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**INDEPENDENT STATE AUDITOR'S REPORT ON  
THE ACTIVITIES OF THE  
SNOW AND ICE REMOVAL PROGRAMS AT THE  
MASSACHUSETTS HIGHWAY DEPARTMENT AND  
THE METROPOLITAN DISTRICT COMMISSION  
JULY 1, 1999 THROUGH JUNE 30, 2001**

**OFFICIAL AUDIT  
REPORT  
APRIL 29, 2002**

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The Massachusetts Highway Department (MHD), which is part of the Executive Office of Transportation and Construction (EOTC), is responsible for planning, designing, maintaining, and operating a safe and efficient highway and bridge transportation system encompassing approximately 12,600 lane miles of state highway, 2,900 state-owned bridges, and 1,500 locally owned bridges.

The Metropolitan District Commission (MDC), which is part of the Executive Office of Environmental Affairs, is responsible for maintaining and operating a 700 lane mile network of parkways and bridges.

Both the MHD and MDC are responsible for maintaining their respective roadways to be reasonably safe for public travel by keeping them sufficiently clear of ice and snow. Both the MHD and MDC carry out these responsibilities under their Snow and Ice Removal Programs, which are funded by appropriations from the Legislature.

The purpose of our audit was to evaluate the adequacy of MHD's and MDC's internal controls over the expenditure of funds under the Snow and Ice Removal Programs. Our audit included a review of the appropriateness of standards for the activation of hired equipment and related expenditures, as well as expenditures for vehicle repairs, materials, and overtime compensation. Our review, which covered fiscal years 2000 and 2001, was made in accordance with applicable generally accepted government auditing standards and included such tests and procedures as we considered necessary under the circumstances.

Adequate internal controls over all aspects of an agency's operation are necessary to ensure that transactions are properly authorized, recorded, and reported and that all assets are properly safeguarded against theft, loss, or misuse. Our audit found that both MHD and MDC had established adequate controls for their Snow and Ice Removal Programs and that, except as noted, the controls were operating as designed.

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Management is responsible for establishing adequate internal controls over all aspects of an agency's operations. Such controls serve to ensure that all transactions are properly authorized, recorded, and reported and that assets are properly safeguarded against loss or abuse. The purpose of our audit was to evaluate the adequacy of controls the MHD and the MDC had established for their Snow and Ice Removal Programs. Based on our review, we determined that both MHD and MDC had established adequate controls over the expenditure of funds for these programs, and, with few exceptions, the controls were operating as designed.

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## INTRODUCTION

### *Background*

Chapter 647 of the Acts of 1989, An Act Relative to Improving Internal Controls Within State Agencies, require a responsible agency official to at least annually evaluate the effectiveness of the agency's internal control system and establish and implement changes necessary to ensure the continued integrity of the system. This report is intended to assist the cognizant officials from the Massachusetts Highway Department (MHD) and the Metropolitan District Commission (MDC) in fulfilling these responsibilities as they relate to the Snow and Ice Removal Programs of these agencies.

The areas examined during our review involved hired equipment, vehicle repairs, materials, and overtime compensation expenditures. We evaluated the following at each agency reviewed:

- The adequacy of controls over the expenditure of such funds.
- The appropriateness of standards for the activation of contractors.
- Measures to prevent fraud and abuse in the program.
- Measures to control overtime compensation costs.

### **Massachusetts Highway Department**

The MHD, which is part of the Executive Office of Transportation and Construction (EOTC), is responsible for planning, designing, maintaining, and operating a safe and efficient highway and bridge transportation system encompassing approximately 12,600 lane miles of state highway, 2,900 state-owned bridges, and 1,500 locally owned bridges. In addition to the headquarters office in Boston, there are five district offices located in Lenox, Northampton, Worcester, Arlington, and Taunton.

Chapter 81, Section 19, of the Massachusetts General Laws, as amended by Chapter 187 of the Acts of 1993, directs MHD to keep state highways sufficiently clear of ice and snow so that they are reasonably safe for public travel. The objective of MHD's Snow and Ice Removal Program is to promote highway safety and mobility during inclement winter weather by providing road

surfaces that enhance vehicle control on ice and compacted snow through chemical treatment, distribution of sand, and plowing. Chemical treatment prevents the bonding between ice and snow and the pavement.

During fiscal year 2001, MHD expended approximately \$78 million, including overtime costs, under its Snow and Ice Removal Program through July 16, 2001. The largest expenditure was \$52 million for hired equipment, which represented approximately 67% of the program's cost. Material costs during this period totaled approximately \$20.3 million, or 26% of the program's cost. Approximately \$163,000 was expended for vehicle repair. In addition, approximately \$5.4 million, or 7%, was expended for MHD overtime costs, which is exclusively allocated for the program from MHD's total payroll budget. Hired equipment operator costs are included as part of the hired equipment rate and are paid for by the owners.

Snow and Ice Removal Program funding and expenditure information for fiscal year 2000 is shown in Appendix A. Similar information for fiscal year 2001, which MHD management indicated was an unusually severe winter season, is shown below.

Description	Requested by Governor	Initial Appropriation by Legislature	Supplemental	Total	Expended Through 7/16/2001	% of Total Expended
Hired Equipment	\$16,143,985	\$6,727,688	\$45,675,309	\$52,402,997	\$51,993,881	67%
Vehicle Repair	175,000	175,000	0	175,000	163,292	Less than 1%
Materials	6,991,662	5,886,473	17,134,877	23,021,350	20,301,798	26%
Overtime	<u>0</u>	<u>1,500,000*</u>	<u>3,906,916</u>	<u>5,406,916</u>	<u>5,406,433</u>	<u>7%</u>
Totals	<u>\$23,310,647</u>	<u>\$14,289,161</u>	<u>\$66,717,102</u>	<u>\$81,006,263</u>	<u>\$77,865,404</u>	<u>100%</u>

\* MHD allocated \$1,500,000 for overtime costs from its total payroll budget. Supplemental funding from the payroll budget was received in the amount of \$3,906,916 for total overtime funding of \$5,406,916, of which \$5,406,433 was actually expended.

Partial MHD program funding for fiscal year 2002, through March 27, 2002, is shown in Appendix C.

### **Metropolitan District Commission**

Chapter 28, Section 1, of the General Laws established the Metropolitan District Commission (MDC) within the Executive Office of Environmental Affairs. The MDC oversees and maintains the Metropolitan Park System, which encompasses 30 square miles of open space within 34 cities and towns in the Greater Boston Metropolitan area. The MDC also manages the 120,000-acre watershed and reservoir system that provides water for 2.5 million people. (The Massachusetts Water Resources Authority is responsible for water transmission and treatment.) The MDC is also responsible for maintaining and operating 700 lane miles of parkways and bridges. In addition to the headquarters office in Boston, there are four district offices located in the Metropolitan Boston area.

MDC's Snow and Ice Removal Program expenditures for fiscal year 2001 totaled \$1.8 million. The largest expenditure was for materials such as salt and sand totaling \$729,193, or approximately 40% of the program costs; employee compensation costs totaled \$582,611, or 32% of program costs; and motor vehicle parts and related repairs totaled \$338,844, or 19% of program costs. Leased snow removal vehicles and equipment totaled \$52,202, or 3% of the program costs. The remaining \$106,584, or 6% of program costs, was expended for other snow removal related expenses, including energy costs and fuel expenses.

MDC program funding and expenditure information for fiscal year 2000 is shown in appendix B. Similar information for fiscal year 2001 is shown below.

<b>Account Number</b>	<b>Requested by Governor</b>	<b>Initial Appropriation by Legislature</b>	<b>Supplemental</b>	<b>Total</b>
2440-2000	\$969,795	\$569,795	\$1,239,639	\$ 1,809,434

Although not appropriation line items, MDC's fiscal year 2001 Snow and Ice Removal Program expenditures can be classified as follows:

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Description	Initial	Supplemental	Total	% Expended of Total Expended
Materials	\$244,795	\$ 484,398	\$ 729,193	40 %
Salaries	300,000	282,611	582,611	32 %
Vehicle Repairs	115	338,729	338,844	19 %
Leased Equipment	0	52,202	52,202	3%
All Other Charges	<u>24,885</u>	<u>81,699</u>	<u>106,584</u>	<u>6 %</u>
<b>Total</b>	<u>\$569,795</u>	<u>\$ 1,239,639</u>	<u>\$ 1,809,434</u>	<u>100 %</u>

### ***Audit Scope, Objectives, and Methodology***

The purpose of our audit was to evaluate the adequacy of MHD's and MDC's internal controls over the expenditure of funds under the Snow and Ice Removal Programs for hired equipment, vehicle repairs, materials, and overtime expenditures. Our audit included a review of the adequacy of current controls over the expenditure of the funds; the appropriateness of standards for the activation of contractors; measures to prevent fraud and abuse in the program; and measures to control overtime compensation costs.

To accomplish our objectives, we reviewed applicable laws, regulations and internal policies and procedures, and interviewed officials from MHD, MDC, the Executive Office for Administration and Finance, and the State Comptroller's Office. In addition, we conducted site visits and met with officials from two MHD districts and depots and one MDC district.

Our review, which covered fiscal years 2000 and 2001, was made in accordance with applicable generally accepted government auditing standards, and included such tests and procedures as we considered necessary under the circumstances.

A draft of this report was provided to the Acting MHD Commissioner at the conclusion of our audit. On March 22, 2002, the Acting Commissioner advised us that the concerns and recommendations mentioned in the report are positive and constructive and that they will attempt to implement a number of these recommendations and policy changes as soon as possible. He also provided us comments, which were considered in drafting our final report.

A draft of this report was also provided to the MDC Commissioner. The Commissioner advised us that the recommendations regarding strengthening controls over fraudulent abuse will be implemented. The Commissioner disagreed with our finding that \$57,000 of demolition costs were improperly charged to the Snow and Ice Removal Program. This issue is fully discussed in the first Audit Result of the report.



## AUDIT RESULTS

### 1. REVIEW OF ADEQUACY OF CONTROLS OVER THE EXPENDITURE OF FUNDS

Management is responsible for establishing adequate internal controls over all aspects of an agency's operations. Such controls serve to ensure that all transactions are properly authorized, recorded, and reported and that assets are properly safeguarded against loss, theft, or misuse. The purpose of our audit was to evaluate the adequacy of controls the Massachusetts Highway Department (MHD) and the Metropolitan District Commission (MDC) had established for their Snow and Ice Removal Programs. Based on our review, we determined that both MHD and MDC had established adequate controls over the expenditure of funds for these programs, and that, except as noted below; the controls were operating as designed.

#### a. Massachusetts Highway Department

Internal controls relating to the procurement and payment of goods and services and other MHD expenditures are identified in Sections 5.3.6 and 5.3.17 of MHD's Administrative Services Manual. In summary, at both the headquarters and district office levels, funding approval must be obtained from the MHD Budget Office prior to any encumbrance activity. As required by normal procurement policies and procedures, orders for goods and services must be approved by various MHD organizational levels and include up-front encumbrance authorizations. For the most part, headquarters approves the encumbrance documentation, and the district offices approve the payment vouchers. All district payment vouchers are reviewed for accuracy and completeness and, depending upon funding availability, are processed into the Massachusetts Management Accounting Reporting System (MMARS) by MHD district personnel.

As part of our review of MHD's Snow and Ice Removal Program, we reviewed 232 payment vouchers totaling \$1,576,448 for materials purchased, hired equipment, and vehicle repair costs at two district offices. We also reviewed overtime policies and procedures and tested payroll records for these two districts and headquarters.

At the Departmental level, we tested MHD's controls over expenditures of funds for its statewide road and bridge program in a separate report (Report No. 2000-4076-3). Both federal and state legislation require MHD to maintain a balanced statewide road and bridge program, exclusive of the Central Artery/Tunnel Project, that will include a sufficient number of projects to result in a minimum annual expenditure of \$400 million. During that audit, we reviewed a sample of over 371 payment vouchers valued at about \$155 million to verify that the nature of the expenditures were consistent with the criteria for inclusion; the payments were made with fiscal year 2001 funds; and the expenditures were properly authorized, calculated accurately, and included the necessary supporting documentation.

We found that MHD's system for controlling and reporting on the expenditure of program funds at the Departmental and Snow and Ice Program levels was adequate and operating as designed. However, our review indicated that MHD's internal controls over the expenditure of funds could be strengthened in the following areas:

- MHD Obligated Funds Prior to the Receipt of Supplemental Appropriations: MHD's Administrative Services Manual states in Section 5.3.6. that, prior to obligating funds, headquarters and district offices obtain funding authorization from the MHD Budget Office. Our review revealed that, at the two districts reviewed, materials had been ordered and independent contractors hired to plow snow and treat roads for ice removal without available funds to pay for the materials or services. The Legislature's initial appropriation to MHD amounted to approximately \$13 million for the past three fiscal years to administer a program that historically has cost an average of about \$40 million to operate. According to MHD, the initial appropriation received from the Legislature is usually depleted in January each year, which necessitates significant supplemental funds to meet obligations. For instance, in fiscal year 2001, the original appropriation of \$12,789,161 was exhausted on January 1, 2001, and additional obligations of \$6,624,170 were accumulated until the first supplemental appropriation was received on January 10, 2001. As a result, MHD did not adhere to its prescribed policies and procedures by obligating the state to pay for services and materials without adequate appropriation authority.
- Vehicle and Equipment Repair Costs Erroneously Charged to the Snow and Ice Removal Program: MHD's vehicle and equipment repair costs for the Snow and Ice Removal Program are funded under a separate appropriation line item for that type of activity, and funds should only be used for that purpose. During our test of vehicle repair payment vouchers at two MHD districts, we noted repair costs charged to the Snow and Ice Removal Program that were not program related.

Specifically, we determined that \$11,495 of the total fiscal year 2000 repair costs of about \$173,000 were non-program-related (e.g., repair cost for lawnmowers, generators, and a passenger vehicle).

**b. Metropolitan District Commission**

According to MDC officials, MDC's internal controls relating to the procurement and payment of goods and services under the Snow and Ice Removal Program, as with all MDC expenditures, comply with Chapter 647 of the Acts of 1989; an Act Relative to Improving the Internal Controls within State Agencies. MDC Division Directors and designated staff approve all requests for the purchase of goods and services. Additionally, the requests must have the approval of the agency's Accounts Manager. The requests to purchase goods and services are reviewed for accuracy and completeness, and processed into the MMARS system. Personnel authorized to approve the purchase of goods and services are not permitted to order or receive the goods.

As part of our review of MDC's Snow and Ice Removal Program, we reviewed 45 payment vouchers totaling \$337,049 for materials purchased, hired equipment, and vehicle repairs. We also reviewed MDC's overtime policies and procedures and tested time charges to the Snow and Ice Removal Program.

Our review at MDC indicated that, although the internal controls over the expenditure of funds were adequate, they could be improved in the following areas:

- MDC Obligated Funds Prior to Receipt of a Supplemental Appropriation: MDC officials indicated that they requested \$969,795 for fiscal year 2001 to administer the Snow and Ice Removal Program, but the Legislature appropriated only \$569,795. MDC officials stated that this amount is less than was required to operate the program and, accordingly, a supplemental appropriation was requested. According to MDC officials, under the Snow and Ice Removal Program, it is customary to order materials required for the upcoming winter season even though it is known that funds won't be available to pay for these items until a supplemental appropriation is passed by the Legislature. MDC officials stated that this situation routinely occurs every year because the amount of Snow and Ice Removal Program funds received in the initial appropriation is insufficient. For instance, in fiscal year 2001, the original appropriation of \$569,795 was exhausted by December 15, 2000, and additional obligations of \$1,239,639 were accumulated until a supplemental

appropriation was received on June 8, 2001. This practice obligates the MDC to pay for materials without adequate program appropriation authority.

- **MDC Charged Building Demolition Costs to the Snow and Ice Removal Program:** We found that the MDC charged \$57,000 to the Snow and Ice Removal Program for the demolition of a building and related work at the Mystic District Yard in Stoneham. Before the building was demolished, it was used for office space, and after demolition it became a parking lot and a landscaped area. Therefore, the non-program-related demolition costs should not have been charged to the Snow and Ice Removal Program.

### ***Recommendation***

MHD and the MDC should:

- Discuss with the Legislature the impact that limited initial appropriations have had on MHD's and MDC's ability to purchase materials and services and, based on these discussions, submit realistic appropriation requests that consider such factors as historical experience, inflation, and current program needs.
- Ensure that the Snow and Ice Removal Program is charged only for costs directly related to that program.

### ***Auditees Response***

In response to our recommendations, the Acting MHD Commissioner stated that:

*The paragraphs that reference the \$400 million statewide road and bridge program are not related to the snow and ice program and shouldn't be included in this audit report.*

### ***Auditor's Reply***

Our comments regarding the processing of payment vouchers under the statewide road and bridge program are included only to offer evidence that agency-wide, MHD's internal controls and operating systems are adequate and operating as designed.

The Acting MHD Commissioner added:

*In response to the comment that "MHD obligated funds prior to the receipt of supplemental funds", MassHighway does order materials and hire independent contractors for snow and ice removal without available funds. For the last four years, the Legislature has appropriated \$14.3 million for snow and ice removal. The five-year average for the snow and ice program is \$47.5 million. As noted, funds for*

*snow and ice removal are usually depleted in January of each winter. Supplemental funds are usually not available until March or later in the fiscal year. We cannot stop the snow and ice operation between January and March. This is done in the interest of public safety. The highways must be kept open at all times for emergency vehicles, commuters and interstate commerce. Headquarter and District offices do adhere to the internal control policies, with the exception of procuring goods and services prior to availability of funds. However, Boston Headquarter and District offices proceed with their procurements only after notifying the Budget Office, in order to keep Fiscal Affairs, and the House and Senate Ways and Means analysts current as to our deficiency status.*

*The audit report suggests that MassHighway should submit realistic appropriation requests to fund the snow and ice budget. For the last three years, MassHighway has requested additional funding in our annual spending plan request, the Governor has supported an increase, but the Legislature has not increased the budget.*

### **Auditee's Response**

The MDC Commissioner stated:

*As you know, the adequacy of sufficient levels of funding is an issue that is beyond the control of any individual Agency. The necessary historical and correct information is routinely forwarded to the Legislature. However, it has been the practice of the Legislature to provide an initial appropriation and to then provide funding on an as needed basis. The MDC, at your recommendation, will continue to have discussions with all appropriate parties external to the Agency relative to funding levels.*

### **Auditor's Reply**

We encourage the Acting MHD Commissioner, the MDC Commissioner and the Governor's Office to continue to work with the Legislature to resolve this issue. This practice of under-funding the Snow and Ice Removal Program reportedly has also caused undue hardships to MHD vendors and service providers in the past because of late reimbursements for services rendered.

The Acting MHD Commissioner also commented that:

*The draft audit report stated that "vehicle and equipment repair costs were erroneously charged to the snow and ice removal program". An argument can be made that most if not all of the costs noted were program related.*

***Auditor's Reply***

During our review at the District Offices, we inquired whether the vehicle and equipment charges in question were related to the Snow and Ice Program. We were advised that in all but two cases, the repairs were not snow and ice related, and no documentation was provided that supported a conclusion that these two cases involved valid snow and ice related charges.

***Auditee's Response***

The MDC Commissioner added:

*Lastly, I need to reiterate that the MDC does not feel that it inappropriately charged a building demolition to the snow and ice account. Upon the recommendation of my Engineering Division and Operation Division, a decision was made to not rebuild/rehabilitate the steel hopper and building in the Stoneham Labor Yard. Notwithstanding the building's recent use for storage, the historical use of the building was the Foreman's Office to monitor utilization of snow and ice operations and the steel hopper. Since the hopper and building were no longer useful for current snow and ice removal operations, the decision was made to eliminate them from building inventory. The fact that the area of this building was paved/landscaped is not relevant since the MDC could obviously not leave a hole in the ground.*

***Auditor's Reply***

During our inspection of the Stoneham facility and subsequent conversations with MDC personnel, we were informed that the facilities in question have not been used for snow and ice operations for many years. The facility has in fact been utilized for general purposes such as storage and office space. Since the entire Stoneham operation benefits from the additional parking spaces and aesthetic landscaping, the costs of this activity should not be borne, for the most part, by the Snow and Ice Removal Program.

**2. REVIEW OF APPROPRIATE DEPARTMENTAL STANDARDS FOR THE ACTIVATION OF CONTRACTORS**

We evaluated MHD's and MDC's standards for activating hired equipment contractors under the Snow and Ice Removal Program. The MDC uses its own equipment to plow roadways and apply sand and salt and seldom hires rental equipment. For example, there was no outside equipment hired in fiscal year 2000, and in fiscal year 2001, approximately

\$50,000 was expended during a statewide emergency, most of which was reimbursed by the Federal Emergency Management Agency (FEMA). Because the MDC is not routinely involved with activating hired equipment contractors for the Snow and Ice Removal Program, this section of the report is not applicable to it. Our review revealed that MHD's written policies and procedures relative to the activation of contractors were adequate. However, as discussed below, we found that they were not uniformly adhered to by district offices.

MHD's Maintenance Manual, Chapter 5.2.4, states that hired equipment shall be authorized for use only as a supplement to state equipment and is to be called upon when storm duration or severity is such that state equipment alone is inadequate to cope with the situation. According to the manual, every effort should be made to first utilize available state equipment, including the shifting of equipment and personnel between district maintenance sections, within reason and when conditions allow.

During the period covered by our audit, MHD maintained a 24-hour emergency dispatch Traffic Operations Center (TOC) in Boston. The TOC receives weather reports from a contracted weather service, and when inclement winter weather is predicted, the TOC contacts the Snow and Ice Engineer, who relays the forecast to all affected districts. If a storm is imminent, additional forecasts are sent to the district's Snow and Ice Engineer. Based on the storm's predicted severity and estimated time of arrival, the district Snow and Ice Engineer decides when and how many contractors to activate and informs headquarters that they are activating for a snow and ice emergency. After three districts have been activated, the radio room in the Transportation Building headquarters is manned and in contact with the districts.

Prospective contractors notify MHD of their interest in participating in the Snow and Ice Removal Program before the winter season begins. Each district submits its hired equipment request to headquarters by November 1 of each year. The request defines equipment needs, taking into consideration availability of state equipment and operators. District Snow and Ice

Engineers are instructed to include only the quantity of equipment necessary to ensure a full complement for the upcoming winter.

MHD's Maintenance Manual requires that hired equipment must be in first-class condition and that preference be given to rehiring those vendors who have demonstrated satisfactory past performance. Contractor performance is evaluated each season and is recorded on MHD's "Record of Contractor's Performance" form.

As part of the hired equipment agreement process, all hired equipment must undergo a pre-season inspection if it is to participate in the Snow and Ice Removal Program. Repeat contractors must have on file a favorable evaluation from the preceding year. There are several items that MHD's maintenance manual requires districts to check before they can hire vendors. This inspection ensures that the trucks have valid registrations, correct license plates (no dealer, repair, or farm plates), inspection stickers, and insurance. District supervisors also inspect the trucks to make sure they have proper lighting and are in good running condition. In addition, contractors that operate material spreaders must have their spreaders inspected annually and properly calibrated by an MHD-approved dealer.

Our review disclosed that MHD's policies and procedures for the activation of contractors were not uniformly being adhered to by MHD's district offices, as follows:

- Utilization of State-Owned Equipment in the Snow and Ice Removal Program: Section 5.2.4 of MHD's Maintenance Manual requires that hired equipment be authorized for use only as a supplement to state equipment when storm duration or severity is such that state equipment alone is inadequate to cope with the situation. According to the manual, every effort should be made to first utilize available state equipment, including shifting equipment and personnel between district maintenance sections within reason and when conditions allow. District 5's usual practice is to use MHD equipment for sanding but hired equipment contractors for plowing and salt applications. According to District 5 officials, state equipment is used sparingly to reduce wear and damage caused by chemical corrosion, operating on snow and ice, and pushing plows so that the equipment will be available for use year round. In contrast, District 2 uses all applicable state-owned vehicles prior to activating hired equipment.



**Recommendation**

MHD should undertake a cost-benefit analysis to determine whether districts should first utilize available state equipment during ice and snow events before using hired equipment as a supplement and, depending on the outcome of that study, enforce or change its stated policy.

**Auditee's Response**

The Acting MHD Commissioner stated:

*The audit report implies that MassHighway does not make every effort to utilize state equipment prior to calling out hired equipment, as required by the Maintenance Manual. The lack of available personnel to adequately monitor and inspect road conditions is the underlying reason why certain Districts cannot take full advantage of available state equipment prior to calling upon hired equipment. In particular, District 2 states that they always use state owned equipment to the fullest extent possible before the hired equipment is employed. MassHighway's staffing level has diminished significantly since the Maintenance Manual was written.*

*The audit report recommends that "MHD" should undertake a cost-benefit analysis to determine whether Districts should first utilize state equipment during ice and snow storm events before using hired equipment as a supplement, and depending on the outcome of the study, enforce or change its stated policy". Due to the recent budget and staffing cutbacks, it may be more efficient and credible if state auditors perform this analysis.*

**Auditor's Reply**

Our report notes that although District 2 uses state-owned equipment before activating outside contractors, District 5 does not. The reason District 5 offered for not using all equipment was to avoid using the equipment for harsh plowing activity, not because of the lack of available personnel. This non-compliance with MHD's Maintenance Manual requirements is the issue that needs to be addressed, since it is a recurring operational problem. MHD needs to enforce the requirement or change it. MHD has the expertise in-house to make this operational determination, and should adjust or enforce this requirement accordingly.

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### **3. REVIEW OF MEASURES TO PREVENT FRAUD AND ABUSE IN THE SNOW AND ICE REMOVAL PROGRAM**

Our review indicated that although MHD and MDC had adequate controls to prevent fraud and abuse in the Snow and Ice Removal Program, the controls could be strengthened, as discussed below.

#### **a. Massachusetts Highway Department**

According to MHD's Director of Administrative Services, the following controls are in place to prevent fraud and abuse in the Snow and Ice Removal Program: (1) segregation of duties in the approval of encumbrances and the payment of vouchers, (2) segregation of duties in the activation and monitoring of hired equipment vendors, i.e., the employee that activates the hired equipment is different than the employees who monitor the work performed, and the monitors very often work in areas where they are not usually assigned, (3) oversight by MHD headquarters during and after a snow and ice event, and (4) monitoring of material usage and storage depot security.

In addition, MHD's Maintenance Manual identifies the applicable policies and procedures relating to hired equipment, materials, vehicle repair, and overtime. These policies and procedures were developed to provide uniformity throughout the agency and to minimize the risk of fraud and abuse within the Snow and Ice Removal Program. Our review of the program included an evaluation of MHD's compliance with the manual.

At the district level, our review of materials included testing payment vouchers to ensure that they had the proper approval signatures and supporting delivery tickets and that vendor invoices had been processed into the state's MMARS system and paid timely. In addition, we visited several depots to ensure that they were secured to prevent theft, vandalism, and injury.

Our review of hired equipment at the district level included reviewing payment vouchers to ensure that proper approval signatures were obtained, supporting equipment time logs were available, and vouchers had been timely processed into the MMARS reporting system for

payment. In addition, we reviewed time logs to ensure that adequate segregation of duties existed for their completion and approval. We also reviewed the districts' procedures for activating and releasing hired equipment to ensure that proper segregation of duties existed between the person who activates the hired equipment and the person who monitors and records their hours.

For vehicle repairs, we reviewed encumbrance documents and payment vouchers for both in-house and contracted repairs. We traced the vouchers to supporting invoices and to the MMARS system for timely payment. In addition, we reviewed the invoices to determine whether the repairs should have been charged to the Snow and Ice Removal Program. We also traced the vehicle number on each invoice to the district's vehicle listing to ensure that the vehicles were actually used for the Snow and Ice Removal Program.

Our review indicated that, although MHD's internal controls to prevent fraud and abuse were adequate, they could be strengthened, as follows:

- Hired Equipment Time Logs Not Adequately Safeguarded: Chapter 5 of MHD's Maintenance Manual requires district offices to maintain Hired Equipment Time Logs (HETLs) for hired equipment. The HETLs include information such as dates of service, chargeable hours, and rates of pay. According to the manual, the HETLs are to be properly maintained and secured when not in use to prevent fraudulent tampering. (The HETLs are the source document for preparing payment vouchers for payment to the vendors). The payment vouchers are entered into the MMARS system by MHD's District personnel and processed for payment to the vendors. According to personnel of Districts 2 and 5, the HETLs are not routinely kept in a secured location, and the districts were unsure how long the logs should be maintained. During our review, we found that several logs could not be located and were told they were probably discarded. Without HETLs, a useful and inexpensive internal control is missing that would help prevent fraudulent tampering and provide assurance that vendors are paid the correct amounts. Moreover, by not retaining the documents that support the payment voucher, there is no audit trail backing up payments to their original source.

At District 5 we found two instances in which data appearing on the logs were different from the data used to prepare the vouchers for payment to the vendors, and four instances in which the accuracy of payment could not be substantiated because the logs could not be located. Similarly, at District 2 we noted three instances in which hired equipment vendors were paid for hours worked that did not agree with the hours shown on the HETLs. District office personnel stated that they were

unaware that the HETLs had to be secured and that there was no requirement to retain the logs after the payment vouchers were processed.

- Maintenance Manual Needs Updating: MHD Maintenance Manual, Chapter 5, which deals with the Snow and Ice Removal Program, should be current and complete. However, we were informed by district officials on several occasions that the Maintenance Manual is outdated and no longer applied to some current practices. The lack of a current, up-to-date manual is an internal control weakness that can cause inconsistent practices throughout the agency.

Our review at Districts 2 and 5 documented instances in which Chapter 5 was outdated and incomplete. For example, the manual requires state equipment to be used for snow and ice removal before outside contractors can be hired. However, District 5 limits the use of state equipment to reduce wear and tear on the vehicles. In addition, the Maintenance Manual refers to “temporary” employees, a category not currently used, and a method of spreading materials that is no longer employed. The Maintenance Manual also does not specify procedures for the retention of HETLs. Moreover, a contradiction exists between the Maintenance Manual and the pre-season hired equipment package that is sent to contractors each year. The hired equipment package states that compensation will begin when the contractor actually arrives at the site. However, the Maintenance Manual provides that the contractor will be paid a half-hour for travel time to the site if the contractor arrives at the site a half-hour from the time called. The manual designates the position and grades of personnel who are to be assigned overtime during storms, but district officials stated that current staffing levels preclude them from adhering to these policies. In addition, the hired equipment payment voucher provides for the District Highway Director’s signature and has the Director’s name pre-printed on the form. However, we were informed that the Director’s signature is no longer required on each payment voucher, but rather on the warrant cover sheet.

- Risk of Theft, Vandalism, and Injury at Unsecured Storage Depots: Prudent business practices advocate that state-owned property, materials, and equipment be properly secured or supervised to prevent theft, vandalism, and injured party lawsuits. During our visits to selected depots in Districts 2 and 5, we observed that, during regular business hours, some depots were not manned and had gates and storage sheds that were not secured to prevent theft, vandalism, and injury to intruders.

By not safeguarding property, equipment, and materials, MHD is vulnerable to theft of materials and vandalism to property and equipment. Moreover, by not locking yards and storage sheds, persons (especially children) gaining entry could incur serious injury. Although MHD procedures require depots to be secured during non-working hours, they do not require depots to be secured during working hours when the property is not supervised.

- Material Delivery Tickets Lacked Proper Approval Signatures: Prudent business practice requires that personnel responsible for inspecting and accepting the delivery of goods acknowledge their receipt by signing a receiving report, which is MHD's internal control verifying that the delivery was received. However, our testing of Districts 2 and 5 material (i.e., salt and sand) delivery tickets found that MHD approval signatures documenting the receipt of materials were missing from 132 of the 1,227 delivery tickets reviewed, or approximately 11%. District 2 lacked signatures on 103 of 129 delivery tickets, and District 5 lacked signatures on 29 of 1,098 delivery tickets. Not having MHD personnel inspect and acknowledge receipt of materials is an internal control weakness that unnecessarily exposes MHD to the risk of delivery shortages.
- Reliability of Snow and Ice Removal Management Reports Needs Improvement: Prudent business practices advocate that program management reports contain current, complete, and accurate data. Our review of MHD headquarters material inventory usage reports revealed that material expenditures were understated at the district offices because the expenditures were incorrectly reported as headquarters expenditures. Our review also revealed that other reports of district office inventory balances had incorrect computations. Accordingly, MHD did not have accurate totals of the amounts expended for materials by district. In addition, incorrect data on the material inventory reports could result in MHD's ordering more or less materials than actually needed. MHD's Budget Director stated that some district personnel were entering an incorrect organizational number when inputting material payment vouchers and that the accuracy of inventory reports were not always checked.

**b. Metropolitan District Commission**

At the MDC, our review of materials included testing payment vouchers to delivery tickets and vendor invoices to verify delivered tonnage, invoice amount, and proper approval signatures. Payment dates were traced to purchase voucher dates to determine whether vendors were paid interest on payments made beyond the 45-day period allowed. In addition, we visited a district yard to determine whether it was properly secured to help prevent theft, vandalism, and injury. We also verified that materials were appropriately stored in the yard.

MDC generally does not hire equipment and uses its own staff and vehicles to salt, sand, and plow roadways. However, during a recent snow emergency it did use some hired equipment. We reviewed that event to ensure that proper approval signatures were obtained, supporting equipment time records and invoices were available, and payment vouchers had been timely processed into the MMARS reporting system. We also reviewed the district's process for

renting equipment to ensure that proper segregation of duties existed between personnel who approve the hired equipment and those who monitor and record the hours worked.

At MDC, all snow and ice vehicles were sent to local garages for repairs during fiscal year 2000. We verified payment vouchers for repairs totaling \$74,039 to supporting vendor invoices and noted no discrepancies. Also, the vehicle number on each invoice was traced to the MDC's vehicle listing to ensure that the vehicles had been used for the Snow and Ice Removal Program.

Based on our reviews at MDC, we believe that controls to prevent fraud and abuse under the Snow and Ice Removal Program were adequate. However, they could be strengthened in the following areas:

- MDC Storage Yard Not Secured During Non-Business Hours: During a visit to an MDC Storage Yard, we were informed that the gates were not secured and often left unattended at night. Without secured gates, the yard is vulnerable to theft and vandalism, and the MDC is exposed to lawsuits if anyone should be injured.
- Inventory Records for Materials Not Maintained at MDC: Salt and sand are the principal materials used during winter storm events. MDC does not maintain inventory records for salt and sand, although in fiscal year 2001 over \$700,000 of this material was purchased, which represented the largest charge to the Snow and Ice Removal Program. Without adequate inventory controls, the risk of salt and sand being over- or understocked or misused increases.

MDC officials stated that they were unaware of any specific MDC requirements that items such as salt and sand should be inventoried. However, program officials agreed that maintaining inventory records would help to increase accountability and facilitate management of the Snow and Ice Removal Program.

### ***Recommendation***

MHD and MDC should review and improve their security procedures at all storage depots.

In addition, we recommend that MHD:

- Clarify the Maintenance Manual as to the retention of source documents and, as part of its training efforts, stress the benefits of adequately safeguarding and retaining HETLs. MHD should also ensure that district and headquarters personnel implement MHD's record retention policy for source documents.

- Update the Maintenance Manual to ensure that it reflects current practices and conditions, provides uniformity throughout the agency, and strengthens MHD's internal control structure.
- Ensure that material deliveries are only accepted when an MHD employee is available to inspect and sign for the delivery.
- Provide necessary training to ensure that employees inputting data to management's materials inventory reports are doing so in a complete and accurate manner.

Further, we recommend that the MDC require that official inventory records be maintained for sand and salt.

### ***Auditee's Response***

With regard to our recommendation regarding measures to prevent fraud and abuse in the Snow and Ice Removal Program, the Acting MHD Commissioner stated that:

*The audit report states that, "Hired Equipment Time Logs are not adequately safeguarded". The Districts consider the Hired Equipment Time Logs (HETL) to be worksheets for the timekeepers to record when hired equipment is called out, when they report to work and when they leave. This information is then transferred to Payment Voucher's (PV's). These PV's are signed by the vendor, Highway Repair Foreman and Contract Specialist III and brought to the District Office. The PV's are kept securely at the District Administrator's office. The Districts believe the PV's are the (only) legal documents that must be kept securely. However, as recommended by the auditors, Highway Operations will stress compliance with the policy to maintain and secure HETLs during training sessions to be held prior to the 2002/2003 winter season.*

*Regarding the difference between the HETLs and the PV's for District 2, the District believes the differences were ½ hour on each PV during an eight-hour event. The monitor or time keeper preparing the HETL showed a break after the 7 ½ hours as described in the Hired Equipment Rental Rate. The timekeeper then prepared the PV for the eight hours the vendor worked. This was a procedural error and the District Personnel have been instructed that the PV's shall match the HETL.*

*The audit suggests that the "Maintenance Manual needs updating". The winter weather in Massachusetts varies significantly. Furthermore, traffic volumes and roadway classifications (Interstate, secondary, local) vary among the Districts. Therefore, a set policy that is all encompassing is difficult to attain and may not be in the best interest of MassHighway or the motoring public. Chapter 5.1.3 of the Manual states, "These Standard Operating Procedures are furnished as a guide to be implemented during Snow and Ice Control Operations. The District Highway Directors or their designee shall have authority to modify these procedures to accommodate the prevailing storm emergency conditions encountered". This*

*flexibility in the policy allows the Districts to improvise and overcome adverse and changing conditions in weather, fiscal constraints and political demands. Also, it is important for the Districts, under the direction of Headquarters, to be able to experiment with new materials and application rates and investigate new practices and techniques in an effort to remain on the cutting edge of snow and ice removal technology. However, Highway Operations agrees that the accounting standard must be set and adhered to and the Maintenance Manual must continue to be updated.*

*“Risk of theft, vandalism, and injury at unsecured storage depots”. Maintenance facilities are kept open from 7:30AM to 4:00PM to allow construction, maintenance and other state agency personnel to access the fuel pumps. During normal working hours, MassHighway personnel are in and out of the facility throughout the day.*

*“Material delivery tickets lacked approval signatures”. District 2 states that District personnel are always present during material delivery and collect the slips as the material is delivered. Usually, that employee is also loading the salt in the shed. However, Highway Operations will reiterate that deliveries should be acknowledged and signed for by a MassHighway representative.*

*“Reliability of Snow and Ice Removal Management Reports needs improvement”. Snow and Ice material inventory reports are based on estimates of material usage and current inventory. During emergency snow ice events, material spreading trucks are not weighed prior to and after completing their various routes. Therefore, an accurate tally of material usage and thus remaining inventory is impossible. Estimates of inventory are made by rough measurements of material remaining in sheds. These estimates have proven accurate enough for headquarters to determine the time and amount required to restock inventory.*

*The Budget Director’s comments were misstated. . . . District personnel used a Highway Operations organization code rather than a District organization code, making it harder to track usage by District. This is a cost allocation problem; it does not affect the reporting accuracy of the inventory levels.*

### **Auditor’s Reply**

We are pleased that MHD plans to enforce its policy to maintain and secure the HETLs and will conduct training sessions to reinforce its implementation. We are also pleased that district personnel will be instructed to correct any procedural errors accounting for the differences between payment vouchers and the HETLs.

We agree with MHD’s practice of allowing its Districts to modify their procedures to accommodate conditions encountered in their areas of responsibility. It is not our intent to lessen this flexibility. Rather, our recommendations are directed at removing and/or clarifying inaccurate or inconsistent statements from the Maintenance Manual to minimize



potential confusion. We are pleased that MHD concurs that the Maintenance Manual must be updated.

We reiterate our recommendation that MHD's security procedures at storage depots be reviewed, especially the practice of allowing the gates to remain open when the depot is unattended.

***Auditee's Response***

The MDC Commissioner stated:

*With respect to your recommendations relative to strengthening controls for potential fraud and abuse (i.e. locking a storage yard and maintaining a proper inventory of sand and salt) the MDC will implement those controls.*

***Auditor's Reply***

We are pleased that the MDC will implement the recommended changes to strengthen internal controls to prevent fraud and abuse and enhance controls relative to safeguarding inventory.

**4. REVIEW OF MEASURES TO CONTROL OVERTIME COMPENSATION COSTS**

We evaluated the adequacy of controls that MHD and MDC established to control overtime compensation costs. Our review indicated that each agency's controls in this area were adequate and operating as designed, as discussed below.

**a. Massachusetts Highway Department**

Chapter 5.2.2 of the MHD's Maintenance Manual details staffing for the Snow and Ice Removal Program. Full-time salaries are not to be charged to the Snow and Ice Removal Program, only payroll costs for overtime hours can be charged. Vendor personnel operator costs are included as part of the hired equipment rate and are paid for by the owners.

The MHD Maintenance Manual details the staff required to work overtime during inclement weather by position, classification, and grade. In early September, a statewide directory entitled "Emergency Organization for Winter Storms and other Natural Disasters" is

prepared, which lists headquarters and district staff who will be assigned overtime when the need arises and the locations of installations where they should report. Overtime staff are usually used as timekeepers or plow chasers, who are assigned to particular routes and are responsible for reporting on the conditions of the roadways and ensuring that the state-owned and hired equipment plows and spreaders are doing their job.

Overtime hours are authorized by the person responsible for assigning the work. The District Snow and Ice Engineer, along with a Contract Specialist who monitors contracted privatized work crews, decides who, when, and for how long someone will be called to work overtime during a storm event. Employees are responsible for completing their time records and submitting them to the Highway Maintenance Foreman at the depot for verification and approval. The records are then submitted to a senior Highway Maintenance Foreman for approval and forwarded to a senior Contract Specialist, who completes and signs the transmittal (time log) for all employees within the depot. Next, the records are submitted to the District Maintenance Engineer who approves the transmittal and forwards them to payroll. We were informed that the District Highway Engineer randomly checks the records and time log for accuracy.

Headquarters personnel charge the Snow and Ice Removal overtime account for overtime work performed when staff are required to remain on site during significant storms. During a storm, if three areas of the state have been mobilized, headquarters will mobilize to provide emergency services, which results in overtime charges at the headquarters level. According to district officials, reduced staffing levels and public safety issues minimize opportunities to reduce overtime use; as public safety, not overtime, is the critical issue.

We reviewed MHD overtime procedures with headquarters and district officials and obtained listings of overtime paid to employees. We tested a sample of payroll records for which overtime was paid and verified that the proper authorization and approvals were obtained.

Our review indicated that MHD's controls over overtime costs were adequate.

**b. Metropolitan District Commission**

Unlike MHD, the MDC charges both regular and overtime costs to the Snow and Ice Removal Program for employees working during storms. The Deputy Commissioner for Operations is the MDC official who authorizes overtime. This authorization is based on forecasted snowfall amounts prior to a storm or the actual snowfall amounts and related weather conditions, such as icing of roadways. The Deputy Commissioner pre-authorizes the number of employees who will work overtime during a storm, based on forecasted weather and discussions with yard supervisors regarding local weather and road conditions.

At each of the four District Yards, the yard supervisor and foreman monitor employee time for each storm. Employees charge all their time to the Snow and Ice Removal Program during the snowstorm, and no partial days are charged. When the Deputy Commissioner determines that the storm is over, the charges to the Snow and Ice Removal Program are discontinued. Time charges for supervisory and administrative staff that work during storms are also charged to the Snow and Ice Removal Program in accordance with the time authorized for the storm by the Deputy Commissioner. If a storm is severe, or the Governor declares a snow emergency, then a “Storm Desk” is established, and all assigned staff are directed to charge time to the Snow and Ice Removal Program.

The employee time records, after being reviewed and approved by supervisors, are reported to the MDC Operations Director at the Central Services Division, where they are reviewed, consolidated, and reported to the Director of Finance, who charges them to the Snow and Ice Removal Program as personnel charges. We reviewed the time cards for selected employee charges to the Snow and Ice Removal Program for a fiscal year 2000 storm event and noted that an appropriate supervisor approved the time cards.

Our review indicated that the MDC’s controls over overtime compensation costs were adequate.

***Auditee’s Response***

The Acting MHD Commissioner responded that:

*We are pleased to note that your review indicated that MHD’s controls over overtime costs were adequate.*

## APPENDIX A

### Massachusetts Highway Department Fiscal Year 2000 Financial Data

During fiscal year 2000, MHD expended approximately \$39.3 million, including overtime costs, under its Snow and Ice Removal Program. The largest expenditure was for hired equipment totaling \$23.7 million, which represents approximately 60% of the program's cost. Material costs totaled approximately \$12.9 million, or 33% of the program's cost, and approximately \$173,000 was used for vehicle repair. Approximately \$2.6 million, or 7% was used for MHD overtime costs, which is an allocation of funds from MHD's total payroll budget and is used exclusively for MHD employee overtime costs for the Snow and Ice Removal Program. Hired Equipment operator costs are included as part of the hired equipment rate and are paid for by owners.

MHD program funding and expenditure information for fiscal year 2000 is shown below:

Description	Requested by Governor	Initial Appropriation by Legislature	Supplemental	Total	Expended	% of Total Expended
Hired Equipment	\$23,131,966	\$6,727,688	\$17,059,179	\$23,786,867	\$23,726,621	60%
Vehicle Repair	386,188	175,000	0	175,000	172,684	Less than 1%
Materials	10,033,681	5,886,473	7,309,733	13,196,206	12,876,405	33%
Overtime	<u>0</u>	<u>1,500,000 *</u>	<u>1,198,946</u>	<u>2,698,946</u>	<u>2,559,683</u>	<u>7%</u>
Totals	<u>\$33,551,835</u>	<u>\$14,289,161</u>	<u>\$25,567,858</u>	<u>\$39,857,019</u>	<u>\$39,335,393</u>	<u>100%</u>

\* MHD allocated \$1,500,000 for overtime costs from its total payroll budget. Supplemental funding from the payroll budget was received in the amount of \$1,198,946 for a total overtime funding of \$2,698,946, of which \$2,559,683 was actually expended.

## APPENDIX B

### Metropolitan District Commission Fiscal Year 2000 Financial Data

MDC's Snow and Ice Removal Program expenditures for fiscal year 2000 totaled \$894,015. The largest expenditure was \$477,801, or approximately 53% of program costs for materials such as salt and sand. Employee compensation costs totaled \$300,000, or 34% of program costs. Motor vehicle and heavy equipment maintenance and repairs totaled \$74,039, or 8% of program costs. The remaining \$42,175, or 5% of program costs, was expended for facility supplies and expenses, energy costs and fuel expenses, and small snow removal equipment purchases, such as snow throwers.

MDC program funding and expenditure information for fiscal year 2000 is shown below:

Account Number	Requested by Governor	Initial Appropriation by Legislature	Supplemental	Total
2440-2000	\$629,795	\$569,795	\$ 324,220	\$ 894,015

Although not separate appropriation line items, MDC's fiscal year 2000 Snow and Ice Removal Program expenditures can be classified as follows:

Description	Initial	Supplemental	Total	% of Total Expended
Materials	\$244,795	\$ 233,006	\$ 477,801	53 %
Salaries	300,000	0	300,000	34 %
Vehicle Repairs	115	73,924	74,039	8 %
All Other Charges	<u>24,885</u>	<u>17,290</u>	<u>42,175</u>	<u>5 %</u>
Totals	<u>\$569,795</u>	<u>\$ 324,220</u>	<u>\$ 894,015</u>	<u>100 %</u>

**APPENDIX C****Massachusetts Highway Department – Fiscal Year 2002 Expenditures****Through March 27, 2002**

Description	Requested by Governor	Initial Appropriation by Legislature	Expenditures Through March 27, 2002
Hired Equipment	\$ 16,494,646	\$ 6,727,688	\$ 14,330,453
Materials	7,141,945	5,886,473	16,283,975
Vehicle Repair	175,000	175,000	175,000
Overtime	<u>1,500,000</u>	<u>1,500,000</u>	<u>2,095,342</u>
Totals	<u>\$25,311,591</u>	<u>\$14,289,161</u>	<u>\$32,884,770</u>