

## Partnering for Traffic Data, Unique Solution for Planning and Development of Thailand's Motorway Network

The Thai motorway network is an intercity roadway system designed for high capacity and swift movement of vehicle traffic. Currently there are two major motorway routes in Thailand – motorway route 7 and motorway route 9 - with new and expansions of existing motorway routes planned.

Motorway route 7 stretches nearly 150 kilometers from Sri Nakharin Road in Bangkok, carrying traffic East. There are two sections of motorway route 7, a toll section and a free section. Motorway route 9, also known as the Outer Ring Road, has free and toll sections as well. The Thai motorway is operated and maintained by the Intercity Motorway Office, which is a government agency under the Department of Highway, Thailand's largest transportation department. Since the motorway routes are not completely closed, vehicles can move in and out of the system for free, avoiding the toll sections. This introduced a problem for the Intercity Motorway Office – what amount of revenue were they losing from vehicles not using the toll sections?

### **Loss of Revenue**

The Intercity Motorway Office determined that they needed to know the number of vehicles using the system as well as their classification in order to determine their loss of revenue. Revenue collected from the tolls goes toward operating and maintaining the motorway system. Without proper funding, roadways can fall into disrepair and eventually cost a greater amount to fix than to just maintain.

In order to collect the type and amount of data needed, the agency required traffic sensors and a method to collect vehicle count and classification at every entrance and exit of the motorway. The motorway does have axle count systems at toll booths, but not on entrances and exits. They needed a more comprehensive solution and a partner.

## **Partnering for a Solution**

New Trend Development Company Ltd., an ITS and traffic data solutions company in Thailand, teamed with Thammasat University to propose a solution for the Intercity Motorway Office. New Trend and the University would supply the equipment required for the project, and sell the traffic data to the Motorway Office. This solution allows the Motorway access to the data they need without having to install and maintain the sensors.

New Trend proposed the use of wireless, permanent traffic sensors. The sensors chosen for this project are known as the Vaisala Nu-Metrics Permanent Traffic Analyzers. They are manufactured by Vaisala, Inc. in the United States. The two main reasons these sensors were chosen were: lower installation costs and ease of maintenance.

“The Vaisala Nu-Metrics Permanent Traffic Analyzers use wireless communication, which saves a lot of installation cost compared to other systems,” comments J.J. Nutayakul of New Trend Development Co. “With the limited time frame given to us by the Motorway, we were forced to install everything in just 20 days. I do not think we could do this with other products.”

In that 20 days, a total of 140 Permanent Traffic Analyzers and 35 Local Base Units (LBUs) were deployed. The Permanent Traffic Analyzers collect vehicle count, speed and classification data, as well as basic pavement temperature and condition data. They are placed in the roadway, flush with the pavement, and feature a removable lid so that sensor components can be removed during road maintenance or sensor maintenance. “The Permanent Traffic Analyzers are easier to maintain than loops and are perfect for areas where permanent traffic data collection is needed, such as this project,” adds Nutayakul.

The Vaisala Nu-Metrics Permanent Traffic Analyzers utilize Vehicle Magnetic Imaging technology to detect vehicle data. Vehicle Magnetic Imaging (VMI) technology works by detecting vehicles as they move through the Earth's magnetic field. Every motor vehicle has parts that are constructed from iron. When a vehicle passes over the traffic sensor, the iron parts interfere with the Earth's magnetic field. This disturbance creates electrical signal changes in the traffic sensor, and as a result, the traffic sensor can determine vehicle presence, count each vehicle, measure vehicle speed, and record vehicle length.

### **It's All About the Data**

The Intercity Motorway Office's ultimate need was the data, not the equipment used to capture the data. With the solution provided by the University and New Trend, the project was able to be deployed quickly and provide accurate data to the Motorway.

Each Permanent Traffic Analyzer reports data back to a roadside device called the LBU. From there, the University and New Trend view the data using Wireless Data Management (WDM) software, created specifically for use by Vaisala for the Permanent Traffic Analyzers. Using the WDM software, data collected can be reported in a variety of charts, graphs or other data displays. With the partnership, the Motorway is able to get the data they need, in an easy-to-read format. Thammasat University and New Trend handle the maintenance and initial data collection, and provide a final report for the Motorway.

With such a recent deployment of these Permanent Traffic Analyzers, the Motorway does not yet have statistics available about vehicle counts or revenue lost. The agency is looking forward to gaining the information they need for future planning and development of the entire motorway system.