

COMING AROUND

The Urban Ring would create a new transit line connecting six cities and towns in Greater Boston's urban core – not only moving people around in new ways, but also providing new opportunities to foster development and improve the 'look and feel' of the region. Planners say the project is critical to a regional 'smart growth' strategy. But questions remain about the project's details – creating an unobstructed pathway for the system, paying for new infrastructure and operations, and making the system an integral part of community planning.

**BY CHARLES C. EUCHNER
AND ANTHONY FLINT**

For decades, Boston and surrounding cities and towns have explored ways to foster better transportation connections and development opportunities in the region's urban core. The region's character is defined by the roads and transit lines that begin in the city's "hub" and extend outward, like spokes in a wheel. The roads and transit lines create an efficient means for people living in Boston's neighborhoods and surrounding cities and towns to reach the city's employment districts in Government Center, the Financial District, and the Back Bay.¹ But as vibrant as Boston's downtown may be, the city and region need to enhance the development opportunities outside the areas that extend from the Financial District along the "high spine" to the Back Bay.

In recent years, employment has boomed in some areas outside this hub. The Longwood Medical Area in Boston, Harvard Square and Kendall Square in Cambridge, Logan Airport in East Boston, and the new South Boston Waterfront all offer levels of employment that would have been unimaginable a generation ago – and promise to offer even more in the next generation. Getting to the new job centers, as well as cultural and educational facilities ranging from Boston University to the Museum of Fine Arts, often proves difficult. Many simple trips require traveling into the urban core and then out again, rather than a simple lateral trip from one place to another. Congestion at the centers of these radial lines requires development of alternatives, and the development prospects of the Urban Ring corridor make a circumferential system a natural. At the same time, the Urban

Ring offers an opportunity to develop not only better access but also a greater “legibility” for the city and region if Boston-area communities are brought together to create a modern version of Vienna’s Ringstrasse.

To meet the growing need for travel in the urban core of the region, planners have proposed a new transit line that connects the present system’s spokes at critical employment centers and new growth areas. The goal of the Urban Ring, MBTA Project Manager Peter Calcaterra said, is to “catch people at the periphery and move them around.” The Urban Ring would not only offer easy access along the edges of Boston’s core, but would also relieve the congestion on the existing transit lines at key points to serve the core more efficiently. At the same time, Commuter Rail ridership would actually increase

The Urban Ring could provide the kind of legibility that creates a modern version of Vienna’s Ringstrasse

under the Urban Ring since the initiative calls for the addition or improvement of five commuter rail stations, at Chelsea, Sullivan Square, Union/Gilman squares, Yawkey, Ruggles and Uphams Corner. But the Urban Ring offers the potential to do more than improve crosstown travel. It also offers the potential to strengthen economic activity throughout Boston and surrounding communities, as well as the potential to enhance the “look and feel” of the region with strong design standards and infrastructure enhancements.

The Massachusetts Bay Transportation Authority and six Boston-area municipalities – Boston, Brookline, Cambridge, Somerville, Everett, and Chelsea – agreed in 1996 to investigate jointly the economic and social demand for the Urban Ring. The MBTA has used the information gathered in this process, as well as its own planning operation, to develop a three-phase plan for implementation of the Urban Ring.

Many questions remain about the specifics of the Urban Ring project, including:

- What modes of transportation should be used to carry passengers along the ring corridor? Should the system operate with buses? If so, what kinds of buses? Is there a future for light or heavy rail along the system? Is it possible to mix modes – that is, use bus for part of the system and rail for others?

- What kinds of zoning and design standards should be adopted in the six communities to allow for the transit line to operate with as little interruption as possible? What should cities and towns do to insure that transit vehicles do not have to negotiate automobile traffic on the streets?

- How can the Urban Ring help to stimulate economic development in critical “nodes” along the corridor?

- What sources of funding are available to finance the project? What funds might be available from the federal government? From the Commonwealth of Massachusetts? From public-private partnerships?

- What strategies might encourage ridership so that the new transportation system can be self-sustaining in the future?

Despite the many questions that remain about the Urban Ring’s specific design and implementation, on some basic issues everybody can agree. The Urban Ring is a proposed circle line around Boston, potentially 15 miles long and with two-dozen stations, that would

place a “rim” on Boston’s existing hub-and-spokes transit system.

The corridor would start and end at Logan Airport; going clockwise, it would run to South Boston and Dorchester, up to CrossTown and Melnea Cass Boulevard in Roxbury, past Ruggles station and Northeastern, through the Longwood Medical Area to Boston University in Brookline, across the Charles River to Cambridge and Kendall Square, on to Lechmere, Sullivan Square, Assembly Square and then into Everett, Chelsea and back down to Logan Airport. The Urban Ring would run through Boston, Brookline, Cambridge, Somerville, Everett, and Chelsea. *(For a graphic view of the corridor, see the maps in Appendix 1.)*

In its fully built form – meaning generally though perhaps not uniformly a rail line – the cost would range from \$2 billion to \$3 billion, requiring a massive infusion of federal funds. Construction would be overseen by the Massachusetts Bay Transportation Authority (MBTA), which would operate it as an addition to its existing system.

CURRENT STATUS OF THE URBAN RING

The Urban Ring exists in the uncomfortable world of settled policy and unsettled implementation details.

On the one hand, MBTA officials say that the agency is committed to building the Urban Ring – and in fact, note that the authority has begun implementation of the first phase of the project. MBTA officials do not talk about “if” but “when” and “how.” The MBTA’s Peter Calcaterra resists the idea of opening up the debate about whether the region ought to build a circumferential transit system. “One of the concerns is, it’s not a good idea to discuss policy as it’s being implemented,” he said. “The time to define the policy is before that time. But in the minds of some technicians, it appears the Urban Ring is not quite defined yet. It is pretty well defined, but details remain, as well as the appropriate question of where’s the money coming from, how much will it cost, issues crossing the river, variations on [bus design], et cetera.”²

In 1995, the MBTA began operation of three new limited stop Crosstown bus routes (CT1, CT2, CT3). At the same time, the MBTA undertook the creation of a Major Investment Study, which examined all the alternatives available to intersect with Boston’s radial lines. The MIS was completed in early 2001, making a three-phase approach official policy: crosstown buses, Bus Rapid Transit, and the addition of rail in the most heavily traveled segments of the Urban Ring corridor.

In October of 2001, the Executive Office of Environmental Affairs certified the phased approach, and established a process for coordinated state and federal review of the project, starting with the preparation of a draft Environmental Impact Report/Statement for Phase 2. In April 2002, EOEA named a Citizens Advisory Committee. Meanwhile, the draft EIR/S focuses on the following elements:

- Establishment of a fleet of low-emission, low-floor, articulated vehicles powered by compressed natural gas.
- The goal of having 50 percent of BRT vehicles operate in dedicated right-of-ways, either fixed busways or dedicated lanes similar to the Washington Street

segment of the Silver Line, with the remainder in mixed traffic.

- All necessary modifications to surface streets and installation of “intelligent” systems at intersections (triggering green lights for BRT vehicles, for example)
- Three new commuter rail stations (Sullivan Square in Boston, Gilman and Union Square in Somerville, plus enhancements at Chelsea, Yawkey, Ruggles and Uphams Corner).

With the adoption of clear policy and significant political support, the Urban Ring appears to be on track. But real policy lies in the details. While the T has formally embraced the Urban Ring as the top priority for transit in the next generation, the project’s character and design is still open to adjustments on significant issues. It is not clear where, exactly, the Urban Ring would run through the Longwood Medical Area, or where, exactly, it would cross the Charles River in its fully built form. In addition, in the Bus Rapid Transit phase, there are two major places where the corridor would branch off at the junction of Melnea Cass and Massachusetts Avenue, and at Lechmere in Cambridge. The University of Massachusetts/Kennedy Library branch would swing through Uphams Corner and up Dudley Street to Melnea Cass, joining the branch of the Urban Ring coming in from South Boston and then carrying as one route to Ruggles and Longwood. And at the Lechmere Station, one branch would head straight for Sullivan Square and then Assembly Square, while another would head northwest to Union Square, rejoining the main line on the other side of the Mystic River from Wellington Circle.

The City of Boston’s latest transportation plan, *Access Boston*, released in the spring of 2003, poses tough choices for “next generation” transportation planners.³ Vineet Gupta, the director of planning for the Transportation Department and the principal author of the document, notes that the city needs to carefully compare alternative projects to make the most of limited resources. The city’s transportation plan gives equal consideration to three transit investments – the Urban Ring, the completion of the Silver Line, and the development of new transit service along Commuter Rail lines. Each of the three plans has its own logic and constituencies, but it is unlikely that the MBTA or the city could support all three.

Frederick W. Salvucci, secretary of transportation in all three administrations of Governor Michael S. Dukakis, expresses concern about how the Urban Ring might connect to other transit and development projects in the region. The connection between the Ring and the new Silver Line (known in parts as the Transitway) that goes from Chinatown to the South Boston Waterfront, for example, is uncertain. “It is very ambiguous, exactly how the buses can make it either into the Bypass Road or the Transitway,” Salvucci said. “The Transitway could be seen as a variant of the Urban Ring, but it’s being built at grade at D Street, which is a terrible mistake. It’s like putting the Green Line at grade at Kenmore Square – which I think in fact was done, originally, and then had to be rebuilt later at great expense. The issue is how to get buses through that area in a graceful way, without getting caught up in traffic. On the inbound trip, the plans call for a ‘head-of-the-line’ signalization preference. But going to the airport from the city, it’s less certain.”

Ultimately, like other major public works projects, the Urban Ring is a collection of many separate projects – some of which have to work perfectly, others which do not. The

Urban Ring will be a series of short transit connections that combine to create a single, coherent system. Each of the pieces poses its own unique barriers and problems, and the whole project requires not only significant public investment but also coordination of communities and interests. Meeting these challenges will require strong leadership to push the project with the state's congressional delegation, various state agencies, the MBTA, key local agencies like the Boston Redevelopment Authority, and important interest groups.

EVOLUTION OF AN IDEA

The idea of a rim or a ring to link radial lines has historic precedent in Greater Boston and abroad. Paris, London, and Tokyo all operate circumferential transit lines, which connect the radial lines that extend from the central city business districts. Those systems provide critical service that connects outer neighborhoods with each other as well as with critical employment centers and government buildings.

Bostonians have discussed circumferential transportation systems for generations, but only recently has the region seriously entertained the idea of a ring transit system. As early as 1907, Arthur A. Shurtleff suggested constructing an inner and outer boulevard on either side of the current Urban Ring corridor. Those boulevards were never built. The idea of circumferential thoroughfares came to fruition in the 1950s, when federal highway funding became available. Route 128, opened in 1951, was the roadway equivalent of the Urban Ring about 10 to 15 miles from the urban core. Interstate 495, about 40 miles from Boston, completed the circular development in the Boston metropolitan area in the 1960s and 1970s.

One circumferential road that did not get built was the Inner Belt, proposed in a 1948 master plan and funded in a 1968 highway and transit plan. That highway would have run near the path of the Urban Ring, and its beginnings can be seen today with the Massachusetts Avenue connector and Melnea Cass Boulevard. Protests against the Inner Belt and the Southwest Expressway—and an independent analysis by a political scientist at the Massachusetts Institute of Technology—persuaded Governor Francis W. Sargent to reassess all plans to build highways. In 1970, Sargent created the process known as the Boston Transportation Planning Review (BTPR), which provided an analysis of the region's overall transportation needs and produced a series of options about what to do next. In November 1972, Sargent abandoned the highways and subsequently lobbied the U.S. Department of Transportation to trade in federal highway funds for investment in new public transit projects. The BTPR report led to the extension of the Red Line to Alewife and the creation of a new Orange line along the path of the abandoned Southwest Expressway.

The BTPR also explored other ideas for improved transit service, including the burying of the Central Artery and construction of a third harbor tunnel. In another proposal, mentioned in passing, the BTPR called for consideration a circumferential transit line.

Alan A. Altshuler, secretary of transportation under Governor Sargent and the driving

The idea of the a circumferential transportation system began in Greater Boston with highways

force behind the BTPR, notes that the Urban Ring idea struggled to gain a following for a simple reason: there was no demonstrated market for it. The radial design of transit systems, which extend from downtown areas to residential neighborhoods, responds to the need to get to work, public offices, and recreation opportunities in the center of the region. One of only three cities in the U.S. with more jobs than population – Washington and San Francisco are the others – Boston has been served well by the radial system.

But population and jobs have dispersed to other areas of Boston and Cambridge and out to Interstate 495 and beyond. Meanwhile, the inner core of Boston has become congested with historic levels of both automobile traffic and congestion on the transit system. In an effort to move cars off the road and shift some transit users out of the hub of the current system, planners have embraced the Urban Ring concept. “The idea in its simplest state was to do an inner-city Route 128” that uses public transit to move people around, says M. David Lee, a prominent urban planner who also teaches at the Harvard School of Design. “Just as 128 spawned America’s first technology highway, what we called the New Urban Ring was an opportunity to create better access to jobs for the people in urban communities. If you live in Roxbury and have to be at the hospital in Longwood at 6 to serve breakfast or whatever, you’d have a fast and reliable way to get there.”

The first major work on the Urban Ring began with the “Draft Circumferential Transit Feasibility Study” produced by TAMS Consultants for the MBTA in May 1989. The report called for a steady series of improvements to the current bus system, improvements to streets, “preservation” of rights of way, analysis of different transportation technologies, consideration of appropriate alignments, study of land-use issues, and investigation of funding options.

In 1992, Lee, then president of the Boston Society of Architects, formed a group called the Infrastructure Forum to create a strategic list of possible investments that might be made in Greater Boston. The circumferential idea was considered a very strong candidate for its ability to improve mobility and strengthen key neighborhoods and commercial and manufacturing districts. Public planning events for the Urban Ring occurred in 1992 and 1993, when the Wentworth Institute of Technology and Northeastern University sponsored design charrettes. George Thrush of Northeastern University produced a report that described some of the options for the ring system.

Republican Governors William F. Weld and A. Paul Cellucci focused in the 1990s on developing new Commuter Rail lines and devoted little energy to the Urban Ring. James Kerasiotes, the Secretary of Transportation under both governors, reportedly told a group of Urban Ring advocates: “When you elect your own Governor, you can do your project.” Big Dig cost overruns and deep uncertainty about federal funding imperiled the Urban Ring. Urban Ring advocates have become frustrated with the pace of the project. “It is taking forever,” BSA president David Dixon sighed.

In 1996, the chief executives of six cities and towns – Boston, Brookline, Cambridge, Somerville, Everett, and Chelsea – signed an agreement to coordinate their planning and work with the MBTA to produce a formal application for federal funds. The so-called Urban Ring Compact has been coordinated by Richard Garver of the Boston Redevelopment Authority in a model of regional cooperation.

Pushed largely by the Conservation Law Foundation and U.S. Representative Michael Capuano, formerly mayor of Somerville, Congress appropriated money for feasibility studies, including a Major Investment Study that establishes the basic framework for different possible routes and vehicle types. State environmental regulators have commented favorably on the project.

The Urban Ring once competed for attention and resources with the North-South Rail Link, a proposed mile-long connection between South Station and North Station. A decade ago, with work on the Central Artery project just beginning, many transportation advocates considered the rail link to be the region's next great infrastructure investment. The rail link would create a continuous trip from Portland, Oregon, to Washington, D.C., on Amtrak. More important, the project would create a direct connection between North Station and South Station, enabling both the northbound and the southbound commuter lines to go to both stations. But the Urban Ring has bypassed the rail link largely because it can be implemented in phases, while the rail link requires completion of a tunnel to operate. The costs of creating the rail link are potentially enormous. Low estimates peg the cost at between \$2.4 billion and \$3.8 billion and high estimates put the cost at \$7.6 billion in 2010 dollars. (Figures vary because of different methods for computing inflation.) Because of public wariness toward a major new "dig" project downtown, many observers consider the rail link project to have little chance of proceeding. In April 2003, MBTA General Manager Michael Mulhern, supported by the Romney administration, asked the FTA in effect to put the project permanently on hold. According to Transportation Secretary Daniel Gribauskas, funding sources from outside the state are necessary if the NSRL has any chance of going forward. In any case, he says, "given the fiscal circumstances in Massachusetts ... [it] is not going to happen for a long time."⁴

The legacy of the \$14-billion Big Dig haunts all major public investment projects in Massachusetts, including the Urban Ring. The Urban Ring's staunchest advocates admit that getting major federal funding will be extremely difficult, especially for a project that involves building new tunnels and addressing tricky engineering problems in a dense urban environment. The specter of cost overruns, a significant legacy of the Big Dig project, haunts the Urban Ring. A 2002 study of 258 public works projects in the U.S. from 1910 to 1998 found average cost overruns of 28 percent. The biggest overruns were in rail projects, which ended up costing 45 percent more than originally estimated.⁵

Still, promoters of the project are optimistic. "People have been drawing this as a dream scenario for a long, long time, but now we can taste it," the BRA's Garver said in 2001. "The land use changes we predicted are here now, and the notion of what the system might be is more tangible."

.....
Congress has appropriated money to study the idea—but money for the project itself could be difficult to secure
.....

THREE CONCEPTS OF THE URBAN RING

For such an apparently simple concept, definitions do not come easy for the Urban Ring.

Observers see the project through three distinct prisms. The first prism is the most obvious – public transportation. Because the Urban Ring planning process has been driven primarily by the MBTA, most planners and observers view it as a vital new system to move people to some of the parts of the Boston area that are now difficult to reach by transit or car, especially during rush hours.

Observers looking through a second prism see transportation as a strategy for urban revitalization. By coordinating planning and development projects among contiguous cities

.....
The urban ring not only
could improve transit
options, but also spur
economic development and
community revitalization
.....

and towns, the Urban Ring could act as a catalyst for business development ranging from light industry and hospital services to retail and housing. By creating access to isolated pockets of the urban core of the region, the project could foster redevelopment of vacant or contaminated industrial sites – and, of special importance to promoters of “smart growth,” stem the sprawl of office parks on the outskirts of the region. The Urban Ring could be a great boon to minority neighborhoods like Roxbury and Dorchester by providing better transit service, improving access to jobs, and sparking development in long-neglected areas.

Through a third prism, the Urban Ring is seen primarily as an urban design opportunity – an opportunity to strengthen the visual appeal and functionality of strategic streets and communities in neglected or uncoordinated pieces of the region’s core. With strict design guidelines along the path of the transit route, the region has the opportunity to create a signature area that improves Boston’s overall “legibility” (its capacity to orient users) and “imageability” (its visual character), to use the terms of the late MIT teacher and Boston planner Kevin Lynch. Designers consider the transportation component of the project to be less important than the need to create a built-up spine that helps define the core’s urban identity.

In fact, all three visions are related. A first-class transit line could not only improve the mobility of residents and workers, but also serve as a magnet for economic development. Strong design standards could not only assure rights of way for buses and trains, but also foster an environment conducive to development.

Let us look at each of the three visions of the Urban Ring in turn:

THE TRANSIT VIEW

The fact that the MBTA is driving the Urban Ring project – and that the discussion centers on trains and buses and rights of way – would indicate that the project is primarily a transit initiative. The Urban Ring offers two related transit benefits: direct access between places outside Boston’s urban core and relief of transit congestion in the core’s existing

transit lines (primarily the Red and Green lines). The new system, combined with freeing up capacity on old systems, could provide greater access to jobs, education, and recreation opportunities to workers and residents in a wide range of Boston-area communities. With the Urban Ring in operation, for example, a health industry worker in Roxbury or Dorchester could travel directly to the Longwood Medical Area or Logan Airport rather than having to go and out on the radial lines or take cross-town buses that get stuck in traffic.

Few people would use the system to travel all the way around the Urban Ring corridor. A South Boston resident, for example, would probably not take the Urban Ring to a job in Assembly Square; it would be just as easy to take the Red Line to the Orange Line. Equally uncertain is whether someone in Harvard Square would use it to get to Logan Airport, or just stay on the Red Line and make the two transfers – a tedious but still sure path to the airport.

The question of how many people would use the system is a crucial one. State and federal transportation planning guidelines for new capital projects require exhaustively researched ridership projections for funding. Urban Ring advocates think they have the numbers to support their claim that the Urban Ring is needed to serve the transportation needs of Greater Boston’s core communities.

Stephanie Pollack, director of the Conservation Law Foundation, argues that the Urban Ring will be an instant success because its corridor is where the people and jobs are increasingly located. Population is projected to increase 34 percent in the communities along the Urban Ring between 1990 and 2025 – more than three times the 11 percent increase in the Greater Boston metropolitan area. In the same period, employment is projected to increase 81

percent in the Urban Ring corridor, compared to 26 percent in Greater Boston. The Urban Ring would make a better trip even for people who do not use it, she said. By relieving congestion on the Green Line, the Urban Ring would make that system more attractive and encourage current riders to keep using it. Across the system, Pollack estimates that T users will save a total of 50,000 hours each day by reducing the need for transfers.

The Urban Ring communities already use public transit more than other communities in Massachusetts, which would indicate a strong potential market for Urban Ring riders. The commuting patterns of Massachusetts and the United States are very similar. But the Urban

JOURNEY TO WORK DATA

Breakdown of mode shares for the Urban Ring area, Massachusetts, and the nation:

	UR	MA	US
Auto	42	74	76
Carpool	19	9	12
Transit	30	9	5
Walking	13	4	3
Other	2	1	1

PROJECTED RIDERSHIP

Phase	Daily ridership
Phase 1	34,720
Phase 2	106,000
Phase 3 – Option A1	282,500
Phase 3 – Option A2	289,350

Ring has a strong non-auto bias, with 48 percent using non-auto modes. So residents along the Urban Ring corridor could be expected to embrace the new service. (See Table AA)

According to the Major Investment Study required by the federal government to qualify for public transportation grants, the Urban Ring's overall daily ridership would be 106,000 people by the completion of Phase 2, and 290,000 daily riders by the completion of Phase 3. If all phases of the project are implemented, the Urban Ring would ultimately become the second most heavily used service in the MBTA system, attracting an estimated 47,000 new daily riders who otherwise would not use any form of public transportation. According to MBTA planners, that extra level of transit service would reduce automobile travel on local roads by 52,000 miles per day in Phase 2 and 350,000 miles per day by Phase 3.

Such numbers might be impressive, but they might overstate the overall impact of the Urban Ring. Although the Urban Ring's overall ridership levels would be high, the net number of new riders might not be substantial. As Urban Ring ridership increases, overall ridership on other lines would decrease. According to Urban Ring MIS, Phase 2 of the Urban Ring project would increase transit ridership by a total of 15,000 riders a day – which really represents 7,500 people, since most rides involve trips in both directions. This increase in transit ridership represents just 1.5 percent of the 500,000 workers who are employed in the Ring area – who in turn account for only about one-third of the overall number of trips in the area.

The fact that the Urban Ring would add relatively few new riders to the MBTA system is not an indictment of the idea – but rather, an acknowledgement that major investments are necessary just for public transit to keep its existing travelers.

Urban Ring advocates say the circumferential system's greatest impact might be reducing the existing system's congestion – and therefore preventing current transit riders from leaving the system. MBTA officials say the congestion of the transit system at the hub – the Red, Green, and Orange lines that converge at Park Street and Downtown Crossing – threatens to drive away current users. Too many people travel from an outer point on the lines into the center of the system and then out again on another line. Crowded cars, slow-moving trains, and greater strain on the system's infrastructure could undermine the attractiveness of transit as an option for people who can use a car. By removing some passengers from those crowded cars and lines, the Urban Ring would enhance the whole system. "Removing pass-throughs and transfers from the central subway system enables more of its limited capacity to be used for serving downtown Boston and the radial markets," the MBTA's Calcaterra said.

If the Urban Ring were not built, the MBTA would be required to invest hundreds of millions of dollars to increase the capacity of the Green and Red lines at the center of the system. Two kinds of investments would be required to improve the existing system's capacity.

- *Transit platforms:* To increase the number of cars in service, the T would need to extend the lengths of the platforms so that passengers could board the trains. Extending the platforms is expensive because those lines, among the oldest in the U.S., would require substantial construction work to create the space needed for platforms. According to the MBTA's Program for Mass Transportation (PMT), to operate eight cars on the Red Line

during peak periods – two more than are currently used in heavy-demand periods – would require \$261 million in capital costs for platform extensions, expanded storage yards, improving power systems, modifying signal blocks, and buying more cars. The improvements would add 3,800 new riders, roughly one quarter of them (950) new riders to transit. The costs of operating the additional cars – maintenance, labor, and the like – would increase accordingly. (The capacity for Red Line trains was increased from four to six in the 1980s.)

▪ *Signaling systems:* To enable the trains to move more frequently through the tunnels, the MBTA would need to invest in new signaling systems. The MBTA is considering installing signaling systems on the Red, Orange, and Blue lines to decrease minimum headways to 2 minutes. Currently, the minimum headway is 3.5 minutes on the Red and Blue Lines and 4.5 minutes on the Orange Line. Antiquated signals on the Orange Line are currently being replaced, a process which may decrease the minimum headway there to 3.5 minutes as well. New signal and train improvement systems would cost \$789 million on the Red Line, \$366 million on the Orange Line, and \$228 million on the Blue Line. The use of Communications-Based Train Control would allow transportation engineers to control rail traffic from a single location. Trains frequently stop in between stations to avoid getting too close to the ones in front – causing them to bunch up behind each other, slowing down service on the entire line. A central computer that controlled each train could work to maintain even spacing. Such a system would reduce stops and starts and increase the line’s perceived reliability. A recent research paper developed an algorithm and simulated its effect on the Green Line’s B branch during morning rush hour. The paper found that application of the algorithm would reduce passenger waiting times by an average of 31 percent and riding times by an average of 4.2 percent.⁶

Improvement of platforms and signaling systems will help relieve congestion at the center of the system—but will not be enough

Even major investments in modernizing the existing radial lines would not be enough to eliminate the system’s congestion. The Central Transportation Planning Staff estimates that, even with the addition of three-car trains on the Green Line, the Green Line will exceed capacity at peak times by 2025. The estimates for Green Line volume keep going up, as growth and development in its catchment area continues to intensify. Other transit lines would also see relief with the construction of the Urban Ring.

Even if system modernization were sufficient to combat congestion in the middle of the system, building the Urban Ring might still be desirable. Transportation planners place a high value on redundancy on urban systems, both for the sake of giving travelers greater choice and flexibility (and perhaps implicating them in the transit system more thoroughly) and also for dealing with emergency situations. New York City’s ability to maintain its economy after the devastating effects of the terrorist attacks of September 11, 2001 is due in part on the redundancy of transit systems in Lower Manhattan and its connections with outside communities.

Even if the Urban Ring substantially increases overall ridership, it does not mean that the transit service would produce significant new revenues. In fact, as many as half of all

Urban Ring riders could be expected to be drawn from the rest of the system. If passengers use monthly passes or transfers from other transit lines, riders would add costs to the system without contributing significant new revenues.

In the final analysis, the Urban Ring might be fighting a losing battle against the automobile. One of the difficult problems facing the Urban Compact communities is the growing number of cars owned by its residents. As residents acquire more cars, it becomes increasingly difficult to convince people to use public transit. Economists have found that when people “sink costs” into car ownership – making monthly payments and paying for insurance – they are more likely to use a car when they make transportation choices. And the number of people with “sunk costs” in cars has skyrocketed in recent years. During the 1990s, while the population of the state increased only slightly, the number of registered cars in the state increased by 1 million. Even a community like Cambridge, in which 60 percent of the residents walk, bike or ride transit to work is faced with a growing number of vehicles registered in the city. The number of cars registered in Cambridge increased a total of 25 percent over the past 6 years, while the population grew at less than 5 percent. The implications could be devastating.

Even if the Urban Ring increases ridership substantially, it will not likely increase revenues

THE DEVELOPMENT VIEW

Almost all advocates of the Urban Ring argue that in addition to better transit service, the new service would open up new economic development possibilities – in the same way Route 128 triggered office-park and residential development. The location of the corridor, close to the core of the metropolitan area, makes development possibilities more compelling in an era of sprawl-busting “smart growth.” Better to re-use vacant industrial land and fill in existing urbanized areas, this thinking goes, than to keep building in the countryside past Interstate 495.

“It’s a belt of communities that want growth, need growth and can handle growth,” said former Governor Michael S. Dukakis, a longtime champion of public transit. “One important part of any smart growth strategy is going back to those older urban communities and take advantage of underutilized land and infill sites. But you can’t do it unless they are connected by public transportation. There’s a whole flock of reasons why it makes sense beyond getting people out of their cars and into an integrated system. That’s important, but the more we can create compact, livable, affordable communities, in close, the better.”

David Dixon, the president of the Boston Society of Architects, considers the Urban Ring is a vital part of “growing the core.” A longtime proponent of a regional strategy to increase urban density and combat regional sprawl, Dixon added: “If we don’t grow the core, that’s a big regional problem. We need to think literally, where are we going to put people. We’ve developed all the environmentally appropriate land; we’re not Ohio or Florida and we can’t just extend sewer lines and highways on and on. We have water on

one side and environmentally sensitive land on the other – so we look again to the core.” Dixon predicts that the state and region will lose economic opportunities if businesses cannot be accommodated in the Urban Ring corridor. “Not everybody wants to be out in Boxborough,” he said. “That’s not close to MIT.”

The CLF’s Pollack said the equation is simple. “If these communities know the ring is coming, they will emphasize economic development opportunities. Historically, road projects have resulted in massive shifts in land uses, and have been seen as economic development tools. Towns are always telling the Massachusetts Highway Department to build an interchange or widen a road because it’s good for business. It just hasn’t always been the case with transit.” Pollack argues that the state should offer equal or balanced incentives for both auto-oriented and transit-oriented land-use development. If the state invested in transit more

aggressively, more businesses would locate near transit lines – with benefits such as economic clusters, fewer environmental impacts, and greater choices for residents and employers.

Development and transit go hand-in-hand in many ways, Dixon and Pollack say. At key infill sites such as the proposed North Point development on McGrath Highway across from Lechmere, for example, the Urban Ring would cut across the property and give it even more transit access. That would help sell the development to wary neighbors worried about traffic. With such abundant transit options around, neighbors might actually believe that not everyone in the new development would own a car.

But many scholars are skeptical about whether new transit service and facilities actually spark new development. The “if you build it, they will come” school may be overly hopeful, said Professor Alan A. Altshuler of Harvard University’s John F. Kennedy School

MODELS IN LONDON AND TOKYO

Boston can look to two world cities for inspiration in building the Urban Ring.

London’s Circle Line, built between 1863 and 1884, began with completion of a spur that would be the world’s first underground railway. Private companies built all the early lines of the London Underground, including the Circle Line, and ran them until nationalization in 1933. Still, Parliament had to approve each specific proposal for a new line or the extension of an existing one. In this way, the government maintained a measure of control over the proceedings.

The Circle Line originated as a single end-to-end line run by a company called the Metropolitan Railway. After early successes, transportation advocates proposed plans of expansion to Parliament. Committees sifted through these proposals and chose a circular line connecting the existing track, on the north side of London, with railway stations on the south side. A private company, the Metropolitan District Railway, built the first pieces of the system. Plans for a public takeover were rejected, and for years London both public and private companies operating the Circle line.

Tokyo’s Yamanote Line was constructed by the Japanese government in partnership with the national railways as a full-fledged train line. It extended far beyond downtown Tokyo into areas that did not yet have much industrial development. While London’s Circle Line can only be understood in the context of a fast-growing network of non-circular Underground lines, the Yamanote Line exerted great power in driving Tokyo’s development. The Yamanote Line continues to spur the growth of the so-called “subcenters,” mini-cities within the Tokyo metropolitan area that sprang up at junctions of the Yamanote Line with other railway lines.

• Daniel Jerison

of Government and the Graduate School of Design. Altshuler, who served as secretary of transportation and public works under the late Governor Francis W. Sargent, said there is little evidence that transit service alone promotes development. "You can't just build transit and wait for things to happen," he said. "Thinking it's going to happen because you build transit - that's just whistling Dixie. Transit can usefully help facilitate development but it is too weak a force to have much impact except in concert with strong land-use policies."

In effect, by driving development through transit policy, state and municipal authorities are dodging the more difficult decisions in land-use policy. By offering transit as a carrot, they avoid the necessary use of the stick to encourage the appropriate levels of density.⁷

Only when state and local authorities push hard for development in vacant and underutilized parcels will that development occur - with or without a new transit service. The main reason that dense development does not occur in many cities and towns is not that there is inadequate transit access, but rather than municipalities use zoning, environmental regulations, and code enforcement to prevent significant levels of density.

Building new transit service will not necessarily foster dense development. The restoration of Commuter Line service to the South Shore shows that while many communities embrace transit service, they also reject dense development that would be a "natural" for areas around stations.

Evidence on the development impact of mass transit, in fact, strongly suggests that transit service cannot be expected to drive local development. Business and household location decisions depend on factors such as labor costs, housing availability and costs, quality of schools, quality of city services, car and truck access, and other factors; transit cannot be expected to trump these and other considerations. A summary of research on transit-oriented development, prepared by the Norman Y. Maneta International Institute for Surface Transportation Policy Studies, found overwhelming skepticism about the potential of transit to reduce car travel or change development patterns significantly, even in traditional urban areas. One study of the San Francisco region concluded: "TOD is inappropriate as the foundation of a congestion reduction strategy for the Bay Area. To the extent that TODs are a part of a larger scale rethinking of urban design, they are likely to have worthwhile non-transportation benefits, such as an enhanced sense of community and the preservation of open space on the suburban fringe."⁸

Even more skeptical is of the transit-development link is Jonathan Richmond, a transportation consultant with an international reputation for rail transit analysis. Richmond found that transit proponents make claims about transit's ability to transform the landscape, with virtually no evidence to back them up. "⁹The problem with the issue of land development is that the proponents make claims without substantiation," Richmond said. "The classic case is Portland, which pumps journalists with ideas about how light rail is making everything hum along, without any evidence. The fact is, development in Portland would have happened without light rail. Development will occur because of accessibility to a parcel of land, but the accessibility provided by light rail is negligible.

At best, there is little positive evidence for a transit-development link. Richmond notes that campaigns for transit investments across the U.S. invariably claim that transit service will increase development. "Whether the claims are realistic cannot be said, because not

.....
enough rigorous studies have been done,” Richmond said. “It’s sort of like the Scottish judgment of ‘not proven.’ We just don’t know at this point. What we do know is that money is being spent on light rail without a lot of data.”

Even without new building, the Urban Ring would have positive effects on the economic vitality of the core, said Jay Wickersham, former director of the Massachusetts Environmental Protection Act (MEPA). The Urban Ring would reinforce the popularity of Boston as a place to live and work by relieving congestion at Park Street, he said. Residents will put up with a lack of parking but only if they can use a reliable and accessible transit system, Wickersham and others say. If they have the worst of both worlds – clogged and unreliable transit systems, on the one hand, auto congestion with a lack of parking, on the other hand – many residents and businesses will move to the suburbs. Wickersham acknowledges the difficulty in identifying a specific “tipping point,” but planners and other experts agree that providing a minimum level of service is essential for keeping customers on the system and avoiding clogged roads.¹⁰

For some communities, the economic development argument is part and parcel of a basic call for justice. For years, poor and working-class communities like Chelsea, Everett, Somerville, and Boston’s Roxbury and Dorchester neighborhoods have lacked both strong transit service and economic development opportunities.

The MEPA certificate explicitly discusses “environmental justice” as an argument for the Urban Ring. The average household income along the Urban Ring corridor is 62 percent of the regional average; over 17,000 households within walking distance of transit stations have incomes below the poverty line, according to the MEPA certificate. Fully 45 percent of residents living in the Urban Ring corridor are minority. The project “promises to bring environmental benefits – along with better access to jobs, housing and public services – to many of our most disadvantaged citizens,” the MEPA report said.

Broadly put, the Urban Ring is seen as a good thing for minority neighborhoods because it will improve transit service and access to jobs and health care, and spark development of industrial sites or otherwise underutilized inner-city property. The Urban Ring could offer better connections to economic activities downtown, in the Longwood area, the airport, and Kendall Square.

Even major proponents of public transit wonder whether the Urban Ring is the best strategy for increasing minority community access to economic opportunity. Skeptics such as Penn Loh, executive director of the advocacy group Alternatives for Community and Environment, say the Urban Ring is little more than an expensive diversion from other transportation and development needs of inner-city residents. Loh and other activists in the Roxbury community have called for a redevelopment of Dudley Station, swifter service on the new Silver Line, and cleaner buses – before action on a new transit line that might not be implemented for years. The Roxbury Strategic Master Plan process found mixed views on the issue.

.....
Residents of Roxbury and other inner-city neighborhoods are skeptical that the Urban Ring would serve their needs
.....

Loh and other skeptics also express the fear that the quality of the Urban Ring would vary, with minority communities getting less efficient and attractive vehicles and service. The fear is that the Urban Ring would be most attractive in the arc between Cambridge and Logan – especially through the Assembly Square area, seen by many as a development opportunity of Back Bay proportions. By contrast, some of the most difficult parts of the Urban Ring corridor, in the Dudley Street area in Roxbury, would receive lesser investment and service. Advocates of “transit justice” charge the MBTA with a pattern of service cutbacks, broken promises, and insensitivity to community concerns. Exhibit A in this indictment is the T’s use of buses on the new Silver Line as replacement service for the old Washington Street elevated line. While the Urban Ring could remedy past discrimination by linking the Dudley Square/Uphams Corner area with South Boston, Longwood, BU, and Kendall Square, critics worry that the line will not have enough stops in residential areas or that it will take money from more essential projects.

Other critics from minority communities are concerned that the Urban Ring would actually be too effective at spurring economic development for the good of current residents in lower-income neighborhoods. The specter of gentrification has shadowed the Roxbury Master Plan process and other community planning and development exercises. While residents expressed a desire to have better access to the employment opportunities, they also expressed trepidation about getting priced out of their own neighborhoods. Without a housing policy that substantially increases the total supply of housing in the city and region, new development could doom longtime residents struggling to climb the economic ladder.

THE DESIGN VIEW

The Urban Ring’s greatest impact on Greater Boston could be to change the “look and feel” of the communities the lie just outside the urban core. By creating a new transit service, the Urban Ring could foster a new sense of identity along those communities. But that opportunity can only be realized if the six cities and towns along the corridor adopt strong design guidelines that give the area a distinctive scale and appearance.

George Thrush, chairman of the architecture department at Northeastern University, envisions a series of communities along the Urban Ring that would improve the overall “imagability” of the city and region. By requiring development to fit a traditional urban style – with buildings close to streets, parking in the rear, wide sidewalks, prominent public buildings and outdoor meeting places, and attractive design elements such as street lamps and benches – Thrush hopes to create communities that attract people all over the region. This attractive image would not only create a local sense of place, but also a regional sense of place. Thrush argues:

By providing a ring of common experience and markers ... the Urban Ring could help to coordinate one’s mental map of the city with a coherent sets of landmarks which could highlight important nodes [that are] located in districts around the central core. In this way, one’s awareness of position and orientation in the region

would be greatly enhanced. Moreover, playing a role at both the scale of the individual street landscape and the regional skyline, the Urban Ring would express its synthetic character; joining previously separated parts of the city.¹¹

Thrush compares the Urban Ring's potential to Vienna's legendary Ringstrasse, a Medieval wall that was later transformed into a road that provides a clear image of the city as well as an "armature" that guides infill development inside and outside the old city.

Thursh's goal for the Urban Ring is broad. If done well, the Urban Ring could not only create an attractive and vibrant new regional corridor, but also bring together people from diverse communities in unique ways. The Urban Ring could be a segregation-buster. The corridor "will cross so many traditional boundaries," Thrush said. "It will go through neighborhoods that are gay, black, Irish, Latino, and Asian. The transit is the tool that mixes it up." Many planners note that there is already a crossroads of this kind in Boston: the South Bay Center, a shopping mall with a K-Mart, Toys R Us, and Stop and Shop (the highest grossing store in the corporation's four-state market). The staggering diversity of the clientele at this mall has been well documented. Thrush envisions many more such crossroads.

The Urban Ring could help to coordinate one's mental map of the city with a coherent set of landmarks

The critical element in building the civic character of the area is that the project involves diverse communities in a unique partnership. "We've already done the hard part," Thrush said, referring to the agreement by political leaders in the six Urban Ring "compact" communities to plan the project jointly. "That was a huge breakthrough for regionalism. Around here, that's always the greatest impediment to smart growth enterprises," Thrush said.

The Urban Ring could gain more momentum if advocates stepped back from the technical questions and concerns about funding and "do things that aren't expensive," Thrush said. The key issue is the corridor's design: "It doesn't have to be a complete loop; they key is to establish the alignment and give it an identity. That could be done with logos everywhere or light poles every three blocks - a picture of what it will be, so people can say, 'I'm not against that.' It's about animating city neighborhoods, designing for density in places now seen as not feasible, in the heart of the region. It can have the ambitions of civic change; it just doesn't have to cost \$5 billion."

Thrush argues that the communities along the Urban Ring should develop a comprehensive approach toward development and design - beginning with the basic alignment of the transit route and how buildings and other structures relate to that route. Thrush calls for common zoning to:

- Maintain a strong "street edge" - a continuous, well-defined path - along the corridor.
- Require building entrances to face the main roads - and not allow entrances to be located in the backs of buildings, as is happening in developments all over the region today.
- Agree on distinct height limits, but also allow taller buildings at critical crossroads along the corridor. The height limits would foster a human feel, while the taller buildings would create distinctive landmarks and improve legibility.

The current planning, Thrush argues, focuses on transit alone and tends to get involved with technical engineering questions such as whether the street has enough width for a train or a bus. Thrush calls for a more robust discussion of design questions. "What can we do to tie these disparate sites into a coherent corridor when one is not on the line?" he asked. The Urban Ring communities benefit from a good setting for urban design, as opposed to a Sun Belt city like Houston, Thrush said. "We have an extant public realm, a skeleton for the doctor to work on, instead of a sack of protoplasm – shapeless, amorphous places." The premier job of the Urban Ring initiative should be to make certain that the region's fragmented spaces are given as much form and legibility as the Back Bay or Jamaicaaway, Thrush argues.

Ben Hamilton-Baille, a transportation consultant in England, seems to support Thrush's point about the importance of urban design and development. For transit to work, the areas surrounding transit stations need zoning rules that demand greater densities. "The 400-meter radius of walkable neighborhoods seems to be a robust rule-of-thumb for the required network of services and transport," said Hamilton-Baillie. "So radial corridors, like the one proposed for Boston, are important, although they are really only the starting point. And some would argue that we are still applying 19th century transport systems to 21st century movement patterns, and that we need systems that can be much more responsive and flexible, exploiting more fully the opportunities offered by information and communication technology."

But as the BSA's Dixon notes, the very notion of density is viewed with skepticism and even hostility by many communities. The BSA has undertaken a major effort to explore the importance of density in urban regeneration, providing housing for all income groups, protecting the environment, and in general confronting the phenomenon of urban sprawl. The BSA will hold a major conference on the subject in September 2003.

Zoning poses the make-or-break challenge the Urban Ring. Zoning changes are necessary not only to clear a path for transit vehicles to move swiftly through the corridor, but also to encourage mixed-use development that would bring riders into the system. But none of the cities or towns have adopted special zoning that would enhance the Urban Ring project. Dennis DiZoglio, the MBTA's planning director, notes that all of the communities have publicly stated that they will pass appropriate zoning regulations for the Urban Ring, but no community has actually done so. But none of the cities or towns have zoned their sections of the Urban Ring corridor to accommodate greater density or even make the passage of transit vehicles easier. Neighborhood-level planning projects sometimes seem obvious to the prospects for a major new transit service. Cambridgeport Neighborhood Study's summary recommendations and action plan, released in March 2003, makes no mention of the Urban Ring and no provisions for zoning changes to encourage development around the prospective Cambridgeport station near the end of Putnam Avenue.

Perhaps as the Urban Ring moves closer to a reality, local governments will act to clear the way for transit vehicles and appropriate development. But experts say that the sooner the appropriate environment for the new transit system is put in place, the better. Thrush has called on Urban Ring communities to adopt design guidelines and creation of a right of

way that would allow transit vehicles to move through the corridor unimpeded. The more the process moves forward without a coherent vision for design, Thrush warns, the less chance it will have to develop economically and bring people together socially.

Once the Urban Ring corridor is established in people's minds, Thrush said, the metropolitan area will begin to be viewed differently, and more cohesively – “like how you think [of the street grid] of Manhattan, and what makes it so accessible.” The Urban Ring should aspire to match Manhattan's legibility, Thrush said. “You know it's very easy to get from here to there,” he said. “It's a cognitive map, a mental picture of the city.”

PHASING THE PROJECT

Urban Ring planners have adopted a three-phase process for implementation of the system. The system would begin with expanded bus service and evolve to use modern “articulated” buses, light rail (like Green Line trolleys), and perhaps heavy rail (like Red Line subway trains). The evolution of the system is outlined in the Major Investment Study released by the MBTA, the U.S. Department of Transportation and the Federal Transit Administration in July 2001. (*See Appendix 3, “Phasing the Urban Ring.”*)

In Phase 1, the Urban Ring would consist of buses along key segments on existing streets, mixing with traffic. In Phase 2, the Urban Ring would use “bus rapid transit” – long buses that can turn and bend in traffic – on routes that provided dedicated rights of way to avoid getting stuck in traffic. In Phase 3, the system would introduce light rail (like the Green Line) or perhaps heavy rail (like the Red Line). The system would become a full-blown subway system.

The phasing of the Urban Ring would allow the system to build support and ridership over time and respond to feedback from riders and nearby businesses. It would also allow the MBTA to create some kind of new service within two years. But even under the modest Phase 1, some segments of the route would require major capital construction to enable buses to move through narrow, crowded urban streets.

The three phases offer a useful shorthand to understand how the project might advance. But Peter Calcaterra, the veteran project manager of the MBTA, suggests that it is not a truly linear progression. He warns against the “automatic question of, is it a light rail or BRT or combination/multi-stage” project. “It is a system that is being built in phases,” he said. “It is not one or the other. It is not a bus system that then gets discarded and turns into BRT and then gets discarded and becomes rail, light or heavy. It is a system composed of all of those components, eventually.”

Calcaterra said that a helpful way to think about the Urban Ring is to consider it a microcosm of the entire MBTA system. “Is the MBTA a bus system? A subway system? A commuter rail system? A boat system? It's a combination of all those things, because in different places you achieve different things.” Similarly, he said, different vehicles and right-of-ways will make up the Urban Ring corridor, depending on the needs of each segment.

PHASE 1

The first phase of the Urban Ring, implemented from 2001 to 2005, would establish better bus service along key segments of the corridor by providing additional vehicles and making modifications to existing bus routes. Signs of the new Urban Ring service are already visible to discerning eyes. Existing diesel buses have been painted with a trademark Urban Ring logo.

Phase 1 calls for 40-foot, low-floor, low-emission buses to operate on Crosstown and Express routes with a service frequency of 10 to 12 minutes at peak periods and 20 minutes at off-peak periods. The ridership is estimated to be 40,000 per day (by 2003). The cost is estimated to be \$100 million; implementation started in 2002 and is set to be complete by 2007. Phase 1 includes plans for additional bus maintenance facilities. The MIS also calls for better connections along defined segments of the Urban Ring "network."

In Phase 1 of the project, the first "articulated" buses would also be acquired. Some 40 feet long, low-to-the-ground, these vehicles run on compressed natural gas. Articulated buses have a flexible middle so the vehicles can maneuver through traffic and they seat up to 100 passengers at a time. They are also equipped with the latest signaling technology that helps them get green lights at appropriate times. Because they burn clean fuels, they are less noxious to residents and businesses along the streets where they travel.

The biggest limitation of Phase 1 is that the vehicles will travel through congested streets. Only when the six communities of the Urban Ring Compact enact zoning and planning reforms that clear the routes for transit traffic can rapid service be offered along most of the pieces of the Urban Ring.

PHASE 2

Phase 2, the focus of an August 2001 "scoping" certificate issued by the Executive Office of Environmental Affairs as part of the enforcement of the Massachusetts Environmental Protection Act, is currently the subject of study in the draft Environmental Impact Review report.

Phase 2 is when the concept of "bus rapid transit" is introduced. BRT is catching on in different parts of the world, most famously in Curitiba, Brazil, but also in Ottawa, Houston, and Pittsburgh. The vehicles in BRT systems run in dedicated "busways" that eliminate the time-consuming mixing with traffic. In the BRT world, riders wait for the bus much as they would wait for a train, at stations that have electronic information showing how many minutes until the next vehicle arrives. BRT advocates say buses could offer the same level of service as subways and trolleys, with the added flexibility of being on tires instead of a fixed rail. In the case of the Urban Ring, this flexibility allows buses to leave busways and tunnels and run on roads like the Haul Road in South Boston or in the Ted Williams Tunnel to Logan Airport. The proposed Silver Line is a BRT system through the South Boston Waterfront. Many planners and experts believe such buses will soon have all the feel and "believability" of rail. The Federal Transportation Administration has selected Boston to be a case study in the use of BRT.

Traditional transit advocates criticize the use of any buses for transit, asserting that buses represent a second-class vehicle that is foisted on the poor and working class while more affluent communities enjoy fixed-rail service. But Robert Cervero of the University of California at Berkley argues that buses can provide as reliable and comfortable service – and offer as good or better development impacts – as rail transit. Referring to Curitiba and Ottawa, Cervero writes:

In both cities, some of the priciest condominiums anchor sites adjacent to busway stops. Retail and office developers also flocked to busway corridors in both cities. Good quality service—whether vehicles are propelled by electricity or fossil fuels, or whether they roll on steel wheels or pneumatic tires—will spawn compact development. It is the accessibility premium that attracts real estate development, not the type of transit equipment. In fact, compared to freeways and even rail corridors, busways produce relatively low ambient noise levels. Its inherent flexibility advantages and superior adaptability to spread-out patterns of development make bus transit—especially when combined with dedicated busways—a potentially stronger shaper of growth patterns than rail transit in some settings.¹²

Phase 2, scheduled for implementation from 2006 to 2010, calls for the acquisition of 60-foot, “articulated,” low-floor, low-emission vehicles, with a service frequency of 10 minutes at peak times and 15 minutes off-peak. The phase would also include the erection of new shelters and accessories that would establish a clear route and stations for the system. A maintenance facility is also contemplated in this phase. Phase 2 calls for expanded Crosstown and Express routes, Bus Rapid Transit (BRT) service in separate right-of-ways, exclusive lanes and in mixed traffic, and improved commuter rail connections.

The ridership is estimated to be 106,000 per day (by 2010). The cost is estimated to be \$500 million; implementation would start in 2008 and be completed by 2010. Phase 2 also calls for “intelligent transportation: system elements and the addition of BRT maintenance facilities.

The first busways, or dedicated rights of way, for the new vehicles to speed along on, would be built in Phase II, but not along the entire route of the Urban Ring. About half of the corridor would be busways; the other half would be painted lanes on surface streets where the vehicles would be mixed with traffic. Some railroad right-of-ways are identified for use by the BRT system.

Former Transportation Secretary Salvucci argues that establishing a clear “busway” is the critical stage of development for the Urban Ring. Establishing a new system can be done quickly with such a system because of fewer environmental and other regulatory reviews than a full-blown rail system. He argues that a bus-based system is essential to establish a ridership and to attract businesses to the transportation corridor. The most important factor in developing ridership, he argues, is not the type of vehicle but the frequency and efficiency of service – both of which can be satisfactorily achieved with buses. “In terms of frequency, which is the primary determinant, the buses are much better,” he said. “If you insist on rail, you’ll end up with a train that runs every 30 minutes which no one rides.”

Frequency of service is the key to transit success, Salvucci said. "There's a lot of documentation showing that frequency is what matters most to transit riders. It's better to have small vehicles frequently rather than large vehicles infrequently. There are rail fans who don't agree with that, but they're wrong. Frequency is what matters. There is a big difference between 5 minutes and 15 [minutes]. Five minutes will win every time. If you look at the Orange Line, one train is carrying 18 busloads of people, so that's an off-the-charts comparison. I doubt it will ever make sense to run an Orange Line. You could run light rail. But four- to five-minute headways on bus service would be a high quality service."

Salvucci's point is driven home by studies that quantify the implied dollar value people place on their own time. Because public transit is usually a means to get from one place to another, time spent on it has little intrinsic benefit. In fact, each minute on a bus or train has an associated cost, since it shortens the time available for other pursuits. That cost varies with the passenger's level of comfort and with the worth of the alternative activities. For instance, a delay in train service becomes much more costly if the passenger is rushing to catch an airplane flight. Similarly, standing on a bus is "expensive" compared with sitting

THE QT ON BRT

The Federal Transit Administration has begun a nationwide experiment – with Greater Boston one of the first regions to be involved – to explore the potential of "bus rapid transit" as a vehicle for improving mass transportation options in metropolitan areas. Other BRT projects are under way in Charlotte, Cleveland, the Dulles Corridor of Virginia, Eugene, Hartford, Honolulu, Las Vegas, Miami, San Juan, and Santa Clara.

The concept is simple: Since fixed-rail transit is three or four times as expensive as bus service, good bus service could be provided for more communities at a fraction of the cost of rail. The trick is to make sure that the roads used by buses are well designed and free of obstructions. The inspiration for much of the discussion of BRT is Curitiba, Brazil, a city that has used fast, reliable bus service to transform its downtown and neighborhoods like.

Transit advocates often criticize bus rapid transit as a poor alternative to fixed-rail service. Because buses often get stuck in traffic, service frequency can be thrown out of kilter during rush hour. Bus stops rarely offer amenities like shelters. Buses also offer less to longterm community building efforts than fixed rail; the very permanence of rail provides assurances to businesses and developers that the area will be accessible for the foreseeable future.

BRT advocates counter that a well-designed and run bus system can offer just as good service as rail – sometimes, even better. The trick is to provide dedicated "rights of way" – paths unimpeded by autos and trucks – so that buses do not get stuck in traffic. New signaling technologies also offer the potential for lights to be changed to green as buses approach to avoid unnecessary stops. Reducing the number of stops on at least some buses can also keep the vehicles moving swiftly. Modern fare collection systems can also reduce the boarding times, allowing buses to get moving quickly after stops. Perhaps as important as removing barriers is creating good streetscape design to make the areas along bus routes lively, attractive, and safe. Since the Urban Ring would likely be based on BRT for the foreseeable future, the adequacy of buses has become a matter of great debate. Boston's first experiment with BRT offers some encouraging news. The Silver Line – a BRT system that runs from Dudley Square to Downtown Crossing and eventually will run to the South Boston Waterfront – has increased ridership along Washington Street significantly since it was introduced in July 2002. Ridership on the old No. 49 bus averaged around 7,500 passengers per day. By October, ridership on the Silver Line had increased to 9,500 per day. By December, ridership reached 11,800 per day, prompting transit officials to increase the number of buses making the run.

on a train. Studies have found wide disparities between the average costs for walking, waiting, riding, and transferring. Waiting time is about two to three times as expensive as riding time. So, frequency of service has a disproportionate effect on the total cost of a journey. As an example, consider a 45-minute trip to work via bus and subway that includes four minutes of walking at each end. (Nationally, the average morning commute on public transit takes 45 to 50 minutes.) Increasing the bus's headway from five to fifteen minutes would make it more crowded and raise the total commuting time. The overall effect on perceived cost, roughly a 20 percent increase, would be about the same as if the trip's distance went up by half.¹³

Reliable service requires clearing out impediments to bus movement. Salvucci notes: "The key there is to make sure the joints work and they aren't caught in bottlenecks. They have to be able to get through congestion without stopping - [and that is] easier with buses than light rail. They don't need a dedicated lane the entire way. But if you are trying to get across the BU Bridge, you're going to need a dedicated lane to get across. You might not need one, though, on Vassar Street. If rail or bus, prioritize getting dedicated right of way in the spots where it's most important. Secondly, wherever there is an intersection, have to make sure it's an easy maneuver - you don't want to tell the passenger he's got to walk two blocks in the rain. You need the transfers to feel planned, and safe, and comfortable and clear - not ad hoc arrangements where you have to know the city to navigate them."

Creating a corridor free of impediments to rapid bus travel poses enormous challenges, all experts agree. "We don't actually own much land" in terms of the corridor, the MBTA's Peter Calcaterra said. "We're not in the business of land-banking. What we own is right of way and most of it is on streets. It's generally a combination of under-utilized (railroad tracks), abandoned rights of way, MDC roadways, City of Boston streets, and municipal property of one sort or another. If something is needed, it will have to be acquired. But we don't sit here with the land ready to go. In San Francisco, the authority that does the transit also owns the streets. That's an easier situation."

"We will be defining in more detail the right of way in the BRT [Bus Rapid Transit]" phase of the project," Calcaterra said. "At this point it's approximate. We want to make sure nothing gets built" that would block access for Urban Ring vehicles. "The draft EIS [Environmental Impact Statement] for BRT includes a conceptual design. If we get the New Starts money, and we get into preliminary design, we will know more about what we are going to need, block by block."

Making the system attractive also requires improvements to the "imagibility" of an area so that people feel comfortable and oriented when they make a switch from one line to another. "Engineers tend to think of the morning/evening rush [hour as the most critical time for the success of a system]," Salvucci said. "But the most stressful time on a transit system is not the peak hour, but say at 9 o'clock at night, making a transfer in a neighborhood you're not familiar with and you don't know when the next bus is coming."

PHASE 3

The last phase of the Urban Ring involves the switch from rubber-tire vehicles (buses) to rail-based vehicles (trolleys and trains). From an engineering standpoint, Phase 3 – which is scheduled for implementation from 2010 to 2015 – is tricky for a number of reasons.

All involved – public officials, advocates, and outside analysts – consider this last phase of the project to be an eventual goal, with uncertain design and funding. Some experts say that given political realities, Massachusetts cannot expect to receive the kind of federal money that would be essential for ever implementing Phase 3 of the Urban Ring.

Phase 3 calls for expanded Crosstown and Express routes, BRT service as in Phase 2, improved commuter rail connections, and rail from Assembly Square to Dudley Station (alternatively Wellington Circle to Ruggles). Phase 3 includes light rail transit (like the Green Line trolleys) or heavy rail (subway cars like the Orange Line), with a service frequency of 4 minutes at peak times and 10 minutes off-peak.

The ridership is estimated to be 290,000 per day (by 2025), with an additional projection that 50,000 riders will be diverted from using automobiles. The cost is estimated to be \$2.3 to \$2.9 billion; implementation is targeted for 2017. Phase 3 also calls for the addition of rail maintenance facilities.

Because of the different needs for rail, the location of the corridor could go along different routes. Indeed, the MBTA has outlined two alternatives for crossing the Charles River. In “Alternative A,” the system would cross the river at Kenmore Square through a tunnel with either light or heavy rail systems. The tunnel would allow more efficient movement of train cars and require fewer connections to radial lines. In “Alternative B,” the system would cross the river near the B.U. Bridge and Park Drive (near Audubon Circle) and follow a longer route. Because of tight turns and the need to negotiate traffic on streets, only light rail would be viable under Alternative B.

.....
Most experts consider
Phase 3—fixed rail—
highly unlikely for the
foreseeable future
.....

Phase 3 poses a stark choice between light and heavy rail – but also poses a larger question of whether rail is needed at all. Some say developing a rail-based system is not worth the time or expense because BRT will accomplish the goals of circumferential travel. Others say that only rail will give riders the excellent service that will create an adequate level of ridership, and that it is not possible to run enough buses to create that reliable service with short “headways” (times between vehicles).

Rail supporters envision a route that capitalizes on existing rail rights of way, the corridors free of automobile and truck traffic, from Longwood through Cambridge and Sullivan Square and in Chelsea. This route would have regular connections with existing subway lines at major new stations. Perhaps most important, it would assume a prominent place on maps in all the subway cars and stations in Boston, thereby attaining “first class” status among transit lines.

FUNDING OPTIONS FOR THE URBAN RING

The prospects for construction and funding of the Urban Ring are a matter of great debate. Some say the project should be implemented in relatively modest, incremental steps, without getting too concerned about the long-range dream of a rapid-transit rail system. Others say that Boston transit planners should think big. A fully built rail system will only be successful – that is, popular with riders – if it is as reliable and easy to use as the Red Line, many advocates argue; half-measures, in this view, will doom the project to failure.

Looming over the entire discussion is the question of funding. Less money is needed for the incremental approach – which could include such simple steps as a recognizable logo and better bus shelters, as a start. But obtaining funding for a major infrastructure project – whether in the hundreds of millions of dollars or \$2 billion or more – is uncertain.

The MBTA estimates that capital costs for Phase 1 of the project would cost about \$100 million and Phase 2 would cost \$500 million. Phase 3 would cost between \$2.2 billion and \$2.9 billion.

But capital investment is just the beginning of the costs. Operating costs of Phase 1 would cost \$23 million a year, Phase 2 would cost \$32 million annually (\$10.5 million and \$20.5 million for bus rapid transit). Phase 3 would cost \$55 million to \$56 million (\$12 to 14 million for bus, \$19 for bus rapid transit, and \$22 million to \$25 million for rail service).

Traditionally the MBTA has used a mix of state funding and federal grants to pay for major transit expansions. Previous to 2000, the Commonwealth of Massachusetts would issue long-term bonds to fund a portion of cost of construction for projects. With the reorganization of the MBTA in 2000, the MBTA is now responsible for issuing bonds based on its own credit worthiness. On the federal side, the Federal Transit Administration awards financial grants on a competitive basis through a program entitled “New Starts”. In years past, federal funds could account for up to 90 percent of a project’s total cost but stricter rules have reduced the average federal match to approximately 50 percent of total costs.

The Central Artery/Third Harbor Tunnel project – the so-called “Big Dig” – changed the whole political landscape for “megaprojects” like the Urban Ring.¹⁴ Congressional critics like Senator John McCain of Arizona have portrayed the Big Dig as little more than a boondoggle, which can never be allowed to happen again. Others on Capitol Hill are even more critical, vowing to slash northeast states’ share of federal transportation money. Representatives of big states like California and Texas are seeking to increase their share of federal dollars, which could hurt smaller and transit-oriented states like Massachusetts. House Majority Leader Thomas DeLay has proposed that states get back what they send to Washington, which could cost the Commonwealth \$37 million a year. The Bush Administration has called for smaller federal contributions to transit and highway projects.¹⁵ The upshot: Technocrats and dreamers alike believe that Boston cannot ask for federal funds for a megaproject anytime soon.

Urban Ring supporters caution against tying the project too much to financial restraints,

arguing that good ideas eventually attract resources. "We have to pay attention to economics and costs, but if we build in limitations and impose that on 10 years from now, we're being irrational, because we don't know what will be possible 10 years from now," said the BSA's David Dixon. "We were working with clients 10 years ago who thought there would be no demand for space in Boston. They were totally wrong within three years. The same was true for the state budget deficit. We have no way of knowing how preferences and conditions change."

Therein lies the major dilemma of the Urban Ring. On the one hand, the six communities pushing for the project need to adopt strong policies to make way for the system – even steps to improve infrastructure to accommodate all three phases of the project. On the other hand, all of the planning may be for naught if the nation's political balance of power continues to shift away from Massachusetts and the rest of the Northeast and Midwest. Planning, then, is essential – but might be besides the point if federal money is not forthcoming.

FEDERAL PROSPECTS

To build a circumferential transit system, the Massachusetts Bay Transportation Authority would be required to get substantial money from the federal government. That money would most likely come from New Starts, the transit program administered by the Federal Transportation Administration in the Department of Transportation. The problem for the Urban Ring is that New Starts must consider far more proposals than it has money and Massachusetts lacks the effective legislative power that was required to bring home funds for projects like the Central Artery project and the Boston Harbor cleanup.

The New Starts program provided \$7 billion over the last nine years to state and local governments to design and build transit projects – and average of less than \$800 million a year. In New Starts funding, the federal government contributes a maximum of 80 percent of the total cost of the project, but usually closer to 50 percent of projects. Observers expect New Starts and other transit projects to maintain such funding levels but not to substantially increase them under a Republican administration or Congress dominated by Sun Belt leaders. The Transportation Equity Act for the 21st Century (TEA-21), passed in 1998, identified 190 projects that would be eligible to compete for New Starts funding – but there was money for just 29 of the projects, according to the FTA. To sort through these proposals, the FTA rated these as "highly recommended," "recommended," and "not recommended" for funding.

The FTA's list of New Starts commitments for fiscal year 2003 is topped by \$100 million for San Francisco, \$70 million for Dallas, Denver, and Portland, \$68 million for Salt Lake City, and \$65 million for San Diego. Numerous "recommended" projects do not receive any funding. The FTA earmarked \$680,000 for Phase 1 of the South Boston Piers Transitway.

The tough federal environment for transit projects is borne out by the recent history of transit investment in Massachusetts. Over the past two decades the MBTA has undertaken seven capital expansion projects and only three of these have qualified for the use of federal

funds. Two of these, the Red Line and Orange Line projects in the 1980s, used federal funds transferred from the highway administration as substitution for the construction of the Inner Belt highway. The table on this page details the set of projects, the year the project opened to service, the total construction cost and whether federal funds were awarded. The MBTA now has a request for federal funding pending with the FTA New Starts program for the third phase of the Silver Line, the connection from New England Medical Center to South Station. The project is estimated to cost approximately \$1 billion.

Competition for federal funds through this program is fierce and extremely political. In 2003, the FTA awarded a total of \$1.1 billion in grants to a total of 23 cities. Many smaller cities across the country are now applying for grants to construct new light rail systems and the shift in political power in Congress to the South and West is evident from the list of projects awarded funds over the past several years. Last year's grant awarded funds to New Orleans, Memphis, and a host of other cities that did not compete for these funds a decade ago.

The FTA judges projects according to a number of criteria before awarding federal funding. Some of the major criteria are number of new riders, construction cost per new rider, travel time savings, and land use suitability.

RECENT TRANSIT PROJECTS

Project	Year opened	Cost	Federal funds
<i>Red Line extension</i>	1984	\$574m	Yes
<i>Orange Line relocation</i>	1986	\$750m	Yes
Worcester extension	1994	\$119m	No
Old Colony (2 lines)	1997-98	\$480m	No
Newburyport extension	1999	\$43m	No
Silver Line (South Boston Piers)	2002	\$608m	Yes

It is questionable whether the third phase of the Urban Ring will deliver enough "transit bang for the buck" to meet FTA's standards. The incremental increase in ridership from Phase 2 to Phase 3 (from 106,000 for Phase 2 to 290,000 in Phase 3) is probably not enough to justify the incremental cost in cost (approximately \$2 billion). And it is difficult to believe that the MBTA would be able to move to Phase 3 without federal aid. Therefore, the real discussion about the long-term viability of the Urban Ring should probably focus on the costs and benefits of Phases 1 and 2.

In a presentation at the New Starts Roundtable in Chicago in April 2003, FTA officials warned transit agency officials from across the U.S. that "competition for funding [would be] more intense than ever" and scarce dollars would be targeted to only the projects that meet strict new FTA standards. Some 28 projects now have full funding grant agreements, 16 projects are in final design, and 38 projects are in preliminary engineering. The FTA is tracking more than 120 planning studies for new initiatives and anticipating 10 preliminary engineering requests and six final-design requests in the next six months.

Transportation funding is in a state of flux at the moment; the historic tension between highway and transit projects will no doubt be worked out in new ways as the funding system comes up for reauthorization next year. But with billions in accumulated gas tax

revenue at stake, Stacey said, there is a growing new spirit of cooperation between backers of highway and transit projects. Funding for major projects is not out of the question, said Robert Stacey, an aide to the influential U.S. Representative Earl Blumenauer of Oregon. "You just have to get in line and make the case," Stacey said.

STATE PROSPECTS

To get the limited federal funding, Massachusetts must provide its own capital resources. Finding matching funds for the Urban Ring will be difficult given the state's \$1.2-billion annual bond limit and the MBTA's overextended financial situation. Massachusetts officials have talked about counting the value of the real estate taken for rights of way as part of the state's contribution to the project. That creative bookkeeping approach has been used in St. Louis and Portland. Since property in Boston and Cambridge could be assessed at a high value, this method could cover a substantial portion of local contribution. But even if such a match were allowed, it would simply extend the period required to do the project since the overall sum of "real money" would be limited to the federal government's contribution. Presumably, other states willing to contribute real money to transit projects would be viewed more favorably by federal officials ranking projects.

Since being switched to "forward funding" – essentially, having to live on a set budget – the Massachusetts Bay Transportation Authority has been operating with thin resources for most major investments and everyday operations. Forward funding requires the MBTA to operate within its annual budget of revenues from the state sales tax and transit fares.

A recent report on MBTA finances, produced by the Massachusetts Taxpayer Foundation and the Pioneer Institute for Public Policy Research, called for giving routine maintenance and improvements to the existing system priority over capital projects such as expanded commuter rail. The report estimates that, even with maintenance and modernization budgets substantially lower than the MBTA estimates is necessary, the T faces a funding shortfall of \$1.7 billion even without pursuing any of its high-priority expansion projects. The report states: "The T can afford a reasonable level of effort to sustain the current system only if the Authority elects to add even more to its already high debt burden, the sales tax returns to historic growth rates, and the T foregoes any expansion projects other than the first phase of the Silver Line, which is nearly complete."¹⁶

In other words, Massachusetts finds itself between a rock and a hard place on transportation planning. Transportation and budgeting experts have been unable to develop a strategy to fund projects already approved or raise new revenues. Cutting back on basic maintenance can be problematic, since both shortterm inconveniences and longterm decay of the system can drive away riders. Token efforts to raise revenues – like increasing transit fares – also backfire. Historically, fare hikes result in lower ridership. No matter how compelling the vision of the Urban Ring might be for redefining and serving the region's urban core, funding the project clearly has to wait. The question is how expensive the wait might turn out to be.

THE PARTNERSHIP APPROACH

Public-private partnerships – virtually the only way that amenities such as new parks come about, in this era of cash-strapped local governments – may also extend into the transportation realm in new ways, if businesses and developers are willing to support transit services they used to get for free. In Longwood, it would not be much of a stretch, since hospitals and research labs are paying for private shuttle buses now.

The developers of city-owned land at Somerville's Assembly Square site have proposed the private funding of a new Orange Line station at their property; the developers of North Point have shown similar willingness to help with the physical necessities of the Urban Ring through their land. If business and developers chipped in a few dollars per square foot for transit all along the corridor – spaced out over time so it could be planned for – hundreds of millions of dollars could be raised. The state legislature would have to enact such a charge as a tax or special assessment – a daunting challenge for Urban Ring proponents.

Even if the road to special taxes were clear, it is unclear whether it would produce the desired effect. The cost of development in Boston is one of the highest in the nation, and even incremental increases can undermine the development prospects of an area. Business interests mobilized in 2001 to defeat passage of the Community Preservation Act in Boston, concerned that the combination of a soft economy and higher real-estate levies would drive away business. There is little reason to expect that such prospects would not also apply to an area like Assembly Square and other sections of the Urban Ring.

THE FUTURE OF THE URBAN RING

Making the Urban Ring part of a broader planning effort might help justify its per-rider cost or win over converts at the State House or Washington. But a growing number of advocates say that more planning is exactly what the project doesn't need. This group, which has adopted the Nike mantra – *just do it* – is made up of veterans who have grown frustrated watching the Urban Ring stagnate. Grab the right-of-way being turned over by CSX between Logan and Chelsea, these project backers say. Lock in the bus lane on Ruggles Street. Establish the corridor so no more development occurs that would block its path. Distribute the Urban Ring logo and create a buzz as if promoting a blockbuster summer movie.

Another thing that would probably help make the case for the Urban Ring, some observers say, is putting the project in a broad context, by launching the "son of" Boston Transportation Planning Review, or BTPR 2. Such a process would force backers to analyze what problems they are seeking to solve in the context of regional transportation trends. The Urban Ring could even be tied to large regional planning efforts, such as the effort begun in June 2002 by the Metropolitan Area Planning Council and the Boston Foundation.

"I don't want to lower my sights, but just get cracking on this thing," former Governor Dukakis said. "Establish the route, establish the market, give people the opportunity to take

advantage of it, and depending on how we decide to pay for all this stuff, we may want to proceed, in pieces, or whatever.”

“Eighteen months from now, you could have an Urban Ring,” said Salvucci. “You could run buses every minute with excellent service. It doesn’t begin to tax the capacity of traffic. You’ll probably have to do something special near (existing?) lines and (build?) stations to make it special. Especially with transfers. That’s the weak link in the system now. It has to be physically easy ... [but] you could start with practically no capital investment. You could build it physically in a manner that, if in 25 years it made sense [to build rail], you wouldn’t waste your time before that. In 25 years or so you could look at it and make a service improvement.”

The incremental approach may be counter-intuitive for some, but it has the added benefit of not spending large sums of money on something that has not been proven or justifiable on a cost-per-rider basis. And yet, every improved crosstown connection would be a small victory for advocates who continue to dream of a major-league new transit system. In the post-Big Dig era, most planners agree, the Urban Ring will have to be sold to the public and to Washington in new and creative ways. Doing all those things at once – having short-term goals and leaving long-term questions for another day, creating public awareness for something that only partially exists – poses a tough challenge. But that’s the thing about encores. They come after hard acts to follow.

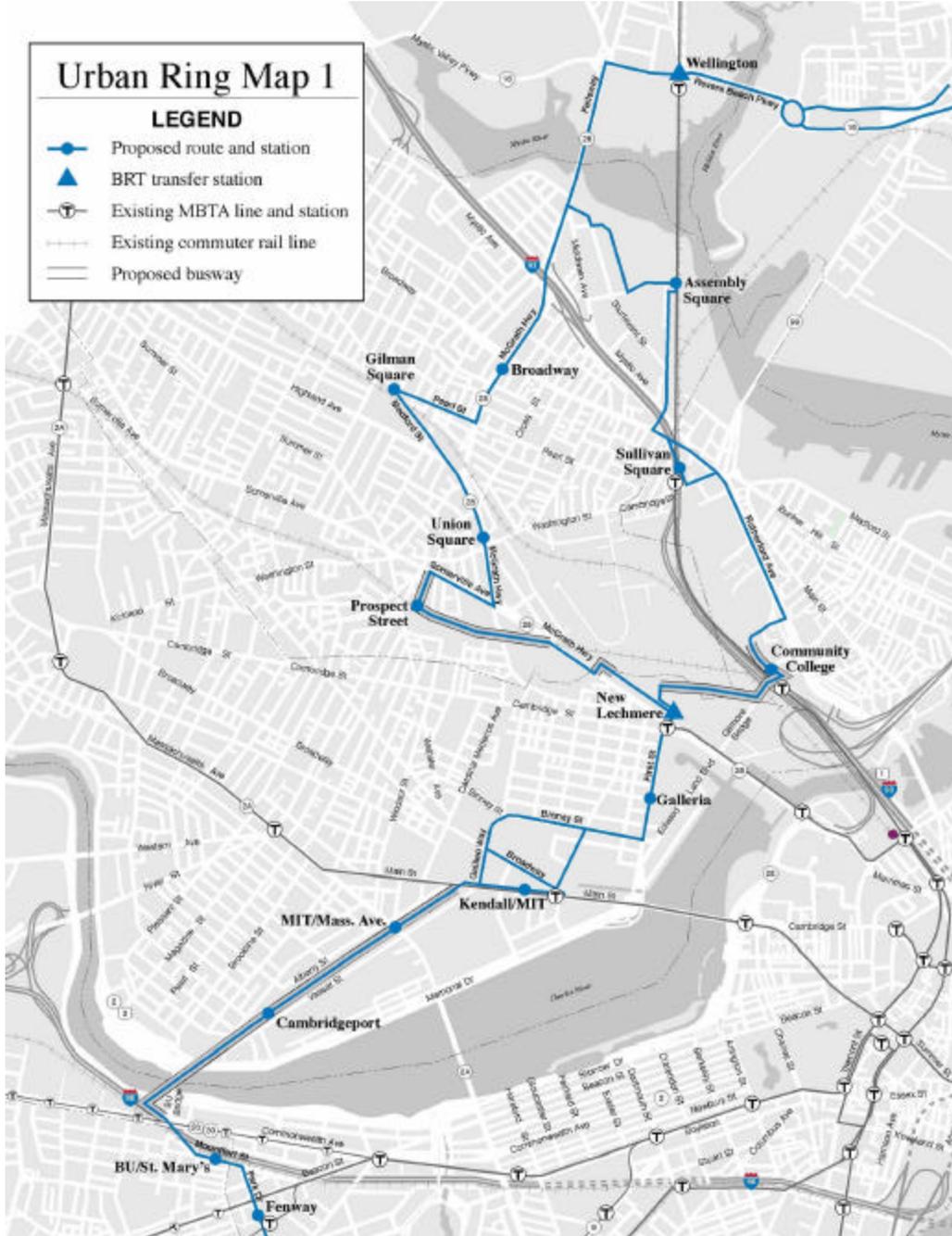
NOTES

1. See Mark I. Gelfand, “Hub and Spokes: Development Policy in Metropolitan Boston,” in Donald N. Rothblatt and Andrew Sancton, editors, *Metropolitan Governance Revisited* (Berkeley: University of California Press, 1998).
2. Except when noted otherwise, all quotations come from interviews with the authors.
3. *Access Boston 2000 – 2010: Boston's Citywide Transportation Plan* is available at <http://www.cityofboston.gov/accessBoston/default.asp>
4. Doug Hanchett, “MBTA Puts Kibosh on Proposed Rail Tunnel,” *Boston Herald*, April 19, 2003.
5. See Michael Wilson, “Study Finds Steady Overruns in Public Projects,” *The New York Times*, July 11, 2002.
6. Xu Jun Eberlein, Nigel H. M. Wilson, and David Bernstein, “The Holding Problem with Real-Time Information Available,” *Transportation Science*, February (35) 2001, pp. 1-18.
7. See Charles C. Euchner with Elizabeth G. Frieze, “Getting Home: Overcoming Barriers to Housing in Greater Boston,” Rappaport Institute for Greater Boston and Pioneer Institute for Public Policy, January 31, 2003, available at <http://www.ksg.harvard.edu/rappaport/research/major.htm>.
8. Nelson et al., p. 116
9. For more analysis of the transit-development relationship, he recommends work by Peter Gordon, professor at USC (213-740-1467) and a recent paper by Bob Savaro (sp) published in *Access* magazine out of Berkeley on the effect of BART on development in the Bay Area; (510-642-1695, Savaro; 510-642-5624, *Access* magazine, they may be able to give us a link).
10. Richard Voith, “The Long-Run Elasticity of Demand for Commuter Rail Transportation,” *Journal of Urban Economics*, vol. 30 (1991), pp. 360-72.

11. George Thrush, "Ring City: Civic Liberalism and Urban Design," available at www.architecture.neu.edu/research/scholarly/Ring_City_Essay_1995.htm.
12. Nelson et al., p. 106.
13. Thanks to Daniel Jerison for this summary of the headway issue. See Philip A. Viton, "On Competition and Product Differentiation in Urban Transportation: The San Francisco Bay Area," *The Bell Journal of Economics*, (12) Autumn 1981, pp. 362-379.
14. See Alan Altshuler and David Luberoff, *Mega-Projects: The Changing Politics of Urban Public Investment* (Washington: Brookings Institution, 2003).
15. Susan Milligan, "South, West Are Slicing the Pie," *The Boston Globe*, June 10, 2003
16. Glen Tepke with Charles Chieppo, "MBTA Capital Spending: Derailed by Expansion?" Massachusetts Taxpayer Foundation and Pioneer Institute for Public Policy Research, February 2002.

APPENDIX I: TRAVELING THE CORRIDOR

The major challenge of the Urban Ring project is developing an unobstructed pathway for transit vehicles. At several points along various proposed routes, barriers could pose a major challenge to the development of efficient service.



Map 1: From Wellington Circle to BU Bridge area

Medford to Somerville

The northernmost portion of the Urban Ring lies near Wellington Circle in Medford.

Wellington Circle – where Routes 1, 2, and 3 converge – would serve as a major northern transfer point for the UR, buses, and cars. Once the vehicles get to Wellington Circle, the UR would move through an existing T maintenance facility, and then south on the Fellsway, crossing the Mystic River and running into Somerville.

Once the UR reaches Somerville, the route branches into two separate routes, both meeting at Northpoint, the site of a major mixed-use development project:

- Under one route, the UR would move southeast through the Assembly Square property, which has been the focus of long planning processes and political battles. The MBTA has participated in feasibility studies for a new Orange Line stop in Assembly Square; T officials are concerned that the new stop not interfere with existing Orange Line service. The route then continues, with a number of twists and turns, to Sullivan Square in Charlestown, down Rutherford Avenue to Bunker Hill Community College, passing along new bus names to the Gilmore Bridge before reaching the North Side Commuter Rail maintenance facility, which the bus would have its own road road to travel through. The end of the route is Northpoint, which connects with Lechmere Station.
- Another route cuts south along Fellsway and McGrath Highway before traveling northwest on Pearl Street, then southeast toward Somerville City Hall. The bus then travels south along city streets to service Union Square before reaching Somerville Avenue and O'Brien Highway, which takes the UR to Northpoint.

Northpoint onward

Out of the Lechmere Station area, the Urban Ring moves westward toward Cambridgeport and the Boston University area of Boston.

The route moves south on First Street in Cambridge toward Kendal Square, before moving west and then west along a curving Binney Street. The route then circulates through Kendall Square along Broadway and Main Street.

Next, the route moves along the Grand Junction, an active rail right of way used by CSX and MBTA Commuter Rail. The Grand Junction is a straight line moving southwest toward the BU Bridge. There are several complications along this route:

- The Grand Junction stretch from Main Street to Mass Ave, narrower than the rest of the route, is owned by MIT, which leases it to CSX. MIT is planning the construction of the new Brain and Cognitive Science Center at main and Albany Streets, which could reduce the available space for a UR right of way. The Grand Junction route is used by the MBTA to move trains between North and South Stations to adjust service e levels on the two commuter systems.
- The T is less certain about being on the Grand Junction. Cambridge is building a regional bike/community path along the Grand Junction right of way. The community path, which would run from Memorial Drive to Main Street, would be within the rail right of way. If the community trail is in fact built, the UR would travel on a dedicated right of way in one direction and in mixed traffic in the other direction.

Other problems are posed by the nanotechnology experiments in the MIT buildings along Albany and Vassar Streets. Train traffic along the corridor already poses problems for researchers during the day because of train vibrations. This causes some research to be done only at night when the trains are not in use.

Maps 2: From the BU Bridge to U.Mass. and Convention Center

Where the Grand Junction crosses the Charles River, the Urban Ring will use the railroad bridge next to the BU Bridge. The river crossing would require widening of the RR bridge, keeping the existing footprint so that there are no changes to the river – allowing for two-way UR route.

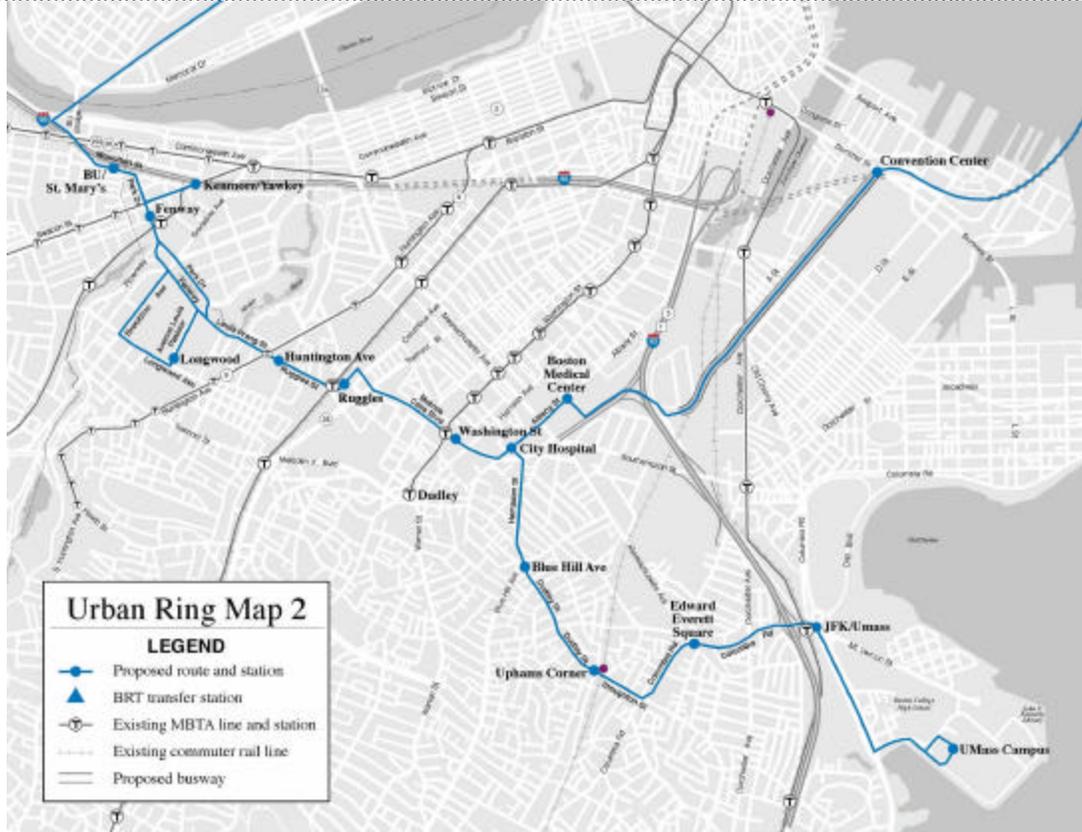
Cambridge is pushing for the construction of bus ramps from the Mass Pike to the rail bridge that would allow commuter BRT buses that serve the western suburbs direct access to the employment centers of Kendall Square.

Once the UR gets to Boston, the UR would require a tunnel to get under Commonwealth Avenue and the Massachusetts Turnpike. Construction work on the tunnel, bridge, and ramps would cost over \$100 million.

The UR would then travel along St. Mary's Street parallel to Commonwealth Avenue, then move on Park Drive past Beacon Street (Audubon Circle) toward Yawkey Station.

Toward Longwood Medical Area

The Urban Ring needs to use congested urban streets through the entire Longwood Medical Area since there are no off-street options for UR lanes. The T is working with the City to come up with some creative solutions for accommodating UR vehicles. Some possibilities: Using a counter-flow lane on The Fenway, looking at exclusive bus lane on The Fenway by



Simmons College, and then along Louis Prang Street into Ruggles station. The T has 40-foot easement along Ruggles Street from Orange line to Parker Street, but community residents and businesses have expressed opposition to increasing the capacity for vehicles on Ruggles Street.

The Urban Ring needs to gain access to a piece of property at Wentworth Institute of Technology to put the stops away from Ruggles Street. The T already owns the right of way.

The stretch from Albany to Dudley- how to get into LMA, where to put the station- put a station where eventually the rail piece at the corner of Louis Pasteur.

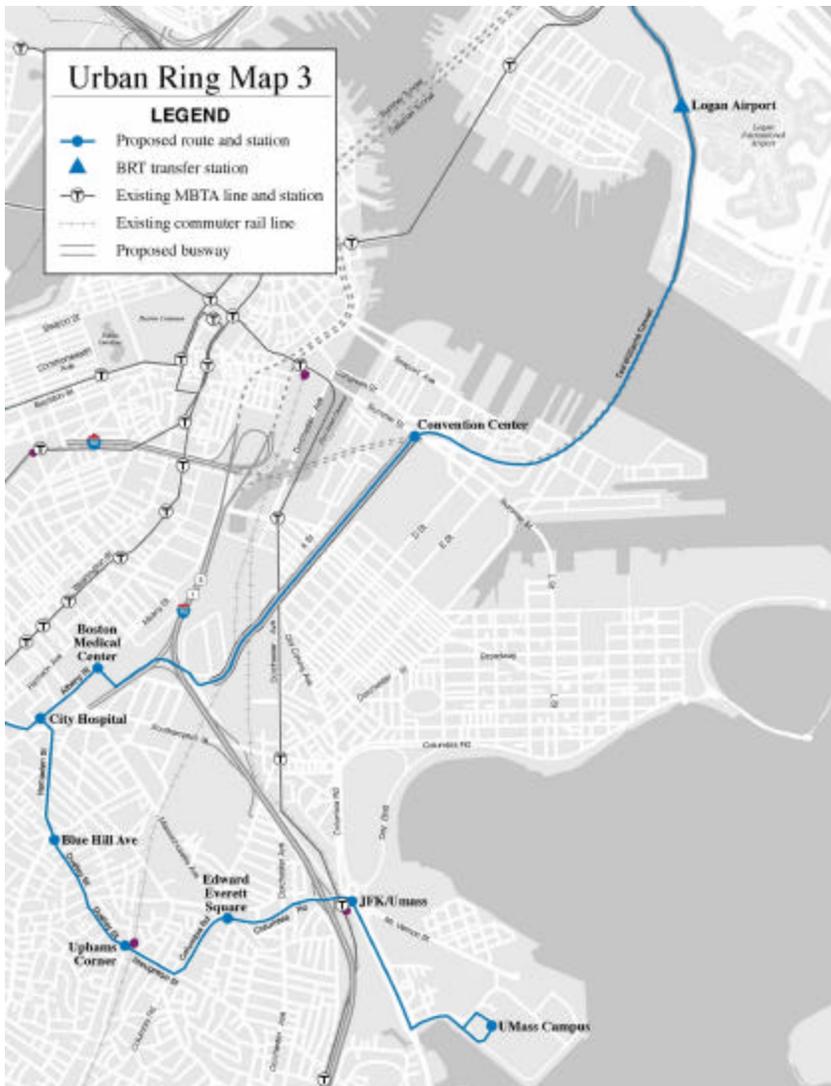
Ruggles to Dudley

Originally, the T did not plan a Commuter Rail stop at Ruggles, but eventually put in a one-side track for some of the trains to stop. Northeastern University is now seeking a larger stop. For the UR to provide rail service at Ruggles would require greater capacity for rail connections.

The next major piece of the Urban Ring corridor is Melnea Cass Boulevard, which stretches from Northeastern to the Boston Medical Center. The City of Boston controls a 40-foot transportation easement for this route. But advocates of the South Bay Harbor Trail have made claims for control of considerable parts of the corridor. The City will make the final decisions about access on Melnea Cass.

The MBTA, responding to pressure from environmental and transit justice advocates, is considering creating a spur off Melnea Cass to Dudley Square along Washington Street to provide better service to the Roxbury community.

Map 3: From Boston Medical Center to U. Mass and Convention Center, then on to Logan Airport



At the BMC, the route splits:

One route goes down to serve the Boston of the University of Massachusetts from Dudley Street and Columbia Road to get to the Red Line station at U. Mass. and then to the interior of the campus. Questions remain about how to serve Columbia Point and whether routing can go to the Kennedy Library and U. Mass. campus. This would be a terminal point on the UR.

Another route from BMC heads north along Albany Street and crosses the Southeast Expressway and then connects with the Haul Road for a clear shot to the Ted Williams Tunnel

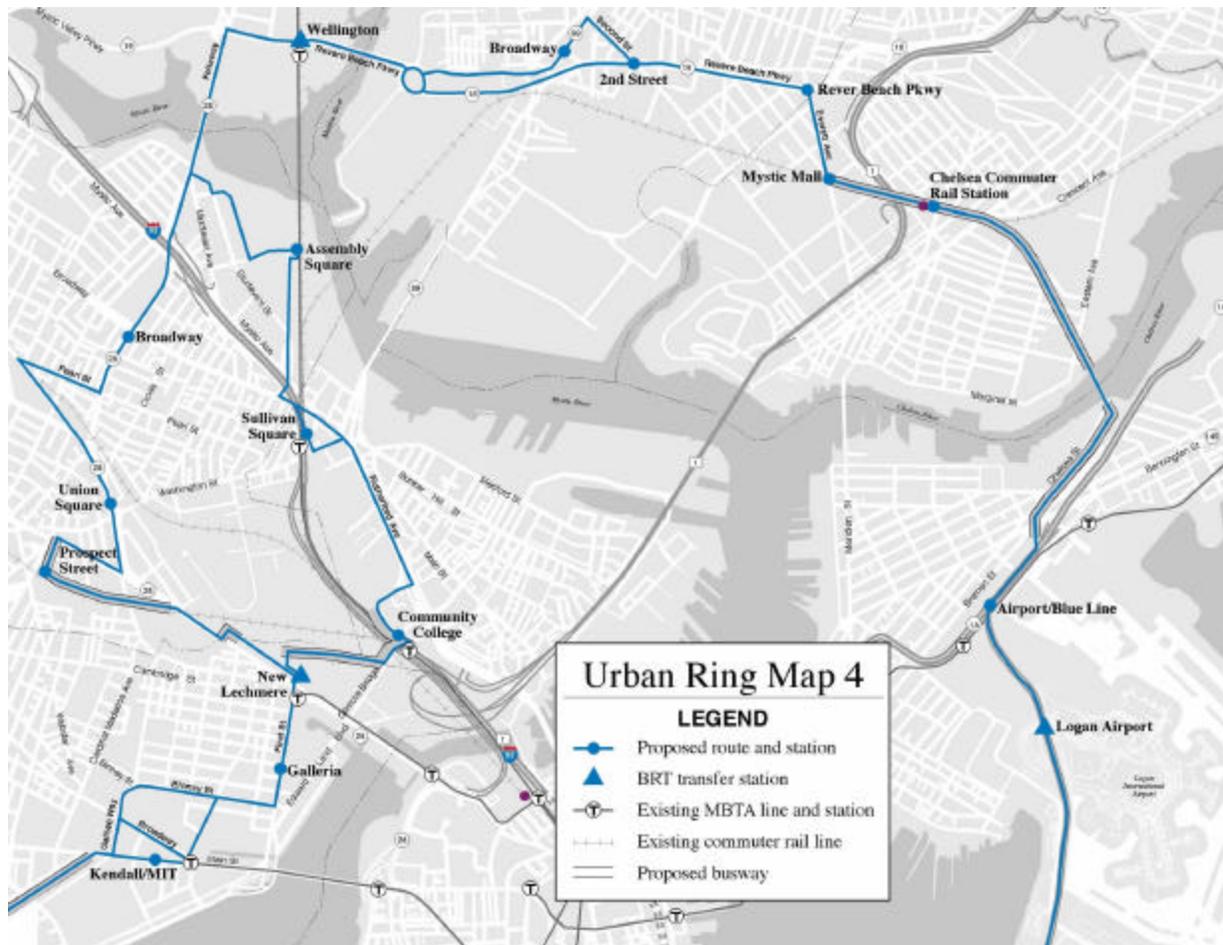
entrance. State law now allows for bus access along the Haul Road until the completion of the Central Artery project. The state legislature would need to renew bus access to the Haul Road for that leg of the UR to operate properly. The city is considering building an access road linking to the Massachusetts Avenue connector.

Airport

At the airport, one approach is to have the UR stop at the front of the Hilton Hotel for distribution to the air terminals. The other alternative is to go to the Blue Line's Airport Station and then feed travelers to the terminals via the airport shuttle.

Map 4: from Airport to Wellington Circle and beyond

Starting with the Airport Station, the aim is to use the CSX Railroad branch from the Airport Blue Line Station northeast to the Chelsea Street Bridge. This section have several pieces:



The corridor alongside Brimmer Street from the Harbor Piers north to Prescott Street is now unavailable for transit service since the City of Boston has dedicated the right of way to create the Greenway Belt pedestrian trail. As a result, transit vehicle will have to operate in mixed traffic on from the Airport roadway up to Prescott Street, where the route connects with the CSX right of way.

Transit can operate on a dedicated right of way from Prescott Street to the Chelsea Creek Bridge.

A parcel along Byron Street owned by a private company would have to be purchased or leased to regain the right of way.

Chelsea to Medford

The Urban Ring corridor crosses the Chelsea Creek Bridge, an old drawbridge that is hazardous to water-borne navigation. The bridge would have to be rebuilt (likely partners would include MassHighway and the City of Boston, with oversight by the U.S. Coast Guard). Urban Ring vehicles would operate in general traffic over the Chelsea Creek Bridge. The City of Boston plans to rebuild the bridge (which would cost in the neighborhood of \$50 million to \$60 million) and hope to count it toward the local contribution dollars for FTA New Starts match. A central question is how much of public and private infrastructure improvements can count towards the local match needed (probably 50 percent) for federal funds.

Once the Urban Ring crosses into Chelsea, it can take advantage of a rail right-of-way that CSX wants to abandon from Eastern Avenue to Broadway. The intent is to put a busway along the right of way so that it does not need to operate in traffic. CSX has not determined when it plans to abandon that corridor; CSX has requested that the MBTA or other public entity maintain the corridor in the meantime. Chelsea already has agreed to maintain a portion of it. The MBTA will probably have to maintain the rest. Meanwhile, CSX ownership of the corridor is uncertain.

Picking up at Broadway, the MBTA owns a right of way now used by the Commuter Rail Eastern Shore lines, which could be shared with the Urban Ring BRT vehicles. The Chelsea Downtown BRT Station would serve as an intermodal center with the commuter rail station. The City of Chelsea is seeking to create a major development project at the station to generate revenues to pay for the intermodal center.

Starting at Everett Avenue, planners are considering two alternate options:

- In the first option, the UR buses would leave the Commuter Rail right-of-way and travel along Everett Avenue to Revere Beach Parkway, then move west along the Parkway. The route would go north on Second Street and then south on Broadway to get to a station there, before reconnecting with Revere Beach Parkway. This route is favored by some planners because it would enable the Ring to travel through densely populated

areas to better serve residents and workers of Chelsea. Chelsea officials have asked the MBTA to test the travel demand model with some stations off of the right of way in areas where people live.

- In the second option, the Urban Ring would stay on the Commuter Rail right of way for about another half-mile. The MBTA would like to stay in the right of way because of transit vehicles' ability to travel in it own corridor.

The route picks up at Second and Revere Beach Parkway and travels west along the parkway in mixed traffic to Wellington Circle in Medford after crossing the Malden River.

APPENDIX 2: GROWTH PROJECTIONS

While Urban Ring advocates like the Conservation Law Foundation and the Boston Society of Architects say that the new transit line would increase the interest in development, the Urban Ring Compact is arguing that the corridor is already primer territory for development. Overall, the compact projects that the Urban Ring area will add 15.2 million square feet of nonresidential real estate to its current 107.7 million from 1996 to 2020, an increase of 14 percent. At the same time, the compact projects the number of jobs in the area to increase from 204,139 to 241,000, a growth of 18 percent. Residential population is expected to increase more slowly, from 221,785 to 238,000, about 7 percent. Here are portraits of key sections of the Urban Ring corridor:

Columbia Point: The site of the Boston campus of the University of Massachusetts and the John F. Kennedy Presidential Library, Columbia Point is expected to add 350,000 square feet of nonresidential space (an 8 percent increase) and more than 700 jobs by 2020. In addition, the university, long a commuter school, plans to build up to 2,000 beds of student housing for the first time. Meanwhile, the Corcoran Jennison Companies is planning to build market-rate housing in the area.

The MBTA in 1996 agreed to provide a commuter rail stop at the U.Mass./JFK Red Line station. Residents complain that stops are infrequent and MBTA officials say they will consider increased service to the station, but point out the difficulties of managing traffic at both the Red Line and Commuter Rail trains. The inclusion of the Urban Ring could open new opportunities for connections at the station – and encourage new development in the area.

Nearby Uphams Corner is also part of the discussions. Anchored by the historic Strand Theater, the area is under consideration for a special overlay district by the Boston Redevelopment Authority. Under the city's Boston 400 planning initiative, the BRA is analyzing a number of "activity centers" to determine the best strategies for concentrating development near transit nodes. Upham's Corner is one of the major foci of the work to date.

New Market/South Bay: New Market and South Bay could be the "sleeper" points along the Urban Ring corridor. The South Bay shopping center is one of the most successful malls in the nation and the nearby Bayside Exposition and Executive Conference Center is the second largest convention center in the region with 300,000 square feet of meeting space and 250,000 square feet of exhibition space. New Market has long been considered a site ripe for industrial and assembly development because of the close access to Interstate 93 and the Massachusetts Turnpike. The Menino Administration has designated New Market as a "Back Streets" site to protect and expand city's blue-collar job base. Meanwhile, developers have begun to show the most interest in the area in decades.

Nonresidential space is expected to expand by 327,000 square feet in the next two decades and employment by 700 workers, relatively trivial amounts. At the same time, the city has rezoned much of the areas from industrial to community commercial uses. That new designation could open the area up to a broader range of activities and expand traffic

needs.

Boston University Medical Center: The Boston University Medical Center has filed a master plan detailing plans for expansion of its complex, and a city plan for the South End calls for mixed-use development between Albany Street and the Massachusetts Avenue connector. The Bio-Square development – a 200,000-square-foot complex on Melnea Cass Boulevard announced in December 2001 – could lead to even further growth of medical research facilities.

The area is expected to add 608,000 square feet of nonresidential space and 1,305 new jobs by 2020. The population is expected to grow by more than 900 in the same period.

Crosstown/South End: The Crosstown area – defined by the Melnea Cass Boulevard corridor from Northeastern University to the B.U. Medical Center – is expected to experience explosive growth in the next generation. More than 1.5 million square feet of nonresidential space and 3,896 new jobs, and 2,400 new residents are expected to be in the area by 2020.

Not far away, in Roxbury's Dudley Square, the city and state have begun a major push to revive one of the city's historic business districts. The state's Department of Public Health is locating in the old Ferdinand Department Store building. The Silver Line bus service will run from Dudley Square down Washington Street to Chinatown before running to the South Boston Waterfront and Logan Airport.

Longwood: The Longwood Medical Area, a 210-acre complex located along the southern end of Huntington Avenue – is home to 21 medical and educational institutions that employs 30,000 people with a payroll of \$700 million, and another 14,000 students study in the area. Annually, the area's hospitals have 1.7 million outpatient visits a year. The Longwood area's power as a research center is underscored by its \$550 million in annual grants from the National Institutes of Health – more than any single district in the country and more than is received by 47 states. The Medical, Academic, and Scientific Community Organization, commonly known as MASCO – has worked for years to encourage workers to use public transportation or live near hospitals and other organizations." Some 30,000 people work at the medical institutions – if Longwood were part of its own city, it would be one of the 20th largest downtowns in the nation – but workers overwhelmingly rely on cars because there is no handy transit option. The two Green Line trunks generally go east-west, and there is infrequent bus service along northward and southward streets. MASCO has been a major supporter of the Urban Ring for years.

"It's the most important thing that could possibly help us," said Rick Shea, president of MASCO. "We've jacked up the price of parking, we have shuttles up the wazoo, and we've tinkered with every signal and street configuration." Experts on the medical industry and development expect that the hospitals will need room for more expansion in the coming years. Without adequate transit access, Longwood's geographic advantage will be reduced, and sites outside the urban core will become more attractive for expanding institutions.

One of the region's greatest economic engines, the Longwood Medical Area is expected to grow by 2.1 million square feet of nonresidential space in the next 20 years (from 10.5 million square feet), with an additional 4,333 jobs on top of the current 31,101 jobs.

Residential growth will be negligible – about 300 – as hospitals and other facilities work to intensify development within a constrained area rather than spread out into nearby neighborhoods.

Fenway: The Fenway is the home of Boston’s most famous and frustrating tenant – the Red Sox baseball team – but also home to a thriving residential area, diverse and growing shopping, and educational institutions like Boston University, Northeastern University, Wentworth Institute, and others. Nonresidential space growth will be negligible, but the number of workers is expected to grow from 14,545 to almost 17,000. The population will grow upwards of 500 residents.

The X factor for many Fenway residents is the Red Sox. A proposal to build a new stadium and parking garage caused great controversy, but the new owners of the team have indicated a willingness to stay put for at least several years. If the team stays and expands or builds a larger facility – or if it leaves and creates a significant opportunity for new institutional, business, and residential development – the neighborhood could be affected significantly.

Even without growth, the area faces difficult transportation challenges. Traffic through the neighborhood to the Longwood Medical Area, downtown, and to nearby universities and cultural institutions has prompted constant calls for traffic improvement plans. The City has commissioned new traffic studies when major institutions embark on expansion or renovation plans.

Former Transportation Secretary Salvucci is concerned about Fenway plans. “These are hard things to make happen. And they don’t happen by themselves. For example, if Fenway Park comes together and there’s a big shift of infrastructure around, unless someone is sitting there looking at how the Urban Ring is going to interact with a Yawkey station, it won’t come out very well.”

Boston University: Boston University has adopted an institutional master plan that calls for mixed-use development of the Commonwealth Armory site. In all, the area is expected to add 1.6 million square feet of nonresidential space, 3,500 new jobs, and 2,200 new residents.

Meanwhile, the city and state have developed strategies for development of the “air rights” over the Massachusetts Turnpike that cuts through the area.

Former transportation chief Salvucci sees the Urban Ring as an opportunity to fix existing traffic problems and replace the crumbling Boston University Bridge. But he warns that planning has been inadequate to relate short- and long-term plans to the development and traffic challenges. “The B.U. Bridge is falling down anyway, so it will have to be dealt with,” he said. “The design of the bridge needs to make provisions to avoid getting stuck in a bottleneck. The game plan needs to be conceptualized at the front end, so the public transportation vehicles go to the head of the line.”

Cambridgeport: A classic old neighborhood of small houses and cottages, located near obsolete industrial spaces, Cambridgeport is expected to add 98,000 square feet of nonresidential space and just over 150 jobs by 2020. Residential growth, however, could approach 3,000 from 1996 to 2020 as the industrial area gets redeveloped as a new mixed-use community.

MIT/Massachusetts Avenue: The Massachusetts Institute of Technology – arguably the region’s premier economic engine – will be the center of major expansion in the next generation. Under zoning regulations that allow for more intense development, the Grand Junction railroad corridor will be developed as research and development, light industry, and back-office activities. The institute, meanwhile, plans to add thousands of beds of student housing. The area is expected to grow by over 1 million square feet of nonresidential space, 2,400 jobs, and 2,000 residents by 2020.

Kendall/East Cambridge: The Kendall Square and East Cambridge area have been the location of the most intense research and development, office, and institutional development in the region. Fifty thousand people now work in the area, which is accessible by Red and Green line stations but still is oriented to automobile access. In January 2000, the city put an 18-month freeze on new commercial development over 20,000 square feet and residential development over 20 units. Planners have long criticized the style of development in the area: large buildings and complexes, wide streets, and little connection among the pieces. The Urban Ring could play a major role in fostering the kind of tightknit development that offers better efficiencies and creates a greater sense of place.

Whatever the look and feel of the area, development will continue into the next generation, adding 1 million square feet of nonresidential space, 2,403 jobs, and 2,000 residents in the next two decades. The BRA’s Garver puts the matter simply: “If they are going to build out what they have approved in their master plan, they can’t get there without the Urban Ring.”

Lechmere/North Point: One of the most intensive mixed-use development projects in the region is taking place near the Lechmere Green Line station – and promises to remake the area. As part of the project, developers are building a new Lechmere station and eventually will provide a below-grade rail tunnel. The area was the focus of a master plan in the 1980s, which led to the construction of the Cambridge Side Galleria mall and other housing and business development projects. North Point – located north of Monsignor O’Brien Highway across the street from the Lechmere station – has been designed a “planned unit development” area with greater density allowed because of its proximity to a transit station. Car traffic will be limited and a park built by the Metropolitan District Commission.

According to the MBTA’s projections, the 51-acre industrial area will add 484,000 square feet of nonresidential development, 1,400 new jobs, and 1,200 new residents. But the signature development in the area, a residential complex, could go much further than the projections and create housing for as many as 10,000 residents. “I think it’s very exciting as it represents the last major undeveloped tract of industrial land in the city,” said former Cambridge Mayor Anthony Galluccio. “The city council has identified building housing as its top priority. It will require a visionary and thoughtful plan to implement both a self-sustaining and sustainable development that integrates into the rest of East Cambridge.”

Former Transportation Secretary Salvucci, however, is concerned that Urban Ring vehicles will be not able to connect with the Green Line in a graceful way. “The developer was asked to extend the comment period and he refused,” Salvucci said. “That’s a case where the planning is going on right now, and presumably it can be worked out.”

Union Square/Boynton Yards: The BRA's Garver sees Union Square as an essential pole to the development goals of the region. The corridor from Union Square to Assembly Square "is where municipalities want development to take place, so it's important to think about augmenting those areas with transit service," Garver said.

Boynton Yards, the city's oldest industrial area, is the focus of a longterm strategy to develop new economic activity. The city has assembled parcels, built infrastructure, and provided financial assistance.

Brickbottom/Cobble Hill/Inner Belt: An old industrial area now made famous by a small artist colony, Brickbottom, Cobble Hill, and the Inner Belt is the focus of block grant development efforts. The area is expected to add 420,000 square feet of business space and 745 jobs in the next two decades.

Assembly Square: The 145-acre Assembly Square site has been the focus of bitter battles for years. The mayor is seeking to develop an acceptable middle ground between the developers and community activists. Developers are seeking to create big-box retail outlets that are largely dependent on automobile usage, while community activists have called for small-scale mixed-use development built around transit. The mayor, meanwhile, is eager to augment the city's tax base, which is dependent largely on residential levies, with revenues from commercial and retail outlets. But activists argue that traffic in the area is already excessive and that the opportunity to build around transit offers the city a unique opportunity to build an even stronger tax base over the next generation.

Somerville's 2000 study of the development potential of the area estimates the capacity for 5 million square feet of new nonresidential space and new employment of 15,400 new jobs by 2020. Mayor Dorothy Kelly Gay is working with developers to finance the construction of a new Orange Line rapid-transit station, which could be the crossroads for a new Urban Ring stop as well.

Rutherford Avenue/Sullivan Square: The area around Rutherford Avenue and Sullivan Square is, in the words of the BRA's Garver, "the place everyone has forgot." Lacking real identity, overrun by traffic, uncoordinated in land-use patterns, the area nonetheless has the potential to become a major transit node and home to a diverse collection of businesses and residences. The area is expected to add almost 1.5 million square feet of nonresidential space and 2,700 jobs by 2020. The population of the area is likely to remain constant or even decline slightly.

The signature event of recent years is the redesign of Rutherford Avenue in Boston's Charlestown community. The redesign seeks to enhance the pedestrian experience on the street while at the same time accommodating heavy flows of traffic from the north into the city.

The area's challenge is not only transit access, but also urban design. "When you're there you don't know what town you're in," said Garver. "It has all this stuff going through it. But it has the potential to be, from a development standpoint, a nodal point. If you could get the commuter rail to stop there, and then cross it with the Urban Ring, so people can get over to their job in East Cambridge, it could become a place."

Development proposals that increase density are viewed skeptically in both Charlestown and Somerville, but the BRA and the MBTA have begun discussions about joint development of T properties. "The idea is to think of all the pieces together," Garver

said. "Develop the property, the T gets the funds from that, so it's investment. And development also provides riders."

Everett: Once the terminus of the old elevated Orange Line, Everett now has no major transit service. The Commuter Line passes through Everett but does not stop in the city. But the area is expected to increase its nonresidential space almost 800,000 square feet and add 1,770 jobs. The city has designated portions of Lower Broadway and an 80-acre section of the Revere Beach Parkway as a business overlay district to spur development. With new transit connections, the area would improve its competitive advantage for many light industrial and back office activities.

Chelsea: Chelsea, struggling to escape bankruptcy just a decade ago, is focusing its development plans on the Urban Ring corridor. Areas previously dominated by dirty industries – scrap metal and fuel oil collection – are targeted for cleanup and new development. The city is planning hotel and office space inside a new urban renewal area and is trying to promote waterfront development along old petroleum storage sites. New development is expected to reach 1.8 million square feet of nonresidential space, producing an additional 3,200 jobs, by 2002.

The city is holding ongoing discussions with CSX, the owner of unused rail right-of-way from Logan Airport through Everett, for a piece of the Urban Ring. Chelsea officials are pushing for the construction of a new Commuter Rail station connected to an Urban Ring stop. City officials also want to relocate its current station, which is out of the way, near the big state data processing facility.

East Boston: The Boston Redevelopment Authority is implementing a master plan for the development of East Boston, with a focus on the piers and Maverick Square area. Long overshadowed by Logan International Airport, East Boston will add 220,000 square feet of nonresidential space and 480 jobs by 202 and see a population increase of about 600.

Logan Airport: Logan Airport is perhaps the most important node along the Urban Ring corridor since it is the one place that most business people and residents all must use at some point. Now accessible only by the Blue Line – the city's least used subway line – Logan could be connected to most parts of the region with a two-stop transit trip if the Urban Ring is completed.

The projections of increased nonresidential development and jobs – 406,000 square feet and 480 jobs – are less important than projections for increased air travel. Close to 30 million passengers now use Logan.

Former transportation chief Salvucci is concerned about the barriers to Urban Ring connections at Logan. "The Logan Blue Line station, in the way the Big Dig is building it, actually blocks the Urban Ring corridor," he said. "The rhetoric is that it's an Urban Ring stop, but the concrete being poured is blocking it." Ideally, Salvucci said, travelers should be able to come through the Ted Williams Tunnel, go to all terminals, stop at the Blue Line, and continue on the Chelsea and Everett. But, he said, "a bus that comes into the Blue Line station will have to go back through the airport, and won't be able to go on to Chelsea. In other words, it's designed for how it works now – bus comes in, picks people up, distributes them to the terminals, picks up, comes back to the station. Under the Urban Ring, some buses should have

the ability to stop at the station and carry on.”

“But the real problem is that it’s being built right now. There’s still time to fix it, but there is no interest on the part of the Big Dig or Massport. They have dodged their commitments for the Blue Line to save money and the whole station is being rebuilt wrong. They were supposed to set up a ramp so the bus pulled up at the same level as Blue Line platform, but haven’t done it.”

APPENDIX 3: PHASING THE URBAN RING

The Urban Ring is a series of phased improvements to the current transit system, marked by increased lateral access among major employment centers like Logan Airport, Kenmore Square, the Boston University area, the Longwood Medical Area, Crosstown, and the Boston Medical Center.

The project potentially involves four kinds of public transportation systems:

- **TSM:** *Transportation system management* offers increased use of buses to provide service to previously underserved areas. TSM uses express commuter buses similar to the current buses from Watertown or Newton to Boston (EC) and crosstown buses such as the bus from Dudley Square to Harvard Square (CT).
- **BRT:** *Bus rapid transit* offers the use of articulated buses with enhanced street design (including dedicated rights of way to avoid getting stuck in traffic) and signaling systems to allow freer movement of vehicles.
- **LRT:** *Light rail transit* offers rail service along trolleys similar to the Green Line's new low-floor cars, operating at grade and often in traffic.
- **HRT:** *Heavy rail transit* offers rapid rail service in subway cars similar to the Red Line, operating in tunnels and otherwise out of traffic.

The Massachusetts Bay Transportation Authority's July 2001 Major Investment Study of Circumferential Transit Improvements in the Urban Ring Corridor" provides a complete overview of how the different modes would be phased into the Urban Ring project.. That information is available at <http://www.mbta.com/newsinfo/geninfo/projects/urbanring/MISChapter4.pdf>.

ABOUT THE AUTHORS

Charles C. Euchner is executive director of the Rappaport Institute for Greater Boston at Harvard University's John F. Kennedy School of Government. The editor of the Rappaport Institute's Governing Greater Boston Series, Euchner is the coauthor, with Stephen J. McGovern, of *Urban Policy Reconsidered: Dialogues on the Problems and Prospects of American Cities* (Routledge, 2003). He is also author of *Playing the Field: Why Sports Teams Move and Cities Fight to Keep Them* (Johns Hopkins, 1993) and *Extraordinary Politics: How Protest and Dissent Are Changing American Democracy* (Westview, 1996). Prior to coming to the Kennedy School, Euchner held positions at the College of the Holy Cross, Boston Redevelopment Authority, and Northeastern University. Euchner holds a bachelor's degree from Vanderbilt University and master's and doctoral degrees from the Johns Hopkins University.

Anthony Flint covers planning and development issues for *The Boston Globe*. A past contributor to the Rappaport Institute's Governing Greater Boston Series, Flint was a Loeb Fellow at Harvard University's Graduate School of Design in 2000-2001. Since coming to *The Globe* in 1989, Flint has covered a wide range of issues, including e-commerce, the presidential elections of 1992 and 1996, the tobacco industry, legal affairs, and higher education. Before coming to Boston, Flint served as a reporter for the *Register-Citizen* of Torrington, Connecticut, and the *Berkshire Eagle* of Pittsfield, Massachusetts, and as a deputy regional press secretary for the 1988 Dukakis for President campaign. Flint holds a bachelor's degree from Middlebury College and a master's degree from Columbia University's Graduate School of Journalism