Enterprise GIS Migration
MapGuide to ArcGIS Server

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Tim Eisler: GIS Coordinator, City of Dublin
July 21, 2015
• Introduction & Overview
• Old Environment and Map Guide: Driver for Migration
• New Environment in Esri / Geocortex: Enterprise Viewers
• Challenges, Solutions, and Lessons Learned
• Summary / Q&A
Overview & Background

- City of Dublin’s GIS evolution
- GIS strategic plan: collaborative partnership with Psomas
- Enterprise GIS implementation
- Migration needs and drivers
- Esri ArcGIS platform and Latitude’s Geocortex
- Deployed intranet and internet versions
- City Staff and Council strong support
AutoDesk MapGuide 6.5
Enterprise GIS

- Began in 2002
- RFP process
- Launched 2003
- ActiveX Plugin
- ShapeFile
- Client-based processing
Interactive maps and reports

- First exposure to web-based GIS for City Staff
- Improved Staff efficiency
- No public option
<table>
<thead>
<tr>
<th>Parcel Attributes:</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>APNs</strong></td>
</tr>
<tr>
<td><strong>Use</strong></td>
</tr>
<tr>
<td><strong>Owner Last Name</strong></td>
</tr>
<tr>
<td><strong>Phone Number</strong></td>
</tr>
<tr>
<td><strong>Bldg/Living Area</strong></td>
</tr>
<tr>
<td><strong>Baths (Half)</strong></td>
</tr>
<tr>
<td><strong># Buildings</strong></td>
</tr>
<tr>
<td><strong>Condition</strong></td>
</tr>
<tr>
<td><strong>Parking Spaces</strong></td>
</tr>
<tr>
<td><strong>Heat Type</strong></td>
</tr>
<tr>
<td><strong>Land Value</strong></td>
</tr>
<tr>
<td><strong>Property Tax</strong></td>
</tr>
<tr>
<td><strong>Recording Date</strong></td>
</tr>
<tr>
<td><strong>Tract</strong></td>
</tr>
<tr>
<td><strong>City Address</strong></td>
</tr>
<tr>
<td><strong>Year Built</strong></td>
</tr>
<tr>
<td><strong>Stories</strong></td>
</tr>
<tr>
<td><strong>Other Rooms</strong></td>
</tr>
<tr>
<td><strong>Commercial Units</strong></td>
</tr>
<tr>
<td><strong>Foundation</strong></td>
</tr>
<tr>
<td><strong>Parking Type</strong></td>
</tr>
<tr>
<td><strong>Air Conditioning</strong></td>
</tr>
<tr>
<td><strong>Improvement Value</strong></td>
</tr>
<tr>
<td><strong>Sale Price</strong></td>
</tr>
<tr>
<td><strong>Deed Type</strong></td>
</tr>
<tr>
<td><strong>Deed Date</strong></td>
</tr>
<tr>
<td><strong>Situs House No/Street Name</strong></td>
</tr>
<tr>
<td><strong>Lot Number</strong></td>
</tr>
<tr>
<td><strong>Lot Acreage</strong></td>
</tr>
<tr>
<td><strong>Bedrooms</strong></td>
</tr>
<tr>
<td><strong>Total Rooms</strong></td>
</tr>
<tr>
<td><strong>Style</strong></td>
</tr>
<tr>
<td><strong>Exterior Wall</strong></td>
</tr>
<tr>
<td><strong>Pool</strong></td>
</tr>
<tr>
<td><strong>Fireplace Number</strong></td>
</tr>
<tr>
<td><strong>Construction Type</strong></td>
</tr>
<tr>
<td><strong>Roof Type</strong></td>
</tr>
<tr>
<td><strong>Porch</strong></td>
</tr>
<tr>
<td><strong>Total Value</strong></td>
</tr>
<tr>
<td><strong>Total Value (Taxable)</strong></td>
</tr>
<tr>
<td><strong>Assessor Map</strong></td>
</tr>
</tbody>
</table>
AutoDesk MapGuide 2007
Enterprise GIS Migration

- 2007, Public AJAX (HTML5)
- Complete re-build
- SDE 9.3 with GeoDatabase in SQL Server
- Open Source and Corporate support
- Web admin
- Server-based processing
AutoDesk MapGuide 2007
Enterprise GIS Migration

- PHP and .NET APIs with spatial functions
- Visual Studio and .NET C#
- Custom built reports and data access made it easy for Staff to learn and use
AutoDesk MapGuide 2007
Enterprise GIS Migration

- Enterprise Studio software for site development
- Complete interface from layer symbology to site design
- Does not use ArcMap symbology
AutoDesk MapGuide 2007
Enterprise GIS Migration

- Reliant on consultant for new applications
- Difficult to spin-off new sites
- Few built-in functions required programming
ArcGIS Server & Geocortex Migration

- MapGuide didn’t deliver hardcopy maps well
- MapGuide development not in sync with Esri GeoDatabase
  - Couldn’t upgrade SDE GeoDatabase without breaking MapGuide
- Desired tighter integration between ArcGIS maps and web services
  - Reuse map layers and symbology already created for paper maps
  - Manage GeoDatabase and web maps from same software
- Preferred to retain tiered approach to map services and web connector
  - Central map server with multiple web servers
  - Staff versus public sites from same maps
ArcGIS Server & Geocortex Migration

- 5 Year GIS Master Plan completed in 2012
- Recommended consolidating to single vendor Enterprise GIS
  - Leverage existing investment in Esri and SDE
  - Upgrade to ArcGIS Server Enterprise
  - Implement COTS software for web viewer
- GIS Committee evaluated software
  - GeoCortex chosen
- RFP issued November 2013
  - Psomas chosen by GIS committee
Virtual Servers using VMWare

- Easy management of system resources
- Backup and recovery
- Spin-off test environments
- Snapshot and rollback
- Migrate servers between hosts
Split functionality between 4 servers

1. Database server with SQL Server 2012
2. ArcGIS Server 10.3.1
   • Web connector with windows based authentication (SSO)
3. GeoCortex 4.3 for Staff
   • GC Essentials
   • Silverlight and HTML5 viewers
4. GeoCortex 4.3 for Public
   • AGS Web connector with anonymous authentication
   • GC Essentials
   • GC Identity Server for authentication and access to Staff data
   • HTML5 viewer
• Multiple GeoDatabase approach
  • Master and Publish
  • State Plane vs. Web Mercator
  • Data replication and models to synchronize data
  • Staff edits to Publish
  • GIS Administrator controls data QC and synchronizing
  • SQL Server for both databases
Overview of Map Services

Publish AGS Map Services from ArcMap
Overview of Map Services

- Draw dynamic for frequent changing and less often view maps
- Use tiles from cache for base maps and imagery
- Choose scales carefully
Overview of Map Services

- WGS 84 Projection in metric
- Engineers like Imperial scales
- Scale by 1.254
Overview of Map Services

- Basemaps
- City_Manager
- Environmental_Services
- Fire_Prevention
- Hazards
- Imagery
- Neighborhood_Resourc...
- Parks_and_Recreation
- Planning
- Public.Works
- System
- Utilities

Site (root)

Operations_and_Maintenance_FS (Map Service)
Operations and Maintenance for the Clean Water Program in the City of Dublin, California
Status: Started
Instances Running: 1
Instances in Use: 0
Maximum Instances: 5

Public_Works_MS (Map Service)
Public Works information for the City of Dublin, California
Status: Started
Instances Running: 4
Instances in Use: 0
Maximum Instances: 11

ROW_Status_FS (Map Service)
Right of Way Status for the City of Dublin, California
Status: Started
Instances Running: 1
Instances in Use: 0
Maximum Instances: 5

ROW_Type_FS (Map Service)
Right of Way Status for the City of Dublin, California
Status: Started
Instances Running: 1
Instances in Use: 0
Maximum Instances: 5

Street_Infrastructure_MS (Map Service)
Street infrastructure data for the City of Dublin, California
Status: Started
Instances Running: 2
Instances in Use: 0
Maximum Instances: 8
Overview of Map Services

- REST endpoints describe layers and schema
- Useful when configuring GeoCortex
Overview of Feature Services

- Feature Services provide data editing capabilities
- A Map Services is always published
- Feature Service an additional option
Assign fewer resources to Feature Services set up for editing than a grouped Map Services that is accessed often.
Assign fewer resources to Feature Services set up for editing than a grouped Map Services that is accessed often.
Web-based site management
New Enterprise GIS Viewers

- Silverlight Viewer
- Advanced functions for Staff
- Feature editing workflows
- Reporting workflows
New Enterprise GIS Viewers

- HTML5 viewer
- No plugin
- Public version
- Staff version
- Will replace Silverlight
Editing Workflows
Reporting Workflows

[Image of GIS portal interface with options like Extract Parcel Data, What's Near Me, Development Projects Report, EDEN Report, Create Mailing List, Identify, Clear Selection, and a buffer distance input dialog box.]

[Image of a dialog box titled "Step 1: Select Parcel features" with options to use the current map area or define custom geometry.]
Reporting Workflows
### Address Proximity Report

<table>
<thead>
<tr>
<th>parcel_no</th>
<th>first_name</th>
<th>last_name</th>
<th>care_of</th>
<th>address_type</th>
<th>address_number</th>
<th>address_street</th>
<th>address_suite</th>
<th>address_city</th>
<th>city_st_zip</th>
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<tbody>
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<td></td>
<td></td>
<td></td>
<td>Additional Situs</td>
<td>7100 SAN RAMON RD</td>
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<td></td>
<td></td>
<td>Absentee Landlord Situs</td>
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<td>941-0040-006-10</td>
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<td>Absentee Landlord Situs</td>
<td>11304 DUNSTOWN CT</td>
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<tr>
<td>941-0040-006-10</td>
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<td></td>
<td>Shared Space Mailing</td>
<td>11875 FLANAGAN CT</td>
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<td></td>
<td></td>
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<tr>
<td>941-0040-006-10</td>
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<td></td>
<td></td>
<td>Owner Situs</td>
<td>7245 CRONIN CIR</td>
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<td>Owner Situs</td>
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<td>Owner Mailing</td>
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<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
# City of Dublin Parcel Report

**Report Date:** Thursday, July 16, 2015

## Maps/Images

A satellite image showing a parcel of land with a red highlight.

## Parcel Information

<table>
<thead>
<tr>
<th>APN</th>
<th>091-0203-062-00</th>
<th>Parcel Type</th>
<th>Residential</th>
</tr>
</thead>
<tbody>
<tr>
<td>City Address</td>
<td>6614 HEMLOCK ST</td>
<td>Parcel Area</td>
<td>5,677 square feet</td>
</tr>
<tr>
<td>Tracts</td>
<td>2772</td>
<td>Additional Addresses</td>
<td>0</td>
</tr>
</tbody>
</table>

## City Services

- **Street Sweeping Schedule:** Second and Fourth Tuesdays
- **Garbage Collection Schedule:** Thursday

## Hazards

- **Earthquake Fault Zone:** None
- **Fire Hazard Zone:** None
- **Roof Class Zone:** C-3
- **Liquefaction Zone:** Property is within a liquefaction zone
- **Landslide Zone:** None
- **Fire Buffer Zone:** None

## FEMA Flood

- **Flood Zone:** X - Minimal risk areas outside the 1-percent and 2-percent annual chance floodplains. No RFEs or base flood depths are shown within these zones.

<table>
<thead>
<tr>
<th>FIRM Panel Number</th>
<th>Effective Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>05601C0308G</td>
<td>8/3/2009 12:00:00 AM</td>
</tr>
</tbody>
</table>

## Land Use

<table>
<thead>
<tr>
<th>Zoning Land Use</th>
<th>Planning Area</th>
<th>Primary Planning Area Boundary</th>
</tr>
</thead>
<tbody>
<tr>
<td>Single Family Residential (0.9 - 5.0 sq/ft)</td>
<td>Planning Area</td>
<td>Primary Planning Area Boundary</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Zoning Planned Development Number</th>
<th>Zoning File Number</th>
<th>Zoning Planned Development Amendments</th>
</tr>
</thead>
</table>
Built-in Queries
Built-in Tools
URL Map Themes

- Simple legend
- Switchable themes
- Links on department pages
- Easy to setup

https://gis.dublin.ca.gov/Html5Viewer/?viewer=default

https://gis.dublin.ca.gov/Html5Viewer/?viewer=default&layerTheme=land%20use
Staff’s familiarity with streamlined interface and reports on MapGuide
  - Staff knew system well and how to get information quickly
  - Training seminars, help manuals, hands-on training

More tools, more power, more confusion
  - Dedicate sites, tool bars, and work flows to specific tasks

Listen, adapt and modify
  - Hand hold staff through a workflow till they get it
  - GIS committee and open relationship with Staff
  - Agile approach to software development to enhance or simplify interface via feedback

Getting browser to accept windows authentication (SSO)
  - Train IT Staff and distribute guidelines for browser configuration
Critical Success Factors

• Agile
• GIS Committee
• GIS Master plan
• Management support
• Close working relationship with vendor and programmer
Q & A