



DETENTION IN TRUCKING

Why Carriers Care (And Shippers Aren't Doing Enough)





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INTRODUCTION

In this paper, JBF Consulting explores the impact of excessive loading times on shippers and carriers and the benefits of addressing this issue. First, we look at detention from a truckload (TL) carrier's perspective, specifically in terms of the financial impact, is explored. Then, we examine the issue from a shipper's perspective, highlighting why it persists and what shippers can do to address excessive detention in their Distribution Center (DC) and yard operations.

OVERVIEW

- › Distribution Center operations that result in excessive loading / unloading times are a drag on carrier revenue and profitability
- › The financial mechanism used by carriers to penalize shippers (i.e. detention charges) does not recover the totality of revenue lost by carriers
- › Carriers respond to excessive detention with both higher rates and increased tender rejections
- › In over-the-road truckload transportation, the buyer / seller relationship strongly favors the buyer due to the fragmented and commoditized nature of freight transport. Carriers that raise their rates are easily replaced with lower cost carriers
- › The inability of shippers to quantify the financial impact of detention leads to inaction
- › This inaction leads to higher freight costs for individual shippers and the shipping community as a whole



PART ONE: THE IMPACT OF DWELL TIME ON TRUCKLOAD CARRIERS

WHAT IS TRUCKING DETENTION

For the purpose of this paper, detention (a.k.a. dwell) is the excess time a carrier spends at a facility performing all the necessary activities required to execute a pickup or delivery.

This paper is focused on detention associated with long-haul TL transportation, as detention is not a significant issue for LTL or parcel carriers.

Moreover, the factors that go into ocean and rail detention/demurrage are quite different and are not covered.

CARRIER REVENUE AND DETENTION

In TL transportation, carriers are primarily compensated based on the mileage between the origin and destination of a load. Additional fees (ex. fuel surcharges, stop-off charges, re-positioning fees) may be applied, but the primary revenue driver for a carrier is loaded miles.

The time that the carrier spends making a pickup or delivery is uncompensated until a contractual threshold is exceeded. At that point, the carrier may be able to claim a detention fee. The threshold wait time before detention fees are applied is typically 2 hours. Hourly fees range from \$25 to \$100. However, carriers report that collecting detention fees is onerous and often not worth pursuing. Consequently, the hourly detention fees collected by carriers are significantly less than the cost incurred.

Even when detention fees are collected, the time spent hauling cargo drives significantly more revenue for a carrier than sitting in a shipper's yard. **Figure 1** highlights this difference. Considering the following using typical industry averages.

- An hour of driving generates \$100 of revenue (assuming an average speed of 50 mph at \$2.00 / mile)
- Waiting time at a DC generates \$0 dollars for the first 2 hours and \$75 / hour for the third hour (assuming typical detention terms and fees)



Driving vs. Detention Revenue

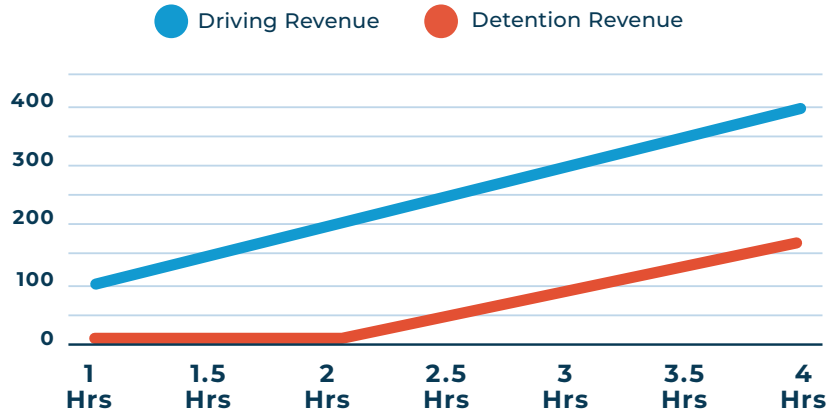


Figure 1 - Comparison of Driving and Waiting Revenue

This simple example explains why carriers are eager to reduce loading/unloading time while providing a glimpse into why shippers view things differently.

(Note: See Appendix for Model Assumptions).

Annualized Revenue Impact Based on Varied Loading / Unloading Times

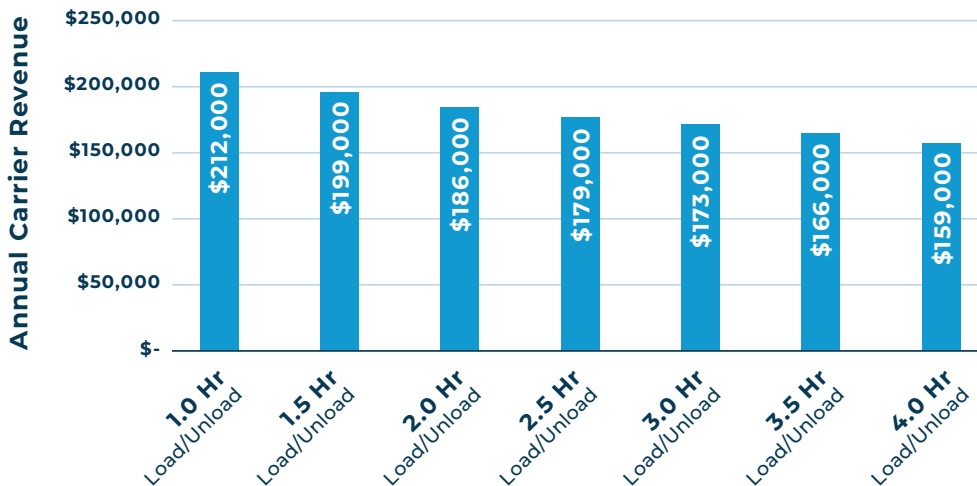


Figure 2 - Annualized Impact of Detention on Carrier Revenue

Figure 2 shows the impact of detention on a carrier’s annual revenue for a single driver/asset combination. As the average detention time increases (X-axis), the number of revenue-



generating miles decreases. While detention fees capture some of the lost revenue, they do not capture the totality of the loss.

To maintain profitability, the carrier can either increase its rates or stop doing business with the offending shipper/receiver. However, if they choose to increase their rates, the probability of maintaining a business relationship with the shipper decreases.

Figure 3 shows the impact to a carrier's rates. In our model, the objective is to generate \$200,000 in annual carrier revenue for a single driver/power unit combination.

Carriers must charge higher rates to maintain revenue as dwell times rise. After 2 hours, the increase slows due to the capture of detention revenue, but the rates still rise, indicating that when using industry-standard rates and fees, detention revenue does not accumulate as fast as driving revenue. Put another way, driving is more productive than waiting.

Per Mile Rate Required by Carriers to Reach \$200k in Annual Revenues

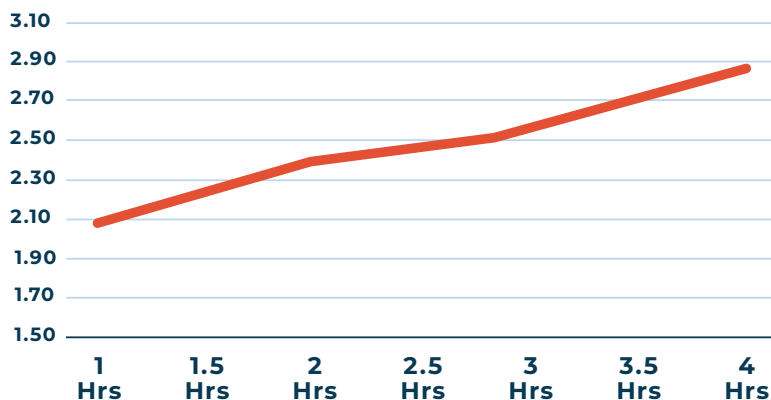


Figure 3 - Required \$ / Mile to Generate \$200k in Revenue

The implication is that the impact of detention on a carrier's top line is significant. If, for instance, a carrier decreases their average pickup and delivery times from 3 to 2 hours, they could lower their rates by \$0.21 / mile and generate the same amount of annual revenue by utilizing their assets more efficiently. A portion of these savings could then be passed on to shippers in the form of lower contract or spot rates.



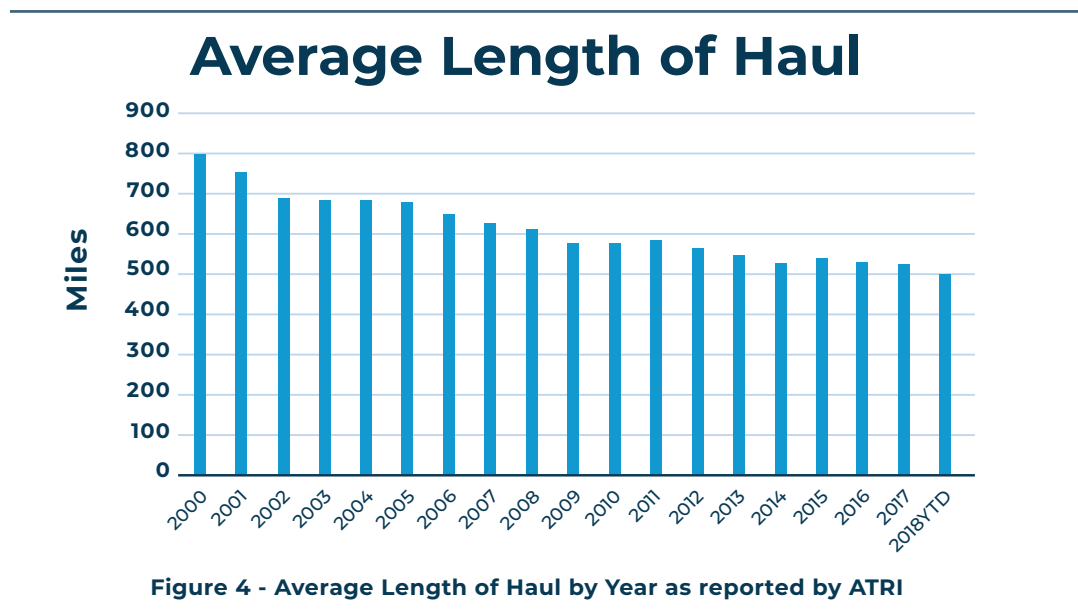
A MANUFACTURING ANALOGY

For a moment, think of a TL carrier as a manufacturer, whereby the “units produced” are the carrier’s loaded miles. The pickup and delivery process can be viewed as machine downtime, or “change-overs.”

When optimizing manufacturing processes, the objective is to maximize the number of units produced over time. Part of this strategy is to minimize change-over times. The same concept applies to trucking.

We want to “produce” the maximum number of loaded miles and minimize detention (i.e. change-overs), which negatively impacts vehicle productivity. Put simply, we want to get the carrier in and out of the DC as quickly as possible.

Another similarity to manufacturing is the trend toward smaller lot sizes. In a manufacturing environment, we see the concept of SKU proliferation reducing lot sizes. In long-haul trucking, the average dry van length of haul has dropped 37% over the last 20 years, according to a **2018 ATRI study** (see **Figure 4**).



Instead of 800 revenue-generating miles per load, as there was in 2000, shipments in 2018 were only averaging 500 mi. This means that in order to maintain the same level of revenue, carriers must haul more loads and are consequently subject to more “production” downtime/change-overs.



Figure 5 demonstrates the effect this has on a TL operator. Assume a carrier drives 100,000 miles / year and 13% of those miles are empty, non-paid miles. If the average length of haul is 500 miles, the carrier will need to haul 174 loads (87,000/500).

Length of Haul Impact On Annual Loads Hauled

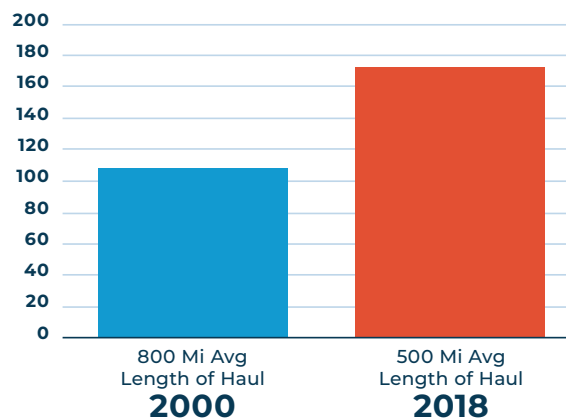


Figure 5 - Decrease in Length of Haul Requires Carriers haul more loads, which increases the percentage of non-productive time

However, if the average length of haul is 800 miles, as it was in 2000, the carrier would need to haul only 109 loads (87,000/800). Assuming an average load/unloading time of 2 hours for each pickup and delivery, the carrier will now spend an additional ~520 hours per year on non-revenue, unpaid activities compared to 2000.

Figure 6 further highlights the change in drivers' work allocation since 2000. When the average length of haul was 800 miles, 26% of a driver's year would be spent getting loaded or unloaded. In 2018, that number increased to 36%, given the assumptions laid out below.

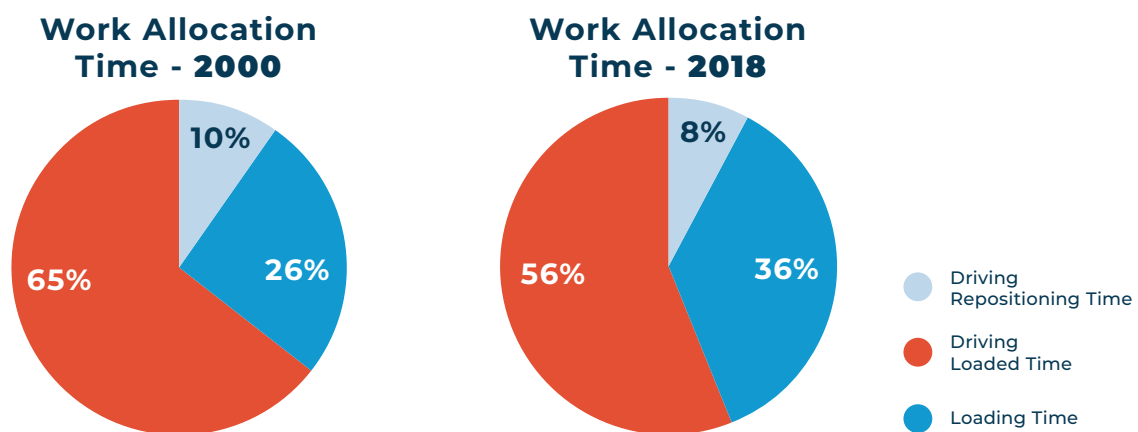


Figure 6 - Decrease in Length of Haul Increases the Percentage of Time a Driver is Not Generating Revenue



PART 2: WHY EXCESSIVE DWELL TIME IS PERVASIVE IN TL SHIPPING AND WHAT YOU CAN DO ABOUT IT

SHIPPER IMPACT ON BASE RATES

A study by **CH Robinson and Iowa State University** seems to confirm the obvious: the cost of carrier detention will be passed back to the shipper and not just in detention fees (see **Figure 7**). Their analysis looked at over 300,000 loads and found that shippers with long dwell times paid more in their base rates than comparative shippers with shorter dwell times. The higher rates were in addition to any detention fees that were applied. A few points of specific interest from the study include:

- › Every hour of dwell time across the shipper/receiver locations increases base rates by approximately 1.3%
- › Detention at the destination is more costly than detention at the origin
- › Base rates are impacted by both the average dwell time as well as the variability of dwell time at a facility

Iowa State Dwell Time Analysis

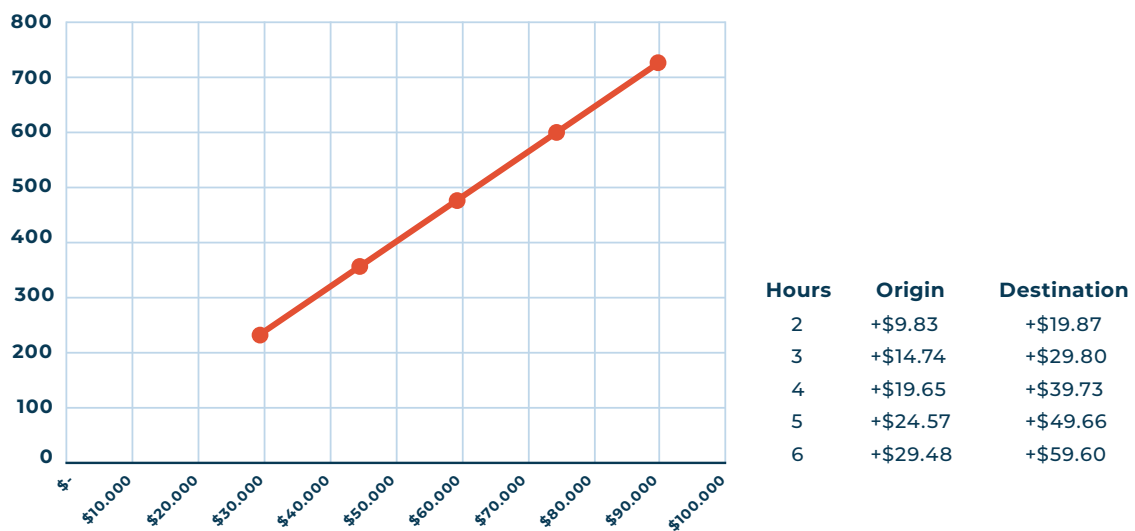


Figure 7 - CH Robinson / Iowa State Study on Shipper Rates and Dwell Time



SO, WHY DOES THE PROBLEM PERSIST

A logical question when discussing detention is that if the problem is so severe, why has it not been addressed? After all, many brilliant minds have worked on an array of supply chain and logistics problems over the past 30 years.

Innovations abound in pricing/demand shaping, inventory optimization, transportation planning, artificial intelligence, and robotics—to name a just few areas; however, for some reason, we cannot efficiently load and unload TL carriers in our yards.

Why is that the case?

Reason #1 – The Majority Of The EXPLICIT Costs Fall To Carriers And Not Shippers

Shippers, not carriers, need to address the problem, but they are not incentivized to do so. When it comes to truckload transport, the power dynamic between the buyer (shipper) and the supplier (carrier) is heavily in favor of the buyer. Key characteristics of the power dynamic, as described by **Michael Porter's 5 Forces**, show why this is the case:

- › There are many potential carriers for a shipper to select from
- › The cost of replacing a carrier is low
- › Carriers are primarily differentiated by cost
- › The service is largely commoditized
- › There is no labor solidarity amongst the carriers. The market is extremely fragmented, with no ability to systemically orchestrate selling power
- › There is virtually no chance that a carrier can “forward integrate” and thereby disintermediate the shipper

Therefore, when the carrier requests additional compensation to recover lost revenues, they are easily replaced by other carriers who may price their services ignorant of the shipping and receiving practices of the buyer.

Reason #2 - Shippers Lack The Tools To Collect This Data And Make An Informed Change

For those who understand the value of becoming a “Shipper of Choice,” the tools necessary to understand where change needs to occur are often lacking.

Visibility from when a driver checks in to when they leave the yard is a key factor in calculating dwell times. There are many tasks for the driver to perform once he/she is at the shipper facility, which incrementally add up to long wait times. Understanding where the bottlenecks are is critical to developing a more streamlined process.



Steps to avoid bottlenecks include:

- › An efficient check-in process, including providing the correct identification and documentation for the pickup or delivery
- › Clear direction on how long the driver may need to wait and where to pull aside
- › Guidance on where a driver needs to take the trailer and the best possible path to do so
- › Details on which dock or yard spot to unload the trailer
- › Information on what amenities are available for the driver while the trailer is being loaded/unloaded
- › Seamless check-out process

Reason #3 – Shippers Are Unable To Determine How Much Excess Detention Truly Costs; Therefore, Business Cases Understate The Value Of A Detention Reduction Initiative

The explicit cost that a shipper sees for poor loading/unloading operations is in their detention accessorial fees. A shipper can easily sum up these costs as they are line items on their freight invoices. However, those fees do not represent the totality of the cost that the shipper incurs, as we have discussed. Unfortunately, distilling the total cost of inefficient operations is difficult since TL pricing is complex and dependent on many factors, including:

- › The lane in question and how that relates to vehicle utilization. For instance, how many empty miles will typically be required to pick up a load at the shipper, and then how many empty miles to reposition after unloading at the receiver
- › The buyer's payment terms
- › The buyer's fuel surcharge program
- › The buyer's accessorial schedule / charges
- › The buyer's shipping / receiving operating hours
- › The buyer's required operating procedures

Additionally, TL pricing is highly correlated to the macroeconomic environment. Periods of fast economic growth typically lead to network-wide capacity constraints and higher rates, while economic slowdowns cause a contraction in freight volumes with correspondingly lower rates. This further muddies the water and makes quantifying the impact of detention harder to confidently calculate.



Therefore, when building a business case to address detention, explicit costs (i.e. detention fees) are weighed more heavily by a shipper than implied savings that may not be captured for years. In fact, most stakeholders will not include the potential of lower rates sometime in the future in a business case aside from capturing it as a “soft” benefit. As such, the problem often goes unaddressed since the underestimated ROI of the initiative does not justify the funding. While the costs are hard to quantify and decouple from other factors, they are undoubtedly there. Rick Jordon, Senior Managing Director at **FTI Consulting** stated it succinctly.

“Carriers are getting more sophisticated and more focused on profitability, utilizing tools and metrics built on detention statistics. This data factors into bidding strategies and how the carrier will prioritize loads when capacity is tight.”

—Rick Jordon, Senior Managing Director at FTI Consulting

Reason #4 – Addressing Detention Will Not Yield Immediate Results

If a shipper or receiver has a reputation for inefficient loading/unloading practices, their reputation will not be rehabilitated quickly. Carriers will factor that shipper's reputation into their rates until they build up enough history to know that the problems have been successfully resolved, which takes time. As a result, there are long delays in benefits being recognized.

To be clear, focusing on the problem will enable the shipper to reduce a portion of their detention accessorial fees, but the majority of value will not be seen right away. Policy changes, better technology, and more efficient processes can minimize the frequency of dwell time, but the resulting cost structures can take years to unwind within an established relationship.



APPROACHES TO MITIGATE

In freight logistics, there is a constant tension between shippers and their transportation service providers. Negotiations tend to be adversarial and predicated on the belief – by both parties – that they represent a zero-sum game. What is good for the carrier must necessarily be bad for the shipper and vice-versa.

However, both shippers and carriers will benefit from initiatives that seek to minimize detention. While the individual benefits differ between shippers and carriers, the commonality is that a reduction in detention time has a net impact of increasing asset and labor productivity, which will drive down costs for both parties, as shown in **Figure 8**.

Dwell Time Cost Correlation for Shippers and Carriers

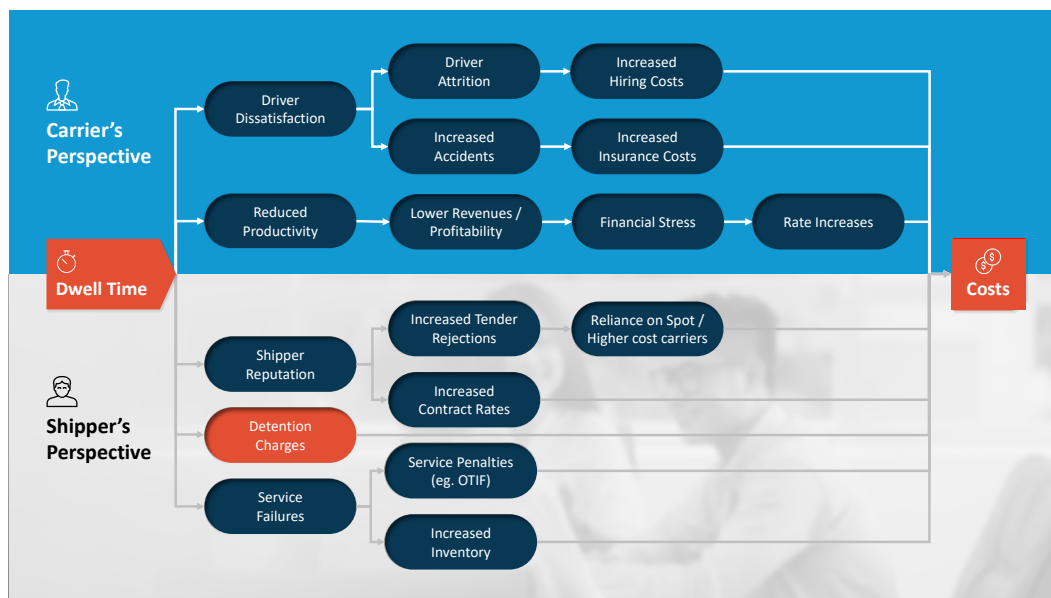


FIGURE 8 - HOW DWELL TIME CORRELATES TO COSTS FOR BOTH SHIPPERS AND CARRIERS

Essentially, lowering detention time is a win-win opportunity. It offers the ability for carriers to increase the productivity of their assets, improve safety, and heighten the morale of their drivers. Similarly, shippers benefit through lower contract rates, higher tender acceptance rates, and lower exposure to the volatile spot markets. It is also important to note that while efficient yard operations are beneficial to shippers at all times, they become critically important during periods of tight capacity when carriers have many options.



OUR APPROACH

JBFC Consulting recommends shippers take a serious look at detention and its impact on their carriers and rates. Reducing detention can be done in a variety of ways and will depend on the identified root cause(s).

The first step is to determine if you have a problem by assessing your operations:

- › What are the annual detention fees you pay to your carriers? In the past few years, have these costs been increasing or decreasing?
- › When meeting with your carriers, what is their perception of your loading / unloading operations? Do they view you as a “Shipper of Choice?”
- › If you are shipping from your suppliers or to your customers, how are their loading and unloading operations?
- › How do your rates compare to other similar shippers?
- › Do you have mechanisms in place to capture the average amount of time it takes to complete each step in the loading/unloading process? These would include steps such as:
 - Gate check-In
 - Wait time prior to load/unload
 - Physical loading/unload time
 - Paperwork preparation
 - Gate check-out
- › When detention occurs, what step in the process is typically the bottleneck?
 - Data analysis should include not just average times for each step but a quantification of the variability of those times
- › If a detention accessorial fee is requested by a carrier, do you have the means to check internal systems to validate/invalidate the request?





Attributes of well performing yards vary, but commonalities include:

- › Operational KPIs are captured that measure average and variability in carrier dwell time and provide insights into continuous improvement opportunities
- › DC labor staffing that is aligned to inbound and outbound freight volumes
- › The implementation of a drop trailer program. This is typically limited to the larger, core carriers used by a shipper, but they provide flexibility to the DC while also reducing carrier dwell time
- › The use of a dock scheduling solution that can serve to even out the flow of trailers over a day and align that flow with loading/unloading capacity (e.g. dock doors and labor)
- › A yard management solution that can prioritize which trailers are processed based on wait times and detention fee impacts
- › Dynamic in-transit appointment scheduling used in the event a carrier is running late or early

SUMMARY

For carriers, excessive detention is a significant hindrance to profitability. For many shippers, however, detention is not a significant cost item and, therefore, not a top-of-mind issue worthy of addressing. Shippers that look at detention in this manner may be costing their organizations significantly more than they believe.

When pricing out a long-term contract or a spot quote, carriers consider the total cost of servicing a shipper. As such, they will apply premiums for those customers that negatively impact their bottom line. While detention fees may be a rounding error for many large shippers, we would urge them to consider the premiums they may be paying through higher contract rates, higher tender rejection percentages, and an increased reliance on the spot market.

For an assessment and more information as to how JBF Consulting can assist you with your transportation and logistics needs, please email us at info@jbf-consulting.com.



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APPENDIX

Assumptions and variables used in the Detention Impact Model

Average Miles Per Year	100000	Approximate number of miles for longhaul Tractor Trailer
Empty Miles Percentage	0.13	Ranges from 10 to 15 Pct for large trucking companies
Loaded Miles (Rev Generating)	87000	Loaded Miles (i.e miles that are revenue generating)
Cost / Mile (Dry Van)	\$ 2.20	Has Ranged from 2.09 to 2.28 in last year (DAT). Excludes Fuel and other accessorial
Avg Length of Haul	500	ATRI 2018 Study
Number of Loads / Year	174	Total Loaded Miles / Avg Length of Haul
Avg OTR Road Speed (MPH)	40	ATRI 2018 Study (39.4)
Working Weeks	50	
Avg Miles per week	2000	
Drive Time / Week (Hrs)	50	
Stops / Week	7.83	
Avg Stops per Load	2.25	> 2 indicates some % of Multi-stop TL
Detention Billed / Hr	\$ 75.00	Ind is typically between 50 and 100 / hr
Detention Applies after X Hrs	2	
Max Hrs per Year	3200	Scenario were driver resets each weekend
Revenue / Load	\$ 1,100.00	

ADDITIONAL RESOURCES

- CH Robinson White Paper Do *“Favored Shippers” Really Receive Better Pricing and Service?*
- ATRI *Operational Costs of Trucking 2018*
- OOIDA *2019 Detention Time Survey*
- Uber Freight *2020 Facility Insights Report*





About Mike Mulqueen

Mike Mulqueen is the Executive Principal of Strategy & Innovation at JBF Consulting. Mike is a leading expert in logistics solutions with over 30 years managing, designing and implementing freight transport technology. His functional expertise is in Multi-modal Transportation Management, Supply Chain Visibility, and Transportation Modeling. Mike earned his master's degree in engineering and logistics from MIT and BS in business and marketing from University of Maryland..

ABOUT JBF CONSULTING

Since 2003, we've been helping shippers of all sizes and across many industries select, implement and squeeze as much value as possible out of their logistics systems. We speak your language—not consultant-speak—and we get to know you. Our leadership team has over 100 years of logistics and TMS implementation experience. Because we operate in a niche—we're not all things to all people—our team members have a very specialized skill set: logistics operations experience + transportation technology + communication and problem-solving skills + a bunch of other cool stuff.





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