Wireless Detection Background and Update
ITS Maryland - June 2013
System Overview

- SPP Digital Radio
- In the Cabinet: Access Point Controller Card
- Stop Bar Detection
- Stop Bar Detection
- Repeater
- Traffic Controller Cabinet
- Access Point Controller Card
- Isolator
Wireless Sensor

- Accurate, 3-axis magnetometer
- Patented ultra-low NanoPower™ communications protocol
- Mechanical packaging for in-road sensors
- Self-calibrating, self-tuning
- Reusable and remotely upgradeable
- 300M+ detections over 10-year battery life
- 5-year Warranty
- Will operate accurately in all conditions
- Ability to use single sensor for both presence and counts/system detection
Why Sensys Networks for Semi Actuation

- Quick install with existing crews
- 25%+ cost of ownership savings, driven by near-zero maintenance
- Bundled remote monitoring eliminates additional costs

"The savings in time and materials were tremendous."
- Baltimore DOT

"Sensys wireless detection enables us to replace all of our broken inductive loops and install vehicle detection in any type of pavement or environment...”
- City of San Francisco
Why Sensys Networks for Full Actuation

- Competitive initial costs
- Quick install with existing crews
- More dependable than loops because of weather resistance
- Near-zero maintenance reduces operating costs

"Requires minimal human intervention, saving us time and personnel energy."

- Michigan Department of Transportation
Why Sensys Networks for Adaptive Control

- Lowest initial cost
- Near-zero maintenance reduces operational costs
- Accurate occupancy and counts critical for Adaptive System Performance

“Traffic managers have precise data to optimize signal timing and information systems, while delivering accurate reports for intelligent future growth”

- Collier County, FL
- Bicycle and vehicle detection
- Same wireless protocol
- Bike presence/actuation and counts
- Accurate space parking detection
MicroRadar™ – An Optimal Solution

**First Technology that**
- Differentiates between bicycles & vehicles
- Allows for “True Presence”
- Detects all bicycle types
- Works in all weather conditions*
- Eliminates occlusion
- Works seamlessly with existing detection

**Maximize Intersection Efficiency**
- Detects stopped & slow vehicles
- Provides full lane coverage
  - Single sensor with controllable zone up to 9 x 11 ft
  - Use in dedicated and shared lanes

**Improve Safety & Optimize Green Time**
- Allows bicycles to safely cross
- Traffic still flows when bicycles not present
Count Stations

Platform saves time and resources over loop trenching
SNAPS Overview

- **Key applications**
  - System Management Tools & Diagnostics
  - Real-Time Data & Reporting for Travel Time & Congestion Maps

- **Flexible installation**
  - Hosted
  - Software on local servers

- **Access reports via browser**

- **Open XML Data Feed to ATMS or other applications**
Data Collection & Reporting Options

- **Statistical report on aggregated data (e.g., 15 minute data)**
  - Count
  - Speed
  - Percent lane occupancy
  - Per vehicle or per lane statistics

- **User selectable bin data**

- **Detailed, definable per event reports**
  - Time of detection
  - Vehicle speed & length
  - Headway

- **Report Formats**
  - HTML report
  - Excel spreadsheet
  - Graphical display

- **Report Templates**
  - Create and save report templates
  - Schedule distribution of reports

- **Health Monitoring and Diagnostics**
  - Automatic alarm notifications
  - User defined thresholds
  - Geographical network map

- **Data Sharing via Open XML**
  - Integrate into any ATMS
  - Output to third party applications (TransCore TransSuite, Kimley Horn KITS, Delcan)
Real-Time Congestion Maps

Map for: Connecticut Ave @ Albemarle St NW NB

Map last updated at 5:54:55 PM

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Travel Time for Arterials and Freeways

Designed to:
• Optimize arterials during peak times
• Provide traveler information
• Monitor adaptive control performance
• Load balance arterials & freeways
• Adjust for freeway construction

Features:
• Re-identify vehicles anonymously
• 98% accuracy
• 50%-70% match/penetration rate
• Measures speeds up to 80 mph
• Sensor arrays spaced ~3 mi apart
System Overview

How it all fits together
Magnetic Re-Identification Technology

Travel Time provides:

- Full distribution of travel times
  - Median Travel
  - 80th percentile
  - 90th percentile
- Vehicles in segment (number)
- Counts & Speed
- Level of Service
- Open XML feed
  - No additional software to purchase
  - Integrates with TranSuite, Delcan, Kimley-Horn ATMS
Benefits & Applications

Real-Time Travel Information & Active Traffic Re-routing
- Portable DMS provides traveler choice of routes
- Real-time
- Penetration rate determines updates
- Open XML feed allows:
  - Neighboring agencies share data
  - Public access to travel times/ 511

Enables Efficient Planning & Optimization
- Identify trends to increase throughput for signal re-timing
- Gather performance measures and ensure results from adaptive systems
- Optimize arterials with one technology

Adaptive Control: Before & After Analysis

Evaluation of ACS Lite Adaptive Control using Sensys Arterial Travel Time Data, by Wang, Robinson, Shelby, Cox, and Townsend
On the Horizon
Sensys Networks is rooted in research and development

Available soon:
- Deep sensor – 5” below surface
- Accelerometer sensor - full FHWA 13-bin classification station
- 15-year battery repeater
- Bluetooth integration

Things were working on:
- Safety and Mobility System (SAMS) – automated turning movement and signal optimization data
- Improved wireless ranges
- Accelerometer sensor for weigh-in-motion
- Pedestrian detection
Deep Sensor

No need to remove sensors at time of mill and overlay

4.0” (102mm)

Road Surface

.75” (19mm)

Epoxy

4.0” (102mm)

Filler (Cold Patch)

.5” (13mm)

Epoxy

2.75” (70mm)

8” (203mm)
Products and Application “In Action”

- Presence
- MicroRadar™
- Count
- Re-id
- Axle Count
- Volume
- Turning Movements
- Classification
- Travel Time
- Advanced Detection
- Bicycle Detection
- Pedestrian Detection
- Light Rail Detection
- Parking
- Stop Bar

Products and Application “In Action”

Image showing a cityscape with various detected objects and labels for different applications.