



## **PARCELLCALL**

### ***Intelligent tracking for transport and logistics***

#### **The challenge**

An increasingly important issue for the transport and logistics industry is keeping track of goods in transit. Supply chains are becoming ever more complex and on the journey from supplier to customer, goods may be handled by a number of different carriers and use a number of different types of transport. There is need for accurate and up-to-date information exchange among these different carriers and modes of transport. Although many transport and logistics carriers already have tracking and tracing systems, these are generally proprietary solutions and are only effective if all the carriers involved use the same proprietary system. A system based on open standards and interfaces would allow seamless tracking and tracing across the entire logistics and transportation chain.

The IST project [ParcelCall](http://www.parcellcall.com) ([www.parcellcall.com](http://www.parcellcall.com)) has developed a scalable real-time, intelligent, end-to-end tracking and tracing system for transport and logistics applications - to operate across all borders, carriers and modes of transport

#### **The technical solution**

Accurate tracking and tracing involves being able to identify individual items and the truck or container that is carrying them. ParcelCall uses Radio-Frequency Identification (RFID) tags to complement existing bar codes and labels. It also uses 'Thinking Tags' to identify sensitive or perishable items. Thinking Tags are equipped with sensors to monitor environmental conditions, keep a record of those conditions and raise an alert if the goods are likely to be damaged. An RFID tag or thinking tag is attached to every parcel in a shipment.

Each container or vehicle is equipped with a Mobile Logistics Server - an on-board computer that regularly interrogates the RFIDs and Thinking Tags to maintain an up to date record of the items it is carrying. It also uses the Global Positioning System to determine where it is. It uses the mobile communications network to send alerts if, for example the goods deviate from the planned route or the thinking tags report that the goods are at risk of being damaged.

Fixed servers called Goods Tracing Servers poll the Mobile Logistics Servers at regular intervals to maintain an up to date inventory of every item currently within the transport system. These Goods Tracing Servers also form the interface between the ParcelCall system and the individual logistics companies. They are equipped with Goods Information Servers which can access the ParcelCall system using cellular networks, ISDN or the Internet to obtain a up-to-date status report on all the items for which they are responsible. This will allow them to even if a single item out of a large shipment gets lost, damaged, or takes a different route to the rest of the shipment.

An important feature of the ParcelCall design is that it uses open (and ideally standardised) interfaces between all the system components and uses standardised communication methods, such as GSM mobile communications, the Global Positioning System, Bluetooth and the Internet. These keep costs down and make it easy for logistics companies to adapt their existing systems to handle the information provided by ParcelCall.

#### **The results**

Field trials of the system were undertaken to check the effectiveness of the RFID tags and 'Thinking Tags' and ensure that the various components of the system could work together and deliver the required real-time flow of information about the status of consignments and individual items across different carriers and transport modes.

The scenario for the field trials involved the distribution of Ericsson mobile phone equipment by the logistics companies TNT and Hammer. The journey started at Katrineholm in Sweden and the equipment went via the carriers' sorting hubs in Germany and the Netherlands, then through Belgium and France and via the Channel Tunnel to their eventual destination in UK. The two carriers handled different parts of the route, with Hammer picking up the goods in Sweden and TNT delivering them in



the UK. The journey also involved a sea crossing from Denmark to Germany and a Eurotunnel trip under the English Channel.

Although the trial only involved a relatively small number of tagged items, the system was able to track their progress with a delay of about 5 minutes, identify when they were handed over from one carrier to another and detect items that were mislaid during the transfer. The status could be monitored by interrogating the system using a web-browser or a WAP mobile phone.

## **Conclusions**

ParcelCall has successfully tested a prototype of a system for tracking the progress of goods in transit. The system design focused on interoperability, open interfaces, and standardisation in order to allow seamless tracking and tracing across the entire logistics and transport chain. Its open and scalable architecture means that a commercial version of the system would be suitable for small trucking companies as well as the large logistics multinationals who took part in the trial.