

APPENDIX L: ITS GLOSSARY

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Ramp and Mainline Metering

Ramp meters are traffic signals located at freeway on-ramps. They control the rate at which vehicles enter the mainline freeway, so that downstream capacity is not exceeded. In turn, this allows the freeway to carry an increased volume at higher speeds. Another benefit of ramp metering is its ability to break up groups (i.e., platoons) of vehicles entering the freeway. The freeway's main lanes, even when operating near capacity, can accommodate merging vehicles one or two at a time. However, when platoons of vehicles attempt to force their way into freeway traffic, turbulence and shockwaves are created, causing the mainline flow to break down.

Mainline metering functions provide a metering of traffic flow through the use of overhead signals. In this case, however, it is the freeway main lane traffic that is stopped in order to slow the inflow of vehicles into a congested area. This can be used to prevent excessive congestion at chain-up areas or to help alleviate incident related traffic complications. Mainline metering is used to control the flow of vehicles leaving the western side of the study area heading to the East. A typical use for mainline metering is to control the arrival rate of vehicles at chain control points at higher elevations.

Traffic Monitoring Stations

Traffic monitoring stations (TMS) are fixed devices that measure speed and count numbers of passing vehicles. Classification of vehicles can be performed at properly equipped stations. This information can then be accessed from a remote location to allow system managers to provide timely response through traveler information systems, metering or initiation of incident verification and response.

Closed Circuit Television (CCTV)

CCTV systems can provide real-time images of highway conditions to remote locations. This allows monitoring that results in quicker incident detection and analysis of traffic and congestion issues. With multiple cameras at various locations, an operator at a TMC can view several locations at once. This technology is another information input for them to rely on when updating traveler information, performing maintenance response, adjusting traffic signal timing, and in incident response and management. CCTV can also serve as a safety and security measure at locations such as rest areas, bus stops, and park-and-ride lots.

Changeable Message Signs (CMS)

Also referred to as Dynamic Message Signs (DMS), CMS provide a highly visible written or graphic message to passing motorists via an overhead electronic display. These signs are deployed with communications that allow their control from a remote location. Locations for deployment could include decision points prior to route intersections and in conjunction with road weather information system sites to provide information regarding conditions ahead. This application can also include portable CMS, which can

be useful for roadway and traffic impacts that are intermittent at various locations such as construction or incidents.

Highway Advisory Radio (HAR)

These systems provide a low power radio broadcast near the roadway in conjunction with highway signing alerting motorists to tune their car radio to the appropriate station. This technology has been in use for some time; however, often its effectiveness is marginal due to the lack of emphasis on updating messages. Technology providing automation of the updating procedure can help to address this issue. Some advantages of HAR include the ability to provide longer messages and to provide messages to either or both directions of travel depending on the need.

Weigh-in-Motion Sensors (WIM) and Pre-Pass

Weigh-in-Motion sensors are typically used in conjunction with commercial vehicle weigh stations to check truck weights while on the highway. They can be used at mainline speeds along with other CVO applications and variable message signs to allow those trucks meeting weight limits and other requirements to pass ports without slowing. They can also be used as an integral component in a safety warning system to provide analysis of a combination of factors such as weight, speed, pavement conditions, and roadway geometry. This analysis can then determine whether or not to provide a warning message for truck drivers with excessive speed for the given conditions.

Road Weather Information Systems (RWIS)

This technology allows remote, automated collection of weather information, which can have a significant impact on the safety of travel, especially in more mountainous areas. These systems can collect information about temperature, humidity, wind speed, visibility, precipitation type and rate, and roadway icing. Information regarding weather related highway conditions is in high demand by both motorists and maintenance personnel.

Traffic Management

The Tahoe Gateway Counties region already has some existing ITS infrastructure to manage traffic in both the rural and urbanized areas. These applications help to detect and respond to incidents, dispatch maintenance crews, improve safety, manage work-zones, and improve traffic flow. A typical piece of infrastructure is a traffic management center, described below.

Traffic Management Center (TMC)

A TMC is a central location for the collection, processing, and dissemination of data in order to facilitate management activities. Incoming data often includes video images from CCTV, weather information from RWIS, traffic data from various monitoring devices, and reports from maintenance personnel, the media, emergency service providers and the public. In many cases emergency service dispatchers are co-located with the transportation management personnel in such a center.

Traveler Information

Many ITS applications provide information to motorists. This benefits the efficiency of the system and the expediency of travel. When travelers have better information they

can make better decisions. Information regarding congestion, weather and road conditions can help travelers avoid delays by postponing trips or choosing alternate routes. Better information means information that is accurate, timely, and accessible. A variety of methods for providing this information are currently in use. One method is using Changeable Message Signs. The Internet and media are also used to disseminate roadway information.

Communications

The existing ITS elements utilize leased telephone service for communications. Both cellular telephone or leased voice-grade communication lines provide this service. Recent modifications to the cellular infrastructure have improved connections and service. Recent advancements in communications have made low-cost options available to gather real time traffic information. These technologies include: wireless Ethernet for carrying high speed data such as video over long distance in rural areas; Cellular Distributed Packet Data (CDPD) for low speed data; and Digital Subscriber Line (DSL) for both high and low speed data over ordinary phone lines. These technologies allow for low cost Internet access through local providers. These new technologies are now the preferred communication approaches by Caltrans in the region. It should be noted, however, that DSL is not often available in rural areas because of technical limitations.