COLLABORATION IN IN-SERVICE PERFORMANCE EVALUATION OF ROADSIDE SAFETY HARDWARE

SHAWN BLAESING

IOWA DEPARTMENT OF TRANSPORTATION
In 2010, after a request from a field manager, started researching the best way to manage information for field crews. First round of tablets deployed in 2013.
IMPROVING PROCESSES
MOBILE DATA COLLECTION HISTORY
COLLECTOR / SURVEY123/FIELDMAP

• Started collecting data in 2012 with Culverts on IPads
• Migrated to ArcGIS Online and Collector in 2013 with Culverts data
• Since have added Lighting, Traffic Barriers, Walls, Fencing, Patching and Signs migrated from an older system
• Also leveraging Survey123 for sample collection
• Upgraded to ESRI portal (hosted server) to serve data in 2019, and deployed FieldMaps in 2021 (replaces collector)
DATA INSPECTION
ENTERPRISE DATA CAPTURE GATHERED
BY MAINTENANCE AND CONSTRUCTION

• Culvert Data within ROW (82% collected – 75,818, 15,000 Subdrain, 355 Tile, 87855 Inspections)

• Guardrail, Crash Cushions (97% collected – Cable 2284, Concrete 942, Steelbeam 10524, Crash Cushions 274, 17000 inspections)

• Signs (98% collected statewide – 272000 signs, 180800 poles, 730660 Inspections)

• Lighting (85% collected statewide – poles 19200, cabinets 1085, handholes 5682)

• Patching Locations, Fences new in 2018/2019

• Added Weed Capture, ADA compliant Intersections, etc
PARTNERSHIPS ARE IMPORTANT
LEVERAGE WHAT YOU KNOW AND
MAKE IT BETTER

• IT and Geospatial Teams work to improve processes, data storage and delivery techniques
• QA/QC is ongoing, nightly/weekly processes being established to maintain data quality
• All data is tied to our RAMS (Roads and Highways network) system on the back end to enable multilayer analytics
• The Apps are NEVER FINISHED
OPPORTUNITIES FOR OUTREACH
HOW ARE WE USING THE DATA?

• Direct tie to crash incidents (borrowed from Indiana DOT)

• Pink Tags – Enforcement officers, tagging signs, lights, fence, or traffic barriers involved in a crash

• TRACS ID, tied to feature inspection

• Deployed statewide in January 2019 with enforcement officers across the state
PARTNERSHIPS

• First, Engaged with Iowa Highway Patrol and Iowa DOT Motor Vehicle Enforcement Officers

• Engaged with pilot county sheriffs and local police departments

• Working to expand our partners through 2022-2023 to add participation from enforcement agencies that respond to crashes on the primary road network, especially in urban areas
PROVIDE TOOLS – PINK TAG KITS

http://www.iowadot.gov/crashtag
Partner agencies carry a crash tag kit which includes:
• Weather proof pink tags
• Sharpies
• Zip ties
• Gardening wire
• A vinyl bank bag
• Damage detail list

Officers can get kits from Highway Patrol or DOT warehouses as well as DOT garages
DEFINE A CLEAR PROCESS

- The Enforcement Officers use the provided tags in the kits
- Maintenance staff remove the tag, log the information and an inspection with photos
- The database pulls the data to generate daily reports to Claims
- Working on analytics to look at feature performance.
Working to get the tag related data tied to the DOT crash system to link offender to the damage.
COST MEMO – CAPTURING THE COST TO REPAIR DAMAGED INFRASTRUCTURE

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<th>Pay Grade</th>
<th>Reg. Rate</th>
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Sub Total $0.00

Labor Additive/Fringe: (State’s share of employee’s benefits) Year Work Completed: 2021 (Reg. Hours) 0.4404 $0.00
(Over Time Hours) 0.00 $0.00

LABOR SUBTOTAL $0.00

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$0.00 $0.00 $0.00 $0.00 $0.00
VISUALIZE DATA – OPERATIONS PORTAL

- Web-based Live feed from FieldMaps – includes inventory and Inspections
- Custom Geolocation Tools
- Custom Map Tools
- Ability to Query Data
- Working on custom reporting tools
LEVERAGING THE DATA TO SOLVE PROBLEMS

• **Pooled Fund: In-Service Performance Evaluation of Roadway Safety Features** - [https://rip.trb.org/view/1899651](https://rip.trb.org/view/1899651)

• **NCHRP 22-33 [Completed] Multi-State In-Service Performance Evaluations of Roadside Safety Hardware**

• **NCHRP 22-44 [Active] A Transportation Agency Data Collection Practice for Use with In-Service Performance Evaluations (ISPEs)**

• **NCHRP 22-58 (Kicking Off): National Guidance for Defining Acceptable Roadside Hardware Field Performance through In-Service Performance Evaluations (ISPEs)**
LEVERAGING THE DATA TO SOLVE PROBLEMS

• ET Plus Head Parts Issues
• Identifying where ET plus heads are on the network
• Identifying a viable process for replacing them when they are damaged
• Identifying a focused process to systematically take them off the network
FOCUS ON THE END GAME

Transportation Infrastructure Life-Cycle

Planning | Design | Survey

GIS

Maintenance | Construction

Operations
QUESTIONS

Thank you!

Shawn Blaesing
Maintenance GIS Coordinator
Shawn.Blaesing@iowadot.us
515-239-1805
The Iowa DOT is collaborating with participating enforcement agencies to have officers responding to crashes tag damaged infrastructure (traffic barriers, lighting features, signs, and fences) along the right of way on the primary road system. These tags allow the Iowa DOT to tie crash information to damage and link to our claims system making the transfer of information easier to manage.

After responding to a crash on a primary road where state infrastructure is damaged, the responding officer will create a pink tag to attach to damaged infrastructure. The tags have the incident ID (where available), agency, responding officer, and date. In cases where multiple crashes occur in the same location, or a single crash damaging multiple features, multiple tags can be attached. Iowa DOT maintenance field staff then log an inspection of the damaged item and enter the pink tags information as part of that process in our existing inspection application, then they log the damage costs in a cost memo tied to the inspection and then a report will be generated for our claims management staff.

This is based off a project initiated by the Indiana DOT, where they have been able to recoup $7 million a year in their state as compared to $1.5 million a year before this program was deployed. Beyond the monetary savings for the taxpayers of Iowa and improved efficiency of sharing information, our safety and design teams are very interested in seeing how our roadside safety features are performing in a crash. Do signs and lighting pole breakaway like they are supposed to and do traffic barriers displace correctly. Does saving cost during initial install out weight the time and cost of our maintenance staff to do the repair. By tying the asset data, crash information and cost together, this allows the DOT to make better decisions about where and what hardware is installed in the roadway. The DOT is also taking part in a Pooled Fund with several other states looking at in-service performance of roadside safety hardware.
LESSONS LEARNED

• The best built app will have a lot of stakeholders involved / look for opportunities to integrate

• Take your initial timeline and multiply it by three

• Leverage other people’s knowledge who have gone before you so you can learn from failures and successes

• Once the process is set for one data type setting up the next one goes pretty quickly.

• Culverts, traffic barriers and signs are in version 3 / Software and processes evolve so evolve with it, the project is dynamic