REINVENTING TRANSIT
INVESTING IN REGIONAL TRANSPORTATION AUTHORITIES FOR STRONG GATEWAY CITY ECONOMIES

Introduction

Transportation networks provide the backbone for economic development in urban regional economies. They increase productivity by moving people and goods around efficiently and by keeping labor markets flexible.[1] These economic benefits are amplified when regional transportation networks are anchored by strong public transportation systems. Effective public transportation supports land use patterns that help people access jobs, housing, and services while protecting quality of life, the environment, and public health. After decades of car-centric urban planning, communities large and small throughout the country increasingly recognize how essential public transportation is to economic success.[2]

Regions that can provide quality public transportation options will have a competitive edge attracting and retaining a talented workforce. Younger Americans are spending significantly less time in cars than previous generations.[3] Their preferences as consumers—including their choice of neighborhood and job location—place an increasing premium on walkable communities served by public transit.[4]

Greater Boston is already reaping the benefits of these changing preferences, largely because the Commonwealth has made significant investment in the MBTA over the past three decades. Conversely, Gateway City regions have seen less growth, in part because investment in their public transportation systems has been inadequate. Yet these smaller regions are rich in walkable neighborhoods and other assets that, if stitched together with stronger transit service, could strengthen their urban cores and the regional economies they anchor.

Governor Patrick and other elected leaders have been outspoken about the need to address the chronic underfunding of the MBTA in the coming year. Their calls to provide a large infusion of new revenue into the system, at a time when state and local governments in Massachusetts have many competing needs, are a clear acknowledgement that the agency provides an outsize contribution to the Greater Boston economy.

At the same time, leaders on Beacon Hill have also argued for significant new state investment in Regional Transportation Authorities (RTAs) to support equitable growth and transportation access in communities across the state. This commitment is embodied in *The Way Forward* plan unveiled by MassDOT and the Patrick administration in January 2013. The plan directs $1.5 billion in new state revenue to all 15 RTAs over the next 10 years, giving every region in the Commonwealth an opportunity to revise and expand their approach to public transit, and to do so simultaneously.

After many years of overlooking the value of RTAs, some may discount the proposed investments in these agencies as a bargaining chip to build a political coalition for new MBTA revenue. This concern could lead the Legislature to continue underfunding the RTAs, or worse yet, to provide these systems with new resources without any real expectation that the investment will lead to significantly enhanced RTA performance.

As state leaders debate and structure new RTA funding, it is critical that they re-envision the role of these agencies in an integrated, public transit system that embodies a statewide culture of public transit and transit-oriented development, and views Gateway Cities as engines of more balanced regional economic growth.

MassDOT and the RTAs have started to lay the groundwork for achieving this vision. Together, they are reforming the ways they plan and deliver RTA service, and they are developing methods for making smarter capital investments with state resources. They are also taking steps to integrate across agencies for more seamless delivery of services, both RTA-to-RTA and from MBTA-to-RTA. While these reforms are necessary, making public transportation a competitive asset for these midsize cities and their regions will require bold innovation that will only come when leaders from beyond the traditional community of transportation stakeholders are inspired by the opportunity.

This report seeks to nurture this broader-base of interest in reinventing RTAs for stronger Gateway City economies by highlighting the link between public transportation and economic growth (Section I); providing a primer on important factors to consider with respect to capitalizing the RTAs (Section 2); surveying the landscape of innovation in the delivery of public transit in small to midsize urban regions (Section 3); and offering high-level recommendations to state leaders preparing to make major decisions that will have an enduring influence on transportation networks across the Commonwealth (Section 4).

I. Reinventing Public Transit, Rebuilding Gateway City Economies

Massachusetts's Gateway Cities, like most small-to-midsize industrial cities in the United States, have struggled to regain their footing in a changing economy. Manufacturing decline and the suburbanization of jobs have drawn investment away from these urban centers, stripping away the tax base they need to reposition themselves and compete for new knowledge industries.[5] This section explores the important role of regional transportation authorities in rebuilding Gateway City economies over both the short term and the long term.

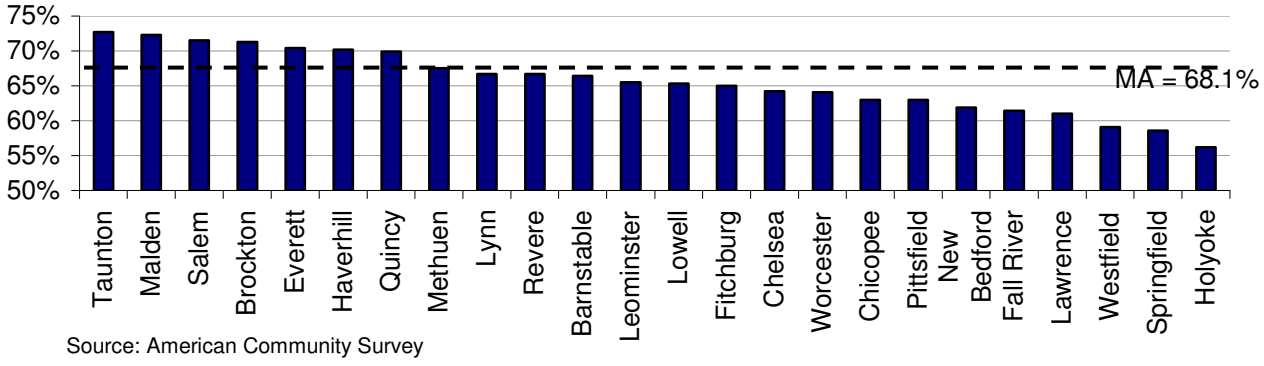
A. Short-Term Economic Gains

By connecting more residents to viable job opportunities, investments in regional transit agencies that enhance service can generate sizeable economic impact in the short term for Gateway Cities, their regions, and the Commonwealth as a whole.

Recent analysis by the Brookings Institution shows that the decentralization of jobs has been particularly strong and continues at a particularly fast pace in Gateway City regions. Among smaller US metro areas, Worcester has one of the most decentralized employment patterns, while Springfield exhibited one of the most rapid decentralization trends between 1998 and 2006.[6] This job sprawl, combined with inadequate public transit service, means that fewer than one-quarter of all jobs in Greater Springfield and Worcester are accessible by transit with a less than a 90-minute one-way commute.[7]

Faced with relatively longer commutes, Gateway residents dependent on public transit have difficulty accessing jobs, and too many simply give up. On average, their labor force participation rates are 2.5 percentage points below the overall Massachusetts rate of 68 percent. Excluding cities near Greater Boston and the core MBTA service area, labor participation rates in Gateway Cities are significantly lower: in Pittsfield it is 4 points lower, in New Bedford it is 6 points lower, and in Holyoke it is 12 points lower (Figure 1).

Figure 1: Laborforce Participation Rate (2009-2011average)



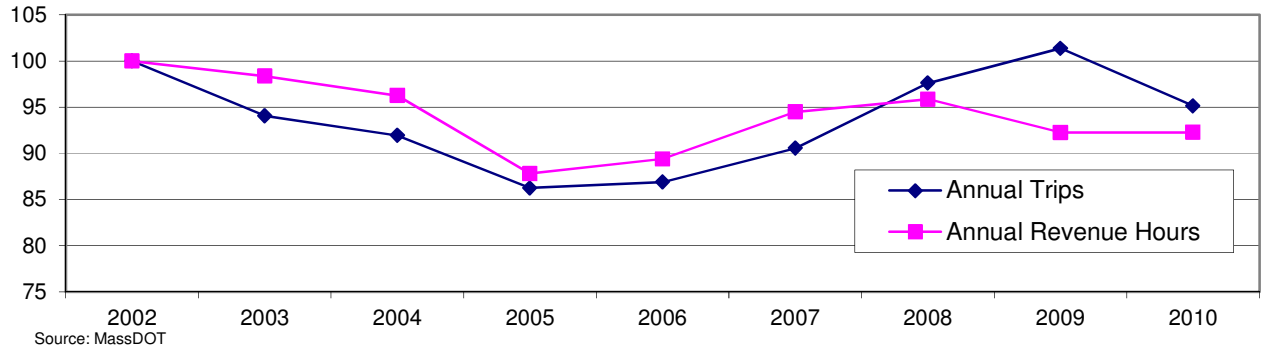
Source: American Community Survey

Gateway Cities' underparticipation in the labor force not only affects local economies, it keeps a lid on the state's economic prospects as a whole. If all Gateway City residents engaged in the labor force at the overall statewide rate of 68 percent, Massachusetts would be home to nearly 50,000 more workers. If these additional workers held only minimum wage full-time jobs, it would amount to more than $780 million in annual wages circulating throughout both local economies and that of the state, adding to the tax base.

Three pieces of evidence suggest that expanded service would lead to higher rates of labor force participation in the short term:

First, MassDOT data show that enhancing RTA service (measured in revenue hours) leads to directly proportional expansions and contractions in ridership. This study provides solid evidence that if more service were available, more residents would be riding public transit (Figure 2).

Figure 2: Annual Passenger Trips vs. Annual Revenue Hours, 2002 - 2010



Source: MassDOT
Note: Excludes systems with incomplete data (MWRTA and FWRTA)

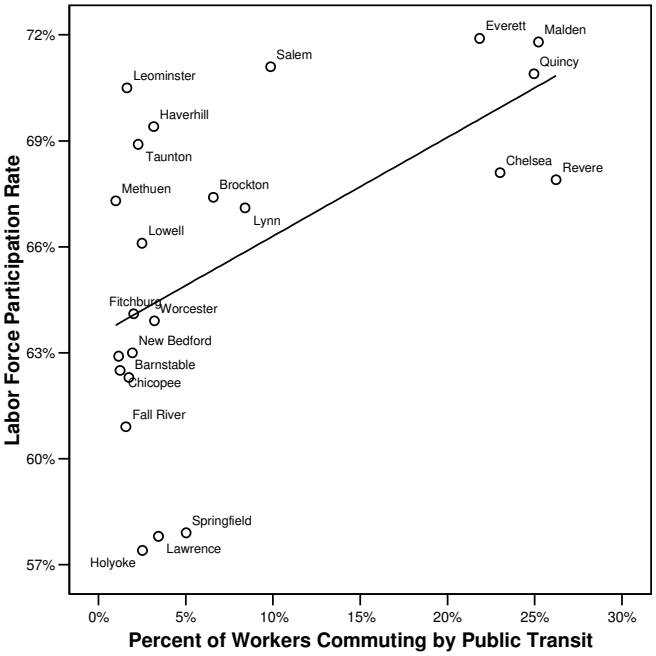
Second, commuting data provided by the U.S. Census Bureau demonstrates a strong positive relationship between the share of Gateway City workers riding public transit and the share of residents actively engaged in the labor force (Figure 3). While this correlation should not be mistaken for causation, the pattern is unmistakable.

Third, rigorous research on small-and-midsize cities in the Midwest shows that metros with strong public transit bus service have higher population and employment growth and lower growth in public assistance (including food stamp use) and unemployment.[8] Evidence also shows that the long-term employment and earnings prospects among economically disadvantaged, carless youth are much improved by access to reliable, affordable public transit. Particularly compelling, this research shows that ease of travel during their formative years enables adolescents and young adults to gain early work experience, as well as access to schools and job-training centers, delivering earnings gains that persist as they move into adulthood.[9]

In addition to increasing labor force participation, improving public transit networks in Gateway Cities would have other immediate economic benefits. Public transit riders

currently spend twice as long travelling to work than those traveling by car. Service improvements that lower the time cost of travel might enable residents to work more hours and/or spend more time with their families. Service improvements that allow low-wage Gateway City workers to forgo vehicle ownership would produce significant savings for these families.[10] Government at all levels would see a fiscal benefit from more stable, economically resilient families. Furthermore, these families could substitute spending on vehicle expenses for good and services that would likely have a much greater impact on the local economy.

Figure 3: Labor Force Participation Rate vs. Percent of Workers Commuting by Public Transit



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B. Long-Term Economic Potential

The long-term role for regional public transit in Gateway Cities varies in relation to each community's place in the Commonwealth's economic geography. Gateway Cities fit into three categories:

- **Satellite Cities.** For Gateway Cities with close proximity to Greater Boston, the long-term growth opportunity provided by RTA transit flows mainly from providing better connections to jobs in the urban core by linking to MBTA commuter rail service.
- **Regional Cities.** RTAs operating beyond the MBTA service area represent these cities' public transportation backbones, connecting residents to jobs across their regions. For these systems, long-term economic gains will come through facilitating more efficient land-use patterns in their metropolitan areas.
- **Regional Hubs.** A number of Gateway Cities play dual roles, serving as both a regional hub and a satellite at the edge of the Greater Boston economy. For these

places, the strategy is mixed: growth will come from stronger connectivity to the Boston metro core through integrated RTA-MBTA service, but the majority of residents will work locally, and so RTAs must also provide strong service to regional employment centers.

Depending on where a city fits within this typology, investments in regional transit will support the growth of the Massachusetts economy over the long term by expanding housing supply, facilitating more efficient and productive regional development patterns, and increasing local consumer spending power.

1. Expanding housing supply

For Satellite Cities and Regional Hubs in particular, improving RTA service is critical to any strategy seeking to address the drag that Boston area high housing costs places on job creation. As new research from Northeastern University's Dukakis Center powerfully demonstrates, the state's restricted housing supply is perhaps the most significant constraint on job creation, especially for mature industries with tight operating margins, which provide a wide array of middle-skill jobs essential to middle-class families in all parts of the Commonwealth.[11]

Northeastern's analysis shows that future housing demand will come largely from households amenable to urban living, which means there is a real opportunity to make Gateway Cities stronger residential centers. However, without high quality transportation service, it will be difficult for them to fulfill this potential.

Renewed interest in residential urbanism is largely rooted in the lower cost of living cities often provide.[12] Because the current public transportation service in Gateway Cities is inadequate, relatively lower Gateway City housing costs are largely offset by the high cost of commuting to jobs from these locations in private vehicles. On average, for residents living in Gateway Cities within Greater Boston, combined housing and transportation costs are just 5 percentage points lower than the Hub's regional average (Figure 4).This modest differential does not provide a strong incentive to relocate to more distant Gateway Cities.

Figure 4:
Housing and Transportation Costs for Gateway Cities with Current and Proposed MBTA Service

Gateway City	Median Household Income	Housing Costs as a Percent of Median Household Income	Transportation Costs as a Percent of Median Household Income	Housing and Transportation Costs as a Percent of Median Household Income
Brockton	$51,577	24%	20%	44%
Chelsea	$40,388	21%	14%	35%
Everett	$50,311	22%	15%	38%
Fall River	$38,297	19%	23%	42%
Fitchburg	$49,422	22%	23%	45%
Haverhill	$62,045	24%	21%	45%
Lawrence	$35,976	20%	19%	39%
Leominster	$59,709	23%	23%	47%
Lowell	$51,156	20%	19%	40%
Lynn	$43,661	22%	18%	39%
Malden	$55,899	25%	16%	41%
New Bedford	$39,147	21%	23%	44%
Quincy	$61,102	24%	18%	42%
Revere	$49,576	23%	17%	40%
Salem	$58,034	24%	19%	43%
Taunton	$56,773	27%	26%	53%
Worcester	$48,348	22%	21%	43%
Average	**$50,084**	**22%**	**20%**	**42%**
Greater Boston	$75,209	28%	19%	47%

Source: Center for Neighborhood Technology

2. Facilitating more efficient and productive regional development patterns

For all Gateway Cities, improved RTA service has the potential to reduce public infrastructure costs by supporting efforts to concentrate development. Strong transit service that makes urban areas more attractive to businesses and residents alike will also add to the tax base and fiscal capacity of Gateway Cities, reducing the need for state aid. If the state can translate these savings into lower tax rates, it will increase the long- term competitiveness of the Massachusetts economy.[13]

For satellite cities and regional hubs within commuting distance to Greater Boston's knowledge economy, stronger public transit will help concentrate employment within the region's core. This is critical for high-tech employers who need access to a large flexible labor market with specialized skills. By helping these companies centralize, strong transportation systems also support the formation of dense clusters of businesses in related fields, such as health care in Longwood Medical Center or biotechnology in Kendall Square. These clusters facilitate the face-to-face interaction critical for innovation and economic growth in the state's knowledge economy.[14] Research shows that residents experience a direct economic benefit from increased knowledge-based productivity in the form of higher wages.[15]

3. Increasing local consumer spending power

For all Gateway Cities, building transportation networks that reduce vehicle travel frees money for circulation in the regional economy. In 2008, the average household in Massachusetts spent $2,200 on gasoline alone. This amounted to $5.4 billion, most of which left the state economy. Research shows that households in regions with strong transit networks save approximately $500 annually in transportation costs. Because a

much larger portion of this substantial savings will stay in the local economy, it generates large net regional economic benefits.[16]

The Massachusetts tourism industry also injects dollars into our local economies. Tourism currently accounts for 200,000 jobs in Massachusetts and $26 billion in annual economic activity. It is a growing sector that offers employment opportunity across the skills spectrum.[17] Particularly for Cape Cod and the Islands and the Berkshires, major drivers in the state's tourism industry, stronger regional public transit service has the potential to provide real long-term value.

Understanding the Opportunity

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During the age of rail travel, most Gateway Cities had elaborate electric streetcar networks and interurban rail lines connecting them to one another and to Boston. Soon after the rise of automotive transportation, during the Great Depression and Second World War, these systems were systematically removed from all but a few large metro areas, such as Boston and New York. Today, as a result, smaller cities throughout the United States—Gateway Cities included—are entirely dependent on automotive travel. Residents who cannot afford to own and maintain a car must get around by public bus transit, and relatively few do (Figure 5).

On average, just 7.3 percent of Gateway City residents ride public transit to work. This is significantly lower than the state average (9.2 percent), and if you exclude Gateway Cities within the core MBTA service area, the figure drops to just 3.1 percent (Figure 6).

Inadequate service is clearly a factor in low ridership. Those who ride public transit to work spend nearly twice as long commuting as do those travelling by car. According to recent U.S. Census Bureau data, the average Gateway City public transit rider spends nearly two hours each day commuting to their place of employment. About one in ten Gateway City residents work second shift (after 4 pm) or very early shifts (before 5 am) on average. For these residents, limited RTA service rules out public transportation as a feasible option.

Gateway Cities retain large institutions and employers, including hospitals and universities with centralized locations and standard work shifts, that can ground public transportation networks. In Worcester, for example, hospitals employ more than 13,000 workers. Over 3,200 Worcester residents commute to work at UMass Memorial Health Center alone. Worcester colleges and universities, such as Clark University, Worcester Polytechnic Institute, and Holy Cross, employ more than 3,000 workers and, like other Gateway Cities, draw thousands of students. For instance, more 3,800 students who attend Quinsigamond Community College live within Worcester city limits and commute to campus each day (Figure 7).

While these institutions are clearly major employers with central locations, data show their workers are underrepresented among public transportation riders. Across all Gateway Cities, workers commuting to jobs in the education and health care fields make up 28 percent of all workers, but just 22 percent of all public transit riders.

Many believe that Gateway City regions lack the density to provide regular public transit service, but this is clearly not true. There is increasingly strong evidence in places such as Broward County, Florida, and elsewhere, that with good planning, public transit can perform efficiently without the high densities found in Greater Boston.[18]

Moreover, Gateway Cities have high densities and walkable urban reform that makes delivering frequent transit service more efficient. Reconnecting America, a national nonprofit focused on building stronger transit-based communities, has defined Opportunity Areas as census tracts with residential and employment densities that make for strong walkable neighborhoods served by public transit. On average, about half of all Gateway City residents currently reside in these neighborhoods (Figure 8). And while Gateway City downtowns could certainly become stronger regional employment centers, the current intensity of development in these areas (workers and residents per acre) is substantial and well above commonly accepted thresholds required to support frequent public transportation service (Figure 9).[19]

Figure 5: Streetcar Service in Gateway Cities

City	Date Service Ended
Brockton	1937
Fall River	1936
Fitchburg	1932
Haverhill	1936
Holyoke	1936
Lawrence	1936
Lowell	1936
Lynn	1937
New Bedford	1947
Pittsfield	1932
Springfield	1940
Worcester	1945

Note: This list may be incomplete

Source: Wikipedia

Figure 6:

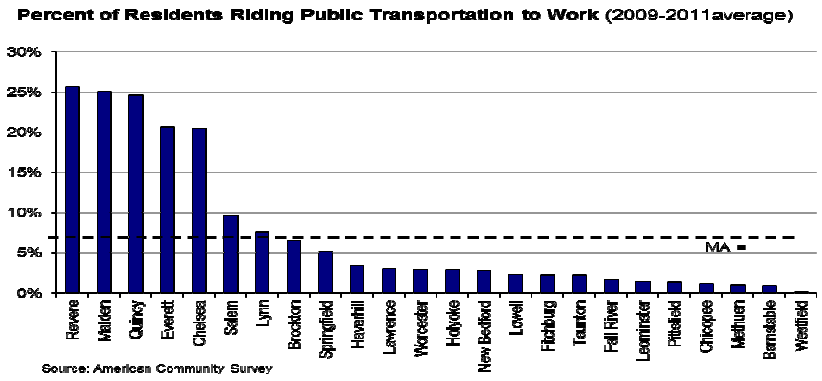


Figure 7: UMass Medical Workers by Location of Residence

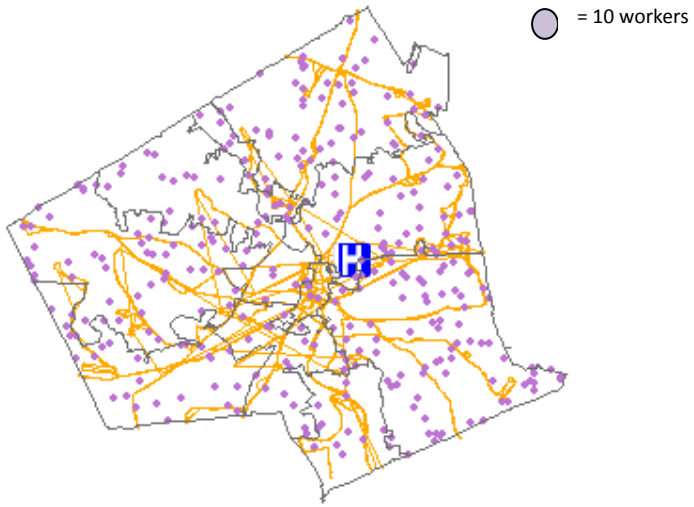


Figure 8:

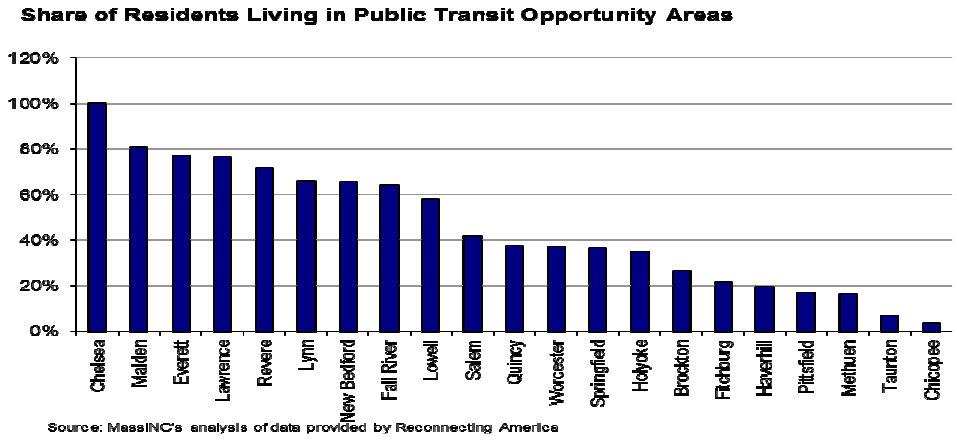


Figure 9:Land Use Intensity in Gateway City Downtowns

Downtown	Residents	Jobs	Intensity (Population+Jobs per Acre)
Brockton	4,231	5,187	24
Haverhill	4,915	5,044	41
Lowell	5,085	8,905	60
Lynn	4,226	5,208	39
New Bedford	1,628	6,124	38
Pittsfield	2,306	5,432	31
Springfield	4,995	13,135	43
Worcester	3,092	11,437	47

Source: MAPC analysis of Census, InfoUSA, and MassGIS data for downtown geographies provided by MassINC

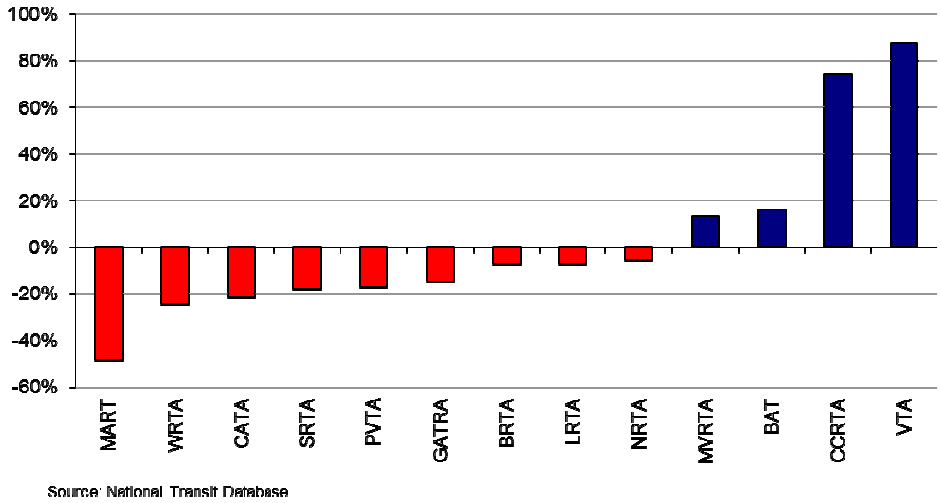
III. Capitalizing Regional Transit Authorities

Positioning regional transit authorities to serve as strong enablers of economic growth in Gateway City economies will require additional investment. This section explores the revenue need, reforms to prepare regional transit authorities to invest these new resources well, and methods of generating new revenue that will lead to equitable and efficient allocation of taxpayer dollars.

A. Revenue Needs

Federal Transit Administration data show that the number of RTA revenue hours (i.e., the aggregate amount of time buses provide service on fixed routes) has fallen in recent years. In some instances, service cuts have been substantial. Between 2002 and 2010, the Pioneer Valley Transit Authority and the South Coast Regional Transit Authority cut service by nearly 20 percent, the Worcester Regional Transit Authority eliminated nearly one-quarter of its service, and the Montachusett Regional Transit Authority halved its fixed route operations (Figure 10).

Figure 8: Percent change in RTA Revenue Hours, 2002 - 2012



Source: National Transit Database

While restoring lost service might seem like a worthy place to start, in many regions the service provided by RTAs in 2002 is inadequate for the needs of residents in today's economy. Without a Comprehensive Service Analysis for each agency, it is difficult to determine optimal levels of investment. However, as summarized below, MassDOT's plan provides some indication of the types of enhancements RTAs are considering.

Investments in service. Clearly, the RTAs' most significant need on the operating side is funding to improve service quality. In consultation with RTAs, MassDOT has outlined additional service needs. The agency calls not only for restoring service eliminated in recent years, but also for adding new service, increasing the frequency of service, extending service hours, and improving accessibility through both

improvements in demand response service as well as enhanced customer service (Figure 11). The plan estimates that these increases will require an additional $100 million annually in state contract assistance to the RTAs, a 140 percent increase over FY13 levels (Figure 12).

Investments in capital. MassDOT's plan includes $400 million over 10 years to add new buses for expanded service, to replace older vehicles, and to upgrade equipment and facilities.

Forward funding. In FY13, RTAs will borrow more than $150 million using Revenue Anticipation Notes (RANs) to cover operating costs while awaiting reimbursement from both state contract assistance and local assessments. The interest expense associated with this borrowing is approximately $2 million. The state portion accounts for about 42 percent of this interest expense. MassDOT's plan will eliminate this cost by forward funding the RTAs, fulfilling a commitment included in the state's 2009 transportation reform law.

Figure 11: Proposed RTA Service Enhancements, FY14 - FY19

RTA	Restore Old Service	Add New Service	Increase Frequency	Extend Hours	Increase Accessibility
BAT		x	x		x
BRTA	x	x	x	x	x
CATA		x	x		x
CCRTA			x	x	
FRTA	x	x	x	x	x
GATRA	x	x	x	x	
LRTA	x	x		x	x
MART	x	x		x	
MVRTA			x		
MWRTA				x	
NRTA	x	x		x	x
PVTA	x	x	x	x	x
SRTA	x	x	x		
VTA		x	x	x	
WRTA		x	x	x	
Total	8	12	11	11	7

Source: MassDOT

Figure 12: Proposed State Contract Assistance Increase by RTA

RTA	FY13	FY14	Increase	Percent Change
BAT	$5.2	$15.0	$9.8	188%

BRTA	$1.9	$5.1	$3.2	168%
CATA	$1.1	$2.5	$1.4	127%
CCRTA	$3.4	$9.3	$5.9	174%
FRTA	$0.7	$1.7	$1.0	143%
GATRA	$2.8	$9.1	$6.3	225%
LRTA	$2.7	$7.4	$4.7	174%
MART	$4.4	$10.2	$5.8	132%
MVRTA	$5.5	$12.7	$7.2	131%
MWRTA	$2.1	$4.7	$2.6	124%
NRTA	$0.4	$0.8	$0.4	100%
PVTA	$17.2	$49.9	$32.2	190%
SRTA	$4.6	$10.0	$5.4	117%
VTA	$1.2	$3.2	$2.0	167%
WRTA	$9.2	$20.3	$11.1	121%
Total	$62.4	$161.9	$99.0	159%

Source: MassDOT

B. Reforms to Improve the Delivery of Regional Public Transportation

For many years, the state's entire public transportation system has been underfunded proportionate to demand. Today, there is much debate among lawmakers and administrators over how to raise new revenue. Preceding that debate, however, transportation officials recognized the need for administrative reform and began to forge plans for action. While most of that conversation focused on the shortcomings of the MBTA, it became increasingly clear that the RTAs also needed of a thorough overhaul before new taxpayer dollars could be invested in their systems with confidence. In partnership, MassDOT and the RTAs have been diligently pursuing the necessary reforms over the past 18 months.

In large part, RTA deficiencies were an outgrowth of the way they were funded under Massachusetts law. The enabling legislation (M.G.L. Chapter 161B) created organizations that are dependent on the state for assistance, yet operationally independent of the state Department of Transportation. Over the years, this structure led to mistrust between state and local authorities, and missed opportunities to improve the delivery of services through coordination.

Over a nine-month period beginning in October 2011 and ending in June 2012, MassDOT conducted a thorough assessment of RTA performance. The study was led by outside consultants from Nelson\Nygard and informed by a 17-member advisory committee made up of MassDOT officials and RTA administrators, operators, unions, and other stakeholders.

The study, *Beyond Boston,* found great divergence in the performance of RTA systems relative to industry standards. Of particular concern, the study demonstrated an absence of transparent processes for allocating state capital and operating dollars to these regional systems based on valid measures of need and performance.

In response to the challenges identified, the study proposed 10 initiatives for improving the quality and efficiency of public transportation service provided by the RTAs. These initiatives were accompanied by a detailed implementation plan. Since the study's release in 2012, MassDOT and the RTAs have been working together successfully, and expect to execute their reforms ahead of schedule.

For leaders stewarding future investment in the RTAs, the three most pertinent reforms are detailed below:

1. ***MassDOT-RTA Integration.*** For a number of years, MassDOT did not formally convene the RTA Council established under the RTA enabling statute. MassDOT now meets regularly with the RTA Council. The working relationship between the RTA Council and MassDOT is the basis upon which the implementation of other reforms is proceeding. In accordance with the 2009 transportation law that created the Rail and Transit Division under which RTA oversight falls, MassDOT has been increasing staffing levels, including the creation of a new position, Deputy Administrator of Transit, to strengthen MassDOT-RTA integration.

2. ***Performance metrics, service standards, and service planning.*** To provide the public with more information, RTAs will publish monthly performance reports. Even more important, RTAs, with MassDOT oversight, are taking steps to tie service decisions to data. Previously, RTAs did not use common standards to measure the performance of routes, making it difficult to assess return on investment. RTAs are now collecting sets of consistent metrics and will begin reporting on them annually in FY14. If routes are deemed underperforming and RTAs lack the capacity to address the challenge, technical assistance teams made up of MassDOT staff and RTA leaders will provide expertise.

   At a systems level, RTAs did not regularly evaluate changes in commercial, institutional, and residential development patterns that might call for realigning service. Contingent upon new funding, all RTAs will contract with regional planning agencies or outside consultants to perform a Comprehensive Service Analysis (CSA) every three to five years, with an annual update.

3. ***Asset management and capital planning.*** The state lacked a system for allocating capital dollars to RTAs, so distributions were based on historical expenditures. MassDOT is now using a scoring system developed for the MBTA to evaluate projects for inclusion in five-year RTA capital plans.

   In part, the state had a challenging time allocating these dollars because it had no information system to manage RTA assets. RTAs are now reporting standard information to MassDOT to aid in the development of an asset management system. MAP-21, the new federal transportation law, also contains extensive provisions for asset management plans using uniform FTA criteria.

C. Closing the Funding Gap

For leaders evaluating investments in RTAs, it is important to recognize that the approach Massachusetts takes to generate and allocate new revenue for regional transportation service is just as important as reform in terms of return on taxpayer investment. While the revenue conversation has frequently centered on the nature of the tax, the much more important question is how the state applies the taxes and distributes the proceeds. There are two distinct approaches:

1. Statewide revenue tied to performance. The MassDOT plan calls for increasing funding for public transit through dedicated statewide sales tax revenue. This approach will lead to significant upgrades in public transit in all regions of the state over a relatively short time span. This statewide approach also has the advantage of creating stronger incentives for greater integration between MassDOT and the RTAs.

The drawback to state funding is it creates more pressure for equity as opposed to efficiency. This dynamic can be moderated by tying future funding to performance. MassDOT and the RTAs have already agreed to apportion future funds according to a formula that accounts for ridership and the size of each system. They have pledged to revisit this approach in two to three years and perhaps incorporate additional efficiency measures. Calibrating this formula to ensure an efficient distribution of resources will be difficult. Fortunately, a number of other states are pursuing this approach and the models they offer could be informative for Massachusetts.[20]

2. Local option regional revenue. MassINC's 2011 analysis demonstrated that robust regional transit systems could be supported, in part, with broad-based regional sources (e.g., a regional payroll tax) at a relatively low average cost to taxpayers (Figure 13). Evidence nationally suggests that states which empower communities to adopt regional taxes to finance transportation invest more in this vital infrastructure than those that do not.[21]

Policymakers may choose not to pursue regional funding as the fiscal foundation for state transportation improvements in the short-term, but the logic behind creating provisions for optional regional funding is strong. Above all, it would mitigate the tendency to uniformity that statewide policies and systems will inevitably foster. With their different, locally tailored visions of the future, regions will invariably require varying funding levels that no one formula will adequately address. Secretary of Transportation Richard A. Davey has acknowledged that many investments that deserve consideration were left out of the Administration's plan. Passing enabling legislation that provides for a regional option would give communities the chance to consider these worthwhile projects in the medium-term, when the state legislature might not want to revisit another thorny discussion of transportation revenue.

Figure 13: Revenue Potential of Regional Payroll Tax by RTA Service Area

RTA	0.16%	0.30%	0.70%
Berkshire	$3	$6	$14
Brockton	$6	$10	$24
Cape Ann	$1	$2	$5
Cape Cod	$4	$8	$19
Franklin	$1	$3	$6
Greater Attleboro	$12	$22	$51
Lowell	$11	$20	$46
Martha's Vineyard	$0	$1	$2
Merrimack Valley	$9	$17	$40
MetroWest	$13	$25	$59
Montachusett	$5	$9	$20
Nantucket	$0	$1	$2
Pioneer Valley	$13	$24	$56
Southeastern	$6	$11	$25
Worcester	$13	$25	$58
Total	$97	$184	$427

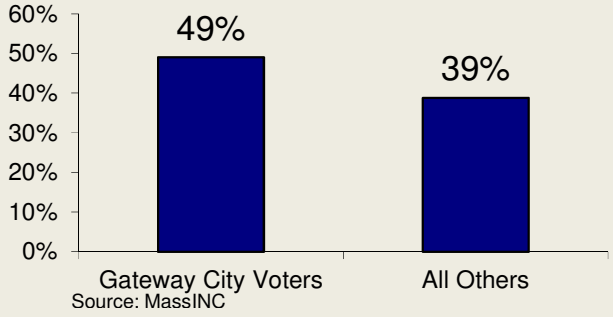
Source: MassINC's analysis of data from the US Bureau of Economic Activity and MA Dept. of Revenue

How do Gateway City Voters View Investments in Transportation?

Results from a large public opinion survey conducted by MassINC from February 7 - 10, 2013 show that Gateway City voters are more supportive of public transit than the average Massachusetts voter by a considerable margin. When asked whether increasing bus service will make a difference in the lives of people in the community, nearly half of all Gateway City voters say it would make a "major" difference, 10 percentage points higher than voters living in other Massachusetts communities. Nearly three-quarters of Gateway City voters say they would be willing to pay $50 more per year for improvements in the state's transportation infrastructure, again, 10 percentage points more favorable than non-Gateway City respondents.

While a majority of Gateway City voters view many reasons for supporting transit favorably, including the environmental benefit, congestion reduction, and short-term economic stimulus, the most popular theme is linking workers to jobs. Nearly 80 percent say connecting people to jobs in the area is a "very strong" or "somewhat strong" argument for investing in public transportation.

Figure 14: Share of Gateway City voters who say **"Increasing bus service in your area with more routes, more frequent service, and longer hours"** will make a **"Major"** differenece for people in the community.



Source: MassINC

Figure 15: Share of Gateway City voters who support paying $50 more per year for transportation improvements

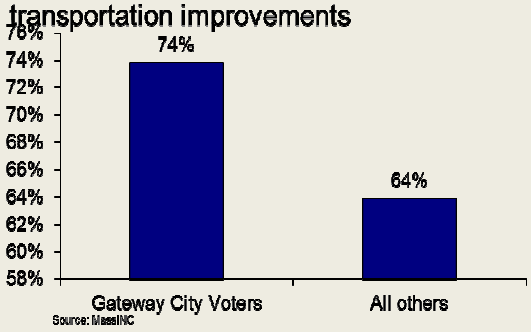
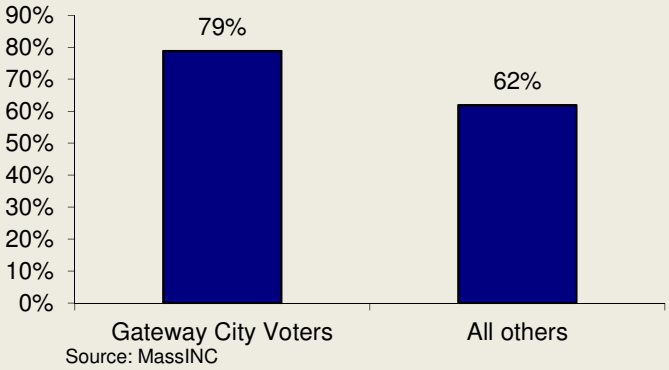


Figure 16: Share of voters who believe "**connecting people to jobs in your area** " is a "very strong" or "somewhat strong" reason to invest in public transportation



IV. Re-envisioning Regional Transit Authorities

Public transit must move from a system of last resort to a true backbone for multimodal transportation systems that support economic development in Gateway City regions across the Commonwealth. In December 2012, the Patrick Administration called for an aggressive statewide "triple mode share" program, with the goal of tripling travel by walking, biking, and public transit by 2030.[22] This worthy objective is consistent with the proposed investment outlined in the Administration's *The Way Forward* plan, published a month later, and creates further opportunity to position RTAs to play larger roles in our regional transportation system.

This section explores how Massachusetts can help enhance RTAs' performance in three categories: marketing and branding regional transit service, improving service quality, and integrating transit with land-use planning.

A. Marketing and Branding

While attitudes toward public transit are growing more favorable, it still has an image problem. Especially beyond Greater Boston, people see public transit, especially bus travel, as unclean, unsafe, unreliable, and inconvenient.[23] As long as people view transit as "not for them," public support for transit funding and the size of the constituency advocating for high-quality service delivery will suffer. The significant investment the state is contemplating for RTAs provides a unique opportunity to capture public attention and rebrand these services.

Rebranding should start at a macro level. Massachusetts, after all, pioneered mass transit and subway travel: the "T," developed in the1890s, stands alongside the London Underground as an iconic public transit brand. MassDOT should regard new statewide investment in RTAs as a chance to build on this brand and develop the state's culture of public transit, while also marketing Gateway Cities as unique places to live, work, and visit.

At the community level, Gateway Cities must begin to regard RTAs as sources of highly visible public architecture that reflects the values of the community and region, and grounds places and spaces they wish to build out.[24] The design of buses, bus stations, shelters, typography, and iconography will influence not only the success of the system in terms of ridership, but also future area development.

Hartford's iQuilt plan (see text box) offers a great example of how a city can use innovative design for both functional and aesthetic purposes. Hartford is leveraging investments in commuter rail and a new intercity bus rapid transit line to beautify the urban landscape and enhance walkability. The iQuilt plan signals the city's commitment to multi-modal mobility by integrating the design of wayfinding, linear parks, pedestrian trails, and bike paths with the local bus system.

At an even finer level, some cities are developing brands around each component of their system: downtown circulator buses, radial routes, and crosstown connectors.[25] When these services are new, the opportunity to capture public interest and market the availability of a premium, higher quality experience is heightened. This more granular branding includes logos and color schemes that signal different service qualities, which are then used in stations and bus shelters, on the vehicles, and on websites and other media. In Perth, Australia, these schemes are used consistently in Perth as well as in smaller regional cities. Boulder, Colorado, has successfully branded its frequent service: the city renamed frequent service bus lines names like "Hop," "Skip," and "Jump" to denote their regularity, and gave each line a unique identity. Together with other strategies, such branding more than doubled ridership over a decade. In a city of 100,000 residents, the system carries 24,000 passengers daily.[26]

As in Boulder, many transit planners believe that using system maps that highlight frequent service lines is critical.[27] Yet agencies are often reluctant to take this approach because it illustrates how unevenly frequent service is distributed across the community. However, as RTAs work to expand frequent service, producing these maps now would provide the public with a visual representation of how future spending will lead to a more robust system.

Urban innovators, for lack of a better term, can also be powerful allies for transit disproportionate to their numbers. They are bringing energy and funding to cities under the mantle of movements such as "tactical urbanism"—fast, cheap, and temporary projects that bring fun and spontaneity to urban culture—and "creative placemaking," a form of arts-based, foundation-supported economic development. As MassINC detailed in a recent report, creative placemaking initiatives are now firmly established in many Gateway Cities across the state. They share, with tactical urbanists and other urban innovators, the conviction that transit-oriented development and walkability are key to urban flourishing. [28]

B. Improving Service Quality

In transportation industry jargon, "choice riders" are passengers who could own or drive a car but choose public transit over automotive travel. Understanding what makes public transit service more attractive to choice riders is therefore crucial to expanding user markets. Peer-reviewed research clearly demonstrates that improving service quality is the most important factor in increasing ridership. Service improvements to reliability, frequency, and speed lead to ridership increases over time, often a period of 5 to 10 years, and can lead to the doubling of ridership if improved service levels are maintained.[29] In recapitalizing RTAs, incentives and resources should be devised to help communities take advantage of innovations that lead to higher quality service. The most promising among them include:

> **1. Real-Time Information Systems.** New information technology gives transit systems a variety of ways to provide passengers with arrival times accurately and cheaply. Through their use, riders are better able to plan and therefore reduce their

wait times. Even when riders learn only the predicted arrival time at a stop, this information makes the wait feel significantly shorter. Reducing time (or the perception of time) spent at the bus stop is particularly important because travelers respond more harshly to time spent waiting for a bus than they do to time spent riding.[30] Providing real-time information has been shown to strongly increase overall satisfaction with public transit, increase transit trips per week, and even produce health benefits by increasing walking distances to transit stops.[31]

Seven RTAs currently offer real-time information through website, smart phone apps, text messages, and automated call lines. Another five are scheduled to add these services in 2013. While providing this dynamic information on visual displays at stops may prove to be too costly for most routes, cities are finding innovative ways to get this information to riders, such as encouraging shopkeepers along the route to provide transit displays as a service to their customers. These devices can be installed for less than $200.[32] Providing information on wait times at stops has also been found to make riders feel safer when waiting after dark.[33]

2. Integrated Fare Payment. Convenient ticketing across systems helps transit providers build ridership. Ten RTAs currently have integrated Charlie Cards. MassDOT has recently made Charlie Cards operational on commuter rail and ferries and they are now working to expand the use of mobile ticketing using smart phones. In addition, RTAs are working to provide greater RTA-to-RTA integration. The greater the extent to which these systems offer interchangeable fare payment, the more success they will have drawing ridership.[34]

3. Signal Prioritization. Research shows that signal prioritization in small-to-midsize cities can reduce travel time by 7 to 10 percent. The technology is particularly promising in these cities because in less congested cities it can be added without creating significant delay in vehicle travel.[35] Many traffic lights are already outfitted with the technology for use by emergency vehicles. While adapting it for transit may carry a modest price tag, the lifecycle costs could be significant because it must be continuously evaluated and adjusted to changing conditions. MassDOT's GreenDOT plan calls for expansion of signal prioritization. The department could fund this improvement in Gateway Cities where cost/benefit analysis suggests it would be appropriate.

4. Schedule adherence systems. As mentioned previously, passengers feel time spent waiting for a bus more profoundly than they do time spent traveling. This wait time is particularly onerous when the bus is behind schedule. Studies show that excess wait times seems two to three times longer than ordinary wait times.[36] For this reason, schedule adherence technology that keeps buses on schedule is extremely valuable.

5. Curb extensions and running ways. The greatest improvements in service quality will require physical improvements that allow buses to move swiftly through urban traffic. A range of design interventions are possible. On avenues with multiple lanes of traffic, curb extensions can be installed that allow the bus to remain in the traffic lane while riders board.[37] Portions of the route can be restricted for bus-only travel, either by constructing physical barriers or demarcating bus lanes with paint. Used well in areas where congestion is modest, these lanes can save time for those travelling by both bus and car.[38]

C. Integrating Land Use Planning

Transportation and land use are highly interconnected, yet administratively they are handled very differently in Massachusetts. Local governments control land use while transportation investment decisions are made by Metropolitan Planning Organizations and the state department of transportation. As Massachusetts prepares to make a major investment in transportation infrastructure, the state should work to maximize the impact of this investment on regional economic growth by creating stronger linkages between transportation and land use planning.

The Patrick administration has already devised one promising model with the development of the South Cost Rail Corridor Plan. Communities in the region came together to prepare an unprecedented regional land use plan in advance of this major state investment. Upon completing this plan, Governor Patrick issued an Executive Order (E.O. 525) calling for state investments in the region to be consistent with the plan's recommendations to the maximum extent feasible. These state actions have the potential to leverage local and private investments in the Corridor Plan's priority development areas.

While the state has substantial power to influence development patterns by targeting public investment consistent with integrated transportation and land use planning, the power of local governments lies largely in their ability to regulate land use through zoning. Unfortunately, the state's zoning statue is among the weakest in the nation. Changes to local ordinances often have limited long-term influence because owners have vested rights under current law that go well beyond those afforded property owners in others states. Recently filed legislation (HD 3216) would address these challenges and give communities and their regions the ability to facilitate development patterns that make for a more efficient and productive transportation network.

Transit and Creative Placemaking

Gateway Cities across Massachusetts are using creativity to reinvent themselves and breathe new life and vibrancy into downtowns and residential neighborhoods.[39] This energy can be tapped to celebrate and rebrand public transit as a fun, unique, asset that contributes to community vitality. With their large vehicles, wait shelters, and uniformed personnel, bus transit systems are a highly visible feature of a city's design landscape. **London**'s identity, for example, is tied to its red double-decker Routemaster buses, even though the manufacturer went out of business in 1968. After filling in the fleet with red buses of varying design for several decades, the mayor's office in 2010 issued the city's first uniform design standards in 50 years. The new buses retain the iconic red double-decker style, but they are also wheelchair and pram accessible, with rounded edges and larger wrap-around windows to improve lighting and driver visibility. They also include interior design standards such as two-person bench-like seats, spacious staircases lit with natural light, and calming color motifs.

Boulder, Colorado, took another approach to coordinated bus design, and a more participatory one. In 1989, the city of 100,000 identified seven high-frequency routes servicing the University of Colorado, and branded each by bus color and a logo created by local artists. It also invited passengers to name the routes and to continuously refine them. In keeping with the community's active outdoor culture, they were named after motion verbs: Hop, Skip, Jump, Bolt, Bound, Dash, and Stampede. Care also has been taken, at the community's urging, to include front-loading bike racks and under-carriage bike storage. Community involvement has become part of the system's brand.[40]

As for shelter design, Bus Rapid Transit, with its dedicated routes, lends itself to color and design branding consistent with those of the bus fleet. Brisbane, Australia, has done this well.[41] Such a program is less feasible for bus transit systems with routes that change periodically. In addition to providing appropriate weather protection, visibility, scheduling information, and consistent signage, they should follow one of two general design principles. One involves integrating a bus shelter's appearance with the culture of its neighborhood. The **Seattle**-area transit system was an early leader in this approach. In 1989, it launched a bus shelter mural program inviting volunteers (as well as a few commissioned artists) to ornament shelters with imaginative imagery.

The well respected Urbanist Aaron Renn his written thoughtfully about the importance of design in public transportation. He's particularly passionate about personnel uniforms, which he believes should convey competence, seriousness, and a sense of the importance of transit workers' mission in the community.[42]

Leadership in Midsize City Transit Delivery

Champaign-Urbana, Illinois

Champaign-Urbana, home to the state's flagship university, offers a good example of how smaller municipalities and anchor institutions can work together to fund state-of-the-art public transit. The Champaign-Urbana Mass Transit District (MTD), created in 1970, serves an area population of about 232,000 and provides more than 11 million rides a year, with one dollar fares and a $60 annual pass. To ground the system fiscally, all 38,000 university students pay a $46 transportation fee each semester in exchange for unlimited use of the bus system; the MTD also levies a 25-cent property tax per $100 of assessed valuation. In addition, the university funds airport shuttle routes, with services available to all area residents. In 1999, the MTD opened an intermodal facility in downtown Champaign—the Illinois Terminal—linking public bus transit to Amtrak and intercity bus service provided by Greyhound and others. Combined with upgrades such as real-time service planning apps, the retirement of 45 diesel buses and purchase of elongated and diesel-electric hybrid buses, and a price reduction of annual passes from $235 to $60, success bred success: between 2008 and 2012, bus ridership increased by 20 percent.[43]

Grand Rapids, Michigan

Grand Rapids, a city with a relatively stable population of about 190,000 in southwestern Michigan, was the second city in the country to convert its streetcar system to bus transit, in 1935. Today, it is about to take another big step into the future: "The Rapid" interurban bus system is planning to open a 9.8-mile, 19-station rapid transit "Silver" line from the downtown "Medical Mile" through one of the city's most impoverished neighborhoods to two inner ring suburbs. With combined federal, state, and local funding, the project—much like Boston's Silver Line—intends to both provide access to jobs for the neighborhood's working poor and attract private investment in transit-oriented development. With completion anticipated in 2015, the Silver Line will include dedicated bus lanes, signal priority, and off-board fare collection, reducing auto commute times by 40 percent. The project attracted support from local metro residents, politicians, and business leaders in part because over the past ten years The Rapid had improved services and connectivity, including the construction in 2004 of a downtown intermodal transit center with interurban bus service. As a result, Grand Rapids developed a culture of public transit, with ridership more than doubling between 2003 and 2012.[44]

V. CONCLUDING THOUGHTS

New transportation investments are crucial to building the Commonwealth's 21st-century economy. State and local leaders pondering the funding and structure of system improvements will need to fundamentally rethink the purpose of the RTAs, and how they can best contribute to economic growth. As decisions are made in the coming months that will likely have great influence over how public transit will shape our regions decades into the future, five key considerations merit particular focus:

1. Aligning oversight responsibility with the source of funding. If future RTA funding is generated from regional sources, than ultimately regions are responsible for monitoring performance to ensure that these dollars are invested well on behalf of their taxpayers. Alternatively, if the Legislature choses to fund RTAs with a significant infusion of new revenue collected from residents across the Commonwealth, than MassDOT should bear responsibility to see that these resources are programmed efficiently. The department must have the resources and staffing to fulfill this obligation.

2. Investing in comprehensive service planning. Whether the state is infusing more money for regional public transit, or regions are empowered to raise funds based on local needs and aspirations, ensuring that all RTAs have funding in place to conduct a thorough comprehensive service plan that quantifies and evaluates the opportunities for cost-effective service improvements is critical.

3. Providing access to transportation assets. As investments are made to improve RTA-MBTA commuter rail connections, the state should ensure that the cost of commuter rail fares are not prohibitive for lower-wage Gateway City workers. The cost of offering subsidies for this population should be carefully weighed against the benefits and alternative strategies for providing greater access to jobs.

4. Connecting transportation and land use planning. Given the level of spending on transportation infrastructure under consideration, it is imperative that the state takes all steps necessary to ensure that these funds generate real return on investment. Putting in place tools to give local communities powers to coordinate land use planning with transportation investment is essential. Continuing to align other state infrastructure spending with transportation investment will also be critical.

5. Building community buy-in for the long term. MassDOT's transportation vision should not be a singular outreach effort geared toward winning legislative approval. Working to build broad-based support in each region of the state for bold investments in multi-modal transportation systems will require a long-term campaign. MassDOT, along with its partners, must develop a thoughtful strategy to continue building the culture of support for high-quality mobility options across all modes throughout the Commonwealth long after a revenue package is approved.

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