EMTRAC

Public-Safety Priority Management

Emergency Vehicle Preemption (EVP) has improved first-responder safety and efficiency for a number of decades. However, existing EVP systems have lacked the required range and reliability to provide green lights for law-enforcement vehicles traveling at high speeds.

The EMTRAC system offers the required range and positioning capability to provide reliable passage for public safety vehicles.

Monitoring personnel are able to see intersection signal states as well as vehicle location and activity on the Central Monitor AVL (automatic vehicle location) application. The EMTRAC system also provides detailed activity data that can be provided in a number of data-access formats.

EMTRAC System Components

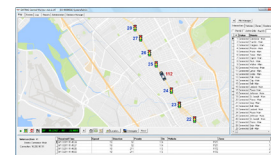| Vehicle Computer Unit	Onboard Control Head	Wayside Detector Unit	Central Monitor Software
Onboard unit determines vehicle position and speed, transmits location and activity data, and triggers alerts to both drivers and central personnel when specified conditions occur.	*Optional units provide audible and visual safety warnings, such as collision-avoidance alerts when multiple responding vehicles are approaching an intersecting from different directions.*	*Network-connected unit receives signal-priority requests and transfers detailed activity data for display on Central Monitor software. This unit is typically installed in wayside cabinets.*	*This AVL software displays real-time vehicle positions and traffic-signal states, while also saving detailed activity logs. Alerts may be set to automatically notify central personnel about specific events.*

Multiple versions available

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EMTRAC System Operation

EMTRAC-equipped vehicles carry a Vehicle Computer Unit **(A)**, which precisely determines vehicle position and speed through communication with GNSS navigation satellites **(B)**.

Upon entering detection zones **(C)** under pre-defined conditions, the Vehicle Computer Unit (VCU) transmits priority requests to wayside Priority Detectors **(D)** via secure 900 MHz radio. Detection zones may be overlapped and assigned to downstream intersections as needed.

The Priority Detectors **(D)** receive EVP requests, along with other vehicle activity data, and output them to the traffic controllers. These detectors may also be network connected, so vehicle activity and traffic-signal states can be displayed remotely via the Central Monitor application **(E)**.
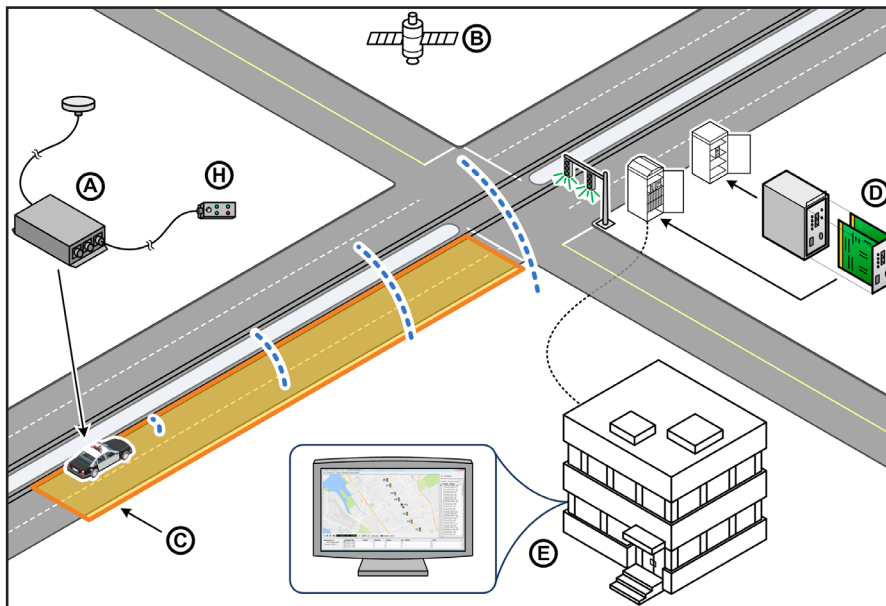
The VCU may be connected to the optional Control Head (H), which provides driver alerts for potentially unsafe conditions, such as when multiple responding vehicles are approaching the same location (collision avoidance).

Illustration of EMTRAC System Operation for Law-Enforcement Applications

EMTRAC System Features & Benefits

- **Responder Safety**: In addition to reducing response times, the use of EVP has been shown to decrease the likelihood of emergency-vehicle crashes during responses.[1]

- **Reliable Range**: Transmissions do not require line-of-sight, and are reliable in even unfavorable conditions, with a typical urban range of over 3,600 feet (1,100 m).

- **Customization**: Detection-zones may be customized for individual vehicles so signal preemption is granted *when needed*. EVP may be granted based on a number of factors, such as *first-come, first-served* or by vehicle priority level.

- **Flexibility**: The EMTRAC system interfaces with third-party traffic systems to enable centralized signal management.

- **Cost Effective**: The same EMTRAC components may be utilized by multiple stakeholders, including police, fire/rescue, EMS, transit, and traffic agencies.

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1. *Traffic Signal Preemption for Emergency Vehicles: A Cross-Cutting Study*, U.S. DOT Federal Highway Administration, Report No. FHWAJPO-05-010, EDL No. 14097. January 2006.