UDOT’s use of ArcGIS Survey123 for eTicketing

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Overview

• Development
  o GIS-centric design
  o S123 + FME
• Implementation
• Challenges
  o Supplier limitations
  o User concerns
• Future
  o Offline data collection
  o PCC eTicketing
Benefits of eTicketing

- Safer ticket collection
- Reduced paper consumption
- Automated data retrieval
- More efficient data storage
- Integration with asset management

UDOT eTicketing

**Commercial Software**
- Pre-configured product
  - Cost
  - Multiple systems
  - Required equipment

**GIS Solution**
- Requires configuration
  + Free*
  + Single app for all projects
  + Use existing equipment
ArcGIS Survey123

- Esri mobile app suite
- S123 = COTS solution for form-based geospatial data collection
- Location + descriptive data stored in an Esri feature service
- Supplier data is written to the feature service in an FME workflow
- Inspector edits the feature service in Survey123
- Results viewed in online dashboard

FME (Feature Manipulation Engine)

- Extract, Transform, Load software
- Data in JSON format is submitted to a REST endpoint on UDOT’s FME server
- Webhook triggers an automation on FME Server (Flow)
FME Form workflow

- Supplier tracks materials data by project in a relational database
- When a truck is loaded and leaves the scale at the hot plant, the supplier’s database is triggered to send a JSON with that load’s data to a REST endpoint on FME Server
- FME workflow parses the JSON and writes data to the HMA layer in UDOT GIS Portal
- Each project has its own Survey123 survey with a query that pulls in new ticket data by project PIN
- When the inspector refreshes the inbox in their S123 survey, it queries the layer and loads in any tickets sent since the last refresh
- Inspector edits the ticket and sends the survey, which updates the HMA layer
- Office manager reviews the submitted data in the eTicketing dashboard and exports records needed

UDOT eTicketing Process

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Life Cycle of an E-Ticket

Supplier Workflow

1. Ticket generated by supplier
2. Truck dispatched
3. Truck arrives at project site
4. Supplier reviews inspection info in dashboard

FME Workflow

1. JSON payload sent to URL
2. JSON received by FME server
3. FME data transformation
4. Record written to GIS layer
5. Completed ticket available to view in dashboard

Inspector/GIS Workflow

1. Inspector views ticket in S123
2. Inspector adds inspection info

Survey123

- Unique survey for each project (by PIN)
- Ticket arrives in survey inbox, labeled with Truck ID, Date/Time, and Load Number
  - Load specifics, including mix design, load number, quantity of material, running total
- Inspector completes the remaining fields:
  - Visual verification of load placement
  - Pay item
  - Lot, temperature, and sample if taken
  - Load rejection information
- Once a completed survey is sent, it can be edited later via the “Sent” folder in S123
eTicketing Dashboard

How to Use the Dashboard

Select a Project Year

Filter E-Tickets

Filter e-Tickets by entering "Filter E-Tickets".

Data Table

This section displays the data table. The data table is designed for easy access to project data. The table includes fields such as project number, date, time, temperature, and other relevant information. For more information on how to use the data table, please refer to the "How to Use the Dashboard" section.

For additional assistance, please email eTicketing@ltdot.com.

Please contact LTDOT customer service with any questions or concerns regarding data access and use.

LTDOT
Limitations & Challenges

- Ticket retrieval only (currently) possible at sites with cell or internet service
- Supplier glitches can cause confusion (incorrect truck IDs, duplicated or voided tickets)
- Significant hesitation from the industry in providing any additional information beyond what is printed on a ticket
- Slow uptake by crews – due to above issues, concerns about time management, reluctance to learn new processes

2024 Field Season Updates

- Bug reporting features within surveys
- Greater collaboration with suppliers to address issues quickly
- Improved interface to easily find and collapse key information
- Masterworks API
Future developments

Concrete eTicketing
• Automated calculations
• Push test data to MasterWorks
• Currently testing with one supplier

Offline eTicketing process
• Verification – vehicle ID, time stamp
• FME workflow to sync with supplier data retrieved online

Thank You

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