

Secretary of State Audit Report

Kate Brown, Secretary of State

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ODOT: Automating Weight-Mile Tax Collections Can Benefit the State and Commercial Motor Carriers

Summary

The Motor Carrier Transportation Division (division) of the Oregon Department of Transportation (ODOT) is responsible for registering commercial vehicles weighing more than 26,000 pounds, and administering Oregon's weight-mile tax for these vehicles. Recently, the division has focused significant effort on identifying automated systems to help motor carriers prepare and report weight-mile tax returns.

In 2012, a New Zealand company called EROAD, Inc. (EROAD) approached ODOT and Oregon motor carriers with its product. EROAD's system uses a global positioning device and cellular technology to capture and transmit operating data from trucks to a web-based computer application. This application generates weight-mile tax records, calculates taxes owed, and could eventually allow online payments by the trucking firms. ODOT management requested that the Audits Division conduct an objective review of a pilot test of the EROAD system that involved 30 trucks driven about 300,000 miles during two months.

We found that the EROAD system accurately and reliably captures and calculates Oregon weight-mile tax information from commercial motor carriers. We also found the company provides a secure and stable environment for transmitting, processing, and storing motor carrier weight-mile tax information. One other component, an ODOT interface to automatically receive weight-mile tax reports and electronic payments, is still under development by ODOT.

We also concluded that an automated system for capturing and preparing weight-mile tax reports could simplify motor carrier report monitoring, reduce costs of manual data entry, and decrease accidental non-compliance with the state's weight-mile tax requirements.

Agency Response

The agency response is attached at the end of the report.

Background

The Motor Carrier Transportation Division administers Oregon's weight-mile tax for commercial motor carriers

ODOT's Motor Carrier Transportation Division (division) is responsible for registering commercial vehicles weighing more than 26,000 pounds, and administering Oregon's weight-mile tax for these vehicles. Proceeds from the weight-mile tax totaled approximately \$252 million during FY 2013, or 15% of total revenues for ODOT.

Weight-mile tax proceeds are included in the state's Highway Fund, which is used to construct, improve, and maintain public highways, roads, streets, and roadside rest areas. Approximately 277,000 trucks are currently registered to operate in Oregon and are subject to the weight-mile tax. More than 41,000 of these come from Oregon based companies.

The weight-mile tax is based on two factors: a vehicle's configuration and the miles traveled on public roads in Oregon. Oregon statutes determine the tax rate based upon a vehicle's declared weight and the number of axles when the vehicle's weight exceeds 80,000 pounds. This rate is multiplied by the number of miles traveled in each configuration to determine the tax owed. Most carriers submit a monthly weight-mile tax report that details these miles for each of the vehicles they operate.

Currently, carriers may submit monthly weight-mile tax reports to the division in one of two ways. A motor carrier may manually enter the required information directly into the division's Trucking Online computer application, which automatically determines the amount of the tax. Alternately, the carrier may submit a paper report to the division using prescribed forms. When carriers submit hardcopy tax reports, division employees must manually input the information into ODOT's mainframe computer system.

In addition to information included in the weight-mile tax report, motor carriers are required to maintain detailed travel records by individual vehicle. This information is the source documentation motor carriers use to compile their weight-mile tax reports and must be available for inspection by the division upon request.

The division has been exploring technology solutions to reduce the burden of record-keeping requirements

Division management has focused significant effort on identifying automated solutions to help motor carriers prepare and submit weight-mile tax reports. For example, the division's Trucking Online computer application allows motor carriers to connect to division computers to file reports, obtain permits, and pay associated fees.

In addition, the division piloted a project to demonstrate the feasibility of capturing and reporting weight-mile tax data automatically. After the

completion of this project, a New Zealand company called EROAD, Inc. (EROAD) approached ODOT and members of the Oregon motor carrier industry with its automated weight-mile tax collection and reporting services.

EROAD introduced its Global Positioning System (GPS)/cellular-based system to help vehicles comply with New Zealand's road user charge requirements. EROAD's system includes a combination of electronic hardware, software, and services. Two major elements of the system are the On-Board-Unit (OBU) and computer application and database called the EROAD Depot (depot).

The OBU is an electronic device that captures distance, location, route and a variety of other operational data about the vehicle and sends it to the depot. The depot allows users to monitor their trucks' activities remotely, view a variety of operational data, input truck configurations, and prepare the Oregon weight-mile tax report. In the United States, EROAD has chosen Amazon Web Services to host its system.

Division management requested that independent auditors evaluate the EROAD system

In 2012, EROAD began working with the division and with motor carriers to demonstrate its weight-mile tax system. This initial commercial pilot was intended to demonstrate EROAD's electronic weight-mile tax capabilities and additional services to commercial carriers.

ODOT management later determined that an additional pilot was needed to provide an objective, technical review of the system. In January 2013, division management requested the Oregon Audits Division perform an audit of the additional pilot.

Division management indicated that their acceptance, and motor carriers' adoption, of automated capture and reporting of weight-mile tax information could reduce their administrative costs by eliminating the need for manual data entry.

Audit Results

The purpose of this audit was to provide the division and motor carriers with an independent assessment of the regulatory pilot they sponsored during May and June 2013. Our specific audit objectives were to determine whether:

- The EROAD electronic On-Board-Unit (OBU) hardware and web-based services platform (system) accurately and reliably captures and calculates Oregon weight-mile tax information from commercial carriers to meet the state's record-keeping requirements.
- EROAD web-based services provide a secure and stable information system processing environment for transmitting, processing, and storing carrier weight-mile tax information.
- ODOT has established an appropriate and secure electronic interface for accepting carriers' system-generated weight-mile tax information.

We found the system accurately and reliably captured and reported weight-mile tax data within a secure and stable information systems processing environment. However, ODOT has not yet established its requisite electronic interface for automatically accepting carriers' system-generated weight-mile tax information.

The system accurately and reliably captured and calculated Oregon weight-mile tax information

Oregon's weight-mile tax regulations allow motor carriers to use electronic systems to meet record-keeping requirements as long as they provide all of the required elements included in administrative rules, and tax reports are complete and accurate.

During the EROAD pilot, OBUs were installed in 30 vehicles from seven motor carriers. To ensure an independent comparison during the pilot, participating motor carriers submitted weight-mile tax reports as usual but were not given access to the EROAD data or reports. These OBUs cumulatively recorded details of about 300,000 miles of travel during May and June 2013.

To evaluate the EROAD system, we reviewed data and reports it generated during the pilot period for accuracy and compliance with record-keeping requirements, and compared that information to the manual records maintained by motor carriers.

The OBU was accurate and reliable

Based on our audit work, we concluded that the OBU accurately and reliably captured and transmitted vehicle trip data. To evaluate the OBU, we performed tests of the data reported by the devices installed in pilot

vehicles and considered the results of tests performed previously by other independent parties.

To determine the validity of OBU data collection, we compared information from state-operated weigh stations to data collected by OBUs installed in vehicles. At least one weigh station report was available for 24 of the 30 vehicles in the pilot. We found that these reports matched EROAD information for time, location, and direction of travel for each of the 485 reported weigh station crossings.

To verify system-reported mileage was accurate, we used a widely available mapping source to validate mileage recorded by the device for specific segments of trips taken by 14 trucks. We found our calculations matched system-generated mileage reports within one percent, which we determined to be an acceptable variance. We also found that system records matched the specific locations carriers reported for the selected trips.

The system appropriately captured and processed required weight-mile tax information

Oregon Administrative Rule (OAR) 740-055-0120 specifies the information that motor carriers must retain for each vehicle. This information is the basis for calculating weight-mile tax and must be retained for at least three years. The information that must be maintained for each truck includes:

- the dates of each trip and origin and destination points;
- Oregon entry and exit points;
- actual Oregon miles for each trip;
- pickup and delivery points in Oregon for each trip;
- routes traveled for each trip;
- daily beginning and ending odometer or other mileage recording device readings for each vehicle;
- load tickets and/or bills of lading for each shipment transported;
- identification of any exempt miles claimed, including beginning and ending odometer or other mileage recording device readings for the exempt portion of each trip; and
- vehicle configurations.

The system electronically collects, processes, and retains the above information, except for load tickets and/or bills of lading that carriers must maintain separately. Through the depot, motor carriers may create the monthly weight-mile tax report and obtain other reports that include the required supporting information collected by the system.

We evaluated system-generated weight-mile tax reports to determine whether they were complete and accurate, and conformed to the division's requirements. We found these reports contained all required data

elements, sufficiently captured motor carrier operations, and applied correct tax rates.

In addition, other system reports provided sufficient information to fully support detailed or summarized items included on weight-mile tax reports and meet record-keeping requirements of the OAR. Specifically, we found:

- The vehicle trip record contains an accurate description of travel taken by a vehicle during a month. For each trip, this report includes beginning and ending odometer readings and locations, vehicle configurations, routes traveled, Oregon taxable and exempt miles, and out-of-state miles.
- The daily activity report contains additional details about each vehicle's daily travel. Significant events recorded by the system include items such as ignition on/off, engine idling, and state line crossings. Each event also includes the associated time, distance reading, and location.
- Maps stored in the depot show routes taken by vehicles and provide additional details about tax-exempt off-road trips.

Although the majority of required information is automatically captured by OBUs, vehicle configuration changes and use of some types of permits must be manually input into the system. Specifically, segments of trips involving non-divisible loads more than 98,000 pounds are excluded from the normal weight-mile assessment and are paid separately through a Road Use Assessment Fee (RUAF). We noted that the system appropriately excluded RUAF segments from weight-mile tax reports when users manually input the required permit information. In addition, the system appropriately generated a separate RUAF report for trip segments as required.

Testing results demonstrate the advantages of an automated system

The results of our review illustrate some of the challenges motor carriers encounter in maintaining extensive manual records, and some of the advantages of an automated system. Specifically, we noted errors in the manually prepared weight-mile tax reports and records that did not exist in the same reports and records processed by EROAD. Some of these issues included:

- One carrier reported the same beginning odometer reading for its May and June 2013 weight-mile tax reports. This error resulted in an overpayment of approximately \$50.
- Another carrier incorrectly reported a truck traveled 825 miles in Oregon that it actually traveled in another state. This error resulted in an overpayment of \$135. We noted that this motor carrier's daily records coincided with EROAD trip records; thus the error likely occurred during the carrier's manual preparation of the report.
- One carrier's weight-mile tax report did not include reportable miles for one of its trucks. However, EROAD records and weigh-station reports indicated the truck made several trips during the month. Over a month later, the carrier amended its tax report to include the actual miles traveled by this truck, and paid the associated tax and 10% late fee.

From the state's perspective, having motor carriers adopt reliable automated systems for capturing and preparing motor carrier weight-mile tax reports can potentially improve motor carrier monitoring, reduce costs of manual data entry, and decrease accidental non-compliance with the state's weight-mile tax requirements.

EROAD provided a secure and stable information system processing environment

In order for information systems to consistently provide their intended results, they should operate within a secure and stable environment. Some key elements that must be in place to ensure this occurs include processes for strictly controlling changes to system code, mechanisms for appropriately limiting logical access to system resources, and procedures for making regularly scheduled backups of system code and data.

Based on the results of our inquiries, EROAD designed controls in its information system operating environment to appropriately address these areas. Specifically, we found that:

- Reasonable controls were in place to ensure all changes to system code are tested and approved prior to implementation, and only approved code operates in the production environment.
- Logical access to EROAD accounts was appropriately restricted and monitored.
- EROAD controls reasonably ensured the availability of backup files for the web-based application, customer data, and source code.
- Controls reasonably ensured critical security related updates would be applied when needed.
- Web servers were appropriately secured.

In addition, the EROAD system is currently hosted on Amazon Web Services' cloud computing environment. As such, Amazon is responsible for securing the infrastructure that hosts EROAD's system. We obtained and reviewed various Service Organization Control reports that Amazon Web Services obtained from other external auditors. The publicly available report dated May 2, 2013 indicates Amazon's assertion that it had effective controls to provide reasonable assurance its system was protected against unauthorized access (both physical and logical) was "fairly stated, in all material respects."

ODOT has not yet developed an electronic interface for accepting system-generated weight-mile tax information.

To fully realize benefits from the use of an automated weight-mile tax reporting system, ODOT must provide a secure electronic interface for accepting system-generated weight-mile tax reports. This interface would eliminate the need for the division to manually input hard copy weight-mile tax information for motor carriers using the system.

ODOT staff indicated that they were in the process of developing an automated interface for receiving system-generated weight-mile tax reports from motor carriers. In addition, ODOT is considering online payment of taxes as a future component. However, at the conclusion of our field work, this project was ongoing.

Although ODOT has not yet established an automated interface with EROAD, motor carriers could create hard copy weight-mile tax reports through the EROAD system and manually file them with payments, or use the information to submit reports using Trucking Online.

Recommendations

To further improve weight-mile tax processing, we recommend that Motor Carrier Division management develop a secure electronic interface for accepting motor carriers' system-generated weight-mile tax information.

Objectives, Scope and Methodology

The purpose of this audit was to provide the division and motor carriers with an independent assessment of the regulatory pilot they sponsored during May and June 2013. Our specific audit objectives were to determine whether:

- The EROAD electronic On-Board-Unit hardware and web-based services platform (system) accurately and reliably captures and calculates Oregon weight-mile tax information from commercial carriers to meet record-keeping requirements of OAR 740-055-0120.
- EROAD web-based services provides a secure and stable information system processing environment for transmitting, processing and storing carrier weight-mile tax information.
- ODOT has established an appropriate and secure electronic interface for accepting carriers' system-generated weight-mile tax information.

The scope of this audit included an evaluation of weight-mile tax and other records produced by the EROAD system during the pilot months of May and June 2013 for the participating vehicles.

During the audit, we conducted interviews with appropriate division and EROAD personnel, reviewed pertinent documentation, obtained and reviewed applicable data files, and observed operations and processes as needed to achieve the audit objectives.

To evaluate whether the EROAD system accurately and reliably captured and calculated weight-mile tax information, and that its documentation met the requirements of OAR 740-055-0120, we:

- evaluated EROAD-produced weight-mile tax reports to determine whether they were accurate and provided the required information;
- reviewed and analyzed EROAD reports and data to determine if they met all requirements of the OAR;
- examined reports from external testing organizations that performed direct tests on the OBU device;
- determined whether independently collected weigh station reports of trucks in the EROAD pilot matched the trip data reported at the EROAD Depot for time and location;
- reviewed selected routes against an external mapping source; and
- analyzed significant variances between EROAD and carrier reports.

To evaluate the information system processing environment for EROAD, we first gained an understating of:

- the operating systems that support the EROAD application;
- how the components of the EROAD application are connected to each other, including network topology, protocols for data transmission, firewall settings, and change management procedures;
- how the EROAD application is hosted on the Amazon Web Services platform and which entity has responsibility for various tasks related to maintaining and securing the infrastructure; and
- the user account management processes in place at EROAD, including how users are granted access to the EROAD system's depot and administrative accounts.

To review program change management controls, we evaluated:

- how program libraries are separated, previous versions of code are maintained, logical access to the different environments is controlled, and version control is maintained;
- procedures to test and approve completed changes;
- requirements for independent technical review and approval of coding changes; and
- the process used to provide final approval of code for implementation and promote approved code into production.

To review logical access controls, we evaluated:

- processes followed to request, establish, and issue new user accounts, modify existing user accounts, and revoke accounts that are no longer needed;
- password parameters, method of assignment, number of attempts allowed before lockout, management of password reset requests, how passwords are displayed while being typed, whether passwords are shared, and how often passwords must be changed;
- whether logical access is periodically reviewed and authorizations for special privileged access rights are reviewed independently and at more frequent intervals; and
- how privileged access is requested, granted, and monitored.

In order to evaluate system and data backup controls, we interviewed program and information technology officials regarding the effectiveness of backup policy and procedures, reviewed procedures for off-site retention, rotation and security of backup media, determined if backups are periodically tested to ensure that they are usable, and if retention periods satisfy the requirements of ODOT and Motor Carriers.

The criteria for this audit include high level control objectives from CobiT along with control techniques and audit procedures from the Federal Information System Control Audit Manual (FISCAM). FISCAM includes audit criteria and guidance consistent with standards developed by the National Institute of Standards and Technology. Additional criteria included relevant laws, rules, and regulations governing ODOT.

We conducted this performance audit 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 findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.



Oregon

John A. Kitzhaber, MD, Governor

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December 6, 2013

The Honorable Kate Brown
Oregon Secretary of State
136 State Capitol
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Regarding the Secretary of State Audit Report **ODOT: Automating Weight-Mile Tax Collections Can Benefit the State and Commercial Motor Carriers**

Dear Madam Secretary:

The Department respectfully responds to the section of the report on page 8: **ODOT has not yet developed an electronic interface for accepting system-generated weight-mile tax information.**

ODOT's Motor Carrier Application Development section has developed a secure electronic interface between the Motor Carrier Transportation Division (MCTD) and the web services provider, EROAD. The Oregon Truck Tracking Online Web Services (OTTOExchange) contains all the functions necessary for a web services vendor to retrieve and pass vehicle and tax-related data. Vehicle data is being transmitted and received through the OTTOExchange and is currently being tested by ODOT and EROAD staff and anticipate implementing production data exchange in January 2014.

The gateway for OTTO vendors has been developed within the framework of ODOT's existing Oregon Trucking Online. Web services providers will have the ability to administer their user access and to set up bank accounts for electronic direct payment via the Automated Clearinghouse (ACH). The gateway through Trucking Online is currently being tested by ODOT staff.

Transmission and receipt of tax report data is under development and is anticipated to be ready for testing in December 2013. Transmission of payment through ACH is under development at EROAD with implementation targeted for April 2014.

The Department wants to thank the auditors of the Secretary of State Audits Division for the time and attention they gave to this project.

Sincerely,

Clyde K. Saiki
Deputy Director



About the Secretary of State Audits Division

The Oregon Constitution provides that the Secretary of State shall be, by virtue of her office, Auditor of Public Accounts. The Audits Division exists to carry out this duty. The division reports to the elected Secretary of State and is independent of the Executive, Legislative, and Judicial branches of Oregon government. The division audits all state officers, agencies, boards, and commissions and oversees audits and financial reporting for local governments.

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The courtesies and cooperation extended by officials and employees of ODOT and EROAD during the course of this audit were commendable and sincerely appreciated.