The Federal Highway Administration (FHWA)
GIS in Transportation and Every Day Counts Programs present on...

Geospatial Data Collaboration: Tools for Data Sharing

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http://gis.fhwa.dot.gov
Overview

• FHWA Data-Sharing Initiatives
• Research Study Purpose & Methodology
• Research Themes & Highlights
EDC seeks to identify and deploy innovations that reduce highway project delivery time, enhance safety, and protect the environment.
Every Day Counts

- Not about inventing the next “Big Thing”
- Taking effective, proven and market-ready technologies and getting them into widespread use
- Keep American moving and competitive

http://www.fhwa.dot.gov/everydaycounts/
FHWA Initiatives

GEOSPATIAL DATA COLLABORATION
Geospatial Data Collaboration (GDC)

- Use and share geospatial data to provide better information
- Use and share geospatial tools to make efficient transportation decisions
- State DOTs and partner agencies working better together
EDC seeks to identify and deploy innovations that reduce highway project delivery time, enhance safety, and protect the environment.
Data-Sharing Benefits

- Stronger Communications
- Increased Efficiencies
- Improved Data Quality
- Streamlined Project Screening & Development
- More Strategic Decision-making
Data-Sharing Benefits

- **Stronger Communications**

- **Increased Efficiencies**

- **Improved Data Quality**

- **Streamlined Project Screening & Development**

- **More Strategic Decision-making**

- Users can consume data as soon they are published

- They can also view the same data through a common framework
Data-Sharing Benefits

- **Stronger Communications**
- **Increased Efficiencies**
- **Improved Data Quality**
- **Streamlined Project Screening & Development**
- **More Strategic Decision-making**

- Users can more easily assess data gaps to better data collection and reduce the possibility that multiple data owners will collect the same information.

- Having a common data entry point also makes it easier and more efficient for users to find information and respond to data requests.
Data-Sharing Benefits

- Stronger Communications
- Increased Efficiencies
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- Making information more transparent helps users see where there are quality control issues
- Encourages data owners to quickly address errors
Data-Sharing Benefits

- Stronger Communications
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- Agencies access and share information more easily, allowing for earlier coordination during project development
Data-Sharing Benefits

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- Nevada DOT’s Planning and Needs System (PLANS) has a mapping component that will help Nevada DOT categorize “bundles” of transportation projects that have similar features
Data-Sharing Benefits

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Study Purpose & Methodology
Study Purpose

• Document examples of tools that support Geospatial Data Collaboration (GDC) goals

• Share lessons learned and success factors among practitioners

• Develop and strengthen a community of practitioners engaging in GDC-related efforts
Methodology

- Literature review
- Telephone discussions with 22 transportation agencies
- Case studies describing agencies’ experiences
- Follow-on peer exchanges in May 2014 (Denver, CO and Raleigh, NC)
- Final report posted on FHWA GIS in Transportation website (gis.fhwa.dot.gov)

Map of States interviewed (dark shade indicates interviewed State)
Classification of Tools/Efforts

Repositories
- Libraries
- Clearinghouses
- Warehouses
- Inventories

Gateways
- Screening tools
- Data viewers
- Portals

Collaboration
- Operating agreements
- Intra- & inter-agency groups
- Statewide coordination
- Data standards/templates
Themes & Highlights
Motivating & Success Factors

• Examples of motivating factors:
  • Federal requirements
  • Natural disasters
  • Perceived need for improved access to information
Example 1

Arizona DOT (ADOT)

• Developed the Historic Preservation Portal, which aggregates information on cultural resources, historic property locations, consultation letters, and more
• Portal is accessible to ADOT staff, consultants, and cultural resource professionals
• Portal helps ADOT assess transportation project environmental impacts

For more information:
Motivating & Success Factors

• Examples of success factors:
  • Have a champion(s)
  • Identify common goals and objectives for multi-stakeholder efforts
  • Promote benefits of tools/efforts
  • Demonstrate how tools/efforts support user empowerment
Example 2

Maryland State Highway Administration (MDSHA)

- Contributes to MD iMap, a Statewide, publically accessible data gateway
- Developed an enterprise GIS that functions as an internal data gateway for MDSHA
- Coordinates effectively with other Statewide efforts

For more information:
http://www.gis.fhwa.dot.gov/webcast22_maryland.asp
http://imap.maryland.gov/Pages/default.aspx
https://data.maryland.gov
Technologies & Platforms

• Agencies using both commercial off-the-shelf (COTS) software solutions as well as customized platforms

• Agencies see a need to:
  – Choose solutions that are flexible/adaptable
  – Quickly integrate new technologies into existing systems to maintain customer service focus
  – Understand capabilities and limitations of new technologies, particularly those that support direct user interaction with data
Example 3

Colorado DOT (CDOT)

- Developed the Online Transportation Information System (OTIS), a publically accessible “one stop shop” for transportation, environmental, and other data
- OTIS has evolved over time in response to user requests for information
- OTIS data quality has increased as users identify updates

For more information:
http://dtdapps.coloradodot.info/otis
Example 4

North Carolina DOT (NCDOT)

- Developed Go!NC to aggregate and share NCDOT’s geospatial information with users both within and outside the agency
- Go!NC uses cloud-based technology to help NCDOT more effectively engage with a broader range of users
- Participated in inter-agency group to share lessons learned for using the cloud

For more information:
http://ncdot.maps.arcgis.com/home/
Data Management & Governance

- Establishing Data & Governance Standards
- Assigning Data Owners
- Setting Standards for Metadata
Establishing Data & Governance Standards

• Most agencies have not yet developed formal standardization processes, but are examining options

• One effective approach to standardization is to develop a guidance document

Assigning Data Owners

Setting Standards for Metadata
Example 5
Montana Department of Transportation (MDT)

- Developed best practices guide for its MDT AGOL site
- Provides guidance but does not set specific standards

For more information:
http://mdt.maps.arcgis.com/home/
Example 6
Iowa DOT

- Developed Geospatial Governance Guidance document
- Lays out responsibilities of Iowa DOT GIS Council, metadata and project standards, etc.

For more information:
http://bit.ly/1mLwEno
Data Management & Governance

Establishing Data & Governance Standards

Assigning Data Owners

• Difficult for agencies to establish authoritative data sources and maintain data quality
• To address this, agencies decide who is responsible for maintaining data

Setting Standards for Metadata
Example 6
Pennsylvania DOT (PennDOT)

- Business units will be “data owners” for PennShare
- Implementing formal administrative system to avoid duplication of efforts, ensure data quality, and maintain consistent branding
  - User agreement
  - Product form
  - Data approval process

For more information:
http://pennshare.maps.arcgis.com/home/
Data Management & Governance

Establishing Data & Governance Standards

Assigning Data Owners

Setting Standards for Metadata

• Many challenges to developing robust metadata:
  • Limited understanding metadata’s necessity
  • Variety of suggested metadata standards
  • Unclear data ownership
Coordination

- Large variety of coordination efforts
- Both formal and informal
- Challenges arise due to fear of sharing and uncertainty of data quality
Example 7
Washington State DOT (WSDOT)

- WSDOT’s Community Planning Portal (CPP) helps state, regional, and local planners understand the transportation system in their area
- WSDOT worked closely with local agencies to develop the portal

For more information:
http://www.wsdot.wa.gov/planning/community/
Example 8
Montana DOT (MDT)

- Montana State Library keeps an official record of all State-produced geospatial data
- Library staff ensure all data is compatible with the library systems, and states can rely on this data to support interagency collaboration efforts

For more information:
http://geoinfo.msl.mt.gov/
Example 9

Missouri DOT (MoDOT)

- Agency developing memorandum of understanding (MOU) with other state agencies on:
  - Sharing natural resource information
  - Integrating planning
  - Updating best management practices
Future of Data-Sharing

Evolving Data Requirements & Practices

- Federal reporting requirements
- Data owner responsibilities
- State agency coordination
Future of Data-Sharing

Advances in Technology

- Public input
- Feedback mechanisms
- Field editing
Future of Data-Sharing
Funding Challenges & Solutions

More with less

Government transparency

OPEN GOV
Data-Sharing Benefits

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Geospatial Data Collaboration
Every Day Counts

Better

- Data
- Tools
- Working relationships with partners

We can

- Reduce highway project delivery time
- Enhance safety
- Protect the environment
Contact Information and Resources

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**FHWA GIS in Transportation Program**  
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**Every Day Counts**  
www.fhwa.dot.gov/everydaycounts

**Geospatial Data Collaboration Initiative**  
www.fhwa.dot.gov/everydaycounts/edctwo/2012/gis.cfm

**Planning and Environmental Linkages**  
www.environment.fhwa.dot.gov/integ/index.asp

**Eco-Logical**  
www.environment.fhwa.dot.gov/ecological/eco_index.asp

**American Association of State Highway and Transportation Officials**  
GIS for Transportation Symposium  
www.gis-t.org/