Maryland Green Registry MEMBER

The Maryland Green Registry promotes and recognizes sustainable practices at organizations of all types and sizes. Members agree to share at least five environmental practices and one measurable result while striving to continually improve their environmental performance.

Maryland State Highway Administration

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State Agency
Member since April 2011

Management and Leadership

☑ **Environmental Policy Statement**

The State Highway Administration's (SHA) mission is to efficiently provide mobility for our customers through a safe, well maintained and attractive highway system that enhances Maryland's communities, economy and environment.

The agency's primary goal is to maintain a safe highway system in an environmentally responsible manner.

Some key objectives of SHA's environmental policy are to:

- *Meet or exceed all federal and state environmental laws and regulations applicable to SHA activities.*
- *Incorporate and integrate environmental protection and enhancement measures in planning, design, construction and maintenance.*
- *Protect and enhance all aspects of the natural and human environment whenever possible, using available state-of-the-art practices.*
- *Support advancement in the environmental protection through innovation and technology transfer.*

SHA has established an Environmental Compliance and Stewardship Key Performance Area as part of the agency's Business Plan.

SHA offers annual training to all staff on managing operations with Environmental Considerations.

SHA conducts environmental awareness training for all new employees and is initiating additional training as part of the Environmental Management System. Every employee receives SHA's Environmental Policy statement and contact information for reporting environmental concerns.

☑ **Environmental Team**

*It is the mission of the **Environmental Compliance and Stewardship Key Performance Area Council** to support SHA's key goal to develop and maintain Maryland State Highways in an environmentally responsible manner. The KPA Council works with SHA Leadership and local business offices to develop objectives, strategies and performance measures to achieve the key goal, and monitors achievement targets to ensure continuous progress.*

***The Earth Day Team** consists of a cross section of SHA staff volunteering from several disciplines and offices. The team serves to educate and raise awareness within the SHA community about various aspects of environmental stewardship either at home or in the office. Annually in April, the team offers a week of interesting and relevant environmental "Lunch and Learn" sessions to celebrate Earth Day. In 2010, the team was able to reach 355 participants in the week of events.*

*SHA initiated a **Climate Change Program** in 2009 to address issues related to Greenhouse Gas reduction and infrastructure adaptation. The program initiated a joint **SHA/MDTA Climate Adaptation Team**, which completed and reviewed a strategic plan for climate change adaptation in 2010. The Team first met in February 2010 and will continue to meet quarterly to engage in infrastructure adaptation planning with a focus on how SHA transportation assets need to adapt to the effects of climate change. The strategic plan identifies strategies already in process as well as others to be implemented. A GIS application has been developed and used to identify areas vulnerable to sea level rise and storm surge in relation to SHA assets, including roads, bridges, and facilities. An adaptation policy is in development to be completed in 2011. GIS tool development and infrastructure analysis will continue to further identify and develop strategies within the adaptation plan. SHA's Climate Change Program supports MDOT initiatives and the Governor's Climate Change Action Plan.*

***The Recycled Materials Task Force (RMTF)** is a group of professionals that are committed stakeholders with regard to increasing the use of recycled materials. The group consists of representatives from the Recycle Industries, State regulators (MDE), State Highway, EPA and from private testing labs. The team meets 3 to 4 times a year and started meeting in 2003. The RMTF is working to create quality products that are economical and environmentally friendly by requiring a quality end product from producers for taxpayers and the*

environment. It is the mission of the RMTF to increase the use of recycled materials for construction on Maryland State Highway Administration projects. Creatively using the most efficient methodologies to incorporate the use of recycled materials with virgin materials, the RMTF intends to create a quality product that is economical and environmentally friendly. This will be accomplished by consciously prioritizing a quality end product to producers, taxpayers and the environment.

*The Maryland members of the **AASHTO Technology Implementation Group** (comprised of SHA, Maryland Department of Natural Resources (DNR) and The Conservation Fund) pursued their mission in FY 2010 to market GIS technology to other state DOTs that lack this technology in their transportation-planning processes and efforts. The technology is two-fold; on the one hand, it is a GIS tool developed by DNR to highlight Maryland's network of important resources, and, on the other, The Conservation Fund's approach on how to best utilize the GIS tool to optimize opportunities to support sustainable ecosystems. Just as SHA highway networks are planned for long-term use with safety and mobility of the traveling public as the main goal, so also must our natural resources network be planned to preserve critical natural and cultural resources for sustainability of Maryland's ecosystems.*

*SHA has established a high-level **Environmental Advisory Committee** comprised of external and internal members. These individuals are leaders in the field of environmental protection and stewardship, industry experts, interest groups, regulatory agencies, resource agencies and SHA senior managers and leadership. The advisory committee's role is to provide recommendations to the Administration on a range of issues directly affecting SHA's environmental performance. The committee provides input and advice on areas for SHA to strengthen and to achieve the greatest environmental benefits for our investments. It also helps build a stronger understanding of our agency's performance as viewed by our customers and stakeholders.*

☑ **Annual Environmental Goals**

- *Create 200 acres of wetlands*
- *Restore 5 miles of stream*
- *Plant 125 acres of wetland*
- *Partner on 1 million Tree Planting Initiative*
- *100% Compliance on Erosion and Sediment Control Permits*
- *Over 200 stormwater facilities are inspected and maintained to ensure pollution reduction from our recurring waters*
- *Recycle 20 percent of SHA solid waste required under the Maryland Recycling Act of 1988.*

- *100% compliance rating with the NPDES*
- *Control the spread of invasive species on SHA rights of way by treating 95 percent of the annual inventory of Phragmites and Canada Thistle*
- *Reduce the usage of paper in SHA by 10%*
- *Reduce fuel consumption in SHA by 10% and increase the use of alternative fuels by 90%*
- *Increase the use of recycled materials in construction*

☑ **Environmentally Preferable Products and Services**

For those deer that have unsuccessfully crossed paths with vehicles, a composting effort is underway using the carcasses, mixed with other biological items, such as hay and woodchips. After nine months, a valuable soil additive is produced and is used on SHA wildflower beds.

SHA is partnering with private industry to recycle aggregate base. The base is recycled during the milling process (on a paving project, crews mill the layers of and replace with fresh asphalt. This is the base material used on a roadway prior to paving operations. The recycled material is being used on SHA's $12.4 million widening project along MD 295 (Baltimore Washington Parkway) between I-695 (Baltimore Beltway) and I-195 in Anne Arundel County. Using recycled crushed aggregate saves fuel that would otherwise be spent while mining for new material and its subsequent transport from quarries. Reducing fuel consumption has the added benefit of lowering vehicle emissions, which are harmful to the environment. Additionally, recycling pavement material conserves shrinking landfill space. So far, both plants that SHA approved for GAB recycling have saved more than 13,000 tons of natural (not yet mined) aggregate.

☑ **Environmental Restoration or Community Environmental Projects**

SHA implemented an innovative approach to mowing in sensitive habitat which received world-wide attention in national and international media: "Using goats to maintain turf in an environmentally sensitive area is not only an innovative idea, it clearly demonstrates our vision of a greener highway system," said Neil Pedersen. SHA continued its conservation grazing project of using goats and sheep within eight acres of meadows and bogs that surround the Hampstead Bypass in Carroll County. FY 2010 marked the second year of a pilot project in an area in which traditional mowing methods could have led to a major disruption of the habitat or even injury or death of the bog turtle, listed as threatened by the Federal Endangered Species Act. SHA is allowing goats and sheep to graze in the fields, providing vegetation management during the mowing season which is just before the bog turtles begin hibernating for winter. To further protect the turtles SHA installed special fencing near the northern end of the bypass to deter the turtles from crossing the roadway.

In another section, SHA is cultivating a field of white turtlehead (Chelone glabra) plants, a Maryland native species. The plants are the main habitat for survival of the official state insect, the Baltimore Checkerspot butterfly. Listed as a rare species by DNR, the population of this butterfly has been further diminished in recent years by loss of natural habitat and this cultivation is an effort by SHA to increase the butterfly's population. SHA and ACF Maryland Chapter planted American chestnut trees on nearly three acres of land at the Bypass, with the goal to re-establish the tree.

SHA supported initiatives the One Million Trees initiative, by planting and/or funding 500,000 new trees since the program's initiation in FY 2008 to FY 2010. Trees provide multiple benefits to the environment, such as enhanced water quality, improved air quality, habitat for wildlife and stabilized topsoil. Although SHA planted trees along state highways; in most cases SHA provided funding and other agencies provided labor and/or land for planting. Tree plantings include a project in Howard County in April 2010 in which 6,300 native trees were planted to replace unhealthy invasive plants that were removed. Trees were also planted throughout the Eastern Shore.

- *Each tree planted under the initiative can absorb 13 pounds of carbon from the air each year.*
- *An acre of trees can absorb 2.6 tons of carbon dioxide each year.*
- *An acre of trees roughly offsets the CO_2 emissions of an average car driven 26,000 miles.*

The largest stream restoration project in Maryland's history was awarded in 2010 to provide 18,000 linear feet (3.9 miles) of stream restoration along Northwest Branch, adjacent to Bonifant Road. The project includes innovative features and structures designed to improve and enhance the Northwest Branch's ecosystem; it will reduce soil erosion and reconnect the stream channel to its original floodplain. This project will use large trees harvested from the ICC Contract B's right-of-way (ROW) to restore the stream's natural character by careful placement of the trees along its banks.

While clearing land for the ICC, six large stands of bamboo were identified and donated to the National Zoo to help feed their giant pandas. Giant pandas are listed as endangered in the World Conservation Union's Red List of Threatened Animals.

Eastern Box Turtle Relocation from ICC Mega-Project Construction: Prior to clearing and excavation work for the $2.5 Billion Intercounty Connector (ICC), SHA environmental teams, using trained dogs, relocated hundreds of Eastern Box Turtles out of harm's way from the project.

Also on the ICC Project, a new system was put in place that is now being accepted nationally. It is called Rain-for-Rent. It is a system that is part of erosion and sediment control systems on projects that discharges water from sites that is cleaner than the precipitation falling from the sky.

SHA has made significant strides in reducing wild animal fatalities on the highways. The ICC Project constructed oversized culverts that animals can use to cross. Animals are directed to the culverts by a series of sound walls and fencing. SHA also bridged over sensitive areas that will protect wildlife and their habitat. In Western Maryland (along I-68) - SHA constructed a fence in areas that research and data pointed as high incident locations of road kill (deer and bear). The fence has deterred animals from crossing the roadway. It appears to be working as road kill is decreasing.

SHA funded and constructed 22 fish passageways and 1 fish ladder to allow fish to spawn upstream of previous manmade barriers on Rock Creek and Anacostia River Tributaries.

SHA is replacing invasive plants with native species along 14 miles of the I-95 corridor between Route 100 in Howard County and the Capital Beltway in Prince Georges County

SHA and the Montgomery County Department of Parks hosted a grand opening celebration and ribbon-cutting on June 19 for the Olney Manor Dog Park, which is a part of the ICC's extensive community stewardship program. The enclosed one-acre park includes separate areas for both large and small dogs, seating for dog owners and plenty of trees for shade.

State Highway Administration (SHA) and the American Chestnut Foundation (TACF) Maryland Chapter partnered with students from North Carroll Middle School to plant the first phase of American chestnut tree seeds and seedlings. The seedlings were planted along MD 30 (Hampstead Bypass) at the northern limits of the highway. SHA set aside nearly three acres of land to re-establish the American chestnut tree, which was nearly wiped out due to blight (the destruction of plant tissues due to disease) in the mid-1950s. The American chestnut tree is highly susceptible to this disease. The arch enemy of the American chestnut tree is an Asian fungus to which the tree has very little resistance. Four billion American chestnut trees across nine million acres were lost in America's forests since the early 50s. SHA, along with TACF, is using new technology and back-cross breeding a blight-resistant Chinese chestnut with pure American trees to produce a hybrid that is blight-resistant with the appearance of the classic American chestnut.

More than 25,000 trees and 128 acres of wildflower meadows were planted; the wildflower planting exceeded SHA's goal to seed 125 acres of wildflowers annually.

SHA continued to make Maryland roadsides greener through a mowing reduction program. This initiative restores natural meadows by reducing mowing along roadways. SHA's Mowing for Meadows program reduces the area of mowing along roadways by approximately 8,500 acres, saving approximately $1 million per year. By allowing grasses to grow naturally, SHA will also re-establish vegetation, forested areas, and enhance the environment while maintaining safety. SHA continues to establish perennial wildflower meadows through the Wildflower Meadow program to further reduce mowing and air pollution, and to reduce the amount of sediment that enters wetlands and waterways through stormwater runoff. The Wildflower Meadow program continues to gain acceptance within the SHA operations community as an alternative treatment for areas that were once mowed which has increased interest is leading to the identification of suitable new sites.

As noted above, SHA planted 128 acres of wild meadows in FY 2010, the long term effects of which include:

- *Improved water quality - meadow plants and trees decrease stormwater runoff better than mowed turf, resulting in better groundwater recharge and reduced sediment in bodies of water;*
- *Improved air quality – the growth of more trees and plants will result in the further removal of carbon dioxide, which will replenish oxygen and reduce the effects of greenhouse gas emissions;*
- *Wildlife habitats - meadow plants and trees attract small animals, birds and insects that are an important part of our ecosystem;*
- *Greater cost-savings - meadows and trees require low maintenance and with no annual reseeding, fertilizer or pesticides cost.*

SHA developed and implemented a management plan for underground storage tanks. All underground motor fuel tanks are scheduled to be removed by 2012.

SHA's highway deicing-salt management program keeps application of sodium chloride within strict limits intended to effectively keep roads safe while maintaining chloride issues associated with road salt.

- *Computerized salt spreading equipment mounted on SHA and contractor tricks are calibrated.*
- *SHA is testing automated chloride-free de-icing systems on several bridges in Western Maryland.*

In addition to salt spreading activities, SHA focuses on environmentally responsible storage. All locations use dome-type storage sheds which protect salt from the weather, and the storage facilities have containment facilities such as berms and retaining walls to manage runoff.

Waste

☑ **Recycling**

SHA takes its recycling responsibilities seriously and continues to recycle far more than the 20 percent of its solid waste required under the Maryland Recycling Act of 1988. Approximately 5,000 tons of recycled material was credited toward the recycling regulatory compliance by MDE, resulting in a recycling rate of 49 percent for CY 2009. In addition to cans, bottles, paper and cardboard, SHA recycles used motor oil and fuel filters, antifreeze, Freon, metal from signs and guardrail, batteries, tires, fluorescent lamps and lamp ballasts, computer and electronic equipment and landscaping debris. SHA recycled an additional 78,000 tons of materials not required by law, making it one of the highest-performing agencies in state government.

SHA's Sign Shop is a major recycler of aluminum by refurbishing and reusing stock for highway signage. SHA is also Maryland's largest recycler of asphalt and concrete that is removed during highway resurfacing. Approximately 19% of paving surface in the highway construction program is made from recycled materials.

Energy

☑ **Energy Efficiency**

SHA has entered into a contract to perform energy efficiency upgrades at SHA facilities and on SHA overhead sign lighting. The cost of this contract is $23.7 million; the project is expected to reduce SHA energy costs by $1.9 million annually.

SHA is reducing energy consumption by installing new LED traffic signal technology on State roads. LED stands for light-emitting diode, and is brighter and far more energy efficient than other types of lighting. It lasts longer and therefore reduces the amount of fuel required to have maintenance personnel and contractors maintain and replace signal lights.

Some light switches and thermostats containing mercury are being replaced with non-mercury switches and electronic thermostats.

Some SHA buildings employ state-of-the-art controls to manage energy consumption to maximum efficiency while maintaining comfort and a healthy internal environment. SHA is in the process of replacing the HVAC system for the Headquarters and 211 Buildings. The new HVAC system will reduce the energy usage for the buildings. SHA has an energy audit underway to evaluate building and facilities for reducing energy consumption and operating efficient systems.

SHA's Headquarters building in Baltimore City was the first State building to implement an energy performance contract in the mid-1990's.

The Maryland State Highway Administration (SHA) is modifying overhead lighting along MD 100 between US 29 (Columbia Pike) and Coca-Cola Drive in Howard County. As part of the year long pilot program to evaluate reductions in highway lighting, SHA turned off approximately 75 lights along MD 100. Although the lights have been "deactivated," the poles will remain until the pilot program is complete. Several locations were examined for this pilot program. SHA determined that lighting along this road could be reduced and meet state and federal safety standards. SHA will closely monitor any changes or patterns in crash data during this program.

☑ **Renewable Energy**

SHA completed the first year of a pilot project to evaluate the effectiveness of small wind energy systems to help power SHA facilities. A 2.4 kilowatt generator, installed at the Westminster maintenance facility in Carroll County, has produced 1,050 kilowatt hours of power that flows directly to the shop's power grid. The project has prevented the release of 1,070 pounds of carbon dioxide, compared to energy from coal.

Transportation

☑ **Employee Commute**

SHA offers flexible work hours, teleworking and carpooling to reduce the number of single occupant vehicles to SHA headquarters.

SHA has more than 100 park and ride locations throughout Maryland to help accommodate other commuters in the state take advantage of ridesharing and public transportation. Maryland ride sharers are reducing CO_2 emissions by an estimated 51.4 tons per year making SHA park and ride facilities a key components to Maryland's Climate Action Plan, which aims to reduce greenhouse gas emissions by 25 percent below 2006 levels by 2020. SHA is

helping reduce the number of cars on the road by providing bicycle and pedestrian alternatives in Maryland's Statewide Transportation Improvement Program, a system-wide practice that helps reduce congestion, vehicle emissions, and greenhouse gas emissions.

☑ **Efficient Business Travel**

SHA is proactive in support of fuel-saving measures to reduce automobile usage, such as carpooling to meetings and videoconferencing where available. SHA has implemented video conferencing measures at headquarters and several of the district offices to reduce drive times from the districts when there are business activities that require the District Engineer at headquarters. Districts one (Dorchester, Somerset, Wicomico, Worcester) and District six (Allegany, Garrett, Washington) are equipped and utilize two-way teleconferencing equipment. District one has saved approximately $30,000 and District six has saved an estimated total of $46, 830. The cost savings reflect savings from travel time, mileage (fuel), wear and tear and meals not required since video conferencing was used.

☑ **Fleet Vehicles**

SHA successfully implemented strategies to reduce fossil fuel dependence and improve air quality with alternative and low-emission fuels. All SHA fuel pumps have been converted to alternative fuels and biodiesel continues to be delivered to all SHA shops. All SHA diesel-powered vehicles and equipment use ultra-low sulfur-bio diesel fuel. SHA will continue to reduce consumption of gasoline by its light-duty vehicle fleet using conservation strategies, such as scheduled fleet replacements by higher-efficiency vehicles and a new fuel additive that improves fuel economy. New hybrid vehicle technologies were introduced into the SHA fleet in 2008. Overall, gasoline usage was five percent lower than the established FY 2010 reduction target.

SHA has also retrofitted diesel trucks with particulate filters or oxidation catalysts resulting in the reduction of diesel emissions from these vehicles by up to 50 percent. To date, all of the older diesel trucks in the heavy equipment fleet have been retrofitted and the remaining newer trucks included emission reducing equipment at the time of purchase. SHA is also developing policies - such as reductions in engine idling, and highway inspection practices - geared toward reducing fuel consumption and emissions.

In maintaining SHA's fleet vehicles, we use oil-water separators in our vehicle washing facilities, have eliminated the use of high VOC solvents, replaced aerosol cleaners and lubricants that contain fluorocarbons with environmentally

friendly products, and continually research the availability of environmentally based fluids and lubricants.

Water

☑ **Stormwater Management and Site Design**

SHA's stormwater management program uses best management practices to safeguard the water quality of local waterways and the health of aquatic ecosystems. SHA is a leader in using redundant stormwater management systems to ensure water quality is not compromised before entering the Chesapeake Bay Watershed. One innovation is SHA's use on the ICC Project to minimize the foot print of a project by constructing underground stormwater management systems.

Road sweeping and debris removal helps to prevent sediment-borne contaminants (such as oil, grease, and chemicals) and other pollutants (such as plastic litter, cigarette butts, and trash paper) from entering streams and creeks and ultimately, Chesapeake Bay and SHA's Litter Collection and Adopt-A-Highway programs also helps to keep trash and debris out of Maryland's waterways.

By maintaining roadside ditches and culverts in an environmentally responsible condition, SHA is helping to manage the highway's hydrology features to ensure adequate environmental performance. Maintaining stormwater inlets also enables water to flow as designed to larger stormwater maintenance facilities such as retention ponds, and grass swales.

Green Building

☑ **LEED Silver**

The I-70 new Welcome Centers and Rest Room Buildings at the existing I-70 Eastbound and Westbound sites located in Frederick County, MD on South Mountain were built to meet the LEED Silver Rating for New Construction. The project included the demolition of the existing facilities, construction of new and/ or reconstruction of existing parking areas and access roads, installation of new landscaping, hardscape, storm water management, reconstruction of sewerage and potable water system, new lighting and new signing.

Other

☑ *SHA's pavement management system employs state-of-the-art sensor technology along with human judgment to maintain State highways in optimal condition. By*

maintaining ride quality motorists use less fuel and generate fewer emissions. This is one step SHA takes to help to systemically reduce greenhouse gas emissions from the transportation sector.

In order to help create a sustainable market for recycled materials, SHA and the University of Maryland have worked collaboratively to evaluate performance and safety issues associated with the use of recycled tires, recycled glass, recycled asphalt, and recycled concrete in the highway construction program.

SHA, working with the Maryland Department of Natural Resources and the Federal Highway Administration, is pioneering beneficial uses of recycled concrete to establish fish habitat in Chesapeake Bay.

SHA is participating with the Maryland Department of the Environment to evaluate environmentally safe uses for recycled concrete and coal combustion by-products in highway projects.

SHA is employing wireless technology on highway system information technology devices to eliminate trenching.