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Interchange

Sharing the Best in Transportation Technology

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Use What You Learn

By Dr. Rockie Blunt
Contributing Writer

These are challenging times: industry regulations are always changing, technological advancements are made in tools and equipment, new procedures are developed for tasks we've always done a certain way, and the sour economy is forcing many towns to do more with less. In the face of all these challenges, we can't stand still. We have to change the way we do business,



Dr. Rockie Blunt

which means we have to sharpen our skills, which in turn means that an increasingly important part of our jobs involves learning.

Many of you have attended Baystate Roads workshops, and when you do, you come away with useful information. Chris Ahmadjian and his dedicated team work hard to identify topics related to your responsibilities, and they locate instructors who are experts in their fields as well as good teachers. As helpful as the workshops are, however, their real value comes in the days and weeks that follow.

*Please see **LEARNING** on page 7*

MassDOT Safe Routes Engineering Projects Shape the Attitudes and Decisions of a Future Generation

By Johanna Blue

MassRIDES Marketing Manager

Throughout the Commonwealth, the Safe Routes to School Program is actively shaping the attitudes and decisions of a future generation. The implementation of GreenDOT policy and the progressive movement to put healthier initiatives into action by promoting active modes of transportation is paramount. Most recently, MassDOT hosted the Moving Together conference to discuss alternative mode shifts which specifically target bicycling and walking as active modes of transportation. That is exactly what the Safe Routes to School program accomplishes, simply with a much younger audience.

The Safe Routes to School program is a federally funded initiative of MassDOT. Established in 2006, the program supports community efforts to encourage elementary and middle school students to walk and bike to school by offering pedestrian safety education, funding for pedestrian infrastructure improvements and encouraging community partnerships between law enforcement, education leaders and public health departments.

MassDOT currently partners with 575 elementary and middle schools with attendance reaching upwards of 259,000 students spanning 165 communities, which is more than 45% of the municipalities across the Commonwealth. Nationally, Safe Routes initiatives are serving 15% of schools, whereas the Massachusetts program is serving nearly 40%.

An added benefit of the Safe Routes Program is that it encourages physical activity and healthy behaviors in an effort to curb childhood obesity rates. Between 1976 and 2004, the percentage of overweight children aged

6 to 11 years nearly tripled. According to the results of a 2010 Center for Disease Control's National Obesity Trends Survey, between 1976 and 2004 the percentage of overweight children ages 6 to 11 years nearly tripled. Clinically obese children make up 17% of children nationwide.

In an effort to curb this obesity trend and with an understanding that suitable school zone infrastructure in support of walking and biking varies from community to community, MassDOT employs the Engineering component of the Safe Routes to School program to create infrastructure improvements. Safe Routes to School partners, through an annual infrastructure assessment application process, request improvements such as the installation of sidewalks, pedestrian crossings, bike paths, traffic signals, traffic calming devices, and pedestrian crossing signs. Most recently, MassDOT completed Safe Routes engineering projects in Attleboro, Canton, Chelsea, Lowell, Reading and Scituate. The following improvements were celebrated this fall:

1. Thacher Elementary School Attleboro, MA

Approximately 1,500 ft of new sidewalk along the easterly side of James Street from the intersection of Brownell Street to the intersection of Carpenter Street was constructed. A small portion of new sidewalk along the westerly side of James Street was also constructed from Maple Street to Carpenter Street. New crosswalks and ADA-compliant wheelchair ramps were constructed at the intersections of James Street, with Brownell, Orange, Mulberry, Maple, and Carpenter Streets. The improvements included new pavement markings, new traffic signs, new pedestrian warning signs, and drainage modifications.

2. The Hansen School Canton, MA

Approximately 200 ft of new sidewalk with grass panel was constructed along Kenney Street to the intersection of Washington Street. Approximately 1400 ft of sidewalk with grass panel was reconstructed along Pecunit Street from Washington Street to the intersection of the Galvin Middle School driveway located to



The area around the Hansen School in Canton, MA prior to improvements.



After improvements were made around the Hansen School in Canton, MA.

Photos courtesy of MassDOT Safe Routes To School Program

the north of the Canton Little League baseball field. The parking lot for the baseball field was reconstructed to provide a one-way flow configuration with angled parking stalls and a defined sidewalk space. Pecunit Street was also reconstructed within the limits of the project and striped to depict 5 foot wide bike lanes. New ADA accessible wheelchair ramps, pavement markings, traffic signs and pedestrian warning signs, and minor drainage modifications were also included.

3. Browne & Wright Middle School Chelsea, MA

The project included sections of sidewalk (or bump-outs) to reduce the roadway section, wheelchair ramps, and approximately 150 ft of full depth pavement reconstruction at the school entrance along Walnut Street. Bump outs, wheelchair ramps and a push-button activated flashing warning beacon were installed at the intersection of Walnut Street and Fifth Street. The intersection of Arlington Street and Sixth Street was also reconfigured to include an additional sidewalk, wheelchair ramps, and a landscaped area. New pavement markings, signs, and minor modifications to the existing drainage system were also included.

4. McAuliffe Elementary School Community: Lowell

Approximately 1400 ft of new sidewalk was added along the entrance and exit driveways of the school, beginning and ending at Beacon Street. In addition, a 100 ft section of sidewalk was constructed along Beacon Street to create a connection with the primary pedestrian crossing to the school. Also included was a 300 ft section of new sidewalk along the west side of June Street between the school's exit driveway and Thirteenth Street. The school entrance and exit driveways were striped to depict 5 foot wide bike lanes. New ADA accessible wheelchair ramps, pavement markings, traffic signs, pedestrian warning signs, and minor drainage modifications were also included.


5. Parker Middle School Reading, MA

The project included approximately 500 ft of new sidewalk with grass panel along Washington Street, between Woburn Street and Prescott Street. Multiple large street trees were preserved during the installation of 650 feet of new sidewalk along Sunnyside Avenue, between Prescott Street and Fairview Avenue. New ADA accessible wheelchair ramps, pavement markings, traffic

signs, pedestrian warning signs, and minor drainage modifications were also included.

6. Hatherly School Scituate, MA

Approximately 2,800 ft of new sidewalk was constructed along Hollett Street from the intersection of Gannett Road to the intersection of Ann Vinal Road. New crosswalks and ADA-compliant wheelchair ramps were constructed at the intersections of Hollett Street with Gannett Road, Sedgewick Drive, Bullrush Farm Road, and Ann Vinal Road. Improvements also included new pavement markings, traffic signs, pedestrian warning signs, retaining walls, and minor drainage modifications. The project was coordinated with the Scituate DPW to incorporate their waterline replacement and a reconstruction project on Hollett Street.

To achieve the goals of the GreenDOT and Healthy Transportation Compact, MassDOT aims to create sustainable and comprehensive walking and biking programs through its Safe Routes to School partners and their communities. The creation of strong partnerships with community stakeholders, government officials and non-profit organizations is vital to fulfilling this goal. Together, these collective partnerships ensure today's youth have access to safe spaces for walking and bicycling to school, educational resources on pedestrian and bicycle safety, opportunities for physical activity and the knowledge to prevent injuries, which will assist in the development of healthy attitudes and decisions towards active transportation. 

For more information on the Massachusetts Safe Routes to School Program please contact Samantha Fonseca-Moreira, Statewide Coordinator at Samantha.fonseca-moreira@state.ma.us or follow us on Twitter @SafeRoutes_MA or Facebook.com/SafeRoutes.MA





Culvert washouts can have costly and devastating results as seen here in Becket along the Walker Brook.

Photo courtesy of Julia Blatt

March workshops on stream crossing design provide tools to improve public safety and protect wildlife

By Julia Blatt
Contributing Writer

When stream crossings fail, results can be catastrophic for those living and working nearby. Hurricane Irene and other recent severe storms wreaked havoc on roads in western Massachusetts, costing millions in damage and disrupting life in affected communities for months.

Road closures from culvert failures lead to increased costs as a result of limited emergency access, longer commute times, and lost business revenue. Many crossings fail, in some cases repeatedly, due to their inability to pass high flows and the materials stirred up by the river at flood stage. These crossings require ongoing maintenance and repairs when they become plugged with debris.

In addition, undersized, shallow, and perched (the culvert outlet is above the streambed) stream crossings can block passage for fish and impact other kinds of wildlife that may climb out of the stream to avoid the obstruction, leaving them vulnerable to road traffic.

The good news is that stream crossings can be improved to increase



The top photo shows a culvert in need of repair. The bottom photo is with the new replacement culvert completed.

Photos courtesy of Julia Blatt

both public safety and fish/wildlife passage. In Spring 2013, Bay State Roads will be presenting three day-long workshops in Westfield (March 13), Pittsfield (March 19), and Greenfield (March 26) to give municipal highway managers, state personnel, and their consultants the tools they need to improve road stream crossings. Each workshop will bring together statewide experts to provide best practices and case studies on replacing road-stream crossings. Topics covered will include site

assessment, engineering standards, permitting standards, installation, and funding.

Crossings designed with rivers in mind – and meeting the Massachusetts Stream Crossing Standards – can safely pass huge volumes of water, sediment, and debris stirred up by high flows, and maintain safe passage for emergency personnel and residents. While initial installation costs for an open arch or bridge span may exceed

Please see STREAM CROSSING on next page

Master Roads Scholar Dan Warren, Town of Arlington

My public works career began 15 years ago with the Town of Arlington. I started in the Motor Equipment Repair Division and filled in to plow when extra personnel were needed. I took an interest in the snow and ice operation early on and set out to learn what I could about it.

Having risen to Highway Foreman 5 years later, I was able to really immerse myself in the snow and ice removal process in town. I've enjoyed being involved with updating our methods and making the operation more productive while working with the public to incorporate their needs into the snow and ice operation.

Thanks to Baystate Roads, I was able to apply much of what I learned to real life issues here.

As the Highway Supervisor for 7 years now, some of my interests include being more user-friendly to the public, striving to be a better supervisor, and getting training to the men whenever possible. Baystate Roads has always been my "go to" with respect to training.

Arlington is situated six miles northwest of Boston. With its elevation ranging from four feet above sea level at the eastern border with Cambridge to 377 feet above sea level at the western border with Lexington, snow and ice operations can be interesting to say the least. Arlington has over



Baystate Roads Program Director Dr. Christopher Ahmadjian (left) congratulates Master Roads Scholar Dan Warren, Highway Supervisor for the Town of Arlington.

Photo by Aldo Villani

Attend 7 workshops and become a
Roads Scholar.

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100 miles of roadway, most of it being thickly settled. With personnel cut backs due to budgetary constraints over the years, Baystate Roads has proven to be an invaluable tool with respect to new technologies and updated methods that allow our DPW to continue to provide the residents of

Arlington the services they expect and deserve.

I would be remiss if I did not mention the outstanding employees I work with. They show up every day in all sorts of weather eager to work and learn new ideas, and I thank them.

My hobbies include surf fishing, spending time in Ireland, re-furbishing a 140-year-old Victorian house we bought 6 years ago, and of course "Jock" our West Highland Terrier.

Fifteen years later and I can honestly say I still love to go to work. 


Stream Crossing

Continued from previous page

traditional culvert approaches, the long-term costs are significantly reduced, because these improved road crossings can withstand larger precipitation events and need less maintenance. Stream Crossing Standards alone do not satisfy the need for proper engineering and design. Design must be conducted in accordance with National Flood Insurance Program regulations. When sizing a crossing for high

flows, communities should consider potential effects of climate change on future storm characteristics and changes in stream hydrology due to development.

The workshops are the product of an innovative partnership among environmental groups, transportation experts, engineering firms, municipalities, and state and federal agencies. Organizers include the Massachusetts Rivers Alliance, the U.S. Fish & Wildlife Service, MA Div. of Ecological Restoration, MassDOT, UMass

Extension, American Rivers, The Nature Conservancy, Tighe & Bond Engineers, the Connecticut River Watershed Council, the Housatonic Valley Association, Berkshire Environmental Action Team, and the Berkshire Regional Planning Commission. The workshops are sponsored by the Massachusetts Environmental Trust, the Westfield River Wild and Scenic Advisory Committee, MassDOT and the Baystate Roads Program. 

Julia Blatt is the Executive Director for the Massachusetts Rivers Alliance.



New Road Anti-Icing: Better for the Environment

On November 14, 2012, MassDOT Secretary & CEO Richard A. Davey and Highway Administrator Frank DePaola unveiled the Department's new salt brine production plant at Sagamore Beach.

For the first time, MassDOT will blend its own anti-icing liquid for use on roadways in Highway District 5 during the snow and ice season, saving money and improving environmental conditions.

"MassDOT works diligently to find cost-effective and environmentally friendly ways to our improve operations," said Secretary Davey. "This plant allows us to trim costs and treat our roads in a smarter, innovative way."

MassDOT will make, store, and apply its own anti-icer for approximately \$.07/gallon. Currently, MassDOT purchases large amounts of magnesium chloride at \$.89/gallon. The mix produced at the plant will be 85% salt brine and 15% magnesium chloride. MassDOT purchased brine last winter for treatment on certain bridges and frost prone areas in Highway District 1 at a cost of \$.55/gallon.

"With salt brine we are able to pre-treat our roads up to 48-hours in advance of a storm. We can be more proactive and reduce overtime costs by closely monitoring the forecast," said Administrator DePaola. "Magnesium chloride has a much shorter window; it

must be applied 2-3 hours prior to the snow and ice event."

The location was chosen because salt brine works best in the average winter temperatures found in this region. Construction of the plant, including equipment and infrastructure, cost approximately \$250,000. Based on weather conditions, MassDOT anticipates the plant paying for itself in 2-3 years.

Environmental Benefits of Salt Brine

Reducing Salt Use

The use of salt brine provides cost savings. Salt brine reduces the impact on soils, vegetation, rivers, streams, wetlands, and water supplies. It also helps reduce vehicle corrosion and deterioration to concrete and steel structures.

The Town of Lexington, through the use of brine, has been able to minimize rock salt applications in certain instances. Marc Valenti, Superintendent for the Town of Lexington said, "The brine is great for providing a 'bond breaker' between the snow and roadway, reducing hard pack. It is also highly effective for events with low accumulation minimizing rock salt applications." According to Valenti brining technology has been a great asset to the town. "Under the proper weather conditions, we have successfully



(Top photo and above) The Town of Lexington's salt brine machine.

Photos by Marc Valenti

pretreated 48 hours ahead of the storm event and received good results," said Valenti.

Chris Doherty, Highway Foreman for the City of Woburn wanted to see first hand the results of brine use so he built a salt brine machine for his department. Doherty said it was much less expensive to build a salt brine machine for the town to try, rather than invest in a commercial machine. "We still haven't used any brine yet, because the weather conditions haven't been exactly right. I have 2,500 gallons of brine stored", said Doherty. Doherty added, "We decided to try brine not only for the cost savings associated with the reduction of rock salt and sand applications, but also for environmental reasons."

Reducing Sand Use

Traction benefits of sand are limited and temporary. Sand




The City of Woburn's new salt brine Machine.

Photo by Chris Doherty.

accumulates on roadside edges, catch basins, and drainage pipes which can lead to flow restrictions and blockages in the storm-water drainage systems. The collection and disposal of sand adds considerable cost to the operation. Sand contributes to the sedimentation in streams, impacting fish species and aquatic ecosystems. Suspended in water, sand increases

turbidity and can result in the death of fish and invertebrates, and reduces photosynthesis in aquatic plants.

Siltation and sediment deposits have been cited as one of the leading causes of water quality impairments in various regions around the country. 

Mass.gov Commonwealth Conversations; Transportation, <http://transportation.blog.state.ma.us/blog/>

Learning

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Imagine this scenario. You are coming into work the day after having attended a Baystate Roads workshop. Two of your co-workers come up to you. One says, “Hey, how was that class yesterday? Did you get a nice nap in?” The other one chimes in, “Yeah. Enjoy your day off?” Instead of bantering back and forth with them, consider this your first opportunity to use what you learned the day before. Tell your buddies what the workshop was about and share any information that would be helpful to them. Explain a new procedure that was introduced. If you were given any printed materials, photocopy them and pass them around.

When you make these simple efforts, a number of important things happen:

1. You have “transferred the training.” In the workplace education field, transfer of training means taking what you learned in a class and applying it back on the job. Information you received in a workshop is valuable, but only if you use it. That is, after all, why the Baystate Roads sessions are held in the first place: to help you perform better when you get back to work.
2. You have practiced “knowledge management,” which is merely a fancy term for sharing what you know. Knowledge is a commodity, and managing that commodity means capturing what’s in people’s heads and making it accessible to others.
3. You have assumed the role of teacher. Those of you who are supervisors or managers realize that giving instructions and helping people learn is one of your most important responsibilities.
4. Finally, all these efforts — transferring training, managing knowledge, teaching others — create

*Please see **LEARNING** on page 8*

Typical Road Treatment Materials used during Snow and Ice operations:			
Common Chemicals	Use	Advantages	Disadvantages
Rock Salt (Sodium Chloride)	Chemical used to either break the bond of ice to the pavement or used to prevent it from forming by lowering the freezing point of water.	Inexpensive. Very effective. Readily available.	Impact on the Environment. Corrosivity. Doesn't work at low temperatures.
Sand	Used only in Reduced Salt Zones and at very low temperatures when Rock Salt will not work effectively.	Inexpensive. Works at low temperatures. Available.	Impact on the Environment. Does not melt snow and ice. Clogs drainage structures. Expenses to sweep and dispose of.
Pre-Mix (Sodium Chloride/Calcium Chloride blend)	The material is used in "reduced-salt areas" and elsewhere when air temperature is very low.	Less harmful to the environment. Works at a lower temperature.	Expensive. Must be stored and kept dry.
Liquid Calcium Chloride	The material works by attracting moisture and releasing heat. When mixed with salt it melts up to eight times as much ice as using salt alone at 20 degrees.	Very effective for pre-treatment or direct liquid application. Works at low temperatures.	Expensive. Applications must be timed correctly.
Liquid Magnesium Chloride	Used as pre-treatment to prevent snow and ice from sticking to pavement.	Less harmful to the environment. Works at low temperatures. Less harmful to equipment.	Expensive. Application must be timed correctly.

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LTAP Local Technical Assistance Program

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Learning

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a “learning culture” in your department. A learning culture is a set of beliefs, values and behaviors that reflect a commitment to learning every day. Within a learning culture, all employees are regarded as learners and all interactions are seen as potential learning experiences that lead to enhanced performance.

Sometimes we mistakenly assume that school is the only place where education takes place, but that's not the case. You learn things every day—in the break room, in hallway discussions, out in the field—as you go about your normal duties. Learning goes on constantly, and most of it is informal; it doesn't involve classrooms or textbooks. By paying more attention to your learning, and by helping others develop theirs, you will be making it easier to respond to the challenges all around you—and you will be getting the full benefit from those Baystate Roads workshops. 

Dr. Rockie Blunt, president of West Boylston-based Blunt Consulting Group, has worked with municipal and state agencies for many years. This is the first in a series of articles he will be writing on learning, communication and management.