Virtual weighstations with image-capture systems

As the volume of commercial vehicles using highway infrastructure increases worldwide, the capacity of existing conventional weighing and inspection stations is being surpassed. Some enforcement agencies are forced to allow vehicles to bypass inspection stations when over capacity or temporarily closed, with trucks can avoid stations by using secondary highways. Expanding the capacity of existing stations or building more stations is costly in terms of land requirement, construction costs, and personnel, and also increases environmental impact. A viable and complementary solution is the use of virtual weighstations (VWS).

VWS are weigh-in-motion (WIM) systems that provide vehicle records for enforcement, traffic surveillance and/or data collection in real-time over a computer network connection to a laptop, mobile device or workstation computer. IRD’s VWS system automatically weighs vehicles as they travel at normal speeds along a road, classifies them based on weight and axle spacings, determines when vehicles are in violation of regulations, produces records of commercial vehicles, and provides a display of vehicle records on a computer with a network connection to the system. The system consists of WIM sensors, a signal processor, image capture and/or automatic vehicle identification (AVI).

Single-site and multi-site

The single-site system collects vehicle records from any number of VWS and stores them on a central database server. The records are stored for a specified period, and can be searched by a number of criteria including date/time, partial vehicle identity (if available), vehicle class, and percentage overweight.

The multi-site system collects vehicle records from any number of VWS and stores them on a central database server. The records are stored for a specified period, and can be searched by a number of criteria including date/time, partial vehicle identity (if available), vehicle class, and percentage overweight.

A weatherproof cabinet houses the iSINC

A weatherproof cabinet houses the iSINC and it is protected from the environment. The iSINC is housed in a weatherproof cabinet that is installed on secondary highways. IRD Inc.

LPR is often used within VWS systems

LPR is often used within VWS systems. The intelligent system uses image capture and filtering to collect images of the vehicle's license plates. These images are then processed to extract vehicle identification information, such as license plate number, vehicle make, model, and year. This information is then used to identify the vehicle and its driver for enforcement, surveillance, and data collection purposes.

System hardware

The heart of IRD’s VWS is the iSINC (Intelligent System Interface and Network Controller), a standalone controller with the ability to collect and output the signals from the WIM sensors, process those inputs into a vehicle record, and act as the VWS network server. The iSINC has an integrated modular design capable of processing signals from multiple types of WIM sensors. The iSINC is designed to aid in system flexibility and scalability, allowing for easy expansion and upgrade over time.

Camera systems and vehicle identification

Images of the entire vehicle are used to assist in vehicle identification or classification. Cameras are used for capturing whole vehicle images, which are typically mounted at the roadside or at the WIM location. The images are then processed to identify the vehicle's license plate, which is then used to identify the vehicle and its driver for enforcement, surveillance, and data collection purposes.

Authorized users can access vehicle records via the Internet

Authorized users can access vehicle records via the Internet. The iSINC is available for use by authorized users via a secure internet connection. This allows for remote access to vehicle records, making it easier for enforcement agencies to access the information they need to make informed decisions.

The ISINC module at the heart of IRD’s VWS

The ISINC module at the heart of IRD’s VWS is designed to automatically convert the image of the plate to digital characters. The digitized number provides the vehicle identification, which may then be used to look up information on the vehicle or carrier in a central database.

Side images are used to capture a picture for vehicle identification, usually of the side of the truck. This information can be used to identify the vehicle, and may also be used to determine whether the vehicle is in violation of any regulations.

Real-time information is sent to operators for enforcement, surveillance and data collection.

The intelligent system interface and network controller collects, interprets and processes signals from WIM sensors.

How images of the vehicle are captured and used for identification or classification purposes

How images of the vehicle are captured and used for identification or classification purposes. Virtual weighstations with Optical Character Recognition (OCR) technology can automatically convert the optical character recognition (OCR) to digital format so the plates may then be used to look up the vehicle identification, which is often used to look up information on the vehicle or carrier.

Electronic stability control (ESC) has been hailed as the most important safety advance since the seatbelt and is already required in many new vehicles in Europe. It is a welcome news that a recent survey by the European consortium, advanced emergency braking system, reveals that when it comes to selecting a new car, safety is the number one priority. It is perhaps surprising, though, that the survey also shows that the two criteria considered next most important are fuel consumption and running costs. This perhaps indicates that car buyers are also realizing the importance of a green vehicle when it comes to buying a new car, with surprisingly the brand taking second place. ESC, advanced emergency braking and adaptive headlights are equally important for men and women, while respondents who had been involved in a critical situation see importance of safety systems higher.

ESC helps avoid a crash by reducing the risk of skidding during a sudden emergency manoeuvre by stabilising the car by braking individual wheels. Advanced emergency braking uses sensor technology to monitor the road ahead and will, if a potential collision is detected, warn the driver of the danger. If there is no reaction to the warning, the technologies activate the brakes together with systems such as seatbelt pretensioners to avoid an accident or to reduce the impact of a crash. ESC is set to be a legal requirement for newly manufactured vehicles in the UK and HDV from 2014, while ESC has only just been introduced in new vehicles in France, Germany, Italy and Poland.

ESC is an efficient, cost-effective method for both enforcement and data collection, and provides an unobtrusive way to monitor traffic in real-time on a 24/7 basis, requiring significantly less infrastructure for installation and operation than conventional commercial vehicle inspection stations.

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