MAXIMIZING FLEET UTILIZATION: a critical strategy for today's crude shipping market

*The traditional method of transporting crude is via pipe, but crude by rail has boomed over the past several years and more firms continue to join the crude by rail shippers list. In this article, Carolyn Barless and Karen Lukacs discuss the impacts of increased production, crude by rail volumes, and upcoming tank car safety regulations on traditional fleet management. All are leading to increased costs, tank car supply shortages, and more complex utilization decisions. As energy firms face tighter profitability, they will need to take a deeper look at more in-depth analysis and reporting tools for the management and growth of their business.*

In 2014, oil production across North America hit all-time highs. The United States became the number one producer of oil in the world and within the first week of 2015, the United States reported production of 9.19 million barrels (bbl) per day. Canada currently produces slightly less than 4 million bbl per day with an expected increase of 3.5% for 2015.1

With limited pipeline capacity, additional production from the oil sands and the Bakken Shale, and the delays of new and expanding pipeline projects, companies were forced to look for alternative ways to move their product to market.

Shipping crude by rail became a viable option and necessity for many companies. Capital investments were made into loading and unloading facilities, which allow crude oil producers to utilize the existing rail network to reach desired markets.

During the latter half of 2014, energy prices fell across the board with crude as the worst performer. Today, the outlook of the energy market is a hot topic within the rail industry. Many are concerned about the volatility of energy prices and its effect on the crude by rail volumes. If prices drop below the all-in cost of production, and are expected to remain there, the planned exploration and capital investment projects would be placed on hold. However, energy prices would have to drop below the short-run marginal costs before existing production is halted. Some industry experts are bullish about crude prices for 2015 while others forecast a slightly gloomier outlook. Either way, the crude by rail increase we have seen in the industry over the past few years will continue through the early part of 2015, albeit at a slower pace. Contractual volume commitments, existing infrastructure investments and current drilling programs will sustain growth for the near term. Longer-term outlooks will depend on the levels of crude prices throughout 2015 as additional exploration and investments will be dependent upon oil prices.
SAFETY AND REGULATIONS – HOW WILL IT CHANGE?

Since 2011, the rapid growth in crude by rail traffic and the number of high-profile rail incidents has increased public scrutiny and concern over the crude by rail boom.

Safety has always been a primary concern, but it has become paramount following the tragic rail accident in Lac Mégantic, Quebec, Canada in July 2013. This incident sparked a complete investigation and review in both Canada and the United States on the safety of tank cars that are shipping crude oil. The Department of Transportation’s (DOT) Pipeline and Hazardous Materials Safety Administration (PHMSA) has proposed rules for the safe transportation of crude by rail. The proposal would require that all tank cars manufactured after October 1, 2015, conform to new required specifications of the DOT-117. Expected retrofits to the existing fleet, as forecasted by PHMSA, range from $27,000 to $65,000 per car depending on the final regulations. If amortized over a 10-year retrofitted tank life, the cost per barrel would equal $0.23 to $0.66.3

Figure 1. Existing and Proposed US and Canadian Pipelines

Figure 2. Originating Carloads of Crude Oil on US Class I Railroads

Figure 3: Originating Carloads of Crude Oil on Canadian Class I Railroads
The DOT has announced that it is expecting the new tank car standards to be published on May 12, 2015, which would give car owners up to five years to adhere to the new requirements. The Canadian Transport Ministry, however, has taken a tougher stance stating that Canada wants the older DOT-111 tank cars removed from all fuel deliveries by May 2017.

THE SLOWING FLEET

The management of railcar fleets and the optimal utilization of rail assets are paramount to successful rail logistics. A significant difference can be achieved by a single percentage point gain in asset utilization. If a shipper managing a railcar fleet of 5,000 tank cars can increase asset utilization by 1.2%, this would equate to having an additional 60 tank cars in the fleet. Financially, this represents an annual savings of approximately $1 million in railcar lease costs.

Efficient utilization of railcar fleets is achieved through in-depth data analysis of cycles to determine transit time performance for all origin-destination pairs. Fleet sizing decisions will be based upon the variability of the cycle time and also will be used in determining risk between over and under capacity costs associated with the railcar fleet. To maximize the efficiency of a rail fleet, the supply chain as a whole needs to be examined. The review of origin loading and destination unloading capacities and capabilities requires consideration when working to increase fleet utilization on an ongoing basis.

Optimal shipping requires continuity throughout the entire movement of the railcar. For instance, if a destination location is experiencing a delay, a push for railways to move idle-flagged railcars can have an adverse effect if the cars will just be stalled at the endpoint of their route. This is analogous to merging into traffic. When vehicles in the merging lane and incoming lane allow for space on a shared road, merging is smooth and does not halt traffic. However, when vehicles from either lane do not allow for space, it ultimately results in a slower flow and creates a backup. This queue will take longer to move vehicles through than if cars were continually moving. When a backlog of railcars occurs at a destination, the same concept applies—it will take longer for them to get through the queue.

Included in the PHMSA proposal for the transportation of crude by rail are speed restrictions and route revisions. If speed reductions are regulated for crude oil traffic, the impacted rail capacity would decrease overall by 10-11% for the rail transportation of all commodities. Additionally, if route revisions are required for crude cars and delays are incurred through lost time while cars are retrofitted, the overall utilization of the fleet would decrease with the increase in cycle times. The reduced rail velocity across the entire network would also increase locomotive and railcar asset requirements for the railroads. If the same shipper lost a one day average in cycle times on his 5,000 tank cars, the reduction of shipped product in a one year period would be 1.4 million barrels of crude oil.

---

Figure 4. Relative Asset Utilization and Annual Savings in Tank Car Lease Costs
OPPORTUNITY OF SHARED DATA
As efficient fleet management becomes increasingly imperative to the bottom line, additional data analysis can help fleet managers make faster, more accurate decisions. Railroads currently provide all raw data on car movement via Car Location Messages (CLMs) to an industry-shared service which provides that data, at a cost, to the shippers, car owners, system providers and other railroads. The data allows users to monitor the status and movement of their particular rail traffic on all 530 railroads.

The benefits of expanding this shared industry service could provide information via the CLMs to be analyzed and summarized, after the removal of competitor data, into reporting tools for shippers. As a result, a fleet owner/lessee could gain more transparency throughout the entire rail network, and in turn, make organizations’ fleet management more efficient. They could have visibility, via a variety of reports, into the performance of rail operations, schedules including current delays or backlogs, percentage commodity breakdowns, traffic moving on lanes, and railroad capacities. These reports would provide shippers and consignees more timely and accurate information to determine best shipping routes, railway shipping patterns, best day of the week shipping and switch and interline performance. This information could also be utilized by railways to determine interline carrier performance, potential route changes, schedule revisions and performance measurements, as well as new business opportunities.

CONCLUSION
Because rail is an important, strategic asset for many companies, successful asset management is critical to achieve business development and sustainable growth. This includes compliance with new regulations for tank cars transporting crude, ongoing operation management of the rail assets, optimization of assets and creating a competitive advantage around extending the supply chain. With the volatility of energy prices and changing regulations, fleet management will become even more critical. Fleet utilization is not just about keeping the cars moving, but ensuring synergy across the entire supply chain. Fleet managers need to complete in-depth analysis of available data with the right tools in order to produce the most accurate results and make decisions quickly and efficiently. This includes data on the fleet, the railroads, interchanges, cycles and routes. For firms to maximize their trade deals, transportation and fleet, costs should be scrutinized in preparation for the changes coming to the crude by rail business.

With a high-level view of the overall supply chain, available data and the right technology firms can take advantage of changing environments and capitalize on market opportunities. Each company that utilizes rail to transport product should be asking themselves if they have the efficient tools required to manage their business, and the available data to determine how well they are managing their overall railcar operations.
CONTROL – Activities tied to the control aspect for the base drivers of the business
• Focus: Regulatory standards and compliance
• Goal: All the processes necessary to operate the business assets are in place and are valid to report against

OPERATE – Activities related to the physical operation of assets under management
• Focus: Ongoing asset operations
• Goal: Business assets are operated safely, prudently and efficiently

OPTIMIZE – Assets are optimized to realize the highest returns
• Focus: Assets and capacity management
• Goal: Achieve the highest returns possible at the commensurate level of risk

EXTEND – Leveraging strategies and positions to grow business results into new areas
• Focus: Business and operating asset acquisition, supply chain extension
• Goal: Achieve business development and growth goals to achieve a competitive advantage

Figure 5. Core Functional Activities Focus Attention on Key Logistics Business Elements
References
1. Financial Post, “Don’t expect the flood of Canadian crude to slow down anytime soon,” Feb 20, 2015
2. CAPP, Crude Oil Forecast, Markets & Transportation, June 2014

THE AUTHORS
Carolyn Barless is a Senior Analyst of Sapient Global Markets Business Consulting practice in Calgary, Alberta, Canada specializing in rail logistics within the midstream industry. She currently works with clients to determine business processes and optimization solutions within their logistics business units. Carolyn has over 15 years of experience across road, rail and marine logistics, managing LTL, dry and liquid bulk commodities. Prior to joining Sapient, she was responsible for the management of logistics operations for agricultural and manufacturing firms.
cbarless@sapient.com

Karen Lukacs is a Director of Sapient Global Markets Consulting in Calgary, Alberta, Canada. Karen works with multiple clients as an account executive, workshop facilitator and midstream advisor. Karen has over 25 years of experience in the North American energy industry as an NGL marketer, transportation analyst, ETRM software vendor executive, and a business process improvement consultant. Karen facilitates the communication between IT, operations and executives and translates these interactions into actionable and achievable plans.
klukacs@sapient.com