



BlueTOAD™

Superior Technology

BlueTOAD™ (Bluetooth Travel-time Origination And Destination) is the most technologically advanced Bluetooth traffic monitoring product on the market today.

How does BlueTOAD™ Work?

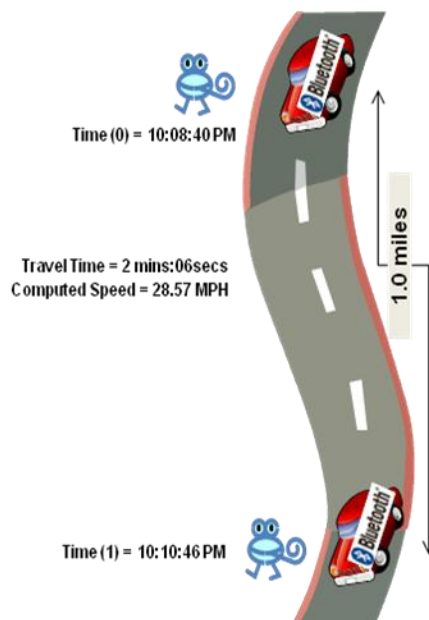
Most modern mobile devices are equipped with Bluetooth technology, the industry protocol for short-range wireless connectivity.

Vehicles may have Bluetooth active to enable functions such as hands-free calling or to interface with navigation systems.

BlueTOAD™ anonymously captures these short-range signals and matches their unique identifiers across a sequence of BlueTOAD™ receivers.



- TrafficCast leveraged the open hardware and software platforms evolved in the mobile phone industry to address the specific needs of transportation agencies through its unique BlueTOAD™ product portfolio
- The anonymity of Bluetooth utilization of MAC (Media Access Control) addresses for device identification assures that BlueTOAD™ preserves vehicle and driver privacy while delivering data on vehicle movements
- Dual mode operations incorporate high speed data connectivity and local data archiving for "real-time" and "post-processed" flow determinations
- BlueTOAD™ connectivity can be either Ethernet or GSM modem which is compatible with all common cellular protocols: GPRS/EDGE/3G
- BlueTOAD™ can be powered with either AC line voltage or solar power



The BlueTOAD™ receiver is capable of monitoring and measuring vehicular and pedestrian flows by measuring Bluetooth MAC (Media Access Control) addresses. The system can be used to collect high quality, high-density travel times by sampling a portion of actual travel times from the traffic stream. By matching MAC addresses at two different locations, accurate travel time is measured directly, with prevailing road speeds derived from travel time; this is the reverse of the process typically used with sensor technology, and is much more cost effective than more specialized vehicle matching technologies.

The addresses received by a sequence of two or more BlueTOAD™ receivers are matched and used to develop a sample of travel time for that particular segment of the roadway based on the relative detection times recorded by the adjacent units.

BlueTOAD™ is anonymous due to the use of Bluetooth MAC addresses as identifiers. MAC addresses are not associated with any specific user account (as is the case with cell phone probes) or any specific vehicle (as with automated toll tags). The MAC address is not linked to a specific person through any type of central database but assigned at the Bluetooth electronic chip manufacturers, and not tracked through the sales chain. Privacy concerns typically associated with alternative probe systems are minimized, if not eliminated.

Configuration Options	Power Source	Data Connection
Option 1	AC 110V	Ethernet
Option 2	AC 110V	Cellular Modem
Option 3	Solar Power w/ Battery	Cellular Modem

TECHNICAL SPECIFICATIONS

Power

Voltage Input: 6 – 30 Volts

Max Current @ 12V
100 mA (Typical 80 mA)

GSM Modem Based
Max Current @ 12V
350 mA (Typical 140 mA)

Power Source

110V AC

Solar Power (Optional)

20W, 12V BP Solar
Battery: 36 Ah Sealed AGM Pb-Acid

Operating Range

Industrial (-20°C to +75°C)

Processor

ARM7 TDMI Microcontroller

Connectivity

Ethernet 10BASE-T / 100BASE-T

GSM Modem (Optional)

Telit GM862 - GPS

Bluetooth

CSR Bluecore 4 Class 1

Data Storage

Micro SD slot supports up to 1GB

Antenna

2 dBi Omni (Bluetooth)
1 dBi Flat Patch Quad-band (GSM)
26 dB Patch (GPS – GSM option only)

Dimensions

PCB: 5" x 6"

NEMA 4 Enclosure: 11.5" x 7.5" x 13"

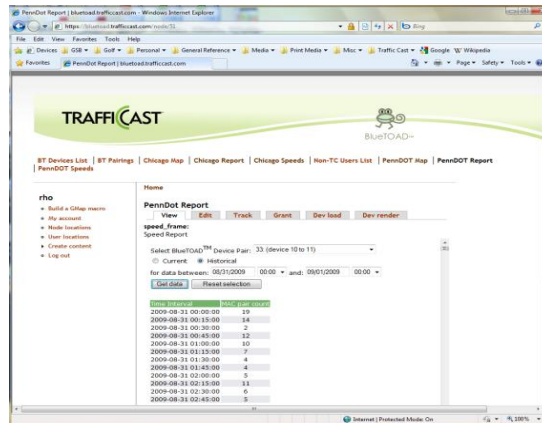
Solar Panel (optional): 16.5" x 20"

Compliance

Bluetooth FCC Compliant

GSM FCC Compliant

Data Processing & Analysis

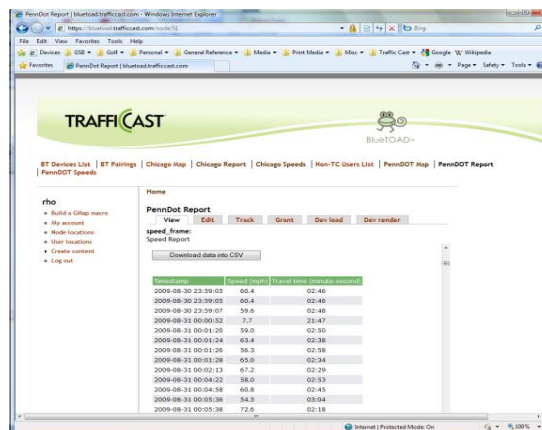


A complete backend support system has been developed to process the data collected by BlueTOAD™. The data can be viewed real time or post processed. Data processing includes travel time, flow speed, and MAC address counts.

The data uploaded from the BlueTOAD™ device is hosted on a TrafficCast dedicated server. This data can be accessed via BlueTOAD™ Web server. The raw data can also be retrieved from the TrafficCast database server by a specific search option. If the raw data needs to interface with a non-TrafficCast operation center then custom development would be required. This task would be scoped and a statement of work would be agreed upon by all parties.

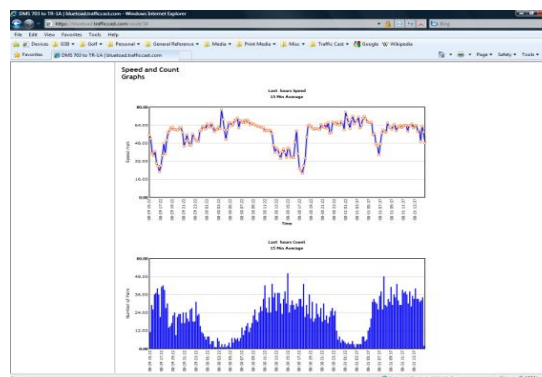
Backend support includes:

- Real time speed and travel time information displayed on website hosted by TrafficCast
- Statistical data reports covering speed, travel time, MAC pairs, origin/destination
- TrafficCast proprietary algorithms for processing flow speed.
- Data analysis and customized reports
- Data archiving
- Industry-standard service level support



SERVICES AVAILABLE

- Technical Support
- Installation and Setup
- Application Support
- System Planning
- Consulting



Sample screen shots of BlueTOAD™ website



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