WMATA Enterprise GIS Architecture

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Role of GIS

GIS is a service, not an application.
GIS owns few business processes and supports many, in four ways:
• Geographic data base display
• Geographic data capture
• Data integrity testing
• Data integration
Business Profile

Common processes (15 departments):

- Land and fixed asset management
- Transit operations (rail, bus, van)
- Security
- Planning
- Public information

GIS
### Key Business Application Interfaces

- **Asset Management**
  - Maximo, Optran, PeopleSoft,
  - AutoCAD, AutoCAD Map

- **Bus and rail operations and planning**
  - ROCS, AIMS, RPM
  - Trapeze, Orbital, Clever, Farebox, ATIS
  - ArcView, TransCAD

- **Security**
  - PSSI

### Core GIS Data Architecture

<table>
<thead>
<tr>
<th>Fixed Asset Inventory</th>
<th>Parcel</th>
<th>Facility</th>
<th>Amenity</th>
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</table>

<table>
<thead>
<tr>
<th>Transit Operations</th>
<th>Bus and Rail Network</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Stops, time points, chain markers, waypoints</td>
</tr>
<tr>
<td></td>
<td>Patterns, routes, lines</td>
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<tr>
<td></td>
<td>Performance (vehicles, trips, blocks)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Areas and Events</th>
<th>Stop Area</th>
<th>Service Area</th>
<th>Incident</th>
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</thead>
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<table>
<thead>
<tr>
<th>External Data</th>
<th>Road Network</th>
<th>Address</th>
<th>Base Maps; Census/Survey Data</th>
</tr>
</thead>
</table>
Enterprise GIS Architecture: Business Considerations

• Key Business Needs
  – Serve available data
    – CAD data, documents, GIS data
    – Add geographic value
  – Make simple apps available
    – Desktop software, web viewers, dashboards, reports
  – Define and set standards/practice/key datasets
    – Metadata, QA tests, common base layers, remove duplication
  – Enable mobile architecture
    – Hand-held devices, versioning

Enterprise GIS Architecture: Operational Considerations

• Key Enterprise Needs
  – Low level integration
    – Calls from Oracle-based apps: SQL functions
  – High level integration
    – Interface to interface: Web map call to Maximo service
  – Systems/Data integration
    – Data exchange, maintenance, overnight updates, Oracle jobs: AVL, Asset Mgmt.; Document repository
  – Enterprise environment
    – Automated deployments, patch management, license management
  – Nimble application development
    – Architecture, development/staging/training environments
Five Components of Enterprise Architecture Design

- **Architecture Strategy and Design**
  - What are the information flows and standards

- **Infrastructure and Systems Architecture**
  - How will physical realization occur, how will users interact

- **Data Architecture**
  - What data will be stored, reported

- **Process Architecture**
  - How will data be maintained and standards enforced

- **Applications Architecture**
  - How will information be used, how will value addition occur

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WMATA GIS Enterprise Architecture

- **Service Tier Diagram**
  - Service production and use

- **Design Diagram**
  - Data flows

- **Deployment Diagram**
  - Physical System
Questions and Discussion

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