



## Yard Management – An Operator’s Perspective

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The implementation of a yard management system (YMS) must result in operational excellence and bring value to the operation. This paper reviews the major segments of the yard and discusses key points that should be considered when making a YMS decision. The application of Real-Time Locating System (RTLS) and RFID technology is supported by some YMS products, which enhances YMS solutions for larger and more complex yard operations. When active RTLS technology is used, the location of equipment and switch tractors is always known, eliminating the need for manual yard checks. Regardless whether or not location technology is used, an effective YMS provides planning, management and execution in the yard, facilitating increased flow velocity of goods through the supply chain.

The life cycle of a trailer in a yard includes the following key processes: gate functions, switcher or jockey dispatch, yard inventory, and dock management. The differentiation between YMS solutions depends on the operational excellence, desired goals and objectives of optimization achieved by each stage of the yard management process.



## 1. Gate Management

The Gate presents the first of many challenges a trailer faces when arriving at a yard. This is the point of initial interaction and communications between the carrier and the facility. The objective is to expedite inbound processing while avoiding congestion at the gate, minimizing the queue so that trailers do not spill onto public streets exposing them to tickets from the local law enforcement. Actions at the gate concurrently should direct trailers to proper locations in the yard. In a drop and pull environment, the driver should be directed to a specific yard location or to a specific dock door for a live load. When done correctly, intelligent parking assignments minimize travel distances between trailers and dock doors, resulting in faster door turns, decreased switcher fuel consumption, and increased switcher productivity.

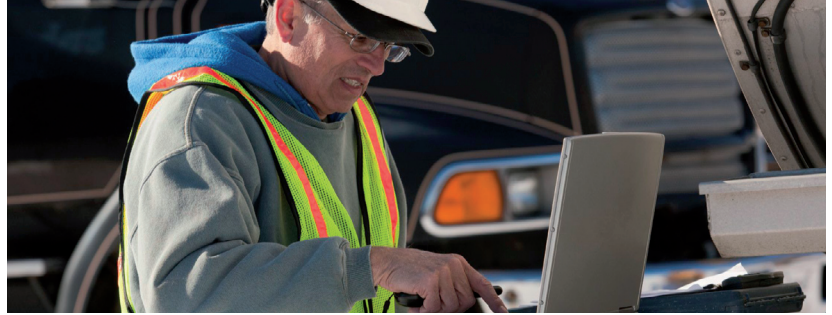
For many operations, the use of mobile handheld devices can further accelerate inbound and outbound processing compared with using stationary computers that impose time delays from walking back and forth between the driver's cab and the guard shack. Prior receipt of trailer details in the form of an advance shipper notice (ASN) is critical to avoid congestion at gates. With the ASN loaded into the YMS, the gate process is simplified to updating the actual arrival of the unit and obtaining driver information. At this point "the handshake" between the facility and carrier takes place. The gate verifies and confirms the seal number on the trailer and any equipment issues can be noted prior to entry. Driver identification details may also be loaded into the YMS in advance of the truck arrival. The gate transaction is accelerated, as now the process becomes one of verification of the identity of the driver, rather than data capture exercise, further eliminating gate delays.

The challenges for departing trailers from a yard are different from the concerns of the inbound process. The most important function during departure is verification that the proper trailer is taken by the correct and authorized carrier, and has the matching paperwork. The ability to perform a duel transaction on the inbound leg can increase overall yard throughput. In a drop and pull transaction, the verification of the pick-up details are performed when the driver checks in. A gate ticket is generated, indicating where to park the inbound trailer and pick up the outbound load. On the outbound leg, the operator verifies the load against the gate ticket, which should also be systematically verified in the YMS. Paperwork is provided to the driver, completing the cycle. This duel transaction results in reducing the time a driver spends in a facility, which ultimately results in lower transportation costs. Studies have shown that a duel transaction at large sites (e.g. over 70 acres) can be accomplished on average of 16.4 minutes from the time the driver arrives until he departs the yard.

When considering a YMS, it is essential to understand its gate capabilities with respect to your operational needs, since no two gates are identical. In most cases, however, a good YMS will support mobile devices, accept pre-arrival and pre-departure information about trailers and drivers, route inbound drivers to the right locations in the yard, block unauthorized trailers from checking out, and support an inspection process.

## 2. Yard Operations

The functions for planning, managing and executing activities of a yard determine the amount of value that a YMS solution brings to an operation. Yard software in the simplest form provides an inventory of trailers in the yard through manual yard checks using clipboards and spreadsheets. Higher functioning YMS solutions provide greater visibility and streamlined operations in yards, producing greater throughput of trailers over the same real estate at lower costs.



Since operations and backend systems differ from yard to yard, it is important that a YMS has enough configuration flexibility to adapt to your needs so that customization can be minimized. Configuration includes a myriad of functions including the ability for users to modify report views, set equipment pool thresholds, create alerts, create standard forms for checking in trailers, checking out trailers, and updating trailers, set user and group privileges, and create business rules that direct trailers to parking locations, block unauthorized trailers upon check-out, and determine which trailers to pull to doors when doors become available. It is also important for a YMS to include an industry standard API so that proper interfaces can be built between the YMS, Transport Management System (TMS), and Warehouse Management System (WMS).

Yard inventory reports containing pertinent information such as carrier, equipment type, load status, dwell time, customer, origin and destination help maintain a balanced yard. Automatic alerts are essential to maintain pool levels and request action on long dwell equipment. These reports can also measure compliance by carriers. Carrier report cards based on timely and accurate data result in productive conversations with carriers as to the expectations and results required for successful supply chain execution.

## 3. Switcher Productivity

In higher functioning YMS solutions, trailer move commands are issued wirelessly to switchers using ruggedized computers mounted inside the switcher cabs. Savings in switcher costs is one of the largest benefits from implementing a YMS solution. The cost of each switcher unit fully loaded including labor costs, fuel, and maintenance amounts to about one hundred and ten thousand dollars (\$110,000) per year. A best in class YMS implementation can produce a savings of 30% or more in switcher expenses.



Planning capabilities, together with configurable business rules in a YMS solution, raise the productivity of switchers. A trailer move plan should cover a full working shift or more. Managing the activities of switchers in the yard should require very little human interaction, resulting in the elimination of radios. A YMS should automatically issue commands to switchers when dock doors need attention. Higher functioning YMS solutions offer intelligent task assignment capabilities that automatically determine which switcher to send a command to based on the least travel time to the trailer, which minimizes fuel expenses. Switchers may also be grouped into “teams” that are associated with distinct operational areas such as shipping and receiving. During slow times a switcher should be able to systematically update and correct trailer locations using an audit function from their cab. Manual yard audits are virtually eliminated when using RTLS technologies.

Switcher dispatch capabilities should carry significant weight when considering a YMS due to potential cost reductions. At a minimum, the YMS should support wireless dispatch of move commands to switchers, allow switchers to perform audit functions during slow times, include an intelligent method for assigning jobs to switchers when multiple switchers are available, and management reports that measure switcher productivity.

## 4. Dock Door Management

YMS solutions can have a significant impact on the cost of labor working the dock doors at supply chain facilities of up to 25% of the labor cost. This is accomplished primarily by the ability to switch out trailers and plug dock doors in a timely fashion, not leaving labor on the docks underutilized. Thus, it is important that the YMS synchronizes the yard activities with the demands of the warehouse.

A higher functioning YMS can plan the trailer dock exchanges for a full shift of work or more by using configurable business rules that instruct switchers on the order in which to pull and replace trailers from dock doors.

The YMS must be capable of recognizing when plan deviations occur and automatically adjust to these situations through proper execution decisions. Additionally, a YMS should allow manual intervention for those exceptions that cannot be handled automatically. A YMS should provide the capability to create templates of rules applicable to a set of dock doors for specific time periods. This functionality provides value to facilities which periodically change dock door setups. For example, templates can be used to accommodate doors that alternate between receiving and shipping functions, or when door functions change between peak and non-peak periods.



A primary function of any YMS is to continuously support the demands of the warehouse with the resources in the yard. To accomplish this, the YMS must have robust planning capabilities combined with intelligent execution management that knows when to bypass the plan based on the current situation in the yard.

## Value Creation And ROI

The selection and subsequent rollout of a yard management solution is determined by the expected value resulting from increased yard optimization, including a fast return on the investment (ROI).

The Zebra YMS is designed to optimize all four stages of yard operations based on your particular goals. It accomplishes this through powerful configuration options, planning tools, execution tools, alerts, reporting, and system interfaces. The Zebra YMS is an effective operations tool for medium to large size yards. The system accepts pre-arrival information, which accelerates the check-in process. The gate process supports mobile handheld devices and stationary desk top computers. If desired, the YMS can be configured to produce paper gate tickets that direct drivers where to park in the yard. The YMS then governs the movements of trailers to and from dock doors using a combination of business rules and manual moves for exception processing. Trailers departing from and arriving at docks are directed by the Zebra YMS Door Manager module. Organizing trailers within the yard is optimized by the business rules. For example the inbound loads can be placed closest to the docks, and once emptied the Zebra YMS can assign parking locations that are closer to the exit gate.

In high velocity yards where shipping dock doors are assigned to set truck routes, yard parking assignments may be laid out by carrier with empties and loads side by side. This latter type of setup allows switchers to quickly plug dock doors while minimizing travel in the yard to obtain the next trailer. Drop and pull carriers also benefit with quick turnarounds. The Zebra YMS yard rules afford an operator to lay out a yard parking scheme that is tailored to their operations, creating efficiencies of a greater throughput of trailers over the same amount of real estate.

The Zebra YMS ROI is accomplished in less than one year. Optimized processes will continue to create value over several years.

## ROI – ZEBRA YMS SOFTWARE HARD DOLLARS SAVINGS ARE CONTRIBUTED BY THE FOLLOWING:

Reduced switcher cost (number of units, fuel and labor)	30%
Elimination of manual yard checks	70%
Reduction of dock labor costs	25%
Increased yard utilization / throughput	20%
Time reduction at gates to process drivers	50%

Additional savings above can be realized by using active RTLS technology with the Zebra YMS.

## YARD OPERATIONS AND RESULTING HIGH LEVELS OF SERVICE (SOFT DOLLAR GAINS) ALSO INCLUDE:

Event-driven transaction recording in the Zebra YMS provides outstanding reporting, and hence an analytical tool to optimize planning and execution of yard processes.
Better load security due to driver detail information capture at gates in addition to seal verification and recording upon arrival and departure.
Commands to switchers are no longer issued with radios. With the Zebra YMS Door Manager module, there is no lag time in executing trailer moves.
Data integrity and system interfaces with TMS and WMS minimize errors.
Drive down transportation costs by fast turn times in yard.
Significant reduction of demurrage expenses.
Improved level of service.
Able to handle trailer surges more effectively.

The Zebra YMS is cost effective and optimizes yard processes. The implementation of Zebra YMS has a direct and measurable positive impact on expediting goods movement across the supply chain.

## About the Author

Charles H. Kerr is a seasoned professional with over 40 years of experience in logistics and transportation.

He has played a key role in planning and implementing YMS solutions using software only and RTLS technology at major logistics operations for the retail industry. Mr. Kerr was President of Trans American Steamship Agency, Inc. / Mexican Line and had senior operations management responsibilities with California Cartage Company, NYK Logistics, Performance Team and Georgia Pacific. Mr. Kerr obtained an MS in Transportation Management from the University of New York Maritime College. He was awarded the NYK Logistics Kaizen award for outstanding continued business improvement practices and the Target Corporation All Star Award for excellence in service to customers.

