

Field Data Collection Notes - Roll Call Round Table — April 2012

These are notes collected during the round table discussion.

Data collection is the capture of unknown data – local roads, bridges and culverts for inventory, inspection as a location/intersection, etc and adding business data to that location

Questions presented by the group

- How do you tie all existing data together?
- Who wants to use the data and to do what?
- What hardware/software processes are being used?
- What different ways folks are collecting location/business information (georeferencing from maps, video logs, field data collection, 3D imagery)?
- What level of accuracy is needed?
- What are long term benefits to RTK/CORS and systems like that?
- What is the best way to correlate feature types (i.e. culverts, inlets, outlets, etc, headwalls (at grade/above grade))?
- How does the standard of DMI play into the mix?
- How does field data collection tie into the bigger picture of Asset Management?

What data types that are important and what drives the need to collect information about them?

- Roads/Bridges (including local roads and bridges)
- Culverts/ Drainage Features (locate, inventory, inspect, photograph)
- Signs/reflectivity, guardrail, access points, billboards
- Pavement information
- Paint stripe information/reflectivity
- Right of Way
- At grade rail crossings

Issues

- Need to know what data you already have and have a workflow for standardizing data across many districts/regions
- Need local buy in for data collection and maintenance of features off the primary system
- There is a need for multiple data capture solutions – LiDAR, Road Log measurements, field devices, 3D data collection
- Conditions can only be collected in the field so there are cases where “boots on the ground” is the only way
- Need some “quick and dirty” data collection tools for the field
- Need to be prepared to collect more than one feature for any given pass out in the field.
- Some assets collected remotely or through automated means can be obscured by vegetation, shadows
- Safety is a factor in field data collection – Recommendation to set up field safety zones for collecting field data, must have strict field safety protocols and training programs.
- Can train engineering interns to do some field data collection
- Agencies must find a balance between data, cost, and safety when putting people in the field
- Agencies must assess the value and cost of the data, asking who is using it and why.
- For most field assets the level of accuracy needed is good enough when it can be found in the field but is there a benefit to collecting at a higher accuracy
- For public Right of Way it needs to be sub-meter, items like pipes and signs
- LiDAR collected by aerial may not be good enough for asset capture.

- Higher resolution LiDAR is needed for ITS, smart cars, and so on...
- Survey data must have correction factor and means to translate information to the GIS systems
- Paper-based location information is usually in county, route, milepost or station – it is easy for the field staff to locate things this way
- Need to have services that link locations in multiple formats to the LRS systems that are in place
- Issues with accuracy of location information with simpler handheld tablet and phone apps

Importance

- Find assets in need of attention
- Saving time and money
- Need a way to measure performance and do analysis (integration into management tools like dashboards)
- Meeting public performance expectations with measures
- Need to keep the traveling public safe
- Meet federal requirements – NBI, HPMS
- Capturing off-state network crashes, grade crossings
- Capturing signs, paint, including retro-reflectivity
- Accuracy is a data integrity issue when used with other datasets
- Integration of data life cycle-design files; design, as build, maintain
- It is important to post process QA/QC the data for quality before moving to enterprise storage and need to allow time for the cleaning to happen. May have to field verify questionable data.
- Need to develop data that is quality and reusable for other government entities outside of our agencies

Notes/Recommendations

- Inventory once, then get data into a maintenance cycle, workflow changes to make this happen can be challenging
- Must balance collection costs with the highest level of accuracy for the highest number of users which may ultimately translate into data being collected at a lower accuracy - The highest accuracy possible makes it usable by the widest audience for the most uses
- Data must be stored as temporal with archival, retire/install dates, condition snapshots over time, include field collection metadata
- Data controls set when mobile data collection units have standard settings across the state (coordinate system); increases accuracy of location information with handhelds
- Must have standards in place for tying data to LRS and GPS metadata guidelines for collection
- Higher accuracy equipment can be rented
- Some states are implementing a barcode system for some of their assets
- States are implementing GPS/AVL systems for tracking and managing some of their assets
- Look for opportunities to engage the private sector for support in the process
- If data is collected once, and higher accuracy is needed later, it can be cheaper to collect the second time
- States with a statewide coordinate system save time and money
- Accuracy can be assured by using NOAA CORS, Leverage CORS and RTK Networks
- Think through what needs to be collected
- Data is only as good as the person collecting it that day
- X,Y can be converted to linear referencing is needed – standard is Lat/Long in Decimal Degrees with coupling to LRS systems
- Implement a data dictionary for field data collection processes and leverage e-forms or apps through pull down menus
- Need to leverage the different hardware and software solutions available for collection(automated, desktop, or field) of different kinds of assets so have to do some homework depending on what your workflow and data collection needs are

- Need to leverage statewide collaboration efforts and should take a look at states that have been successful at bringing together groups to do statewide LiDAR and Imagery
- Need to look at ways to leverage cloud based infrastructure for data collection and storage as well as online resources like ArcGIS Online for disseminating information
- Emergency management has a high need for high res. LiDAR as well as a suite of field based data
- Should have an awareness of the National Map Accuracy standards when collecting data

Reference Materials/Reports

- Oregon Low Distortion Projection Information - <http://www.oregon.gov/ODOT/HWY/GEOMETRONICS/ocrs.shtml>
- Stay tuned for Nat. Hwy safety accuracy research
- USGS is working to develop a high resolution elevation database and encourages those collecting LiDAR to do it in the highest resolution they can
- <http://kygeonet.ky.gov/> - <http://technology.ky.gov/gis/Pages/Governance.aspx>
- Some best practices and implementations http://www.gis.fhwa.dot.gov/documents/GIS_AssetMgmt.htm#top
- Washington States Features Inventory Program <http://www.wsdot.wa.gov/mapsdata/roadway/RPIP/default.htm>
- Colorado Asset Management Plan <http://www.fhwa.dot.gov/infrastructure/asstmgt/dico05.cfm>
www.coloradodot.info/programs/research/pdfs/2001/assetmanagement.pdf at download/file
- FHWA Asset Management http://www.dot.state.ak.us/stwddes/asset_mgmt/assets/fhwa_tam_overview.pdf
- Michigan Asset Management Plan http://www.michigan.gov/mdot/0,1607,7-151-9621_15757---,00.html
- Oregon http://www.oregon.gov/ODOT/TD/asset_mgmt/index.shtml
- Other resources <http://www.gis.fhwa.dot.gov/resources.asp>