



BUSINESS WHITE PAPER

Next Generation Mobile Resource Management (MRM 2.0)– Breaking Down Traditional Silos

Unifying Route Planning, Proof of Delivery (POD), and On-board Computers/DOT Compliance to Help Improve Performance and Return on Investment

The goal of Mobile Resource Management (MRM) is to help organizations enhance management of their commercial fleet assets to be more effective in meeting customer service expectations, reducing risk, and complying with transportation regulations. Successful MRM deployments also help fleets reduce cost while improving productivity and performance.

Historically, the MRM market has been fragmented and generally comprised of niche providers of route planning (both strategic and daily), route execution and POD, and on-board computers / Department of Transportation (DOT) Compliance solutions. While at the same time, many MRM consumers generally only focused on single pieces of the puzzle -stand alone planning, GPS-tracking, or DOT compliance solutions. This fragmentation has made it more difficult for customers to adopt a holistic MRM strategy that collectively targets maximizing results, lowering cost of ownership, and reducing the risk of project failure.

Next generation MRM providers have broken down these traditional silos. They leverage advances in mobile technology, which make the benefits of MRM more accessible than ever, and have positively altered the return on investment (ROI) paradigm that fleet operators can achieve from today's technology.

The future of MRM is having a single vendor or systems integrator that can bring all the critical components together on a single platform, therefore helping avoid the traditional 'silo' pitfalls such as:

- No ability for planning systems to 'learn' from mobile data collection in the field;
- Brittle, multi-vendor integrations with high points of failure;
- High total cost of ownership associated with maintaining multiple systems;
- Manual processes to accurately factor in remaining DOT driver hours during the daily route planning process;
- Inability to effectively manage metrics-based driver incentive programs; and,
- Limited visibility to accurate, real-time pick-up/delivery information (POD, updated ETA, exceptions, etc.) for customer service, sales, and end customers

A holistic MRM strategy helps organizations avoid these pitfalls, while unlocking the potential savings and operational improvement potential of deploying next generation fleet technology which can include the following and much more:

- 10-15% in mileage savings from route planning; Eliminating 1 labor hour per driver per day with metrics-based driver performance management;
- Eliminating \$1.00 per stop by going paperless;
- Increasing fuel efficiency by 15% by improving driver behavior; and,
- Transforming the customer experience with access to real-time status information;

The savings potential is significant. The average benefit for MRM 2.0 deployments can be as high as \$1,000,000 for every 100 vehicles in the fleet.

MRM 2.0 Average Benefit = Savings of **\$1,000,000** per **100 vehicles**

Critical Components

Solutions for i) route planning, ii) route execution and mobile proof of delivery, and iii) on-board computers for vehicle tracking and DOT compliance, have traditionally been three separate silos that were generally sourced from separate technology vendors. By unifying these critical fleet management processes, operators can lower total cost of ownership while enabling their fleet and mobile resources to be more productive, offer new or improved services, better manage driver performance and cost of compliance with government regulations. Additionally, significant operational savings, in the range of 5-10%, can be achieved by leveraging holistic fleet management best practices and using a single integrated MRM platform.

Route Planning

Route planning and optimization solutions give logistics professionals the tools to maximize vehicle utilization and the efficiency of their planners, dispatchers, drivers and other field personnel. Operating an efficient fleet and mobile workforce that meets customer service expectations begins with proper planning. There is a broad range of providers offering route optimization solutions that span a wide variety of scenarios from static territory and master route planning through to complex dynamic routing models driven by real-time demand.

These solutions take into consideration different business rules, customer requirements, asset parameters, driver capabilities, geographic data, and other constraints to create reliable routes using fewer trucks, miles and drivers. Traditional systems, offering standard capabilities, are generally batch-oriented point solutions that are better at handling more static scenarios and a more limited set of parameters. Advanced solutions leverage enterprise-class architecture and next generation continuous and incentive-centric optimization, handle large order sets and can accommodate complex parameters common to dynamic environments, such as same-day home delivery for retail, and demand driven vendor-managed replenishment in sectors such as propane, less-than-truckload operations.

Figure 1: Improving Route Efficiency - Before & After Optimization

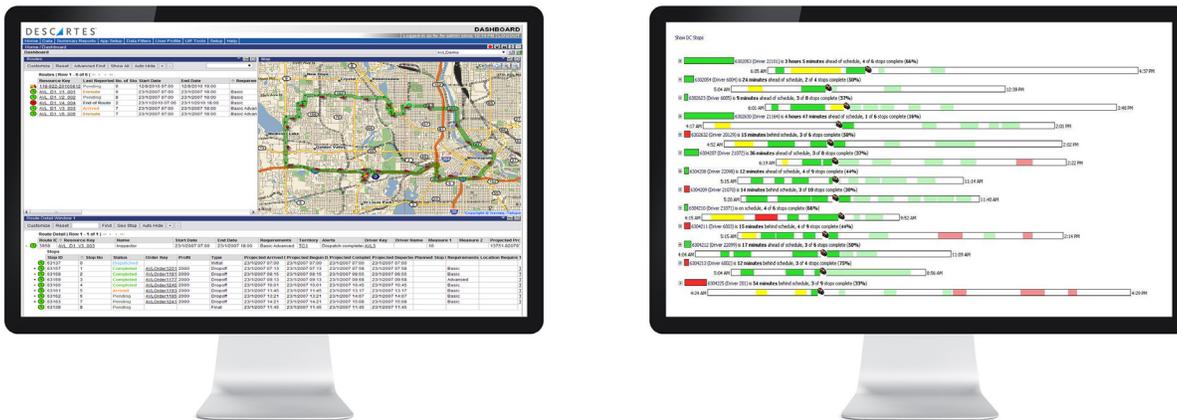


Route Execution and Proof of Delivery (POD)

Great route plans only go so far. Effective fleet operations require the flexibility to adjust and respond to the day-to-day realities once vehicles leave the depot and execute on the road. It's also an important best practice to continuously measure route performance against the route plan to achieve maximum productivity and to support continuous improvement.

Operations benefit from mobile communication and GPS-based fleetwide visibility. These solutions can provide real-time status updates, which enable dynamically linked map, schedule and asset views, to provide information on key indicators such as capacity usage, time to service each stop, customer time window violations, alternate available resources, route profitability, and more. Using this information, dispatchers are able to more effectively manage exceptions, assign new orders and coordinate activities between drivers, call centers and other field resources, to streamline operations and enhance customer service.

Figure 2: Managing Performance in Real-time



Turn-by-turn navigation systems offer multiple benefits to improve the execution of route plans while supporting safer driving. These solutions are most effective when they are integrated with a route planning and dispatch system and must consider commercial driving restrictions.

Significant savings can be achieved by removing physical paper and manual processing costs through the use of mobile solutions which enable drivers to download routes to a wireless device, while transmitting status events and POD data, and while executing in the field. Overages, damages, shorts, signatures, customer feedback, and more can be captured at each stop, while the information is automatically uploaded to back office systems in real-time. This improves visibility and data accuracy, supports faster billing cycles, mitigates fraudulent claims and helps to improve customer service overall.

Figure 3a: Paperless Proof of Delivery Process

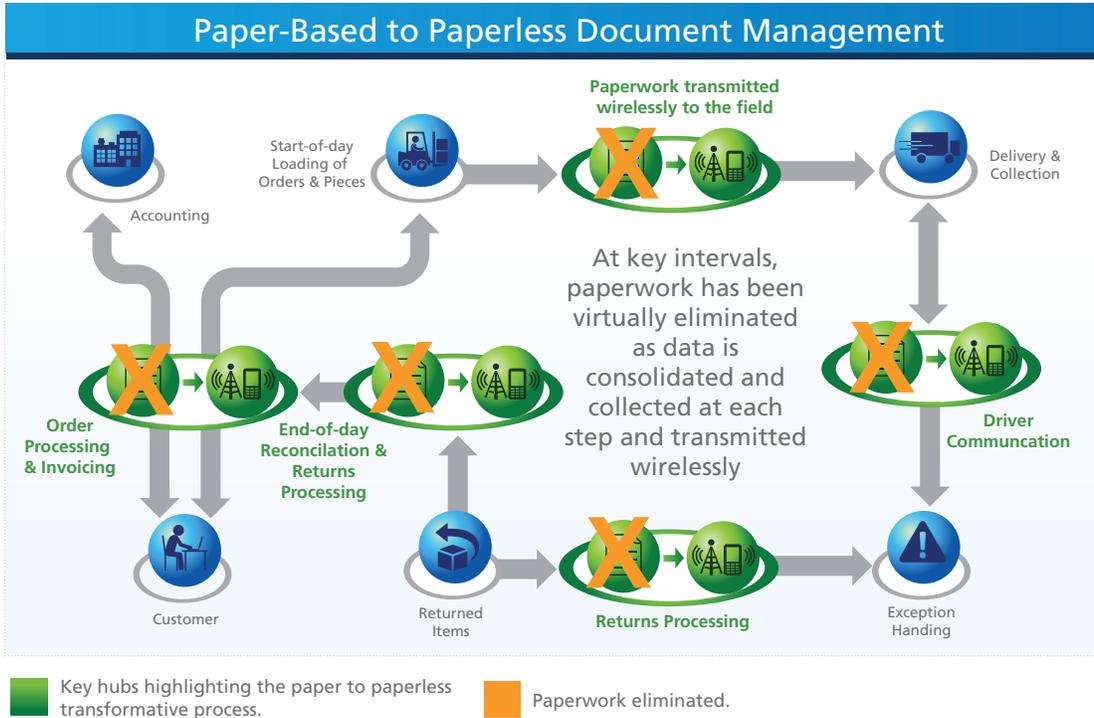
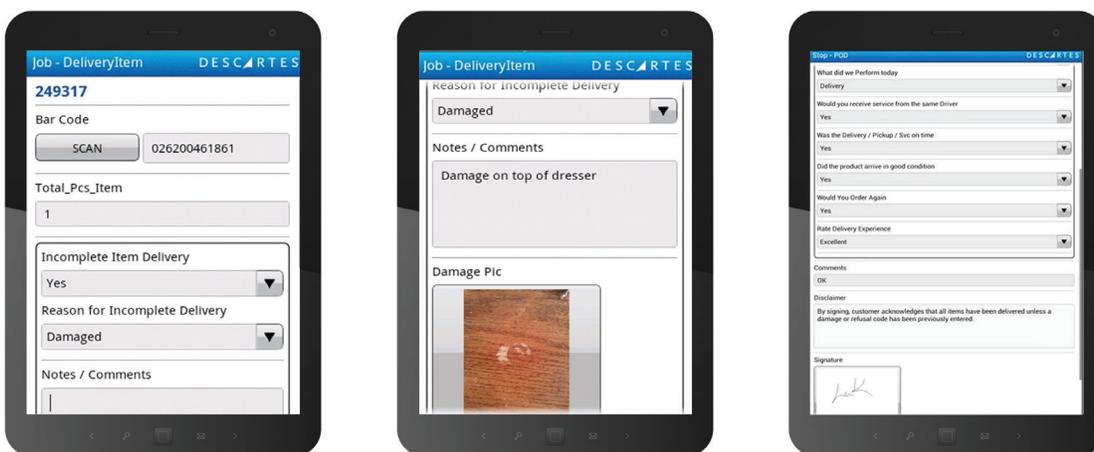


Figure 3b: Paperless Proof of Delivery - Capturing Signatures, Pictures & Customer Feedback



On-board Computers & DOT Compliance

In addition to helping to comply with regulations related to Hours of Service (HOS) and fuel tax reporting, the latest generation of electronic on-board recording devices (EOBR) enables fleet operators to take advantage of capabilities beyond mere compliance. Fleets can maximize the benefits of telematics and advanced fleet tracking to improve driver behavior, enhance productivity and monitor vehicle diagnostic information in real-time.

The elimination of manual data capture (paper logs), back office data re-entry, and processing time not only squeezes out unnecessary costs, but also removes transcription errors and the potential for falsification of data, helping to reduce regulatory compliance risk. In contrast with manual, non-integrated methods, the ability to automatically consider DOT compliance in the daily route planning processes, not only improves accuracy, but can save planners hours of time.

Improving driver behavior by effectively capturing real-time, quantitative data to support automation of driver scorecards for route performance, idle time, speeding, and heavy braking can amount to huge savings. By eliminating one hour of idle time per day and reducing the average fleet speed by 3mph, fleet operators have been able to save an average of \$3,000 per vehicle per year. Significant additional savings can also be achieved in the vehicle maintenance area by reducing excessive tire, brake and engine wear related to speeding, hard cornering, hard braking, engine over-revving, and so on – attributable to poor driver behavior.

Figure 4: Driver Performance Scorecard



Driver		Avg. Start Time	AM Time (Average)	On Time %	% GPS Mileage to Standard	% Time to Standard	Score
John Smith	✓	6:15	14	78	-2.60%	-11%	88%
Brian James	✓	6:00	7	100	0.00%	-20%	100%
Don Kenny	⚠	7:12	11	76	23.00%	13%	54%
Grant Sims	⚠	5:45	15.3	45	-2.20%	22%	58%
Mark Reynolds	✓	7:34	10	89	-0.60%	-11%	95%
Mike Morris	✓	11:34	4.2	32	1.10%	8%	77%
Sean Jones	✓	6:00	12.6	90	2.20%	1%	90%
Steve Adkins	✓	6:32	18	98	0.00%	-3%	99%
Average		-	11.5	76	0.10%	-0.13%	83%

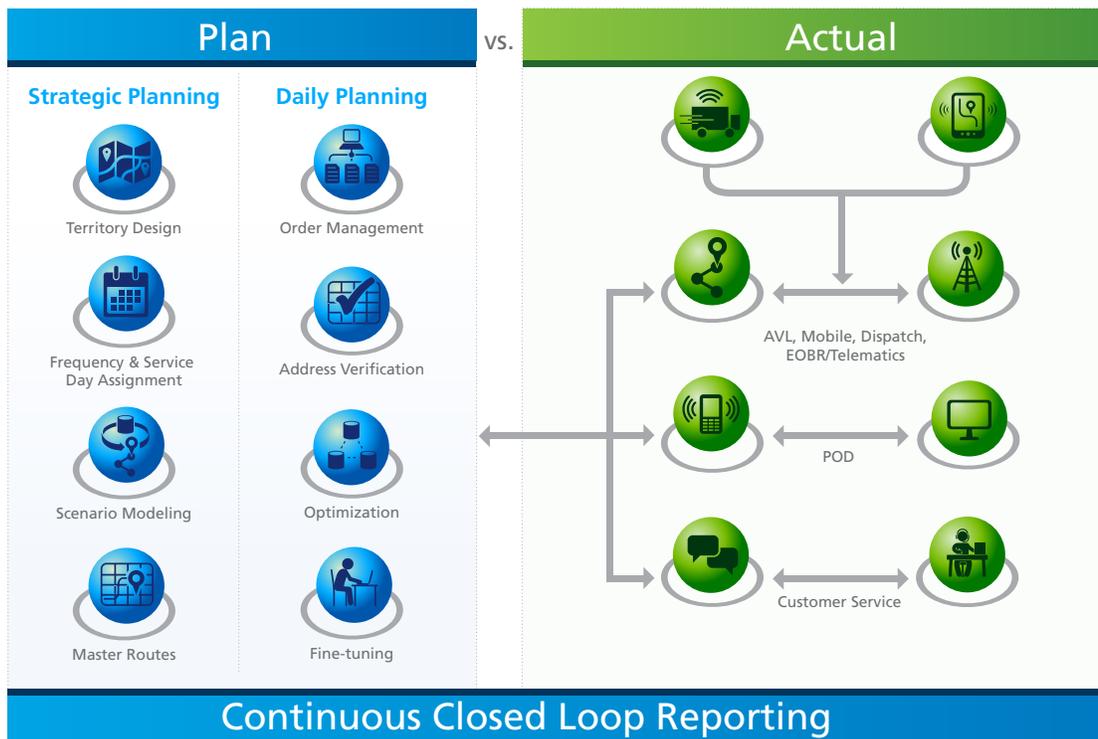
Tying the Pieces Together

While most fleet operators desire a single integrated system for planning, execution, and telematics, they do not want to be systems integrators. It's also unlikely that their own internal IT departments (if they have them) want or would be effective in taking on this role. It makes more financial and practical sense to procure these components from a single source. Aggressive market consolidation, across what used to be a 'sea' of small niche vendors, as well as, progress by leading vendors in broadening their functional and technological capabilities, has lead to the MRM 2.0 convergence consumers require.

Organizations that take advantage of end-to-end capabilities, through an integrated platform from a single, market-leading vendor that can bring together optimized route planning, dispatch and GPS tracking, mobile applications, telematics, fleet/driver compliance and performance analytics, can eliminate less effective 'islands' of automation, process differences, and unnecessary costs that result from traditional silos.

While the majority of fleet owners continue to struggle with isolated and outdated systems, best-in-class fleet operators, employing a unified approach, leverage bulk buying power, minimize implementation time and risk, derive greater ROI, and benefit from dealing with one vendor that is accountable for success.

Figure 5: End-to-end MRM 2.0 Functionality



The Descartes Difference

Descartes has been a leader and innovator in the fleet management space for more than 30 years. More than 32 million routes per year are managed using Descartes' technology. Descartes' Routing, Mobile and Telematics solutions are designed to help fleet operators of all sizes increase the productivity of their fleets and mobile resources.

Descartes is unique in the industry, in that, its Logistics Technology Platform leverages the three critical components of MRM on a single unified platform:

- Route planning solutions that facilitate the proper design and daily execution of optimal route plans with basic through advanced capabilities, and flexible deployment options to address the needs of all types of organizations;
- Route execution solutions that leverage the latest innovations in mobile device technology, that monitor planned vs. actual performance, support dynamic order/work changes and assignments, and provide real-time information regarding stop/customer activities, and paperless proof of delivery; and
- On-board computer solutions, for telematics and DOT compliance that capture information about driver behavior, hours of service, fuel tax reporting, plus diagnostics and other information about vehicle status/performance.

Descartes has helped thousands of customers around the globe with enhanced command and control of their mobile workforce and fleet assets. The average estimated, quantifiable benefit from implementing the next generation mobile resource management is a savings of \$1,000,000 per 100 vehicles. Qualitative benefits include more agile pick-up, delivery, and/or service operations that are better able to respond to customer requirements and support growth.

Finally, good fleet management practices are also good for our planet. Descartes has assisted the world's leading fleets to proactively address environmental pressures to reduce fleet size, carbon emissions and eliminate paper.

Figure 6: Holistic Approach to Save \$1,000,000 per 100 Vehicles



To learn more on how unifying critical fleet management processes can unleash the potential of your fleet operations please contact info@descartes.com.

About Descartes

Descartes (TSX:DSG) (Nasdaq:DSGX) is the global leader in providing on-demand, software-as-a-service solutions focused on improving the productivity, performance and security of logistics-intensive businesses. Descartes has over 172,000 connected parties using its cloud based services. Customers use our modular, software-as-a-service solutions to route, schedule, track and measure delivery resources; plan, allocate and execute shipments; rate, audit and pay transportation invoices; file customs and security documents for imports and exports; and complete numerous other logistics processes by participating in the world's largest, collaborative multi-modal logistics community. Our headquarters are in Waterloo, Ontario, Canada and we have offices and partners around the world. Learn more at www.descartes.com.