

Partnership for a Statewide Composite Roadway Framework



GIS-T – Minnesota

Monday March 27, 2000 – Session 1.2.1 – 1:30pm

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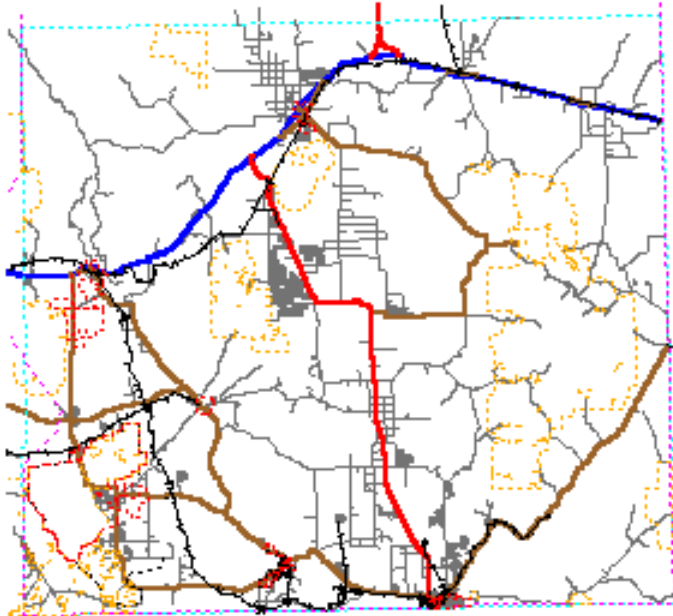
Arizona DOT

Slides available at: www.gisworks.com/library

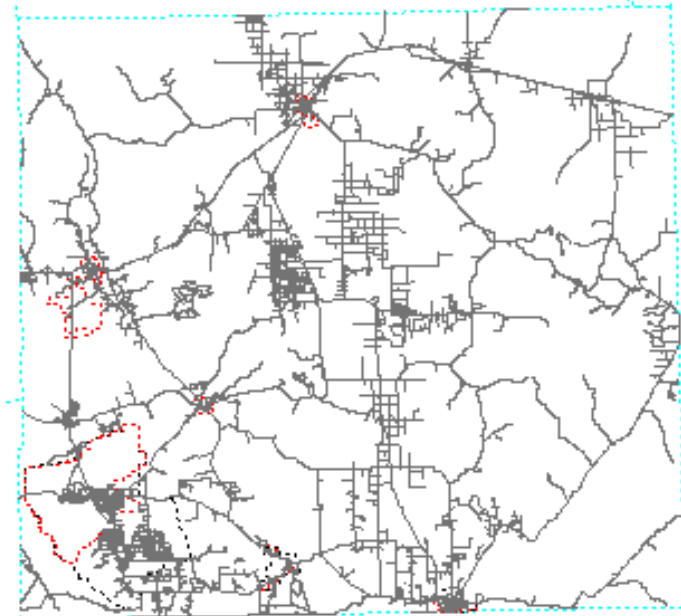
The Problem

- Arizona GIS base map significantly out-of-date at the county and local community level

Before: 2708 miles
of local centerline



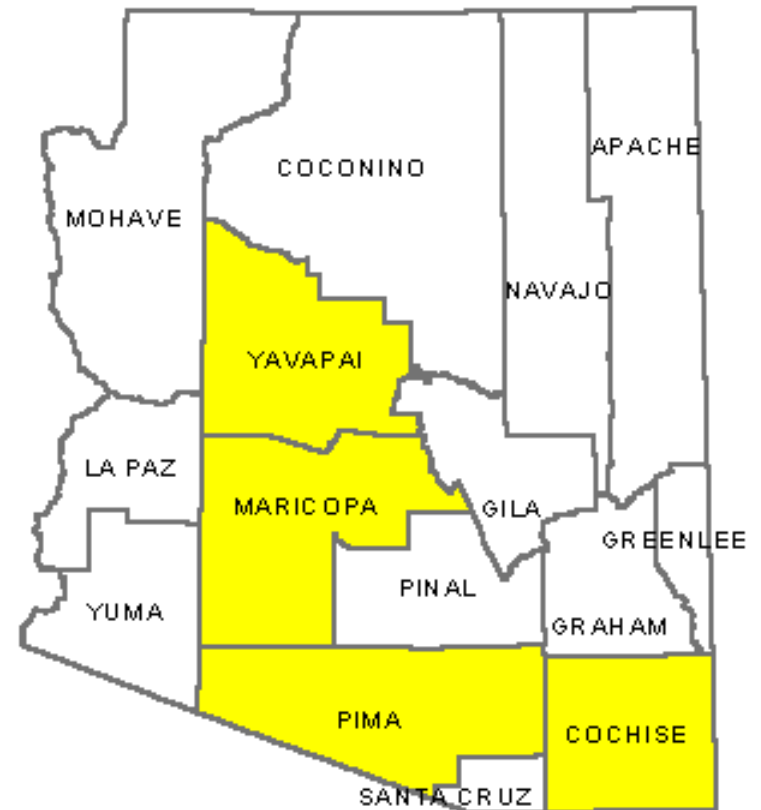
Now: 3252 miles of
local centerline



Cochise County

History

- Base map is 25 years old
- ADOT roads (5600 centerline miles) are up to date with GIS-grade GPS
- Some Local Communities are 25 years out of date
- 4 of 15 counties (29% of Arizona land area) have their own GIS program with current centerlines.



Reasons

- Lack of Direction?
- Lack of Funding (budget cuts)
- Local roads not seriously considered as part of the “state” highway agency business needs

So... What Changed?

- Grass-roots GIS effort within ADOT delivered many critical “project-based” applications that work with each other.
- Successful applications began to drive the importance of local agency inventory, crash, and planning issues
- TEA-21 provided planning money

Composite Framework

- An integrated base map composed of ADOT's centerlines across the state highway system (6750 miles) – supplemented by the best available local data (50,180+ miles).
- ADOT's robust linear referencing system is attached, enabling all local agencies to exploit GIS for transportation.

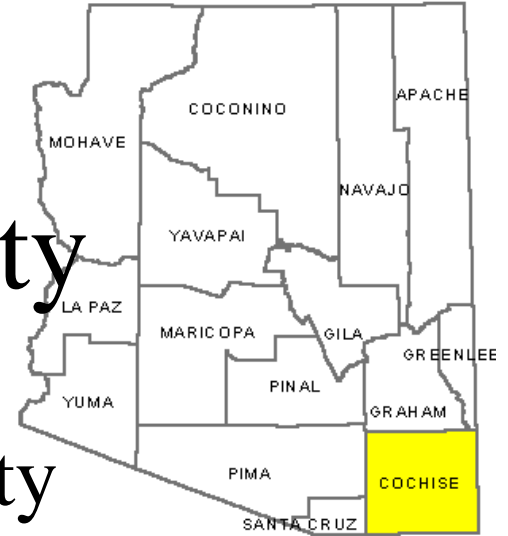
How does it happen?

- GIS-developed agencies submit centerlines for “bulk integration”
- ADOT removes local arcs from state coverage
- ADOT removes state arcs from local coverage
- Both coverages are “put” together
- Intersections between different sources are edited
- Linear referencing system is built to fit multiple applications
- Product is distributed back as desired by local agency

Integration Happens – Then what?

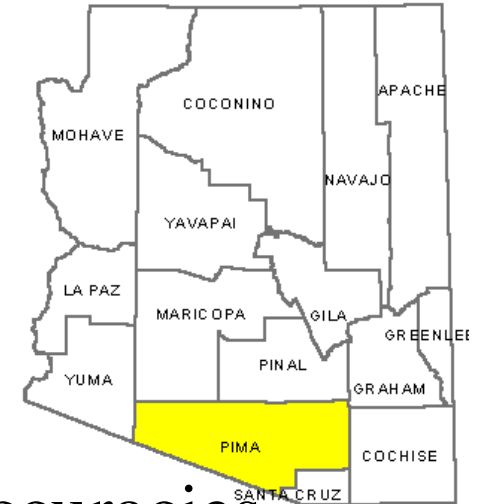
- Maintenance can occur at local level with piecemeal update tools (in ArcView or ArcIMS [future]).
- Annual bulk upgrades for bigger GIS agencies that have established procedures.
- Host of statewide applications (crash, HPMS, centerline maintenance, roadway maintenance, best path, E-911) available for use at all levels of government.

Example 1: Cochise County



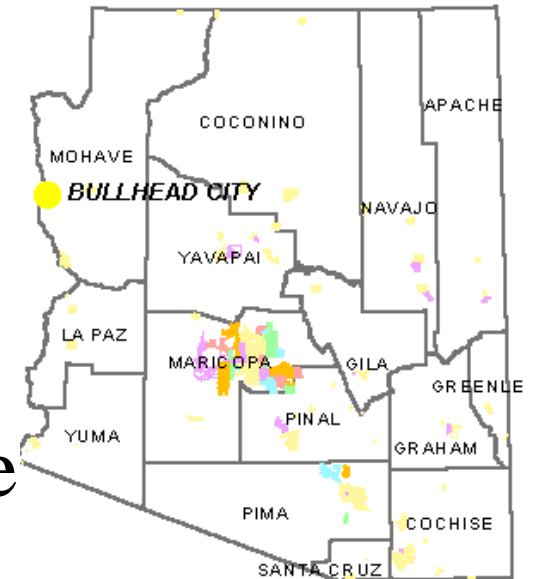
- Sub-meter coverage of entire county recently available (>4500 centerline miles).
- Bulk-integration takes 1-2 days editing the 3873 local miles to 668 miles of state route.
- LRS creation takes run-time only.
- Meeting in 2 weeks to make technical arrangements for improved repeatability.

Example 2: Pima County



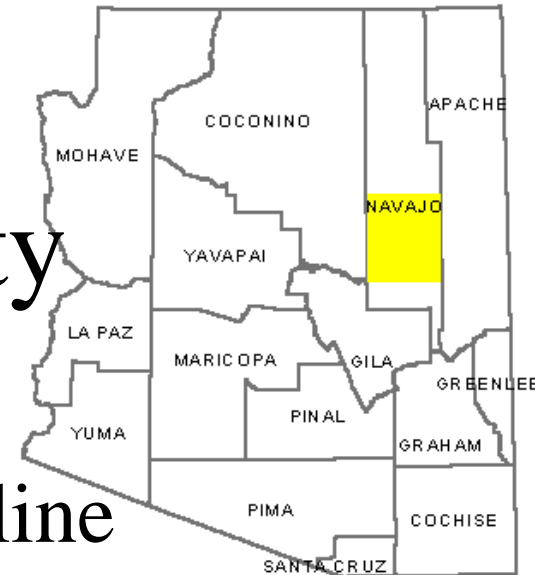
- Parcel-base centerlines created more inaccuracies that currently in ADOT's cover
- Instead of bulk integration, just added linear referencing to satisfy Pima County technology gap
- Meeting in two weeks to present results and LRS technology workshop
- ADOT hopes to persuade Pima County into a centerline "precision" improvement project – and then bulk integration.

Example 3: Bullhead City



- A city without own GIS centerline
- ADOT provides:
 - 1975 centerline and works with local agency to bring up-to-date
 - and GPS to acquire 100 miles of new streets
 - and integration technology/training
- Bullhead City adds – address ranges to all other centerlines to create E-911 database.

Example 4: Navajo County



- A county without own GIS centerline
- ADOT provides:
 - 1975 centerline and works with local agency to bring up-to-date
 - and GPS to acquire 363 miles of roads
 - and integration technology/training
- Navajo County adds – GIS cleanup on all centerlines.

Lessons Learned

- Bullhead City and Navajo County took on challenge of editing and QC but were understaffed. Still awaiting QC output of their desired coverage.
 - Do we need IGA's?
 - Do we need added ADOT involvement to help the locals and persuade timeliness?

If Integration Doesn't Happen

- ADOT still deploys robust linear referencing on the local roadways (outside of statewide coverage).
- This enables simple LRS-based conflation of local data to state databases
- Technology solution provides working example of how simple and easy GIS-T can be – leading to eventual acceptance.

The Product?

- ATIS Reference Library
 - Projected for statewide use
 - Projected for specific local government use
- Available to multiple existing applications (HPMS, crash, traffic, etc.) as well as those being built at ADOT and all levels of gov't
- FGDC compliance expected

The next year(s)

- Incoming centerline files to be “bulk integrated” from: Navajo Nation, Flagstaff, Yavapai County, and Maricopa Association of Governments
- County GIS acquisition projects in Mohave, Coconino, Pinal, and others (all will be ADOT-assisted)
- Promote the concept to bring remaining counties into the project.

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