Intelligent Transportation Systems
U.S. Department of Transportation

# Impact of New Data Sources on Transportation Safety and Mobility

## Transportation CPS Workshop
## November 18, 2008

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# Impact of New Data Sources

## A Data Revolution is Coming!

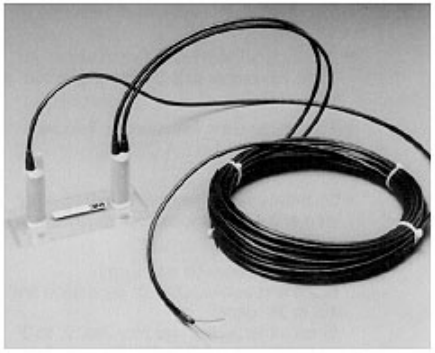
# Agenda

- Historical Context
- Market Developments and New Data Sources
- Opportunities to Improve Transportation
  - Safety Services
  - Mobility Services
- Future Challenges

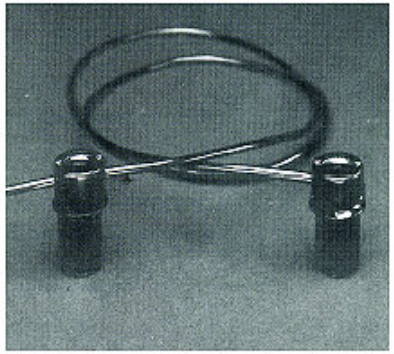
# Traditional Data Solution

## Traditional Solution:

- Fixed sensors (e.g. loops)
- Public investment through
  - Federal-Aid Program
  - State and Local Funds



Model 701



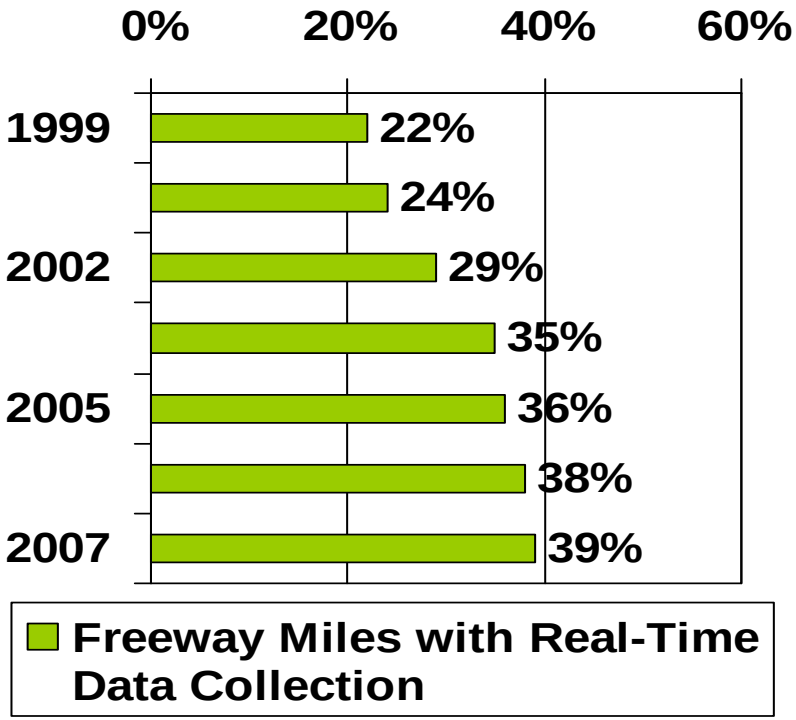
Model 702

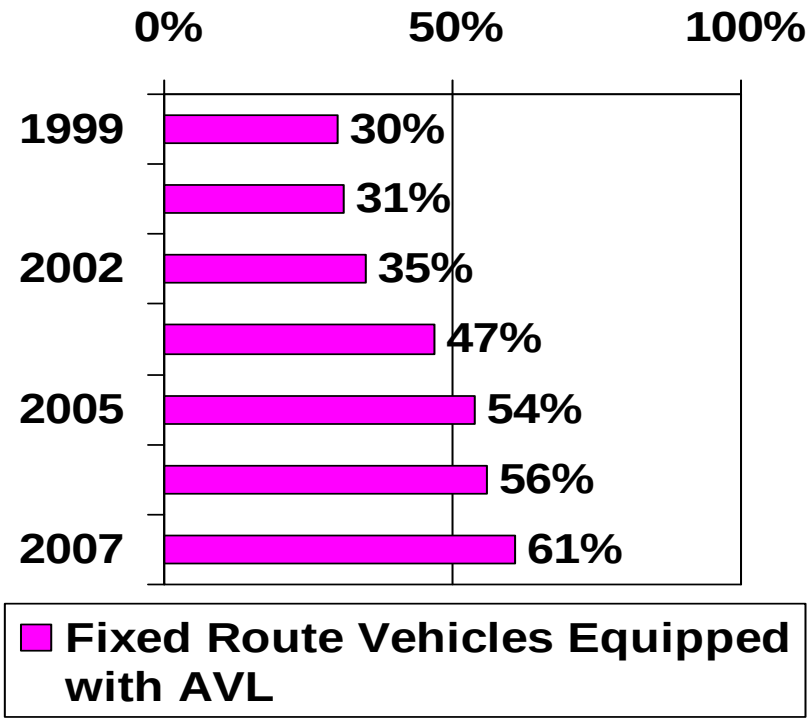
## BUT

- Trust Fund is Going Broke
- Funding is Insufficient for Basic Needs
  - Technology Investments Typically are Low Priority
  - O&M funding is typically insufficient

# Slow Pace of Deployment

- Freeways and transit have moderate ITS deployment.
- Deployment on arterials is even less.

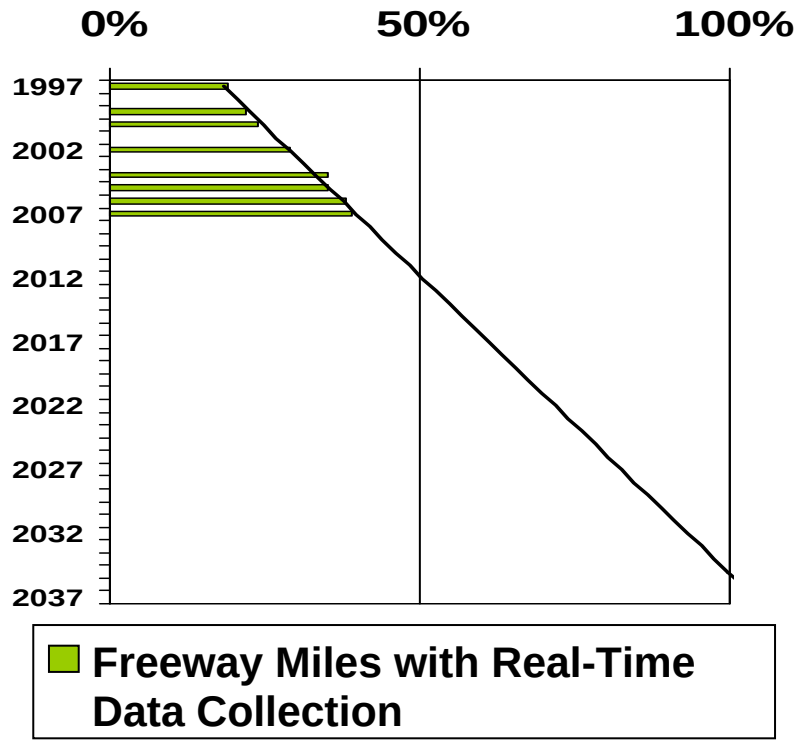


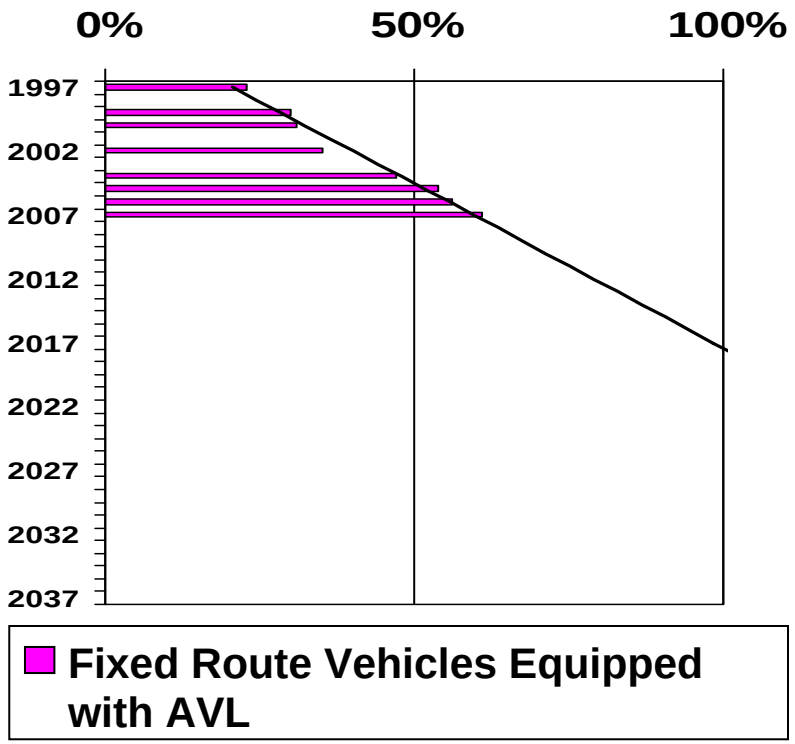




**Source**: ITS Deployment Statistics Database (www.itsdeployment.its.dot.gov)

# Slow Pace of Deployment

- At the present rate, full deployment will not be achieved for years.
  - Not until **2035** in freeways, **2019** in transit




**Source**: ITS Deployment Statistics Database (www.itsdeployment.its.dot.gov)

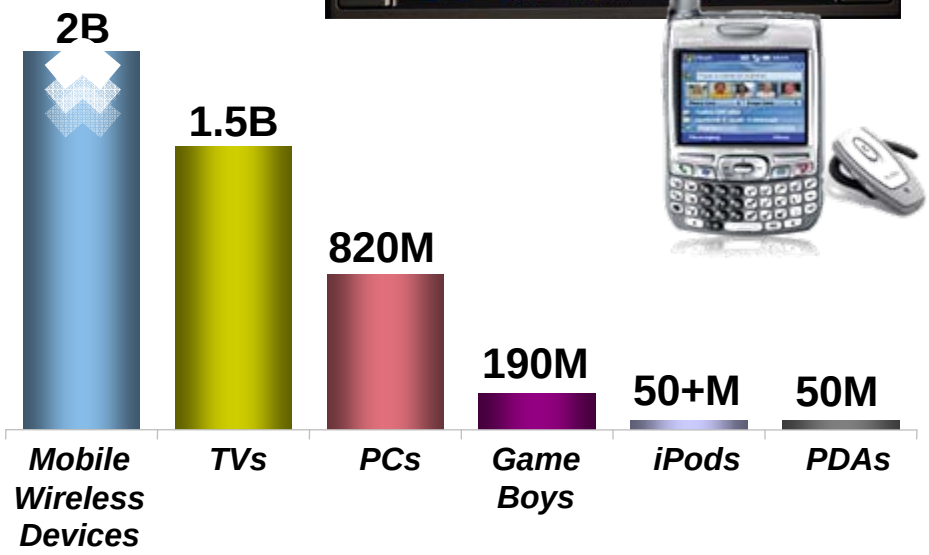
# Current Statistics – *2006 Deployment Statistics Database (108 metro areas surveyed)*

- 70-77% of agencies collect **volume** data
- 61% of agencies collect **speed** data
- 39% signalized **intersections** covered by electronic surveillance
- 38% freeway miles in metro areas with **R-T traffic data** collection
- 27% of agencies display **travel time on DMS**
- 14% states disseminate **transit** data on agency web sites
- 13% of agencies deploy **parking** data collection systems
- 8% of agencies disseminate **parking** information

# Information Technology is Booming

## At the Same Time:

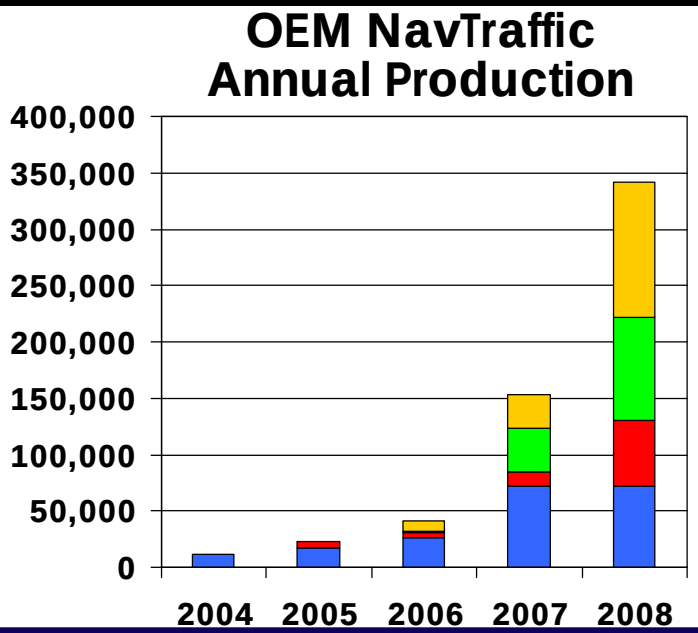
- Information Technology Explosion
  - Smaller
  - Faster
  - Ubiquitous connectivity
  - Market driven
  - Based on industry standards

## *Automotive Adoption of Real-Time Traffic*

Number of OEM Models with available factory-installed XM NavTraffic

| OEM | Traffic Intro | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 |
|---|---|---|---|---|---|---|---|
| **Honda/Acura** | MY 2005 | 1 | 1 | 4 | 4 | - | - |
| **GM/Cadillac** | MY 2005 | 1 | 1 | 1 | 1 | - | - |
| **Toyota/Lexus** | MY 2007 | 0 | 0 | 2 | 5 | - | - |
| **Nissan/Infiniti** | MY 2007 | 0 | 0 | 2 | 8 | - | - |
| **Ferrari** | MY 2008 | 0 | 0 | 0 | 1 | - | - |
| **Total** | | **2** | **2** | **9** | **19** | **40+** | **50+** |



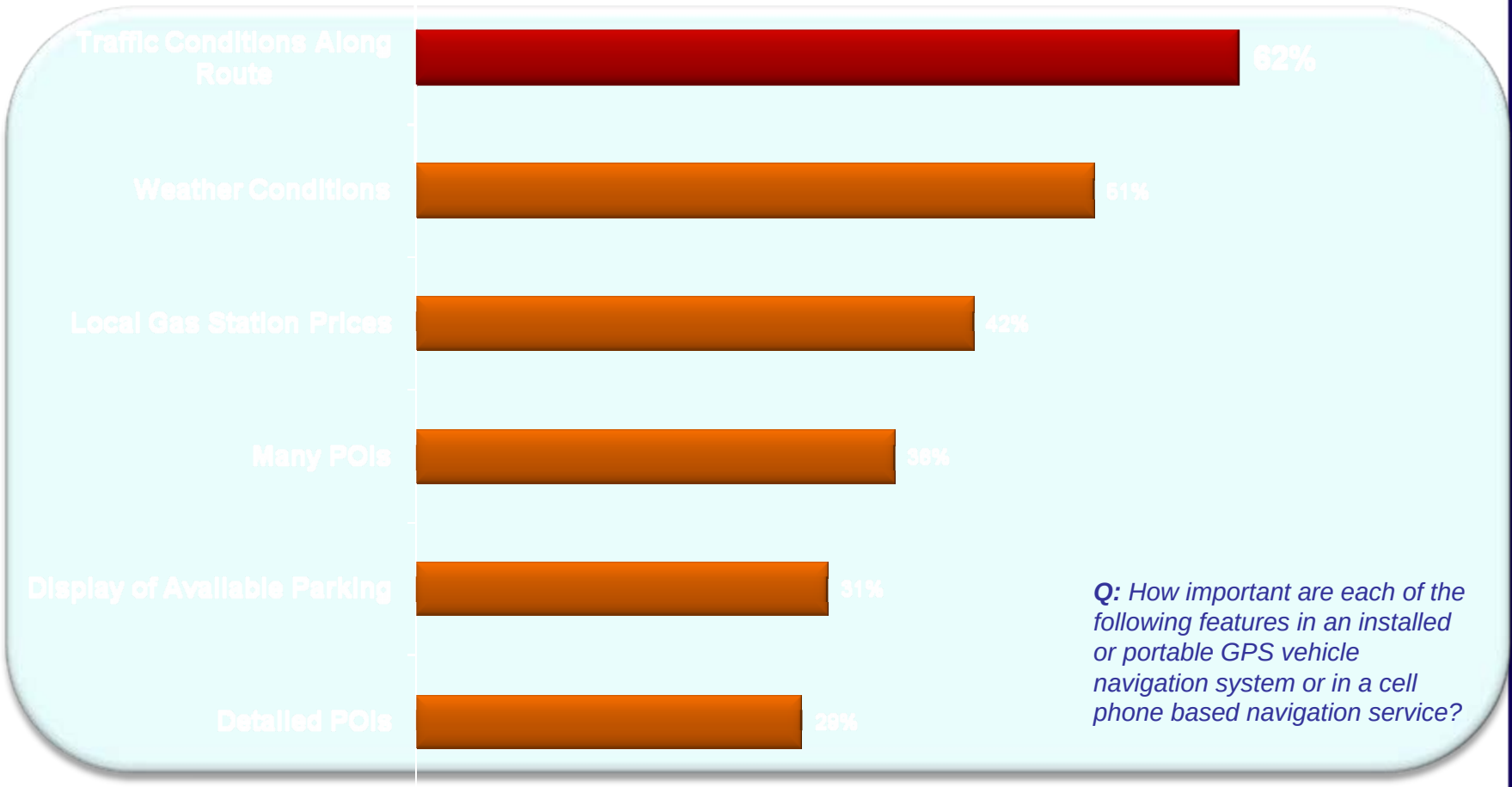





Source: Vehicle Traffic Information Coalition

# Consumers Expect Traffic with Navigation

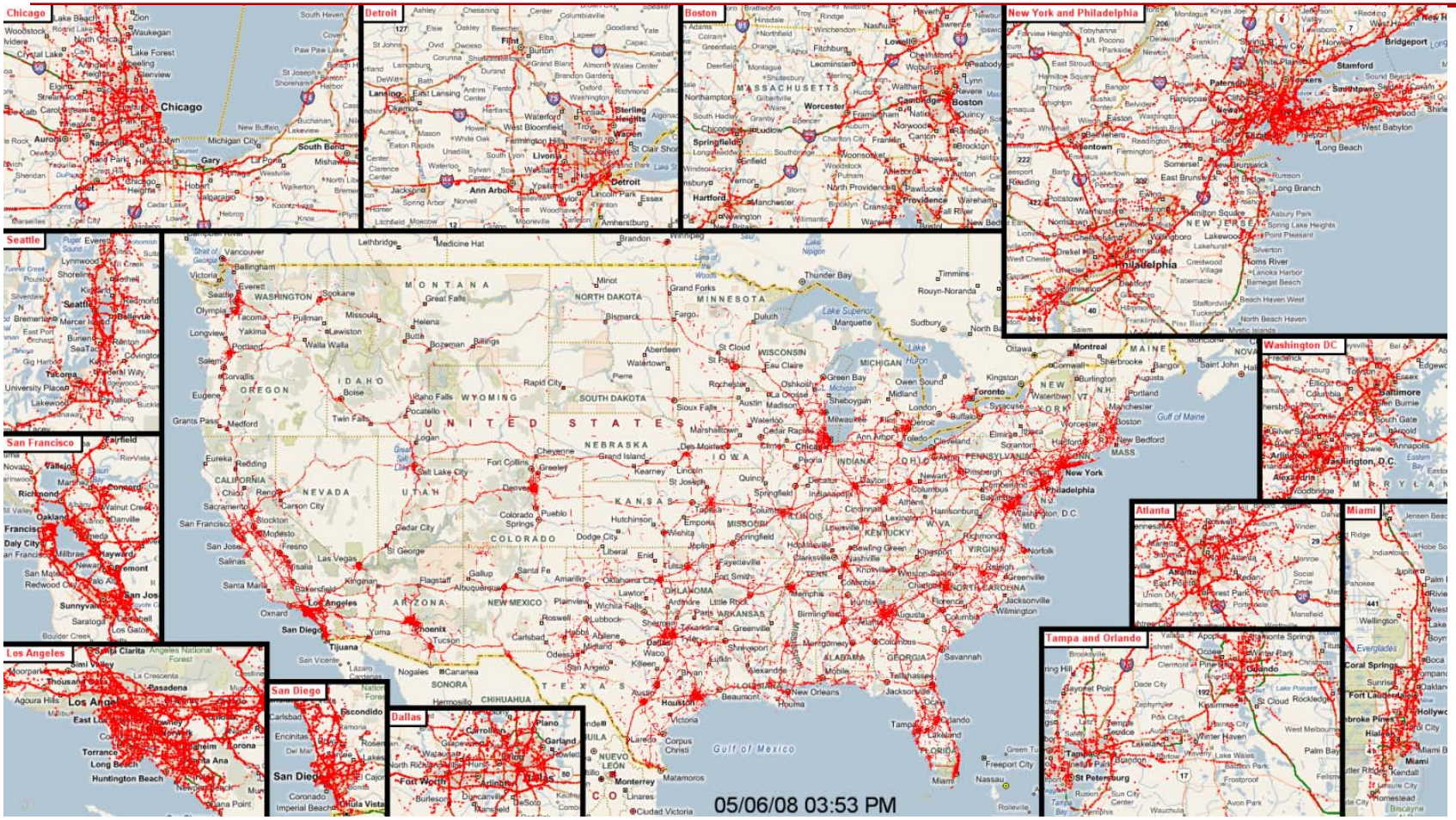
**Traffic is the #1 content feature requested by consumers for navigation systems**



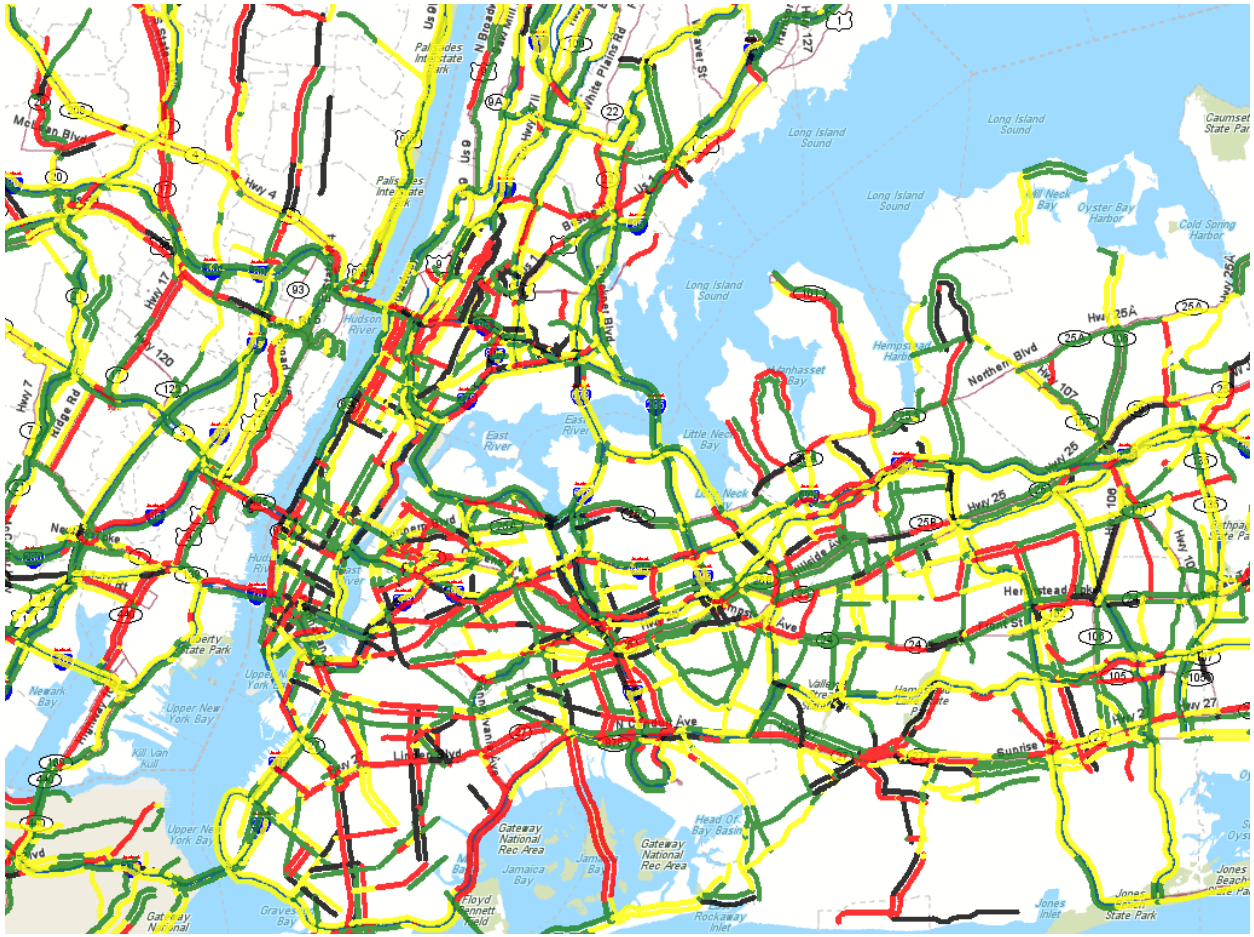

***Q:*** *How important are each of the following features in an installed or portable GPS vehicle navigation system or in a cell phone based navigation service?*

Source: "Interest of U.S. Consumers in Traffic Information Services", C.J. Driscoll & Associates, October, 2006

# Each red dot on the map represents a vehicle reporting data to INRIX on 5/6 at 3:53 PM

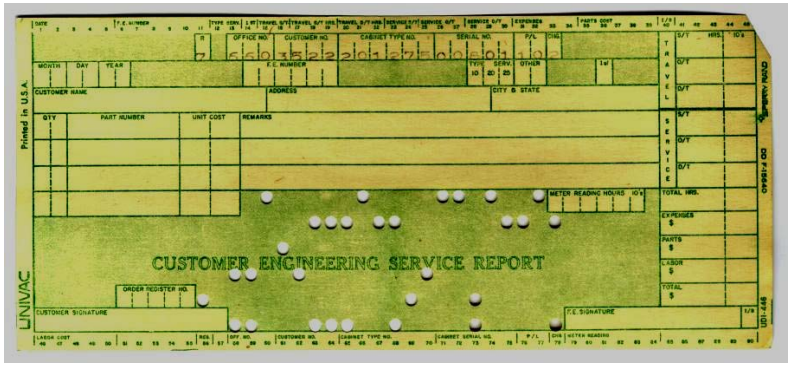


# New York City, 8/4 at 5:20 PM



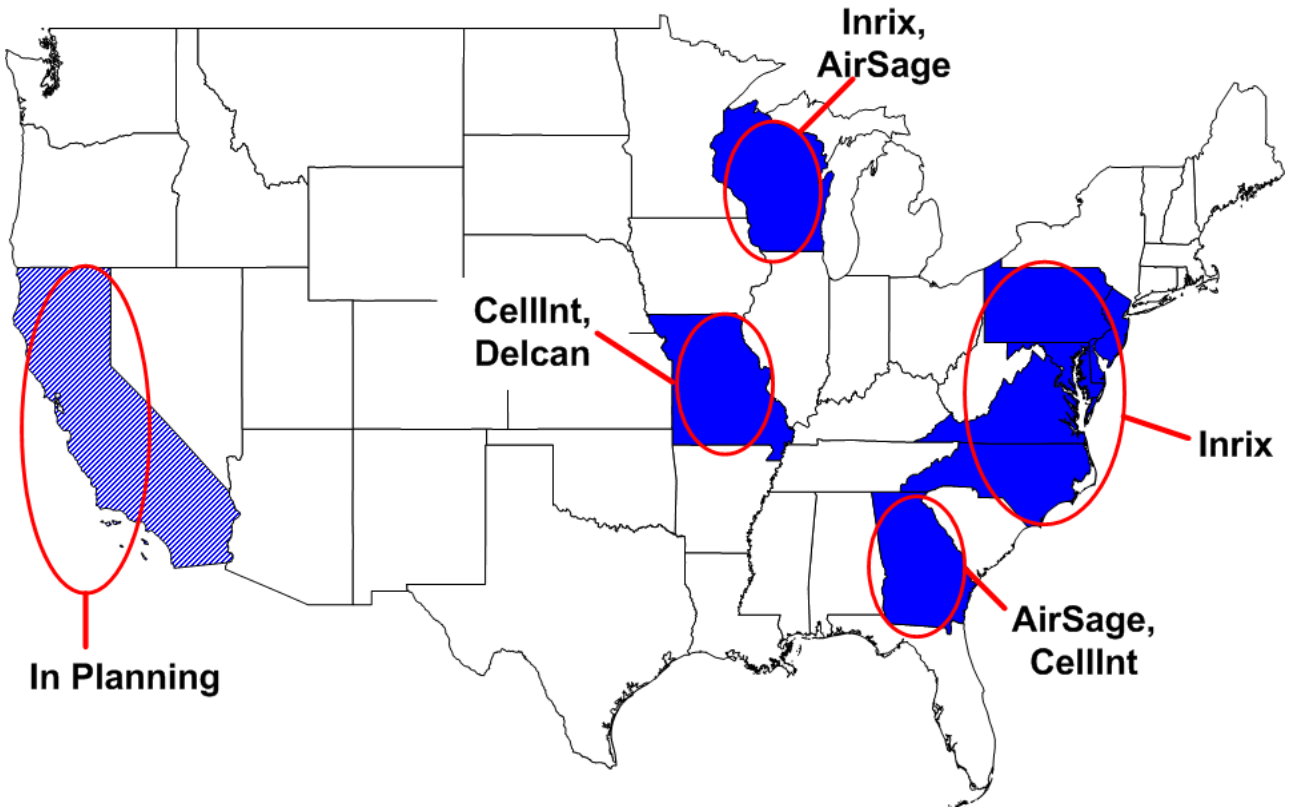
# We Can Leverage the Market or Be Left Behind

- We live in an information rich world, and
- Public agencies are information poor for real-time travel information



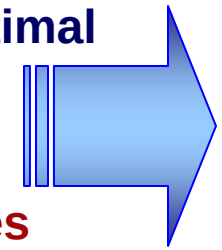
# Public Agencies Are Making the Change

- Agencies are purchasing real-time data from private providers



# What Would We Wish For?

- End-to-end transportation trip information for traveling public
- Transportation network is managed for optimal performance
- Technology-enabled performance measures support outcome-based investment decisions
- End-to-end freight movement is seamless and secure



Real Time Travel Data
- All Roads
- All Modes
- All the Time

# *Probe Data Brings New Opportunities*

## Probe Data From Multiple Technologies

- Cell phones, AVL and after-market devices
- Provides GPS data, speeds and travel times

## Probe Data From Vehicle CAN Bus

- ABS
- Airbag
- Rain Sensor
- Wipers
- Headlights
- Temperature
- Traction Control

# Safety Services

- **Improved Situational Awareness**
  - Adverse weather or road conditions
  - Accidents or stopped traffic ahead
  - Work zones
- **Active Safety Warnings (VII-enabled)**
  - Intersection safety
  - Curve speed warnings
  - Lane departure warnings

# Mobility Services

- Mobility Management
- Performance Measurement
- Transportation Planning
- Traveler Information

# *Mobility Management*

- **With better data, we can manage network better**
- Network Management
  - Traffic (freeways and arterials)
  - Transit
  - Parking
  - Freight

- **New modeling capabilities (predictive)**
- **New operational tools**

# Performance Measurement

- **With better data, we can measure performance**
- Enables System Monitoring
- Suite of performance measures
  - Nationally
  - Regionally
  - Locally
  - Usable for day-to-day management

# Transportation Planning

- **With better data, we can inform our investment decisions**
  - Archived data
  - Origin-destination studies
  - Trip generation

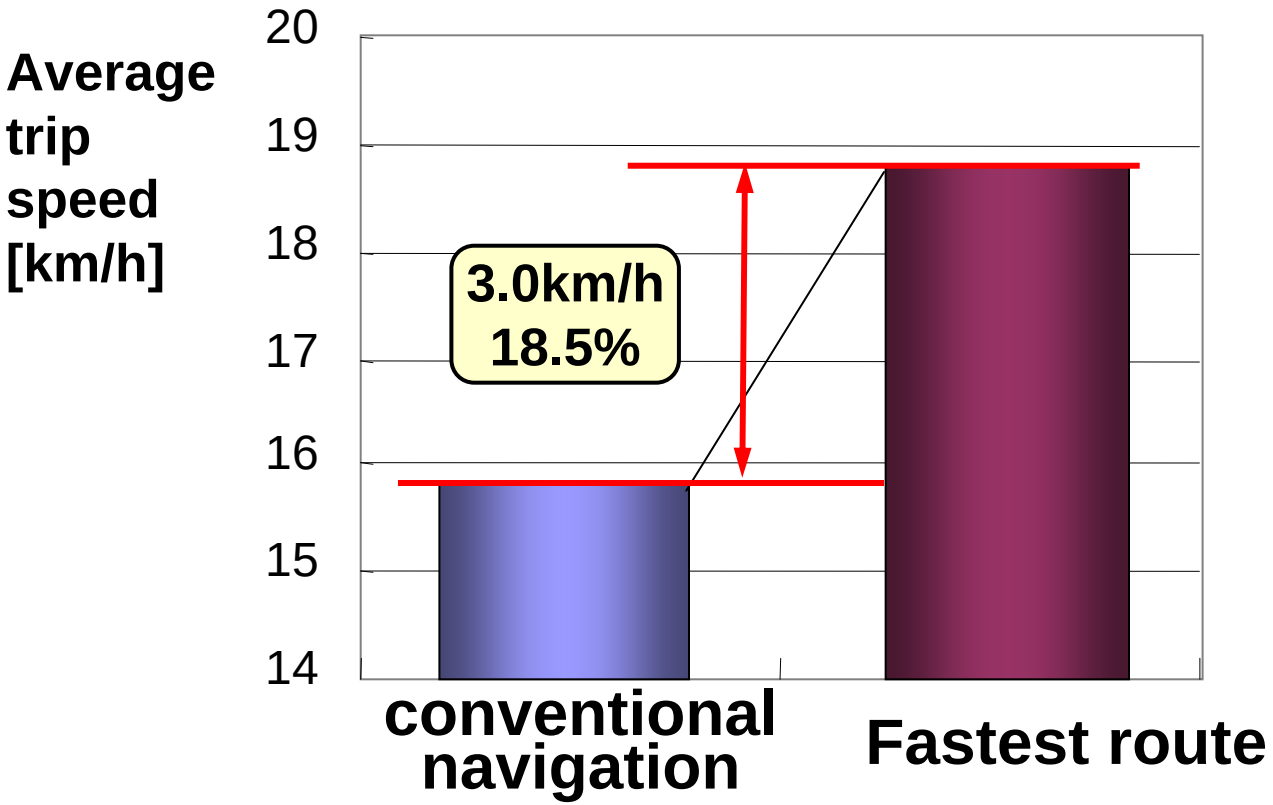
Supports:

- **Outcome-based Investment decisions**
  - Infrastructure
  - Maintenance
  - Operational performance
  - Safety needs

# Traveler Information

- **End-to-end trip information**
  - Traffic
  - Transit
  - Parking
  - Weather
- **Private Sector uses**
  - Navigation systems (PND)
  - Hand-held devices and cell phones
- **Public Sector uses**
  - 511 (phone and web)
  - Dynamic Message Signs (DMS)

# Average trip speed for fastest route was 18.5% Faster than with conventional navigation.




**Comparison of average trip speed during Feb '07**



Nissan Motor Co.

# Future Challenges

- Understanding data quality
- Understanding how data be used – need for new applications
- Are there standards issues? What about data ownership?
- Need transit & parking data, too!

# The Role of ITS and Better Data

- Technology can provide **information** & **visibility**.
- Technology can facilitate **performance measures**.
- Technology can facilitate **management tools**.
- Technology can provide **safety**.
- Technology can provide **customer choice**.

*Capturing Transportation's Imagination through Technology*