Effective Management of Your Ready Mix Fleet

The Need

Early in the 20th century, a competitive market with a serious lack of standard practice in making concrete block resulted in unsatisfactory conditions. In the ensuing years, associations were formed to promote best practices. Their efforts paid off, and today in the USA, concrete is a $200 billion industry with 500,000 people employed, but with a new set of success problems.

Concrete industry customers depend on getting the materials they require precisely when needed. Concrete production and delivery are fast-paced, time sensitive operations where preparation in the plant and field delivery are happening simultaneously. Typically, trucks are loaded at a batch plant, are dispatched to multiple job sites, and return for reload. At the job site, multiple stages of concrete preparation are required at precisely the right time. To ensure both quality and efficiency, a well-trained dispatcher needs the tools to oversee this complex operation. And, that's just the technical side!

Tracking customers, vehicle location, delivery timing, varying labor rates, and invoicing brings its own set of operational challenges. The scale and demands of today's concrete industry requires the latest technology and solutions to ensure maximum efficiency and profitability.

Without accurate real-time vehicle location and job status data, it is difficult for dispatchers and drivers to efficiently manage the job. So, how could high-tech innovation help a low-tech industry? This paper explores the connected job site and areas where innovation leads to industry improvements, adding value to products and services, increasing quality, profitability, and efficiency, all with a short capital payback period.

The Solution

The RadioMobile end-to-end system is a customizable, scalable concrete fleet manager providing a solution to improve productivity and accuracy during the job cycle by:

- Reporting on each stage of the job delivery cycle.
- Real-time automatic vehicle location and job status to help drivers and dispatchers effectively plan the job including navigation and routing.
- On-board Internet of Things (IoT) sensors to assist with monitoring, identifying and directing the stages the job cycle.
- In-vehicle equipment including: Data and GPS communication.
- Dispatch office vehicle location workstation connected to the CAD displaying real-time fleet job status and location information as well as billing and reporting functions.
- Job reports and analytics including driver safety, quality, and telematics vehicle diagnostics.

DISPATCH
CHARGE
ENROUTE
ADD WATER
DISCHARGE
WASHOUT
RETURN
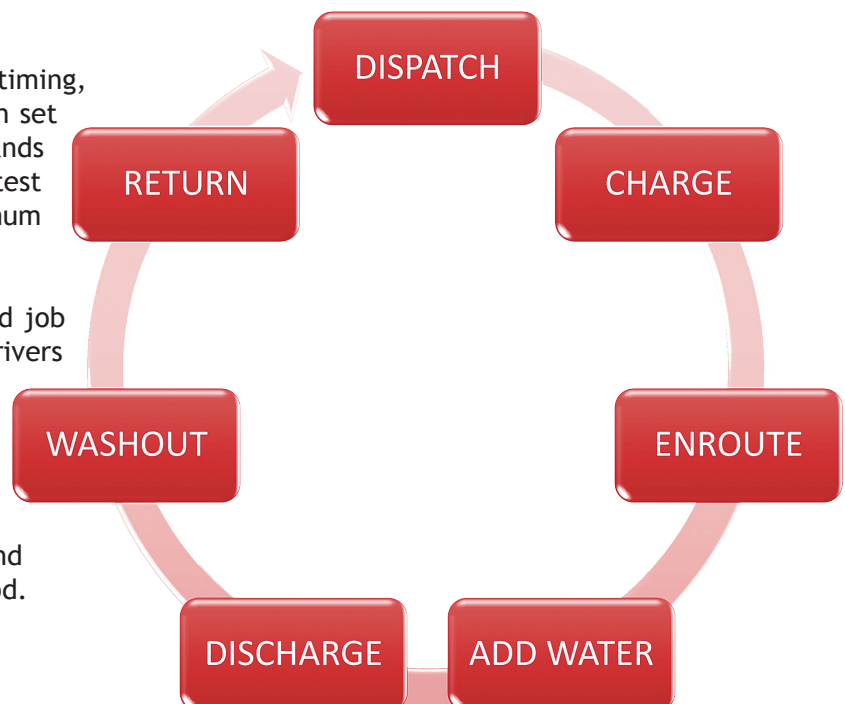
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Dispatch

Step into a typical headquarters building and you'll see a dispatch center that resembles those in a public safety agency. In a medium to large operation there might be seven dispatchers handling 100-300 active concrete delivery trucks at any given time. Using a computer-aided dispatch system (CAD), careful sequencing in dispatching and routing allows trucks to arrive just in time, one after the other, avoiding a line of trucks waiting to offload their concrete. Concrete must be delivered within a short time after it is batched, usually within two hours depending on the weather and other conditions. Prompt delivery and offloading from the batch plant is essential.

Since the industry's origins, a basic CAD with voice has been used for dispatch. Today's dispatch center technology is much more sophisticated allowing for non-voice mobile data vehicle status change including location and concrete condition to be received, and job instructions to be transmitted. Automatic vehicle location (AVL) systems such as RadioMobile's IQLocator provide the dispatch center with basic fleet management functions including status, location, the ability to give estimated time of arrival (ETA) updates to customers, and reports to understand fleet utilization ensuring efficiency and profitability. Fleets of vehicles can be managed, messaged, and viewed by defined groups depending on customer, location, status, or other factors.

In-Vehicle Fleet Management

Mobile Data Computers (MDC) provide wireless data communications between the truck's driver and the dispatch center. Each truck is equipped with a mobile router that links it via the wireless network to the company's host computer, as well as a high-bright MDC display for use by the driver. Vehicle location, job status, driving directions, job instructions, and mix readiness information is all shared. Depending on the network, a private data network, a 4G/LTE cellular module, or a satellite terminal can be used for this data backhaul path.

In addition to the job dispatch requirements, there are billing requirements that must be accounted for. During a job cycle, there are varying labor rates depending on the operation of a truck. A typical job process may go through nine stages including In-Service, Loading, Leave-Plant, Arrive-Job, Begin-Pour, End-Pour, Leave-Job, Arrive-Plant, and Out-of-Service. During each of these tasks, the invoiced labor rate may be different.

RadioMobile's MDCs are ruggedized computers that provide a touch screen display with status messaging, fill-in forms, a backlit LCD, and audible tones. Other MDC options include vehicle-to-vehicle messaging, maps with real-time traffic and navigation and AVL applications.

These MDC devices provide the essential information link of automating the delivery process by providing vehicle location and job status without the need for manual input with the additional benefit of allowing dispatchers to be aware of the mix-readiness stages in the delivery cycle.

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On-Vehicle IoT Payload Management

Here's where IoT and technology really kick-in! At the end of the day, the primary issue being addressed is tracking the concrete order from the time the order was placed to the moment the order is off-loaded. This needs to take into account more than just the in-vehicle status, but also the on-vehicle mix-preparation stage. The system needs to track the exact mix of the concrete formula, when the activating agent is added, the temperature inside the drum, the route taken by the driver, as well as the time of delivery.

In order to manage the payload, RadioMobile's solution utilizes and integrates in various sensors including drum rotation, wash-out, and water-add sensors. These sensors are placed on the truck to enable the system to measure the processes performed by the truck. Sensor outputs are combined with location information to automatically determine truck status without the need for manual input. The system will update dispatch on all standard stages within the delivery cycle.

This transmitted information is then used to help the business determine efficiency gaps and cost-savings for areas such as: job wait time, pour time, idle time, load time, slump time, dead time, and travel time. Measuring and taking action on these areas improves customer service and profitability by managing the jobsite without much manual input. Analytical reports of time-stamped events and locations are provided and help evaluate efficiency and reduce operational costs.

Private and Public Data Networks

The data telecommunications network is utilized to provide the vehicle status and location information to dispatch. The network used can take the form of a public wireless network such as 4G, a private LMR-based data network, a satellite communications network, or some combination of the above. Each network has unique advantages and disadvantages.

For a concrete supplier with existing equipment in their vehicles that support one or more of these networks, the RadioMobile solution can overlay on the current solution. Tradeoffs need to be considered when choosing the data communications network. The RadioMobile team can help analyze and assess which solution is best and build out a system designed to meet network coverage and financial ROI goals.

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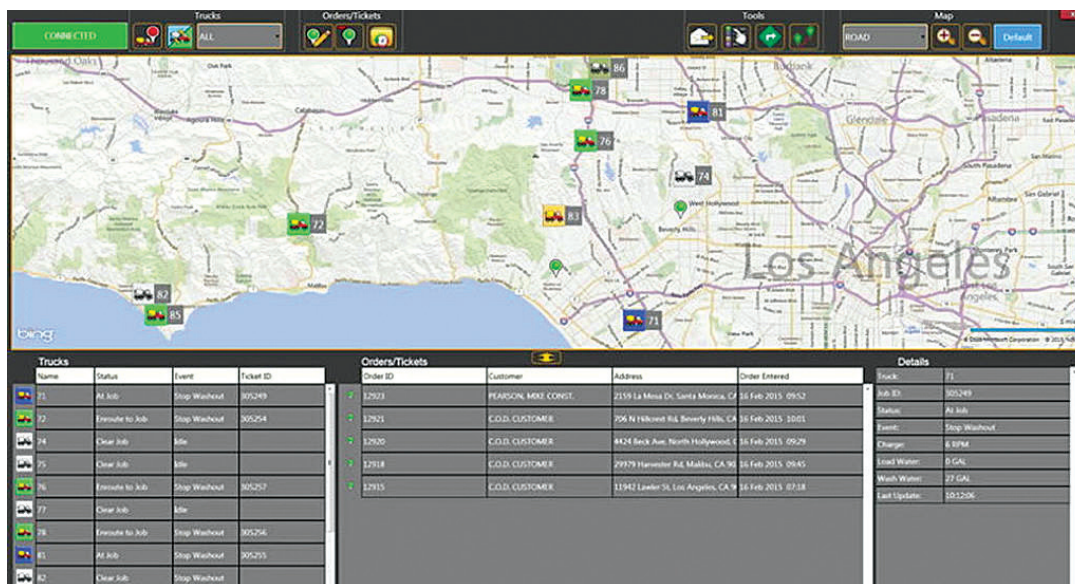
Conclusion

The Concrete Industry is one with specific fleet management, job site, and dispatch needs. To best serve customers, today's effective concrete fleet management system needs to incorporate a solution that tracks, schedules, routes, communicates and responds in real-time.

The benefits of such a system are clear. With effective dispatch decision-making, a company doesn't have to invest in more drivers or trucks, but rather can get more out of the current fleet. By providing the tools to increase productivity, reduce costs, and increase quality, a company can win contracts in a highly competitive market by managing costs and reducing job risks.

Consistency is key. The RadioMobile solution delivers this by incorporating dispatch, mobile data communications, vehicle location/status, job site status, payload status, as well as reporting and billing systems – all real-time. Furthermore, automation reduces the need for manual input to avoid error and improve overall efficiency of the delivery cycle process thereby reducing costs and improving performance and customer satisfaction.

RadioMobile

"By creating a solution that increases both delivery capacity and dispatch efficiency, we are able to provide premium customer service."
– Jim Moore, CEO RadioMobile

To learn more about how your company can efficiently modernize its technology, contact:

RadioMobile
www.radiomobile.com

8801 Kenamar Drive
San Diego, CA 92121

858-444-1330
Email: info@radiomobile.com