Ruthanne Fuller
Mayor

City of Newton, Massachusetts
Department of Planning and Development
1000 Commonwealth Avenue Newton, Massachusetts 02459

Telephone
(617) 796-1120
Telefax
(617) 796-1142
TDD/TTY
(617) 796-1089
www.newtonma.gov

Barney S. Heath
Director

M E M O R A N D U M

DATE: September 25, 2019

TO: Councilor Albright, Chair of the Zoning and Planning Committee
Members of the Zoning and Planning Committee

FROM: Barney Heath, Director of Planning and Development
Jennifer Steel, Chief Environmental Planner

RE: **#13-19 Adoption of the Climate Action Plan**
DIRECTOR OF PLANNING requesting discussion and adoption of the Climate Action Plan as an amendment to the 2007 Comprehensive Plan.

MEETING DATE: October 2, 2019

CC: Planning Board
Ann Berwick, Co-Director of Sustainability
Bill Ferguson, Co-Director of Sustainability
Jonathan Yeo, Chief Operating Officer

Climate Action Plan Revision

Attached is a revised draft of the City's Climate Action Plan.

City staff have worked to:

1. Address the comments provided at the joint ZAP/PF meeting held on September 26, 2019,
2. Integrate the interests of the "V-CAP" group, the dedicated volunteers who developed the citizens' climate action plan, and
3. Ensure that City staff are comfortable with the plan.

Several noticeable and many more subtle changes to the document have been made. These changes can be summarized as follows.

- An Executive Summary has been added (pages 5-7).

- The Top Ten Strategies and Top Twenty Recommended Actions are listed in the executive summary on pages 5 and 6.
- The specific metrics listed on page 24 (as part of Action A.1.3) were modified slightly and reflected in a new chart of goals on page 11.
- Some aspects of the tone of the citizen's plan were incorporated, for example, in the Local Context section on page 11.
- Some of the "demographic" and descriptive data included in the citizens' plan has been integrated into the text of this plan.
- Details have been added to individual action items, for example, noting the interest in contracting electric school buses.
- Figures have been added to, for example, clarify the difference in taking action now vs. delaying action, the import of Energy Use Intensity, and the scale of contribution of embodied energy to GHG footprints.
- Appendices have been properly arranged based on order of appearance in the text.
- A Table of Figures was added.

Attachment: Climate Action Plan - Draft, September 23, 2019

"Use Less and Green the Rest"

The City of Newton's Five-Year Climate Action Plan

A Living Plan for 2020 – 2024

Draft: September 23, 2019

Green Buildings:
Zervas Elementary School

Clean vehicles:
City Hall EV charging station

Renewable Energy:
Solar array at Rumford Avenue

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Acknowledgements

This plan was developed by the City of Newton with the help of the Metropolitan Area Planning Council (MAPC). The Project Team would like to thank the following individuals for their hard work and thoughtful contributions throughout the planning process. In particular, the City would like to acknowledge the ideas, inspiration, data collection, and analysis provided by the Newton Citizens Commission on Energy (NCCE) and the long-term vision put forth by them in the Newton Citizens Climate Action Plan. Many of the strategies and specific action recommendations included in this plan parallel the recommendations articulated in the Citizens Climate Action Plan. The Project Team would also like to thank all the residents of Newton and members of the public who contributed through the online questionnaire or participation in the public workshops held as a part of the planning process. similar

City of Newton Mayor

Ruthanne Fuller

City of Newton Staff

Jennifer Steel, Claire Rundelli, Barney Heath, Jonathan Yeo, Ann Berwick, William Ferguson, Nicole Freedman, James Freas, Josh Morse, Linda Walsh, Marc Welch

Newton City Councilors

Public Facilities Committee Chair, Councilor Crossley
Public Facilities Committee Vice-Chair, Councilor Leary
Public Facilities Members, Councilors Norton, Kelley, Gentile, Danberg, Laredo, and Lappin

Climate Action Plan Working Group Members

Peter Barrer, Ann Berwick, Halina Brown, Deb Crossley, William Ferguson, Barney Heath, Jonathan Kantor, Eric Olson, Claire Rundelli, Jennifer Steel, Puja Vohra, and Jonathan Yeo.

Newton Citizens Commission on Energy

Halina Brown (Chair), James Purdy, Ira Krepchin, Michael Gevelber, Jonathan Kantar, Stephen Grody, Puja Vohra, Jonathan Klein, Asa S. Hopkins

Metropolitan Area Planning Council Staff

Project Manager/Clean Energy Analyst II, Megan Aki
Clean Energy Coordinator II, Brooks Winner
Director of Clean Energy, Cammy Peterson
Assistant Director of Clean Energy, Patrick Roche
Climate Action Development, Nicole Sanches, Sasha Shyduroff, Kasia Hart, Travis Pollack

Executive Summary

Long-term success is a carbon-neutral Newton by 2050. That is our goal.

This plan addresses 6 areas of action.

A. Implementing Newton's Climate Action Plan: The City is committed to ensuring the success of this Climate Action Plan by adapting internal operations and working with dedicated partners.

B. Promoting Clean and Renewable Energy: "Greening" the sources supplying electricity to the City is vital to the pathway to carbon neutrality. The City will promote and expand Newton Power Choice, increase local renewable energy production through the installation of municipal solar arrays and the promotion of private solar installations, and offset its own GHG emissions with the purchase of renewable electricity supply.

C. Greening Newton's Transportation and Streetscapes: The second largest source of GHG emissions in Newton comes from on-road transportation. The City will support Newton's residents, workforce, and visitors in switching to battery electric and plug-in hybrid vehicles; reducing single-occupancy vehicle trips; and increasing biking, walking, telecommuting, public transportation, and shared trips.

D. Improving New Construction and Major Renovations: Energy use reduction and electrification are the backbones of any GHG emissions reduction plan. As new developments are built and renovations are undertaken, the choices made by developers and architects will have a significant impact on the City's GHG emissions profile. To the extent legally permissible, the City will take steps to ensure that construction meets standards necessary to achieve carbon neutrality by 2050.

E. Improving Existing Buildings: Existing residential and commercial buildings in Newton are responsible for a majority of the City's GHG emissions. The City will work with homeowners to increase energy efficiency and reduce reliance on natural gas and heating oil in the City's existing building stock. Moving the needle for existing buildings will require the City to put in place "carrots and sticks" to incentivize significant action by the private sector.

F. Reducing Emissions associated with Consumption and Disposal: We will work to protect and enhance the City's natural resource base and help Newtonians limit their consumption and disposal of goods and services.

Each action area identifies strategies and specific actions to get us well on our way to our goal of carbon neutrality. The Top 10 strategies to be employed are:

Establishing Teams and Partnerships

1. Create a City implementation team, develop appropriate municipal planning and budgeting processes, and ensure regular Plan evaluations and updates (A.1.)
2. Work with partners to build awareness and drive action (A.2.)

Use Less

3. Increase rate of biking, walking, telecommuting, shared rides, and use of shuttles and public transit, while reducing single-occupancy vehicle trips (C.4.)

4. Advocate for a more energy-efficient and climate-smart building code (D.1.)
5. Work with City Council to adopt Zoning Ordinance amendments that require and/or incentivize high-efficiency performance and/or net-zero new construction – within the next 12 months (D.3.)

Green the Rest

6. Increase the amount of electricity provided by New England renewable energy resources (B.1.)
7. Ensure that municipal infrastructure and operations are as "green" as possible (C.1.)
8. Incentivize residents to switch to EVs with a goal of having 10% of all vehicles on the road be EV, BHEV, ZEM, PHEV+ by 2024 (C.2.)
9. Transition to electric and thermal heating and cooling in residential and commercial buildings (E.2.)
10. Consider initiatives to engage businesses and residents in reducing GHG emissions resulting from corporate operations and individual activities (F.1.)

Of the 53 specific actions recommended in this plan, the top 20 recommended actions are as follows.

A. Implementing Newton's Climate Action Plan

A.1.1. Transform the existing Major Projects and Infrastructure Cluster into the Major Projects, Infrastructure, and Climate Change Cluster to oversee implementation of this Plan.

A.1.2. Develop more concrete estimates of costs and fiscal benefits for each action in this plan and incorporate funding categories or appropriate metrics in the CIP prioritization process to reflect the priorities of this plan and other related plans (such as the Climate Change Vulnerability Assessment and Transportation Plan).

A.2.2. Develop an Energy Coach Role.

A.2.3. In collaboration with the Utilities, work with the largest energy users in the City to reduce their GHG emissions.

A.2.4. Work with the Newton-Needham Chamber of Commerce and the NCCE to explore possible structures for a "Green Ribbon Commission" and implement the preferred model.

B. Promoting Clean and Renewable Energy

B.1.1. Encourage residents and businesses to opt up to 100% renewable energy through Newton Power Choice.

B.2.1. Support Green Newton's efforts to implement the Newton Solar Challenge for residents and businesses which encourages the installation of rooftop solar.

C. Greening Newton's Transportation and Streetscapes

C.1.3. Install EV charging stations in village centers, school facilities, and other priority municipal sites, primarily through the Make Ready and GreenSpot programs.

C.2.3. Continue to work with partners (such as Make Ready) to install EV charging stations on private properties throughout the City.

C.3.1. Support local non-profits and for-profits such as Green Newton, the NCCE, and Newton-Needham Chamber of Commerce, the Transportation Advisory Group (TAG), Safe Routes to School, the utilities, and local businesses efforts in education, events (such as test drives and Tour du Newton), and literature dissemination.

C.4.1. Work with City Council to develop a Transportation Demand Management (TDM) program to reduce single-occupancy vehicle trips through amendments to the Zoning Ordinance.

C.4.2. Work with City Council to reduce or eliminate the minimum parking requirement in the Zoning Ordinance and set a maximum on parking allotments.

C.4.3. Create and encourage the use of safe bicycle and pedestrian facilities for commuters and residents.

D. Improving New Construction and Major Renovations

D.1.1. Register and educate all eligible representatives to ensure strong City participation in the vote on the International Energy Conservation Code (IECC) to increase base building efficiency and support electrification and other carbon reduction strategies, and advocate to the Board of Building Regulations and Standards (BBRS) for a net zero Stretch Code.

D.3.1. Work with City Council to amend the Zoning Ordinance to require new construction and major renovations seeking a Special Permit maximize energy efficiency and the use of renewable energy, including thermal energy.

D.3.2. Work with City Council to require that all new construction and major renovations analyze the costs, benefits, and GHG impacts of maximizing energy efficiency; utilizing electric heating, cooling, and hot water; and using renewable energy, including thermal energy.

D.3.5. Work with City Council to adopt Zoning Ordinances that encourage additional, appropriate low-carbon, housing near public transportation.

E. Improving Existing Buildings

E.3.2. Work with City Council to adopt an ordinance requiring residential and commercial building owners to disclose to potential buyers electric, gas and heating oil bills for the previous 12 months, and explore the possibility of listing energy performance in the Assessor's database.

F. Reducing GHG Emissions Associated with Consumption and Disposal

F.1.1. Work with the Economic Development Director and the Newton-Needham Chamber of Commerce to explore incentive programs for businesses to reduce GHG emissions associated with consumption and disposal.

F.1.2. Explore adoption of a voluntary program that would allow contributions to a municipal program to help offset GHGs produced by air travel.

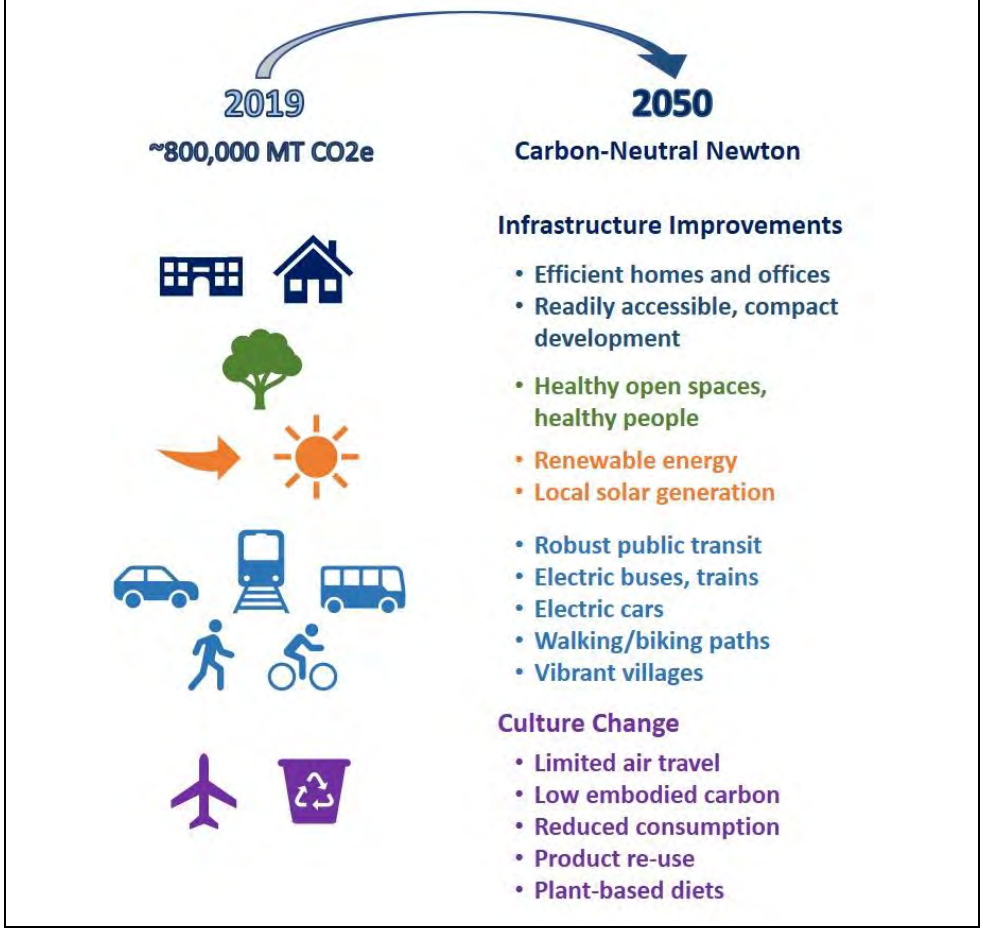
Introduction: **Newton's Climate Challenge**

Stepping up to the Plate: Creating a Brighter Future

Newton developed this, our first Climate Action Plan, informed by our citizens, shared values, and recent accomplishments. Newton's Climate Action Plan builds on recent efforts and outlines the steps that the City will take during the next five years (2020-2024) to significantly reduce greenhouse gas (GHG) emissions across the community and meet our goal of a carbon-neutral Newton by 2050 (Figure 1).

In its Climate Action Plan, the City will seek to equip our residents and businesses with the tools and support needed to make climate-conscious choices that reduce the community's GHG emissions while also leading by example.

Figure 1. Pathway to Success



Global, State, and Local Contexts

Global Context

Climate change is an increasingly urgent crisis and will continue to worsen unless we make significant changes, particularly in our building and transportation sectors. The longer we delay taking ambitious action to reduce GHG emissions, the greater the environmental, public health, and economic problems will be and the harder it will be to achieve our goal. In the Northeastern U.S., climate change will continue to lead to more severe weather events such as heat waves, heavy downpours and droughts; dramatic sea level rise; population relocation; compromised infrastructure, agriculture, and fisheries; and significant changes in the local ecosystems on which we depend. Inaction will exacerbate these occurrences to a catastrophic degree.

The Intergovernmental Panel on Climate Change[1] (IPCC) emphatically states that aggressive, near-term action is required to ensure that global temperatures do not increase more than the upper limit of 1.5ºC. The Fourth National Climate Assessment[2] (2018) underscores the deleterious impacts of climate change already experienced across the country and highlights the gravity of the specific challenges facing people in the Northeast, including changing seasons, sea level rise, changing coastal and ocean habitats, and threats to human health.[3] In light of the crisis, action at the local level – by municipalities and individuals – is essential.

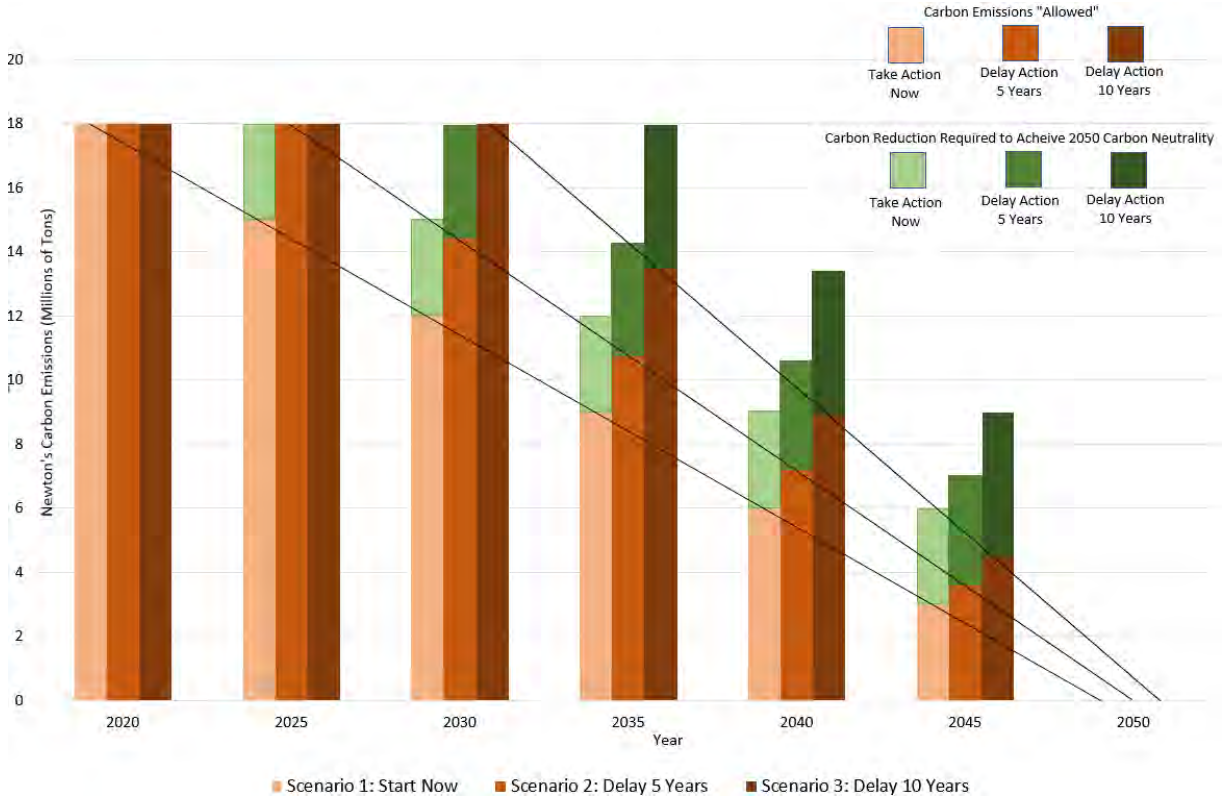
Scientific consensus tells us that we must reduce global GHG emissions by 50-60% in the next 10 years and achieve net zero global GHG emissions by 2050 to avoid catastrophic climate change. The sooner we reach those goals, the better off we will be (Figure 2).

[1] The Intergovernmental Panel on Climate Change (IPCC) is the United Nations body for assessing the science related to climate change.

[2] The Fourth National Climate Assessment (NCA4), completed in November 2018, is a comprehensive and authoritative report on climate change and its impacts in the United States.

[3] Dupigny-Giroux, L.A., E.L. Mecray, M.D. Lemcke-Stampone, G.A. Hodgkins, E.E. Lentz, K.E. Mills, E.D. Lane, R. Miller, D.Y. Hollinger, W.D. Solecki, G.A. Wellenius, P.E. Sheffield, A.B. MacDonald, and C. Caldwell, 2018: Northeast. In Impacts, Risks, and Adaptation in the United States: Fourth National Climate Assessment, Volume II [Reidmiller, D.R., C.W. Avery, D.R. Easterling, K.E. Kunkel, K.L.M. Lewis, T.K. Maycock, and B.C. Stewart (eds.)]. U.S. Global Change Research Program, Washington, DC, USA, pp. 669–742. doi: 10.7930/NCA4.2018.CH18

Figure 2. Newton's Required Reductions to Reach Net Zero - Delay Scenarios



In construction, heating/cooling, and transportation, there have been challenges in increasing efficiencies and in converting from fossil fuels to clean fuels. Fortunately, in the past few years, many more affordable and more reliable solutions have come into the market. Solutions now exist to deliver the necessary GHG emissions reductions in the coming years. The City will enact the appropriate policies and programs to encourage and support rapid adoption.

State Context

The Commonwealth of Massachusetts committed to tackle GHG emissions in the Global Warming Solutions Act of 2008, with requirements to reduce GHG emissions 25% from 1990 levels by 2020, and 80% by 2050.[4] (Net zero emissions means reducing GHG emissions to zero or balancing GHG emissions with removal or sequestration.) The Commonwealth has developed energy efficiency and renewable energy programs and incentives to support residents, businesses, and municipalities. However, more efforts are needed. In the models developed by the IPCC, keeping global temperatures from rising more than 1.5ºC requires that we reduce global GHG emissions 45% from 2010 levels by 2030 and that we reach net zero GHG emissions by 2050.[5] State and local climate leaders are committing to the deep GHG emissions reductions necessary to mitigate the current and imminent impacts of climate change.

[4] *An Act Establishing the Global Warming Solutions Act*, Chapter 298 of the Acts of 2008. https://malegislature.gov/Laws/SessionLaws/Acts/2008/Chapter298

[5] IPCC, 2018: Summary for Policymakers. In: Global warming of 1.5°C. An IPCC Special Report on the impacts of global warming of 1.5°C above pre-industrial levels and related global greenhouse gas emission pathways, in the

Local Context

To reach the goal of a carbon neutral Newton by 2050, we must achieve interim goals along the way. This 5-year plan, therefore, lays out some of the most critical interim goals on the pathway to carbon neutrality. Each of these goals has a readily measurable metric (see Action A.1.3. for details on what the City will be measuring to ensure that it is on track to reach its interim and overall goals).

Critical Interim (2025) Goals	2050 Goals
Clean Energy	
84% renewables as Newton Power Choice base	100% renewables as Newton Power Choice base
??% of residents opted up to 100% NPC match	
Transportation	
5% reduction in vehicle miles traveled	20% reduction in vehicle miles traveled
10% of all private cars in Newton be electric	100% of all private cars in Newton be electric
New Construction	
??% all-electric buildings	100% all-electric buildings
Existing Residential Buildings	
?? home energy assessments/year	?? home energy assessments/year
450 insulations and 563 heat pump installs/year	450 insulations and 563 heat pump installs/year
3% reduction in total energy consumption	20% reduction in total energy consumption
??% all-electric buildings	100% all-electric buildings
Existing Commercial Buildings	
15% reduction in total energy consumption	50% reduction in total energy consumption
??% of new units with HERS ≤40	??% of new units with HERS ≥40

Newton is already experiencing the effects of climate change. We have more frequent and more intense floods and more dangerously hot days.

> "Given the magnitude of the changes required, it is clear that residents and business owners will need to be strong partners for the City as a whole to make meaningful reductions in greenhouse gas emissions."
>
> Mayor Ruthanne Fuller

In 2013, the baseline year for this plan, Newton emitted 785,068 metric tons of carbon dioxide equivalent (CO_2e). Emissions from buildings accounted for 64% of Newton's overall emissions, and emissions from transportation made up another 25% (Figure 3). These sectors will be the focus of this plan.

context of strengthening the global response to the threat of climate change, sustainable development, and efforts to eradicate poverty [V. Masson-Delmotte, P. Zhai, H. O. Pörtner, D. Roberts, J. Skea, P.R. Shukla, A. Pirani, W. Moufouma-Okia, C. Péan, R. Pidcock, S. Connors, J. B. R. Matthews, Y. Chen, X. Zhou, M. I. Gomis, E. Lonnoy, T. Maycock, M. Tignor, T. Waterfield (eds.)]. World Meteorological Organization, Geneva, Switzerland, 32 pp.

Figure 3. GHG Emissions in Newton by Sector (2013)

Newton is the "Garden City," a place known for its Olmsted-designed parks, verdant neighborhoods, and 13 village centers. We are a community of thinkers, learners, and doers. Newton's motto, "Liberty and Union," conveys the City's respect for individual freedom along with its understanding of the importance of collective action to advance the common interest.

> "Working together, we must think globally but act locally. That means reducing emissions of CO_2... **It means improving the energy efficiency of our City** buildings and installing solar panels on more of them. It means moving toward sustainable energy."
>
> Mayor Ruthanne Fuller

Newton is also known for its hills: "Heartbreak Hill" has been the undoing of many a Boston Marathoner. The Marathon is an apt metaphor for the process we are beginning with this plan. Decarbonizing our homes, our businesses, our transportation, and our society will be a long trek. The sooner we start, the sooner we will reach the finish line. There will be many challenges and hills to climb along the way, but together we can reach our goal – carbon neutrality.

The City of Newton is facing the challenge of climate change head on.

> With this Climate Action Plan, the City is committing to implement significant GHG emission reduction strategies in the next five years, with goals to reduce – and ultimately eliminate – **the City's GHG emissions.**
>
> This plan focuses on points of municipal leverage: where municipal regulation, leadership, investment, and advocacy can have the greatest impact.

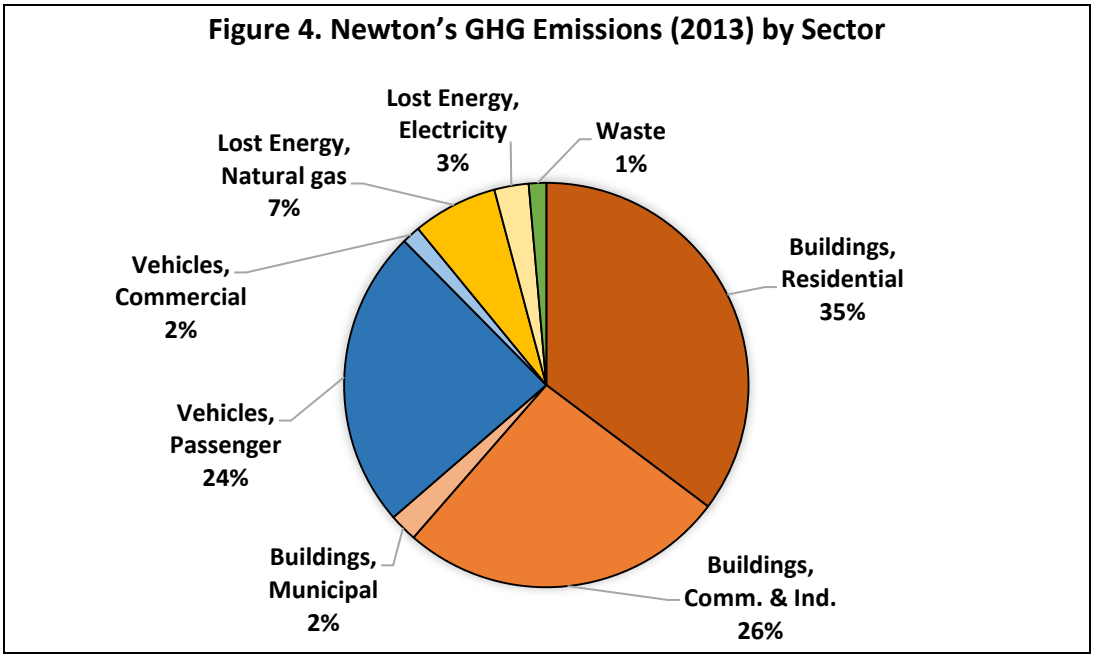
Newton has been addressing issues of sustainability for some time. Newton is designated as a "Green Community" by the Massachusetts Department of Energy Resources. Newton recently completed its Climate Change Vulnerability Assessment Plan (CCVA) and Action Plan, a plan that specifically addresses issues of resiliency in the face of climate change, but which contains many recommendations similar to and supportive of the recommended actions in this mitigation-focused plan. Newton recently updated its Hazard Mitigation Plan. As the City works to implement this Climate Action plan, it will look closely at these other plans to ensure optimal coordination and efficiency. See Appendix A for recommendations from the Climate Change Vulnerability Assessment and Action Plan.

Newton's GHG Baseline

As a part of the City's climate action efforts, the City conducted a GHG emissions inventory with a baseline year of 2013 [based on available data and prior work completed by the Newton Citizens' Commission on Energy (NCCE)]. The Metropolitan Area Planning Council expanded on the work completed by the NCCE to provide the City with a methodology that would be simple and easy to update on a regular basis to track progress toward the City's climate action goals (see Appendix B).

The GHG inventory work found that in 2013, 785,068 metric tons of carbon dioxide equivalent (CO_2e) were directly emitted from the activities of residents and businesses in Newton. Figure 4 provides a summary of Newton's GHG emissions. We can organize this information by sector, as in Figure 4, revealing that buildings and transportation are the largest contributors, or by responsible party (see Figure 8), revealing that residents and businesses are the largest contributors.

Figure 4. Newton's GHG Emissions (2013) by Sector



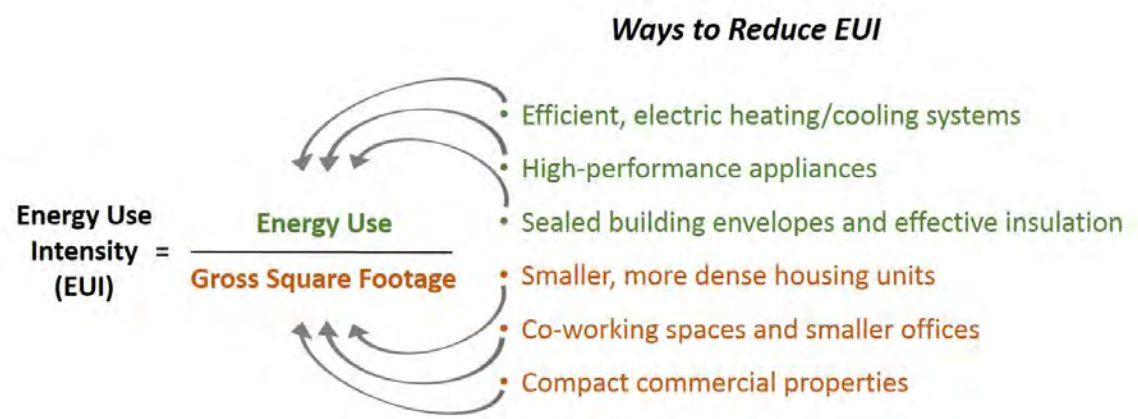
It should be noted that the sector-based approach of the Global Protocol of Community-Scale Greenhouse Gas Emissions Inventories ("GPC") method applied in Newton's 2013 GHG inventory does not include the global impact of GHG emissions from Newton residents' consumption of goods and services. Existing resources point to the need for reducing resource consumption and maximizing of the reuse of materials as important strategies to address the lifecycle GHG emissions associated with goods and services. That said, we are aware that our definition of "carbon neutral" addresses the community's direct GHG emissions from buildings, transportation, etc., and does not focus on "embodied" or indirect consumption-related emissions. Estimates of embodied energy vary widely, depending in part on the timeframe involved.

GHG Contributions by Sector: Buildings (64%)

In Newton, the building sector, excluding municipal buildings, emitted 64% of total GHG emissions identified in the 2013 GHG Inventory baseline. Residential buildings in the City are responsible for the

largest portion of GHG emissions (35.2%), followed by commercial and industrial buildings (26.2%). Energy Use Intensity (EUI) measures the relative efficiencies of buildings of the same size (Figure 5) For residential, commercial, and industrial buildings in Newton, an opportunity exists to reduce GHG emissions through energy efficiency, weatherization, and the purchase or generation of renewable energy supply. Municipal buildings are a much smaller contributor to overall GHG emissions; nevertheless, they represent an opportunity for the City to lead by example through the reduction or elimination of natural gas and heating oil in municipal buildings, utilization of clean heating and cooling technologies, and use of and support for renewable energy.

Figure 5. How to Calculate Energy Use Intensity (EUI) and Ways to Reduce EUI



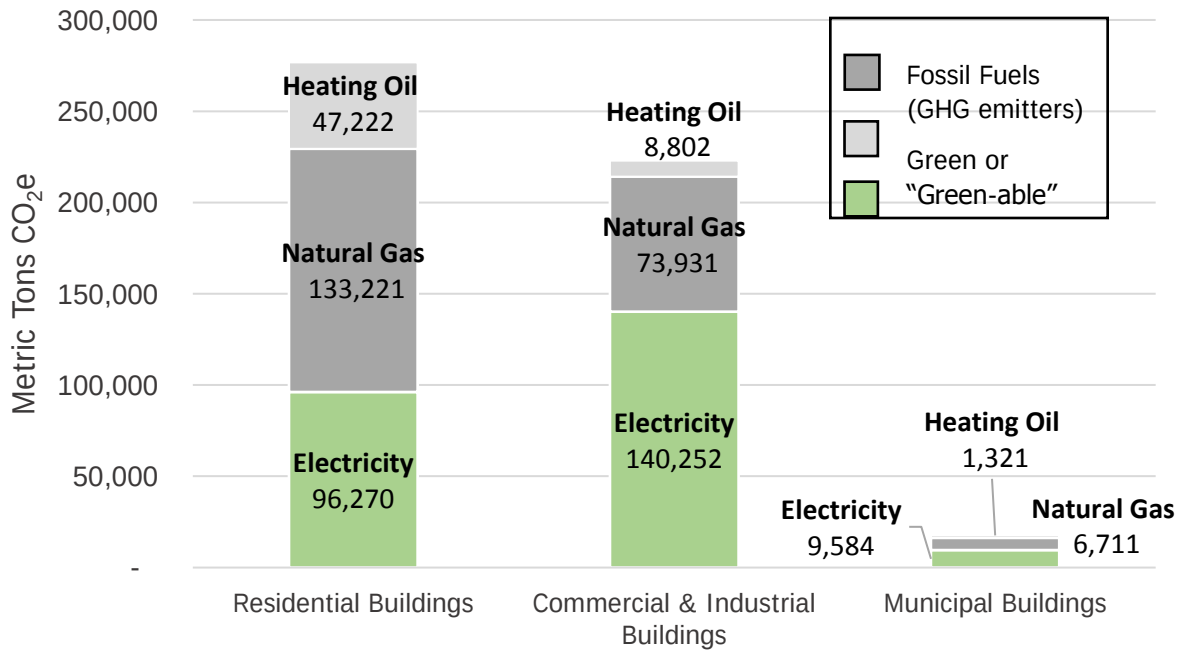
In Newton's residential buildings, natural gas and oil for heating consumption account for nearly two-thirds of total GHG emissions from residential buildings (see Figure 6). Natural gas and oil are fossil fuels that contribute greatly to GHG emissions. We can reduce these GHG emissions by increasing the efficiency of buildings and electrifying then. Using electricity allows building owners to utilize power generated from solar, wind, or other "green"/renewable sources of energy as they become available. In this way we can (re)build our infrastructure to become ever more sustainable as more and more renewable electricity becomes available. Achieving carbon neutrality in the building sector rests on three essential approaches:

(1) For existing buildings currently using natural gas or oil for heat, hot water, and appliances, transitioning to electric and/or renewable power;

(2) For existing buildings with inadequate insulation, retrofitting with air-sealing and insulation to reduce energy losses; and

(3) For all new construction, using low embodied energy materials and building to low energy use standards (e.g., Passive House)

Figure 6. Newton's Building Sector Emissions (2013) by Fuel Type



GHG Contributions by Sector: Transportation (26%)

GHG emissions from passenger and commercial vehicles in Newton are the second largest source of GHG emissions and make up a quarter (25.5%) of the City's emissions.

Achieving carbon neutrality in the transportation sector rests on two essential approaches:

(1) mode shift (to reduce the number of single-occupancy vehicle trips); and

(2) transition of passenger and commercial vehicles to zero-emission vehicles, namely battery electric vehicles (or plug-in hybrid electric vehicles as an interim step to fully electric).

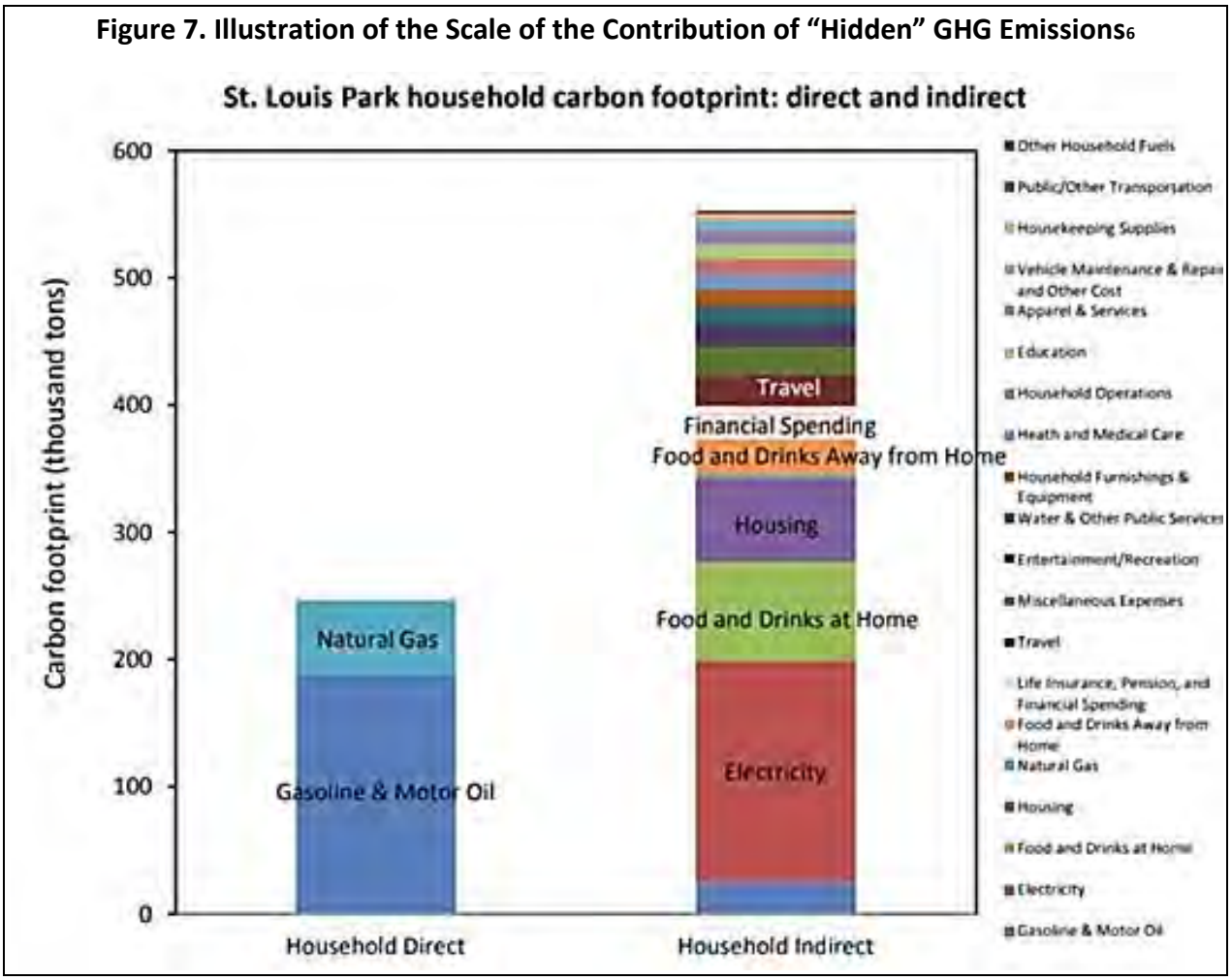
GHG Contributions by Sector: **"Hidden"** Contributions (Significant)

There are two additional "hidden" but huge contributing "sectors" not accounted for in Newton's GHG inventory.

"Embodied energy" or "embodied carbon" is the greenhouse gas emitted during the production and transport of materials consumed in Newton, from building supplies to furniture, to clothing. It can represent an additional 50-100% of total emissions (see Figure 7).

The GHG emissions associated with air travel are also not accounted for in Newton's GHG inventory, yet they are one of the largest contributors to global GHG emissions. Reduction of air travel is one of the most effective means of reducing an individual's carbon footprint. People can explore their own "carbon footprints" at a number of websites, including: https://www3.epa.gov/carbon-footprint-calculator/ and https://www.carbonfootprint.com/calculator.aspx

Figure 7. Illustration of the Scale of the Contribution of "Hidden" GHG Emissions[6]



See Section F for more discussion on these issues.

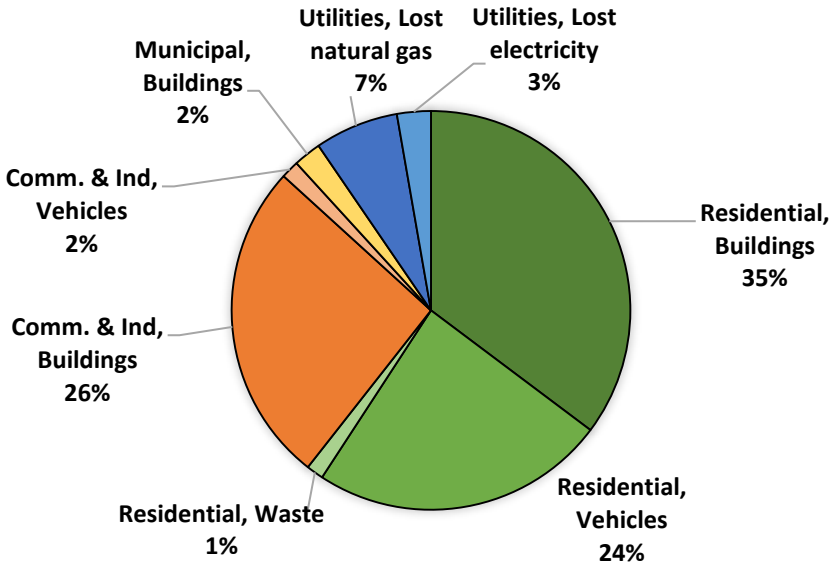
GHG Contributions by Contributing Party: Residents (59%)

Figure 8 breaks down GHG emissions in Newton by responsible party. This figure highlights the point that the greatest opportunities -- and responsibilities -- to reduce the City's GHG emissions lie in the hands of Newton residents and businesses.

The sections of Figure 8 shown in shades of green illustrate that 59% of all direct GHG emissions result directly from citizens' activities. Private homes and vehicles are the single largest contributing factor to our overall carbon footprint. This means that choices made by the residents of Newton will be the single most important determinant in mitigating GHG emissions.

[6] Front and Centered, Oregon https://frontandcentered.org/what-counts-when-we-count-carbon-pollution-lessons-from-oregon/

Figure 8. Newton's GHG Emissions (2013) by Responsible Party



GHG Contributions by Contributing Party: Businesses (27%)

Those sections shown in shades of orange in Figure 8, 28% of all GH emissions, illustrate the contributions by Newton's businesses and industries. Newton's businesses will play a key role in impacting the community's GHG emissions.

GHG Contributions by Contributing Party: Utilities (10%) and Municipal Operations (3%)

Those sections shown in yellow and shades of blue in Figure 8 illustrate that the remaining 14% of GHG emissions result from energy distribution system losses, municipal building and fleet operations, and domestic and industrial waste and wastewater. Energy system losses reflect the sum total of leaking gas, electricity lost in transmission, and other system losses.

What Success Looks Like for Newton and How to Get There

Long-term success is a carbon-neutral Newton by 2050. That is our goal.

The carbon-neutral Newton of 2050 will have electrified vehicles, homes, and appliances; an energy-efficient built environment; transit-oriented neighborhoods and business districts; robust, electrified public transit from the MBTA; significant use of solar panels; well-developed and well-used walking and biking trails; and a generous street tree canopy. These conditions will provide the associated benefits of new job opportunities, reduced energy costs, reduced traffic congestion, improved air quality and improved public health.

> **Carbon Neutrality**
>
> "Carbon neutrality" is achieving net zero greenhouse gas emissions. This is accomplished by eliminating carbon and other GHG emissions altogether and by balancing any remaining GHG emissions with "carbon sequestration" (removing GHG emissions from the air by storing it in natural areas, like trees and soils, or manmade "mines"), and potentially by "carbon offsetting" (buying carbon credits from elsewhere).

In the shorter term, success will set Newton on a pathway to carbon neutrality. The steps laid out for the first five years of the City's commitment to climate action, when implemented, put the City on the pathway toward achieving this goal. The success of this plan will be measured through action-specific performance indicators outlined herein.

To achieve its goal, Newton will have to embrace the strategic mantra:
"Use less and green the rest."

Use Less: We must take every opportunity to reduce the energy consumed by and embodied in buildings and transit by insulating our homes, reducing travel, and reducing consumption.

Green the Rest: We must take every opportunity to stop using fossil fuels to generate power in our buildings (coal, natural gas, and oil are the greatest contributors of GHG emissions) and instead use renewable energy sources (solar and wind) to create clean/green electricity. We must replace our gasoline-powered cars and lawn mowers and our natural gas fired boilers and water heaters with efficient electric replacements. And we must capture carbon from the atmosphere by expanding our urban forests and green infrastructure.

Image from Newton Mothers Out Front

Concerted individual efforts and new partnerships will be necessary for success. The Administration and staff will have to direct the power of City Hall to help educate, advocate, and promote real change. And residents and businesses will have to accept the magnitude of the challenge and make the changes necessary to achieve success. Individuals must take one or more actions over the next five years for this plan to be a success, and then build on that.

"Reducing energy use is not about doing without – it is about doing without waste"

--Daniel Yergin (author, speaker, energy expert, and economic historian)

The Top 10 strategies to be employed are:

Establishing Teams and Partnerships

1. Create a City implementation team, develop appropriate municipal planning and budgeting processes, and ensure regular Plan evaluations and updates (A.1.)
2. Work with partners to build awareness and drive action (A.2.)

Use Less

3. Increase rate of biking, walking, telecommuting, shared rides, and use of shuttles and public transit, while reducing single-occupancy vehicle trips (C.4.)
4. Advocate for a more energy-efficient and climate-smart building code (D.1.)
5. Work with City Council to adopt Zoning Ordinance amendments that require and/or incentivize high-efficiency performance and/or net-zero new construction – within the next 12 months (D.3.)

Green the Rest

6. Increase the amount of electricity provided by New England renewable energy resources (B.1.)
7. Ensure that municipal infrastructure and operations are as "green" as possible (C.1.)
8. Incentivize residents to switch to EVs with a goal of having 10% of all vehicles on the road be EV, BHEV, ZEM, PHEV+ by 2024 (C.2.)
9. Transition to electric and thermal heating and cooling in residential and commercial buildings (E.2.)
10. Consider initiatives to engage businesses and residents in reducing GHG emissions resulting from corporate operations and individual activities (F.1.)

The following 6 sections or focus areas identify 53 specific specific actions to reduce GHG emissions and make significant progress toward achieving carbon neutrality by 2050. The recommended actions focus on points of municipal leverage where the City can reduce municipal emissions or support emissions reductions in the broader Newton community.

A. Implem**enting Newton's Climate Action Plan**: The City is committed to ensuring the success of this Climate Action Plan by adapting internal operations, working with dedicated partners, and tracking our progress with specific metrics.

B. Promoting Clean and Renewable Energy: "Greening" the sources supplying electricity to the City is vital to the pathway to carbon neutrality. The City will promote and expand Newton Power Choice, increase local renewable energy production through the installation of municipal solar arrays and the promotion of private solar installations, and offset its own GHG emissions with the purchase of renewable electricity supply.

C. **Greening Newton's Transportation and Streetscapes**: The second largest source of GHG emissions in Newton comes from on-road transportation. The City will support Newton's residents, workforce, and visitors in switching to battery electric and plug-in hybrid vehicles; reducing single-occupancy vehicle trips; and increasing biking, walking, telecommuting, public transportation, and shared trips. .

D. Improving New Construction and Major Renovations: Energy use reduction and electrification are the backbones of any GHG emissions reduction plan. As new developments are built and renovations are undertaken, the choices made by developers and architects will have a significant impact on the City's GHG emissions profile. To the extent legally permissible, the City will take steps to ensure that construction meets standards necessary to achieve carbon neutrality by 2050.

E. Improving Existing Buildings: Existing residential and commercial buildings in Newton are responsible for a majority of the City's GHG emissions. The City will work with homeowners to increase energy efficiency and reduce reliance on natural gas and heating oil in the City's existing building stock. Moving the needle for existing buildings will require the City to put in place "carrots and sticks" to incentivize significant action by the private sector.

F. Reducing Emissions associated with Consumption and Disposal: We will work to protect and enhance the City's natural resource base and help Newtonians limit their consumption and disposal of goods and services.

Recommended Actions: 2020-2024

A. Implementing **Newton's** Climate Action Plan

Newton's Implementation Leadership Strategies

- Create an appropriate municipal implementation structure and processes
- Foster collaboratives of businesses promoting adoption of clean energy technologies and practices to build awareness and drive action

A plan is only as good as its implementation. The City is committed to ensuring the success of this Climate Action Plan by revising internal coordination and working with dedicated partners.

A.1. Create a City implementation team, develop appropriate municipal planning and budgeting processes, and ensure regular Plan evaluations and updates

A.1.1. Transform the existing Major Projects and Infrastructure Cluster into the Major Projects, Infrastructure, and Climate Change Cluster to oversee implementation and track the progress of this Plan.

The new Cluster (an interdepartmental working group) will include, but not be limited to, representatives from the Sustainability Department, Planning Department, Department of Public Works; Public Buildings Department; Parks, Recreation, and Culture Department, and the Mayor's Office. Decision makers will view all decisions with a climate focus, spanning the panoply of municipal endeavors. While the Sustainability Director(s) will be the project manager(s) for the implementation of the Climate Action Plan, all members of this Cluster will help oversee the implementation of the plan, analyze the efficacy of actions (based on the "key performance indicators" for each action), and ensure that annual progress reviews are undertaken.

Members of the Cluster will collaborate with the Newton Citizens Commission on Energy, City Council, Newton-Needham Chamber of Commerce, Green Newton, Charles River Watershed Association, neighboring communities and other local and regional advocacy and action groups.

Members of the Cluster will coordinate with the Metro Mayors Coalition (MMC) Climate Preparedness Taskforce to share best practices learned, access shared resources, and advocate for changes at the state level.

- Examples: Existing Newton City Hall clusters
- Metric(s): Regular Cluster meetings, identification of specific projects and project leaders
- Implementer: Major Projects, Infrastructure, and Climate Change Cluster

A.1.2. Develop more concrete estimates of costs and fiscal benefits for each action in this plan and incorporate funding categories or appropriate metrics in the FY 2021 CIP prioritization process to reflect the priorities of this plan and other related plans (such as the Climate Change Vulnerability Assessment and Transportation Plan).

The Cluster will assess the City's staff capacity to determine whether it will be necessary to add additional staff and/or hire consultants to support the implementation of this and other climate-related plans. The Cluster will engage relevant City staff in implementation of initiatives and will ensure that the plan is used to inform municipal priorities.

This plan reflects Newton's first effort to compile background information and generate a comprehensive set of recommended actions designed specifically to reduce GHG emissions. This plan does not contain detailed information on the anticipated costs of individual reduction efforts (capital, operating, staff, etc.) or the magnitude of expected GHG reductions. Such information is important and will be added as the plan is refined and updated. It is clear, however, that the success of this plan requires investments of time and money. It is understood that both time and money are in short supply, and many worthy investments, from public safety to affordable housing, also deserve increased funding and human resource support.

As a community we also have to think strategically about how costs and benefits are evaluated. We must consider and compare all benefits and all costs of action and inaction over long time horizons. Individual residents will have to commit their own resources of time, money and behavior change.

As priority actions are identified, costs will be scrutinized, and questions will be wrestled with.

- Who will pay for new initiatives? The City's taxpayers? Individual residents? Businesses?
- Are the proposed costs short-term or long-term?

Benefits will also be scrutinized. It should be noted that taking action to address climate change not only reduces GHG emissions, it can also result in cost savings and quality of life improvements (see Figure 9). Some actions raise costs in the short term but save money in the longer term. Other actions can result in immediate cost savings. For example, new net-zero buildings, some brands of electric vehicles, and additional City staff devoted to implementation of new programs may require significant investment up front but will save money in the long term. On the other hand, by installing solar panels and switching to LED lighting, the City has saved millions of dollars in the short run. Similarly, individuals who adopt energy efficiency measures, unplug unused devices, participate in the Newton Power Choice program, and eat less meat save money, even in the short run. Some actions cost more yet have significant reductions in GHG emissions. The City should continue to pursue all "win-win" actions and should encourage residents and businesses to do the same.

Similarly, **"externalities"** (costs that we all pay but don't recognize or explicitly account for) need to be considered. Examples of externalities include the health care expenses associated with breathing dirty air or the costs of providing flood relief. Addressing climate change can help eliminate these "silent costs."

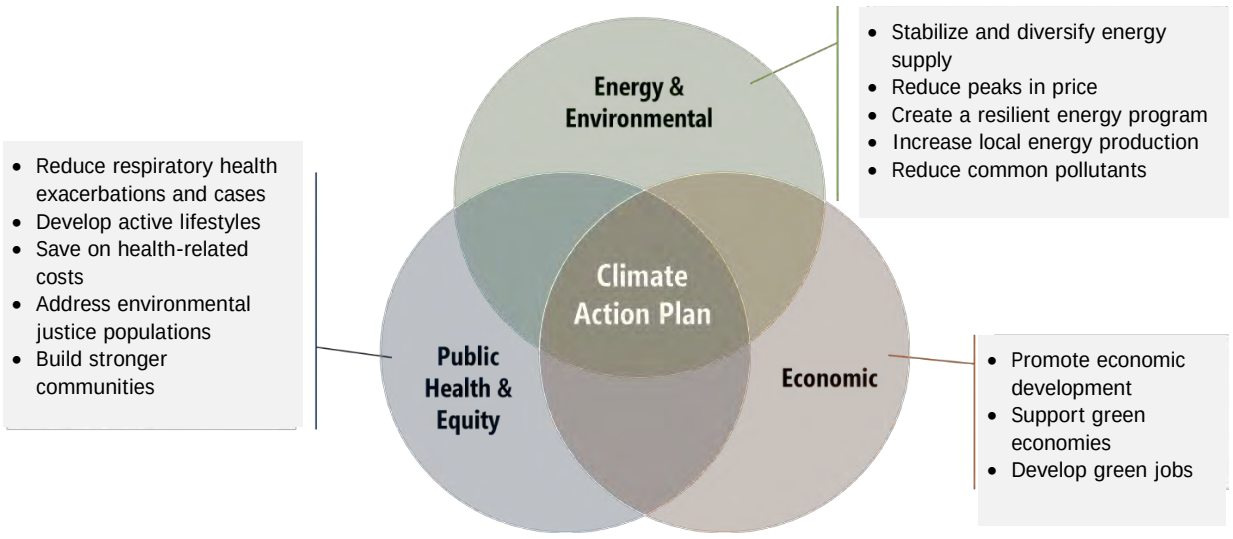
The value of leadership in addressing climate change will also be considered. One example of the benefits of strong leadership is the City's experience with Newton Power Choice, the City's "municipal electricity aggregation" program. By choosing a high standard level of renewable resources (i.e., 60%), Newton has encouraged other cities and towns, like Lowell and Watertown, to increase the percentage of renewables in their own aggregation programs.

Newton should continue to consider the importance of its leadership role as it makes difficult policy choices.

Ultimately, climate change priorities will have to be incorporated in the City's Capital Investment Plan (CIP) and annual operating budgets.

- Examples: none
- Metric(s): Clear documentation of project costs and benefits, information incorporated in CIP documents
- Implementer: Major Projects, Infrastructure, and Climate Change Cluster, CFO

Figure 9. Co-Benefits of Climate Action



A.1.3. Evaluate the success of initiatives in this plan -- collect data on immediate and measurable results.

Ultimately, the Climate Action Plan will be successful to the extent that it results in lower GHG emissions.

Directly measuring the City's GHG emissions is difficult and often the data isn't available until years after the fact. For example, as of late 2018, MAPC had released data on GHG emissions from miles driven by vehicles registered to Newton residents only through 2014.

In addition, the actions of the City itself will have only indirect impacts on GHG emissions. For example, while the plan calls for providing EV chargers and preferred parking for EVs as a way to generate awareness and to entice residents to make EV purchases, in the end, it is the residents who make EV purchases. After the City has implemented a well-executed preferred parking program and if EV purchases have not met targets, the City should reevaluate its plans and consider new initiatives.

Additionally, many of the actions the City will take between 2020 and 2024 will have a very small impact on emissions in the near term. For example, it would be a major accomplishment to have 20 new homes built to Passive House standards in 2020. However, that accomplishment would have a negligible impact on 2020 emissions. Nonetheless, 20 new homes built to Passive House standards is important.

Despite these challenges, the City will collect data on immediate and measurable results.

1. Clean Energy
    a. Percent of renewables as Newton Power Choice baseline
    b. Percent of residents opted up to 100% NPC match
2. Transportation
    a. Percent reduction in vehicle miles traveled
    b. Percent of all private cars in Newton that are electric
3. New Construction
    a. Percent of all-electric buildings
4. Existing Residential Buildings
    a. Number of home energy assessments per year
    b. Number of insulations and number of heat pump installs per year
    c. Percent reduction in total energy consumption
    d. Percent of buildings that are all-electric
5. Existing Commercial Buildings
    a. Percent reduction in total energy consumption
    b. Percent of new units with HERS ≤40
6. The other individual performance indicators identified in this plan

- Examples: none
- Metric(s): Annual reports provided to the public, documentation from individual projects
- Implementer: Major Projects, Infrastructure, and Climate Change Cluster, Sustainability Department

A.1.4. Update the Greenhouse Gas Inventory every 3 to 5 years.

Appendix C provides the City with an easily updatable framework for the GHG inventory. Appendix B provides a detailed description of the methods applied and data sources for the inputs necessary to update the inventory.

- Examples: the GHG inventory in Appendix E
- Metric(s): A current GHG inventory
- Implementer: Major Projects, Infrastructure, and Climate Change Cluster, Sustainability Department

A.1.5. Review the Climate Action Plan regularly.

The City will review the Climate Action Plan regularly throughout the process of detailed planning, budgeting and implementation. The City will continue to evaluate the need and opportunity for the increased stringency of this plan. Only through continuous adaptation based on measurable results can the City achieve its climate goals.

- Examples: none
- Metric(s): Annual reports provided to the City Council

- Implementer: Major Projects, Infrastructure, and Climate Change Cluster, with municipal, volunteer, and private partners

A.1.6. Update the plan as needed, but at least every 5 years.

This plan will be updated as needed to account for the City's progress in meeting its goals, fiscal conditions, policy changes, technological advancements, and other developments beyond the control of the municipal government. At a minimum, it will be updated every 5 years.

- Examples: This Plan
- Metric(s): Revised Climate Action Plan
- Implementer: Major Projects, Infrastructure, and Climate Change Cluster

A.1.7. Provide annual updates to the City Council.

Annual reports will be provided to the City Council on this plan's progress.

- Examples: none
- Metric(s): Annual reports provided to the City Council
- Implementer: Major Projects, Infrastructure, and Climate Change Cluster

A.2. Work with partners to build awareness and drive action

A.2.1. Promote energy efficiency and GHG emission reduction in the Newton community through a Memorandum of Understanding with Eversource and National Grid.

Eversource and National Grid, Newton's electric and natural gas providers, have ratepayer funded programs available to help all customers make their buildings more efficient and support the installation of EV charging stations. These programs provide customers energy assessments, financial incentives, and information, primarily through the Mass Save organization.

The City is working with both utilities and the Newton Citizens Commission on Energy to develop a Memorandum of Understanding (MOU) with the utilities, with a goal of increasing uptake by Newton customers of these energy programs. The goal of this MOU is to get greater participation by more Newton customers in the programs. The MOU will address programs for residences and businesses to help them implement more measures that will save energy and reduce GHG emissions.

- Examples: none
- Metric(s): Signed MOU
- Implementer: Sustainability Department, Mayor's Office

A.2.2. Develop an Energy Coach Role.

A new role in the City, an "Energy Coach," will be initiated in FY 2021 if funding is made available (see action A.2.1.). The Energy Coach will, initially:

(1) Create and maintain a repository of locally relevant energy information and provide information on the City's website, www.newtonma.gov/climate, through the climate action newsletter, and in-person at City Hall.

(2) Build relationships with qualified contractors to increase participation in energy efficiency upgrades.

(3) Provide information to residents, developers, and businesses applying for building permits, wetland permits, and special permits about clean heating and cooling technologies and efficient appliances and about grants or other financing for buildings currently heated with gas or oil (currently more than 90% of residential, retail, and office buildings in Newton). The Energy Coach will develop outreach programs to improve access to incentive programs across the community and particularly in underserved sectors (e.g., landlords/renters), targeting buildings with the worst energy performance, such as the 9,000+ homes and businesses in Newton currently heated with oil, and other areas of greatest opportunity. The Energy Coach will focus on ways to tighten building envelopes through the Mass Save program and other vendors. The goal is to triple the number of homes and businesses participating in energy assessments and implementation of major energy efficiency measures.

(4) Coordinate with community organizations to implement a community-wide, energy-efficiency outreach program to significantly increase uptake of energy efficiency measures including clean heating and cooling technologies.

(5) Promote the resources available from Mass Save, the Massachusetts Clean Energy Center (MassCEC), and others to support the installation of these systems.

- Examples: Boston[7], Cambridge[8],Energy Smart Bangor[9]
- Metric(s): Creation of an Energy Coach role; number of homes and businesses undertaking energy efficiency retrofits; dollars of energy system upgrade incentives; dollars of private investment leveraged
- Implementer: Sustainability Department(with support from, the Newton Citizens Commission on Energy, and local environmental groups), Utility Providers

A.2.3. In collaboration with the Utilities, work with the largest energy users in the City to reduce their GHG emissions.

Newton is home to many large businesses and institutions that can play key roles in making Newton a Green City and in the implementation of this Climate Action Plan and reducing the community-wide greenhouse gases in Newton. Establishing a leadership group will help raise the visibility of the Climate Action Plan among commercial property owners, businesses, and institutions, and encourage them to develop their own initiatives to reduce GHG emissions and share best practices. Membership in such a collaborative would likely begin with the City's largest energy users. Members would develop MOUs with the utilities pledging to achieve specific GHG improvements (e.g., reductions in energy use, installation of EV charging stations, and on-site solar generation) in return for incentives from the utilities. By engaging a relatively small group of stakeholders and by leveraging their support for smaller local businesses to undertake similar improvements, significant reductions of GHG emissions could result.

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[7] City of Boston, MA. "Greenovate Boston 2014 Climate Action Plan Update," p. 32 https://www.boston.gov/sites/default/files/greenovate_boston_2014_cap_update.pdf

[8] City of Cambridge, MA. "The Getting to Net Zero Framework," p. 17 https://www.cambridgema.gov/CDD/Projects/Climate/~/media/D74193AF8DAC4A57AC96E2A53946B96B.ashx

[9] The City of Bangor, Maine used unexpected budget surplus funds left over after oil prices were lower than anticipated to start the Energy Smart Bangor program which provided additional incentives for its residents to participate in the Efficiency Maine program, similar to Mass Save. More information at http://www.bangormaine.gov/energysmartbangor.

The Sustainability Department will work with the Newton Citizens Commission on Energy, Newton-Needham Chamber of Commerce, the Economic Development Director, and Green Newton to develop the right group mechanism to support, incentivize, and educate businesses and organizations in the City of all sizes. That group will also work with Eversource and National Grid to recruit and support new members of an enlarged leadership group in developing MOUs for energy efficiency.

- Examples: none
- Metric(s): Number of large users participating in MOU
- Implementer: Mayor's Office, Sustainability Department, Planning Department, and Partners

A.2.4. Work with the Newton-Needham Chamber of Commerce and the NCCE to explore possible structures for a "Green Ribbon Commission" and implement the preferred model.

Explore models that would best educate and incentivize businesses of all sizes to reduce their GHG emissions. Consider advertising and promoting achievers with awards and public recognition events.

- Examples: Boston Green Ribbon Commission[10], Cleveland's 2030 District[11]
- Metric(s): Establishment of Green Ribbon Commission, GHG reduction commitments from participating members
- Implementer: Mayor's Office, Sustainability Department, Planning Department, Economic Development Commission, N-N Chamber of Commerce, Green Newton

Successful Community Engagement Strategies from other Cities

Community Summits have been highlighted as a successful tool to engage community in Boston, Chicago, and other cities. The City of Chicago's Climate Action Plan recommends bringing stakeholders together every five to six months to keep stakeholders informed of progress and ensure community-wide buy-in. http://www.chicagoclimateaction.org/

External Advisory Groups for focus areas with representatives from key partner organizations such as business and industry associations, other levels of government, non-government organizations and academia has been a highlight throughout multiple CAPs to ensure accountability for goals progress. Identifying a responsible group of individuals to implement certain goals helped many cities to stay on track and collect better data.

The City of Paris engages stakeholders in a creative way by providing an opportunity to become **"Partners" in the Paris Climate and Energy Action Plan**. By signing a partnership agreement, stakeholders receive the status of "Sustainable Paris Doers." This stakeholder network, led by the City of Paris, acts as a social network and lists all eco-actions and showcases Doers, encourages exchange of sustainable ideas, offers practical tools, and hosts monthly free events that are open to public. https://parisactionclimat.paris.fr/fr/propos

[10] The Boston Green Ribbon Commission is a "group of business, institutional, and civic leaders in Boston working to develop shared strategies for fighting climate change in coordination with the City's Climate Action Plan." https://www.greenribboncommission.org/

[11] 2030 Districts are "organizations led by the private sector, with local building industry leaders uniting around a shared vision for sustainability and economic growth – while aligning with local community groups and government to achieve significant energy, water, and emissions reductions within our commercial cores." http://www.2030districts.org/

Newton's Municipal Climate Leadership Accomplishments and On-Going Efforts

- As a Green Community, Newton has leveraged over $1.3 million dollars of grants for municipal energy conservation measures in buildings and fleet resulting in 12% less municipal energy use since 2010.
- The City has transitioned nearly half of the interior lighting in its buildings and all of its streetlights to energy-efficient fixtures.

B. Promoting Clean and Renewable Energy

Newton's Clean and Renewable Energy Strategies

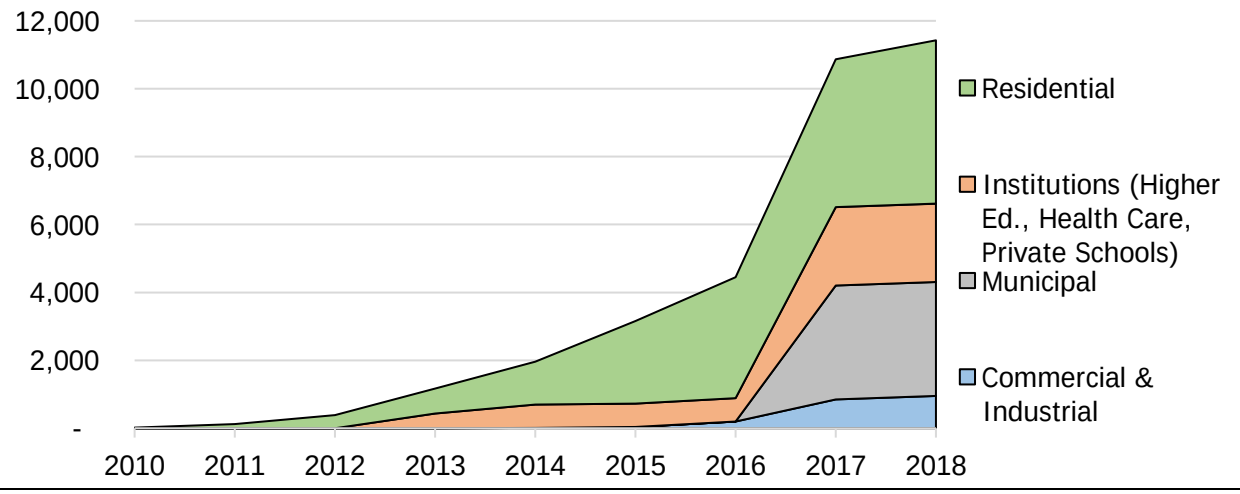
- Increase renewable energy production in New England and the percentage of residents and businesses opting up to 100% renewable energy through Newton Power Choice
- Increase residential and commercial solar production in Newton
- Support advocacy groups' efforts to transition from natural gas to renewable energy systems

To eliminate carbon emissions altogether or to achieve a net-zero carbon footprint will necessitate deep reductions in overall energy consumption through increased energy efficiency, energy conservation, and management of energy demand *and* a transition from fossil fuels to renewable energy. We must, therefore, work to harness clean energy from renewable sources (e.g., solar and wind) for the generation of "clean" electricity.

While an impressive amount of solar PV has already been installed in Newton (see Figure 10), there is more untapped potential for solar on the rooftops of Newton's homes, municipal buildings, and businesses as well as solar canopies on parking lots.

Both solar thermal and geothermal energy present other opportunities to increase the use of renewable sources of energy in Newton.

Figure 10. Renewable Energy in Newton Total kW of Nominal Capacity* (DOER 2018 SREC Data)



**Nominal Capacity* *is the theoretical full-load sustained output of a facility (e.g., power plant, generator,*

B.1. Increase the amount of electricity provided by New England renewable energy resources

B.1.1. Encourage residents and businesses to opt up to 100% renewable energy through Newton Power Choice.

To increase the percentage of residents and business that choose to opt up through Newton Power Choice, the City will continue its ambitious "Opt-Up" campaign involving a variety of public outreach mechanisms to encourage electricity customers to choose 100% renewable power. This includes installing signs throughout the City, sending email messages and other communications from the City to electricity customers, and continuing a well-publicized competition between Newton and Brookline to achieve the highest percentage of opt-up customers. By mid-2019, more than 6% of Newton residents who were on Eversource Basic service have opted up to 100%. This is higher than any other Massachusetts municipality.

- Examples: Newton[12], Arlington[13]; Somerville[14]; Brookline[15]
- Metric(s): Number of customers that opt up through Newton Power Choice, additional renewable energy purchased
- Implementers: Sustainability Department, Local Environmental Organizations

B.1.2. Explore increasing the percentage of MA Class 1 RECS in the City's next Newton Power Choice contract.

As of mid-2019, Newton Power Choice has a higher standard level of renewables (i.e., 60%) than any other municipal aggregation program in the State. When the current Newton Power Choice 22-month contract expires, Newton will go out to bid again for an electricity supplier and, bid prices permitting, will increase the standard percentage of renewables in the program. With the next contract, Newton will again engage in an ambitious campaign to persuade electricity customers to choose 100% renewables.

Newton will also continue its efforts to persuade the state Department of Public Utilities (DPU) to facilitate the adoption of successful "green" municipal aggregation programs in other communities.

- Examples: none
- Metric(s): Increased percentage of Class I MA RECs
- Implementer: Sustainability Department, Mayor's Office

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[12] Through Newton Power Choice, residents and business in Newton are buying renewable electricity to match 60% of their electricity use, which is the highest amount of any community electricity aggregation program in Massachusetts. https://masspowerchoice.com/newton

[13] The Town of Arlington provides residents and businesses with a simple way to opt up to 100% renewable energy through their Community Choice Aggregation website. https://arlingtoncca.com/opt-up/

[14] The City of Somerville offers an option online for residents and business to subscribe to 100% local green energy through their community choice electricity program. https://somervillecce.com/opt-up-to-premium-100-local-green/

[15] The Town of Brookline provides residents and businesses with a simple way to opt up to 100% renewable energy through their community choice aggregation website. https://brooklineoptup.com/

B.1.3. Explore increasing the percentage of MA Class 1 RECS in the City's next municipal electricity contract.

Like other large electricity customers, Newton enters into a contract for electricity with a competitive supplier, in order to minimize the electricity costs for the City as compared to the cost of Eversource Basic Service. In the pending contract, entered prior to the City's launch of Newton Power Choice, the City matches 5% of its electricity consumption with MA Class I RECs. When that contract expires, the City will seek new bids for electricity and, prices permitting, will increase the percentage of MA Class I RECs in its power purchase or consider joining Newton Power Choice.

- Examples: none
- Metric(s): Increased percentage of Class I MA RECs
- Implementer: Sustainability Department, Mayor's Office

B.2. Support the installation of residential and commercial solar

B.2.1. Work with City Council to adopt a zoning requirement that all new buildings with a certain roof area require solar PV where technically feasible, and other "eco-roof" treatment where appropriate. (See D.3.4.)

B.2.2. Support Green Newton's efforts to implement the Newton Solar Challenge for residents and businesses which encourages the installation of rooftop solar.

To follow up on the implementation of Solarize Newton in 2013, the City will support community groups' efforts to implement a Solarize Plus program for residents.

- Examples: Lowell[16]; Lincoln, Wayland, and Sudbury[17]
- Metric(s): Number of renewable energy installations by technology and size
- Implementer: Green Newton, Sustainability Department

[16] The City of Lowell participated in the 2018 Solarize Plus Mass program offered by MassCEC. Their outreach program provides educational information and advertises solar and heat pump options for residents. https://solarizelowell.com/

[17] The Towns of Lincoln, Wayland, and Sudbury participated in the 2017 Solarize Plus Mass program offered by MassCEC. Their outreach program provided education information and advertised solar and solar hot water options for residents. https://solarflair.com/solarize/solarize-lincoln-wayland-sudbury/

B.2.3. Work with the Housing Authority to install solar PV on their buildings under the state's SMART incentives.

The City will explore project options in partnership with the Housing Authority (which controls ~360 units at 10 locations) that may allow the City to access low-income community shared solar incentive "adders." Adders, offered through the Department of Energy Resources' SMART program[18], increase the incentive amount if the proposed solar system has other desirable features (e.g., energy storage capabilities, community shared solar, etc.).

- Examples: Resonant Energy Pilot Projects in Boston[19]
- Metric(s): Number of low-income customers served
- Implementer: Sustainability Department, Planning Department, Newton Housing Authority

B.3. Support advocacy groups' efforts to transition from natural gas to renewable energy systems

B.3.1. Support HEET in its efforts to pilot neighborhood-scale conversion to all-electric heating and cooling systems for neighborhoods in which there is a high prevalence of leak-prone gas infrastructure.

HEET, a non-profit working on energy efficiency, gas leak repair, and clean energy transition, is in the midst of studying the feasibility of GeoMicroDistricts to wean neighborhoods off of natural gas and onto clean heating and cooling systems. To address emissions from fugitive natural gas leaks, HEET will use data from National Grid to identify high-opportunity neighborhoods where there is high prevalence of leak-prone infrastructure, and then assess the feasibility of a neighborhood-level full electrification pilot in partnership with National Grid – supporting the transition from fossil fuel infrastructure to a clean heating and cooling systems.

- Examples: none
- Metric(s): Number of customers switching to clean heating and cooling systems
- Implementer: Sustainability Department, Planning Department, Department of Public Works

[18] DOER created the Solar Massachusetts Renewable Target (SMART) Program to create a long-term sustainable solar incentive program that promotes cost-effective solar development in the Commonwealth. This webpage provides an overview of past and planned public meetings, relevant documents, presentations, and reports related to the new program. https://www.mass.gov/solar-massachusetts-renewable-target-smart

[19] Through partnerships with local nonprofits, Resonant Energy delivers high quality solar arrays for houses of worship, affordable housing providers, and homeowners regardless of income. http://www.resonant.energy/

Newton's Clean and Renewable Energy Accomplishments and On-Going Efforts

- Solar PV
  - The City has installed more municipal solar PV than any town or city in Massachusetts and will build another 2.1 MW of solar in its third phase. Newton now has solar PV installations on 12 municipal buildings and parking lots and has 17 more installations in progress.
  - The 12.01 megawatts of renewable energy already installed across Newton generates roughly 14,000 megawatt hours of electricity – the equivalent of 30% of today's municipal electric demand or 2,000 average homes in Newton.
  - The City is now working on "Phase III" of its solar installation efforts.
- Newton Power Choice
  - The City set a 60% renewable energy default for its program, 46% above the state's Renewable Portfolio Standard of 14%. As of mid-2019, it is the highest renewables default levels of any municipal aggregation program in Massachusetts. Residents automatically match 60% of their electricity use with renewable energy and can "opt up" to 100%.
- Solarize
  - Solarize Newton facilitated the installation of 64 residential solar arrays.

C. Greening **Newton's** Transportation and Streetscapes

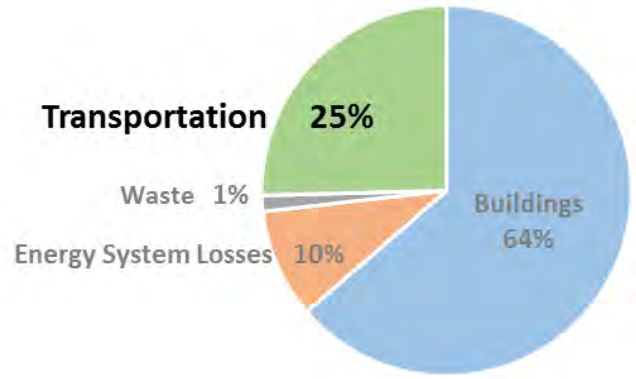
Newton's Green Transportation and Streetscape Strategies

- Decrease single occupancy vehicle trips and vehicle miles travelled (VMT) by engaging with third-party partners to increase the rate of biking, walking, telecommuting, shared rides, and use of shuttles and public transit
- Increase adoption of EVs by engaging with third-party partners to promote EVs.
- Improve municipal infrastructure and implement programs and policies that are as "green" as possible
- Incentivize residents to switch to EVs with a goal of having 10% of all vehicles on the road be EV, BHEV, ZEM, PHEV+ by 2024

Newton residents own nearly 73,000 cars, an average of over 2 cars per household. Every year, Newton residents purchase roughly 6300 new vehicles, making the average car ownership period 9.2 years. In Massachusetts in 2018, almost 70% of all new vehicle purchases were SUVs, light trucks, and vans (vehicles with very low fuel economy). Newton drivers average over 40 miles per day and average only 23 miles per gallon. Only 5% of cars in Newton are hybrids and only 1% are electric. [Data collection Courtesy of Newton Citizens Commission on Energy and the Newton Citizen Climate Action Plan (May 2019).] Fortunately, prices of EVs have been dropping rapidly and, with greater competition, will likely continue to drop. EV charging stations are becoming more common, and EV technologies are improving rapidly.

GHG emissions from passenger and commercial vehicles registered within the City of Newton make up a quarter of City-wide emissions and are the second-largest emitting sector after building energy consumption (Figure 11). This data includes all trips taken by Newton residents inside and outside of the City; it does not account for emissions that result from pass-through traffic of non-Newton vehicles (e.g., vehicles that drive through Newton on the Massachusetts Turnpike).

Figure 11. GHG Emissions (2013) in Newton: Transportation Sector



In 2018, only roughly 1% of all vehicles registered were battery electric (Figure 12 and Figure 13). There is, therefore, a tremendous opportunity to reduce vehicular carbon emissions by transitioning to more low- and zero-emission vehicles. The increasing trend of EVs and PHEVs being purchased is encouraging and is increasing.

Figure 12. Number of Cars Registered in Newton

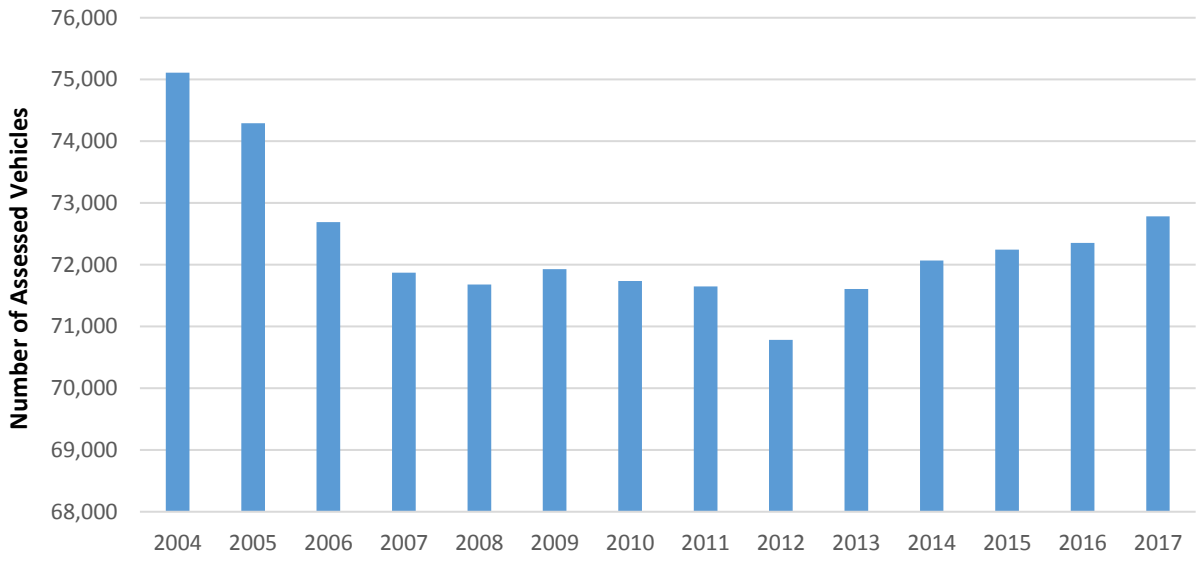
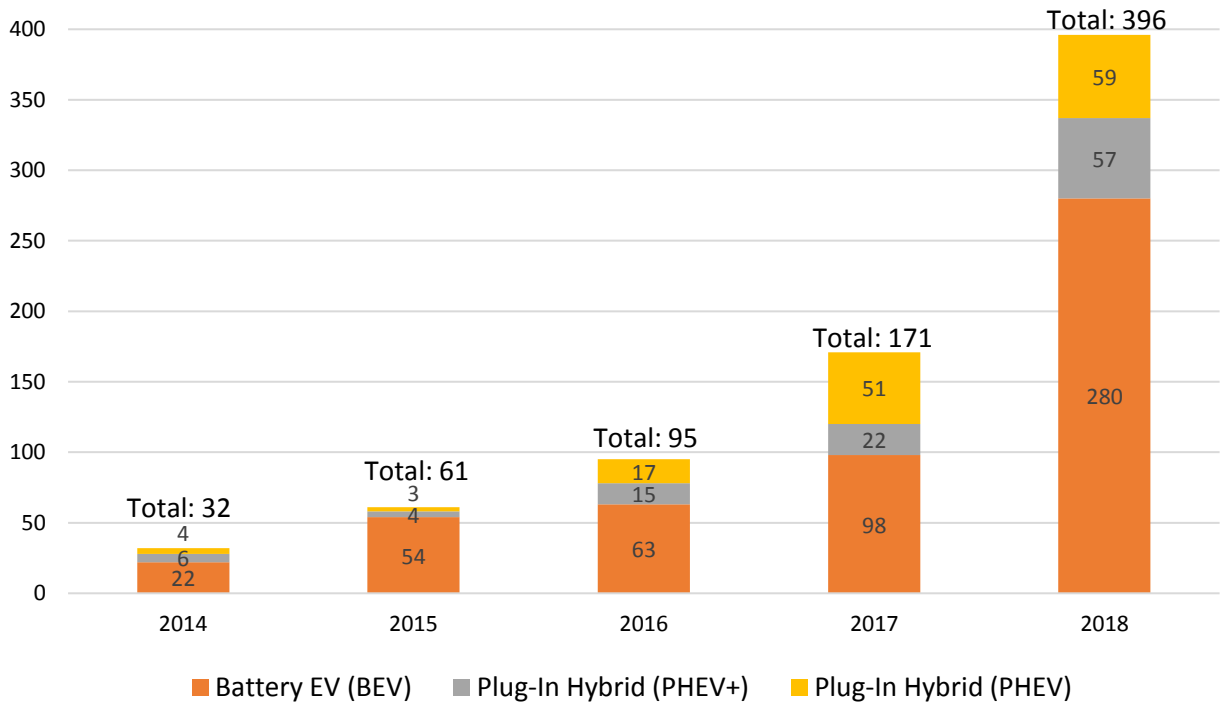


Figure 13. Electric Vehicle Purchases in Newton (by Year and Type)

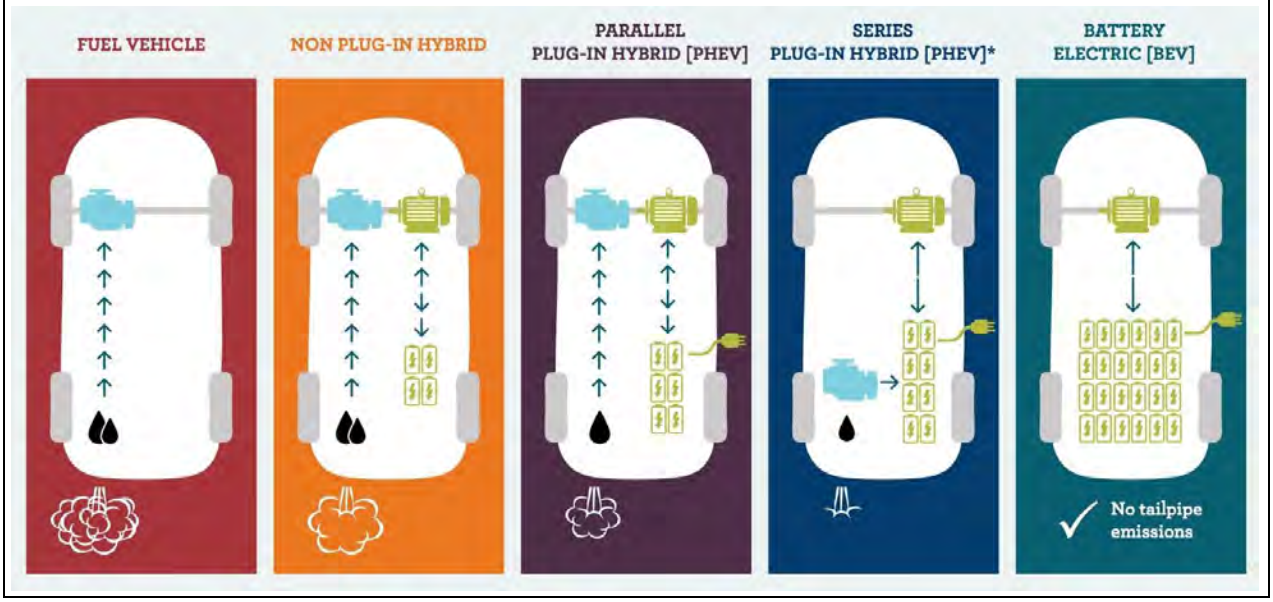


Newton must help to accelerate the current trend to be on track for a 50% reduction of fossil-fuel vehicles in 10 years. We must work to combat the perception of the low cost of driving. Since public transit requires payment for each trip, it can appear to be more expensive than driving, but the private capital and maintenance costs of cars is large and the public subsidies for roadways and parking lots makes the true cost of cars relatively great.

Transitioning passenger and commercial vehicles to zero emission and hybrid (see Figure 14 for an illustration of different kinds of vehicles) will support the City's transition away from fossil fuels, improve public health, and enable trips that are powered by electricity that can be supplied increasingly by renewable sources. Providing support to for residents to use public transportation, bicycles, and walking paths will also help reduce GHG emissions.

The City of Newton can best support these interests by providing improved infrastructure within the municipal realm and requiring or incentivizing similar improvements within the private realm.

Figure 14. Types of Vehicles[20]



C.1. Ensure that municipal infrastructure and operations are as **"green" as possible**

C.1.1. Replace 100% of the City's own passenger vehicles with EVs or other zero-emission vehicles.

The City will reassess its fleet annually to determine if additional vehicles are candidates for replacement based on availability of new alternatives. Continuing implementation over the course of the plan will significantly reduce emissions from the municipal fleet and provide a visible example for Newton residents of the feasibility of switching to zero-emission vehicles. Electric vehicle technology is developing rapidly, including for police vehicles, so the options available to the City may increase over the next five years.

- Examples: Climate Mayors Electric Vehicle Purchasing Collaborative[21]

[20] Better NZ Trust, Championing Sustainable Initiatives *https://www.leadingthecharge.org.nz/nz_electric_car_guide*
[21] https://driveevfleets.org/

- Metric(s): Number and percent of EVs purchased, fuel use reduction
- Implementer: Public Works Department

C.1.2. Reduce GHG emissions from all municipal non-passenger vehicles.

Reduce emissions from municipal fleet vehicles by determining the vehicles in the City's fleet with high likelihood of idling and install anti-idling systems. Investigate electrification and new technology options for different fleet vehicles.

Additional measures to reduce idling will include: (1) imposing and enforcing a strict policy banning idling in all other municipal vehicles, (2) exploring ways to incorporate anti-idling language in the City's school bus contracts, and (3) advocating for state-level anti-idling laws.

- Examples: Columbus, OH – Police Department implementation of idle reduction technology[22]
- Metric(s): Number and percent of vehicles with anti-idling, electrification, and/or other GHG reduction systems in place
- Implementer: Department of Public Works, School Department

C.1.3. Install EV charging stations in village centers, school facilities, and other priority municipal sites, primarily through the Make Ready and GreenSpot programs.

In addition to the 11 EV chargers already installed, the City is planning to install EV charging stations and/or designate preferential parking for EVs in municipal and school parking lots and in other priority municipal sites, such as the main library and City Hall.

Preferential parking for EVs is a measure to drive demand for EVs that uses signage and paint to designate spaces. (See also C.2.2.)

- Examples: none
- Metric(s): Number of charging stations installed
- Implementer: Department of Public Works, Planning Department, Newton Public School Department

C.1.4. Initiate small, medium, and large Green Infrastructure and Complete Streets projects specifically aimed at supporting bike/pedestrian travel, reducing GHG emission, increasing tree and shrub installations.

Complete Street principles, as identified in the Street Design Guide (2018), of incorporating green infrastructure stormwater features, supports reduction of impervious areas and increases carbon capture.

- Examples: various
- Metric(s): Miles of bike lanes added, number of Complete Streets projects completed
- Implementer: Department of Public Works, Planning Department

[22] AssetWorks. "Case Study: City of Columbus, Ohio GPS." https://www.assetworks.com/resource-items/fleet-columbus-gps-case-study/

C.1.5. Facilitate municipal employees' use of alternate modes of transportation.

To reduce vehicle miles traveled and improve personal health, Newton will advertise to its employees the benefits of getting to work by means other than single-occupancy vehicles. The City will offer information to facilitate carpools, biking, ride-share, train, bus, and shuttles and will offer incentives, such as gift cards, to the top performers.

- Examples: Longwood Medical/MASCO[23]
- Metric(s): Change in employee commute mode share (percent of trips of each mode)
- Implementer: Watertown Transportation Management Authority (TMA) with support from the City

> CASE STUDY:
> City of Boston EV Policy
>
> For projects that are substantial renovations, new construction, or located in a parking freeze zone, the City of Boston requires that at least 5% of parking be equipped with electric vehicle chargers and that an additional 10% be EV-Ready.
>
> In an effort to further streamline and standardize the presence of EV charging stations in Boston, the City has developed and approved standard signage to alert community members of the availability of charging stations.

C.1.6. Prioritize street tree preservation, tree planting, and landscaping, with special consideration given to hot spot areas identified in the Climate Vulnerability Assessment.

Trees provide cooling shade, carbon sinks, and improved storm water quality. Hot spots are defined as the top five percent of the hottest land area in the MAPC region. The City's 2018 Climate Change Vulnerability Assessment (CCVA) identifies the hot spots, also known as heat islands, in Newton which primarily correspond with areas zoned for commercial and industrial use, but there are some residential hot spots identified as well. The City is intending to plant hundreds of new street trees, carefully selected to thrive and be resilient, in areas highly impacted by these heat islands, and special attention will be placed on areas identified in the CCVA over the next several years.

- Examples: Newton CCVA Report identifies locations[24]
- Metric(s): Number of trees planted in hot spot areas
- Implementer: Parks, Recreation, and Culture Department

C.2. Incentivize residents to switch to EVs with a goal of having 10% of all vehicles on the road be EV, BHEV, ZEM, PHEV+ by 2024

C.2.1. Incorporate electric vehicle charging station requirements into the Zoning Ordinance and a criterion for large multi-family, commercial, and mixed-use developments.

A majority of electric vehicle owners charge their vehicles primarily at home.[25] Proposed and future development needs to anticipate the demand for at-home and at-work charging capacity as more and more Newton residents make the switch to electric vehicles. The October 2018 draft

[23] As the Transportation Management Association for the Longwood Medical and Academic Area, CommuteWorks helps employees and students better plan their commutes with info about MBTA, ridesharing, shuttle, walking and biking options. https://www.masco.org/directions/commuteworks

[24] The City of Newton's Climate Change Vulnerability Assessment and Action Plan, adopted December 2018. http://www.newtonma.gov/civicax/filebank/documents/94675

[25] Idaho National Laboratory, *Plugged In: How Americans Charge Their Electric Vehicles*, https://avt.inl.gov/sites/default/files/pdf/arra/PluggedInSummaryReport.pdf

Zoning Ordinance includes requirements that new and expanded parking lots with 20 or more spaces equip 10% of parking spots with EV charging stations and an additional 10% with EV-ready infrastructure. The City will ensure that these requirements are incorporated into the evaluation criteria for large developments. In the near-term, that includes evaluation of the proposals for the Riverside, West Newton, and Northland developments. Reduced requirements for parking should be incorporated into the Zoning Ordinance.

- Examples: City of Boston EV Policy[26]
- Metric(s): Number of installed EV charging stations at large multi-family, commercial, and mixed-use developments, increase in electric vehicles registered in Newton
- Implementer: City Council, Planning Department

C.2.2. Provide preferential parking for EVs to make it easier to park.

With striping, ground marking, and EV-only signage, the City will provide preferential parking for electric vehicles at City-owned parking lots, school parking lots, and other priority locations. These spots will serve to incentivize electric vehicle adoption in the community and make more visible the presence of electric vehicles.

- Examples: none
- Metric(s): Number of preferred parking places established
- Implementer: Planning Department, Sustainability Department, Department of Public Works

C.2.3. Continue to work with partners (such as Make Ready) to install EV charging stations on private properties throughout the City.

Through MOUs with the utilities private businesses will be encouraged to install EV charging stations on their properties.

- Examples: none
- Metric(s): Number of EV charging stations installed on private property
- Implementer: Sustainability Department, Planning Department

C.3. Engage with third-party partners to promote EVs and encourage biking walking, public transit and shared transportation

C.3.1. Support local non-profits and for-profits such as Green Newton, the NCCE, and Newton-Needham Chamber of Commerce, the Transportation Advisory Group (TAG), Safe Routes to School, the utilities, and local businesses efforts in education, events (such as test drives and Tour du Newton), and literature dissemination.

Non-profits and local businesses excel at working with the community and creating interest in new opportunities.

- Examples: Green Newton's leadership in Newton Power Choice
- Metric(s): n.a.
- Implementer: Local Community Groups

[26] The City of Boston's EV resources and policy regarding requirements for EV charging infrastructure. https://www.boston.gov/departments/environment/ev-boston-electric-vehicle-resources

C.3.2. Support local environmental organizations and car dealerships in implementing group-purchasing discounts and other incentivization efforts.

As more vehicle manufacturers set goals related to electric vehicles, more opportunities may arise to partner directly with manufacturers to increase incentives for the purchase of electric vehicles. For example, Nissan offers a "Fleetail" rebate program in partnership with municipalities, universities, and private sector employers. Nissan works with its partners to establish a unique rebate code and develop outreach materials and provides participating dealers with a discount off Manufacturer's Suggested Retail Price (MSRP) for the Nissan Leaf. Other successful local and national models exist for time-limited group buy programs in partnership with local dealerships.

CASE STUDY:
Colorado EV Group Buy Program

In 2015, Boulder County, Adams County, and the City and County of Denver came together to pilot a group-purchasing program for solar panels and electric vehicles. The program made time-limited discounts on solar panels and electric vehicles available to the counties' residents.

In Boulder County alone, the Nissan dealership saw a 4-fold increase in sales for the Nissan Leaf as a result of the program.

Key components to a successful group purchase program include having an engaged dealership partner, available EV inventory, coordinated outreach with partners, and good media coverage.

- Examples: Northeast region offer; Drive Green[27]; Colorado[28], Mass Drive Clean[29]; Greater Portland Council of Governments[30] San Joaquin Valley Charging Roadmap[31].
- Metric(s): Sales of electric vehicles to Newton residents
- Implementer: Local environmental organizations, car dealerships

C.3.3. Engage the transportation network companies (TNCs) and private shuttle operators to increase adoption of electric vehicles, primarily in partnership with other metro Boston communities.

While TNCs are regulated at the state level, there are opportunities for the City, working with other communities in the area, to partner directly with TNCs to implement programs that support driver and rider awareness and adoption of electric vehicles. The City will engage with TNCs to gauge their interest in partnering to provide similar services that TNCs have offered nationally and internationally. For example, Uber has worked with the City of Los Angeles to provide drivers

[27] The Green Electricity Consumers Alliance provides pre-negotiated discounts on electric vehicle models through their Drive Green program to buyers in Massachusetts and Rhode Island. https://www.greenenergyconsumers.org/drivegreen

[28] Southwest Energy Efficiency Project evaluated the group purchasing pilots implemented in the Colorado area for electric vehicles in 2016. https://www.swenergy.org/data/sites/1/media/documents/publications/documents/Colorado_EV_Group_Purchase_Programs_Mar-2016.pdf

[29] Mass Drive Clean is the nation's first state-sponsored electric vehicle test drive campaign. The campaign is sponsored by Eversource, National Grid, and private entities and supported by Plug In America, the Massachusetts Executive Office of Energy and Environmental Affairs, MassDEP, and its event partner REACH Strategies. http://www.massdriveclean.org/

[30] The Greater Portland Council of Governments provides its stakeholders with access to their EV Lending Program. Through this program, stakeholders can borrow a Chevy Bolt for up to a week to test drive how a battery electric vehicle can meet their day-to-day travel needs. https://www.gpcog.org/clean-transportation/

[31] In 2014, the Center for Sustainable Energy completed Charging Roadmap for the San Joaquin Valley to recommend optimal locations for siting electric vehicle charging stations. https://energycenter.org/sites/default/files/docs/nav/programs/pev-planning/san-joaquin/san_joaquin_valley_siting_analysis-web.pdf

with notifications about the benefits of electric vehicles and the availability of rebates and incentives and has worked with the City of San Diego to provide electric vehicle drivers with an additional dollar per ride over the normal fare. Lyft Express Drive provides drivers with the option to rent electric vehicles, rather than own or use their personal vehicles. This includes a rental offering for the Chevy Bolt and cost coverage for vehicle charging. In order to effectively measure the impact of any partnership, the agreement should include terms for data sharing.

- Examples: Uber EV Champions Initiative[32], Lyft Green Mode and Express Drive electric vehicle options[33]
- Metric(s): Number and percent of TNC drivers in Newton driving electric vehicles, number and percent of TNC electric vehicle miles driven in Newton
- Implementer: Planning Department, Mayor's Office

C.4. Increase the rate of biking, walking, telecommuting, shared rides, and use of shuttles and public transit, while reducing single-occupancy vehicle trips

C.4.1. Work with the City Council to develop a TDM program to reduce single-occupancy vehicle trips through amendments to the Zoning Ordinance.

The introduction of transportation demand management (TDM) requirements into the Zoning Ordinance is an important component of the Zoning Redesign project. Working with the City Council, the City will explore ways to refine its approach to TDM requirements and metrics, establishing thresholds at which projects must provide TDM aligned with the goals of the Climate Action Plan. The overall objective is to create predictable, measurable, and enforceable TDM programs that ensure that property owners are actively incentivizing modes of transportation that shift building occupants away from single-occupancy vehicle trips.

- Examples: Cambridge PTDM ordinance[34]
- Metric(s): Reductions in single-occupancy vehicle trips in areas of new development
- Implementer: City Council, Planning Department

C.4.2. Work with the City Council to reduce or eliminate the minimum parking requirement in the Zoning Ordinance and set a maximum on parking allotments.

Together with the City Council, the City will explore reductions in, or elimination of, minimum parking requirements in the Zoning Ordinance, including the introduction of maximum parking requirements by establishing a cap on how many parking spaces a property can have. Appropriate parking caps will limit expanses of asphalt, limit other negative effects of parking, increase available developable land, and increase opportunities for green space.

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[32] Uber launched its EV Champions Initiative in 2016, in partnership with seven initial communities: Austin, Los Angeles, Montreal, Sacramento, San Diego, San Francisco, and Seattle https://www.uber.com/newsroom/electrifying-our-network/

[33] Lyft Express Drive provides drivers with the option to rent vehicles, rather than own or use their personal vehicles. This includes a rental offering for the Chevy Bolt and cost coverage for vehicle charging. In 2019, Lyft began a pilot "Green Mode" in Seattle, WA, that allows riders to opt for an EV or Hybrid driver. https://blog.lyft.com/posts/2019/2/6/making-cities-more-liveable-with-electric-vehicles

[34] The City of Cambridge adopted its Parking and Transportation Demand Management ordinance in 1998. Their ordinance includes specific single occupancy vehicle trip reduction targets for large developers. https://www.cambridgema.gov/CDD/Transportation/fordevelopers/ptdm

- Examples: Hartford, CT[35]
- Metric(s): Zoning Ordinance changes that remove parking minimums and create parking caps
- Implementer: City Council, Planning Department

C.4.3. Create and encourage the use of safe bicycle and pedestrian facilities for commuters and residents.

The City will prioritize implementation of the bicycle and pedestrian improvements as outlined in the City's Transportation Strategy, including but not limited to:

1) Upgraded bus stops
2) The buildout of the calm, off-road biking and walking network, including MAPC's Landline[36] Greenway Network, Riverside area trails, trail connections along Commonwealth Avenue, the aqueducts, and the California/Bridge Street gap in the Charles River Path,
3) More bike lanes emphasizing protected bike lanes,
4) More connected bike paths,
5) More and better sidewalks,
6) More protected bike parking,
7) Better lighting,
8) More frequent painting of crosswalks, and
9) Policies designed to reduce vehicle trips to schools

as well as other "bike/ped" priorities that may emerge from the City's updated Open Space and Recreation Plan.

- Examples: Cambridge Bicycle Plan[37]
- Metric(s): Added miles of walking and biking infrastructure, bike racks installed
- Implementer: Planning Department, Department of Public Works

C.4.4. Support local transportation partners, such as Safe Routes to School, MassRides, and others in allowing Newton residents to reduce single-occupancy vehicle trips.

The City will partner with community groups to increase awareness about public transit, bike share, and other alternative transit options in the City. As a part of this effort, the City will develop and/or promote targeted transportation options such as NewMo and MassRides. The City will integrate Safe Routes to School into transportation and school facility planning.

- Examples: Safe Routes to School (https://www.mass.gov/safe-routes-to-school)
- Metric(s): Case by case
- Implementer: Planning Department, Sustainability Department, Newton Public School Department, local environmental organizations

[35] Shared-Use Mobility Center. "Parking Minimums Eliminated, Citywide, Hartford, Connecticut, 2017." http://policies.sharedusemobilitycenter.org/#/policies/997

[36] https://www.mapc.org/resource-library/landline-vision-plan/

[37] City of Cambridge's 2015 Bicycle Plan, https://www.cambridgema.gov/CDD/Transportation/bikesincambridge/bicyclenetworkplan

C.4.5. Explore public-private partnerships to develop shared and electric shuttles to support first- and last-mile connections.

The Transportation Strategy prioritizes creation of shuttles within Newton and just beyond Newton's borders to provide first- and last-mile connections to transit and an alternative to single-occupancy vehicle trips. With reliable connections to and from the existing limited network of train and bus stops in Newton, residents and commuters are more likely to take public transit. This effort aligns with the City's efforts to increase bike and pedestrian infrastructure and support first- and last-mile connections through programs like the bike share program.

- Examples: NewMo[38], Lexington Lexpress fixed route shuttle[39], Bedford The Dash on-demand shuttle service[40]
- Metric(s): Number of passengers served/Ridership rates of shuttles
- Implementer: Planning Department, Mayor's Office

C.4.6. Explore opportunities to contract with companies that supply electric school buses.

Since school buses sit idle for much of the day, charging is readily available. The City will consider contracting with a company that can supply all electric buses.

- Examples: none
- Metric(s): Number of electric buses used
- Implementer: School Department

C.4.7. Advocate for Newton's transit service needs including: frequent and accessible service, expanded routes and service hours, transit station upgrades, dedicated lanes for buses and zero-emission vehicles on the MassPike, and other measures during planning processes at the MBTA and MassDOT.

The City will advocate for its needs in several regional transit planning efforts. Near-term opportunities include MBTA's Phase II Better Bus Project, Bus Network Redesign, and Commuter Rail Accessibility Upgrades. Long-term opportunities include Urban Rail Vision, Green Line Transformation Project, and Focus40. Specific advocacy efforts can focus on:

- Accessibility upgrades at Newton's three commuter rail stations.
- Service improvements to critical local bus routes (such as the 59 and 52 bus routes).
- Additional service on the Framingham/Worcester commuter rail line to bring frequency up to the frequency of the Green Line D Branch.
- Electrification of the commuter rail line.

[38] "Via and the City of Newton Launch Microtransit Network Aimed to Support Local Seniors." https://ridewithvia.com/2019/06/via-and-the-city-of-newton-launch-microtransit-network-aimed-to-support-local-seniors/

[39] The Town of Lexington operates a fixed route neighborhood minibus for residents called the Lexpress. https://www.lexingtonma.gov/lexpress/pages/rider-information

[40] The Bedford DASH is an on-demand transportation service being piloted by the Town of Bedford in partnership with the Middlesex 3 Transportation Management Association. The DASH provides trips to Bedford, Billerica, Burlington, Concord (Monday and Tuesday only), and Lexington. https://www.bedforddash.com/

- Bus stop upgrades including improved shelters, real-time information, bike facilities, the possibility of dedicated bus lanes in appropriate locations, and implementation of public transit vehicle signal priority.

- Examples: none
- Metric(s): Incorporation of Newton specific improvements in the MBTA's final bus network redesign and commuter rail service options
- Implementer: Mayor's Office, Planning Department

Newton's Green Transportation Accomplishments and On-Going Efforts

Green Infrastructure

- The City has a 15-year Street Tree Planting Plan to plant 800+ trees/year along city streets and in parks to mitigate urban heat island impacts and sequester carbon.
- In 2016, the City adopted a Complete Streets Policy that committed the City to creating a street network that prioritizes green infrastructure and meets everyone's needs, regardless of age, ability, income, or mode of transportation.

Transportation

- In 2017, the City developed a progressive vision for transportation in Newton in a strategic plan for 2040, Newton in Motion Transportation Strategy ("Transportation Strategy"). The plan identifies strategies to build a transportation system that will be safe, smart, accessible, livable, and sustainable.
- In 2019, Newton joined the Watertown Transportation Management Authority, a public/private non-profit that promotes driving less and taking transit, shuttles, carpooling, and biking/walking.
- Newton implemented bike share with Lime Bike in 2018 and now provides residents with electric bike share services.
- In the spring of 2019, the City launched NewMo, a shared-trip shuttle service for seniors, in partnership with Via.
- The City signed a contract with electric vehicle car share company GreenSpot in 2019.
- In 2017, the City implemented traffic calming processes and has successfully completed many such projects.
- In 2018, the City completed our comprehensive Complete Streets Design Guide and identified 24 priority projects (four of which were completed as of November 2018).
- Village enhancement road reconstructions in the Village Centers of West Newton and Newtonville are imminent.

Municipal Fleet

- The City has transitioned 61% of its passenger fleet to all-electric or other zero-emission vehicles. The City has 28 EVs, 10 hybrids, and 3 plug-in hybrids. Lease agreement will lead to 100% of City sedan passenger vehicles being EV by the end of 2020.
- The City has installed 11 EV charging stations in municipal parking lots and is currently planning for more chargers and preferential parking in municipal and school lots for EVs.

D. Improving New Construction and Major Renovations

Newton's New Construction and Major Renovations Strategies

- Advocate for a more energy-efficient and climate-smart 2021 International Energy Conservation Code that will update the Massachusetts state building code
- Ensure that new and renovated municipal buildings meet the highest energy efficiency standards possible
- Work with City Council to adopt Zoning Ordinance amendments that require and/or incentivize high-efficiency performance and/or net-zero new construction
- Develop and provide to residents, developers, and businesses educational resources about clean heating and cooling technologies

Newton is seeing a development boom. Several new large-scale construction projects are pending. They are bringing a mix of commercial and residential space to Newton. As dense, transit-oriented developments, they represent a real opportunity for Newton to benefit from new clean-energy and energy-efficient spaces.

Like all cities and towns in Massachusetts, the City of Newton is limited in its ability to set high energy standards for new buildings because municipalities are not permitted to exceed the Stretch Code standards approved by the Massachusetts Board of Building Regulations and Standards (BBRS). However, through zoning, special permits, and design review, Massachusetts municipalities can improve energy performance and reduce greenhouse gas emissions associated with new construction and major renovations.

According to data provided by the Newton Assessor's Office, 58% of the new buildings constructed in Newton since 2014 are single-family homes; that is 308 new single-family homes or an average of 77 homes per year that could be built to new high standards.

The actions listed below, designed to create a new stock of low-carbon buildings, are ambitious yet achievable and are important steps toward ensuring that future development moves the City towards its climate action goals.

D.1. Advocate for a more energy-efficient and climate-smart building code

D.1.1. Register and educate all eligible representatives to ensure strong City participation in the vote on the 2021 International Energy Conservation Code (IECC) to improve the state base building code (with regard to energy efficiency, electrification, and other carbon reduction strategies), and advocate to the Board of Building Regulations and Standards (BBRS) for a net zero Stretch Code.

Creating energy efficiency standards within state building and energy codes is one of the most effective ways to reduce GHG emissions. The state building codes (base code and Stretch Code) set the requirements for energy efficient design in new buildings. Cities and towns are not permitted under Massachusetts law to adopt their own building codes. Passing a strong base building energy code and Stretch Code is one of the best ways to ensure that new buildings use progressively less energy. Newton can register up to eight municipal officials per eligible department to vote on the IECC in 2019 and help shape the future of building energy codes in

Massachusetts and around the country.[41] Educating registered Newton staff about options for updating the code will be critical.

- Examples: none
- Metric(s): Number of municipal officials voting on the IECC, BBRS net zero Stretch Code
- Implementer: Sustainability Department

D.2. Ensure that new and renovated municipal buildings meet the highest energy efficiency standards possible

D.2.1. Require that all new and renovated municipal buildings continue to meet the City's Sustainability Guidelines for Public Buildings (see Appendix G): (1) minimize Energy Use Intensity (EUI), (2) transition away from fossil fuel use, (3) have solar photovoltaics (PV) panels or are solar-ready, and (4) have EV chargers and/or are charger-ready. Ensure that such goals are reflected in the CIP.

The City will require that new municipal buildings optimize energy use. The use of an Energy Use Intensity (EUI) indicator provides the means to standardize the way energy use is compared among various sizes and types of buildings and to evaluate ways of reducing overall energy consumption. Through EUI, energy use is expressed as a function of a building's total annual energy consumption divided by its total area, typically expressed in energy used per square foot per year.

The City will develop a protocol for evaluation (including building envelope assessments) and will transition to clean heating and cooling technologies in all new construction and major renovations. In all new and significantly renovated municipal buildings, the City will minimize and phase out the use of fossil fuels, transitioning to electric (or other low-carbon) heating systems and other appliances. Several economically viable and commercially-ready technologies exist for municipal buildings – the most applicable being variable refrigerant flow (VRF) heat pumps and ground-source heat pumps.

The City is actively pursuing Phase 3 of its solar PV installation program and will install roof top panels and parking lot canopies on municipal and school buildings and municipal and school parking lots in Newton.

The City is currently developing a strategy to install EV chargers and to create preferential parking for EVs in village centers, school parking lots, and other priority locations.

- Examples: Wayland[42]
- Metric(s): Plan in place and reflected in the CIP, EUI of new and renovated buildings
- Implementer: Public Buildings Department, Planning Department, Department of Public Works

[41] For information on how to get involved in the IECC adoption process, visit https://www.mapc.org/resource-library/building-codes-climate/#takeaction

[42] At its 2018 Town Meeting, Wayland committed to "seek cost-effective design and construction of all new municipal building construction and substantial renovation projects to minimize carbon-based energy use through cost-effective energy efficient design, building system controls, and on-site renewable energy generation and energy storage."

D.3. Work with City Council to adopt Zoning Ordinance amendments that require and/or incentivize high-efficiency performance and/or net-zero new construction – within the next 12 months

D.3.1. Work with City Council to amend the Zoning Ordinance to require new construction and major renovations seeking a Special Permit maximize energy efficiency and the use of renewable energy, including thermal energy.

Working with the City Council, the City will work to amend the Zoning Ordinance to require builders and developers to incorporate, to the maximum extent possible, energy efficiency measures and the use of renewable energy in newly constructed and substantially renovated buildings where a special permit is required. Working with the City Council, City staff will evaluate the size of developments and retrofits to which these requirements will apply.

City staff will consider the Green Newton Green Building Principles when developing guidelines and evaluation criteria including Passive House and other systems.

City staff will consult with IDEA (International District Energy Association) on the local potential for district energy and, where appropriate, encourage Special Permit applicants to explore the possibility of district energy for heating and cooling as well as microgrids for resiliency and the reduction of GHG emissions.

- Examples: none
- Metric(s): Adoption of special permit requirements
- Implementer: City Council, Planning Department, Sustainability Department

D.3.2. Work with City Council to require that all new construction and major renovations analyze the costs, benefits, and GHG impacts of maximizing energy efficiency; utilizing electric heating, cooling, and hot water; and using renewable energy, including thermal energy.

City staff, working with the City Council, will work to amend the Zoning Ordinance to include a requirement that proposals for new construction and major renovations include an analysis of the costs and benefits of incorporating, to the maximum extent possible, energy efficiency measures and the use of renewable energy, even where a Special Permit is not required. The City will determine the size/types of buildings to which this requirement will apply. The large proposed developments, such as the redevelopment projects on Needham Street, the Riverside MBTA station area, and along Washington Street, provide tremendous opportunity to implement net zero and/or Passive House building practices.

- Examples: Boston[43], Cambridge[44]
- Metric(s): Adoption of new program, LEED/high- performance buildings constructed
- Implementer: City Council, Planning Department, Sustainability Department, Inspectional Services Department

[43] Boston Planning and Development Agency. "Article 37 Green Building Guidelines." https://www.cityofboston.gov/images_documents/Article%2037%20Green%20Buildings%20LEED_tcm3-2760.pdf

[44] City of Cambridge. "Sustainable Building Requirements." https://www.cambridgema.gov/~/media/Files/CDD/ZoningDevel/Ordinance/zo_article22_1397.ashx

D.3.3. Work with City Council to adopt a zoning requirement that all new parking lots above a certain size require EV charging stations.

Working with the City Council, City staff will evaluate a requirement that all new parking lots above a certain size, to be determined, include EV charging stations in their parking facilities.

- Examples: none
- Metrics: Adoption of special permit requirements
- Implementer: City Council, Planning Department

D.3.4. Work with City Council to adopt a zoning requirement that all new buildings with a certain roof area require solar PV where technically feasible, and other "eco-roof" treatment where appropriate.

Working with the City Council, the City will evaluate a requirement in the Zoning Ordinance that all new buildings and major renovations and additions with roof area larger than a certain size (to be determined), require solar PV. Where solar is infeasible due to shading, roof orientation, or other condition, other "eco-roof" approaches may be required.

Maximizing solar production is critical, but where it is not feasible due to shading or building orientation, "eco-roofs" offer alternative benefits. Eco-roofs may include white roofs (to reflect/prevent solar gain), blue roofs (to collect stormwater), and green roofs (to do both). Eco-roofs have multiple benefits including reducing GHG emissions, decreasing the urban heat island effect, and lowering temperatures during sunny summer days. Such a requirement would allow flexibility for builders and developers to choose from different options for eco-rooftop design. In some instances, solar may be combined with other eco-roof options.

- Examples: Watertown for solar[45]
- Metric(s): Passage of zoning amendment, number of solar and eco roofs installed
- Implementer: City Council, Planning Department, Sustainability Department

D.3.5. Work with the City Council to adopt Zoning Ordinances that encourage additional, appropriate low-carbon housing near public transportation.

The Zoning Ordinances can allow increases in the number of housing units if the housing is near public transit and is low carbon either because of the way it is designed (e.g., small units) or otherwise highly energy efficient. While housing developments must be appropriate for the neighborhood in many other ways, the City should incentivize new construction and major renovations that are climate-friendly by decreasing dependence on automobiles, reducing the size of living space, and/or otherwise being highly energy efficient. Determining the appropriate additional number of housing units and/or height allowed will be an important part of the work of the City Council and Planning Staff. Further facilitating the development of Accessory Dwelling Units can help achieve this objective.

- Examples: Watertown[46]
- Metric(s): Zoning Ordinance changes that promote density and transit access

[45] Town of Watertown, MA. Solar Energy Zoning Requirements, 11/12/18. https://www.watertown-ma.gov/DocumentCenter/View/26235/2018-11-27-Zoning---Solar-Assessments

[46] Town of Watertown, MA. "Watertown Comprehensive Plan." https://www.watertown-ma.gov/DocumentCenter/View/14558/2015-Watertown-Comprehensive-Plan---Adopted-June-23-2015

- Implementer: City Council, Planning Department

D.4. Develop and provide to residents, developers, and businesses educational resources about clean heating and cooling and renewable technologies

D.4.1. Provide educational resources to developers, residents, and businesses applying for municipal permits about the financial and lifestyle benefits of clean heating and cooling and renewable technologies.

The Energy Coach (see A.2.2.) and City staff will provide information to developers, residents, and businesses about the latest widely available and cost-effective clean heating and cooling technologies and the resources available from Mass Save, MassCEC, and others to support the installation of these systems.

- Examples: Boston[47], Cambridge[48]
- Metric(s): Number of residents, businesses, developers engaged with resources
- Implementer: Sustainability Department, Planning Department

Newton's New Construction and Major Renovations Accomplishments and On-Going Efforts

- The City has registered all staff eligible to participate in the upcoming International Code Commission vote regarding energy efficiency updates to the national building code.
- The City is requiring and will continue to require new municipal buildings to minimize Energy Use Intensity (EUI) and minimize the use of fossil fuels. It evaluates and invests through the CIP to replace fossil fuel systems with alternatives such as electric, variable refrigerant flow (VRF) heat pumps and ground-source heat pumps, or other carbon-free heating and cooling systems and appliances.
- Many of the City's newest buildings and all new school buildings are LEED certified and have roof-mounted solar.
- The City has adopted Building Design and Construction Sustainability Guidelines intended to reduce energy use as much as possible, maximize the use of on-site renewable power, and define a path to net zero for all new public buildings and renovations of existing buildings.
- The City Council is working to re-draft of the Zoning Ordinance to promote climate-friendly development projects.
- The City Council, as the Special Permit Granting Authority, has established its ability to condition new development on higher standards of performance.
- The City Council is working to enhance Special Permit criteria requiring conservation of energy and natural resources.

[47] Boston provides information and resources for building owners and developers through its website: https://www.boston.gov/departments/environment/building-energy-reporting-and-disclosure-ordinance

[48] Cambridge provides information to building owners and developers through its website: https://www.cambridgema.gov/CDD/climateandenergy/greenbuildings

E. Improving Existing Buildings

Newton's Existing Building Strategies

- Advance energy efficiency and weatherization in existing homes and businesses by helping homeowners and contractors understand options (see Section D on new construction and major renovation)
- Transition to clean heating and cooling by electrifying heating and cooling in residential and commercial buildings
- Work with City Council to adopt zoning ordinances for energy efficiency and clean energy technologies

Newton's housing stock is old and therefore relatively inefficient, but it is undergoing change. Newton has roughly 32,000 households (in 25,700 residential buildings). Roughly 77% of these were built before 1960 and over 50% were built before 1930. Over 90% are heated by fossil fuels. Annually, roughly 650 homes change hands, 120 homes get substantial additions, and over 100 homes are torn down. Roughly 34% of single-family homes are under 1850 square feet; new single-family homes average 4048 square feet. Buildings built three to four decades ago had HERS energy ratings of roughly 135 (reflecting their relative inefficiency); homes built to current code have HERS ratings of roughly 55 (i.e., more efficient). But even older homes periodically get new roofs, new heating systems, and new appliances – and these are real opportunities for improvement. [Data collection and Figure 15, Courtesy of Newton Citizens Commission on Energy and the Newton Citizen Climate Action Plan (May 2019).]

Newton's "commercial" building stock consists of 935 buildings. Relatively few owners control a large portion of the commercial stock. [Data collection Courtesy of Newton Citizens Commission on Energy and the Newton Citizen Climate Action Plan (May 2019).]

Buildings account for 64% of Newton's GHG emissions, by far the most of any sector (see Figure 16). Making changes to existing buildings is challenging, but essential. And with the current rates of remodels, energy audits and retrofits, and tear-downs, opportunities abound.

Figure 15. Newton's Households (by type) Divided by Size (in sq. feet)

(Figure courtesy of the Newton Citizens Climate Action Plan (May 2019))

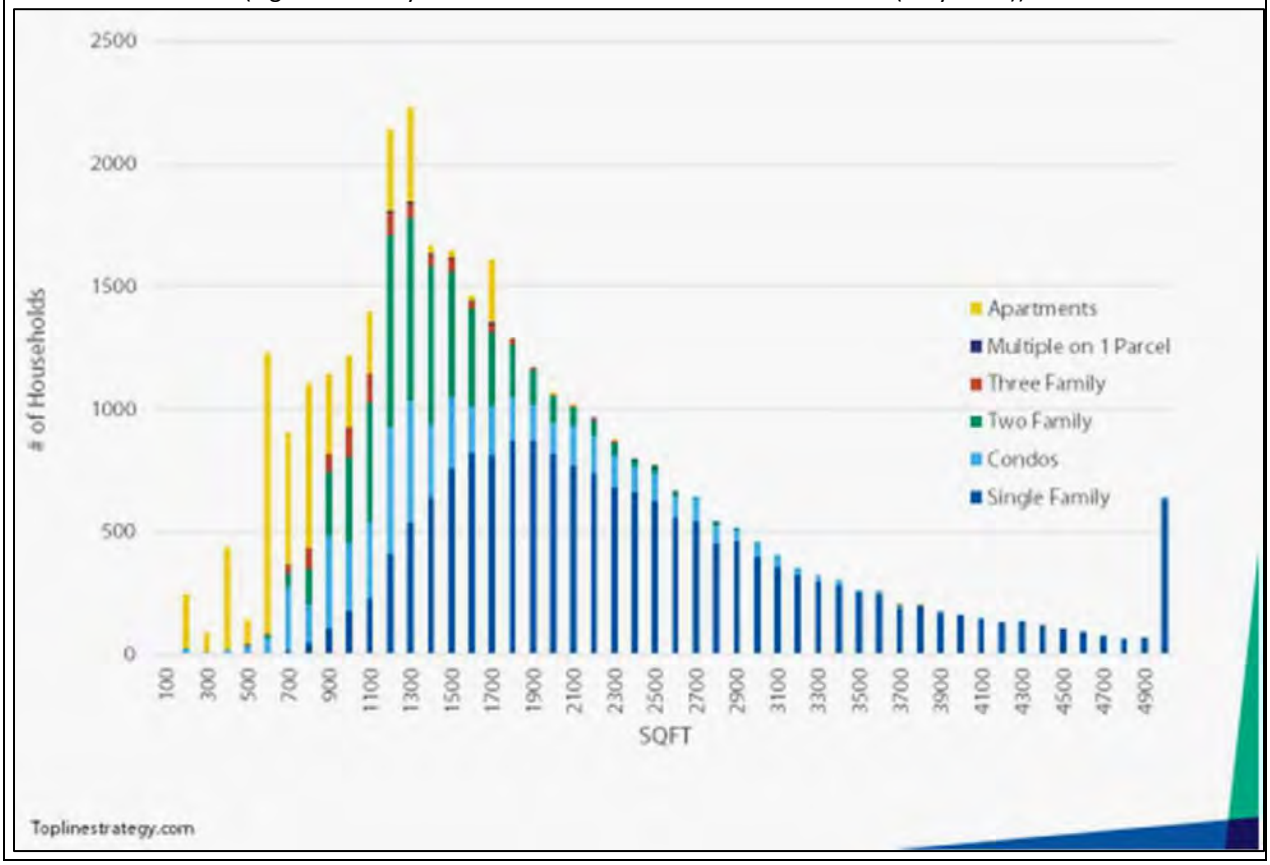
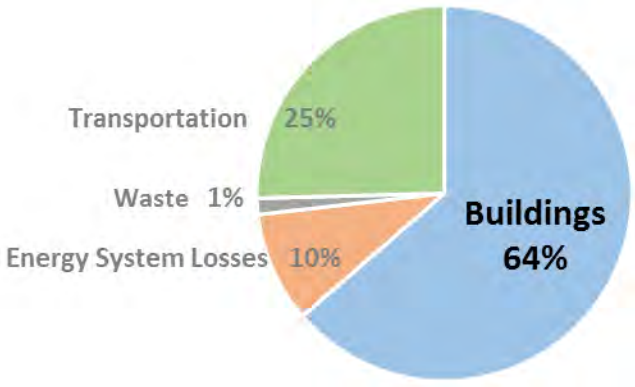
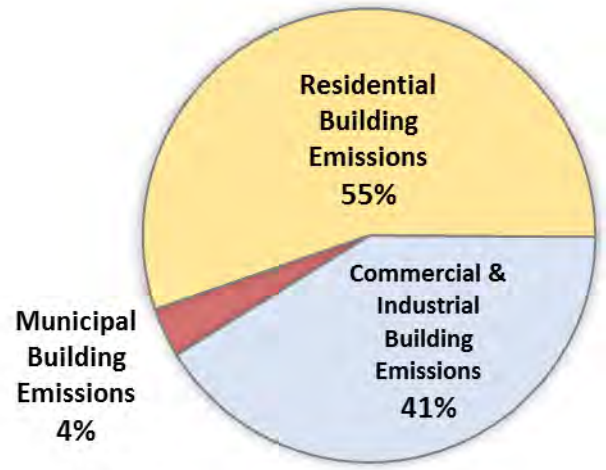


Figure 16. GHG Emissions (2013) in Newton: Building Sector



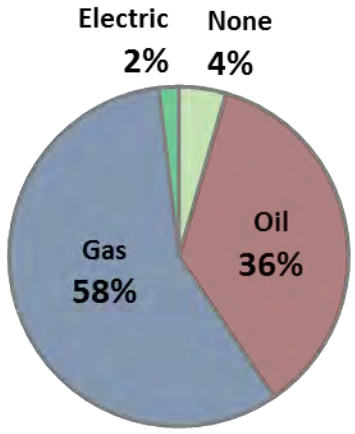
Emissions from buildings systems and appliances account for 64% of Newton's GHG emissions. Of that, residential buildings (single-family and multifamily) account for 55%; commercial, institutional, and industrial buildings account for another 41%; and municipal buildings account for 4%, as shown in Figure 17.

Figure 17. Breakdown of Total Newton Building Emissions (2013) by Building Type



More than 90% of buildings in Newton are heated with gas or oil (see Figure 18). Finding ways to transition heating and cooling in these buildings to cleaner and more efficient technologies will be a crucial part of reducing GHG emissions in Newton.

Figure 18. Heat Sources of Newton Buildings*



**It should be noted that this chart is based on data from the Newton Assessor's database which likely does not capture all conversions from to oil to natural gas and so may underestimate the percentage of buildings heated by natural gas.*

63% of all buildings in Newton are single-family homes, making single-family homeowners critical to the success of this plan. There are 15,301 single-family homes in Newton built before 1970. Many of these homes are poorly insulated and could be made significantly more energy efficient with energy retrofits

offered through the Mass Save program. Many newer homes are also be inefficient and could benefit from the energy efficiency program offerings available.

E.1. Advance energy efficiency and weatherization in existing homes and businesses by helping homeowners and contractors understand options (see Section D on new construction and major renovation)

E.2. Transition to electric and thermal heating and cooling in residential and commercial buildings

E.2.1. Implement a Solarize Plus, HeatSmart, or similar outreach program for residents and businesses to encourage adoption of electric and clean heating and cooling technologies such as air-source heat pumps, ground-source heat pumps, and thermal options.

The Energy Coach will support community organizations to build on Green Newton's Solarize campaign initiated in 2013 to encourage the transition to clean heating and cooling, weatherization, and energy efficiency improvements. Engage contractors and developers to build awareness about air-source heat pumps and other clean heating and cooling technologies.

- Examples: HeatSmart Mass[49] and Solarize Mass Plus[50], MassEnergize[51])
- Metric(s): Number of solar PV arrays/installed generating capacity (kW), number of heat pumps installed, number of EV charging stations installed/purchased
- Implementer: Local environmental organizations, Energy Coach

CASE STUDY: Heat Smart Mass

In some Newton neighborhoods, more than 40% of households use high-cost, less-green heating options such as oil, propane, or electric resistance, making them strong candidates for conversion to clean heating and cooling systems (Source: Mass CEC).

The HeatSmart Mass program helps communities increase the adoption of clean heating & cooling technologies by aggregating the buying power of residents to lower the cost of installation. As of 2019, 13 Massachusetts communities have participated in the HeatSmart program.

E.3. Work with City Council to adopt zoning ordinances for energy efficiency and clean energy technologies

E.3.1. Work with City Council to allow by right the installation of GHG-reducing building improvements.

The City will explore ways to allow by-right installation of certain GHG-reducing improvements in existing buildings. Covered improvements may include enhancements to the building envelope (e.g., vestibules, insulation wraps, etc.), renewable energy generating equipment, high-efficiency heating and cooling equipment, and electric vehicle charging stations. Planning staff will evaluate what GHG-reducing improvements would still require a special permit.

[49] HeatSmart Mass. https://www.masscec.com/heatsmart-mass-0

[50] Solarize Mass. https://www.masscec.com/solarize-mass

[51] MassEnergize is a shared program and platform launched by the Towns of Wayland and Natick, MA. https://massenergize.org/

- Examples: Green Communities solar zoning[52], Massachusetts model solar zoning ordinance[53]
- Metric(s): Adoption of by-right zoning amendments, number of building improvements installed connected to special permit review process
- Implementer: City Council, Sustainability Department, Planning Department, Inspectional Services Department

E.3.2. Work with City Council to adopt an ordinance requiring residential and commercial building owners to disclose to potential buyers electric, gas and heating oil bills for the previous 12 months, and explore the possibility of listing energy performance in the Assessor's database.

It is extremely difficult to reduce GHG emissions from existing building stock. One of the few points of leverage is at the time of sale, when a buyer pays attention – or should be encouraged to pay attention – to building energy use.

It would be preferable for the State to require the disclosure of energy bills, or a building's energy rating, to the buyer at the time of sale. Newton will advocate at the State level for an energy use disclosure requirement. In the meantime, we will work with the City Council to adopt a requirement that sellers of buildings provide the previous year's electric, natural gas, and heating oil bills to prospective buyers at the time of sale, and then work with local realtors on implementation.

Having detailed utility cost information will educate homeowners about energy use and will provide a market advantage to more energy efficient homes[54]. Some cities require disclosure of utility costs (Chicago, IL; Minneapolis, MN). Some states require listings to include "energy efficient characteristics" such as high efficiency HVAC equipment and insulation values (Kansas; South Dakota). Portland, Oregon requires every home to receive a Home Energy Score before it can be listed for sale. In Chicago in 2013, after the city passed its energy disclosure ordinance, Elevate Energy conducted a study of how energy cost disclosures affected sales in 2013 and 2014. They found that houses whose listings included energy data sold faster and got a higher percentage of the asking price than houses listed without the information. 'Energy cost disclosure' – adding historical energy cost information to a real estate listing – fills the data gap between buyers and sellers. It also has the potential to create a 'virtuous cycle' that increases market demand for energy efficient homes."[55]

- Examples: Examples noted above, Chicago, American Council for an Energy-Efficient Economy[54]
- Performance indicators – Passage of ordinance
- Implementer: City Council, Planning Department, Sustainability Department

[52] Massachusetts Department of Energy Resources (DOER). "Becoming a Designated Green Community: Criterion 1." https://www.mass.gov/guides/becoming-a-designated-green-community#criterion-1

[53] DOER. "Model Zoning for the Regulation of Solar Energy Systems." https://www.mass.gov/files/documents/2016/08/nc/model-solar-zoning.pdf

[54] http://www.mwalliance.org/sites/default/files/meea-research/energy-disclosure-fact_sheet.pdf and https://aceee.org/sector/local-policy/toolkit/residential-disclosure

[55] Moving the Market: Energy Cost Disclosure in Residential Real Estate Listings. Deborah Philbrick, Rachel Scheu, and John Blaser, Elevate Energy https://www.elevateenergy.org/wp/wp-content/uploads/Moving-the-Market_-Energy-Cost-Disclosure-in-Residential-Real-Estate-Listings.pdf

Newton's Existing Building Accomplishments and On-Going Efforts

- The City has converted 24 municipal buildings from fluorescent and incandescent lighting to LED lighting (in addition to converting street lights to LED).
- Energy management systems are now installed in several existing buildings (and in all new buildings).
- The City has upgraded the Lower Falls Community Center, resulting in a 70% reduction in energy use.

F. Reducing GHG Emissions Associated with Consumption and Disposal

Newton's Consumption and Disposal Strategies

- Reduce GHG emissions resulting from corporate operations and individual activities
- Maximize recycling and other waste diversion

Consumption

It is relatively easy to determine a "direct production-based" GHG footprint, i.e., the GHG released directly by a vehicle, a company, a building, or a sector. But a total greenhouse gas footprint is far more than the emissions for which the subject is immediately and directly responsible. For example, we are each responsible for the emissions associated with the share of goods and services we consume. A complete ("consumption-based") GHG footprint includes the emissions associate with housing materials, furniture, medical supplies and services, transportation (transit and infrastructure), travel (transit and accommodations), food, clothing, and all other consumer goods and services. The difference between the two can be significant.

"Embodied energy" refers to all the GHG emissions associated with the manufacture, transport, and construction of materials, together with the end-of-life GHG emissions from these materials. Understanding and accounting for embodied energy is vital to mitigating climate change because there is the potential for a *nominally* "net zero" building to have a substantial climate impact if materials with high amounts of embodied energy are used in its construction. For example, if a home is built with concrete or foam insulation, the GHG emissions released in making that concrete and foam are large and should be accounted for to understand the full picture of GHG emissions associated with the home.

Figure 19 illustrates the relative contributions of direct AND indirect GHG emissions. It is clear that for a representative household, indirect and travel-associated contributions can be very significant. And, as household income rises, so to do GHG emissions (see Figure 20)

Neither this Climate Action Plan nor the NCCE Plan directly addresses embodied energy. Embodied energy will need to be addressed in the future, as accounting methodologies and mitigation strategies continue to be developed.

Figure 19. Scale of the Contribution of "Hidden" GHG Emissions

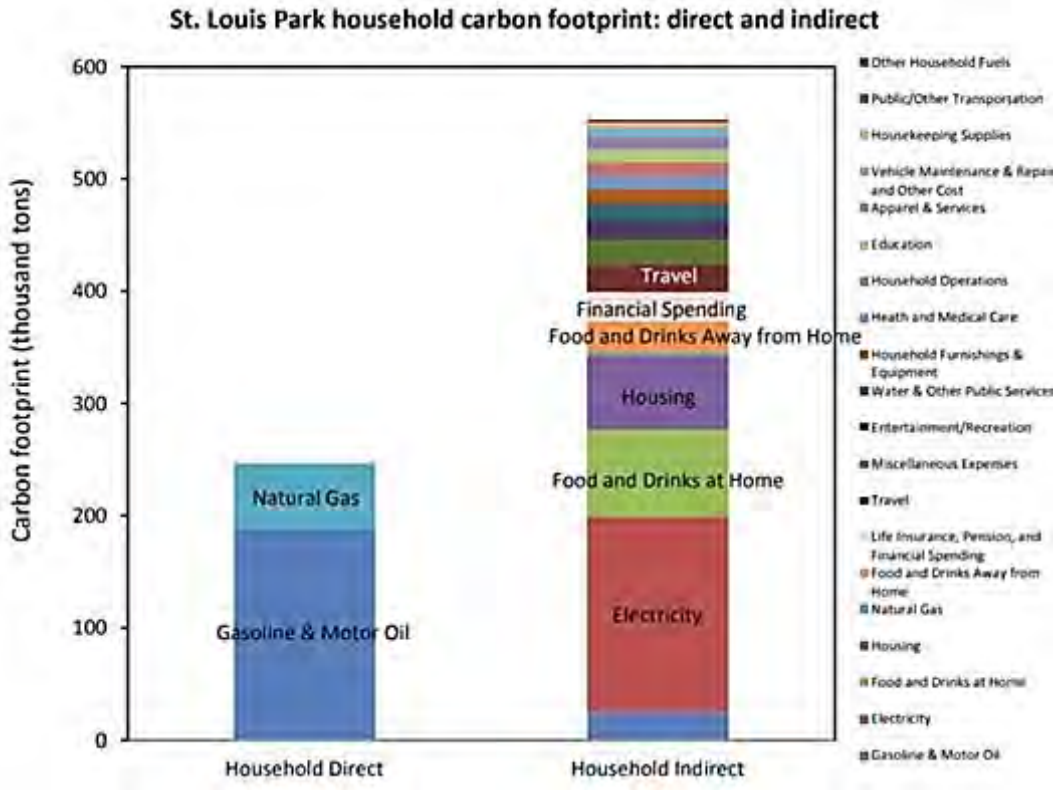
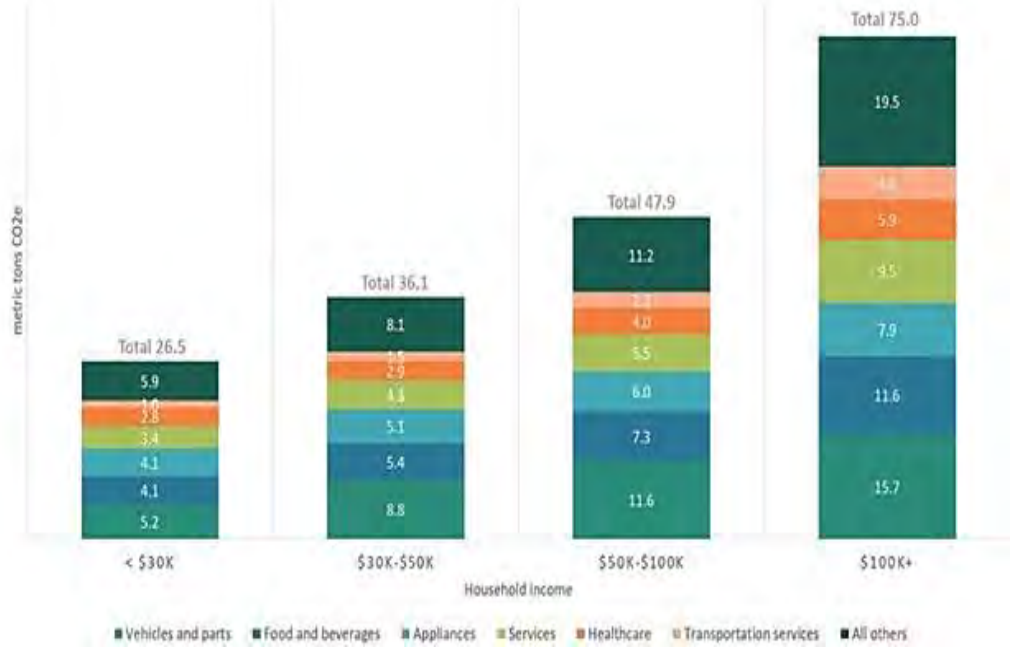


Figure 20. Average per Household Consumption-Based GHG Emissions (MTCO2e/household) in Oregon, by Income Group[56]

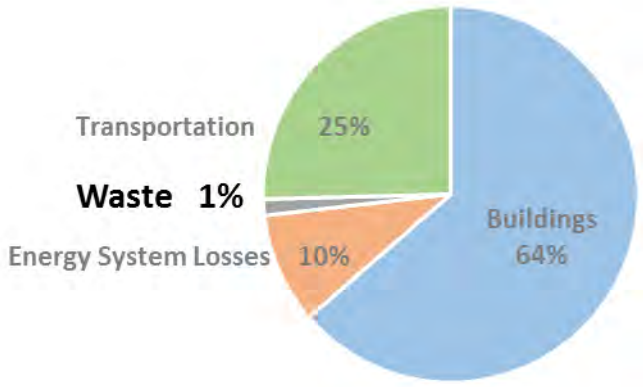


[56] https://frontandcentered.org/what-counts-when-we-count-carbon-pollution-lessons-from-oregon/

Solid Waste Disposal in Newton

The waste stream contributes a very small amount to Newton's overall GHG emissions (see Figure 21); nevertheless, there are opportunities to reduce the contribution from that sector.

Figure 21. GHG Emissions (2013) in Newton: Waste Sector



While GHG emissions from Newton's municipal solid waste and wastewater represent less than 2% of the City's emissions profile, this sector should be not overlooked when considering a holistic approach to community-wide climate action. The City has in place a robust sustainable materials management program that promotes waste reduction, reuse, and recycling.

Newton has been recycling since 1971. In 1990, dual stream recycling became mandatory, meaning all acceptable recyclable materials were separated into two streams: paper products and bottles/cans. Newton switched to single-stream recycling in April 2009. Opened in 1990, the City's Resource Recovery Center on Rumford Avenue is where Newton residents can bring excess curbside recycling as well as many other items that are only accepted through drop-off programs, such as CFL light bulbs. Household hazardous waste collection events are also held at this site. As of the 2013 GHG Inventory, 29% of the City's municipal solid waste was diverted to recycling and 20% of waste was composted. Yard waste and Christmas trees are collected at curbside and composted. The remaining municipal solid waste is disposed of at Wheelabrator-Millbury, a waste-to-energy facility located in Millbury, MA.

F.1. Consider initiatives to engage businesses and residents in reducing GHG emissions resulting from corporate operations and individual activities

F.1.1. Work with the Economic Development Director and the Newton-Needham Chamber of Commerce to explore incentive programs for businesses to reduce GHG emissions associated with consumption and disposal.

Consider assisting local businesses to develop a program to reduce GHG emissions, for example, reducing on-site food waste, reducing air travel by encouraging virtual meetings. Engage local groups such as the Newton-Needham Chamber of Commerce, Green Newton, Green Leaders (A.2.3.), and the Green Ribbon Commission (A.2.4.).

- Examples: none

- Metric(s): Number of businesses participating in the program
- Implementer: Planning Department, Sustainability Department

F.1.2. Explore adoption of a voluntary program that would allow contributions to a municipal program to help offset GHGs produced by air travel.

Work with a community partner to establish a carbon offset program. For example, Newtonians could be encouraged to contribute to a local Newton tree planting fund every time they take an airplane flight.

- Examples: City Forest Credits (CFC) Program[57], Forest Carbon Program in King County, WA[58]
- Metric(s): GHG emissions logged, funds generated to fund city trees
- Implementer: Parks, Recreation, and Culture Department, Sustainability Department

F.2. Evaluate strategies to improve waste reduction and diversion among residents, businesses, and municipal operations in Newton

F.2.1. Consider citywide mandatory commercial recycling.

MassDEP encourages municipalities through its guidance document, Best Practices for Municipalities Developing Private Hauler Regulations, to improve waste diversion from the commercial sector by combining mandatory recycling with regulating private haulers to require bundled waste disposal with recycling service.

- Examples: Town of Brookline[59]
- Metric(s): Inspections done at businesses, number of permitted haulers
- Implementer: Department of Public Works, Health and Human Services Department

F.2.2. Solicit ideas for a consumption/waste reduction campaign.

Working with members of Newton's Solid Waste Commission and community organizations, like Green Newton, develop a public engagement campaign to reduce consumption and waste. Incentive-based waste reduction programs could be considered.

- Examples: Recycle Bank[60]
- Metric(s): Trash tonnage, recycling tonnage
- Implementer: Department of Public Works, Solid Waste Commission

F.2.3. Work to implement organics diversion programs for Newton residents.

In 2018, the City piloted curbside organics collection with 200 households for four months. Over the next 3-12 months, the City will investigate a subscription program with a preferred vendor to offer curbside organics collection at a favorable price to all residents.

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[57] City Forest Credits seeks to make American cities greener, healthier, and more equitable by enabling urban tree-planting and preservation projects to earn carbon credits. https://www.cityforestcredits.org/

[58] King County's Forest Carbon Program is a component of the region's Land Conservation Initiative. https://kingcounty.gov/services/environment/water-and-land/land-conservation/forest-carbon.aspx

[59] "Brookline Commercial Recycling," Town of Brookline. https://www.brooklinema.gov/1235/Commercial-Recycling

[60] Recycle Bank provides incentives for residents in communities whose waste haulers have partnered with Recycle Bank for waste diverted from landfills. https://www.recyclebank.com/

- Examples: Newton's 2018 Composting Pilot[61], Natick Composting Pilot[62], Cambridge[63]
- Metric(s): Number of residents participating, tons of waste composted annually
- Implementer: Department of Public Works

F.2.4. Increase waste diversion through recycling and household hazardous waste efforts.

Ongoing efforts include curbside recycling, drop-off recycling options, the Swap Shop, and household hazardous waste collection events at the Resource Recovery Center on Rumford Avenue. Greater detail will be included in the Sustainable Materials Management 5-Year Strategy, to be released in 2020. Waste diversion could be increased by expanding Swap Shop hours and modifying Resource Recovery Center hours to increase convenience.

- Examples: none
- Metric(s): Recycling tonnage, recycling contamination, amount of drop-off materials collected for recycling, traffic counts at the Resource Recovery Center
- Implementer: Department of Public Works, Solid Waste Commission

Newton's Consumption and Disposal Accomplishments and On-Going Efforts

- The City is developing a 5-year sustainable materials management strategy.
- The City undertook a successful educational campaign to reduce contamination in the recycling stream.
- The City ran a successful curbside organics collection pilot in 2018.
- The City is introducing an organics subscription program and organics drop off options.

[61] "History of Recycling in Newton," City of Newton. http://www.newtonma.gov/civicax/filebank/documents/83468

[62] The Town of Natick piloted curbside composting for 500 households, and is currently expanding the program with the goal of increasing to 1,500 households served. https://www.natickma.gov/1302/Curbside-Composting-Pilot

[63] After two pilot phases, the City of Cambridge expanded to provide curbside composting city-wide in 2018. https://www.cambridgema.gov/Services/curbsidecomposting

Appendix A: Climate Change Vulnerability Assessment and Action Plan (Summary)

The greater Boston regions is already experiencing warmer temperatures, increased precipitation, and rising seas. Precipitation in the Boston area has increased by 10% in the past fifty years. Recently released design storm figures (NOAA 14) for the 10-year, 24-hour storm are 15% higher than those issued in 1961. Climate projections for this century include increased frequency and intensity of rain storms, and more frequent days with extreme heat. The devastating effects of Hurricanes Harvey, Irma, and Maria highlight the imperative to plan now for future storms.

In Newton, the March 2010 rains caused millions of dollars in damages and disrupted service on the Green Line. Twenty-five of the City's seventy-eight facilities flooded. As rainfall amounts increase, rain events similar to 2010 will become more frequent. A one-thousand-year event would nearly double the rainfall experienced over three days in March 2010. As is evident from Hurricane Harvey, damage and suffering from such an extreme event is severe. Indeed, flooding or extreme heat, and the resultant potential for power outages can have devastating and cascading effects during far lesser storms than a one-in-one-thousand-year occurrence.

Yet we can take steps to increase Newton's resilience and limit future damages. Many of today's investments and decisions in the City of Newton have long legacies that will influence future vulnerabilities. Of particular concern are the impacts on vulnerable populations in Newton including seniors, individuals living alone, people with a disability, young children, people who are socially isolated, and people with limited English language proficiency. Advance planning can save money, while inaction, or actions that don't anticipate future conditions, may lead to higher costs in the future. An example of effective planning comes from the reports that Florida properties experienced much less damage from Hurricane Irma in 2017 than from Hurricane Andrew in 1992. This is attributed to critical improvements made to the building code because of lessons learned from Hurricane Andrew.

Newton's Climate Change Vulnerability Assessment and Action Plan identifies future climate vulnerabilities and suggests strategies for the City of Newton that can reduce the risk of harm to people, properties, and natural resources and help speed recovery when inevitable future storms occur. The recommendations span many areas and range from easy and quick to difficult and expensive. They include such areas as:

- Communicating with and supporting vulnerable populations
- Improving stormwater systems and restoring natural drainage
- Planting more trees
- Continuing and improving emergency preparedness
- Investing in critical infrastructure (e.g. bridges and culverts)
- Incorporating green infrastructure and stormwater management into the zoning ordinances as they are revised.

Appropriate Plan/Process	Recommended Action	Lead Department(s)	Possible Timing	Category* and Action #
• ALL	The Steering Committee, or a successor group, should continue to meet to establish priorities, incorporate new information, and monitor progress on climate goals. The City should expand the Steering Committee to include additional relevant departments, such as Senior Services, Inspectional Services, and Urban Forestry.	• Steering Committee	FY18-19 on	A3
• ALL	Establish relationships with state agency staff responsible for climate resilience. Communicate City concerns and priorities and stay abreast of agency planning (e.g. DCR and MWRA).	• Sustainability • Executive Office	On-going	G1
• Annual Departmental Budgets	Provide training to empower City staff to implement cutting edge techniques for green practices. [i]	• ALL	FY18-19 on	E2
• Capital Improvement Plan (**CIP**)	Place signage at popular park and recreation areas to inform residents about tick/mosquito protection measures.	• Parks and Rec • Planning • HHS	FY19	C3
• Capital Improvement Plan (**CIP**)	Assess municipal properties for opportunities for LID/GI retrofits. [ii]	• Public Facilities	On-going	E5
• Capital Improvement Plan (**CIP**)	Prioritize retrofits and emergency planning for City facilities vulnerable to flooding and heat impacts.	• Public Facilities	On-going	E15
• Capital Improvement Plan (**CIP**)	Target affordable housing sites and low-income residents for flood and heat protection upgrades.	• Planning	FY20	B3
• Capital Improvement Plan (**CIP**)	Prioritize public health education programs that address the illnesses and conditions forecast to be exacerbated by climate change (e.g., extreme heat). [iii] [iv]	• HHS	FY20	C1
• Capital Improvement Plan (**CIP**)	Publicize hot spot and potential flooding areas to current residents, businesses, and to permit applicants. Direct them to educational materials.	• Planning • ISD	FY22	E14
• Capital Improvement Plan (**CIP**)	Develop and distribute education and outreach materials on climate related technologies and practices including, for example, elevating utilities, preventing backflow, protecting basements, and weatherization. Consider targeting flooding areas outside of flood zones, including areas with older housing stock, and properties with chronic mold issues. [v]	• ISD	FY20	E13
• Capital Improvement Plan (**CIP**) • Stormwater Infrastructure Improvement Plan (**SIIP**)	Prioritize energy efficiency and stormwater management in capital planning.	• Sustainability • DPW • Executive Office	FY18-19 on	E8

Appropriate Plan/Process	Recommended Action	Lead Department(s)	Possible Timing	Category* and Action #
• Stormwater Infrastructure Improvement Plan (**SIIP**)	Utilize flood claim (losses) mapping to target stormwater improvements.	• DPW	On-going	E7
• Stormwater Infrastructure Improvement Plan (**SIIP**)	Look for stream daylighting or re-naturalizing opportunities to restore natural habitat as part of stormwater or other infrastructure projects. [vi]	• DPW • Planning	As needed	D3
• Stormwater Infrastructure Improvement Plan (**SIIP**)	Reach out to property owners in a specific catchment area (as a pilot project) about ways to improve conditions through Green Infrastructure and stormwater projects. Locations could include an area prone to chronic flooding or an important resource area such as the Crystal Lake watershed.	• DPW • Planning	FY20	E6
• Comprehensive Emergency Management Plan (**CEMP**)	Identify gaps in services to vulnerable populations and prioritize: developing strategies to address gaps, coordinating with community partners to strengthen relations, and considering staff/Medical Reserve Corps involvement in emergency plans.	• Emergency Management • Steering Committee	On-going	B1
• Comprehensive Emergency Management Plan (**CEMP**)	Update the Comprehensive Emergency Management Plan to incorporate changes in emergency situations and response activities that may result from climate impacts.	• Emergency Management	At next cycle	C4
• Comprehensive Emergency Management Plan (**CEMP**)	Develop advance shelter-in-place and communication strategies for residents who may not be able to evacuate during emergencies.	• Emergency Management	On-going	B6
• Comprehensive Emergency Management Plan (**CEMP**)	Assist local businesses in developing emergency preparedness plans. [vii]	• Sustainability • Planning	On-going	F1
• Comprehensive Emergency Management Plan (**CEMP**)	Identify and support vulnerable households most in need of air conditioning. Encourage use of efficient air conditioning.	• HHS	FY20	C5
• Comprehensive Emergency Management Plan (**CEMP**)	Ensure redundancy in the City's emergency communications infrastructure.	• Emergency Management	On-going	H2
• Comprehensive Emergency Management Plan (**CEMP**) • Hazard Mitigation Plan (**HMP**) • Emergency Support Functions (**ESF**) Model	Review climate projections and revise and update climate resilience priorities every five years.	• Sustainability	FY23	A1
• Comprehensive Emergency Management Plan (**CEMP**) • Hazard Mitigation Plan (**HMP**)	Communicate emergency preparedness information to linguistically isolated households.	• Emergency Management	On-going	B4

Appropriate Plan/Process	Recommended Action	Lead Department(s)	Possible Timing	Category* and Action #
• Comprehensive Emergency Management Plan (**CEMP**) • Hazard Mitigation Plan (**HMP**)	Incorporate and prioritize climate resilience and energy efficiency, stormwater management into all City planning documents and activities.	• Executive Office • Planning	On-going	A4
• Comprehensive Emergency Management Plan (**CEMP**) • Hazard Mitigation Plan (**HMP**)	City departments should review the projections and reevaluate climate vulnerabilities relevant to their assets and mission and identify potential and current activities that bolster resilience.	• All	FY18-19	A2
• Hazard Mitigation Plan (**HMP**)	Explore joint procurement opportunities with MAPC to purchase emergency generators and pumps.	• Facilities • Emergency Management	As needed	E12
• Hazard Mitigation Plan (**HMP**)	Evaluate readiness of facilities that serve vulnerable populations (e.g. group homes). Assess retrofit needs and evacuation plans. Assess air conditioning and back-up generators. Encourage sign-up for the emergency notification system.	• Emergency Management	On-going	B2
• Hazard Mitigation Plan (**HMP**)	Work with local health providers to provide emergency preparedness information to clients with physical and mental disabilities.	• Health and Human Services	On-going	B5
• Street Tree Planting Plan (**STPP**)	Increase funding for increased street-tree planting and landscaping at public facilities in "hot spot" areas. Continue to increase tree diversity and consider trees well-adapted to warming temperatures to boost climate resilience. [viii]	• Parks and Rec/Forestry	On-going	C2
• Zoning Redesign	Ensure that the zoning ordinance requires Green Infrastructure/Low Impact Development/Renewable Energy through, e.g., green buildings, creative approaches to parking, driveways, street width, stormwater, and site plan review in all development and redevelopment. Include incentives to increase green landscaping, reflective pavements, and cool or green roofs to lessen heat island impacts. [ix] [x]	• Planning	FY18-19	E1
• Zoning Ordinance	Establish green building requirements. [xi]	• Planning • ISD	FY19-20	E9
• Floodplain Ordinance	Expand the floodplain ordinance to include documented areas of flooding. [xii]	• Planning	FY21	E3
• Floodplain Ordinance	Develop plans to address flooding outside of FEMA flood zones (e.g., expand wetlands protection jurisdiction, restrict basements, or require flood proofing for basements).	• Planning • ISD	FY20	5E4

Appropriate Plan/Process	Recommended Action	Lead Department(s)	Possible Timing	Category* and Action #
• Open Space and Recreation Plan (**OSRP**) • Conservation Restrictions (**CR**s)	In open space planning include: 1) protecting large, connected or buffering green spaces to foster ecological resilience and biodiversity; 2) removing asphalt; 3) planting trees; and 4) identifying locations where soil will support stormwater infiltration. .[xiii]	• Planning	FY18-19 (plan due in 2020)	D1
• DPW evaluation of specific bridge and culvert projects	Ensure that bridge and culvert repairs take into account future precipitation projections. [xiv]	• DPW	As needed	D2
• DPW review of special permits, administrative site plans, and proposed subdivisions. • Zoning Ordinance or LID Ordinance. • Complete Streets Policy	Incorporate depaving permeable concrete, and GI/LID stormwater management guidelines into street design for construction and reconstruction. Use GIS to prioritize areas where such activities will address flooding.	• DPW • Planning	FY20	E10
• DPW monthly meetings with Eversource (electrical distribution), National Grid (gas distribution), and Verizon (communication distribution).	Work with Eversource to address vulnerabilities and coordinate work, including capital improvements and vegetation management, to ensure protection of Newton assets.	• Sustainability • DPW	On-going	H1
• Newton North High School microgrid plan. • Newton Wellesley Hospital microgrid plan.	Encourage use of microgrids, district energy, and battery storage to keep critical facilities functioning in the event of power loss. [xv]	• Sustainability	FY19-20	E11

*Category

A. Implementation Recommendations
B. Socio-Economic Recommendations
C. Public Health Recommendations
D. Natural Resources Recommendations
E. Built Environment
F. Economic Recommendations
G. State-owned Infrastructure Recommendations

[i] The University of New Hampshire Stormwater Center conducts research and offers technical training on innovative stormwater treatments.

[ii] Possible project with MAPC.

[iii] The Bureau of Environmental Health of the Massachusetts Department of Public Health has online resources, including a conceptual pathways matrix that identifies hazards, exposures, vulnerable groups, and health risks https://matracking.ehs.state.ma.us/Climate-Change/conceptual-pathways.html.

[iv] Center for Disease Control Extreme heat guidebook: https://www.cdc.gov/climateandhealth/pubs/extreme-heat-guidebook.pdf MAPC's Keep Cool App. MAPC's Keep Cool App.

[v] Example: Basement protection materials from Kingston, Ontario, Canada (https://utilitieskingston.com/Wastewater/BasementFlooding/Protect).

[vi] Example: The Muddy River project in Brookline and Boston has restored natural habitat and reduced flooding risk.

[vii] Example: The City of Cambridge and MAPC partnered in providing workshops to small business owners. The City of Cambridge maintains a Business Emergency Preparedness website: https://www.cambridgema.gov/CDD/econdev/resourcesforbusinesses/smallbusiness/emergencypreparednessforbusinesses

[viii] The U.S. Forest Service has developed a comprehensive manual, "Forest Adaptation Resources: Climate Tools and Approaches for Land Managers," available at https://www.fs.fed.us/nrs/pubs/gtr/gtr_nrs87-2.pdf.

[ix] MAPC Low Impact Development Toolkit, ex. Town of Littleton Low Impact Development Manual.

[x] Examples: Seattle Green Factor establishes green landscaping requirements for projects of a certain size. Sacramento Parking Lot Shading Requirement mitigates urban heat island impacts.

[xi] The Boston Planning and Development Agency has a climate resiliency checklist that could be modified for use in Newton. LEED resources include climate resilience screening tools. Example: The City of Cambridge has developed sustainable building requirements.

[xii] The Town of Braintree floodplain by-law includes documented areas of flooding outside FEMA flood zones.

[xiii] The Metro Mayors Climate-Smart Region (CSR) Decision Support Tool is a new GIS-based program developed to prioritize locations for green infrastructure. The CSR program analyzes spatial data in four climate strategies: Connect (carbon-free transportation links), Cool (shade areas to reduce heat), Absorb (innovative stormwater management), and Protect (natural land buffers for sea level rise). MAPC can provide training on use of the tool.

[xiv] Massachusetts Stream Crossing Handbook: http://www.mass.gov/eea/docs/dfg/der/pdf/stream-crossings-handbook.pdf and State grant program for replacement of high ecological value culverts.

[xv] The state's Advancing Commonwealth Energy Storage (ACES) program, and the Mass Clean Energy Center Community Micro grids program. Examples: The City of Northampton is building a microgrid to power its DPW, emergency shelter, and local hospital.

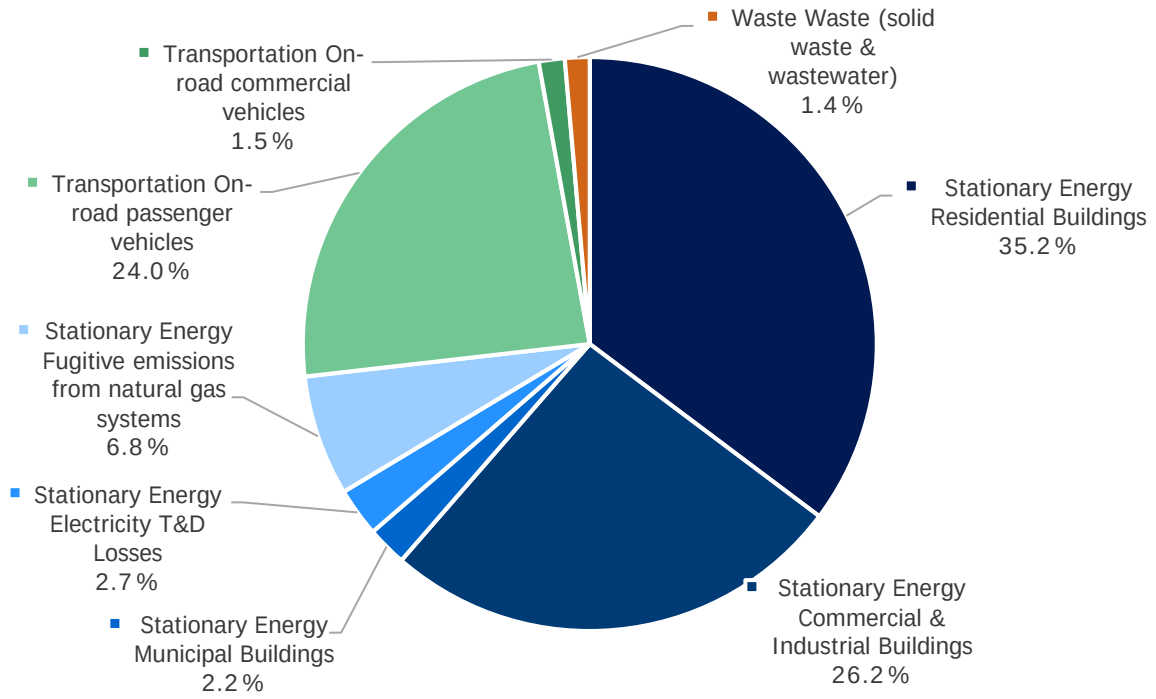
Appendix B: Greenhouse Gas Inventory Methodology

Greenhouse Gas Inventory Overview

The City established a baseline year of 2013 based on the availability of data and prior work completed by the Newton Citizens' Commission on Energy ("NCCE"). The Metropolitan Area Planning Council ("MAPC") expanded on the work completed by the NCCE to provide the City with a methodology that would be simple to update on a regular basis and to track progress towards the City's climate action goals. This appendix provides all supporting documentation on the methodology and data used to develop the City's GHG inventory to accompany the GHG Inventory worksheet provided in Appendix E.

In the baseline year of 2013, the City of Newton emitted 785,068 metric tons of carbon dioxide equivalent (CO_2e) from the residential, commercial, industrial, transportation, and waste sectors. Residential buildings in the City are responsible for the largest portion of GHG emissions (35.2%), with commercial and industrial buildings (26.2%) and on-road transportation (25.5%) following closely behind. Figure B1 below provides a summary of the GHG emissions accounted for by sector in the City's 2013 GHG inventory.

FIGURE B1: CITY OF NEWTON GREENHOUSE GAS INVENTORY (2013)



Scopes and Boundaries

The City's GHG Inventory uses the Global Protocol for Community-Scale Greenhouse Gas Emission Inventories ("GPC") for sources of emissions where data is reasonably available to the City.[64] With some limitations in resources and data, the City's GHG Inventory adheres most closely to the BASIC level reporting under the GPC framework. This includes emissions from Scopes 1 and 2 for Stationary Energy and Transportation, and Scopes 1 and 3 for Waste (Table F1). The inventory uses the GPC's definitions for scopes 1, 2, and 3. Scope 1 GHG emissions are those from sources located within the City's boundary. Scope 2 GHG emissions occur from the use of grid-supplied electricity, heat, steam, and cooling within the City's boundary. Scope 3 represents all other GHG emissions that occur outside of the City's boundary as a result of any activities within the City's boundary.

TABLE F1: NEWTON GHG INVENTORY SECTORS AND SCOPES INCLUDED

GHG Emissions Source (by sector and subsector)	Scope 1	Scope 2	Scope 3
Stationary Energy			
Residential buildings – electricity		•	•
Residential buildings – natural gas and heating oil	•		
Commercial and industrial buildings – electricity		•	•
Commercial and industrial buildings – natural gas and heating oil	•		
Fugitive emissions from natural gas systems	•		
Transportation			
On-road transportation – Fuel combustion	•		
On-road transportation – Electricity		•	
Waste			
Solid waste disposed at landfills			
Biological treatment of waste	•		•
Incineration and open burning	•		•
Wastewater treatment and discharge	•		•

**Blue cells in Figure B1 note all scopes required for GPC BASIC reporting. Green cells indicate scopes only required for BASIC+ reporting. "•" indicates data points that are included in the City's GHG inventory.*

[64] Global Protocol for Community-Scale Greenhouse Gas Emission Inventories, https://ghgprotocol.org/sites/default/files/standards/GHGP_GPC_0.pdf

Data Limitations

The City's GHG Inventory is limited to those emissions sources included in the BASIC level of the GPC framework. The City's inventory also does not include transportation emissions from railways, aviation, or off-road vehicles, or stationary energy emissions from manufacturing industries or construction, agriculture, forestry, and fishing.

The GHG emissions associated with heating oil for residential, commercial, and industrial buildings are limited by the static estimation methodology used to approximate total gallons of heating oil consumed by each sector. A consistent and complete local data set for fuel oil consumption has yet to be identified for cities and towns in Massachusetts.

The transportation sector GHG emissions are limited to those associated with on-road vehicles. Additional data and analysis are also required for estimation of emissions from public transportation. In Newton, this would include data on fossil fuels combusted and grid-supplied electricity consumed by the portions of the MBTA Green line and Commuter Rail within Newton and local MBTA bus routes.

Sector-Specific Methods, Data Sources, and Emissions Factors

Activity Data Calculations

Stationary Energy

The stationary energy sector includes all GHG emissions from combustion of natural gas and heating oil and use of grid-supplied electricity. A majority of stationary emissions result from existing buildings. A smaller subset of stationary energy emissions results from electricity transmission and distribution losses and fugitive emissions from the natural gas system. The electricity and natural gas data used in the inventory are from MassSaveData (with the exception of municipal energy consumption, which was sourced from MassEnergyInsight).

Heating fuel oil consumption for residential, commercial, and industrial buildings was estimated using public national, state, and local datasets to calculate average fuel consumption by building type. Residential heating oil consumption is estimated based on American Community Survey (ACS) data for heating fuel type and housing unit types and U.S. Energy Information Administration (EIA) data for average fuel oil consumption by housing type to calculate a localized estimate that takes into account the housing portfolio in Newton and energy use profiles of these buildings. Commercial and industrial heating oil consumption is estimated based on U.S. EIA data for average fuel oil consumption by business and industry type and MA Executive Office of Wages and Labor Division data on local businesses and industries. Local businesses and industries are mapped by their three-digit NAICS code to the appropriate Principal Building Activity (PBA). Emissions from these facilities are then calculated using data from U.S. EIA on average fuel oil consumption by PBA.

Electricity losses are estimated using a grid-supplied transmission and distribution loss factor, multiplied by the cumulative activity data reported on grid-supplied energy consumption by the U.S. Energy Information Administration. Fugitive emissions from the natural gas distribution system are estimated based on the Boston-specific average loss factor produced in a 2015 Harvard Proceedings of the Natural Academy of Sciences (PNAS) study.[65]

[65] K. McKain, et al., "Methane emissions from natural gas infrastructure and use in the urban region of Boston, Massachusetts," *Proceedings of the National Academy of Sciences*, February 2015, www.pnas.org/cgi/doi/10.1073/pnas.1416261112

Transportation

The transportation sector uses a resident-activity model to calculate GHG emissions from on-road vehicles. The emissions calculated represent all trip miles travelled inside and outside of Newton carried out by passenger and commercial vehicles registered in the City of Newton. This includes vehicles of all fuel types registered in Newton (gasoline, diesel, hybrid, and battery electric). Data from the Massachusetts Vehicle Census (MAVC) on average daily emissions from registered passenger and commercial vehicles in Newton was used to calculate emissions for the GHG inventory. The MAVC combines information from the MA Registry of Motor Vehicles on vehicle registrations, inspection records, mileage ratings, and other sources to document the ownership and mileage history of each vehicle. MAPC uses the actual vehicle miles traveled (VMT) of registered vehicles and the adjusted miles per gallon (MPG) to generate daily fuel consumption and associated greenhouse gas emissions based on the greenhouse gas density of the associated fuel type.

Waste

The waste sector includes GHG emissions from the disposal of municipal solid waste and treatment of wastewater generated by residents and commercial entities in the City. All the municipal solid waste generated in Newton that is not recycled or composted is disposed of by incineration. GHG emissions are calculated for the tons of waste in Newton that is either composted (i.e., biologically treated) or incinerated. All of the wastewater generated by the City is delivered by the Massachusetts Water Resources Authority (MWRA) to the Deer Island Wastewater Treatment Plant. On Deer Island, no methane is released from the treatment process at the facility. Nearly all of the facility's methane is used for heating the digester tanks according to MWRA records. The excess is diverted to a cogeneration system where it is used to heat buildings and generate electricity via steam turbine generators. As such, only nitrous oxide emissions are calculated for the wastewater generated in the City.

TABLE F2: PRIMARY SOURCES FOR ACTIVITY DATA

Source	Data Type	Sector/Subsector
MassSaveData[66]	Statewide	Residential and commercial/industrial buildings – electricity and natural gas
MassEnergyInsight[67]	Local	Municipal buildings and vehicles – all fuels
EIA RECS, CBECS, MECS[68]	Regional	Residential and commercial/industrial buildings – heating oil estimation
American Community Survey[69]	National	Residential and commercial/industrial buildings – heating oil estimation
EOLWD Wages and Labor Survey[70]	Statewide	Residential and commercial/industrial buildings – heating oil estimation

[66] http://masssavedata.com/public/home
[67] https://massenergyinsight.net/home
[68] https://www.eia.gov/consumption/
[69] https://datacommon.mapc.org/browser/Housing/Household%20Tenure
[70] http://lmi2.detma.org/lmi/lmi_oes_a.asp

Massachusetts Vehicle Census[71]	Statewide	Passenger and commercial vehicles
City of Newton, DPW	Local	Municipal solid waste

Emissions Factors

Emissions factors are applied to all activity data to calculate emissions for a greenhouse gas inventory. The greenhouse gases included in this inventory are carbon dioxide (CO_2), methane (CH_4), and nitrous oxide (N_2O). The best practice guidance for developing GHG inventories is to apply emissions factors that are most relevant to the inventory boundary. In most cases, city-specific emissions factors are unavailable unless additional data collection and analysis has been performed. For Newton's GHG inventory, a range of local, regional, and national factors were applied. Where relevant emissions factors were unavailable, the inventory uses the default factors provided by either IPCC or ICLEI guidance on GHG inventories (as is recommended in the GPC method).

TABLE F3: PRIMARY SOURCES FOR EMISSIONS FACTORS

Source	Factor Type	Factor Application
2016 ISO New England Electric Generator Air Emissions Report[72]	Regional	CO_2 emissions from consumption of grid-supplied electricity
2018 EPA Emissions Factors for Greenhouse Gas Inventories[73]	National	CH_4 and N_2O emissions from consumption of grid-supplied electricity and all emissions from combustion of natural gas, fuel oil #2 (heating oil), propane, diesel, and gasoline
2006 IPCC Guidelines for National Greenhouse Gas Inventories[74]	Default guidance	CH_4 and N_2O emissions from composting and N_2O emissions from wastewater
2003 ICLEI US Community Protocol for Accounting and Reporting of Greenhouse Gas Emissions[75]	Default guidance	All emissions from incineration of municipal solid waste
2015 Harvard Study published in the Proceedings of the National Academy of Sciences[76]	Local	CH_4 emissions from non-combusted natural gas losses from the distribution system (i.e. gas leaks)

71 https://datacommon.mapc.org/browser/Transportation/Massachusetts%20Vehicle%20Census%20(2009-14)

72 https://www.iso-ne.com/static-assets/documents/2018/01/2016_emissions_report.pdf

73 https://www.epa.gov/sites/production/files/2018-03/documents/emission-factors_mar_2018_0.pdf

74 https://www.ipcc.ch/report/2006-ipcc-guidelines-for-national-greenhouse-gas-inventories/

75 http://icleiusa.org/publications/us-community-protocol/

76 K. McKain, et al.

The "REFERENCES" sheet of Appendix E provides complete documentation of the specific emissions factor values used in the City's GHG inventory. This section of Appendix E also documents all other conversion factors applied in the inventory.

Emissions from Grid-Supplied Electricity

The GHG inventory applies the locational marginal unit (LMU) heat rates and emissions factors produced by ISO New England to calculate emissions from grid-generated electricity. The heat rates and emissions factors provided by ISO New England provide a higher level of local accuracy than the eGRID factors calculated by the U.S. Environmental Protection Agency (EPA). The LMU methodology bases the emissions factor on the last unit dispatched to balance the system, rather than a fuel type assumption method that places assumptions based on the overall composition of energy sources. Additionally, ISO New England provides updated factors by year – allowing for adjustments as the energy portfolio of the regional electricity grid changes in composition.

Fugitive Emissions from Natural Gas Systems

The GHG inventory applies the 2.7 % loss factor reported in the Harvard Proceedings of the Natural Academy of Sciences (PNAS) study to the total amount of natural gas combusted by buildings in Newton. This application of the factor is likely an underestimation of total fugitive emissions, because the study examined the average fractional loss rate of all downstream components of the natural gas system, including gas lost along transmission and distribution. The GHG inventory assumes that 90 % of the total amount of natural gas lost is released as methane into the atmosphere.

Updating the GHG Inventory for Future Years

MAPC produced the workbook in the Appendix E Excel spreadsheet to support the City in updating the GHG inventory as more recent years of activity data become available. The City intends to update the GHG inventory every two to three years to benchmark progress toward the City's climate goals.

Using the Inventory Workbook

All of the sheets in the workbook link back to the "INPUTS" tab. To calculate the City's GHG inventory for a new year, save a copy of the entire workbook and update all the INPUTS cells highlighted in yellow below with the respective data for the updated year of the inventory. No changes should be made within the "REFERENCES" or sector-specific sheets, unless a revision to the methodology is being implemented. All of the linked calculations will update for the new year of data and auto populate in the "GHG SUMMARY" and "FIGURES" tabs for immediate use.

Appendix C: 2013 Greenhouse Gas Inventory

The information contained in this Appendix is available as a separate excel spreadsheet for ease of updating and is shown here.

City of Newton Greenhouse Gas Emissions Inventory SUMMARY (2013)

The following inputs are for the calendar year 2014

The City of Newton's Greenhouse Gas Inventory ("GHG Inventory") uses the Global Protocol for Community-Scale Greenhouse Gas Emission Inventories ("GPC") for sources of emissions for which data is reasonably available to the City. With some limitations in resources and data, the City's GHG Inventory adheres most closely to the BASIC level reporting under the GPC framework. This includes emissions from Scopes 1 and 2 for Stationary Energy and Transportation, and Scopes 1 and 3 for Waste.

How to use the City's GHG Inventory Tool: All of the sheets in this workbook link back to the INPUTS tab. To calculate the City's GHG inventory for a new year, save a copy of the entire workbook and update all the INPUTS cells highlighted in yellow below with the respective data for the new year. No changes should be made within the REFERENCES or sector-specific sheets (STATIONARY ENERGY, TRANSPORTATION, and WASTE), unless a revision to the methodology is being implemented. All of the linked calculations will update with the new year of data and auto-populate in the GHG SUMMARY and FIGURES tabs for immediate use.

Current limitations and methodology details: As stated above, the City's GHG Inventory is limited to those emissions sources included in the BASIC level of the GPC framework. The City's inventory also does not include Transportation Emissions from railways, aviation, or off-road vehicles or Stationary Energy Emissions from manufacturing industries or construction, agriculture, forestry, or fishing activities. See Appendix F of the City's Climate Action Plan for further documentation on the limitations of the current methodology and background on the sources supporting the calculations made.

STATIONARY ENERGY

The following inputs are being used to calculate emissions in the stationary energy sector for Newton's Greenhouse Gas Inventory.

Residential Buildings	Input	Source
Electricity (MWh)	226,802.00	MassSaveData
Natural gas (Therms)	25,081,856.00	MassSaveData
Heating oil (Gallons)	4,610,351.49	MAPC Estimate Methodology

Commercial & Industrial Buildings	Input	Source
Electricity (MWh)	330,418.00	MassSaveData
Natural gas (Therms)	13,919,189.00	MassSaveData
Heating oil (Gallons)	859,372.50	MAPC Estimate Methodology

Municipal Buildings	Input	Source
Electricity (MWh)	22,578.52	MassEnergyInsight
Natural gas (Therms)	1,263,525.00	MassEnergyInsight
Heating oil (Gallons)	128,924.00	MassEnergyInsight
Propane (Gallons)	755.00	MassEnergyInsight

Electricity Transmission & Distribution Losses	Input	Source
Estimated losses (MWh)	3,009,923	US EIA
Total disposition (MWh)	34,159,686	US EIA
Direct use electricity (MWh)	1,123,088	US EIA

Fugitive Emissions from Natural Gas Systems	Input	Source
Fractional loss rate from all downstream components of the natural gas system	2.7%	Harvard PNAS (2015)

TRANSPORTATION

The following inputs are being used to calculate emissions in the transportation sector for Newton's Greenhouse Gas Inventory.

Passenger Vehicles	Input	Source
Average Daily Emissions Q1 (lbs CO_2e)	513.52	MA Vehicle Census
Average Daily Emissions Q2 (lbs CO_2e)	513.87	MA Vehicle Census
Average Daily Emissions Q3 (lbs CO_2e)	521.36	MA Vehicle Census
Average Daily Emissions Q4 (lbs CO_2e)	512.32	MA Vehicle Census

Commercial Vehicles	Input	Source
Average Daily Emissions Q1 (lbs CO_2e)	32.53	MA Vehicle Census
Average Daily Emissions Q2 (lbs CO_2e)	31.60	MA Vehicle Census
Average Daily Emissions Q3 (lbs CO_2e)	31.44	MA Vehicle Census
Average Daily Emissions Q4 (lbs CO_2e)	30.04	MA Vehicle Census

Municipal Vehicles	Input	Source
Gasoline (Gallons)	191,907	MassEnergyInsight
Diesel (Gallons)	71,348	MassEnergyInsight

WASTE

The following inputs are being used to calculate emissions in the waste sector for Newton's Greenhouse Gas Inventory.

Municipal Solid Waste Treatment	Input	Source
Landfill (US tons)	-	City of Newton, DPW
Incineration (US tons)	18,719.65	City of Newton, DPW
Composting (US tons)	7,106.62	City of Newton, DPW
Recycling (US tons)	10,411.30	City of Newton, DPW

Wastewater Treatment	Input	Source
City population	87,636	US Census, MAPC Population Estimates
Per capita protein consumption (kg/pers/yr)	31.9	US EPA, 2013 GHG Inventory

City of Newton Greenhouse Gas Emissions Inventory SUMMARY (2013)

GHG Emissions Source (by sector and subsector)	Scope	Notation Key*	Emissions (MT)				Data Quality**	
			CO_2	CH_4	N_2O	CO_2e	Activity Data	Emissions Factor
Stationary Energy								
Residential buildings			275,830.49	12.18	2.05	276,713.70		
Electricity	2		95,674.47	7.79	1.43	96,270.32	High	High
Natural gas	1		133,084.33	2.51	0.25	133,221.02	High	Medium
Heating oil	1		47,071.69	1.89	0.37	47,222.35	Medium	Medium
Commercial & industrial buildings			222,013.40	13.09	2.29	222,985.42		
Electricity	2		139,383.99	11.34	2.08	140,252.06	High	High
Natural gas	1		73,855.22	1.39	0.14	73,931.08	High	Medium
Heating oil	1		8,774.19	0.35	0.07	8,802.28	Low	Medium
Manufacturing and construction		NE						
Electricity	2	NE						
Natural gas	1	NE						
Heating oil	1	NE						
Energy Industries	1, 2, 3	NO	-	-	-	-	N/A	N/A
Transmission & distribution losses from grid-supplied electricity consumption	3		21,416	2	0	21,549	Medium	High
Fugitive emissions from natural gas systems	1		-	1,905	-	53,335	Low	High
Transportation								
On-road transportation						199,535		
Fuel combustion - passenger	1					188,072.84	Medium	Medium
Fuel combustion - commercial	2					11,462.54	Medium	Medium
Waste								
Solid waste disposal								
Disposed at landfills in-city boundary	1	NO					N/A	N/A

Disposed at landfills outside city boundary	3	NO						
Biological treatment of waste			-	64	4	2,830		
Treated within city boundary	1		-	64	4	2,830	High	Low
Treated outside city boundary	3	NE						
Incineration and open burning			6,112	6	1	6,488		
Treated within city boundary	1		6,112	6	1	6,488	High	Low
Treated outside city boundary	3	NE						
Wastewater treatment and discharge			-	-	6	1,630		
Treated within city boundary	1	NO						
Treated outside city boundary	3		-	-	6	1,630	High	Medium

**Notation keys from GPC used (IE = Included Elsewhere, NE = Not Estimated, NO = Not Occurring, C = Confidential)*

***Data quality assessment applies GPC standards for High, Medium and Low quality ratings for the data used.*

STATIONARY ENERGY EMISSIONS CALCULATIONS

Cells highlighted in yellow are data points sourced from the inputs tab. Included in the current calculations for stationary energy are: Residential Buildings (Starts Row 4), Commercial & Industrial Buildings (Starts Row 16), Municipal Buildings (Starts Row 28), Electricity Transmission & Distribution Losses (Starts Row 40), and Fugitive Emissions from Natural Gas Systems (Starts Row 59).

Residential Buildings

	Natural Gas		Oil		Electricity	
Units	Therms	MMTBU	Gallons	MMBTU	MWh	MMBTU
Consumption	25,081,856.00	2,508,185.60	4,610,351.49	636,228.51	226,802.00	1,551,552.48

	Natural Gas	Oil	Electricity	All Fuels
	Metric Tons	Metric Tons	Metric Tons	Metric Tons
CO_2	133,084.33	47,071.69	95,674.47	275,830.49
CH4	2.51	1.89	7.79	12.18
N2O	0.25	0.37	1.43	2.05
CO_2e	133,221.02	47,222.35	96,270.32	276,713.70

Commercial & Industrial Buildings

	Natural Gas		Oil		Electricity	
Units	Therms	MMTBU	Gallons	MMBTU	MWh	MMBTU
Consumption	13,919,189.00	1,391,918.90	859,372.50	118,593.40	330,418.00	2,260,389.54

	NaturalGas	Oil	Electricity	AllFuels
	MetricTons	MetricTons	MetricTons	MetricTons
CO_2	73,855.22	8,774.19	139,383.99	222,013.40
CH4	1.39	0.35	11.34	13.09
N2O	0.14	0.07	2.08	2.29
CO_2e	73,931.08	8,802.28	140,252.06	222,985.42

Municipal Buildings (Subset of Commercial & Industrial - do not include in GHG SUMMARY tab)

	Natural Gas		Oil		Electricity		Propane	
Units	Therms	MMTBU	Gallons	MMBTU	MWh	MMBTU	Gallons	MMBTU
Consumption	1,263,525.00	126,352.50	128,924.00	17,791.51	22,578.52	154,459.66	755.00	

	Natural Gas	Oil	Electricity	Propane	All Fuels
	Metric Tons	Metric Tons	Metric Tons	Metric Tons	Metric Tons
CO_2	6,704.26	1,316.31	9,524.55	4.32	17,549.45
CH4	0.13	0.05	0.78	0.00	0.95
N2O	0.01	0.01	0.14	0.00	0.16
CO_2e	6,711.15	1,320.53	9,583.87	4.33	17,619.88

TRANSPORTATION EMISSIONS CALCULATIONS

Cells highlighted in yellow are data points sourced from the INPUTS tab. Included in the current calculations for Transportation are on-road emissions from passenger vehicles and commercial vehicles. Emissions from the municipal vehicle fleet are calculated separately - but are accounted for in the GHG inventory in the Commercial Vehicle Emissions.

Passenger Vehicle Emissions

	Average Daily Emissions Q1	Average Daily Emissions Q2	Average Daily Emissions Q3	Average Daily Emissions Q4	Average Daily Emissions - All Quarters	Total Annual Emissions
	Metric Tons	Metric Tons	Metric Tons	Metric Tons	Metric Tons	Metric Tons
CO_2e	513.52	513.87	521.36	512.32	515.27	188,072.84

Commercial Vehicle Emissions

	Average Daily Emissions Q1	Average Daily Emissions Q2	Average Daily Emissions Q3	Average Daily Emissions Q4	Average Daily Emissions - All Quarters	Total Annual Emissions
	Metric Tons	Metric Tons	Metric Tons	Metric Tons	Metric Tons	Metric Tons
CO_2e	32.53	31.60	31.44	30.04	31.40	11,462.54

Municipal Vehicle Emissions (Subset of commercial vehicles - do not include in GHG SUMMARY tab)

	Gasoline		Diesel	
Units	Gallons	MMBTU	Gallons	MMBTU
Consumption	191,907	23,111.17	71,348	9,801.86

	Gasoline	Diesel	All Fuels
	Metric Tons	Metric Tons	Metric Tons
CO_2	1,684.94	724.18	2,409.13
CH4	0.07		0.07
N2O	0.02		0.02
CO_2e	1,691.05	724.18	2,415.24

WASTE EMISSIONS CALCULATIONS

Cells highlighted in yellow are data points sourced from the INPUTS tab. Current calculations for the Waste sector of the GHG inventory area treatment of municipal solid waste by incineration and biological treatment (composting) and wastewater treatment. The emissions equations used for incineration and composting are from ICLEI's U.S. Community Protocol for Accounting and Reporting GHG Emissions. The data collected for this inventory does not support use of either the first order of decay or methane commitment models recommended in the GPC method.

Municipal Solid Waste Treatment

	Landfill		Incineration		Composting (Yard Waste)		Recycling	
Units	US Tons	kg	US Tons	kg	US Tons	kg	US Tons	kg
Waste Generated	-	-	18,719	16,982,185	7,106	6,447,019	10,411	9,444,975

	Landfill	Incineration	Composting (Yard Waste)	Recycling	All Methods
	Metric Tons	Metric Tons	Metric Tons	Metric Tons	Metric Tons
CO_2	-	6,112.34	-	-	6,112.34
CH4	-	5.99	64.47	-	70.46
N2O	-	0.79	3.87	-	4.65
CO_2e	-	6,488.42	2,830.24	-	9,318.66

Wastewater Treatment

	City Population	Protein per Capita
Units	Persons	kg/person/year
Inputs	87,636	31.9

	Domestic& Industrial Metric Tons
CO_2*	-
CH4**	-
N2O	6.15
CO_2e	1,629.83

**CO_2 from wastewater treatment is considered to be of biogenic origin and reported outside the scope.*
***For Deer Island, no methane is released from the treatment process. The facility utilizes nearly all of its methane for heating the digester tanks according to MWRA records. The excess is diverted to a cogeneration system where it is used to heat buildings and generate electricity via steam turbine generators.*

Appendix D: **Newton's 2020**-2024 Climate Action Plan Strategies

A. **Newton's** Implementation Leadership Strategies

A.1. Create a City implementation team, develop appropriate municipal planning and budgeting processes, and ensure regular Plan evaluations and updates

A.2. Work with partners to build awareness and drive action

B. **Newton's Clean and Renewable Energy** Strategies

B.1. Increase the amount of electricity provided by New England renewable energy resources

B.2. Support the installation of residential and commercial solar

B.3. Support advocacy groups' efforts to transition from natural gas to renewable energy systems

C. **Newton's Green Transportation** Strategies

C.1. Ensure that municipal infrastructure and operations are as "green" as possible

C.2. Incentivize residents to switch to EVs with a goal of having 10% of all vehicles on the road be EV, BHEV, ZEM, PHEV+ by 2024

C.3. Engage with third party partners to promote EVs and encourage biking walking, public transit and shared transportation.

C.4. Increase the rate of biking, walking, telecommuting, shared rides, and use of shuttles and public transit, while reducing single-occupancy vehicle trips

D. **Newton's New Construction and Major Renovations** Strategies

D.1. Advocate for a more energy-efficient and climate-smart building code

D.2. Ensure that new and renovated municipal buildings meet the highest energy efficiency standards possible

D.3. Work with City Council to adopt Zoning Ordinance amendments that require and/or incentivize high-efficiency performance and/or net-zero new construction – within the next 12 months

D.4. Develop and provide to residents, developers, and businesses educational resources about clean heating and cooling and renewable technologies

E. **Newton's Existing Building S**trategies

E.1. Advance energy efficiency and weatherization in existing homes and businesses by helping homeowners and contractors understand options

E.2. Transition to electric and thermal heating and cooling in residential and commercial buildings

E.3. Work with City Council to adopt zoning ordinances for energy efficiency and clean energy technologies

Newton's Consumption and Disposal Strategies

F.1. Consider initiatives to engage businesses and residents in reducing GHG emissions resulting from corporate operations and individual activities

F.2. Evaluate strategies to improve waste reduction and diversion among residents, businesses, and municipal operations in Newton

Appendix E: Proposed Actions by Action Number

A. Implementing Newton's Climate Action Plan	
A.1.1.	Transform the existing Major Projects and Infrastructure Cluster into the Major Projects, Infrastructure, and Climate Change Cluster to oversee implementation and track the progress of this Plan.
A.1.2.	Develop more concrete estimates of costs and fiscal benefits for each action in this plan and incorporate funding categories or appropriate metrics in the CIP prioritization process to reflect the priorities of this plan and other related plans (such as the Climate Change Vulnerability Assessment and Transportation Plan).
A.1.3.	Evaluate the success of initiatives in this plan -- collect data on immediate and measurable results
A.1.4.	Update the Greenhouse Gas Inventory every 3 to 5 years.
A.1.5.	Review the Climate Action Plan regularly.
A.1.6.	Update the plan as needed, but at least every 5 years.
A.1.7.	Provide annual updates to the City Council.
A.2.1	Promote energy efficiency and GHG emission reduction in the Newton community through a Memorandum of Understanding with Eversource and National Grid.
A.2.2.	Develop an Energy Coach Role.
A.2.3.	In collaboration with the Utilities, work with the largest energy users in the City to reduce their GHG emissions.
A.2.4.	Work with the Newton-Needham Chamber of Commerce and the NCCE to explore possible structures for a "Green Ribbon Commission" and implement the preferred model.
B. Promoting Clean and Renewable Energy	
B.1.1.	Encourage residents and businesses to opt up to 100% renewable energy through Newton Power Choice.
B.1.2.	Explore increasing the percentage of MA Class 1 RECS in the City's next Newton Power Choice contract.
B.1.3.	Explore increasing the percentage of MA Class 1 RECS in the City's next municipal electricity contract.
B.2.1.	Work with City Council to adopt a zoning requirement that all new buildings with a certain roof area require solar PV where technically feasible, and other "eco-roof" treatment where appropriate. (See D.3.4.)
B.2.2.	Support Green Newton's efforts to implement the Newton Solar Challenge for residents and businesses which encourages the installation of rooftop solar.
B.2.2.	Work with the Housing Authority to install solar PV on their buildings under the state's SMART incentives.
B.3.1.	Support HEET in its efforts to pilot neighborhood-scale conversion to all-electric heating and cooling systems for neighborhoods in which there is a high prevalence of leak-prone gas infrastructure.
C. **Greening Newton's Transportation and Streetscapes**	
C.1.1.	Replace 100% of the City's own passenger vehicles with EVs or other zero-emission vehicles.
C.1.2.	Reduce GHG emissions from all municipal non-passenger vehicles.
C.1.3.	Install EV charging stations in village centers, school facilities, and other priority municipal sites, primarily through the Make Ready and GreenSpot programs.

C. Greening Newton's Transportation and Streetscapes (cont'd)	
C.1.4.	Initiate small, medium, and large Green Infrastructure and Complete Streets projects specifically aimed at supporting bike/pedestrian travel, reducing GHG emission, increasing tree and shrub installations.
C.1.5.	Facilitate municipal employees use of alternate modes of transportation.
C.1.6.	Prioritize street tree preservation, tree planting, and landscaping, with special consideration given to hot spot areas identified in the Climate Vulnerability Assessment.
C.2.1.	Incorporate electric vehicle charging station requirements into the Zoning Ordinance and a criterion for large multi-family, commercial, and mixed-use developments.
C.2.2.	Provide preferential parking for electric vehicles to make it easier to park.
C.2.3.	Continue to work with partners (such as Make Ready) to install EV charging stations on private properties throughout the City.
C.3.1.	Support local non-profits and for-profits such as Green Newton, the NCCE, and Newton-Needham Chamber of Commerce, the Transportation Advisory Group (TAG), Safe Routes to School, the utilities, and local businesses efforts in education, events (such as test drives and Tour du Newton), and literature dissemination.
C.3.2.	Support local environmental organizations and car dealerships in implementing group purchasing discounts and other incentivization efforts.
C.3.3.	Engage the transportation network companies (TNCs) and private shuttle operators to increase adoption of electric vehicles, primarily in partnership with other metro Boston communities.
C.4.1.	Work with the City Council to develop a TDM program to reduce single-occupancy vehicle trips through amendments to the Zoning Ordinance.
C.4.2.	Work with the City Council to reduce or eliminate the minimum parking requirement in the Zoning Ordinance and set a maximum on parking allotments.
C.4.3.	Create and encourage the use of safe bicycle and pedestrian facilities for commuters and residents.
C.4.4.	Support local transportation partners, such as Safe Routes to School, MassRides, and others in allowing Newton residents to reduce single-occupancy vehicle trips.
C.4.5.	Explore public-private partnerships to develop shared and electric shuttles to support first- and last-mile connections.
C.4.6	Explore opportunities to contract with companies that supply electric school buses.
C.4.7.	Advocate for Newton's transit service needs including: frequent and accessible service, expanded routes and service hours, station and bus stop upgrades, dedicated lanes for buses and zero-emission vehicles on the MassPike, and other measures during planning processes at the MBTA and MassDOT.
D. Improving New Construction and Major Renovations	
D.1.1.	Register and educate all eligible representatives to ensure strong City participation in the vote on the 2021 International Energy Conservation Code (IECC) to improve the state base building code (with regard to energy efficiency, electrification, and other carbon reduction strategies), and advocate to the Board of Building Regulations and Standards (BBRS) for a net zero Stretch Code.
D.2.1.	Require that all new and renovated municipal buildings continue to meet the City's Sustainability Guidelines for Public Buildings (see Appendix G): (1) Minimize Energy Use Intensity (EUI), (2) Transition away from fossil fuel use, (3) Have solar photovoltaics (PV) panels or are solar-ready, and (4) Have EV chargers and/or are charger-ready. Ensure that such goals are reflected in the CIP.
D.3.1.	Work with City Council to amend the Zoning Ordinance to require new construction and major renovations seeking a Special Permit maximize energy efficiency and the use of renewable energy, including thermal energy.
D.3.2.	Work with City Council to require that all new construction and major renovations analyze the costs, benefits, and GHG impacts of maximizing energy efficiency; utilizing electric heating, cooling, and hot water; and using renewable energy, including thermal energy.

D. Improving New Construction and Major Renovations	
D.3.3.	Work with City Council to adopt a zoning requirement that all new parking lots above a certain size require EV charging stations.
D.3.4.	Work with City Council to adopt a zoning requirement that all new buildings with a certain roof area require solar PV where technically feasible, and other "eco-roof" treatment where appropriate.
D.3.5.	Work with the City Council to adopt Zoning Ordinances that encourage additional, appropriate low-carbon housing near public transportation.
D.4.1.	Provide educational resources to developers, residents, and businesses applying for municipal permits about the financial and lifestyle benefits of clean heating and cooling and renewable technologies.
E. Improving Existing Buildings	
E.2.1.	Implement a Solarize Plus, HeatSmart, or similar outreach program for residents and businesses to encourage adoption of electric and clean heating and cooling technologies such as air-source heat pumps, ground-source heat pumps, and thermal options.
E.3.1.	Work with City Council to allow by right the installation of GHG-reducing building improvements.
E.3.2.	Work with City Council to adopt an ordinance requiring residential and commercial building owners to disclose to potential buyers electric, gas and heating oil bills for the previous 12 months, and explore the possibility of listing energy performance in the Assessor's database.
F. Reducing GHG Emissions Associated with Consumption and Disposal	
F.1.1.	Work with the Economic Development Director and the Newton-Needham Chamber of Commerce to explore incentive programs for businesses to reduce GHG emissions associated with consumption and disposal.
F.1.2.	Explore adoption of a voluntary program that would allow contributions to a municipal program to help offset GHGs produced by air travel.
F.2.1.	Consider citywide mandatory commercial recycling.
F.2.2.	Solicit ideas for a consumption/waste reduction campaign.
F.2.3.	Work to implement organics diversion programs for Newton residents.
F.2.4.	Increase waste diversion through recycling and household hazardous waste efforts.

Appendix F: Proposed Actions by Type of Action (listing implementers)

Action by type of action	Implementers
Working with Commercial Property Owners	
A.2.3. In collaboration with the Utilities, work with the largest energy users in the City to reduce their GHG emissions.	Mayor's Office, Sustainability Dept., Planning Dept., and Partners
A.2.4. Work with the Newton-Needham Chamber of Commerce and the NCCE to explore possible structures for a "Green Ribbon Commission" and implement the preferred model.	Mayor's Office, Sustainability Dept., Planning Dept., Economic Development Commission, N-N Chamber of Commerce, Green Newton
F.1.1. Work with the Economic Development Director and the Newton-Needham Chamber of Commerce to explore incentive programs for businesses to reduce GHG emissions associated with consumption and disposal.	Planning Dept., Sustainability Dept.
F.1.2. Explore adoption of a voluntary program that would allow contributions to a municipal program to help offset GHGs produced by air travel.	Parks, Recreation, and Culture Dept., Sustainability Dept.
Educating about and Marketing Climate-Friendly Actions	
A.2.2. Develop an Energy Coach Role.	Sustainability Dept.(with support from, the Newton Citizens Commission on Energy, and local environmental groups), Utility Providers
B.2.2. Support Green Newton's efforts to implement the Newton Solar Challenge for residents and businesses which encourages the installation of rooftop solar.	Green Newton, Sustainability Dept.
D.4.1. Provide educational resources to developers, residents, and businesses applying for municipal permits about the financial and lifestyle benefits of clean heating and cooling and renewable technologies.	Sustainability Dept., Planning Dept.
E.2.1. Implement a Solarize Plus, HeatSmart, or similar outreach program for residents and businesses to encourage adoption of electric and clean heating and cooling technologies such as air-source heat pumps, ground-source heat pumps, and thermal options.	Local Environmental Organizations
F.2.2. Solicit ideas for a consumption/waste reduction campaign.	Dept. of Public Works, Solid Waste Commission
F.2.4. Increase waste diversion through recycling and household hazardous waste efforts.	Dept. of Public Works, Solid Waste Commission

Promoting Electric Vehicles	
C.2.2. Provide preferential parking for electric vehicles to make it easier to park.	Planning Dept., Sustainability Dept., Dept. of Public Works
C.2.3. Continue to work with partners (such as Make Ready) to install EV charging stations on private properties throughout the City.	Sustainability Dept., Planning Dept.
C.3.1. Support local non-profits and for-profits such as Green Newton, the NCCE, and Newton-Needham Chamber of Commerce, the Transportation Advisory Group (TAG), Safe Routes to School, the utilities, and local businesses efforts in education, events (such as test drives and Tour du Newton), and literature dissemination.	Local Environmental Organizations
C.3.2. Support local environmental organizations and car dealerships in implementing group purchasing discounts and other incentivization efforts.	Local Environmental Organizations, Car Dealerships
C.3.3. Engage the transportation network companies (TNCs) and private shuttle operators to increase adoption of electric vehicles, primarily in partnership with other metro Boston communities.	Planning Dept., Mayor's Office
C.4.6 Explore opportunities to contract with companies that supply electric school buses.	School Dept., Mayor's Office
Adapting Municipal Coordination	
A.1.1. Transform the existing Major Projects and Infrastructure Cluster into the Major Projects, Infrastructure, and Climate Change Cluster to oversee implementation and track the progress of this Plan.	Major Projects, Infrastructure, and Climate Change Cluster, Sustainability Department
A.1.2. Develop more concrete estimates of costs and fiscal benefits for each action in this plan and incorporate funding categories or appropriate metrics in the CIP prioritization process to reflect the priorities of this plan and other related plans (such as the Climate Change Vulnerability Assessment and Transportation Plan).	Major Projects, Infrastructure, and Climate Change Cluster, Sustainability Department
A.1.3. Evaluate the success of initiatives in this plan -- collect data on immediate and measurable results	Major Projects, Infrastructure, and Climate Change Cluster, Sustainability Department
A.1.4. Update the Greenhouse Gas Inventory every 3 to 5 years.	Major Projects, Infrastructure, and Climate Change Cluster, Sustainability Department
A.1.5. Review the Climate Action Plan regularly.	Major Projects, Infrastructure, and Climate Change Cluster, with municipal, volunteer, and private partners
A.1.6. Update the plan as needed, but at least every 5 years.	Major Projects, Infrastructure, and Climate Change Cluster
A.1.7. Provide annual updates to the City Council.	Major Projects, Infrastructure, and Climate Change Cluster
A.2.1 Promote energy efficiency and GHG emission reduction in the Newton community through a Memorandum of Understanding with Eversource and National Grid.	Sustainability Dept., Mayor's Office
B.1.3. Explore increasing the percentage of MA Class 1 RECS in the City's next municipal electricity contract.	Sustainability Dept., Mayor's Office

Adapting Municipal Coordination (cont'd)	
C.1.1. Replace 100% of the City's own passenger vehicles with EVs or other zero-emission vehicles.	Public Works Dept.
C.1.3. Install EV charging stations in village centers, school facilities, and other priority municipal sites, primarily through the Make Ready and GreenSpot programs.	Dept. of Public Works, Planning Dept., Newton Public School Dept.
C.1.4. Initiate small, medium, and large Green Infrastructure and Complete Streets projects specifically aimed at supporting bike/pedestrian travel, reducing GHG emission, increasing tree and shrub installations.	Dept. of Public Works, Planning Dept.
C.1.2. Reduce GHG emissions from all municipal non-passenger vehicles.	Dept. of Public Works, School Department
C.1.5. Facilitate municipal employees use of alternate modes of transportation.	Watertown TMA with support from the City
C.1.6. Prioritize street tree preservation, tree planting, and landscaping, with special consideration given to hot spot areas identified in the Climate Vulnerability Assessment.	Parks, Recreation, and Culture Dept.
D.2.1. Require that all new and renovated municipal buildings continue to meet the City's Sustainability Guidelines for Public Buildings: (1) Minimize Energy Use Intensity (EUI), (2) Transition away from fossil fuel use, (3) Have solar photovoltaics (PV) panels or are solar-ready, and (4) Have EV chargers and/or are charger-ready. Ensure that such goals are reflected in the CIP.	Public Buildings Dept.
F.2.1. Consider citywide mandatory commercial recycling.	Dept. of Public Works, Health and Human Services Dept.
F.2.3. Work to implement organics diversion programs for Newton residents.	Dept. of Public Works
Promoting Clean Energy Production and Utilization	
B.1.1. Encourage residents and businesses to opt up to 100% renewable energy through Newton Power Choice.	Sustainability Dept., Local Environmental Organizations
B.1.2. Explore increasing the percentage of MA Class 1 RECS in the City's next Newton Power Choice contract.	Sustainability Dept., Mayor's Office
B.2.2. Work with the Housing Authority to install solar PV on their buildings under the state's SMART incentives.	Sustainability Dept., Planning Dept., Newton Housing Authority
B.3.1. Support HEET in its efforts to pilot neighborhood-scale conversion to all-electric heating and cooling systems for neighborhoods in which there is a high prevalence of leak-prone gas infrastructure.	Sustainability Dept., Planning Dept., Dept. of Public Works
Enhancing Transportation Options	
C.4.3. Create and encourage the use of safe bicycle and pedestrian facilities for commuters and residents.	Planning Dept., Dept. of Public Works
C.4.4. Support local transportation partners, such as Safe Routes to School, MassRides, and others in allowing Newton residents to reduce single-occupancy vehicle trips.	Planning Dept., Sustainability Dept., Newton Public School Dept., Local Environmental Organizations
C.4.5. Explore public-private partnerships to develop shared and electric shuttles to support first- and last-mile connections.	Planning Dept., Mayor's Office

C.4.7. Advocate for Newton's transit service needs including: frequent and accessible service, expanded routes and service hours, station and bus stop upgrades, dedicated lanes for buses and zero-emission vehicles on the MassPike, and other measures during planning processes at the MBTA and MassDOT.	Mayor's Office, Planning Dept.
Improving Newton's Zoning Ordinance and Permitting Processes	
C.2.1. Incorporate electric vehicle charging station requirements into the Zoning Ordinance and a criterion for large multi-family, commercial, and mixed-use developments.	City Council, Planning Dept.
C.4.1. Work with the City Council to develop a TDM program to reduce single-occupancy vehicle trips through amendments to the Zoning Ordinance.	City Council, Planning Dept.
C.4.2. Work with the City Council to reduce or eliminate the minimum parking requirement in the Zoning Ordinance and set a maximum on parking allotments.	City Council, Planning Dept.
D.1.1. Register and educate all eligible representatives to ensure strong City participation in the vote on the 2021 International Energy Conservation Code (IECC) to improve the state base building code (with regard to energy efficiency, electrification, and other carbon reduction strategies), and advocate to the Board of Building Regulations and Standards (BBRS) for a net zero Stretch Code.	Sustainability Dept.
D.3.1. Work with City Council to amend the Zoning Ordinance to require new construction and major renovations seeking a Special Permit maximize energy efficiency and the use of renewable energy, including thermal energy.	City Council, Planning Dept., Sustainability Dept.
D.3.2. Work with City Council to require that all new construction and major renovations analyze the costs, benefits, and GHG impacts of maximizing energy efficiency; utilizing electric heating, cooling, and hot water; and using renewable energy, including thermal energy.	City Council, Planning Dept., Sustainability Dept., Inspectional Services Dept.
D.3.3. Work with City Council to adopt a zoning requirement that all new parking lots above a certain size require EV charging stations.	City Council, Planning Dept.
D.3.4. Work with City Council to adopt a zoning requirement that all new buildings with a certain roof area require solar PV where technically feasible, and other "eco-roof" treatment where appropriate.	City Council, Planning Dept., Sustainability Dept.
D.3.5. Work with the City Council to adopt Zoning Ordinances that encourage additional, appropriate low-carbon, housing near public transportation.	City Council, Planning Dept.
E.3.1. Work with City Council to allow by right the installation of GHG-reducing building improvements.	City Council, Sustainability Dept., Planning Dept., Inspectional Services Dept.
E.3.2. Work with City Council to adopt an ordinance requiring residential and commercial building owners to disclose to potential buyers electric, gas and heating oil bills for the previous 12 months, and explore the possibility of listing energy performance in the Assessor's database.	City Council, Planning Dept., Sustainability Dept.

Appendix G: Acronyms, Terms, and Definitions

Term	Abbreviation	Definition
Air-source heat pump	ASHP	An energy-efficient heating system which uses electricity to transfer heat from outside to inside a building, or vice versa
British thermal unit	Btu	The amount of heat needed to raise one pound of water at maximum density through one-degree Fahrenheit
Battery Hybrid Electric Vehicle	BHEV	Vehicles powered by both gasoline and electricity. The electric energy is generated by the car's own braking system to recharge the battery
Capital improvement plan	CIP	The City of Newton's Capital Improvement Plan is a multi-year plan designed to create a logical, data-driven, comprehensive, integrated and transparent capital investment strategy that addresses infrastructure needs, reflects community values, supports City operations, programs and services, and exemplifies financial and environmental best practices
Carbon dioxide equivalent	CO_2e	A measure for describing how much global warming a given type and amount of greenhouse gas may cause, expressed as the equivalent amount of carbon dioxide
Carbon neutrality		Emitting no net carbon dioxide through reducing and/or offsetting emissions
Carbon sequestration		The process of removing carbon dioxide from the atmosphere and storing it long-term to mitigate global warming
Clean heating and cooling		Refers to a number of heating and cooling technologies that do not require fossil fuel combustion, including air-source heat pumps, geothermal heat pumps, modern wood heating systems, and solar thermal systems
Community choice aggregation	CCA	Also known as municipal electricity aggregation, CCA allows municipalities to use bulk purchasing power to negotiate electricity supply contracts on behalf of their electricity customers
Community shared solar	CSS	A solar-electric system that provides power and/or financial benefit to multiple community members
Distributed energy resources	DER	Distributed generation is electrical generation and/or storage performed by a variety of small, grid-connected or distribution system connected devices such as renewable energy systems and battery storage
District Energy		Networks of hot and cold-water pipes, typically buried underground, that are used to efficiently heat and cool buildings using less energy than if the individual buildings were to each have their own boilers and chillers.
Eco roof		A term used to describe a number of roof types including solar (photovoltaic or thermal), white roofs, blue roofs, and green roofs, which have multiple benefits. These benefits include reducing greenhouse gas emissions, reducing the heat island effect, and lowering temperatures during hot days

EV	Electric vehicle	A vehicle that uses one or more electric motors or traction motors for propulsion
Electrification		The conversion of a machine or system to the use of electrical power
Embodied energy		The amount of greenhouse gases emitted in the production of materials consumed, from building materials to clothing
Energy use intensity	EUI	A measure used to express a building's energy use as a function of its size or other characteristics. A building's EUI is generally expressed as energy consumed in one year (measured in Btu) per square foot
Fossil fuels		Natural fuels such as coal, oil, and gas formed in the geological past from the remains of living organisms
Green infrastructure		Vegetation, soils, and other elements and practices used to restore natural processes required to manage water and create healthier urban environments, including green roofs, rainwater harvesting, bioswales, permeable pavement, and more
Greenhouse gas	GHG	Gases in the atmosphere that absorb and re-emit heat, and thereby keep the planet's atmosphere warmer than it otherwise would be. Those most commonly accounted for are carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O)
Heat Pumps		Heating and cooling systems that use electricity to move heat from a cool space to a warm space, making the cool space cooler and the warm space warmer
Intergovernmental Panel on Climate Change	IPCC	An intergovernmental body of the United Nations dedicated to providing the world with an objective, scientific view of climate change, its natural, political and economic impacts and risks, and possible response options
International Energy Conservation Code	IECC	A building code created by the International Code Council adopted by many states and municipal governments in the United States (including Massachusetts) for the establishment of minimum design and construction requirements for energy efficiency
Key performance indicator	KPI	A quantifiable measure used to evaluate the success of an organization, employee, etc. in meeting objectives for performance
Leadership in Energy and Environmental Design	LEED	Leadership in Energy and Environmental Design (LEED) is a green building rating system developed by the US Green Building Council
Life cycle impacts		Impacts (environmental or otherwise) of a given product, process, or service through production, usage, and disposal
Light-emitting diode	LED	A semiconductor that glows when a voltage is applied. LED lights are up to 80% more efficient than traditional lighting technologies such as incandescent light bulbs
Massachusetts Class I Renewable Energy Certificate	MA Class I REC	Renewable energy certificates (RECs) generated by qualified renewable energy facilities (including solar photovoltaic, wind, small hydropower, etc.) that began operation after 1997. RECs are purchased by electricity suppliers to comply with the state's Renewable Energy Portfolio Standard (RPS)

Microgrid		A small network of electricity users with a local source of supply that is usually attached to a centralized national grid but is able to function independently
Mode shift		Changing the mode of transportation, e.g., shifting from driving to bicycling
Net Zero Municipality		A municipality that produces zero net carbon pollution and/or gets as much electricity from renewable sources as it uses, achieved through a combination of energy efficiency improvements, local clean energy production, and purchasing renewable energy
Passive House		A rigorous, voluntary standard for energy efficiency in a building, which reduces the building's ecological footprint and results in ultra-low energy buildings that require little energy for space heating and cooling
Plug-in Hybrid Electric Vehicle	PHEV	Vehicles that can recharge their battery through both regenerative braking and "plugging in" to an external source of electrical power
Plug-in Hybrid Electric Vehicle +	PHEV+	PHEVs that have a greater battery capacity than the standard, usually greater by 10+kwH
Renewable energy		Energy that is collected from resources that are naturally replenished on a human timescale, such as sunlight, wind, and geothermal heat
Renewable energy certificate	REC	A market-based instrument that represents the property rights to the environmental, social and other non-power attributes of renewable electricity generation. RECs are issued when one megawatt-hour (MWh) of electricity is generated and delivered to the electricity grid from a qualifying renewable energy resource
Renewable portfolio standard	RPS	A Massachusetts law requiring the increased production of energy from renewable energy sources such as wind, solar, and geothermal
Solar Thermal		Technologies that capture the energy from the sun for either heating (e.g., hot water or space heating) or the production of electricity
Transportation network companies	TNCs	A company that matches passengers with drivers via websites and mobile apps such as Lyft or Uber
Vehicle Miles Travelled	VMT	Number of miles travelled by a vehicle
Zero Emissions Motorcycle	ZEM	An electric powered motorcycle

Appendix H: Climate Action Best Practices

As Newton joins the ranks of communities around the world planning for significant action on climate, it has looked to learn from others' best practices and innovative approaches. The City researched climate action plans from a range of cities leading in climate action in North America to identify effective strategies and relevant case studies to inform this plan.

Emerging Best Practices

As the scientific consensus about the urgency of the climate crisis becomes clearer, communities are developing increasingly bold and ambitious plans. One example of the increasing ambitiousness of climate action plans is the recent shift from long-term goals focused on 80% GHG reductions by 2050 to plans targeting *carbon neutrality* or *net zero* emissions by 2050 (or sooner). This shift reflects the IPCC's recent findings that global emissions must be reduced to net zero by 2050 to limit global warming to 1.5ºC.[77] Similarly, communities have shifted the focus of their climate planning efforts from accounting solely for GHG emissions generated by municipal operations to those that account for community-wide GHG emissions.

Most Prevalent Climate Actions

Across the ten climate action plans reviewed, some of the most commonly included actions were:

- Bike share
- Green municipal fleet
- Mixed zoning and high-density planning
- Energy benchmarking and mandates
- High-performance mandates for new construction
- Retrofitting incentives for businesses and residents
- Municipal building upgrades, retrofitting
- Investment in renewable energy development and/or procurement
- Home energy performance rating mandates at the point of sale

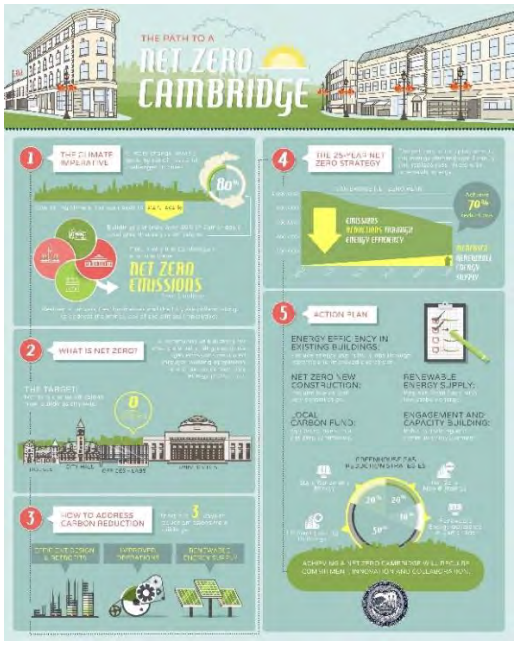
Our analysis of local climate action plans found that many municipalities used a combination of capital investment projects, ordinances, zoning, and municipal "lead by example" initiatives to reduce greenhouse gas emissions. The more aggressive actions and reductions in greenhouse gas emissions were represented in plans from larger cities that were able to mobilize stakeholders and leverage public-private partnerships. For many communities, the transportation sector and existing buildings were the hardest to address successfully and it has proven difficult to demonstrate significant progress after years of targeted policies and investments. Cities and towns are also seeking to address co-benefits associated with climate action, such as workforce development, health and wellbeing, natural resource preservation, and affordability.

Case Studies

Among the climate action plans reviewed were five that stood out as exemplary and informed the City's development for its Climate Action Plan. See Appendix J for a list of other resources and plans that were used to develop the City's Climate Action Plan.

[77] IPCC, 2018: Summary for Policymakers. https://www.ipcc.ch/sr15/chapter/summary-for-policy-makers/

CAMBRIDGE, MA: NET ZERO ACTION PLAN



The City of Cambridge released the Net Zero Action Plan for the building sector in 2015. Within the plan, City created an adaptable Net Zero process and plan and established a process for tracking the City's progress toward meeting the goals set in the Plan. This plan is also an example of how climate plans can and should align with existing and future plans across City departments.

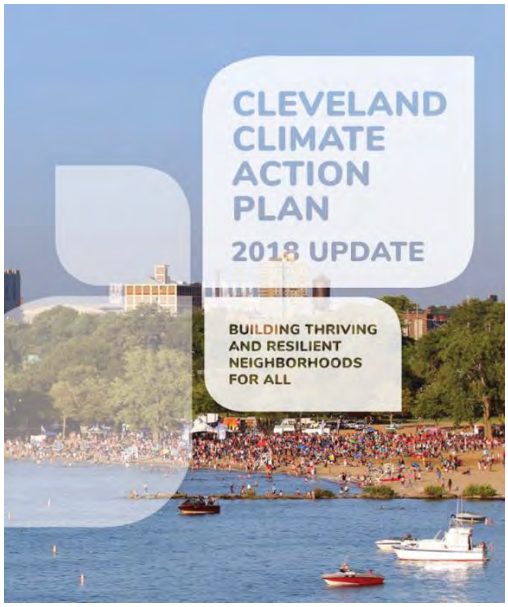
Climate Goal	Focus Areas
80% by 2050, and Net zero annual emissions for buildings citywide by 2040	Energy Efficiency in Existing Buildings, Net Zero New Construction, Local Carbon Fund, Renewable Energy Supply, Engagement and Capacity Building

SOMERVILLE, MA: SOMERVILLE CLIMATE FORWARD

Released in 2018, the City of Somerville's Plan identifies 13 priority areas and 22 key supporting actions across all of the priority areas. By narrowing to 22 priority actions, the City provides comprehensive details on the implementation approach and the necessary steps to achieve success.

Climate Goal	Focus Areas
Carbon Neutral by 2050	Buildings and Energy, Mobility, Environment, Community, Leadership

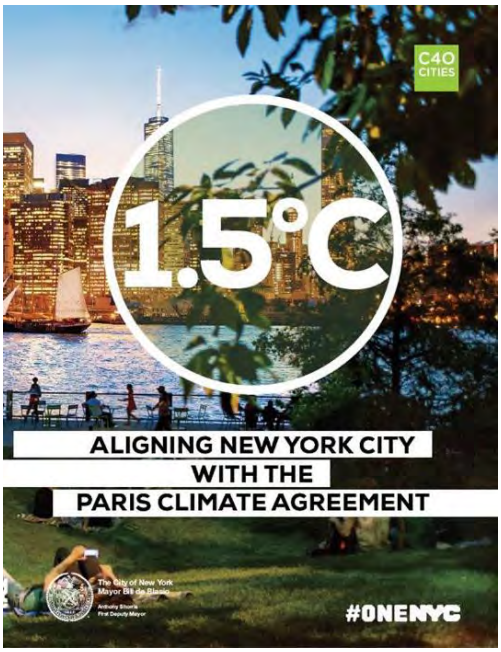
CLEVELAND, OH: CLIMATE ACTION PLAN 2018 UPDATE



The City of Cleveland's Plan divides into focus areas, each with a set of objectives and actions. For each action, the Plan identifies the appropriate implementers and indicators. An aspect of this plan that is unique is the cross cutting priorities identified in the plan of Social and Racial Equity, Good Jobs, Green Jobs, Climate Resilience, and Business Leadership.

Climate Goal	Focus Areas
80% below 2010 emissions by 2050	Energy Efficiency and Green Building, Clean Energy, Sustainable Transportation, Clean Water and Vibrant Green Spaces, More Local Food, Less Waste, and Cross-Cutting Priorities

NEW YORK, NY: 1.5°C PLAN



In 2017, the City released a second climate action plan with near term actions to align with the Paris climate agreement and achieve carbon neutral by 2050. Along with GHG impact and financial feasibility, the Plan analyzes the associated benefits for growth, equity, sustainability, and resiliency. By considering all of these factors – and providing the associated implementer responsible for each action – the City provides a clear picture of how these actions will move forward.

Climate Goal	Focus Areas
Carbon neutral by 2050	Buildings, Energy, Transportation, Waste, and All Sectors

VANCOUVER, BC: GREENEST CITY 2020 ACTION PLAN

Vancouver's Plan establishes a holistic framework to achieve zero carbon, zero waste, and healthy ecosystems. The Plan aligns with economic and public health plans for the City. Additional components of the plan are detailed targets, indicators, and five-year priority actions.

Climate Goal	Focus Areas
80% below 2007 emissions by 2050	Climate and Renewables, Green Buildings, Green Transportation, Zero Waste, Access to Nature, Clean Water, Local Good, Clean Air, Green Economy, Lighter Footprint

Appendix I: Public Buildings Department, Building Design and Construction Sustainability Guidelines (Approved by DRC 5/10/2017)

A. Introduction and Summary

In its decisions regarding the design and construction of new municipal buildings and the major renovation of existing municipal buildings, the City of Newton strives to reach the best balance among many goals. Key goals include building function, construction budget, operating costs, siting, appearance, maintenance requirements, longevity, and flexibility for future needs. This document is intended to better guide decision-makers who seek to achieve the best balance among these objectives. They are recommendations and do not alter the existing jurisdiction or authority of the City Council.

1) These guidelines will be reviewed at least every three years by the Public Buildings Commissioner as technology developments and experience warrant.

2) Newton is a leader in the pursuit of a sustainable built environment. As it plans the construction and major renovation of buildings, it will look beyond minimum regulatory standards and consider intelligent building strategies that will contribute to substantial long-term conservation of natural resources and operational economies. For each building design project, in addition to meeting code requirements, the City will evaluate all cost-effective features that reduce energy and other operational costs and minimize environmental impacts through the use of sustainable building materials and other strategies. This document will guide building siting, design, construction, and operations.

3) Newton's goal of a sustainable built environment is, to the extent possible, to

   a. minimize the use of energy, water, and other resources

   b. maximize the use of renewable sources to provide electricity and heat

   c. maximize building longevity through rigorous design processes and quality-controlled construction

   d. minimize environmental impacts of construction materials and methods

   e. institute building operations and maintenance practices to minimize environmental impacts, achieve optimal performance and maximize occupant health and well-being.

4) In all new buildings and in the renovation of existing buildings the City strives to minimize building energy use. To attain that goal, the City has a building design and operation approach that will reduce life cycle costs, demonstrate significant improvements over previous designs, help define a path to net zero, and educate the community regarding feasibility and value. The path to net zero includes reducing building energy use as much possible and maximizing the use of on-site renewable power and heat.

5) Per Sec 5-54 of the City of Newton Ordinances, a Design Review Committee (DRC) has been established to coordinate the design review process, examine specifications and study the feasibility of any proposed public facility as submitted to it by the Mayor, City Council, or other public agency (e.g., the Public Buildings Department), and shall make recommendations on a range of solutions

within realistic budgetary limits. The DRC may recommend that components of these guidelines be relaxed or modified to accommodate projects whose size or inherent nature make the component inapplicable.

B. Guidelines for Design Teams

1) Design Process Requirements

a. Newton requires its design teams to use an integrated design approach at all phases of the design process, especially in schematics and design development. Because reduction in energy consuming features and HVAC loads may also reduce the size and cost of other parts of the project, and because choice of building materials may impact durability of construction, Newton requires its consultants to identify all building features that can be affected, when making energy efficiency related decisions. (See the attached commentary by Josh Morse, Newton's Buildings Commissioner, regarding "Integrated Design Approach".)

b. During all phases of design

1. Refer to "lessons learned" list from Public Buildings Department
2. Evaluate Value Engineering options using life cycle cost analysis with full consideration of the impact on other building systems and components.
3. Value Engineering options that increase energy use require recommendation by the DRC
4. Continuously consider, propose and evaluate sustainability options
5. All budget estimates to include air infiltration testing

c. During Conceptual Design Phase

Provide a minimum of three options before completion of Conceptual Development Phase. These options will require creative interactive discussions among the design consultants. These analyses will address onsite alternative energy source options and consider funding sources beyond the established building budget. The City will explore budget sources for Options 2 and 3 before completion of Conceptual Design.

Option 1. Meets all codes and budget

Option 2. Reduces energy use to 30% below code requirements, with any budget implications

Option 3. Reduces energy use to net zero. If net zero is not feasible, show an option that reduces net energy use to the minimum feasible. Estimate budget implications.

d. During Schematic Design Phase

1. At the start of Schematics, the City will direct the design team regarding the major options developed in Conceptual Design.
2. The design team will develop options to improve sustainability within the parameters accepted in Conceptual Design. Evaluate life cycle costs of each option.

e. During Design Development Phase

1. The design team will develop options to improve sustainability within the parameters accepted in Schematic Design. Evaluate life cycle costs of each option.
2. Make provisions that enable future building modifications to improve sustainability.

f. During Completion of Construction Drawings

1. Develop options for commissioning building envelope construction
2. Develop options for air infiltration testing

g. Modeling for Large Projects. For projects of 20,000 square feet or more of gross floor area the design team is responsible for Building Energy Use Modeling using the following approach:

1. Establish expected schedule of building use before completion of schematics
2. As the design progresses, refine the model and complete energy model runs at Schematics, Design Development, and near completion of Construction Drawings. These models will be used to guide designers on how to achieve better energy conservation results and the impact of sustainability options being considered.
3. For schools, evaluate the feasibility of reducing energy use by 5%, 10%, and 15% compared to the models of three recently completed Newton schools.

2) Certification and Ratings system requirements

a. Design teams are responsible to meet the following requirements. While LEED is presently the preferred benchmarking system the DRC/ Public Buildings Department may consider alternative indices.

b. Projects of less than 20,000 sf shall meet the requirements of the most current applicable US Green Building Council (USGBC) Leadership in Energy and Environmental Design (LEED) Building Design and Construction (BD+C) building rating system at the level 'Certified' or better.

c. Projects of 20,000 square feet or more of gross floor area shall meet the requirements of either:

1. The most current applicable LEED BD+C building rating system at the level "Gold" or better. For twelve months from the time of adoption of a new version of LEED projects shall have the option to file under either the old or newly adopted version.

OR

2. For schools, energy efficiency standards acceptable by the Massachusetts School Building Authority (MSBA) for additional reimbursement.

d. To further support the design, construction, and operation of a project that meets Newton's requirements for energy, water, indoor environmental quality, and durability, provide for implementing the LEED BD+C Enhanced Commissioning requirements.

e. The Design Review Committee may recommend any project conform to the certification system without actual participation in the formal process.

C. Guidelines for Designer Selection Committee

Consider the comparative capabilities and experience of design teams, including sub-consultants, to respond to these Guidelines as part of the designer selection criteria. Compare design teams' familiarity with recent sustainability achievements of similar buildings.

D. Guidelines for Public Buildings Department

1) Include these Guidelines in RFQs and contracts with Design Teams.

2) For all design projects, identify means to fund Life Cycle Cost-effective options that raise the cost higher than the established budget.

3) Maintain "lessons learned" list for use by design teams. Update this list after construction of each project and after one year of its occupancy. Semi-annually provide this list to the DRC. Among many other considerations, "lessons learned" shall include:

   a. Evaluation of high performing windows used on recent projects

   b. Evaluation of air barrier and insulating wall and roof assemblies used on recent projects

   c. Evaluation of constructability of thermal break strategies in foundations and structural components on recent projects

   d. Evaluation of HVAC and lighting approaches used on recent projects

   e. Evaluation of building controls, management, monitoring and display functions

   f. Evaluation of durability and performance of building materials

   g. Evaluation of educational opportunities for users and the community

4) Two years after completion of projects larger than 20,000 sf, compare actual energy use to the building model, and include reasonable explanations for significant deviations, recommendations for performance improvements, and a plan to implement such improvements. Require re-measurement and review one year after substantial completion of any significant improvements.

   Establish a formal "recommissioning" process to be completed by the third year of occupancy of buildings, and repeated every three years as follows:

   a. Projects of at least 10,000 sf of floor area but less than 20,000 sf shall meet the requirements of the most current applicable LEED Operations and Maintenance (O+M) building rating system at the level 'Certified' or better.
   b. Projects 20,000 sf or more shall meet the requirements of the most current applicable LEED O+M building rating system at the level 'Silver' or better.

Appendix J: Planning Process and Public Input

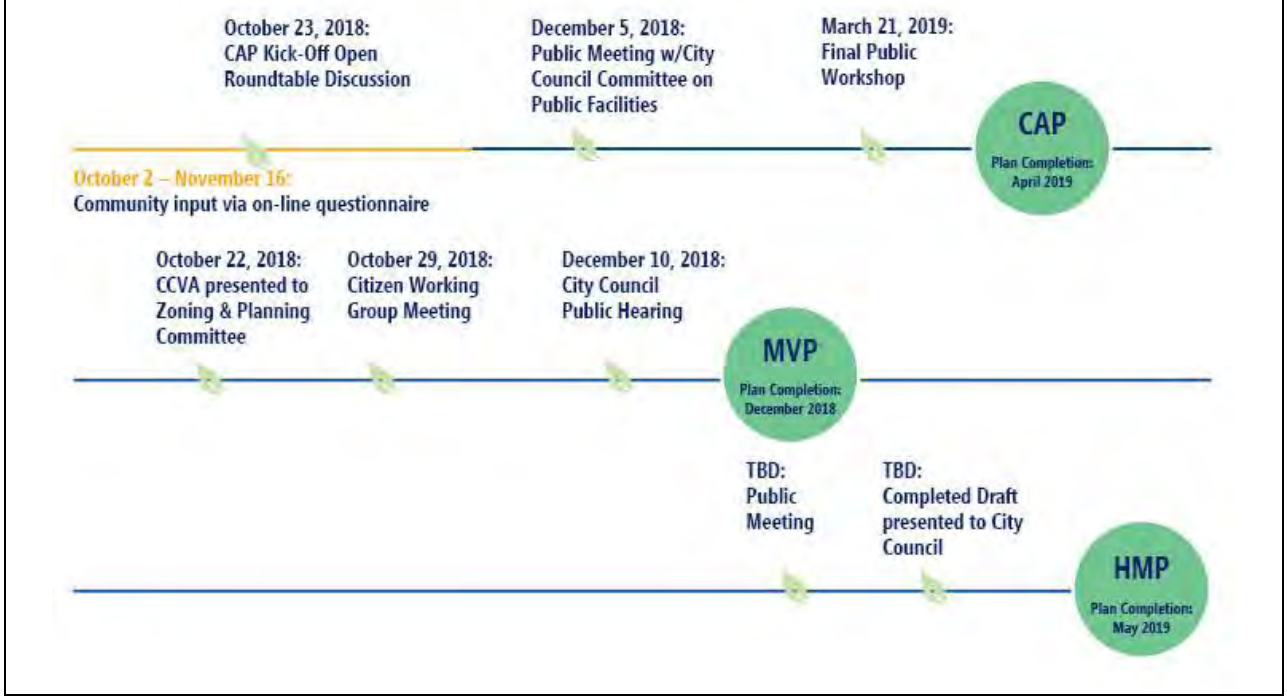
Plan Development Process

In her inaugural address, on January 1, 2018, Mayor Ruthanne Fuller committed to the development of a Climate Action Plan for the City of Newton. In August 2018, the City contracted with the Metropolitan Area Planning Council (MAPC) to revise the City's Greenhouse Gas Inventory and develop a Five-Year Climate Action Plan. The plan development process included continuous engagement of city staff and volunteer stakeholders and several points of public engagement to collect input and feedback from city residents, businesses, and climate organizations.

At the same time, Newton's Citizens Commission on Energy (NCCE) has prepared its own 30-year Climate Action Plan. The City is extremely grateful for the NCCE members' tremendous contributions, advocacy, and long-term vision that provided valuable context to the development of this five-year action plan.

As a part of this process, the Climate Action Plan Working Group ("Working Group") was assembled to guide and assist with the development of the City's Climate Action Plan. The Working Group included representatives from the City's Planning Department, other City departments, NCCE, and MAPC. The Working Group convened regularly over the nine months of the plan's development. In addition, MAPC staff and NCCE members held a series of coordination meetings at the close of 2018 and the beginning of 2019 to incorporate the recommendations and expertise of the volunteers as the action sections of the plan were developed.

Figure J1. Public Engagement Process



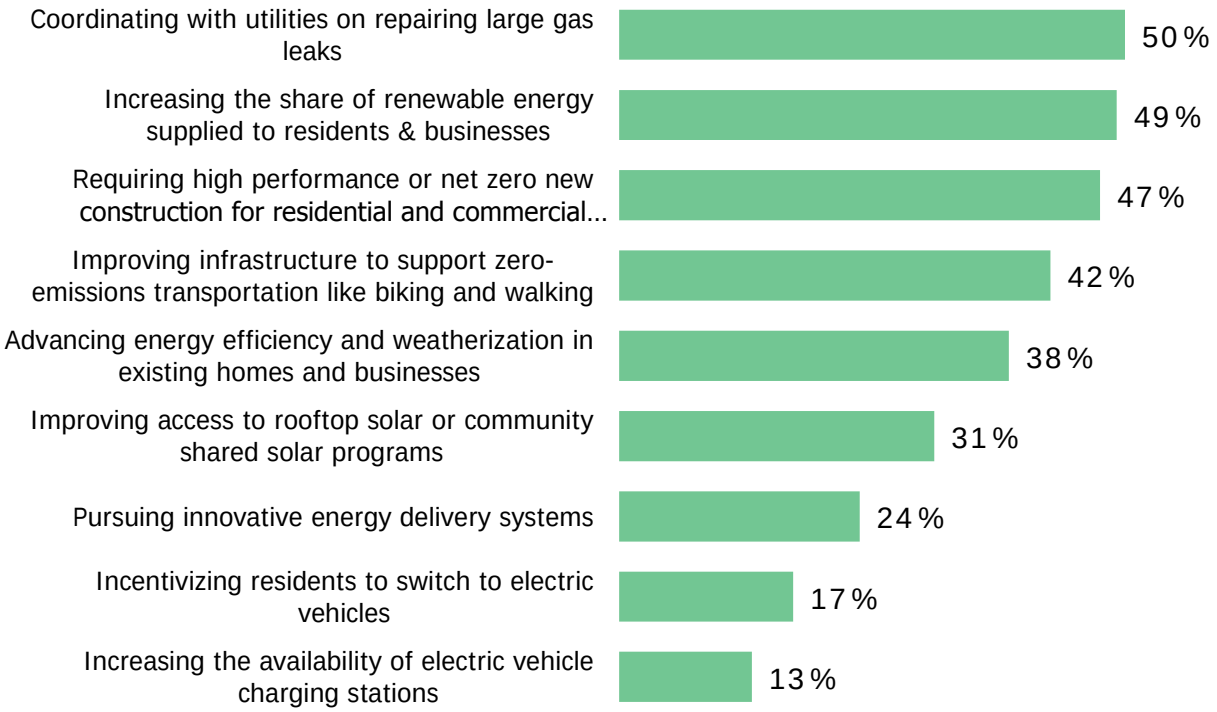
Public Input and Engagement

The City sought input from residents and businesses to inform the priorities and actions identified in the Climate Action Plan. At the beginning of October 2018, the City opened an online community input form that asked community members about their priorities for climate action in Newton and the ideas they would like to contribute to inform the plan's development.

The City received more than 125 responses from the public. While more than 90% of respondents identified as living in Newton, only 28% identified as working in Newton and even fewer identified as owning a business in Newton (approx. 13 %). A smaller subset of respondents identified as being either an elected official or working for the City of Newton (3% and 5%, respectively).

When asked to prioritize from a list of 9 possible climate actions the City could take, respondents gave these as the top 3 actions: (1) coordinating with utilities on repairing large gas leaks, (2) increasing the share of renewable energy supplied to residents and businesses, and (3) requiring high performance or net zero new construction for residential and commercial buildings.

Figure J2. Online Questionnaire Responses to, "What is most important to you? Please select the three actions that you find the most important."

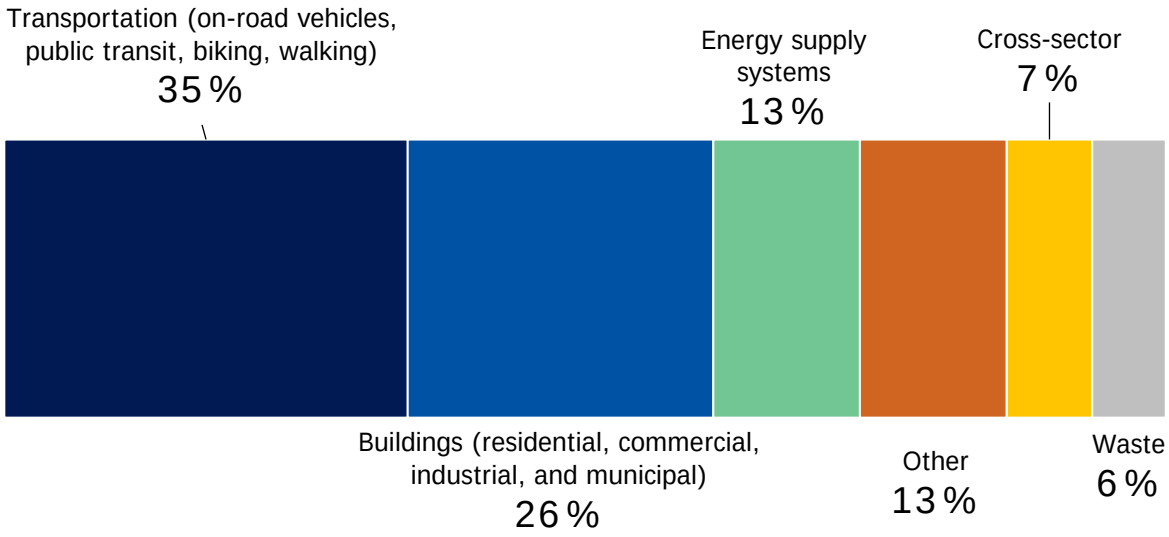


The second part of the questionnaire allowed respondents to submit their own ideas about climate actions to include in the plan. Respondents were asked to identify the sector their idea related to and who they felt should be responsible for implementing their idea (City Council, Municipal Staff, Community organizations/non-profits, Local businesses, Residents, or Other).

Overwhelmingly, the ideas submitted by the public had to do with the transportation and building sectors, which are also the two sectors responsible for a majority of the City's community-wide GHG emissions. Of

the 35% of ideas submitted that related to transportation, improvements to the bike lane network and frequency of MBTA service in Newton were most frequently mentioned. These ideas also highlighted the need for bike and transit options to reduce traffic congestion and improve public health. Ideas submitted about building emissions ran the gamut from installation of solar panels and heating electrification to increased housing density and availability of affordable housing in proximity to public transportation.

Figure J3. Online Questionnaire Responses to,
"What sector does your idea relate to?"



The ideas submitted provided the City and MAPC with both new action areas to investigate and validation of community support for the draft action areas that were in the process of being formulated for inclusion in the final Climate Action Plan.

Table H1: Sampling of Ideas Submitted Through the Online Questionnaire

Sector	Quoted Idea
Buildings	*More affordable family homes and apartments need to be built in the area.*
Buildings	*We need to increase housing density in Newton. Higher density decreases environmental impact. We border Boston, which is only going to thrive economically and attract workers in the next century. Why should they drive 50 miles to get to work instead of take public transportation from Newton? We need to plan forward to build the infrastructure to support an increased population - better public transit, more schools, more businesses/services.*

Energy Supply	*Partner with businesses esp. warehouses e.g., along Needham at, and malls (e.g., the Street, Chestnut Hill Mall, Wegmans) to use their very large and flat roofs that receive tremendous amounts of sun that just reflects off of it for SOLAR installations. Provide incentives for these same businesses to utilize solar for their own purposes.*
Energy Supply	*Run a HeatSmart Plus campaign for PV solar and heat pumps to get lower costs for both. Advertise the availability of the MassSolar Loan program- especially to those with incomes below 80% State median income (provides a 30% principal buy-down and 1.5% interest rate buy-down). Target seniors - almost every retired person qualifies. Give all roofing permit applications information about the mass solar loan program.*
Energy Supply	*In order to reduce fossil fuel use, the City should maximize its use of electricity obtained from solar panels installed on municipal parking lots, and on city buildings, including schools.*
Transportation	*Increase use of bicycles (and walking) for everyday activities. And improving public transportation to get out of automobiles.*
Transportation	*Improve the quality (i.e., frequency, efficiency) of public transport services to and from major Newton T stations to promote use of public transports and help lower carbon emissions.*
Waste	*Improve education programs, signage and labeling for residents to learn about productive recycling. Better labeling will ensure residents understand the importance and do not contribute to contamination.*

Public Workshops

On October 23, 2018, more than 60 people gathered at the Newton War Memorial for the Kick-Off Roundtable Discussion for the City of Newton's Climate Action Plan. MAPC presented on the climate action planning process, greenhouse gas emissions in Newton, and best practices from national and international climate action plans. Ann Berwick, Co-Director of Sustainability for the City, provided an update on ongoing climate projects and initiatives. Mayor Ruthanne Fuller provided remarks to open up the table discussions where attendees had the opportunity to discuss priority actions and sectors they would like to see the Climate Action Plan address and why these were important to them.

Table H2: Summary of Kick-Off Roundtable Discussion Notes

Sector	# of Actions Identified	Percentage of Total
Buildings	21	25%
Energy Supply	20	24%
Transportation	15	18%
Education and Outreach	14	17%
Waste	3	4%
Other	10	12%

The nine small group discussions, led by members of the Working Group and City Staff, produced more than 80 priority actions that covered recommendations related to buildings, energy supply, transportation, education and outreach, waste, and other topic areas.

Table H3: Themes from Discussions at the October 23 Kick-Off

Buildings	Within the building sector, workshop attendee priorities demonstrate a depth of knowledge of the topic area. Overwhelmingly, the table discussion notes highlighted electrification of the heating and cooling systems for all buildings in Newton as a priority action area to address in the Climate Action Plan. Some tables included discussion of how the City could lead by example in its own municipal buildings through energy efficiency and electrification. Residential and commercial energy efficiency also rose to the top of discussions at the workshop. Attendees prioritized regulation, zoning, requirements for new construction through efficiency standards, and support for rooftop solar PV as actions to take in support of building energy efficiency.
Energy Supply	There was overwhelming support for and prioritization of the City's Newton Power Choice initiative as a strategy to increase the renewable energy supply for residents and businesses. The table discussions emphasized the importance of increasing renewable energy supply in tandem with their prioritization of electrification of heating and cooling and transportation. Several recommendations referenced specific targets for the percentage of renewable energy purchased through Newton Power Choice, such as committing to 100% renewable by different time frames (2021 and 2050 were proposed at some of the tables). Other actions prioritized by some of the groups in this sector included co-generation, community shared solar, district energy, gas leak repair, rooftop solar, and municipal solar.
Transportation	While there was less specificity in the priority actions identified by the workshop attendees in the transportation sector, there was a clear emphasis on several overarching categories of action. This included improved bike infrastructure, increased public transportation options, complete streets, electrification of transportation, and first and last mile connections.
Education & Outreach / Waste	Many of the tables prioritized actions that would increase education and outreach by the City to support resident and business behavior changes and decision-making. Many of these actions focused on raising public awareness and understanding of high efficiency options through targeted training and programs in schools. There was also a focus on ways that outreach could be implemented to support a comprehensive lifestyle change for Newton residents around food choices and waste. There was less emphasis on specific actions related to waste.
Other	Several of the actions noted during the discussions did not cleanly fit into the categories above, but still merit mention. Some of the table discussions prioritized overarching concepts the attendees would like to see the City's Climate Action Plan address, such as providing incentives, leading by example, setting short and long term goals, and support for state policies such as carbon pricing. Two of the table discussions also raised the carbon benefits of green infrastructure through creation of tree canopies or tree planting in general.

On March 21, 2019, the City held an implementation prioritization open house which was attended by 30 people. At the open house, the City released the first draft of the actions and goals included in the City's Five-Year Climate Action Plan. Mayor Ruthanne Fuller provided opening remarks to attendees, and

staff from the Metropolitan Area Planning Council presented on the research and analysis that guided the actions with the six priority focus areas included in the draft plan.

After the opening presentations, attendees were able to peruse the actions in each focus area of the plan and provide feedback for the City and MAPC. Attendees were asked to place dots next to their top three priorities in each focus area and to provide additional qualitative input. While the statistical significance of the input collected is limited for a number of reasons, there were several actions that clearly rose to the top for those in attendance.

Table H4: Top Ranked Actions and Associated Comments from the March 21 Open House

Rank	Focus Area	Action	Associated Comments
1	Mobility	C.2.1. Advocate for community transit service needs and bus stop upgrades during MBTA's Phase II Better Bus Project, Bus Network Redesign, Commuter Rail Upgrades, and Urban Rail Vision projects	*"Make the bus cool again"* *"Get Mayor on bus for press event"* *"Promote amenities associated with public transit to increase peoples' feelings for reliability, comfortability, and safety"*
2	Existing Buildings	E.3.3. Adopt an ordinance requiring that residential building energy use be assessed and disclosed through an energy efficiency scorecard at the point of listing	*"Annual reporting not just at transaction points"*
3	Clean Energy Supply	B.4.1. Explore the opportunity to pilot neighborhood-scale conversion to neighborhoods that are all-electric heating and cooling systems, neighborhoods that are all-oil heat, or neighborhoods in which there is a high prevalence of leak-prone infrastructure	*"Good idea but very challenging"*
4	Clean Energy Supply	B.3.1. Adopt requirements within the City's site plan and special permit review process for large-scale developments and major retrofits to consider the feasibility of rooftop solar, clean heating and cooling alternatives, and district energy or microgrid systems	*"Too broad"* *"Needs to be stronger than this with strong standards"*
5	New Construction and Major Renovations	D.2.2. Adopt zoning changes that allow appropriate housing density and ready access to public transportation to encourage low-impact development and mode shift	*"This action is critical"* *"Public outreach with need to increase to get Newton residents to buy into higher density neighborhoods, which is important!"* *"Especially near the Green Line"*
6	New Construction and Major Renovations	D.1.1. Adopt ordinance and/or special permit requirements that all new construction and major renovations meet certain sustainability standards and demonstrate that they have analyzed the	*"We need to [be] Passive House and net zero/fossil fuel free"* *"No natural gas – heat pumps instead"* *"Low embodied energy!"*

		costs and benefits of high-efficiency or renewable energy systems	*"Require much higher energy efficiency like Passive House"*

City Staff and Council Engagement

On December 5, 2018, MAPC presented to the Public Facilities Committee of the Newton City Council. The primary focus of the presentation and discussion was to solicit feedback from the Councilors on their priorities for the Climate Action Plan and identify any gaps or areas for additional focus as work on the Climate Action Plan progressed. Overall, the Councilors' recommendations supported a plan that sets ambitious targets for the City, focuses on points of municipal leverage, and aligns with other planning processes and project work. In particular, there were several suggestions about incorporating specific zoning recommendations and aligning the current zoning reform process with the recommendations being made in the Climate Action Plan. Councilors also emphasized the importance of the City keeping apprised of broader policy conversations at the state level as a way to advance the City's Climate Action goals and objectives.

On January 28, 2019, City planning staff presented the City Council's Zoning and Planning Committee the key assumptions guiding the development of the Climate Action Plan. The Committee discussed the matter of adopting the Climate Action Plan as an amendment to the City's 2007 Comprehensive Plan. The City also worked with MAPC staff to ensure that the recommendations in the Climate Action Plan related to zoning changes were considered in the redrafting of the Zoning Ordinance which coincided with the development of this plan.

MAPC interviewed many City staff from five departments. City staff identified many opportunities for Newton to reduce GHG throughout the community and provided valuable input about ongoing projects and processes related to the Climate Action Plan.

TABLE H5: CITY STAFF INTERVIEWED BY MAPC

Name	Title	Department
Amanda Berman	Director of Housing and Community Development	Planning and Development Department
Ann Berwick	Co-Director of Sustainability	Public Buildings Department
Bill Ferguson	Co-Director of Sustainability	Public Buildings Department
Dave Stickney	School Facility Manager	School Department
James Freas	Deputy Director of Planning and Development	Planning and Development Department
Josh Morse	Commissioner of Public Buildings	Public Buildings Department
Kathryn Ellis	Economic Development Director	Planning and Development Department
Linda Walsh	Deputy Commissioner of Health and Human Services	Health and Human Services Department
Marc Welch	Director of Urban Forestry	Parks and Recreation Department
Nicole Freedman	Director of Transportation Planning	Planning and Development Department

Appendix K: Climate Action Resources and Bibliography

1.5C: Aligning New York City with the Paris Climate Agreement (New York, NY)
https://www1.nyc.gov/assets/sustainability/downloads/pdf/publications/1point5-AligningNYCwithParisAgrmt-02282018_web.pdf
The City of New York's CAP includes other metrics besides reduction of GHGs. Its CAP includes other benefits, such as workforce development, health and wellbeing impacts, natural capital preservation, affordability, etc. Design and presentation of initiatives in the CAP are exceptionally well-done, making navigation of the document available for research and quick references. CAP also outlines the progress of CAP initiatives and responsible agencies for each initiative, promoting accountability and transparency of the CAP.

Carbon Free Boston Report (Boston, MA)
https://www.greenribboncommission.org/wp-content/uploads/2019/01/Carbon-Free-Boston-Report-web.pdf
This report was produced by the Boston Green Ribbon Commission and the research and analysis efforts were led by Boston University's Institute for Sustainable Energy. The report covers emissions reduction pathways out to 2050 for the city of Boston across the energy, buildings, transportation, and waste sectors.

The Carbon-Free City Handbook
https://www.rmi.org/insight/the-carbon-free-city-handbook/
Produced by the Rocky Mountain Institute, this handbook provides "22 recommendations for no-regrets actions that will help cities become carbon free," along with resources and vignettes from cities that have implemented the actions and policies highlighted in the handbook.

Climate of Opportunity: A Climate Action Plan for the District of Columbia
https://doee.dc.gov/sites/default/files/dc/sites/ddoe/publication/attachments/ClimateOfOpportunity_web.pdf
Washington D.C.'s CAP suggests using a separate entity for community engagement strategies (monthly workshops, educational and outreach programs). Additionally, the CAP discusses the importance of the funding to update infrastructure and perform retrofitting initiatives around the city. The CAP suggests intertwining city's development priorities with climate action plan action items, bundling CAP initiatives with general District initiatives. Frequent GHG inventory adjustments were highlighted as meaningful factors in measuring the impacts of CAP and suggested as a good practice along the way of measuring impacts.

A Community Climate and Energy Action Plan for Eugene (Eugene, OR)
https://www.eugene-or.gov/Archive/ViewFile/Item/80
Eugene's CAP contains many innovative policies such as 20-minute neighborhoods plan that was developed where 90 % of Eugene residents can safely walk or bicycle to meet most basic, daily, non-work needs, and have safe pedestrian and bicycle routes that connect to mass transit. Another relevant and interesting suggestion that stood out during the time of research was an initiative to evaluate and remove financial, infrastructural, regulatory, and perceptual barriers to increase the use of on-site renewable energy systems.

Consumption-based GHG Emissions of C40 Cities
https://www.c40.org/researches/consumption-based-emissions
This report presents the methodology and results of a study investigating the consumption-based greenhouse gas emissions (GHG) from 79 cities, carried out by the C40 Cities Climate Leadership Group (C40). Consumption-based GHG accounting is an alternative to the sector-based approach to measuring city GHG emissions which focuses on the consumption of goods and services (such as food, clothing, electronic equipment, etc.) by residents of a city, and GHG emissions are reported by consumption category rather than GHG emission source category.

Copenhagen Climate Plan
https://www.energycommunity.org/documents/copenhagen.pdf
Copenhagen's 2009 CAP includes many initiatives, but not many clearly outline measurement indicators to evaluate initiatives. A more recent CAP update (below) was found to research more recent initiatives and lessons learned.

CPH 2025 Climate Plan. Roadmap 2017–2020. (2016)
https://kk.sites.itera.dk/apps/kk_pub2/index.asp?mode=detalje&id=1586
While implementing the CAP, some of the challenges that arose were tackling traffic congestion, converting vehicles to new types of fuel, reducing energy consumption in the city and achieving the targets for sorting plastic and organic waste. The City of Copenhagen's CAP mentions that the transition has been slower than expected, with national measures such as the congestion zone and changes to energy taxes failing to materialize, which hindered some of the local initiatives. Most of the updated plan focuses on incentives for individual and businesses to engage more actively with the CAP initiatives.

Fourth National Climate Assessment
https://nca2018.globalchange.gov/
This report from the U.S. Global Research Program assesses the science of climate change and variability and its impacts across the United States, now and throughout this century. The report concludes that climate change is *already* having negative impacts on our communities and our economy and that those impacts will increase significantly in the future if we do not act. It also concludes that, "global action to significantly cut greenhouse gas emissions can substantially reduce climate-related risks and increase opportunities for [vulnerable] populations in the longer term."

The Getting to Net Zero Framework (Cambridge, MA)
https://www.cambridgema.gov/CDD/Projects/Climate/~/media/D74193AF8DAC4A57AC96E2A53946B96B.ashx
This report, produced collaboratively by a task force of representatives from the City of Cambridge, Harvard, and MIT, lays out recommendations for reducing emissions from buildings by 70%.

Global Warming of 1.5°C: IPCC Special Report - Summary for Policymakers
https://report.ipcc.ch/sr15/pdf/sr15_spm_final.pdf
The latest major report from the United Nations Intergovernmental Panel on Climate Change provides a summary of the latest climate science and the emissions pathways for limiting global warming to 1.5°C. The report states we have already caused about 1°C of warming and that that climate models show that global emissions must decline by about 45% by 2030 and 100% by 2050 to limit warming to 1.5°C.

GPS Case Study: City of Columbus, OH
http://my.assetworks.com/rs/153-QDM-861/images/GPS_City_of_Columbus.pdf

This case study highlights the City of Columbus, Ohio's efforts to reduce fuel consumption through the use of anti-idling technology, a project which saved the city an estimated $1.2 million per year.

Greenest City: 2020 Action Plan (Vancouver, BC)
https://vancouver.ca/files/cov/greenest-city-2020-action-plan-2015-2020.pdf
Vancouver's CAP includes plans for initiatives around the specific locations and already established programs. With ambitious goals (100% of energy from renewable sources by 2020), Vancouver's CAP heavily focuses on restructuring and changing the composition of the public transit system and municipal fleet that requires heavy GHG fuel. Vancouver's CAP, similarly to New York City's, includes status updates on the ongoing initiatives and highlights responsible parties and departments as a means to promote transparency to stakeholders and the general public.

Greenovate Boston: 2014 Climate Action Plan Update // Summary Report
https://www.cityofboston.gov/images_documents/Greenovate%20Boston%202014%20CAP%20Update_Summary_tcm3-49733.pdf
Boston's CAP update builds on seven years of GHG reduction initiatives. Citywide, GHG emissions are down 17% than they were in 2005. Emissions from City government operations have been reduced by almost 25% since 2005. Update highlights the urgency to prioritize comprehensive climate preparedness strategies, cross-cutting means of measuring effects of CAP (social equity, economic development, and public health and safety), extensive and inclusive community engagement, more rigorous greenhouse gas inventory and emission projections. The update focuses on a public as well as private initiatives, offering suggestions and initiatives for both sectors to engage in order to reduce GHG. A new update will be published in 2019.

Lessons Learned: Creating the Chicago Climate Action Plan
http://www.chicagoclimateaction.org/filebin/pdf/LessonsLearned.pdf
Chicago's Lessons Learned document highlights successes and failures while implementing the CAP. Particularly, a commitment to staffing (at least 2 people and project manager per initiative) has been suggested as a measure to ensure initiatives of the CAP are implemented to the best of their abilities. Additionally, the Lessons Learned document observes that it was helpful to have an outside person facilitating the community engagement processes. As a result, CAP initiatives have been accompanied by a strong presence and participation of non-profits and community leaders which ensures support and quick turn-around of initiated projects.

Local Action Plan for Climate Protection (Alameda, CA)
http://www.ca-ilg.org/sites/main/files/file-attachments/local_action_plan_for_climate_protection.pdf
The City of Alameda's CAP highlights various initiatives for transportation, energy, and others, and includes a dedicated chapter for implementation and monitoring strategies. This section discusses the need to distinguish between quantifiable and non-quantifiable initiatives and prioritize both in evaluating initiatives. Allocating dedicated staff to guide initiatives in public and private sectors was highlighted similarly to Chicago's CAP. Stakeholder engagement strategies and participatory methods of engaging private and public sectors have been identified as a means of successful implementation of CAP.

London Environment Strategy
https://www.london.gov.uk/sites/default/files/london_environment_strategy-_draft_for_public_consultation.pdf
London's CAP highlights an Economic Development Strategy as a means to influence carbon economy and move the needle in the direction of a global transition to a low carbon circular economy. Other initiatives - RE:NEW and RE:FIT – were highlighted by many other sources as the cornerstone of

London's public building retrofit activities. These programs are some of the most effective initiatives in helping public buildings to get an energy makeover and save energy costs. The initiative incorporates an energy service company (ESCo) to undertake energy efficiency works in buildings.

Municipal Climate Action Plan (Portland, ME)
https://www.portlandmaine.gov/DocumentCenter/View/6274/Municipal-Climate-Action-Plan
Portland's CAP is focuses exclusively on municipal operations. Policies like changing behavior of municipal staff to conserve energy were prioritized over ordinances or private sector engagement.

One City: Built to Last (New York, NY)
https://www1.nyc.gov/assets/builttolast/downloads/OneCity.pdf
A supplement to the city's CAP, this report charts a path for reducing GHG emissions from buildings 80% by 2050.

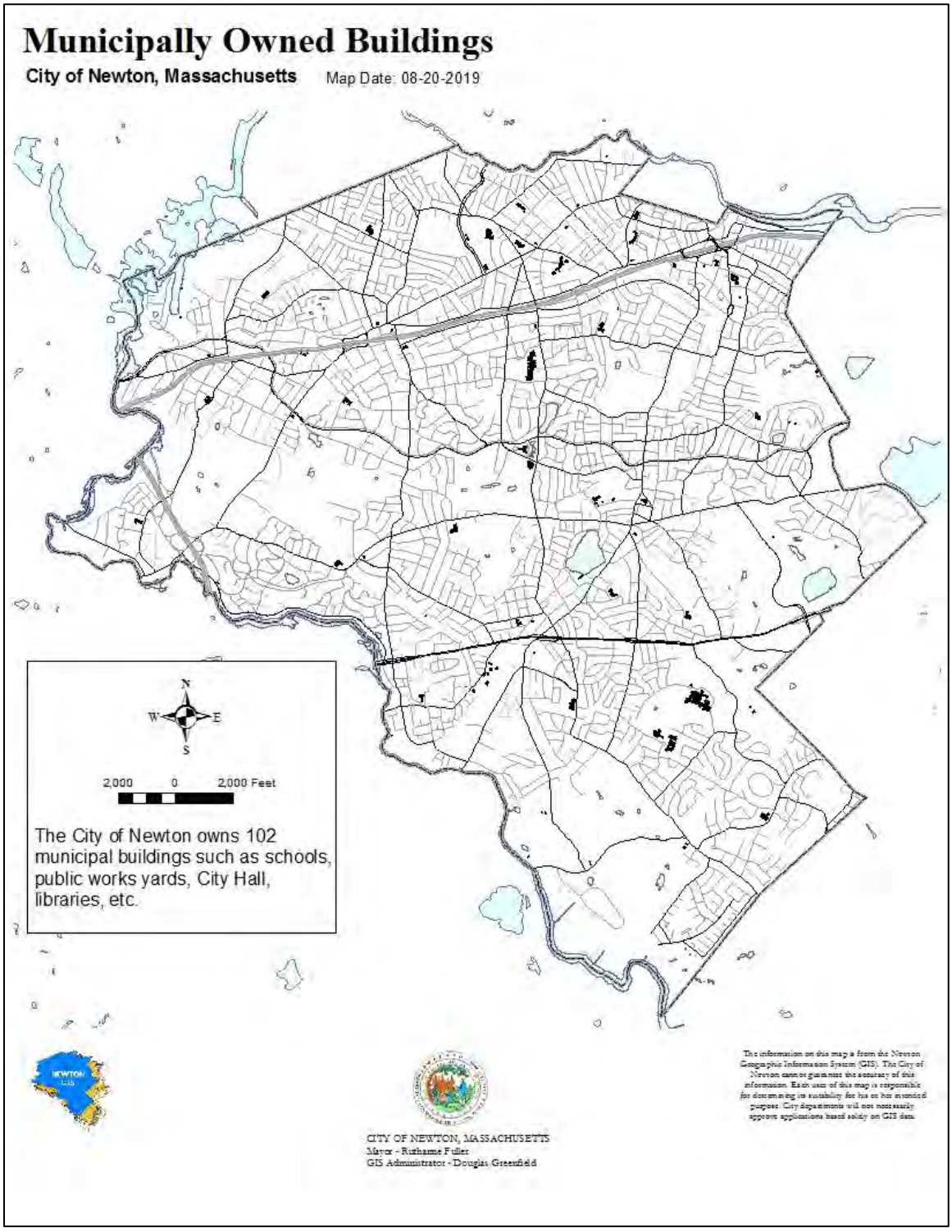
Paris Climate Partnership Agreement: Climate action partnership agreement
http://parisactionclimat.paris.fr/en/p/charte
The city of Paris engages stakeholders in a creative way by providing an opportunity to become "Partners" in the Paris Climate and Energy Action Plan by signing dedicated partnership agreement which gave stakeholders status of "Sustainable Paris Doers". This created network, led by the City of Paris, acts as a social network and lists all eco-actions and showcases Doers; encourages an exchange of sustainable ideas, offers practical tools, and hosts monthly free events that are open to the public.

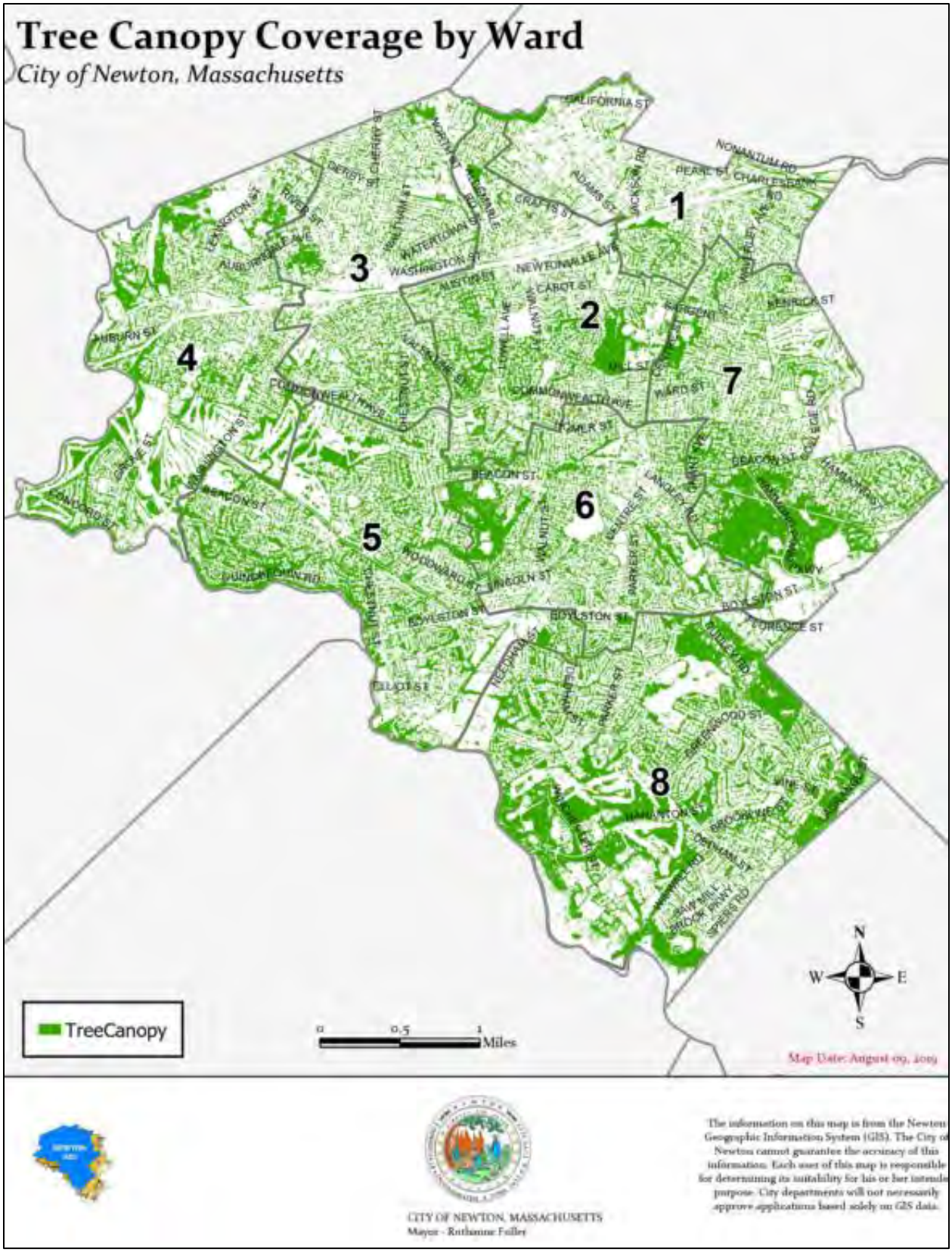
The Portland Plan: Progress Report (Portland, OR)
https://www.portlandonline.com/portlandplan/index.cfm?a=632343&c=45722
This progress report discusses the accomplishment of Portland to pass 10-cents per gallon gas tax that helped the city to secure funds for expansion of preventive maintenance that saved the city money, prevented future development of potholes, improved sidewalks, street crossings, and bike routes. Moreover, Portland's bike share system installed in 2016 demonstrated 26 percent auto trip replacement rate. Biking infrastructure has many action items and goals in the progress report.

Seattle Climate Action
http://durkan.seattle.gov/wp-content/uploads/2018/04/SeaClimateAction_April2018.pdf
Seattle's CAP was the most recent CAP that was researched and includes commentary on the withdrawal from the Paris Agreement as well as a message of encouragement for other cities to take initiatives on the CAPs. The CAP is an exception amongst researched CAPs as it is highlighting goals as a specific percentage change in each sector. The plan outlines pilot programs for initiatives in every sector. Piloting is viewed as a reliable way to collect data on the effectiveness of the CAP's initiative without heavy financial commitment. The CAP lists actionable items for the private sector to engage in GHG reduction initiatives.

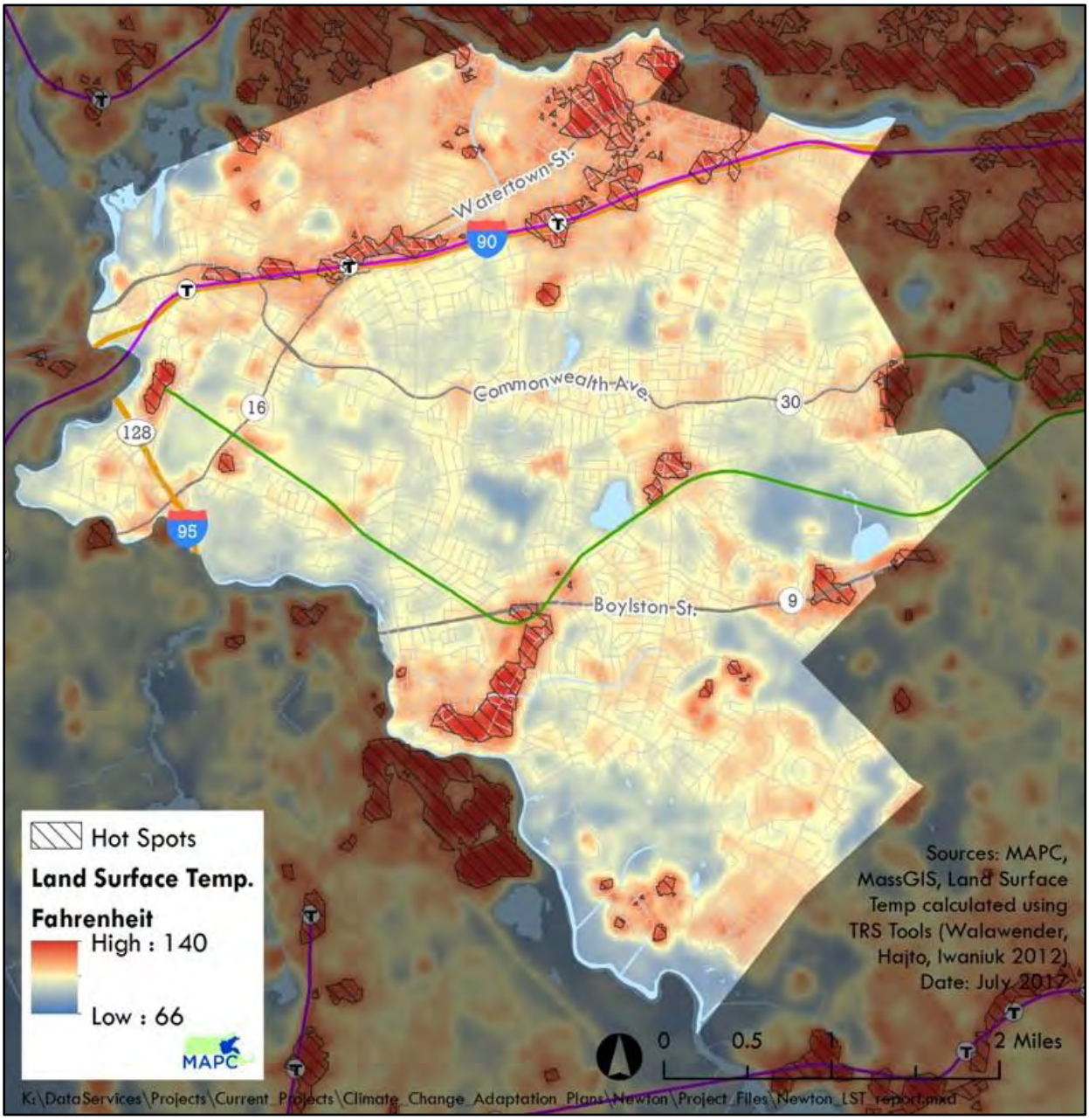
Somerville Climate Forward
https://www.somervillema.gov/sites/default/files/somerville-climate-forward-plan.pdf
Somerville's CAP, the Climate Forward plan lays out a vision to start the city on a path to meeting its 2050 carbon neutrality goal, though the actions outlined in the plan only account for a 79% reduction in emissions. The plan sets out to create a city that is *thriving, equitable, carbon neutral,* and *resilient*. The plan was completed with consulting support from Kleinfelder and AECOM and was the result of a 17-month process. For reference, Somerville's annual budget in Fiscal Year 2018 was approximately $233 million, compared to Newton's budget of $395 million.

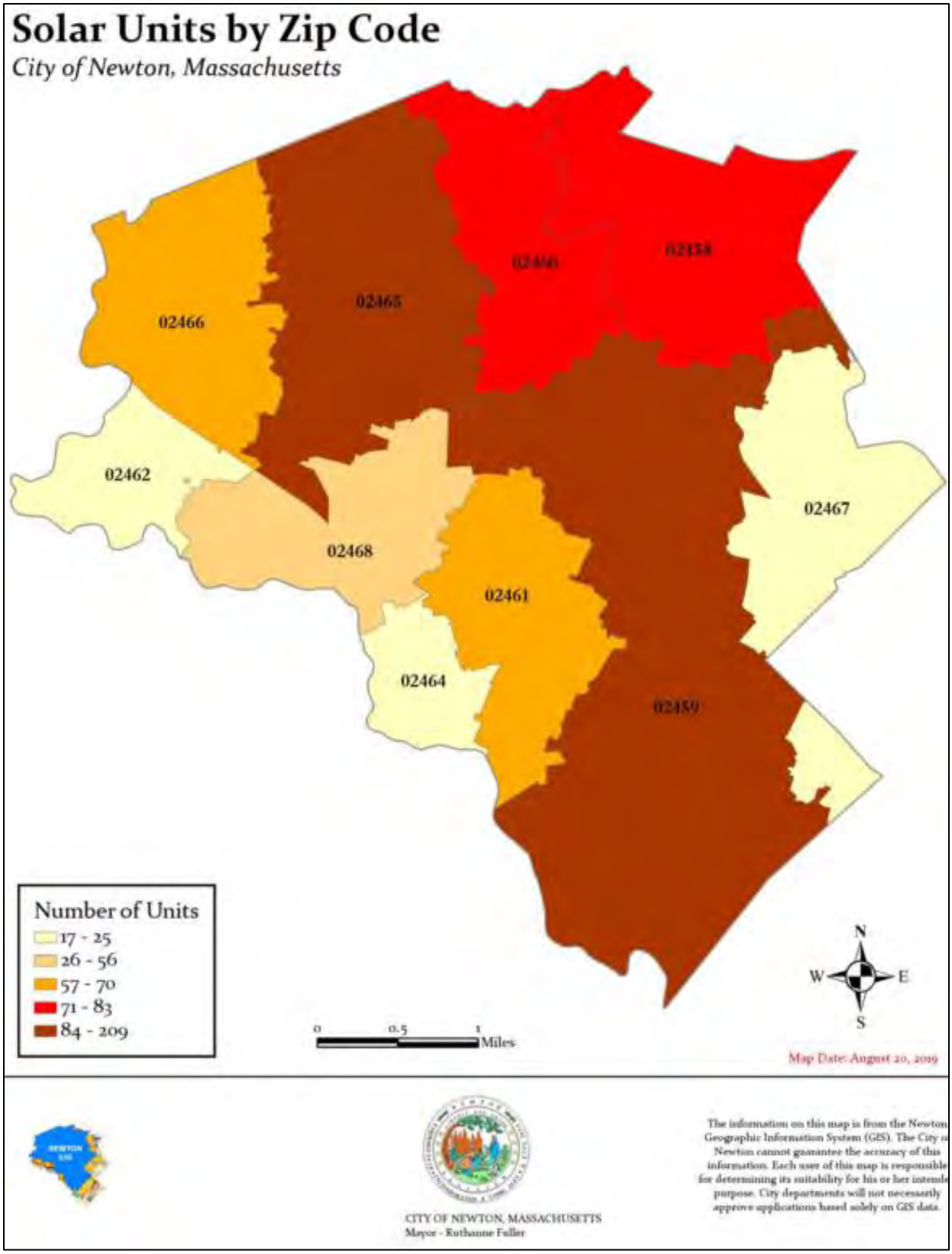
Appendix L: Relevant Maps and Illustrations




Tree Canopy Coverage by Ward
City of Newton, Massachusetts
1
2
3
4
5
6
7
8
TreeCanopy
0
0.5
1
Miles
N
W
E
S
Map Date: August 09, 2019
CITY OF NEWTON, MASSACHUSETTS
Mayor - Ruthanne Fuller
The information on this map is from the Newton Geographic Information System (GIS). The City of Newton cannot guarantee the accuracy of this information. Each user of this map is responsible for determining its suitability for his or her intended purpose. City departments will not necessarily approve applications based solely on GIS data.

Hot Spots in Newton




Solar Units by Zip Code
City of Newton, Massachusetts
02466
02465
02462
02468
02461
02464
02459
02467
Number of Units
17 - 25
26 - 56
57 - 70
71 - 83
84 - 209
0
0.5
1
Miles
N
W
E
S
Map Date: August 20, 2019
CITY OF NEWTON, MASSACHUSETTS
Mayor - Ruthanne Fuller
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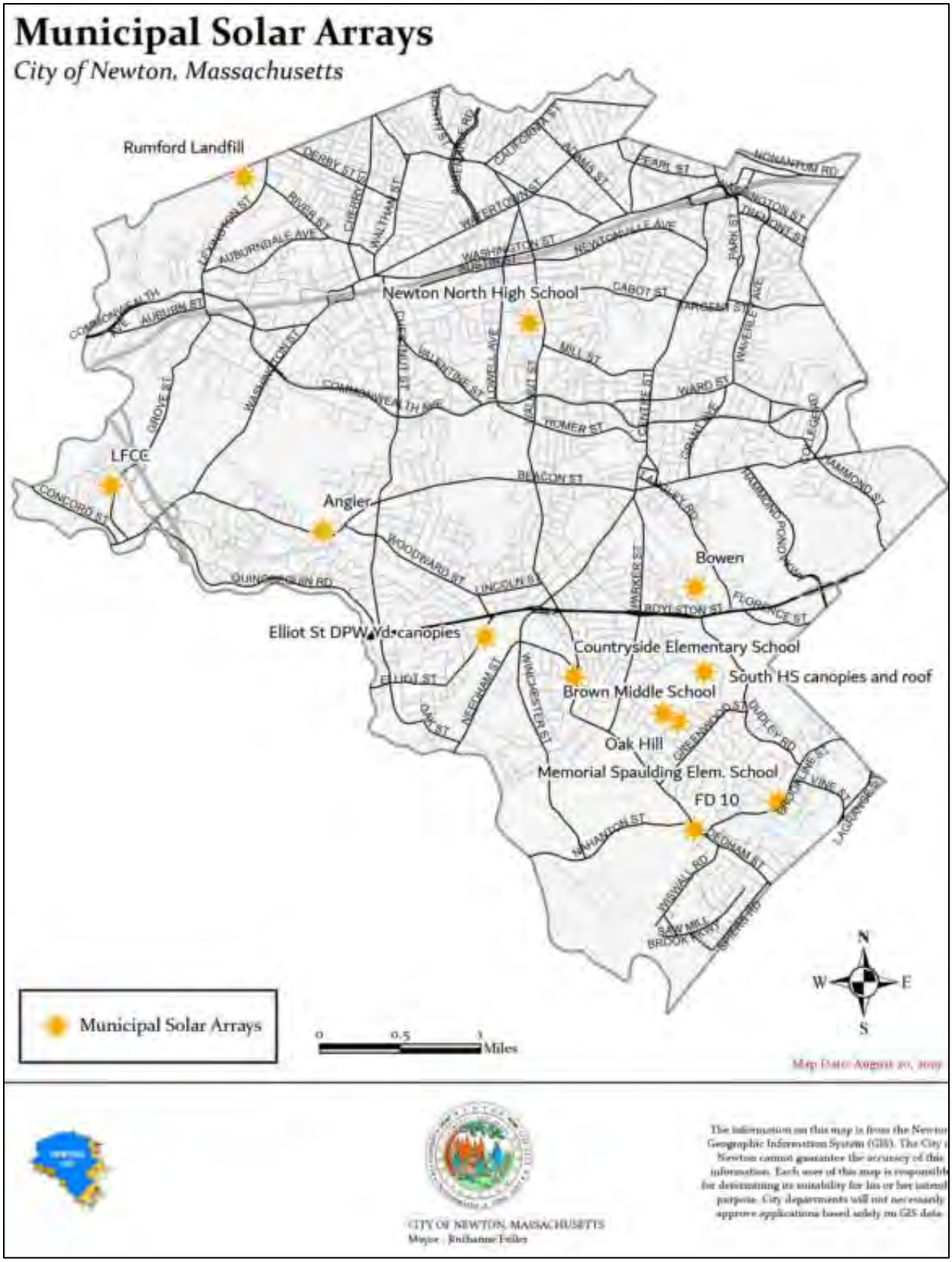
Municipal Solar Arrays
City of Newton, Massachusetts
Rumford Landfill
Newton North High School
LFCC
Angier
Elliot St DPW Yd canopies
Bowen
Countryside Elementary School
South HS canopies and roof
Brown Middle School
Oak Hill
Memorial Spaulding Elem. School
FD 10
Municipal Solar Arrays
0
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1
Miles
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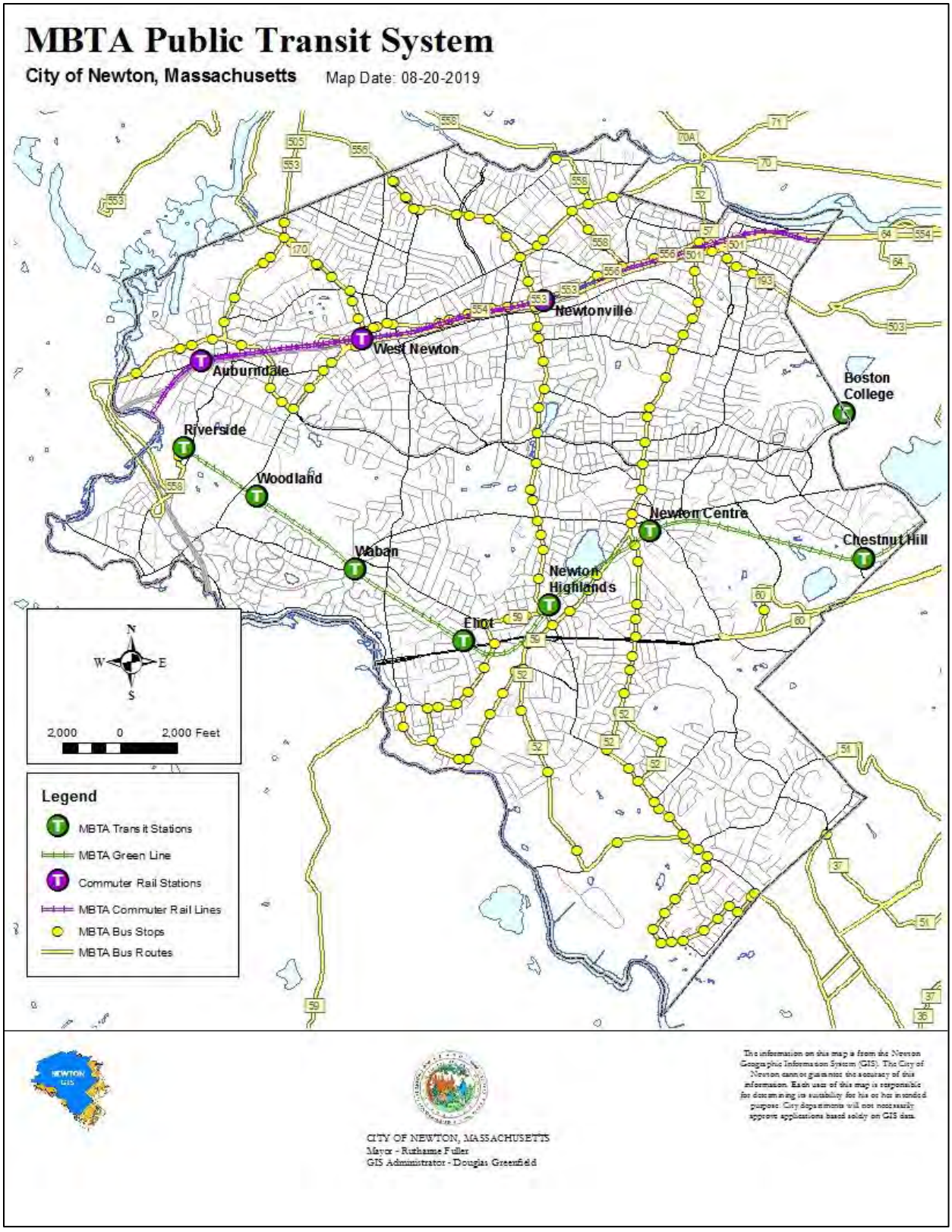
S
CITY OF NEWTON, MASSACHUSETTS


MBTA Public Transit System
City of Newton, Massachusetts
Map Date: 08-20-2019
Newtonville
West Newton
Auburndale
Riverside
Woodland
Waban
Newton Highlands
Eliot
Newton Centre
Chestnut Hill
Boston College
N
W
E
S
2,000 0 2,000 Feet
Legend
MBTA Transit Stations
MBTA Green Line
Commuter Rail Stations
MBTA Commuter Rail Lines
MBTA Bus Stops
MBTA Bus Routes
CITY OF NEWTON, MASSACHUSETTS
Mayor - Ruthanne Fuller
GIS Administrator - Douglas Greenfield
The information on this map is from the Newton Geographic Information System (GIS). The City of Newton cannot guarantee the accuracy of this information. Each user of this map is responsible for determining its suitability for his or her intended purpose. City departments will not necessarily approve applications based solely on GIS data.

Ruthanne Fuller
Mayor

City of Newton, Massachusetts
Department of Planning and Development
1000 Commonwealth Avenue Newton, Massachusetts 02459

Telephone
(617) 796-1120
Telefax
(617) 796-1142
TDD/TTY
(617) 796-1089
www.newtonma.gov

Barney S. Heath
Director

M E M O R A N D U M

DATE: September 27, 2019

TO: Councilor Susan Albright, Chair
Members of the Zoning and Planning Committee

FROM: Barney Heath, Director of Planning & Development
James Freas, Deputy Director of Planning & Development

MEETING DATE: October 2, 2019

SUBJECT: **#165-19 Washington Street Comprehensive Plan Amendment**

CC: Planning & Development Board
City Council

Staff is submitting the most recent version of the Washington Street Vision Comprehensive Plan Amendment. Copies of this version of the document have been provided to the Zoning and Planning Committee, other members of the Council may view copies of the document online or in the Clerk's Office.

The updated Washington Street amendment incorporates comments received from City Councilors and the public. The most significant changes in the plan document include:

- Removal of references to the West Newton armory building.
- Removal of the up to 10-story height area at the intersection of Craft and Washington Streets and restriction of this allowed height to only the larger MBTA parking lot at West Newton station.
- Consolidation of the plan, incorporating edits and improving readability, while reducing it from 116 pages to 106.

The draft plan is scheduled to be discussed in full at the October 16th Zoning and Planning Committee meeting. There will not be a presentation at the Oct 2nd meeting, but there will be an opportunity for questions and comments.


WASHINGTON STREET
VISION PLAN
DRAFT 10.02.2019
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Acknowledgments

Special Thanks

The City of Newton would like to thank the many community members who attended our planning events and provided their valuable input in a collaborative process. This plan would not exist without them.

Mayor Ruthanne Fuller

Newton City Council 2018-2019

	Councilors		
ONE	Maria Scibelli Greenberg	Alison M. Leary	Allan Ciccone, Jr.
TWO	Emily Norton	Jacob D. Auchincloss	Susan Albright
THREE	Barbara Brousal-Glaser	Andrea W. Kelley	James R. Cote
FOUR	Christopher J. Markiewicz	Leonard J. Gentile	Joshua Krintzman
FIVE	John Rice	Andreae Downs	Deborah Crossley
SIX	Brenda Noel	Gregory R. Schwartz	Victoria L. Danberg
SEVEN	R. Lisle Baker	Marc C. Laredo	Rebecca Walker Grossman
EIGHT	Cheryl Lappin	Richard A. Lipof	David A. Kalis

Community Connectors

The Washington Street Community

City Staff

PLANNING DEPARTMENT

Barney Heath, Director of Planning & Development
James Freas, Deputy Director of Planning & Development
Lily Reynolds, Project Manager, Community Engagement Manager
Rachel Nadkarni, Long Range Planner
Shubee Sikka, Urban Designer
Nicole Freedman, Director of Transportation Planning
Norine Silton, Executive Assistant
Kathryn Ellis, Economic Development Director
Jennifer Steel, Chief Environmental Planner
Amanda Berman, Director of Housing and Community Development
Jennifer Caira, Chief Planner
Jane Santusuosso, Chief Zoning Code Official
Katy Hax Holmes, Chief Preservation Planner
Barbara Kurze, Senior Preservation Planner
Alice Ingerson, CPA Program Manager

DEPARTMENT OF PUBLIC WORKS

James McGonagle, Commissioner

MAYOR'S OFFICE

Jonathan Yeo, Chief Operating Officer

PUBLIC BUILDINGS DEPARTMENT

Joshua Morse, Commissioner

LAW DEPARTMENT

Jonah Temple, Assistant City Solicitor
Jini Fairley, ADA Coordinator

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WASHINGTON STREET VISION PLAN

A CITY OF NEWTON COMPREHENSIVE PLAN AMENDMENT

DRAFT 10.02.2019

I. Introduction

A Vision for Washington Street

What is a Vision Plan?

Where is this applicable?

Why plan now?

How was this plan developed?

How will this plan be used?

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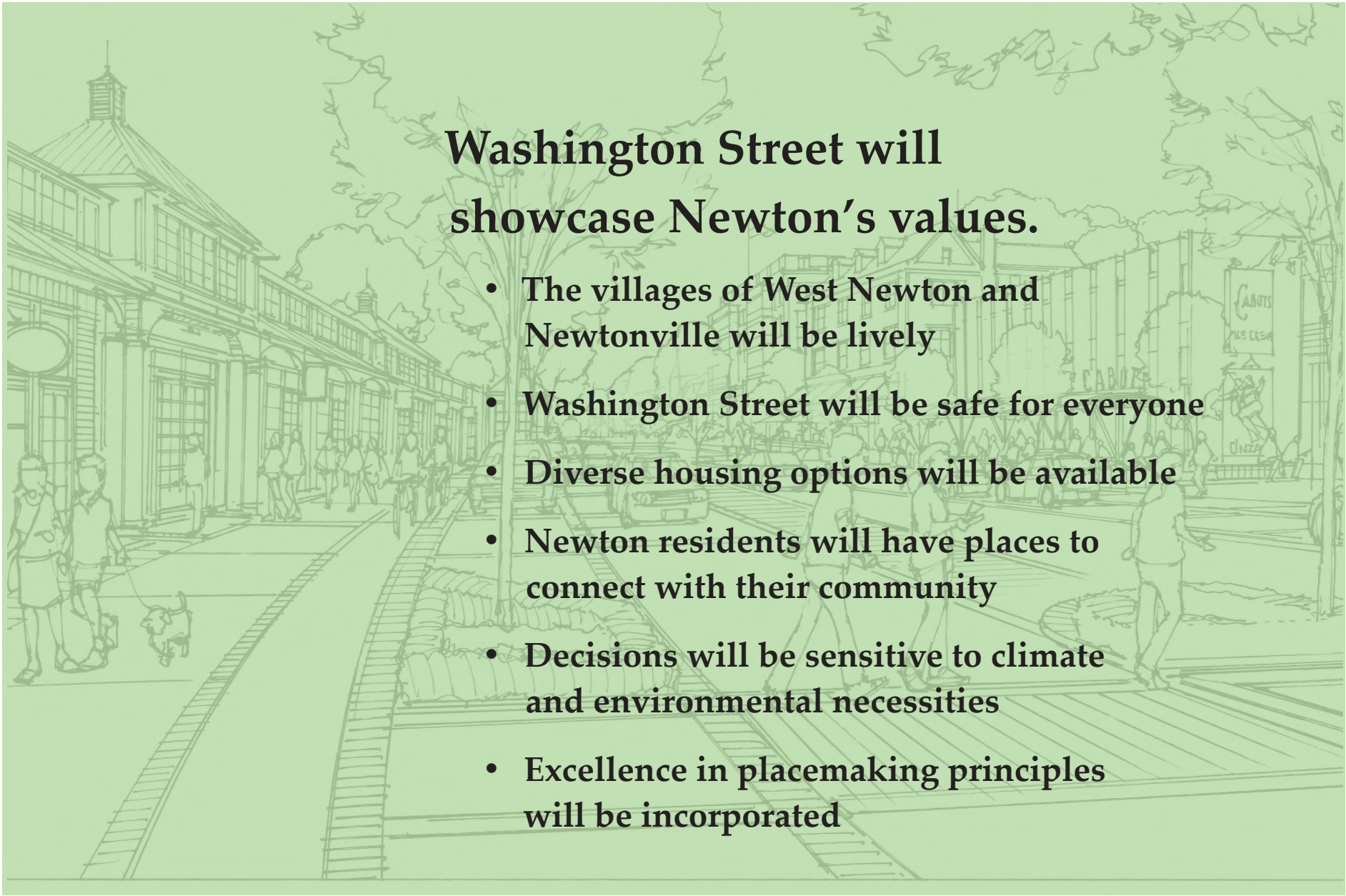
A Vision for Washington Street



Washington Street will showcase Newton's values.

- The villages of West Newton and Newtonville will be lively
- Washington Street will be safe for everyone
- Diverse housing options will be available
- Newton residents will have places to connect with their community
- Decisions will be sensitive to climate and environmental necessities
- Excellence in placemaking principles will be incorporated

What is a Vision Plan?

A vision plan is a guide to assist future decision-making regarding a specific area, in this case the area along Washington Street through West Newton and Newtonville, that brings together and expands upon citywide policies and goals with input from community members.

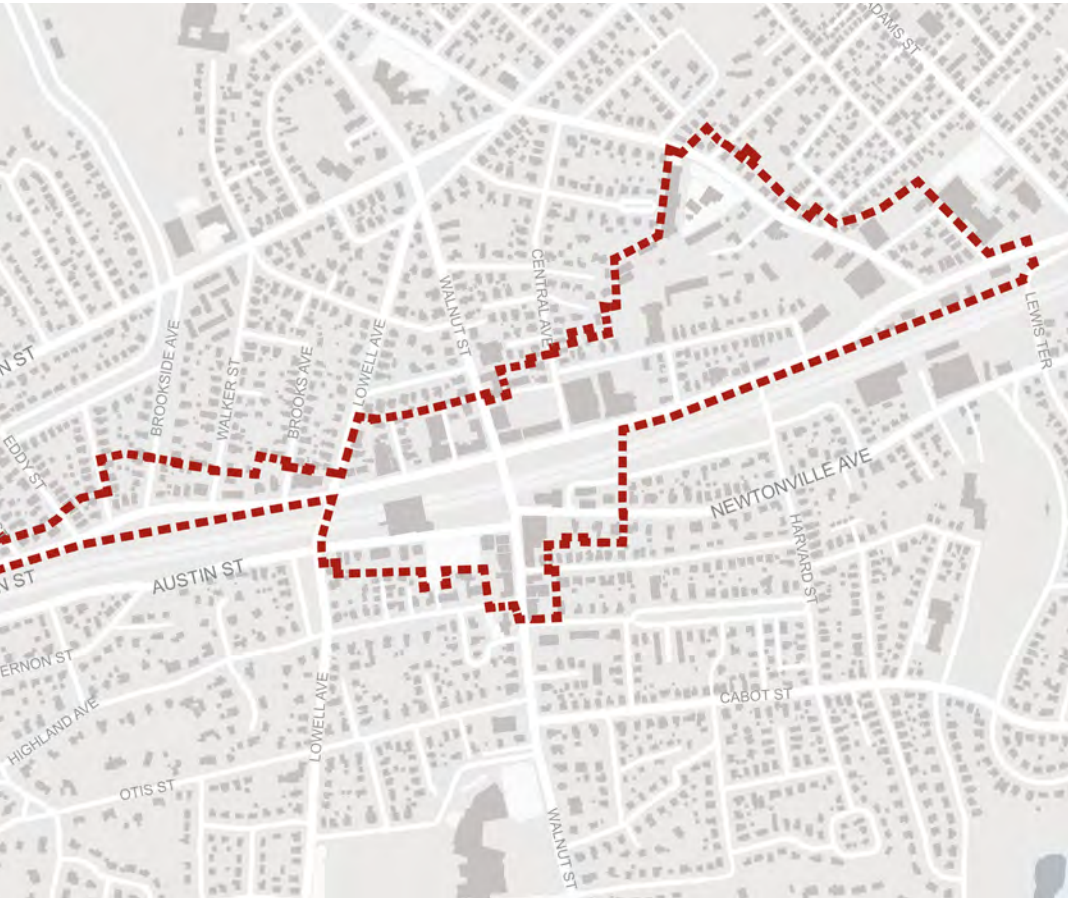
The Washington Street Vision Plan is the result of a year-long engagement program led by the City of Newton Planning Department and its consultant team at the Principle Group. The Principle Group produced the Hello Washington Street Report documenting the work and ideas developed through that effort.

This document, the Washington Street Vision Plan, [has been] adopted by the Newton City Council as an amendment to the City of Newton Comprehensive Plan. Like the broader Comprehensive Plan and the other recent amendments, this plan is intended to be used by the City Council as well as staff in the City's departments to inform discussions about public investments and to guide private development to align with Newton's priorities.

Where is this plan applicable?

Washington Street stretches across Newton from Boston to Wellesley connecting the village centers of Newton Corner, Newtonville, West Newton and onward through neighborhoods in Auburndale to the village center in Lower Falls. This Vision Plan discusses priorities

Why Plan Now?



for a portion of Washington Street that parallels the Massachusetts Turnpike from West Newton through Newtonville to the Crafts Street intersection before Newton Corner.

The Hello Washington Street process undertaken in 2018-2019 has been an opportunity to evaluate how Washington Street as a colletion of neighborhoods and villages, should change overe time consistent with City policy and objectives. This Vision Plan addresses this question with consideration of:

- Renewed development interest in Washington Street
- Newton's housing needs and trends
- Changes in the transportation system
- The need for more community gathering spaces
- Economic development opportunities
- Community ideas and feedback

The 2007 Comprehensive Plan has a stated goal to complete area vision plans for Newton's village centers and commercial areas. Overall, the Comprehensive Plan calls for "moderate, controlled, and responsible growth." (3-30). Specificly with regard to this area of Washington Street, the plan states:

> *The time is near (but not yet here) to seriously consider additional air rights projects over the Mass Pike. In addition to Newton Corner, it would be feasible and appropriate to study high rise air rights developments in Newtonville and possibly in West Newton. These developments could not only be physically connected to Washington Street but also be part of a larger development plan so that the connection of the new to the existing is relatively seamless, the uses are complementary, and a reuniting of north and south portions of those areas is achieved. (3-31)*

How was this plan developed?

The "Hello Washington Street" planning process spanned an entire year and involved hundreds of Newton residents in developing ideas for the area along Washington Street and in refining the vision. Community members participated in large events, small meetings, and by providing their thoughts online. Community input forums were structured to collect input from as broad a range of stakeholders as possible and for participants to provide feedback in a range of settings to ensure that as many voices as possible could be heard. Community input has been reviewed along with a study of existing conditions, planning and design best practices, and the current real estate market to create this Vision Plan.

The City of Newton worked with consultants from the Principle Group on the Hello Washington Street Process. The process concluded with the Hello Washington Street Report and a draft zoning ordinance for the area. The report has been used to inform this Washington Street Vision Plan that [has been] incorporated as a Comprehensive Plan amendment.

Timeline of Community Involvement:

- May 1, 2018 – Launch Event at Second Church in West Newton
  - Surveys gathered responses online through late June; 1,345 surveys completed
- June 5 – 12, 2018 – Public Design Week several events and open-studio in West Newton
  - Over 75 hours of public engagement; 400+ individual visitors
- October 24, 2018 – First Draft released at the Plan Open House at Newton North High School
  - Month-long comment period; 2,672 comments from 317 individuals
- November 2018 – Four open drop-in sessions at City Hall
- February 11, 2019 – Second Draft released at City Council and community preview event
  - Month-long comment period; 1,017 comments from 97 individuals & 50+ emails/ letters
- March 2019 – Three drop-in sessions at City Hall


BIG IDEAS WANTED

How will this plan be used?

The Washington Street Vision Plan [has been] adopted by the City Council as an amendment to the Comprehensive Plan because it is a basis for future decision-making by the City Council, the Mayor and City staff, and other decision-making bodies.

Many of the ideas described in this Vision, including the public investments proposed, require additional discussion by the City Council before they can be implemented. The Planning Department, along with other City staff, the Mayor, and the City Council will carry the conversation forward in the coming months and years. The City Council will also be able to use this Vision to guide decision-making on proposed private and non-profit development projects. Project proponents will be encouraged to use the Vision Plan when preparing their proposals in order to align with this adopted vision for Washington Street.

This Vision Plan will additionally be used to shape zoning for this portion of Washington Street. As the zoning ordinance draft development continue, this Vision Plan will serve as a guiding document.

In addition to this amendment to the Comprehensive Plan, the Washington Street report provided by the City's consultant team can provide further background information and ideas. Particularly useful from that report are a series of site studies showing potential development scenarios that could inform and inspire publicly or privately led projects.

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II. A VISION FOR WASHINGTON STREET

Unique and Vital Village Centers

Safe Multimodal Transportation

Housing Diversity

Global Climate and Local Environment

Excellence in Placemaking and Design

A. UNIQUE AND VITAL VILLAGE CENTERS

Strengthen the Village Business Climate

Design for Engaging Walks

Invest in Public Art and Programming

Strengthen the Village Business Climate

Guiding Principles:

- Promote the village centers' competitive advantages
- Encourage clusters of office & lab activity in each village
- Explore incentives and investments in locally-owned businesses

Newton's villages are significant centers of economic activity in the City and in many respects Newton has a strong local economy. There are also aspects of the Newton economy that recommend active investment in supporting economic growth. Newton is a jobs center, with more workers commuting into Newton each day than residents commuting out. Additionally, Newton is an attractive place to locate new jobs: job growth in Newton outpaced the Boston regional average for the 10-years between 2007 and 2017 (14% vs. 9% growth over 10-years).

The villages of Newtonville and West Newton both represent opportunities to strengthen and expand the local economy relying on the unique business mix and the competitive advantages of walkable and transit served mixed-use villages. Growth, focussed on serving local needs and building on existing strengths, can support a stronger commercial tax base and reduce the share of residential taxes in the city.

See also: *Economic Development Action Plan for the City of Newton*, January, 2019.

Promote the village centers' competitive advantages

Newtonville and West Newton have many attractive features to companies looking for business space. The mix of supportive amenity businesses in each village make for lively places to locate a new office space. Local coffee, lunch, dry-cleaning, gyms, and gift shops all are ancillary businesses that residents as well as employees at major companies find beneficial. Highlighting the range of collocated businesses in each village can be an inducement to companies looking to move into lively business locations.

Beyond the local business mix, West Newton and Newtonville offer a better than typical range of transportation options for the Greater Boston area. The mix of commuter rail, express bus service, and highway access is an advantage. Highlighting existing transportation diversity and continuing to expand options is another way the City can promote this area to businesses.

Finally, highway visibility along the Mass Turnpike is a potentially substantial benefit to companies locating along Washington Street. Ensuring that prominent yet appropriate signs are allowed along the Turnpike edge are possible for major employers is another way that Newton can promote business growth on Washington Street. Thinking critically about sign placement, size, and lighting is important to ensuring that new signs along the Mass Pike demonstrate Newton's commitments to excellent placemaking while also showcasing the businesses that choose to locate on Washington Street.

Encourage innovation clusters of office & lab activity in each village

One of the successes of traditional downtowns and 21st-century innovation districts is the benefits employers can gain through the intermingling of ideas and people in places that support formal and informal collaboration and networking. Such places exhibit design characteritics that include mixed-uses, public gathering spaces, and various types of social and business related events. Newton can support the development of such clusters through zoning, event programing, and urban design.

The pattern in both West Newton and Newtonville is for office-type buildings to be at the outer edges of the villages and the shops and restaurants to be located in the cores. There is already a small cluster of offices and industrial activities at the Crafts St intersection in Newtonville and a cluster of office and industrial businesses at Elm St/Border St and east of Chestnut St in West Newton. In each case this puts these office areas in easy walk of the village cores. Zoning for Washington Street could build upon this pattern to expand the mix of uses, create more gathering spaces, and support more office and lab space development opportunities at the village center edges.

Rockport Office Interior,
Photo by Robert Benson/Baker Design Group

A casual open meeting space within Rockport's West Newton headquarters

Explore incentives and investments in locally-owned businesses

Locally owned businesses are among the most important assets of Newtonville and West Newton. These individual stores, services, and restaurants help to make each village center a unique destination. As redevelopment or rehabilitation occurs, and as the overall vitality of the villages improves, commercial rents will rise, and these locally owned businesses may struggle to afford to stay. The City will need to study a range of approaches for fostering and encouraging existing and new locally-owned businesses. Development along Washington Street offers an opportunity to pilot different approaches in concert with new zoning and public and private investments in the corridor.

Zoning, through requirements or incentives, can be the most direct way to influence the opportunity for locally owned businesses in new developments. Ideas to consider include regulations on formula style (chain) businesses, conditions related to reduced rent spaces reserved for locally owned businesses, and incentives that allow for greater density or a greater range of allowed uses where space for locally owned businesses is provided. There is also an interesting opportunity to create low-cost business incubator space in kiosks on public land along the Mass Pike side of Washington Street (see pg. 20).

Small business assistance programs are another effective means of encouraging locally owned businesses. Through the Director of Economic Development in the Planning Department, the City provides assistance to businesses getting started or expanding in the City. Some communities have gone further to expand these assistance programs to include basic market analysis information, connections to existing state or federal business lending programs, and other creative business support services.

Finally, area or village-based business associations can be a strong support system for small locally owned businesses, allowing these businesses to aggregate resources for the creation of marketing programs that advertise the village as a destination and create events and programming that draw people to the village centers.

Design for Engaging Walks

Guiding Principles:

- Use buildings and trees to make a more comfortable environment
- Activate the Pike edge
- Promote narrow and transparent shopfronts
- Incorporate opportunities for outdoor dining
- Design streets and plazas as places to linger

Vitality in the village centers is in part measured by how much activity is visible on the street. Are people strolling from shop to shop or are people hidden away in buildings, emerging only when absolutely necessary? A place that has vitality is one where the life of the place is bursting out into the public realm - It could be the frenetic energy of a business center spilling out into sidewalk cafes or the peaceful quiet of a residential street with front yards full of flowers. No matter the place's character – a place with vitality is one where it is interesting to go on a walk. Washington Street has a few blocks that have a lot of interest, but over and over again the planning team heard that walking along most of Washington Street could be so much better.

Use buildings and trees to make a more comfortable environment

Streets and sidewalks with defined edges created by close-by buildings and trees is an essential component of designing comfortable walking environments. The physiology of the human species means that there are some universal principles to creating comfortable environments for people – among them is a near universal preference for spaces with edges. Cognitive science and urban planning researchers Ann Sussman and Justin B Hollander have confirmed what designers have recommended for centuries, writing: "When edge conditions are ill-defined, we instinctively go on alert…clear edge conditions, on the other hand, do so much: they can release us from anxiety, enable our subconscious construction of mental maps, suggest a way forward that fits our bipedal frame, and our preferred way of holding our head, all the while helping us conserve energy" (Cognitive Architecture, 26). In other words, well-defined edges make people feel comfortable walking.

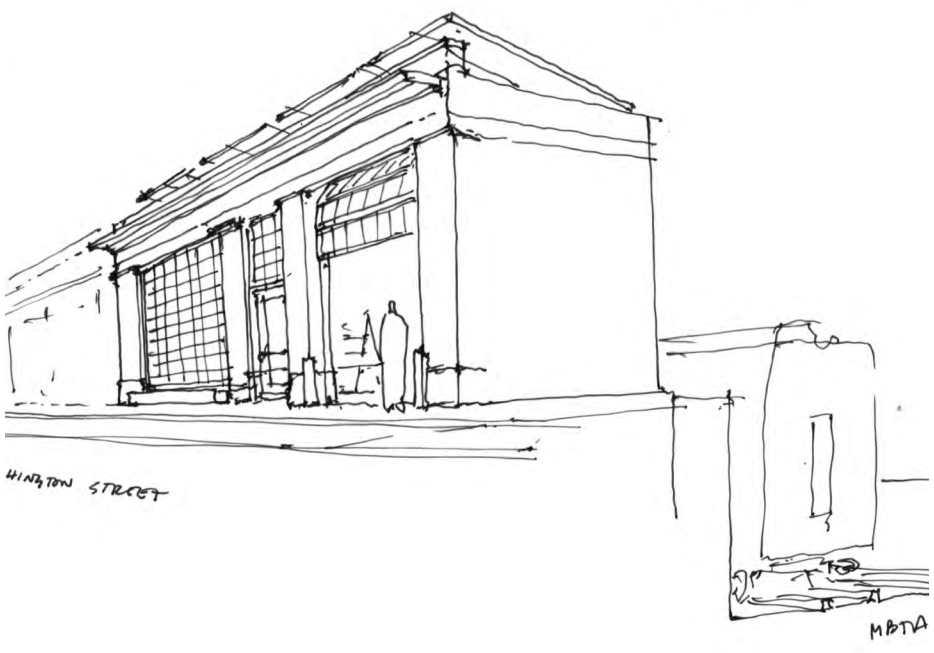
These principles of creating comfortable edges are recommended to be integrated into the setting of height and setback standards in zoning for the Washington Street corridor. The ratio of building height to street width is well established principle of designing for walkable comfort. Street design experts have had varying perspectives on what ratio is best, but generally 1:1 is considered to be a strong sense of enclosure with high pedestrian comfort, while 1:3 is moderately comfortable, and therefore an acceptable minimum (see diagram on page xx).

The Mass Pike adds a unique challenge to defining edges for Washington Street. Right now, the views are very open such that one can see all the way to the south side of the Mass Pike, which is a substantial distance in some portions of the corridor. There are many reasons to create a defined edge along the Mass Pike, among them giving Washington Street more comfortable edges.

Activate the Pike edge

The Mass Pike edge of Washington Street is an opportunity within a challenge. There are multiple negative effects of living and working so close to the Mass Pike; the noise, the air pollution, and the unsightly views. One of the most well received ideas coming out of the design week was the idea of creating more than just sound walls along the Mass Pike edge and thinking more creatively about how the south side of Washington Street could be better than today.

One concept is to create small scale storefronts along certain publicly owned areas next to the edge of the Mass Pike. These pavilions could serve as a sound barrier with a thick wall at the back, could have south-facing solar panels on the roof to generate electricity, and serve as low-cost start-up space for new entrepreneurs. Retail-focused planning research has found that retailers generally do better when there are shops on both sides of a street. Where possible, extending the village center experience to the south side of Washington Street along the Mass Pike has the potential to strengthen the village shopping experience.



Promote narrow and transparent shopfronts

Narrow shopfronts are a common feature of the retail blocks in West Newton and Newtonville. Some of these storefronts are as narrow as 20-25 ft. Not only are narrow storefronts a typical feature of these two village centers, but a typical feature of many of the great retail streets around the world. Narrow storefronts generally means there are more retailers in a business district, that there are more doors, and more diversity in the window displays; detail and diversity in the retail environments makes for great walking.

Frequent doors and large clear-glass windows offer connections to the shops within. These physical and visual connections between shops and sidewalks have benefits to both the passersby and the retailer. Retailers thrive on foot-traffic, and clear windows into stores encourage passersby to stop in and explore the shop. Having clear windows out to the street also means that those inside can see out and help monitor activity outside.

Zoning rules can be used to mandate new development in these village centers extend the traditional pattern of narrow storefronts with large windows while providing flexibility for larger tenants to use space toward the back of a property or to use multiple storefronts.

The Cinema Block in West Newton Square demonstrates several principles with regard to narrow storefronts. The Cinema itself is a large facility with a narrow storefront that primarily occupies space toward the back of the property, thereby mirroring the storefront widths of the district. The Elements Massage center next to the Cinema is also a slightly larger facility and utilizes two storefronts, while the neighboring shops each have just one storefront bay.

Incorporate opportunities for outdoor dining

Newton already allows outdoor dining in village centers, but the sidewalks are not always wide enough to allow for accessible sidewalks and outdoor dining. The Walnut Street Enhancements Project in Newtonville will substantially widen the sidewalks to create new outdoor dining opportunities for restaurants and cafes along the street. Along Washington Street, there are generally wider sidewalks but there may still be physical limits relating to the configuration of furniture and infrastructure.

There are two approaches to expanding outdoor dining opportunities that are worth further investigation: allowing seating at the far side of the sidewalk and allowing seating in "parklets." Newton has not yet allowed restaurants to block off curb-edge space for outdoor dining, but with a wide enough sidewalk, that space can sometimes be the more efficient way of providing outdoor dining while meeting accessibility goals. This approach should be considered where sidewalks are wider than 16 ft, which is common in parts of West Newton Square and will be a new condition on Walnut Street after the Enhancements project. A similar result can be achieved with parklets – seasonal sidewalk expansions into parking spaces. Lexington Center has a public parklet that has seating and table space accessible to everyone. Private parklets are also common in many communities – Montpelier Vermont has several private parklets that are built and maintained privately by restaurants for seasonal outdoor dining.

Both strategies would need to be considered in the context of site-specific design but are opportunities to create more outdoor dining space. Any public seating program could also include seating with tables to further open up outdoor dining opportunities in village centers.

Design streets and plazas as places to linger

A great walk often includes stopping. Creating places for people to sit and talk when out for a walk in West Newton and Newtonville is an investment in community life and village vibrancy. A variety of seating options should be provided, with some furniture oriented to groups included where space is generous enough to accommodate it. Movable and playful furniture gives people a reason to engage directly with the items and some control over how they use the space. Both the West Newton Square and Walnut Street Enhancements projects will include new seating areas in the village centers and new plazas are being built at Austin Street and Washington Place. The zoning ordinance should require mid-large-scale projects to include new neighborhood plazas along Washington Street and as the street design project continues, seating areas should be dispersed along Washington Street.

Invest in Public Art & Programming

Guiding Principles:

- Promote West Newton and Newtonville artists
- Allow for arts production, presentation, and artist housing
- Design for music and community events in public spaces

West Newton and Newtonville are home to some of Newton's most active arts organizations and artist-led businesses. Part of the identity of the Washington Street corridor is the arts and culture community that has chosen to locate here. The City of Newton is organizing and beginning to work with stakeholders on an Arts and Culture Master Plan process that will strategize about supporting Newton's arts community at a broader level; the ideas here are based in the findings of the Hello Washington Street planning process and are intended to be refined by this forthcoming work.

Promote West Newton and Newtonville artists

The arts is one of Newton's most highly concentrated economic sectors. A significant portion of those in this sector are self-employed - these artists are in-fact independent local business owners. Connecting artists into Newton's economic development programs and supporting and promoting their work is a link between economic development and arts and culture planning that could be further explored.

The City could also explore public art programs to showcase local artists from the area. Whether in the form of temporary installations and live-arts programs or commissioning and installing a permanent piece, the City could lead in promoting the local arts communities by bringing locally produced art into the village centers.

An exhibition at the New Art Center

Allow for arts production, presentation, and artist housing

The practicalities of making art can mean different things depending on one's craft – dancers need large open spaces with high ceilings, musicians need sound proofed practice rooms if sharing walls with neighbors, and sculptors may need access to a metal or woodworking shop. Artistic production and presentation spaces often involve a combination of traditional land use categories that appear in zoning that can prove challenging for artists to navigate when seeking new workspaces. Zoning for Washington Street should clarify the standards for arts spaces to make permitting processes clearer for artists.

Artist housing should also be given special consideration. Artist-specific housing models, like the Claflin School Studios off of Lowell Ave, often combine units with studio spaces or offer an array of studios and practice spaces within the building and even sometimes publicly accessible galleries and performance spaces. As the Arts and Culture Master Plan process develops, local artists should be engaged directly in identifying needs that can be met either through zoning standards or partnership development projects.

Felix Doolittle - Stationary

Claflin School Studios, #7
RE/MAX Destiny

Design for music and community events in public spaces

Arts programming does not always need to be formal; it could be someone who simply brings his or her guitar and friends to a park or plaza. Such public spaces need to be large enough for the musicians to be out of the path of travel of passersby and quiet enough for their music to be heard. For event music, electrical outlets for amplifiers and electric instruments may be needed.

The West Newton Square Enhancements and the Walnut Street Enhancements projects are both creating spaces that could work well for casual music and small gatherings in the village centers. The new plaza at Austin Street will add another community space for slightly larger events.

Because of noise from the Mass Pike we should consider encouraging new development to create publicly accessible courtyards tucked between buildings and away from the Washington Street edge. Guidelines and mechanisms for encouraging music and community activities in those courtyards should be developed.

Another idea to be explored is the creation of large deck parks, which could serve as village greens, over the Mass Pike in Newtonville and West Newton, shielded from the Mass Pike with buildings on the edges. As this idea is developed in the coming years, attention should be given to ensuring the parks can accommodate large community events.

Artful Pianos, 2018
Newton Senior Center

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B. SAFE MULTIMODAL TRANSPORTATION

Prioritize People, Safety, and Comfort

Create More Route Options

Organize and Advocate for Better Transit

Actively Manage Driving & Parking

Prioritize People, Safety, and Comfort

Washington Street is one of the major east-west connectors through Newton. In both West Newton and Newtonville, Washington Street is a "Main Street" environment where locals gather together, go out for dinner, and do their shopping. Between village centers, Washington Street is lined with residences and civic spaces. These multiple functions mean that there are competing demands for space and priority in the road design.

As the street design process moves ahead, Newton envisions a Washington Street where people are the priority. Prioritizing people means thinking about the human element of all transportation: the experience of how people perceive the safety and comfort of moving along the street. This idea includes improving the safety and experience of driving on Washington Street. Improving the driving experience is consistent with improving Washington Street for all users. By reducing conflicts with walkers and bikers, encouraging everyone to behave predictably, and focusing on a smooth drive experience over a fast drive along Washington Street we ensure that safety and comfort are always top of mind no matter if the discussion is about transportation on foot, by bike, bus, or car.

See also: Newton Street Design Guide, 2018
Newton Transportation Strategy, 2017

Guiding Principles:

- Reconfigure Washington Street as a boulevard
- Promote safe neighborhood streets
- Make room for people-powered transportation
- Design sidewalks for year-round comfort
- Test before the City invests

Reconfigure Washington Street as a boulevard

Washington Street presents a remarkable opportunity for transformation into a street that is safer, better functioning for all users, and attractive - a true world-class street. A design option to consider is to use the great width of this street to reconfigure it into a boulevard with a strong emphasis on trees and landscaping. A typical boulevard has one lane of traffic in each direction separated by a planted median that becomes turn lanes where needed. There are many benefits to this type of roadway configuration: limited conflict between drivers going in opposite directions; simplified crossings for pedestrians because of the median; the environmental benefits of street trees, and additional spaces on the edges for bikeways and parking.

To advance this design idea, a boulevard approach would require in depth study as part of a roadway design project for Washington Street alongside other alternatives. Since Washington Street in the study area ranges from approximately 75 ft to 95 ft, the design will need to be responsive to changing conditions block-by-block.

Promote safe neighborhood streets

Slowing traffic on side streets is important for public safety. One recommendation is to tighten up the curb-radii at the neighborhood streets that intersect with Washington Street to force drivers to slow down as they turn onto the neighborhood streets. Another is to add crosswalks across the entrances to the neighborhood streets to improve visibility between pedestrians and drivers and to take the opportunity to update the accessible ramps at each of these corners.

Beyond the entrances, traffic calming strategies could be employed to slow drivers to the speed limit of 25 mph and encourage them to take it even slower.

Make room for people-powered transportation

Despite the fact that Washington Street is a major connector in Newton, it does not have complete sidewalks on both sides of the street. Along the Mass Pike side of Washington Street there are long stretches without sidewalks. This makes it difficult for those who park or take the bus on that side of the street to safely make their way in and out of vehicles or just walk along the road. In addition to the inconvenience this routinely causes, the lack of sidewalks is counter to Newton's accessibility goals and standards. As the street design project moves forward, the Street Design Guide should be utilized and accessibility standards must be met to ensure that Washington Street has accessible sidewalks along both sides for its entire length.

Infrastructure for residents who bike also requires consideration. With no dedicated space for cyclists, conflict with drivers is frequent and those conflicts have the potential to be deadly. The Street Design Guide includes a range of recommendations for safe bikeway design that are applicable to Washington Street as well as the side streets that connect Washington Street into the neighborhoods.

Design sidewalks for year-round comfort

Walking should be comfortable throughout the year with adequate street lighting, shade from summer heat, trash receptacles, and places to sit. The West Newton Square and Walnut Street Enhancements Projects will greatly improve walking comfort in Newtonville and West Newton village centers. Combined, these projects are expected to add more than 80 new trees to the village centers, widen sidewalks, add unique furniture, and upgrade the lighting for both the roadway and the sidewalks.

However, there will still be substantial areas of Washington Street that could use more comfortable sidewalks. The area between Chestnut St and Walnut St and Walnut St and Crafts St could both benefit from routinely spaced benches and trash receptacles and improved lighting for winter evenings. There are two ways in which the City of Newton can pursue these features – by working with developers to upgrade the sidewalks in front of their buildings (as is the case with Washington Place) or by directly investing in sidewalk comforts, which could be done as part of the street design project.

Test before the City invests

Reconfiguring Washington Street will require substantial investment and take several years to implement. In order to test the idea of a boulevard on Washington Street, the City should explore a trial layout change on a portion of the street. Testing the idea will allow the engineering team to adjust the layout and improve upon the design before the project is fully implemented. Newton has used trials and demonstrations of road designs before with good success. The trial implementations not only allow the design team a chance to test details of the layout but also allows the public an opportunity to experience a pared down version of the design.

A test before invest strategy can also be used for smaller safety and traffic-calming initiatives on neighborhood streets (see pg 33), for parkletts and similar public space initiatives (see pg 22), and a range of other public improvements. Some of the same materials used to test ideas, like paint, flex posts, planters, can also be used for long-term interventions, allowing the City, for example, to complete a larger number of public safety improvements at a lower cost for immediate safety improvements, Then, over time, as funding is available, those improvements can be made more permanent.

A demonstration sidewalk extension in Newtonville, 2016.

Create More Route Options

Transportation starts with a destination - a need to go somewhere. Then there are three basic questions involved in deciding to go to that destination: what time should I go; how should I get there (walk, bike, drive, transit, or combination); and what route should I take. These three questions have to be considered simultaneously since the available options and the travel time-cost estimate will change depending on when one makes the trip. In addition to creating the infrastructure to make all modes of travel viable options for Washington Street area residents and employees, all modes benefit when there are a variety of routes to choose.

Guiding Principles:

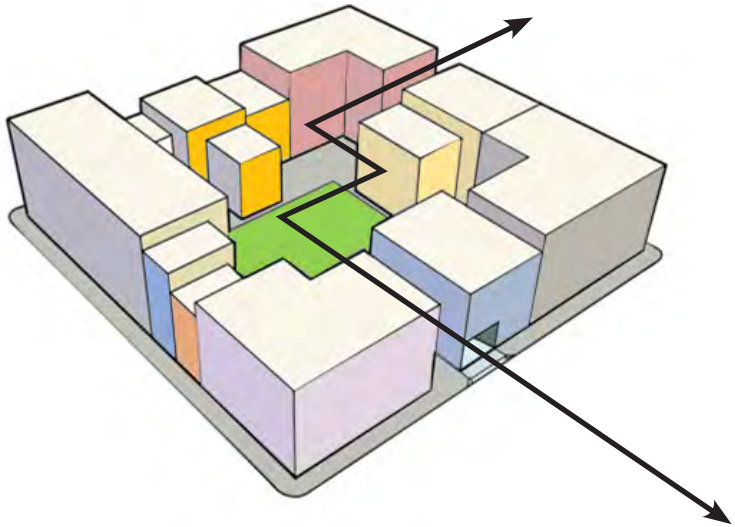
- Promote small blocks
- Connect Washington Street to the Charles River Greenway
- Consider building more bridges over the Pike
- Make way for crosswalks

Promote small blocks

One of the strongest indicators of a walkable place is the density of intersections per square mile. In order to increase intersection density – a community needs smaller blocks. Blocks with more than ¼ mile in perimeter are considered too big to support the benefits of interconnectivity. Many of the blocks along Washington Street exceed this threshold.

Smaller blocks within neighborhoods help to distribute traffic and also mean more direct and faster response times for emergency services. Keeping any pass-through traffic on small neighborhood blocks moving slowly and safely is critical but creating connections through large blocks can in fact contribute to improved traffic conditions within neighborhoods as well.

The process for building new routes through existing blocks is not always simple. The Zoning Ordinance can play a role in ensuring developments that span a large area create opportunities for pedestrian and vehicular interconnections. Additionally, the City can track opportunity sites to create new public connections between blocks.



Connect Washington Street to the Charles River Greenway

The Charles River Greenway is a key link in the regional commuter and recreational biking and walking network connecting to Waltham Center, Watertown Square, the Arsenal Mall in Watertown, and ultimately into Boston and Cambridge.

Improved bicycle connections northward to the Charles River Greenway should be considered at the following locations:

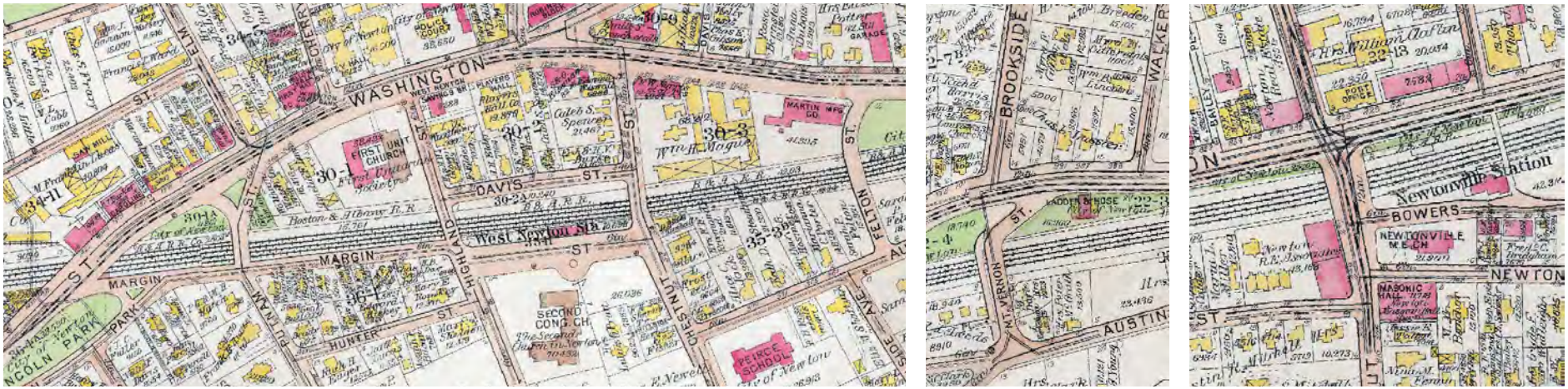
- between Washington Street and Albemarle Rd (with bicyclists then following Albemarle Rd to the Greenway and the Greenway Bridge)
- along Watertown St from West Newton Square to Nonantum and then to the Greenway connection in Watertown Yard
- on Crafts St and North St to the Greenway connection

Consider building more bridges over the Pike

When the Mass Pike was developed in the 1960s, several of the older bridges across what was then just the railroad were demolished. In West Newton, Shaw and Putnam Streets connected more seamlessly into West Newton Square; Felton St (now the driveway to Rockport's headquarters) connected across from Washington St to Austin St.; and Mount Vernon Street connected from West Newton hill across to Brookside Ave through what is now Walker Park. In Newtonville, there was also a pedestrian bridge from Bowers St to Central Ave that provided access to the Newtonville rail station.

There are a number of possibilities for re-establishing these connections One recommendation is a pedestrian and bicycle bridge between Mount Vernon Street and Brookside Ave, integrating the bridge into a new design for Walker Park. Longer term, we should consider deck parks over the Mass Pike at two locations, each of which would be edged by road and sidewalk connections. These deck schemes would re-establish the Central Ave to Bowers St connection in Newtonville and the Putnam St and Shaw St connection to West Newton Square.

Each of these ideas requires additional investigation and substantial financial planning before it could be implemented. As a first step, the City of Newton could invest in a finance strategy to understand the process involved and the resources required to bring these proposals to reality.



The 1917 Atlas shows several bridges that no longer exist, mostly demolished during the construction of the Mass Pike. Lincoln Park and Felton St in West Newton Square, Mt. Vernon St through Walker Park, and the station pedestrian bridge between Bowers St and Central Ave in Newtonville Square.

Make way for crosswalks

There are not enough crosswalks on Washington Street. Crossing from the the south side of Washington Street to Newtonville destinations such as Cabot's Ice Cream is an area of particular concern. Safe crossings are needed to guide people who need to cross the street.

We recommend that crossings should be located approximately every 400 feet. This recommendation should be considered along with the Street Design Guide's recommendations with respect to key contextual considerations when developing a new design for Washington Street.

Organize and Advocate for Better Transit

Guiding Principles:

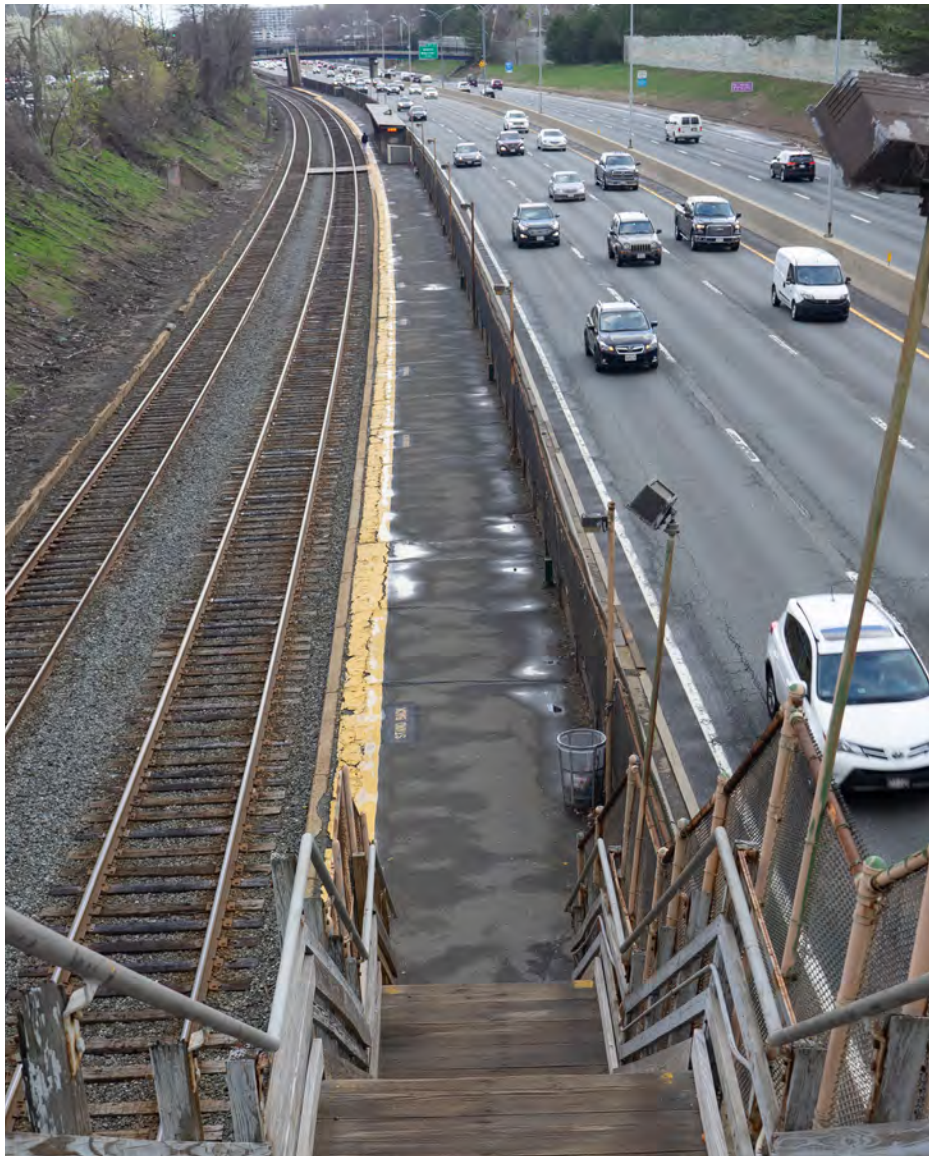
- Support new accessible stations
- Improve the bus experience
- Organize and advocate for early implementation of the Rail Vision

The neighborhoods along Washington Street were built for rail commuting. In the 1890s, when Newtonville saw a wave of growth, the village was accessible by the commuter service on the Boston and Albany Railroad (now the commuter rail) and trolley services south as far as Needham, north to Watertown, and west as far as Waltham (Newtonville Historic District Study Report, 7). During the 20th century, trolley service was replaced by bus service and the commuter rail service eroded. There is a long-standing interest in restoring modernized rail services to West Newton, Newtonville, and the surrounding neighborhoods as well as a state-of-the-art bus system. That vision dovetails well with the MBTA's current effort to develop a Rail Vision to guide the transformation of the commuter rail system across the Boston region into a robust service and their on-going efforts to improve bus services. While Newton does not have control over how these public transit services are developed, the City and community can and should advocate for a vision that includes robust service to the villages and neighborhoods along Washington Street.

Support new accessible stations

The Newton commuter rail stations at Newtonville, West Newton, and Auburndale are among the 32 remaining non-accessible commuter rail stations in the MBTA network. The City should make every effort working with the MBTA to ensure these stations become accessible as soon as possible.

The MBTA has begun the design process to make all three stations accessible via a high-level platform at each station on the northern embankment and ramp access to the platforms from street level. The City's key priorities in this project are that the station designs can be implemented cost-effectively, expediently, and will not preclude future service expansions.



Improve the bus experience

Washington Street has several well utilized express buses that run from a variety of locations to the north, then along Washington Street to the Mass Pike, and ultimately into Boston.

Some of the ideas already described would substantially improve the bus ride experience - having sidewalks connecting to the eastbound bus stops and adequate lighting on the sidewalks and roadway for instance. Additionally, the City can further improve the bus experience by:

- Providing crosswalks at every bus stop to make it easy to get from the neighborhoods to and from the eastbound stops on the south side of Washington Street
- Working with the MBTA to make sure that stops are placed conveniently but not too frequently along Washington Street
- Incorporating transit-signal priority technology to move buses through intersections faster
- Investing in bus shelters and real-time wait information at major stops along Washington Street

With comuter rail available, especially with future improvements to that line, and other priority uses of the street space like dedicated bike lanes, parking, and landscaping, we do not recommend dedicating a lane on Washington Street to buses at this time. However, every effort should be made to improve the service, as described above, and to lower the cost of comuter rail for low-income riders.

Organize and advocate for early implementation of the Rail Vision

The MBTA's Rail Vision outlines seven alternatives for the future of the Commuter Rail. In four of them, all of the Newton Stations are shown to be upgraded to have access to both tracks and service is shown to be upgraded with trains every 15-minutes in each direction throughout the day. Such an investment would be transformative for the Washington Street area. The City of Newton should actively advocate for the options that bring new service to Newtonville, West Newton, and Auburndale stations (and potentially adds a station at Newton Corner).

The proposed investment described in Rail Vision would represent a significant advancement in service for the entire Worcester Line, including the idea of extending service to western Massachusetts and connecting service to Cambridge. The City should partner with the other municipalities on the line and state and federal representatives, to secure support and funding to bring the Rail Vision investments to fruition ASAP.

Actively Manage Driving & Parking

Guiding Principles:

- Actively manage village parking
- Develop and implement a public parking garage strategy
- Shape where and how much parking is in private developments
- Require transportation demand management by developers
- Track and prepare for driverless technology

Driving and parking go hand in hand – the private car portion of the transportation system depends on there being available parking at the end of the trip. In West Newton and Newtonville, the City is faced with striking a balance of both ensuring there is adequate parking to serve those driving while also not oversupplying parking to the extent that people are induced to drive. There are many well tested techniques to creating enough parking for those who need to drive while not disincentivizing other transportation options.

See also: *Newton Centre Parking Strategy*, 2015

Actively manage village parking

In addition to private off-street parking, Washington Street and the village centers have a variety of public parking resources. The West Newton Square and Walnut Street enhancements projects will include new smart meter technology that will enable the City to more nimbly adjust parking regulations in the village centers and better track how the metered parking is utilized. This new infrastructure along with the kiosks in the public lots, and the Passport pay-by-phone service will soon provide the City the data needed to dynamically respond to parking demand in each village with changes in price or time limits.

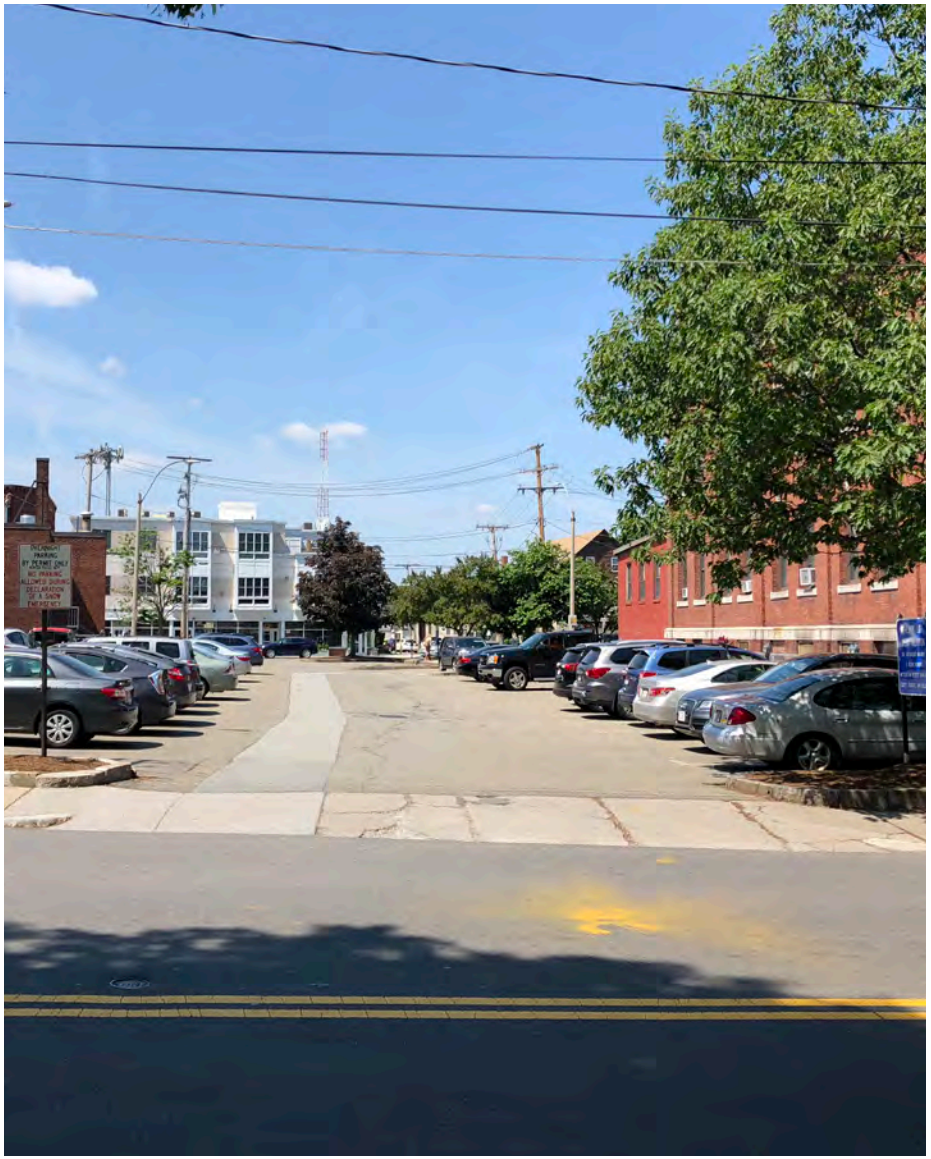
As parking regulations are updated in the village centers, the City should also develop expanded management plans for the neighborhood streets that immediately surround the village centers. The City can build on successes in Auburndale, Waban, and Newton Highlands to incorporate the needs of residents and village center businesses in district parking plans for West Newton and Newtonville.

Finally, these parking plans should also address the quick access curbside uses – loading areas for delivery vehicles, passenger pickup/drop-off locations, and 15-minute quick visit parking that is needed for some businesses like dry-cleaners and take-out restaurants. If not actively incorporated in curbside management/ parking plans, these vehicles are likely to double park and can cause backups in traffic and safety hazards for all involved.

Develop and implement a public parking garage strategy

One way the City of Newton can support smaller-scale buildings with limited or even no on-site parking is to expand the supply of public parking in the area. Possible locations could include building a municipal parking garage as part of a project on the MBTA parking lot in West Newton Square or working with the owner of the Rockport garage at the corner of Chestnut Street and Washington Street to open it up to the public on nights and weekends.

Financing a new parking garage is expensive, as each space in an above ground parking garage costs between $30,000 and $50,000, and even more for an underground garage. These costs mean that any new municipal project to build a parking garage is likely to take time to finance. The City of Newton can start by considering potential financing strategies and potential partners such as the MBTA or property owners who wish to have access to the garage for long-term parkers from their properties instead of providing it on site. Any plan to design and construct a parking garage should also include consideration of future reuse of that garage in the eventuality that parking demand declines in the future.



Shape where and how much parking is in private developments

Buildings with large amounts of above ground structured parking are large, boxy, and contrary to the village scale character intended for the areas of Washington Street near West Newton and Newtonville. Such buildings are less likely to exhibit varied building heights or courtyard-style plazas.

Newton currently requires a minimum of two parking spaces for every residential unit and at least three spaces for every 1,000 square foot of new office space. The parking requirement is often at odds with the City's priorities to reduce drive-alone trips, to reduce the community's climate impacts, and on Washington Street to see smaller and diverse buildings with open civic spaces.

Zoning for Washington Street should include revised parking standards that align with the community priorities. Newton should consider removing the minimum parking requirement entirely. Determining an appropriate parking standard should be considered within a broader zoning ordinance update for Washington Street.

Projects like this residential complex in Watertown are shaped around a large above ground garage. This example is better than some because it hides the garage from view, but the bulky shape that results was not viewed positively in Newton.

Require transportation demand management by developers

Transportation demand management strategies aim to create parity between the incentives to drive and the incentives to walk, bike, or take transit.

Ensuring that non-driving options are available and that buildings are positioned to make walking up to the building as easy as or easier than driving up to the building are essential first steps as well. Managing transportation demand is an operational challenge that requires ongoing monitoring to ensure that incentives to not drive continue to work. Strategies can vary depending on the available transportation options near a particular development and whether the strategies are aimed at residents, employees, or shoppers. The zoning ordinance could be used to ensure that these first steps happen as new development occurs and that large development projects include ongoing management.

Washington Street is in the service area of the Watertown Transportation Management Association which provides coordinated transportation demand management services to employers and developers in northern Newton and Watertown.

Track and prepare for driverless technology

Driverless vehicles will be here in the near future. There are still many questions about what driverless technology will mean for the design of Washington Street and the City of Newton must understand how the technology is developing and consider how it will be deployed and regulated in Newton.

Little Roady is a pilot autonomous shuttle service in downtown Providence. These electric vehicles go up to 25 mph and connect 12 shuttle stops along a 5.3 mile route from 6:30 am to 6:30 pm.

C. HOUSING DIVERSITY

Attract All Ages, All People

Seek Affordable Housing Opportunities

Link Housing and Transportation

Attract All Ages, All People

The nature of Newton's housing stock determines the diversity of the community. Housing affordability determines the range of households at different income levels in the community, which itself often ties to racial diversity. Without multi-family housing options the households that would choose to live in an apartment, most frequently down-sizing seniors and young professionals, do not have opportunities in the community. The lack of diversity then has compounding effects such as employers struggling to find employees and those they do find commuting long distances. Fundamentally, Newton has historicly been a diverse community and has sought to encourage and welcome that diversity, especially in the area around Washington Street.

Throughout the Boston region, and in Newton, the cost of housing is rising. Those rising costs are a product of limitted supply relative to a growing demand and the significant drop in housing production over the last several decades. Multiple organizations have documented the housing crisis in greater Boston and its implications for the economy.

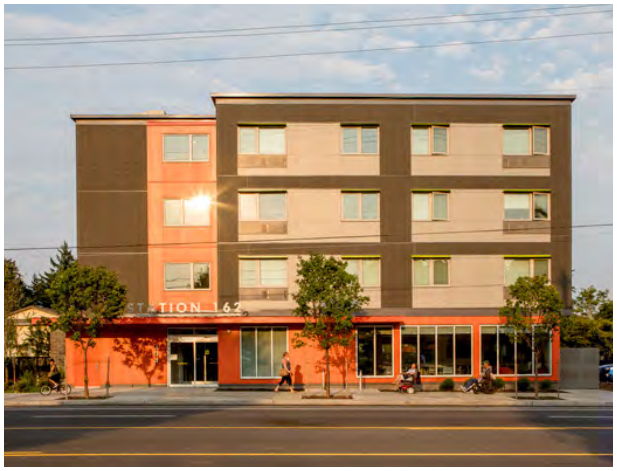
See also: Newton Housing Strategy, 2016

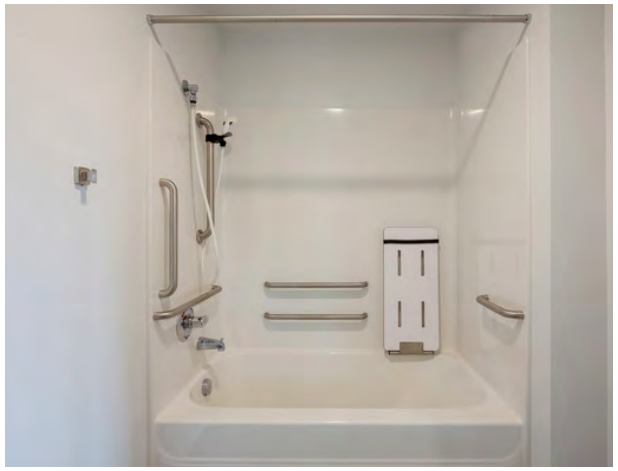
Guiding Principles:

- Ensure availability of accessible units
- Promote diverse building and unit sizes
- Allow communal living models

Ensure availability of accessible units

Accessible units are needed in buildings of all sizes in order to accommodate those with disabilities. Newly constructed buildings have to meet strict federal and state accessibility requirements which often means they are better equipped to serve residents with disabilities and those aging-in-place. Even still, there are many details to ensuring that a unit is accessible and age-friendly. The Newton Council on Aging has created a checklist with criteria to guide the development and renovation of age-friendly housing which often overlap with meeting the diverse needs of residents with disabilities and residents of all levels of physical ability. This checklist is a useful tool for future conversations about housing development on Washington Street.





Station 162 in Gresham OR is an affordable housing complex for seniors and disabled individuals. Units are adapted to meet tenants needs including accessible kitchens and bathrooms. It is located near transit and accessibility features extend to the site layout and community amenities as well.
Case Study: HUD - Office of Policy Development and Research

Promote diverse building and unit sizes

The diversity of people and families is one of the positive aspects of Washington Street. In order to further bolster that diversity, the housing stock needs to be diverse enough to serve the community's diverse population. The neighborhoods along Washington Street have a wide range of living environments including single-family homes, two-family homes that are both condominiums, two-family homes where a one family owns both units and rents one of them out, and two-family homes where both units are rented. There also are small multifamily buildings with 3-8 units and larger multifamily buildings, some that are only apartments and others that have commercial uses on the ground floor. New construction should continue to enhance the diverse offering in the area. New zoning for Washington Street can ensure that the building types allowed in each portion of the corridor are contextually appropriate and support the goal for diversity in housing.

In Massachusetts, both age and familial status are protected classes, meaning that denying a person housing based on their age and family status (including whether or not the family includes children under 18) is discriminatory. At a citywide level, Newton is obligated to affirmatively further fair housing and actively facilitate an inclusive, equitable community with free and open access to housing opportunities. This includes evaluating local actions, policies, processes, and practices to ensure they do not have a discriminatory effect on people of a protected class, like seniors or families with children.

Allow communal living models

There are a broad range of multi-unit housing options with a focused mission that need specific allowances in a zoning ordinance. Age-restricted senior housing is possibly the most common communal living model. There are also all-age models like co-housing that bring multiple families into a community with shared amenity spaces and communal activities. There is also purpose-built multi-generational housing to bring together extended families. Artist housing, like the Claflin School on Lowell Ave, is another form of communal living. Live-work housing units that incorporate maker space within residential space, often are created to foster communities of entrepreneurs and artists/artisans. Washington Street is a location to consider for these more complex forms of multi-family housing.

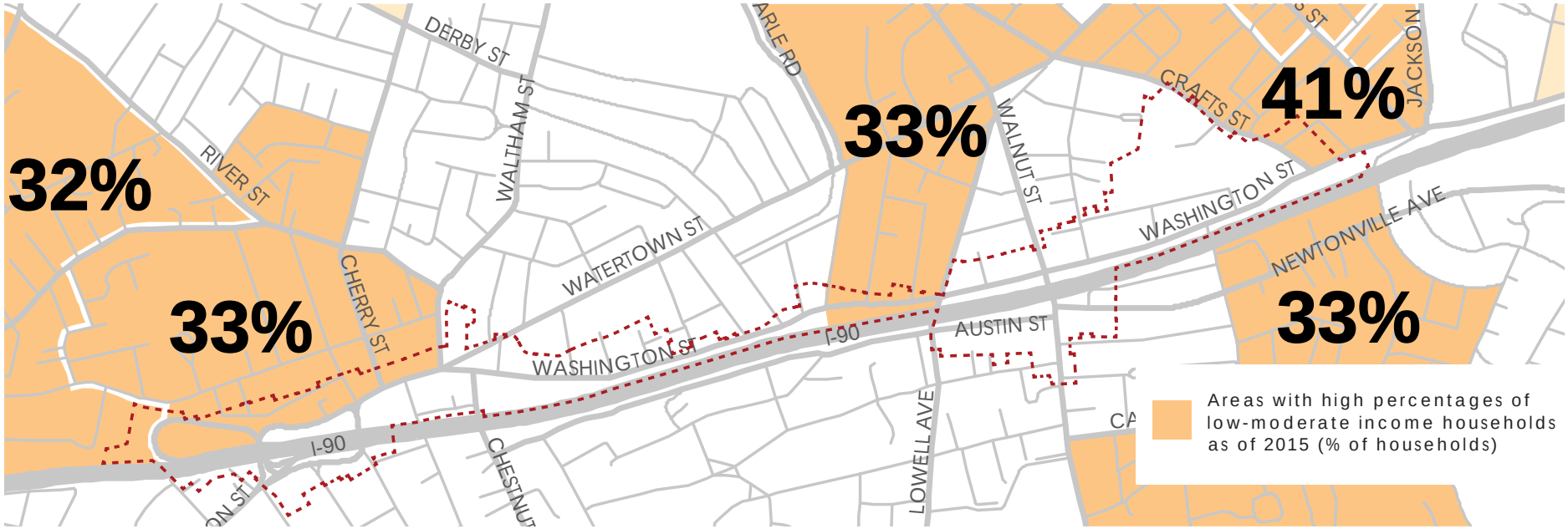
Jamaica Plain Cohousing is a multigenerational intentional community with 30-units with community spaces and a central courtyard

Seek Affordable Housing Opportunities

Guiding Principles:

- Invest directly in affordable housing
- Leverage public land for affordable housing development

The neighborhoods along Washington Street have historically been communities with income diversity. As of 2019, low-moderate income households comprise between 32% to 41% of some of the census block groups along Washington Street (HUD 2019 LMISD, based on 2011-2015 ACS). Ensuring that those families can afford to reside in their communities is a growing concern as housing prices in Newton continue to rise. In the coming years, the City of Newton should look for ways to support diverse and affordable housing throughout the Washington Street area to maintain economic diversity in these neighborhoods.



Invest directly in affordable housing

The City of Newton has a variety of funding sources that can be directed to the production and preservation of affordable housing units. The City of Newton receives approximately $3.5 million each year from the U.S. Department of Housing and Urban Development (HUD) to support economic diversity and expanded opportunity for low-to-moderate income households in the city. The majority of these funds is aimed at producing and preserving affordable housing. The City of Newton and WestMetro HOME Consortium's FY16-FY20 Consolidated Plan identifies affordable housing as the City's greatest need when it comes to supporting economic diversity and obligates approximately 60% of each year's allocation toward this critical line item. Additionally, the City raises a little over $3 million each year through a local surcharge for the Community Preservation Program, a portion of which is intended to support affordable housing activities. At the end of 2019, the City may also begin receiving fractional payments from private development projects subject to the Inclusionary Zoning Ordinance. These diverse funds could collectively be utilized to directly invest in affordable housing in the Washington Street area.

New affordable housing under construction on Auburn Street, a project supported by funds from Newton's housing programs.

Leverage public land for affordable housing development

The City should consider opportunities to support affordable housing development through the use of public land or through the public acquisition of land. This strategy could work with a for-profit developer to build mixed-income housing with a substantial affordable housing component or the City could partner with a non-profit affordable housing developer in a 100% affordable units project. The City should conduct an inventory of City-owned properties, as well as properties that might be acquired, to facilitate affordable housing development.

Link Housing and Transportation

A home's location relative to transportation options guides what jobs are accessible and how a person is likely to commute to that job. Washington Street is served by the commuter rail at West Newton and Newtonville and the express bus lines 504, 553, 554, and 556. Already residents along Washington Street are some of those most likely to take transit to work. In some Census tracts along Washington Street more that 25% of residents commute to work by transit (Census ACS 2010-2014, Newton Transportation Strategy). As new development occurs on Washington Street, the City of Newton is interested in seeing developments that build on the existing transit infrastructure, encouraging new residents to use transit, and improving the link between the neighborhoods and the transit services on Washington Street.

Guiding Principles:

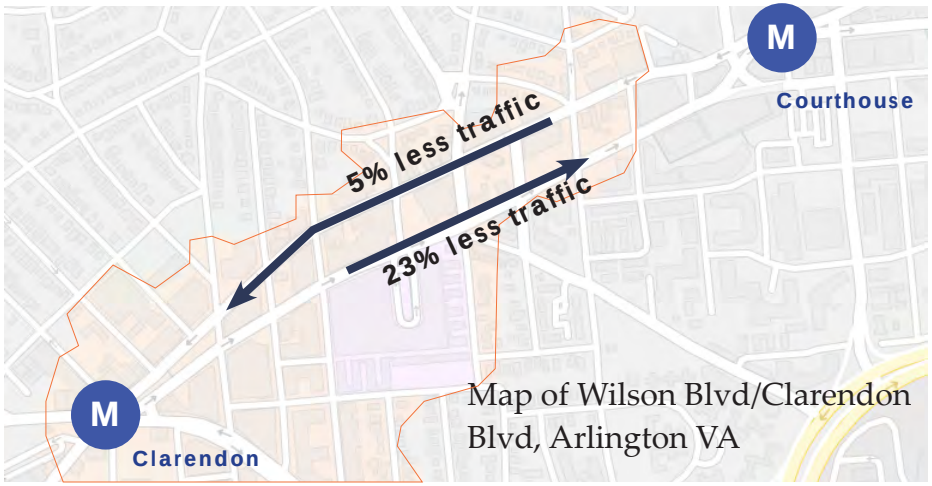
- Focus housing where residents have transportation options
- Pair housing near transit with new commercial and retail space

Focus housing where commuting traffic can be mitigated

Washington Street sees its peak traffic during commuting hours, as residents from across Newton use Washington Street to travel east or west through the city or to connect with the Mass Pike at West Newton or Newton Corner. There is a strong interest in seeing new housing that is transit-oriented and in putting in place a framework to curtail traffic growth related to new development.

One of the most effective ways to limit the traffic impacts of new housing is to focus new development near transit. Some communitie, such as Arlington, Virginia, have been able to achieve substantial residential and office development while actually decreasing automobile traffic through smart growth principles and a focus on good walkable design. Newton could encourage a similar transition by focusing new housing close to transit and ensuring that new development meets walkable design standards.

Newton has also been developing and applying transportation demand management to reduce single occupancy vehicle trips coming from new residents (see page 55). Not only should new housing be focused physically around transit stations, but there should be programs in place to ensure that new residents near transit service have every incentive not to drive. Development particularly close to transit, like the locations where taller height buildings are possible (see pg. 95), should have strict requirements to prevent traffic increases.



The Wilson Blvd and Clarendon Blvd pair of streets was measured for traffic changes before and after a period of substantial mixed use development. Both saw a decrease in traffic while the population increased; the change has been credited to improved walking, biking, and bus riding comfort.

Pair housing near transit with new commercial and retail space

Traffic is not just about commuting. Housing located within a comfortable walk of shops, services, and dining options also reduces driving. Furthermore, having these daily services in close proximity allows transit commuters from the surrounding neighborhoods to "trip-link," to pick up dry-cleaning, prescriptions, or dinner on their walk home, further reducing car trips. The mix of uses in West Newton and Newtonville already allow for some trip linking. This service mix can be further enhanced as new development occurs, particularly at the West Newton station which is much less integrated into the village center than the Newtonville station.

Vinatage on Selby in St. Paul Minnesota pairs housing with a large format grocer, making trip linking easy for all the residents of the new site and those commuting past this site on the rapid bus line out front.

D. GLOBAL CLIMATE AND LOCAL ENVIRONMENT

Provide Options for Low-Carbon Living

Improve Climate Resilience

Expand Access to Open Spaces and Recreation

Mitigate the Mass Pike's Effects

Provide Options for Low-Carbon Living

Fighting the climate change crisis requires that individuals make choices that will lower their carbon footprint. Newton has an important role to play in ensuring there are places in the city that enable those choices. The longer we delay taking ambitious action to reduce greenhouse gas emissions and change how we interact with our environment, the greater the environmental, public health, and economic problems we will face, both now and in the future. Two of the greatest areas of emissions, and therefore the most needed areas of change, are in buildings and transportation systems. Fundamentally, both need to move towards greater efficiency and reduced reliance on fossil fuels.

Redevelopment along Washington Street can help to make low-carbon living easier. The recommendations in this Vision can help people significantly reduce their individual greenhouse gas emissions.

See also: *Use Less & Green the Rest, A Climate Action Plan for Newton*, 2019 (DRAFT)

Guiding Principles:

- Allow for smaller unit residences
- Build in features to make low-carbon living easy
- Create incentives and mandates for an energy-efficient future

Allow for smaller unit residences

One way to achieve greater efficiency in housing is through smaller unit sizes. Smaller units require less energy to heat or cool. Smaller units can also mean higher overall residential densities which, coupled with local services in walking distance and transit opportunities, can reduce greenhouse gas emissions. Smaller units can additionally address the city's needs for a greater housing diversity.

While smaller units of various types, from small single-family to small apartments make sense anywhere within the Washington Street area, higher density clusters should occur close to the village centers and the rail and bus transit services.

Made possible by efficient interior design, folding furniture, or a minimalist lifestyle, there is a growing interest in living in smaller more energy efficient spaces. The piece shown here is a bookshelf, bed, and wardrobe combination.

Build in features to make low-carbon living easy

An enhanced walking, biking, and transit environment will allow more people to take advantage of these modes of transportation and thereby encourage a low-carbon lifestyle. Vibrant and appropriately dense village areas will make for destinations that are more desirable to walk to and will be more competitive than other shopping or entertainment areas that require a drive.

Individual development projects are encouraged to make low-carbon living easier by further incorporating substantial insulation, high-efficiency heating and cooling systems to provide comfortable indoor temperatures with less energy, as well as electric vehicle charging stations to encourage residents and employees to purchase electric vehicles. Wherever possible, operational aspects should include low-carbon lifestyle features like waste management systems that include recycling and composting and stormwater/ graywater recapture to reduce water consumption.

EV-charging is available at City Hall and becoming more common at residences and offices.

Create incentives and mandates for an energy-efficient future

The Washington Street zoning should include a combination of standards, special permit criteria, and incentives to ensure the highest degree of energy efficient design is achieved. One succesful model is thePassive House design. Passive House's requirement for strong sound insulation and indoor air filtering are both valuable added benefits for Washington Street given the proximity to the Mass Pike.

For large projects, investments to increase efficiencies through low embodied carbon construction materials and the development of on-site energy production should be considered.

Auburndale Builders is retrofitting an existing office building to meet Passive House standards on Adams Street.

Improve Climate Resilience

Excessive heat and storm-related flooding will likely be the most significant climate change impacts in the Washington Street area.

See also: *Newton's Climate Change Vulnerability Assessment and Action Plan*, December, 2018

Guiding Principles:

- Improve Cheesecake Brook to reduce downstream flooding
- Reduce heat island effect through building and site design standards

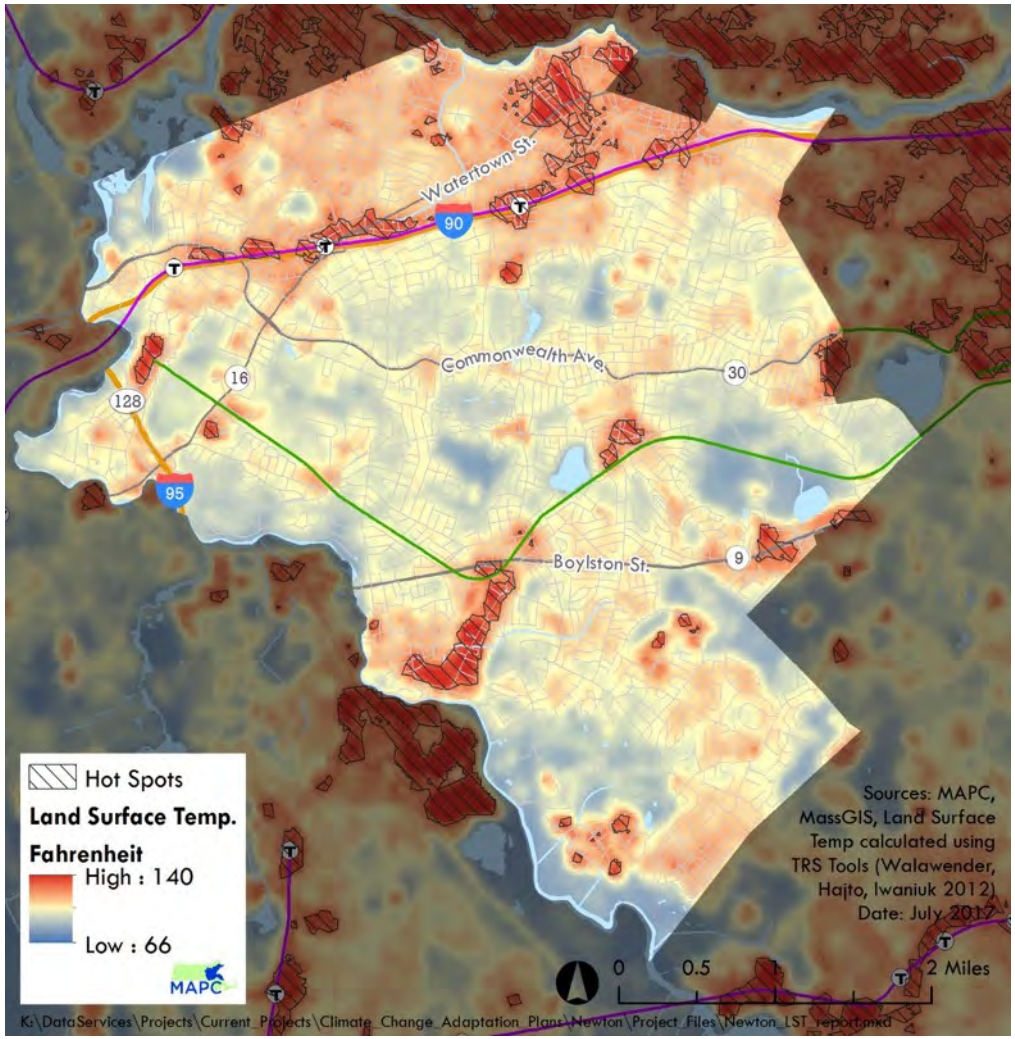
Improve Cheesecake Brook to reduce downstream flooding

During the first half of the 20th century Newton's engineers made the decision to underground and channelize Cheesecake Brook in long sections of culvert. Doing so was likely perceived as the best course of action to protect land from flooding. While the engineered waterway was likely sized appropriately at the time for the anticipated volume of water, the increasing size and intensity of storm events are already being felt in Newton and we can anticipate even larger storms and greater amounts of rainfall, further straining the capacity of this system. Today there are other design solutions that can ameliorate flooding and improve stream ecology and water quality. The vision plan calls for working with adjacent property owners to uncover or "daylight" portions of Cheesecake Brook where feasible and line the brook with park space that can serve to both buffer the waterway and absorb stormwater during flood events.

Reduce heat island effect through building and site design standards

One of the challenges Newton will face regularly as a result of climate change is the increase in hot and extremely hot days. Along the Washington Street corridor, there is an increased "heat island effect" where paved surfaces and other factors exacerbate the effects of high heat. Building and site design can be used to lessen the heat island effect. For example, buildings can have deep awnings or other similar features that shade the front of the building and the sidewalk. Rooftops that are white, green (planted), and/or blue (trapping rainwater) reduce the urban heat island effect. Minimizing pavements from driveways and parking lots and light colored pavement also reduces summer heat.

Shade is an essential element for addressing excessive heat and should be required when new sidewalks and parking lots are being developed to shade large hardscaped areas. Shade can be provided by trees, canopies, or a combination of both.



Expand Access to Open Green Spaces and Recreation

Guiding Principles:

- Facilitate the creation of a network of pocket parks, tot lots, and community plazas
- Activate existing and new public spaces
- Expand tree canopy and add layers of vegetation

Most residents in the Washington Street area are within a 10-minute walk to a park, but there are some notable gaps. For example, Court Street is almost entirely more than a ten minute walk from the nearest parks (Cabot Park and Lowell Park). There are also gaps in walkable park access on West Newton Hill and just north of Watertown Street. One of the goals of this Vision is to create a network of new small parks and plazas, to reinvigorate existing park space, and possibly to create new village greens over the Mass Pike for both West Newton Square and Newtonville Square (see page 84 for more on this idea). In time, the hope is that all residents in the Washington Street area will be within a ten minute walk of a communal outdoor space.

Facilitate the creation of a network of pocket parks, tot lots, and community plazas

Parks are an essential part of a community with a wide range of recognized benefits for the local environment, public health, and general sense of community. While Newton overall is well-served by park space, the neighborhoods along Washington Street could benefit from a range of smaller, infill parks and plazas. Such civic-space should be incorporated as required amenities in new development projects. At the same time, the City should work to reinvigorate existing parks and open spaces. Captain Ryan Park in West Newton could be redeveloped as a more vibrant community space. The Walker Street green space, located in the bend of Washington Street by the Mass Pike, currently unprogrammed lawn, could be re-imagined as a new park.

Activate existing and new open spaces

Parks and public spaces are more than just their built features; a bandshell after all means little without a band. As parks and plazas are being developed, it is important to consider how they will be managed and programmed. This is particularly significant for newly created private plazas and courtyards. During the permitting of large developments with new civic spaces, it will be important to discuss how new privately-built civic spaces will be programmed – particularly those spaces that are being arranged to accommodate community events.

Expand tree canopy and add layers of vegetation

The Washington Street corridor has relatively few trees compared to other parts of the Garden City. Beyond simply looking beautiful, street trees provide a sense of enclosure that helps slow vehicle speeds in neighborhood settings; filter pollution by capturing particulate matter and buffering traffic noise; reduce the urban heat island effect and provide shade for people in the summer; capture rain and help infiltrate stormwater thereby reducing the burden on the stormdrain system and contributing to healthier waterways. Trees and ground-level landscaping also may enhance property values. Perhaps most importantly, connecting the built environment to nature is known to benefit mental health.

The West Newton Square and Walnut Street Enhancements Projects will each add dozens of new trees and new landscaped areas to the village centers in the next few years. The redesign of Washington Street should provide for the incorporation of trees as an important element of the design, recasting the street as a tree-lined boulevard. As will be modeled in the upcoming village center projects, newly planted trees should use the latest planting techniques to provide for the longevity of the trees. In keeping with the City's Street Design Guide, stormwater management best practices for street trees and shrubs should be incorporated wherever feasible.

Mitigate the Mass Pike's Effects

Guiding Principles:

- Install plants at the Pike edge to improve noise, air quality, and aesthetics
- Build sound barriers that have multiple positive outcomes
- Investigate opportunities to deck over sections of the Mass Pike

The construction of the Massachusetts Turnpike through Newton in the 1960s has had some negative local effects on Washington Street. Communities to the north and south were further separated from each other and bridges between neighborhoods were removed. The air pollution and noise of Mass Pike traffic is constant throughout the day. The City should work to mitigate the negative local effects of the Mass Pike on Washington Street and the surrounding neighborhoods.

Install plants at the Pike edge to improve noise, air quality, and aesthetics

One strategy to tame air pollution is to install plants on buildings, bridges, and structural sound barriers. Plants mitigate noise and remove particulates from the air. A diversity of densely planted, multi-story perennials along the Mass Pike could have a substantial visual, environmental, and public health impact, especially where Washington Street and the Turnpike are situated at the same grade. Plantings could be installed in conjunction with structural sound barriers. Cities such as Paris have enlisted private citizens to promote and even manage planting programs. Newton should look to such models.

Wieser Concrete Products, Inc.

Collins Engineers

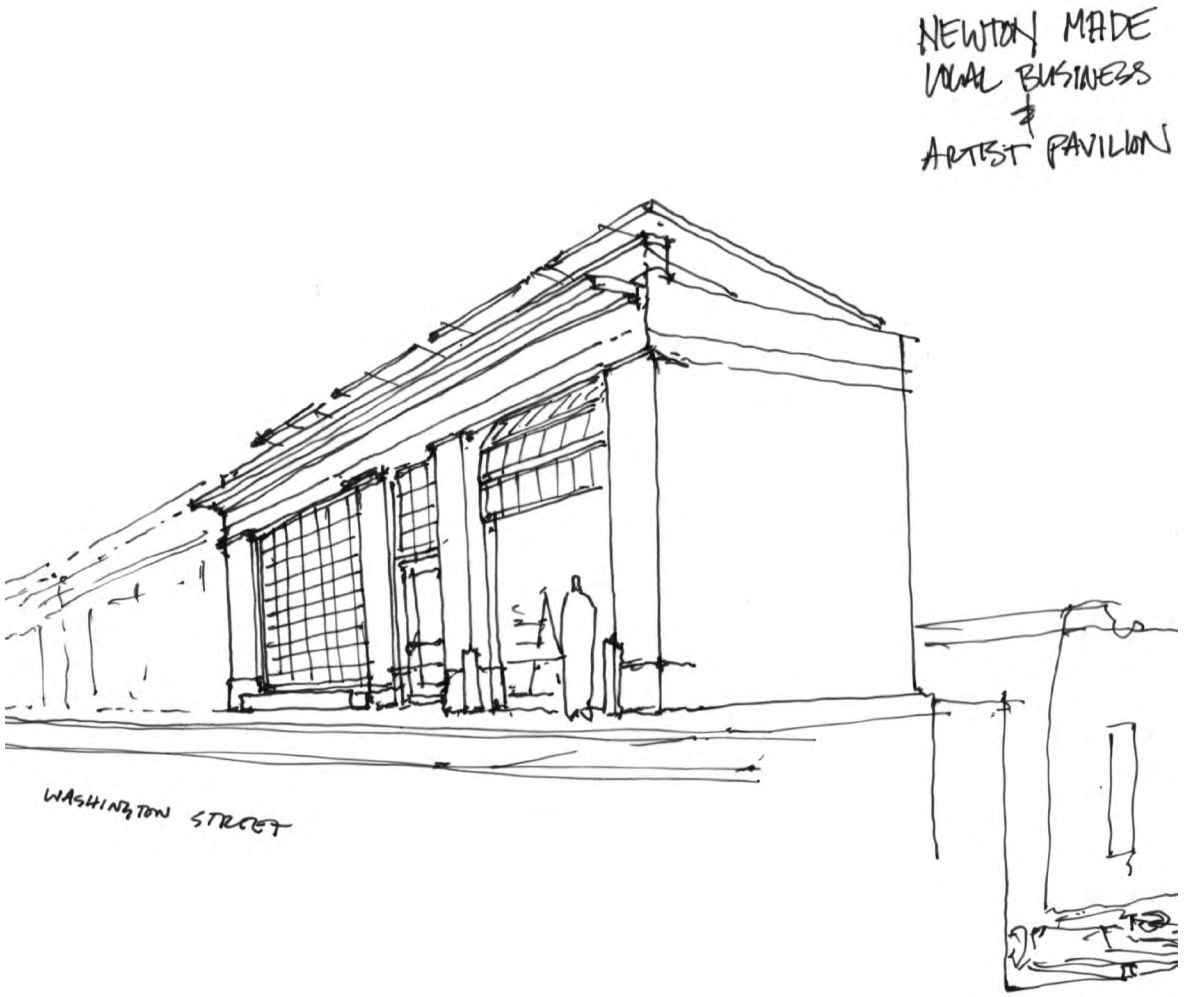
Two photos of a planted highway sound barrier in Chicago, IL. The photo on the left shows the concrete elements that are custom designed to hold soil for the plantings. The photo on the right shows the view from the adjacent park - neither the concrete sound wall structure nor the highway is visible behind all of the plantings. *Precast.org*

Build sound barriers that have multiple positive outcomes

The Mass Turnpike/commuter rail edge of Washington Street could provide much greater community value.

One concept would be to install solar panels on sound walls on the City-owned land between the commuter rail tracks and Washington Street. The east-west orientation of the Mass Pike provides an opportunity for solar panels to have a clear southern exposure, facing toward the tracks and the Mass Pike.

The City might also construct, or allow a private or non-profit group to construct, small scale buildings along the Mass Pike edge in the places where there is sufficient public land. The idea would be that these buildings could provide noise mitigation, generate solar power with panels on the roof, and fill a need for low cost business/arts space.



An illustration of the pavilion sound barrier idea. The sketch shows a row of small pavilions built with a solid sound absorbing wall at the back, toward the commuter rail and Mass Pike. There are solar panels on the roof to power the buildings and generate income to the City. The small interior spaces could be provided to local businesses and artists at low cost.

Investigate opportunities to deck over sections of the Mass Pike

The City should examine the potential value of air-rights development in West Newton and Newtonville by building decks over the Mass Pike for economic development, the creation of new public open spaces, and to help heal the divide created by the Mass Pike. These open spaces could be created for each village center - a similar to the traditional New England village - to serve as central gathering spaces in both villages, contributing to village vitality. With new buildings and other mechanisms for buffering the Mass Pike from these village greens, they could be attractive new parks that serve to ameliorate the presence of the Mass Pike in the villages. Decking over the Mass Pike is a substantial investment that development in the Washington Street area could help to financially support. A potential early action is to research the financial tools and partnerships available to make this idea possible.

The Principle Group prepared this drawing of what a Newtonville village green over the Mass Pike could look like. The proposal recreates the historic connection between Central Ave and Bowers St. The space between the Walnut Street bridge and the new Central Ave bridge would be filled in with park space. The edges would have liner retail/restaurant buildings, like the example photo from Columbus Ohio, to block noise from the highway and create a connected village experience around the green. On the Walnut and Washington Street corner of the green there could also be elevator access down to the commuter rail platforms below.

E. EXCELLENCE IN PLACEMAKING AND DESIGN

Area-wide Planning Principles

Site Planning Principles

Building Design Principles

Area-wide Planning Principles

The Washington Street Vision Plan covers an area with multiple neighborhoods and two distinct village centers. The interplay of all of priorities for vitality, transportation, housing, and the environment ultimately come together and are expressed through the development of buildings, the creation of open and recreational spaces, the opening of new stores, and the implementation of roads and other infrastructure. Thinking about this portion of Washington Street as a whole, there are a number of physical planning principles that will be used to guide the development of zoning for Washington Street.

Guiding Principles:

- Ensure Newtonville and West Newton remain distinct and vital
- Protect iconic buildings
- Foster moments of arrival
- Require gentle transitions to adjacent neighborhoods
- Develop standards and guidelines for human-scale design
- Encourage variety in building size and shape

Ensure Newtonville and West Newton remain distinct and vital

West Newton and Newtonville are two distinct villages that should remain separate and distinct rather than appear to blend together into one continuous development along the length of Washington Street. Much of Newton's identity derives from having separate and individually unique villages. For Washington Street, the appropriate place to focus new, denser development is at the edges of the village centers.

There is a portion of Washington Street around Brookside Ave and Walker Park where the neighborhood meets Washington Street. This Vision recommends that the neighborhood scale be reflected in new zoning for this part of Washington Street.

Protect iconic buildings

The center of West Newton is a federally designated historic district, its character derived from several important civic buildings and a handful of historic commercial buildings. Newtonville is similarly home to iconic civic structures. The residential neighborhood north of the village center is a local historic district. Newton should continue to protect iconic buildings and to treat them as guideposts in the views along Washington Street while also growing and changing to support the other objectives of this Vision Plan.

Typically the center of a village is where more height is allowed, but that approach could mean detracting from the historic structures and character in the core of the village centers.

In this Vision, density and height are recommended to be located in areas of underutilized land just outside of the village cores and yet well within the walkable and transit served areas of the villages. In West Newton, this area includes the MBTA parking lots and the "Cheesecake Brook lots" east of Chestnut Street as far as the Trader Joe's on Armory Street. In Newtonville, this area is along Washington Street approaching the intersection with Crafts Street. Essentially, the vision calls for improving these areas that are currently less reflective of the ideal of Newton placemaking excellence. The Vision proposes that these portions of the corridor could realize the important policy objectives while also incorporating the quality design that define the West Newton and Newtonville village cores.

The photo on the left shows the view across the Walnut Street bridge in the early 20th century. This building was lost during the Great Depression. The Masonic Temple in Newtonville is now one of the dominant feature buildings in Newtonville Square that should continue to have a prominent position as a landmark.

Foster moments of arrival

Because height is being guided to the edges of the village rather than the center, it can be used to mark moments of arrival as one moves through the village. Newly created taller buildings would mark arrival at the edges of each village, and then heights in the village core areas would be kept relatively low in order to allow the historic civic buildings to continue to have prominence. The taller features of the Masonic Hall on Walnut Street in Newtonville and the Unitarian Church in West Newton should continue to catch one's attention as one passes through the village centers.

This approach would mark each transition into and out of the village centers with a moment of well-designed height – for example, arrival at West Newton Square near the MBTA station or West Newton before Chestnut Street.

Require gentle transitions to adjacent neighborhoods

The gentle transition from the village centers to surrounding residential neighborhoods is an important part of retaining the historic pattern of villages and neighborhoods. This Vision recommends, and the zoning could ultimately require, that building heights be lower adjacent to residences in order to be complementary to the scale of surrounding neighborhoods.

Setbacks are another way to create a gentle transition, a taller building that is pulled away from the side property line in favor of green space or even a driveway lined with trees creates a more gentle transition. The transition can also be made gentler by locating smaller footprint buildings adjacent to residential neighborhoods; for instance, a small four-story office building that has the same footprint as a house could actually be a better transitional structure than a one-story office building with a long facade and large footprint. All of these approaches to creating gentle transitions should be incorporated when developing zoning for Washington Street.

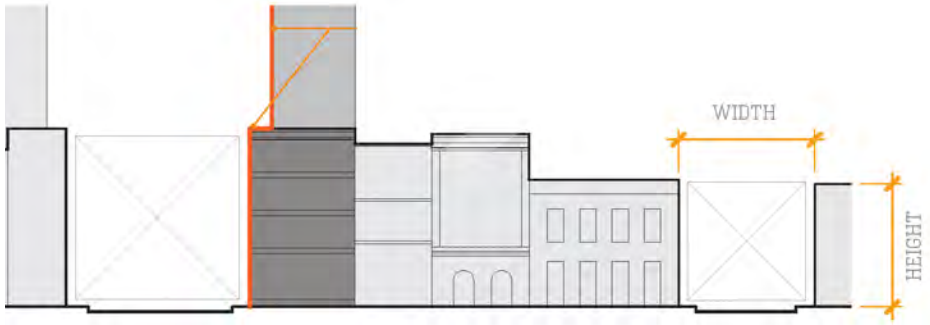
This sketch of Dunstan Street shows a gradual transition from a 6-story building on Washington Street to a 3.5-story building closest to the neighborhood. The building closest to the neighborhood also has a 1-story portion at the edge nearest to residences.

Develop standards and guidelines for human-scale design

Every building and public space along Washington Street should be designed with a focus on what it feels like to be in the space. This includes thinking about the relationship of the human body and the sensory experience of a space - texture, enclosure, views, variety, sound, and feel. The human field of vision relates to building height and width, as well as the details of the architecture – the layout of windows on the ground floor, the frequency of doorways, the architectural details that relate a building to the people who will ultimately use it. Such "human-scale" design principles should be incorporated into zoning for Washington Street as well as design guidelines for Washington Street.

It is a well established principal of urban design that people gravitate to well-defined edges such as provided by buildings or landscaping. People generally feel more comfortable in these sheltered edge areas than in wide open spaces. Building height is an important component of creating this sense of shelter or enclosure with a 1:1 ratio of building height to street width generally being considered the ideal

Building design should also respond to the fact that people can see a lot of detail at eye-level and closer to the ground, and generally less detail up above. Therefore the ground level should be well-detailed with architectural features, signs, windows, and similar.

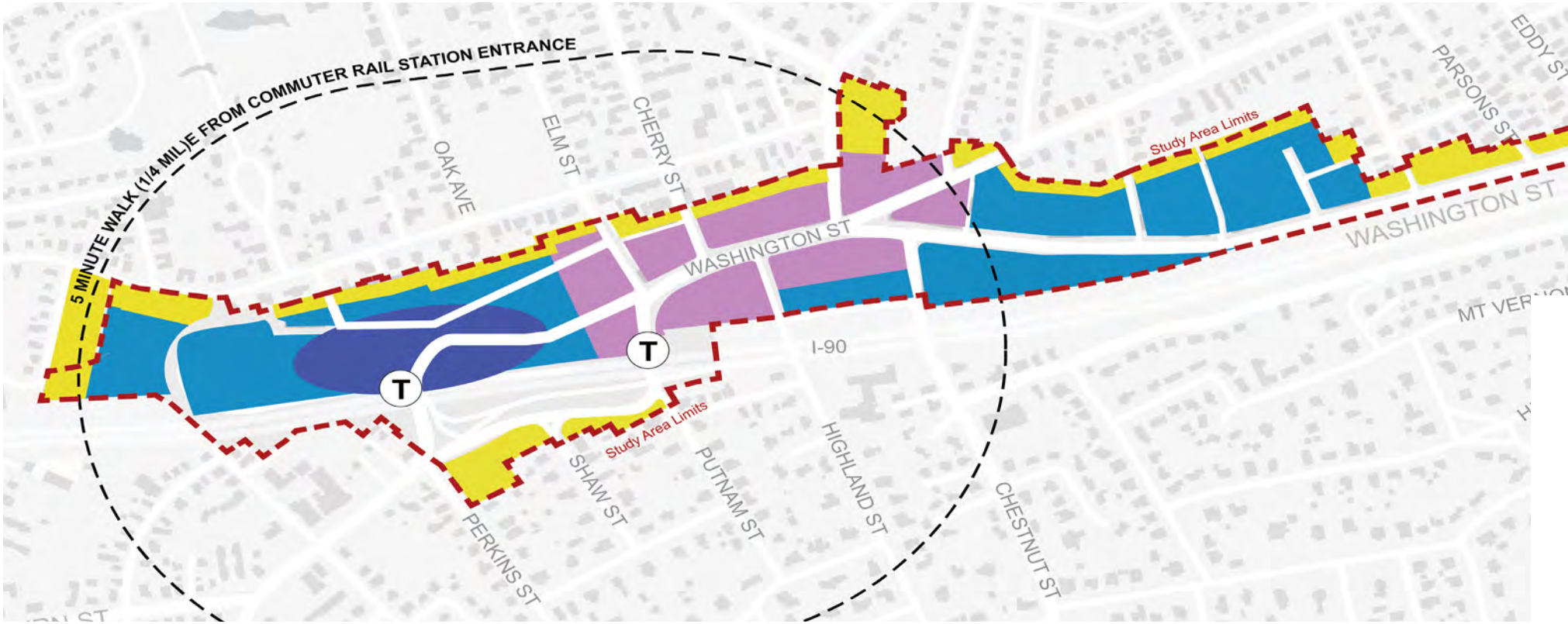


This diagram describes two of the design principles for setting building height in relationship to a street. First, note the gray square with an X through it above each street. The sides of the square are equal. The diagram demonstrates that the height of the buildings at the street edge are equal to the width of the open space. This ratio has generally been found to make for a comfortable sense of enclosure for humans. Second, note that on the left, the buildings are taller, but are set back at the upper levels. This preserves the proportions at which the street is comfortably enclosed and allows more sunlight into the street.

Height Principles Diagram

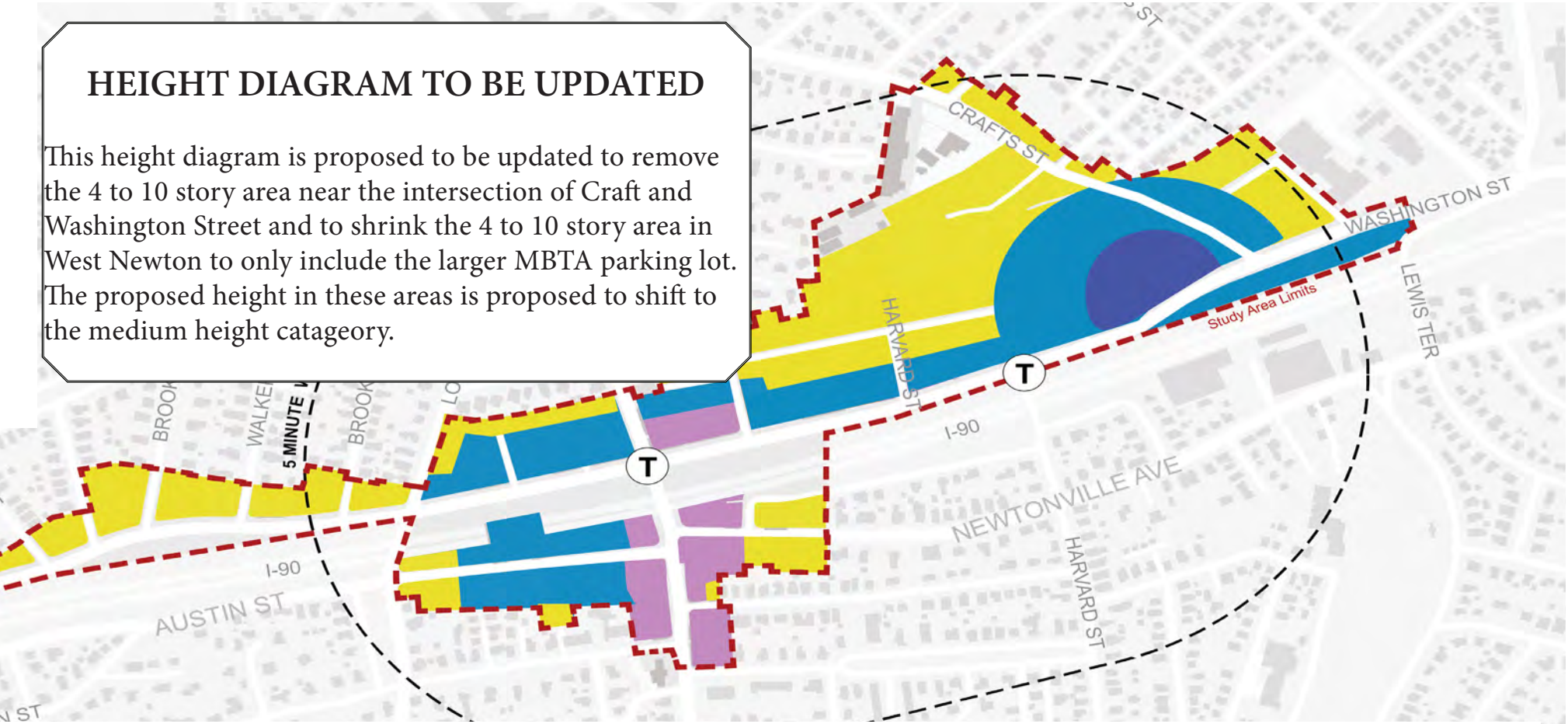
This diagram illustrates the height principles along Washington Street. The height ranges shown correspond to the area-wide planning principles:

- Maintaining the lower height neighborhood between West Newton and Newtonville
- Maintaining the prominence of historic iconic buildings in the village cores
- Creating moments of arrival and transition at the edges of the villages
- Ensure buildings respond to human-scale throughout the area including upper story stepbacks on taller buildings.



HEIGHT DIAGRAM TO BE UPDATED

This height diagram is proposed to be updated to remove the 4 to 10 story area near the intersection of Craft and Washington Street and to shrink the 4 to 10 story area in West Newton to only include the larger MBTA parking lot. The proposed height in these areas is proposed to shift to the medium height catageory.



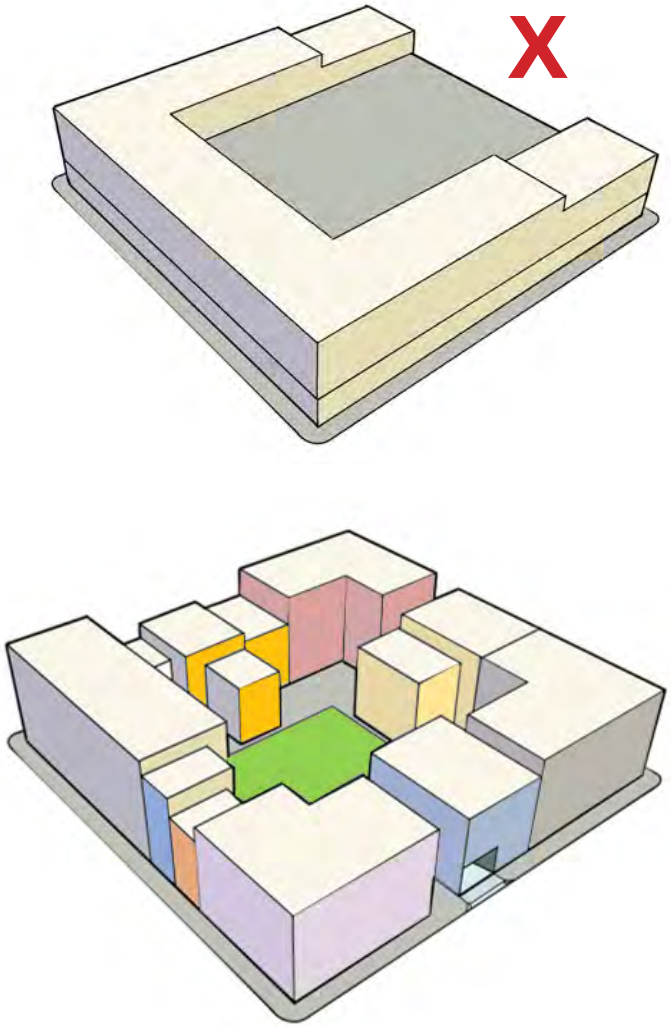
- Low Heights - Neighborhood Character (1 to 3 stories)
- Low Heights - Village Character (1 to 4 stories)
- Medium Heights - Village Character (3 to 6 stories)
- Taller Heights - Village Character (4 to 10 stories, with anything above a height between 4 and 6 stories stepped back from the building edge)

Footnotes:

- This is an illustration of principles only; this is not a regulatory or zoning map.
- Further nuance must be developed in Washington Street Zoning including specifying the limits of each zoning district and the rules for each district and building type.
- The scale of some buildings, including taller height buildings, will require additional review and community input as can be achieved through the Special Permit Process.

Encourage variety in building size and shape

A distinguishing characteristic of both West Newton and Newtonville is that the buildings in these villages developed incrementally over time and are therefore distinctive from each other, varying in height, width, materials, and other aspects of their design. These building patterns are another essential feature that defines the unique sense of place of Newton. The vision recommends that zoning for Washington Street require that new development reinforce these building patterns. In particular, where a larger new development is proposed that might include multiple buildings or stretch over an entire block, that such a development reinforce the idea of multiple buildings with varying heights, materials, and other design distinctiveness.



A market-driven building shape common today is a large parking garage with the building shaped around it. Such buildings would be out of context for Washington Street, so the Vision recommends developing standards that require large scale projects to mirror the building diversity that is typical on Washington Street.

Site Planning Principles

Individual properties affect the fabric of the neighborhood and excellence in placemaking. Site design principles should be carried forward through zoning and design guidelines to ensure that any new development adds to design excellence on Washington Street.

Guiding Principles:

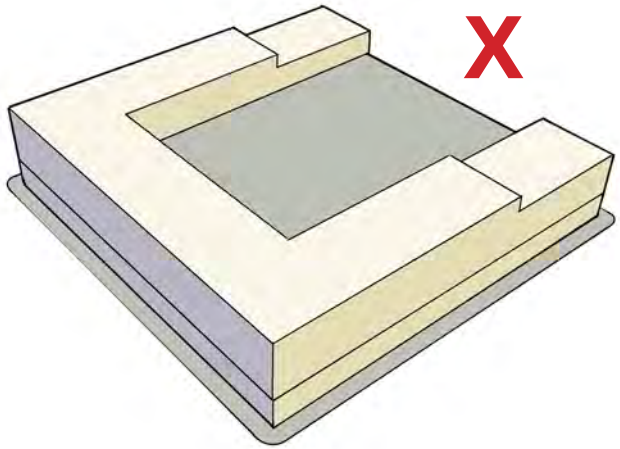
- Limit visible parking
- Broaden the toolkit to incentivize historic preservation
- Break down the scale of larger projects with new streets, paths, and open spaces

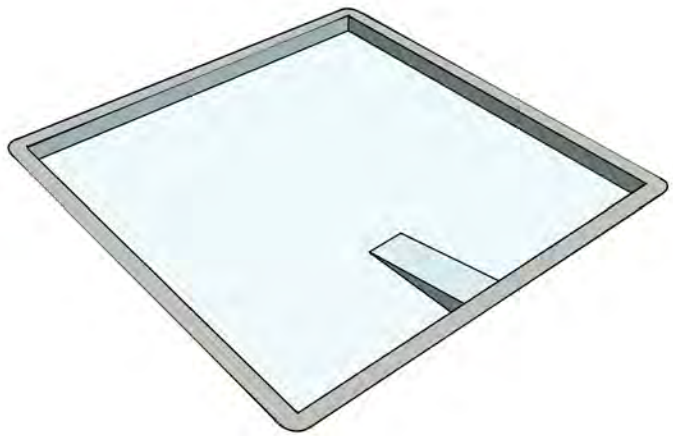
Limit visible parking

Parking should not dictate the size of buildings nor dominate the landscape. Any parking that is provided should be behind buildings, screened from the sidewalk, or ideally below ground.

Generally, below-grade parking garages are preferred for Washington Street over above-ground garages because they do not add to the visible mass of buildings. Understanding though that below-grade parking is not always achievable due to physical and financial constraints, the second priority is for parking to be at the back of a property, away from the street. Parking lots are very boring to walk alongside and can discourage pedestrian activity. In addition to locating parking lots behind a building, parking lots on the side of a building should be as limited as possible, and parking should not be located between a building and the street. Small convenience parking areas are more effective from a range of perspectives: higher customer convenience, reduced design impact, lower heat island effects, and lower opportunity costs.

The details of parking requirements, including parking lot design standards, should be considered as part of future zoning and design guidelines for Washington Street.





Broaden the toolkit to incentivize historic preservation

Historic preservation in Newton has long been an important community goal and there are many tools in place to preserve important structures. There is a challenge though in preserving the structures that are underperforming economically relative to their land value. Some of the most challenging with respect to preservation are the one-story commercial properties built in the 1930s that are valuable for their narrow shopfront and detailed facades but are based on a simple box structure at the back. An added tool for keeping the portions of the property that have historic value, would be to establish a height/floor area bonus that would be granted on condition of maintaining the historically significant portions of the existing structure. This approach would give the Newton Historic Commission and the City Council an additional option when discussing preservation in the context of a special permit project. Such a bonus should be structured to allow the Historic Commission an opportunity to weigh in on what building-specific historic features need to be preserved in order to be granted the bonus.

The incentive of an added story should be tied to featuring the preserved historic portion of the building. In the precedent photo, the added story contrasts with and does not compete with the historic brick facade. In the sketch of a building with an added story on Washington Street, the pattern of narrow bays continues on the upper stories and the new portion of the building is set back to give the historic storefronts prominence.

Break down the scale of larger projects with new streets, paths, & open spaces

Washington Street today is an eclectic mix of architectural styles and building sizes and there is an interest in seeing that pattern continued in new construction. Writing zoning requirements that treat large projects as a series of contextually appropriate buildings rather than single large structures can reinforce the desired outcomes. In addition to requiring large new projects to be multiple varied buildings, the zoning for Washington Street can require that large projects include new streets and paths to create new smaller blocks and can require that new large projects include public open spaces, such as public courtyards.

Courtyards can be used as public space that is buffered from the noise and pollutants coming from the Mass Pike and offer more intimate settings for community gatherings.

Building Design Principles

Guiding Principles:

- Allow form to follow function
- Encourage traditional New England roof diversity
- Promote energy-efficient, human-scaled and durable construction

Like site planning, the decisions of individual architects can have an effect on the overall feel of Washington Street. The issues at hand have a lot less to do with architectural style (modern vs. traditional for example) and more to do with how a building addresses issues of scale. There are many building design elements that affect the perception of scale: the proportion of height to width along the street, the composition and arrangement of windows and doors, and even the size of the exterior materials (traditional brick or clapboards vs. large panels). As zoning and design guidelines are developed for Washington Street, the architectural principles below should be incorporated into those standards.

Allow form to follow function

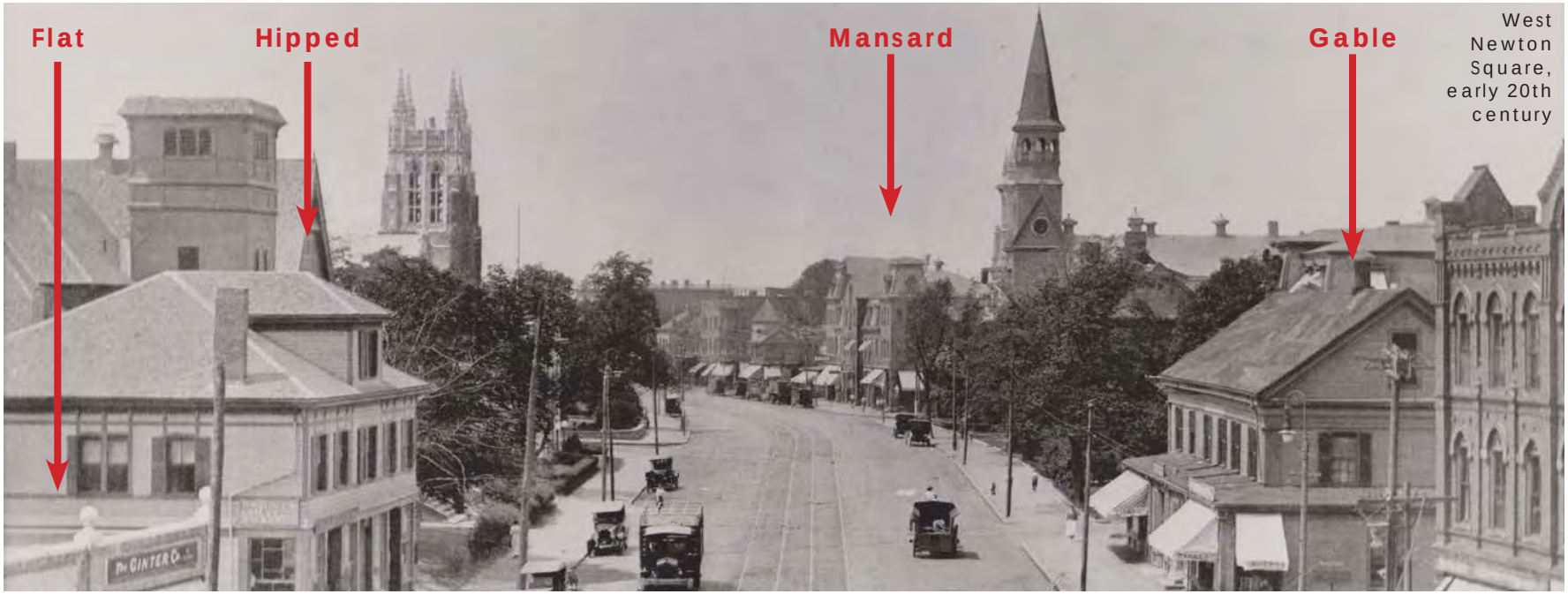
Washington Street is a mixed-use area, meaning that there will be properties that are primarily commercial and properties that are exclusively residential. Tailoring the building design regulations to the expected range of uses in the building is important to ensure that the rules work with today's building code requirements and desired uses.

For instance, a restaurant space requires a high ceiling height in order to accommodate the requisite hoods in the kitchen and air exchange system in the dining room. In order to accommodate restaurants in new construction, the zoning would need to allow sufficient ground floor height to meet those needs (estimated at 15 ft or more). Likewise, if Newton would like to see new buildings in the village centers have the flexibility to be used for either residential or office, the floor-to-floor height will need to be tall enough for all of the additional infrastructure that offices need between floors (additional wiring, air exchangers, etc.). Residential buildings are anticipated to need 9-12 ft floor-to-floor while offices are estimated to required 10-14 ft floor-to-floor.

These two buildings have the same functions: ground floor retail with upper story residential. Because of changes in construction techniques and building codes, the more modern building is necessarily taller than its historic counterpart.

Encourage traditional New England roof diversity

Washington Street has a wide range of roof types reflecting the variety of development periods and land uses in the area. The Seth Davis Tavern, one of the oldest buildings in West Newton Square has a gable roof as do many of the residential homes between the village centers. There are also a variety of hipped roofs and mansard roofs on the residential structures, including those that have been since converted into small offices. While most of the 20th century commercial buildings have flat roofs (often with parapets), there are two commercial buildings with pitched roofs - the office building at 246 Walnut Street has a gable roof and a turret at the corner, and the office building at 580 Washington Street has a post-modern split gable roof. Today's construction methodology, particularly for commercial buildings means that pitched roofs are rarely cost-effective. One way Newton could incentivize roof diversity is to allow the area under a roof to be habitable above and beyond the allowed number of stories. It is expected that most new buildings would still find the flat roof to be the more cost-effective choice, but this tradeoff could result in a few more interesting building shapes over time.



West Newton Square, early 20th century

Promote energy-efficient, human-scaled and durable construction

New construction or major renovation on Washington Street should be expected to last many decades of longer. Therefore, new construction and renovations should be of the highest quality possible, including energy and resource efficient, relating to human-scale, and durable. While the principles for high quality design and construction have been described elsewhere in this Vision, it is important to recognize that the City of Newton can play a role in promoting quality design and construction for projects of all sizes. One means of doing so is through advisory design review. Newton already has an Urban Design Commission that reviews projects and provides advice to applicants, city staff, and the City Council. That role could be expanded for a broader range of projects on Washington Street and could be supported with Washington Street specific design guidelines.

This sketch prepared by the Principle Group shows an idea for a new park and buildings surrounding it along Watertown St in West Newton. Concept plans for specific development projects should be considered by the City's design review bodies.

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III. IMPLEMENTING THE VISION FOR WASHINGTON STREET

How is the Comprehensive Plan and its amendments used?

Guiding Principles for Implementation

Early Actions

Guiding Principles for Implementation

Return to the Vision Statement

The Vision described by this plan is intentionaly broadly defined. The ideas presented in this document will likely need to be adjusted over time as implmentation proceeds, feasability is studied, and new ideas towards the same objectives are explored. Those priorities for vitality in the villages, safe streets, housing diversity, community gathering, and environmental protection should be integrated into the purpose statements of future activities coming out of this Vision Plan. For instance, the zoning for Washington Street could integrate the vision statement into an overall purpose statement for the new districts. This way the vision for Washington Street is always top of mind when projects are being implemented.

Engage the Community at Key Touchpoints

The development of this Vision Plan benefited immensely from the involvement of community members who live and work along Washington Street. The community conversations at the large meetings and in small group office-hours settings was an essential input in the process.

Many of the ideas described in this Vision will need substantially more discussion in the future and there is a role for the community to play in each of those major implementation projects. At key touchpoints, the community should be asked again to share their ideas and perspectives as the vision is implemented.

Establish Equity as an Essential Consideration

Maintaining Washington Street's diversity is an underlying objective throughout this Vision plan. Where opportunities arise in new private-development projects and in City investment projects, the equity impacts of decisions should always be considered.

Early Actions

The following are some early actions for the first 6-18 months after adopting this Vision as an amendment to the City's Comprehensive Plan, in order to make immediate progress toward the vision of lively villages, a safe street, diverse housing, places for community connections, and environmental protection.

Develop a Concept Design for Washington Street Enhancements

The City of Newton intends to develop a concept design for Washington Street and a long-term trial for a portion of the roadway. This concept plan, along with the finance strategy below, will give the City a clearer understanding of how to proceed with the street repair objectives outlined in the vision plan.

The West Newton Square & Walnut Street Enhancements projects will both move into construction in 2019-2020. Any future roadway or sidewalk work will be coordinated with these current investments.

Adopt Washington Street Zoning

The City Council will work toward the adoption of specific zoning changes to implement the ideas about building shape, size, and form and related performance standards for new construction.

Develop Parking Management Strategies for West Newton and Newtonville

Effective public parking management requires continuous action to ensure that parking policies conform to the city's transportation goals. Effective parking management is an essential first step towards understanding the parking demand characteritics of a place in order to consider planning for a possible new public garage as well as preparing to incorporate driverless vehicles and other new mobility services.

Prepare a Finance Strategy for Washington Street Infrastructure & Public Spaces

This strategic effort would explore the financing tools available to guide the City in budgeting for the proposed public investments in this vision, including the ideas for new public spaces, street improvements, and possible public parking garages.

Incorporate the Vision Plan into Ongoing Citywide Strategies

The City of Newton is currently developing an Arts and Culture Master Plan and working on implementing the Economic Development Strategy. Supporting artists and small businesses in Newtonville and West Newton are of vital importance to the community. The findings and ideas developed here will be integrated into these efforts along with other city initiatives like the City's street tree program.

Convene a Commuter Rail Conference

The City of Newton will work together with Newton's representative government leaders at the state and federal levels and the leadership of other municipalities on the Worcester line to convene a discussion on how to move the commuter rail vision forward to implementation.

Pilot Pop-Up Retail Pavilions

The City of Newton will create a process for testing pop-up retail pavilions along Washington Street.

Host a Design Imagination Day at Walker Park

Walker Park (located along the Mass Pike across from Walker St) could be an excellent neighborhood resource. In this early action time frame, the City of Newton will host an "Imagination Day," at Walker Park to bring local families and children into the idea development phase of the design.

IV. SUMMARY OF GUIDING PRINCIPLES FOR WASHINGTON STREET

Unique and Vital Village Centers

Safe Multimodal Transportation

Housing Diversity

Global Climate and Local Environment

Excellence in Placemaking and Design

A. Unique and Vital Village Centers

Strengthen the Village Business Climate

- Promote the village centers' competitive advantages
- Encourage clusters of office and lab activity in each village
- Explore incentives and investments in locally-oned businesses

Design for Engaging Walks

- Use buildings and trees to make a more comfortable environment
- Activate the Pike edge
- Promote narrow and transparent shopfronts
- Incorporate opportunities for outdoor dining
- Design streets and plazas as places to linger

Invest in Public Art & Programming

- Promote West Newton and Newtonville Artists
- Allow for arts production, presentation, and artist housing
- Design for music and community events in public spaces

B. Safe Multimodal Transportation

Prioritize People, Safety, and Comfort

- Reconfigure Washington Street as a boulevard
- Promote safe neighborhood streets
- Make room for people-powered transportation
- Design sidewalks for year-round comfort
- Test before the City invests

Create More Route Options

- Promote small blocks
- Connect Washington Street to the Charles River Greenway
- Consider building more bridges over the Pike
- Make way for crosswalks

Organize and Advocate for Better Transit

- Support new accessible stations
- Improve the bus experience
- Organize and advocate for early implementation of the Rail Vision

Actively Manage Driving and Parking

- Actively manage village parking
- Develop and implement a public parking garage strategy
- Shape where and how much parking is in private developments
- Require transportation demand management by developers
- Track and prepare for driverless technology

C. Housing Diversity

Attract All Ages, All People

- Ensure availability of accessible units
- Promote diverse buildings and unit sizes
- Allow communal living models

Seek Affordable Housing Opportunities

- Invest directly in affordable housing
- Leverage public land for affordable housing development

Link Housing and Transportation

- Focus housing where residents have transportation options
- Pair housing near transit with new commercial and retail space

D. Global Climate and Local Environment

Provide Options for Low-Carbon Living

- Allow for smaller unit residences
- Build in features to make low-carbon living easy
- Create incentives and mandates for an energy-efficient future

Improve Climate Resilience

- Improve Cheesecake Brook to reduce downstream flooding
- Reduce heat island effect through building and site design standards

Expand Access to Open Green Spaces and Recreation

- Facilitate the creation of a network of pocket parks, tot lots, and community plazas
- Activate existing and new public spaces
- Create tree canopy and add layers of vegetation

Mitigate the Mass Pike's Effects

- Install plants at the Pike edge to improve noise, air quality, and aesthetics
- Build sound barriers that have multiple positive outcomes
- Investigate opportunities for larger parks over sections of the Mass Pike

E. Excellence in Placemaking and Design

Area-wide Planning Principles

- Ensure Newtonville and West Newton remain distinct and vital
- Protect iconic buildings
- Require gentle transitions to adjacent neighborhoods
- Foster moments of arrival
- Develop standards and guidelines for human-scale design
- Encourage variety in building size and shape

Site Planning Principles

- Limit visible parking
- Broaden the toolkit to incentivize historic preservation
- Break down the scale of larger projects with new streets, paths, and open spaces

Building Design Principles

- Allow form to follow function
- Encourage traditional New England roof diversity
- Promote energy-efficient, human-scaled, and durable construction

Ruthanne Fuller
Mayor

City of Newton, Massachusetts
Department of Planning and Development
1000 Commonwealth Avenue Newton, Massachusetts 02459

Telephone
(617) 796-1120
Telefax
(617) 796-1142
TDD/TTY
(617) 796-1089
www.newtonma.gov

Barney S. Heath
Director

M E M O R A N D U M

DATE: September 27, 2019

TO: Councilor Susan Albright, Chair
Members of the Zoning and Planning Committee

FROM: Barney Heath, Director of Planning & Development
James Freas, Deputy Director of Planning & Development
Katy Hax Holmes, Chief, Preservation Planning

MEETING DATE: October 2, 2019

SUBJECT: **#204-19 Amendment to demo delay ordinance and landmark ordinance**

CC: Planning & Development Board
City Council

Staff will present a brief synopsis of the demo delay and landmarking ordinances and highlight possible areas of improvement.

Demolition Delay Ordinance (22-50)

The Demolition Delay ordinance was adopted in 1985, ten years after the creation of the Newton Historical Commission (NHC) under City Ordinance Chapter 22, Section 22-50. This ordinance was intended to create a waiting period to allow the identification and possible preservation of historically significant buildings and structures over 50 years old in Newton. The Newton Historical Commission administers both partial and full demolition applications. Staff, in partnership with the commission chair, is authorized to make the initial determination of historical significance.

Also, in 1985, the City of Newton became a Certified Local Government, one of the first in the state. This status is an acknowledgement by the state historic preservation office, in this case the Massachusetts Historical Commission, that Newton adopted a comprehensive historic preservation program which incorporated its goals into local planning initiatives. Newton signed a contract with the Massachusetts Historical Commission in July 1985 that affirmed this partnership, and more importantly identified funding sources available to the city for continued survey efforts. Newton is now one of 25 Certified Local Governments in the state and was

recently acknowledged by the MHC as continuing to have one of the state's most comprehensive historic preservation programs.

Since its adoption in 1985, the Demolition Delay ordinance has been administered by four preservation professionals who over time, with the help of this committee, tailored the ordinance to respond to local development trends. Changes to the ordinance and best-practices over time include lengthening the delay period for National Register-listed properties from one year to 18 months; instituting a minimum four-month period after a property is preferably preserved to allow all parties time to work toward preserving the property where possible; changing the trigger for NHC review of partial demolitions from 25% of an elevation to 50% or more; and restarting a demo delay if property ownership changed during the demo delay period.

The Newton Historical Commission takes a 'tiered' approach to preferably preserving historically significant buildings under this ordinance. If a building is uniquely and individually significant due to its architecture or historical association, at a minimum, then the Commission will preferably preserve the building for architectural integrity. If the building is also significant as part of a larger historic neighborhood of a similar period or style, the Commission will preferably preserve the building for architectural integrity and historic context. If a property is not significant individually but was built as part of an intact planned development, often constructed after WWII, the property may be preferably preserved for historic context only. It is this latter finding where a waiver to the demo delay is more likely, so long as the proposed replacement structure is designed in such a way as to mitigate the loss of the preferably preserved structure.

The staff presentation will depict Commission voting trends over time, as well as data showing the results of application activity after the ordinance was revised.

<u>Local Landmark Ordinance (22-60)</u>

Established in 1993 under City Ordinance Chapter 22, Sections 22-60 through 22-75, Newton's Local Landmark Ordinance was created to serve as a municipal tool to preserve the City's most historically significant buildings. The Landmarks Ordinance in the City of Newton provides the highest level of protection for properties determined to be the most architecturally or historically significant in the city. Under the Landmarks program, the Newton Historical Commission identifies buildings, structures, landscapes, and places that define the historic character of the city and have, over time, helped to establish a sense of place.

In addition to the Newton Historical Commission, the Mayor, members of the City Council, the Director of Planning and Development or the Commissioner of Inspectional Services may nominate properties as landmarks. Landmarks are designated at a public hearing of the Newton Historical Commission by a 3/4 vote of the Commission. In order of be eligible for Landmark status a property must be listed in or eligible for listing in the State or National Register of Historic Places.

Once a property becomes a local landmark, the Newton Historical Commission reviews proposed changes to landmarked properties as if they were included in a local historic district. This means that any alterations to the exterior of the structure, such as demolition, additions, renovations, deterioration by neglect, or new construction, must be reviewed and approved by the Newton Historical Commission. Designation of a local landmark means that the decision is filed with the Registry of Deeds.

In practice, the Local Landmarks ordinance has been invoked when the city's historically significant buildings become the subjects of applications for full demolition. Newton currently has 22 Local Landmarks. In 2005/2006, the city undertook a program to identify the city's most important historic buildings and approached individual property owners for their consent to landmark their own properties.

Attachments

Article III, **Historical Provisions**, from Section 22-38 to 22-76

(13) Strong's Pond..... 65.0

(14) Silver Lake..... 45.0

*[6] Includes all lands below the listed elevation in feet, City of Newton Base.
(Ord. No. S-83, 1-21-85; Ord. No. T-167, 8-12-91; Ord. No. V-289, 3-20-00; Ord. No. Z-66, 06-07-10)

In Zones A and AE, along watercourses that have not had a regulatory floodway designated, the best available federal, state, local or other floodway data shall be used to prohibit encroachments in floodways which would result in any increase in flood levels within the community during the occurrence of the base flood discharge.

In a riverine situation, the planning department shall notify the following of any alteration or relocation of a watercourse:

- Adjacent communities
- NFIP State Coordinator, MA Department of Couservation and Recreation, 251 Causeway Street, Suite 600-700
- NFIP Program Specialist, Federal Emergency Management Agency, Region I, 99 High Street, 6th Floor, Boston, MA 0210

Other Use Regulations

1) In Zones AE, along watercourses that have a regulatory floodway designated on the Middlesex County FIRMs, encroachments are prohibited in the regulatory floodway which would result in any increase in flood levels within the community during the occurrence of the base flood discharge.

2) All subdivision proposals must be designed to assure that:

   a) such proposals minimize flood damage;

   b) all public utilities and facilities are located and constructed to minimize or eliminate flood damage; and

   c) adequate drainage is provided to reduce exposure to flood hazards.

Secs. 22-23—22-37. Reserved.

ARTICLE III.
HISTORICAL PROVISIONS

DIVISION 1. COMMISSIONS AND DISTRICTS

Sec. 22-38. Historical commission—establishment, purpose, appointment, officers.

(a) There is hereby established under General Laws chapter 40, section 8D a Newton Historical Commission for the preservation, promotion and development of the historical or archeological assets of the city, to be governed by and operated in accordance with the provisions relative thereto of the General Laws or any special act or amendment thereto.

(b) Said commission shall consist of seven members, including one member from two nominees submitted by the Jackson Homestead Trustees; one member who is a registered architect from two nominees submitted by the Boston Society of Architects; one member from two nominees submitted by the Newton Board of Realtors; and four members who shall be appointed at large. If within thirty (30) days after submission of a written request for nominees to any of the organizations herein named no such nominations have been made, the mayor may proceed to appoint the commission without nomination by such organization. There also shall be appointed no more than seven alternate members, who shall be selected at large.

(c) The permanent members shall elect one member as chair and one member as secretary. In the event a member is absent or unable to act for any reason, the chair shall designate an alternate member to act.

(d) Members and alternate members of the historical commission shall by their appointment to the historical commission also be appointed as members and alternate members respectively of the historic district commission(s) established under section 22-40. (Ord. No. 102, 12-15-75; Ord. No.

X-17, 4-16-02)

Cross references—Division of city into zoning districts, §1-4; regulations governing appointment to and service on commissions and committees, §2-8

Sec. 22-39. Same—Powers and duties.

(a) The historical commission shall be possessed of powers and subject to duties in accordance with the provisions of the General Laws relative thereto, as they may be amended, to the extent of monies given, granted, contributed, bequeathed and appropriated.

(b) The historical commission shall have in addition to the powers and duties of an historical commission under the General Laws the following further powers and duties, subject to appropriation or other receipt of monies, and may, in exercise of any of its powers or duties accept and expend such monies and employ clerical and technical assistants and consultants:

(1) to cooperate with, consult, and serve as an advisory body on matters affecting the historical assets of the city to officers, departments, boards, commissions, committees and other agencies of the city, and to assure that the comprehensive plan embodies appropriate preservation of those assets;

(2) to conduct a survey of Newton buildings and sites for the purpose of determining those of historic significance architecturally or otherwise;

(3) to propose as it deems appropriate the establishment of additional historic districts and changes in existing historic districts;

(4) upon recommendation of the historic district commission(s) established under section 22-40, and in accordance with the Historic Districts Act, to act as the historic district study committee for the establishment of additional historic districts;

(5) to offer assistance to and advise owners and occupants of historic buildings and structures on problems of preservation;

(6) acquire in the name of the city by gift, purchase, grant, bequest, devise, lease or otherwise the fee or lesser interest in real or personal property of significant historical value and may manage the same; and may administer on behalf of the city any properties or easements, restrictions or other interests in real property which the city may have or may accept as gifts or otherwise and which the city may designate the commission as the administrator thereof. (Ord. No. 102, 12-15-75)

Sec. 22-40. Historic district; purpose, governance, appointments, officers.

(a) *Purpose.* The purpose of this section is to promote the preservation and protection of the distinctive characteristics of buildings and places significant in the history of the City of Newton, the maintenance and improvement of settings of such buildings and settings, and the encouragement of design compatible with the existing architecture.

(b) *Definitions.* As used in this section, the following terms shall be defined as set forth herein unless otherwise stated:

To alter, alteration: To rebuild, reconstruct, restore, remove, demolish or other similar activities, including a change in exterior color.

Building: A combination of materials forming a shelter for persons, animals or property.

Certificate of Appropriateness: The certificate issued by a commission if it determines that the construction or alteration for which an application for a certificate of appropriateness has been filed will be appropriate for or compatible with the preservation or protection of the district.

Certificate of Non-applicability: The certificate issued by a commission if it determines that the construction or alteration for which a certificate of appropriateness or a certificate of non-applicability has been filed does not involve any exterior architectural feature or involves an exterior architectural feature which is not subject to review by the commission.

Certificate of Hardship: The certificate issued by a commission if it determines that owing to conditions especially affecting the building or structure involved, but not affecting the historic district generally, failure to approve an application will involve a substantial hardship, financial or otherwise, to the applicant and such application may be approved without substantial detriment to the public welfare and without substantial derogation from the intent and purposes of this section. A certificate of hardship shall also be issued by the commission in the event that it failures to make a determination on an application within forty-five (45) days of filing.

Commission: An historic district commission as established hereunder.

To construct, construction: To build, erect, install, enlarge, move and other similar activities.

District: An historic district established pursuant to chapter 40C and these ordinances consisting of one or more district areas.

Exterior architectural features: Such portion of the exterior of a building or structure as is open to view from a public street, public way, public park or public body of water, including but not limited to the architectural style and general arrangement and setting thereof, the kind, color and texture of exterior building materials, the color of paint or other materials applied to exterior surfaces and the type and style of windows, doors, lights, signs and other appurtenant exterior fixtures.

Person aggrieved: The applicant, an owner of adjoining property, an owner of property within the same historic district as property within one hundred (100) feet of said property lines and any charitable corporation which has as one of its purposes the preservation of historic structures or districts.

Sign: Any symbol, design, or device used to identify or advertise any place of business, product, activity or person.

Structure: A combination of materials other than a building, including a sign, fence, wall, terrace, walk or driveway, and all supporting assemblies, supporting structures, equipment and facilities ancillary or accessory to antennae and wireless communication equipment as described in Sec. 30-18A of the Newton Revised Ordinances, entitled Wireless Communications Devices.

(c) *Districts.*

(1) A district shall consist of one or more district areas as delineated in the map or maps identified in subsection (c)(4) hereof.

(2) Prior to the establishment of additional districts, an investigation and report on the historical and architectural significance of the buildings, structures or sites to be included in the proposed district shall be made by the existing district commission(s) or by the historical commission acting as an historic district study commission pursuant to the provisions of G.L. C. 40C, sections 3 and 4, as set forth in subsections (c)(2) - (4) of this section. The buildings, structures or sites to be included in the proposed district may consist of one or more parcels or lots of land, or one or more buildings or structures on one or more parcels or lots of land. Copies of the report shall be transmitted to the planning board and to the Massachusetts Historical Commission for their respective consideration and recommendations. Not less than sixty (60) days after such transmittal, the study committee shall hold a public hearing on the report after due notice given at least fourteen days prior to the date thereof, which shall include a written notice mailed postage prepaid, to the owners as they appear on the most recent real estate tax list of the board of assessors of all properties to be included in such district or districts. The committee shall submit a final report with its recommendations, a map of the proposed district or districts and a draft of the proposed ordinance to the city council for its consideration. Adoption of such ordinance shall require a two-thirds (2/3) vote of the city council.

(3) In the case of the enlargement or reduction

of an existing district, the investigation, report and hearing shall be conducted by the historic district commission having jurisdiction over such district. In the case of a creation of an additional historic district, the investigation, report and hearing shall be conducted by the existing historic district commission or commissions acting jointly if there is more than one historic district commission, provided, however, that the existing historic district commission(s) may relinquish all power relative to the establishment of an additional district(s) as permitted by G.L. C. 40C, section 3, in which event the historical commission shall serve as an historic district study committee to perform all acts required of historic district commission(s) for the establishment of additional districts.

(4) A district created pursuant to this ordinance or any amendment to the boundaries of an existing district shall not become effective until a map or maps setting forth the boundaries of the new district, or the change in the boundaries of an existing district has been filed with the city clerk and recorded in the Middlesex South Registry of Deeds.

(d) *District Commissions.*

(1) Each district shall be administered by a commission consisting of seven (7) members, appointed by the mayor subject to confirmation by the city council. Initial terms shall be as follows: two (2) members shall be appointed for one (1) year; two (2) members shall be appointed for two (2) years and three (3) members shall be appointed for three (3) years. The mayor shall fill the vacancies in membership arising from expired terms by appointments for a term of three (3) years. Appointments to membership shall be so arranged that the term of at least one member will expire each year, and their successors shall be appointed in the same manner as the original appointment. Any vacancy in the membership of the commission shall be filled for the unexpired portion of any member's term by the mayor.

(2) A commission shall include one member from two nominees submitted by the local chapter of the American Institute of Architects; one attorney; one realtor from two nominated by the local Board of Realtors; one member or alternate member of the historical commission; one additional member or alternate member of the historical commission or one member nominated by the Newton Historical Society; and two residents or property owners from the district administered by the commission. If within thirty (30) days after submission of a written request for nominees to any of the organizations herein named no such nominations have been made, the mayor may proceed to appoint members without nomination by such organization.

(3) The mayor shall appoint at least two and no more than seven alternate members to each commission. Alternate members need not be from nominees of organizations entitled to nominate members. In the event that a permanent member is absent or unable to act for any reason, the chairman of the commission shall designate an alternate member to act in place of a permanent member. The initial appointments of alternate members shall be for terms of two or three years, with appointments thereafter being for three year terms.

(4) Each member and alternate member to a commission shall continue to serve in office after the expiration date of his or her term until a successor is duly appointed, except as provided in subsection (d)(5) hereof.

(5) The term of the historical commission member shall be coterminous with his or her membership on the historical commission. Any member of a commission appointed by virtue of his or her residence or ownership of property

within the district who removes his/her residence or property ownership from such district shall be considered to have resigned from his membership on such commission.

(6) A commission shall at the beginning of each fiscal year hold an organizational meeting and elect a chairman, a vice chairman, and secretary from among the permanent members, and file notice of such election with the city clerk.

(7) Meetings of a commission shall be held at the call of the chairman, at the request of two permanent members and in such other manner as a commission shall determine.

(8) Four (4) members of a commission shall constitute a quorum.

(e) *District Commission Powers and Duties.*

(1) A commission shall regulate the construction and/or alteration of any building(s) or structure(s) within the district over which it has jurisdiction in accordance with the provisions of G.L. c. 40C and the procedures and criteria established by this ordinance. Except as otherwise provided in subsection (h) hereof or in the ordinance provision establishing a specific district, no building or structure within a district shall be constructed or altered in any way that affects exterior architectural features unless the commission having jurisdiction over that district shall first have issued a certificate of appropriateness, a certificate of non-applicability or a certificate of hardship with respect to such construction or alteration.

(2) A commission may adopt and/or amend reasonable rules and regulations which are consistent with the provisions of this section and with G.L. c. 40C, and which set forth such procedures as it deems desirable and necessary for the regulation of and conduct of its business, including requirements for the contents and form of applications for certificates, fees, hearing procedures, and other matters. The commission shall file a copy of any such rules and regulations with the city clerk. All fees imposed by the commission shall be approved in advance by the city council.

(3) A commission shall keep a permanent record of its decisions, transactions, resolutions, and of the vote of each member participating therein.

(4) A commission shall cooperate with, consult and advise officers, departments, boards, commissions, committees and other agencies of the city on matters affecting the administration of the district under its jurisdiction.

(5) A commission shall offer assistance to and advise owners and occupants of historic buildings and structures within the district of its jurisdiction on problems of preservation.

(6) A commission may propose as it deems appropriate enlargements and reductions to the district under its jurisdiction; and in accordance with the provisions of this section and G.L. c. 40C, conduct investigations, prepare reports and conduct public hearings concerning enlargements or reductions to the district.

(7) A commission may act relative to the establishment of additional historic district(s) as permitted by G.L. c. 40C, or may relinquish all its powers relative to the establishment of additional historic districts and recommend that the historical commission act as an historic district study committee to perform all acts required of an historic district commission(s) for the establishment of additional historic districts.

(8) A commission may, subject to appropriation or receipt of other monies, employ clerical and technical assistants and consultants and incur other expenses appropriate to the carrying on of its work and may accept money gifts and expend the same for such

purposes.

(f) *Procedures for Review of Applications for Certificates of Appropriateness, Non-Applicability and Hardship.*

(1) Any person who desires to obtain a certificate from a commission shall file an application with a commission. The application shall be accompanied by such plans, elevations, specifications, photographs, and other information, including in the case of demolition or removal a statement of the proposed condition and appearance of the property thereafter, as may be reasonably deemed necessary by the commission to enable it to make a determination on the application. The date of the filing of an application shall be the date on which a copy of such application is received at the city's department of planning and development. A commission shall determine within fourteen (14) days after the filing of an application for a certificate whether the application involves any exterior architectural features which are subject to approval by the commission.

(2) If the application involves any features which are subject to approval, a commission shall hold a public hearing within twenty (20) days after the filing of a completed application for a certificate of appropriateness or a certificate of hardship unless additional time is agreed to by both the applicant and the commission or unless such hearing is dispensed with as provided in subsection (f)(3) hereof. Copies of the public notice of the time, place and purposes of the public hearing shall be mailed to the applicant, to the owners of all other adjoining property and to other property owners deemed by the commission to be materially affected thereby, to the planning and development board, to any person filing written request for notice of hearings and to such other persons as the commission shall deem entitled to notice.

(3) A public hearing on an application need not be held if such hearing is waived in writing by all persons entitled to notice thereof. In addition, a public hearing on an application may be waived by a commission if the commission determines that the exterior architectural feature involved or its category, as the case may be, is so insubstantial in its effect on the district that it may be reviewed by the commission without public hearing on the application, provided, however, that if the commission dispenses with a public hearing on an application, notice of the application shall be given to the owners of all adjoining property and other property deemed by the commission to be materially affected thereby as above provided and ten (10) days shall elapse after the mailing of such notice before the commission may act upon such application.

(4) A commission shall render a decision within forty-five (45) days after the filing of a completed application for a certificate of appropriateness unless further time for a decision is allowed, in writing, by the applicant. If the commission shall fail to make a determination within forty-five (45) days, the commission shall thereupon issue a certificate of hardship.

(5) In the case of a disapproval of an application for a certificate of appropriateness, a commission shall place upon its records the reasons for such determination and shall forthwith cause a notice of its determination, accompanied by a copy of the reasons therefore as set forth in the records of the commission, to be issued to the applicant, and the commission may make recommendations to the applicant with respect to appropriateness of design, arrangement, texture, materials, and similar features. Prior to the issuance of any disapproval, the commission may notify the applicant of its proposed action accompanied by recommendations of changes in the applicant's proposal which, if made, would make the application acceptable to the commission. If within

fourteen (14) days of the receipt of such notice the applicant files a written modification of his application in conformity with the recommended changes of the commission, the commission shall cause a certificate of appropriateness to be issued to the applicant.

(6) The concurring vote of a majority of the members, i.e. four members, of a commission shall be required to issue a certificate.

(7) In issuing certificates, a commission may, as it deems appropriate, impose certain conditions and limitations, and may require architectural or plan modifications consistent with the intent and purpose of this section.

(8) If a commission determines that the construction or alteration for which an application for a certificate of appropriateness has been filed will be appropriate for or compatible with the preservation or protection of the district, the commission shall issue a certificate of appropriateness.

(9) If a commission determines that an application for a certificate of appropriateness or for a certificate of non-applicability does not involve any exterior architectural feature, or involves an exterior architectural feature which is not subject to review by the commission, the commission shall cause a certificate of non-applicability to be issued to the applicant.

(10) If the construction or alteration for which an application for a certificate of appropriateness has been filed shall be determined to be inappropriate and therefore disapproved, or in the event of an application for a certificate of hardship, a commission shall determine whether, owing to conditions especially affecting the building or structure involved, but not affecting the district generally, failure to approve au application will involve a substantial hardship, financial or otherwise, to the applicant and whether such application may be approved without substantial detriment to public welfare and without substantial derogation from the intent and purposes of this section. If the commission determines that owing to such conditions failure to approve the application will involve substantial hardship to the applicant and approval thereof may be made without such substantial detriment or derogation, the commission shall issue a certificate of hardship.

(11) Each certificate issued by the commission shall be dated and signed by the chairman or such other person designated by the commission to sign such certificates on its behalf.

(12) The commission shall send a copy of certificates and disapprovals issued to the applicant and shall file a copy with the city clerk and the commissioner of inspectional services.

(13) Any person aggrieved by a determination of a commission, may, within twenty (20) days of the filing of the notice of such determination with the city clerk, file a written request with the commission for a review by a person or persons, not exceeding three, of competence and experience in such matters, designated by the Metropolitan Area Planning Council. The finding of the reviewers shall be filed with the City Clerk within forty-five (45) days after the request, and shall be binding on the applicant and the commission, uuless further appeal is sought in superior court as provided in G.L. c. 40C, section 12A. The filing of such further appeal shall occur within twenty (20) days after the finding of the reviewers has been filed with the city clerk.

(g) *Criteria for Determinations.*

(1) In deliberating on applications for certificates, a commission shall consider, among other things, the historic and

architectural valne and significance of the site, building or structure, the general design, arrangement, texture, material and color of the features involved, and the relation of such features to similar features of buildings and structures in the surrounding area.

(2) In the case of new construction or additions to existing buildings or structures, a commission shall consider the appropriateness of size and shape of the building or structure both in relation to the land area upon which the building or structure is situated and to buildings and structures in the vicinity, and a Commission may in appropriate cases impose dimensional and set-back requirements in addition to those required by applicable zoning ordinances.

(3) A commission shall not consider interior arrangements or architectural features not subject to public view.

(4) A commission shall not make any recommendation or requirement except for the purpose of preventing developments incongruous to the historic aspects or the architectural characteristics of the surroundings and of the district.

(5) Nothing in this section shall be construed to prevent the ordinary maintenance, repair or replacement of any exterior architectural feature within a district which does not involve a change in design, material or the outward appearance thereof, nor to prevent landscaping with plants, trees or shrubs, nor construed to prevent the meeting of requirements certified by a duly authorized public officer to be necessary for public safety because of an unsafe or dangerous condition, nor construed to prevent any construction or alteration under a permit duly issued prior to the effective date of any ordinance provision or amendment thereto listing a specified district.

(6) A commission shall not review and shall issue a certificate of non-applicability for the reconstruction, snbstantially similar in exterior design, of a bnilding, structure or exterior architectural feature damaged or destroyed by fire, storm or other disaster, provided such reconstruction is begun within one (1) year thereafter and carried forward with due diligence.

(7) With the exception of applications submitted pursuant to subsection (f), nothing in the design controls authorized by this section shall be construed as giving a commission the power to require restoration of any building or structure or portion of any building or structure to any particular historic appearance or style of said building or structure or said portion of building or structure had already been substantially removed or lost or changed prior to the adoption of the initial ordinance provision establishing historic commissions, to-wit, December 15, 1975.

(8) A commission is authorized to deny any application for a certificate of appropriateness, non-applicability or hardship for the proposed construction or alteration of any building or structure within the district over which it has jurisdiction upon a determination that there is an unremediated violation of this ordinance in existence at the subject building or structure, regardless of whether said violation is attributable to the present owner or a predecessor in title to the subject premises. Upon proper remediation of any such violation, as verified by said commission with the assistance of and review by the commissioner of inspectional services, or building official, if necessary, any such application shall proceed through the established procedure for commission review, subject to the established administrative criteria for determinations, as set out in subsections 22-40(f) and 22-40(g).

(h) *Exclusions.*

(1) A commission shall have no jurisdiction to

review the following categories of exterior architectural features, and shall issue a certificate of non-applicability for:

a) temporary structures and signs erected for a period of ninety (90) days or less;

b) residential identification signs which are not more than one foot square in area; provided that a second set of residential building numbers affixed or inscribed on buildings in order to comply with Section 26-7, Numbering of buildings, shall not be subject to review by nor shall they require a certificate of non-applicability from said commission; provided further that:

i) the sign consists of letters and/or street identification numbers painted or otherwise suitably inscribed on wood, brass or stone without a symbol or trademark; and

ii) if illuminated, such sign is illuminated only indirectly (indirectly meaning by a light source directed at the sign surface and not contained within the sign or its structure).

c) signs for professional or security purposes which are not more than one foot square in area; provided that:

i) only one sign is displayed for each building or structure;

ii) the sign consists of letters painted on wood or brass without a symbol or trademark;

iii) if illuminated, it is illuminated only indirectly.

d) terraces, walks, aud sidewalks so long as such structure is substantially at grade level;

e) storm doors, storm windows, screens, lightning protection, window boxes, window air conditioners and lighting fixtures, except for freestanding lighting fixtures;

f) paint colors;

g) colors of roof materials.

h) antennae designed to receive television broadcast signals; antennae designed to receive direct broadcast satellite services, including direct-to-home satellite services, but only if one meter or less in diameter; antennae designed to receive video programming services via multipoint distribution services, including multichannel multipoint distribution services, instructional television fixed services, and local multipoint distribution services, but only if one meter or less in diameter or diagonal measurement, as set out in Section 207 of the Federal Telecommunications Act of 1996 and rules and regulations promulgated thereunder, 47 C.F.R. Ch.1, Subpart S, §1.4000, and any successor laws, rules or regulations; satellite earth station antennae, as detailed in FCC rules and regulations, 47 C.F.R. 25.104 and any successor laws, rules and regulations; and any antennae in a non-residential building or structure which are not visible because they are concealed within the building, structure or its physical appurtenances, including, but not limited to a steeple, belfry, or the like. Supporting assemblies, supporting structures, equipment and facilities ancillary or accessory to such antennae as described in Sec. 30-18A of the Newton Revised Ordinances are not exempt nor excluded from historic district commission and historic commission jurisdiction and review pursuant to M.G.L. c. 40C and Sec. 22-40 through 22-44 of the Newton Revised Ordinances.

(i) *Enforcement.*

The commission, as defined herein, is authorized to institute any and all actions and proceedings, in law or in equity, in any court of competent jurisdiction, consistent with the provisions of G.L. c. 40C, s. 13, as amended, or its successor, as it deems necessary and appropriate to obtain compliance with the requirements of this ordinance and the determinations, rulings and regulations issued pursuant thereto. Whoever violates any of the provisions of this ordinance shall be punished by a fine not exceeding three hundred dollars ($300.00) for each offense. Each day any violation of this ordinance shall continue shall constitute a separate offense.

(j) *Building Permits.*

The commission shall notify the commissioner of inspectional services or building official in writing of any violation of the requirements of this ordinance or its determinations, rulings and regulations with regard to a specific building or structure, and shall instruct said commissioner or building official to make a permanent record of such violation in the corresponding property file maintained in the department of inspectional services as required by law. Prior to the issuance of any building permit for the construction, reconstruction, alteration, renovation, repair, removal, demolition, or change of use or occupancy of any building or structure, said commissioner or building official shall review the property file and ascertain whether a notice of unremediated violation of this ordinance is on record. To the extent allowed by law, including but not limited to the provisions of the state building code, 780 CMR 111.1 (6th ed.) or its successor, unless the commissioner or building official is satisfied there is no outstanding unremediated violation of this ordinance, he or she shall reject such application for a building permit for such building or structure in writing, stating the reasons therefor.

(k) *Severability.*

The provisions of this section shall be deemed to be severable. If any of its provisions shall be held to be invalid or unconstitutional by any court of competent jurisdiction the remaining provisions shall continue in full force and effect. (Ord. No. 102, 12-15-75; Ord. No. V-157, 12-15-97; Ord. No. V-214, 12-21-98; Ord. No. V-300, 5-15-00; Ord. No. X-197, 03-20-06; Ord. No. X-209, 05-01-06)

Sec. 22-41. Newton Upper Falls Historic District; established, boundaries.

There is hereby established an historic district to be known as the Newton Upper Falls Historic District, bounded and described as shown on the map entitled "Newton Upper Falls Historic District Expansion, July 11, 1985." (Ord. No. 102, 12-15-75; Ord. No. 274, 6-5-78; Ord. No. R-190, 11-16-81; Ord. No. S-133, 10-21-85; Ord. No.T-155, 6-17-91)

Editor's Note – The referenced map is on file in the office of the City Clerk. A copy of the map appears in the Appendix at the end of this chapter.

Sec. 22-42. Chestnut Hill Historic District; established, boundaries.

(a) There is hereby established an historic district to be known as the Chestnut Hill Historic District, bounded and described as shown on the map entitled, "Chestnut Hill Historic District, March 19, 1991."

(b) As authorized by the General Court in chapter 49 of the Acts of 1996, the following definition of "exterior architectural features" shall control in the Chestnut Hill Historic District only:

> *Exterior architectural features:* Such portion of the exterior of a building or structure as is open to view from a public street, public way, public park, public body of water or private way, including but not limited to the architectural style and general arrangement and setting thereof, the kind, color and texture of exterior building materials, the color of paint or other materials applied to exterior surfaces and the type and style of windows, doors, lights, signs and other appurtenant exterior fixtures.

(c) Notwithstanding the provisions of this section and section 22-40 in general and section 22-40(e)(i) in particular, the Chestnut Hill Historic

District Commission may make only non-binding recommendations regarding changes to the exterior architectural features open to view from a private way of properties located on Essex Road and from Nos. 147 through 256 Chestnut Hill Road, with the following exceptions where such decisions of the commission shall be fully binding in the ordinary course:

(1) demolition of a building or structure so long as such demolition occurs after such property ceases to be legally or beneficially owned by the owner of record as of the effective date of the 1996 amendment to Sec. 22-42;

(2) any lot created by subdivision of such properties where its required frontage lies on a way whose properties are not then subject to such limited commission review;

(3) any property where the legal or beneficial owner of record files with the city clerk a certificate indicating irrevocable consent on behalf of such owner and of successor owners to submit to the jurisdiction of the historic district commission and to be bound by its decisions, subject to any statutory rights of appeal;

(4) all of such properties on Essex Road or on the portion of Chestnut Hill Road identified above, if at any time not less than seventy-two and one-half percent of the total number of owner-occupied properties on the specific road under consideration have been made the subject of a filing described in subsection (c), at which time the limits on commission review established by the above provisions shall lapse and shall not be reestablished for such specific road. It shall also be sufficient for such lapse to occur if the owner-occupants of all but four of the owner-occupied properties on the specific road under consideration have made the filing described in subsection (c).

(d) No owner of any property claiming the benefit of this exemption shall have standing as an aggrieved person for the purpose of appealing any decision of the district commission concerning property other than his own, other than a decision relating to changes to architectural features visible from a public way.

(e) The limited commission review herein established shall not affect the district commission's authority to regulate exterior architectural features open to view from a public street, way, park or body of water, even if such features are located on property containing exterior architectural features subject to such limited review, nor shall it affect the commission's authority under sections 22-60 et seq., and 22-50 of the Newton Revised Ordinances relating to landmark preservation and the demolition of structures, respectively. (Ord. No. T-155, 6-17-91; Ord. No. V-100, 12-16-96)

Editor's Note – The referenced map is on file in the office of the City Clerk. A copy of the map appears in the Appendix at the end of this chapter.

Sec. 22-43. Newtonville Historic District; established, boundaries.

(a) There is hereby established an historic district to be known as the Newtonville Historic District, bounded and described as shown on the map entitled "Proposed Newtonville Local Historic District," prepared by Newton Geographic Information System (GIS), with a date of 12-Aug-2002. (Ord. No. X-29, 9-3-02)

Editor's Note – The referenced map is on file in the office of the City Clerk. A copy of the map appears in the Appendix at the end of this chapter.

Sec. 22-44. Auburndale Historic District; established, boundaries.

(a) There is hereby established an historic district to be known as the Auburndale Historic District, bounded and described as shown on the map entitled "Auburndale Proposed Local Historic District," prepared by Newton Geographic Information System (GIS), with a date of January 05, 2005. (Ord. No. X-135, 03-21-05)

Editor's Note – The referenced map is on file in the office of the City Clerk. A copy of the map appears in the Appendix at the end of this chapter.

Secs. Reserved 22-45—22-49. Reserved.

DIVISION 2. DEMOLITION DELAY

Sec. 22-50. Demolition of historically significant buildings or structures.

(a) *Intent and Purposes.* This section is adopted in furtherance of the policy set forth in the Newton Comprehensive Plan to assure the preservation and enhancement of the City of Newton's historical and cultural heritage by preserving, rehabilitating or restoring whenever possible, buildings or structures which have distinctive architectural features or historical associations that contribute to the historic fabric of the City.

(b) *Definitions.* For the purposes of this section, the following words and plurases have the following meanings:

Commission: The Newton Historical Commission, or if the regulated building or structure is in a local historic district established pursuant to G.L. c. 40C, the local historic district commission.

Commission staff: The person(s) regularly providing staff services for the commission whom the commission has designated commission staff for the purposes of this ordinance.

Commissioner: The commissioner of inspectional services.

Application: An application to the commissioner for a demolition permit as defined by this ordinance.

Demolition permit: Any permit issued by the commissioner which is required by the State Building Code and which authorizes the total or partial demolition of a building or structure (excluding interior demolition) regardless of whether such permit is called a demolition permit, alteration permit, building permit, etc.

Total demolition: The pulling down, razing or destruction of the entire portion of a building or structure which is above ground regardless of whether another building or structure is constructed within the original footprint of the destroyed building or structure.

Partial demolition: The pulling down, destruction or removal of a substantial portion of the exterior of a building or structure or the removal of architectural elements which define or contribute to the historic character of the structure.

(1) Items requiring review by the commission at a hearing. Partial demolition of any architecturally significant features which would alter the massing of the existing structure including, but not limited to the following items.

a) Additions or ells determined to be architecturally significant by commission or commission staff.

b) Roofs, including flat roofs, determined to be architecturally significant by commission or commission staff.

c) Porches determined to be architecturally significant by commission or commission staff, except open decks, staircases, and entryways, which are excluded from review.

d) Removal or envelopment by subsequent additions of 50% or more of any single exterior wall surface. Each wall is calculated by square footage individually.

e) Demolition of any architectural detail determined to be architecturally significant by commission or commission staff.

i) Brackets

ii) Crown molding

iii) Porch columns and railings

iv) Bay windows

v) Dormers

vi) Chimneys

(2) Items requiring review by the commission that may be reviewed and approved by commission staff without a hearing if plans indicate

a) Removal or alteration of the roof structure.

b) Repair or replacement of existing and original porches with similar materials to match existing.

c) Demolition or construction of additions or alterations not visible from a public way.

d) Removal or envelopment by subsequent additions of 50% to 100% of any single exterior wall surface. Each wall is calculated by square footage.

(3) *Items considered to be de minimis and requiring no commission or commission staff review:*

a) Open porches and entryways consisting of only a set of stairs, an entrance platform and a roof which are utilitarian in design or do not contribute to the architectural significance or character of the building.

b) Demolition or construction of new additions which remove, alter, or envelop 50% or less of a single exterior wall.

c) Removal or alteration of less than 50% of the roof structure

d) Normal maintenance of a building's exterior, including, but not limited to repair or replacement of roof surfaces, repair or replacement of gutters, and repair or replacement of existing doors and windows, including casings and frames, repair or replacement of existing exterior cladding (clapboards, shingles, masonry, etc.).

Historically significant building or structure: Any building or structure which is in whole or in part fifty or more years old and which

(1) is in any federal or state historic district, or if in any local historic district, is not open to view from a public street, public park or public body of water; or

(2) is listed on or is within an area listed on the National Register of Historic Places or eligible for such listing, or listed on or is within an area listed on the State Register of Historic Places, or eligible for such listing; or

(3) has been determined by the commission or its designee to be a historically significant building after a finding that it is:

a) importantly associated with one or more historic persons or events, or with the architectural, cultural, political, economic or social history of the City of Newton, the Commonwealth of Massachusetts or the United States of America: or

b) historically or architecturally important by reason of period, style, method of building construction or association with a particular architect or builder, either by itself or in the context of a group of buildings or structures; or

c) located within one hundred fifty (150) feet of the boundary line of any federal or local historic district and contextually similar to the buildings or structures located in the adjacent federal or local historic district.

Preferably preserved: An historically significant building or structure which the commission has determined should be preserved, rather than totally or partially demolished, in accordance with the standards set forth in subsection (c)(5) below.

(c) *Procedure.*

(1) No demolition permit for a building or structure which is in whole or in part fifty or more years old shall be issued by the commissioner except in conformity with the provisions of this section, as well as any other applicable law, statute, ordinance or regulation.

(2) If any applicant and the owner of the building or structure, if different from the applicant seeks to demolish, in whole or in part, a building or structure which is in whole or in part fifty or more years old, the owner of the building or structure shall file a demolition review application with the commission for a determination as to whether the building or structure is historically significant and shall provide the commission with the following information:

a) a site plan or a copy of that portion of the tax assessor's map which shows the building or structure to be demolished and the property on which it is located;
b) photographs of all existing façade elevations of the building or structure to be totally or partially demolished;

c) a description of the proposed plans for demolition and the reason(s) therefore.

(3) Within fifteen (15) days after the commission's receipt of a demolition review application, the commission shall make a determination as to whether the building is or is not historically significant and shall notify, in writing, the commissioner and the applicant of this determination. The commission may delegate the determination that a building or structure is historically significant to commission staff or to a designated commission member. In the event that the commission delegates the determination to the commission staff or to a designated commission member, the commission shall adopt criteria to be followed by the staff or the member in making this determination. A determination that a building or structure is or is not historically significant made by the commission staff or a designated commission member may be appealed to the full commission by filing a notice of appeal with the commission not later than fifteen (15) days after the written notice that the building or structure is or is not historically significant has been filed with the commissioner. Filing the appeal of the determination shall not stay the effect of such determination. Following a hearing before the commission, which may, but is not required to be conducted in conjunction with the hearing on whether the building or structure is preferably preserved, the commission shall affirm or reverse the determination and file notice of such determination with the commissioner. If the appeal of the determination is made independent of the preferably preserved hearing, the commission shall follow the same procedure for such hearing as that set forth in subsection (c)(5) below. If the commission fails to conduct a hearing on the appeal of said determination or fails to rule on the appeal within forty-five (45) days from the filing of the appeal, the determination that a building or structure is or is not historically significant shall remain unchanged, and the commissioner shall not issue a demolition permit until the procedural requirements of subsection (c)(5) below have been satisfied.

(4) No demolition permit shall be issued by the commissioner for a building or structure determined to be historically significant until the procedural requirements of subsection (c)(5) of this ordinance have been satisfied. The commissioner may grant the demolition permit if the commissioner:

a) does not receive written notice within forty-five (45) days after the commission's receipt of a demolition permit application that the building or structure is historically significant; or

b) receives written notice from the commission that the building either is not historically significant, or is historically significant, but clearly would not be deemed preferably preserved by the commission.

(5) When a building or structure is determined to be historically significant, the commission shall hold a public hearing to determine whether the building or structure, or the portion of the building or structure to be demolished, is preferably preserved. The applicant shall provide the commission with the following information for this determination:

a) in the case of partial demolition involving alteration(s) or addition(s) to a building or structure, (i) proposed plans and elevation drawings for the affected portion of the building or structure; and (ii) a plot plan of the property, if the same is required to obtain a permit under the State Building Code for the proposed alteration(s) or addition(s); and

b) if the site of the building or structure to be demolished is to be redeveloped, plans showing the use or development of the site after demolition together with a statement identifying all zoning variances and/or special permits which may be required in order to implement the proposed use or development.

The date the commission receives all the above information shall be stamped on the information received and shall be considered the submission date. Following public notice as set forth in subsection (c)(8) of this ordinance, the commission shall hold a public hearing within forty-five (45) days of the submission date to determine whether the building or structure should be preferably preserved, based on the criteria set forth in this paragraph. If the commission finds that the demolition proposed in the application would result in the demolition of a historically significant building or structure whose loss would be detrimental to the historical or architectural heritage or resources of the City of Newton, then the commission shall find that the building or structure should be preferably preserved.

(6) Upon a determination that the building or structure which is the subject of an application for a demolition permit is preferably preserved, the commission shall give written notice of the determination to the commissioner. A copy of the commission's determination shall also be sent to the applicant for the demolition permit and to the owner of the building or structure if different from the applicant.

a) For a building or structure listed in the National Register of Historic Places or determined eligible for listing in the National Register of Historic Places by the Massachusetts Historical Commission no demolition permit shall be issued for a total demolition or a partial demolition of a building or structure until eighteen (18) months after the date of such determination by the commission, unless the commission informs the commissioner prior to the expiration of such eighteen (18) month period that the commission is satisfied that the applicant for the demolition permit and the owner of the building or structure, if different from the applicant, has:

i) made a bona fide, reasonable and unsuccessful effort to locate a purchaser for the building or structure who is willing to preserve, rehabilitate or restore the building or structure; or,

ii) has agreed to accept a demolition permit on specified conditions approved by the commission.

iii) If the specified conditions involve approved plans and elevations, then no demolition permit shall be issued by the commissioner unless the applicant provides, as part of his application for a demolition permit, a complete set of plans and elevation drawings which have been signed and stamped by the commission or commission staff.

iv) The applicant shall have two (2) years from the date of the expiration of the eighteen (18) month period in which to apply for and obtain a demolition permit. No demolition permit shall be issued for such building or structure after the expiration of this two (2) year period, unless the procedural requirements of subsection (c)(5) hereof have been satisfied.

v) In order to encourage applications that preserve, restore, reuse, or rehabilitate historic buildings and structures, no application for a total demolition of a building or structure which has been unfavorably and finally acted upon by the commission shall be acted favorably upou within four months after the date of final unfavorable action unless the said commission finds

(a) by a vote of two-thirds (2/3) of those members present, substautial and material changes in said resubmitted application; or,

(b) by a majority vote of those members present, that the resubmitted application proposes to preserve the building or structure.

vi) Due notice shall be given to parties in interest of the time and place of the proceedings when the resubmitted application will be considered.

b) For all other buildings and structures not covered under section (6)a) above, no demolition permit shall be issued for a total demolition or a partial demolition of a building or structure found preferably preserved until one (1) year after the date of such determination by the commission, unless the commission informs the commissioner prior to the expiration of such one (1) year period that the commission is satisfied that the applicant for the demolition permit and the owner of the building or structure, if different from the applicant, has:

i) made a bona fide, reasonable and unsuccessful effort to locate a purchaser for the building or structure who is willing to preserve, rehabilitate or restore the building or structure; or,

ii) agreed to accept a demolition permit on specified conditious approved by the commission.

iii) If the specified conditions involve approved plans and elevations, then no demolition permit shall be issued by the commissioner unless the applicant provides, as part of his application for a demolition permit, a complete set of plans and elevation drawings which have beeu signed and stamped by the commission or commission staff.

iv) The applicant shall have two (2) years from the date of the expiration of the one (1) year period in which to apply for and obtain a demolition permit. No

demolition permit shall be issued for such building or structure after the expiration of this two (2) year period, unless the procedural requirements of subsection (c)(5) hereof have been satisfied.

v) In order to encourage applications that preserve, restore, reuse, or rehabilitate historic buildings and structures, no application for a total demolition of a building or structure which has been unfavorably and finally acted upon by the commission shall be acted favorably upon within four months after the date of final unfavorable action unless the said commission finds

(a) by a vote of two-thirds (2/3) of those members present, substantial and material changes in said resubmitted application; or,

(b) by a majority vote of those members present, that the resubmitted application proposes to preserve the building or structure.

vi) Due notice shall be given to parties in interest of the time and place of the proceedings when the resubmitted application will be considered.

(7) In the event a transfer of ownership of a preferably preserved property occurs during the applicable demolition delay period, the full applicable demolition delay period will restart from the date of the transfer of ownership.

(8) In the event a transfer of ownership of a preferably preserved property occurs after the applicable demolition delay period expires but prior to the issuance of a demolition permit, no demolition permit shall issue until the new owner complies with the procedures set forth in section 22-50 (c) (5).

9) Upon a determination by the commission that a building or structure is not preferably preserved or upon the commission's failure to make any determination within forty-five (45) days of the submission date, the commissioner may grant a demolition permit for the building or structure.

(10) Public notice of commission hearings shall provide the date, place and time of the hearing and the addresses of the properties to be considered at the hearing. Public notice shall include, at a minimum, posting with the city clerk and notification to the director of planning and development, to the applicant, to the owners of all abutting property and to other property owners deemed by the commission to be materially affected.

(11) If the applicant is someone other than the owner or his designated agent a demolition review application cannot be filed until the commission receives written authorization from the owner that the applicant may apply for changes to their property.

(d) *Emergency Demolition.* If a building or structure poses an immediate threat to public health or safety due to its deteriorated condition, the owner of such building or structure may request issuance of an emergency demolition permit from the commissioner. As soon as practicable after the receipt of such request, the commissioner shall arrange to have the property inspected by a board consisting of himself or his designee; the city engineer or his designee; the fire chief or his designee; the chairman of the commission or his designee; and one (1) disinterested person chosen by the commissioner. After inspection of the building or structure and consultation with the other members of the board, the commissioner shall determine whether the condition of the building or structure represents a serious and imminent threat to public health and safety and whether there is any reasonable alternative to the immediate demolition of the building or structure which would protect

public health and safety. If the commissioner finds that the condition of the building or structure poses a serious and imminent threat to public health and safety and that there is no reasonable alternative to the immediate demolition of the building or structure, then the commissioner may issue an emergency demolition permit to the owner of the building or structure. Whenever the commissioner issnes an emergency demolition permit under the provisions of this section of the ordinance, he shall prepare a written report describing the demolition of the building or structure and the basis of his decision to issue an emergency permit with the commission. Nothing in this section shall be inconsistent with the procedures for the demolition and/or securing of buildings and structures established by M.G.L. c. 143, sections 6-10.

In the event that a board of survey is convened under the provisions of M.G.L. c. 143, section 8 with regard to any historically significant building or structure, the commissioner shall request the chairman of the commission or his designee to accompany the board during its inspection. A copy of the written report prepared as a result of such inspection shall be filed with the commission.

(e) *Non-Compliance.* Anyone who demolishes a historically significant building or structure without first obtaining and complying fully with the provisions of a demolition permit issued in accordance with this section shall be subject to a fine of not more than three hundred dollars ($300.00) for each day of violation of this ordinance.

In addition, unless a demolition permit issued in accordance with this section was obtained and unless such permit was fully complied with, including full compliance with plans and elevation drawings signed and stamped by the commission, the commissioner may elect to (1) issue a stop work order halting all work on the building or structure until the commission notifies the commissioner in writing that the applicant has appeared before the commission to address such non compliance, and the commission has accepted the applicant's plans to remediate such noncompliance; (2) refuse to issue any certificates of occupancy, temporary or final, until any noncompliance has been remediated; and/or (3) refuse to issue a permit required by the State Building Code pertaining to any property on which an historically significant building or structure has been demolished for a period of two (2) years from the date of demolition, provided that this provision shall not prevent the commissioner from issuing any permit required to insure the safety of persons and property."

The commission may, upon application to and determination by the commission that reuse of the property in accordance with building plans prepared by the owner and submitted to the commission and all relevant agencies will substantially benefit the neighborhood and provide compensation for the loss of the historic elements of the property either through reconstruction of the lost historic elements or significant enhancement of the remaining historic elements of the site or the surrounding neighborhood, waive the fine, in whole or in part, and/or the ban on issuance of a building permit in order to allow the issuance of a building permit for construction or reconstruction of a building or structure approved by the commission. An owner receiving a waiver of the fine and/or ban on issuance of a building permit under this provision shall execute a binding agreement enforceable against all heirs, assigns and successors in interest with the commission to insure that any reuse of the site undertaken during the two-year ban shall be implemented in accordance with the plans, terms, and conditions approved by the commission. Any reuse of the site undertaken during the two-year ban which fails to comply with the terms of the commission's approval granted under this provision shall also permit reinstitution of the fine for non-compliance with this ordinance.

(f) *Securing Historically Significant Buildings and Structures.* If, following an application for a demolition permit, a building or structure has been determined to be historically significant, and the building or structure is subsequently destroyed by fire or other cause before any determination is made by the commission as to whether the building or structure is preferably preserved, a rebuttable presumption shall arise that the owner voluntarily demolished the building or structure without obtaining a demolition permit in accordance with the provisions of this ordinance. In such cases, the commissioner shall not issue any permit required

under the State Building Code pertaining to the property on which the historically significant building or structure was located (except as necessary to secure public safety or health) for a period of two (2) years from the date of destruction of the building or structure, unless the owner can provide evidence satisfactory to the commissioner that he took reasonable steps to secure the building or structure against fire or other loss or that the cause of the destruction was not otherwise due to the owner's negligence.

(g) *Securing Preferably Preserved Buildings and Structures.* If during the period of demolition delay for a building or structure determined to be preferably preserved, such building or structure is destroyed through fire or other cause, the commissioner shall not issue any permit required under the State Building Code pertaining to the property on which the preferably preserved building or structure was located (except as necessary to secure public safety or health) until the end of the period of demolition delay, unless the owner can provide evidence to the commission that he took reasonable steps to secure the building or structure against fire or other loss or that the cause of the destruction was not otherwise due to the owner's negligence.

(h) *Buildings and Structures located in Local Historic Districts.* The provisions of this ordinance shall not apply to any building or structure located in a local historic district established pursuant to M.G.L. c. 40C and subject to regulation by the local historic district commission under the provisions of Sec. 22-40 of the Revised Ordinances.

(i) *Severability.* In case any section, paragraph, or part of this section is declared invalid or unconstitutional by any court of competent jurisdiction, every other section, paragraph, or part of this ordinance shall continue in full force and effect.

(j) *Enforcement.* The commission is authorized to institute any and all actions and proceedings, in law or in equity, in any court of competent jurisdiction, as it deems necessary and appropriate to obtain compliance with the requirements of this section.

(k) Applicability.

(1) Notwithstanding the foregoing, this section shall not apply and a demolition permit shall be issued for the reconstruction substantially similar in exterior design of a building structure or exterior architectural feature damaged or destroyed by fire, storm, or other disaster, provided such reconstruction is begun within six (6) months thereafter and is carried forward with due diligence. This exception shall be limited to reconstruction of only that portion of the building or structure damaged by such catastrophic event.

(2) This subsection shall not apply to buildings or structures which have been designated as landmarks pursuant to Sec. 22-60 of the revised ordinances.

(Ord. No. S-230, 12-1-86; Ord. No. S-315, 6-20-88; Ord. No. T-252, 12-7-92; Ord. No. U-19, 6-20-94; Ord. No. V-98, 12-16-96; Ord. No. V-99, 12-16-96; Ord. No. X-205, 5-1-06; Ord. No. Z-22, 04-22-08; Ord. No. Z-76, 02-07-11; Ord. No. A-74, 04-04-16)

Sec. 22-51. Demolition by Neglect.

(a) Purpose and Intent

It is the intent of this section to preserve from deliberate or inadvertent neglect the exterior features of landmarked buildings and structures, or the interior portions thereof when such maintenance is necessary to prevent deterioration and decay of the exterior of the building or structure.

(b) Definition

"Demolition by neglect" shall mean neglect in maintaining, repairing, or securing a landmark that results in (i) loss of the character of a documented exterior architectural feature of the building or structure that contributes to its status as a landmark; (ii) deterioration of an exterior feature of the building or structure; or (iii) the loss of the structural integrity of the building or structure.

(c) Owner's Obligations

The owner of a landmark shall preserve such landmark against decay and deterioration through prompt correction of any of the following defects:

(1) Deteriorated or inadequate foundation, defective or deteriorated flooring or floor supports, deteriorated walls or other vertical structural supports;

(2) Structural components of ceilings, roofs, floors, ceiling, roof and floor supports or other horizontal structural components which sag, split or buckle due to defective material or deterioration;

(3) Deteriorated or ineffective waterproofing or weatherproofing of exterior walls, roofs, foundations, or floors, including broken or missing windows or doors, siding, trim, shingles or cladding, or windows left open when weather conditions do not warrant it;

(4) Defective or insufficient weather protection for exterior wall covering, including lack of paint or weathering due to lack of paint or other protective covering;

(5) Any fault or defect in the building which renders it structurally unsafe, whether interior or exterior;

(6) Deterioration of exterior chimney or chimney support system;

(7) Deterioration of external plaster, stucco, masonry or mortar;

(8) Deterioration of rainwater drainage systems whether interior or exterior;

(9) Deterioration of any documented exterior architectural feature which in the judgment of the commission produces a detrimental effect upon the character of the building;

(10) Failure to adequately heat the premises to avoid freezing of heating and/or plumbing fixtures, or failure to properly drain heating and/or plumbing systems before the advent of freezing temperatures;

(11) Failure to adhere to any preservation plan or guideline regarding maintenance provided by the commission pursuant to section 22-64(a); or

(12) Deterioration of any other elements which, if not adequately maintained, would eventually cause the building or structure to crack, bulge, buckle, sag, rot, crumble or collapse, in whole or in part.

(d) Any owner who fails to maintain such building or structure in compliance with this section shall be subject to the remedial procedures of subsection (e)(1) as well as the penalties under section 22-71.

(e) (1) Upon receipt of a complaint that an historic landmark is threatened by demolition by neglect, or on the commission's own initiative, the commission shall request the commissioner of inspectional services or his designee to inspect such landmark. If the commissioner of inspectional services concludes that the landmark is threatened by demolition by neglect, he shall make a written report of his findings to the commission.

(2) Upon the receipt of such written finding of the commissioner of inspectional services, the commission shall hold a public hearing after giving such notice as provided under section 22-63(d). If the Commission finds that the landmark is threatened by demolition by neglect, and the owner has not requested and received a hardship exemption under section (f) herein, the Commission may vote to:

a) require the owner to repair all conditions contributing to demolition by neglect by a date certain;

b) secure the building or structure against further deterioration or other loss;

c) provide the owner with a preservation plan and maintenance guidelines as authorized under Sec. 22-64, and require the owner to undertake such plan according to a timeline set by the commission;

d) assess penalties as set forth in section 22-71; and

e) seek such injunctive relief as it deems necessary and appropriate to preserve such landmark in cases where there is imminent danger of the loss of a landmark.

These remedies shall be cumulative and not exclusive.

(3) For purposes of this ordinance, if a landmark threatened by demolition by neglect is located within a local historic district, then reference to "commission" hereunder shall refer to the local historic district commission of the local historic district in which such landmark is located.

(f) Building Permits

The commission shall notify the commissioner of inspectional services or building official in writing of any landmark found to be threatened by demolition by neglect, and shall instruct said commissioner or building official to make a permanent record of such determination in the corresponding property file maintained in the department of inspectional services as required by law. Prior to the issuance of any building permit for the construction, reconstruction, alteration, renovation, repair, removal, demolition, or change of use or occupancy of any landmark, said commissioner or building official shall review the property file and ascertain whether a notice of unremediated violation of this ordinance is on record. To the extent allowed by law, including but not limited to the provisions of the state building code, 780 CMR 111.1 (6th ed.) or its successor, unless the commissioner or building official is satisfied there is no outstanding unremediated violation of this ordinance, he or she shall reject such application for a building permit for such landmark in writing, stating the reasons therefor; provided, however, that he or she shall not reject such application if the work intended to be performed is required by the commission to remediate such violation.

(g) Exemptions

(1) The owner may request exemption from this ordinance if the owner can prove to the commission that maintenance of the landmark will cause substantial hardship according to the standards set forth in Section 22-40(f)(10); provided, however, that the owner's self-created hardship shall not qualify as a basis for a hardship exemption.

(2) In situations where, in the commission's view, it is impracticable to immediately repair an architectural feature, or prohibitively expensive to replace it, then the owner shall remove and store such architectural feature safely, until such time as it becomes financially possible to recreate the feature from the original pieces. The owner shall make temporary repairs in its place to protect the structure and/or provide for the safe use of the landmarked premises. (Ord. No. X-179, 12-19-2006)

Secs. 22-52—22-59. Reserved.

DIVISION 3. LANDMARKS

Sec. 22-60. Landmark Preservation—enactment and purpose.

This division is enacted pursuant to the authority derived from section 6 of the Home Rule Amendment to the Constitution of the Commonwealth of Massachusetts, and Charter of the City of Newton.

The purpose of this enactment is to promote the educational, cultural, economic and general welfare of the public through the preservation and protection of the distinctive architecture and other characteristics of buildings, structures, landscapes, and places significant in the history and prehistory

of the Commonwealth of Massachusetts and the City of Newton and through the maintenance and improvement of settings for such buildings, structures, landscapes, and places and through the encouragement of compatible development and the discouragement of destruction of or damage to such resources. (Ord. T-288, 9-9-93)

Sec. 22-61. Definitions.

For purposes of this section, the following words shall be defined as follows:

Altered: changed in exterior color, otherwise changed, rebuilt, reconstructed, restored, removed, or remodeled.

Building: a combination of materials forming a shelter for persons, animals, or property.

Commission: the Newton Historical Commission or particular Historic District Commission acting under the provisions hereof.

Constructed: built, erected, installed, enlarged, or moved.

Demolished: destroyed or altered in such a substantial manner as to constitute destruction.

Exterior architectural feature: such portion of the exterior of a building or structure as is open to view from a public or private street, way, park, or body of water which is identified for preservation by its designation by the commission as a landmark, including but not limited to the architectural style and general arrangement and setting thereof, the kind, color, and texture of exterior building materials, the color of paint or other materials applied to exterior surfaces and the type and style of windows, doors, lights, signs, and other appurtenant exterior fixtures.

Historic district: any area containing distinctive buildings, structures, landscapes, and places as established in accordance with G.L. c. 40, s. 8D and chapter 22 of the Revised Ordinances.

Landmark: any building, structure, landscape or place which has been designated for preservation for reasons of its historic significance.

Landscape: a streetscape or an arrangement of land for human use and enjoyment, including placement of structures, vehicular and pedestrian ways and plantings.

Person aggrieved: the applicant, an owner of adjoining property, an owner of property within the same historic district or of property within one hundred feet of the property lines of the property subject to the application, and any charitable corporation having as one of its purposes the preservation of historic buildings or places.

Structure: a combination of materials other than a building, including, but not limited to, a bridge, tower or other engineering work, sign, fence, wall, terrace, walk or driveway. (Ord. No. T-288, 9-9-93)

Sec. 22-62. Eligibility for designation.

All buildings, structures, landscapes and places currently listed on the National Register of Historic Places as individnal sites or otherwise listed as eligible for said National Register as individnal sites shall be eligible for landmark designation and preservation. No additional investigation and report on the historical and architectural significance of the buildings, structures, landscapes or places to be designated as a landmark shall be required for such sites.

Buildings, structures, landscapes, and places listed on the National Register of Historic Places as part of an historic district, but not individnally, or which are eligible for said National Register as part of an historic district, but not individually, may be eligible for landmark designation and preservation if the commission determines that snch building, structure, landscape or place is a contributing element of such National Register historic district and possesses one or more of the National Register criteria. The commission may reject the nomination of any such building, structure, landscape or place if it determines that such property lacks sufficient historical or architectural significance for landmark designation. Buildings which are eligible for the National Register either individually or as part of a district may be nominated for landmark designation if they possess historic characteristics

sufficient to qualify for listing on the National Register as certified by the Massachusetts Historic Commission.

Any land which, as of August 9, 1993, is contained in the same lot upon which a building or structure eligible for landmark designation is located regardless of whether such lot is later divided, subdivided or redrawn, or any land which, as of August 9, 1993, is contained in an adjoining or surrounding lot(s) held in common ownership or control or used in connection with the lot upon which the building or structure eligible for landmark designation is located, shall be subject to inclusion in the landmark designation as a Newton Landmark Preservation Site, where the preservation and maintenance of such land is necessarily and reasonably related to the stated legislative goal of landmark preservation. Any such designation of land shall include a statement of the reason(s) for the inclusion of the land in the landmark designation pursuant to the legislative standards established herein.

Should any owner, subsequent owner, lessee, heir or assign seek to place a new building or structure on a lot which has been included in a designation as a landmark, the design, size, shape and location of said new building or structure shall be subject to the full review authority of the commission as set out in sections 22-65 and 22-66 as a condition to any building permit to insure that such new building or structure is not detrimental to the landmark status of any pre-existing building or structure, and does not undermine the purpose and intent of this division of the preservation of any building, structure, landscape or place of historic significance. (Ord. No. T-288, 9-9-93; Ord. No. U-25, 9-7-94; Ord. No. X-159, 07-11-05: Ord. No. X-240, 11-6-06)

Sec. 22-63. Designation.

(a) Members of the city council, the mayor, the director of planning and development or the commissioner of inspectional services may, in addition to the commission, nominate properties for designation by the commission as Newton Landmark Preservation Sites, through a written nomination to the commission. The commission shall notify the owner of the property upon receipt of the written nomination.

(b) The commission by three-quarters (3/4) vote may, after public hearing, designate as a landmark any property within the city being or containing a structure or landscape which it determines to be either (1) importantly associated with one or more historic persons or events, or with the broad architectural, aesthetic, cultural, political, economic, or social history of the city or the commonwealth or (2) historically or architecturally significant (in terms of period, style, method of construction, or association with a famous architect or builder) either by itself or in the context of a group of structures and may order amendments to any designation of landmark theretofore made. Designation of a landmark or ameudment or rescission of previous designation shall include a statement of the reasons for such designation pursuant to the legislative standards established herein.

(c) The commission shall consider the following conditions:

(1) that the location and setting is compatible with future preservation and use;

(2) that the distinguishing characteristics of significance are for the most part original and intact or capable of restoration;

(3) that the existing or proposed use is compatible with the preservation and maintenance of the site.

(d) The commission shall hold a public hearing prior to any designation of landmarks. The commission shall give not less than fourteen days notice of such public hearing by publication in a newspaper of general circulation in Newton and by mailing notice thereof to the owner of the proposed landmark and to every property owner abutting the proposed landmark (each such owner to be determined from the then current records of the assessing department), and to the mayor, the planning board, and the city clerk.

Prior to the public hearing, the commission shall transmit copies of the agenda to the planning board for its consideration and recommendation.

(e) The Newton Landmark Preservation Sites shall be recorded as follows:

(1) The office of the city clerk shall record with the Middlesex County recorder the legal description of all buildings, lands, sites or areas designated as Newton Landmark Preservation Sites by the board, and shall send a copy to the commissioner of inspectional services. In addition, the same may be made available to the public in form and fashion as the commission or board deems appropriate.

(2) Newton Landmark Preservation records.

a) The commission shall keep current and public a list of all properties designated as Newton Landmark Preservation Sites, or included in the State or National Register of Historic Places and make the same available to the public in form and fashion as the commission or city council deems appropriate.

b) The commission will provide the commissioner of inspectional services and the director of planning and development with current lists and maps showing Newton Landmark Preservation Sites and Districts for their use in referring applications to the commission. (Ord. No. T-288, 9-9-93; Ord. No. X-228, 9-18-06).

Sec. 22-64. Additional powers and duties of the commission.

The commission shall have the following powers and duties in addition to those otherwise specified herein:

(a) The commission shall have the authority to provide general preservation plans and guidelines to owners of Newton Landmark Preservation Sites regarding maintenance, restoration, and rehabilitation.

(b) The commission shall have the authority to promote public recognition and appreciation for Newton Landmark Preservation Sites. It shall periodically publish a register of designated and potential Newton Landmark Preservation Sites, along with guidelines and preservation programs available at that time.

(c) The commission shall have the authority to initiate solicitation of gifts and contributions to be made to the city to support the activities and purposes of the commission. The commission shall assist the city staff in the preparation of applications for grant funds made by the city to outside funding sources for the purpose of city landmark preservation. (Ord. No. T-288, 9-9-93)

Sec. 22-65. Review authority.

(a) Except as this division may otherwise provide, unless the commission shall first have issued a certificate of appropriateness, a certificate of non-applicability, or a certificate of hardship, no building, structure, exterior architectural feature or landscape of a landmark shall be altered or demolished nor any building or demolition permit issued therefor by the city or any department thereof.

(b) Any person who desires to obtain a certificate from the commission shall file with the commission an application for a certificate of appropriateness, a certificate of non-applicability, or a certificate of hardship, as the case may be, in such form as the commission may reasonably determine, together with such plans, elevations, specifications, materials, or other information the commission deems necessary to enable it to make a determination on the application. When such an application involves the proposed alteration to or demolition of a Newton Landmark Preservation Site that is located within a local Historic District, the commission shall have the option of delegating its review authority to the local Historic District Commission which has the review authority over that local historic district.

(c) The commission shall issue a certificate of appropriateness to the applicant:

(1) if the commission determines that the construction, alteration or demolition for which an application of appropriateness has

been filed will be appropriate for or compatible with the preservation or protection of the landmark, or

(2) if prior to the issuance of any disapproval, the commission, as it may, notifies the applicant of the commission's proposed action and includes, as it may, recommendations for changes in the applicant's proposal, which may include recommendations as to appropriateness of design, arrangement, texture, material and similar features, that, if made, would make the application acceptable to the commission and within fourteen days of the receipt of such notice, the applicant files a written modification of his application in conformity with the recommended changes of the commission.

(d) The commission shall issue a certificate of non-applicability to the applicant if the commission determines that an application for a certificate of appropriateness or for a certificate of non-applicability:

(1) does not involve any exterior architectural feature or landscape of a landmark, or (2) involves an exterior architectural feature or landscape of a landmark that is not then subject to review by the commission in accordance with the provisions hereof.

(e) If a certificate of hardship has been applied for, or if the commission determines that the construction or alteration for which a certificate of appropriateness has been applied for is inappropriate, the commission shall issue a certificate of hardship to the applicant if the commission determines that:

(1) owing to conditions especially affecting the building, structure, landscape, or place involved, but not affecting the landmark's general historic qualities, failure to approve an application will involve a substantial hardship, financial or otherwise, to the applicant;

(2) such application may be approved without substantial derogation from the intent and purpose of this ordinance; and

(3) the application may be approved without substantial detriment to the public welfare.

(f) The commission shall issue a certificate of appropriateness to the applicant if the commission fails to make a determination on an application within the time specified in paragraph three of section 22-67. (Ord. No. T-288, 9-9-93; Ord. No. X-240, 11-6-06)

Sec. 22-66. Factors to be considered by the commission.

In passing upon matters before it, the commission shall consider, among other things:

(a) *In general*:

(1) the historical and architectural value, and significance of the building, structure, landscape, or place;

(2) the general design, arrangement, texture, material, and color of the features involved; and

(3) the relation of such features to similar features of buildings and structures in the surrounding area.

(b) *In the case of new construction or additions to existing buildings or structures:* the appropriateness of the size, shape, and location of the building or structure, both in relation to the land area upon which the building or structure is situated and to buildings and structures in the vicinity.

(c) *In the case of demolition or removal:*

(1) whether the demolition or removal of a building or structure of such architectural or historic significance would impair the public interest and the general welfare of the people of the city, town, or state;

(2) whether the demolition or removal of the building or structure would undermine the purpose and intent of this division and the objectives of local preservation plans;

(3) whether the bnilding or structure has so deteriorated that preservation or restoration is not structurally or economically feasible, provided that the owner's self-created hardship or failure to maintain the property in good repair shall not qualify as a basis for the issuance of a certificate of hardship.

The commission shall not make any recommendations or requirements except for the purpose of preventing developments incongruous to the historical or architectural characteristics of a building, structure, landscape or site, or their surroundings.

The commission may impose dimensional and set-back requirements in addition to those required by the applicable ordinance or by-law. (Ord. No. T-288, 9-9-93)

Sec. 22-67. Determination.

The commission shall determine promptly, and in all events within forty-five (45) days after the filing of an application for a certificate of appropriateness, a certificate of non-applicability or a certificate of hardship, as the case may be, whether the application involves any exterior architectural features, or landscapes that are subject to approval by the commission. If the commission determines that such application involves any such features or landscapes, the commission shall hold a public hearing on such application, unless such hearing is dispensed with as hereinafter provided in paragraph four of this section.

The commission shall fix a reasonable time for the hearing on any application and shall give public notice of the time, place, and purposes thereof at least fourteen days before said hearing in such manner as it may determine, and shall give notice by mailing, postage prepaid, a copy of said notice to: (a) the applicant, (b) the owners of all adjoining property and other property deemed by the commission to be materially affected thereby as they appear on the most recent real estate tax list of the board of assessors; (c) the planning board; (d) any person filing a written request for notice of hearings, such request to be renewed yearly in December, and (e) such other persons as the commission shall deem entitled to notice.

As soon as convenient after such public hearing but in any event within sixty days after the filing of the application, or within such further time as the applicant may allow in writing, the commission shall make a determination on the application. If the commission fails to make a determination within such period of time, the commission shall thereupon issue a certificate of appropriateness.

A public hearing on an application need not be held if such a hearing is waived in writing by all persons entitled to notice thereof. In addition, a public hearing on an application may be waived by the commission if the commission determines that the exterior architectural feature, landscape or archeological feature of the landmark is so insubstantial in its effect on the landmark that it may be reviewed by the commission without a public hearing on the application, provided, however, that if the commission dispenses with a public hearing on an application, notice of the application shall be given to the owners of all adjoining property and other property deemed by the commission to be materially affected thereby as above provided, and ten days shall elapse after the mailing of such notice before the commission may act upon such application.

A certificate of appropriateness, a certificate of non-applicability or a certificate of hardship shall be issued upon majority vote of the members of the commission, except in the case of inaction by the commission within the time specified in this section, in which case a certificate of appropriateness shall be automatically issued.

Each certificate of appropriateness, non-applicability or hardship issued by the commission shall be dated and signed by its chairman, vice chairman, secretary, or such other person designated by the commission to sign such certificates on its behalf.

The commission shall file with the city clerk, and with any department of the city having authority to issue building or demolition permits, a copy of notice of all certificates and determinations of disapproval issued by the commission. (Ord. No. T-288, 9-9-93)

Sec. 22-68. Ordinary maintenance.

Nothing in this division shall be construed to prevent: (a) the ordinary maintenance or repair of any building, structure or landscape; (b) the ordinary maintenance, repair or replacement of any exterior architectural feature of a landmark that, with respect to either (a) or (b), does not involve a change in design or material, or the appearance thereof; if such features have been included in the findings of the Landmark Commission at the time of designation; (c) landscaping with plants, trees or shrubs, provided that such landscaping does not affect any significant landscape feature; (d) meeting of requirements certified by a duly authorized public officer to be necessary for public safety because of an unsafe or dangerous condition; (e) any construction or alteration under a permit duly issued prior to the effective date of the landmark ordinances, except as provided herein. (Ord. No. T-288, 9-9-93)

Sec. 22-69. Administrative review.

There shall be a review procedure whereby any person aggrieved by a determination of the commission may, within twenty days after the filing of the notice of such determination with the city clerk, file a written request with the commission for a review by a person or persons of competence and experience in such matters, designated by the Metropolitan Area Planning Council (MAPC).

The finding of the person or persons making such review shall be filed with the city clerk within forty-five days after the request, and shall be binding on the applicant and the commission, unless a further appeal is sought in the superior court as provided herein. (Ord. No. T-288, 9-9-93)

Sec. 22-70. Judicial review.

Any person aggrieved by a determination of the commission, or by the finding of a person or persons making an administrative review as provided herein, may, within twenty days after the filing of the notice of the aforesaid determination or finding with the city clerk, appeal to the superior court sitting in equity for Middlesex County. The court shall hear all pertinent evidence and shall uphold the determination of the commission if the court finds the decision of the commission to be supported by substantial evidence and within the authority of the commission, or may remand the case for further action by the commission, or make such other decree as justice and equity may require. The burden of proof shall be on the aggrieved person. The remedy provided by this section shall be exclusive, but the parties shall have all other rights of appeal and exception as in other equity cases. Costs shall not be allowed against the party appealing such determination of the commission unless it shall appear to the court that the appellant acted in bad faith or with malice in making the appeal to the court. (Ord. No. T-288, 9-9-93)

Sec. 22-71. Enforcement.

Middlesex Superior Court sitting in equity shall have jurisdiction to enforce the provisions of this division and any regulations enacted hereunder and the determinations, rulings, and regulations issued pursuant thereto and may, upon the petition of the mayor or of the city council or of the commission, restrain by injunction violations thereof; and, without limitation, such court may order the removal of any building, structure, or exterior architectural feature constructed in violation thereof, or the substantial restoration of any building, structure, exterior architectural feature or landscape of a landmark altered or demolished in violation thereof, and may issue such other orders for relief as may be equitable.

Whoever violates any of the provisions of this division shall be punished by a fine of three hundred dollars ($300.00). Each day during any portion of which a violation continues to exist shall constitute a separate offense. (Ord. No. T-288, 9-9-93)

Sec. 22-72. Advisory review.

The review process set out in section 22-65 shall be advisory only for properties containing from one through four family dwellings which continue to be owned and occupied by the legal owner-occupants of record as of August 9, 1993, unless full review as set out in section 22-65 is voluntarily agreed to by said owner-occupants. Such advisory review shall cease, and the commission shall have authority to

impose the full review set out in section 22-65 when and if such occupancy ceases or when legal or equitable ownership is transferred, whether by sale, an agreement to sell, or a transfer in trust, but excluding the grant of a mortgage. (Ord. No. T-288, 9-9-93; Ord. No. U-1, 2-7-94)

Sec. 22-73. Severability.

The provisions of this division shall be severable. If any of its provisions shall be held to be invalid or unconstitutional by any court of competent jurisdiction, the remaining provisions shall continue in full force and effect. (Ord. No. T-288, 9-9-93; Ord. No. T-288, 8-9-93)

Secs. 22-74—22-75. Reserved.

DIVISION 4. CITY-OWNED BUILDINGS

Sec. 22-76. Preservation of city-owned properties subject to funding under the Community Preservation Act.

(a) Purpose and Intent:

The purpose of this section is to encourage (1) the preservation and protection of city-owned buildings, structures and properties (2) the maintenance and improvement of landscapes, grounds and settings of such buildings and structures and (3) compatible development to preclude destruction or damage of snch resources

(b) Definitions:

For the purpose of this division, the following words and phrases shall be defined as follows:

Alter/alteration: Rebuilding, reconstructing, restoring, removing, demolishing or similar actions relating to regulated buildings, structures and properties including a change to the exterior paint color or colors.

Building: A combination of materials including a roof forming a shelter for persons, animals or property.

Certificate of Appropriateness: The certificate issued by the commission if it determines that the construction or alteration for which an application for a certificate of appropriateness has been filed will be appropriate for or compatible with the preservation or protection of the city-owned building or structure.

Certificate of hardship: The certificate issued by the commission if it determines that owing to the conditions especially affecting the building or structure involve failure to approve an application will involve a substantial hardship to a city department or agency and that such application may be approved without substantial detriment to the public welfare and without substantial derogation from the intent and purpose of this section.

Certificate of non- applicability: The certificate issued by the commission or its designee if it determines that the construction or alteration for which a certificate of appropriateness or a certificate of non-applicability has been filed does not involve any exterior architectural feature, any interior primary space, or involves an exterior architectural feature which is not snbject to review by the commission.

City: The City of Newton.

Commission: The Newton Historical Commission.

Commissioner: The Commissioner of the Newton Inspectional Services Department.

Demolish/Demolition: To destroy or to alter in such a substantial manner as to constitute destruction.

Structure: Any construction, erection, assemblage or other combination of materials other than a building at a fixed location upon the land including but not limited to, a bridge, tower or other engineering work, sign, fence, wall, terrace, walk, or driveway.

(c) Application of this section to city-owned properties of Newton:

This section shall apply to the exterior and the interior of those historically significant city-owned

buildings or structures including such structures and buildings owned by the city but leased to third parties for which community preservation funds are expended as necessary for the rehabilitation or restoration of historic resources pursuant to the provisions of the Community Preservation Act, G. L. c. 44B. However, such interior spaces shall be classified as either primary or secondary spaces, as follows:

(1) Primary spaces:

Spaces designated not only based on function, but also on their architectural features, details, surface finishes and design proportions that together serve to define the historic character of the building. These spaces are generally open to public access with formal areas designed to contribute to the historic character created by the structure as a whole. Primary spaces within city hall include but are not limited to the following:

a) rotunda/lobby;

b) first and second floor hallways;

c) staircases;

d) city council chambers;

e) conference rooms 203, 205, 211 and 204;

f) mayor's office, hallway and reception area; and

g) War Memorial and hallway museum displays.

b) Such other primary spaces as shall be determined by the commission or may be delegated to the commission staff.

(2) Secondary spaces:

Spaces defined chiefly by their function with little or no architectural detail or decoration. These spaces are usually designed to be easily adaptable and can be extensively altered without affecting the historic nature of the structure.

Public access is generally limited. Secondary spaces within city hall include, but are not limited to the following:

a) departmental offices;

b) cafeteria;

c) basement hallways; and

d) storage and building maintenance areas.

e) Such other secondary spaces as shall be determined by the commission or commission staff.

(3) Landscapes, grounds and setting:

Outdoor spaces, such as landscapes, grounds and settings by themselves, such as burying grounds, cemeteries, and playground fields, or by their relation and historical context to one or more buildings or structures erected thereon or adjoining. Outdoor spaces are designated not only based on function, but also on their features, details, decoration and design including their being created by or associated with a particular landscape architect, architect, designer or historic person or events, or with the architectural, cultural, political, economic or social history of the city of Newton, the Commonwealth of Massachusetts or the United States of America.

(d) Mandated review and approval:

Any proposed alteration or demolition of the exterior or the interior primary spaces of any city-owned building or structure shall require an application for prior review and commission approval except for temporary alterations which do not permanently change the exterior of the city-owned building or structure, such as the seasonal installation of door or window screens, seasonal window air conditioning units, and temporary

signs.

The commission shall review and approve in advance all proposed plans for alteration or demolition of city-owned properties in accordance with the procedural standards set forth in subsection (d)(1) below.

(1) Procedure:

a) No building permit or demolition permit for a historically significant city-owned building, structure or property shall be issued by the commissioner except in conformity with the provisions of this section.

b) The public buildings department is encouraged to submit plans and proposed materials directly to the commission while still in the planning and development stage. Before receiving a building or demolition permit for a proposed alteration or demolition of the exterior or the interior primary spaces of a city-owned building or structure or the alteration of city-owned property such as landscapes, grounds or settings, the city, or the applicant for such permit if other than the city, shall file an application with all plans as required by the commissioner to the commission for a certificate of appropriateness for the proposed plans of alteration or demolition.

c) The commission shall hold a public hearing with due public notice within forty-five (45) days after the filing of the completed application for a certificate of appropriateness or a certificate of hardship unless both the applicant and the commission agree to additional time.

d) The commission shall use its best efforts to render a decision within forty-five (45) days after the filing of a completed application for a certificate of appropriateness unless additional information is deemed necessary by the commission.

e) Provided there is a quorum present, the concurring vote of a majority of the members in attendance shall be required to issue a certificate.

f) In issuing certificates, the commission may as it deems appropriate impose certain conditions and limitations and may require architectural or plan modifications consistent with the intent and purpose of this section.

g) If the construction or alteration for which an application for a certificate of appropriateness has been filed shall be determined to be inappropriate and therefore disapproved, or in the event of an application for a certificate of hardship, the commission shall determine whether, owing to conditions especially affecting the building or structure involved, failure to approve an application will involve a substantial hardship, financial or otherwise, to the applicant. If the commission determines that owing to such conditions, failure to approve the application will involve substantial hardship to the applicant and approval thereof may be made without detriment or derogation to the purpose of this section, the commission shall issue a certificate of hardship.

h) If the commission or its designee determines that an application for a certificate of appropriateness or for a certificate of non-applicability does not involve any exterior architectural feature, any interior primary space, or involves an exterior architectural feature which is not subject to review by the commission, the commission shall cause a certificate of non-applicability to be issned to the applicant.

i) Reconstruction, construction or

alteration of secondary interior spaces may be performed by the public buildings department or its authorized agent without review by and approval of the commission upon satisfaction of all requirements for receipt of a building or demolition permit from the inspectional services department. The public buildings department shall consult with the commission staff, if necessary, on a determination whether the interior space in question is deemed a primary or secondary space as defined herein.

j) The commission shall send a copy of the certificates and disapprovals issued to the applicant and shall file a copy with the city clerk and the commissioner of inspectional services. The decision of the commission shall be final.

(e) Factors to be considered by the commission:

The commission shall consider among other things the following factors when determining whether the proposed demolition or alteration plans are appropriate for or compatible with the preservation of the city-owned building or structure:

(1) In general: (1) the historical and architectural value, and significance of the area to be altered on the building, structure or property; (2) the general design, arrangement, texture, materials, color finishes, and condition of the features involved; and (3) the relation of such features to similar features of buildings, structures and property in the surrounding area.

(2) Specifically, the commission, in considering architectural features and finishes may examine (1) all materials utilized in flooring, walls and ceilings, (2) furniture which has been built into the room (3) light fixtures or other decorative elements which were designed specifically for the space, and (4) paint color, stains, varnishes and other finishes which could alter or affect the visual impact of the space. The commission may also consider structural systems including but not limited to framing elements, exposed load-bearing walls or columns and stone foundations, and mechanical systems which directly relate to the historic nature of the building or decorative elements which contribute to the historic nature of the building and which are part of a mechanical system including but not limited to grills, radiators, light fixtures and switch plates.

(3) In the case of new construction or additions to existing buildings or structures, the commission may consider the appropriateness of the size, shape, and location of the building or structure, both in relation to the land area upon which the building or structure is situated and to buildings and structures in the vicinity.

(f) Non-compliance

Any agency of the city or any entity that alters or demolishes a city-owned historically significant building, structure or property without first obtaining and complying fully with a certificate of appropriateness issued in accordance with this section shall not be permitted to obtain any further building or demolition permits for the same building, structure, or site. This ban on the issuance of any further building or demolition permits can only be waived by a majority vote of the commission if the commission determines that new plans submitted to the commission will substantially benefit the neighborhood and provide compensation for the loss of the historic elements of the property.

(g) Legal Effect

This section shall not be construed to abrogate, diminish nor replace the protective measures already adopted in the City of Newton, but is designed to provide further protection and to assure preservation of city-owned buildings, structures and properties

(h) Severability

If any section, paragraph or part of this section is declared invalid or unconstitutional by any court of competent jurisdiction, every other section, paragraph, or part of this section shall continue in full force and effect. (Ord. No. X-188, 12-19-05; rd. No. X-204, 04-03-06)

Secs. 22-77—22-79. Reserved

ARTICLE IV. URBAN DESIGN COMMISSION

Sec. 22-80. Purpose, composition.

There shall be an urban design commission of eight (8) members for the preservation, improvement and development of the physical environment of the city. The members of the commission shall, so far as practicable, be selected to provide representation from the fields of city planning, landscape architecture, horticulture, arboriculture, architecture, landscaping and related fields of specialization, and so far as practicable, be selected to provide representation from as many wards of the city as possible. (Ord. Z-43, 02-17-09)

Sec. 22-81. Powers and duties.

The commission established by this article shall conduct studies of urban design or beautification programs, techniques and methods currently used in Newton and elsewhere and make recommendations to responsible city agencies on the implementation of such programs; conduct periodic meetings and seminars for interested private and public groups; give advice, upon request of the mayor, director of planning and development, the city council, the planning and development board, or the school committee, upon specific matters affecting urban design and beautification, including but not limited to: landscaping of streets, parks, playgrounds and public areas, public and private parking lots; air rights construction; municipal buildings; private buildings; gasoline station design and landscaping; requests for zoning changes and special permits; signs; setback, height and bulk of new public and private construction, as may be required to assure that the aforementioned are aesthetically designed, located and landscaped; advise the parks and recreation commissioner and the public works commissioner in the carrying out of their responsibilities; study the availability of public and private sources of funding for urban design and beautification programs and projects; and perform other such functions as may be delegated to it by ordinance. (Ord. Z-43, 02-17-09)

Secs. 22-82—22-94 Reserved.

ARTICLE V. ECONOMIC DEVELOPMENT COMMISSION

Sec. 22-95. Economic Development Commission: establishment, purpose, membership, officers.

(a) There is hereby established under General Laws chapter 40, section 8A, a development and industrial commission to be known as the Newton Economic Development Commission for the promotion and development of business and industry within the City of Newton, for the purpose of strengthening the local economy, thereby providing additional jobs and expanding the city's tax base, so as to enable the city to maintain existing service levels and if possible, enhance them; said commission to be governed and operated in accordance with the provisions relative thereto of the General Laws or any special act or amendment thereto.

(b) Said commission shall consist of fifteen (15) members who shall be residents of the city and who shall be appointed by the mayor subject to section 3-3 of the Charter. Initial terms shall be as follows: three (3) for a term of one year, three (3) for a term of two years, three (3) for a term of three years, three (3) for a term of four years, and three (3) for a term of five years. The mayor shall fill the vacancies in membership, arising from expired terms, by appointments for a term of three (3) years. Any vacancy in the membership of the commission shall be filled for the unexpired portion of any member's term by the mayor. Each member shall serve until his or her successor is appointed and duly qualified.

(c) The members of the commission shall elect annually one (1) member of said commission to be

chairman, another to be vice-chairman, and a third to be secretary.

(d) The members of the commission shall receive no compensation for their services.

(e) Said commission shall be staffed by the city's department of planning and development, such staff to be provided for in the city's budget. The economic development director shall serve as executive director to the commission. Said commission may hire consultants and purchase materials and supplies necessary for the discharge of its duties, within the limits of any sum appropriated for such purpose.

(f) Said commission may apply for and receive funds through gifts, grants, and donations for the purposes of carrying out its activities, subject to the approval of the city council.

(g) Said commission shall have the power and duty:

(1) to study, investigate, and appraise economic conditions and trends affecting Newton industry, business and commerce;

(2) to promote, assist, and encourage the preservation and development of existing Newton industry, business and commerce;

(3) to promote, assist, and encourage the location and development of new industry, business and commerce in the city;

(4) to investigate and assist in the establishment of commercial projects, including projects involving private enterprises, for the purpose of strengthening the local economy; to identify appropriate commercial areas and zones for the establishment of said commercial projects; to consider and evaluate the environmental and traffic impacts of commercial developments;

(5) to prepare, collect, compile, advertise and distribute books, maps, charts, pamphlets and graphic material for the purpose of furthering the objectives for which the commission was established;

(6) to cooperate with, and seek to coordinate the activities of, all official and unofficial civic, neighborhood, research and promotional agencies, commissions, groups, associations and organizations having like or kindred economic development functions and concerns;

(7) to confer and cooperate with agencies of the state and federal government in the exercise of the aforesaid powers and duties;

(8) to confer and cooperate with other municipal departments and official and unofficial groups, associations and organizations in Newton, including but not limited to neighborhood associations and organizations, in order that industrial, business, and commercial development shall be appropriately related to residential, recreational, and municipal land uses in the city;

(9) to advise and make recommendations to appropriate officials, agencies, boards, departments and commissions of the City of Newton, including the mayor, the city council and the department of planning and development, regarding actions which, in said commission's judgment, would affect or improve the economic conditions and development of the city;

(10) to prepare and transmit to the city council, annually during the month of February, a report of said commission's activities and of its recommendations for improving the economic condition and development of the city. (Ord. No. S-71, 5-21-84; Ord. No. V-52, 12-4-95)

Secs. 22-96—22-99. Reserved.

ARTICLE VI.
COMMISSION ON DISABILITY

Sec. 22-100. Created, membership, terms, removal, chairperson, officers.