Hours of Service:

Shipping Solutions to Mitigate the Impact

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Abstract

The purpose of this paper is to investigate the problem of reduced driver capacity due to a new government regulation, Hours of Service, on the trucking industry that will take effect in July 2013. The regulation was established to increase transportation safety related to commercial motor vehicles (CMV). As noted by its name, the Hours of Service (HOS) regulation specifies the amount of time a CMV driver can operate this type of vehicle in any given day or week. The new regulation will decrease driver time resulting in a need to hire more drivers to accomplish the same amount of work. The industry is already experiencing hiring pressure due to an aging driver workforce. The average age of truck drivers is believed to be around 50 (Williams, 2012), with IBIS World citing that “many drivers are over 55 years old and will retire in the next five years, dampening employment growth” (Setar, 2013). As this aging workforce exits the industry, carriers must focus on attracting new employees. However, recruiting fresh, young talent to an industry with long working hours, little pay, and a less-than-desirable trucker lifestyle is not easy. High school graduates that might be interested in the industry are often excluded due to the 21-years-of-age requirement to obtain a Class “A” commercial driving license needed to operate a CMV, thus creating further problems in the recruitment of new drivers (Streigler, 2013). Taken together, these factors suggest that there will be an increased shortage of drivers available to transport shipments in 2013. This shortage will cause higher driver turnover rates, a focus shift to driver retention, and ultimately higher costs for both carriers and shippers. It is imperative that companies understand these regulations as they will directly affect every company beginning in July 2013. As a future employee of the transportation industry, this issue is pertinent to my career. This thesis focuses on the impact and suggested solutions to moderate the new regulation. Through a combination of literature
research, data collection, and executive interviews, future changes to the transportation industry resulting from HOS are examined in depth. According to the data collected, shippers should expect to see the largest cost increase through higher freight rates. The research suggests that shippers are primarily addressing this through operational and tactical initiatives from the use of technology to better space utilization of equipment.
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Introduction

Over the years, many organizations have debated highway safety, arguing for stricter policies and procedures on the trucking industry. According to the U.S. Department of Transportation (DOT), motor vehicle crashes are the leading cause of death among Americans 1-34 years old. Of these crashes, the DOT estimates that commercial motor vehicles are involved in one out of every eight traffic fatalities (FMCSA, Commercial Motor Vehicle Facts, November 2011). Data from the Advocates for Highway & Auto Safety report that large trucks are involved in fatal multiple-vehicle crashes at twice the rate of passenger vehicles (The Dangers of Large Trucks, 2005). These facts are some of the compelling reasons why the federal government has been engaged in constructing and implementing policy to increase highway safety. One of the outcomes of these efforts was the creation of Hours of Service (HOS). HOS is a federal government regulation that stipulates the amount of time a CMV driver can operate this type of vehicle. The purpose of the regulation is to help decrease the amount of CMV accidents. In addition to the benefits that have resulted from the regulation, there have also been some negatives. Primarily, these include increased transportation costs and decreased transportation efficiency resulting from the HOS demands for more driver break time. Because drivers have less hours to accomplish the same amount of work, excess capacity is demanded, which lowers productivity and ultimately leads to higher costs for both the carrier and shipper.

Research Methodology

This thesis examines the history and impact of the HOS. Regarding the current regulation, the research presented in the paper explains these changes and what they mean to
companies. It also outlines future cost increases and how companies can change their transportation operations to mitigate these rises.

In order to understand HOS and its impact on shippers, extensive prior background research was conducted on the topic. Published information and data on the current HOS requirements were reviewed, followed by pending changes and their impact. Once these impacts were understood in full, interviews with subject matter experts were conducted. These subject matter experts consisted of a small focused sample within the North American Region Transportation operations at Whirlpool Corporation. Whirlpool is a major home appliance manufacturer specializing in laundry appliances, refrigerators and freezers, cooking appliances, dishwashers, and compressors. The company sells products under an array of brand names including Whirlpool, Amana, KitchenAid, Maytag, and Roper to customers such as Lowe’s, Home Depot, Sears, and Best Buy retailers. In 2012, Whirlpool’s year end revenue was 18,143 million (Yahoo Finance, 2013). The transportation operations of Whirlpool will be used to exemplify cost reduction best practices in accordance with HOS impacts.

The thesis is organized as follows. First, a history and the specifics of the Hours of Service will be discussed to provide the background that is necessary to understand the current regulation. Federal rules on commercial vehicle operation have been in place since 1938. Over time these guidelines have been much more detailed and restrictive. The second section of the paper will address the impacts of the HOS revision on carriers. This section is followed by a detailed discussion of the impact to shippers. Finally, the thesis will conclude with an in-depth examination of possible solutions for mitigating the impact of the HOS regulation.
History of Hours of Service

In 1938 the Interstate Commerce Commission (ICC), which originally held jurisdiction over commercial motor vehicle highway safety, enforced the first set of HOS regulations on CMV driving hours. The mandate relayed that in a 24-hour time period, drivers were limited to a 15-hour period of time on-duty. Within that 15-hour period, 12 hours could be spent on work, defined as unloading, loading, driving, completing reports, or dealing with any other task relevant to the transportation of property, and the last three hours were intended for meals and rest breaks. (FMCSA, Hours of Service of Drivers; Driver Rest and Sleep for Safe Operations, 2000). Before long, however, labor unions were battling the regulations. By 1939 the ICC changed the HOS rules from a 12-hour work limit to a 10-hour driving limit within 24 hours and withdrew the 15-hour on duty limit, allowing for longer work hours (FMCSA, Hours of Service of Drivers; Driver Rest and Sleep for Safe Operations, 2000). These regulations stayed intact until 1962 when the ICC eliminated the 24-hour limit. The 15-hour limit was reinstated, allowing drivers to be on the road for 10 hours, take an 8 hour rest break, and then start again. This 18-hour cycle allowed drivers to expend their weekly hours in an average of 5 days.

From 1962 to 2003, many proposals to change the HOS rules were made, but none were ever confirmed. The ICC was terminated in 1995, and the Federal Motor Carrier Safety Administration (FMCSA) took over its duties of highway safety (FMCSA, Hours of Service of Drivers of Commercial Motor Vehicles; Regulatory Guidance for Oilfield Exception, 2012). Finally, in 2003, the FMCSA implemented new HOS regulations. The 2003 amendment extended driving time from 10 to 11 hours, capped on-duty time at 14 hours, which could not be extended by breaks, and reduced minimum off-duty time to 10 hours. Lastly, a 34-hour restart rule, which required 34 consecutive hours off duty once a driver had completed 60/70 hours in
7/8 days, was instated. These regulations were more restrictive than anything formerly implemented and carriers soon found themselves struggling due to constricted capacity and decreased productivity.

The regulations have continued to be tweaked since 2003. The newest adjustment occurred on February 27, 2012, requiring carriers and drivers to be in compliance with the newest HOS regulations by July 1, 2013. If not, they will face egregious violations subject to maximum civil penalties (FMCSA, 2011).

Because carriers must be in compliance with the new Hours of Service regulations by July 1st, companies and motor carriers alike need to understand the regulations and their impacts to transportation. The previous regulations and the current regulation changes are outlined as follows:

Table 1. HOS Regulations, Pre-2012

<table>
<thead>
<tr>
<th>PREVIOUS HOS REGULATIONS</th>
<th>RULE DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>11-Hour Driving Limit</td>
<td>May drive a maximum of 11 hours after 10 consecutive hours off duty</td>
</tr>
<tr>
<td>14-Hour Limit</td>
<td>May not drive beyond the 14th consecutive hour after coming on duty, following 10 consecutive hours off duty. Off duty time does not extend the 14-hour period</td>
</tr>
<tr>
<td>60/70 Hour On-Duty Limit</td>
<td>May not drive after 60/70 hours on duty in 7/8 consecutive days. Driver may restart a 7/8 consecutive day period after taking 34 or more consecutive hours off duty</td>
</tr>
<tr>
<td>Sleeper-berth Provision</td>
<td>Drivers using a sleeper berth must take at least 8 hours in the sleeper berth, plus a separate 2 consecutive hours either in the sleeper berth, off duty, or a combination of the two</td>
</tr>
</tbody>
</table>

(FMCSA, Summary of Hours-of-Service Regulations, 2011)
Table 2. HOS Regulations, 2013

<table>
<thead>
<tr>
<th>PROVISION</th>
<th>PRIOR RULE</th>
<th>FINAL RULE – COMPLIANCE DATE JULY 1, 2013</th>
</tr>
</thead>
<tbody>
<tr>
<td>Limitations on minimum “34-hour restart”</td>
<td>None</td>
<td>(1) Must include two periods between 1 a.m. – 5 a.m. home terminal time</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(2) May only be used once per week</td>
</tr>
<tr>
<td>Rest Breaks</td>
<td>None except as limited by other rule provisions</td>
<td>May drive only if 8 hours or less have passed since end of driver’s last off-duty period of at least 30 minutes</td>
</tr>
<tr>
<td>On-duty time</td>
<td>Includes any time in CMV except sleeper-berth</td>
<td>Does not include any time resting in a parked vehicle. Does not include up to 2 hours in passenger seat immediately before or after 8 consecutive hours in sleeper-berth.</td>
</tr>
<tr>
<td>Penalties</td>
<td>“Egregious” hours of service violations not specifically defined.</td>
<td>Driving (or allowing driver to drive) 3 or more hours beyond driving-time limit may be considered an egregious violation and subject to the maximum civil penalties</td>
</tr>
</tbody>
</table>

(FMCSA, Summary of Hours-of-Service Regulations, 2011)

Impacts of HOS Revision on Carriers

34-Hour Restart

In order to effectively manage transportation costs, companies need to recognize the effects of the newest HOS revision. The biggest change is the new limitation on the 34-hour restart provision. Formerly, a driver was limited to working 60 hours in 7 consecutive days or 70 hours in 8 consecutive days before being required to take 34 hours off duty. Once he/she completed the 60 hours, which could be done in less than 6 days, said driver could take 34 consecutive hours off-duty and then begin a new cycle. According to the new regulation, the 34-hour restart can only occur once a week and must include two consecutive periods between 1
AM - 5 AM (FMCSA, 2011). This means significantly less operating time for drivers, which leads to an increase in the demand for eligible CMV operators. The demand for more commercial vehicle drivers is a problem that is already being faced by the industry. The following sections discuss this issue.

**Driver Shortages**

As government regulations have become a bigger concern, carriers have seen a direct impact on the pool of available drivers. Between 2007 and 2010, statistics from the Department of Labor reported a decline of 226,850 employed drivers operating heavy truck or tractor trailers, representing 15% of the total drivers employed (Streigler, 2013). This decline was further aggravated in 2010 when the FMCSA instituted the Compliance, Safety, Accountability (CSA) program. CSA, another safety program which scores drivers in areas such as impaired, fatigued, or unsafe driving, has banned many drivers for eligible hire based on their driving habits. Although this program has encouraged safe driving, it has increased recruiting costs for carriers because of the dramatic reduction in the amount of qualified, experienced drivers.

The driver shortage problem will be further exacerbated by the HOS regulations. Noel Perry, Principal of Transport Fundamentals LLC, estimates that when the HOS regulations take effect in July 2013, the trucking industry will need to hire an extra 200,000 drivers to move the same amount of freight that is currently being transported (Streigler, 2013). With recruiting costs totaling $1,000 for every person hired (Streigler, 2013), and a mean annual CMV operator wage of $39,830 in 2011 (BLS, 2011), this increase in employees could cost the industry close to $8 billion just in recruiting and salary expenses. In addition, wages for 2013 are expected to increase at an annual rate of 1.5% (Setar, 2013). This upward trend is expected to last through 2017, and shippers are sure to see these costs embedded in future freight rates.
**Driver Retention**

As regulatory pressures increase and the driver shortage expands, carriers are realizing that the trucking business model has to change. Because the driver shortage is so extensive (reaching between a low of 20,000 and a high of 90,000 this year), drivers are able to easily switch companies in search of signing bonuses, higher salary, or better benefits (Cassidy, 2012). According to the American Trucking Association, the average annual driver turnover rate for truckload carriers reached 100% in 2012 (Cassidy, 2012). This means that just to keep up with current capacity, carriers will have to replace the equivalent of their entire driver workforce each year – a staggering cost in both time and money invested. The quarterly increase in driver turnover from 2010-2012 can be seen in the chart below.

**Figure 1. Commercial Motor Vehicle Driver Turnover, 2010-2012**
To mitigate these high costs, carriers are competing to retain experienced, safe drivers. Drivers choose employers based on obvious things like hours, pay rate, and the amount of miles offered, but it has been shown that these are not the most important aspects in retaining a seasoned employee. Instead, keeping the best drivers comes through focusing on building relationships, fostering teamwork, being proactive, and paying attention to detail (Streigler, 2013). Drivers want to feel appreciated for what they do. By offering simple comforts like well-maintained equipment, support initiative programs, and updated communication devices, carriers send the message that they no longer see the driver as a commodity that can be replaced. There has been a significant shift in power between carriers and drivers over the past few years, leaving drivers with the ability to make demands they before could not. Carriers, who have been affected by this power shift for the last decade, are only now beginning to realize the impact. Companies will soon also experience the repercussions of the driver shortage as drivers begin demanding backhauls and drop and hook freight. This could impact the way freight moves are planned, and in some cases the acceptance of the load itself as certain moves will be more “freight friendly” than others.

Rest-Break Provision

The other aspect of the 2013 HOS regulation that cannot be overlooked is the new rest-break provision. Formerly a driver could operate a CMV for the full 11 hours without stopping. However, under the new rest-break provision, once the driver has driven eight hours, he/she must stop for an off-duty period of at least 30 minutes (FMCSA, 2011). This 30 minute break could change the nature of short-haul transportation, impact JIT delivery windows, and in general put a strain on current distribution schedules.
Drivers are required to keep a record of such breaks and hours driven in logbooks so that
the HOS rules are not violated. However, current logbooks are often paper sheets that can be
altered. Thus, many drivers keep inaccurate records in order to drive longer amounts of time.
According to the FMCSA, Federal and State inspectors found that 48% of roadside driver
inspections that resulted in citations in 2011 were related to compliance with HOS or
maintenance of logbooks. These violations included “exceeding daily and weekly driving time
limits, false logs, ‘no log’ violations, form and manner violations, and non-current logs”
(FMCSA, Electronic On-Board Recorder (EOBR) FAQs, 2012). These violations result in low
CSA scores and depletion in quality drivers.

Because of these violations, the U.S. Congress mandated that the FMCSA implement a
rule stating that CMV drivers are required to maintain logbooks through electronic on-board
recorders (EOBR). These recording devices would track HOS hours and make it virtually
impossible for drivers to fudge their work time. Upon implementation of the EOBR devices,
companies often see a great deal of push back from drivers, but once they become familiar with
the device, they do not seem to mind using them. The FMCSA has until July 2013 to write the
rule, and carriers have two years from that date to be in compliance with the regulation
(Compliance and Safety Services, Inc., 2013). Although many carriers see the rule as a positive
step because it will eliminate driver recording errors, the implementation of EOBR devices will
be an added expense in coming years. The FMCSA estimated that “the typical carrier would
likely be required to spend $1,500 to $2,000 per CMV to purchase and install EOBRs, and
several hundred dollars per year for service fees” (FMCSA, Electronic On-Board Recorder
(EOBR) FAQs, 2012). This is not a small fee for carriers owning hundreds of trucks. Thus, the
implementation of EOBR devices is just one more added cost pressure for the trucking industry.
As the costs of driver shortages, driver retention, and EOBR devices increase for carriers, shippers will also begin to feel the effects.

**Impacts of HOS Revision on Shippers**

*Increased Costs*

The profit margin in the trucking industry is small. Estimates are the operating ratio is 95.2 (Trucking Statistics). This means for every dollar in revenue a trucking company makes, all but 4.8 cents goes to expenses. As a consequence, when costs increase the industry has little recourse other than to pass it along to their customers. The increased costs that carriers incur from the HOS regulations will be passed on to shippers in the form of increased freight rates and fuel surcharges. According to Cass Information Systems, truckload linehaul rates, excluding fuel, were up 4.1% in January from the previous year (Cass Information Systems, Inc., 2013). The year-over-year increase can be seen in the graph below.
As linehaul rates climb, capacity continues to tighten under the proposed HOS changes, causing truckers to expect a “3 to 7 percent reduction in driver productivity…, or 50 to 100 fewer miles of driving a day” when the regulations take affect (Cassidy W. B., 2011). Less miles in a day means longer lead times and potentially delayed shipments, equating to a possible 1 to 3 percent increase in total transportation costs. This percent increase translates to “tens of millions or even hundreds of millions of dollars in additional transportation spending for many of the nation's largest shippers” (Cassidy W. B., 2011). With transportation as one of the biggest expenses in the supply chain already, millions of dollars in additional spend will be very impactful to shippers.
Fuel prices are also a concern for shippers. As HOS raises the overhead for the trucking industry, carriers are seeking to cut costs wherever possible. One way to do this is to pass fuel costs on to the shipper through the use of a fuel surcharge. The fuel surcharge is a fee that can be added to freight rates that allows the carrier to be reimbursed for fuel costs above a formally-agreed to level that is incurred during the transportation of freight. On-highway diesel fuel prices currently cost $4.159 per gallon, which is up $0.11 since last year (Energy Information Administration, 2013). The typical tractor-trailer gets 6 miles per gallon at an average speed of 55 mph (Cariaga, 2012). Taking this information in to account, if a trucker drives the full 11 hours allotted by HOS regulations, then $420 will be spent solely on fuel for that one truck. As diesel prices rise, shippers can be sure to expect higher surcharges.

*Delayed Shipments*

The HOS regulations will reduce drive time for CMV operators and the anticipated outcome is delayed shipments. The HOS regulations will cause this due to a couple of reasons. The first is the 34-hour restart. As discussed earlier, the 34-hour restart has changed to now include two consecutive periods from 1 – 5 AM and can only be used once in a 7 day period. Under the previous restart provision, a driver could potentially get off work Saturday morning at 5 AM and return to work on Sunday afternoon at 3 PM. Said driver could then work 70 hours by Friday, take a 34 hour restart, and repeat the process. Under the new HOS regulations, the driver still gets off work Saturday morning at 5 AM, but is not able to return to work until Monday morning at 5 AM, losing 14 hours, or a full day of work time. If the driver restart times begin overlapping, the longer restart could become even more concerning with less and less drivers available for work. The provision also puts drivers on the road during rush hour, which increases traffic congestion, wastes fuel, and slows delivery times. The 34-hour restart mostly concerns
long-haul shipments and drivers who repetitively drive the maximum amount of hours, but transportation efficiency and delivery schedules will be affected none-the-less.

The second way that HOS will decrease drive time and delay shipments is through the new rest-break provision. According to the new provision, a CMV operator must take a 30 minute break after eight hours of drive time. If a driver is averaging 55 mph, he/she can drive 500 miles in nine hours, meaning that, typically, this break will fall somewhere between 300 to 500 miles, depending on external factors such as traffic and speed. With the new rest-break provision, short-haul shipments that take 8 to 9 hours to deliver will now take 30 minutes longer. According to the Department of Transportation (DOT), 70 percent of truck shipments are short-haul deliveries between 250-500 miles (The Center for Urban Transportation Research). This means that 70 percent of shipments will be affected by this provision. The extra 30 minutes could change JIT delivery windows, causing shippers to rework their distribution routes. Shippers will need to become creative in finding new ways to decrease transit times in order to continue to meet customer expectations.

**Transportation Assurance**

The current dynamics of the marketplace reflect that demand for transportation capacity often exceeds supply. This leaves shippers focusing on getting low cost but reliable carriers. Before the recession in 2009, carriers fought for business from shippers by undercutting competitors’ prices or offering better services. The HOS regulation could further tilt the balance of power in favor of carriers. According to TransCore DAT, truck freight tonnage has increased 8.9% year-over-year since last January (Freight Capacity and Loads, 2013). BLS predicts a 20% increase in drivers from 2010 to 2020; if the predicted increase is divided equally over the 10 years, that equates to a 2% increase each year (Bureau of Labor Statistics, 2012). The result is a
gap between supply and demand. It means that as the expanse between freight demanded and drivers available continues to grow, there will not be enough drivers to satisfy freight shipment requirements.

To add to the growing change in the balance of power between shippers and carriers, both the trucking and manufacturing industries saw downturns during the 2009 recession, but manufacturing has bounced back more quickly than trucking. During 2008 and 2009, the trucking industry took a heavy hit from the economic decline, recording 405 carrier bankruptcies in the third quarter of 2009 (Broughton, 2009). According to Avondale Partners, 14,135 trucks were pulled from the market that same quarter (Broughton, 2009). Although the trucking industry has been on the track to recovery since that time, with a 2.3 percent increase in carrier establishments during 2012 (Setar, 2013), the concern that carriers may be hard pressed by HOS, fuel prices, and driver shortages is still growing.

The manufacturing industry saw a 4.4 percent increase in output during 2012 and continues to strengthen its production as the economy recovers (Bureau of Labor Statistics, 2012). Comparing this to the increase in the trucking industry, it is easy to see why companies might have a difficult time shipping freight in the upcoming years with 2.1 percent more goods being produced than trucks available to deliver it. Competition for freight capacity could very well become the norm. Companies should be prepared for this shift in power by changing their focus from one of transportation spend to transportation assurance.

**Shipping Solutions for Decreased Capacity**

*Operational Improvements*
The background material presented in the previous sections provides the basis for examining the issue of decreased capacity as a result of the change in HOS. Of interest to this research is how a company can dampen the impact of HOS by transitioning to a focus on transportation assurance. To explore this research topic, a qualitative research approach is utilized. This approach gathers an in-depth understanding of a particular phenomenon and seeks to gain a better understanding of the things that influence it. Using the qualitative method, the supply chain operations at the Whirlpool Corporation are investigated to exemplify how the transition would work. Structured and unstructured interviews and conversations with Whirlpool executives are used for the case study. Whirlpool executives were interviewed based on their previous experience with HOS regulations and knowledge of the Whirlpool supply chain. While only three of these interviewees are mentioned by name, the others are represented through the overall ideas discussed. Information and data gathering concentrated on current procedures and ways to improve supply chain functions, particularly those relating to Whirlpool’s transportation operations.

Ten major themes emerged from the research including:

- Use of fourth party logistics
- Use of technology
- Process improvement
- Maximizing operational efficiency
- Delivery time requirements
- Space utilization
- Freight modal allocation
- Network design
• Class of transportation service
• Optimization of fuel costs

Each of these topics is discussed below. It should be noted that the order of presentation does not imply importance or impact of the item in the transition to a focus on transportation assurance.

1. Use a Fourth Party Logistics (4PL) Firm. With capacity constraints on the rise, companies must properly manage supply chain activities to keep costs down. One way to do this is to outsource non-core functions to a 4PL so that shippers can focus on the core value competencies of their business. A 4PL essentially manages the process, technology, and people of the supply chain, resulting in visibility and integration across multiple companies. The reason a 4PL is so effective is because it is a neutral manager of a shipper’s supply chain, meaning it will choose the best carriers, 3PLs, freight forwarders, etc. for the company regardless of the relationship that is involved. In 2006, Whirlpool hired Penske Logistics 4PL to support the transportation planning for the company’s network of over 120 locations. The LLP objectives include streamlining and standardizing processes, managing complexity, improving flexibility, ensuring compliance, and driving out cost. Within four months, Penske had increased on-time loading by 13%, increased on-time departure by 13%, and increased on-time delivery to local distribution centers LDCs by 12%. With a wide variety of product lines, employing Penske to manage its 3PLs was a sound business decision and has significantly decreased Whirlpool’s supply chain costs while improving service.

2. Implement a Transportation Management System (TMS). Transportation Management Systems allow for more affective interactions between a shipper and carrier through the use of electronic exchanges. These systems decrease the possibility of poor communication by offering
a variety of capabilities including automated information flows between shipper and carrier, tendering of carriers based on shippers wants and needs, objective carrier measurement based on cost and reliability, automated freight payment, multi-modal optimization and execution, and more. According to Liz Hall, Senior Transportation Manager at Whirlpool, the company is using a TMS to optimize fleet routing and delivery scheduling. The company just brought the last Regional Distribution Center (RDC) into the system in August 2012. With this system, Whirlpool and Penske are able to manage carriers and effectively track key performance indicators (KPIs) such as loading, unloading, on-time delivery, etc. Tracking these KPIs allows Whirlpool to pinpoint problems within the supply chain, enabling quicker solutions and reduced costs (Hall, 2012).

3. Streamline Unload Process at Docks and Stores. Whirlpool currently operates mainly drop and hook shipments, which means that a driver drops an empty trailer at Whirlpool’s facility, and then picks up a fully loaded trailer ready for delivery. This dramatically decreases dwell time and increases driver satisfaction. As Michelle VanderMeer, Senior Director, North American Logistics, points out, “Whirlpool’s use of drop and hook could be an excellent selling point for why the company should be a preferred shipper” (VanderMeer, 2012). Companies that operate with live loads that require a driver to wait to be loaded or actually load the trailer themselves/herself should consider the possibility of moving towards drop and hook. Those already using drop and hook should make it clearly known to their carriers because increasing a driver’s satisfaction will increase retention, ultimately pushing carriers to choose shippers who are taking driver capacity constraints into consideration in their logistics operations.

4. Maximize Backhaul Opportunities. A backhaul is a term referring to dropping one load and then picking up another so that a driver does not return to home base empty. Backhauls are
imperative for cutting shipping costs, but they also improve driver retention because they allow payment to be given for travel to and from a destination. According to Nick Roberts, former Carrier Manager for Whirlpool, the company currently does try to use backhauls to decrease transportation costs, but there is still room for improvement (Roberts, 2012). In July, one of Whirlpool’s carriers was considering dropping Whirlpool as a customer due to an inability to find backhauls. The carrier mentioned that “The greatest challenge [is] the unload times…the trucks getting empty between 1 AM – 4 AM have not allowed us the opportunity to find backhauls that allow this level of service not…to be jeopardized” (Roberts, 2012). The carrier could no longer afford to service that route at the current rate charged, and ultimately, increased Whirlpool’s freight rates by almost 50%. If Whirlpool had been able to work with the customer to change delivery times, it is possible that the carrier could have found a backhaul opportunity that would have allowed freight rates to stay the same. In an ideal world, shippers would partner with other companies to provide backhauls for carriers, saving costs for all three companies. Backhaul opportunities could offer huge cost savings in freight rates, and shippers should be actively seeking them out just as often as carriers.

5. Increase Delivery Windows. A recent supply chain trend has been to move towards just-in-time (JIT) shipments to please customers. However, JIT puts a heavy strain on drivers who are expected to deliver loads within a plus or minus 30 minute delivery time. This limited time window often leads to more missed service levels which reflects poorly on the driver as well as his/her company. Thus, JIT prompts unsatisfied drivers to look for employment with a new carrier, in turn encouraging carriers to focus on shippers who offer flexible delivery windows. Whirlpool shipments from Factory distribution centers (FDCs) to RDCs will be mostly unaffected by this trend because the majority, if not all, of FDC to RDC shipments have
considerable delivery windows. However, the lanes that are expected to be affected are those traveling from RDCs to LDCs due to more rigid delivery times (Hall, 2012). Currently, it is expected that 149 of Whirlpool’s lanes will be affected by the new rest break provision. This represents 32% of the RDC to LDC lanes. If these tight delivery windows were increased by a couple of hours, it would offer much greater flexibility for carriers when planning shipping routes. Below is a chart examining the affected RDC lanes.

Table 3. Number of Affected Lanes by Mode and RDC, 2012

<table>
<thead>
<tr>
<th>RDC</th>
<th>DTL</th>
<th>HAD DTL</th>
<th>R to R</th>
<th>SHTL</th>
<th>Total Affected Lanes</th>
<th>Total Lanes</th>
<th>Percent of Lanes Affected</th>
</tr>
</thead>
<tbody>
<tr>
<td>Atlanta</td>
<td>11</td>
<td>4</td>
<td>0</td>
<td>5</td>
<td>14</td>
<td>38</td>
<td>36.84%</td>
</tr>
<tr>
<td>Bridgeton</td>
<td>9</td>
<td>5</td>
<td>0</td>
<td>5</td>
<td>15</td>
<td>99</td>
<td>15.15%</td>
</tr>
<tr>
<td>Carlisle</td>
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<tr>
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<tr>
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<tr>
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<tr>
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<td>0</td>
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<td>22</td>
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</tr>
<tr>
<td>Wilmer</td>
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<td>7</td>
<td>0</td>
<td>5</td>
<td>18</td>
<td>41</td>
<td>43.90%</td>
</tr>
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If Whirlpool works with customers to change delivery times and expand delivery windows, the company could dramatically decrease transportation costs due to increased ability to find backhauls and improve cube utilization, making both the carrier and shipper happy. Lower costs would then transfer to the customer who would not have to endure product price increases due to higher transportation costs.

6. Improve Cube Utilization. Cube utilization refers to the usage of space in a trailer. Ideally, a trailer would reach the maximum space and weight requirements for each shipment made, but this is rarely the case. Instead, trailers often ship LTL or even those that are TL cannot utilize all of the space due to the weight or shape of the product being shipped. For example, Whirlpool’s products, like washing machines, dryers, and dishwashers, usually “cube out” the trailer before
they “weigh out,” meaning that no more of Whirlpool’s product can fit into the trailer, but the weight limit of the load has not yet been reached. This left over space equates to wasted money because the company is essentially “shipping air.” One way to mitigate this cost is to partner with other companies to combine shipments of product. In 2012, that is exactly what Whirlpool did. According to Roberts, “Whirlpool began working with Dal-Tile to consolidate truckloads, improving capacity utilization, and decreasing costs for both Dal-Tile and Whirlpool” (Roberts, 2012). By combining Dal-Tile’s heavy tile shipments that only used 20% of cubic capacity with Whirlpool’s washers and dryers that used only 20% of weight capacity, the two companies were able to ship a full trailer of product while significantly decreasing transportation costs. Although these types of partnerships are difficult to find due to specific product criteria and lane destinations, if Whirlpool could find a way to continue customized partnerships such as this one, the company would be ahead of the curve in innovation, sustainability, and cost reduction.

7. Use More Rail and Intermodal Transportation. Shippers can leverage rail and intermodal solutions to gain access to capacity and negotiate cheaper rates. “Using rail/intermodal shipments takes long-haul cargo off the highway and makes shipping easier in heavily congested areas or places where trucks are scarce,” says Hall. It also helps take capacity pressure off of the trucking industry. Whirlpool currently ships 50% percent of loads on the rail. Although it takes longer in some cases, the cost savings of shipping via rail instead of over the road (OTR) is undeniable. For instance, a load shipped 750 miles via rail would cost $0.20, compared to shipping it OTR at $0.60 (Hall, 2012). This is a 200% change in price, which is no small cost when shipping large volumes. However, shipping via rail is not always the answer. “Sometimes we have no option but to ship OTR because there are no intermodal facilities in particular geographic areas,” says Roberts, “but we continue to seek out new opportunities with rail
shipments, especially as new intermodal facilities are built” (Roberts, 2012). It will take time before there are enough intermodal facilities to service the growing amount of freight, but none-the-less, shipping via rail/intermodal is a good business choice whenever possible.

8. **Reevaluate the Network.** After a while, companies often get used to doing business a certain way and forget to continually reevaluate and optimize the network that makes up the supply chain. For instance, one of Whirlpool’s RDC to LDC lanes is currently a 470 mile trip from Atlanta to Greenville, South Carolina. If the LDC in Greenville is serviced from a closer RDC in Carlisle, Pennsylvania the trip would only be 390 miles. By servicing Greenville from the closer RDC, Whirlpool could decrease freight, fuel, and warehousing costs. It would also decrease the mileage of the shipment, opening up drivers to less pressured delivery times. Although this RDC change may not be possible due to the nature of product stored in the Atlanta and Carlisle RDCs, the idea is that servicing a LDC from the closest RDC is more time and cost effective.

Analyzing the location of distribution centers (DCs), considering building more DCs to locate product closer to the customer, or possibly shipping straight to the point of origin to bypass excess warehousing costs are all viable options for decreasing transportation costs. Optimizing the network is the key to smooth, cost effective operations.

9. **Analyze Cost of Private Fleet vs. Contract Carrier.** As capacity concerns rise, companies should be evaluating whether private fleets or contract carriers are more cost effective. Both have positives and negatives, but it seems that as the driver capacity tightens, managing a private fleet could be the best option for companies despite ongoing challenges such as fleet maintenance, driver recruitment, and equipment acquisition. The reason for this is that owning a private fleet allows a company to be in complete control of capacity, something that is difficult to manage and control with contract or common carriers. Capacity is becoming a core
competency for many companies, and those that have 24/7 access to it could be future leaders of the market. Private fleets also allow for better customer service, greater scheduling flexibility, and improved on-time deliveries. Whirlpool currently operates with both contract carriers and dedicated fleets. As HOS regulations put more strain on carriers, shippers are increasingly looking for ways to keep high service levels while keeping costs low. For this reason, reevaluating carrier options should be at the top of the list.

10. Optimize Fuel Cost. Just like regular fuel, diesel prices fluctuate from city to city and station to station. Because of this, if a driver fills up at a Shell in Nashville instead of a Pilot in Knoxville, diesel prices could be exponentially more expensive. To avoid this fluctuation in cost, optimizing fuel costs are a must. Whirlpool’s solution to fuel optimization was to partner with Breakthrough Fuel who conducts fuel benchmarking analyses and creates a customized fuel management strategy based on actual fuel prices instead of distorted weekly averages. The result is that carriers and shippers pay a more accurate price for fuel. A carrier’s ability to be reimbursed for fuel is based on rules established between shipper and carrier. These include items such as mileage, base fuel rates, and miles per gallon. Whirlpool’s partnership with Breakthrough Fuel ensures that Whirlpool is getting the best fuel rate and reduces the ability for carriers to overprice surcharges. Like Whirlpool, shippers should consider investing in a fuel management program that could balance rising fuel costs, allowing the shipper to continue focusing on the company’s core value propositions.

Conclusion

The themes discovered in the case study can be categorized into three main decision making areas in a company: strategic, tactical, and operational. Each of these three areas are
important, but each company has different needs, and thus, should decide which area and its related objectives will be most effective in mitigating costs for its unique transportation operations. To do this, first a company must understand the differences in the objectives that emanate from the three areas respectively.

Strategic objectives are generally more long-term goals that focus on converting an overarching vision into specific plans and projects to achieve that vision. These types of plans usually identify the key strengths and weaknesses of a process, outline steps to improve said process, and set benchmarks for success that should be achieved over a two- to four-year time period in order to document progress.

A tactical objective is a planning task that leads to the overall success of a strategic objective. These types of objectives are focused more on the desired short term result of an activity than a strategic objective. Tactical objectives are daily, weekly, or monthly project benchmarks that are required to achieve the overarching strategic objective. Tactical project tasks must be measurable and specific so that management can make cost effective decisions. Tactical objectives are considered an intermediate step to achieving operational objectives.

Operational objectives are focused on the actual execution of a tactical plan. These types of objectives center on the implementation of new processes based on the analytical findings from tactical plans. Completion of operational objectives is where the change and cost savings actually begin to occur. For example, if a company had the strategic objective to reduce transportation costs, a tactical objective might be to analyze the cost of using a private fleet vs. a contract carrier, and the operational objective would be to implement a private fleet or continue using contract carriers based on the cost savings found from the analysis.
To further exemplify the use of these objectives combined with the suggested cost mitigation themes, the table below outlines the classification for each theme.

Table 4. Classification of Cost Mitigation Themes, 2013

<table>
<thead>
<tr>
<th>THEME</th>
<th>CLASSIFICATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Use a 4PL</td>
<td>Strategic</td>
</tr>
<tr>
<td>2. Implement a TMS</td>
<td>Tactical</td>
</tr>
<tr>
<td>3. Streamline Unload Process at Docks and Stores</td>
<td>Operational</td>
</tr>
<tr>
<td>4. Maximize Backhaul Opportunities</td>
<td>Operational</td>
</tr>
<tr>
<td>5. Increase Delivery Windows</td>
<td>Strategic</td>
</tr>
<tr>
<td>6. Improve Cube Utilization</td>
<td>Operational</td>
</tr>
<tr>
<td>7. Use More Rail and Intermodal Transportation</td>
<td>Tactical</td>
</tr>
<tr>
<td>8. Reevaluate the Network</td>
<td>Strategic</td>
</tr>
<tr>
<td>9. Analyze Cost of Private Fleet vs. Contract Carrier</td>
<td>Tactical</td>
</tr>
<tr>
<td>10. Optimize Fuel Cost</td>
<td>Operational</td>
</tr>
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</table>

Another way to view the cost mitigation themes that emerged from the case study is to present them in hierarchical order (Figure 3). This view indicates that a change in focus from transportation spend to transportation assurance will primarily involve operational and tactical initiatives. These two decision making areas comprise 60% of the actions prescribed by Whirlpool. The good news is that these initiatives have shorter lead times for implementation and their effect on lessening the impact of decreased capacity should be immediate. This is compared to strategic programs that tend to have much longer return on investment timeframes.
Data from the Whirlpool case study suggests that since the HOS rules will impact capacity in the near future, companies should look for quick ways to reduce costs. This should include a focus on operational solutions such as streamlining loading and unloading processes, maximizing backhaul opportunities, improving cube utilization, and transferring OTR shipments to rail or intermodal. These quick fixes can save millions in transportation spend for leading US manufacturers and should not be undervalued. However, short-term solutions are not the complete answer to the problem.
Companies also need to focus on strategic objectives to ensure long-term growth and cost reduction. Shippers should be considering strategic possibilities such as using a 4PL to enhance carrier and shipper communication, increasing delivery windows by working with customers and carriers, and reevaluating the transportation network to ensure optimal performance. Although these objectives take much longer to complete because they involve suppliers, shippers, carriers, and customers, they often have the biggest impact on cost reductions. Supply chain professionals should be paying special attention to performance enhancing processes such as these.

Tactical objectives require large amounts of analysis and benchmarking processes. Optimizing fuel, fleet, and carrier costs takes less time than implementing a strategic plan, but these solutions impact some of the biggest cost drivers in transportation. Keeping a close watch on rising fuel and freight rates keeps a company from being unpleasantly surprised one day to the next.

Although the HOS regulation will influence driver capacity and transportation costs, the impacts will not be unmanageable if shippers begin preparing now. There are many ways to reduce costs, both big and small. Companies must simply decide which strategies are best for their operations and begin an implementation process as soon as possible. There is a possibility that the HOS regulations will not impact shippers as greatly as carriers and industry experts are predicting, but the continued expanse between freight growth and decreased capacity cannot be ignored. Regardless of regulations, cost reduction should be on the forefront of every supply chain professional’s mind, and in this economy, there is no room for an apathetic attitude.

While the case study presented in this thesis provides important insights into HOS and ways companies can dampen its impact, more research is needed to fully understand how to
mitigate the anticipated cost increases due to lost capacity. Additional case studies across multiple industries would confirm (or conversely refute) the themes that came out of this case study. Further, the ten themes in all likelihood do not represent a comprehensive list of initiatives or objectives that companies can take to become more transportation-assurance oriented. Other case studies would contribute to achieving this end which would be a valuable contribution to the current knowledge on ways to reduce the negative effects of the HOS regulation.
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