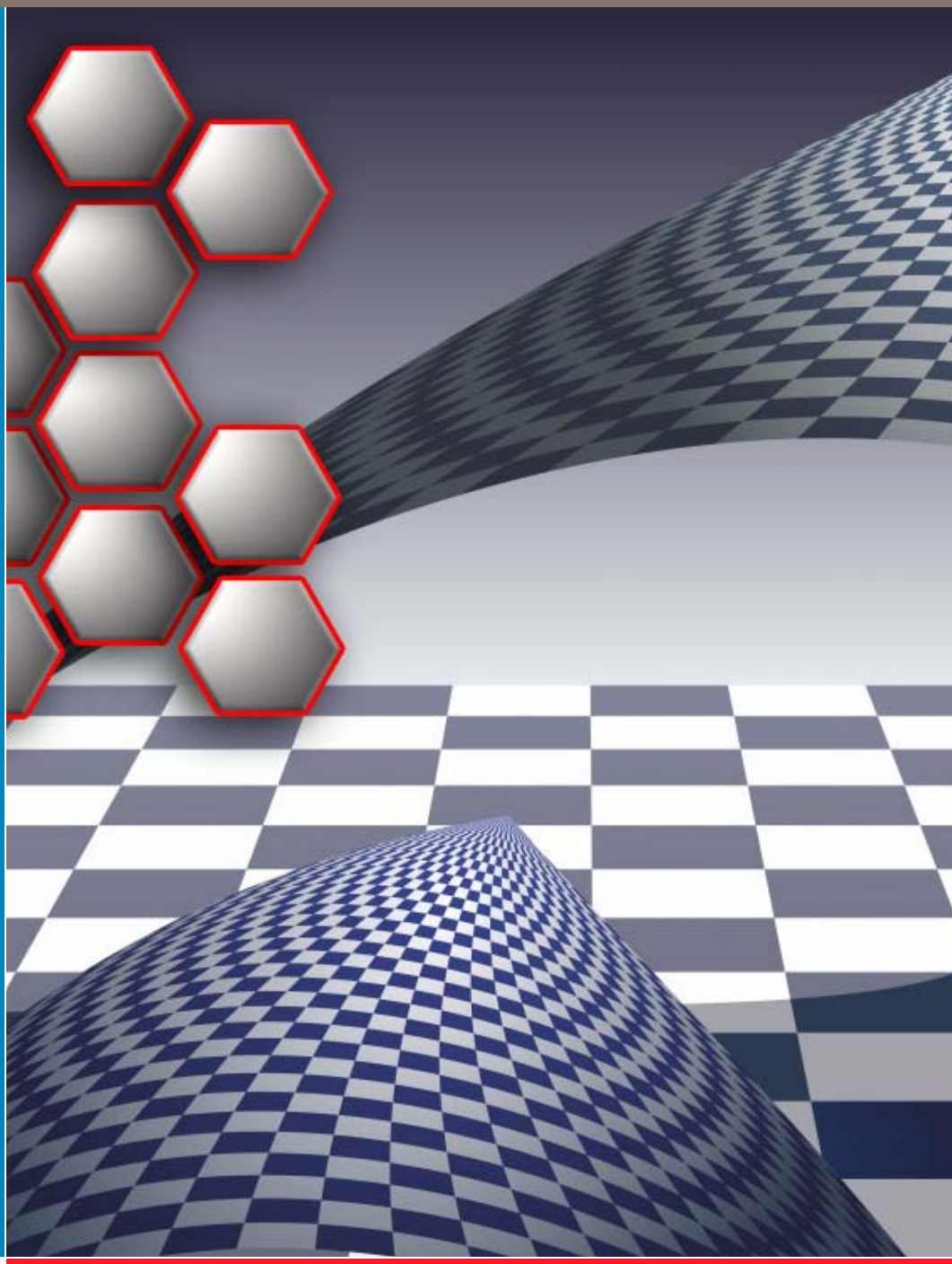
A COMMAND ALKON EXECUTIVE WHITE PAPER

Maximizing Profits in a Tight Market Through Optimization

BY JIM WAGNER



Command Alkon

Solutions To Build On

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Maximizing Profits in a Tight Market with Optimization
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Finding the balance between service and efficiency is one of the more important objectives for which ready mixed companies strive. When business in our industry was thriving and efficiency was not on anyone's mind, providing good customer service took a back seat to profits. Now that the market has softened, providing good service is more important but achieving efficiency is more difficult. Questions regarding the utilization of company money and resources are raised monthly or, perhaps even weekly by management. Most owners and managers strive for good truck utilization (i.e. higher profits), while most dispatchers look to avoid angry customers by over-trucking a job. In this whitepaper we'll examine how **Computer Optimized Dispatch can enhance both**.

Computer *Aided* Dispatch has been around since the mid 1970's. It schedules the orders entered and displays the results on a scheduling screen as well as on a truck tracking screen arranged by order. A dispatcher must make a decision on when to load a truck using the computer's suggested loading time. This loading time is often based on *one-spacing* from the previous load and does not take into account the actual travel or unloading times. The computer merely displays the schedule and trucks sorted by order; it does no thinking or suggesting.

Computer *Optimized* Dispatch is a more recent development. A Computer Optimized Dispatching system continuously evaluates the dispatch plan and updates it in real-time. It "learns" travel and unloading times and adjusts the schedule accordingly. It always seeks the lowest cost scenarios and displays loading suggestions. Computer Optimized Dispatch is "triggered" to reevaluate whenever an order, truck, ticket, or dispatch event occurs. These triggering events include: added, changed, or deleted orders, ticketing of a truck, and all subsequent truck status changes. Triggering can also occur whenever a dispatcher overrides a suggested load.

While there are several computer-driven optimization methods, the best ones to consider assign a cost to everything. The system's method would take into account the hourly and overtime costs associated with running different trucks. It would calculate the plant opening, operating, and material costs of each mix. Lateness would be assigned a cost that increases by increments as the lateness grows. Lateness costs would be further increased depending upon the priority of the customer or job.

Computer Optimized Dispatch could also require certain truck types or exclude certain types depending upon the customer's wishes. Plant, loading capacity, and truck haul capacity would be some of the factors that need to be included in the calculation. Roundtrip travel time is calculated by time of day. Based on these individual costs the computer would determine the least costly dispatch scenario. Consider a few examples:

Example 1: Plant 2's material costs are $3.00 greater than Plant 1. A job is 15 minutes from Plant 2 but 25 minutes from Plant 1. From which Plant should a 12 cubic yard (cy) order be delivered?

> **Solution:** The material cost at Plant 2 is $30.00 greater for the 10 cy load and $6.00 greater for the 2 cy load. Delivery cost from Plant 1 is an extra 10 minutes each way for a total of 20 minutes. Delivery cost is $60.00 per hour so 20 minutes is $20.00. If all things are equal the 10 cy load should come from Plant 1 while the 2 cy cleanup load should come from Plant 2.

Example 2: Plant 1 and 2's materials costs are the same. An order is 15 minutes from Plant 1 but 25 minutes from Plant 2. Plant 1's drivers are on overtime, Plant 2's are not. Calculated round trip time for Plant 1 = 120 minutes. Calculated round trip time for Plant 2 = 140 minutes. Wages, without benefits, are $15.00 per hour so the labor cost to deliver on time-and-a-half is $22.50/hr Which Plant should deliver the order?

Solution: It is less expensive to deliver from Plant 2 on straight overtime even though the haul time is greater. Plant 1 delivery will cost $90 ($22.50/ hr x 4.0 hrs). Plant 2 delivery will cost $70 ($15/ hr x 4.67 hrs).

Example 3: Plant 1's material costs are $6.00/cy higher than Plant 2's. An order is 15 minutes from Plant 1 but 25 minutes from Plant 2. Plant 1 drivers are on overtime, Plant 2 drivers are not. Calculated round trip time for Plant 1 = 120 minutes. Calculated round trip time for Plant 2 = 140 minutes. Wages, without benefits, are $15.00 per hour so the labor cost to deliver on time-and-a-half is $22.50/hr. Plant 1 is extremely busy and will delay loading the truck by 10 minutes. Which Plant should deliver the order?

Solution: It depends. Is this load going to be late? Is this a high priority order? Have any of these trucks been on site today?

Computer Optimized Dispatch quickly and efficiently performs calculations and makes decisions. It is to dispatch as computer chess is to chess. The computer always wins. The computer can think many moves ahead. It can quickly recalculate the optimum strategy when a piece moves, resources break down, or jobs change. Would a dispatcher take the time to analyze all the factors of a situation? Dispatchers often do not have the information, time, or inclination to perform such analysis. The costs and constraints that go into making the "perfect" decision are not always taken into account by the human mind. Computer Optimized Dispatch can reduce delivery costs by quickly planning and rescheduling as the day progresses. Reductions in delivery cost per order add up to significant savings at day's end. When you start multiplying the cost of a "less-than-perfect" decision to your yearly yardage, you will quickly recognize the overall benefit of Computer Optimized Dispatch.

Another important feature of the optimization "cost" methodology is the ability by management to fine-tune cost components to ensure that the company's priorities are considered. Is the optimization program leaning toward too much lateness in lieu of better costs? Increase the cost of lateness in the program. Is too much deadheading being planned? Increase its cost in the program. In this manner companies can tailor an optimization program to attain the desired balance between service and efficiency that is optimal for their specific company objectives.

Computer Optimized Dispatch is the future. New technologies have made it possible to bring optimization to the ready mixed concrete industry. Optimization programs have been widely used and accepted in other industries for years and it is only recently that optimization has been considered and accepted for our industry. Just as the batching of concrete went from levers to electric, from over air to punch card systems, and finally to computers, dispatching will follow a similar route. We've witnessed the transition from dispatch sheets, to truck status boards, to mini-computer central processor dispatching, and to networked microcomputers. The next logical evolution will be that of Computer Optimized Dispatch and the balance it will bring between service and efficiency.

Jim Wagner has worked in the Construction Materials Industry since 1964 and has been with Command Alkon, Incorporated for 29 years. Jim began his concrete career as a dispatcher which led to him assisting in the development and co-patenting of The Operations Monitor, a mechanical truck-tracking device, and established processes and procedures for concrete scheduling. Jim became certified as a concrete technician and worked in QC and sales. He developed the Concrete bid price calculator and implemented a successful FOB concrete pricing scheme for special customers where delivery was charged separately by the hour. In 1973 he founded Advanced Control Systems (ACS) to market dispatching systems. In 1975, ACS introduced the first commercial computerized dispatching system. ACS grew to be the leading supplier of computerized dispatching systems for the Ready Mixed Concrete, Aggregate and Block and Building products industries. In 1985 Jim merged his company with Command Data Inc. to integrate more closely with accounting. Jim has been a teacher for NRMCA's "Management of Materials Dispatching" classes since 1968. In 2001, he published a book "The Handbook of Ready-Mixed Concrete Dispatching". Jim has installed hundreds of dispatching systems worldwide. His services are unique in that they cover dispatching and marketing specifically for the Ready Mixed Concrete industry.