

Main Takeaways

- ❑ Use of the cloud is quickly evolving
- ❑ Many agencies experiencing benefits from using the cloud but are still in the early stages of explorations
- ❑ Use of the cloud is addressing multiple needs that include storing/sharing data, communicating within the agency and with the public, and improving data management
- ❑ The cloud is both sparking and addressing important questions about how transportation agencies do business

Topics to Cover

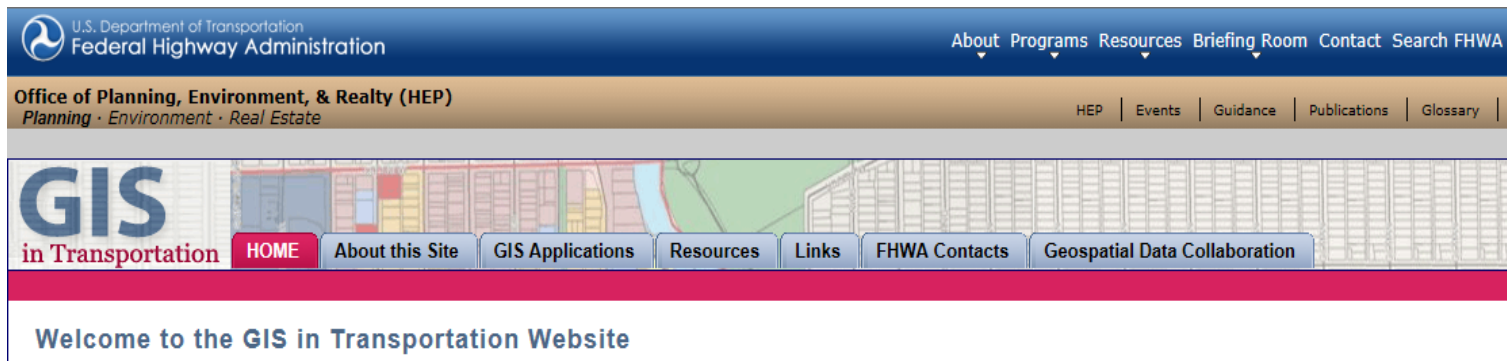
- ❑ Study Purpose
- ❑ Background and Methodology
- ❑ Cloud Definition and Core Characteristics
- ❑ Key Observations
- ❑ Case Study Examples (highlights)
- ❑ Future Directions and Linkages

Study Purposes

- ❑ Explore how select transportation agencies are **using the cloud for geospatial applications**
- ❑ Identify **innovative examples**
- ❑ Share **benefits, challenges, success factors, and lessons learned** with select agencies and others
- ❑ Identify **opportunities to expand the use of the cloud** in geospatial applications

Background

- ❑ Study conducted on behalf of the Federal Highway Administration's (FHWA) Office of Planning in 2012/2013
- ❑ Part of FHWA's GIS in Transportation Program



www.gis.fhwa.dot.gov

Methodology

- ❑ Online **literature review**

- ❑ Telephone discussions with **five transportation agencies**:
 - Idaho Transportation Department (ITD)
 - Maryland Department of Transportation (MDOT)
 - Mid-Ohio Regional Planning Commission (MORPC)
 - Washtenaw Area Transportation Study (WATS)
 - Utah Department of Transportation (UDOT)

- ❑ **Case studies** describing agencies' experiences

- ❑ Follow-on **peer exchange** in spring 2013 (Boise, ID)

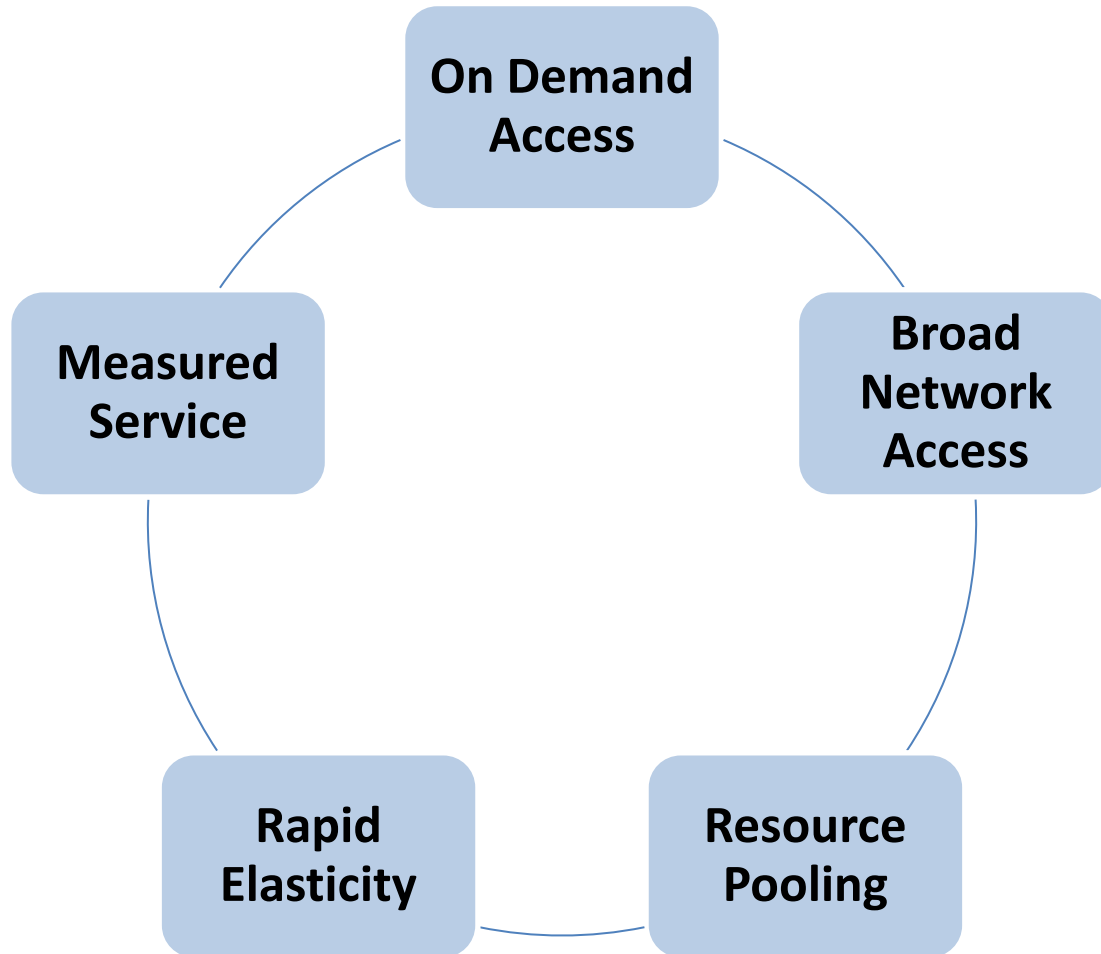
- ❑ **Report** posted on [FHWA GIS in Transportation](#) website

What is the “Cloud”?

[Cloud computing] is a model for enabling **ubiquitous, convenient, on-demand network access** to a shared pool of configurable computing resources...that can be rapidly provisioned and released with **minimal management effort** or **service provider interaction**.

- National Institute of Standards and Technology (NIST)

Cloud Core Characteristics



Cloud Implementation Models

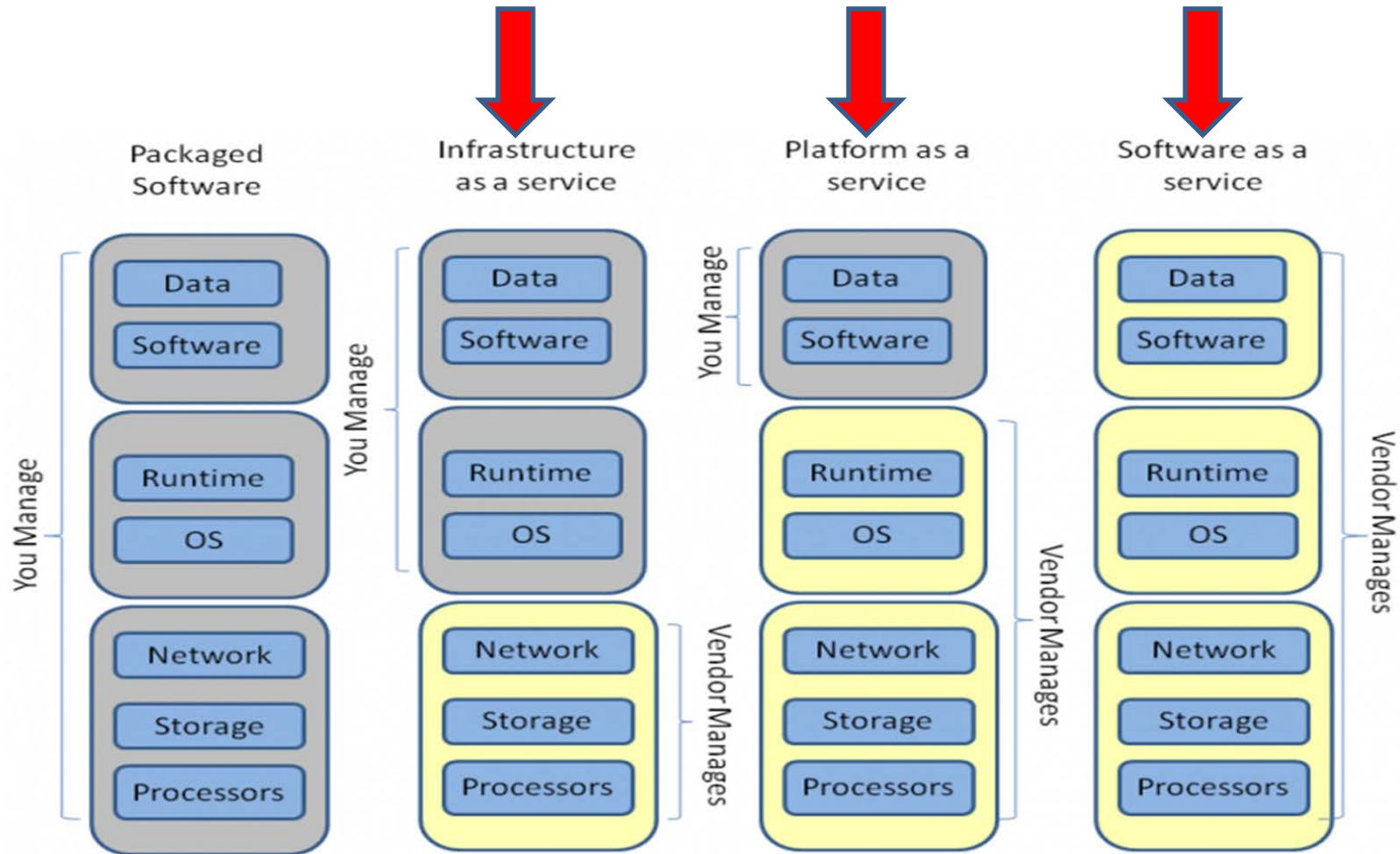
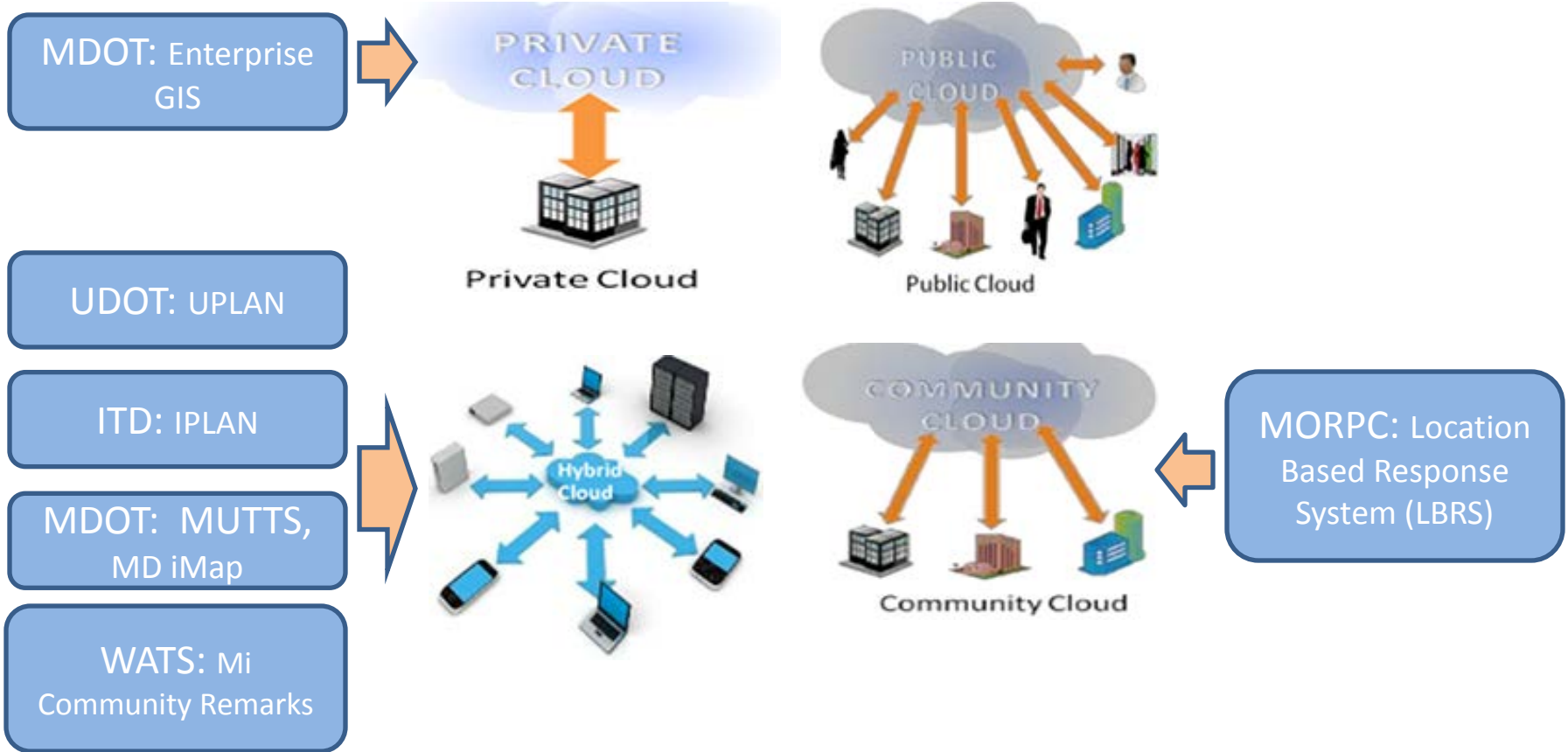


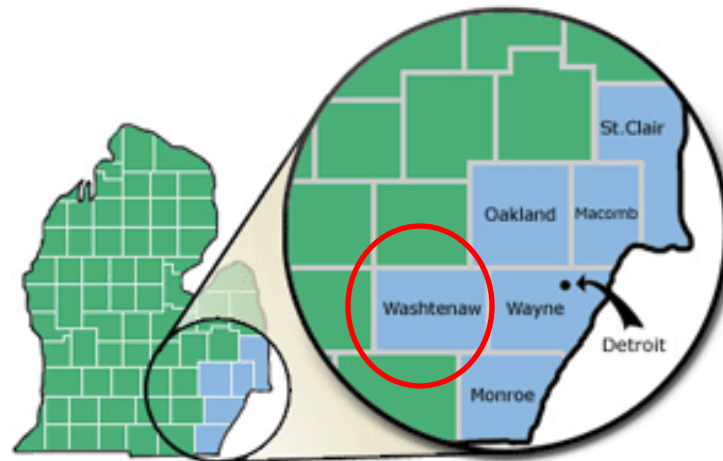
Diagram credit: www.e-education.psu.edu/cloudGIS/node/91

Cloud Deployment Models



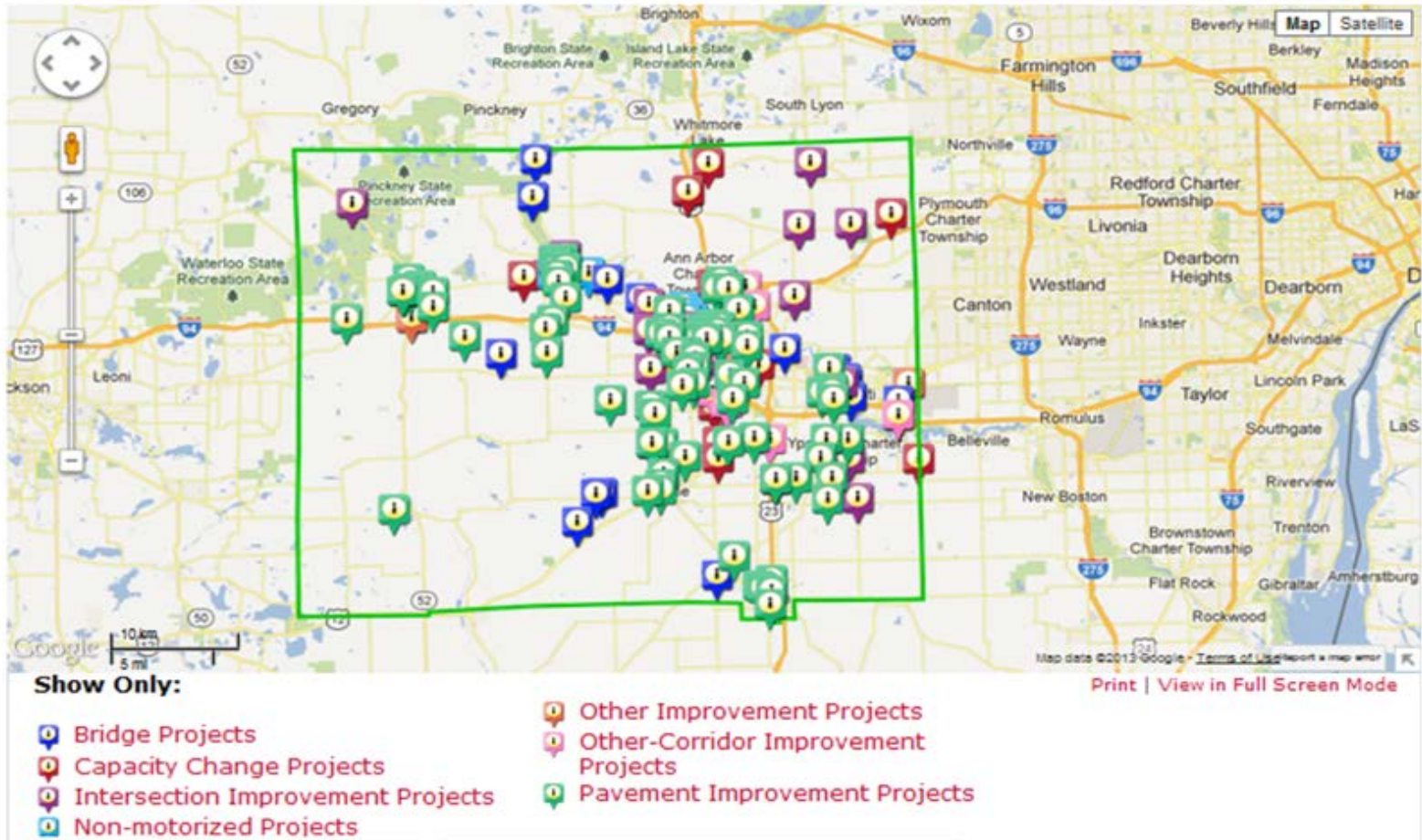
Graphic credit: www.armedia.com/blog/2012/03/Federal-cloud-computing-challenges-part-1-cloud-deployment-models/

Case Study Example I: WATS

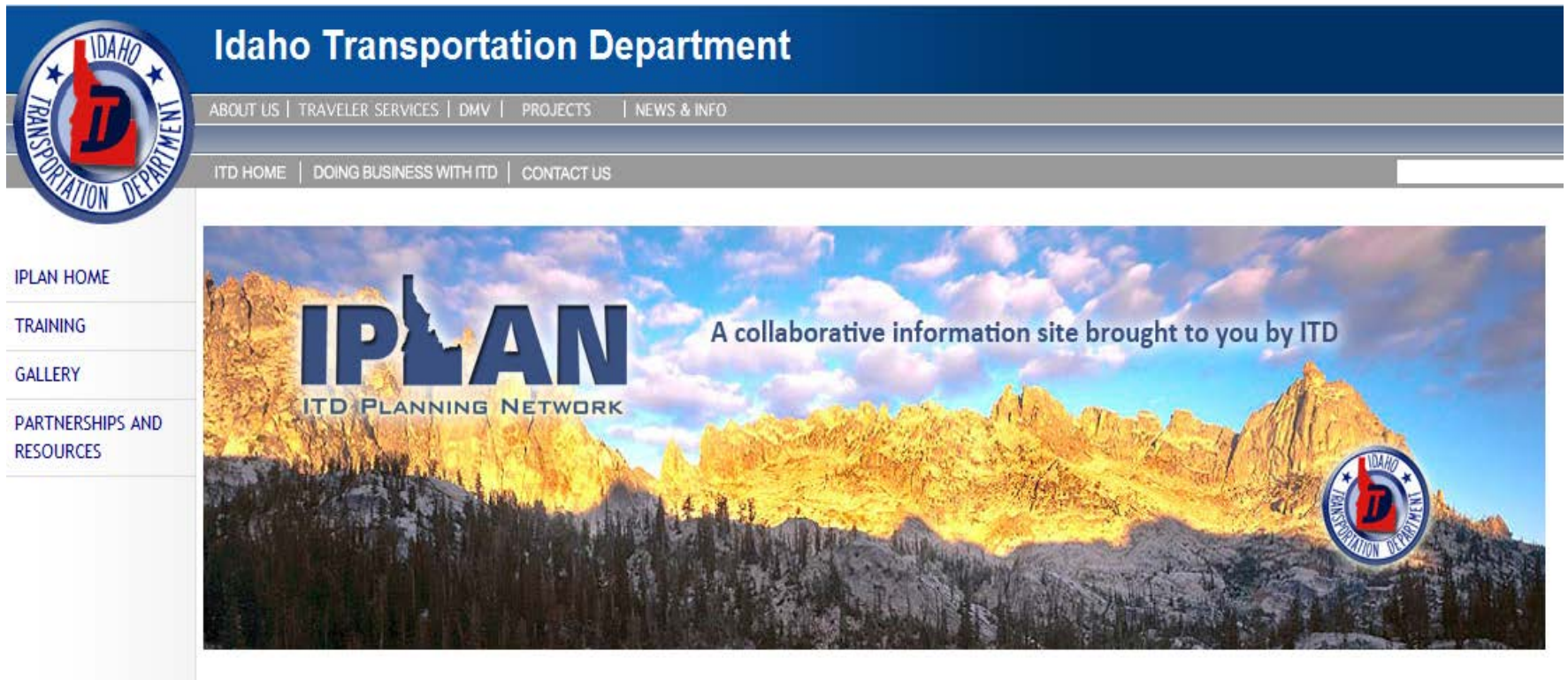


Map credit: www.semiuasi.net/Pages/default.aspx

Mi Community Remarks



Case Study Example 2: ITD



The screenshot displays the Idaho Transportation Department website. At the top left is the Idaho Transportation Department logo, a circular emblem with a stylized 'ID' and the text 'IDAHO TRANSPORTATION DEPARTMENT'. To its right, the text 'Idaho Transportation Department' is displayed in white on a dark blue background. Below this, a navigation bar contains links: 'ABOUT US | TRAVELER SERVICES | DMV | PROJECTS | NEWS & INFO'. A secondary navigation bar below that contains 'ITD HOME | DOING BUSINESS WITH ITD | CONTACT US'. On the left side, a vertical menu lists: 'IPLAN HOME', 'TRAINING', 'GALLERY', and 'PARTNERSHIPS AND RESOURCES'. The main content area features a large banner with a scenic mountain landscape at sunset. The banner includes the text 'IPLAN' in large blue letters, with the 'I' shaped like the state of Idaho, and 'ITD PLANNING NETWORK' below it. To the right of the logo, the text reads 'A collaborative information site brought to you by ITD'. A smaller version of the Idaho Transportation Department logo is visible in the bottom right corner of the banner image.

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IPLAN Designated 129K Routes PUBLIC Web Map



IPLAN City-Urban Boundaries - Map PUBLIC Web Map



IPLAN Administrative Boundaries - Service PUBLIC Map Service



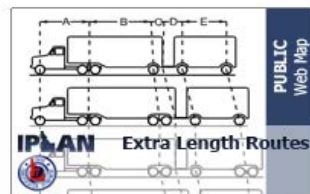
IPLAN Administrative Boundaries - Map PUBLIC Web Map



IPLAN Idaho Airports - Map PUBLIC Web Map



IPLAN City-Urban Boundaries - Application PUBLIC Web Application



IPLAN Extra Length Routes PUBLIC Web Map

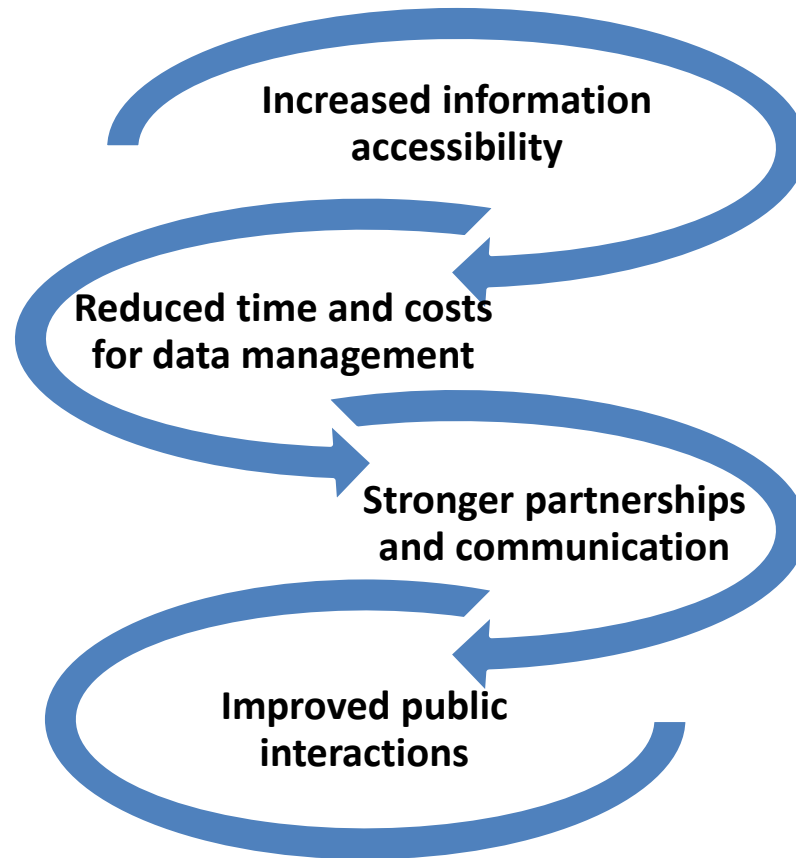


IPLAN Administrative Boundaries PUBLIC Web Application



IPLAN Mile Points PUBLIC Web Map

Observations: Benefits



Observations: Challenges

Addressing security concerns

Navigating unfamiliar or untested cost models

Evolving levels of expectation for data accuracy

Maintaining a historical record

Observations: Lessons Learned

Remain flexible

Seek input from partners

Demonstrate benefits

Coordinate business interests

Identify risks and mitigation strategies

Consider implications of third-party systems

Future Directions

- ❑ Areas of opportunity
 - Conducting cost-benefit analyses
 - Developing performance metrics
 - Exploring opportunities for public engagement

- ❑ Connection with FHWA resources/efforts:
 - Every Day Counts/Geospatial Data Collaboration
 - Planning and Environment Linkages (PEL)
 - Eco-Logical

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