

WEBINAR SESSION
**ATMS TRAFFIC
DETECTION**

Latest Emerging Technologies and
Alternative Approaches

June 13th, 2013

MAGNETOMETERS



Introduction

◎ **GTT - Global Traffic Technologies**

Headquartered in St Paul, MN with sales and support personnel located in Canada, GTT was formed in 2007 from 3M corporation's Intelligent Transportation Systems division. GTT continues with over 40 years of vehicle detection, and priority control expertise.

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Timothy Hall has over 10 years of vehicle detection system engineering experience with both GTT and 3M. He also has extensive systems engineering experience in wireless and medical devices.

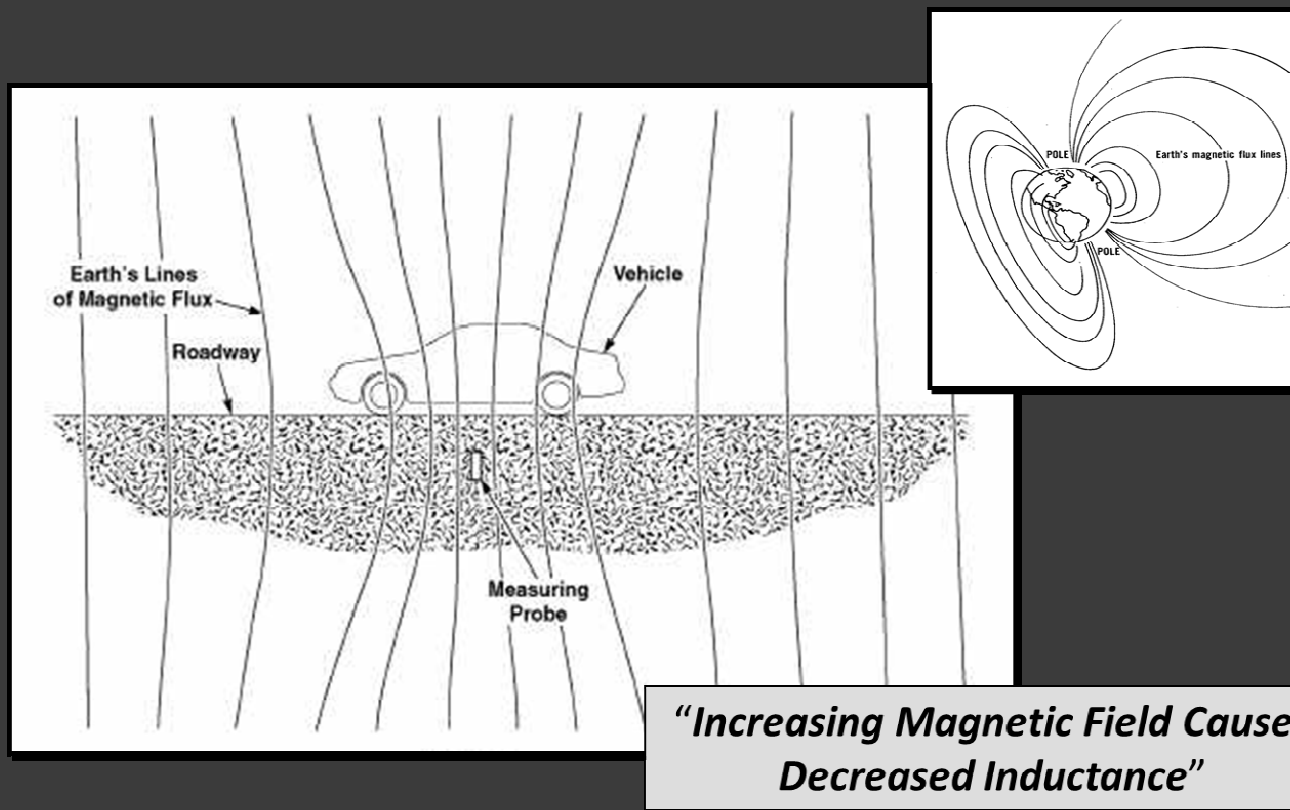


Magnetometer Based Vehicle Sensing

- Delivers outstanding accuracy in any weather every day, year after year.
- Offers real-time traffic data, including count, speed, length, occupation rate and even vehicle classification, to help engineers manage traffic flow.
- Integrates seamlessly with virtually any traffic management software for easy modification, reconfiguration and scalability.
- Maximizes ROI with easy installation, minimal maintenance and incredible reliability.

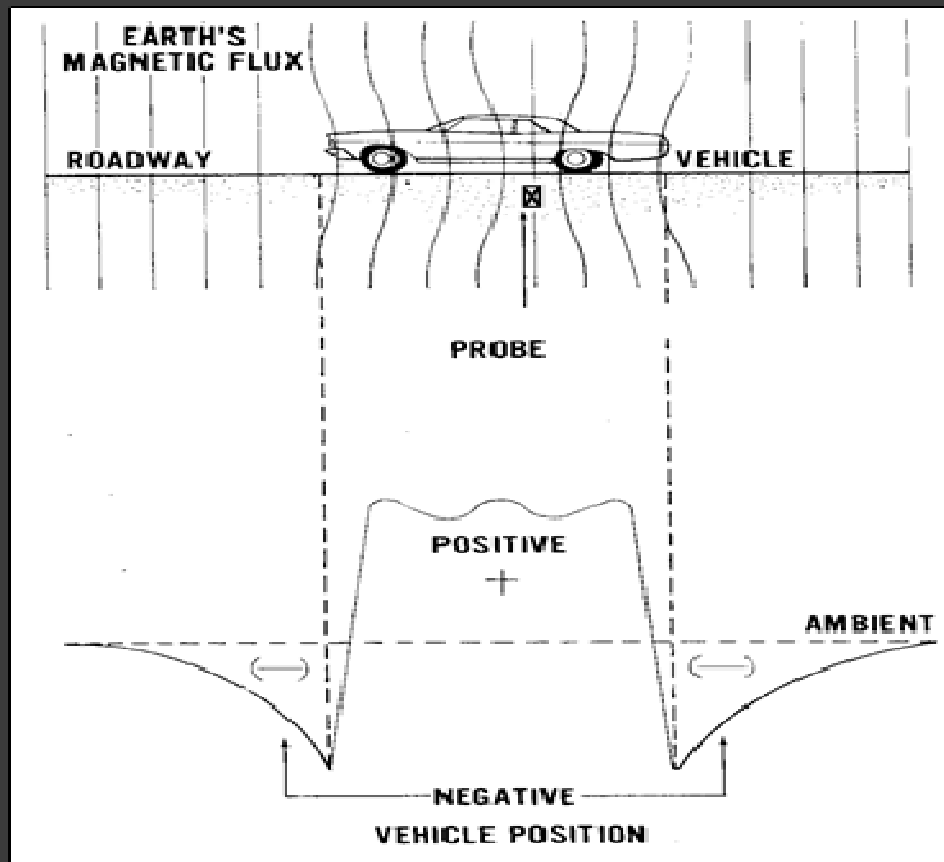
Canoga Micro-loops are small magnetometers that are used to sense changes in the Earth's magnetic field

- Micro-loop sensors measure changes in the vertical component of the earth's magnetic field caused by vehicles near the sensor and convert them into an equivalent inductance change.

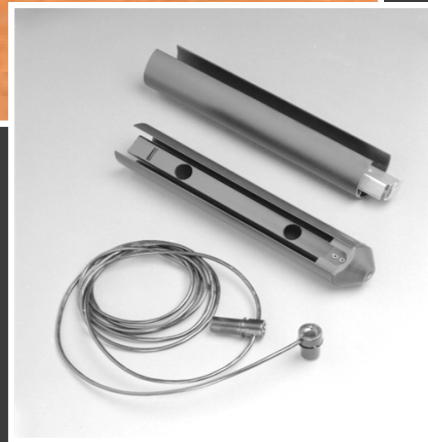


How does magnetometer based sensing work?

- As the vehicle approaches and then traverses the area sensed by the probe. The ferrous content of the vehicle changes the sensed value of the earth's magnetic field.

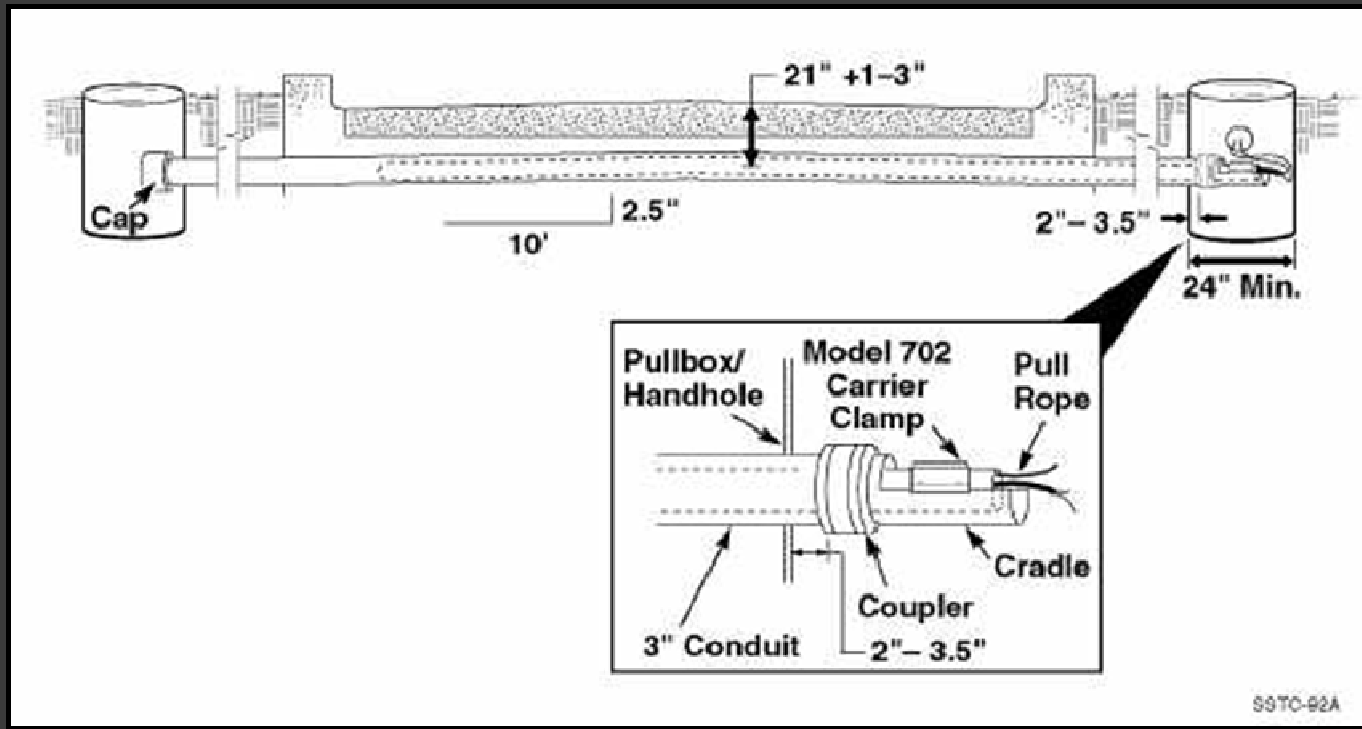


Canoga™ Micro loop Installation



- Non-invasive, Non-intrusive
- System Components
 - Canoga C900, or TMC Vehicle Detectors
 - Canoga Configuration Software
 - Model 702 Non-invasive Micro-loop
 - Non-invasive Carrier Assembly
 - Homerun Cable
- Micro-loops are installed in a conduit underneath the road surface
 - unaffected by road stresses such as resurfacing.
 - non-invasive i.e. not in the road surface and non-intrusive i.e. out of sight.
- Sensors are installed on the side of the road so there is no need to shutdown traffic during sensor installation.

Installation considerations



Best Practice depth of protective conduit - 18"- 24" from road surface.

Maximum depth = 36"

Carriers to insert sensors and hold them in place.

One to three sensors per lane.

Installation considerations



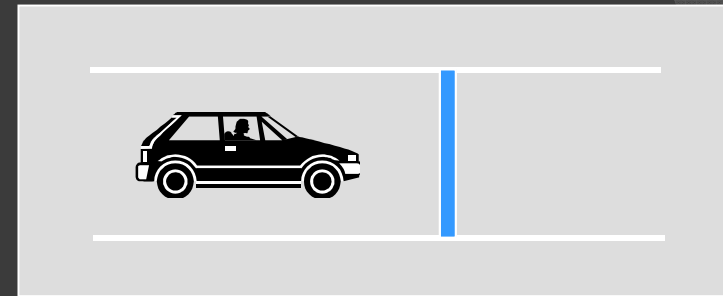
New road construction or re-construction offers the least expensive installation. The conduit is trenched in and paved over.

This approach may also be used for existing roads when there is no room to the side of the road for the placement of a horizontal directional drilling machine.

Data Types

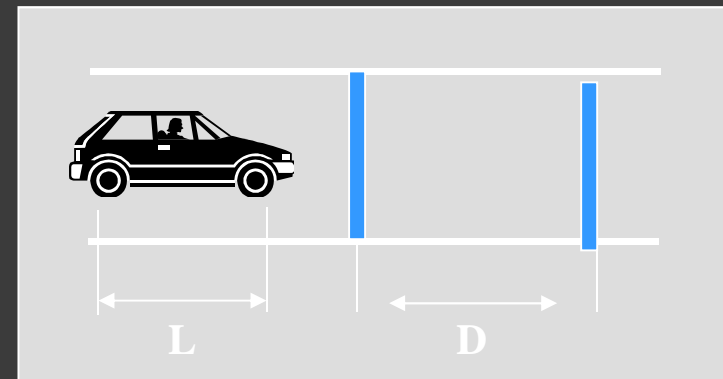
① Single Sensor String Data

- Vehicle Presence
- Vehicle Count
- Roadway Occupancy



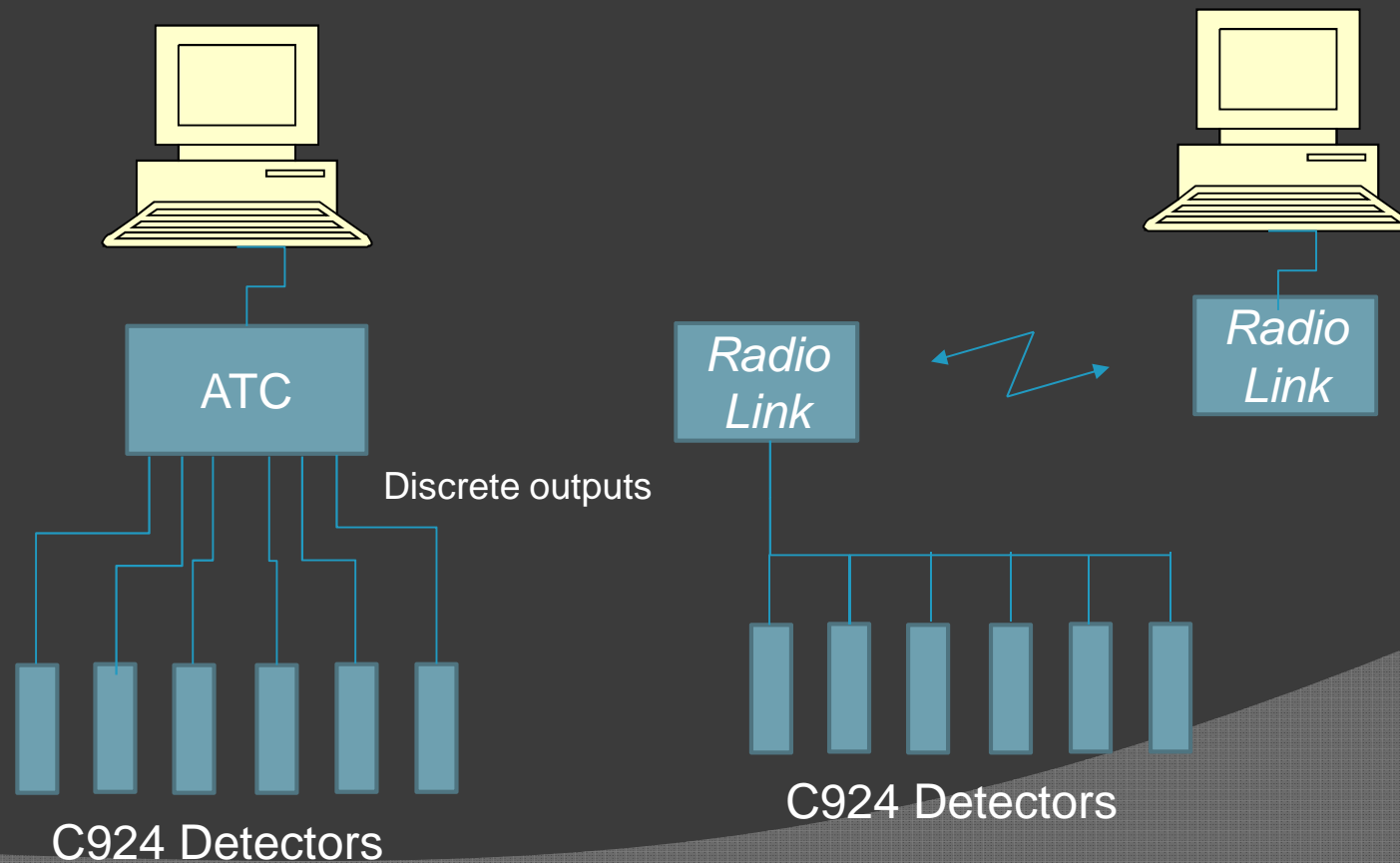
② Double Sensor String Data

- Vehicle Speed
- Vehicle Length
- Vehicle Classification, Length based
- Incident Management
 - Stopped traffic
 - Congestion
 - Lane enforcement



Data Aggregation Alternatives

- ATC based
- Card based with Central Aggregation
 - Leverages on card analysis capabilities



Input / Output Interfaces

- ⦿ Canoga detector cards provide two methods of information output.
 - Discrete Call outputs
 - Serial data retrieval of count, class, speed, and conditional alert data
- ⦿ GTT provides the ITS Link software application that gathers, records, and logs Traffic data
- ⦿ GTT works with our customers to assist in integrated data collection from the Canoga TCM cards.

Canoga Magnetometer based detection is especially effective in the following installations

- ⦿ Highway installations requiring highly accurate speed, count, classification, and occupancy measurements.
- ⦿ Unique applications where other technologies may have difficulties
 - Harsh climates
 - Bridge decks
 - Truck parking lots
 - Bicycle detection
- ⦿ Sites where accurate detection of all licenced vehicles from mopeds to semis is required.

Canoga Magnetometer based detection is Accurate, robust and reliable, but attention must be paid to installation.

- ⦿ Best Practice is installation at a depth of 18" +/- 3"
- ⦿ If an ATC is used proper wiring practices should be followed (twisted pairs, minimum wire lengths) to guard against noise and cross talk
- ⦿ Installation near power lines or electric trains should be reviewed for power line noise filtering settings.
- ⦿ Sensor placement should be reviewed to ensure against adjacent lane detections

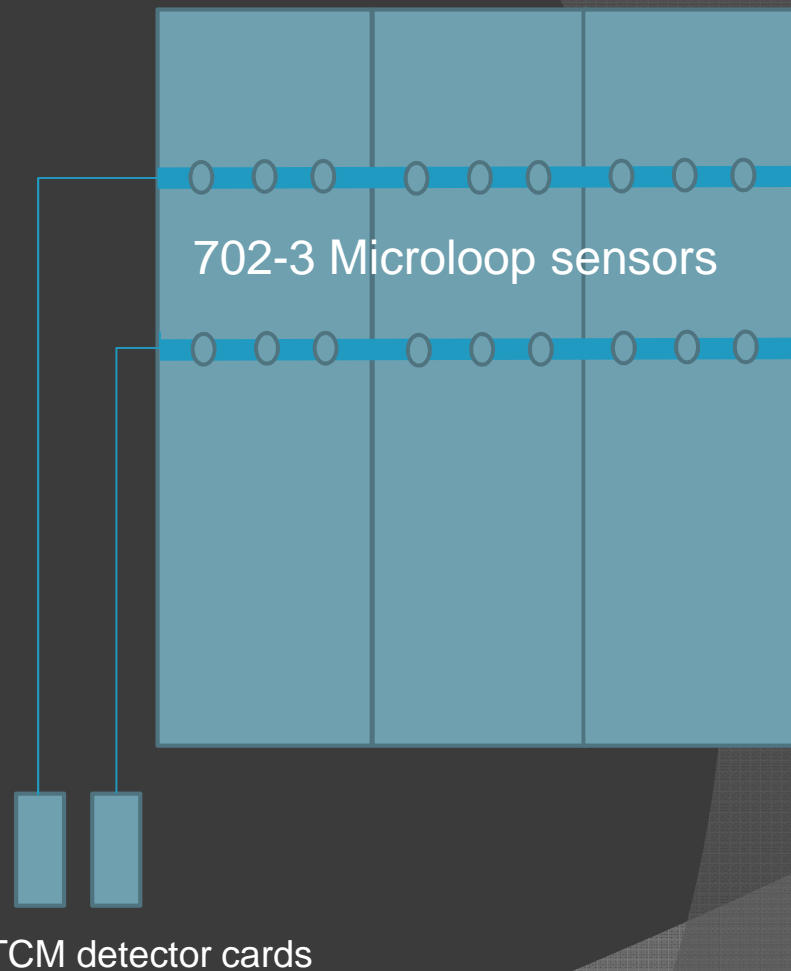
- ⦿ Following best practices in installation will result in superior accuracy, and reliability.

Maintenance Considerations

- Canoga Non-invasive Micro-loop installations require no regularly schedule preventative maintenance.

Deployment

- Equipment for a 3 lane count and classification station capable of, motorcycle to semi truck detection, with count, class, speed, occupancy and conditional alerts by lane.
 - 6) 702-3 Microloop sensors
 - 2) C944 TCM detector cards
 - 3) Installation Kits
 - Home run cable
 - Sensor Carriers
- Trenching or horizontal boring
- Recurrent maintenance



Successful Micro-loop Deployments

- ◎ successfully deployed
 - Arizona 101 Freeway
 - Indiana DOT I65 Lafayette
 - Minnesota DOT Highway 35W
 - Netherlands (Tunnel Congestion Monitoring)
 - Ontario 401, and 402, 403
 - Manhattan (Van Wyk bridge Counting and Classification)
 - Boulder Colorado bicycle lane detection
 - Pennsylvania (Bechtel Burris Secure Facility access)
- ◎ The majority of Micro-loops are freeway vs. arterial installations. Canoga loop detection products are the preferred arterial solution in Maryland, Delaware, and other states.
- ◎ Canoga micro-loop installations were first installed in the 1960s in California.

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