

Boston Climate Action Plan Leadership Advisory Committee:

Mitigation Measures

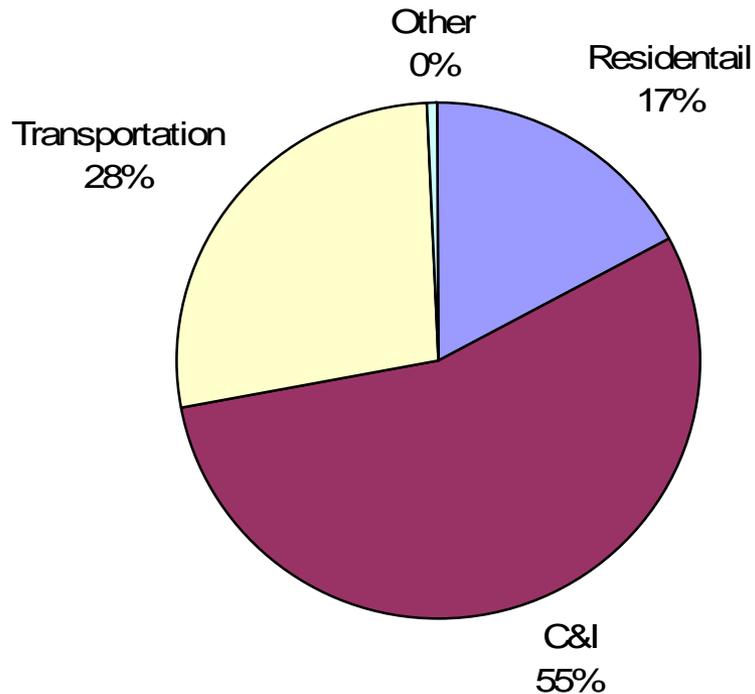
July 21, 2009

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Mitigation Program Areas

- Buildings
- Cars, Transit, and Land use
- Energy Resources (next mtg.)
- Other/Waste (next mtg.)

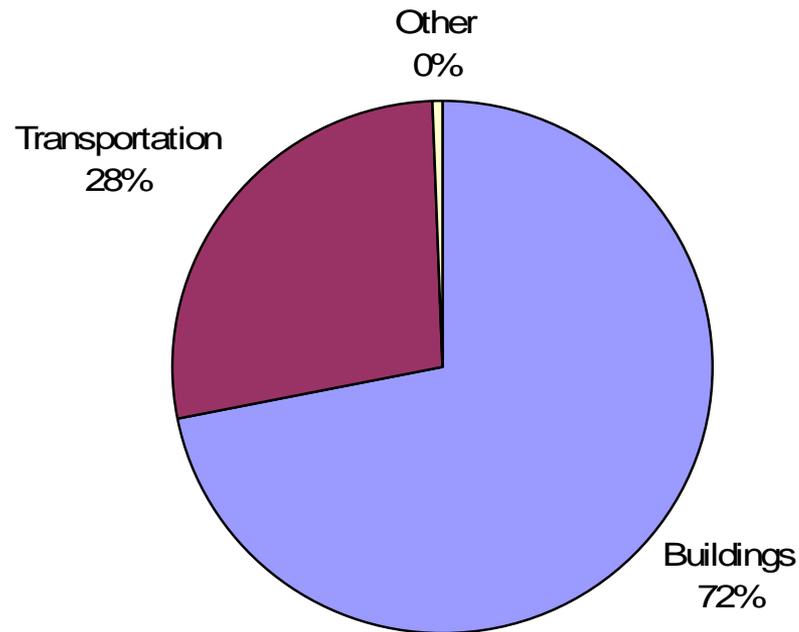
Boston 2007 GHG Emissions by Sector*



*Electricity allocated between the different sectors

Boston 2007 GHG Emissions:

Buildings (Residential and C&I) relative to other sectors



Mitigation in Buildings

MAPC Forecasts

Boston

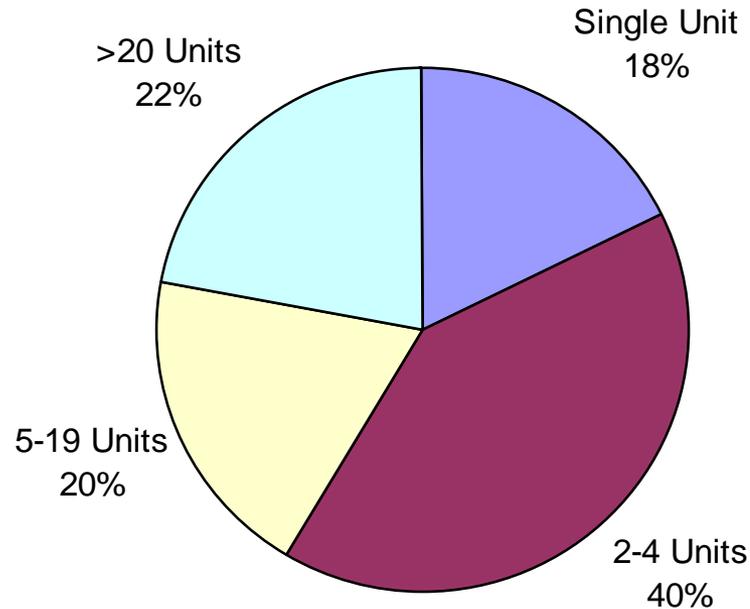
	<u>2010</u>	<u>2020</u>	<u>% Change</u>
Population	608	618	1.6%
Households	245	250	2.0%
Employment	573	596	4.0%

Boston/Region

Population	13.4%	13.2%	-0.2%
Households	13.8%	13.3%	-0.4%
Employment	23.4%	23.5%	0.1%

2007 Boston Housing Breakdown

Boston Housing Units (2007 Census)



Total Housing Units: 255,702

Boston Commercial/Industrial Buildings (2002-2003)

Type	Building (Ft. sq)	% of Total
Office	69,672,033	41%
Mixed Use	24,205,397	14%
Retail	12,537,826	7%
Auto	12,047,580	7%
Lodging	7,085,854	4%
Sci/Med	3,180,947	2%
Service	2,649,878	2%
Entertainment	2,065,440	1%
Undeveloped	1,051,790	1%
Industrial	35,925,070	21%
Total	170,421,815	100%

Source: 2003 BRA data

Existing/Planned Building Related Programs and Policies

Federal/Massachusetts

- Utility efficiency programs
- IECC Building Code:
commercial and residential
- Federal and State appliance
efficiency standards
- State Lead-by-Example in
state buildings
- Renewable System Benefit
Charge funds

Boston

- RENEW Boston
- Energy Efficiency
Community Block Grants
(Federal Stimulus)
- Boston Green Building
(Article 37)
- LEED Silver for Municipal
Buildings
- Green Affordable Housing
Program

Boston Buildings Work Group: Brainstormed Potential Focus Areas

- “Green Building” programs and policies
 - Building codes and zoning codes
 - Enforcement
 - Stretch codes
 - Rating/labeling/benchmarking (e.g. Energy Guide, ENERGY STAR, HERS)
 - Green Roofs
 - Including vegetation, reflective surfaces, and PV
 - Performance-based incentives
 - Density bonuses
 - Fast track permitting
 - Fee reimbursement
 - Grants
- Grid interconnection policies for on-site DG
- Improve education and training

MA GHG Bldg. WG: Brainstorming

■ New Construction

- Improved code compliance (enforcement)
- Stricter requirements on bigger buildings (homes)
- Stricter infrastructure sizing (e.g., to prevent oversized HVAC)
- Efficiency incentives (e.g., density, zoning relief)
- Incentives for adopting stretch code

■ Existing Buildings

- Home audits at time of sale
- Mandatory benchmarking for commercial buildings
- Incentives for peak-shaving
- Explicit funding for oil heat efficiency
- Fuel switching (away from oil)
- Submetering and other measures for data-gathering

MA GHG Bldg. WG: Brainstorming (continued)

- Other Building Related Programs and Policies
 - Higher caps on DG subsidies
 - District steam
 - Elimination of conflicting regulatory requirements
 - More training programs (e.g., for architects, facility managers)
 - tied to state licensing
 - Broader education and community engagement
 - Current programs tied to 2050 goals
 - Smart grid and real-time pricing
 - “Green lease” policy

Discussion

- What can be done to ensure Boston residents, businesses, and institutions take maximum advantage of existing programs?

- What can and should Boston do on top of existing State and City programs?
 - Residential/Commercial/Industrial/Institutional
 - Existing buildings/retrofits
 - New construction
 - Renewables
 - Additional considerations
 - Rental/lease vs. owner occupied
 - Low income

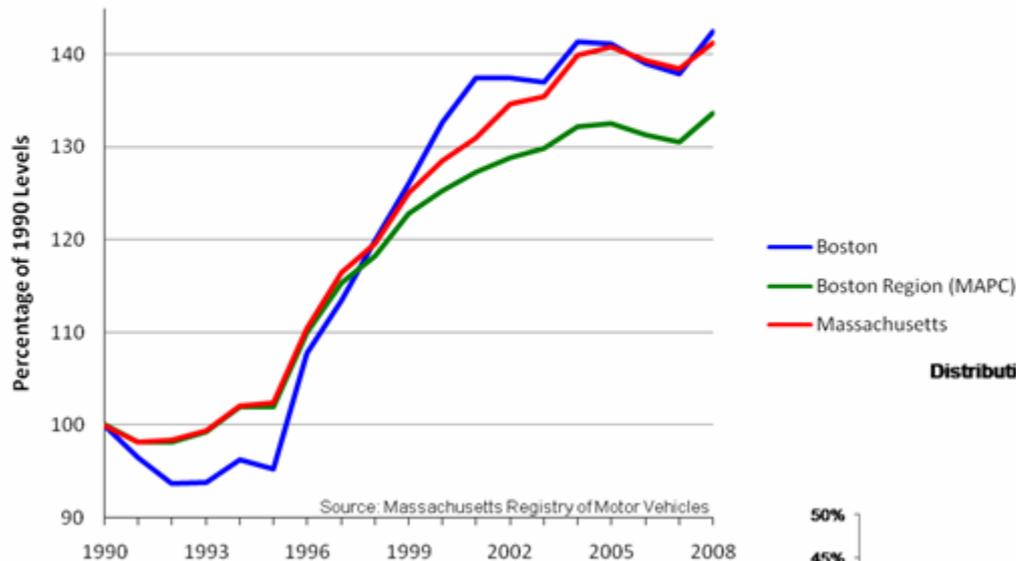
- What are the most important considerations for the Boston Climate Leadership Advisory Committee regarding Building Efficiency and Renewables?

Transportation

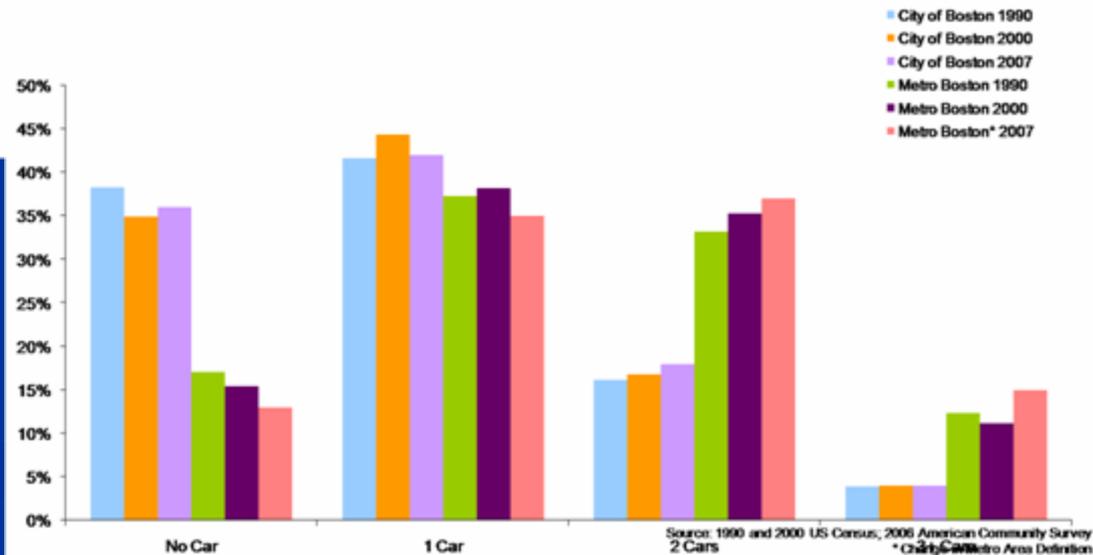
Making Boston the best city to live and work in without a car?

Boston Transportation Trends: Car Ownership is Rising

Motor Vehicle Registrations: City of Boston, Boston Region, and Massachusetts

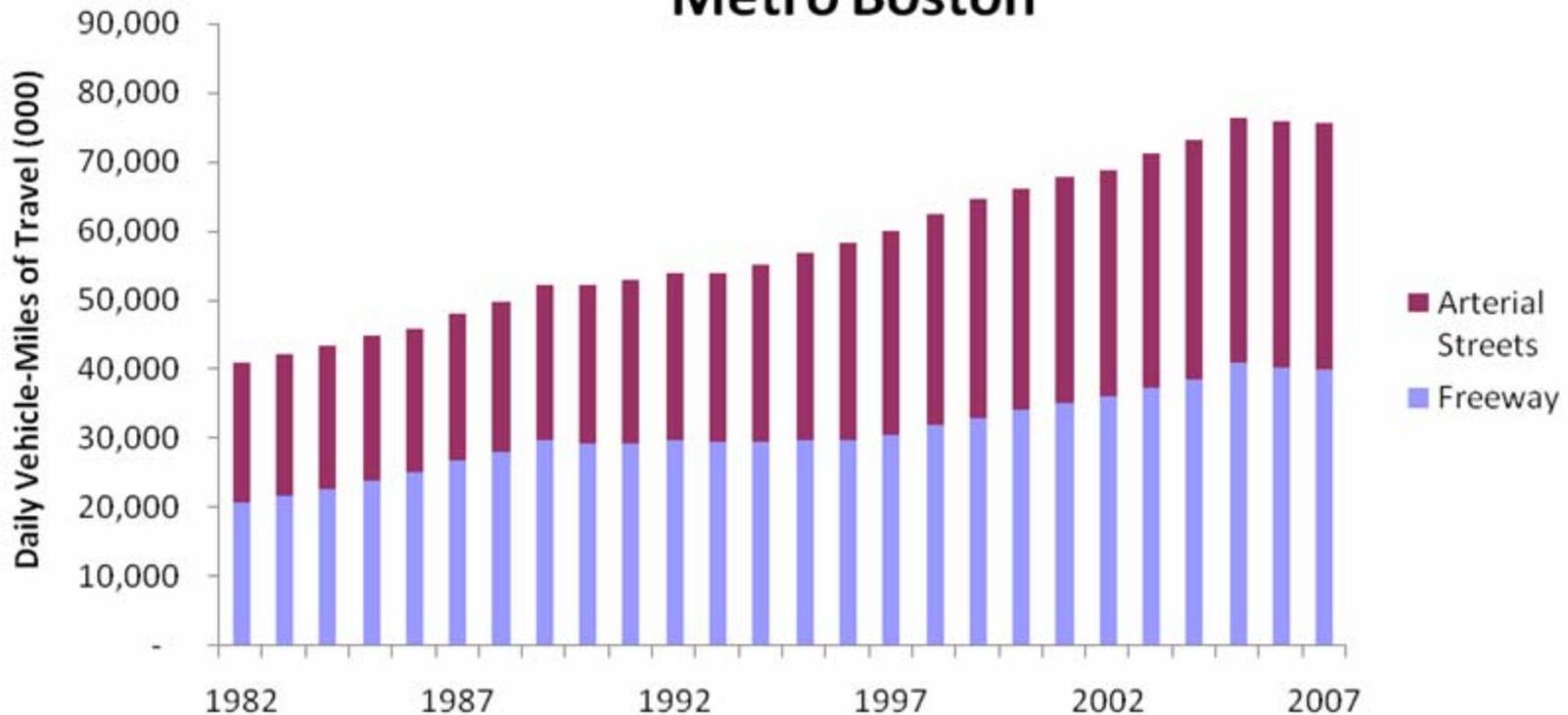


Distribution of Households by Car Availability, City of Boston & Metro Boston: 1990, 2000 & 2007



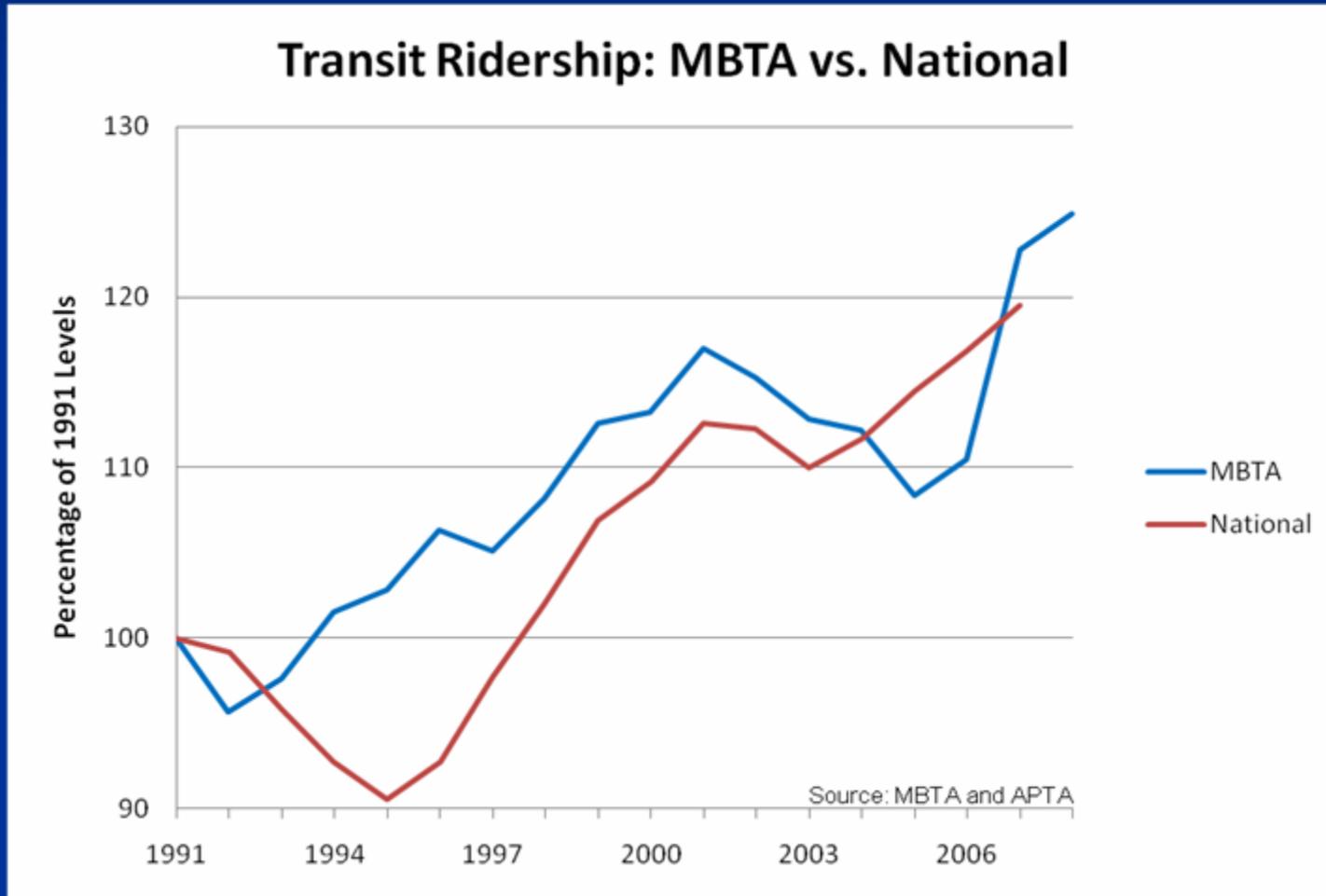
Boston Transportation Trends: Vehicle Miles Travelled is rising

Vehicle Miles Traveled by Roadway Type, Metro Boston



Source: Texas Transportation Institute, Urban Mobility Study

Boston Transportation Trends: Transit ridership is rising



Major Federal and Massachusetts Transportation-related Laws and Programs Overview

- Obama/CAFÉ efficiency standard
 - CA Pavley vehicle emission standard
- Federal Renewable Fuel Standard (RFS)
- MA Chapter 40R, Smart Growth Zoning
- State anti-idling law (Chapter 90: Section 16A)

Existing Boston Programs

- Parking freeze
- Hybrid taxis mandate
- Efficient car purchase mandate for City
- Smart Growth Overlay (Article 87)
- Access Boston
- Anti-idling campaigns
- Expanded bicycle programs and City bike sharing/bike pool

Transportation Modes and Actors Interactions

Modes

- Cars and Trucks
 - Personal vehicles
 - Commercial
 - Taxis
- Mass Transit
- Bicycles
- Walking

Actors

- City residents
- Commuters
 - Daily workers
 - Shoppers/Event attendees/Tourists
- Institutions
 - Universities
 - Hospitals
- Commercial vehicles

Land use

Working Group Brainstorm: Transportation Goals

- Invest in green transportation infrastructure to support walking, biking, transit and paratransit, car sharing and use of clean fuel vehicles
- For Boston residents, decrease car ownership while increasing availability and convenience of non-auto options
- For commuters and visitors, promote mode shift away from single occupant vehicles
- Make provision of non-auto transportation alternatives an integral part of “green building” for both new construction and retrofit projects

Can we make similar goals for Buildings-related actions?

Potential Transportation Indicators

- Indicators that should increase
 - MBTA boardings at stations in Boston
 - Percentage of Boston residents who walk/bike/use transit to get to work
 - Vehicle occupancy (commuters)
 - Fueling facilities for alternative fuel vehicles
- Indicators that should decline
 - Vehicle miles traveled
 - Car registrations and on-street parking permits
 - Proportion of household income spent on transportation

Working Group Brainstorm: Transportation Programs/Policies

- Parking issues
 - Improve downtown parking freeze
 - Ratchet down maximum parking space ratios and remove minimum for new development
 - Increase parking meter charges, further restrict on-street parking
- Expand bike program
 - Infrastructure development (bike lanes, bike racks, showers)
 - Bike sharing/free bikes citywide
 - Bike pool for City Hall

Working Group Brainstorm: Transportation Programs/Policies

- Develop integrated “Transit First” strategy
 - Require employers (e.g., over 100 employees) to survey, track, and report how employees get to work
 - Look beyond MBTA as the transit system
 - Transportation Access Plan Agreements
 - Transportation Demand Management building requirements
 - Transportation Management Association (non-profit organizations that aggregate commuter amenities for members)
- Facilitate car sharing and van pooling
- New street design committee (Complete Streets?)
- Need State-designated growth areas in Boston
- City to lead by example to gain credibility for other asks

Synergy Building And Transportation Policies and Programs

- Green building and smart growth; Transit Oriented Development (TOD)
- Mixed use retail/residential/commercial
 - E.g. urban access to goods and services without the need for a private vehicle
- Living in a city is more efficient than living outside a city (especially if you don't drive a car!)

Sample Incremental Transportation Programs and Policy Areas

Chicago

1. Universal Fare Cards will make use of transit easier and cost-effective
2. Regional benefit program-Pre-tax option to purchase regional transit fares
3. Increase city government fleet fuel-efficiency and use clean fuels
4. Increase/ease bicycle use and walking
5. Transit-oriented development
6. Support intercity rail and improved freight service

NYC

1. Expand public transit, including ferry service and new Bus Rapid Transit
2. Congestion pricing
3. High Occupancy Truck Toll: to create exclusive truck lanes
4. Complete Streets Program: multi-use

Discussion

- What can and should Boston do on top of existing State and City programs?
 - Vehicle efficiency/electric vehicles/alternative fuels
 - VMT and vehicle operation
 - Public transit
 - Biking and walking
 - Transportation-related land use issues (e.g. TOD and other high-density options)
- What are the most important considerations for the Boston Climate Leadership Advisory Committee regarding Transportation?

Appendix: Existing Program/Policy Details

Buildings Details

State: Utility Energy Efficiency Programs

- Covers efficiency in new construction and retrofits
- In lieu of new generation, utilities must first try to meet demand through all cost-effective energy efficiency
 - Expect 2-3X current SBC funding levels
 - Total 2010-2012 spending will equal around \$1.1 billion
- EEAC consultants suggest 3% savings per year over 10-year period for electricity (including 0.5% CHP) and 2% savings per year for natural gas
- Funded through System Benefit Charge, RGGI, FCM, and other minor sources

State: Building Codes

- Must adopt the most recent IECC codes for commercial and residential, within one year of code update
- IECC codes updated every three years

Federal and State: Appliance Standards

- The State has adopted efficiency standards for several types of appliances, some of which have been preempted by recent Federal standards
- Federal standards now cover or are planned to cover 30 product classes, primarily via the ENERGY STAR program
 - Residential standards include most major appliances, e.g. refrigerators, dishwashers, room AC units, etc.
 - Commercial standards include multiple types of commercial refrigeration, multiple types of commercial AC, boilers, warm air furnaces, and water heaters
- MA original standards still in effect are:
 - Medium-voltage dry-type transformers (2008)
 - Metal halide lamp fixtures (2009)
 - Residential furnaces and boilers (TBD)
 - States must seek and be granted waivers from federal preemption to implement state furnace and boiler standards. MA is developing its application
 - Residential furnace fans (TBD)
 - Also preempted; DOE to set a standard by January 2014, which might be effective three years later
 - State-regulated incandescent reflector lamps (2008)
 - Single voltage external power supplies (2008)

State: Lead-by-Example in State Buildings

- Goal to reduce consumption 20% by 2012 and 35% by 2020 (from 2004 levels)
- New buildings and major retrofits must meet MA LEED Plus
 - energy performance of 20% better than the Massachusetts Energy Code
 - reducing outdoor water consumption by 50% and indoor water consumption by 20%
- Minimize building life-cycle cost through use of EE and RE

Renewable System Benefit Charge

- MTC Renewable Energy Trust administers funding for state renewable energy projects
- Incentive program to construct renewables in MA
- Examples include Commonwealth Solar, etc.

City: RENEW Boston

- Being created to assist with Mayor's goals
 - 200 megawatt electricity demand response and avoided demand growth through energy efficiency and alternative energy installations by 2017
 - 25 megawatts of solar power installations by 2015
 - Potential GHG savings of around 17,000 tons CO₂

City: Federal Stimulus \$ (EECBG)

- Energy Efficiency Conservation Strategy
 - City to receive \$6.5 million to spend next 36 months
 - Reduce Boston GHG emissions 40K metric tons per year and create 100 green-collar jobs
 - Energy retrofit for existing homes
 - EE for multi-family homes
 - Residential retrofit and solar pilot
 - Rental property energy audit ordinance R&D
 - Community based outreach
 - Small business EE
 - Energy performance contract for municipal buildings
 - Solar on Archives
 - Municipal Energy Office
 - LED street lights pilot

City: Green Building (Article 37)

- Ensure large new buildings are LEED certifiable
- Applicable to any Proposed Project which is subject to Large Project Review (Section 80B) by the BRA
- Achievable via Boston Green Building Credits and LEED Certification

City: LEED Silver for Municipal Buildings

- For all municipal buildings
 - New construction
 - Major renovations
- Must achieve LEED Silver certification

City: Green Affordable Housing Program

- All affordable housing supported by the Boston Department of Neighborhood Development must achieve LEED Silver and/or ENERGY STAR qualification
 - Project size determines which standard
 - Requirement for all new construction

Transportation Details

Federal and State: Obama/CAFÉ

- Increase fleet averages for new car sales to 35.5 mpg by 2016
 - 5% per year between 2012 and 2016
- Designed to be consistent with Pavley, but will preempt
 - New CAFÉ rules are for 2012 - 2016
 - Waiver provides precedent for CA to petition for stricter standards for after 2016
 - CAFÉ addresses efficiency (mpg) rather than emissions, but impact is essentially the same

State: Pavley

- Massachusetts adopted California's Low-Emission Vehicle Program in 2006, committing to a 30% reduction in average new vehicle greenhouse gas emissions from 2002 levels by 2016.
- EPA granted waiver to CA, allowing CA and other states to implement (June 2009)
- CAFÉ will preempt Pavley beginning in 2012

Federal and State: Renewable Fuel Standard

- The Renewable Fuel Standard program will increase the volume of renewable fuel required to be blended nation-wide into gasoline from 9 billion gallons in 2008 to 36 billion gallons by 2022.
 - New 2008 goal up from 5.4 billion gallons in RFS1
 - Fuel type breakdown is not available for 2008
- RFS2 is open for public comment
 - Slightly more aggressive than original RFS in EPA 2005
 - 2020 target is 30 billion gallons blended
 - Fuel type breakdown for 2020 will be:
 - Cellulosic: 10.5
 - Biomass-based diesel: TBD, but not less than 1.0
 - Advanced biofuels: 15.0

State: Smart Growth Zoning

- Provides financial incentives for municipalities to increase density and build affordable housing in areas with good access to transit
 - Municipalities must provide as-of-right higher density residential development zoning to be eligible for incentives
 - Proximity and access to existing and/or planned transit is an important component

State: Anti-idling

- Vehicles prohibited from idling longer than 5 minutes
- Punishable by \$100 fine for 1st offense; \$500 for subsequent offenses

City: Parking

- Parking Freezes
 - Cap the total number of off-street parking spaces in three areas of Boston
- Meter fees
- Zoning rules
 - parking requirements
- TAPA requirements for parking for shared car services, van pool and carpool vehicles
- Infrastructure for plug-in hybrids

City: Hybrid Taxis

- Mandate for all 1,800+ cabs by 2015 to be 35 mph+/hybrid technology
 - Phased in for replacement vehicles
 - Commercial rule rather than human health rule (distinction from NYC attempt)

City: Alt-fuel Municipal Cars

- In September 2005, Mayor Menino announced that all new vehicles purchased by the City of Boston will be alternative fuel vehicles or the most fuel-efficient vehicles available
- Requirement in 2007 to use 5% biodiesel blend in all City diesel vehicles

City: Smart Growth Overlay

- Article 87 works in accordance with MA 40R
 - Promote compact design and preserve open space
 - Mixed land uses
 - Provide a variety of transportation options
- Article 37 (Green Building) allows developers to obtain Boston Green Building Credits for Transportation Demand Management (TDM) measures

City: Access Boston

- Long range plan for reducing Vehicle Miles Traveled (VMTs) in Boston
 - Promote trip reduction
 - Promote use of public transit
 - Improve flow of remaining vehicle traffic
- A physical planning program, e.g. bicycle and pedestrian infrastructure development

City: Anti-idling

- Anti-idling enforcement and education for city generally and City (municipal) vehicles
 - Enforce State law
 - Dashboard “reminder” stickers and other information targeting municipal employees

City: Bicycle Programs

- Boston Bikes launched in 2007
 - Hired a Bicycle Coordinator
- City Will:
 - Install more bike racks (100's per year)
 - Conduct a mapping project for planning bike routes
 - Line 10 miles of new on-road bike lanes per year
- City Hall has a bike pool/bike sharing program for employees
- Boston considering a public bike sharing program, e.g. Paris
- TAPA requirements for bicycle facilities