EARTH RESOURCE MAPPING
TRACKS HONG KONG VEHICLES

E &S Land Data Management Consultants (ESLD, Kowloon, Hong Kong, ROC) have developed a real-time vehicle tracking system to enable the Hong Kong government to manage the transport industry’s ground fleet of 8,000 vehicles more effectively. The high-rise buildings and narrow streets of Hong Kong make it extremely difficult to cost-effectively track and manage such a large fleet. Only by contacting the drivers could managers in the control center determine the approximate location of the vehicles. There was no sure-fire way to accurately schedule deliveries and pick-ups.

In February of this year, ESLD outfitted 60 vehicles in the fleet with GPS receivers and modems. This black box system requires no driver intervention. Units are located in the vehicle cabs with a roof-mount antenna and are encoded with unique identification numbers. The system generates a Global System for Mobile Communication (GSM)-formulated GPS located signal that is constantly updated and transmitted to the control center with the unique identifier.

In the control center, the On Line Fleet Management system can track as many as 100 vehicles in real time using custom-built Windows-based software. The user interface runs on a standard off-the-shelf PC with Windows NT installed.

To give real-world context to the vast amount of GIS data that control center operators must view, ESLD uses wavelet compressed raster images as backdrops. ESLD mosaiced 1:20,000 digital maps and vectors and compressed the 600-MB files to less than 10MB. The compression provides faster access times to imagery and enables the operator to open several different map windows simultaneously to monitor multiple situations.

The application windows display compressed raster imagery of Hong Kong and its surrounding metropolitan area with incorporated vectors and blinking vehicle location icons, as well as log file records and geospatial details for each vehicle. This means that, in addition to real-time data, the system displays a list of coordinates for every vehicle, showing the history of a particular unit’s movements.

Using compressed imagery in its GIS allows the system operators to roam and zoom over the maps in real time as the vehicles are moving. Vehicle locations can be compared against preset routes to determine whether a driver is adhering to the schedule. The interface is customizable, allowing the operator to control update rates, icon labeling and point sizes, and window placement.

The Hong Kong government’s vehicle tracking system relies on Trimble (www.trimble.com) Placer GPS receivers to position its vehicle. The GPS data are transmitted using a 455DR WM02 GSM 900 (since renamed the WMOD2) modem from Wavecom (www.wavecom.com). ESLD compressed the imagery using Earth Resource Mapping (www.ermapper.com) ER Mapper ECW product. The Lands Department of Hong Kong supplied the imagery.