

California GIS Conference

GIS 2.0: Squeezing New Value From Old GIS

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Full Disclosure: about Farallon



- IT Systems Integrators focused on GIS-centric Business Solutions
 - Ensure your GIS investment ROI
 - Geodatabase, Spatial web application services
 - Training, knowledge transfer
- Help our clients use GIS to achieve enterprise business objectives

Some History



- GIS starts as a grass roots effort in a department, developed to address a very specific and narrow business need



- Success; soon other groups are asking for maps



- Other departments start to grow their own, select technologies that best meet their own business needs



- Technology silos form; everybody is managing common “framework data” (parcels, streets, addresses, aerials). Plus their own special data.



- And... administrative, budgetary, cultural clashes between departments make it difficult to develop a cohesive approach.

Inevitably...



- Departments investment in multiple technologies that all do the same thing
- Redundant data management efforts (which is complete? Most current? Valid? "Mine!")
- Lack of coordinated administrative oversight
- Ad-hoc budgeting
- Training?

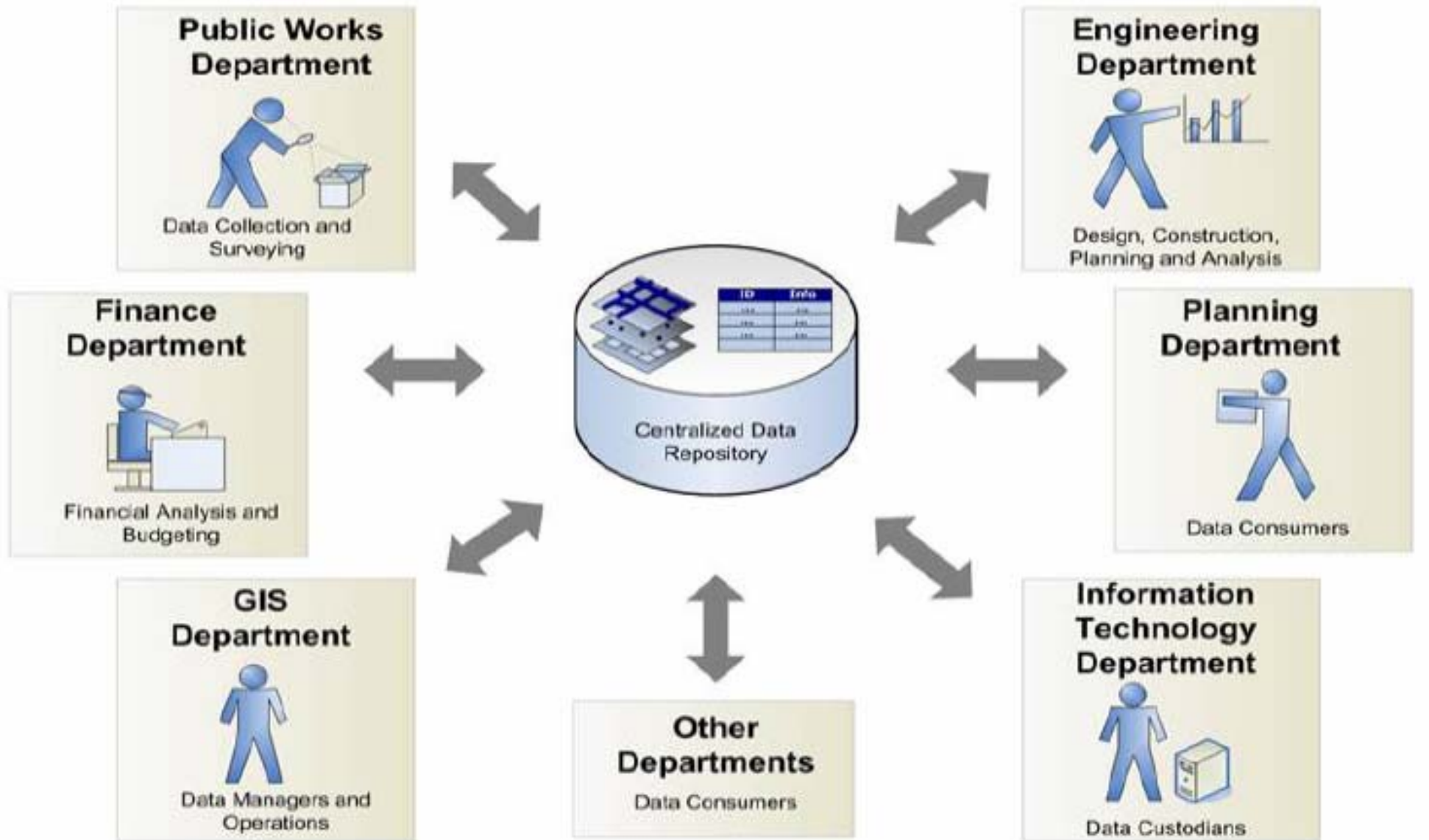
The problem...



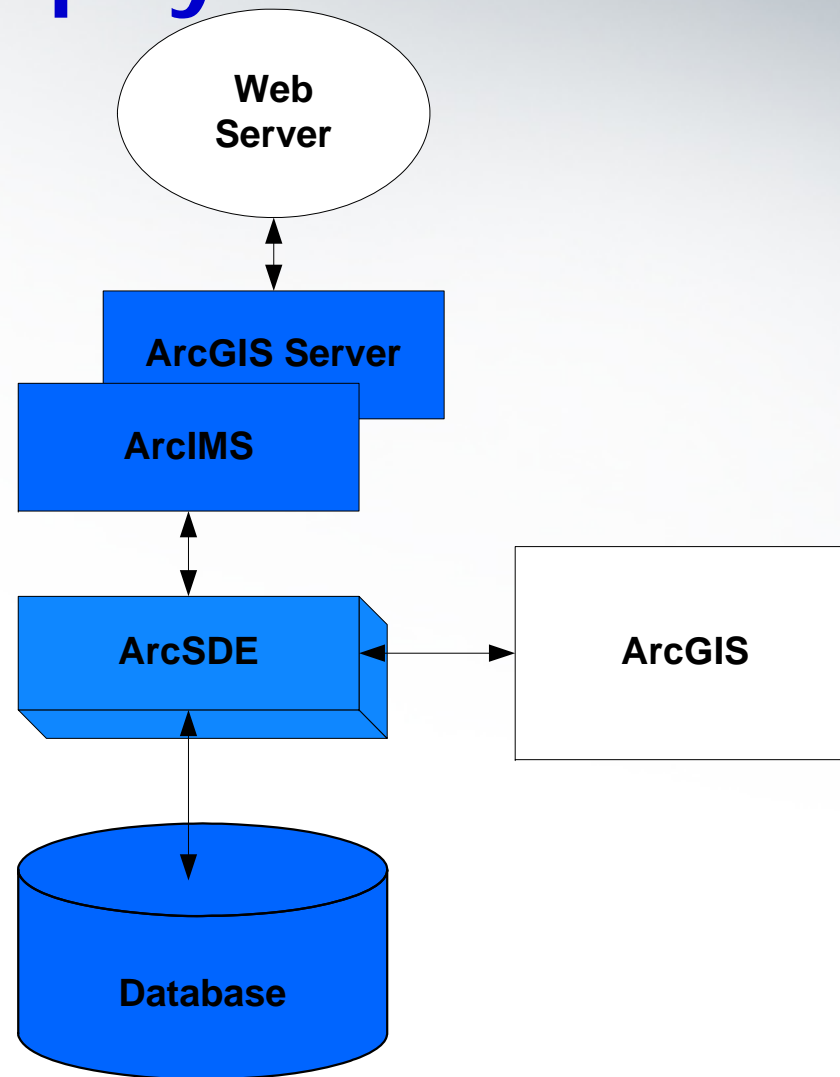
- Your most fundamental data exists as hundreds (thousands?) of files in each department

The Solution: Enterprise Approach

original slide by: Rod Schatz, M.Sc., GISP; UMary Engineering Ltd.



Enterprise GIS: Data and Technology for Expert Analysis and Cartography



For IT, GIS still a Black Box



- Spatial Reference Systems, Geodetic datums, Geometry, Rubbersheeting, Geocoding, Linear Referencing, topology, Conflation, spatial analysis, network analysis, Spatial joins...

For GIS, IT is complicated



- SOA, SQL, XML, J2EE, .NET, PHP, Asynchronous JavaScript, BPM, Virtualization, VOIP, CRM, ERP, SAAS, SOAP, UDDI, Web Services, Load Balancing, DBMS ...

And for everyone else, GIS still hard to use



County of Kern Public Online Mapping - Windows Internet Explorer

http://206.169.45.184/imf/imf.jsp?site=kern_pub

Kern County
Online Mapping System

About Layers Legend Key Map Bookmarks Locate Print PDF Help Exit

Map Layers [Feedback](#)

- Property
 - Address Points
 - Parcels 2006
 - Assessor Map Books
 - Tract Boundaries
 - Parcel Maps
- Transportation
- Townships-Sections & Survey
- Cities & Counties
- Representation, Districts, Voter
- Census & Traffic Analysis Zones
- Zoning/General Plan/Flood
- Lakes/Rivers/Precipitation
- Public Safety
- Zip Codes
- Public Buildings
- Schools & Attendance Areas
- Waste - Landfills & Sewers
- Parks & Campgrounds
- AG Crops
- Special Land Uses
- Faults
- Hillshade & Contours
- Air Photos

Automatically Refresh Map

Notes:

Scale: 1: 1,088,727 Map Tool: **Zoom In** Active Layer: *** NO ACTIVE LAYER ***

Powered by [geocortex](#)

Done Internet 100%

start MISAC... Inbox... Adobe... 2 Int... 3:01 PM

Best of all...



We've spent lots of time and money getting here...

For a typical mid-sized city or county, over 10 years:

- Data Costs: 1,000,000's of \$
- Software Costs: 100,000's of \$
- Training Costs: 10,000's of \$
- Staff Time: zillions? \$

Meanwhile... two new technologies were born that form the basis of GIS 2.0



34009 Alvarado-Niles Rd, union city, ca - Google Maps - Windows Internet Explorer

http://maps.google.com/

Google Maps

34009 Alvarado-Niles Rd, union city, ca

Search Maps

Search the map Find businesses Get directions

Maps

Print Email Link to this page

Map Satellite Hybrid

Address:
34009 Alvarado Niles Rd
Union City, CA 94587

Make this my default location

Get directions: [To here](#) - [From here](#)

[Search nearby](#)

©2006 Google, Map data ©2006 NAVTEQ

Done Internet 100%

start 2 Micr... 34009 ... C:_drw... Microso... 10:37 AM

And: Spatial Databases



- Spatial analytics run inside database using SQL
- Query results can be returned as XML for use by spatially unaware front-ends
- Scaleable, secure, well-known technology... able to use existing IT staff/resources to manage

```
C:\WINDOWS\system32\cmd.exe - sqlplus

SQL> select a.stopname, sdo_nn_distance(1) as distance from sfmtastops a,
2 sffacilities b
3 where b.fid=80
4 and
5 sdo_nn (a.geom, b.geom, 'sdo_num_res=5', 1)= 'TRUE'
6 order by distance;

STOPNAME                                DISTANCE
-----
Eddy St&Laguna St SE-FS/BZ              491.076043
Eddy St&Laguna St NE-NS/BZ              560.348677
808 Mcallister St NW-FS/BZ              577.380104
785 Mcallister St SE-FS/BZ              634.541711
Eddy St&Gough St NW-FS/BZ              660.158525

SQL>
```

Increasing Relevance of Geographic Information for non-experts



- Over 100,000,000 Google Earth Downloads in the past year

(GIS: 1,000,000 customers over the last 35 years)

Lay people beginning to see the value of simple, fast, convenient access to spatial data

Notice...



Mash-ups and spatial databases were NOT invented by GIS people...

But by folks who wanted to integrate business data with maps

Direct Feed From GIS to Google/Microsoft APIs:



Data Viewer - Microsoft Internet Explorer

Address: http://gis.fargo.com/blackhawk_ghad/pviewer/pviewer.html

HOME ASSET MANAGEMENT INCIDENT REVIEW CANYON LAKES FAQ

Blackhawk GEOLOGIC HAZARD ABATEMENT DISTRICT ASSOCIATION

Search for an APN
Enter city, address, or landmark

Map Satellite Hybrid

Info Chart

H104C - (flow rate gal/day)
Demo Version - Visit us at <http://www.scarlettech.com>.

ID	Flow Rate	Reading Date	Comments
1	H100C	28	12/1/1999
2	H101A	15	12/1/1999
3	H102C	38	12/1/1999
4	H102D	23	12/1/1999
5	H103A	595	12/1/1999
6	H103B	776	12/1/1999
7	H103C	14	12/1/1999
8	H104A	20	12/1/1999
9	H104B	20	12/1/1999
10	H104C	20	12/1/1999
11	H12E	46	12/1/1999
12	H12I	64	12/1/1999
13	H12J	218	12/1/1999
14	H13E	6	12/1/1999
15	H13H	1191	12/1/1999
16	H13J	714	12/1/1999
17	H14A	34	12/1/1999
18	H14B	2	12/1/1999
19	H204B	31	12/1/1999
20	H204C	35	12/1/1999
21	H205E	6	12/1/1999

Ready.

Critical Piezometers
Incidents

www.fargo.com

How it can work (in a nutshell):

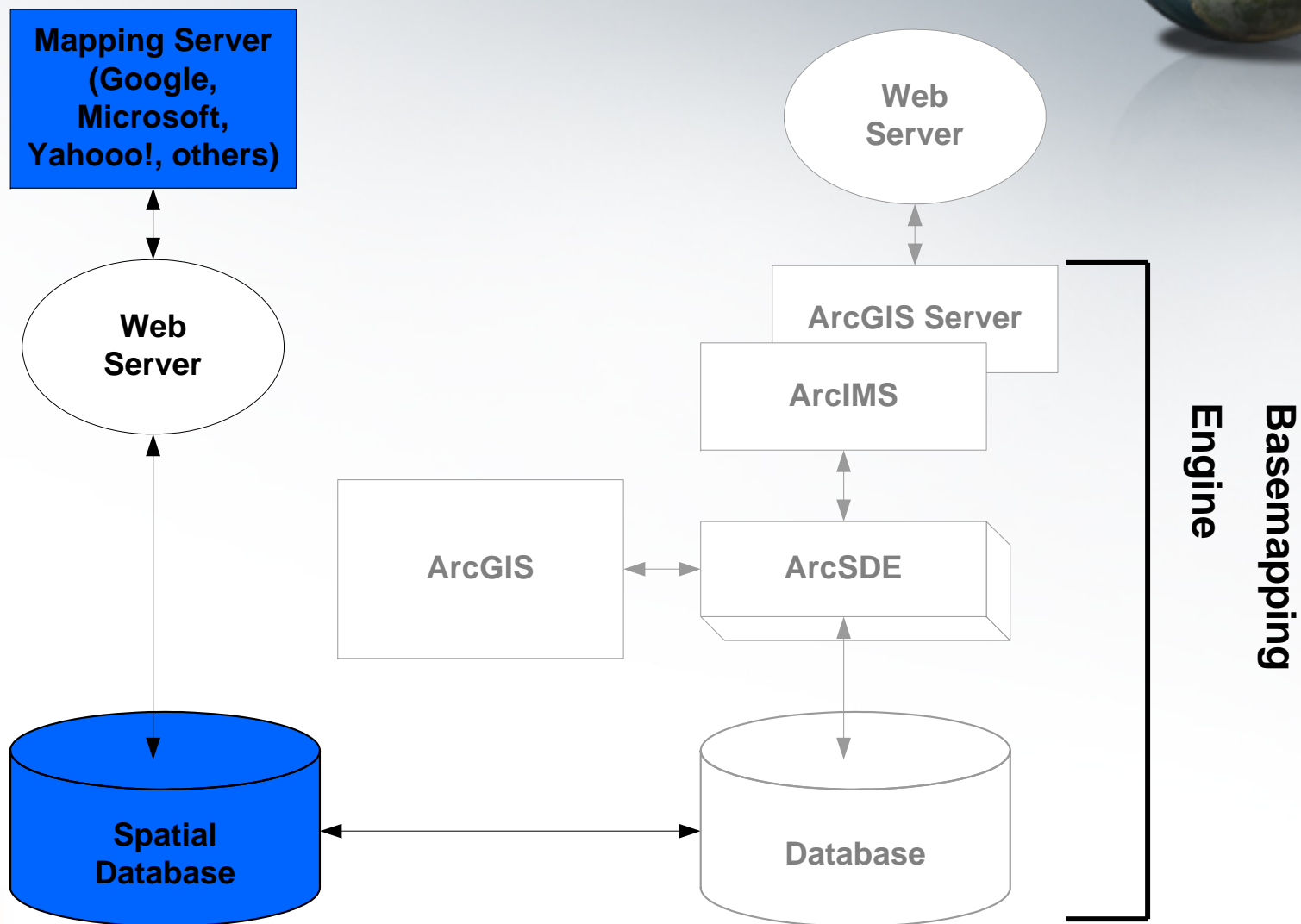


- Coordinates managed/maintained in your enterprise GIS
- Data copied to an external spatial database on a regular basis
- SQL script or simple web service builds XML based on user request or query in the database
- Result set rendered in a public mapping API

Distributed Systems: An Opportunity for Increasing Business Use of Your GIS Data:



Basemapping Engine



The Result...



http://dev.fargeo.com/CCCED/ - Microsoft Internet Explorer

File Edit View Favorites Tools Help

Address http://dev.fargeo.com/CCCED/

Google

Contra Costa County California

Economic Development

QUICK SEARCH

METRO / CITY: Concord

PRICE FROM: \$150,000

PRICE TO: \$200,000


SQFT MIN: No Min

SQFT MAX: No Max

SEARCH

221 Barkley Ave

22500 sq ft
zone: mixed use
avail: 10/14/06



Add to my collection
zoom to street level
[View Building in Google Earth](#)

Done Internet

start Microsoft PowerPoint ... http://dev.fargeo.com ... 7:23 AM

www.fargeo.com

Fly To Local Search Directions

e.g. Hotels near JFK

Places

- My Places
 - PARCEL_UPDATE_ATTRIBUTES.shp
 - FEMA_fld_polys.shp
 - SAMPLE Hazzard Materials Business
 - [NGA Hurricane Relief Imagery](#)
Access the latest imagery from hurricaneimagery.org provided by NGA.
 - GE Data Feeds
 - DRW
 - Sightseeing
 - default
Google Earth default view
- Temporary Places
 - bldgs_apn.shp
 - bldgs_apn
 - zoning_historic.shp

Layers

- National Geographic Magazine
- Google Earth Community
- Community Showcase
- Google Earth Community (Unrank)
- Dining
- Lodging
- Banks/ATMs
- Bars/Clubs
- Coffee Shops
- Shopping Malls
- Major Retail
- Movie/DVD Rentals
- Grocery Stores
- Pharmacy
- Gas Stations
- Golf
- Sports Venues
- Parks/Recreation Areas
- Fire/Hospitals
- Schools
- Elementary School Districts



Pointer 38°18'42.17" N 122°27'01.60" W elev 413 ft

Streaming 100%

Google

Eye alt 3304 ft

- Lodging
- Roads
- Terrain
- Dining
- Borders
- Buildings



Oracle XE, An Example of a Free Spatially Aware Database



- Small footprint version of Oracle Database Free to develop, deploy, distribute
- Simple, web-based management console
- Native spatial data, analysis, management
- 100% compatible with enterprise version of Oracle

Why XE?



- Handles Spatial Analysis in advance of rendering in Mapping API
- Supports GIS features natively (points, line, polygons, etc.) using SQL
- Works with desktop GIS software: ESRI, Intergraph, Autodesk, MapInfo, Manifold
- Open geometry spec and OGC standards-compliant
- Native spatial indexing, operators; coordinate system support

Direct Feed From Spatial Database to Google/Microsoft APIs:



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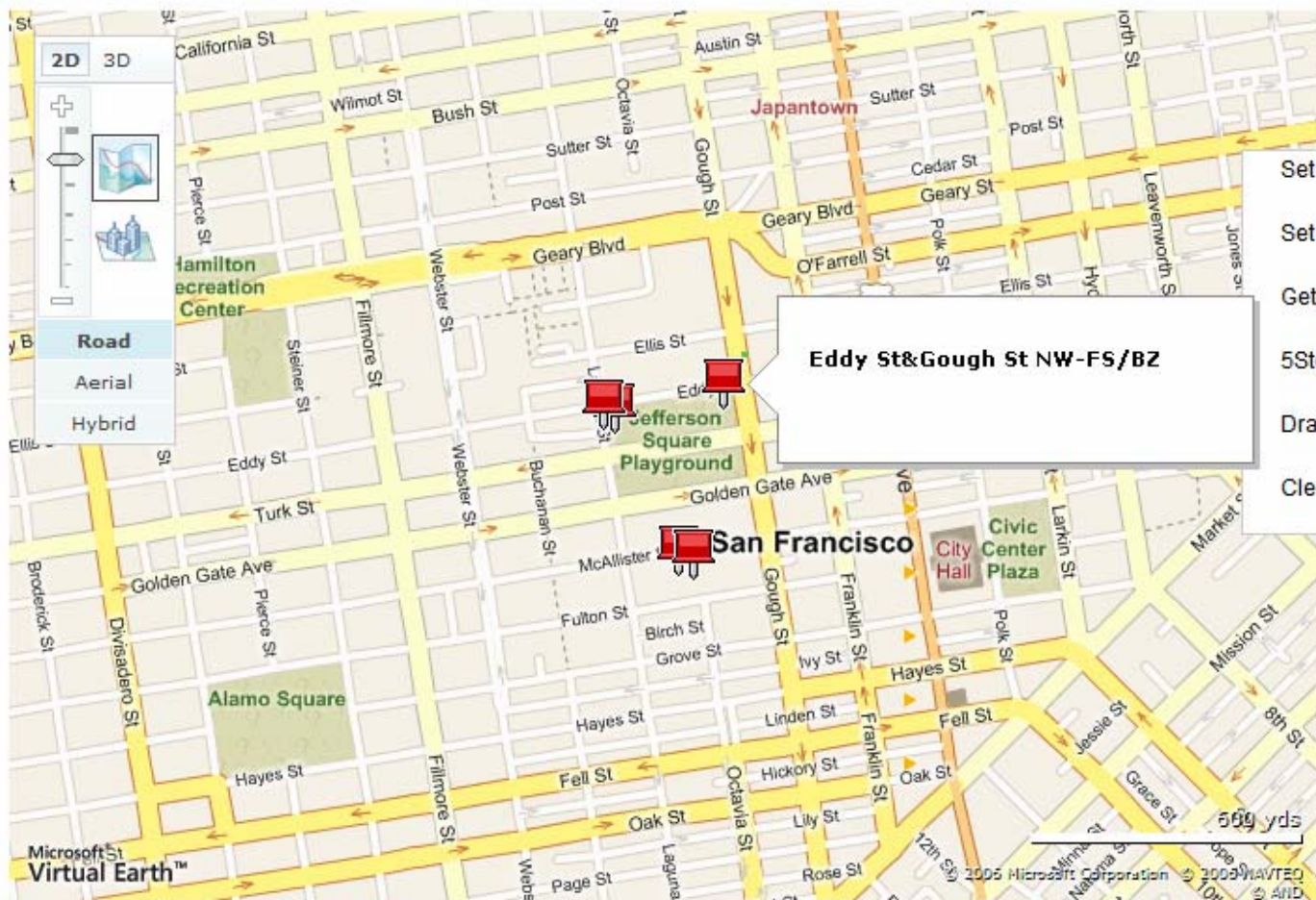
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808 Mcallister St NW-FS/BZ	577.380104
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Eddy St&Gough St NW-FS/BZ	660.158525

SQL>

ANONYMOUS Logout

Page 1

MAP



- Set Start
- Set End
- Get Directions
- 5Stops
- Draw Route
- Clear all lines

javascript://pushin hover

Mapguide Open Source Server Provides Additional Capabilities



- Build the same fast applications with your own basemap features
- Support more sophisticated GIS analyses
- Blend traditional GIS Mapping Server capabilities with new visualization technology

Benefits of GIS 2.0 Approach



- Fast
- Simple
- Free
- Familiar to Users
- Scalable
 - Built to support 1000's of simultaneous users
- Modern (APIs use standard IT tools)
 - Asynchronous JavaScript
 - XML
 - Services Oriented Architecture

More Benefits



- High Quality
 - Excellent data/cartographic quality
 - Street maps/commercial data
 - Aerial photographs (orthos, oblique, 3D, photorealistic)
 - 3-d models
- Convenient
 - No Basemap Maintenance Required
 - Geocoding Functionality
 - Routing Functionality
- Seamless
 - View maps, aerials beyond municipal boundary

Show Me the Money...



Avoiding a single new set of GIS licenses means saving:

Software	Typical GIS	Free API, Spatial Db	Savings
Desktop GIS	\$2k to \$7k	n/a	0
Internet Mapping Server	\$12k	0	\$12k
Database Middleware	\$13k	0	\$13k
Database instance	\$5k	0	\$5k
Cost Savings			\$30k

Plus ongoing costs for software maintenance

But...



- Myth: No real savings
 - Still need to train staff, support multiple vendors
 - But mainstream, standards-based technology (eg, XML) is everywhere. IT staff should already have these skills.
- Myth: No support for free, open source
 - Oracle, Autodesk
 - Farallon Geographics
 - Active User Community: OGC, OSGEO, others
- Myth: Not ready for mission critical apps
 - Internet runs on open source (Apache, Linux, etc.)
 - Google runs its business on free/open source software

You Now Have Options for application development.

We Advocate:

- Enterprise GIS:
Specialized Software for GIS Experts:
Maintenance, Desktop Analyses, Desktop
Cartography
- “GIS 2.0” for Business Applications:
Open, Standards-based, and Cost Effective
Architecture for Developing Spatially-Enabled
“Published” Business Applications for non-
experts



To Do: Evaluate Emerging GIS Technologies



- Free APIs
 - Google Maps, Google Earth, Virtual Earth, Yahoo!
- Free Geospatial Software
 - Oracle XE
 - uDig, GRASS
- Open Source
 - Databases (PostGIS, MySQL)
 - Web Mapping Servers (MapGuide, many others)

(I m)ponderables



- “The new source of power is not money in the hands of a few but information in the hands of many. “
– John Naisbitt, Megatrends
- “The application of GIS is limited only by the imagination of those who use it”
– Jack Dangermond, President, ESRI
- “The barriers to adoption of open source technology in the geospatial industry are mental”
– Gary Lang, VP Autodesk



Thank You!

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