

***METROPOLITAN GOVERNMENT OF  
NASHVILLE AND DAVIDSON COUNTY***

***OFFICE OF INTERNAL AUDIT***

**Professional Audit and Advisory Service**

**FINAL REPORT**

**Performance Audit of Public Works  
Traffic Operations**

Date Issued: March 30, 2009

Office Location and Phone Number

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*The Metropolitan Nashville Office of Internal Audit is an independent audit agency  
reporting directly to the Metropolitan Nashville Audit Committee*

**EXECUTIVE SUMMARY**  
**March 10, 2009**

| Results in Brief  | Recommendations  |
|---|--|
| <p>We performed an audit of the processes and controls in place pertaining to the operations of Public Works Traffic Operations. Key audit objectives and conclusions are as follows:</p> <ul style="list-style-type: none"> <li>• Does Traffic Operations have a systematic traffic signal and traffic sign selection and approval methodology?</li> </ul> <p>Yes. The procedures currently in place are effective, adequate, and efficient.</p> <ul style="list-style-type: none"> <li>• Does Traffic Operations have adequate IT controls in place to prevent unauthorized access to its systems?</li> </ul> <p>Generally no. We have observed several areas where procedures should be enhanced.</p> <ul style="list-style-type: none"> <li>• Do Traffic Operations procedures prevent the overcharging of electric services by NES?</li> </ul> <p>Yes. Current procedures are adequate and no material weaknesses or significant issues were noted.</p> <ul style="list-style-type: none"> <li>• Does Traffic Operations have adequate response times for emergency and non-emergency repairs?</li> </ul> <p>Undeterminable due to lack of standard response time criteria</p> <ul style="list-style-type: none"> <li>• Does Traffic Operations have adequate maintenance programs for signals?</li> </ul> <p>Yes. The maintenance program is viable and effective. No material weaknesses or significant issues were noted.</p> <ul style="list-style-type: none"> <li>• Does Traffic Operations have adequate maintenance programs for signs?</li> </ul> <p>Generally no. Sign maintenance is primarily reactionary.</p> | <p>Key recommendations of this report include:</p> <ul style="list-style-type: none"> <li>• Ensure dedicated engineering assets are available to maintain benefits derived from recent signal synchronization efforts.</li> <li>• Develop a formalized risk assessment process for IT systems.</li> <li>• Improve IT systems security procedures.</li> <li>• Institute a proactive sign maintenance program.</li> </ul> <p>Management's response can be seen in Appendix A</p> |

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# INTRODUCTION

## GENERAL BACKGROUND

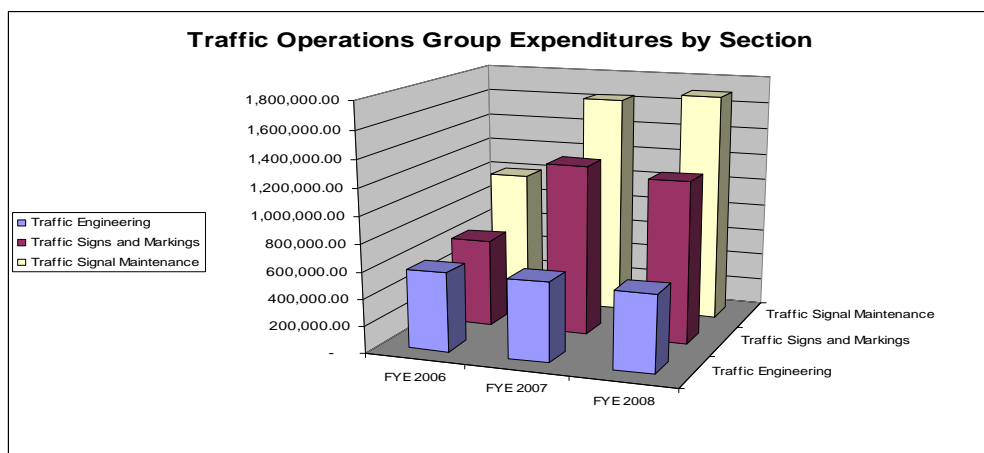
The Engineering Division of Public works is composed of three operating sections, the *Capital Projects Section*, the *Development Services Section*, and the *Traffic & Parking Section*. The Traffic and Parking Section is tasked with ensuring safe and efficient transportation and parking products to Davidson County. The Traffic and Parking Section is further subdivided into two operations, *Parking Management* and *Traffic Operations*.

The *Traffic Operations* group is charged with designing all pavement markings, signs and traffic signals within Davidson County. Traffic Operations manages, operates, and maintains approximately 790 traffic signals and over 100,000 road signs throughout the county. Additionally, Traffic Operations serves as the staff to the *Traffic and Parking Commission*. The Commission is composed of nine members, including one appointee representing Metro Council and one appointee representing the Metro Chief of Police. The Commission has the final authority to either approve or reject signal and road sign requests. Determinations on all signal and sign requests are first made by Traffic Operations. Traffic regulatory signals and signs must then have final approval of the Commission, who also hears appeals by those in disagreement with any Traffic Operations decision. Traffic Operations also oversees the Metro Neighborhood Traffic Management program and conducts traffic studies and surveys.

## FINANCIAL INFORMATION

Financial information obtained from Metro's financial system, EBS, using the Budgeted vs. Actual Revenues and Expenditures query, indicated that Traffic Operations has three main business units: Traffic Engineering (42141210), Traffic Signal Maintenance (42142710), and Traffic Sign and Markings (42142832). A summary of the expenditures from FYE 2006 through FYE 2008, grouped by business unit, is shown below in Exhibit A.

Exhibit A



## INFORMATION TECHNOLOGY BACKGROUND

The Traffic Operations group employs a variety of software applications that are used for overall management of the county's traffic system. The systems include:

***MIST***- is a server based software that interacts with field signal devices via modems that are connected to the communications server. This system manages and monitors the signal devices in the main Nashville Downtown area.

***MATTS*** - a client based software that communicates with field modems directly via dedicated phone lines. This system is used to monitor and manage the field signals in the area outside the main downtown grid which *MIST* controls. This software will eventually be replaced as signals are moved to the *MIST* system as part of the Metro Intelligent Traffic System (ITS) phased implementation.

***Collision View*** – a client based software used for the analysis of vehicle accident reports received from the Metro Police Department. Monthly extracts of vehicle accident report data is converted to Geographical Information System (GIS) format for Traffic Engineers to use in research of various streets and intersection study requests. The data captures accident details/attributes but contains no personal data from the accident report.

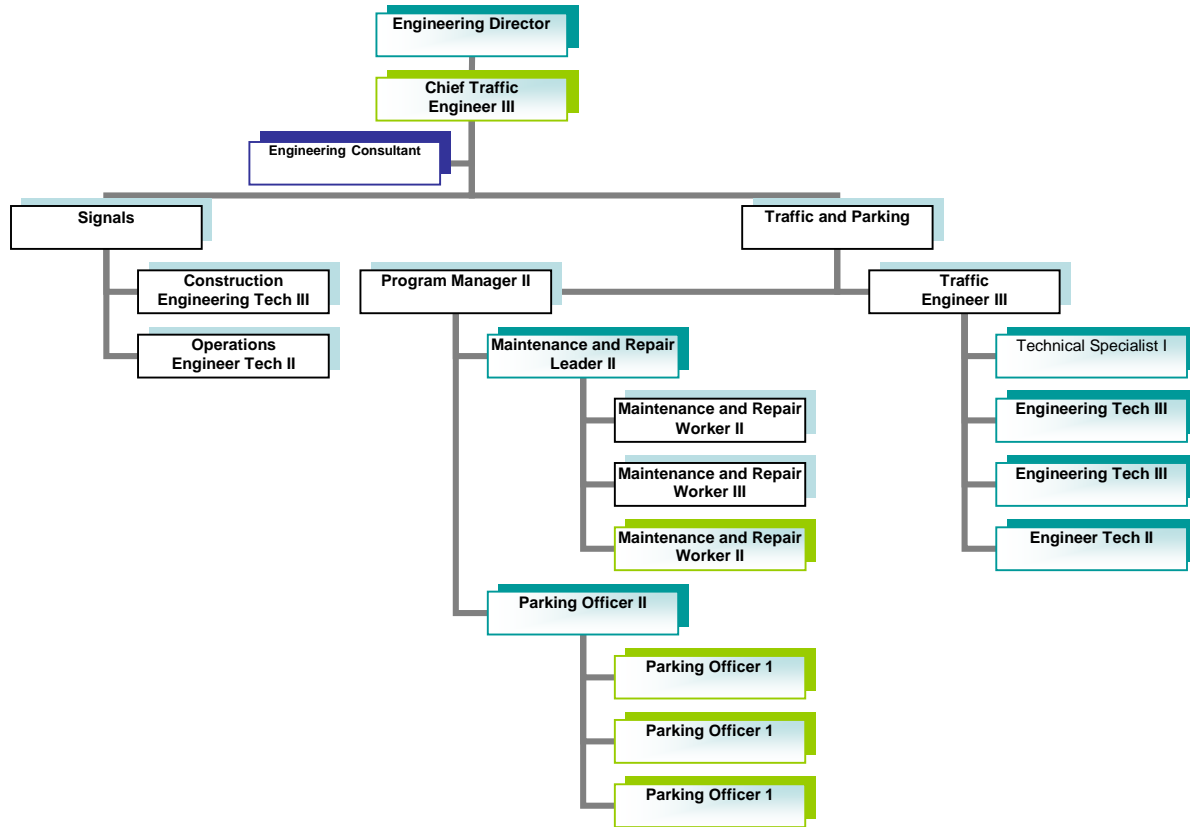
***CityWorks*** — Public Works' GIS based service request and work order (WO) management system. Traffic Operations utilizes CityWorks for the various requests that are submitted to their area for study or other action. Intersection studies, designs, and other work related requests and actions are stored on the local area network for future reference. Photos and other documents pertaining to the request are also stored and attached to the service request or work order, and both are tied to the GIS for infrastructural asset management.

***PetraPro/Jamar***— Software for use with tube/machine and manual traffic counters. Client based software that interfaces with traffic counter hardware used to document actual traffic volume.

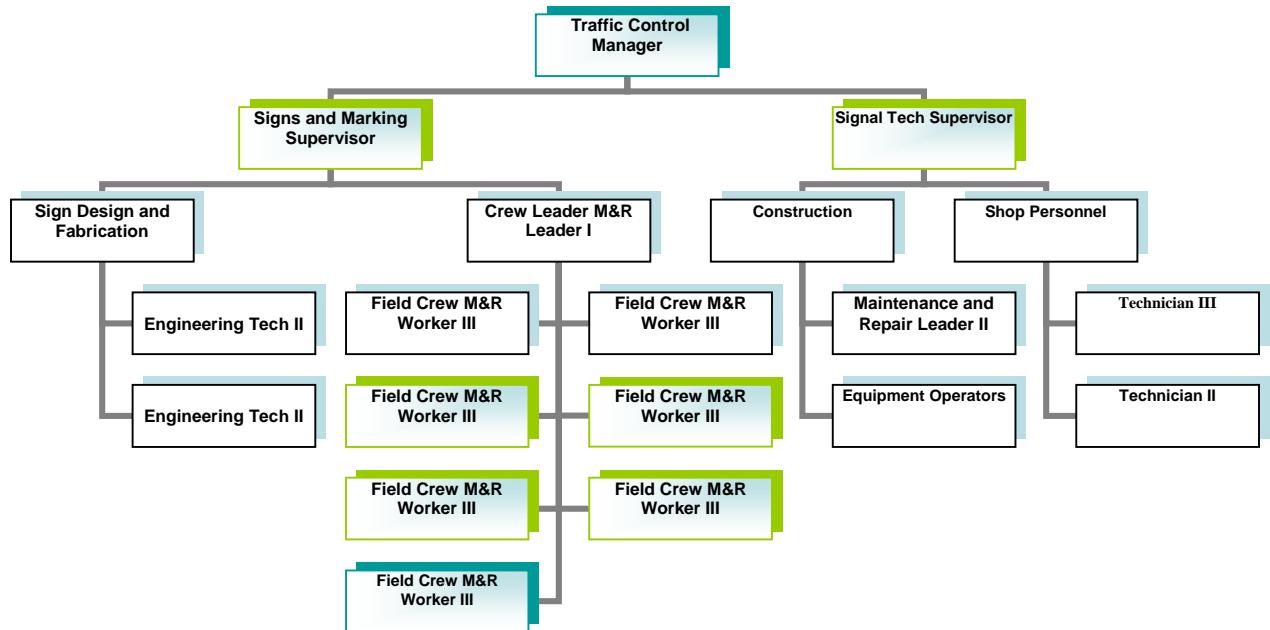
## ORGANIZATIONAL STRUCTURE

The Traffic Operations group contains the three business units previously listed but is operationally divided into two segments. They are Traffic Signal Operations and Sign and Marking Operations. Traffic Signal Operations handles all traffic signal and road sign requests (new installations, signal changes or modifications, and sign placements) and performs traffic studies, speed studies, and other related studies in order to determine the legitimacy of proposed sign and signal changes. Once a regulatory signal is approved by the Chief Engineer, the proposal is sent to the Traffic Commission for final approval. Sign and Marking Operations is primarily responsible for installation and maintenance of the signals and signs within the Davidson County area. The organization chart of both operations can be seen at Exhibit B and C.

**Exhibit B - Traffic Engineering Operations Organizational Chart**



**Exhibit C – Sign, Signal, and Marking Operations Organizational Chart**



## OBJECTIVES AND CONCLUSIONS

### **1. Does Traffic Operations have a systematic traffic signal selection and approval process?**

Yes. The OIA evaluated the traffic signal selection and approval process by performing test of controls to ascertain the consistency of application and also to measure the adequacy and validity of the process. In order to determine the consistency of application, the auditors evaluated 66 installations between July 1, 2006 and June 30, 2008. Supporting documentation was obtained to determine whether an appropriate traffic study was conducted and the installation properly approved by the Traffic and Parking Commission. Results of the tests indicated that all 66 installations reviewed went through a traffic study of some type. In particular, 49 of 66, or 74% of new installations, were reviewed by the Traffic and Parking Commission prior to installation. The remaining 17 item (26%) were not reviewed by the Parking and Traffic Commission because the traffic signals were under the jurisdiction and responsibility of the Tennessee Department of Transportation (TDOT), who is responsible for their own traffic studies.

The second test of controls was used to ascertain the adequacy and validity of the signal selection and approval process by determining if actions taken by Traffic Operations regarding new signal requests were either upheld or reversed by the Metro Traffic and Parking Commission. For this test, the auditors took a random sample of 80 new signal installation requests from a population of 242 requests; supporting documentation for each request was subsequently obtained. An examination of the documentation revealed that 64 of 80, or 80%, of the signal requests tested were deemed unwarranted and 12 of 80 (15%) were deemed warranted (four requests were referred to TDOT due to state right of way intersections.) Final resolution revealed that all 12 requests deemed warranted by Traffic Operations were subsequently approved by the Traffic and Parking Commission. Additionally of note was that in 14 of the 64 signal request that were denied or deemed unwarranted, Traffic Operations proposed alternative solutions that would alleviate the situation without addition of a traffic signal, thus saving money for either Metro or third party developers in some cases.

### **2. Does the Traffic Control Group have adequate controls in place to prevent unauthorized access to its information system resources?**

Generally no. The OIA conducted interviews and analysis of the Traffic Control Group's information technology security practices and noted several items and areas that should be improved. These areas include:

- Developing an overall risk assessment process for IT systems
- Limiting administrator rights to the MIST system
- Initiating an effective password policy for accessing IT system resources
- Improving the physical and logical security of MATTS enabled computers (See Observation A)

**3. Does Traffic Operations have procedures in place to prevent the overcharging of electric services by NES?**

Yes. Traffic Operations has adequate measures in place to ensure that NES does not overcharge Metro for electricity used for traffic signals. The auditors reviewed all 50 billing schedules from each month between July 2004 and August 2008 (totaling \$1,237,856). Additionally, the auditors recalculated rates, tested 10 of 48 signal submission bills and obtained external confirmations to ascertain that electricity usage was not overbilled. Traffic Operations uses a standardized process for calculating electricity requirements for Metro's traffic signals. Additional research determined that there appears to be no discrepancy in the rates charged by NES for Metro and for other municipalities. No other issues or concerns were noted.

**4. Is the group adhering to the signal synchronization plan developed to minimize congestion, travel time, and pollution across Metro Nashville?**

Yes. The auditors obtained and reviewed Metro's signal synchronization plan. Background information revealed that the traffic synchronization plan was designed to help alleviate traffic congestion within the major thoroughfares of the Metro Nashville area. The eventual intent and objectives of the project was to make the traffic signals perform at their maximum efficiency. This would eventually result in reduced vehicle stops and delays, reduced fuel consumption, and a corresponding improvement in air quality. To achieve this goal, 29 major corridors carrying the heaviest traffic, representing 542 signalized intersections were identified. The final phase of the project was completed on July 2008. It was determined through reports provided by the auditee that the program appeared to succeed in meeting its objectives.

Although published results indicated achievement of desired objectives, OIA's assessment of the program indicated possible problems in the foreseeable future. The OIA is concerned that the benefits derived from the program may eventually diminish due to the lack of dedicated personnel charged with ensuring that the signals remain synchronized. (See Observation B)

**5. Does Traffic Control have adequate maintenance programs and schedules for the traffic signals installed within their jurisdiction?**

Yes. Traffic control utilizes a maintenance program that seeks to conduct preventive traffic signal maintenance, on each traffic signal, on an annual basis. The auditors assessed signal maintenance procedures by selecting a random sample of 80 intersections, from approximately 790 signalized intersections, and obtaining their preventative maintenance records. An evaluation indicated that 79 of 80, or 99%, of the intersections received preventive maintenance work at least once since July 1, 2007. The lone intersection that did not receive preventive maintenance was a recent installation that was not activated until May 2007. Based on results of our evaluations, it appears that adequate maintenance procedures are in place and no other issues or concerns were observed.



**6. Does Traffic Operations have adequate response times for emergency and non emergency traffic signal and sign repairs?**

Undeterminable (due to lack of standard response time criteria.) The OIA was unable to ascertain the adequacy of response times for sign and signal repair. The OIA attempted to determine the adequacy of current operating performance by obtaining separate reports pertaining to sign and signal emergency and non emergency data encompassing the audit period July 1, 2006 through June 30, 2008. The auditors evaluated the available data by calculating an average response time for all sign and signal service/repair calls. All 13,701 non-emergency signal service calls were analyzed to yield an average response time of roughly three hours. Additionally, 2,360 emergency signal service calls were analyzed to yield an average response time of 33 minutes. The calculated composite (combined) signal response time was one hour and 28 minutes.

Sign service/repair calls were also obtained and evaluated in the same manner as the signals. Available data for the audit period indicated that the average response time for 17,634 non-emergency sign service calls was approximately 24 hours. Additionally, the auditors evaluated 750 emergency sign service calls and calculated an average response time of one hour and 20 minutes.

The OIA attempted to benchmark these results by requesting external response time data from other comparable cities. However, the OIA failed to obtain responses but did obtain information assembled by the American Association of State Highway Transportation Officials (AASHTO). The maintenance response time standards survey, compiled by AASHTO, attempted to ascertain whether states have implemented a standard for formal emergency response time. The results indicate that only six states have documented emergency response time goals; these goals range from 45 minutes (Rhode Island) to as much as 24 hours (Maine).

The overall results of the OIA's evaluation indicate that service efforts appear to be correctly and reasonably applied to emergency requirements and that actual Metro response times are on par or better than published measures; no other issues or concerns were noted.

**7. Does Traffic Operations, Sign and Marking Operations have adequate procedures in place for sign selection, approval, asset protection, inventory management, and maintenance?**

Generally yes. Sign selection and approvals were consistent, systematic, and effective in much the same manner as the signal selection and approval process. The auditors evaluated a random sample of 80 sign requests, from a population of 2,308, and determined whether an appropriate traffic study was conducted prior to a determination whether a sign was warranted or not warranted. Based on the results of the tests, 80 of 80, or 100%, of the requests reviewed indicated that a traffic study of some type was conducted in each case. Additionally, results indicated that 55 requests were approved (warranted), 21 requests were denied (unwarranted), and four remain

unresolved at this date. Overall, all factors indicate that the selection and approval process for road signs was systematic, not arbitrary.

Business process reviews in the areas of sign asset protection, sign inventory management and sign maintenance indicated that these processes could be improved. (See observations C, D, and E)

**8. Are substantial amounts of personnel productivity lost due to information requests and court appearances?**

Undeterminable. The OIA attempted to quantify management's concern that personnel resources are not maximized because inordinate amounts of time are spent responding to information requests from external sources. The OIA evaluated management's concerns by reviewing documentation related to information requests.

The results of the review indicated that there were a total of 173 requests from July 1, 2006 through June 30, 2008 and a total of 36 separate days spent in court as an expert witness. Accurately quantifying the hours was not possible because the documentation was inadequate. Therefore, no observation could be made by the OIA regarding productive time lost. Additionally, external entities requesting information and appearances could make arguments that they are entitled to such services from local government.

## **OBSERVATIONS AND RECOMMENDATIONS**

### **A – Improve the Information Systems Security Procedures**

During the assessment of Traffic Operation's information systems security practices, the OIA noted several processes that should be enhanced to create a more secure IT environment. The following observations related to Traffic Operation's information security were noted:

- Currently, there are no formalized risks assessment procedures to assess traffic data loss and/or data alteration. The risk issue was only considered at the engineering level whose primary concern is to avoid signal conflicts. However, potential possibilities of altering traffic control signals through over-granted user privileges within the computer program exist.
- User access to the MIST system is not formally controlled. Multiple users were found to have administrator rights over the system which is installed on at least six computers, five at the Traffic Engineering offices and one at the signal shop.
- MIST users are not required to change passwords. Our interviews indicated that the Chief Traffic Engineer has not changed his password since the initial login to the system, approximately 2 years ago.
- User access to the MATTS system is not formally controlled. Two computers were observed running MATTS, which has the ability to access and control 250 signal controllers outside the Nashville urban area. One of the computer located in Traffic Engineering is placed in an unlocked closet sized room, not password protected, and has no established user accounts to control access. Therefore, the system is totally exposed.

#### **Criteria**

The ISO 27000 series of standards have been specifically reserved by ISO for information security matters. Criteria that apply to these observations include: ISO 27002 4.0, 6.0, 5.0, ISO 27001 11.2, 11.6.1a, b, ISO 27002 11.2.3, 11.3, and ISO 27002 9.1, 9.2

#### **Risks**

The following risks were identified in relation Traffic to Operation's information security practices:

- Traffic Operations may fail to identify and prevent potential harmful situations due to the absence of a comprehensive risk assessment policy.
- Unauthorized access and/or unauthorized increased access levels could allow dangerous manipulation of the traffic control system.
- Absence of a password policy could enable unauthorized users to gain entry into the system.

- Inadequate physical controls over information systems enable unauthorized access to the hardware.
- Unauthorized access to MIST or MATTS could enable retiming of traffic signal devices causing traffic jams, delays, accidents, and inefficient traffic flow for perhaps thousands of commuters.

### **Recommendations**

OIA recommends the following procedures be implemented by traffic management to ensure a more robust information security environment:

- Establish and document a procedure for risk assessment of information systems. This process should study the sensitivity of the traffic control signaling data, explore possible incidents which may reduce the traffic control efficiency and effectiveness, and propose solutions to those situations. This process should also decide, based on the assessed risk level, the reviewing cycle of the assessment.
- We recommend that management study the job functions carefully for all MIST operators and limit administrator's rights to only one or two positions. Administrators can then assign relevant rights to appropriate users.
- A password policy should be addressed either individually or in other relevant policies or procedures using references such as ISO 27007 or other industry best practices.
- Restrict the physical access to the machine and establish end user logical security within the MATTS application.

### **B – Traffic Operations Lacks a Dedicated Traffic Signal Engineer**

Currently, there is only one qualified traffic signal engineer within Traffic Operations. Research indicated that this may not be sufficient to meet the needs of Metro. Comparative data collected from the Institute of Traffic Engineers indicates an average of one dedicated traffic engineer for every 76 traffic signals along with one traffic signal technician per 47 signals. Additionally, the National Transportation Operations Coalition recommends one traffic engineer dedicated solely to signal timing and an additional four to seven traffic technicians and for every 200 signals.

Metro's current ratio of 1:790 of Traffic Engineers to traffic signals falls well below acceptable standards. Additionally, Metro currently has no traffic technicians who also perform synchronization of traffic signals. Without the needed resources, benefits gained from the recent signal optimization project, which cost approximately \$2 million to implement, will be negated if there is no continuous monitoring and adjustment of traffic signals.

### **Criteria**

- Institute of Traffic Engineers
- National Transportation Operations Coalition

## **Risk**

The lack of a dedicated traffic signal engineer results in a reactive rather than proactive program to alleviate the traffic concerns of the city and county.

## **Recommendation**

We recommend that Traffic Operations provide for an additional traffic signal engineer or dedicate traffic signal technicians that would help oversee the efficient operation of Metro's traffic signals. Additionally, we recommend that the department look into augmenting the engineering capabilities by adding additional traffic technicians dedicated to ensure that signal timing is optimized throughout the Metropolitan Nashville area.

### **C – The Sign Shop has Inadequate Controls over Sign Assets.**

Interviews with key sign shop personnel indicated there is inadequate and insufficient controls over sign inventory stored in the warehouse. Further evaluation was conducted by obtaining a listing of inventory items, as listed in the database, and sampling this list by obtaining 15 random stock items representing 512 individual units. The actual inventory varied by 34 units from the computer's inventory. Additionally, seven of the 15 stock items sampled, were incorrectly stated. This represented a 47% rate of variance of stock items that were incorrectly stated and an overall 6.6% rate of individual units that were incorrectly stated. Follow-up interviews indicated that inventory counts are taken only once a year and if there is a discrepancy, the number is just adjusted without trying to figure out what happened to the variance.

## **Criteria**

*The COSO Internal Control- Integrated Framework* establishes a common definition of internal controls, standards, and criteria by which organizations can assess their internal control systems. Inventory control is critical in ensuring an organization has established and designed a strong internal control framework.

## **Risk**

Possible loss of inventory, incorrectly stated assets, and ordering unneeded signs.

## **Recommendation**

We recommend that management enhance control over the sign inventories by performing a quarterly or biannual periodic inventory and reconciliation. This would allow the shop to better manage the sign inventory and catch any discrepancy at an early point. Utilizing the current computer tracking datasheet more diligently will create a more efficient inventory management system. Additional benefits could be seen in the procurement process because the inventory tracking will enable an accurate determination of sign needs.

## **D – The Sign Shop does not have a Formalized Maintenance Program.**

No formalized sign maintenance program is currently in place. Although Traffic Operations adopted maintenance policies put forth by the International Municipal Signal Association, no systematic departmental sign maintenance program is functioning. The current procedure is reliant on customer complaints and is therefore reactionary in nature. A systematic program would mitigate the risks associated with sign related accidents, alleviate safety concerns of the commuting public, and mitigate exposures to legal action on the Metro Government.

### **Criteria**

*The Committee of Sponsoring Organizations Internal Control - Integrated Framework* establishes a common definition of internal controls, standards, and criteria by which organizations can assess their internal control systems. A formalized maintenance program will help ensure the primary objectives of the business unit are achieved.

### **Risk**

Possible safety issues and additional expense to the Metro Government due to litigations costs

### **Recommendation**

We recommend that the sign shop institute a systematic sign maintenance procedure that will address maintenance issues especially for regulatory signs. A proactive instead of a reactive approach would increase the safety of Nashville's commuting public and possibly mitigate other risks associated with sign maintenance.

## **E – The Traffic Operations is Unable to Track and Evaluate Installed Sign Assets.**

Traffic Operations currently has no functioning process to track the status of installed traffic signs throughout the county. The completion of a GIS database currently under development will eventually create an inventory of all of Metro's traffic signs and signals. The described inventory system should eventually provide the ability to track assets and provide benefits to greatly enhance the level of service to the public. Although this projected solution will eventually fill the need, currently, no system is in place and therefore no adequate mechanism is being used to track the sign inventory and replacement needs.

### **Criteria**

- *The Committee of Sponsoring Organizations Internal Control - Integrated Framework* establishes a common definition of internal controls, standards, and criteria by which organizations can assess their internal control systems. An adequate inventory program will help ensure the primary objectives of the business unit are achieved.

- Manual on Uniform Traffic Control Devices (MUTCD), 2003 Edition, by the Federal Highway Administration

### **Risk**

The inability to track and evaluate installed sign assets inhibits the development of a systematic maintenance program for sign assets.

### **Recommendation**

We recommend that the Traffic Operation pursue the completion of the installed sign inventory management program and incorporate maintenance schedules with this project. The Sign Inventory Program must be an on-going process, with the addition of new sign installations and continuous replacement maintenance since sign information is constantly changing. Additionally, the use of GIS technology will allow Metro personnel to accommodate the continuous growth and expansion of sign assets in Metro, the demands of the installation of new traffic signs and other assets, maintain existing signs, and perform future replacements in compliance with the Manual on Uniform Traffic Control Devices (MUTCD).

## GENERAL AUDIT INFORMATION

### STATEMENT OF COMPLIANCE WITH GAGAS

We conducted this performance audit from October 2008 to January 2009 in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our observations and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our observations and conclusions based on our audit objectives. Our audit included tests of management controls that we considered necessary under the circumstances.

### SCOPE AND METHODOLOGY

The audit period focused primarily on the period July 1, 2006 through June 30, 2008 financial balances, transactions, and performance on the processes in place during the time of the audit.

The methodology employed throughout this audit was one of objectively reviewing various forms of documentation, including written policies and procedures, financial information, various forms of data, reports and information pertaining to Public Works' Traffic Operations. Additionally, management, administrative and operational personnel were interviewed and directly observed.

### CRITERIA

In conducting this audit, the existing Public Works processes were evaluated for compliance with:

- *The Committee of Sponsoring Organizations Internal Control-Integrated Framework*
- Traffic and Parking Code of the Metropolitan Government of Nashville and Davidson County
- Manual on Uniform Traffic Control Devices (MUTCD), 2003 Edition, by the Federal Highway Administration.
- Traffic Signal Timing and Phasing Policy of the Metropolitan Government of Nashville and Davidson County
- Standards and Guidelines provided by the Tennessee Department of Transportation
- Guidelines set forth by the Institute of Transportation Engineers (ITE)
- ISO 27000 series

### STAFF ACKNOWLEDGEMENT

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## **APPENDIX A. MANAGEMENT RESPONSE**

- Management's Responses Starts on Next Page -

KARL F. DEAN  
MAYOR



**METROPOLITAN GOVERNMENT OF NASHVILLE AND DAVIDSON COUNTY**

DEPARTMENT OF PUBLIC WORKS  
DIVISION OF ENGINEERING  
750 SOUTH FIFTH STREET  
NASHVILLE, TENNESSEE 37206  
615-862-8760

March 25, 2009

Mark Swann  
Metropolitan Auditor  
Office of Internal Audit  
222 3<sup>rd</sup> Avenue North, Suite 401  
Nashville, TN 37201

RE: Public Works – Traffic Operations

Dear Mr. Swann:

This letter acknowledges that the Metropolitan Department of Public Works received the report entitled, Performance Audit of Public Works-Traffic Operations. The Department of Public Works has evaluated all of the observations raised in the report. Each suggestion and corrective action has been considered. Wherever possible, changes have been or will soon be implemented. Specific concerns that prevent implementation of some recommendations are expressed in the attached response.

The Department of Public Works would like to express its appreciation for your assistance and cooperation during this process. Any improvement that this department can make toward increasing the efficiency of the Metropolitan Government is always welcomed.

Sincerely,  
The Department of Public Works

A handwritten signature in black ink that reads "John W. Lynch".

John W. Lynch  
Public Works Director

MLW:s

**Public Works Traffic Operations Management Response to Audit Recommendations  
March 2009**

| Report Item and Description  | Response to Recommendation / Action Plan   | Assigned Responsibility   | Estimated Completion                          |
|--|--|---|---|
| <p>A.1 Traffic Operations should improve the information systems security procedures in the following areas:</p> <ul style="list-style-type: none"> <li>• Risk assessment</li> <li>• Formally controlling access to MIST</li> <li>• Requiring password changes</li> <li>• Enhancing physical security and access to the MATTS computers</li> </ul> | <p><b>Accept / Partially Accept / Reject</b><br/>Traffic Operations is in agreement:</p> <ul style="list-style-type: none"> <li>• We are currently working with the IT Manager (Dan Pursley) on developing a risk assessment policy.</li> <li>• Since the observation by Metro OIA, all user rights have been analyzed and password changes required. Also, the user list has been reviewed with the unused (i.e., older out of date) names deleted. All remaining users are currently being analyzed to determine what 'level' of rights each should have.</li> <li>• OIA findings are accurate. Due to the physical restrictions of current facility, the MATTS computer is located in the supply room. Restricting access to the room via lock would be inefficient to the other employees. Until other arrangements for housing the MATTS computer can be made, we have implemented a username and password on the computer. Also, users are required to log off after each use – requiring a username and password to gain access to the programs on the PC (i.e., MATTS). Note: the current facility, although open during business hours, is locked after hours. Also, the entire MPW complex is gated and is monitored by security guard.</li> </ul> | <p>PW IT – Supervisor</p> <p>Traffic Engineering – Supervisor, Chip Knauf</p> <p>Traffic Engineering – Supervisor, Chip Knauf</p> | <p>6 months</p> <p>1 Month</p> <p>1 Month</p> |
| <p><b>B.1</b> The Traffic Operations Group should augment its current engineering staff with a dedicated traffic signal engineer to ensure signal synchronization is optimized throughout the Metropolitan Nashville area.</p>   | <p><b>Accept / Partially Accept / Reject</b><br/>Although OIA findings are accurate, it should be noted that MPW traffic engineering currently has active contracts with two traffic engineering consulting firms. These firms are available on an “as-needed” basis to assist with signal related issues. This agreement works for in depth analysis such as retiming an entire corridor.</p>   | <p>Engineering – Director, Mark Macy</p>  | <p>n/a</p>                                    |

**Public Works Traffic Operations Management Response to Audit Recommendations  
March 2009**

| Report Item and Description   | Response to Recommendation / Action Plan   | Assigned Responsibility                             | Estimated Completion                  |
|---|--|---|---------------------------------------|
| <p><b>C.1</b> Traffic Operations, specifically the sign group, should institute keep better sign inventories procedures. Periodic (biannual or quarterly) inventory reconciliation should be performed.</p> | <p><b>Accept / Partially Accept / Reject</b><br/>OIA findings are accurate. MPW recognizes the need for accurate inventory control.</p>  | <p>Special Operations – Supervisor, David Himes</p> | <p>6 months</p>                       |
| <p><b>D.1</b> Traffic Operations should institute a systematic sign maintenance procedure that will address maintenance issues especially for regulatory signs.</p>   | <p><b>Accept / Partially Accept / Reject</b><br/>MPW is currently in the early stages of establishing a sign maintenance program. This program is primarily based on reflectivity assessment – not necessarily obstructions. This maintenance program is in addition to the sign inventory project. The sign inventory project recently completed the field data gathering portion of the project and has entered the ongoing maintenance portion. Every sign that is installed by MPW is documented and entered into the database as well as pinpointed on a GIS map. Concerning sign obstruction, MPW personnel are instructed to clear (or inform the appropriate group of the need) any obstructions to signage, the OIA findings related to a maintenance / visibility program are accurate. It should be noted, that the implementation of such a program may entail dedicated personnel as there are numerous signs and roadways to manage.</p> <p>Also, the sign sheet (i.e., the material that is placed on a blank sign) has a visibility / reflectivity warranty (most cases 10 years).</p> | <p>Special Operations – Supervisor, David Himes</p> | <p>1 year</p>                         |
| <p><b>E.1</b> Traffic Operations should pursue the completion of the installed sign inventory management program and incorporate maintenance schedules with this project.</p>                               | <p><b>Accept / Partially Accept / Reject</b><br/>The sign inventory has been completed. Currently, staff is updating the inventory database with recent installations that were not gathered with the initial field inventory. All signs in the inventory are housed in a GIS database. This database is secured with limited user rights controlled by individual passwords.</p>  | <p>Special Operations with Traffic Engineering</p>  | <p>1 year (maintenance schedules)</p> |

**Public Works Traffic Operations Management Response to Audit Recommendations  
March 2009**

| Report Item and Description | Response to Recommendation / Action Plan                                      | Assigned Responsibility | Estimated Completion |
|-----------------------------|---|-------------------------|----------------------|
|                             | To insure accuracy, only approved personnel have rights to edit the database. |                         |                      |