WHAT IS ASSET MANAGEMENT?

- Management of a client’s investments (Investopedia),
- System that monitors and maintains things of value (Wikipedia),
- Managing of money for investment so that it makes as much profit as possible (Financial Planner World)

A process that guides the acquisition of assets, along with their use and disposal; in order to make the most of the asset and their potential throughout the life of the assets (Bellweather Corp)

- Prudent administration of investable (liquid) assets aimed at achieving an optimum risk-reward ratio (Business Directory)
• Assets – Historically have been:
  • Buildings
  • Machinery
  • Equipment
  • Vehicles
  • Trucks
  • Field Tools

• Infrastructure Assets:
  • Signs
  • Bridges / Culverts
  • Guardrail
  • Pavement Markings
  • Traffic Signals
  • Street Lights
  • & Other permanent devices/fixtures
  • Also – Flood locations, snow drifting and other hazard mitigation issues.
GIS = G E O G R A P H I C I N F O R M A T I O N S Y S T E M S

- A manner in which to represent information geographically or in space.

- ESRI Definition - A geographic information system (GIS) is a framework for gathering, managing, and analyzing data. Rooted in the science of geography, GIS integrates many types of data. It analyzes spatial location and organizes layers of information into visualizations using maps and 3D scenes.

- A system designed to capture, store, manipulate, analyze, manage, and present spatial or geographic data. GIS applications are tools that allow users to create interactive queries (user-created searches), analyze spatial information, edit data in maps, and present the results of all these operations; visually and other formats.

- ...system capable of assembling, storing, manipulating, and displaying geographically referenced information.
GIS DATA LAYERS

Many different types of data can be integrated into a GIS and represented as a map layer.
Examples can include: streets, parcels, zoning, flood zones, client locations, competition, shopping centers, office parks, demographics, etc.

When these layers are drawn on top of one another, undetected spatial trends and relationships often emerge. This allows us to gain insight about relevant characteristics of a location.
INTEGRATION TO GIS – THE JOURNEY

DATA MANAGEMENT TRANSITION TO PAPERLESS

- **Conversion** of existing excel database tables to access data attributes and features.
  - Gleaning data inputs (entry errors).
  - Validating information with Collector apps.

- **Collection** real time with a computer application – ESRI Collector
  - Cell phone
  - Computer Tablet with hotspot
  - Run in offline mode - update when in cell coverage area options

- **Collection**, analysis, and creation via Lidar Technology by Mandli Communications
  - Drive the infra-structure and gather data real-time - 3D panoramic visual of the data.
  - Review data point clouds and extract information related to assets.
  - Also can provide pavement condition ratings more precisely - cracks, deformations, etc.
  - Create GIS data layers from collected data - tabletop exercise.
3 Counties involved in Asset Management integration using ESRI GIS solutions.
IOWA COUNTY:

- 365.7 CL (730+ Lane) Miles
- 3,350 Acres of Right of way
- 152 Bridges (55 County)

Excel Data Tables 2002-03:
- 1,987 Culverts – 43 “Sheets”
- 5,400+ Signs
- 312+/ 609 Ball-banked curves
- 165 Barriers (Guardrail)
- 137 Accidents (3 fatal)/Yr
- PASER – 352 Sections
- Piles of Assessment Forms and Data Sheets

2011 UW-Platteville converted data to GIS
2014 Software updates complete
2017 Collector app.
Planning & Zoning had ARCGIS and created several Layers:

- Property Boundaries
- Parcel Annotation – Owners – Tax Parcel Listing
- Addresses
- Platted Lands / CSM’s – Zoning and Landuse
- Soils maps, topography maps
- Roads
- Rivers / Lakes / Wetlands / Floodplains
- Civil Divisions / School Districts
- Supervisory Districts
- Quarries
- Aerial Photography Historic comparisons – 1968 to 2015

ARCReader / ARCVIEW / other formats
Culvert database
43 Sheets of data
COLUMBIA COUNTY:

- 21 Townships / 8 Towns involved
- 712 CTH LnMi, and 1,860 Town LnMi
- 10,500 acres ROW
- 81 Local Bridges

Collected information:
- 2,604 Culverts (CTH and 8 towns)
- 180 Barriers (guardrail)
- 1,650 accidents per year
- 9,569 Signs
- 435 Signed curves
- 172 Rumble Strip Locations
- ROW Permits (1964-2019)

- Started 2015 with culvert data
- Field data collection with app.
- Add layers with Interns annually
Created attribute tables

- Culverts
- Signs
- Barriers

Intern collecting data

- +/- 100 Features/Week
- All attributes
- 20-30 / Feature
App driven forms create data and integrates to ARCGIS mapping solutions
Smart phone or ipad/chrome book driven
Collect whether in cell coverage or out (Online or Offline)
Captured
100 Culvert features with all attributes / week
Maintenance – 24/30 signs / Day with all attributes – work dependent
EAU CLAIRE COUNTY:

Eau Claire County

• 690 Ln Mi
• 80 Local Bridges
• Limited historical data available

Data extrapolated:
• 5,628 Driveways
• 695 Intersections
• 418 Barriers
• 7,898 signs

• Started July 2018 – Contract for horizontal Lidar collection
Vendor contract:
Mandli Communications

Laser digital terrain mapping
2D and 3D Image capture
Data extraction
Workstation extrapolating data to GIS
Lidar Data Viewer
3 COUNTIES WITH...
UNKOWN S + EXPEC TAT IONS + LIMITED RESO URCE S
= 1 SOLUTION (3 DIFFERENT PATHS TO GET THERE)

Cost of Implementation

Setup - Gathering Data

Inventory - Data to ARCGIS platform

Operating - Collector App & Maintenance

$0
$20000
$40000
$60000
$80000
$100000
$120000

Eau Claire
Iowa
Columbia

Mobile Lidar Data Collection  Data Lists to Tables  App Field Collection
ARCGIS Pro – desk top

Collector App

ARCGIS Online – Web-based
• **ARC GIS Pro (Reader) – Planning and Mapping Tool**
  Hosted / licensed desktop program
  Programmer / Coordinator builds layers and data
  Content / Symbology whatever we want – Coordinator in-house
  Time limitations with in-house staff – Tax Maps & 911 Cadds

• **ARC Collector app – Real-time Data / Asset Inventory Management Tool**
  Create a form or table of data to collect about a feature / object
  Online and offline collection of data into tables or forms
  Information updates ARCGIS Online real-time (wifi connection) with field inputs

• **ARCGIS Online – Web-based Analysis Tool**
  Hosted as a web-based application
  Build layers from data tables or data collection – manage our own
  View by layer, queries, filters = analyze data to create maps
WHY ARC G ISO NLINE?

• See information differently
  • View data as visual maps or tables.
  • View layers of data and analyze.
    • Recommend 1 Feature / Layer.
    • Add or Show as many Layers as want.
  • Create maps (visual) of the results for analysis, or in tabular form.

• View Inventory vs seeing data in differing tables
  • Search / Query data by custom filters.
    • display features in the layer that match an expression
    • display features in the layer that match any of the expressions.
    • 25+ filters to create per layer.
    • Filters not limited (all visible) - multiple layers simultaneously.

• Map view and data information can co-exist:
  • road departure accidents, curves, curve signage, and ballbank data.
  • Accidents, rumble strip locations, and uncontrolled/controlled intersections.
  • Culverts in need of repair, improvement and capital plans.
  • Endless possibilities if setup correctly.

• Print / Share maps.
  • Capital Planning Justification.
  • Visual representation.
  • Collaboration/consensus building.

• Transfer data back and forth to ARCPRO as tables of information.
ARCGIS Online Terminology 101

Layer - Theme of data such as roads or rivers/lakes/streams.

The illustration of a collection of common data.

Feature - Method of representation of common data with the same geometry, shape, or other characteristic

Roads = line; Bridge = point or object; Sign = MUTCD BLOB or point or picture

Attributes - Non-spatial information about a feature, typically stored in a table with a unique identifier link to a feature. Stored as one of 4/5 Types or forms of data.

Example attributes for a sign might be: MUTCD nomenclature, name, size, sheeting type, material type, post size, etc.

Table of Information (attributes) for the data describing the feature.

Controls how Queries are run or created
GIS allows you to visualize table(s) of data or portions of tables and create maps.
ARCGIS Online and Collector applications

Start with (ESRI) predetermined base map options:
- Aerial Photos
- Street Views
- Topographic
- National Geographic
- Terrain with Labels
- USA Topo maps
- USGS National Topographic
- Choice of basemap at anytime.
- 1 of the above + Layers you create or collect

BUILD LAYERS OF HWY ASSETS
**Attribute - Data Table of information (4/5 Types)**

**A. Character** - a string for text based values such as the name of a street or its' condition, stored as a series of alphanumeric symbols.

A. Can categorize (Street, Boulevard, Avenue, Road, Court, Lane, CTH, STH, Etc.)
B. Rank Road conditions (1 thru 10)
C. Can be sorted in ascending (A to Z) or descending (Z to A) order
D. Numbers are alphabetical so 1, 2, 9, 11, 13, 22 would be sorted as 1, 11, 13, 2, 22, 9.
E. Not numeric, no calculations (sum, average, median, less than, greater than, or other mathematical commands)
F. Can summarize to produce a count (how many “Avenue”)

**B. Numeric / Integer VS. Floating** – Numeric whole integer values (left of decimal). Floating – Numeric values with decimal or fractional values (right of decimal)

A. Will be sorted sequentially (1 to 10) or (10 to 1)
B. Can perform mathematical operations such as sum or average
C. Can be counted (Number of stop signs on a route) or a as ratio (% of stop signs of the total)

**C. Date / Time** - Date and or time values.

**D. BLOB** – Binary Large Objects such as images, multimedia, bits of code.

A. Ability to link a photo of a sign, guardrail, or driveway to the particular attribute.
B. Or link an MUTCD sign designation to a template or symbol, such as R1-1 = STOP
TIPS ON ATTRIBUTE DATA:

A. UNIFORM NOMENCLATURE - ESTABLISH AND UTILIZE A STANDARD NOMENCLATURE (NAMING CONVENTION) SYSTEM FOR CONSISTENT DATA NO MATTER THE USER.

EXAMPLE: CTH = COUNTY ROAD = ROAD = HIGHWAY = HWY

B. DROPDOWNS SPEED DATA COLLECTION - CREATE UNIFORM DROPDOWNS FOR FILLING IN TEXT OR OTHER FIELDS WITH DATA TO SPEED EDIT TIME IN THE FIELD.

EXAMPLE: DIRECTION - N / NE / E / SE / S / SW / W / NW
SHOULDER - OTHER, EARTH, GRAVEL, ASPHALT, CONCRETE
GUARDRAIL END TREATMENT - ENERGY ABSORBING, TYPE A, DOWNTURN/BURIED, TRANSITION, BLUNT, BRIDGE RAIL, OTHER

C. FEWER ATTRIBUTES = LESS FIELD TIME => ALSO LIMITS QUERIES. HOW MUCH IS ENOUGH?

EXAMPLE: CULVERT ANALYZE AS ONE RATHER THAN EACH SECTION/SEGMENT = ONE CONDITION RATING

D. SIMPLIFY RATING SYSTEMS = EASIER TO MANAGE - FOR CONDITION RATING A SIMPLER SYSTEM IS EASIER TO MAINTAIN

EXAMPLE: CONDITIONS 1 TO 3 OR GOOD – FAIR – POOR
VERSUS A 1 TO 10 WITH 1-2 BEING POOR, 2-5 BEING FAIR, 6-8 GOOD, AND 9-10 – NEW.
EASIER TO RATE = FASTER TRAIN, LESS INSPECT, NO ANALYSIS, FEW ERRORS, NO DIFFERENCES OF OPINION

E. QUANTIFY CONDITIONS RATINGS - TRY TO COMBINE CONDITIONS YOU MIGHT BE INTERESTED IN.

EXAMPLE: CULVERT ENDWALL, CHANNEL CONDITION, END TREATMENT, SCOUR, TWO PIPE ENDS?
VERSUS AN OUTLET CONDITION - POOR AND A COMMENT – REPLACE ENDWALL.
What Feature (ASSET) Layers are available?

- Signs – MUTCD, Adopt-A-Highway, Tourist Oriented Directional, Memorial, etc.
- Culverts - cattle passes, arches, boxes, tunnels, etc.
- Bridges
- Guardrails
- Functional Classification – Principal Arterial, Major/Minor Collector, Local – Low Volume
- Pavement Markings
- Accident Data
- Flood Hazard / Mitigation
- Driveway permits
- Invasive or Endangered Species
- Construction, Improvement, and Maintenance Plans
- Utility Permits
- Winter Plow Routes
- And Growing, Others, ETC.

Plow Routes & Drifting
Rumble Strips
Ballbank Curve Data
Encroachments
PASER Road Ratings
Mowing Plans
School Districts
Collector (Field) mimics ARCGIS Online (Desktop)

Base information / attributes for all Layers / Features:

- The Object or Feature
- Longitude
- Latitude
- Elevation
- Date Installed / Year built
- Feature/Object Identification #
- On Route – At Route – Toward and Offset(s) = Location Data
- Inspector / Owner
- Condition ratings – quantity?, per object?, all require followup.
- Special Data – Pictures or Links
- **Comments** – catch all, condition, special issues, “delete”, etc.
SAMPLES OF DATABASE Setup:

SIGNS (Feature)
- DATE (Attributes with / without dropdowns)
- LATITUDE
- LONGITUDE
- ON ROUTE - AT ROUTE location descriptor
- Log Mile reference point
- MUTCD nomenclature (R1-1 Stop, etc)
- Sign Condition (Good / Fair / Poor)
- Direction facing (NE, N, NW, W, SW, S, SE, E)
- Sign Material Type (Engineering Grade, High Prismatic, etc.)
- Sign Material Condition (Good / Fair / Poor)
- Comments section = catch all
  - Maintenance
  - Data additions
  - Data deletions
- Other considerations, posts, sizes, condition, offset, lengths, # signs/location, on and on but manage it too.
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<td>27</td>
<td>Rt Shldr Mat Asphalt</td>
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<td>28</td>
<td>Rt Shldr Con Good</td>
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<tr>
<td>29</td>
<td>Rt Curb</td>
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<tr>
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<td>Lt Shoulder W</td>
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<td>32</td>
<td>Lt Shldr Mat Asphalt</td>
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<td>33</td>
<td>Lt Shldr Con Good</td>
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<td>Lt Curb</td>
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<td>Lt Sidewalk</td>
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### HWY ATTRIBUTES

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<th>Inspected By</th>
<th>Date Inspected</th>
<th>Rating</th>
<th>Classification</th>
<th>Construction Year</th>
<th>Section ID</th>
<th>File</th>
<th>On_Route</th>
<th>At_Route</th>
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<td>2,003.00</td>
<td>53-40</td>
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</table>

**Notes:**
- The data represents highway attributes such as signs, culverts, and guardrails.
- The table shows inspection details for different sections along Highway 1.
- The data is used for rating and maintenance purposes.
- The map visualizes the distribution of these attributes across the highway.

**PASER (RATINGS) DATA**
Collector app... MANAGE ARC GIS Online DATA REALTIME

Accurate data collection made easy
AVOID ANALYSIS PARALYSIS - Considerations which effect time to accomplish data collection tasks:

Quantity - how much information on an asset is enough to manage it? (All or part)
EXAMPLE - FHWA Culvert assessment form includes
- 4 General items
- 6 Culvert statistics
- 24 Inspection items
- 4 Maintenance recommendations
- 8 Historic information items
- 4 signatures = 50 attributes.
  We have simplified to 26 (10 are general for any feature or 16 special culvert feature related).

Quality - How detailed does the information need to be? (Rating scales)
- 1 to 3 / 1 to 10 / Good-Fair-Poor / Replace - Poor - Fair - Good - New / others
- Flattened, bowed, collapsed, rusted out, no bottom, different materials, etc.
- Capture other concerns within comments at time of inspection.

Attribute (Data) type limits query / sort abilities if not done properly,
- Character / Numeric - Floating / Date - Time / BLOB - Object linking

Time - search queries / analysis / collection (Consumes energy/resources)
DOES it ALL

FiT to the Data

how To mAnAge
Filter(s)
• Display features in the layer that match the expression - simple.
• Multiple
  • Display features in the layer that match ALL OF the expressions.
  • Display features in the layer that match ANY OF the expression.
• Can set triggers to assist matching or finding either:
  • Hint
  • Prompt

QUERY(IES) depends on attribute format:
• Character (Text) – is / is not / starts with / ends with / contains / does not contain / is blank / is not blank
• Numerical - Integer / Floating – is / is not / is at least / is less than / is at most / is greater than / is in between / is blank / is not blank
• Date or Time
• BLOB – Links or Attachments

• Word or Phrase Identifiers
  • Value – enter a value (any).
  • Field – pick from selections or field entries (dropdown of choices).
  • Unique – select from unique values within the field.
All attributes are filterable
Filter: HWY_ATTRIBUTES

View Edit

Add another expression Add a set

Display features in the layer that match any of the following expressions

Construction Year is less than 1960

Construction Year is less than 1970

Add Filter Apply Filter and zoom to Close
Const.Yr < 2000
273/352 = 77.6%
Examples of Other Queries of Data:

Citizen concerns for school bus stops or signage?
• Roads
• Plow Routes
• School Districts
• Signage - existing
• Addresses
• Can analyze for MUTCD criteria
MUTCD Recommendations for horizontal curve signage
• Roads
• Curve Data / Information
• Accident History
• Ballbank curve data
• Chevrons
• Warning Signs - Winding Road / Curve
• Speed Placards
• Query Data to determine recommendations.
“COMMUNITY MAPS”

Community Maps - Wisconsin County TSC Crash Mapping
This crash map is updated from preliminary police crash report data and does not represent a final and complete source of Wisconsin motor vehicle crashes. [More]

Search Input
- Fatality
- Injury (A)
- Injury (B)
- Injury (C)
- Property Damage
Select the form below to filter the crash map based on high level crash attributes. Click Apply to apply your filters or Reset to go back to the default settings.
There are 936 of 957 total crashes displayed. [More]

Apply | Reset

Counts?
- IOWA
- Center

Date Range?
- Begin Year/Month: 2010
- End Year/Month: 2018

Crash Severity?
- Clear Selected
- (K) Fatality
- (A) Suspected Serious Injury
- (B) Suspected Minor Injury
- (C) Possible Injury
- (O) No Apparent Injury

Crash Flags?
- Alcohol Flag
- Pedestrian Flag

Map | Satellite

BALLBANK CURVE DATA

Recommendations:
Red = Decrease
Yellow = No Change
Green = Increase

<table>
<thead>
<tr>
<th>BALL BANK (Features: 312, Selected: 0)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exst. Speed Placard</td>
</tr>
<tr>
<td>---------------------</td>
</tr>
<tr>
<td>35</td>
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<tr>
<td>45</td>
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<tr>
<td>45</td>
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<tr>
<td>25</td>
</tr>
</tbody>
</table>
Identify issues with data

Map location to Collector
QUANTIFY BRIDGE RATINGS FOR FEDERAL AID

- Query Sufficiency ratings
- Query other data if available?
  - Condition State Ratings
  - NBI Ratings
  - Load Ratings - create a map of load posted bridges in the county.
  - Etc.

- Filters:
  - Sufficiency < 50
  - 50 < Sufficiency < 80
Bridge sufficiency $X$
location:
$<50 = 6$ in red
$50 < X < 80 = 10$ in yellow
Signs

- Inspected By: Feature showing last employee to inspect feature: Enter name or Employee #
- Inspection Date: Feature showing the date in which the inspection occurred
- Section #: Number determined by portion of county the feature is in
- Latitude: Take GPS Cord.
- Longitude: Take GPS Cord.
- On Route: County highway which the feature is located: CTH (Insert Letter) Or follow dropdowns
- At Route: Intersection in which the object is closest to: If side road give name if CTH use CTH
- Offset distance: The distance in which you have traveled down the CTH: (Units in Mi.)
- Direction Heading: The direction in which you are heading down the CTH: Follow Dropdowns
- Object ID: The ID for the specific sign being inventoried on the CTH
- Fire #: BEF: Nearest Fire number before the sign
- Fire #: AFT: Nearest Fire number after the sign
- Sign Name: Input should be the type of sign.
- Installation date: The date in which the sign was installed: Can be found on the front or back of sign....if no sticker is found put NA
- Direction Facing: Which direction is the front of the sign facing: Follow Dropdown
- Facing Material: 3 Types follow dropdown: Eng. Grade need to be replaced to meet code.
- Sign Condition: Use judgement to assign: Good Fair Poor
- Sign material: What is the sign composed of
- Sign Facing Material condition: Based off of facing material: Based of judgement like sign condition
- Sign Size HxW: Height and width of sign in In.
- Post Type: What type of Post holds up the sign: Follow Dropdown
- Post Condition: See Sign Condition
- Post Length: Total length of Post: (Units in Feet)
- Post Height to Bottom of Sign: Measure height from the ground to the bottom of the sign
- Distance from Edge of pavement: Measure from edge of pavement to base of sign: (Units in feet)
<table>
<thead>
<tr>
<th>Direction Heading</th>
<th>Object ID</th>
<th>FIRE # BEF</th>
<th>FIRE # AFT</th>
<th>Sign Name</th>
<th>Installation Date</th>
<th>MUTCD Code</th>
<th>Direction Facing</th>
<th>Facing Material</th>
</tr>
</thead>
<tbody>
<tr>
<td>East to West</td>
<td>A7</td>
<td>CTH A 8370</td>
<td>RIVER FORK RD.</td>
<td>BRIDGE</td>
<td>NA</td>
<td>H1-L</td>
<td>B-RS</td>
<td>Eng. Grade</td>
</tr>
<tr>
<td>East to West</td>
<td>A14</td>
<td>HWY 151</td>
<td>STEFFES RD.</td>
<td>NIGHT ARROW</td>
<td>02/2002</td>
<td>W1-6</td>
<td>FRONT</td>
<td>Eng. Grade</td>
</tr>
</tbody>
</table>
TAKEAWAYS:

• Query Asset Conditions (filter data)
  • Identify need, sizes, locations
  • Quantify backlog
  • Prioritize funding

• Planning (Visual/Map Aids):
  • Capital Planning and scheduling tool.
    • Condition ratings prioritize workload.
    • Quantify age of assets.
    • Identify Assets eligible for Fed Aid programs (Local Bridge sufficiency ratings).
  • Preventative Maintenance Planning tool
    • Crackfill, wedge, sealcoat history and future.
    • Crack logging and analysis tools.
    • Wedging locations or spot improvement histories.
    • Improvement program history and future capital plans.
  • Road Safety Planning
    • Identify Guardrail upgrades thru ballbank, accident, curve signage, road curve analysis.
    • Ballbank Signing compliance.
    • Pavement Markings.
    • Driveway Accesses / Intersections.

• Spot Repairs / Requests backlog tool
TIPS – LESSONS LEARNED GIS SETUP

• Put some thought into the data, features, and attributes.
  • Not enough, Too much, Endless ability.
  • Asset Management tool not engineering or design program – help identify actions.

• Consider how you will manage data, inventories, photos, etc.
  • Dropdown data prompts speed collection time
  • Consistency in nomenclature (CTH / CT / CTY / HWY / ETC.)
  • Retaining photos, naming, and archiving.

• Costs can be other than monetary.
  • Inventory upgrades, replacements.
  • Maintaining Data or Analysis Paralysis.
  • Timing for collection and resources – based on attribute setup
    • Uniform Nomenclature.
    • Format of Data – Numeric / Integer / Character / Date / Time / BLOB.

• Application setup method can limit information filtering.
  • Character
  • Numeric/Floating
  • Date/Time
  • BLOB

• Data management archiving / layering single versus multiple

• Cell coverage issues – GPS versus mapping.
  • Work in both modes – cell coverage issues.
TIPS – LESSONS LEARNED COLLECTOR…

• ESRI credits to utilize – funded from current licenses at X/License annually.

• 1 or 2 Person team works best

• Train on ARC Collector functions
  • Adding points on map versus by location
  • Offline mode enabled
  • Data syncing upon connection

• Devices
  • Cell phone functions for review of data or updates
  • Tablet easier for creating data
  • Add hotspot for poor coverage

• Review/Create Nomenclature, Format of Attributes, Units of measure
  • Take up to 256 characters – abbreviations speed entry
  • CTH versus County Trunk Highway etc.

• Discuss & Implement Dropdowns versus Creation of Inputs

• Acquire BLOB – photos and other data as you go
  • Archive by Route, Object/Feature, or other system
  • Proceed methodically – cardinal direction then reverse or other system
• Acquisition - Consider early spring/late fall to aid cell coverage
• Extra batteries for cameras, car charger for tablets, power block.
• Hard copy map to organize collection; “Plan Route” in ARCCollector but costs credits.
• Proper tools for gathering data of all attributes.
  • PPE
  • Tape measures
  • Vehicle Distance measuring device
  • Level, Etc.
  • Easier to perform one feature/layer at a time, but can work in multiple.
• Comments as a catchall – to remove or delete features for errata or bad location data, errors, etc. Simple query for all.
• Latitude - Longitude Coordinate versus spatial reference.
  • Disagreement in the basemap versus what the GPS gives for location
  • Good service = GPS coordinates valid.
  • Poor Service connection – plot location on basemap provided.
  • Check with reference data for validity.

• Perform data real-time with installations / replacement / upgrades.

• Settings
  • if using multiple devices; settings may differ or change at login.
  • Verify settings prior to utilizing device.
    • Look for missing dropdowns.
    • order of attributes changing.
    • editable data showing as non-editable.
    • attribute fields disappearing.
    • pictures not saving or linked.
    • pictures uploading at different resolutions.
    • Have a copy of feature attribute tables available for reference
Settings should be as shown below

**Collection**  Location  General  About

**Streaming interval**
Set how often to collect a new vertex while streaming line and polygon features.

- [ ] 5 sec

**Photo size**
Limit the size of photo attachments. Smaller attachments sync faster.

- Extra Large

**Collection mode**
Use continuous when you are repeatedly collecting the same type of feature.

- Single
- Continuous

**GPS averaging**
GPS averaging with multiple locations can improve accuracy in some conditions.

- [ ] Off

**Filter types**
Enforce the relationship between features. Disable to create features for all types.

- On
DOWNLOAD THE ESRI BLOG - COLLECTOR APP GUIDE TO ASSIST WITH DEVICE SETTINGS AND COLLECTION.

https://community.esri.com/groups/mobile-gis/blog/2016/04/21/generic-collector-for-arcgis-guide
6 SAMPLE ATTRIBUTE TABLES – FOLLOW THIS PRESENTATION
TIME FOR DEMO?

Gallery for Iowa County, WI

- Item Type
  - Maps
  - Layers
  - Scenes
  - Apps
  - Tools
  - Files
- Date Modified
- Tags
- Status

HWY_uneditable
Uneditable service containing roads and civil divisions for the highway

HWY_EDITABLE
All editable data that will be edited by personnel out in the field

Highway1 - Signs, Culverts, etc.
web map to be used by group 1 in ArcCollector

HWY_ATTRIBUTES
MXD only for Attribute editing
Iowa County – Highway Department – Sign Assessment Form

Employees Name(s): ___________________________ Date of Work: ___/___/______

Vehicle Number: _______ and Vehicle Odometer Reading: __________

Maintenance Section Number: ______

Object Elevation (Feet): _______

Latitude Degree: ___________ and Latitude Decimal: _____________

Longitude Degree: ___________ and Longitude Decimal: _____________

Sign ID Number: _______ (Explain Numbering system) A1 or COA1 or CTHA1

Fire Number Before: __________________________________________

Fire Number After: __________________________________________

Sign Name: ___________________ and Sign Type (MUTCD Code): _______________

Facing (Front, Back, RS, LS): ___________ and Face Type (Eng. Grade): _______________

Reason Why Work was Needed: (Circle below.)

Sign Faded / Sign Damaged / Post Damaged / Post Straightened / Inventory / New Install

Sign Background: ___________ and Sign Emblem: ___________

Size/Dimensions (Inches): ______ x ______ and Post Height Above Ground (Feet): _______

Post Type (4x4, 4x6, Steel): ___________________

Post Distance from Edge of Roadway: not shoulder (Feet): _______

Comments:
Sign ATT

- Inspected By: No Dropdown
- Inspection Date: No Dropdown
- Length Down Route: No Dropdown
- Section #: Dropdown
- Elevation: No Dropdown
- Latitude: No Dropdown
- Longitude: No Dropdown
- Object ID: No Dropdown
- Fire # Before: No Dropdown
- Fire # After: No Dropdown
- Sign Name: No Dropdown
- MUTCD Code: No Dropdown
- Direction Facing: Dropdown
- Facing Material: Dropdown
- Reason Replaced: No Dropdown
- Replacement Date: No Dropdown
- Sign Size HxW: No Dropdown
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<th>C</th>
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Iowa County – Highway Department – Culvert Assessment Form

Employees Name(s): ___________________________ Date of Work: ___/___/_____

Vehicle Number: _______ and Vehicle Odometer Log Mileage Reading: ________

Maintenance Section Number: ______

Culvert Elevation (Feet): ______

Latitude Degree: _______ and Latitude Decimal: _______________

Longitude Degree: _______ and Longitude Decimal: _______________

Culvert ID Number: ______

Location on CTH: _______________________________________________________

Name of Nearest Side Road: ___________________

Type of Structure, Material: __________________________

Culvert Length (Feet): _______ and Culvert Diameter (Inches): _______

Total Number of Spans: ______ and Length of Each Span (Feet): _______

Pipe Arch Width (Inches): _______

Apron In (Yes or No): _______ and Apron Out (Yes or No): _______

Waterway Inlet Condition (Good, Fair, Bent, Plugged): __________________________

Waterway Discharge Condition (Good, Fair, Bent, Plugged): __________________________

Roadway Width (Not including the shoulders): ___________

Structure Too Narrow (Yes or No): ______

Structure Overall Condition Report (Good, Fair, Bad): __________________________

Comments:
Guardrail Assessment Checklist:

Date:

Inspect by:

Location
- On CTH:
- Nearest side road:
- Distance to side road:
- Purpose/Obstacle:
  - (Obstacle = Bridge/ Fill Embankment/ Slope/ Curve)

Dimensions
- Total length:
- Length of end treatment:
- Length of guardrail:
- Height (ground to top rail):
- Distance to road CL:
- Roadway width:
- Shoulder width:

Description:
- Type of rail:
  - (Class: Thrice/A/B/other)
- Type of end treatment:
- Typical post size: 6X8
- Guardrail post spacing:
- End treatment post spacing:

Condition:
- (New/Good/Poor/Replace)
- End treatment:
- Main guardrail:
- Backfill/back slope:
- Shoulder:

Recommendations:
Guardrail Att.

- Inspected By: No Dropdown
- Date Inspected: No Dropdown
- Distance Traveled on Rd.: No Dropdown
- Section #: No Dropdown
- Elevation: No Dropdown
- Latitude: No Dropdown
- Longitude: No Dropdown
- Guardrail I.D.: No Dropdown
- Roadway Width: No Dropdown
- On CTH: No Dropdown
- Nearest Side Rd.: No Dropdown
- Reason For Guardrail: ← FIX SPELLING: Dropdown
- Total Length: No Dropdown
- Type of Rail: Dropdown
- Length of Guardrail: No Dropdown
- Type of End Treatment: Dropdown
- Length of End Treatment: No Dropdown