

PLAN

Dudley Square
Roxbury

PLAN: Dudley Square

Climate Readiness & Resiliency Workshop
October 16, 2017

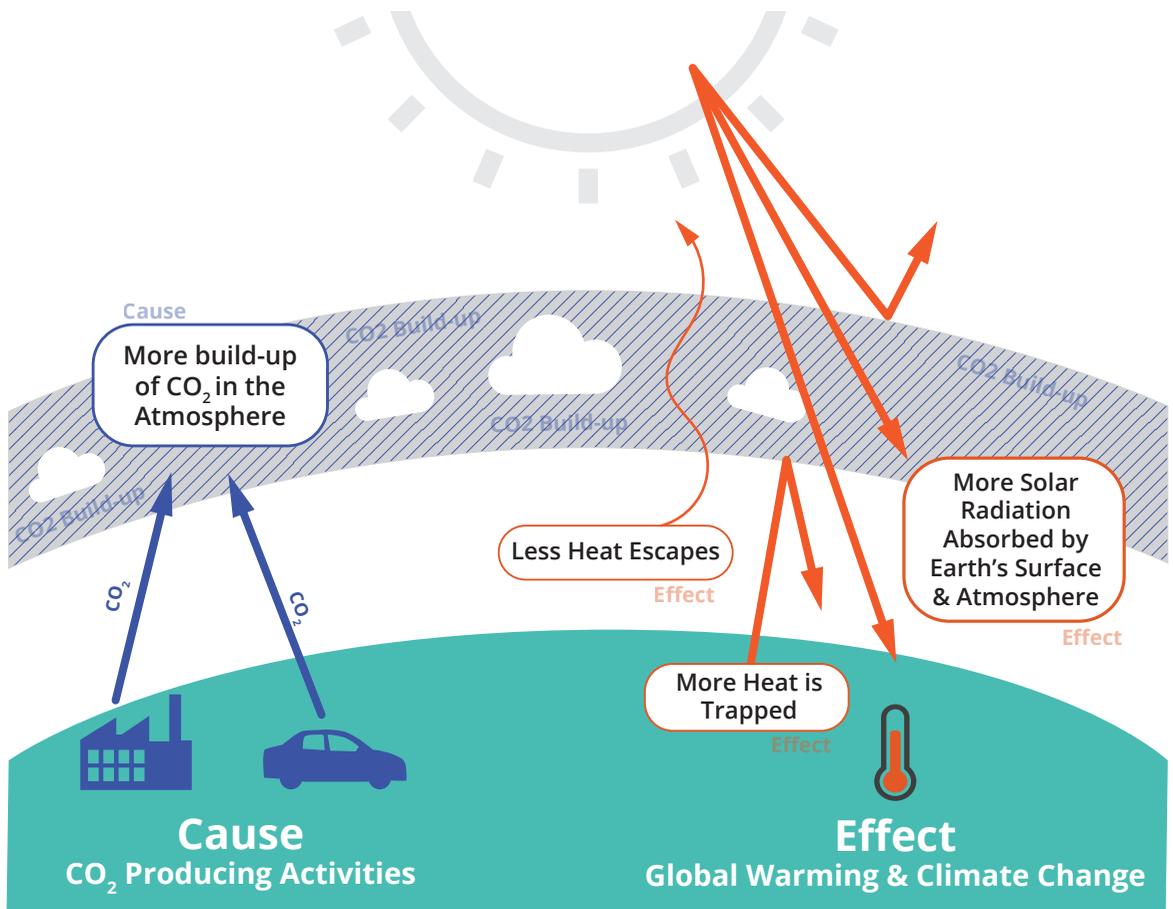


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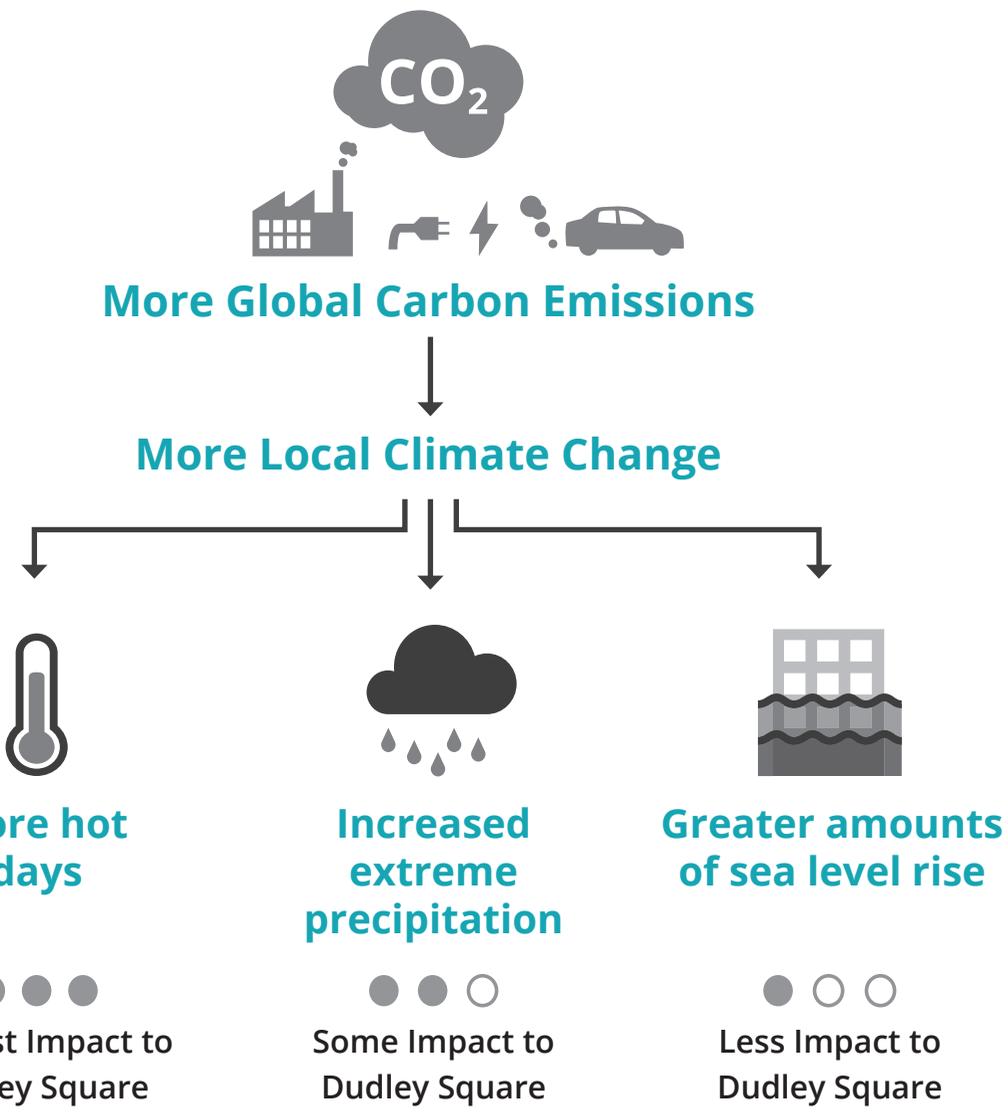
Climate Ready Boston is a plan to prepare the city for the impacts of future climate change.

Climate change means we will experience hotter days, higher seas, and more intense rain events in Boston. Last year the City released the **Climate Ready Boston Report** to better understand how Boston's climate is going to change over time, what's most at risk, and steps we can take to ensure our communities thrive in the future.

Greenhouse Gases (CO₂), Global Warming, and Climate Change



Climate Change will impact neighborhoods differently depending on the context.



Boston currently has an average of 11 days over 90 degrees, which could increase to 90 days by 2070.

By 2060 heavy rain events could regularly drop over 6 inches of rain in a 24 hour period; which is 20% more than what we see now.

Sea levels in Boston Harbor have risen 9 inches in the past 100 years and are expected to rise another 40" by 2070.

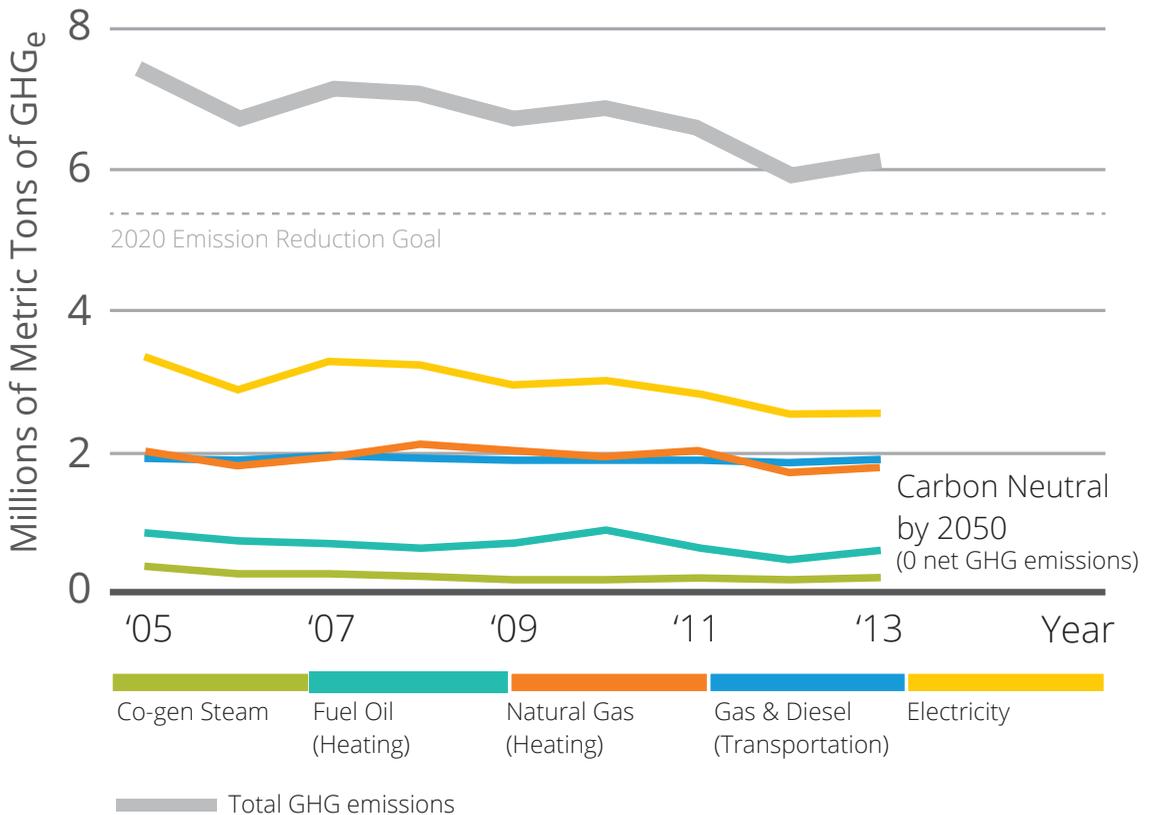


Greenhouse Gas reduction depends on energy efficiency and cleaner energy.

Since 2005, Boston's greenhouse gas emissions (GHG) have declined by approximately 17 percent. Additionally, per capita emissions has decreased from 12.7 CO₂e per person in 2005 to 9.5 in 2013.

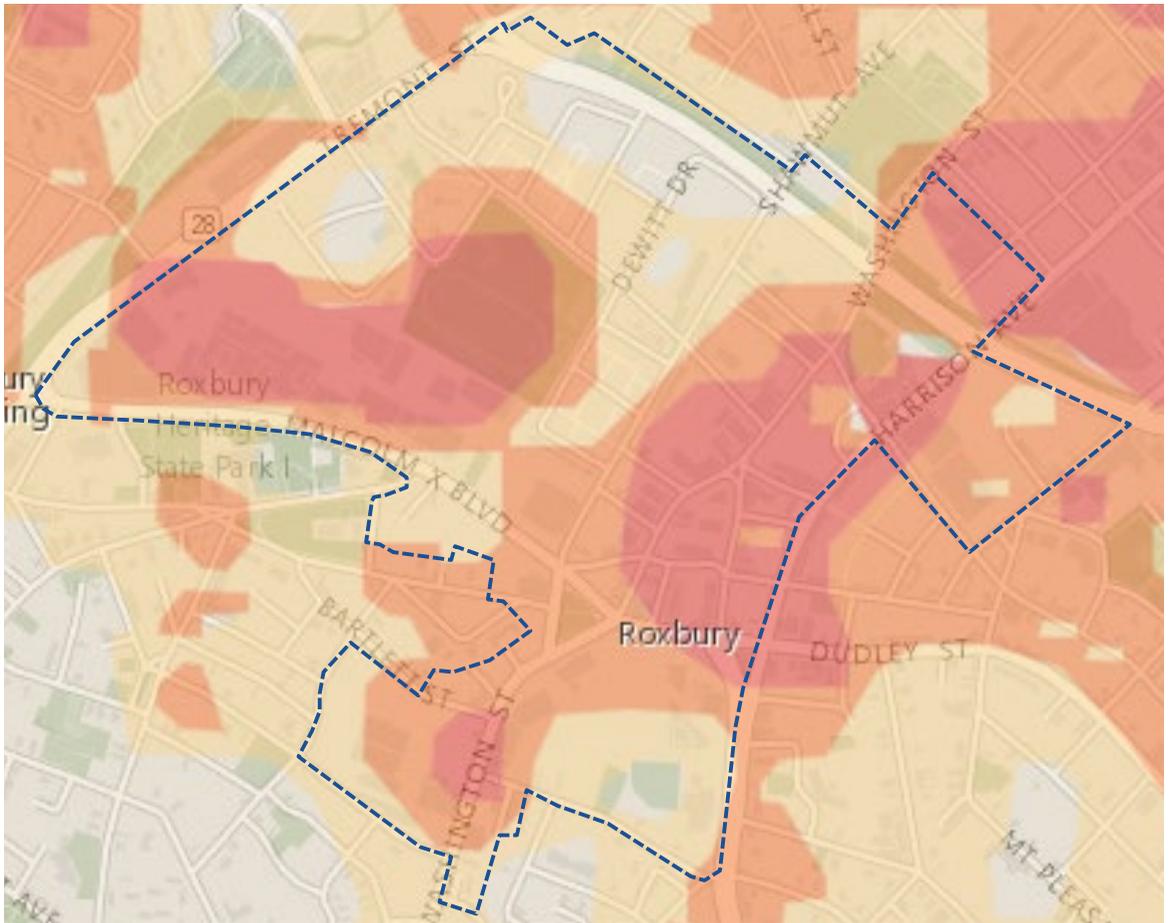
Boston's goals are to reduce greenhouse gas emissions 25% by 2020 and to be carbon neutral by 2050. The greatest reduction so far has been from transitioning sources for electricity generation and heating.

Boston Greenhouse Gas (CO₂) Emission Reduction Progress 2005-2013





Urban Heat Islands are concentrated in commercial districts like Dudley Square.



Existing Heat Island Intensity

Borders of intensity are an estimation and are illustrative

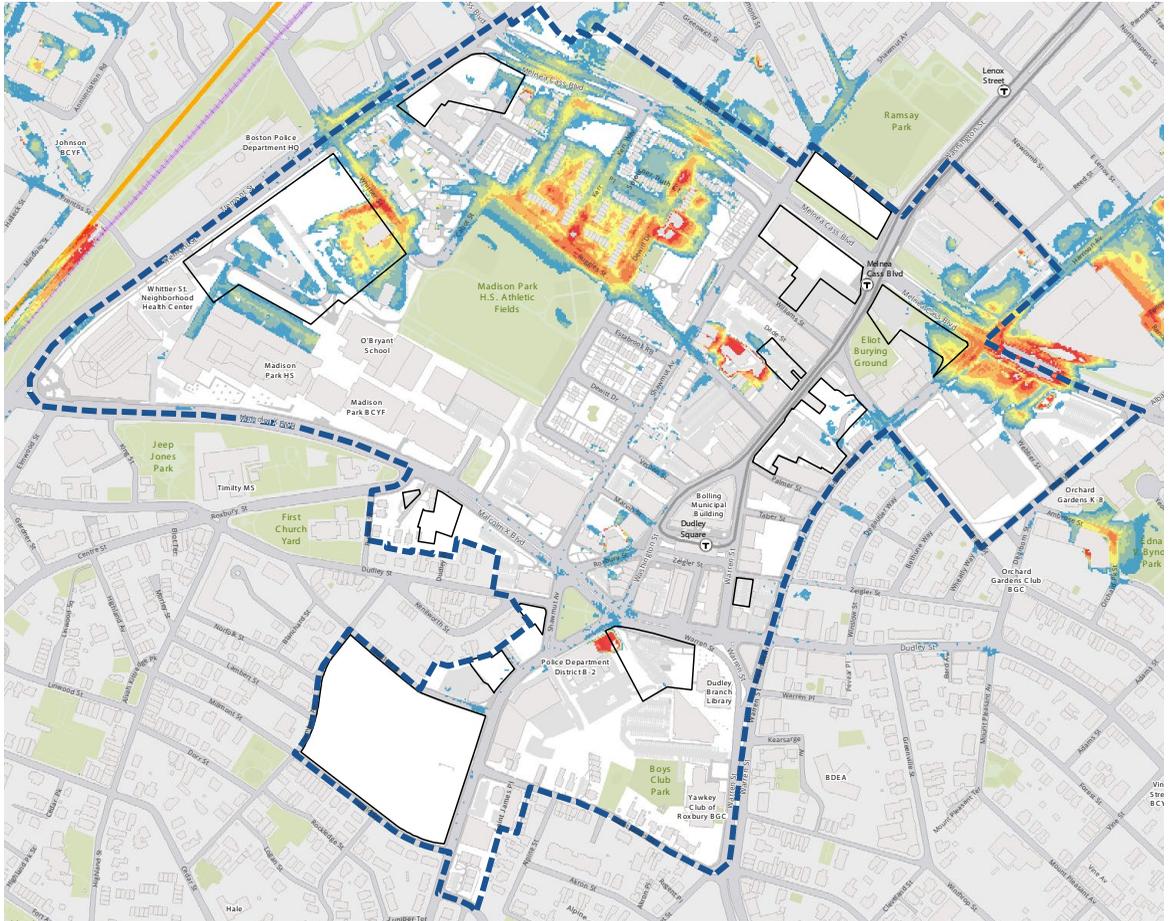
- Greater Heat Island
- Moderate Heat Island
- Some Heat Island
- Less Heat Island

0 500 ft

Increased temperatures and heat waves have greater effects on urban commercial districts like Dudley Square due to “heat islands”, or areas with more asphalt roads, dark roofs which absorb heat, and less tree canopy to provide shade.



Stormwater Flooding from future heavy rain events can affect Dudley's low-lying areas.



2035 Projected stormwater flood for 24 hour storm with 5" of rain

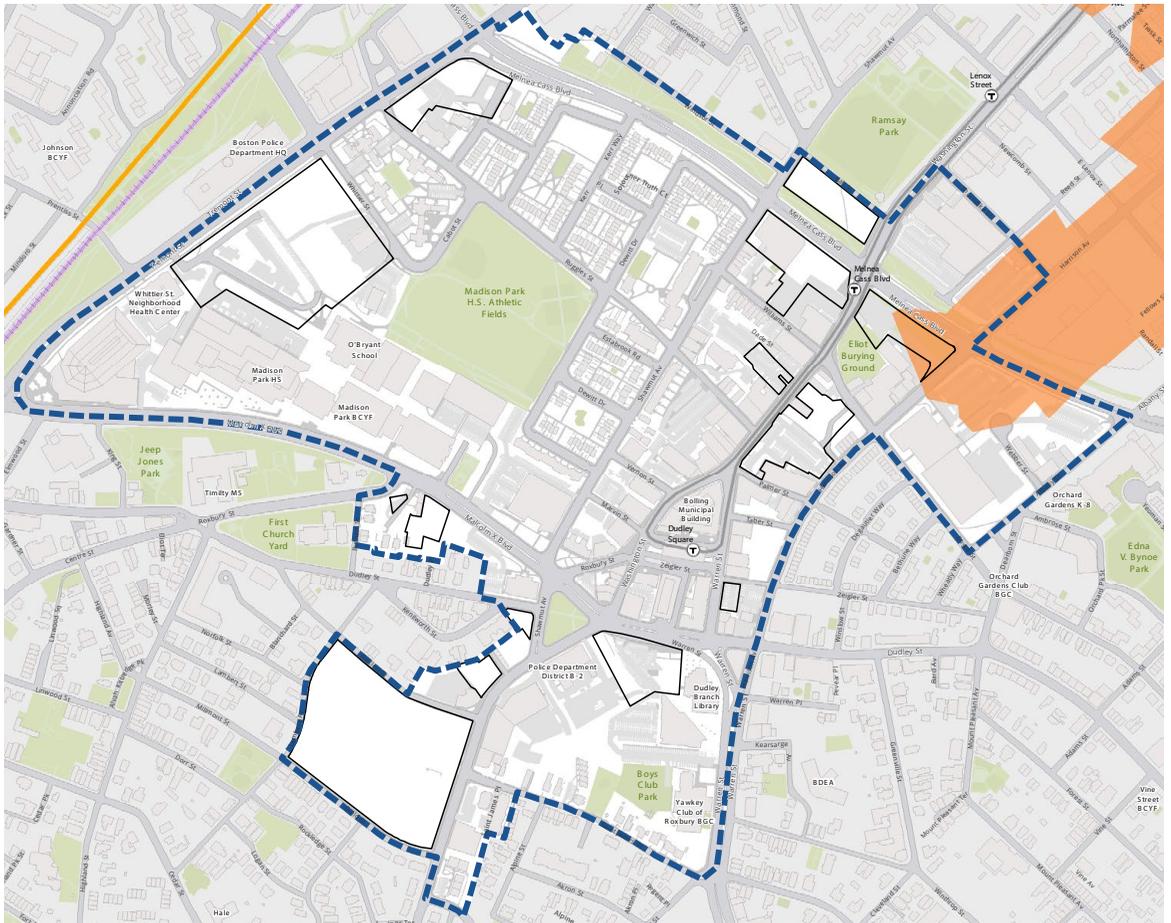
In feet, does not include storm surge



Low-lying areas with impervious surfaces and roads could see flooding with future heavy rain events that will impact homes, businesses, and access to transportation.



Sea Level Rise is not anticipated to affect most of Dudley Square in the near future.



2070 Projected coastal flood risk for a major coastal storm with 40" of sea level rise

 Risk of Coastal Flooding



Although Roxbury is not anticipated to see water from coastal flooding until later in the century larger areas of the neighborhood could be affected as sea levels continue to rise beyond 2100.

Green Site Infrastructure mitigate severe impacts of weather events on the neighborhood.



Use Permeable Surfaces & Water Retention

Permeable pavement looks like normal pavement but allows water to go through and be absorbed by the ground below.



Create Multi-purpose Solutions

Open space reduces the amount of heat absorbed and can also hold excess rainwater to slowly drain like in this outdoor amphitheater with drainage.



Promote Walkable and Bikeable Communities

Wider sidewalks and improved bike lanes will create a safer and more enjoyable experience that will encourage people to walk and bike.



Increase Shade and Tree Canopy

Street trees can provide a canopy that shades the street and sidewalks below. Trees can also help to reduce air pollution.

Climate Change Impacts



Mitigation Strategy	Heat Islands	Stormwater flooding	Rising sea levels	GHG / Air Quality
LEED Certification Site Category <ul style="list-style-type: none"> Sustainable Sites 	✓	✓	✓	✓
Use permeable surfaces and water retention, such as: <ul style="list-style-type: none"> More green, open space Permeable pavement Rain garden & bioswales 	✓	✓		
Improve shade and tree canopy, such as: <ul style="list-style-type: none"> Street trees Sun shelters 	✓			✓ Reduces Air Pollution
Promote walkable and bikeable communities <ul style="list-style-type: none"> Reduce car use and dependency Electric Vehicles and clean fuels 				✓ Carbon Mitigation
Build flood resistant sites <ul style="list-style-type: none"> Raise site elevation Ensure site & buildings remain accessible during floods 		✓	✓	
Provide community emergency cool and warm rooms <ul style="list-style-type: none"> Ensure community access to emergency, climate-controlled spaces to allow sheltering in place 	✓			

Green Buildings create healthy and safe places while reducing their impact on the environment.



Improve Energy Efficiency

E+ Roxbury Townhouses use high-performing materials that reduce wasted energy.



Install Building Awnings

Awnings overhanging on the sidewalk provide shelter and shade for pedestrians.



Install Cool Roofs

Green roofs or white, reflective roofs reduce the amount of heat absorbed by buildings.



Install On-site Solar Electricity Generation and Storage

Solar panels can reduce the need to rely on electricity produced by greenhouse gas emitting sources.

Climate Change Impacts



Mitigation Strategy	Heat Islands	Stormwater flooding	Rising sea levels	GHG / Air Quality
LEED Certification Building Categories <ul style="list-style-type: none"> Water efficiency; energy & atmosphere; materials & resources; indoor environmental quality; innovation & design 	✓	✓	✓	✓
Improve Energy efficiency <ul style="list-style-type: none"> Insulating walls and windows Allow for cross-breeze and natural ventilation Use day lighting from windows and energy efficient LED lighting 				 Carbon Mitigation
Install cool roofs and building awnings <ul style="list-style-type: none"> Reflective colored roofs Awnings and window shading 	✓			
Improve water efficiency <ul style="list-style-type: none"> Cisterns for irrigation Storage tanks to increase infiltration and slow discharge in system. Reduce wastewater with low flow fixtures 		✓		
Install on-site solar photovoltaic (PV) electricity generation and storage				 Carbon Mitigation
Improve indoor environmental quality <ul style="list-style-type: none"> Reduce off-gassing materials Improved ventilation, air filtration, and location of intake valves 				 Reduces Air Pollution
Build Flood Resistant Buildings <ul style="list-style-type: none"> Plan for future adaptation and do not locate any critical building systems or equipment below 		✓	✓	

Regulatory Frameworks check to make sure developments are sustainable and resilient.

Climate Change Article 80 Checklist

The Climate Change Checklist provides a framework for considering present and future climate conditions in assessing the environmental impacts and mitigation strategies of a proposed project. The Checklist focuses on greenhouse gas emissions, increased heat, more intense precipitation, and sea level rise.

Green Building Article 37 Checklist

The purpose of Zoning Article 37 Green Buildings is to ensure that major building projects are planned, designed, constructed, and managed to minimize adverse environmental impacts; to conserve natural resources; to promote sustainable development; and to enhance the quality of life in Boston. Projects are evaluated using the LEED building rating systems.

Leadership in Energy & Environmental Design (LEED)

The Leadership in Energy & Environmental Design rating system provides a holistic indication of the sustainability of a building across six categories, using a credit points system out of 100 to determine the rating.

The levels are certified, silver, gold, and platinum.



Sustainable Sites



Water Efficiency



Indoor Environmental Quality



Materials & Resources



Energy & Atmosphere



Innovation & Design

To learn more visit: bit.ly/plandudley
or contact Courtney Sharpe at **617.918.4431**



Mayor Martin J. Walsh



boston planning & development agency