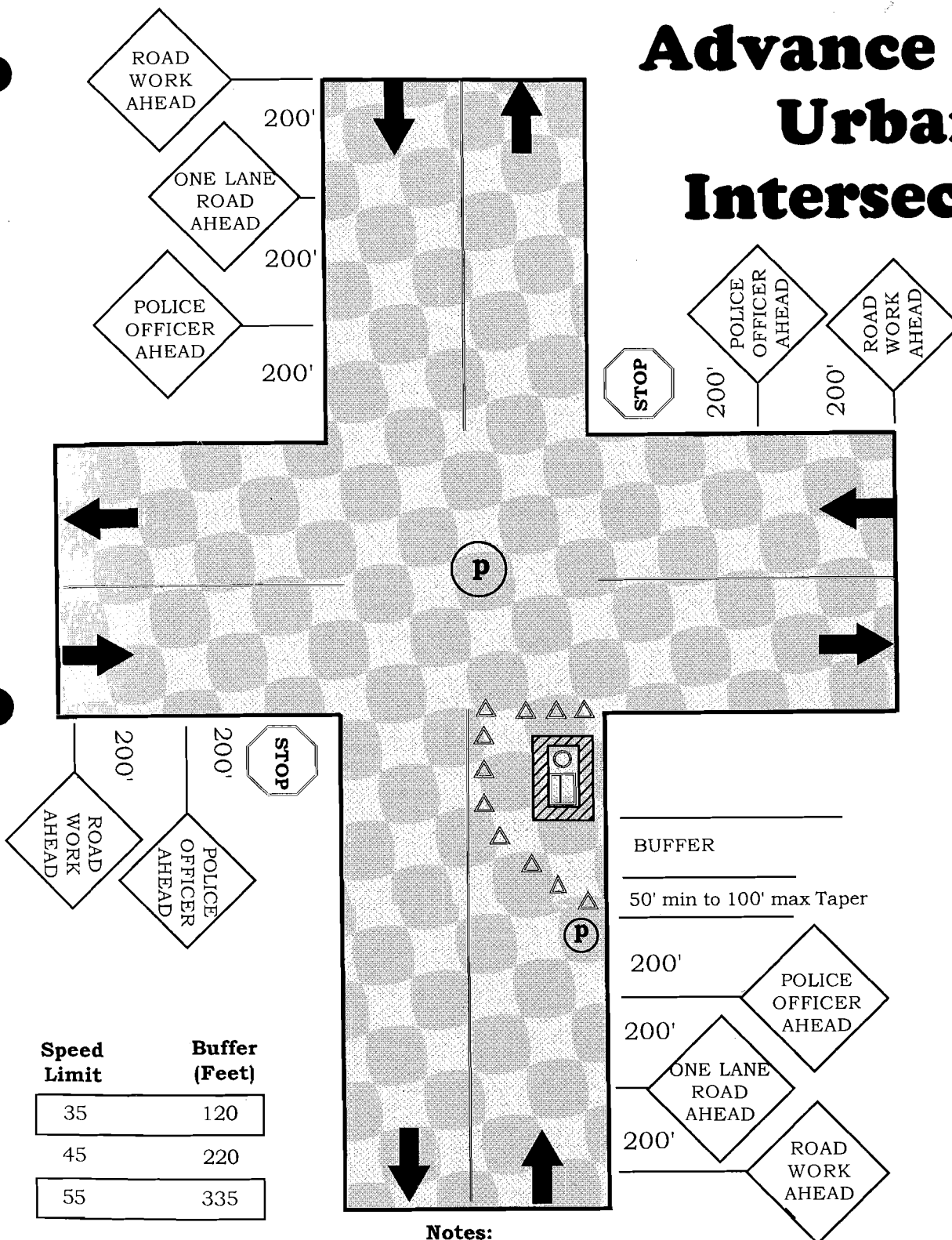
ST-175	Traffic Safety Series
ST-127	It Always Happens to the Other Guy
MO-218	Traffic Control: What Works?
MO-223	Contract Maintenance Series
MO-224	Low Volume Roads Series
PA-146	Highway Management Series (2 tapes)
PA-147	Construction Management Systems Series
PA-148	Technology Transfer Series
PA-149	Equipment Management Systems Series

NEW PUBLICATIONS

BIK-14	Bicycle Crash Types: A 1990's Informational Guide
PED-11	Pedestrian Crash Types: A 1990's Informational Guide
S&I-51	Snow Mechanics: Review of the State of Knowledge and Applications
DRA-42	Stormwater Management: Vol. 1: Policy Handbook, Vol. 2: Technical Handbook
DRA-34	Road Design and Maintenance Handbook
MAI-24	Inspector's Job Guide & Highway Maintenance Tables (Metric)
UNS-18	Field Guide for Unpaved Roads
D&C-64	Utility Cuts in Paved Roads (Field Guide)
DRA-33	Pollution Control Programs for Roads, Highways, and Bridges

**Please fax your requests by code number to Baystate Roads at
413-545-6471 or call 1-800-374-ROAD.**

Lane Closure in Advance of an Urban Intersection



Notes:

1. For low speed (35 MPH or less) conditions, a 200-foot sign spacing may be used. For speeds of 40 to 50 MPH a 350-foot sign spacing may be used.
2. Depending on traffic conditions, additional traffic control, such as police officers and appropriate signage, may be needed on the side road approaches.
3. End roadwork signs can also be used 200' from end of work zone.

Excerpted from Work Zone Safety produced by Institute for Transportation Research and Education. Please refer to Chapter VI of MUTCD for other suggested scenarios.

Congratulations!



to our newest

BAYSTATE ROADS SCHOLARS!

Thomas Brezinski
from the
Town of Pelham

Jeff Koranda
from the
Town of Concord

NOTE: We would like to make a correction from the last issue's list of graduates: John Modelewski is working for the City of Worcester, *not* the Town of Holden. Apologies to John and the City of Worcester.

in this issue

Work Zone Wonders	Page 1
Five Parts of a Traffic Control Zone	Page 2
7 Principles of Planning a Work Zone	Page 3
Calendar	Page 3
Danger in the Highway Work Area	Page 4
Work in Travel Lane (illustration)	Page 5
Videos and Publications	Page 6
Lane Closure in Advance of Intersection (illus)	Page 7

**SEE INSERT FOR YOUR CHANCE TO WIN
AN INFRARED INTRUSION ALARM AND
OTHER GREAT PRIZES!**

The Baystate Roads Program, which publishes *Mass Interchange* each quarter, is a Technology Transfer (T2) Center created under the Federal Highway Administration's (FHWA) Local Technical Assistance Program (LTAP). FHWA is joined by the Massachusetts Highway Department, the Department of Civil and Environmental Engineering at the University of Massachusetts/Amherst, and local public works departments in an effort to share and apply the best in transportation technologies.

In addition to publishing *Mass Interchange*, the Baystate Roads Program facilitates information exchange by conducting workshops, providing reports and publications and videotapes on request, and offering one-to-one technical assistance on specific roadway issues. Because the program relies on input from many sources, inquiries, articles, and ideas are encouraged.

Local Technical Assistance/Technology Transfer Center

To contact the Baystate Roads Program, call (800) 374-ROAD (in state) or (413) 545-2604.

8 

MASSINTERCHANGE

WINTER 1998

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