

Mainstream Transportation Providers Adopting Biometrics

The adoption of biometrics technologies for cargo transportation applications, now being driven by the post-Sept. 11 "security fever," has actually been in process for several years. The biometrics-based projects profiled in the case studies included in this section (with the exception of the concept piece for the U.S./Canadian border crossing) were well underway prior to Sept. 11. For many of these projects, security enhancement was only part of the motivation for implementing biometrics. Equal, or in some cases greater, emphasis was placed on the potential for increased operational efficiency gained through expediting the movement of cargo and the processing of paperwork.

market drivers

Surprisingly, transportation companies can be aggressive adopters of new technologies—once the technologies have been proven. These companies are driven to adopt new technologies because of dynamics within the highly volatile transportation marketplace that require continual process improvement and related cost reduction. These dynamics include on-going industry deregulation, the acceleration of global commerce, the unprecedented expectation of instantaneous worldwide communication, intense competition among and between transportation sec-

tors, low operating margins and the opposing forces of fragmentation and consociation in certain industrial sectors.

mainstream adoption

As with all emerging technology markets, process improvement is key to the mainstream adoption. When faced with serious business-process deficiencies and technology solutions proven to address these deficiencies, mainstream adopters take the plunge and integrate new technologies into their existing infrastructure.

Post-Sept. 11, media-hyped security concerns have forced transportation providers to look more closely at their vulnerabilities and focus substantial resources on assessing and reducing risk. However, ultimately it is *process improvement* - cost reduction, productivity increases and improved customer service - that will motivate mainstream transportation companies to turn to biometrics.

market innovators

The market innovators profiled in this section have linked human identity to the transfer of goods and delivery of services. As these organizations have learned, this link creates accountability, expedites cargo processing, helps address fraud and theft risks, and pro-

vides an accessible and reliable audit trail if security is compromised.

For these market innovators, biometrics solutions also contribute to increased operational efficiency. In the Chicago O'Hare electronic manifest pilot, for instance, a biometrics-based driver-authentication system has proved two to four times faster than traditional paper based systems. Union Pacific Railroad's voice-recognition rail car release program has reduced call center traffic for these calls by 30 percent. These examples demonstrate that significant time and cost savings can be achieved through the application of biometrics-based solutions.

The case studies appearing on the next few pages include reviews of these and several other early-market successes in conceptualizing, testing and deploying biometrics to expedite and secure cargo transportation. The technology applications showcased in these case studies meet the requirements necessary to foster mainstream adoption because they achieve operational efficiencies and are endorsed by trusted players within mainstream market sectors. As a result, they can be leveraged to foster further market development.

Transportation Case Studies - Freight and Cargo

These case studies demonstrate the security enhancements and operational efficiencies that can be achieved with biometrics and set the stage for mainstream adoption in the trucking, rail, maritime and air cargo industry sectors.

Location	Company/Sponsor	Application	Biometrics	Vendor/Solutions Provider	Status
Rotterdam	Rotterdam Seaport	Secure Access - Commercial Truckers	hand	Recognition Systems	Deployment
Chicago	FAA, ATA, Sate of Illinois	Logical Access - Cargo Supply Chain	finger	SecureCom	Pilot
Edmonton	Canadian National Rail	Secure Access - Commercial Truckers	finger	SAIC	Pilot > Deployment
Canada/US	InterVISTAS	Border Crossing - Commercial Vehicles	unknown	unknown	Concept/Strategy
St. Louis	Union Pacific Railroad	Logical Access - Rail Car Release	voice	Speechworks	Deployment

Case Studies

Secure Access: Marine-to-Truck Transfer at Rotterdam Seaport

(Vendor -- Recognition Systems)

Rotterdam, in The Netherlands, is home to the world's largest seaport. Handling more than 300 million tons of freight each year and accounting for 40 percent of all European cargo, this port is the central hub for European commerce. More than 40 percent of all European Union trucking companies originate in The Netherlands.

Faced with the increasing demands of global commerce and reliance on intermodal cargo transfers throughout the freight distribution chain, Rotterdam has pushed its seaport to the forefront of modernization (see page 5 for more on Intermodal Cargo). One small part of this modernization process has centered around the deployment of a hand-recognition system to control truck driver access to the port. The system, which was

installed in June 1999, expedites the movement of cargo from marine vessels to trucks, verifies the identities of "known" or trusted drivers and provides a detailed electronic audit trail for cargo. Drivers access the system's hand recognition reader via their vehicle windows as they pass through the facility control gate. Their identities are verified as their hand geometry is compared against the template stored on a radio frequency activated smart card. The system serves more than 6,000 truck drivers and has successfully completed more than 3 million transactions.

In many ways, The Netherlands is on the forefront of biometrics adoption. Amsterdam's Schiphol Airport is in the process of deploying iris recognition technology for

50,000 trusted EU travelers and eventually for 50,000 employees for secure access. Asylum seekers in Rotterdam are enrolled in a biometrics-based registration program and The Netherlands' government recently announced that EU identification cards will be biometrically enhanced by 2003.

With the success of so many existing biometrics applications and plans for a number of future applications, the Netherlands is poised to become a leader in biometrics adoption. It is likely that we will see additional biometrics installations at the Rotterdam seaport and for air cargo security at Amsterdam. For information about biometrics at Rotterdam seaport, contact the vendor at www.recogsys.com

Secure Access: Rail-to-Truck Transfer - Canadian National Railway

(Vendor – SAIC)

Canadian National Railway (CNR), the fifth largest railroad in North America, recently completed a test pilot that integrated a fingerscan biometrics application into its *Speedgate* control system at the company's intermodal transfer facility in Edmonton, Ontario (See page 5 for more on Intermodal Cargo). The *Speedgate* system was designed to monitor and expedite commercial truck access to all of CNR's intermodal transfer facilities located throughout North America. (The fingerscan biometrics application was initially tested only at the Edmonton facility.)

The *Speedgate* system uses Optical Character Recognition (OCR) surveillance to identify vehicles by reading license plates, container numbers and even company names and logos printed on trucks. Electronic bills of lading - the documents describing shipment contents - are activated as the containers are recognized by the system. A fingerscan biometrics application was added to the *Speedgate* system in Edmonton to enhance security by linking cargo containers to the identity of specific drivers. This provides an

accurate record of who is accessing the facility and a readily accessible audit trail for all containers in the event of a security breach. CNR required all truck drivers that access the Edmonton facility to enroll in the fingerscan program, but relies on documentation provided by truck companies to establish the identities of their drivers.

The biometrics template data for the program is stored in a central database so that enrolled drivers can access the system at any of CNR's intermodal transfer facilities. CNR's system conforms to strict Canadian privacy laws and all data is protected under the Canadian Federal Privacy Act. SAIC was the project integrator, providing the control gate, the OCR surveillance system, the biometrics and the systems and software.

The motivations driving CNR's biometrics pilot program include:

- improving traffic flow through an intermodal facility that is seeing rapid increases in freight volume;
- reducing theft and fraud;

- creating an audit trail for all transactions throughout the facility; and
- improving operational efficiencies.

CNR encountered some initial resistance from drivers regarding the fingerscan biometrics. Drivers expressed discomfort and fear because of the association of finger images with criminal activity. However, no one refused to participate and this initial reluctance was overcome. As the facility operators and user community became familiar with the system, processing was smooth and the results positive.

CNR is extremely pleased with the results of the Edmonton pilot and is planning three additional deployments at its Toronto, Montreal and Chicago transfer facilities. 500 drivers were enrolled in the Edmonton pilot. Total enrollment at the four facilities is expected to climb to 2,000. CNR may eventually roll the biometrics based system to approximately 20 facilities system wide. For more information about CNR visit their website at www.cn.ca.

Case Studies

Logical Access: Rail Car Release - Union Pacific Railroad

(Vendor – Speechworks)

Union Pacific, the largest freight railroad in North America, has integrated voice recognition technology into its customer service operations to enable customers to release empty railcars. Prior to integrating this technology into its customer service operations, 18 percent of Union Pacific's total customer service calls - approximately 22,000 monthly - were to notify the company of empty railcars to be moved out of the customer's inventory. Transferring 30 percent of these calls to a secure automated system has expedited release requests and reduced call center costs by offloading calls from human operators. Currently, 1,000 users access the system to release approximately 7,000 railcars per month.

Initially, higher than expected failure rates were experienced when enrollment was based on using a single voiceprint to create a biometric template. The success

rate of the deployment increased dramatically when the system was modified by requiring enrollees to provide three voiceprints. The caller's voice was then matched to one of the three enrollment prints, which immediately resulted in a high success rate. Voice prints are tied to a Union Pacific provided User ID, which results in three levels of security. The User ID is tied to the caller's employer, the railcar being released must have the employer as part of the shipping document and the User ID is tied directly to the voiceprint.

The application has been extremely well received and Union Pacific plans to expand its use of voice recognition technology. This month, the company implemented a new application that will include some 6,000 users and address security for major intermodal shippers. This new voice recognition technology is being used to provide a unique shipment security number to pre-selected truckers

that are moving containers from the railroad's intermodal ramp to its unloading point.

Union Pacific has prior experience integrating voice-based technologies into its business processes. The railroad company was an early adopter of the Dragon speech-recognition system, which was integrated to decrease the potential for carpal tunnel syndrome among its loyal, long-term workforce by reducing keystroke volume.

The company has ongoing plans to integrate voice-based biometrics into several critical business processes to improve efficiency and enhance security. These include voice enabling the ability to order loaded or empty railcars, rail equipment tracking and simple bills of lading. More information on Union Pacific at their website at www.up.com.

Concept Piece For Expedited Border Crossing between Canada & US

(Vendor - InterVISTAS)

InterVISTAS Consulting, Inc, a strategic consulting firm in Vancouver, has introduced a *concept piece* - a strategic approach - to address the management of land border crossings between the United States and Canada. The plan addresses the movement of both passenger and commercial vehicles with an emphasis on expediting freight movement.

InterVISTAS concept was motivated by the "Smart Border Declaration," a 30-point action plan designed to speed and secure the flow of goods across the U.S./Canadian border that was signed on December 2001 by U.S. Homeland Security Chief Tom Ridge and Canadian Minister of Foreign Affairs John Manley. The "Smart Border Declaration" addresses the impact of post-Sept. 11 security measures on cross-border transportation and specifically references the

need to create a *common biometric platform* as part of an overall border-crossing solution.

Sept-11 exacerbated an existing cross-border issues as 50 percent all Canadian cargo is destined for the U.S. and more than 400,000 containers cross the border each year. The U.S./Canadian border covers 5,500 miles and includes 130 crossing points with 3 locations -Windsor, Vancouver and Niagara Falls --accounting for 70 percent of this traffic.

InterVISTAS has developed an overall strategy to address cross-border issues that integrates several technologies. These include electronic seals, radio frequency identification, global positioning system for freight containers and commercial vehicles and biometrics for attendants, drivers and other individuals involved in the manage-

ment and distribution of cargo. The idea is to pre-clear low-risk cargo delivered by pre-approved or "trusted" drivers to reduce border chokepoint congestion.

The company proposes creating commercial trans-border crossing facilities directly inside the Canadian border. These areas would process trucks more quickly and with greater flexibility than currently exists at established border-crossing points. Clearance activities would be completed and commercial vehicles would proceed to border checkpoints where biometrics and other technologies would be used to ensure the integrity of the cargo expediting overall throughput.

InterVISTAS has created a coalition to generate funds, complete research, demonstrate benefits and determine advocacy for the advancement of this idea. Individuals

Case Studies

Logical Access: Electronic Supply Chain Manifest - O'Hare Airport

(Vendor – SecureCom)

Perhaps, the most well documented, publicly accessible and widely reported on pilot of biometrics in the transportation industry, is the O'Hare Electronic Supply Chain Manifest System (ECSM). This is the second phase of a pilot initiated in 1996 to design, develop and test a technology-based alternative to existing manual air cargo processing. The project has two distinct overarching goals: 1) automate traditional manual processing of cargo documents to improve operational efficiency and 2) secure cargo integrity by confirming the identify of responsible parties along the entire distribution chain.

Phase-one of this pilot used biometric identification linked to smart cards to secure electronic manifests and confirm identity of all individuals originating, transporting or receiving cargo. Phase-two extends the efficiency and security achieved in phase one by introducing a secure virtual private network (VPN) to automatically transfer cargo information and shipping data across multiple transportation modes and political jurisdictions. The system tracks shipments from origination in the Chicago area through delivery to JFK.

Phase-two participants include 12 airlines, 25 trucking companies, 12 manufactures/shippers and 750 drivers. The project includes 20 sample distribution chains based

on existing relationships among commercial enterprises.

Traditional methods of verifying shipments and drivers rely on photocopies of commercial licenses, identification numbers and "known" shipper status (see *How Well is The "Known" Shipper Known*, page 11). The biometrically enhanced ECSM greatly reduces opportunities for fraud, theft and other security breaches.

A combination smart card and fingerscan reader is used to secure access to the ECSM. Manufactures/shippers logon to a designated computer and create an electronic manifest in a central repository accessible via a VPN. All downstream participants - truckers, freight forwarders, airlines - are notified as manifests are confirmed ready for shipment. In fact, all participant are notified as the cargo moves through each stage of the distribution chain. This advance notice improves operational efficiency as participants can plan and schedule around anticipated shipments.

The driver's identity is verified on pick-up and delivery. The driver submits their biometric and swipes their smart card. The biometric is confirmed and the photo and personal information from the driver's commercial license (CDL) is displayed on the

computer screen. (The biometric template and the CDL information are both stored on the smart card). The attendant confirms that the information on the screen matches the individual presenting themselves and - at the shipper's discretion - information from the electronic manifest can be loaded onto the smart card. The process is repeated and reversed when the shipment is delivered to next transportation provider.

The project was led by the American Trucking Association Foundation in a public-private partnership composed of the Federal Aviation Administration, the Department of Transportation Office of Intermodalism, The Federal Highway Administration, The State of Illinois, the Chicago Department of Aviation and participating manufacturers, shippers, motor carriers and airlines representing distribution chains in the Chicago O'Hare airport area.

The 12 month phase-two pilot will be completed in this month. The long test period was essential in order to demonstrate the effectiveness of the fingerscan technology in a variety of extreme weather conditions. Current plans call for extending the pilot to JFK, LAX and Toronto airports. For extensive coverage of project and details and results, see www.cargosafety.net