Water Distribution System

- Central water utility system established in 1871
- Department of Utilities officially established in 1969
- Provides water for more than 820,000 people in Hampton Roads
- >800 miles of water distribution mains
- >65,000 Water meters
- Approximately 24,000 Valves
- >42,000 Fittings
- 2 Water Treatment Plants
Sanitary Sewer System

- Central sewer utility system established in 1879
- >800 miles of gravity sewer mains
- >62 miles of sewer force mains
- 126 pump stations
- >20,000 Manholes
- 66 square miles

Hampton Roads Sanitation District (HRSD) for sewer treatment
Reasons for a New Record System

- Enterprise GIS
- Consolidation into one system.
- Increasing update speed.
- Integration with HANSEN.
- Increased speed in map distribution of maps and data.
Data Conversion
Data Conversion

- **History**
  - Data Development
  - Data Maintenance

- **Data Sources**
  - Planimetric Drawings
  - Intersection Drawings
  - As-Built Drawings
  - GIS Data (Shapefiles)
GeoDatabase Design

- Water
  - Standard ESRI
  - Customizations
  - Geometric Network

- Sewer
  - Standard ESRI
  - Customizations
  - Geometric Network

ArcSDE
- Datasets
- Feature Classes
- Attributes
- Integration Requirements
- Domains
- Default Values
- Network
Methodology

- Digitizing
- Versioning
- Disconnected Editing
- Workflow Management
Methodology

- Digitizing
- Versioning
- Disconnected Editing
- Workflow Management
Methodology

- Digitizing
- Versioning
- Disconnected Editing
- Workflow Management

- Data Check-out
- Data Check-in
Methodology

- Digitizing
- Versioning
- Disconnected Editing
- Workflow Management

Bottom-Right Rule
Custom Applications

- QC Tools
- Data Maintenance
- Calculated Length
- Lateral Placement Tool
Early Milestones

- Intersection Points
- Staff Training
- Staff Participation
- ArcReader
Integration with Hansen
Hansen Asset Management System

- Service Requests
- Work Orders
- Scheduled Maintenance
- Maintenance Cost
- Asset Valuation
- Condition Assessment
Reasons to Integrate GIS with Hansen

- Requires less labor to maintain
- Systems are more accurate
- Continuity among datasets
- Customers are better served
- More informed decision-making
- Existing investment
Geodatabase Design

- Hansen required fields
  - COMPKEY
  - UNITID
  - COMPTYPE
  - MAINCOMP1, MAINCOMP2
- Field Properties
- Code Tables / Domain Values
- Geometric Network
Populating the Geodatabase

Original Data Sources

ArcSDE Enterprise Geodatabase
Developing a Workflow

- Determine Ownership
- Map Related Fields
- Identify System Specific Fields
  - Hansen specific fields
  - GIS specific fields
Maintaining the Data

- Automated Tools
  - GeoResults Sync
  - UNITID Generator

- Manual Tools
  - GeoAdministrator
  - GeoAssistant
Validating the Data

- Resolving Sync Logs
- Orphan Hansen Assets
- Orphan GIS Features
- Changed Compkeys
- Bad Data
One to One Link

Hansen

ArcSDE
Mapping and Viewing Data
Automated creation of physical records

- Map Book Developer’s Sample
  - Created a new grid based on previous Planimetric drawings

- Reason for creating physical records
  - Backup for power/network failure
  - Comfort of use for some customers and applications

- Updates to physical records
  - As needed due to changes in system
New Sheet Drawings

City of Norfolk
Department of Utilities
400 Granby St.
Norfolk, VA 23510

Lea View Ave
Chela Ave
W Ocean View Ave

Sewer Sheet:
D-01-E-2

Note: Locations, elevations, and invert are approximate and should be field verified. City does not guarantee accuracy. Check with private utility owners for further information.

Remember: Before you dig call Miss Utility at 811.
Improvements of The New Record System
Color Planimetrics
Up to date Addresses

Lot Lines

Buildings
Uniform Scale Overlapping Sheets

Note: Locations, elevations, and invert are approximate and should be field verified. City does not guarantee accuracy. Check with private utility owners for further information.

Remember: Before you dig call Miss Utility at 811

Sewer Sheet: D-01-E-3
Old Drawings: No Uniform Scale

Other Areas
Reasons for ArcReader

- Ease of viewing records digitally.
- Standalone program.
- Allows easy printing of custom maps.
Implementation of ArcReader

- Packaging information
  - Field Use
- Frequency of Updates
  - Every 2 months or if major changes in shorter time
- Methodology of updating field computers
  - External hard drive
- Future of ArcReader Application
  - Will continue to update and use
Reasons for Flex Viewer Selection: Cost

- ESRI’s Sample Flex Viewer is free to download, modify, and use
  - Minor modifications to Sample Flex Viewer requires only a text editor
- $249 Standard edition for Personal/Business
Reasons for Flex Viewer Selection: Ease of Development

- Code well developed
  - Limited changes to code are easy to implement
  - Larger changes... not so much
- Large community of Users
  - More free code to add to the Flex Viewer
  - Free advice
    - From the basic: how do I get this to work on my computer
    - To the complex: how do I modify the code from the viewer to limit the search functionality to only return desired information on specific items
Reasons for Flex Viewer Selection: User Friendly Application

- Sample Flex Viewer appears to require less technical knowledge for the end user than ArcReader
  - Encourages people to use newer record system
  - Enables people to have multiple methods of getting to data
Modifications to Flex Viewer

- Config.xml
  - Text editor or Adobe Flex Builder 3

- Search Widget
  - Modified to search and identify based on limited feature classes

- Overview Map
  - Added back and forward buttons
Modifications to Flex Viewer (continued)

- Added shortcut menu bar
  - Found file at the ESRI ArcGIS Server Flex API Resource Center
  - Contains icons that dock on upper right of menu bar
- Developed application specific help files
  - Enables easier learning curve for the new application
Flex Viewer Facts

- Sample flex viewer looks nice
- Minor changes easy to make
- Major changes can be a big hassle to make
- Acceptance has been greater than ArcReader by people who are not as comfortable with computers
Sewer Viewer Demonstration
Contact Information

Tracy Wamsley, GISP
GIT Project Manager
Michael Baker Jr., Inc. (VA Beach, VA)
757-631-5406
twamsley@mbakercorp.com

Nathaniel S. Davis, GISP
GIS Manager
Charleston Sanitary Board
Charleston, WV

Alex English
Engineering Technician II
City of Norfolk
Department of Utilities