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Industry Study: Public Transit in Boston

As the sole provider of public transit in Metropolitan Boston, the Massachusetts Bay Transit Authority, or MBTA, supplied Boston commuters and visitors with nearly 400 million rides last year, mostly by urban rail and busses (MBTA, 2015). Over the past year, a number of factors, including unprecedented weather delays due to last winter's snow and the possibility of Boston hosting the 2024 Summer Olympic Games, have brought into the public's eye many of the shortcomings in the MBTA's infrastructure and practices, and individuals from both the news and social media have demanded increased accountability and systemic reforms. While improvements to the subway would require long-term planning and significant capital investment, many adjustments to the urban bus service could be performed at a much lower time and monetary cost. In particular, partial privatization is a solution being discussed by the state legislature, pundits, and the MBTA itself.

In the early 1990s, Republican Bill Weld won the gubernatorial race on a platform of aggressive fiscal reform. Under Governor Dukakis, the state budget had grown massively, and Weld was committed to cut spending through sweeping spending cuts, elimination of state employees, and privatization of services. While some of Weld's efforts to privatize succeeded, the anti-privatization State Senate president, William Bulger, led the legislature to pass the Taxpayer Protection Act, commonly referred to as the "Pacheco Law" in 1993 (Jacoby, 1996). The law

requires a proposal to privatize a state service to include a detailed study proving that the privatized service will be both of equal or better quality than what the state provides and be less expensive (Mass Gen. Laws). Being a state agency, privatization of the MBTA certainly falls under the purview of the Pacheco Law, and has largely prevented considerations of privatization over the last twenty years. Under the new Baker administration, discussions of partial privatization of MBTA services has been reignited, and this year's state budget bill included a three year exemption of the MBTA from the Pacheco Law, opening up the potential for reforms, particularly in the urban bus market.

Modelling the structure of the public transit market is difficult. In cities like Boston where transit provision is the responsibility of a single agency, the market does exhibit some qualities of a monopoly, particularly a natural monopoly. The Pacheco Law puts up such high regulatory barriers to entry that no other firm could enter the urban bus market in Boston, and the high fixed costs of building subway infrastructure protects the MBTA's hold on urban rail. However, a traditional monopoly typically results in a market where the producer supplies fewer units than would be socially optimal and chooses this quantity and associated price to maximize profit, and there is significant evidence that the MBTA does not behave in this way.

Berechman highlights positive externalities in the provision of public transit. Active use of transit reduces automobile use, thus improving traffic congestion and reducing the environmental impact from cars (Berechman, 2013). Additionally, a case can be made for transit being a necessary good for low income individuals who would not be able to otherwise afford a mode of transportation to go to work. In this case, there are additional economic externalities for providing accessible and affordable transportation to the population. For these reasons, the

MBTA receives significant subsidies from the state. A Boston Globe breakdown of the 2015 MBTA revenues and expenses reveals that fare collection only accounts for 30 percent of the budget. Nearly all of the remaining 70 percent comes from state and local subsidies. The bulk of this comes from “Dedicated Sales Tax Revenue”, through which the MBTA is assured 16 percent of annual Massachusetts sales tax receipts (Garvin, et.al., 2015). Through these subsidies, the MBTA does not need to charge a price to maximize its profit.

Earlier this year, the MBTA identified 32 routes, including some late-night versions of popular daytime routes as candidates for elimination or privatization. As part of a November 2015 report, the MBTA identified its 20 most and 28 least efficient bus routes, as measured by net subsidy per trip. The most efficient routes are typically used heavily by commuters or move through areas not serviced by other modes of transit. An interesting outlier, the most efficient route is the SL1 trolley which runs from South Station to Logan Airport, and services the Seaport District, a region of Boston distinctly lacking in both subway and other bus service and operates at a net loss of just one cent per trip. The other 19 routes identified operate at a loss of about \$1.20 on average, compared to a system-wide average of \$2.83. On the other side, most of the least efficient routes are ones with at least one endpoint outside of the city; eleven are marked as “Lynn/North Shore”. The outlier in this selection is route #191, which is a special once-per-day early morning run of the #15. This bus makes one round trip a day at an operating loss of \$44.93. However, because of the infrequency with which this route runs, the net operating loss over fiscal year 2014 was slightly over \$100,000. The 27 other routes run on a normal schedule and average an operating loss of around \$7.00 per trip. Overall, the MBTA bus system only covers about a quarter of its operating costs through fare collection, compared to 69 percent

coverage by heavy rail subway and 47 percent by light rail subway, and accounts for slightly less than one third of the \$1.5 billion operating cost and slightly more than one third of the \$850 million operating deficit (MBTA, 2015).

The metric of route efficiency may be a better one to use than total revenue or profit. In the same 2015 report, the MBTA identifies the total operating loss of the 48 highlighted routes, and organizing them by total loss tells a much different story. One of the routes in the “most efficient” list, the #32, operates at a loss of nearly \$5 million annually. However, this ignores the approximately 3.5 million annual riders, bringing the subsidy per rider to about \$1.40. Compared to the #465 which operates at a loss of just over \$1 million but only sees 110,000 riders per year, for a per-rider subsidy of \$9.70 (MBTA, 2015). Instead of looking at the MBTA as a monopoly that seeks to maximize revenue or profit, it may be more appropriate to consider the MBTA and the state monopolistically providing a service with the goal of maximizing social welfare in the transit market. In this way, examining route efficiency per passenger is a strong metric to evaluate how effectively the MBTA spends money.

In determining whether or not to privatize or deregulate the MBTA, it must be determined whether or not a competitive or contested market could even provide certain routes. While the staggering subsidy of \$44.93 per trip and \$53 per passenger on the #191 seems like a waste of resources by the state, the annual ridership of only 2,000 passengers indicates that even at a price of \$1.60, demand for this route is very low. A private firm entering this market would not provide this bus ride for a price that low, and at a certain price threshold, it becomes less expensive for a rider to take a taxi every day. The 32 routes identified by the MBTA are grouped into the categories of low ridership, late night, and partial highway, and many of these routes

appear on the list of least efficient routes. The #191 is an extreme example, but there are several other routes which have ridership low enough that it is unlikely that a private firm could set its price low enough that riders would not seek substitute transit options.

However, a Baker-commissioned study and report of the MBTA in April of 2015 suggests that privatization could play a role in remedying some of the fiscal problems moving forward. The report highlighted several structural issues in the MBTA's operation and leadership, but the primary finding was that the MBTA's operating budget is unsustainable and is reliant on growing state subsidies. The total deficit in 2015 is projected to be \$295 million, and is expected to widen to \$558 million by 2020, which is being driven by growth in costs outpacing growth in ridership. The MBTA's bus maintenance cost is higher than that of all other major urban transit systems in the country with the exception of New York's MTA. Contributing to this are some inefficient work practices also highlighted in the report. Restructuring of night shifts while the MBTA was offering late night subway service led maintenance workers to be paid for full eight hour shifts while only actually working less than three hours. Additionally, the binding arbitration allowed for the Carmen's Union, overtime costs, and rampant absenteeism all lead to significant costs for the MBTA and the state (Governor's Special Panel, 2015). Many of these issues could be alleviated by partial privatization of the MBTA bus system. The power of the Carmen's Union and, by extension, the forgiveness for worker absences, would not be factors for a small private bus company, particularly if the MBTA sells or leases the rights to that route, granting the new firm a monopoly in their market.

Academic research on privatization is abundant. Leland and Smirnova (2009) perform a comprehensive review and update of Perry and Babitsky's 1986 study of comparative efficiency between public and private transit providers. In the 1980s, the Reagan administration implemented incentives for privatization of public transit services. The Federal Transit Authority released studies that showed that the policies had the effect of creating more efficient transit systems, but Perry and Babitsky found that contracting out transit to private providers was no more efficient than it being operated by the public agency. Future studies showed that there is no gain in cost savings on the administrative side, but that there may be savings on maintenance expenditure. The main finding of their replication was that 25 years later, private firms are no more efficient in transit provision than government agencies, confirming the original findings. Part of this is attributed to higher transaction costs for private firms, but the two major factors the authors highlight are the lack of competition in the market and the contracting process (Leland and Smirnova, 2009).

Finding a lack of competition in privatized bus systems is not a surprise. Whether a route is provided by a government or a private firm, if only one agent supplies it, there will be a lack of competition in that market. Because non-competitive firms don't have the same incentive to innovate as firms in more competitive environments, this would certainly contribute to a private transit provider's cost structure, but the same can be shown for public providers. Two or more firms competing to provide an individual route creates an interesting game-theoretic scenario in which the firms choose the frequency of their schedules, but this competitive cost factor should not be used to compare the efficiency of a monopolistic public agency to a monopolistic private agency, as the cost should be present for both.

On the other hand, the contracting process is a significant step in moving from a public system to a privatized one, and if the contracts are not distributed in a fair and efficient way, the associated costs could be very high. Leland and Smirnova posit that because firms typically earn either a fixed price or a percentage of revenue and still receive subsidies that there is little motivation to innovate or improve efficiency (Leland and Smirnova, 2009). If the purpose of partial or total privatization of a transit system is to provide the service more efficiently, then whether or not the private firms can bridge that efficiency gap is of primary importance.

While the findings of Leland and Smirnova seem dismal for the prospects of partially privatizing the MBTA, their research aggregates data from the United States as a whole, which features transit authorities of a wide range of size and scope. Meyer and Gomez-Ibanez (1991) take a more nuanced approach and find that there may be efficiency gains from privatizing urban bus systems. While much of their research focuses on urban transit systems in developing countries, there is a significant focus on the results of the privatization of the British bus network in the 1980s. Much like Boston, busses in Britain were owned and operated by a single large government-backed agency. In 1986, the Thatcher Government deregulated the bus system and allowed private firms to compete across the country, with the exception of metropolitan London. The effects on the British system were seen in both service innovations and cost savings. In particular, they found that mini-busses and other smaller vehicles replaced the classic double-decker busses in some markets, allowing service to be provided to regions with lower ridership density at a lower cost, as well as the expected decrease in transit wages from lower subsidization and freedom from the unionization of the public agencies (Meyer and Gomez-Ibanez, 1991).

The prospect of private firms bringing in smaller vehicles could have major impacts on the Boston bus market. Part of what makes the #191 route so expensive is that the daily ridership is under ten passengers, yet the MBTA must use a full-sized bus to provide this service. A private company could use a large van or a mini-bus, which has a lower operating cost. The MBTA's vehicle garages are currently at capacity, so it must continue to use its existing fleet, even in cases where a smaller vehicle makes more sense. A small private firm could take over this and other routes where this is a problem, and even if the state subsidizes the firm to the point where its fare is identical to the MBTA's, there would be a net cost savings as a result of the efficiency gains.

Meyer and Gomez-Ibanez also discuss the implications of subsidies in a partially privatized system. Given the MBTA's 26 percent fare recovery on bus service the average subsidy per bus passenger is about \$4.80, given the \$1.60 fare, but some of this is a function of the inefficiencies of the MBTA highlighted by the Governor's commission and the agency itself. The authors' state that while in developing countries, subsidies may not be effective due to the high density of demand and low labor costs naturally maintaining an efficient system, results from the British privatization process suggest that subsidies can allow smaller firms to compete in the market with larger firms and the public agency. They also outline some drawbacks of subsidies in a partially privatized system, primarily that, given a small difference in fares between the public and private entities, that the public system will have no incentive to innovate its service, and due to the low fare differential, this outweighs the gain to society from having a less expensive transit option (Meyer and Gomez-Ibanez, 1991).

Finally, privatization can have distortionary effects on the market, particularly with regards to equity of access. While the positive externalities of public transit are important and improving the efficiency of the system certainly has a positive effect on social welfare, it is important to also consider how individuals who use the service will be affected. Berechman highlights the possibility for a change in equity of access as a result of deregulation or privatization. Due to increases in prices or decreases in service on privatized routes, groups particularly reliant on public transit, such as low income individuals, students, and the elderly, particularly in low-density ridership areas, may be adversely affected by this change in service (Berechman, 2013). Ordinarily, in considering how a changing market structure affects buyer behavior, consumers are treated uniformly. However, because of the nature of public goods and the role of the government to provide certain services to society, the way in which privatization affects people who rely heavily on public transit and have no alternative mode of travel must be considered.

Privatization does not necessarily cause diminished equity of access. One advantage that government-sponsored transit agencies gain from their monopoly power is the ability to subsidize long trips with fares from short trips (Berechman, 2013). All else equal, the cost for a bus to drive three miles through a city is less than for that same bus to drive four blocks, but riders are charged a uniform fare regardless of distance travelled. When spread out over the whole system, riders who travel on efficient routes pay the cost of riders travelling on inefficient routes. This suggests that in order for privatization to be successful, a firm must, like the original public agency, supply a diverse range of transit routes in order to minimize the loss of rider equity, as the more diverse the routes, the greater opportunity there is for efficient routes to

subsidize inefficient ones, thereby providing riders with a lower price than if the firm only serviced the relatively inefficient low-ridership and long distance routes.

Recent developments in ridesharing services may also have an impact on the Boston transit market and the MBTA's strategy moving forward. In its report, the MBTA identifies ridesharing services such as Uber and Bridj as possible alternative sources of transit in the areas with low ridership (MBTA, 2015). While it is an innovative service, Uber is not a strong candidate to replace busses in most parts of the city, due to the general unpredictability of timing and pricing. Rather, the fascinating impact of Uber will be on the market for taxis and personal automobiles in urban areas. Bridj, however, may make an interesting substitute for MBTA busses. Bridj is a startup which provides a ridesharing service, but unlike Uber's use of drivers' personal vehicles, Bridj uses a company van, and instead of submitting requests for an individual ride, the Bridj app allows a user to drop a marker at a nearby street corner and join the current van's trip. Currently, Bridj only operates rush hour service between certain areas in Boston. In this way, it insures against operating losses from low ridership. This by-demand private solution may be a way for the MBTA to privatize some of the least efficient routes. Coupled with a small subsidy, a small-vehicle ridesharing system solves many of the cost problems stemming from these routes while still providing them at a low cost to consumers.

Overall, the market structure of public transit in Boston is fascinating, as it is nominally a monopoly which creates positive externalities, and, due to the significant taxpayer subsidies, likely creates inefficiencies as a result of over-provision of some goods, whereas typically monopolies create deadweight loss by under-producing its good. Systemic and fiscal problems in the MBTA have led to widespread frustration and calls for reform; coupled with the newly

relaxed legislative restrictions, the MBTA is facing both internal and external pressure to partially privatize its operations. Numerous natural experiments from both the United States and other countries, particularly Great Britain can offer some insight into how privatization of some MBTA routes may positively or negatively affect both the financial position of the agency as well as the consumers who rely heavily on the public transit system. Additionally, new ridesharing systems like Bridj could prove to be challengers and competitors to public transit both in Boston and across the country, or they could be an important component within the system by serving niche routes with low ridership. Looking forward, if the MBTA moves forward with partial privatization, the market structure of the public transit industry in Boston could change dramatically, depending on the method of privatization.

References

- Berechman, J. *Public Transit Economics and Deregulation Policy*. N.p.: Elsevier, 2013. *Google Books*. Web. 21 Dec. 2015.
- Garvin, Patrick, Catherine Cloutier, and David Butler. "How the MBTA Makes and Spends Its Money - The Boston Globe." *Boston Globe*, 2 Mar. 2015. Web. 21 Dec. 2015.
- The Governor's Special Panel to Review the MBTA. *Back on Track: An Action Plan to Transform the MBTA*. Rep. Commonwealth of Massachusetts, 8 Apr. 2015. Web. 21 Dec. 2015.
- Jacoby, Jeff. "Bill Weld's Revolution That Wasn't." *City Journal* Winter 1996: n. pag. Web. 21 Dec. 2015.
- Leland, Suzanne, and Olga Smirnova. "Reassessing Privatization Strategies 25 Years Later: Revisiting Perry and Babitsky S Comparative Performance Study of Urban Bus Transit Services". *Public Administration Review* 69.5 (2009): 855–867. Web..
- Manski, Charles F.. "The Zero Elasticity Rule for Pricing a Government Service: A Summary of Findings". *The Bell Journal of Economics* 10.1 (1979): 211–223. Web...
- Massachusetts Bay Transit Authority. *Net Subsidy by Mode: Part II*. Rep. N.p.: Massachusetts Department of Transportation, 2015. Print.
- Mass. Gen. Laws ch.7, § 52-54 (1993)
- Salsberg, Bob. "Baker Seeks Nearly \$65M Hike In State Subsidies For MBTA." *Baker Seeks Nearly \$65M Hike In State Subsidies For MBTA RSS 20*. WBUR, 3 Mar. 2015. Web. 21 Dec. 2015.
- Vaccaro, Adam. "Why Something Called the 'Pacheco Law' Is an MBTA Battleground." *Boston.com*. Boston Globe Media Partners, 8 July 2015. Web. 21 Dec. 2015.