ADVANTAGES of the SENSYS™ WIRELESS VEHICLE DETECTION SYSTEM
INTRODUCTION

• The sensor is a state-of-the-art magnetic sensor with innovative low-power radio technology creating a reliable, accurate and cost effective detection system with the flexibility to address a wide range of traffic management applications.
A WIRELESS ALTERNATIVE

• As with conventional technologies, Sensys wireless sensors can be located exactly where measurements are required be it at a specific through lane, turn lane or entrance or exit ramp.
• The ruggedized pavement-mounted magneto-resistive sensors detect the presence and movement of vehicles, real time data is transmitted via radio to a Sensys access point which in turn communicates with a traffic controller, remote management system or both.
SENSOR INSTALLATION

• Installation is simple and cost effective, a 10cm hole with a depth of 6cm is bored at the required sensing location, the sensor is placed in the hole and aligned with the direction of traffic. The hole is then sealed with quick drying epoxy.
• The sensor is typically installed in the middle of a traffic lane where it will detect the presence and passage of vehicles in that lane. Sophisticated signal processing algorithms in each sensor provide highly accurate vehicle detection as well as discrimination against interference from vehicles in adjacent lanes or vehicles travelling close to each other in the same lane.
• To measure a vehicles speed two sensors are placed in the same lane with the distance between them measured and configured in software upon installation.
SENSYS ACCESS POINT

• The Sensys Access Point (AP) collects data from up to 250 sensors either directly within a range of ± 50m, depending on how high the AP has been installed, or from sensors supported by Sensys repeaters within a range of ± 300m.
• All wireless data collected can then be provided via contact closure interface to a roadside traffic controller or via IP communications over twisted pair, coaxial cable, fiber optic cable or wireless services to central facilities.
• The AP can also be configured with an integrated cellular modem to support communications over GSM networks using EDGE/GPRS data services.
• The AP can be powered from a local power supply, POE or a solar panel.
• The AP runs on embedded Linux, thus implementing standards such as NTCIP is a simple process.
Time-Stamped Event Data

The detection data reported by a Sensys wireless sensor is either an ON (Detect) event, the time at which a vehicle is first detected, or an OFF (Un detect) event, the time at which a vehicle is no longer detected. All sensors are time synchronized to their communicating access point to within 100 microseconds, making it possible for time-stamped event data from different sensors at an installation to be meaningfully compared.

Data for each event can be sent as it occurs, or as many as 16 events can be buffered at the sensor and transmitted at a fixed reporting interval or whenever the buffer is nearly full (synchronized reporting). The first option minimizes data latency but consumes more sensor power, while the second option, by conveying more event data per transmission, limits power consumption and can reduce the bandwidth required between the access point and a remote server but introduces reporting latency of as much as 10 seconds -- the choice between these different configurations again depends on the particular vehicle detection application to be supported. In general, latency must be minimized for traffic signal control applications but can be tolerated when the detection data is used solely for informational purposes.
SENSEYS REPEATER

• In cases where one or more installed wireless sensors are beyond the range of the AP, one or more Sensys Repeaters can be used to provide a two-way relay between the out of range sensors and the AP.
• The repeater is battery powered and pole mounted, as with the AP issues such as setback from the roadway and stability of the mounting point are not critical thus simplifying installation.
• Both the AP and Repeater’s antennae provide a 120° field of view allowing flexibility when multiple repeaters are used to extend an AP range.
ACCURACY EQUAL TO INDUCTIVE LOOPS

- Inductive loops are generally considered to be the most accurate of all vehicle detection technologies. This accuracy can however be degraded by incorrect sensitivity settings, cross talk between adjacent loops and changes to the local environment over time.
- Various independent studies have repeatedly shown that the Sensys vehicle detection system is just as accurate as well maintained loops.
- Like inductive loops the Sensys vehicle detection system is independent of weather or traffic conditions.
Sensys permanent count station (freeways & arterials)
optional sensors *(faded)* provide additional presence or queue detection

option of one or two side-by-side sensors at stop bar -- two sensors increase sensitivity for motorcycles, scooters, bicycles, etc.
Sensys advance detection

Sensys Access Points

traffic controller

optional sensors (faded) provide additional speed detection

Sensys Repeaters

Sensys Wireless Sensors
Sensys system counts

Sensys Wireless Sensors
[optional sensors]

Sensys Access Point
traffic controller

Sensys Repeater
[as required]

optional sensors (faded) provide additional speed detection
Sensys stop bar detection, advance detection, & system counts

optional sensors (faded) provide additional speed, presence, or queue detection

option of one or two side-by-side sensors at stop bar — two sensors increase sensitivity for motorcycles, scooters, bicycles, etc.
SUMMARY

• The Sensys wireless traffic detection system offers a viable alternative to traffic detection offering both a cost effective accurate solution
• Installation is simple and quick, reduced traffic accommodation requirement, average sensor installation time is ± 5 min
• Occlusion and pre-determined set back distance not an issue
• Simple AP and Repeater installation
• Sensors have a battery life of approximately 10 years and is self calibrating
• Road resurfacing has no impact on sensor performance
• Various forms of communication can be utilised thus offering solutions to several applications
• The AP has the ability to store data thus preventing crucial data loss
THANK YOU

shaun@basixtraffic.co.za