

Cell Probe Data

The Baltimore Multimodal Traveler Information System (MMTIS)



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What if ...

- We knew everything?
 - Location of all vehicles
 - Speeds/travel times on all roads
 - Origins and destinations
 - Roadway conditions
 - Weather
 - Short-term forecasts of system performance
- We would change how we:
 - Operate
 - Manage
 - Plan
 - Finance



MMTIS Project Goals

- Provide accurate and timely traveler information
 - Traffic and transportation management data (incidents, speeds, travel times, events) for both highway and arterial routes
 - Integrated information from both existing and newly developed data streams
- Facilitate access to traveler information from neighboring regions
- Design mutually profitable public-private partnership



Baltimore Model – Public-Private Partnership

- Provides first regional test of commercial-quality cellular traffic probes in North America
- Mutually profitable public-private partnership
 - Test commercial markets during project
 - Integrate with existing public data – including transit and E-911
 - Encourage public applications beyond traditional ITS



Cell Probe Technology

- Part of general trend away from fixed sensors toward vehicle-based information
- Reflects frustration with high costs and slow pace of deployment for traditional sensors
- **Management and planning tool** rather than just ITS
- Low cost, full regional coverage, performance-based, and self sufficient business model – we hope

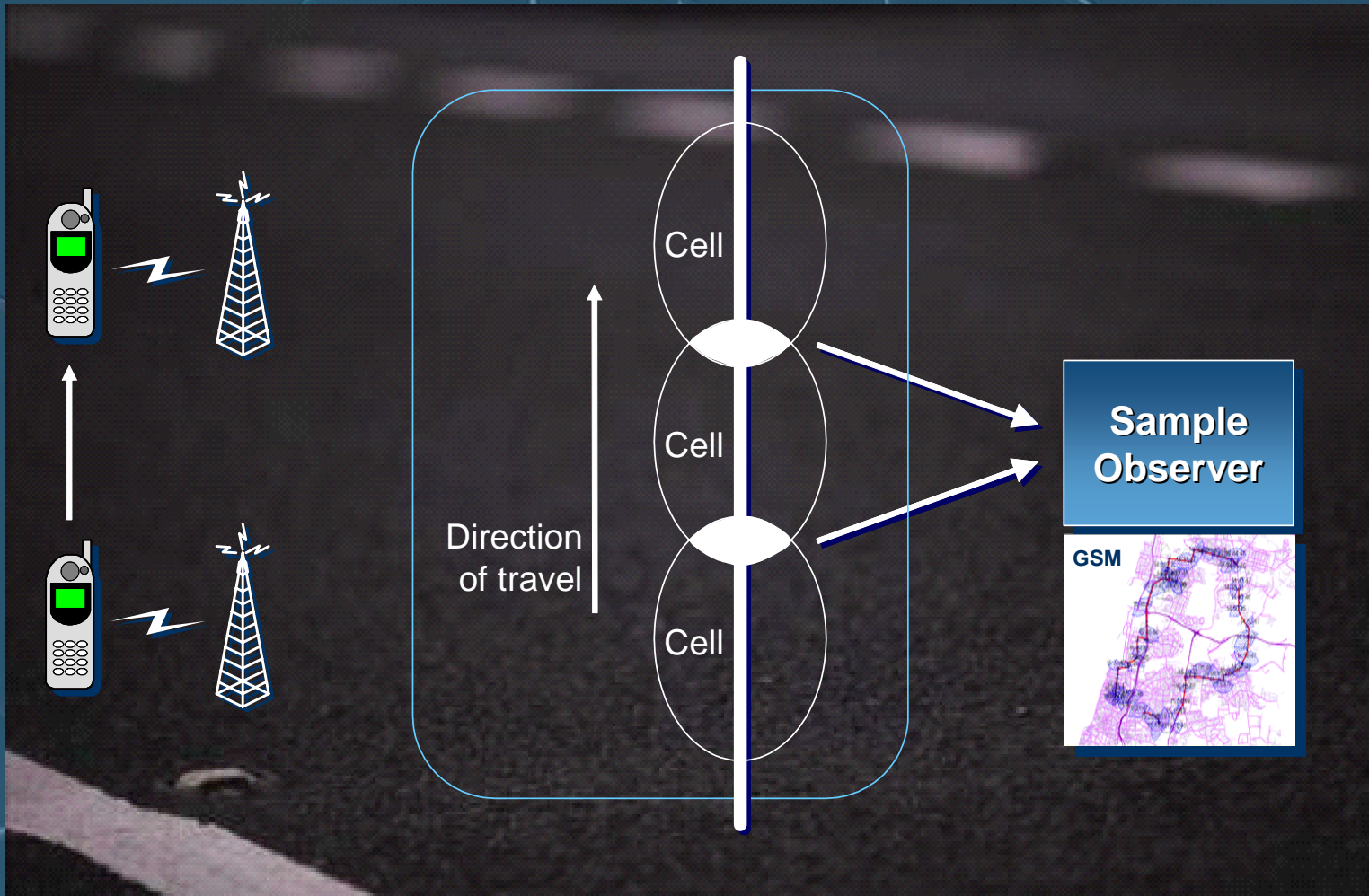


Cell Probe Technology

- Statistical methodology “assigns” vehicles to the network
- Cell phone movement is captured between cell towers as “hand-offs” from one tower to another
- Technology filters data from pedestrians and those not on the highway network
- Cell phones need to be turned on, but not necessarily in use

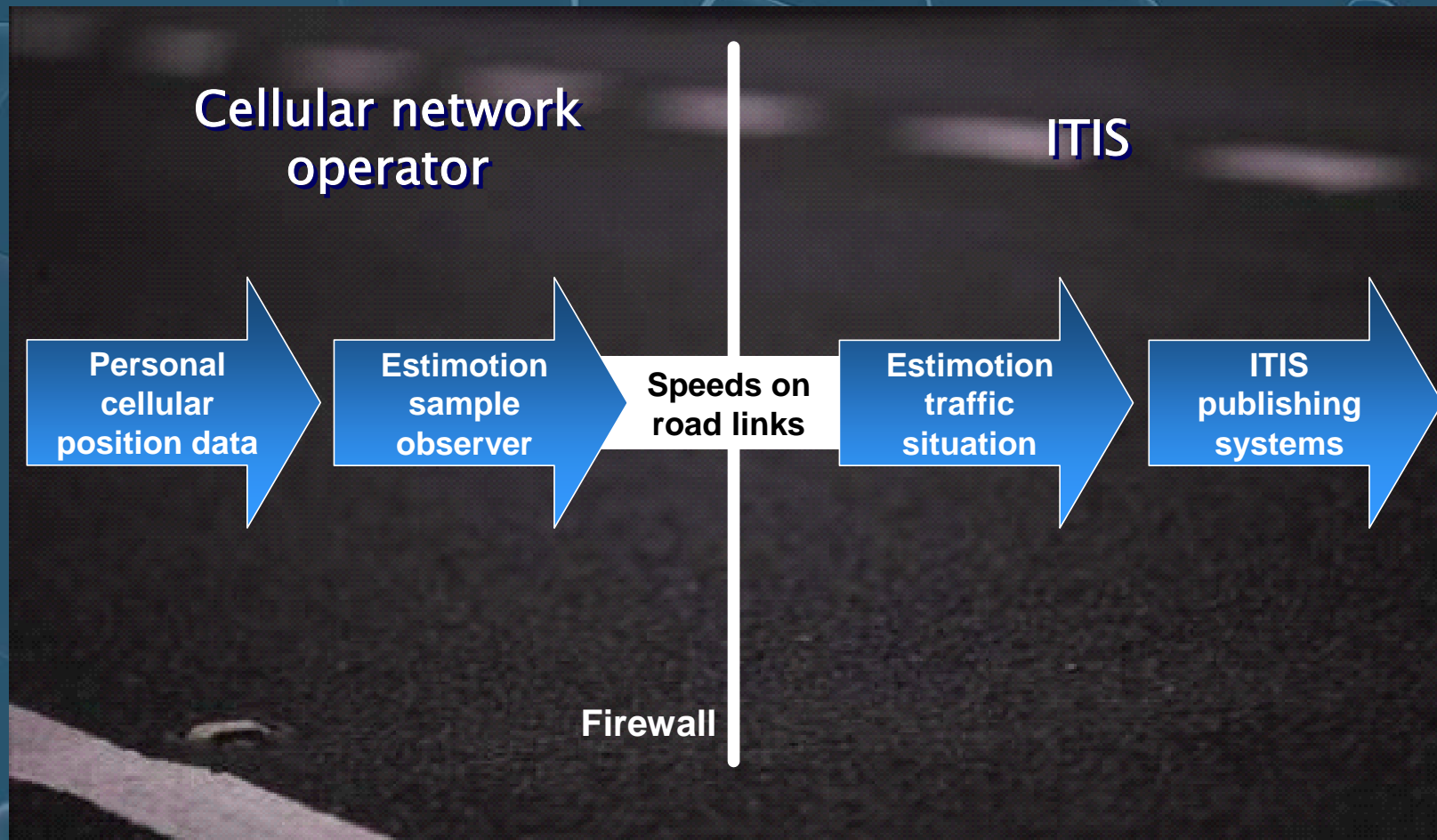


Cell Probe Technology





Cell Probe Privacy



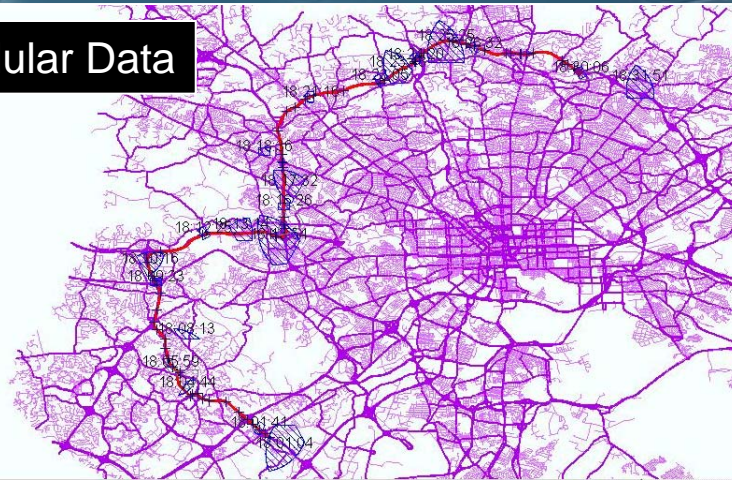


Baltimore Test Drive

GPS Data



Cellular Data





What Cellular Probe Data Can Provide to Transportation Planning

- Speed and travel time data for a much larger network (e.g. >1,000 miles of roads in the Baltimore area)
- Data for much longer periods of time, enabling better travel time variability data, as well as better time of day and day of the week analysis
- More current data
- More statistically valid data
- Consistent data across agency boundaries



Applications – Beyond ITS

- Operations
 - Congestion management – potential for congestion pricing
 - “Extreme” or special events
 - Reliability – measure travel times with regional ... travel times
- Management
 - HPMS and performance measures in general
 - Performance-based systems – information for operators, users, and the public
 - Evaluation of alternative operations – how are we doing?



Applications (2)

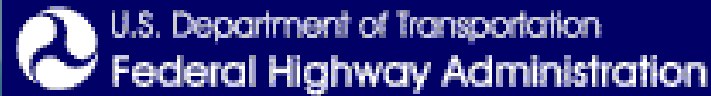
- **Planning**
 - O-D data – frequent updates for models or small scale regional planning
 - Model validation
 - Air Quality models – MOBILE 6 etc.
 - New model development – activity-based and beyond
- **Safety**
 - Analysis
 - Targeted deployment
- **Communication**
 - Local outreach – real data on congestion
 - 511 – integrated “free” and premium services



Challenges

- Privately owned Data Needs to be Protected or Isolated on Public Systems
- Shared Business Risk
- Separate accounting of Public and Private Revenue Sources within the same project
- Differing public and private sector deployment priorities

Partners





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