

# Neogeography & Nanaimo

*Leveraging Google and Open Source  
Spatial Technologies for Local  
Government*

# Nanaimo



- ↳ Nanaimo is a mid-sized community on the east coast of Vancouver Island
- ↳ About 80,000 residents
- ↳ City employs between 500 and 700 people
- ↳ Fifteen I.T. staff including managers



# Background



- ↳ City of Nanaimo has a philosophy of using the best tool for the job while remaining fiscally responsible
- ↳ Depending on user requirements, we have chosen to deploy technologies from Microsoft, Autodesk, ESRI, Google, OSGeo, and other sources
- ↳ This kind of mixed environment requires continuous integration, adoption of open specifications and standards, and endless creativity

## ↳ Creative integrations at the City of Nanaimo

- Spatial Access Framework
  - Fire daily calls using GeoRSS, Google Maps
  - eNotifier uptake analysis
- Open Source Web Mapping
  - Cemetery Map
  - NanaimoMap
- Making Google Earth Useful
  - Internal deployment/usage of Google Earth
  - [earth.nanaimo.ca](http://earth.nanaimo.ca)

## ↳ Hard or Easy?

- Hard integration hooks into underlying data store
- Easy integration is only possible with an open data API

## ↳ Spatial data integration into business applications can leverage several open data formats and APIs

- GML/WFS
- GeoRSS/AtomPub
- KML/gData
- GeoJSON
- ...

# Spatial Access Framework



## ↳ Easy by Default

- New applications are built using web services
- First “exposure” of data requires effort, but additional integrations are simple

## ↳ Consistent Access

- By using a common framework, we only have to connect the dots between the source format and the outputs
- Applications that can access one source can easily access others as they are brought online

## ↳ Allows unforeseen integrations

# Fire & Rescue Daily Calls



- ✎ Project originally created in 2001.
- ✎ Used for posting fire and rescue incidents on our website for local media and residents.
- ✎ Simple ASP solution to show fire 911 calls by day.
- ✎ Residents could signup for email notifications of incidents.
- ✎ 911 operators had to manually add and update new incidents to the website.



# FDC Problems



- ✎ Due to the manual entry requirement it was hard to add new incidents and update existing ones
- ✎ No visualization for the users of the site
- ✎ Email notification was problematic
- ✎ Didn't allow for easy integration with other applications or services
- ✎ Didn't comply with new city direction of using ASP.NET for web applications



- Create a new solution using ASP.NET, GeoRSS
- Integrated with Google Maps as the front end
- Ability to view historical data and generate reports
- More robust subscription mechanism

- City recently implemented citizen emergency notification program
- Users sign up to receive phone and email notifications of emergency events
- City manages enrollment application, and uses third-party service provider to perform notifications

# eNotifier Problem



↻ Need to market to citizens:

- Radio
- Newspapers
- Inserts into utility and tax bills
- Word of mouth

↻ Spatial and temporal analysis would allow measurement of marketing efforts

# eNotifier Solution



- ↳ Plugging the notification database into the spatial access framework allowed ongoing analysis of uptake
- ↳ DEMO [eNotifier Analysis](#)

# Open Source Web Mapping



- Web mapping has become commoditized
- Adopting and promoting open source and open standards leads to more sustainable solutions
- Open source allows for earlier adoption of new web technologies, and typically has better support for geospatial standards

# Cemetery Map



- ↳ City of Nanaimo maintains four cemeteries
- ↳ Recent project data-entered all of the records into a SQL Server database
- ↳ Engineering has worked to georeference all of the plots
- ↳ Needed a solution for public and staff to locate plots on a map

# Cemetery Map Solution



- ✎ Pilot project to determine viability of migrating from MapGuide 6.5 to MapGuide Open Source
- ✎ Technically relatively simple (paid consultant to develop HTML/CSS/JS application)
- ✎ Organizationally difficult to bring together four departments (I.T., Engineering, Finance, Public Works)
- ✎ DEMO [Cemetery App](#)



- ↳ MapGuide 6.5 deprecated
- ↳ Google Maps & co has changed user expectations, we can no longer deliver “expert” GIS interfaces by default.
- ↳ Can no longer develop just for Internet Explorer

# NanaimoMap Process



- ✦ Worked with DM Solutions group to build new flexible development framework for MapGuide Open Source
- ✦ In process of re-implementing deep integrations from old Nanaimo CityMap
- ✦ Considerable additional functionality
- ✦ DEMO [NanaimoMap](#) (pre-alpha)

## ↳ Mowing Management

- Field data capture
- Uses open source FDO to sync with Oracle
- DEMO [Mowing App](#)

## ↳ Parks and Trails

- Integrating MapGuide maps into business application

↳ On its own, Google Earth is cool...

- First thing everyone does is look at their house; many people spend hours sightseeing

↳ How to transition from this “coolness” into a useful business tool?

- Data!
- Web integration

# Why?



## ↳ Providing data to Google:

- Extended reach
- Solid base for distributed geospatial data.
- Disaster response

## ↳ Using internally:

- Free and easy 3-D visualization without server components
- Simple to publish KML: low cost, high benefit

- Our first foray into publishing data in KML format for Google Earth users
- Three simple layers for now:
  - Master (parks, lakes, parcels, city boundary)
  - Virtually Downtown (3-D buildings, panoramas)
  - Businesses from current business license database, organized by NAICS category
- DEMO <http://earth.nanaimo.ca/>

# Static KML publishing



- ✎ Finalizing MSI install of Google Earth 4.2 (free) for corporate distribution
- ✎ Making KML data (and SHP, SDF, DWG, DWF, etc) available to internal users from internal MapGuide implementation
- ✎ Intend to make some of this data available on public website (at no cost)
- ✎ DEMO



Map Window - Nanaimo On-line - Windows Internet Explorer

http://wolf\_test/webmap/map.cfm

Map Window - Nanaimo On-line

GENERATE QUERY PRINT PRINT SETUP RESET TOOLBARS PLACES OF INTEREST LEGENDS PARKS SEARCH HELP

MAP

- Infrastructure Studies
- Boulevard Mowing
- Roads
- School Catchment A
- Active Building Perm
- All Building Permits b
- Completed Building F
- Parks and Trails
  - Trails
  - Parks
    - City Owned
    - Other
- Business Improve
- Agricultural Land Re:
- Schedule G (Zoning
- Schedule H (Zoning
- Zoning (Individual Zc
- Development Permit
- North Slope Regime
- OCP Schedule A
- Water Bodies
  - Rivers
  - Lakes
  - Wetlands
- OCP Schedule B
- Coal Mines
- Aerial Photos
- Relief Map

Lat: 49.182982, Lon: -123.987540 Medium Grid : 452C 1 'Medium Grid' selected 1 : 23,745 3.97 x 3.26 (Km)

"Viewable" Area of Selected Properties: 2,999,990 m<sup>2</sup> - 741.3 acres

NANAIMO MAPGUIDE

javascript:openDWFPublisher("452C");

DWF Map Files - Windows Internet Explorer

## Map Files for Grid 452C

- DWG
- KML

nts 452c  
52c  
network 452c  
452c  
52c  
e 452c  
52c

network 452c

Cadastre 452c

Local intranet 100%

Road Network: 452c

# Ad-hoc visualisation



- ✦ The majority of proprietary and open source geospatial applications support KML output
- ✦ There are many tools that allow KML creation outside of traditional GIS environment
- ✦ 4-D representation of data particularly powerful
- ✦ DEMO
  - [Manager Tracker](#)
  - [Alternate Walkway Plan](#)

# Bringing it Together



- ↳ Building a platform for integration
- ↳ Creating applications that integrate business data in a geospatial context
- ↳ Making data available to allow users to perform their own integrations and ad-hoc analysis