ITS Strategic Plan – Interoperability

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Strategic Priorities

- Two Strategic Priorities reflect a sense of where the bulk of transportation research and innovation is heading. These priorities are not exclusive of other technologies or research areas.

- ***Realizing Connected Vehicle Implementation***
  - builds on the substantial progress made in recent years around design, testing, and planning for connected vehicles to be deployed across the nation.
- ***Advancing Automation***
  - shapes the ITS Program around research, development, and adoption of automation related technologies as they emerge.

Cooperative

Cyber Physical Systems and the Internet of Things:

- A Cyber Physical System is a system of **collaborating** computational elements controlling physical entities.
- The Internet of Things is system of computational elements controlling physical entities using Internet Protocol communications.

Cyber Physical Systems in Transportation:

- We have figured out how to build a very complex **collaborating** system of elements.
- Before, the auto industry **controlled their** customer's experience **completely**.
- The National Highway Traffic Safety Administration (NHTSA) investigated the use of Internet of Things technology to help to *avoid* vehicle crashes. Results were good.
- Now, individual car makers will **depend on other company's contributions** to their customer's experience.

Interoperability – U.S. DOT Role

- Facilitate development and deployment of an architecture for collaborating connected vehicle systems as part of the Internet of Things
- Develop a common graphical language for documenting connected intelligent transportation systems
- Create common data exchange processes and tools to implement them to assist practitioners
- Provide tools, training, and resources to promote system understanding and assist common, interoperable deployments

Proposed Vision for Interoperability

Graphical Language

⇩

Designs and Tools,
Certification

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Training, Resources

Southeast Michigan 2014 Architecture

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Regional Unified Model Architecture 2015

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National Unified Model Architecture 2016

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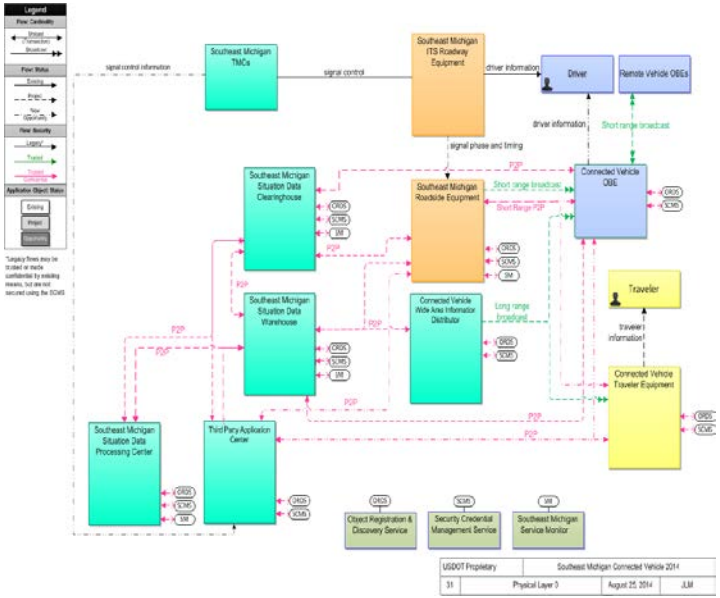
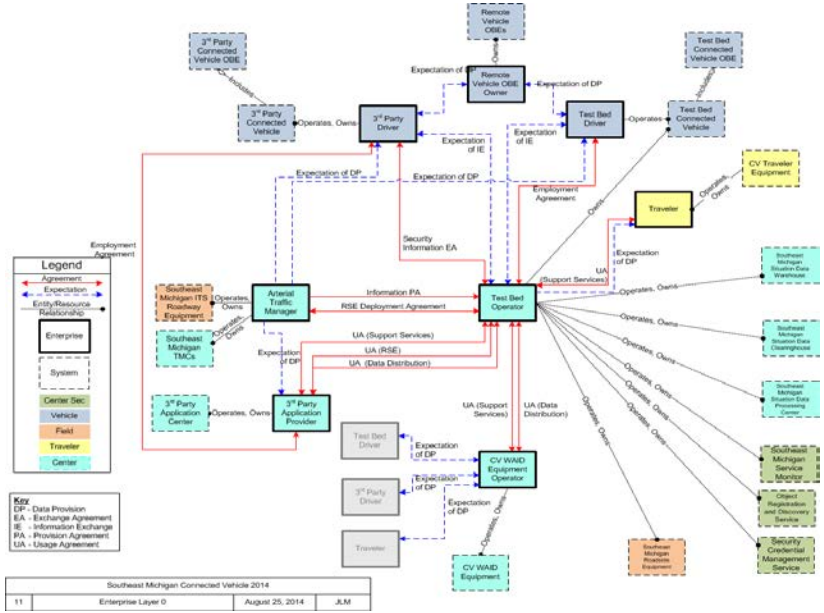
Continent-Wide Unified Model Architecture 2017

Common Architecture, Graphical Language

Things

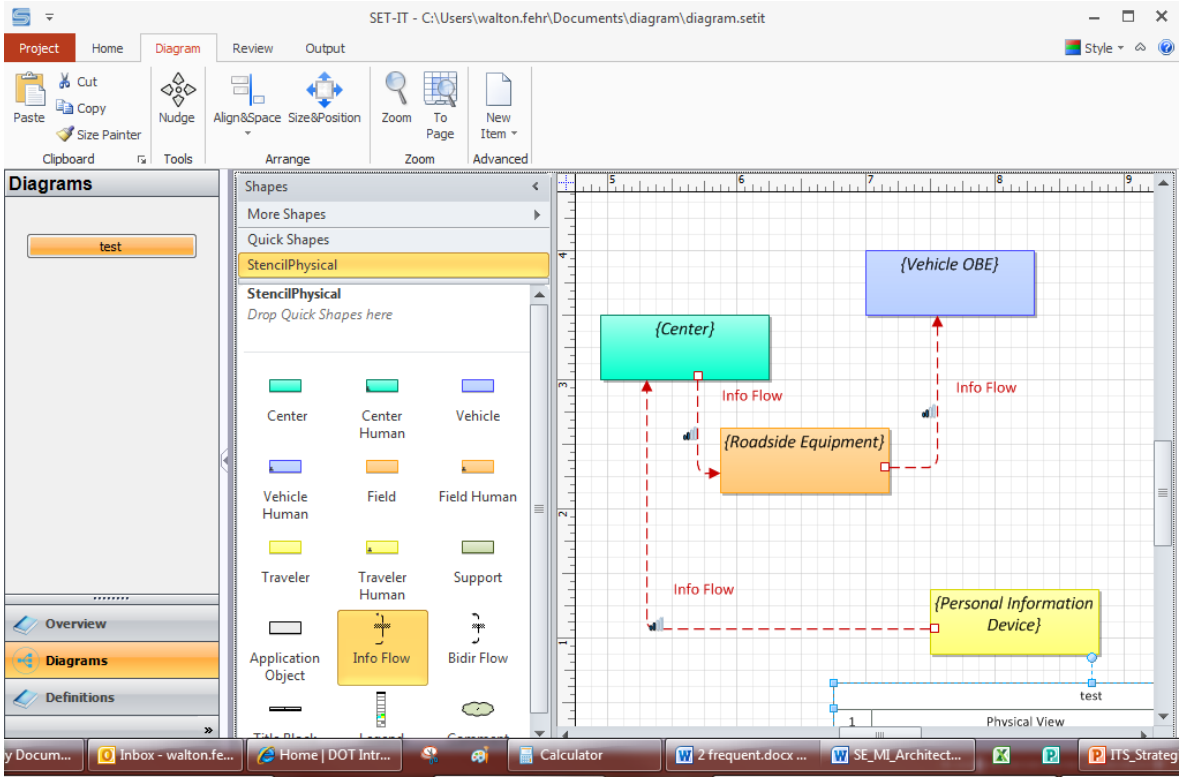


People



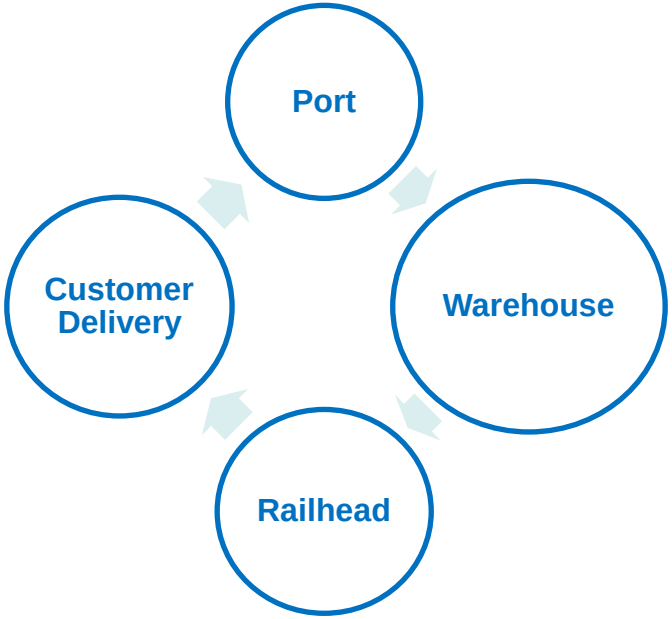
Design, Tools

- Architecture
- Concept of Operation
- Design Elements
  - Objects
  - Information Flows



Test Case – Commercial Vehicle Operations

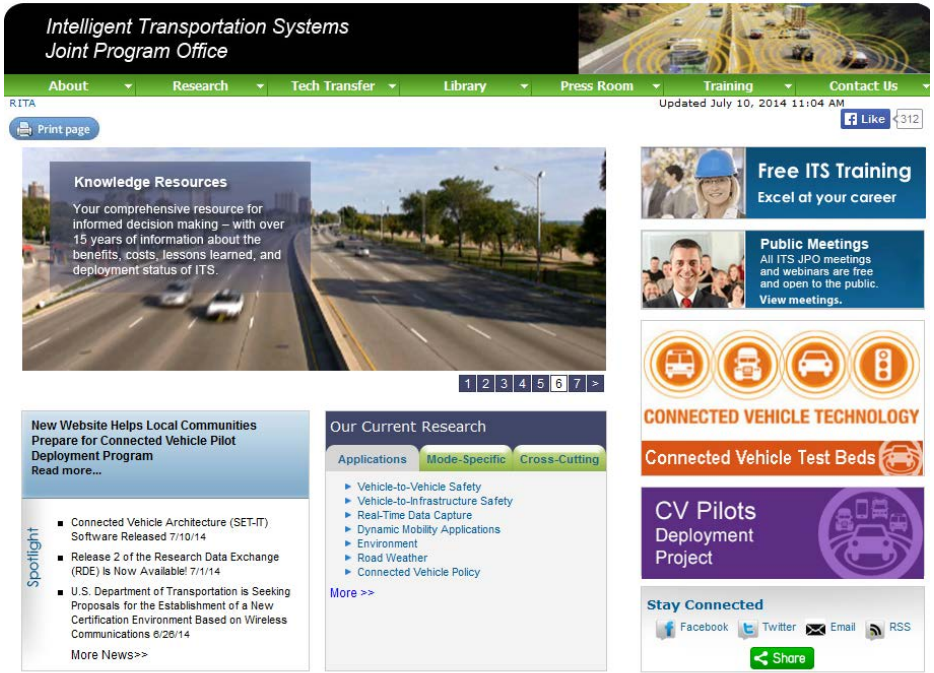
- Part of the whole – active contributions to all connected intelligent transportations systems.
  - Vehicles are vehicles and need to be part of crash avoidance, mobility improvement and road management activities.
- Self-driving in controlled situations – improve operations at specific points in the operating cycle
  - Concentrated activities take place at ports, rail heads, warehouses.
- Vehicle, cargo, and enforcement – communication-based technology used to improve business practices and control and management of heavy vehicles.



Connected Vehicle Pilots

- Pilot deployments should **use USDOT-sponsored research**
- Well-defined, focused while part of the whole, with quantitative **performance measures**
- **Share data and lessons learned** while protecting privacy and intellectual property
- www.its.dot.gov/pilots

For More Information



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