

December 2003

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Recommended Citation

"eTrucking: How New Technologies are Transforming the Trucking Industry" (2003). *bled 2003 Proceedings*. 26.
<http://aisel.aisnet.org/bled2003/26>

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eTrucking: How New Technologies are Transforming the Trucking Industry

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Abstract

The trucking industry is undergoing an evolution of revolutionary proportions. As American businesses continue to embrace just-in-time manufacturing and distribution methods to reduce inventory levels, smaller and quicker deliveries of goods in the supply chain are essential. A booming economy has increased the demand for transportation services to an extent that finding enough qualified drivers becomes a major challenge. Because of this and many other factors private fleets, full-load and less-than full-load carriers are feeling increasing pressure to adapt to new challenges and possibilities. Supply chain management and fleet management are becoming even more important as customers demand more services from their carriers. Carriers are continuing to embrace satellite tracking and communications technologies as key elements of increasing the productivity of their fleets while also reducing waste and inefficiency at the same time. The introduction of these previous forces has begun to turn the truck driver into a knowledge worker. These drivers just don't drive these big trucks, but they are in continuous communication via e-mail and satellite contact with their dispatcher. The web site has also become an important tool for carriers to facilitate new business relationships and enter new markets. Transportation.com and pnv.com are two important examples of how our carriers are creating web sites that are providing solutions and new potential for all of those involved in the trucking industry.

1. Introduction

Over the last ten years American manufactures and distributors have continued to embrace just-in-time manufacturing and distribution methods in order to keep inventories lean. In effect, our nation's trucking firms are evolving into warehouses on wheels.⁵ In response to these changes the trucking industry is embracing and utilizing new technologies that seem unimaginable only ten years ago.

The dynamics of e-commerce is facilitating a powerful shift in power from the seller to the buyer. Logisticians call this demand-chain as opposed to supply-chain economics. With the power of the World Wide Web, the buyer is now king of the purchasing process. The Internet is seen as a way for companies to expand their supplier base in ways that previously were not available.¹¹

In the past, sellers had substantial control over shipping prices. Now buyers have much more information on prices and more firms out competing for their business. Buyers are now much more able to find the best supplier and can now practically name their price and terms of sale. More than ever before buyers expect deliveries to be made when they want and where they want and are using the power of the web to find the lowest-cost provider using the power of the Internet.⁴

The trucking industry has been having a hard time attracting and keeping enough qualified drivers over the last few years. The booming economy over the last six year has lead to the unprecedented demand for trucking services and more drivers at a time when alternative jobs are in great supply. The driver shortage is especially dire for TL (long haul) carriers. The drivers often spend a great deal of time away from transporting goods throughout the nation. Today, industry estimates peg the number of unfilled TL driving positions at 80,000.²⁸

Robert Sturgeon, CEO of Barr-Nunn Transportation in Granger, Iowa, says the scarcity is limiting capacity for the national TL dry-van carrier founded in 1982. Even though his driver turnover rate is just over 40 percent in an industry where the average is 98 percent, Sturgeon says Barr-Nunn policy of paying drivers well (34 center a mile for drivers with five years' experience) and providing them with steady work, more at-home time, and home-office support while on the road isn't enough to keep the company from being affected.²⁸

“The things that do work in recruiting and retaining drivers, says Roberts (Miller Transporters Inc.), are better working conditions—roomier cabs that are more comfortable, better truck suspensions that reduce damage to cargo, engines with better torque for improved performance, a responsive and informed home office—the kinds of changes that make the on-road experience smoother and easier for drivers.”²⁸

The American Trucking Association (ATA) estimates that there are over 3.08 million commercial truck drivers in the United States. An additional 9.5 million are employed in jobs that directly involve the trucking industry.² In 1997 the \$372 billion spent for truck freight dominated the freight transportation market at 81.3% of the nations freight bill.² By 2008, it is estimated that this will grow to \$625 billion, of which 87.2% will go to the trucking industry.³ Across the industry, freight companies are struggling with sky-high fuel costs, while a rippling economic slowdown is cutting into orders.³

2. Problems and Challenges

With these rapid changes we're beginning to see enormous pressures being put on private fleets, TL and LTL carriers to adapt. In order to adapt to these pressures, each must design new strategies to improve their competitiveness and efficiencies or face the consequences. This entails effectively utilizing new technologies in order to broaden their customer bases. Of the three types of carriers just mentioned, private fleets are having the greatest difficulty adapting to the new competitive pressures.

Private fleets are those that are owned and operated by the manufacturer or distributor. Wal-Mart is an excellent example. Private fleets are under more pressure than ever. They are seeing increasing competition from for-hire carriers in addition to the effects of the changing business models. They typically aren't equipped with the latest technologies, as more emphasis has been placed on controlling costs, internal security and quality control.¹⁶

Today, technological lag is becoming one of the biggest challenges facing private fleets. For-hire carriers have not stinted on the installation of the high-tech routing, tracking, and

communications systems that their customers demand, but relatively few private firms have followed suit. As demand for more precise delivery scheduling and supply chain “visibility” grows, private-fleet managers are finding that fleet technology is no longer a luxury.¹⁶

The next carriers are called TL. These carriers are considered full-load or truckload carriers. They have traditionally operated in delivering goods over long distances. The old full load carriers will face new challenges as the emphasis shifts to smaller and more frequent trips. “The whole movement toward just-in-time manufacturing and e-commerce has made for more shipments of smaller quantities moving faster,” say Hugh Randall, head of Mercer Management Consulting Inc.’s transportation group. And that hurts truckloads carriers and railways.¹⁸

The next outfits are known in industry lingo as less-than-truckload (LTL) carriers. They usually deliver a mix of different products over short distances, usually overnight.⁸ These carriers are the most likely to benefit as more producers shift to just-in-time manufacturing. Typically these shipments don’t fill an entire semi trailer.¹⁸ LTLs are looking for way to maximize their capacity. Currently, most have extra capacity of 10 percent or higher. They are especially eager to tap new opportunities to increase the utilization to near 100 percent levels.¹²

3. Supply Chain Management

These current changes are putting an increased emphasis of integrating supply chains. Carriers will have a much more visual and integral presence with the technological ability to meet the demands of their customers if they wish to succeed in this new competitive environment. What is especially important is that the Internet is helping to link carriers and their customers much more effectively. Now they have the ability to better manage supply-chain flows and cutting costs by reducing unnecessary inventories.⁵

“Carriers have to be Web enabled,” claims Delaney. “The more efficient carriers will allow customers visibility from pickup to delivery.” Richardson, Helen L. Motor carriers embrace Web-enabled service.²⁶

“Customers require us to make their supply chain more efficient with faster transit times and lower cost,” according to Lou Esposito, a VP of with Roadway System. “We must address all aspects of the logistics question. In the new e-commerce environment, we must be able to handle freight and give visibility. We do that with better information systems and tying in our Web site.”¹⁷

As integrating Web sites will continue to evolve at Internet usage increases, one industry insider is quoted as saying that retail collaborative planning, forecasting and replenishment will become “a vital part of a just-in-time replenishment plan aimed at reducing inventory and cycle times.” He believed that TL carriers could benefit from improved consistency in the supply chain.¹¹

4. Improvement in Customer Service

With the increased emphasis on improving supply-chain management, the importance of providing excellent customer service is essential. Even though technology is important for this industry, balancing the costs and potential benefits is crucial and must be considered. According to Bob Obee, VP of operations planning at Roadway Express,

“We’re willing to invest in any technology leading to cost reductions or service improvements. Those improvements also have to be valuable enough to be recognized in the marketplace by our customers.”¹³

Every investment these trucking firms make in new technologies must be measured against real gains in cost savings and profits. The trucking industry is extremely competitive and every dollar invested must have a strategic measurable payback, whether it be increasing customer service, increasing utilization trailer, increasing sales etc. By using existing technologies to improve customer relations and customer service, I believe carriers can improve the relationships they have with their customers and will ultimately lead to profitable long-term contracts with.

5. Fleet Management

In order to ensure effective and efficient supply chain management, an efficient use of a carriers’ fleet is of paramount importance. The economics of trucking are about maximizing “loaded” miles and minimizing “empty” miles – which is easier said than done.²¹

If a carrier isn’t able to have the drivers where they need them, when they need them, they will not be able to properly coordinate the flow of goods from one point to another. The million-dollar question for every dispatcher is deciding which driver should take which load. In an environment as complex, and fast paced as today, these scheduling decisions are best-understood and evaluated through the use of quantitative decision models. There are at least ten such software programs available on the Internet which can help a carrier better manage their fleet. I found one particular software program quite interesting.

Transport Dynamics Inc. sells a software program called Dynamic Vehicle Allocation (DVA). This program grew out of a research lab from Princeton University. DVA has customized high-powered vehicle-optimization technology. This program uses three complicated algorithms – the demand-forecasting model, a fleet-management model, and a driver-scheduling model – to consider one simple question: Which truck should take this load?²¹

As all carriers need answers to these types of questions for each load, possibly a few thousand or more times a month, all pertinent information concerning the size of fleet, objectives, factors, point values, the day of the week, and “projected economic value” of shipment, among many others, will constantly be evaluated on a real-time basis through this DVA software program.²¹

6. Satellite Tracking

Knowing where every driver you’ve got is at all times is increasingly important if we wish to coordinate the supply chain with our scheduling problem. The trucking industry has access to a whole range of commercially available technologies that enables tracking, locating and communicating with every driver in their cabs while out on the road, regardless of whether they may be in the Seattle area or ten miles north of Miami.

National Distributing Co. Inc. (NDC), an Atlanta-based distributor of wine, beer, and spirits, was looking for a vehicle tracking system that would help it better manage their fleet of 600 trucks through their 16 distribution centers to deliver better services to the 60,000 to 70,000 stores they deliver to.⁹ NDC ultimately chose a system from Roadnet Technologies Inc. The Roadnet system enables the company to route and then monitor

trucks. Communications between the fleet's dispatch center and the truck is facilitated by a wide-area wireless network. In addition, a satellite periodically "pings" the truck to record its position in a handheld computer on board the vehicle. The location data are then communicated back to the dispatch center via radio-frequency transmissions." The end result of this new system was a 30 percent reduction in driver stops per hour and a \$100,000 savings in overtime pay.⁹

Don Buchta, a LT trucker described what his job was like before satellite technology and e-mail. Before his company installed a satellite tracking system to manager trucks and communicate with drivers, Buchta used to spend much of his time sitting by a pay phone – waiting for load orders, directions and "calling back, calling back, calling back," he said.²⁰ But the most important benefits of all is that the technology reduces delays and cuts costs.

In 1988, Roberts Express learned of OmniTRACS, a two-way satellite communication system offer from QUALCOMM Inc. The firm installed satellite dishes and computers in 800 of its trucks. After the first year of use, Roberts saw the number of driver calls drop by half, the productivity of their dispatchers doubled and the fleet carried 5% more loads.²¹

In 1998, Qualcomm introduced TruckMAIL, a new service designed to the needs of smaller truck fleet operators, those with less than 100 units on the road. This service allows dispatchers' to use real-time tracking and two-way messaging over Qualcomm's satellite network.²⁶

7. Building an Effective Web Site

There should be a sound business reason for everything any trucking company does on the web. It's probably not worth it unless it saves time, saves money, generates new business, retains old business, increases margins, eliminates less-profitable aspects and expands services that generate more revenue than typical cost.¹ It is important to remember that by creating a web site where others can learn about you and your services offers the potential to gain more customer contacts and ultimately lead to increased sales. "We know there is no last word in transportation—there is only the latest word," says a trucking CEO. "The Internet changes any product from being unique to being a commodity. When you have a commodity, you have to do it faster, quicker and better—or you die."²² Firms have to design their sites strategically so that potential customers will find something valuable to them in your site. An excellent example of an effective site is one that has a clear goal and objective to be a one-stop shopping spot.²²

Roadway is an excellent example of a company who understands the importance of meeting these new needs. Roadway's e-strategy is simple: to build stronger bonds with customers, suppliers, partners, employees and shareholders. To do that it must achieve "seamless" integration of online and offline business processes.²²

Mr. Puglia of Roadway offered some useful tips that trucking firms can use to get the biggest impact possible out of their Internet sites:²⁴

1. Use meta tags, a small thing that helps market a site.
2. Special drawings and giveaways help build mailing lists.
3. Create your own award, such as Wickham's top 10 Internet sites.
4. Engage and equip the entire company work force.
5. Encourage links to your sites and create a set of linking tools.
6. Put your URL "everywhere."
7. Use banner advertising and purchase keywords.

8. Use e-mail marketing, including a guest book.
9. Spend money to get listed on search engines and directories.
10. Hire a promotional agent.

I've found some interesting web sites that are extremely useful for carriers, shippers and truckers alike. They provide excellent example as to how these players are taking full advantage of these technologies to create value for the user.

7.1 Yellow Corporation

Yellow Corp. is a major carrier located Overland Park, KS. Yellow is a big believer in the power of the Internet and has made extensive investments to harness its potential to increase sales and build customer relationships. "The most obvious example of technology use is the Internet," says Bill Zollars, CEO of Yellow Corp. "We're receiving 13 million hits per month on our Web site. Two years ago, it was 15,000 hits per month."¹⁷

Using MyYellow.com customers can actually build their own web site within Yellow's Internet infrastructure. Customers can customize their individual site to get needed information in the form they choose. This site features a live chat function in case they are having difficulty or need a question answered they can click on an icon and communicate with a customer service representative who can provides an answer.¹⁷

Yellow Corporation also recently a new web site [Transportation.com](http://www.transportation.com) (www.transportation.com) through a joint venture with two other firms. This site provides load-matching services that link truckers with capacity to companies that need to move freight. Using this site one can easily find a shipping quote from a particular zip code to another. One can also find carriers willing to deliver from a specific city to another using a specific type of equipment (containers, flatbeds, dump trailers, logistics trailer, etc.). The site also can handle insurance claims, billing, bookkeeping and regulatory compliance for small and medium sized carriers. Members can also search for and sell used equipment through auctions and classified ads.² This is an extremely useful site in that it is specifically designed to provide needed solutions for shippers and carriers alike.

This site was also designed with simplicity in mind. It makes extensive use of drop down menus, simple data entry fields, informative tutorials, and FAQs and help features. I believe that this layout with its easy to use functions will really help less experienced Internet users up and running quickly with little effort and/or frustration. This site does a great job by keeping the process simple (see printout in Appendix).

Transportation.com had about 6,000 customers and earned \$6.6 million in revenues during the second half of 2000. They were able to find matches for 55 percent of the more than 26,000 loads posted. They expect annual revenues to reach \$30 million in 2001.²

7.2. PNV Inc.

When most people try to imagine what a truck stop looks like, images of overweight truckers having a cup of coffee or breakfast in a greasy restaurant just off the Interstate must spring to mind. Surely it must seem you're as close to nowhere as you can get. The truth is that our nations truck stops are right on the cutting edge of the latest Internet and communications technologies. Truckers on the road need to keep up to date with their dispatcher to receive new pickup/delivery requests or send a message to a family member. Not every carrier fleet has the latest satellite or wireless in cab communication capabilities. Enter PNV.

PNV Inc., formerly Park 'N View, is an e-commerce portal www.pnv.com pitched to long-haul truck drivers. PNV is a one-stop website for truckers, offering free e-mail and a variety of driver-related services.⁶ Using the site drivers can find the lowest fuel prices in their area, plan a trip, shop for books and music, monitor their daily finances, read the latest news and sports, send an email, look for a better paying job, and search the classifieds.

PNV is the leading provider of bundled telecommunications, Internet access and cable-television services to truck drivers in their cabs. For a small \$30 monthly subscription fee, these drivers can hook up their cabs at 75% of the nation's full service truck stops.¹⁴

8. Government Regulation of Trucking Industry

Federal law requires truck drivers to record and keep track of the number of hours they spend on the road. These laws help keep our highways safe from sleepy truckers by limiting hours spent behind the wheel on a given day and requiring days off. In 1998 the Federal Highway Administration (FHWA) permitted the first use of satellite location technology to verify a driver's hours of service instead of the regular method of paper log books.²⁴

There is considerable pressure in Washington to further curtail the amount of time drivers can spend behind the wheel. Should this bid by U.S. regulators to change truck drivers' hours-of-service rules prevail, an additional 60,000 new drivers would be needed, according to proposal's critics. If this reduction in hours of service is ever implemented it could only further exacerbate the demand for qualified drivers.²⁸

9. Conclusion

The trucking industry has been undergoing rapid changes overall the last few years that have completely revolutionized how the key actors behave and the technologies they use to increase the capabilities of carriers and shippers alike. I firmly believe that this industry will continue to grow and evolve to an even greater extent in the next few years as these technologies receive greater saturation and become more powerful.

Philosophy - I believe that private carriers, LT's and LTL will continue to consolidate but may evolve into a hybrid mix of structure, serving dual markets at the same time. If you can build and maintain relationships with your customers and please them time and time again, you are likely to remain in business for a very long time.

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