



AMERICAN PUBLIC TRANSPORTATION ASSOCIATION

2010 Annual Meeting: October 3-6 in San Antonio, TX

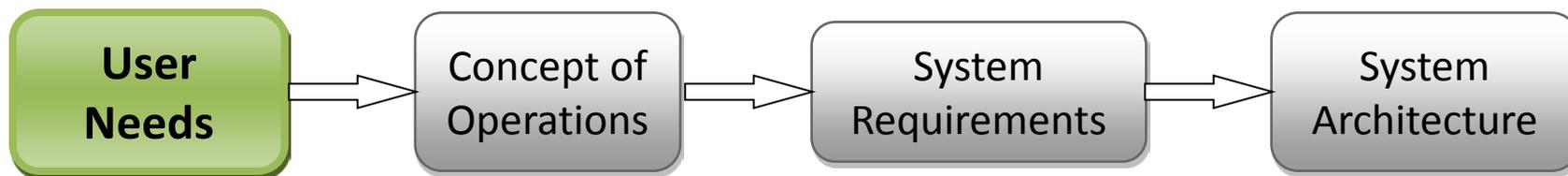
IntelliDriveSM Listening Session

Gathering User Needs

October 5, 2010

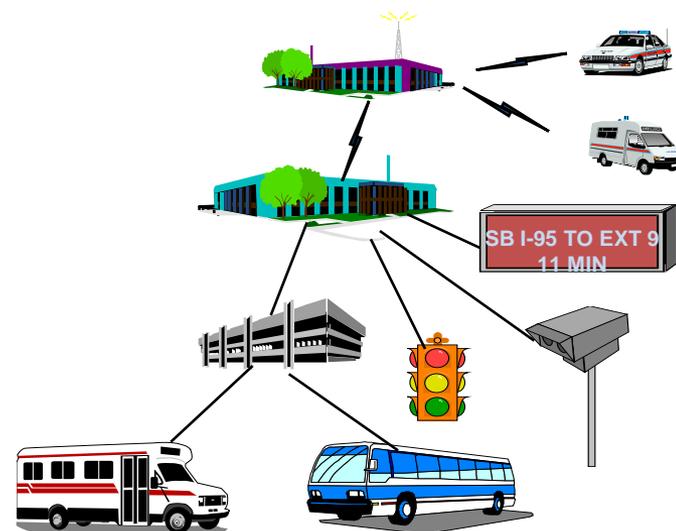
Topics

- Defining terms:
 - ITS
 - IntelliDrive
 - Systems Engineering
 - User Needs
- Discussion on your transit related needs
- Next Steps

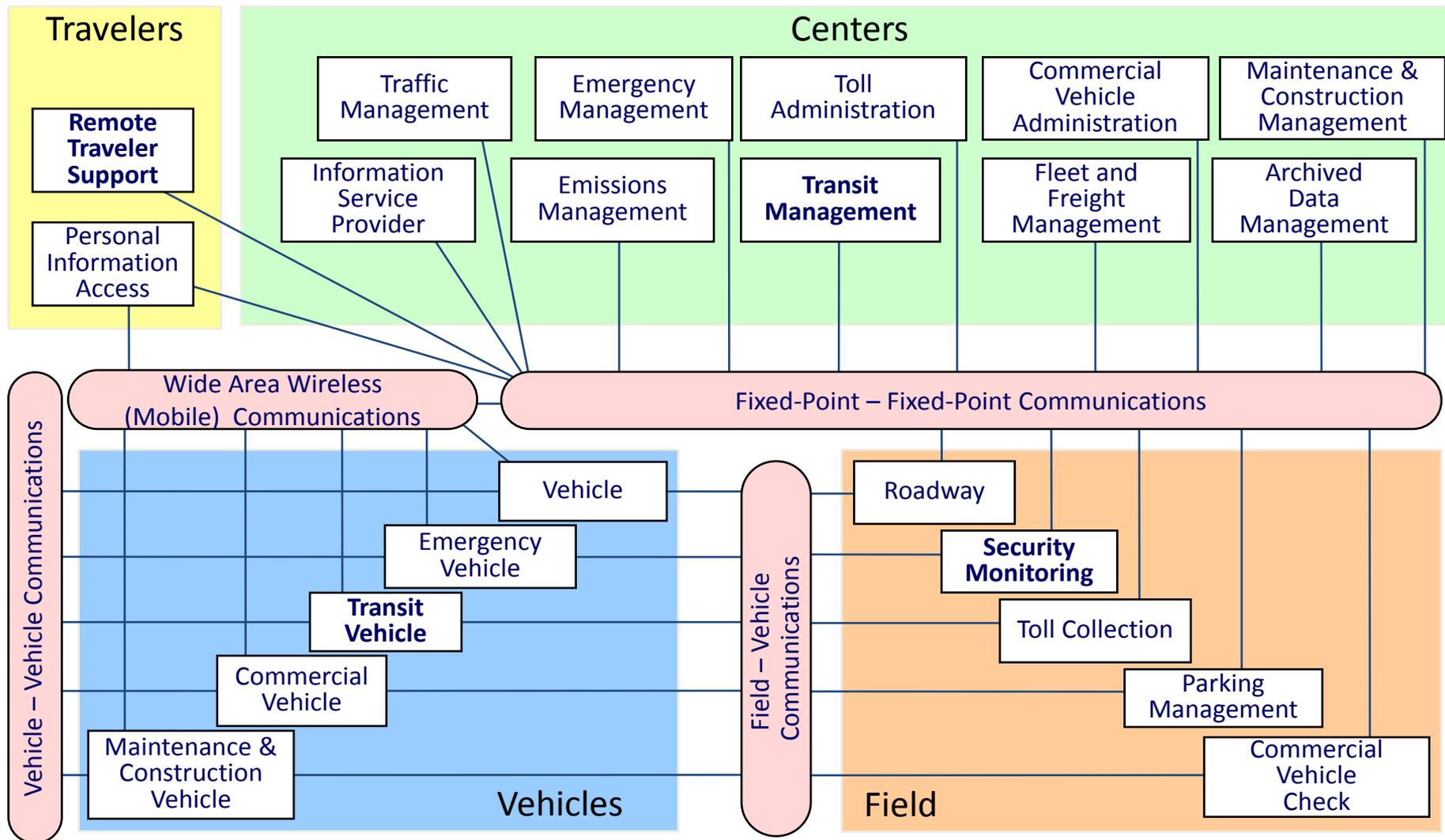


First, What is ITS?

- Intelligent Transportation Systems (ITS) include the electronics, communications or information processing used singly or integrated to improve the efficiency or safety of surface transportation
- Examples:
 - Traffic signal controllers
 - Traffic Management Centers
 - “511” (traveler information)
 - Electronic payment

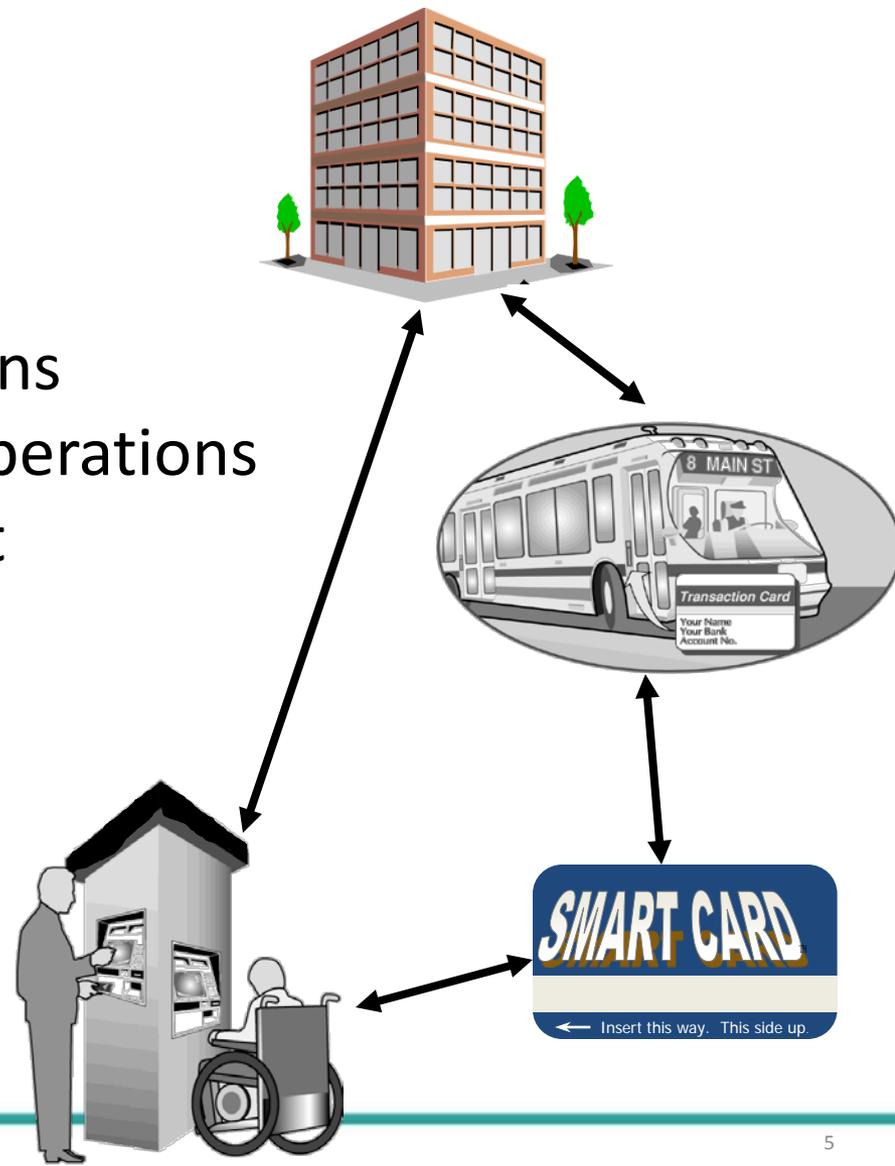


National ITS Architecture Covers a Wide Range of Services, Communications



Transit ITS Services

- Transit Vehicle Tracking
- Transit Signal Priority
- Transit Passenger Counting
- Transit Fixed-Route Operations
- Demand Response Transit Operations
- Fare Collection Management
- Transit Security
- Transit Fleet Management
- Multi-modal Coordination
- Transit Traveler Information



What is IntelliDrive?

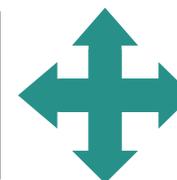
- Suite of technologies and applications that use wireless communications to provide connectivity:
 - Between vehicles (of all types)
 - Between vehicles and roadway infrastructure
 - Between vehicles and wireless communication devices
 - Between wireless communication devices and roadway infrastructure
- Focused on Safety, Mobility, and the Environment



Drivers



Vehicles

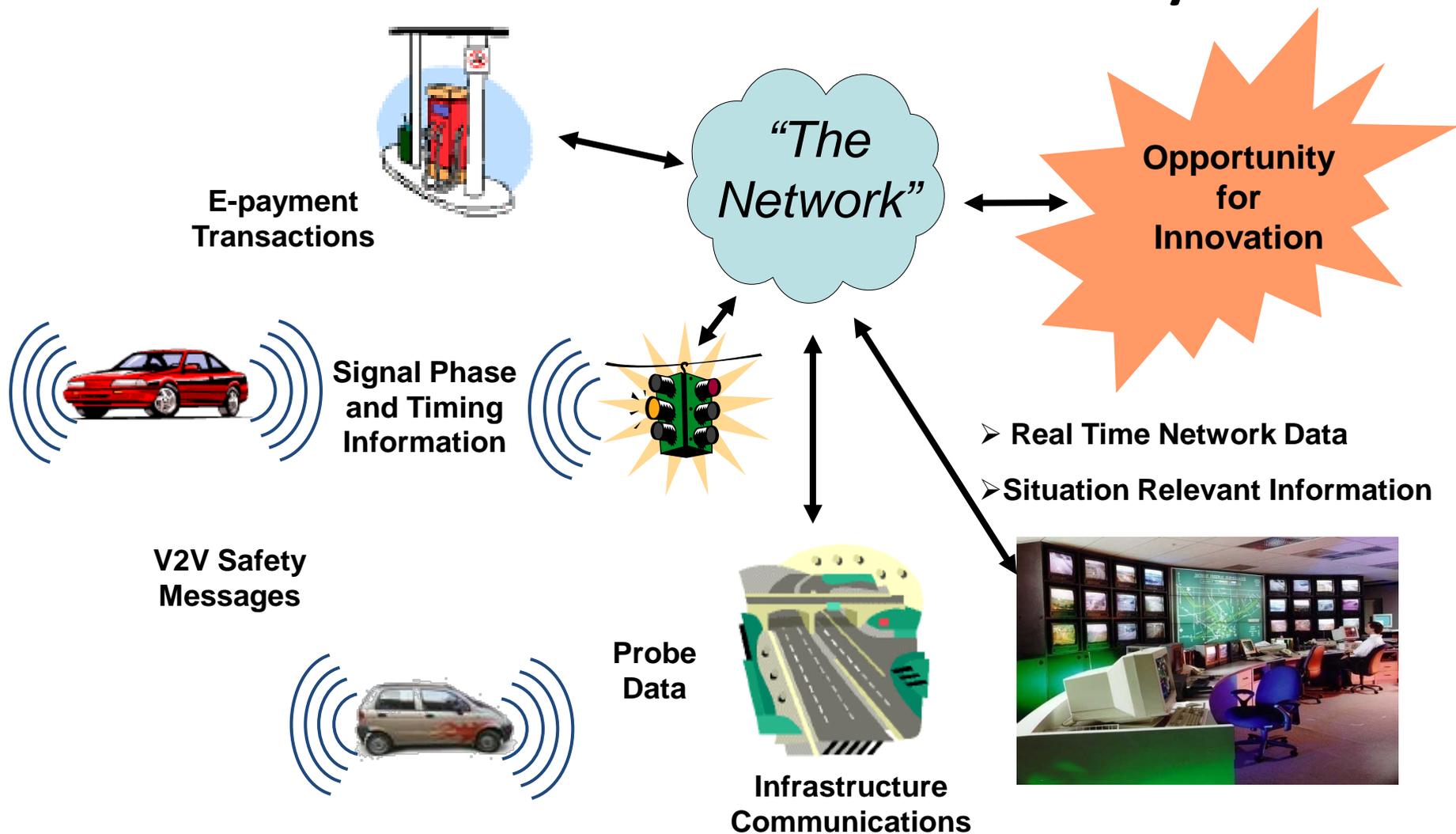


Infrastructure

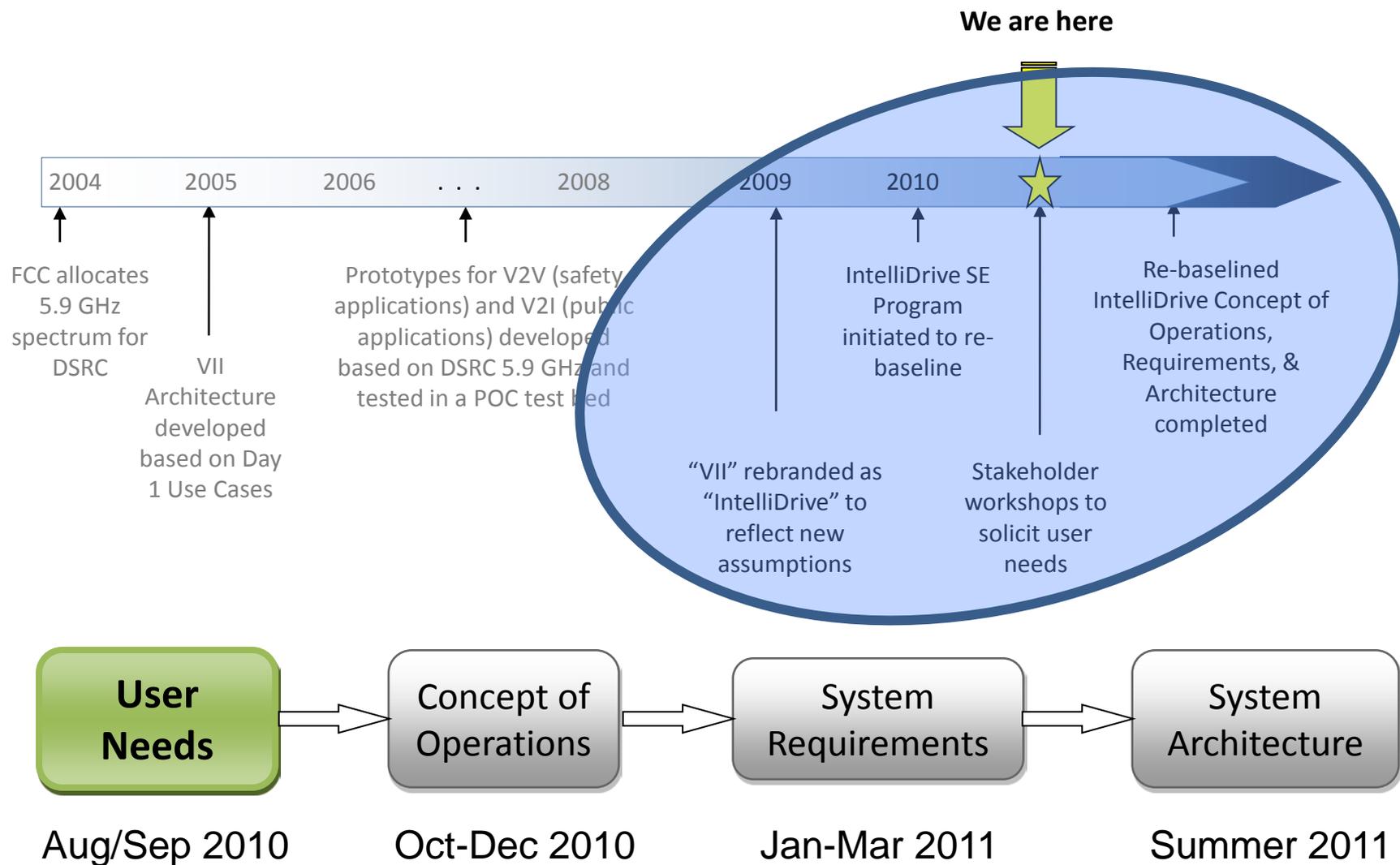


Wireless Devices

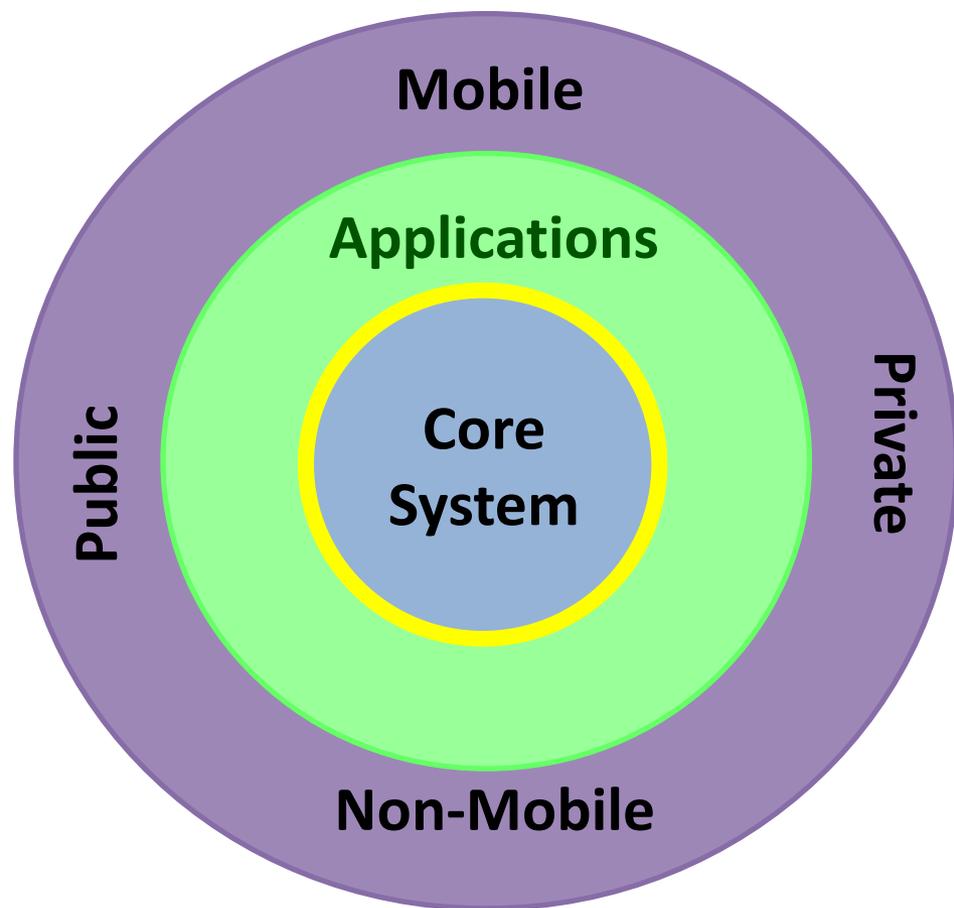
It's All About Connectivity



When is IntelliDrive Taking Place



IntelliDrive SE Program



- Revisit and update the IntelliDrive concept of operations, requirements, and architecture
- Provide the technical foundation for future activities: testing, deployment, continuing research
- Focused on Core system, enabling applications with cooperative data exchange capabilities

How does DSRC fit in?

- Dedicated Short Range Communications (DSRC)
 - Remains *one of* the important technologies used within the IntelliDrive System
- 75MHz of spectrum in 5.9 GHz range allocated by FCC to:
 - “[provide] vehicle-to-vehicle and vehicle-to-infrastructure communications, helping to protect the safety of the traveling public. It can save lives by warning drivers of an impending dangerous condition or event in time to take corrective or evasive actions.”
 - “The band is also eligible for use by non-public safety entities for commercial or private DSRC operations.”

VII vs. IntelliDrive

VII

5.9 GHz DSRC only

OEM only

Light vehicles

National interoperability

Must not compromise safety, security

Must protect privacy

Probe data, publish-subscribe

IntelliDrive

5.9 GHz DSRC and others

OEM, aftermarket and retrofit

All vehicles

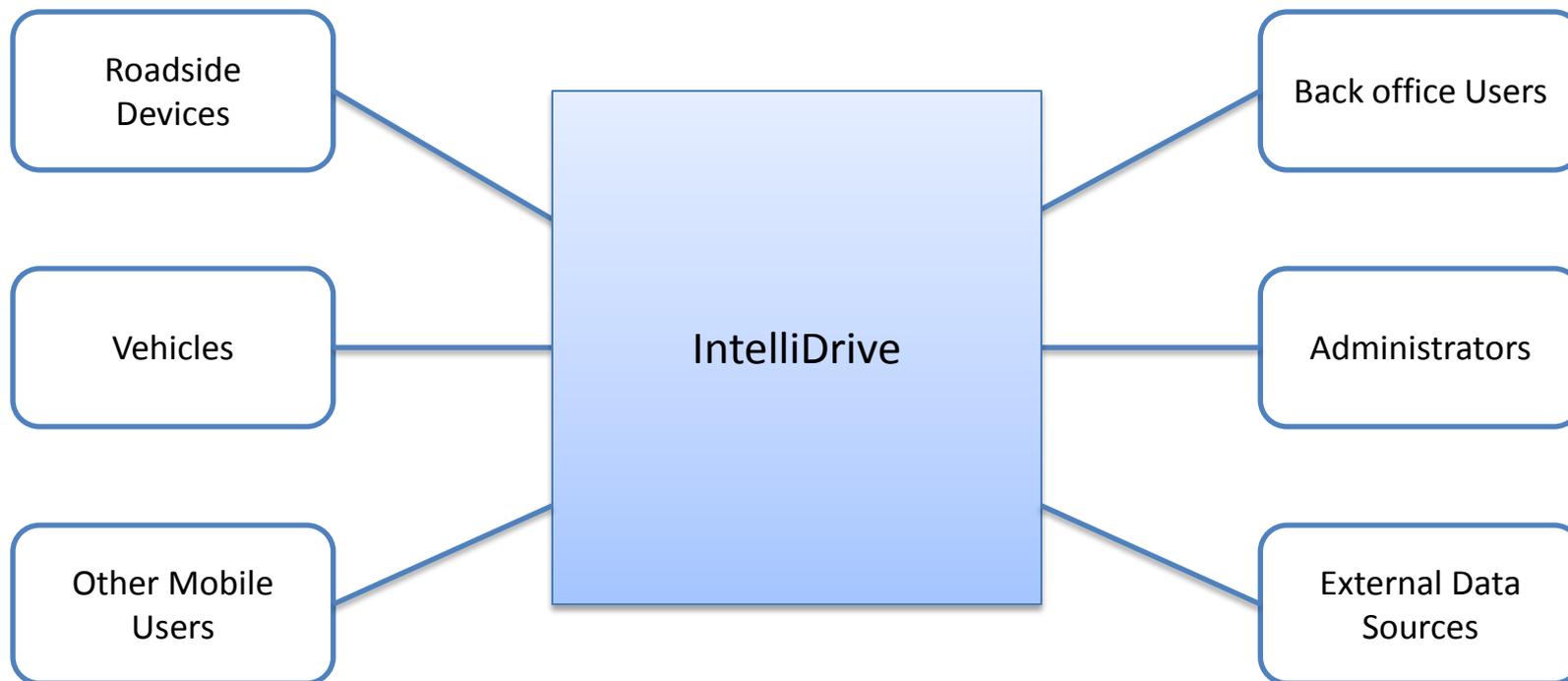
National interoperability

Must not compromise safety, security

Must protect privacy

Probe data?

IntelliDrive Context



What is a User Need?

- A “User Need” is defined as a capability that is identified to accomplish a specific goal or solve a problem that is to be supported by the IntelliDrive System.
- “A user requirement for a system that a user believes would solve a problem experienced by the user.”
 - IEEE Std 1362-1998, Section 3.26 - User Need
- Describes “what” is needed and not “how” it is to be implemented

Characteristics of User Needs

- Scoped to the appropriate level
 - Too general -- needs to be further defined
 - Too specific -- may imply design
- Not Application specific
- May include notional latency, security, size or bandwidth (if applicable) needs
 - Not the solution of any specific interface or protocol

User Need Example

- **Who?** Transit Manager
- **What is the problem?** I can't ensure that my transit vehicles stay on schedule.
- **Why is this a problem?** Late transit vehicles has resulted in a drop in ridership.
- **What do you need to solve the problem?** I have a need for the signals to be modified in order to accommodate a bus that is behind schedule.
- **Why should IntelliDrive solve this problem?** IntelliDrive could provide a way for my transit fleet to communicate with the signals and reduce my reliance on proprietary signal priority equipment.

Gathering User Needs:

What have we heard so far?

- Give me the data – current traffic, all roads, all the time
- Standardize it
- Support multiple modes – include Cyclists, Pedestrians, other vulnerable users
- Set driver's expectations: inform them when IntelliDrive/safety services are available
- Support targeted broadcasts to sets of vehicles – by location, type, individual
- Support back-office brokering of data sets via standardized interfaces, services
- Support roaming for users devices
- Provide authentication, ensuring users that messages are from legitimate sources

What have we heard from Transit?

- Same as above. In addition, consider the following safety related needs
 - Support broadcast of complete vehicle characteristics
 - Special vehicle types like articulated buses, light rail operating at grade, trolleys,
 - Provide warnings when entering and exiting lanes of traffic
 - Provide warnings to vehicle operator when pedestrians approaching vehicle
 - Provide precise positioning of BRT vehicles to maintain train-like spacing, scheduling

What else have we heard from Transit?

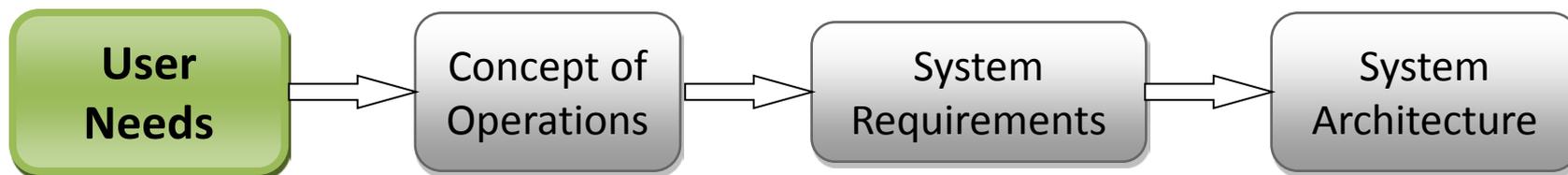
- Consider the following mobility related needs
 - Support transactions with passengers having special needs (availability of bus with bike rack, wheel chair access)
 - Provide alternate communications path for provision of operational data: schedule adherence, current passenger counting, security
- Consider the following environmental needs
 - Support V2I signal priority to maintain smooth flow, reduces emissions

Today – Let's Hear Your Needs

- Who are you?
- What is the problem?
- Why is this a problem?
- What do you need to solve the problem?
- Why should IntelliDrive solve this problem?

Next Steps

- The inputs from this workshop will be collected and organized
- Findings Report provided to USDOT
 - DOT will disseminate to the participants
- Next step for the program will be to update the IntelliDrive System Concept of Operations
- Stay tuned!



Thank you for your participation!

<http://www.intelldriveusa.org/>

Site sponsored by the US Department of Transportation
[Research and Innovative Technology Administration](#)

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News & Updates

Proof of Concept Test Results Released
 March 11th, 2009 at 4:04pm

IntelliDriveSM Brand Replaces VII
 February 23rd, 2009 at 10:12am

SAFETRIP-21 News
 December 4th, 2008 at 3:12pm

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Overview
FAQs

Who We Are

DOT's IntelliDrive Program
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