

TO: Mayor Joseph Curtatone
FROM: Andy Likuski, Urban Planning and Transportation Advisor
DATE: December 7, 2010
SUBJECT: McGrath Corridor Recommendations

Mayor Curtatone:

Your strategy for redevelopment of the entire McGrath corridor must interweave economic opportunities with the emergencies of climate change and public health. East Somerville has few long-term obstacles to redevelopment--Assembly Square, Union Square, and East Broadway are your target zones for this decade and the Inner Belt will likely undergo substantial development shortly thereafter. With the exception of East Broadway, these sites will all soon feature high quality rail transit and excellent accessibility to Boston, West Somerville, and Cambridge. Your primary obstacle to comprehensive redevelopment is the excess of vehicular traffic.

From a public health perspective, you need to limit local and regional use of vehicles through East Somerville neighborhoods. Gains that accompany rail transit expansion will not be sufficient alone to curtail vehicle pollution, danger, and its overallocation of public space. Your plan must accomplish a significant overall reduction of Somerville-based automobile trips and move as much traffic as possible off of Route 28 and onto I-93. I-93 is a significant health concern for Somerville, but it is better isolated from Somerville's neighborhoods than Route 28 and largely outside of Somerville's responsibility. Vehicles that must remain on McGrath after redevelopment should by in large be limited to those conducting business in East Somerville neighborhoods.

Summary of Past, Present, and Future Conditions

The Northern Artery was constructed in 1928 as fast state-owned arterial connector between the Charles and Mystic River paralleling the Cross St. and Medford St. Boston Elevated streetcar lines¹. It was elevated in the 1950s. Today population densities along the portion now called McGrath range from 1,200 to 12,000 per square mile.² Population densities along Route 28 in East Cambridge are 6,800 per square mile, but new developments will drive that number upward. Likewise, more density gains will be achieved at Assembly Square, Union Square, Brickbottom, and in the Inner Belt as redevelopment efforts take hold. Some of the traffic growth from developments will be both fueled and alleviated by the Green Line extension, expected in 2015, and a new Orange Line station at Assembly Square. Gentrification is already transforming parts of East Somerville and East Cambridge along the corridor.

Despite a report of satisfactory conditions by MassDOT, the elevated portions of McGrath are showing their age and will likely require retrofitting, rebuilding, or removal in the near future. The elevated structure helps bypass two major intersections at Washington St. and Somerville Ave., but creates poor

1 "Boston Elevated Railway - Wikipedia, the free encyclopedia,"
http://en.wikipedia.org/wiki/Boston_Elevated_Railway.

2 Central Transportation Planning Staff, "Toward a Route 28 Corridor Transportation Plan: An Emerging Vision" (Central Transportation Planning Staff, 2008).

conditions characteristic of an elevated freeway--obstructed views, dismal and dangerous areas under the structures, an impedence to pedestrian-oriented redevelopment. McGrath and the Fellsway are additionally the location of four of the top 1000 crash locations in the state, at Mystic Ave., Broadway, Washington St., and Pearl St.¹ As an advocate for improvements to East Somerville, you, as well as the Central Transportation Planning Staff Route 28 Advisory Committee, have recommended that the elevated portions of McGrath be removed in favor of a pedestrian-friendly boulevard that will drive dense redevelopment. Thus there are a combination of near-term pressures and alleviations on traffic along Route 28, the former being development and decreased road capacity and the latter a vastly improved transit network and more walkable communities.

Issues

The 2003 Central Transportation Planning Staff Route 28 Report highlights the following issues that are relevant to your considerations of McGrath.

- Severe rush hour congestion between Highland Ave. and Broadway.
- Traffic volumes between 40,000 and 65,000 in 2001, which show similar volumes today.²
- Poor Pedestrian access at I-93, Mystic Ave, Foss Park, Broadway, Pearl Street, Medford Street, and at Washington St.
- Air quality issues along the corridor.
- Redevelopment opportunities blocked by the elevated structures.
- Solutions need to investigate I-93 incident management, new direct I-93 ramp connections, trip reduction, growth management, and parking limitations
- Four major crash locations in the Somerville Portion of Route 28

I would also add the following, in part from the report's other observations and my own:

- As of 2003, 58% of the McGrath trips were local, 42% were drivers originating north of Somerville with destinations in Somerville and Cambridge, thus there is a dual challenge in reducing use of a McGrath Boulevard for two trip types.
- Climate change and the public health epidemic need to be aggressively addressed by long-term transportation and land use plans.
- Poor public transit will exist on the Fellsway between Assembly Square and Broadway even after the Green Line extension.
- Green Line costs and lack of point-to-point convenience will disincentivize transit use over driving for local trips. This will be not effect trips to Boston, where parking charges are high.

1 Central Transportation Planning Staff, "Toward a Route 28 Corridor Transportation Plan: An Emerging Vision."

2 Massachusetts Highway Department, "Traffic Counts for Somerville," <http://www.mhd.state.ma.us/traffic.asp?f=1&C=SOMERVILLE>.

Rxecommendations

I make the following two part recommendation with accompanying analysis. The first part follows your preference to de-elevate McGrath to create a boulevard, and the second part suggests maximizing the gains from the emerging transit network in East Somerville by creating a free transit zone.

Part 1. De-elevated McGrath Boulevard



Present-day McGrath looking north from Somerville Ave and a conceptual boulevard. Photo from Google Earth.

Your preferred approach of converting McGrath Highway from an elevated structure to a boulevard would move a significant number of trips fully or partially off of Route 28. The entirety of McGrath and the Fellsway should be converted to a four lane boulevard to maximize social and environmental benefits to East Somerville.

As of the 2003 pre-Big Dig survey, about 42% of travelers on McGrath originated from communities north of Somerville with the majority having destinations in Somerville and Cambridge. Slowing McGrath with new intersections and a safe boulevard speed of 30mph will encourage some of these trips to partially or fully avoid using McGrath. Such a shift in behavior can be accomplished with minor increases in driving time, unless those alternatives suffer significantly more congestion than McGrath does today. In absolute driving time these alternatives only add a few minutes to the average trip. See Appendix ALTERNATIVES for sample trip alternatives.

The primary questions that the boulevard conversion must settle are the following: 1) New bottlenecks at the de-elevated intersections and a lower speed limit; 2) reduction of the six lane segments of McGrath and removal of access roads to create a boulevard-friendly four lane road; 3) accommodation of on-street

parking; 4) dedication of space for transit and bicycles; 5) redevelopment of excess space created by de-elevation.

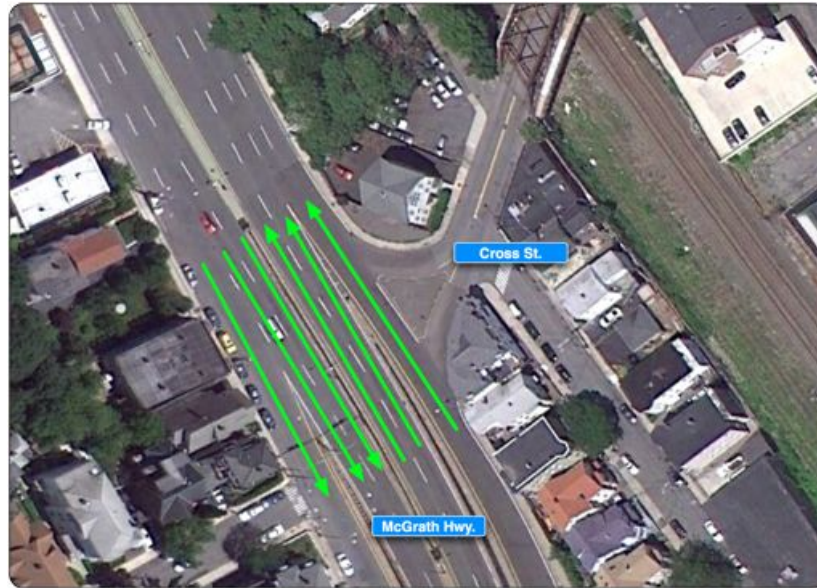
New Bottlenecks. New bottlenecks will emerge for McGrath drivers at Washington St. and Somerville Ave. Note that these bottlenecks already inhibit drivers using Washington St. and Somerville Ave., since there exist major intersections with the McGrath access roads. Even for through traffic on McGrath, bottlenecks would not be a new phenomenon, since traffic is already delayed at Medford St. and Broadway to the north and 3rd St. and Commercial Ave/Charlestown Ave. to the south. In fact, proper signal synchronization at the two new intersections will move through traffic as though the two intersections had a single traffic light. With additional synchronization at the aforementioned intersection pairs to the north and south, reasonable throughput may be maintainable along the length of McGrath. You should pursue signal synchronization improvements immediately to test potential throughput improvements, especially since MassDOT now manages McGrath and O'Brien Highways¹.



A simple example of signal synchronization between Washington St. and Somerville Ave. along the new boulevard. Through traffic would experience the pair of intersections as a maximum of one red light if they maintain the speed limit.

1 Jim O'Sullivan, "Transportation bill takes McGrath Highway out of DCR hands," *Somerville Journal*, <http://www.wickedlocal.com/somerville/news/x488801998/Transportation-bill-takes-McGrath-Highway-out-of-DCR-hands>.

Lane and Access Road Reductions. McGrath Hwy. is six lanes north of Cross St. Two lanes will have to be eliminated to create a boulevard feel from Cross St. to Assembly Square. The current lane reduction at Cross St. is not noticed because this is the point where McGrath splits between the elevated segments and access roads, so there remain in effect six total lanes. A similar situation exists south of Somerville Ave. where McGrath or its access roads form six or more lanes all the way to Cambridge.



McGrath Hwy. at Cross St. The highway transforms from a four lane elevated structure with access roads to a six lane road to the north. The north segment will initially remain six lanes while the elevated section and access roads are reduced to a four lane boulevard.

The access roads to the elevated portion of McGrath, though confusing to inexperienced users, greatly aid through traffic by relegating local access vehicles, cyclists, and pedestrians off of the primary thoroughfare. Mixing transportation modes and types of road use will complicate traffic patterns on a McGrath Boulevard, but the reduction of the entirety of McGrath and the Fellsway to four lanes is necessary in the long-term to create a tolerable environment for non-motorists and a climate for redevelopment.

Given that the initial boulevard will focus on the de-elevated sections of McGrath, you will need to manage a reduction of lanes from three to two at the Medford St. and Somerville Ave. intersections. A right-turn-only lane from McGrath southbound onto Medford St. will accomplish this, as will a limitation of two right-turn lanes on McGrath northbound at Somerville Ave. When you reduce the remainder of McGrath and the Fellsway to four lanes, the turning lanes will remain without the antecedent third lanes.



The portion of McGrath between Medford St. and Somerville Ave. will be reduced to four total lanes after de-elevation. The portions of McGrath north of the de-elevated segment will remain six lanes initially, but one southbound lane can be reduced to a right-turn only lane. Further reduction to four lanes north of Medford St. will leave the turn lane in place without the antecedent third lane.



A proposed intersection of Somerville Ave., Medford St. and McGrath Blvd. Initially McGrath will maintain six lanes south of Somerville Ave. so only two lanes can continue northbound (left image). When McGrath is narrowed to four lanes south of Somerville Ave., the turn lanes will remain in place (right image).

On-Street Parking. McGrath currently supports very little on-street parking, with the exception of the southbound access street. This precedent means that you should only provide on-street parking where it is already relied upon, and reduce the number of spots to something that the boulevard can support. On-street parking must be balanced against the ability to sell excess space for development, or as a trade-off with bike and pedestrian amenities. Where off street parking is offered it should permit fluid entrance and exit using paired spaces to minimize traffic obstruction.



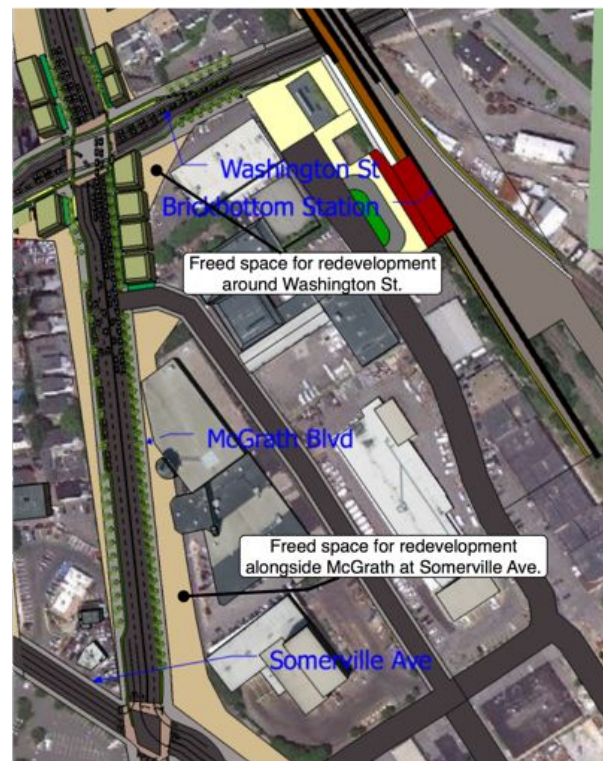
Paired parking bays along McGrath Boulevard between Washington St. and Somerville Ave. Parking must be weighed against pedestrian and bike amenities, or against the overall width of the boulevard, which eliminates developable land (shown in tan) and impacts the human scale of the boulevard.

Dedicated Space for Transit and Bicycles. McGrath's role as a transit corridor will increase as the developments at Assembly Square, Union Square, Brickbottom, Twin Cities, and North Point progress. However, the Green Line and Orange Lines will be the primary modes of public transportation along the Route 28 corridor. Buses that used shared traffic lanes on Route 28 will suffice if good provisions are made for pull-off space at every stop. Similarly, bicycles will have access to the community path along the primary Green Line extension, which will parallel the southern portion of McGrath. Nonetheless, bicycles will use McGrath to access sites situated on the boulevard itself, so provisions should be made for experienced cyclists. Shared lanes with cars would drastically impact traffic performance, thus on-street bike lanes are a good option where no on-street parking exists. Cycle tracks alongside the sidewalks are obligatory if bikes are to be supported along with on-street parking; there is no way to create a safe cycling lane between driving lanes and parked cars on a busy boulevard, as Massachusetts Ave. proves. On Route 28 north of Medford St. you will need better provisions for cyclists, since there is no parallel community path. Here you should either provide dedicated bike lanes on the Fellsway or consider making improvements to Cross St. to be a bicycle boulevard. The former approach is probably more realistic, given that many bikers will have destinations on the Fellsway itself.



Bicycle access options north of Medford St. Bike provisions should be made on McGrath Blvd or Cross St. to connect with the proposed community path. Bicycle accommodations on McGrath provide access to more amenities, especially Foss Park.

Redevelopment of Excess Space. The de-elevation of McGrath Hwy will create large areas of excess space at the Washington St. and Somerville Ave. intersections as well as along the corridor between the two intersections. It is possible to sell most of this space for redevelopment without blocking views nor access to the homes and businesses along McGrath. The boulevard should be situated on the west side of the corridor between Washington St. and Somerville, rather than directly below the current elevated structure. This will position the boulevard alongside the houses on the west side while freeing developable space in front of the large commercial buildings on the east side. Because the State and Somerville share ownership of the corridor, some land swaps will be required for the shift. The businesses along the east side of McGrath are primarily



automotive, and it may be strategically valuable to purchase certain properties to expand the redevelopable area. It may also be necessary to dedicate some of the excess space to public off-street parking, particularly if on-street parking is minimized, as I have already recommended.

I do, however, recommend situating the Washington St. intersection in the center of the corridor, so as to build up the newly available land on all corners of the intersection. The Washington St. intersection will represent a critical corridor between Union Square and Brickbottom Station and therefore should represent one of the most significant redevelopment areas. Many pedestrians from Union Square will opt to walk to Brickbottom Station for service north and even south on the Green Line, and cyclists will use Washington St. to connect between Union Square and the community path. I have previously recommended that streetcar service be installed between Sullivan Station, Union Square, and Central Square along Washington St. and Prospect St. to strategically connect several neighborhoods in a cross-town manner, similar to the proposed Urban Ring corridor to the east. I urge you to at reserve lanes on Washington St. for a busway until a streetcar can be funded.



Intersection of McGrath Boulevard with Washington St, looking east toward Brickbottom Station. Buildings would be situated in the excess space at all corners of the boulevard. Pedestrians would enjoy wide sidewalks and raised crosswalks. Cycle tracks are shown as well as Washington St. streetcar that I have previously recommended.



View of McGrath Boulevard at Washington St. looking northbound. New bus service from Assembly Square should serve the entirety of Route 28 in Somerville.



Freed space (in tan) created by a compact boulevard intersection at McGrath and Washington St.

Part 2. An East Somerville Free Transit Zone

The largest obstacle to trip reduction will be local trips along McGrath, accounting for the remaining 58% of trips as of the 2003 survey. The only way to maintain tolerable traffic conditions as the developments around McGrath progress is to create a comprehensive transit network in East Somerville that provides a strong economic alternative to driving. In conjunction with advocating the demolition of the elevated portions of McGrath, you should propose that the state leverage a portion of the highway fund savings to create the first MBTA free transit zone in East Somerville. This will give you the following substantial benefits:

Traffic

- Free transit will decrease traffic demand along the Route 28 zone, making the boulevard redevelopment more feasible.
- Enable Somerville to receive more of the state funding that would have been allocated for rebuilding the elevated structure by shifting funds to both the construction of the boulevard and a fund for the free transit zone.
- Increase demand for the new Green Line service and better use of the Broadway transit routes. This will decrease headways for both branches of the Green Line, creating more satisfied customers in both East and West Somerville and raising revenue from West Somerville and Medford riders. This is a win for the State as well, as increased ridership will better justify the State's expenditures on the Green Line.

Development

- Draw more developers, businesses, and new residents to the redevelopment projects at Assembly Square, Union Square, and Brickbottom.
- While maintaining fares at the new Assembly Square Orange Line station, making transit from Assembly Square down Route 28 free will increase transit mode share along Route 28. The Assembly Square businesses might be willing to fund this route, and it might qualify for federal Small Starts funding¹.
- Improve developer interest at Gilman Square and in the Inner Belt.

Political

- Win strong support from East Somerville residents and businesses.
- Demonstrate economic justice for low-income residents in East Somerville and give them a further incentive to reduce their vehicle ownership.
- Riders outside East Somerville will ride free from East Somerville, encouraging more car-free commerce within East Somerville, especially in Union Square.
- The free transit zone can sunset after the initial funds are exhausted. The zone should be funded for ten years after the opening of the Green Line to demonstrate its longevity and seek a permanent funding source using East Somerville developer and business partnerships.

¹ "Federal Transit Administration - Small Starts,"
http://www.fta.dot.gov/planning/newstarts/planning_environment_222.html.

- Create a stronger demand for the Urban Ring and other transit improvements, especially a Porter Square Green Line Extension.
- Encourage possible partnerships with Cambridge and Boston to extend the free transit zone to Lechmere Station and Sullivan Station.
- Increase Somerville's attractiveness for federal boulevard funding via TIGER II grants and Community Challenge Planning grants from the Department of Housing and Urban Development¹
- Using a free transit zone to support de-elevating McGrath will create new political and media recognition of innovation in Somerville.

The free transit zone displayed in the figure below is delineated by School St. and the Gilman Square Station, which should be included in the zone.



The East Somerville Free Transit Zone would apply to all MBTA transit service within the shaded area, except for the Assembly Square Orange Line station. The zone could alternatively be restricted to buses, non-commute hours, or exclude Union Square to balance lost revenue estimates with available funding.

Using Freeway De-Elevation to a Fund Free Transit Zone

To understand what funding opportunities are available from the de-elevation of a freeway, let us examine some applicable examples.

¹ "Highway To Boulevard Concept Comes of Age With Today's Joint HUD-DOT Announcement | Congress for the New Urbanism," <http://www.cnu.org/node/3744>.

San Francisco Central Freeway. When the San Francisco Central Freeway was damaged in the 1989 Loma Prieta earthquake, the Federal Highway Administration allocated \$40 in emergency funds for seismic upgrade. A city ballot measure approved \$67 million for retrofitting. When a later proposition to build a boulevard overrode the retrofit option, funding to construct Octavia Boulevard in place of the northern portion of the Central Freeway was estimated at \$25 to \$35 million¹. However, this cost was more than compensated by the selling of excess land around the boulevard: “The removal of this freeway freed up nine acres of land. The sale of that land paid for all the construction of the boulevard and it has generated surpluses”².

San Francisco Embarcadero Freeway. The San Francisco Embarcadero Freeway was also damaged in the 1989 Loma Prieta Earthquake. Long existing activism for dismantling the freeway resurfaced and succeeded in replacing the structure with an The Embarcadero boulevard. The estimated cost of rebuilding the elevated freeway in the early 1990s would have been \$69.5 million. The boulevard cost less than \$50 million³. Space saved by the boulevard was allocated to a two-way historic streetcar line, bicycle lanes, wide sidewalks, and public space.

Funding McGrath Boulevard and the East Somerville Free Transit Zone

The two San Francisco examples demonstrate that tens of millions of dollars in savings are at play when de-elevating a structure to a boulevard. Additional capital funding emerges from selling excess land. Though East Somerville is not comparable to San Francisco, the construction savings are applicable, as is the capability to greatly improve social and economic conditions.

East Somerville Free Transit Zone costs and ridership

MBTA buses that run through East Somerville were last reported to carry 33,791 passengers per day. (See Appendix BUS). The Green Line Extension is expected to increase transit ridership by 8,900 passengers per day by 2030, 8,010 of which is expected opening day⁴. East Somerville can lay claim to only a modest portion of this bus and future Green Line ridership. The 2000 Census indicates that an estimated 6,100 workers living in the proposed East Somerville Free Transit Zone commuted on public transit, out of an estimated 24,750 workers (See Appendix CENSUS). Attributing one half of the new transit ridership from the Green Line Extension to Union Square, Gilman Square, and Brickbottom, plus new ridership since 2000, would create a total of roughly 15,000 passengers per day in the free transit zone prior to its establishment.

According to the MBTA's elasticity coefficients, if one assumes a linear curve, free transit would increase bus use by roughly 8% to 25%, depending on the whether users used a single ride tickets or a pass, and whether or not the riders remained in the transit zone for both directions of the trip. Similarly, Green Line

1 “DSpace@MIT : Shifting urban priorities : the removal of inner city freeways in the United States,” <http://dspace.mit.edu/handle/1721.1/40128>.

2 Clarence Eckerson Jr., *Streetfilms* | *San Francisco: Removal of the Embarcadero Freeway*, 2006, <http://www.streetfilms.org/lessons-from-san-francisco/>.

3 “San Francisco's Embarcadero | Congress for the New Urbanism,” <http://www.cnu.org/highways/sfembarcadero>.

4 “State's transportation guru says Green Line should run to Route 16 - Somerville, Massachusetts 02144 - Somerville Journal,” <http://www.wickedlocal.com/somerville/news/x2143284199/States-transportation-guru-says-Green-Line-should-run-to-Route-16>.

usage would increase by roughly 17% to 39%. (See Appendix ELASTICITIES). Because Lechmere and Sullivan stations will continue to serve as major bus transfer points and are outside the free transit zone, the free rides will be most useful to those traveling within the transit zone or those accessing the Green Line from within the transit zone. This means the more local users of McGrath are most benefited by the free transit zone. Strong marketing and media coverage of the free transit zone may boost ridership beyond that estimated by the linear elasticity of demand, or the elasticities might not be as strong at extreme price drops.

	Pre-Green Line Extension	Post-Green Line Extension Estimates	Post-Free Transit Zone Estimates
Buses	33,791 boardings on buses that pass through East Somerville	Portion of 8,010 new transit riders.	+8% to 25% based on elasticities of demand
Green Line	No Stations	About half of 8,010 new transit riders estimated for opening day (since 3 of 5 new stations are in East Somerville)	+17% to 39% based on elasticities of demand
All Transit	6,100 commuters in 2000, plus new users thereafter and non-commute users	Upwards of 15,000 individuals who board at least one-way in East Somerville, perhaps 15-20,000 total boardings.	A few thousand additional riders, based on elasticities
Auto Traffic	37,700 (North of Medford St.) 38,800 (South of Broadway) 2006 Traffic Counts ¹	Unknown, but ideally a few thousand of the 8,010 new transit trips would be McGrath drivers diverted to transit.	Unknown

Ballpark estimates of daily transit and traffic after the Green Line Extension and the East Somerville Free Transit Zone in East Somerville.

Though an accurate estimate of costs and ridership increases will require a full feasibility study, the number of free fares that would have otherwise been paid would likely be between 15,000 and 20,000 boardings per day. This estimate assumes that of approximately 15,000 daily passengers, few rides would both start and end in the free transit zone, any many would pay the full fare when transferring from bus to rail at Sullivan, Lechmere, or a Red Line station. The number of new riders who shift from auto use to transit could be upwards of a few thousand, some of whom would pay a one-way fare that was not previously being paid. The total cost of the free transit zone would thus be on the order of a few tens of thousands of dollars per day, or around one million dollars per year. A fund to compensate the MBTA for the estimated losses should be negotiated with the state and MBTA, leveraging the expense saved by building the boulevard. Several cost-saving reductions to the free transit zone could also be considered, namely limiting free service to buses, charging outside commute hours when traffic reduction is non-critical, or eliminating Union Square from the free transit zone. Some free transit zones have demonstrated measurable savings from reduced fare collection delays, which should be factored into any cost savings.

¹ Massachusetts Highway Department, "Traffic Counts for Somerville," <http://www.mhd.state.ma.us/traffic.asp?f=1&C=SOMERVILLE>.

Free transit zones are normally limited to downtown business districts to reduce car traffic and stimulate commerce. Several U.S. cities have successfully run free transit zones for years, such as Portland, OR, Seattle, Salt Lake City, and Annapolis, though they typically limit the free trips to those commencing and ending within the zone (sometimes complicating fare collection)¹. The East Somerville Free Transit Zone would differ by offering some free trips outside the zone, and therefore create stronger incentives to adopt transit and do business in East Somerville. The largest factor in transit use appears to be service quality rather than cost², thus a combination of free transit, improved service due to the Green Line extension, and fare collection time reductions may have the best overall effect at reducing traffic on McGrath.

Convincing allies and adversaries

State Government. The Patrick administration recently approved the Green Line appropriation and is the biggest stakeholder in seeing the extension meet or exceed ridership estimates. You may receive additional support from the governor if you package the boulevard and free transit zone as an innovative generator of economic development and environmental justice. However, MassDOT's top priority is to keep traffic moving at acceptable levels along Route 28 and I93. They will not support the boulevard project unless you can demonstrate a minimum impact on traffic, which is threatened by the de-elevation and new development opportunities that emerge alongside the boulevard. Although MassDOT may support a free transit zone to decrease congestion, they will certainly resist allocating funds to it. Had they already committed funds to reconstructing McGrath as an elevated structure, it would make diverting the funds to both the boulevard and transit zone easier. That said, the transit zone may be the only way to accomplish significant traffic reductions on McGrath that keeps up with development pressure. If you can extend the current boulevard feasibility study to consider the impact of a free transit zone, you may find results that can sway the governor and MassDOT. Make sure that the State applies for to the Small Starts program for a new Route 28 bus route in order to improve your case with the state. Demonstrating the possibility of federal capital to support the transit zone will help justify its existence. You should also make sure that the proposal reaches the attention of U.S. Secretary of Transportation Ray LeHood, who has a good track record of publicizing and funding innovative transportation projects.

MBTA. The MBTA may object to the free transit zones on implementation grounds, perceived loss of revenue, and the anticipation that free rides will lead to overcrowding and less predictable rider behavior. A pilot project would probably assuage some fears but would be difficult to fund. You should sell the MBTA on the merits of a free transit zone; demonstrate that delays from fare collection can be eliminated aboard buses, that the MBTA will receive a guaranteed payment that matches the estimated fare revenue without the free transit zone, and that the zone will actually create new paying customers who travel outside the zone. To cite a precedent, Mayor Bloomberg has recently advocated free cross-town buses in New York City to reduce bus trip times by 24%, creating a significant double-incentive to attract new riders.³ Improving ridership to Union Square could furthermore help win future federal or state funding for the Porter Square extension, a critical missing link in the rail network.

1 Rick Halvorsen, Karla Karash, and Jim Wenslev, *CRCOG Northwest Corridor Study - Free Fare Zone Analysis*, http://www.crocog.org/publications/TransportationDocs/NW/NW_FreeFareZoneReport.pdf.

2 R. B Cervero, "Efficiency and Equity Implications of Transit Fare Policies," *Journal of Planning Education and Research* 1, no. 1 (1981): 48.

3 Charles Komanoff, "Worldchanging: Bright Green: Bloomberg Tests Free-Transit Waters," *Worldchanging*, <http://www.worldchanging.com/archives/010303.html>.

MAPC. The MAPC will be one of your primary supporters, as your project clearly meets and exceeds their urban development policies. They may have political sway that can help build support with the cities in the MPO most affected by the changes to McGrath.

East Somerville Businesses and Property Developers. You can build a strong constituency with certain types of East Somerville businesses and most developers by creating an attractive boulevard and free transit zone. Boutique businesses on Broadway and Union Square that benefit most from increased foot traffic will favor better pedestrian and transit access on McGrath. Union Square shops may even see the benefits of de-elevated auto traffic, which will make their shops more visible. I believe the Somerville Chamber of Commerce can also be sold on the plans for a McGrath boulevard, but might demand on-street parking, which you should minimize in preference of public lots. You should also inform labor interests that your goal is redevelopment of the entire Route 28 corridor in Somerville, which will bring generate more work than the rebuilding of the elevated portion of McGrath alone.

Your loudest opponents to the boulevard will be some of businesses along McGrath that most benefit from its current easy access, such as the Target and the automotive centers on the east side of McGrath, as well as some auto-oriented businesses in neighboring districts like Union Square who benefit from the speed of the elevated structure without its direct environmental impacts. These businesses may, however, benefit more by reducing the complexity and sightline disadvantages of the current configuration. You will see additional resistance from businesses on the east side of McGrath whose buildings may lose visibility if development rights are sold along the shrunk corridor. You will have to be sensitive to their needs, strategically configuring new parcels or leaving some areas as open space or parking to maintain visibility. Reach out to these businesses early with the details of your plans in order address their primary concerns.

Somerville Residents. You should receive strong support from the residents of East Somerville as long as they do not perceive catastrophic traffic conditions. Car commuters will be skeptical of the new delays on McGrath, so it is important to publicize predicted changes to driving times as the data become available. There is a large transit-dependent population in East Somerville, but they will likely be silent supporters unless you can effectively use community organizations to engage them. I believe that the residents of West Somerville will by and large support this plan. As drivers they are less likely to use long segments of Route 28 for their commute, and they have the most alternatives in I-93 and several surface routes. As large-scale transit users they will derive benefit from the free transit zone in East Somerville and are interested in seeing more easy-to-access business districts. Because East Somerville has clearly suffered disproportional environmental injustice and lacked quality transit, West Somerville residents should be able to acknowledge the fairness of a limited free transit zone.

Community Organizations. Community organizations will strongly favor this proposal, including East Somerville Main Streets, the Somerville Community Corporation, S.T.E.P, and the Mystic Valley Task Force. Use the broad group of citizen and business supporters to lobby the state to dedicate capital funding to the transit zone in conjunction with the boulevard. You may find it useful to collaborate with your allies to create an advocacy group called the *East Somerville Free Transit Zone Solution* or similar.

Cambridge. Your policy would benefit from the support of Cambridge, which has an equal interest in redeveloping Route 28 into a smaller boulevard to benefit its new developments at North Point and East Cambridge. Engage the mayor and Cambridge Chamber of Commerce early with your plans. A coordinated plan with Cambridge to redevelop the O'Brien Hwy segment of Route 28 to be a friendly boulevard would make a stronger case for state support and federal funding.

Advisory Committee. Also keep in mind the additional interests represented by the advisory committee of the 2008 Route 28 Corridor Transportation Plan, which includes the Central Transportation Planning Staff, Metropolitan Area Planning Council, East Cambridge Planning Team¹. Winning of the support of advisory committee members would expand your reach into several important agencies. The recommendations outlined in this memo bear a strong overlap with those of the committee. You should meet with individual committee members regarding your plan to garner their support and discover possible improvements.

Implementation

Short-Term Preparations

As previously recommended, you should attach the free transit zone feasibility study to the current boulevard study immediately to gauge the potential for significant traffic ameliorations. If no such improvements are demonstrable, there is no reason to pursue the free transit zone. The boulevard proposal, on the other hand, needs to be solidified in the minds of the public and state, despite the fact that the ongoing feasibility studies could predict increased congestion. You should publicize the boulevard regardless of the traffic impacts, knowing that any short-term traffic problems can be mitigated and will be less politically damaging than the overall political advantages of improving East Somerville. By making the boulevard East Somerville's vision, you can take credit for leadership and have broad allies to deflect objections to your plans. It is difficult to imagine a Democratic administration fighting neighborhood and business groups in East Somerville on the grounds that the least costly option might worsen traffic, especially where two new light-rail lines and alternative driving routes exist.

Prepare visions of a new McGrath boulevard from Assembly Square to Somerville Ave. Somerville's visual presentations of the proposed improvements to East Broadway and the new Green Line stations have been strikingly poor². You need to take advantage of skilled artists and computer technology to begin conveying your boulevard vision to the public. No one will be sold on McGrath Boulevard with a few

¹ Central Transportation Planning Staff, "Toward a Route 28 Corridor Transportation Plan: An Emerging Vision."

² "City Of Somerville - Broadway Streetscape Project in East Somerville,"
<http://www.somervillema.gov/spotlight.cfm?id=68>.

conceptual sketches at key intersections. Use the large pool of university student talent that is all but free and at your disposal. Present the public with traffic studies, economic analysis, and environmental impacts as the data become available. If the city serves as the primary and most transparent source of information, it will positively impact the type of media coverage that the project receives.

Mitigation Measures

Deconstruction of the elevated portion of McGrath should occur as soon as possible after the Green Line extension opens. The extension will serve as the most visible mitigation measure to construction on McGrath. It would be ideal to surge Green Line ridership in its first year of operation by reducing McGrath's capacity. The following demonstrates a plausible sequence of events to construct McGrath Boulevard and how the impacts can be mitigated.

1. To complement the ongoing completion of the Assembly Square development, propose a new MBTA bus line between Assembly Square and Lechmere station via the Fellsway and McGrath. This will provide the first full coverage of Route 28 in Somerville and be in place when lane reductions begin on McGrath during de-elevation.
2. With commencement of work on McGrath, create the East Somerville Free Transit Zone. The triple incentive of new Green Line service, free transit, and construction on McGrath will be a powerful motivator to shift from driving to transit. I strongly believe that you should push to fund free transit on Route 28 buses during de-elevation, even if the overall free transit zone proves unfeasible.
3. If traffic modeling is not adequate to test the upcoming road closures and lane reductions, the city and state may choose to conduct detour tests and lane closure tests to measure the changes in traffic. This may show the need for different traffic detours or additional transit incentives during the actual construction. One useful test would be to detour one or both directions of traffic from the elevated portion to the access streets. Both sides can be modified to support two lanes of traffic with minimal changes.
4. Deconstruct the portion of the elevated structure north of Washington St. Washington St. will remain open and serve as a detour to I-93. Reroute all traffic to the access streets as shown above, after enabling two lanes for traffic on each side.
5. Construct the boulevard lanes north of Washington St. in the area previously below the elevated structure in conjunction with the demolition of the elevated structure south of Washington St. Four lanes of traffic will remain open via the access streets. Additional lane closures for construction can be performed during off-peak hours.
6. Deconstruct the portion of the elevated structure, south of Washington St., leaving Washington St. open as long as possible. Again, the McGrath access streets will serve four lanes of traffic during deconstruction. Through traffic will have to be blocked on Washington St. during part of the deconstruction, and traffic crossing McGrath on Washington St. will have to be detoured south to Somerville Ave. or northbound on McGrath.
7. Post deconstruction, construct the boulevard on the west side of the corridor between Somerville Ave. and Washington St. Northbound traffic might need to be rerouted on

temporary lanes on the east side of the corridor next to the southbound traffic during construction of the boulevard.

8. Post boulevard construction, reconfigure Washington St. to provide streetcar or busway lanes, bicycle, and pedestrian amenities from Brickbottom Station to Union Square. Washington St. traffic may again need to be detoured to Somerville Ave. and northbound McGrath Boulevard.
9. The south and north extremes of McGrath and the Fellsway can be improved to a four-lane boulevard in parallel with the de-elevation work, or may occur at a later time when funding permits it.



Demonstration of detour routes to test the boulevard traffic flow. All traffic can be detoured from the elevated portion of McGrath to two lanes on the access roads. These lanes will have similar intersection conditions at Washington St. and Somerville Ave. as the proposed boulevard. This configuration will also be essential during deconstruction of the elevated portion of McGrath.

Alternatives

In considering alternatives, you should create a local environment where there is no politically feasible alternative to a boulevard, and tolerate nothing beyond four lanes of traffic on any portion of Route 28 in Somerville. Leaving any portion of McGrath six lanes of traffic would similarly propagate the unsatisfactory urban conditions that exist on McGrath at Broadway. There is also the danger of using too much of the saved space along the boulevard for on-street parking, which will lead to undesirable traffic congestion and deteriorate the feel of the boulevard. Manage parking with off-street lots that can be removed when development pressure offers a better use of the space.

An alternative to the Free Transit zone would be to issue transit passes to all East Somerville residents. Though this option would give East Somerville residents a greater advantage than simply a free zone, it

would create more political problems. First, a non-arbitrary definition of East Somerville residents is more difficult than creating a zone where all users ride free. It would also fail to give outsiders any incentive to shop and recreate in East Somerville. With the free transit zone, outsiders would have some incentive to come to destinations like Union Square by transit, knowing they will get half the trip for free.

A no-free transit alternative would result in more traffic from local trips. It would eliminate the opportunity to decrease headways on the new Green Line extension or make better use of the existing buses, which are well used but rarely full. It would also eliminate the potential one-way fare revenue from new riders. Somerville might be able to convince the state to fund more improvements to the boulevard with the money saved by not rebuilding the elevated structure, rather than asking the state to commit that money to a free transit zone. However, being a state road, the state will already be funding the boulevard itself and will provide most of the amenities needed if Somerville presents a comprehensive plan.

Many alternatives suggested in other reports advocate new access roads to I-93 or completely new streets, like the Brickbottom Boulevard Proposal¹. Any new right-of-way construction through the Inner Belt could accelerate development opportunities, but comes at tremendous expense in negotiating the existing industrial and railroad facilities. The worst use of state funds is new costly roads; they should instead be directly funded by new developments. New roads shifts traffic capacity problems and may even induce new demand. Others have proposed improving conditions on alternative routes like Rutherford Ave. to support the boulevard. This will create unneeded opposition from communities outside of Somerville and suggest that McGrath Boulevard can only be implemented at the expense of other low-income neighborhoods.

Outcomes, benefits, costs, impacts

Traffic Impacts

Reconstruction of McGrath will lead to an immediate reduction of traffic along McGrath. Any drivers who used McGrath as an alternative to I-93 will cease to do so. Regional drivers with destinations in Somerville and Cambridge will probably use the suggested detours. Some may permanently switch routes after the introduction of more intersections, loss of lane capacity, and a slower speed limit on McGrath. Local traffic will continue to use the portions of McGrath that remain open during construction. The opening of the Green Line will convert some local drivers to transit, and a free transit zone would motivate additional drivers to switch modes. Without an Urban Ring, few regional drivers will switch to transit because cross-town transit is currently limited to slow bus service.

The new McGrath boulevard will support significantly less trips than the existing configuration. With four total traffic lanes open to commuters during rush hour, McGrath will maintain two-thirds of its lane capacity on the currently unelevated sections and a hundred percent of its lane capacity on the currently elevated portion. The new at-grade intersections at Somerville Ave. and Washington St. will decrease throughput on McGrath, but may have a useful traffic metering effect.

¹ Central Transportation Planning Staff, “Toward a Route 28 Corridor Transportation Plan: An Emerging Vision.”

Benefits

Reduced traffic and reduced traffic speeds will decrease pollution and danger to drivers, pedestrians, and cyclists along the Fellsway and McGrath. Existing and newly available land along the boulevard will become more appealing to retail use. There is a very real possibility that a lot of the traffic along McGrath will be dissipated to other roads or reduce in overall volume due to decreased throughway supply. The visual appearance along the full length of Route 28 in Somerville will be drastically improved, with the exception of the area beneath I-93.

Impacts

There will certainly be periods of congestion at the new intersections that did not exist previously. Some congestion will have to be tolerated during rush hour. By 2020 a substantial number of vehicles will run partially or fully on battery power, which should cancel out some of the emissions from the new congestion.

Operation and Maintenance

Operation and maintenance of the boulevard will cost less than maintaining the elevated structures, but new costs will surface to maintain the quality of the street surfaces for multiple uses. MassDOT and Somerville will need to collaborate to maintain the boulevard. Somerville may have responsibility for maintaining some off the off-road amenities, depending on the land ownership configuration that results from combining the elevated portion of McGrath with the access streets.

Ex-Post Review

In the event that traffic conditions deteriorate with ongoing development, it may become necessary to create another boulevard as an access road through the Inner Belt to I-93. A new study of traffic patterns may reveal problems that can be resolved without new roads, such as an adjustment of signals or increased turning lanes. New business and residential development along McGrath Boulevard may be delayed by an excess of other developments already in progress. It may be necessary for the city to hold newly available parcels for longer than anticipated. If the free transit zone is implemented and attracts thousands of otherwise drivers, you will have to seek permanent funding for it. If it fails to decrease auto usage, it can be sunset at the end of ten years.

Appendix ALTERNATIVES

The following sample trips demonstrate alternatives for regional drivers to minimize their use of Route 28. Most of the alternatives add only minutes to each trip under normal driving conditions. White line indicate trips and the green line indicates the Green Line Extension.

Driving Southbound to East Cambridge



Top Left: Full utilization of Route 28 from southbound to East Cambridge.

Top Right: Partial utilization of Route 28 beginning at Washington St.

Bottom Left: Use of New Rutherford Ave. instead of Route 28.

Bottom Right: Use of the Levertt Circle Connector instead of Route 28.

Driving Southbound to Harvard



Top: Via Route 28 to Washington St.

Middle: Bypass Route 28 by using Mystic Ave and Cambridge St.

Bottom: Bypass Route 28 by using Temple St. and School St.

Driving Northbound from Downtown Boston to Union Square



Top: Via Route 28 until Somerville Ave.

Bottom: Via I93, Cambridge St., and Washington St.

Driving Northbound from Downtown Boston to Davis Square



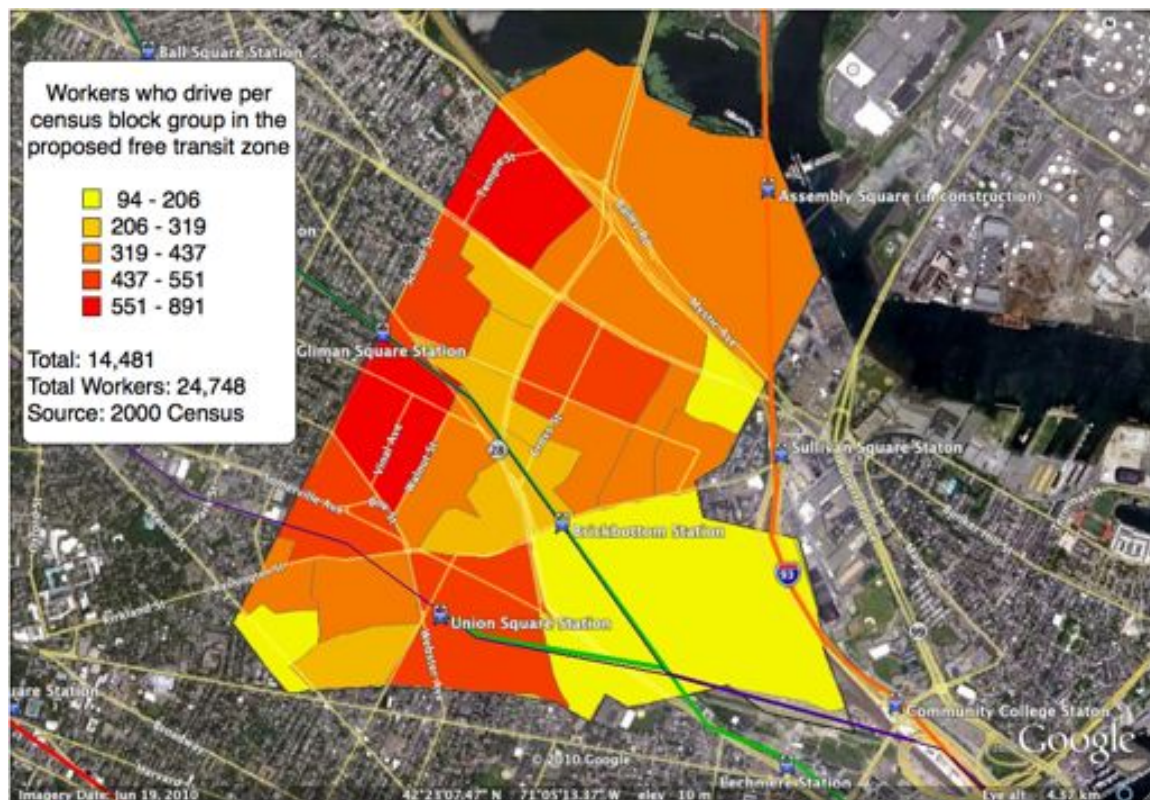
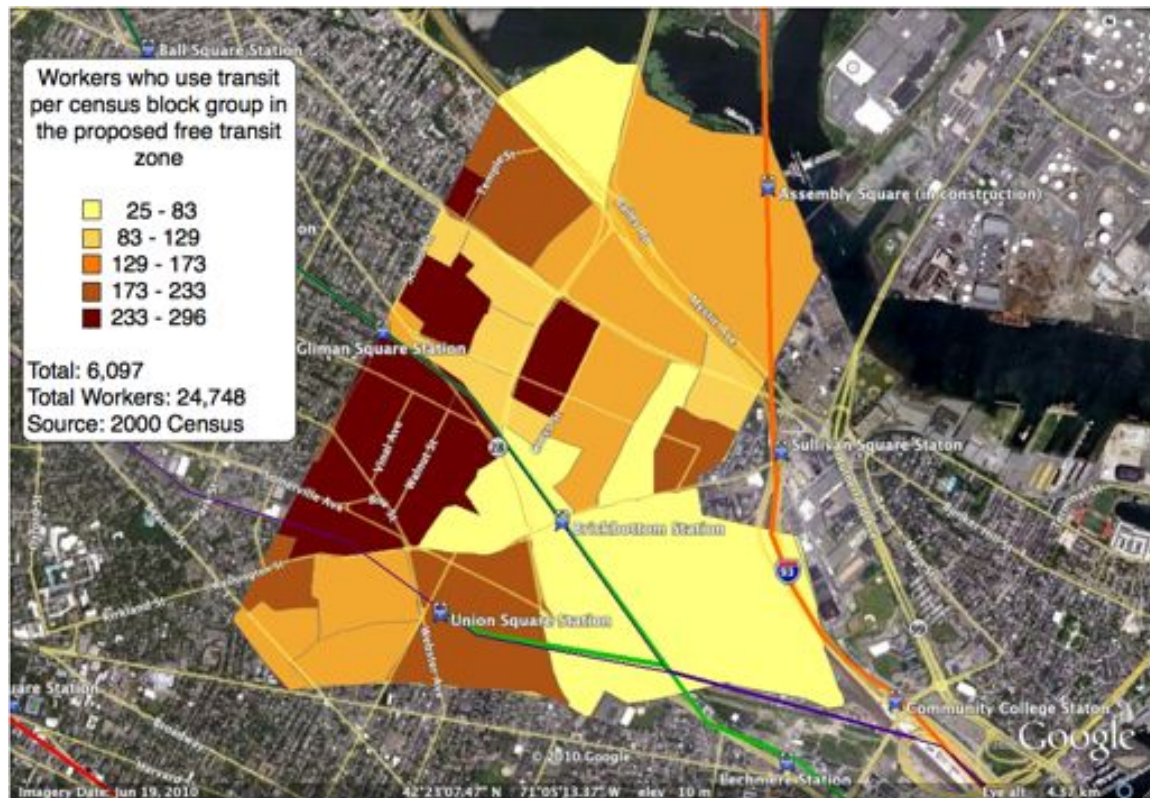
Top: Via Route 28 until Highland Ave.

Bottom: Via I-93, Temple St, Broadway, and Cedar St.

Appendix BUS

Transit Usage at Lechmere Station and Buses through East Somerville	
Green Line	Daily Ridership
Lechmere:	6416
Buses	
80 Arlington-Lechmere:	1872
85 Spring Hill - Kendall Square (via Union Square): 397	397
86 Sullivan Square - Cleveland Circle:	5193
87 Clarendon Hill - Lechmere via Somerville Ave: 3373	3373
88 Clarendon Hill - Lechmere via Highland Ave: 3785	3785
89 Clarendon Hill - Sullivan Station:	3431
90 Davis Square - Wellington Station: 920	920
91 Sullivan Square - Central Square:	1482
92 Assembly Square Mall - Downton via Main St 1055	1055
95 West Medford - Sullivan Station:	1751
101 Malden Station - Sullivan Station:	4116
Bus Total	33791

Appendix CENSUS



Appendix ELASTICITIES¹

Assuming Charlie Card prices, rather than Charlie Ticket or Cash prices.

Linear Elasticity Formula

New Demand = Original Demand * (1 + e * (New Fare / Old Fare - 1))

where e indicates Price Elasticity

Bus Single Ride

e = -.21, existing fare = \$1.25 per ride

Full Savings: $100,000 * (1 - .21 * (0/1.25 - 1)) = 121,000 \Rightarrow 21\%$ increase

Half Savings: $100,000 * (1 - .21 * ((1.25/2)/1.25 - 1)) = 110,500 \Rightarrow 10.5\%$ increase

Bus Monthly Pass

e = -.25, existing fare = \$40 per month

Full Savings: $100,000 * (1 - .25 * (0/40 - 1)) = 125,000 \Rightarrow 25\%$ increase

Assuming 20 days of riding per month and switching to daily rides:

Half Savings: $100,000 * (1 - .21 * ((20 * 1.25)/40 - 1)) = 107,875 \Rightarrow 7.9\%$ increase

Surface Green Line Single Ride

e = -.39, existing fare = \$1.70 per ride

Full Savings: $100,000 * (1 - .39 * (0/1.70 - 1)) = 139,000 \Rightarrow 39\%$ increase

Half Savings: $100,000 * (1 - .39 * ((1.70/2)/1.70 - 1)) = 119,500 \Rightarrow 19.5\%$ increase

Surface Green Line Monthly Pass

e = -.43, existing fare = \$59 per month

Full Savings: $100,000 * (1 - .43 * (0/59 - 1)) = 143,000 \Rightarrow 43\%$ increase

Assuming 20 days of riding per month and switching to daily rides:

Half Savings: $100,000 * (1 - .43 * ((20 * 1.75)/59 - 1)) = 117,494 \Rightarrow 17.5\%$ increase

¹ "Draft Fare Increase Report 7-27-09 final.pdf," http://www.boston.com/news/local/breaking_news/Draft%20Fare%20Increase%20Report%207-27-09%20final.pdf.