

BEST PRACTICES FOR ESTABLISHING AND MAINTAINING STATEWIDE CULTURAL RESOURCES GIS DATABASES NCHRP 25-25 Task 61

**Requested by American Association of State Highway and
Transportation Officials (AASHTO)
Standing Committee on Environment**

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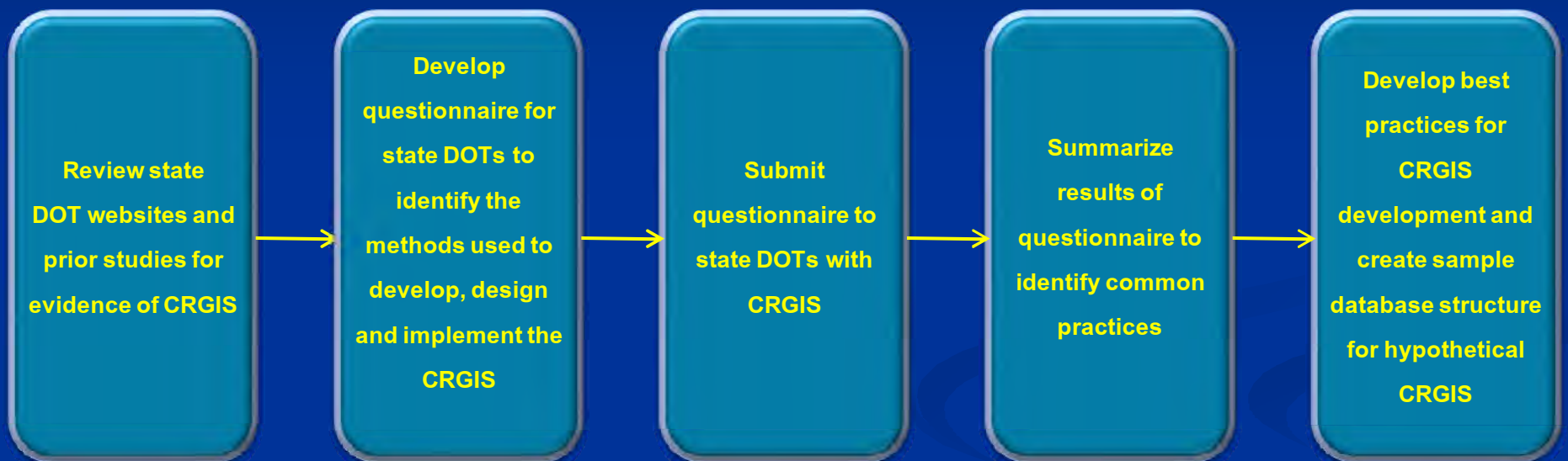
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Purpose of this Study

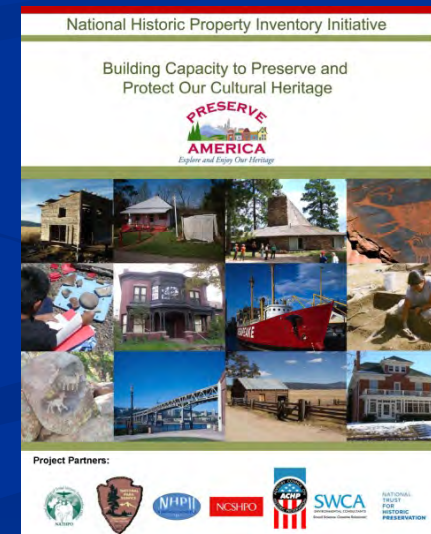
- Create an inventory of the range of Cultural Resource GIS (CRGIS) databases used by state DOTs nationwide
- Identify and report on the best practices used by state DOTs that have developed CRGIS databases for transportation planning and environmental compliance
- Develop best practices for state DOTs that either
 - are contemplating the development of a CRGIS
 - have begun to develop a CRGIS or
 - are considering updating and enhancing an existing GIS to include cultural resources
- Create a sample GIS data structure using optimal variables found in extant CRGIS.



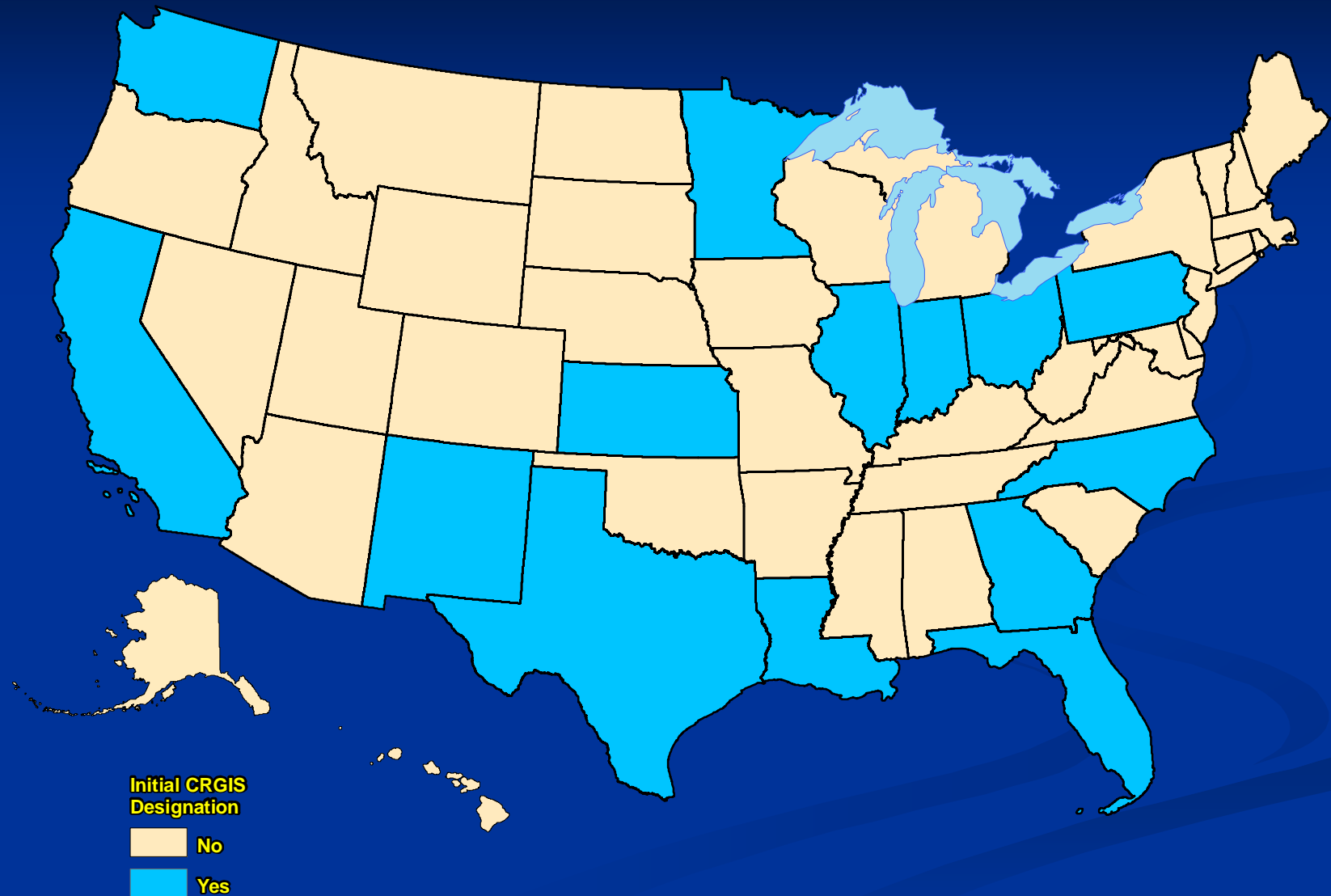
Task 61 Methodology



DOT Website and Prior Study Review



Initial Results of Internet and Document Review



Determining DOT CRGIS Involvement

DOTs with CRGIS (n=14)

- Involved with the initial development and implementation over several years of a CRGIS that included both archaeological and historic architectural resources
- Covers the entire state
- CRGIS used for early project planning to avoid (or minimize) impacts to cultural resources.

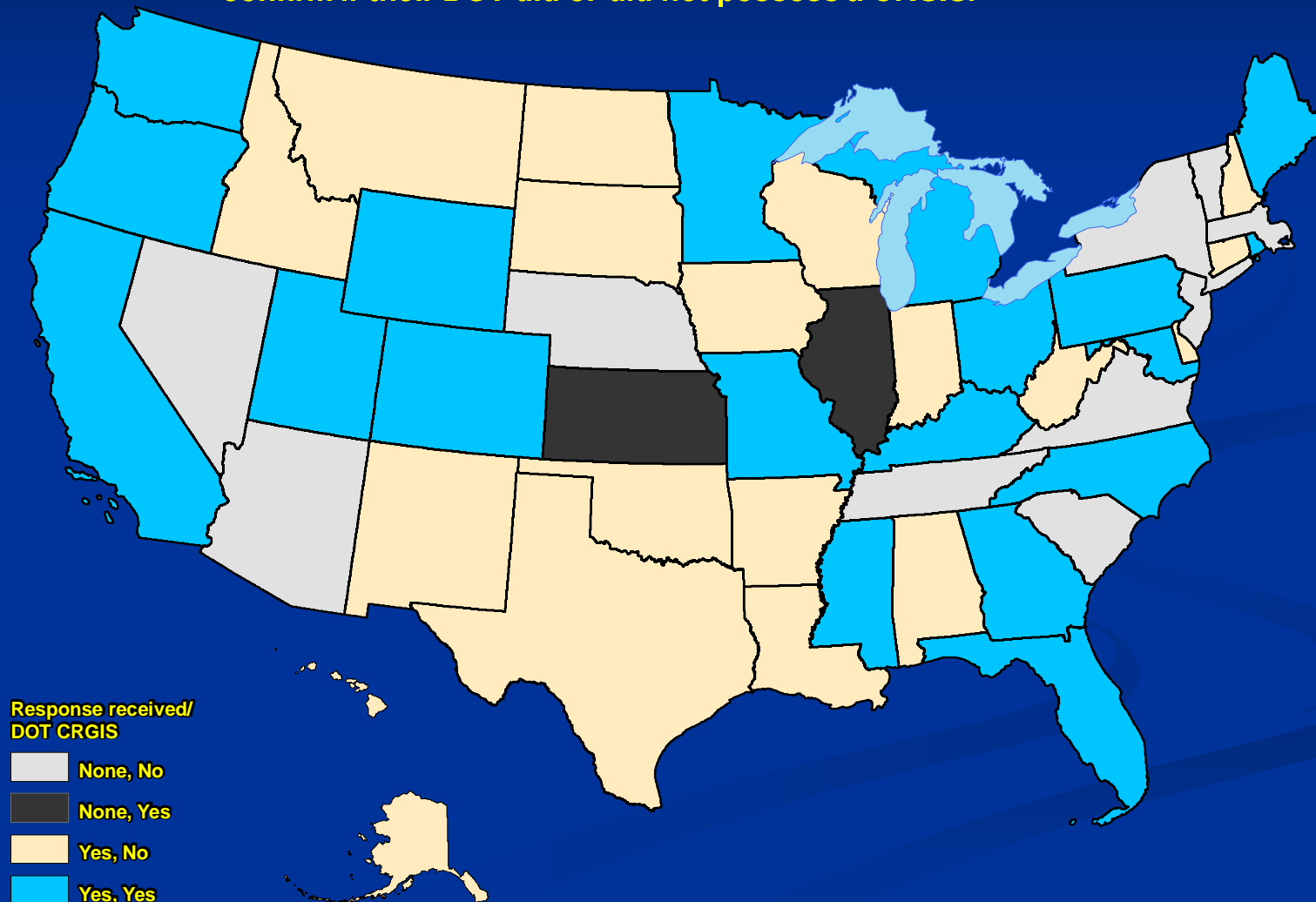
DOTs without CRGIS (n=36)

- No evidence of cultural resource GIS on DOT website.
- DOTs that only provided funding to develop the CRGIS and had little to no involvement with the structure of the CRGIS



Response to Email Inquiry to State DOTs

➤ All DOTs were sent an email asking each DOT to confirm if their DOT did or did not possess a CRGIS.



Questions for the State DOTs with CRGIS

Database Development

- Who created it?
- Why was it created?
- How?
 - Data source
 - Funding

Database Design

- GIS program used
- Data standards
- Content/structure
- Coordinate system
- Other data included

Database Access

- Where are data stored?
- How to access data?
- Public access?
- Remote updates?

Implementation

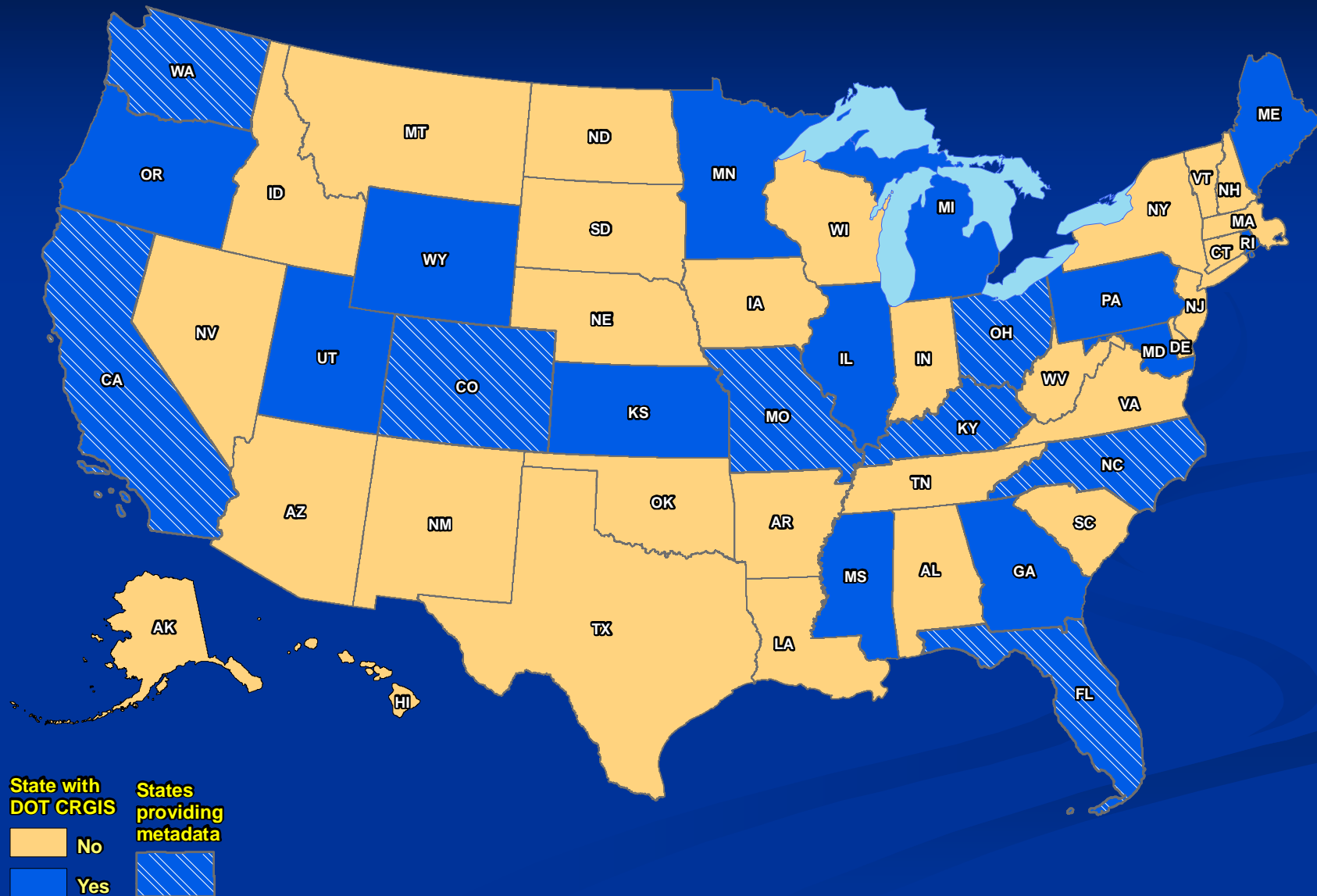
- How used?
 - Locational
 - Early Project Planning
 - Predictive Modeling

Future Plans

- When to update?
- Information to be added
- Funding maintenance



DOTs Providing Metadata to their CRGIS



Results of the Questionnaire

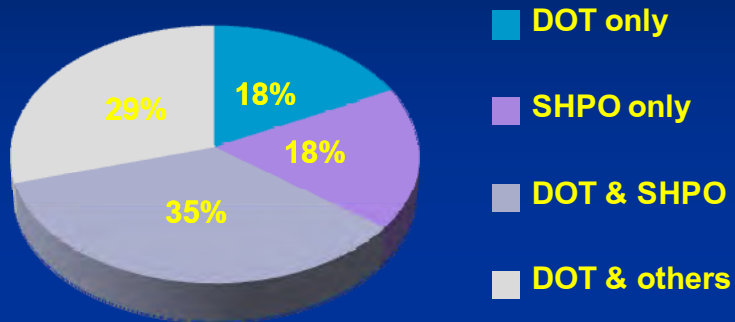
Response summaries grouped into five areas

- **CRGIS database development**
- **CRGIS database design**
- **Database access**
- **Implementation of the CRGIS**
- **Future plans for the CRGIS**

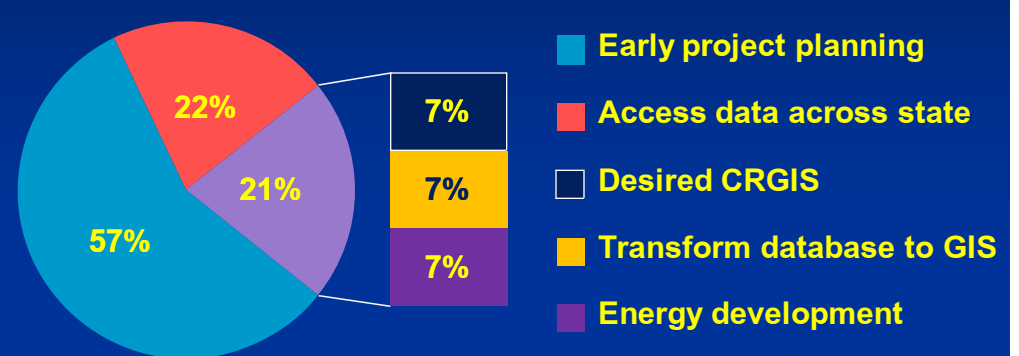


CRGIS database development

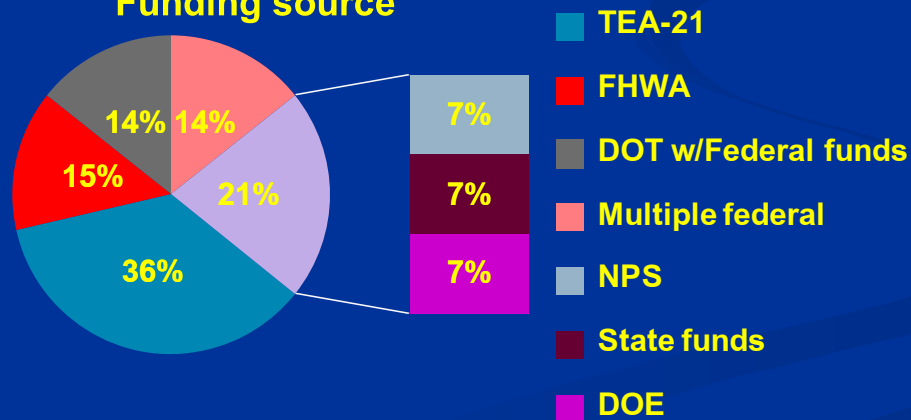
Developed CRGIS



Catalyst to create CRGIS

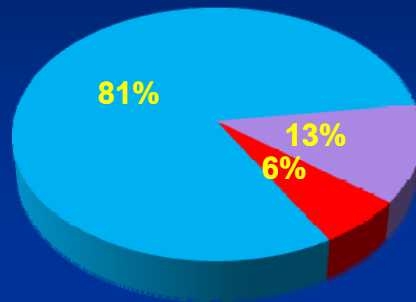


Funding source



CRGIS database design

GIS program used



■ ESRI ArcView

■ GeoMedia

■ Mapguide

Data standards

Federal Geographic Data Committee's Content Standard for Digital Geospatial Metadata (CSDGM)	12 DOTs
ESRI CSDGM	1 DOT

Content of the CRGIS

Vector data	All CRGIS
Raster data	USGS Quad maps Digital orthophotos Scanned cultural resource reports National Register nomination forms Historic resource survey forms
Grid data – archaeological predictive data	California Missouri Minnesota Washington

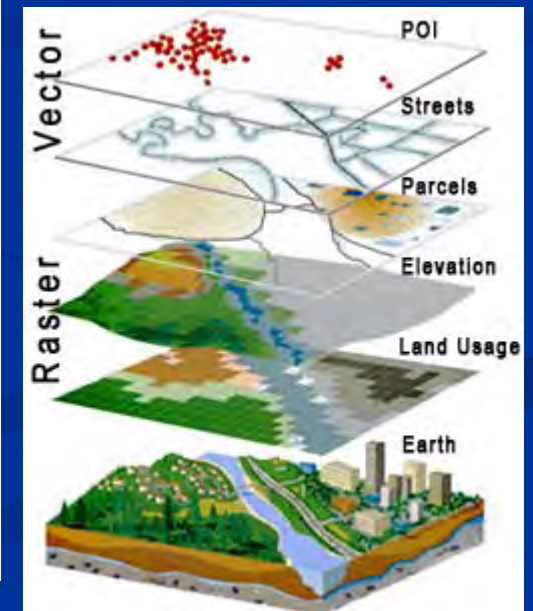
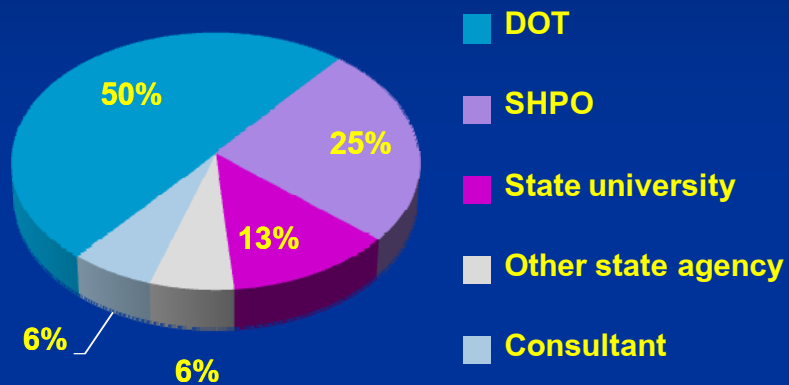


Image: I-Ten Associates, Inc.



CRGIS database access

Where is the database stored?



Access to CRGIS via

Password protection	10 DOTs
ArcIMS application	6 DOTs

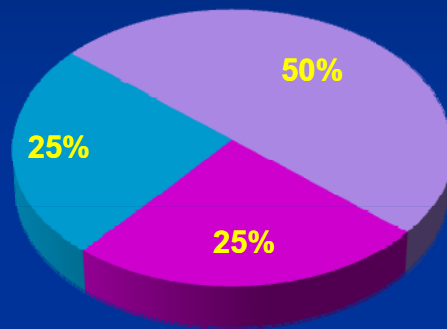


Image: ESRI



Implementation of CRGIS

Implementation



- Locational
- Project planning
- Predictive modeling

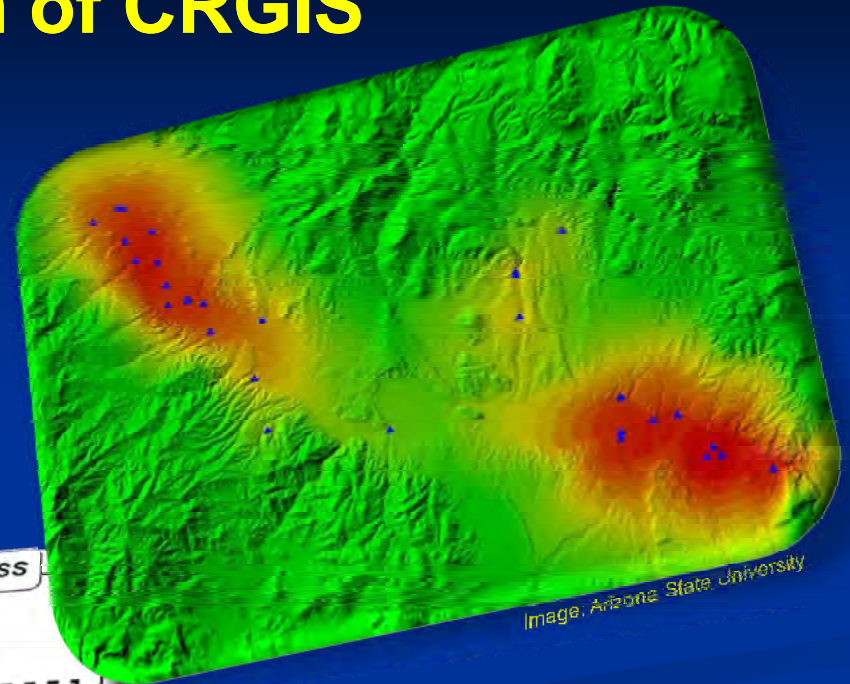


Image: Arizona State University



Image: Agrisoft-Systems



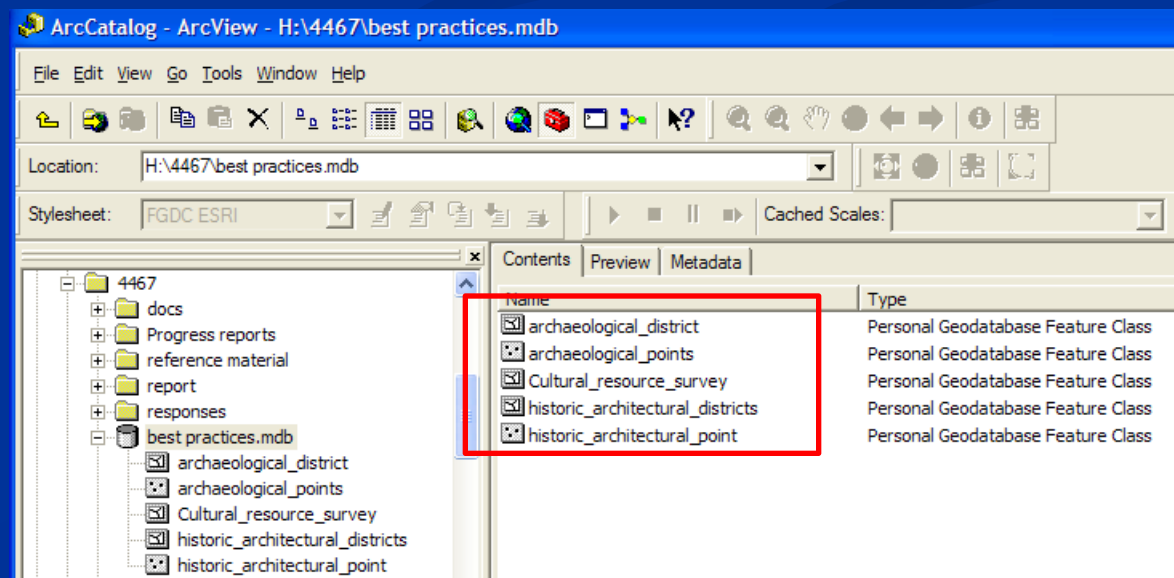
Image: NASA



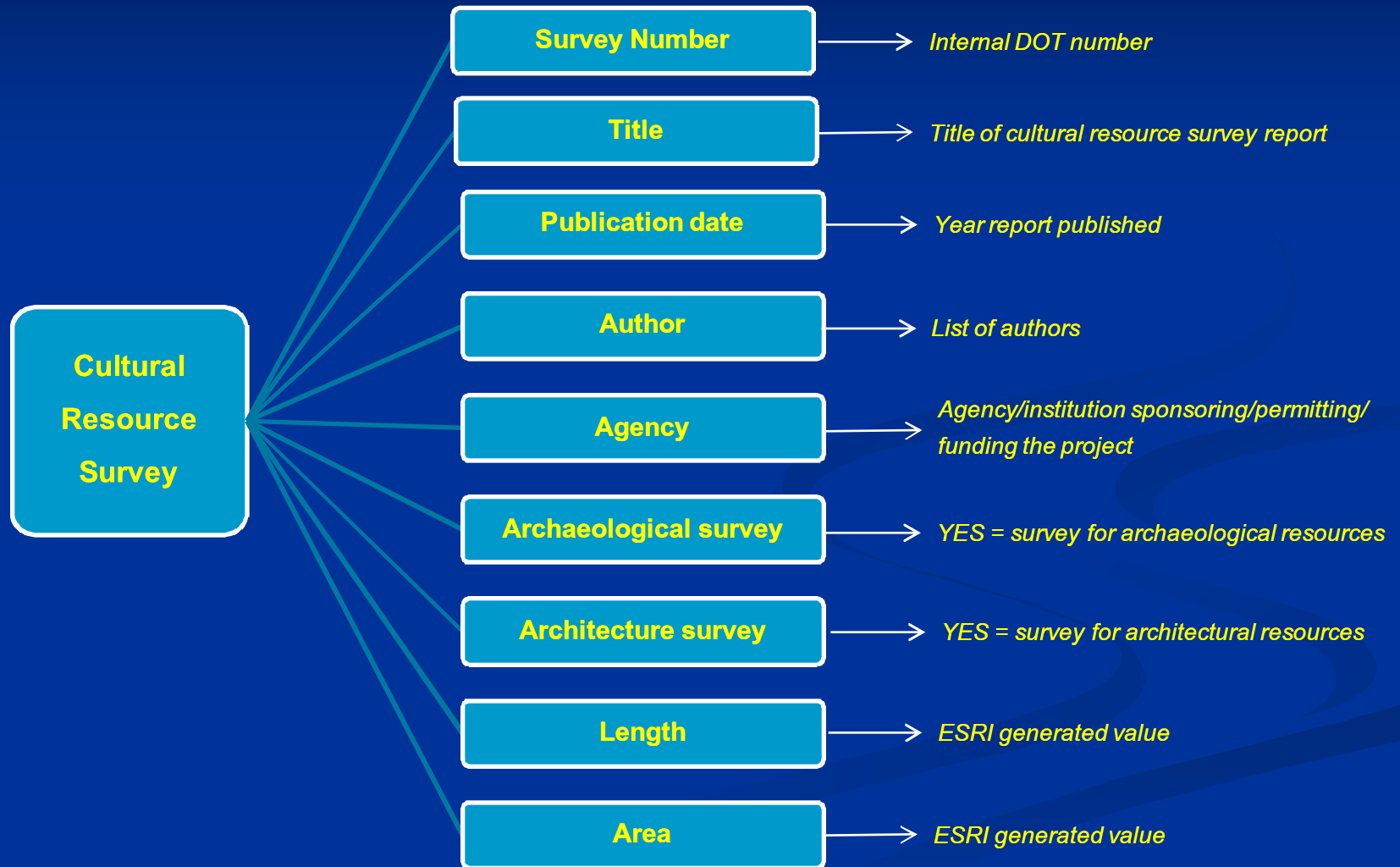
Sample GIS Database

Five base files to encompass the geodatabase

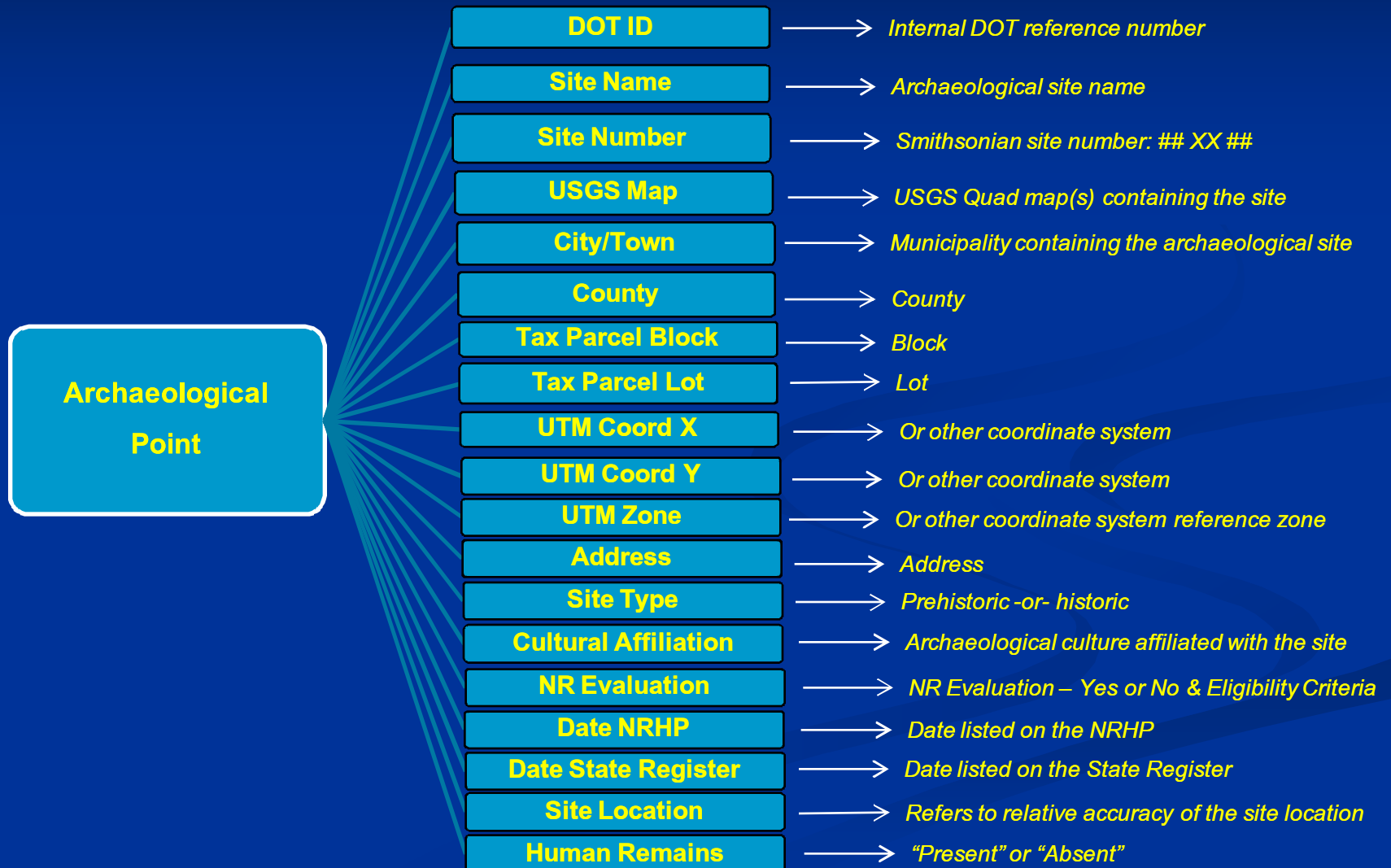
1. Cultural Resource Survey
2. Archaeological Point
3. Archaeological District
4. Historic Architectural Point
5. Historic Architectural Districts



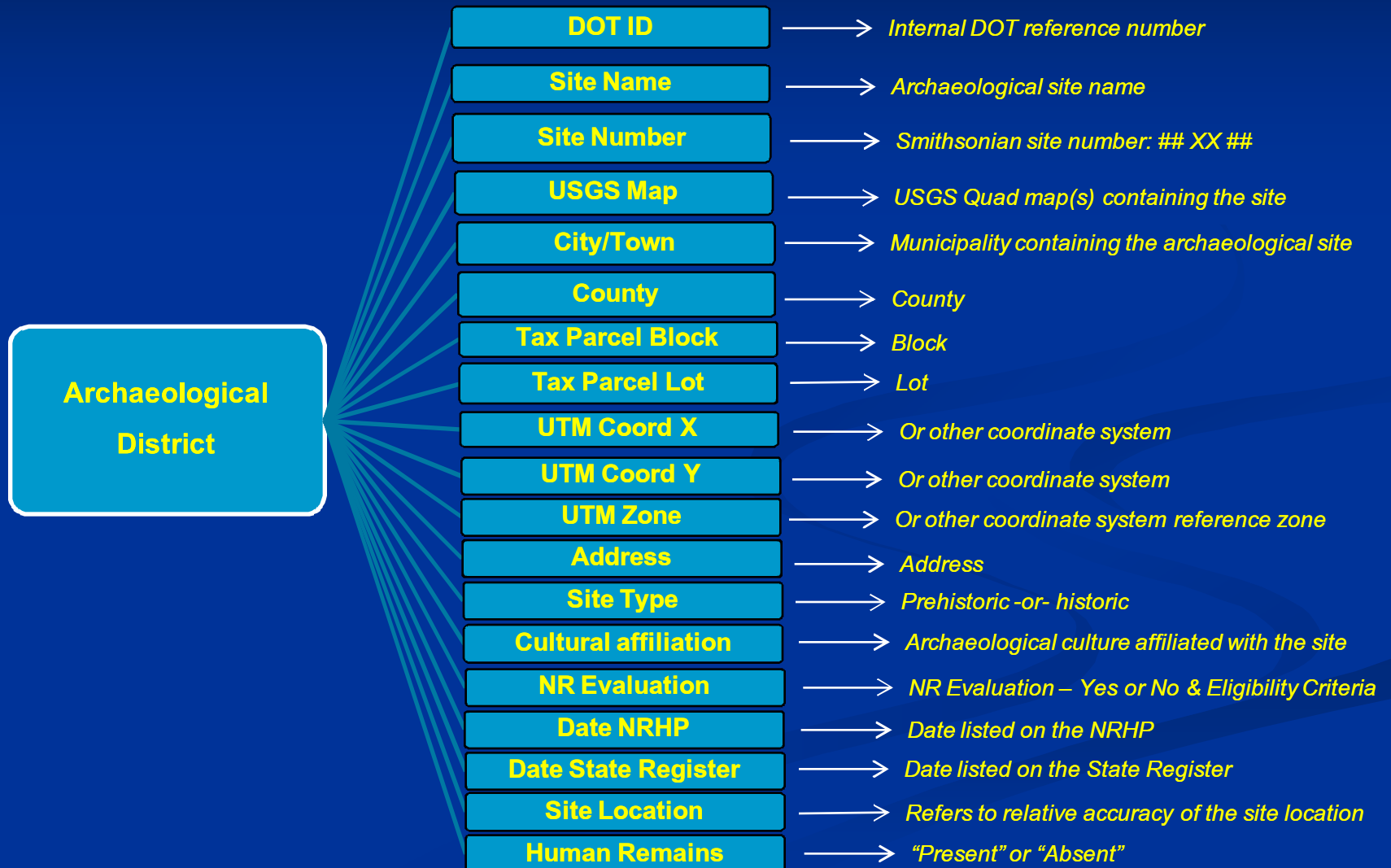
Structure of Cultural Resource Survey GIS File



Structure of Archaeological Point GIS File



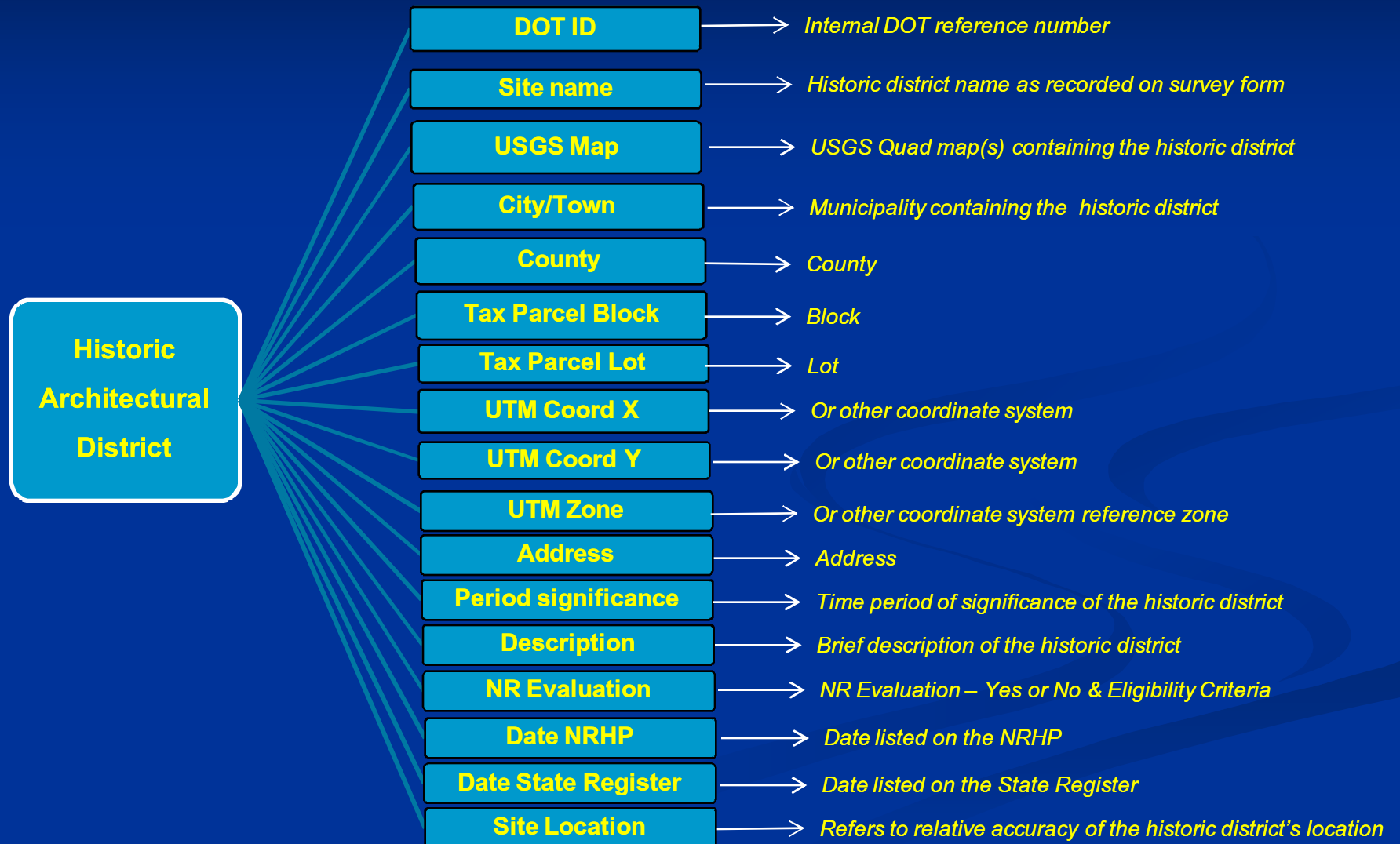
Structure of Archaeological District GIS File



Structure of Historic Architectural Point GIS File



Structure of Historic Architectural District GIS File



Acknowledgements

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Bill Turner (Alabama DOT), Kathy Price (Alaska DOT), John Miller, III (Arkansas DOT), Anmarie Medin and Bill Silva (Caltrans), Greg Wolff (Colorado DOT), Keith Hall (Connecticut DOT), David Clarke (DelDOT), George Ballo and Peter McGilvray (Florida DOT), Jim Pomfret, Eric Duff and Glenn Bowman (Georgia DOT), Glenn Yasui (Hawaii DOT), March Munch (Idaho DOT), David Moffatt and Matthew Coon (Indiana DOT), Randy Faber (Iowa DOT), David Waldner and Carl Shields (Kentucky Transportation Cabinet), Noel Ardoin and Jim Mitchell (Louisiana DOT), David Gardner (Maine DOT), Julie Schablitsky (Maryland DOT), James Robertson (Michigan DOT), Joseph Hudak and Elizabeth Hobbs (Minnesota DOT), John Underwood (Mississippi DOT), Bob Reeder (Missouri DOT), Kerry Nichols (Missouri SHPO), Steve Platt (Montana DOT), Joyce McKay (New Hampshire DOT), Sharon Brown (New Mexico DOT), Derek Pierce (New Mexico SHPO), Matt Wilkerson and Brian Overton (North Carolina DOT), Bob Christensen (North Dakota DOT), Paul Graham (Ohio DOT), Ann Steffes (USDOT, Volpe Center, Cambridge, Massachusetts), Scott Sundermeyer (Oklahoma DOT), Carolyn McAleer and Chris Bell (Oregon DOT), Ira Beckerman and Joe Baker (PennDOT), Noël Strattan (Pennsylvania Historical and Museum Commission), Michael Hébert (Rhode Island DOT), Tom Lehmkuhl (South Dakota DOT), Lisa Hart (Texas DOT), Dan Julien (Texas SHPO), Betsy Skinner (Utah DOT), Kristen Jensen (Utah SHPO), Scott Williams (Washington DOT), Ariadne Moore (West Virginia DOT), James Becker (Wisconsin DOT), Julie Francis (Wyoming DOT), Mary Hopkins and Chris Young (Wyoming SHPO).



Questions???

