PINCSolutions

White Paper

Finding the KPIs for Yard Management



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EXECUTIVE SUMMARY

Yard management is a critical linkage in logistics management practices, and has a significant impact on the overall efficiency of the supply chain. Many of the yards still rely on manual processes to manage the operations, creating a visibility gap such that accurate and timely data cannot be ascertained, and thus hampering the management's ability to assess the operational performance of the yard. With a clear understanding of the key yard management metrics and their relevance to specific operations, the users can establish key performance indicators (KPIs) to help improve operational efficiencies and realize cost savings.

Increasing real-time visibility is key to achieving greater efficiencies in logistics management practices. Companies have made significant investments in systems and technologies to track transportation assets, however, few realize that transportation delays often take place not on the road, but while the assets are still in the yards at distribution centers (DCs), warehouses, and manufacturing plants. As all goods often go through multiple yards throughout the lifecycle, any inefficiencies or errors in the yard are amplified as the effects propagate through the supply chain network.

Some common yard management related challenges include lengthy gate check-in processes, multiple or redundant moves, time-consuming yard checks, delays, excessive detention/demurrage charges, unproductive administrative time due to ineffective communications, and the general lack of actionable information. The level of "pain" caused by a specific element depends on the nature and the size of the operations. For instance, delays can mean production down time for manufacturing operations, product spoilage if handling perishable goods, lost opportunities caused by stock-out for retailers, or credibility issues with carriers and customers. On the other hand, all of these problems can be attributed to the fundamental issue of lack of accurate, real-time information (i.e. visibility) about the yard operations.

Although electronic documentation and process automation are common practices at warehouses and DCs, most of their yards are still managed with data recorded manually on paper or in a collection of spreadsheets. In a recent survey published by the Aberdeen Group, 58% of the companies surveyed still relied on manual processes to manage their yard operations. [1] Not only is such practice labor intensive and thus costly, these companies typically do not have a good means to measure and improve the efficiencies of their yard operations, as the performance metrics are not well understood.

Yard management can be described in a framework covering the following main processes:

- **Resource planning** – decisions on capacity, labor and equipment requirements and yard zoning
- **Task scheduling** – dock appointment management for inbound and outbound shipments, and trailer move optimization based on custom criteria
- **Yard process execution** – check in/out trailers and tractors, and park trailers at staging areas or move to dock doors for loading/unloading
- **Event monitoring** – for security control and generating alert and notifications
- **Asset tracking and management** – records of asset inventory, movements, and history
- **Performance management** – analytics on equipment and facility utilization, labor productivity, and resource time

Earlier yard management systems (YMSs) typically were designed based on similar concepts used by warehouse management systems for directing forklift and pallet movements in the warehouses. These YMSs employ structured data entry and focus on optimization algorithms for routing and task assignments for managing trailer traffic in the yards. In order to set up the complex business rules required as the optimization parameters, however, the management often ends up trading operations personnel for additional IT resources for on-going maintenance of the system. More importantly, such

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approach does not address the fundamental issue of the lack of real-time visibility that is critically needed for better yard management, since any decision directing the yard operations is only as good as the accuracy of the input data. Furthermore, the performance management feature, if available, is often ineffective, as the reliance on manual inputs and record keeping results in incomplete and delayed information at best, and erroneous or lack of any data more typically.

The key yard management metrics commonly considered include such performance measures as driver, equipment (trailers and yard trucks), and facility (including parking spaces and dock doors) utilizations, which contribute to the overall productivity of these resources. The ratio of move to drive time can be calculated by keeping track of the time individual yard truck spent on driving with vs. without trailers, idling, or simply being off. Individual driver's performance can be evaluated based on mean time to complete moves, average number of moves performed per hour, and the number of misplaced trailers (not due to traffic coordinator's error.)

Meanwhile, dwell time of a trailer at a same location, particularly at dock doors, can be an indicator of the overall operational efficiency of the plant or warehouse/DC. Similarly, other metrics such as average trailer turn time and on-time receiving and dispatching of the inbound and outbound shipments have impacts on the transportation operations as well, as delays in shipment or appointment processing affects a shipper's credibility and relationship with its customers and carriers. Average drive and move distances can be yet another measure of how effective the yard is being utilized and/or zoned, considering the constraints of the overall layout of the facility. Finally, the “green metrics” of a facility's operations must include that of the yard. Whether it's excessive idling at the gate and inside the yard, or “empty miles” driven while the yard truck driver searches for the trailers, these factors all contribute negatively to the overall sustainability of the operations.

Based on the yard management metrics discussed above, key performance indicators (KPIs) can be established to help management assess the efficiencies of the operations, and subsequently take proper actions to achieve improvements and cost savings. KPIs based on quantifiable data are particularly useful, in that their values can be determined objectively. As inputs to the formula for calculating these KPIs, accurate data need to be obtained in real-time, which necessitates automating certain key aspects in the data gathering and monitoring processes.

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Real-time location system (RTLS) is increasingly accepted as the enabler for achieving high data quality through timely recording and reporting of supply chain events in and about the yard. Finding an optimal solution that leverages current processes while minimizing the required investment in the infrastructure is the most prudent approach to increase return on investment (ROI). More advanced RTLS solutions also employ stochastic methods to combine sensor and user inputs, further increasing the accuracy of the resultant information.

The benefits of having real-time visibility into the yards extend far beyond what can be seen locally, especially when the live information is shared across the organization and beyond corporate boundaries. The system can serve as a platform for information exchange among trading partners to facilitate collaborative supply chain practices. The data provides the transportation organization with the information needed for better planning and managing the shipments, while addressing the increasing needs for better visibility as required by the customers, carriers and suppliers.

Any management plans and strategies to improve supply chain performance must address the shortcoming of insufficient visibility, limited by the data collection mechanism and, consequently, the quality and timeliness of the data. Gaining real-time visibility is essential for achieving best practices in supply chain management, and finding the right solution for yard management may just be the place to start.

About PINC Solutions

PINC is the leading supplier of supply chain asset visibility and yard management solutions with Fortune 500 customers in manufacturing, retail, logistics, and transportation. PINC has pioneered the development of cost-effective RTLS using passive RFID technology that minimizes capital investment required in the infrastructure. PINC's award-winning products are designed with a scalable architecture for businesses of any size, and are expandable with modular components as customers' needs grow. Available as turnkey solutions delivered through a Software-as-a-Service (SaaS) model, these systems have proven their value through immediate efficiency improvements in customers' daily operations, typically generating positive ROIs in less than a year.

Reference:

[1] "The Key to Getting the Most Out of Yard Management Systems," the Aberdeen Group, March 2007.