UNITED STATES
DEPARTMENT OF TRANSPORTATION

Platform Approach

Meeting of the ITS Program Advisory Committee
January 6–7, 2011
Metropolitan Transportation Commission Auditorium
Oakland, California

Advisory Committee Questions

- Does JPO's ITS Research initiative provide an open platform for further development by others?
- Does it leverage advances and investments being made in other sectors of the economy?
- Does JPO's ITS Research program provide an environment in which non-highway applications can flourish, including even pedestrians?

Definition of Open Platform

- Wikipedia (12/21/2010):

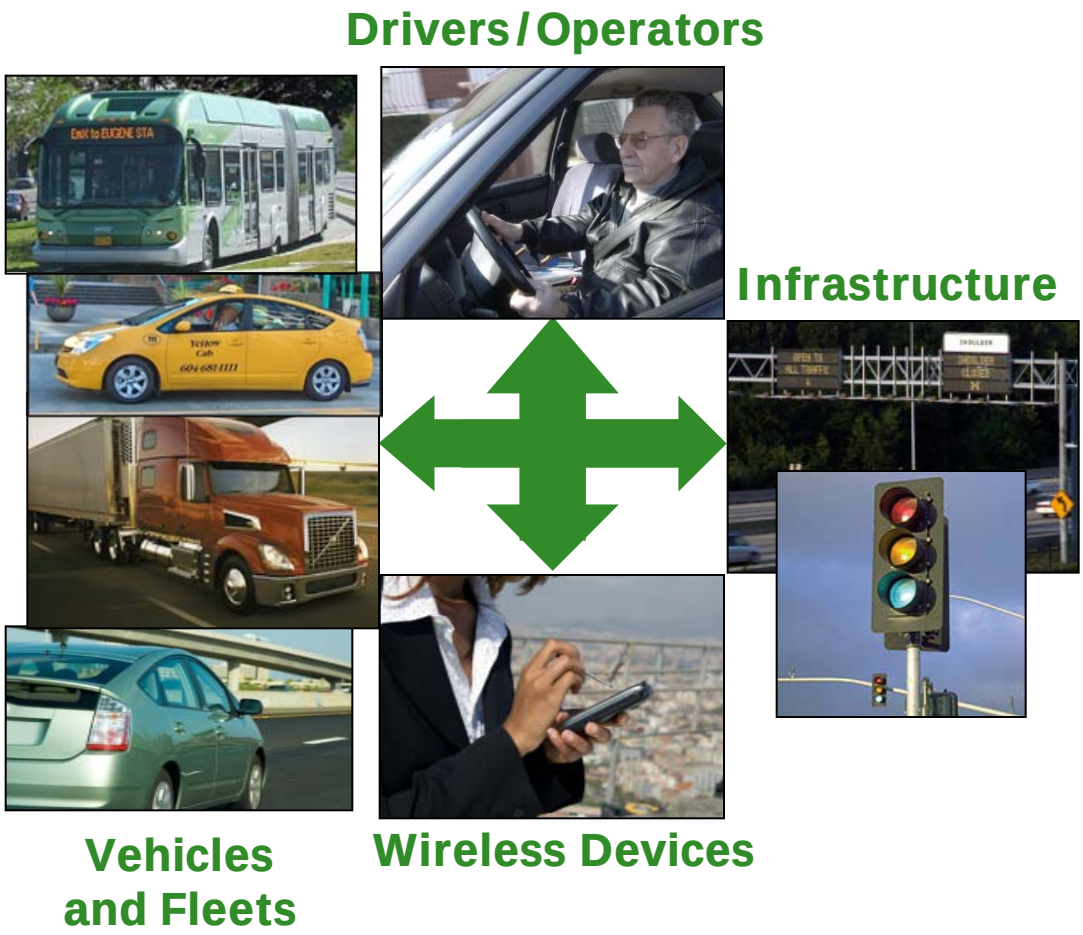
  In software and web-based architectures, an **Open Platform** describes a software system which is based on Open Standards, such as published and fully documented external programming interfaces that allow using the software to function in other ways than the original programmer intended, without requiring modification of the source code. Using these interfaces, typically known as an Application Programming Interface (API), a 3rd party could integrate with the platform to add functionality.

U.S. DOT ITS Program Definition of Open Data/Open Source

- **Formal Definitions:**
  - **Open Data**: data and metadata are free and available for use without restriction; data are re-usable without requiring further permission.
  - **Open Source**: a method for collaborative development of software through peer input, review, and transparency. Methods, algorithms, and source code will be made available by participants to all.
- **In the Context of Dynamic Mobility Applications Research**:
  - Provide a web location for broad sharing of multi-source and multi-modal infrastructure and probe data and source code while adhering to open source and detailed governance rules that protect the integrity, privacy, and quality of the data.

Connected Vehicle Concept

- Suite of technologies and applications based on wireless connectivity
- Among all types of vehicles and fleets, infrastructure and wireless consumer devices, including the after-market
- To enhance safety, mobility and the environment



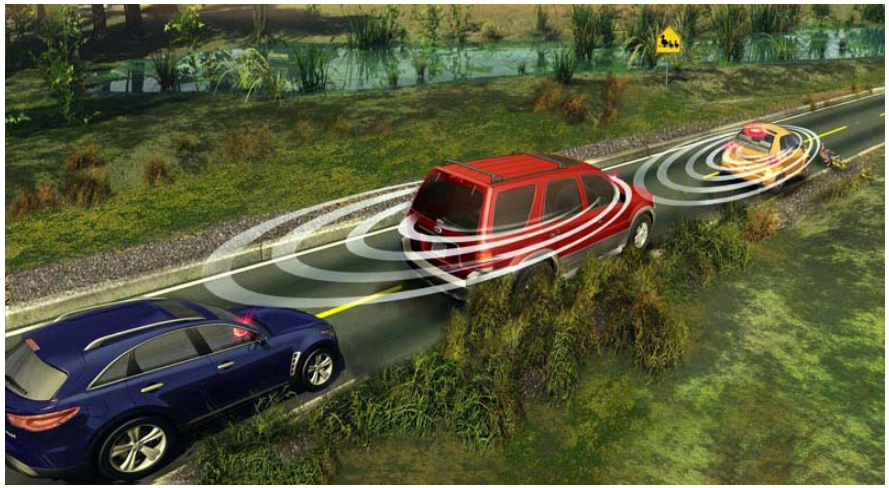
Two Complementary Tracks in Parallel

Safety (Crash Prevention)

- DSRC for safety critical vehicle links

Mobility/Environment/Public Safety/Other

- Technology agnostic building on DSRC link



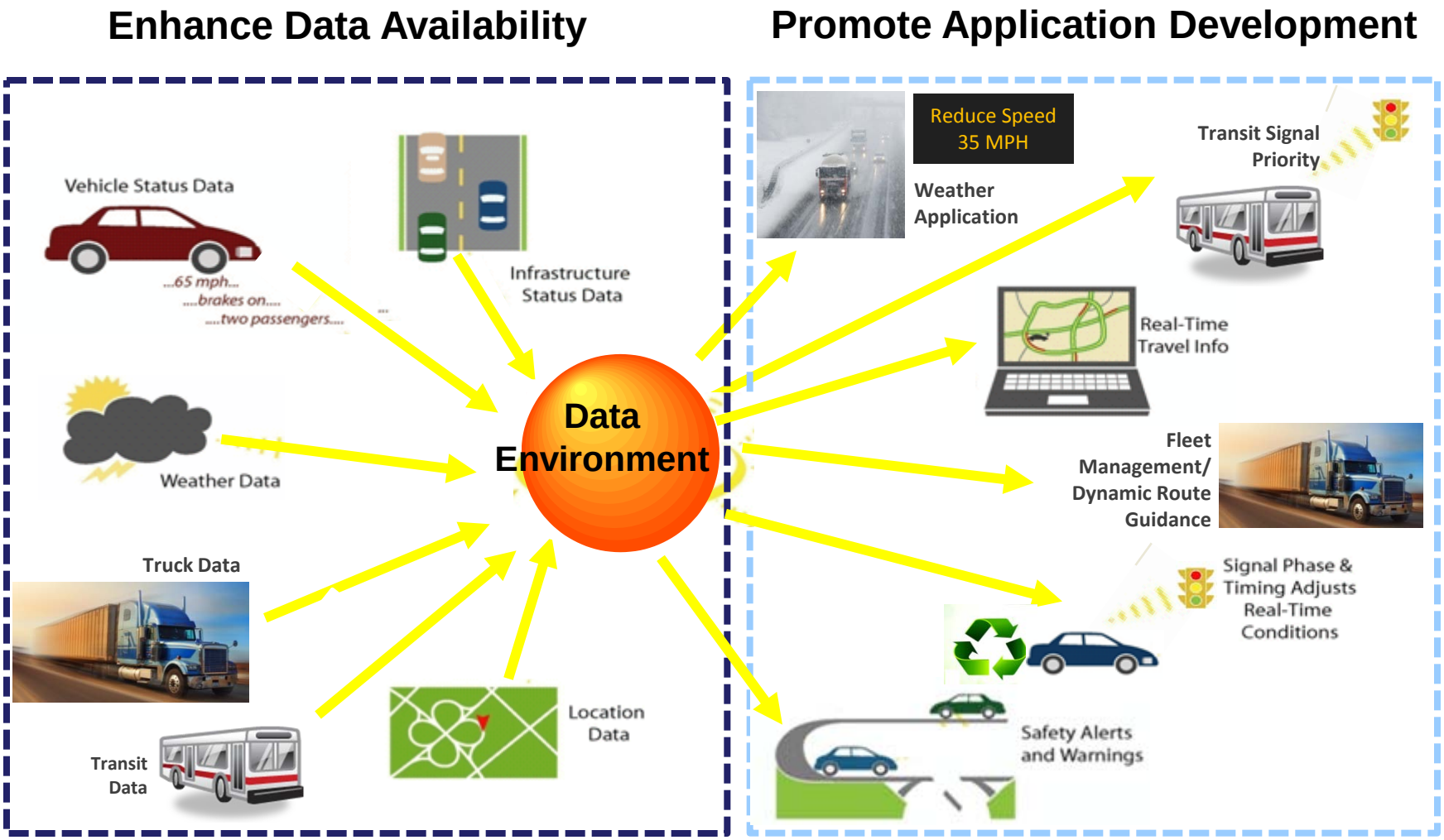
Both Contribute to Open Data Environment

V2V and V2I Safety Applications

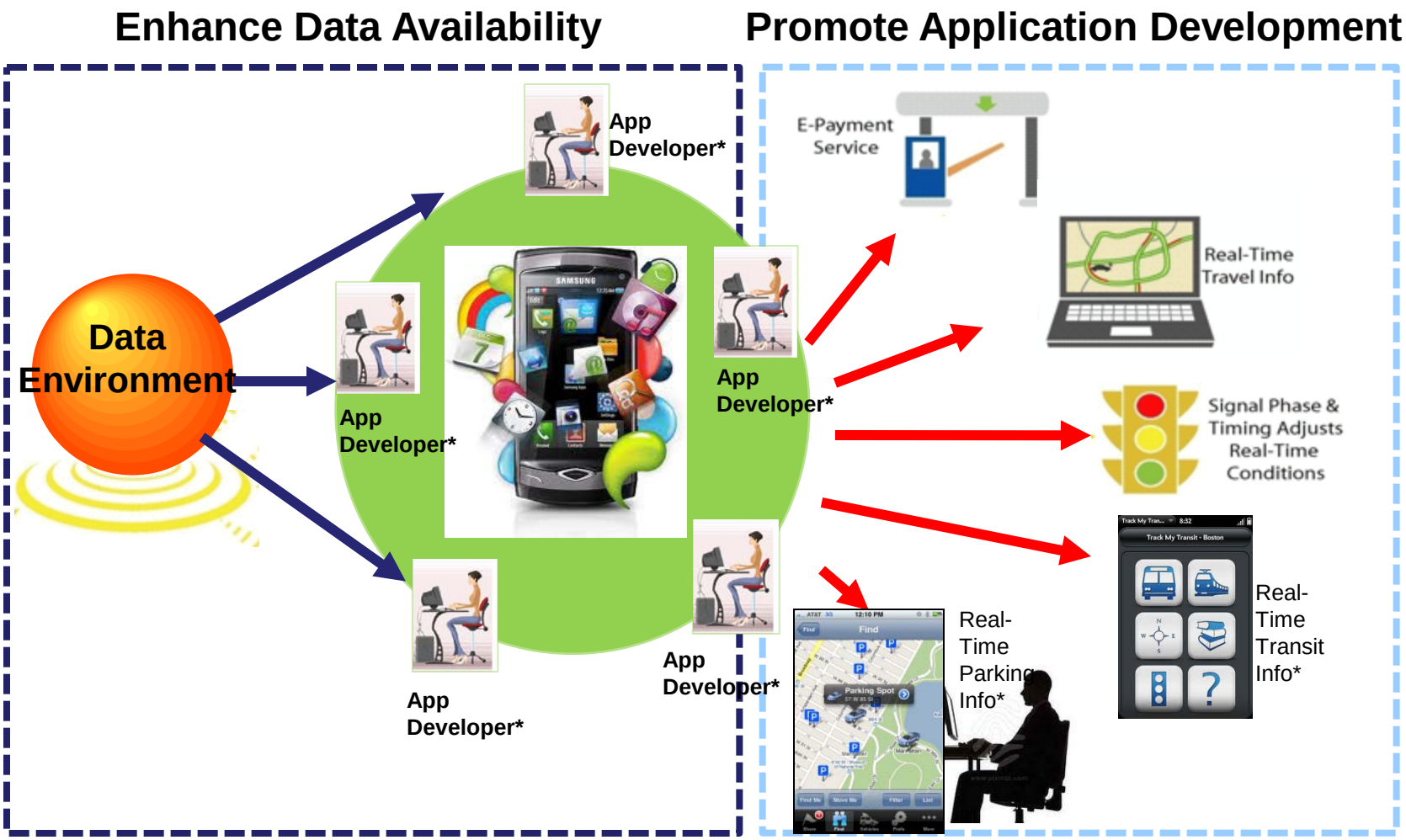
- Using DSRC in research and pilot testing for link between vehicles and between vehicles and roadside infrastructure due to unique characteristics of DSRC:
  - Communication Speed
  - Security
  - Reliability
  - Stability
  - Spectrum availability

- DSRC is open
  - Spectrum available to any user for transportation safety/mobility purposes
  - Based on open standards
  - Enables interoperability

Real Time Data Applications Concepts



Data Environment Supports Application Development



** Images Courtesy of Google*

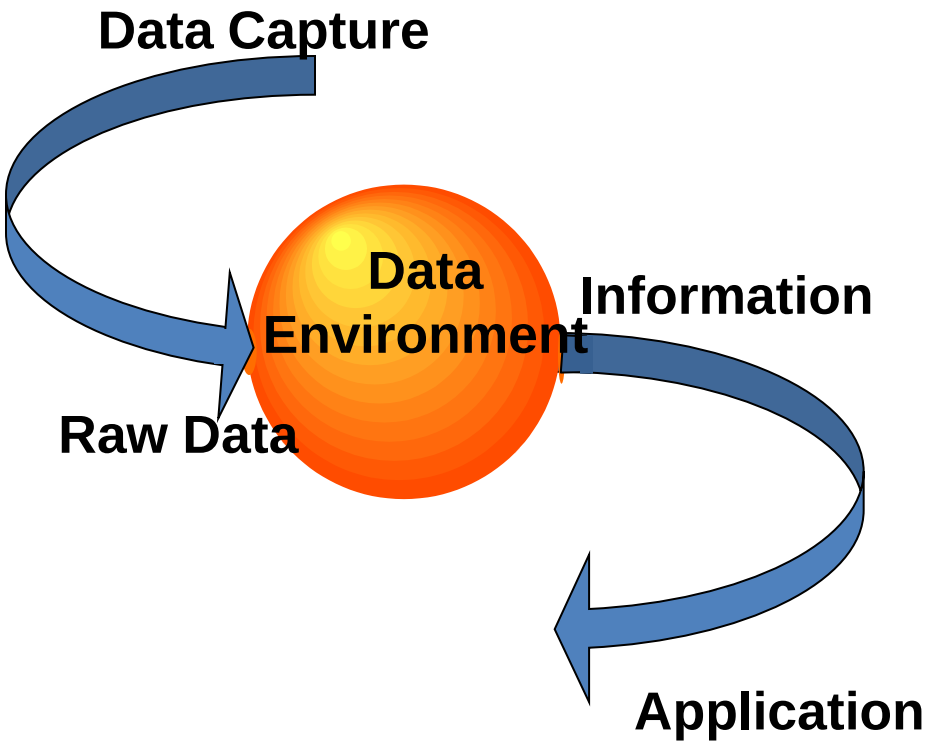
Open Data/Open Source Philosophy and Application

- **Why?** *Philosophy: Gather once, reuse many times*
  - Cost savings
  - Better quality, higher reliability, more flexibility, lower cost.
  - Open systems vs. proprietary systems
- **How?**
  - Use of Open Source Licenses – Granting rights in support of a balance between collaboration and commercialization
  - Acquisitions – Identifying requirements and restrictions/limitations in contract language
  - Use of ITS Standards

Data Environment Concept

Data Environment:

- Well-organized collection of data of specific type and quality
- Captured and stored at regular intervals from one or more sources
- Systematically shared in support of one or more applications

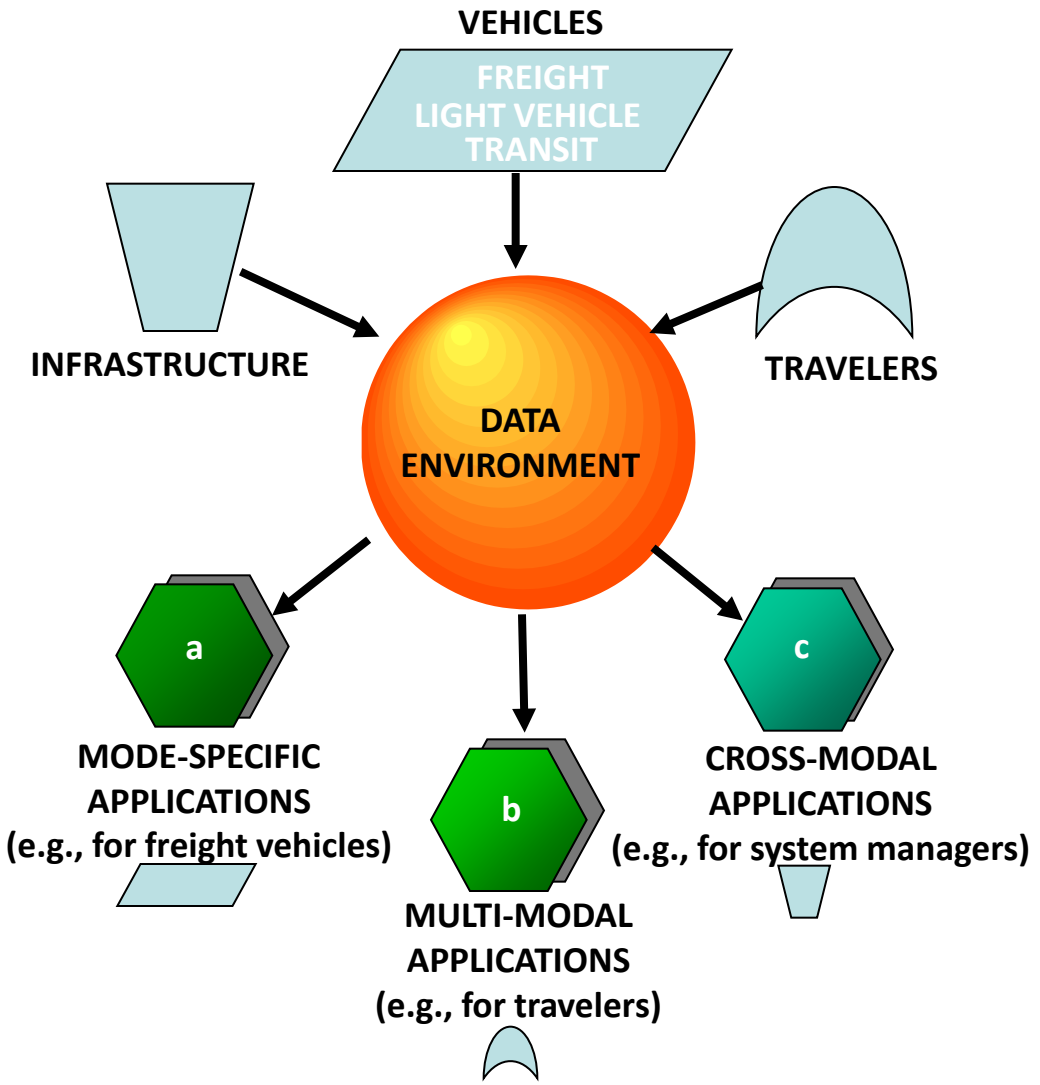


Data Capture Prototype Data Environment

- Data (and meta-data) from the Michigan Test Bed
  - Documented probe data samples from recent tests (POC/NCAR)
  - Open source analytical tools
  - Simulated 100% market penetration data for the test bed contributed by the University of Michigan Transportation Research Institute (UMTRI)
  - Forums for researchers to register projects, flag erroneous data, contribute analyses and view data
- Prototypes one component of a desired end system
  - Refine the Data Environment concept
  - Test key hypotheses about governance and user collaboration

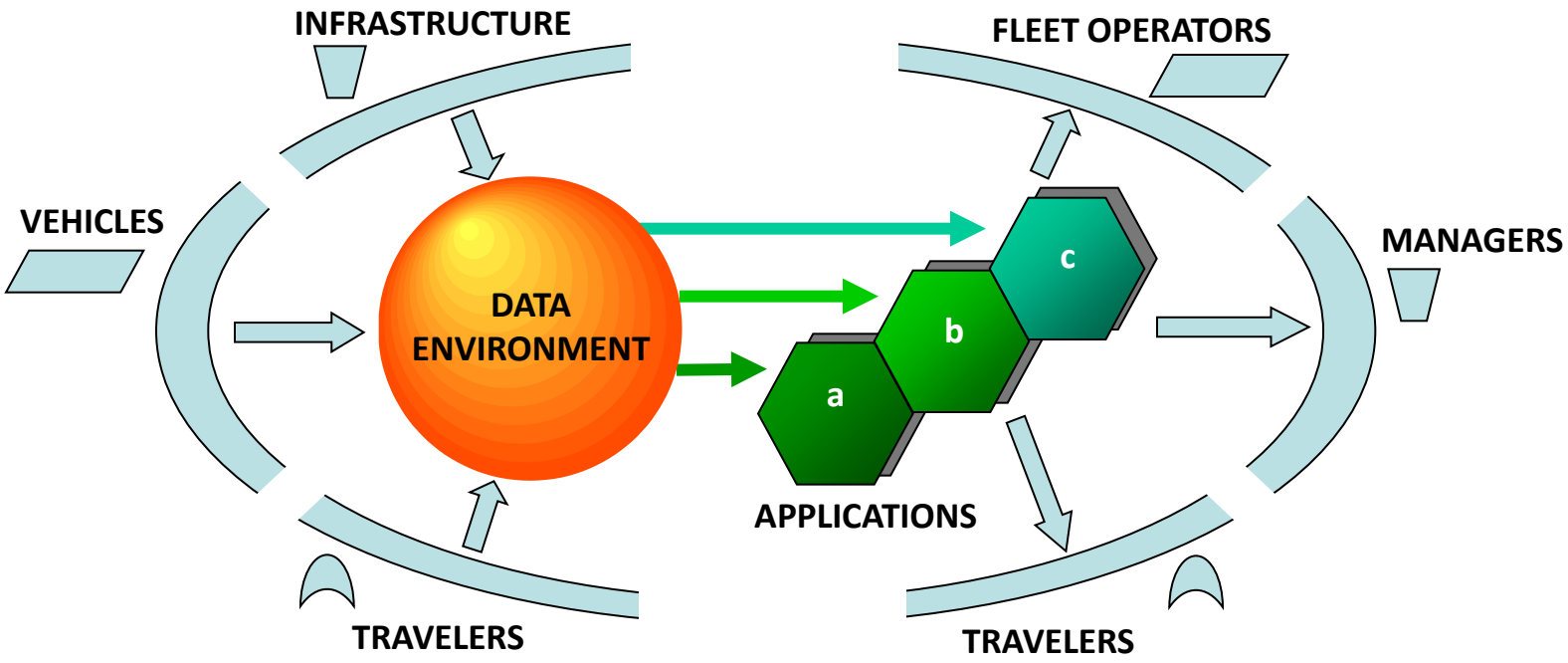
Dynamic Mobility Applications (DMA) Program

- Leverage high-quality data integrated from mobile and fixed sources to develop multiple applications (mode-specific and multi-modal)
- Requires coordination with Real-Time Data Capture and Management program

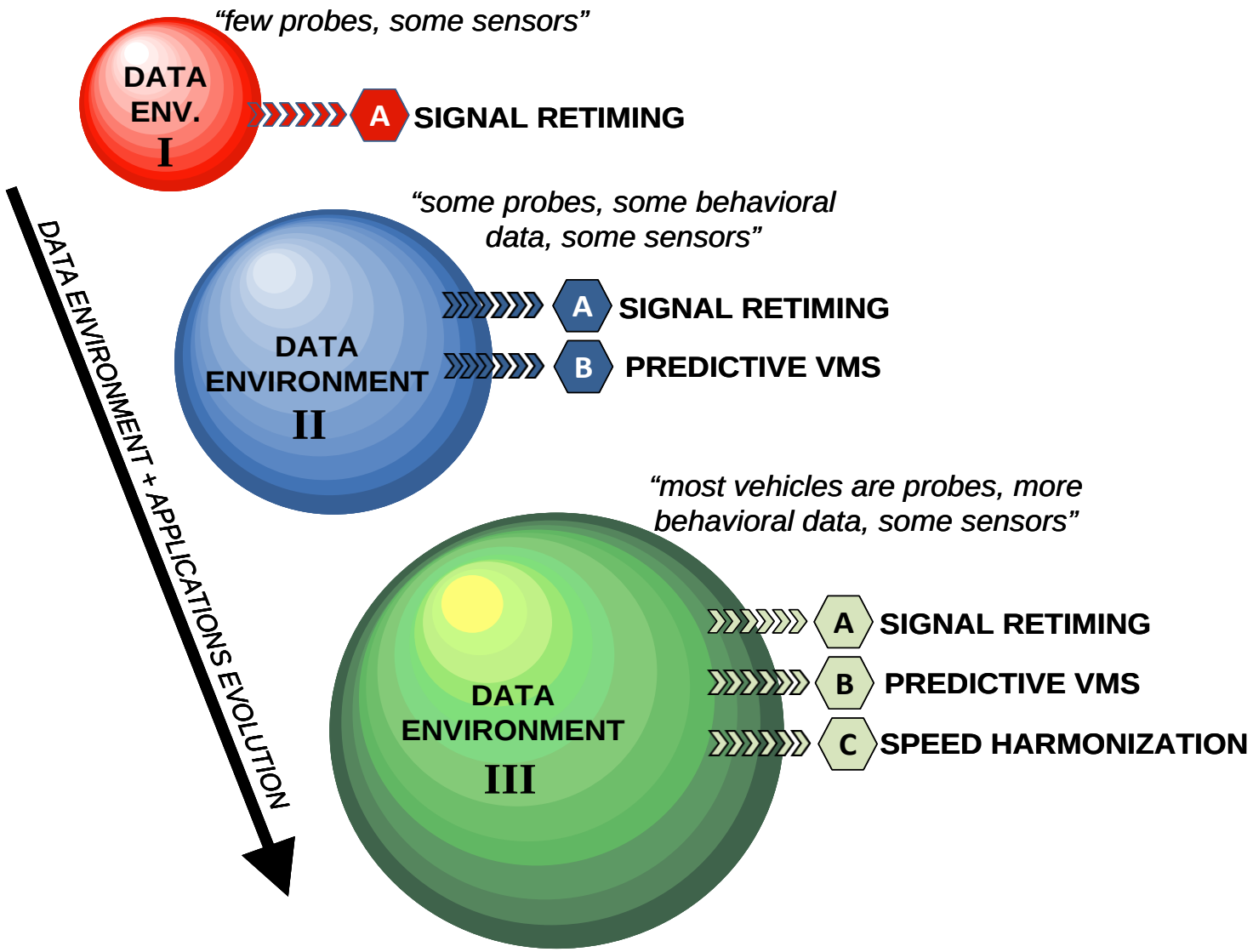


Multi-Modal Applications Development and Test

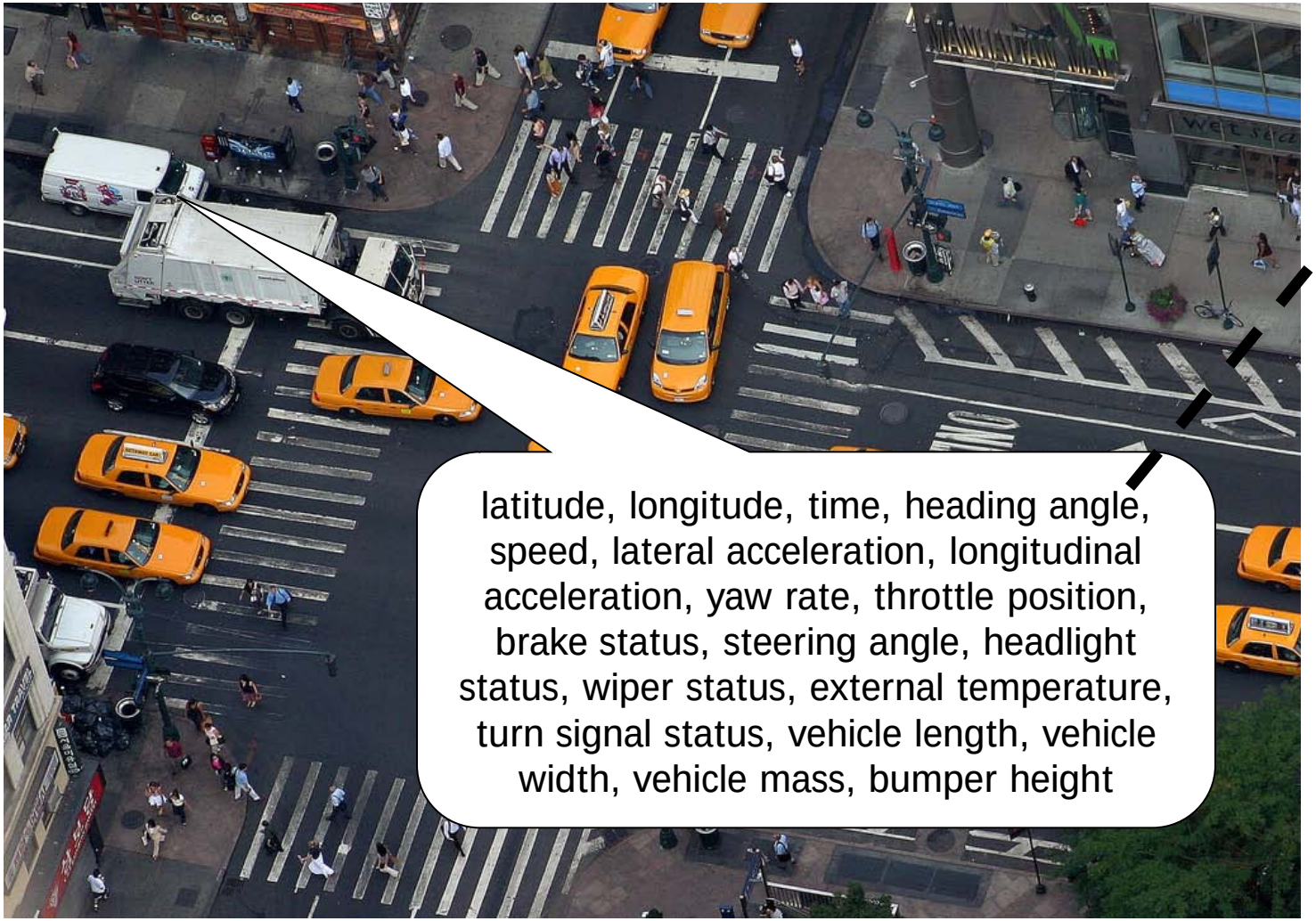
- Coordinated development of mode-specific and multi-modal applications:
  - Avoid duplication
  - Cost-effective



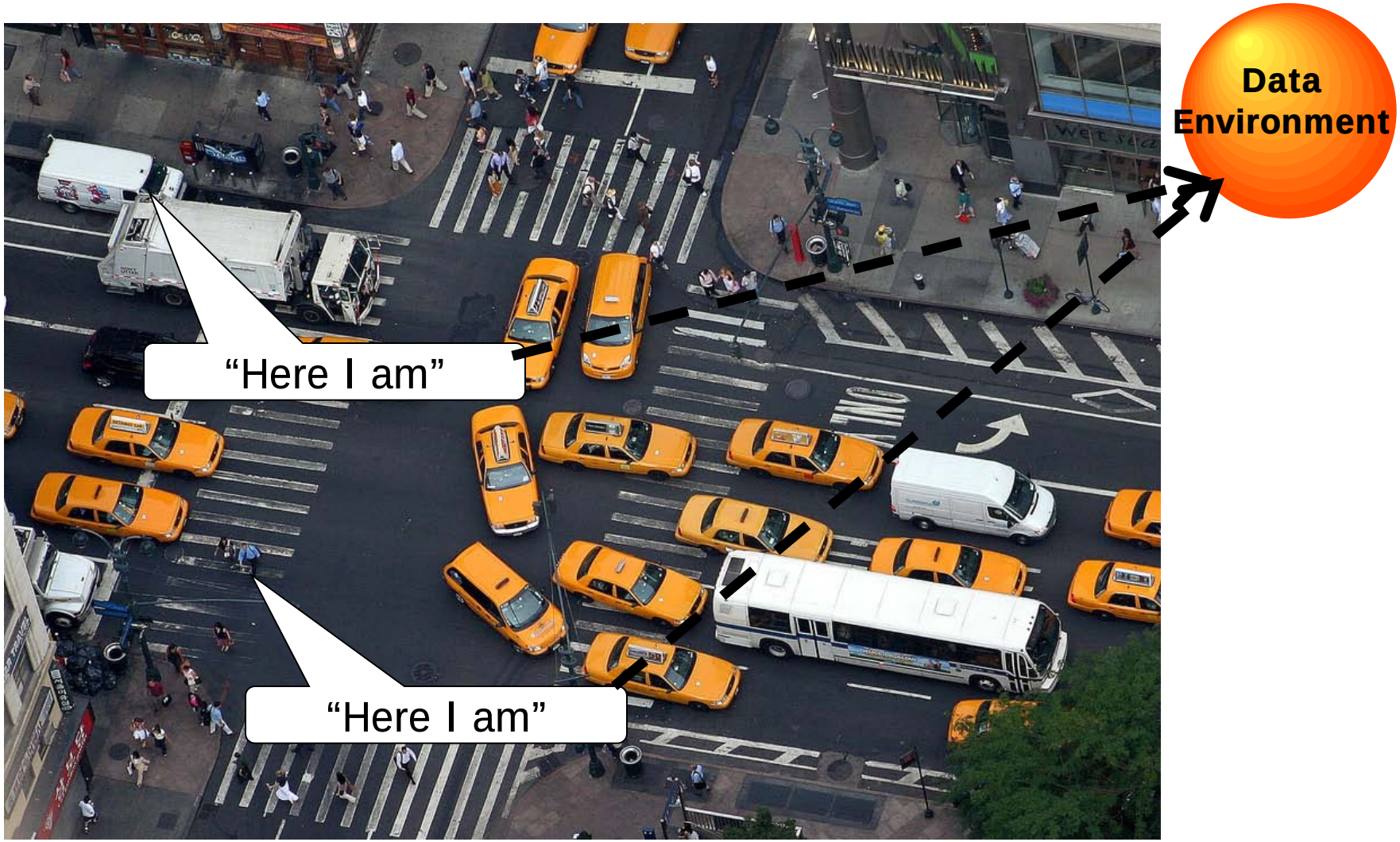
Applications Possible with Enhanced Data



Connected Vehicles Will Contribute to the Data Environment



So Will “Here I Am” Devices



Discussion

- How can we encourage population and use of the data environment prior to wide scale equipage of the vehicle fleet?

- What can we do to encourage participation by private sector data providers and application developers?