

PARTNERING WITH OTHER AGENCIES EVALUATION

2016 OReGO FAST Act
STSFA Grant

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Executive Summary

Some government agencies need the same data that the OReGO program collects. These agencies may spend significantly more money to obtain the data than they would if they partnered with the OReGO program. This project focus' on building data interfaces between the OReGO program, ODOT's Transportation Development Division (TDD), and, the Department of Environmental Quality (DEQ). This task also includes potential interface modifications between account managers and the Road Usage Charge Administration System (RUCAS), OReGO's internal system.

- **ODOT, Transportation Development Division (ODOT TDD):** Federal legislation requires each metropolitan planning organization to develop a transportation plan. The plan must provide valid forecasts of future transportation demand using travel demand models based on regional household travel survey data. The RUC data set is similar to that already collected through household surveys. ODOT recruited RUC participants who agreed to allow account managers to collect travel behavior data and basic demographic information, remove all personally identifiable information to ensure the participant's anonymity, and report the revised data set to ODOT. ODOT would use RUC systems to generate travel data for modeling and analytics on a trial basis. This could reduce ODOT's overall data collection costs and provide a more robust data set to run travel demand models.
- **Department of Environmental Quality (DEQ):** Emissions testing is required in some jurisdictions in Oregon before a vehicle can be registered with DMV. The data needed to evaluate a vehicle's emissions can be collected by the OReGO MRD. Sharing devices and/or account managers offers benefits including decreased costs for both partners and time savings for participants who would no longer need to wait in line at DEQ test sites. OReGO and DEQ will also need to assess any impact the existing data sharing between DEQ and DMV might have on the project.

The primary objectives and deliverables of this project are to:

- Use incentives to recruit participants who agree to share their anonymous data with other entities beyond the OReGO account manager;
- Obtain participants' consent to share their data and identity with entities beyond the account manager (as required by statute);
- Enhance system functionality to handle integration and interfaces with additional agencies;
- Evaluate use of the RUC system to generate travel data for travel modeling; and
- Monitor and report how the shared services affect the RUC Payers who volunteer to assist with system testing.



Background

ODOT Road Usage Charging and OReGO

In 2001, the legislature formed the Road User Fee Task Force (RUFTF). Its mission was to find an alternative source of transportation funding outside of fuel taxes. From this legislative body, the concept of road usage charge -- where volunteers pay for every mile they drive, rather than for every gallon their vehicles consume—came into existence. With the passage of SB 810 in 2013, the Oregon Department of Transportation (ODOT) was mandated to create and maintain a road usage charge (RUC) program. The resulting OReGO program became operational on July 1, 2015.

2016 FHWA FAST Act STSFA Grant

In 2016, ODOT was awarded a federal grant from the Federal Highway Administration (FHWA) under the Fixing America's Surface Transportation (FAST) Act Surface Transportation System Funding Alternatives (STSFA) program. ODOT has defined eight projects to meet the objectives in the grant and enhance the OReGO program.

The primary project objectives are to:

- 1: Expand the market
 - Expand technology options for reporting mileage
 - Manage the open market
 - Develop requirements for a manual reporting option
 - Streamline reporting and data sharing
- 2: Increase public awareness
- 3: Evaluate compliance mechanisms
 - Account manager
 - RUC payer
- 4: Explore interoperability

Description of the “TDD” subproject

The Transportation Development Division (TDD), within the Oregon Department of Transportation (ODOT), collects household travel behavior data designed specifically to estimate travel demand models. Data collection is costly and sample size is limited. Surveys are typically conducted every ten years. While the RUC data does not capture the detailed travel data needed to estimate travel models, it has potential to identify travel patterns that may be used to improve model performance and/or analysis methods.

Project Purpose

- Identify information currently processed and readily available from each OReGO account manager;
- Identify information that could be potentially provided by OReGO account managers, if RUC payers consent to sharing their data;
- Explore the possibility of collecting household demographic data from RUC Payers through the OReGO account managers.

OReGO account managers will provide documentation of information currently available, with no additional data processing required. The existing OReGO account managers, under contract to the OReGO program, will recruit RUC Payers to allow data sharing with ODOT researchers. The data requested from private vehicle owners includes, but may not be limited to:

- Daily miles of travel with date stamp and start and end time for daily travel;
- Vehicle Identification number (VIN) to identify vehicle characteristics in a standardized form;
- Upon permission of participant, collect household demographic information related to household size, age of head, household income, number of workers, number of driving age adults, number of vehicles available to drive.

The data requested from commercial fleets includes, but may not be limited to:

- Daily miles of travel with date stamp and start and end time for daily travel;
- Daily miles of travel split out into specific time periods, such as morning peak, mid-day, and evening peak;
- Vehicle make, model, year, gross weight, fuel type, fuel efficiency, vehicle county of residence;
- Firm size, NAICS code, number of drivers;

The OReGO account managers will work with TDD to develop a method to obtain additional demographic information from OReGO payers,

identifying characteristics such as household size, number of vehicles, number of workers, and income category.

Evaluation

What Was Done

ODOT acquired Azuga as the contracted account manager in November 2017 and began developing business requirements and processes. Azuga recruited participants into three groups, aptly named Group 1, Group 2, and Group 3. The groups were segmented according to the type of data the participant would agree to share:

Group 1 data collection consisted of:

- Vehicle Unique identifier
- Trip start and end timestamps
- Trip start and end XY coordinates
- Miles per trip
- Average speed per trip

Group 2 data collection consisted of all of Phase 1 data with the addition of the following:

- XY coordinates every 30 seconds
- Time stamp every 30 seconds
- Speed every 30 seconds

Group 3 data consisted of demographic data of all Phase 1 and 2 data with the addition of the following:

- Household size
- Age of head of household
- Household income
- Number of children
- Number of workers in household
- Number of licensed drivers residing in household
- Number of vehicles available to drive in household

Communications were sent out to participants on milestone dates for their selected group, and incentives were distributed at the end of the project.

Data sharing was completed each month throughout the project, correlating to the group milestones. The data was anonymized with a two-step identification process, and provided by Azuga to TDD for analysis.

STSFA Requirements

Recruit Participants

Azuga utilized a three-pronged marketing approach to entice vehicle owners to sign up and share their traffic usage patterns. The first tactic was to send out email invitations to all current Azuga Insight customers on strategic dates identified by Azuga. Tactic two was advertising with the Oregon Public Broadcasting station, both on its radio broadcast and website. The final tactic was to utilize Facebook ads, emphasizing the possible incentive.

Additionally, Azuga and ODOT both updated their home webpages to advertise the pilot and attract participants.

Consent to Share Data

For this pilot vehicle data was shared at a detailed level that had not been done before with an additional agency. Due to this massive change an additional agreement was written and required for each TDD Pilot participant.

System Data

To meet the needs of TDD, Azuga deployed changes to its RUC system to capture the necessary data for analysis. These changes include capturing data points at 30-second intervals and logging the latitude and longitude coordinates at that interval. Security changes were also made to ensure the anonymity of the vehicle before the data was passed to the agency.

Integration

During the system modification phase, Azuga also ensured its changes were developed in such a way that any additional agencies could consume the data. Its solution was to export the data into a .csv file, which can then be uploaded to a database system or fed into a spreadsheet, whichever the receiving agency found most useful. This allows for scalability with additional agencies in the future, should the need arise.

Participant Testing

To monitor participant testing, including satisfaction and results, a monthly Operations and Service Level Agreement was provided to ODOT each month the pilot was in operation, May – October 2017.

In total nine participants left the pilot before completion.

- Two of the nine exiting participants indicated their reasoning was due to not wanting to participate with OReGO, which was a requirement for the TDD Pilot.
- Two participants were required to leave the pilot, one due to selling the vehicle, and the other because the vehicle was not compatible with the technology.
- The additional five participants that exited the pilot did not provide a reason.

All other 146 participants completed the pilot, with only 3 customer service inquiries for the whole 6 months of operation, all of which were handled by a single phone call.

Lessons Learned

The outline below summarizes the OReGO team's lessons learned, including challenges that were encountered and recommendations for future implementations.

Certification Requirements

During the pilot, the certification process that was followed was found to be cumbersome and inefficient. Although initial certification was completed for the OReGO program requirements, this is the first certification OReGO has completed for pilot project requirements, and many improvements were realized.

- Document Sharing
 - Create a centralized document sharing repository so there is only one current version, thus eliminating confusion on which requirements have and have not been met.
- Testing Materials
 - Evaluation forms that are tailored to an individual tester and test case are inefficient. If a test case needs to be assigned to a different person there is high documentation overhead. This can be avoided by generalizing the evaluation form.
 - There was confusion with the process flow when test cases were handed out to testers. The steps were delineated at a sufficient level of detail, but each step was numbered. The numbering scheme lead some testers to believe that each step was sequential, resulting in some inefficiencies and corrupt tests. By simply removing the numbers in the test case document much of this confusion can be avoided.

- Deadlines
 - Certification deadlines need to be communicated earlier and more often, to both Account Managers and testers, to avoid late completion.

Some efficiencies OReGO would like to continue in the next pilot certification were also discovered.

- Certification Coordinator
 - Having all certification related communication come from one centralized person was very helpful.
 - All materials were completed by the Certification Coordinator prior to the project kick-off, allowing ample time for review and familiarity.

Account Manager Coordination

Because this pilot was the first to operate in parallel with the ongoing OReGO Program, communications were convoluted at times and several opportunities for improvement were found.

- Weekly Project Meetings
 - In order to manage project risks and issues that came up in a timely manner the, Account Manager and ODOT Project Team began to meet weekly. This scheduled touch-point was highly beneficial to ensure all involved were in alignment with goals and objectives.
- Prioritization
 - Clearly communicating priorities not just within a single project plan, but also across multiple project plans, is necessary when working with an Account Manager on multiple projects. This will also help to understand resource constraints on the project.
- Staff Changes
 - Both ODOT and Azuga experienced staffing changes early in the project, causing a lag in schedule and missed deadlines on both sides. Completing staff transition plans when a project team member leaves will help mitigate any issues this could present.

Potential for Supplementing Household Travel Surveys

This pilot study has provided great value exploring the potential use of the RUC data to support travel demand models. Typical household travel surveys cost about \$200 per household and require sample sizes large enough to provide statistical confidence for estimating the model coefficients. While the last survey collected information from 18,000 households, this sample size limited analysts' ability to establish statistically valid behavioral patterns associated with travel.

For this pilot, the RUC data was anonymized and trips were inferred using criteria established by the account manager. A voluntary questionnaire asking for basic demographic information was agreed to by a majority of participants. This demonstrated participants are willing to share personal information. However, travel models require a much greater level of detail, which increases the survey respondent burden. Adding more demographic questions is likely to reduce participation rates, the direct replacement of standard household travel surveys with a passive source such as OReGO is unlikely viable. However, use of OReGO passive data has other potential uses.

OReGO data has the potential to provide valuable information on aggregate patterns in several areas key to validating and calibrating travel models, such as:

- Vehicle ownership patterns – the number of vehicles owned, miles driven, vehicle characteristics related to age, size and fuel type. These traits are key to conducting analysis related to fleet energy use, emissions and transportation-related greenhouse gas production; data would also reveal how patterns differ by region of the state, e.g., rural vs. urban.
- Trip making patterns – the number of trips taken by day of week, distance traveled for trips on weekdays vs weekends; seasonal patterns such as summer vs. winter, holidays, regional special events (e.g., solar eclipse); time of day patterns related to when trips start and end. This helps understand peak hour demand.
- Miles of Travel – patterns on how far people travel, when they travel, potential for non-motorized travel for regions with shorter trips. This helps identify destinations with high demand that may be served by transit or rail modes.
- Safety-related patterns – identifying locations with higher than average braking or acceleration events. This helps to reveal potential for higher probability crash locations.
- Land-Use patterns – identify fueling patterns to design placement of alternative fuel stations such as electric or natural gas; parking demand patterns to design placement of park and ride lots served by non-auto modes. This could help to reduce congestion.
- Validating purchased data – vendors transforming passive cell phone data into trip information are aggressively approaching public agencies, promising the information can replace traditional surveys, but agencies have no way to evaluate the accuracy or suitability of these products. OReGO data could be used to evaluate such products;
- Vehicle miles of travel estimates – once most of the Oregon fleet of highway users are using the OReGO system, there is the potential to more accurately measure statewide vehicle miles traveled; miles could be reported by facility and jurisdiction.

This pilot revealed enormous potential for using Oregon observed data to developing information that would greatly contribute to the development of more accurate forecast tools, public policy and equity analysis.

Description of the “DEQ” subproject

DEQ started allowing for another DEQ testing option other than its drive-in sites in early 2016. The option is called DEQ Too™ and involves motorists voluntarily authorizing On-Board Diagnostics (OBD) data to be remotely transmitted from their vehicles to DEQ. Instead of visiting a Clean Air Station, motorists test their vehicle at locations they are driving to already. The vehicle’s OBD data is immediately transmitted to DEQ and then at the motorist’s convenience results can be checked using a smart phone or other device.

Evaluation

What Was Done

DEQ engaged with ODOT’s DMV to create an interface that allows remote emission testing to be performed by DEQ certified business partners. Azuga is a certified account manager with the OReGO Program that utilizes the OBD II port of a vehicle to extract data and is sent electronically. Azuga became certified in the DEQ Too Program using its OReGO platform to extract emission readings.

The “partnership” between ODOT and DEQ enabled both agencies to leverage technologies, expertise and partnerships to offer greater services to their respective programs (DEQ Too and OReGO).

OReGO provided support to Azuga and its customers in the OReGO program. OReGO provided DEQ consultative support and contributed to the communication and outreach strategy lead by DEQ.

Lessons Learned

Improve Change Management

To support DEQ and (and maintain industry parity) Azuga had to implement enhancements to its platform. This resulted in replacement of the devices used by all OReGO participants enrolled with Azuga. OReGO and Azuga determined that the change process needed refinement and made these observations:

- Due to the maturity of RUC, the OReGO change management processes hadn't been fully developed by the program. What was in place was not followed. The program determined that internal processes should be updated, documented and formalized.
- The Change Request form used by Azuga was vendor-centric and didn't directly align to OReGO.

After the DEQ project the OReGO program evaluated its processes and implemented improvement to address change management.

Improve Testing

Azuga failed to provide "Release Notes" so Testers didn't know what to look for when testing. The test cases weren't targeted and too complicated. Testing was rushed and incomplete due to conflicting priorities and last minute deadline changes.

Improve Communications

A few instances were documented of poor communications between the Account Manager and Customers.

- Customers were not informed of the gap in mileage reporting that would result from the transition
- Emails were sent indicating there was inactivity when it was due to the transition
- Communications limited to email (ideally should have included a message with instructions with the device)

OReGO has since incorporate communications into the Change Management approval process. OReGO has stressed to Azuga to engage OReGO communications early and often so the program may offer guidance.

Improve OReGO Internal Communications

Because the project was primarily a communications outreach effort, the operational side of the OReGO program had information gaps, which was not helped because they were working on other concurrent OReGO initiatives. As a result some key details were not shared to the Operational Team:

- Not all OReGO team members were aware there would be a disruption in service
- Team was unsure if there would be impacts to TDD (due to suspended state of accounts)

The program will strive to communicate more broadly in weekly team status meetings.



Conclusion and Next Steps

The Partnering with Other Agencies project allowed the OReGO Program to evaluate the feasibility of applying OReGO data to meet the needs of other entities that use traffic data. It also demonstrated that partnering with other agencies, such as DEQ, was possible but requires greater collaboration at the beginning to ensure a more seamless experience for users. Several lessons were learned along the way, which were documented, and in the end all pilot objectives were met or exceeded.