



# POD

Wireless Vehicle Detection System™

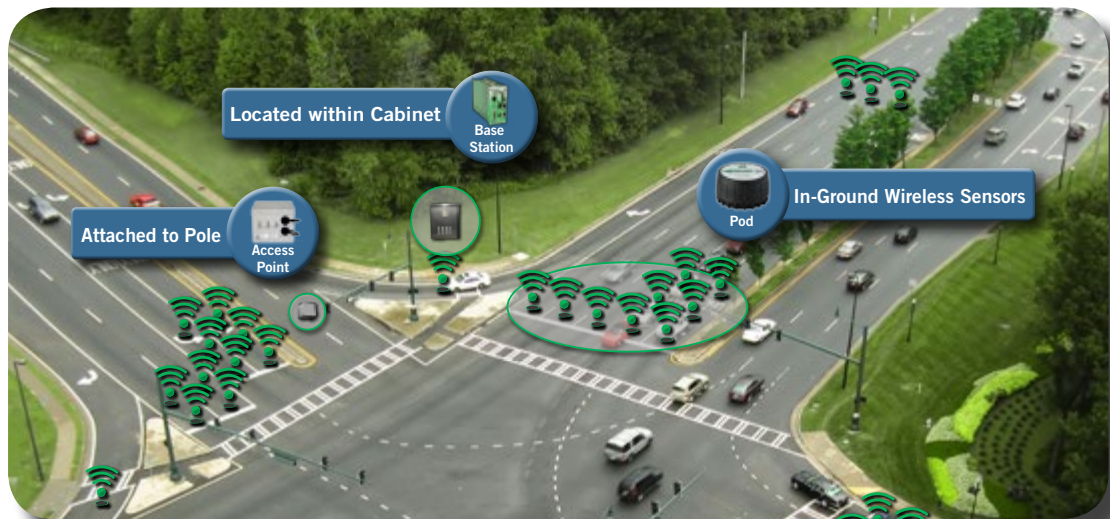
# Overview

Cubic | Trafficware has been solving some of the traffic industry's biggest problems since 1979. Accurate, economical, and flexible vehicle detection is one of the industry's current challenges. In 30+ years of developing our own detection systems, as well as interfacing with all leading manufacturers, Cubic | Trafficware has collected a lot of data on how to approach and solve the detection problem.

Cubic | Trafficware's Pod Detection System™ uses patented technology exclusively licensed from Massachusetts Institute of Technology (M.I.T.) and has one or more features covered by one of the following patents: U.S. Patent Nos. 6,662,099, 8,855,902 and 9,020,742. Other patents pending. The foregoing notice is intended to serve as a notice under 35 U.S. C. § 287(a).

Our answer is the Pod Detection System™, a wireless magnetic field sensor embedded in the road to accurately measure vehicle occupancy and detection. Powered by an industry-leading D-cell lithium battery, the Pod will transmit real-time data autonomously for up to 10 years, providing a solution to a broad range of transportation needs.

The Pod Detection System™ is simple to install and easy to use, with three primary components: the Pod, Access Point, and Base Station.



## Pod

The sensors are located in the roadway, wirelessly transmitting vehicle data and receiving administrative data.

- Compact and robust (2"H x 3.6"D)
- Industry-leading D-size lithium battery, providing up to 10 years of life with an average of 700 activations per hour, 24/7.
- 900 MHz wireless frequency:
  - Allows greater range, **eliminating the need for a repeater**. This simplifies the system by reducing the number of components, as well as easing installation and maintenance.
  - More reliable communication that can pass around buildings and penetrate foliage.
  - Better inroad performance, with the ability to communicate through snow, water, and ice that may have collected on the road surface over the sensor.
  - Smaller signal uses less battery to ensure longer system (or component) life.
- Auto-tune functionality, allowing the Pod to re-calibrate if the environment changes or roadway shifts or buckles.
- Three axis magnetometer with dual sensors in the Z-axis. Dual sensors in the most important axis provides redundancy and improved accuracy.
- Installation is quick, with minimal road closure duration:
  - Cut a hole that is 4.5" in diameter x 2.75" deep, using a diamond tipped drill bit.
  - Place a dab of epoxy in the bottom of the hole.
  - Install the Pod in a clamshell and place Pod in the hole, with upper edge 3/8" from roadway surface.
  - Fill balance of hole with epoxy.
- Relocatable and battery replaceable.



## Access Point and Antennas

Mounted on an intersection pole or mast-arm, the Access Point and Antennas provide two-way wireless communication between the Pod and Base-Station.

- Securely straps to the pole, within line-of-sight of the control cabinet. A wired connection is also available if there is occlusion or if the cabinet is on the same corner as the pole.
- There are four (4) radios – three (3) to broadcast to Pods and one (1) to broadcast to the Base Station.
- The omni-directional antenna covers all Pods located at the intersection. Long-range directional antennas are used for advance detection where Pods are located up to 700 feet away. These antennas are typically mounted on the mast-arm and are mounted back-to-back. Use of these long-range antennas **eliminates the need for a repeater**.



## Base Station

Located in the control cabinet, the Base Station has the computing power of a full ATC controller, providing data processing and storage.

- SDLC connection for TS2 cabinets – allows direct connect and eliminates need for loop detector racks.
- Can emulate one to four BIU's, or run in parallel with loops and other forms of detection.
- Detector card interfaces with NEMA, ITS or 33X cabinets.
- Either wired or wireless communication to the Access Point.
- Can support more than 150 Pods per intersection.
- Linux operating system.
- Ethernet Port and USB connection.
- Allows access to a browser-based graphical user interface (GUI), without software (licenses, annual fees, etc) required on individual computers.



Rack Mount  
Base Station

## Pod Connect

Pod Connect is a graphical user interface (GUI) that can be easily accessed from a web browser, simplifying the process of configuring, monitoring, and reporting the Pod System.

- May be conveniently accessed from tablets and smart phones.



## How does a magnetometer or magnetic sensor work?



It senses the disturbances in the earth's magnetic field due to the presence of a car or motorcycle. There are algorithms that interpret this disruption to characterize it into meaningful and reliable data.

## How does the Pod compare to other forms of detection?

### Pod vs. Loops

- Much simpler installation process.
- Wireless - no loop or lead in cable required.
- Small form factor allows the installation of Pod in minutes as opposed to hours for a loop.
- Much more durable and not subject to degradation in the roadway.
- Smart – can be grouped into larger detection zone or used as an individual point.
- Directional, capable of providing the direction of traffic flow.
- If there is a failure, it may be diagnosed through the web browser and the pods re-configured to work around the problem - without going into the field.
- More economical - requires less time to install and there is no need for expensive conduit and trenching to advance or system detectors.
- Eliminates damage to road surface caused by saw cuts.



### Pod vs. Video

- Pod response time is quick, allowing it to be used for dilemma zone management applications.
- High accuracy for vehicle counts and measures of effectiveness.
- Not affected by:
  - Shadows
  - Reflections
  - Fog
  - Winter white-out conditions
  - Dirty or smudged lens
  - Salt build-up on lens (common in coastal towns)
  - Vibration on mast arm due to wind
  - Re-direction/aiming due to storms
- More economical.
- Can be used for accurate stop bar and advance detection.



## ABOUT CUBIC | TRAFFICWARE

Cubic | Trafficware specializes in researching, designing, and developing electronic equipment and enterprise software designed to address the challenges in the transportation industry. Our industry expertise comes from:

1. Hands on experience attained while solving traffic management challenges across the world for almost four decades.
2. Our in-house team including: professional traffic engineers, hardware and software design and development staff, manufacturing personnel, and customer service/field application engineers.
3. Regular dialogue with our customers to address their real-world operational issues and future traffic management requirements.

Cubic | Trafficware manufactures a full line of traffic equipment in its 100,000 square-foot technology center located in the Houston area. Manufactured in the USA, our products have earned a reputation for unmatched quality and reliability.