INFRASTRUCTURE AND ECONOMIC DEVELOPMENT IN METROPOLITAN BOSTON: A REGIONAL SURVEY

EXECUTIVE SUMMARY

Preface

The Greater Boston that we know today is the economic product not only of the ingenuity of its people, but of the transformative investments they have made for four centuries in the region's infrastructure. In Boston's core, much of the ground on which we live and work was created by filling Town Cove, Mill Cove, Back Bay, South Bay, Commonwealth Flats, the Miller's River, and other historic waterways. Some of these filled lands were created for maritime, rail, and canal transportation to fuel earlier generations of development. Over time, those tideland transportation facilities have been modernized, or replaced by different technologies, or recycled for the mixed-use, knowledge based urban development of the late twentieth and early twenty-first centuries.

When the Legislature was considering the Massachusetts Water Resources Enabling Act in 1984, the pollution of the harbor—in violation of federal and state law—had the regional economy a step away from a moratorium on sewer connections and, effectively, on normal growth. The region's water supply system was in more precarious condition than generally understood. Three decades and seven billion dollars later, our regional water resource systems are among the nation's best, providing a reliable platform for growth. This transformation is an echo of the work of earlier generations in creating the Cochituate Reservoir and then the Wachusett and then the Quabbin.

Today's regional transit system, for all its needs going forward, stands on a monumental base of investment over the last four decades: the Southwest Corridor and the Orange Line extension to Melrose; the Red Line Extensions to Alewife and Braintree; the creation of the Silver Line; the rebirth of the north and south commuter rail systems and, with them, North and South Stations. These investments reflect Greater Boston's earlier role as a transit pioneer—from the Winnisimmet Ferry to the regional railroads of the 1830s; from the first streetcar lines of the mid-nineteenth century to the Tremont and East Boston subways at the turn of the twentieth. What other American cities are striving for today—a sustainable, competitive pattern of development in dense, walkable communities organized around transit—is what Greater Boston has had for 140 years.

The metropolitan Boston highway system connects the streets of every downtown, neighborhood business district, and industrial park to the interstate highway system. In a sixty-year span, two iconic highway investments helped redefine the socio-economic fabric of Greater Boston and its role in the national economy. Route 128 fueled the rise of high technology and the diffusion of commercial, industrial, and residential capital to what were once the outer edges of the region. The Big Dig reinforced the emergence of the region's historic core as its twenty-first century development frontier, enhancing mobility, Smart Growth, and the attraction of new and old Bostonians to the waterfront and the transit system.

This Study

This study was commissioned by A Better City (ABC), with funding from The Boston Foundation. The research and writing was carried out by the consulting firm AECOM, with guidance from ABC staff and an Advisory Committee which ABC convened for this study. The study seeks to evaluate the state of

public infrastructure investment in metropolitan Boston, particularly as it relates to the region's potential for near- and longer-term economic development.

The contemporary relationship between infrastructure and economic development is hardly a new topic. It is the subject of many recent analyses and a theme of daunting breadth and depth. The intended contribution of this study is to deepen the discussion by linking infrastructure investments—and the consequences of making or not making them in timely fashion—to concrete economic development agendas in the cities and towns of Greater Boston. ABC's strategy for doing so in this study is to start with a review of infrastructure issues at the regional level and progressively "drill down" to subregional and local examples.

The ABC Metropolitan Infrastructure and Economic Development Survey is organized as follows:

- This Executive Summary describes all sections of the study, summarizes the research, and states the principal conclusions. The Executive Summary also introduces the study's analytic framework—its approach to defining the metropolitan region, economic development, and public infrastructure for purposes of this analysis.
- Part I: Regional Infrastructure Review. This is the study's region-level overview of infrastructure issues. It summarizes and organizes a large body of relevant analysis conducted by others and adds current information on key initiatives and concerns.
- Part II: Area Profiles. Twenty-five "economic development areas" were defined by the study to represent the universe of region-scale economic development opportunities in metropolitan Boston, from the inner core to I-495. Each profile summarizes the key development opportunities and infrastructure needs of the area in question. This chapter is the "hinge" between the regional overview which precedes it and the detailed case studies which follow.
- Part III: Case Studies. The heart of the study is a set of four geographic Case Studies, which explore in detail the interface of development and infrastructure issues in a diversity of settings. They include the inner core cluster of East Cambridge and East Somerville; the North Shore cities of Lynn, Salem, Beverly, and Peabody; the MetroWest towns of Framingham, Natick, and Ashland; and the I-495 town of Franklin.

Parts I, II, and III are summarized here and are available in their entirety on the ABC website at http://abettercity.org/about/publications.html.

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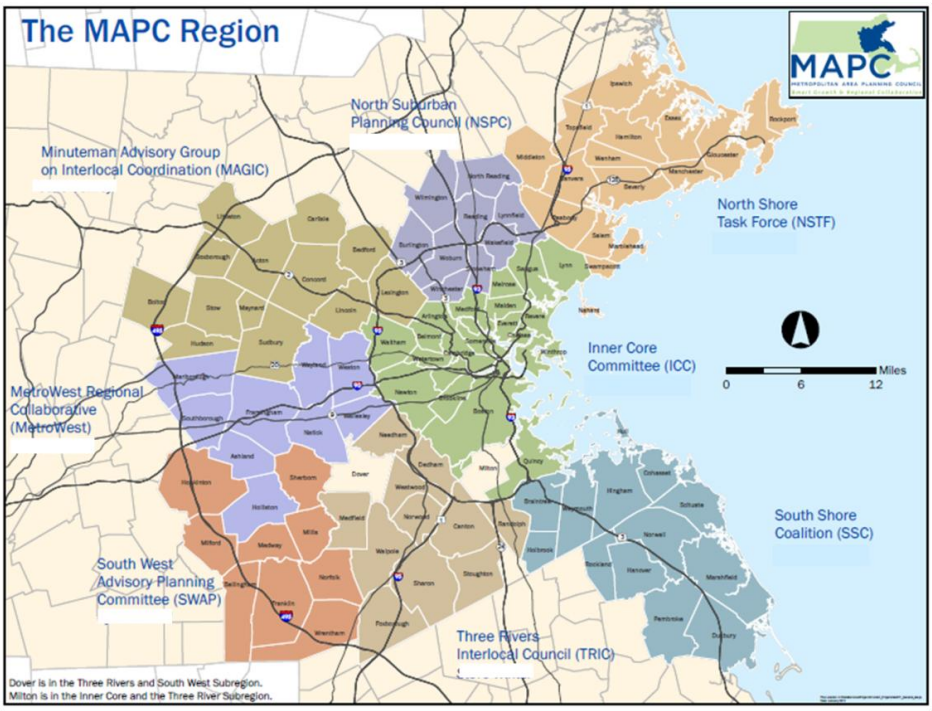
Analytic Framework

Defining the Region

In this study, metropolitan Boston is defined as the 101 municipalities—22 cities and 79 towns—in the Metropolitan Area Planning Council (MAPC) region. For planning purposes, as shown in Figure 1, MAPC divides the region into eight smaller, easily understood subregions, which are used in a variety of contexts in this report.

Figure 1: MAPC Region and Subregions [1]



The subregions, and the MAPC consortia that direct their planning efforts, are:

- Inner Core Committee (ICC)
- Minuteman Advisory Group on Interlocal Coordination (MAGIC)
- MetroWest Regional Collaborative (MWRC)
- North Shore Task Force (NSTF)
- North Suburban Planning Council (NSPC)
- South Shore Coalition (SSC)
- Southwest Advisory Planning Committee (SWAP)
- Three Rivers Interlocal Council (TRIC).

Economic Development and Smart Growth

ABC recognizes Smart Growth as an organizing framework for regional infrastructure and development planning. Smart Growth means, among other things, that new development is concentrated in places where substantial infrastructure is already in place—city and town centers, established employment districts, brownfields, and other places with an existing or historic built environment. New development

that does occur outside built-up areas is concentrated in locations where density, and thus a relatively cost-effective investment in new infrastructure, can be achieved going forward.

The region has a strategy in place to promote Smart Growth over the next two decades and beyond—*MetroFuture: Making a Greater Boston Region*, published in 2008 by MAPC.[2] MetroFuture is a planning scenario that departs from current trends to steer development in a Smart Growth direction. While it lacks regulatory authority, it can be used by its many stakeholders to guide land use and infrastructure decisions. MetroFuture sets forth 65 specific, inter-related planning goals, ranging from land use and infrastructure to open space, affordable housing, public health, and historic preservation. The first five of these goals bear directly on this report: [3]

1. Population and job growth will be concentrated in municipalities already well served by infrastructure, with slower growth in less developed areas where infrastructure is more limited.
2. Throughout the region, most new growth will occur through reuse of previously developed land and buildings.
3. Brownfields and other polluted sites will be cleaned up and re-used for parks or development.
4. In suburban municipalities, most new growth will occur near town and village centers.
5. Most new homes and jobs will be near train stops and bus routes, and new growth will be designed to promote transit use.

Among MAPC's strategies for advancing MetroFuture, two were of particular use in framing this analysis. One is the designation of Priority Development Areas by MAPC and its subregional consortia. The other is the organization of growth planning, where applicable, around transit stations and corridors—the concept broadly known as transit-oriented development. "TOD" is not applicable everywhere, but it is a growth strategy shared by ABC, MAPC, the Commonwealth, many cities and towns, and a growing number of developers and employers. In its 2012 report, *Growing Station Areas*, MAPC estimated that a potential of 76,000 new residential units and commercial space for 133,000 jobs could be built near MBTA rapid transit and commuter rail stations by 2035—*representing 31% of regional housing demand and 58% of employment growth*. [4]

Public Infrastructure

For purposes of this study, the region's public infrastructure consists of four domains:

- surface transportation, including roads, bridges, transit systems, and railroads
- water resources, including water supply, sewerage, stormwater management, and dams
- energy, specifically the electric power supply
- telecommunications, specifically broadband voice and data service.

Part I: Regional Infrastructure Review

For each of the four infrastructure domains, Chapter I presents an overview of "the state of the system". The discussion addresses the basic elements of each system, its condition and capacity relative to economic development needs, and, where applicable, any identified gap between investment needs and identified resources. The four infrastructure domains are addressed in order of complexity, at least with respect to the scope and subject matter of this analysis.

Surface Transportation

In the last two decades, Massachusetts has added significantly to the region's transportation assets: the Artery-Tunnel Project; on-going improvements on Route 128; the Accelerated Bridge Program and a series of high-profile bridge rebuilding projects, including the Longfellow, Whittier, and Fore River Bridges; Silver Line I and II; the Blue Line Modernization; rebuilt stations at Ashmont, Kenmore, Arlington, Charles, and Science Park; the restoration of the three-branch Old Colony rail system; new commuter rail service to Worcester, Newburyport, and Rhode Island and improved service to Fitchburg; expanded commuter rail parking; and successful advocacy for Amtrak's Acela and Downeaster.

Nonetheless, the region's surface transportation infrastructure is at a well-documented crossroads, with a significant and widening gap between needs and resources. The region cannot remain economically competitive, and local development plans cannot advance very far, unless roadways and bridges are maintained. And a regional land use and growth strategy that seeks to maximize transit-oriented development cannot succeed unless our rapid transit, commuter rail, and bus systems are kept in a state of good repair with some capacity for the highest priority expansion projects. In 2007, the Transportation Finance Commission empanelled by the Legislature three years earlier issued its report. Subsequent analyses have updated, not refuted, its core finding: [5]

> *Over the next 20 years, the cost **just to maintain our transportation system** exceeds the anticipated resources available by **$15 billion to $19 billion**. This does nothing to address necessary expansions or enhancements. (Transportation Finance Commission, 2007)*

Transit. The MBTA is one of the nation's legacy transit systems and its fifth-busiest. It is indispensable to the region's economy, not only because it carries a record 1.3 million riders every weekday, but because the region cannot solve its roadway congestion issues by building new highway capacity. After last year's temporary measures to balance its 2013 operating budget, the MBTA faces a potential $140 million operating deficit in 2014—a deficit widely understood to be structural.

Beyond operations, the MBTA faces a growing "state of good repair" (SOGR) funding gap. In 2007, the T's own projected requirement for annual SOGR investment was $470 million. The Transportation Finance Commission estimated the need at $570 million, and in 2009, the independent review of MBTA finances led by David D'Alessandro placed the number going forward at $694 million.[6] No combination of the T's own current revenues and foreseeable FTA funding levels will support that level of investment, which the MBTA's FY13-17 Capital Investment Program places at $2.9 billion during that five-year span. Aside from the Green Line extension, SOGR constitutes virtually the entire five-year capital plan.[7]

The core of the rapid transit system is of unique importance, both to nurture long-term development along the "spokes" of the rail system and to sustain the regional employment centers of the Seaport, Downtown, Back Bay, Kendall, and Longwood Medical Area.[8] The *Hub and Spoke* report published in 2012 by the Urban Land Institute and Northeastern University's Dukakis Center identified congestion issues on core segments of the Orange, Red, and Green Lines. For the next ten years, the report anticipates potential

ridership increases of 100,000 to 367,000. Yet the Orange and Red Line fleet replacements, and the needed upgrades of the Green Line's power, switching, and signal systems, are not fully funded.[9]

The MBTA at a crossroads:

- *$132 million operating deficit*
- *Highest debt of any US transit system*
- *$2.9 billion state of good repair backlog*
- *System core facing overload and delay*
- *Minimal funding for new projects*

In addition to state of good repair, the MBTA's capital program in the metropolitan region includes a handful of enhancements and expansions, funded with non-MBTA sources. Underway are some potentially transformative projects: the Green Line Extension, the Fairmount or "Indigo" Line, Assembly Square Station, the Wonderland garage and TOD infrastructure, the downtown Beverly and Salem commuter and TOD garages. On the horizon are several additional projects, all in the core of the system, whose outcome will have a significant long-term effect on regional development: the expansion of South Station; the completion of the Silver Line; the Red-Blue Connector; and individual segments of the former Urban Ring. These simply cannot be built within the system's current financial parameters.

The roots of the MBTA's structural deficit are by now familiar: the underperformance of its dedicated penny of the sales tax, and the unique burden of the largest bonded debt and highest annual debt service of any transit agency in the country, due largely to "forward funding" and Artery-Tunnel-related mitigation commitments. Underlying the shortfalls in both transit and highways is the inexorable erosion in value of the state gasoline tax (last raised in 1991) and the federal gasoline tax (last raised in 1993); each has lost about one-third of its purchasing power in the intervening two decades and will continue to do so until and unless the gas tax is increased or replaced by an alternative. The federal Highway Trust Fund has staved off insolvency three years in a row only because Congress was willing to fill the gap with General Fund appropriations rather than confront the gas tax head-on. The recent enactment of MAP-21 (a two-year reauthorization of highway and transit programs) defers the revenue issue for that long.

Roads and bridges. The MassDOT Highway Division, created by the 2009 reform act, encompasses the former Highway Department and Turnpike Authority; the Highway Division also acquired the Tobin Bridge from Massport and assumed operation and maintenance (but not ownership) of the Department of Conservation and Recreation's parkways and bridges (the former MDC parkway system). There are approximately 72,000 lane miles of roadway in the Commonwealth; the 13% of those lane miles under the jurisdiction of MassDOT carry 58% of the annual vehicle miles traveled in the Commonwealth.[10]

A primary method for identifying and prioritizing maintenance needs is a Pavement Management System. To achieve the desired targets in the five-year span from FY11-FY15 would require an annual investment of $313 million. On the Interstate side, 55% of the need is funded. On the non-Interstate side, where pavement deficiencies are more acute, the five-year need was estimated at $925 million and available funding at $88 million—*simply put, MassDOT can fund less than 10% of its non-Interstate pavement upkeep needs during this five-year period.*[11]

Cities and towns, which own 55,000 of the state's 72,000 lane miles, rely mainly on real estate taxes and the state's Chapter 90 program to maintain them. The Massachusetts Municipal Association estimates that cities and towns would need to spend more than $300 million annually to reconstruct the worst local roads and keep the rest in good condition—well above recent Chapter 90 funding levels, even taking into account the $200 million for 2012 proposed by Governor Patrick and enacted by the Legislature.[12]

There are over 5,000 bridges in the Commonwealth, of which some 3,500 are owned by MassDOT and 1,500 by other agencies or municipalities.[13] More than 40% of bridges in Massachusetts were built between 1950 and 1970, and the average age is about 45, which means that many will need rehabilitation

or replacement as they near the end of their useful lives.[14] There is thus a resource allocation tension between preventative repairs to bridges that have not yet become structurally deficient and the need to rebuild those that already are.

Highways and bridges at a crossroads:

- *10% of non-interstate pavement upkeep funded.*
- *Chapter 90 far short of local needs, even after large 2012 enactment.*
- *Landmark Accelerated Bridge Program can reach less than half of deficient bridges at current levels.*
- *Congestion worsening, no broad-based capacity expansion solution.*

The $3.0 billion Accelerated Bridge Program (ABP), proposed by the Governor and enacted in 2008, is targeted mainly at structurally deficient bridges. Thanks to the ABP, since 2008 the number of former Mass Highway and DCR structurally deficient bridges has dropped from 543 to 439, a decline of 19.2%. As of June 2012 the program has completed 90 bridge projects, with another 72 in construction and an additional 25 scheduled to start construction within the next year. Over the course of the eight-year program, more than 200 bridges are planned to be replaced or repaired.[15]

Yet the ABP, as historic and ambitious as it is, will not reach half of the structurally deficient bridges it inherited in 2008. To replace or rebuild the remaining structurally deficient bridges that already exist, and to minimize the number of additional bridges that will slide into deficiency as the inventory ages, the regular (non-ABP) Statewide Bridge Program will require significant on-going investment. MassDOT's 2010 *Five-Year Capital Plan* estimated a need of $1.525 billion for the five years from FY11-FY15, with resources identified for less than half that amount.[16]

Congestion and failure on the highway and bridge network impose a quantifiable cost on the regional economy. In metropolitan Boston, 58% of vehicle-miles traveled are in congested conditions.[17] According to one analysis, the cost of congestion in metropolitan Boston increased from $550 million in 1991 to $1.8 billion in 2005—$895 per driver, reflecting higher operating costs and the value of time.[18]

There is a broad policy consensus that regional congestion cannot be overcome solely or primarily by highway system expansion. MassDOT's current five-year plan does include a short list of widening and expansion projects in the metro region—the Route 128 add-a-lane and I-93/95 interchange, the Route 18 widening, the Saugus Route 1 add-a-lane, the Crosby's Corner Improvements.[19] These are important for economic development; but beyond them, the vast majority of planned (and underfunded) highway and bridge investments will be directed *at preserving the system we have, at a higher level of performance than we currently enjoy.*

Freight. Some 87% of Massachusetts freight movement is by truck; the heaviest corridors are those carrying trucks eastward and northward into Massachusetts: I-84, I-90, I-95, and the northern arcs of I-290 and I-495. Only 5% of the state's 2007 freight volume moved by rail, and 7.5% by maritime port. Air freight, while proportionately high in value and critical to the regional economy, accounts for a negligible fraction of tonnage.[20] Highway congestion is caused, to a disproportionate degree, by truck traffic—only 15% of Massachusetts highway volume, and 9% of the volume on major highways in metro Boston, involve trucks; but trucks are larger, and accelerate and decelerate more slowly, than cars. They also inflict proportionally more wear and tear on pavement and bridge structures, leading to additional congestion. Freight volumes in Massachusetts are projected to increase *70% by 2030*, and the overwhelming majority will continue to move by truck.[21]

The state's 2010 Freight Plan recognizes that a multi-billion dollar highway capacity program is neither affordable nor environmentally desirable. It recommends a shorter list of high-return, system-level interchange improvements, and a menu of rail, port, and intermodal improvements that could shift a meaningful percentage of freight movement away from congested highways. The Texas Transportation

Institute projects that by shifting 25% of projected truck traffic to freight railroads, workers in the Boston metropolitan area would save an average of 33.2 hours commuting annually.[22]

Water Resources

MWRA water and sewer. Since 1985, metropolitan Boston has undertaken, and substantially completed, a massive realignment, expansion, and modernization of its water supply and wastewater systems, through the creation of the Massachusetts Water Resources Authority (MWRA), whose $7.1 billion of investments has cleaned Boston Harbor, stabilized and modernized the drinking water supply, and largely eradicated the combined sewer overflow problem in the region's core. Without these investments, economic development would have been drastically limited—not only because development needs reliable, high-quality water and sewer services, but because in the case of the sewer system, a judicial moratorium on sewer connections was a step away from reality in 1984. The coalition that successfully pushed for creation of the MWRA included the region's business and labor leadership.

However, the reach of the MWRA systems is limited in two ways. First of all, the MWRA is a *"wholesale"* provider; its customer municipalities control the local or "retail" pipes and pumping stations that draw water from the MWRA supply system or feed the MWRA wastewater system. Second, MWRA covers only part of the region. Nearly half of the MAPC's 101 communities receive neither water nor sewer service from the MWRA, and only 30 receive both water *and* sewer.[23] The ability of cities and towns to maintain their local systems, or to expand their reach and capacity to serve priority development areas, represents a cumulative region-wide challenge in the billions of dollars.

Non-MWRA water and sewer. Outside the MWRA service area, communities maintain their own water supplies or purchase water from neighboring communities. On the wastewater side, non-MWRA communities belong to smaller regional districts (like the South Essex Sewerage District or Charles River Pollution Control District) or maintain their own treatment facilities. (Statewide, some 435 million gallons of wastewater are treated by 126 state and federally permitted wastewater treatment facilities, most with capacities below two million gallons per day.)[24]

The Massachusetts Water Infrastructure Finance Commission (WIFC) was formed in 2009 to quantify the funding needed to adequately manage water and wastewater infrastructure, and to identify ways to fill the funding gap through proactive planning and reforms. In addition to the on-going investment program at MWRA, the Commonwealth has since 1989 offered low-interest State Revolving Fund (SRF) financing to communities to fund water and wastewater projects implemented by municipalities and regional water supply or wastewater treatment districts.

WIFC estimates that the Commonwealth faces a $10.2 billion gap in resources for drinking water and a $11.2 billion gap in resources for wastewater projects over the next 20 years. Through estimates from the American Water Works Association, WIFC projects that costs for pipe replacement and repair in metropolitan Boston will grow to $5 billion by 2030 based on the estimated age of pipes and their life expectancy.[25] Most water mains installed 100 years ago are still in the ground; 10% of water loss in the Commonwealth is estimated to originate from deteriorating mains.[26] In some older towns and cities, sewer pipes are over 100 years old, and the service life of these pipes is estimated at 50-75 years.[27]

Economic development relies on the existence of water resource infrastructure and its capacity to meet future demand. While the MWRA has available water supply capacity, its wastewater capacity is nearly taken, due in part to infiltration and inflow. Moreover, according to the 495/MetroWest Compact, the volume of wastewater managed by existing municipal wastewater treatment facilities has been increasing faster than population and employment growth in the MetroWest region. [28]

The relationship between water or wastewater deficiencies and Smart Growth is complex. Portions of some outlying MAPC communities remain unsewered, and in general, Smart Growth principles would suggest that these lands not be considered as future development areas. On the other hand, to the degree that areas appropriate for development lack sewer service, residential growth may fall back onto large-lot, low-density patterns that can be get by with septic systems.

Stormwater. Stormwater management is emerging as the "next big thing" in water resource infrastructure. Most cities and towns have storm sewers in their developed areas, but these systems are aging and of varying quality. EPA is currently preparing to issue renewed General Permits for stormwater discharges in general and municipal storm sewers in particular; the new "MS4" regulations will affect 99 of the 101 MAPC communities and could impose significant new requirements for system upgrades, outfall monitoring, and, in some cases, discharge treatment. In the Charles River Watershed, even more extensive long-term measures are under consideration. Cumulatively, stormwater management may represent another multi-billion dollar regional need, with eventual impacts on economic development.

Energy

The availability of adequate electric power is virtually a given throughout the region. The principal issues and opportunities related to electric power are those associated with changes in the market, particularly the series of public policy shifts contained in the state's *Clean Energy and Climate Plan for 2020*. This plan, which is mandated by the 2008 Global Warming Solutions Act, incorporates the state's pre-existing policies for Renewable and Alternative Portfolio Standards, and includes additional state and EPA policies designed to push the market into generating and importing cleaner power. The Plan sets a 25% greenhouse gas emissions reduction target for 2020 (below 1990 levels), and nearly one-third of this reduction, or 7.7%, is to be achieved through the various electric power policies.[29]

In the coming decade, these policy shifts could affect metropolitan Boston's economic growth in two ways. At the macro level, the energy market and its regulators must ensure that the replacement of higher-emission power sources by lower-emission, renewable, or alternative sources is as seamless as possible, with no significant gaps. A recent analysis by ISO-New England confirms that the region has become far more natural gas-dependent, for both power generation and home heating; in 1990, 5% of New England's electric supply was gas-fired, in 2011, it was 51% (and 70% in Massachusetts). The ISO analysis identifies potential reliability issues, requiring complex market adjustments or eventual expansion of pipeline capacity.[30] At the micro level, individual power plants may be closed or repowered; the proposal to replace the Salem Harbor Power Station with a new gas-fired plant and redevelop two-thirds of its waterfront site for other purposes is, by itself, a development opportunity of regional significance.

Telecommunications

Broadband telecommunications coverage is nearly ubiquitous across the MAPC region. While there are scattered pockets of wireless-only service, the vast majority of developed territory within the 101 cities and towns is served by both wireless (mostly 4G) and wireline technologies, and in most of the region, wireline service includes cable, DSL, and fiber. By contrast, there are other regions of Massachusetts where broadband coverage is lacking or deficient, creating a significant competitive disadvantage. The Massachusetts Broadband Initiative is addressing these deficiencies through the development of the MassBroadband 123 Network in Western and North Central Massachusetts (including some North Central communities just outside the MAPC region along I-495) and the Open Cape Initiative.

Part II: Area Profiles

Introduction

Chapter II provides an overview of specific economic development areas in the metropolitan region. Twenty-five such areas were defined for purposes of this study. Listed in **Table 1**, all are located within the 101-community boundary of the Metropolitan Area Planning Commission (MAPC). The selection captures the Targeted Growth Areas identified in MAPC's *MetroFuture* Plan (see **Figure 2**), excluding those located outside the MAPC boundary.[31] Three additional sources were used to identify locations with a consensus for development:

- Under the state's Growth District Initiative, the Governor has designated 20 locations as priorities for public investment and expedited permitting. Seven of these districts are located within the MAPC boundary.[32]
- In 2012 MAPC published *Growing Station Areas*, its report on TOD as an organizing framework for regional growth.[33] The development areas selected for this review include stations identified in the MAPC report as key TOD opportunities.
- Also published in 2012 was the 495/ MetroWest Development Compact—a joint effort of MAPC, the Executive Office of Housing and Economic Development, the MetroWest Regional Collaborative, and other partners. The analysis, extending along the entire western arc of I-495 and as far east as Natick, designates site-specific Priority Development Areas (PDAs) and Priority Preservation Areas (PPAs) in each community.[34]

Figure 2: MAPC Targeted Growth Areas

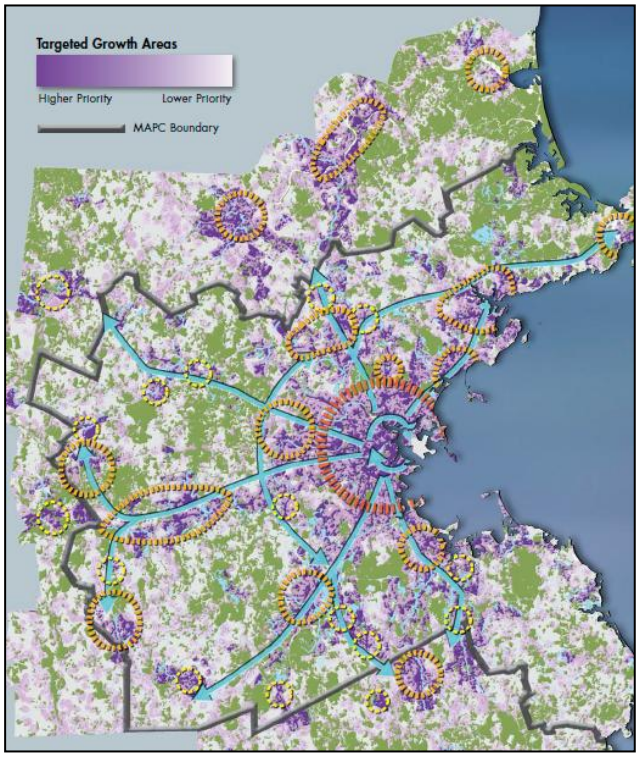


Table 1 categorizes the 25 economic development areas according to:

- the eight MAPC sub-regions
- the *MetroFuture* community typology of Inner Core, Regional Urban Centers, and Suburban Centers.

Table 1: Economic Development Areas by MAPC Subregion and Community Typology

	Inner Core (9)	Regional Urban Centers (10)	Suburban Centers (6)
Inner Core	• South Station / Seaport District • Downtown (including North Station) • Back Bay • Longwood Medical Area (including Brookline Village Gateway) • Southwest Corridor • Indigo Line • East Cambridge / East Somerville (Kendall, North Point, Brickbottom/Inner Belt, Union Square) • Assembly Square (Growth District)/ Wellington/River Edge Growth District • Route 1A Corridor (Suffolk Downs/ Revere Beach Growth District)	• Lynn Downtown/Waterfront Growth District • Waltham • Quincy Center Note: Lynn, Waltham, and Quincy, while part of the Inner Core, share many characteristics of Regional Urban Centers.	
North Shore		• Gloucester • Salem/Peabody/Beverly	
North Suburban		• Woburn/Burlington NW Park Growth District *	
Minuteman			• Concord • Maynard • Littleton/Boxborough (495 PDAs)
Metro West		• Framingham/Natick/Ashland * • Marlborough/Southborough/Hudson (495 PDAs) *	
Southwest		• Milford/Hopkinton (495 PDAs) *	• Franklin (495 PDAs)
Three Rivers		• Norwood/Canton / University Station *	• Foxborough Growth District (495 PDA)
South Shore			• SouthField Growth District

* Combination of a Regional Urban Center (Woburn, Marlborough, Framingham, Milford, Norwood) and contiguous suburban locations.

Within the Inner Core, nine economic development areas were defined. They include the five "development/transit hot spots" identified in the Urban Land Institute's *Hub and Spoke* report: Downtown Boston, Back Bay, the Seaport District, Kendall Square, and the Longwood Medical Area. Also included are the Southwest Corridor; the Indigo Line; the cluster of Assembly Square, Wellington Circle, and the River Edge district; and the Route 1A Corridor in East Boston and Revere.

The 16 economic development areas located outside the Inner Core are shown in Figure 3. They include Regional Urban Centers, Suburban Centers, or combinations of the two.[35]

Figure 3: Development Areas Located Outside the Inner Core

The Development/Infrastructure Nexus: an Overview

While the 25 areas differ significantly, some important observations can be drawn from this review. In the Inner Core, infrastructure issues affecting economic development relate principally to three concerns:

- Region-scale transportation improvements. These include transit projects (such as the Green Line extension or Assembly Square Station), as well as highway projects, like rebuilding the Longfellow Bridge or improving the Route 1A Corridor in East Boston and Revere.
- The state of good repair and long-term carrying capacity of the core MBTA system, which serves and in many ways defines all of the Inner Core development areas.
- District infrastructure—the nexus of streets, sidewalks, open space, storm drainage, and utility distribution required to support redevelopment in transformational locations like Assembly Square, Brickbottom, North Point, the Seaport, and the Southwest and Indigo Line corridors.

Assembly Square exemplifies how a regional transportation project can combine with district infrastructure to create a platform for large-scale development. The new $56 million Orange Line Station was jointly funded by the developer, MassDOT (using federal "flex funds"), and the Executive Office of Housing and Economic Development. The 65-acre grid of streets, sidewalks, open space, and utilities—a district infrastructure program costing over $100 million—was achieved through developer contributions,

federal stimulus funds, and Massachusetts' two innovative value capture mechanisms: District Infrastructure Finance (DIF) and the Infrastructure Investment Incentive Program (I-Cubed). The result is construction of 453 units of housing and 200,000 square feet of commercial space—the first phase of a $1.5 billion, five million square foot private development program.

In Regional Urban Centers and Suburban Centers, the picture is more mixed. Transportation issues abound, including:

- Highway needs, from interchange improvements in MetroWest's Route 9 corridor, to SouthField's East-West Parkway, to redesign of the Lynnway to make it more development-friendly and less of a barrier between downtown and the waterfront.
- Local transit needs, particularly new or enhanced commuter rail stations (as in Salem, Beverly, and Littleton) and the expanded use of "last-mile" collector and shuttle routes to tie development to stations not within walking distance.
- Capacity and efficiency at the core of the MBTA. Both *Hub and Spoke* report and *Growing Station Areas* make clear that without the capacity to distribute commuters once they reach the core (or to collect commuters who live in the core and work in the suburbs), the benefits of expanded commuter rail service and better suburban stations will not be fully realized.

Outlying areas are also more likely to face water resource issues beyond simple distribution. In non-MWRA or partial-MWRA communities, either water supply or wastewater treatment may constrain the capacity for growth. The full redevelopment of SouthField (the former South Weymouth Naval Air Station) as a Smart Growth village combining densely clustered, mixed-use development with large expanses of open space and commuter rail service, depends on a long-term solution for the district's 1.3 million gallon per day water demand. Weymouth, Abington, and Rockland, the three host municipalities, are all non-MWRA water communities. An agreement between the South Shore Tri-Town Development Corporation and Weymouth has enabled the first major phase of development to proceed.[36]

The following pages provide a sample of three of the 25 Area Profiles. These were chosen to represent the Inner Core (Assembly Square/Wellington/River Edge) and outlying areas. The cluster of Marlborough, Southborough, and Hudson includes a Regional Urban Hub (Marlborough) and two Suburban Centers. SouthField—the redevelopment of the former South Weymouth Naval Air Station—is a Suburban Center.

Figure 4: Sample Area Profile

Assembly/Wellington/River's Edge

Development Summary

Assembly Square (Somerville)

130 acres, designated a Growth District 2010
Assembly Row, by Federal Realty Investment Trust:

- ~65 acres, total of ~5.2 MM sf mixed use
- ~16,000 construction jobs, ~8,500 permanent jobs
- $1.8 billion lift in valuation, $23 MM net new taxes
- 2,050 residential units
- 1.75 MM sf office space
- 830,000 sf retail
- Phase I underway (453 res., 200,000 sf retail/cinema)

Additional ~65 acres for future development by others

Station Landing (Wellington Station, Medford)

Directly across river from Assembly Square
Mixed-use by National Development; mostly complete:

- 1 MM+ sf total
- 587 residential units
- 160,000 office
- 30 shops and Boston Sports Club
- central garage shared with MBTA Station

River's Edge (Medford, Malden, Everett)

Between Wellington and Malden Center Stations

- ~100-acre Growth District designated 2009
- Formerly known as "Telecom City" in 3 cities
- Phase I: 30 acres in Medford:
  - developed by Preotle Lane & Associates
  - 222 residential; 410,000 sf office
  - riverfront amenities

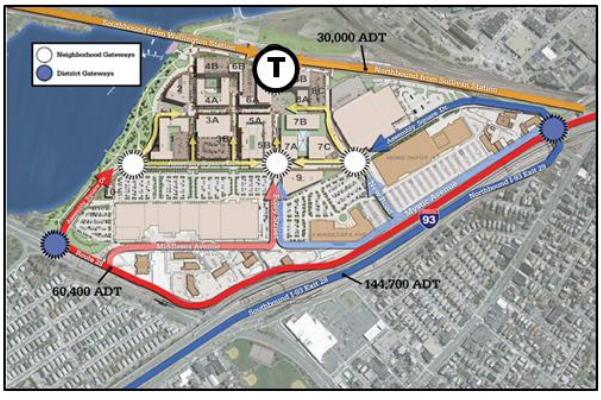
Infrastructure Needs

Assembly Square

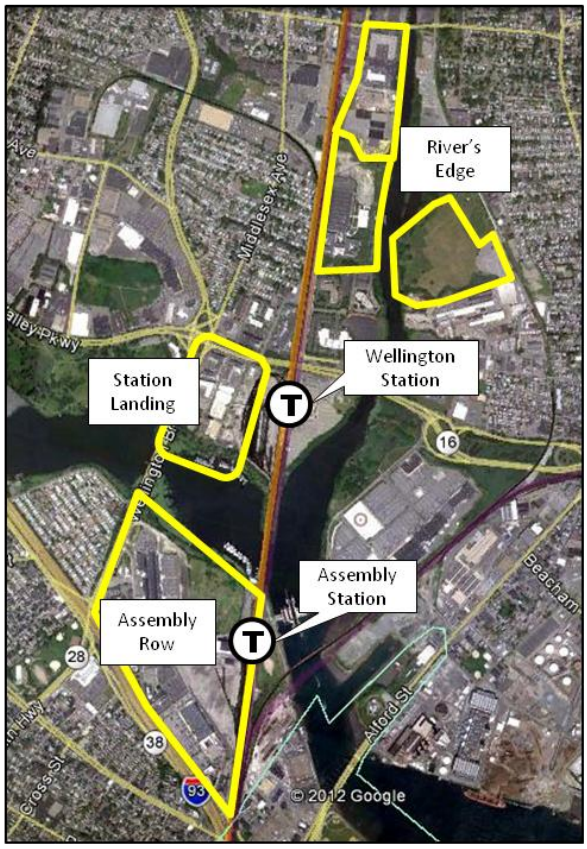
- MBTA Orange Line station: under construction
- Unique funding: developer, MassDOT, Ec. Devt.
- MAPC station typology: "Transformational Subway"
- District infrastructure: street/sidewalk grid, green space, water/sewer/drainage: ~$110 million total
- Financed mostly by I-Cubed; DIF
- DCR to improve Mystic River parklands
- No material infrastructure shortfalls: challenge met

Wellington and River's Edge

- Station built in 1970s at regional highway node
- MAPC station typology: "Transformational Subway"
- River's Edge Drive done
- district infrastructure needed for remaining phases



Assembly Row (Federal Realty)



- http://assemblyrow.com/
- http://stationlanding.com/index.html
- http://www.mass.gov/hed/economic/eohed/pro/gdi/gdi-guidelines.html (select River Edge)
- http://www.riversedgema.com/

Figure 5: Sample Area Profile

Marlborough, Southborough, Hudson

Development Summary

Marlborough

- Comprehensive plans for redeveloping target areas: Downtown, Lincoln Street
- 4 Marlborough EDC priority development sites: 362 Elm, 417 South, Chestnut Ridge, Devonshire
- 2 state priority development sites:
  - Southwest Quadrant Simarano Dr, HP/Fidelity
- Disparity res-com tax rates is disadvantage
- No significant new space built until vacancies reduced:
  - 2M SF office vacant in 2011
  - 2.1M SF office permitted but unbuilt

Southborough

- Major Route 128 job centers
- Some projects just permitted, under review:
  - EMC SB/Westborough Campus (R&D/off): 2.2M SF
  - SB Place (office): 100,000/200,000 SF
  - Capital Grp Properties (office): 20,000-50,000 SF
  - Southville Rd Business Park

Hudson

- 2012: Town encourages smart growth, adopted CPA
- Important clusters: Intel, CBD, Rt. 62/495, Tech Park
- Adaptive Reuse Overlay District to promote mixed use
- CBD revitalization: includes infr. and façade investment
- 495 State PDA: Tower Street Mill
- 4 PDAs: 185-205 and 173 Wash St, 75 Reed, Cabot Rd

Infrastructure Needs

Marlborough

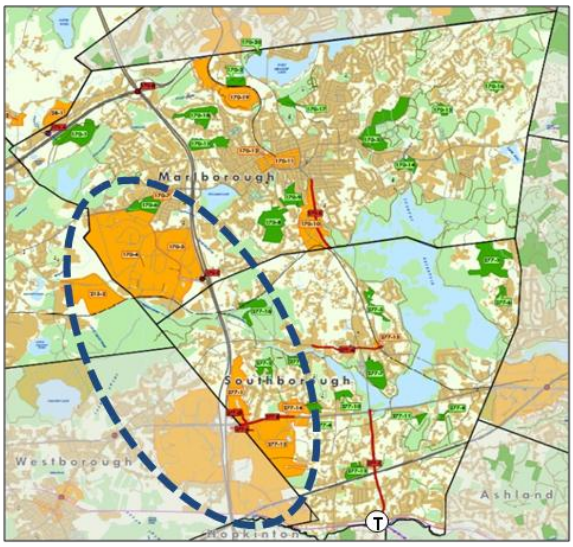
- 495 traffic projected to grow 20% by 2030
  - Significant transportation investment points/corridors:
    - Bridge widening over Assabet River
    - 290/495 and Simarano/495 interchanges
    - Rt. 85 south corridor improvements
- New CSX freight terminal will reduce truck traffic
- No direct commuter rail
- Water: MWRA provides 64% water, can provide more
- Sewer: Westerley Plant getting upgrade, Easterly needs
- Electricity: problem of frequent power outages

Southborough

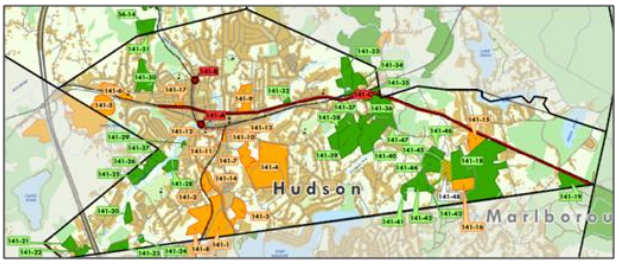
- No sewer system; exploring sewage/septic options
- Water system has undersized pipes, many dead ends
  - Demand outpacing growth, can't meet max need
  - No usable storage for fire flows, etc.
- Commuters clog arterials. esp. Rt. 9
  - Need to focus on 495/90, 495/9 interchange, Oak Hill
  - Severe parking issues need to be addressed
- SB station is "Undeveloped" typology (MAPC)

Hudson

- Washington St/Rt. 85 construction widens, multimodal
- 495/290/85 interchange: critical hub needs investment
- Cherry St. Extension will foster CBD development
- No direct commuter rail
- Hudson not w/in MBTA service area, and no RTA
  - Transit limited to single Senior Center shuttle bus
  - Density could support fixed route transit
- Sewers serve 60% of population
- Water supply meets avg day demand but not peak



I-495 Priority Development Areas: Marlborough and Southborough (MAPC)



Priority Development Areas: Hudson (MAPC)

- Marlborough Economic Development Corporation Master Plan
- 495/MetroWest Partnership
- 2008 Southborough Master Plan
- 2004 Hudson Community Economic Development Plan
- Washington St/Rt 85 Construction
- 2012 Hudson RFP for Master Plan
- 2012 Hudson CD Strategy

Figure 6: Sample Area Profile

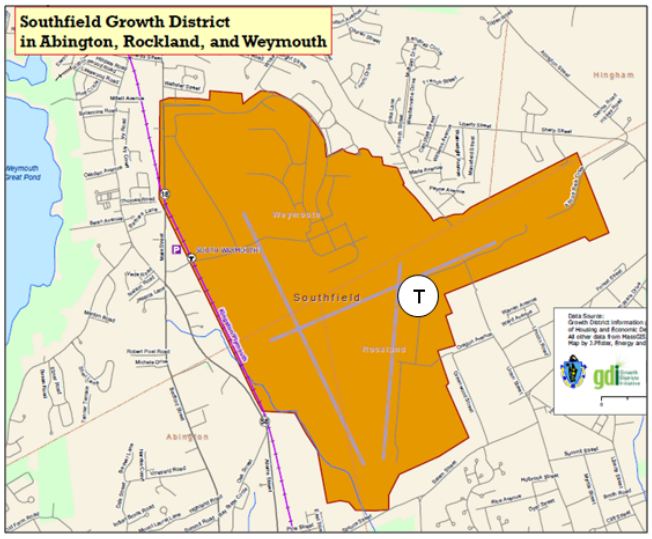
SouthField

Development Summary

- Redevelopment of So. Weymouth Naval Air Station.
- Designated a Growth District in 2008.
- Mostly in Weymouth, partly Rockland and Abington.
- South Shore Tri-Town Development Corp.
  - Local Redevelopment Authority for BRAC
  - Created by 1998 Enabling Act
  - Bought land from Navy for $43 million.
  - Has Town zoning powers on the whole site.
  - LNR Properties designated master developer 2002.
- A 1400-acre site; development program:
  - 2,855 housing units (first 500 largely complete)
    - mandatory 10% affordable (<80% AMI)
    - mandatory 10% workforce (80-120% AMI)
  - Up to 1.7 million sf of commercial development.
  - 81-acre campus known as Shea Science Park
    - up to 1.5 million sf
  - Proposed movie studio
  - 45-acre recreational facility, 18-hole golf course
- Compact development:
  - 1,000 acres left undeveloped.
  - Core feature is Village Center
  - Transit Village next to commuter rail station
  - East Village, Golf Village, North Village Center.

Infrastructure Needs

- Transit:
  - Encompasses existing So. Weymouth station.
  - MAPC station type: "suburban transformation"
  - Planned Multi-Modal Transportation Center.
  - Shuttle connecting whole site to station.
  - Long-term need: South Station capacity expansion.
- Roadway:
  - Widening Route 18
  - New 3.5 mile East-West Parkway underway
  - Will connect Route 18 with Route 3 thru the site
  - State committed $42.5 million funding.
- District infrastructure:
  - East Village street grid
  - Trail network
- Water supply:
  - need 1.3 million gpd; all 3 towns are non-MWRA
  - initial phases supplied by Weymouth
  - full buildout solution still TBD; may use MWRA
- Wastewater collection system to feed MWRA.



- http://www.southfield.com
- http://ssttdc.com/corpnews.asp
- http://www.mass.gov/hed/docs/permitting/gdi.southfield.pdf

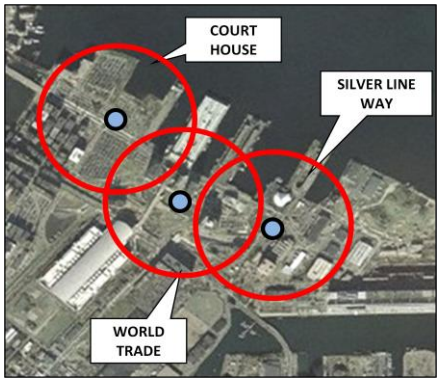
Part III: Case Studies

Preface: The Seaport District

Boston's Seaport or Innovation District is an archetypal example of the relationship between infrastructure and development. Its lessons are seen, in different ways, in the four in-depth case studies that follow. The investments that made the Seaport began with landmark undertakings at a regional scale:

- the Big Dig in general and its I-90 Extension, South Boston Interchange, Ted Williams Tunnel, and South Boston Bypass Road in particular;
- the $800 million Silver Line, which connects the district to South Station and Logan airport and places every development site within walking distance of rapid transit;
- the Harbor Cleanup, without which a vibrant waterfront would have been impossible.

Figure 7: Seaport Silver Line Stations



No less important is "district infrastructure". West of D Street, this is a grid of streets, sidewalks, parks, promenades, lighting, drainage, and utility distribution essential for dense, mixed-use development; no such grid existed when the district was an expanse of railyards, parking lots, and industrial buildings. The grid has been built by the public sector (Massport, the Artery-Tunnel, and the City) and by developers, who are creating multi-block grids within the larger sites. The nine city blocks created on Fan Pier are supported by the Commonwealth's I-Cubed value capture program, which uses future developer tax revenues to finance public infrastructure. A semi-dedicated system of freight routes allows trucks to serve the Boston Marine Industrial Park and other industrial users east of D Street.

Figure 8: The Fan Pier

The result of this investment is planned development at a scale unique in the region. To date, some 30 million square feet of development has been built or entitled, with room for about 15 million more. The mixed-use format, the reliance on transit and walkability, and the South Boston Parking Freeze have combined to support development with less than one parking space per 1,000 square feet of program. The ease of access to the airport and the Boston-Cambridge educational and medical institutions has allowed the City to brand the Seaport as the Innovation District, suggesting a concentration that contributes not only to Smart Growth but to regional competitiveness.

Nonetheless, the Seaport is also an example of future development that depends on infrastructure investments which are not yet funded and whose outcome is uncertain. The grade-separation of the Silver Line and D Street will be needed sooner rather than later if the next phases of approved development are to occur without gridlock affecting cars and transit vehicles alike. In the longer term, the extension of the Silver Line to Chinatown and Boylston, intersecting the Orange and Green Lines, was dropped from the fiscally constrained Transportation Improvement Program in 2009; but the buildout of the Seaport to its full potential almost certainly depends on it. The South Station Expansion, now in its early planning stages, is the gatekeeper to the Seaport, the Financial District, and full emergence of Fort Point Channel. And the working port, which occupies half of the 1,000-acre filled waterfront, will need investments like Massport's proposed East First Street haul road and buffer zone to thrive and grow.

An Overview of the Case Studies

Four areas were chosen for detailed case studies representing the economic and geographic diversity of Greater Boston and the different ways in which development is tied to infrastructure investment. As noted earlier, they include: the inner core districts of East Cambridge and East Somerville; the contiguous North Shore cities of Lynn, Salem, Beverly, and Peabody; the MetroWest towns of Framingham, Natick, and Ashland; and the I-495 town of Franklin. As in the case of Seaport District, each of these case studies provides compelling examples of economic development that has already occurred as a result of infrastructure investments, as well as proposed development that is dependent on future infrastructure investments which may or may not be funded. The case studies are summarized in the following pages and are available in full at http://abettercity.org/about/publications.html. Some general findings are as follows:

Transportation, both highway and transit, is at the heart of every development story. Even in East Cambridge and East Somerville, where the emphasis is overwhelmingly on TOD, there are critical highway projects: the reconstruction of the Longfellow Bridge; the proposed "de-elevation" of the O'Brien Highway; reconstructing streets in Union Square. In the outlying areas, future development in MetroWest requires decisions about interchange capacity on Route 9 and at Exit 12 of the Turnpike. The largest industrial development opportunity on the North Shore segment of Route 128 depends on roadway improvements near Exit 19 in Beverly. The decades-old plan to redevelop the 305-acre Lynn waterfront will not be realized without a redesign and repositioning of the Lynnway. Downtown revitalization in Salem, Beverly, Peabody, Framingham, and Franklin is organized around roadway projects designed to improve access and create "complete streets". New development opportunities like the Salem Harbor Power Station and Franklin's old treatment plant site on Pond Street require improved roadway access.

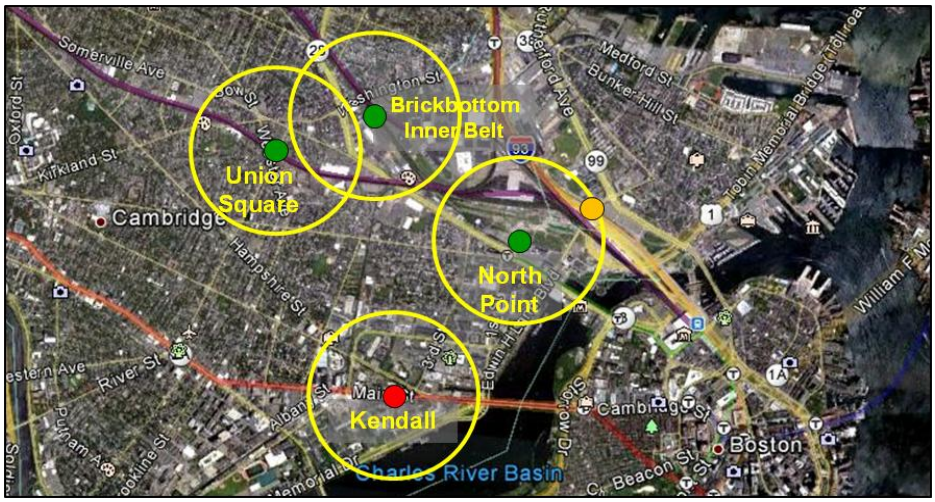
Transit is the defining precondition for economic development in the Inner Core. In the case of East Cambridge and East Somerville, that means the Green Line Extension, the eventual implementation of key segments of the Urban Ring, and the long-term capacity and efficiency of the MBTA's core rapid transit system. In each of the other case study settings, the presence of commuter rail is a distinguishing advantage for economic development, especially in the historic downtowns where stations are located. New and improved stations (as in Ashland and Framingham), station garages (as in Salem and Beverly), and enhanced train service are investments that can be replicated in other communities and corridors. On the other hand, local and subregional transit is more of a challenge on the edges of the MBTA district, where more robust networks of shuttles and feeders could extend the footprint of the commuter rail system for both residential and employment growth.

Water resource issues affect economic development in diverse but critical ways. In two case study communities, revitalization of historic city center districts—Peabody Square and Somerville's Union Square—requires critical investment in flood control infrastructure. Framingham, which is an MWRA community, has had to undertake a $120 million upgrade of its local sewer system to maintain economic growth. Franklin, a non-MWRA community, has been upgrading both its water and sewer systems for the same reason. And the emergence of stormwater management as a long-term issue for economic development, requiring both private and public investment in drainage and treatment, is exemplified by Franklin and the neighboring towns of Bellingham and Milford.

East Cambridge and East Somerville

Overview. The East Cambridge/East Somerville case study area consists of four development districts defined by existing or future rapid transit stations: Kendall Square and NorthPoint (Lechmere Station) in Cambridge; Union Square/Boynton Yards and Brickbottom/Inner Belt in Somerville. As Figure 6 shows, the station "walksheds" are contiguous and, with stronger market and transportation linkages, are close enough to look and feel like one extended place.

Figure 9: The Four East Cambridge/East Somerville Station Areas (One-Third Mile Radii)



Kendall Square, as the hub of the entrepreneurial district associated with MIT, is an economic driver not only for Cambridge but for the entire metro region. In the life sciences, the R&D and start-up activities centered at Kendall have ties to the Longwood Medical Area. There is also an emerging linkage—both collaborative and competitive—with Boston's Innovation District, seen by many in the market as the "next place Kendall companies look" to scale up. A near-term objective for NorthPoint, and a longer-term objective for Brickbottom and Union Square, is to develop as "near Kendall" locations, enabling them to attract some of Kendall's spill-over employment growth, as well as the residential market for the future Kendall workforce. But of central importance is the development of each district in its own right. In Inner Core settings like these, economic development means land recycling—at infill scale in the developed squares, at district-scale transformational level in the railyards and brownfields. The development potential is summarized in the table.

For Cambridge, the continued evolution of Kendall, with higher densities, more jobs, and a 24/7 mix of uses, is a key priority, as is the full, multi-phase build-out of NorthPoint.[37] In Somerville, the new Comprehensive Plan, *SomerVision*, targets 85% of the city's growth between 2010 and 2030 into three designated "transformative areas" occupying just 15% of the city's land mass: Brickbottom/Inner Belt, Union Square/Boynton Yards, and nearby Assembly Square.[38] The unifying theme is TOD.[39]

Table 2: Development Agenda, East Cambridge/East Somerville

Kendall	4 million sf in last decade; City of Cambridge planning 5.5-8.5 million more
North Point	Approved plan: 2900 residences, 2 million sf office and R&D, 200,000 sf retail. Total buildout: 5.2 million sf representing $2 to $3 billion in private investment.
Union Square	City of Somerville targets 14% of 2010-2030 growth, representing 1.5 million sf of commercial development; 4,300 jobs; 850 residences.
Brickbottom/ Inner Belt	City of Somerville targets 41% of 2010-2030 growth, representing 4.4 million sf of commercial development; 12,500 jobs; 1,750 residences.

Regional Infrastructure. Several transportation investments of regional scale and impact are essential to the economic development agenda of East Cambridge and East Somerville:

1. The Green Line Extension. "GLX" is the study area's transformative infrastructure investment. Its benefits include 45,000 daily boardings and alightings by 2030 and a projected daily reduction of 25,728 Vehicle Miles Traveled. The new Lechmere Station is essential to the NorthPoint development buildout, and Somerville has designated each of its five stations as "areas to enhance" or, in the case of Union Square and Washington Street, "areas to transform" targeted for large-scale development. Somerville has undertaken an extensive TOD planning process for each of its five station areas, as has Cambridge for Lechmere. GLX has a current estimated cost of $1.33 billion. Final design is underway; construction funding is in place at this time only for Lechmere, Union Square, and Brickbottom Stations.
2. The Capacity, Connectivity, and Efficiency of the Red Line. Kendall Station is the MBTA's eighth-busiest, and the economic success of the Kendall district depends on the Red Line more than any factor other than the presence of MIT. In the *Hub and Spoke* report, Kendall is identified as one of the system's core "hot spots", where operating constraints and growing demand may lead to unsustainable congestion. Replacements are needed for 74 Red Line cars built in 1969-70—a procurement not yet fully funded.[40] A related core capacity issue is the Red Line-Blue Line Connector; that project, now estimated at $750 million, has been repeatedly deferred by MassDOT.[41] If the built, it would bring significant long-term benefits to Kendall.
3. Longfellow Bridge. The structurally deficient Longfellow Bridge connects Kendall to Boston, carrying 28,000 motor vehicles, 90,000 Red Line users, and 1,000 pedestrians and cyclists per day. It is indispensable to Kendall's current and future economy. The $289 million reconstruction is the signature of MassDOT's Accelerated Bridge Program.

Figure 10: Longfellow Bridge

4. The Cambridge-Somerville Segments of the Urban Ring. In 2010, MassDOT suspended the Urban Ring due to severe financial constraints, but reserved the option of pursuing Bus Rapid Transit in high-value segments going forward.[42] The segments from Assembly Square to Kendall, and from Kendall to the Longwood Medical Area, would link the study area station districts to each other and to the LMA without transfers in the core of the system. The Assembly-Kendall segment would also open up the Inner Belt district for development; it requires an Inner Belt-NorthPoint Bridge, which would carry the route over the railyards separating the two districts.
5. The McGrath Highway Redesign. MassDOT is conducting a planning study on the viaduct known as the McCarthy Overpass, an unsightly and development-frustrating barrier between the Union Square and Brickbottom districts. The City of Somerville advocates "de-elevating" the McGrath and converting it to an urban boulevard, with an estimated cost of $70 million.

District Infrastructure. Each of the four station area development districts also has its own set of place-specific infrastructure needs:

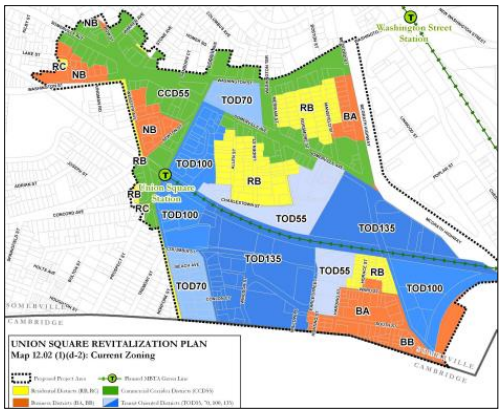
1. Kendall. The City of Cambridge is in the midst of its Kendall Square/Central Square (K2C2) planning study, with the Kendall phase of the work substantially complete. The City's primary objectives for Kendall, reflected in proposed zoning changes, include: a significant increase in density between now and 2030, with at least 5.5 million square feet of new development in the immediate station area and 8.5 million in the larger district; more housing and retail; and a massing strategy that places the greatest height and density next to the station, reinforced by parking reductions and shared parking requirements. The development plan requires a high level of

investment in public amenities. The City is considering a Kendall Square Fund, to which non-residential development benefitting from the increased FAR and height would pay $10 per square foot, primarily for public open space and transit improvements.[43]

2. NorthPoint. NorthPoint, encompassing 18 parcels on 45 acres, was revived in 2010 when the rights were acquired by a team led by HYM Investment Group, in partnership with the primary landowner, Pan Am Properties. The revised Master Plan, approved by the City of Cambridge in July 2012, includes up to 2900 residential units, 2.0 million square feet of office and R&D space, 200,000 square feet of retail, and a series of public parks. The total buildout of up to 5.2 million square feet represents $2 to $3 billion in private investment.[44] In addition to the Green Line Extension (for which the developer and the MBTA have concluded a critical land swap), the infrastructure requirements include large-scale district infrastructure. The prior developers invested about $40 million in on-site roads, open space, and stormwater management. The full buildout requires an additional $25 million.

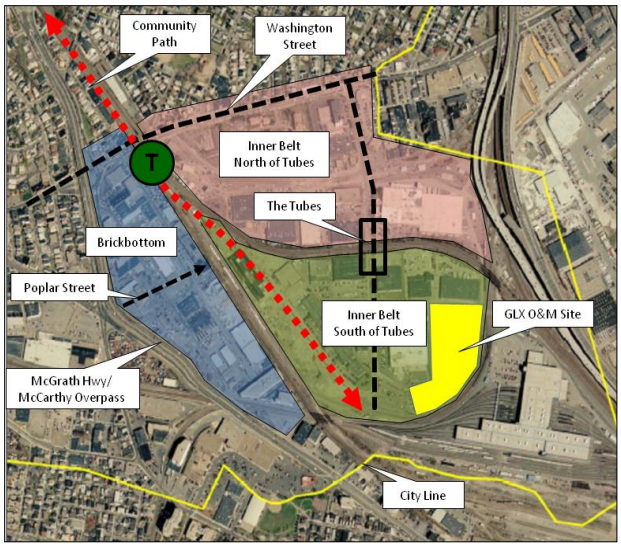
3. Union Square. In October 2012 Somerville adopted the Union Square Revitalization Plan, a 117-acre district covering comprising the historic Square itself and its future Green Line station, the blighted industrial area south of the railroad known as Boynton Yards, and the industrial area at Medford Street and McGrath Highway.[45] There are about 60 developable acres, to which the City hopes to attract 4,300 jobs, 1.5 million square feet of new commercial space, and 850 housing units in the next two decades.[46] The Plan was preceded by comprehensive rezoning, which created five new mixed-use Commercial and TOD districts.[47] In addition to the Green Line (for which the City and the MBTA have concluded a station land swap), the plan requires the rebuilding of Union Square's streets, sidewalks, and amenities, and a massive 72" storm drain designed to prevent the flooding that has plagued the Square; and 35 acres of new district infrastructure in Boynton Yards. Each is estimated at roughly $60 million.

Figure 11: Union Square Revitalization Zoning



4. Inner Belt/Brickbottom. Of the four station areas, the one which today least resembles a mixed-use TOD district is Brickbottom/ Inner Belt, which remains largely in industrial and distribution uses framed by railroads. The City has set high goals for this 144-acre area: 12,500 jobs, 4.4 million square feet of commercial development, and 1,750 units of housing.[48] For the Brickbottom section, the breakthrough requirements are the Green Line Extension and the de-elevation of the McCarthy Overpass. For the larger and mostly landlocked Inner Belt section, on the other hand, unlocking the development potential will involve implementing the Assembly-Kendall BRT segment via Inner Belt Road; building the Somerville Community Path alongside the Green Line, a

Figure 12: Brickbottom/Inner Belt Infrastructure Framework



$36 million project and the main pedestrian link to the new station; greatly improved vehicular access under the railroad embankments; and a full a district infrastructure template of streets, sidewalks, utilities, and open space.[49]

The infrastructure investments associated with current or future economic development in the East Cambridge/East Somerville study area are summarized in the following table:

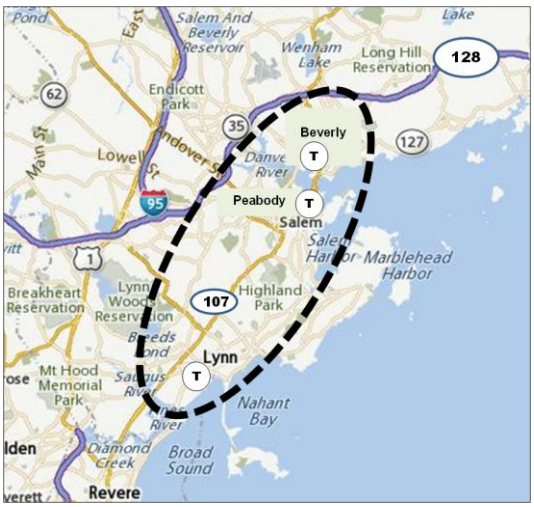
Table 3: Potential Infrastructure Investments, East Cambridge/East Somerville

Proposed Investment	District(s) Affected	Estimated Cost (MM)	Status
Green Line Extension (Phases 1-2A)	NorthPoint, Brickbottom, Union Square	$350 (total project: $1.33 billion)	Final design, committed construction 2014-2017. Remainder of project *not* funded.
Red Line Fleet Replacement	Kendall	$215	In CIP but deferred, not funded
Red-Blue Connector	Kendall	$750	In TIP but MassDOT will seek deferral
McGrath Highway Grounding	Brickbottom, Union Square	$70	MassDOT Study underway
Longfellow Bridge Reconstruction	Kendall	$289	Design-build procurement underway
Assembly-Kendall BRT Corridor (former Urban Ring segment)	Brickbottom, North Point, Kendall	TBD	Future; sources and timing TBD
Kendall-LMA BRT Corridor (former Urban Ring segment)	Kendall	TBD	Future; sources and timing TBD
Kendall Streets and Amenities	Kendall		
O'Brien Boulevard Improvements	NorthPoint	$10	Committed by developer
NorthPoint On-Site District Infrastructure	NorthPoint	$65	~$40 by prior developer; ~$25 pending by developer, seeking I-Cubed
Union Square Station site assembly	Union Square/ Boynton Yards	$6	Committed by City in MOA with MBTA
Union Square Roadway and Drainage Improvements	Union Square/ Boynton Yards	$60	Design about to begin; funding needed
Boynton Yards District Infrastructure	Union Square/ Boynton Yards	approx. $60	Future; sources and timing TBD
Community Path Extension	Brickbottom/ Inner Belt	$36	Seeking funding
Access Improvements via Tubes and/or Poplar Street	Brickbottom/ Inner Belt	TBD	Future; sources and timing TBD
Inner Belt District Infrastructure	Brickbottom/ Inner Belt	TBD	Future; sources and timing TBD

North Shore Cities

Overview. The North Shore cities of Salem, Peabody, and Beverly form a cluster, with their downtowns less than two miles apart. Although perceptually separate from the other cities, downtown Lynn is only five miles from downtown Salem, and together the four cities form the nucleus of the North Shore.

Figure 13: North Shore Cities Study Area



Lynn, Salem, and Beverly are maritime cities whose cores developed around their waterfronts. Since 1836, they have also shared the Eastern Railroad, today the Newburyport-Rockport commuter rail line. All four cities are focused on the revitalization of their core areas, where the downtowns, historic neighborhoods, and industrial or commercial redevelopment opportunities converge. TOD is a key theme in the three rail downtowns.

Industry remains an important part of these cities' economic makeup and development strategy. Beverly seeks to follow two major successes—the redevelopment of the old United Shoe Machine complex as the Cummings Center and the Cherry Hill Industrial Park at Beverly Airport—with more industrial land development on Route 128. Lynn seeks to modernize and diversify its industrial base at the River Works and on portions of the Lynnway waterfront. Peabody relies on full occupancy of its Centennial Industrial Park, one of the region's major employment centers on Route 128. The four-city development agenda is summarized in Table 4.

Table 4: Development Agenda, North Shore Cities

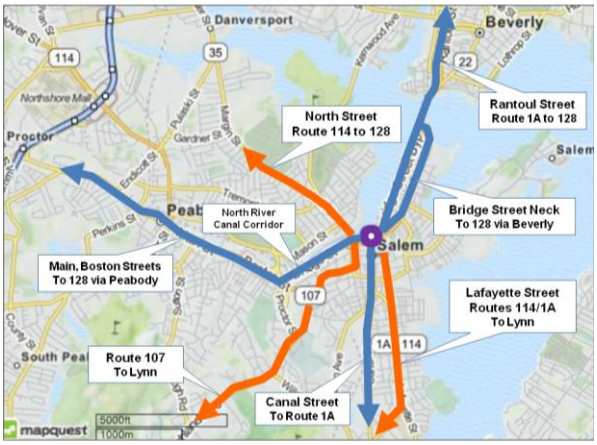
Lynn	Waterfront: 305 acres next to downtown and 2 rail stations. 2007 Master Plan: 4 million sf residential, 1.3 million sf retail and lab/R&D; maritime shoreline.
Salem	• Downtown revitalization and TOD • No. River Canal (300 residences, 140,000 sf commercial) • Salem Harbor Power Station site redevelopment • Bridge Street and Canal Street corridor revitalization.
Beverly	• Downtown revitalization and TOD • Route 128/Brimbal Avenue industrial development (7,500 jobs, 2 million sf, $415 million valuation).
Peabody	• Downtown revitalization • maximize occupancy of Centennial Industrial Park

Regional Infrastructure. Regional infrastructure issues affecting the cities' economic development agenda relate principally to transportation:

1. Highway access. The 1972 decision to cancel much of the metropolitan highway master plan included the I-95 express-way through the Lynn Woods and a related series of Peabody-Beverly-Salem connector plans. Only the Salem-Beverly Bridge and Bridge Street Bypass were built, and Salem was left without direct highway access to 128 or I-95. Today's access solution for the three city cores is a series of improved arterials shown in Figure 11 (those in blue are undergoing current or near-term improvements). Known in Salem as the Entrance Corridors, they are designed for both mobility and development. With a total roadway, sidewalk, and utility investment of about $40 million, the corridors are in various stages of funding.

In Lynn, the downtown, waterfront, and GE River Works are accessed only by Route 1A (the Lynnway) and Route 107. Revitalization depends on redesigning the Lynnway as a more urban street without serious loss of capacity, and on improving the connection of 107 to Route 60.

Figure 14: Salem Entrance Corridors



2. Rail access. Salem Station and Beverly Depot are two of the three busiest stations in the commuter rail system.[50] The MBTA is building garages at each, to increase park-and-ride capacity and relieve the downtowns of "spillover" commuter parking. The garages are also designed to free up strategic land for transit-oriented development.[51] Peabody, by contract, is not on the commuter line, and while Peabody Square and its adjoining neighborhoods are barely a mile and a half from Salem Station, the lack of a robust connection is an emerging economic development issue.[52]

   Lynn's rail proximity to Boston is a historically critical but currently underutilized asset. Over the past decade, MassDOT has studied several alternatives for improving rail transit to Lynn, including an extension of the Blue Line alongside the commuter rail to a new Central Square terminus. In the absence of any foreseeable funding source no preferred alternative has been selected. Lynn's long-term economic development prospects will surely be influenced by the eventual outcome, including a "no-build" if that turns out to be the case.[53]

District Infrastructure. Each of the four cities has development areas with distinct place-specific infrastructure needs:

Figure 15: The Lynn Waterfront

1. The Lynn Waterfront. Lynn has lost some 12,000 jobs in the last three decades, due largely to a long-term decline in employment at the River Works. The City's top development priority—the 305-acre Lynnway waterfront, designated a Growth District in 2008—has languished due to market weakness, poor regional access, and infrastructure costs. The Waterfront Master Plan calls for 4.2 million square feet of housing; 1.3 million square feet of commercial or R&D space; a hotel; and 45 acres of maritime uses.[54] The City estimates the plan would generate $18 million in annual property taxes. [55] A power line that had blocked development of the site has been relocated, but ahead, and unfunded, lie the redesign of the Lynnway and district infrastructure estimated at $186 million.

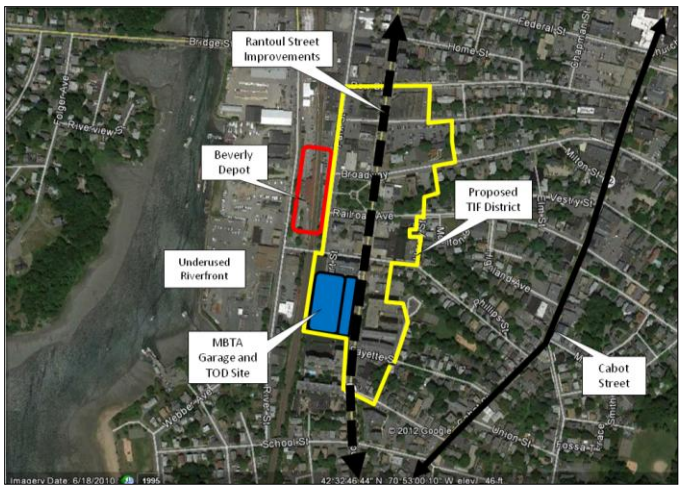
2. Downtown Salem. The historic downtown has seen a number of public and private investments in the last 15 years, including the National Park Visitor Center in the renovated Armory; the state-funded South Harbor Garage; the 266-unit Jefferson at Salem Station apartment complex on the site of the old Parker Brothers factory; the state trial court directly across from the station; a major expansion of the Peabody Essex Museum; and the redevelopment of the St. Joseph's Parish site as mixed-income housing and retail. [56] The City is now planning the complex, multi-phase South Commercial Waterfront.[57] Continued revitalization depends on Entrance Corridor improvements described above and on the MBTA's new $37 million, 715-car station and garage.

3. North River Canal Corridor. This area just southwest of downtown Salem is characterized by vacant industrial properties and substandard infrastructure. Its redevelopment as a residential and commercial neighborhood is a key City priority. Five properties are moving toward redevelopment, representing a total of 320 units of housing and nearly 200,000 square feet of retail, civic, and medical space.[58] Most of the requisite district infrastructure work remains to be done, including the redesign and reconstruction of Boston and Bridge Streets, which constitute an Entrance Corridor from Peabody and Route 128, and improvement of local streets within the canal district.

4. North Commercial Waterfront. Salem Harbor Power Station will be repowered in a project that leaves two-thirds of the 63-acre site, just north of downtown, available for development.[59] This opportunity directly adjoins the City's new $18 million wharf accommodating thr Fast Ferry to Boston and small coastal cruise vessels. The combined site could become a regionally significant waterfront, hosting larger cruise ships and extending the Derby Street tourist waterfront. This opportunity is constrained by the tight roadway access. The infrastructure requirements will emerge over time, but it is clear that the public and private sectors will have to collaborate on the roadway, pedestrian, bicycle, transit, and maritime ingredients of a new development district.[60]

5. Downtown Beverly. Downtown revitalization, a joint effort of the City and its Main Streets organization, depends on turning Rantoul Street (Route 1A) into a complete "main street" similar to Cabot, which runs parallel. Two key investments, both underway, are the $16 million reconstruction of Rantoul Street itself and the $34 million MBTA garage, a short walk from Beverly Depot train station. The garage is designed to create a substantial TOD opportunity on Rantoul Street. Among the City's complementary strategies to attract private investment is the adoption in 2013 of a residential Tax Increment Finance District along Rantoul.[61]

Figure 16: Downtown Beverly Economic Infrastructure



6. Exit 19 Industrial Development. With significant industrial successes behind it, the City is undertaking a more ambitious industrial development initiative in North Beverly, involving 200 acres surrounding Exit 19, where Brimbal Avenue crosses Route 128. The key infrastructure investment is a two-phased reconfiguration of local roads, costing about $25 million. The state has granted Beverly design funds for Phase 1. The full program would result in: 12,000 jobs, 3.8 million square feet of building, and $415 million in assessed valuation. Securing funding for these improvements is thus a critical economic development priority for the City.

7. Downtown Peabody. Continued revitalization depends on several key infrastructure improvements, including "complete street" improvements on Main Street from Peabody Square to the Salem Line and a planned Riverwalk. Most important is a flood mitigation program addressing a key disincentive to private investment—the major flooding events that have occurred in 1996, 1996, 2001, 2004, 2006, 2010, and 2011 due to the industrial-age channelization of the North River and its tributary brooks. The City's first project will install 2000 linear feet of twin culverts under Foster Street and the Square, at a cost of $26 million.[62] An Economic Benefits Analysis commissioned by the City in 2011 showed significant potential gains in business losses avoided, City costs avoided, property value enhancement, and a better climate for private reinvestment and infill.[63]

The infrastructure investments associated with current or future economic development in the four North Shore cities are summarized in the following table:

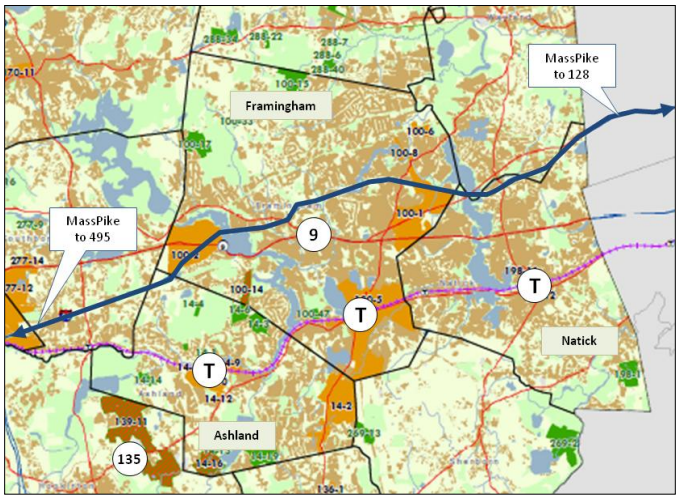
Table 5: Potential Infrastructure Investments, North Shore Cities

Proposed Investment	District(s) Affected	Estimated Cost (MM)	Status
Bridge Street Reconstruction (Salem)	Bridge Street Neck; access to downtown	$10	Approaching completion
Boston Street Improvements (Salem)	No. River Canal; access to downtown	$7-9	Future; sources and timing TBD
Canal Street Improvements (Salem)	Access to downtown	$6	In TIP for construction in 2014
Rantoul Street (Route 1A) Improvements (Beverly)	Downtown Beverly	$16	In TIP for construction in 2014
Main Street Corridor Improvements (Peabody)	Downtown Peabody; access to Salem	$2	Under construction
Beverly MBTA Garage and TOD Site	Downtown Beverly	$34	Under construction
Salem MBTA Station, Garage, and TOD Site	Downtown Salem	$37	Scheduled for construction on 2013
Lynnway (Route 1A) Redesign	Lynn waterfront; access to downtown	TBD	Future; sources and timing TBD
Lynn Waterfront Power Line relocation	Lynn Waterfront	$6	Completed 2011
Lynn Waterfront on-site district infrastructure	Lynn Waterfront	$190	Future; sources and timing TBD
Lynn Ocean Ferry Terminal	Lynn Waterfront	$5	Landside complete; dredging and vessel seeking funding
Lafayette St. Improvements (for St. Josephs Redevelopment)	Downtown Salem	$2	Complete 2012
South River Basin Improvements	Downtown Salem	TBD	Dredging pending. Remainder: future; sources and timing TBD
Essex Street Mall Improvements	Downtown Salem	TBD	Incremental; initial phases (~$400,000) under construction
Causeway Park	Bridge Street Neck	$1.4	In TIP for construction in 2013
Bridge St. Neck Improvements	Bridge Street Neck	TBD	Future; sources and timing TBD
Boston Street Improvements	North River Canal	$7-9	Future; sources and timing TBD
Bridge Street Improvements	North River Canal	$___	Future; sources and timing TBD
No. River Canal Improvements	North River Canal	$4	Seeking funding
Salem Wharf (Ferry and Small Cruise Facility)	North Commercial Waterfront	$18	Under construction
Salem Harbor Power Station redevelopment infrastructure	North Commercial Waterfront	TBD	Future; sources and timing TBD
Brimbal Ave. Area Roadways	Exit 19 Industrial Development	Ph. 1: $6 Ph. 2: ~$20	Phase 1 in design, seeking funding. Phase 2: future; sources and timing TBD
45 Walnut Remediation & Park	Downtown Peabody	$1.4	Under construction
Peabody Square Flood Mitigation	Downtown Peabody	Project 1: $26	Project 1 in design, funded; future phases: sources and timing TBD

MetroWest Core Towns

Overview. The MetroWest towns of Framingham, Natick, and Ashland represent Metro Boston's growing suburban areas, particularly in the 128/495 belt. The three form a cluster, with Natick Center 3.5 miles east of Downtown Framingham and Ashland Center three miles west. Framingham, the most populous Town in Massachusetts, is characterized by MAPC as a Regional Urban Center; Natick and Ashland are Maturing Suburbs. MetroWest's defining highway corridors—the Turnpike and Route 9—traverse Framingham and Natick north of their downtowns. The three town centers are connected by Route 135 and the MBTA/ Amtrak Framingham-Worcester Line.

Figure 17: MetroWest Core Towns



Framingham and Natick are the core of nine-MetroWest, with substantial downtowns, an industrial heritage, and a retail concentration of New England-level significance at the confluence of the Turnpike and Route 9. Ashland combines a more rural character with a pursuit of economic development. Table 6 summarizes the development agenda for the three towns:

Regional Infrastructure. Regional issues affecting development involve both transportation and water resources.

Table 6: Development Agenda, MetroWest Core Towns

Framingham	• Town-wide: 41% of all MetroWest jobs • Downtown revitalization (2.9 million sf new and rehab mixed-use; MassBay CC campus) • Exit 12: Tech Park (Genzyme, Bose) and 9/90 (Staples) • Route 9/Golden Triangle : 4-6.5 million sf new commercial; up to 1,200 residential units
Natick	• Route 9/Golden Triangle: 1.4-2 million sf new commercial, 800 residential units • Downtown revitalization and TOD
Ashland	• Rail Transit District: 209 acres adjoining downtown and MBTA station; 600-800 residences, 70,000 sf commercial • Downtown urban renewal district • Route 135 and Route 136 corridors

1. Highways. Route 9's capacity to sustainably accommodate further development is a core issue for Framingham and Natick that ripples throughout MetroWest. In 2011, MAPC issued a *Route 9 Corridor Analysis*, followed in 2012 by a *Route 9 Smart Growth Plan*. These compare two future scenarios—one reflecting current zoning and assuming its full realization (the "Build-Out"), the other reflecting a somewhat less dense and more mixed-use, walkable, and transit-supportive concept (the "Community Test").

   While either scenario pushes Route 9 well beyond its current capacity, the Community Test scenario adds much less traffic relative to its economic footprint.[64] The "soft" transportation measures associated with the Community Test—sidewalks, pedestrian over- or underpasses, signalization, garages, bicycle paths, bus stops, expanded shuttle and collector services—are a major investment; MAPC envisions a mix of public funding, District Improvement Financing (DIF), and developer contributions.[65] Structural solutions may also be needed at key locations.

Framingham's Tech Park/9-90 Crossing employment center may require a direct ramp from the Turnpike into the complex, bypassing Route 9 entirely.[66] In Natick, growth in the Golden Triangle and the nearby intersection of Routes 9 and 27 has led to an $18.5 million intersection improvement project designed by the Town and now in search of construction funding.[67]

2. Rail and transit. The Framingham-Worcester Line is one of the top three in the commuter rail system. Framingham's modern station replaced the historic Boston & Albany terminal in 1996, and Ashland Station, with region-scale park-and-ride capacity, was added in 2002. In 2012, the MBTA began increasing service, resulting in 21 daily round trips with further enhancements planned. This significant growth of service has created an opportunity for transformative development in the center of Ashland and for continued revitalization of Downtown Framingham and Natick Center. The MetroWest Regional Transit Authority, formed in 2006, serves the Natick, West Natick, and Framingham Stations, connecting them to major employment and commercial destinations. With adequate funding, this new RTA could be the beginning of a robust subregional transit network, centered on the train stations and town centers, which the MBTA could not provide here on the outer edge of the district.

3. Water resources. All three Towns are MWRA sewer communities. Framingham's archaic local collector system of pump stations and force mains led to the accumulation of sulfides in the discharge to the MWRA and to sewage backups in town. In 2007, under enforceable agreements with MWRA and the Department of Environmental Protection, Framingham launched a Comprehensive Wastewater Management Plan, at a cost of approximately $120 million. This major undertaking, without which further growth would have been limited, was financed with assistance from the state's Clean Water Revolving Fund.[68]

   Ashland's wastewater system discharges to MWRA via Framingham. This arrangement limits Ashland's capacity to extend its sewer system or to add hookups in areas already sewered.[69] In the near term, this constraint requires on-going efforts to remove Infiltration and Inflow. In the longer term, designing and building a direct connection to the MWRA Framingham would be a major undertaking for Ashland. Ashland also faces a water supply constraint; its municipal system has suffered regular summer shortages, as a result of which Ashland is evaluating whether it should join the MWRA water system at an estimated connection cost of $7.5 million.[70]

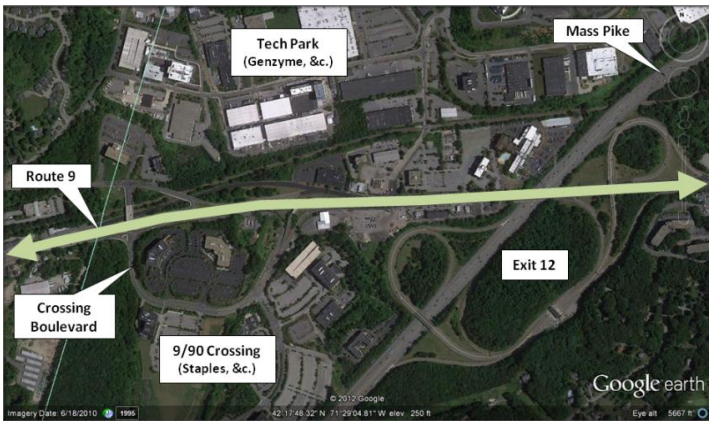
District Infrastructure. In 2012, the Commonwealth and MAPC issued the 495/MetroWest Development Compact Plan, a smart growth framework covering the entire western arc of the 128/495 belt.[71] At the heart of this framework was the identification of Priority Development Areas.

1. The Golden Triangle is the regional commercial core straddling the Framingham-Natick line at Route 9, Route 30, and Speen Street near Exit 13 of the Turnpike. The Triangle developed as a retail node around Shoppers' World and Natick Mall, but also includes knowledge-based industry. At the old Carling Brewery site on Route 9, Boston Scientific has maintained 800 employees since 1995; MathWorks, headquartered nearby on Route 9, is preparing to buy the Boston Scientific property and expand into it.[72] In recent years, the Triangle has also begun to attract large-scale multi-family housing development.[73] Both the near-term accommodation of new development and the long-term sustainability of the Golden Triangle will require selected intersection improvements (such as the planned changes at Routes 9 and 27) and the evolution of the street grid, pedestrian environment, and local transit service to support a more mixed-use development pattern.

2. Exit 12. Where Route 9 and the Turnpike intersect, two private industrial parks constitute a key employment district for all of MetroWest: Framingham Tech Park, anchored by Genzyme, and 9/90 Crossing, anchored by Staples. The parks' full build-out depends on strategic transportation and water resource investments. As noted earlier, a direct ramp from the Turnpike may be needed to bring traffic in and out of the parks efficiently. The second need is for adequate water, sewer, and

drainage service at the "retail" level. Framingham is the community furthest west of Boston with town-wide MWRA sewer and water. However, the problem of insufficient or deteriorating connections was illustrated by the recent Genzyme expansion, which was able to advance only because the Commonwealth, through its Life Sciences Initiative, contributed $12.9 million in funding to upgrade sewer and water connections throughout Tech Park.[74]

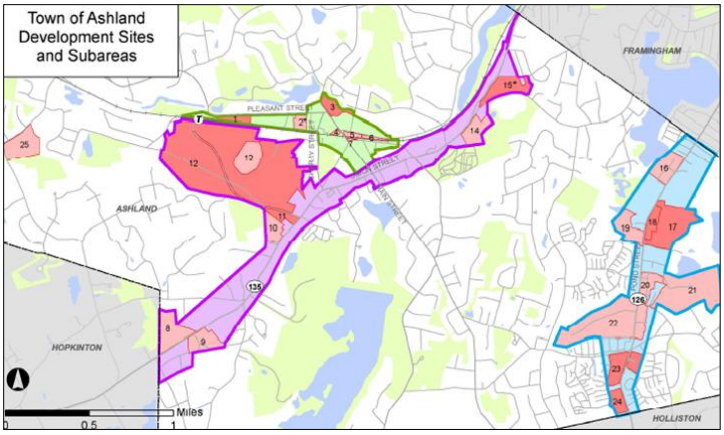
Figure 18: Exit 12 Access Configuration



3. Downtown Framingham. The Town's 2009 downtown study estimated that 2.9 million square feet of redevelopment could occur through infill and higher utilization.[75] Downtown has been rezoned to facilitate housing, mixed-use development, and TOD, and a Main Streets organization works closely with the Town. In 2012, the Commonwealth announced that Massachusetts Bay Community College would build a new downtown campus, an investment of over $60 million.[76] The key infrastructure hurdle is the at-grade rail alignment, which crosses the central intersection of Routes 126 and 135. In the long term, the 2009 study recommends that the intersection be improved by grade-separating Route 135 under Route 126; along with the community college campus, this would be the seminal public investment in downtown Framingham in the coming decade. In the interim, a major short-term project is underway—a federally-funded $8.4 million set of traffic, streetscape, and in-street water and sewer improvements.

4. The center of Ashland is organized around the convergence of Route 135 (shown in purple in Figure 11), Main Street, and the railroad. The Downtown Urban Renewal District (green) adjoins the rail corridor. Its infrastructure needs include millions in street, sidewalk, traffic, grade crossing improvements, environmental remediation, and open space.[77] The Rail Transit District (red) is a private parcel of 209 acres, surrounding the 35-acre Nyanza capped superfund site. Accessed from both the train station and Route 135, the Rail Transit District is Ashland's largest development opportunity. A program of 600-800 residential units and roughly 70,000 square feet of commercial space is envisioned. Access roads and water-sewer connections to the Town systems are estimated at $3 million. On-site infrastructure costs are not yet known but will be substantial.[78]

Figure 19: Ashland's Development Districts



The infrastructure investments associated with current or future economic development in the three MetroWest Towns are summarized in the following table:

Table 7: Potential Infrastructure Investments, MetroWest Core Towns

Proposed Investment	District(s) Affected	Estimated Cost (MM)	Status
Routes 9/27 Interchange Improvements	Golden Triangle, Natick Center	$18.5	In design, funding sought
MassPike ramp to Tech Park and 9-90 at Exit 13	Tech Park/9-90	TBD	Future; sources and timing TBD
Natick MBTA Station Flooding Remediation	Natick Center, entire Framingham rail line	$1	Under construction
Natick MBTA Station ADA Access	Natick Center	TBD	In design, funding sought
South Station Expansion, Beacon Park dual track	Entire Framingham rail line	TBD	Future; sources and timing TBD
Framingham Comp. Wastewater Mgmt. Plan	Townwide, all districts	$120	Approaching completion
Ashland sewer, direct connection to MWRA	Townwide, all districts	TBD	Future; sources and timing TBD
Ashland sewer, water supply connection to MWRA	Townwide, all districts	$7.5	Future; sources and timing TBD
Framingham Golden Triangle Mixed-Use District Infrastructure	Golden Triangle	TBD	Future; sources and timing TBD
Framingham Tech Park Water/ Sewer District Infrastructure	Tech Park/9-90	$12.9	Completed; funded by state Life Sciences Initiative
Downtown Framingham Street and Infrastructure Improvements	Downtown Framingham	$8.4	Under construction
Natick Center Garage	Natick Center	$6-9	Future; sources and timing TBD
Ashland Downtown Renewal Public Improvements	Downtown and Rail Transit Districts	TBD, at least $3	Future; sources and timing TBD
Ashland Rail Transit District On-Site Infrastructure	Downtown and Rail Transit Districts	TBD, at least $3	Future; sources and timing TBD
Ashland Route 135 and Route 126 Improvements	Routes 135 and 126	TBD	Future; sources and timing TBD

Town of Franklin

Overview. Franklin was chosen to represent communities on the outer edge of Metro Boston. Located on the southwest arc of I-495 near the Rhode Island border, Franklin grew rapidly from 1980 (18,000) to 2000 (30,000), leveling off since then. In *MetroFuture*, Franklin is counted among the Developing Suburbs—towns with low density and rapid or imminent suburbanization, threatened by worsening traffic and loss of open space.

Figure 20: Town of Franklin

Franklin's highest development priorities are the downtown, the privately owned Forge Park and Franklin Industrial Park, and the Town-owned Pond Street development site. All are identified as Priority Development Areas in the 495/ MetroWest Compact issued in 2012 by the Commonwealth, MAPC, and other partner organizations.[79]

Forge Park, Pond Street, and Franklin Industrial Park are also Priority Development *Sites* under the state's Expedited Permitting law, Chapter 43D.[80] Franklin makes extensive use of the state's Economic Development Incentive Program, under which projects in designated Economic Opportunity Areas can receive state and local tax credits and negotiate a local Tax Increment Finance agreement with the host municipality.[81] Finally, the Town has created a Biotechnology Uses Overlay Zoning District including these same designated priority areas. In 2010, the Massachusetts Biotechnology Council awarded the Town a Gold BioReady Community rating, enabling Franklin to market its industrial sites nationally to biotech and life science users.[82] The Town's development agenda is summarized in Table 8.

Regional Infrastructure.
Regional issues impacting economic development involve both transportation and water resources.

Table 8: Development Agenda, Town of Franklin

Downtown	• New fire station, museum, parking lots • Dean College: stable size; dorm construction, $51 million in recent investments • Goal: commercial/mixed-use reinvestment and infill
Forge Park	• 360 acres at 495 Exit 17 and train station • Created 1985, nearly full (approx. 2 million sf) • About half the parcels could support intensification
Franklin Industrial Park	• 300 acres at 495 Exit 16 • Nearly full (approx. 2.9 million sf) • About half the parcels could support intensification
Pond Street	• Town-owned 34-acre brownfield • Potential mixed uses being evaluated; approx. 500,000 sf

1. Highways. Franklin is defined economically by its dual-exit location on I-495 (Exits 16 and 17). The Boston MPO's current Transportation Improvement Program (TIP) provides $37 million in Interstate Maintenance work on the southwest arc of I-495.[83]
2. Rail and transit. The MBTA's Franklin Line is one of the top three in the commuter rail system. Franklin's two stations are in the downtown (Franklin/Dean College) and at Forge Park/I-495; the latter is the terminus and has a region-scale park-and-ride lot of 716 spaces. MAPC categorizes Franklin/ Dean College as a "Town and Village" station and Forge Park/I-495 as a "Commerce Park" station. The MBTA is evaluating an extension to Milford.[84]

Local transit is a challenge, as in other places on the fringes of the MBTA district. Franklin is a member of the Greater Attleboro Taunton Regional Transit Authority, which operates an hourly route connecting major Franklin destinations, including the downtown station.[85] But Franklin does not have a shuttle/collector service connecting its two stations to the concentrations of industrial jobs at Forge Park, Franklin Industrial Park, or Grove Street.

3. Water and sewer. Franklin is a non-MWRA community and operates its own systems. Its approach to maintaining its water resource infrastructure is a successful example of staying ahead of the relationship between infrastructure and development. The water supply system has 157 miles of mains. Franklin's Public Works Department is conservation-conscious, maintaining an aggressive leak detection program and incrementally replacing the oldest 25 miles of mains, at cost of about $15 million. Average daily consumption has been reduced from approximately 3.5 million gallons per day to 2.8. Franklin's sewer system discharges to the Charles River Pollution Control District's regional treatment plant in Medway. The Town is now undertaking Phase IV of a multi-phase Infiltration & Inflow removal program, an investment of $4-5 million over ten years. [86]

4. Stormwater. EPA has pending a set of renewed General Permits which, if promulgated in their current draft form, would significantly impact the way municipalities manage stormwater. The General Permit for Municipal Separate Storm Sewer Systems (MS4) applies to 99 of the 101 MAPC communities; the proposed renewal would require upgrading of storm sewer infrastructure; water quality monitoring of discharges, a labor- and technology-intensive process involving dozens of outfalls in a given community; and in some cases, treatment of discharges.[87]

   Beyond MS4, EPA and DEP are focusing on the Charles River Watershed for even higher levels of stormwater intervention and have chosen the headwater towns of Franklin, Bellingham, and Milford for a pilot project to reduce stormwater-conveyed phosphorus discharges. A Draft Residual Designation General Permit for those three Towns sets the potential parameters for individual properties of two impervious acres or more. While still preliminary, the regulatory approach will affect those properties as well as the three municipal storm drainage systems.[88]

   A recent study suggests a capital program cost for Franklin in the $75 million range and a total implementation cost, if phased over 25 years, in the $125 million range. All told, the capital and operating program involved for Franklin, Milford, and Bellingham could approach $300 million, based on draft regulatory conditions and preliminary cost estimates.[89] The Franklin-Milford-Bellingham pilot program, supported by an EPA planning grant, is designed to sort out how big a program is actually needed, over how long an implementation period, to cost-effectively address the phosphorous discharge issue, and how to finance it.

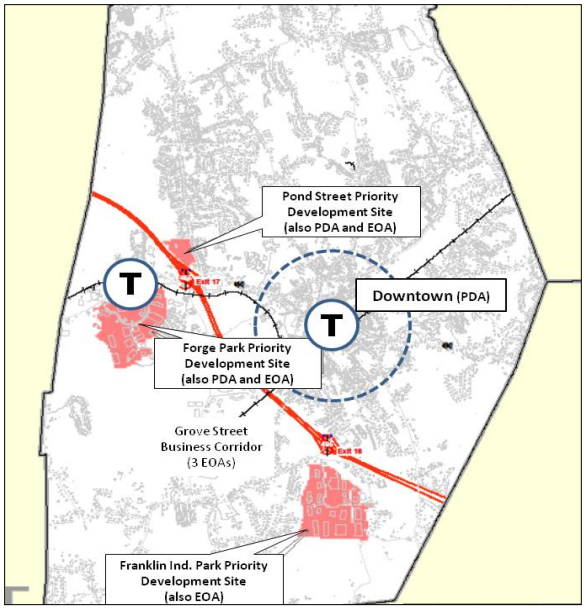
District infrastructure. Franklin's key development districts and infrastructure needs are as follows.

1. Downtown. Franklin aspires for its historic downtown to be a mixed-use, walkable town center with a sense of place, cultural destinations, improved traffic and parking, and better connections to the train station.[90] A number of recent initiatives have supported that vision, including new civic buildings, $51 million in campus improvements by Dean College, and Franklin Center Commons, a $30 million, four-building mixed-use development.[91] A key investment tying all of these developments together and supporting future development is the Downtown Improvement Project, a $7.25 million, fully funded series of roadway and sidewalk improvements.[92]

2. Pond Street. This Town-owned, 34-acre site was once used as Franklin's sewage treatment plant. Located near I-495 Exit 17, it is a Priority Development Site under the state's expedited permitting law, an Economic Opportunity Area, and part of the Town's biotech zoning district. The Town envisions a mixed commercial development of 250,000 to 500,000 square feet.[93] This will require site cleanup and infrastructure, as well as an upgrade of roadway access from Route 140.

3. Forge and Franklin Parks. Nearly five million square feet of space has been developed in Franklin's two principal industrial parks. Their designation as Priority Development Sites and Economic Opportunity Areas, and their inclusion in the Biotechnology District, are consistent with the Town's goal of more intense development, even though the two parks are nominally "full".[94] In the Town's view, as many as half the developed parcels could support more intense use—if structured solutions to parking and stormwater can be built. These parks are already examples of major infrastructure investments paying off over time. I-495, the train station, and the parks' internal roads, sewer, water, electricity, and telecommunications, were made long ago and are responsible for thousands of jobs and millions of dollars in tax revenue.

Figure 21: Franklin's Key Development Areas



The infrastructure investments associated with current or future economic development in Franklin are summarized in the following table:

Table 9: Potential Infrastructure Investments, Town of Franklin

Proposed Investment	District(s) Affected	Estimated Cost (MM)	Status
I-495 Interstate Maintenance	Entire Town	$37	Funded in TIP in 2013 and 2016
Commuter Rail extension to Milford	Forge Park	TBD	Future; sources and timing TBD
South Station Expansion	Forge Park, Downtown	TBD	Future; sources and timing TBD
Transit shuttles to commuter rail	Forge Park, Franklin Ind. Park, Downtown	TBD	Future; sources and timing TBD
Water main replacement	Entire Town	~$15	On-going
Sewer Infiltration & Inflow	Entire Town	~$5	On-going
Enhanced EPA stormwater program	Entire Town	TBD, up to $125	Future; sources and timing TBD
Downtown Improvement Program (streets and sidewalks)	Downtown	$7.25	Under construction (mostly state and federal)
Downtown MBTA parking	Downtown	TBD	Future; sources and timing TBD
Pond Street access and infrastructure	Pond Street	TBD	Future; sources and timing TBD
Forge Park intensification (structured parking or stormwater)	Forge Park	TBD	Future; sources and timing TBD
Franklin Industrial Park intensification (structured parking or stormwater)	Franklin Industrial Park	TBD	Future; sources and timing TBD

Endnotes

[1] *Source: Metropolitan Area Planning Council; http://mapc.org/sites/default/files/MAPC_Subregions_2012.pdf*.

[2] Metropolitan Planning Area Planning Council (MAPC), *MetroFuture: Making a Greater Boston Region*, 2008 (hereafter *MetroFuture*). MetroFuture covers 164 communities, including 63 located outside the MAPC boundary. This study is limited to the 101 MAPC member communities.

[3] Ibid.

[4] MAPC, *Growing Station Areas: The Variety and Potential of Transit Oriented Development in Metro Boston*. June 2012 (hereafter *Growing Station Areas*).

[5] *Transportation Finance in Massachusetts: An Unsustainable System*; findings of the Massachusetts Transportation Finance Commission, 2007 (p. 1).

[6] David F. D'Alessandro et al., *MBTA Review, 2009*. http://www.mbtareview.com/MBTA_Review_2009.pdf.

[7] MBTA *Capital Investment Program, FY13-FY17* (p. 18).

[8] Urban land Institute and Northeastern University, *Hub and Spoke: Core Transit Congestion and the Future of Transit and Development in Greater Boston*; June, 2012 (hereafter *Hub and Spoke*).

[9] MBTA *Capital Investment Program, FY13-FY17* (p. 11, 54ff, 73ff, 83ffr, 95ff). Significant SOGR investments in the commuter rail and bus systems are also deferred.

[10] MassDOT Highway Division, *Five-Year Capital Investment Plan*, 2010 (Ch. 3-p.3).

[11] Ibid. (Ch. 4-pp. 3ff).

[12] http://www.mma.org/advocacy-mainmenu-100/exec-directors-reports/6401-transportation-funding-debate-key-to-strong-economy

[13] MassDOT Highway Division, *Five-Year Capital Investment Plan*, 2010 (Ch. 3-p. 8).

[14] Ibid., and Massachusetts Infrastructure Investment Coalition, *Infrastructure Status Report on Bridges*, 2005

[15] http://www.eot.state.ma.us/acceleratedbridges/

[16] MassDOT Highway Division, *Five-Year Capital Investment Plan*, 2010 (Ch. 4-p. 5).

[17] Ibid.

[18] A Better City (prepared by Cambridge Systematics, Inc.), *Building Massachusetts' Economy through Transportation Investment*, 2009.

[19] MassDOT, *Five-Year Capital Investment Plan*, 2010 (Ch. 3-p. 17); not all of these are fully funded.

[20] Massachusetts Department of Transportation, *Freight Plan*, 2010 (p. ES-21ff).

[21] Ibid. (p. ES-24).

[22] Massachusetts Infrastructure Investment Coalition, *Infrastructure Status Report on Freight*, 2008.

[23] http://www.mwra.com/02org/html/whatis.htm 6/18/2012

[24] Massachusetts Infrastructure Investment Coalition, *Infrastructure Status Report on Wastewater*, 2007

[25] Commonwealth of Massachusetts Water Infrastructure Finance Commission, *Massachusetts' Water Infrastructure: Toward Financial Stability*, 2012

[26] Massachusetts Infrastructure Investment Coalition, *Infrastructure Status Report on Drinking Water*, 2007

[27] Massachusetts Infrastructure Investment Coalition, *Infrastructure Status Report on Wastewater*, 2007

[28] Commonwealth of Massachusetts, Executive Office of Housing and Economic Development, Metropolitan Area Planning Council, and others, *The 495/MetroWest Development Regional Compact Plan*, 2012 (hereafter *MetroWest Development Compact)*.

[29] Commonwealth of Massachusetts, *Massachusetts Clean Energy and Climate Plan for 2020*. A report to the Great and General Court pursuant to the Global Warming Solutions Act (Chapter 298 of the Acts of 2008, and as codified at M.G.L. c. 21N).

[30] http://www.boston.com/business/news/2012/08/22/cheap-plentiful-natural-gas-increases-demand-worries-arise-about-new-england-supply/cjOWemX2fqkh0oOGiAvIGL/story.html;

http://www.iso-ne.com/committees/comm_wkgrps/strategic_planning_discussion/materials/natural-gas-white-paper-draft-july-2012.pdf

[31] *MetroFuture*; June 2009 summary and map.

[32] http://www.mass.gov/hed/economic/eohed/pro/gdi/

[33] *Growing Station Areas*.

[34] *MetroWest Development Compact*.

[35] Lynn, Waltham, and Quincy, while located within MAPC's Inner Core subregion, play a role more closely resembling Regional Urban Centers and are treated as such in this study.

[36] http://www.wickedlocal.com/weymouth/news/x874248797/SouthField-water-study-raises-concerns#axzz23ZGY6fq1

[37] For Kendall, see http://www.cambridgema.gov/CDD/Projects/Planning/K2C2.aspx, especially the June 2012 Summary of Zoning and Urban Design Recommendations.

[38] S*omerVision—Somerville's Comprehensive Plan;* City of Somerville, 2012 (hereafter *SomerVision*)(p. 143).

[39] Interview, City of Somerville, Michael Glavin, Director, and staff, Mayor's Office of Strategic Planning and Community Development; September 20, 2012.

[40] Ibid., and *Hub and Spoke* (pp. 15-16).

[41] http://bostonmpo.org/bostonmpo/3_programs/2_tip/FFYs_2013_2016_TIP_Amend_One_Action_0925.pdf.

[42] http://www.massdot.state.ma.us/theurbanring/

[43] Community Development Department Memo to Planning Board, August 2012; also http://www.cambridgema.gov/CDD/Projects/Planning/K2C2.aspx, June 2012 Summary of Zoning and Urban Design Recommendations.

[44] Boston *Globe*, "Construction of NorthPoint mini-city in Cambridge to resume"; August 10, 2012; and interview with Thomas N. O'Brien, Managing Director, HYM Investment Group, LLC, September 19, 2012.

[45] City of Somerville, Union Square Revitalization Plan; September 2012; as of the date of this report the Plan is at the state Department of Housing and Community Development for review and approval under Chapter 121B. (http://www.somervillema.gov/sites/default/files/Union%20Square%20Revitalization%20Plan%20DRAFT%202%20%28EDITS%29%209-25-12.pdf)

[46] *SomerVision* (pp. 144-145).

[47] City of Somerville Ordinance No. 2009-03, Rezoning Union Square and Boynton Yards.

[48] *SomerVision* (pp. 143-145).

[49] City of Somerville, TIGER II Application for the Somerville Community Path; August 2010.

[50] MBTA Bluebook, 2010 edition (p. 72).

[51] http://www.mbta.com/about_the_mbta/t_projects/default.asp?id=22490; http://www.mbta.com/about_the_mbta/t_projects/default.asp?id=18255

[52] MAPC, Cities of Peabody and Salem, Peabody-Salem Corridor Concept Action Plan (2011); pp. 18-19. Also, interview with Karen Sawyer, Director, Peabody Department of Planning and Community Development; November 2, 2012.

[53] http://www.mbta.com/about_the_mbta/t_projects/default.asp?id=1012#project. In the 2002 scoping of the Draft EIS, the Blue Line extension alternatives to be studied went all the way to Salem. The MBTA has subsequently limited the potential Blue Line extension to Lynn.

[54] City of Lynn, *Lynn Waterfront Master Plan*, 2007; http://ediclynn.org/files/LynnFinalReport_LowRes_9-07.pdf

[55] Interview with James M. Marsh, Director, Lynn Office of Economic and Community Development, October 1, 2012.

[56] http://pem.org/press/press_release/209-pem_announces_650_million_advancement_campaign and http://www.salem.com/pages/salemma_dpcd/studiesreports/finalpublic.pdf

[57] http://salem.com/Pages/SalemMA_DPCD/studiesreports, *Salem Harbor Plan*, January 2008; pp. 38 ff.

[58] City of Salem, *North River Canal Corridor Transportation Plan*, June 2012; http://www.salem.com/pages/salemma_dpcd/studiesreports/nrccfinalstudy.pdf.

[59] http://www.bostonglobe.com/business/2012/08/06/deal-sell-salem-power-plant-closes-new-gas-plant-and-development-planned/2QXaYxH8CEQ9pvciaNISuN/story.html.

[60] Interview with Lynn G. Duncan, Director, and Katherine Winn, Project Director, Salem Department of Planning and Community Development, September 25, 2012. Also: City of Salem, *A Site Assessment Study on Potential Land Use Options at the Salem Harbor Power Station Site*, January 2012.

[61] Interview with Tina Cassidy, Director, Beverly Department of Planning and Development; November 15, 2012, and City of Beverly, Proposed TIF District Map, May 10. 2012.

[62] Contributors include FEMA ($3 million), Verizon ($6 million), and a City bond issue.

[63] City of Peabody (RKG Associates), Flood Mitigation – Economic Benefits Analysis, November 2011.

[64] MAPC Presentation of December 4, 2012; http://mapc.org/sites/default/files/Route_9_MW_SG_Plan_120412.pdf

[65] MAPC and MetroWest Regional Collaborative, *Route 9 Corridor Analysis*, Spring 2011 (pp. 27-28).

[66] Interview with Alison Steinfeld, Director, Framingham Dept. of Community and Economic Development; October 4, 2012.

[67] Interview with Patrick Reffett, Director, Natick Department of Planning and Community Development, November 15, 2012 (hereafter Natick DPCD Interview).

[68] Framingham Department of Public Works; www.framinghamma.gov/DocumentView.aspx?DID=2477. Build Framingham: http://buildingframingham.org/Default.aspx.

[69] Interview with David Manugian, Town of Ashland, Town Planner, October 2, 2012 (hereafter Ashland PD). See also http://www.metrowestdailynews.com/news/x949390826.

[70] http://www.metrowestdailynews.com/news/x1076645283/Ashland-considers-hookup-with-MWRA-for-water-needs

[71] *MetroWest Development Compact*.

[72] http://www.boston.com/yourtown/news/natick/2012/11/natick_town_officials_sad_to_s.html

[73] Natick DPCD interview.

[74] http://www.businesswire.com/news/home/20120419005115/en/Genzyme%E2%80%99s-Biologics-Support-Center-Achieves-LEED-Gold; http://www.wbjournal.com/apps/pbcs.dll/article?AID=/20081124/PRINTEDITION/31124; http://www.boston.com/news/local/articles/2010/07/11/a_plan_to_double_genzymes_campus_in_framingham_would_bring_new_jobs_businesses_to_area/

[75] Town of Framingham (BETA Group, Inc., and Cecil Group, Inc.), *Final Report: Downtown Study*, 2009 (p. 88 ff).

[76] http://www.metrowestdailynews.com/news/x21084657/MassBay-plans-new-Framingham-campus

[77] Ashland Redevelopment Authority, *Downtown Ashland Revitalization and Redevelopment Plan*, January 2012.

[78] Ashland PD interview.

[79] *MetroWest Development Compact*.

[80] http://www.mass.gov/hed/business/licensing/43d/; see also Town of Franklin, *Franklin's Priority Development Sites*.

[81] http://www.mass.gov/hed/business/incentives/edip/edip-program-information.html.

[82] Town of Franklin, Department of Planning and Community Development, *Economic Development Initiatives: January 2012.*

[83] Boston Metropolitan Planning Organization, 2013-2016 Transportation Improvement Program, TIP Tables.

[84] MBTA and CTPS, *Program for Mass Transportation*, 2004; p. 5C-60; *Program for Mass Transportation* 2009 (Appendix E, p. E-12); http://www.bostonmpo.org/bostonmpo/2_planning_activities/3_studies_underway/studies.html; http://www.gatra.org/index.php/routes/bellingham-franklin/bellingham-t-shuttle/.

[85] http://www.gatra.org/index.php/routes/bellingham-franklin/franklin-area-bus/

[86] Interview with Town of Franklin: Department of Planning and Community Development, Brian W. Taberner, Director, and Beth Dahlstrom, Town Planner, and Department of Public Works, William J. Yadisernia, PE, Town Engineer; November 5, 2012 (hereafter Franklin Interview).

[87] http://cfpub.epa.gov/npdes/stormwater/munic.cfm/

[88] http://www.epa.gov/region1/npdes/charlesriver/index.html

[89] http://www.epa.gov/region1/npdes/charlesriver/pdfs/20111019-UtilityProjectGPFactSheet.pdf;

also EPA Sustainable Stormwater Funding Study for Bellingham, Franklin & Milford May 22, 2012; New England Stormwater Technology Workshop; AMEC Environment & Infrastructure, Inc.:

http://www.rinkerstormceptor.com/EducationalSeminars/May%202012/AMEC%20Stormwater%20Presentation%205-22-12.pdf

[90] http://franklinma.virtualtownhall.net/Pages/FranklinMA_Planning/initiatives/franklincenterplan.pdf

[91] http://www.franklincentercommons.com/home.htm

[92] http://www.town.franklin.ma.us/Pages/FranklinMA_Planning/dtimprovement and Franklin Interview.

[93] http://www.town.franklin.ma.us/Pages/FranklinMA_Economic/documents/pondpds.pdf

[94] Franklin Interview.

Notes:

- The study team gratefully acknowledges the insight and information provided by the municipal officials and private developers who agreed to be interviewed for this report. Any inferences or conclusions are those of the study team.
- Estimated costs of projects, or groups of projects, reflect information available at the time this report was compiled. Many are expressly preliminary, and all are subject to change as projects are advanced or modified by their sponsors.