



BUSINESS WHITE PAPER

Fuel & Labor Cost Savings Through Next Generation Fleet Management Best Practices

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Overview

New fleet management best practices are encouraging fleet owners to re-evaluate their ways of working and the technologies they use to manage their fleets. While traditional fleet management practices remain effective, new practices are emerging in response to a dramatically-changing environment.

Three factors are primary in catalyzing the change: Unstable fuel costs; increased governmental regulation; and rapid technological progress with corresponding reductions in technology costs.

Fuel and labor are the fleet manager's top two operating expenses. Fuel prices are uncontrollable, and as fuel costs rise, profits diminish correspondingly. In order to offset rising fuel costs, fleet managers must find efficiencies in other areas of the operation – either by driving fewer miles or by operating fewer vehicles. Where possible, fleet strategies should consider back haul opportunities to minimize empty miles and reduce 3rd party delivery costs.

A regulation recently announced jointly by the USA Environmental Protection Agency (EPA) and the Department Of Transportation (DOT) will require a 20% reduction in fuel consumption and greenhouse gas emissions by 2018. While this regulation will reduce fleet costs, it increases cost in other areas. It either causes the retrofitting of engine component upgrades to meet the regulation (at over \$6,000/tractor), or accelerates the replacement of vehicles that cannot comply.

Other regulations, such as CSA 2010, create an imperative to collect more and different types of statistical and performance data about drivers, vehicles, trips, loads, and contents. Each additional regulation necessitates new "systems" to collect, summarize, and report the data. Compliance is essential; the cost must be absorbed.

Technology, particularly mobile applications and telematics, can be the cost-mitigant. Technology convergence from consumer electronics has significantly reduced the unit costs, which was previously the key barrier to implementation. Network-based SaaS platforms are helping to overcome the islands of automation endemic to traditional to back-office fleet systems. These technological advances have enabled new ways-of-working, which become new best practices.

This paper delineates commonly-accepted best practices and highlights emerging best practices. The best practices are separated into three categories: (i) Planning to Minimize Fleet Costs; (ii) Managing Execution and Compliance; and (iii) Centralizing Command and Control.

Industry experts speculate that less than 10% of fleet owners have implemented many of these best practices. The incentive to act now is significant – best practice implementation can result in a 15-20% cost savings for fleet operations!

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Planning to Minimize Fleet Costs

Best-in-class fleet managers plan at two levels – strategic and tactical. Strategic Planning is performed periodically to determine the right level of assets to actualize the service level policy. It analyzes the fleet's service territory to define needs and asset allocation *in advance* to meet demand; it also develops master route designs. Fundamentally, strategic planning is used when the existing network configuration is determined no longer to be effective or efficient, or new service strategies or policies are being contemplated.

Traditionally, many fleet managers have used spreadsheets to perform territory planning. Spreadsheets have limited capabilities because they are only calculators and cannot evaluate the possible combinations of service, cost, and asset types and number to produce the best service for the customer and lowest cost for the fleet. Solving the allocation problem requires an optimization routine that can evaluate all possibilities and determine how to get the right assets in the right place at the right time – and at the lowest cost. Strategic Planning must be integrated with tactical planning and other back-office systems to avoid isolation and to enable more dynamic re-planning as necessary and with minimum effort.

Best Practice #1: Best-in-Class Fleets employ history to strategically plan their fleet asset allocation, to provide adequate assets to ensure service in each territory, and when appropriate, to develop master routes; they revisit these plans frequently to adjust for change – new customers, routes, seasonal demands, and other periodic peak demand issues.

The benefits of this type of planning are significant. Having the right assets in the right place at the right time increases customer service and satisfaction due to on-time performance-to-plan and elimination of service failures. It enhances equipment utilization and reduces miles. Thinking ahead and evaluating the impact of change on plans, adjusts asset inventory in advance for unusual demand and prevents last-minute, frenzied reaction. It is not unusual for strategic planning to yield the greatest savings, and in the fastest time.

Tactical Planning is the development of daily/weekly optimized route plans – determining how many vehicles are needed at any given time, the routes they should run, and delivery sequence. This process maximizes vehicle utilization. As part of this process, the tactical plan must respect constraints such as appointment time windows, road restrictions and speeds, and additional equipment and driver requirements.

Tactical Planning is not just sequencing orders for delivery; it includes evaluating the cost of delivery and availability to determine the most cost-effective routing and schedule. All operational constraints must be optimized to build feasible routes that maximize delivery reliability, including drivers, equipment, and travel restrictions.

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If the customer delivery window is flexible, such as with vendor-managed inventory, the planning system should consider moving the deliveries plus-or-minus a day or two to maximize delivery density and to reduce the cost to serve those customers.

Rather than just static route plans created through traditional batch optimization techniques, the planning system must include dynamic planning to accommodate change up to the time the truck is loaded – and even when in route. It provides the ability to adjust to a variety of anomalies and last minute plan changes. When an order must be added to, or deleted from the plan at the last-minute, the route planning evaluates the most cost effective way to deliver orders, and re-sequence stops.

Best Practice #2: Best-in-Class Fleets develop optimized daily route plans; route plans can be optimized on cost-of-delivery or route profitability, as well as capacity to meet delivery requirements. The completed route plans contain vehicle and driver assignments and are downloaded to each individual in-vehicle system and/or driver handheld mobile device to direct the entire trip.

In addition to the traditional benefits of realizing customer service and performance-to-plan, daily route optimization also efficiently manages assets – both vehicles and drivers. Efficient routes result in reduced overall fleet fuel consumption and operating costs. They also result in enhanced quality-of-life and increased driver retention due to allocating drive time most efficiently. Additionally, efficient planning results in improved vehicle utilization.

Managing Execution and Compliance

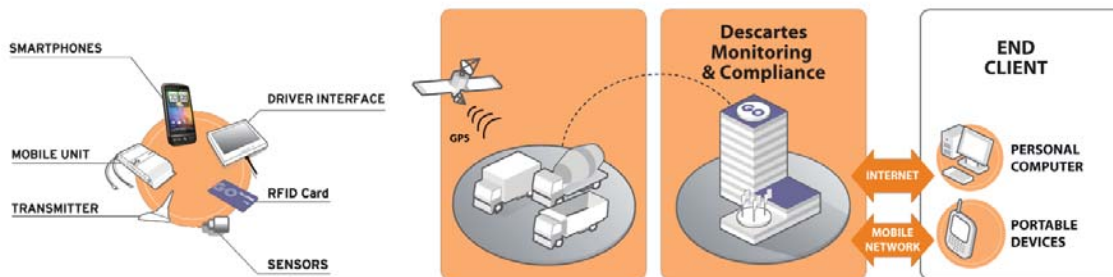
Mobile and onboard computer systems, whether they be vehicle-mounted or handheld¹, serve two primary purposes: the first is helping to manage the trip and the second is to collect driver, equipment, and product data during the trip. Managing the trip begins with downloading the trip plan from the integrated planning and dispatch system to communicate the route and delivery sequence to the driver.

¹ Note: Vehicle-mounted and handheld systems perform many similar functions, such as downloading trip plans, monitoring and communicating vehicle position, and recording and reporting trip events. Vehicle-mounted systems can also capture data from a variety of sensors within the vehicle that report equipment status, driver behavior, and provide data for regulatory compliance. Handheld devices cannot accommodate these sensors, but serve other purposes, such as the ability to scan contents on and off the trailer, photograph damaged goods, and capture acceptance signatures. Fleet managers may employ one type of system or both, depending on their specific needs.

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The current generation of mobile resource management solutions enable real-time data exchange with the driver and vehicle while the trip is in progress. This enables monitoring of performance and compliance, and communication of route and schedule changes. GPS-enabled systems can also deliver driving instructions and vehicle location. They communicate their data automatically and interactively to the integrated planning and dispatch system, eliminating the need to either transcribe manual logs or return a portable device to the home base, dock it, and download the data.

FIGURE 1



Best Practice #3: Best-in-Class Fleets employ full-function, field-deployed mobile and telematics systems to manage route execution, including: accepting trip plans, managing dispatch, navigating, monitoring compliance-to-plan, and communicating interactively between the vehicle and back-office systems - dynamic route changes, event status, and confirmations (proof of delivery/ POD).

More onerous regulations and the desire to improve safety and regulatory compliance is driving increased adoption of telemetry. Collecting data of all types on the trip, and events in transit, is an extremely valuable by product. Mobile devices and onboard computers enable automatic data capture of multiple data attributes and metrics (driver, vehicle, mileage, hours) in a paperless environment. These systems automate reporting of:

- **Hours of Service** - Automatically capture drive-time and resting time; electronic monitoring and reporting hours-of-service and hours-per-work-week with real-time notifications
- **Fuel Tax Accounting, Safety, and Compliance** - Automatically capture mileage by state; GPS mileage and actual route traveled
- **CSA 2010 Compliance (USA Domestic Regulations)** - Automatically capture driver and vehicle metrics and performance via onboard computers that monitor driver performance and behavior, account for vehicle inspections, and provide accident reconstruction

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- **Driver Behavior** - Automatically capture on-time performance, out-of-route travel, idling time, and speed
- **Equipment Status** - Automatically capture engine data, idle control, and trailer temperature (shock and vibration, open doors, lift gate status, etc).

This Implies Several Best Practices:

Best Practice #4: Best-in-Class Fleets employ full-function, mobile and telematics systems to collect all forms of trip and driver information for safety and regulatory compliance (Hours of Service, Fuel Tax Accounting, CSA 2010 compliance).

Best Practice #5: Best-in-Class Fleets employ full-function, vehicle-mounted electronic on-board recorders (EOBR) to collect critical vehicle information for fuel consumption, engine performance and idle control, vehicle maintenance, trailer temperature control, and chain-of-custody reporting (FDA compliance).

There are manifest benefits to implementing this latest generation of mobile and on-board computer systems with telematics. First, they increase driver and back office productivity by automatically communicating results to back office systems. This eliminates manual data capture (paper logs), back office data re-entry, and processing time. As a by product, this eliminates transcription errors and the potential for falsification of data. Regulatory compliance is increased by capturing actual trip data. For example, Fuel Tax mileage is computed from the actual route traveled, which eliminates issues like an out-of-route fuel ticket. Trip event data, such as proof-of-delivery and confirmation signatures, can be captured automatically.

Mobile resource management systems that include GPS Navigation and cellular voice communications provide command and control of drivers and vehicles with real-time communication. This provides visibility to vehicle position at all times, and the ability to make dynamic route changes, if necessary.

Finally, telematics capabilities can provide data to assess and improve driver behavior. When actual trip data is summarized and analyzed, it can be used to identify under-performing drivers and encourage them to comply with company policies and local ordinances - eliminating speeding, erratic stops-and-starts, off-route driving, unplanned stops, and reducing idling time.

Best Practice #6: Best-in-Class Fleets employ full-function, in-vehicle telematics systems to collect driver performance and behavioral information, then employ company-wide historical driver performance information to benchmark individual drivers against clearly-defined metrics and best-in-company performance, report performance-to-plan, and establish periodic reviews and continuous improvement programs for their drivers.

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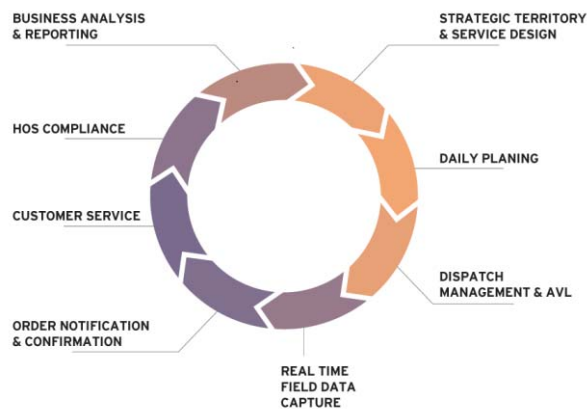
Centralizing Command and Control

When operations are decentralized, they often operate independently and differently. This often increases fleet expense through redundant resources and systems, inconsistent fleet management practices, and multiple different ways-of-working. In addition, dispersed planning systems tend to fall into disuse as their configuration and master data becomes obsolete. If the locations have multiple non-integrated systems performing the same, or overlapping tasks, the problem is exacerbated.

Creating a “Command Center” to centralize fleet operations is a recognized best practice. It allows the fleet owner to capitalize on their total enterprise volume and assets and plan and execute holistically (in contrast to a single facility at a time). It requires a common systems platform supported by a single way of working to manage fleet assets and coordinate routes and schedules across all of a company’s operations. Managing the fleet holistically from a Command Center can maximize asset usage and minimize costs.

Centralization can also provide increased control through a closed-loop process, with planning results flowing directly into execution management and the results being captured into an historical database for business intelligence.

FIGURE 2: FROM THE POINT OF ORDER TO THE TIME OF DELIVERY TO BUSINESS ANALYSIS TO THE IMPROVEMENT OF YOUR OPERATIONS



Centralizing command and control does not imply that all functions must be performed in one location. Certain functions, such as dispatch, can be distributed to field offices but they are still performed on a single system that enforces a common way of working across all locations.

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Best Practice #7: Best-in-Class Fleets manage their fleets holistically from a central Command Center and through a centralized, network-based system. The system should provide the flexibility to support effective local execution while enforcing common corporate objectives and standardized business processes.

The fleet's planning, dispatch, and mobile trip management systems must be integrated to reduce costs, simplify operations and fuel continuous improvement. Ideally, they should be provided by one vendor to avoid costly in-house integration and systems maintenance and eliminate functional overlap (versus isolated and disconnected, multi-vendor systems). When this integration exists, additional best practices are enabled:

Best Practice #8: Best-in-Class Fleets employ trip event and performance-to-plan information to provide information consumers (customer service, customers, inbound suppliers) not directly involved in the shipment management, with visibility to: in-transit shipment status; pick-up and delivery confirmation; and changes, exceptions, and corrective actions.

Best Practice #9: Best-in-Class Fleets employ post-delivery service and satisfaction calls/surveys that can be cost-effectively executed via automated and integrated interactive voice response (IVR) solutions to complete a holistic picture of the customer's pick-up and/or delivery experience.

Conclusion

Fleet Management solutions grew up as independent applications that had a specific purpose and served only part of the systems need of the fleet manager. Initially, planning tools were built as PC desk-top applications. Dispatch systems were server-based, but often different technologies from, and not interfaced to, planning systems. Mobile and telematics technology tended to be proprietary hardware and software systems that did not communicate back to the dispatch system (except location data through the vendor's proprietary network) - and they were very expensive, which was a barrier to implementation on all but a few fleets.

Subsequent generations of mobile and telematics technology collected data and performed some automatic computations, but did not communicate. They required that the driver return the system to the dispatch office and download the system contents to a back-office system. Even today, most handheld and vehicle-mounted systems are extremely dated and report performance and trip data after-the-fact only. They cannot intelligently manage change.

Local instances of different systems from different vendors purchased and implemented separately led to islands of automation. Different vendors' technology standards resulted in misaligned technologies and approaches that caused integration and functional overlap issues (which system "owns" a function). Further, absent centralized command

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and control, these different deployments led to different ways of working. Worst of all, this often forced the fleet owner to become a systems integrator.

Fleet Managers do not Want to be Systems Integrators!

Fleet Managers want one routing, mobile and telematics platform with bi-directional communications for voice and data. They want all onboard applications in one box: trip instructions, driving directions, performance and compliance measurement, trip reporting, and driver communications. The solution must be integrated with their back office system to provide for continuous and dynamic reaction. They want a single system for planning and execution that works symbiotically and allows immediate re-planning with results sent directly to execution management as conditions change. Finally, they want all systems and components from one source, so they do not have to integrate components.

Best Practice #10: Best-in-Class Fleets implement a single solution from a single vendor with routing, mobile, and telematics that provide all mobile trip, performance, and compliance functions in a single apparatus, and a network-based, pre-integrated, full-function planning and dispatch system in a holistic solution.

There has been both a functional and technical convergence that has enabled this type of solution and has significantly reduced its cost. Mobile and telematics technology has benefited substantially from the consumer electronics industry - specifically the Smart Phones that can collect data from various sensors, incorporate both GPS positioning and bi-directional communications, and are a multi-function platform.

These systems can provide all required onboard functionality and do so at significant savings over proprietary hardware and network systems. Smart Phone technology has eliminated the cost barriers that prevented many fleets from previously implementing mobile resource management solutions.

The leading enterprise-class fleet management solutions – whether a SaaS or a server-based deployment – provide not only a centralized business process sharing data across the enterprise, but a single way of working. This business process can be deployed to distributed field operations, yet it enforces operational standards. These solutions eliminate islands of automation, process differences, and unnecessary costs that result from inefficient ways-of-working. They maximize communications and process efficiency, and minimize costs.

In addition to lower costs, speed of implementation is a key criteria. Pre-integrated single vendor solutions can be deployed quickly without integration issues and unanticipated delays. They deliver the shortest time-to-benefit to the fleet owner. Implementation is measured in weeks, not in months.

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Best-in-class fleet owners have successfully employed this single vendor, holistic system strategy to minimize cost, maximize utilization and process efficiency, and minimize implementation time. This opportunity remains for the majority of fleet owners who continue to struggle with isolated and outdated systems. The potential savings of 15-20% of operational costs can more than offset the investment in technology.

About Descartes

Descartes (TSX:DSG) (Nasdaq:DSGX) is the global leader in logistics technology. If logistics is critical to your business, Descartes connects the people and technology to put your organization in motion. We extend the command of logistics operations, helping the world's largest and most connected logistics community to quickly reduce costs, improve service and comply with customs and transportation regulations. Descartes' cloud-based Logistics Technology Platform uniquely combines the power of The Global Logistics Network, the world's most extensive multi-modal network, with the industry's broadest array of modular and interoperable web and wireless logistics applications. At our core, Descartes' team of industry-leading logistics experts is dedicated to delivering innovative solutions while working closely with our customers to help ensure their success. Descartes is headquartered in Waterloo, Ontario, Canada and has offices and partners around the world. Learn more at www.descartes.com.