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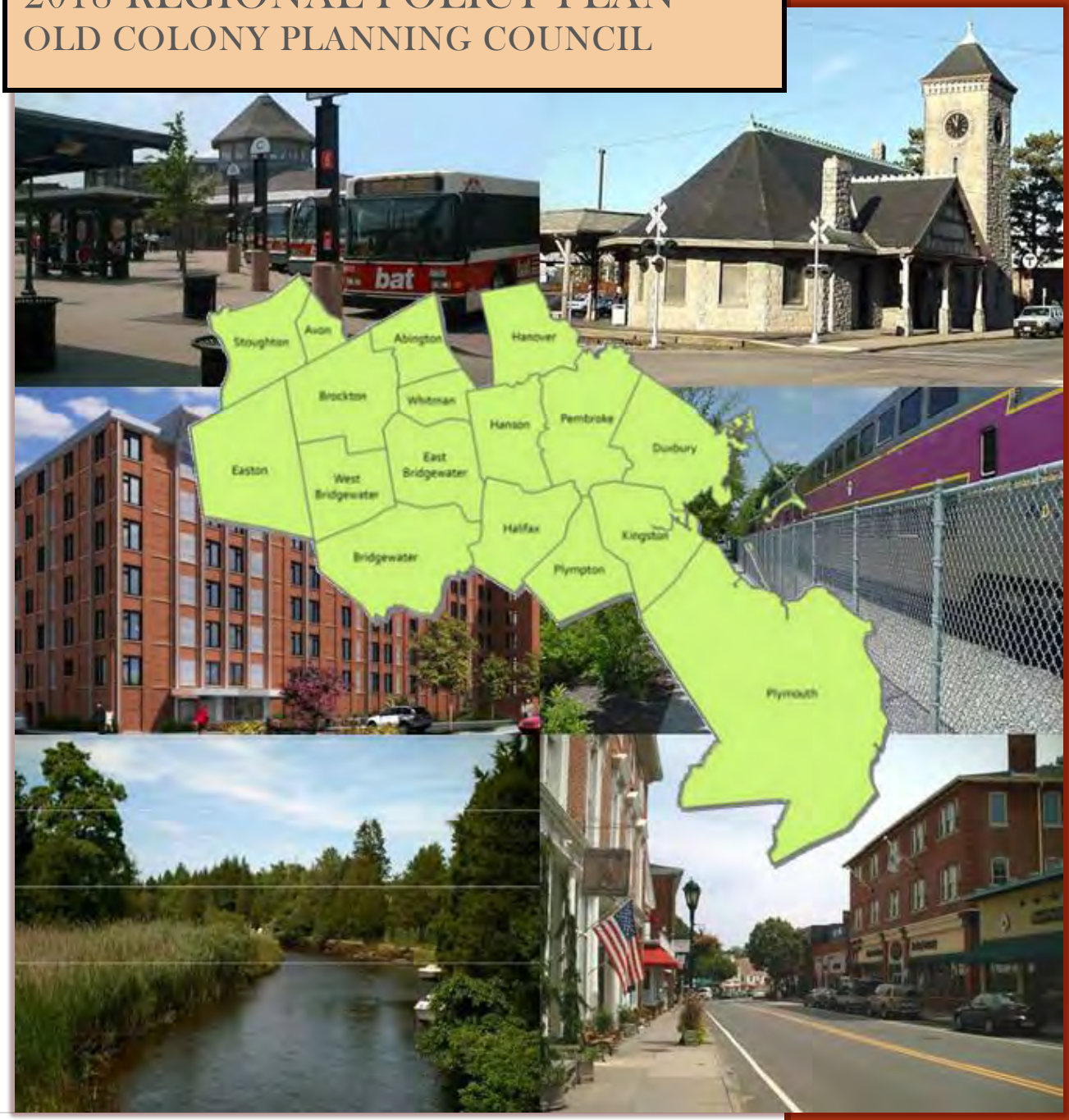
CREATING LIVABLE COMMUNITIES

2018 REGIONAL POLICY PLAN

OLD COLONY PLANNING COUNCIL



ACKNOWLEDGEMENTS

The following members of the Old Colony Planning Council staff prepared *The Old Colony Planning Council Regional Policy Plan* under the direction of Pasquale Ciaramella, Executive Director, and the supervision of Charles Kilmer, Assistant Director/Transportation Program Manager, and Laurie Muncy, Principal Comprehensive Planner. This plan was prepared under UPWP Task 3500: Transportation and Land Use Policy Implementation Plan: contract numbers 88826 and 103517 with the Massachusetts Department of Transportation.

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DISCLAIMER

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857-368-8580

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Mon-Khmer, Cambodian ប្រសិនបេបើេ-អកក្រត្រូវបការេ េ របពាក់នេន នេន ះ សូមកទ់ងអកស រម បស់ ស់ រមលជំពូ ជំពូ ក6 របស់ MPO មរយៈេល េល ខទូរស័ព រស័ព រស័ព 508-583-1833 រ ួចបនេេល េល ខ 202។

Arabic

508- إذا كنت بحاجة إلى هذه المعلومات بلغة أخرى، يُرجى الاتصال بمنسق الباب السادس لمنظمة التخطيط الحضري على الهاتف - 583 . 1833 ثم اضغط الرقم 202

Updated May 2017

Old Colony Planning Council

The Policy Plan for the Old Colony Planning Council Region

Prepared By:

The Old Colony Planning Council

November, 2018

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MISSION STATEMENT

A region is sustainable if economic, social, and environmental systems provide a healthy, productive, and meaningful life for all community residents, present and future.

We at the Old Colony Planning Council envision a sustainable region where people live in a comfortable balance with natural systems and with each other long into the future. Our vision includes a region of resilient communities with vibrant ecological, social, and economically thriving neighborhoods, with clean air, clean water, green landscapes, and sustainable local food systems where its residents enjoy a high quality of life.

The Council will work to promote a resilient region by developing long-term strategic policies focused on creating a vision to serve as a guidepost for developing a sustainability philosophy in terms of energy, water, and construction, on which to build economically viable communities. These strategies will focus on sustainable living practices in regards to conservation, transportation, and reasonable and viable recommendations for managing growth.

This Regional Policy Plan builds upon, and carries forward, the smart growth principles outlined within previous plans. In addition to the strengths of those policies, this plan serves as a foundation for how our region will grow and invest in infrastructure that provides more choices, strengthens the economy, promotes a healthy environment, and supports thriving, livable communities.

The Region's plan for growth, sustainability, resiliency, and equity, addresses the challenges of climate change on multiple fronts, by ensuring our neighborhoods, economies and public services are more resilient to the impacts of climate change.

This plan will be dynamic, adaptive, responsive, and ever-changing as recommendations become implemented and as the Region's collective sustainability vision evolves. This plan offers strategies to manage the region's environmental assets, reduce its environmental impact, promote citizen engagement, and educate the community-at-large through a variety of ways.

The complex and interconnected nature of climate, energy, and health challenges facing the Region demand an ever evolving approach to sustainable development and environmental stewardship. The recommendations contained within this plan are intended to cultivate robust and thriving communities that are healthy, economically viable, and environmentally sound. The mission of the Old Colony Planning Council Regional Policy Plan is to promote conscious development and land management that results in sustainable buildings that support the communities that surround them.

INTRODUCTION

Change is inevitable. Over the next 30 years, the population of the Old Colony Planning Council region is expected to increase from the 2016 American Community Survey data population count of 396,932 to an estimated projected population of 413,555 in 2040, a region-wide increase of 4.2 percent. The statewide population is projected to increase 7.2 percent, or 488,382 residents. Where will these people live and work? How will they travel? Can we find ways to retain the character of our communities and still have a thriving, sustainable region? What can we do now to create a better community for our children and grandchildren?

Along with population change, we also face economic and demographic changes that force us to reevaluate past practices. The rising costs of infrastructure, energy and public services demand that we find more efficient ways to grow; environmental expectations require us to more fully respect our natural systems; and an older, more diverse population will demand new housing and mobility choices. Climate change and the challenges of environmental sustainability pose a serious threat to our future. This Regional Policy Plan is a critical and necessary step forward in building a more sustainable future.

By developing the Regional Policy Plan for growth around transit, designing walkable streetscapes, and facilitating energy efficient building design, the Region is working to reduce energy consumption and its contribution to climate change. The Region is working to improve resiliency by working with communities in the floodplains to reduce the risks to sea level rise and coastal flooding thereby improving the ability of its neighborhoods, buildings, and infrastructure to withstand and recover quickly from flooding and climate events. This Regional Policy Plan will identify and implement land use and zoning changes as well as other actions to support the short-term recovery and long-term vitality of communities at risk.

Figure 4: Downtown Plymouth

REGIONAL PLAN

The Old Colony Planning Council Region is a sustainable region that increases the vitality of our society, economy and environment for current residents and future generations.

THE REGIONAL VISION

THE OVERARCHING GOALS OF THE REGIONAL PLAN ARE SIMPLE BUT AMBITIOUS: TO CREATE AND PROTECT COMMUNITIES THAT ARE COMPLETE AND CONNECTED, WHICH PROVIDE INNOVATIVE MOBILITY CHOICES THAT SUPPORT A SUSTAINABLE AND HEALTHY REGION, A VIBRANT ECONOMY, AND AN OUTSTANDING QUALITY OF LIFE FOR ALL.

Before us lie challenges and opportunities to help guide the future growth of our region building a transportation system that works for everyone, all in ways that protect our environment, support our economy, and maintain our quality of life. Thinking ahead, and working together, helps the region achieve a high quality of life, economies of scale, high-quality regional services, and a competitive edge envied by other communities. The Regional Policy Plan presents an opportunity to shape our region for the 21st century. Our Regional Plan does two main things to ensure that tax dollars will be spent for the greatest public good; it provides a roadmap to grow and evolve, and it prioritizes 35 years of regional transportation projects to create a framework for much of the region's transportation infrastructure. The transportation decisions detailed in the Regional Plan serve an overarching goal; create more transportation choices, which ultimately will lead to healthier communities, healthier people, and a healthier environment.

This document establishes the policy foundation used to complete regional systems and policy plans, development policies, and implementation strategies that together form a comprehensive development guide. This Plan provides an expanded policy framework to inform the Council's review of the local comprehensive plans drafted by the member communities. This policy direction will assist local governments to create consistent, compatible, and coordinated local comprehensive plans that together strive to achieve local visions within the regional policy framework, and help ensure efficient and cost-effective regional infrastructure. The Council considers each local comprehensive plan's compatibility with the plans of neighboring municipalities, consistency with adopted Council policies, and conformance with the policies of the Commonwealth. If the Council finds that a community's local comprehensive plan is more likely than not to have a substantial impact on or contain a substantial departure from Commonwealth plans, the Council can assist the community to modify its local plan to assure conformance with other state or local plans.

THE PRINCIPLES OF THE REGIONAL PLAN

ENSURE ENVIRONMENTAL JUSTICE

The investment decisions made as a result of the Regional Plan will affect different communities in varying ways. Benefits and adverse consequences must be fairly distributed across all communities, including areas with high concentrations of low-income and minority populations. Where possible, adverse consequences should be avoided or greatly reduced. Improving mobility and access to jobs for the low-income and minority populations is a key consideration in evaluating growth and investment options.

PROTECT NATURAL RESOURCES AND MINIMIZE IMPACTS TO ENVIRONMENTAL FEATURES AND WATERSHEDS

Southeastern Massachusetts contains significant environmental assets and productive, prime farmland, which provide important economic and quality-of-life benefits. This Regional Plan conserves the green infrastructure that supports native species, maintains natural ecological processes, protects air and water resources and contributes to the health and resiliency of the region.

INTEGRATE TRANSPORTATION AND LAND USE

Transportation and land use growth are traditionally linked. The development of a multimodal system, including enhanced public mass transit and non-motorized transportation, helps to improve mobility, access to jobs and improved quality of life for all.

STRATEGIC REGIONAL ISSUES:

1. ADEQUATE INFRASTRUCTURE DOES NOT KEEP PACE WITH THE IMPACTS OF DEVELOPMENT.
2. THERE IS LITTLE COORDINATION AMONG PUBLIC FACILITIES AND SERVICES PLANNING, TRANSPORTATION PLANNING, AND LAND USE PLANNING.
3. PROTECTION AND SUSTAINABILITY OF GROUNDWATER AND SURFACE WATER RESOURCES ARE NOT ALWAYS ADDRESSED IN LOCAL, STATE, AND REGIONAL PLANNING PROCESSES.
4. ILL-TIMED EXTENSION OF WATER SERVICE, SEWER AND ROAD FACILITIES, AND SERVICES MAY EXPEDITE SPRAWLING, INEFFICIENT DEVELOPMENT.

KEY STRATEGIES OF THE REGIONAL POLICY PLAN:

EDUCATION

Ensure that all residents have full access to the highest quality of education opportunities.

ENGAGEMENT

Ensure that the planning process actively involves all segments of the community in analyzing issues, generating visions, developing plans, and monitoring outcomes. Require that residents be included and participate in the planning process that affects them and their neighborhoods.

ENVIRONMENTAL JUSTICE

Make sure that no single geography or population bears a disproportionate environmental burden and that all places and people have equal access to a healthy environment.

ECONOMIC DEVELOPMENT

Foster a "development without displacement" economic development strategy that provides all residents with training opportunities, provides a broad array of job opportunities for a variety of skill levels and career paths, and provides entrepreneurial resources and opportunities.

REGIONAL ECONOMIC PROSPERITY

Invest in transportation projects that provide access for all communities to a variety of jobs with competitive wages.

Build infrastructure that makes the movement of freight in our community more efficient and environmentally friendly.

HOUSING

Build into development and redevelopment a range of housing and price points.

TRANSPORTATION

Develop a transportation system that provides a range of choices and enhances access to jobs, services, and other opportunities.

MOBILITY CHOICES

Provide safe, secure, healthy, affordable, and convenient travel choices between the places where people live, work and play.

Take advantage of new technologies to make the transportation system more efficient and accessible.

PUBLIC HEALTH

Develop communities that encourage healthy lifestyles and provide easy access to healthy foods, recreation and health care services.

HEALTHY AND COMPLETE COMMUNITIES

Create livable centers for people of all ages to live, work and play.

Connect communities through a variety of transportation choices that promote healthy lifestyles, including walking and biking.

Increase the supply and variety of housing types, affordable for people of all ages and income levels in areas with frequent transit service and access to a variety of services.

REINVESTMENT

Policies that encourage reinvestment in existing neighborhoods.

HABITAT AND OPEN SPACE PRESERVATION

Focus growth in areas that are already urbanized, allowing the region to set aside and restore more open space in our less developed areas.

Protect and restore our region's coastlines, beaches and water resources.

ENVIRONMENTAL STEWARDSHIP

Make transportation investments that result in cleaner air, environmental protection, conservation, efficiency, and sustainable living.

Support energy programs that promote sustainability.

THE IMPORTANCE OF PLANNING

We all know that having a plan for the future is a good idea. Over the years, OCPC has coordinated regional efforts to address a large number of important issues. These include using land more wisely; building an efficient and more accessible transportation system; protecting the environment; improving public health; promoting a strong regional economy; better managing our access to energy; ensuring adequate housing for everyone; incorporating equity into the planning process; and supporting a vibrant border.

More recently, planning has focused sharply on how the region can offer people more transportation choices – including more options for biking, walking and public transit. We have also focused on what we can do collectively to better reduce greenhouse gas emissions and better adapt to the effects of climate change. We have drawn stronger links between how we use land and how we get around, and achieved a better understanding for how our choices for both can improve or harm our health. We are also working to make sure the region can benefit

from emerging technologies that will make transportation more efficient. Finally, we are ensuring that all groups, including low-income, minority, and senior populations, have the opportunity to be meaningfully involved in developing plans for the future.

As residents of the Commonwealth of Massachusetts, we all share the responsibility for shaping our region's future. In a region as culturally and economically diverse as ours, crafting a plan for how best to grow and the smartest ways to get around is not easy. But it is vital at a time when the challenges we face are being confronted by Americans across the nation. Among these are an increasing rate of obesity, which drives chronic illnesses such as heart disease, diabetes, cancer, and asthma. Other challenges in our region include a "Silver Tsunami" of aging citizens who will have significant needs, and a growing and dynamic population of "Millennials" with their own principles and desires. These two generations have many overlapping interests, including an increasing desire for urban lifestyles and more options for getting around. These are just a few reasons why it is important to plan for our future – locally, regionally, and across all of our borders.

It is critical that we coordinate planning with our neighbors outside and within our geographic boundaries. We live in a region with diverse landscapes, politics, economies, languages, and cultures. We are linked socially and economically. People and goods flow across our borders in huge numbers every day. How we grow impacts our neighbors just as our neighbors' growth impacts us. Our region is large and diverse with 17 individual cities and towns.

THE IMPORTANCE OF HOUSING

How much housing is built, what type is built, and where it gets built will impact our future.

Providing adequate housing for a growing number of people, from all income levels and at all stages of their lives, continues to be one of the major goals of our region. One way to do this is to provide more housing choices – more multi-family dwellings, apartments, townhomes, condominiums, and single family houses in all price ranges. These homes need to be affordable to people of all income levels, and accessible to people of all ages and abilities. They should be located in our urban communities close to jobs and transit. That will help preserve our open spaces and rural areas, bolster our existing neighborhoods, and keep communities manageable.

THE IMPORTANCE OF WATER

Water is one of the most fundamental natural resources. A safe and reliable water supply is necessary for human and animal life and to irrigate crops and provide electric power to our communities. Until recent decades, the availability of water to support human settlements was taken almost for granted. There was not widespread worry that water resources had finite limits, that they could be lost to contamination or outright removal, or that the pressures of burgeoning populations would create physical and chemical stresses on these resources.

The water supply for many urban areas is drawn from rivers or lakes that may be a great distance away, while rural and agricultural areas often receive their water directly from local surface waters or groundwater wells. The land area that contributes to a specific water supply, from either above-ground or subsurface flows, is known as a watershed. Watersheds do not observe municipal boundaries. Planning at a regional or watershed scale can help ensure consistent water quality and quantity to meet existing and future demand, improve coordination among multiple agencies and stakeholders, and implement land-use planning and ecosystem protection to protect water quality from degradation. Planning at the regional scale also helps municipalities cope with extended periods of drought through conservation and other best practices.

Providing enough water for our growing population is essential to our economy and our quality of life. The drought that we have recently experienced has reminded us that water is a precious and sometimes scarce resource. We are often asked how the region can accommodate new growth when the existing population is facing conservation mandates due to drought.

We have long assumed that our region has plenty of water, but we now recognize that our reliance on groundwater is unsustainable. Increased pumping of groundwater to support development is depleting aquifers, affecting lakes, streams, and wetlands. Drought is a recurring feature of nearly every climate on the planet. Drought planning can and should be conducted at all levels of decision making. As average temperatures rise due to the impacts of climate change, more frequent and intense droughts may be expected in some areas. Planning for drought is a challenge that requires effective water management planning and conservation to ensure the safety and well-being of affected communities.

THE IMPORTANCE OF GREEN INFRASTRUCTURE PLANNING

As community decision makers recognize the value of integrating water planning with other aspects of planning for the natural and built environments, the evolving concept of green infrastructure has emerged. Green infrastructure planning means different things to different groups and at different scales. An original intent in bringing together the terms infrastructure and green was to elevate the societal value and functions of natural lands and systems to the same level of importance as conventional constructed, or gray, infrastructure. Often green infrastructure refers specifically to systems and practices that use or mimic natural processes to improve water quality. A broader definition of green infrastructure planning with application to regional planning would include restoration of the hydrologic functions of a region's landscape and management of stormwater. This could include reducing or eliminating the need for gray infrastructure. Many approaches to green infrastructure also integrate open space planning, including conservation of habitat and green spaces.

The legacy of the Commonwealth's transportation network plays a central role in supporting *and maintaining* ***the region's quality of life.*** Metropolitan Boston is one of the nation's half-dozen "legacy transit" regions, along with metropolitan New York, Philadelphia, Washington, D. C., Chicago, and San Francisco. These are regions where land use and development have been organized around a broad and deep public transportation network for over a century. Transit helps offset the negatives of operating in a dense urban environment by reducing the growth rate of congestion in the core and allowing working households to mitigate the high cost of living by selecting residential locations with lower commuting costs.

Metropolitan Bostonians take 1.3 million weekday rides on the MBTA. Since 2000, ours in one of a handful of US regions to achieve significant gains in the percentage of daily commuters using transit. From 2010 to 2016, as our region bounced back from the Great Recession and the metropolitan population grew by 5 percent, daily MBTA ridership grew by 10 percent.

The vast majority of the MBTA's physical infrastructure and daily travel occurs in Metropolitan Boston's 20-community "Inner Core." The Inner Core contains a disproportionate share of the region's population and employment and is expected to spearhead regional growth over the next quarter-century. When the unit of analysis is shifted to specific district and corridors in the Inner Core, the impact of transit on land use, development, labor market connectivity, and future growth emerges.

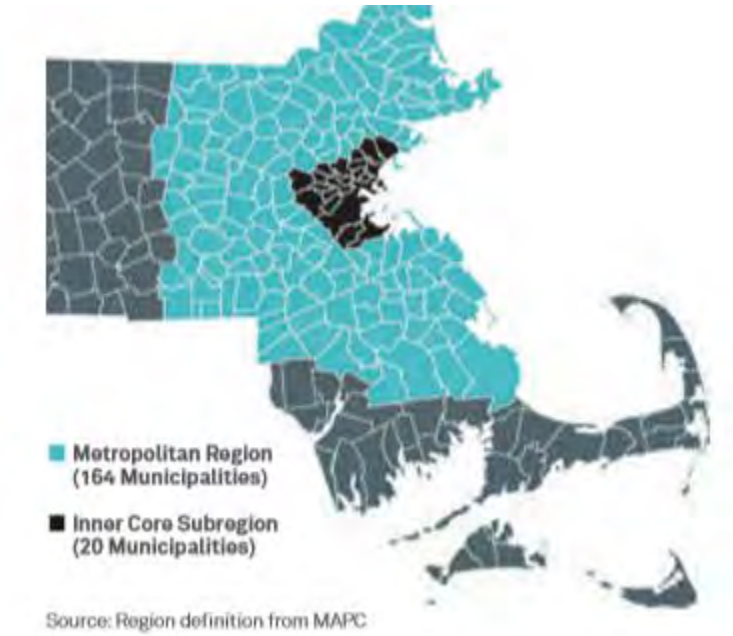


Figure 5: Metropolitan Region and Inner Core

A regional economy concentrated in a footprint much smaller than its road system gains efficiency and productivity, but is also unusually vulnerable to the pressures of an overburdened transportation system. Despite its transit orientation, Metropolitan Boston remains indisputably one of the most traffic-congested regions in the US, a condition reflected in a series of national and global studies. Congestion – the loss of efficient mobility – is the enemy of regional productivity and growth. A highly functioning and expansive transit system can be (among other things) an effective way to reduce congestion.

Nearly all modes of transportation exist in our region. A critical element to our region's economic success hinges on the ability to move people and goods in a safe, efficient and

effective manner. Coupling our transportation strengths with our needs will be key in providing a solid multimodal network from which everyone in the region will benefit.

The intermodal nature of the transportation system offers the greatest long-term benefits to our region. A challenge that the regional plan addresses involves how Livable Centers will take advantage of the region's vast transportation options by shifting more people from inefficient means of travel, to those modes that enhance our environment, health and quality of life (mode shift). Livable Centers create a unique, identifiable destination, bolstering civic pride and acting as a catalyst for investment and development in an area.

Livable Centers are walkable, mixed-use places that provide multimodal transportation options, environmental quality and promote economic development.

As we look to the future, we can learn about new modes of transportation and mobility that are being studied and in some case implemented around the world. Some of these ideas may work in our region. They may also be more cost-effective than other transit infrastructure investments. Future studies will assess the alternatives to existing transportation routes in several corridors.

As our region grows, a quality transportation system will go a long way toward preserving our quality of life, even making it better than it is today. The way we get around impacts our environment, our wallets, and our physical and mental health. It impacts how much we exercise, the quality of the air we breathe, and the amount of money we have available to spend on other things. Our Regional Plan reflects our commitment to a healthier and higher-quality daily life for the people in our region.

WHERE WE ARE AND HOW WE GOT HERE

To understand where we are today and effectively plan for our future, we need to know where we have been. Our region has continually grown, and the reasons are easy to understand. Our beautiful coastline, unique neighborhoods, strong economy, and colonial history make our region an attractive place to visit and live. In past decades, these and other attributes drew people to our region, and neighborhoods steadily expanded. But more recently, we have placed a greater value on protecting open space. Collectively, the long-term plans for our local cities and towns now call for focusing new growth in the urbanized areas of our region where more people already live. This will allow us to preserve more open space and make more efficient use of resources such as water, energy and transportation facilities.

A HISTORY OF SPRAWL

Efforts to create a more sustainable future began in the late 1960s and early 1970s, when Congress and the Commonwealth of Massachusetts passed sweeping federal and state

environmental protection laws. Concerns had been rising over the environmental impacts of rapid growth and development. Our cities and suburbs had quickly expanded as developers built tracts of single-family homes to meet the rising demand. Our local governments developed long-range plans that allowed the continued spread of suburban development into open lands of the agriculturally based suburban towns. By the late 1980s, rapid suburban development was threatening remaining open space, with long commutes resulting from growing traffic congestion and air quality impacts.

By the year 2000, new challenges emerged as familiar ones persisted. Affordable housing grew harder to come by. Traffic, a consequence of growth and a strong economy, continued to worsen. We needed a refined vision for planning that recognized these new realities. During the last 15 years, our jurisdictions have changed their land use plans significantly, resulting in development patterns that concentrate future growth in urbanized areas, reduce sprawl, and preserve more land for open space and natural habitats, using the region's water and energy supplies more efficiently.

AVOID SPRAWL THROUGH CLIMATE-SMART ZONING AND REGULATIONS:

1. PROTECT NATURAL RESOURCES AND OPEN SPACE
2. PROMOTE EFFICIENT, COMPACT DEVELOPMENT PATTERNS, MIXED COMPATIBLE LAND USES AND INFILL DEVELOPMENT
3. SMART DESIGNS THAT REDUCE OVERALL IMPERVIOUSNESS
4. ADOPT STORMWATER MANAGEMENT PROVISIONS (LOW IMPACT DEVELOPMENT)
5. ENCOURAGE EFFICIENT PARKING.
6. PROMOTE A NUMBER OF MODE CHOICES TO REDUCE RELIANCE ON THE AUTOMOBILE.

Figure 6: Urban Sprawl Uncontrolled Growth

TRANSPORTATION

OVERARCHING GOAL: TO PROVIDE A SAFE AND SECURE TRANSPORTATION SYSTEM WITH ADEQUATE FUNDING AND AN EFFICIENT USE OF RESOURCES THAT SUPPORT THE HEALTH OF ALL PEOPLE WITH INCREASED MOBILITY, ACCESSIBILITY AND TRANSPORTATION OPTIONS FOR PEOPLE AND FREIGHT.

THE TRANSPORTATION NETWORK

The transportation network seeks to ensure that transportation projects are designed to maintain and improve the existing road system, increase public transportation services between cities and towns in the region, and expand infrastructure serving pedestrians and bicyclists both in and out of town.

Current goals and objectives of the transportation network:

1. To facilitate interaction and participation of all stakeholders in a process of gathering additional information when a project has been identified that would affect any of the regional corridors.
2. To facilitate a regional transportation plan.

The primary responsibility for transportation system planning is given to the Old Colony Planning Council Metropolitan Planning Organization (MPO), which oversees the application of the Federal and State transportation funding. The MPO produces a Regional Transportation Plan (RTP) every four years. The RTP envisions a safe, efficient, environmentally responsible, and seamless multimodal transportation system integrated with sustainable land use patterns to serve the mobility and accessibility needs of the region's residents, businesses, and through-travelers.

The plan has a goal of expanding transportation choices and improving the performance and operation of the transportation system for all modes. It aims to improve the quality of life for people in the region by encouraging livable communities and efficient land use. It emphasizes efficiently using existing transportation funds while pursuing additional funding opportunities for other transportation system improvements.

ROADWAY NETWORK

Of all the transportation modes in use, by far the most prevalent are our roadways. Since the end of WWII, our primary means of getting around has been the automobile. In addition, over the past three decades, trucking has overtaken railroads as the chief means to ship goods. The

result has put an enormous strain on our existing road network, with increased congestion and deteriorating infrastructure.

The Regional Plan's emphasis for our future roadway network is on increased efficiency, maintenance and safety.

PUBLIC TRANSPORTATION NETWORK

Critical to the success of our region is the availability of transit options. Simply stated, our current network of public transportation systems is not sufficient to achieve the goals set out in the Regional Plan. Many portions of the region are underserved and lack connectivity between modes, such as train and bus. To make matters worse, declining federal, state and local funding subsidies, have resulted in service cuts that further reduce ridership, and in turn hamper the quality of life of our residents.

Achieving the plan's vision for Livable Centers will:

- Provide a significant means of reducing the reliance on the automobile and will reduce traffic congestion on the regional roadway network.
- Fulfill a critical role in reaching underserved and transportation-deprived areas of the region since access to employment and regional services is essential for all.

PEDESTRIAN AND BICYCLE CONNECTIVITY

The benefit of a regional bicycle and pedestrian transportation network is that it allows individuals the ability to travel by means other than private automobiles in a safe and comfortable manner. Currently, the Old Colony region does not have a uniform bicycle and pedestrian transportation network, but progress is being made in making this a reality. Allowing connectivity throughout the region is of utmost importance to developing and improving access in the region.

The current Regional Pedestrian Network varies by community. A goal of the Old Colony Planning Council is to guide communities creating a stronger sidewalk network by educating communities on the benefits of a uniform sidewalk network that could connect communities to each other. The plan seeks to educate communities about maintenance of the sidewalk network including level of service and snow and ice removal.

The Old Colony Region has over 300 miles of roadway with a sidewalk on one side or both sides of the road. A few of these sidewalks connect communities together. The Old Colony Planning Council will also work with communities looking to implement policies and strategies such as the ADA Transition Plan or Safe Routes to School program, which help strengthen the ADA network and educate future generations on proper transportation etiquette.

Figure 7: OCPC Region Sidewalks and Walking Corridors

REGIONAL PEDESTRIAN NETWORK NEEDS

The needs of the pedestrian network region wide are similar throughout each community; many sidewalks are orphaned off within the region and lack ADA accommodations. Every person has the right to equitable transportation and a sustainable environment that would allow opportunity for progress, a community without connection limits access and does not take into account those that may have mobile impairments or lack the financial ability to afford a vehicle. Therefore it is imperative to create a pedestrian network that can service the region in whole by making inter/intra-connections within and between communities.

BICYCLE TRANSPORTATION NETWORK NEEDS

Bicycle transportation continues to become a popular mode of transportation rather than just a recreational pastime. With the ever-growing presence of cyclists, more and more bicycle lanes are being designed and painted on roadways as well. MassDOT's "GreenDOT" Implementation Plan, the Commonwealth's Healthy Transportation Compact and statewide Mode Shift Goal

Initiative, make certain that all MassDOT projects are designed and carried out in a manner where all road users are taken into consideration.

OCPC is committed to working with the Old Colony communities on maintaining MassDOT's standard and plan accordingly for cyclists in the region and beyond. Having a strong communication between communities can help expand access for more residents and visitors in the OCPC region.

Currently the Old Colony Region does not have an established bicycle network, yet bicycle facilities do exist in the region. Old Colony planners and community members plan to expand upon the established bicycle facilities within the region.

In efforts to create a stronger network, OCPC has selected key routes to be utilized as Bicycle Corridors. These corridors act as interconnecting routes between communities allowing cyclists to expand their bicycle trips and provide a safe way of doing so. The selected routes are suggested routes. It is up to the host community to adopt selected routes and maintain them.

The purpose of the Bicycle Corridors is to provide safe infrastructure to cyclists on roads where there may not be enough right-of-way for bicycle facility designs, and at the same time raising the awareness of other road users that cyclists may be present, even on rural roads.

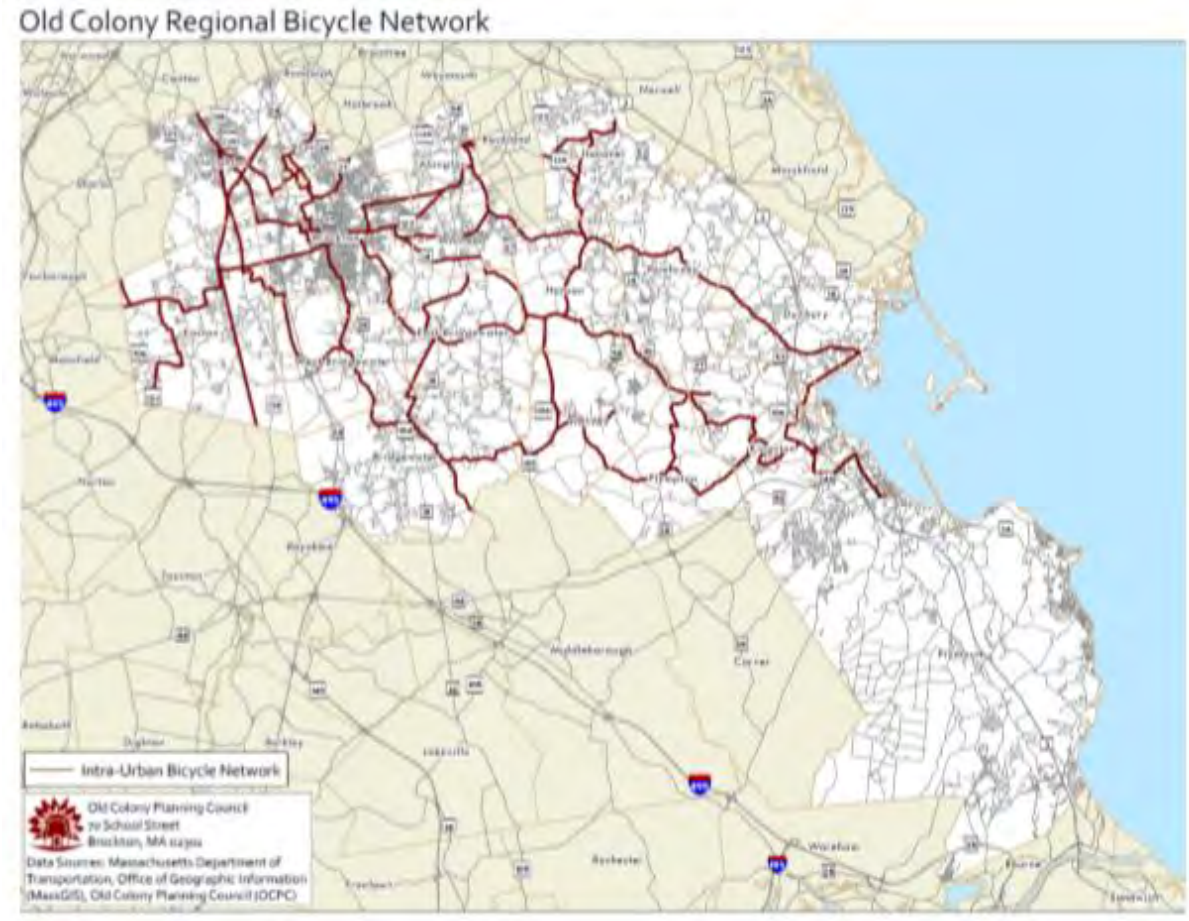


Figure 8: OCPC Regional Bicycle Network

BICYCLE NETWORK MAINTENANCE

Once bicycle lanes are put down and are in use, they must be maintained to provide an efficient level of service for users. Bicyclists may have an uncomfortable ride if road maintenance is not in a functioning state. Potholes can do a lot more damage to cyclists then to motorists, and storm drains with single bars placed longitudinal rather than 90 degrees can cause serious injury to a cyclists. Each OCPC community has different methods of managing snow removal; much consideration must be taken when maintaining bicycle facilities to the different practices used by each community.

Bicycle facilities such as painted bicycle lanes and bike boxes tend to fade and require more upkeep then regular road facility devices. Bicycle Pavement markings should be monitored and maintained regularly; maintenance plans tailored to bicycle facilities must provide an overview of vehicles that are tailored to bicycle facility maintenance for all seasons.

UNIVERSAL ACCESS

The definition of Universal Access means to provide complete access to the transportation network for every citizen through various modes of transportation including walking, wheelchair, biking, transit, and motor vehicle.

GOAL: TO GUIDE COMMUNITIES IN CREATING A STRONGER SIDEWALK NETWORK BY EDUCATING COMMUNITIES ON THE BENEFITS OF A UNIFORM SIDEWALK NETWORK THAT MAY CONNECT COMMUNITIES TO EACH OTHER. THIS PLAN SEEKS TO EDUCATE COMMUNITIES ABOUT MAINTENANCE OF THE SIDEWALK NETWORK INCLUDING LEVEL OF SERVICE, AND SNOW AND ICE REMOVAL.

Universal Access enables everyone regardless of age, physical ability, or economic class and calls for accommodation of all users of the road without bias by using exceptional engineering guidelines. Universal Design involves designing products and environments to be usable by all people to the greatest extent possible, regardless of special needs or age, without requiring adaptation or specialized design.

OCPC looks to address these needs by working collaboratively with communities through efforts such as Safe Routes to School, Road Safety Audits, and projects through the Regional Transportation Plan, Transportation Improvement Program (TIP), Prioritization Plans, and ADA Transition Plans.

As our region grows, a quality transportation system will go a long way toward preserving our quality of life, even making it better than it is today. The way we get around impacts our environment, our wallets, and our physical and mental health. It impacts how much we exercise, the quality of the air we breathe, and the amount of money we have available to

spend on other things. Our Regional Plan reflects our commitment to a healthier and higher-quality daily life for the people in our region.

Our transportation investments are not just about the transportation projects themselves. They are also about the surrounding land uses that make our communities livable and vibrant. Local jurisdictions are urged to promote new mixed-use development in climate-smart growth areas that combine affordable housing with stores and other commercial buildings, all near existing and planned public transit.

Beginning in 2007, the proposed South Coast Rail provided technical assistance grants to communities in the South Coast Area for projects that support the goals of the South Coast Rail Economic Development and Land Use Corridor Plan. Communities used the grant proceeds to implement the smart growth principles of the Corridor Plan through projects that include transit-oriented development bylaws, mixed-use bylaws in town centers, and bicycle and pedestrian connectivity studies. The technical assistance grants were part of a broader strategy to target state investments in the region to advance the housing, economic development and preservation goals outlined in the Corridor Plan. According to a report prepared by the Executive Office of Housing and Economic Development, $939 million in public investments were targeted to cities and towns for fiscal years 2009 through 2011. These new investments, along with our existing transportation infrastructure, will use new and emerging technologies to become more accessible and more efficient.

The Department of Conservation and Recreation's Universal Access Program provides outdoor recreation opportunities in Massachusetts state parks for visitors of all abilities. The Universal Access Program ensures equal access to outdoor recreation in Massachusetts state parks.

TRANSPORTATION CHOICE

A transportation system that offers more choices to get around empowers people to choose more sustainable ways to travel.

Commuting to work, school, shopping, and errands, and saving time for some fun away from home, all require mobility. We all want the freedom to choose how and when to get around.

The ways in which our communities are built can make a difference in providing the kinds of choices available to us. By designing communities that better integrate the connections between how we use land and how we get around (i.e. transportation), we can create more opportunities for developing a wider variety of travel choices beyond the car, encourage mode shift, and reduce greenhouse gas emissions.

To maximize our transportation investments, particularly those in transit, we recognize that we need to pay close attention to the mix of land uses and urban design in the immediate vicinity of existing and planned transit stations. A TRANSPORTATION SYSTEM THAT OFFERS MORE CHOICES IMPROVES THE CONNECTIONS BETWEEN BUSINESSES AND THEIR WORKERS, CUSTOMERS, AND PARTNERS, FUELING THE ECONOMY WHILE IMPROVING AIR QUALITY AND THE ENVIRONMENT. This ultimately makes the system itself more functional, because more choices allow people and businesses to choose the best options for them, for the kinds of trips they are making and the time of day they are making them.

This investment will improve mobility for everyone, and give us more freedom by creating more travel choices, while also taking steps to protect the environment. This is not just a goal for our everyday trips. It is vital for shipping the goods that help fuel our regional economy, and for keeping our region healthy. How we get from point A to point B is important and impacts the quality of our lives.

The social benefits of having access to a wider range of travel choices are numerous. We can spend less time in our cars and save gas money. We can reduce air pollution and maximize public health. And we can lower the amount of greenhouse gases that we emit into the atmosphere.

Together, we can strive to achieve what we want for our future: a vibrant economy, innovative mobility, a healthy environment and great communities.

TRANSPORTING GOODS MORE EFFICIENTLY

The shipping of goods fuels the regional economy. It is made possible by an extremely complex network of public and private assets and operations, and as a result, it is often the least understood part of the regional transportation system. The flow of goods by truck, rail, air and sea – throughout our region and across borders – generates a constant stream of raw materials, parts, and finished goods. They all keep us supplied with foods, clothing, shelter, vital consumer goods, and discretionary items. Over the last few decades, the development of globalized, trade-dependent supply chains has led to substantial growth in the demand for efficient, long-distance freight movement.

These systems will play a significant role in meeting the region's mobility and economic development activities in the foreseeable future. Statewide and regional planning efforts that focus on opportunities for economic development include the movement of freight as a key transportation investment. The regional economic benefits of targeted investments in the freight system include better regional and national connectivity, increasing business taxes and revenues and localized job creation.

ENCOURAGE FREIGHT SUPPORTIVE LAND USE PLANNING AND ZONING

Industrial and freight-related development has its place in a livable community if it is the result of collaborative land use and transportation planning. Coordination and consensus-building between public officials and private sector operators is necessary to identify the appropriate locations for industrial and freight-related development and to develop effective multimodal links between them. Proactive community planning and land assembly can identify and resolve these issues in advance of facility proposals.

The Massachusetts Bay Transportation Authority provides commuter rail service to and from Boston, which offers a connection to the Amtrak national rail passenger network at South Station in Boston in the following OCPC communities: Abington, Bridgewater, Brockton, Halifax, Hanson, Kingston, Plymouth, Stoughton, and Whitman. CSX provides rail freight transportation on the Braintree to Middleboro line, which runs through Brockton and the Stoughton branch.

PASSENGER RAIL SERVICE

Public transportation is vital in rural communities, where many residents may be elderly or poor, and either lack cares or the ability to drive. The natural of public transportation service in smaller cities and towns, naturally, differs substantially from higher-population regions. To succeed in rural communities, public transportation often must operate flexible schedules and routes, and it is often is an amalgam of various services. Rural public transportation can also be improved by

land-use decisions that concentrate important services like jobs, retail, schools, and healthcare in the towns' center.

The ability to travel within and between communities is essential to maintaining independence, health and social connections, in short, in ensuring a meaningful quality of life. Those without access to appropriate mobility options, are more likely to experience isolation or rely on institutionalized care.

Over the past few decades, MassDOT has acquired significant segments of track and right-of-way to leverage investments for freight and passenger rail. MassDOT intends to strategically look for opportunities to leverage these investments to better serve the Commonwealth over the next 20 years. The commonwealth's vision for rail investment can be summarized as follows:

Rail investments in the Commonwealth of Massachusetts reduce environmental impacts by offering shippers and travelers a lower emissions alternative to motor vehicle and air travel. Greater movement of goods, in particular by rail, produce large GHG emission benefits — a 75 percent reduction for every ton-mile shipped by rail versus truck. In addition, passenger rail services can offer similar GHG reduction benefits when train ridership is high.

Long-Term Reliability & Resiliency: Maintain and improve the rail system in Massachusetts to enable efficient and dependable passenger and freight rail operations.

Modernize: Improve existing systems to meet industry standards and Federal regulations to ensure proper operations for both freight and passenger rail services.

Optimize: Pursue opportunities to leverage prior investment to improve service. Maximize return on prior investments, leverage partnership opportunities.

Regional Balance: Pursue strategies that balance the costs and benefits of rail throughout the Commonwealth.

Amtrak provides inter-city services at 13 stations in the State. From 2010 to 2016, there has been an overall 17.5 percent increase in Amtrak ridership at these stations. Amtrak routes include:

- Northeast Regional/Acela: Boston to Washington, DC
- Downeaster: Boston to Brunswick, ME
- Lake Shore Limited: Boston to Chicago, IL
- New Haven-Springfield Shuttle: Springfield to New Haven, Connecticut
- Vermonter: St. Albans, VT to Washington, DC via Springfield, MA

Figure 9: Rapid Transit Bus Routes Map

Figure 10: Inter-city Passenger Rail Ridership in Massachusetts

Figure 11: Passenger Rail Operations in Massachusetts

SOUTH COAST RAIL

The South Coast Rail project is an initiative of the Massachusetts Department of Transportation (MassDOT), implemented through the Massachusetts Bay Transportation Authority (MBTA). MassDOT's stated purpose of the Project is to more fully meet the existing and future demand for public transportation between Fall River/New Bedford and Boston, Massachusetts, and to enhance regional mobility while supporting smart growth planning and development strategies in the affected communities. The SCR Project will ultimately extend the existing Stoughton Line commuter rail service south to Fall River and New Bedford using the out-of-service Stoughton Line from Stoughton to Taunton, the New Bedford Main Line from Taunton to New Bedford, and the Fall River Secondary from Myricks Junction (Berkley) to Fall River. Both the New Bedford and Fall River lines are active freight railroads.

The South Coast Rail project consists of the development of a public rail system to connect the cities of Fall River and New Bedford to Boston and enhance regional mobility, while supporting smart growth planning and development strategies in affected communities. Fall River and New Bedford are historically underserved areas with respect to public transportation options. The

South Coast Rail is a priority transportation initiative and a component of MassDOT's efforts to increase transit access throughout the Commonwealth.

The South Coast Rail will provide commuter service to South Station using the Northeast Corridor, Stoughton Line, New Bedford Main Line, and Fall River Secondary Line. The New Bedford to Boston route is 54.9 miles long and the Fall River to Boston route is 52.4 miles long. Travel time during peak periods on the New Bedford line and the Fall River line are estimated at 77 minutes and 75 minutes, respectively. The project requires upgrades to track infrastructure along the existing Stoughton line including reconstruction of tracks from Canton Junction to Stoughton, construction of new tracks from Stoughton to Winter Street in Taunton to Weir Junction, a distance of 1.7 miles. The project requires reconstruction of tracks in the Southern Triangle. Infrastructure improvements associated with the project including construction, reconstruction, or widening 45 bridges, and constructing or reconstructing 46 at-grade railroad crossings.

The Project will provide electric commuter rail service, with stops at the reconstructed Canton Center Station and the relocated Stoughton Station as well as ten new rail stations (North Easton, Easton Village, Raynham Park, Taunton, Taunton Depot, Freetown, Fall River Depot, Battleship Cove, Kings Highway and Whale's Tooth). New Stations will include high-level platforms (four feet above track), canopies, commuter parking, a drop-off area for buses, and a kiss and ride area. Platforms will be designed to handle a nine-car train set (approximately 800 feet long). The station designs include areas for bike storage and pedestrian connections to neighboring streets.

The project includes two overnight layover facilities, one on the New Bedford Main Line (Wamsutta site) and one of the Fall River Secondary (Weaver's Cove East site). Independent of the South Coast Rail project, MassDOT is proposing an expansion of South Station (SSX) as well as midday layover facilities in Boston to address existing and future Massachusetts Bay Transit Authority (MBTA) and Amtrak capacity needs. South Station will support infrastructure requirements associated with the project. MassDOT has adequately supported the advancement of the Stoughton Electric Alternative as the Preferred Alternative.

MassDOT has proposed to phase construction of the project to provide service to the South Coast Region much sooner than would be possible if it were constructed at one time. MassDOT estimates that Phase 1 will cost approximately $935 million and service is projected to start in 2022.

Phase 1 consists of the construction and operation of commuter rail service from Fall River and New Bedford to the Middleborough/Lakeville Main Line via Cotley Junction in Taunton and the Middleborough Secondary Line. Phase 1 will provide service using the Middleborough/Lakeville Main Line from South Station in Boston to Pilgrim Junction in Middleborough, where the rail intersects the Middleborough Secondary at the existing Middleborough Layover facility. The Middleborough Secondary Line, an active freight line, will be reconstructed and expanded.

Phase 1 will include the following improvements along the Middleborough Secondary: reconstruction of existing single track from Pilgrim Junction to Cotley Junction (approximately 7.1 miles) including limited new double track construction, culvert replacements and retaining wall construction; new signal/communications systems; positive train control (PTC); and upgrades to

five grade crossings. Phase 1 will include three peak-period trains from and to each terminal station. The existing Lakeville Station may be retained by providing a shuttle bus to the new Middleborough station or closed. Because the stations proposed for the Full Build project in Taunton are north of Cotley Junction they are not included in Phase 1.

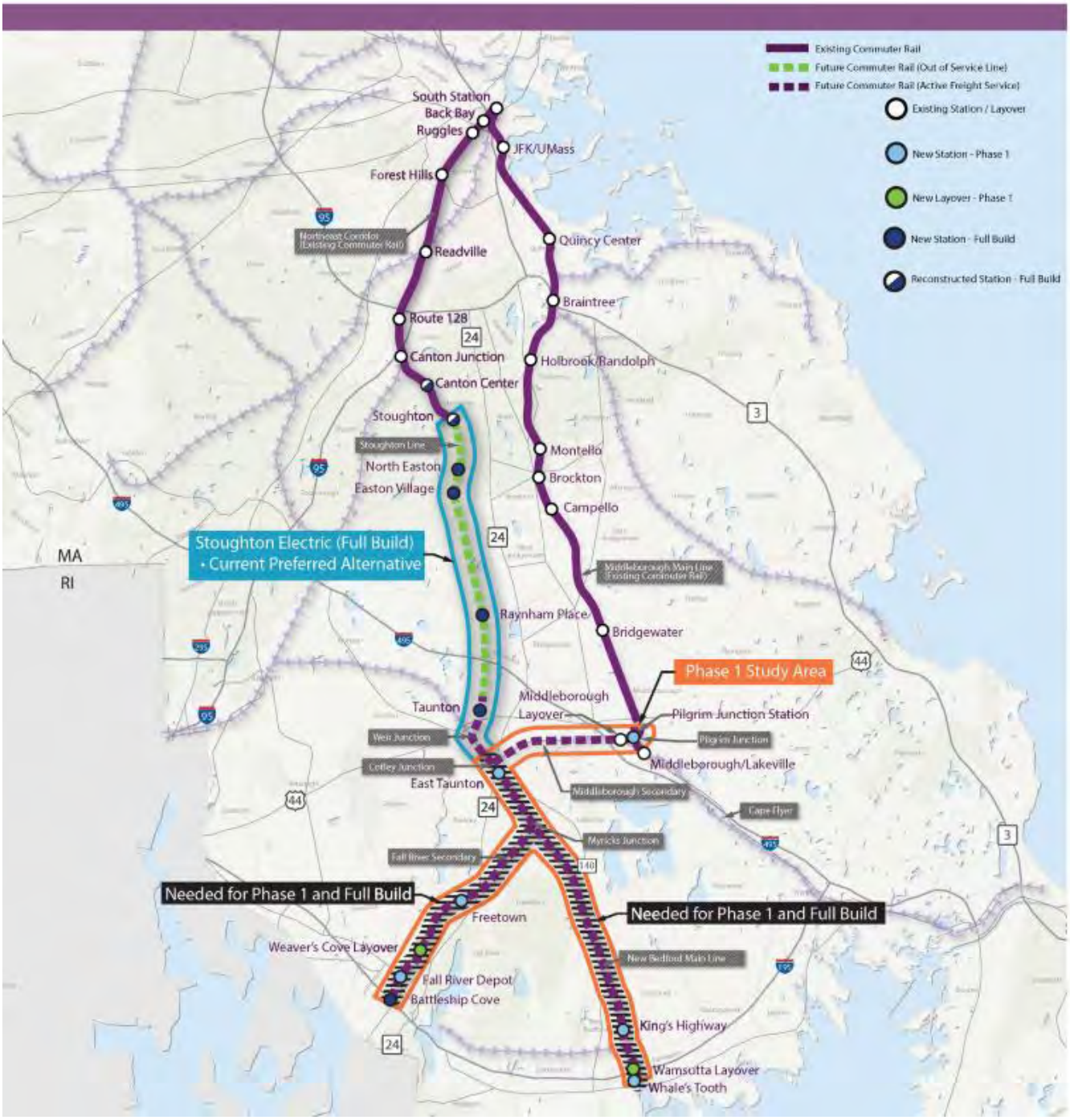


Figure 12: South Coast Rail Phasing Plan

FREIGHT RAIL SERVICE

Freight rail offers Massachusetts economic and environmental advantages, as well as an opportunity to reduce highway congestion. Intermodal connections between freight rail and other modes also proves critical towards advancing the movement of goods. The freight corridor that parallels Interstate 90 and Route 495 is a particularly important link to the national rail network. The freight network also offers manufacturers and distributors in rural areas a cost effective way to ship and receive products such as frozen fish, cranberries, building materials, chemicals, pulp and paper, scrap, and metal.

From a freight perspective, the Massachusetts system is comprised of a mix of Class 1, regional and short-line railroads serving freight shippers and receivers to the benefit of Massachusetts businesses and residents.

The following are freight railroads operating in Massachusetts. Currently, Class 1 railroad operations include:

- CSX Transportation (CSX)

The regional railroads include:

- Pam Am Railways (PAR) and operating subsidiary Springfield Terminal Railway (ST)
- Pam Am Southern (PAS), a joint venture of Pan Am Railways and Norfolk Southern
- Providence and Worcester Railroad (P&W)
- New England Central Railroad (NECR)

The short line railroads include:

- Grafton and Upton Railroad (GU)
- Bay Colony Railroad (BCLR)
- Housatonic Railroad (HRRC)
- Pioneer Valley Railroad (PVRR)
- Massachusetts Central Railroad (MCER)
- Connecticut Southern Railroad (CSO)

The terminal railroads include:

- East Brookfield and Spencer Railroad (EBSR)
- Fore River Transportation Corporation (FRVT)

Although many of the freight railroads operate along lines that they own, some freight railroads operate and serve customers along lines owned by others. Five freight railroads operate on MassDOT-owned rail lines to serve more than 46 customers in 28 communities. Operators on the freight rail system in Massachusetts are presented in the next Figure on the following page.

Figure 13: Operators of Freight Rail Lines in Massachusetts

Several MBTA Lines are shared with freight:

- Fairmount Line (Shared use, by CSX)
- Fitchburg Line (Shared use, by Pan Am and Pan Am Southern)
- Framingham/Worcester Line (Shared use, by CSX)
- Franklin Line (Shared use, by CSX)
- Green bush Line (Shared use, by the Fore River Railroad)
- Haverhill Line (Shared use, by Pan Am)
- Lowell Line (Shared use, by Pan Am)
- Middleborough/Lakeville Line (Shared use, by CSX)
- Newbury/Rockport Line (Shared use, by Pan Am as far north as Salem)
- Providence/Stoughton Line (Shared use, by CSX)
- Foxboro – Special Events (Shared use, by Mass Coastal/CSX and the MBTA)

The freight rail network handles more than 6.6 million carload tons and 5.5 million intermodal tons either originating or terminating in the Commonwealth.

INTERCITY COACH OPTIONS

Nowhere is it more important to take a smarter and more strategic approach to transportation than in rural and small town communities. The current system for planning, building, and maintaining transportation infrastructure in rural areas falls short of meeting the need for access within small cities and towns and their surrounding regions to jobs, shops, services, education and healthcare.

Rural communities face a number of challenges in providing accessibility, the transportation connections between the community and its needs, and livability, the characteristics that make the community a desirable place to live. These challenges are amplified by global changes in the economic marketplace as well as demographic shifts within the US. Nearly every community struggles with insufficient funding to maintain and improve substandard or unpaved roads, improve public transit services, and upgrade or replace substandard or deteriorating bridges. Another challenge comes from the wear and tear on highways by the increasing load of truck traffic, as freight has shifted away from rail.

For many rural and small communities, changing demographics will require new approaches to increasing available travel options. Non-metropolitan areas have higher proportions of older and lower-income citizens who could directly benefit from increasing the availability of viable transportation options. These groups, including persons with disabilities, often remain isolated in their homes with few options for getting around.

Intercity bus transportation is integral to the Commonwealth's surface transportation network and is particularly important to smaller communities and rural areas. Intercity bus can be a critical element in the rural transportation system that allows residents access to the greater region and into larger cities. Intercity buses link smaller communities within the region and also link those communities to larger urban areas that offer services and opportunities otherwise not available. Intercity bus transportation also plays a critical role for smaller communities without air or passenger rail service options – for many rural residents, intercity bus is a more affordable option. Intercity bus service is one element in a wider approach to maintaining and improving rural public transit. The intercity bus network fills a unique niche, providing the only scheduled intercity service to many rural communities, intercity buses also offer low fares and travel options for persons without an available personal vehicle.

Intercity bus passengers tend to be more transit dependent than passengers of other intercity modes. Data from the Bureau of Transportation Statistics' American Travel Survey of 1995 show that regular-route intercity bus riders are:

- More likely to be under 24 years old, or over 60 years old than travelers on other modes,
- More likely to have lower household incomes than those using other intercity modes, and
- Less likely to have a vehicle – about 30 percent have no vehicle.

Acknowledging the role of intercity buses in rural areas and realizing the industry's financial problems after deregulation, Congress included federal funding for rural intercity bus service in the Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA) and continued the funding in 1998 with the Transportation Equity Act for the 21st Century (TEA-21).

MASS BUSPLUS+ PROGRAM

In 2014, the Massachusetts Department of Transportation, in one of many initiatives to reduce greenhouse gas emissions, made a commitment to shift modes of travel toward healthier options and triple the share of travel that takes place via biking, walking or transit. Among the many elements involved in this initiative is the creation of a stronger and broader regional intercity bus network. The BusPlus+ program represent an innovative public-private partnership designed to not only replace MassDOT's expiring Intercity Bus Capital Assistance Program (IBCAP) but also increase bus ridership throughout the Commonwealth. This program is funded by a Federal Transit Administration State of Good Repair grant and will be overseen by the Rail and Transit Division of MassDOT. The Rail and Transit Division of MassDOT seeks to increase transportation options across the Commonwealth and New England by assisting, funding, and/or overseeing bus, train, or van service provided by Regional Transit Authorities, local governments, non-profits or private carriers.

The MassDOT BusPlus+ program is designed to increase the number of comfortable and convenient regional transportation options available to the Commonwealth's residents and visitors. This program will be implemented as a public/private partnership in which MassDOT provides regional buses to private for-profit bus companies, who are then responsible for all capital maintenance and annual operating costs. In order to receive a regional bus through the BusPlus+ program, carriers must implement a regional service improvement. This partnership thereby creates a system in which regional transportation options increase while at the same time reducing the need for taxpayer funded operation and maintenance costs.

A program sponsored by the Massachusetts Department of Transportation

The federally-funded competitive grant program includes replacement of 31 regional buses with new, state-of-the-art vehicles that currently or previously operated an IBCAP regional bus, including Peter Pan Bus Lines, Plymouth & Brockton Street Railway Company, DATTCO, The Coach Company, Bloom Bus Lines, and Yankee Line, along with new private sector partner Greyhound.

- ✓ Greyhound: Boston, Nashua, Keene, and Brattleboro - new route, one round-trip on Friday and Sunday.

- ✓ Greyhound: Continued daily service along the following route: Springfield, Northampton, Greenfield, Brattleboro, VT, Keene, NH, Bellows Falls, VT, and White River Junction, VT. This service is being continued, in conjunction with an operating subsidy provided by the Vermont Agency of Transportation.

- ✓ Plymouth & Brockton: Plymouth, Middleborough, Taunton, Somerset, and Providence. Two new round-trips, morning and afternoon, Monday – Friday.

The new buses include the latest advances in safety and equipped with fully outfitted restrooms, increased leg room, new comfortable seating, Wi-Fi, and 110v power outlets at every seat. Carriers that receive a BusPlus+ regional bus must meet the following marketing and promotion requirements:

- ➢ Create General Transit Feed Specification (GTFS) data to allow for all regional bus service route information to be accessed via web mapping service and posted to the MassDOT Developers Page.

- ➢ Adopt the use of a universal smart phone ticketing application, to be developed by both RTD and all BusPlus+ carriers in conjunction with a private vendor.

SUSTAINABILITY

Planning for sustainability is the defining challenge of the 21st century. Overcoming deeply ingrained economic and cultural patterns that result in resource depletion, climate instability, and economic and social stress requires holistic problem solving that blends the best scientific understanding of existing conditions and available technologies with the public resolve to act. Planning processes allow communities to look past immediate concerns, evaluate options for how best to proceed, and to move towards a better future. This Regional Policy Plan has the legal authority to act as the vehicle for guiding community development, the scope to cover the necessary functions and facilities, and the history of practice to inspire public acceptance of its policies. Planning can provide the necessary analysis, the requisite communitywide reflection and education, and the momentum required to respond to these monumental challenges (Godschalk and Anderson 2012, 7).

WHAT IS SUSTAINABILITY?

Sustainability encompasses an integrated set of social, economic and environmental principles where these spheres of our community work together to provide a better future for ourselves and future generations.

Embedded in this definition is the idea that we can take actions and adopt policies that will simultaneously create an equitable society, a strong economy, and healthy environment, both for us and our children. With careful planning and by working together, we can do this without sacrificing one part of this vision for another.

Conserving resources and reducing environmental impacts can begin at home. Efficient fixtures, appliances, and landscaping can help conserve water and energy. New systems and technology provide opportunities for the reuse of wastewater. Improved indoor air quality and increased daylight contribute to better health and comfort. More efficient sources of energy allow each household to decrease the amount of carbons entering the atmosphere and can save money as well.

The key to a successful sustainability vision is identifying those overarching principles and determining how they can be translated to specific places and programs. The following set of principles are intended to guide the work of the initiative and help define what sustainability means to our region. They are expressed as a vision for the kind of region and communities we want as we move forward into the 21st century.

WHAT MAKES A SUSTAINABLE PLACE?

Planning for sustainable places is a dynamic process through which communities plan to meet the needs of current and future generations without compromising the ecosystems upon which they depend by balancing social, economic, and environmental resources, incorporating resilience, and linking local actions to regional and global concerns (Godschalk and Anderson 2012, 4).

A Sustainable Place is where the use of resources resulting in emissions of greenhouse gases and other pollutants are going down, not up; where the air and waterways are accessible and clean; where land is used efficiently and shared parks and public spaces are plentiful and easily visited; where people of different ages, income levels and cultural backgrounds share equally in environmental, social and cultural benefits; where many needs of daily life can be met within a 20-minute walk and all may be met within a 20-minute transit ride and where industry and economic opportunity emphasize healthy, environmentally sound practices.

A model for sustainable communities includes neighborhoods sporting healthy amounts of green space and shared vegetable gardens; mass transit; biking and walking replacing the majority of automobile traffic; and mixed-use communities where schools, residences and commercial spaces are near each other and are powered by solar panels, geothermal heat pumps or windmills.

Sustainable communities are economically, environmentally and socially healthy and resilient and meet challenges through integrated solutions rather than through fragmented approaches. Sustainable communities take a long-term perspective, focusing on both the present and the future, well beyond the next budget or election cycle so that the needs of the current as well as future generations are met with adequate resources. The success of a community's efforts to be sustainable depends on its members' commitment and involvement as well as leadership that is inspiring, effective and responsive.

Sustainability is a process of continuous improvement so communities constantly evolve and make changes to accomplish its goals.

CREATING SUSTAINABLE PLACES PRINCIPLES

The process of creating Sustainable Places is guided by a set of principles, adopted by the Council, that address the elements of a sustainable community which include; equity, environment, economy, healthy community and responsible regionalism. These principles should be reflected in plans, projects, and implementation strategies. The principles serve as a guide for municipalities in our region working toward a more sustainable future.

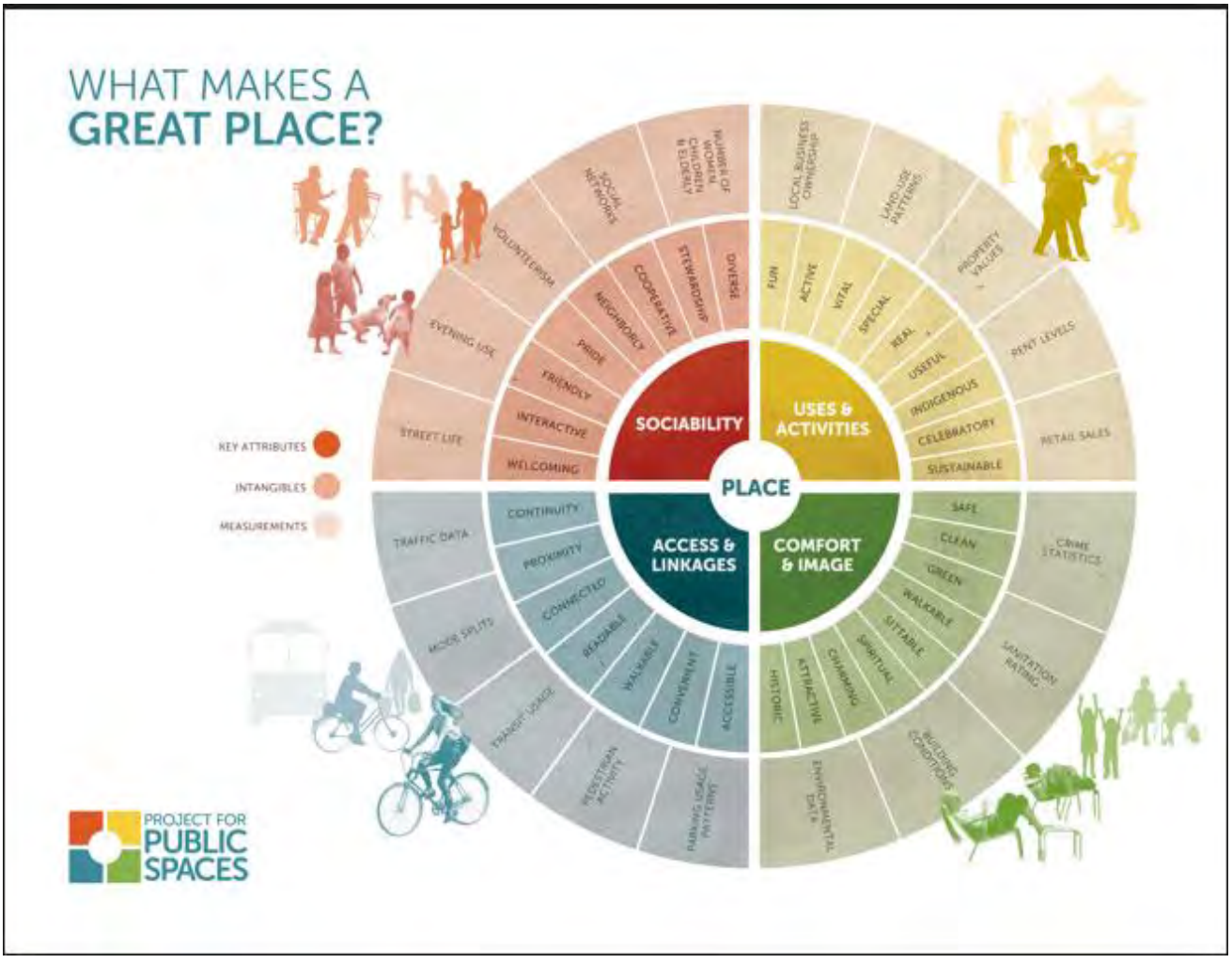


Figure 14: What Makes a Great Place?

EQUITY

Residents of all races, economic means and abilities are welcome and equipped to participate in all aspects of community life. A region is most likely to be sustainable, and nationally and globally competitive, if all residents are active participants in its economy, community and public life. Equity includes providing fairness in housing, services, health, safety and livelihood needs of all citizens and groups.

ENVIRONMENT

The environment and our natural resources assets are preserved, protected and restored under the sustainable planning approaches. Natural assets such as wetlands and open space provide benefits, including clean air and water that are essential for the health and vitality of the region's residents and neighborhoods. In addition, elements of the built environment – including land use, transportation, housing, energy, and infrastructure – should work together to provide sustainable, green places for living, working and recreating, with a high quality of life. The contributions of natural resources to human well-being are explicitly recognized and valued and maintaining health is a primary objective.

ECONOMY

A competitive, robust economy is supported and promoted by fostering innovation, supporting quality education, and enhancing access to quality jobs. A sustainable region requires a productive, resilient, adaptable, and innovative economy. Full participation in the economy by a well-educated workforce with easy access to next-generation job opportunities strengthens the economy, increases quality of life, and makes the region more sustainable. Increasingly, the strength of a region's economy is measured by how well it competes across the country and the world, not by how much it competes within itself. The Plan strives to ensure that the community is prepared to deal with both positive and negative changes in its economic health and to initiate sustainable urban development and redevelopment strategies that foster green business growth and build reliance on local assets.

HEALTHY COMMUNITY

This Plan strives to ensure that public health needs are recognized and addressed through provisions for healthy foods, physical activity, access to recreation, health care, environmental justice, and safe neighborhoods.

RESPONSIBLE REGIONALISM

The Plan strives to ensure that all local proposals account for, connect with, and support the plans of adjacent jurisdictions and the surrounding region.

VIBRANT, CONNECTED AND GREEN COMMUNITIES

OVERARCHING GOAL: CREATE HEALTHY COMMUNITIES THAT ARE VIBRANT, CONNECTED AND GREEN.

A healthy community keeps its air and water clean. It recognizes the delicate balance between its natural systems and its man-made systems. A healthy community makes sure reasonable measures are in place so that the natural systems and man-made systems work together to maintain a healthy environment. A Healthy Community supports the fitness and nutrition of its residents and provides opportunities for active living (sidewalks, bike paths).

VIBRANT, CONNECTED AND GREEN PLACES ARE SUSTAINABLE PLACES THAT ARE ENDURING, RESILIENT AND ADAPTABLE, THEY ARE PLACES THAT STAND THE TEST OF TIME AND WILL BE AS ATTRACTIVE 50 YEARS FROM NOW AS THEY ARE TODAY. Sustainable places provide every resident with a high quality of life without harming our ability to do the same for future places.

Figure 15: Vibrant, Connected, and Green

VIBRANT SUSTAINABLE PLACES ARE CHARACTERIZED BY:

REINVESTMENT

Investment in existing communities and neighborhoods ensures that they remain or become vibrant, connected, green places.

TRANSPORTATION CHOICES

Travel choices help reduce family transportation costs, reduce air pollution, and connect families to jobs and services.

HOUSING CHOICES

Housing choices for all ages, lifestyles, incomes, races and ethnicities help connect families and jobs and support a robust economy and healthy housing industry.

DEVELOPMENT IN CORRIDORS AND ACTIVITY CENTERS

Vibrant corridors, with housing, employment, and commercial development, support public transportation, create new development opportunities, provide increased lifestyle choices, make efficient use of existing public and private assets, and help knit the region together.

DESIGN FOR HEALTHIER LIFESTYLES

Places designed for healthier lifestyles and access to healthy foods improve the health of residents, reduce health-care costs and contribute to vibrant neighborhoods.

PRESERVATION OF UNIQUE COMMUNITY CHARACTERISTICS

Distinctive communities and historic and cultural assets increase the vibrancy of the region and contribute to its overall economic health.

RESOURCE CONSERVATION AND ENERGY EFFICIENCY

Sustainable places conserve resources for future generations and simultaneously reduce costs and increase economic and fiscal efficiency.

BUILDING A SUSTAINABLE COMMUNITY THAT MEETS THE NEEDS OF A GROWING REGION

Reducing greenhouse gas emissions, given the potential consequences of climate change, will help build a more sustainable future globally. The path toward sustainability requires lowering these emissions locally, combined with other strategies.

Sustainability planning and decision making are associated with a framework in which environmental protection and restoration, social equity and public well-being, and economic prosperity are addressed simultaneously, in an integrated way. Sustainability emphasizes achieving multiple benefits that advance multiple goals and objectives. Creation of frameworks for cooperation and collaboration that recognize holistic effects of development choices for the environment, social equity, and economic well-being are parts of sustainable planning. Planning for sustainable places includes a dynamic, democratic process through which communities plan to meet the needs of current and future generations without compromising the ecosystems upon which they depend by balancing social, economic, and environmental resources, incorporating resilience and linking local actions to regional concerns.

There are seismic shifts in thinking about how to grow, and new perspectives about how our region should invest in public transit, roads and highways, and other transportation infrastructure. It is becoming clear that people need more options for getting around than just the car. This is the basis of the current transportation network.

New transportation investments will help us improve existing infrastructure with technology designed to help cut congestion and travel times. Strengthening our public transit system and other transportation choices where most of us live and work, meanwhile, will give us more options for getting around. In the MBTA system as a whole, the half-mile radii around rapid transit and commuter rail stations, representing just 5 percent of the region's land area, hold 25 percent of its people and 37 percent of its jobs, and generate a disproportion and growing share of its real property valuation.

As we look to the future, we can learn about new modes of transportation and mobility that are being studied and in some case implemented around the world. Some of these ideas may work in our region. They may also be more cost-effective than other transit infrastructure investments. Future studies will assess the alternatives to existing transportation routes in several corridors.

Strategies include:

- A land use pattern that accommodates our region's future employment and housing needs, and protects sensitive habitats, cultural resources, and resource areas.
- A transportation network of public transit, highways, local streets, bikeways, and walkways built and maintained with reasonably expected funding.

- Managing demands on our transportation system (also known as Transportation Demand Management, or TDM) in ways that reduce or eliminate traffic congestion during peak periods of demand.
- Innovative pricing policies and other measures designed to reduce the number of miles people travel in their vehicles, as well as traffic congestion during peak periods of demand.
- Sustainability and Resilience*:* The capacity to prepare for, navigate through, and recover from turbulent change. Can refer to responses to both natural and human caused disasters and threats (earthquakes, sea level rise).
- Sustainability and Livability*:* Sustainability is an extension of livability. Livability connotes aspects of "quality of life". A concept used in planning for designing infrastructure and facilities to fit better in urban contexts, while also achieving certain mobility needs.

THE FOLLOWING DESCRIBE OUR PATH TOWARD SUSTAINABILITY IN CONCRETE STRATEGIES WE CAN UNDERSTAND AND BUILD UPON.

- *FOCUS HOUSING AND JOB GROWTH IN URBANIZED AREAS WHERE THERE IS EXISTING AND PLANNED TRANSPORTATION INFRASTRUCTURE, INCLUDING TRANSIT.* As local jurisdictions continue to update their comprehensive plans, they should be encouraged to continue to embrace *climate-smart* land use policies and sustainable development. The Region should identify places with the potential to focus future high-density, mixed-use, and compact-walkable developments close to job centers, public services, and transportation access in areas of the region already served by water, sewer and other public amenities.
- *PROTECT THE ENVIRONMENT AND HELP ENSURE THE SUCCESS OF CLIMATE-SMART LAND USE POLICIES BY PRESERVING SENSITIVE HABITAT, OPEN SPACE, CULTURAL RESOURCES, AND FARMLAND*. These open space lands include habitat conservation areas, parks, steep slopes, farmlands, floodplains, and wetlands. Complementing plans for how our urbanized areas will develop protects parklands, open space, natural resource areas, and farmland.
- *INVEST IN A TRANSPORTATION NETWORK THAT GIVES PEOPLE TRANSPORTATION CHOICES WHILE REDUCING GREENHOUSE GAS EMISSIONS.* Our goal for a more sustainable future is one in which fewer people have to drive alone, and more people have increased travel choices available to them. These choices will include an ever-expanding, more accessible, and more convenient public transit system: carpooling; ridesharing, and more interconnected networks of biking and walking paths.

CLIMATE SMART COMMUNITIES

A Climate Smart Community believes that climate change poses a real and increasing threat to our local and global environments and is primarily due to the burning of fossil fuels. THEY BELIEVE THE EFFECTS OF CLIMATE CHANGE WILL:

- Endanger our infrastructure, economy and livelihoods;
- Harm our farms, orchards and ecological communities, including native fish and wildlife populations;
- Spread invasive species and exotic diseases, reduce drinking water supplies and recreational opportunities;
- Pose health threats to our citizens;
- Provide us with an unprecedented opportunity to save money, and to build livable, energy-independent and secure communities, vibrant innovation economies, healthy and safe schools and resilient infrastructures;
- Require the scale of greenhouse gas emissions reductions for climate stabilization contain a sustained, substantial effort; and
- Require adaptations by communities to the effects of climate change for decades to come even if emissions were dramatically reduced today.

Our Climate-Smart Cities™ process bring together a team of experts to research, design, and build the infrastructure and tools that help increase our resilience to climate change. Our strategy is to:

Trails and transit lines provide carbon-free transportation and link residents to popular destinations and each other.

Shady green spaces reduce the urban "heat island" effect, protect people from heat waves, and reduce summer energy use.

Water-smart parks, playgrounds, and green alleys absorb rainfall, reduce flooding, and recharge drinking water supplies while saving energy for water management.

Shoreline parks and natural lands protect vulnerable infrastructure, neighborhoods, and residents from coastal and riverine flooding.

Figure 16: Climate Smart Strategies

MEMBERS OF CLIMATE SMART COMMUNITIES PLEDGE TO:

1. *Set goals, inventory emissions, plan for climate action.*
2. *Decrease community energy use.*
3. *Increase community use of renewable energy.*
4. *Realize benefits of recycling and other climate-smart solid waste management practices.*
5. *Reduce greenhouse gas emissions through use of climate-smart land-use tools.*
6. *Enhance community resilience and prepare for the effects of climate change.*
7. *Support development of a green innovation economy.*
8. *Inform and inspire the public.*
9. *Commit to an evolving process of climate action.*

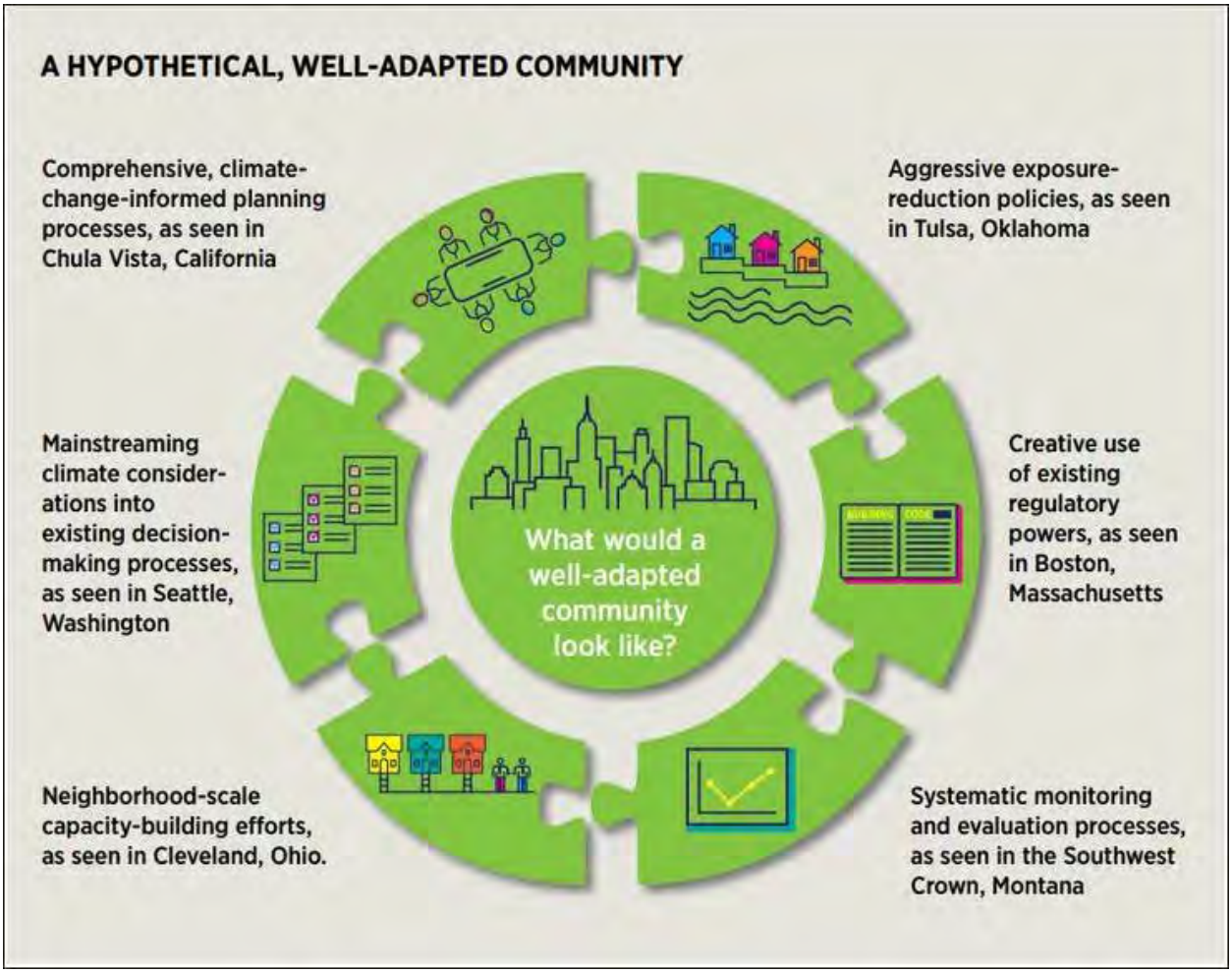


Figure 17: A Well-Adapted Community

LIVABLE CENTERS

Livable Centers are places where people can live, work and play with less reliance on their cars. Livable Centers, with concentrations of residential and employment, support more trips by foot, bicycle, transit or carpool. The ideal Livable Center works to curb traffic congestion by reducing vehicle miles traveled (VMT), single-occupant vehicle trips and offering attractive alternatives through promoting walking, cycling, and public transportation.

Other points of consideration which compose a Livable Center include:

- Improved environmental quality.
- Stronger sense of community.
- Continued economic development.
- Encourage mixed but complementary uses.

- Promote physical integration of urban development, either vertically or horizontally.
    - Horizontal integration refers to linking related topics such as land use, environmental planning, mobility and economic development. Smart mobility efforts have expanded to include not only urban land use and transportation integration but also environmental resource protection, regional economic development and social equity considerations.
    - Vertical integration refers to connecting regional level efforts with federal and state level policymaking. Some aspects of regional smart growth planning are implemented through county and city level use planning and regulations.
- Encourage appropriate levels of density depending on district size and context.
- Allow people to move between destinations without having to use vehicles.
- Provide multi-modal transportation options.
- Provide adequate parking without creating oversupply.
- Promote activity throughout the day, creating balanced transit ridership.

Figure 18: Building Resilient Communities

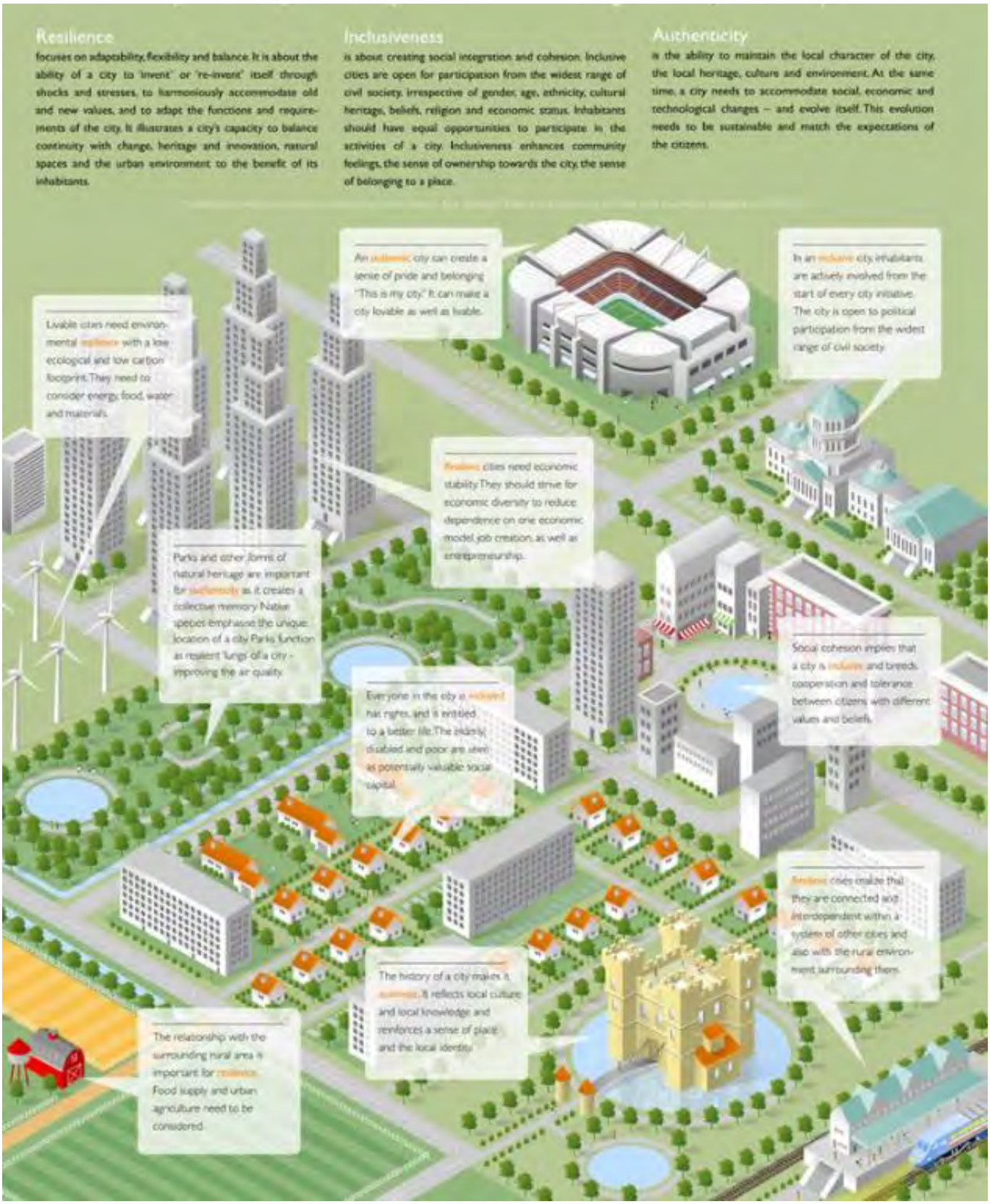


Figure 19: Livable Centers

The adoption of Streetscape Design Guidelines will promote high quality urban design by reinforcing basic principles that make a Town Center desirable and attractive for residents, employees, and visitors. The Guidelines are not intended to limit the development program, but rather to ensure that the program responds to its site context and minimizes adverse impacts to the pedestrian environment.

The intent is to ensure that each building acknowledges surrounding buildings and site characteristics, enhances the pedestrian environment, and contributes to the civic pride of the Town over the long term. In some cases, new civic buildings may be designed as an exception to the Guidelines, allowing these unique buildings to stand out within the urban fabric due to their public function and their role as landmarks for the community.

Investments in streets in the Streetscape district should prioritize walking with improvements that strengthen a pleasant and safe pedestrian experience, enhance a welcoming and attractive streetscape and encourage safe driving.

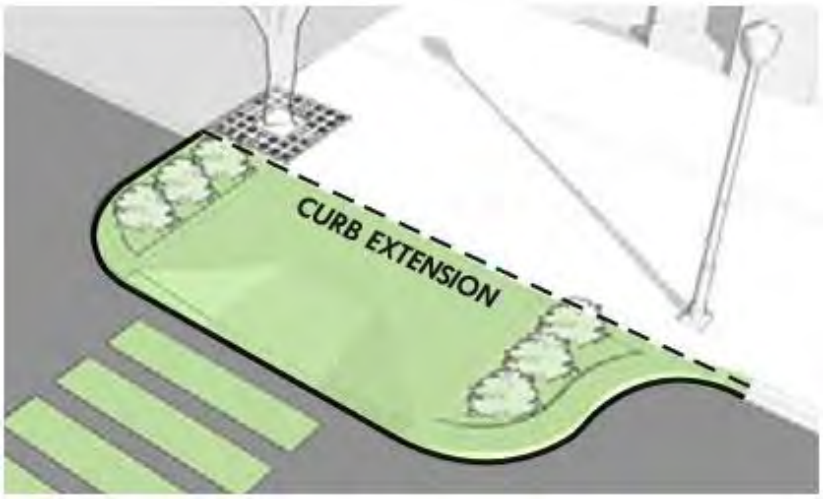
Sidewalks are the key pedestrian circulation component. They provide pedestrian access to virtually every activity and connect walking with other modes of travel, including automobiles and public transit. The pedestrian experience will play an important part in the functionality and the economic health of the community. The following are design guidelines for sidewalks and pedestrian treatments.

Multi-functional Sidewalks - Provide generous and multi-functional sidewalks that are safe, accessible, and visually engaging. Three distinct zones should provide adequate space for circulation with a minimum clear width of 5 feet, adequate space for utilities, streetscape, and

amenities and adequate space for activity in front of the building. These three distinct zones should be accounted for in the overall width of the sidewalk.

1. Sidewalks should have a "*circulation zone*" that is kept clear of street furniture, landscape features, and other fixtures/obstructions. A minimum of five feet – preferably eight feet – should be reserved to allow for two people to walk comfortably side by side in compliance with the American Disabilities Act (ADA) requirements.
2. Sidewalk surfaces should be stable, firm, smooth, cleanable and slip-resistant.
3. Sidewalk paving pattern, color, and material should continue when driveways/curb cuts intersect. Where pedestrian circulation paths come in contact with vehicular circulation paths, crossing should clearly delineate a continuous pedestrian path (material change, contrasting color, or slightly raised surface).
4. Design features such as enhanced paving on walkways, landscaping, and lighting should be used to distinguish the pedestrian route from the vehicular route.
5. Sidewalks shall be well maintained, kept free of litter and cleaned regularly.
6. On-street parallel parking, or diagonal parking, raised planters, and landscaping planting strips should be used to define the sidewalk edge and provide a buffer between pedestrians and moving vehicles.
7. Planting areas, bike racks, street lighting, transit furnishings, newspaper racks, and other street furniture should be contained in the "*amenity/utility zone*" located between the sidewalk and curb to keep the "*circulation zone*" free for walking.
8. Raised planters adjacent to hard surfaces should be fitted with skateboard deterrent devices that are tamper-proof, safe, attractive, designed to minimize liability and blend in with the character of the site.
9. Where appropriate, seating and outdoor dining opportunities can be accommodated in the area between the "*circulation zone*" and the building frontage, depicted as the "*building activity zone*."

Crosswalks – Pedestrian crossings are critical components of pedestrian mobility. On high volume streets, pedestrian crossings should be located at signalized intersections. Valuable improvements may include accent paving, additional landscaping, directional signs where appropriate, sidewalk extensions, and selected street furnishings consistent with the guidelines.



The following are design guidelines for crosswalk treatments:

1. *Crossing distances should be minimized to the greatest extent possible*. Uninterrupted pedestrian crossings without a central refuge island should be limited to a maximum of fifty feet.

2. Extensions of the sidewalk into the roadway at crosswalks are called "*bulb-*

outs" or "*curb extensions*" and are designed to give pedestrians greater visibility as they approach the crossing. Bulb-outs decrease the distance users must cross as well as slow traffic. Sidewalk bulb-outs should be used where feasible given the requirements of traffic volumes and specific storm drainage conditions. Landscaping in bulb-outs should be kept under 18 inches for driver and pedestrian visibility.

3. Pedestrian crosswalks should be adequately lit, have clear sight distances, and be free of obstructions.
4. Countdown pedestrian walk-signals should be employed at intersections with high vehicular and pedestrian traffic.

Special paving treatments communicate to individual users that the crosswalk is part of pedestrian space, not an encroachment by pedestrians into the roadway. Paving, texture, and color treatments are especially important in places where it is important to make pedestrian more comfortable crossing.

Sidewalk Seating Areas – Strengthen a sense of community and sense of place through the integration of modest plazas and seating areas throughout the district that are part of the design of the frontage of a private property and combined with the multi-functional sidewalks.

Pedestrian Landscape Buffers – Strengthen the walkability of the district by buffering pedestrians from vehicular traffic with landscaping buffers either at the curb or between sidewalks and parking areas, or both, where applicable. Interrupt large areas of paving where the street, sidewalk and parking are adjacent.

Visible and Well-marked Crosswalks – Enhance the pedestrian safety of the district with visible and well- marked street crossings and driveway crossings. The change in materials should be easily maintained and used to indicate pedestrian right-of-way through painted crossings or a change in paving materials.

Safe and Short Crossings - Add curb extensions to enhance the pedestrian safety of the district. The curb extensions reduce the street crossing distance for pedestrians, reduce the speed of

turning vehicles and add sidewalk space for additional amenities and landscape. Curb extensions should be used at intersections, mid-block crossings, or in locations where added sidewalk width would benefit the site frontage, sidewalk activities or provision of landscape. Also, reduce vehicular travel lane widths, center medians, turn lanes, or other components that contribute to wide street crossings.

Welcoming Streetscape – Strengthen a district-wide approach to thoughtfully designed landscape that is appropriate to the context of the building and surrounding streetscape. Public and private investments should be coordinated and integrated to provide consistent street trees at a spacing of no more than 35 feet per tree. Other planting beds, potted plants, or streetscape features should reinforce a consistent district feel through uniform placement to define sidewalk activity areas and buffer pedestrians from vehicles and harmonious species of streetscape plantings. Private investments in bike rack, trash receptacles, benches, lights, or other amenities should also be coordinated and integrated with public investments in the district.

Reduce Curb Cuts – Strengthen the walkability of the district by placing priority on the continuity of sidewalks and crosswalks and clearly defining the places in which pedestrian and vehicular circulation overlaps. Reduce the frequency and width of curb cuts that interrupt the sidewalk for vehicular circulation.

Durable Materials – Select materials for quality, durability, and climate. Match or complement adjacent materials and coordinate between public and private investments to reinforce continuity of the community character. The communities of the region will have many choices among materials and elements that will compose the improved streetscape. As they continue with the process of designing the streetscape

improvements, the participants will need to determine the approach that best matches the community character that they wish to reinforce.

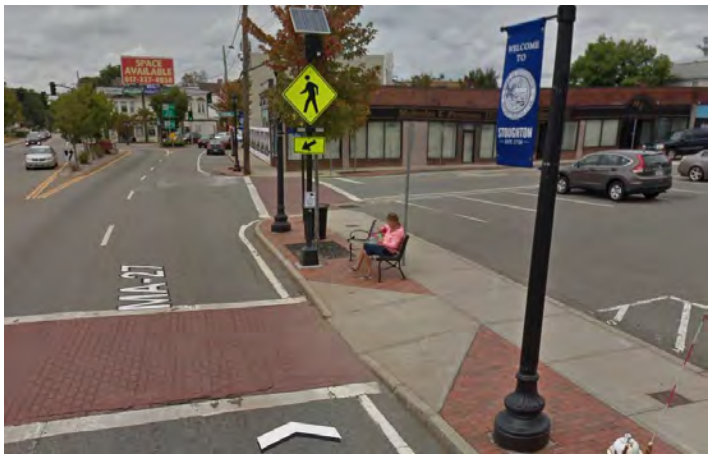
Street Furniture Palette – Street furnishings not only serve a utilitarian function but also improve the aesthetic quality of the public realm. Street furnishings include all items placed within the public right-of-way, such as street lights, benches, bus shelters, bollards, trash receptacles, planters, tree grates/guards, bicycle racks, kiosks, and newspaper racks. Proper design and placement of street furnishings is extremely critical, and when properly executed, has the power to unify and bring new life to the community.

Islands and Medians – The traffic islands and medians can be designed to provide visual relief and differentiation from the surrounding asphalt. Island and medians can be designed with unit pavers or patterned colored asphalt. If adequately wide, the islands and medians can contain plantings, including street trees. As defined islands beside crosswalks, pedestrians are provided with a refuge if they do not proceed all the way across the street. Many of the planters can be sponsored by area businesses or organizations. Portions of Route 138 and 27 have these improvements (see below).

Curb cuts – There are a number of curb cuts that are needed to provide access to drives, parking areas, and service entrances. Rather than continuing asphalt paving through the curb cut, the paving should have a continuous concrete paving, set at the same level as the driving surface. This treatment provides a visual signal that pedestrians are present and expected to have safe passage across the curb cut areas. The width of the curb cuts should be minimized wherever possible to constrain the circulation of vehicles in deference to the pedestrian environment.

Street lighting – Street lighting technology today provides opportunities to tailor the lighting levels in different locations, even though the same light posts and fixtures are employed. In general, the areas along shops and at intersections should have high lighting levels, while the areas in between can be stepped down to lower levels. Fixtures can be used to highlight architectural features, or significantly limit the spillover onto surrounding buildings and structures.

Accessibility and handicapped ramping – The design must comply with contemporary standards for accessibility and should incorporate best practices. This now includes provision of textured materials at crosswalk ramps, and care in the placement to avoid potential problems at the top or bottom of the ramps.



Street trees and plantings – The streetscape should be augmented with strategically located street trees and plantings. The design process should consider where new trees and plantings can best occur.

Green Building – The Town encourages all builders and developers to consider environmental impact with every new development and renovation project. As part of the planning process, the U.S. Green Building Council's Leadership in Energy and Environmental Design (LEED) certification guidelines should be consulted to determine the practicality of green construction. Whenever possible, LEED guidelines should be incorporated into design plans to reduce environmental impact and promote energy efficiency and cost savings.

Green Infrastructure – Green Infrastructure is a system where stormwater runoff is slowed, infiltrated, used, and/or treated using vegetation, soils, and natural processes to manage water runoff and create healthier environments. Green Infrastructure is a cost-effective, resilient approach to managing wet weather impacts that provides many community benefits. Green Infrastructure reduces and treats stormwater at its source while delivering environmental, social and economic benefits. Permeable pavement, soil amendments, enhanced infiltration, and underground stormwater storage systems can be used to mitigate drainage problems or nuisance flooding in parking areas and walkways. Addressing issues of standing water on pavement or in low-lying areas improves public safety and helps to eliminate mosquito breeding habitat. Stormwater planters better enable stormwater to slowly drain into the ground, reducing stormwater runoff, flow rate, volume and pollutants, and recharging groundwater supplies.

Green Streets – Green Streets refer to streets designed with green infrastructure features to allow rainwater flowing over buildings, streets, and parking lots to soak into the ground and be filtered by soil. This reduces the quantity of water and pollutants flowing into storm drains and local rivers. Green streets are created by integrating green infrastructure elements into their design to store, infiltrate, and evapotranspire stormwater. Permeable pavement, Bioswales, planter boxes and trees are among the elements that can be woven into street design. Green streets combine more than one feature to capture and treat stormwater.

SITE DESIGN GUIDELINES

Site investments should prominently position positive features, conceal negative aspects of a property, and reinforce a sense of community through thoughtful response to the patterns of neighboring properties.

Strengthen the Street Frontage - Design the primary orientation of the site and building to define the street frontage of the property. This definition is created through the placement of the building on the site, building entries, storefront windows, and signage. Parking should not be a part of the street frontage with a location in the rear of the building or setback behind a generous landscape buffer.

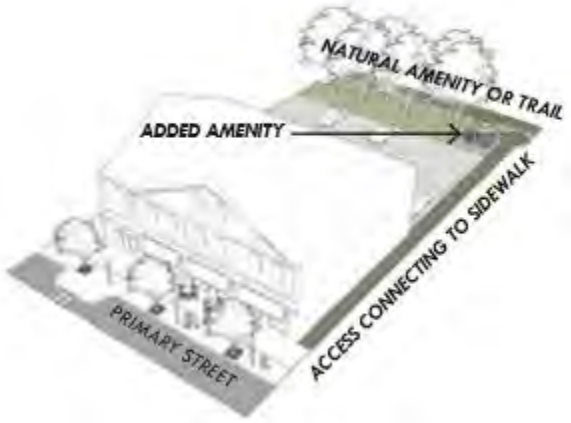
Define Site Entry and Exit – Reinforce the site patterns of circulation for the site through clearly defined sidewalks, paving patterns, curbed driveways, landscaped beds and features, signs, or other means to guide pedestrian and vehicular access to the site and building entries and exits.

Minimize Parking Visibility – Design the site to place all parking areas to the rear of buildings. Minimize the visual impact of parking on the district and position buildings to more directly contribute to the character and pedestrian orientation of the district.

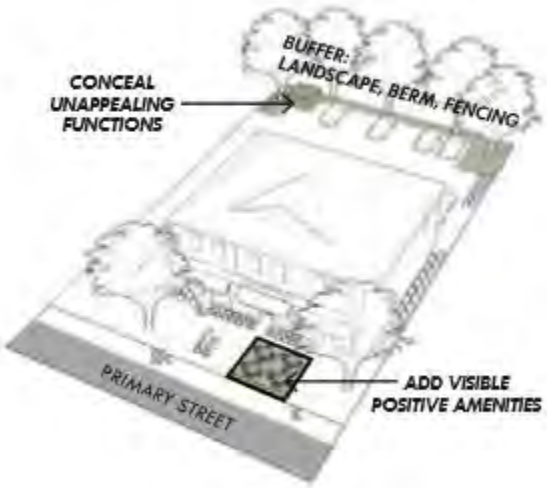
Respect the Neighboring Context – Relate the pattern of building and site layout to abutting properties to create similar building setbacks and street frontage conditions. Do not emulate existing patterns that are discouraged by these guidelines, for example, by relating to a property that places all of its parking in front of the existing building.

Strengthen Recreational Connections – Design site circulation to strengthen connections to parks, riverfront trails, rail trails or other community amenities that connect to or that are nearby the property.

Expand Positive Amenities – Use unused corners or edges of the property to expand positive amenities with new small plazas, sitting areas, landscape areas, or locations for public art. Redeveloped properties should be designed to use the site as efficiently as possible to strengthen the district vibrancy and amenity.



Conceal Unappealing Functions – Design site layout to minimize impact, visibility, and public view of parking areas, service areas, loading docks, dumpsters, utilities, or other utilitarian functions of the property. The site layout should place these components to the rear of the building and buffered with site landscaping and fences.

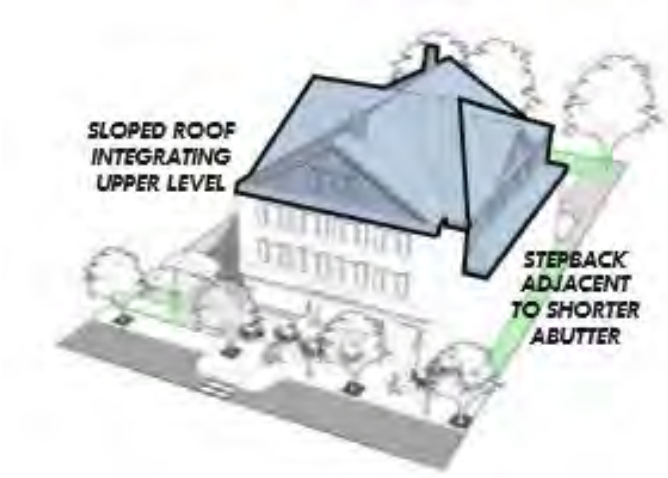


Optimize Sloping Sites – Design site layouts to take advantage of topography that may naturally slope. The lower portion of slopes should be used to the advantage of the property by concealing parking, services or loading areas below street level.

BUILDING DESIGN GUIDELINES

Building investments in each community should strengthen and reinforce the intimate and historic scale of the region and contribute to the vitality, activity, and continuity of a walkable place.

Sensitive Building Size and Shape – Respect the historic context of the community that includes modestly sized stores and houses. The building size and building form of future development should be sensitive to this context. Typically, the width of historic buildings was no more than 40 feet. This should be reflected in new building massing to reinforce the modest scale of the district. While a building may be larger, the plan and shape of the building should reduce larger lengths into bays of no more than 40 feet.



Sensitive Building Height – Respect the historic context of the community that includes a context of primarily one and two story houses, and stores. The building height of future development should be sensitive to this context, while creating opportunities for buildings taller than one and two stories. New buildings which are taller than surrounding buildings should respect neighboring properties by stepping down a portion of the building near property lines or providing a step back at the upper levels to reduce the visual impact.

Interesting Rooflines - Reinforce the village aesthetic with interesting and sloped rooflines. Most of the historic buildings and historic photographs of the region reflect a relatively consistent application of sloped roofs that should be a part of the character of future buildings. Flat roofs or parapet roofs are not consistent with the village character and are discouraged. Sloped roofs should be used to reduce the overall perceived height of taller buildings by integrating the upper most floor within the slope of the roof.

Building Orientation – Strengthen district continuity with the orientation of buildings. All aspects of the building should reinforce an orientation to the primary street or streets on which it is located. The primary façade, building entries, placement of the building on the property, location of signage, and location of storefront windows should all reinforce an orientation toward the street and a framing of the street frontage to create a sense of enclosure and continuity of the street wall.

Leverage Historic Structures – Respect and reinvent original structures, if redevelopment involves a property with historic structures. The preservation or restoration of an existing or historic structure or adjacency to a historic structures should result in redevelopment that is respectful and deferent to the original building or portion of the building retained. The past legacy of the Town Center should be elevated through thoughtful reuse of structures.

Strategic Modifications – Respect and reinvent original structures through strategic additions that will enhance the visual interest and reinforce the modest scale of the district. Minor modifications to existing structures should be used to better align them with the quality and character of the future district with new roof features, dormers, window bays, cupolas, storefronts, awnings, porches, or other strategic modifications and additions.

Preserve Variety of Uses – Reinforce the community as a neighborhood center. At minimum, space should be provided on the ground floor for a mix of uses that would complement the neighborhood center. Additional residential uses may be part of future redevelopment, but residential uses should not completely eliminate all other uses in the center.

FAÇADE DESIGN GUIDELINES

Investments in building facades should improve character and quality of the community by elevating design, enhancing materials, and increasing the visibility of vibrant activity.

Define Façade with Detail – Reinforce district architectural patterns characterized by understated and simple façade details that are constructed of high quality materials and finishes that are durable. The focus of façade details were typically designed to draw attention to doors, windows, ground floor levels, cornices, and eaves. Façade details and materials should also be used to break down large scale facades by dividing them into a pattern of smaller bays.

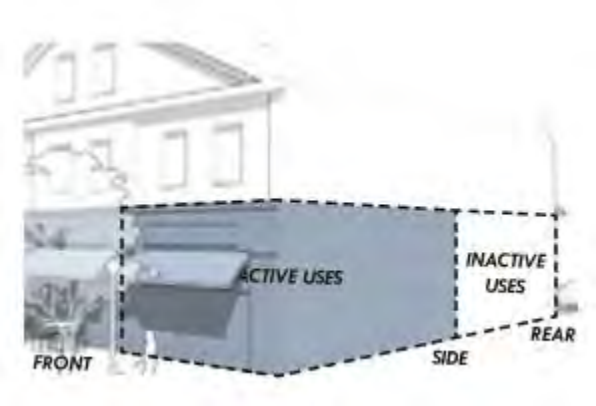
High Quality Materials – Employ authentic natural materials such as brick and stone for the exterior of structures and landscape features. Construct windows, storefronts, and public doorways of wood where possible. Any synthetic materials should be as close in appearance and detail to the natural material it simulates.

Façade Organization – Divide the façade vertically into a base, middle, and top to emulate historic façade patterns. The base of the building providing a visual anchor for the structures while displaying ground floor activity. The middle portion reflecting the different use of upper floors, often with smaller, regularly spaced windows and different façade materials. The top of the building typically designed as a transition to the roof or integrated with the roof.

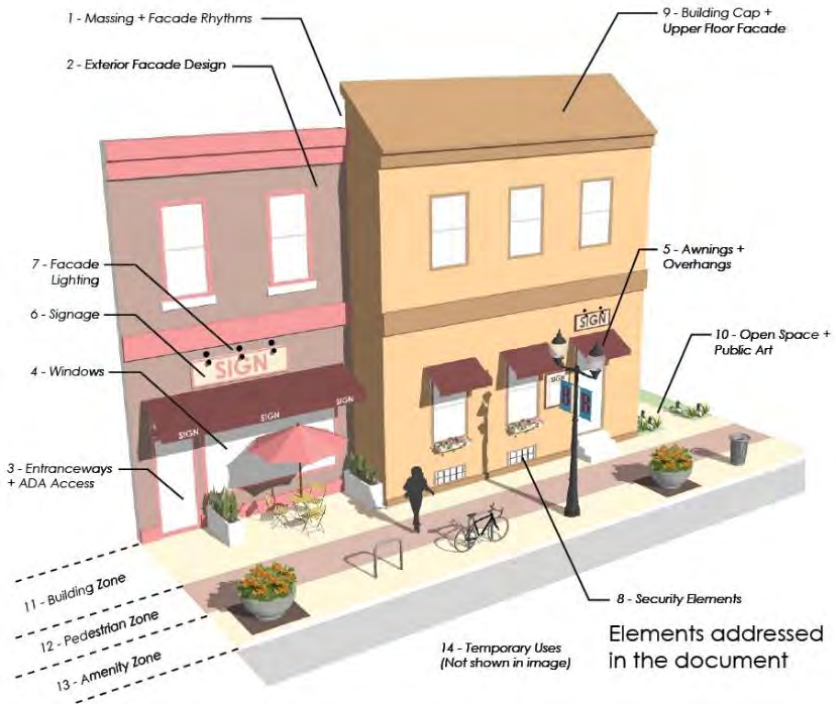
Local Character – Emphasize the local character of the district with façade design, details, and colors, including prioritizing local character over national franchise colors or other standardized design features.

Active Ground Floor Uses – Strengthen the vibrancy of the district with activity and visibility of that activity at the ground level facing primary streets. This activity traditionally includes shops, businesses and restaurants, but may also include residential lobbies, community rooms, exercise rooms, cafes, or art gallery spaces, among others. Transparency should be provided through storefront widow systems.

Ground Floor Storefront Windows – Increase the visibility of active ground floor uses to contribute to district vibrancy. The ground floor of buildings should include a higher percentage of transparent windows, typically at least 60%. These ground floor storefront windows are typically more frequent, if not continuous and taller, matching a ground floor which is typically taller than other levels. Glass in the storefront should be clear, as opposed to reflective, tinted, or mirrored.



Future Active Interior Activities – Arrange the building program and interior activities to display the most active portions of the program at the ground floor street level. The most active uses should be oriented to the primary street on the ground floor with a storefront window. The least active uses should be oriented to the rear or side of the building. No blanks, walls greater than 20 feet, devoid of windows, doors, or other features should be visible from the street.



LANDSCAPE DESIGN GUIDELINES

Landscaping in the public right-of-way, including street trees, medians, parkways (landscaped strips between the street and sidewalk), and accent plantings, improves the appearance of roadways, complements private properties, and unifies the area. Plant materials and hardscaping should be easy to maintain, set the proper tone, be appropriate to the locale, and blend with other uses in the area. Landscaping can be used to frame, soften, and define important structures. Safety and environmental impacts should be considered when selecting and locating trees and other landscaping elements.

Urban "*greening*" is a key feature of redevelopment activities and, while this effort is not always "green" in the traditional sense, the focus of landscaping should be to create comfortable and attractive pedestrian spaces. The addition of appropriate street trees alone can be the single biggest improvement to a revitalized community.

Landscape Details – Integrate landscape components thoughtfully into the site with focus on the location of plantings, selection of plantings, integration with hardscape features, and integration with other amenities such as outdoor seating, benches, bicycle racks, fences, lighting, and trash receptacles.

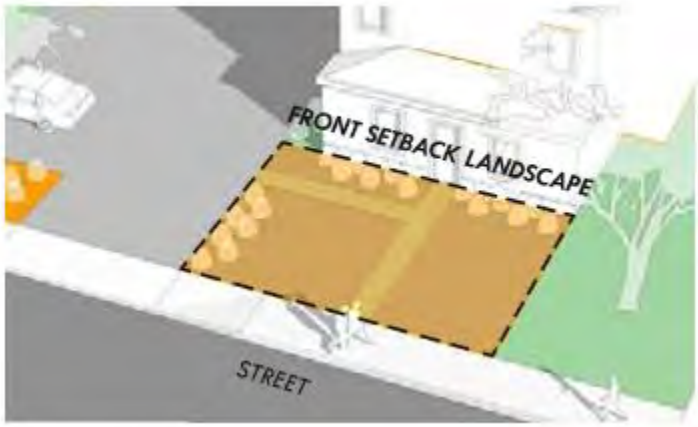
Site Lighting – Use simple lighting of landscape and site features to enhance the overall evening and night appearance of the district and to highlight district features. Lighting should be energy efficient, pedestrian-scaled, and dark-sky compliant (full cut-off lighting) that focuses illumination downward or directly onto the highlighted feature. Ornamental street light fixtures should be selected to match light fixtures used in the area.

Landscape Integration – Coordinate private landscape investments at the property frontage with public and abutting investments. This approach should link seamlessly to adjacent properties and provide an opportunity for enhanced landscaped features. Additional landscape should be provided to supplement public investments to define areas for sidewalk seating or frame building entries.

Street Trees – Street trees play a key role in establishing a unified street scene, reducing perceived street widths, and softening otherwise discordant arterials. When properly scaled, trees often make a street memorable through rich and vibrant foliage, colors, and textures. Accent trees should be used to call attention to important intersections, gateways, and other key locations. Species should be chosen for their cleanliness, ability to survive in an urban environment, and appropriate scale in relation to the built environment. Street edge trees should provide shade and cool during the warm summer months. Trees that provide attractive

fall colors, seasonal flowers, or shade are preferred. Species native or naturalized to the region are encouraged.

Building Landscape – Introduce planting features as part of the building design on building facades through the use of (1) widow boxes, (2) entry or seating area trellises, (3) vertical gardens and green walls on blank facades, and (4) foundation plantings to anchor buildings to the site.



Front Setback Landscape – Integrate landscape into front setbacks with a simple approach integrating signs with a planting bed, focal tree in the yard, and side edges that may also include denser planting or additional trees.

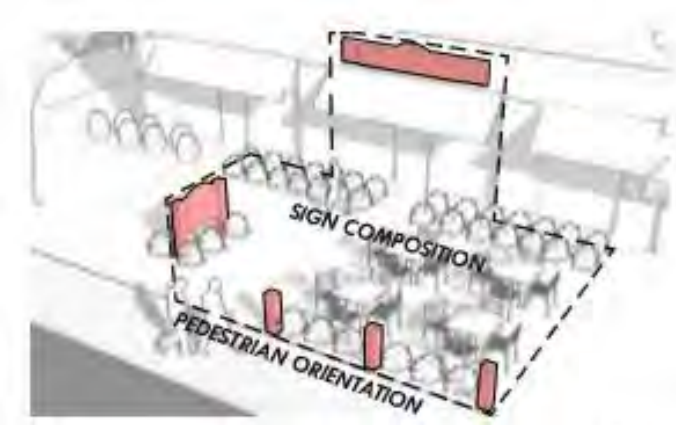
Landscape Site Features – Anchor site features or site plans with plantings that will integrate the features or signs with the overall site and landscape design. Landscape should be designed and selected as to support but not obscure the sign or site feature.

Parking Landscape – Integrate landscape into larger parking lots of more than 10 cars to reduce the visual impact of large areas of paving. Integrated landscape should replace 1 out of every 10 parking spaces with a landscape bed the size of a parking space. Landscape beds may be curbed or uncurbed and should include shrubs and trees.

Consistent Plant Species – Select plant materials to reflect the character of the district and species native to Eastern Massachusetts and appropriate to the climate conditions. Plantings selected should be low-maintenance, long-lived, hardy, and sturdy with salt tolerance when adjacent to roadways or parking lots. Landscape selections should also include native perennial pollinator friendly plants. Landscape maintenance plans should be included with landscape proposals and improvements.

SIGN DESIGN GUIDELINES

The establishment of a clear and attractive navigational (also known as wayfinding) system allows visitors to find important services and attractions. A sign program should include directional signs with arrows and labeling to denote the location of key destinations. Directional signs should reflect design materials and components of the gateway and street signs to provide consistency and unity. Signs in town centers should contribute to the vibrancy and attractiveness of the area reflecting the close-knit community, sense of pride, and historic narrative that is at the center of the neighborhood. In the long-term, consideration should be given to developing a unique street sign program for each community.



Signs to Reinforce Walkability – Select and design signs to reinforce a pedestrian scale and walkability in the district. Free-standing and auto-oriented signs should be minimized in size. Signs should be scaled to pedestrians in the district.

Integrate Signs with Design – Coordinate and integrate signs as part of the site and building design to reinforce the overall character and quality of the property. All sign elements and sign details, such as address numbers and awnings, should be consistent and integrated with the overall approach to the overall design and other signs on the property.

ALL SIGN TYPES AND COMPONENTS INTEGRATED WITH A COMMON DESIGN THEME AND MATERIALS

Sign Types – Restrict sign types to include address numbers, freestanding signs, wall signs, projecting signs, shop front window, awnings, and temporary signs.

Sign Placement – Integrate sign placement with the building design, façade design, and site design to be an integral part of the composition. All combinations of signs should be coordinated and integrated to support a single design theme and approach. Signs and awnings should coordinate with other façade features.

PUBLIC ART

Public artworks are an important element in the marketing, promotion, and economic development of a community. Public art creates a sense of place by bringing out the community's unique character. Art can be integrated into public improvements such as benches, trash containers, street lights, signs, paving patterns, fountains, and gateways. Locations for public art pieces are suggested at most public spaces such as streets, or along pedestrian passageways.

The Old Colony Planning Council is committed to expanding public art through the region. Whether publicly or privately constructed and maintained, art in the public realm enriches the lives of residents and visitors, strengthens the sense of place, and enhances the civic spirit. Public art identifies the community as a place that values its streetscape and cultural assets as enhancements to economic development initiatives. Public art indicates a town of vision and pride.

- The Old Colony Planning Council will work with both public and private entities to ensure that public art is a key component of community design. Whether integrated into development projects, incorporated into public spaces, or supported by financial contributions, public art will increasingly become a part of the region's planning. Public art reflects and respects its surroundings and also generates interest and excitement.
- Residents, particularly school children, can create decorative tiles that can be integrated into paving, benches, seating areas, walls, stairs, entries, and fountains.
- Public art should incorporate lighting to provide visibility and enjoyment during evening hours.

Public Art for Blank Facades - Integrate public art (murals, sculptures, lighting, etc.) with building facades that are blank (absent of walls, doors, or other architectural treatments). For example, shown to the left, the exterior wall of a store façade integrates a mural that features community assets.

Public Art for Utilities – Contribute and integrate public art (murals, sculptures, lighting, etc.) with utility structures or components that are part of the nearby public realm or private frontages, utilitarian in nature, and absent of decorative features. For example, utility and traffic boxes are shown with decorative finishes.

Public Art for Streetscape and Plazas – Contribute and integrate public art (banners, sculptures, lighting, etc.) with streetscape (street lights or utilities) or components that are part of the nearby public or private plazas. For example, shown to the left, banners on light posts and a metal sculpture that highlights the industrial past of a district.

Interpret History – Research and interpret the significance of buildings, sites, past events, and historic contributions of individuals or organizations through interpretive signage, commemorative plaques, or public art.

Local Character – Emphasize the local character of the district with sign design and colors, including prioritizing local character over national franchise colors, logos, or other standardized design features.

Materials and Durability – Select and design sign details and materials for durability, ease of maintenance, and consistency with the character of the building on which it is placed and the character of the district overall.

THE SUSTAINABLE COMMUNITIES STRATEGY

At the heart of this Regional Plan is a Sustainable Communities Strategy (SCS) that charts a course toward lower greenhouse gas emissions related to cars and light trucks, and proposes other measures to make the Region more environmentally sustainable. Reducing greenhouse gas emissions is a major goal for the Commonwealth and the nation. Rising emissions, chiefly carbon dioxide from the burning of fossil fuels, are increasing average temperatures around the globe. Those emissions are leading to numerous changes, including rising sea levels and shifting weather patterns. Climate scientists project that the effects of climate change include increasingly higher temperatures and more intense and frequent storms and droughts, among other consequences.

SUSTAINABILITY AND ENVIRONMENTAL PROTECTION THROUGH TRANSPORTATION CHOICES

Confronting this challenge, the Commonwealth has moved aggressively to reduce statewide greenhouse gas emissions. Massachusetts is one of a number of states that has created a legal framework to address climate change. In July of 2008, the Commonwealth became a national leader in taking action when it signed into law the Massachusetts Global Warming Solutions Act (GWSA). This legislation adopted statewide greenhouse gas (GHG) emissions limits for 2020, 2030 and 2040 that will maximize the ability of the Commonwealth to meet a 10 percent to 25 percent reduction in GHG emissions below 1990 levels by 2020 and at least an 80 percent decrease below 1990 levels by 2050; implement plans to achieve these statewide GHG emission limits; and, mandatory reporting of GHG emissions by larger GHG emitting sources and retail sellers that sell electricity in the Commonwealth. Passage of this landmark bill was a recognition that states have significant roles to play in our collective effort to reduce greenhouse gas emissions.

MassDOT is doing its part by working with state agencies to study possible impacts to key infrastructure (coastal roadways, bridges, tunnels) and to investigate ways to mitigate GHG emissions from transportation operations and facilities by searching for ways to reduce energy use, increase efficiency and encourage renewable sources of energy. Through implementation of these programs and other planning efforts, our region has for years moved toward better integrating land use and transportation plans to show how future investments will reduce greenhouse gas emissions to meet the targets.

Also in 2008, the Massachusetts legislature passed the Green Communities Act as a means to improve the Massachusetts economy and environment by increasing the use of energy efficiency and renewable energy. The Green Communities Division provides grants, technical assistance, and local support from Regional Coordinators to help municipalities reduce energy

use and costs by implementing clean energy projects in municipal buildings, facilities, and schools.

THE GREEN COMMUNITY DESIGNATION AND GRANT PROGRAM PROVIDES A ROAD MAP ALONG WITH FINANCIAL AND TECHNICAL SUPPORT TO MUNICIPALITIES THAT:

1. *Pledge to reduce municipal energy use by an ambitious and achievable goal of 20% over 5 years; and*
2. *Meet four other criteria established in the Green Communities Act.*

Participation in the Program has grown steadily since the first group of 35 municipalities achieved designation status in July of 2010 to include more than half of the diverse cities and towns of the Commonwealth and nearly two-thirds of the population. Over 200 of the Commonwealth's municipalities have earned their Green Communities designation and 72 percent of Commonwealth residents now live in a Green Community. The benefits of designation extend beyond the program itself, inspiring cities and towns to undertake additional energy-related initiatives, improve coordination between municipal staff and departments, and increase messaging with the public at large about energy related issues and actions.

Currently 12 communities within the OCPC region have received Green Community Designation and collectively received $5,657,628 in grant funding. Since the program began in 2010, DOER's Green Communities division has awarded over $85 million in grant funding to the Commonwealth's cities and towns through designation and competitive grant rounds. The Commonwealth's 210 Green Communities range from the Berkshires to Cape Cod.

Continuing the effort to reduce greenhouse gas emissions beyond the GWSA time horizon (year 2050) will require carefully crafted and aggressive policies and strategies. The effort must be a global one, far beyond the scope and control of just regional government bodies such as the OCPC.

As our region looks ahead, it will be important to consider how we can reduce greenhouse gas emission beyond the current GWSA targets as they apply to cars and light duty trucks. Progress could be made on several fronts, including:

- Expanding programs that enhance Transportation Demand Management (TDM) and Transportation System Management (TSM), making the existing transportation system increasingly efficient.
- Implementing transportation projects that provide people with alternatives to driving alone and reduce vehicle miles traveled.
- Getting more zero emission vehicles on the road.
- Increasing the availability of vehicle charging stations, in order to extend the electric range of plug-in hybrid electric vehicles.
- Providing supportive infrastructure for the operation of automated vehicles and other emerging technologies.

It is worth noting that 2050 greenhouse gas emission projections are highly uncertain, and depend on assumptions regarding the growth of our regional population and economy, increasing the utilization of clean technologies, and major changes in markets for energy and

transportation systems. To achieve the 2050 greenhouse gas emission reduction goals will require a concerted effort among federal, state, regional, and local agencies. Massachusetts lawmakers, along with many local and regional governments within the Commonwealth and beyond, are working to create innovative policies, plans, and programs to strive for a lower-carbon future. In the OCPC region, local governments and other regional public agencies are working collaboratively with local non-profits, universities, and businesses to coordinate efforts with state, federal, and international initiatives.

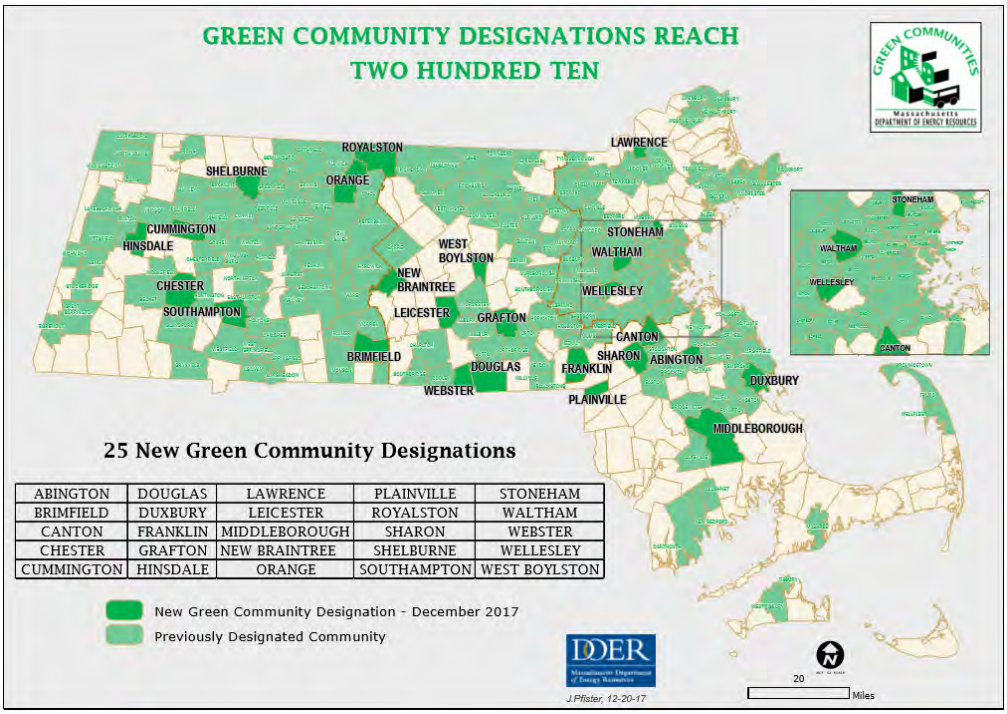


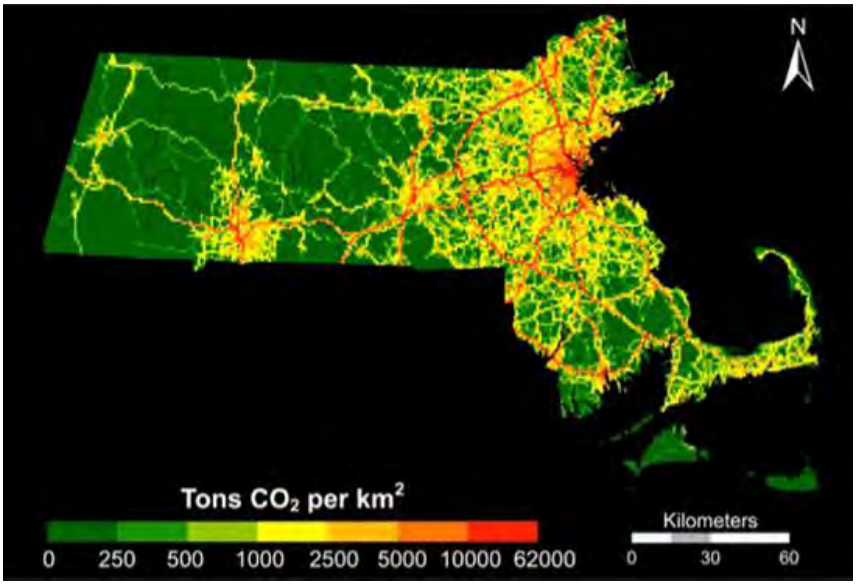
Figure 20: Designated Green Communities

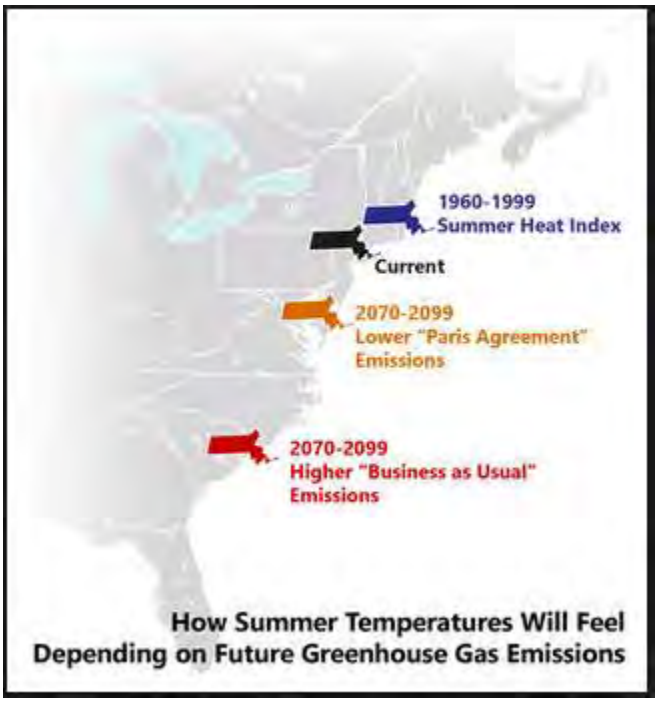
USING OUR LAND AND BUILDING A TRANSPORTATION SYSTEM IN WAYS THAT LEAD TO REDUCED GREENHOUSE GAS EMISSIONS

The legislature has mandated reductions across the Commonwealth in greenhouse gas emissions. It is also calling upon regional planning agencies to coordinate efforts that make the state more adaptable and resilient to the effects of climate change. That means supporting a strong economy, improving public health, providing more sustainable transportation and energy choices, protecting infrastructure, conserving open space and natural habitats, and striving for equal opportunities for everyone.

The OCPC is working collaboratively with local governments to reduce the production of greenhouse gases that contribute to climate change, as well as to prepare for the potential impacts of a changing climate in the region.

Land use decisions made at the local level can impact nearly all sources of emissions, for better and for worse. Development guided by smart growth principles brings people closer to more destinations. It also encourages alternative travel choices, such as public transit, carpooling, walking and biking, which cut greenhouse gas emissions and other forms of pollution. Mixed-use, compact developments, also use less water, electricity, heating, and cooling per capita. Beyond this, smart growth promotes the preservation of agricultural land, open space, and natural habitats; improved water quality regionally because more compact developments cover less land than suburban housing tracts, less air pollution, and healthier lifestyles.





ELEMENTS OF 21ST CENTURY MOBILITY

OVERARCHING GOAL: THE REGION WILL HAVE A SAFE, CLEANER, INTEGRATED, SUSTAINABLE, AND HIGHLY EFFICIENT MULTIMODAL TRANSPORTATION SYSTEM THAT SUPPORTS THE REGIONAL GROWTH STRATEGY AND PROMOTES ECONOMIC EQUALITY, ENVIRONMENTAL VITALITY, AND BETTER PUBLIC HEALTH.

GOAL: THE FUTURE TRANSPORTATION SYSTEM WILL SUPPORT THE REGIONAL GROWTH STRATEGY BY FOCUSING ON CONNECTING CENTERS WITH A HIGHLY EFFICIENT MULTIMODAL TRANSPORTATION NETWORK.

PLAN FOR MULTIMODAL TRANSPORTATION

This Regional Policy Plan is built around the concept that additional transportation infrastructure and services are to be provided to areas that accept an increased share of the region's growth. A multimodal transportation system allows people to use a variety of transportation modes, including walking, biking, and other mobility devices, as well as transit where possible. Such a system reduces dependence on automobiles and encourages more active forms of personal transportation, improving health outcomes and increasing the mobility of those who are unable or unwilling to drive. Fewer cars on the road also translates to reduced air pollution and greenhouse gas emissions with associated health and environmental benefits.

The strategy focuses on preserving and developing compact communities, directing employment and housing growth into centers, and redeveloping underutilized urban land. The region's designated centers are the most visible examples of progress in integrating land use and transportation policy. The centers strategy is devised to achieve multiple growth management goals, including the creation of an efficient transportation system that supports travel options by all modes and maximizes the benefits of system investments. Transit and non-motorized travel modes can reduce the number and length of automobile trips and are, in general, supported by higher concentrations of development and activity.

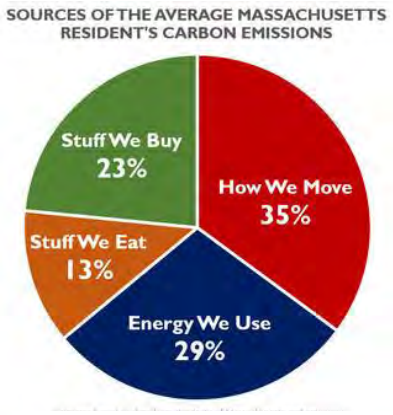


Figure 21: Sources of Carbon Emissions

A safe and efficient multimodal transportation system is essential to the quality of our lives and serves as the backbone of the region's economy. Improving mobility, as a growing region with changing travel needs, will be a challenging task. This plan establishes the long-range regional direction for meeting this challenge and provides a basis for the more detailed planning and investment strategies for the region. By supporting the construction of housing under the state's 40R and 40S programs the region can utilize state funds for affordable housing choice to ease the cost burden on development while creating the type and character of options that meet the housing requirements of the targeted populations.

PLAN FOR TRANSIT-ORIENTED DEVELOPMENT

Transit-oriented development (TOD) is characterized by a concentration of higher-density mixed-use development around transit stations and along transit lines, such that the location and design of the development encourage transit use and pedestrian activity.

CHAPTER 40R AND 40S DISTRICTS

THE OLD COLONY PLANNING COUNCIL WILL EXPLORE OPPORTUNITIES TO PROMOTE "CHAPTER 40R" SMART GROWTH, MIXED-USE, MULTI-FAMILY OVERLAY DISTRICTS NEAR TOWN CENTERS AND TRANSIT.

Chapter 40R and 40S Districts must be in "smart growth" locations near transit or commercial centers, in areas with existing infrastructure or otherwise suitable for high-density mixed-use development. The overlay district must allow housing to be built as of right at densities of at least 8 to 20 units per acre depending on the type of housing, at least 20% of the new units will be affordable, all units in rental housing developments, including market rate units, can be counted as part of the Subsidized Housing Inventory (SHI). Other benefits can also be tapped including becoming more competitive for MassWorks infrastructure funds and higher levels of financial assistance from the Massachusetts School Building Authority for new schools.

The designation allows the local municipalities to set detailed design standards for projects built within the overlay district and reject applicants that don't meet the standards. The companion designation, "Chapter 40S" offers "school cost" insurance to address fears of local school impacts.

Figure 22: What is 40R?

Population and employment growth in the region over the last several decades has led to substantial increases in travel, straining our transportation system. Since the late 1970s, there has been an increase in the number of people per household commuting to work. Land use patterns evolved in a manner that further separated housing from jobs and other locations, including shopping, schools, and other activities, increasing the need for more daily travel and lengthening trip distances. This pattern of urbanization has made walking, bicycling, and transit use less convenient and has increased the use of automobiles for meeting our daily needs.

Quality transportation is about personal mobility and the movement of freight and goods. It places a priority on an effective system, rather than on a specific mode of transportation. Cars, buses, bicycles, streetcars, and trains are modes of transportation. Developing particular facilities should not be the end goal; rather, the result should be improved mobility and accessibility. This Regional Policy Plan addresses the goal of providing transportation in our region, improving mobility and creating a user-oriented transportation system. Convenience, safety, travel time, flexibility, options, and cost are key features of a user-oriented system. A user-oriented system combines modes, routes, transfer facilities, and management into a system centered on the need for mobility.

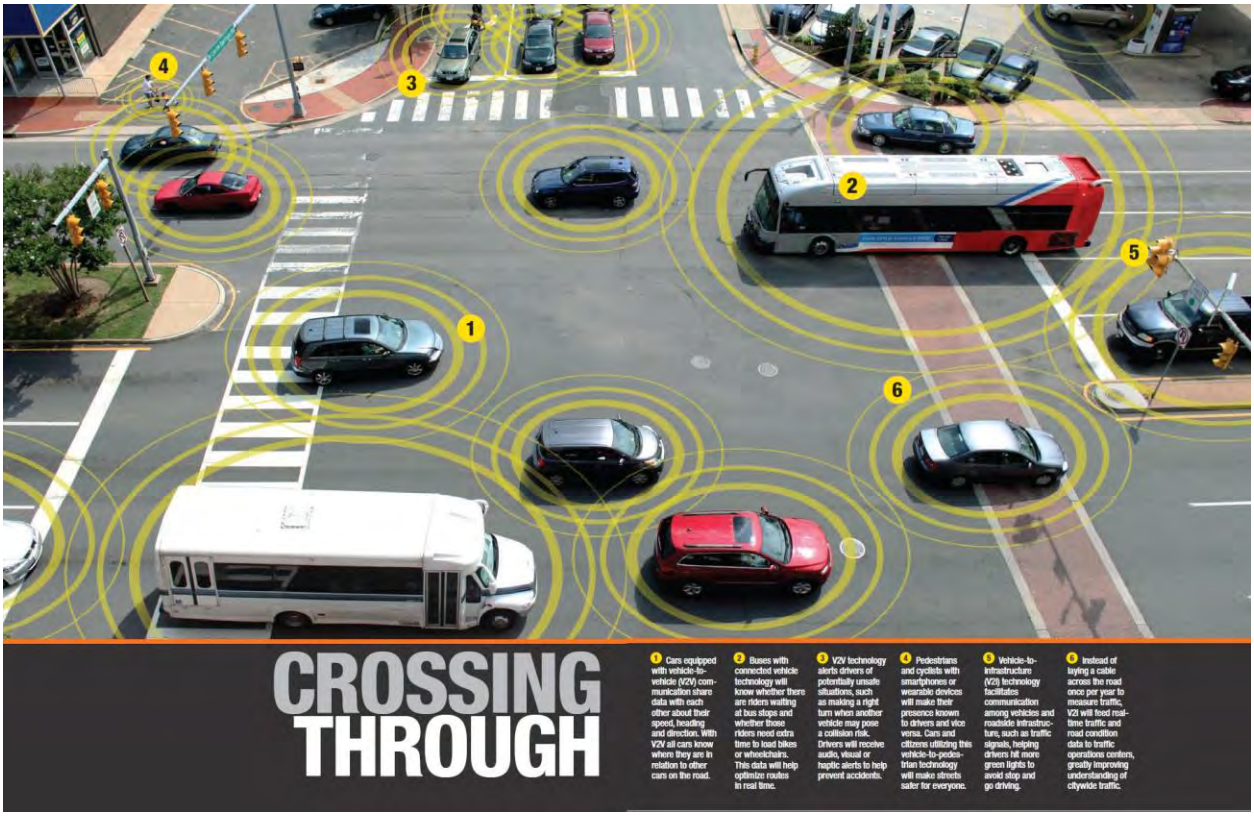


Figure 23: Intelligent Transportation Systems (ITS)

1. Cars equipped with vehicle to vehicle (V2V) communications.
2. Buses with connected vehicle technology will know whether there are riders waiting at bus stops or whether riders need extra time to load bikes or wheelchairs.
3. Vehicle to Vehicle (V2V) technology alerts drivers of potentially unsafe situations. Drivers receive audio, visual or haptic alerts to prevent accidents.
4. Pedestrian and cyclists with smartphones can make presence known to drivers.
5. Vehicle to infrastructure (V2I) technology facilitates communications among vehicles and infrastructure, such as traffic signals.
6. Instead of laying cable across the road to measure traffic, V2I will feed real-time traffic and road conditions data to operations centers.

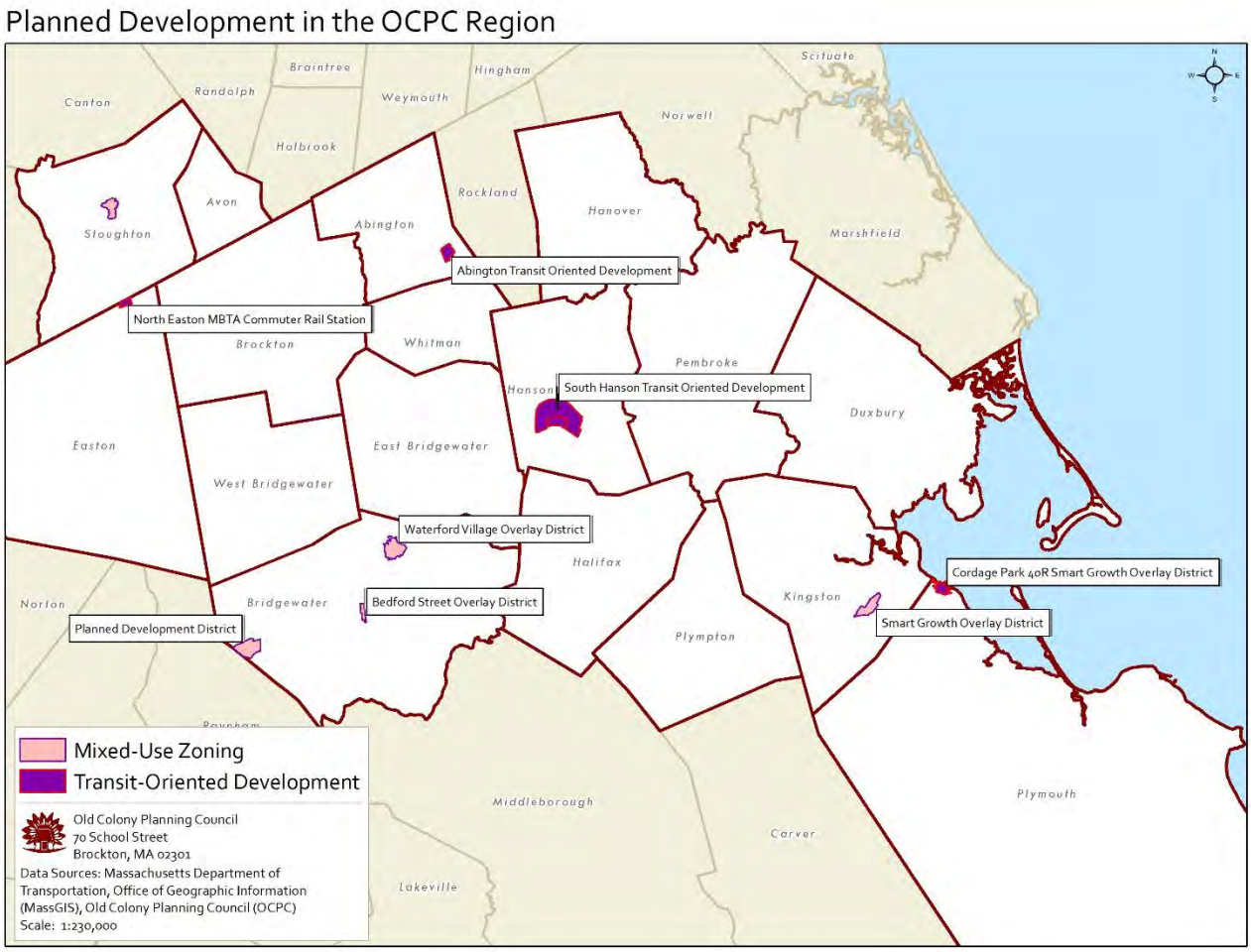


Figure 24: TOD Development in the OCPC Region

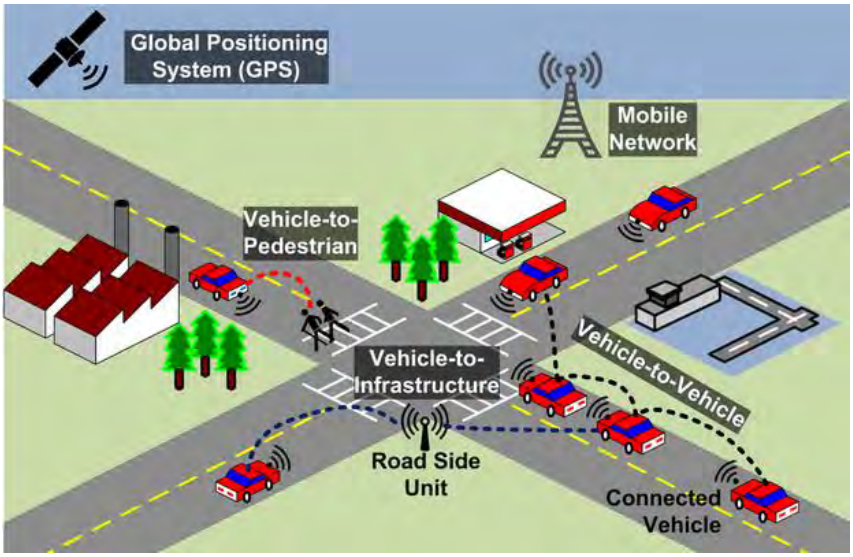


Figure 25: Intelligent Transportation Systems

Green Infrastructure is composed of a complex array of natural and environmental features. The green infrastructure concept also includes a vast majority of the region's agricultural resources. The term Green Infrastructure refers to the management of wet weather flows using these process's, and to refer to the patchwork of natural areas that provide habitat, flood protection, cleaner air and cleaner water. Green infrastructure practices aim to preserve, restore and create green space using soils, vegetation, and rainwater harvest techniques.

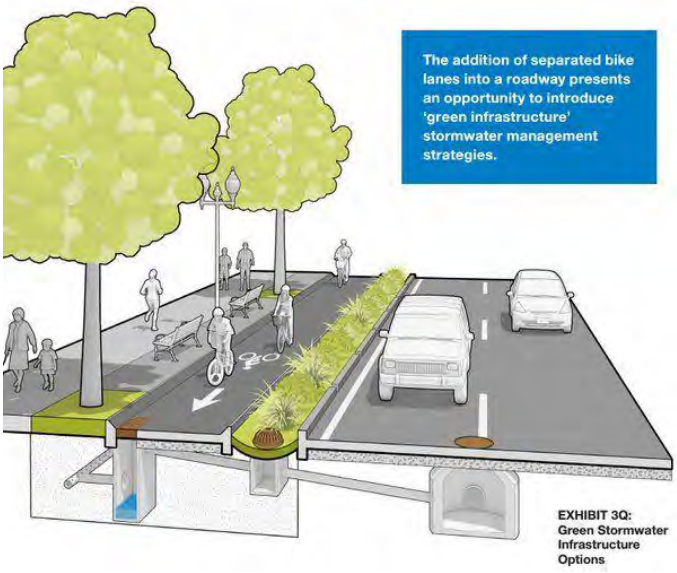


Figure 26: Green Stormwater Infrastructure

Green infrastructure practices include:

- An approach to land development that works with nature to manage stormwater as close to its source as possible;
- Employs principles such as preserving and recreating natural landscape features, minimizing effective imperviousness to create functional and appealing site drainage that treats stormwater as a resource rather than a waste product;
- Bio-retention facilities, rain gardens, vegetated rooftops, rain barrels, and permeable pavements;
- Water can be managed in a way that reduces the impact of built area and promotes the natural movement of water within an ecosystem or watershed.

Green Streets feature enhanced landscaping, pervious and decorative paving, and other features that increase their attractiveness to pedestrians, calm traffic, and help to retain and purify stormwater in passive systems. Many green streets are primarily designed to integrate innovative stormwater management techniques into the right-of-way of a road. *Green Streets*

create street canopies and other "green infrastructure" that can add to the aesthetics of a community, as well as mitigate temperature and contribute to improving air quality.

The operation of vehicles and the construction of transportation infrastructure affect both the natural and built environment. In particular, transportation has a direct relationship with the production of greenhouse gases that are related to climate change. Currently the way we travel relies primarily on a finite natural resource, fossil fuel, particularly oil. This reliance has significant environmental and economic consequences. Half of the sources of greenhouse gas in the region are related to transportation, primarily through the burning of gasoline and diesel fuel. There is a growing urgency in the region, to reverse this trend. Changes in fuels, technologies, and travel patterns are all needed to meet the region's greenhouse gas reduction goals.

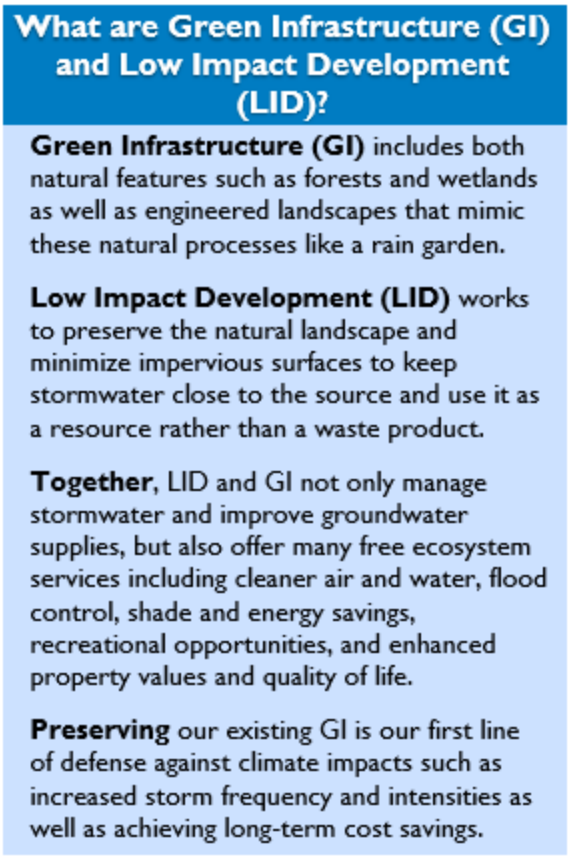


Figure 27: Green Infrastructure and LID

Low Impact Development (LID) is the best principal to use nature as a model and manage rainfall at the source.

1. Conserve natural areas wherever possible (do not pave over the whole site if you do not need to).
2. Minimize the development impact on hydrology
3. Maintain runoff rate and duration from the site (do not let the water leave the site)
4. Scatter Integrated Management Practices (IMPs) throughout the site - IMPs are decentralized, microscale controls that infiltrate, store, evaporate, and/or detain runoff close to the source.
5. Implement pollution prevention, proper maintenance and public education programs.

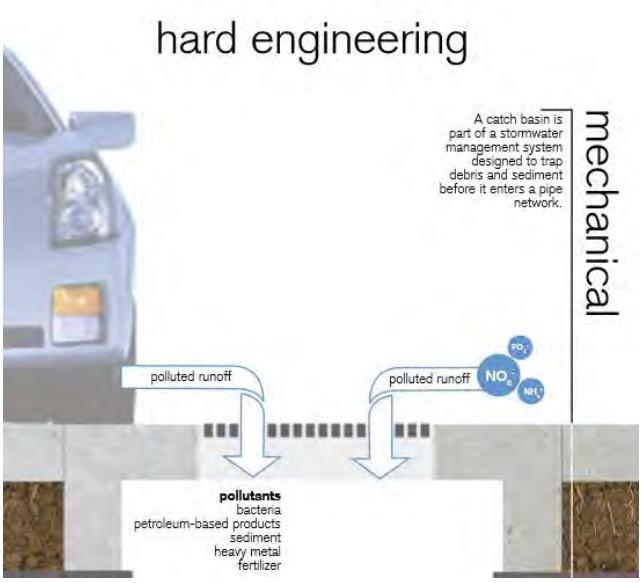
Research indicates that when an impervious area in a watershed reaches 10 percent, stream ecosystems begin to show evidence of degradation, and coverage more than 30 percent is associated with severe, practically irreversible degradation. What Low Impact Development does is make hard engineering work more like soft engineering.

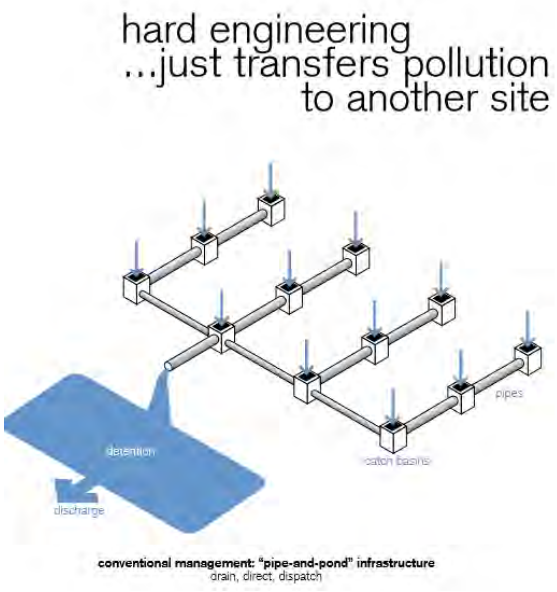
Infiltration practices are engineered structures or landscape features designed to capture and infiltrate runoff. They can be used to reduce both the volume of runoff discharged from the site and the infrastructure to convey, treat, or control runoff. Infiltration practices can also be used to recharge ground water. They can be integrated into landscape features in a site-dispersed manner. This feature can result in aesthetic benefits.

Downspout Disconnection – This simple practice reroutes rooftop drainage pipes from draining rainwater into storm sewer to draining it into rain barrels, cisterns, or permeable areas. Stormwater can be stored for use later or allowed to infiltrate into the soil. Water from the roof flows from this disconnected downspout into the ground through a filter of pebbles.

Planter Boxes – Planter boxes are urban rain gardens with vertical walls and either open or closed bottoms. They collect and absorb runoff from sidewalks, parking lots, and streets and are ideal for space-limited sites in dense urban areas and as a streetscaping element.

Bioswales – Bioswales are vegetated, mulched, or xeriscape channels that provide treatment and retention as they move stormwater from one place to another. Vegetated swales slow, infiltrate, and filter stormwater flows. As linear features, they are particularly well suited to being placed along streets and parking lots.





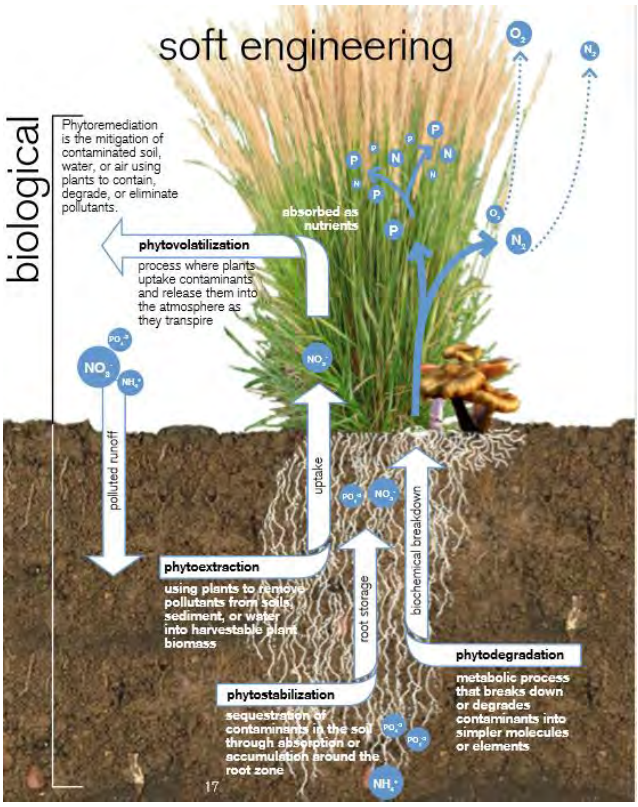
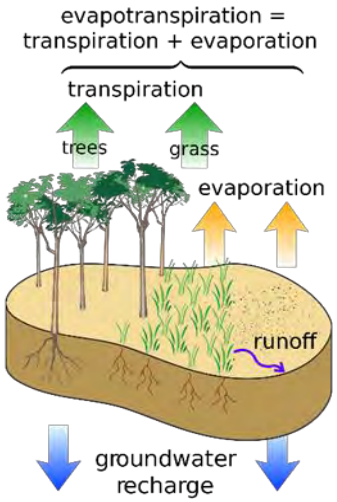


Figure 28: Hard Engineering vs. Soft Engineering Stormwater Management Solutions



LID is one of many strategies and techniques used to counteract the impact of development. This strategy refers to systems and practices that use or mimic natural processes that result in the infiltration, evapotranspiration or use of stormwater in order to protect water quality and associated aquatic habitat.

Evapotranspiration is the process of transferring moistures from the earth into the atmosphere. Evaporation occurs when water vapor leaves the soil or a plant's surface. Transpiration involves the passage of water through a plant, from its roots through is vascular system. Factors that affect the rate of evapotranspiration include the amount of solar radiation, atmospheric vapor pressure, temperature, wind, and soil moisture.

Figure 29: Evapotranspiration

SUSTAINABLE TRANSPORTATION

Sustainable Transportation involves the efficient and environmentally sensitive movement of people, information, goods, and services, with attention to health and safety. Sustainable transportation *includes the design of walkable cities and bike-able neighborhoods, as well as using telework and other travel options.* Sustainable transportation minimizes the environmental impacts of transportation activities, including reducing air pollutants and greenhouse gasses. It relies on cleaner, renewable resources of energy and on dependable financing mechanisms.

Protecting and enhancing the environment, promoting energy conservation, and improving the quality of life must be considered as part of the transportation planning process. If transportation programs and projects are to support social and economic activity, they must also contribute to the health and vitality of human and natural environments. Innovative design and construction – as seen in Green Streets – can minimize environmental impacts.

- Design transportation facilities to fit within the context of the built or natural environments in which they are located.
- Apply urban design principles in transportation programs and projects for regional growth centers and high-capacity transit station areas.
- Implement transportation programs and projects in ways that prevent or minimize negative impacts to low-income, minority, and special needs populations.

PROMOTING SUSTAINABLE MOBILITY: BUILDING INFRASTRUCTURE FOR ENVIRONMENTALLY-FRIENDLY VEHICLES

Transportation projects that result in lower greenhouse gas emissions go hand-in-hand with the drive toward smarter growth and a healthier environment. Reducing the number of miles that people travel in their cars is an important goal of our Regional Plan. Transitioning to more fuel efficient vehicles and alternative, low-carbon fuels are key steps toward a more sustainable region. Fuel efficiency improvements and alternatives also comprise a major part of the Commonwealth's plan for reducing greenhouse gas emissions from the transportation sector. The Commonwealth is working to reduce greenhouse gas emissions from transportation statewide by promoting the use of alternative fuels (including propane, natural gas, biodiesel, and ethanol).

LOOKING PAST 2040 – MOVING TOWARD 100% LOCAL CLEAN ENERGY

Efforts are underway to promote the use of zero-emission vehicles and alternative fuels, and to ensure that we have the infrastructure to support them. Recognizing this, the Massachusetts Legislature has set aside funding to support projects that reduce emissions. In January of 2017, Governor Baker signed Senate Bill 2505, *An Act Promoting Zero Emission Vehicle Adoption*. The legislation works to increase access to ZEV charging stations for the general public by prohibiting owners of public charging stations from charging users a subscription or membership fee and requiring the use of payment options available to the general public. Further, the legislation allows municipalities and private businesses to restrict parking spaces specifically for ZEV use, and builds upon the Baker-Polito Administration's ongoing commitment to adopting emerging clean energy technologies as the Commonwealth continues to add renewable energy generation into the Massachusetts' diverse energy portfolio.

In 2016, the Administration committed $14 million to the Commonwealth's electric vehicle rebate program, Massachusetts Offers Rebates for Electric Vehicles (MOR-EV), more than doubling the historic funding of the MOR-EV program. Massachusetts automotive customers can qualify for rebates ranging from $750-$2,500 on the purchase or lease of more than 25 qualifying new electric vehicles, including battery electric, plug-in hybrid electric and fuel cell electric vehicles. Since June 2014, the MOR-EV program has issued or reserved over $7 million for 3,355 vehicles, cutting the state's greenhouse gas emissions output by an estimated 9,255 short tons annually.

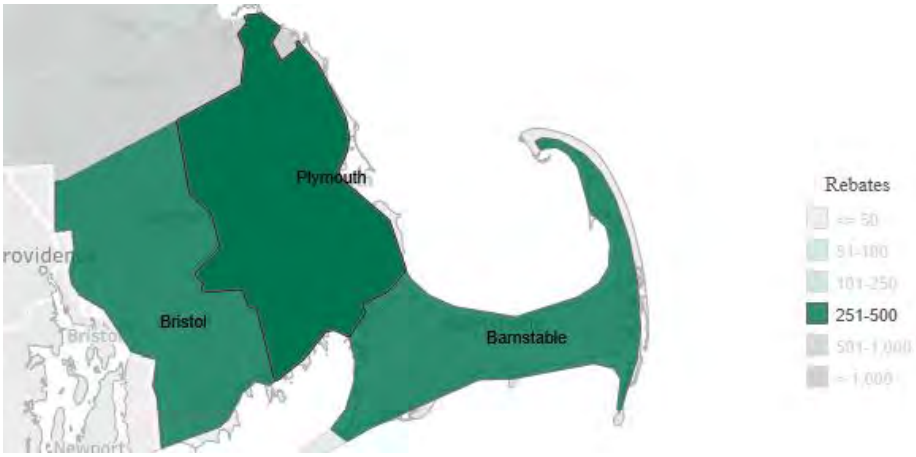
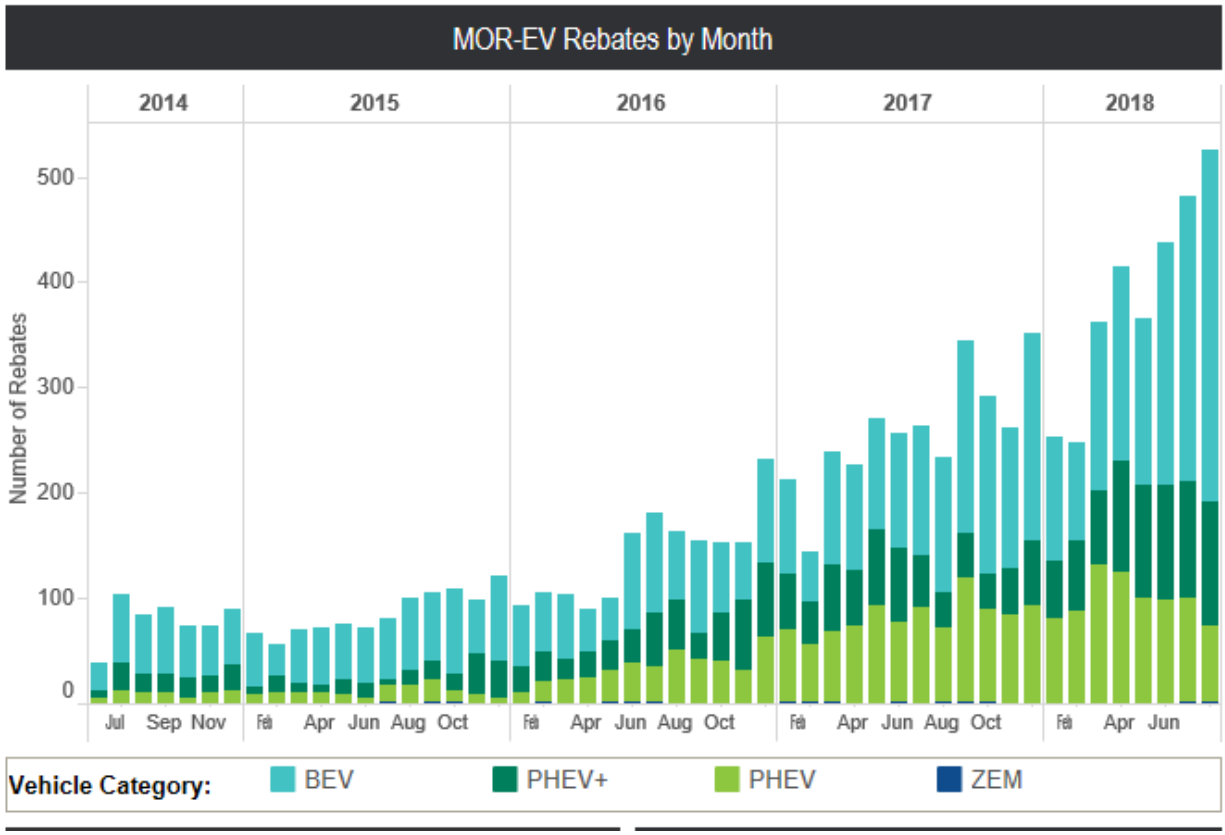


Figure 30: MOR-EV Rebates



AUTONOMOUS VEHICLES

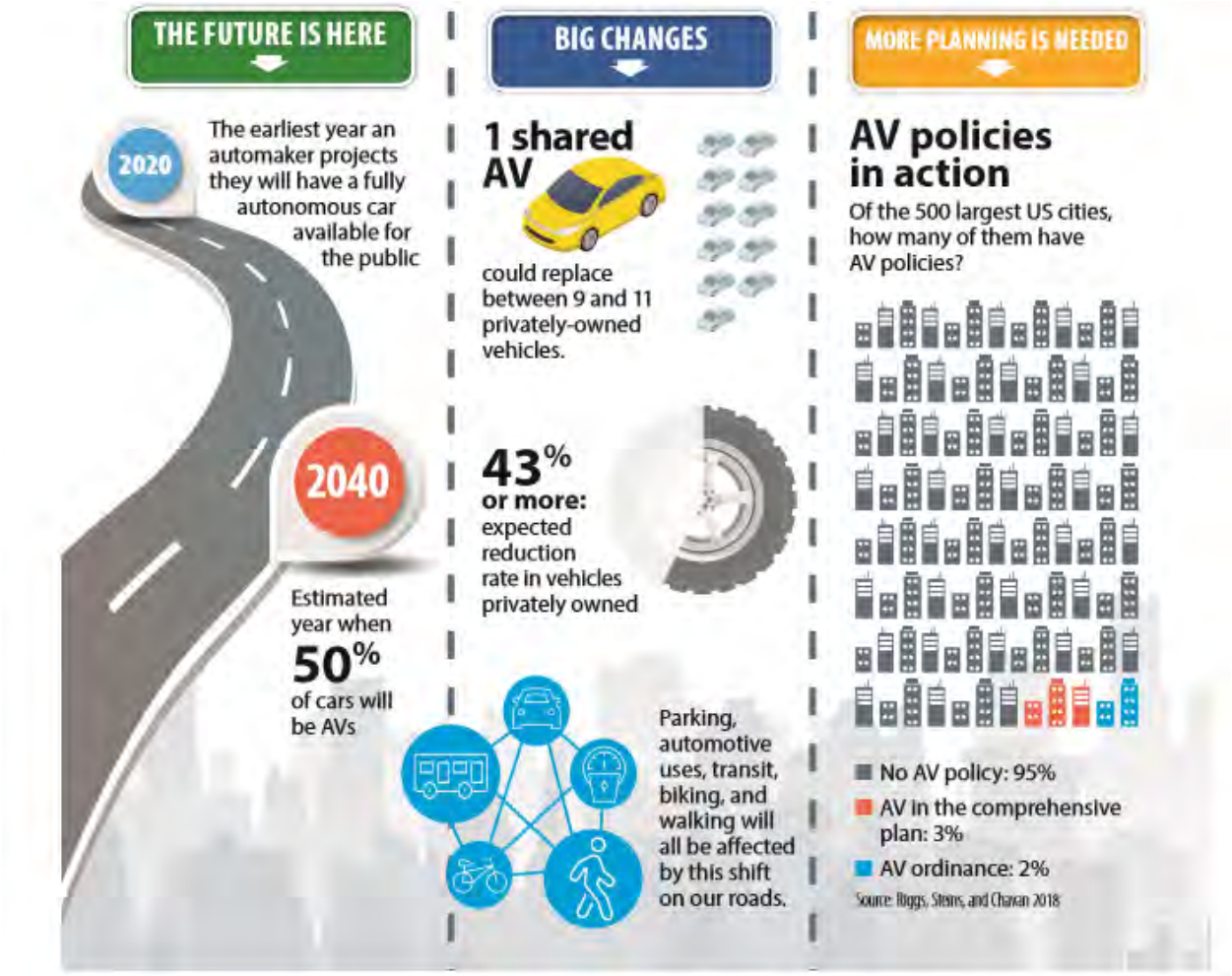
In October of 2016, Gov. Charlie Baker issued Executive Order 572 "To Promote the Testing and Deployment of Highly Automated Driving Technologies." This Executive Order also created a special working group on autonomous vehicles. The group – dubbed "The AV Working Group" – which is continuing to convene and consult with experts on motor vehicle safety and automation and encourage the development of automated vehicle technologies in Massachusetts. The working group examines things like motor vehicle safety, proposed legislation and a state approval process for companies that want to test out autonomous vehicles. The idea is to promote the testing and deployment of autonomous vehicles in the state by creating a framework for companies using this technology.

In June, 2018, fifteen cities and towns signed an agreement with the state to allow autonomous vehicles to be tested in those communities. Per the agreement, the municipalities will work with MassDOT to develop a process (expected by December, 2018) to allow for testing in phases. Officials say the deal will allow self-driving car companies to improve their technology and experiment with new mobility services by testing in the region's toughest driving conditions. "We fully expect that we will learn faster by having an opportunity to spend some time on the roads here in Massachusetts," Gov. Charlie Baker said at the press conference announcing the agreement. The agreement is also a strong signal to companies that Massachusetts is open for autonomous vehicle testing. The fifteen cities and towns that signed onto the agreement are: Arlington, Boston, Braintree, Brookline, Cambridge, Chelsea, Malden, Medford, Melrose, Newton, Revere, Somerville, Weymouth, Winthrop, and Worcester.

Researchers at the Metropolitan Area Planning Council conducted a survey of 1,000 ride-sharing users in an attempt to improve the limited understanding of the effects of autonomous vehicles on traffic and infrastructure. The survey revealed such services actually increase the number of cars on the road as 42 percent of ride-sharing users said they would have otherwise taken public transportation. "Overall, 15 percent of ride-hailing trips are adding cars to the region's roadways during the morning or afternoon rush hours," according to the report.

Aside from the impact on people trying to get from place to place, experts predicted economic and fiscal impacts on the state and local level. Preparing for self-driving cars requires investment in infrastructure improvements like repairing roads, improving street signs and traffic signals, and increased attention to snow removal. At the same time, current sources of revenue that come from parking and traffic violations, highway tolls, and the gas and excise taxes will become less lucrative. For rural and suburban areas, the impact on revenue isn't expected to be as large but still between 3 to 16 percent.

Another concern is that a proliferation of self-driving vehicles could lead to "Sprawl 2.0" as people become less reliant on public transit lines. Self-driving cars have the potential to decrease traffic accidents, reduce the amount of parking space needed, and provide easier access to transportation for those who can't drive. And the time that people do spend in traffic can be spent working or relaxing, rather than focusing on the road.



Autonomous vehicle is advancing rapidly and several companies anticipate having AVs available for sale in the early 2020s. The novelty and convenience of autonomous driving could speed adoption, and highly, if not fully, autonomous vehicles could easily represent at least a quarter of the vehicles on the road in less than 15 years. However, vehicle prices, regulatory delays, and uncertainties surrounding insurance, legal liability, testing and validation procedures, and cybersecurity could delay AV's market availability.

Autonomous vehicles offer possible challenges. They could lead to changes in historical housing settlement patterns, causing sprawl to spread farther into exurban areas. In a rapidly aging society with growing social and economic disparities, they may exacerbate spatial and cultural separation. As e-commerce and workplace automation continue, they could reshape how, where, and when community members live, work, play and shop. AVs have great potential to impact and alter the built environment in the coming decades. While these impacts are not predictable, all indications are that the impact of AV's on roadway design, urban form, and site design may be of a magnitude similar to those that occurred during the rise of the private automobile in the early 20th century. AVs could enable narrower rights-of-way and travel lanes; influence the location, form, and amount of parking; impact the mobility of bicyclists and pedestrians; declutter urban environments through reduced signalization and signage; and provide opportunities for redevelopment on excess parking lots and rights-of-way.

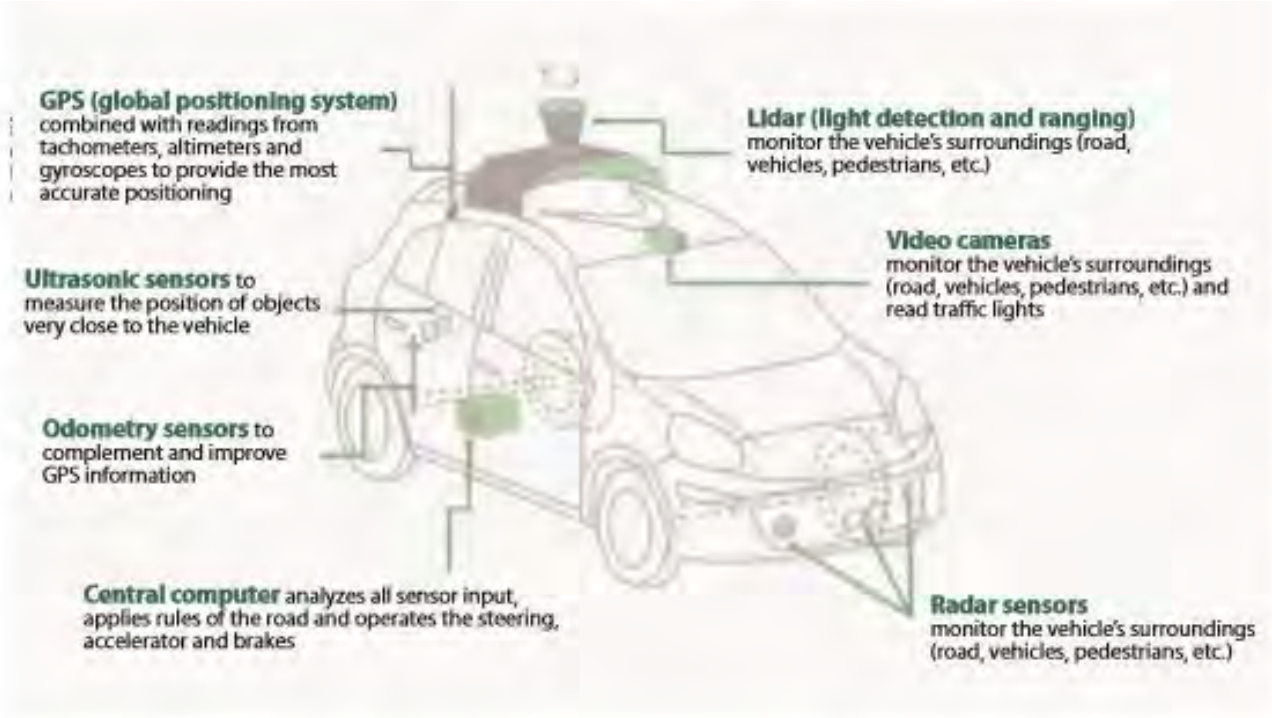


Figure 31: Autonomous Vehicle Technology

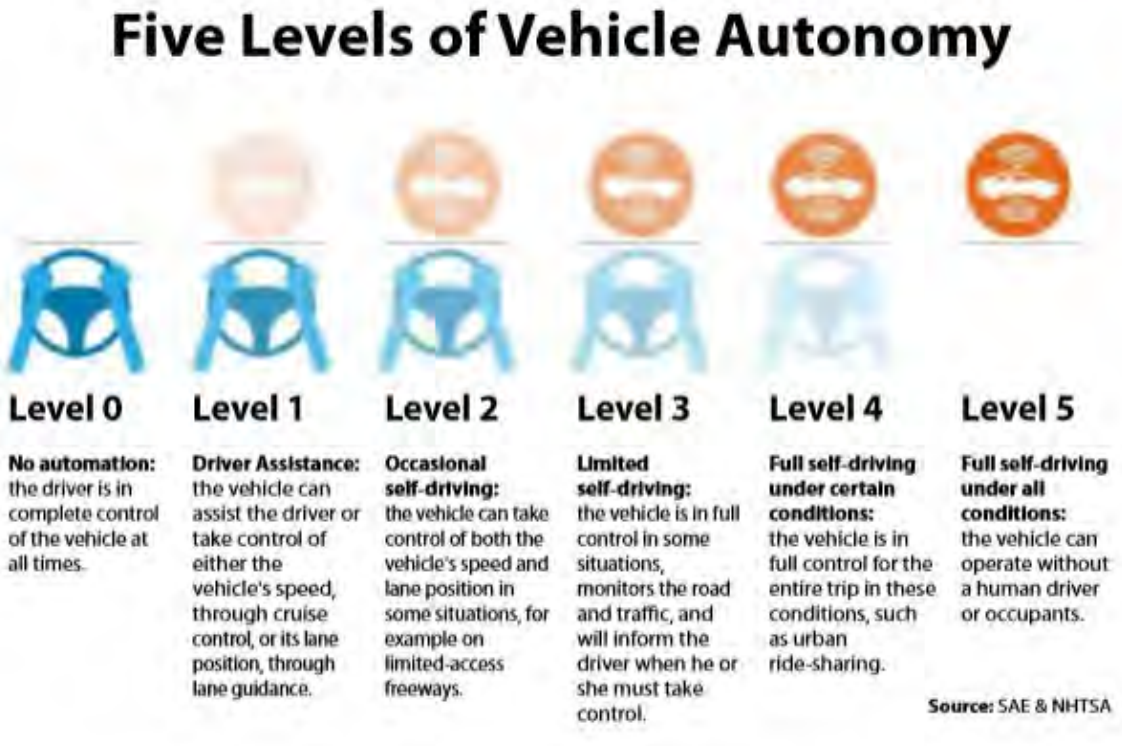


Figure 32: Vehicle Autonomy

Automated vehicle technology is an umbrella term that includes a wide variety of features and technologies that enable vehicles to take control of some or all of the major driving functions normally completed by the driver. This includes fully autonomous vehicles that no longer require a human driver to operate them, as well as a range of advanced driver assistance systems (ADAS) that enhance driver safety by taking temporary control of one or more driving functions (speed, lane position, braking, etc.).

Connected Vehicle (CV) technology includes the vehicles and infrastructure that enable vehicles to communicate with other vehicles, infrastructure, or pedestrians to make better driving decisions. CV technology relies on information gathered by vehicles and the transportation infrastructure about real-time operations of the transportation network.

ELECTRIC VEHICLES

Many proponents of AVs point to automated vehicle technology, electric vehicle (EV) technology, and on-demand ride sharing as three converging trends that promise to undo many of the problems created by our current transportation system. By providing a more efficient transportation system that utilizes cleaner energy sources, on demand electric AVs could drastically reduce energy emissions. In fact, many of the environmental and efficiency benefits AVs could provide will only be possible if AVs are powered by electricity. Otherwise, the transportation system will remain completely dependent on combustion engines and AVs at best will be a temporary fix for the global carbon emissions crisis and at worst will exacerbate the problem by increasing vehicle miles traveled (VMT).

Many have speculated that because AVs will require a significantly more extensive electrical system to power the sensors and computers necessary to drive autonomously, it will be easier and more efficient to engineer AVs that are electric-powered rather than combustion-powered. Many AV prototypes on the road today are hybrid vehicles that may provide an early sign of how AV technology may complement the increasing development and use of EVs. Recent announcements from major auto manufacturers of their intentions to work toward an all-electric future may provide a positive indication of the potential for a fully electric and fully autonomous future. Many of these announcements have been driven by the major innovations in battery technology that have significantly improved the cost effectiveness of electric vehicles. The cost of EV battery packs fell by 80 percent between 2010 and 2016. While the per-mile cost of EVs will need to continue to drop for them to be a viable option for mass adoption, these trends are projected to continue and AV production is expected to largely comprise EVs.

In December, 2017, the Massachusetts Department of Public Utilities approved a proposed $45 million investment in electric vehicle charging infrastructure. Electric vehicles are a critical part of Massachusetts climate and transportation future. Under the Global Warming Solutions Act, the state is legally required to reduce our emissions of global warming pollution by 80 percent by the year 2050.

Transportation is the largest source of pollution in Massachusetts, and it's the one area of our economy where emissions have actually grown since 1990. Achieving our climate limits will require the near-complete transition of our vehicle felt to electric vehicles or other zero-emission vehicle technologies.

Electric vehicles, when plugged in to the relatively clean New England grid, get the emissions equivalent of a 100 mpg conventional vehicle. Nationally, EVs represent less than half of one percent of new vehicle sales. In 2012, Massachusetts committed to a goal of putting 300,000 electric vehicles on the road by 2025. At the end of 2017, we were still about 288,000 EV sales short of that goal.

One of the biggest challenges facing the growth of electric vehicles is limited infrastructure. People are hesitant to buy an EV if they don't know where to plug it in. Limited access of charging infrastructure is one of the biggest obstacles to EV purchases. New investments in charging infrastructure are critical to making EVs as convenient as filling up at a gas station.

Investments in EV charging infrastructure include more funding for infrastructure for people who live in apartment buildings, more fast-charging infrastructure along highways, and increasing charging infrastructure in low income communities and greater access to workplace charging stations. The proposal anticipates the construction of 72 fast-charging stations and 3,955 "level 2" home and workplace charging ports over the next 5 years. OF those charging ports, 10 percent will be in low income communities, where utilities will also provide consumers with a rebate for charging stations. These investments will provide thousands of Massachusetts residents with access to EV charging stations.

Most residents are not aware of the many incentives available for EV customers, both here in the Northeast and at the federal level. The Massachusetts Electric Vehicle Incentive Program (MassEVIP) helps eligible entities acquire electric vehicles and install charging stations. Incentives are available on a first-come, first-served basis. This program is aimed at increasing the deployment of electric vehicles and giving advanced transportation technology more visibility across the state. Cities and towns, state agencies, and state colleges and universities are eligible to apply for funding toward the purchase of EVs and the installation of Level 2 dual-port charging stations.

Incentives:
PHEV: $3,000-$5,000
BEV: $5,000-$7,500
Charging Station*: $5,000-$10,000
ZEM**: $750
* Level 2 dual-port charging station funding is based on the number of BEVs acquired.
**ZEM funding is limited in quantity and for municipalities only

The Massachusetts Electric Vehicle Incentive Workplace Charging Program helps employers acquire electric vehicle charging stations on a first-come, first-served basis. This MassDEP open grant program provides incentives for companies with 15 or more employees in non-residential places of business to acquire Level 1 and Level 2 electric vehicle charging stations. MassDEP provides 50 percent of the funding (up

to $25,000) for hardware costs to employers installation of stations capable of charging EVs produced by multiple manufacturers.

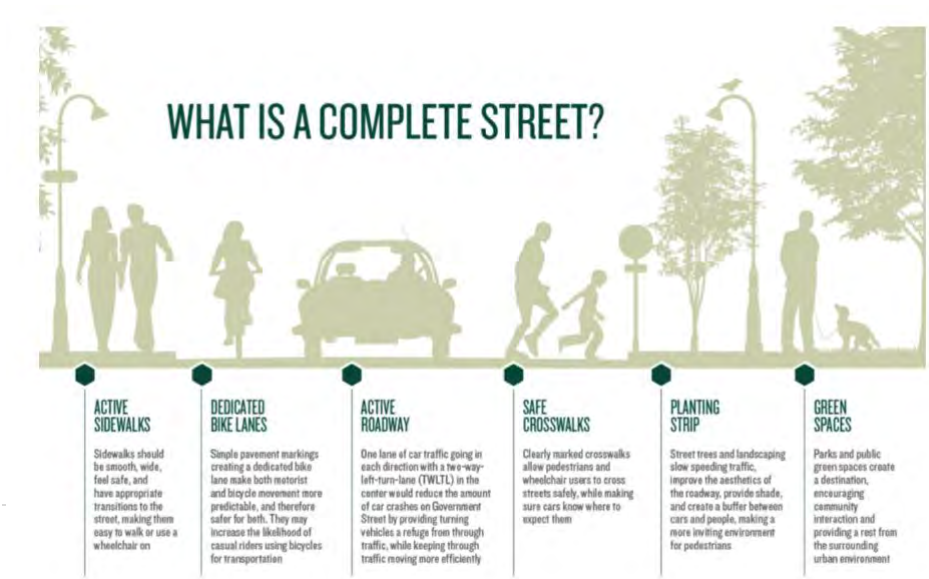
THE ACTIVE TRANSPORTATION NETWORK: HEALTHY ALTERNATIVES TO DRIVING

More of us than ever before are choosing to walk or ride our bikes to more places. Biking and walking, while not for everyone all the time, are important choices for many people. Over time, choosing to walk and bike has become known as *active transportation*, because these two forms of getting around provide opportunities for exercise rather than letting a car do all the work. At some point in the day, walking is a part of most every person's life. That is particularly true in mixed-use, climate-smart neighborhoods, where people often walk and sometimes bike between their homes, stores, parks, schools, and jobs.

Our active transportation projects are intended to make walking and biking safer, particularly for students, seniors, and people with disabilities. Walking and biking will only be viable choices for people if they are safe. This Plan recognizes this, and so it incorporates safe bike and pedestrian access into investments in other modes of travel, including public transit and roadway improvements.

Currently, the OCPC region does not have a uniform bicycle and pedestrian transportation network, but progress is being made in making this a reality. Deficiencies in the network have been identified with cooperation and input from each community. OCPC has identified key bicycling and walking corridors for cyclists and pedestrians. OCPC has created and maintained the Regional Transportation Plan (RTP) to include all communities and advance transportation connections and mode shift throughout the region. The RTP provides a detailed overview of the transportation network and outlook over a twenty-year planning horizon.

Missing links in the region's bicycle, pedestrian, and local street networks should be completed to improve local and regional connections. All transportation projects and programs need to consider impacts to the natural environment, public health, and the climate, as well as to the communities in which they are located.



Active Sidewalks

Dedicated Bike Lanes

Active Roadway

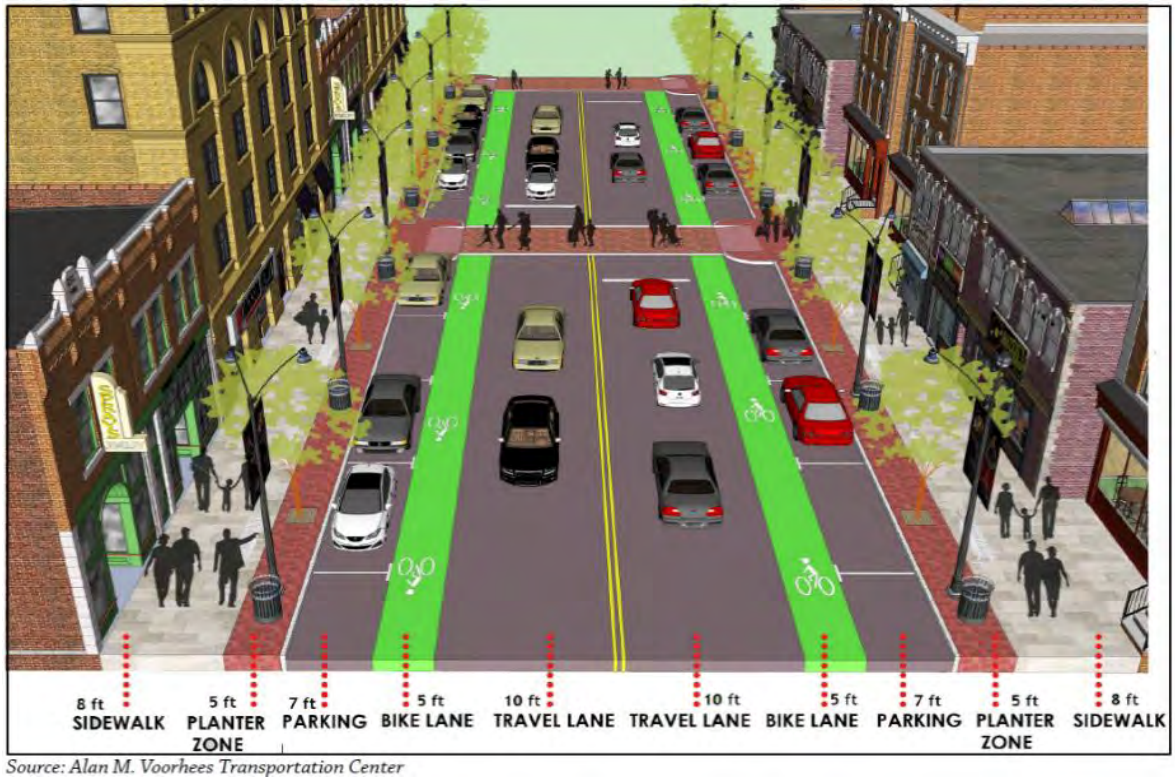
Safe Crosswalks

Planting Strip

Green Spaces

COMPLETE STREETS

For a number of years, a growing movement has been underway to convert our streets, over time, to roads that serve the needs of a broader range of users than primarily those who drive cars. Our transportation investments are not just about the transportation projects themselves. They are also about the surrounding land uses that make our communities livable and vibrant, and the improvements to our streets to make them friendlier and safer for all users, including people who walk and bike.



Source: Alan M. Voorhees Transportation Center

Figure 33: Complete Street

A Complete Street is one that provides safe and accessible options for all travel modes – walking, biking, transit, and motorized vehicles – for people of all ages and abilities. *Complete Streets* are designed and operated to enable safe and convenient access for all road users, while accommodating the movement of freight and goods. Pedestrians, bicyclists, motorists, and transit riders of all ages and abilities can safely move along and across a complete street. By designing and operating streets to be complete, transportation agencies increase capacity, avoid expensive retrofits, encourage physical activity, and help create walkable communities.

The effort to create "Complete Streets" involves rethinking roadway design to better accommodate people walking and riding bikes. Designing streets with these principles contributes toward the safety, health, economic viability and quality of life in a community by improving the pedestrian and vehicular environments and providing safer, more accessible and comfortable means of travel between home, school, work, recreation and retail destinations.

The good news is that many of our local jurisdictions have adopted or are in the process of developing local Complete Streets policies for future improvements.

Complete Streets improvements may be large scale, such as corridor wide improvements that include a separated bicycle lane, new crosswalks, and new bus stops; or a small scale improvement, such as a new bus shelter to encourage transit use. Other Complete Street project examples include improved street lighting, minor changes to traffic signal timings, new bicycle or pedestrian facilities, a median refuge island, or improved connection to transit. The design should be context sensitive and incorporate improvements or treatments that fit with the need and within the character of a community.

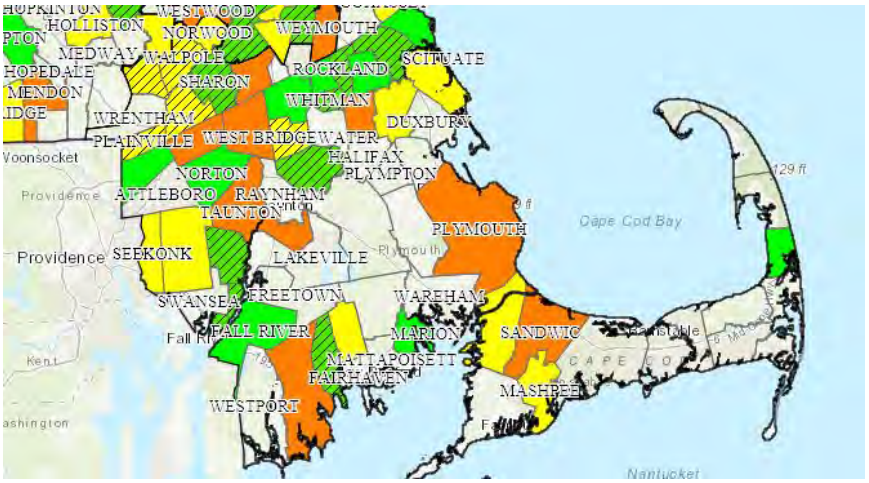
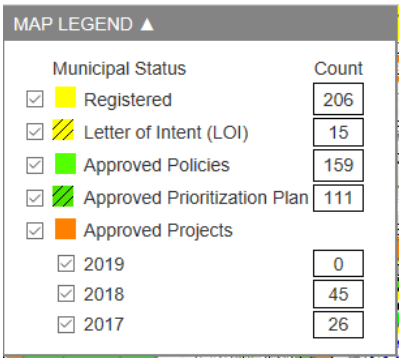


Figure 35: District 5 Complete Streets Communities

Figure 34: Complete Streets Map Legend



In 2013 MassDOT issued a *Healthy Transportation Policy Directive* to ensure that all MassDOT projects are designed and implemented in a way that all customers have access to safe and comfortable healthy transportation options and initiated the Complete Streets Funding Program to further the understanding and development of Complete Streets on local roads across the Commonwealth. MassDOT has allocated $12.5 million for the first two years of this effort. Future funding will be based on the availability of funds and the interest and success of the program.

THE REWARD TO MUNICIPALITIES THAT CHOOSE TO PARTICIPATE IN THE COMPLETE STREETS PROGRAM IS:

1. FUNDING FOR TECHNICAL ASSISTANCE TO ANALYZE THEIR COMMUNITY NEEDS AND DEVELOP A COMPLETE STREETS PRIORITIZATION PLAN, AND
2. FUNDING FOR CONSTRUCTION OF COMPLETE STREETS INFRASTRUCTURE PROJECTS.
3. A MORE LIVABLE COMMUNITY FOR VARIOUS TYPES OF USERS, INCLUDING CHILDREN, PEOPLE WITH DISABILITIES AND OLDER ADULTS.
4. IMPROVED EQUITY, SAFETY, AND PUBLIC HEALTH WHILE REDUCING TRANSPORTATION COSTS AND TRAFFIC CONGESTION.

CONTEXT-SENSITIVE DESIGN

This a collaborative, interdisciplinary approach that involves all stakeholders to develop a transportation facility that fits its physical setting and preserves scenic, aesthetic, historic, and environmental resources while maintaining safety and mobility in the design and construction of transportation projects. Projects are tailored to be harmonious with their surroundings. Emphasis is placed on preserving the visual, aesthetic, historic, cultural, and environmental resources of the community, while maintaining safety, accessibility, and mobility. Another way of describing *Context Sensitive Design* is "merging the function of a transportation project with its setting". This new approach is an effort to design transportation projects in harmony with the project's context, such that these projects respect the community values, physical needs, natural environment, social needs, cultural characteristics, and transportation needs. The "context" of the project can include a variety of elements such as community, scenic byways, rivers, historic districts, residential character, parks, farmland, wetlands, highways, and commercial neighborhoods.

Context Sensitive Design is an approach to develop better and improved ways of designing roads, highways, and other transportation facilities that are integrated with their environment and are more consistent with the needs of the communities they serve. It is a way of achieving planning and design excellence.

Figure 36: Context Sensitive Design

PUBLIC FACILITIES AND SERVICES

OVERARCHING GOAL: THE REGION WILL SUPPORT DEVELOPMENT WITH ADEQUATE PUBLIC FACILITIES AND SERVICES IN A COORDINATED, EFFICIENT, AND COST-EFFECTIVE MANNER THAT SUPPORTS LOCAL AND REGIONAL GROWTH PLANNING OBJECTIVES.

GOAL: ADEQUATE PUBLIC FACILITIES AND SERVICES WILL BE AVAILABLE FOR ALL PLANNED DEVELOPMENT, AND ADEQUATE CAPACITY WILL BE MAINTAINED FOR ALL EXISTING DEVELOPMENT AND REDEVELOPMENT AREAS.

- *PROTECT AND ENHANCE THE ENVIRONMENT AND PUBLIC HEALTH AND SAFETY WHEN PROVIDING FACILITIES AND SERVICES.*
- *TIME AND PHASE FACILITIES AND SERVICES TO GUIDE GROWTH AND DEVELOPMENT* in a manner that supports the regional vision.
- *DO NOT PROVIDE URBAN SERVICES IN RURAL AREAS*. Design services for limited access when they are needed to solve isolated health and sanitation problems, so as not to increase the development of the surrounding rural area.

Having adequate services and facilities ensures that the Region can maintain the health, safety, and economic vitality of our communities. Key services include sanitary and sewer systems, water supply, energy, telecommunications, public safety and emergency services, schools, libraries, and other community facilities.

New development needs new or expanded public services and infrastructure. At the same time, existing facilities require ongoing maintenance and upgrading. Taking advantage of renewable resources and using efficient and environmentally sensitive technologies can curb some of the need for new infrastructure. A commitment to sustainable infrastructure ensures the least possible strain on the region's resources and the environment, while contributing to healthy and prosperous communities.

Conservation and more efficient use of services are a vital part of sustainability and are important to ensure that resources will be there for future generations. They can also provide benefits for the climate, particularly in the area of energy efficiency. This plan encourages improving infrastructure to support development and maintain healthy and livable communities. Having reliable power, telecommunications, and water supply, along with other services and infrastructure, contributes to quality of life and the region's economic well-being.

Taking advantage of existing infrastructure and services is both efficient and cost-effective. This plan stresses that new public facilities, whether landfills, libraries, or schools, be located in a manner consistent with the proposed growth pattern. These facilities must be constructed and operated in ways that minimize adverse impacts to both people and the environment, and maximize benefits. Public facilities and services need to be located in a manner that allows jobs and housing to develop where they are desired and planned, and discourages unplanned growth and sprawl.

LEADING BY EXAMPLE

INVESTMENTS IN PUBLIC FACILITIES AND SERVICES SHOULD DIRECT DEVELOPMENT OR REDEVELOPMENT RATHER THAN PRIMARILY RESPOND TO DEMAND, AND/OR PREMATURELY RESULT IN THE CONVERSION OF RURAL LAND TO OTHER USES.

Executive Order 484, Leading by Example (LBE), establishes higher energy efficiency standards in the operation of state buildings, setting short- and long-term targets and goals to advance clean energy and efficiency, and reduce greenhouse gas emissions that contribute to global warming. The LBE Program promotes sustainability activities within state government to include waste reduction, water conservation, green buildings, alternative fuels, efficient transportation, and recycling.

Infrastructure is the basic structural foundation of a community. Man-made infrastructure serves the common needs of the population. The terms "infrastructure" and "public facilities" are often used interchangeably. This document will use the phrase "public facilities and services" *to more narrowly mean infrastructure that can be tied to a level of service standard, including: roads; sanitary sewer; solid waste; drainage; potable water; parks and recreation; and mass transit.* These are the facilities and services that local governments in the Old Colony Planning Council region can most influence.

A broader definition of a public facility or service is a facility or service provided at a local, state, or national level. These facilities and services are generally provided and/or maintained by government as a means of promoting and preserving public health, safety and welfare. Public facilities and services can be funded either partially or wholly with public funds, and are used by the residents of more than one community. A public facility or service is generally operated and managed by a public officer, board, or commission. There are also some public facilities and services that are provided by private entities, such as the rural water suppliers, electric power suppliers, and entertainment and sports complexes.

All public facilities and services represent a significant capital outlay, whether with public or private dollars. Users and taxpayers pay either directly or indirectly for the maintenance of these items. Public facilities and services serve as a framework for rural and urban development. The timely, ordered and efficient arrangement of these facilities is accordingly key to the future and well-being of communities in the region.

Public facilities and services are critical to the vitality of the entire OCPC region. Their existence is critical, but so is their adequacy. We need sufficient capacity in our water, sewer and roadway systems to accommodate the needs of the region's existing and future populations, wherever they are located. In the central, older areas where infrastructure has existed for years, their general condition and expected life can present opportunities or problems in service delivery, environmental protection, redevelopment and capital budgeting. In areas experiencing new development, however,

planning for, budgeting, and providing the adequate public facilities and services to keep pace with the impacts of new development can be equally or more difficult.

The difficulty arises in the form of fiscal stress in the fast growing areas of the region. The stress occurs because rapid population growth requires large public expenditures to provide needed roads and all the other public facilities and services required to support the community.

A LONG-RANGE PLAN THAT INTEGRATES PHYSICAL PLANNING WITH CAPITAL BUDGETING ALLOWS COMMUNITIES TO DIRECT DEVELOPMENT AND REDEVELOPMENT IN TERMS OF THE TIMING AND LOCATION OF PUBLIC FACILITIES AND LAND USES.

With a few exceptions, most comprehensive plans in the OCPC region are not truly comprehensive in the sense that they do not address all of the components of a comprehensive plan for maximum effectiveness. With a properly drafted comprehensive plan, cities, towns and counties can determine what capital improvements will be needed in the coming five years, where they will be located, how much they will cost, and who will pay for them. The comprehensive plan is the official statement of a local government establishing policies for its future long-range development.

Public facilities, transportation, and land uses function together, and in order for local governments to manage their fiscal impacts, they must be correlated and integrated. Historically, this has not happened.

TRUE COORDINATION WOULD REQUIRE SYNCHRONIZING THESE ELEMENTS – PUBLIC FACILITIES, TRANSPORTATION, AND LAND USES – WITHIN THE LOCAL COMPREHENSIVE PLAN, AS WELL AS COORDINATING BETWEEN THE INDEPENDENT BODIES THAT PLAN AND BUDGET FOR PUBLIC FACILITIES AND SERVICES, TRANSPORTATION, AND LAND USE.

When a local government receives a proposal to convert a one hundred acre farm to a 300-unit subdivision, for example, it must make several determinations, including whether the timing and location of the proposed subdivision is appropriate; and whether adequate water, sewer and roads can be provided when the impacts of the subdivision occur. Not all 300 homes in this example are likely to be built all at once, and the proposed project may be built in phases. Subdivisions build out over time. The day a hotel or a casino opens, however, impacts on roads alone are immediate and large. Public sector investors at all levels should plan and budget for development and redevelopment projects of varying intensities. It is most economical to provide sufficient public facilities and services concurrent with the impacts of development.

Ensuring that the necessary public facilities and services are in place at the time the impacts of development occur requires a community to establish and maintain measurable level of service standards. Level of service standards are indicators of the degree of service provided by, or proposed to be provided by, a facility based on and related to the facility's operational

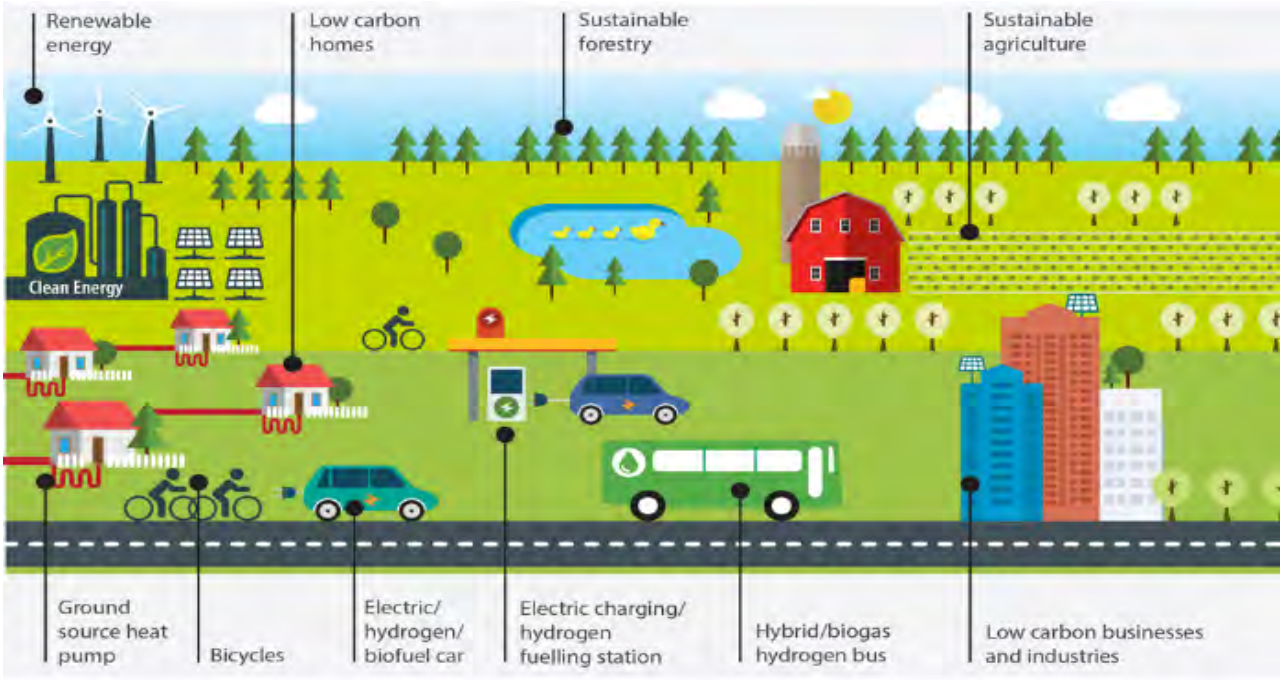


Figure 37: Public Facilities and Climate Change

characteristics. Level of Service (LOS) indicates the capacity per unit of demand for each public facility. In the case of roadways, the public expects a high level of service (free flowing traffic, or frequent and highly convenient transit service), as opposed to a low level of service (congestion and gridlock). Maintaining the highest levels of service may be cost-prohibitive, however.

In general, level of service standards should be set such that public facilities and services are able to handle current demand. Residents expect clean, fresh, pressurized water when they turn on the tap or flush the toilet. They expect the storm water from a heavy rain to be conveyed away from their basements. They expect to drive a car or take a bus to a destination with minimal delay.

Development or redevelopment carries demands for public facilities and services. New development can bring more people, more cars on the roads, more children in the schools, more storm water run-off, or higher demand for public water supplies. The public expects infrastructure to keep pace with the impacts of development.

THE PLACEMENT OF PUBLIC FACILITIES AND SERVICES, SPECIFICALLY WATER, SEWERS, AND ROADS, AND THEIR CAPACITIES AFFECTS THE LOCATION AND INTENSITY OF NEW DEVELOPMENT.

Publicly-funded capital improvements can be used as inducements for new development; they can direct and manage land development and redevelopment. Public facilities can draw development to various specific locations. The provision of public facilities and services without proper planning and analyses may mean communities trend towards scattered, untimely, poorly

planned development in urban fringe and rural areas. These patterns are typically manifested in one or more of the following ways: leapfrog development; ribbon or strip development; and large expanses of low-density, single-dimensional development.

Another phenomenon is that these public facilities and services – water, sewers, and roads – are constructed in response to demand. Utilities and roads can be extended over long distances to subdivisions and businesses. Roads and the prominent fixtures of America's landscape that they serve – including uses like big box retail, edge cities, residential subdivisions, and corporate campuses – are clearly codependent. Without proper planning and analyses, the demand for public facilities and services can exceed their capacity more quickly than anticipated. The haphazard provision of public facilities is almost always more costly to taxpayers than if a planned capital improvements schedule were employed.

MANY OF THE LAND USE PATTERNS OF THE REGION EXHIBIT ONE OR MORE OF THE FOLLOWING CHARACTERISTICS:

- low-density, low intensity, or single-use development or uses;
- development in rural areas at substantial distances from existing urban areas; development that may have leaped over undeveloped lands that are available and suitable for development;
- urban development in radial, strip, isolated or ribbon patterns generally emanating from existing urban developments;
- development that fails to adequately protect and conserve natural resources, and adjacent agricultural areas and activities;
- development that fails to maximize use of existing public facilities and services;
- development that fails to maximize use of planned or constructed future public facilities and services;
- the timing of land uses which disproportionately increases the cost of providing and maintaining facilities and services (in terms of time, money and energy), including roads, potable water, sanitary sewer, stormwater management, law enforcement, education, health care, fire and emergency response, and general government;
- development that discourages or inhibits infill development or the redevelopment of existing neighborhoods and communities;
- single-use development, or development that fails to encourage a functional mix of uses;
- development that results in poor accessibility among linked or related land uses;
- development that results in the loss of significant amounts of functional open space; and,
- development that does not follow the recommendations of a comprehensive plan.

These characteristics of the region's sprawling development patterns add to the cost of providing public facilities and services. A primary generator of these inefficient development patterns is the perceived desire of people to achieve the "American dream" of living on a large lot in a low-density, single-family neighborhood. The single-use auto-dependent residential subdivision has become the trend and the preferred living situation for a large percentage of the population.

CHANGING THE REGION'S LAND DEVELOPMENT TREND WOULD TEND TO LOWER PUBLIC FACILITIES CAPITAL AND OPERATING COSTS.

The initial cost of providing water, sewer, and roads to new development is typically higher in low-density areas than in compact areas where the facilities and services can be centralized. A continuation of the region's land development characteristics and trends will result in a number of costly long-term impacts, including scattered, untimely, poorly planned extension of water, sewer, and road facilities and services. Planned and budgeted reinvestment in existing infrastructure is preferable to ill-timed extension of public facilities and services.

Increased Pavement Area	More Dispersed Development
• Reduced openspace (gardens, parks, farmlands and wildlife habitat). • Increased flooding and stormwater management costs. • Reduced groundwater recharge. • Aesthetic degradation.	• Reduced openspace (farmlands and wildlife habitat). • Longer travel distances, more total vehicle travel. • Reduced accessibility for non-drivers, which is inequitable (harms disadvantaged people). • Increased vehicle traffic and resulting external costs (congestion, accident risk, energy consumption, pollution emissions).

This table summarizes various land use impacts and costs from transport planning decisions.

Figure 38: Transportation Planning Land Use Impacts

Attribute	Sprawl	Smart Growth
Density	Lower-density	Higher-density.
Growth pattern	Urban periphery (greenfield) development.	Infill (brownfield) development.
Activity Location	Commercial and institutional activities are dispersed.	Commercial and institutional activities are concentrated into centers and downtowns.
Land use mix	Homogeneous land uses.	Mixed land use.
Scale	Large scale. Larger buildings, blocks, wide roads. Less detail, since people experience the landscape at a distance, as motorists.	Human scale. Smaller buildings, blocks and roads, care to design details for pedestrians.
Transportation	Automobile-oriented transportation, poorly suited for walking, cycling and transit.	Multi-modal transportation that support walking, cycling and public transit use.
Street design	Streets designed to maximize motor vehicle traffic volume and speed.	Streets designed to accommodate a variety of activities. Traffic calming.
Planning process	Unplanned, with little coordination between jurisdictions and stakeholders.	Planned and coordinated between jurisdictions and stakeholders.
Public space	Emphasis on the private realm (yards, shopping malls, gated communities, private clubs).	Emphasis on the public realm (streetscapes, sidewalks, public parks, public facilities).

This table compares Sprawl and Smart Growth land use patterns.

Figure 39: Comparing Sprawl and Smart Growth

Solid waste management represents a significant cost to taxpayers and businesses, and disposal of materials causes environmental impacts and is a waste of resources and a lost economic opportunity. The more we can reduce the amount of waste that has to be disposed of by reducing generation and increasing reuse, recycling, and composting, the more money we can all save, the more resources we can capture, and the better we can protect our environment and feed our economy. In the decade before 1990, almost all trash in the Commonwealth was thrown out in more than 150 landfills and nine "municipal waste combustors" which burn trash and generate electricity. Most of the landfills were owned and operated by municipalities, and lacked liners and modern controls for the leachate and gas produced as the waste decomposes. Only small quantities of waste were being recycled.

Today, Massachusetts has a modern solid waste management system that promotes waste reduction and recycling, and ensures that facilities that handle and dispose of waste are properly designed and operated to protect public health and the environment. Our solid waste management facilities have installed modern pollution control equipment and adopted operating practices that minimize environmental impact. However, we continue to dispose of materials that have significant value and whose environmental impacts could be avoided if they were reused. Ensuring that disposal facilities are safely designed and operated is important to prevent air and water pollution and avoid potential public health concerns. However, reducing waste generation or recycling and composting waste instead of disposing of it provides even greater benefits. Recycling and composting capture valuable and limited natural resources and enable us to continue to use these materials instead of extracting new ones. Recycling and composting also create jobs and support economic development in the process.

Every year, even though Massachusetts boasts one of the highest recycling rates in the nation, the Commonwealth disposes of enough trash to fill 74 Fenway Parks. The disposal of that much material carries a large cost to the environment and the taxpayer wallet. By recycling and reusing more waste materials, Massachusetts cities and towns can save money and benefit the environment as they throw away less trash. As landfills close, municipalities and businesses seek innovative solutions to the problem of higher waste disposal costs. In 2015, around a quarter of the state's waste, around 1.4 million tons, was exported to facilities in New Hampshire, Ohio, Maine, New York, Connecticut, Vermont, and Rhode Island. That's a 16 percent jump from 2014. Solid waste management is an important contributor to greenhouse gas emissions (GHG), which Massachusetts is bound by law to reduce 25 percent by 2020 to below 1990 levels and 80 percent by 2050.

As consumers, businesses and government officials, we can no longer afford our traditional methods of managing waste. Solid waste management currently requires significant expenditures by taxpayers and businesses. Disposal of valuable materials is a waste of resources and lost economic opportunity. Diverting material from the waste stream by reducing generation and increasing reuse, recycling, and composting, saves everyone money, captures

valuable resources, protects our environment, and feeds our economy. Over the next decade, annual landfill disposal capacity in Massachusetts is expected to decline by as much as 1.5 million tons. By reducing waste and by recycling and composting more, we can reduce our need for overall disposal capacity and reduce the amount of waste that we will need to ship to other states for disposal as Massachusetts disposal capacity diminishes.

In the 2010 -2020 Solid Waste Master Plan (Master Plan) the Executive Office of Energy and Environmental Affairs (EEA) and the Massachusetts Department of Environmental Protection (MassDEP) established a plan and vision for how Massachusetts will manage its solid waste for the 2011-2020 timeframe. MassDEP now believes that disposal reduction is a simpler, more direct and more effective metric for evaluating waste reduction and diversion progress, including source reduction, recycling, composting and other forms of diversion. Therefore, the 2010 – 2020 Plan has shifted from a waste reduction rate to a disposal reduction target as our primary goal for measuring progress. MassDEP will measure disposal reduction by comparing the total disposal in the future year against disposal in 2008 as a baseline year. Given this change, MassDEP is no longer reporting on recycling, composting, and other diversion data on an annual basis.

Chinese Government restrictions on imports of recyclable commodities (known as China National Sword) have had a dramatic effect of recycling in Massachusetts, across the country, and around the world. China's new anti-pollution campaign refuses some items outright and demands extremely clean recyclables for the rest (0.5 percent contamination). Tighter end-market specifications for recovered paper and plastics have led to higher processing costs and lower revenues, particularly for paper. Before National Sword China was the world's largest importer of recyclable paper and plastic, accepting more than half of these materials generated around the globe. Like any other commodity, recyclables have always been subject to market fluctuations. But when viewed as a long-term waste management strategy, recycling has helped cities and towns reduce their disposal costs, boosted our economy, and improved the environment around us.

At the same time, cities and towns across Massachusetts are feeling the impacts of both China National Sword and regional market disruptions, such as the closure of a large recycled-content glass bottle manufacturing plant in Milford.

To help cities, towns, and processors more effectively meet the challenge of tighter end-market specifications for recyclables, MassDEP has:

- Developed the Recycling IQ Kit, which provides cities and towns with steps, tools, and resources to help educate residents about the need to improve the quality of materials they recycle;
- Expanded the Sustainable Materials Recovery Program to include grants for acquiring equipment to convert glass into processed glass aggregate for use in construction and paving projects;
- Authorized the use of Recycling Dividends Program payments to offset increases in recycling costs; and
- Introduced new Business Recycling Development Grants to both spur investment in equipment to more efficiently remove contaminants and develop new markets for targeted materials, such as glass.

Diverting more material from disposal is:

- An *environmental opportunity* that will help Massachusetts reduce greenhouse gas emissions, conserve natural resources, and supplement energy conservation;
- An *economic development opportunity* that can spur the expansion of businesses and jobs in the Commonwealth, using materials diverted from waste to make new products and competing the global marketplace; and
- An *opportunity to reduce disposal costs* for waste generators and municipalities.

Previously, we treated waste as waste. We must think of waste as material that can be used and capitalized upon. We must move toward a comprehensive and integrated approach that manages materials throughout their lifecycles and encourages stakeholders to take their share of responsibility, through smartly designed incentives. A 2014 ban on commercial food waste disposal has sent large amounts of organic material to composting facilities. The ban applied to institutions that generate a ton or more of food waste per week. The organics ban has forced colleges, universities and large businesses to revise their food management practices. Now, come food that formerly got thrown away is being donated to food banks, shelters, and soup kitchens.

That shift in thinking means we will focus on:

- Reducing the production of waste
- Promoting more efficient use of materials;
- Increasing the recycling of materials that have served their useful purpose;
- Reducing the amount of waste requiring disposal;
- Reducing the toxicity of the waste requiring disposal; and
- Improving the environmental performance of solid waste management facilities.

ENVIRONMENTAL BENEFITS

In 2009 alone, Massachusetts prevented the disposal of nearly 5 million tons of waste through recycling, composting and other diversion, eliminating the need for the equivalent of 12 landfills the size of the state's largest (400,000 tons per year). In addition to saving landfill space, waste reduction conserves natural resources, saves energy, prevents pollution, and reduces greenhouse gas emissions. In 2009, Massachusetts is estimated to have:

- Reduced greenhouse gas emissions by nearly 1.8 million tons of carbon equivalent per year;
- Saved 70 trillion BTUs of energy, equivalent to the annual energy consumption of more than 12 million barrels of oil or nearly 600 million gallons of gasoline; and

- Avoided the use of 1.1 million tons of iron ore, coal, limestone, and other natural resources.

Recycling creates environmental and energy conservation benefits, primarily by avoiding the extraction of virgin resources and reducing the environmental impacts of extracting these resources. Capturing these valuable materials provides these critical benefits for our environment and our economy in Massachusetts, but also nationally and internationally.

These lifecycle benefits dwarf the greenhouse gas emissions associated with transporting recycled materials to facilities that will use them, as well as the greenhouse gas emissions of the recycling processes. For example, the greenhouse gas benefits of recycling aluminum instead of disposing it are so large that you would need to transport aluminum about 116,000 miles by truck before the GHG emissions from this transportation would equal the GHG emissions avoided by recycling that aluminum. This relationship holds true for other recyclables as well: cardboard would need to be trucked for 27,000 miles to offset the lifecycle greenhouse gas benefits from recycling it.

ECONOMIC BENEFITS

Recycling bolsters the state's economy. Recycling, reuse, and remanufacturing (that is, manufacturing based on recycled feed stocks) directly support more than 2,000 businesses with an estimated 14,000 jobs in Massachusetts, maintain a payroll of nearly $500 million, and bring in annual revenues of $3.2 billion. Handling materials through reuse and recycling operations creates many more jobs than handling the same materials through disposal facilities. Materials recovery facilities create 10 times more jobs than landfills and municipal waste combustors, while recycling-based manufacturers create 25 times more jobs than disposal facilities for the same amount of material. Materials reuse operations create even more jobs, between 28 and nearly 300 times the number of jobs as disposal facilities.

Diverting material from disposal, whether through up-front waste reduction, reuse, recycling, or composting, can save significant disposal costs. Current disposal fees in Massachusetts typically range from $60 to $80 or more per ton. Depending on the status of recycling markets, municipalities or businesses may be able to receive some revenue for recyclable materials; however the greatest benefits will come from avoided disposal costs. It is important to recognize that recycling and composting are not free, as there are collection and processing costs. But the combination of avoided disposal costs and potential material revenues makes recycling, anaerobic digestion and composting cost effective materials management strategies.

LAND USE POLICIES

Land uses around major transit investments can have a big impact on the success of the system. The surrounding uses and density can promote transit ridership, connections to other modes, and access to destinations such as employment and entertainment districts. A mix of transit-supportive uses around transit stops not only creates or supports the density of people and infrastructure needed to support enhanced transit service, but also encourages the creation of quality places, where the combination of transit service, walkable neighborhoods, and housing allows for more affordable, healthier lifestyles. Planning and zoning changes that actively promote the transit investment should:

- Focus on compact mixed-use development.
- Provide a range of housing options for various incomes.
- Provide a range of community uses and amenities.
- Create an environment that supports bicycles and pedestrians.
- Facilitate high-quality public space including parks, plazas, and public art.
- Develop traffic-calming measures and limit curb cuts.
- Create well-landscaped streets that frame the street.
- Develop buildings with minimal setbacks and activity on the ground level.

Factors such as the local political, social, and economic climate, the quality and frequency of the new transit services, and its ability to meet the needs of the user contribute to the transit system's inability to stimulate economic development and shape surrounding land uses. In addition, the choice of transit mode, rapid bus- also affects the system's potential for shaping land use.

TO BUILD THE FOUNDATION FOR A PROSPEROUS, EQUITABLE, LIVABLE, AND SUSTAINABLE FUTURE, THE COUNCIL IDENTIFIED SEVEN POLICIES TO GUIDE LAND USE AND REGIONAL DEVELOPMENT.

ORDERLY AND EFFICIENT LAND USE: Align land use, development patterns, and infrastructure to make the best use of public and private investment.

NATURAL RESOURCE PROTECTION: Conserve, restore and protect the region's natural resources to ensure availability, support public health, and maintain a high quality of life.

WATER SUSTAINABILITY: Conserve, restore, and protect the quality and quantity of the region's water resources to ensure ongoing availability, support public health, and maintain a high quality of life.

HOUSING AFFORDABILITY AND CHOICE: Promote housing options to give people in all life stages and of all economic means viable choices for safe, stable, and affordable homes.

ACCESS, MOBILITY, AND TRANSPORTATION: Sustain and improve a multi-modal transportation system to support regional growth, maintain regional economic competitiveness, and provide choices and reliability for the system's users.

ECONOMIC COMPETITIVENESS: Foster connected land use options to provide businesses and industries with access to materials, markets, and talent.

BUILDING IN RESILIENCE: Promote sensitive land use and development patterns to achieve Massachusetts adopted greenhouse gas emissions goals at the regional scale, and to develop local resiliency to the impacts of climate change.

To implement these policies, the Council has identified land use strategies for local communities and the Council to implement. While each strategy is linked to a specific policy in this document, in practice strategies serve multiple purposes. For example, a strategy of focusing development around centers on transit corridors aligns land uses to make the best use of public and private investments, reduces the development pressures in areas with high quality natural resources, grows transit ridership, and expands options for urban living. We cannot focus on one policy alone to attain the outcomes identified in this plan. Instead, a combination of strategies addressing all of the policies are interrelated, and implementation must be integrated to achieve the preferred outcomes.

ORDERLY AND EFFICIENT LAND USE

ALIGN LAND USE, DEVELOPMENT PATTERNS, AND INFRASTRUCTURE TO MAKE THE BEST USE OF PUBLIC AND PRIVATE INVESTMENT.

Orderly and efficient land uses lay the foundation for a prosperous region. The Council sets the framework for land use patterns and guides the overall development of the region. To be fiscally responsible, the Council guides land uses and development patterns that leverage the region's infrastructure investments and private development to the benefit of both. Directing growth where infrastructure already exists also reduces the need to add roads and expand the wastewater systems to support the same growth elsewhere.

Making efficient use of land and capitalizing upon existing infrastructure also reduce outward development pressures in rural and natural resource areas. Planning for and supporting growth where infrastructure is already in place allows these rural areas to continue to maintain large tracts of natural resources, agricultural productions, and a sparsely developed rural environment.

Aligning land uses, development patterns, and infrastructure is important at the local level. Orderly and efficient does not just mean wise use of regional infrastructure; it

Figure 40: Land Use Planning Objectives

also means planning livable neighborhoods connected to places of work and play. While planning has traditionally separated residential neighborhoods from commercial and industrial areas, residents still need to access these places to meet their daily needs and get to work. Communities should continue to consider strategic locations for integrating different uses into neighborhoods and make it easier for people to access parks and pick up groceries without a car. Compact development patterns, integrated natural resources, and interconnected local street networks all add to the livability of our communities.

The region is able to provide cost-effective infrastructure and services when it is able to anticipate where, when, and to what extent growth will occur. Density thresholds are based on an understanding of future regional growth, market demand in different parts of the region, existing development patterns and redevelopment opportunities, existing planned land uses in local comprehensive plans, and regional policies to support the concentration of higher density growth around transit stations.

Because each community and its values are unique, precisely how and where density is guided is determined by each community consistent with regional policies. Communities are expected to plan for achieving the overall minimum average density expectations in their community across all areas that a community identifies for new growth, development, and redevelopment.

COUNCIL ROLE

- Advance the Council mission of ensuring orderly and economic development.
- Develop and update regional plans to manage forecasted growth by using regional systems and land efficiently and effectively.
- Coordinate major regional investment projects with local infrastructure and planning for development and redevelopment.
- Promote development patterns that protect natural resources, and our water supply.
- Promote land use patterns that differentiate between urban and rural uses.
- Promote inter connected, compact development patterns

COMMUNITY ROLE

- Plan for development to support forecasted growth at appropriate densities.
- Plan and develop interconnected and well-connected local streets, adequate stormwater infrastructure, adequate water supply, and properly managed subsurface sewage treatment systems to support local growth forecasts.
- Develop plans to improve conditions for and encourage walking and bicycling where appropriate.

UPDATE COMPREHENSIVE PLANS

GOAL: EACH LOCAL MUNICIPALITY WILL HAVE AN UP TO DATE COMPREHENSIVE PLAN (MASTER PLAN) RECOMMENDING THAT THE NECESSARY PUBLIC FACILITIES AND SERVICES WILL BE IN PLACE AT THE TIME THE IMPACTS OF DEVELOPMENT OCCUR, AND THAT DISCOURAGES THE PROVISION OF PUBLIC FACILITIES OUTSIDE OF AREAS RECOMMENDED FOR NEW DEVELOPMENT.

In the typical process of local land development approvals, transportation investments often lag behind the impacts of development and redevelopment activities. Consequently, regional transportation planning agencies like OCPC find themselves reacting to the impacts of incremental development or redevelopment projects, rather than planning and budgeting for adequate public investments that are available at the time development impacts occur.

A community's vitality can be affected by the degree to which it addresses a wide-ranging set of elements in its local comprehensive plan, including not only public facilities, transportation, and land use, but also economic development, housing, the environment, recreation, capital improvements, and intergovernmental coordination. Solutions to a wide range of shared problems can be found thorough cooperation among adjacent local governments and between governments at all levels.

INTERGOVERNMENTAL COORDINATION ENCOURAGES CONSISTENCY WITHIN AND BETWEEN LOCAL GOVERNMENTS, THEREBY INCORPORATING A BROADER VIEW IN THEIR INDIVIDUAL PLANNING PROCESS.

The primary benefit of coordinated comprehensive planning is that it provides for timing and location of development and redevelopment, something that zoning and subdivision regulations do not achieve on a community-wide basis. The timing and location of development or redevelopment have direct implications on the use of local taxes for capital projects and on the conservation of natural resources.

- *DEVELOP MODEL COMPREHENSIVE PLAN GUIDELINES* that link transportation, land use, economic development, public facilities, housing, natural systems, recreation, intergovernmental coordination, and capital improvements for use by all local governments in the region. Local comprehensive plans (master plans) will be consistent with the region's model comprehensive plan guidelines.
- *ENCOURAGE COORDINATION WITH AND AMONG WATER AND SEWER PROVIDERS AND STORMWATER MANAGEMENT AUTHORITIES*. The Council will encourage a public facilities element within each local comprehensive plan to analyze the need for public facilities and services, as well as specify areas for capital improvements, in consultation with water and sewer providers.
- *INVENTORY AND TRACK THE GROWTH OF WATER AND SEWER SYSTEMS* to help local and regional planners understand where new development is being encouraged and where transportation system improvements could be needed.

- *EACH LOCAL COMPREHENSIVE PLAN WILL INCLUDE LEVEL OF SERVICE STANDARDS*, will identify the facilities needed to meet them, and will reference capital improvement plans from relevant jurisdictions and water and sewer utilities.
- *LOCAL GOVERNMENTS WILL EVALUATE LAND USE PROPOSALS FOR CONSISTENCY WITH THE CAPACITY AND LEVEL OF SERVICE OF THE PUBLIC FACILITIES AND SERVICES* identified in their comprehensive plans, and will estimate public facility and service costs associated with these proposals.
- *ENCOURAGE LOCAL COMPREHENSIVE PLANS INCLUDE THE COSTS OF PROVIDING PUBLIC FACILITIES AND SERVICES FOR DEVELOPMENT ARE ACCOUNTED FOR AND COVERED* by available funds, fee structures, and benefits to the community.
- *DEVELOP EVALUATION CRITERIA AND TECHNIQUES THAT CAN BE USED AT THE LOCAL LEVEL* to ensure that needed infrastructure improvements are provided when the impacts of development occur.

Figure 41: Blueprint for Brockton APA Award

NATURAL RESOURCE PROTECTION

OVERARCHING GOAL: CONSERVE, RESTORE, AND PROTECT **THE REGION'S NATURA**L RESOURCES TO ENSURE THEIR ONGOING AVAILABILITY, TO SUPPORT PUBLIC HEALTH, AND TO MAINTAIN A HIGH-QUALITY OF LIFE.

GOAL: PROTECT AND IMPROVE THE DIVERSITY AND SUSTAINABILITY OF THE REGION'S NATURAL SYSTEMS.

GOAL: THE REGION'S ECONOMY PROSPERS THROUGH THE CREATION OF GREAT CENTRAL PLACES, DIVERSE COMMUNITIES, AND HIGH QUALITY OF LIFE THAT INTEGRATES TRANSPORTATION, THE ECONOMY AND THE ENVIRONMENT.

- Ensure that economic develo**pment sustains and respects the region's environmental** quality.
- Maintain, replace, or expend local facilities and infrastructure to meet growth and development needs.
- Encourage zoning amendments to promote Open Space Residential Design Development (OSRD) design elements that support reduced dimensional requirements including lot sizes, setbacks, and parking ratios to encourage construction of affordable housing units with increased densities that facilitate more flexible developments on smaller footprints.

The region's diverse communities and natural settings are assets that make us a magnet for growth. Protecting and enhancing the environment, both natural and built, helps the region remain both competitive and livable. As the region's economy grows, this plan calls for sustaining and respecting the area's environmental quality and unique attributes, as well as each community's distinctive identity.

An abundance of natural resources has long contributed to the vibrancy of our region. BioMap2 is designed to guide strategic biodiversity conservation in Massachusetts over the next decade by focusing land protection and stewardship on the areas that are most critical for ensuring the long-term persistence of rare and other native species and their habitats, exemplary natural communities, and a diversity of ecosystems.

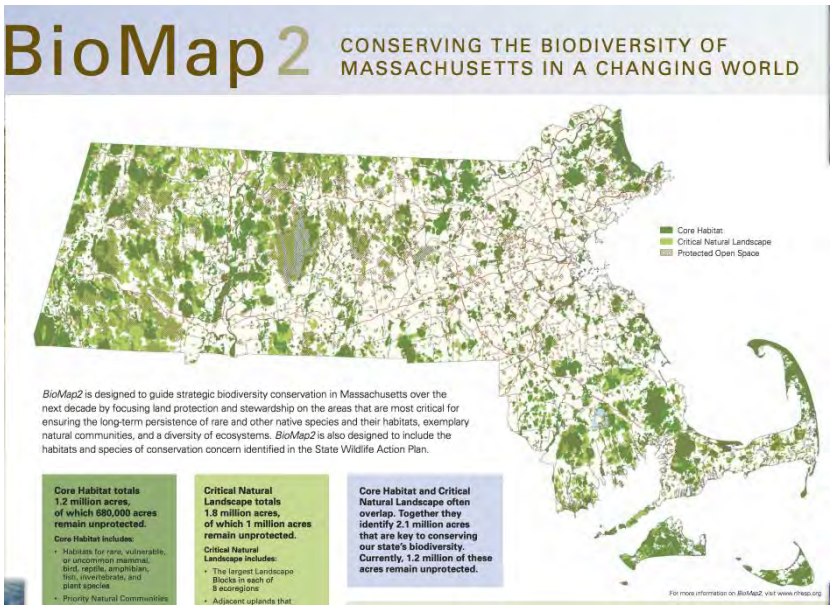


Figure 42: Massachusetts BioMap2

Communities often unintentionally discourage climate-smart development by:

- Requiring large lots
- Requiring strict dimensional requirements
- Prohibiting curb cuts for drainage
- Requiring wide, curbed roads
- Not prioritizing Low Impact Development
- Not prioritizing preservation of natural features

PRESERVING NATURAL FEATURES OFFERS NUMEROUS BENEFITS. EVERY $1 INVESTED IN LAND CONSERVATION OFFERS A $4 RETURN THROUGH:

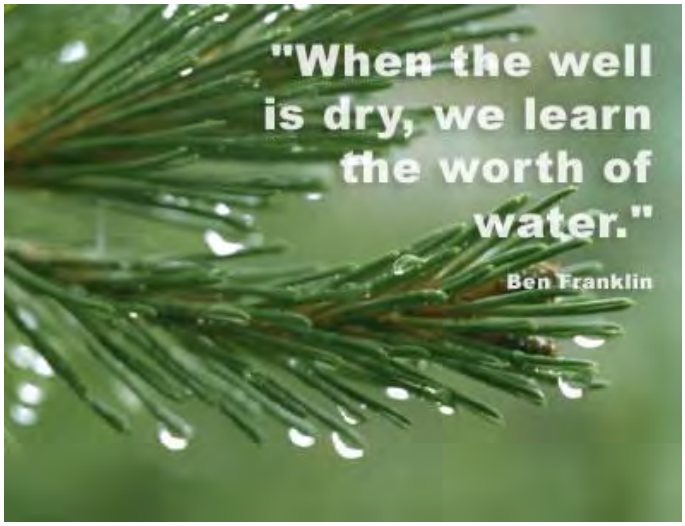
- Flooding: Floodplains provide flood protection and reduce infrastructure damage
- Public Health: Managing stormwater and reducing retention ponds reduces creation of mosquito habitat
- Air Quality & Public Health: Trees reduce the urban heat island effect, reducing smog creation and resulting asthma occurrences as well as reducing nitrogen dioxide and particulate matter.
- Water Quality: Streamside vegetation filters pollutants and reduces erosion.
- Water Quantity: Forests and wetlands store water, improve water quality, and recharge groundwater.
- Recreation: Clean, flowing waters support recreation, including boating, fishing, and swimming while open space provides areas for hiking and biking.
- Quality of Life: Open space and street trees create a more enjoyable walking environment benefiting community connection, health, and economic benefit in downtowns and commercial areas.
- Property Value: Healthy, mature trees add an average of 10-30% to a property's value.

The long-term viability of the OCPC region is dependent on the health and quality of our dynamic and interdependent natural resources and open spaces.

Every building erected, public utility placed, and every road constructed could potentially have an impact on the individual resources and broader natural systems. The value of the region's natural resources and open space can be positively or negatively affected by local land use and transportation decisions.

In broad terms, natural resources are materials and assets occurring in nature that provide for the sustenance of life, that have potential economic value, or that serve the community's well-being or recreational interests. Open space is land that is undeveloped or in its natural state. The value of natural resources and open space in the region includes enhanced quality of life, physical attractiveness, and enhanced economic vitality. Groundwater and surface water are

thus key components of the region's economy and quality of life. The principal uses of the region's water resources are water supply, waste disposal, drainage, recreation, habitat and navigation.



Open Space Residential Design (OSRD) is a tool to protect natural resources and open space by linking low underlying densities with compact patterns of development so that significant amounts of land can be permanently protected and forever available for agriculture, forestry, recreation, water supply protection, and wildlife habitat. OSRD includes elements of conservation subdivision regulations in a manner that maximizes the protection of natural resources (wetlands, forest, agriculture lands, open space) while providing for new construction and adequately compensating landowners. *OSRD helps mitigate suburban sprawl impacts by addressing both open space and natural resource preservation through subdivision design that maximizes resource protection while providing flexibility to allow various lot sizes, setbacks, and frontage requirements within the development.*

The use of OSRD will concentrate development on to smaller areas of a site than what would generally happen under conventional zoning practice. It also provides flexibility to combine civic, educational, and recreational activities with open space and homes while protecting land and water resources and promotes recharge to underlying aquifers. OSRD bylaws can expand housing opportunities in a community where diverse housing types and allowed in a subdivision or when used in conjunction with inclusionary zoning.

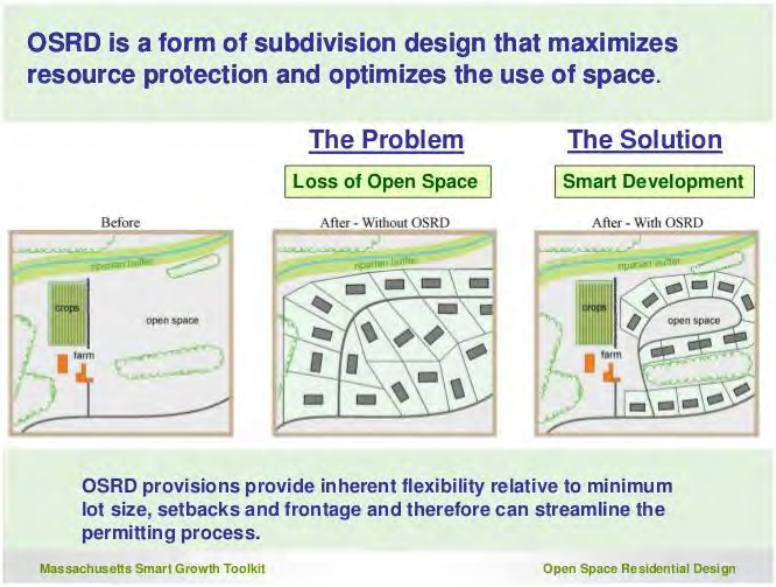


Figure 43: Open Space Residential Design

WATER SUSTAINABILITY

OVERARCHING GOAL: TO ACHIEVE OUR LONG-TERM V**ISION OF THE REGION**'S PROSPERITY AND LIVAB**ILITY, OUR REGION'S** WATER RESOURCES MUST BE SUSTAINABLE, SUPPORTED BY A REGIONAL STRATEGY THAT BALANCES GROWTH AND PROTECTION TO IMPROVE AND MAINTAIN THE QUALITY AND QUANTITY OF OUR WATER IN OUR LAKES, RIVERS, STREAMS, WETLANDS, AND AQUIFERS.

A well-maintained, reliable water infrastructure system is vital to the Commonwealth's health, economy, environment, and cultural vitality.

When we turn on the tap in the morning, clean, drinkable water flows from the faucet. It is an uninteresting and unremarkable fact of modern life until, one day, no water comes out. We have learned to take the reliability of our drinking water and wastewater disposal systems as well as our storm water systems for granted. It is only when there is a major problem with our water infrastructure systems - a large water main breaks, or leaking sewage causes a beach closing, or a blocked drain causes flooding - that we state to pay attention to the thousands of miles of pipes, pumping facilities, and numerous treatment plants that are part of our water infrastructure.

Clean water is perhaps our most precious commodity and assuredly our most recycled resource. Our water supply, wastewater treatment, and storm water management protect our health, keeping us safe from deadly waterborne diseases. The availability of high quality water is an important consideration for many businesses, including life sciences and manufacturing. A high pressure water system allows us to put out fires, and healthy rivers, lakes, and wetlands free from pollution are critical for a thriving environment.

Yet despite its importance, our aging water infrastructure system suffers from a lack of investment, delayed maintenance and insufficient resources. Hundreds of miles of pipes are kept in service far past their useful life, leading to lost water and sewage through underground leaks and, in the worst case, water main breaks that can leave thousands of families without water for days. Many municipal treatment plants are in need of updating to meet current public health and environmental guidelines. Our drinking water, wastewater and stormwater infrastructure need increased investment if they are going to continue to deliver reliable clean water and keep wastes and toxic chemicals out of our environment without service interruptions.

- *GROUNDWATER AND SURFACE WATER RESOURCE PROTECTION* will be addressed in local comprehensive plans, and will continue to be addressed in relevant OCPC planning efforts.
- *LOCAL JURISDICTIONS WILL PROTECT WATER QUALITY THROUGH LAND USE DECISIONS* and implementation of best management practices for stormwater run-off, with consideration of downstream impacts.

WATER RESOURCES

With water resources, the region has an economic interest in meeting the needs of the present generation without compromising the ability to meet the needs of future generations. The value of water resources as economic and social assets is best understood in the context of population growth, capital budgeting, the timing and location of future land uses, infrastructure needs and economic development.

In the OCPC region, protection of water resources at the local level is often done by local environmental management or public works agencies, water suppliers, health departments, and sanitation districts, with monitoring and technical assistance sometimes provided by consultants and universities.

At the local level, water resources planning and protection is typically not addressed in local comprehensive plans along with land use, transportation and other infrastructure, housing, recreation, intergovernmental coordination, and capital budgeting issues.

Where significant water resources are present in a jurisdiction, most local comprehensive plans reviewed by OCPC failed to identify and analyze rivers, lakes, wetlands, floodplains, major natural drainage features, or groundwater sources and uses. The comprehensive plans also failed to analyze those resources' existing or potential commercial, recreational or conservation uses, or their known pollution problems including hazardous wastes. The local comprehensive plans do not identify and analyze current and projected water needs and sources based on the demands for industrial, agricultural and potable water use, and the quality and quantity of water available to meet these demands.

PROTECTION AND SUSTAINABILITY OF WATER RESOURCES ARE FURTHER COMPLICATED WHERE THESE RESOURCES ARE PROVIDED BY ONE JURISDICTION TO ANOTHER. In such cases, there typically are no long-range analyses of neighboring areas served for the purpose of projecting facility needs. For such shared facilities, the proportional capacity of the systems allocated to serve multiple jurisdictions is often not fully understood in the context of population growth, future land uses and economic development.

PROTECTION OF WATER RESOURCES IS COMPOUNDED BY THE MULTIPLICITY OF POTENTIAL POLLUTION SOURCES.

Groundwater contamination, for example, results from a variety of sources. Some sources are found throughout the nation, such as septic systems. Some sources are direct causes of contamination, such as leaking underground storage tanks, while others are not, such as abandoned wells and gravel mining pits. Control of these diverse sources of groundwater contamination requires a combination of voluntary precautions, prescribed management practices and regulatory oversight.

The Clean Water Act strategy to protect surface waters essentially consists of a goal, a stream-use classification system, pollutant discharge guidelines, and surface water quality standards. Groundwater protection efforts have also begun to follow this strategy by pursuing a groundwater-quality goal, an aquifer classification system, wellhead protection guidelines and groundwater quality standards.

At the regional, state and federal levels, the emphasis on, and funding for water resource planning has shifted in recent years from "point" sources of pollution to "non-point" sources.

> "Flooding is not caused by an unusual amount of water falling on the land, but by the inability of the landscape to absorb it"
>
> Patchett, James H. The Ecology and Culture of water, revised March 2008.

Stormwater, the rainwater runoff from roads, parking lots, and rooftops, is considered one of the greatest threats to the region's marine life, because it carries pollution and erodes streams. Increased volumes of runoff in both upland and downstream water bodies adjacent to the ocean have worsened water quality over the years. This degradation results in a variety of impacts, environmental, economic, and social, including destruction of habitat and restrictions to shellfish harvesting.

Urban runoff can disrupt the natural water balance, resulting in less recharge of groundwater supplies. Impervious surfaces and alterations to natural processes for percolation affect water quality and quantity in streams and lakes, which in turn can create hazards, such as landslides and flooding. In planning for the future, improvements to stormwater management practices are necessary.

The region needs to be more attentive to groundwater recharge, water quality treatment, channel protection, aquatic practices, and flood control. Measures could include retrofitting existing systems that currently lack stormwater controls, as well as improving collection systems to reduce the amount of rainwater and groundwater that infiltrates the pipes. Increasing capacity at existing treatment plants could reduce the need for expanded treatment facilities. Low-impact development practices create opportunities to employ more natural ways to manage stormwater. Redevelopment also creates opportunities to restore urban streams, reestablish stream buffers, and take steps to better control erosion and sediment.

PROMOTING THE WISE USE OF WATER

Water is sustainable when the use does not harm ecosystems, degrade water quality or compromise the ability of future generations to meet their own needs.

Our water supplies are not limitless. Population, growth, development, localized water shortages, contamination, drought, and the impact of groundwater withdrawal on surface waters is affecting our future water supply. Increasing reliance on groundwater as our main source of drinking water has become a significant issue. In parts of the region, groundwater levels are declining. In some cases, it is affecting, or has the potential to affect, lake and wetland levels. A passing concern is the impact that current groundwater use and future development might have on the reliability of groundwater as a municipal water source.

Forecasts indicate that the region will add over 16,623 residents over the lifetime of this plan, a 4.2 percent increase from 2016 through 2040. The Commonwealth population is forecasted to increase by 7.2 percent or 488,382 residents between 2016 and 2040. Continuing current practices of using groundwater as a primary drinking water source will lead to continued depletion of groundwater supplies across the region. Conservation measures alone are inadequate to protect the region's water supply. Rather, the region needs to restore balance among water sources, maintain and enhance groundwater recharge, and expand the use of conservation measures.

THE OLD COLONY PLANNING COUNCIL IS COMMITTED TO COLLABORATING WITH ITS PARTNERS TO PROMOTE THE LONG-TERM SUSTAINABILITY OF THE REGION'S WATER RESOURCES AND WATER SUPPLY.

This regional strategy will balance growth and protection to improve and maintain the quality and quantity of our lakes, rivers, streams, wetlands, and groundwater supplies. The Council will work with state, local, and regional partners to provide for sustainable water resources through effective planning and management of water supply, surface water, and wastewater. To promote adequate and high-quality groundwater and surface water supplies, the Council will:

- *PROMOTE WATER SUSTAINABILITY* in communities through the review of local comprehensive plans.
- *PROMOTE THE WISE USE OF WATER* through optimizing surface water and groundwater use, conservation, reuse, aquifer recharge, and other practices.
- *COLLABORATE WITH PARTNERS*, including providing technical assistance to local governments, about wastewater, water supply, and surface water management.
- *ADDRESS THE RELIABILITY, RESILIENCY, SECURITY, AND COST-EFFECTIVENESS OF THE* ***REGION'S WATER SUPPL****IES*.
- *INCORPORATE WATER SUSTAINABILITY CONSIDERATIONS IN ALL AREAS OF COUNCIL POLICY AND ACTIONS*, including overall development patterns, water management, transportation, housing, and regional parks.
- *IDENTIFY SUB-REGIONAL AND LOCAL WATER SUSTAINABILITY SOLUTIONS* that balance regional needs and local objectives.

THE TRUE COST OF WATER

THE PUBLIC IS OFTEN UNAWARE OF THE TRUE COSTS OF FULLY SUPPORTING, OPERATING, MAINTAINING AND INVESTING IN OUR WATER INFRASTRUCTURE. At the same time, consumers generally underestimate the value of water in protecting public health and safety, promoting economic vitality, creating jobs, and preserving our environment. Most of all, the public and policymakers at all levels often misunderstand the consequences of failing to invest, from the high costs of deferred maintenance and emergency repairs to the missed opportunity to grow our economy by strengthening our infrastructure.

The result is a lack of public attention to and support of policies that will ensure we have the resources necessary to rehabilitate our aging infrastructure, meet the challenges of environmental regulation, and continue to provide safe, clean drinking water across the Commonwealth without interruption.

WATER UTILITIES FACE MANY COST CHALLENGES:

- *AGING SYSTEMS NEED INVESTMENTS.* Some water and sewer systems in Massachusetts' older communities were constructed as early as the 1800s. Major federal investments in water and wastewater in the 1970s and 1980s brought new plants and new technologies to many towns, but many of these assets are nearing the end of their intended service life. As a result, many communities in the Region are facing serious challenges posed by the cost of needed upkeep, upgrades, and improvements to aging water and sewer systems.
- *ENVIRONMENTAL AND PUBLIC HEALTH CONCERNS ARE ADDRESSED.* Many systems are in need of improvements and upgrades in their level of treatment to meet stronger environmental or public health standards. Many municipal systems are facing ongoing, increasingly expensive, and unfunded regulatory requirements to address various environmental or public health requirements. Nutrient control and stormwater mitigation are particularly significant challenges in Massachusetts. The cost of addressing them is high and sometimes unpredictable.
- *LACK OF STATE LEVEL CONTROL OVER CLEAN WATER PERMITS MAY BE PREVENTING SMART PLANNING AND PRIORITIZATION OF RESOURCES.* Massachusetts is one of only four states in the nation that has not taken over responsibility ("primacy") for managing water pollutant control from the federal government. While the state would still be required to meet federal standards, primacy may allow the state to work collaboratively with cities and towns to manage wastewater and stormwater programs and provide the flexibility needed to most effectively prioritize scarce pollutant control resources. As federal wastewater and stormwater regulations become more and more stringent, having this flexibility on the local level may become increasingly important.
- *SECURITY AND REDUNDANCY INVESTMENTS ARE REQUIRED.* To protect the public during emergencies – from natural disasters to system failures to acts of terrorism – communities must invest significant dollars in security and redundancy in their systems.
- *COSTS ARE RISING.* Pumping, delivering, collecting and cleaning water and wastewater uses a significant amount of energy, chemicals, and manpower. As these costs rise, so does the cost of providing clean water. As treatment systems become more complex,

so does the level of skill and training of personnel needed to operate them, and the compensation needed to attract those skilled personnel has also increased.

- *MANY WATER UTILITIES ARE NOT RUNNING AT OPTIMAL EFFICIENCY.* Generally accepted industry best management practices exist, but are used only partially or not at all by water utilities across the state. Many municipalities need technical assistance and training that could help them run more efficient and financially healthy systems that recognize and address the true cost of water services.
- *MUNICIPAL DEBT IS A GROWING BURDEN.* Many municipalities have taken on increasing levels of debt to maintain their water infrastructure and meet obligations for mandated improvement projects. For many communities, this means a significant portion of their finances have been and will continue to be consumed by debt service.
- *RATES VARY WIDELY AND DO NOT ALWAYS COVER THE FULL COST OF SERVICE.* Unlike other utilities, all too often, municipal water and sewer rates do not come close to covering the full cost of providing clean water and eliminating waste. Rates frequently do not cover capital improvement plans, the management and replacement of pipes and other assets, or the protection of watershed land. As a result, the public has grown accustomed to low user rates and can dramatically underestimate or misunderstand and resist rates that reflect the true cost of service.
- *AFFORDABILITY IS AN IMPORTANT ISSUE FOR MANY COMMUNITIES.* Rate payers are very concerned about the cost of services, and system managers must address affordability in setting their rates. Keeping water and sewer service affordable is of particular concern to individuals on low and/or fixed incomes. As water infrastructure is paid for increasingly with user rates, it is important to recognize that different communities have different abilities to pay for necessary improvement.

The OCPC Region needs to catch up with the rehabilitation of aging infrastructure, meet the challenges of environmental regulation, invest in a sustained asset management program, and integrate our infrastructure to be more energy efficient and more environmentally sustainable. The challenge is to find a sustainable way of accomplishing these goals now and in the future.

The Old Colony Planning Council believes that the Commonwealth has an obligation and an opportunity to reduce the likelihood of inconvenient or catastrophic water system failures that threaten public health and safety and our economic well-being.

We can also embrace tremendous opportunities for innovation that can stimulate research and development, provide good jobs, and lay the groundwork for a twenty-first century water infrastructure network that addresses structural deficiencies, is sustainable, cost-effective and protective of our environment and future generations.

TO DO THIS WILL REQUIRE A SIGNIFICANT INCREASE IN SPENDING ABOVE CURRENT LEVELS.

1. INCREASE AND WISELY USE AVAILABLE FUNDS FOR CRITICAL INVESTMENT.
2. EMBRACE NEW WAYS OF MANAGING OUR INFRASTRUCTURE TO FIND EFFICIENCIES AND COST SAVINGS.
3. MANAGE OUR WATER RESOURCES IN MORE ENVIRONMENTALLY SOUND AND SUSTAINABLE WAYS.

SPECIFICALLY, THE OLD COLONY PLANNING COUNCIL RECOMMENDS:

1. *INCREASING FUNDS AVAILABLE FOR WATER-RELATED INFRASTRUCTURE AT ALL LEVELS*.
    - Incent all communities, authorities and districts to utilize rate structures that reflect the full cost of water supply and wastewater treatment.
2. *REDUCING COSTS AND FINDING EFFICIENCIES.*
    - Provide strong incentives for municipalities, districts and authorities to use best management practices.
    - Encourage enterprise funds for stormwater mitigation.
    - Encourage appropriate regional solutions starting with management and technical assistance and followed where appropriate with system integration.
    - Encourage sustainable infrastructure.
    - Encourage a watershed approach when making land use and funding decisions to support efficient water and energy use.
    - Encourage strategic public-private partnerships.
    - Assist towns in the adoption of best management practices through changes in law, technical assistance and other incentives.
3. *PROMOTE ENVIRONMENTAL SUSTAINABILITY.*
    - Educate stakeholders in the principles and practices of sustainable and energy-efficient design.
        - ✓ Provide guidance and technical support in assisting communities with DOER Green Community designation.
    - Encourage investments and regulations that are aligned with environmentally sustainable principles:
        - ✓ Prioritize solutions that use technologies that are environmentally and financially sustainable over the lifetime of the assets.
        - ✓ Promote water conservation and water reuse.
        - ✓ Reduce the release of nutrients in watersheds.
        - ✓ Encourage energy efficiency.
        - ✓ Prioritize solutions that keep water within its basin while protecting water quality.
        - ✓ Protect water sources through watershed protection programs.
        - ✓ Encourage more effective long-term planning, optimization of resources, and management efficiencies.
        - ✓ Encourage integrated resource management, where "wastes" are viewed as resources from which revenues can be generated.
4. *PROMOTE INNOVATION.*
    - Allocate resources for programs that mitigate the inherent risks in innovation by supporting pilot projects, proof of concept projects and new technology.
    - Provide technical assistance to communities interested in innovative approaches.
    - Implement alternative analyses that put innovative solutions on an equal footing with traditional approaches.
    - Harness the Commonwealth's educational strengths to train engineers, scientists, researchers, and workers to be at the forefront of innovative water management.
    - Invest in consumer education about the true costs and value of our water infrastructure.

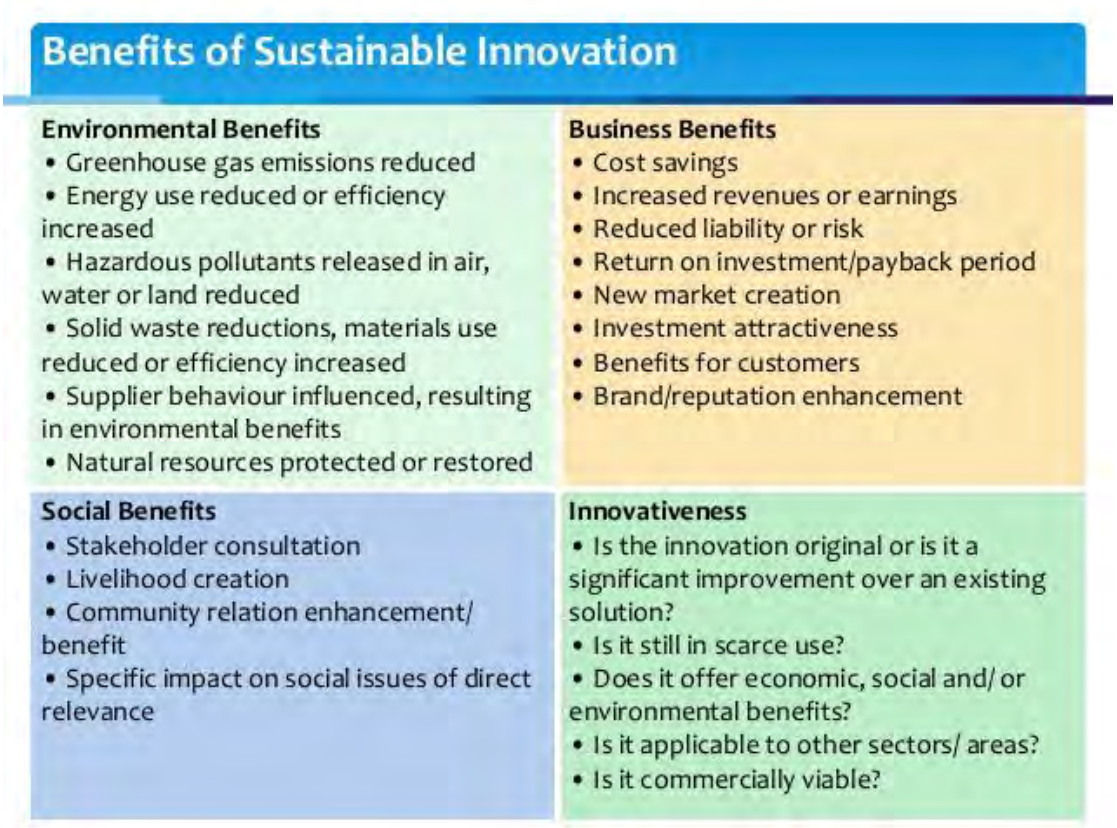


Figure 44: Sustainable Innovation

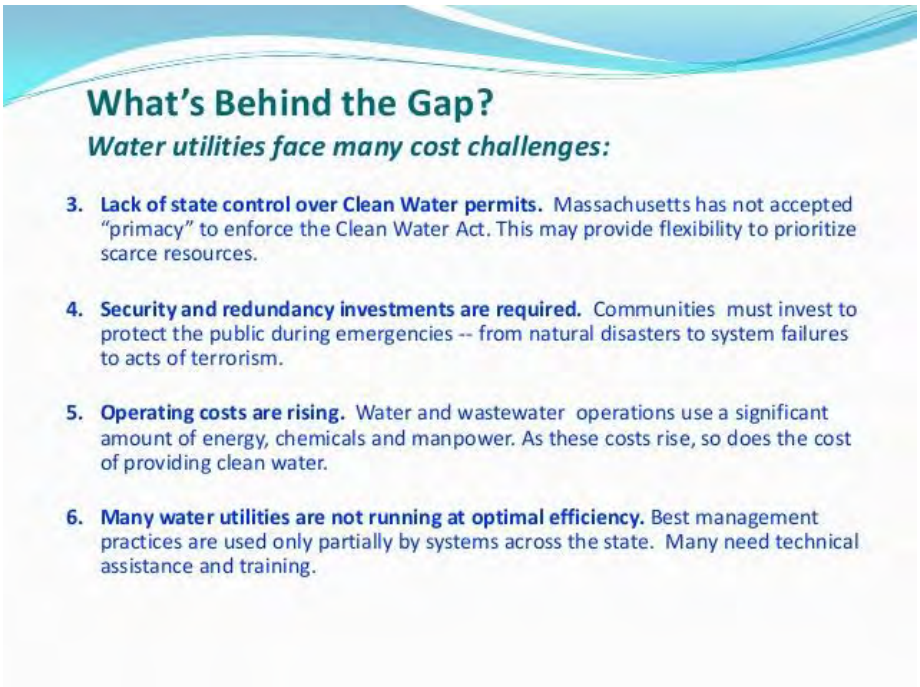


Figure 45: Water Utility Challenges

HOUSING AFFORDABILITY AND CHOICE

OVERARCHING GOAL: THE REGION WILL PRESERVE, IMPROVE, AND EXPAND ITS HOUSING STOCK TO PROVIDE A RANGE OF AFFORDABLE, HEALTHY, AND SAFE HOUSING CHOICES TO EVERY RESIDENT. THE REGION WILL CONTINUE TO PROMOTE FAIR AND EQUAL ACCESS TO HOUSING FOR ALL PEOPLE.

GOALS: ADDRESS THE HOUSING NEEDS OF ALL ECONOMIC SEGMENTS OF THE POPULATION. INCREASE THE SUPPLY AND MIX OF HOUSING TYPES, PROMOTE INFILL DEVELOPMENT AND EFFICIENT DEVELOPMENT PATTERNS, AND PROMOTE AN IMPROVED RELATIONSHIP BETWEEN JOBS AND HOUSING TO CREATE ECONOMICALLY BALANCED COMMUNITIES.

GOAL: ACHIEVE AND SUSTAIN, THROUGH PRESERVATION, REHABILITATION, AND NEW DEVELOPMENT, A SUFFICIENT SUPPLY OF HOUSING TO MEET THE NEEDS OF LOW-INCOME, MODERATE-INCOME, MIDDLE-INCOME, AND SPECIAL NEEDS INDIVIDUALS AND HOUSEHOLDS THAT IS EQUITABLY AND RATIONALLY DISTRIBUTED THROUGHOUT THE REGION.

GOAL: DEVELOP AND PROVIDE A RANGE OF HOUSING CHOICES FOR WORKERS AT ALL INCOME LEVELS THROUGHOUT THE REGION IN A MANNER THAT PROMOTES ACCESSIBILITY TO JOBS AND PROVIDES OPPORTUNITIES TO LIVE IN PROXIMITY TO WORK.

GOAL: PROMOTE AN INCLUSIONARY ZONING ORDINANCE WITH INCENTIVES TO INCLUDE ACCESSIBLE AND ADAPTABLE HOUSING UNITS IN NEW DEVELOPMENT THAT PROVIDE AFFORDABLE HOUSING OPTIONS FOR PEOPLE WITH LOW- OR MODERATE-INCOME, SENIORS, VETERANS OR DISABLED PERSONS WITHIN THE REGION.

HOUSING AFFORDABILITY

HOUSING AFFORDABILITY refers to the balance (or imbalance) between incomes and housing costs within a community. A common measurement compares the number of households in certain income categories to the number of units in the market that are affordable – at 30 percent of gross income.

This regional plan uses the following household income categories and definitions to track regional housing affordability:

- Middle: 80% - 120% of area median income
- Moderate: 50% to 80% of area median income
- Low: Below 50% of area median income
- Very Low: Below 30% of area median income

WORKFORCE HOUSING refers to housing that is affordable to households with at least one full-time worker in which earned incomes are too high to qualify for significant federal housing subsidies, and which – given local housing market conditions – have difficulty affording market prices for homes or apartments in the communities where the residents work.

SPECIAL NEEDS HOUSING refers to supportive housing arrangements for populations with specialized requirements, such as the physically and mentally disabled, the elderly, people with medical conditions, the homeless, victims of domestic violence, foster youth, refugees, and others.

JOBS-HOUSING BALANCE is a concept that advocates an appropriate match between the jobs base and available housing supply within a geographic area. Balance is a means to address travel demand by improving accessibility to jobs, as well as to goods, services, and amenities. Improving balance means adding more housing to job-rich areas and more jobs to housing-rich areas. There is also an affordability aspect to achieving balance that involves matching the mix of dwelling types and prices with labor force needs and wages.

Housing is a very basic need for every individual. With the opportunities and challenges that come with growth and new development, the region must be attentive to how we address the housing needs of the region's population while protecting our environment, supporting our economy, and enhancing our communities. Our success depends on ensuring the availability of a variety of housing types and densities, as well as an adequate supply of housing affordable at all income levels, to meet the diverse needs of both current and future residents.

Housing affordability continues to be a major challenge for the region. Housing costs are a greater burden for many households today than a decade ago, leaving less for other basic needs and amenities. Housing demand exceeds supply in many areas of the region, resulting in rising rents and sale prices. More and more residents are experiencing the strain of spending 30 percent or more of their income on housing, which is the US Census threshold for identifying cost-burdened households. Renters, in particular, face a considerable shortage of affordable housing opportunities. With housing prices significantly outpacing income growth over the last several years, it has become more difficult for low-, and moderate-, and even middle-income households to purchase first homes. Homeownership rates for minorities remain well below the average rate for all households.

Finding affordable housing options near employment centers can be difficult for many workers. Low-to middle-wage workers, such as teachers, health-care professionals, retail workers, administrative personnel, police officers and firefighters, who are essential to the economic and social vitality of a community, often cannot afford to live in the places where they work. The imbalance between where people live and where people work can result in longer and more expensive commutes. More driving also leads to worsening air quality, including greenhouse gas emissions.

INCLUSIONARY ZONING ORDINANCES

The inclusionary zoning ordinance has been an important means of integrating affordability into new development, and some consideration should be made to adopt this zoning in the future to better promote additional income tiers to provide benefits to a broader range of households. Should communities within the region who have not yet done so vote to adopt the Community Preservation Act, there would be opportunity to explore the use of CPA funds to further subsidize

these projects, once again creating housing opportunities for several income tiers within a single development where feasible.

Inclusionary zoning is another tool to create affordable housing and helps to ensure that production of new affordable units keeps pace with the overall rate of new development of market rate units in the community, thereby helping to ensure continued compliance with the State's 10% affordable housing goal. An Inclusionary Zoning Ordinance would require a developer to set aside a certain percentage of housing units for low and moderate income residents.

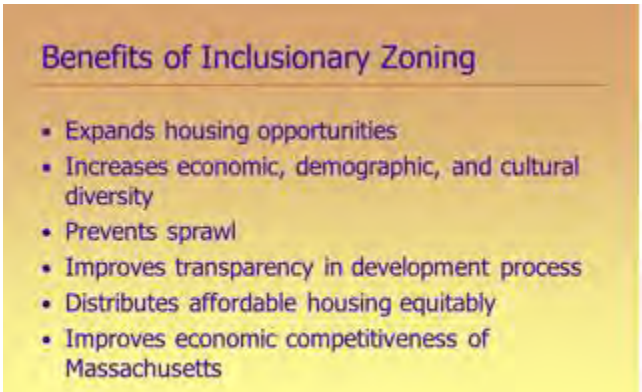


Figure 46: Inclusionary Zoning

An Inclusionary Zoning Ordinance is an effective and predictable way to increase affordable housing stock in the community without requiring significant outlays by the community and ensures that new sizeable market-rate developments will not adversely affect the SHI percentage. It should be noted that the ordinance can also allow in-lieu payments that reflect the price of affordable housing and land availability. The fee can be calculated based on a formula. Many variations of inclusionary zoning ordinances have been adopted throughout the Commonwealth with varying degrees of success.

PLANNING FOR HOUSING AT THE REGIONAL LEVEL IS CRITICAL

Planning for housing at the regional level is critical to ensure that the needs of diverse and changing populations are met in a manner that provides sufficient, safe, and healthy housing for all. Planning for housing also provides benefits such as more job opportunities and improved mobility. Housing strategies are not merely about guaranteeing that people have a place to live; they must also ensure that where people live reflects sound principals of growth and social equity. Providing affordable housing opportunities throughout the region is critical to maintaining a healthy region that permits individuals to live near their work, allows regions to grow in an environmentally responsible fashion, and begins to undo the concentrations of low-income households and minority populations in urban neighborhoods.

This Policy Plan calls for increasing the supply of housing throughout the region by providing a variety of housing types and densities for both renters and owners. Special emphasis is placed on providing equitably distributed affordable housing for low-, moderate-, and middle-income households and appropriate housing for special needs population. It also encourages more low-to middle-income homeownership opportunities.

Providing adequate housing for a growing number of people, from all income levels and at all stages of their lives continues to be one of the major goals of our region. The Council will work

with local communities to develop a *Housing Production Plan*, a proactive strategy for planning and developing affordable housing by creating a strategy to enable it to meet its affordable housing needs in a manner consistent with the Chapter 40B statute and regulation.

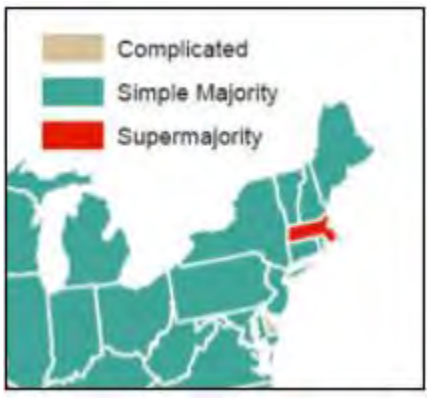
The Department of Housing and Community Development regulation became effective on February 22, 2008 and is contained in 760 CMR 56.03(4). This regulation requires a Comprehensive Housing Needs Assessment to establish a strategic plan for municipal action with regards to housing. The plan may identify areas within the region sufficient to house all economic segments of the population, over the course of the planning period together with a projection of future population and housing needs. The plan should identify the constraints and limitations on its current and future needs and the municipality's plan to mitigate those constraints and the capacity of the infrastructure to accommodate anticipated future growth. This process is designed to better integrate housing, land use, and transportation planning, to ensure that the Commonwealth's housing goals are met.

HOUSING CHOICE INITIATIVE

GOAL: The Old Colony Planning Council will support legislation which represents the role of local decision-making while lowering the voting threshold to a majority vote for zoning amendments that support the production of housing choices.

GOAL: The Old Colony Planning Council will support regional efforts to obtain "Housing Choice Community" designation to coordinate technical assistance and sustainable development of affordable housing production.

The *HOUSING CHOICE INITIATIVE* provides incentives, rewards, technical assistance and targeted legislative reform to encourage and empower municipalities to plan and build the diverse housing stock that the Commonwealth needs to continue to thrive. A *Housing Choice Designation* rewards communities that are producing new housing and have adopted best practices to promote sustainable housing development. Designation provides exclusive admission to new Housing Choice Capital Grants, and priority access to many Commonwealth grant and capital funding programs such as MassWorks, Complete Streets, MassDOT capital projects and LAND and PARC grants. *The Housing Choice Initiative will track progress toward a goal of 135,000 new housing units statewide by 2025 to serve the expected population growth, or about 17,000 units per year*. This goal represents a 26 percent increase in housing production compared to the last eight years.



The Administration will file An Act to Promote Housing Choices, to facilitate housing production and adoption of zoning best practices. It eliminates barriers to building new housing and improving land use without mandating that cities and towns adopt any specific zoning practices. The Act will change state law to reduce the required vote from 2/3 **"supermajority" to a simple majority for certain zoning**

changes. This change makes Massachusetts more consistent with current practice in most states.

Zoning changes that promote best practices that would qualify for the simple majority threshold include:

- Building mixed-use, multi-family, and starter homes, and adopting 40R "Smart Growth" zoning in town centers and near transit.
- Clustering new homes to permanently preserve open space and protect natural resources.
- Reducing parking requirements and dimensional requirements such as minimum lot sizes.
- Allowing for transfer of development rights (TDR) zoning and natural resource protection zoning.
- Allowing for increased density through a Special Permit process, promoting more flexible development.
- Allowing accessory dwelling units or "in-law" apartments.

These initiatives meet the OCPC region's four housing goals – increasing the supply and mix of housing types, promoting infill development and efficient development patterns, promoting an improved relationship between jobs and housing, and creating economically balanced communities. This future, spelled out in local plans for growth, will increase the supply, mix, and affordability of housing region-wide.

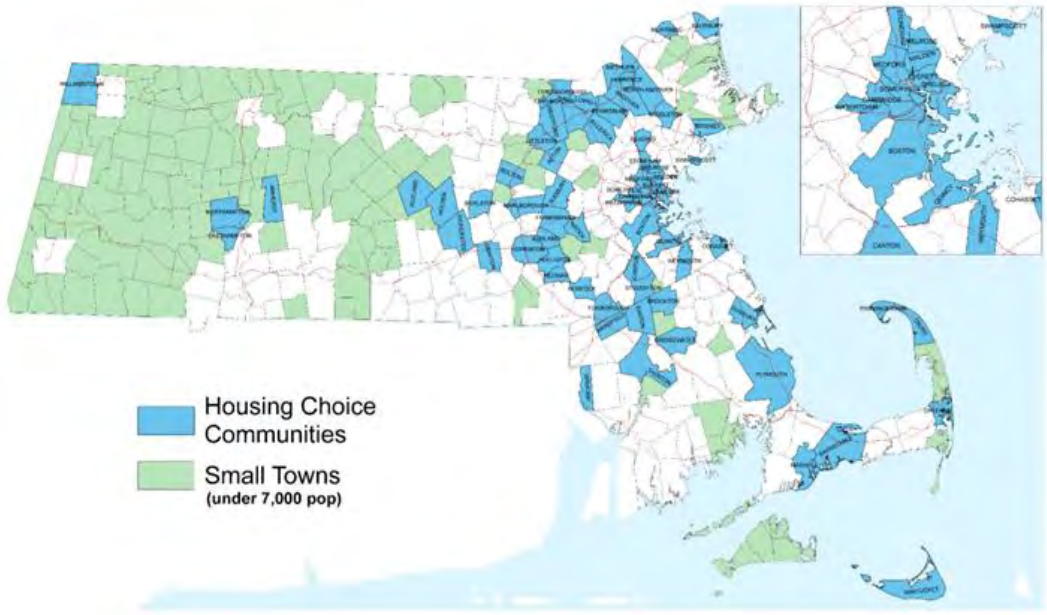


Figure 47: Housing Choice Communities

The transition toward more multifamily homes throughout the region will benefit everyone. In particular, it will help young adults, single parents, and seniors whose incomes often are not enough to afford a single family home in our high-priced market. Metropolitan areas around the nation are moving toward this kind of development. Surveys show that an increasing number of people prefer to live in denser, more walkable neighborhoods with access to a wide variety of

stores and services, and, importantly, public transit. A larger number of multifamily homes situated near public transit options will offer people of all ages – and from all backgrounds, economic circumstances, and physical capabilities – lives enriched by more opportunities to work, shop, study, exercise, and play.

THERE ARE NUMEROUS INCENTIVES AND TOOLS THAT LOCAL JURISDICTIONS CAN WORK WITH TO HELP INCREASE THE OVERALL SUPPLY AND DIVERSITY OF HOUSING, INCLUDING:

1. INNOVATIVE LAND USE PRACTICES, SUCH AS FLEXIBLE ZONING, STREAMLINED DEVELOPMENT REGULATIONS, AND DENSITY BONUSES;
2. PROVISION OF NEEDED INFRASTRUCTURE AND PUBLIC SERVICES, SUCH AS TRANSPORTATION FACILITIES AND SERVICES, UTILITIES, AND OTHER AMENITIES;
3. PUBLIC EDUCATION TO INCREASE AWARENESS AND ACCEPTANCE OF HOUSING ALTERNATIVES AND INNOVATIONS SUCH AS ACCESSORY DWELLING UNITS, SMALL LOT SINGLE-FAMILY HOMES, TOWNHOMES, AND OTHER MULTI-FAMILY HOUSING OPTIONS, AND MIXED-USE PROJECTS.

SUCH TECHNIQUES AND PRACTICES OFFER GREATER AFFORDABILITY AND HOUSING CHOICE AND PROMOTE MORE EFFICIENT USE OF LAND.

HOUSING BOND BILL

Housing Bond Bill: On May 31, 2018, Governor Charlie Baker signed the $1.8 billion Housing Bond Bill (H. 4536) into law. The legislation, the largest housing bond bill in the state's history, will increase the production of affordable housing, diversify the state's housing portfolio, modernize public housing, preserve the affordability of existing housing, and invest in new, innovative solutions to address Massachusetts' rising demand for housing.

The bill authorizes $1.8 billion in new capital spending over the next five years for the production and preservation of affordable housing for low- to moderate-income households, supportive housing, and housing serving vulnerable populations. It expands tax credit programs that support affordable housing, including the state Low Income Housing Tax Credit, the Community Investment Tax Credit, and the state Historic Tax Credit. It also extends the Brownfields Tax Credit and the Housing Development Incentive Program. Finally, it re-authorizes the Early Education and Out of School Time Fund, which supports quality early education centers for children.

The combination of a strong state economy, high housing demand and low production has created one of the largest affordability gaps in the United States. More than 240,000 low-income individuals and families in Massachusetts now pay more than half of their income on rent. Private housing production alone will not solve that problem. The programs authorized in this bill are one of the few ways to close this gap.

THE HOUSING BOND BILL INCLUDES:

- *STATE LOW-INCOME HOUSING TAX CREDIT*: Extends the state's ability to commit $20 million per year in tax credits to affordable housing projects units 2025 and authorizes an additional $5 million per year in tax credits specifically to support preservation of existing affordable housing. Current law would cut the size of this tax credit to $10 million on January 1, 2020.
- *HOUSING DEVELOPMENT INCENTIVE PROGRAM*: Extends the state's ability to commit $10 million per year in tax credits to market-rate housing projects in Gateway Cities until 2024. Current law would cut the size of this tax credit in half, to $5 million, on January 1, 2019.
- *ACCESSORY DWELLING UNIT CONSTRUCTION AND LANDLORD MODIFICATIONS*: Authorizes the use of home modification funding to construct accessory dwelling units for elders and individuals with disabilities and also authorizes up to 10 percent of the funds to be used to support landlord expenditures to modify units for tenants with disabilities, implementing recommendations of the administration's Interagency Council on Housing and Homelessness.
- *MASSHOUSING SERVICES*: Expands MassHousing's authorizing language, to allow the quasi-public agency to provide contract administration, loan servicing, and other services to other states' housing finance agencies.
- *EARLY EDUCATION AND OUT-OF-SCHOOL TIME (EEOST CAPITAL FUND FACILITIES IMPROVEMENT GRANT PROGRAM*: Provides funding to non-profit child care programs licensed by the Department of Early Education and Care to renovate, acquire, or construct high-quality child care program facilities that serve low-income families and communities, fostering high quality child care environments that support positive outcomes for children.

MASSWORKS INFRASTRUCTURE PROGRAM

The highly effective MassWorks Infrastructure Program continues to be a key catalyst for housing production, supporting the creation of more than 3,000 housing units. The MassWorks Infrastructure Program is a competitive grant program that provides a robust and flexible source of capital funds for municipalities and other eligible public entities to complete public infrastructure projects that support and accelerate housing and job growth throughout the Commonwealth.

In 2017, the town of Easton received a $2.5 million award to complement local funding and previous state support to drive the ongoing revitalization of the North Easton Village. Funds will allow the town to move utilities underground that currently impede development and unlock development opportunities under Easton's mixed-use zoning. This project will build on previous infrastructure improvements, including streetscape enhancements that have already attracted new private development, including The Farmer's Daughter, a regional destination restaurant, and the conversion of the historic Ames Shovel Works Factory into 113-units of affordable housing. This project will support the expansion of The Farmer's Daughter and new development, attracting up to $32 million in private investment, and resulting in the creation of 33 new housing units and 100 new, full-time jobs.

In 2016, Avon received $965,000 in MassWorks Infrastructure Program funding to reconstruct West Main Street, a major inter-community connector roadway that serves the surrounding communities of Randolph, Holbrook, and Brockton. This road safety project will complement recent water and utility upgrades.

Brockton Enterprise Block Redevelopment Phase 1 – A 2012 MassWorks grant in the amount of $4 million to support the acquisition of the Enterprise Block by the City of Brockton. Funds were used to demolish the Gardner Building and prepare the site for future development. This project is part of a larger redevelopment to create new office, retail and residential units on this block in the heart of Downtown Brockton.

Figure 48: Phase 1 Enterprise Block project

Also is 2016, the City of Brockton received $10 million in MassWorks grant funding to unlock the second phase of the city's Enterprise Block development, by funding the construction of a new municipal parking garage. The new 474-space municipal garage will allow for the immediate development of 111 new housing units, and create new capacity for further investment in Brockton's downtown. The Enterprise Block is a transit-oriented housing development by Trinity Financial, and permitted under the state's Chapter 40R smart growth housing incentive program. The redevelopment of Brockton's Enterprise Block advances the vision of the city's Transformative Development district. The downtown parking upgrades complement downtown streetscape improvements funded through a 2015 MassWorks grant.

ACCESS, MOBILITY, AND TRANSPORTATION

CONNECTED COMMUNITIES

OVERARCHING GOAL: THE REGION WILL INVEST IN TRANSPORTATION SYSTEMS THAT OFFER GREATER OPTIONS, MOBILITY, AND ACCESS IN SUPPORT OF THE REGIONAL POLICY PLAN.

GOAL: BUILD CONNECTED COMMUNITIES - A CONNECTED COMMUNITY HAS A VARIETY OF TRANSPORTATION OPTIONS CONNECTING ALL OF ITS COMMUNITY COMPONENTS AS WELL AS CONNECTING IT TO OTHER NEARBY COMMUNITIES.

- Emphasize transportation investments that provide and encourage alternatives to single-occupancy vehicle travel and increase travel options, especially to and within centers and along corridors connecting centers.
- Increase the proportion of trips made by transportation modes that are alternatives to driving alone.
- Ensure mobility choices for people with special transportation needs, including persons with disabilities, the elderly, young, and low-income populations.
- Focus on investments that produce the greatest net benefits to people and minimize the environmental impacts of transportation.
- Promote the preservation of existing rights-of-ways for future high-capacity transit.

To develop and support a comprehensive transportation system, the region needs to concentrate on transportation facilities and services, as well as on the factors that affect how travel choices are made. These factors include a greater regional understanding of the true costs of transportation at the personal, regional, and environmental levels. This Regional Plan supports improvements to roads, transit centers, walkways, bike facilities, and other infrastructure to increase mobility and support different travel options.

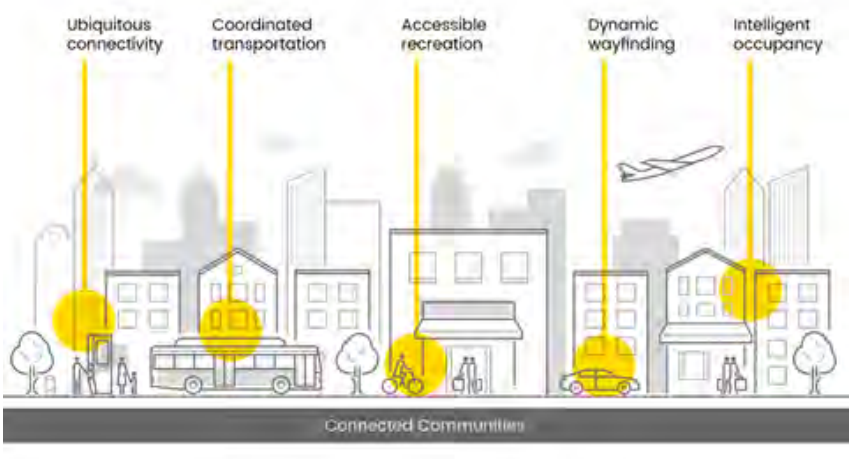


Figure 49: Connected Communities

System management strategies influence how different travel modes operate. They can increase the capacity of transportation facilities without adding major new infrastructure. Transportation system management activities include ramp-metering, priority lane access for transit and other high-occupancy vehicles (HOV lane), traveler information, incident management, traffic signal optimization, road or lane pricing, and advanced system technology.

Transportation demand management is the term for strategies that influence how and when we travel. Specifically, demand management strategies aim to increase transit ridership, vehicle occupancy, walking, and bicycling, and reduce the duration of some trips, often by moving them to off-peak periods or eliminating them altogether. Demand management reduces the rate of growth, as well as the overall number, of people driving alone. This results in less traffic congestion, fewer vehicle emissions, and less fuel consumption.

- Develop and maintain staff awareness of Intelligent Transportation System Technology, and promote Intelligent Transportation System solutions in the region and participate in the implementation of Intelligent Transportation System Architectures.

GOAL: AS A HIGH PRIORITY, THE REGION WILL MAINTAIN, PRESERVE, AND OPERATE ITS EXISTING TRANSPORTATION SYSTEM IN A SAFE AND USABLE STATE.

- Maintain and operate transportation systems to provide safe, efficient, and reliable movement of people, goods, and services.
- Protect the investment in the existing system and lower overall life-cycle costs through effective maintenance and preservation programs.
- Foster a less polluting system that reduces the negative effects of transportation infrastructure and operation on the climate and natural environment.
- See the development and implementation of transportation modes and technologies that are energy-efficient and improve system performance.
- Develop a transportation system that minimizes negative impacts to human health.
- Protect the transportation system against disaster, develop prevention and recovery strategies, and plan for coordinated responses.

ADDRESSING PARKING NEEDS

Over the last 50 years, new patterns of development have reflected both the mobility and convenience provided by the car and the segregation of land uses decreed by zoning codes that put residences in one area, offices in another, and retail in yet another spot. Increasingly far-flung destinations and more complex daily activities rely on the ability to get from one place to another as fast and predictably as possible. We have to drive to get from work to home to shopping, and at each place, we need to park. We expect safe, plentiful, easily accessed parking at work, at home, and at the store. Parking has become part of our culture: an office perk, a selling point for retailers, a display case for a household's cars and a requirement for financing development projects.

Our communities have become increasingly worried, however, about the downside of an auto-based landscape that is no longer holding the promise of progress and growth, but rather fosters congestion that steals precious time from our lives. In contrast to auto-oriented sprawl, smart growth recognizes that the future and vitality of our communities is dependent upon our ability to foster a better planned, more environmentally protective, more sustainable pattern of development.

When it comes to planning for a more efficient transportation system, parking is a big focus. Many of us are often concerned about the location, price, supply, and convenience of parking, as well as the impact it has on travel choices and even the affordability of housing, among other issues. There are growing concerns about how parking impacts the transportation system, land use, and the design of our communities.

Over the years, studies have shown that managing parking effectively can help communities achieve their goals for climate-smart growth, mobility, and a healthier environment. We have also learned that proactive parking programs can support thriving commercial districts, affordable housing development, and increased choices for travelers.

This work, however, does not come without its challenges, and no aspect of development illustrates this better than parking. Indeed, one of the biggest challenges facing smart growth is identifying new ways to address the need for parking while minimizing its negative impacts and encouraging better and different design. Parking is consuming a huge amount of land that could otherwise be developed. Surface and structured parking lots present sterile, unattractive environments that deaden city and suburban streets alike, further isolate uses and preclude lively pedestrian-friendly streets. Moreover, the adverse environmental impacts of parking lots, particularly on water quality, are increasingly recognized.

As dependency on the automobile has grown, local policies have reinforced the car culture, accommodating increased parking demand through local zoning ordinances. Parking requirements now drive many site designs, and are often the make or break issue for financing new developments. Too many quality smart growth projects remain on the drawing board because they simply cannot solve the parking dilemma. We need parking, but we need to re-think parking design, parking financing, and parking supply and demand to better meet the needs of communities, developers, and users.

The primary tool local governments have used to accommodate parking is parking ratio ordinances, which establish the minimum number of spaces a development project must provide for a given land use and project size. These ratios are typically drawn from generic parking generation rates, irrespective of site-specific and project-specific characteristics and other variables that would help to more accurately reflect market reality. The overstatement of parking ratios has in many cases led to an oversupply of parking.

Rather than imposing inflexible requirements, local zoning ordinances could incorporate mechanisms to tailor parking requirements to specific development projects. The following list of factors are among those that should be considered.

- Locational Factors. The location of the proposed project will impact parking demand. For example, if a project is well served by mass transit, the project might generate a

lower parking demand than what would otherwise be anticipated, relying on generic parking generation formulas. Moreover, if the proposed project is located amidst high-density development with a mix of land uses, there might be existing parking facilities nearby, thus reducing the demand for parking on-site. Users may also access the project and other nearby uses on foot, further reducing parking demand.

- Demographic Factors. The demographics of the anticipated users of a project, including employees, customers, and residents, will impact parking demand. For example, due to the high cost of car ownership, low-income residents generally have lower levels of car ownership than that of the general public. If the anticipated users of a proposed project have low levels of car ownership, the project might generate a lower parking demand than what would otherwise be anticipated. The age distribution of anticipated users will also be indicative of parking demand. For example, if the anticipated users of a proposed project are seniors, the project will necessitate less parking than what would otherwise be anticipated.

In addition to tailoring parking requirements to project specific conditions such as location and demographic factors, local zoning ordinances might also prescribe reductions to minimum parking requirements on a project-by-project basis in exchange for a developer's commitment to a transportation demand management program or payment of fees in lieu of providing the required parking.

TRANSPORTATION DEMAND MANAGEMENT PROGRAMS

Transportation Demand Management (TDM) programs are typically employer-led programs intended to reduce the parking demand of employees by supporting carpooling, offering subsidies for transit, furnishing bicycle facilities, and providing shuttle service from off-site parking facilities.

Figure 50: Transportation Demand Management Tools

Cash-Out Programs. Many employers are now establishing and implementing cash-out programs to provide subsidized employees with a choice of receiving free parking or foregoing free parking for a cash payment equaling the cash equivalent of free parking, to use transit or other alternatives to the single-occupancy vehicle. As more and more employees opt for cash out, employers will likely require less and less parking. However, the effectiveness of cash out typically depends on the availability of transit and other alternative modes to solo driving and the availability, or lack thereof, of free and unregulated parking supplies, especially where employees could still park after taking the cash out rather than taking an alternative to

the single occupancy vehicle. Moreover, cash out is not as effective in reducing solo driving as charging employees for parking with no other compensation.

Fees-in-lieu. Fees-in-lieu are established by jurisdictions as an alternative to requiring onsite parking facilities. More specifically, some local jurisdictions allow reductions to minimum parking requirements in exchange for developer payment into a municipal parking or traffic mitigation fund. The accrued money from the municipal parking fund helps finance city owned, centrally located, off-site parking facilities. The in-lieu fees may be mandatory or voluntary and are set either by calculating a flat rate for each parking space not provided or by carefully determining appropriate development specific fees on a case-by-case basis. By paying fees-in-lieu, developers have the ability to circumvent constructing on-site parking facilities, and are subsequently able to improve site design and preserve unique and historic resources that might otherwise be demolished to accommodate on-site parking.

Parking Maximums. Parking maximums restrict the total number of parking spaces that can be constructed at a particular development site. Maximums can complement minimum parking requirements, thus ensuring a threshold level of parking supply, or can stand alone, leaving individual developers to determine the appropriate amount of parking necessary. While reduced minimum parking requirements allow developers the choice of providing more parking than the required amount, parking maximums are absolute limits on the amount of parking that can be provided. As such, parking maximums leave little room for making mistakes in projecting parking demand. If a jurisdiction underestimates parking demand and sets maximums too low, developers cannot "second guess" that decision and provide more parking, as they can with reduced minimum parking requirements.

Area-wide Parking Caps. Area-wide parking caps limit the total number of parking spaces that can be constructed in a defined area. Similar to parking maximums, area-wide parking caps set an absolute limit on the amount of parking that can be provided, in so doing, leaving little room for mistakes in projecting parking demand. Area-wide parking caps require considerable administrative and planning effort to determine the appropriate number of parking spaces for a defined area, and to accurately apportion the allotted spaces to specific development projects.

Peripheral Parking with Shuttles. Local employers may wish to provide peripheral parking locations to the main core and employment sites. These employers may consider providing shuttle service from transit stations to employment sites that are located in areas that are not well served by mass transit. Providing shuttle service from peripheral parking locations may not be effective in reducing single-occupancy vehicle use, it might just shift where the necessary parking spaces are actually located from the main activity center to a more peripheral location. Providing shuttle service from transit stations to employment sites can help reduce single-occupancy use and parking demand since people living in close proximity to a transit station will now have a viable alternative to driving to work.

Preferential Parking for Carpools and Vanpools. Employers might provide incentives for alternative modes of travel to the single occupancy vehicle by reserving close-in, secure, covered, or otherwise preferable parking spaces for high-occupancy vehicles. The carpool

spaces must be the closest spaces to the building entrance of elevator, but not closer than parking for the disabled.

Both parking maximums and area-wide parking caps encourage better utilization of existing parking facilities and force businesses to encourage their employees and customers to use alternative modes of transportation. For either parking maximums or area-wide parking caps to be successful, it is imperative to have accessible and frequent public transportation, and the jurisdiction must have a strong real estate market, where the locational advantages considerably outweigh the perceived drawback of a lack of parking.

SHARED PARKING

Shared parking can be defined as parking utilized jointly among different buildings and facilities in an area to take advantage of different peak parking characteristics that vary by time of day, day of week, and/or season of year. For example, many businesses or government offices experience their peak business during normal daytime business hours on weekdays, while restaurants and bars peak in the evening hours and on weekends. This presents an opportunity for shared parking arrangements.

Historically, local zoning ordinances have not permitted shared parking—stating that if two or more uses are located on the same lot or in the same structure, the total number of parking spaces required equals the sum of spaces required for each individual use. Since most parking spaces are only used part time, this policy leads to the underutilization of many parking facilities, with a significant portion of spaces unused. On the other hand, by allowing for and encouraging shared parking, local jurisdictions can decrease the total number of spaces required relative to the total number of spaces needed for each land use separately. As a result, allowing for shared parking arrangements significantly reduces the amount of land devoted to parking and, in so doing, creates more opportunities for creative site planning and landscaping.

One way in which local ordinances help enable shared parking is to allow for off-street parking facilities to be located off-site of the lot on which the structure or use being served is located. Such ordinances usually specify a maximum distance from the structure or use within which the off-site parking facility must be located. These location requirements are typically based on acceptable walking distances.

Figure 51: Shared Parking

PARKING MANAGEMENT DISTRICTS

Parking management districts are areas designated by local jurisdictions in which parking supply and rates are regulated to meet the parking needs of the area, at the same time as promoting transit use, ridesharing, and other alternative modes of transportation to the single occupancy vehicle. The two key components of parking management districts—supply management strategies and pricing policies—are designed to work together to enhance economic development and encourage a balanced transportation system in the parking management district. District-based supply management strategies are established to encourage mixed use development projects and areas and to ensure the maximum utilization of land, requiring less land area for parking and, in so doing, making more land available for tax-generating purposes. To complement these supply management strategies, district-based pricing policies are established to influence individual travel behavior and encourage alternative modes of transportation.

TRANSIT INVESTMENTS

One of the most effective ways of reducing the demand for parking is by providing people with a viable alternative to the personal automobile. Therefore, in seeking to control the demand for transportation facilities tailored to the automobile, the public sector must make a commitment to expand and otherwise improve transit systems and services. There are various ways in which transit systems could be improved to better meet the needs of existing users and potentially attract new users, including expanding already existing routes for existing modes, adding new routes for existing modes, and creating new modes such as additional express bus service routes.

Capital investments could also be made to improve maintenance of facilities, such as buses and trains, and to revitalize transit stations, bus stops, and their surrounding neighborhoods. In addition to these capital investments in routes, modes, and facilities, operational improvements such as scheduling changes can be instituted to offer more frequent and convenient service.

There are several challenges to these investments in transit. Capital projects may be extremely costly and demand a substantial upfront investment of government resources. Extensive planning and coordination is important to ensure appropriate location of routes and stations—this planning process adds additional time to what is already a time consuming process. Capital investments should be complemented by inducements such as marketing campaigns to help people realize the value of substituting mass transit for single occupancy vehicle use, improvements to fare structures, and enhanced passenger amenities.

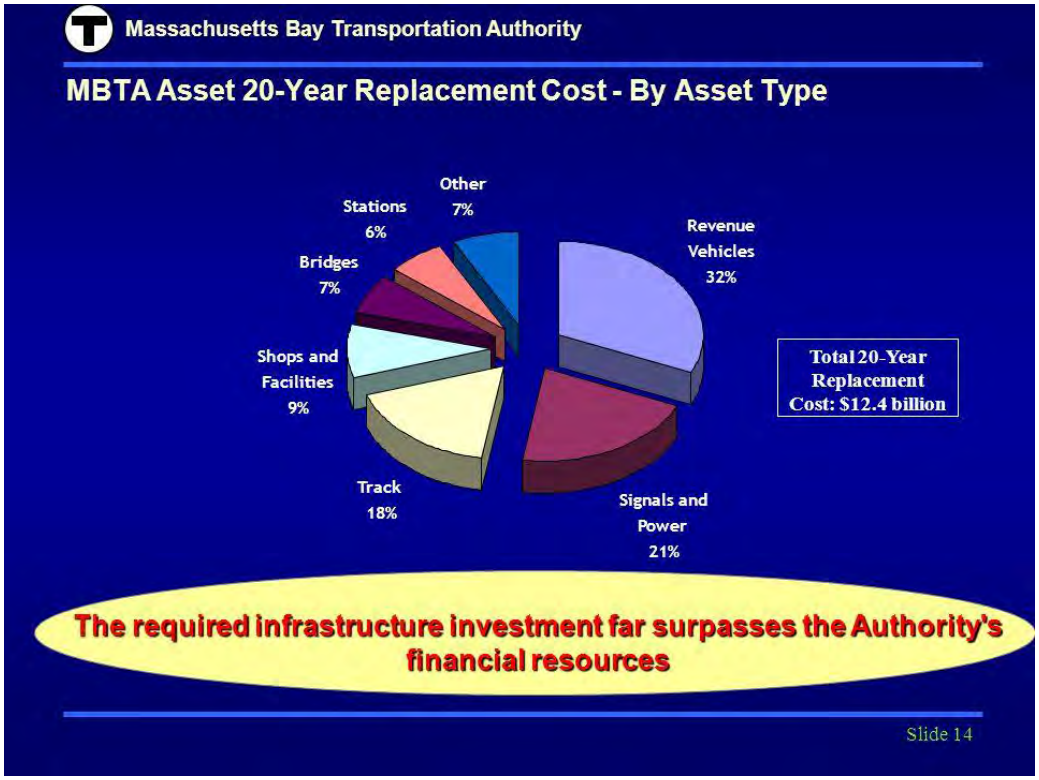


Figure 52: MBTA Infrastructure Investment

ECONOMIC COMPETITIVENESS

OVERARCHING GOAL: THE OLD COLONY PLANNING COUNCIL IS COMMITTED TO ADDRESSING RACIAL AND ECONOMIC DISPARITIES SO THAT ALL RESIDENTS CAN LIVE IN A HEALTHY, VIBRANT, AND LIVABLE REGION. THE REGION WILL HAVE A PROSPERING AND SUSTAINABLE REGIONAL ECONOMY BY SUPPORTING BUSINESSES AND JOB CREATION, INVESTING IN ALL PEOPLE, SUSTAINING ENVIRONMENTAL QUALITY, AND CREATING GREAT CENTRAL PLACES, DIVERSE COMMUNITIES, AND HIGH QUALITY OF LIFE.

GOAL: ENCOURAGE ECONOMICALLY VIBRANT COMMUNITIES. ECONOMIC GROWTH THROUGH JOBS, LAND DEVELOPMENT AND NEW HOUSING OPPORTUNITIES FOR CITIZENS TO PROSPER, EXISTING BUSINESSES TO EXPAND, AND LOCAL GOVERNMENT TO GROW THE TAX BASE TO PAY FOR PUBLIC SERVICES AND INFRASTRUCTURE.

The Regional Policy Plan contains economic goals and policies to promote a sustainable economy that creates and maintains a high standard of living and quality of life for all. To create stable and lasting prosperity, this plan focuses on businesses, people, and places, recognizing that growth management, transportation, economic, and environmental policies must be integrated, and must take social, economic, and environmental issues into account while preserving key regional assets.

Family Wage: The term Family Wage generally refers to a full-time wage level needed to independently support and meet the basic needs of a family. The wage should reflect differing cost-of-living factors, such as housing, food, transportation, utilities, health care, child care and recreation.

Foster connected land use options to provide businesses and industries with access to material, markets, and talent. *Economic competitiveness* factors such as adequate infrastructure, housing availability, and workforce development programs in long range planning. The Importance of regional jobs, business retention and work force needs.

Figure 53: Family Wage

An Economic Development District designation allows the district to be agents for comprehensive economic development strategies in areas that qualify for economic assistance.

SIX GOALS TO IMPROVE THE FOUNDATIONS OF THE ECONOMY:

1. *Ensure residents have access to family-wage jobs and employers have access to world class talent.*
2. *Foster a regional business climate that supports high quality investment and job creation.*
3. *Harness the entrepreneurship and technology innovation assets in the region.*
4. *Identify the "Sustainability Industry" as a burgeoning market and encourage a "business cluster" to further attract businesses to the Region.*
    a. *Support partnerships with surrounding organizations to develop "green" workforce training opportunities.*
5. *Advance the region's infrastructure to meet the demands of a globally connected modern economy*
6. *Ensure a healthy and beautiful environment, vibrant and thriving communities, and a high quality of life for all the region's residents.*

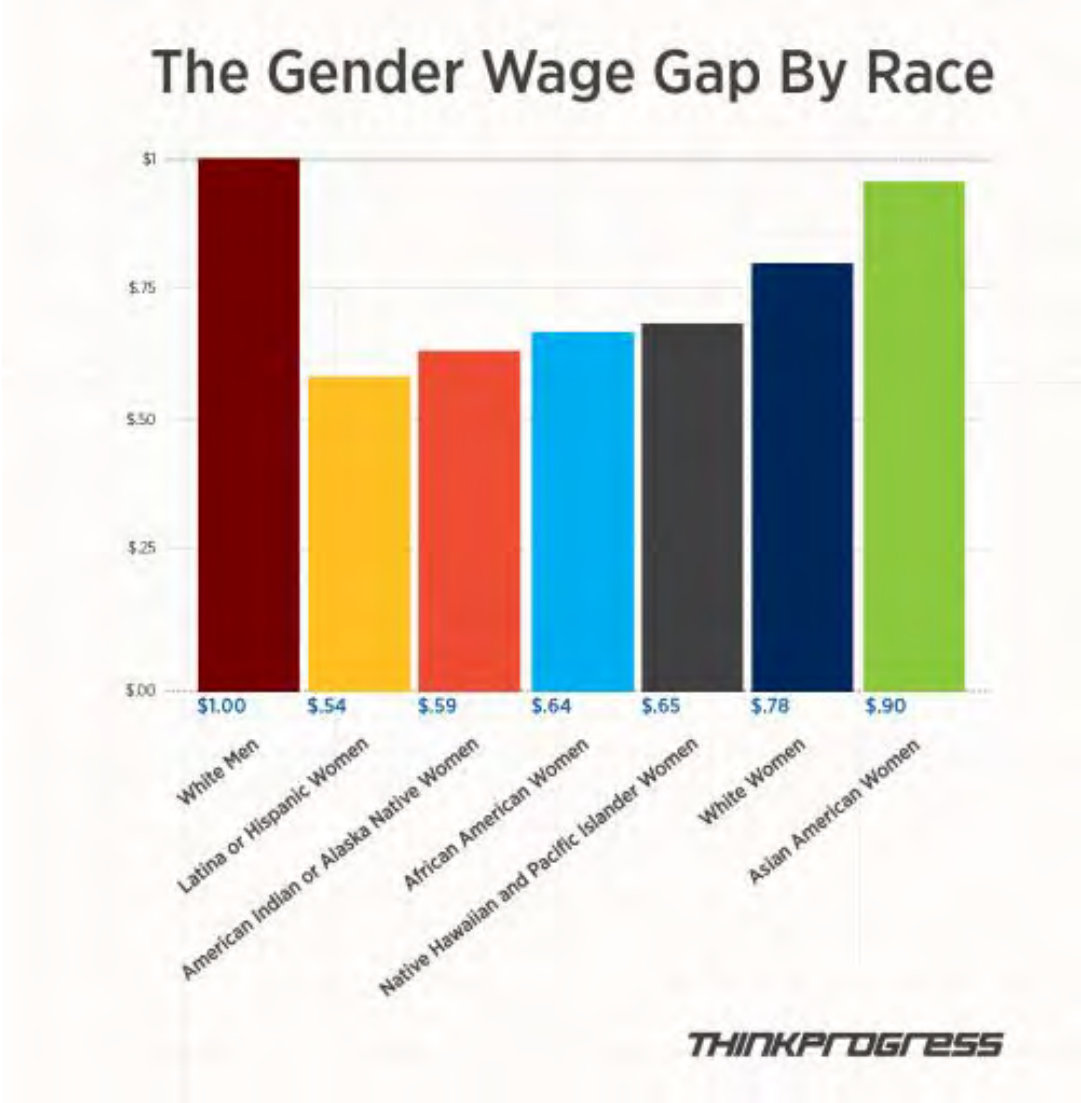


Figure 54: The Gender Wage Gap by Race

A sustainable economy embraces growth that can be supported over the long term by the region's physical infrastructure, financial resources, and natural resources.

The region's outstanding natural environment is a key element for economic progress. Our abundant natural resources, spectacular setting, and vibrant communities make every industry more competitive in a global economy. These and other features help to attract and retain talented, active, and creative people. The region's connection to the environment gives it a strategic advantage in developing clean, green processes and technologies, and providing new economic opportunities that it can export to the rest of the world. Maintaining this advantage depends on a healthy built and natural environment, with clean industries, good jobs with good incomes, managed growth, and lively centers.

In-migration is important to the region's economy and contributes to innovation, the development of new technologies, the creation of startup companies, and related job growth. In-migration also enriches the region's communities with a growing diversity of cultures, languages, and knowledge. These diverse communities serve as a competitive asset in an increasingly connected global economy, creating potential trade linkages and other economic opportunities that would not otherwise exist.

A healthy and growing economy provides good jobs and opportunity. It pays for vital public services such as education, criminal justice, transportation, and environmental preservation. It allows us to support the arts and cultural institutions, maintain our parks, and build our communities. A healthy economy permits us to provide for ourselves and our families. It enables us to care for those who are vulnerable, to protect the environment, and to preserve the quality of life that make the region a special place.

This Regional Policy Plan emphasizes supporting business and job creation through retention, expansion, and diversification of the region's employment base. It calls for fostering a positive business climate through coordination among public institutions, private businesses, and the nonprofit sector. This coordination helps us to recognize and address the diverse needs of the region's economy and to support key employment sectors. These sectors include established and emerging industry clusters, industries involved in trade-related activities, startups, and new businesses.

This plan places an emphasis on small and locally owned businesses, recognizing their importance in both job growth and promoting sustainable economic development. Supporting clusters and sectors that provide family-wage jobs involves leveraging the region's position as a gateway to ensure an efficient flow of people, goods, services, and information throughout the region – particularly in and between growth centers.

This plan recognizes that businesses depend on a multimodal transportation system – serving both personal mobility and freight movement – as well as communications infrastructure to

develop, support, and expand commercial relationships, move intermediate and finished products within the region, and support global trade and export activities.

- SUPPORT ECONOMIC DEVELOPMENT ACTIVITIES THAT HELP TO RETAIN, EXPAND, OR DIVERSIFY THE REGION'**S BUSINESSES**. Target recruitment activities towards businesses that provide family-wage jobs.
- FOSTER A POSITIVE BUSINESS CLIMATE by encouraging region-wide and statewide collaboration among business, government, education, labor, military, workforce development, and other nonprofit organizations.
- SUPPORT ESTABLISHED AND EMERGING INDUSTRY CLUSTERS that export goods and services, import capital, and have growth potential.
- **LEVERAGE THE REGION**'S POSITION AS A GATEWAY by supporting businesses, ports, and agencies involved in trade activities.
- FOSTER A SUPPORTIVE ENVIRONMENT FOR BUSINESS STARTUPS, small businesses, and locally owned businesses to help them to continue to prosper.
- ENSURE THE EFFICIENT FLOW OF PEOPLE, GOODS, SERVICES, AND INFORMATION in and through the region with infrastructure investments, particularly in and connecting designated centers, to meet the distinctive needs of a regional economy.
- ENCOURAGE THE PRIVATE, PUBLIC, AND NONPROFIT SECTORS TO INCORPORATE ENVIRONMENTAL AND SOCIAL RESPONSIBILITY into their practices.

PEOPLE

Whereas the region's economic prosperity was once driven by natural resource extraction and industrial scale manufacturing, the new economy relies to a greater extent on highly skilled, well-educated, and diverse populations to stimulate creative and innovative enterprise. This plan responds to the changing reality of the global economy by placing people at the center of a prosperous region.

This Regional Policy Plan underscores investment in all of the region's people to create shared prosperity and to sustain a diversity of family-wage jobs. Investing in people means ensuring accessible and high quality education and skills-training programs, fostering economic opportunities in distressed areas, and sustaining the region's arts and cultural activity. This plan call for supporting our culturally and ethnically diverse communities. It also calls for addressing the unique obstacles and special needs of the regions economically disadvantaged populations, as well as the assets and contributions they bring to our regional prosperity.

- PROMOTE ECONOMIC ACTIVITY AND EMPLOYMENT GROWTH that creates widely shared prosperity and sustains a diversity of family-wage jobs for the region's residents.
- ENSURE THAT THE REGION HAS A HIGH QUALITY EDUCATION SYSTEM that is accessible to all of the region's residents.
- ENSURE THAT THE REGION HAS HIGH QUALITY AND ACCESSIBLE TRAINING PROGRAMS that give people opportunities to learn, maintain, and upgrade skills necessary to meet the current and forecast needs of the regional economy.
- ADDRESS UNIQUE OBSTACLES AND SPECIAL NEEDS – as well as recognize special assets – of disadvantaged populations in improving the region's shared economic future.
- FOSTER APPROPRIATE AND TARGETED ECONOMIC GROWTH IN DISTRESSED AREAS to create economic opportunity for residents in these areas.
- SUPPORT THE CONTRIBUTIONS **OF THE REGION'S CUL**TURALLY AND ETHNICALLY DIVERSE COMMUNITIES in helping the region continue to expand its international economy.
- SUSTAIN AND ENHANCE ARTS AND CULTURAL INSTITUTIONS to foster an active and vibrant community life in every part of the region.

POPULATION GROWTH AND AGING IN PLACE

The Southeast region of the Commonwealth has experienced modest population growth in the past decade, adding 37,633 persons with an annualized population growth rate of 0.35% between 2000 and 2010. The region should expect to see continued population growth over the next twenty-five years, although at an increasingly slower rate as times moves on. Our model anticipates that the region will add another 39,490 residents between 2010 and 2020, after which levels of growth start to diminish, with fewer than 28,000 residents gained from 2020 to 2030. By 2035, the population of the Southeast region will approach 1.19 million persons, a gain of almost 75,000 residents over the 2010 Decennial Census.

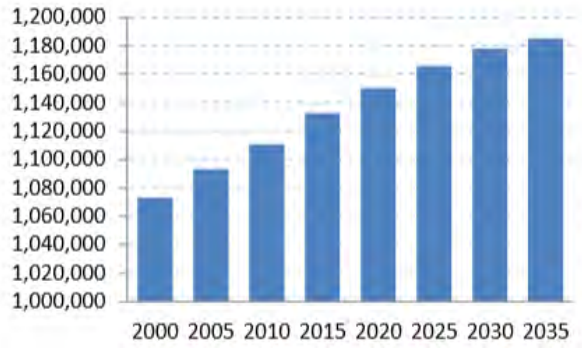


Figure 56: Projected Population, Southeast Region

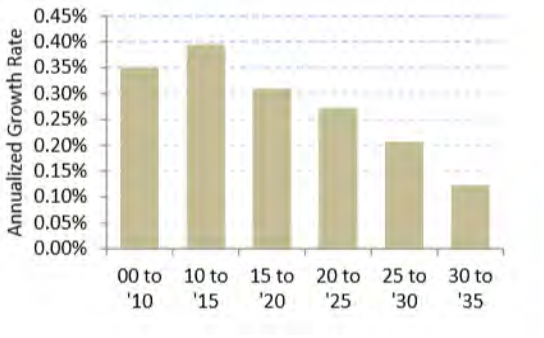


Figure 55: Annualized Rate of Population Change, Southeast Region

Population growth in the region will be driven largely by the in-migration of persons in their thirties, and with these young families, a fairly steady number of births. However, increasing deaths with the aging in place of the sizable baby boom population will slowly chip away at the rate of population growth, eventually exceeding new births by 2025.

In recent years, the Southeast region has tended to lose residents due to domestic out-migration, and this trend is expected to continue through 2025. At the same time, international migration offsets this net domestic loss, with gains of over 19,000 each five years expected to continue through this time-series such that the region continues to increase in population size.

Domestic out-migration is heavily concentrated among the college-age population and, to a lesser extent, older residents in the 55-and older cohorts. However, the region tends to import residents in their thirties, as well as their school-age children. In the near future, the large population of millennials move out of their teens and twenties (age-groups prone to leaving the region) and into their thirties (the groups that tend to move in). This, together with only modest levels of out-migration among boomers, will result in decreasing levels of out-migration and increasing levels of domestic in-migration. Domestic in-migration will catch up to out-migration by 2025 to 2030 and start contributing to population gain in the region.

Figure 57: Southeast Region

	2010-2015	2015-2020	2020-2025	2025-2030	2030-2035
Starting Population	1,108,845	1,132,805	1,150,345	1,166,038	1,178,095
Births	58,476	60,541	61,219	60,694	59,810
Deaths	52,082	57,177	62,674	69,403	76,810
Natural Increase	*6,394*	*3,364*	*-1,455*	*-8,709*	*-17,000*
Domestic In-Migration, MA & Border	125,472	133,625	134,316	135,015	136,109
Domestic In-Migration, Rest of U.S.	43,962	45,425	46,925	48,369	49,645
Domestic Out-migration	171,223	184,097	183,331	181,833	180,706
Net Domestic Migration	*-1,789*	*-5,048*	*-2,089*	*1,552*	*5,048*
Net International Migration	*19,356*	*19,223*	*19,238*	*19,214*	*19,188*
Ending Population	1,132,805	1,150,345	1,166,038	1,178,095	1,185,331

Figure 58: Estimated Components of Population Change

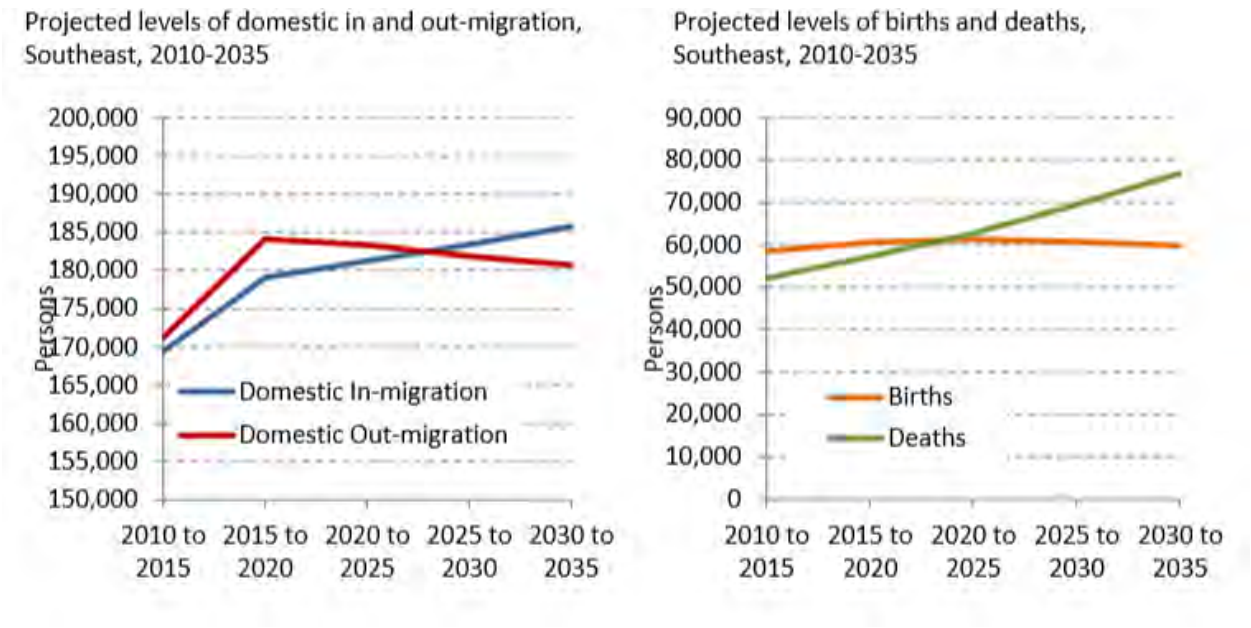


Figure 59: Projected Levels of Domestic In and Out Migration and Projected Levels of Births and Deaths

Growth in the Southeast region will be partially constrained, however, by a steady increase in deaths in the coming years, coupled with a small decline in births. Natural increase was a major contributor factor to the region's growth over the past decade, with 15,371 more births than deaths between 2005 and 2010. This reflects the region's status as a favored residence among young families. During the 2000s, the Southeast region had a particularly high concentration of residents progressing through their thirties, forties and early fifties. Likewise the region also had a high concentration of children with relatively few elderly residents. However, we expect the

number of deaths to increase with the aging of the baby boomers. Mortality rates show a marked increase as people approach their seventies and eighties. The baby boom population will begin to move into these high-mortality cohorts by 2025, and by that time the number of deaths in the region will start to exceed the number of births, subtracting from the population gained by migration.

By 2030, baby boomers will move into the retirement phase of their life cycles. Although some older residents will retire outside the region, these will be eclipsed by those deciding to age in place, shifting the entire population distribution upward. By 2035, 24 percent of the region's population will be over the age of 65, compared to14 percent in 2010. Yet the Southeast will continue to attract young families, including many from the millennial generation, who will be moving into their forties by 2035. The result will be a regional age profile that, while older, will be more evenly distributed among the different age groups.

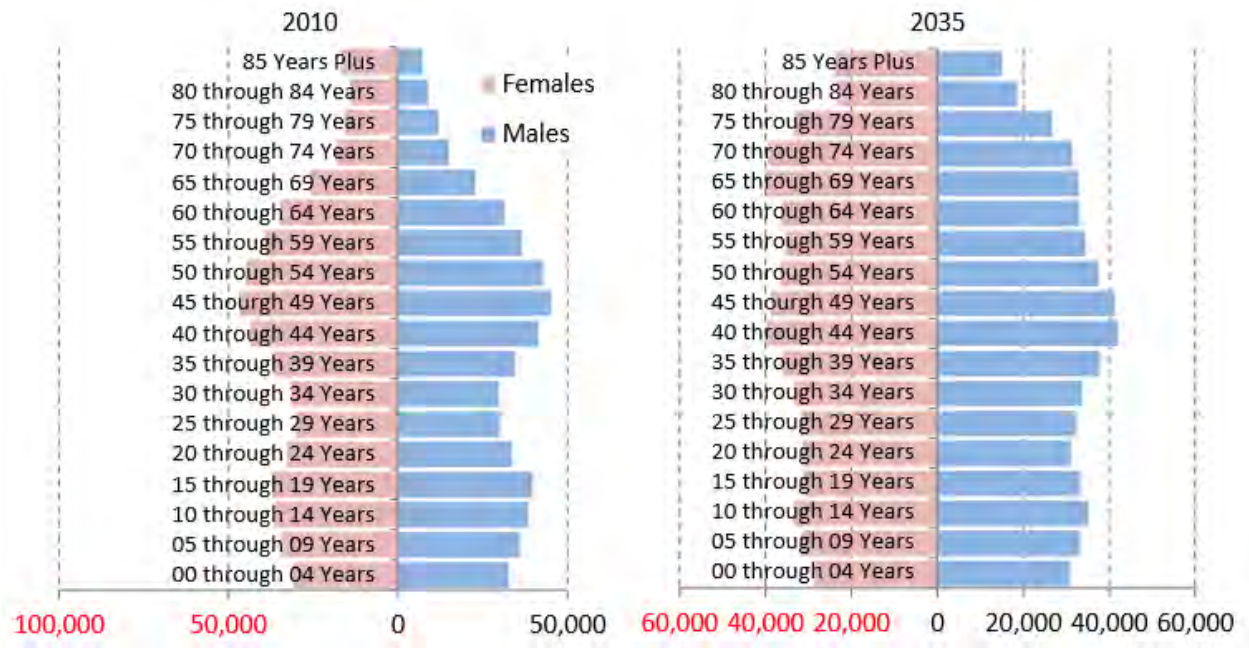


Figure 60: The Age and Gender Composition of the Southeast Region, 2010 (actual) vs. 2035 (forecasted)

The figure below shows the Southeast region population by age at 2000, 2010 and then projected at five-year intervals through 2035, demonstrating how the population ages forward through the time-series.

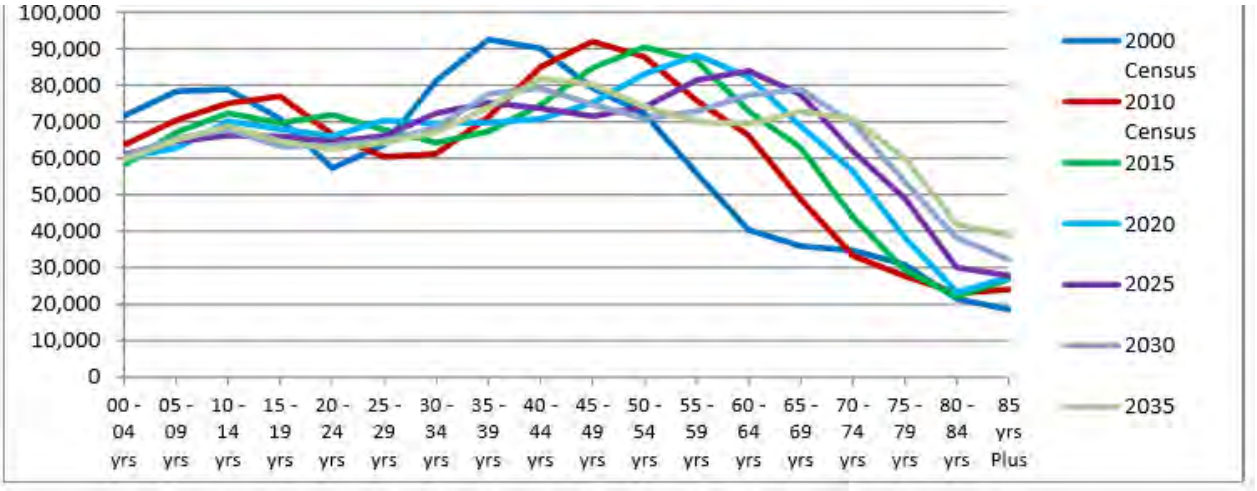


Figure 61: Population by Age, Southeast 2000-2035

The following graphic contains the most official Census 2010 population figures for the communities of the Region and the Commonwealth of Massachusetts, along with a summary of growth since 2000 and population densities as of 2010.

	Recent Population Growth				Population Density	
	Census 2010	Census 2000	% Growth 2000-2010	Annual % Growth	Land Area (Sq. Miles)	Density in 2000 (Pop/ Sq. Mile)
Abington	15,985	14,605	9.45%	0.91%	10	1,615
Avon	4,356	4,443	-1.96%	-0.20%	4.4	990
Bridgewater	26,563	25,185	5.47%	0.53%	27.5	966
Brockton	93,810	94,304	-0.52%	-0.05%	21.5	4,363
Duxbury	15,059	14,248	5.69%	0.56%	23.8	633
East Bridgewater	13,794	12,974	6.32%	0.61%	17.2	802
Easton	23,112	22,299	3.65%	0.36%	28.4	814
Halifax	7,518	7,500	0.24%	0.02%	16.1	467
Hanson	10,209	9,495	7.52%	0.73%	15	681
Kingston	12,629	11,780	7.21%	0.70%	18.5	683
Pembroke	17,837	16,927	5.38%	0.53%	21.8	818
Plymouth	56,468	51,701	9.22%	0.89%	96.5	585
Plympton	2,820	2,637	6.94%	0.67%	14.8	191
Stoughton	26,962	27,149	-0.69%	-0.07%	16	1,685
West Bridgewater	6,916	6,634	4.25%	0.42%	15.7	441
Whitman	14,489	13,882	4.37%	0.43%	7.0	2,070
OCPC Region	348,527	335,763	3.80%	0.37%	354.1	984
Massachusetts	6,547,629	6,349,097	3.13%	0.31%	7,840.0	835

Figure 62: Population Growth – Density

The population of the Region, similar to state and national trends, is getting older with an increasing percentage of the population aged 65 and over. From the 2010 Census, 13 percent of the population of the Old Colony Region was 65 or older, a percentage that has risen consistently since 1970 and up nearly 2 percentage points from 11.1 percent in the 2000 Census. The next chart shows the percentage of population aged 65 or older by community and the

Region in 2000 and 2010 and illustrates how the percentage of persons aged 60 and over in the Commonwealth has risen consistently since 2005.

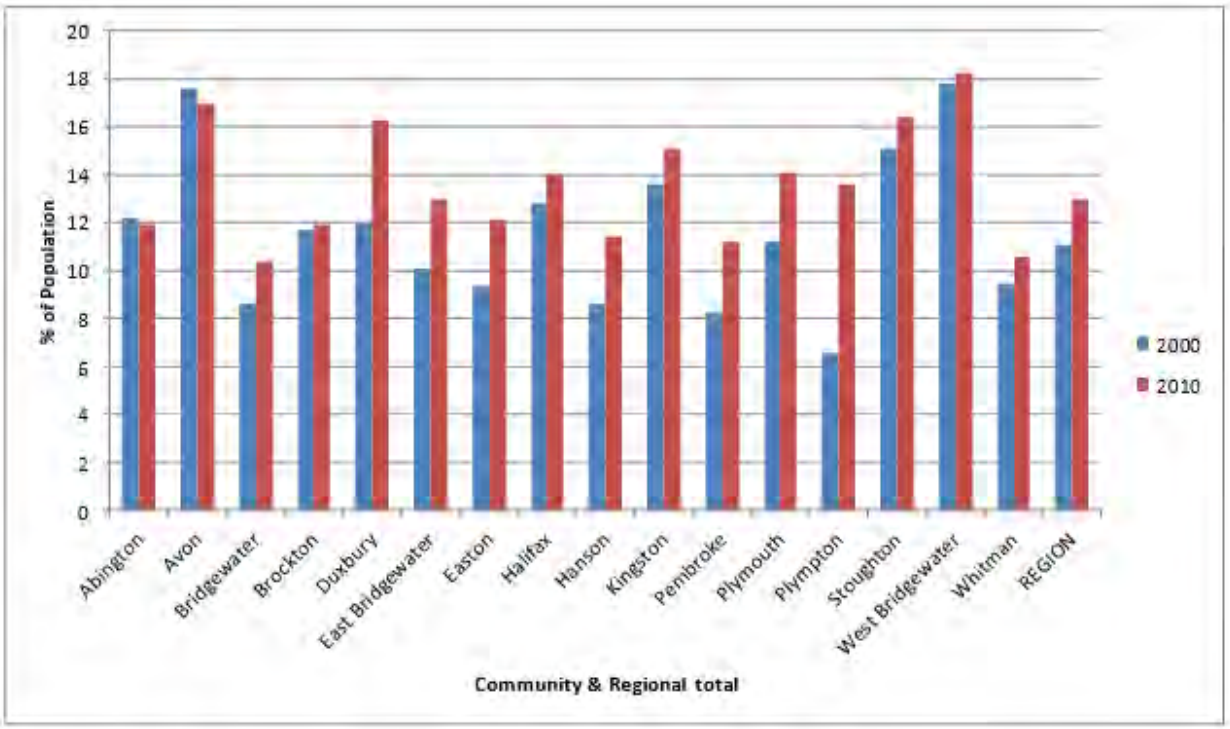


Figure 63: Percentage of Population Aged 65 and Older

Other trends in recent years have shown many elder persons choosing to stay in their own suburban homes rather than opting for a specific community or facility that caters to their physical and social needs. Similarly, people are generally working later in life than in past generations, further emphasizing the transportation needs for this segment of the population.

The Federal Highway Administration (FHWA) in Guidelines and Recommendations to Accommodate Older Drivers and Pedestrians cites results of a survey that identifies specific challenges faced by older Americans while driving. For example, crash analyses and observational studies indicated the following factors in intersection crashes involving older drivers:

- 27 percent had difficulty reading road signs
- 21 percent had difficulty driving across an intersection
- 20 percent had difficulty finding the beginning of a left turn lane
- 19 percent had difficulty making a left turn
- 17 percent had difficulty following pavement markings
- 12 percent had difficulty responding to traffic signals

The same study also yielded the following results of a survey given to older drivers to identify highway features more important to them for safe driving as they grow in age:

- Lighting at intersections (62 percent)
- Pavement markings at intersections (57 percent)
- Number of left turn lanes at an intersection (55 percent)
- Width of travel lanes (51 percent)
- Raised-curb channelization for turns at intersections (47 percent)
- Size of traffic signals at intersections (42 percent)

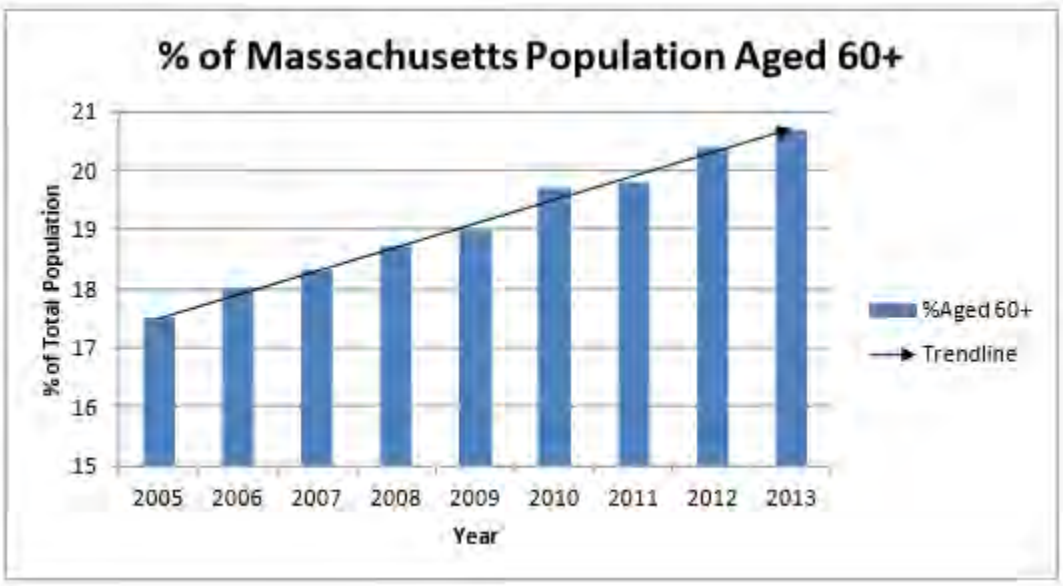


Figure 64: Statewide Increasing Trend on Percent of Population Aged 60 and Over

FUTURE GROWTH AND DEVELOPMENT

The Massachusetts Department of Transportation in a joint effort with the Metropolitan Area Planning Council (the Boston MPO), the Boston MPO staff, and the University of Massachusetts Donahue Institute (UMDI) have developed statewide, regional, and municipal level population and economic forecasts through 2040. These forecasts were developed using a comprehensive land use model to best determine where development will occur and to what magnitude. Census 2010 data was used as the baseline for the model. Overall, a total 7 percent increase in population and 10.86 percent increase in employment from 2010 figures are forecast for the region.

The following figures contain the statewide, regional, and community level population forecasts generated by MassDOT and employment forecasts through the year 2040.

	2010 Census	Forecast Year 2020	2030	2040	% Increase 2010 - 2040
Massachusetts	*6,547,629*	*6,798,770*	*7,059,629*	*7,203,380*	*10.02%*
OCPC Region	*348,527*	*361,527*	*372,470*	*372,907*	*7.00%*
Abington	15,985	17,730	19,470	20,382	27.51%
Avon	4,356	4,364	4,380	4,327	-0.67%
Bridgewater	26,563	27,055	27,619	27,456	3.36%
Brockton	93,810	96,651	98,536	97,886	4.34%
Duxbury	15,059	15,140	15,434	15,472	2.74%
East Bridgewater	13,794	14,492	15,057	14,967	8.50%
Easton	23,112	23,149	23,123	23,019	-0.40%
Halifax	7,518	7,509	7,486	7,448	-0.93%
Hanson	10,209	10,734	11,237	11,351	11.19%
Kingston	12,629	13,347	14,283	14,630	15.84%
Pembroke	17,837	18,345	18,773	18,622	4.40%
Plymouth	56,468	60,929	64,182	64,342	13.94%
Plympton	2,820	2,887	2,910	3,002	6.45%
Stoughton	26,962	27,060	27,180	27,209	0.92%
West Bridgewater	6,916	7,172	7,471	7,559	9.30%
Whitman	14,489	14,963	15,329	15,235	5.15%

Figure 65: Population Forecasts Through 2040

	2010 Employment	Forecast Year 2020	2030	2040	% Increase 2010 - 2040
Massachusetts	*3,092,231*	*3,362,346*	*3,370,552*	*3,325,416*	*7.54%*
OCPC Region	*133,273*	*146,709*	*146,434*	*147,745*	*10.86%*
Abington	4,032	4,684	4,665	4,706	16.72%
Avon	5,178	5,377	5,339	5,390	4.09%
Bridgewater	8,025	9,084	9,031	9,119	13.63%
Brockton	37,160	38,180	37,906	38,278	3.01%
Duxbury	3,563	3,575	3,558	3,595	0.90%
East Bridgewater	2,975	3,485	3,480	3,505	17.82%
Easton	10,440	10,700	10,637	10,739	2.86%
Halifax	1,431	1,457	1,450	1,463	2.24%
Hanson	2,158	2,143	2,137	2,151	-0.32%
Kingston	5,570	7,773	7,755	7,808	40.18%
Pembroke	4,987	5,018	5,003	5,041	1.08%
Plymouth	23,807	28,234	28,148	28,370	19.17%
Plympton	393	1,125	1,121	1,131	187.79%
Stoughton	13,777	14,989	15,374	15,512	12.59%
West Bridgewate	7,096	8,158	8,124	8,197	15.52%
Whitman	2,681	2,727	2,706	2,740	2.20%

Figure 66: Employment Forecasts Through 2040

Education is a fundamental factor of development and achieving sustainable economic development is impossible without investments in human capital.

Workforce development has long been recognized as one of the smartest strategies we have to create household wealth and grow our regional economies. Unfortunately, it's often been overshadowed by other economic development approaches that look easier, faster, and more glamorous.

The global-knowledge economy creates and destroys industries at an accelerating pace. This means each year more adults need to retool their skills to keep Bay State employers competitive. But change and uncertainty have made companies hesitant to invest directly in employee training. Regions with public workforce development systems that can effectively partner with the private sector to quickly adjust to shifting skill needs will gain significant advantage.

The Commonwealth of Massachusetts has an aging population, especially in Gateway City regions outside of Greater Boston that struggle to hold on to young workers. In these areas, a disproportionate share of the future workforce resides in high-poverty neighborhoods and attends high-poverty schools – environments in which children have an extraordinarily difficult time garnering the advanced skills required for jobs in Massachusetts' knowledge-intensive industries. Even entry-level employment now requires a relatively advanced set of foundation skills (reading, math, English), work readiness skills (communications and teamwork), and technical skills.

WORKFORCE DEVELOPMENT BASICS:
WORKFORCE DEVELOPMENT SEGMENTS

In addition to the supply-side, demand-side frame, workforce development practitioners often describe their efforts as targeting three distinct segments:

INCUMBENT WORKERS: Those working in jobs and looking to upgrade their skills to earn more money; or from an employer perspective, helping current employees adapt to change and remain competitive.

TRANSITIONAL WORKERS: Unemployed or underemployed workers who need retraining and employment services to move into new jobs. This segment also includes those moving from safety-net systems and the criminal-justice system into the workforce.

EMERGING WORKERS: In-school and out-of-school, at-risk youth age 14 to 21, who are or will be the newest entrants into the workplace, and who will require additional support services, education, career guidance, and job readiness skills to succeed.

Gateway City leaders must work to see that their efforts are balanced to ensure that all three of these segments are appropriately served by their regional workforce development strategy and system.

Figure 67: Workforce Development Segments

Gateway Cities and their regions are also increasingly reliant on immigrants. While many immigrants arrive with advanced skills and need only limited assistance successfully transitioning into our labor force, a large majority of foreign-born residents in Gateway Cities have significant basic education and training needs. Workforce development leaders must overcome many obstacles to serve these residents, including ineligibility for federal programs, language and cultural barriers, and the especially long training pathway these workers must follow while they try to support their families through employment in some of our most arduous and unstable occupations.

Without workforce development systems that can help disadvantaged youth and new immigrants acquire skills to contribute at their full potential, these regional economies will contract as older residents exit the workforce.

Policies should be directed towards capacity building in human resources, it especially concerns youth, individuals with inadequate qualifications and persons that face the danger of discrimination in the labor market (handicapped people, etc.). At the same time, in order to receive qualified academic and technical workforce in the long-term period, it is necessary to improve the quality of education and access to quality education systems.

Job creation and the full involvement of the workforce in comprehensive economic growth are much more effective at overcoming poverty than the simple provision of social assistance.

The education and skills of the workforce play a hugely important role in determining the productivity of firms and the earnings of working households. Education and training help individual students and workers by increasing their skills and giving them opportunities to achieve higher earnings. Individual companies benefit by having more productive workers who are able to learn quickly and adjust to changing economic conditions. The available evidence suggests that investments in education at all levels – from preschool to training of incumbent workers – generates economic growth and increases employment.

- *ENCOURAGE A STRONG EDUCATIONAL SYSTEM AND WORKFORCE TRAINING TO PROVIDE SKILLED LABOR FOR EXISTING AND PROSPECTIVE BUSINESSES.*
- *IDENTIFY CONTINUING EDUCATION AND VOCATIONAL TRAINING NEEDS FOR THE WORK FORCE, UNEMPLOYED, UNDEREMPLOYED, AND IDENTIFY ORGANIZATION STRUCTURE NECESSARY TO MEET THOSE NEEDS.*

Special emphasis may be placed on telecommunications, computer literacy, and automation. Involve appropriate organizations to coordinate this effort. Consider policies that build the skills of its local workforce. This includes partnerships between business, education and government so that all residents can be contributing members of the local economy.

THE REGION SHOULD ENSURE THAT EDUCATIONAL OPPORTUNITIES AND FRUITFUL PARTNERSHIPS ARE AVAILABLE TO PROVIDE RESIDENTS THE RESOURCES THEY NEED TO ACHIEVE LONG-TERM EMPLOYMENT AND ECONOMIC SECURITY.

- Connect high school, vocational school and community college programs with employers to link students with industries that stand to benefit from the skills acquired at these educational facilities.
- Commit to workforce training, re-training, and career pathways for youth and adults in high quality training programs.
- The Council will promote increased funding for ESL (English Second Language) resources connected with training and GED programs that support immigrant immersion into the local economy and diverse workforce.

- The Region will focus on STEM (Science, Technology, Engineering and Mathematics) curricula that will have long-term benefits for the city and the culture it embodies, *supporting programs* inclusive of women and minorities.
- The Council will promote partnerships with businesses and create employer-driven education and training programs.
- The Council will support the creation of a bridge program to vocational schools, community colleges, and four-year bachelor programs will allow residents to continue building career skills.

Successfully moving clients through training and into a career that offers family-sustaining wages requires more intensive services and support over a longer period of time. This is why it is critical to enlist the support of Gateway City leaders. As centers in their regional economies, Gateway Cities are home to the community college campuses, careen and technical schools, human service providers, and a large share of major employers.

Vested with this power, Gateway City leaders can play a prominent role spearheading the transformation of the Commonwealth's workforce development systems and draw attention to effective new approaches to make the case for redirecting and/or increasing investment in these programs.

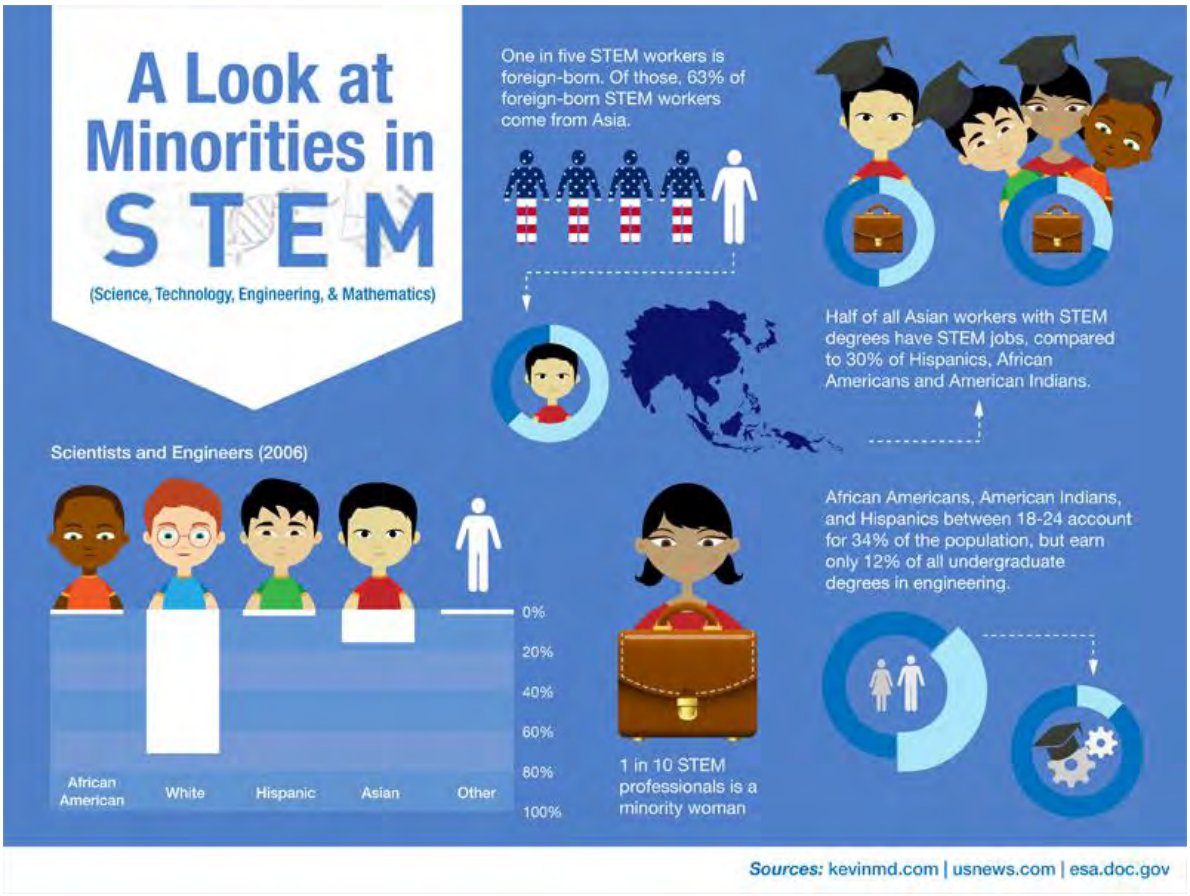


Figure 68: Minorities in STEM

PUBLIC HEALTH AND QUALITY OF LIFE

Public health is what we, as a society, do collectively to assure conditions for people to be healthy.

Humans interact with the environment constantly. These interactions affect quality of life, years of healthy life lived, and health disparities. The World Health Organization (WHO) defines environment as it relates to health as "all the physical, chemical, and biological factors external to a person, and all the related behaviors." Environmental health consists of preventing or controlling disease, injury, and disability related to the interactions between people and their environment.

THE FOLLOWING SIX THEMES HIGHLIGHTS AN ELEMENT OF ENVIRONMENTAL HEALTH:

1. Outdoor air quality. Poor air quality is linked to premature death, cancer, and long-term damage to respiratory and cardiovascular systems. Progress has been made in the Commonwealth to reduce unhealthy air emissions. Decreasing air pollution is an important step in creating a healthy environment.
2. Surface and groundwater quality. Surface and groundwater quality concerns apply to both drinking water and recreational waters. Contamination by infectious agents or chemicals can cause mild to severe illness. Protecting water sources and minimizing exposure to contaminated water sources are important parts of environmental health.
3. Toxic substances and hazardous wastes. The health effects of toxic substances and hazardous wastes are not yet fully understood. Research to better understand how these exposures may impact health is ongoing. Meanwhile, efforts to reduce exposures continue. Reducing exposure to toxic substances and hazardous wastes is fundamental to environmental health.
4. Homes and communities. People spend most of their time at home, work, or school. Some of these environments may expose people to :
    a. Indoor air pollution
    b. Inadequate heating and sanitation
    c. Structural problems
    d. Electrical and fire hazards.
    e. Lead-based paint hazards.
5. Infrastructure and surveillance. Preventing exposure to environmental hazards relies on many partners, including state and local health departments.
6. Global environmental health. Water quality is an important global challenge. Diseases can be reduced by improving water quality, and sanitation and increasing access to adequate water and sanitation facilities.

Studies have shown that areas with concentrated poverty and minority populations are more likely to have greater health disparities due to lack of access to healthy food, health care, recreation and physical activity. Many local governments have taken positive steps to address the health of their residents. Actions include expanding parks and recreation facilities and programming; adopting Complete Streets policies and improving opportunities for safe bicycling

and walking; installation of community gardens; support for expanded public transit, which enables some element of active transportation; and encouraging the design of private development to incorporate walkability features. The location and design of housing has a large impact on the community's built environment and on residents' resulting health status.

Public health and the design of cities are inextricably intertwined; the way we build our communities has a profound effect on our physical and mental health. In addition to providing for all of our basic needs – shelter, food and the space to move around freely – healthy communities ensure residents benefit from access to education, housing, jobs, the ability to live without fear of violence, freedom from environmental hazards and a meaningful built environment.

Whether designing communities that are walkable, integrating artwork to ease the mental pressure of urban life, or incorporating green spaces in the densest downtown core, design can create healthier communities. In the most livable cities, arts and culture blend with bustling business, shopping, and entertainment districts to create desirable places to live, work and play. These places inspire and connect inhabitants, while promoting healthy lifestyles that make them places where people enjoy spending time and achieve prosperity.

The physical design of our communities can improve or worsen our health. Projects are often designed around car access. The infrastructure of roads is similarly designed to get vehicles as rapidly as possible from one discrete environment to another. The separated land uses and low density of typical sprawling development, often leapfrogging to distant green fields, offers no chance for connectivity between neighborhoods. In only the densest communities can a resident live comfortably without owning a car; families often own one per driver. Once a city's residents are car-dependent, the concept of walkability tends to be forgotten. The impetus behind most land development policies was the encouragement of economic development and the facilitation of traffic flow. Few development policies of the past several decades were written to favor a pedestrian environment.

Even policies seemingly dictated by safety can end up endangering citizens. Each time fire trucks get larger and faster, a bigger turning radius is required. The resulting streets become too wide, fast, and dangerous for young pedestrians as well as older walkers. Schools, which used to be community centers and that could be reached by students on foot, are relegated to town edges where cars and school buses can easily drive but are unsafe for children to walk to school.

Most municipalities are beginning to understand that a walkable community is not just healthier for residents but for their own economic health as well. A walkable city center is an economically viable one. If shops and services of all types are available, then local residents will spend their dollars there rather than driving to regional malls.

Health is influenced as much by design of cities as it is by diet or medical care. Well-designed places engage, reduce stress, enhance learning, and allow those who become ill to heal faster and better. Many health challenges are directly related to transportation choices, land use patterns, infrastructure and accessibility. Improving built environments is an important part of the solution to today's public health crisis.

There is no better full health indicator than the degree to which a community is fully walkable. Walkable streets and neighborhoods maximize not only immediate access to active transportation, but also determine how often we take walks or go outside, how connected we feel to nature, how much we feel engaged and involved with others, how likely we are to volunteer and influence many other positive health indicators. From a study published in the *American Journal of Preventative Medicine,* residents of walkable neighborhoods weigh 6-10 pounds less than residents of sprawling neighborhoods.

Donald Appleyard, a scholar and livability pioneer in the early 70s, measured the social impacts of traffic on neighborhoods streets. He found that light-traffic streets with slow speeds and houses providing "eyes-on-the-street" (natural surveillance) helped knit a community together. In contrast, heavy-traffic streets actually ripped a community apart; people had fewer social ties. Light-traffic streets had residents with an average of three friends per person, heavy traffic streets only 0.9 friends per person.

Changing built environments so that walking, biking, and using transit are natural and rewarding parts of peoples' daily lives is not only good for individual health, but also community and environmental health by reducing costs, pollution, noise, congestion and especially greenhouse gases. To increase public safety, accessibility, equity and a community's overall well-being, measures must be taken to reduce Vehicle Miles Traveled (VMT). Communities reducing their VMT's the most, thus shifting their mode shares, are moving toward health and wellness goals. Even small shifts in VMT levels can make funds available for vital active transportation and place making projects.

THE OLD COLONY PLANNING COUNCIL RECOMMENDS THE FOLLOWING CONCEPTS AND PRINCIPLES FOR DESIGNING AND BUILDING HEALTHY COMMUNITIES. These concepts and principles apply to communities large and small, new and old, and influence both individual and community health.

People First. People, human-scale and quality-of-life trump speed and efficiency of automobiles. Designs and features of well-planned districts accommodate cars, but give greatest support and incentive to people on foot. Pedestrians receive highest support, followed by transit, bikes, freight, and then cars.

Active Transportation is the Natural Choice. Walking and active movement are not only the natural choice, but the unavoidable choice. People walk and are active a minimum of one-hour per day, by design.

High Bump-into-it. Mentally, emotionally and socially healthy people require full lives of rich and dynamic engagement. A diversity of people live at this location (diverse in lifestyle, economic and social levels). Bumping into others happens naturally, through design of streets, open buildings and beautiful public spaces. Each building, block, park, other element or system creates natural engagement.

Social Engagement nearby. Layout and design of buildings and open spaces maximizes easy and natural mixing of people. No individual living in the community needs to walk more than 1000 feet to engage others in a public setting.

Green Design. The built environment is in harmony with the natural environment by featuring biophilic design. Biophilic Design is an innovative way of designing the places where we live, work, and learn. We need nature in a deep and fundamental fashion, but we have often designed our cities and suburbs in ways that both degrade the environment and alienate us from nature.

Figure 69: Biophilic Design

Auto-dependency is low to non-existent for many. Incentives for driving are no longer dictating the architecture and placement of buildings. Parking in unbundled, metered, and managed. Ideally, parking is placed at the edges, and most people enjoy walking to their vehicles as part of their more active lifestyles.

Transit is easy, convenient and comfortable. A variety of transit options and desirable walking routes to transit are featured. Options might include trolleys, trams, buses and water taxis. Intermodal stations are convenient, welcoming, comfortable and well connected. Transit is not

just competitive to other modes, it makes possible, efficient, comfortable and enjoyable movement.

Pavement is minimized. Use of non-porous materials in streets, parking lots and other features is minimized. Potential water and pollution runoff, solar heat traps and auto-centric designs are minimized.

Paths (and low-volume streets) lead to activity centers, transit stops and other places of reward. Alignment of streets celebrates landmark places (natural and man-made). Individuals find it comfortable, easy, rewarding and memorable to walk, bike, and travel to featured landmarks.

Street making. Use transportation to build the community, not divide it. Build streets to add value and livability to adjacent properties. The first priority of commercial streets is to maximize retail and social exchange.

FOUR WAYS IN WHICH THE BUILT ENVIRONMENT AFFECTS PUBLIC MENTAL HEALTH:

1. Commuting by car introduces avoidable stress into people's daily lives. Road rage is a symptom of this toxic practice: pent-up frustration leads to outbursts, which are both plainly unhealthy and dangerous. Most people take communing as a given, but it's time we examine it more closely.
2. Suburbia's lack of public spaces limits social interaction, leading to isolation.
3. Sedentary habits associated with car dependence exacerbate mental ill-health.
4. Urban areas do not have better psychological health compared to non-urban areas.

IMPLEMENTATION STRATEGIES

- Zoning overlay to preserve open space, pedestrian and bicycle access plans
- Open Space and Recreation Plans
- GIS layers of data to determine where active transportation facilities are needed
- Green building ordinance
- Climate Action Plan
- Community cooking and gardening workshops
- Create community garden
- 'Rethink your Drink' campaign for student outreach
- Zoning regulations that encourage healthier development decisions
- Strong ordinance language about filling in sidewalk gaps, new sidewalk requirements
- Expand farmers markets options and opportunities
- Active design in workplace policies
- Healthy vending machines
- Expand regional bicycle connectivity/infrastructure
- Combine stormwater management with park redevelopment
- Increase mileage of streets on road diets
- As-of-right exemptions for solar and alternative energy installations
- Urban agriculture rezoning
- Support additional Open Space Residential Design zoning ordinances
- Decrease Vehicle Miles Traveled

SOCIAL COHESION & MENTAL HEALTH, ACTIVE LIVING, ENVIRONMENTAL HEALTH

- Agricultural and Natural Land Preservation
- Transit-Oriented Development
- Access to Open Space
- Ecological Health
- Public Safety
- Equity
- Healthy Local Food
- Green Buildings
- Reasonable Mobility
- Healthy Air and Clean Water
- Multimodal Transit
- Mixed-use neighborhoods

ENVIRONMENTAL HEALTH, ACTIVE LIVING, FOOD AND NUTRITION, SOCIAL COHESION AND MENTAL HEALTH

- Tree Canopy
- Multimodal Transit
- Local Food
- Equity
- Parks
- Stormwater Management
- Green Infrastructure
- Pedestrian and Bicycle Connectivity

FOOD AND NUTRITION, ENVIRONMENTAL HEALTH, SOCIAL COHESION AND MENTAL HEATH

- Reduction in vehicles miles traveled
- Access to healthy foods
- Access to open space

FOOD & NUTRITION, ACTIVE LIVING, ENVIRONMENTAL HEALTH, HEALTH AND HUMAN SERVICES

- Pedestrian improvements
- Community gardens
- Air and water quality
- Open space
- Equity

PUBLIC HEALTH AND QUALITY OF LIFE PRIORITIES FOR LOCAL COMPREHENSIVE PLANS

- Explicitly address health in designing the comprehensive planning process and the structure of the plan itself.
- Explicitly encourage pedestrian improvements to encourage physical activity, the direct health benefits associated with walking as a result of addressing this issue, walking becomes safer and more appealing for everyone.

- Ensure that an emphasis on public health exists throughout all the chapters. Articulate the connection between park and recreation, transportation and the environment to health.

DATA AND FIGURES CAN SPUR ACTION AND BRING THE FOCUS ON HEALTH TO THE FOREFRONT.

- Assess current gaps in regional data collection
- Make data gathering a part of the outreach process
- Ensure that all communities use common data sets integrating planning and public health sources.
- Tie goals and objectives in plan to available data that are trackable over time.
- Findings indicate that there is a basic need for data when initially deciding which areas of public health need to be prioritized.
- Need for data as a way to identify health priorities and design a monitoring and evaluation system to measure progress and impact of local comprehensive plans.
- Since health data is not typically available at the town or city level, data collection is a great time for health and planning departments to work together to share their respective expertise and provide the other with the data that it lacks.
- Data collection is an opportunity to engage community groups and recruit local community assistance.

Figure 70: Public Health and Quality of Life

HAZARD MITIGATION AND CLIMATE RESILIENCY

GOAL: THE COUNCIL INTENDS TO EXPAND ITS ROLE SUPPORTING LOCAL COMMUNITIES IN CLIMATE CHANGE PLANNING TO ASSIST THEIR EFFORTS TOWARD MITIGATION, ADAPTATION, AND RESILIENCE.

GOALS WILL BE GENERAL, BROAD STATEMENTS REPRESENTING LONG-TERM VISION FOR HAZARD REDUCTION AND MITIGATION BASED ON POLICY DEVELOPMENT.

1. *EVALUATE AND ANALYZE VULNERABILITY* in order to guide and promote sound mitigation activities.
2. *INCREASE AWARENESS OF THE BENEFITS OF HAZARD MITIGATION* through outreach and education.
3. *INCREASE COORDINATION AMONG LOCAL AGENCIES*.
4. *PROMOTE COST-EFFECTIVE HAZARD MITIGATION ACTIONS* that protect and promote public health and safety, reduce damage and loss to properties.
5. *MONITOR AND EVALUATE INFORMATION ON THE EFFECTIVENESS OF HAZARD MITIGATION ACTIONS.*

The Old Colony Planning Council is dedicated to providing leadership to support climate change mitigation, adaptation, and resilience. Over the long term, climate change will be one of the greatest threats to our region's ongoing prosperity and livability. Climate change threatens our continued orderly and economic development. Our region is already seeing rising temperatures and increased severe weather events. Climate change looms large as an issue with the potential to adversely affect the region in the absence of intentional and proactive planning. *Responding to climate change takes three approaches: mitigation, adaptation, and resilience*. Mitigation strategies focus on minimizing contributions to climate change – for example, reducing energy use that leads to greenhouse gas emissions. Adaptation strategies focus on how to change policies and practices to adjust to the effects of climate change. Resilience strategies recognize the difficulty of predicting what the impacts of climate change will be and emphasize increasing our flexibility to survive and thrive regardless of how climate change develops.

The Council is committed to building a resilient region that minimizes its adverse contributions to climate and air quality and is prepared for the challenges and opportunities of a changing climate. Recognizing the importance of climate change mitigation, adaptation, and resilience, the Council will use climate impacts as a lens through which to examine all of its work. The Council will look for opportunities to use both its operational and planning authorities to plan for and respond to the effects of climate change, both challenges and opportunities. In addition to climate change, regional air quality factors threaten both the quality of life and our economy as we may face severe additional regulations from the federal government.

THE COUNCIL WILL:

- Expand the information and technical assistance it provides to local governments to support regional and local climate change planning.
- Work with partners to collaboratively identify and examine the feasibility of energy improvement opportunities, and pursue group purchasing to facilitate energy improvements where this might provide synergy and/or an improved economy of scale.
- Develop, collect and disseminate information about climate change, including energy and climate data.
- Work with the Commonwealth of Massachusetts on a greenhouse gas emissions inventory that informs regional discussion on emissions reduction.
- **Provide technical assistance to the region's local governments**, including identifying risks, best practices, and model ordinances for climate change mitigation and adaptation.
- Assess the risks and opportunities presented to the region from a changing climate and the potential rewards from addressing those risks and opportunities.
- Provide information to local jurisdictions about the risks of not responding to or preparing for climate change, and encourage local governments to plan and prepare for climate change, including incorporating climate change planning into their local comprehensive plans.
- Explore incentives to reward local governments that set and make progress on local greenhouse gas reduction goals.
- Protect vulnerable populations from natural hazards. Vulnerable neighborhoods face higher risks than others when disaster events occur and may require special interventions to weather those events. A population maybe vulnerable for a variety of reasons, including location, socioeconomic status or access to resources, lack of leadership and organization, and lack of planning.

In addition to its ongoing efforts to promote compact development, provide alternatives to single-occupant automobile travel, and protect natural resources and open space, the Council's approach to climate change will expand first into collaborative approaches, such as providing information, technical assistance, and incentives. The Council will explore how to effectively use its planning authorities to address climate change, including reducing vehicle miles traveled, regional greenhouse gas emissions, and the airborne fine particulate matter that threatens the region's air quality attainment status with the Environmental Protection Agency.

- The Council will collaborate with regional leadership and convene local governments and the broader community to address climate change mitigation and adaptation within the region. These expanded roles in information and technical assistance will help the Council serve as a resource to both local jurisdictions and the region at large. The Council intends to be a prominent player in elevating this serious and important issue which affects the long-term viability of the Old Colony Planning Council region.

The Northeast will experience warmer temperatures, higher seas, and greater amounts of rain and snow than federal scientists forecast only three years ago. The findings were based on an array of new research tools and methods that have sharpened climate scientists' understanding of how climate change will affect the United States. Thousands of studies conducted by tens of thousands of scientists around the world have documented changes in surface, atmospheric,

and oceanic temperatures; melting glaciers; disappearing snow cover; shrinking sea ice; rising sea level; and an increase in atmospheric water vapor.

HAZARD MITIGATION AND CLIMATE ADAPTATION

Mitigation is the effort to reduce loss of life and property by lessening the impact of disasters. In order for mitigation to be effective we need to take action now, before the next disaster, to reduce human and financial consequences later (analyzing risk, reducing risk, and insuring against risk). *Adaptation* actions are informed by iterative planning that incorporates the most current information about climate change into the decision-making process.

The practices of Hazard Mitigation and Climate Adaptation planning have a great deal in common. They are both largely about deliberative long-term actions in the built and natural environments that reduce harms from hazards. In addition, the frameworks are very similar with vulnerability and risk assessment underpinning the analysis.

While hazard mitigation planning seeks to reduce harm from human, technological, and natural hazards, climate adaptation is focused on climate-related conditions and hazards. In addition, climate adaptation not only considers the impacts of particular events or disasters, but also examines the implication of slow-onset changes, such as changes in seasons. Thus, it is in the area of climate-related natural hazards, such as flooding, heat waves, and wildfires, that the integration of these two practices is most applicable.

Despite the similarities between climate adaptation and hazard mitigation planning, it is worth highlighting some of the differences that may need to be reconciled when integrating these frameworks in a planning process. First, hazard mitigation planning has traditionally relied on analysis of historical events to characterize risk. On the other hand, climate adaptation employs projections of future conditions derived from global climate models to characterize risk. At the core of adaptation planning is the assumption that the climate is changing in such a way we cannot plan based on the climate of the past.

A hazard mitigation or climate adaptation action is a specific action, project, activity or process taken to reduce or eliminate long-term risk to people, property, and natural systems from climate change and/or natural hazards and their impacts. According to the Federal Emergency Management Agency (FEMA), the purpose of hazard mitigation planning is to identify local policies and actions that can be implemented over the long term to reduce risk and future losses from hazards. Actions can be large-scale, multi-year projects, ongoing efforts that continue to reduce risk or raise risk awareness, or single, targeted actions for a particular facility.

THE STEPS OF THE RISK ASSESSMENT ARE:

1. Describe hazards: a description of the location, extent (strength, magnitude, and duration), previous occurrences, and probability of future events. Can be described with narratives or maps.

2. Identify community assets: participating jurisdictions identify assets at risk to hazards, which can be anything that is important to the character and function of a community, such as people, economy, built environment, and natural environment.
3. Analyze risks: involves evaluating vulnerable assets, describing potential impacts, and estimating losses for each hazard. Risk can be expressed qualitatively (describe the types of impacts that might occur during a hazard event) or quantitatively.
4. Summarize vulnerability: involves summarizing the large amount of information generated in the previous steps so that the community can understand the most significant risks and vulnerabilities.

A natural hazard is defined by the Federal Emergency Management Agency (FEMA) as an event or physical condition that has the potential to cause fatalities, injuries, property damage, infrastructure damage, and agricultural loss, damage to the environment, interruption of business, or other types of harm or loss. As the costs and seeming frequency of natural disasters continue to rise, governments and citizens must find ways to reduce the risks of natural hazards to our communities. The 2015 Natural Hazard Mitigation Plan for the Old Colony Region covers the 344 square mile OCPC region in Southeastern Massachusetts. Within the OCPC region, the three biggest natural hazards are flooding, hurricanes, and tropical/winter storms.

Local decision makers have the greatest capacity to influence the resiliency of their communities. Typically, they are the first to respond to a disaster, and understand the physical and social characteristics of the community. They also have the most direct authority and responsibility to ensure the health, safety and welfare of their constituents. Historically, communities have merely responded to the effects of natural hazards, but now more than ever, local governments have the responsibility to take a more aggressive stance toward reducing their vulnerability to disasters.

Communities, especially those in coastal areas, are moving from a strategy of response to a proactive stance of planning, public education, and disaster preparedness to ensure their infrastructure and community members are capable of coexisting with the dynamics of the environment. Communities work toward climate resilience through strong leadership, citizen engagement, interdepartmental collaboration, and interdependence. Unfortunately, building resilience is often a challenge because the responsibilities of limiting hazard exposure, reducing vulnerability, assessing risk, and responding and adapting quickly to changes are dispersed among many local departments and offices.

MUNICIPAL VULNERABILITY PREPAREDNESS PROGRAM

The Executive Office of Energy and Environmental Affairs has launched a new program, the Municipal Vulnerability Preparedness (MVP) grant program which provides support for cities and towns in Massachusetts to plan for and implement key climate change adaptation actions for resiliency. The state awards municipalities with expert consulting and funding to conduct a vulnerability assessment and develop action-oriented resiliency plans. The program helps communities to:

- Define extreme weather and natural and climate related hazards.
- Understand how their community may be impacted by climate change with a Massachusetts specific climate change clearinghouse containing the latest science and data.
- Identify existing and future vulnerabilities and strengths.
- Develop and prioritize actions for the community.
- Identify opportunities to take action to reduce risk and build resilience.
- Implement key actions identified through the planning process.

MVP certified providers are trained in workshops across the state to provide technical assistance to communities in completing the assessment and resiliency plan using the *Community Resilience Building Framework.* Cities and towns will then be able to choose the provider of their choice from a list of certified providers. Communities who complete the MVP program become certified as an MVP community and are eligible for MVP Action grant funding and other opportunities. Through this program municipalities will be better equipped to plan and prepare for climate change, and state government will gain a better understanding of the challenges communities face.

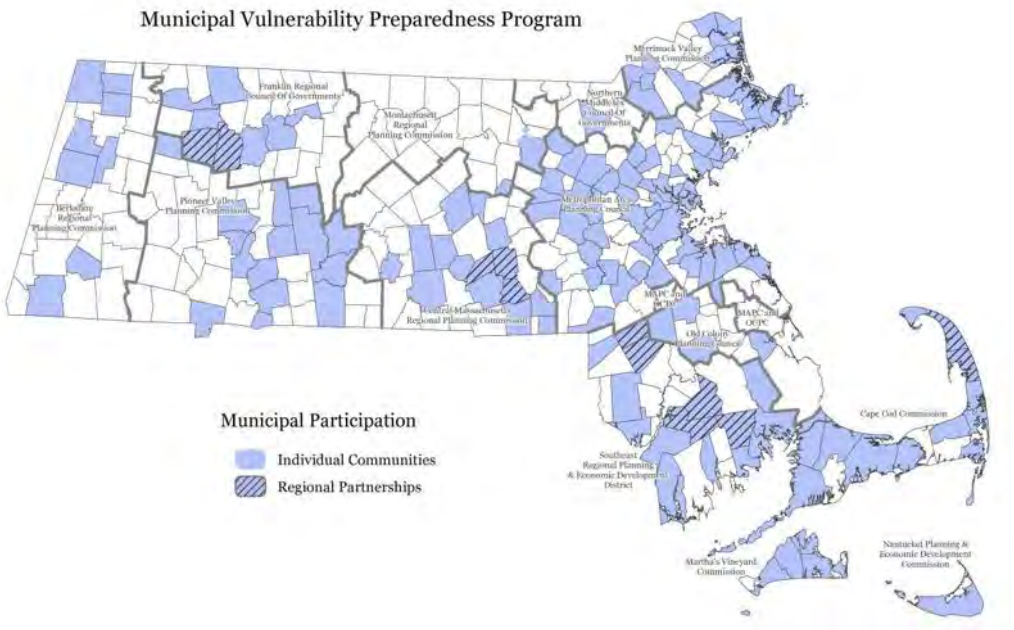


Figure 71: Municipal Vulnerability Preparedness Program Participation

PRIMARY CLIMATE CHANGE INTERACTIONS

SEA LEVEL RISE

Despite local efforts to reduce greenhouse gas emissions, the OCPC region will experience the consequences of ongoing global climate change. Sea level rise refers to the increase in mean sea level over time. Sea level has been rising around the globe for thousands of years since the end of the last ice age. Sea levels along our coastline are already rising. Coastal flooding occurs frequently along the Massachusetts coast.

Global average sea levels, without significant cuts to emissions, are now projected to rise by as much as 8.2 feet — 1.6 feet more than previously projected. Accelerated rates of global, or ecstatic, sea level change are driven principally by increases in the volume of the ocean from two primary factors: thermal expansion and melting ice sheets. Steady increases in global atmospheric temperature serve to expand sea water molecules which increases ocean volume. Increased global temperatures also result in the melting of glaciers and continental ice masses, such as the Greenland ice sheet that covers terrestrial areas, not ice-covered ocean as in the Arctic, which contribute significant amounts of freshwater input to the Earth's oceans.

Historically, the highest concentration of coastal flooding events has occurred in Eastern Plymouth County. Coastal flooding is often characterized as minor or major based on the magnitude (elevation), duration, and frequency of the flooding that is experienced. As sea level has continued to increase, there has been a corresponding increase in minor (or disruptive) coastal flooding associated with higher than normal monthly tides.

As ice melts on the South Pole, the resulting gravitational pull on the ocean, as well as the gradual sinking of land in the Northeast, means that Boston and other New England communities are likely to experience about a 25 percent higher increase in sea levels than other parts of the planet, according to a 2016 study issued by the city of Boston.

Sea level rise will increase the frequency and severity of both routine tidal flooding and storm-related coastal flooding. Downscaled climate projections suggest that Boston may experience between 4.0 and 7.5 feet of seal level rise by 2100 for intermediate and high scenarios, respectively. The potential impacts to our region include less fresh water, an increase in the frequency and intensity of storm events, and the loss of native plant and animal species. Many local variables influence the extent of damages from coastal flooding associated with sea level rise. Elevated coastal landforms (e.g., coastal banks) and salt marshes have the ability to buffer increased tidal levels, as well as storm surges. Due to the concentration of development in the

coastal zone, economic exposure from this hazard is high. This damage will likely include both direct impacts, such as damage to homes and government buildings, as well as lost tourism revenue and impacts to local businesses.

Other impacts associated with more severe coastal flooding include beach erosion, loss or submergence of wetlands and other coastal ecosystems, saltwater intrusion into drinking water and wastewater infrastructure, high water tables, loss of coastal recreation areas, beaches, protective sand dunes, parks and open space, and loss of coastal structures (sea walls, piers, bulkheads, and bridges) and buildings.

Figure 72: March 2018 Storm Surge

Potential Effects of Climate Change		
	SEA LEVEL RISE → INCREASE IN FREQUENCY AND SEVERITY OF COASTAL FLOODING	Sea level rise will increase the frequency and severity of both routine tidal flooding and storm-related flooding. Downscaled climate projections suggest that Boston may experience between 4.2 and 7.6 feet of sea level rise by 2100.
	EXTREME WEATHER → STORM SURGE	Climate change is likely to increase the frequency of severe storm events, including hurricanes and nor'easters. As a result, storm surge sufficient to cause coastal flooding is likely to occur more often.

CHANGES IN PRECIPITATION

In the last federal report, in 2014, scientists found that the region's precipitation had increased by more than 10 percent over the past century, and the worst storms in the Northeast had brought significantly more rain and snow. Since 1900, average annual precipitation over the U.S. has increased by roughly 5 percent. This increase reflects, in part, the major droughts of the 1930s and 1950s, which made the early half of the record drier. Precipitation since 1991 (relative to 1901-1960) increase the most in the Northeast (8 percent), Midwest (9 percent), and southern Great Plains (8 percent), while much of the Southeast and Southwest had a mix of areas of increases and decreases. Between 1981 and 2015, the Northeast experienced a 17 percent increase in precipitation from the largest storms, compared with similar storms during the first half of the last century. That was substantially more than any other region in the country.

If emissions of heat-trapping gases continue their upward trend, certain global patterns of precipitation change are projected to emerge that will affect northern and southwestern areas of the United States. The northern U.S. is projected to experience more precipitation in the winter and spring, while the Southwest is projected to experience less, particularly in the spring. The contrast between wet and dry areas will increase both in the U.S. and globally. In other words, the wet areas will get wetter and the dry areas will get drier. There has been an increase in the amount of precipitation falling in heavy events, and this is projected to continue.

The projected changes in the northern U.S. are a consequence of both a warmer atmosphere (which can hold more moisture than a colder one) and associated changes in large-scale weather patterns (which affect where precipitation occurs).

Changes in the amount, frequency, and timing of precipitation, including both rainfall and snowfall, are occurring across the globe as temperatures rise, and other climate patterns shift in response. Climate change is projected to exacerbate the severity of storms and severe rainfall events. Therefore, it is anticipated that all forms of flooding will increase in severity as a result of climate change.

Potential Effects of Climate Change

RISING TEMPERATURES → HIGHER EXTREME TEMPERATURES	The average summer across the Massachusetts during the years between 1971 and 2000 included 4 days over 90°F (i.e. extreme heat days). Climate scientists project that by mid-century, the state could have a climate that resembles that of southern states today, with between 10-28 days over 90°F. By the end of the century, extreme heat could occur between 13-56 days during summer.
RISING TEMPERATURES → HIGHER AVERAGE TEMPERATURES	Compared to an annual 1971-2000 average temperature baseline of 47.6°F, annual average temperatures in Massachusetts are projected to increase by 3.8 to 10.8 degrees (likely range) by the end of the 21st century; slightly higher in western Massachusetts.

RISING TEMPERATURES

If little is done to cut the rise in greenhouse gas emissions, average annual temperatures in the Northeast could rise between 5.3 degrees and 9.1 degrees Fahrenheit by 2071, according to a draft report about climate change awaiting the approval of the Trump administration. Over the past century, the region's average annual temperature increased about 2 degrees, compared to 1.2 degrees for the nation as a whole. Most of that warming has occurred since the late 1970s, according to the report.

The eight warmest years on record, 2016, 2015, 2014, 2010, 2013, 2005, 2009, and 1998 – have all occurred in the last twenty years according to the U.S. National Oceanographic and Atmospheric Administration. Average global temperatures have risen steadily in the last fifty years, and scientists warn that the trend will continue unless greenhouse gas emissions are significantly reduced. Even small changes in temperature can have dire consequences, leading to more prolonged heat waves, intense storms, extinctions of large numbers of species, and the bleaching of coral reefs around the world.

There is no universal definition for extreme temperatures. The term is relative to the usual weather in the region based on climatic averages. Extreme heat for Massachusetts is usually defined as a period of three or more consecutive days above 90°F, but more generally as a prolonged period of excessively hot weather, which may be accompanied by high humidity. Extreme cold is also considered relative to the normal climatic lows in a region.

VECTOR-BORNE DISEASES

Vector-borne diseases are transmitted typically by the bite of an infected arthropod. The arthropod could be something rather familiar like a mosquito, tick, or black fly. These arthropods that carry and transmit diseases are known as vectors. Other non-arthropod vectors can include rodents such as rats, certain bats, a species of aquatic snail, and several species of wild birds. Different vectors carry different diseases such as malaria, dengue, encephalitis, African sleeping sickness, and yellow fever.

In general, climate plays an important role in the seasonal pattern or temporal distribution of diseases that are carried and transmitted through vectors because the vector animals often thrive in particular climate conditions. For example, warm and wet environments are excellent places for mosquitos to breed. If those breeding mosquitos happen to be a species that can transmit disease and if there is an infected population in the region, then the disease is more likely to spread in that area. Because they are sensitive to climate, the distribution and number of vectors is also affected by climate change. There is evidence that the geographic range of ticks and mosquitos that carry disease has changed in response to climate change. While future climate change is expected to continue to alter the distribution of disease vectors, it is important to recognize that there are several other factors (such as changes in land use, population density, and human behavior) that can also change the distribution of disease vectors as well as the extent of infection.

The number of illnesses caused by mosquito, tick, and flea bites have tripled in the United States over the last 13 years, according to new data from the Centers for Disease Control and Prevention. According to the report, more than 640,000 cases were reported across the country from 2004 through 2016, though officials say the actual number of illnesses is likely much higher.

During this time period, nine new germs spread by mosquitos and ticks were either discovered or introduced into the U.S. The number of reports diseases from ticks more than doubled during the study period and accounted for more than 60 percent of all reported cases. Massachusetts is one of the states with the most reported cases of tick-borne diseases – some 50,234 from 2004 through 2016, according to the Centers for Disease Control and Prevention. Massachusetts had some 1,209 reported cases of diseases from infected mosquitos, including both locally transmitted and travel-associated, between 2004 and 2016, putting it among the second tier of states in terms of number of these cases. Several New England states, including Massachusetts, New Hampshire and Rhode Island, have high incidence rates for Lyme disease during recent years.

In you increase temperatures in general, tick populations move further north, expanding the range of people affected. Warmer temperatures also increase the length of tick season. Those black-legged ticks, the carriers of Lyme disease, thrive in warm, muggy weather. In New England, where winters have gotten warmer and shorter, these tiny, sesame seed-sized insects have more time to bite humans and spread Lyme disease. Tick season used to be relegated to summer; it now spans spring and autumn. Seasonal patterns and warming are expected to not only lead to earlier seasonal tick activity but may also speed up mosquito biting rates, accelerate the mosquito life cycle, and decrease the time needed for an infected mosquito to transmit West Nile Virus.

- Local municipalities in the region need to build and sustain public health programs that test for and track vector-borne diseases, train vector control staff appropriately and educate the public on how best to prevent bites and control the spread of germs by mosquitos, ticks and fleas in their communities.

There are two mosquito-borne diseases of concern in Massachusetts, Eastern equine encephalitis (EEE), which was identified as a human disease in 1938, and West Nile virus (WNV) infection, which has been present in the United States since 1999. EEE is a rare but serious neuro-invasive disease that causes meningitis or encephalitis, and often results in death or severe disability. WNV infection is more common, though typically less severe than EEE; presentation of WNV ranges from febrile illness to neuro-invasive disease.

Currently there are no available vaccines to prevent human infections from either mosquito-borne virus. Personal protection measures that serve to reduce exposure to mosquitos and thereby prevent human infection remain the mainstay of prevention. To estimate the risk of human disease during a mosquito season, the MDPH, in cooperation with the local Mosquito Control Projects, conducts surveillance for EEE and WNV using mosquito samples, and specimens from human and veterinary sources.

There have been no human cases of EEE virus infection identified in Massachusetts since 2013.

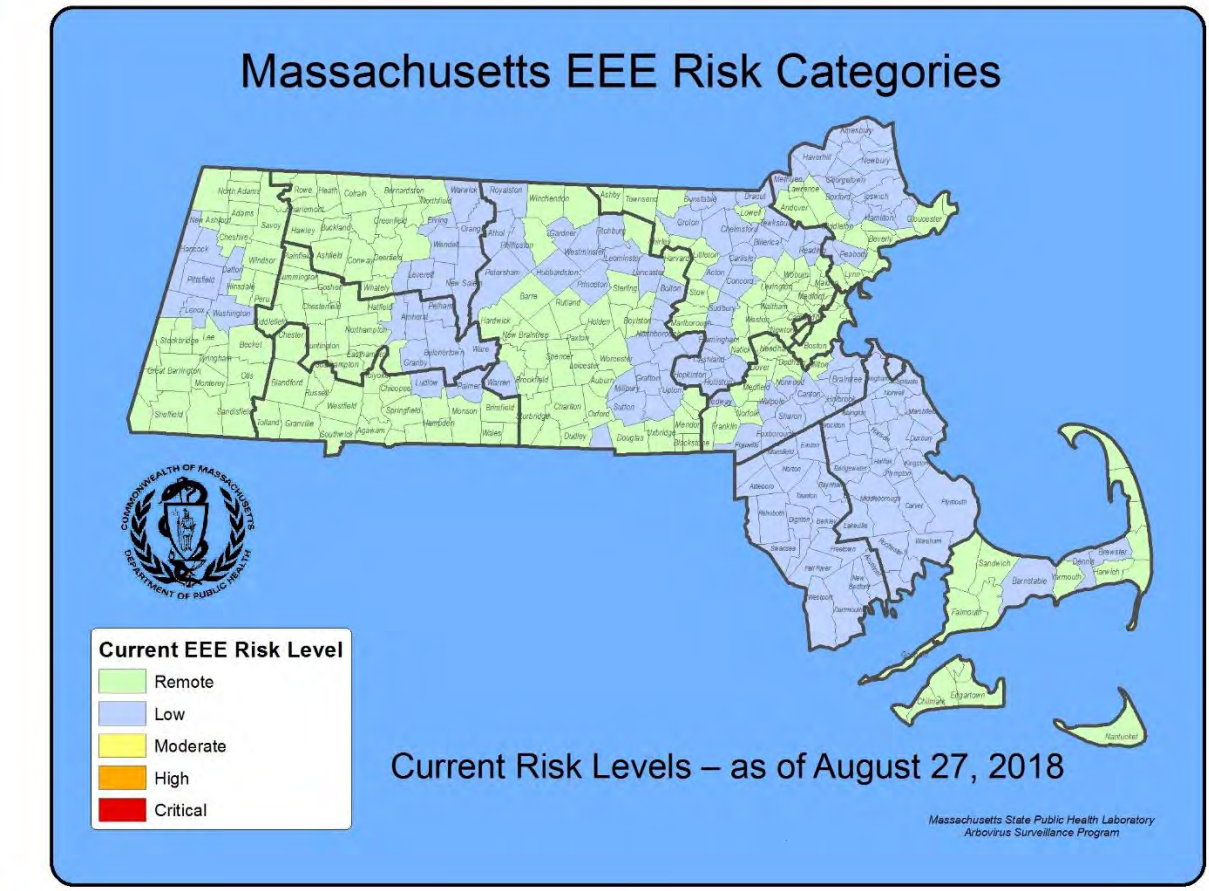


Figure 73: Mosquito-Borne Illness Risk Map

EXTREME WEATHER

Climate change is expected to increase extreme weather events across the globe and right here in Massachusetts. There is strong evidence that storms – from heavy downpours and blizzards to tropical cyclones and hurricanes – are becoming more intense and damaging and can lead to devastating impacts for residents across the state.

According to the U.S. Global Change Research Program, the Northeast has been experiencing increased extreme precipitation, with a more than 70 percent rise in the amount of precipitation falling in "very heavy" weather events over the 1958 to 2010 period. Of the 10 heaviest snowstorms in Boston, five occurred since 2000 — with two taking place in the same two weeks of 2015, making it the all-time snowiest season for the city.

Extreme weather has not been all cold news for the Northeast. While February typically means painfully cold weather, often reaching single digits, this year saw T-shirts and shorts as temperatures in some areas soared above 70 degrees for the second year in a row.

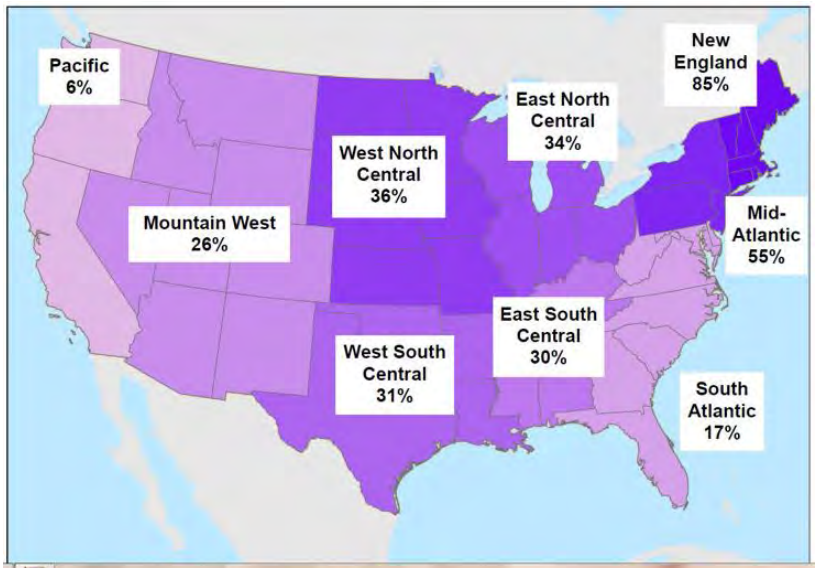


Figure 74: Regional Trends toward Increased Extreme Rainstorm and Snowstorm Frequency

In 2017, 19 areas across the Northeast experienced their warmest February on record, including Washington D.C., Philadelphia, Buffalo, and Baltimore. Daily temperatures that month broke records dating back to 1906. Also of note that month was the first tornado to ever touch down in February in Massachusetts since official records began in 1950.

All of these are expected to threaten public health and the regional economy. Preparing the region for the inevitable consequences of our changing climate requires steps to adapt to these consequences and create more resilient communities. Adapting to climate change means adjusting how we build, where we build, how we store and distribute water, and a myriad other things in the face of ongoing change. Making our region more resilient to the consequences of climate change means increasing the capacity of our communities, economy, and environment to cope with hazardous events such as storms, heat waves, and ongoing drought.

OCPC considers the impacts of climate change on transportation projects by designing infrastructure to withstand impacts such as sea level rise, extreme heat, and intense rain events. We also study how to help natural habitats become more resilient to climate changes and promote collaboration to build and maintain beaches, which are threatened by rising sea levels.

Constructing and managing a transportation network that will work best for our region into the future is no small challenge.

Primary Climate Change Interaction	Natural Hazard	Other Climate Change Interactions	Representative Climate Change Impacts
 Sea Level Rise	Coastal Flooding	Extreme Weather	Increase in tidal and coastal floods, storm surge, coastal erosion, marsh migration, inundation of coastal and marine ecosystems, loss and subsidence of wetlands
	Coastal Erosion	Changes in Precipitation	
	Tsunami	Rising Temperatures	
 Changes in Precipitation	Inland Flooding (including Dam Overtopping)	Extreme Weather	Flash flooding, urban flooding, public health impacts from mold and worsened indoor air quality, vector-borne diseases from stagnant water, episodic drought, changes in snow-rain ratios, changes in extent and duration of snow cover
	Landslide	Rising Temperatures, Extreme Weather	
 Rising Temperatures	Average/Extreme Temperatures	N/A	Shifting in seasons (longer summer, early spring including earlier timing of spring peak flow), increase in length of growing season, increase of invasive species, energy brown-outs from higher energy demands, more intense heat waves, public health impacts from high heat exposure and poor outdoor air quality
	Drought	Changes in Precipitation	
	Wildfires	Changes in Precipitation	
	Invasive Species	Changes in Precipitation, Extreme Weather	
 Extreme Weather	Hurricanes/Tropical Storms	Rising Temperatures, Changes in Precipitation	Increase in frequency and intensity of extreme weather events, resulting in greater damage to natural resources, property, and infrastructure, as well as increased potential for loss of life
	Severe Winter Storm	Rising Temperatures, Changes in Precipitation	
	Nor'easter	Rising Temperatures, Changes in Precipitation	
	Tornados	Rising Temperatures, Changes in Precipitation	
	Other Severe Weather (Including Strong Wind and Extreme Precipitation)	Rising Temperatures, Changes in Precipitation	

Figure 75: Climate Change Interactions

BUILDING IN RESILIENCE

ENSURE THAT THE REGION IS PREPARED TO DEAL WITH BOTH POSITIVE AND NEGATIVE CHANGES IN ITS ECONOMIC HEALTH AND TO INITIATE SUSTAINABLE URBAN DEVELOPMENT AND REDEVELOPMENT STRATEGIES THAT FOSTER GREEN BUSINESS GROWTH AND BUILD RELIANCE ON LOCAL AND REGIONAL ASSETS.

Resilience, the ability to recover from disturbance and change, applies not just to anticipating natural disasters and planning for post-disaster recovery but to other shocks such as severe economic downturns. Some have referred to resilience as the "new sustainability" however, it is important to distinguish between the two. Resilience allows a region to respond to and recover from specific disruptive events, while sustainability seeks to preserve for future generations the resources and opportunities that exist for current generations. These two concepts need to work hand in hand.

RESILIENT ECONOMY

The region's economy is made up of the businesses, trades, productive facilities, and related activities that provide the livelihoods of the population. Economic health is critical to providing jobs and incomes to support the community; as it rises or falls, so do the livelihoods of people. Because local economies depend upon outside (regional, national, and even global) inputs and trends, their employment base is affected not only by local business formation and activity but also by the decisions of distant firms or governments. Therefore, more reliance on local assets increases the economic resilience of the community, as well as contributing to place-based revitalization. Because some productive activities generate negative impacts, green businesses (such as solar-powered energy systems0 may be preferable to those with greater impacts and can reduce reliance on outside resources. Although some communities develop and implement separate economic development strategies, the comprehensive plan provides the instrument for placing those strategies within the context of the broader regional development agenda.

THE OLD COLONY PLANNING COUNCIL WILL ENCOURAGE THESE BEST PRACTICES IN SUPPORT OF THE RESILIENT ECONOMY PRINCIPLE:

- *Provide the physical capacity for regional economic growth.*
- *Plan for a balanced land-use mix for fiscal sustainability.*
- *Plan for transportation access to employment centers.*
- *Promote green businesses and jobs.*
- *Encourage community-based economic development and revitalization.*
- *Provide and maintain infrastructure capacity in line with regional growth or decline demands.*
- *Plan for post-disaster economic recovery.*

With this policy, we encourage resiliency by promoting sensitive land use and development patterns that contribute toward achieving Massachusetts greenhouse gas emission goals at a regional scale, and to develop local resiliency to the impacts of climate change. Through this policy, we have committed to using climate change as a lens through which to examine our work.

Designing resilient communities means creating places that are able to adapt to change and quickly recover from environmental, social or economic shifts. Resilience acknowledges that communities will face change – sometimes dramatic change – and prepares them to weather it.

Climate change is the greatest environmental challenge of this generation, with potentially profound effects on the economy, public health, water resources, infrastructure, coastal resources, energy demand, natural features, and recreation. The Old Colony Planning Council is committed to doing its part to mitigate and adapt to this challenge, recognizing the necessity of engaging in adaptation planning today by taking a close look at strategies that could help the region become more resilient and ready to adapt to climate change as it occurs.

The growing frequency and large-scale impact of severe weather events demonstrate the importance of planning for resilience. The risks and costs of not preparing for significant climatic events have been seen through experiences, such as the 2010 flooding in Plymouth County and the winter storms of 2018. March 2010 was the wettest month on record in Massachusetts with 18.8 inches of precipitation.

Massachusetts' climate is already changing and will continue to do so over the course of this century – ambient temperature has increased by approximately 1.8 degrees since 1970 and sea surface temperature by 2.3 degrees between 1970 and 2002. These warming trends have been associated with other observed changes, including a rise in sea level of 22 centimeters between 1921 and 2006, more frequent day with temperatures above 90 degrees, reduced snowpack,

and earlier snow melt and spring peak flows. By the end of the century, under the high emissions scenario of the Intergovernmental Panel on Climate Change (IPCC), Massachusetts is set to experience a 5 degree to 10 degree increase in ambient temperature, with several more days of extreme heat during the summer months. Days with temperatures greater than 90 degrees are predicted to increase from the 5 to 20 days annually that Massachusetts experiences today to between 30 to 60 days annually; while up to 28 days annually are predicted to reach above 100 degrees, compared to up to two days annually today. Sea surface temperatures are expected to increase by 8 degrees; while winter precipitation, mostly in the form of rain, is expected to increase by 12 to 30 percent. The number of snow events is predicted to decrease from five each month to one to three each month.

An increase in temperature can cause increased virulence of viruses, insects and pests; decimation of sensitive crops and plants; increased asthma and other human health effects; and can impact the built environment. Increased intensity of precipitation can cause increased flooding, put humans and their property at risk, ruin crops, and create public health concerns from sewage and hazardous waste leaks. Higher temperatures, especially the higher incidence of extreme heat days, will have a negative impact on air quality and human health. In general, impacts from climate change on human health can include respiratory illnesses, exacerbation of allergies and asthma, an increase in vector borne diseases, and degraded water quality.

Some solutions to address climate change adaptation can also be considered mitigation strategies because, in addition to contributing to increased resilience and preparedness to climate change, they concurrently achieve reductions in greenhouse gas emissions that contribute to the problem.

The need to perform risk and vulnerability assessments to determine levels of susceptibility and exposure to and impacts of climate change among people, physical structures and assets, natural resources and the environment, economic conditions, and other resources and interests.

Areas needing thorough risk and vulnerability assessments include existing critical infrastructure and facilities, vulnerable natural habitats and ecosystems, vulnerable groups or populations, community-or region-specific hazards and threats, water supplies, businesses, homes and other structures, and social and cultural resources.

Once the risks and vulnerabilities are properly assessed, their impacts must be minimized through effective planning and management. Future risks and costs can be reduced for new development, and redevelopment through the careful siting and inclusion of design, engineering, construction and maintenance standards that account for higher sea levels, increased temperatures, more intense coastal storms, and inland flooding. Sound land use decisions, guided by regulation and standards, incentives, and technical support, will help the region adapt to and withstand climate change impacts.

Another important set of cross-cutting strategies identified during the development of this report include measures that preserve, protect, and restore natural habitats and the hydrology of watersheds. These strategies not only benefit natural resources and habitat, but can also play a

critical role in protecting and increasing resilience of key infrastructure sectors, human health, and the local economy.

- Identify and fill critical information gaps. Effective adaption efforts require up-to-date and accurate information, models, and decision-support tools. Addressing the key knowledge and technological gaps to identify and predict vulnerability of both the built environment and natural resource areas is a high priority. Assessing future risk and developing strategies for adaption poses significant challenges.
- Identify and fill critical information gaps. Through climate models that reflect Massachusetts-specific conditions, and by expanding mapping, monitoring, and assessments of specific parameters and ecosystem processes, more robust and specific information can be advanced to support the development of strategies targeted to changing conditions.
- Evaluate and prioritize adaptation strategies for implementation. Challenging decisions lie ahead regarding the options and alternatives for reducing risk to public infrastructure, private property, and human safety and welfare as a result of climate change. There is a strong need to prioritize specific adaption responses determined to be the most effective and efficient. Evaluation and prioritization of adaptation alternatives should consider many factors including the probability and magnitude of potential impacts, the vulnerability of the groups affected, the range and feasibility of alternatives available, stakeholder input, and the opportunity to build upon current programs and successes.
- Support local communities: As a home-rule state, many of the land-use decisions in Massachusetts are made by cities and towns. To be successful, adaptation strategies must be connected with and directly support vulnerable communities. Addressing some of these challenges at the local level will require assistance, both technical and financial, from state and federal governments, regional planning agencies, trade organizations and non-profit partners. Communities can learn from one another, as some already have experiences with climate change adaptation strategies to share.

COASTAL RESILIENCE

OVERARCHING GOAL: BUILD HAZARD RESILIENCE TO IMPACTS OF COASTAL EROSION, FLOODING, STORMS, AND CLIMATE CHANGE THROUGH REGION-WIDE DISSEMINATION OF DATA, TOOLS AND CASE STUDIES, AS WELL AS FOSTERING COLLABORATIVE ACTIONS.

Resilience, adaptive capacity, and risk tolerance should be key factors in the evaluation of different sea level rise scenarios for planning and decision making. Resilience in this context refers to the ability to endure impacts associated with sea level rise and to respond, recover, and adapt to consequences. An area, site, facility, or project that is highly resilient will be able to accommodate or tolerate more frequent flooding and adverse consequences associated with increasing sea level rise, and one with low resilience and adaptive capacity will be more severely impacted, take longer to recover (or may not recover at all), and require greater resources for recovery. Risk refers to the potential for, or exposure to, loss or undesirable impacts

(or outcomes) and can be characterized as the combination of probability and consequence. In other words, the lower the likelihood and effects, the lower the risk. Some projects or facilities, such as parks, playing fields, or above-ground parking garages, may have greater inherent resilience attributes and may be at lower risk.

Coastal resilience means building the ability of a community to "bounce back" after hazardous events such as hurricanes, coastal storms, and flooding, rather than simply reacting to impacts (National Ocean Service, NOAA). The decisions communities are making today for how and where they develop dictate their ability to bounce back after storm events. Understanding where and how our communities are vulnerable to loss from coastal hazards, and adapt planning and development practices to compensate for these vulnerabilities will ultimately result in lives and dollars saved, and stronger communities for the future.

Massachusetts coastal communities face significant risks from coastal storms, flooding, erosion, and sea level rise, challenges that are exacerbated by climate change. Coastal salt marsh wetlands are particularly vulnerable to even the smallest amount of sea level rise. Coastal wetlands are critical habitat for commercial and recreational fish and invertebrate species. Loss of these wetlands through sea level rise could pose a real threat to coastal economies and water quality if they are lost. Planning for sea level rise today can preserve land and allow coastal wetlands to migrate inland and maintain their essential functions for the communities.

Coastal hazards information and tools can assist state and local officials to better plan for impacts of storms and sea level rise and implement strategies to prevent recurring future damages. Data such as detailed terrestrial contours, shallow water bathymetry, and mean high water positions are needed throughout the region to support efforts to identify potential inundation zones from storm surge, erosion and sea level rise. A companion to data is the need to develop user-friendly tools to access and analyze data and support management decisions and recommendations.

THE OLD COLONY PLANNING COUNCIL WILL:

Promote regional dialogue on broad-scale adaptation strategies for responding to the effects of sea-level rise.

- ✓ The Council will continue to monitor membership, facilitate data acquisition and assess emerging needs related to coastal hazards and climate adaptation.
- ✓ Assess opportunities to partner with other organizations on funding proposals for climate adaptation and hazard resilience related projects.
- ✓ Support regional efforts to advance green infrastructure and living shoreline management approaches.

SOCIAL EQUITY AND ENVIRONMENTAL JUSTICE

GOAL: IN 2040, THE REGION WILL HAVE SIGNIFICANTLY REDUCED ECONOMIC, HOUSING, SAFETY, AND HEALTH DISPARITIES AMONG PEOPLE OF COLOR AND MINORITIES COMPARED WITH NON-MINORITES.

Our region is stronger when all people live in communities that provide them access to opportunities for success, prosperity, and quality of life.

Equity connects all residents to opportunity and creates viable housing, transportation, and recreation options for people of all races, ethnicities, incomes, and abilities so that all communities share the opportunities and challenges of growth and change. For our region to reach its full economic potential, all of our residents must be able to access opportunity.

The concept of Social Equity (or environmental justice) requires that minority and low-income communities get special attention from public agencies during public decision-making processes. Environmental Justice is defined as the fair treatment of all people regardless of race, color, national origin, or income, in the development, implementation, and enforcement of environmental laws, regulations, and policies. Its goal is to provide all communities and person across the region with the same degree of protection from environmental and health hazards and equal access to decision making processes. This results in healthy environments for all in which to live, learn and work.

Fair Treatment means that no group of people should bear a disproportionate burden of environmental risks, including those resulting from the negative environmental consequences of industrial, governmental, and commercial operations or programs and policies. This is achieved by taking steps to ensure the effects of all programs, policies, and activities on minority populations and low-income population are identified and addressed in the transportation planning process.

THERE ARE THREE FUNDAMENTAL ENVIRONMENTAL JUSTICE PRINCIPLES THAT ARE EMPLOYED IN THE PROCESS:

1. *To avoid, minimize, or mitigate disproportionately high and adverse human health and environmental effects, including social and economic effects, on minority populations and low-income populations.*
2. *To ensure the full and fair participation by all potentially affected communities in the transportation decision-making process.*
3. *To prevent the denial of, reduction in, or significant delay in the receipt of benefits by minority and low-income populations.*

These populations include minority groups: African-Americans, American Indian, Asian and Hispanic, as well as low-income communities. They are often expanded to include other groups sometimes underrepresented in the planning process, like the elderly, children and people with disabilities.

Minority populations are among the fastest growing in the region, and low-income communities are increasingly dispersed throughout the region.

SOCIAL EQUITY PLANNING ENSURES THAT:

- *These communities are included in discussions about planning needs and outcomes.*
- *Planning research and technical evaluation activities include potential impacts to these groups.*

Social equity planning also ensures that low-income and minority populations are not disproportionately or adversely affected by human health and environmental impacts as compared to the general population. Transportation-related impacts could include air pollution, noise, safety issues, reduced property values and displacement of homes and businesses. Social equity in planning ensures that better decisions are made for the benefit of the entire community. Considerable attention is given to the fair and equitable distribution of benefits and burdens combined with the equal opportunity for participation in the development of regional plans, policies and projects.

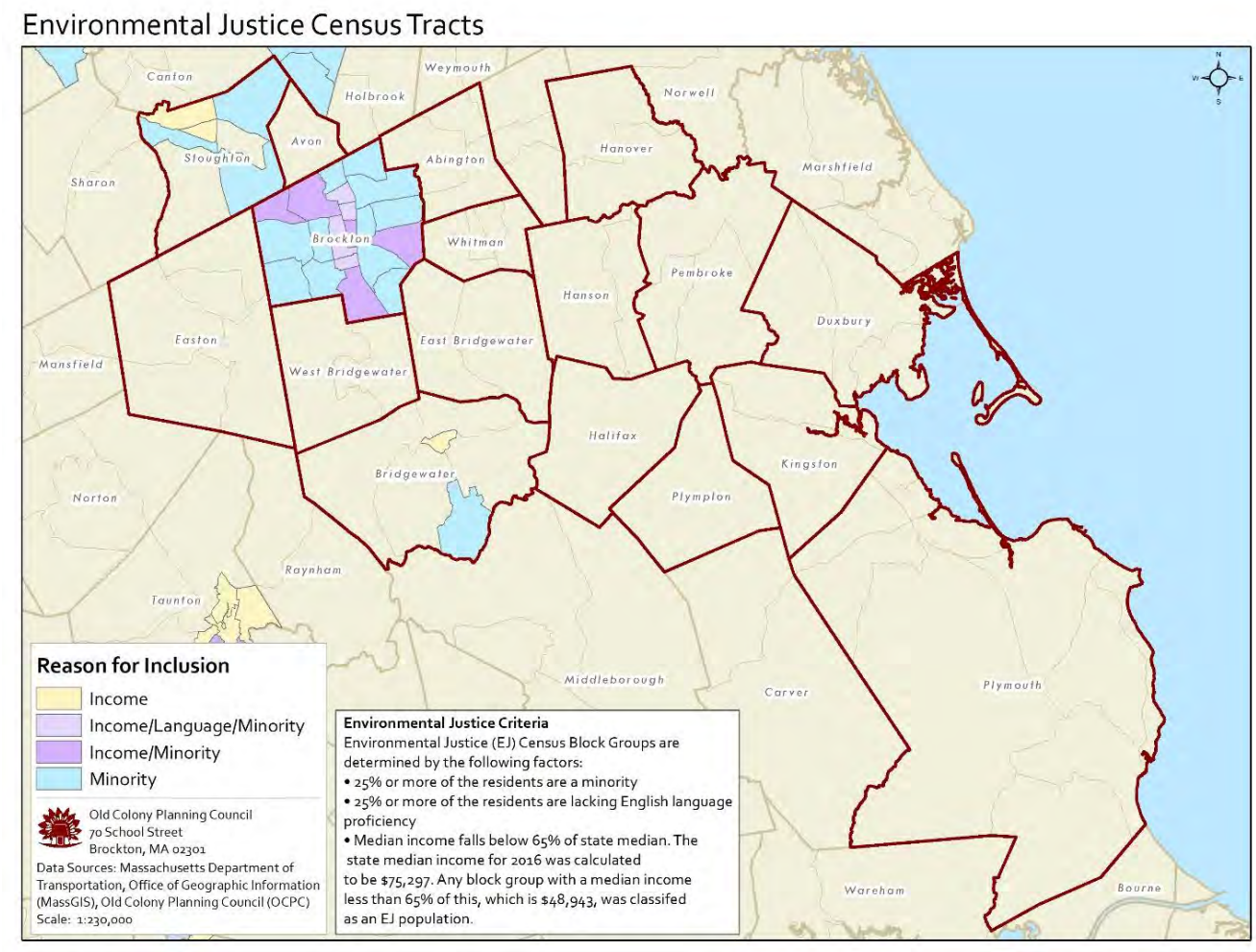


Figure 76: Environmental Justice Census Tracts

SOCIAL EQUITY METHODOLOGIES ENSURE THAT THERE ARE EQUITABLE IMPACTS AND OUTREACH TO ALL SEGMENTS OF THE COMMUNITY THROUGH THE FOLLOWING TOOLS AND PROGRAMS, AMONG OTHERS:

- *Provides guidelines for public participation, including minority and low-income communities, in the planning process.*
- *Provides advice and guidance to, and forges new relationships with members of the potential affected communities.*
- *Assist in partnering with members of Hispanic and Asian American communities.*
- *Allow members of the affected community to voice concerns and express their perspectives, particularly regarding impacts and benefits of transportation projects.*
- *Allow environmental justice communities to provide specific feedback on transit, roadway projects, and other components of transportation plans.*

PROMOTING EQUITY MEANS:

- *Using our influence and investments to build a more equitable region.*
- *Creating real choices in where we live, how we travel and where we recreate for all residents, across race, ethnicity, economic means, and ability.*
- *Investing in a mix of housing affordability along the region's transit corridors.*
- *Engaging a full cross-section of the community in decision making.*

THE COUNCIL WILL:

- *Work to mitigate Areas of Concentrated Poverty and Racially Concentrated Areas of Poverty by better connecting their residents to opportunity and catalyzing neighborhood revitalization.*
- *Work with communities to create more income-diverse neighborhoods to develop market-rate housing in areas that lack market-rate options.*
- *Work with our partners and stakeholders to identify indicators used to measure how projects, supported with Council's resources, advance equity.*

Race										
		One Race								
Town	2010 Census Total Population	Total	White	African American	American Indian or Alaska Native	Asian	Native Hawaiian Pacific	Other	2 or more races	Hispanic or Latino
Abington	15,985	15,766	14,788	342	47	284	2	303	219	310
Avon	4,356	4,284	3,660	434	5	120	-	65	72	121
Bridgewater	26,563	26,139	24,163	1,292	62	328	-	294	424	838
Brockton	93,810	87,327	43,821	29,275	332	2,151	52	11,695	6,483	9,357
Duxbury	15,059	14,935	14,649	62	16	149	2	58	123	184
East Bridgewater	13,794	13,593	13,139	216	28	117	-	93	201	204
Easton	23,112	22,733	21,144	745	20	563	5	256	379	575
Halifax	7,518	7,409	7,291	45	6	42	-	25	109	81
Hanover	13,879	13,750	13,392	110	15	161	5	67	129	128
Hanson	10,209	10,069	9,850	104	3	48	1	63	140	95
Kingston	12,629	12,467	12,137	133	14	116	1	66	162	140
Pembroke	17,837	17,664	17,274	109	29	170	3	79	173	193
Plymouth	56,468	55,482	52,955	1,147	193	516	22	649	986	1,030
Plympton	2,820	2,793	2,731	24	8	22	-	8	27	36
Stoughton	26,962	26,267	21,634	2,984	46	291	2	630	695	876
West Bridgewater	6,916	6,817	6,564	104	7	75	-	67	99	121
Whitman	14,489	14,249	13,768	180	35	111	5	150	240	267
OCPC Total	**362,406**	**351,744**	**292,960**	**37,306**	**866**	**5,264**	**100**	**14,568**	**10,661**	**14,556**
Massachusetts	6,547,629	6,375,626	5,265,236	434,398	18,850	349,768	2,223	305,151	172,003	627,654
OCPC % of State	**5.53%**	**5.52%**	**5.56%**	**8.59%**	**4.59%**	**1.50%**	**4.50%**	**4.77%**	**6.20%**	**2.32%**

Figure 77: Population by Race in OCPC Region, 2010 Census

Race										
		One Race								
Town	**Total Population**	**Total One Race**	**White**	**African American**	**American Indian or Alaska Native**	**Asian**	**Native Hawaiian Pacific**	**Other**	**2 or more races**	**Hispanic or Latino**
Abington	16,196	16,016	15,034	472	0	430	0	80	180	409
Avon	4,476	4,363	3,403	519	17	315	0	109	113	199
Bridgewater	27,381	26,647	23,587	2,089	42	522	15	392	734	1,124
Brockton	94,813	91,342	42,238	39,008	336	1725	48	7,987	3,471	9,610
Duxbury	15,444	15,352	15,029	134	0	163	0	26	92	101
East Bridgewater	14,222	14,034	13,624	77	34	231	0	68	188	270
Easton	23,770	23,407	21,629	1,115	0	373	0	290	363	684
Halifax	7,753	7,714	7,525	116	0	19	0	54	39	232
Hanover	14,332	14,171	13,715	91	0	236	14	115	161	118
Hanson	10,477	10,234	9,874	205	19	122	0	14	243	173
Kingston	13,106	12,917	12,693	108	0	88	0	28	189	334
Pembroke	18,166	17,616	17,087	110	6	257	0	156	550	523
Plymouth	58,216	57,021	54,122	1,077	152	694	0	976	1,195	1,476
Plympton	2,913	2,871	2,833	0	0	22	0	16	42	81
Stoughton	28,260	27,590	21,740	3,981	137	928	0	804	663	1,162
West Bridgewater	7,044	6,838	6,446	291	11	6	0	84	206	421
Whitman	14,767	14,422	14,026	85	0	120	0	191	345	252
OCPC Total	371,336	362,555	294,605	49,478	754	6,251	77	11,390	8,774	17,169
Massachusetts	6,742,143	6,539,129	5,343,665	489,233	13,931	411,736	2,002	278,562	203,014	731,739
OCPC % of State	5.51%	5.54%	5.51%	10.11%	5.41%	1.52%	3.85%	4.09%	4.32%	2.35%

Figure 78: Population by Race in OCPC Region, 2012-2016 American Community Survey

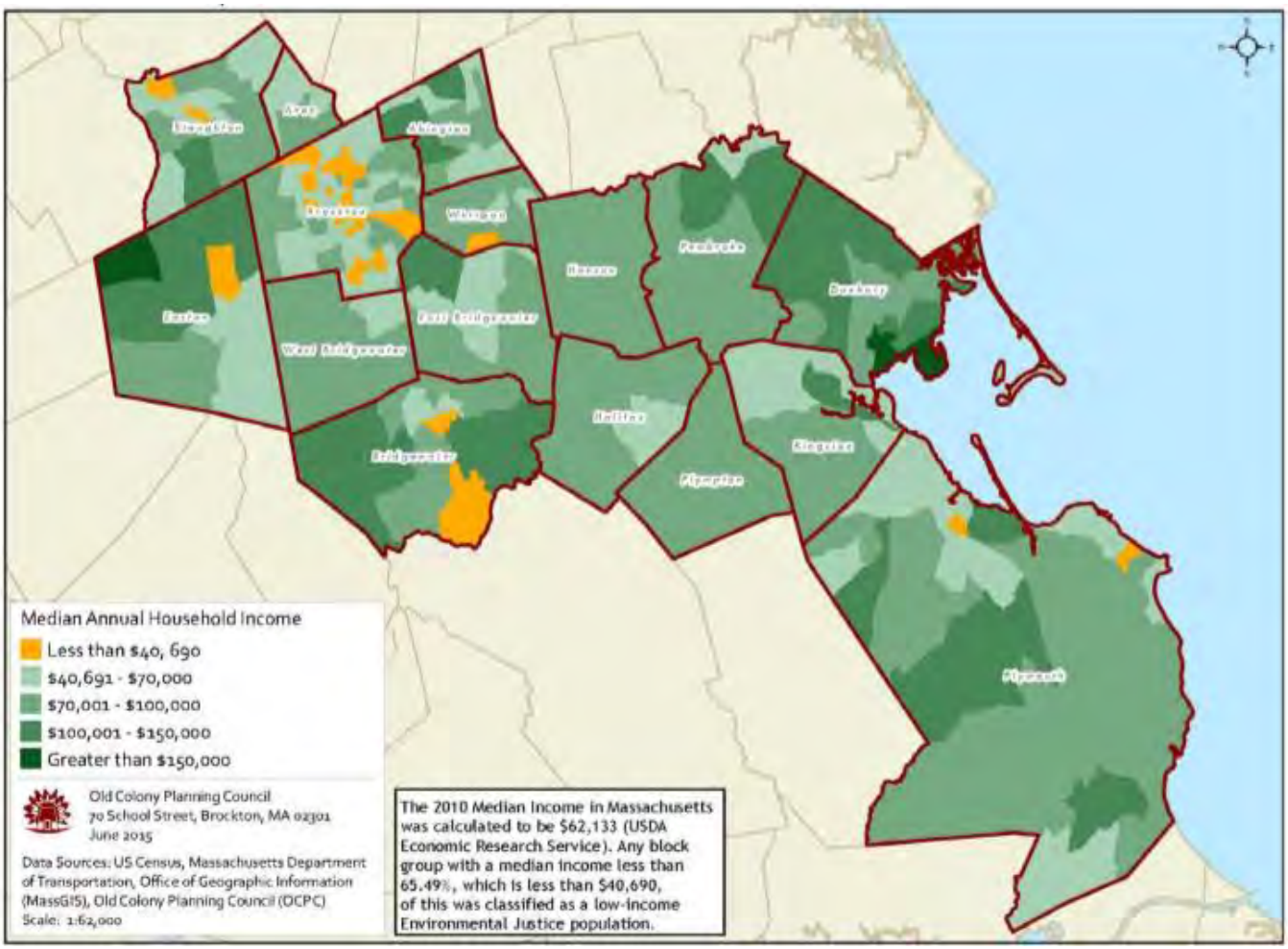


Figure 79: Low Income Populations by Block Group, 2010 Census

WORKFORCE DEVELOPMENT

OVERARCHING GOAL: ENCOURAGE THE CREATION OF WORKFORCE-HOUSING UNITS THAT ARE AFFORDABLE TO MIDDLE INCOME HOUSEHOLDS MAKING BETWEEN 80% AND 120% OF AMI.

The region's future economic growth is dependent in large part on having a qualified workforce that meets the needs of existing and new employers and to enable an environment for new business formation and growth. Access to quality education remains an important constraint to producing a qualified labor force. The relocation of jobs to outlying suburban locations makes it more difficult for urban core residents to obtain employment that creates a pathway to self-sufficiency. Strategies include encouraging the location of employers along transit corridors and around key activity centers; focusing the region's economic development efforts on attracting businesses in industries where the region has the greatest location quotients and the areas where those industries have the potential to offer higher paying jobs for area residents, and designing training programs and services to help residents and students become better prepared to meet the demands of employers.

Workforce Development requires the coordinated efforts of many different organizations to implement policies that build the skills of its local workforce. This economic development strategy that focuses on people rather than businesses; it attempts to enhance a region's economic stability and prosperity by developing jobs that match existing skills within the local workforce or training workers to meet the labor needs of local industries. Promoting workforce diversity and development is a vital piece of economic development efforts, making areas attractive to employers and enabling residents to fine employment in their communities.

Workforce development includes partnerships between business, education, and government so that all residents can be contributing members of the local economy. Current and future development trends indicate that workforce development will receive increasing focus. Programs must be aimed at the 60-70% of high school graduates who do not earn a college degree. A close working relationship between employers and the local school district is essential.

Workforce households, both local municipal employees and employees of local businesses, earn slightly over the 80 percent income limits, and cannot afford market rate housing. Enabling people who work in the community in which they live creates a sustainable community and helps to reverse the trend of exporting professionals during the day, and importing service workers.

Workforce diversity is characterized by the employment of a wide variety of people in terms of age, cultural background, physical ability, race and ethnicity, religion, and gender identity.

Workforce development is a customer-driven process. Providing childcare services and transportation support can be as important as skill development training. Results in workforce development are not as easily quantified as with other types of economic development. Economic and technological changes have created a need for skills that are often not taught in traditional academic programs.

Workforce development is a statewide system of education and training that prepares people for high-skill jobs and assures employers of a skilled flexible workforce in the future. This comprehensive program is designed to improve the productivity level of the workers and allow companies to grow in the future. While the program may be articulated under a single organization (often the economic development office), it is actually implemented by a number of organizations throughout the community. A workforce development effort can only succeed when it has the resources – qualified workers – to fill the jobs that new employers will have. It does little good to create jobs for which there are no people who can do them.

WORKFORCE DEVELOPMENT INCLUDES:

- Education Reform – adjusting the local education system to produce graduates who have skills necessary for the next century.
- Skill development for displaced workers – making sure that people who have lost their jobs never have it happen again due to their job skills.
- On-the-job training – to help workers to gain new skills and handle the increasing use of technology in the workplace.
- Welfare-to-work programs – to help people become economically self-sufficient by removing barriers, building skills, and meeting the individual's basic needs.

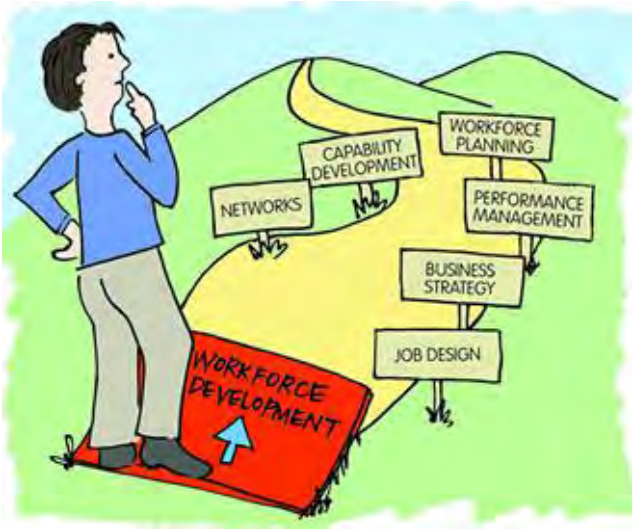


Figure 80: Workforce Development

Because of the large number of individuals and organizations, the need for system wide coordination and accountability in workforce development programs is substantial. While few agencies absolutely have to work together, the primary role of the economic development organization is to act as an intermediary and create a community-wide vision, so that everyone is recognized for their contributions and is provided an environment where they benefit from participation.

WHY IS WORKFORCE DEVELOPMENT IMPORTANT?

- Increases productivity*:* The rate of worker productivity (the amount of work produced per unit of time) has been steadily declining in the United States. Workforce development intends to reverse that trend.
- Enhances ability to compete*:* A skilled workforce helps companies expand and remain competitive.
- Fewer entry-level positions*:* An expected decline in the number of young workers may lead to labor skill shortages in all professions.
- Low-skill jobs are disappearing*:* They will be replaced by jobs requiring a higher level of technical skill, especially with computers.
- The workforce is aging*:* Without effective training, older workers could become entrenched in old ways, unwilling or unable to learn the new.
- Opportunities for women and minorities*:* People historically denied higher-paying jobs will require more education and training. Women now make up nearly 50 percent of the workforce, and 65 percent of the entrants into the labor market will be women and minorities.
- Aids in retention of workers*:* A trained workforce will lead to steady jobs, which will encourage their families to stay in the community.
- Increases Standard of Living*:* Better job skills will lead to increased wages and upward mobility.
- Reduces Illiteracy*:* Skill-building will enhance the self-esteem of the workforce, which will increase productivity.
- Reduces Gap between the Haves and the Have-Nots*:* Skill shortages contribute to economic disparities between people in many communities. Workforce development helps balance the scale.

WORKFORCE DEVELOPMENT GOALS

1. *SUPPORTING BUSINESSES*
    A. Retain existing businesses. Existing businesses are the foundation of any economic growth strategy. By building on what already exists, municipalities can support current businesses and create a strong foundation on which to attract new businesses, residents, and employment.
    B. Attract new businesses. Attracting new businesses, particularly in high-priority industries, could help increase local employment options and built the tax base. This is most effective when the effort is tailored to the industries that are best suited to a community's assets and opportunities and can provide high-quality employment options for local residents.
    C. Promote entrepreneurship. Encouraging entrepreneurs to start businesses gives people power over their own lives and lets them build wealth in their own communities. Business owners who also live in the community tend to spend more on local business services and keep more of their earnings in the local economy. They also have a vested interest in the community and are less likely to move elsewhere in response to incentives offered by other regions.
    D. Encourage business growth in infill locations. In addition to encouraging expansion of existing businesses and attracting new businesses, the community can consider where businesses locate within the community. Encouraging business growth in specific locations, can help improve the overall quality of life for existing and future residents, workers, and visitors.
    E. Promote and advocate economic development and livability through transit investments. Transit services can help support increased regional economic vitality by providing mobility for an expanded workforce while also working in conjunction with local area land use regulations.
2. *SUPPORTING WORKERS*
    A. Improve access to local employment opportunities – entails bringing more jobs closer to residents or increasing access through transportation investments in bike, pedestrian, and public transportation facilities. This goal might include improving the local jobs-housing balance, but it should also aim to increase access to regional employment centers. Encouraging businesses to locate near public transportation service, to expand commute options for local workers.
    B. Increase access to advanced education, workforce development and job training opportunities. Providing workers with an opportunity to educate themselves and train for more skilled jobs helps them compete for hobs in the community now and in the future. A workforce with the right mix of skills and education is an important asset for attracting new industries. Offering local residents the opportunity to gain skills for a wider range of jobs can also reduce the need for residents to commute long distances to find appropriate employment, thereby improving quality of life for workers and reducing traffic congestion and air pollution.
    C. Improve the quality of K-12 education. The foundation of a good education begins at a young age; therefore, having a high-quality public school district is an important component to building a skilled workforce. Specific goals could also be

set to ensure that students receive appropriate training, such as establishing science, technology, engineering, and math (STEM) programs, which help young people compete for jobs and advanced education in fields that use these skills.

D. Ensure a service balance between job seekers and employers by developing and fostering employer and business services relationships. Re-introduce on-the-job training as a primary business service and training and placement strategy supporting business and job seeker success.

E. Be data driven. Use labor market information, performance and expenditure information and other data sources to inform investment decisions.

IT IS THE POLICY OF THE OLD COLONY PLANNING COUNCIL TO:

- ✓ Elevate public education to the top of local, regional, and state policy and public awareness.
- ✓ Support education leaders in integrating best practices and innovative programs to positively impact PreK-12 classrooms.
- ✓ Support the creation of, and maturing of, a regional workforce development system.
- ✓ Promote the development of skills and education needed for key jobs within the region.
- ✓ Improve coordination between education, workforce organizations, employers and government.
- ✓ Develop and support comprehensive youth workforce development programs.
- ✓ Ensure equitable access for people of all ages, abilities, and income levels to educational opportunities, career training, and skills development to match employer demands.
- ✓ Attract, develop, and retain a high-quality, diverse, professional staff with the ability to create innovative, implementation plans and the expertise to facilitate authentic community engagement.

COMMUNITIES FOR ALL AGES

COMMUNITIES FOR ALL AGES: The Donahue Institute at the University of Massachusetts projects that roughly 30 percent of the population will be 60 or older by 2025. By 2035, the 65-and-over population will represent 23 percent of the state's population. Therefore, it is important for communities to start planning for this substantial increase now. *Develop strategies to help communities address issues related to creating multi-generational communities*.

Planning for a community for all ages recognizes that elders already serve as resources to children and families, and finds ways to enhance that capability. Successful planning boosts the capacity of elders to serve as assets to children and families by, among other activities, contributing to a family's financial stability and providing child care and permanent care, volunteer services, and civic leadership. This approach also recognizes that young people help support elders in their families and communities.

Mobilizing different age groups as resources for each other and for their communities creates access to human and social capital in wisdom, advocacy, skills, and historical and cultural knowledge. This strategy can also serve as an effective vehicle for seeking to bridge race, class, income and other differences.

When resources are allocated to benefit an entire neighborhood, and not just one segment, competition is eased as resources are re-designed to benefit all ages. The various generations become resources for each other, rather than competitors. Programs and policies designed within this approach embrace age-group defined priorities, while moving forward the entire community.

Source: Sandra Harris, Design For Aging Committee, BHA

Figure 81: Communities For All Ages

Using age as a lens, it is possible to build upon existing theories to create a community building approach that is life-span focused.

Based on our knowledge of social networks, social capital, and community capacity, the following strategies need to be part of this Regional Policy Plan approach:

- Expanding social networks and social support, particularly for vulnerable youth, older adults, and families;
- Increasing social capital by promoting ties across ages and expanding opportunities for lifelong civic/social engagement;
- Integrating a life-course perspective into existing institutions and services;
- Creating policies and promoting norms that foster reciprocity, interdependence, and age-integration.

- Support aging in the community through increased multi-generational housing options, progressive senior facilities, exploration of allowing for alternative housing arrangements (i.e. Small Efficiency Dwelling Units (SEDUs) and Accessory Dwelling Units (ADUs).

The *communities for all ages* approach focuses on an environment as a whole, which affects the quality of life for all of the children, youth, families, and elders who live there. *Some of the benefits include*:

Increased child and family well-being. The presence of well-supported elders in the lives of children and families as volunteers, service providers, and family members means a spreading of the burdens and costs of raising a family. This presence often leads to shared caregiving responsibilities, better access to services, a leveraging of family income, an enhanced ability for the family to earn and save, and assistance for children with schoolwork and with the removal of barriers that may prevent successful learning. Engagement in productive activities and social ties are also positively correlated with successful aging. Sharing knowledge and experience with younger generations has been shown to improve well-being in later years.

Stretching and leveraging of limited resources: The approach is not an "add-on" to traditional methods of community change, but transforms the way that choices are made. Instead of viewing children and elders as separate groups, with entirely separate strengths and needs, this approach views them as related, with shared needs and with strengths that can be employed to help to meet those needs. Children and elders are recognized as members of the same families and social support networks, not unrelated groups competing in isolation for limited resources, but interconnected elements of a unified social fabric. Resources that affect one age group reach others as well.

Policy transformation: When this age-integrated view is applied, resources are freed from traditional constrains limiting them to one group or another. New alliances, perspectives, and resources become available to boost success for children, youth, families, and elders.

- Create an application system for adoption by municipalities for residents and developers to apply for building SEDUs and ADUs.
- Encourage partnerships with private developers to build SEDUs in appropriate locations.
- Measure effects and effectiveness of pilot programs over a determined period of time to be used in recommending whether the policies should be continued, altered, or terminated.
- Support creations of partnerships between public and non-profit housing organizations to assist in housing development and placement of low-income families into new homes.
- Support multi-generational community housing opportunities that give priority to local residents, veterans, town employees, and families of students enrolled in public schools.

Accessory apartments have been a fundamental part of New England's historic approach to affordable housing – whether as a way to accommodate children, aging parents and hired help, or for supplemental income. Accessory apartments can be incorporated into traditional carriage houses or in small flats on top of two-car garages. They can also be built in walk-out basements, attics, or as free-standing buildings (sometimes called "granny flats" in back yards.)

Accessory apartments help meet a number of public policy objectives including:

- Provide homeowners with additional income, which is particularly important for elderly homeowners, single parents, and others who are spending too much of their income on housing and for whom such income may be critical to remain in their homes. Without the flow of income from the rent of an accessory apartment, some young families or moderate-income households might not be able to afford homeownership.
- Provide appropriately sized units for growing numbers of smaller households.
- Generate increased tax revenue in a locality because accessory units add value to existing homes.
- Offer a way of preserving historic properties given the rental stream available to help maintain the property.

Recognition of natural alliances*:* A life-span approach to community change, one that brings children, family members, and elders to the table together, allows common perspectives to be recognized and ways to emerge for the generations to support each other and to serve as allies in ensuring that appropriate services, supports and programs are in place for all.

Increased civic participation*:* A greater sense of community across age strata and the recognition of shared interests build networks and leads to the growth of support for all ages.

- The Old Colony Planning Council will support adoption of zoning ordinances that promote Supportive Senior Housing *development for persons aged 60 or over.*
- Assess areas served by existing infrastructure for opportunities to amend zoning to facilitate affordable active-senior and/or supportive senior housing development.

Identify zoning districts or geographic areas in which the municipality proposes to modify current regulations for the purpose of creating Supportive Senior Housing developments for populations aged 60 or over to meet its production goal.

- Provide alternative housing for a maturing population (all dwellings are limited to those 55 years of age or older);
- Provide a type of housing which reduces residents' burdens of property maintenance as well as demands on municipal services;
- Encourage the development of affordable housing for active adults with low and moderate income, as defined in 760 CMR 45.02 (at least 10% of the units must be affordable and eligible for inclusion on the SHI, however some or all of the affordable units may not be age-restricted); and
- Promote flexibility in site planning while protecting natural features, scenic views into property, existing vegetation and land forms and the utilization of land in harmony with neighboring properties.

Supportive Housing provides very low-income elderly with options that allow them to live independently but in an environment that provides support activities such as cleaning, cooking, transportation, etc. Project rental assistance funds are provided to cover the difference between the HUD-approved operating cost for the project and the tenants' contribution toward rent. Project rental assistance contracts are approved initially for 3 years and are renewable based on the availability of funds.

MARIJUANA AS AN EMERGING INDUSTRY

The recreational marijuana industry is the definition of an emerging market. Massachusetts is the most recent state to begin establishing a legal market for adult use of marijuana. The Bay State will be the first on the East Coast to tap into the legal marijuana market and industry experts predict big payoffs. By 2020, marijuana sales in the state are predicted to top $1.1 billion and a $21 billion dollar market nationwide according to research data provided by New Frontier. Unlike other places where cannabis is legal, Boston is within driving distance to many of the most populous places in America. This will make Boston the cannabis capital of the world in short order.

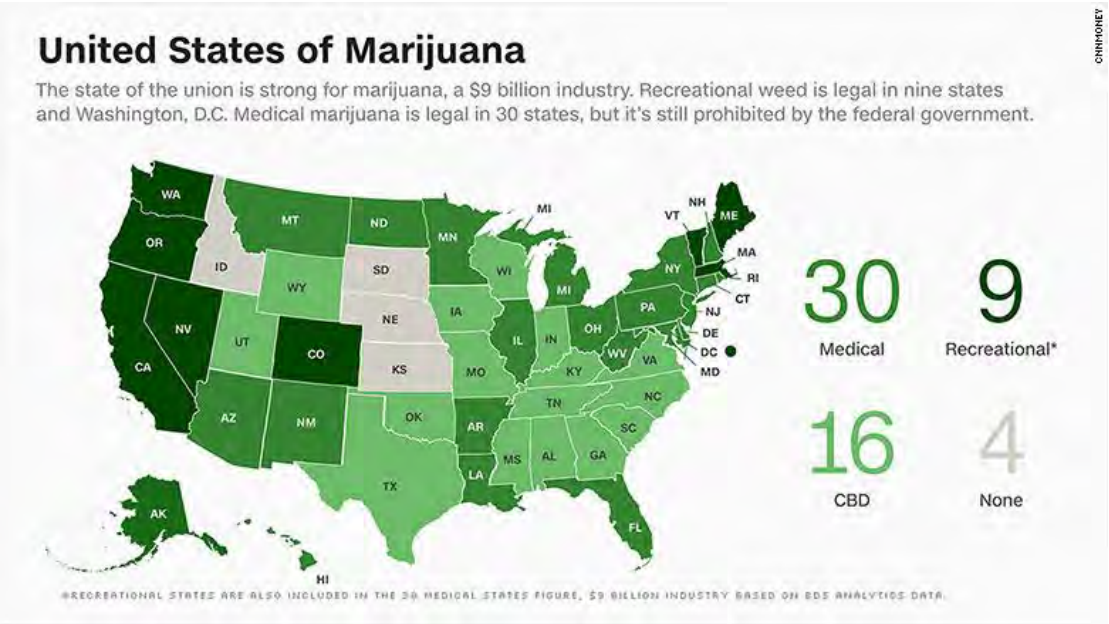


Figure 82: Recreational Marijuana

The "Yes on 4" campaign launched in 2014 with the goal of passing a referendum that would legalize recreational marijuana for adults over 21, allowing possession, growing and selling of the plant and infused products.

Over the two years it took, the campaign raised more than $6.4 million. In Massachusetts, where the requirements on licenses and regulations on retail businesses have recently been drafted, many small businesses are finding that high costs are the biggest deterrents of getting into the business. The national average cost for starting a marijuana dispensary is about $325,000 when you add up application and license fees and the costs to open. It is indicative of a process hampered by intense regulation with compliance itself considered a full time job.

The 2016 ballot petition known as "Question 4" became Chapter 334 of the Acts of 2016. It created General Laws Chapter 94G which governs the adult use of marijuana and creates the *Cannabis Control Commission.* Chapter 334 and G.L. c.94G were amended by Chapter 55 of the Acts of 2017. The 2017 Act requires the Commission to promulgate regulations necessary for the issuance of licenses by March 15, 2018. The act requires five types of licenses to be

available: retail, manufacturer, cultivator, craft marijuana cultivator cooperative, and independent testing laboratory.

Adults over the age of 21 years old may possess up to one ounce of marijuana on their person. Those same adults may possess up to 10 ounces of marijuana and any marijuana produced by plants cultivated on the premises. An individual 21 years of age or older may grow and process 6 plans in their home. If more than one individual 21 years of age or older lives in the residence and wishes to grow or process marijuana, the maximum number of plants that may be grown or processed at the residence is 12 plants total.

- The plants must be grown and processed in an area that is equipped with a lock or security device.
- The plants cannot be visible from a public place without the use of binoculars, aircraft, or optical aids; and
- An individual cannot manufacture at home marijuana or hemp by means of any liquid or gas, other than alcohol, that has a flashpoint below 100 degrees Fahrenheit.

Any amount of marijuana or marijuana products over one ounce must be kept secured by a lock. Failure to keep marijuana products in excess of one ounce locked up within the home may be punished by a civil penalty of up to $100 and forfeiture of the marijuana. The Act prohibits punishment for the act of giving away or otherwise transferring without payment or other compensation up to one ounce of marijuana to a person 21 years of age or older, as long as the transfer is not advertised or promoted to the public.

The Commonwealth of Massachusetts *CANNABIS CONTROL COMMISSION* anticipates substantial growth in the availability of jobs in the legal marijuana industry in all areas, from cultivation to retail of marijuana, and in related enterprises. The Commission is expressly authorized to set out regulations for licenses for working in marijuana establishments. The Commission is also expressly required to adopt policies and procedures to promote and encourage participation in the marijuana industry by people from communities that have been disproportionately harmed by marijuana prohibition and enforcement and to positively impact those communities. The Commission is also expressly required to develop procedures and policies, to promote and encourage full participation in the regulated marijuana industry by farmers and businesses of all sizes. The Commission is also required to conduct a study on participation in the regulated marijuana industry, including participation by minority business enterprises, women business enterprises, and veteran business enterprises.

Cannabis Control Commission
COMMONWEALTH OF MASSACHUSETTS

Figure 83: Cannabis Control Commission

Medical use marijuana procured from a medical use marijuana licensee or establishment will remain exempt from taxes. An excise tax is imposed on the sale of marijuana or marijuana products for adult use by a marijuana retailer to anyone except another marijuana establishment. The excise tax is 10.75% of the total sales price of the marijuana or product sold. A state sales tax of 6.25% is also imposed. A city or town that accepts the 2017 Act may impose

a local sales tax upon sale or transfer of marijuana or marijuana products by a marijuana retailer operating within the municipality to anyone other than a marijuana establishment at a rate no greater than 3% of the total sales price. The revenues collected from the marijuana industry are collected in a fund called the Marijuana Regulation Fund. Money in the fund shall be subject to appropriation by the Massachusetts Legislature. The 2017 Law sets out the following prioritization requirements for spending the funds:

Money in the fund shall be expended by the Commission for the implementation, administration, and enforcement of the 2017 Act, and by the Department of Agricultural Resources for the implementation, administration, and enforcement of the industrial hemp program and the provision of pesticide control.

After the expenses above are met, money in the fund shall be spent on:

- Public and behavioral health including but not limited to, evidence-based and evidence-informed substance use prevention and treatment and substance use early intervention services in a recurring grant for school districts or community coalitions who operate on the strategic prevention framework or similar structure for youth substance use education and prevention;
- Public safety;
- Municipal police training;
- The Prevention and Wellness Trust Fund established in section 2G of chapter 111; and,
- Programming for restorative justice, jail diversion, workforce development, industry specific technical assistance, and mentoring services for economically-disadvantaged people in communities disproportionately impacted by high rates of arrest and incarceration for marijuana offenses pursuant to chapter 94C of the Massachusetts General Laws.

EXPANDED GAMING IN THE COMMONWEALTH

On November 22, 2011, Governor Deval Patrick signed Chapter 194 (largely codified at Mass. Gen. Laws, Ch. 23K) "An Act Establishing Expanded Gaming in the Commonwealth," (the Massachusetts Gaming Act), which sets procedures and standards for authorizing legalized gaming in the Commonwealth of Massachusetts. This legislation designed to provide significant benefits to the Commonwealth by advancing job creation and economic development. The arrival of expanded gaming is expected to create thousands of jobs for Massachusetts residents in the areas of construction, hospitality, and tourism while also generating $300-$500 million in revenue for the Commonwealth.

The Gaming Act allows for up to three destination resort casinos located in three geographically diverse regions across the state and a single slots facility competitively awarded for one location statewide. The legislation divides the state into three regions to include:

Figure 84: Gaming Regions

Region A: Suffolk, Middlesex, Essex, Norfolk, and Worcester counties.

Region B: Hampshire, Hampden, Franklin, and Berkshire counties.

Region C: Bristol, Plymouth, Nantucket, Dukes and Barnstable counties.

The legislation includes a number of key principles to ensure the successful implementation of expanded gaming. The principles include: a transparent and competitive bidding process, maximum long-term value to the Commonwealth, protection for host and surrounding communities, mitigation for social impacts and costs and ensuring the nation's best and most rigorous public safety, regulatory and enforcement mechanisms.

The statute specifically identifies a variety of uses for the new revenue that will be generated for the Commonwealth by the implementation of expanded gaming. These include payments for

local aid, health care payment reform initiatives, education and community colleges, transportation infrastructure, manufacturing initiatives, debt reduction and tourism. In addition, the legislation provides for a myriad of mitigation efforts, which includes public health and addiction services and community and cultural mitigation. Gaming revenues will also support a newly established Race Horse Development Fund, to be paid to horsemen, trainers, riders and other stable workers and to breeding programs that support farms and other agri-business in the Commonwealth.

The legislation also called for the creation of a five member independent body, the Massachusetts Gaming Commission, to oversee the implementation and licensing process. This Commission was established in March 2012. The costs for the operation of the state's gaming commission will be paid solely by the gaming industry and not by Massachusetts tax dollars.

The licensing fee for each resort casino will be a minimum of $85 million and requires a capital investment, to include a hotel facility, of at least $500 million. The Commonwealth will receive 25 percent of gross gaming revenues. The slots facility, which will hold up to 1,250 slot machines, has a $25 million license fee, and a minimum capital investment of $125 million. The slots facility will be taxed at 40 percent of its gross gaming revenue.

The Massachusetts Expanded Gaming Act of 2011 approved up to three resort casinos and one slots parlor spread across the state. On February 28, 2014, the Commission awarded the slots license to Penn National Gaming, which operates Plainridge Park Casino in Plainville. Plainridge Park Casino opened to the public on June 24, 2015. The Massachusetts Gaming Commission has issued the Western Massachusetts resort-casino to MGM Springfield, which is expected to open on August 24, 2018. The Eastern Massachusetts resort-casino license was granted to Wynn MA, LLC for Encore Boston Harbor in Everett which is expected to open in the summer of 2019.

Figure 85: Expanded Gaming Act of 2011

The Massachusetts Authorization of a Second Slots Location Initiative, also known as Question 1, was on the November 8, 2016 ballot in Massachusetts as an indirect initiated state statute. A "yes" vote supported this proposal to grant the Massachusetts Gaming Commission the ability to issue an additional slots license. A "no" vote opposed this proposal, retaining the existing law that allows three resort casinos and one slots parlor. The measure was defeated with 60.74 percent voting "no" and 39.26 percent voting "yes".

The Expanded Gaming Act provided a window until July 31, 2012 for the Governor to negotiate and the Legislature to approve a "compact" with one or more Indian Tribes for the right to operate a casino in Southeastern Massachusetts. On July 30, 2012, with the approval of the Legislature, the Governor signed a compact with the Mashpee Wampanoag Tribe. The Compact was returned to the Governor's Office from the U.S. Department of Interior and was renegotiated.

On March 20, 2013, Governor Deval Patrick and Chairman Cedric Cromwell announced that a gaming Compact between the Commonwealth and the Mashpee Wampanoag Tribe had been signed. This compact has since been approved by the U.S. Department of Interior.

On September 18, 2015, the United States Department of the Interior approved the Mashpee Wampanoag Tribe's application for land-in-trust, including 151 acres in Taunton approved for gaming use.

On March 15, 2016, the Mashpee Wampanoag Tribe presented the Massachusetts Gaming Commission with plans regarding First Light Casino and Resort in Taunton.

Figure 86: First Light Casino and Resort, Taunton, MA

On April 5, 2016, the Mashpee Wampanoag Tribe broke ground on the First Light Casino and Resort in Taunton. On July 28, 2016, in the case *Littlefield et al. vs. United States Department of Interior,* a judge in the U.S. District Court ruled that the Department of Interior did not have the authority to approve the Mashpee Wampanoag Tribe's application for land-in-trust. At a time deemed appropriate, the Massachusetts Gaming Commission will engage in a public discussion to further our review of what course of action will be in the short and long-term best interests of Southeastern Massachusetts and the Commonwealth.

In March, 2018, Senator Elizabeth Warren introduced a bill with fellow Massachusetts Democrat Senator Edward Markey, that would allow the Mashpee Wampanoag Tribe to build a $1 billion gaming resort about halfway between Boston and Cape Cod even through a federal court

blocked the project in 2016. The Senate bill and its House companion H.R. 5244, the Mashpee Wampanoag Tribe Reservation Reaffirmation Act, closely track the language of the Gun Lake Trust Land Reaffirmation Act, a 2014 law which was the subject of a closely-watched case that was just decided by the U.S. Supreme Court.

In *Patchak v. Zinke,* six justices said Congress can protect tribal homelands from litigation. In the case of the Mashpee Wampanoag, the tribe is seeking to restore its homelands in southeastern Massachusetts. Opponents of the proposed casino have filed a lawsuit that has placed a cloud on the land-into-trust application there. The Mashpees didn't gain federal recognition until 2007 so opponents believe the tribe doesn't qualify. The bill would reaffirm a 2015 decision by the U.S. Department of Interior to take 171 acres in Mashpee and 150 acres in Taunton into trust, and establish statutory safeguards against further litigation on the matter in federal court.

The legislation is a response to fears that the Interior Department, which is presently deciding if it can maintain the trust agreement under a different legal category than one a federal judge previously rejected, is leaning toward revoking the tribe's right to the reservation land in the coming months. If the Interior reverses its 2015 decision, the tribe would lose access to a variety of funding sources, including for social services, housing, education and environmental programs.

SPORTS BETTING

On May 14, 2018 the US Supreme Court struck down a federal law that bars gambling on football, basketball, baseball and other sports in most states, giving states the go-ahead to legalize betting on sports. The Supreme Court ruled 6-3 to strike down the Professional and Amateur Sports Protection Act. The 1992 law barred state-authorized sports gambling with some exceptions. It made Nevada the only state where a person could wager on the results of a single game. The court's decision came in a case from New Jersey, which has fought for years to legalize gambling on sports at casinos and racetracks in the state.

More than a dozen states had supported New Jersey, which argued that Congress exceeded its authority when it passed the 1992 Professional and Amateur Sports Protection Act, barring states from authorizing sports betting. New Jersey said the Constitution allows Congress to pass laws barring wagering on sports, but Congress can't require states to keep sports gambling prohibitions in place.

Massachusetts state senator Eileen Donoghue (D-First Middlesex District) proposed a bill looking to permanently legalize Daily Fantasy Sports (DFS) in the Commonwealth. The bill (SD 2480) would create a committee to study, regulate and examine taxation of legal sports betting in Massachusetts.

Governor Charlie Baker stated he expects the legwork necessary to write a sports betting bill can be done in the coming months, with the goal of filing legislation at the beginning of the new legislative session in 2019.

House Speaker Robert DeLeo said it is not a decision he wants to rush into. DeLeo and Rep. Joseph Wagner, House co-chairman of the Committee on Economic Development and Emerging Technologies, have had initial discussions about sports betting but are in agreement that they should take their time. DeLeo has expressed concerns about preserving the "integrity" of professional and college sports, has listened to constituents, and is only beginning to understand all the facets of sports betting that would have to be considered if it were to be legalized in Massachusetts, including whether to allow online betting and how to approach minors. While DeLeo has stated that Massachusetts does not want to fall too far behind other states that might begin to capture a new revenue source from legal sports gambling, he would like some answers from the federal government. The Massachusetts Gaming Commission has estimated that sports betting could generate between $9 million and $61 million in state tax revenues a year, depending on the tax rate.

Figure 87: Mass Gaming Sports Betting White Paper

PLANNING FOR PROSPERITY

The OCPC will use equity as a lens to evaluate its operations, planning, and investments, and explore its authority to use its resources and roles to mitigate the place-based dimension of disparities by race, ethnicity, income and ability.

PROMOTING BOTH ECONOMIC VITALITY AND EQUITY: THE BIG PICTURE

ENSURE FAIRNESS AND EQUITY IN PROVIDING FOR THE HOUSING, SERVICES, HEALTH, SAFETY, AND LIVELIHOOD NEEDS OF ALL CITIZENS AND GROUPS.

USING OUR INFLUENCE AND INVESTMENTS TO BUILD A MORE EQUITABLE REGION

For our region to thrive, all parts of our region must prosper. By using public resources to catalyze investment in areas that have seen chronic private disinvestment, the Council will seek to help the region grow and prosper more equitably.

ENGAGING A FULL CROSS-SECTION OF THE COMMUNITY IN DECISION MAKING

To move toward equity, our region needs the full range of voices at the table so all affected parties understand the issues, explore alternative approaches, and proceed with action. Beyond convening regional stakeholders, the Council is strengthening its approach to outreach, public participation, and community engagement.

THE COUNCIL WILL:

- *Define consistent expectations of how the Council will engage with the region's residents and constituencies.*
- *Evaluate what types of policy, planning, and operational decisions need what levels of engagement, recognizing that not all decisions need and merit the same intensity of engagement.*
- *Collaborate and consult with members of the community, especially historically under-represented populations.*
- *Focus on developing lasting relationships with the region's residents and constituencies.*
- *Highlight best practices for engagement in our region.*
- *Work toward making decisions with people, not for people.*

LIVABILITY

ENSURE THAT ALL ELEMENTS OF THE BUILD ENVIRONMENT, INCLUDING LAND USE, TRANSPORTATION, HOUSING, ENERGY, AND INFRASTRUSTURE, WORK TOGETHER TO PROVIDE SUSTAINABLE, GREEN PLACES FOR LIVING, WORKING NAD RECREATION, WITH A HIGH QUALITY OF LIFE.

The Council's focus on livability is on creating and renewing vibrant places and underlying infrastructure, investing in regional parks and affordable housing, and collaborating with partners to achieve the full range of possibilities that help our region thrive.

The built environment encompasses physical features (such as buildings, streets, and utilities) and the systems and processes associated with them (such as movement of people, flow of water). As such, it defines the multifaceted community that people experience through their daily lives – the places where they live, work, and recreate. Because the built environment shapes quality of life for the entire population, sustaining its livability and ensuring that it functions at the highest possible level are primary tasks for comprehensive planning.

The regional built environment is a complex system made up of many interacting and dynamic elements, creating challenges in sustaining and coordinating the overall system as well as its component parts.

Livability focuses on the quality of our residents' lives and experiences in our region, and how places and infrastructure create and enhance the quality of life that makes our region a great place to live. With abundant and beautiful open spaces, an active arts community, and a range of housing options, the OCPC region is widely recognized for its high quality of life.

Livability adds value to our region by helping to retain and attract a talented workforce, increasing living choices, building community identity, highlighting the unique qualities of local places, and supporting individual decisions that reinforce those qualities. *The Council is committed to increasing livability for people of all ages, races, ethnicities, incomes, national origins, and abilities in the region through its authorities, its investments in infrastructure, and its collaboration with others to sustain and increase a high quality of life.*

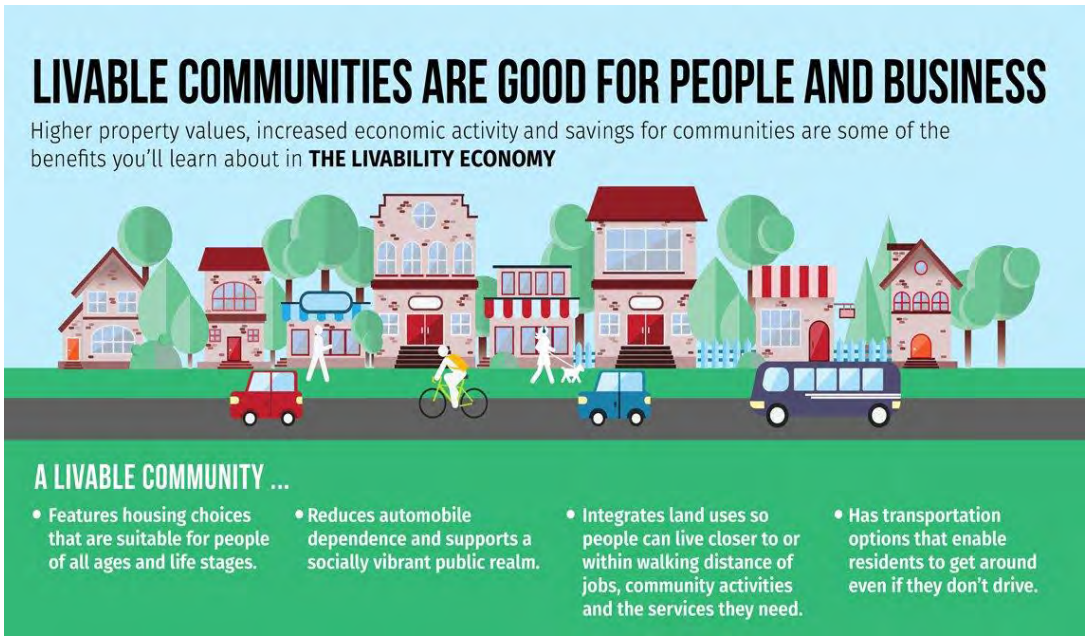


Figure 88: Livable Communities

ENHANCING LIVABILITY MEANS*:*

- *Provide complete streets for multimodal transportation serving multiple functions.*
- *Providing housing and transportation choices for a range of demographic characteristics and economic means.*
- *Supporting bicycle facilities to promote bicycling for transportation, recreation, and healthy lifestyles.*
- *Aligning resources to support transit-oriented development and walkable places.*
- *Coordinate regional transportation investments with job clusters.*
- *Promoting healthy communities and active living through land use, planning and investments.*
- *Plan for infill development.*
- *Provide design standards appropriate to the regional context.*
- *Provide accessible public facilities and spaces.*
- *Conserve and reuse historic resources.*
- *Increasing access to nature and outdoor recreation through regional parks and trails.*
- *Implement green building design and energy conservation.*
- *Discourage development on unsuitable properties.*

Livability helps attract and retain the people and businesses that our region needs to thrive and compete economically. People are increasingly choosing where they want to live – especially in urban areas that offer attractive amenities and lifestyles – and then looking for jobs there. Young creative professionals today are highly mobile and can live anywhere they want. They are choosing high-amenity places that have a diverse population, a rich arts and entertainment culture, natural beauty, abundant recreation, and sufficient walkability and transit systems that allow them to travel without a car. Attracting younger talent through high-quality communities

is also an investment in the future market for our housing stock. Many young urbanites look for more space as they have children and their lifestyle preferences change. As existing residents age out of their homes, these younger residents will be ready to move in. Businesses also place a high value on livability. Whether a large company seeking a location for an office or a talented entrepreneur looking to grow an innovative business, decision-makers want to know their employees can get to work and are happy living there.

Plan for improved health and safety for at-risk populations. An at risk population is characterized by vulnerability to health or safety impacts through factors such as race or ethnicity, socioeconomic status, geography, gender, age, behavior, or disability status. These populations may have additional needs before, during, and after a destabilizing event such as a natural or human-made disaster or period of extreme weather, or throughout an indefinite period of localized instability related to an economic downturn or a period of social turmoil. At-risk populations include children, the elderly, and persons with disabilities, those living in institutionalized settings, those with limited English proficiency, and those who are transportation disadvantaged.

Provide accessible, quality public services, facilities, and health care to minority and low-income populations. A public service is a service performed for the benefit of the people who live in the jurisdiction. A public facility is any building or property owned, leased, or funded by a public entity. Public services, facilities, and health care should be located so that all members of the public have safe and convenient transportation options to reach quality services and facilities that meet or exceed industry standards for service provision. Minority and low-income populations are often underserved by public services and facilities and health care providers.

LIVABLE BUILT ENVIRONMENT

GOAL: THE OLD COLONY PLANNING COUNCIL WILL ENSURE THAT ALL ELEMENTS OF THE BUILT ENVIRONMENT, INCLUDING LAND USE, TRANSPORTATION, HOUSING, ENERGY, AND INFRASTRUCTURE, WORK TOGETHER TO PROVIDE SUSTAINABLE, GREEN PLACES FOR LIVING, WORKING, AND RECREATION, WITH A HIGH QUALITY OF LIFE.

Because the built environment shapes quality of life for the entire region, sustaining its livability and ensuring that it functions at the highest possible level are priorities of the Council. Every community can strive for better livability, but the needs and challenges for infrastructure and place-making vary widely by location. The built environment is a complex system made up of many interacting and dynamic elements; the challenge is sustaining and coordinating the overall system as well as its component parts.

A neighborhood in the urban core may need wider sidewalks, shared open spaces, careful building detailing, and a mix of activities to be livable. A suburban neighborhood may need increased housing options and more bike trails to access parks and transit stops. A rural center may need a traffic-calmed main street that allows pedestrians to cross more safely or renovated downtown buildings to catalyze reinvestment.

Livability for all areas also requires the network of businesses – whether an ethnic restaurant owned by new immigrants or the small-town bar owned by the same family for generations – that makes our communities unique, both supporting local residents and attracting visitors from across the world. Each jurisdiction has a unique combination of natural landscape, built environment, and local culture; communities that recognize and value their particular character, needs, and opportunities can more effectively invest in their future.

Promote the upgrade of infrastructure and facilities in older and substandard areas. Infrastructure comprises the physical systems that allow societies and economies to function. These include water mains, storm drains, municipal sewer systems, electrical grids, telecommunications facilities, and transportation facilities such as bridges, tunnels and roadways. Upgrading is the process of improving these infrastructure and facilities through the addition or replacement of existing components with newer versions. An older area is a neighborhood, corridor, or district that has been developed and continuously occupied for multiple decades. A substandard area is a neighborhood, district, or corridor with infrastructure that fails to meet established standards. Targeting infrastructure in older and substandard areas provides a foundation for future community revitalization efforts and improves quality of life for residents in these neighborhoods.

Healthy community. Ensure that public health needs are recognized and addressed through provisions for healthy, locally grown foods, physical activity, access to recreation, health care, environmental justice, and safe neighborhoods.

- Reduce exposure to toxins and pollutants in the natural and built environments. Toxins are poisonous substances capable of causing disease in living organisms. Pollutants are waste substances or forms of energy (noise, light, heat), often resulting from industrial processes, that can contaminate air, water, and soil and cause adverse changes in the environment.
- Plan for increased public safety through the reduction of crime and injuries. Public safety involves prevention of and protection from events such as crimes or disasters that could bring danger, injury, or damage to the general public.
- Plan for the mitigation and redevelopment of brownfields for productive uses. Redevelopment of brownfield sites requires an environmental assessment to determine the extent of contamination and to develop remediation strategies. The feasibility of site cleanup, market forces, and other factors may help define appropriate reuse options, which range from open space to mixed-use development.
- Plan for physical activity and healthy lifestyles. Barriers to the design of the physical environment can influence rates of physical activity and health benefits. Active transportation facilities and accessible, equitably distributed recreational opportunities support physical activity and healthy lifestyles.
- Provide accessible parks, recreation facilities, greenways, and open space near all neighborhoods. These facilities offer a range of benefits to residents, including opportunities for increased physical activity. The proximity of parks to neighborhoods supports increased physical activity among residents; however, social and environmental impediments such as crime, unsafe pedestrian conditions, and noxious land uses may

decrease accessibility and subsequent use of these facilities. Plans should ensure that the type of park and its function and design are appropriate for its locational context.

- Plan for equitable access to health care providers, schools, public safety facilities, and arts and cultural facilities. Equitable access ensures services and facilities are reachable by all persons, regardless of social or economic background.

PROMOTING HOUSING AND TRANSPORTATION CHOICES FOR A RANGE OF DEMOGRAPHIC CHARACTERISTICS AND ECONOMIC MEANS

Over time, our region has grown into a variety of communities and neighborhoods with a wide range of housing. According to the American Community Survey 2012-2016 5-Year Estimates, single-family homes comprise 67.26 percent of our region's current housing stock. Some communities in our region have greater than 85 percent of the housing stock comprised of single family dwellings. Demand for this housing stock is projected to continue, but the segments of our population that are growing will consist of households that may increasingly prefer alternative forms of neighborhoods. The livability challenge around these shifts is to create communities that offer satisfying experiences and meet the daily needs for living, shopping, working, and recreation for each group, not simply housing developments that offer a place to own or rent.

As residents' age, their needs, preferences, and travel behavior shift; some communities may be poorly designed to accommodate their residents' future needs. Growing cohorts of residents, including international immigrants and young professionals living alone, may need housing and transportation choices beyond what our region now offers. Going forward, each jurisdiction should examine whether it offers satisfying living options to attract and maintain a competitive workforce and meets the needs of current residents as they age.

GROWING DEMOGRAPHIC GROUPS THAT COULD DEFINE NEW HOUSING NEEDS INCLUDE:

- Seniors – the "Silver Tsunami" of those age 65 and older – will be the fastest growing segment of our population, doubling in absolute numbers by 2030 and reaching 23 percent of our region's residents by 2035. As people age, their housing preferences tend to change. Some seniors choose to move to a downtown condo. Other seniors want to age in place, close to their places of worship, friends, or family members. Across these locational preferences, most seniors share common interests in less household maintenance, one-level or accessible living, and easy access to nearby goods and services, especially health care. Are there adequate housing choices, including age-integrated options, available for seniors to stay active, conveniently access goods and services, and/or be near friends and family?
- The Millennial Generation - born in the 1980s and 1990s, is already the largest generation demographically and seems to have different lifestyle preferences. Millennials tend to favor urban amenities, access to transit and bicycling options, and more dense and active neighborhoods rather than the auto-oriented subdivisions of

their youth. Between stagnant entry-level wages, higher student loan debt, and delayed marriage and child-rearing, Millennials are moving into homeownership at later ages than previous generations. Critical to the region's future prosperity, will we have places that retain and attract these young individuals and households?

- New Americans - move to our region from across the globe, bringing with them unique cultural histories that build the richness of our region. Some of these new Americans also bring preferences for more multigenerational living than our current housing stock supports. As these residents come to the region, will they find places that facilitate their settlement, provide affordability, community and employment, and offer opportunities to prosper?

TO SUPPORT THE LIVABILITY OF OUR REGION FOR OUR CHANGING DEMOGRAPHICS, THE COUNCIL WILL:

- *Encourage and invest in a wide variety of housing options throughout the region to serve the increasingly diverse population, including viable housing choices for low-and moderate-income households and multigenerational households.*
- *Invest in bus service and transit to expand the spectrum of transportation options, particularly to connect workers to jobs and opportunities throughout the region.*
- *Support and encourage Complete Streets approaches to enhance transportation choices (highways, streets and roads designed to consider the needs of pedestrians, bicyclists, transit users and vehicles, motorists, and commercial and emergency vehicles, and to serve all ages and abilities).*
- *Promote the preservation of existing housing, especially affordable housing, to cost-effectively maintain affordability and preserve the unique historical characteristics of the region's housing stock.*

THE NEED FOR WIDESPREAD ACCESS TO QUALITY TRANSPORTATION

Transportation choices are as important to lower-income households as housing choices and may be more important for people with disabilities. The Council will continue to strengthen bus and transit connections between lower-income residents and opportunities such as jobs and education.

TO EXPAND THE TRANSPORTATION CHOICES AVAILABLE TO ALL HOUSEHOLDS, INCLUDING IN SOME NEIGHBORHOODS THE CHOICE TO LIVE WITHOUT A CAR, THE COUNCIL WILL:

- *Complete environmental justice analyses that ensure no disproportionately high and adverse impacts of transportation projects to the region's minority and low-income populations.*
- *Prioritize transportation investments that connect lower-income areas to job opportunities.*
- *Engage neighborhood residents in transit planning to understand how to most effectively use transit service and investments to promote access to opportunity.*

SUPPORT BICYCLE AND PEDESTRIAN FACILITIES TO PROMOTE BICYCLING FOR TRANSPORTATION, RECREATION AND HEALTHY LIFESTYLES.

Over the last 10 years, bicycling as a mode of transportation has increased as a result of growing interest in physically active lifestyles, concern about climate change, improved connections to transit, and the preference of the Millennial generation. The Council will collaborate with local communities, the Massachusetts Department of Transportation, nonprofit organizations, and other partners to connect and improve bicycle and pedestrian facilities.

SPECIFICALLY, THE COUNCIL WILL:

1. Focus its bicycle and pedestrian efforts on regional-scale issues and coordination among jurisdictions in the region, including:
   - ✓ *Aggregating local bike plans into a shared regional format.*
   - ✓ *Identifying regionally important bicycle corridors in the 2040 Transportation Policy Plan.*
   - ✓ *Reducing gaps and barriers and improving links across jurisdictional borders.*

2. Work with its partners, including the Massachusetts Department of Transportation, to plan, construct, expand and maintain the region**'s bicycle and pedestrian connections to** regional systems (such as transit stations, highways, or regional parks) to increase these **modes' share of** regional trips over the coming decades by:
   - ✓ *Encouraging local jurisdictions to recognize planning and building of bicycle and pedestrian facilities as a component of new development.*
   - ✓ *Encouraging the adoption of Complete Streets policies by local communities where appropriate.*
   - ✓ *Encouraging local communities to include bicycle plans and pedestrian plans in their comprehensive plans.*

ALIGNING RESOURCES TO SUPPORT TRANSIT-ORIENTED DEVELOPMENT AND WALKABLE PLACES.

Transit-oriented development (TOD) is walkable, moderate-to high-density development served by frequent transit that can include a mix of housing, retail, and employment choices designed to allow people to live and work with less or no dependence on a personal car.

TO PROMOTE THESE VIBRANT, MIXED-INCOME PLACES, THE COUNCIL WILL:

1. Support local efforts and lead regional efforts to foster transit-oriented development which will lead Council efforts to:
   - ✓ Prioritize transit-oriented development in the planning, engineering, and operation of transit.
   - ✓ Pursue private sector and local government partnerships to accelerate development and land acquisition for transit-oriented development.

- ✓ Develop and share technical resources and education materials to improve capacity in the region for transit-oriented development.
- ✓ Provide clear policy guidance to local partners concerning the types of plans and local controls that will be needed to effectively implement transit-oriented development.
- ✓ Collaborate with partners, including local governments and private sector stakeholders, in transit-oriented development activities including policy development, site-specific transit-oriented development resources and opportunities, and station area planning to enable transit-oriented development.
- ✓ Encourage transit-friendly development patterns, including increased density and concentration of uses, to expand walkability and lay the groundwork for future transit-readiness.

2. Support local and regional incentives for continuation of downtown re-development efforts including incentives for construction of new housing developments strategically located near transit hubs to promote the develop of land and sites that are underutilized within the region.
    A. Utilization of abandoned properties to provide for innovative use of historic, commercial, or other vacant buildings, to create mixed-use developments that would increase the area's housing stock and improve the attractiveness of the community as a place to live.
    B. Additional residential units in the downtown areas will bring businesses back to the areas (restaurants, grocery stores, and retailers).
    C. Explore and support special area planning, new zoning and leveraging public land and infrastructure investment to support the transformation of the region into a 21st century mixed-use community that provides for long-term residency and the benefits of a sustainable community.

ACHIEVING SOCIAL EQUITY

Social equity and environmental justice are embedded in the cherished right to equal opportunity that we value so much as Americans. By making investments in lower-income and minority communities, the Regional Policy Plan gives everyone an opportunity to participate in the economy, which benefits all of our communities.

Equity connects all residents to opportunity and creates viable housing, transportation, and recreation options for people of all races, ethnicities, incomes, and abilities so that all communities share the opportunities and challenges of growth and change.

For our region to reach its full economic potential, all of our residents must be able to access opportunity. We should all have the opportunity to participate in planning the future of our

region. Our region is stronger when all people live in communities that provide them access to opportunities for success, prosperity, and quality of life.

PROMOTING EQUITY MEANS:

- Using our influence and investments to build a more equitable region.
- Creating real choices in where we live, how we travel, and where we recreate for all residents, across race, ethnicity, economic means and ability.
- Investing in a mix of housing affordability along the region's transit corridors.
- Engaging a full cross-section of the community in decision making.

THE REGION WILL BECOME MORE RACIALLY AND ETHNICALLY DIVERSE.

According to the 2010 Census, 15.08 percent of our region's population was African American or some other non-white minority. Fifteen percent of the people living in Massachusetts in 2010-2012 were foreign born. Of the foreign born population, fifty percent were naturalized US citizens, and ninety-four percent entered the country before the year 2010. Six percent of the foreign born entered the country in 2010 or later. Foreign born residents of Massachusetts come from different parts of the world. This rich and growing racial and ethnic diversity should be an asset to our continued economic vitality.

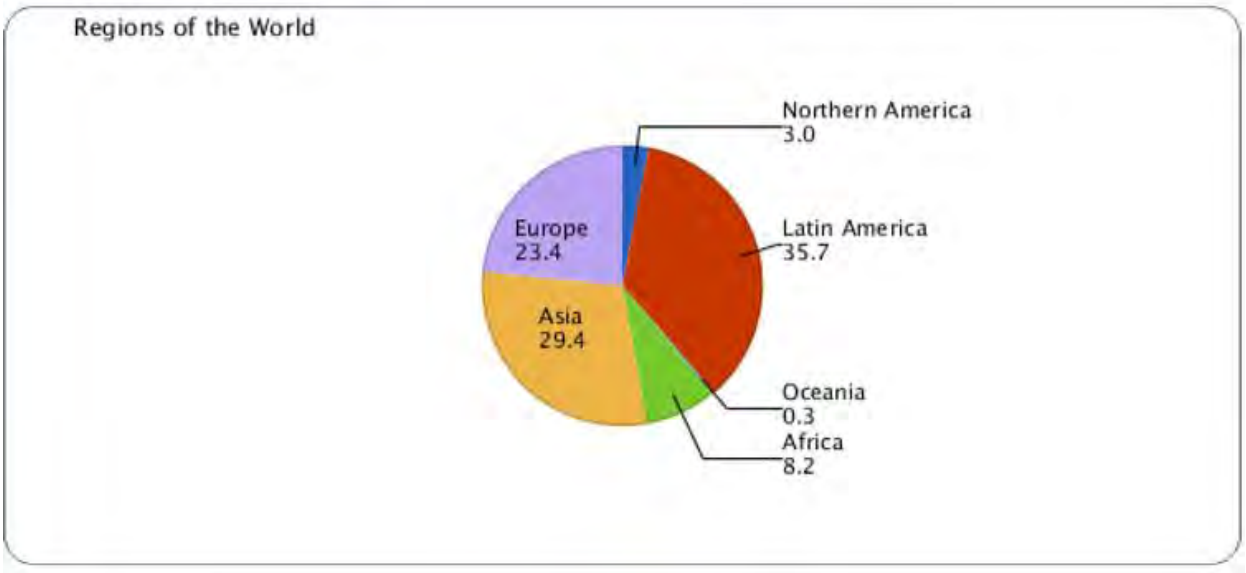


Figure 89: Foreign Born Populations

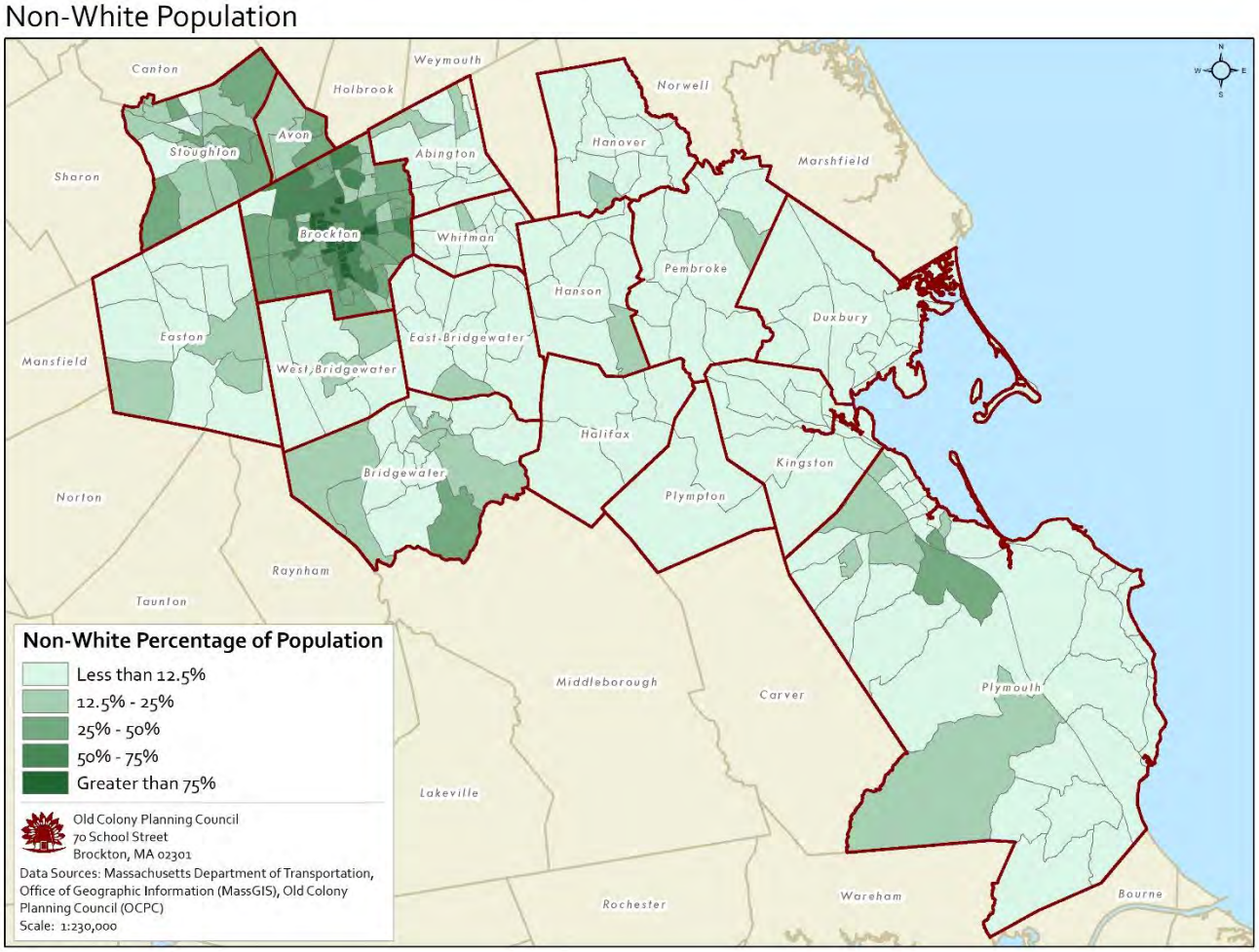


Figure 90: Non-White Populations

These disparities are growing at the same time the share of our region's population of color is growing. Eliminating these disparities and accessing the full potential of our region's residents of color could have dramatic benefits. The combined impact of increased employment, income, and homeownership would go far to close today's disparities in wealth by race and ethnicity. Nearly all of our region's net workforce growth over the next three decades will come from residents of color. In short, all residents of the region need access to opportunity if the region is to have a healthy and prosperous future.

Creating real choices in where we live, how we travel, and where we recreate for all residents, across race, sex, ethnicity, economic means and ability.

TO ADVANCE RACIAL AND ECONOMIC EQUITY ACROSS THE REGION, THE COUNCIL WILL WORK TO CREATE AND PROTECT VIABLE HOUSING, TRANSPORTATION AND RECREATION OPTIONS FOR THE REGION'S RESIDENTS, REGARDLESS OF RACE, ETHNICITY, INCOME AND ABILITY. THE COUNCIL'S PRIORITY WILL BE EXPANDING REAL CHOICES FOR HOUSING, TRANSPORTATION AND RECREATION WITHIN THE REGION.

THE REGION NEEDS TO OFFER HOUSING OPTIONS THAT GIVE PEOPLE IN ALL LIFE STAGES AND OF ALL ECONOMIC MEANS VIABLE CHOICES FOR SAFE, STABLE, AND AFFORDABLE HOMES. Individual housing preferences vary as each household considers factors such as access to desirable schools, proximity to jobs, the availability of transit, and nearby amenities, including cultural or religious institutions. ***THE COUNCIL'S GOAL IS TO EXPAND HOUSING CHOICES FOR ALL RESIDENTS, WHATEVER THEIR CHOICES MAY BE.***

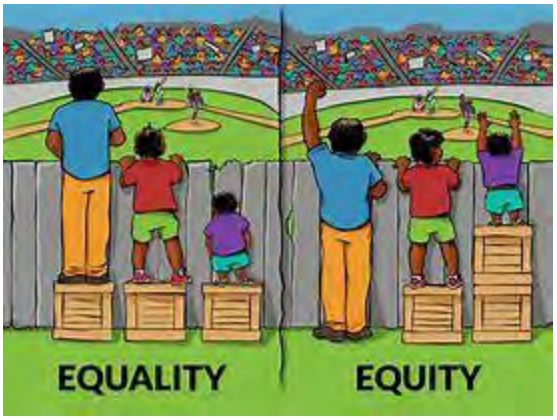


Figure 91: Equality and Equity

ACHIEVING HOUSING EQUITY

INVESTING IN A MIX OF HOUSING AFFORDABILITY ALONG THE REGION'S TRANSIT CORRIDORS.

As our region makes significant investments in transit, we must also ensure that the inevitable changes in neighborhoods along transit do not displace existing low-income residents. The increased accessibility that transit investments provide can lead to rising housing costs, making it more important to take proactive steps to preserve housing affordability and protect housing options for existing low-income residents.

The availability of affordable housing also influences the success of important industry clusters, and on the overall economic health of the region. Investing money to improve our transportation system will result in affordable housing costs and improving the standard of living of workers in these corridors. Investments in transportation reduce the costs of traveling and improve productivity in a corridor, potentially leading to a rise in wages.

Transit-Oriented Development: TODs take advantage of transit access, which typically attracts riders bound for work destinations. With a mixed-use living environment, including services and jobs within walkable distances from station areas, residents often can eliminate the need for unnecessary vehicular trips. The Regional Plan identifies a regional transit framework for a system of transit-supported centers, including TODs around existing commuter stations, and at regional bus and multimodal hubs.

TO PROMOTE A MIX OF HOUSING AFFORDABILITY ALONG THE REGION'S TRANSIT CORRIDORS, THE COUNCIL WILL:

- Align its resources and work with other partners to help preserve a mix of housing affordability along the region's transit routes and corridors to help low-income households benefit from transit investments.
- Promote transit-oriented developments that ensure a mix of housing affordability in transit station areas.

TO HELP MORE HOUSEHOLDS HAVE REAL HOUSING CHOICES, THE COUNCIL WILL:

- Use its resources, including investments in transit, infrastructure, and redevelopment, to help create and preserve mixed-income neighborhoods and housing choices across the region.
- Encourage preserving existing housing where rehabilitation is a cost-effective strategy to maintaining housing affordability.
- Explore opportunities to increase education and awareness of first-time homebuyer programs *to provide financial support for low-and moderate-income housing investment.*
- Invest in and encourage new affordable housing in higher-income areas of the region, particularly in areas that are well-connected to jobs, opportunity, and transit.
- Ensure that local comprehensive plans guide an adequate supply of land to meet each **jurisdiction's fair share of housing** for low-and moderate-income households.
- Encourage increased resources for affordable housing at the federal, state, regional and local levels to help close the gap between the region's affordable housing need and the supply.
- Support efforts to expand the supply of affordable housing that is accessible to people with disabilities.
- Work with housing partners and local governments to expand the supply of affordable housing available at all income levels, including extremely low-income households earning less than 30% of the area median income (that is $26,150 for a family of four in 2016). Median income $90,648
- Promote regional and local efforts to streamline the process and reduce the costs of developing housing, including affordable housing.
- Promote and support participation in the Housing Choice Initiative, legislation which provides incentives, rewards, and technical assistance to our cities and towns to encourage and empower municipalities to plan and build the additional housing that the Commonwealth needs to continue to thrive.

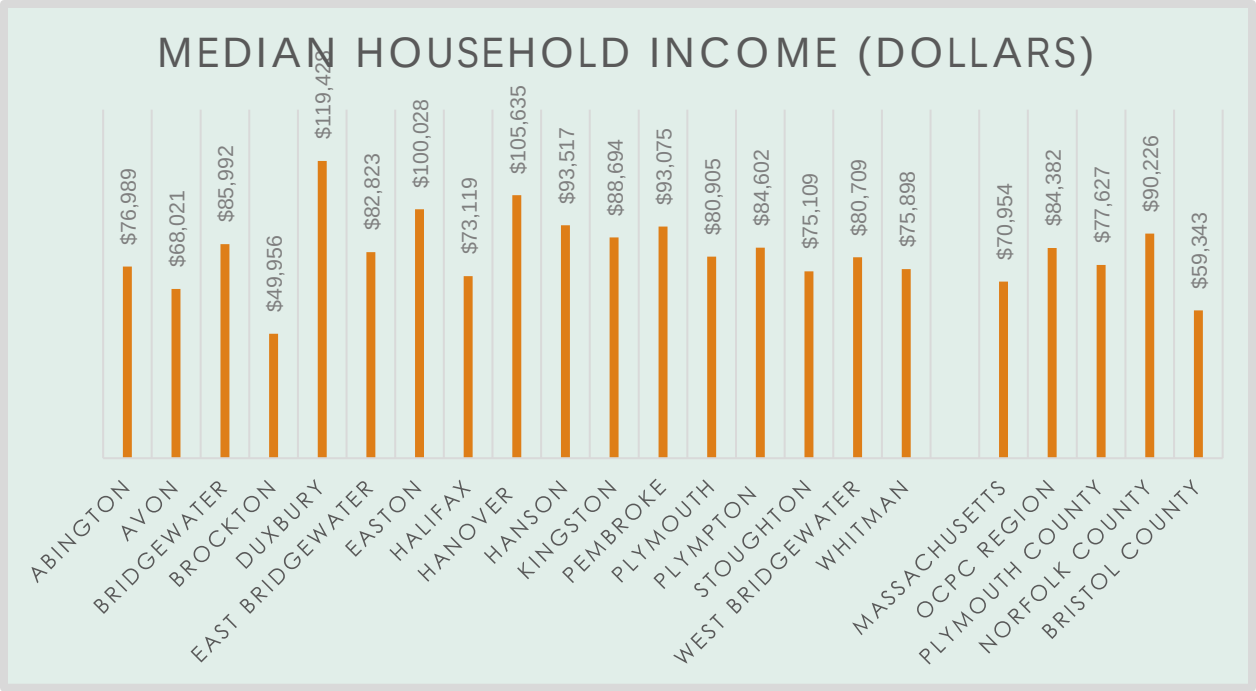


Figure 92: Median Household Income

Source: U.S. Census Bureau, 2012-2016 American Community Survey

Persons in Family	Extremely Low (30%) Income Limits	Very Low (50%) Income Limits	Low (80%) Income Limits
1	$18,350	$30,500	$46,000
2	$20,950	$34,850	$52,600
3	$23,550	$39,200	$59,150
4	$26,150	$43,550	$65,700
5	$28,440	$47,050	$71,000
6	$32,580	$50,550	$76,250
7	$36,730	$54,050	$81,500
8	$40,890	$57,500	$86,750

Source: U.S. Department of Housing and Urban Development (HUD)

Figure 93: HUD Income Guidelines

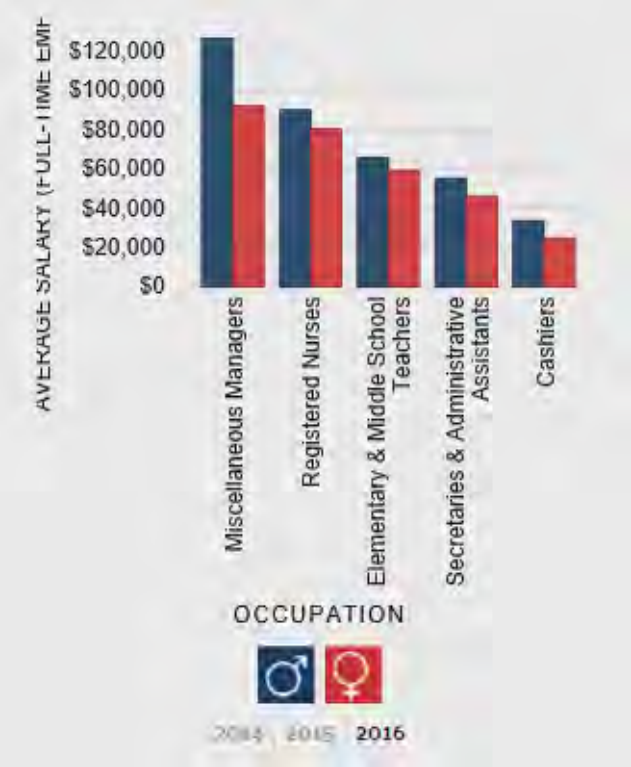


Figure 94: Gender Based Wage Disparity

ENSURING PERFORMANCE – IMPLEMENTING THE PLAN AND MONITORING OUR PROGRESS

A key questions is: what actions should we take to implement the Regional Policy Plan and our Sustainable Communities Strategy and most effectively achieve our vision, goals and policy objectives?

STRATEGY 1: RESPONSIBLE REGIONALISM

ENSURE THAT ALL LOCAL PROPOSALS ACCOUNT FOR, CONNECT WITH, AND SUPPORT THE PLANS OF ADJACENT JURISDICTIONS AND THE SURROUNDING REGION. PROVIDE TECHNICAL ASSISTANCE TO INCORPORATE THE STRATEGIES OF THE REGIONAL PLAN INTO LOCAL PLANS.

The Regional Plan is intended to serve as guidance for local comprehensive plans and as a means to encourage sound and informed planning decisions through the integration of local and regional priorities. The recommendations of the Regional Plan are not a substitute for, and will not supersede, local land-use planning. Local contexts and decisions will influence how these recommendations are implemented.

Regional planning agencies, although typically without regulatory authority, provide perspectives broad enough to encompass the scope of various regional systems, such as transportation and water supply, which extend beyond local jurisdictional boundaries. Because regional agencies coordinate the activities of groups of local governments, they provide an institutional setting for joint decision making that transcends local politics. From the local governmental perspective, the plans and policies of adjacent jurisdictions have reciprocal impacts, in terms of factors such as the location of new development, commuting patterns, and stormwater flows. Therefore, connecting these plans and policies through a comprehensive manner is a way to understand and manage these and other overlapping functions, and to responsibly integrate a community's plan with those of its neighbors.

The need for coordinated planning and development efforts, as well as the provision of services is multilayered. As policy, transportation, and development impacts do not necessarily stop at a defined border, stakeholders should have the opportunity to be part of the decision-making process. Additionally, as municipal governments and organizations have similar challenges and goals, there may be partnership opportunities to leverage resources and funding to complete coordinated projects.

It is important for the Old Colony Planning Council to work cooperatively with other governments, agencies, and community stakeholders to promote social, environmental and economic conditions necessary to achieve the region's goals. The Old Colony Planning Council will ensure that there are open channels of communication between the municipalities and

citizens so that regional community concerns and interests are heard and taken into consideration when decision are made that impact the residents and businesses of the Old Colony region.

BEST PRACTICES IN SUPPORT OF THE RESPONSIBLE REGIONALISM PRINCIPLE INCLUDE THE FOLLOWING:

- *Coordinate local land-use plans with regional transportation investments.*
- *Coordinate local and regional housing plan goals.*
- *Coordinate local open space plans with regional green infrastructure plans.*
- *Delineate designated growth areas that are served by transit.*
- *Promote regional cooperation and sharing of resources.*
- *Enhance connections between local activity centers and regional destinations.*
- *Coordinate local and regional population and economic projections.*
- *Include regional development visions and plans in local planning scenarios.*
- *Encourage consistency between local capital improvement programs and regional infrastructure priorities.*

THE IMPORTANCE OF COLLABORATION AND INCENTIVES

IMPLEMENT THE REGIONAL PLAN THROUGH INCENTIVES AND COLLABORATION.

The course charted by the Regional Plan won't be implemented by OCPC alone. Achieving the Regional Plan's vision and goals requires collaboration among local jurisdictions, the Regional Transit Providers (BAT and GATRA), the MBTA transit operators, developers, energy providers, and other infrastructure provides, and a wide range of interest groups, stakeholders, and organizations.

The Regional Plan calls for using federal, state, regional, and local transportation funds, in conjunction with locally-generated incentives, as catalysts to promote smart growth, economic prosperity, and sustainable development.

Authentic Participation: Ensure that the planning process actively involves all segments of the community in analyzing issues, generating visions, developing plans, and monitoring outcomes.

Public participation in planning is a mainstay of democratic governance and decision making. By actively involving the entire region in making and implementation plans, the government fulfills its responsibilities to keep all citizens informed and to offer them the opportunity to influence those actions that affect them. Authentic participation processes may have to overcome the perception that what participants say will not be respected. Authentic participation programs go beyond the minimum legal requirements to connect with citizens through innovative communication and outreach channels, such as creative use of the Internet and interactive workshops in locations where people work and live.

BEST PRACTICES IN SUPPORT OF THE AUTHENTIC PARTICIPATION PROCESS INCLUDE:

- *Engage stakeholders at all stages of the planning process.*
- *Seek diverse participation in the planning process.*
- *Promote leadership development in disadvantaged communities through the planning process.*
- *Develop alternative scenarios of the future.*
- *Provide ongoing and understandable information for all participants.*
- *Use a variety of communication channels to inform and involve the community.*

STRATEGY 2: REINVEST

CREATE A COMPETITIVE, ROBUST ECONOMY BY FOSTERING INNOVATION, SUPPORTING QUALITY EDUCATION, AND ENHANCING ACCESS TO QUALITY JOBS.

Infill Development and Adaptive Reuse: Infill population and employment growth will require the reuse of previously developed lands for new and creative projects. Many areas in the region have experienced significant infill development in their revitalization efforts. Similarly, adaptive reuse is the conversion, update and/or expansion of a building originally designed for one purpose to a different and new one.

Suburban Retrofit/Sprawl Repair: Suburban retrofit could also be considered on a small-or large-scale basis. This technique involves reworking conventional, automobile-oriented areas, like single-use housing developments, office parks and shopping centers, into more walkable/bike-able, mixed-use, transit-ready urban places.

- Requiring home ownership units as part of redevelopment projects where practical to better promote a wider range in affordability and to create affordable units and housing choice along a range of incomes.
- Engage the local real estate community *and property owners to increase understanding of and foster development/redevelopment opportunities.*

VIBRANT ECONOMY

- *Continue to apply social equity and environmental justice considerations in the implementation of projects and programs.*
- *Continue to collaborate with key partners and stakeholders, including representatives from low-income and minority communities and actively involve the public in the planning process.*
- *Leverage available funds in order to maximize every dollar, and advocate for legislation that supports implementation of the Regional Policy Plan.*

STRATEGY 3: SMARTER LAND USE DECISIONS THROUGH LAND SUITABILITY

This Regional Policy Plan is an overall framework for the region's expansion and development pattern. It is based on supporting local plans while encouraging the formation and strengthening of livable centers, efficient positioning of infrastructure and limiting development in rural and environmentally sensitive areas. Land suitability analysis provides a valuable tool to assist the region's communities and stakeholders in understanding where development may be most appropriate.

Factors include the availability of infrastructure and utilities, proximity to preferred growth and infill areas and the presence of important natural and water resources. This result is a prioritization and ranking of land, within the context of the Regional Plan policy, most suitable for sustainable development. This will guide local planning activities toward sound and informed development decisions.

THE OLD COLONY PLANNING COUNCIL WILL:

1. *Create Sustainable Places that adopt the principles of equity, environment and economy while promoting energy efficiency and conserving natural resources for future generations.*
2. *Create healthy communities that are vibrant, connected and green and are characterized by reinvestment, transportation choice, and housing choice for residents of all races, economic means, age and ability.*
3. *Focused and planned development in vibrant corridors and activity centers with public transportation and commercial development, increased housing choice in neighborhoods designed for healthier lifestyles, reduced health-care costs, that supports preservation of community characteristics while allowing seniors to age in place.*

STRATEGY 4: LINK TRANSPORTATION AND LAND USE

IDENTIFY WAYS TO CAPITALIZE ON THE REGION'S FREIGHT INFRASTRUCTURE AND GENERATE OPPORTUNITIES FOR SUBSTANTIAL ECONOMIC RETURNS.

Significant land tracts are available along truck and freight lines. Many of these sites are former industrial properties (brownfields) or underutilized land that could be brought back into more productive use as cargo-oriented development for the benefit of the community and region.

TO PROMOTE HOUSING AND MOBILITY CHOICE ALONG THE REGION'S TRANSIT CORRIDORS, THE COUNCIL WILL:

1. *Continue to seek funding for transportation investments that provide a variety of choices, reduce greenhouse gas emissions and promote healthy lifestyles through more active transportation.*

2. *Continue working with communities in the region to create additional "Chapter 40R" smart growth areas, mixed-use, multi-family developments that support multi-modal transportation that promotes biking and walking and seek additional funds to leverage existing grant programs.*
3. *Consider greater affordability requirements in areas that are more conducive to high density development near transit and downtown areas.*
4. *Consider different requirements for rental and ownership developments in recognition of addressing different target populations with rentals directed to lower income tiers.*
5. *Continue to support implementation of state-of-the-art technologies and Transportation Demand and Systems Management Programs to provide more mobility choices and allow the transportation system to function more efficiently.*
6. *Continue to work with member agencies on parking management solutions.*
7. *Link technologies in vehicles and mobile devices to improve the way people travel and reduce VMT. These include emerging technologies such as autonomous vehicles, expansion of the regional communications network, smart parking systems, and universal transportation payment systems.*
8. *Continue to pursue opportunities to expand shared mobility services and new Smart Growth opportunity areas in the region. Examples of shared mobility services include: car sharing, bike-sharing, real-time ridesharing, Transportation Network Companies (e.g., Uber, Lyft), neighborhood electric vehicles, and on-demand shuttle services.*
9. *Support the development of policies, programs, and funding for moving goods in the state, as well as for infrastructure in the region that supports moving goods.*

STRATEGY 5: CREATE LIVABLE CENTERS

THE OLD COLONY PLANNING COUNCIL WILL SUPPORT CLIMATE SMART COMMUNITIES THAT ARE HEALTHY, LIVABLE, AND ENERGY-INDEPENDENT AND SECURE, WITH VIBRANT, INNOVATIVE ECONOMIES, AN INTERCONNECTED NETWORK OF RESILIENT INFRASTRUCTURE THAT ADOPTS SUSTAINED AND SUBSTANTIAL GREENHOUSE GAS EMISSION REDUCTION POLICIES THAT PROTECT THE NATURAL RESOURCES FOR THE BENEFIT OF FUTURE GENERATIONS.

The development of "Livable Centers" within the Growth and Infill areas is fundamental to achieving the preferred regional strategy for land use, transportation and environmental balance.

- Livable centers support existing communities: They attract public investment to encourage sustainable pattern of population and employment growth that maximizes the use of areas already served by roads and utilities.
- Livable Centers are connected: They promote regional connectivity and are supportive of public transportation.

- Livable Centers are compact: They support a vibrant mix of uses within a concentrated, accessible area.
- Livable Centers are walkable: They promote non-motorized opportunities for pedestrians and bicyclists and provide convenient and safe alternatives to driving for local trips.
- **Preserving the Region's rural character and resources:** The regional plan focuses on the protection of natural resources while supporting the agricultural and rural economy.
- Develop our local food systems: Food, like water and shelter, is essential for sustaining us. An objective of the Regional Plan is to foster the development of local food systems and a local food economy. The success of our local food system will depend on creating efficient ways of getting local foods from our fields to our residents. Transporting local foods to their destination is one piece of the puzzle. The other is getting residents to the distribution centers (grocery stores, farm stands, farmers markets in urban centers). At this time, there are limited public transit options that provide convenient access to local food.
- Local food and land use: With a large portion of our region's land devoted to agriculture, the Regional Plan targets managed growth to protect these areas. There are also many opportunities to convert vacant urban properties into a network of urban farms, creating a direct link for low-income communities to access high-quality produce.
- Local Food and the environment: Growing a local food system has the potential to protect and enhance our environmental assets. As such, local food can be a tool to advocate for the health of the soil and water resources in our region.

STRATEGY 6: NEW WAYS TO DETERMINE AND ADDRESS HOUSING NEEDS AND AGING IN PLACE

The range of housing choices should include housing for people of all income levels and for people in different phases of life – including younger and older families, seniors, singles and empty-nesters. Emphasis will be placed on encouraging the compact and diverse mixing of housing types and affordability levels near job centers and transit routes. There are many parts of the region where neighborhoods are in decline and housing is of poor quality and not considered affordable. Facilitating rehabilitation of neighborhoods and the maintenance of quality and affordable housing will help to stabilize neighborhoods. Affordable housing finance tools, including loans, grants, inclusionary zoning practices and other methods, will be necessary to realize this objective.

Figure 95: Aging in Place

THE OLD COLONY PLANNING COUNCIL WILL EXPLORE NEW WAYS TO DETERMINE AND ADDRESS THE HOUSING NEEDS OF THE REGION BY:

- Identification of zoning districts or geographic areas in which the region proposes to modify current regulations for the purposes of creating affordable housing developments to meet its housing production goals.
- Identification of specific sites for which the region will encourage the filing of comprehensive permit developments.
- Continue local planning, education, and advocacy to promote achievement of local affordable housing goals. Build local awareness of housing demand, issues and activities.
- Identify characteristics of proposed residential or mixed-use developments that would be preferred by the region.
- Participation in regional collaborations addressing housing development.
- Explore communities in the region to operationalize and capitalize a Municipal Affordable Housing Trust to analyze, and implement opportunities in support of affordable housing production and oversee housing-related issues.

Continued and strategic efforts to inform residents and local leaders on the issue of affordable housing and specific new initiatives builds support by generating a greater understanding of the benefits of affordable housing, reducing misinformation and dispelling negative stereotypes.

These outreach efforts are mutually beneficial as they provide useful information to community residents and important feedback to local leaders on concerns and suggestions.

The Old Colony Planning Council should explore the process of establishing a Municipal Affordable Housing Trust pursuant to MGL Chapter 44, Section 55C that will manage funding and/or opportunities to raise funds in support of local housing efforts to create affordable housing opportunities. The state enacted the Municipal Affordable Housing Trust Fund Act on June 7, 2005, which simplified the process of establishing housing funds that are dedicated to subsidizing affordable housing.

The law provides guidelines on what trusts can do and allows communities to collect funds for housing, segregate them out of the general budget into an affordable housing trust fund, and use these funds without going back to City Council for approval. It also enables trusts to own and manage real estate, not just receive and disburse funds. The law further requires that local housing trusts be governed by at least a five-member board of trustees. Per statute, the chief elected official must be one of the members of the Trust. While the trusts must be in compliance with Chapter 30B, the law which governs public procurement as well as public bidding and construction laws, it is likely that most trusts will opt to dispose of property through a sale or long-term lease to a developer so as to clearly differentiate any private affordable housing project from one constructed by the public-sector.

Figure 96: Annual Home and Community Care Costs

STRATEGY 7: GREEN COMMUNITIES

Streets comprise a significant portion of the paved surfaces throughout the region and are a major source of stormwater drainage, or runoff. A *green street* is a corridor that is designed with less water-tight or impervious surfaces and more landscaped and functional green space in order to capture and absorb stormwater.

SEVERAL COMMON PRACTICES FOR GREENING STREETS INCLUDE:

- Skinny Streets: By reducing the width of the street, the amount of impervious surfaces and stormwater runoff is reduced.
- Bio-swales: Vegetated open drainage channels designed to accept water runoff, disperse it and absorb it in the ground.
- Stormwater Capturing Curb Extensions: An excavated area behind the reinforced curb with accommodations for stormwater and landscaping with appropriate vegetation.
- Permeable Pavement*:* Paving material that allows rainwater to pass through surface.
- Street Trees: The leaf canopy intercepts, slows and filters rainwater, preventing it from hitting the ground or giving it time to percolate into the soil.
- Link Open Space Fragments: Many ecosystems have become fragmented over many years of development. Small pockets of surprisingly high-quality natural areas still exist, though. The protection and linking of these open spaces and ecosystems are important for air and water quality, flood control, wildlife habitat, recreation, scenic landscapes and an overall improved quality of life. The regional plan recommends linking the remaining fragments of key open space that existing within the region.
- Urban agriculture: a network of urban agricultural practices have proven to be an effective means of reusing property and strengthening community bonds. The regional plan should consider the development of a local food economy in the region.

CONTINUING ACTIONS – HEALTHY ENVIRONMENT AND COMMUNITIES

1. *Continue to provide and expand incentive programs that support the reduction of greenhouse gas emissions, protect open space and farmland, and create great places to live, work, and play.*
2. *Through incentives and collaboration, continue to work to increase the supply and variety of housing types affordable for people of all ages and income levels in areas with frequent transit service and with access to a variety of services.*
3. *Continue to refine planning and modeling tools to assess the public health implications of regional and local plans and projects.*
4. *Continue to support wildlife and habitat conservation through the acquisition, management, and monitoring of the region's habitat preserve areas.*
5. *Promote the use of zero-emission vehicles and alternative fuels to ensure that we have the infrastructure to support these innovations.*
6. *Support the efforts of local jurisdictions to receive Green Community Designation and implement programs to save energy in their own operations.*

7. *Develop strategies to enhance our region's ability to adapt to the consequences of climate change, including planning and design strategies to help communities to cope with hazardous events such as storms, heat waves, or ongoing drought.*
8. *Continue to help improve our regional air quality through the implementation of transportation investments detailed in this Regional Policy Plan, coupled with improvements in fuel and vehicle technologies.*

Growing Healthy Communities:
A Prescription for Better Health

ENSURING PERFORMANCE

Think globally, plan regionally, and act locally.

Regional Planning can be defined as collaborating to plan for common issues within a common geographical area that may be defined ecologically, politically, or economically. Jurisdictional boundaries may give definition to the region, but jurisdictional boundaries, including county and city/town limits, do not necessarily correspond with current understandings or definitions of regional issues.

The Old Colony Regional Policy Plan is a blueprint for how we will grow as a region and get around in the future. Putting this Regional Plan into action requires concrete steps we need to take to realize our vision, goals and objectives for 2040 and beyond. This Regional Plan will take time to implement. Each Regional Policy Plan builds upon the one before it, reflecting the new realities of changing demographics, economics, laws, and other developments. They are continually reevaluated, revised, and refined, all in the service of ensuring a high quality of life in our region for years to come.

As discussed in previous chapters, this Regional Policy Plan has been drafted collaboratively with a wide variety of stakeholders. This broad range of public involvement will help strengthen support for several key actions, including enhancing the connections between transportation and how we use land; reinforcing the links between our local and regional plans; and providing the framework to collaborate on implementing the Regional Plan.

This Regional Policy Plan calls for using federal, state, regional, and local transportation funds, in conjunction with locally-generated incentives, as catalysts to promote smart growth, economic prosperity, and sustainable development. As changes develop around our region, whether they are biking or pedestrian connectivity projects, new train and bus lines, enhancements to our highway networks, local smart growth projects, or initiatives that preserve and enhance our environment, that together strive to reach a common purpose.

As planning evolves, it is becoming increasingly creative, collaborative, and integrated across multiple functions, while engaging both public and private actors. At the same time, it is addressing the broader aspects of social, environmental, and economic sustainability. The challenges, and opportunities, of planning on a regional scale show that there is no one-size-fits-all approach. Rather, there are many different forms and variations of how regions, large and small, urban and rural, find ways to work together on common issues that transcend borders.

Regional planning is continuing to evolve in ways that signal a renewed interest in regionalism sparked by the growing reality that complex issues such as climate changes, economic competitiveness, and even infrastructure finance cannot be addressed by one jurisdiction alone. A trend toward integrated and comprehensive regional planning strategies that are fundamentally reliant on cross-sector partnerships and data driven processes. Many of these plans and programs are designed around principles of sustainability.

OUTCOMES

This regional vision includes five desired outcomes: stewardship, prosperity, equity, harmony with nature, and sustainability. While each outcome is described below, it is important to note that the five outcomes reinforce and support one another to produce greater benefits that any single outcome alone.

STEWARDSHIP

Stewardship advances the Old Colony Planning Council's longstanding mission of orderly and economic development by **responsibly managing the region's natural and financial resources**, and making strategic investments in our region's future. Several of the major challenges that the Council was established to address – such as an aging bus fleet and inadequately treated wastewater polluting the region's lakes, rivers and streams – demonstrate the need for effective regional stewardship.

- ENSURE THAT ALL ELEMENTS OF THE BUILT ENVIRONMENT, INCLUDING LAND USE, TRANSPORTATION, HOUSING, ENERGY AND INFRASTRUCTURE, WORK TOGETHER TO PROVIDE SUSTAINABLE, GREEN PLACES FOR LIVING, WORKING AND RECREATION, WITH A HIGH QUALITY OF LIFE.
- RESPONSIBLY MANAGING **OUR REGION'S FINITE** RESOURCES, INCLUDING NATURAL RESOURCES – SUCH AS LAKES, RIVERS, STREAMS, WETLANDS, GROUNDWATER, HIGH QUALITY NATURAL HABITATS, AND AGRICULTURAL SOILS – FINANCIAL RESOURCES, AND OUR EXISTING INVESTMENTS IN INFRASTRUCTURE.
- LEVERAGING TRANSIT INVESTMENTS WITH HIGHER EXPECTATIONS OF LAND USE.

The built environment, which shapes the quality of life, encompasses physical features (such as buildings, streets, and utilities) and the systems and processes associated with them (such as movement of people, flow of water). As such, it defines the multifaceted community that people experience through their daily lives, the places where they live, work, and recreate.

PROSPERITY

The Council's contributions to regional economic competiveness lie in the arena of community development – that is supporting the infrastructure, amenities, and quality of life that are essential to attracting and retaining businesses and talent.

Prosperity is fostered by *investments in infrastructure and amenities that create regional economic competitiveness,* thereby attracting and retaining successful businesses, a talented workforce, and, consequently, wealth. *Regional economic competitiveness results from strategic, long-term public and private decisions that build on and grow our region's economic strengths relative to other regions.* Collectively, the region must provide great locations for businesses to succeed – particularly the industries that export products or services beyond the metropolitan area and bring revenue into the region.

Though the economy has evolved over the last 150 years, businesses still seek locational advantages, particularly access to a skilled workforce, access to markets, and an overall environment that allows them to compete in the global market. Some businesses rely more heavily on freight and the movement of goods, while knowledge-intensive services concentrate on moving people to jobs and on the quality of life that attracts and retains a highly skilled workforce.

The Old Colony Planning Council's regional planning efforts set the stage for our region's economic competiveness and prosperity. While local economic development authorities work directly with businesses, the work of creating and retaining businesses in the region requires coordinated efforts.

THE COUNCIL WILL USE ITS EXISTING ROLE AND CAPACITY TO:

- Plan and invest in community development and consider prosperity and economic competiveness as a lens through which to evaluate its planning, operations, and investment decisions.
- Fostering the conditions for shared economic vitality by balancing major investments across the region. The Council will intentionally consider regional balance – that is balancing its investments and activities across the region – in its planning, operations and investments decisions. The Council's intent is that no part of the region is consistently favored or consistently ignored. The issue of regional balance has multiple dimensions. Because development patterns vary across the region, advancing regional balance does not guarantee that all parts of the region will receive the same level or intensity of investments, activity, or attention. Rather, advancing regional balance will be a consideration that helps all parts of the region receive investments that promote prosperity at their stage and level of development.
- Protect natural resources that are the foundation of prosperity. Prime agricultural soils support the region's farm economy and sustain local food production. Agricultural land creates economic opportunity for a variety of residents, ranging from farmers growing crops on century-old family farms to new Americans bring their farming experience into small-scale local food production serving farmers markets.

THE COUNCIL SUPPORTS PRESERVING AGRICULTURAL LAND TO PROTECT THE AGRICULTURAL ECONOMY IN THE REGION, PROVIDE ECONOMIC OPPORTUNITIES FOR FARMERS, AND PROMOTE LOCAL FOOD PRODUCTION AND PROCESSING.

- Encourage local governments to promote and preserve agricultural land and locate and design new developments in ways that reduce development pressures on this limited resource

PLANNING FOR AND INVESTING IN INFRASTRUCTURE, AMENITIES, AND QUALITY OF LIFE NEEDED FOR ECONOMIC COMPETITIVENESS.

The benefits of the Council's regional approach include planning for the efficient movement of people and freight, providing cost-effective and efficient wastewater treatment, and contributing to a quality of life and cost structure that attract and retain businesses and talent. Regional transportation systems provide efficient, effective, and reliable access to materials and regional, national and international markets. The region's highway investments are part of a coordinated, interconnected, and multimodal regional transportation network that safely, reliably and affordably connects people and freight with destinations in the region and beyond. In fact, the vast majority of the region's freight moves by truck. The Council works with the Massachusetts Department of Transportation and local units of government to preserve and improve these roadways.

Employers locate worksites to maximize their accessibility and proximity to the workforce they need. Our region competes with other regions across the country to attract the talented young workers who are necessary to meet the needs of the region's growing economy and replace retiring baby boomers.

> To compete successfully for this generation, our region must provide the housing, transit, transportation networks, and quality of life amenities that will continue to attract the talent needed by employers in our region.

The region's transportation system, including highways, transit, the emerging bicycle network, and pedestrian amenities, provides our residents options to commuting to their workplaces and enhances our quality of life. Accessibility to transit benefits employers by reducing their costs towards parking, decreasing employee transportation costs, and expanding their pool of potential employees to include those who do not drive.

TO PLAN FOR AND INVEST IN THE INFRASTRUCTURE, AMENITIES, AND QUALITY OF LIFE THE REGION NEEDS TO BE ECONOMICALLY COMPETITIVE, THE COUNCIL WILL:

- Contribute to a quality of life and cost of living that attract and retain talented workforce.
- Pursue additional funding for the multimodal transportation system including highways, transit (including bus capital investment and operations), local roads, and the bicycle and pedestrian systems.
- Plan for the efficient and multimodal movement of freight globally, nationally, and regionally to support the region's industries.
- Use its authority and provide technical assistance to protect and preserve compatible land uses around resources.

- Encourage workforce housing that is affordable to a variety of income levels across the region.

ENCOURAGING REDEVELOPMENT AND INFILL DEVELOPMENT. Development on undeveloped or agricultural land – Greenfield development – traditionally costs developers or builders less because the costs of demolition or pollution remediation are minimal. However, development on Greenfields often has higher long-term public costs because it requires extending regional infrastructure to new areas. On the other hand, infill development and redevelopment require less new regional infrastructure but can cost more for the developer up front, both in the direct costs of demolition and pollution remediation as well as the increased complexity of integrating projects into existing neighborhoods. Over the long term, proportionately more infill development and redevelopment compared to Greenfield development will result in a denser, more compact region, minimizing the loss of agricultural land, reducing travel distances, and enhancing the ability of the region to support transit. Redevelopment projects may require direct public subsidy or indirect support through specific infrastructure investments.

EQUITY

Creating real choices in where we live, how we travel, and where we recreate for all residents, across race, ethnicity, economic means and ability.

Equity connects all residents to opportunity and creates viable housing, transportation, and recreation options for people of all races, ethnicities, incomes and abilities so that all communities share the opportunities and challenges of growth and change. For our region to reach its full economic potential, all of our residents must be able to access opportunity. Our region is stronger when all people live in communities that provide them access to opportunities for success, prosperity, and quality of life.

PROMOTING EQUITY MEANS:

- Using our influence and investments to build a more equitable region.
- Creating real choices in where we live, how we travel, and where we recreate for all residents, across race, ethnicity, economic means and ability.
- Investing in a mix of housing affordability along the region's transit corridors.
- Engaging a full cross-section of the community in decision making.

OVER THE NEXT THREE DECADES, THE REGION WILL BECOME MORE RACIALLY AND ETHNICALLY DIVERSE.

These disparities are growing at the same time the share of our region's population of color is growing. Eliminating these disparities and accessing the full potential of our region's residents of color could have dramatic benefits. The combined impact of increased employment, income, and homeownership would go far to close today's disparities in wealth by race and ethnicity.

Nearly all of our region's net workforce growth over the next three decades will come from residents of color. In short, all residents of the region need access to opportunity if the region is to have a healthy and prosperous future.

Using our influence and investments to build a more equitable region. The OCPC will use equity as a lens to evaluate its operations, planning, and investments, and explore its authority to use its resources and roles to mitigate the place-based dimension of disparities by race, ethnicity, income and ability. For our region to thrive, all parts of our region must prosper. By using public resources to catalyze investment in areas that have seen chronic private disinvestment, the Council will seek to help the region grow and prosper more equitably.

To advance racial and economic equity across the region, the Council will work to create and protect viable housing, transportation and recreation options for the region's residents, regardless of race, ethnicity, income and ability. The Council's priority will be expanding real choices for housing, transportation and recreation.

The region needs to offer housing options that give people in all life stages and of all economic means viable choices for safe, stable, and affordable homes. Individual housing preferences vary as each household considers factors such as access to desirable schools, proximity to jobs, the availability of transit, and nearby amenities, including cultural or religious institutions. The Council's goal is to expand housing choices for all residents, whatever their choices may be.

TO HELP MORE HOUSEHOLDS HAVE REAL HOUSING CHOICES, THE COUNCIL WILL:

- Use its resources, including investments in transit, infrastructure, and redevelopment, to help create and preserve mixed-income neighborhoods and housing choices across the region.
- Encourage preserving existing housing where rehabilitation is a cost-effective strategy to maintaining housing affordability.
- Invest in and encourage new affordable housing in higher-income areas of the region, particularly in areas that are well-connected to jobs, opportunity, and transit.
- Ensure that local comprehensive plans guide an adequate supply of land to meet each **jurisdiction's fair share of housing for low**-and moderate-income households.
- Encourage increased resources for affordable housing at the federal, state, regional and local levels to help close the gap between the region's affordable housing need and the supply.
- Support efforts to expand the supply of affordable housing that is accessible to people with disabilities.
- Work with housing partners and local governments to expand the supply of affordable housing available at all income levels, including extremely low-income households earning less than 30% of the area median income.
- Promote regional and local efforts to streamline the process and reduce the costs of developing housing, including affordable housing.
- Promote and support participation in the Housing Choice Initiative, legislation which provides incentives, rewards, and technical assistance to our cities and towns to encourage and empower municipalities to plan and build the additional housing that the Commonwealth needs to continue to thrive.

- Transportation choices are as important to lower-income households as housing choices and may be more important for people with disabilities. The Council will continue to strengthen bus and transit connections between lower-income residents and opportunities such as jobs and education.

TO EXPAND THE TRANSPORTATION CHOICES AVAILABLE TO ALL HOUSEHOLDS, INCLUDING IN SOME NEIGHBORHOODS THE CHOICE TO LIVE WITHOUT A CAR, THE COUNCIL WILL:

- Complete environmental justice analyses that ensure no disproportionately high and adverse impacts of transportation projects to the region's people of color and low-income populations.
- Prioritize transportation investments that connect lower-income areas to job opportunities.
- Engage neighborhood residents in transit planning to understand how to most effectively use transit service and investments to promote access to opportunity.

INVESTING IN A MIX OF HOUSING AFFORDABILITY ALONG THE REGION'S TRANSIT CORRIDORS. As our region makes significant investments in transit, we must also ensure that the inevitable changes in neighborhoods along transit do not displace existing low-income residents. The increased accessibility that transit investments provide can lead to rising housing costs, making it more important to take proactive steps to preserve housing affordability and protect housing options for existing low-income residents.

TO PROMOTE A MIX OF HOUSING AFFORDABILITY ALONG THE REGION'S TRANSIT CORRIDORS, THE COUNCIL WILL:

- Align its resources and work with other partners to help preserve a mix of housing affordability along the region's transit routes and corridors to help low-income households benefit from transit investments.
- Promote transit-oriented developments that ensure a mix of housing affordability in transit station areas.

ENGAGING A FULL CROSS-SECTION OF THE COMMUNITY IN DECISION MAKING.

To move toward equity, our region needs the full range of voices at the table so all affected parties understand the issues, explore alternative approaches, and proceed with action. Beyond convening regional stakeholders, the Council is strengthening its approach to outreach, public participation, and community engagement.

THE COUNCIL WILL:

- Define consistent expectations of how the Council will engage with the region's residents and constituencies.
- Evaluate what types of policy, planning, and operational decisions need what levels of engagement, recognizing that not all decisions need and merit the same intensity of engagement.
- Collaborate and consult with members of the community, especially historically under-represented populations.

- Focus on developing lasting relationships with the region's residents and constituencies.
- Highlight best practices for engagement in our region.
- Work toward making decisions with people, not for people.

We are committed to addressing racial and economic disparities so that all residents can live in a healthy, vibrant, and livable region.

HARMONY WITH NATURE

Ensure that the contributions of natural resources to human well-being are explicitly recognized and valued and that maintaining their health is a primary objective.

The natural environment comprises the earth's interrelated systems of air, water, soil, and vegetation and their ongoing processes. Human well-being depends upon a healthy natural environment to provide the services of nourishing food, breathable air, drinkable water, hazard protection, energy, and spiritual sustenance. Because urban development and human activities can disturb nature's balance and damage the resources it provides, regional plans and implementation programs must monitor the health of and mitigate negative impacts to the natural environment. A healthy environment is a common resource that belongs to everyone but is owned by no one. The region through this policy plan must advocate for, and present the value of, the contributions of natural systems and services to the triple bottom line (environment, economy, and equity). While some natural resources are protected through separate functional plans, such as those for air and water quality, this plan is the proper tool for the overall coordination and maintenance of natural systems within the full community and regional context.

Our residents, through their Open Space and Recreation Plans, have consistently singled out the region's parks, trails, and natural environment as the most attractive feature in the region. Parks and trails support community and individual well-being. Increasing access to nature and outdoor recreation through regional parks and trails. Access to these resources can help increase residents; physical activity, support mental health, and foster community and social interactions.

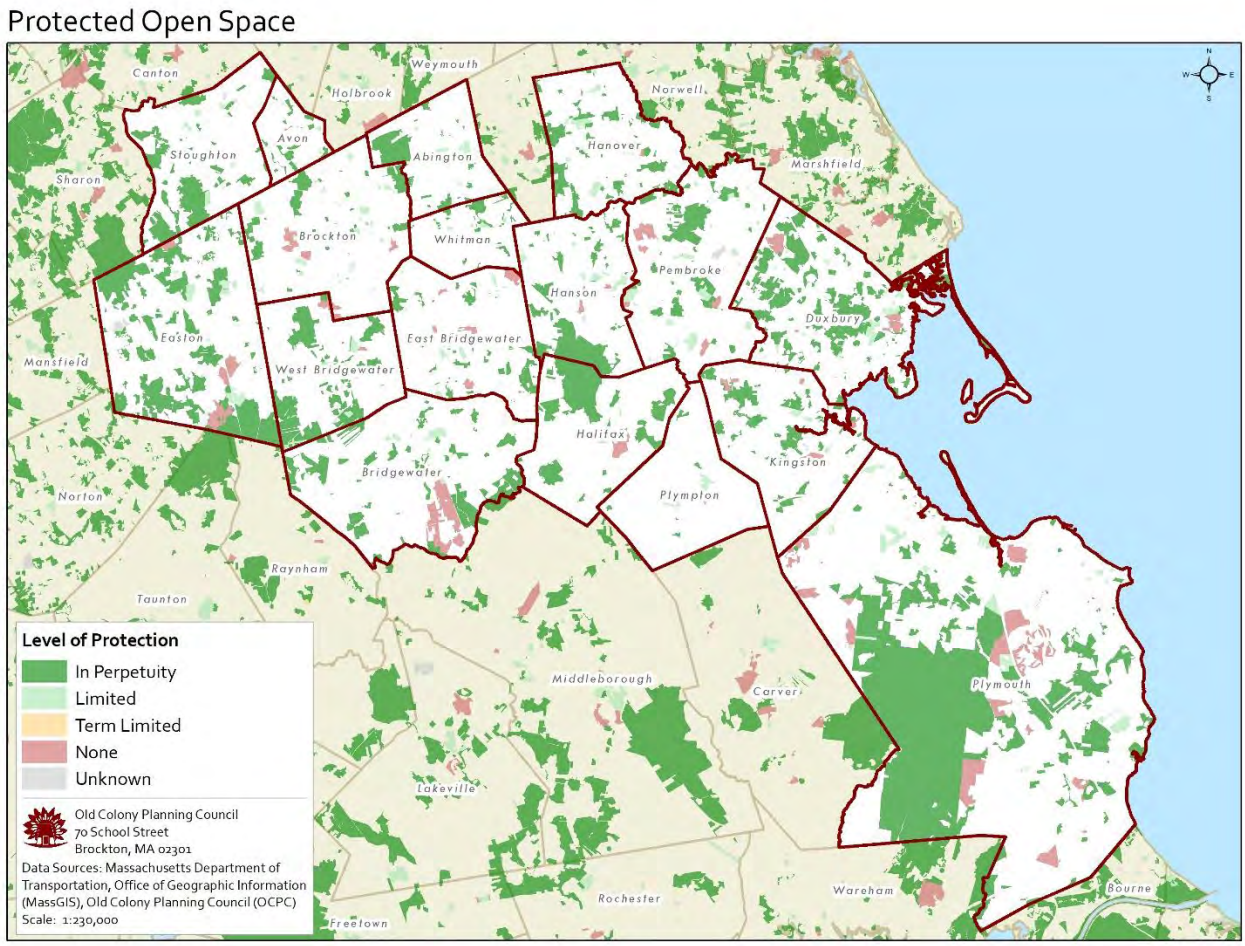


Figure 97: Protected Open Space

Figure 98: Health Benefits of Open Space

THE COUNCIL WILL COLLABORATE WITH THE CITIES AND TOWNS OF THE REGION TO:

- Encourage and support the creation of a comprehensive park network and trail system that preserves high-quality natural resources, increases climate resiliency, fosters healthy outcomes, connects communities and enhances quality of life in the Region.
- Promote expanded multimodal access to parks, trails and the transit network, where appropriate.
- **Strengthen equitable usage of parks and trails by our region's residents**, such as across age, race, ethnicity, income, natural origin, and ability.
- Restore, connect and protect natural habitats and sensitive lands.
- Plan for the provision and protection of green infrastructure.
- Encourage development that respects natural topography.
- Enact policies to reduce carbon footprints.
- Promote compliance with state and local air quality standards.
- Encourage climate change adaptation.
- Provide opportunities and technical support for renewable energy use.
- Provide for solid waste reduction.
- Encourage water conservation and plan for a lasting water supply.
- Protect and manage streams, watersheds, and floodplains.

Promoting healthy communities and active living through land use, planning and investments. Land use and planning decisions can promote active living and healthy communities. Populations living in walkable places are more active and therefore healthier than populations living in car-dependent areas. Considering the immense costs of obesity and sedentary lifestyles to our health care system, promoting active living through land use decisions provides a key opportunity to improve livability, equity, and our region's health outcomes.

Land use decisions can create opportunities for people to walk or bike to their destinations rather than drive door-to-door, provide active outdoor recreational options, and offer access to open space. Achieving healthy communities also requires efforts by many sectors beyond land use decisions. Planning offers opportunities to coordinate actions and investments across multiple sectors.

TO PROMOTE HEALTHY COMMUNITIES AND ACTIVE LIVING THROUGH LAND USE, PLANNING, AND PUBLIC INVESTMENTS, THE COUNCIL WILL WORK WITH ITS PARTNERS TO:

- Incorporate active living considerations when evaluating competitive funding proposals, infrastructure investments, and operations.
- Encourage local communities to conserve, protect, and interconnect the full range of local open spaces to provide seamless active living experiences across systems, including local parks, green corridors and boulevards.
- Promote walkable neighborhoods, pedestrian-oriented town centers, and compact development patterns to expand walkability.
- **Expand the region's bicycle infrastructure.**
- Encourage communities to adopt active living strategies across sectors and pursue partnerships to improve health outcomes.

- Recognize opportunities for urban agriculture and small-scale local food production.
- Encourage policies and investments that improve access to safe and healthy foods.

SUSTAINABILITY

Sustainability means protecting our regional vitality for generations to come by preserving our capacity to maintain and support our region's well-being and productivity over the long term. Simultaneously meeting our current economic, environmental, and community needs, while also ensuring that we are not jeopardizing the ability of future generations to meet their needs. The region's investments in prosperity, equity, and livability will fall short over the long term if the region exhausts its resources without investing in the future.

Creating a sustainability plan strengthens buy-in and stakeholders' understanding of the efforts needed to keep the work operating and improving.

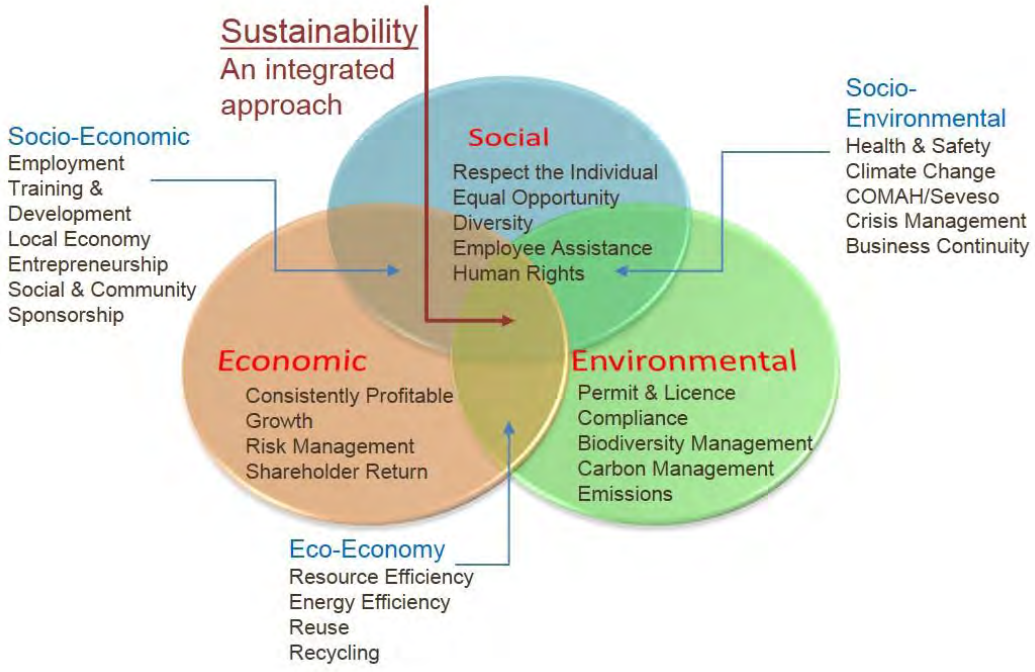


Figure 99: Sustainability an Integrated Approach

Promoting the use of water through expanding water conservation and reuse, increasing groundwater recharge, and optimizing surface water and groundwater use.

Providing leadership, information, and technical assistance to support local governments' consideration of climate change mitigation, adaptation, and resilience. Sustainability planning is the process by which interested stakeholders and partners create a road map for decision making in regard to what to sustain, why, and how, so that policy, initiatives, and programs are continuously improved, adapted, or discontinued to achieve intended outcomes and goals.

Creating a sustainability plan strengthens buy-in and stakeholders' understanding of the efforts needed to keep the work operating and improving. A sustainability plan can be used to share the progress of the early learning work with potential partners. It can also be used as a guide to support ongoing management of the work.

Sustainability planning and implementation should always be connected to a common set of clearly stated early learning goals. MUNICIPALITIES COMMONLY USE THE FOLLOWING SEVEN STEPS FOR THEIR SUSTAINABILITY PLANNING AND IMPLEMENTATION EFFORTS.

1. *ASSEMBLE A BALANCED SUSTAINABILITY PLANNING TEAM*. For early learning, such a team should include key staff from each involved public early learning agency. In the case of the RTT-ELC grant, the team will include key staff from multiple early learning agencies.
2. *CLARIFY YOUR VISION, MISSION, AND GUIDING PRINCIPLES*. Confirming a shared understanding of a purpose and goals is the foundation for sustainability planning.
3. *ESTABLISH YOUR TOP PRIORITIES; IDENTIFY SPECIFIC GOALS RELATED TO THOSE PRIORITIES; AND DETERMINE WHICH EXISTING EFFORTS YOU WILL CONTINUE, MODIFY, OR ELIMINATE TO REACH THE GOALS* you have set. States usually establish no more than five top priority areas. During this step, the stakeholders analyze all current programs, policies, and systems and use data to inform their work.
4. *CREATE OPTIONS FOR IMPLEMENTING THE DECISIONS YOU MADE* in step #3 based on the Commonwealth's vision, mission, and guiding principles—as well as on the results of the analyses and data collected.
5. *IDENTIFY AND CONTACT KEY LEADERS AND ORGANIZATIONS THAT ARE NEEDED TO SUPPORT* and execute the sustainability strategies. Share the early learning sustainability plan with essential people and organizations in order to secure their buy-in, cooperation, and collaboration.
6. *DEVELOP AND IMPLEMENT ACTION STEPS*. The stakeholders develop concrete and realistic action steps and carry them out.
7. *MONITOR AND EVALUATE THE IMPLEMENTATION OF YOUR SUSTAINABILITY PLAN*, in cooperation with your collaborators and partners. Stakeholders modify the sustainability plan as needed. They document what they do as they do it. They communicate often.

GLOSSARY OF TERMS

The following terms are defined according to their intended use in this document.

ACCESSIBILITY

A measure of the ability to travel easily among various origins and destinations.

ACTION

A provision or task to implement adopted policies.

ACTIVE LIVING

Promotion of physical activity, including walking and bicycling, to address health and personal well-being, focusing on how the built environment – including neighborhoods, transportation systems, buildings, parks and open space, can contribute to more daily movement and activity.

ADAPTIVE MANAGEMENT

A planning framework for decision-making based on information that exists today, which can be modified and refined later as new information becomes available.

AFFORDABLE HOUSING

A dwelling unit restricted for purchase or rent by a household with an income at or below 80 per cent of the area median income for the applicable metropolitan or non-metropolitan area, as determined by the United States Department of Housing and Urban Development; provided, however, that affordable housing shall be subject to an affordable housing restriction. The cost of housing as a percentage of household income. Housing is considered unaffordable when housing costs exceed a threshold percentage. Nationally that standard ranges from 25 to 33 percent of household income.

AUTONOMOUS VEHICLE (AV)

A vehicle that is capable of driving itself without human intervention.

ADVANCED DRIVER ASSISTANCE SYSTEMS (ADAS)

A range of vehicle technologies that enhance driver safety by taking temporary control of one or more driving functions (speed, lane position, braking, etc.)

BIOREGION

A distinct collection of plant and animal ecosystems in a geographic area that functions in certain ways and has particular needs for survival. Temperature and precipitation primarily determine most bioregions – with elevation, soils, watersheds, and microclimates as contributing factors.

BROWNFIELD

A previously developed property or site – often having been used for industrial activity – that now is underutilized or not in active use, on land that is either contaminated or perceived as contaminated.

BUILT ENVIRONMENT

Refers to the human-created surroundings that provide setting for human activity, ranging from large-scale civic districts, commercial and industrial buildings, to neighborhoods and individual homes.

"BY-RIGHT" OR "AS OF RIGHT"

Development that may proceed under a zoning ordinance or by-law without the need for a special permit, variance, zoning amendment, waiver or other discretionary zoning approval; provided, however, that "by-right" or "as of right" development may be subject to site plan review.

CARBON FOOTPRINT

A measure of the amount of carbon dioxide (CO2) emitted through the combustion of fossil fuels. In the case of an organization, business, or enterprise, the measure is based on routine operations. For an individual or household, it is a measure related to day-to-day living. A carbon footprint is often expressed as tons of carbon dioxide or tons of carbon emitted, usually on a yearly basis.

CLIMATE CHANGE

Refers to the variation in the earth's global climate (or in regional climates) over time. It describes changes in the variability or average state of the atmosphere. Climate change may result from natural factors or processes (such as changes in ocean circulation) or from human activities that change the atmosphere's composition (such as the burning of fossil fuels or deforestation).

CLUSTER DEVLOPMENT OR OPEN SPACE RESIDENTIAL DEVELOPMENT

A class of residential development in which reduced dimensional requirements allow the developed areas to be concentrated in order to permanently preserve open land for natural, agricultural or cultural resources elsewhere on the plot.

COMMUTE

Regular travel between home and a fixed location (e.g., work, school).

COMPLETE STREET

Designed and operated to ensure safe travel for all users – pedestrians, cyclists, transit-riders, and motorists. Typically, complete streets include sidewalks, bike lanes, and other features and amenities.

COMPREHENSIVE PLAN

A document that guides growth and development for a local jurisdiction.

CONGESTION

A condition characterized by unstable traffic flows that creates stop-and-go movement on a transportation facility. Nonrecurring congestion is caused by actions such as special events, weather, and/or traffic accidents. Recurring congestion is caused by problematic facility design at a key location or constant excess volume compared with capacity.

CONNECTED VEHICLE

Features that enable vehicles to communicate with other vehicles, the infrastructure, or pedestrians.

CONSERVATION EASEMENT

A restriction of the use of land that is voluntarily sold or donated by a landowner to a private land trust or governmental agency.

CONTEXT- SENSITIVE DESIGN

A concept in transportation planning that addresses the physical setting of the project and the preservation of scenic, aesthetic, historic, and environmental resources.

DENSITY BONUS

An incentive that permits developers to increase the number of housing units or commercial floor area ratio allowed by right on a property in exchange for rent restrictions, lowered sales prices, public or other benefit defined by the permitting jurisdiction.

DEVELOPMENT IMPACT FEE

An assessment imposed by a zoning ordinance or by-law to offset the impacts of a development, in an amount roughly proportionate to the impact of the development.

ECOREGION

An ecological area, sometimes called a bioregion that covers a relatively large area of land or water and contains a characteristic, geographically distinct mix of natural communities and species. The biodiversity of flora, fauna, and ecosystems that characterize an ecoregion tend to be distinct from that of other ecoregions.

ECOSYSTEM

The diversity of plant and animal species in a geographic area and how they interact. Biodiversity is the variety of plant and animal species within an ecosystem or geographic area.

ENVIRONMENTAL JUSTICE

The fair distribution of costs and benefits, based on a concern for social equity. Environmental Justice is concerned with the right of all people to enjoy a safe, clean, and healthy environment, and with fairness across income, ethnic, and racial groups in the siting and operation of infrastructure, facilities, and other large land uses, such as power plants or landfills. Presidential Executive Order 12898 (1994) directs federal agencies – and those receiving federal funds – to make environmental justice part of their missions by identifying and addressing the effects of all programs, policies, and activities on minority and low-income populations.

FAMILY WAGE

The wage required to meet the basic needs and costs of supporting a family independently. Factors for determining family wage include housing, food, transportation, utilities, health care, child care, and recreation.

FARMLAND PRESERVATION

The purchase of development rights or a conservation easement from a farmer so that the land can be used only for farming or as open space.

FLEXIBLE ZONING

A practice that permits land uses and density of buildings and structures different from those which might otherwise be allowed by right. The intent is to be more adaptable and to streamline the development process for achieving a desired land use outcome.

FLOOD STORAGE

The interceptions, capture, and retention of water, primarily in wetlands associated with rivers and lakes, to reduce the duration and severity of floods. Storage areas can also be used to intercept surface water flow and slow it down, reducing the potential for floods and minimizing drought.

FORECAST

Projection of population or employment for a given future year.

FORM BASED ZONING

Text and graphics in a zoning ordinance or by-law that specify the built form of the community, general intensity of use, and the relationship between buildings and the outdoor public spaces they shape.

FRAGMENTATION OF HABITAT

The division of an ecological system or habitat that once was continuous.

GLOBAL WARMING

The increase in the average temperature of the earth's near surface air and oceans in recent decades and its projected continuation. Global warming can occur from a variety of causes, both natural and human induced. The term often refers to the warming that can occur as a result of increased emissions of greenhouse gases from human activities.

GREEN BUILDING (ALSO GREEN DESIGN)

Building design that yields environmental benefits, such as savings in energy, building materials, and water consumption, or reduced waste generation. Green development minimizes energy consumption, pollution, and the generation of wastes, while maximizing the re-use of materials and creating healthful indoor environments.

GREYFIELD

An older, economically obsolete retail or commercial area. Greyfield malls may have outdated buildings and large areas devoted to parking lots. Many fail to generate the revenue that would justify continued use in their current form.

GOAL

In the planning process, a goal identifies a desired end state.

HABITAT

The natural home of a plant or animal.

HIGH-OCCUPANCY VEHICLE (HOV)

A motor vehicle with two or more people traveling in it. Includes carpools, vanpools, and transit. A *high-occupancy vehicle lane* refers to a highway and arterial lane restricted to vehicles carrying multiple occupants or passengers.

HOUSING AFFORDABILITY

The balance (or imbalance) between housing costs and income within a defined area, such as an urban region.

INCLUSIONARY HOUSING

An affordable housing unit or a housing unit restricted for purchase or rent by a household with an income at or below 120 percent of the median family income determined by the United States Department of Housing and Urban Development for the applicable metropolitan or nonmetropolitan area; provided, however, that a municipality may set the income thresholds for inclusionary housing at a level at or below 120 percent of median income.

INCLUSIONARY ZONING

Zoning ordinances or by-laws that require the creation of affordable housing or inclusionary housing.

INTELLIGENT TRANSPORTATION SYSTEMS (ITS)

Advanced technologies that improve the safety and efficiency of the transportation system by collecting, analyzing, and communicating information in real time.

IMPACT FEES

Costs imposed on new development to fund public facility improvements required by new development and ease fiscal burdens of providing services on localities.

IMPERVIOUS SURFACE

Surfaces – such as rooftops, sidewalks, roads, and parking lots – covered by impenetrable materials, including asphalt, concrete, brick, and stone. These materials seal surfaces, repel water and prevent precipitation and runoff from infiltrating into soils.

INCOMPATIBLE LAND USES

Facilities or activities on a site that have negative effects on adjacent properties.

INFILL DEVELOPMENT

Projects that use vacant or underutilized land in areas that were previously developed.

INTERMODAL

Accommodation or interconnection of various transportation modes for the movement of both people and goods.

INVASIVE SPECIES

An introduced species or non-indigenous species that expands outside of its native range, often in detrimental way to local species.

JOBS-HOUSING BALANCE

A planning concept which advocates that housing and employment be in relative proximity so as to reduce the length of commute travel or vehicle trips altogether.

JOINT PLANNING

Cooperative planning between two or more jurisdictions or agencies.

LANDSCAPE ECOLOGY

The study of how multiple ecosystems fit together into an interconnected and interdependent mosaic within a region.

LEADERSHIP IN ENERGY AND ENVIRONMENTAL DESIGN (LEED)

A rating system for green buildings, developed by the US Green Building Council, which provides standards for sustainable construction, including a number of energy and environmental measures.

LEVEL-OF-SERVICE STANDARD

A mechanism used to determine if a given facility or service is operating efficiently. Innovations in level-of-service for transportation now take into account overall people-moving performance, rather than focusing on traditional assessments of vehicular volume and capacity.

LOT

An area of land in one ownership, with defined boundaries, used or available for use as the site of one or more buildings.

LOW-IMPACT DEVELOPMENT

An approach to environmentally friendly land use planning. Includes a number of landscaping and design techniques to maintain the natural, pre-developed ability of a site to manage stormwater. More broadly, it refers to a range of development techniques that have minimal environmental or energy-related impacts.

MANUFACTURING/INDUSTRIAL CENTER

An area of intensive manufacturing and/or industrial activity.

MEASURE

An indicator used in determining how adopted provisions are performing.

METROPOLITAN PLANNING ORGANIZATION (MPO)

The federally mandated forum for cooperative transportation decision-making in a metropolitan area.

MINOR SUBDIVISION

The division of a lot, tract or parcel of land into two or more lots, tracts or parcels where, at the time when it is made, every lot within the lot, tract or parcel so divided has frontage on: (1) a public way or a way in which the clerk of the city or town certifies is maintained and used as a public way; (2) a way shown on a plan approved and endorsed in accordance with the subdivision control law; (3) a way in existence when the subdivision control law became effective in the city or town in which the land lies having, in the opinion of the planning board, sufficient width, suitable grades and adequate construction to provide for the needs of vehicular traffic in relation to the proposed use of the land abutting thereon or served thereby and for the installation of municipal services to serve the land and the buildings erected or to be erected thereon;

provided, however, that the frontage shall be of at least the distance as is then required by the zoning ordinance or by-law, if any, for erection of a building on the lot, and if no distance is so required, the frontage shall be of at least 20 feet, or (4) a new way to be created by the sub-divider.

MIXED-USE DEVELOPMENT

Projects or districts that include residential, commercial, and business accommodations. Vertical mixed-use development refers to buildings that have multiple uses in a single structure, such as ground-floor retail, office, and residences. Horizontal mixed-use development refers to districts where zoning allows for different uses to be in adjacent buildings and complexes.

MOBILITY

The ability of people to move about the region from one location to another.

MODE SPLIT

A term that describes the relative number of people using various forms – or modes – of transportation. Frequently used to describe the percentage of people using private automobiles as opposed to the percentage using transit.

MONITORING

An organized process for gathering and assessing information related to achieving established goals and policies. The process uses performance indicators to show progress toward, movement away from, or static state in policy implementation or policy achievement. Implementation monitoring tracks whether agree-upon actions are taking place. Performance monitoring assesses whether desired results are achieved.

MULTI-FAMILY HOUSING

A building with 3 or more residential dwelling units or 2 or more buildings on the same lot with more than 1 residential dwelling unit in each building.

MULTIMODAL

Those issue or activities which involve or affect more than one form – or mode – of transportation, including transportation connections, choices, cooperation, and coordination of various modes. (See also *Intermodal)*

MUNICIPAL AFFORDABLE HOUSING CONCESSIONS

Measures adopted by a municipality to contribute to the economic feasibility of an inclusionary-zoned residential or mixed-use development, including, but not limited to, increases in the otherwise maximum allowable density, floor-area ratio or height or reductions in otherwise applicable parking requirements, permitting fees and timeframes.

MUNICIPAL AFFORDABLE HOUSING TRUST FUND

The Massachusetts Affordable Housing Trust Fund (AHTF) was created with the enactment of Section 227 of Chapter 159 of the Acts of 2000, now known as Chapter 121D of the Massachusetts General Laws (the Statute). The AHTF is designed to provide resources to create or preserve affordable housing throughout the state for households whose incomes are not more than 110% of median income, as determined by the U.S. Department of Housing and Urban Development (HUD).

NATURAL RESOURCE PROTECTION ZONING

Zoning ordinances or by-laws enacted principally to protect natural resources by establishing higher underlying density divisors relative to other areas, a formulaic method to calculate development rights and compact patterns of development so that a significant majority of the land remains permanently undeveloped and available for agriculture, forestry, recreation, watershed management, carbon sequestration, wildlife habitat or other natural resource values.

NON-MOTORIZED

Generally refers to bicycle, pedestrian, and other modes of transportation not involving a motor vehicle.

OPEN SPACE

A range of green places, including natural and resource areas (such as forests), recreational areas (such as parks and trails) and other areas set aside from development.

OZONE

An air pollutant that is a toxic, colorless gas which is the product of the reaction of hydrocarbons (HC) and oxides of nitrogen (NOx) in the presence of sunlight in the atmosphere. Automobile emissions are the primary source of ozone.

PARATRANSIT

Transit service that is scheduled or dispatched upon demand, providing "point-to-point" travel. Normally used in specialized applications with user eligibility limitations (e.g., elderly and/or handicapped) or where demand is not sufficient to support fixed-route service.

PARTICULATE MATTER

A pollutant consisting of liquid and solid particles in the air, such as soot, dust, and smoke. Particulate matter pollution includes inhalable coarse particles of 10 micrometers or less in diameter (PM10), and fine particles of 2.5 micrometers or less in diameter (PM2.5). These particles may pose serious health problems, such as heart and lung ailments, as

well as environmental consequences, such as reduced visibility. Automobiles, particularly those fueled with diesel, are a significant source of particulate matter.

PEDESTRIAN-ORIENTED DEVELOPMENT

The development and siting of housing, commercial space, services, and job opportunities in a manner that accommodates walking. Such development is intended to create more vibrant urban areas and to reduce dependence on automobile travel.

PERMIT GRANTING AUTHORITY

The board of appeals, zoning administrator or planning board as designated by zoning ordinance or by-law for the issuance of permits or as otherwise provided by charter.

PRESERVE

To maintain intact or unchanged. In environmental planning, to set aside an environmental feature or natural resource to prevent its alteration.

PROTECT

To keep from injury, harm, or damage. In environmental planning, to prevent and, where possible, reverse environmental degradation or pollution.

PUBLIC SERVICES

Facilities and infrastructure, including sanitary and storm sewer systems, water supply, energy, telecommunications, public safety and emergency services, schools, libraries, and other facilities.

PURCHASE OF DEVELOPMENT RIGHTS

Programs through which local governments restrict development by purchasing rights to develop from private landholders.

RECYCLING

The process by which waste materials are collected and reused for new products.

REDEVELOPMENT

The restoration or improvement of an existing structure or property.

REGIONAL GEOGRAPHY

Groupings of cities, along with the unincorporated urban growth area, rural areas, and designated resource lands which are used for planning and growth distribution purposes.

RENEWABLE ENERGY

Energy sources that can be regenerated and that are much less polluting than nuclear power or fossil fuels, such as wind, solar power, biomass, and hydropower.

RENEWABLE RESOURCE

A natural resource that is able to regenerate, either by itself, or with human help, over a short to moderate time horizon, such as fish, food crops, and trees.

RESOURCE LANDS

Lands that support resource-based industries, such as timber harvesting and farming. Sometimes shorelines are included – especially where fish and other aquatic species are harvested.

RURAL AREA

Outside the urban growth area, rural lands contain a mix of low-density residential development, agriculture, forests, open space and natural areas, as well as recreation uses. Counties and adjacent small towns provide a limited number of public services to rural residents.

RURAL TOWN

A municipality with a population density of less than 500 people per square mile as determined by the most recent decennial federal census.

SENDING AREA

Part of a transfer of development rights program, sending areas are locations where landowners are enabled to sell the development rights on their property for transfer to more appropriate or other areas where development is desired. Sending areas often include properties with agricultural, environmental or historic importance.

SINGLE-OCCUPANCY VEHICLE (SOV)

A motor vehicle occupied by the driver only.

SHADOW PLATTING

A document or other device on showing a configuration of potential future land use parcels consistent with anticipated future development and density requirements. This serves as a guide for future development, especially in unincorporated areas.

SITE PLAN

The submission made to a municipality that includes documents and drawings required by an ordinance or by-law showing the proposed on-site arrangement of buildings, structures, parking, pedestrian and vehicle circulation, utilities, grading and other site

features and improvements existing or to be placed on a parcel of land in connection with the proposed use of land or structures.

SMALL CITY

A regional geography in VISION 2040 that refers to those cities without a regionally designated center that have a combined total population and employment of less than 22,500.

SOLID WASTE

Refuse generated by individual households and businesses.

SPECIAL NEEDS HOUSING

Housing arrangements for populations with special physical or other needs. These populations include: the elderly, disabled persons, people with medical conditions, homeless individuals and families, and displaced people.

SPECIAL SERVICE DISTRICT

Limited purpose local governments separate from a city, town, or county government. Generally they perform a single function, though some do perform a limited number of functions. School districts and transit districts are examples of special service districts.

STEWARDSHIP

Taking responsibility for actions affecting the natural or built environment. Stewardship demonstrates acceptance of this responsibility through the continuous improvement of environmental performance by individuals, communities, the private sector, and governmental agencies.

STORMWATER MANAGEMENT SYSTEM

An infrastructure system that collects runoff from storms and redirects it from streets and other surfaces into facilities that store and release it — usually back into natural waterways.

SUSTAINABILITY

Commonly defined as "meeting the needs of the present without compromising the ability of future generations to meet their own needs." Encompasses environmental, economic, social, and institutional factors.

TARGET (ALSO GROWTH TARGET)

The number of either residents, jobs, or both that a jurisdiction is expected to plan for in its comprehensive plan.

TELECOMMUNICATIONS

The conveyance of information by electronic means. Examples include the telephone, interactive cable facilities, computer networks, and video conference centers.

TRANSFER OF DEVELOPMENT RIGHTS

The regulatory procedure whereby the owner of a parcel may convey development rights to the owner of another parcel and where the development rights so conveyed are extinguished on the first parcel and may be exercised on the second parcel in addition to the development rights already existing regarding that parcel. A system that gives landowners the option of selling the rights to further develop the land. By selling development rights, a landowner gives up the right to develop his/her property, but the buyer could use the rights to develop another piece of land at a greater intensity than would otherwise be permitted.

TRANSIT-DEPENDENT

Individual(s) dependent on public transit to meet personal mobility needs (e.g., unable to drive, not a car owner, not licensed to drive).

TRANSIT-ORIENTED DEVELOPMENT

The development of housing, commercial space, services, and job opportunities in close proximity to public transportation. Such development is intended to reduce dependency on automobiles, as well as to improve mobility and access between residences, jobs, and services.

TRANSPORTATION DEMAND MANAGEMENT

A concept designed to reduce or eliminate vehicle trips, including a variety of programs and strategies, such as carpool/vanpool, flextime, working from home, and ride matching.

TRANSPORTATION IMPROVEMENT PROGRAM (TIP)

The multiyear program of transportation projects for highways, transit, and other modes. The regional TIP consists of projects and programs drawn from the Metropolitan Transportation Plan, as well as from local plans and the transportation programs of other agencies in the region.

TRANSPORTATION SYSTEM MANAGEMENT

Improvements to existing transportation facilities that increase the flow of travel, such as ramp metering and signal synchronization. Such improvements typically have a lower capital cost than major construction and can be implemented in a relatively short time.

UNIVERSAL DESIGN

Designing without products for the home and living environments to be used by all people, regardless of their special needs or age, without requiring special adaptation.

VEHICLE MILES TRAVELED

A measurement of the total miles traveled by all vehicles for a specified time period. For transit, the number of vehicle miles operated on a given route, line, or network during a specified time period.

WORKFORCE HOUSING

Housing affordable to households with at least one full-time worker.

WORKING LANDSCAPE

Lands that are used as farms, ranchlands, timberlands, and mines.