A Multi-Purpose Geodatabase Serving GIS, Cartography, and Engineering at SHA

Highway Information Services Division
SHA Enterprise GIS Application

• Background
  • How we’ve gotten where we are today

• TSD
  • Centralized data repository in development
  • Serves HISD, and SHA with spatial data

• Web Services Development
  • IMS platform
  • Engineering focus
  • New foundation for enterprise GIS
  • Factors involved and decisions

• Highway Development, Plats and Surveys
  • How new mapping services with their data can help them do their job better

• Future Phases and Demonstration
SHA Highway Information Services Division

• Public Road Data Collection
• Public Road Inventory Database
• Highway Mapping/Cartography
• GIS-based and attributed public highway system centerline, numerous map products and applications
• SHA currently working on statewide centerline project in conjunction with local governments
Role of DataViewer Application

- Signals
- Pavement
- HPMS
- Bridge
- Planning
- Accidents

- GPS Data
- CADD Data
- Rd Inventory

- Linear Reference System (Routes)
- Road Data (Events)
- Dyn-Seg
- GIS Data Server

- DataViewer ArcView Client

District #1
District #2
District #n
Vision for Centralized Data Storage

Need Common Foundation: Data

- ArcGIS Editing
- MicroStation Editing
- DataViewer
- Cartographic Publishing
- ArcIMS
Use Cases Addressed in Model

• Editing and Maintenance of Base Map Layers
• Editing and Maintenance of the Map Templates
• Route System Maintenance
• Temporality
• Projection Management
• Data Import and Export
• Map Production
• Data Query and Access
TSD - Key Concepts

- A Central Data Repository
- Interoperability - CAD and GIS
- Support Cartographic Production
- Efficiency/Ease of Use
- Security and QA/QC
- Support Enterprise GIS Applications
Web Client Enterprise System

• Need for better distribution all the way to shops

• Less training needed

• Less client end support

• More information to all desktops

• Some integration capability

• Common denominator
Web Client Enterprise System

• Part of new 3 pronged approach to the GIS needs of the enterprise
  • Web client- ArcIMS application
  • ArcReader
  • ArcMap, Arc/Info, ArcCatalog

• Two Approaches to IMS at SHA
  • Integrate others data into our site
  • Push map into frame in web app
Projects At SHA

- Support for Engineering Environment
  - Every organization has a mission, support for ours depends on understanding of:
    - Engineering environment
    - Project focus
    - Full project lifecycle
    - Demanding data needs, short turnaround
SHA Environment

- Everything has spatial component
- Lack of understanding of data needs
- Lots of CAD data
- Project focused; deadlines
- More and more technology used/needed to get job done
- More data coming from outside organization and flows back & forth
- So....more and more partners distributed
- The engineering data storage practices
- Support for interoperable environment
Goal of application

• Data Warehouse Approach
  • Data gathered from different units
• Interoperable
• Get user to place on ground
  • Assume they want all information available about that place in Maryland
• Eye towards decision support in future versions
Services Approach

• Web services approach
• Integration of other tools besides viewing
  • Import/Export services
    • Short term solution
    • Avoid short lifespan/shelf-life data copied in numerous places
  • Data is then used to make new products
  • Will be implemented in ~month
Decision Process

• What data do we need to integrate
• What do we want to accomplish
  • What phase
• Interface
• Funding
• Plan for growth
• Risk Assessment
• Accessibility
• Training
Decision Process

• What Data Do We Have Ready To Work With?
• What Data Will Need To Be Developed?
• Who Are We Going To Serve?
• What Business Process(es) Are We Going To Support?
• Can The Infrastructure Support These Needs?
• What Are The Interoperability Requirements of Project?
• Technology Available For Project?
Phases of Project

• Phase I
  • One stop shop for all digital imagery available at SHA
    • Both orthogonal and forward looking roadway imagery
  • Data includes centerline, project imagery, VisiData roadway imagery, Grid Maps
  • Queries driven from roadway section selection or from cursor location click
  • Web service; shapefile export to .dgn with reprojection option
Why Start with Plats and Surveys

• As a service Division for all of Maryland State Highway and its districts. We do our own Data Collection through Field Surveys and Photogrammetry.

• Maintain Basemapping for design and planning projects.

• We are the starting point for highway projects.
Plats and Surveys Base Mapping

- Internal Field Data Collection
- Photogrammetry
- High Resolution Orthophotos
- County Base mapping
- County Orthophotos
How We Obtained the Mapping

- Photogrammetry contracts (project based)
- Coordination with all State Highway Divisions
- Commercial Photo Purchases
- Data Sharing relationships with other state agencies
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On-Going Relationships

- County relationships for new mapping from both ends
- Group funding efforts with other state agencies
- Group funding efforts with other state highway divisions
The Application

Zoom Box or Route Search
How we will build on this internally

- GPS Data
- Archive of Data Collection
- Plats
- Tax maps
- Property Owner Information
- Pending Access Permits
- On Going Design Projects
Phases of Project

- Phase II
  - Pavement
    - Owners of VisiData roadway imagery
    - Pavement History
    - Pavement Attributes (qualitative)
  - Highway Hydrology
    - Infrastructure: pipes, culverts, inlets, outfalls
    - Water quality data
Phases of Project

• Phase II
  • Highway Hydrology
  • Other needs
• Land Parcel Data
  • Available land records information
  • Local parcel vectors
  • Parcel ID, SDAT
• Survey Points
  • NGS blue book points
  • Other SHA survey points
Phases of Project

- Phase III and beyond
  - Bridges
    - Other needs
  - Project Extent Data

- Long Range Planning
  - Highway Needs Inventory
- Safety Data
  - Incidents
- Tie to Highway Asset Data
Survey Points and Benchmarks
Phase II Interface Prototype

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Survey Points and Benchmarks
Land Parcel Information
Land Parcel Information
Demonstration