EVALUATION OF ALTERNATIVE FARE STRUCTURES FOR BOSTON'S SUBWAY

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A. Introduction

The Massachusetts Bay Transportation Authority (MBTA) subway and bus system is critical to the Boston region's economy and resident enabling mobility. However, the system needs new revenue to upgrade aging infrastructure and rolling stock, as well as keep pace with the rate of inflation for energy and employee benefits. In addition, the agency was given a large amount of debt incurred for Big Dig related projects, which consumes a large portion of its budget. The MBTA is primary funded through rider fares and a dedicated portion of the state sales tax. The combination of these two sources is not enough to meet the agency's obligations. As a result, despite recent reforms the agency faces a severe structural deficit going forward (Massachusetts Transportation Finance Commission 2007).

The most direct mechanism for raising addition revenues is fare increases. In fiscal year 2011, the MBTA received $451.2 million in fares, or roughly 28% of the total budget. The direct operating expenses were $1.217 billion, and debt service expenses were $404.9 million.[1] One strategy to increase fares is to introduce fares that vary by the time of day and by distance. The Washington, D.C. Metrorail system uses both approaches, and recently introduced ―peak of the peak" fares to create three tiers of time-varying fares. Although introducing distance-varying fares would require substantial investment in fare collection technology, in the long term such shifts may be needed to ensure financial viability.

Using price elasticities estimated by the Central Transportation Planning Staff (CTPS)[2] after the agency's 2007 fare restructuring, this study estimates the effect of alternative fare structures on revenue. The results are calculated from the Automated Fare Collection (AFC)

[1] FY2011 MBTA Operating Budget Summary, www.mbta.com
[2] The technical staff for the region's Metropolitan Planning Organization.

system data, which provides monthly entrance counts for each station broken down into one hour per day.

B. Research Context

1. Transportation Research and AFC Data Mining Context

Research on urban transportation systems and public transportation finance can be organized into several strands. Urban transportation modeling has been completed in order to generate optimal systems to facilitate travel from residences to jobs at a minimum of time and rationally allocate public resources. In this framework, fares are used to shift demand to ensure efficient system utilization. Secondly, pricing policies including transportation taxes and fares are used to internalize negative externalities. Gas taxes and congestion tolls are justified under this rational as a mechanism to internalize air pollution and congestion delays, respectively. The public subsidy of urban public transit systems is justified from the reduced auto congestion, air pollution, or perhaps reduced need for parking and improved quality of the public realm.

Lastly from a management perspective, the use of detailed ridership data is related to data-driven or performance management. In a more general sense it allows more precise estimation of ridership, as well as improved calibration of traditional transportation models and prospective impact studies such as this one. Transportation price elasticities are estimated to calibrate models for planning and prediction, as well as econometric studies of travel behavior.

The development and adoption of automated fare collection (AFC) systems in urban public transit systems have created new sources of data for modeling and analysis. Researchers have used the resulting in several ways. Wilson estimated the destinations for bus-to-rail linked trips using automated vehicle location (AVL) and transaction-level AFC data (Wilson, Zhao, and Rahbee 2009). A similar analysis was completed in New York using the unique card ID numbers to estimate origins and destinations, assuming passengers return to the station they started the day, and they return to the same station to make the next trip segment (Barry et al. 2002). Where linked trips exist, some researchers proposed creating analytical measures of service levels as well as estimating an O-D matrix (Chan 2007).

CTPS is currently experimenting with using this linked serial number approach. However, the transaction-level data is not easily available. Since it can be tied to specific customers, it may not be widely published. Therefore the methodology described here provides a method where only aggregate data is available.

3. Transit Price Elasticity

A price elasticity is the percent change in demand that results from a percent change in price. This corresponds with a movement along the demand curve. In general the relationship is curved, so the elasticity can change at different price-demand combinations. Price elasticities are generally negative, reflecting the fact that increasing prices decreases demand. Elasticities with larger absolute values are elastic and values closer to zero are inelastic.

The price elasticity of urban public transit varies widely by metropolitan region and by time. This is expected, as it represents not only an elasticity of total transportation demand (riders can reduce total travel by shifting where they live, work schedules, or cutting non-work trips) as well as a cross-elasticity with alternative modes. The costs of other modes vary as a result of exogenous factors. For automobiles, these include highway tolls, gas prices and taxes, and the price of parking. Other modes could include the availability of carpooling, buses, and for walking and biking climate and road design factors. Many of these are time varying, or spatially heterogeneous both between and within metropolitan areas. According to an informal survey of peer agencies, CTPS found a range of short-term elasticities used for planning purposes including -0.10 for the New York subway, -0.41 for the Chicago L, and -0.10 to -0.30 for the Toronto subway (Central Transportation Planning Staff 2006).

In addition, short-term and long-term elasticities are expected to differ. According Alonso's monocentric model of land value, the total travel cost will be reflected in the land market. Deceasing the cost of transportation will have the effect of increasing the size of a monocentric city. Subsequent theory has allowed for the location of jobs to shift as well. Under these models, increased transportation costs encourage the development of sub-centers. As a result it could be possible public transportation is relatively inelastic in the short term, but elastic in the long term as households and firms move to new locations. In Boston, certain types of travel, such as transportation to large events or the downtown CBD may be inelastic due to the relative high cost of alternative modes due to parking and congestion. However, other types of travel may exhibit high elasticities as riders opt for less expensive modes or reduce the number of trips. In addition, changes in the pattern of land use are tightly regulated by municipal zoning, which may reduce high long-term elasticities. Integrated land use and transportation models can be used to explore the interactions between these variables.

3. Public Transportation: Public Good or Publically Provided Private Good?

In general, positions on appropriate pricing policies for public transportation fall into two categories. These arguments are described briefly below as the context for interpreting the results of the study, which considers the amount and distribution of fares on transit riders. First, public transportation is often thought of as a pure public good (For example, see Sanchez (2007)). Under this argument, free mobility of residents for low or no cost is provided as a public good to all. Following this logic, public transportation systems should be constructed and operated with subsidies from general revenue sources, such as the sales, income, or property tax revenue.

Under this perspective, fares may be used to limit congestion during peak periods or provide a minor mechanism to restrict overconsumption. At its logical extreme, adherents of this position advocate for no fares whatsoever.

Secondly, public transportation can be thought of as a publically provided private good. From this viewpoint, the direct users of transportation should bear the full cost of the service in the form of fares. Even if this position is adopted, subsidies from general revenues are sometimes justified if other modes have greater negative externalities that cannot be internalized for practical or political reasons. In practice, American public transportation policy reflects a hybrid approach. Following the public good view, most transit systems enjoy large subsidies from localities and the federal government for construction and operation. Many provide free or discounted fares to students, the elderly, during special events, or in special downtown zones. Conversely, rider fares do provide significant support and agencies providing longer-haul services such as commuter rail generally charge higher fares.

This study does not take a position on this debate but responds to the pragmatic observation that the general public budget is in crisis. Fare policies are more directly controlled by transit agencies, and in lieu of additional revenue from state or local governments may look to changes to generate revenue in ways that minimize impact of low-income travelers and achieve optimization objectives, such as encouraging nonpeak travel where there is excess system capacity.

C. Current and Proposed Fare Structure

The MBTA is made up of bus, rapid transit, commuter rail, commuter boat, and the ride service. In 2007, the rapid transit portion resulted in $438 million, or 56% of fare revenue for the entire system. Bus and rapid transit together constitute 74% of total system revenue. The most recent changes to MBTA fares took effect on January 1, 2007. CTPS completed a technical report in 2006 estimating the impact of the change on ridership using a spreadsheet model and the regional four-step transportation model. A follow-up study, completed in 2008, compared the demonstrated elasticity The changes in 2007 included changes to the structure of passes, new surcharges to encourage Charlie Card use, and changes to transfer policies between bus and rail. The post study found single-ride trips elasticity of -0.14 for subway and silver line waterfront, and -0.31 for pass trips. My analysis does not keep this distinction, simply using the total trips elasticity of -0.21 (Central Transportation Planning Staff 2006, 2008).

Like most urban public transportation systems, the MBTA has a complex fare structure for multiple modes and to allow riders to transfer between modes. The following fare types are available for subway ridership:

Table 1. MBTA Subway Fare Types

Fare Type	Price	Note
Cash or CharlieTicket	$2.00	
CharlieCard	$1.70	Free transfer to local bus, discounted transfer to Express Bus
Monthly Linkpass	$59	Unlimited travel on subway plus local bus
Day/Week LinkPass	$9 / $15	Unlimited travel on subway, local bus, commuter rail Zone 1A, and Inner-Harbor Ferry
Seniors and Persons with Disabilities	$.60/ride or $20/month	Unlimited travel on local bus and subway with ID card
Students	$.85/ride, $20/month	Unlimited travel on bus, subway, express bus, and commuter rail zones 1, 1a and 2 until 8pm on school nights with student ID
Children 11 and under	Free	With paying adult. Excluded from ridership data.

Of all 2007 unlinked trips on the subway and silver line waterfront, 57.4% were made with passes. The popular LinkPass was introduced in the fare restructuring in 2007. It provides unlimited monthly bus and subway rides. CTPS estimates an average of 47.38 trips per pass per month on the subway and 65.11 for the total system, resulting in a significant savings over the cost if each trip was paid for with cash or CharlieCard.

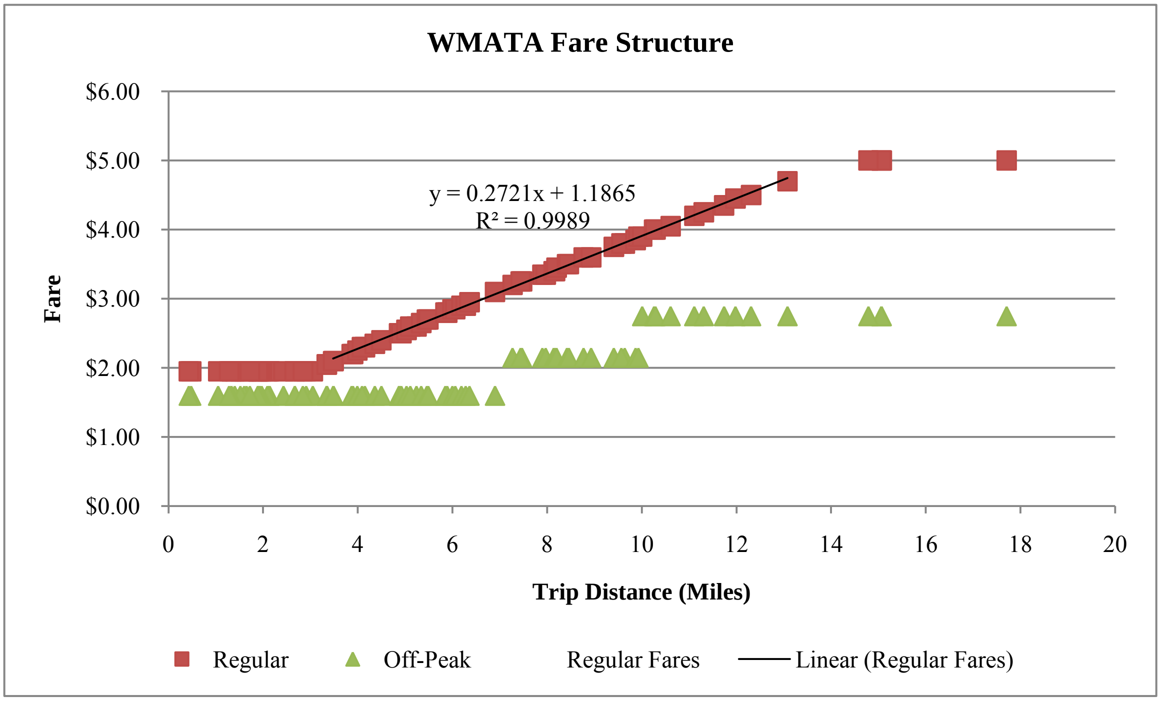
D. Methodology

1. Proposed Fare Structures

The project sought to apply five alternative fare structures to the MBTA subway: (1) WMATA's current peak-of-the-peak fare surcharge of $0.20, (2) Flat fare of $2.00, (3) Flat fare of $2.25 (New York City), (4) WMATA's Regular distance-based fares, (5) WMATA's regular distance based fares plus peak-of-peak.

The WMATA peak-of-the-peak fare surcharge is applied to all trips entering the system during three hours each day, 1.5 hours during each rush hour. For modeling simplicity, for this report the surcharge is applied only to two hours, the MBTA's peak morning and afternoon hours for 2008. The two agencies have similar operating hours, roughly 5AM to midnight, except WMATA is open until 3AM on Fridays and Saturdays and opens at 7AM on weekends. WMATA has two sets of distance-based fares. Regular fares, which range from $1.95 to $5.00, apply from opening to 9:30 AM, 3-7:00 PM, and after midnight on weekends. Reduced fares apply all other times, ranging from $1.60 to $2.75. This report simulates the revenue from regular fares for the MBTA, although it is possible to also simulate the reduced fares.

WMATA's regular distance-based fares are available for each station as a price matrix to each other station. In a previous study these fares were graphed against the travel distance, and the fares are flat until a minimum distance, after which they follow a linear formula. This formula was used to calculate fares for the 11 distance categories at their mean values, and for the longest trip category at 12 miles. The fare structure is shown below.



2. Methodology

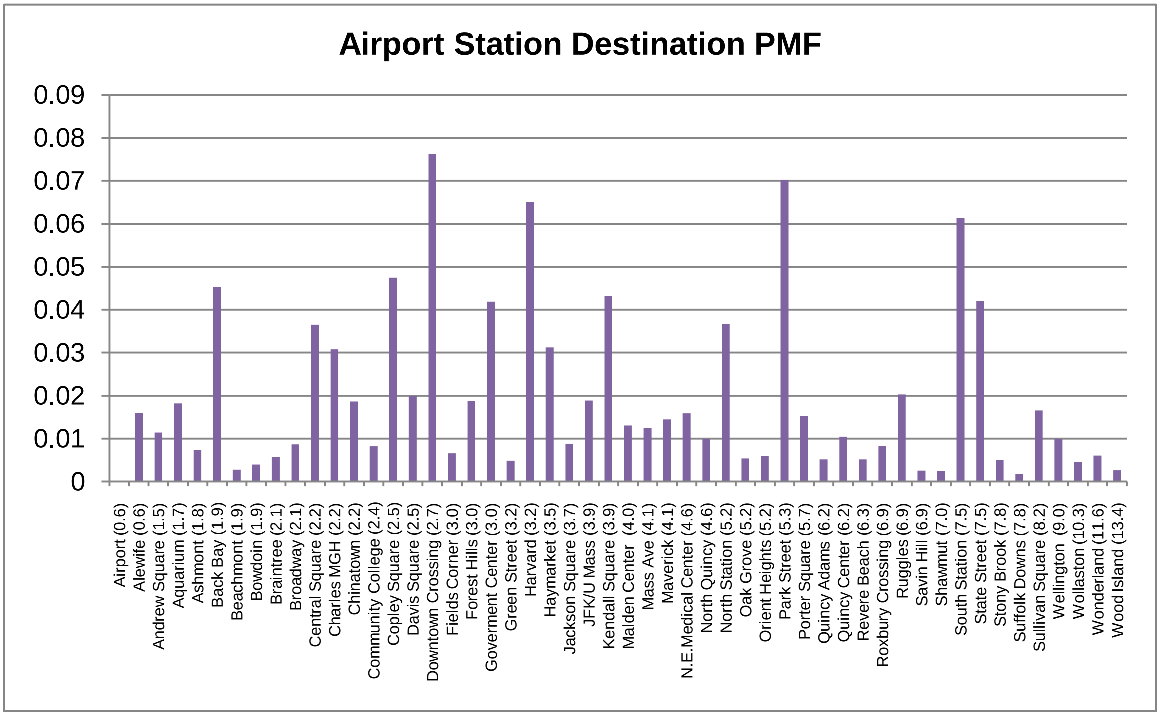
To apply these policies, the station-level ridership data had to be transformed into estimated linked trips, and then the distribution of ridership by trip distance could be estimated for each station and also for the system as a whole. All trips were assumed to be linked, or round-trips on the system. The total number of boardings for 2008 before 12 noon, and after noon was calculated. For each station, all morning trips were allocated to all other system stations using the proportion of afternoon entrances for these stations only.

This analysis assumes commuters entering at each station have the same destination distribution as all commuters in the system. Supporting this assumption is the observation that all rider types visit popular station destinations, such as athletic facilities, the downtown business district, and shopping districts. It is also reasonable since all stations receive transfer riders from other modes, such as buses, commuter rail, or park and ride lots, ensuring rider heterogeneity for each station.

The MBTA subway includes two lines where boarding data is not linked to physical station locations: the Green Line and Silver Line. In both cases, passengers pay after boarding the vehicle, so the data is available for the route as a whole. As a result, the analysis was completed only for the 52 stations on the Blue, Orange, and Red lines. These include stations that connect to the Green and Silver Lines. Since only the proportion of PM entrances is used to allocate AM trips, eliminating these two lines from the analysis would only be a problem if the omitted passengers entering on the Green or Silver Line had systematically different travel patterns than other passengers. For example, if Green Line Passengers commuted to a station where passengers from other lines did not travel to, their high number of evening boardings would result in estimates of the included lines travelling there when they did not. This seems unlikely for a calendar-year aggregate. In addition, the Silver Line services the airport. These trips are assumed to be unlinked. Trips from the airport to any station are not counted, and trips from stations to the airport would be imputed to the length for included destinations. If the magnitude of airport trips is relatively large it may result in an under-estimate of long-distance trips from far stations, however the large number of daily commuters will dilute this effect.[3]

The result of the first stage is a probability mass function (PMF) for trips from each station to all other 51 stations. For example, this is the results from the Airport station on the Blue Line:

[3] This could be empirically investigated from the ridership data if you think it is cause for concern.



At this stage, the number of trips from each station to each other included station is imputed by multiplying the probabilities by the number of morning boarders from each station. This is then combined with an origin-destination distance matrix to find the distribution of one-way trip distances in miles. This data is available for each station as well as the system as a whole, subdivided into 11 distance categories, from 0 to 10 at one-mile increments, and one for all trips above 10 miles. The total trip distance distribution is included in Appendix B.[4] Since all stations do not have destination stations within each category, the result are frequency and density distributions that vary widely. End stations have a high density of long trips, and central stations have a high density of shorter trips. This result matches the intuitive observation that many commuters enter at the end station and commuting downtown or to other job centers, and people entering in more central locations having shorter average trip distances.

[4] To prevent double counting, the categories are exclusive of the lower bound and inclusive of the upper bound. >0 and <=1, >1 and <=2, etc.

Next, the systemwide trip distance distribution was used to apply alternative fare structures. To do this a price elasticity of -0.21 was applied to the category based on the difference between the old and new fare, and then the number of trips is multiplied by the fare times two to capture total revenue. As explained above, the fare paid by passengers varies widely according to fare type. Since a previous fare is needed to estimate the elasticity effect on demand, two base fares were used. First, the number of trips is divided the total subway fare revenue for 2007, resulting in an effective fare of $1.26. This reflects an average for all fare and pass types. Secondly, the analysis was completed for $1.70 base fares. Although the revenue figures will be higher, they provide a sense of the proportional increase in revenue (and decrease in revenue) for the proportion of riders paying the higher per-ride fare, roughly 50% of all riders.

The elasticity was applied by a method that calculates percent changes from the mean of the original and proposed fare, instead of simply from the original fare. This method results in less steep predicted ridership declines for the many of the proposed new fares which result in proposed fares with increases of 50% and above. It also provides results very similar to the application formula used by CTPS. Where P_1 is the previous price, P_2 the second price, D_1 the previous demand, with elasticity of E, the new demand D_2 is:

$$D_2 = D_1 + D_1 \frac{P_2 - P_1}{(P_1 + P_2)/2} E$$

E. Results and Conclusions

1. Results

The result of the analysis is reported in Appendix C. The peak-of-peak fare would result in $4.05 million in additional revenue and decrease peak ridership by 809,349 trips each year. A more inelastic peak period, or if the surcharge was not applied to pass users, would result in less ridership loss and greater revenue. Switching from a $1.70 flat fare to $2 would increase fare revenue 17.7%, and $2.25 would increase it 32.6%. Implementing the WMATA distance-based fare structure would increase revenue 19.5% over $1.70. If it were implemented assuming a base fare of $1.26 per ride, the effect would be even more dramatic, an increase of 51.6% or $70 million. However, this would be accompanied by a 10.1% decrease in ridership.

A station impact analysis was conducted to see what each station's riders, considered in aggregate, would pay under the WMATA regular distance-based fares. The results are included in Appendix D, and include all fare revenue generated from people who leave from the station in the morning (including the return trip). A one-way flat price of $1.70 was assumed for the purposes of this analysis to both estimate fare revenue, as well as apply the elasticity to adjust demand. The results show riders for eight stations would pay less under distance-based fares, since the lowest fare is $1.60 versus the $1.70 Charliecard fare. Riders which would experience the greatest increases are those who board at stations farthest from downtown, including Braintree, Quincy Adams, Quincy Center, Wollaston, and Oak Grove.

2. Public Policy Discussion

As noted above, American public transportation reflects an uneasy compromise between alternative views of how it should be designed and funded. Most mainstream conceptions accept the role of public subsidy because of the role it helps in producing public goods: dense, vibrant neighborhoods without parking, improved air quality, mobility for residents, etc. In a study of the Chicago system, after concluding that system expansion to expand the number of riders were financially impractical, Schofield considers reducing transit prices. Modest gains in system ridership did not have significant improvements to regional vehicle miles traveled or air quality.

In fact, most of the gains from system enhancement would come from decreased wait times and faster headways (Schofield 2004).

Boston may be able to raise additional revenue from increased fares, however this would be accompanied by a decrease in travel. A full cost-benefit analysis of this would estimate the externality impact from the proportion of travel which is reduced or shifted to nonmotorized modes, and the portion which is shifted to motorized modes (such as in Washington, D.C. by Nelson (2007)). For areas where ridership is high enough, theoretically it would be reflected in the land market and thus allocation of new density. It may encourage the development of sub-centers or development along highway corridors. The high uncertainty about the price of gasoline, and the impact of improved efficiency and alternative fuels on the per mile cost of driving make this highly speculative. In short, this analysis proposes the MBTA can use relative inelastic subway service to raise additional revenue. In lieu of alternative funding sources or savings, such as controlling the costs of energy and fringe benefits, this may be necessary to fund needed infrastructure upgrades to ensure a minimum quality of service. However, a regionally optimal level of transit ridership may justify public subsidies from general revenue sources.

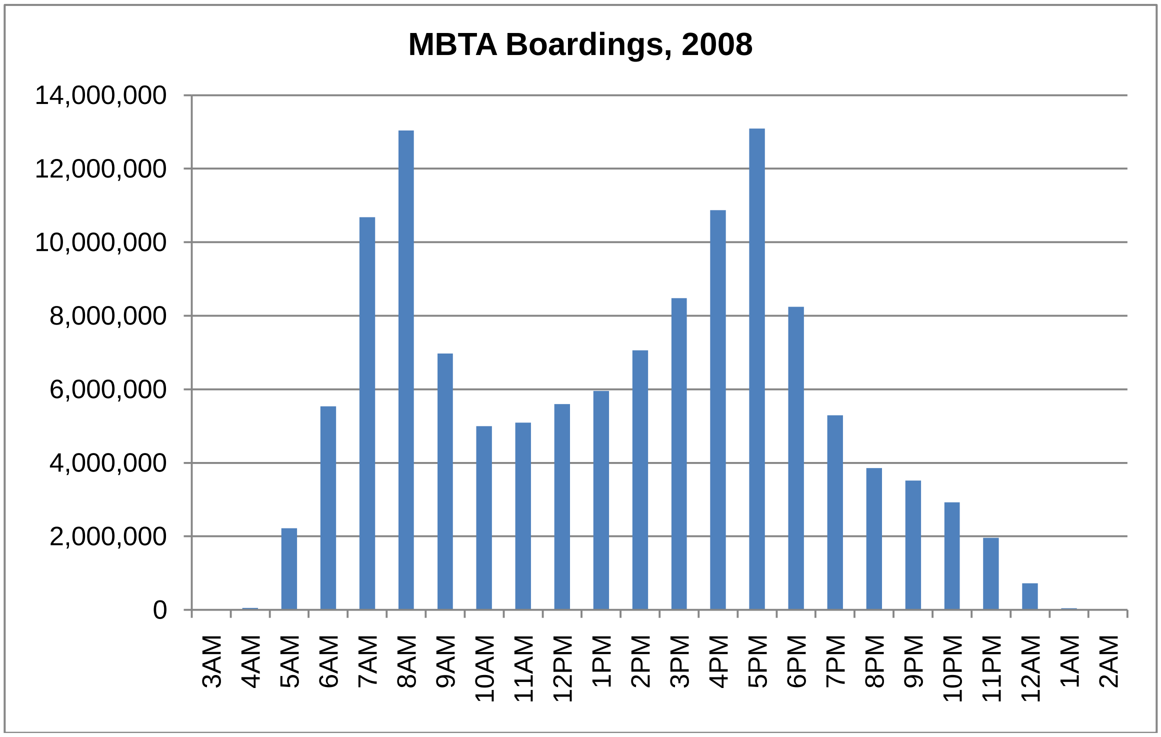
Appendix A: 2007 Pass-Ride Values and Discount Analysis

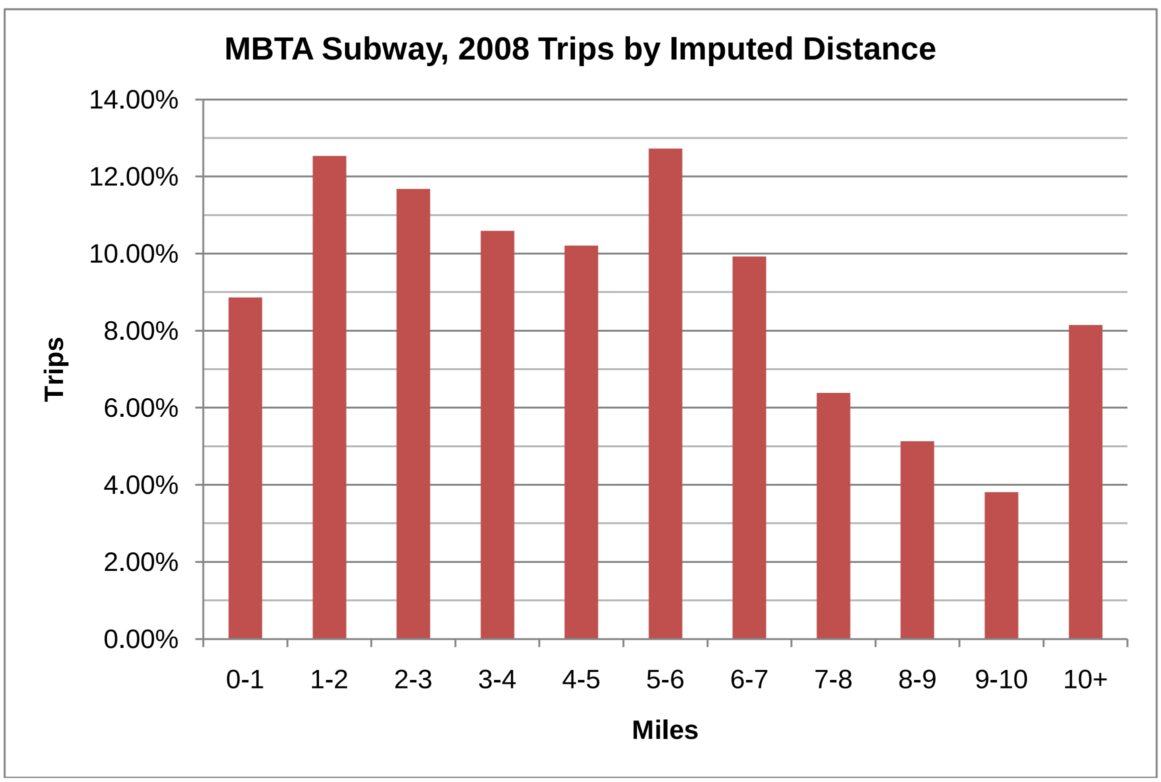
This table contains the total annual average number of trips made on each mode for each pass type. It was found by dividing the number of unlinked trips using that pass type by the number of passes sold. The number of trips is per the unit of the pass. Each monthly LinkPass sold results in 52.13 trips on the subway, including the Silver Line and Green Line. The subway-only value column calculates the cost of the subway trips if each trip charged a regular CharlieCard fare of $1.70. The discount is the difference between the regular fare value of the trips and the pass price. It should not be interpreted as lost revenue since increasing the real cost of transportation would reduce demand.

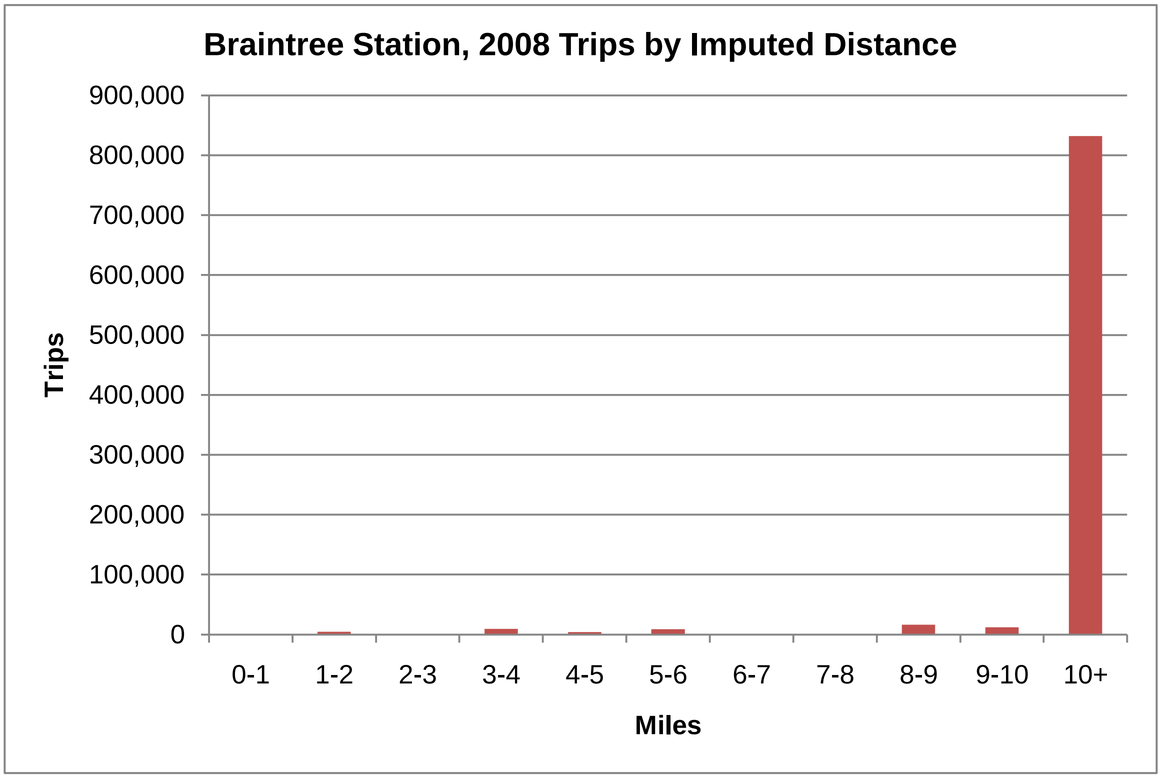
Fare Type	Local Bus ($1.25)	Inner Express ($2.80)	Outer Express ($4.00)	Subway ($1.70)	Comm. Rail ($1.70- $8.25)	Comm. Boat ($1.70 - $12)	Total System Trips	Retail Price	All mode value[1]	All mode average discount	Subway-only value	Subway average discount
Monthly LinkPass	12.79	0.03	0.01	52.13	N/A	0.16	65.11	$59.00	$104.73	$45.73	$88.62	$26.62
1-Day LinkPass	0.15	0.01	0.01	4.53	N/A	N/A	4.68	$9.00	$7.93	-$1.07	$7.70	-$1.30
7-Day LinkPass	5.39	0.02	0.01	13.79	0.02	0	19.22	$15.00	$30.28	$15.28	$23.44	$8.44
Senior/TAP	27.89	0.10	0.01	40.94	N/A	N/A	68.93	$20.00	$104.78	$84.78	$69.60	$49.60
Student	3.87	0.06	0.01	15.97	0.5	N/A	20.4	$20.00	$32.19	$12.19	$27.15	$7.15

[1] No transfer value included, although most fares allow for free or discounted transfers to another mode. See Table 1 for description of travel allowed for each pass type.
Partially adapted from Table 23, Central Transportation Planning Staff (2008).

Appendix B: Boarding Time Distribution and Imputed Trip Distances by Station






Braintree Station, 2008 Trips by Imputed Distance
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200,000
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Trips
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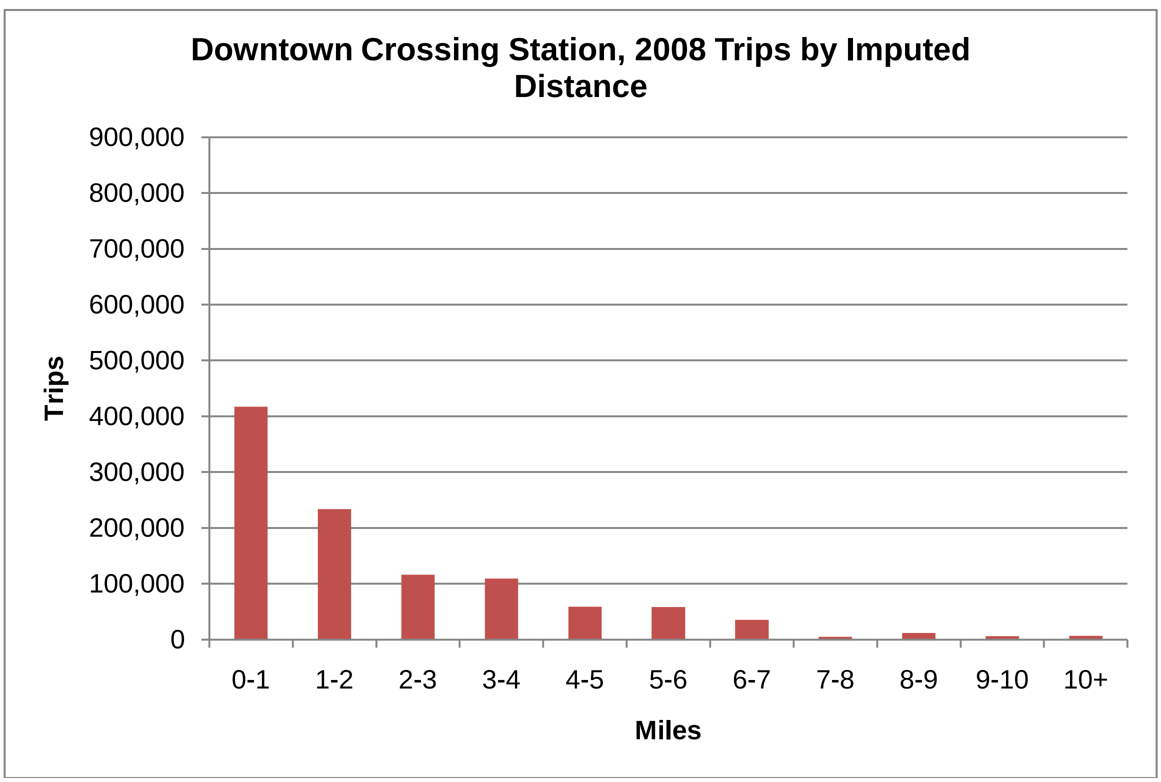
Downtown Crossing Station, 2008 Trips by Imputed Distance
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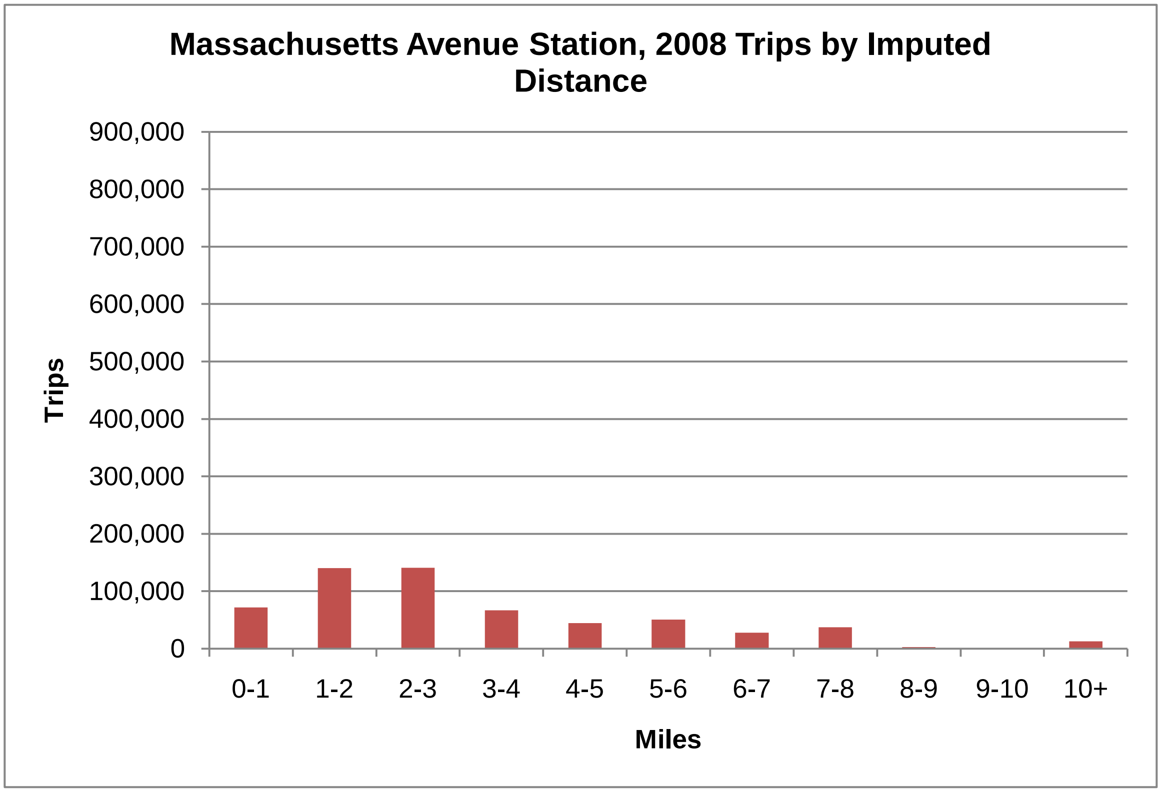
Massachusetts Avenue Station, 2008 Trips by Imputed Distance
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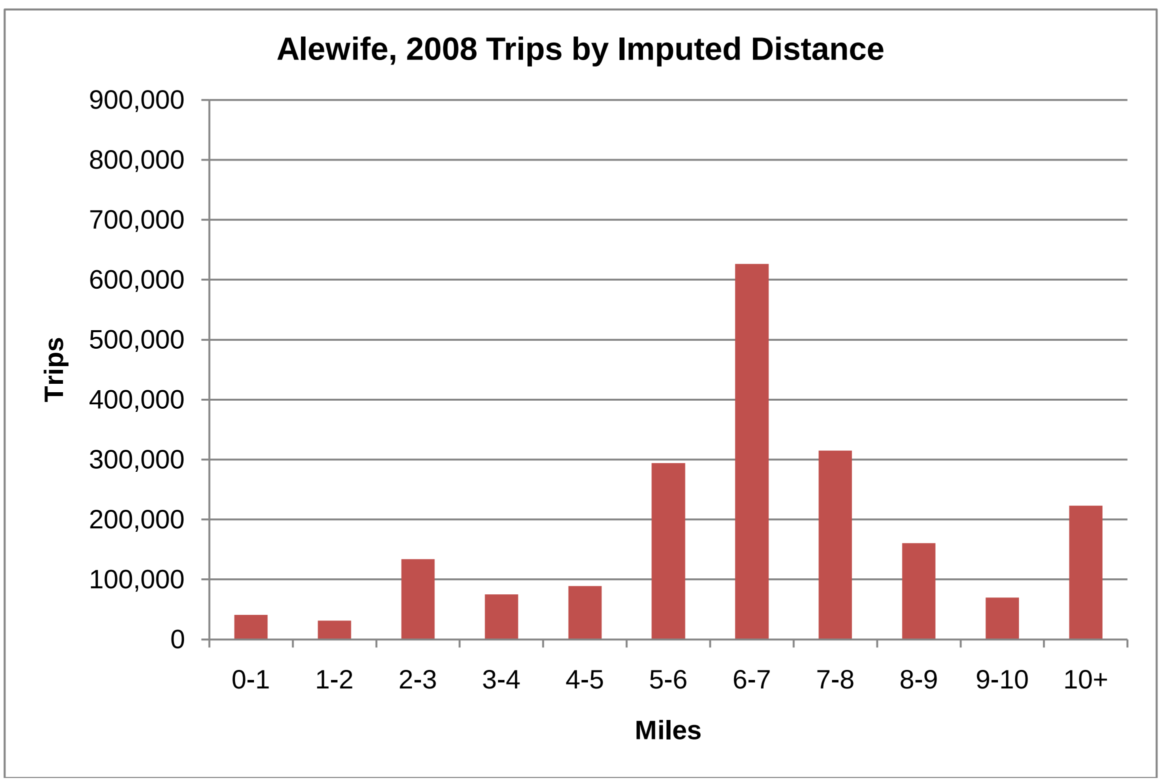
Alewife, 2008 Trips by Imputed Distance
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Appendix C. Revenue Forecast for Alternative Fare Structures

Fare Type	Fare	Estimated Revenue (2008)	Percent Revenue Change	Percent Ridership Change
Current fares	$1.26 per ride	$136,954,102	0.0%	0.0%
WMATA peak-of-peak only	$0.20 surcharge for peak AM and PM hour only	$141,002,523	2.96%	-1.48%
$2.00 flat rate	$2.00	$197,120,452	43.9%	-9.6%
New York City	$2.25 per ride	$216,092,673	57.8%	-11.9
WMATA distance based fares	$1.60 – 3.79	$207,564,465	51.6%	-10.1
WMATA distance and peak-of-peak	$1.60 - $3.99	$211,684,508	54.6%	-11.0%
Current fare	$1.70	$185,331,524	0.0%	0.0%
WMATA peak-of-peak only	$0.20 surcharge for peak AM and PM hour only	$189,399,899	2.2%	-1.1%
$2.00 flat fare	$2.00	$210,612,041	13.6%	-3.4%
New York City	$2.24	$230,946,815	24.6%	-5.9%
WMATA distance-based fares	$1.60-$3.99	$221,572,995	19.6%	-4.0%
WMATA distance and peak-of-peak	$1.60 - $3.99	$225,650,081	21.8%	-5.0%

Notes: Includes heavy rail stations only (excluding Green and Silver Lines), imputed round trips, assuming commuting patterns homogenous from each station, estimated from 2008 calendar year, price elasticity effect on demand -0.21, percent change over mean method.

Appendix D. Estimated Station Fare Revenue Changes from Distance-Based Fares

This table shows the total round-trip fares paid by riders originating at each station.

	Fare Revenue, $1.70	Fare Revenue, WMATA Regular	Fare Increase	Percent Increase
Quincy Center	$5,337,949	$8,681,381	$3,343,432	62.64%
Malden Center	$7,859,637	$10,584,419	$2,724,782	34.67%
Forest Hills	$8,846,365	$11,423,570	$2,577,205	29.13%
Braintree	$3,016,460	$5,545,811	$2,529,351	83.85%
Quincy Adams	$3,362,410	$5,859,217	$2,496,808	74.26%
Alewife	$7,003,691	$9,368,869	$2,365,178	33.77%
Oak Grove	$4,534,981	$6,478,308	$1,943,327	42.85%
North Quincy	$4,624,428	$6,548,462	$1,924,033	41.61%
Davis Square	$7,367,654	$9,269,203	$1,901,549	25.81%
Wollaston	$3,358,030	$5,071,336	$1,713,306	51.02%
Wonderland	$4,170,185	$5,797,061	$1,626,876	39.01%
Ashmont	$3,663,871	$5,033,096	$1,369,225	37.37%
Porter Square	$5,260,939	$6,349,327	$1,088,388	20.69%
Harvard	$7,495,909	$8,347,182	$851,274	11.36%
Wellington	$4,978,719	$5,773,421	$794,702	15.96%
Revere Beach	$1,942,002	$2,621,651	$679,649	35.00%
Fields Corner	$2,449,333	$3,069,812	$620,480	25.33%
Shawmut	$1,514,234	$1,986,397	$472,163	31.18%
Green Street	$2,017,104	$2,480,747	$463,643	22.99%
Orient Heights	$2,899,846	$3,343,222	$443,376	15.29%
Beachmont	$1,442,474	$1,835,668	$393,195	27.26%
Sullivan Square	$5,051,475	$5,434,690	$383,215	7.59%
Stony Brook	$1,977,073	$2,319,513	$342,440	17.32%
Jackson Square	$2,775,702	$3,107,428	$331,726	11.95%
Charles MGH	$6,260,366	$6,566,881	$306,515	4.90%
JFK/U Mass	$3,341,982	$3,623,780	$281,798	8.43%
Airport	$3,528,612	$3,749,895	$221,283	6.27%
North Station	$7,493,603	$7,694,449	$200,846	2.68%
Maverick	$5,163,294	$5,363,778	$200,483	3.88%
Ruggles	$2,787,062	$2,972,981	$185,920	6.67%
Savin Hill	$1,266,388	$1,429,820	$163,432	12.91%
Roxbury Crossing	$1,595,600	$1,749,505	$153,905	9.65%
Andrew Square	$2,925,421	$3,074,720	$149,299	5.10%
Back Bay	$4,960,920	$5,108,592	$147,673	2.98%
Suffolk Downs	$469,622	$584,126	$114,504	24.38%
Mass Ave	$2,020,844	$2,130,799	$109,954	5.44%
Copley Square	$3,560,868	$3,667,484	$106,616	2.99%
Haymarket	$4,780,713	$4,873,807	$93,094	1.95%
Wood Island	$1,048,526	$1,128,806	$80,280	7.66%

Central Square	$1,434,542	$1,503,382	$68,840	4.80%
Kendall Square	$2,698,852	$2,752,663	$53,811	1.99%
Broadway	$2,068,992	$2,121,548	$52,556	2.54%
South Station	$7,772,329	$7,820,792	$48,463	0.62%
N.E.Medical Center	$1,533,686	$1,565,275	$31,589	2.06%
Chinatown	$2,458,458	$2,488,547	$30,088	1.22%
Downtown Crossing	$3,593,858	$3,615,192	$21,334	0.59%
Park Street	$3,682,081	$3,696,250	$14,169	0.38%
State Street	$1,519,630	$1,527,202	$7,572	0.50%
Government Center	$2,157,834	$2,164,988	$7,154	0.33%
Community College	$1,299,392	$1,304,184	$4,793	0.37%
Aquarium	$724,363	$729,056	$4,693	0.65%
Bowdoin	$233,220	$234,702	$1,482	0.64%
Totals	**$185,331,524.32**	**$221,572,995**	**$36,241,470**	**19.6%**

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