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**INDEPENDENT STATE AUDITOR'S REPORT
ON CERTAIN ACTIVITIES OF THE
MASSACHUSETTS BAY TRANSPORTATION
AUTHORITY
JULY 1, 2000 TO DECEMBER 31, 2005**

**OFFICIAL AUDIT
REPORT
JANUARY 29, 2008**

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Our review of the Massachusetts Bay Transportation Authority (MBTA) was conducted to determine the overall effectiveness of the MBTA's debt management practices of utilizing interest rate derivatives, including interest rate swaps and options, in its attempt to reduce its annual debt service costs.

We also reviewed the effectiveness of the MBTA in overseeing the disposal of surplus vehicles and equipment, including whether proper internal controls are in place to ensure that all surplus vehicles and equipment are disposed of economically, efficiently, and in compliance with applicable laws, rules, and regulations. In addition, we reviewed the Authority's inventory reconciliation procedures and controls for currently active vehicles and equipment to ensure that all such assets are being properly accounted for.

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1. THE USE OF INTEREST RATE SWAPS TO REDUCE ITS DEBT SERVICE COSTS ACTUALLY INCREASED THE MBTA'S DEBT SERVICE COSTS BY OVER \$55 MILLION

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In an effort to manage their annual debt service costs on its \$4.6 billion of outstanding debt, the MBTA decided to utilize interest rate derivatives to try to reduce their exposure to rising interest rates and lower their annual bond interest expense. During this period the MBTA entered into 12 such agreements totaling approximately \$1.632 billion. However, we determined that contrary to their expected savings, the MBTA incurred additional interest costs of more than \$55 million during the period July 1, 2000 to December 31, 2005 by utilizing interest rate derivative agreements. As a result, the MBTA actually increased their total indebtedness by using derivatives to manage their debt.

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The MBTA, contrary to federal law and generally accepted accounting principles, did not perform a bi-annual physical inventory of its non-revenue vehicles valued in excess of \$26 million. According to federal guidelines, a physical inventory of items with a cost of \$5,000 or more must be conducted every two years. Instead, the MBTA relied on the reconciliation of its perpetual inventory list to confirm the existence of these non-revenue vehicles. As a result, the Authority cannot be assured that these assets have been properly safeguarded against loss, theft, or misuse.

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INTRODUCTION

Background

The Massachusetts Bay Transportation Authority (MBTA) is the oldest and fifth-largest transit system in the United States, operating subway, bus, and commuter rail service in 175 cities and towns primarily located in eastern Massachusetts.

The MBTA System consists of the following modes of transportation:

- Four rapid transit routes (the Red, Orange, Blue and Silver Line) operating over 46 miles with 53 stations/stops.
- Five Green Line routes operating on 33 miles with 78 stations/stops.
- 11 commuter rail routes with 125 stations/stops.
- 161 bus routes covering 710 miles with 9,000 scheduled stops.
- Four water ferry routes with six stations/stops.

Currently this system provides over 1.1 million passenger trips per business day, as outlined in the chart below:

MBTA Transportation Mode	Daily Boarding
Green Line	225,200
Red Line	214,200
Orange Line	160,900
Blue Line	55,900
Mattapan Trolley	7,000
Bus	376,900
Commuter Rail	141,000
Commuter Boat	5,000
The RIDE	<u>5,000</u>
Total daily passenger trips	<u>1,191,100</u>

To provide this service, the MBTA currently operates 2,539 revenue vehicles, and has assigned these vehicles, as follows:

MBTA Revenue Vehicle Fleet	
Red Line Rapid Transit Cars	218
Blue Line Rapid Transit Cars	70
Orange Line Rapid Transit Cars	120
Green Line Light Rail Vehicles	220
Compressed Natural Gas (CNG) Buses	343
Commuter Rail Passenger Coaches	377
Commuter Rail Locomotives	80
Diesel Bus Coaches	571
Electric Trackless Trolleys	68
RIDE Paratransit Vehicles	453
Prototype Buses	2
60' CNG Silver Line Vehicles	<u>17</u>
Total Revenue Vehicles	<u>2,539</u>

In addition, the MBTA owns and operates over 1,000 non-revenue vehicles that are used to maintain the infrastructure supporting the MBTA's transit services, right-of way, signals, power, and ancillary services.

Vehicle procurement, as outlined within the MBTA's Fiscal Year 2005 to 2010 Capital Investment Plan (CIP), is funded by three major sources:

- Revenue bonds
- Pay- as- you- go- financing
- Federal Grants

Legislative History

The MBTA was created by Chapter 563 of the Acts of 1964, which is incorporated into Massachusetts General Laws Chapter 161A, and is considered a political subdivision of the Commonwealth. The Authority is managed by a nine-member board of directors (board). The Secretary of the Executive Office of Transportation serves as the Chairman of the nine-member board. The Governor of the Commonwealth appoints the other eight directors, who serve in

staggered two-year terms. The board has the authority to appoint a general manager and other officers, as it deems necessary. An advisory board, consisting of a representative of each of the cities and towns paying assessments, reviews and approves the MBTA's annual operating budget and their long-term capital programs. As of December 31, 2005, the MBTA employed approximately 5,700 full-time and 600 part-time employees.

Funding Mechanism

Prior to July 1, 2000, the MBTA was subsidized by the Commonwealth to provide various forms of assistance to offset the MBTA's annual operating deficit and to subsidize and guarantee its annual debt service requirements. In order to finance its capital programs, the MBTA was authorized to issue debt secured by its general obligation. If the MBTA lacked the funds to pay the debt, the Commonwealth, through its full faith and credit, would guarantee to pay the debt service due to the bondholders.

However, Chapter 127 of the Acts of 1999 repealed and restated the Commonwealth's funding mechanism for the MBTA. This legislation, effective July 1, 2000, established a "Forward Funding" procedure, which allows the MBTA to receive a dedicated revenue stream comprised of annual assessments to the 175 member cities and towns in the MBTA's service area, which represents an increase from the prior 78 members. In addition, each year the MBTA will receive "dedicated sales tax revenues," which are equivalent to 20% of the Commonwealth's current state sales tax levy.

Also, effective July 1, 2000, all new debt issued by the MBTA will no longer be guaranteed by the Commonwealth, nor will this debt be eligible for any repayment subsidies. Instead, these bonds will be repaid strictly from the revenues of the MBTA and guaranteed by the pledge of the Authority. The MBTA's capital program is funded primarily through revenue bonds, federal grants, and project financing. After all operating expenses and debt services are met, any remaining revenues may also be used to fund capital projects. Prior to Forward Funding, the MBTA financed their non-federal portion of their capital program by issuing General Transportation System (GTS) Bonds backed by the Commonwealth. As of June 30, 2005, MBTA had bonds and notes payable of approximately \$4.6 billion. Included in this amount were \$1.771 billion of GTS bonds (the old debt) and \$2.665 billion of Sales Tax Assessment Revenue Bonds (the new debt) outstanding.

Disposal of Surplus Vehicles and Equipment

The MBTA's policy and procedures for the disposal of surplus vehicles and equipment was last updated in April 1998. For all items with a historical cost greater than \$5,000, the MBTA prepares a written request to the Treasurer-Controller's Department for a Residual Value Schedule. (RVS). The RVS lists each item proposed for disposition along with the original acquisition cost and the stated reason for disposal (i.e. obsolescence, wear-out, disrepair, etc.). Prior disposal approval from the Federal Transit Authority (FTA) is required for all federally funded equipment that originally cost more than \$5,000 and has not reached the end of its useful life. The request for disposal authorization from the MBTA's Treasurer-Controller's Department and FTA approval, if required, is sent to the General Manager's Office for final authorization. The completed and approved request for disposition is forwarded to the MBTA's Department of Materials Management, which is responsible for offering equipment for public sale.

Similarly, the MBTA's policies and procedures for disposal of scrap metal and obsolete or surplus material of the transit system require that, prior to disposition, an approved schedule must be prepared listing each item deemed unusable by the MBTA and its associated estimated market value. The MBTA has adopted a policy of disposing of this surplus metal and material by selling it to the highest bidder through a public request for bids.

During our audit we examined the MBTA's internal controls over their inventory of fixed assets (items costing over \$5,000) and office equipment. We reviewed the Authority's Fixed Assets Database (FAD) and Maintenance Control and Reporting System (MCRS) which the Authority relies upon to control and reconcile these assets. It is the MBTA's practice to conduct an annual physical inventory of all revenue vehicles; however, non-revenue vehicles are excluded from this process.

Our review of the MBTA's inventory and disposition practices for its office equipment included all laptops, desktops, fax machines, and printers. MBTA office computer equipment is ordered directly by each department, which maintains its own inventory of these items. Departmental requests to purchase computer equipment are made to the MBTA's Material Department. The Materials Department purchases the needed equipment using the following guidelines:

- Items costing less than \$2,500 must be at the most reasonable and fair price.

- Items costing between \$2,500 and \$10,000 require three phone proposals, confirmed in writing, unless the provider is the sole source of the product, or there is limited competition.
- Items costing between \$10,000 and \$25,000 require the buyer to obtain five facsimile bids.
- Items costing in excess of \$25,000 require formal advertisement when requesting the submission of sealed bids.

Debt Management

As of June 30, 2005, the MBTA had approximately \$4.6 billion in outstanding debt. As part of an overall approach to manage this funded debt and the annual interest payments required to service this debt, the MBTA has adopted a practice of utilizing interest rate swap agreements. An interest rate swap is a contractual agreement between two parties under which each party agrees to make periodic payments to the other based on a notional amount of principal for an agreed upon period of time. The MBTA has entered the swap market primarily as a way of hedging interest rate fluctuations on its funded debt in order to minimize its annual debt service costs.

The two most common forms of interest rate swaps are fixed rate for floating rate of interest and floating rate for fixed rate interest. In addition, forward swap refunding contracts may be used to “synthetically” refund outstanding bonds that are eligible for current redemption or for bonds that are not currently eligible for redemption or refunding using today’s current interest rates, or to lock in current fixed rates for bonds to be issued at a later date. These forward swap refunding contracts have a delayed start date effective upon the date when the underlying bonds are eligible for refunding. Finally, swaptions, or options on swap agreements, can be used by the issuer to sell, for a premium payment, the right to enter into an interest rate swap agreement for a set period of time in the future, with the terms mutually agreed to by the issuer (the MBTA) and a willing counterparty. By their nature, swaptions are speculative, and provide the greatest risk/reward for the issuer and counterparty.

Interest rate swaps are derivative instruments, and as such carry inherent risks, as well as benefits, to the issuer. Some of the potential risks are:

- Credit Risk- the risk that the counterparty to the swap agreement may become financially unable to meet its swap interest payment obligations.
- Termination Risk- in certain circumstances it may be possible for the counterparty to terminate the swap early due to a possible default or credit downgrade by the issuer. Also, dramatic

changes in interest rates may compel the issuer to seek to prematurely terminate this agreement. If so, a substantial prepayment penalty usually results.

- Interest Rate Risk- since the issuer or borrower is obligated to pay the actual rate on its outstanding bonds, any difference between that rate and the rate they actually receive from the counterparty represents continuing interest rate risk.

Some of the benefits of interest rate swaps are:

- Potential interest cost savings.
- Savings on debt issuance costs.
- Increase investor demand by issuing variable rate debt.

During the period of our audit, the MBTA entered into 12 interest rate swap agreements with various investment banks for approximately \$1.632 billion notional amount of outstanding debt. Of these 12 swaps, the Authority initiated three synthetic fixed rate swaps, three forward starting swaps, and six swaptions for possible future interest rate swaps. As of December 31, 2005, eight of these 12 swap agreements were still in effect, and three swaptions agreements covering approximately \$438 million in notional debt were terminated by the MBTA.

Audit Scope, Objectives, and Methodology

Our audit, which covered the period July 1, 2000 to December 31, 2005, was conducted in accordance with applicable generally accepted government auditing standards for performance audits. The objectives of this audit were to review the MBTA's:

- Policies and procedures for disposing of surplus vehicles and equipment to determine whether the disposal process is being performed in the most economical and efficient manner, and in accordance with applicable laws, rules, and regulations.
- Records relating to the disposal of vehicles and equipment to determine that they are complete, accurate, and up-to-date.
- Inventory practices and records for its vehicles and equipment to determine whether they are adequately safeguarded and accurately recorded.
- Policies and procedures for managing its annual debt service costs and its funded debt.
- Effectiveness of utilizing interest rate swaps as a means of reducing its debt service expenses.

Our methodology included reviewing: 1) MBTA's written policies and procedures for the disposal of surplus vehicles and equipment; 2) inventory records for MBTA revenue and non-vehicles and office equipment; 3) disposition records and supporting documentation for items tested; 4) a test of selected vehicles and equipment to inventory and disposition records maintained; 5) and interest rate swap agreements between the MBTA and its counterparties, counterparty interest payments made and received, termination payments, premium payments, and written correspondence. In addition, we interviewed appropriate MBTA officials.

Our review indicated that, except as noted in the Audit Results section of this report, MBTA had adequate internal controls over its vehicles and equipment and debt management practices and complied with applicable laws, rules, and regulations for the areas tested.

AUDIT RESULTS

1. THE USE OF INTEREST RATE SWAPS TO REDUCE ITS DEBT SERVICE COSTS ACTUALLY INCREASED THE MBTA'S DEBT SERVICE COSTS BY OVER \$55 MILLION

As part of the MBTA's overall financing plan for its \$4.6 billion in funded debt, the Authority has adopted a policy of utilizing interest rate swap agreements in an attempt to hedge its interest costs and reduce their exposure to rising interest rates, hopefully reducing its annual interest and debt service costs. The Authority adopted this debt management practice in June 2000 upon the implementation of Forward Funding. Forward funding was established by Chapter 127 of the Acts of 1999 and provided the MBTA with a dedicated revenue stream comprised of annual assessments to the 175 member cities and towns and 20% of the Commonwealth's current sales tax levy. For fiscal year 2005, the MBTA received \$704.8 million in dedicated sales tax revenue. In addition, the MBTA received dedicated local assessments of \$137.7 million, interest income of \$6 million, capital grants and contributions of \$182.3 million and other income of \$11.9 million as a means to fund its expenses. However, our review of these interest rate hedge transactions utilized by the MBTA indicates that contrary to the expected reduction of its debt service costs, the Authority actually incurred an additional \$55 million in its debt service costs through December 2005 due to these agreements.

In an interest rate swap, the parties to the agreement, known as the counterparties, contractually agree to make periodic payments to the other, based on a predetermined interest rate index and/or a fixed rate. Total payments owed by each party are determined by the specified notional principal amount (see Exhibit C) of funded debt, which is never exchanged. The principal and interest owed to the original bondholders on this notional amount remains the obligation of the original issuer (the Authority).

Moreover, since these swaps are synthetic in nature and not part of the Authority's funded debt, all counterparty interest payments owed by the MBTA must be paid from the Authority's operating funds, and not from debt service reserves. As a result, large interest rate moves could adversely impact the MBTA's annual operating budget and result in large, unanticipated deficits.

The two most common forms of interest rate swaps are fixed rate for floating rate of interest and floating rate for fixed rate interest. In addition, forward swap refunding contracts may be used to "synthetically" refund outstanding bonds that are eligible for current redemption or for

bonds that are not currently eligible for redemption or refunding using initial interest rates or to lock in current fixed rates for bonds to be issued at a later date. These forward swap refunding contracts have a delayed start date effective upon the date when the underlying bonds are eligible for refunding. Finally, swaptions (see Exhibit C), or options on swap agreements, can be used by the issuer to sell, for a premium payment, to a counterparty the right but not the obligation to enter into a interest rate swap agreement for a set period of time in the future, with the terms agreed to today, between the issuer (the MBTA) and a willing counterparty. By their nature, swaptions are speculative, and provide the greatest risk/reward for the issuer and counterparty.

During the period from July 1, 2000 to December 31, 2005, the MBTA entered into 12 interest rate swap agreements with various investment banks for approximately \$1.632 billion notional amount of outstanding debt. Of these 12 swap agreements, the Authority initiated three synthetic fixed rate swaps, three forward starting swaps, and six swaptions for possible future interest rate swaps. As of December 31, 2005, eight of these 12 swap agreements are still in effect, and three swaptions agreements covering approximately \$438 million in notional debt were terminated by the MBTA.

(A detailed listing of these swap agreements and their status as of December 31, 2005 is included as Exhibits A and B of this report.)

The following is a summary of the \$55 million in additional costs incurred by the MBTA due to these interest rate swaps through December 31, 2005:

Payments Made By MBTA

Swap interest payments to counterparties	\$37,504,132	
Termination Fees	48,870,000	
Consultants Fees	<u>504,653</u>	
Total Payments		\$86,878,785

Less: Interest and Premiums Received by MBTA

Swap interest received from counterparties	\$ 198,353	
Premium/Exercise payments received	<u>31,292,812</u>	
Total Receipts		<u>31,491,165</u>
Net Cost of Interest Rate Swaps		<u>\$55,387,620</u>

As an example of swap interest payments paid by the Authority, on June 27, 2000 the MBTA entered into a “synthetic” fixed rate swap with Bear Stearns Capital Markets, Inc. (Bear Stearns). Under the terms of this swap the MBTA agreed to pay to Bear Stearns a fixed rate of 4.928% on \$188 million of its variable rate debt, and in return receive from Bear Stearns a variable rate based on the Bond Market Association (BMA). The term of this interest rate swap agreement was from June 29, 2000 to September 1, 2005. As of the expiration of this swap, we determined that the MBTA had paid an additional \$29.2 million in interest payments to Bear Stearns. These payments to Bear Stearns were in addition to the \$16.7 million in scheduled interest payments on the actual outstanding debt that secured this swap agreement, which the MBTA is always obligated to pay to its bondholders.

As previously mentioned, during the period of our audit the MBTA terminated three swaption agreements and as a result made \$48.8 million in termination payments to the counterparties. As an example, on December 21, 2000, the MBTA entered into a swaption to refund \$219 million of 1992 General Transportation System (GTS) bonds. Under the terms of this agreement, the MBTA sold to Lehman Brothers Special Financing, Inc. (Lehman), as counterparty, the right to receive a fixed rate of 5.27% from the MBTA on these bonds beginning on March 1, 2003 until expiration on March 1, 2021, in exchange for the right to pay the MBTA the BMA variable rate, which was approximately 4.63% on December 20, 2000. As an inducement to sell this option, Lehman offered to pay \$8.36 million in up front premium payments to the MBTA. However, in January, 2003 the BMA interest rate subsequently fell to less than 1%, at which time the MBTA decided to terminate this swaption due to the potential future losses that would be incurred over the 18 year term of this option. As a result, the MBTA was required to pay Lehman a “termination fee” of \$25.3 million in order to cancel this agreement.

In reviewing the terms of these various swap agreements we have determined that the opportunity to receive up front or future premium payments by the MBTA, which in most cases can be used for any purpose including operating expenses, may be inducing the Authority to participate in this speculative interest rate derivatives market. Indeed, during the period reviewed, the MBTA received approximately \$31.3 million in premium and exercise payments from various counterparties. However, the benefit of all these premiums received was eliminated by the termination payments made, additional interest costs paid, and consultant fees incurred to set up these agreements.

Indeed, given the MBTA's past and current budget deficits, a more prudent debt management approach should be taken for its \$4.6 billion of outstanding debt to avoid this speculative interest rate swap market. Instead, the MBTA should continue to limit the amount of variable rate debt that it issues, continue to rely mainly on fixed rate bonds to service its debt, and take advantage of fluctuations in interest rates to refund its debt at lower rates whenever possible.

Recommendation

We recommend that the MBTA consider the following as part of its prudent debt management policy:

- Be conservative and limit the amount of variable rate debt that it issues and accept the interest rate risk associated with this type of debt.
- Continue to rely upon fixed rate bonds, and the certainty of costs that they offer, to service its debt and plan its operating budget.
- Continue to refinance higher yielding debt with lower cost debt as the interest rate market fluctuations allow.
- Create a reserve fund in which all future premium, termination, and exercise receipts would be deposited to offset future swap interest payments and possible termination fees to minimize major unbudgeted swap liabilities and the burden it would place on the operating budget.
- Consider discontinuing its participation in this highly speculative interest rate derivatives market.

Auditee's Response

The review of the Authority's use of interest rate swaps relies on the significant advantage of twenty-twenty hindsight, and the need of an ongoing operating enterprise such as the MBTA to manage risk. In fact, the report's recommendations are often completely inconsistent with its own criticisms of the Authority's swap transactions.

For example, the 2000 Bear Stearns swap highlighted in the report was entered into shortly after forward funding was enacted. As the MBTA entered into this new financial environment and was admittedly unable to predict the future movement of interest rates, it followed a prudent, conservative strategy in this initial financing structure. The MBTA entered into a five-year floating-to-fixed rate swap and obtained what at the time was a lower fixed rate borrowing cost without exposure to the fluctuations of variable rate debt. The short, five-year term for the swap was designed to manage interest rate risk at the onset of forward funding while minimizing any counterparty risk associated with longer term agreements. That in retrospect interest rates declined during that five-year period does not change the merits of the transaction.

In addition, the report's criticism of synthetically fixing variable rate debt with a fixed rate interest swap is narrow. Had the Authority issued fixed rate bonds in 2000, as the report recommends, the "additional interest payments" above the rate on variable bonds would have been identical, if not more costly, given that interest rates on bonds were 10 basis points higher than swaps at the time. However the "additional \$29.2 million in interest payments" would not have been as transparent and easily calculated and the accompanying criticism likely would have been avoided.

Anytime the MBTA issues fixed rate bonds it is forgoing the almost guaranteed savings variable rate bonds offer over a thirty-year term. Although the report would lead a reader to believe that the MBTA trades heavily in the variable rate bond market, in reality less than 7.19% of the Authority's debt is currently variable and of that only 0.92% is pure floating with the remainder swapped to a fixed rate. These levels are well below the 20% threshold both bond rating agencies (Moody's and Standard and Poor's) characterize as conservative (See attachment I: S&P report). Despite the report's suggestions otherwise, the Authority has maintained a low percentage of variable rate debt in its portfolio to maintain cost certainty and avoid the adverse budget impact of possible rate volatility.

The MBTA has whenever possible refinanced "higher yielding debt with lower cost debt as interest rate market fluctuations allow," as also recommended in the report. The Authority's policy is to set a target savings threshold and then execute a prudent refunding when this savings threshold is exceeded. Of course, without the ability to accurately predict future interest rate movements, it is entirely possible the MBTA may have benefited from waiting for lower interest rates to execute these traditional refinancings. Conversely, while waiting for these lower rates to arrive, it is also entirely possible that rates could have increased, eliminating the savings completely. This is no different than the decisions made when using interest rate swaps to refund existing debt. Consistency with the report's premise would suggest that refinancings be subject to the same criticism on market "speculation" as swaps.

The report also analyzes the swaption transactions in isolation, [concluding] that by terminating the swaptions the MBTA "incurred \$48.8 million in losses." Entering into swaps or swaptions in isolation as described in the report would be purely speculative and does not accurately reflect the Authority's prudent use of these hedging instruments. The Authority only enters into swaps and swaptions associated with underlying bonds to hedge interest rate risk and lower debt service costs. By terminating the swaptions and refunding the associated bonds the Authority achieved an overall additional present value debt service savings of \$7 million in these transactions. The swaptions described in the report locked in refinancing savings on bonds otherwise not refundable at the time. Had the Authority not terminated the swaptions, it would have issued variable rate bonds and received guaranteed savings associated with the fixed rate swap. However, market conditions further improved and the Authority was able to terminate the swaptions and achieve additional savings by refunding the underlying debt with fixed rate bonds. This transaction also eliminated variable rate debt exposure, which the report agrees is beneficial. By ignoring the associated bond refinancing, the report's analysis [does not] take into account the entire transaction and overall financial benefit to the Authority.

An amended version of chart (Exhibit A) contained in the Auditor's report should include future payments the MBTA will receive as part of the swaption transactions. The MBTA believes that by omitting those payments the Auditor's report incorrectly reduces the benefits of the transaction to the Authority, since these payments are guaranteed by highly rated counterparties and could be accelerated and received by the MBTA at anytime (at a present value) at the Authority's request.

In closing, the Authority's hedging program, including swaps, is used prudently and effectively to manage risk, create cost certainty where possible, and insulate the budget from rapid price

fluctuations in the interest and commodity markets. In fact, the rating agency Standard & Poor's in a recent report on the Authority states "The overall score of 2 reflects Standard & Poor's view that the swaps pose a low risk to the Authority's credit quality." An additional example is the Authority's recent actions to lock in fuel prices for diesel and natural gas, two large budget items. Auditor's staff indicated during meetings on the hedge program that they saw these fuel price locks as effective and reasonable transactions. Yet locking in prices with fuel hedges is identical in all material respects to locking in debt service costs with interest rate swaps.

Auditor's Reply

Contrary to the MBTA's comments, we believe our report to be both accurate and fair in our summary of the actual additional debt service costs that were incurred by the Authority under its swap interest rate program. Although hindsight is, by necessity, part of our analysis, our objectives were to determine the actual additional costs incurred by the Authority, the reasons for utilizing these swaps, and the risk associated with these transactions. Although we understand that the Authority's management was guided by their desire for prudent debt management when entering into these swap agreements, we examined whether additional incentives beyond the projected interest cost savings presented by these counterparties might have further induced the Authority to enter into these swaps. Finally, we attempted to determine if these swap transactions were the results of open and competitive proposals solicited by the Authority or instead were privately negotiated agreements.

The inclusion of the 2000 Bear Stearns swap example was to demonstrate the basic mechanics of an actual swap; explain that the interest on the original bonds remained the obligation of the Authority, and to summarize the interest obligations on the original bonds as well as the additional interest that was incurred to synthetically fix the rate on these floating bonds. We realize that the net counterparty interest payment of \$29 million represented the cost to "fix the rate" for the five-year term; however, the Authority's assertion that it saved money by synthetically fixing the rate was not demonstrated and therefore may not be accurate. Information provided to us by the Authority indicated that the relevant bond yield for a revenue bond of similar quality maturing in 2005, was 4.84% at the time of the swap agreement. This is the approximate fixed interest rate that the Authority would have paid if it chose to issue five-year bonds at that time. In addition, the Authority would have incurred approximately .06% in bond issuance costs for a total fixed rate of 4.90%. However, the synthetic fixed rate that the MBTA achieved via this swap agreement was 4.9284%, or .0284% higher. In addition, in order to achieve this swap rate, the Authority issued Variable Rate Demand Obligations (VRDO) as

the underlying bonds for this swap agreement. These bonds generate significant additional annual costs to the issuer (the MBTA). Specifically, during the five year swap agreement the Authority paid over \$2.2 million in liquidity and remarketing fees equal to approximately .19% per year. As a result, it could be argued that the true all-inclusive cost of this synthetic fixed rate swap was actually 5.1184% (4.9284%+.19%), or .2184% more per year than what would have been achieved by simply issuing fixed rate bonds and foregoing the variable to fixed rate swap that was ultimately chosen. Of course, in hindsight the most advantageous method to have financed these bonds, albeit with added interest rate risk, would have been to simply issue the VRDOs and incur the added costs for liquidity and remarketing while limiting this arrangement to the same five year term. If the Authority had done this, hindsight shows that they would have saved a net, after all expenses, of approximately \$27 million in interest costs. The Authority's computed "adjusted" fixed market rate for these five-year bonds was assumed to be 5.05%, and they contend that a "synthetic fixed rate savings" of .12% per year would have been realized with this swap. However, even if this .12% "savings" were correct, the Authority would have realized a savings of only \$1.1 million over this five-year period while still incurring over \$29 million in additional interest as the cost of this hedge. We concur with the Authority's assertion that over time, variable rate bonds may offer the lowest interest rate costs. However, the Authority's practice of purposely issuing variable rate bonds, as was done in this case, in order to affect a synthetic fixed interest rate swap on these same bonds is questionable. If the amount and duration of future variable rate bonds were strictly limited to less than 10% of the MBTA's total indebtedness and were less than 10 years in duration, then issuing variable rate bonds may be a prudent financing option for the Authority. If interest rates were to subsequently rise before these bonds are eligible to be redeemed, then the Authority could, at that time, initiate a swap to lock in a synthetic fixed rate, thereby capping additional interest rate risk until the bonds mature, or an interest rate cap could have been purchased at the time of issue to limit their upside rate risk. Therefore, we again urge the Authority to limit, but not eliminate, the use of variable rate debt, and to continue to rely mainly on fixed rate bonds.

We concur with the Authority's decision to terminate these swaptions; however disagree with the portrayal of the net costs of doing so. We acknowledged the Authority's assertion that it ultimately saved \$7 million by canceling these swaptions and issuing new lower fixed interest rate debt in their place is technically correct. In these instances however, the MBTA was doing what

any debtor would do in refinancing their debt at lower market interest rates. However, in the Authority's case, they were forced to pay a \$48.8 million "prepayment penalty" in order to refinance their debt. Moreover, the ultimate cost of this pre-payment penalty was compounded because the Authority was unable to make this payment from operating funds. Instead they issued an additional \$48.8 million in bonds in order to make these payments. We estimate that over the average life of these additional bonds issued, the MBTA will incur approximately \$27 million in interest. Therefore, these termination payments will ultimately cost the MBTA approximately \$75.8 million in principal and interest payments alone, exclusive of related financing costs. As a result, we conclude that the Authority did not save \$7 million when they terminated these swaptions, but instead ultimately incurred an additional \$68.8 million in future debt service costs and lost potential interest savings.

We did not include in Exhibit A of this report the \$18.6 million in future premium payments that the Authority will receive as part of their remaining swaption agreements because the Exhibit was compiled on a cash basis. However, if we were to include these future premium payments, we would also have to include the aforementioned \$27 million in future interest costs that the Authority will incur. Moreover, these future premium payments represent a return of interest and will be "earned" by the Authority by paying to the counterparty, if the swap is exercised, a "synthetic" fixed rate that is higher than the market rates at that time. Finally, although the Authority has been prudent in its pursuit of opportunities to refund its outstanding debt, the use of interest rate swaps should be limited and exercised with caution. The risks associated with these agreements, including termination and default events, although rare, are possible. Moreover, the determination of total actual savings achieved via swaps can, in some instances, become as "synthetic" as the fixed rates contracted for, due to additional costs to service these agreements. Accordingly, we recommend that the Authority to create a restricted reserve account that will hold all future swap premium and termination payments received by the Authority. The establishment of such a reserve account will help to defray any additional termination liabilities that might be incurred under their outstanding swap contracts. Moreover, a restriction on the use of these future revenues to fund only future swap liabilities may eliminate any urge to enter into a swap agreement mainly to earn premium payments to supplement operating revenues. Finally, if the Authority continues to participate in interest rate swaps, it should ensure that it obtains the most favorable swap terms and incurs the lowest possible

financing costs for its underlying bonds by competitively bidding all future swaps and bond issuance and discontinuing its practice of negotiated agreements. This will ensure an open and competitive process that can only benefit the Authority and the taxpayers of the Commonwealth.

Finally, the Authority's initiative to secure future fuel prices at current price levels will be deemed successful as long as market fuel prices either hold steady or increase over the "Lock-in" period. The Authority asserted that their initiative has been successful. The fuel price lock-in program was not part of our audit scope, nor did we evaluate it. However, it should be noted that the Authority's benefit/risk is spread over the fuel price lock-in period, which generally ranges between 12-24 months. Therefore, the benefit/risk period of the fuel price lock-in program is much shorter than the period of most interest rate swap agreements.

2. THE MBTA NEEDS TO IMPROVE ITS INVENTORY CONTROL PRACTICES FOR ALL NON-REVENUE VEHICLES

Our audit disclosed weaknesses regarding the accounting, controlling, and reporting for the MBTA's non-revenue vehicles. Specifically, we found that the Authority does not conduct an annual physical inventory for these vehicles to verify their location and existence, does not use proper inventory control tagging devices to match each vehicle to its unique control numbers, and does not prepare an annual report listing these vehicles and their asset-based values. As a result of the inadequate controls over these vehicles, the MBTA cannot be assured that those assets are safeguarded against loss, theft, or misuse.

During the period of our audit, the MBTA purchased approximately 492 non-revenue vehicles costing \$26,565,000. Examples of non-revenue vehicles used to maintain transit services include: vans, cars, snowplows, pick-up trucks, tow trucks, police cruisers, motorcycles, and other safety equipment.

In order to properly control and report on these assets, accepted management practices would require a periodic physical inventory to verify the existence of these assets and to reconcile any variances found to their inventory control records. Indeed, generally accepted accounting principles (GAAP) require an annual physical inventory and reconciliation for vehicles and equipment. In addition, the Federal Transit Administration requires that all federally funded

vehicles and equipment that have a historical cost of \$5,000 or more be inventoried and reconciled at least every two years.

However, instead of performing these required annual and bi-annual physical inventories, the Authority relies on two listings to confirm the existence of non-revenue vehicles; the Fixed Asset Database (FAD), maintained by Materials Management and the Maintenance Control and Reporting System (MCRS), developed by Vehicle Management. Vehicle Management also keeps Master Files on each vehicle (index cards) that contain make, model, title, registration, repairs, and accidents.

The MBTA then adds vehicles to the FAD and the MCRS as they are purchased or disposed on a perpetual basis.

We tested 20 non-revenue vehicles and their individual property identifiers such as make, model, registration, etc. from the FAD maintained by Materials Management. Our testing was conducted to verify the accuracy of the inventory listings for these vehicles maintained by Materials Management and Vehicle Management for vehicles assigned to the MBTA's Charlestown facilities.

The results of our test of these 20 non-revenue vehicles revealed the following errors in the MBTA's inventory control records:

- The Department Identification Number did not match the inventory control number for two vehicles (Utility Truck and Full Size Pickup).
- The License Plate Numbers did not match the inventory control number for four vehicles (Full Size Utility Truck, Utility Truck, Intermediate Sedan, and Service Truck)
- The Property Identification Control Number did not match the inventory control number for two vehicles (Full Size Utility-4WD and 7-Passenger Van)
- 15 vehicles including pickups, vans, trucks, sedans, and tractors had no original purchase date.

These types of recordkeeping and inventory control errors occur when physical inventories are not performed for each item and compared to the perpetual records and department records maintained for these assets.

Recommendation

The MBTA should take the following corrective actions to ensure proper asset management of its non-revenue vehicles:

- Conduct a physical inventory at least once every two years and ensure that all noted variances are properly reconciled to the perpetual inventory records.
- Prepare an annual report that completely and accurately lists all MBTA-owned non-revenue vehicles. Moreover, this report should reflect all relevant historical cost information and dates for vehicle acquisition, disposition, current assigned location, and current condition status.
- Designate an individual whose responsibilities will include facilitating the annual physical inventory and reconciling and reporting the results to appropriate management officials.

Auditee's Response

The Authority maintains inventory control over its extensive non-revenue vehicle fleet through the use of two (2) databases; Operations' Maintenance Control and Reporting System (MCRS) and the Treasurer's Office Fixed Asset Database. The MCRS is a comprehensive system that tracks the status, as well as all services provided to these vehicles including preventive maintenance, general repair, fueling, and the Annual State Inspection (conducted by trained Authority staff). The Treasurer's Fixed Asset database (a module of the PeopleSoft Financial System) provides accounting control, by maintaining individual equipment record for each vehicle that includes the acquisition cost, funding source, identification numbers, and useful life.

The Authority considers the MCRS a "perpetual" inventory of the fleet as it tracks all servicing provided to a vehicle. In addition, the annual State Inspection process requires each vehicle to be physically inspected. By reconciling the records on these two systems, independent verification and reasonable assurance are provided of the validity of the non-revenue fleet inventory. The Authority has utilized this "inventory" process for non-revenue vehicles for a considerable period, and it has satisfied the reviews conducted by all Federal and independent auditors during this time. In the Authority's opinion, this process provides more than adequate safeguards over the non-revenue vehicle fleet in a reasonable and cost-effective manner.

Auditor's Reply

We acknowledge that the Authority does in fact have several databases that track and monitor the location, maintenance, costs, etc. of its non-revenue vehicles. However, the results of our sample test indicate that the accuracy of these databases, for certain attributes, is lacking. We continue to urge the Authority, if resources allow, to consider the value of conducting a periodic physical inventory of these vehicles and to report on the results.

Exhibit A								
SUMMARY OF MBTA INTEREST RATE SWAP AGREEMENTS								
Payments and Receipts								
As of 12/31/2005								
							Exercised	Premium
Date	COUNTERPARTY	Notional Amount	Swap Interest Paid	Termination Payments	Consultant Fees	Swap Interest Received	Payments Received	Payments Received
6/27/2000	Bear Stearns Capital	\$ 188,000,000	\$ (29,237,234)	\$ -	-	\$ -	\$ -	\$ -
12/19/2000	UBS AG	\$ 49,122,655	\$ -	\$ -	\$ (15,327)	\$ -	\$ -	\$ 1,250,000
12/21/2000	Lehman Brothers Financing	\$ 219,255,000	\$ -	\$ (25,295,000)	\$ (19,326)	\$ -	\$ -	\$ 8,362,000
7/18/2001	UBS AG	\$ 188,000,000	\$ -	\$ -	\$ (32,000)	\$ -	\$ -	\$ 12,229,993
12/14/2001	Bear Stearns Financial	\$ 87,805,000	\$ (8,235,527)	\$ -	\$ (31,500)	\$ -	\$ 2,019,515	\$ -
12/14/2001	Bear Stearns Financial	\$ 79,645,000	\$ -	\$ -	\$ (31,500)	\$ -	\$ -	\$ 4,140,103
1/16/2003	UBS AG	\$ 123,170,000	\$ -	\$ (14,175,000)	\$ (87,500)	\$ -	\$ -	\$ 2,030,268
1/16/2003	UBS AG	\$ 96,085,000	\$ -	\$ (9,400,000)	\$ (87,500)	\$ -	\$ -	\$ 1,260,933
2/3/2004	Morgan Stanley Capital	\$ 25,005,000	\$ (31,371)	\$ -	\$ (125,000)	\$ 198,353	\$ -	\$ -
6/3/2005	UBS AG	\$ 248,485,000	\$ -	\$ -	\$ (75,000)	\$ -	\$ -	\$ -
6/3/2005	UBS AG	\$ 47,055,000	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8/12/2005	Bear Stearns Financial	\$ 280,000,000	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Totals		\$ 1,631,627,655	\$ (37,504,132)	\$ (48,870,000)	\$ (504,653)	\$ 198,353	\$ 2,019,515	\$ 29,273,297
	Total Paid by MBTA		\$ (86,878,785)					
	Total Received By MBTA		\$ 31,491,165					
	Net Cost To MBTA		\$ (55,387,620)					

Exhibit B
SUMMARY OF MBTA INTEREST RATE SWAP AGREEMENTS
Terms and Contract Status
As of 12/31/2005

<u>Date</u>	<u>COUNTERPARTY</u>	<u>Notional Amount</u>	<u>Swap Term</u>	<u>MBTA Pays</u>	<u>MBTA Receives</u>	<u>Contract Status</u>
6/27/2000	Bear Stearns Capital	\$ 188,000,000	6/29/2000-9/01/2005	4.9284% fixed	BMA	Expired
12/19/2000	UBS AG	\$ 49,122,655	7/01/2010-7/01/2030	BMA	5.60% fixed	Open
12/21/2000	Lehman Brothers Financing	\$ 219,255,000	3/01/2003-3/01/2021	5.27% fixed	BMA	Terminated
7/18/2001	UBS AG	\$ 188,000,000	9/01/2005-9/01/2030	5.00% fixed	67% of LIBOR	Exercised
12/14/2001	Bear Stearns Financial	\$ 87,805,000	3/01/2003-3/01/2022	5.2% fixed	BMA	Exercised
12/14/2001	Bear Stearns Financial	\$ 79,645,000	3/01/2009-3/01/2030	5.61% fixed	BMA	Open
1/16/2003	UBS AG	\$ 123,170,000	3/01/2005-3/01/2025	5.093% fixed	BMA	Terminated
1/16/2003	UBS AG	\$ 96,085,000	3/01/2005-3/01/2026	5.037% fixed	BMA	Terminated
2/3/2004	Morgan Stanley Capital	\$ 25,005,000	7/01/2004-7/01/2020	4.13% fixed	BMA	Open
6/3/2005	UBS AG	\$ 248,485,000	12/02/2006-7/01/2023	3.783% fixed	BMA	Open
6/3/2005	UBS AG	\$ 47,055,000	4/03/2010-7/1/2030	4.132% fixed	BMA	Open
8/12/2005	Bear Stearns Financial	\$ 280,000,000	1/10/07-7/01/2036	4.158% fixed	BMA	Open
Totals		<u>\$ 1,631,627,655</u>				

EXHIBIT C

GLOSSARY OF TERMS

Derivative

A financial instrument, traded on or off an exchange, the price of which is directly dependent upon the value of one or more underlying securities, equity indices, debt instruments, commodities, other derivative instruments, or any agreed upon pricing index or arrangement. Derivatives involve the trading of rights or obligations based on the underlying product but do not directly transfer property. They are used to hedge risk or to exchange a floating rate of return for a fixed rate of return.

Notional Principal Account

The notional principal amount is the specified amount on which the exchanged interest payments are based; this may be in US dollars, or pounds sterling, or whatever currency the swap is based on. Each period's rates are multiplied by the notional principal amount to determine the value of each counter-party's payment. A notional principal amount is the amount used as a reference to calculate the amount of interest due on an 'interest only class' which is not entitled to any principal.

Synthetic Security

Any combination of financial instruments producing a market instrument with different characteristics than could otherwise be achieved, for example, higher yield, better liquidity, or interest rate protection. These securities mimic conventional financial instruments that may or may not be available to investors. Most such deals are Private Placements involving two investors, and usually are created through Interest Rate Swaps, for example, creating a synthetic Floating Rate Note by matching a fixed rate bond and an interest rate swap.

Swap-Option

An option giving the buyer the right to enter into a swap agreement by a specified date. This is a blend of a swap and an option. To entice buyers, a premium is paid.

Swap

A contract in which two parties agree to exchange periodic interest payments, especially when one payment is at a fixed rate and the other varies according to the performance of a reference rate, such as the prime rate. An interest rate swap is a contractual agreement entered into between two counterparties under which each agrees to make periodic payments to the other for an agreed period of time based upon a notional amount of principal. The principal amount is notional because there is no need to exchange actual amounts of principal in a single currency transaction: there is no foreign exchange component to be taken account of. Equally, however, a notional amount of principal is required in order to compute the actual cash amounts that will be periodically exchanged. Under the most common form of interest rate swap, a series of payments calculated by applying a fixed rate of interest to a notional principal amount is exchanged for a stream of payments similarly calculated but using a floating rate of interest. This is a fixed-for-floating interest rate swap. Alternatively, both series of cash flows to be exchanged could be calculated using floating rates of interest but floating rates that are based upon different underlying indices. Examples might be Libor and commercial paper of Treasury bills and Libor and this form of interest rate swap is known as a basis or money market swap. LIBOR is the acronym for the London Interbank Offered Rate Index and is an average

of the interest rates that major international banks charge each other to borrow U.S. dollars in the London money market. LIBOR tends to move and adjust quite rapidly to changes in interest rates.

Option

A financial derivative, which represents a contract sold by one party (option writer) to another party (option holder) The contract offers the buyer the right, but not the obligation, to buy (call) or sell (put) a security or other financial asset at an agreed-upon price (the strike price) during a certain period of time or on a specific date (exercise date). Traders use options to speculate, which is a relatively risky practice, while hedgers use options to reduce the risk of holding an asset. For example, since the option writer will need to provide the underlying shares in the event that the stock's market price will exceed the strike, an option writer that sells a call option believes that the underlying stock's price will drop relative to the option's strike price during the life of the option. This is how the option writer earns the maximum profit.

This is exactly the opposite outlook of the option buyer. The buyer believes that the underlying stock will rise, because if this happens, the buyer will be able to acquire it for a lower price and then sell it for a profit.

Premium

The difference between the higher price paid for a fixed-income security and the security's face amount at issue. The premium of an option is basically the sum of the option's intrinsic and time value. It is important to note the volatility also affects the premium. If a fixed-income security (bond) is purchased at a premium, existing interest rates are lower than the coupon rate. Investors pay a premium for an investment that will return an amount greater than existing interest rates.

Variable Rate Debt

A security with an interest rate that changes periodically according to an index or formula set forth in the document.

Intrinsic Value

The actual value of a security, as opposed to its market price or book value. The intrinsic value includes other variables such as brand name, trademarks, and copyrights that are often difficult to calculate and sometimes not accurately reflected in the market price. One-way to look at it is that the market capitalization is the price (i.e. what investors are willing to pay for the company) and intrinsic value is the value (i.e. what the company is really worth). Different investors use different techniques to calculate intrinsic value.