City’s Future in ArcGIS Platform and Business Systems Integration

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About the City

- Virginia Beach Metropolitan Statistical Area (MSA) is the 38th largest in the United States, with a population of over 1.67 million.
- Virginia Beach is the most populous city in Virginia.
- Population: 447,215
- MSA Population: 1,714,475
- City encompasses 307 square miles.
- Land: 248 square miles.
- Water: 59 square miles, 80 miles of Scenic Waterways.
- Beaches: 38+ miles.
Changing World…Changing Cities…

- Business and Spatial Data *Storage and Access*
  - Cloud
  - On-Premise
  - Hybrid

- **Data Analytics** across the information scape
  - Faster and better decision-making

- *Increasing* Business and Spatial Data *Omnipresence*
  - Desktops, Laptops, Tablets, Smartphones…
  - HoloLens- Holographic Computing…
Driving Force…Information…

- Empowered by computing power and mobility

- Access to data all the time is key

- Data consumption is at a rapid pace

- Thinking… in the Digital World
  - 3rd Graders using Self-Service Mapping for projects
  - ESRI's $1 Billion Pledge
  - Students Gain Geographic Ground Following Esri's Billion-Dollar Software Pledge to White House ConnectED Initiative
City’s Cloud/On-Premise Environments…

Spatial Systems Self-Service Mapping

Business Systems Self-Service Reporting
(Making inroads into Mapping)
Future of Mapping and Data...
Mapping is becoming Mainstream…
ArcGIS Online and Office 365 in Review…

Esri Maps for Office

Office 365 (Excel)
Spatial vs. Business Data Streams…

- City has ESRI’s ArcGIS Server, ArcGIS Online and other Spatial Systems… providing efficient spatial data in features, imagery etc..

- City’s IT Systems provide efficient and robust business data with business logic…

- City is currently working on ideas, prototyping with the hybrid environments for the future…
Strengthening Our Data Streams…

• **Business Data Warehouse**
  - Aggregation of Business data to provide fast data analytics in Real Time
  - Efficient dissemination of Data for Analytics

• **Spatial Data Warehouse**
  - Providing data that can be consumed by any platform or device spatially
  - Enabling spatial data for multiple platforms

• **Hybrid Data Warehouse**
  - Business and Spatial Data – MDS and Other…
Supporting our Customers and Citizens...

• Enhancing **spatial data accessibility** across various platforms...

• Enabling **business system integration** with mapping systems...

• Enhancing **data and spatial analytics in near real-time**
### Business Systems with Spatial Data and Self-Service Reporting Integration

<table>
<thead>
<tr>
<th>System</th>
<th>Data Elements</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hansen Work Order</td>
<td>Shape Files</td>
</tr>
<tr>
<td>Hansen Asset Management</td>
<td>Shape Files</td>
</tr>
<tr>
<td>Thomas Rueters Proval</td>
<td>SDO Geometry</td>
</tr>
<tr>
<td>ACCELA Code Enforcement</td>
<td>Address</td>
</tr>
<tr>
<td>ACCELA Permits</td>
<td>Address</td>
</tr>
<tr>
<td>Banner</td>
<td>Address (Mailing)</td>
</tr>
<tr>
<td>PCI Business License</td>
<td>TBD</td>
</tr>
<tr>
<td>POLICE RMS</td>
<td>Address</td>
</tr>
<tr>
<td>COMPSTAT</td>
<td>Address</td>
</tr>
<tr>
<td>FIRE RMS</td>
<td>Address</td>
</tr>
<tr>
<td>EVENT Planning</td>
<td>TBD it is a need</td>
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<tr>
<td>WEB EOC</td>
<td>Shape File?</td>
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<tr>
<td>OSSI Crime Data</td>
<td>Address</td>
</tr>
<tr>
<td>POLICE RMS</td>
<td>Address</td>
</tr>
<tr>
<td>See Click Fix</td>
<td>XYZ location</td>
</tr>
<tr>
<td>Happy Section 8 Housing</td>
<td>Address</td>
</tr>
<tr>
<td>DSC ATLAS</td>
<td>XYZ Coordinate (Shape file)</td>
</tr>
<tr>
<td>Fleet Anywhere (Cloud)</td>
<td>Geoevent Processor</td>
</tr>
<tr>
<td>Tow Tracker</td>
<td>XYZ Location</td>
</tr>
<tr>
<td>ARCHIBUS</td>
<td>Address</td>
</tr>
<tr>
<td>SCADA</td>
<td>XYZ location</td>
</tr>
<tr>
<td>VBLand Records</td>
<td>Instrument #</td>
</tr>
</tbody>
</table>

**Currently In Works..**
Recent Activity…

• Implementation of **Data Warehouse** and **Self-Service Reporting** using SharePoint Portal provided by Database Team – SSRS, SSAS, Power View…

• Application support enabling database data access using REST services – **Property Search** Application… provided by Application Support, Web and Mobile Team

• Spatial REST services being provided by **CGIS Team** – Web Map Services that are available across all devices…
Mapping Integration with Business Systems... Prototyping

- **Fire, ECCS**...
  - Spatialey enabling RedNMX, CAD...
  - Mapping with Self-Service Reporting Integration
  - Access to ECCS data
- **REA**...
  - Mapping with Self-Service Reporting
- **Property Search**...
- **ePro**
  - **Spatially enabling** crime data with Blocks, Intersections... Future – **Integrating with Self-Service Reporting**
Current ESRI Software…

- ArcGIS Server 10.2.2
- ArcGIS Online, Community Analyst
- Image Server
- Geoevent Processor
- Other Extensions…
Challenges…

• Feature Services with limitations (1000 or 2000 features…) – Web AppBuilder, Operations Dashboards…

• Volume of data that is presented by business systems with business logic that cannot be part of map service in many instances…

• Data relationships such as relate tables may cause some limitations…

• Real-time data that is delivered from business systems cannot be part mapping systems in many instances…
Addressing the Challenges...

- Feature Services – Analysis of the data streams, filtering at the business system level, UI design can help minimize issues...

- Leverage spatial and business system data wherever applicable and design, embracing the strengths each data stream brings...

- Query Layers, BI reporting tools...

- Hybrid UI design with data from multiple web services and applications may minimize issues...
Neighborhood Values...
Fire Incidents By Station...

### Virginia Beach Fire Department Station Summary Report (2015)

#### Incident Count By Type:

**Incident Types:**
- Emergency/Medical/Rescue
- Fire Prevention Bureau
- Hazardous Conditions/Hazardous Materials Incidents
- Other Fire Incidents (Vegetation, Rubbish, Other)
- Service Call, Miscellaneous or Special Incidents
- Structure Fire

#### Incident Count By Shift:

- **A Shift**
  - Total: 17
  - April: 6
  - May: 11
- **B Shift**
  - Total: 15
  - February: 18
  - March: 16
  - April: 4
  - May: 7
  - Total: 6
- **C Shift**
  - Total: 10
  - January: 5
  - Total: 6
  - Total: 6

#### Station Summary:

<table>
<thead>
<tr>
<th>Station</th>
<th>Incident Type</th>
<th>Month</th>
<th>Shift</th>
<th>Nature Code Description</th>
<th>Nature Code</th>
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<tbody>
<tr>
<td>ST17</td>
<td>Total</td>
<td></td>
<td></td>
<td></td>
<td>156</td>
</tr>
<tr>
<td></td>
<td>Emergency/Medical/Rescue</td>
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<td></td>
<td>156</td>
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<tr>
<td></td>
<td>Fire Prevention Bureau</td>
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<td></td>
<td>Hazardous Conditions/Hazardous Materials Incidents</td>
<td>Total</td>
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<tr>
<td></td>
<td>Other Fire Incidents (Vegetation, Rubbish, Other)</td>
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<tr>
<td></td>
<td>Structure Fire</td>
<td>Total</td>
<td></td>
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</tr>
</tbody>
</table>
Thanks for attending the presentation. I hope some ideas that were presented are worth taking back with you. Your feedback is welcomed and it may help me think of new approaches.

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