

## OCIA Audit Finding & Recommendations for Updated Responses

Road Data Services

4/19/2012

### **Finding:**

Although organized and functioning within AASHTO guidelines, Road Data Services did not have a copy of the revised (2001) AASHTO Pavement Management Guide on file for reference and guidance.

### **Recommendation:**

We recommend that Road Data Services obtain and review the revised AASHTO Pavement Management Guide in order to comply with the guidelines and to reference issues as needed. The OICA acquired and provided a copy of these guidelines to management of Road Data Services for reference.

### **April 2012 Response:**

While a copy of the AASHTO Pavement Management Guide was not readily available during the audit, the PMO was established based on The AASHTO Pavement Management protocols contained in the AASHTO Pavement Management Guide (revised) as well as other guidance and they are incorporated into the operations. Pavement rating, pavement life models, profiler concepts and so forth that are part of Pavement Management at the SCDOT parallel the AASHTO Guide as well as the Strategic Highway Research Program (SHRP) Manual.

### **April 2015 Updated Response:**

Pavement Management has a copy of the 2012 AASHTO Pavement Management Guide on file for reference as guidance.

### **Finding:**

Currently Pavement Management is not in compliance with FHWA Highway Performance Monitoring System (HPMS) Reassessment 2010 which requires the collection and reporting annually on a universe basis of the International Roughness Index (IRI) for the National Highway System (NHS) network. During 2010 we collected only 50% of the required miles for reporting, with the remaining scheduled for 2011.

### **Recommendation:**

We recommend that necessary action be taken to achieve full compliance with HPMS reporting and that the IRI data for the NHS be collected and reported annually.

### **April 2012 Response:**

We concur that we have not met the annual report due to staff vacancies. Whenever pavement management data is not current, the system provides projections to key index values as well as IRI. With the limited staffing, we have prioritized our workload to collect data on the interstate system every year. As noted earlier, we have been delaying

changes to the office until this report came out. We will now be in a better position to evaluate manpower and outsourcing options to improve productivity (See response to finding #4).

**April 2015 Updated Response:**

Pavement Management has hired a contractor to assist with data collection. We have collected 100% of HPMS requirement in 2014, and anticipate meeting the requirements in future years.

**Finding:**

Personnel within RDS are being held to a strict nine (9) or nine and a half (9.5) hour daily work schedule. This is effectively reducing the workday to two to three (2-3) hours on those days in which travel to the pavement segment is required. This procedure not only requires additional hours to complete the task, but also adds to operating and maintenance costs of profilers-vans and increases our liability for significant additional miles in travelling to and from the site. These are exempt employees who, with management approval, should be able to effectively manage their work schedules to get the tasks completed in the most efficient manner.

**Recommendation:**

We recommend that daily work schedules be reviewed with Human Resources and be adjusted in order to allow for the additional hours required for the efficient and effective collection of pavement data. SCEIS should be effective in reporting of daily work schedules. Consideration should be given to allow for overnight travel in those instances warranted. This is especially significant with the current reduced staffing levels.

**April 2012 Response:**

We will consider the recommendation of daily work schedules during our evaluation of the office. Overnight travel will be weighed against the cost to the agency and the operating budget.

**April 2015 Updated Response:**

Approval was granted to occasionally work outside the standard 5-day schedule. Also, the ability to reimburse employees who work outside a 50 mile radius and stay overnight exist under SCDOT guidelines and Pavement Management has been given authority to utilize this when needed. Pavement Management has already used this flexibility to collect data in certain counties such as Horry.

**Finding:**

The current staffing levels are not adequate to allow for the completion of outlined collection schedules and additional necessary re-evaluations, reporting, or special work which may be required. There have been long-term staffing deficiencies. We currently have more profilers (eight collection vans) than raters on staff, thus grounding equipment that has required significant investment. While Pavement Management has met the objective of annual collection of the Interstate miles, it is not in compliance with the schedule for Primary nor Secondary collections. SCDOT continues to fall farther behind on the completion of the Primary

and Secondary routes by county, which are scheduled on a three-year cycle. The universally accepted principle of pavement management is that the more current the data, the better the decision model.

**Recommendation:**

We recommend that necessary action should be taken to achieve compliance with the collection schedule for Interstate, Primary and Secondary routes as required. This may involve an evaluation of the current schedules and objectives so that available resources ensure compliance.

**April 2012 Response:**

When the audit began in July of 2011, there were significant shortfalls with staffing levels. However, as the hiring restrictions have been relaxed, staffing is approaching a full complement of raters/operators. In the past, we had retained several profilers that were scheduled to be turned-in. This action was based on a potential to bring additional FTE slots into the PMO. With the on-going Manpower Taskforce review, we have identified that this option of additional slots will not be viable and are evaluating methods of outsourcing data collection in order to meet established goals.

**April 2015 Updated Response:**

Pavement Management has hired a contractor to assist with data collection on the Interstate and Primary system, in order to achieve collection goals on these systems. The collection schedule on the Secondary System has also been modified so that low volume Secondary routes are not collected as often. As a result, the Secondary System collection goals are also being met. The number of profilers for collection of the secondary system has been reduced to 5 which give one extra van for the 4 teams.

**Finding:**

Specially requested evaluations of pavement data, referred to as “re-do’s” originate primarily within the Maintenance Division or District Offices. These “re-do’s” are requested on pavement segments in which the data reflected is being questioned or newer data reflecting current conditions is needed. These requests are top priority items within Pavement Management and require considerable resources for the results achieved. Due to the timeliness and perceived importance, they are handled by the most experienced rating staff from Headquarters. These requests are submitted by email by various personnel at various times and are not screened or approved in any manner. The current process is quite inefficient and ineffective due to this method of submission and selection and the considerable resources required for what could be a very small segment of pavement data. We were informed that discussions with Maintenance regarding a new procedure are already in progress.

**Recommendation:**

We recommend the current procedure for “re-do’s” be evaluated with applicable personnel from Maintenance with a goal of making this process more efficient and effective. “Re-do” requests should funnel thru Maintenance for approval and prioritization to allow Pavement

Management to utilize limited resources to complete these requests in an efficient and effective manner.

**April 2012 Response:**

We concur. When PMO began to rerun highway segments on demand, The Director of Maintenance office agreed to be the clearing point for these requests. At some point, PMO began to carry out re-evaluations and then send them on to the requestor and copy Director of Maintenance office at that point. Certainly, Pavement Management would benefit by re-establishing the Director of Maintenance office clearing point idea for all requests regardless of origin.

**April 2015 Updated Response:**

A clearing house within the Maintenance Department has been established and is functioning as of this date.

**Finding:**

In addition to the current staffing levels and equipment issues, Pavement Management is facing the loss of significant expertise in the very near future. This is a specialized area which utilizes highly technical equipment and computer software and requires experience in order to be functional and beneficial to SCDOT. As evidenced by surveys of DOT in neighboring states, technology is ever-changing and additional resources are available in order to accomplish the objectives. Long-range planning is necessary to provide the required resources in the short term as well as the long term. This involves staffing and training, succession plans for management, evaluations of new technology, equipment, vendors, and software.

**Recommendation:**

We recommend the development of a Capital Management Plan within Pavement Management of Road Data Services. This plan would involve the development of detailed staffing plans, training requirements, management succession planning, equipment retirements and purchasing schedules. This should encompass current staff and equipment, as well as planning for future retirements and other replacement of staff and equipment. The Division of Human Resources has offered assistance in the development and execution of such plan which should support future mission or objectives of Pavement Management and should be completed in conjunction with the agency FTE evaluation and manpower requirements. Consideration should be given to the use of private contractors for data collection activities in some areas of Pavement Management.

**April 2012 Response:**

We concur and these activities will be considered within the framework of the manpower management study underway.

**April 2015 Updated Response:**

The Pavement Management Engineer has developed a plan for Pavement Management which includes staffing and equipment needs. This plan will be used as a guide. Pavement Management has also hired a contractor to help with the collection of pavement data.

The new MAP-21 requirements concerning Pavement data are also now available in draft form. SCDOT is reviewing these requirements and providing comments back to FHWA. The final version of these requirements will likely dictate staffing, quality control, and equipment requirements. Therefore these requirements will be used as a basis for the development of a Capital Management Plans.

**Finding:**

While Pavement Management does have quite voluminous policies, procedures, and other documentation concerning the technology and methodology employed, they are not organized in a comprehensive manner. Current procedures and documentation consist of various files, forms, screen shots, report examples, etc. which could be better organized.

**Recommendation:**

We recommend that the current operating documentation be organized into a comprehensive policy and procedure manual. This should be accomplished in conjunction with any reestablishment of pavement management mission or objectives. This would provide an invaluable training tool as well as quick reference, especially for field personnel.

**April 2012 Response:**

We concur. PMO has voluminous policies and procedures. A comprehensive training manual does exist and is utilized by the PM office. This was provided on CD saved as "Final Manual." Note that other files, Appendixes A, B, C, D and "Edge Cracking" should be consulted in conjunction with the manual. A shortened version of this manual was written for reference in the field. Currently (in-house) PMO is:

1. Developing SOP's for processing, quality control, loading, and images for the new WIN Report Processing System.
2. Standardized document for WIN Report software settings for old profiler and new profiler processing.
3. New quality control standardized blue print for all engineers to process / load / quality control MDR distress and roughness data.

However an established "warehouse" for guidelines and training would be a benefit to the office.

**April 2015 Updated Response:**

The 3 primary documents used by SCDOT raters and engineers have been combined into one binder for each reference. This binder, along with 2012 AASHTO Pavement Management Guide and other AASHTO guides (e.g., Standard practice for Evaluating Faulting of Concrete

Pavements) have been placed in one location which will be used Pavement Management's Library.

**Finding:**

SCDOT developed a dedicated Pavement Management Office and began collection of pavement condition data in the early 1990's. Based upon our surveys of other states, it would appear that South Carolina was "on the cutting edge" of pavement management not only in methodology, but also in technology. Resources were committed to accomplish the objectives as well as expanding the role to include collection and mapping with images, and enhanced results through new technology and automation.

In our opinion, the Pavement Management Office is at a crossroads, which provides the opportunity to re-evaluate the mission, objectives, technology, resources, and reporting. RDS currently operates eight (8) profilers (technology-equipped collection vans) with each of these vans costing up to \$250,000 per van. However, SCDOT does not employ the staff necessary to complete our annual collection efforts. Existing staff with many years of experience at SCDOT and significant expertise in our methodology and technology are fast approaching retirement without replacement plans in place for continuity of operations. Our surveys of pavement management within DOT's of neighboring states revealed evolving technology, more dependence on private contractors for collection activities and a shared level of frustration in "having to do more with less". Most states are struggling to accomplish the mission in light of budget cuts, personnel issues, new reporting requirements, and ever evolving technology.

**Recommendation:**

We recommend the creation or re-establishment of a Pavement Management Group, comprised of key personnel of Engineering, including Construction, Maintenance, Traffic Engineering and Materials and Research. This group should evaluate and aid in the establishment of mission and objectives of pavement management and recommend as to what data to collect, collection schedules, the methodology and technology to be utilized, necessary reporting and reporting formats. This should be accomplished within the framework of HPMS requirements, AASHTO guidelines, and agency directives.

We recommend that RDS and pavement management organizationally remain an entity within Traffic Engineering, to ensure objective and independent collection and reporting of pavement data. The Capital Management Plan as per Recommendation Number Six (#6) would be implemented in support of the mission and objectives developed.

**April 2012 Response:**

We concur. As noted earlier, we are currently evaluating the potential of outsourcing data collection activities. With this approach, we will involve our internal DOT customers to ensure the level of confidence in the overall effort.

**April 2015 Updated Response:**

Personnel from Pavement Management, Maintenance, Planning, and the Research and Material Lab recently had a meeting to discuss the current decision trees, and deterioration curves using in the Pavement Management Application. This working group will meet again to continue the discussion, and this group will be involved in all major decisions concerning Pavement Management.

The new MAP-21 requirements concerning Pavement data are now available in draft form. SCDOT is reviewing these requirements and providing comments back to FHWA. Pavement Management is also planning to release a Request for Information (RFI) in early 2015 in order to learn more about the semi or fully automated pavement data collection equipment now available. This RFI should then provide the ability to budget appropriately in order to move to the newer equipment available today. As stated earlier, the Pavement Management group listed above will have input on what equipment is selected.