

Chapter 6

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6. ENVIRONMENTAL

In 2010, MassDOT launched their sustainability and environmental responsibility initiative to “green” the state transportation system, called GreenDOT. All branches of the Commonwealth’s transportation system (transit, air, highway and planning) are subject to the policies contained within the GreenDOT initiative. The policy is driven by three primary objectives: (1) reduce greenhouse gas emissions, (2) promote healthy transportation options, and (3) support smart growth and development. In order to meet these objectives and to become a national leader in sustainability and transportation, MassDOT created an implementation plan in 2012 that outlines 7 themes (Air, Energy, Land, Materials, Planning Policy & Design, Waste, Water) and 16 sustainability goals. As part of the GreenDOT policy, each indicator was given a priority for implementation. Indicators for immediate implementation are those that were to be implemented by 2013, medium-term by 2015 and long-range policy targets for 2020.

While the concept of improving sustainability and environmental responsibility would prove beneficial for Massachusetts, coordination and input from the 15 RTAs across the state has not yet occurred. In addition, while the GreenDOT policy outlines 331 indicators applicable to the rail and transit division, not all of these are relevant to the fifteen RTAs across the state²⁰. Those that are not relevant are often the responsibility of the MBTA, Bay State Roads, metropolitan planning organizations, and/or MassDOT but not the RTA. Many of the policies extend beyond the responsibility and reach of any of the RTAs and the timeline for achieving the indicators are not realistic or necessarily right sized for the RTA’s. Many of the RTA’s (either individually or collectively) will require more time to implement these environmental initiatives. A logical step is for each RTA to coordinate and confirm with MassDOT which initiatives are the most appropriate and achievable actions that can be taken and how best to achieve them.

In addition to GreenDOT, Massachusetts recently passed regulation *310 CMR 60.05: Global Warming Solutions Act Requirements for the Transportation Sector and the Massachusetts Department of Transportation*. The purpose of the act is to assist the state in achieving their goals of reduced greenhouse gas emissions (GHG). There are various parts to the regulation that require interagency coordination between MassDOT, Metropolitan Planning Organizations (MPOs), Regional Transit Authorities (RTAs), the Department of Environmental Protection and the Executive Office of Energy and Environmental Affairs. The RTAs are specifically given 4 tasks:

- Conduct comprehensive service reviews (CSRs),
- Identify service enhancements to increase passenger ridership
- Identify vehicle technology and operational improvements that can reduce GHG emissions
- Work within the MPO process to prioritize and fund GHG reduction projects and investments

²⁰ Mass GreenDOT policy <http://www.massdot.state.ma.us/GreenDOT.aspx>

The RTAs along with MassDOT and the MPOs will be required to calculate GHG impacts on all RTP projects, consider GHG impacts when prioritizing and selecting projects, and report GHG impacts of all projects. Spreadsheet calculation tools have been developed for calculating GHG emissions and air quality analysis on bus replacements, new bus services, complete street programs and park and ride lots. The Department of Environmental Protection requires that the GHG impacts be measured for all projects and reported annually.

This section of the WRTA plan examines how the policy’s themes and their goals are being applied to regional transit authorities and which ones, in particular the WRTA, is currently meeting. There are a total of 331 indicators identified in the GreenDOT policy, of which only 174 or 53% are applicable to the WRTA. Of the 174 applicable indicators, 92 are short term indicators which are recommended to be in place by 2013, 63 are medium term indicators to be implemented by 2015 and the remaining 18 indicators should be implemented by 2020. For the applicable indicators WRTA has met 54 (59%) of the short term, has met or is working towards meeting 47 (75%) of the medium-term and 13 (72%) of the long-range indicators (Figure 33) Overall, the WRTA is meeting 94 (54%) of the 174 applicable indicators (Figure 32), even though 47% are not required to be met until the end of 2015 or 2020 according to GreenDOT.

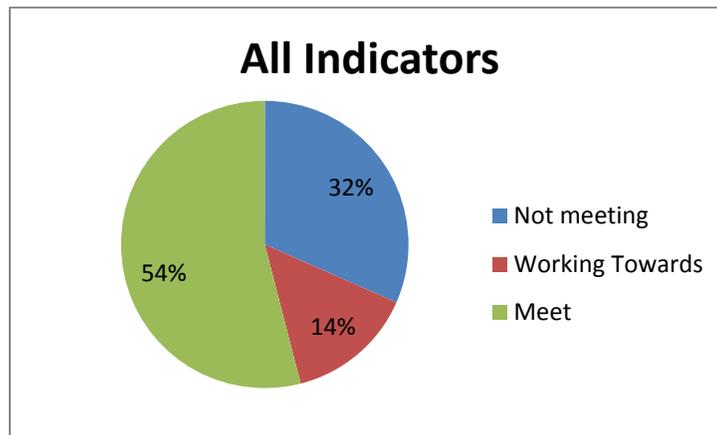


Figure 32. All Applicable Indicators Level of Attainment

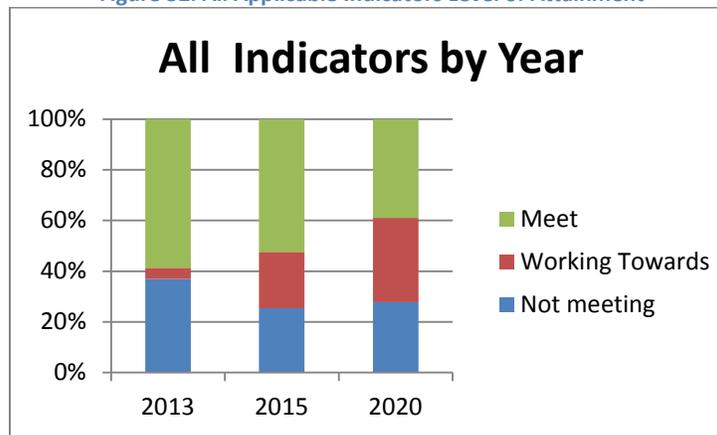


Figure 33. All Applicable Indicators Attainment by Year



The WRTA is working continuously to achieve the indicators and has accomplished many of them ahead of schedule. Some of the applicable indicators are joint responsibilities of the WRTA, MassDOT, the planning commission or the municipality and they must work collaboratively to achieve success. Additionally, of the 156 indicators that do not apply, some reasons may be because they are specific to the MBTA, specific to rail, require that there has been or will be new construction, they are for MassDOT owned facilities, they are for environmentally sensitive land areas, and/or there may be other constraints beyond the WRTAs control.

6.1 GreenDOT Policy

The seven themes of GreenDOT that aim to reduce carbon footprints and improve sustainability include air, energy, land, materials, planning (policy and design), waste and water. Each theme has at least two goals and several objectives and indicators for meeting the goal. The indicators are measurable tasks that describe sustainable practices. Table 10 outlines the goals, objectives and indicators for each theme. For each indicator WRTA was asked if they currently are achieving it, working towards achieving the indicator, do not meet the indicator and are not currently working towards or if it is not applicable to them.

Table 10. GreenDOT Goals, Objectives and Indicators

Theme	Goals	Objectives	Indicators	Applicable Indicators
Air	2	11	49	27
Energy	2	7	39	23
Land	2	9	45	11
Materials	3	14	63	33
Planning, Policy & Design	3	12	56	29
Waste	2	9	33	24
Water	2	9	46	28
Total	16	71	331	175

6.21 Air

Air goals include improving the state’s air quality and reducing greenhouse emissions. There are 49 indicators for air but only 27 (55%) are applicable to WRTA. WRTA is meeting 14 (52%), working towards 2 (7%) and not meeting 11 (41%) of the applicable air indicators as seen in Figure 34. Figure 35 outlines the air indicators by implementation time and level of achievement. There are 22 indicators in the air theme which are not applicable to WRTA. For the applicable indicators 11 are short term indicators, 10 are medium-term, and 5 long-range. Of those that are applicable to WRTA they have met 6 (55%) of the immediate implementation (2013) indicators, and are working towards or meeting 6 (60%) of the medium-term (2015) indicators and 3 (60%) of the long-range indicators.

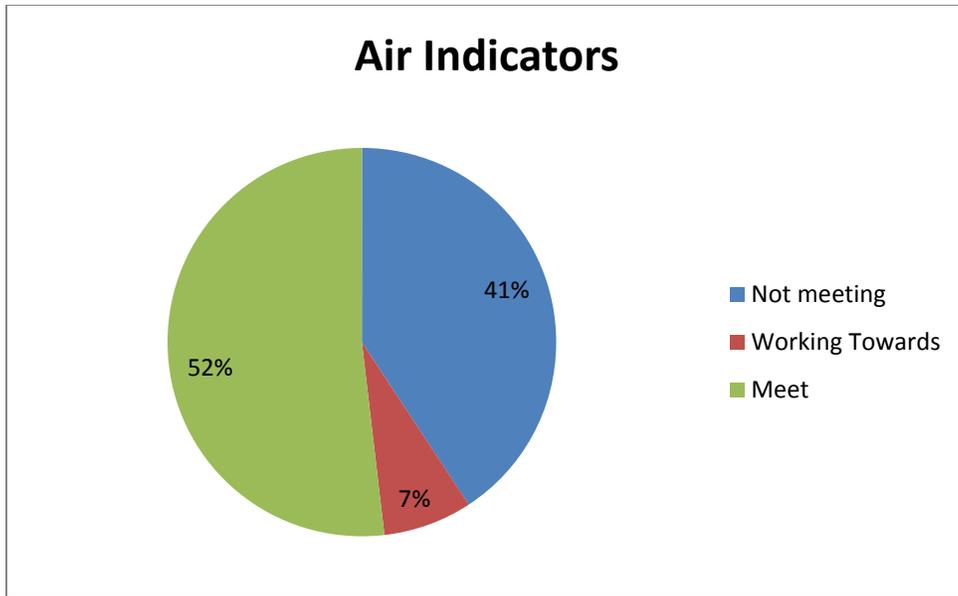


Figure 34. Air Indicators Level of Attainment

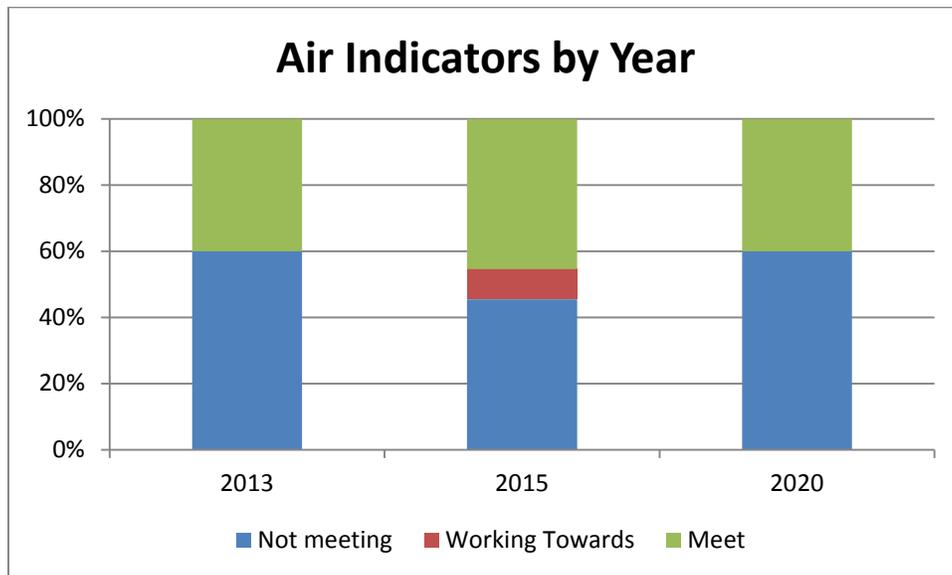


Figure 35. Air Indicators Attainment by Year



Figure 36. WRTA Proterra Electric Vehicle

To improve statewide air quality WRTA has electric and hybrid vehicles in their fleet (16 Hybrid and 6 electric). This has also shown operational savings through decreases in the average cost per mile. Between January 2013 and May 2014 the average cost per mile for the entire fleet dropped by \$0.10. The electric Proterra zero emissions vehicles (Figure 36) were funded through a Clean Funds Grant to reduce greenhouse gas emissions and between May 2013 and April 2014 WRTA had reduced CO2 emissions by 171 tons.

Table 11. Air Goal Achievement

Goal 1: Improve Statewide Air Quality	
Objective: Reduce emissions from maintenance & construction equipment	
Indicator	Contribution
Retrofit + use of hybrid engine system for each vehicle class piloted (2013)	No
Diesel retrofit program for on and off-road vehicles expanded (2013)	No
Hours of non-revenue vehicle operation reduced by 5% through operations streamlining (2015)	Not Applicable - Non-revenue vehicle use is minimal and geared toward street supervision.
Electric and/or full exhaust cycle motors have replaced 2-stroke equipment (2015)	No
All new heavy equipment purchased run hybrid, CNG, or other high efficiency engines (2020)	Yes - Includes all bus purchases.



Objective: Decrease total engine idling	
Indicator	Contribution
On-board electrification of maintenance equipment for each vehicle type piloted (2013)	Yes - AVM
MassDOT compliance with anti-idling laws ensured (2013)	Yes
On + off-road anti-idling policies included in all construction, maintenance + service contracts (2013)	Not Applicable - no contracts
Anti-idling policies, more restrictive than state law developed to eliminate unnecessary idling (2015)	No
Anti-idling technology in transit vehicle + maintenance truck operations utilized (2015)	No
90% of MassDOT over-road maintenance vehicles run hybrid engines or have on-board electrification (2020)	Not Applicable - No MassDOT vehicles
Objective: Decrease volatile organic compound discharge from facilities	
Indicator	Contribution
Spray painting restricted to permitted booths + emissions controls installed at spray shops (2015)	Yes
All maintenance yard gasoline fueling pumps retrofitted with vapor recovery systems (2015)	Yes
Technologies for diesel + jet fuel vapor recovery explored + implemented where feasible (2020)	Yes
Air emission control training provided to all maintenance employees (2015)	Yes
Objective: Increase fuel efficiency of operating transit fleet	
Indicator	Contribution
100% of transit bus fleet replaced or retrofitted with hybrid systems or best in class fuel efficiency vehicles (2013)	Yes
Statewide diesel transit + school bus retrofit program optimized + balanced with efficient vehicle purchases (2015)	Yes
20 new high efficiency commuter rail diesel locomotive in service (2020)	Not Applicable - Do not operate Commuter rail
40 new high efficiency commuter rail locomotives purchased (2020)	Not Applicable - Do not operate Commuter rail
Objective: Increase efficiency of transportation systems operations	
Indicator	Contribution
Bus route efficiency measures implemented by all transit operators (2015)	Working towards - Creating a regional transit plan
Planned bridges and ROWs designed to increase options for double tracked lines + allow double-stack cars (2020)	Not Applicable - Do not operate rail
Six rail corridors upgraded to increase speed including separated grade crossings or other improvements (2015)	Not Applicable - Do not operate rail
Dwell time of commuter rail trains at stations decreased (2015)	Not Applicable - Do not operate Commuter rail
Program initiated to increase the number of high level commuter rail platforms (2015)	Not Applicable - Do not operate Commuter rail
Electronic tolling facility of road and parking facilities launched (2020)	Not Applicable - No tolled facilities



Goal 2: Reduce Greenhouse Gas Emissions	
Objective: Increase vehicle electrification facilities	
Indicator	Contribution
At least 30 electric vehicle (EV) chargers installed along state highway system + transit parking areas (2020)	Yes - City has several at Hub parking facility; only transit parking area for WRTA
All major park and ride, + transit parking lots (>50 vehicles) have charging stations (2020)	Not Applicable - No such facilities
Feasibility analysis of expanding the use of battery + fuel cell powered buses completed (2015)	Yes - Battery only
Optimal Statewide EV plug-in station network planned + implemented (2020)	Not Applicable - State Initiative
The feasibility of electric commuter rail locomotives studied within the Commuter Rail Master Plan (2015)	Not Applicable - Do not operate Commuter rail
Objective: Increase use of alternative + renewable fuels	
Indicator	Contribution
Bio-fuel (such as B10-B20 biodiesel) tested in oil heated buildings (2013)	NA – no gas heated buildings
20% biodiesel (B20) blend purchased for oil heated buildings (2015)	NA - no gas heated buildings
Recycled vegetable oil / non-food stock impairing fuel purchased for biodiesel blends (2013)	NA - no gas heated buildings
Volume purchasing of alternative fuels established across facilities + divisions (2015)	Not Applicable - no multiple facilities/divisions
B10 + B20 biodiesel pilot begun in all diesel vehicle types (2013)	na – use clean diesel; hybrid; and electric
B10 to B20 biodiesel utilized in all diesel vehicles, depending on availability, vehicle type + season (2013)	na – use clean diesel; hybrid; and electric
Objective: Increase fuel efficiency of light duty vehicles	
Indicator	Contribution
Vehicle fleet inventoried + prioritized for replacement and retrofit based on emissions reduction (2013)	Yes
A portion of light duty fleet in urban areas integrated with car-share programs (2015)	Not Applicable - Car sharing not applicable for road supervision purposes.
Light duty fleet downsized with carpooling, interdepartmental vehicle use, + car-sharing (2020)	Not Applicable - Car sharing not applicable for road supervision purposes.
All light duty vehicles replaced or retrofitted with hybrid, electric, CNG or best in class technology (2020)	No
50% of DOT light vehicle fleet replaced or retrofitted with zero or partially zero emission vehicles (2015)	Not Applicable - No DOT vehicles
Objective: Increase fuel efficiency of maintenance + construction equipment	
Indicator	Contribution
Performance measures added to maintenance + construction contracts for green fleets (2013)	No
15% of maintenance fleet replaced with best in class emission ratings (2015)	No

Objective: Increase telecommuting + meetings by web conference	
Indicator	Contribution
Teleconference technology capabilities installed at all offices (2013)	Yes
Take home vehicle fleet for office employees eliminated (2013)	Yes
Telecommuting + flex time options expanded for employees (2013)	No - Most employees are drivers and maintenance staff
Peak hour single occupancy vehicle trips by employees reduced by 20% (2020)	No
Objective: Track progress toward statewide GHG reduction + other sustainability goals	
Indicator	Contribution
All resource use + purchases reported for performance monitoring (2013)	No
MassDOT's GHG emissions target of 40% reduction from a 2002 baseline is met (2040)	Working towards - Have reduced but not by 40%

6.22 Energy

Energy goals are focused on consuming less energy and increasing the percentage of energy which comes from renewable sources. There are 39 indicators for energy but only 23 (59%) are applicable to WRTA. WRTA is meeting 4 (17%), working towards 14 (61%) and not meeting 5 (22%) of the applicable energy indicators as seen in Figure 37. Figure 38 outlines the energy indicators by implementation time and level of achievement. There are 16 indicators in the energy theme which are not applicable to WRTA. For the applicable indicators 9 are short term indicators, 9 are medium-term, and 5 long-range. Of those that are applicable to WRTA they have met 2 (22%) of the immediate implementation (2013) indicators, and are working towards or meeting 9 (100%) of the medium-term (2015) indicators and 4 (80%) of the long-range indicators.

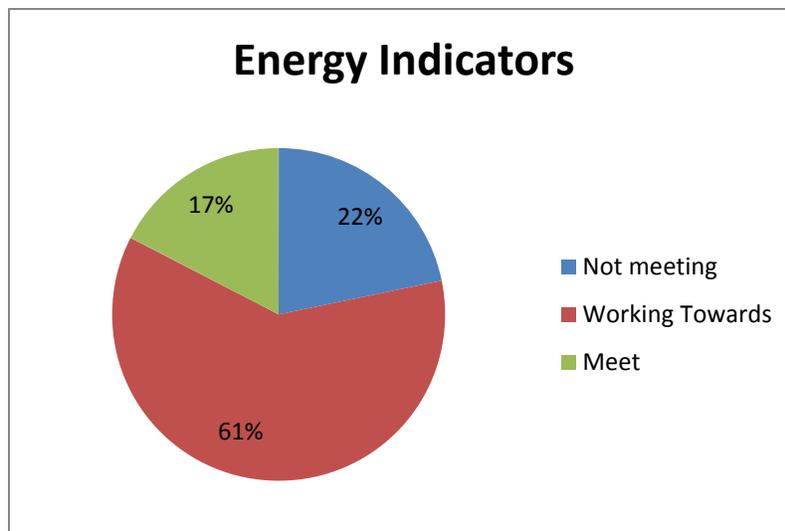


Figure 37. Energy Indicators Level of Attainment

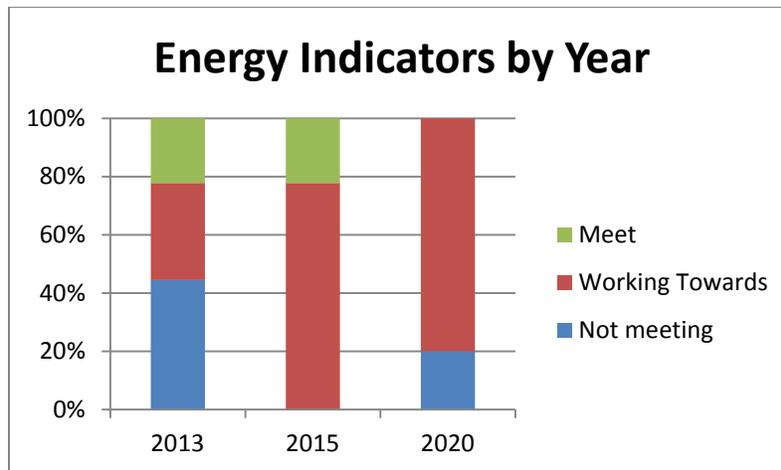


Figure 38. Energy Indicators Attainment by Year

WRTA is working towards being more energy efficient with The Hub, the new Operation and Maintenance facility, and their solar monitoring program²¹. Solar panels were installed in July 2013 on the roof of the bus platform bays (Figure 39) and since then have generated almost 70,000 kilowatt hours²². This equates into saving 49 tons of CO₂ which would have been generated from power plants or 5,634 gallons of fuel. The electricity is used to charge the electric buses among other uses.



Figure 39. Solar Array at The Hub

²¹WRTA solar monitoring program website: <http://live.deckmonitoring.com/?id=wrt>

²² As of 3/17/2015



Table 12. Energy Goal Achievement

Goal 1: Consume Less Energy	
Objective: Reduce building electricity use	
Indicator	Contribution
Electrical + HVAC use of all buildings + facilities audited (2013)	No
Office electrical equipment shutdown program implemented (2013)	No
Employee education and incentive programs established to encourage energy use reduction (2013)	No
All buildings not updated in 10 years renovated / overhauled / consolidated (2015)	Working towards - New Hub, and New M&O in works.
Motion sensor/occupancy lighting installed in all buildings (2015)	Working towards - New Hub, not old M&O
Electricity purchased by the MBTA reduced by 20% per passenger mile (2015)	Not Applicable - Not the MBTA
Objective: Reduce electricity use by outdoor lighting	
Indicator	Contribution
Use of incandescent bulbs eliminated (2015)	Working towards - Most locations
Outdoor lighting assets + technology inventoried (2013)	Yes
50% of all outdoor lighting (ROW, parking lots, tunnels, runways, airfields) retrofitted (2015)	Yes
100% of all outdoor lighting retrofitted (2020)	Working towards - New Hub, not old M&O
Electricity consumption for lighting reduced by 50% through retrofits and operations (2020)	No
All traffic signals replaced with LED bulbs (2015)	Not Applicable - no traffic signals
Objective: Reduce fuel use for heating buildings + water	
Indicator	Contribution
Audit of all heating systems + water fixtures conducted + opportunities for retrofit identified (2013)	Working towards - New Hub, not old M&O
Temperatures of all adjustable boilers/heaters reduced (2013)	Yes
All inefficient / electric water heaters replaced with high efficiency tanks or tankless systems (2020)	Working towards - New Hub, not old M&O
Oil heating systems converted to natural gas or renewable alternatives where feasible (2015)	Working towards - New Hub, not old M&O
Geothermal + cogeneration heating systems studied for all new buildings (2013)	NA – currently in new building and a building being replaced in 2016
Envelops of all buildings are evaluated and prioritized for insulation upgrades (2015)	Working towards - New Hub, not old M&O
Total heating fuel + costs for MassDOT-owned buildings reduced by 20% (2020)	Not Applicable - Not MassDOT facility
Total heating fuel + costs for MassDOT-owned buildings reduced by 35% (2020)	Not Applicable - Not MassDOT facility
Insulation of all heated / air conditioned buildings assessed and replaced as needed (2020)	Working towards - New Hub, not old M&O
All MassDOT-owned HVAC systems +/- or windows retrofitted or replaced (2020)	Not Applicable - Not MassDOT facility
Shade tree planting around MassDOT buildings increased to improve building energy performance (2015)	Not Applicable - Not MassDOT facility



Objective: Reduce electricity consumption by subways + trolleys	
Indicator	Contribution
Evaluation of on-board and/or wayside energy recapture conducted for all subway lines (2015)	Not Applicable - Do not operate rail
Electrical systems of all subway lines evaluated and retrofitted where cost effective (2020)	Not Applicable - Do not operate rail
All outdated transit vehicles replaced with high efficiency cars (2020)	Not Applicable - Do not operate rail
New subway car purchases contain regenerative braking technology (2013)	Not Applicable - Do not operate rail
RFR issued for wayside station regeneration installation (2020)	Not Applicable - Do not operate rail

Goal 2: Increase Reliance on Renewable Energy

Objective: Participate in MassDOT Energy Initiative	
Indicator	Contribution
Create a MassDOT energy management plan (2013)	Not Applicable - MassDOT responsibility
All energy consumption (electricity / heating / fleet fuel) tracked + centrally reported (2015)	Yes
Feasibility study completed for additional wind power generation sites on MassDOT properties (2013)	Not Applicable - Not MassDOT facility

Objective: MassDOT GreenDOT Implementation Plan Increase energy produced at MassDOT facilities	
Indicator	Contribution
Comprehensive feasibility assessment and renewable energy generation plan completed (2013)	Working towards - At new Hub
4 RFR's issued by MassDOT for additional renewable generation sites (2013)	Not Applicable
10 new renewable energy projects installed at MassDOT facilities (2015)	Not Applicable - Not MassDOT facility
At least 5% of electricity demand generated by MassDOT renewable projects (2020)	Not Applicable - Not MassDOT facility

Objective: Purchase more renewable energy	
Indicator	Contribution
Bulk purchasing of green electricity portfolio with other state agencies initiated (2013)	No
12% of electricity needs met through production or green energy purchases (2015)	Working towards - Not able to control but some through Worcester's Electricity bid.
25% of electricity needs met through production or green energy purchases (2020)	Working towards - Not able to control but some through Worcester's Electricity bid.

6.23 Land

Land goals are aimed at using sustainable vegetation maintenance practices and protecting significant habitat areas and natural landscapes. There are 45 indicators for land but only 10 (22%) are applicable to WRTA. WRTA is meeting 8 (80%) applicable land indicators as seen in Figure 40. Figure 41 outlines the land indicators by implementation time and level of achievement. There are 35 indicators in the land theme which are not applicable to WRTA. For the applicable indicators 6 are short term indicators, 4 are medium-term, and 0 long-range. Of those that are applicable to WRTA they have met 5 (83%) of the

immediate implementation (2013) indicators and are working towards or meeting 3 (75%) of the medium-term (2015) indicators.

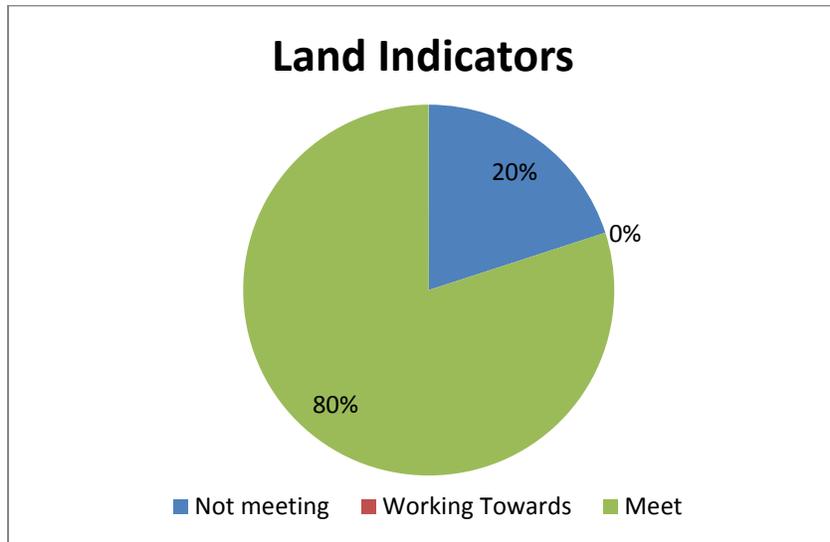


Figure 40. Land Indicators Level of Attainment

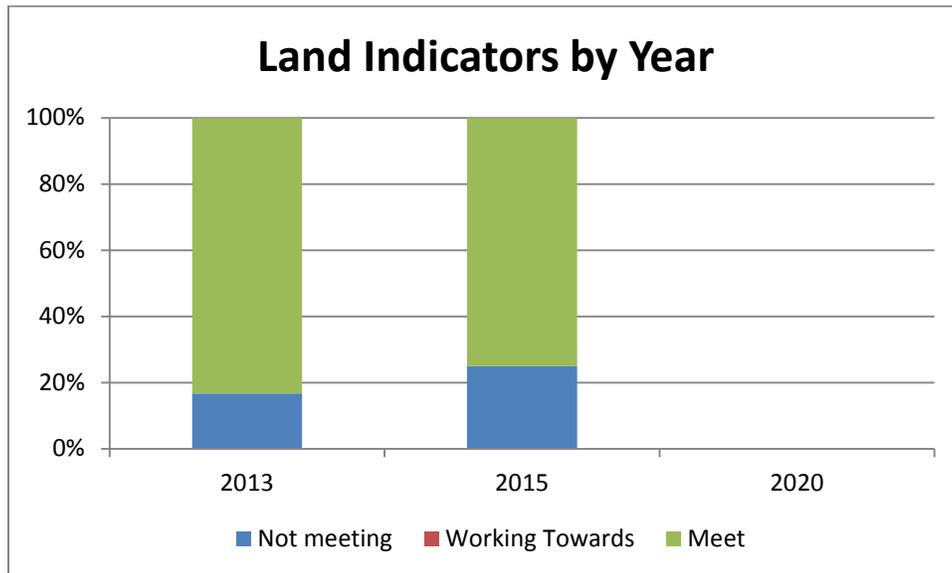


Figure 41. Land Indicators Attainment by Year

Land goals are aimed at using sustainable vegetation maintenance practices and protecting significant habitat areas and natural landscapes. Many of the indicators are not applicable because there are no significant habitats on any of the WRTA property, no endangered species and no surplus land. While there are no endangered species WRTA does consider wildlife protection when conducting studies. They also advocate for urban trees, have reduced light pollution through installing light shields, and have a

turf management program to inventory grasses, reduce mowing and use slow growing grass blends. The new O&M facility will have a diverse planting of native trees and shrubs (Figure 42).



Figure 42. Rendering of the New O & M facility

Table 13. Land Goal Achievement

Goal 1: Minimize Energy + Chemical Use in Maintenance	
Objective: Increase acreage of land planted with native / low maintenance vegetation	
Indicator	Contribution
New facilities planted with sustainable, minimally managed native landscape (2013)	NA - Minimal opportunity in urban setting.
Lawn installations around five facilities replaced with natural (low maintenance) vegetation (2015)	Yes
Native plant restoration or managed fallow habitat restoration increased 25% along ROWs (2015)	Not Applicable - No fallow habitat
Available land surrounding all rural depots and offices planted with native vegetation (2020)	Not Applicable - Not rural
Objective: Decrease area + frequency of land mowed	
Indicator	Contribution
Inventory of grassed area conducted (2013)	Yes
Turf grass replaced with broad spectrum blend of grasses including warm season + slow growing for low maintenance (2013)	Yes
Mowing frequency reduced by 25% (2013)	Yes
Mower blades raised in turtle habitat + areas contiguous with natural areas as standard operating procedure (2013)	Yes
Mowing + brush cutting jobs are scheduled around animal nesting season to the maximum extent possible (2013)	Not Applicable - <5 acres



Objective: Implement an integrated vegetation management approach for ROWs + facilities	
Indicator	Contribution
Landscape areas inventoried by habitat area + maintenance regime (2013)	NA – areas too small
Adopted Vegetation Management Plans focus on integrated management approach (2015)	Not Applicable - areas too small
Soil augmentation utilize organic landscape techniques + minimize nutrient loads to water supplies (2013)	Not Applicable - areas too small
Compost materials used as the preferred soil amendment in all maintenance + construction projects (2015)	No
Objective: Require intelligent use herbicides + pesticides in construction + maintenance	
Indicator	Contribution
Mechanical weed control utilized to minimize traditional herbicide use (2013)	Not Applicable - don't use weed control
Herbicides used only in conjunction with integrated + sustainable roadside/railway vegetation management plans (2013)	NA – minimal areas
Increase number of employees trained for herbicide application to allow more selective application (2015)	NA – minimal areas
Integrated pest management (IPM) implemented for all maintenance projects + construction sites (2013)	NA – minimal areas
Ongoing training for employees + technical assistance for municipalities on organic/IPM practices established (2013)	NA – minimal areas
Objective: Protect, preserve + enhance woodland + urban tree coverage	
Indicator	Contribution
2 to 1 tree replacement policy implemented where woodland preservation desired (2013)	Not Applicable - urban area
Mature, healthy tree preservation is maximized in maintenance and project design where feasible (2013)	Yes
Trees and naturalized landscaping emphasized in revised Project Development + Design Guide (2013)	Not Applicable – MassDOT responsibility
Sustainable roadside woodland management plan established for construction and maintenance (2015)	Not Applicable - urban area
Urban street tree coverage enhanced during improvement projects (2015)	Yes
Coordinated tree planting policy established to encourage locally supported urban forestry practices (2015)	NA – minimal areas
100,000 trees planted along roadways as part of MassDOT's Complete Streets practices (2020)	Not Applicable - MassDOT responsibility



Goal 2: Enhance Ecological Performance of MassDOT Impacted Land	
Objective: Increase habitat preservation + enhancements	
Indicator	Contribution
Proactively coordinate project development with MA Department of Fish + Game (2013)	Not Applicable - Not in Fish & Game jurisdiction
Restored + maintained areas increased for non-urban construction projects (2015)	Not Applicable
25 nest boxes installed at appropriate locations (2015)	Not Applicable - no areas that are applicable for nest boxes
Surplus land with high natural resource value evaluated for transfer to appropriate state agencies (2015)	Not Applicable - No surplus land
Grassland and/or Woodland Management Plans in place for all appropriate facilities (2015)	Not Applicable - no grassland areas
Wildlife + endangered species training program provided for applicable employees (2015)	Not Applicable - not applicable to urban area
Ten rare species habitat management/ enhancement projects initiated within right-of-way (2015)	Not Applicable - no rare species habitat
Objective: Increase wildlife accommodation along ROWs + facilities	
Indicator	Contribution
Wildlife hazard mitigation plan(s) implemented for all facilities (2015)	Not Applicable - not applicable to urban area
Reptile + amphibian + fish passage structures incorporated into maintenance activities (2013)	NA - not applicable to urban area
Project forms revised to include wildlife accommodations measures early in design review (2013)	NA- not applicable to urban area
Wildlife fencing along ROWs/properties within all critical habitat areas evaluated + installed (2020)	NA - not applicable to urban area
Objective: Decrease quantity of invasive + noxious species	
Indicator	Contribution
Planting of all listed noxious or invasive species prohibited (2013)	NA – minimal opportunity
All stockpiled materials screened for noxious or invasive species (2013)	NA – no stockpiled material
Transportation of cut wood materials limited to avoid beetle + other pest transportation (2013)	Not Applicable - no transport of cut wood
Aggressive species early detection + rapid response program in place (2015)	Not Applicable - no aggressive species
Invasive species control on sites are managed with minimal adverse impact on other species (2013)	Not Applicable - No invasive species
Active invasive species management programs in place within priority habitat areas (2015)	Not Applicable - no priority habitats
All maintenance crews trained on invasive species detection (2015)	Not Applicable - nothing but grass
Objective: Decrease outdoor light pollution	
Indicator	Contribution
New lighting designed to conserve energy + avoid light pollution (2013)	No - Lighting is designed for maximum safety of urban area
Light shields installed in coordination with roadway + parking lot lighting fixture retrofits (2015)	Yes

6.24 Materials

Material goals include using environmentally friendly products, using innovative materials and construction techniques that leave smaller environmental footprints, and having green facilities. There are 63 indicators for materials but only 33 (52%) are applicable to WRTA. WRTA is meeting 16 (48%), working towards 0 (0%) and not meeting 17 (52%) of the applicable material indicators as seen in Figure 43. Figure 44 outlines the material indicators by implementation time and level of achievement. There are 30 indicators in the materials theme which are not applicable to WRTA. For the applicable indicators 23 are short term indicators, 8 are medium-term, and 2 long-range. Of those that are applicable to WRTA they have met 11 (48%) of the immediate implementation (2013) indicators, and are working towards or meeting 4 (50%) of the medium-term (2015) indicators and 1 (50%) of the long-range indicators.

Material goals include using environmentally friendly products; using innovative materials and construction techniques that leave smaller environmental footprints; and having green facilities. WRTA is working towards using more environmentally friendly products and increasing recycling at all facilities. They use reclaimed materials where possible and have started an environmentally preferred purchasing program. Many of the indicators though are not applicable because WRTA does not perform routine paving or roadwork.

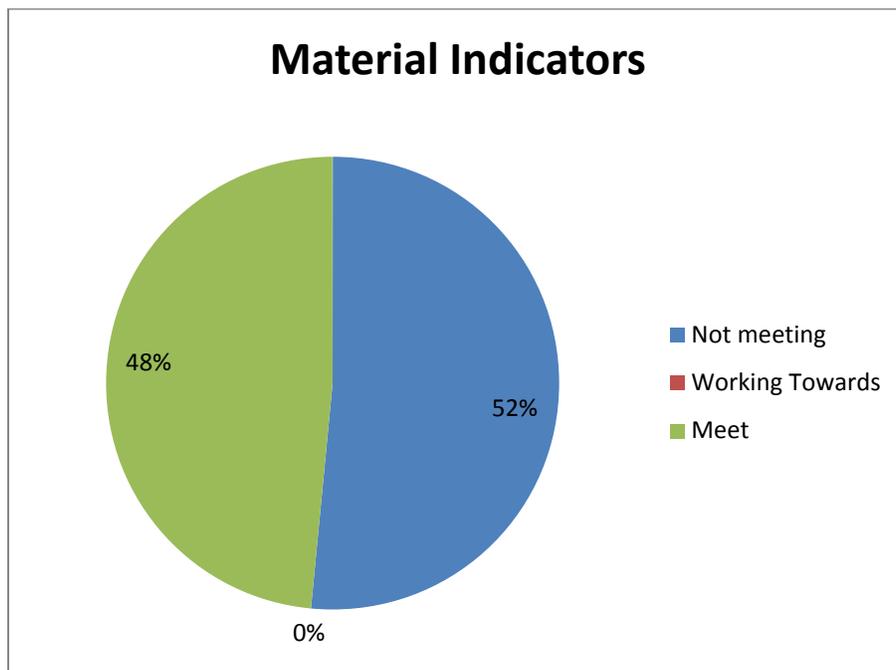


Figure 43. Materials Air Indicators Level of Attainment

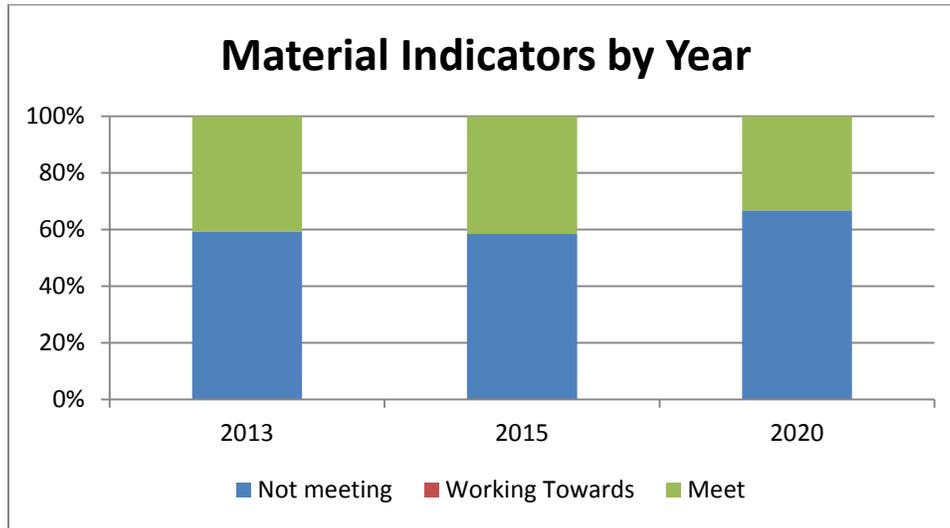


Figure 44. Material Indicators Attainment by Year

Table 14. Material Goal Achievement

Goal 1: Purchase Environmentally Preferred Products	
Objective: Implement an environmentally preferred materials purchasing program	
Indicator	Contribution
Environmentally preferred materials purchasing programs implemented in collaboration with OSD (2013)	No
Low or no volatile organic compound furniture + flooring purchased (2013)	No
100% recycled content paper products purchased (2013)	Yes
Reclaimed + recycled materials utilized for landscaping + earthwork (2013)	Yes
Only refrigerators with low Global Warming Potential (GWP) refrigerants and insulation purchased (2013)	Yes
Sustainable Forestry Certified wood for permanent or temporary construction utilized (2013)	No
Standards for recycled content of traffic control/safety devices developed (2015)	Not Applicable - no traffic control devices
Sustainability practices integrated into all construction and service contract evaluation criteria (2013)	Yes
Objective: Purchase energy efficient equipment	
Indicator	Contribution
Only Energy Star or Electronic Product Environmental Assessment Tool certified electronic products purchased (2013)	No
Total electronic appliances within office locations reduced (2015)	No
Energy efficient criteria utilized for shop equipment + machinery purchases (2020)	Yes



Objective: Use environmentally friendly cleaning products + procedures	
Indicator	Contribution
Maintenance products + procedures utilized that pose least harm to humans + the environment (2013)	Yes
Protocols for disposal of all cleaning product waste established (2013)	Yes
Environmentally friendly cleaning products purchased when available (2015)	Yes
Environmental friendly cleaning products required to be used within vendor service contracts (2013)	Yes
Objective: Reduce hazardous chemical use in operations + maintenance	
Indicator	Contribution
Hazardous materials substitution program developed (2013)	Yes
Hazardous materials spill prevention control and countermeasures plan created (2013)	Yes
Lead free wheels purchased and steel weighted wheels phased in to replace older wheels (2013)	Yes
Natural or organic fertilizers, pesticides, + landscaping materials purchased (2013)	No
Low or no volatile organic compound paints applied on indoor facilities (2013)	No
Purchasing lists + disposal protocols for engine service + maintenance standardized (2015)	Yes
Technology implemented reducing the quantity of salt applied to roadways proportional to weather conditions (2013)	NA – No roadway salting
Objective: Increase opportunities for local vendors or locally sourced products sold at facilities	
Indicator	Contribution
Vendor solicitation for MassDOT facilities written to encourage local ownership / sourced products (2013)	Not Applicable - Not MassDOT building
Lease language for MassDOT facilities written to encourage locally sourced products (2015)	Not Applicable - Not MassDOT building
Local vendors + locally sourced products sold at MassDOT facilities doubled (2020)	Not Applicable - Not MassDOT building

Goal 2: Improve Life-Cycle Impacts of Investments

Objective: Reduce energy inputs into paving operations	
Indicator	Contribution
Warm asphalt mix chosen as the standard state specification and hot mix asphalt eliminated (2013)	NA – No routine paving. Only when driveway needs replacing after 20 plus years.
Two pilots of cold in-place paving completed (2013)	NA – No routine paving. Only when driveway needs replacing after 20 plus years.
Standard specifications + guidelines for expansion of cold in-place paving established (2015)	NA – No routine paving. Only when driveway needs replacing after 20 plus years.
Two pilots of full depth reclamation advertised (2013)	Not Applicable - Only paving of one new constructed facility
Standard specifications + guidelines for expansion of full depth reclamation projects established (2015)	NA
Research to increase the recycled content, reduce energy inputs, and improve vehicle efficiency of paving completed (2015)	Not Applicable - MassDOT responsibility



Objective: Increase total volume of materials sourced within 200 miles of construction site	
Indicator	Contribution
Total weight/volume/cost of material purchased locally (within 200 miles) measured in all projects (2013)	No
Product source information added to bidding requirements (2013)	No
Cost share of locally sourced materials increased 20% on state funded projects (2020)	No
Objective: Increase % of recycled materials in paving + concrete installations	
Indicator	Contribution
20% of recycled paving material content used in road resurfacing projects (2015)	Not Applicable - No routine paving
25% recycled paving material content used in road reconstruction projects (2015)	Not Applicable - No routine paving
The highest recycled content paving and base material available utilized for shared-use paths (2013)	Not Applicable - No routine paving
Use of recycled rubberized asphalt + rubberized asphalt sealer increased (2015)	Not Applicable - No routine paving
Minimum 25% fly ash, slag concrete, or silica flume utilized (2013)	Not Applicable - No routine paving
Innovative sustainable concrete construction techniques encouraged in contracts (2015)	Not Applicable - No routine paving
20% recycled course aggregate concrete used in all suitable applications (2013)	Not Applicable - No routine paving
Objective: Increase albedo factor in hardscapes, rooftops + paving	
Indicator	Contribution
Solar Reflectivity Index minimum of 78 instituted for all roofing projects (2013)	No
Two innovative roofing (green, vegetation or blue water) projects piloted (2015)	NA – Only have administrative and maintenance facility.
All new roofing installations utilize high measured albedo factor materials (2015)	Yes
Albedo factor increased in paving surfaces + hardscape materials (2013)	No
Urban roadways + parking lots designed to maximize shade coverage of asphalt + concrete surfaces (2013)	No
Solar Reflectivity Index of at least 30 required for paving projects (2015)	No
Objective: Design for deconstruction + reuse	
Indicator	Contribution
Road rehabilitation standards developed for reuse of existing installations (2013)	Not Applicable - No road work
Expertise in designing for deconstruction specified in all RFRs for design contracts (2013)	Not Applicable - No road work
Procurement criteria include incentives to contractor bids utilizing higher recycled content materials (2015)	Not Applicable - No road work
Lifecycle analysis in design, project alternative + material selection included (2015)	Not Applicable - No road work
Readily reusable + renewable materials encouraged in design specifications (2015)	Not Applicable - No road work



Goal 3: Build Green Facilities for MassDOT	
Objective: Design all new facilities to green building standards	
Indicator	Contribution
New facilities funded or built by MassDOT over 20,000 sq. ft. designed to MA LEED Plus (2013)	No - Energy savings incorporated but LEED Plus was too expensive.
New facilities funded by MassDOT designed to LEED Gold or Net Zero Energy Building standard (2015)	No - Energy savings incorporated but LEED Plus was too expensive.
Objective: Retrofit existing facilities to meet environmental design criteria	
Indicator	Contribution
All window AC units removed from office buildings or replaced with Energy Star units (2015)	Not Applicable – No window units
Three building retrofits to LEED Existing Buildings Operations + Maintenance (EBO+M) initiated (2015)	No - New construction only; existing building being replaced.
Air circulation/filtration of MassDOT owned indoor facilities improved (2015)	Not Applicable - Not MassDOT employees
Objective: Relocate offices + encourage healthy transportation options	
Indicator	Contribution
Offices in town or city centers relocated to be served by transit, walking + bicycling (2015)	Yes
Provide transit pass exchange for employees with subsidized parking benefits (2013)	Yes - Yes transit pass; parking free in existing open lot
Free parking + take home vehicles for MassDOT urban office employees eliminated (2015)	Not Applicable - Not MassDOT employees
Objective: Consolidate office + maintenance facilities where feasible	
Indicator	Contribution
MassDOT office + maintenance facility consolidation opportunity study completed (2013)	NA – Not MassDOT office
One office consolidation site piloted (2015)	NA Only one administrative and one maintenance office
Three pilot consolidation and/or cross utilization maintenance sites piloted (2020)	NA – no multiple maintenance sites

6.25 Planning, Policy & Design

Planning, policy and design goals are aimed at developing a multi-modal system designed to promote healthy transportation and livable communities. There are 56 indicators for planning, policy and design but only 29 (52%) are applicable to WRTA. WRTA is meeting 20 (69%), working towards 5 (17%) and not meeting 4 (14%) of the applicable indicators as seen in Figure 45. Figure 46 outlines the planning, policy and design indicators by implementation time and level of achievement. There are 27 indicators in the theme which are not applicable to WRTA. For the applicable indicators 13 are short term indicators, 16 are medium-term, and 0 long-range. Of those that are applicable to WRTA they have met 10 (77%) of the immediate implementation (2013) indicators, and are working towards or meeting 15 (94%) of the medium-term (2015) indicators and 0 (0%) of the long-range indicators.

Planning, policy and design goals are aimed at developing a multi-modal system designed to promote healthy transportation and livable communities. WRTA promotes healthy transportation by providing

pedestrian and bike amenities in all newly designed facilities. This helps promote Complete Streets and increase connectivity. All buses are equipped with bike racks.

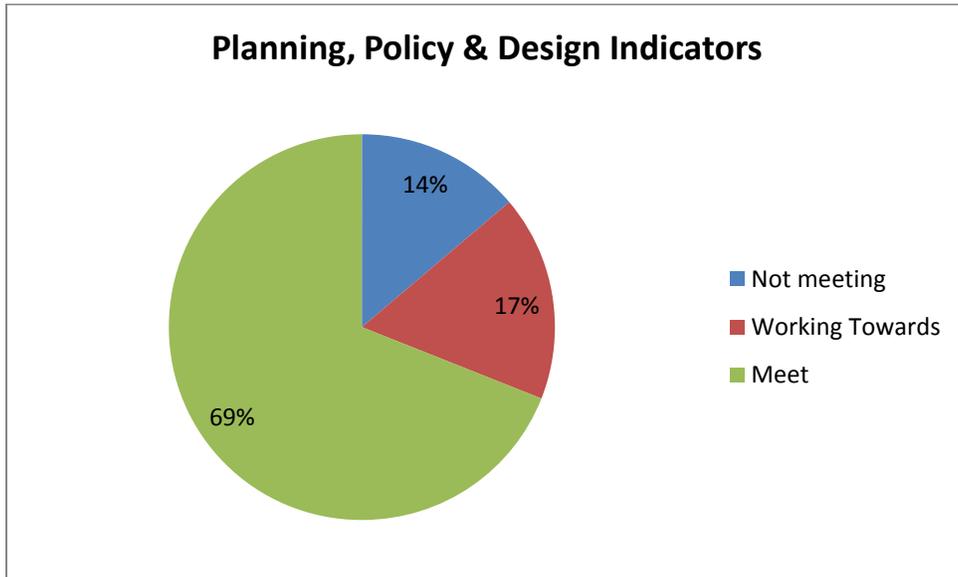


Figure 45. Planning Indicators Level of Attainment

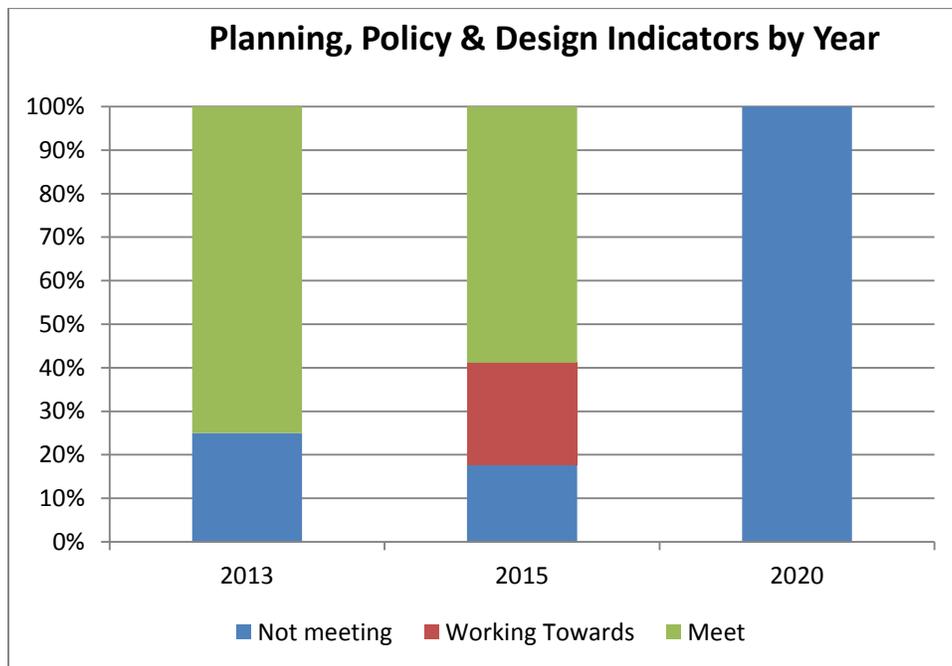


Figure 46. Planning Indicators Attainment by Year



Table 15. Planning, Policy & Design Goal Achievement

Goal 1: Design a Multi-Modal Transportation System	
Objective: Increase delivery of Complete Streets projects	
Indicator	Contribution
Bicycle + pedestrian facilities featured + prioritized in designs, rather than simply accommodated (2013)	Not Applicable - Complete Sts not applicable; no roadwork; bike and ped provided for in all facility construction design.
Project forms + databases revised to track Complete Streets + sustainability measures (2013)	Not Applicable - Complete Sts not applicable; no roadwork; bike and ped provided for in all facility construction design.
Update of Project Development + Design Guide underway to reflect evolution of Complete Streets (2013)	Not Applicable - Complete Sts not applicable; no roadwork; bike and ped provided for in all facility construction design.
Surfaces and facilities of at-grade rail crossings improved for pedestrian + bicycle travel (2015)	Not Applicable - No at-grade crossings
All 'driveway' approaches to MassDOT airports, rail stations + MassDOT provide bicycle + pedestrian access (2015)	Not Applicable - No rail
Objective: Increase bicycle parking + access to transit	
Indicator	Contribution
Transit stations with significant customer car parking (>50 spaces) have covered +/- or secure bicycle parking (2015)	Not Applicable - No car parking, but bike parking provided at Hub
All MBTA + RTA buses equipped with bicycle racks (2015)	Yes
Study + pilot programs completed evaluating options for eliminating peak hour restrictions of bikes on transit (2015)	Not Applicable - Bike racks on all buses outside
Bike stations at North, South, and Back Bay stations established with showers + locker facilities (2020)	Not Applicable - Do not operate these stations
High capacity bicycle coaches operated on all commuter rail lines + peak-hour access restrictions lifted (2020)	Not Applicable - Do not operate Commuter rail
Bicycle access to heavy rail lines expanded to all hours except two 1-hour peak periods (2015)	Not Applicable - Do not operate rail
Objective: Improve traffic controls to reduce vehicle emissions, + to support walking + biking	
Indicator	Contribution
Inventory of traffic signals + grade crossing signal conducted (2015)	Not Applicable - no traffic signals
All signals evaluated and adjusted for optimal operations for all users (2020)	Not Applicable - no traffic signals
Objective: Improve transit system performance statewide	
Indicator	Contribution
Bus stop consolidation on key routes assessed (2015)	Working towards - Presently assessing
All RTA's have conducted comprehensive service analysis to improve system connectivity + efficiency (2015)	Yes
Opportunities for express bus lanes + regional bus services analyzed (2015)	Working towards - currently assessing
Transit operation efficiency improved while maintaining/increasing ridership (2015)	Yes
Transit Signal Priority for all new traffic signals implemented (2015)	Working towards - TSP on all buses; working with City to implement
Payment + boarding system for MBTA light rail + vehicles + buses improved (2015)	Yes
Green Line extension + South Coast Rail service completed (2020)	Not Applicable - Do not operate rail



Goal 2: Promote Healthy Transportation + Livable Communities	
Objective: Encourage walking, biking, + transit as active transportation	
Indicator	Contribution
MassDOT Bay State Bike Week facilitated + promoted annually in partnership with MassBike (2013)	Yes
All office locations have visible bicycle parking locations for visitors near entrances (2013)	Yes
Selection of public meeting venues prioritizes locations with transit, pedestrian + bicycle access (2013)	Yes
Information on transit, bicycle + pedestrian travel provided on public meeting announcements (2013)	Yes
MassDOT sidewalks + bicycle facilities are cleared of snow + ice simultaneously with vehicle lanes (2015)	Yes
Navigational signage to transit stations expanded along local roads and highways (2015)	No
Employees + contractors required to use transit, walk, bike or carpool to meetings whenever location + service schedules allow (2013)	No
40% of elementary + middle schools reached through Safe Routes to Schools program (2020)	Not Applicable - This is a statewide and DOT initiative
Objective: Promote eco-driving + programs to reduce reliance on single occupancy vehicles	
Indicator	Contribution
Eco-driving promoted through digital display boards + customer facilities (2013)	No

Expand commuter options programs	
Objective: Indicator	Contribution
Commuter options programs through digital displays promoted statewide (2013)	Not Applicable - only transit
Parking spots at major transit stations with parking reserved for car sharing (2013)	Not Applicable - no parking
Covered +/or secure bicycle parking installed at major park + ride facilities (2015)	Not Applicable - no park and ride
Secure indoor bicycle parking + shower facilities provided at all major MassDOT employment centers (2015)	NA – not a MassDOT employment center
Objective: Utilize surplus land, parking lots + air rights for transit-oriented developments	
Indicator	Contribution
All properties, including air-rights, studied for development feasibility (2015)	Not Applicable - no surplus land
Large parking lots at transit stations analyzed for TOD redevelopment in the Commuter Rail Master Plan (2013)	Not Applicable - no rail
Four new RFP's issued for land development (2013)	Not Applicable - no land to develop
At least two mixed use developments on MBTA properties initiated (2015)	Not Applicable - Not the MBTA



Goal 3: Triple Bicycling, Transit + Walking Mode Share	
Objective: Connect land use planning with transportation planning + investments	
Indicator	Contribution
Transit authorities participate in all MassDOT and MPO corridor studies (2013)	Yes
RTA's participate in MassDOT MEPA review and mitigation formation (2013)	Yes
Land use + transportation planning strategies to support mode shift incorporated into 2016 RTPs (2015)	Yes
GreenDOT Implementation Plan activities incorporated into MPO's Unified Planning Work Programs (2013)	Yes
Project evaluation criteria that prioritize mode shift, GreenDOT + GHG reduction adopted by MPOs (2013)	Yes
Complete Commuter Rail Master Plan to evaluate options to expand capacity + increase ridership along each line (2015)	Not Applicable - Do not operate commuter rail
Priority Development Areas (PDAs) + Priority Protection Areas (PPAs) approved by HED established in all MPOs (2015)	Yes
Strategic regional visions for 'zero' SOV growth + GHG reduction adopted by MPOs (2015)	Yes
State-of-the-practice metric for measuring bicycle and pedestrian quality of roadways utilized in corridor planning + design (2015)	Yes
Objective: Stabilize travel demand growth on roadways from single occupancy vehicles	
Indicator	Contribution
All rail stations are accessed by Complete Streets (2020)	Not Applicable - no rail
Objective: Collect data regarding factors influencing mode choices + utilize better planning tools	
Indicator	Contribution
Person Miles Travelled (PMT) for all modes measured and/or estimated annually at state and regional levels (2013)	Yes
Public health impacts of major transportation projects considered in project selection criteria (2015)	Yes
New methods for collecting travel data for bicycles and pedestrians piloted (2013)	Yes
Scenario planning methods utilized by MassDOT and MPOs instead of traditional growth trend forecasts (2015)	Working towards - uses PPA/PDA information
Traffic model assumptions for road design revised to assume limited traffic growth rather than historic VMT growth trends (2013)	No - growth in area still high; calibrate with current volumes
MassDOT conducts travel demand forecasts with an activity based model (2015)	Not Applicable - This is a MassDOT responsibility, not RTA
Objective: Increase training opportunities on GreenDOT and Mode Shift	
Indicator	Contribution
Coordinated information gateway for shuttles and inter-city bus travel implemented (2015)	Working toward – w/expanded GATRA RideMatch program
Programs for healthy transportation education and travel training for young + elderly travelers developed statewide (2015)	NA – statewide initiative
Bay State Roads technical assistance offers materials on sustainability, mode shift, Complete Streets, and parking policies (2013)	Not Applicable - Not Bay State Roads

6.26 Waste

Waste goals aim to reduce the exposure to hazardous waste and minimize the disposal of waste. There are 33 indicators for waste but only 24 (73%) are applicable to WRTA. WRTA is meeting 12 (50%), working towards 1 (4%) and not meeting 11 (46%) of the applicable waste indicators as seen in Figure

47. Figure 48 outlines the waste indicators by implementation time and level of achievement. There are 9 indicators in the waste theme which are not applicable to WRTA. For the applicable indicators 15 are short term indicators, 7 are medium-term, and 2 long-range. Of those that are applicable to WRTA they have met 7 (47%) of the immediate implementation (2013) indicators, and are working towards or meeting 4 (57%) of the medium-term (2015) indicators and 1 (50%) of the long-range indicators.

Waste goals aim to reduce the exposure to hazardous waste and minimize the disposal of waste. WRTA is minimizing waste by recycling, educating employees on recycling and implementing litter control programs such as installing trash bins and information at The Hub. WRTA is even partaking in brownfield redevelopment. The new O&M facility is located on a reclaimed brownfield site.

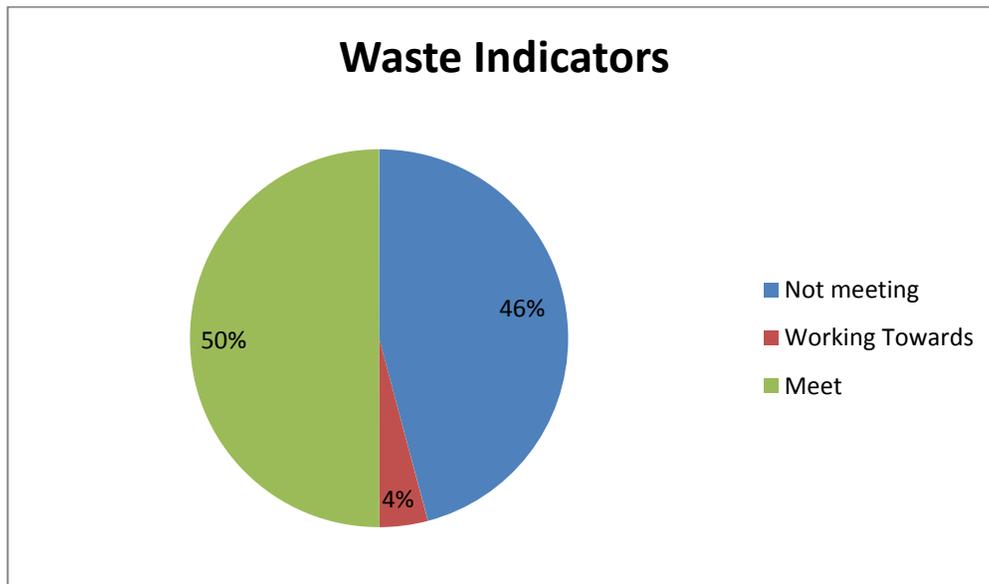


Figure 47. Waste Indicators Level of Attainment

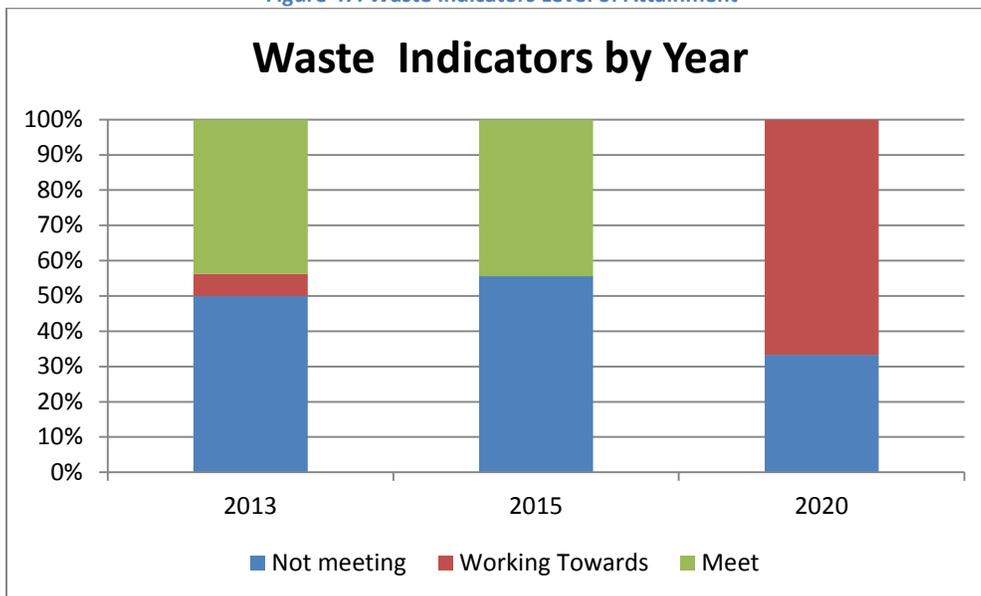


Figure 48. Waste Indicators Attainment by Year



Table 16. Waste Goal Achievement

Goal 1: Achieve Zero Solid Waste Disposal	
Objective: Increase the diversion rate of office waste	
Indicator	Contribution
Zero waste plan developed for MassDOT (2013)	NA – MassDOT plan
Full "single stream" recycling provided at all buildings (2013)	No
All electronics, cartridges, batteries, + accessories recycled (2013)	Yes
Employee education program on recycling + waste reduction underway (2013)	Yes
15% reduction in solid waste from offices achieved (2015)	Yes
Office building composting or biomass heating piloted at two facilities (2015)	NA – no composting opportunities
Waste reduction / recycling program emphasized in all janitorial service contracts (2013)	Yes
30% reduction in solid waste disposal achieved (2013)	No
Objective: Eliminate litter accumulation in ROWs + stations	
Indicator	Contribution
Litter control programs initiated in all corridors (2013)	Yes - At hub; no corridors
Litter prevention information provided at all rest areas + stations (2015)	Yes - At hub; no rest areas
Objective: Provide "full-stream" recycling opportunities at all customer facilities	
Indicator	Contribution
Container + paper recycling installed at all rest area, airports, transit stations + RMV branches (2013)	Working towards - Office yes; public area no
Mobile electronics + license plate recycling drop off provided at key locations (2015)	Not Applicable - Not RMV connected
Objective: Decrease amount of waste generation during construction + maintenance	
Indicator	Contribution
Waste management plans developed for all construction projects (2013)	Yes
At least 65% of construction debris is reused or recycled (2015)	No - Not reused; yes recycled when possible
At least 80% of construction debris is reused or recycled (2020)	NA – No additional opportunities expected
At least 90% of landscaping waste material is reused or composted (2015)	NA – No additional opportunities expected
Objective: Decrease paper use	
Indicator	Contribution
Paperless office procedures and equipment piloted in all offices (2013)	No
Paper use is cut in half (2015)	No
A paper-free office program adopted + implemented (2020)	No
Other paper products consumption (paper towels, napkins, etc.) reduced in all facilities (2015)	No



Goal 2: Reduce all Exposure to Hazardous Waste	
Objective: Implement Environmental Management System	
Indicator	Contribution
EMS systems adopted + implemented for all divisions (2013)	Yes
All waste is managed in compliance with a hazardous waste management plan (2013)	Yes
Metrics of recycling + disposals reported from all sites (2013)	Yes
EMS data from all Divisions compiled annually into a central performance management system (2013)	Yes
Best management practices for salt and sand storage in place at all depot facilities (2013)	Yes
Objective: Comply with waste ban + eliminate on-site storage	
Indicator	Contribution
100% compliance with state waste bans met at office + maintenance facilities (2013)	No
Long-term storage of hazardous waste minimized (2015)	Yes
Objective: Increase recycling rate of hazardous materials	
Objective: Indicator	Contribution
Refrigerants with high global warming potential from HVAC + refrigerators recycled (2013)	Not Applicable - none
80% of all hazardous waste generated is recycled where possible (2015)	Working towards - Less than 80% but working towards 80%
100% of hazardous waste with recycling potential is diverted (2020)	Yes
Objective: Evaluate + remediate brownfield sites	
Indicator	Contribution
An assessment of all brownfield properties is completed (2013)	Yes
Remediation / redevelopment of at least four properties underway (2015)	Not Applicable - only one property available for this; yes to the one
Remediation / redevelopment at all known brownfield sites initiated (2020)	Yes

6.27 Water

Water goals aim to use less water and improve water systems. There are 46 indicators for water but only 28 (61%) are applicable to WRTA. WRTA is meeting 20 (71%), working towards 3 (11%) and not meeting 5 (18%) of the applicable water indicators as seen in Figure 49. For the applicable indicators 15 are short term indicators, 9 are medium-term, and 4 long-range. Of those that are applicable to WRTA they have met 13 (87%) of the immediate implementation (2013) indicators, and are working towards or meeting 6 (67%) of the medium-term (2015) indicators and 4 (100%) of the long-range indicators.

Many of these are not applicable as there is no open water flow on any of the properties. Where possible water has been conserved, such as with recycling rain water to wash the vehicles. WRTA is also working hard to reduce stormwater runoff and non-point pollutant discharge.

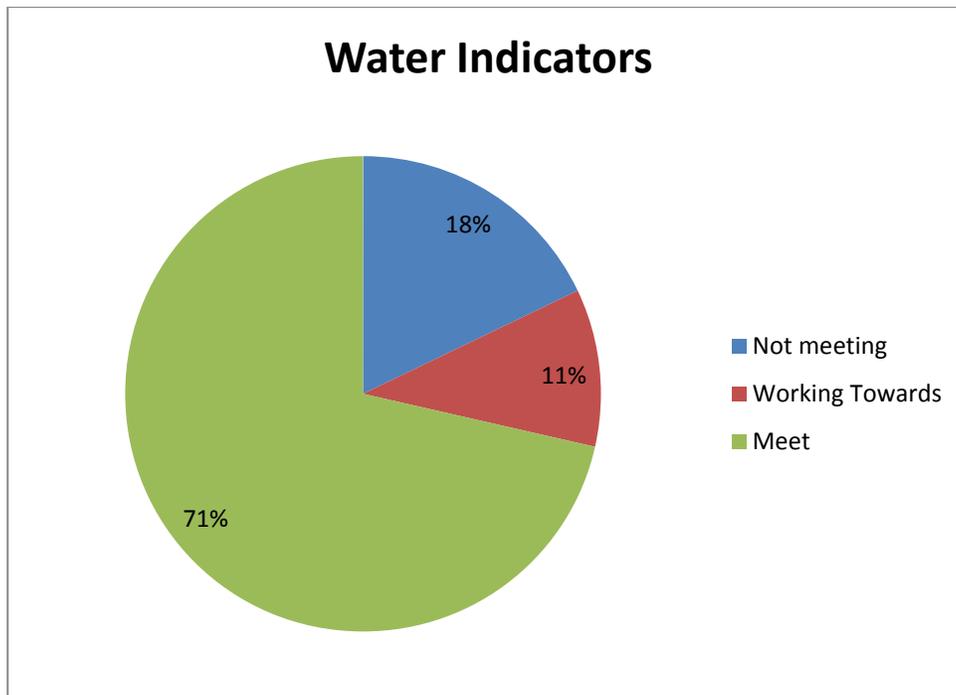


Figure 49. Water Indicators Level of Attainment

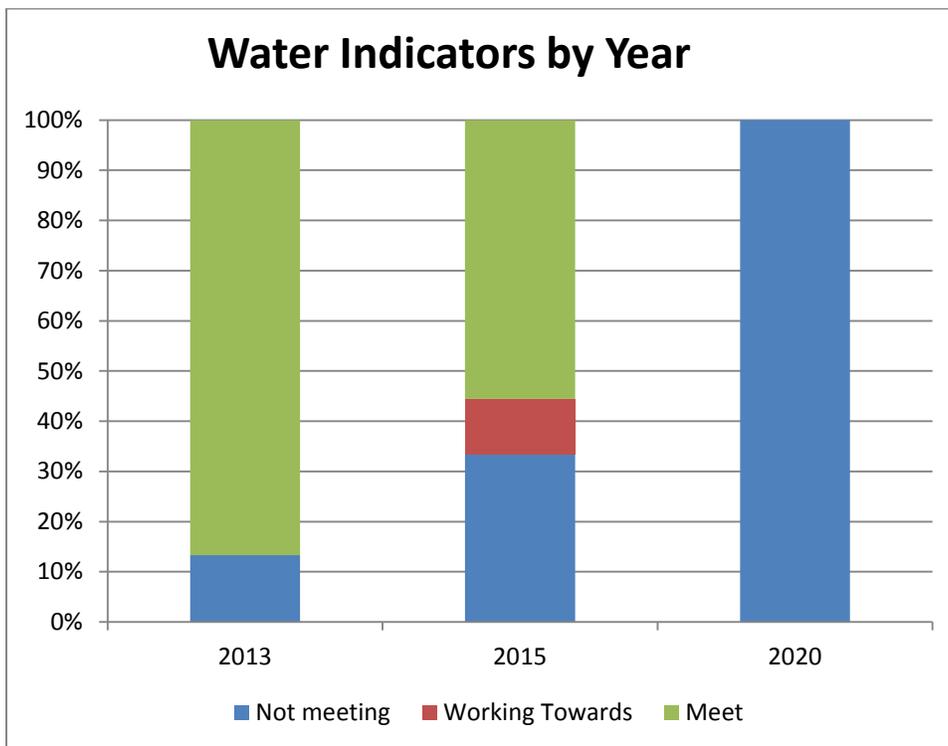


Figure 50. Water Indicators Attainment by Year

Table 17. Water Goal Achievement

Goal 1: Use Less Water	
Objective: Decrease potable water use in buildings	
Indicator	Contribution
The efficiency of all water fixtures in buildings evaluated (2013)	Yes
Fixtures retrofitted to gain a 10% reduction in water use (2015)	Working towards - not in old building being replaced
Plumbing system retrofitted to gain 20% reduction in water use (2020)	Working towards - not in old building being replaced
Objective: Decrease water use for irrigation	
Indicator	Contribution
Water conservation integrated into vegetation management plans (2013)	Yes
Potable water use for irrigation reduced by 25% (2015)	Yes
Objective: Increase utilization of recycled water + rainwater	
Indicator	Contribution
Water conservation practices at bus, vehicle, or airplane washing facilities required (2013)	Yes
All new vehicle/bus/rail vehicle washing facilities designed and built with recycled water technologies (2013)	Yes
All existing vehicle washing facilities evaluated for recycled or recaptured rain water alternatives (2015)	Yes
Study of rooftop rainwater use for toilets / HVAC of largest office facilities completed (2013)	No
Rain barrels or other means to reuse rainwater + disconnect drain spouts from sewage systems installed (2015)	No
Objective: Install innovative dual plumbing water systems in facilities	
Indicator	Contribution
Water use innovations required in all new building proposals (2013)	Yes
Three new pilot structures or building retrofits utilizing dual plumbing completed (2020)	Not Applicable - Joint MassDOT responsibility

Goal 2: Improve Ecological Function of Water Systems	
Objective: Minimize impacts + enhance wetlands + impaired waters	
Indicator	Contribution
Preservation + enhancement of wetlands is adopted in design instead of replacement (2013)	Not Applicable - no wetland
Environmental benefits of impact mitigation through watershed planning improved (2015)	Not Applicable - watershed being mitigated in construction of new facility in brownfield
Natural buffers between wetland resources + transportation infrastructure increased whenever possible (2015)	Not Applicable - no wetland
Alternative deicer agents utilized in areas with wetlands, coldwater fisheries, and water supplies (2015)	Not Applicable - no wetland
Five wetland restoration projects not considered mitigation completed (2015)	Not Applicable - no wetland



Objective: Adapt facilities for climate change resilience	
Indicator	Contribution
Climate change adaptation strategies initiated between local and federal parties (2013)	Yes
Revised extreme precipitation data utilized for rainfall, flood flow + stormwater calculations (2013)	Yes
Climate Adaptation Plan applicable to all MassDOT facilities adopted (2015)	Not Applicable – not MassDOT facility
Statewide climate change vulnerability assessment for MassDOT facilities completed (2015)	Not Applicable - not MassDOT facility
Critical roadway or rail segments targeted for culvert replacement + rearming for scour protection (2015)	Not Applicable - no roadway or rail
Fish passage structures which meet state crossing standards included in maintenance activities (2013)	Not Applicable - no open water
All reconstruction projects crossing tidal habitats include measures to eliminate tidal flow restrictions (2013)	Not Applicable - not near tidal water
Objective: Minimize impacts of ROWs + bridges on fluvial processes	
Objective: Indicator	Contribution
New roadways + bridges designed to maximize natural fluvial processes including tidal flushing (2013)	Not Applicable - no roadways
At minimum 12 bridge replacement projects improving water flow under construction or completed (2015)	Not Applicable - no water flow
All railroad bed reconstruction projects retrofitted with enhanced stream crossing standards (2020)	Not Applicable - Do not operate rail
The standards within MA Stream Crossing Handbook utilized in all project development processes (2013)	Not Applicable - no stream crossings
A minimum of five culverts redesigned + rebuilt for improved fish migration (2015)	Not Applicable - no culverts
All projects crossing tidal habitats evaluated for restriction of tidal flow (2013)	Not Applicable - no tidal habitats
Objective: Reduce stormwater volumes + increase permeable surface areas	
Indicator	Contribution
Environmentally sensitive site design in new construction projects utilized (2013)	Yes
Post peak discharge rates held to less than pre-project discharge rates to the maximum extent possible (2013)	Yes
All projects designed to remove solids + pollutants to the maximum extent possible (2013)	Yes
All projects designed to include measures to increase infiltration + reduce stormwater volumes (2015)	Yes
Permeable paving or other infiltration installations included in parking lot resurfacing projects (2020)	Yes
Design charette conducted for creating "green roof" bus shelters for the MBTA and/or major RTA (2013)	No
Green roof installed on at least one large bus or rail maintenance garage (2020)	Working towards - currently under construction



Objective: Decrease non-point source pollutant discharges	
Indicator	Contribution
All structural best management practices inspected annually + cleaned as necessary (2013)	Yes
Illicit discharges from MassDOT structures eliminated upon detection (2015)	Yes
Long-term pollution prevention programs implemented at all maintenance sites (2013)	Yes
Environmentally sensitive design / Low Impact Design (LID) utilized in all construction projects (2013)	Yes
New best management practices installed at all facilities identified by Impaired Waters Program (2020)	Yes
Phytotechnology as part of stormwater evaluation + constructed stormwater controls utilized (2015)	Yes
Assessment protocol developed to evaluate water quality functions of roadside vegetation (2015)	No
Stormwater 'Low Impact Design' integrated into revised Project Development + Design Guide (2013)	Not Applicable - MassDOT responsibility
Commuter ferries follow best practices for fuel handling, bilge water, sanitary waste + trash disposal (2013)	Not Applicable - Do not operate ferries

6.2 Conclusion

With over 300 indicators, as identified in the GreenDOT policy 53% are applicable to WRTA. Overall WRTA is meeting 54% of those. They are working hard to achieve the indicators and have achieved many indicators ahead of schedule. Some of the indicators which are applicable are joint responsibilities of WRTA and either MassDOT, the planning commission or the town and they must work collaboratively to achieve success. Of the indicators that do not apply, reasons may be because they are specific to the MBTA; apply to the rail mode; require that there has been or will be new construction; are specifically for MassDOT owned facilities; or they are for environmentally sensitive land areas.