



GETTING THE BEST LONG-TERM USE OF UTILITY DATA

(IS VERSUS WAS)

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AMERICAN ASSOCIATION OF
STATE HIGHWAY AND
TRANSPORTATION OFFICIALS

AASHTO
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NEW EFFORTS TO PRESERVE UTILITY DATA

- SHRP R01A “3D Utility Data Storage”
- EDC3 “Collect Once, Use Many Times”
- RTC Southern Nevada “Utility Permitting and As-Built Surveying”
- Utah DOT
-
- GIS databases
- Cloud / Site Server

WHY PRESERVE DATA

- Save time and money on future utility investigations
- Use data for maintenance and asset management
- Do better job of stewarding remaining public underground space

TIMES TO COLLECT UTILITY DATA

- During project development process (PDP) for planning/design engineering purposes
- During PDP design stage for project construction (e.g. track relocations, abandonment)
- During construction for accurate as-builts
- Between projects for asset management

WHY DOTS MAP

- Utility records not accurate or complete enough for engineering purposes
- No idea of how “certain” the existing data may be.
- Engineers work with “uncertainty” by making design decisions based upon health, safety, and welfare of public – the more “uncertain” the more the ultimate cost to the project
- For past three decades answer to uncertainty has been ASCE 38 quality levels as an end product of utility investigations

ASCE 38

- Search for utility data at a specified level of effort (utility quality level) **within a specified area.**
- May **exempt certain utilities** from investigation/depiction
- Therefore, depiction of a specific utility is just part of the data

ASCE 38

- A quality level is the attribute given to a utility asset segment for a project
- Insurance coverage only during that project development
- After project, project owner assumes all risk for future use of that quality level

FOR LONG-TERM DATA STORAGE

- Need to know project limits, scope of work within them
- Need to realize quality level attribute no longer “valid”
- Used to be Quality Levels D, C and B
- Need to keep project utility data current during project, plus add new data between projects

AFTER MAPPING COMPLETE, BUT BEFORE CONSTRUCTION

- Walk entire project limits with existing utility mapping in hand
 - Check every utility pole for new risers and/or new appurtenances/attachments
 - Look for “new” street patches (on first update, sketched all patches on plans for future comparison)
 - Look for ongoing long-duration construction projects

AFTER MAPPING COMPLETE, BUT BEFORE CONSTRUCTION

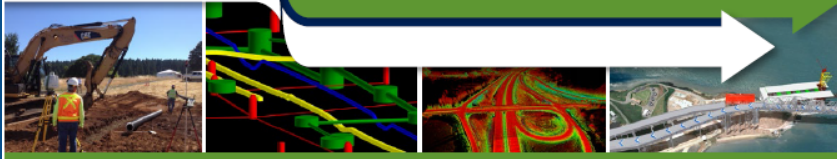
- Research permits issued by the city after mapping complete
 - If it appeared as if work could involve any utility work (new, abandoned, removed, replaced), re-designate area.
- Ask all utility owners (including different city departments) for any new records
- Re-designate areas where utility changes from records
- Research all one-call tickets within project limits
- If appeared to be utility related, re-designate area

DURING CONSTRUCTION / RELOCATION

- As-Built new utility relocations
- As-Built new utility Installations
- Modify utility database to reflect relocations, abandonments, change in operational status, removals



3D Engineered Models: Schedule, Cost and Post-Construction



Participant Workbook

Every Day Counts | Innovation Initiative
September 25, 2014



U.S. Department of Transportation
Federal Highway Administration

The Federal Highway Administration (FHWA) emphasized 3D engineered models for design and construction in the second round of the *Every Day Counts initiative* (EDC-2), and is continuing this support under EDC-3

The EDC-3 effort is focused on three practices: using the as-found data from which the model is created (for example, LiDAR-based data) for roadway inventory and asset management purposes, incorporating schedule (4D) and cost (5D) information into models, and using post-construction survey data to correct the design model and **create an accurate as-built record drawing (including subsurface utilities).**

Benefits of Digital As-Built Records

- More portable data format
- Less effort to translate
- No manual data entry
- No need to manage paper
- Projection and datum information can be embedded
- Connects to [EDC2 Geospatial Data Collaboration](#) and [EDC3 e-Construction](#) activities



Collect once, use often!

Case Study: Subsurface Utility Engineering



Effort to create a national standard for as-built and as-found subsurface utilities



Image Source: Cardno

METADATA THAT NEEDS TO ACCOMPANY DATA

- Who collected the data
- Project description (project limits, type of work, existing utilities, etc.)
- Contract requirements relative to utilities
- Methods used to collect and depict subsurface utility information, and why this equipment was selected for use
- Types of equipment selected and used to collect information
- Areas swept; areas not swept; and suspect areas
- Utility record log and owner information
- Exclusions and reasons for exclusions
- Photos including labels
- Test hole data sheets / other documents

OTHER IMPORTANT DATA

- Where did the “z” come from?
- What is the spatial reference system?
 - Depth from existing grade when measured?
 - Vertical datum, Epoch, etc.

SUMMARY: FROM ASCE 38 XX

An engineer portraying a utility at a utility quality level previously performed by another engineer without verifying the currency of such data does so at his/her own risk.

SUMMARY: FROM ASCE 38 XX

A quality level is developed and sealed by a licensed professional for a specific project. After the project is finished, ASCE 38 and the definition of Quality Level D indicate that the old project utility information becomes a “record” and if used for a new project, can only be used as “Quality Level D” unless a professional for the new project certifies it at a higher quality level.

SUMMARY: FROM ASCE 38 XX

Thus, the attribute of a Quality Level D depiction for a new project might include metadata that says for instance “Previously Quality Level B Data;” (i.e., IS Quality Level D but WAS Quality Level B). This might allow the engineer and project owner to make decisions on using the old information as is for some aspects of project risk management, rather than re-designating, while still protecting the current professional.

USING DATA AFTER THE PROJECT

- Need data to start
- Need to know investigation project limits
- Using ASCE 38 is a good start to know initial reliability
- Need metadata within project limits
- Adding changes, additions to project area during and after construction is essential
- Need data “gatekeeper”
- Watch out for entropy

QUESTIONS / MAYBE SOME ANSWERS