



Department of Transportation

Traffic Division



Wireless Magnetometer Vehicle Detectors

- Wireless Detector History
- Testing and Development
- How They Work
- Installation
- Results
- Alternatives
- Maintenance



DOT Wireless Detector History

- **May 2006, Contacted Sensys to Develop and Provide Stop Bar Detection**
- **August 2006 Installed First Beta Prototype at Signal Facility Test Bed.**
- **May 2007 First Active Intersection Installation**
 - Observation and timing adjustments
- **September 2007 Begin Full Deployment Along Edmondson Ave.**
 - Nine semi-actuated intersections
- **November 2007 Purchase equipment for 50 + Intersections**
- **157 Installations to date**



Test Results and Development

August 2006 Thru November 2007



- **Testing Began - Simple Volume and Occupancy Counts.**
 - Comparison with baseline loop detectors, data recorded and analyzed through system controllers
 - Sensors comparable with loops under all local weather conditions.
 - About 1% error.
- **Stop Bar Capabilities Tested**
 - Full presence mode tested and verified.
 - Optimum sensor placement and configuration established.
 - Sensor sensitivity improvements implemented to detect a wider variety of vehicles.
- **Parked Vehicle Detection and Tune Out Tests (BDOT Requirement)**
 - Tune out function tested and verified.
 - Firmware upgrade implemented for improved operation.
- **Wireless Detector System comparable to inductive loops in performance, functionality and stability.**

Wireless Detector System

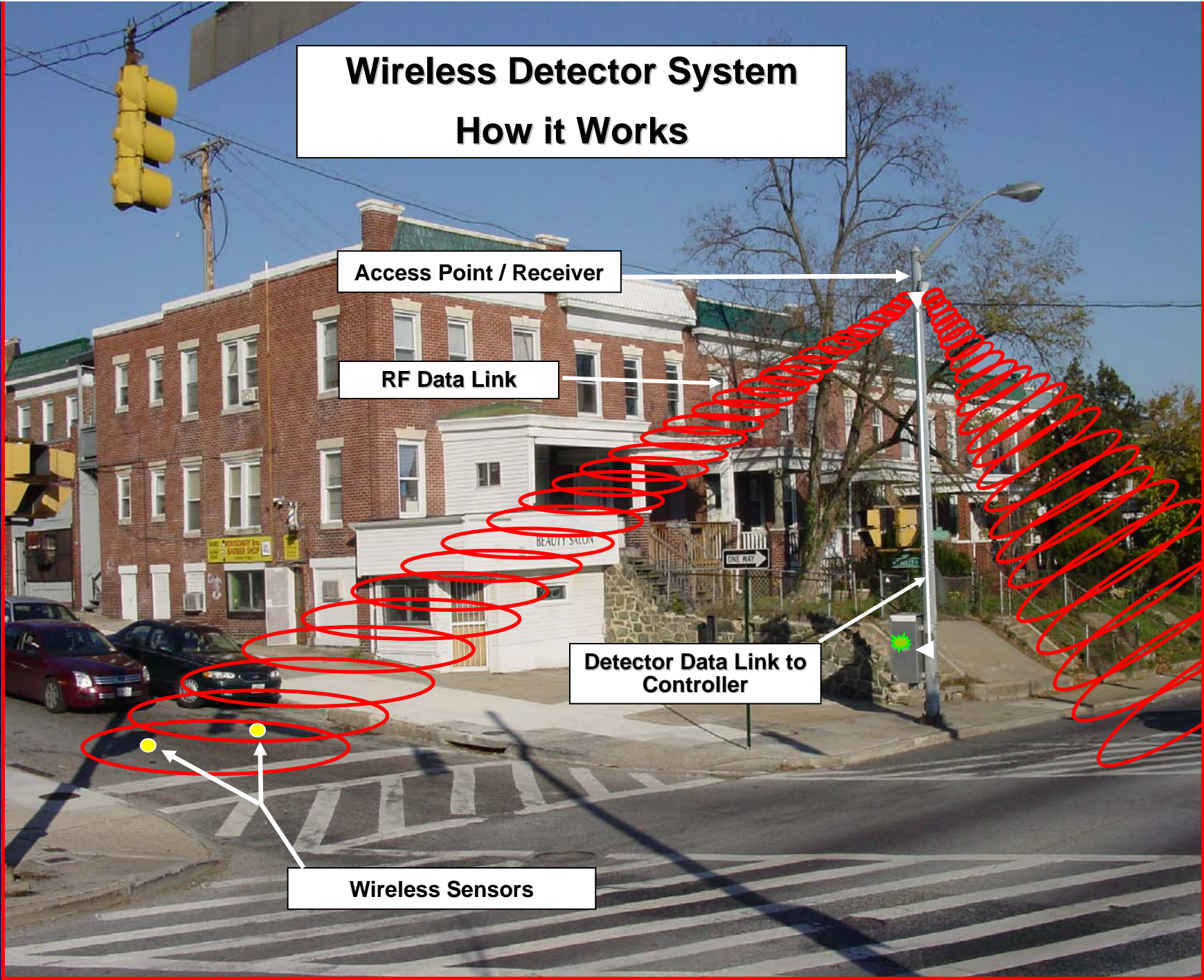
How it Works

Access Point / Receiver

RF Data Link

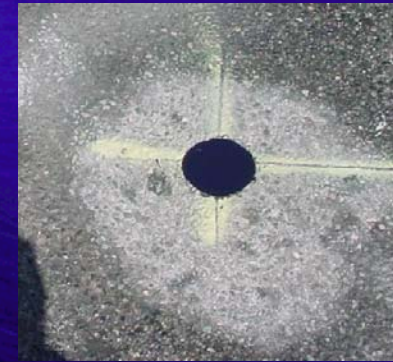
Detector Data Link to Controller

Wireless Sensors





Field Installation



- Access Point / Receiver fastened to signal pole 25 – 30 feet high
 - CAT-5 cable is installed from AP to Controller
 - Detector cards are installed in the control cabinet.
 - Average install time 1 hour
 - Final set up 20 minutes
 - **Average field install time, per intersection – About three hours***
- Each flush-mount sensor is installed using a core drill
 - 4" diameter hole
 - 2 ½" deep
 - Less than 20 minutes install time per sensor
 - Minimal lane closure time

*Typical install is 1 AP with four sensors. Assumes no other maintenance required. Does not include travel time.



Detector Improvement Results



- **Reduced Peak Travel Times Along Arteries**
- **Eliminate Unnecessary Main Street Stops**
- **Faster Return to main Street Green**
 - **Minimizes unnecessary side street green time**
- **Reliable Side Street Detection**

Alternatives + -

➤ Wireless Technology

- + Good for actuated installations
- + Quick deployment, simple installation, relatively low cost
- + Accurate
- + Small footprint in roadway
- + Sensors may be retrieved from road
- Lap Top required for field diagnostics
- To Be Determined

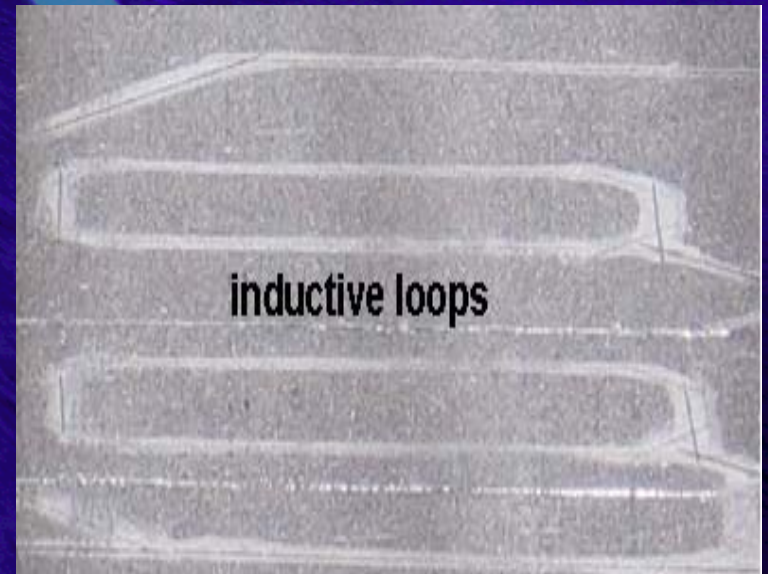


Alternatives + -

➤ Good Ol' Loops

- + Lowest equipment cost
- + Accurate
- + No special equipment for diagnostics

- Labor intensive and costly installation
- Large footprint, easily damaged



Alternatives + -

➤ Video Detection

- + Wide coverage, multi-lane detection
- + Non-intrusive
- + Easy to change detection zones
- High cost for small intersections
- Extensive cabling required
- Special equipment for diagnostics
- Becomes maintenance intensive over time.



Maintenance

- **Let's Not Forget Pedestrian Detectors (Push Buttons)**
 - Push buttons checked for proper operation during detector install
 - Defective buttons replaced
 - Defective wiring corrected or replaced

- **There is no such thing as set it and forget it...For any System**
 - Expect increased maintenance as equipment ages
 - Control Equipment
 - Detectors
 - Poles and Cabling
 - Signals