Welcome to Geospatial Assessments of Critical Infrastructure

Speaker:
- Jim Gavin, Senior Electrical Designer, Stanley Consultants
Collaborating with Industry to Fill Capability Gaps
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Dormero Hotel, Stuttgart

Geospatial Asset Survey for improving base safety, resilience and infrastructure asset performance.

Jim Gavin    Stanley Consultants
Geospatial Asset Survey Learning Objectives

- Know the gaps in your existing asset management system
- Key elements of a geospatial asset survey
- Using your geospatial asset data
- Best practices to ensure GIS data is continually updated
Being screwed is optional…

APPEARANCES

It just looks like you're screwed, but maybe that's your plan.
The answers are this way!
Learning Objective 1:

Gaps In Existing Asset Management System

- Unknown utility infrastructure reliability issues
- Inaccurate or inadequate utility mapping
Unknown Utility Infrastructure
Reliability Issues
Inaccurate or Inadequate Utility Mapping

- Water discharge line
- A beginning, an end and no middle
- Until it was under a footing
The Realities of a Military Installation

- Mix of host nation and tactical equipment
- Hastily constructed
- Changes in missions and personnel
Outcome
Learning Objective 2:

Key Elements of a Geospatial Survey
Geospatial Assessment Process Flow Diagram

1. Develop Task Order
2. Collect Existing Data
3. Plan Requirements and Priorities
4. Identify Key Utility Features
5. Asset Data Collection and Assessment
6. Establish Survey Base Station
7. Conduct GIS Locate and Survey
8. Build the 3D GIS Asset Model
Develop the Task Order

- Develop list of mission critical assets
- Define asset precision and accuracy requirements
- Define Survey precision and accuracy
Collect Existing Data and Plan Requirements

- Existing site maps and drawings
- Satellite and remotely sensed data
- Develop health/life safety response plan
But I’ve got a site map and as-built drawings!
Establish the Base Station/Coordinate System

- Post Process survey data with the National Spatial Reference system and established GPS compatible coordinate system such as WGS84 UTM

- World Geodetic System (WGS84) is used by the Global Positioning System

- Confirm any existing monuments and update to WGS84 UTM
Identify Key Utility Features
Underground Utility Survey

- Electromagnetic locators
- Ground Penetrating Radar (GPR)
- Potholing
Conduct Survey and Data Collection

- Use electronic data collection
- Use trained field technician
- Security clearances
- System condition assessed
- Health/Life-safety issues immediately flagged
Outcome of a GIS Asset Solution:

- Accurate building, roadway, utility and asset locations

- Asset condition and preventive maintenance needs are identified
Now you’ve got an ACCURATE site map!
Reduce Project and Operational Headaches

- Accidental damage
- Unknown locations of utility tie-ins
### Build Accurate Asset Management Model

#### Survey Handbook

<table>
<thead>
<tr>
<th>Asset Name</th>
<th>D137</th>
</tr>
</thead>
<tbody>
<tr>
<td>Asset Type</td>
<td>Culvert Line</td>
</tr>
<tr>
<td>Date Collected</td>
<td>Jeremy Reviewer</td>
</tr>
<tr>
<td>Date Created</td>
<td>2/4/2014 10:56:28 AM</td>
</tr>
<tr>
<td>GIS Latitude</td>
<td>3.5429457</td>
</tr>
<tr>
<td>GIS Longitude</td>
<td>4.1820028</td>
</tr>
<tr>
<td>Grid-Section</td>
<td>E12 - B4</td>
</tr>
<tr>
<td>Elevation</td>
<td>12.7 - 65.4</td>
</tr>
<tr>
<td>Remarks</td>
<td>No handhole or culvert</td>
</tr>
</tbody>
</table>

| Subtype | NONEXISTED |
| Location/Building | north side of intersection at street extension entrance |
| Degradation Index | 4 - Minor Repair Required |
| Material Texture | fine |
| Pipe Material | polyvinyl chloride |
| Pipe Size (mm) | 900 mm |

**Operational Status**
- In Service

**Gate Type**
- The culvert contains no provision to block or direct water flow.

<table>
<thead>
<tr>
<th>Asset Name</th>
<th>E106</th>
</tr>
</thead>
<tbody>
<tr>
<td>Asset Type</td>
<td>Bus Bar</td>
</tr>
<tr>
<td>Date Collected</td>
<td>Stan-Worcester</td>
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<tr>
<td>Date Created</td>
<td>1/16/2014 11:16:34 AM</td>
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<tr>
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<td>4.13359</td>
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<tr>
<td>Grid-Section</td>
<td>G12 - A4</td>
</tr>
<tr>
<td>Elevation</td>
<td>1.6 - 61.9</td>
</tr>
<tr>
<td>Remarks</td>
<td>Communication hub dist panel A1</td>
</tr>
</tbody>
</table>

| Subtype | Panelboard |
| Location/Building | Communication hub |
| Model Number | Unknown |
| Voltage Class | 690V |
| Bus Panel Amperage Rating | Unknown |
| Btu Rating | Unknown |
| # of Poles/Ways | 3 |
| # of Spares Remaining | 3 |
| OL Source Asset | Unknown |

**Connection**
- 4W Line
- 129 A

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**Image**: Various images showing the condition and details of the assets, including D137 and E106.
Learning Objective 3:

Using Your Geospatial Asset Data
USE GIS Database For Asset Management
A Foundation For the Right Improvements

Asset Management
- Builder
- PAVER
- iNFADS
- ACES/IWIMS
- TRIRIGA
- RAMAS
- Maximo

Engineering
- ETAP
- SKM
- WaterGems
- SewerGems
- H2onet
- Civil 3D
GIS For Master Planning

Reduces Assessment Time/Cost and Improves Accuracy.

- Accurate infrastructure data
- Planning scenarios
- Provides capacity analysis
- Asset replacement plan
Learning Objective 4

Share Best Practices to Ensure Systems are Continually Updated
What’s at Stake… Mission Resilience
Barriers to Success
Is Your GIS system Continually Updated?

- Funding
- Base Personnel
- BOSS Contractor
- Construction Contractor
Best Methods and Practices

- Current mobile technologies tablets, smartphones
- Pre-deployment training
- 2 year data validation review
- Locally maintained centrally managed GIS database
GIS Asset Survey

- Conserves resources
- Saves lives
- Improves mission effectiveness
- Just smart business
Contact Information

Jim Gavin
Geospatial Field Project Manager
Principle Electrical Designer
BICSI- RCDD - ESS
Stanley Consultants
225 Iowa Ave, Muscatine, Iowa 52761
563-264-6754
gavinjames@stanleygroup.com

Noel Henneman
Principal GIS Analyst
Stanley Consultants
225 Iowa Ave, Muscatine, Iowa 52761
563-264-6785
hennemanNoel@stanleygroup.com

John P. Berrettini
Accurate Infrastructure Data, Inc (AI Data)
Vice President
1123 Hanzlik Avenue, Baltimore, MD 21237
410-686-5091 office
jberrettini@aidatainc.com