

**M****A****S****S**

# INTERCHANGE

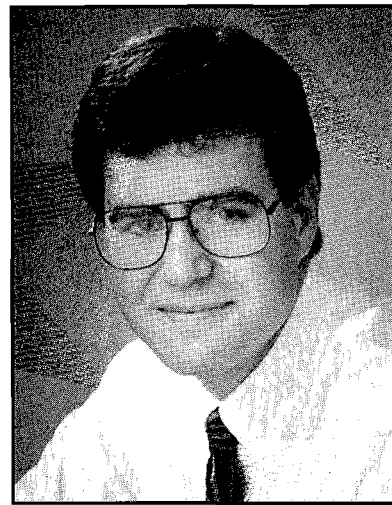
Volume 7, Number 2

Winter 1993

## *CHANGES, CHANGES, CHANGES*



*Silvio J. Baruzzi*



*Chris Ahmadjian*

"Once more into the fray..." Having come to us in January, 1990 from the position of Highway Superintendent for the Town of Montague, Silvio Baruzzi has returned to the firing line as Director of Public Services for the Town of Ashland.

As Program Manager, Silvio's advice on local road problems was in constant demand, as was his familiar and welcomed presence in many of our smaller communities. The mini-workshop series that Silvio initiated is still an active component of our program. Our loss is Ashland's gain.

We are pleased and fortunate to be able to welcome Christopher Ahmadjian as the new Program Manager for the Baystate Roads Program. Chris holds a B.S.C.E. degree from the University of Massachusetts/Amherst, and an MBA from Clark University; he is also Registered as a Professional Civil Engineer in the State of Massachusetts.

His academic credentials are matched by considerable experience in site design and consulting engineering in Massachusetts and as an engineer with the New York State Department of Transportation. Before joining Baystate Roads, Chris worked as a Counselor with the Small Business Development Center in Worcester.



Baystate Roads Program wishes everyone  
a very happy Holiday Season!

Paul W. Shuldiner, Director

**Local Technical Assistance/Technology Transfer Center**

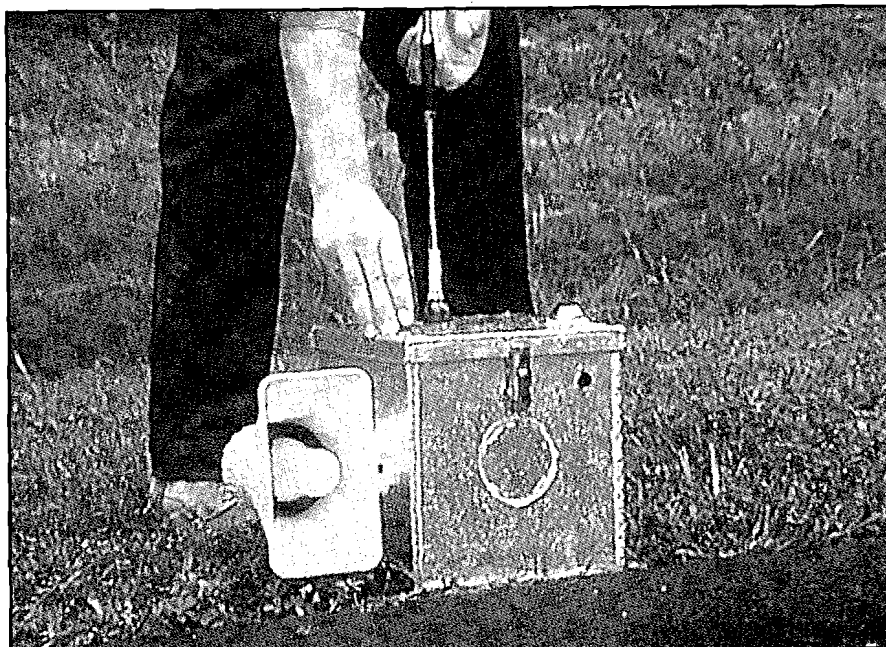
**(413) 545-2604**

# Intrusion Alarm Buys Time for Workers

Of all the new safety devices coming out of the Strategic Highway Research Program, the Infrared Intrusion Alarm was rated tops by about 35 maintenance workers surveyed in Iowa, Michigan, and Oregon. The alarm works by sounding a loud (120 decibel) siren whenever a vehicle strays into a work zone, giving maintenance workers four to seven seconds warning to clear the work area. Developed by Graham-Migletz Enterprises of Independence, Mo., the alarm has three components:

- a detector with an infrared "eye";
- an orange safety cone with a reflective sock; and
- a receiver with a siren.

This mostly solid-state detector weighs in at only 28 pounds. A worker can set it up in seconds. Placed at the edge of the road at the end of the work zone taper, the detector bounces its infrared beam off a reflective strip or sock on an orange safety cone placed on the opposite side of the closed lane. The detector communicates with the siren by radio so no wires are necessary. The siren is placed near maintenance workers. When an errant vehicle enters the closed lane and breaks the beam, the siren sounds. This life-saving device costs about \$4,000.



**Infrared Intrusion Alarm**

The Infrared Intrusion Alarm can either be purchased, or fabricated on-site using detailed plans that are available free from SHRP. In addition, the SHRP is also offering cities and counties a chance to try this new safety device free of charge. For more information write or phone SHRP or FHWA:

Mr. S.C. Shah  
SHRP  
818 Conn. Ave., N.W., Suite 400  
Washington, D.C. 20006  
(202) 334-3774

Mr. Joe Lasek  
FHWA  
Office of Technology Applications  
400 Seventh Street, S.W.  
Washington, D.C. 20590  
(202) 366-8033

*This article was reprinted in part from the July 1992 issue of Product Alert!, a publication of the Strategic Highway Research Program.*

## IN THIS ISSUE



Changes, Changes, Changes .....	Page 1
Intrusion Alarm Buys Time for Workers.....	Page 2
Safety Tip - Eye Protection.....	Page 3
The Effects of Banning Salt for Roadway Deicing.....	Page 4
Rock Salt Study .....	Page 5
Dump Body Airfoil .....	Page 6
Calendar of Events .....	Page 6
New Listings/Publications .....	Page 7
Videotape Lending Library: New Acquisitions.....	Page 8

# SAFETY TIP

## Eye Protection

### An Eye For An Eye

A carpenter asked his insurance company to pay for damage to his glass eye. It had been broken when a nail he was driving flew up and struck it. When asked how he had lost his own eye in the first place, he replied: "The same way, a nail hit it."

A world of darkness awaits this man if a nail strikes his remaining good eye. He has yet to appreciate the need for eye protection. You, yourself, may find it difficult to get accustomed to wearing eye protection, but would getting accustomed to wearing a glass eye be any easier?

### A Sight Saver For Years

Eye protection has been used in the construction industry since 1910. And, undoubtedly, many workers have escaped serious injury because of it. You may personally know some fortunate individuals who saved their sight this way.

### Take Time To Select The Right Kind

Depending on your job, you may need goggles, an eye shield, a face mask or safety glasses. All it takes on your part is a little effort to select the appropriate type and to wear it.

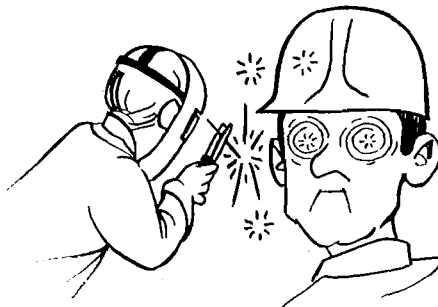
### Four Basic Types of Hazards

Basically, there are four types of particles that cause eye injuries on the job:

Unidentified Flying Objects: These microscopic objects consist of dust and particles floating around in the air, generated by wind, equipment, or cleaning operations. When working in dusty conditions, wear eye protection. Even a small speck in the eye can lead to trouble.

Particles Resulting From Chipping, Grinding, Sawing, Brushing, Hammering, or Using Power Tools: These particles move at an amazing speed and strike with the force of a bullet. Wear eye protection any time overhead operations are performed. It may be advisable on some jobs to wear safety goggles under a full face shield.

Invisible Hazards: You can't see the injurious light rays generated by welding operations or laser beams. And their effects often are not felt until hours later. Wear the eye protection required when using such equipment. And if you happen to be working nearby, don't look in the direction of welding arcs or where a laser beam is being used.



Liquids: Hot liquids, such as tar or asphalt, solvents, paint, and solutions for cleaning masonry or metal, can cause serious eye injury if splashed in your face. The use of proper eye protection, possibly a full face shield, is essential when transferring liquids between containers and when using caustic or acid cleaners.

### Instant Darkness

Eye injuries happen in a split second. So put on your eye protection as soon as you get back to your job after reading this. Don't blind yourself to the necessity of protecting your sight.

## What's in a name?

Sometimes quite a lot. Some of our readers may have noticed that, starting with this newsletter, the "Rural" in our name has been replaced with the term "Local." We, along with Rural Technical Assistance Programs throughout the country, have become "Local Technical Assistance Programs."

### "RTAP is now "LTAP"

The reason this happened is that the Federal Intermodal Transportation Efficiency Act (ISTEA) of 1991, which will provide much of the funding for our operations through 1997, has expanded the scope of our Technology Transfer Program to include communities of up to one million persons. Previous to this our services were focused on communities of less than 50,000 persons.

If you are a member of a community larger than 50,000 persons, welcome to the technology transfer program. Let us know how we can meet your needs. We're here to help make your job easier.

If you are a member of one of our smaller communities, don't be concerned. We will continue our existing service to you, and in addition we will now be able to add new activities of use and interest to all communities.

Shortly, each city and town will be asked what their technology transfer needs are and how we may best serve those needs. So, if all of you could begin to think of what it is you need and/or want from us now, that would be helpful. If you have an immediate need, give us a call.

We look forward to continuing to work with everyone to help make our program even more useful to you in the coming years.

# The Effects of Banning Salt for Roadway Deicing

As environmental concerns increase across the United States, public works officials are finding themselves under increasing pressure to re-evaluate traditional snow fighting techniques. And more often than not, the reconsideration centers on the use of deicing salt.

Public works professionals have been evaluating the effects of salt for many years, and genuine citizen's concern about it should not be ignored. But before elected officials rush headlong into a salt ban, they should study the effects of such a ban in Tulsa, Oklahoma during the 1985-86 winter.

The use of sodium chloride to control snow and ice has been debated for years across North America and in Tulsa, which has used salt since 1972. The debate has grown more heated in recent years with increased environmental awareness among public works officials, elected representatives, and citizens.

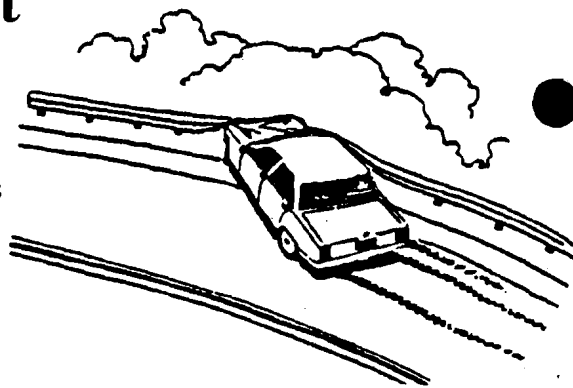
In winter 1985-86, this debate culminated in a ban on the use of salt to control ice and snow in Tulsa, which has a population of 370,000 (670,000 in the greater Tulsa metropolitan area) and averages about one foot of snow and three ice storms yearly. Although the amount of annual snowfall

is light, motorists are not used to driving in winter storms, and many drivers have become accustomed to good winter driving conditions due to the city's bare pavement policy utilizing salt.

Public safety was jeopardized. Hundreds of vehicle accidents occurred during the ban and dozens of citizens suffered injuries. Street maintenance and other emergency vehicles, although properly equipped for poor road conditions, were stuck in traffic by vehicles not equipped for poorly-treated roads.

Motorists transferring from the salt-treated, bare pavement interstates managed by the Oklahoma Department of Transportation (DOT) to sand-treated state and local highways handled by the city found themselves immediately and unexpectedly driving on hazardous pavement. In fact, a significant number of accidents occurred at interstate interchanges to the state and city system. Those who thought the salt ban would be a good idea because it would protect their cars were probably unaware that the Oklahoma DOT, Oklahoma Turnpike Authority, and many private parking lot owners used salt.

Public confidence and trust in the gov-



ernment's ability to provide for basic public safety was severely eroded. Thousands of complaints were lodged in government offices and in the media by citizens who had grown accustomed to safe streets during winter storms. The professional capabilities and integrity of street maintenance managers, all of whom opposed and advised against the ban, were called into question by citizens and the media.

In summary, it is the consensus of street maintenance professionals across the country that the search for an environmentally safe, cost-effective salt substitute must continue. Until such an alternative is found however, most experts agree that an effective winter storm control program must continue to include the properly controlled application of salt.

*(From the FHWA Transporter, July 1992, and the Ohio Technology Transfer Quarterly, Fall 1992)*

## Check out these Winter videotapes...

- MO-184** Effective Snow Fences - This videotape describes the benefits of snow fences and shows how snow fences work. (20:42)
- MO-120** Plow Power - This videotape shows the proper techniques for residential and local highway plowing. (25:00)
- ST -138** Safety Restoration - Snow Removal Guidelines - Safety hazards in snow and ice control programs are illustrated in this videotape. (25:24)
- MO-104** Snow Plowing & Sanding Techniques - Coverage of basic snow plowing and sanding techniques used in snow and ice control are explained in this videotape. (20:00)
- MO-169** Wetted Salt - This videotape explains how calcium chloride works to melt snow and ice faster and at lower temperatures than plain salt. (20:00)

❖ To request a tape from our Lending Library, simply call the Baystate Roads Program at (413) 545-2604 ❖

# ROCK SALT STUDY COMPLETED

A Congressionally mandated study to compare the full economics of using rock salt and calcium magnesium acetate (CMA) for highway deicing has been completed for FHWA by the Transportation Research Board (TRB).

The researchers for the study evaluated the myriad factors affecting the use of deicers, e.g., deicer cost, costs of corrosion to motor vehicles and infrastructure, and environmental and health factors. Costs assignable to these factors, with the exception of environmental and health factors, were developed for rock salt. Since CMA is non-polluting and non-corrosive, the principal costs entailed in its use are production costs handling, storage, manpower, and equipment which are comparatively small.

The TRB researchers did not include economic comparisons of the widespread use of CMA and rock salt. The consensus was that the widespread use of CMA as a general replacement

for salt is "unlikely and unwarranted". The use of CMA on a selective basis (e.g. corrosion-prone bridges or in environmental sensitive areas) was judged to be a reasonable option. Even though no direct cost comparisons were made, information was developed that permits a direct comparison of most of the factors affecting the economics.

**"If the cost of producing CMA could be significantly reduced, we believe the annual cost for its widespread use would be nearly equal to that of salt."**

Using the data from the study, FHWA prepared the table below that demonstrates that deicer costs is the overriding factor precluding more widespread use of CMA. If the cost of producing CMA could be significantly reduced, we believe the annual cost for its wide-

spread use would be nearly equal to that of salt.

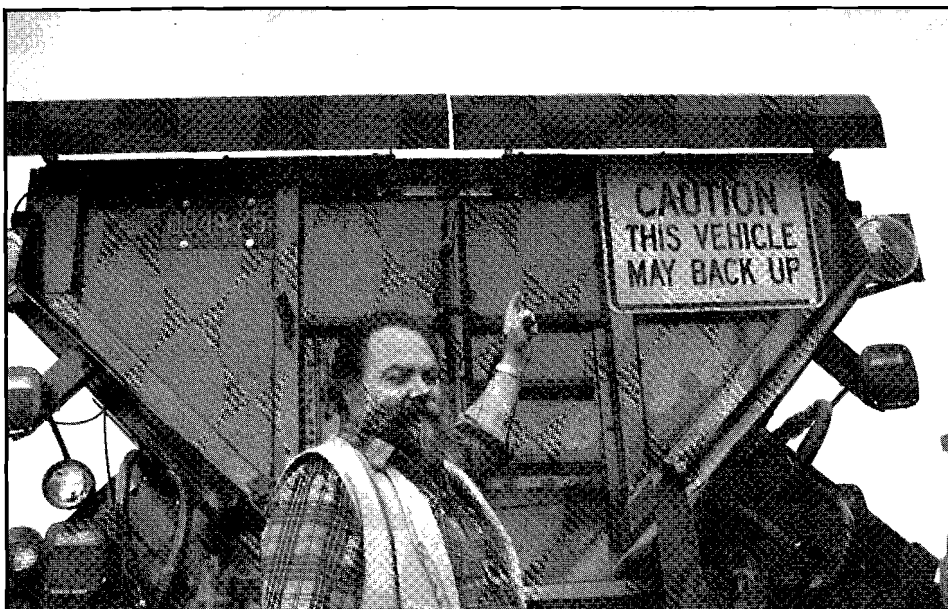
In view of the generally favorable experience with CMA, increasingly stringent environmental regulations being promulgated, the public's increasing sensitivity to environmental and health matters, and the sizeable investment already made in CMA by FHWA, FHWA is initiating a large-scale effort to discover means for reducing its production costs. This effort, scheduled to begin in FY 1993, is supported by FHWA, Con Edison, the States (through pooled fund activities), and the New York State Energy Research and Development Authority.

*This article was written by Brian H. Chollar, and was printed in the July 1992 issue of the FHWA Transporter and the Fall 1992 publication of the Ohio Technology Transfer Quarterly. Reprinted with permission.*

## ECONOMICS OF USING SALT VERSUS CALCIUM MAGNESIUM ACETATE

Item	Annual Cost - in Billions	
	SALT	CMA
Motor vehicle corrosion protection	1.900-3.900	
Bridge decks	0.125-0.325	0
Parking structures	0.075-0.175	
Motor vehicle corrosion damage	1.000-2.000	
Bridge nondeck components	0.125-0.325	0
Other highway components	0.100	
Roadside objects	NA	NA
Underground objects	NA	NA
User costs	NA	NA
Deicer purchase	.300	7.800 (1,2)
Storage, handling, manpower, equipment	.250	0.500 (3)
Environmental costs	NA	0
TOTAL	3.875-7.375	8.300

NA - not available; (1) CMA cost: \$650 per ton; (2) CMA application rate: 1.2 times salt  
(3) Storage, handling, manpower costs for CMA increased over salt because larger amounts required.



Lee Cram from Michigan's Grand Traverse County points to new airfoil.



## Dump Body Airfoil

From highway staff at Michigan's Grand Traverse County comes the idea of mounting an airfoil on the rear of V-body snow plow trucks.

A common problem with trucks used for clearing snow off highways and roads is the accumulation of snow on the back of the spreader. This accumulation of snow can obscure a motorist's view of tail lights and any caution sign located at the rear of the truck.

As an experiment, the county personnel placed an airfoil on the tailgate of the V-body truck. The airfoil worked like a charm throughout the winter, keeping lights and signs clearly visible. When spring arrived, it became obvious the airfoil had year round application for gravel roads (dust) as well.

Lee Cram, a Grand Traverse county driver, summed it up: "This thing really works".

The airfoil is made from an old aluminum road sign bent into a simple curve. The frame is made from one-inch flat stock. It spans the tailgate in two sections, right and left.

This eliminates the need to replace the whole foil if damaged by a loader bucket.

Call and tell us about any innovations your town has developed (413-545-2604). Other towns can benefit from your ideas. Plus, you might get your picture in the newsletter.

(From: Missouri Transportation Bulletin, Fall 1992, and, The Bridge, newsletter of the Michigan Transportation Technology Center, Fall 1991)

### Calendar



#### January 13-15, 1993

**Implementing the Americans with Disabilities Act; Coordinating Community Transportation Resources**

Princeton, N.J.

Contact: Community Transportation Assistance Project  
(800) 527-8279

#### March 9-10, 1993

**Crumb Rubber Modifier Workshop**  
Albany, N.Y.

Contact: Cornell Local Roads Program  
(N.Y. T2 Center)  
(607) 255-8033

#### February 2-3, 1993

**Urban Stormwater Management Workshop**

Atlanta, GA

Contact: University of Wisconsin/  
Milwaukee  
Center for Continuing Engineering Education  
(414) 227-3200

#### May 10-13, 1993

**Seventeenth Biennial Low-Rank Fuels Symposium**

St. Louis, Missouri

Contact: University of North Dakota  
Division of Continuing Education  
(701) 777-2663

**Geotextile Design & Construction Guidelines - Participant Notebook**, Revised April, 1992, U.S. DOT/FHWA. This publication is useful for project managers, highway designers, and pavement and geotechnical specialists. After a general introductory chapter, application chapters are presented on drainage, erosion control (permanent and temporary), roadways, pavement overlays, reinforced embankments and slopes, and retaining walls and abutments. Each chapter presents step-by-step procedures for design, selection, and installation of geotextiles for these applications.



## NEW LISTINGS

**Geotextile Design & Construction Guidelines - Design Examples**, Revised April, 1992, U.S. DOT/FHWA. This publication reviews design methods used with geotextiles. Designs for a filter for a trench drain, erosion control, road stabilization, and reinforced soil slopes are covered in a simplified fashion to illustrate the design process.

**Technology Applications Program**, July 1992, U.S. DOT/FHWA. This publication focuses on four project areas regarding various technology applications: demonstration, application, test, and special. It gives the reader an overview of projects throughout the country, and includes a description, contact person, and status of the project. Pavement, construction and maintenance, bridge design, geotechnology, safety, traffic control, and design are some of the areas of technology applications described in this publication.

### And other available publications:

- **Handbook on Successful Supervision for Local Road Supervisors**, U.S. DOT/FHWA, November 1990
- **Pavement Recycling Guidelines for Local Governments**, U.S. DOT/FHWA, September 1987
- **Pavement Recycling Guidelines for Local Governments - Reference Manual Appendices**, September 1987
- **Design and Operation of Work Zone Traffic Control - Participant Notebook**, U.S. DOT/FHWA/NHI, 1988
- **How To Talk And Communicate At The Same Time**, National Association of County Engineers Training Guide Series, Revised 1986
- **Road and Highway Maintenance Table**, and **Inspector's Job Guide for Highway and Street Construction** (laminated, small hand-held spiral notebook), Baystate Roads Program, February 1988
- **Work Zone Safety for Rural Local Agencies** (laminated, same as above), Baystate Roads Program, January 1991

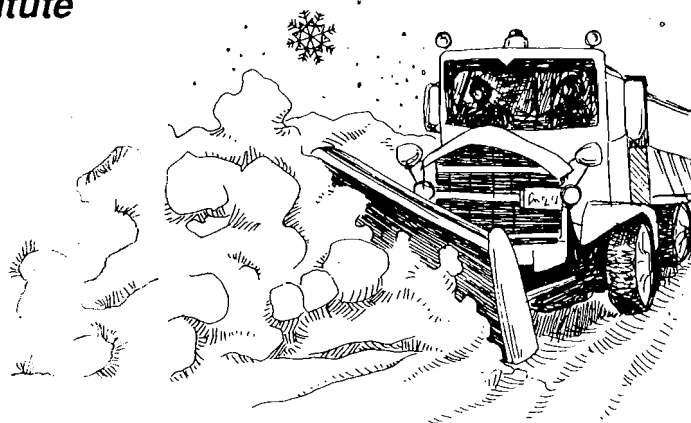
All of the above publications are available free of charge. To receive a copy, simply write, call or fax us with your request: Baystate Roads Program, 214 Marston Hall, Department of Civil Engineering, University of Massachusetts, Amherst, MA 01003.

**Phone: (413) 545-2604; Fax: (413) 545-2840**

### **Winter Maintenance....from the Salt Institute**

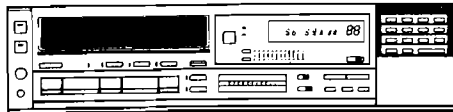
The Snowfighter's Handbook  
Deicing Salt and our Environment  
Salt Storage Handbook  
Comparative Cost Analysis of Salt and Abrasives  
Salt & Highway Deicing

Single copies of all literature are free. To order, contact the Salt Institute, 700 North Fairfax Street, Fairfax Plaza, Suite 600, Alexandria, VA 22314-2040  
Phone: 703/549-4648 Fax: 703/548-2194





## VIDEOTAPE LENDING LIBRARY



### NEW ACQUISITIONS

#### To Warn, Guide and Protect ST-139

21 minutes

This videotape reviews flagging equipment and safety gear, techniques of slowing, stopping, and releasing traffic, the variable conditions that involve traffic control, and the duties of a flagger. The proper set-up of a work area for safety, and how two flaggers can work together to control traffic are also outlined.

#### Superpave: Asphalt Pavements That Perform DC-136

5 minutes

Superpave was developed to reduce rutting, cracking, and fatigue on our nation's pavements. This videotape briefly describes the use of new technology which assists in the selection of binders that meet the demands of different climates, designs, and loads.

#### The Idea Store #7 PA-142

10 minutes

A storehouse of ideas from across the nation on ways to make your job safer, easier or better. Ideas in this videotape include: curb scraper, dump truck airfoil, better cylinder wrench, shoring trailer, generic forms for town use, and more.

**To borrow a copy of a videotape, simply write, call or fax us with your request.**

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 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.

**To contact the Baystate Roads Program, please call (413) 545-2604.**

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MASS INTERCHANGE

Winter 1993

#### BAYSTATE ROADS PROGRAM

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Amherst, MA 01003

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**MASS HIGHWAY**



Massachusetts Highway Department  
Federal Highway Administration  
University of Massachusetts/Amherst

