White paper

In Transit Visibility:
It's all about Mobility, Visibility and Control

Intermec®

The transportation and logistics industry has been among the hardest hit by recent challenges to the world economy, and the market is poised for increased complexity. Freight volumes are down while fuel costs rapidly rise. Changes in regulatory requirements and a short supply of qualified drivers have only intensified the situation.

Although these challenges are widely recognized, customers continue to demand premium services, more options, more information; simply put, more for their money.

Transportation companies know they must respond to customer demands as well as the industry's competitive pressures, but turning a profit is paramount, and, as any business student knows, it all comes down to **increasing revenue while reducing costs.**

Turning a Profit . . .and Then Some

In the transportation industry, increased revenues are earned by:

- Improving customer service
- Better managing capacity
- Identifying new revenue streams
- Providing on-time, error free, damage-free shipments

Fixed and variable costs are reduced by:

- Improving asset, resource and inventory utilization
- Meeting changing regulatory requirements
- Eliminating claims, accidents and incidents that detract from the profit line

What changes are necessary within your business to attain these improved levels of efficiency and profitability?

Introducing In-Transit Visibility

While many transportation companies possess "back end" systems that excel at extracting, analyzing and utilizing information, mobile computing solutions are now available that supply this valuable information to achieve a new level of visibility and control over assets, resources and inventory.

In-Transit Visibility (ITV), a term coined by The Department of Defense, is a concept quickly becoming commonplace in private industry. ITV is defined as the ability to track the identity, status and location of inventory and shipments from origin to consignee or destination, delivering true transparency to the supply chain.

ITV brings transportation companies increased opportunity by improving their visibility to assets, inventory and resources, making each much easier to control while allowing companies to attain new efficiencies and reduce costs.

The increased control afforded by ITV also allows transportation operations to differentiate from the competition by enabling a higher level of customer service, and potentially new revenue streams. In-Transit visibility applications create visibility and control in the cab, at the terminal/ depot and at the customer's door.

ITV in the Cab

Location awareness, inventory and equipment tracking, and hours of service monitoring are all ITV-enabled functions that bring visibility and control to the driver and those that manage the driver.

Enhanced Location Awareness

Traditionally, location awareness was the ability for dispatch to identify a vehicle's current and past locations. Today's more proactive approach allows transportation companies to optimize revenue-generating opportunities, maximize cost efficiency and improve resource utilization. These benefits are realized through the use of the following tools:

1. Navigation

While commonplace in the consumer space, navigation is just beginning to deliver the benefits promised to the transportation sector. More powerful mobile computers can perform real-time navigation and voice guided turn-by-turn directions, which enable safer, more cost efficient driving conditions.

Even the most seasoned drivers can get turned around at the city street level, and any time spent searching for the customer address eats into company resources, fuel and customer patience, and puts the driver and equipment at significantly higher risk for accidents, driving violations, hijackings or personal injury. Risk mitigation aside, the reduction in unnecessary miles achieved through navigation technology delivers its single largest return on investment.

Source: ALK CoPilot screen. www.alk.com.

Save Five Miles, Save a Gallon

Just five miles a day (or two to three miles and thirty minutes worth of idle time, spent while the driver finds someone to give them local directions) can save a gallon of fuel. At today's prices a gallon of fuel costs around $4.00 (USD). Saving $4 a day, three days a week, translates into $52 per month or $624.00 per year, dropping $62,400 a year to the bottom line for a 100-vehicle fleet. That's without considering costs associated with driver time, vehicle wear and tear or customer service and satisfaction. This return supplies a great foundation for justifying the investment in a mobile computing solution to improve overall operation performance.

2. Route Optimization
Enabled by today's mobile technology, companies can take advantage of dynamic route optimization, by which a software application allows dispatch to add extra stopping points to the route. The software then sequences the stops to make the new route the most expedient one. This differs from past solutions in that only the new route point is transmitted to the mobile computer for optimization instead of a reorganized version of the entire route.

Previously, the back office system reorganized all points on the route and sent a new route to the driver, which became out of date the moment he made a wrong turn or detoured off the intended route. Optimization performed at the vehicle continually monitors for location and offers the driver the most efficient route for completing the tasks left on his route.

Without this technology, the driver must pull over and figure out a new route, relying on his knowledge of the area and perhaps a map, or the driver spends more mileage and time, driving back and forth on what he thinks might be the best route, wasting precious time and fuel.

Route optimization also helps transportation companies that perform local pick up and delivery to offer enhanced services. With priority packages that require delivery before a specific time in the day, regular packages to be delivered by end of day, and pickups scheduled throughout the day, a driver's route can crisscross an area countless times. The best route optimization applications consider all the tasks, time constraints and locations in a driver's day and identify the most efficient route to satisfy each of the demands in the safest manner possible.

In-transit Track and Trace
True in-transit visibility allows users to know exactly where a fleet's trucks are, and more importantly, where the shipments or inventory they are carrying are located at any specific time. This visibility is available through item level tracking, which gives transportation operations the transparency today's customers demand.

Item level tracking answers questions such as:

- Is the shipment/item en route?
- Has this item or product been delivered?
- Who was it delivered to and at what location?
- Was the delivery location the intended destination?

Without item level visibility there are no proven answers to these questions, only the knowledge that the truck traveled the intended route. But where is the customer's package or inventory item? Will the company be paid for its services, or, without proof of the delivery, is it liable for the item's loss?

Item level track and trace verifies that the right shipment got to the right destination, on time, damage free, all with the validation of the recipients' signature and confirmation from location stamps, time stamps and other forms of identification as necessary.

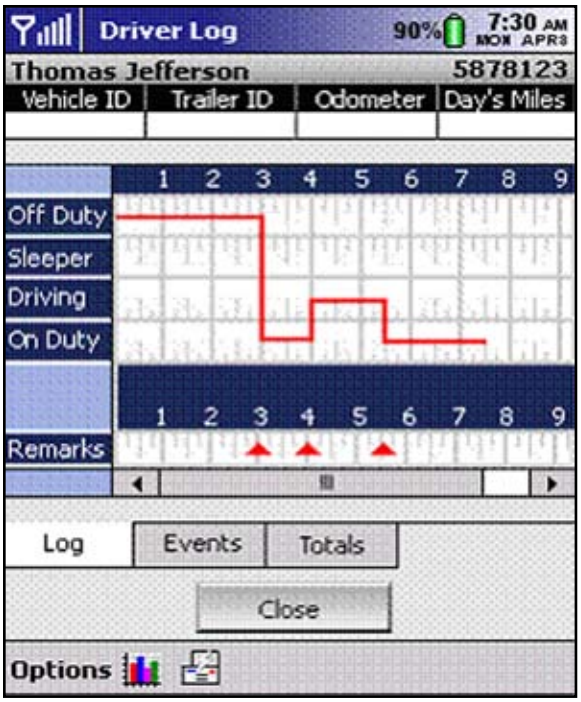
ITV-enabled track and trace also allows fleet operators to locate specific products and shipments in the transportation stream, which can be particularly useful for damage control in the case of a product recall or when an emergency situation demands that inventory is redirected.

Hours of Service
Simply put, the fleet cannot produce without drivers, and drivers are limited by regulations that mandate work availability. Once a driver starts a work period, they must work as efficiently as possible to best utilize their time. Any efficiency robbing-distraction -- waiting for a new assignment, getting lost or being delayed by customer -- costs time, which results in loss of company revenue and earning potential for the driver.

The application of these regulations – and thus the productivity of the fleet -- generally is left in the hands of the driver, who may or may not have an agenda that falls in line with that of the company. And, as is universally true, we all make mistakes on paper. Intentionally or not, drivers can manipulate the productivity of their fleet simply by the way worked hours are reported, lessening the company's ability to use and control the hours available to production.

Additionally, to keep paper logs up to date, drivers often must pull over to the side of road, which consumes time otherwise used moving product and making money for themselves and their employer. Bottom line: Paper-based HOS reporting systems make it extremely difficult for fleet operators to control productivity and best utilize the hours of driving time available to them.

ITV solutions allow visibility into a driver's hours that can empower a company to coach the driver and improve reporting practices, so everyone wins. Real time electronic logs reduce company liability for reporting errors, and very often increase driver time available to the company. An automated, electronic reporting system ensures full-time, real-time visibility and control over this valuable and finite resource.



Source: Velocitor Solutions driver hours of service log screen. www.velsol.com

ITV at the Terminal / Depot
Operations employees such as dispatchers and customer service personnel rely on data to do their jobs; accurate, timely information is vital when optimizing asset utilization and resource productivity. To ensure that the company's assets are applied in the most efficient and expedient manner, terminal and depot employees need to know the location of each company truck as well as detailed information about the condition of the truck, drivers and individual items in the shipments they are transporting.

Asset Management
How Many Trucks Do We Need?
The mobile assets of a transportation fleet – tractors, trailers and trucks -- are its single most valuable, and require the most capital to maintain. Owning too much equipment can ensure readiness for any customer request, but this option is needlessly costly. And although transportation companies sometimes meet unexpected demand by supplementing the fleet with leased trucks & trailers, this last-ditch effort is expensive.

The optimal balance is enough trucks but not too many to maintain, pay for, insure and account for, because anything more is taking money from the company's bottom line. The only way to take advantage of all the company has to offer is through a thorough, up-to-the-minute understanding of exactly what assets are available for use. This understanding is available via in-transit visibility.

Proof in the Profits
ABC Corp. has 1000 trucks shipping 1700 loads a day or 1.7 loads per truck per day, with an average revenue of $500/load or $850/day revenue per truck. If ABC increases the loads from 1.7 to 1.8 by understanding more details about their fleet and available capacity, it will add $50,000 a day or $13M a year to the revenue line without increasing fixed costs.

By increasing visibility of the fleet, the company can accurately project where/how to increase the number of shipments per day, which is a more profitable way to grow the business than to add additional equipment. ITV makes these projections possible by delivering visibility to the location and activity of your assets.

How Do We Take Care of the Trucks We Have?
In today's economy with high fuel and labor prices, assets must be closely monitored so that they operate efficiently on the road. Two factors – asset operation and asset performance -- greatly influence equipment "health," and ITV helps to control them both.

Asset Operation – ITV technology allows visibility into the way drivers operate company assets. Telematics systems and sensors such as accelerometers measure G forces, hard braking events and analyze driving patterns, alerting the company to hard or reckless driving that wastes fuel and puts the company at risk for increased liability.

Asset Performance – ITV measures the efficiency of the asset's operation, answering questions such as: Is the vehicle running as cleanly and efficiently as it can? Does it have fault codes or other indicators of less than optimal operation? Is it burning too much fuel? Putting out emissions? Operating reliably? Is it safe and comfortable for the driver?

Brake sensors, tire pressure sensors, RPM and MPG monitors, ambient outdoor thermometers and other devices deliver real time visibility to these important details, alerting the company to an impending part failure or simple maintenance issues that can result in costly vehicle performance.

From the fuel efficiency of an individual vehicle to the optimization of the entire fleet, ITV provides the information needed to improve operational efficiency and the opportunity to generate new revenue.

Resource Management
By having better visibility to its human resources, operations managers can best match the most qualified person to a job, manage that person's time and activities and provide them with all of the information they need to deliver superior customer service and operational efficiency. ITV enables operations to see where available resources are, what they are doing, and how to make them the most productive.

Beyond choosing the best driver for the job, ITV also allows operations to determine available driver hours, which is essential to answering the question, "Do we have enough drivers to accept this new assignment?" ITV not only answers this question, but also allows dispatch to examine drivers' hours of service alongside payroll and other information, such as special licenses or training, to help them choose the best driver for each job.

Location Awareness
Today, location awareness technology not only allows terminal/depot staff to locate vehicles, but also human resources and inventory. ITV-enabled location awareness indicates the location of trucks and drivers that are on the road as well as those in the yard, bringing visibility into what is available to go out on short notice, so the terminal or depot can easily pinpoint exactly how many new assignments it can accept.

For example, knowing that ten trucks are due into a city doesn't help the depot know when these trucks and their drivers will be available for use again. Having real-time location awareness, along with detailed shipment status, allows operations to be more confident in accepting future assignments.

Oddly enough, it can be more difficult to locate an asset on the company facility than one out on the road. ITV-enabled Real Time Location Services (RTLS) allows users to know exactly what is in the yard and, more importantly, where it is. This ability strengthens security of physical assets and speeds processes such as maintenance, so the maintenance crew can fix a light on a truck instead spending time looking for it. Clearly, this increased awareness improves the productivity of operations and maintenance staff alike.

Inventory and Shipment Management
For private fleets, inventory management is greatly enhanced by ITV, as it allows users to watch product as closely as if it were still in the warehouse. Each item is quickly and easily scanned on and off the truck, giving immediate visibility to each specific piece in the shipment.

ITV enables real time proof of delivery, signature capture, even digital photos of the delivered goods to ensure quick payment for services rendered and extend the service offerings available for customers.

Overage, Shortage and Damage Management (OS&D)
Overages and damages happen; ITV helps to eliminate OS&D and reclaim the lost profits they consume by employing data collection and imaging technology. These technologies allow shippers to prove to customers exactly what is loaded and unloaded, along with the count and condition of the inventory at each point of action.

This up-to-the-minute, undisputable documentation also streamlines back office processes, eliminates unnecessary loss and damage claims, deductibles, associated administration efforts and data collection costs, ultimately providing customers with a higher level of service and more efficient operations for the company.

ITV at the Customer Door

At each customer doorstep the transportation service provider must collect information needed to prove that the shipment was delivered on time, without damage and in full. ITV technologies provide multiple levels of proof, including:

Signature Capture
ITV allows for electronic signature capture versus the traditional pen and paper signature, speeding the cash to cash cycle and significantly reducing time between completed service and collection for the service, thus positively impacting cash flow.

Signature capture can be accomplished via on-screen electronic capture, or, in industries and locations that require the signature on a physical bill of lading or delivery receipt, proof can be obtained via a signature document capture, where the paper is signed, scanned and then digitally transmitted. Signature document capture allows for the same efficiency of on-screen capture without requiring a process change.

Imaging technology has advanced considerably in recent years and now can locate the signature on a page and optimize the image, ensuring that it is usable. Professional imaging solutions are effective regardless of the skill of the operator, so no special training is required to produce useable images. As a buyer, however, be sure to understand the difference between document imaging and simply photographing a document, as the two solutions are worlds apart and can deliver significantly different results. For more on this topic, see Intermec's whitepaper, "Imaging in Transportation," at http://www.intermec.com/learning/content_library/white_papers/index.aspx.

Proof of Delivery/Service
ITV allows mobile computers to report an item level inventory of specifically what was delivered, from a single letter envelope, to boxes, barrels, pallet or truckload level. ITV technology delivers proof of delivery accuracy down to the level required by the customer and in the format they prefer – a capability not previously available with manual processes or legacy transportation data systems. Additionally, ITV-enabled proof of delivery technology ensures the count and condition of the delivered goods, significantly decreasing the instance of shortages and damages.

The advanced capabilities of ITV technology also enable transportation operations to use collected data to generate new revenue through premium services such as signature scans, detailed delivery and handling documentation, including photos, and document images stamped with location, date times and other pertinent data.

Generate New Revenue with Premium Services
- Signature Delivery Service – Electronic signature available for use in back office and web applications within seconds of delivery acceptance
- Secure Delivery – Allows more detailed verification of recipient and recipient identification
- Item level tracking and inventory visibility

Quality of Service
As transportation professionals know, providing information that substantiates the count, condition, date and time of a completed shipment is often as important as the shipment itself. Shippers must prove that deliveries were completed on time and damage free, and the more detailed and accurate information they can provide, the better for business.

Since many large shippers hold stringent reporting requirements of their service providers, acquiring advanced reporting capabilities can open up new business opportunities. Because these reports can be viewed as an extension of the services your company provides to its customers, they often command a premium pricing structure previously unattainable with manual reporting methods. This is not to say that in every case incremental charges can be expected for the services, but moreover that additional services help differentiate your business from the competition, endearing current customers and inviting new customers that desire the increased level of service.

Having real data collected at the point of work and immediately available to back office systems and on line portals helps transportation operations cut costs by eliminating general inquiry calls from the customer -- "Did it get there?" -- and verifies details such as date and time of customer signature and who signed for the shipment.

GPS stamping further enhances visibility by confirming the precise location of the completed delivery, and provides verification at the time of the service to the service provider that they are correctly delivering the shipment, thus eliminating the costly and time-consuming chore of retrieving and redelivering shipments that went to wrong address due to driver error.

Drivers can photograph the delivered shipment at the customer location, with the address of the shipment as identified by a GPS based application stamped into the image.

How To Choose an ITV Solution
Although ITV is a relatively new concept, the information technology industry has responded to the need with a broad range of options and solutions. Consider choosing an ITV solution with the following characteristics and features.

Solutions that are easy to handle get used more often, and therefore pay for themselves more quickly. Employees use hardware that is big or uncomfortable to operate only when they absolutely have to. Choose hardware that is ergonomic and comfortable for end users to work with day after day.

Overly complex technology intimidates those who are accustomed to manual systems or are new on the job. When employees avoid using new technology, the investment is wasted. New hires, temporary and peak time or holiday employees especially require a solution that is intuitive and easy to use.

Instead of weighing employees down with multiple devices to carry, learn and operate, choose one flexible solution that implements multiple technologies. Look for devices that incorporate a scanner, imager, cell phone, data and voice communications with GPS so there is one solution to buy, support, maintain, provide training on, carry and keep powered.

Rugged devices result in reduced total cost of ownership through longer use life with fewer repairs, higher solution up time, lower support costs and improved device utilization. Ruggedized devices also eliminate issues related to maintaining multiple modes as is necessary with consumer non-rugged devices over the course of a solution use life. For more information on ruggedized devices, read the Intermec whitepaper "It Pays to Understand the Total Cost of Ownership" at http://www.intermec.com/learning/content_library/white_papers/index.aspx.

Choose a single platform solution that can be used for multiple applications to get more value out of your technology investment. When a driver is finished with the device for the day, switch out the batteries and hand it over to a warehouse employee for loading and unloading in the distribution center or depot. The best ITV solutions are often based on a single device model that can be used in the truck cab, at the customer door, in the back office and warehouse.

Solutions that offer data capture instead of data creation (machine data collection over driver entry) greatly enhance system accuracy and bring all new time management and workflow efficiencies. Additionally, look for solutions that allow users to validate or select information from a database instead of entering the information via keypad speed workflow processes.

Look for solutions that offer a clear migration path and implement forward-looking technology to ensure that the ITV solution you buy today can be used and expanded for years to come.

How to Choose an ITV Applications Provider

Transportation is not just transportation. Each sector of the industry has different agendas, areas of focus and levels of detail; so one application does not fit all. Select an application provider that offers a broad catalogue of business solutions or one that can demonstrate experience in your sector addressing your specific needs. Don't be satisfied with a one-size-fits-all package.

Remember, hardware and software solutions differentiate themselves by the content --applications, tools, utilities and support -- they can supply to the user. Work with providers whose solutions are based on open industry standards so that your company can choose from an array of components when expanding your system. Open systems allow companies to select technologies by what works best for their business, not just what's available to work within a limited, proprietary system.

Upon immediate analysis of an ITV solution, the areas of return are not always obvious. Be sure to examine opportunities the solution affords for expense reduction as well as productivity improvement. Also, look for benefits that grow your business, such as customer service improvement, customer visibility improvement, and differentiated services that will net additional revenue.

Summary

Ultimately, ITV benefits transportation companies by delivering visibility and control of assets, resources, shipments and information to generate cost savings and enhanced revenue opportunities. These benefits result in increased customer confidence and transparency into their supply chain, either directly or through their chosen supply chain service providers.

About Intermec

Delivering the broadest ITV solution set in the industry with solutions and partners experienced in many specific applications, Intermec provides a one-stop, standards-based solution and boasts a long history of serving the transportation and logistics industry.

Intermec's plug and play hardware solutions are easy to support and make for easy, quick application development and deployment. The solutions deliver real time information as well as features such as a color camera and GPS, specific applications including turn by turn tracking, and economically priced, rugged hardware.

For more information on Intermec's suite of ITV solutions, visit www.intermec.com.

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