SUMMARY REPORT

Climate Action in Boston

Recommendations of the Boston Climate Action Leadership Committee and the Community Advisory Committee on Climate Action

APRIL 2010

green BOSTON

Climate Action Leadership Committee

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The work of the Climate Action Leadership Committee and the Community Advisory Committee on Climate Action was made possible by grants from the Barr Foundation and The Boston Foundation.

Dear Mayor Menino,

On behalf of the Climate Action Leadership Committee and the Community Advisory Committee on Climate Action, we are honored to present to you the committees' consensus recommendations for ensuring that, despite the threat of climate change, Boston remains a safe, healthy, vital city into the next century.

When you first met with the Leadership Committee, you gave us a clear message, "Be bold!" For the past ten years, Boston's municipal government and the community at large have taken many steps to build more efficient buildings, increase renewable energy sources, encourage walking, biking, and the use of public transit, raise recycling rates, and expand green jobs and green businesses. Boston's standing as a pioneer in climate action is recognized across the country. To be bold is to push ahead even farther on the path that Boston has already taken.

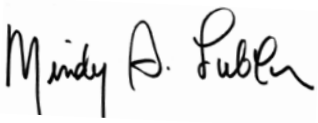
As you will see, the committees have raised strong voices in support of climate action. The committee members remain convinced that the complete body of evidence shows that climate change is real, that human activity is very likely the major cause, and that potential threats to Boston are of great concern.

The committees' recommendations address reducing our greenhouse gas emissions, preparing Boston for environmental changes that cannot be avoided, and engaging all segments of the community. They result from an intensive public process. Over the past year, the Leadership Committee met seven times and the Community Advisory Committee six times (including one joint meeting). Members attended each others' meetings, and joined working groups on buildings, transportation, adaptation, and public engagement. All presentations and documents were posted on the City's Climate Action Web site. In February and March of this year, over 400 people participating in five community workshops contributed their voices to the committees' deliberations. The committees also benefited from the advice of experts from local universities, businesses, institutions, and many departments and agencies of City government. Finally, the committees had fruitful consultations with colleagues and staff of the Commonwealth's climate mitigation and adaptation committees in the hope that the city's and the state's plans become mutually reinforcing.

Behind the many hours of voluntary work by committee and working group members and workshop participants, the financial support of the Barr Foundation and The Boston Foundation was essential for obtaining the committees' excellent facilitators and the logistical resources that this process required. We are grateful for their assistance.

Mayor Menino, we know that the delivery of this report is only one stage in Boston's ever-deepening commitment to climate action. As you and members of your administration turn the recommendations into the City's formal Climate Action Plan and implement them—a process that will require further public hearings and other forms of public participation—we are ready to provide additional support and advice. Addressing climate change requires the commitment of every segment of the Boston community. We are ready to do our part.

Sincerely,



Mindy Lubber
Co-chair

James W. Hunt, III
Co-chair

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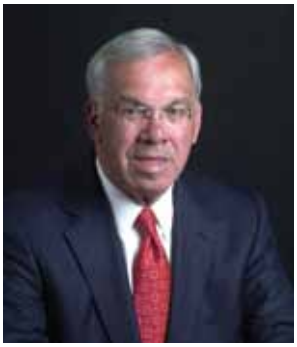


Dear Committee Members:

I accept this report with a tremendous sense of gratitude and an even greater sense of urgency. I want to thank the Climate Action Leadership Committee and the Community Advisory Committee on Climate Action for their service. I am eager to explore all of the committees' recommendations to prepare Boston for a more sustainable future, because climate change demands our attention now.

Thankfully, Boston is in a strong position to further decrease our carbon footprint and create more jobs for our residents in the green economy. Our leading universities, our growing clean tech sector, and so many of our residents are already pushing the environmental envelope. In city government, we have been just as innovative. My administration has launched the largest public housing energy efficiency project in our country's history; our city is well on our way to planting 100,000 thousand trees by 2020 to cool our neighborhoods; and, this summer, we are preparing to kick off a model bike share program.

With all of this momentum behind us, I am excited about the committees' recommendations to take our work citywide and engage all stakeholders, from government to businesses, from institutions to neighborhood groups, in our efforts to mitigate and adapt to climate change. That means more energy-efficient homes, healthier and cleaner neighborhoods, and wider economic opportunities for all.

I look forward to continue working with the committees and all parts of the Boston community to make sure that Boston is at the forefront of climate action.

Sincerely,

Thomas M. Menino
Mayor of Boston

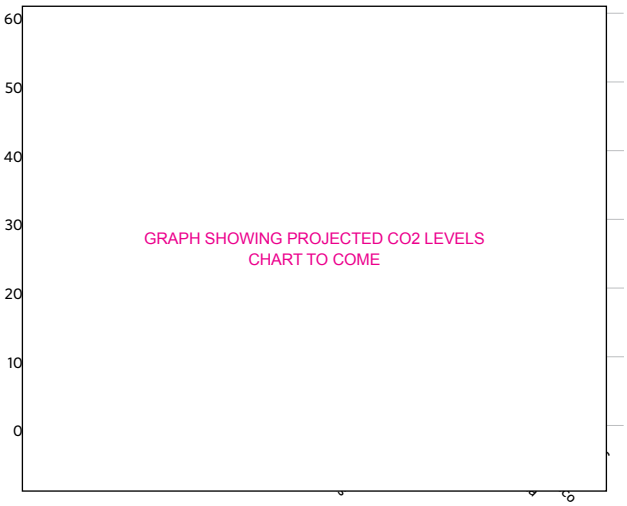
We are changing the climate.

In the air, concentrations of carbon dioxide and other greenhouse gases are increasing. On the land, temperatures are going up. In the oceans, water levels are rising. This is global climate change. Everything that depends on air, earth, and water must adjust. This includes Boston.

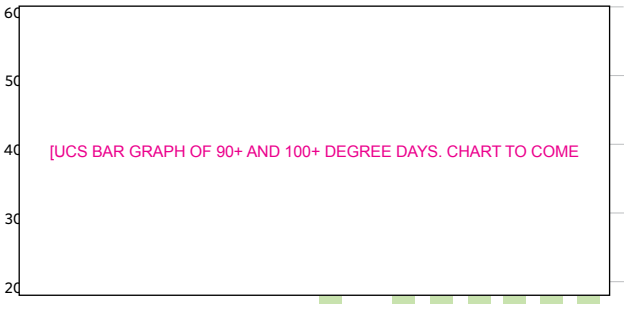
In Boston, heat waves and smog alerts will become more frequent. Flooding from coastal storms will become more common and more extensive. These, in turn, will affect the health of residents and visitors, the safety of neighborhoods, the success of businesses and institutions, the viability of plants and animals in our parks, and the ability of the government to cope with short-term emergencies and longer-term stresses. Potential costs for medical care, property and infrastructure repair, and lost opportunity figure in the billions of dollars. There is uncertainty about the speed at which the climate changes will occur, but we can see that they have started.

Boston cannot stop climate change by itself. We cannot eliminate all the risks. But we can take meaningful action.

Atmospheric carbon dioxide levels



High-degree days in summer



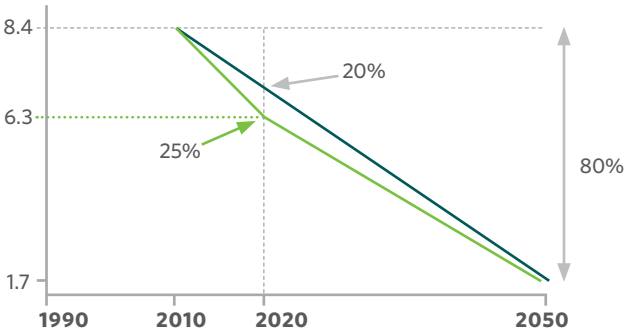
USC Flooding Projection for Back Bay

We know what to do.

The Boston community is ready to address the challenge of climate change: to do our part to reduce the problem, to confront the risks, and to work together. ***The Climate Action Leadership Committee and the Community Advisory Committee on Climate Action offer five overarching recommendations:***

1 **Climate mitigation:** The Boston community must collectively reduce its emissions of carbon dioxide and other greenhouse gases, the primary cause of recent climate change, by at least 25 percent by 2020, and then by 80 percent by 2050.

GHG Reduction Goals to 2050



2 **Climate adaptation:** The Boston community must immediately incorporate projected changes in sea level, increases in extreme weather, and other effects of climate change into all planning and operations for infrastructure, land use, emergency preparedness, economic development, public health, and other vital civic functions.

3 **Public engagement:** Boston City Government must lead the effort to engage all segments of the Boston community—residents, businesses, institutions, and government—in working together and taking responsibility for reducing greenhouse gas emissions, participating in climate planning and policy development, and adopting a longer-range perspective that will help the city to adapt as our knowledge of climate change grows.

4 **Green economy:** The Boston community must take advantage of opportunities offered by climate action to develop innovative businesses and workforce skills to ensure the continued economic vitality of the city and the well-being of its residents. By capitalizing on its inherent efficiencies and lower per person greenhouse gas emissions, Boston, as a regional focus for both residential and commercial growth, can contribute to the reduction of regional emissions.

5 **Resources:** The Boston community must ensure that sufficient public and private resources, both within City Government and in the community at large, are dedicated to these goals, that responsibility for climate action is clearly identified within City Government, and that leaders in all segments of the Boston community step forward.

Will need to credit or caption these photos? <A couple are from the facilities maintenance program at AACA, and one is from YouthBuild Boston. If you use them you should probably credit the agency.>

Benefits exceed costs.

Investments in energy efficiency save energy and lower costs for residents and businesses.

Decreases in travel by cars save fuel and money and reduce congestion.

Reductions in air pollution from burning fuels improve public health and reduce healthcare costs.

Demand for energy efficiency and renewable energy services creates jobs.

Long-range planning creates a safer, cleaner, more prosperous city.

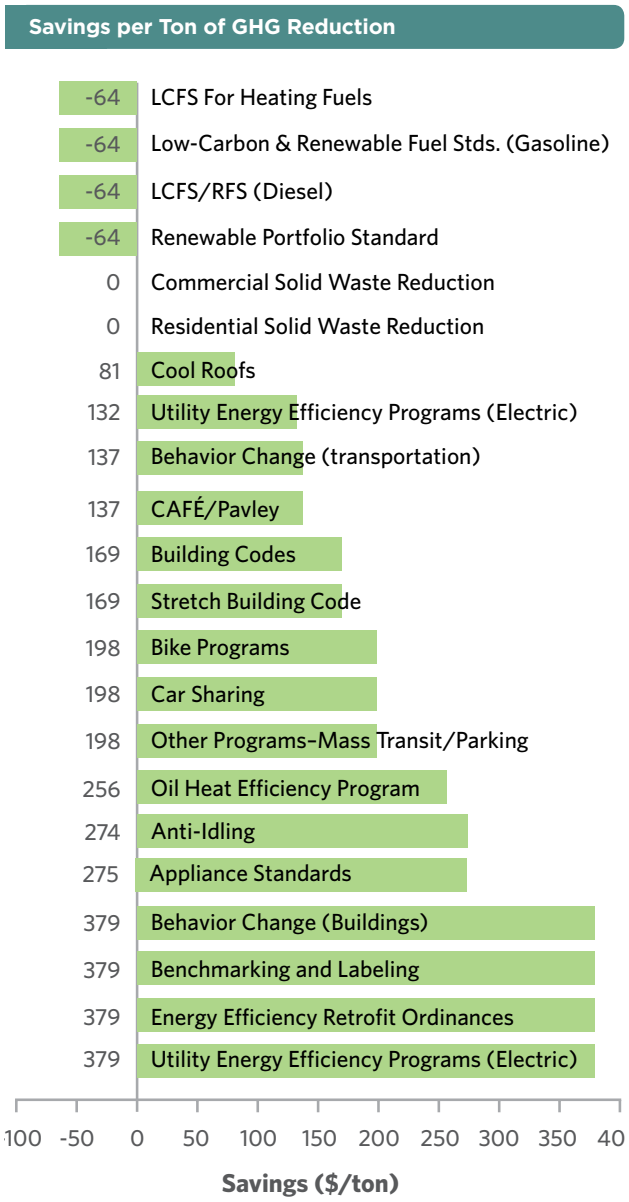
Education and outreach produces an active, productive, supportive community.

By 2020, implementation of the climate mitigation recommendations will produce total net savings to Boston citizens, businesses, and institutions worth an estimated two billion dollars, mostly from reduced spending on energy, though specific benefits will vary according to many individual factors. These numbers don't include other indirect benefits, such as reducing air pollution and its effects on health. Financial benefits will be split about evenly between residents (through residential efficiency and personal transportation savings), and businesses and institutions.

	Cumulative GHG Reductions through 2020 (thousand tons)	Total Net Savings ($ million)
Buildings	6,750	1,680
Transportation	3,130	410
Other	150	0
TOTAL	**10,030,000**	**2,090,000,000**

Climate action will create jobs in at least two ways. With reduced energy costs, residents and businesses will have more money to spend on investments, goods, and services that will increase economic activity. More directly, the need for builders, electricians, carpenters, energy auditors, and other skilled workers to carry out energy efficiency and renewable energy work will produce local, good-paying jobs. Training programs are already underway to ensure that Boston residents and businesses are ready to take on this work.

Climate action has even broader economic implications. Living and working in cities is, on average, more efficient and sustainable than in less dense areas. Boston emits about 14 tons of greenhouse gases per person; Massachusetts, about 16 tons—and Boston's emissions include those caused by the hundreds of thousands of people who come into Boston everyday to work and study. Therefore, regional or state-level climate action should direct residential and commercial growth toward Boston and other major cities, and Boston should emphasize urban efficiency when working with state and regional planning authorities.



Everyone must contribute.

We are asking people and businesses to spend money—to buy better equipment, to pay energy contractors—though they will get that back in the form of lower utility and fuel bills.

And we are asking them to change habits or develop new ones—to walk or bike instead of drive, to drive more slowly, to turn off a switch—and there are benefits here, too.

And we are asking them to talk with their neighbors and co-workers, to change the ways of the neighborhood and the workplace.

We are asking everybody, because the costs of inaction are high, because we have ambitious goals, because to reach those goals we need the help of every Bostonian.

Many residents, businesses, community groups, and institutions in Boston have already heard this message, are helping others understand it, and are taking effective climate action. Boston City Government is setting an example by raising standards for its buildings, vehicles, and operations.

We need to engage everyone. And for that, we need a public campaign that will unify the city in this effort. It should:

- Emphasize that we are all in this together
- Connect climate issues to broader concerns about health, quality of life, and community well-being
- Utilize the expertise and community relationships of organizations across the city
- Encourage community involvement in policy development and implementation at city, state and national levels
- Recruit all municipal employees as models for climate action and resources for the community

No person, business, or organization should be left out.

Will need to credit or caption these photos? Green Business award presentation

Everyone must benefit.

Climate change will affect different parts of the city in different ways. Some areas will be more threatened by sea-level rise; others, by storm-swollen rivers. It will affect different people in different ways, some being more vulnerable to extreme heat and others to increased smog. In a similar way, the costs and benefits of climate action will not be the same for everyone. Residents and businesses who pay their own energy bills may see different financial results from utility efficiency programs than those who don't. People with less access to public transportation or with non-traditional working hours may not be able to give up their cars as easily as those with better public transit access or 9-to-5 jobs.

We know that climate action will benefit us collectively. We must ensure that these benefits are distributed as equitably as possible.

- Policies and programs must recognize the varied resources, motivations, and barriers of different groups.
- Climate action should not exacerbate existing social and economic inequalities and, whenever possible, should contribute to reducing them, especially by ensuring fair access to all economic benefits.

Action	Status (Existing, Expanded, Proposed	Jurisdiction (Federal, MA, Boston)	Proportion of 2020 reductions	Description
Buildings and Energy Sources				
Renew Boston and Electric Utility Efficiency Programs	Expanded	M, B	24%	Help residents and businesses access electric utility program resources for energy efficiency
67% of 2020 reductions				
Renewable Portfolio Standard	Existing	M	11%	Increase supply of electricity from new renewable sources
Renew Boston and Gas Utility Efficiency Programs	Expanded	M,B	7%	Help residents and businesses access natural gas utility program resources for energy efficiency
Appliance Standards	Existing	F	5%	Increase energy efficiency of appliances
Building Codes	Existing	M	2%	Raise energy standards for construction and renovation
Energy Efficiency Retrofit Ordinances	Proposed	B	7%	Require energy efficiency upgrades at time of sale
Behavior Change—Buildings	Proposed	B	3%	Educate public to use buildings more efficiently
Oil Heat Efficiency Program	Proposed	B	3%	Establish energy efficiency program for heating oil and propane customers
Benchmarking and Labeling	Proposed	B	2%	Require publicly accessible energy efficiency ratings for buildings
Low-Carbon Standard for Heating Fuels	Proposed	M	2%	Reduce greenhouse gas from heating fuels
Stretch Code or equivalent	Proposed	M,B	1%	Raise energy standards for building construction above state base
Cool Roofs	Proposed	B	1%	Require light-colored or vegetated roofs
Transportation				
Federal/State Mileage and GHG Standards	Existing	F, M	14%	Increase fuel efficiency of vehiclesw
31% of 2020 reductions				
Vehicle Miles Traveled Reduction Strategies				Reduce vehicle use
Mass Transit/Parking	Expanded	M, B	5%	Encourage use of mass transit; raise parking costs
Car Sharing	Expanded	B	2%	Encourage use of car sharing
Bike Programs	Expanded	B	1%	Expand bicycle infrastructure
Behavior Change—Transportation	Expanded	B	4%	Educate public to use vehicles more efficiently
Low-Carbon/ Renewable Fuel Standards for Gasoline and Diesel	Proposed	F, M	5%	Reduce greenhouse gas from vehicle fuels
Anti-Idling	Expanded	B	<1%	Increase enforcement, expand education on idling
Solid Waste				
Commercial Solid Waste Reduction	Expanded	B	2%	Increase requirements and incentives for recycling
3% of 2020 reductions	Expanded	B	1%	Increase requirements and incentives for recycling
Residential Solid Waste Reduction	Expanded	B	1%	Increase requirements and incentives for recycling

Action	Description
Adaptation	
Give adaptation the same priority as mitigation	Develop an adaptation plan; focus on sea-level rise, heat waves, and extreme storms; engage all levels of government
Assess vulnerability	Conduct a vulnerability assessment; include a range of projections; give special attention to the most vulnerable; start considering the potentially catastrophic very long-term
Remain flexible	Collect and analyze new data, establish an advisory group. revise plan triennially
Include climate change in all planning and review	Include in all formal development review and capital planning; identify "no-regrets", "low-cost", and "wait-and-see" strategies; begin adaptation planning case studies;
Review impacts on existing programs and infrastructure	Require every municipal department and agency to undertake a formal review of consequences of climate change
Economy	
Promote good, green jobs	Extend Boston Resident Jobs Policy to climate action; expand worker and contractor databases and training programs; ensure access
Promote economic equity	Ensure that costs and benefits of climate action are shared fairly throughout the community; do not exacerbate existing inequalities
Community Engagement	
Promote climate action at the neighborhood level	Partner with community organizations; develop local priorities; facilitate communication; acknowledge local work; creative incentives for collective action
Collaborate with community in program development and implementation	Establish oversight board; actively engage all segments of community in design and implementation of policies and programs
Support a citywide awareness campaign	Frame climate action in the context of broad community concerns; customize messages for subgroups; use traditional and new media
Equip individuals to take action	Develop accessible, interactive website; establish climate information centers; promote climate education in schools
Continue to lead by example	Raise standards for municipal buildings, vehicles, operations, procurement; engage all municipal employees as models of climate action
Implementation	
Secure sufficient human and financial resources	Draw on public, philanthropic, and private resources; designate official with climate action responsibility;
Develop a detailed plan and monitor implementation	Specify priorities, sequencing, and responsibilities for climate action; develop indicators, targets, and metrics; gather data on effectiveness, difficulties, costs, and benefits

CHARTS STILL BEING REFINED

We can reduce future climate change.

Green House Gas (GHG) Inventory

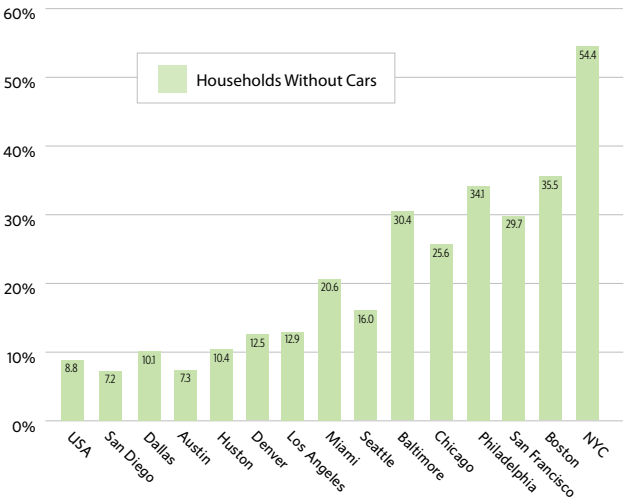
PLACEHOLDER

Human greenhouse gas emissions come primarily from the burning of fossil fuels—oil, gasoline, natural gas, coal. The general (though not unanimous) international understanding is that the world needs to reduce its total emissions by as much as 80 percent by 2050 to stabilize global climate.

The Boston community has already begun the process of reducing its emissions. Overall emissions have not changed much since 1990, despite an increase in the number or residents, businesses, and buildings. As a result of government policies, advances in technology, and concerted efforts of many members of the community, Bostonians use energy more efficiently and rely on cleaner sources. We have bigger, more powerful cars and trucks, but gas mileage has remained about the same. And while we have more cars, Boston is still one of the least car-dependent cities in the country. To take the next step, to actually reduce greenhouse gas emissions, is going to take greater, more deliberate, and more sharply focused effort.

Boston can reduce its greenhouse gas emissions by 25 percent by 2020 through more efficient buildings and vehicles, lower-carbon fuels, reduced driving, more recycling, and other changes in behavior.

Percentage of Households Without Cars



Sector	Greenhouse gas reductions from total baseline
Buildings	17%
Transportation	7%
Solid waste and other	1%
TOTAL	25%

We can make our buildings more efficient.

In the past few years, all levels of government have been establishing programs and policies to reduce energy use and greenhouse gas emissions.

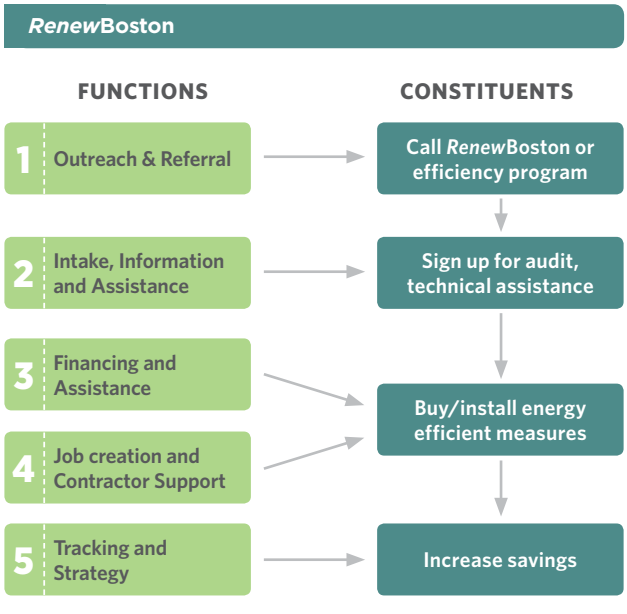
Measures related to buildings include:

- Massachusetts's Renewable Portfolio Standard requiring more electricity from solar, wind, and other renewable sources
- Higher energy standards in the Massachusetts building code
- Federal efficiency requirements for major appliances
- Proposed regional standard to lower the carbon content of heating fuels

The City of Boston should continue to wholeheartedly support these policies.

The most important step that Boston can take is to improve the energy efficiency of existing buildings. This will enable us to achieve about half of our greenhouse gas reduction goal.

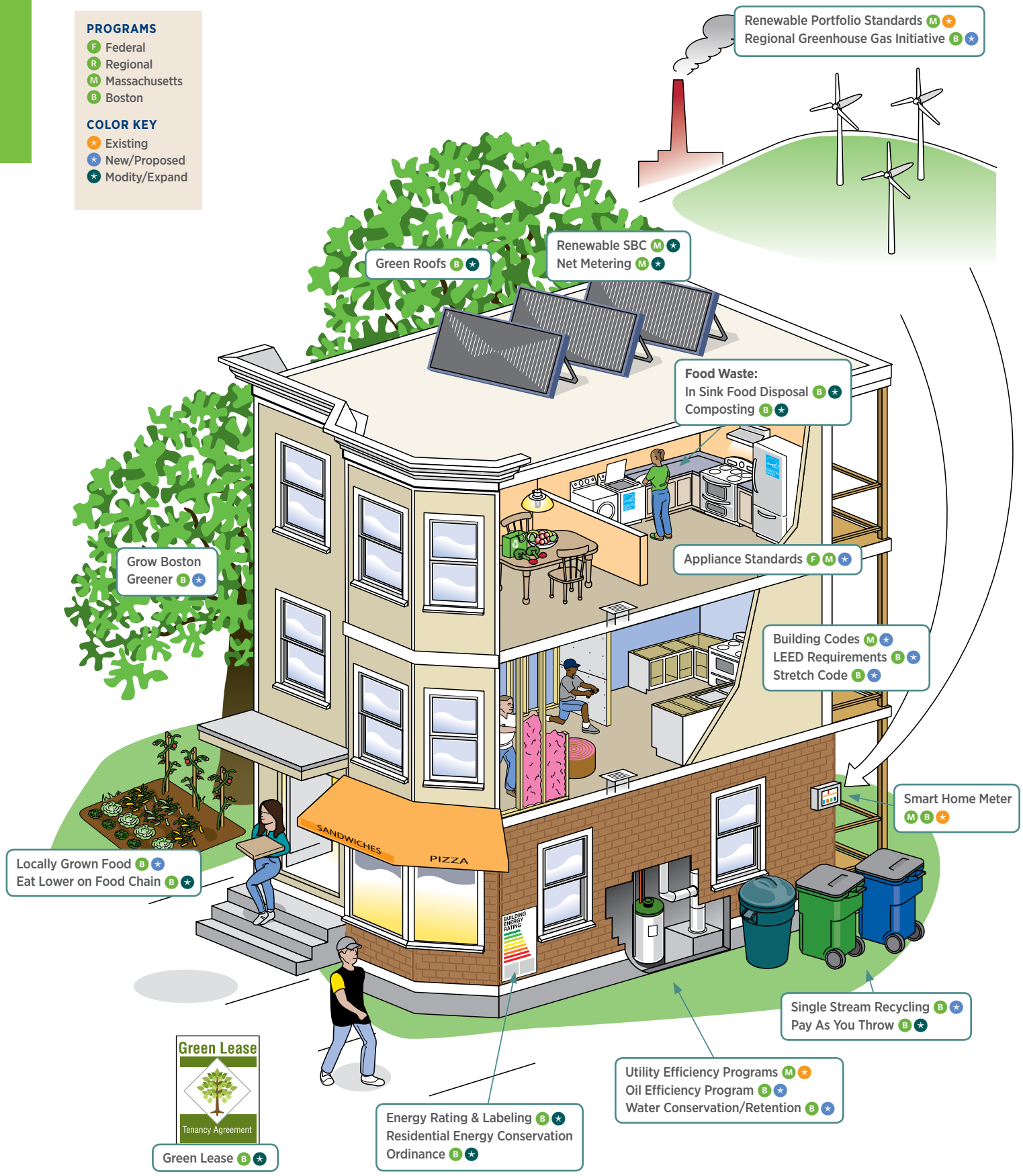
In 2008, the Massachusetts Green Communities Act required electric and natural gas utilities to help their customers take all cost-effective measures for energy efficiency. To help Boston residents and businesses gain access to the resources available through the utility efficiency and state renewable energy programs, Mayor Menino announced the Renew Boston program in 2009. Renew Boston will provide guidance, coordination, monitoring, and verification to Boston businesses and residents wanting to upgrade heating and cooling equipment, insulate walls, weatherize doors and windows, and take other efficiency steps. The utility programs could provide roughly $145 million over the next three years for Boston, with about one-fourth of that going to residential customers and three-fourths to commercial, industrial, government, and institutional customers. Assuming the utility programs continue as expected, Renew Boston and the utilities will help about 150,000 households in Boston (65 percent) and 30,000 businesses (70 percent) by 2020.



Climate Mitigation Policies and Programs for Boston Buildings

PROGRAMS
- F Federal
- R Regional
- M Massachusetts
- B Boston

COLOR KEY
- ★ Existing
- ★ New/Proposed
- ★ Modity/Expand



Greater local incentives or requirements could ensure full participation in the utility programs and even help Boston's building owners to exceed those goals.

Boston City Government should:

- Require buildings to obtain labels that provide public information on energy performance and potential improvements (benchmarking and labeling)
- Require buildings to meet a minimum level of energy performance at time of sale (energy efficiency retrofit ordinance)
- Work with the Commonwealth to develop efficiency programs for oil and propane users
- Require reflective or green roofs to lower summertime energy demand [photo of new green roof at Roosevelt School]
- Encourage energy-conscious behavior changes in building use (for example, changing thermostat and water heater settings)

In the long term, it is just as important to continually raise the standards for new buildings as to upgrade existing ones. The City's 2007 adoption of the U.S. Green Building Council's LEED (Leadership in Energy and Environmental Design) standards for large projects was an excellent step. The Commonwealth's new building code was another.

Now, the City should take three additional steps:

- Amend Boston's zoning code to reduce the project size at which LEED standards apply
- Require that all buildings minimize life-cycle costs through energy efficiency (stretch code or equivalent)
- Provide additional incentives for building owners and developers to exceed codes and standards

As zoning code amendments and other measures go through their required public hearing processes, it will be important to hear from stakeholders to ensure that new measures do not create economic barriers to new development or give rise to social or economic inequities. Furthermore, not all measures should be implemented immediately. In some cases, we should try to encourage voluntary action—perhaps by offering incentives—before imposing requirements. In other cases, a progression of mandated steps may be necessary.

Building Mitigation Measures	Proportion of 2020 reduction goal
Existing and Expanded Policies and Programs	
Renew Boston and Electric Utility Efficiency Programs	24%
Renewable Portfolio Standard	11%
Renew Boston and Gas Utility Efficiency Programs	7%
Appliance Standards	5%
Building Codes	2%
Proposed Policies and Programs	
Energy Efficiency Retrofit Ordinances	7%
Behavior Change—Buildings	3%
Oil Heat Efficiency Program	3%
Benchmarking and Labeling	2%
Low-Carbon Standard for Heating Fuels	2%
Stretch Code or equivalent	1%
Cool Roofs	1%
TOTAL	**67%**

We can drive less.

PLACEHOLDER

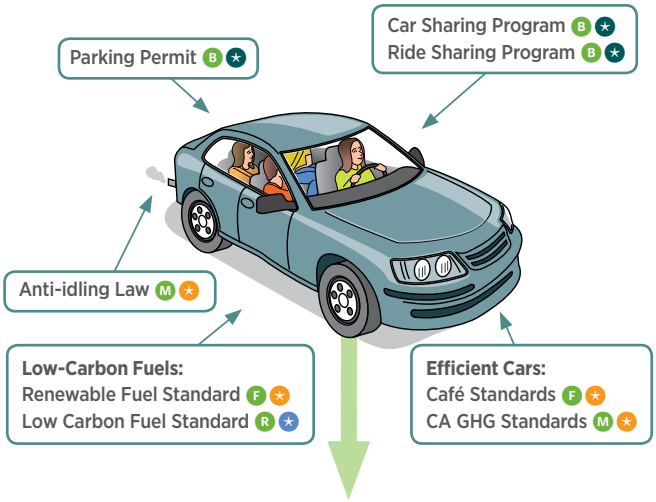
Most of the rest of our emissions reduction goal will be achieved through changes in transportation. Some of the most important measures are already on the books. These are federal and state standards that require better fuel mileage for vehicles (CAFE standards) and directly lower their greenhouse gas emissions. Next come possible regional standards for lower-carbon transportation fuels (including biofuels, natural gas, and electricity), which ten northeastern states, including Massachusetts, are now developing.

The way that we drive and care for vehicles is important. Regular engine maintenance, proper tire inflation, conformance with the speed limit, and elimination of unnecessary idling are effective ways to reduce gasoline consumption, vehicle operating costs, and greenhouse gas emissions.

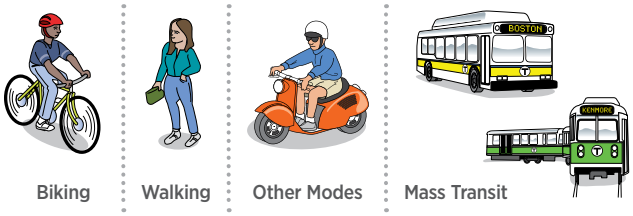
In addition to these steps, we must also reduce our reliance on cars. One of the major reasons that urban residents produce, on average, lower greenhouse gas emissions than those who live elsewhere is that we can more easily walk, bike, or take public transit to work, school, or almost anywhere we please.

Vehicle travel is growing far more slowly in Boston than in the state and the region—with increases projected at only 0.25 percent a year; but Boston will not achieve its greenhouse gas reduction goals unless we can enhance the essential features of urban life and reverse this growth in vehicle travel. By favoring walking, biking, public transit and transit-oriented development, Boston should be able to reduce the amount of driving in the city by about ten percent by 2020.

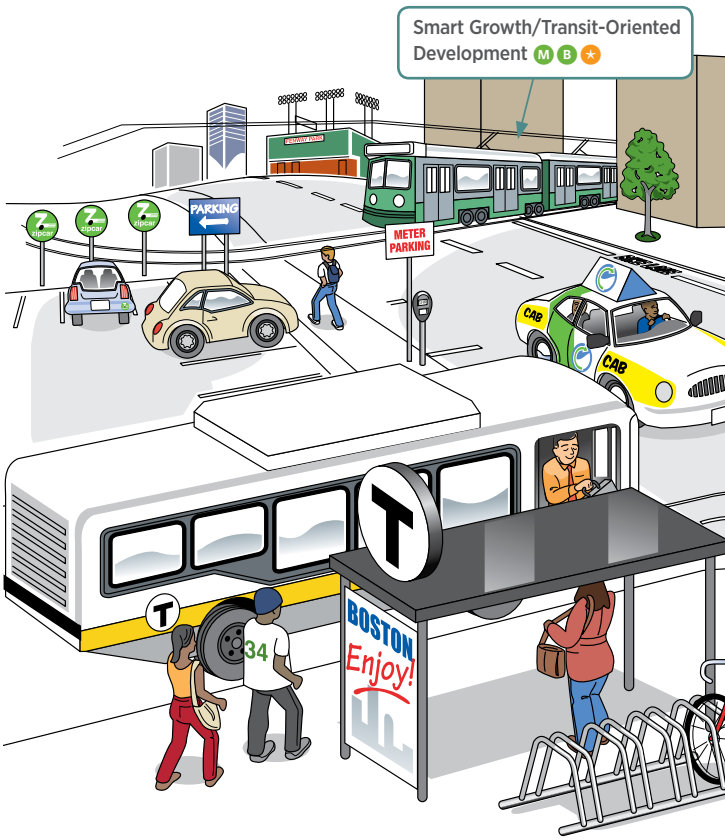
Climate Mitigation Policies and Programs for Personal Automobiles



Promote Alternative Transportation Modes



Climate Mitigation Policies and Programs for Transportation



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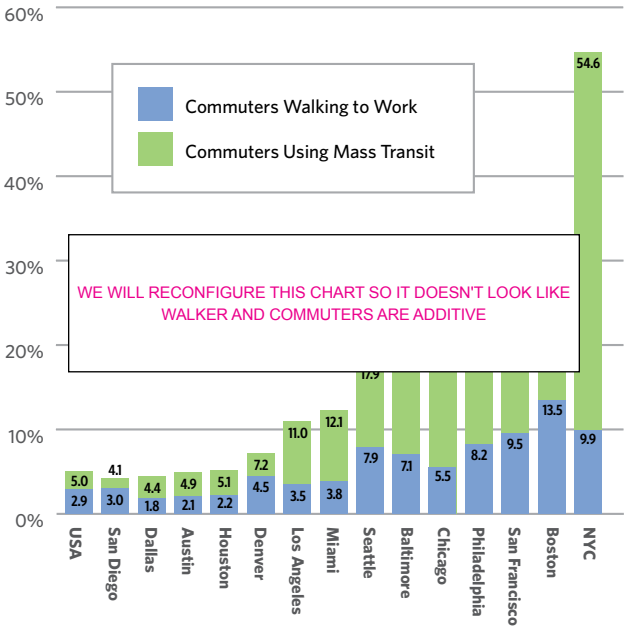
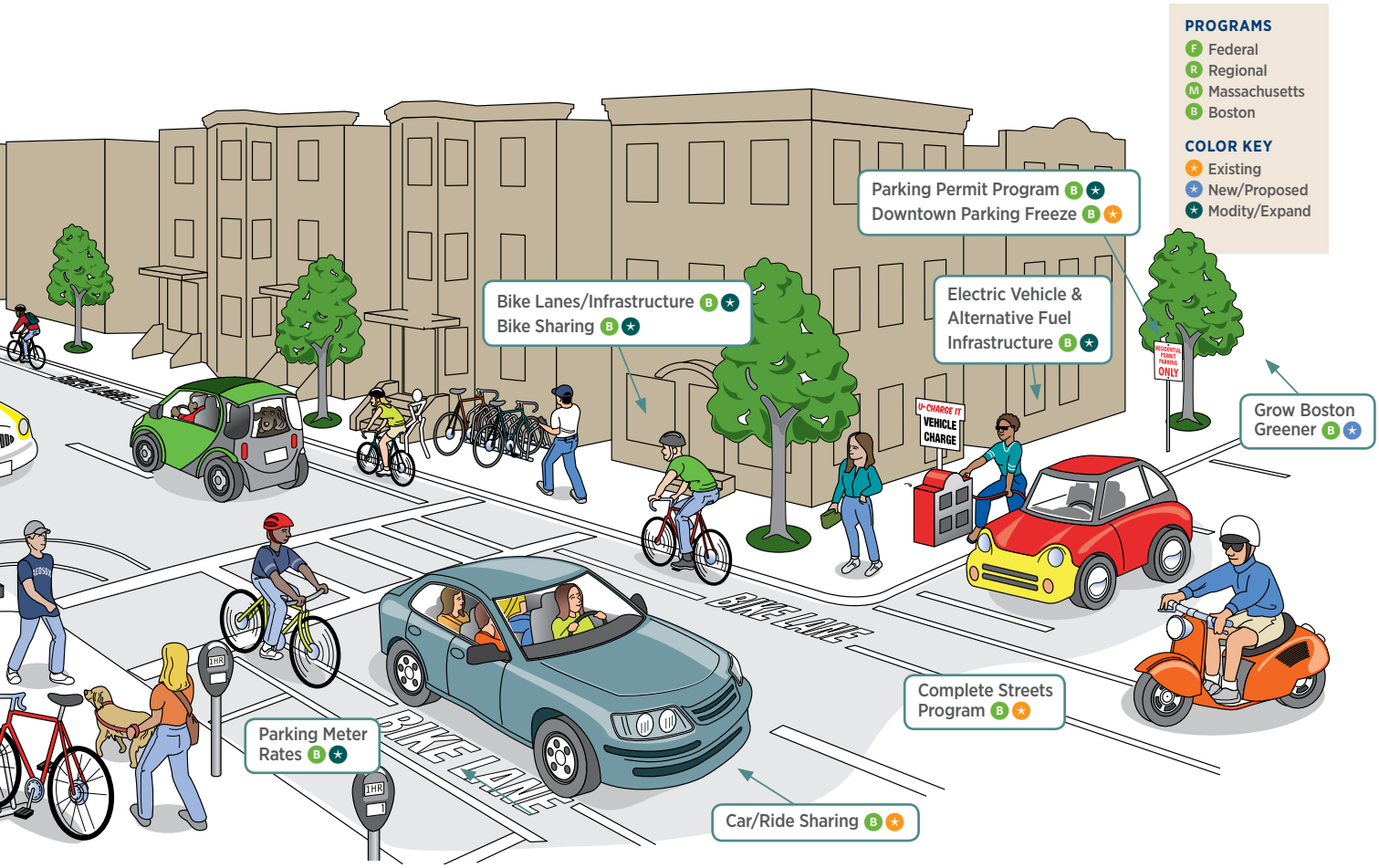


To do this, Boston City Government should:

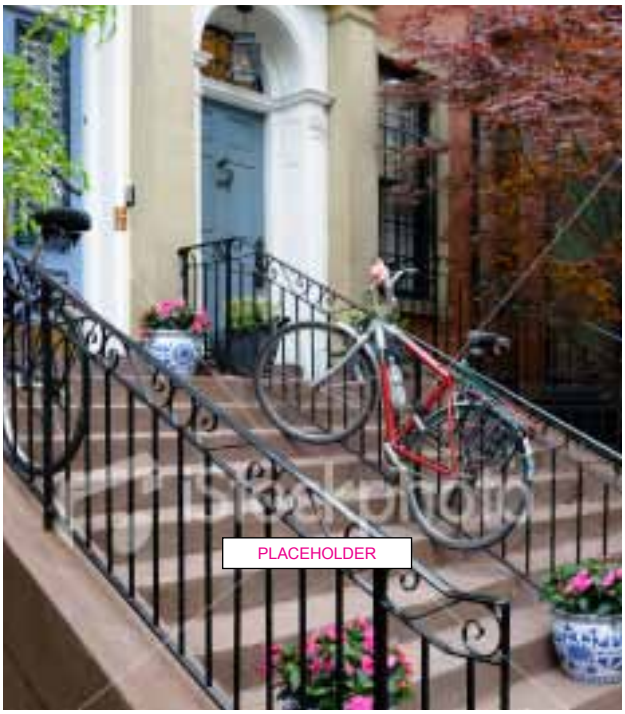
- Accelerate the construction of bike lanes, the planned bike-sharing program, and other bike infrastructure [bike photo of some sort]
- Support, promote, and expand car-sharing throughout the city.
- Raise parking meter rates and extend parking meter hours
- Impose a fee for and limit the number of residential parking permits
- Strengthen the downtown parking freeze and expand Traffic Demand Management (TDM) programs
- Use planning requirements more aggressively to reduce commuter driving and downtown commercial parking and create more pedestrian-friendly and bike-friendly streets



The foundation necessary to make all the other programs work is a well functioning public transit system that serves as many of Boston's homes, businesses, and travel destinations as possible. Boston is fortunate to have an extensive public transit system with relatively high ridership compared to other similarly-sized cities. All segments of the Boston community must remain forceful advocates for the upkeep, expansion, and sound financial standing of all MBTA transportation options (buses, rapid transit, and commuter rail) as well as the continued development of passenger rail, especially high-speed rail, between Boston and other major cities.

With these steps, we can make Boston a city where many more individuals and families can live comfortably and conveniently without owning a car.

Transportation Mitigation Measures	Proportion of 2020 reduction goal
Existing and Expanded Policies and Programs	
Federal/State Mileage and GHG Standards	14%
Proposed Policies and Programs	
Vehicle Miles Traveled Reduction Strategies	
Mass Transit/Parking	5%
Car Sharing	2%
Bike Programs	1%
Behavior Change—Transportation	4%
Low-Carbon/Renewable Fuel Standard for Gasoline and Diesel	5%
Anti-Idling	1%
TOTAL	**31%**



We can lighten our trash load.

The disposal of solid waste, the delivery of clean water, and the treatment of sewage account for less than three percent of Boston's greenhouse gas emissions, but reducing greenhouse gas emissions from these services is necessary to meeting our goals and will also provide many other environmental and economic benefits.

Water conservation measures are included in the energy utilities' efficiency programs because decreasing the use of hot water also reduces the need for energy to heat it. Boston also has other programs to encourage water conservation in homes and businesses and to manage sewage and stormwater, although reducing greenhouse gases is not their primary purpose.

Reducing solid waste lowers disposal costs and reduces greenhouse gas emissions that arise from landfills and other disposal methods. Boston residents currently recycle only about one-seventh of the trash that they produce (including yard waste and Christmas trees), but more than half of this refuse is actually recyclable. The commercial recycling rate is higher, but can still be improved. A stronger recycling program would establish norms and expectations throughout the community that Boston is a city that actively cares for its appearance, environment, and health. Many people have entered the world of climate and environmental action through committing to recycling as a first step.

PLACEHOLDER

The Boston community should adopt a long-term goal of zero waste. Achieving this goal will take time.

To move us toward it, Boston City Government should:

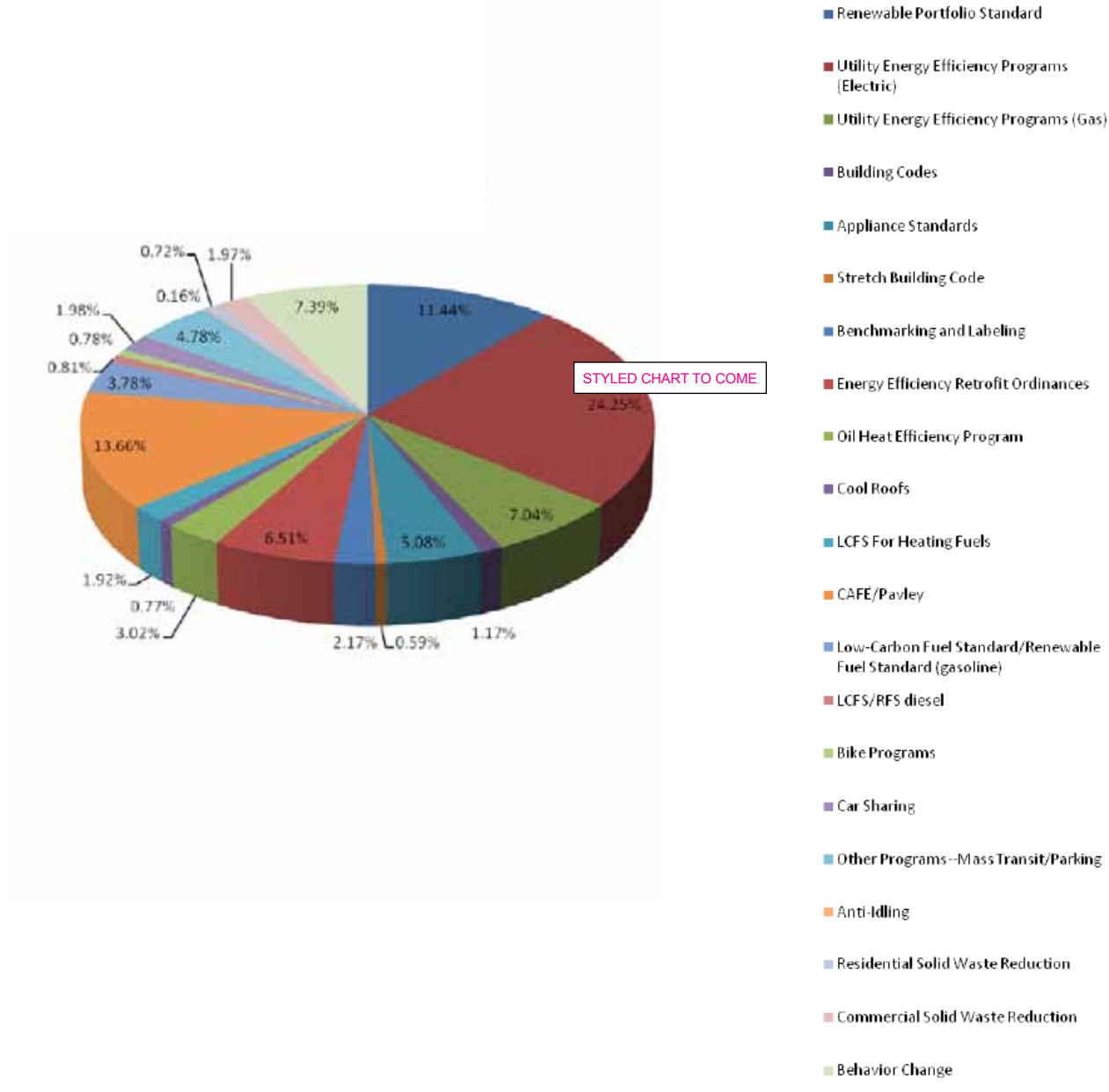
- Complete, as soon as possible, the full city-wide rollout of recycling without sorting (single-stream)
- Establish a mandatory recycling policy, followed by financial disincentives for trash
- Develop a year-round composting program for all residential and commercial organic waste (food and garden waste)
- Create requirements to increase commercial recycling rates

Solid Waste Reduction	Proportion of 2020 reduction goal
Commercial Solid Waste Reduction	2%
Residential Solid Waste Reduction	1%
TOTAL	**3%**

We have to do everything, and there's no need to wait.

Reducing our greenhouse gas emissions 25 percent by 2020 is an ambitious, yet attainable goal that will bring economic, environmental, and health benefits to Boston. Reducing emissions does not require advances in technology. To the contrary: it relies primarily on the adoption of practices, technologies, and techniques that many people and businesses are already using. Still, reaching this goal requires commitment; the participation of all sectors of the community; coordination among all levels of government; and partnerships among government and residents, businesses, neighborhood groups, and institutions. It also requires that the community work in many areas simultaneously.

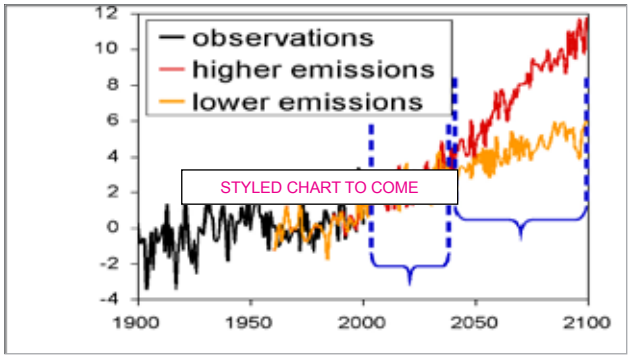
Boston 2020 GHG Savings by Individual Programs



We have to prepare for change.

The climate will continue to change even as we reduce greenhouse gas emissions. Lowering emissions now will bring significant returns in 20 to 30 years—and will achieve major results by the end of the century—in the form of lower than expected temperature and sea-level rise, and a reduction in other disruptive outcomes of climate change.

Title for Temperature Graph



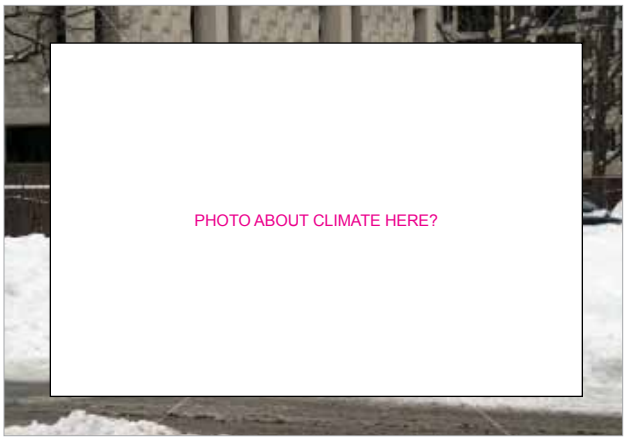
But we need to adapt to the changes that we can already foresee, changes that in some cases have already begun. For this reason, climate adaptation must immediately become an essential part of the Boston community's response to climate change and a foundation of all planning within the city. Adaptation should be just as prominent as mitigation in our climate agenda.

Climate adaptation is more multifaceted than mitigation, which centers on the overarching strategy of using less fossil fuel. For adaptation, the necessary actions depend on the physical, social, and economic details of every neighborhood, street, and lot. As with mitigation, some measures can be taken locally—for example, making streets and buildings more resistant to flood damage and rising sea levels—but some will require regional solutions—for example, actions to assure the viability of Boston Harbor or the Deer Island Sewage Treatment Plant.

Adaptation responses will also occur over varying time frames. We can take some actions immediately, with benefits to the city, even if the climate changes very slowly. For instance, Mayor Menino announced the tree-planting project, Grow Boston Greener, in 2007, which will bring cooling and other benefits to the city; and new development in vulnerable areas can be designed with changing conditions in mind . Other responses may take years of planning and even more years of implementation, for example, long-term adjustments to the city's sewer system.

As part of its adaptation plan, Boston City Government should:

- Focus on three critical, near-term aspects of climate changes: sea-level rise, increased frequency and intensity of heat waves, and increased intensity of summer and winter storms, and the economic and social effects associated with them.
- Conduct a climate change vulnerability assessment and regularly re-evaluate it in the light of new data and scientific understandings.
- Give special attention to segments of the Boston community that are more vulnerable because of lack of resources, poor health, age, or other reasons.
- Incorporate climate adaptation into all planning and review processes for both public and private activities.
- Formally review the possible consequences of climate change on all on-going programs and infrastructure.



We know what to do, but...

…the climate is already changing, and so will our understanding of it.

…technology, society, the economy, and politics will change.

…many things we try will work, some won't.

…we'll meet some of our goals, and sometimes fall short.

…even when we reduce emissions 25 percent by 2020, we'll have to do more and do it better to reduce emissions 80 percent by 2050

… there will be surprises.

So, we must prioritize actions, establish benchmarks of progress and measure what we can, prepare as best we can, re-evaluate costs and benefits, formalize regular and rigorous public oversight, and adjust programs and policies, while keeping our goals firmly in mind. Beyond this, we must prepare ourselves with eagerness to learn, flexibility to respond, concern for ourselves and for our city, and willingness to share the burdens and the benefits of taking action. With that, Boston can thrive, lead, and prosper.

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[more to come]

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