



MEMORANDUM

To: Kate Fichter
MassDOT

From: Laura Brelsford
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MBTA

Date: March 26, 2015

Re: Overview of Capital Needs Related to
Fixed-Route Accessibility

Introduction

Despite meaningful progress in recent years, significant and urgent improvements to the accessibility of the MBTA fixed-route system remain necessary. Similar to general State of Good Repair (SGR) concerns, most of these issues (from aging elevators to inaccessible stations and trolleys) have accumulated after years of limited funding and an absence of proactive planning.

While the cost estimates for achieving a fully accessible system outlined below appear daunting, it's important to recognize the significant overlap between SGR and accessibility needs. Further, addressing these issues together will provide visible and lasting improvements to each customer's MBTA experience, all while continuing to promote mode shift from the overburdened RIDE service to the fixed-route system.

Demographic Data

The urgency of addressing fixed-route accessibility concerns is informed in no small part by the demographic data available on seniors and people with disabilities. Roughly 1 in 5 Americans qualifies as having a disability—a physical or mental condition that significantly impacts daily life. This can include sensory, mobility, cognitive, and psychiatric disabilities, as well as conditions such as diabetes, hypertension, and asthma. Disproportionate numbers of people with disabilities are minorities and people who live below the median income level, populations which are among the most heavily dependent on public transportation. The likelihood of disability also increases with age: according to U.S. Census data, 40% of people aged 65 and older have one or more disabilities. By the year 2030, in the Boston MPO region nearly 1/3 of the

population in the Boston MPO region will be over 60 years of age, making investment in the accessibility of the MBTA's fixed-route infrastructure an imperative operational need. In short, disabling conditions are a fact of life and if a person lives long enough, he or she will experience one or more of these conditions.

Early Legislation and Advocacy

Coupled with current and looming demographic realities are a number of federal, state, and local requirements passed over the last sixty years which specifically mandate accessibility for people with disabilities. On the federal level, the 1968 Architectural Barriers Act (ABA) requiring access to federal facilities marked the first time that people with disabilities began to have legal rights to accessible facilities. Then in 1973, the Rehabilitation Act's Section 504 prohibited discrimination in any program or activity for which federal funds were directly or indirectly received, meaning that all public transit now had to be readily usable by people with disabilities. At the state level, the Massachusetts Architectural Access Board (MAAB) integrated accessibility requirements into the state's building code in 1968, adding a specific chapter in the 1980s which governed state transportation facilities.

By then Massachusetts was home to the Boston Center for Independent Living (BCIL), the second oldest nonprofit civil rights organization promoting the full integration of people with disabilities into all aspects of society. BCIL and the larger disability community advocated vigorously for equal access to the MBTA fixed-route system. In just one example of these efforts, the MBTA's purchase of inaccessible buses and Green Line vehicles in 1985 led to a series of protests in which people with disabilities chained themselves to trolleys at Park Street during rush hour. While the MBTA did not cancel the trolley order, 50% of the buses were retrofitted with lifts.

The Americans with Disabilities Act of 1990 and the Key Station Plan

In 1990 Congress passed the Americans with Disabilities Act, a comprehensive federal civil rights law prohibiting discrimination against people with disabilities in public accommodations, commercial facilities, government, and public transportation. In particular, Title II of the ADA mandated that all major transportation systems design and implement a "Key Station Plan." Under this requirement, agencies would identify critical stations within their rail systems—e.g., stations with above-average ridership, those at the terminus of a line, intermodal stations, etc.—and develop detailed plans for the implementation of accessibility at these locations on a fixed timetable. Stations which were not prioritized as "Key Stations" would only be required to be made accessible if they underwent renovations at a future date.

Luckily for the MBTA, the 1970s and 80s work on the Orange and Red Lines had already provided access at terminal stations and major transfer points such as Harvard and Ruggles. Additionally, the planned 1990's modernization of the Blue Line, a byproduct of the Big Dig, meant that most of the line would become accessible. In accordance with these requirements, the MBTA gathered its stakeholders to determine the Key Stations for all MBTA rail lines. Out of this process, 56 Heavy and Light Rail stations, along with a number of Commuter Rail Stations, were identified for inclusion.

Ironically, even as work on the Key Station Plan advanced, customers with disabilities faced continuous and mounting barriers to access as maintenance of systems, stations, and vehicles began to decline. Broken kneelers and wheelchair lifts consistently barred customers from the most basic access to vehicles, while defective public address equipment and missing signage barred them from the most basic access to information. In stations, the reliability of vertical transportation systems (elevators and escalators) deteriorated drastically. By 2002, bus lifts were failing over 50% of the time, and elevators at critical stations such as Downtown Crossing, Harvard, Park Street, and Porter were out of service over 60% of the time.

MBTA/BCIL Settlement Agreement of 2006

In 2002, the level of unreliability for both bus lifts and elevators acted as a catalyst for people with disabilities to file a class action lawsuit against the MBTA on the basis of the MBTA's systemic violation of both 504 and ADA including the basic responsibility of an entity to maintain accessible features. The suit was filed by eleven named plaintiffs with disabilities and the Boston Center for Independent Living (BCIL). Apart from specifically addressing the state of MBTA elevators and bus service, numerous other issues were cited—including unsafe station conditions, gaps between platforms and rail cars, subpar service by poorly trained staff, and an inadequate management oversight structure.

In 2006, the MBTA, BCIL, and the named plaintiffs entered into a landmark settlement agreement. Containing over 200 individual commitments to improving accessibility, the agreement aimed at getting the MBTA back on track by ensuring rigorous monitoring of bus and rail services, training of front line employees, and the maintaining of equipment to ensure safety, reliability and accessibility for all riders. A new emphasis was placed on increasing the reliability of elevator service, as well as on other crucial elements of accessible transit such as wayfinding and emergency evacuation procedures inclusive of customers with disabilities.

The settlement agreement also mandated the establishment of the position of Assistant General Manager for System-Wide Accessibility (SWA). The SWA

AGM would build a department to oversee all accessibility efforts across the Authority, and would build connections among key departments and personnel as well as outside stakeholders. This provision, considered a centerpiece of the agreement, has fostered an environment of open communication and trust among MBTA staff, the plaintiffs and BCIL, and the larger disability community.

Since 2006, the MBTA has made strides in improving access. Elevator uptime is now 99.5% system-wide, the bus fleet is all but entirely low floor and ramp-equipped, and staff are now provided in-depth training on serving customers with disabilities. Although the settlement is still on-going and work continues, the impact of the agreement and partnership between the T and disability community has already been significant.

The Plan for Accessible Transit Infrastructure (PATI)

While the MBTA/BCIL Settlement Agreement called for sweeping improvements to service and maintenance, it did not impose substantial requirements for the remediation of inaccessible stations not identified in the ADA-mandated Key Station Plan. But in recognition of the critical role that accessibility plays in the provision of a reliable and safe transit system for all of its customers, the MBTA is committed to the goal of achieving 100% accessibility system-wide. Informing this commitment as well is the juxtaposition of other critical SGR needs with the regulations requiring that stations undergoing alterations are required to be made accessible.

With this in mind, the PATI initiative seeks to identify all meaningful barriers to fixed-route access and to develop a plan for their removal, creating a prioritization scheme based on criteria such as ridership and additional SGR needs at each location. PATI surveys of stations and bus stops are scheduled to begin in Spring of 2015.

Current Capital Needs Related to Accessibility

Achieving 100% Accessibility System-Wide

Even prior to the execution of the PATI project, a glance at those stations that are fundamentally inaccessible today provides a meaningful scope of the system-wide need.

MBTA Subway Station Accessibility

Line	Inaccessible Stations	Total Stations	Percentage of Inaccessible Stations
Blue	2	12	17%
Green (Subway)	3	14	23%
Green (Surface)	31	53	58%
Orange	0	20	0%
Red	1	22	5%
Mattapan Trolley	1	8	14%
Total	38	129	29%

It is important to note that Bowdoin, Boylston, and Symphony are the only non-surface stations that are not currently under design or construction. Green Line surface stops therefore represent the area of greatest need within the rapid transit system.

Rough order of magnitude costs for Green Line surface stations and adjacent roadwork range from \$3-5m per station for a rough total cost of \$155m. However there are efficiencies as well as risks worth exploring in combining both design and construction with the MassDOT Highway Division since all lines follow MHD routes (Beacon St, Commonwealth Ave, and Huntington Ave). Further strategic stop consolidations along the B Line would also reduce the total cost.

MBTA Commuter Rail Station Accessibility

<i>Line</i>	<i>Inaccessible Stations</i>	<i>Total Stations</i>	<i>Percentage of Inaccessible Stations by Line</i>
Fitchburg	9	17	53%
Haverhill	6	13	46%
Lowell	3	8	38%
Needham	0	8	0%
Newburyport / Rockport	3	18	17%
Fairmount	0	6	0%
Franklin	6	12	50%
Greenbush	0	7	0%
Kingston / Plymouth	0	7	0%

Middleborough / Lakeville	0	9	0%
Providence / Stoughton	0	13	0%
Worcester	7	15	47%
Total	34	133	26%

A major factor in accessibility across the Commuter Rail mode are the various types of platforms at stations. Low-level platforms do not offer any level (stair-free) boarding and are considered fundamentally inaccessible. Mini high-level (“mini-high”) platforms allow for level boarding at two cars, typically at the rear of the train; these represent segregated access and are generally no longer permitted unless full high-level platforms are not technically feasible. Full high-level (“full-high”) platforms provide for level boarding at all cars and are the standard for new or altered stations.

Commuter Rail Platform Type

Type of Platform	# of CR Stations	Percentage of CR Stations
Accessible Full High-Level Platforms	49	36%
Semi-Accessible Mini High-Level Platforms	50	38%
Inaccessible Low-Level Platforms	34	26%

The cost of constructing fully accessible full-high platforms at Commuter Rail stations varies depending on whether stations have side or center platforms, as well as variables such as platform and track specifications required to accommodate wide freight. Rough order of magnitude costs for side platforms accessed by ramps or elevators range from \$15M–\$18M. For center platforms, based on cost estimates from Boston Landing station, costs range from \$22M–\$30M depending on right-of way-constraints, length of track needing relocation, proximity of adjacent structures such as bridges, and structural needs of overhead elements.

Assuming that all 50 mini-high–equipped stations remain side platforms and that at least 75% (26) of the 34 inaccessible stations will remain as side platforms, rough order estimates would be \$1.14B for 76 stations. An additional \$264M would be required for center platforms at the remaining 12 inaccessible stations, for a total of \$1.44B in costs.

Placing these estimates within a 20-year timeframe, at least \$70M of funding each year is required to equip all current stations with full high-level platforms and accessible ramps or elevators. Efficiencies may be found in designing a particular line all at once, acquiring mass quantities of precast platforms, and

other construction sequencing savings. Some stations may continue as single-track/single-platform, which potentially cuts their cost in half. Finally, the MBTA could opt to discontinue service at Commuter Rail stations that experience extremely low ridership. Additionally, SWA is working with MBTA/MassDOT Real Estate to evaluate potential Air Rights and TOD projects at certain stations, particularly along the Worcester Line.

Additional Elevators Required at Existing Stations

Beyond Green Line and Commuter Rail accessibility needs, additional elevators are needed at the following stations to address missing accessible routes to neighborhoods, intermodal transfer points, and/or between station levels:

- Back Bay
- Davis
- Downtown Crossing
- JFK/UMASS
- NEMC/Tufts
- Oak Grove
- Reservoir
- Ruggles
- State
- South Station
- Sullivan

These stations combined will require an estimated additional 25 elevators. While costs per shaft may run as low as \$1M, many locations will be considerably constrained and may also require easements or permanent takings. Erring on the high side of \$4M per unit, these stations will require at least \$100M in funding.

Bus Stop Accessibility

Providing accessible bus stops is a shared responsibility between the MBTA and the property owner, typically a municipality.. The MBTA currently serves approximately 9,000 bus stops. While the PATI project will survey all MBTA stops, based on data from the Key Bus Routes project, it is safe to assume that at least 75% of the 9,000 stops have poor sidewalk conditions and non-compliant curb ramps or crosswalks. Ensuring bus stops are accessible is a key component to encouraging fixed route usage rather than paratransit usage. Typically bus stops upgrades cost \$10-15,000 each. The cost is doubled if intersections are involved or tripled when sidewalks are not present.

Achieving 100% Accessibility—Cost Overview

	Quantity	Low Estimate	Low Subtotal	High Estimate	High Subtotal
Remaining Inaccessible Subway Stations	4	\$20M ea	\$80M	\$30M	\$120M
Inaccessible Green Line Surface Stations	31	\$3M ea	\$93M	\$5M ea	\$155M
Commuter Rail Side platforms	76	\$15M ea	\$1.14B	\$18M ea	\$1.37B
Commuter Rail Center Platforms	12	\$22M ea	\$264M	\$30M ea	\$360M
Additional Elevators	25	\$1M ea	\$25M	\$4M ea	\$100M
Bus Stop Simple Replacement	3,250	\$10,000 ea	\$32.5M	\$15,000 ea	\$48.75M
Bus Stop Complex Replacement	3,250	\$20,000 ea	\$65M	\$30,000 ea	\$97.5M
		Total Additional Funding Required	\$1.70B		\$2.25B
		Spread Over 20 Yrs	\$85M per year		\$115M per year

All told improving accessibility and making the MBTA 100% Accessible is at least a \$1.7B to \$2.25 Billion effort above and beyond what is currently budgeted for. This figure does not include life safety upgrades to major stations and station subsystems. Spread out over 20 years, a minimum of \$85m to \$115m is needed each year to continue expanding access. This does not include the funding for replacing/maintaining vertical systems and providing fully accessible fleets of vehicles.

Replacement of Aging Vertical Systems Currently in Place

Federal and state regulations mandate that transit providers maintain their stations and vehicles in an accessible manner such that they are readily accessible and usable by people with disabilities. As discussed earlier, the MBTA's previous failure to do so had been one of the primary drivers behind the BCIL lawsuit.

According to the MBTA's vertical transportation records, out of the Authority's 168 station elevators, at least 70 elevators are twenty years old or more and 107 out of 173 escalators are twenty years old or more, representing 42% and 62% of all units respectively. The vast majority of these elevators and escalators are between Chinatown and Forest Hills on the Orange Line, as well as the Red Line extensions to Alewife and Braintree where redundant elevators are not provided.

The MBTA is working on a plan to replace vertical systems on a rolling basis. Meanwhile, however, the Authority faces a hurdle similar to the current MassDOT Highway Division (MHD) challenge of repairing/replacing 400+ bridges: when redundant elevators are not already present at stations, unit closure causes riders significant hardship. Elevator replacement alone typically requires up to 12 months. And for practical and legal reasons, at certain major transfer stations redundant elevators need to be designed and installed before replacement of existing elevators can even begin. The MBTA does not presently have the staffing or shuttle capacity to absorb or manage more than half a dozen elevator replacements at once, and fast-track construction/contracting methods are non-existent.

As a consequence of these issues, replacements are deferred and the overall problem grows. Units installed in the late 1990's are now approaching or exceeding their useful lives. While daily elevator reliability currently remains above 99.5% and escalators above 97% system-wide, the likelihood of maintaining such reliability into the future appears improbable.

Vehicles

Buses

Since 2006, the Vehicle Design team has included SWA in its bus procurements in order to improve upon the accessibility and usability of buses. The chief priority is the full retirement of the approximately 40 remaining high-floor RTS Diesel buses, all of which are over 20 or more years old and excessively difficult for people with disabilities to board. Beyond this is the need to establish a continuous bus procurement cycle, so as to keep pace with the industry standard for fleet age as well as with regulatory and technological changes.

Green Line Trolleys

Perhaps the most expensive and unfunded vehicle procurement is the replacement of the nearly 110 Type-7 Green Line cars. Type 7 cars, which require traversing several steps to board and alight, are only accessible to people with mobility disabilities via a mobile lift (located on a limited number of station platforms). Given the availability of the modern, low-floor Type 8 vehicle, which allows for customer boarding and alighting via a small on-board ramp, the Type 7 car is considered inaccessible.

Federal guidelines require that each train consist contain at least one accessible vehicle. This has proven challenging for the MBTA, which currently has a greater number of Type 7 cars than Type 8 cars in its fleet. And while the procurement of accessible Type 9 cars for the Green Line Extension is underway, those vehicles will be technologically incompatible with Type 7 vehicles. The only way to ensure fully accessible consists, then, is to retire and replace the entire Type 7 fleet.

Commuter Rail Coaches

Fifty-six percent of the MBTA's Commuter Rail fleet (269 out of 481 coaches) do not meet federal accessibility code requirements pertaining to door and vestibule widths. The remaining 211 coaches do meet these requirements; however, of those, only 75 coaches meet the ADA's Effective Communication requirement to provide visual announcements in addition to public address announcements.

While SWA would like to see the prompt retirement of older coaches from the fleet, the absence of funding to exercise the option for additional coaches in the Rotem order means that orders for additional coaches will require a new design and procurement cycle with delivery of new coaches potentially a decade away.

Ferries

The MBTA's Ferry fleet consists of two MBTA-owned catamaran (multi-hulled) ferries and 11 contractor-supplied ferries. The MBTA has ordered an additional pair of catamaran ferries, and the City of Boston has issued a RFP for up to two more catamaran ferries to support Inner Harbor Routes. These catamaran orders are critical to water transportation accessibility, because unlike the contractor-supplied vessels, the catamarans support bow-loading for customers with mobility disabilities and have bulkheads, doorways, and restrooms that meet accessibility requirements. Securing funds to acquire supplementary catamaran ferries, as well as to upgrade docks at Rowes Wharf, Charlestown, and other locations, will be necessary in order to make the MBTA's Ferry system fully accessible.

Roadblocks to Improving Accessibility

Funding

The inability to secure steady funding for station renovations, including vertical transportation systems, is the largest impediment to improving access long-term and to encouraging mode shift from THE RIDE to fixed-route. A corresponding issue is the irregular funding of vehicle procurement, which continues to delay accessibility upgrades throughout the MBTA fleet. Absent consistent replacement of inaccessible and/or outdated vehicles on all modes, customers will continue to encounter substantial barriers to accessing the fixed-route system. While the cost of these improvements is not insignificant, failure to implement them will come at the far greater price of additional litigation and heightened dependence on an overburdened RIDE.

Myth of SGR vs. Accessibility

It is not uncommon to hear concerns regarding the belief that addressing SGR needs are slowed or even prohibited by accessibility requirements. Although this is true in some unique circumstances, it is more so the case that there is tremendous overlap between the two concerns. Many of the oldest stations are inaccessible and, not surprisingly, they are home to SGR issues such as deteriorating stairs and platforms. Additionally, many accessibility features such as elevators and escalators are themselves SGR needs.

Achieving State of Good Repair and becoming 100% Accessible go hand in hand and are part of the larger goal--providing visible and lasting improvements to all customers' MBTA experience. Level boarding with high platforms dramatically reduces dwell time and eliminates the barrier of steps. Elevators and escalators are used not only by people with visible disabilities (crutches, scooter user, etc) but by parents with strollers, customers with luggage, and business people with wheeled briefcases.

Long-Term Regulatory Guidance & Support

While ultimate legal enforcement of federal accessibility requirements rests with the Department of Justice for ADA Title II entities, the MBTA most commonly interacts with the Federal Transit Administration and the Federal Railroad Administration within the U.S. Department of Transportation, as well as with the Massachusetts Architectural Access Board (MAAB) for state-level regulations. Over the past year, SWA and community stakeholders have worked with these agencies to improve communication and streamline review processes, fostering what has been a largely positive relationship conducive to achieving the Authority's accessibility goals.

It will be of ongoing importance to continue to work with agencies to identify potential areas of regulatory flexibility in service of the MBTA's accessibility objectives. Specifically, we intend to propose to FTA a plan to install mini-high platforms at certain existing inaccessible Commuter Rail stations in lieu of full-high level platforms in order to accelerate bringing some access to those locations. Also, we will need regulatory support in order to have latitude to address SGR issues in stations that might otherwise trigger larger accessibility upgrades, and/or time variances for the completion of necessary accessibility-related work. Sustaining the positive relationships necessary to garner such flexibility, however, will require that the MBTA demonstrate to regulatory agencies a concrete, strategic plan for implementing system-wide accessibility in the long term. Finalization of the PATI plan will be a critical component of this effort.

Slow Pace of Project Implementation Processes

The time and effort required to procure services—whether for design, construction, or other needs—is extensive. Similarly daunting is the coordination required to receive the necessary approvals and cooperation for ensuring that projects advance. The internal and external procedures required for even a relatively mundane project, such as replacing an elevator using the existing shaft, typically takes 18 months or more before an NTP is issued to a contractor.

Recommendations

1. Through the PATI initiative and other long-term planning processes, maximize the efficiency of funding by addressing SGR and accessibility needs together. There is a tremendous amount of overlap between older stations experiencing serious SGR needs (deteriorating platforms, broken stairs, etc.) and stations that are fundamentally inaccessible. Funding should be targeted at locations that are home to these consonant needs.
2. Establish a dedicated funding stream to make the MBTA's remaining 70 inaccessible stations accessible within a decade and achieve 100% accessibility within 20 years.
3. Establish a replacement plan for elevators and escalators with a dedicated funding stream to maintain an average unit age of less than 12.5 years. Identify methods to fast-track design, procurement, and installation of 1 for 1 replacement units to 12 months or less.
4. Identify internal delays to moving projects from initial design to construction and adopt practices similar to those utilized by MassDOT Highway Division's Accelerated Bridge Program.