



The Pacheco Law has cost the MBTA more than \$450 million. Here's the evidence.

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EXECUTIVE SUMMARY

In the aftermath of last winter's operational failures at the MBTA, Governor Baker appointed a task force to study and make recommendations to improve the T's performance and cost efficiency. Among its recommendations is a proposal to exempt the MBTA from the so-called Pacheco Law (M.G.L. Chapter 7, Sections 52-54) that places limitations on contracting of services traditionally provided by employees of state agencies and five enumerated authorities, including the MBTA. The governor included this proposal in his MBTA reform legislation.

The Massachusetts House of Representatives responded to his recommendation by including in its version of the fiscal 2016 state budget an outside section calling for a five-year suspension of the Pacheco Law at the MBTA. The Senate version of the budget did not include any provision concerning the Pacheco Law.

In coming weeks, the state legislature will decide whether to adopt Governor Baker's proposal to repeal the Pacheco Law at the MBTA. Opponents claim that no evidence has ever been presented showing that the Pacheco Law has had an adverse effect on the MBTA. Members of the legislature have expressed interest in reviewing information and data about the impact of the Pacheco Law at the MBTA. This report responds to that request. It presents documented examples of the adverse effects the Pacheco Law has had on the MBTA by preventing it from deriving savings through outsourcing of bus routes and bus maintenance services. It presents information and data demonstrating that the Pacheco Law has cost the MBTA at least \$450 million.

This report is organized as follows:

- The Pacheco Law's anti-competitive underpinnings and restrictions;
- Historical background of the Pacheco Law and the MBTA;
- A review of the history of the 1997 Pacheco Law decision that banned the MBTA from awarding two competitively-bid contracts to operate 38.0 percent of the MBTA's fixed bus routes, including the repair and maintenance of MBTA-owned buses used on those routes.
- An estimate of how much the Pacheco Law has cost the MBTA since 1997 by comparing the contract terms of the disallowed contract with how much the MBTA spent delivering the bus and maintenance service using agency employees;

- National trends on bus service outsourcing;
- An overview of the reasons why the MBTA's bus service costs are so high, with a series of analyses of operational efficiency compared to the MBTA's peer transit agencies, including agencies designated by the Federal Transit Administration (FTA) and incorporated in the FTA-sponsored Integrated National Transit Database Analysis System (INTDAS), as well as to regional transit authorities, hybrid US transit agencies that purchase bus transportation as well as provide it directly, US transit agencies with robust outsourcing, and major US transit agencies with significant snowfall.
- An overview of the reasons why the MBTA's bus vehicle maintenance costs are so high compared to MBTA peer agencies. The analysis examines cost-efficiency data, repair and maintenance costs and staffing, age of bus fleets, and capital expenditure for buses.

The report has three major findings—each of which demonstrates that the Pacheco Law has cost the MBTA more than \$450 million since it blocked the MBTA from signing two contracts in 1997 to purchase 38.0 percent of its bus and bus maintenance service from private companies.

1. A comparison of the financial terms of the two five-year contracts that were barred by the Pacheco Law with the actual cost incurred by the MBTA over the five year term demonstrates conclusively that the MBTA spent \$80.4 million more from 1998 to 2002 than it would have had it been allowed to execute the contracts as approved by the MBTA Board of Directors. Had the MBTA been allowed to continue to outsource 38.0 percent of its bus service and bus maintenance following the initial five year contract through 2013, the most recent year for which data is published by the FTA's National Transit Database (NTD), it would have saved a total of \$412.2 million, even if its contract rates per bus hour of service with the private carriers increased at the same high escalation rate of the MBTA's own agency provided bus service. If the same rate of savings continued in 2014 and 2015, the MBTA would have saved a total of \$450.3 million, including the initial transition costs to the private carriers.
 - Before the state auditor rendered his Pacheco Law decision in 1997, the MBTA had been the seventh-largest provider of agency-purchased bus service in the U.S., providing 4.65 million miles annually at an average cost of \$1.33 per mile, the lowest of all major transit agencies. The MBTA's cost of providing direct service at the time of the decision was more than six times higher at \$8.10 per mile, sixth highest of the nation's largest transit agencies. Despite this strong evidence of potential savings, and despite contract terms providing for five-year savings of \$37 million over prior year costs according to the MBTA, the Pacheco Law decision barred the execution of the contracts by concluding that lower costs could be achieved by "regular agency employees providing the service *in the most cost efficient manner*," an intractable standard imposed by the law. Under the law, the auditor's decision is final and binding.
 - During the 1997 Pacheco review by the state auditor, MBTA employee organizations argued that they could deliver the service for \$5 million less than the two winning bidders by improving cost efficiency, but after the contract was blocked, that never happened. Over the next five years, the MBTA's operating cost rose from \$85.10 to \$100.73 per bus hour, increasing by 18.4 percent. The contract with the two vendors approved by the MBTA Board had been for \$74.34 per bus hour for five years. Because the Pacheco Law forced the MBTA to forgo this agreed-to lesser rate, the MBTA spent \$80.4 million more by providing the bus service in-house over the five year period. The Pacheco Law does not require agency employees to generate the cost efficiency improvements they assert are achievable during the Pacheco Law's administrative

process. The hypothetical cost-efficiency standard imposed by the Pacheco Law during the 1997 MBTA bus contract review had no residual effect after the contract was disallowed in reliance upon it.

2. National trends and data provide further conclusive evidence that the Pacheco Law has cost the MBTA hundreds of millions of dollars.
 - In the years since the 1997 Pacheco decision, transit agencies across the country have increased their purchasing of contracted bus service dramatically. Transit agencies serving areas with populations greater than one million increased their annual purchase of private bus service from 93.9 million miles in 1997 to 221.8 million in 2013, an increase of 127.8 million miles. During the same period, directly provided service by these agencies declined by 82.0 million miles. The reason for this wholesale substitution is easy to understand: from 1997 to 2013 purchased transportation cost 42.2 percent less per mile than directly provided service at these transit agencies.
 - A report published by the National Center for Transit Research sponsored in part by the U.S. Department of Transportation entitled “Analysis of Contracting for Fixed Route Bus Service” found that in the nation’s large transit systems, defined as those with 250 or more vehicles operating at maximum service, agencies paid 40.4 percent less in 2008 by contracting for fixed-route bus services per revenue mile (\$6.67 per mile) than for directly provided bus transportation (\$11.19 per mile).
 - In 2013, the average cost for purchased bus service among U.S. transit agencies serving populations greater than one million was \$7.58 per revenue mile, 41.3 percent less than the \$12.92 cost of directly-provided bus service.
 - In 2013, the nation’s largest providers of hybrid bus service, i.e., those that both purchase and provide bus service directly, paid an average of \$11.41 per mile for their directly provided service versus \$6.38 per mile for purchased service, an average savings of 44.1 percent per mile.
 - The principal explanation for the enormous magnitude of foregone savings attributable to the 1997 Pacheco Law is the MBTA’s inordinately expensive agency-provided bus service. The MBTA’s cost per revenue mile for agency-provided bus service is 36.5 percent higher than the average of its five bus agencies designated as peer agencies by the INTDAS peer system. If the MBTA’s cost per revenue mile had been held to the average of its peer agencies, the MBTA would have saved \$100.9 million in 2013 alone.
 - The principal reason for the MBTA’s high cost of directly provided bus service is its high bus maintenance cost. Of 425 bus transit agencies in the US in 2013, the MBTA had the highest bus maintenance cost per hour of bus operation. The MBTA’s high bus maintenance cost is attributable in large part to its high maintenance staffing and labor hours per vehicle mile: the MBTA has 59.6 percent more full-time bus maintenance personnel per bus mile than the average of its five peer agencies. Its maintenance costs per bus mile are 92.2 percent higher than its five peer agencies. Its labor hours per vehicle mile are 65.7 percent higher than average of its peer agencies.
 - While winter conditions in the Greater Boston area are often used as an explanation for the MBTA’s high costs, this report finds that the MBTA’s costs for bus operation and maintenance are far higher than those of the six biggest public bus transit systems that

serve areas that receive more snow than Boston. If the MBTA's cost per bus revenue mile had been held to the average cost of the six agencies receiving more snow annually than Boston, the MBTA would have saved \$147.2 million in 2013.

3. The state's own Regional Transit Authorities (RTAs) illustrate the financial advantage of competitively procured bus service.
 - The MetroWest Regional Transit Authority (MWRTA), which serves the towns of Ashland, Dover, Framingham, Holliston, Hopkinton, Hudson, Marlborough, Milford, Natick, Sherborn, Southborough, Sudbury, Wayland, Wellesley, and Weston, provides more than 800,000 miles of bus service annually at a cost 78.1 percent less than the MBTA's. Through legislation led by State Senator Karen Spilka, MWRTA provides a locally managed service connecting the region's communities and linking commuters to the MBTA's Green Line and to the Framingham commuter rail line. Legislators might wonder how MetroWest has been able to deliver a superior product at a fraction of the cost of the MBTA's. The big difference: MWRTA competitively procures its bus service and the MBTA does not. How is it able to do so? The RTA's are not subject to the Pacheco Law. For those who defend the MBTA's high costs by arguing that it serves a metropolitan area with a high cost of living and severe winter weather: MWRTA serves a metropolitan area with the 14th highest Consumer Price Index in the nation, higher than Boston's, and with winter conditions virtually the same as Boston's. MWRTA uses smaller buses than the MBTA does, and that is partially responsible for the lower costs, but competitive procurement is the major contributing factor.
 - Other RTA's in Massachusetts use buses 40 feet and longer, such as Pioneer Valley RTA (PVRTA), which operates 110 full-sized buses and 83 smaller buses. Its cost per revenue hour in 2013 was \$90.02, 45.6 percent less than the MBTA's cost of \$165. Its cost per revenue mile was \$6.66, 60.0 percent less than the MBTA's cost of \$16.63.
 - Ten other RTAs joined with MWRTA and PVRTA in providing a total of 22.7 million revenue miles of purchased bus service in 2013 at an average cost of \$6.38 per revenue mile, 61.6 percent less than the MBTA's direct service cost per revenue mile of \$16.63. The RTA's cost per revenue hour was \$88.09 in 2013, 46.8 percent less than the MBTA's cost of \$165.50.

INTRODUCTION

In coming weeks, the state legislature will decide whether to adopt Governor Baker's proposal to repeal the Pacheco Law at the MBTA. This statute, adopted in 1993, places limitations on contracting of services traditionally provided by employees of state agencies and five enumerated authorities, including the MBTA.

Anti-Competitive Elements of the Pacheco Law

As a procurement model, the Pacheco Law is antithetical to virtually every principle of fair procurement because it inordinately favors the incumbent provider, i.e. agency employees, over competing contractors:

1. Requires that any outside bidder pay the same wage rates and health insurance benefits to its employees as the incumbent; this neutralizes any potential advantage the outside bidder may have based on cost of labor;

2. Requires a comparison of the outside bidder's operational cost efficiency and actual service quality to what the incumbent's cost efficiency would be if the incumbent were providing the service in the most cost efficient manner, not with what its actual cost efficiency and service quality are. This neutralizes any potential advantage the outside bidder may have based on cost efficiency and/or service quality;
3. Requires the outside bidder to offer jobs to the incumbent's employees if it wins the contract; this neutralizes any potential advantage of the outside bidder in employee recruitment;
4. Disallows a losing bidder from legally challenging the bid award, except on very narrow grounds, by allowing a single state official--the state auditor—to make a final, binding, unilateral decision to award the contract to the incumbent;
5. Requires that if any of the work for a privatization contract is to be performed outside of Massachusetts, that amount of lost taxes be added to the bid cost. There is no corresponding provision to account for the fact that the state gets revenue when services are delivered by tax-paying private businesses;
6. Even if after all the analyses are performed and the result favors the outside bidder, the procurement can be struck down by the state auditor if he or she deems it not to be in the public interest.

All these factors combine to create the nation's most extreme anti-privatization law.

Restrictive Elements of the Pacheco Law

The following restrictions on privatization contracts are included in the Pacheco Law, M.G.L. Chapter 7, sections 52-54, with respect to the MBTA:

- An agency shall not make any privatization contract and no such contract shall be valid if . . . the state auditor notifies the agency of his objection;
- The state auditor or his designee may require by summons the attendance and testimony under oath of witnesses and the production of books, papers and other records relating to such review;
- The objection of the state auditor . . . shall be final and binding on the agency;
- Every privatization contract must include compensation and health insurance benefits for the contractor's employees no less than those paid to equivalent employees at the public contracting agency;
- Every privatization contract shall contain provisions requiring the contractor to offer available employee positions pursuant to the contract to qualified regular employees of the agency whose state employment is terminated because of the privatization contract and who satisfy the hiring criteria of the contractor;
- The agency shall prepare a comprehensive written estimate of the costs of regular agency employees' providing the subject services in *the most cost-efficient manner*;
- If the designated bidder proposes to perform any or all of the contract outside the boundaries of the commonwealth, the said contract cost shall be increased by the amount of income tax revenue, if any, which will be lost to the commonwealth by the corresponding elimination of agency employees, as determined by the department of revenue to the extent that it is able to do so;

- The head of the agency and the commissioner of administration shall each certify in writing to the state auditor that the quality of the services to be provided by the designated bidder is likely . . . to equal or exceed the quality of services *which could be provided by regular agency employees pursuant to paragraph (4)*; [Note: paragraph 4 requires the agency to base its in-house estimate upon regular agency employees' providing the subject services *in the most cost efficient manner.*]

HISTORICAL BACKGROUND: The Proposal to Privatize Certain MBTA Bus Lines

The Pacheco Law must be understood in historical context: in particular, it represented the undoing of a reform enacted by the legislature 13 years earlier. In 1980, the Massachusetts legislature enacted c. 581, the MBTA Management Rights Act. The Act granted MBTA administrators the right to determine whether goods or services should be made, leased, contracted for, or purchased on either a temporary or permanent basis. It did so by excluding these matters from collective bargaining. The Act also prohibited the inclusion of automatic cost-of-living adjustments, credit for overtime in pensions, and restrictions on hiring of part-time employees.

Timeline on Proposed Privatizations

In June, 1993, Governor William Weld announced his intention to privatize the operation and maintenance of at least one-quarter of MBTA bus routes and bus repair garages following the release of a report by Comsis Corporation, a transportation management consulting firm based in Maryland. The firm concluded that the MBTA's bus operating and maintenance expenses were 30 percent higher than the average of the 27 biggest urban transit systems. After Governor Weld's announcement, MBTA unions mounted a strong effort to block the Act's implementation.

In November 1993, five months later, the legislature enacted the Pacheco Law, which placed restrictions on privatization of services provided by regular employees of an agency in the executive branch of state government, the MBTA, the Massachusetts Turnpike Authority, the Massachusetts Department of Transportation, the Massachusetts Port Authority and the Woods Hole, Martha's Vineyard and Nantucket Steamship Authority.

In August 1996, the MBTA issued a request for proposals from private contractors to operate and maintain MBTA buses. On December 31, 1996, the MBTA received bids from contractors to operate all fixed routes running out of the Charlestown/Fellsway and Quincy bus maintenance garages, including the repair and maintenance of MBTA-owned buses used on those routes. Pursuant to the Pacheco Law, the MBTA was required to submit to the state auditor on the following business day, January 2, 1997, a comprehensive written estimate of how much it would cost the MBTA to provide the same bus maintenance service with in-house labor, calculated in accordance with the provisions of the Pacheco Law.

On April 18, 1997 MBTA officials submitted for the auditor's review two proposed contracts with private transportation companies selected as the winners of the competitive procurement. Along with the proposed contracts, MBTA officials submitted the agency's estimate of the total cost to the agency of the proposed contracts including all in-house administrative and other costs as specified by the Pacheco Law.

On June 20, 1997, the auditor notified the MBTA of his final and binding decision disapproving the awarding of the contracts. The state auditor's rejection letter stated: "the Office of the State Auditor hereby notifies you of its objection to the awarding of these contracts. . . . [T]his objection is final and binding on the MBTA until such time as a revised certificate is submitted and approved by this office."

On June 23, 1997, the MBTA filed suit in Superior Court seeking reversal of the state auditor's decision, claiming that it was arbitrary and capricious and claiming further that the Pacheco Law was unconstitutional.

On September 1, 1998, a state Superior Court judge rejected the MBTA's arguments in a related lawsuit concerning another proposal rejected by the state auditor under the Pacheco Law. This other proposal advanced a contract for MBTA bus shelter maintenance. The Superior Court judge upheld the authority of the state auditor to make final and binding decisions, rejecting privatization of MBTA services by virtue of the Pacheco Law, which superseded the 1980 Management Rights Law's authorization of MBTA privatization.

Since that time, the MBTA has never attempted to privatize its fixed-route bus service.

The Law in Practice: The 1997 Rejection of Bus Line Privatization

In rejecting the MBTA's proposed bus privatization contract in 1997, the auditor cited three specific provisions of the Pacheco Law as authority for his decision, each of which demonstrates a counter-productive element of the law. The auditor's June 20, 1997, final decision stated:

Specifically, this office continues to object to these two proposals due to the MBTA's continuing failure to comply with several of the substantive requirements contained in Section 54(7), namely, cost, quality, compliance with the public interest requirement, and compliance with the privatization law. We find the MBTA's certification in each of these areas to be incorrect.

The substantive requirements of Section 54(7) cited by the auditor were 1) that the MBTA had failed to demonstrate that the estimated cost of the contract would be less than the estimated "cost of regular agency employees providing the subject services *in the most cost efficient manner*;" 2) that the MBTA had failed to demonstrate that service provided under the contract would "equal or exceed the quality of services which *could* be provided by regular agency employees providing the subject services *in the most cost efficient manner*;" and 3) that the contract "was not in the public interest" because it contained a provision for liquidating damages of \$740,000 during the initial stages of contract performance to less than \$50,000 during the latter stages in the event that the MBTA terminates the agreement without cause. Section 54(7)(v) allows the state auditor to reject a proposed contract if he or she determines that the proposed privatization contract is not in the public interest, in that it does not meet the applicable quality and fiscal standards set forth therein.

The state auditor's June 7, 1997 final decision demonstrates the effect of the Pacheco Law's hypothetical cost efficiency and quality of service comparison in practical application:

"The MBTA has failed to provide a reasonable, responsible standard or basis to demonstrate that the proposed service [of the outside bidder] will equal or exceed the quality of that which *could be* provided by agency employees." (Emphasis added.) Although [the outside bidder's] quality assurance surveillance plan is highly desirable as a means of measuring performance, its effectiveness must be measured against the "quality of services *which could be* provided by regular agency employees" rather than by "existing conditions"--that is, to determine the most efficient method of providing the bus service. Nonetheless, the MBTA still has not provided measurable performance factors for key qualitative attributes."

This citation illustrates the adverse consequences of the Pacheco Law at the MBTA. The law was used in this instance to disqualify two winning bidders—whose quality metrics the state auditor described above as being highly desirable—because the law prevented the MBTA from comparing the relatively

higher quality of service provided by a bidder with the actual quality of service provided by the MBTA to its customers. The state auditor's letter indicates that the MBTA had submitted a highly desirable quality assurance plan. Notwithstanding, the law required the state auditor to reject the contract if the agency could demonstrate that the contractor's quality of service will not "equal or exceed the quality of services which *could* be provided by regular agency employees . . . providing the subject services *in the most cost-efficient manner.*" The auditor concluded that the MBTA "failed to provide a reasonable, responsible standard or basis to demonstrate that the proposed service of the outside bidder will equal or exceed the quality of that *which could be provided by agency employees.*" The hypothetical, conjectural nature of the required comparison, in the context of a public procurement, renders the process vulnerable to subjectivity and favoritism.

The Pacheco Law does not contain any requirement that agency employees subsequently provide service in the most cost efficient manner or in an improved manner if the proposed privatization contract is rejected.

ESTIMATION: How Much Has the 1997 Decision Cost the MBTA?

The short answer is that the MBTA lost more than \$450 million dollars because of the 1997 Pacheco Law decision.

Since the MBTA is required to file detailed financial reports as a requirement of receiving federal funding, including cost per revenue hour of bus operation, it is easy to determine how much extra the MBTA wound up paying to provide the same amount of bus service directly instead of through the contract. NTD data shows that the MBTA paid \$80.4 million more than the contract rate over its five-year term from 1998 to 2002. From 1998 to 2015, the MBTA's lost savings amounted to \$450 million.

On April 18, 1997 the MBTA sent to the state auditor two five-year contracts to operate and maintain more than 300 buses running out of the Charlestown/Fellsway and Quincy bus garages, including the operation of 38 percent of the MBTA's bus routes. The contracts, approved by the MBTA Board of Directors, required the two companies, ATC/Vancom of Illinois and ATE/Ryder of Ohio, to offer positions to MBTA employees at current MBTA compensation levels when hiring, but did not require that all employees be hired. The MBTA anticipated that the companies would reduce total staffing by 15 percent, from 628 to 519 at the Charlestown/Fellsway garage, for example. The ATC/Vancom contract provided for payment by the MBTA of \$243.4 million over five years to provide a total of 3.25 million hours of bus service on 80 routes operated from the Charlestown/Fellsway garage as well as for the repair and maintenance of a fleet of 241 buses there. The ATE/Ryder contract was for \$61.8 million over five years for 853,500 hours of bus operations based out of the Quincy garage. As previously explained, the auditor subsequently determined that the MBTA could not demonstrate to his satisfaction that the contract would result in savings when compared to agency employees working in the most efficient manner. He invoked his Pacheco Law authority and forbade the execution of the contracts.

After the passage of time, it is a relatively straightforward matter to determine whether the Pacheco Law ended up costing the MBTA money through foregone savings, and if so, how much. The two contracts had established an agreed-upon cost over five years. When combined, the contracts totaled \$305.2 million to provide 4,105,500 revenue hours of bus service, amounting to \$74.34 per revenue hour of bus operation.

If the MBTA had continued purchasing 38.0 percent of its bus service through 2013, the most recent NTD year currently reported, and if the subsequent contracts had increased at the same rate as did the MBTA's operating expenses per revenue hour over the same period, its savings would have amounted to

\$412.2 million through 2013. Adding continuing losses in 2014 and 2015, the 1997 Pacheco Law decision cost the MBTA more than \$486.3 million through 2015.

During its Pacheco Law review, the state auditor’s office and the MBTA disagreed about the estimated one-time cost of transitioning from agency-provided to vendor-provided service, having to do with an unknown expense concerning potential payments to laid-off workers not hired by the vendor. The MBTA estimated the maximum liability to be between \$2.9 and \$4.3 million; the auditor’s office estimated \$36 million. The one-time transition cost, even at the auditor’s higher estimate, would have dropped the long-term savings through 2015 to \$450.3 million.

The following chart (figure 1) presents the MBTA’s annual reported operating cost for bus operations, revenue hours of service provided, and a comparison for each year with the terms of the contract. To estimate contract cost escalation from 2002 to 2013, the contract cost has been increased by the same percentage rate that the MBTA's cost per revenue hour increased each year. Because NTD data is not available for 2014-2015, the 2013 lost savings are carried forward to 2014 and 2015.

Figure 1. Lost savings due to the Pacheco Law: Annual reported bus operation operating cost, revenue hours of service provided, MBTA compared to terms of proposed contract, 1998-2015

Year	MBTA bus Operating expenses	MBTA bus revenue hours	MBTA Operating expenses per revenue hour	Contract rate 1998-2002, MBTA % increase 2003-2013	MBTA lost savings per revenue hour at contract rate	Contract revenue hours (38% of MBTA total)	MBTA contract mgmt overhead	MBTA lost savings per year	MBTA lost savings (cumulative)
1998	\$183,692,211	2,158,889	\$85.09	\$74.34	\$10.75	821,100	\$460,000	\$8,363,914	\$8,363,914
1999	\$198,916,973	2,164,427	\$91.90	\$74.34	\$17.56	823,206	\$460,000	\$13,997,835	\$22,361,749
2000	\$207,232,310	2,190,006	\$94.63	\$74.34	\$20.29	832,935	\$460,000	\$16,437,222	\$38,798,970
2001	\$213,815,095	2,187,072	\$97.76	\$74.34	\$23.42	831,819	\$460,000	\$19,023,838	\$57,822,809
2002	\$231,169,949	2,294,935	\$100.73	\$74.34	\$26.39	872,843	\$460,000	\$22,574,763	\$80,397,571
2003	\$234,058,306	2,193,427	\$106.71	\$78.75	\$27.96	834,236	\$476,454	\$22,846,117	\$103,243,688
2004	\$242,582,169	2,103,426	\$115.33	\$85.11	\$30.21	800,006	\$496,962	\$23,674,963	\$126,918,651
2005	\$264,427,058	2,656,304	\$99.55	\$73.47	\$26.08	1,010,284	\$503,878	\$25,844,765	\$152,763,416
2006	\$286,817,772	2,386,915	\$120.16	\$88.68	\$31.48	907,826	\$525,816	\$28,053,933	\$180,817,349
2007	\$296,770,498	2,374,054	\$125.01	\$92.26	\$32.75	902,935	\$535,193	\$29,036,289	\$209,853,638
2008	\$306,383,692	2,306,448	\$132.84	\$98.04	\$34.80	877,222	\$553,192	\$29,976,189	\$239,829,827
2009	\$331,334,211	2,279,516	\$145.35	\$107.27	\$38.08	866,979	\$550,393	\$32,465,165	\$272,294,993
2010	\$335,275,969	2,310,631	\$145.10	\$107.09	\$38.02	878,813	\$565,798	\$32,842,534	\$305,137,527
2011	\$344,470,480	2,338,608	\$147.30	\$108.71	\$38.59	889,453	\$571,874	\$33,752,638	\$338,890,165
2012	\$369,323,989	2,350,758	\$157.11	\$115.95	\$41.16	894,074	\$586,365	\$36,214,657	\$375,104,822
2013	\$377,855,295	2,283,137	\$165.50	\$122.14	\$43.36	868,356	\$596,061	\$37,055,057	\$412,159,878
2014	National Transit Database data not available for 2014 (2013 savings carried forward)							\$37,055,057	\$449,214,935
2015	National Transit Database data not available for 2015 (2013 savings carried forward)							\$37,055,057	\$486,269,992
1998-2015	Total savings 1998-2013 (MBTA escalation 2003-2013) less \$36 million start-up cost							TOTAL	\$450,269,992

The lost savings amount of \$450.3 million from 1998 to 2015 is a conservative estimate in that it assumes that the contract rate from 2003 through 2013 would have increased at the same rate that the MBTA's operating cost per bus revenue hour increased. The MBTA's savings would have been substantially greater if the rate of increase of the contract from 2003 forward had been held to 133 percent of the Consumer Price Index of the Boston area. In that case the savings would have totaled \$52.1 million in 2013 and \$531.5 million from 1998 through 2015. In other words, even if the rate of increase of the contract had exceeded the Consumer Price Index by a sizable percentage, the MBTA would have saved \$531.5 million to date.

Figure 2, shows how much the MBTA would have saved if it had continued to purchase 38% of its bus service and held the increase of the rate of subsequent contracts to one and one-third times the Consumer Price Index for the Boston area.

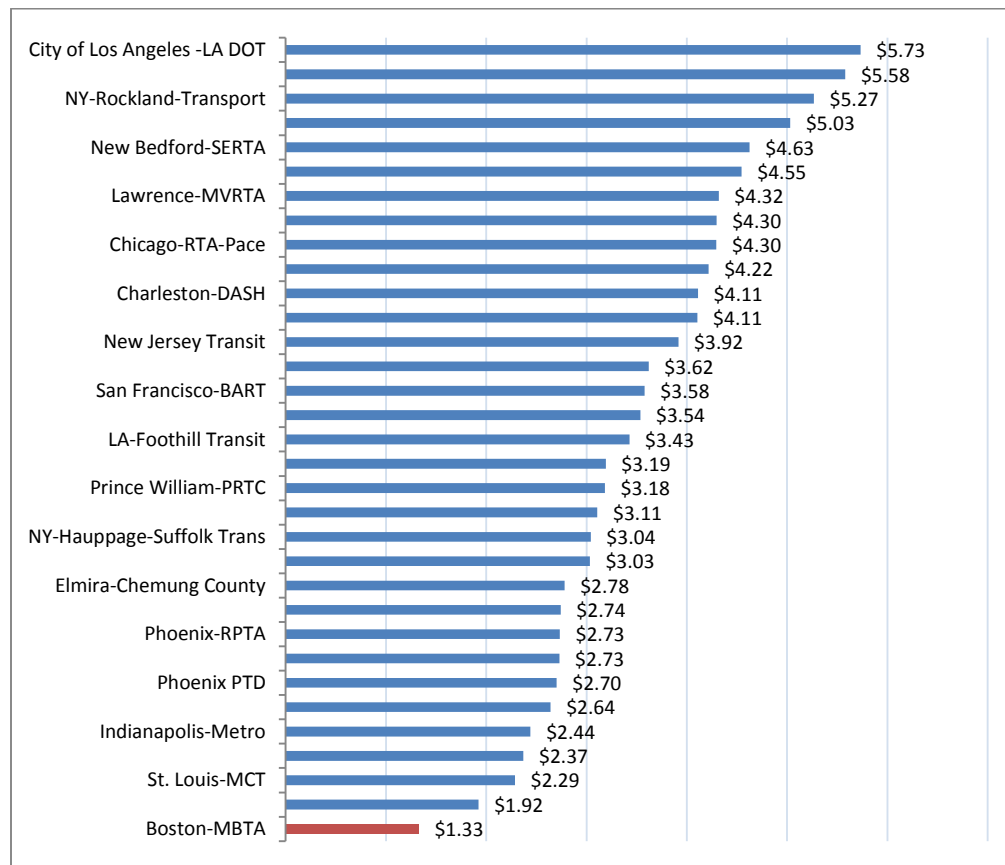
Figure 2. Lost savings if subsequent contracts increased at 1 1/3 times Boston area CPI: Annual reported bus operation operating cost, revenue hours of service provided, MBTA compared to terms of proposed contract, 1998-2015

Year	MBTA Operating expense (bus)	MBTA bus revenue hours	MBTA Operating expense per revenue hour	Contract rate 1998-2002, 133% CPI increase 2003-2013	MBTA lost savings per revenue hour at contract rate	Contract revenue hours (38% of MBTA total)	MBTA contract mgmt overhead	MBTA lost savings per year	MBTA lost savings (cumulative)
1998	\$183,692,211	2,158,889	\$85.09	\$74.34	\$10.75	821,100	\$460,000	\$8,363,914	\$8,363,914
1999	\$198,916,973	2,164,427	\$91.90	\$74.34	\$17.56	823,206	\$460,000	\$13,997,835	\$22,361,749
2000	\$207,232,310	2,190,006	\$94.63	\$74.34	\$20.29	832,935	\$460,000	\$16,437,222	\$38,798,970
2001	\$213,815,095	2,187,072	\$97.76	\$74.34	\$23.42	831,819	\$460,000	\$19,023,838	\$57,822,809
2002	\$231,169,949	2,294,935	\$100.73	\$74.34	\$26.39	872,843	\$460,000	\$22,574,763	\$80,397,571
2003	\$234,058,306	2,193,427	\$106.71	\$77.88	\$28.82	834,236	\$476,454	\$23,569,846	\$103,967,417
2004	\$242,582,169	2,103,426	\$115.33	\$82.35	\$32.97	800,006	\$496,962	\$25,882,271	\$129,849,688
2005	\$264,427,058	2,656,304	\$99.55	\$83.88	\$15.67	1,010,284	\$503,878	\$15,323,256	\$145,172,943
2006	\$286,817,772	2,386,915	\$120.16	\$88.75	\$31.41	907,826	\$525,816	\$27,991,932	\$173,164,876
2007	\$296,770,498	2,374,054	\$125.01	\$90.86	\$34.15	902,935	\$535,193	\$30,297,206	\$203,462,082
2008	\$306,383,692	2,306,448	\$132.84	\$94.93	\$37.91	877,222	\$553,192	\$32,698,507	\$236,160,589
2009	\$331,334,211	2,279,516	\$145.35	\$94.29	\$51.06	866,979	\$550,393	\$43,718,483	\$279,879,072
2010	\$335,275,969	2,310,631	\$145.10	\$97.81	\$47.29	878,813	\$565,798	\$40,994,788	\$320,873,859
2011	\$344,470,480	2,338,608	\$147.30	\$99.21	\$48.09	889,453	\$571,874	\$42,199,573	\$363,073,432
2012	\$369,323,989	2,350,758	\$157.11	\$102.56	\$54.55	894,074	\$586,365	\$48,183,055	\$411,256,487
2013	\$377,855,295	2,283,137	\$165.50	\$104.82	\$60.68	868,356	\$596,061	\$52,092,769	\$463,349,256
2014	National Transit Database data not available for 2014 (2013 savings carried forward)							\$52,092,769	\$515,442,026
2015	National Transit Database data not available for 2015 (2013 savings carried forward)							\$52,092,769	\$567,534,795
1998-2015	Total savings 1998-2013 (1.33 x CPI escalation 2003-2013) less \$36 million start-up cost							TOTAL	\$531,534,795

OUTSOURCING AT THE MBTA AND NATIONALLY

It may surprise observers of the MBTA that prior to 1997 the MBTA had been outsourcing a substantial amount of bus service elsewhere within the MBTA district. The Authority had been authorized to do so by the legislature's passage of the 1980 MBTA Management Rights Act. During 1997, the year of the Pacheco ruling, the MBTA continued to provide purchased bus service under pre-existing contracts with private companies. The MBTA paid contractors in 1997 for a total of 4.65 million revenue miles of bus service (17 percent of the MBTA's total), which ranked the T as the seventh largest purchaser of privately contracted bus service in the U.S. that year. In 1997 the MBTA paid vendors to operate 65 large buses and 25 smaller ones. As shown in figure 3, the MBTA's cost for contracted bus service, as reported on the NTD, was \$1.33 per revenue mile: the lowest of any U.S. bus transit agency that provided more than a million miles of contracted bus service.

Figure 3. Cost of contracted bus service per revenue mile, US bus transit with > 1 million miles of contracted service, 1997



The MBTA was actively involved in purchasing bus services prior to the Pacheco Law decision in 1997. Figure 4 presents data on the total revenue miles, revenue hours, operating cost per revenue hour and operating cost per revenue mile for US bus transit agencies with over 1 million miles of contracted service in 1997.

Figure 4. Cost of contracted bus service per revenue mile, US bus transit with > 1 million miles of contracted service, 1997

System	Miles (000)	Hours (000)	\$/Hour	\$/Mile
Boston-MBTA	4,648.91	166.42	\$37.11	\$1.33
Providence-GATRA	1,935.18	78.14	\$47.62	\$1.92
St. Louis-MCT	1,431.59	89.94	\$36.38	\$2.29
Oakland-Vallejo Transit	2,040.95	107.26	\$45.08	\$2.37
Indianapolis-Metro	1,302.49	80.81	\$39.35	\$2.44
LA-LACMTA-Metro	6,248.84	361.61	\$45.63	\$2.64
Phoenix PTD	1,139.28	83.77	\$36.75	\$2.70
San Diego-SANDAG	6,159.69	467.45	\$35.96	\$2.73
Phoenix-RPTA	2,148.43	191.64	\$30.65	\$2.73
Lancaster-AV Transit	1,393.08	64.87	\$58.89	\$2.74
Elmira-Chemung County	1,003.12	59.99	\$46.50	\$2.78
Austin-Capital Metro	3,469.23	198.00	\$53.14	\$3.03
NY-Hauppauge-Suffolk Trans	6,324.20	324.34	\$59.32	\$3.04
Maryland-Ride-On	1,630.72	96.58	\$52.46	\$3.11
Prince William-PRTC	1,577.69	78.80	\$63.77	\$3.18
Atlanta-CCT	1,680.97	88.12	\$60.88	\$3.19
LA-Foothill Transit	9,000.12	539.04	\$57.23	\$3.43
Modesto-MAX	1,324.11	96.23	\$48.65	\$3.54
San Francisco-BART	2,128.70	103.99	\$73.28	\$3.58
Santa Rosa-Sonoma County	1,407.45	81.79	\$62.31	\$3.62
New Jersey Transit	6,783.49	511.26	\$51.96	\$3.92
Oakland-Wheel	1,220.23	75.61	\$66.26	\$4.11
Charleston-DASH	1,618.47	132.49	\$50.23	\$4.11
Denver-RTD	7,259.55	483.78	\$63.27	\$4.22
Chicago-RTA-Pace	3,250.77	173.45	\$80.50	\$4.30
SF-SamTrans	2,532.62	135.54	\$80.28	\$4.30
Lawrence-MVRTA	1,154.67	83.02	\$60.06	\$4.32
Baltimore-Maryland-MTA	1,940.24	78.68	\$112.12	\$4.55
New Bedford-SERTA	1,395.51	115.31	\$56.00	\$4.63
Brockton-BAT	1,403.97	113.50	\$62.24	\$5.03
NY-Rockland-Transport	1,286.21	64.23	\$105.50	\$5.27
Seattle-Snohomish-Commun.	1,523.52	64.42	\$131.96	\$5.58
Los Angeles (LA DOT)	2,245.06	183.45	\$70.18	\$5.73

By contrast, as figure 5 shows, the MBTA's cost for agency-operated bus service in 1997 was \$8.10 per revenue mile, the sixth most expensive of the nation's 33 largest bus transit agencies. The \$8.10 per revenue mile spent on in-house bus service at the MBTA in 1997 is six times higher than the \$1.33 per mile spent on contracted bus service that year.

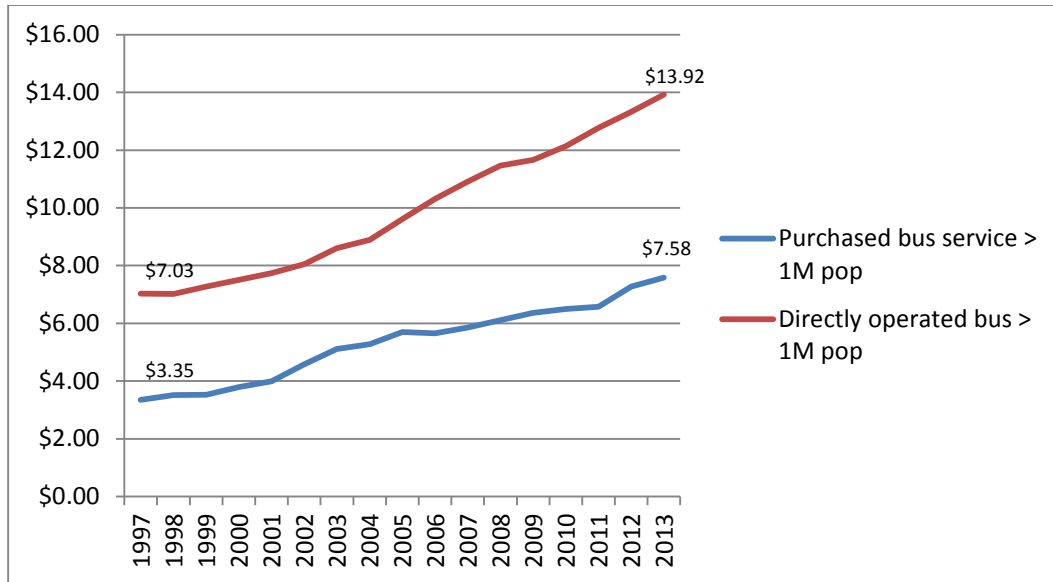
Figure 5. Expense per revenue mile and expense per revenue hour compared with transit agencies with greatest number of annual revenue miles of contracted bus service, 1997

System	Miles	Hours	\$/Hour	\$/Mile
San Antonio-VIA	18,018.24	1,273.14	\$46.83	\$3.31
Salt Lake City-UTA	17,047.31	891.59	\$66.71	\$3.49

NJ Transit (Contract)	17,134.37	1,329.34	\$56.03	\$4.35
Chicago-RTA-Pace	16,220.48	988.93	\$74.23	\$4.53
San Diego Transit	11,335.44	976.26	\$57.71	\$4.97
Houston-Metro	36,283.76	2,485.75	\$72.66	\$4.98
Denver-RTD	23,987.07	1,331.70	\$91.31	\$5.07
St. Louis-Bi-State	18,845.06	1,237.89	\$78.20	\$5.14
Milwaukee-County	17,640.51	1,457.43	\$63.89	\$5.28
LA-OCTA	15,616.00	1,210.16	\$69.89	\$5.42
Portland-Tri-Met	21,239.99	1,665.12	\$71.18	\$5.58
Miami-MDTA	23,765.35	1,849.78	\$74.01	\$5.76
Atlanta-MARTA	26,638.14	2,151.62	\$71.86	\$5.80
Minneapolis-St. Paul-MCTO	22,909.03	1,656.65	\$80.85	\$5.85
New Orleans-RTA	12,018.93	895.25	\$80.27	\$5.98
Honolulu-DTS	16,204.11	1,165.37	\$85.03	\$6.12
New Jersey Transit	63,119.93	4,147.06	\$96.49	\$6.34
Pittsburgh-PAT	24,166.14	1,809.81	\$85.48	\$6.40
Cleveland-RTA	21,306.67	1,689.44	\$82.83	\$6.57
Seattle-Metro	30,808.53	2,212.37	\$92.45	\$6.64
Detroit-D-DOT	17,905.87	1,527.68	\$85.30	\$7.28
Chicago-RTA-CTA	64,932.58	6,453.76	\$74.58	\$7.41
Oakland-AC Transit	19,242.26	1,611.92	\$88.67	\$7.43
Baltimore-Maryland-MTA	18,060.81	1,649.50	\$82.09	\$7.50
Dallas-DART	18,066.90	1,398.61	\$97.09	\$7.52
San Jose-SCCTD	17,451.36	1,280.26	\$102.96	\$7.55
Washington-WMATA	33,742.57	3,023.30	\$89.85	\$8.05
Boston-MBTA	22,470.22	2,140.02	\$85.10	\$8.10
LA-LACMTA-Metro	71,876.51	5,930.51	\$101.40	\$8.37
Philadelphia-SEPTA	33,781.27	2,733.46	\$110.58	\$8.95
San Francisco-Muni	12,118.69	1,327.57	\$91.99	\$10.08
NYCDOT-GTJC	11,783.99	1,338.64	\$91.91	\$10.44
NY-MTA-NYCTA	86,844.38	11,279.76	\$95.75	\$12.44

Figure 6 compares the cost per revenue mile of purchased bus services with directly operated bus service by transit agencies serving areas with populations greater than one million from 1997 to 2013. It demonstrates that directly provided service has been consistently more expensive.

Figure 6. Comparison of expense per revenue mile of purchased bus services with directly operated bus service by major transit agencies, 1997-2013



The data presented in figure 7 shows transit agencies that provided hybrid service in 1997, a combination of a substantial amount of purchased service and agency-provided service, demonstrating that purchased service was less expensive per revenue mile and per revenue hour.

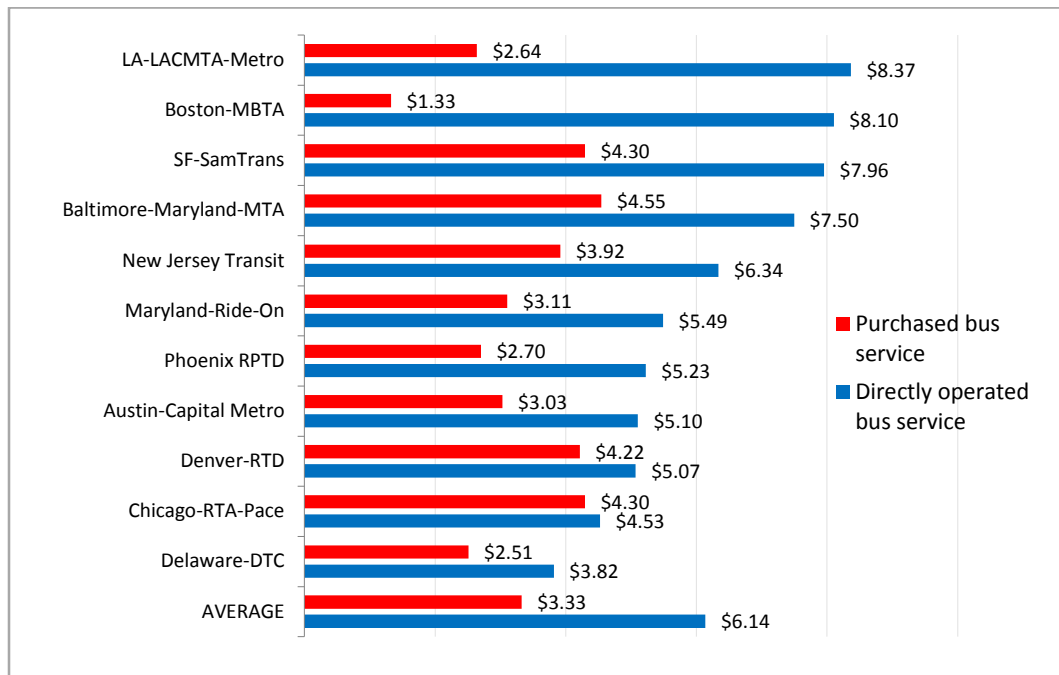
Figure 7. Operating expense per revenue mile and operating expense per revenue hour, 11 transit agencies providing a combination of directly operated and contracted bus service, 1997

System	Mode	Revenue miles	Revenue hours	\$/mile	\$/hour
Boston-MBTA	Direct	22,470	2,140	\$8.10	\$85.10
Boston-MBTA	Purchased	4,649	166	\$1.33	\$37.11
New Jersey Transit	Direct	63,120	4,147	\$6.34	\$96.49
New Jersey Transit	Purchased	6,784	511	\$3.92	\$51.96
Baltimore-Maryland-MTA	Direct	18,061	1,650	\$7.50	\$82.09
Baltimore-Maryland-MTA	Purchased	1,940	79	\$4.55	\$112.12
Maryland-Ride-On	Direct	6,147	370	\$5.49	\$91.27
Maryland-Ride-On	Purchased	1,631	97	\$3.11	\$52.46
Delaware-DTC	Direct	5,099	308	\$3.82	\$63.23
Delaware-DTC	Purchased	922	30	\$2.51	\$78.02
Chicago-RTA-Pace	Direct	16,221	989	\$4.53	\$74.23
Chicago-RTA-Pace	Purchased	3,251	174	\$4.30	\$80.50
Austin-Capital Metro	Direct	8,535	645	\$5.10	\$67.58
Austin-Capital Metro	Purchased	3,469	198	\$3.03	\$53.14
Denver-RTD	Direct	23,987	1,332	\$5.07	\$91.31
Denver-RTD	Purchased	7,260	484	\$4.22	\$63.27
SF-SamTrans	Direct	4,948	437	\$7.96	\$90.04
SF-SamTrans	Purchased	2,533	136	\$4.30	\$80.28
Phoenix PTD	Direct	9,510	673	\$5.23	\$73.80

Phoenix PTD	Purchased	1,139	84	\$2.70	\$36.75
LA-LACMTA-Metro	Direct	71,877	5,931	\$8.37	\$101.40
LA-LACMTA-Metro	Purchased	6,249	362	\$2.64	\$45.63

Of the 11 transit agencies that provided a combination of directly provided and contracted bus service of approximately 1 million or more revenue miles in 1997, the MBTA's cost of directly provided service was second highest (behind Los Angeles-LACMTA-Metro), while the agency's cost per contracted bus service was lowest (figure 8).

Figure 8. Purchased Bus Service vs. Directly Operated Bus Service, US transit systems, 1997

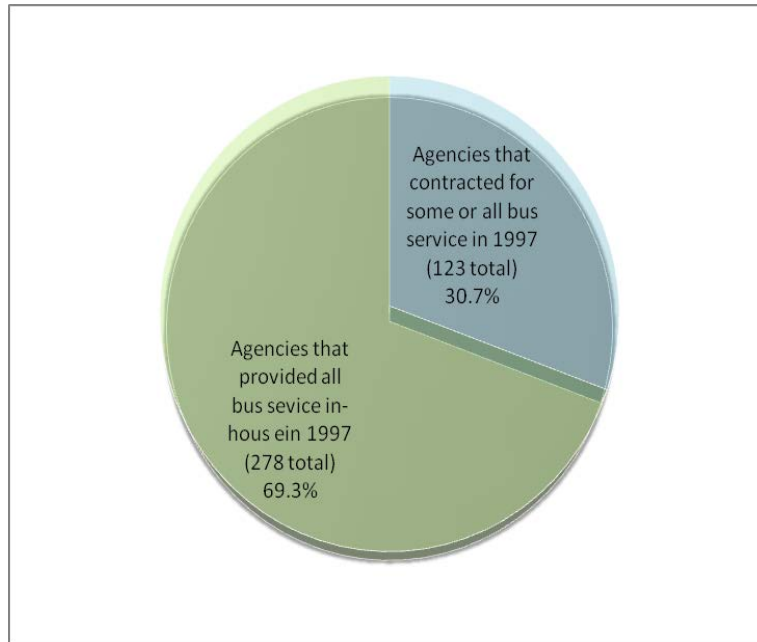


In 1997, 123 of the nation's 401 active bus transit agencies, or 30.7 percent (see data in figure 9 and graph in figure 10) purchased some or all bus service from private contractors. Of 401 transit agencies, 278 provided all service in-house, 70 contracted for all bus service, 53 provided a combination of direct and purchased service, 331 provided some or all service directly, and 123 purchased either some or all bus service.

Figure 9. Extent of in-house and contracted services, US bus transit agencies, 1997

Agencies providing all bus service in-house	278
Agencies contracting for all bus service	70
Agencies providing a combination of in-house and contracted service	53
Agencies providing some or all bus service in-house	331
Agencies contracting for some or all bus service	123
Total bus agencies	401

Figure 10. US transit agencies contracting some or all bus service, 1997



Privatization in Mass Transit in the US Since 1997

In this section of the report, we compare the privatization trends at the MBTA to others across the country. What is evident from the data is that since the Pacheco Law barred the MBTA from contracting for bus service in 1997, the nation’s biggest transit agencies have added 127 million annual miles of purchased service and subtracted 82 million annual miles of agency-provided service.

Since the Pacheco Law barred the MBTA from contracting for bus service in 1997, the nation’s biggest transit agencies have added 127 million annual miles of purchased service and subtracted 82 million annual miles of agency-provided service.

Since the 1997 Pacheco Law ruling, Massachusetts has gone in the opposite direction of other U.S. transit agencies with respect to contracting for bus service. According to data from the NTD (presented in figures 11A and 11B), U.S. transit agencies serving population areas of one million or more increased their total amount of purchased bus service from 93.9 million revenue miles in 1997 to 221.8 million in 2013—an increase of 127.9 million (136.2 percent.) Over the same period, the total amount of directly operated bus service at these larger transit agencies has decreased from 1.15 billion revenue miles to 1.07 billion miles, a drop of 82.0 million, meaning that agencies have been substituting purchased service for agency-provided service to a considerable extent.

Figure 11A. Total Purchased Bus Service, by revenue mile, US Transit Agencies Serving > 1 million, 1997-2013

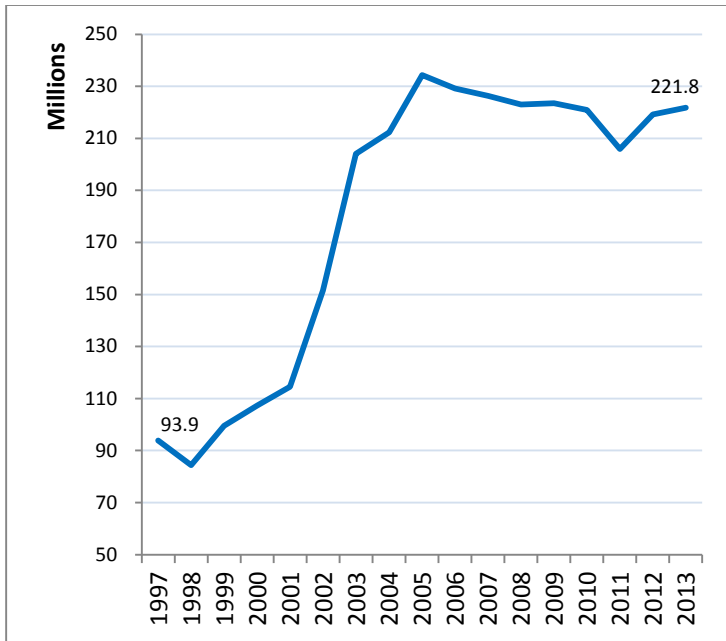
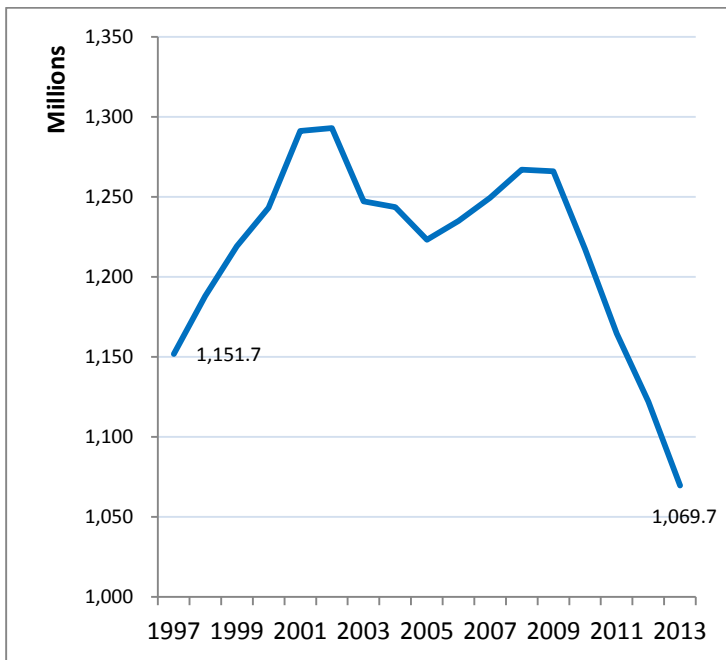
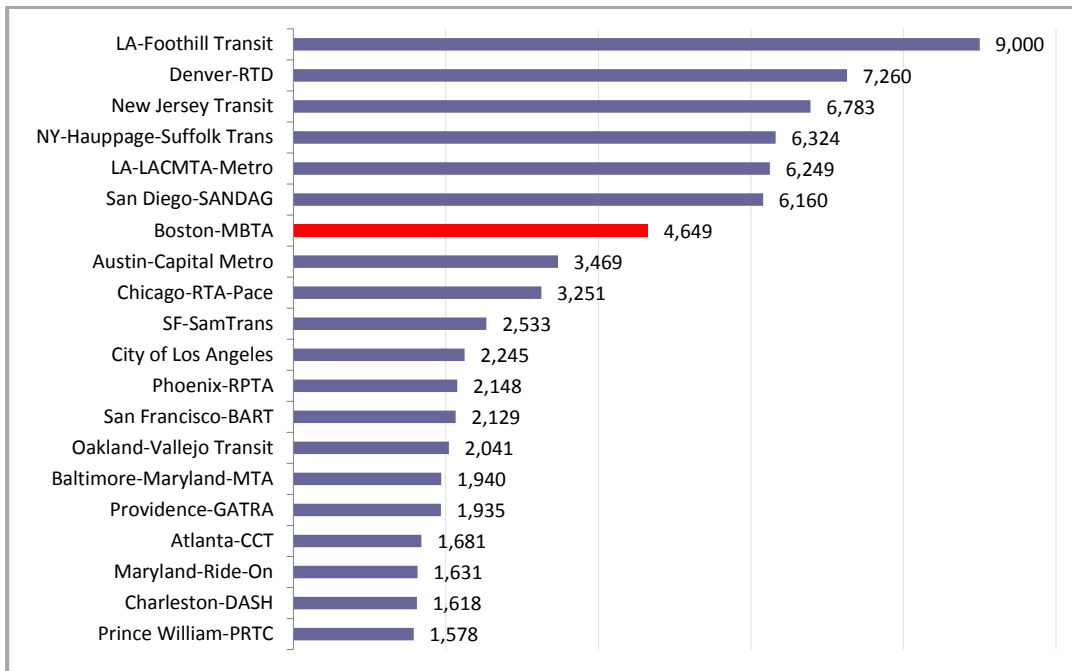


Figure 11B. Total direct service, by revenue mile, US transit agencies serving > 1 million, 1997-2013



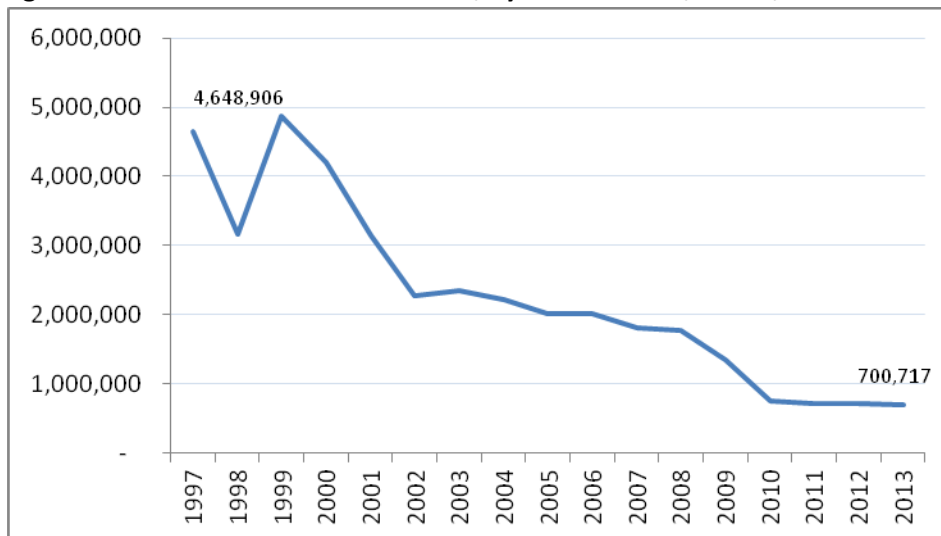
In 1997, the MBTA continued to provide contracted bus service under previously existing contracts that were grandfathered by the effect of the Management Right's Act. That year, as can be seen in figure 12, the MBTA purchased a total 4.65 million miles of private bus service, ranking it as the seventh largest purchaser of contracted bus service of the nation's transit agencies. By contrast, during that same year, the MBTA's cost per revenue mile for directly operated bus service was the sixth highest among the nation's biggest providers of transit bus service, at \$8.10 per mile.

Figure 12. Largest Purchasers of Contracted Bus Service in 1997, Total Purchased Bus Service Miles



As figure 13 shows, from 1997 to 2013, following the Pacheco ruling, the MBTA reduced its purchased bus service from 4.6 million to 0.7 million revenue miles per year, a decrease of 84.9 percent.

Figure 13. Total Purchased Bus Service, by revenue mile, MBTA, 1997-2013



Among U.S. transit agencies serving areas with populations greater than 1 million in 2013, the average cost for purchased bus service was \$7.58 per revenue mile — 41.3 percent less than the \$12.92 cost for directly provided bus service by those agencies. A 2011 report by the National Center for Transit Research entitled “Analysis of Contracting for Fixed Route Bus Service” found that large transit systems - those with 250 or more vehicles operating at maximum service- paid 40.4 percent less for purchased bus

transportation per revenue mile (\$6.67 per mile) than for directly provided bus transportation (\$11.19 per mile) in 2008.

A November 2013 report by the National Center for Transit Research entitled “Transit Contracting Models and Proper Incentives for Long Term Success” concluded that “contracting with private service providers for the management, operation and maintenance of transit services has become an acceptable business practice within the transit industry.” It also concluded, “The most common reason that transit agencies contracted service was to improve operational cost efficiency, followed by the desire to take advantage of resources available to private contractors that would enhance the agency’s capability to start new service or expand existing service.”

These national trends—and the opportunity for efficiency and cost savings through purchase of bus transportation—have been lost to the MBTA because of the Pacheco Law.

WHY DOES THE MBTA’S BUS SERVICE COST SO MUCH?

So why are the MBTA’s operating costs for bus service so high? In order to understand the specific cost differentials, this section provides a series of analyses of operational efficiency comparing the MBTA to other transit agencies. These include the MBTA’s INTDAS-designated peer agencies as well as regional transit authorities, hybrid US transit agencies that purchase bus transportation as well as provide it directly, US transit agencies with robust outsourcing, and major US transit agencies that serve areas with significant snowfall. This analysis examines cost-efficiency data, repair and maintenance costs, staffing, age of bus fleets, miles and hours of revenue service per year, and capital expenditure for buses.

“Cost efficiency” versus “cost effectiveness” measures

This report compares the MBTA’s bus service with that of other agencies using “operating expense per revenue mile” and “operating expense per revenue hour” as its basis of comparison. These statistics are described as cost efficiency measures in Transit Cooperative Research Program (TCRP) Report 141, “A Methodology for Performance Measurement and Peer Comparison in the Public Transportation Industry” sponsored by the FTA. The TCRP report explains: “Operating cost per revenue hour and operating cost per revenue mile measure how much it costs to provide a unit of service. These types of measures are very common and are utilized by virtually all transit systems when evaluating system-wide performance.” According to the NTD, “Cost efficiency is the relationship between service inputs and service outputs.” Vehicle Revenue Miles (VRM) and Vehicle Revenue Hours (VRH) are the miles and hours a transit vehicle travels while in revenue service. A transit vehicle is in revenue service when the vehicle is available to the public with the expectation of carrying passengers. Cost efficiency measures compare the actual cost of providing a mile of vehicle service and hour of vehicle service, irrespective of how many passengers are on board the vehicle during such service. This report uses cost efficiency measures as its basis of comparison because cost efficiency is highly relevant to decisions about the outsourcing of fixed bus routes, such as the one made by the Pacheco decision in 1997.

Alternative transit statistics such as “operating expenses per passenger trip” and “operating expenses per passenger mile” are cost effectiveness measures and are useful in comparing whether operating expenses are being used in a cost effective manner. Cost effectiveness measures are especially useful in deciding about resource allocation, hours of operation, and scheduling of service. For example, the MBTA incurs measurable costs to run a fixed schedule of bus service between Forest Hills station and East Walpole forty times a day during regular weekday starting at 4:53 a.m. and ending at 12:12 a.m.

Cost effectiveness measures include operating expenses per passenger trip and operating expenses per passenger mile trip that can help to assess whether the provision of such service is cost effective; i.e., is it cost-effective to operate very early morning and very late night bus service if few passengers use the service at those times? That is a useful thing to consider and one that the MassDOT Board of Directors should study, but it does not concern the actual unit cost of providing the service. The cost of providing such service remains virtually unchanged regardless of how many passengers use it, with the exception of the marginal increase in fuel costs associated with the carrying of more passengers. Fuel costs constituted 6.2 percent of the MBTA bus budget in 2013, and the addition of one extra passenger per large transit bus during all hours of service would increase fuel consumption by approximately 4/10ths of 1 percent system-wide, which would add approximately \$83,800 per extra passenger per year on average. The addition of 10 extra passengers per bus mile (the MBTA had 11.8 passengers per bus mile in 2013) would add approximately \$830,000 per year to the MBTA's bus budget (\$377.8 million in 2013), a relatively small percentage. Other than that, passenger statistics are not directly relevant to the comparative cost analysis of purchased versus directly provided bus transportation. The cost-efficiency measures used in this report address how much it costs the MBTA per mile and per hour of service in comparison with its peer bus transit agencies.

The MBTA's bus service cost efficiency compared to INTDA-Designated Peer Transit Agencies

This section presents a comparison of the MBTA's bus service with that of five peer transit agencies identified as peers by the Integrated National Transit Database Analysis System. INTDAS is a web database system designed for retrieval and analysis of data from the NTD and is partially funded by the FTA in cooperation with and under the direction and leadership of the Florida Department of Transportation's Transit Information System. As one of its many useful and valuable functions, INTDAS includes an online automated transit agency peer identification process that identifies comparable transit systems for peer analyses.

The peer-grouping methodology can be applied to a transit agency as a whole (considering all modes operated by that agency) or to any of the specific modes an agency operates. This report looks at the bus transportation mode.

The peer transit agencies utilized in this report represent all five transit systems identified by INTDAS as having "likeness scores" good enough not to be deemed "undesirable due to a large number of differences with the target agency." Likeness scores are used to determine the level of similarity between a potential peer agency and the target agency both with respect to individual factors (e.g., urban area population, modes operated, and service areas) and for the agencies overall.

According to INTDAS:

A total likeness score of 0 indicates a perfect match between two agencies (and is unlikely to ever occur). Higher scores indicate greater levels of dissimilarity between two agencies. In general, a total likeness score under 0.50 indicates a good match, a score between 0.50 and 0.74 represents a satisfactory match, and a score between 0.75 and 0.99 represents potential peers that may be usable, but care should be taken to investigate potential differences that may make them unsuitable. Peers with scores greater than or equal to 1.00 are undesirable due to a large number of differences with the target agency, but may occasionally be the only candidates available to fill out a peer group.

As shown in figure 14, the five transit systems used in this analysis received transit peer likeness scores from the automated INTDAS of less than 1.00, making them acceptable peers for analysis with the MBTA as the target agency. All other transit systems received likeness scores higher than 1.0 and were therefore deemed undesirable due to a large number of differences with the MBTA.

Figure 14. Transit Agencies and INTDAS Peer Likeness Scores

Transit Agency	City	State	INTDAS Score
Massachusetts Bay Transportation Authority (target agency)	Boston	MA	0.00
Maryland Transit Administration	Baltimore	MD	0.45
Southeastern Pennsylvania Transportation Authority	Philadelphia	PA	0.73
Washington Metropolitan Area Transit Authority	Washington	DC	0.80
Metropolitan Atlanta Rapid Transit Authority	Atlanta	GA	0.90
Miami-Dade Transit	Miami	FL	0.96

As figure 15 shows, of the five bus transit agencies designated by the FTA-sponsored INTDAS website as acceptable peers of the MBTA for purposes of comparison, the MBTA's bus division had the highest cost in 2013 at \$16.63 per revenue mile, 36.5 percent higher than the \$12.19 average of the five peer agencies. Had the MBTA reduced its total operating expenses per revenue mile in 2013 to the average of its five INTDAS peers, it would have saved \$101.0 million dollars in 2013. Over the 10-year period from 2004 to 2013, the MBTA had operating costs per bus mile of \$13.13, 19.5 percent higher than its five peer bus agencies. Had the MBTA operated at the average cost per revenue mile of its peer agencies over that ten year period, it would have saved \$513.9 million. Of the five peer bus transit agencies, the MBTA had the highest cost per revenue hour in 2013 at \$165.50, 21.9 percent higher than the \$135.73 average of the five peer agencies. Had the MBTA reduced its total operating expenses per revenue hour in 2013 to the average of its five INTDAS peers, it would have saved \$68.0 million dollars. Over the 10-year period from 2004 to 2013, the MBTA had operating costs per bus hour of \$134.90, 8.7 percent higher than its five peer bus agencies. Had the MBTA operated at the average cost per revenue hour of its peer agencies over that period, it would have saved more than \$252.2 million dollars.

Figure 15. Cost per revenue mile and per revenue hour, MBTA vs. five INTDAS Peers

Transit Agency	Operating expense/VRM 2013	Operating expense/VRM 2004-2013	Operating expense/VRH 2013	Operating expense/VRH 2004-2013
Boston (MBTA)	\$16.63	\$13.13	\$165.50	\$134.90
Philadelphia (SEPTA)	\$14.99	\$12.72	\$153.57	\$130.62
Washington, D.C. (WMATA)	\$14.09	\$12.76	\$147.13	\$138.90
Baltimore (MTA)	\$11.51	\$12.05	\$133.51	\$137.94
Atlanta (MARTA)	\$9.69	\$7.96	\$118.30	\$98.17
Miami (MDT)	\$10.66	\$9.47	\$126.12	\$114.95
AVERAGE 5 PEERS	\$12.19	\$10.99	\$135.73	\$124.12
MBTA above peer average/VRM	\$4.44	\$2.14	\$29.77	\$10.78
MBTA % above peer average/VRM	36.5%	19.5%	21.9%	8.7%
MBTA VRM	22,719,357	240,272,542	2,283,137	23,389,797
<i>MBTA savings if at peer average</i>	\$100,976,744	\$513,861,263	\$67,974,716	\$252,187,976

The MBTA's bus service cost efficiency compared to Massachusetts' Regional Transit Authorities

As figure 16 shows, the MBTA had a higher cost per revenue mile in 2013 than that of the Regional Transit Authorities (RTAs) in Massachusetts. The MBTA's 2013 cost per revenue mile was \$16.63 for directly provided service, more than double the average of the 13 RTAs, which was \$6.22. Note that the MBTA is included among the group listed as providing purchased transportation in 2013. This is because the MBTA continued to pay for \$700,017 in residual purchased services at an average cost per revenue mile of \$4.41. As noted in a previous section, the Pacheco Law does not apply to the Regional Transit Authorities. The differential in cost is not fully attributable to the Pacheco Law, given modest differentials in cost of living between Boston and other parts of the state. That said, the cost differentials are sizable and clearly raise the question of why the MBTA has not been given the opportunity to operate in a manner similar to the RTAs regarding the purchasing of bus service.

Figure 16. Cost per revenue mile, MBTA vs. Massachusetts RTAs, 2013



As figure 17 shows, the MBTA had the highest cost per revenue hour in 2013 compared to the Massachusetts RTAs. The MBTA's 2013 cost per revenue hour for directly provided service was \$165.50, nearly twice the \$86.32 average of the 12 RTAs that purchase bus transportation.

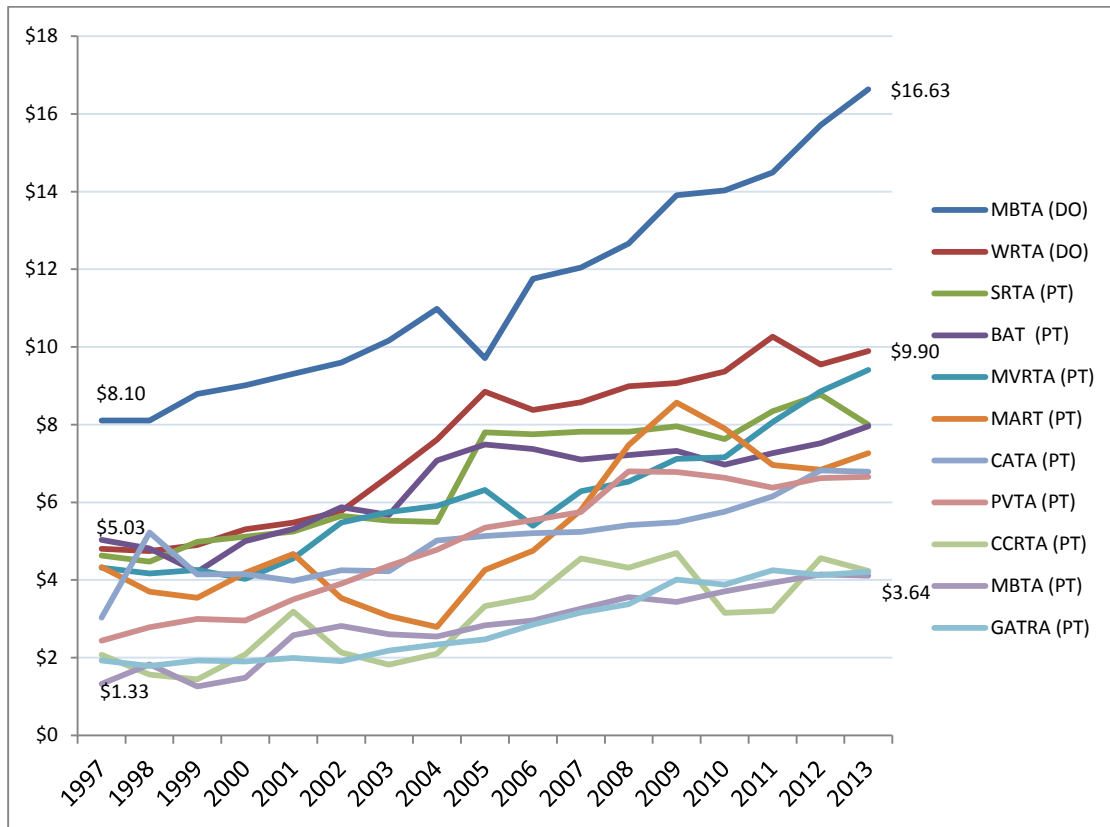
Figure 17. Cost per revenue hour and per revenue mile, MBTA vs. Massachusetts RTAs, 2013

Agency	Mode	Operating expense	Vehicle revenue miles	Vehicle revenue hours	\$ per VRH	\$ per VRM
Merrimack Valley Regional Transit Authority(MVRTA)	PT	\$11,421,716	1,214,103	109,859	\$103.97	\$9.41
Southeastern Regional Transit Authority(SRTA)	PT	\$11,320,126	1,415,854	107,172	\$105.63	\$8.00
Brockton Area Transit Authority(BAT)	PT	\$10,127,285	1,272,694	110,323	\$91.80	\$7.96
Montachusett Regional Transit Authority(MART)	PT	\$4,803,110	661,333	43,879	\$109.46	\$7.26
Lowell Regional Transit Authority(LRTA)	PT	\$7,968,905	1,172,348	79,955	\$99.67	\$6.80
Cape Ann Transportation Authority(CATA)	PT	\$1,665,789	245,524	17,222	\$96.72	\$6.78

Pioneer Valley Transit Authority(PVTA)	PT	\$29,192,499	4,385,363	324,283	\$90.02	\$6.66
Berkshire Regional Transit Authority(BRTA)	PT	\$4,514,735	817,560	48,318	\$93.44	\$5.52
Cape Cod Regional Transit Authority(CCRTA)	PT	\$5,004,229	1,181,930	80,836	\$61.91	\$4.23
Greater Attleboro-Taunton Regional Transit Authority(GATRA)	PT	\$6,525,645	1,549,250	87,034	\$74.98	\$4.21
Massachusetts Bay Transportation Authority(MBTA)	PT	\$2,882,602	700,717	53,099	\$54.29	\$4.11
MetroWest Regional Transit Authority(MWRTA)	PT	\$2,964,476	813,622	54,988	\$53.91	\$3.64
REGIONAL TRANSIT AUTHORITIES (purchased transportation)	PT	98,391,117	15,430,298	1,116,968	\$86.32	\$6.22
Massachusetts Bay Transportation Authority(MBTA)	DO	\$377,855,295	22,719,357	2,283,137	\$165.50	\$16.63

Figure 18 shows the substantial additional operating cost per revenue mile of the MBTA's directly provided service in comparison with the RTA's cost of purchased transportation.

Figure 18. Trend of cost per revenue mile, MBTA vs. Massachusetts RTAs, 2007-2013



The MBTA's bus service cost efficiency compared to the largest fixed route large bus operators in 2002

The analyses in figures 19-21 compare the cost-efficiency of MBTA bus service to that of the transit systems that purchased the most large bus (40 feet or greater) service in 2002, showing operating cost

per revenue mile from 2002-2013. Had the MBTA been allowed to purchase bus service for the five year period from 1998 to 2002, which the Pacheco Law prevented, it would have had the option to re-procure bus services for the following years at the conclusion of the initial contract. Figure 19 presents the four transit agencies in the U.S. that purchased the most large bus service in 2002, presenting how many large and small buses were operated by vendors under purchased transportation bus contracts. The MBTA operated 85 large buses and 36 small buses in 2002. By 2013, the MBTA no longer operated any large buses under purchased transportation contracts. To the contrary, other transit agencies, as shown, increased the number of large buses under purchased transportation contracts between 2002 and 2013.

Figure 19. Large buses (40 foot or greater) and smaller buses operated under purchased transportation contracts, by largest purchasers of fixed route service, 2002-2013

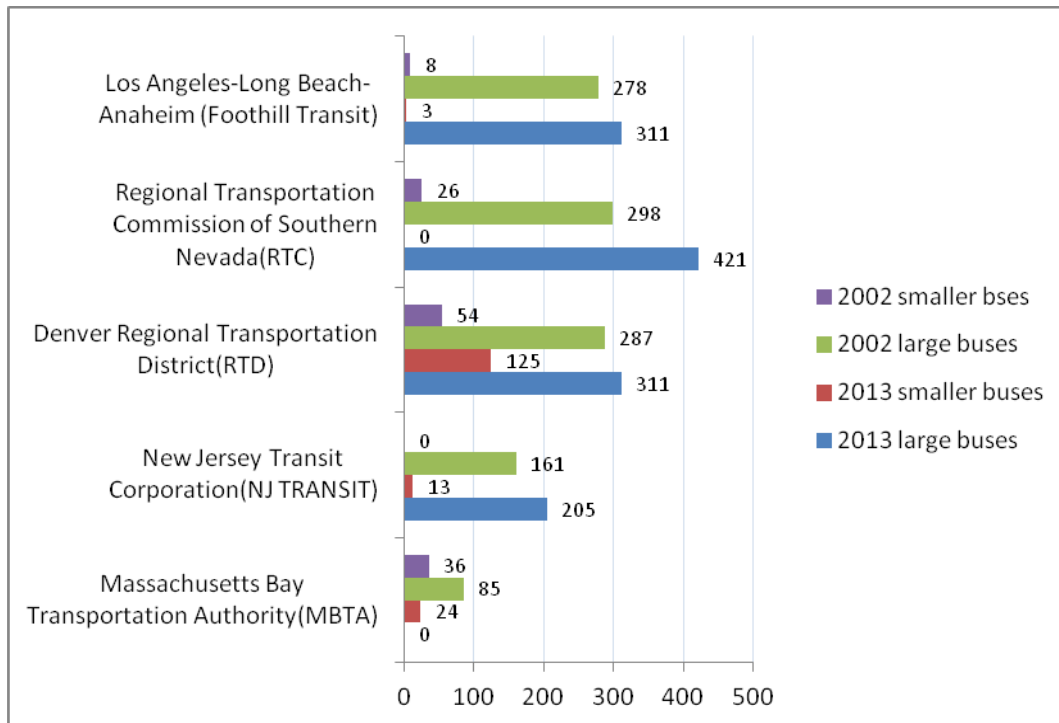


Figure 20 shows the operating costs per bus revenue mile from 2002 to 2013 of the four biggest transit agency purchasers of large bus services in 2002. Their operating costs per revenue mile were substantially less than those of the MBTA's agency-provided bus service over this period (MBTA agency-provided service shown for comparative purposes.)

Figure 20. Operating cost per revenue mile, 4 largest transit agency purchasers of large bus service (40-foot or greater) in 2002, 2002-2013

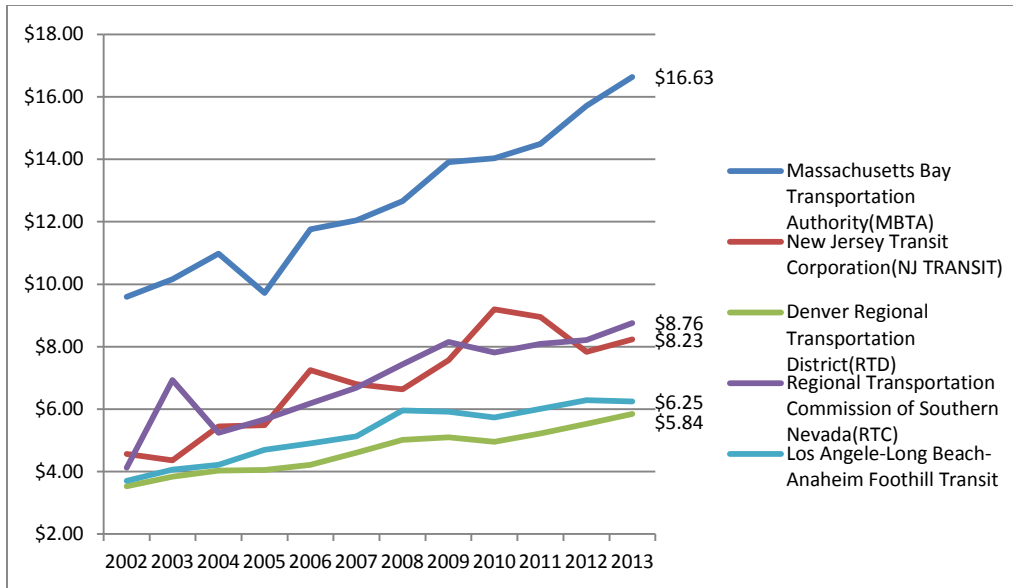
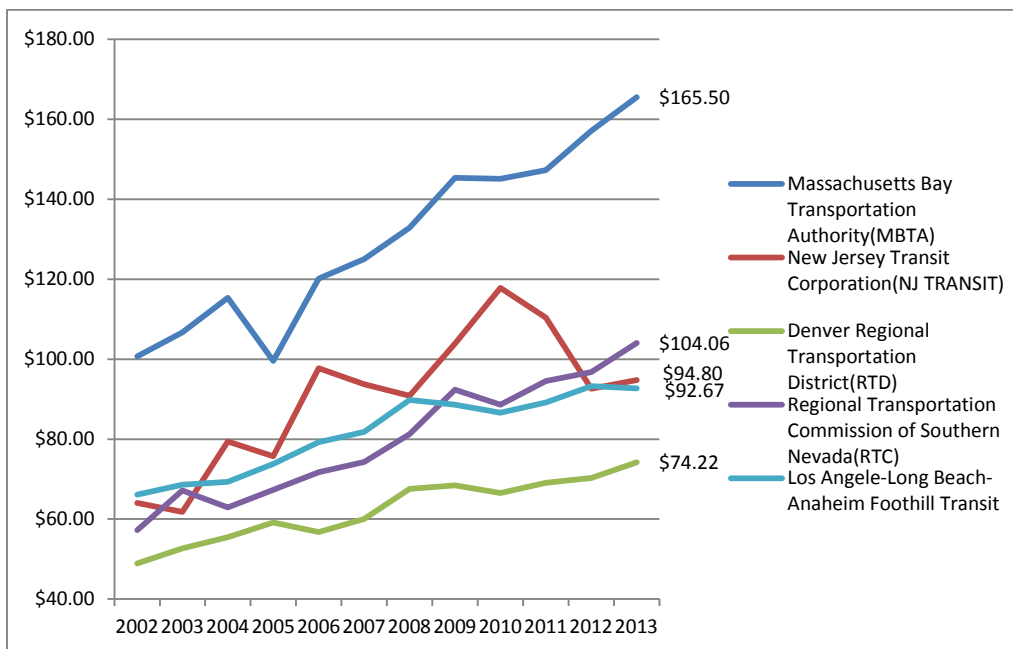


Figure 21 shows the operating costs per bus revenue hour from 2002 to 2013 of the four biggest transit agency purchasers of large bus services in 2002. The operating costs per revenue mile of these transit agencies were substantially less than those of the MBTA’s agency-provided bus service over this period (MBTA agency-provided service shown for comparative purposes.)

Figure 21. Operating cost per revenue hour, 4 largest transit agency purchasers of large bus service (40-foot or greater) in 2002, 2002-2013



VEHICLE MAINTENANCE

The 1997 Pacheco Law decision blocked the MBTA from outsourcing the repair and maintenance of 38 percent of its buses under the two disallowed contracts, in addition to blocking it from outsourcing the bus service. Comparison of bus repair and maintenance costs at the MBTA with those of its INTDAS peer agencies and of the snowiest major transit agencies in the U.S. demonstrates that the T's costs have been and continue to be extraordinarily high. Two reasons for this are the MBTA's comparatively excessive maintenance staffing levels and its failure to establish and enforce time performance standards and productivity practices to control costs, as recommended by the FTA.

In a 2002 report published by the Transit Cooperative Research Program (TCRP) sponsored by the FTA entitled "Maintenance Productivity Practices," the TCRP described the benefits of instituting time performance standards in the repair and maintenance of bus transit vehicles at public transit agencies. The authors reported that they had interviewed MBTA maintenance administrators and concluded that "there are no restrictions in the union labor agreement on the use of repair times." But the authors also reported that MBTA officials had told them that "if the T wanted to require that maintenance employees meet time standards, it would have to negotiate with the unions."

Since publication of that report, no time standards for repairs have been instituted, according to MBTA maintenance officials with whom Pioneer Institute spoke in 2013. T officials told Pioneer Institute that the practical difficulty of instituting and enforcing time standards in the union-manned garages has dissuaded them from doing so.

The MBTA Board of Directors, former-Secretary of Transportation Richard Davey, and the MBTA administration took advantage of cost-saving opportunities available through competitive procurement in rare instances when the Pacheco law had not prevented them from doing so because of insufficient in-house manpower capacity to meet schedule demands, an exception to the Pacheco Law. In December of 2012, they outsourced the full-scale "mid-life" reconstruction of 192 Neoplan diesel buses purchased by the MBTA in 2004/2005 to a Michigan bus refurbishing company following a competitive bidding process. The 192 Neoplan diesel buses constituted 22.5 percent of the buses the T used for maximum service, which was 850 in 2011 according to the NTD data. The MBTA's decision to outsource followed the recommendations of a transportation consulting company whose hiring had been approved by the MBTA Board of Directors. Saving money was on board members' minds when they voted to outsource the bus overhauls. Meeting minutes indicate that the board's chair asked the MBTA's chief procurement officer to compare the cost of contracting to the in-house alternative. She responded that it would cost 50 percent more to do the work in-house. The board then approved the contract.

Bus Repair and Maintenance Cost Efficiency, the MBTA versus INTDAS Peers

Figures 22 through 29 compare the MBTA's vehicle maintenance cost efficiency with that of five other systems designated by INTDAS as peer bus transit agencies. The goal of the analyses is to understand what has driven the elevated maintenance costs at the MBTA. In this section and the section below, we explore a number of potential drivers of the T's elevated costs for maintenance, including differences in work hours dedicated to bus maintenance, the number of full-time equivalent (FTE) employees dedicated to bus maintenance, wage and fringe rate differences, vehicle age, annual vehicle miles, annual vehicle hours, and capital investments. In doing so, we use a variety of comparisons, including comparisons to the MBTA's INTDAS-designated peer transit agencies, vehicle maintenance work hours per vehicle revenue mile and revenue hour, single-year 2013 data (the latest data currently available) and 2004-2013 longitudinal data to ensure that any inferences based on 2013 numbers are not the result of outlier data in 2013.

Figure 22 shows that the MBTA had the highest maintenance cost per vehicle revenue mile (VRM) in 2013 at \$4.57, 92.2 percent higher than the \$2.38 average of the five peer agencies. Had the MBTA reduced its total bus maintenance expenses per revenue mile in 2013 to the average level of its five INTDAS peers, it would have saved \$49.8 million dollars in 2013. Over the 10-year period from 2004 and 2013, the MBTA incurred bus maintenance costs per mile of \$3.39, 44.8 percent higher than that of its five peer bus agencies. Had the MBTA operated at the average maintenance cost per revenue mile of its peer agencies over that period, it would have saved more than \$250 million dollars.

Figure 22. Vehicle maintenance cost per revenue mile, MBTA compared to INTDAS peers, 2013 and 2004-2013

Transit Agency	Maintenance /VRM 2013	Maintenance/VRM 2004-2013
Boston (MBTA)	\$4.57	\$3.39
Philadelphia (SEPTA)	\$2.55	\$2.14
Washington, D.C. (WMATA)	\$2.99	\$3.14
Baltimore (MTA)	\$2.13	\$2.72
Atlanta (MARTA)	\$2.03	\$1.74
Miami (MDT)	\$2.18	\$1.99
AVERAGE 5 PEERS	\$2.38	\$2.34
MBTA above peer average/VRM	\$2.19	\$1.05
MBTA % above peer average/VRM	92.2%	44.8%
MBTA VRM	22,719,357	240,272,542
<i>MBTA savings if at peer average</i>	\$49,777,067	\$252,235,474

Figure 23 turns to a maintenance cost analysis on the basis of vehicle revenue hours. Again, as the figure shows, the MBTA had the highest maintenance cost per revenue hour in 2013 at \$45.44, 71.3 percent higher than the \$26.52 average of the five peer agencies. Had the MBTA reduced its total bus maintenance expenses per revenue hour in 2013 to the average of its five INTDAS peers, it would have saved \$43.2 million dollars. Over the 10-year period from 2004 and 2013, the MBTA had bus maintenance costs per hour of \$34.87, 31.3 percent higher than its five peer bus agencies. Had the MBTA operated at the average cost per revenue hour of its peer agencies over that period, it would have saved \$194.3 million dollars.

Figure 23. Bus maintenance expense per revenue hour, MBTA compared to INTDAS peers, 2004-2013

Transit Agency	Maintenance/VRH 2013	Maintenance/VRH 2004-2013
Boston (MBTA)	\$45.44	\$34.87
Philadelphia (SEPTA)	\$26.08	\$21.96
Washington, D.C. (WMATA)	\$31.27	\$34.17
Baltimore (MTA)	\$24.72	\$31.10
Atlanta (MARTA)	\$24.73	\$21.47
Miami (MDT)	\$25.78	\$24.10
AVERAGE 5 PEERS	\$26.52	\$26.56
MBTA above peer average/VRM	\$18.92	\$8.31

MBTA % above peer average/VRM	71.3%	31.3%
MBTA average VRH/year	2,283,137	23,389,797
<i>MBTA savings if at peer average</i>	\$43,195,146	\$194,284,769

One reason for the MBTA's extraordinarily high bus maintenance costs is its high number of annual bus maintenance work hours compared to those of its INTDAS peer bus agencies. Figure 24 shows that the MBTA had the greatest number of maintenance work hours per vehicle revenue mile of the INTDAS peer agencies in 2013 at 57.2 maintenance work hours per 1,000 vehicle revenue miles, 65.7 percent higher than the 34.5 hour average of its peer agencies. Had the MBTA reduced its total bus maintenance work hours per vehicle revenue mile in 2013 to the average of its five INTDAS peers, it would have reduced its total work hours by more than 500,000 hours. Looking back five years earlier, we see that the same phenomenon occurred in 2009, with the MBTA incurring 49.7 percent more work hours per revenue mile than its peer agencies. In that year the MBTA paid its bus maintenance employees to provide 50.3 hours of maintenance work per 1,000 revenue miles compared to the average of its peers, 35.9 hours.

As will be shown in subsequent charts, the average MBTA bus was 15 days older than the average of its INTDAS peers in 2009 and 43 weeks older than its peers in 2013. The same disproportionately high number of work hours per vehicle hour occurred five years earlier in 2009, when the MBTA paid for 60.6 bus maintenance work hours per 100 revenue hours of bus operations while its peer agencies needed an average of only 40.5 hours, 49.7 percent fewer. Had the MBTA reduced its total bus maintenance work hours per vehicle revenue hour in 2009 to the average of its five INTDAS peers, it would have reduced its total work hours by more than 450,000.

Figure 24. Bus maintenance work hours per revenue mile and revenue hour, MBTA compared to INTDAS peers, 2009 and 2013

Transit Agency	Work hours/1K VRM 2013	Work hours/1K VRM 2009	Work hours/100 VRH 2009	Work hours/100 VRH 2013
Boston (MBTA)	57.2	50.3	52.59	60.61
Philadelphia (SEPTA)	38.0	39.1	40.19	39.33
Washington, D.C. (WMATA)	43.4	36.9	39.98	45.03
Baltimore (MTA)	37.2	41.5	47.83	41.01
Atlanta (MARTA)	29.5	29.6	36.90	42.94
Miami (MDT)	24.4	32.5	39.01	34.06
AVERAGE 5 PEERS	34.5	35.9	40.8	40.5
MBTA above average of peers	65.7%	40.1%	29.0%	49.7%
MBTA VRM, VRH	24,194,260	23,824,480	2,279,516	2,283,137
MBTA work hours	1,383,740	1,198,769	1,198,769	1,383,740
<i>MBTA hours in excess of peer average hours per VRM and VRH</i>	548,544	343,374	269,139	459,612

Another reason for the MBTA's high bus maintenance costs is the high staffing level of its bus maintenance division compared with that of its INTDAS peer bus agencies. Figure 25 demonstrates that the MBTA had the greatest number of full-time maintenance employees per vehicle revenue mile of the

INTDAS peer group in 2013. The MBTA's staffing rate of 2.9 employees per 100,000 vehicle revenue miles was 59.6 percent more than the 1.8 employee average of its peer agencies. The inverse way to express this statistic is to say that the average peer agency had 37.3 percent fewer employees per revenue mile in 2013 than the MBTA had. Considering that the MBTA employs 710 full-time employees in its bus division, that adds up to a big number. The next closest agency with respect to staffing per vehicle mile in the peer group was Washington, D.C.'s WMATA bus transit system, which employed 2.3 maintenance employees per revenue mile, 20 percent less per revenue mile and 22 percent less per revenue hour than the MBTA. In order to match the staffing level of WMATA, the MBTA would have needed to reduce its full time bus maintenance staffing by more than 140 employees.

Looking back five years, we see that the same phenomenon was already occurring then. In 2009, the MBTA employed 49.4 percent more employees per revenue mile than its peer agencies did. High MBTA staffing levels are evidenced by a comparison of maintenance employees per bus revenue hour, with the MBTA exceeding the average of its peer agencies by 44.9 percent and 37.7 percent in 2013 and 2009 respectively.

Figure 25. Bus maintenance employee count per revenue mile and revenue hour, MBTA compared to INTDAS peers, 2009 and 2013

Transit Agency	Employee count/100K VRM 2013	Employee count/100K VRM 2009	Employee count/10K VRH 2013	Employee count/100K VRH 2009
Boston (MBTA)	2.9	2.8	3.1	2.9
Philadelphia (SEPTA)	2.1	2.0	2.2	2.1
Washington, D.C. (WMATA)	2.3	2.1	2.4	2.3
Baltimore (MTA)	2.0	2.0	2.2	2.3
Atlanta (MARTA)	1.4	1.5	2.1	1.9
Miami (MDT)	1.3	1.7	1.9	2.0
AVERAGE 5 PEERS	1.8	1.9	2.1	2.1
MBTA above average of peers	59.6%	49.4%	44.9%	37.7%
MBTA VRM, VRH	24,194,260	23,824,480	2,283,137	2,279,516
MBTA full time employee count	710	665	710	665
<i>MBTA FTEs in excess of peer average</i>	265.1	219.9	219.8	182.1

Figure 26 provides a review of average wages and fringe benefits paid per hour by the peer agencies' bus maintenance departments. The figure shows that the MBTA is not far out of line with its peers in terms of wages per hour. In 2013, the average wage at the MBTA maintenance department was \$28.65 per revenue hour. This is higher than the peer agency average, but only by 4.8 percent in 2013.

What is not taken into consideration in this data is that MBTA employees were awarded pay raises in 2014, retroactive to prior years, including to 2013. Even with the retroactive pay raises included, the MBTA's wages per hour are on the high end but do not begin to approach the disproportionate ratios that we have reviewed thus far with regard to staffing, work hours, and overall maintenance costs per mile and per hour at the MBTA in comparison with peer agencies. When fringe benefits are added as part of the comparison, the MBTA stands at 14.6 percent and 11.3 percent above the average of its peers in 2013 and 2009. This is higher but does not approach the 40, 50, and 60 percent ratios seen in previous costs analyses. Efforts to effectuate cost efficiencies at the MBTA maintenance department

must focus on improving productivity and decreasing excessive work hours, since those seem to be the primary causes of the overall differential between the MBTA's overall bus spending and its peer agencies.

Figure 26. Average bus maintenance employee wage and fringe benefit per hour, MBTA compared to INTDAS peers, 2009 and 2013

Transit Agency	Avg. maintenance employee wage per hour 2013	Ave. maintenance employee wage per hour 2009	Avg. maintenance employee wage & fringe per hour 2013	Avg. maintenance employee wage & fringe per hour 2009
Boston (MBTA)	\$28.65	\$28.52	\$50.23	\$49.16
Philadelphia (SEPTA)	\$26.59	\$26.31	\$49.48	\$46.88
Washington, D.C. (WMATA)	\$28.45	\$29.27	\$47.70	\$49.66
Baltimore (MTA)	\$26.49	\$25.07	\$41.33	\$44.35
Atlanta (MARTA)	\$21.35	\$22.40	\$37.73	\$36.57
Miami (MDT)	\$33.85	\$29.04	\$42.83	\$43.39
AVERAGE 5 PEERS	\$27.35	\$26.42	\$43.82	\$44.17
MBTA above average of peers	4.8%	8.0%	14.6%	11.3%
MBTA above average per hour	\$1.30	\$2.10	\$6.41	\$4.99
MBTA total maintenance wages	\$39,644,140	\$34,188,911	\$69,499,376	\$58,936,289
MBTA work hours	1,383,740	1,198,769	1,383,740	1,198,769
<i>MBTA sum of workforce wages above average</i>	\$1,804,556	\$2,518,053	\$8,869,454	\$5,986,118

An explanation often given for the operational failures of the MBTA last winter is that the MBTA's vehicle fleet is worn out and that the MBTA has not made adequate capital investment in fleet equipment. Given the data previously presented herein, including data showing that that the MBTA's bus maintenance expenses were 44.8 percent higher than its INTDAS peers per vehicle mile between 2004 and 2013, the following data about the age, mileage, and capitalization of the buses is informative.

One possible explanation for the MBTA's high vehicle maintenance costs would be that its buses are much older than those of its peers. Figure 27 presents NTD data about the age of the MBTA's active bus fleet in comparison with that of its INTDAS peers. Over the most recent 10-year period reported by NTD, 2004-2013, the average age of an active MBTA bus was 8.01 years compared to the INTDAS peer group average of 7.18 years, which translates to a difference of approximately 10 months. For the most recent eight-year period, the average age of an active MBTA bus was 7.11 years compared to the INTDAS peer group average of 7.07 years, which translates to the MBTA's buses having been on average 14 days older during this period. It seems unlikely that these small differences could be responsible for overall maintenance cost differences of the magnitude previously described.

Figure 27. Average age of bus fleet, MBTA compared to INTDAS peers, 2004-2013 and 2006-2013

Transit Agency	Ave. Age of Active Fleet 2006-2013	Ave. Age of Active Fleet 2004-2013
Boston (MBTA)	7.11	8.01
Philadelphia (SEPTA)	7.33	7.16

Washington, D.C. (WMATA)	7.46	7.78
Baltimore (MTA)	7.09	7.33
Atlanta (MARTA)	6.69	6.46
Miami (MDT)	6.74	6.33
AVERAGE 5 PEERS	7.07	7.18
MBTA older than peer agency average (years)	0.04	0.83
MBTA older than peer agency average (days)	14	302

Another possible explanation for the MBTA's high vehicle maintenance costs would be data showing that the MBTA's capital investment in buses has been substantially less than that of its peer agencies. Figure 28 presents NTD data demonstrating that the MBTA's capital expenditures for buses over the past 10-year period exceeded its INTDAS peers, on average. The MBTA's capital expenditures exceeded the average of the peer group by \$156,369 per bus operated in maximum service during the years 2004-2013, 34.5 percent more than the average of the peer agencies. The MBTA exceeded the average of the peer group by \$74,090 per active fleet bus from 2004-2013, 19.7 percent more than the average of the peer agencies.

Figure 28. Capital investment in buses by transit agency, MBTA compared to INTDAS peers, 2004-2013

Transit Agency	Capital expenditures/ buses in max. service	Capital expenditures/ active bus fleet
Boston (MBTA)	\$609,779.47	\$451,020.32
Philadelphia (SEPTA)	\$523,994.60	\$446,127.08
Washington, D.C. (WMATA)	\$596,398.01	\$506,258.85
Baltimore (MTA)	\$620,144.91	\$494,043.02
Atlanta (MARTA)	\$288,115.03	\$242,800.24
Miami (MDT)	\$238,399.54	\$195,423.10
AVERAGE 5 PEERS	\$453,410.42	\$376,930.46
MBTA above peer average/VOM	\$156,369.05	\$74,089.86
MBTA average # of VOMS	775	1,048
<i>MBTA % above peer average</i>	34.5%	19.7%

Another potential explanation for the MBTA's high maintenance costs would be data showing that the MBTA's bus mileage is higher than its peers, measured by revenue miles and revenue hours per year of bus service. Figure 29 presents data from NTD showing the average total mileage per bus over the past 10 years, and over the past eight years. The MBTA's total revenue mileage per vehicle operated in maximum service was 310,029 miles between 2004 and 2013, 16.4 percent less than the average of the INTDAS per group agencies: 370,888 revenue miles. The MBTA's buses also had 8.1 percent fewer total hours of operation than the average of the peer agencies' buses between 2004 and 2013.

Figure 29. Average mileage and hours of operation of buses, MBTA compared to INTDAS peers, 2004-2013 and 2006-2013

Transit Agency	Ave. VRM per VOM 2004- 2013	Ave. VRM per VOM 2006-2013	Ave. VRH per VOM 2004- 2013	Ave. VRH per VOM 2006-2013

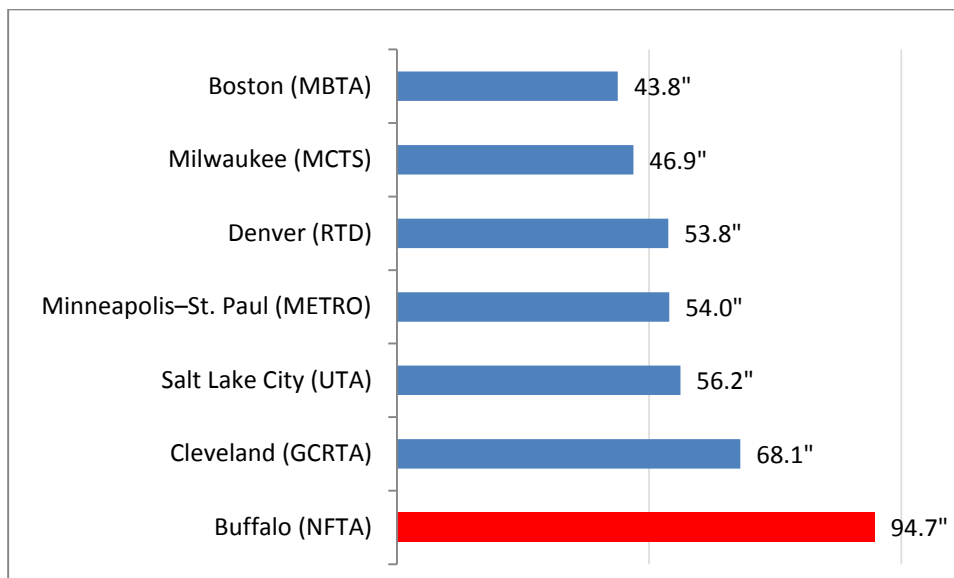
Boston (MBTA)	310,029	247,331	30,180	24,128
Philadelphia (SEPTA)	340,606	272,696	33,179	26,619
Washington, D.C. (WMATA)	308,646	246,077	28,351	22,781
Baltimore (MTA)	346,867	283,656	30,302	24,661
Atlanta (MARTA)	495,977	406,897	40,218	32,969
Miami (MDT)	423,202	331,369	34,874	27,458
AVERAGE 5 PEERS	370,888	298,004	32,851	26,436
MBTA versus average of peers	-16.4%	-17.0%	-8.1%	-8.7%

The data presented above indicates that the leading causes of the MBTA’s extraordinarily high bus maintenance costs are its excessive annual bus maintenance work hours and staffing levels compared to its INTDAS peer bus agencies, and to a lesser extent to its moderately higher hourly combined wages and fringe benefit costs.

What about the snow? Maintenance cost efficiency at the MBTA compared to 6 major transit agencies serving areas with greater annual snowfall than Boston

Are the elevated maintenance costs at the MBTA a function of Boston's rough winters? That is an argument that many proponents of the status quo at the MBTA have made. Figures 30 through 33 compare bus operating expenses, bus maintenance expenses, and average bus age at the MBTA to that of the six major transit agencies serving areas with greater annual snowfall than Boston’s. Figure 30 presents annual snowfall of the areas served by these agencies.

Figure 30. The 6 Major Transit Agencies Serving Areas with Greater Annual Snowfall than Boston, with Annual Snowfall, Inches



Analyses presented in figures 31 to 33 put that thesis to the test. As figure 31 shows, the MBTA had the highest operating cost per revenue mile (\$16.63) of the snowiest major transit agencies in 2013, 63.8 percent higher than the average of the six agencies, \$10.15. On a cost per revenue hour basis, the MBTA was the highest of the peers, 28.8 percent higher than average.

Figure 31. Bus operating expense per revenue mile and revenue hour, MBTA compared to snowiest transit agencies, 2013 and 2006-2013

Transit Agency	Operating expenses per revenue mile 2013	Operating expenses per revenue mile 2006-2013	Operating expenses per revenue hour 2013	Operating expenses per revenue hour 2006-2013
Boston (MBTA)	\$16.63	\$13.87	\$165.50	\$142.15
Buffalo (NFTA)	\$10.72	\$9.42	\$117.56	\$112.78
Cleveland (GCRTA)	\$11.80	\$9.90	\$135.74	\$118.06
Denver (RTD)	\$11.10	\$9.87	\$160.14	\$139.07
Milwaukee (MCTS)	\$8.52	\$8.32	\$104.77	\$105.08
Minneapolis–St. Paul (METRO)	\$11.43	\$10.25	\$131.77	\$120.47
Salt Lake City (UTA)	\$7.34	\$6.60	\$121.26	\$119.52
AVERAGE of 6 SNOWIEST TRANSIT AGENCIES	\$10.15	\$9.06	\$128.54	\$119.17
MBTA above peer average/VRM,VRH	\$6.48	\$4.81	\$36.96	\$22.98
MBTA % above peer average/VRM,VRH	63.8%	53.0%	28.8%	19.3%
MBTA VRM,VMH	22,719,357	190,970,076	2,283,137	18,630,067
<i>MBTA savings if at peer average</i>	\$147,225,504	\$917,700,457	\$84,385,252	\$428,172,480

As figure 32 shows, the MBTA had the highest maintenance cost per revenue mile (\$4.57) of the snowiest major transit agencies in 2013: 139.8 percent higher (more than double) than the average of the 6 agencies, \$1.90. On a per revenue hour basis, the MBTA’s vehicle maintenance expense was 88.7 percent higher than the average of its snowy peers.

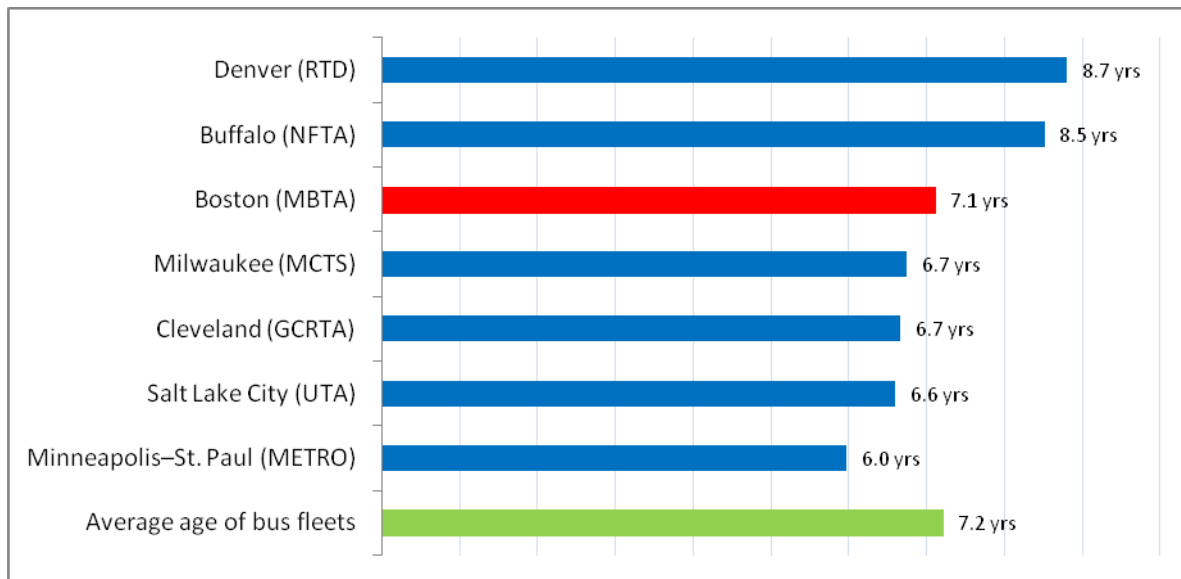
Figure 32. Vehicle maintenance expense per revenue mile and revenue hour, MBTA compared to snowiest transit agencies, 2013 and 2006-2013

Transit Agency	Vehicle maintenance expense per revenue mile 2013	Vehicle maintenance expense per revenue mile 2006-2013	Vehicle maintenance expense per revenue hour (2013)	Vehicle maintenance expense per revenue hour 2006-2013
Boston (MBTA)	\$4.57	\$3.62	\$45.44	\$37.10
Buffalo (NFTA)	\$2.63	\$2.24	\$28.85	\$26.78
Cleveland (GCRTA)	\$2.19	\$2.00	\$25.16	\$23.83
Denver (RTD)	\$2.00	\$1.85	\$28.83	\$26.13
Milwaukee (MCTS)	\$1.13	\$1.13	\$13.88	\$14.28
Minneapolis–St. Paul (METRO)	\$1.95	\$1.70	\$22.45	\$19.96
Salt Lake City (UTA)	\$1.53	\$1.17	\$25.33	\$21.21

AVERAGE of 6 SNOWIEST TRANSIT AGENCIES	\$1.90	\$1.68	\$24.08	\$22.03
MBTA above peer average/VRM,VRH	\$2.66	\$1.94	\$21.35	\$15.06
MBTA % above peer average/VRM,VRH	139.80%	115.10%	88.70%	68.40%
MBTA VRM,VMH	22,719,357	240,272,542	2,283,137	18,630,067
<i>MBTA savings if at peer average</i>	\$60,471,208	\$465,352,074	\$48,750,336	\$280,605,205

Finally, we come back to the possibility that the age of the MBTA’s buses could be driving the dramatically higher costs at the MBTA in comparison with transit agencies that get more snow than Boston does. Figure 33 presents data about the age of the MBTA’s active bus fleet in comparison with that of its snowiest peers. Over the most recent eight-year period reported by NTD, the average age of an active MBTA bus was 7.1 years compared to the snowiest peer average of 7.2 years up operating and maintenance costs at the MBTA.

Figure 33. Average bus age, MBTA compared to snowiest agencies, 2006-2013



CONCLUSION

Members of the state legislature have asked whether there are examples of the Pacheco Law having had an adverse impact on the MBTA. The 1997 Pacheco Law decision barring the MBTA from executing two contracts for maintenance and operation of a portion of its bus service is one.

At the time of the Pacheco decision in 1997, the MBTA was the seventh leading outsourcer of public transit bus services in the nation, providing 4.65 million miles annually at an average cost of \$1.33 per mile, the lowest of all major transit agencies. Its cost of agency-provided service at that time was six times higher per mile at \$8.10, sixth highest of all major US transit agencies. Despite this track record and despite contract terms providing for 5-year savings of \$37 million over prior year costs according to MBTA administrators, the Pacheco Law decision barred the execution of the contracts by concluding that lower costs could be achieved by “regular agency employees providing the service *in the most cost efficient manner.*” MBTA employee organizations argued that they could deliver the service for \$5

million less than the two winning bidders by improving cost efficiency, but after the contract was blocked, that never happened.

The contract with the two vendors, approved by the MBTA Board but rejected by the Pacheco process, had been for \$74.34 per bus hour for 4.1 million hours over five years. Over those five years, instead of going down, the MBTA's operating cost rose from \$85.10 to \$100.73 per bus hour, increasing by 18.4 percent. This differential between what the MBTA could have paid the contractors and what it actually ended up paying for in-house service added up to \$80.4 million additional dollars over the five year period. This is a tangible example of the adverse effect of the Pacheco Law, but only the beginning. Over the following 13 years, the MBTA's operating costs for bus service rose to \$165.50 dollars per revenue hour. Even if one assumes that the contractors' rates would have increased at the same annual percentage rate as the MBTA's in-house service did, the total additional cost paid by the MBTA from 1998 to 2015 would have amounted to more than \$450 million dollars.

These statistics are consistent with results of national studies. A report published by the National Center for Transit Research sponsored in part by the U.S. Department of Transportation entitled "Analysis of Contracting for Fixed Route Bus Service" found that in the nation's large transit systems, defined as those with 250 or more vehicles operating at maximum service, agencies paid 40.4 percent less in 2008 by contracting for fixed-route bus services per revenue mile (\$6.67 per mile) than for directly provided bus transportation (\$11.19 per mile). This finding, together with previously presented data showing enormous savings attributable to the purchasing of bus service by major transit agencies across the country, indicates that the Pacheco Law hurt the MBTA financially by barring it from outsourcing.

The point of this report, however, is not to advocate for any particular plan to outsource any component of the MBTA's operations. The point is to demonstrate how distorted and anti-competitive the Pacheco Law's process was in the 1997 decision. The standards established by the Pacheco Law led to the conclusion that the two proposed contracts would not result in savings. History has proven that conclusion wrong by at least \$450 million dollars.

The MBTA, its commuters, and Massachusetts taxpayers have paid an exorbitant premium because of the Pacheco Law, one that it can no longer afford. Giving the FCMB flexibility to outsource is critical if the legislature is committed to developing an efficient and reliable transit system in the coming years.