UNITED STATES
DEPARTMENT OF TRANSPORTATION

Communications and Technology

An Update for the ITS Program Advisory Committee

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March 1, 2011

Presentation Objective

- ***Communications*** - The JPO program has emphasized DSRC is its communications mode. We observe that recently JPO has considered other technologies for V2V and reserved DSRC for latency critical communications for intersection safety. This is a step in the right direction by JPO since it provides an open platform for communications. Further, we observe that DSRC can be expensive and sole reliance on it might constrain development of a multimodal program. Communications, as a central ITS technology, should be the subject of continued emphasis at JPO.
- ***Technology*** - The committee worries that ITS is already substantially behind – one member said ten years behind—in the technologies it is applying. If so, what does this imply for the ultimate efficacy and viability of ITS? How can transportation keep up with the rest of the world? What might JPO do to remedy this situation?

ITS JPO Activities

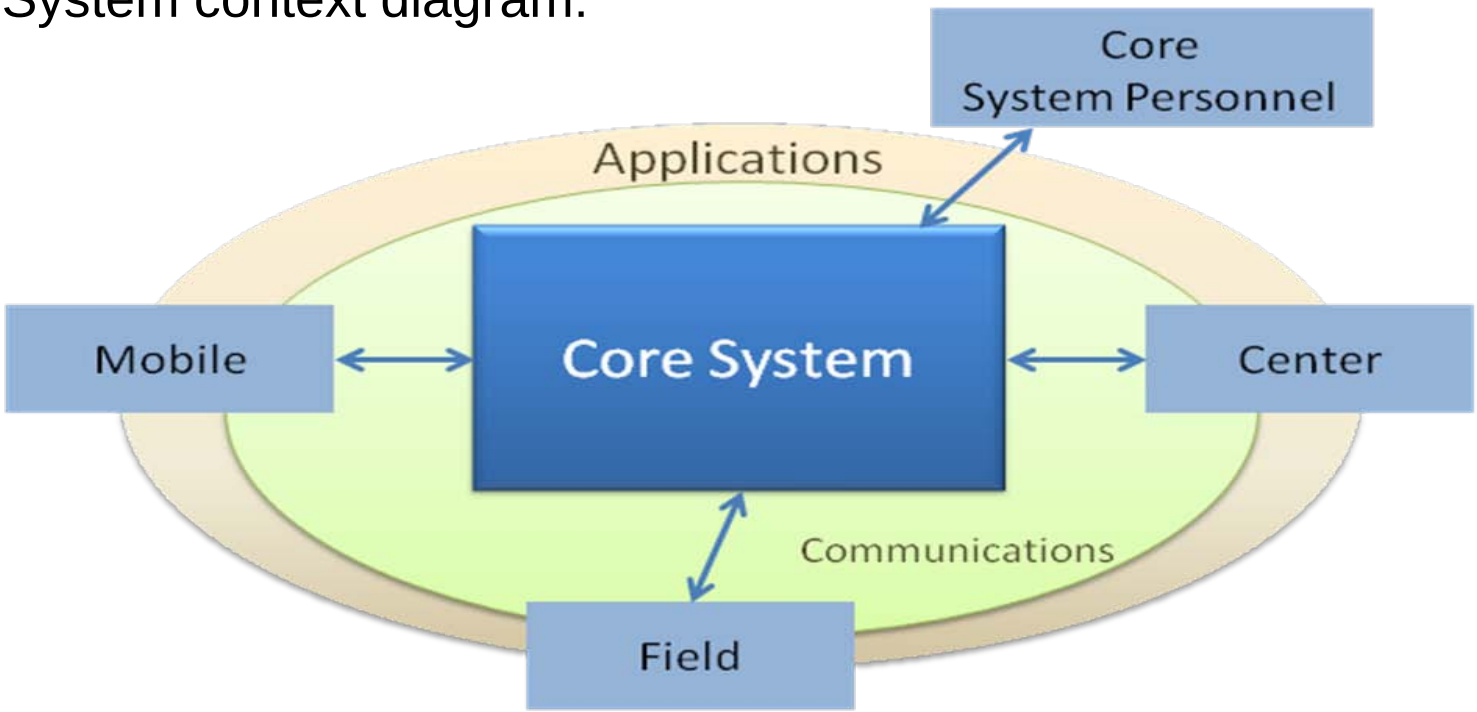
- System definition update (reassessment)
  - Updating our understanding of the system communication needs
  - Includes both Over-The-Air and within the Internet
- Technology scan
  - Communication media
  - Security technology
  - Sensors (possibly)
- *We now understand that we will have a very different, more diverse deployment than what we may have understood in the past*

Findings from the System Definition Update

- Canvassed user needs
- Developed a new Concept of Operations

  Communication media is separated from data exchange definitions

  Core System context diagram:



Findings from the System Definition Update, Cont.

- Communication between mobile and fixed elements
  - Situation broadcasts with different levels of immediacy and scope
  - Point-to-point data exchanges
- Unified process for data exchanges between application components independent of communication media
- Unified process for establishing trust relationships and protecting ownership (privacy) independent of communication media
- Central need to manage and broker certain data

Tech Scan and Assessment

- Scan:
  - Track trends, technologies and innovations that could influence, or be leveraged as part of, next-generation intelligent transportation systems, within a 5-7 year horizon
  - Includes technical, cultural, regulatory, and business drivers behind their emergence
- Assessment:
  - Assess potential role as a “transformative” technology, profoundly affecting the advancement of connected vehicle technology

Connected Vehicle Research Technology Scan & Assessment , Phase II: First Quarter Review, Steven H. Bayless, ITS America, Adrian Guan, ITS America

Findings from Tech Scan –
Long term: New Network Services (from the P2Q1 summary)

- In next decade, 4G promises **an Internet Protocol (IP) Multimedia Subsystem (IMS)** to let the network adapt to the needs of applications
  - IMS will schedule and manage data streams based on quality of service (QoS) level
  - Creates “predictable” experience for real-time applications beyond “best effort” (e.g for Voice-over-IP where latency and jitter are critical)
  - Measure connection quality and usage to allow for more flexible pricing such as charging per application, per session, per volume, per QoS level
- Integrate or “offload” streams from multi-standard terminals (e.g. pass Wi-Fi data to 4G; offload 4G data to less congested WiFi to load balance cellular network)
- “Presence and Availability” engine may allows user to hop between best and most suitable communication media mid session (e.g. start with DSRC, end with 4G or Satellite etc..)

Findings from Technology Scan –
Near term: Existing ecosystems

- A number of communication technologies are available beyond 5.9GHz DSRC
  - Analyzing trends in the vehicle and communication industries – telematics and the App Store phenomenon
  - Understanding secondary issues related to specific communication devices or media – the complexity of current handheld devices, the ability to influence or control deployments