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

Highway Information Services Division

SHA Enterprise GIS Application

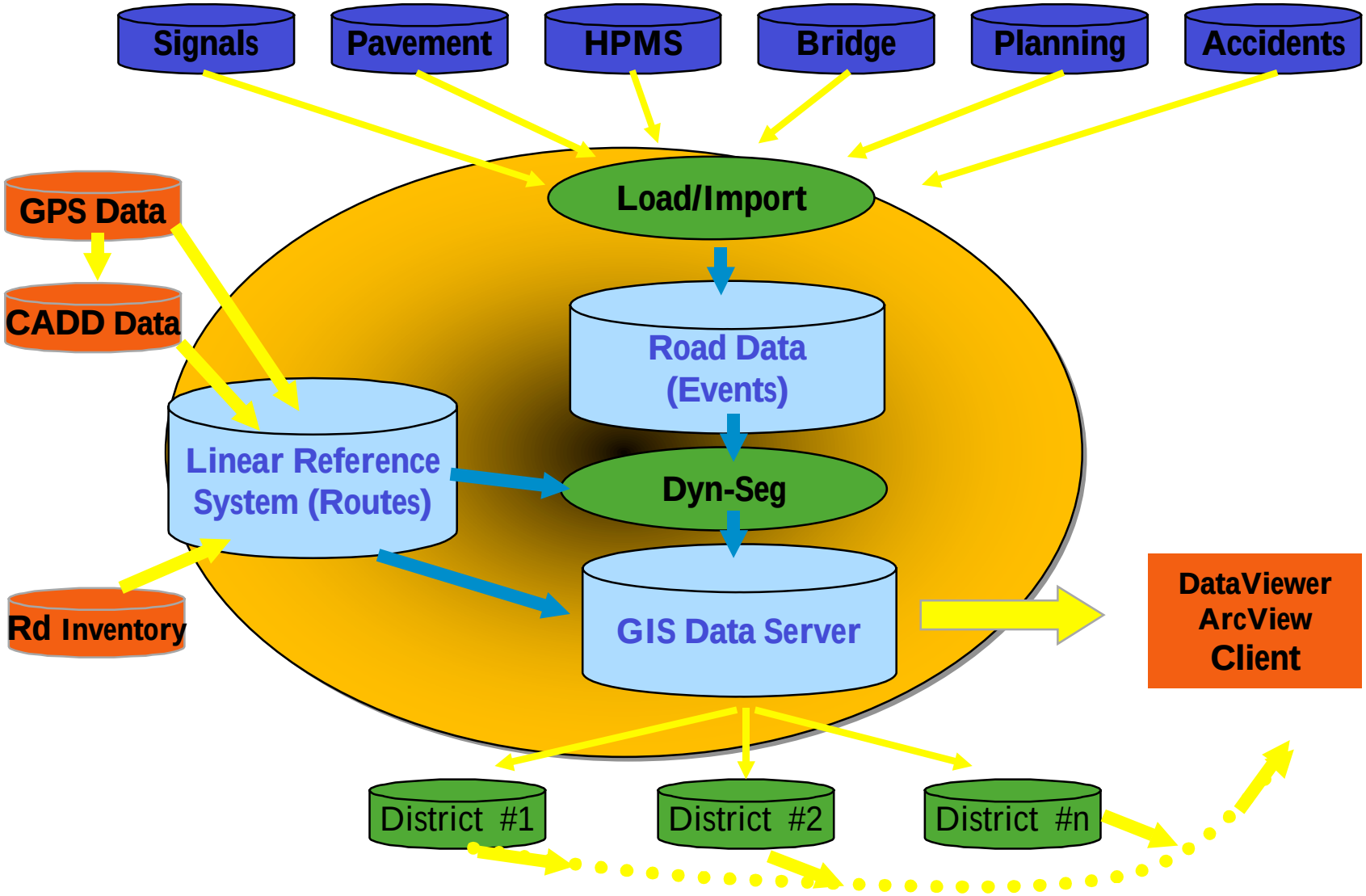
- **Background**
  - How we've gotten where we are today
- **TSD**
  - Centralized data repository in development
  - Serves HISD, and SHA with spatial data
- **Web Services Development**
  - IMS platform
  - Engineering focus
  - New foundation for enterprise GIS
  - Factors involved and decisions
- **Highway Development, Plats and Surveys**
  - How new mapping services with their data can help them do their job better
- **Future Phases and Demonstration**

Who HISD Is & What We Do

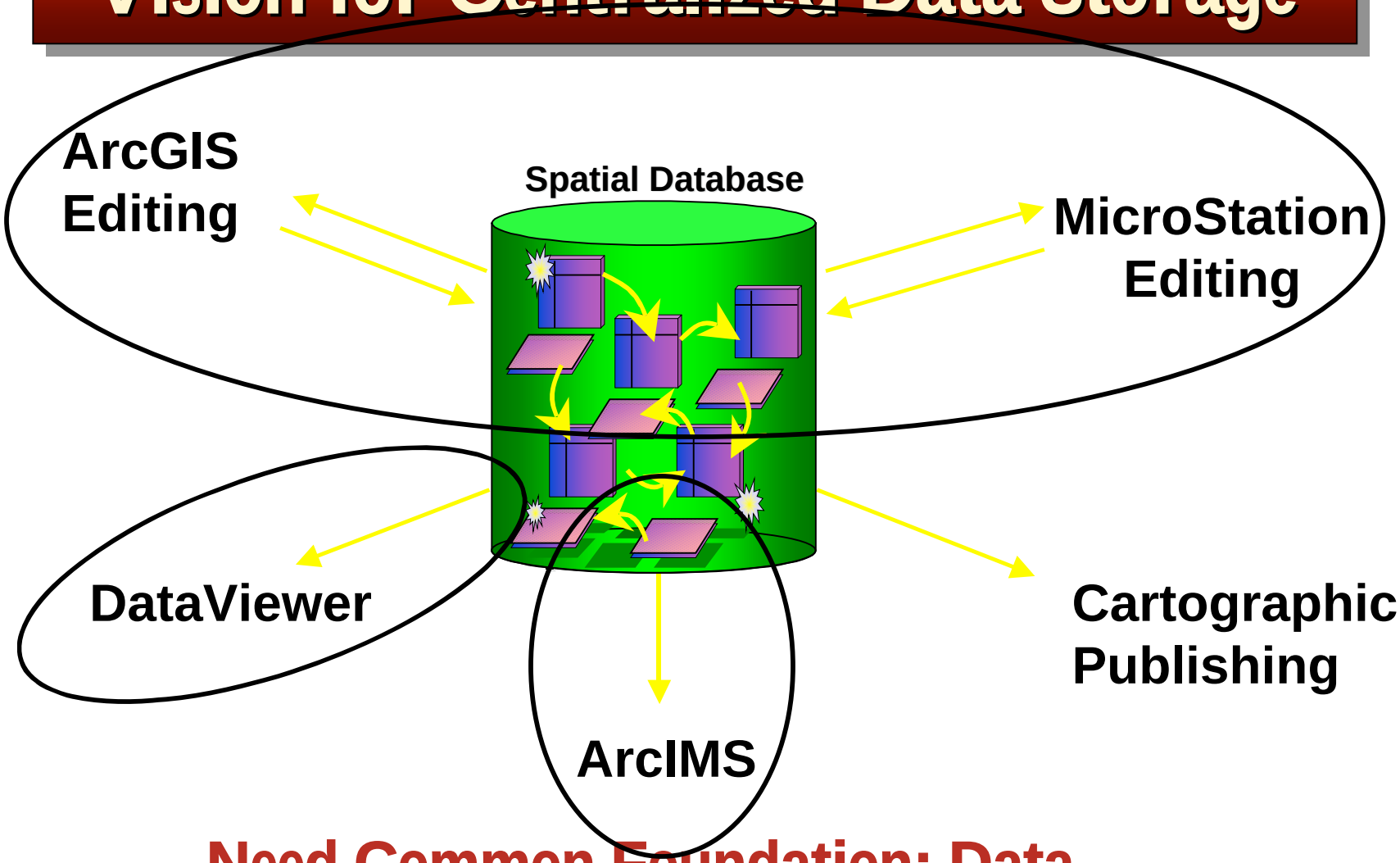
SHA Highway Information Services Division

- 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



Vision for Centralized Data Storage



Need Common Foundation: Data

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

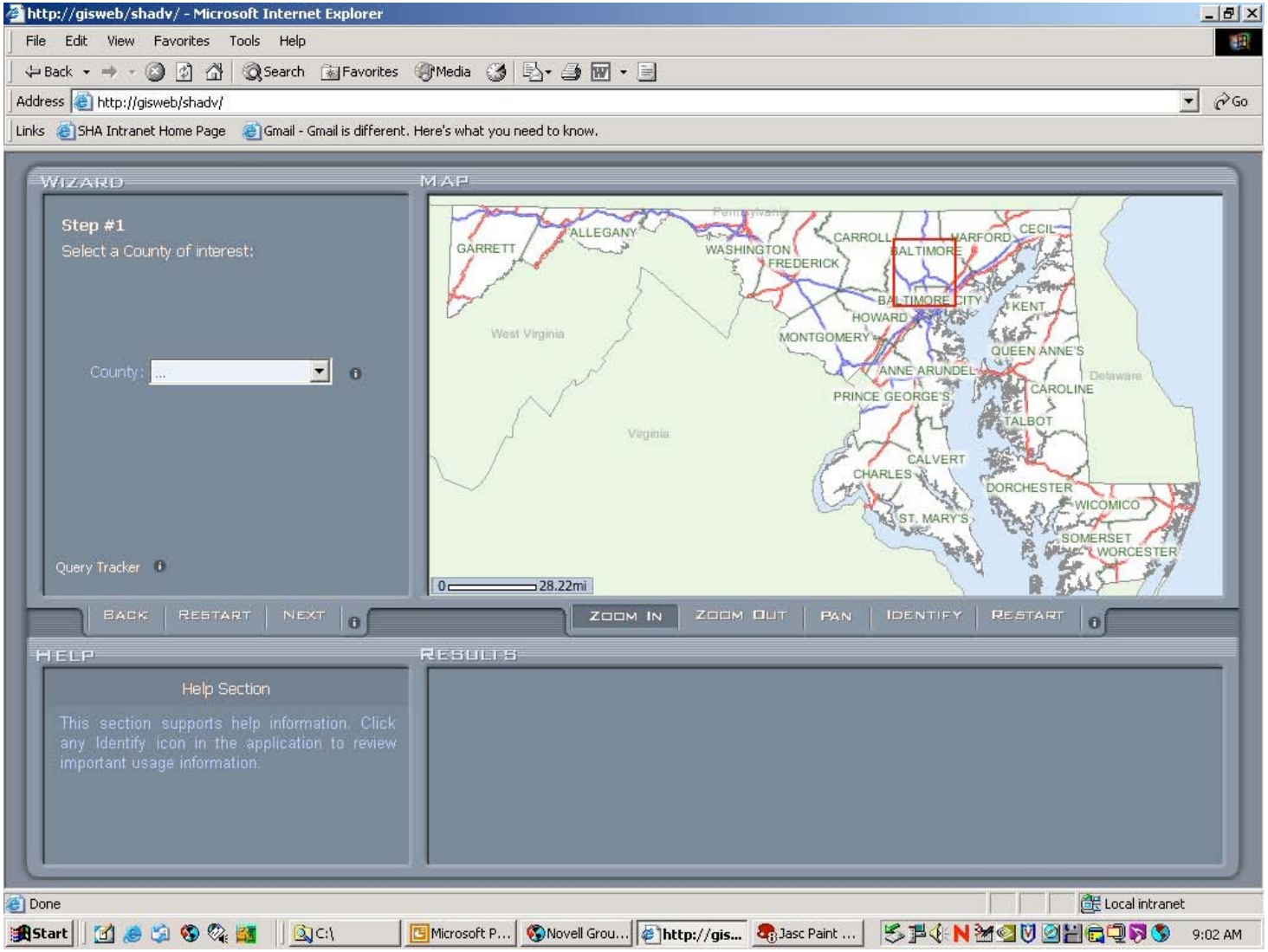
How We Obtained the Mapping

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

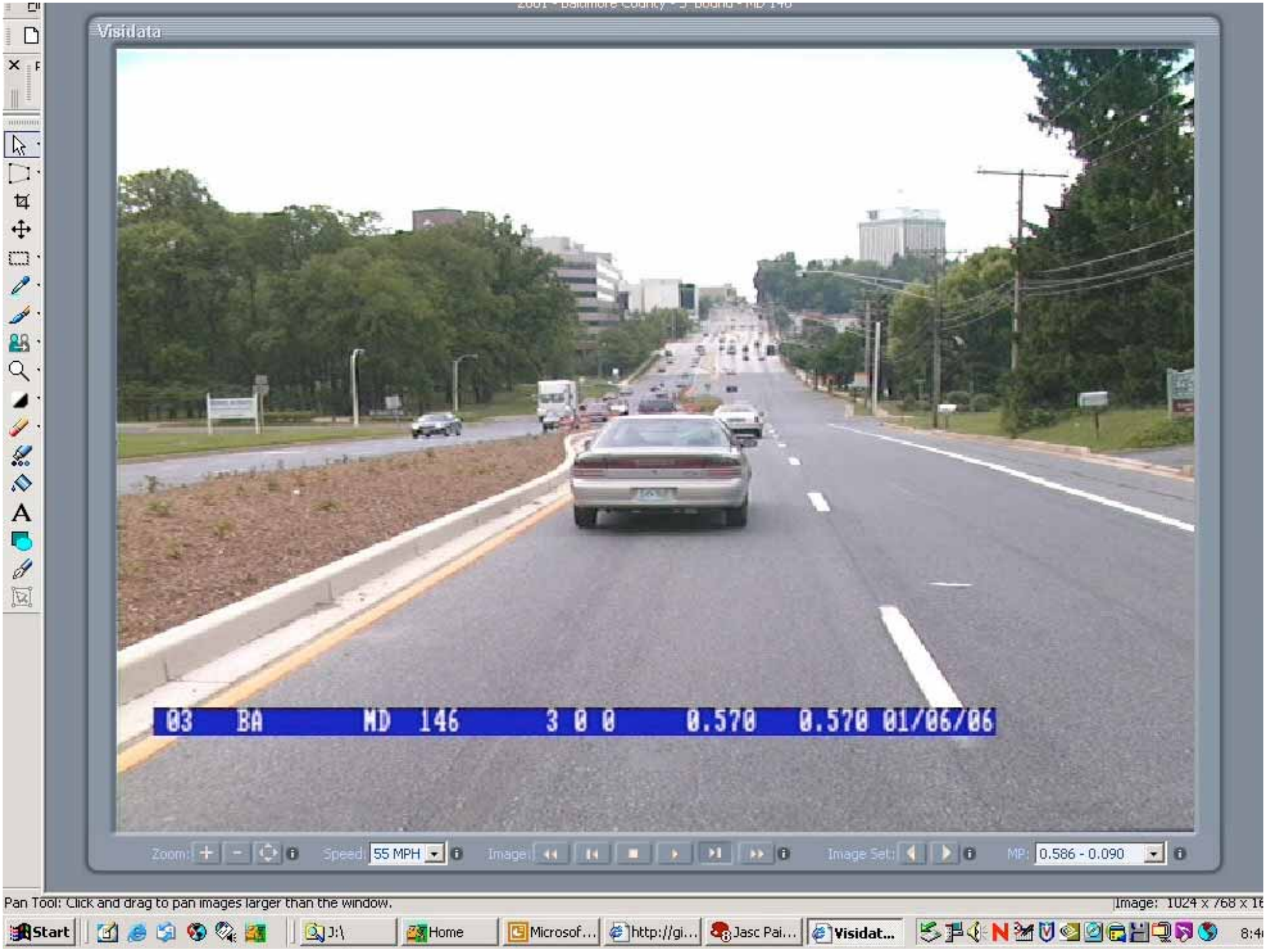
On-Going Relationships

- 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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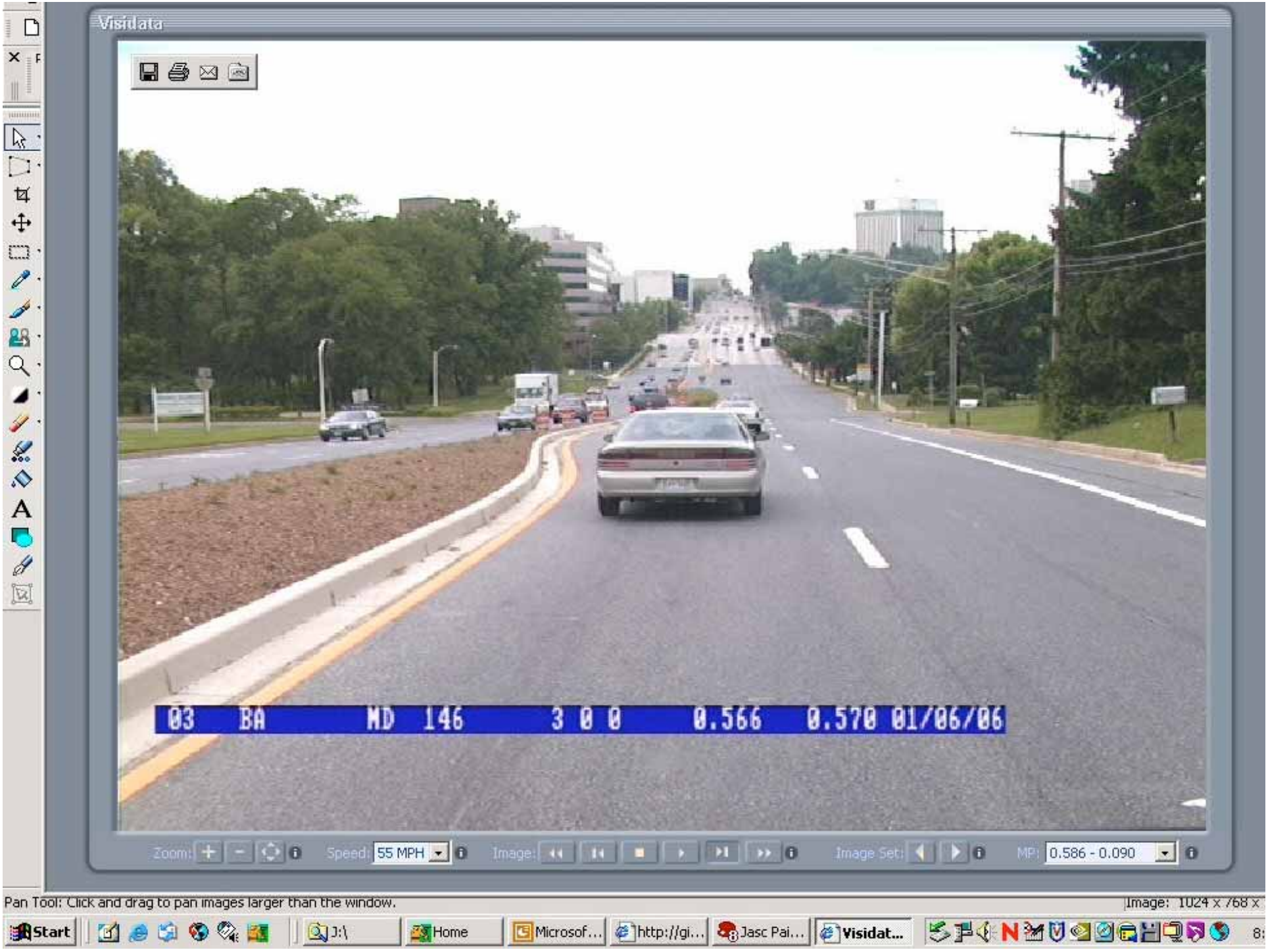
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How we will build on this internally

- 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

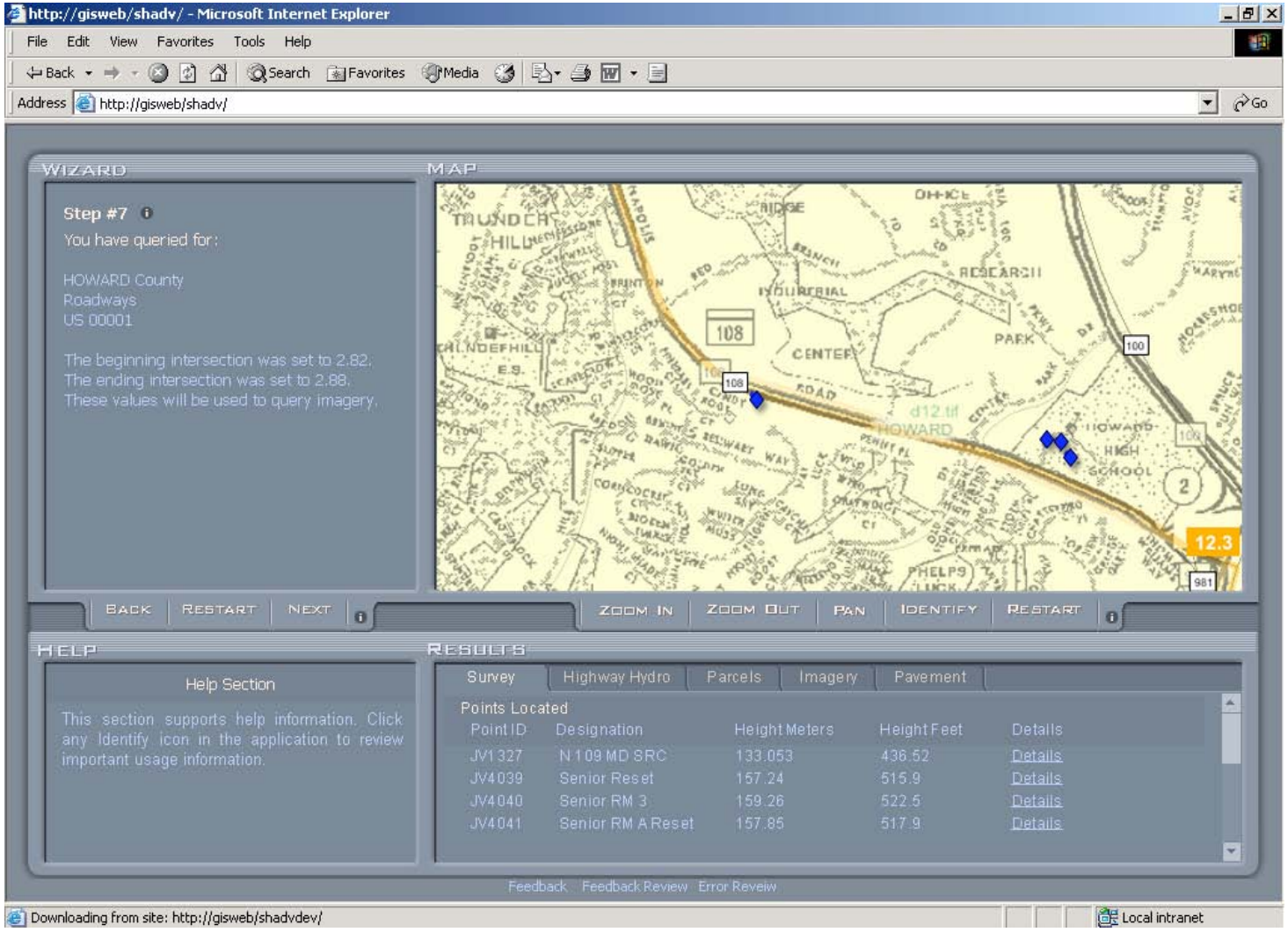
- **Phase II**
  - **Highway Hydrology**
    - **Other needs**
  - **Land Parcel Data**
    - **Available land records information**
    - **Local parcel vectors**
    - **Parcel ID, SDAT**
  - **Survey Points**
    - **NGS blue book points**
    - **Other SHA survey points**

Phases of Project

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

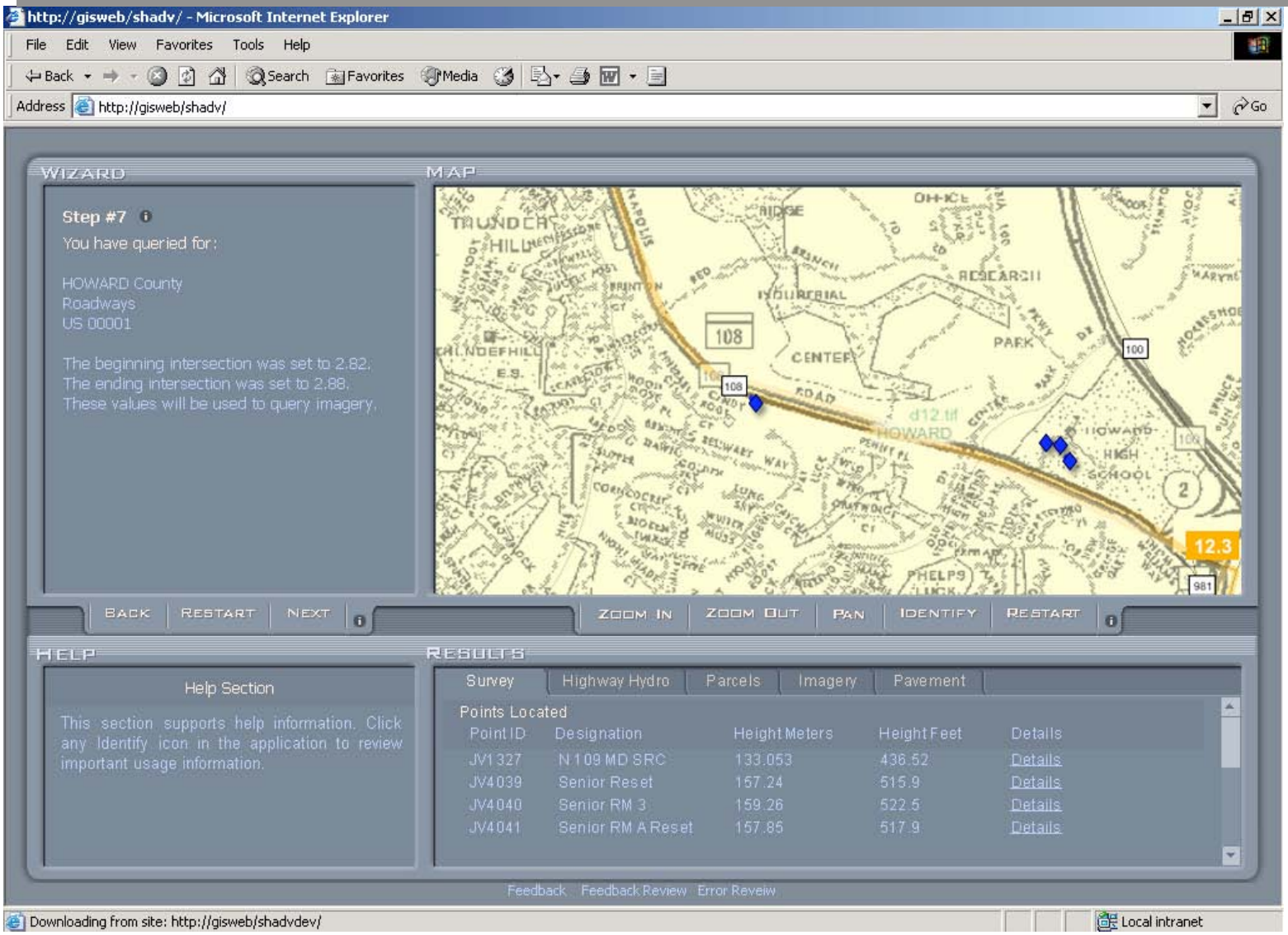
  - Long Range Planning
    - Highway Needs Inventory
  - Safety Data
    - Incidents
  - Tie to Highway Asset Data

Phase II Interface Prototype



Survey Points and Benchmarks

Phase II Interface Prototype



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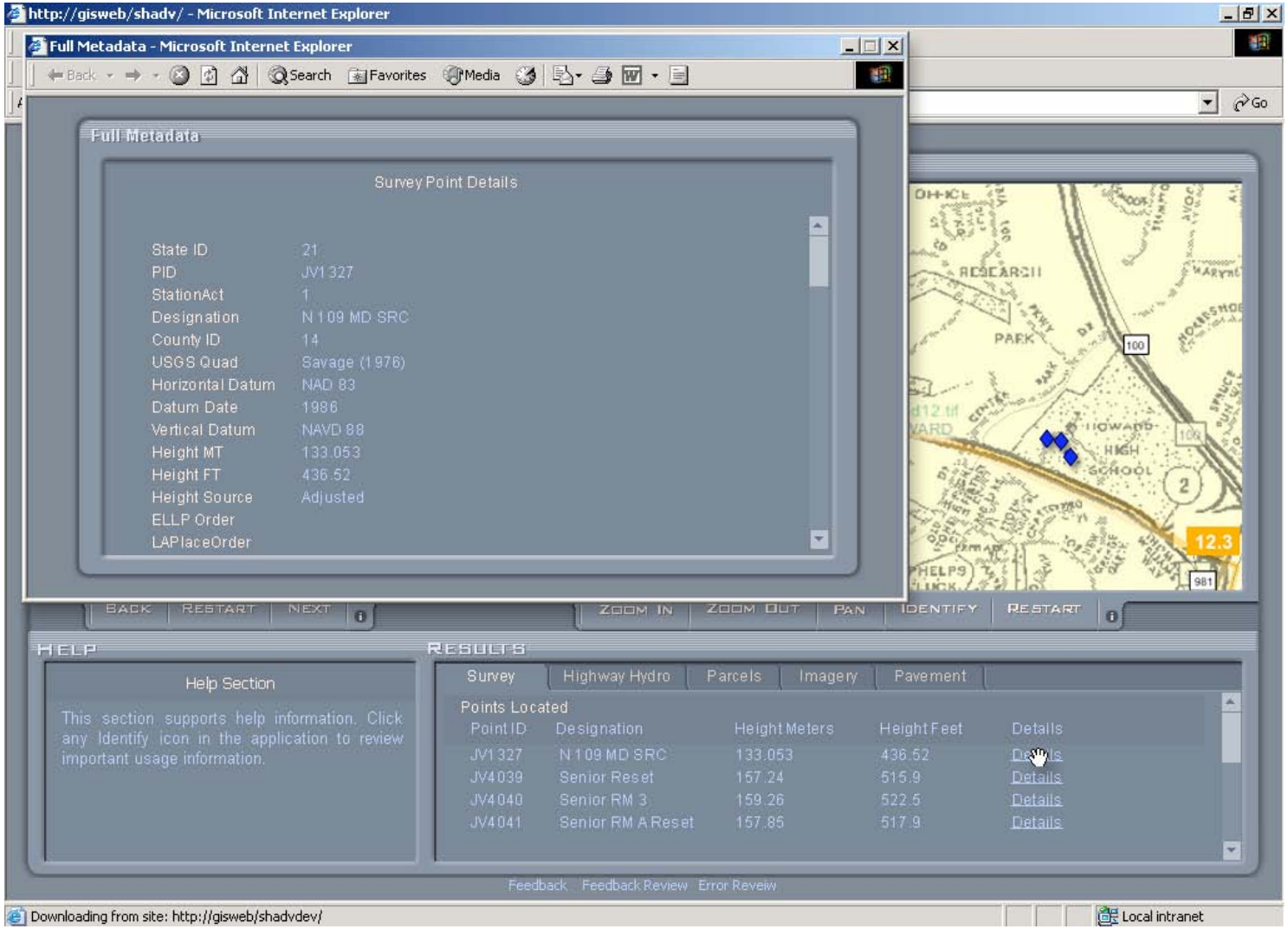

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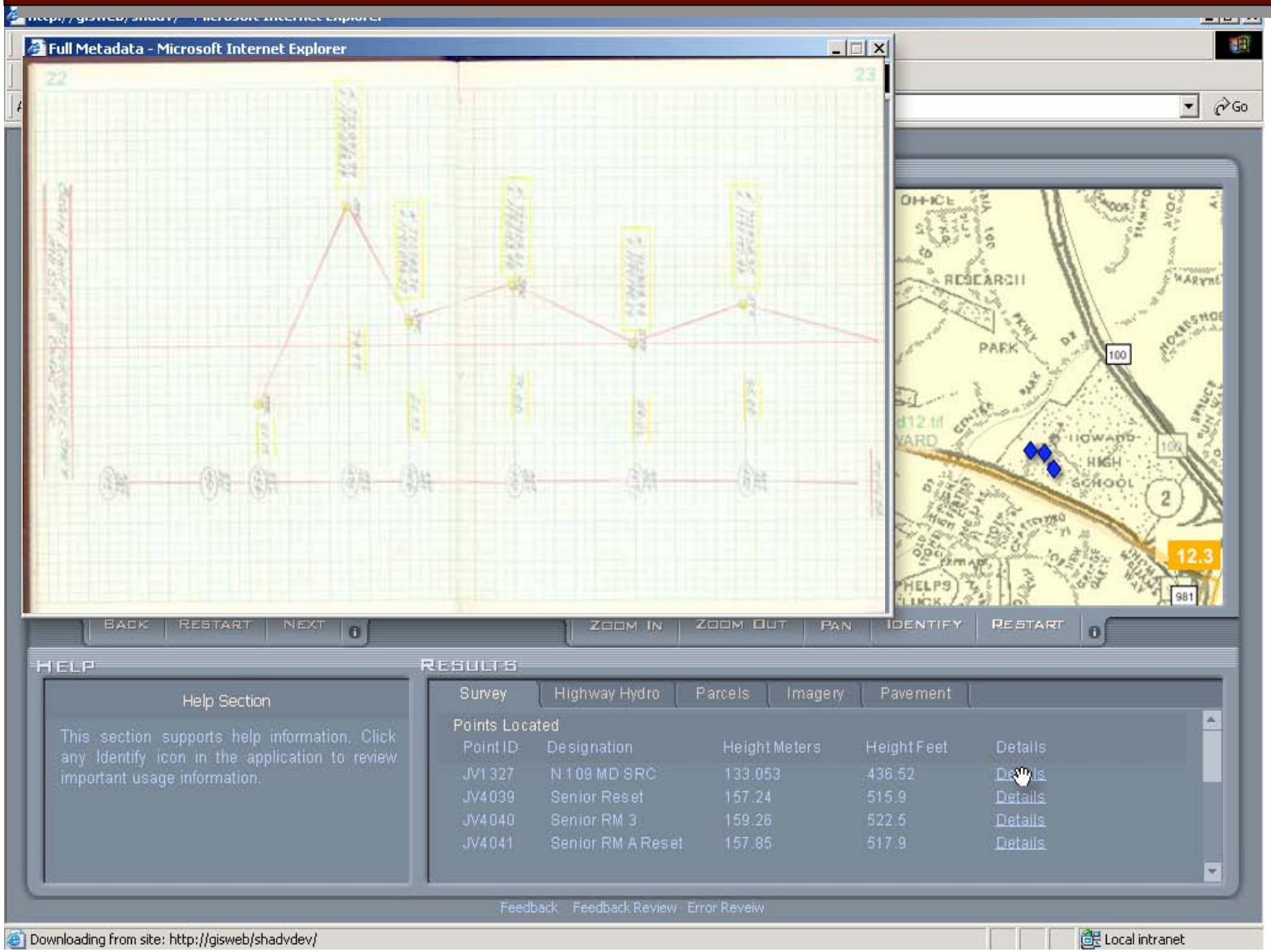

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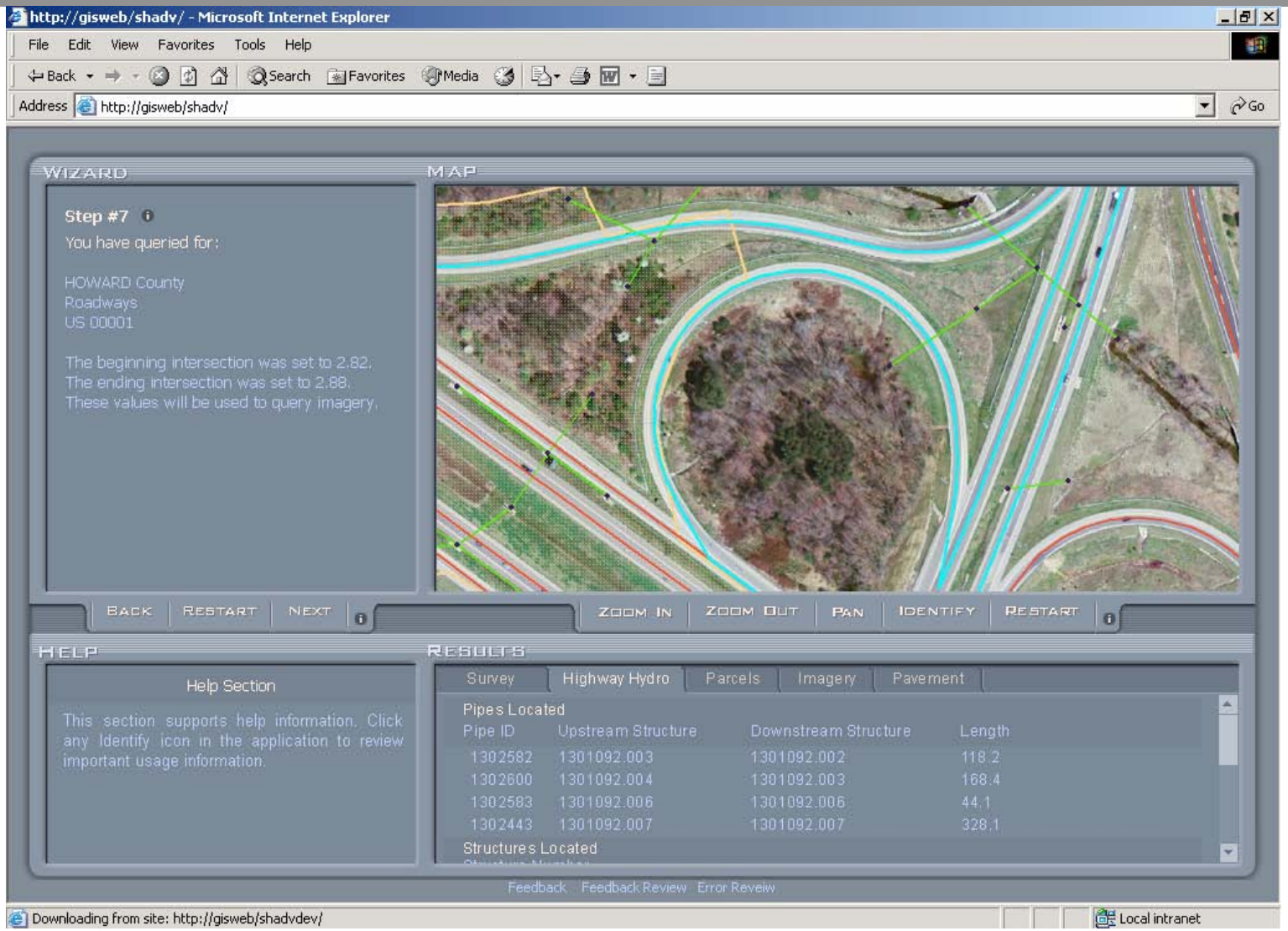

Highway Hydrology Data

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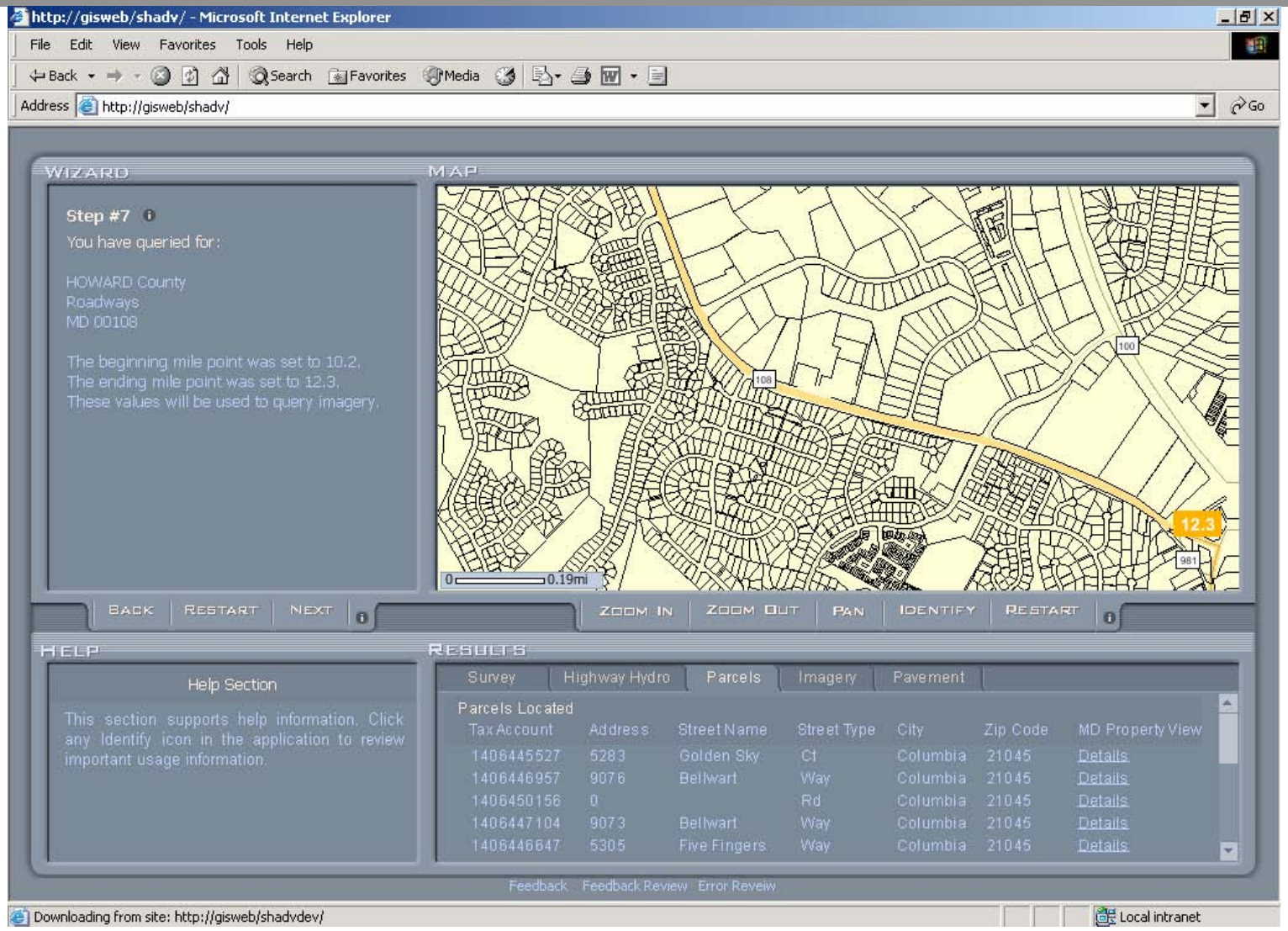

Land Parcel Information

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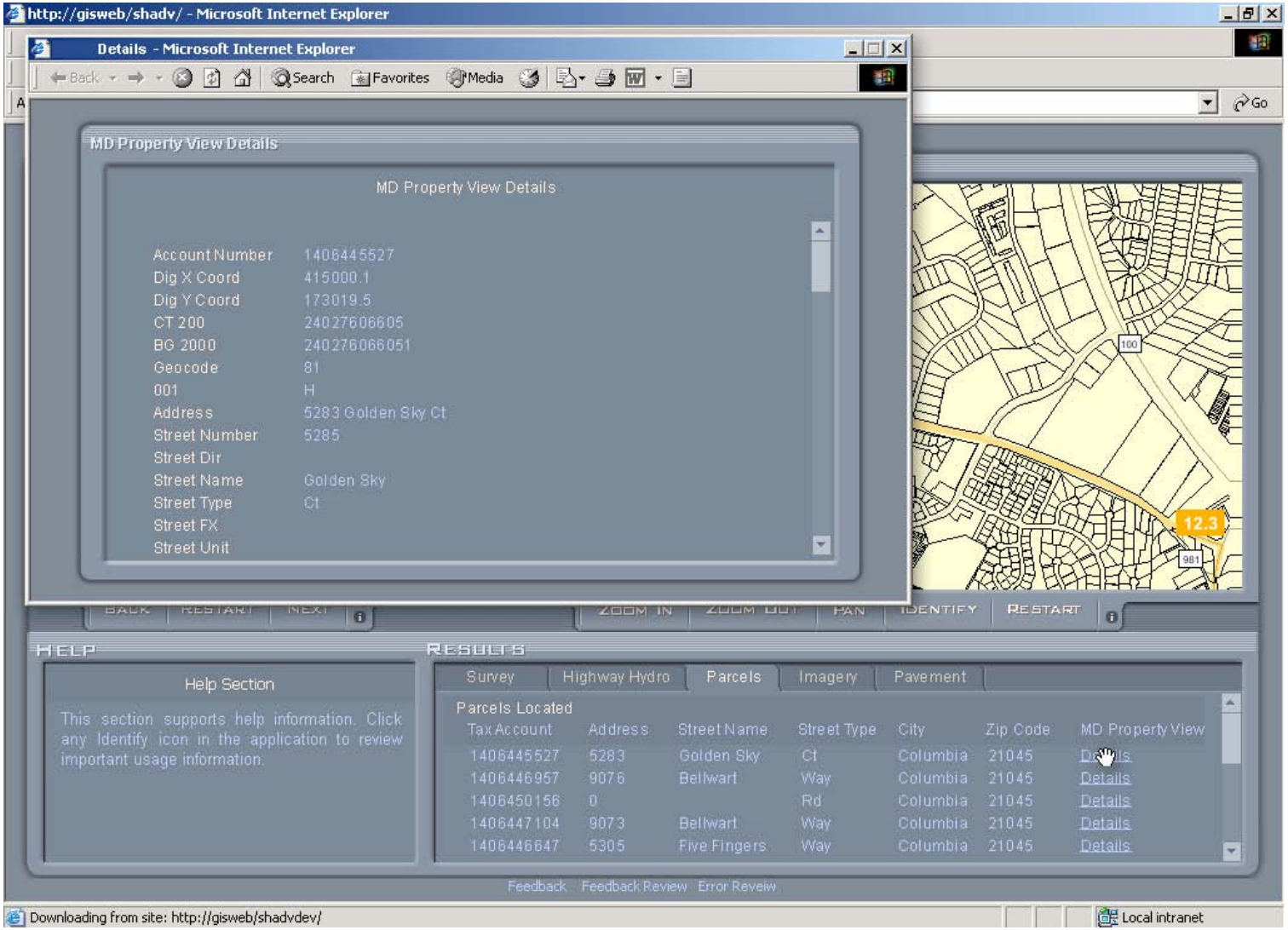

Land Parcel Information

Demonstration