Sensys Networks

Sensys Travel Time
A Solution for Congestion Management
Who Is Sensys Networks?

• Leading provider of wireless traffic detection and integrated data systems for freeways, arterials and traffic control.
• Initial research of concept at UC Berkeley
  – Private sector took over idea in 2003 with Venture Capital
• In production since 2005
• 5 Fundamental patents awarded and 3 Patents Pending
• Accelerating pace of deployments
  – 80+ customers in 30 US States and 15 countries internationally
• Fastest growing traffic detection system provider ever
Sensys Customers: 30 U.S. States (& 15 Countries)
Caltrans SHOPP/CMIA Deployments in 08-09
Why Sensys Networks?

• Sensys Wireless Detection systems are now becoming top choice of technology for the some world’s largest implementers of vehicle detection and traffic data systems because they are:

  ➢ ACCURATE
  ➢ FLEXIBLE
  ➢ AFFORDABLE
  ➢ RELIABLE
  ➢ RE-USABLE
  ➢ FUTURE PROOF
The Sensys™ Wireless Vehicle Detection System
Sensys Components
WVDS provides agencies with a solution that provides:

1) Accurate vehicle data in managing traffic flows
2) Cost and time savings in installation and setup
3) Reduced traffic congestion and improved air quality in metropolitan areas
4) Provides a single platform for local streets, arterial, ramps and freeways for integrated traffic data systems for corridor management
5) Arterial travel time using a unique Vehicle Re-Id method
Sensys Travel Time

• What is it?
  – A patented, accurate and reliable system that measures and reports REAL-TIME travel times along a city traffic corridor
  – It improves corridor management and reduces congestion
    ▪ Enables drivers to choose best route and balance capacity/route usage
    ▪ Allows agencies to coordinate and make better use of capacity
    ▪ Decreases the amount of time vehicles are on the road
    ▪ Reduces fuel consumption and vehicle pollution
  – An infrastructure based solution:
    ▪ Uses unique vehicle magnetic signatures with no privacy issues
    ▪ Re-identifies vehicles to provide accurate travel times and vehicle density

• Who benefits from this technology solution?
  – Drivers, emergency services, local and state DOTs
Travel Time Benefits

• What does it provide?
  – Travel Time per vehicle
  – Travel Time distribution
  – Queue length or density measurements
  – Plus a host of other parameters to evaluate the performance of the arterial or a particular traffic signals

• Scalable system
  – Start with a few key arteries in the city and expand out over time to increase responsiveness and coverage

• Enables the 4th Dimension in traffic management
4th Dimension in Traffic Management

- Until now, arterial traffic management has been based on 3 fundamental measured parameters:
  - Counts (Volume)
  - Speed
  - Occupancy (Density)
- We are adding a 4th and highly desirable new parameter
  - Arterial travel time (Delay)

Arterial Travel Time is considered, by many, to be the Holy Grail of Urban Traffic Management
Sensys Travel Time System Components

SNAPS
Re-ID Engine

3 Sensor Array VSN-F in Mode C

AP-E/G
What’s the technology behind the solution?

- Matching unique vehicle signatures from the sensors
  - The sensors provide the magnetic signature of a vehicle and the time it crosses the sensor
  - The signature is independent of vehicle speed allowing matching to occur in stop and go traffic conditions

- A new application running on field proven, mature Sensys VDS240 wireless vehicle detection system
Travel Time Trade-offs / Decisions

• **# of Lanes**
  – Implement in Fast Lane = Basic system
  – Additional lanes improves accuracy and provides redundancy and incident detection

• **Density of sensors (sensors /lane)**
  – 3 for typical lanes
  – 5 for wider lanes

• **Distance between sensor arrays**
  – $\frac{1}{2}$ mile if there is no major leakage – i.e. large percentage of vehicles leaving or joining the arterial
  – Major cross traffic areas must be instrumented
Sensys Travel Time Architecture & Interfaces

Web Browser

Sensor Array

EDGE/EV-DO Cellular Ethernet

AP-E/G

Navigation
- PND’s
- Maps
- Cell phones

SNAPS

Re-ID Engine

XML

Sensys Google Map Application (Demo)

TMC Software
- Transcore
- Telvent
- Delcan
- Others...

Traveler Information Systems
- 511...

Customer or Partner Applications & Services

TMC Software
- Transcore
- Telvent
- Delcan
- Others...

Navigation
- PND’s
- Maps
- Cell phones

EDGE/EV-DO Cellular Ethernet

Or

Wired Ethernet

Customer or Partner Applications & Services

Navigation
- PND’s
- Maps
- Cell phones

Edge/EV-DO Cellular Ethernet

Or

Wired Ethernet

Customer or Partner Applications & Services

Navigation
- PND’s
- Maps
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EDGE/EV-DO Cellular Ethernet

Or

Wired Ethernet

Customer or Partner Applications & Services

Navigation
- PND’s
- Maps
- Cell phones
3-link, 6-signal, 0.9-mile segment; sensors at A, B, C, D
Intersection D

3 wireless sensors/magnetometer array per lane
Travel Time Competitive Solutions

• Toll tags
  – Valid solution only in regions where they already have tags
  – Need sufficient penetration
  – Privacy issues

• Video (LPR)
  – Inaccurate due to vibrations, weather, regular calibration required
  – Privacy issues

• GPS based systems
  – Technical feasibility unproven/being demonstrated/evaluated on small scale
  – Will require large penetration (% of vehicles contributing data)
  – Privacy issues

• Loop / Radar count stations
  – Provides count and occupancy information
  – Currently work on freeways but not on city streets

• There is no solution commercially available today that provides arterial travel times in an accurate and anonymous manner.
Example application for OD Travel time from San Diego to Chula Vista on I-805