

GIS for Arizona 9-1-1

Meeting Arizona's Emergency Response Needs for Today and Tomorrow

Oregon GIS/MSAG Conference
August 25, 2015
Salem, OR



Today's Discussion

- Arizona 9-1-1 Program
- Arizona's NG911 Preparation
 - Participation and Education
 - Challenges/First Decisions
 - GIS Data Creation
 - Statewide Networks
 - Accuracy
 - Arizona NG911 Manuals

Arizona 9-1-1 Program

- 9-1-1 State Administrator, (2) Project Managers and a Billing Specialist
- 88 PSAP's
- 17 9-1-1 Systems
- All Arizona PSAPs have GIS
- 99% of Arizona WPH2 (one remaining 911 system)
- No Text-to-911 Deployments

Revenues generated through the Telecommunications Services Excise tax rate of \$0.20 per month for each activated wire, wireless and voice over internet protocol (VoIP) service account. In addition, a small percentage of the amount for prepaid wireless sales at the retail level also contribute to the fund.



9-1-1 Fund Governance

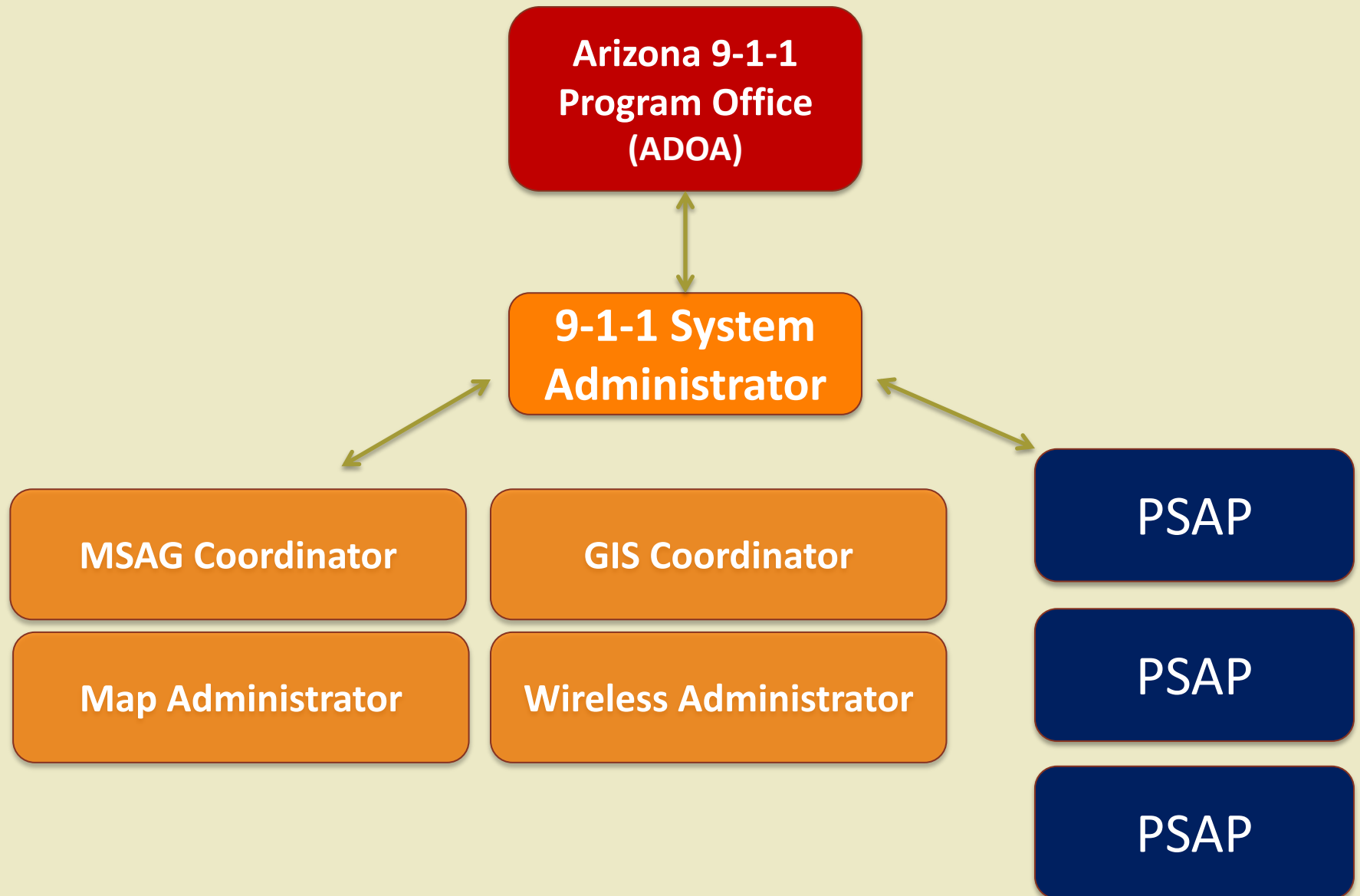
Arizona Administrative Code, Title 2, Article 4

R2-1-409, Funding eligibility

The following costs of providing 9-1-1 service shall be reimbursed by the ADOA 9-1-1 Office from the fund, subject to available monies and the following requirements, to a 9-1-1 planning committee that has a Certificate of 9-1-1 Service Plan Approval:

- Costs of the network exchange services necessary to provide the minimum grade of service.
- Costs for necessary and appropriate equipment required by the PSAP to receive and process 9-1-1 calls and messages. This may include computer telephone integrated systems or other automated call management and distribution systems.
- Ongoing maintenance costs following the warranty period, if any, for the customer premise equipment used in the receiving and processing of 9-1-1 calls and messages.
- Necessary and appropriate consulting services or administrative costs, not to exceed 3% of the amounts deposited annually in the revolving fund.

9-1-1 Roles/Relationships



NG911 Preparation: Participation and Education

- Creation of 911 Working Group (Aug 2012)
 - 35 members representing 11 of the 17 9-1-1 systems along with interested state agencies such as ADOT/ADOR/AZDPS/ASU/UofA and private sector
- Creation of the 911WG Technical Committee to focus on NG911 standards (Feb 2013)
- Addition of 911 track at the annual AGIC Education and Training Symposium
- Creation of NG911 Manuals

911 Working Group

Technical Committee

Jack Avis	Pima County ITD-GIS
Brian Bond	Yavapai County GIS Dept
Brian Brady	Yuma ITS-GIS
Joe Breyer	Works Consulting
Judith DeLury	Gila River Indian Community GIS
Matthew Deveney	Gila River Indian Community GIS
Sandra Dyre	Arizona 9-1-1 Program Office
Sarah Hess	Pinal County IT/GIS
Tom Homan	Gila County Public Works
Shea Lemar	Arizona State University - ISSR
James Meyer	Arizona Dept of Transportation
Curtis Pulford	Arizona State Cartographer
Gene Trobia	University of Arizona
Howard Ward	TerraSystems Southwest

AGIC

ARIZONA GEOGRAPHIC
INFORMATION COUNCIL

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Register Early for AGIC 2015

Early-bird registration for the 2015 Education and Training Symposium is now available - [Register now!](#) The conference will be held on September 23-25, 2015 at the Prescott Resort and Conference Center.

[Read More](#)

AZGEO

<https://azgeo.az.gov>
Clearinghouse to share
data and applications

Arizona State Land

<https://land.az.gov>

**Arizona Geographic Information
Council AGIC**

<https://arcgis2.geo.az.gov/agic/welcome-agic>

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AZGEO USAGE STATISTICS

	1908 screened and approved users
	346 agencies and organizations
	206 datasets
	22 services

- AZGEO Usage Statistics
- Controlled Access
- Standardized Metadata
- Subscribe to Data



AZGEO Groups

Before you request to join a group:

Groups have been implemented in the Clearinghouse to more effectively organize users, increase security, and make it easier for data contributors to control access to their data. Being a member of a group means that you are specifically a part of that agency, county, or collection of people. This means that to be in the Government group, you must be affiliated with a government agency, to be in the ASLD group, you must be an employee at the Land Department, etc. This definition of a group allows data contributors to know exactly with whom they are sharing their data when they choose to share with other groups. If you would like to [create your own group](#), or [contribute data](#) yourself, please click the links to request group creation.

Request Group Creation

If your agency does not have a group, you can request one.

[Request Group Creation](#)

Multi-Agency



E-9-1-1 Public Safety

The 9-1-1 Program office has oversight responsibility for the revenues that are collected through the Emergency Telecommunication Service Revolving Fund. Revenues are generated through a... [Read more](#)

[Join Group](#)[Contact Group Admins](#)

Sharing is Fun!

NG9-1-1 Preparation: Challenges/First Decisions

- Local business practices
 - Ripple effect
- Incomplete GIS Data
 - Road Network
 - ESN/Community Boundaries
 - Address Points
- Locally-maintained GIS view vs. Statewide View
 - No statewide datasets
- Lack of national standards or best practices (lots in draft mode)



NG9-1-1 Preparation: 9-1-1 Data Comparison



A	D	E	F	G	H	I	J	K	L	M	N	O
FIELD	Cochise	Coconino	Gila	Graham	Greenlee	Maricopa	Mohave	Pima	Pinal	SantaCruz	Yavapai	Yuma
STSEG_ID	GID	STREETID	ROAD_ID					ROADID			ROUTEID	
ALTSEG_ID												
FROM_ADD_L	FROMADDL	LEFTFROMAD	LEFT_FROM	LLO	FROM_ADD_L	LEFTFROM	LFROM	L_ADD_FROM	LLO	L_F_ADD	FROMLEFT	FROM_ADDR_L
TO_ADD_L	TOADDL	LEFTTOADDR	LEFT_TO	LHI	TO_ADD_L	LEFTTO	LTO	L_ADD_TO	LHI	L_T_ADD	TOLEFT	TO_ADDR_L
FROM_ADD_R	FROMADDR	RIGHTFROMA	RIGHT_FROM	RLO	FROM_ADD_R	RIGHTFROM	RFROM	R_ADD_FROM	RLO	R_F_ADD	FROMRIGHT	FROM_ADDR_R
TO_ADD_R	TOADDR	RIGHTTOADD	RIGHT_TO	RHI	TO_ADD_R	RIGHTTO	RTO	R_ADD_TO	RHI	R_T_ADD	TORIGHT	TO_ADDR_R
PRE_DIR	PREFIX	PREDIRECTI	PREFIX	PRE_DIR	PRE_DIR	PREDIR	PRD	PRE_DIR	PRD	ST_DIR	ST_PREDIR	PRE_DIR
PRE_TYPE										ST_PRETYPE		PRE_TYPE
ST_NAME	NAME	STREETNAME	NAME	ST_NAME	STREET_NAME	STREETNAME	STN	STR_NAME	STN	ST_NAME	ST_NAME	STREET_NAME
ST_TYPE	SUFFIX	STREETTYPE	SUFFIX		STREET_TYPE	STNAMETYPE	STS	STR_TYPE	STS	ST_POSTTYP	ST_TYPE	STREET_TYPE
SUF_DIR		SUFFIXDIRE	DIR	SUFF_DIR	POST_DIR	POSTDIR	POD	SUF_DIR	POD	ST_POSTDIR	ST_SUFDIR	POST_DIR
FULL_NAME	STREET	FULLNAME	RDNAME	STREET	FULLNAME	FULLSTNAME	FNM	STREET		FULLNAME	FULLST_NAME	FULLNAME
ALT_NAME		STREETNA_1	ALIAS		ALT_NAME		ANM		ASN		FULLST_ALIAS	P_ALIAS
ONEWAY					ONEWAY		SIDE	TRAVDIR_CD	ONW	SIDE		ONE_WAY
MSAG_COMM_L		LPLACE	COMMUNITY	COMMIL	MSAG_COMM_L		MCL		MCL	L_MSAG_COM	MSAG_LEFT	MSAG_LEFT
MSAG_COMM_R		RPLACE	COMMUNITY	COMMR	MSAG_COMM_R		MCR		MCR	R_MSAG_COM	MSAG_RIGHT	MSAG_RIGHT
ESN_L		ESZLEFT	ESN	ESNL	ESN_L					L_ESN	ESN_LEFT	ESN_LEFT
ESN_R		ESZRIGHT	ESN	ESNR	ESN_R					R_ESN	ESN_RIGHT	ESN_RIGHT
CITY_L			COMM	L_City								CITY_L
CITY_R			COMM	R_City								CITY_R
ZIP5_L	ZIPL		ZIPL	L_Zip		ZIPLEFT		Lzip			ZIPCODE_LEFT	ZIP_LEFT
ZIP5_R	ZIPR		ZIPR	R_Zip		ZIPRIGHT		Rzip			ZIPCODE_RIGHT	ZIP_RIGHT
ADD_ORIG	SOURCE				SOURCE				SOD	CREATION_U	CREATEBY	
UPD_BY				SOURCE	MODIFY_USER		ED			MODIFY_USE	LASTUPDTBY	
UPD_DATE			DATE_MOD	DLU	MODIFY_DATE		DLU		DLU	MODIFY_DAT	LASTUPDATED	
APD_SOURCE												

12 out of 15 Counties with GIS Data

12 Different Ways of Doing Business

NG9-1-1 Preparation: Developing GIS Data For Arizona 9-1-1

**Leveraging Projects, Partnerships and Best
Practices to Meet the Needs of Arizona**

GIS Data Creation

Leveraging Projects & Partnerships to Meet Arizona's Needs

- Arizona Broadband Mapping and Planning Project
 - NTIA State Broadband Initiative (SBI – Federal American Recovery and Rehabilitation Act – ARRA) (Federal)
 - Arizona obtained funding to complete roads, ESN and community boundaries for three (3) counties and address points for seven (7); develop statewide database and networks to improve geocoding of address data; develop Address Editor and Parser to assist with data maintenance and processing.
- Arizona Department of Transportation (ADOT)
 - All Roads Network of Linear Referenced Data (ARNOLD) (Federal)
 - ADOT provided funding to complete road development



GIS Data Creation

Leveraging Projects & Partnerships to Meet Arizona's Needs

- Arizona State Land and the Arizona Geographic Information Council (AGIC)
 - Arizona Geospatial Clearinghouse – AZGEO (State)
 - Committees support clearinghouse, data and application development and maintenance
 - AGIC Data Committee 9-1-1 Working Group and Technical Committee is meeting 9-1-1 GIS needs
- Arizona 9-1-1: Arizona 911 Program and 911 Systems
 - Completed road network and address point network for remaining 9-1-1 systems and assist with preparation for Next Generation 9-1-1 (Public)

NG9-1-1 Preparation: GIS Data Creation

NAUA 9-1-1 Project

Northern Arizona Users Association

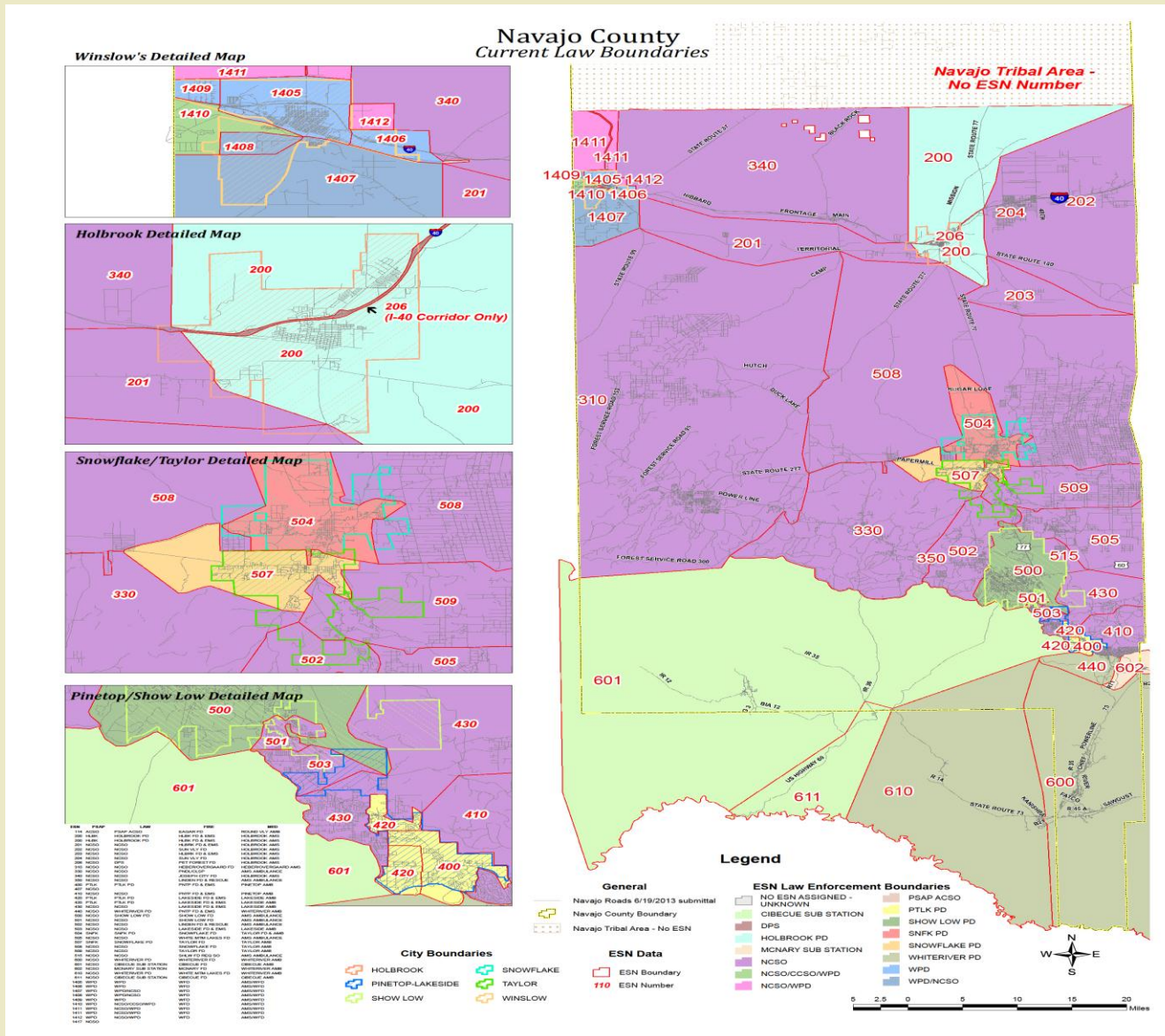
Apache and Navajo Counties

NAUA 911:

Lessons Learned

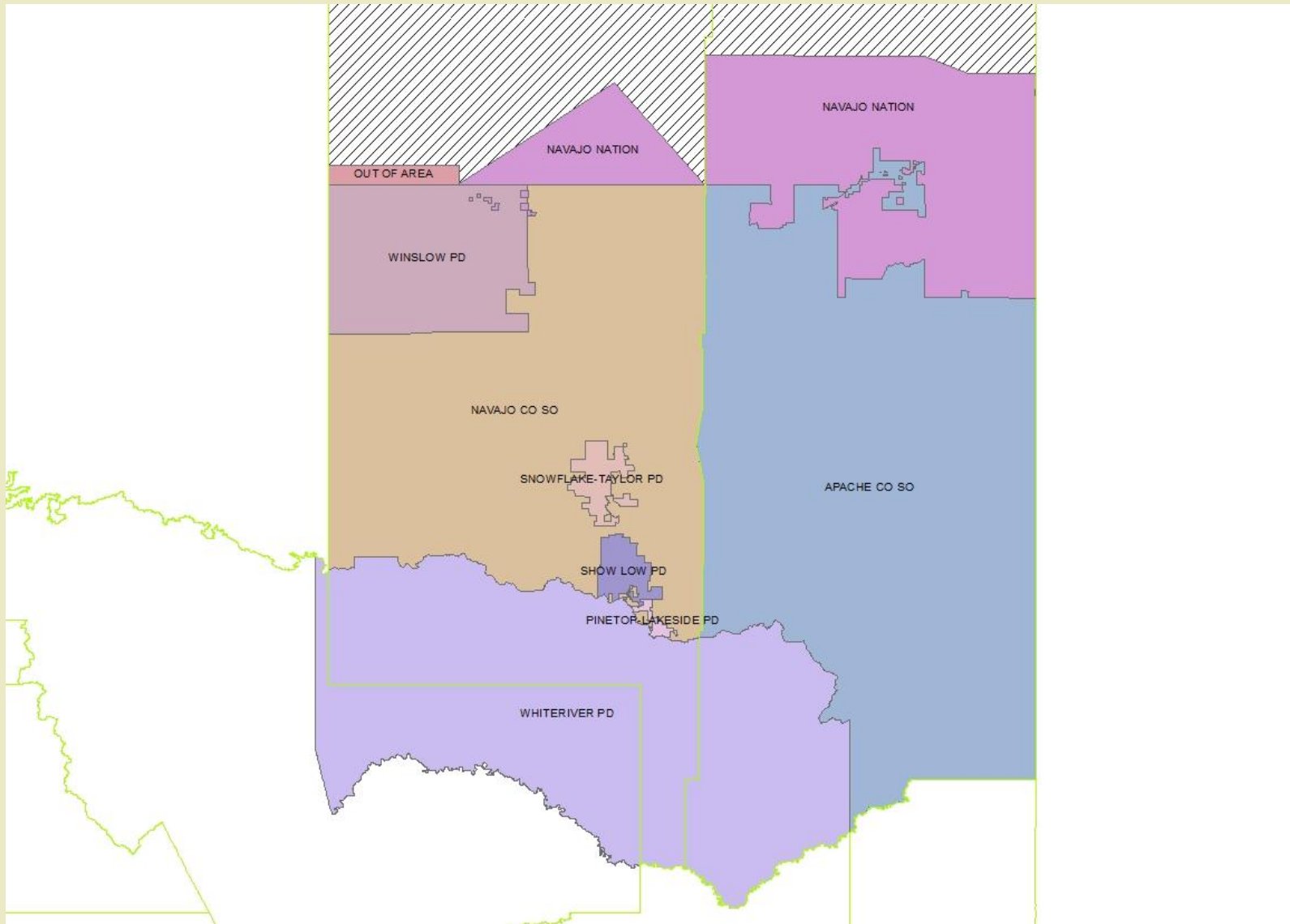
- Little understanding of how 911 works
- Importance of data management (911/GIS)
- Legal/Authoritative data
- Error Reporting
 - Dispatcher
 - First Responder
- Value of workflows

NAUA 9-1-1 ESZ/ESN Boundary



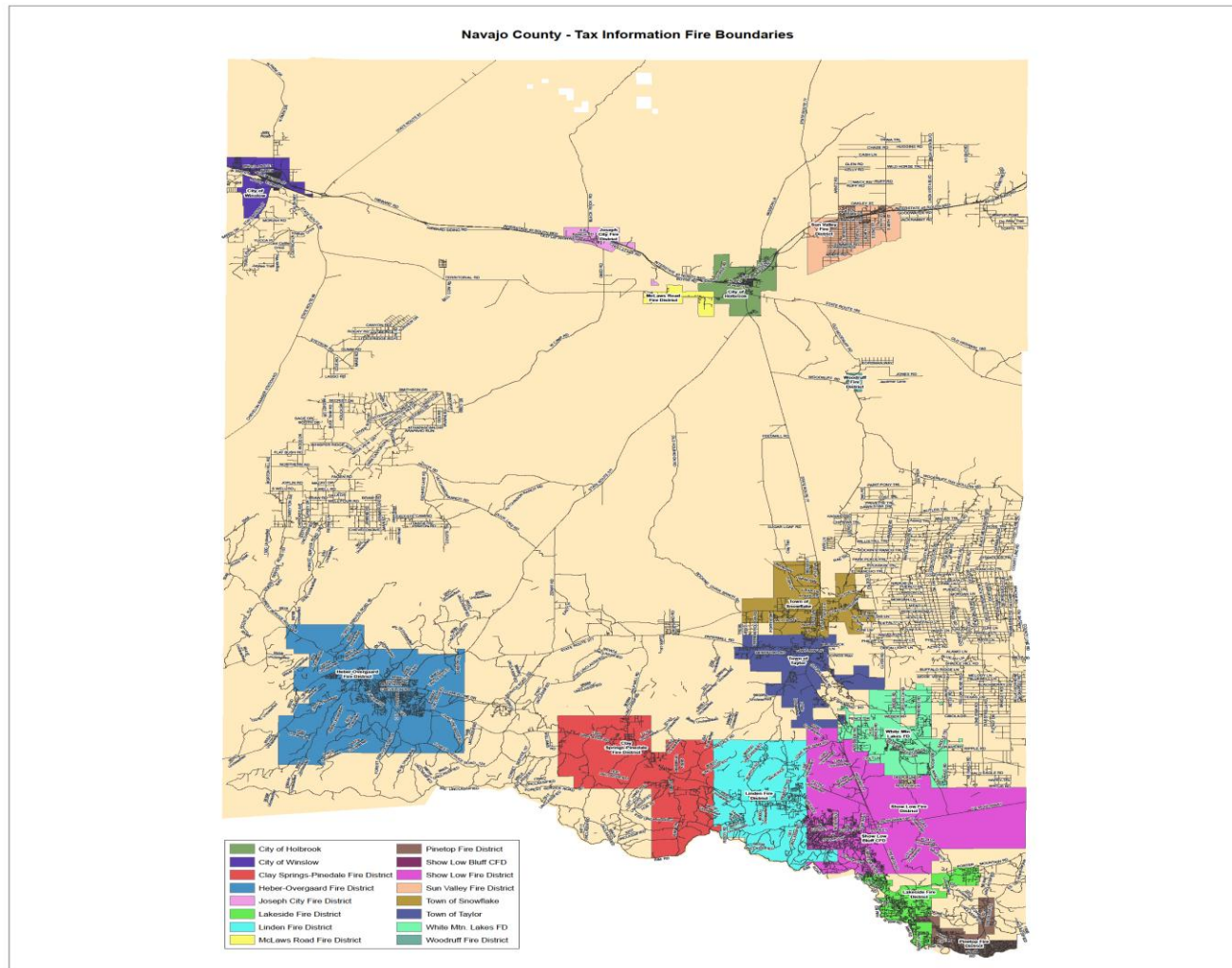
* BASED ON ORIGINAL MSAG

NAUA 9-1-1 LAW Boundary



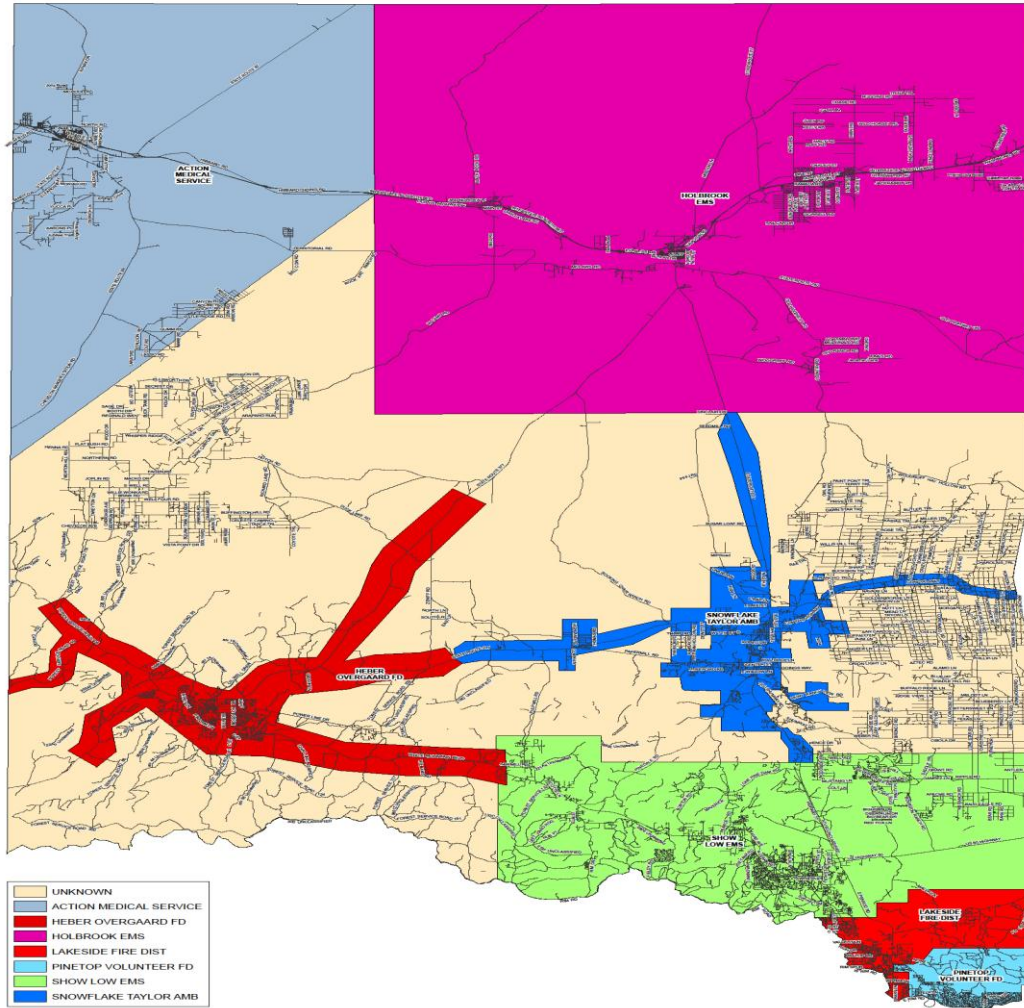
NAUA 9-1-1 FIRE Boundary

Effect of Legal Boundaries:
Do I have a response unit?



NAUA 9-1-1 EMS Boundary

Navajo County EMS Boundaries

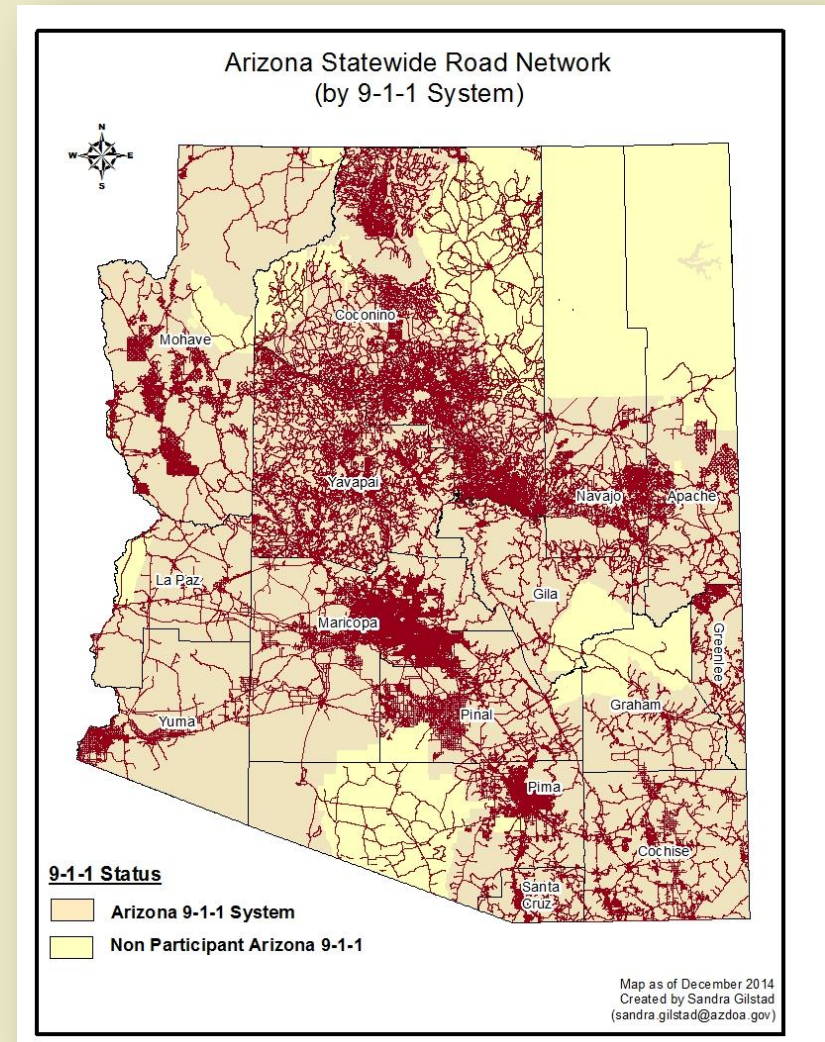


NG9-1-1 Preparation: Developing Statewide Networks For Arizona 9-1-1

**Lessons Learned Through
Data Development and Assessment**

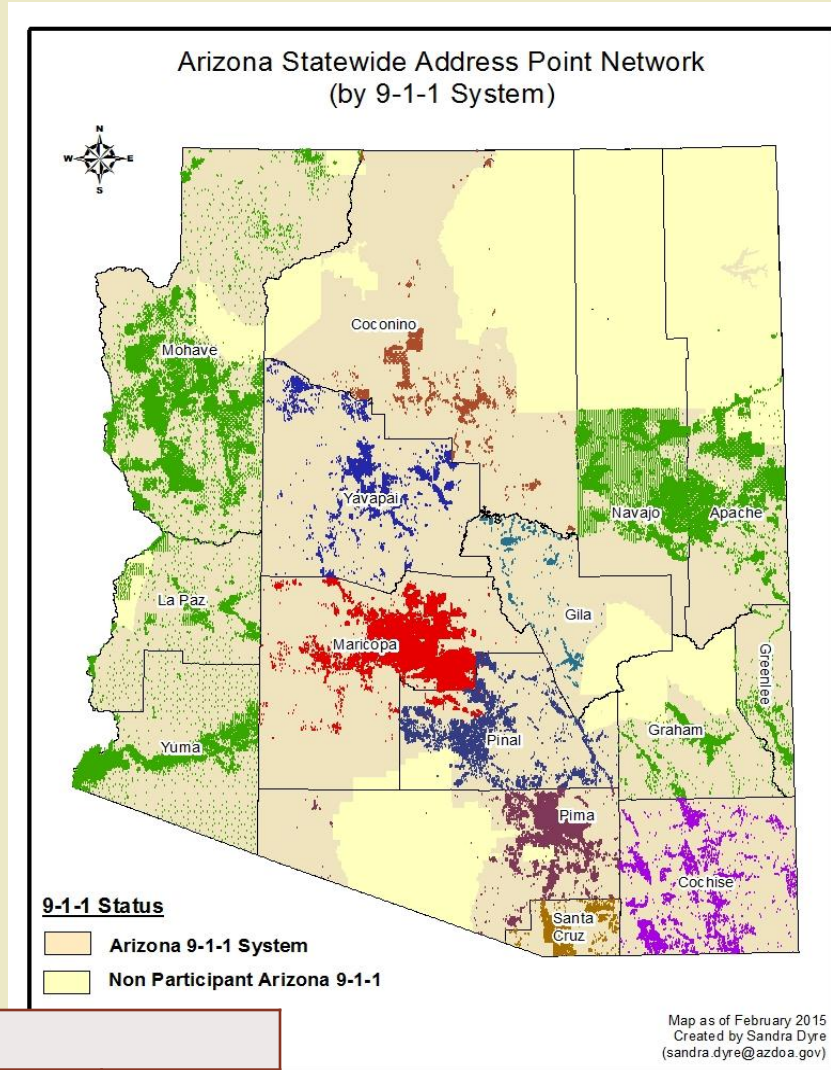
Arizona Road Network

- 9-1-1 provides public road data to ADOT which improves and completes road network to support 9-1-1
 - ✓ Today and Future
- For NG911, allows for QA/QC reporting and maintenance of road:
 - ✓ Gaps
 - ✓ Overlaps
 - ✓ Duplicates
 - ✓ Parity
 - ✓ Edgematching (ADOT)
 - ✓ ADOT Ticketing System



Arizona Address Point Network

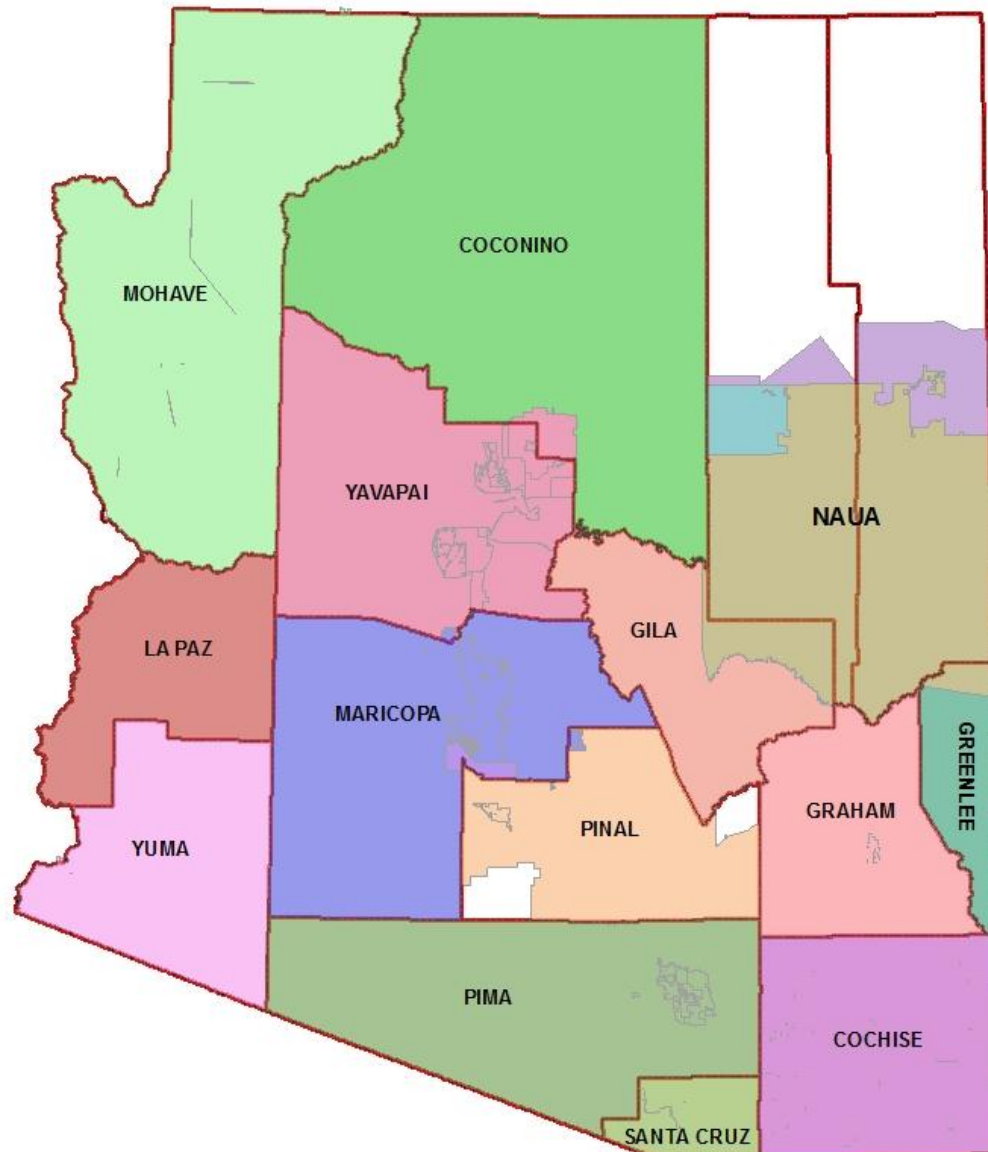
- Completion of address points to support 9-1-1
 - ✓ Additional grant funds (SBI)
 - ✓ 477,643 total points
 - ✓ Today and Future
- Project Parameters
 - ✓ 6 week completion
 - ✓ Structure point placement
 - ✓ Focused on parcels 20,000 sq. ft. or larger with situs address
 - ✓ Utilized university student intern workforce



County Address Point Totals

Apache	Graham	Greenlee	La Paz	Mohave	Navajo	Yuma
58,446	10,759	4,880	16,147	262,787	95,392	29,232

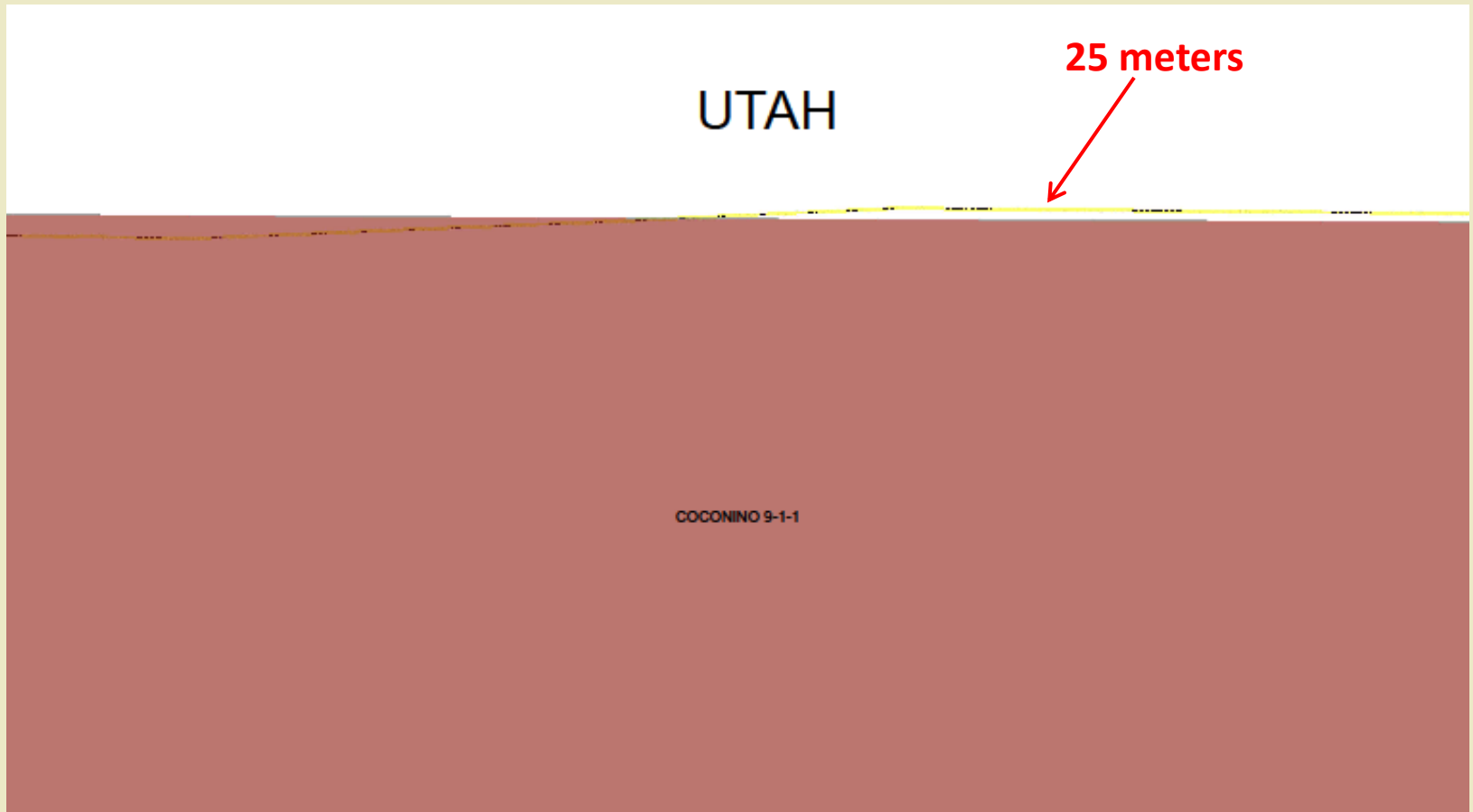
Arizona 9-1-1 Authority Boundary



Arizona 9-1-1 Authority Boundary: Gaps between 9-1-1 Systems



Arizona 9-1-1 Authority Boundary: Gaps/Overlaps between States



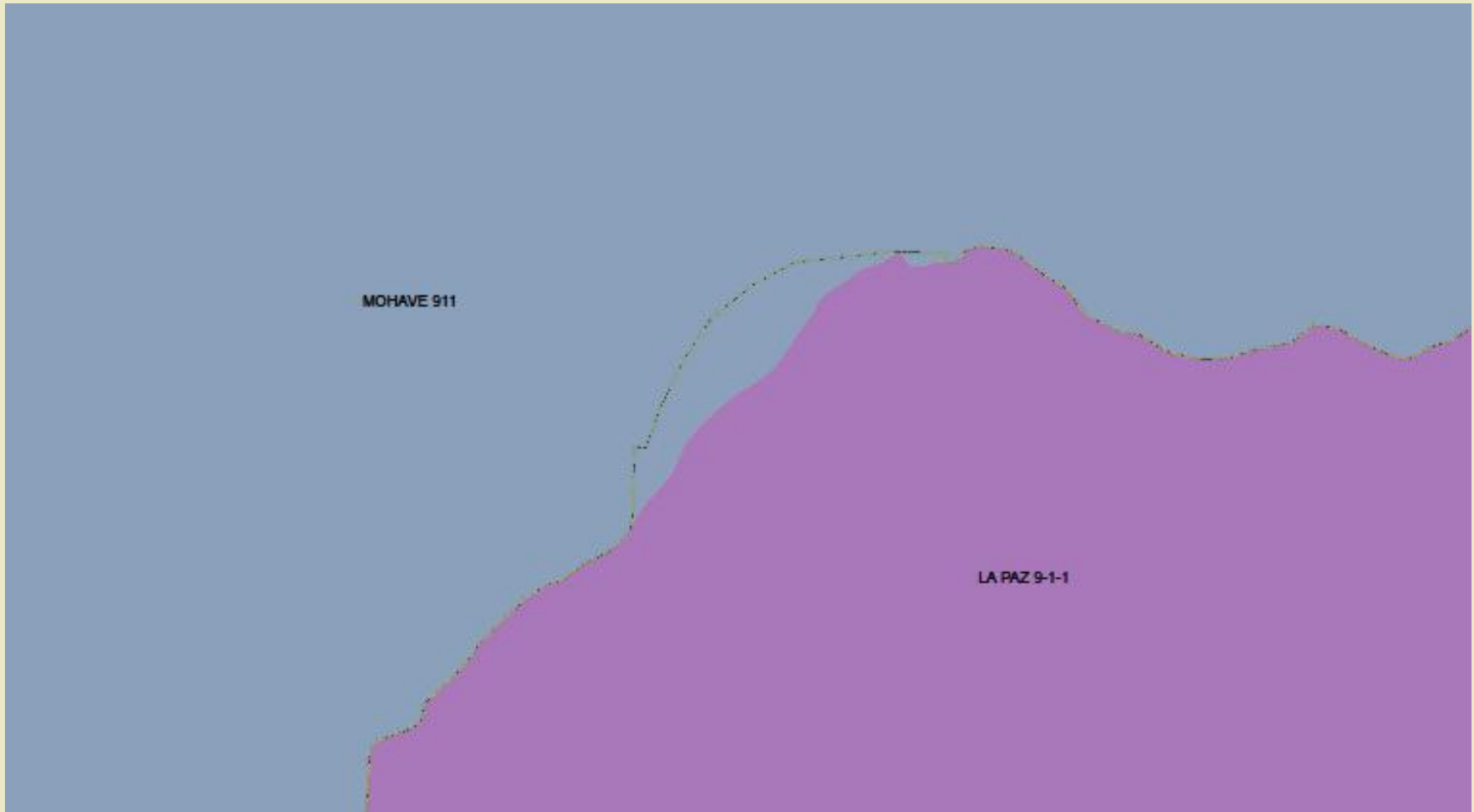
Arizona 9-1-1 Authority Boundary: Gaps between International Borders



Arizona 9-1-1 Authority Boundary: Overlap



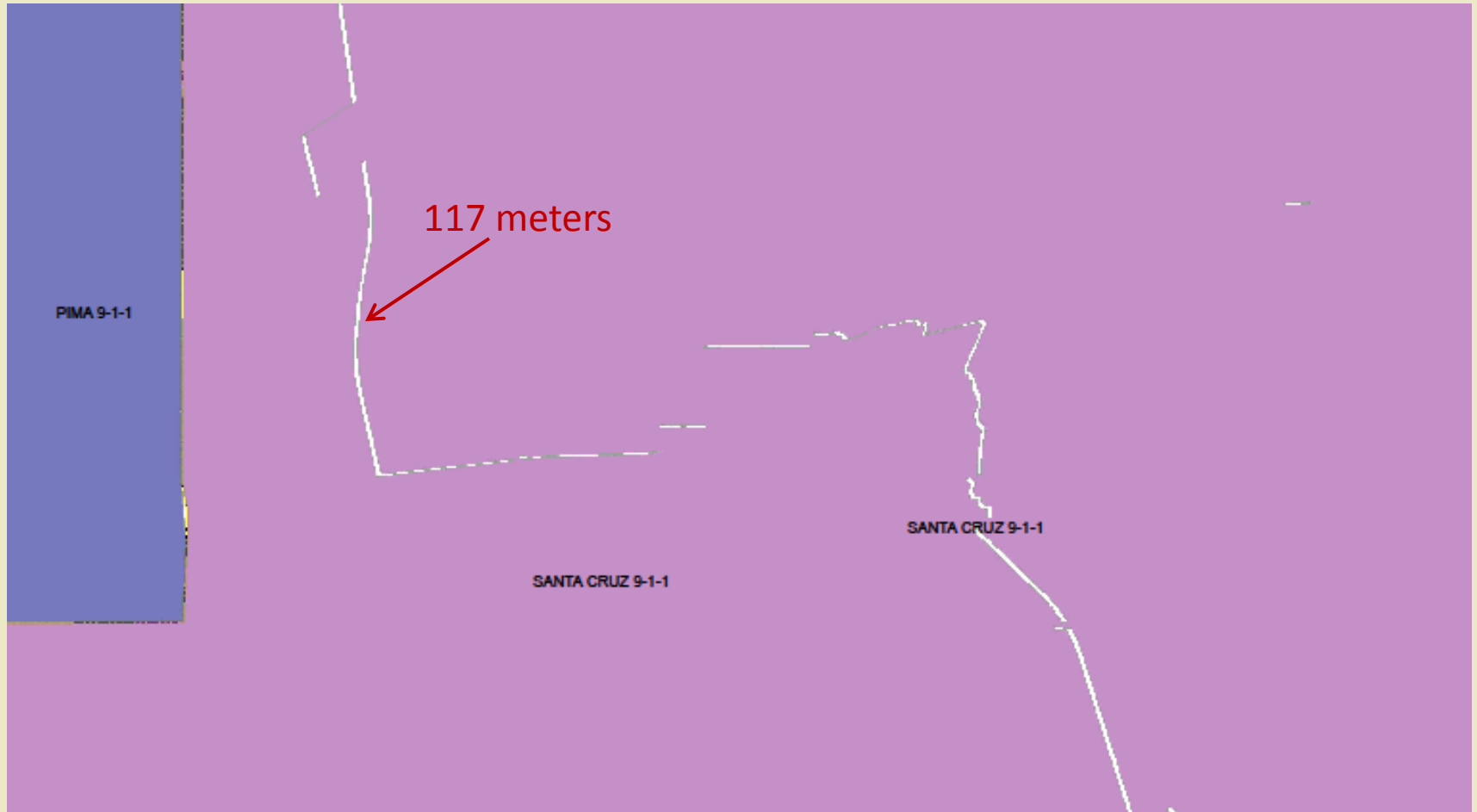
Arizona 9-1-1 Authority Boundary: County Boundary Discrepancies



Arizona 9-1-1 Authority Boundary: Gaps, Overlaps and Conflicts



Arizona 9-1-1 Authority Boundary: Gaps Within 9-1-1 Systems



Lessons Learned

QA Tests Against Statewide Networks

- ☐ Gaps

- ☐ Overlaps

 - ✓ Some as simple as clipping at the boundary

 - ✓ Others more complicated such as EMS boundaries issued by AZBEMS and 911 Authority boundaries

- ☐ Near-Analysis

 - ✓ Address points to road network

 - ✓ Distance of point from road/missing roads

- ☐ Common Framework?

- ☐ Need for change in current accuracy reporting

Accuracy

Today

- Tied to the funding of Wireless Phase 2 Costs
- ALI to GIS Comparison
- 95% for the 9-1-1 system
- Centerline Only
 - Learned varying ways this report is done

Future

- Tied to the funding of the NG9-1-1 System Costs
- ALI to GIS Comparison
 - Need for more comprehensive databases (*)
- 98% to the ESN/ESZ
 - System-wide accuracy veiled problems
- Centerline and Address Point
 - Full Address plus Community
 - Full Address plus ESN
 - Four (4) Reports

* Utility Data, USPS Data, etc.

NG9-1-1 Preparation: USER GUIDES

- Procedure Guide
- Data Model
- User Guide
 - Compilation of national standards
 - Highlights information from standards
 - Points out where preparation is needed
 - Missing mandatory fields identified
 - Examples/Recommendations
 - Field Mapping
 - Add local processes

Next Steps?

- Pilot Project 2Q16
- Webinars/GTM
- Statewide Accuracy Testing

QUESTIONS OR SUGGESTIONS



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