POWERFUL REPORTING — IMPROVES INSIGHT —

How Transportation Benefits from Big Data Initiatives

PLS
Logistics Services

INTRODUCTION

The concept of collecting and studying data for business intelligence is nothing new – but today, there is more data available than ever before. It's estimated that each day, we create 2.5 quintillion bytes of data. This data, "big data", is able to be gathered, sorted and analyzed thanks to advanced, systematized technology.

Leveraging big data is extremely valuable in transportation and logistics planning. When managed properly, big data can be used to make better transportation decisions and can help enhance business operations.

ONLY 23% OF COMPANIES HAVE A BIG DATA STRATEGY

In the transportation industry alone, there is a massive quantity of data that is generated daily to be consumed and analyzed. Because of mobile communication, increased knowledge and software tools, shippers and carriers are discovering insights that allow them to create solutions that optimize processes and increase profits.

The demand for answers and solutions to simplify processes and cut costs is increasing, but only 23% of companies have a big data strategy. Many companies are missing out on the opportunity to achieve peak performance and service levels, not realizing there's a practical way to approach implementing a big data initiative.

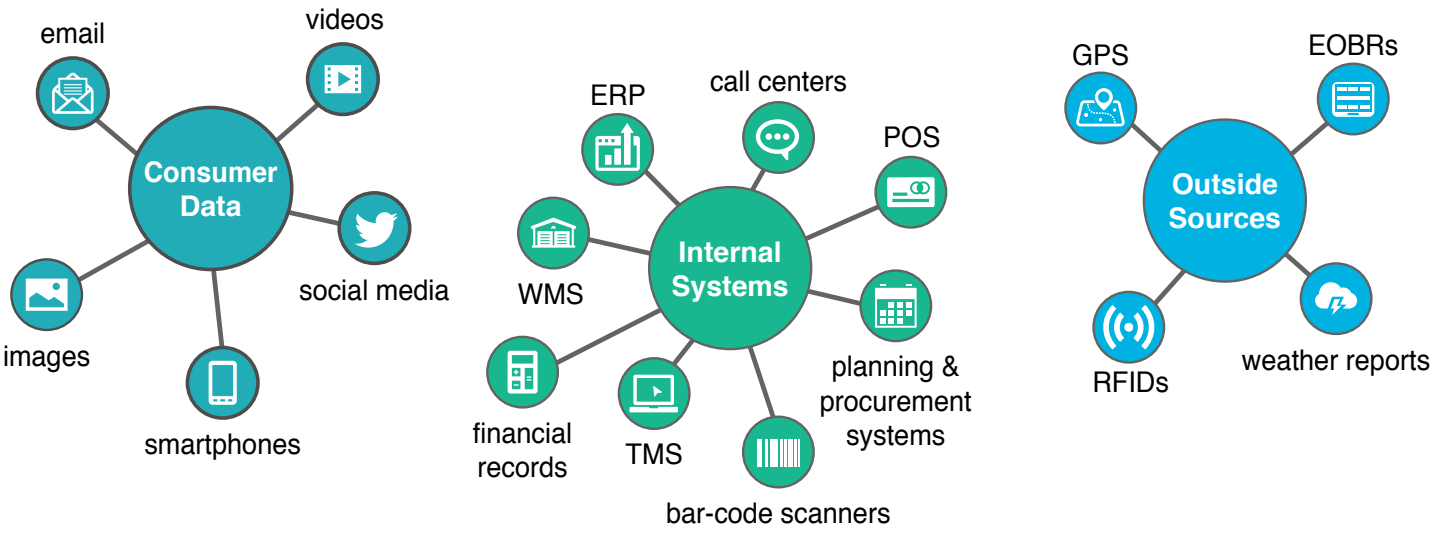
There's so much data available that it's actually impossible to comb through it all. Taking a hands-on approach to begin mining big data is crucial to a sustained, profitable strategy where evaluation can be effectively used for predictive analytics and quick, informed decision-making.

THE BIG DEAL ABOUT BIG DATA

WHAT IS IT?

Big data refers to the practice of collecting various forms of information from a myriad of sources, making sense of that information, and using advanced tools to identify patterns and trends. The goal of analyzing big data is to be able to make quick, smart decisions that produce lasting results.

In today's world, information comes from a variety of sources, including but not limited to:

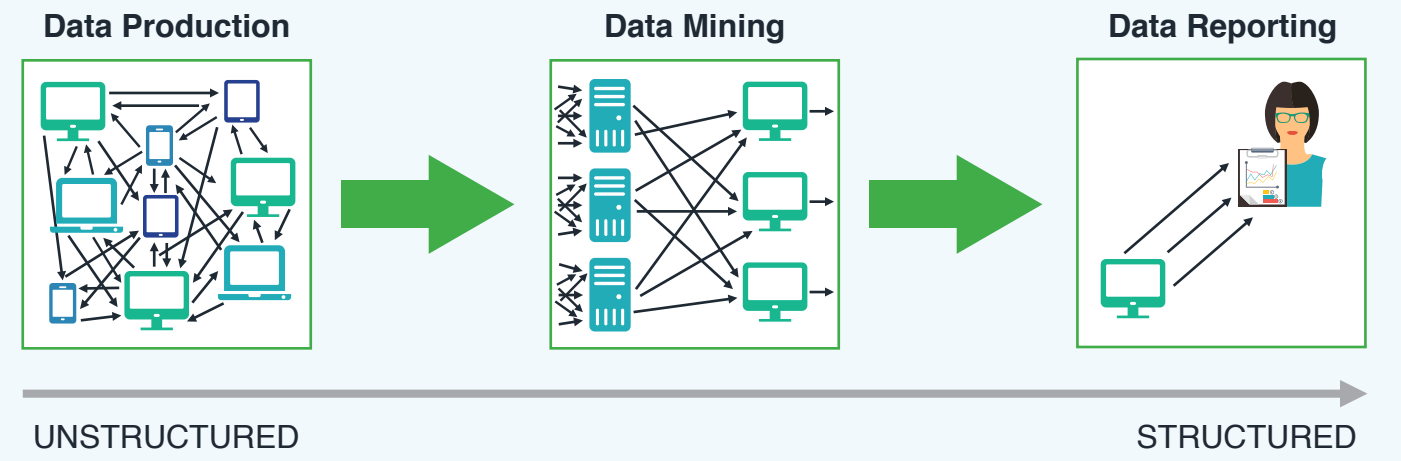


From all of these different channels, big data can be broken down into two primary categories: structured and unstructured data.

Structured data: numeric data in traditional design and databases. Information created from the line-of-business, whether generated on computers or by people. Experts estimate that structured data accounts for about 20% of the big data. Structured data is easily stored.

Unstructured data: text documents, email, video, audio, social media and financial transactions. Unstructured data does not fit neatly into a database. Experts estimate that 80 to 90 percent of data within an organization is unstructured. The amount of unstructured data is growing rapidly, probably even faster than it can be organized.

The monumental obstacle to effectively utilize big data, for any company, is making sense of all of the information, structured and unstructured. But, once achieved, the benefits are enormous.



POTENTIAL VALUE

Big data has nearly limitless potential. Oracle says it's "the electricity of the twenty-first century – a new kind of power that transforms everything it touches in business, government and private life." There is no doubt that big data could completely reshape daily life, but it has a particularly high potential to enhance the business world.

Understanding the data you collect will lead to what was once an unimaginable depth of insight. Hypothetically, you could learn exactly what your company, your competitors and your customers are doing in real-time and make professional decisions from current demand and behavioral forecasts.

This deep level of visibility may bring radical changes in the business world, especially in an industry as time-sensitive as transportation. Clearer insight means more accurate and confident decision making, which leads to operative proficiency, reduced expenses and fewer disruptions. The collection of data from structured and unstructured sources, inside and outside your company, represents a chance for continuous discovery of opportunities and obstacles in every aspect of your business.

Properly accumulating, handling and consuming data will improve customer satisfaction; a priority for all companies. Plus, it will determine actionable solutions to existing business challenges. Companies will be able to pinpoint inefficiencies in the supply chain, improve freight movement and create better inventory management. Studying data will support new resolutions that differentiate one company from its competition. Big data permits us to look forward to a more intelligent future.

Global Data:

- There are 3.17 billion internet users, approximately 40% of the population
- Internet data will be four times larger in 2016 than it was in 2011
- The number of bits of information in the digital universe exceeded the number of stars in the universe in 2007
- Every 2 days we create as much information as we did from the beginning of time until 2003
- Every minute we generate 204 million emails, 2.5 million Facebook posts, 278,000 tweets, and 2 million Google searches

Business Data:

- Retailers could increase profit margins by 60% by effectively mining big data
- The market for Hadoop and similar companies is expected to rise from $2 billion in 2013 to $50 billion by 2020
- Companies monitor 12 terabytes of Tweets every day
- The growth of the Internet of Things (IoT) will lead to 50 billion connected devices by 2020, compared to 13 billion connected devices now
- In 2011, there were 12 million RFID devices ever sold. By 2021, that number will increase to 209 billion

PRACTICAL VALUE

The potential impact of big data on a business is remarkable, but only 20% of the data accumulated is in an easily digestible, structured form. Trying to make sense of unstructured data takes serious commitment of time and resources. For transportation, big data can deliver significant improvements to procedures through a thought-out strategy.

IF PRODUCING, PROCESSING AND MOVING GOODS CAN BE DONE FASTER AND AT A LOWER RATE, THEN ALL INDUSTRIES WILL BENEFIT

Current applications of big data are paving the way for a safer, better performing transportation environment; it is pointing supply chains in a smarter direction - towards original decisions that improve the bottom line. Shippers who have high-performance standards are using big data to discover their competitive advantage. Here's how:

Big data in supply chain, logistics and transportation is supported throughout all industry verticals and job levels. If producing, processing and moving goods can be done faster and at a lower rate, then all industries will benefit – through more efficient product development and time to market.

ONLY 20% OF THE DATA ACCUMULATED IS IN AN EASILY DIGESTIBLE, STRUCTURED FORM

Routing, tracking and monitoring capabilities enable companies to augment their schedules and processes to keep customers happy and avoid disruptions. Big data supports cost savings and soon will become a mandatory part of operations for all companies.

Exploiting big data offers a chance for powerful decision making. In transportation, there are endless amounts of data to be collected; trucks and trailers, management, loading docks, warehouses, maintenance systems and employees can all be two-way channels of information.

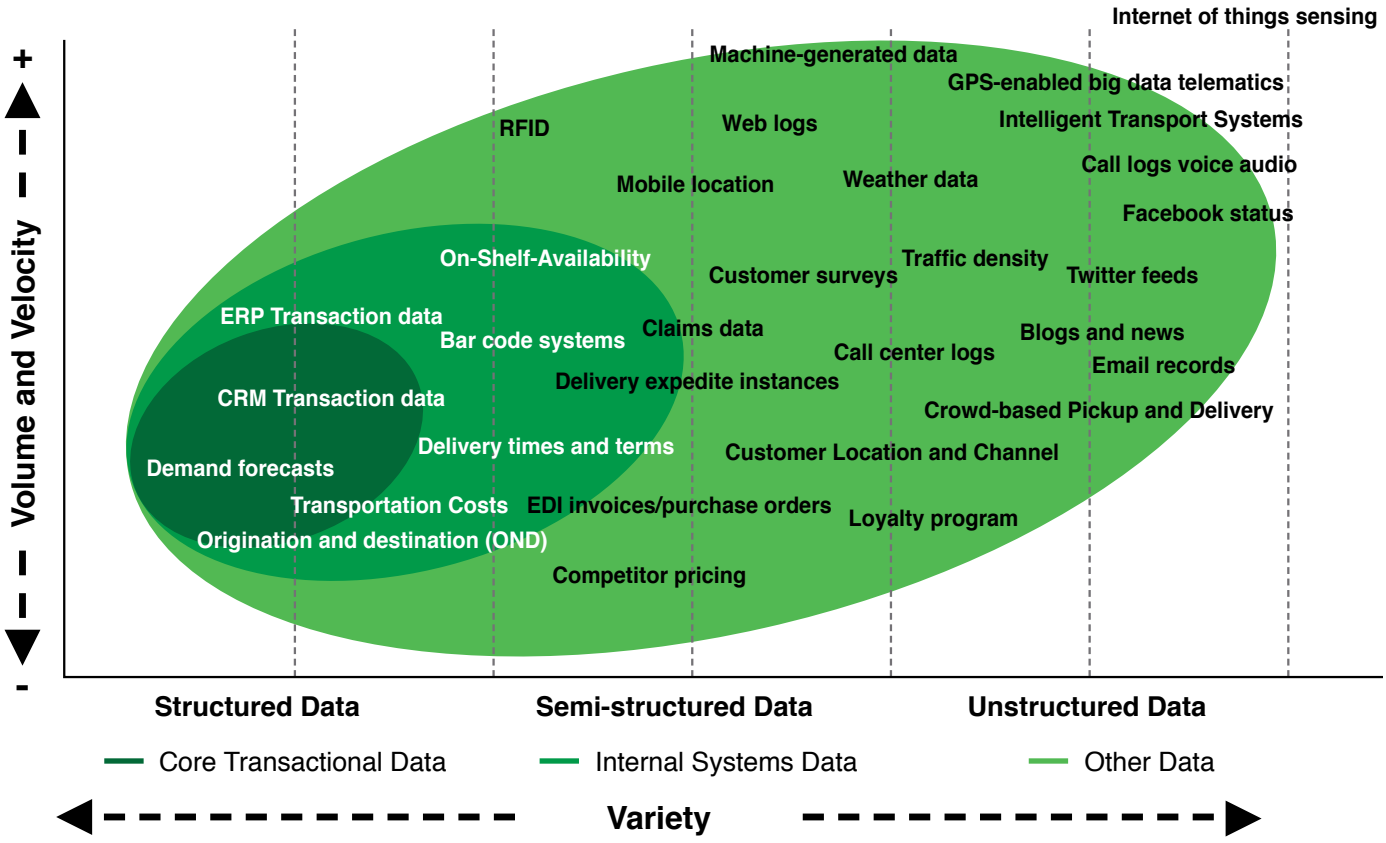
Access to structured data allows for collaborative communication between

carriers and shippers, who can then work together to achieve the best results – recognizing equipment problems, improving loading procedures, realizing better routes and reducing costs.

With this new, or at least enhanced, visibility into logistics processes, shippers are able to forecast trends, disruptions and opportunities. Then, with these analyses, a company can make more knowledgeable decisions and strategies – projecting them to competitive differentiation.

WHERE ARE THE MOST PRACTICAL SOURCES OF BIG DATA?

With the incredible volume of data being produced, every minute of every day, structured and unstructured, it can be very difficult to collect meaningful information and make sense of it, especially when there are so many channels creating data. So where do you even start?



Source: Rozados, Tjahjono. "Big Data Analytics in Supply Chain Management: Trends and Related Research"

As you see in the graph above, structured data with a lower volume and slower production velocity is the best place to begin mining big data. Starting small is the best strategy, it's less overwhelming and you can quickly learn challenges and opportunities which will help grow your future big data strategy.

Two of the best sources of big data that a company can immediately put to use are from EOBRs, which are outside of the company, and from a TMS, which is inside the company.

EXTERNAL SOURCE: EOBRs

One piece of equipment revolutionizing business intelligence for shippers and carriers is the electronic on-board recorder (EOBR). EOBRs collect data and communicate regularly to ensure that there are no problems on the road and that deliveries will arrive on time.

These devices make it possible for drivers and shippers to make decisions during a route. The Federal Motor Carrier Safety Administration (FMCSA) requires all carriers to install some technology similar to electronic on-board monitoring devices to track vehicle and driver status. These devices also improve safety.

Based on what the data indicates, shippers are accountable for communication with drivers. Status sensors reveal important information to stop major disruptions before they impact business. Weather and traffic reports might alert a shipper to warn the driver of upcoming delays, and reach out to the customer that the shipment might be delayed. Shipping and delivery procedures can be monitored and tracked – right down to the exact location of a package.

This type of data offers extremely high service levels to all parties involved. Effectively using this information is necessary to stay competitive. Here are some ways EOBR data can be used:

- **Reefer monitors will send a signal to the shipper or carrier that the refrigerated trailer temperature is changing. Since the temperature is critical to the product's integrity, the driver will be notified that something is wrong. The shipper or carrier will even advise the driver where to stop and have the trailer fixed. Because of the technology's capabilities and constant monitoring, the product will not be compromised.**
- **Cargo status sensors will detect the presence or absence of cargo in a standard trailer, providing asset visibility and security. These sensors eliminate yard checks, plus increase turn time and profitability.**
- **Fault alerts on a truck can prevent safety problems like low oil and equipment failure.**

INTERNAL SOURCE: TMS

A TMS is critical for providing supply chain visibility, which adds value and improves operations for a company. To gain visibility, a significant amount of big data must be analyzed. From this data, reports are made and distributed among internal professionals to create a more efficient strategy.

A TMS OBTAINS AND CONSTRUCTS INFORMATION THAT MIGHT HAVE BEEN LIMITED BEFORE

Visibility into the supply chain is fundamental for creating improvements. Once a company can identify challenges and inefficiencies, they can brainstorm solutions and work towards increasing accuracy and leadership.

Investing in technology systems provides ROI for a company. Integrated technology like a transportation management system is a great tool that obtains and constructs information that might have been limited before.

A TMS records new data and stores historic data which, when used together for actionable insight, will create stronger communication, forecasting and decision making. Software and data can be intimidating during and immediately after implementation, but once utilized properly, advanced technology results in increased profitability, more organized databases, and effective management.

A TMS ADDS VALUE AND IMPROVES OPERATIONS

More than half of shippers are overwhelmed by big data created from a TMS. Using a TMS instead of traditional, manual spreadsheets lets a shipper measure, predict and expose obstacles and solutions in the supply chain, all from one source of data.

Shippers want the ability to manage big data – from tracking, tracing, transport and payment. The entire transportation process can be quantified through TMS reporting features. These reports will allow shippers to streamline and manage data from all shipments – outbound and inbound.

IMPORTANCE OF TMS REPORTING TO UTILIZE BIG DATA

You can take TMS data and turn it into something indispensable – actionable intelligence that reveals profitable results. Use analytics to grow business. Predictive analysis is a key benefit of TMS reporting features, as well as the main benefit of an overall big data strategy.

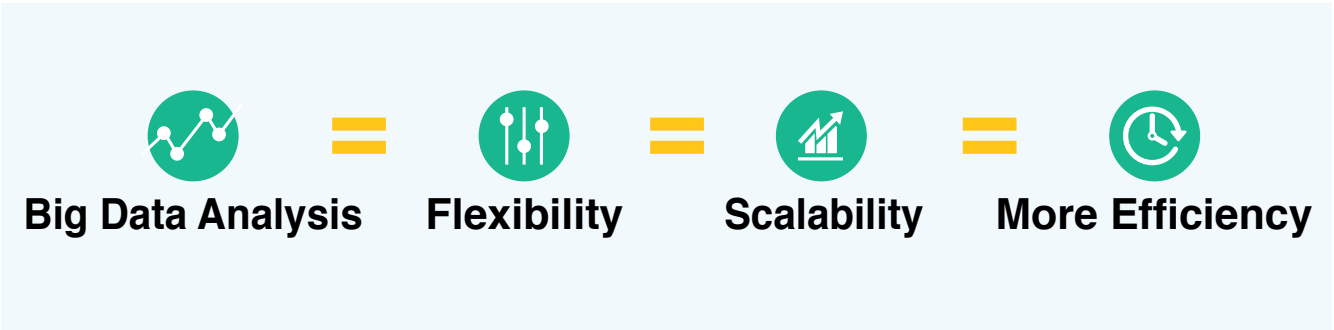
The term 'predictive analytics' refers to the process of forecasting what will happen in the near future based on analysis of past documented data. Predictive analyses aim to find relationships among complex, largely incompatible data sets and predict certain outcomes. Predictive analysis creates a safer trucking environment, improves quality and service, cuts costs and generates lasting results.

Big data means that more workers and companies will work to anticipate needs, instead of changing procedures after analyses. Being proactive, rather than reactive, permits continuous growth and improvement in logistics functions.

Reports generated from TMS data will hone in on pain points that were once difficult to recognize, which will improve market forecasts. Analyzing data for new insights helps improve transportation and logistics, which then improves customer service.

- If a company examines data and learns what delivery locations are profitable and which are not, it can develop a specific strategy to serve the popular locations more frequently, and the non-profitable locations more efficiently.
- If a company learns a customer's purchase history and/or which products they have searched for online, they can begin predicting future consumer behavior.

Big data makes consumer and business information transparent. It provides thorough information on everything, from inventory level to freight location, and can significantly impact profitability through reduced supply chain costs.



REPORT EXAMPLES

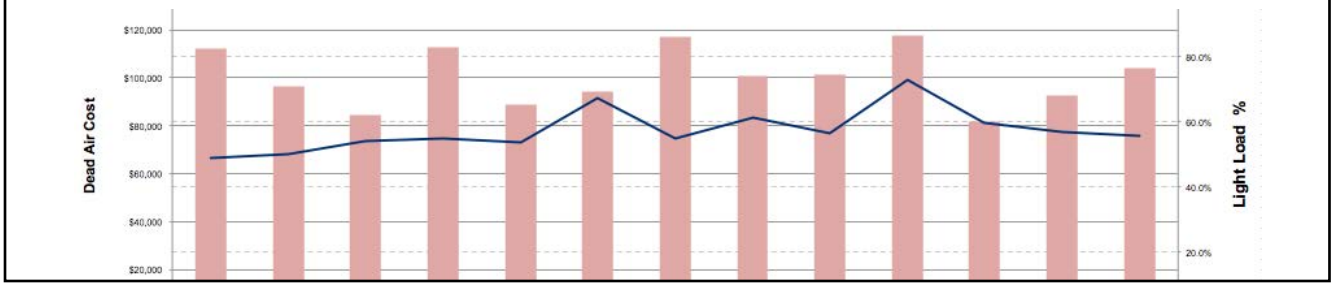
Cost Analyses

The following examples are the most common forms of customized reporting requested by shippers, as they provide information for immediate ROI. All costs are listed both in numeric and graphical format with monthly and yearly comparisons of historic data. The data is then broken down into more specific reports such as fuel costs and the impact of light loads. This makes it easy for the shipper to view pain points and places for opportunities.

Cost Summary Information

Shipper Location	(All)	<-- Select Location						
Equip Type	(All)	<-- Select Equipment Type						
	MTD				YTD			
	201506	201406	Var	Var %	201506	201406	Var	Var %
Load Count	358	322	36	11.2%	1,966	1,967	(1)	-0.1%
Billed Tons	4,896	4,425	471	10.6%	26,167	27,716	(1,549)	-5.6%
Total Miles	140,068	140,793	(725)	-0.5%	715,677	731,371	(15,694)	-2.1%
Avg. Miles Per Load	391.3	437.2	(46)	-10.5%	364.0	371.8	(8)	-2.1%
Ton Miles (in 000s)	1,591	1,758	(167)	-9.5%	8,124	9,130	(1,007)	-11.0%
Linehaul	$ 327,498	$ 324,701	$ 2,796	0.9%	$ 1,827,182	$ 1,774,327	$ 52,855	3.0%
Fuel	35,895	62,513	(26,618)	-42.6%	194,462	335,691	(141,229)	-42.1%
Premiums	14,450	3,160	11,290	357.3%	54,400	21,210	33,190	156.5%
Accessorials	700	7,800	(7,100)	-91.0%	21,000	43,750	(22,750)	-52.0%
Total Sample Co Cost	**$ 378,543**	**$ 398,175**	**$ (19,632)**	**-4.9%**	**$ 2,097,044**	**$ 2,174,977**	**$ (77,933)**	**-3.6%**

Light Load Detail and Cost



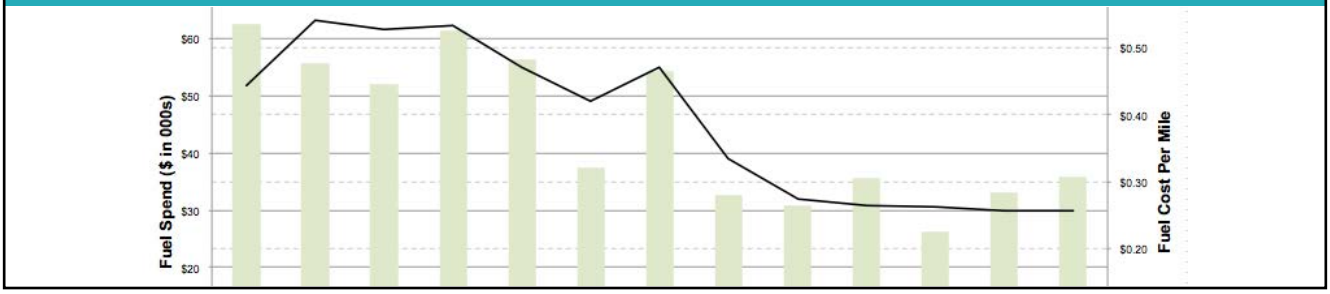
Avg Length of Haul vs. Cost Per lb.

Volume vs. Total Costs

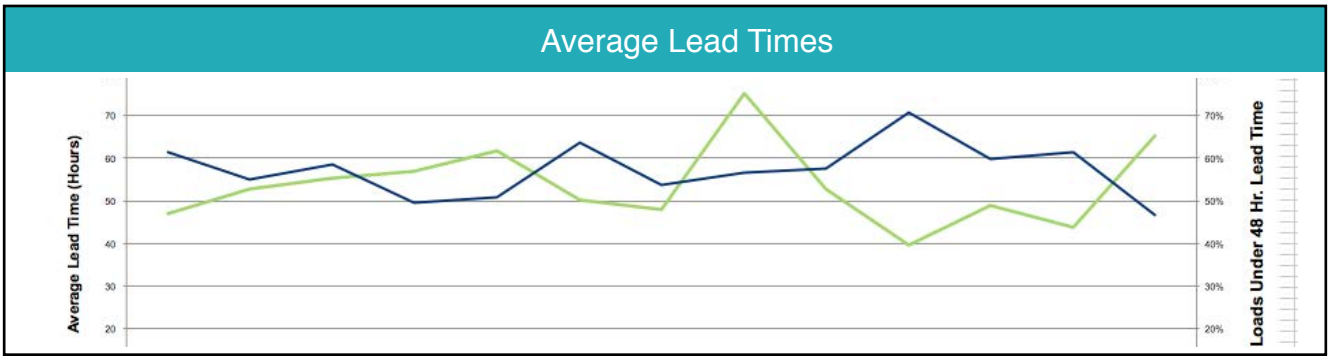
Performance Analyses

The performance of carriers, and ultimately, the perceived performance of your company, is crucial to shipping activities. Reliable, on-time deliveries will keep customers happy, and long lead times will keep carriers happy. Without comparing current performance to historical data, there is no way to know if you are improving your level of service. This is important not only for customer service, but to lock down capacity as it gets tighter and tighter.

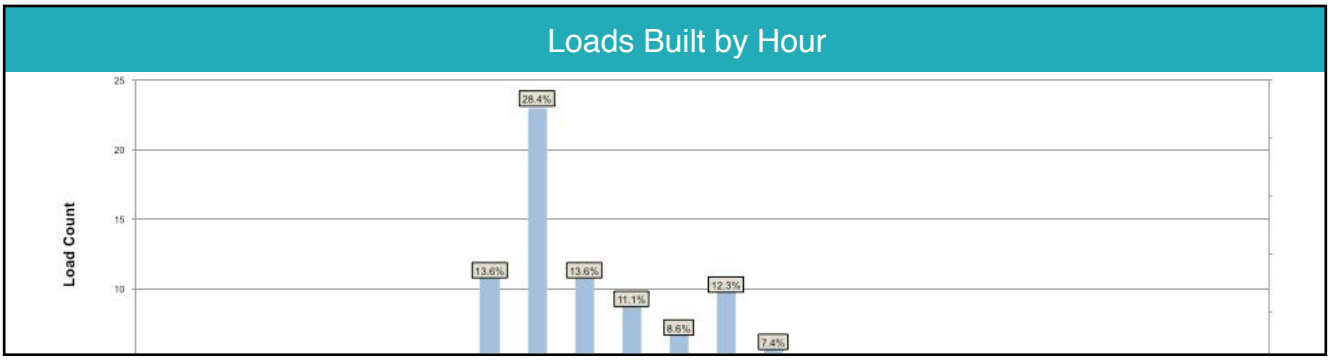
Fuel Detail Reports



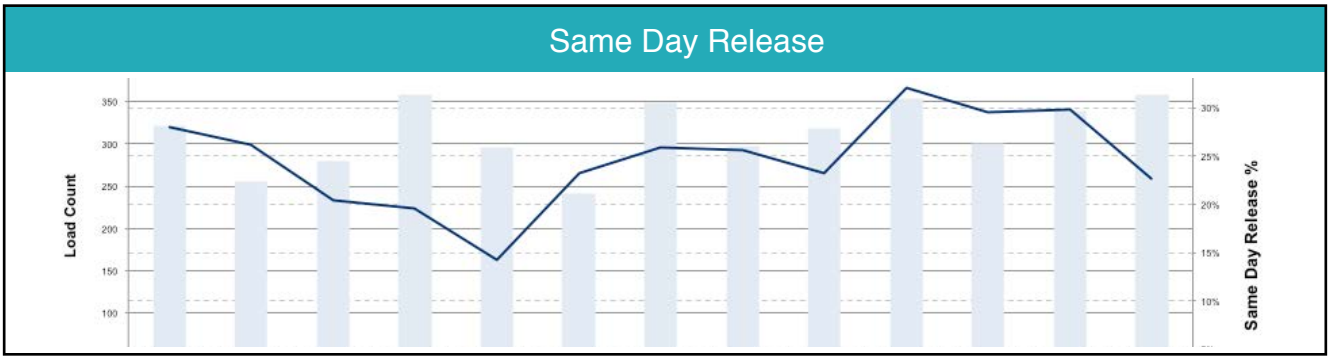
Average Lead Times



Loads Built by Hour



Same Day Release



BIG DATA CHANGES EVERYTHING

Big data mining provides visibility into logistics functions, which is the key to making accurate, profitable decisions. The future of big data will lead to confident, proactive decisions in every part of a business.

Due to the radical potential of big data, businesses of all kinds are launching initiatives to gain deep visibility into their supply chain. Those who lag behind the trend will see slower decision making and lost profits.

The most successful way to implement a big data strategy is to start small and utilize the tools that are readily available. Many companies enlist the help of 3PLs because of their sophisticated TMS reporting features. This is a simple, straight-forward approach to begin mining big data, and the ROI produced from transportation initiatives can launch further, more sophisticated strategies.

KEY TAKEAWAYS

1. **The potential of big data is nearly limitless.**
2. **Despite the difficulty in collecting and making sense of the overwhelming amount of unstructured data, there are practical ways to utilize the data available right now.**
3. **Through data and analyses, shippers and carriers are finding efficient practices to increase profits.**
4. **Big data is the best method for identifying inefficiencies within business practices.**
5. **All industries and businesses benefit from big data in transportation.**

CASE STUDY

A national, high-quality steel manufacturer was experiencing difficulty within its supply chain because of a limited scope and sole focus on outbound management. The company wanted to remain focused on their core competencies, but their transportation needs were taking up too much time and effort.

This company realized their need to outsource logistics functions to a 3PL. They needed a partnership with a logistics firm who could handle a complicated, wide-ranging transportation network. As a steel manufacturer, they needed a 3PL that prioritizes safety and could be responsible for all levels of transportation.

The company chose PLS Logistics Services. PLS Logistics adds value to the company's supply chain efforts through cost savings, a large carrier network, a transportation management system and an on-site team of logistics experts.

First, PLS used integrated technology to identify inefficiencies in their supply chain. Through detailed reports, PLS saw the need for centralized logistics management and consolidation of transportation metrics. The steel company's outbound freight management had to be restructured and the inbound raw materials were not moved as efficiently as they could have been.

Since implementing actionable solutions to the challenges identified by detailed transportation reports, PLS and the steel manufacturer found profitable results. Today, PLS manages over 200,000 truckloads annually for the company and has expanded their scope to include tactical and strategic rail / barge management.

This manufacturer has seen a 15 - 20% reduction in freight costs due to PLS' purchasing power, and has benefited from a fuel surcharge 40% lower than the market fuel surcharge because of the 3PLs relationships and carrier network.

With the help of on-site logistics coordinators, PLS continues to facilitate collaborative projects to uncover additional savings in freight spend and resource utilization.

The relationship between this client and PLS was effective because transportation management technology was fully integrated, creating a centralized logistics policy where information could be stored and shared throughout the organization.

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SOURCES

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