Greening the Highways

Fall 2000
Issue 1

A Publication of the Massachusetts Highway Department

Inside this Issue

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Recycling Resource

Have you heard of the Recycled Materials Resource Center, the new national center created to promote the use of recycled materials in the highway environment? Check out RMRC's webpage at www.rmrc.unh.edu.

A Message from the Commissioner:

It gives me great pleasure to welcome you to the first issue of ***Greening the Highways***.

As you will see, we at MassHighway are making great progress in improving the Commonwealth's infrastructure through an aggressive transportation agenda that is sensitive to our environment's wellbeing.

While we will strive to exceed our goals in the coming years, I believe you will be pleased to hear of MassHighway's recent recycling accomplishments as you read this newsletter.

I am certain this will be just the first of many informative and useful issues to come. We look forward to receiving your feedback on the newsletter and its contents. Enjoy!

Sincerely,

Matthew J. Amorello
Commissioner

Asphalt: America's Most Recycled Material?

From the National Asphalt Paving Association

According to a recent Federal Highway Administration (FHWA) report, 80 percent of the asphalt pavement removed each year during widening and resurfacing projects is reused. This amounts to 73 million tons of reused asphalt per year. Asphalt pavement accounts for 92 percent of the nation's highways and roadways and reclaimed asphalt pavement (RAP) is used as part of new pavement, roadbeds, shoulders and embankments.

According to Byron Lord, deputy director of the Office of Pavement Technology of FHWA, "For every ton of municipal solid waste, our nation generates about 35 tons of nonhazardous industrial solid waste. Our landfill space would be overwhelmed if it weren't for large-scale recycling of industrial products such as asphalt pavement. The asphalt paving industry is truly a leader in this respect".

COMING SOON: MHD's 2000 Recycling Report

The 2000 Recycling & Pollution Prevention Report is nearly complete! For those of you with copies of last year's report, you already know this is a valuable resource.

For those unfamiliar with the publication, it's purpose is threefold: to qualitatively and when possible, quantitatively define MassHighway's past accomplishments in terms of recycling, environmentally preferable procurement, and pollution prevention; to discuss and promote ongoing projects; and to establish goals for the coming years.

Highlights of the upcoming report:

- More than 10,000 tons of Automotive, Office, and Operations wastes were recycled in 1999.

- More than 138,000 tons of waste and recycled content materials, such as reclaimed asphalt pavement (RAP), recycled glass beads, and fly ash were used in construction projects in 1999.

- More than $444,000 were spent on recycled content products ranging from re-refined motor oil, to recycled toner cartridges, to plastic lumber picnic tables in 1999.

If you are interested in receiving a copy of the 1999 or 2000 reports, please send your contact information to Jessica LeBlanc, MHD Recycling Coordinator, 10 Park Plaza Room 3531, Boston, MA 02116, or email jessica.leblanc@state.ma.us.

Upcoming Events

October 26, 2000

Boxborough, Massachusetts

6th Annual Buy Recycled and EPP Vendor Fair and Conference

A unique opportunity to see and learn more about the growing volume of EPPs that are available, speak to manufacturers and distributors about purchasing issues, and hear from government agencies who are already buying and using these products. For more information call Marcia Deegler, Operational Services Division, at 617-720-3356.

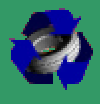
Environmentally Preferable Products Spotlight

Bio-Based Hydraulic Fluid

Currently included on state contract VEH18 and available from Terresolve Technologies Ltd., bio-based lubricants are readily biodegradable and non-toxic. They are direct replacements for and meet the same performance standards of petroleum-based fluids. However, as opposed to the traditional petroleum alternative, bio-based lubricants accidentally released into the environment will cause no long-term negative impacts. Contact Terresolve at 800-661-3558 or Marcia Deegler, Operational Services Division, at 617-720-3356.

Recycled Plastic Guardrail Offset Blocks

MassHighway has recently approved a new Standard Specification that allows for the use of recycled plastic offset blocks as an alternative to pressure-treated wood offset blocks. Several manufacturers offer blocks that meet the 80% recycled polyethylene requirement and have been approved by FHWA. Blocks range in price from $4.50-12.00 and the manufacturers claim they last twice as long as wood blocks and are impervious to dry check, rot, cracking, discoloration, weathering, and insects. For more information contact Jessica LeBlanc, MassHighway, at 617-973-7820.



Retread Tires

Now included in the OSD Tires and Tubes contract (VEH21) retreads make good economic and environmental sense. Manufactured and guaranteed through the Bandag process, these retread tires are available from Pete's Tire Barn and Sullivan Tire Co. Each retread tire costs on average 30-50% less than a comparable new tire and saves about 15 gallons of oil. For more information contact Eric Friedman, Operational Services Division, at 617-720-3351.

6TH Annual Buy Recycled & Environmentally Preferable Products Vendor Fair and Conference

Are you planning to attend?

On October 26, the Massachusetts Operational Services Division (OSD) will be hosting its 6th Annual Buy Recycled and Environmentally Preferable Products Vendor Fair and Conference at the Boxborough Woods Holiday Inn in Boxborough, MA.

The intent of this event is to bring together public sector purchasers, managers, and officials from throughout the state with vendors of recycled and environmentally preferable products (EPPs) to ask questions and learn more about the many benefits of recycled and environmentally preferable products. Seminars, presentations and vendor displays offer the latest information on performance, price, availability and environmental benefits of purchasing these goods.

Last year's event registered over 600 attendees and had a full exhibit hall of approximately 100 booths and the selection of EPPs continues to grow. This year's slated workshop topics include: alternative fuel vehicles; recycled materials in roadway construction; and emerging issues in green procurement.

If you are interested in attending or exhibiting, please contact Marcia Deegler, OSD, at 617-720-3356.

Reader Survey

We want input from you!

1. **What recycling topics would you like to see addressed in future newsletters?**
2. **Are there specific recycled materials workshops that would be useful to you?**
3. **Are you aware of any manufactured products or waste materials that may have potential for highway and roadway applications?**

Send respones to:
MHD Recycling Coordinator
10 Park Plaza, Rm 3531
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Recycled Plastic Offset Block Specs Adopted

MassHighway has adopted new guardrail offset block specifications allowing recycled plastic blocks as an alternative to pressure-treated wood blocks. The new specification will be included in MHD's next Supplemental Specifications Edition. The text of the specification (M8.07.0 C.2.) is as follows:

"Plastic Offset Blocks shall be made with a minimum of 80% recycled polyethylene plastic. Ultraviolet (UV) protection shall consist of at least 2.5% carbon black evenly dispersed throughout the block in accordance with ASTM D-1603 or an equivalent form of UV protection. Wood fillers will not be allowed. Each block shall be stamped at the factory with the Manufacturer's Identification and lot number and conform to the dimensions shown on the plans."

The polyethylene (both high and low density) used for these blocks is a long-lasting material, which is impervious to dry check, rot, cracking, discoloration, weathering, and insects. Manufacturers claim that because of their resilience, the plastic blocks are expected to last twice as long as their wood counterparts and are not affected by outdoor storage during installation. In addition, the recycled plastic blocks are also recyclable.

Only those blocks meeting the requirements of NCHRP Report 350, Test Level 3 will be accepted. Available blocks range in price from $4.50-$12.00.

To find out more please contact Jessica LeBlanc, MHD Recycling Coordinator, at 617-973-7820.

New Technical Report Released : **Life Cycle Assessment of Guardrail Offset Blocks**

While updating the guardrail offset block specifications to include a recycled plastic alternative, MassHighway was eager to learn more about the lifecycles of various offset blocks. With the help of funding from the Chelsea Center for Recycling and Economic Development, MassHighway commissioned a Life Cycle Assessment to evaluate the impacts of recycled steel, recycled plastic, and pressure-treated wood blocks. The Life Cycle Assessment (LCA) is a tool used to evaluate the impacts associated with all stages of a product's lifecycle from the cradle to grave both downstream and upstream. This LCA was limited in scope to a qualitative inventory of all the inputs and outputs of industrial processes that occur during the life cycle of an offset block. It also included a detailed cost comparison of the offset blocks in terms of both installation costs and net life cycle costs for 10, 20, and 30-year useful product life spans (see the chart below). Net Current Costs are defined as installation costs less recycling value or disposal costs (whichever may be the case). Net Present Costs take into account inflation, interest,

Net Present Cost for 190.5 meter Guardrail Systems

	Net Current Cost	Net Present Cost for Replacement after Useful Life of:		
		10 years	*20 years*	*30 years*
W-Rail:				
Steel on Steel	$6,350	$4,546	$3,255	$2,410
Wood on Steel	$6,146	$4,400	$3,150	$2,332
Plastic on Steel	$6,065	$4,342	$3,109	$2,301
Thrie-Beam:				
Steel on Steel	$9,570	$6,852	$4,906	$3,631
Wood on Steel	$9,332	$6,681	$4,783	$3,541
Plastic on Steel	$9,359	$6,701	$4,797	$3,551

scrap value and/or disposal costs over a specified time period. The results of the analysis were as follows: Wood on Steel guardrail systems have the lowest estimated installation cost for both W-Rail and Thrie-Beam and the lowest estimated net present costs for all time ranges for Thrie-beam systems; Plastic on Steel guardrails constructed with plastic offset blocks have the lowest estimated net present costs for all time ranges for W-beam systems; and steel on steel systems are always the most expensive. If you would like a copy of the full report, go to www.chelseacenter.org and check under "Publications" or you can contact the Chelsea Center at (617) 887-2300.

The Many Construction Applications of Shredded Tires

As with many other recycled materials, tire shreds are becoming commonplace in highway and roadway construction. Tire shreds are waste tires that have been cut into 2"-12" pieces and can be used as lightweight fill, backfill, conventional fill, and for insulation and drainage applications. As lightweight fill, tire shreds can help to correct for slope stability or landslide problems and minimize settlement caused by the weight of an embankment. As backfill behind a retaining wall or bridge abutment, tire shreds help to reduce wall pressure and settlement. Depending on the situation, tire shreds may be the best solution for your construction project. They are lightweight, free draining, durable, compressible, have low earth pressures and are good thermal insulators. Depending upon the project location, they may also be the least expensive solution.

Although they do not currently allow or specify the use of tire shreds, MassHighway has recently approved a research and demonstration project to test the use of tire shreds as lightweight fill in a roadway embankment in Tewksbury, Massachusetts. The study will investigate the effect of the tire shred embankment on the underlying organic soils. One important objective of the study is to develop standard specifications and design details for future tire shred projects.

While Massachusetts has had little experience with tire shreds in highway construction, many other states have been active in using tire shreds in various construction applications. A FHWA survey through 1996 found that out of 70 tire shred projects, 59 had occurred in Minnesota. Since 1985, Minnesota has been using shredded tires as lightweight fill material on logging roads through areas with weak soils. The Maine Department of Transportation has used tire shreds as lightweight fill and retaining wall backfill in several areas across the state including the Portland Jetport Interchange. The Texas Department of Transportation has also been proactive in this area, using approximately 4,500 tons of tire shreds as embankment fill material on the Loop 375 overpass in El Paso.

MASS HIGHWAY

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