Geospatial Survey

A review of recent survey efforts
by the GIS Pros

A Presentation for the
State Geospatial Coordinating Board Meeting
April 29, 2016

Presenter:

- Barry C. Hutchins
  Sr. Public Safety GIS Program Manager
  County of Lycoming, Public Safety
  542 County Farm Road, Suite 101
  Montoursville, PA 17754
  570-329-4731

  GeoBoard Member representing the
  County GIS Professionals Association of Pennsylvania

Also with me today…

- Laura Simonetti
  GIS Director
  Mifflin County GIS Department
  20 North Wayne Street
  Lewistown, PA 17044

  Current Vice-president County GIS Professionals Association of Pennsylvania

The four surveys, that we will review today, were sent to our county members

GIS Pros Login

County GIS Professionals
Association of Pennsylvania

Find! Search this site...

Leadership | Map Gallery | Contact Us

Who We Are

The County GIS Professionals Association of Pennsylvania is a group of county GIS employees dedicated to the coordination and leadership of GIS at all levels within county government; including the establishment, deployment and maintenance of GIS systems.

Why Should You Join?

If remaining current with GIS technology is important... if you think there needs to be a strong voice on policy issues which affect you... if you need a reliable source of leadership on GIS issues... and if advocating that partnerships be established and maintained with federal and state government on GIS issues is something you think has to happen, then the County GIS Professionals Association of Pennsylvania needs to be in your future!

Contact Us

Staff support to the County GIS Professionals Association is currently being provided in-kind by concerted efforts of the County Commissioners Association of Pennsylvania (CCAP).

Sam Neely
Meetings and Technology Events Manager
County Commissioners Association of Pennsylvania
sneely@pacounties.org
(717) 736-4751

Stacey Sekkes, GISP
2016 President
Chester County
ssekkes@chesco.org

In anticipation of the GeoBoard starting in 2015

- We asked the member counties, in late 2014, to identify the top three priorities that the 'statewide geospatial coordinating council should consider'
  - The top three out of 41* total responses
    - Imagery/PAMAP
    - Next Generation 9-1-1
    - Data delivery

* does not constitute 41 individual counties

There was some overlap in the responses

and Boundaries and Standards also stood out as priorities

Please identify the top three priorities you think the statewide geospatial coordinating council should consider:		Response out of 41 total
Municipal Boundaries	BOUNDARIES	4
Boundaries (Municipal, County, State)	BOUNDARIES	
Boundary Issues - Municipal/County	BOUNDARIES	
Standardizing county and municipal boundaries	BOUNDARIES	
Are there any plans to promote GIS modernization, standardization, and an overall plan of usage within the State's PennDOT Districts We feel that these Districts would have a unique ability to collect, create, edit, share, etc. GIS data within the State – but for whatever reason it has not been promoted.	DATA DELIVERY	5
The State should consider managing and operating a "once stop shop" repository for current and/or "official" GIS base-layer data fro sources at the County, State, Federal, etc. level. This would greatly help Counties in performing comparative analyses for issues such as tax reassessments. Currently, the PASDA site managed by PSU has served this purpose but its provisioning of current data in an organized manner over the years has been lacking.	DATA DELIVERY	
Data stewardship and integration	DATA DELIVERY	
encouragement of more use of PASDA as a data clearinghouse	DATA DELIVERY	
Data sharing	DATA DELIVERY	
Funding for GIS	FUNDING	2
Advocating for increased availability of state funding for the purchase, maintenance, or upgrading of GIS/geospatially oriented equipment and software by counties and municipalities.	FUNDING	
NextGen 911	NG911	6
NG 911	NG911	
NextGen 911	NG911	
Next Gen 911 Initiatives	NG911	
NG 911	NG911	
NG 911	NG911	
Recurring Imagery Acquisition & Funding	PAMAP	11
Statewide Imagery	PAMAP	
High quality regional aerial imagery flown at regular intervals	PAMAP	
Funding for and seamless imagery for PA	PAMAP	
PAMAP imagery	PAMAP	
Aerial imagery for the state	PAMAP	
Aerial imagery and LiDAR updates	PAMAP	
re-instatement of the PAMAP imagery and LiDAR Program	PAMAP	
Updated Aerials	PAMAP	
Reinstate the PAMAP program	PAMAP	
Routine acquisition of Aerial Photography	PAMAP	
Data Accuracy	STANDARDS	4
GIS standardization has been a problem in the GIS profession since its inception and is a mandate that the State should require at the County level. There is a Local Government Information Model (LGIM) available which is essentially the industry standard for local government GIS data consistency. Statewide initiatives such as NextGen-911 would benefit greatly if all data at the County and State level was standardized.	STANDARDS	
Minimum standards to support statewide datasets	STANDARDS	
Establishing data standards	STANDARDS	
Working out any issues with PSLS		
Collaboration on GIS between all levels of government		
collaboration of state agencies		
GIS job descriptions for PA employees		
Gerrymandering		
Coordination/Communication between all PA GIS stakeholders		
Identifying and gathering contact information for all GIS/geospatially focused groups, organizations, agencies, etc. in Pennsylvania.		
Advisory role for legislation that contains GIS related requirements		
Education/Training Opportunities		

When it became obvious that formal start up of the GeoBoard would take longer than first thought…

- additional county response was not pursued
  - It may be appropriate at this point to re-issue the survey in some form to the member counties
    - It is expected that Imagery/PAMAP and NG9-1-1 will remain top priorities for counties

The NG911 Survey

- For any County GIS department which provides support to a PSAP (9-1-1 Center)
  - The GIS aspect of NG9-1-1 will be a high priority for the next several years
    - And will require ongoing maintenance

- To put that in perspective, the next several slides will be a rather high level overview of NG9-1-1
  - Looking at some of the differences between E9-1-1 that we have now, and NG9-1-1 as expected in the future

E9-1-1 vs NG9-1-1

Core Capabilities	E9-1-1	NG9-1-1
Telephony	Circuit switched (CAMA, TDM, SS7)	All IP (VoIP/SIP)
Communications Model	Call Centric	Data Centric
Integrated media (RTT, images, video)	No* (Can kludgeText)	Yes
Caller Location & Call Routing	Static & Predefined	Dynamic, GIS centric
Network Architecture	Public Switch Telephone Network (PSTN)	Managed IP Network (ESInet)
Technology Infrastructure & Interfaces	Proprietary	Open standards

What is NG9-1-1?

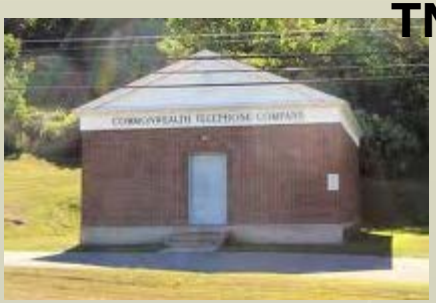
E9-1-1	NG9-1-1
Complex analog trunking and data network	Engineered, managed IP networks (ESInet)
Translation based control	GIS database controls
Limited to voice calls or TTY via phones	Voice, text, video
Data limited to 512 characters	Data unlimited
Custom interfaces for each service type	Standardized Interface for all services
Limited ability to transfer calls	Transfer calls to anywhere
Limited Emergency Notification capability	Location-specific emergency alerts possible
Limited Interoperability	Interoperability unlimited

Marc Berryman, ENP co-chair NENA NG9-1-1 GIS Data Model Working Group

Todays E9-1-1 System

Voice + TN

Voice + TN



Central Office

Tandem Office

ESN	PSAP	10 Digit#
	...	
017	PSAP Q	817-911-0292
018	PSAP R	817-911-4944
019	PSAP S	817-911-0292
	...	

TN→ESN→PSAP Trunk

Voice + TN

PSAP

GIS (Map) Display

Location *(ALI)*

TN

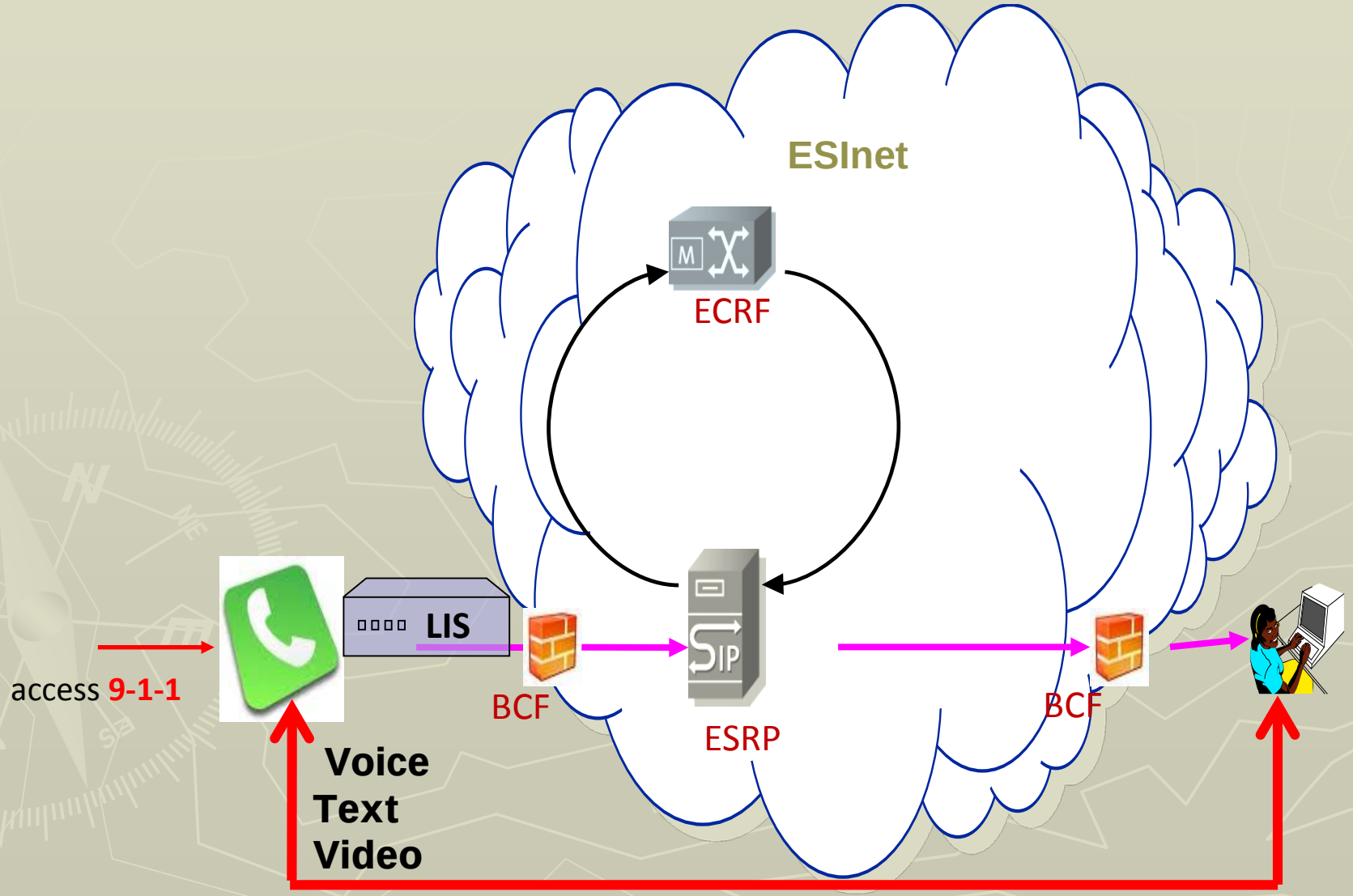
ALI Database Management System

The 9-1-1 call flow changes for NG9-1-1

- In NG9-1-1 the Location "comes with the call"
  - The Location Information Server stores*, validates and provides this location
    - **LIS** – The Location Information Server

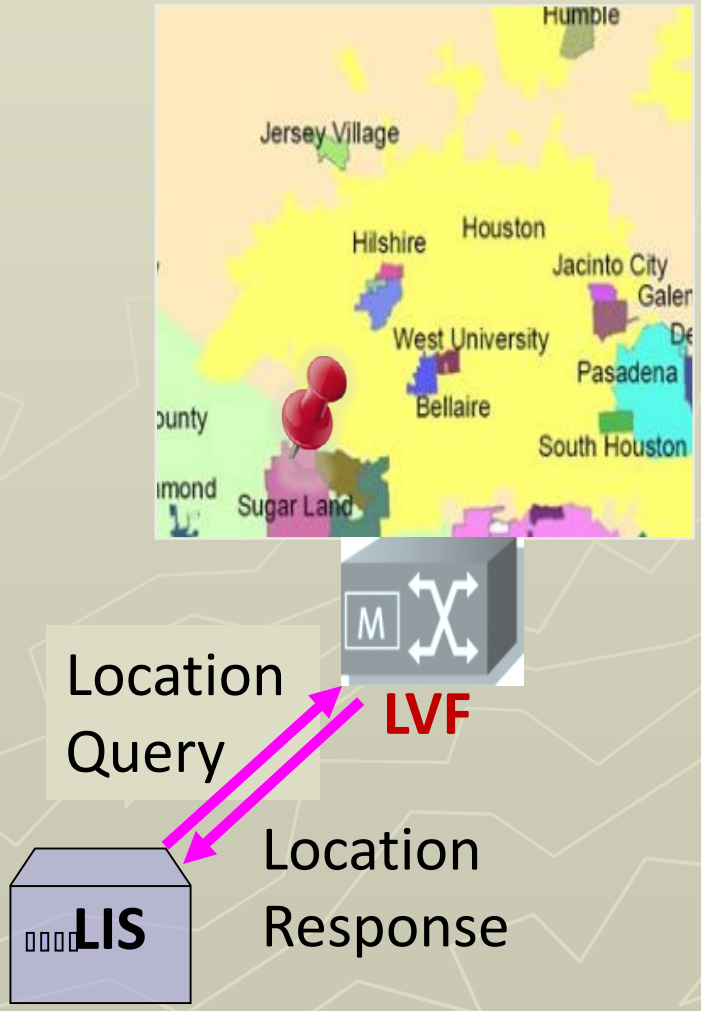
Marc Berryman, ENP co-chair NENA NG9-1-1 GIS Data Model Working Group

Basic NG9-1-1 Call Flow



LVF
Location Validation Function

- The Location Validation Function (LVF) validates the Location stored in the Location Information Server (LIS)
- Uses Local 9-1-1 Authority GIS data for location validation
  - Gives Local 9-1-1 Authority total control of their data



GIS Data Requirements

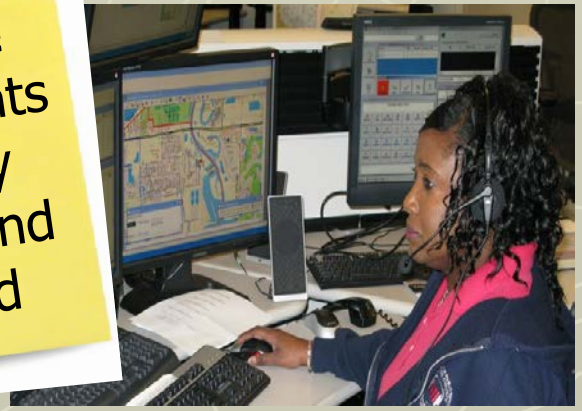
Location data

- Road Centerlines, with address ranges, required
- Address points preferred, but not required

Area / Boundary data

- PSAP Boundaries, required
- Emergency Services Boundaries, required
- Cities, Counties, Municipalities, Jurisdictional, preferred

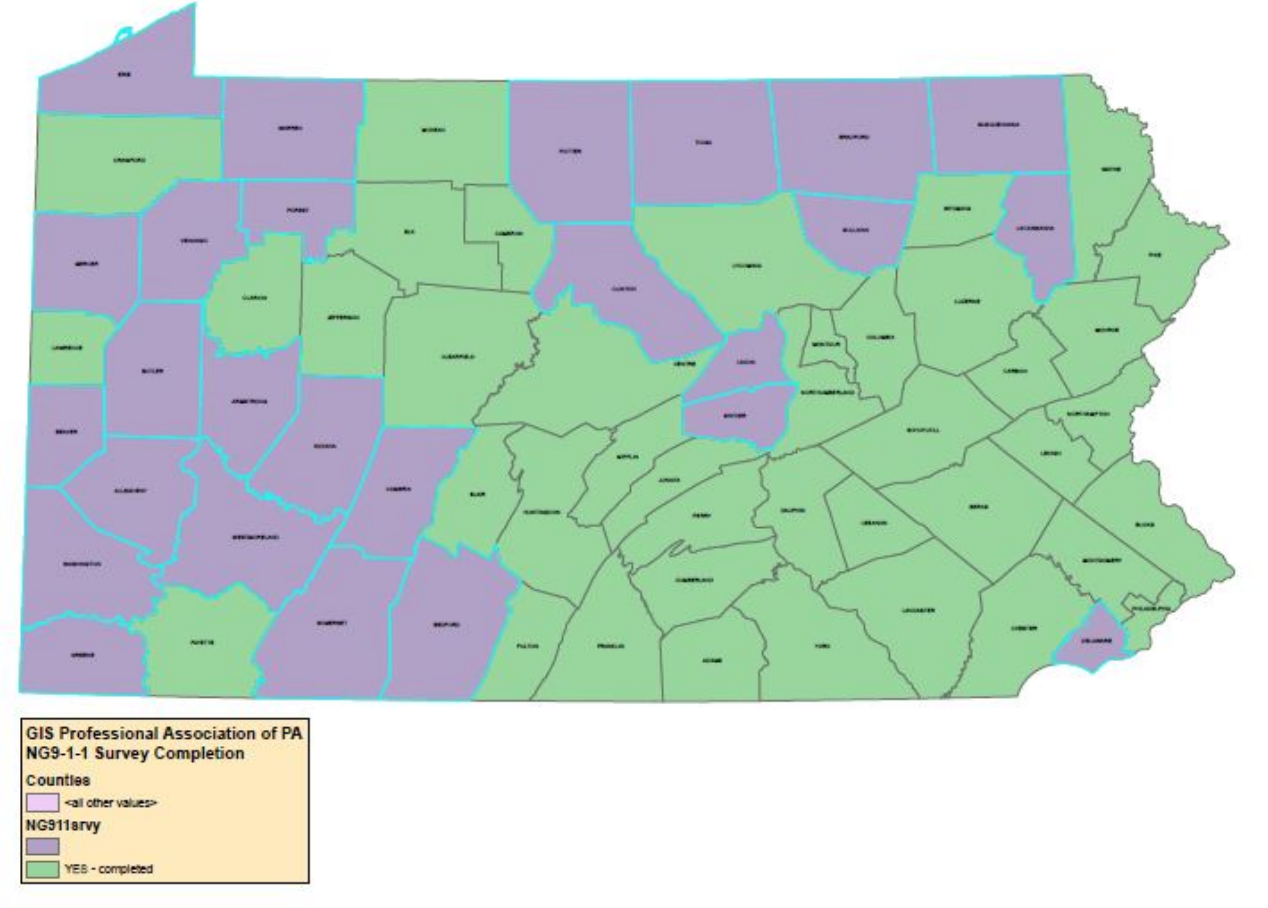
In NG9-1-1 the data requirements become highly Standardized and more detailed



GIS is a core component of NG9-1-1

- Local GIS data (located primarily at a county level) will be needed
  - To get a better understanding of where counties are now at in supporting E9-1-1
    - The GIS Pros NG9-1-1 Sub-committee put out a survey

NG911 survey completion to date



The following questions comprised the survey

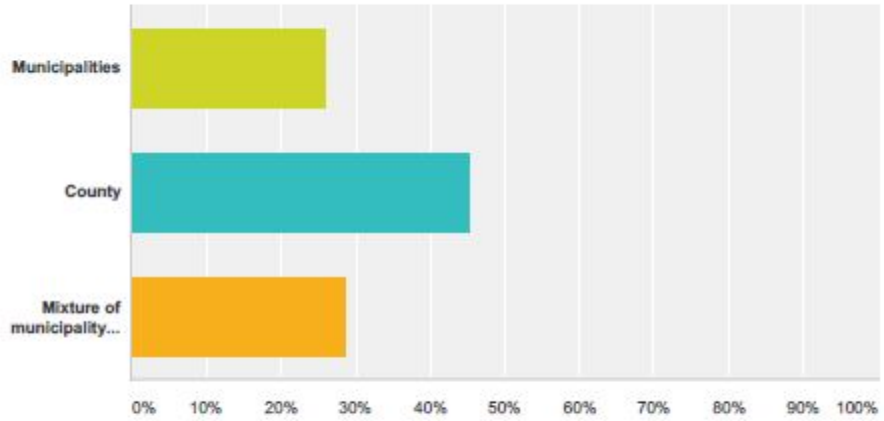
- Q1 County
- Q2 Who is the authority that assigns addresses?
- Q3 How does your county manage the Master Street Address Guide (MSAG)?
- Q4 What address data tables does your county use to synchronize GIS address datasets? (choose all that apply)
- Q5 Who produces the GIS layers in your 911 CAD system?
- Q6 Select the functional layers used in your county's 911 CAD system. (choose all that apply)
- Q7 What data sources do you use to map address points? (choose all that apply)
- Q8 From what source does your 911 CAD consume GIS data?
- Q9 How often does your county load updated GIS into your 911 CAD? Choose one that most accurately represents your update cycle.
- Q10 Does your 911 CAD use road networks for routing emergency vehicle responses?

The next several slides show the responses from Questions 2-5

NG911 survey

Q2 Who is the authority that assigns addresses?

Answered: 42 Skipped: 0

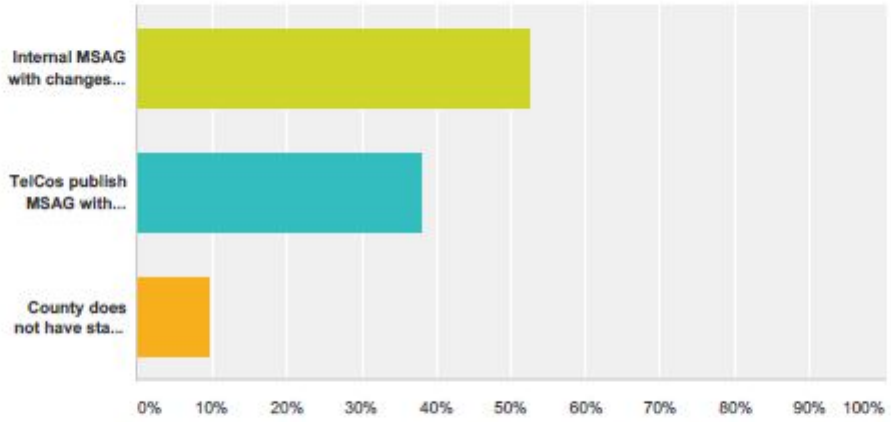


Answer Choices	Responses	
Municipalities	26.19%	11
County	45.24%	19
Mixture of municipality and county authority	28.57%	12
Total		42

NG911 survey

Q3 How does your county manage the Master Street Address Guide (MSAG)?

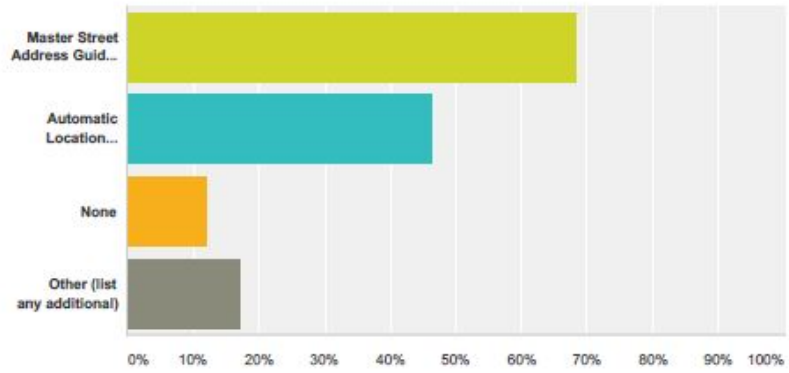
Answered: 42 Skipped: 0



Answer Choices	Responses	
Internal MSAG with changes emailed to TelCos	52.38%	22
TelCos publish MSAG with counties editing	38.10%	16
County does not have staff maintaining MSAG	9.52%	4
Total		42

Q4 What address data tables does your county use to synchronize GIS address datasets? (choose all that apply)

Answered: 41 Skipped: 1

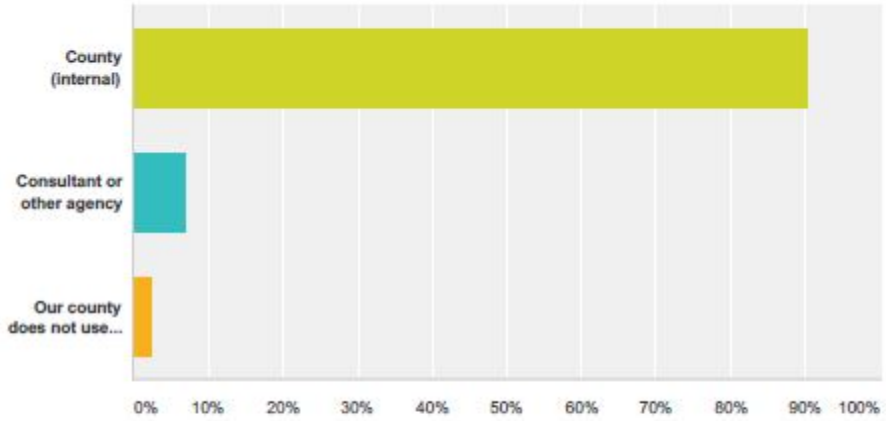


Answer Choices	Responses	
Master Street Address Guide (MSAG)	68.29%	28
Automatic Location Information (ALI)	46.34%	19
None	12.20%	5
Other (list any additional)	17.07%	7
Total Respondents: 41		

#	Other (list any additional)	Date
1	Address Pts dataset	4/12/2016 8:38 AM
2	The City of Philadelphia for years maintained the Unified Land Records System (ULRS). We current working on a new and improved addressing system called the Address Information System (AIS).	3/30/2016 8:58 AM
3	We utilize GIS for all address management, and have a separate secondary database in house that is kept up to date.	3/16/2016 3:48 PM
4	Parcel Layer/911 Address Point Spatial Joins if necessary	3/15/2016 11:51 AM
5	Nightly scripts sync database copies (ArcGIS for Server).	3/15/2016 11:44 AM
6	Township provided data	3/11/2016 11:00 AM
7	The original MSAG sent to the TELCOS was created from Lycoming County GIS as a product of the Enhanced 9-1-1 Re-Addressing Project. The MSAG is maintained by Verizon, and additions, deletions, and corrections (Street Names, Ranges, Municipalities, Emergency Response) are made by the Lycoming County Public Safety Addressing Coordinator via a secure login to the Verizon MSAG web portal.	3/10/2016 3:55 PM

Q5 Who produces the GIS layers in your 911 CAD system?

Answered: 42 Skipped: 0



Answer Choices	Responses	
County (internal)	90.48%	38
Consultant or other agency	7.14%	3
Our county does not use GIS in our 911 CAD	2.38%	1
Total		42

The third survey (also related to NG9-1-1)

- Was done in June of 2015
  - By the NextGen911 workgroup
    - As an attempt to provide information on regional GIS data sharing
- Will need to be updated to show progress

Northwest Task Force and Northwest Central Task Force

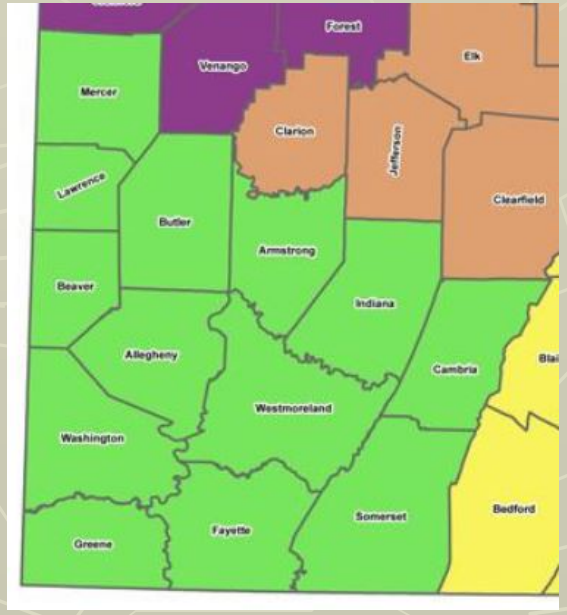
- Northern Tier ESInet
  (an ESInet is a managed IP network used for emergency services communications)
- Cameron, Clarion, Clearfield, Crawford, Elk, Erie, Forest, Jefferson, McKean, Warren
  - Road centerlines are edge matched to PennDOT county boundaries, Structures as well, currently working on the ESZ
  - FTP site used to upload county data and download regional data
  - Geoprocessing model converts regional data to meet counties 911 CAD schemas
  - Elk County hosting ArcServer for the region, and currently working on publishing a map service.

North Central Task Force

- North Com ESInet
  Bradford, Clinton, Potter, Lycoming, Sullivan, Tioga, Union
  - Participated in a Federated GIS Pilot Project
    utilizing the ArcGIS Data Interoperability extension
    - The project provided proof of concept that GIS Data can be replicated regionally and consumed individually by the participating PSAPs

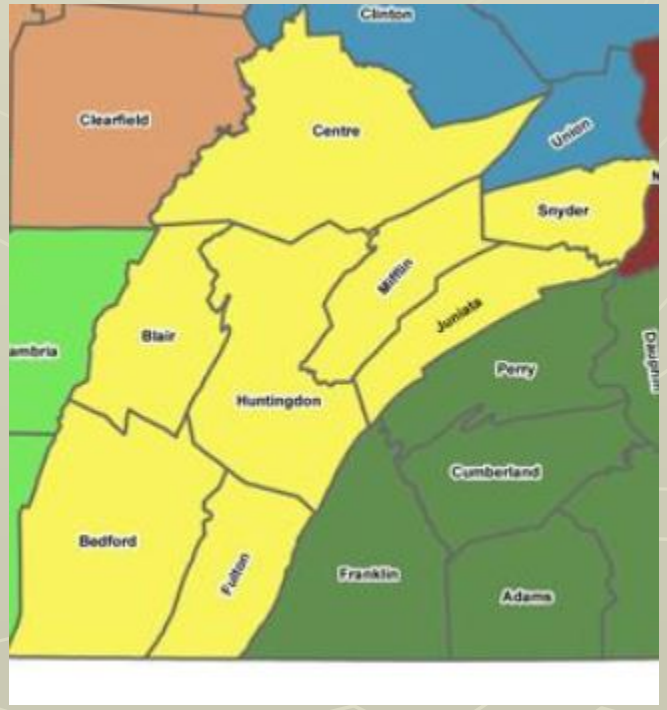
Region 13 Task Force

- WestCORE ESInet
- Allegheny, Armstrong, Beaver, Butler, Cambria, Fayette, Greene, Indiana, Lawrence, Mercer, Somerset, Venango, Washington, Westmoreland
  - Meeting with vendors to explore regional GIS sharing
  - Region 13 Task Force has requested a justification for GIS presence on ESInet



South Central Mountain Task Force

- Blair, Bedford, Centre, Fulton, Huntington, Juniata, Mifflin, Snyder
  - Roads are edge matched
  - Regional layers are published on map services with Centre County hosting ArcServer



South Central Task Force

- SCTFnet ESInet
- Adams, Cumberland, Dauphin, Franklin, Perry, Lancaster, Lebanon, York
  - FTP site used to upload county data and download regional data
  - Scripts transform county data into regional dataset using GIS for the Nation data model
  - Regional layers include Address Points, Facilities, Hydrology, Rail, Roads, Commonplaces, and Shelters
  - Regional layers are published on map services with Lancaster County hosting ArcServer
  - Layer files provide quick and consistent symbology
  - SCTF ArcServer available on SCTFnet (ESInet)

East Central Task Force

- Various – ESInets
- Berks, Columbia, Luzerne, Montour, Northumberland, Schuylkill, Wyoming
  - Former utilization of federated GIS (AGS 9.3.1) – Used ArcGIS Data Interoperability extension
  - Task Force license of ArcGIS not currently utilized
  - Berks County hosts two web based GIS applications and published services for use in these application. Data refreshed yearly by counties for geocoders, etc.
  - Have reverted to delivery of revised data via secure ftp hosted at Berks

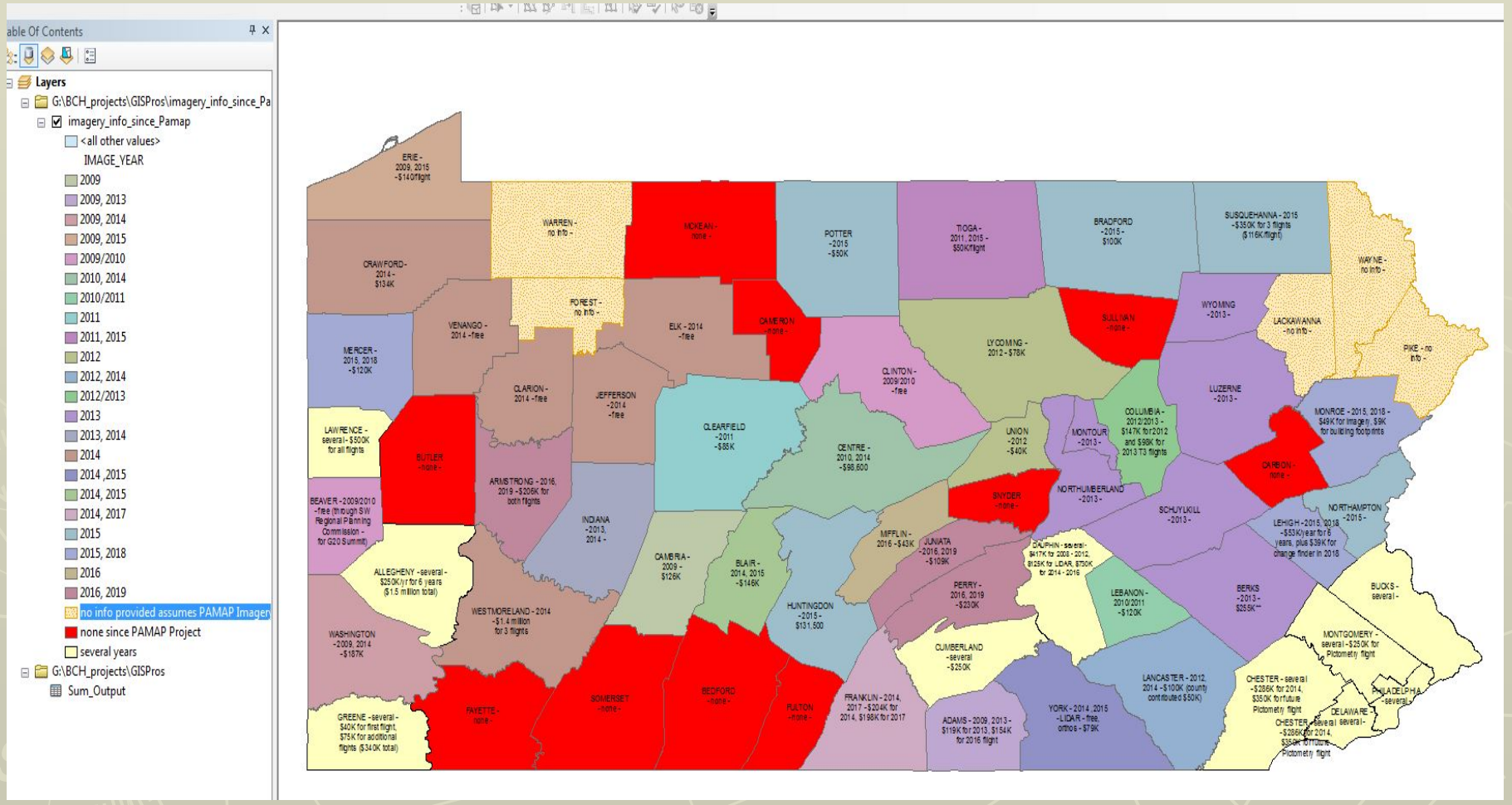
Southeastern Task Force

- SECOM ESInet
- Berks, Bucks, Chester, Delaware, Montgomery, Philadelphia
  - Regional centerlines meet NENA standards (*as known at the time*)
  - Pursuing Amazon cloud web services to share GIS over SECOM ESInet
  - ArcGIS Online hosted map packages and services
  - Working on regional address points layer

Our fourth survey

- Is ongoing in regards to the data collection..
- Because updated imagery is important to many aspects of county GIS operations
  - This survey looks at the following:
    - Last year of imagery
    - Costs of imagery
      - It should be noted that these costs take away from a county's ability to invest in improving other GIS deliverables

Survey overview



It should be noted that the counties in red only indicated as having the last PAMAP imagery

The estimated lower end of cost to counties = $8,758,100

Sum_Output

DollarCost	Count_DollarCo	total
0	31	
40000	1	$40,000.00
43000	1	$43,000.00
49000	1	$49,000.00
50000	2	$100,000.00
78000	1	$78,000.00
79000	1	$79,000.00
85000	1	$85,000.00
98600	1	$98,600.00
100000	2	$200,000.00
109000	1	$109,000.00
119000	1	$119,000.00
120000	2	$240,000.00
126000	1	$126,000.00
131500	1	$131,500.00
134000	1	$134,000.00
140000	1	$140,000.00
146000	1	$146,000.00
147000	1	$147,000.00
187000	1	$187,000.00
204000	1	$204,000.00
206000	1	$206,000.00
230000	1	$230,000.00
250000	2	$500,000.00
255000	1	$255,000.00
286000	1	$286,000.00
318000	1	$318,000.00
340000	1	$340,000.00
350000	1	$350,000.00
417000	1	$417,000.00
500000	1	$500,000.00
1400000	1	$1,400,000.00
1500000	1	$1,500,000.00
	total	**$8,758,100.00**

As compared to costs associated with PAMAP

The Economics and Funding of PAMAP

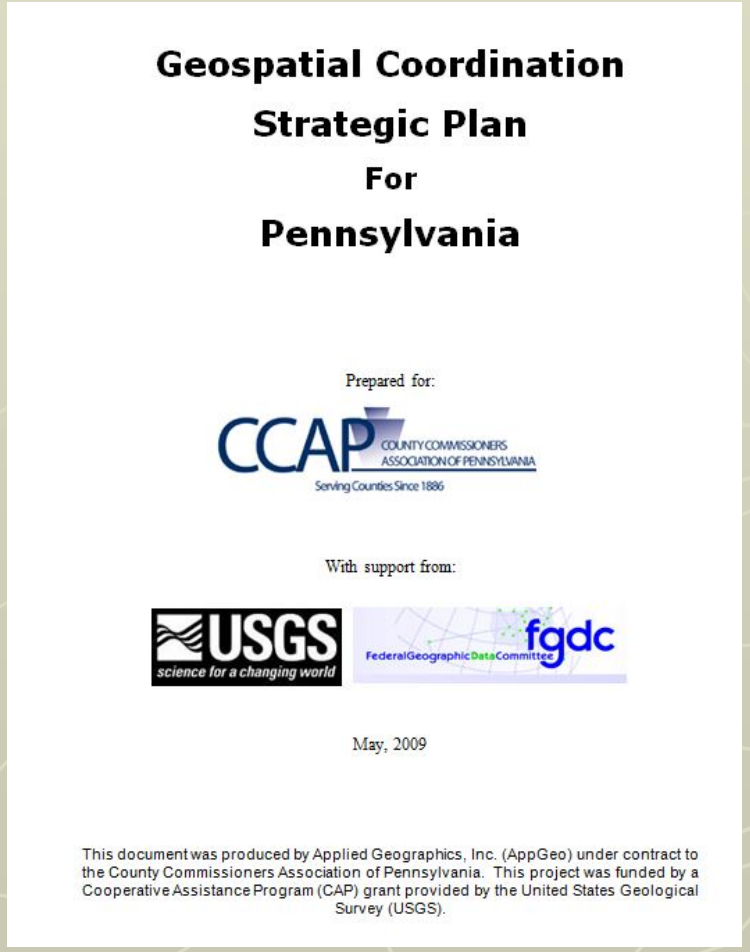
Theodore R. Alter
Jeffrey C. Bridger
and
Sheila S. Sager
Department of Agricultural Economics and Rural Sociology
The Pennsylvania State University

- "To reach this potential, a sustainable, long-term funding strategy must be developed. In addition to the initial $20 million investment required to make PAMAP operational, mechanisms must be developed to update the technology on a regular basis and provide for routine maintenance and operations costs. These annual costs are conservatively estimated at $3 to $4 million. Without these investments, PAMAP may be only partially completed, or it may become obsolete and deteriorate. In the absence of a long-term funding strategy, much of the initial investment will be wasted and the potential benefits will not be realized. "

Counties have already invested, at the least,
close to half of the original PAMAP investment

Final thoughts

- It may be worthwhile as a Board to review the document produced in 2009



Geospatial Coordination

Strategic Plan

For

Pennsylvania

Prepared for:

CCAP County Commissioners Association of Pennsylvania
Serving Counties Since 1886

With support from:

USGS science for a changing world

fgdc Federal Geographic Data Committee

May, 2009

This document was produced by Applied Geographics, Inc. (AppGeo) under contract to the County Commissioners Association of Pennsylvania. This project was funded by a Cooperative Assistance Program (CAP) grant provided by the United States Geological Survey (USGS).

Particularly the stakeholder workshop and Survey sections

Geospatial Coordination Strategic Plan for Pennsylvania

Project Sponsored by:

CCAP County Commissioners Association of Pennsylvania
Serving Counties Since 1886

Project Funded by:

USGS science for a changing world

fgdc Federal Geographic Data Committee

Project Consultant:

Applied Geographics, Inc.
Empowering People with Spatial Solutions

Principal Author & Project Manager:
Michael Terner

Co-Author & Sub-consultant:
Brady Stroh
Center for GIS, University of Pennsylvania, Harrisburg

The authors would like to acknowledge the outstanding cooperation and input received from the entire Strategic Planning Steering Committee. Their direct and indirect contributions were essential to the successful completion of this document. With a complex environment and a challenging planning process, the entire team hung tough, and stayed together.

Table of Contents

2.2 Geospatial Stakeholder Information Gathering Workshops

A core element of the project was to reach out to GIS stakeholders across the state, listen to their experiences and gather their ideas for improved geospatial coordination in Pennsylvania. Towards that end, six **Geospatial Stakeholder Information Gathering Workshops**[2] were conducted during the fall of 2008:

- September 15: **Clarion County**
- September 16: **Westmoreland County**
- October 7: **Cumberland County**
- October 8: **Lycoming County**
- November 12: **Carbon County**
- November 13: **Chester County**

In general there was excellent turnout with an overall attendance of 154 people across the six sessions. In addition, state agency personnel participated in their own workshop via the Geospatial Technologies Steering Committee meeting of October 10, 2008, which addressed many of the same topics independently. The table below illustrates, there was a representative distribution of participation across stakeholder sectors in the six project sponsored workshops:

	Clarion	Westmoreland	Lycoming	Cumberland	Chester	Carbon	TOTAL	%
Academic/Education		1		4	1		**6**	4%
City/Town Government		1		1	3	2	**7**	5%
County Government	12	11	14	17	7	8	**69**	45%
Federal Government			1	1	1	1	**4**	3%
Private Non-profit		2		2	1	1	**6**	4%
Private Sector	2	7	2	11	7	5	**34**	22%
Regional Organization	3	1	1	3	3	1	**12**	8%
State Government	2	1	3	8			**14**	9%
Utility Company	1					1	**2**	1%
TOTAL	**20**	**24**	**21**	**47**	**23**	**19**	**154**	**100%**

2.3 Survey

During the spring of 2009 an on-line survey was deployed in an attempt to gain further stakeholder input on forming recommendations and priorities for the strategic plan. The survey attempted to gather information in four categories:

1. Characterizing the survey respondent and their organization
2. Characterizing the utilization of geospatial technology in the respondent's organization
3. Identifying the benefits to the organization of geospatial technology
4. Soliciting ideas, opinions and prioritization of potential roles for a statewide geospatial coordination council

Thank you

Questions?