

Florida Unified Transportation Basemap – A Roadway to Integrate Safety Data

presented to

Traffic Records Forum

presented by

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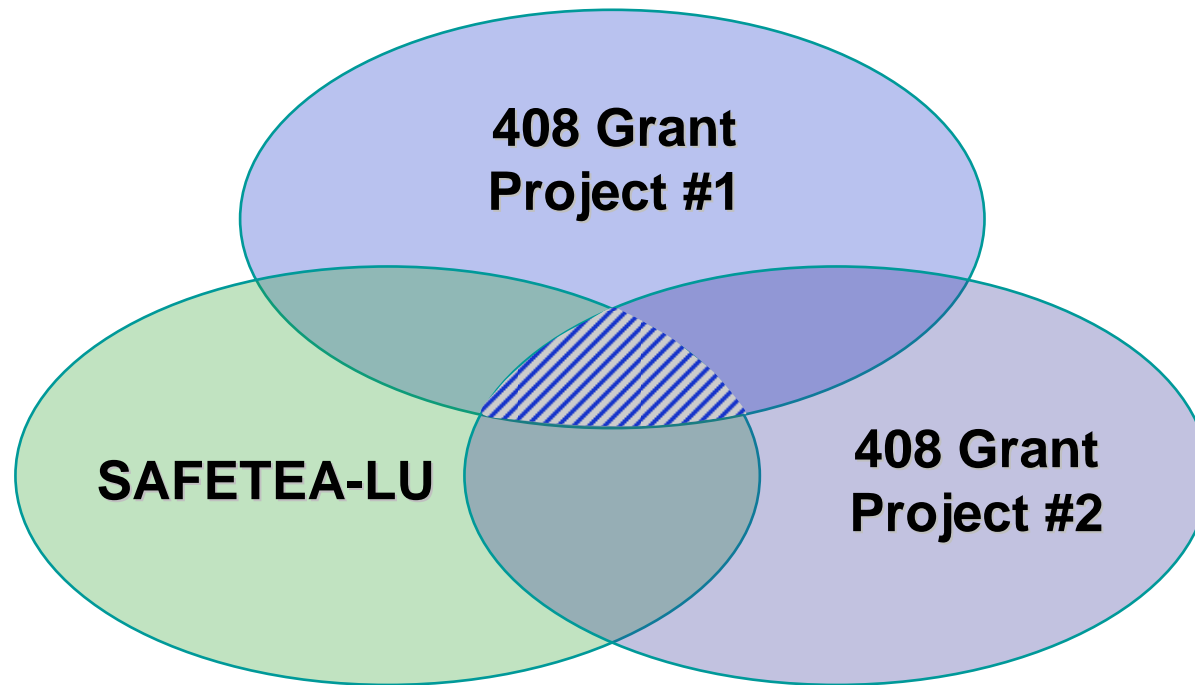
Outline

- Background
- FDOT SAFETEA-LU project & Section 408 Proposed Projects
- Benefits of projects
- Unified Basemap Feasibility Study
- Implementation Plan
- Next Steps

Background

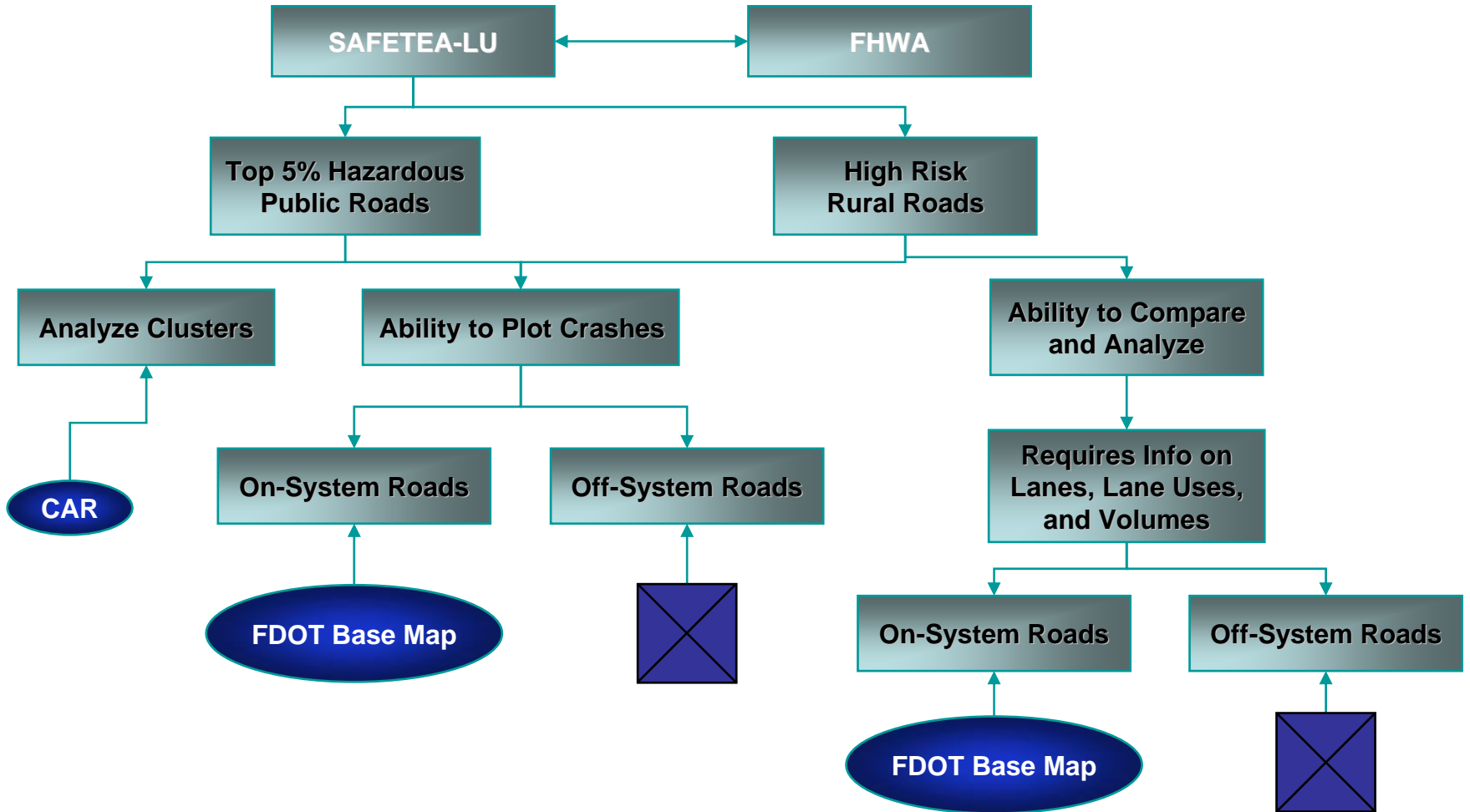
- SAFETEA-LU
- Traffic Records Assessment
- TRCC directed formation of GIS Subcommittee
 - Feasibility study needed prior to proceeding with 408 project (GIS One Map)

Florida Traffic Records GIS Projects



→ **System for accurately analyzing safety data to ensure maximum funding for improvements**

Traffic Records GIS Projects



FDOT SAFETEA-LU Project

- **Purpose**
 - FDOT must provide to FHWA
 - **Identification of the 5% of most hazardous public roads** regardless of the jurisdiction owning the facility (State and Local roads)
 - **High Risk Rural roads** - Make improvements on High Risk Rural Roads with local roads that target areas that have above the average Fatal plus incapacitating injury crash rates
- **Currently available**
 - Data for on-system and a very small percentage of off-system roads
- **Gap**
 - In order to comply with the SAFETEA-LU requirements – **NEED to report on all LOCAL ROADS**

FDOT SAFETEA-LU Project

- Scope
 - FDOT is pursuing conflating TeleAtlas data to the Department's basemap
 - Once FDOT has the local road data with the Department's Linear Referencing System, we can meet requirements

FDOT SAFETEA-LU Project

- Benefits

- Department manages federal funding for
 - High risk rural road projects to improve/enhance safety transportation (>\$5 million/yr)
 - Federal highway safety program funds (>\$75 million/yr)
- Potential to improve efficiency of sharing data to support transportation planning
 - Project Prioritization
 - Corridor Planning
 - Transportation Modeling
 - Efficient Transportation Demand Management (ETDM)
 - ITS Traffic Operations and Planning
 - Long Range Transportation Plan

FDOT SAFETEA-LU Project

- Why TeleAtlas?
 - **FDOT currently owns a site license for the agency**
 - **Currently being used by several agencies**
 - **Market Leader**
 - **Committed to Florida**
 - **Currently provide roadway characteristics inventory data for 25+ counties**
 - **Willing to partner with local agencies to improve data quality**
 - **Has completed similar projects for other states**

Section 408 Project 1 – Off System Project

- Scope
 - **FDOT Safety Office to geo-locate all crashes for calendar year 2007**
 - **Integrate the Linear Referencing of local roads into FDOT's data structure**
 - **Obtain operational and geometric data for local roads and populate the data structure**
 - **Integrate the analysis of local road crashes into the FDOT's Crash Analysis Reporting (CAR) system**

Section 408 Project 1 – Off System Project

- Benefits
 - Meets SAFETEA-LU requirements. More data from TeleAtlas for off-system roads = more accurate SAFETEA-LU reports
 - Ability to plot and analyze crashes on off-system/local roads
 - A refined basemap that has ability to communicate with current FDOT on-system basemap

Section 408 Project 2 – Unified Transportation Basemap

- Scope
 - Establish a uniform transportation base map that includes all roads for all public entities
 - Define a uniform linear referencing system to facilitate data collection of length items and point items that are offset a distance from an anchor point (must be consistent with established FDOT process)
 - Establish methods for data sharing
 - Establish partnerships and cooperative agreements with various agencies to ensure data accuracy and consistency

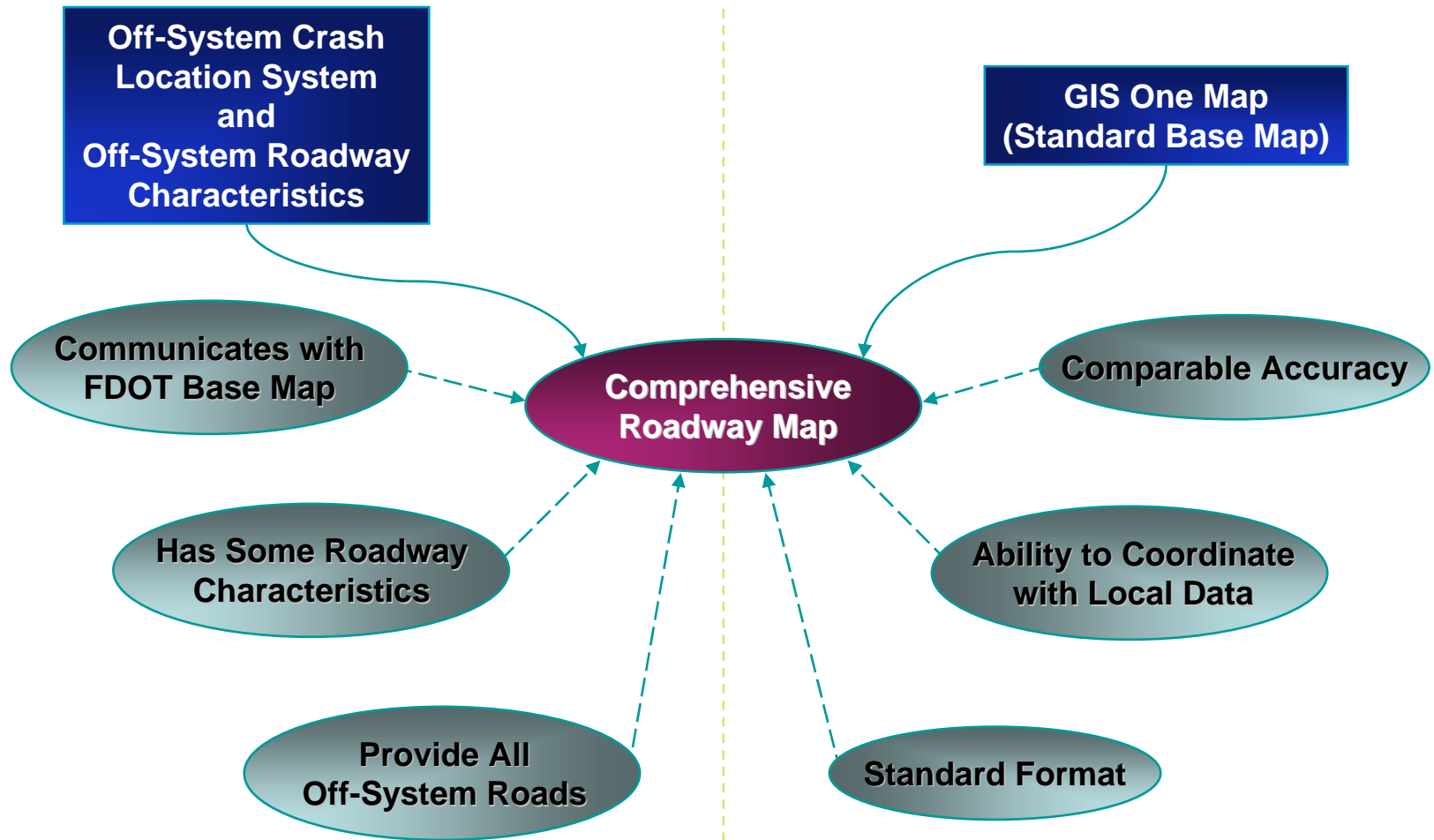
Section 408 Project 2 – Unified Transportation Basemap

- Benefits
 - Enterprise license for all public entities
 - Acts as a centralized repository
 - Better prioritization for distribution of Federal funds for Transportation Safety improvement projects
 - Facilitates merging/sharing local and state data
 - Provides communication mechanisms
 - More timely and accurate data

Section 408 Project 2 – Unified Transportation Basemap

- Steps
 - Conduct feasibility study
 - Develop a plan for implementation
 - Identify and procure a comprehensive roadway basemap that meets the needs
- End Product
 - Comprehensive statewide roadway data resource accessible over internet, managed and maintained through documented procedures, standards, partnerships and cooperative agreements

System Summary



Florida Unified Roadway Basemap

- Mission –

“To provide a comprehensive roadway network accessible over the internet, managed and maintained through documented procedures, standards, partnerships and cooperative agreements”

Feasibility Study

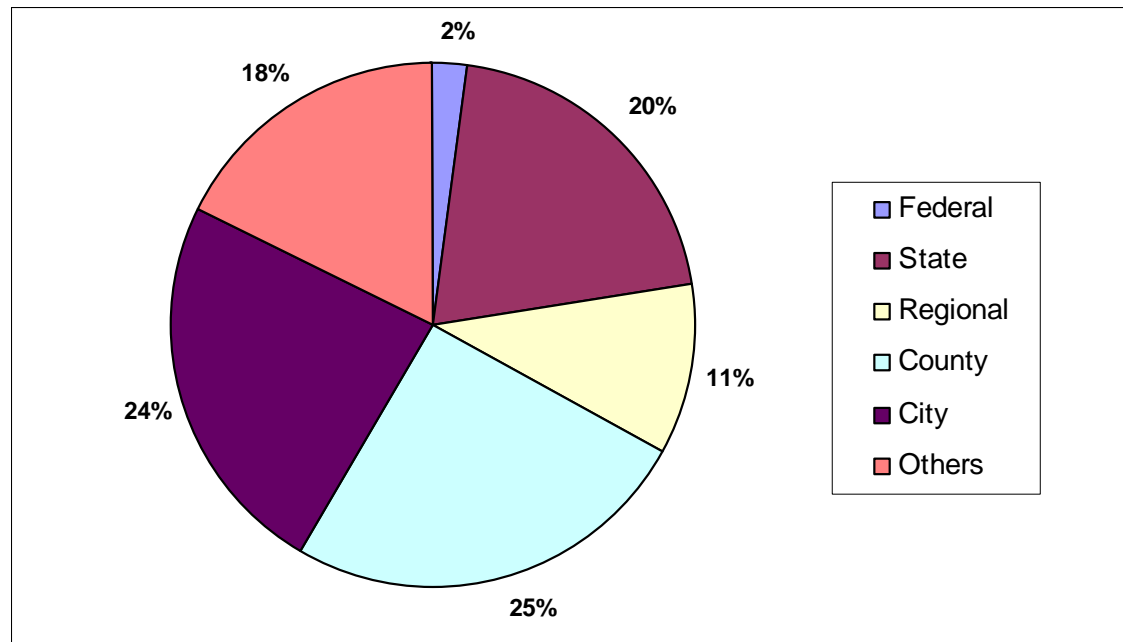
- Assess the **need** for Unified Roadway Basemap
- Identify who is **impacted** (state, regional, local agencies)
- Identify **basemaps** that are being used by affected parties
- Assess **interest in participating** in Unified Roadway Basemap initiative

Survey Components

- **Understanding** of current basemaps
- **Applications** dependent on basemap
- Interaction with other agencies/**Data sharing** efforts
- **Interest** in unified roadway basemap initiative

Response Profile

- Sent out to approx. 645 people in approx. 300 agencies, belonging to state and regional entities like MPOs, RPCs, Counties, Cities, User groups etc.
- **190** responses received from **155** agencies.



Coverage of Responses



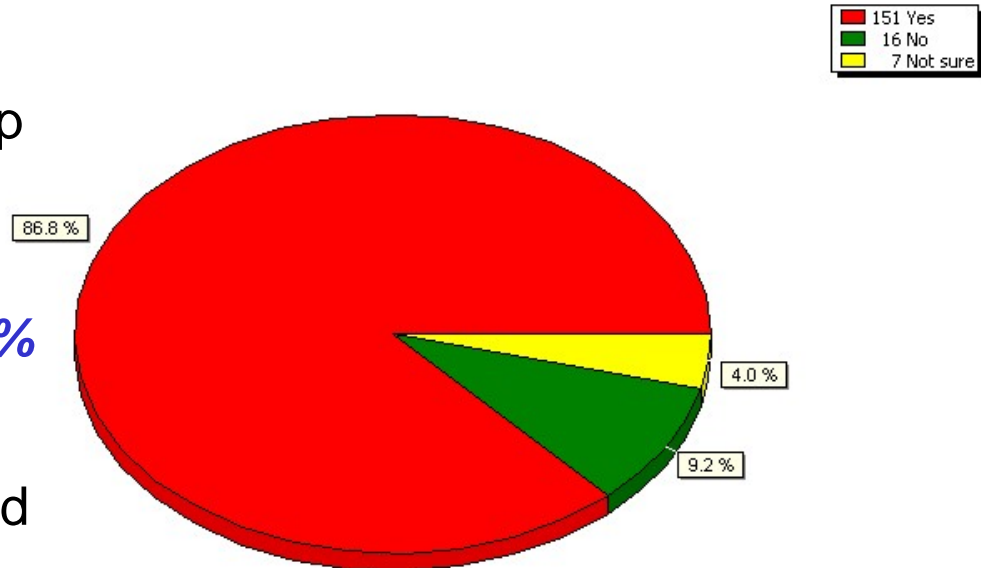
Survey Results – Existing Basemaps

- **Do you have a roadway Basemap?**

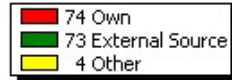
- 13% do not have a basemap

Unified Roadway Basemap will definitely cater to this 13%

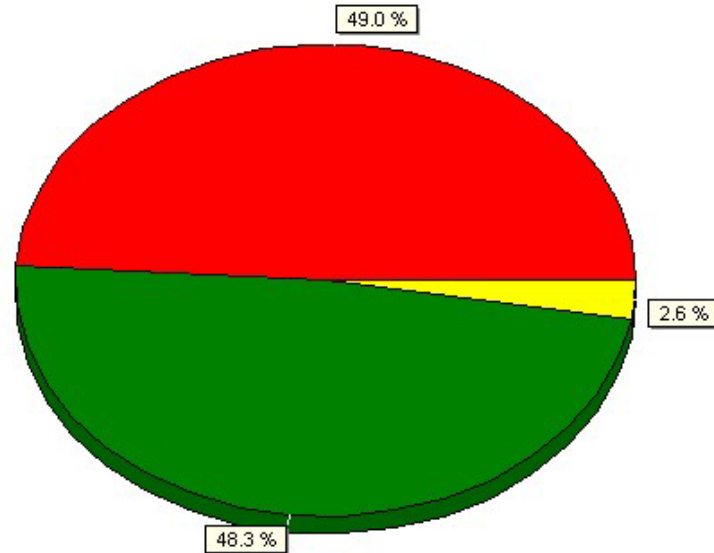
- Of these 13%, **92%** specified interest in obtaining access to the Unified Roadway Basemap



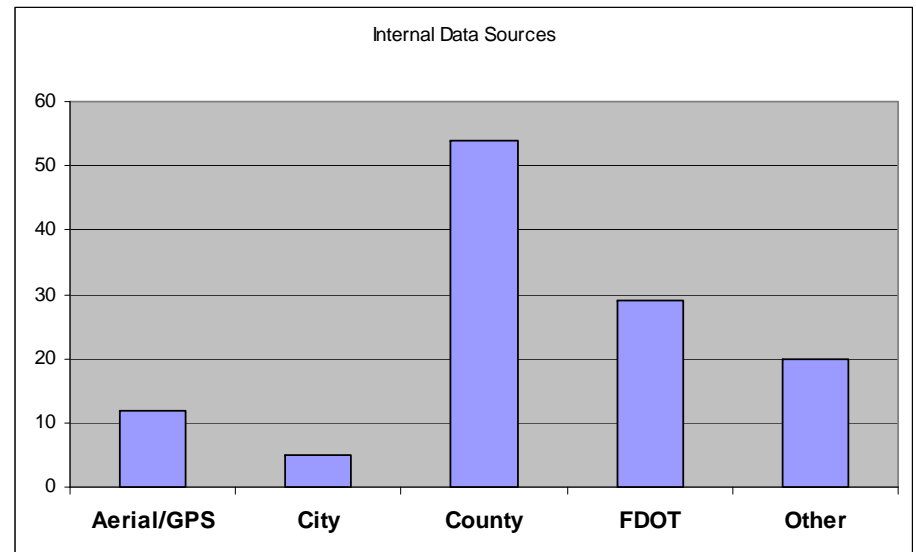
Survey Results – Existing Basemaps



- **Is it your own or from an external source?**
 - 50-50 split (approx.) between internal and external sources
- **Some Internal sources**
 - USGS Quad maps
 - County Appraiser maps
 - Florida power and light
 - Original paper maps digitized
 - From MPOs



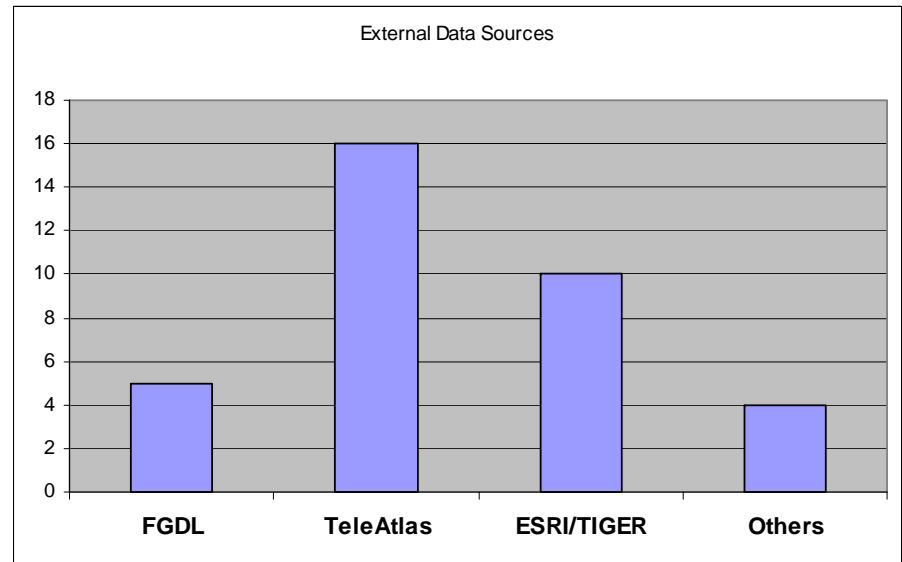
Large variety of basemaps floating around – may make it difficult to maintain



Survey Results – Existing Basemaps

- **Some External Sources**

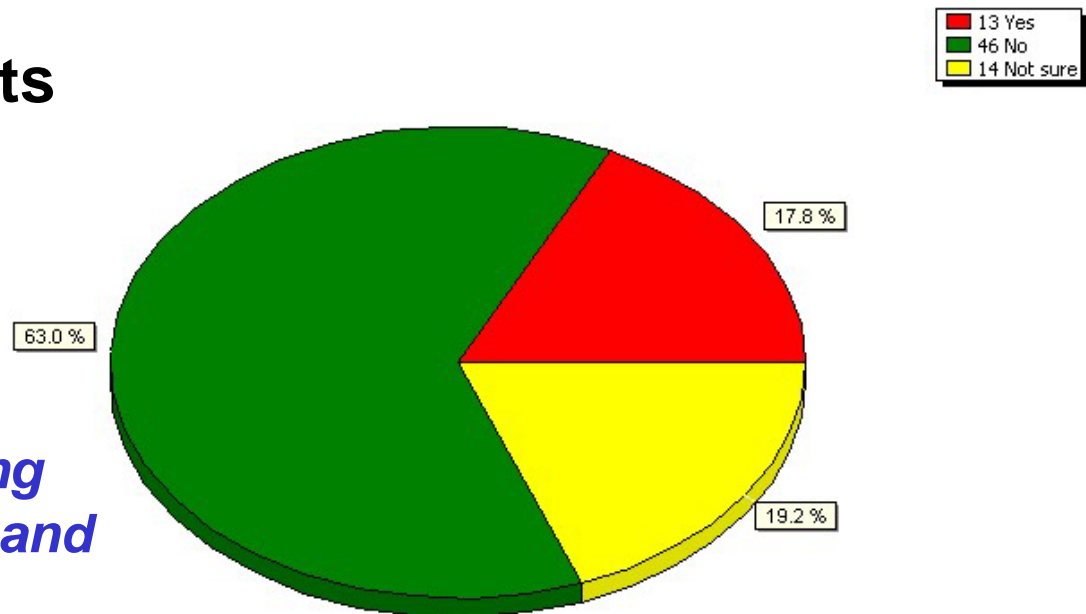
- TeleAtals/Dynamap
- ESRI/Tiger lines
- FDOT
- Combination of one or more



- **Contractual agreements for external sources**

- 63% do not have any
- 20% are unsure

Most entities might be using publicly available sources and customizing them



Survey Results – Existing Basemaps

- **Maintenance of basemaps**

Many different maintaining entities

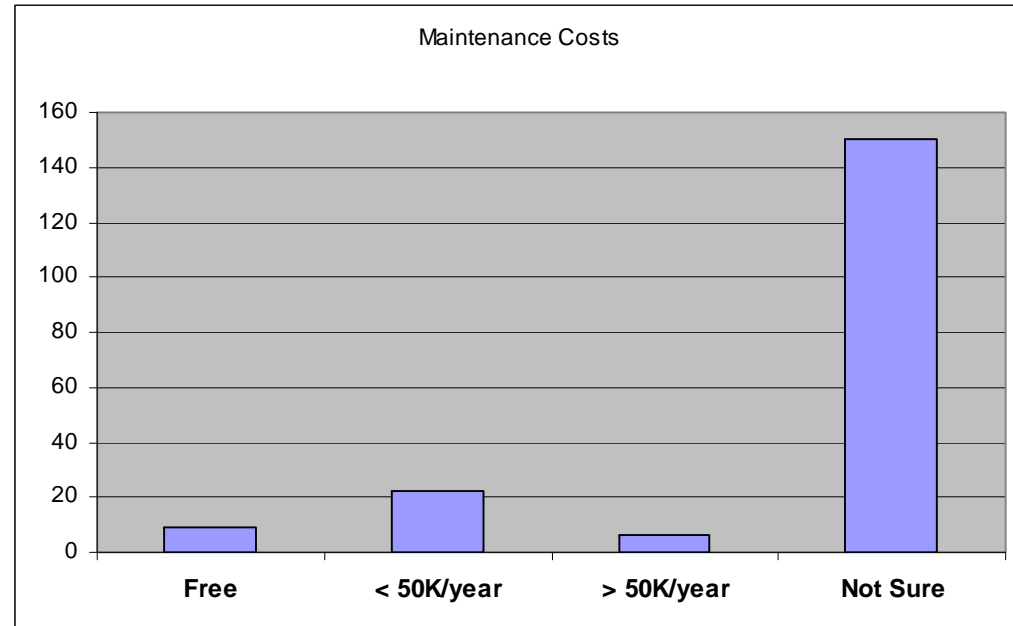
- **Maintenance costs**

- Only 27 Responses

Most entities were unsure of maintenance costs

- Maximum – \$ 200K/year
- Total above \$1 million for 27 responses

Approximately \$40k / entity



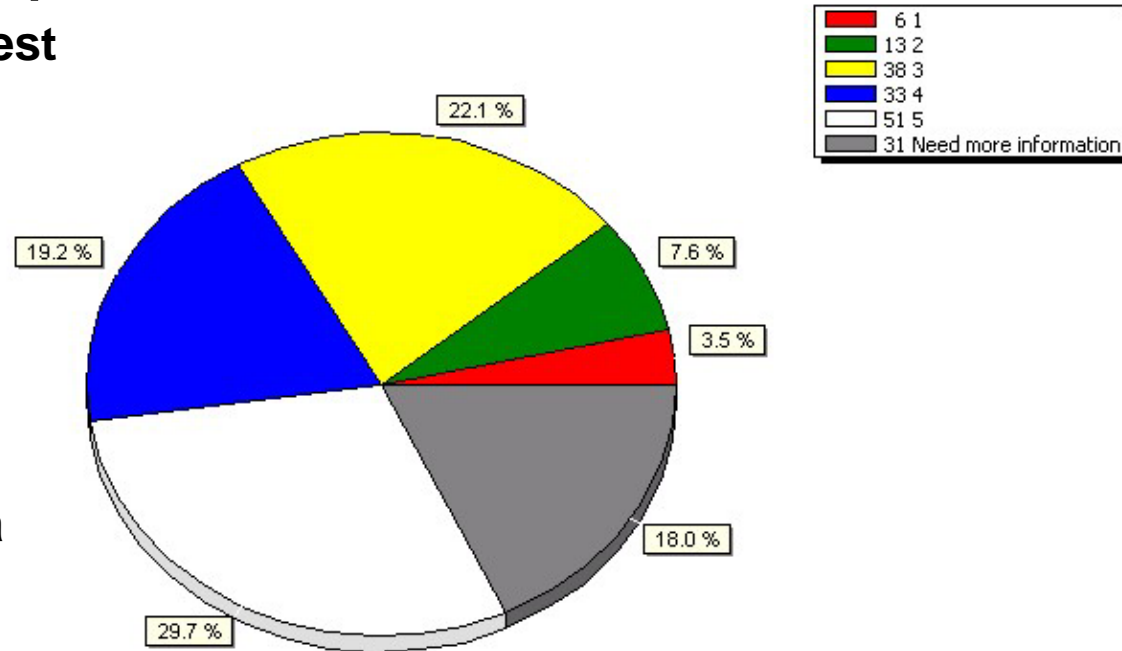
Survey Results – Data Sharing

- **Most agencies are willing to share their information (76%)**
- **Most agencies are sharing on an Ad-hoc frequency (> 50%)**
- **Several mechanisms (email, FTP, postal mail, CD, DVDs and ArcSDE) specified as sharing mechanisms**
- **Most agencies are fairly satisfied with their sharing mechanism (2.5/5)**
- **Most agencies do not pre or post process any data before sharing (65%)**

Aspects of data sharing will be reviewed in the implementation plan

Interest in Unified Roadway Basemap

- **Level of interest in participating in GIS OneMap**
 - 50% specified keen interest
 - 20% specified need for additional information
- **Additional Information**
 - Anticipated accuracy
 - Exchange format
 - Maintenance processes
 - Attribution, Data Schema
 - Coordination groups/mechanisms
 - More details on the initiative



Indicates the need for an implementation plan and active marketing

Summary of Feasibility

- **General Interest in Unified Basemap concept**
- **Agencies affected – state, regional, county and city**
- **Need for Implementation Plan clear**
- **To be answered in Implementation Plan stage**
 - **What are overall benefits to me?**
 - **Do users need to change what they are doing?**
 - **What additional tools will be needed?
Who will pay for them?**

Implementation Plan

1. Mission and goals of Unified Roadway Basemap Initiative
2. Final system – What will it look like? What will it do?
3. Case studies/lessons from other states/similar initiatives
4. Case study including scenarios of adaptation
5. Marketing/promotion plan
6. Phases – Cost, scope, timeframe for each
 - A. State license – License agreements
 - B. Procure basemap – Accuracy, data schema, format
 - C. Processes, Data and Tools – Necessary for adaptation
 - D. Communication/sharing guidelines – Exchange mechanisms, maintenance mechanisms, partnerships etc.
7. Overall schedule

Unified Basemap Implementation Plan

Summary of Lessons Learned

- Objective
 - To research and understand issues and lessons associated with the implementation of a Unified basemap in other states
- 8 States were selected and evaluated based on
 - Goals and Objectives
 - Partnerships
 - Tools and Functionality
 - Funding
 - Basemap Data sources
 - Benefits and Lessons

States Selected

- New York
- Illinois
- Minnesota
- Washington State
- Oregon
- Connecticut
- Maryland
- Iowa

New York

Unified Basemap status: [Established](#)

Key players: Department of Motor Vehicles (NYS DMV), Department of Transportation (NYS DOT), Office of Cyber Security and Critical Infrastructure Coordination (NYS CSCIC), Other local partners

Funding: Federal grants, NYS DMV, NYS DOT, and NYS Office of Cyber Security and Critical Infrastructure Coordination

Basemap Source: Tele Atlas + Line work from Counties → Monthly Updates

Data Dissemination: Participation in GIS Data Sharing Cooperative and through Web based Mapping interfaces

ILLINOIS

Unified Basemap status: [Established](#)

Key players: Illinois GIS Transportation Coalition, Illinois Geographic Information Council

Funding: Illinois Department of Transportation – Bureau of Information Processing budget

Basemap Source: NAVTEQ → Quarterly Updates

Data Dissemination: Participation in GIS Transportation Coalition and through Web based Mapping interfaces. Enterprise licensing agreements with NAVTEQ. → ArcSDE export files downloaded from a FTP site

Illinois One-Stop Shop

Getting Around Illinois website

Getting Around Illinois



Rod R. Blagojevich, Governor
Milton R. Sees, Acting Secretary

[Home](#) | [Help](#) | [Contact](#)

NAVIGATE ILLINOIS

DESCRIPTION

Getting Around Illinois is a web-based interactive mapping site that provides the ability to search and display several sources of information.

Check out the Quick Launch, Find a Location, Get Directions, or Browse the Map. Get Help or Contact us by clicking on the links provided.

QUICK LAUNCH TO...

<ul style="list-style-type: none"> ▶ Road Construction ▶ Average Annual Daily Traffic ▶ Chicago Public Transportation Options ▶ E85/BioDiesel Stations <small>View List</small> ▶ Designated Truck Route 	<ul style="list-style-type: none"> ▶ Winter Road Conditions ▶ Multi-Year Program ▶ Annual-Program ▶ For the Record ▶ Roadway Weather Information System
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ANNOUNCEMENTS


Work Zone Safety



KEEP US ALIVE

DRIVE 45

When workers are present it's 45 mph--
It's the Law!



AVOID the Dan Ryan

Welcome to the Illinois Department of Transportation.

FIND A LOCATION ▶

Select this section to find:




- address
- intersection
- community
- zip code
- points of interest

GET DIRECTIONS ▶

Use this section to get driving directions. Select from points of interest locations or enter your own address information. Also, RTA (Regional Transit Authority) Travel Information Center is available.

BROWSE THE MAP ▶

Use this section to view map.

MINNESOTA

Unified Basemap status: [Established](#)

Key players: Minnesota Governor's Council on Geographic Information (18 members: State Land Management Information Center (LMIC), Minnesota DOT, GIS Departments at St. Cloud State University and the University of Minnesota Duluth)

Funding: Unknown

Basemap Source: Department of Transportation – Annual updates

Data Dissemination: Interactive web based mapping site

Minnesota – Mn/DOG

Fetch and Integrate Data From Multiple Systems

Interactive Basemap Interface

GIS BaseMap
The BaseMap is a planning level set of data developed at a scale of 1:24000. The data set includes information about transportation features (roads, railroads and navigable waters), as well as boundary information (State, County, and Municipal Boundaries, Mn/DOG District Boundaries, Civil, and Congressional Townships, State Forests and Parks, Military Reservations, Indian Reservation Lands, National Forests and Parks), and stream and lake locations.

Data Download Website

Questions and comments regarding the data on this site should be directed to utinf@dot.state.mn.us

- Statewide Data
- County Based Graphic Select
- County Based Text Select

Data Download Website

WASHINGTON

Unified Basemap status: Initiative just taking off the ground; Requirements gathering stage

Key players: Municipalities and Individual county departments, regional governments, Geospatial Integration and Sharing Data Consortium (GISDC)

Funding: Contribution from Partners, Microsoft grant, Transportation Pooled fund

Basemap Source: Data provided by Washington State Transportation Framework (WA-Trans) partners

Data Dissemination: Ongoing Research on Data Translator and One Road pilot for documentation of processes and prototype software for sharing and integration of GIS data

Washington WA-Trans System Interface

Washington State Department of Transportation

Home | Data User | Help | FAQ | Update Profile | Contact Us | Search | Portal/Req. Questions | Data Flow

Welcome to WSDOT

Washington State Transportation Framework Data Provider Home Page

Welcome Snohomish County

Submit Data:
Click the **Structural Changes** radio button if structural changes need to be made prior to submitting data, otherwise click the **Submit Data** radio button to submit data.
 Submit Data
 Structural Changes

Data Status:
Your most recent data submission date:
January 17, 2007
Current data processed and in production was submitted on: December 18, 2006
Click links to view data status details

Data Structure Mapping
The mapping of the provider attributes is necessary to successfully transform local data to the WA-Trans attribute standard. If any changes have been made to the structure of the local data that affects the attribute mapping you will need to alter your Data Structure Mapping accordingly.

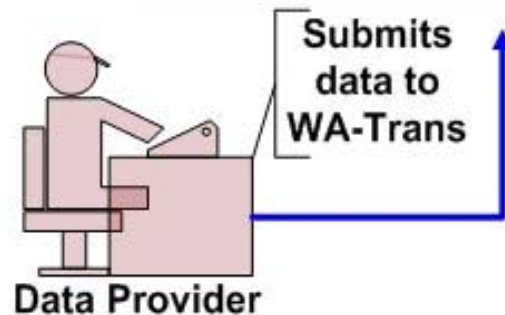
Minimum Data Requirements
There are some minimum required attributes necessary to transform geospatial data to WA-Trans. Efforts have been made to create the standard to minimize issues with local data and still ensure a successful transformation process.

Data Standards
The complete WA-Trans Data Standards are accessible from this link.

Current Events
Testing the Data User Interface
The Data Standards have been updated
IAC meeting notes

WA-Trans Project

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O R E G O N

Unified Basemap status: [Initiative well ahead in the process](#)

Key players: Oregon Geographic Information Council (OGIC), Oregon Framework Implementation Team (FIT) and local governments

Funding: Oregon DOT, 911 partners, Transportation Pooled Fund

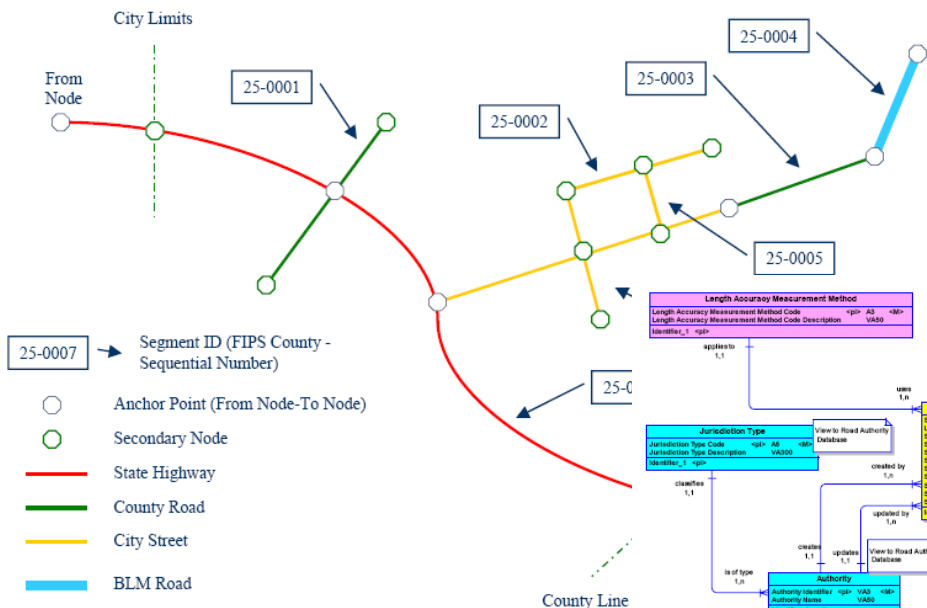
Basemap Source: Line work from counties, TIGER and Bureau of Land Management (BLM) + Attributes from DOT

Data Dissemination: Data sharing agreements; Data distributed to centralized FTP server; Currently working on possible legislative action to mandate sharing

Oregon Transportation Network

Development of Basemap Standards

Oregon's FIT-Transportation
All Roads Project

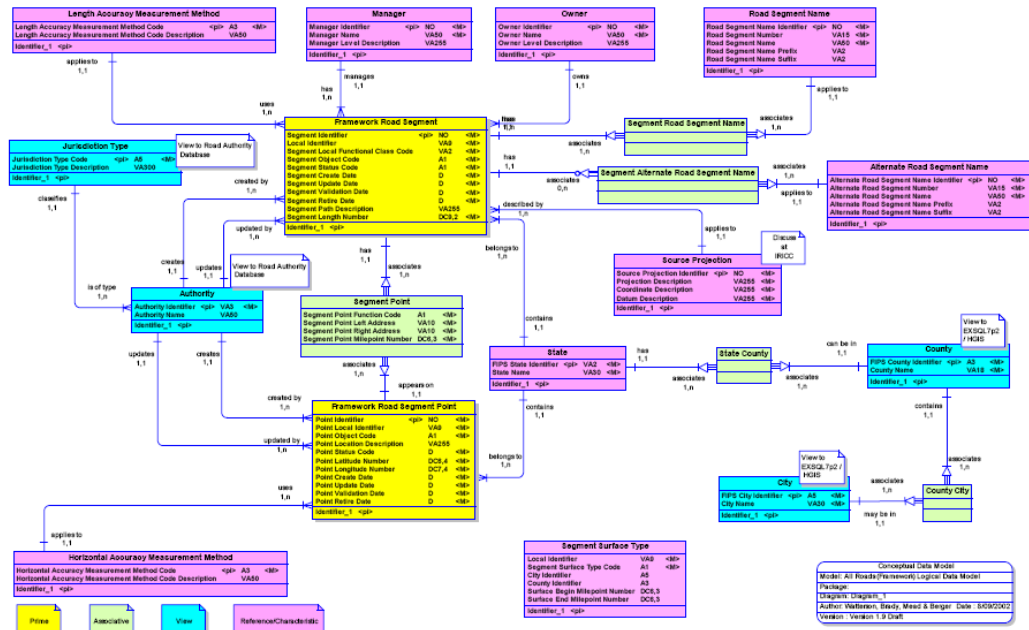


25-0007 → Segment ID (FIPS County - Sequential Number)

- Anchor Point (From Node-To Node)
- Secondary Node
- State Highway
- County Road
- City Street
- BLM Road

Geometry and Attribution Standards

Basemap Data Model



CONNECTICUT

Unified Basemap status: Initiative just taking off

Key players: Connecticut Geospatial Information System Council (CGISC), DOT and Department of Public Safety

Funding: National Highway Traffic Safety Administration Grants, Homeland Security Grants, FHWA State Planning and Research Grants, Dedicated funds from E911 and other sources like 408 grants

Basemap Source: Through orthophotography collected by the DOT along with field reviews; Updated by local agencies through probable red-lining tool

Data Dissemination: Probably through web based application and participation through CGISC

MARYLAND

Unified Basemap status: Initiative well underway

Key players: Maryland State Geographic Information Committee, Towson University Center of GIS, State Highway Administration (SHA)

Funding: National Spatial Data Infrastructure (NSDI) Cooperative Agreement Program (CAP) Grants.

Basemap Source: Local governments provide line work and address information; SHA provides roadway attributes + QA/QC

Data Dissemination: Participation in Maryland Cooperative Centerline Program; Web based application – ArcGIS Server

Lessons Learned

- **Planning**
 - **Preplanning in terms of developing geometry and attribute data standards is critical**
 - **Discuss and develop data sharing, coordination and maintenance agreements upfront in the process**
- **Coordination**
 - **Collaborate, Collaborate and Collaborate**
 - **Identification and early involvement of state, regional and local partners is extremely critical**
 - **Outreach, education, marketing and associated communication protocols are important project responsibilities**
 - **Educate both internal and external staff and management of the benefits and anticipated changes to their current business processes**
- **Governance**
 - **Most states have GIS councils or state level organizations that guide and promote the basemap initiative**

Lessons Learned

- **Technology**

- **Understand and take advantage of emerging GIS technologies to manage and maintain the system and to reduce manual processes**
- **Conduct pilot studies, as needed, to evaluate technical and institutional implications of new concepts**
- **Identification of basemap source based on data accuracy and maintenance logistics → determine usage of proprietary datasets vs. local datasets**

- **Funding**

- **Identification of sustainable funding sources and funding partners is an essential step in the process**
- **Probable Funding Sources –**
 - **408 Grants, 911 Centers, CAP grants, Federal Research Funds, NSGIC resources, NSDI grants, Transportation Pooled Fund**

Conclusions of Feasibility and Implementation Plan

- **Florida conducting appropriate pre-planning**
- **Should consider establishing GIS council or a statewide entity to guide thru the process**
- **Discuss with neighboring states to take advantage of ‘pooled fund’ for any further research**
- **Owners of existing systems internal and external to the DOT should be involved early in the process**
- **Discuss and deliberate advantages of using and not using proprietary datasets for basemap in Florida**
- **Develop geometry and attribute standards working closely with all critical partners that benefit from the process**

Next Steps

- Complete Implementation Plan
- Present to TRCC and GIS Task Team
- Proceed as Recommended
- Stay Tuned.....



Questions

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