

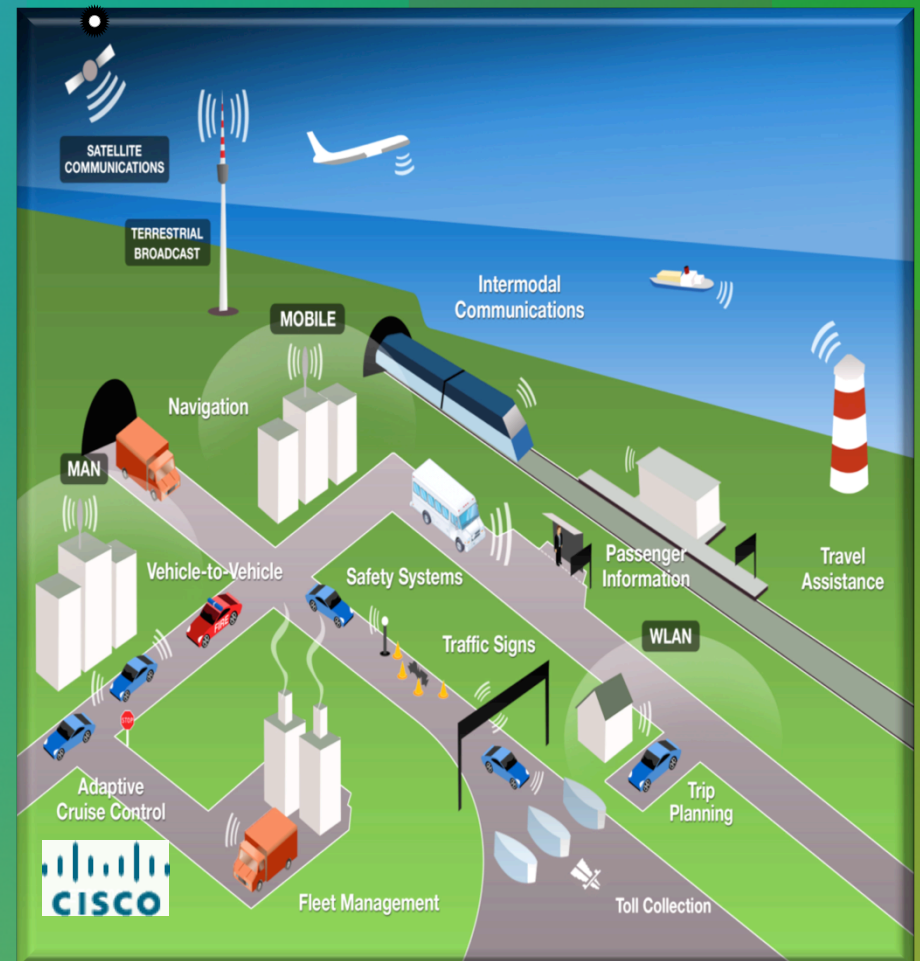


Connected Vehicles/ Connected Transportation

Sept 2012 in Seattle

Gordon Feller

Cisco - Director of Urban Innovations



Transportation Solutions Across the Spectrum

Rail



Roadways



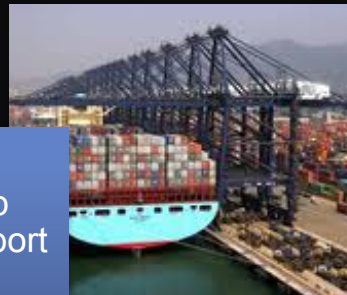
Public Safety



Aviation



Ship Transport



Mass Transit



Fleet



Connected Vehicle



Technology Trends and Drivers



Wireless Technology Boom

- *91% or 285 million Americans are wireless services subscribers*
- *Growth in Wireless technology and consumer adoption allowed for more and better information to be distributed to the users enabling them to make better transportation decisions.*



Fast Pace of Innovation

- *From 2007 to 2008, overall patent application were static while ITS applications grew 17%⁶*
- *Due to continued investment and focus in the ITS industry, technology is becoming more widely adopted*



Ubiquitous Connectivity

- *As we reach ubiquitous connection between people, vehicles, roads, etc. information is not only readily available, but in high demand*
- *With the grow of data mining (Goggle or GPS positioning for example) focused information and advertising can be targeted to individual users*



Person-to-Person Connectivity

- *Social Networking grew 60% from 2007 to 2008⁷*
- *With the introduction of smart phone applications, social networking, people can inform people how to move around more efficiently*

⁶The Intelligent Transportation Society of America, 2009 Market Data Analysis, Phase 1 White Paper

⁷comScore 'Digital World-State of the Internet' March 2008

Industry Trends and Drivers



Safety Focus

- In 2008, there were 5.8 million crashes, resulting in 37,000 fatalities and 2.3 million injuries²
- Crashes are the leading cause of death for ages 3 through 34¹



Growing Congestion

- U.S. highway users waste 4.2 billion hours a year stuck in traffic – nearly one full work week for every traveler³
- Congestion is crippling our major cities and even our small towns, at a cost of more than \$78 billion a year⁵



Growing Environmental Awareness

- The total amount of wasted fuel topped 2.8 billion gallons in 2007 – three weeks' worth of gas for every traveler³
- FHA FY11 Budget estimates dedicating \$6.4B or 15% to Environmental Stewardship⁵



Increase of Transportation Technology Spending

- Stimulus authorizes \$48B for a smarter transportation system
- 28 (of 191) companies reported over \$1.7 billion in CY 2008 revenue attributable to ITS, a 17% increase from 2007⁴
- In FY 2009, FTA allocated more than \$7 billion to cities, towns, regional governments and transit authorities⁴



Globalization

- FHA FY11 Budget estimates dedicating \$1.3B to Global Connectivity⁵
- Reduce barriers to trade and enable safe and efficient movement of passengers and cargo across international borders and improved travel time reliability on key networks.

¹NHTSA's National Center for Statistics and Analysis, Traffic Safety Facts:

<http://www-nrd.nhtsa.dot.gov/Pubs/811226.pdf>

²NHTSA Traffic Safety Fact Sheet at: <http://www-nrd.nhtsa.dot.gov/Pubs/811170.pdf>

³Schrank, David and Lomax, Tim, 2009 *Urban Mobility Report*, Texas Transportation Institute, July 2009 <http://mobility.tamu.edu>

⁴The Intelligent Transportation Society of America, 2009 Market Data Analysis, Phase 1 White Paper

⁵US DOT, Federal Highway Administration FY11 Budget Estimates

Connected Roadway



Roadway
Management
Arterials
Freeways
Corridors
Toll ways
Bridges
Tunnels



Safety Systems
Collision
Avoidance
Road weather
management



Operations and
Maintenance
Network
management



Traveler
Information
Systems
DMS
VMS
HAR
511
E-911



Incident
Management
Emergency
Response

Connected Roadways

THE CHALLENGE:

- Federal goals to deliver fast, safe, efficient, accessible, and convenient
- Lack of coverage or capacity over much of the network
- Unable to share information between modes of transportation

THE SOLUTION:

- Deliver EtherNet/IP-enabled integrated systems and the ability to share information whenever, wherever needed
- An end-to-end solution providing the ability of Cisco and agencies to communicate across IT and operational boundaries



Connected Transit



Transit
Management



Safety and
Security
Systems
Collision
Avoidance
Road weather
management



Operations
and
Maintenance
Network
management
Integrated
Networks with
other modes



Passenger
Information
Systems
Fare
Collection
Systems
Retail
Operations



Incident
Management
Emergency
Response

Four Levels of Smart Connected Vehicle

– rapid development work is just ahead



Uninterrupted Connectivity to Highly Mobile Network

Session Persistency, Connection Management, Network Mobility and Resilience, Optimized to deliver Voice, Video, Cloud, TS, ...



Network Services

Transport and Application Optimization, Monitoring, Identity Mgmt, Access Control, SLA



Secure Computing and Communication Infrastructure

VPN, Security service (FW, IPS, Deep Packet Inspection, NBAR, Flow Monitoring), Virtualization, Vehicle Network Security

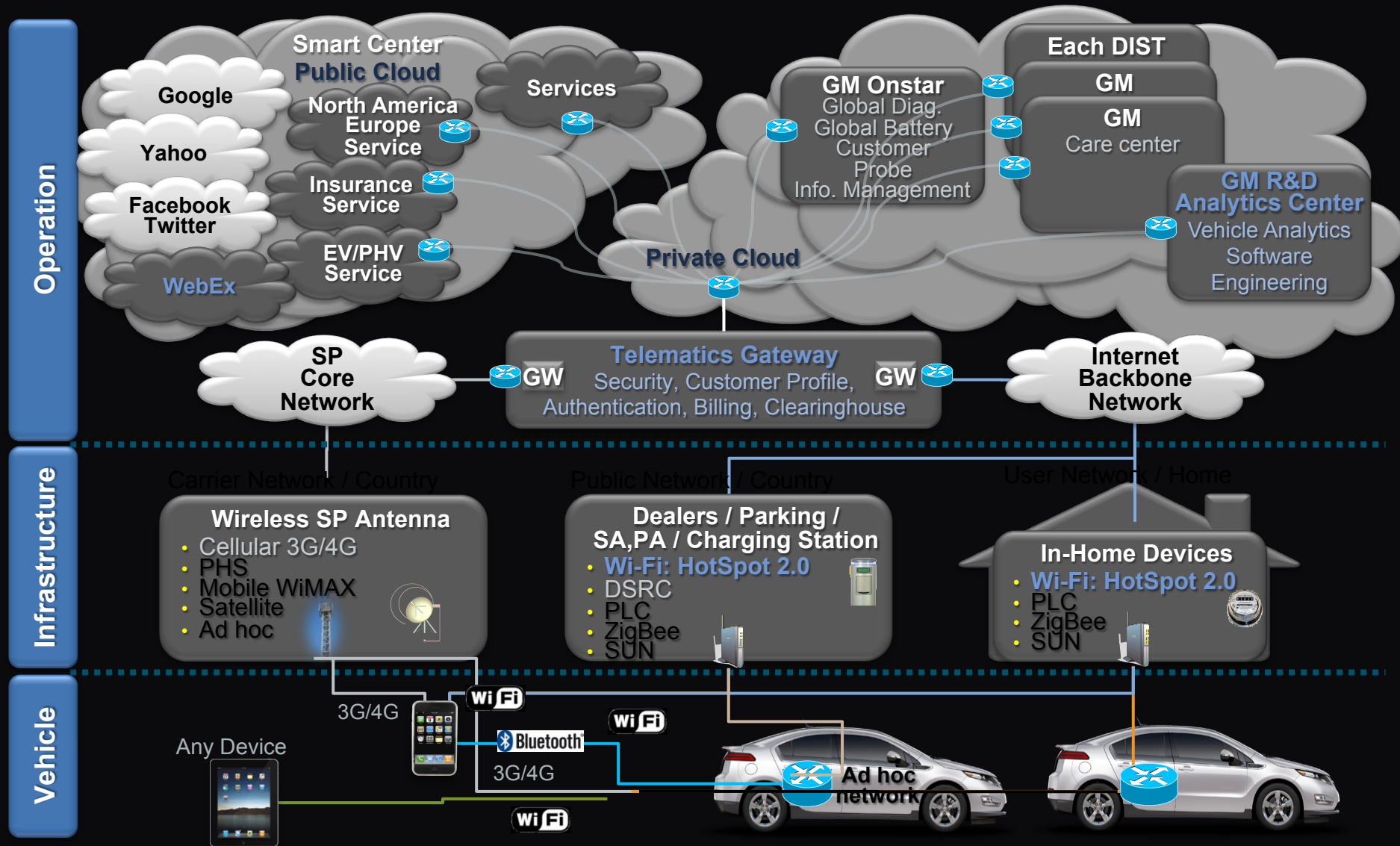


M2M and Pervasive Computing

802.11P, Adhoc Communication, Hotspot 2.0, Smart Grid Technology (Sensor Networking), IPV6, Service Delivery MW

Cisco Smart Vehicle

Technology Architecture Overview



Annual Benefits per Connected Passenger Vehicle, by Source

