

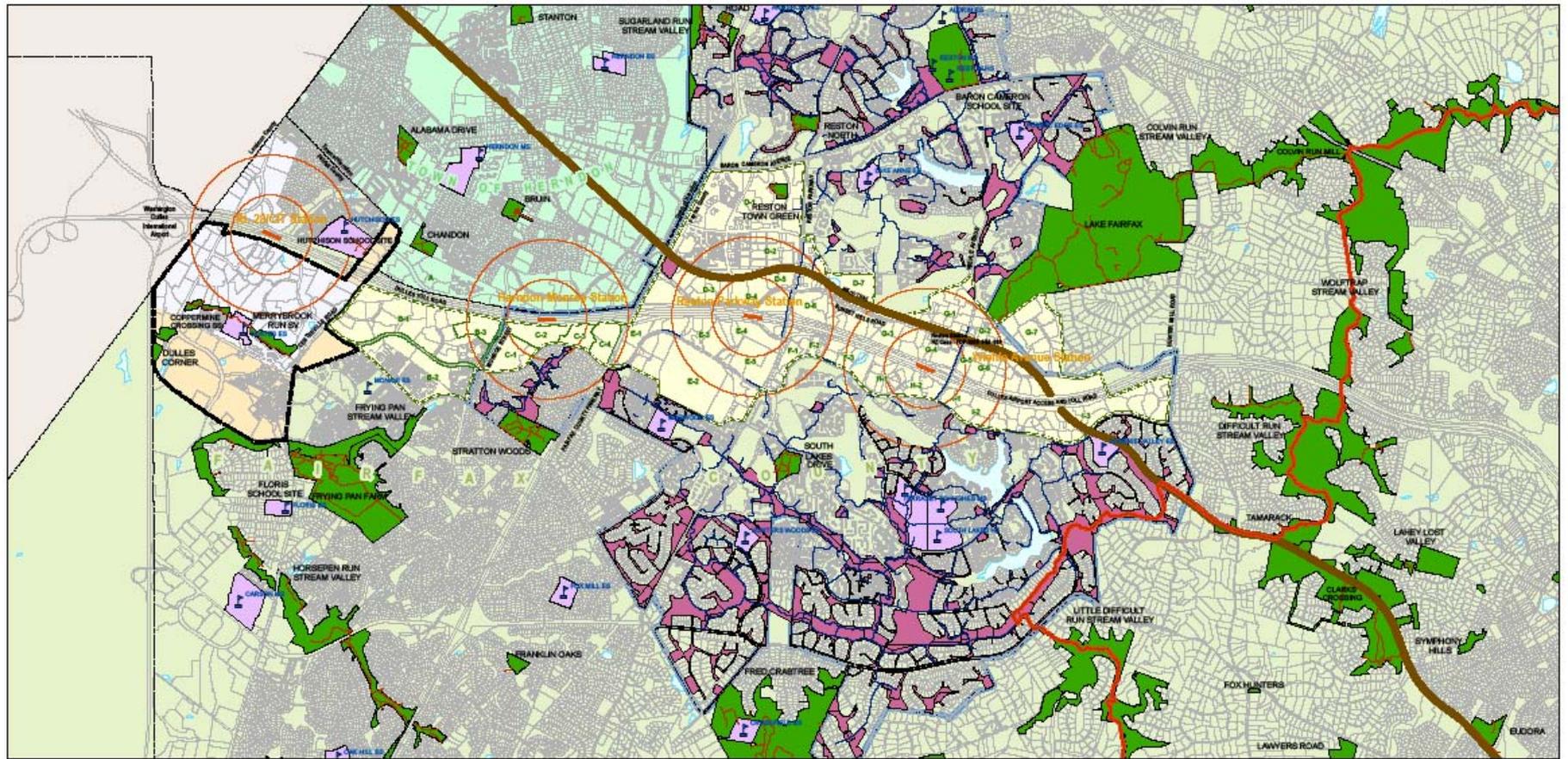
GIS Excellence Awards 2009



Fairfax County, Virginia

GIS Excellence Awards 2009

CARTOGRAPHIC CATEGORY



**Reston Master Plan Special Study
Park Analysis : Existing Conditions
Fairfax County, Virginia, 2009
EXHIBIT 2 : Parkland and Schools**

Legend

-  Reston Boundaries
-  Reston-Herndon Suburban Center Land Units and Sub-units
Note: Land Unit A is not part of special study. Planning responsibility for Land Unit A has reverted to the Town of Herndon.
-  General Location Transit Station Platforms
Circles denote 1/4 and 1/2 mile distances from center of station platform
-  Fairfax County Park Authority Park Land
-  Reston Association Park Land
-  School Property
-  School Facilities
-  W & O DRR Trail
-  Cross County Trail
-  FCPA Trails
-  Reston Trails



Map prepared by FCPA
Planning & Development Division
September 2009
G:\projects\parkland\2009\Reston_Dulles
Reston-Dulles_Special_Study_2009.mxd



Third Place
Reston Master Plan Special Study Exhibit
Buddy Rose, Pat Rosend, Andy Galusha, Sandy Stallman
Park Authority

LOCAL ATTRACTIONS



Burke Lake

Lake Accotink

Lake Fairfax

Fairfax Corner Shopping

Tysons Corner Shopping

Fair Oaks Mall

Springfield Mall

Meadowark Gardens

Fairfax Station Railroad Museum

Smithsonian National Air and Space Museum Steven F. Udvar-Hazy Center

Frying Pan Farm Park

Green Spring Garden & Horticultural Center

Fairfax County Government Center

George Washington's Mount Vernon Estate & Gardens

Workhouse Arts Center

Fairfax County Courthouse

Gunston Hall

Woodlawn

Sully Historic Site

Chantilly Battlefield

Claude Moore Colonial Farm

George Mason University

Colvin Run Mill

Northern Virginia Community College

Ft. Belvoir Military Base

Great Falls National Park

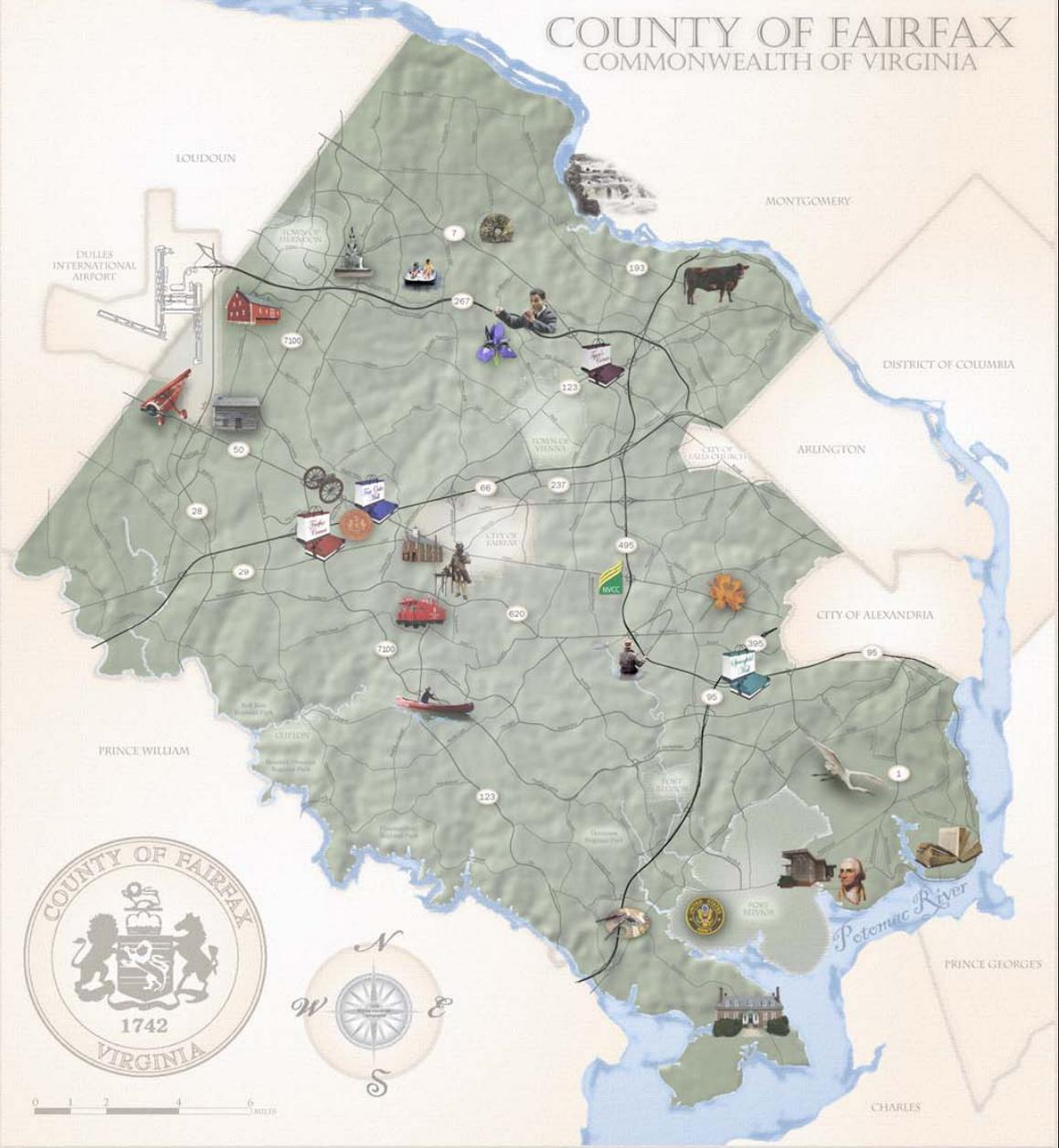
Reston Town Center

Huntley Meadows

Collingwood Library & Museum on Americanism

Wolf Trap National Park for the Performing Arts

COUNTY OF FAIRFAX
COMMONWEALTH OF VIRGINIA



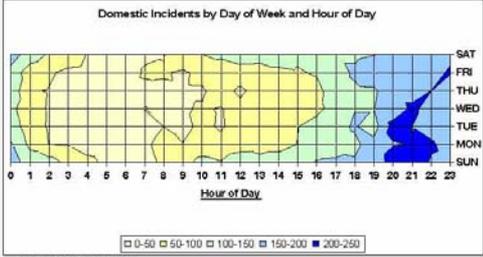
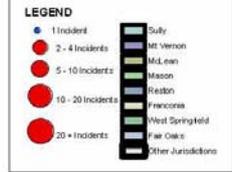
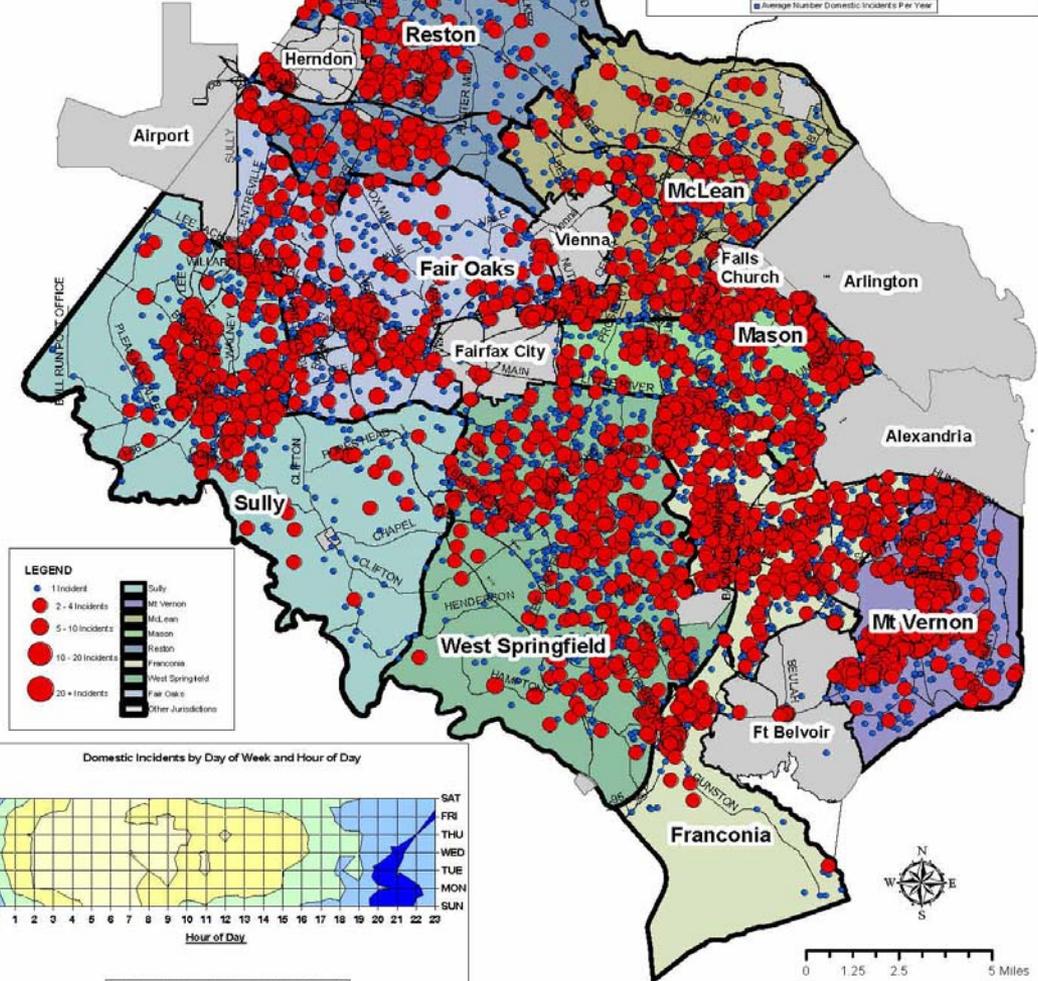
Second Place
 Fairfax County Featuring Local Attractions
Krystal Workman
 Department of Housing & Community Development

GIS Excellence Awards 2009

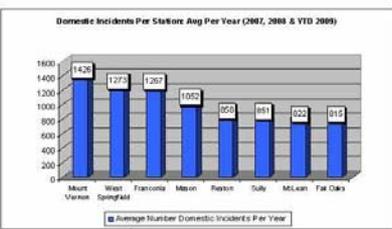
ANALYTIC CATEGORY



Analysis of Domestic Incidents in Fairfax County Past 24 Months (October 2007 - September 2009)



Prepared: 10/21/09, Camie King

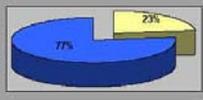


DOMESTIC INCIDENTS IN FAIRFAX COUNTY

The following map displays domestic dispute, domestic violence and domestic assault events in Fairfax County in the past 24 months. There were 8,465 domestic incidents in Fairfax County in 2007 and 8,417 in 2008. There have been 5,963 domestic incidents between January and September 2009.

ANALYSIS OF DOMESTIC INCIDENTS IN FFX COUNTY

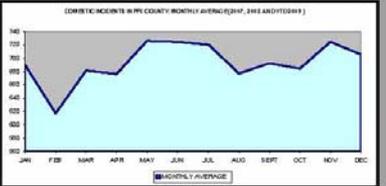
During the previous 24 months, 2,701 households (23%) experienced more than one reported domestic incident.



The stations located on the southern and eastern end of the county have more domestic related incidents per year.

TEMPORAL ANALYSIS

Domestic Incidents show a decrease in February likely due to the decreased number of days that month. Domestic Incidents tend to increase during the summer months and then decline in August and September. This is likely due to the start of the school year. Victims tend to delay reporting as they want the family to be "intact" for the sake of their children as they start school.

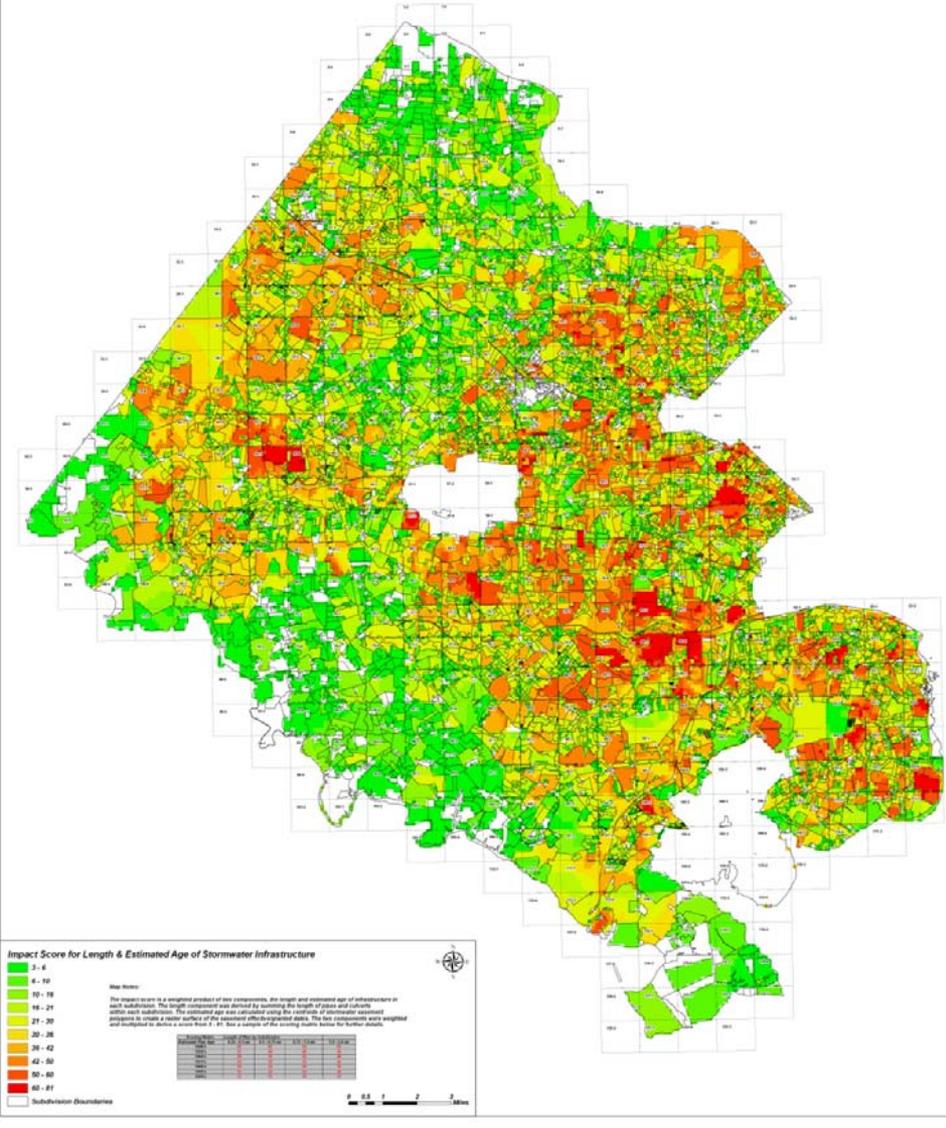


Incidents are most commonly reported between 1700 and 0100 hrs. The most common hour for reports is 2100 hrs. In addition, the most common days of week for reports are Saturdays and Sundays. One may infer that these times and days are more common for reports as they relate to times when families are together (evenings and weekends).

Third Place
Domestic Incidents in Fairfax County (2007-2009)
Camie King
Police Department



Length and Estimated Age of Stormwater Infrastructure by Subdivision



Second Place

Length and Estimated Age of Stormwater Infrastructure by Subdivision

Keith Appler

Department of Public Works and Environmental Services, Stormwater Management



Herndon Fire Station Alternatives: Emergency Response Performance Analysis

Planning Project



The Fairfax County Fire and Rescue Department (FRD) needed to analyze the operational impact of relocating the Herndon fire station to an alternative site.

Background:

The Herndon fire station, built in 1950, is located in the middle of the Town of Herndon and is the oldest fire station in Fairfax County, Virginia. Emergency call volume has increased in the past 15 years and is projected to grow. The station houses two apparatus which is insufficient to meet the future emergency service needs of the planned high density commercial and residential development along the Dulles Road Corridor.

Process:

To determine the operational impact of relocation of the fire station to the two sites, several analyses were performed using a combination of GIS-based analytical tools against the current location.

Site Comparison:

The FRD was asked to evaluate a county property (school site) in addition to a Town of Herndon property (police site) and make a recommendation. For the school site, a portion of the property would be allotted for the fire station. For the police site, over \$5 million would be needed to purchase a portion of the site and building demolition would be required.

April 2008, Copyright 2007 Commonwealth of Virginia

GIS Analysis

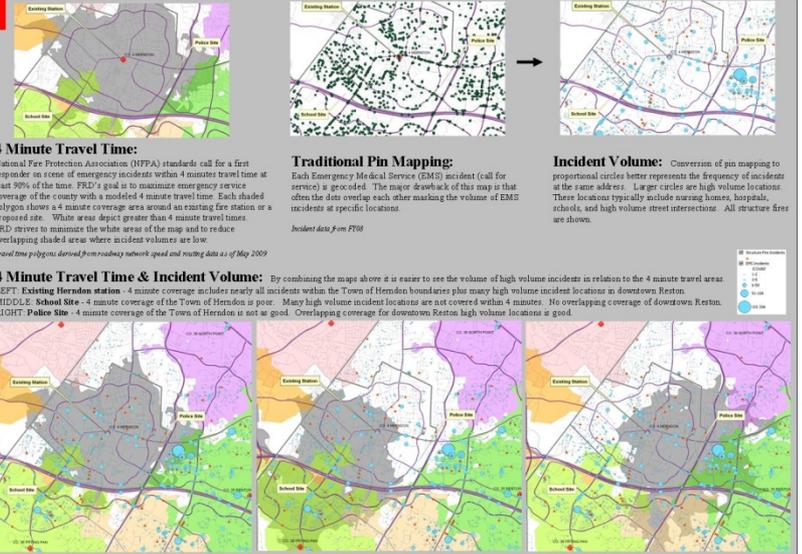


Residential Population: In general, the larger the population the greater the number of calls for service. Many factors can influence this generally including: age/young population, transient population due to major transportation corridors, specific high-demand locations, and socio-economic levels.

Data Source: HSLTAC Population 2000
Population per Area

Incident Density: Fire and Emergency Medical (EMS) Incidents for FY2008. Choropleth Mapping of total incident count by fire box area.

Count / Firebox



4 Minute Travel Time: National Fire Protection Association (NFPA) standards call for a first responder in cases of emergency incidents within 4 minutes travel time at least 90% of the time. FRD's goal is to maximize emergency service coverage of the county with a modeled 4 minute travel time. Each shaded polygon shows a 4 minute coverage area around an existing fire station or a proposed site. White areas depict greater than 4 minute travel times. FRD strives to minimize the white areas of the map and to reduce overlapping shaded areas where incident volumes are low.

Travel time polygons derived from roadway network speed and routing data as of May 2009

Traditional Pin Mapping: Each Emergency Medical Service (EMS) incident (call for service) is geocoded. The map or stackback of this map that often the dots overlap each other masking the volume of EMS incidents at specific locations.

Incident data from FY08

Incident Volume: Conversion of pin mapping to proportional circles better represents the frequency of incidents at the same address. Larger circles are high volume locations. These locations typically include nursing homes, hospitals, schools, and high volume street intersections. All structure fire are shown.

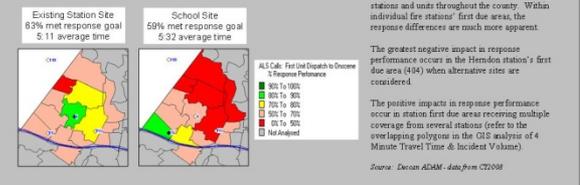
4 Minute Travel Time & Incident Volume: By combining the maps above it is easier to see the volume of high volume incidents in relation to the 4 minute travel areas.

LEFT: Existing Herndon station - 4 minute coverage includes nearly all incidents within the Town of Herndon boundaries plus many high volume incident locations in downtown Reston.
MIDDLE: School Site - 4 minute coverage of the Town of Herndon is good. Many high volume incident locations are not covered within 4 minutes. No overlapping coverage of downtown Reston.
RIGHT: Police Site - 4 minute coverage of the Town of Herndon is not as good. Overlapping coverage for downtown Reston high volume locations is good.

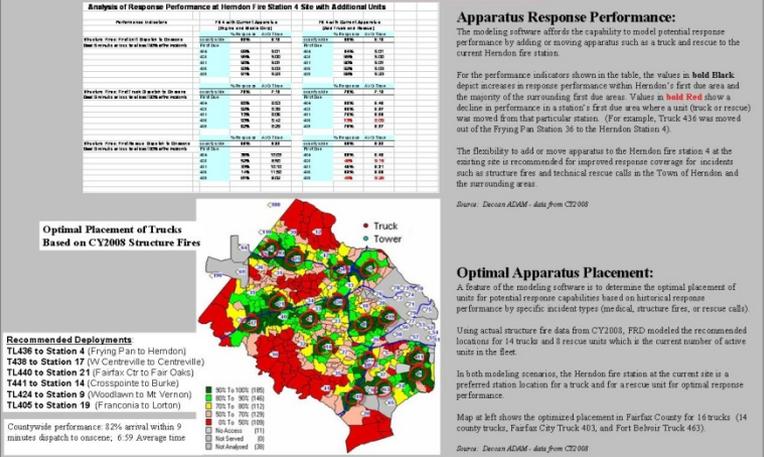
Analysis of Response Performance at Alternative Sites

Analysis of Response Performance at Alternative Site for Herndon FS 4

Performance Indicator	Existing Station Site	School Site	Police Site
All Data: First Responded to within 5 minutes	83%	59%	51%
All Data: First Responded to within 10 minutes	95%	85%	75%
All Data: First Responded to within 15 minutes	98%	92%	85%
All Data: First Responded to within 20 minutes	99%	95%	90%
All Data: First Responded to within 25 minutes	99%	96%	92%
All Data: First Responded to within 30 minutes	99%	97%	93%
All Data: First Responded to within 35 minutes	99%	97%	94%
All Data: First Responded to within 40 minutes	99%	97%	94%
All Data: First Responded to within 45 minutes	99%	97%	94%
All Data: First Responded to within 50 minutes	99%	97%	94%
All Data: First Responded to within 55 minutes	99%	97%	94%
All Data: First Responded to within 60 minutes	99%	97%	94%



Modeling Apparatus Placement



Conclusions

Results of the GIS-based analysis included the following:

- The preferred station location for optimal response coverage for all emergency incidents in the Town of Herndon and the surrounding areas is at the existing site in close proximity.
- The County school site is not a viable option and was eliminated from consideration.
- The Town police site is a viable alternative but is not the optimal site for coverage.
- The FRD is currently pursuing a feasibility study to build a multi-story fire station (with underground parking) with the flexibility to house additional specialty units to address the limitations of the current site.

Financial Benefits

The results of this analysis provided the data and justification of potential improved response coverage which enabled the FRD to submit an application for a FEMA Fire Station Construction grant of \$5 million. Furthermore, if a new station is constructed on the existing site, the County will save approximately \$5.6 million in land acquisition cost.



GIS Excellence Awards 2009

AGENCY CATEGORY

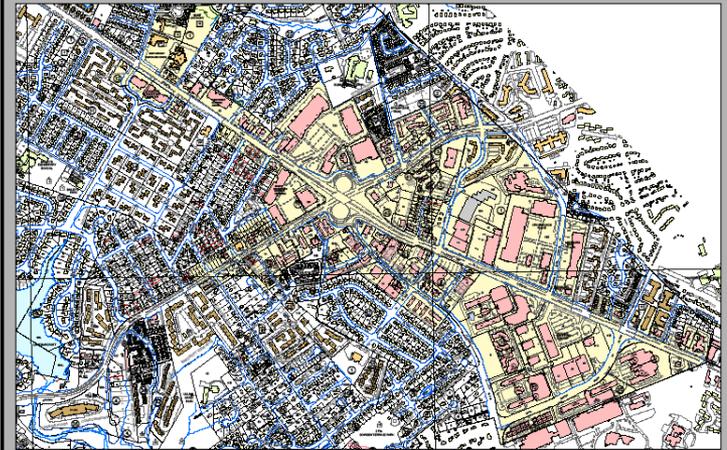
Best Use of GIS on the Web

FAIRFAX COUNTY COMMERCIAL REVITALIZATION AREAS AND DISTRICTS



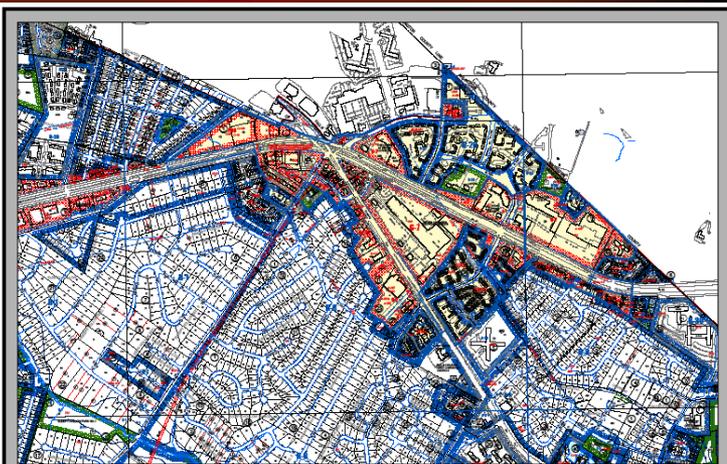
Legend
 COMMERCIAL REVITALIZATION AREA (CRA)
 COMMERCIAL REVITALIZATION DISTRICT (CRD)

Note: Not all features are drawn to scale
 Map Produced November 13, 2008 by Fairfax County Office of Community Revitalization and Reinvestment



**Bailey's Crossroads Section of
Bailey's Crossroads and Seven Corners
Commercial Revitalization District**

Legend
 Commercial
 Industrial
 Other
 Single Family Residential
 Public
 OCRR Office of Community Revitalization & Reinvestment
 Fairfax County, Virginia
 Map Created March 27, 2009 by OCRR



**Seven Corners Section of
Bailey's Crossroads and Seven Corners
Commercial Revitalization District Zoning Map**

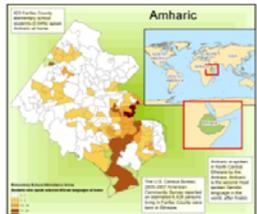
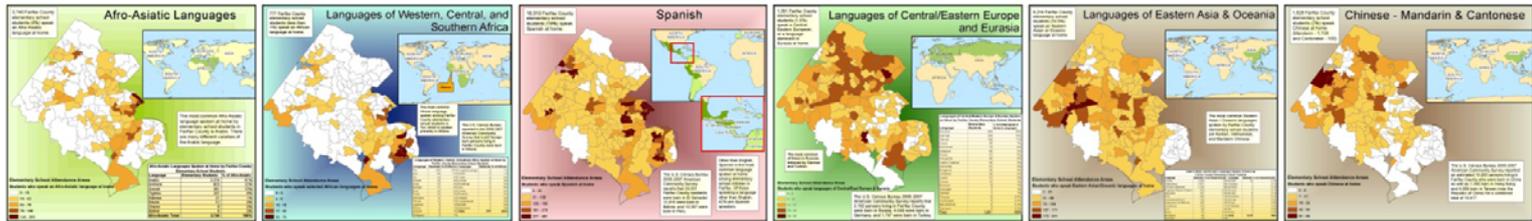
Legend
 Commercial
 Industrial
 Other
 Single Family Residential
 Public
 OCRR Office of Community Revitalization & Reinvestment
 Fairfax County, Virginia
 Map Created March 27, 2009 by OCRR

New Office of Community Revitalization and Reinvestment Website
Office of Community Revitalization and Reinvestment
 Adam Kelly

GIS Excellence Awards 2009

AGENCY CATEGORY

Best Use of GIS for Public Outreach



38,760 Fairfax County elementary school students (44%) speak a language other than English at home.

Students who Speak a Language Other than English at Home Fairfax County Elementary School Districts May 2009

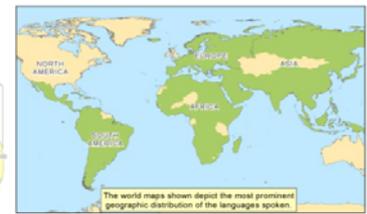
Top Five Languages (Other than English) Spoken by Elementary School Students at Home

Language	Elementary Students	% of All Students	% of Non-English
Spanish	18,310	19%	42%
Korean	3,029	3%	8%
Vietnamese	2,557	3%	7%
Arabic	2,274	3%	6%
Urdu	1,729	2%	4%
Chinese / Mandarin	1,728	2%	4%

Foreign-Born Population in Fairfax County by Continent

Continent	All Persons	% of Foreign-Born
Asia	140,161	50%
Latin America	83,867	30%
Africa	26,644	10%
Europe	24,296	9%
Other	3,530	1%

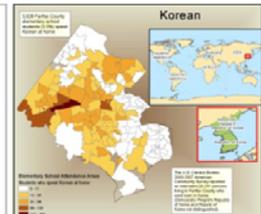
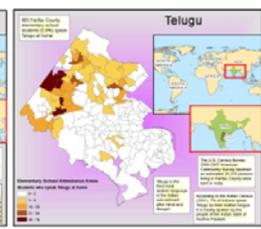
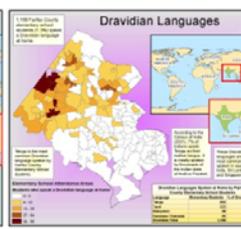
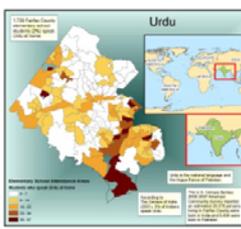
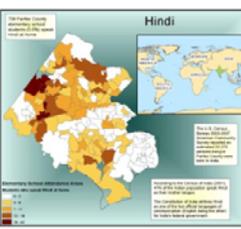
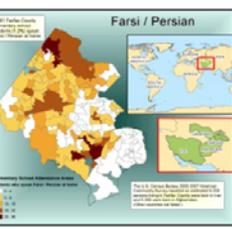
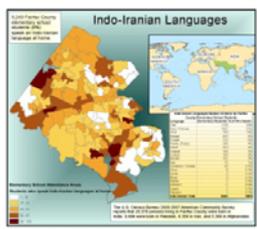
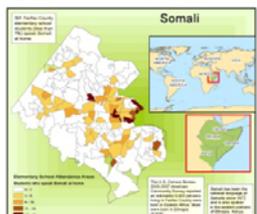
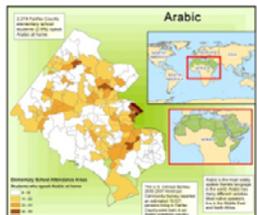
The U.S. Census Bureau 2005-2007 American Community Survey reports that approximately 278,498 persons living in Fairfax County are foreign born. This accounts for about 28% of the total county population.



These language maps depict the geographic distribution of Fairfax County elementary students who speak languages other than English at home. Only data for elementary school students are used in these analyses because the secondary schools have different geographic boundaries from which they draw students. Due to the large number of languages spoken in Fairfax County, only selected languages and language groups are shown. The surrounding smaller maps illustrate groups of language families, languages grouped by geographic region, and individual languages as noted with coordinating background colors.

The 2008 American Community Survey conducted by the U.S. Census Bureau indicated that 29 percent of Fairfax County's residents age five years and older speak a language other than English at home. Fairfax County Public Schools information indicates that 44 percent of all elementary school students speak a language other than English at home as of May 2009. These households containing elementary students who speak languages other than English at home form a very diverse group with more than 100 different languages being spoken.

Not all households which speak a language other than English contain members who are immigrants. Data from the 2000 Census indicate that 83 percent of the households that speak a language other than English at home had at least one member who was an immigrant. However, all of the household members were native-born citizens in 17 percent of these households.



GIS Excellence Awards 2009

AGENCY CATEGORY
Most Significant Data Contributor

Enhancing a Routable Centerline for Enterprise GIS

Department of Fire and Rescue (FRD) committed extensive resources to improve the enterprise centerline. Routable street networks have always been important to the FRD because of the business emphasis on response times. Previous to this initiative, the department maintained its own street centerline with speed limits. This was very time consuming and wasn't as accurate as desired. With the County's adoption of the Intergraph Computer Aided Dispatch (CAD) System which uses proximity based dispatch, there was a definite need for an improved routable centerline.

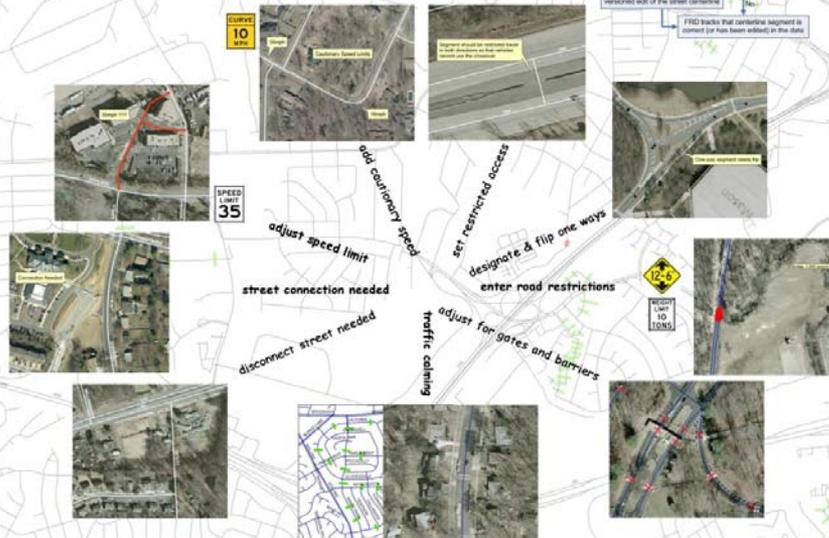
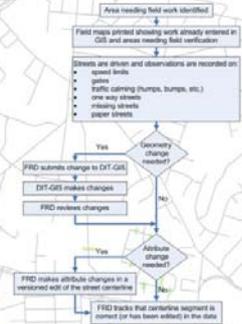
Streets were driven by light-duty Firefighters, information was collected, vehicle drivers in the fire stations were interviewed, and GIS Analysts made attribute changes & forwarded geometry changes to DIT-GIS.

The improvements to the centerline included adjusting speed limits to match signage and correct data errors; locating street connection problems of unconnected streets and unbuilt (paper) streets; adding data for impediments to travel such as restrictions, gates and traffic calming devices; and adding oneway data.

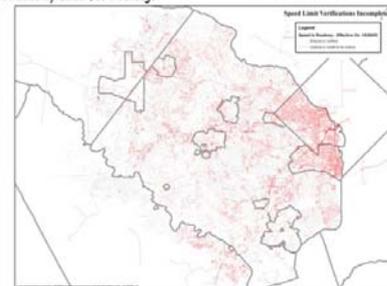
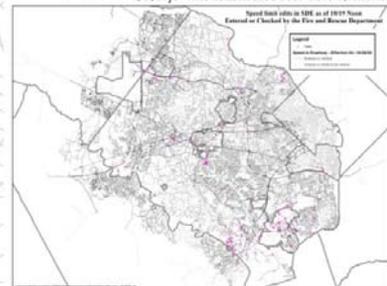
- Various stages of preparing data for routing are possible.
- I. Distance based only. Routing is based on proximity only.
 - II. Travel time based on road classification. For example, all interstates are 55 and all local roads are 25. In relatively urban Fairfax County, there is too much variability among road classes to assign a single speed limit.
 - III. Field verified speed limits. In Fairfax County, the majority of streets with speed limit signs have been field verified.
 - IV. Other source verification for unposted streets. Aerial imagery and driving unposted streets is helping FRD assign speed limits to streets without signs.
 - V. Impediments to full travel speed. FRD is also factoring in changes in travel speed based on traffic calming devices and barriers such as gates.
 - VI. Fully integrating turns and stops. At this time, turn restrictions, turn impedances, and intersection impedances are beyond our scope.

Currently, the Fire & Rescue Department has taken the centerline data from stage II to stage V. This has been a labor intensive process involving uniformed firefighters and civilian GIS staff.

Verification & Editing Process



In the last year, FRD has verified or reviewed over 4,200 miles of roadway used for Public Safety. This constitutes over 58% of the total roadway used for routing.



GIS Excellence Awards 2009

AGENCY CATEGORY
Most Significant Progress

Massing Models for Site Density



BRAC APR Nominations



Arc GIS was used to create Feature Classes for the basis of the Models.

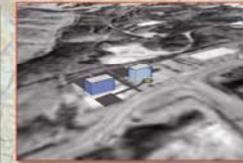


The SketchUp Plug-in for ArcGIS was an integral part of getting the shapes into a useful format.

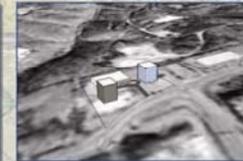


Additional GIS layers can be overlaid to provide accurate depictions of the site. In the example above the RPA was overlaid to define the developable site.

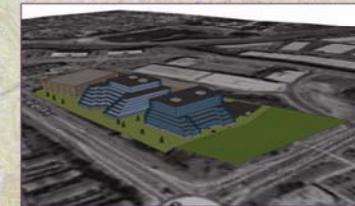
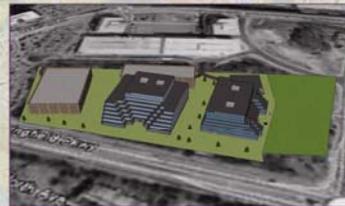
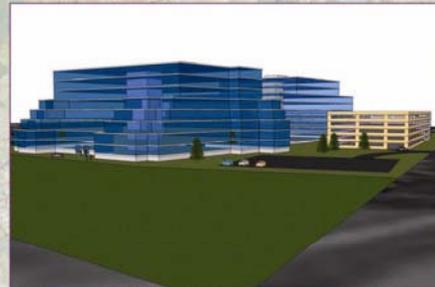
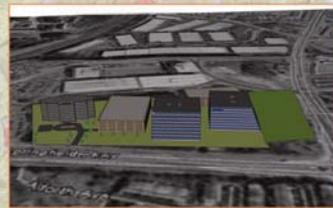
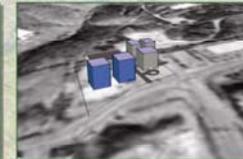
.50 Floor Area Ratio



.75 Floor Area Ratio



Maximum Floor Area Ratio Under Current Zoning Regulations

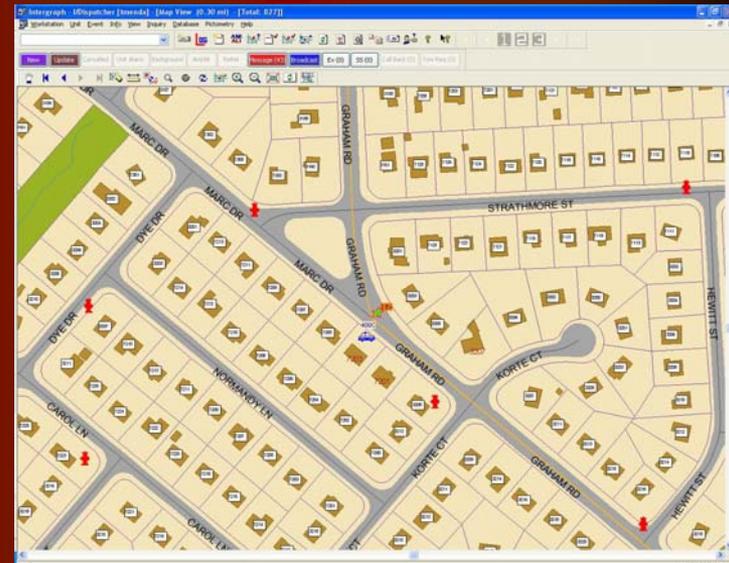
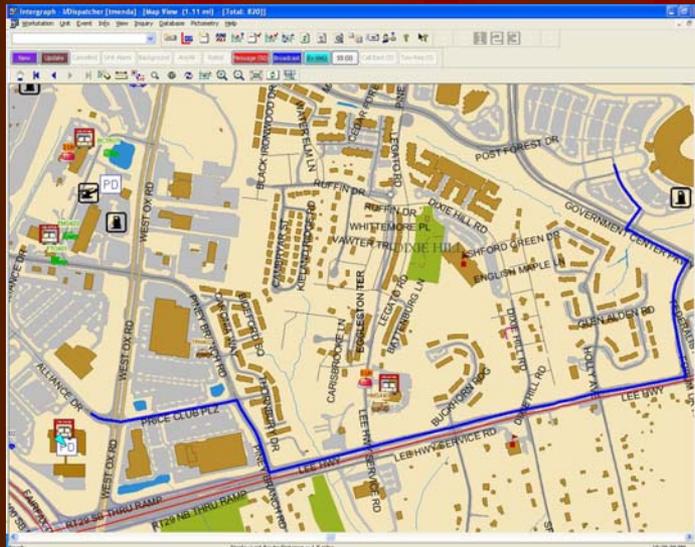
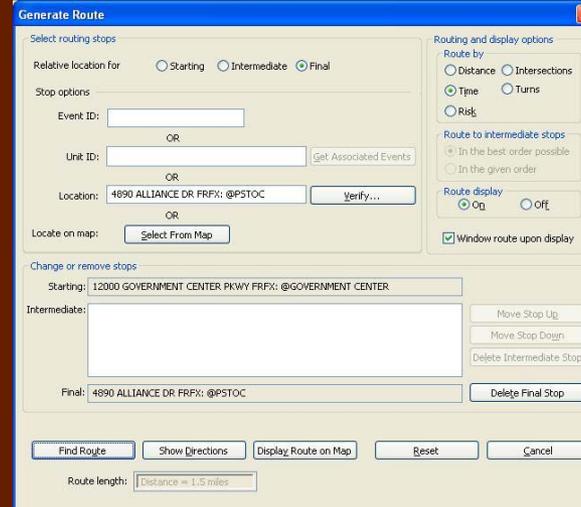
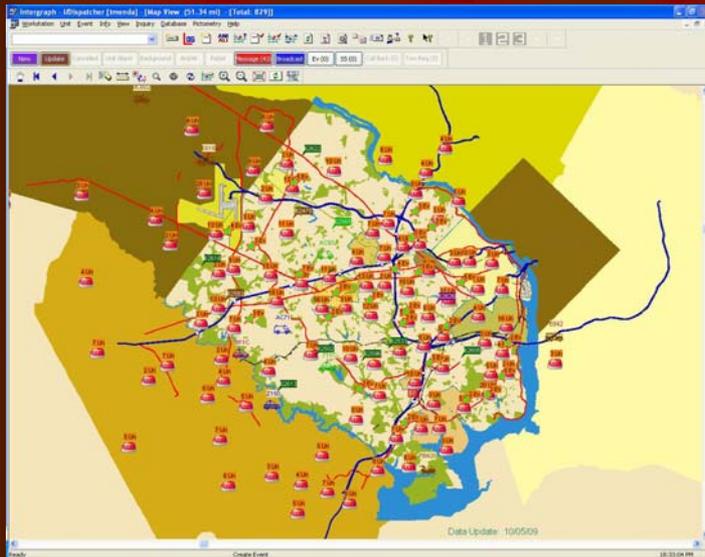


Created by: Daniel White

GIS Excellence Awards 2009

AGENCY CATEGORY

Best GIS Integration or Application



CAD/RMS for Fairfax County Public Safety Agencies
 Department of Public Safety & Communications, Police Department, Fire & Rescue Department, GIS & Mapping Services
 Tim Menda; Chris Gao; Jeff Gallagher; Eric Fisher; Katherine Good; Judy Lamey-Doldorf; Greg Thomas; Diane Bentley

GIS Excellence Awards 2009

CONGRATULATIONS!!