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).

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.

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.

**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.

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**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.