Merging Travel Forecasting and Traffic Management Data and Models

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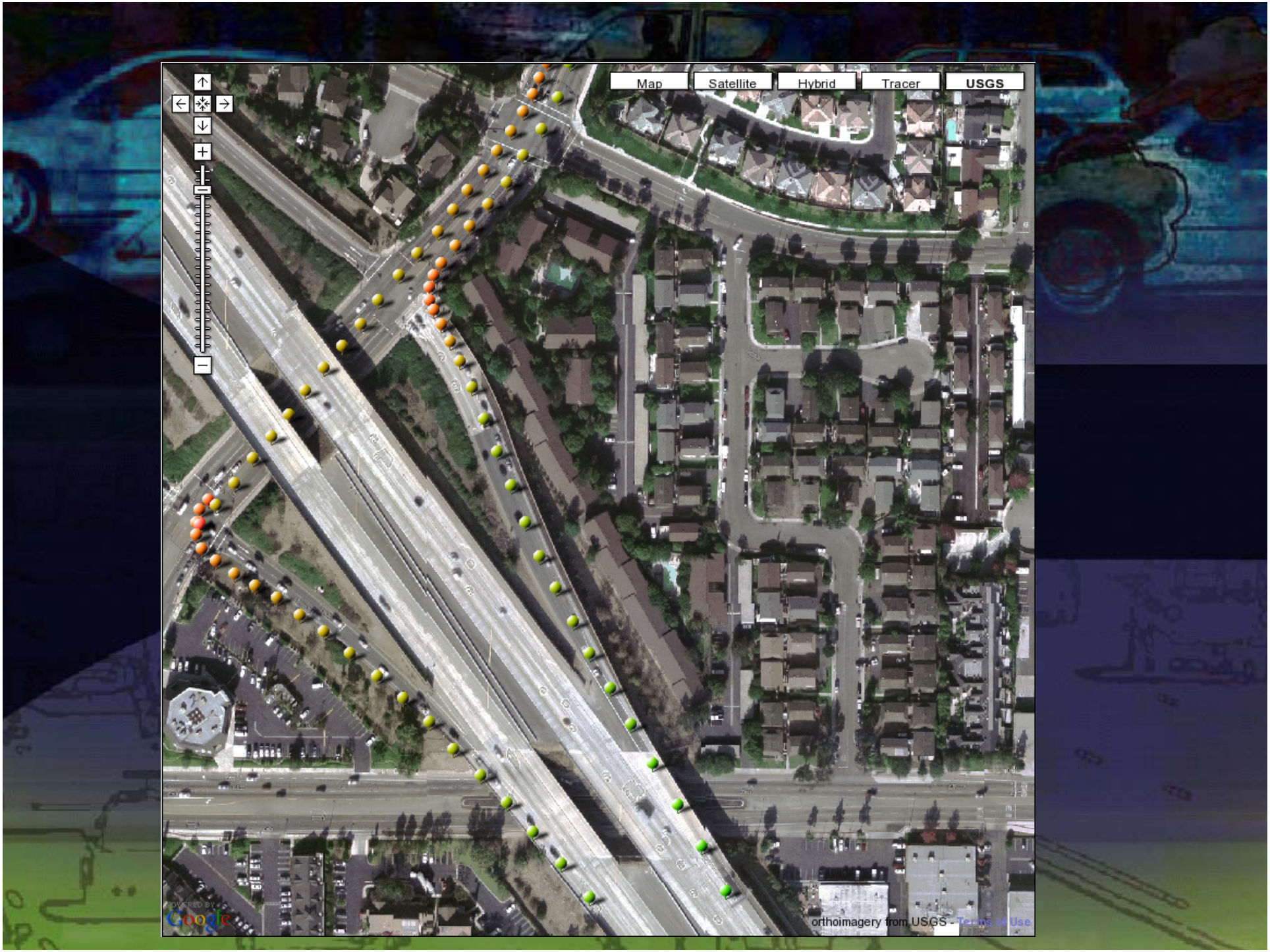
REACT! Travel/Activity Survey (Ming Lee)

- REACT! is a web-based Travel/Activity Survey
- Self-administered Initial Interview gathers household socio-economic and location data
- Pre-travel and post-travel components. The Pre-travel component is used to record planned activities for the coming week. The Post-travel component records the preceding 24 hours of travel activity data
- Integrated with TRACER, an in-vehicle data collection system for expanded capabilities
- ZEVNET application

TRACER (James Marca)

- GPS-based in-vehicle wireless communication tracking system
- PC104 Pentium Processor, Linux OS, Flash Ram, GPS / WAAS
- CDPD (GPRS) & 802.11b Wireless Communication and Data Transfer
- Time and location data easily collected over large time frames with little if any user interaction
- Integrated with REACT! and ANNE
- ATMS Testbed Web Site
- Link-based tracings for AQ models


Map
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Tracer
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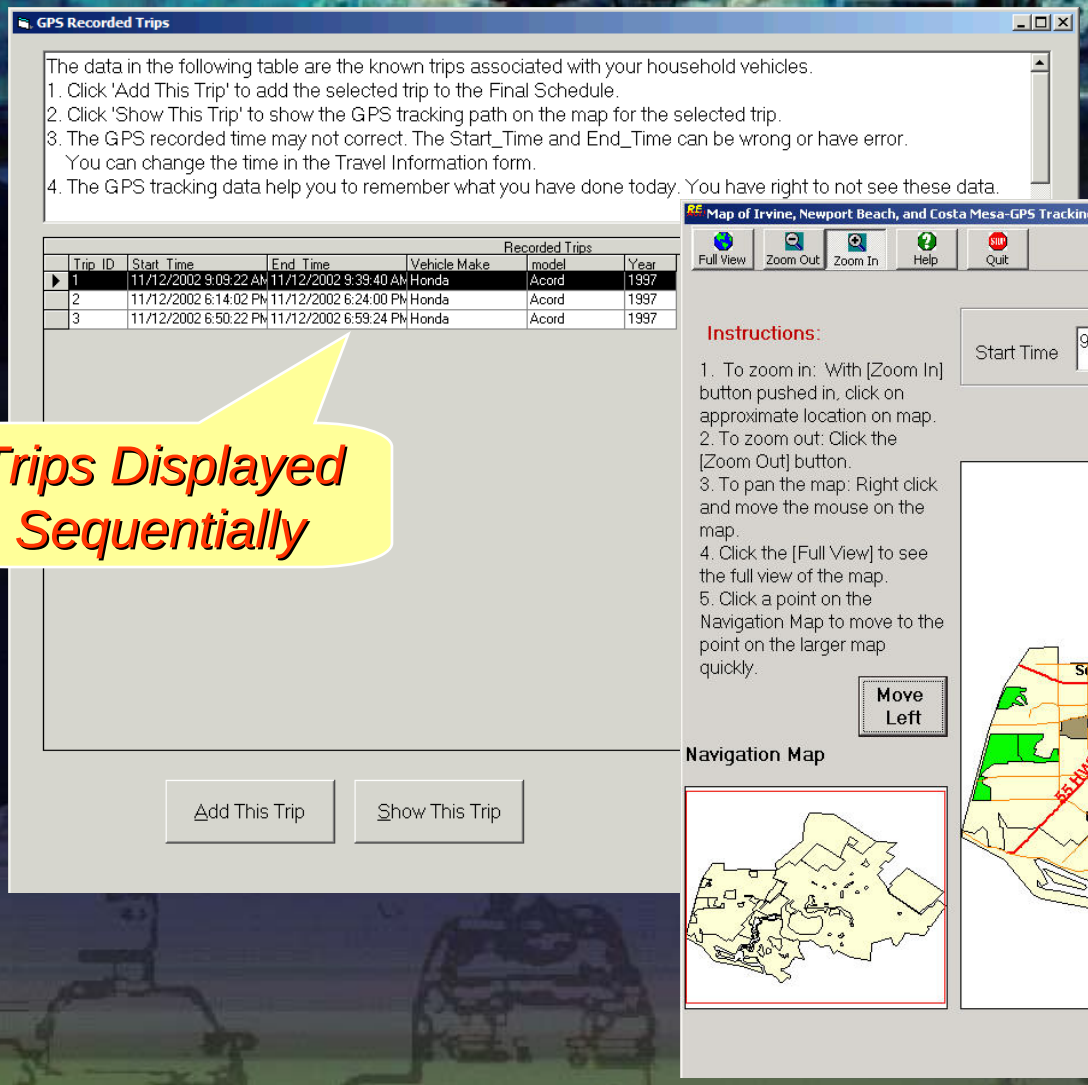
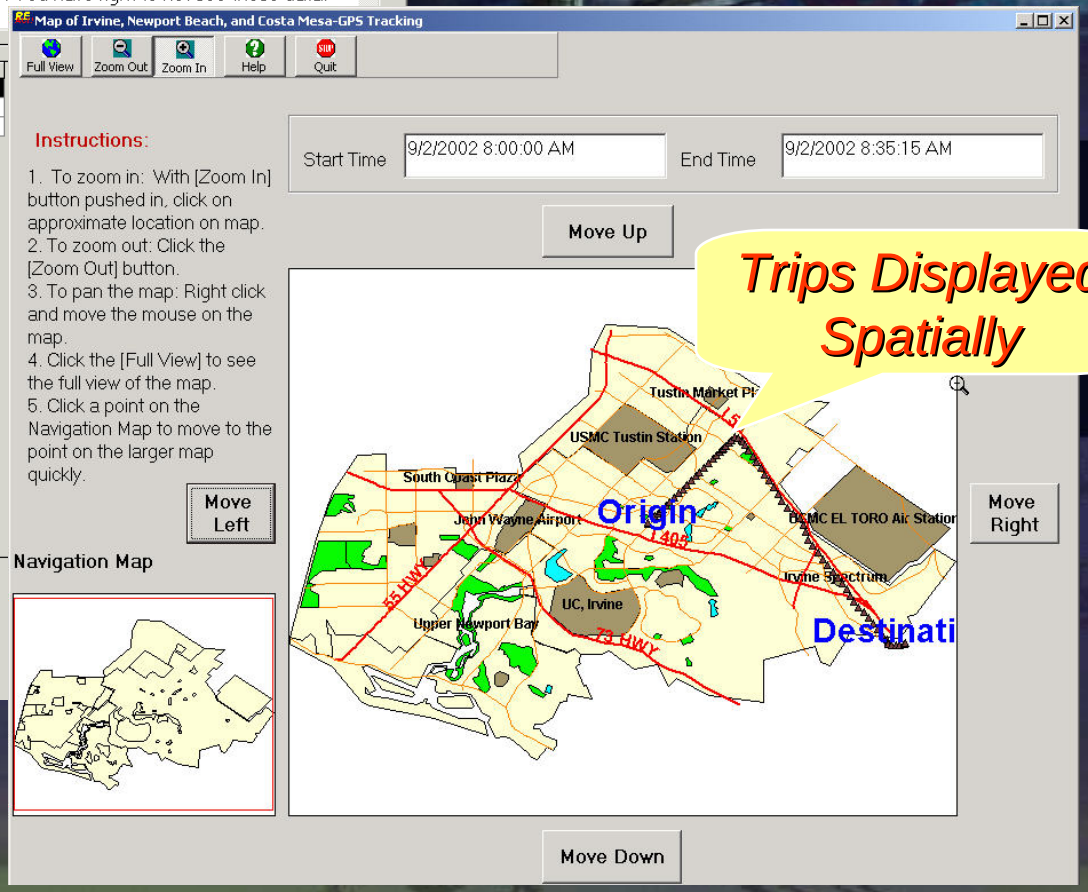
Integrating REACT! & TRACER



Trips Displayed Sequentially



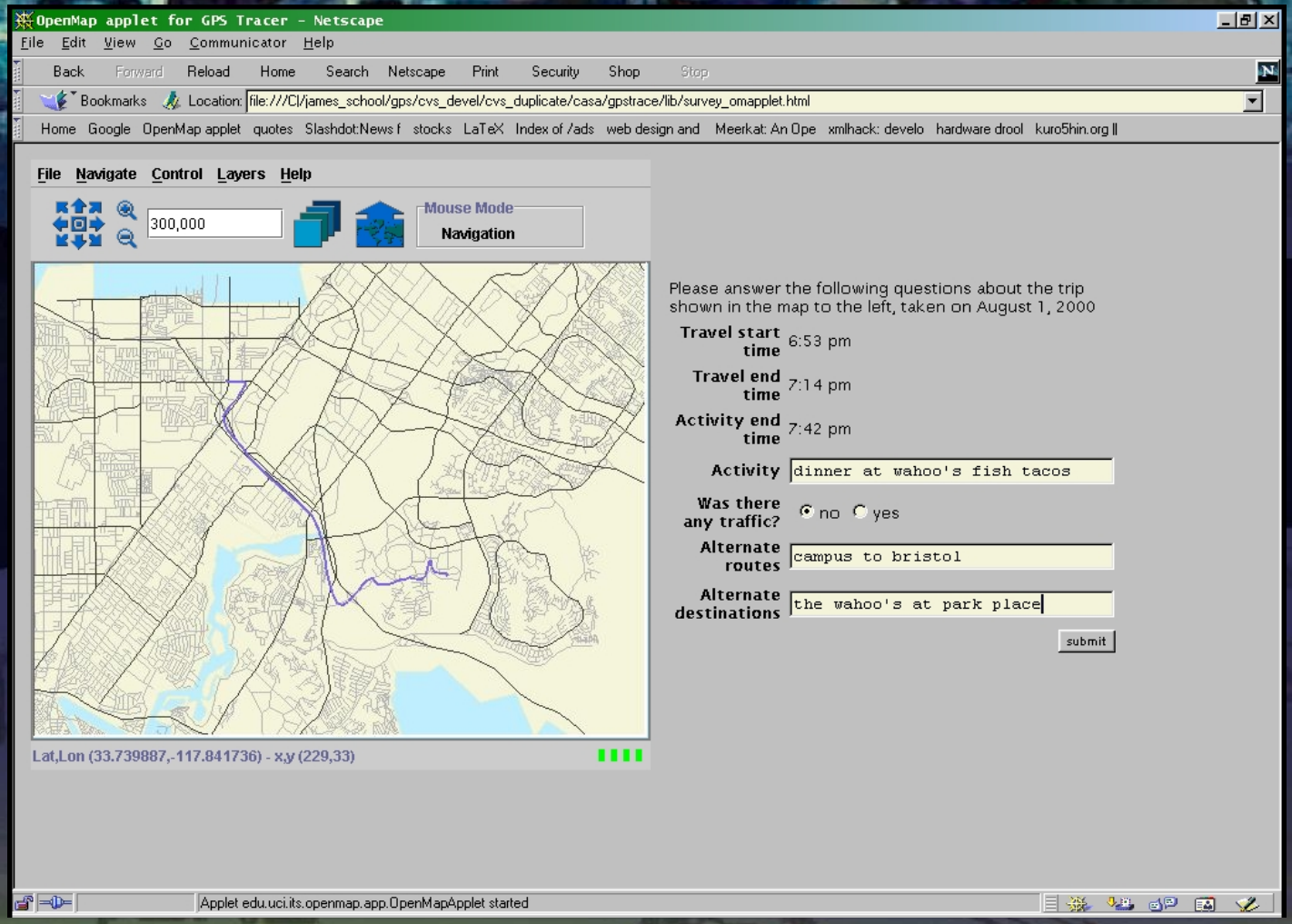
Trips Displayed Spatially

http://www.its.uci.edu/~react/ladera-react.html

ANNE: Appending Data to Tracer

ANNE vs. REACT!

In-vehicle or post-travel web-based surveys to elicit activity attributes of trips



CASASIM (Craig Rindt)

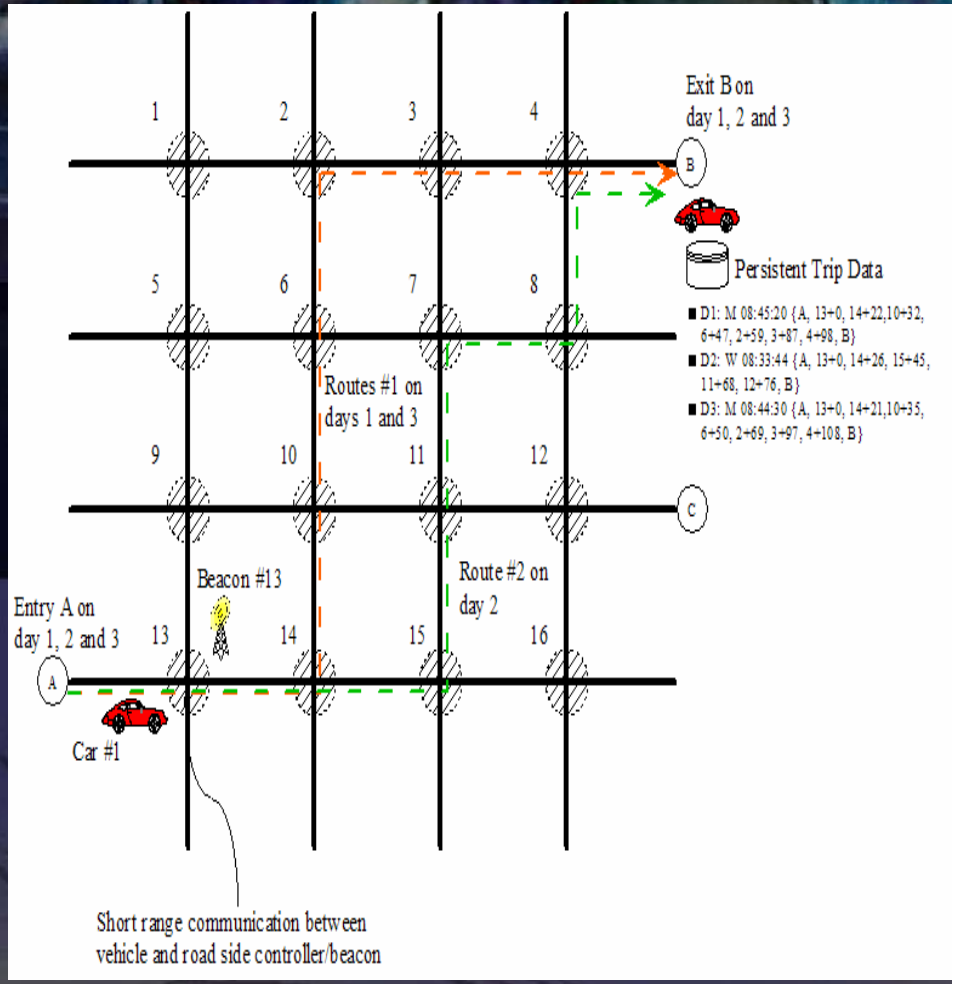
- A theory of human activity focusing on interaction, emergence, and adaptation (FHT)
- Constructed a bottom-up model of activity execution via modified Contract Net Protocol to model interaction
- Activity system modeled using Agent-based Simulation with dual hierarchy of physical and social agents
- Transportation system modeled using ParaDyn microsimulation (a Paramics/Dynasmart hybrid)

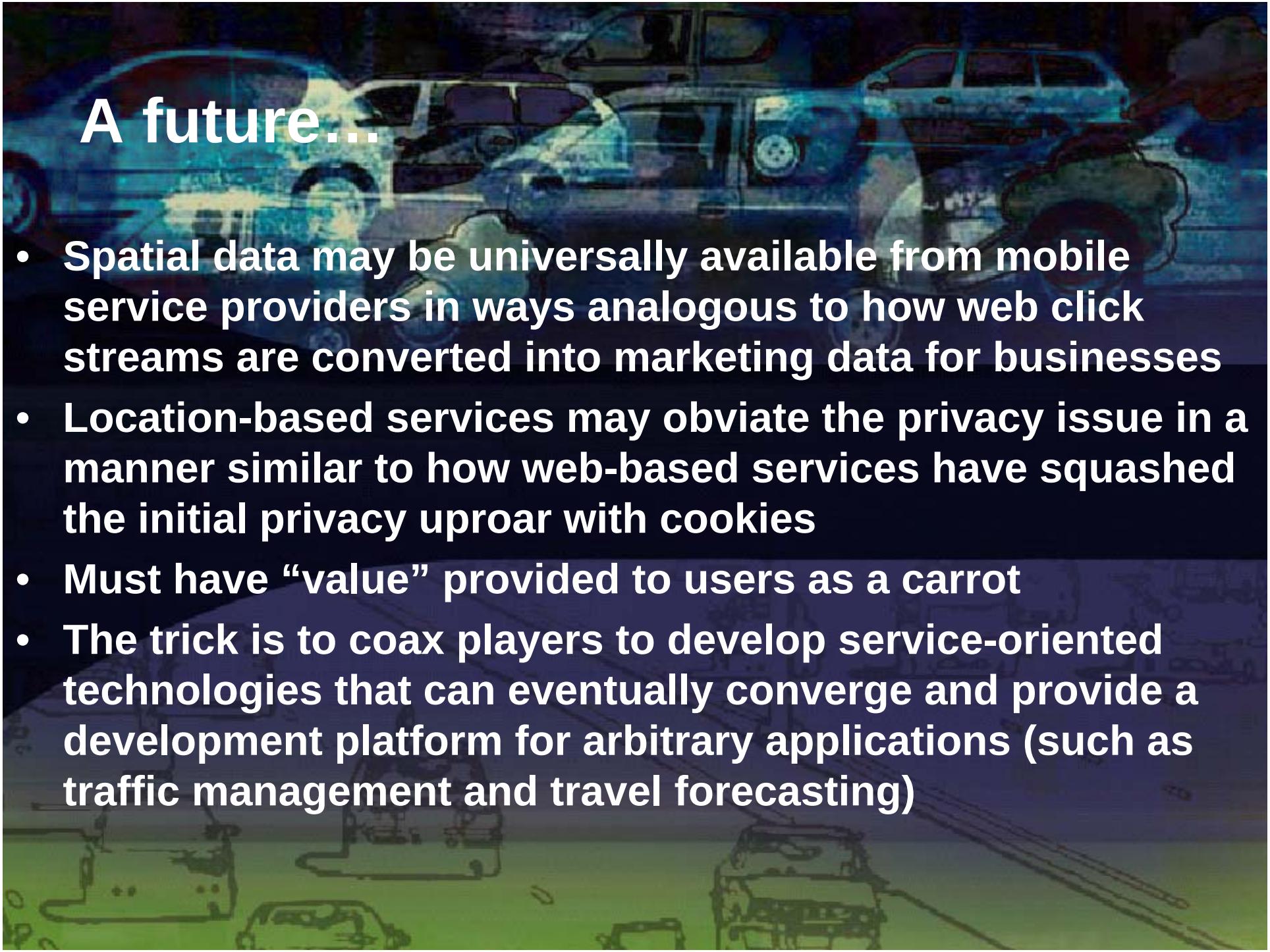
AUTONET … and PTC

- AUTONET is an information technology architecture that features a mobile, ad-hoc, dynamic, peer-to-peer network that integrates vehicles, information, and communication systems
- Evolved from TRACER project and UCI ATMS Testbed projects directed toward traffic management (e.g., CARTESIUS)
- Simulation and field tests at UCI (and by many car companies)
- P2P architecture and application limitations led to PTC project

PTC (persistent traffic cookies)

- PTC addresses the problem of collecting, storing, and utilizing AUTONET-type data from each vehicle in a traffic network
- Each vehicle stores it's travel history (with driver consent) by accepting authenticated information from roadside controllers via short range wireless communication, producing a distributed database of historical travel patterns
- These historical travel patterns can be used to predict the movement of vehicles currently in the system, which can, in turn, be used for traffic control applications
- This same data can be used to build real-time demand matrices for both real-time traffic management and for conventional travel forecasting
- CASASIM feeds PTC simulation





A future…

- Spatial data may be universally available from mobile service providers in ways analogous to how web click streams are converted into marketing data for businesses
- Location-based services may obviate the privacy issue in a manner similar to how web-based services have squashed the initial privacy uproar with cookies
- Must have “value” provided to users as a carrot
- The trick is to coax players to develop service-oriented technologies that can eventually converge and provide a development platform for arbitrary applications (such as traffic management and travel forecasting)