Enterprise GIS
A State Perspective

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Abstract
Enterprise GIS—A State Government Perspective

- Government efficiency and effectiveness can be enhanced through an enterprise GIS.
- In Utah the Automated Geographic Reference Center (AGRC) has been building the state's geospatial capacity for over twenty years based on approaching the development and implementation with an enterprise strategy.
- A brief discussion of what this meant historically and operationally for AGRC: Shared vision and goals; policies and practices, sharing geospatial data, building information partnerships, shared infrastructure/technology transfer, and authority to accomplish these. AGRC has built relationships with the state legislature, local government, federal agencies, and other state agencies and developed executive support to implement enterprise strategies. The success of AGRC's efforts is exemplified in an enterprise initiative to acquire and share statewide high resolution imagery acquisition which included over 60 partners and saved nearly $2 million for Utah cities and counties.

Why Enterprise GIS Works

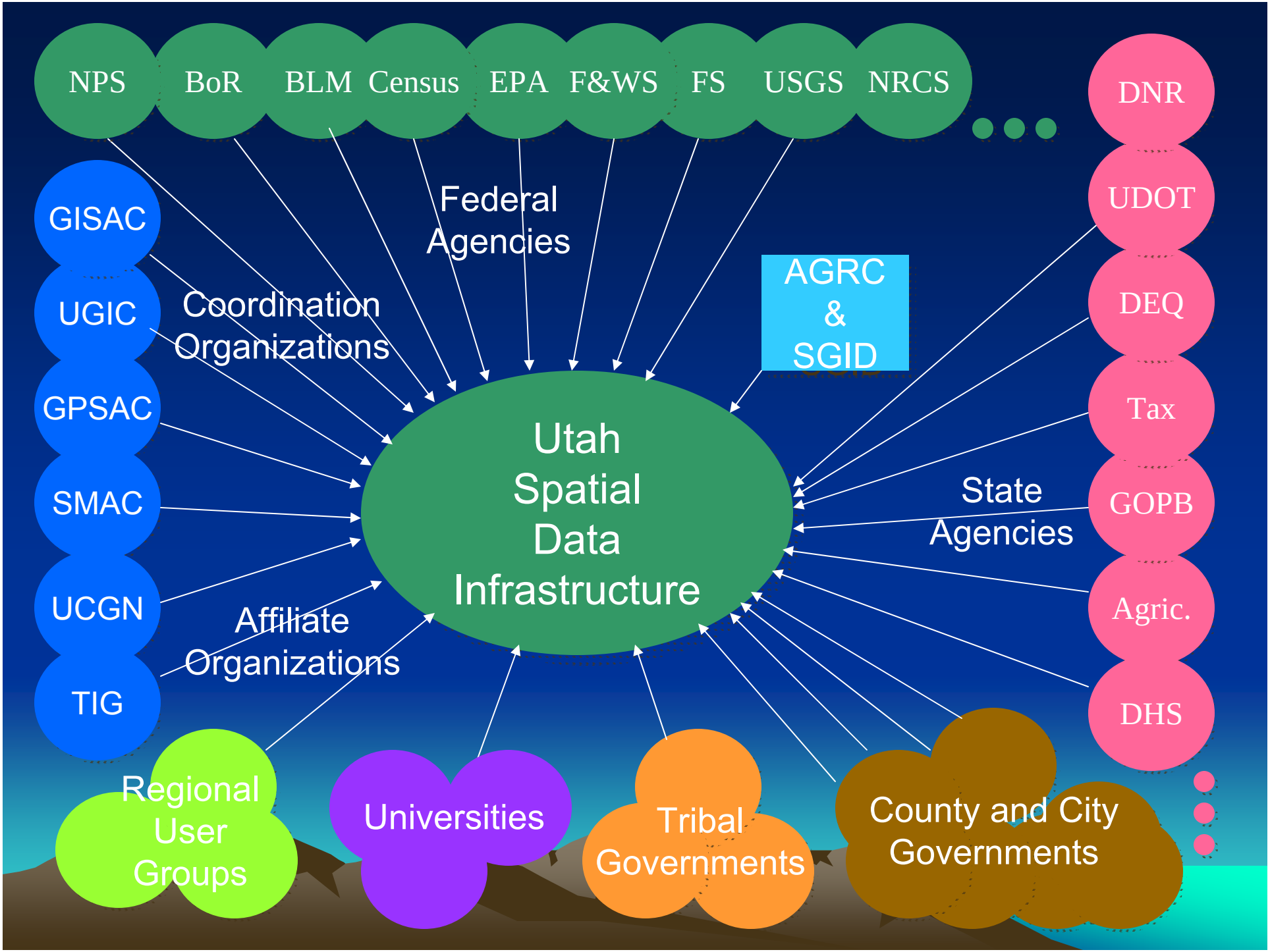
- Most government data can be '**spatially enabled**'.
- GIS uses location as a means to **integrate** & **organize** data.
- GIS provides a host of tools for **analyzing** and **communicating** information.

Benefits of Geospatial Enterprise

- Better and more data availability
- Realize the value of data standards
- Improve efficiency/reduce duplication of effort
- Technology support in the community
- Synergy for new or additional funding

History of Coordination in Utah

- 1978 – Recommendations to create State Geographic Information Database
- 1980 & 81 – Price/Waterhouse and ESRI studies
- 1981 – AGRC created
- 1987 – ESRI established as state GIS standard
- 1987 – GISAC established
- 1991 – SGID created in statute
- 1991 – UGIC created and held first conference
- 1994 – Canyon Country Partnership chartered
- 1997 – FGDC signs MOU with GISAC
- 1998 – Data Sharing Agreement with Federal agencies signed by Gov.
- 2001 – Framework Implementation Plan completed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NRCS
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UDOT
DEQ
Tax
GOPB
Agric.
DHS
GISAC
UGIC
GPSAC
SMAC
UCGN
TIG
Federal Agencies
Coordination Organizations
AGRC & SGID
Utah Spatial Data Infrastructure
State Agencies
Affiliate Organizations
Regional User Groups
Universities
Tribal Governments
County and City Governments

Building an Enterprise Geospatial Infrastructure

- Identify and meet the needs of broad base of users
- Shared vision
- Building relationships for collaboration
- Technical expertise
- Communications network
- Shared data & technical infrastructure

Essential for Enterprise GIS and Statewide Coordination

- NSGIC (National States Geographic Information Council) published 9 essential criteria.

How does Utah meets these?

NSGIC Coordination Criteria

1. *Full-time coordinator position*

   AGRC – Office designated with that responsibility

   Developing an enterprise strategic plan for the state

NSGIC Coordination Criteria

2. *Clearly Defined Authority*

   Utah Code 63F-1-506

   - AGRC shall manage the State Geographic Information Database

   - AGRC shall provide geographic information system services

NSGIC Coordination Criteria

3. *Formal relationship with CIO*

   AGRC is under the CIO and is part of the Utah Dept. of Technology Services

NSGIC Coordination Criteria

4. *GIS Champions*
   - Governor
   - Legislators
   - Legislative fiscal analyst
   - County Commissioners/recorders

NSGIC Coordination Criteria

5. *Responsibilities for NSDI and State clearinghouse assigned*

   Responsibility of AGRC

NSGIC Coordination Criteria

6. *Ability to coordinate statewide* with locals, academia, & public sector

   In Utah Code

NSGIC Coordination Criteria

7. *Sustainable funding*

   State Legislative Appropriation in state's base budget provides sustainable funding.

NSGIC Coordination Criteria

8. *Authority to enter into contracts*

   Yes

NSGIC Coordination Criteria

9. *Federal government works through Statewide Coordinating Authority.*

   Yes, AGRC has coordinating authority.

   Utah has an MOU with 13 federal agencies for data sharing

Benefits of Coordination Examples in Utah

- Aerial Imagery Project
- Cadastral Data Development
- GPS Reference Network

Aerial Imagery Project Objectives

- Use new aerial digital photographic technology as an opportunity to get better resolution and additional imagery products from a single project.
- Develop partnerships to leverage the planned acquisition of NAIP imagery statewide to better meet state, local, and federal needs.

Broad Base of Partners

Federal Partners / Contributors

- NAIP (FSA, NRCS, FS, USGS)
- Aerial Photography Field Office
- Bureau of Land Management
- National Park Service
- Natural Resources Conservation Service
- US Geologic Survey

State Partners / Contributors

- Automated Geographic Reference Center
- Department of Agriculture
- Department of Transportation
- Division of Forestry, Fire, and State Lands
- Public Land Policy Coordination Office
- State Parks and Recreation
- Utah Geological Survey
- Utah National Guard
- Utah State Legislature Appropriated Additional Funds

Other Partners / Contributors

- Counties (25 of 29 counties)
- Cities (50??)
- Water Districts
- Special Service Districts
- Museum of Natural History
- Energy Companies
- Real Estate Companies
- The Nature Conservancy
- Utah State University
- Wendover City, Nevada

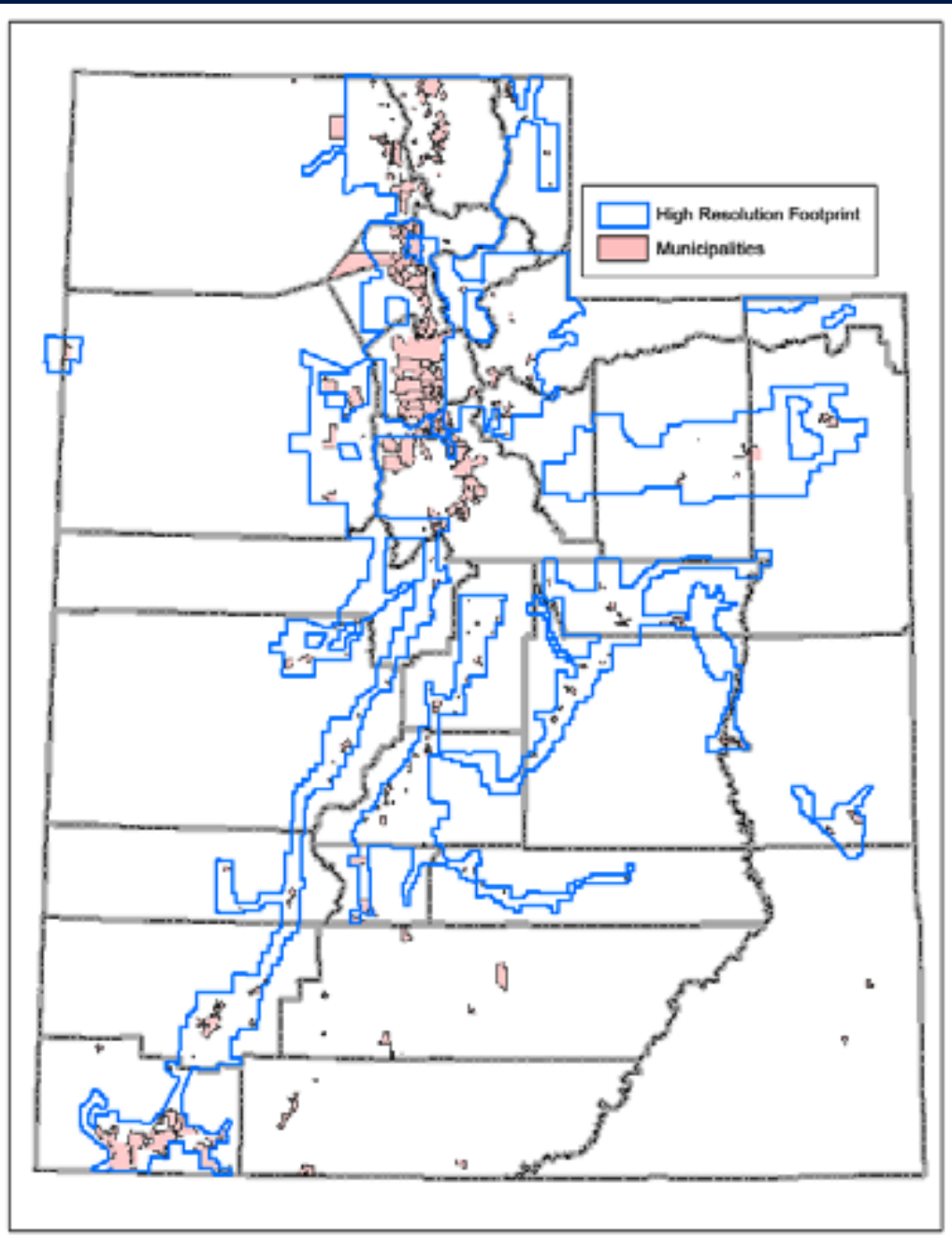
Final Imagery / Elevation Deliverables

Statewide Products (85,000 square miles)

- 1-meter natural color imagery (absolute accuracy, 95% 6 meter)
- 1-meter Color Infrared imagery (CIR)
- 5-meter auto-correlated Digital Elevation Model (DEM)

High-Resolution Products

- 1-foot imagery (13,876 sq. miles)
- 6-inch imagery (1,481 sq. miles)
- High-res auto-correlated DEM (2,891 sq. miles)
- LiDAR (1,284 sq. miles)



Economies of Scale
High Resolution Imagery for Counties

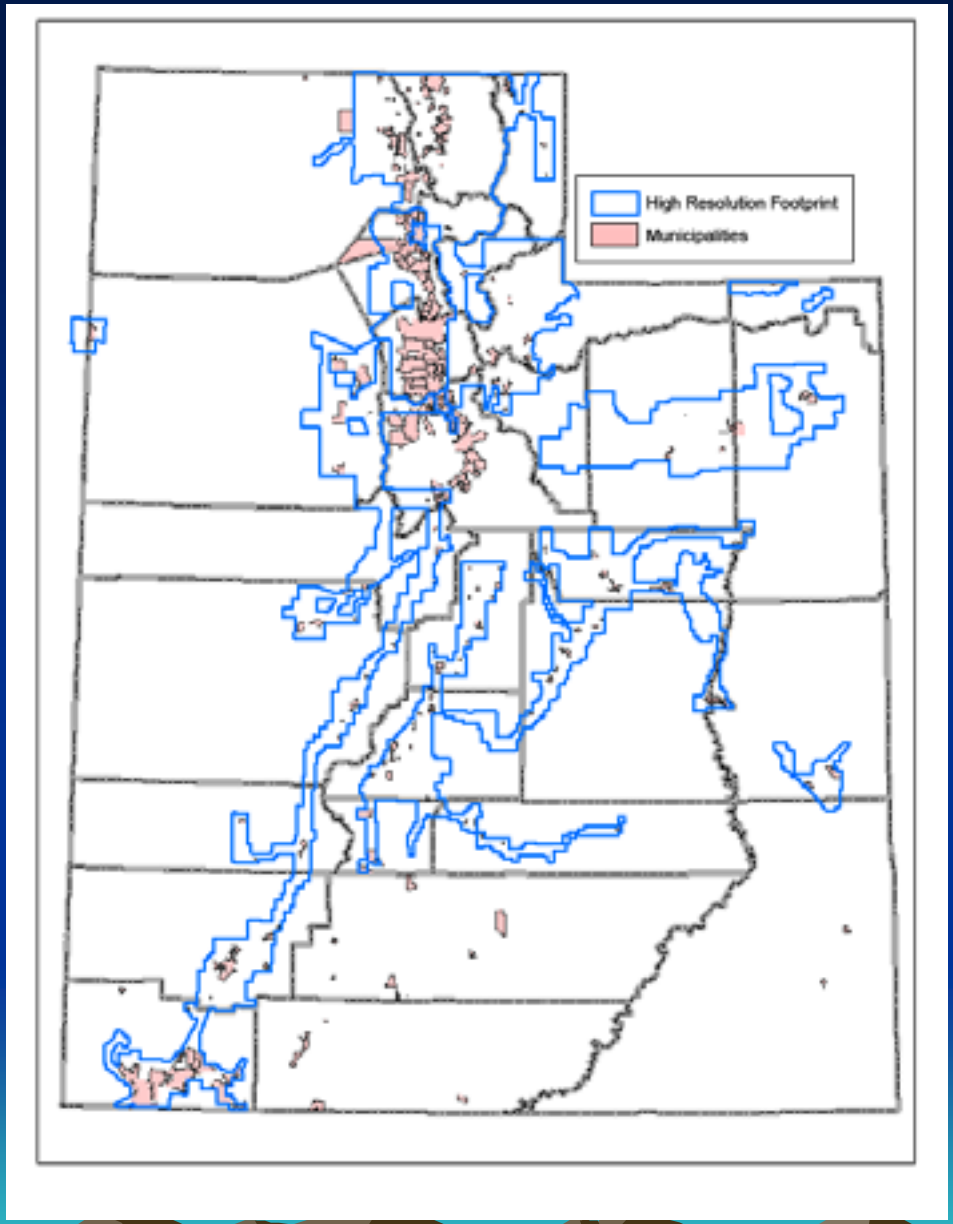
If each county had done imagery independently (15,381 sq miles):

Total = $2,215,780

through coordinated effort:

Total = $1,429,860

Saving $786,000



Economies of Scale
High Resolution Imagery for Cities & Towns

Municipalities total cost bought separately

(1,490 sq miles):

Total = $1,123,464

through coordinated effort:

Total = $108,301

Saving over $1 million

ROI for the Utah Legislature

→ Investment of $500,000

→ Return to the State, $4 million in imagery products

Cadastral Data Development

Application Layers

Ownership, Boundary Layers

Survey Reference Layer

Surface of the Earth

Uses of Digital Cadastral Data

- Accurate PLSS
  - Controlling parcel and jurisdictional boundaries
  - Land use and management
  - Valuation, taxation and address-based services
  - Issues related to complex land ownership in Utah

Partnerships

Counties

- Collect accurate PLSS section corners (with survey grade GPS)
- Digital parcel automation
- Build local GIS capacity

Bureau of Land Management

- Support of coordinated effort to build solid digital cadastral infrastructure

AGRC

- Assist rural governments in developing GIS capacity
- Implement standards and procedures
- Integrate resulting data

Synergy for Funding

Rural Cadastral Grant Program

25 rural Utah Counties

1999-2002 State Legislature $600,000

2004-2006 U.S. Congress $1.6 million

2007-2008 State Legislature $800,000

The Utah Reference Network for High Accuracy GPS

- Statewide high-accuracy, real-time GPS survey data and mapping-grade GPS data
- Network of strategically located GPS Reference Stations (~20-50 km spacing)
- Network solution delivered over Internet connection via cellular digital data enabled rover or mapping grade GPS.

Takes Partners to Build It

- Estimated Cost $1.5 Million
- Funding-State Legislature $ 800,000
  - Balanced Needed $ 700,000

Partners helping to cover that difference

Receivers

Location

Network communications

Thank You !