NAVFAC MidLANT
Utility GIS Data Development

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Objectives:

- **Project Overview**
  - Background
  - Understanding the Scope
  - Training

- **Project Approach**
  - Safety Programs
  - Field Team Deployment
  - Technology
  - Survey Methodology
  - Geodatabase
  - QA/QC
  - Other Applications

- **Lessons Learned**
  - Contractor
  - Government
Background

- GeoReadiness is the NAVY’s Installation Geospatial Information and Services (IGI&S) program
- Data is maintained at the Regional level in the Regional GeoReadiness Center (GRC)

NAVFAC MIDLANT (on board)
Demographics: 3623
Military 95
Civilian 3422
Contractor 101

MIDLANT Core
Demographics: 639
Military 10
Civilian 600
Contractor 29

Hampton Roads IPT
Demographics: 1600
Military 39
Civilian 1541
Contractor 20

North Carolina IPT
Demographics: 238
Military 21
Civilian 187
Contractor 26
Background

- GRC maintains Common GIS features. Provides access and tools for users.
- Utilities is one of the commonly requested dataset, but was not centrally managed or maintained.
- Contract awarded to Critigen-Clark Nexsen JV to develop GIS Utilities at 15 major sites across the AOR, to bring Utilities GIS up-to-date across the region.
Understanding the Scope
Understanding the Scope

- Expect the Unexpected
- Field Work Conditions
- Discipline Specific Training
- Trip Logistics
- Team Structure
- Base Access

![Diagram showing the organizational structure of a project team with roles such as Technical Manager, Admin Staff, Project Manager, Electrical Leader, Mechanical Leader, Civil Leader, GIS Development Lead, Trip Captains, Electrical Inspectors, Civil Inspectors, Mechanical Inspectors, and GPS Data Collectors.]
Understanding the Scope

Installations:
- NAVSTA Norfolk
- Portsmouth Naval Shipyard
- NSA Mechanicsburg
- NWS Earle
- NAVSTA Newport
- NSA Philadelphia
- NAS Oceana & Dam Neck

Utility Types:
- Storm
- Electrical
- Wastewater
- Water
- Steam
- Natural Gas
Understanding the Scope

Work Flow Process

“Advance Party” Site Visits

Existing Data Collection

Source Data Analysis

Pre Site-visit Mapping

Geodatabase

GIS Data Development

GPS Data Collection
Training

GPS Data Collection

Mechanical
- Steam
- Compressed Air
- Natural Gas

Civil
- Storm
- Water
- Wastewater
- Salt Water

Electrical
- Electrical
Safety Programs

• Trip captain & site safety officer
• Coordination of field trip, including facility contacts and project team
• Responsible for health, safety and production
• Execute safety program, including daily safety briefings
• daily Review facility scope with discipline specialists
• Maintain project schedule
• provide daily progress updates to project management
Safety Programs

- Health and safety organization
- Safety procedures & requirements
- Hazard assessment
- Motor vehicles
- Safety equipment
- Emergency response planning
Q: What are potential safety hazards at a sewer manhole?

- Slip/Trip/Fall
- Back/Foot Injury
- Confined Space
- Biological Contaminants
- Noxious Gas
- Flammable Gas
- Spiders & Animals, i.e.
Q: What are potential safety hazards at a sewer manhole?

- Slip/Trip/Fall
- Back/Foot Injury
- Confined Space
- Flammable Gas
- Noxious Gas
- Spiders & Animals, i.e.
- Biological Contaminants
- Else?
Safety Programs

Safety Equipment

- Steel-toe boots
- Heavy duty Leather gloves
- High visibility safety vests
- Weather-Appropriate clothing
- Temperature measurement devices
- Safety lifting belt
- Manhole lifting device
- Hard hats
- Flashlights
- First aid kit
- Traffic control devices
- Your brain!!!
Field Team Deployment

**GPS**
- GPS Units (Topcon Tesla units)
- 2 meter pole
- eWebsync to the cloud capabilities
- eGIS software
- Network RTK capabilities
- Mifi devices
- GPS enabled cameras

**Software**
- Arcgis 10.2
- Data Reviewer
- eViewer software
- GeoJot Core
Technology

Hardware
• GPS Units (Topcon Tesla units with PG-s1 antenna)
• 2 meter pole
• Network RTK capabilities
• Wireless Mifi devices
• eWebsync to the cloud capabilities
• Ricoh 700 GPS-enabled cameras

Software
• eGIS software
• Arcgis 10.2
• Geojot core
Technology: GPS

Network RTK Availability

- Global Positioning Systems Methodologies
- Base-Rover Configuration OR Network RTK
Technology: GPS-Network RTK

Network RTK Availability

- Available across much of the U.S.
- Multiple RTK Networks across the Mid-Atlantic States
Technology: eGIS Software Suite

TOPCON eGIS Advanced Field Mapping Software

- eGIS is the software
- eGIS customization: Forms & Projects
- eGIS Websync
Technology: GPS Enabled Cameras

Ricoh model G700SE GPS-enabled Camera & GeoJot Software
- GPS-Enabled
- Positional data is protected
- Ruggedized housing
- Tells a better story than a sketch in some cases
Technology: GIS Software

ESRI ArcGIS version 10.2

- Allows for management and development of data
- Handles various formats of data to be imported or exported
- Powerful tools for loading, managing & developing data
Survey Methodology

Two-Person Field Survey Teams

- Discipline specialist
- GPS Specialist
Geodatabase : Development

- Develop the Existing Data from various sources into a geodatabase
- Incorporate Data Collected from Field Work
- Link GPS-Enabled Photography with the geodatabase
- The result is a dataset developed using historical, working and recently collected field data
QA/QC

- Automated checks (customized scripts)
- Data Reviewer (ArcGIS Extension)
Other Applications

Now it is served up on web/Apps

- Access by your team
- View it anywhere
- Take it to the field
- Free Applications
- Possibilities are only limited by your imagination
Lessons Learned (Contractor)

• Learn the safety requirements at each Installation (which sometime vary) prior to contract negotiations. Certain safety requirements sometimes require the Contractor to purchase extra equipment and add extra time to the project. Knowing this information during contract negotiations can help avoid having to modify the contract down the road because of some unforeseen safety requirement.

• Include greater detail in the SOW covering delineation of ownership on each utility system. This would avoid field crews collecting features outside of scope, and it would also highlight sections of the network that would not be required to connect.

• Have a Plan B for field work. To meet Scope requirements, the GPS equipment needed for this project heavily relies on an outside provider for WiFi connectivity and constant Satellite communication. When working on military installations, Radar, Sonar and other signal-blocking elements may occur – usually shutting down all teams at the same time. Some days, there will be poor signal quality from your outside vendor.

• Plan for a manual solution to collect data on the down day and follow up with GPS point collection on a better day.
Lessons Learned (Government)

- Need to specifically designate if you need active and/or abandoned utility features to be collected. Also clearly identify points of ownership demarcation (where exactly will the contractor start/stop collecting data because ownership of the utility changes?).
- Be careful with estimates! Discuss protocols for what happens when your estimates are far short of reality, including having the contractor notify you immediately when actual work will exceed the estimate.
- Verify safety and access requirements for each site prior to start. Some installations have much stricter requirements than others and this can potentially impact the cost and timeline.
- Establish limits on level of effort required to obtain location & attribution
- Have a prototype/pilot to iron out all the wrinkles that undoubtedly arise. This will help the prospects for long term success.
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QUESTIONS?