

GreenDOT Policy Directive

"Consistent with Governor Patrick's leadership on greenhouse gas emissions and sustainability issues, MassDOT is pleased to adopt our GreenDOT policy, a comprehensive environmental responsibility and sustainability initiative designed to make us a national leader in greening the state transportation system."

Secretary Jeffrey E. Mullan

GreenDOT will be driven by three primary goals:

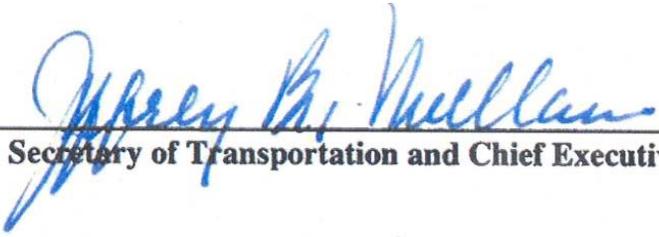
- Reduce greenhouse gas (GHG) emissions;
- Promote the healthy transportation options of walking, bicycling, and public transit
- Support smart growth development

We believe that, with this policy, we are the first DOT in the United States to adopt specific targets to reduce GHG.

Through the GreenDOT policy, MassDOT will promote sustainable economic development, protect the natural environment, and enhance the quality of life for all of the Commonwealth's residents and visitors **through the full range of our activities, from strategic planning to construction and system operations.**



POLICY DIRECTIVE



Secretary of Transportation and Chief Executive Officer

GreenDOT is the Massachusetts Department of Transportation's sustainability initiative.

GreenDOT Vision: The Massachusetts Department of Transportation will be a national leader in promoting sustainability in the transportation sector. Through the full range of our activities, from strategic planning to construction and system operations, MassDOT will promote sustainable economic development, protect the natural environment, and enhance the quality of life for all of the Commonwealth's residents and visitors. This will enable MassDOT to use resources in a manner that serves its existing customers while preserving our resources for future generations.

State Policy Context. GreenDOT is designed to support implementation of the following existing state laws, Executive Orders, and MassDOT policies:

- Climate Protection and Green Economy Act (Mass. Gen. L. c. 21N)
- Green Communities Act (Chapter 169 of the Acts of 2008)
- Healthy Transportation Compact (section 33 of Chapter 25 of the Acts of 2009)
- Leading by Example (Executive Order of Governor Patrick, no. 488)
- MassDOT's youMove Massachusetts planning initiative
- The "Complete Streets" design standards of the 2006 MassDOT Highway Division Project Development and Design Guide, as amended

Three GreenDOT Goals. The following three mutually-reinforcing goals form the foundation of GreenDOT:

- Reduce greenhouse gas (GHG) emissions
- Promote the healthy transportation modes of walking, bicycling, and public transit
- Support smart growth development

GreenDOT Policy. MassDOT will pursue the GreenDOT Vision and achieve the three GreenDOT goals by making sustainability an integral part of every MassDOT employee's job, and by integrating these objectives into our organizational vision and mission.

- We will address short- and long-term greenhouse gas emissions at every stage of design, construction, and operation of our transportation system in order to minimize climate disruption and its effects on the environment and on our customers.
- We will consider the needs of all our customers, regardless of mode choice or ability, in the design and operation of MassDOT transportation facilities. We will be guided by the MassDOT Complete Streets design philosophy articulated in the Highway Division Project Development and Design Guide and the principles of safe and full access to and within transit, rail, and other transportation facilities.
- We will distribute staff resources and define department objectives in a manner that ensures adequate attention to all customers and modes.
- We will design, build and operate our transportation system so that it supports smart growth development; this in turn will facilitate travel by the healthy transportation modes of walking, bicycling, and public transit; improve air quality; preserve the environment; and enhance quality of life for all of our customers.
- We will measure our performance toward the GreenDOT goals with a robust set of performance measures that evaluate sustainability and service to our customers – the users of our transportation facilities.

MassDOT will pursue the GreenDOT Policy with the objective of achieving the greenhouse gas emissions reductions specified in Exhibit A to this Policy Directive. Exhibit B to this Policy Directive sets forth an initial list of specific steps that MassDOT has taken, or will take, in order to achieve these reductions. This list is illustrative only, and will be updated as appropriate to reflect new technologies and new MassDOT policies that support the GreenDOT goals.

Exhibit A: Specific Targets

GreenDOT policy implementation will be guided by a target for greenhouse gas reductions under the Climate Protection and Green Economy Act (Mass. Gen. L. c. 21N), which Governor Deval Patrick signed into law in August 2008. This law will make Massachusetts one of the first states in the nation to move forward with a comprehensive regulatory program to address climate change. The law requires the Massachusetts Executive Office of Energy and Environmental Affairs (EOEEA), in consultation with other state agencies and the public, to set economy-wide greenhouse gas (GHG) emission reduction goals for Massachusetts to achieve:

- By 2020, a reduction of between 10 percent and 25 percent below statewide 1990 GHG emission levels, which were 94.4 million metric tons of CO₂ equivalent (MMTCO₂e); and
- By 2050, a reduction of 80 percent below statewide 1990 GHG emission levels.

The following is a summary of the projected reductions in greenhouse gas emissions levels that are expected to result from the GreenDOT Policy.

GreenDOT Policy Projected GHG Reductions in 2020 and 2050, in million metric tons of CO₂ equivalent (MMTCO₂e)

Comparison Conditions			
1990 Baseline Case – Economy-wide GHG Emissions			94.4
1990 Baseline Case – Transportation Sector GHG Emissions			28.9
GreenDOT Policy Goals	2020 (% below 1990 level)	2050 (% below 1990 level)	Notes and Assumptions
Reduce Greenhouse Gas Emissions	1.53 (5.3 %)	1.65 (5.7 %)	Reduced GHG emissions from construction and operations, more efficient fleets, travel demand management programs, eco-driving, and mitigation of development projects
Promote Healthy Transportation Modes of Walking, Bicycling and Public Transit	0.20 (0.7 %)	0.37 (1.3 %)	Reduced automobile travel resulting from MassDOT transportation investments that improve pedestrian, bicycle, and public transit infrastructure and operations
Support Smart Growth Development	0.38 (1.3 %)	1.53 (5.3 %)	Reduced automobile travel that is enabled by denser, smart growth development patterns
GreenDOT Subtotal	2.11 (7.3 %)	3.56 (12.3 %)	

The GreenDOT Policy is expected to result in the following GHG emissions reductions:

- By 2020, the proposed GreenDOT Policy would produce a reduction of 7.3 percent below 1990 transportation GHG emissions.
- If left unchecked by GreenDOT and other GHG reduction policies of the Commonwealth and the Federal government, transportation GHG emissions would be expected to increase to 34.4 MMTCO_{2e} by 2020, a 19.0 percent increase from 1990 levels. Instead, according to EOEEA, the GreenDOT Policy, combined with other state and federal government policies, is expected to reduce 2020 transportation GHG emissions by almost 30 percent below the “business as usual” level of 34.4 MMTCO_{2e}.
- The GreenDOT Policy measures extrapolated to 2050 are expected to reduce transportation GHG emissions by a total of 12.3 percent below 1990 levels. This reflects only the further GHG reductions resulting from those policies that are within MassDOT’s direct control, such as impacts of travel behavior that are shaped by MassDOT project priorities, MassDOT design and construction practices, and MassDOT fleet emissions. In order to meet the 80 percent GHG emissions reduction called for in the Climate Protection and Green Economy Act, many other changes in the transportation sector that lie outside MassDOT’s direct control are necessary. These changes relate largely to the issues of vehicle efficiency, fuel type, and pricing of fuel and emissions. The Commonwealth of Massachusetts will continue to work with other states and the Federal government in order to facilitate the changes that will be required in these areas.

Exhibit B

The following is a summary of the specific measures, initiatives, and programs that MassDOT will implement and is implementing in order to affect the GreenDOT Policy. In this way, the GreenDOT Policy is supported through all of MassDOT's activities, from long-range planning through system operation and maintenance, and it informs decision-making throughout MassDOT. This list is illustrative only, and will be updated as appropriate to reflect new technologies and new MassDOT policies that support the GreenDOT goals.

Statewide and Regional Long-Range Planning

- Statewide planning documents (including the Strategic Plan and Capital Investment Plan) and the Metropolitan Planning Organization's (MPO) long-range Regional Transportation Plans (RTPs) will integrate the three GreenDOT Goals. These planning documents will evaluate GHG emissions and ensure that GHG emissions are reduced over time, consistent with the Climate Protection and Green Economy Act.

Project Prioritization and Selection

- Regional Transportation Improvement Programs (TIPs) and State Transportation Improvement Program (STIP) will include an evaluation of overall greenhouse gas emissions from the project programs, and will need to be developed in a manner that fits into an overall state greenhouse gas reduction target. This will require that the MPOs and MassDOT balance highway system expansion projects with other projects that support smart growth development and promote public transit, walking and bicycling.

Project Design and Construction

Complete Streets

- Pedestrian and Bicycle Accommodation. All MassDOT projects must include accommodation of pedestrians and bicycles per the MassDOT Highway Division Project Development and Design Guide.
- Online Plans. Plans for all MassDOT projects will be posted online at 25 percent design review, along with a basic project checklist that includes measures of pedestrian and bicycle accommodation.
- Pedestrian and Bicycle Safety Education. The RMV is updating its educational and licensing materials to increase focus on safety for pedestrians and bicyclists.
- Permit Requirements. Recipients of highway access permits will be required to adhere to Highway Division Project Development and Design Guide standards on Complete Streets design.
- Grantee Obligations. Recipients of state discretionary funding, such as Public Works Economic Development (PWED) and the Transit-Oriented Development (TOD) Bond Program funds, will be required to adhere to Highway Division Project Development and Design Guide standards on Complete Streets design.

Rail Transportation

- MBTA System Improvements. The MBTA is working enhance subway and commuter rail service, which will increase transit system capacity, enable a mode shift from auto to transit travel, and reduce greenhouse gas emissions. Major projects include the Green Line Extension, Fitchburg Line Improvements, Fairmount Line Improvements, Framingham/Worcester Line service improvements, the South Coast Rail Project, and South Station Track Expansion, which will facilitate increased commuter rail service.
- Knowledge Corridor Improvements. Using \$70 million in Federal funds from the FRA's High Speed and Intercity Passenger Rail (HSIPR) program, MassDOT is working with Pan Am Railways to upgrade the Connecticut River rail line to enable Amtrak service to shift back to this corridor. This will also support service along the Inland Route (from Boston to Springfield via Worcester) to Montreal.
- CSX Freight Rail Improvements. The Commonwealth will purchase property rights on the Boston to Worcester rail line from CSX Transportation. CSXT will concentrate its freight rail operations to the west; MassDOT and CSXT will work together to enable double-stack rail clearances from the New York border to Westborough. This will increase the freight rail capacity of the CSXT line, and increase the potential for additional commuter service while also taking control of dispatching and maintenance of the line.
- Pan Am Southern Rail Line. This joint venture of Pan Am Railways and Norfolk Southern will bring a second Class I railroad to the Commonwealth, and will entail the rehabilitation of the Pan Am Southern Main Line between Ayer and Mechanicville, NY. The partnership will rehabilitate 138 miles of track, increase the line's weight capacity, replace ties, and add just over 35 miles of new rail. The \$47.5 million effort that began in 2009 and is expected to be completed in 2010 is one of the largest new private investments in the Commonwealth's rail system in decades.
- MassDOT Freight and Rail Plan. This ongoing MassDOT planning initiative will produce a comprehensive multi-modal freight plan and a state rail plan with a vision for the future and a program of improvement priorities. This will put the Commonwealth in good position to receive federal rail funding and enter into public-private partnerships to improve freight and rail infrastructure, facilitate economic development, and enhance the environment and quality of life for Massachusetts residents.

Bicycle and Pedestrian Transportation

- Transportation Enhancements (TE) Program. In order to revitalize the Massachusetts TE program, MassDOT is streamlining the TE application process, conducting early screening for technical feasibility of TE projects, and enabling greater technical support for TE projects.
- Bay State Greenway (BSG). MassDOT is mapping this 740-mile network of seven statewide on- and off-road bicycle corridors, a key recommendation of the 2008 Massachusetts Bicycle Transportation Plan, and will promote it as the state's bicycle network vision. MassDOT has identified an additional 100 miles of high priority BSG shared-use paths that connect to urban areas and/or extend existing shared-use paths that connect to urban areas.
- Accelerated Bridge Program. Through its Accelerated Bridge Program, which will rehabilitate nearly 600 bridges over 8 years, MassDOT is working to improve pedestrian and bicycle accommodation on the bridges that it repairs, including those in the Charles River Basin.
- Bicycle Facility Data. MassDOT has developed an online bicycle mapping tool, has publicly released its bicycle facility data layer, and is incorporating bicycle accommodation into Roadway Inventory to be updated annually by municipalities.

- Bike to Transit. The MBTA has allocated \$4.8 million in ARRA funds to enhance and expand bicycle parking facilities at MBTA stations. Building on the success of the Alewife and Forest Hills bike cages, this program will fund the construction of 6-8 additional bike cages at major transit stations, and will expand the number of conventional bike racks at other stations. All commuter rail stations have bike racks, as do about 95 percent of subway stations. Seventy percent of MBTA buses are equipped with bicycle racks, and the full fleet will be equipped by 2013.
- MassDOT Bike Pool. MassDOT will implement a “bike pool” at appropriate locations for travel to and from meetings.

Sustainable Design and Construction Best Practices

- Drainage and Water Resources. MassDOT employs best practices in drainage design to maximize groundwater recharge and minimize run-off by designing projects to maximize stormwater detention and permeable cover.
- Pavement. MassDOT currently uses a range of recycled materials in pavement, including recycled asphalt pavement, recycled tires, and shingles in its pavement, as well as warm mix asphalt. MassDOT is working to increase the use of these environmentally-friendly technologies, and continues to conduct research so that it can maximize use of recycled materials and warm-mix asphalt paving.
- Lighting. For new and replacement traffic signals, MassDOT installs only high-efficiency light-emitting diode (LED) traffic signals, and is replacing red bulbs with LEDs on a systematic basis.
- Facility Design and Construction. MassDOT will design and build resource-efficient buildings, and pursue LEED certification for new or rehabilitated buildings.

System Operations, Maintenance and Customer Service

Fuel Use and Vehicle Emissions

- MBTA Fleet. The full MBTA fleet is low emission: electric, CNG, or emission control diesel (ECD), as well as 25 new diesel – electric hybrid buses purchased with ARRA funds. MBTA new bus procurements will include at least 10 percent diesel – electric hybrid buses, or a technology with comparable GHG emission reduction. The MBTA will continue to evaluate vehicle technology and life-cycle costs, including the on-road and maintenance performance of its new diesel – electric hybrid buses, and work with bus manufacturers to improve bus technology.
- MassDOT Fleet. MassDOT has procured efficient hybrid electric and CNG fleet vehicles, has used ARRA funding to retrofit its on-road diesel light truck fleet with emission controls, and is pursuing retrofit of hybrid electric fleet vehicle to make them plug-in capable.
- Diesel Bus Retrofit. A DEP/MassDOT program has retrofitted over 500 school buses with emission control devices; MassDOT is working with the Regional Transit Authorities to implement a program to retrofit RTA transit buses with emission control devices.
- Truck Stop Electrification. MassDOT will be doing a procurement for this project that is designed to reduce emissions from idling trucks.
- Shore Side Power at the Port of New Bedford. MassDOT will fund this project that is designed to reduce emissions from idling ships.
- Contractor Vehicles. MassDOT requires that contractors install emission control devices in all off-road diesel vehicles; as a result, private construction companies have retrofitted over 800 vehicles.
- Eco-Driving. Significant improvements to vehicle fuel efficiency and emissions can be realized through what some have termed “smart driving” or “eco-driving,” i.e. moderating speed,

Travel Demand Management and Traveler Information

- Travel Demand Management. MassDOT will continue to promote and deliver travel demand management (TDM) information and services, including ridematching, traveler information, real-time bus tracking, and other measures for the general public and among MassDOT employees.
- New Ridematching and Trip Planning System. MassDOT is currently working to procure a new ridematching/trip planning system to facilitate carpooling, vanpooling, and mode shifting from automobile travel.

Renewable Power

- MassDOT is pursuing several renewable power generation projects along our state highways and other MassDOT property. This includes Highway Division projects (a solar photovoltaic array in Carver, solar PV installation at District 2 Ashley Ave Depot, wind turbine at Blandford rest area, and solar PV at park and ride lots) and MBTA projects (a wind turbine at the Kingston commuter rail layover facility, a wind turbine in Bridgewater, and a solar photovoltaic array on the roof of the proposed Wonderland Garage). MassDOT will continue to identify opportunities for renewable power projects, and will work with municipalities and stakeholders to increase implementation.

Facilities Management

- MBTA Environmental Management System. The MBTA has implemented an Environmental Management System (EMS), a comprehensive management tool for implementing its pollution prevention and environmental compliance responsibilities and programs in a comprehensive, systematic, planned and documented manner. The MBTA's EMS has broad coverage, with a particular focus on the operations and management of its maintenance facilities, (e.g., hazardous material handling and disposal, wastewater management, vehicle management, facility upgrades and compliance, infrastructure management, etc.), as well as at its storage areas, bus and rail garages, its procurement systems as well as the environmental management of the design and construction activities on new projects and project upgrades. Other MassDOT divisions will review the MBTA's EMS to identify best practices and opportunities for technology transfer.
- Energy Audits. MassDOT has conducted energy audits and is pursuing energy conservation programs at a number of facilities.

Performance Management

- Sustainability measures will be embedded in all aspects of the MassDOT performance management system, based on best practices.

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