

# Transport & Logistics

Spring 2009

- 3 The Complex Future of the North American Rail Network**
- 10 From the Mine to the Sea: Optimizing Multi-Party Logistics**
- 16 The Liner Shipping Downturn: Business as Usual or Something New?**
- 23 Don't Chance It: Getting More Out of Risk Modeling**
- 27 Factoring Risk into Transportation and Logistics Sourcing**
- 32 Cracking the Yield Management Code**

## ■ To Our Readers

Oliver Wyman (formerly Mercer Management Consulting) is pleased to unveil our redesigned *Transport & Logistics* journal. In this issue, we have focused on topics that are particularly relevant to the current adverse economic climate, with a view to offering some perspective for both providers and users of transportation and logistics services.

Our first article looks at the future of North American freight rail, with a focus on structural changes that will test railroads' ability to evolve their business designs. As the importance of intermodal increases and there is more demand for network capacity, how will railroads maintain and grow their franchise value?

The next article considers the situation of multi-party logistics chains where investment needs are imminent. An extended case study demonstrates that it is possible to optimize capital deployment across the entire logistics chain through an iterative, collaborative process.

Our third perspective looks at the impacts of the economic downturn on liner shipping, and by extension, ports. We believe there are opportunities even now to develop a baseline for future growth, including greater partnering and adjusting the product/service mix.

We next offer up a pair of articles related to risk management. The first examines the broad "do's and don'ts" of using modeling to assess risk; the second focuses on how shippers can reduce risk in their supply chains.

Finally, we end with a discussion of yield management. Although widely applied in the travel industry, it is still often challenging for freight. Making certain changes to the process, however, can turn yield management into a valuable tool to better manage variable costs and enhance revenue.



Transport & Logistics / Spring 2009



# The Complex Future of the North American Rail Network

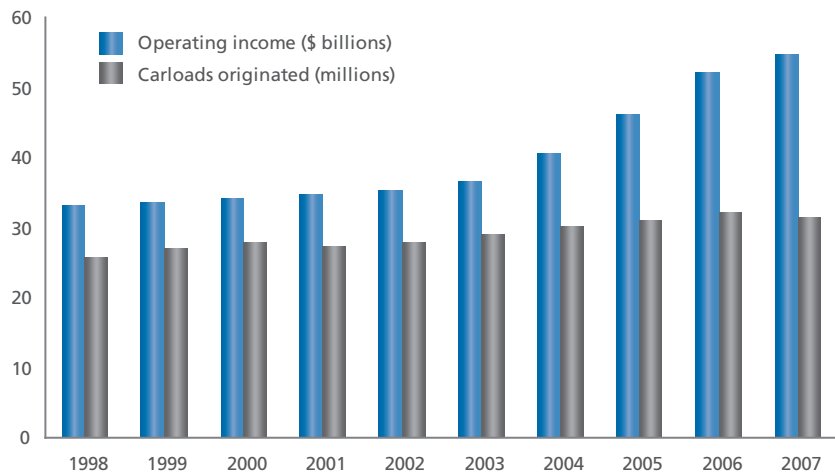
## Rod Case

Rod Case is a Toronto-based partner of Oliver Wyman. He can be reached at [rod.case@oliverwyman.com](mailto:rod.case@oliverwyman.com).

It can be difficult to remember, in the midst of today's tough economic news, that we are in the second "golden age" of North American railroading. In the past several years, all of the Class I's have seen increased profitability and service levels, even in the face of some traffic reductions (Exhibit 1-1).

It can be argued that renewal has been driven by stronger railroad business designs and enhanced by the increasing attractiveness of rail transportation. The future of the railroads—and the role they can play environmentally and economically—continues to be of intense interest not only to shippers but to government, private equity investors, and the public at large.

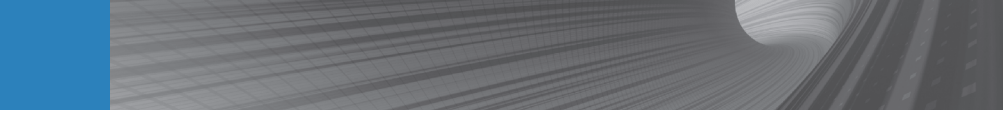
**Exhibit 1-1 Class I Operating Income and Carloads Originated, 1998-2007**



Source: Railroad Facts, 2008 Edition, Association of American Railroads.

While railroad performance to date has been strong, structural changes now arising out of both the market and political worlds will likely test railroads' capacity to evolve their business models while retaining or enhancing the value of their franchises. Two key structural changes discussed herein—the evolution of intermodal and the uses of network capacity—are being driven by fundamentally different concerns, but both offer the possibility of profound shifts in terms of how railroads will operate, maintain, and expand their networks:

- The intermodal business, the engine of growth for railroads over the past few years, is poised to evolve into a market of smaller lanes



with shorter hauls demanding higher service levels. There will be opportunities to generate new revenues, but these revenues will be far more challenging to capture and retain.

- Public debate over network capacity and who defines, controls, and funds it continues to grow and this is rapidly becoming a complex strategic issue for the railroads. All levels of government appear to be placing billion-dollar bets on the return of passenger trains to many now freight-only corridors, while local communities are demonstrating increased capacity to influence the extent of individual mainline capacities.

These two issues are both likely to lead to the development of more complex networks targeting the transportation needs of shorter haul markets once thought to have been lost permanently to the roads. The return of short haul services promises increased rail activity but will require a revamping of business models for both freight and passenger franchises.

### **The Evolution of Intermodal: Smaller Lanes, Shorter Distances**

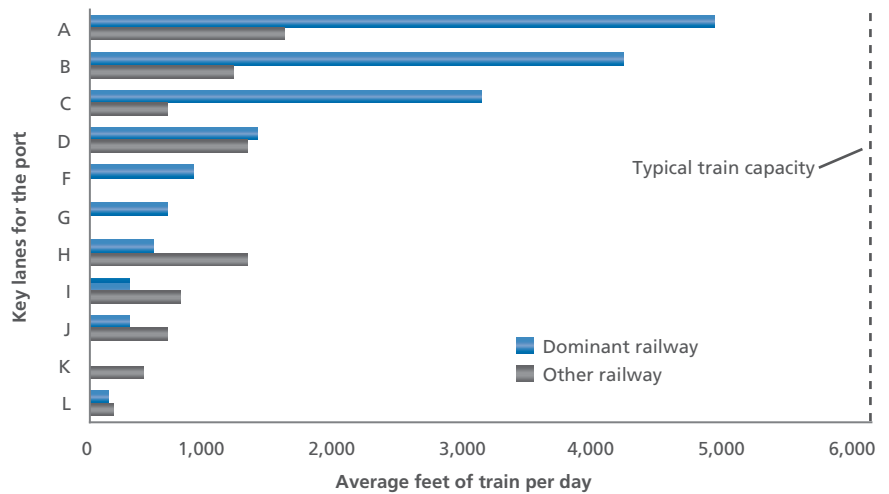
In the 1990's, the rail industry maintained an open debate about the future of intermodal and its ability to pay for the extra network capacity it required. A decade later, expanding traffic volumes, coupled with strong pricing, led the Class I's to make significant investments in their networks. In particular, the Class I's capitalized on the rapid growth of the import container business to develop and reinforce their intermodal networks to the benefit of domestic business.

But the rapid drop in import container volumes over the past year has once more raised strategic questions about the future of this business. The market is entering a period of lower long-term growth and supply chains are being reconstructed based on a new reality of increasingly expensive and scarce longer-term transportation capacity.

Further, intermodal growth will no longer be based largely on West Coast port throughput. While the future expansion of the Panama Canal is one risk to the continued growth of West Coast ports, recent volume developments at Gulf and East Coast ports suggest a shift is already occurring. This will shorten length of haul to key markets; more importantly, unlike West Coast ports, smaller East Coast ports cannot generate sufficient volume to build daily "solid trains." CSX and NS, which serve primarily the East Coast, will likely have to evolve their service designs to accommodate these smaller volume and shorter haul markets, resulting in a more complex operation based on "blocks" of traffic, rather than on trains. As shown in Exhibit 1-2,

the typical daily volumes from a one million TEU port generate many small blocks that will need to be combined into a network of trains to remain commercially viable.

**Exhibit 1-2 Typical Daily Volumes for a One Million TEU East Coast Port**



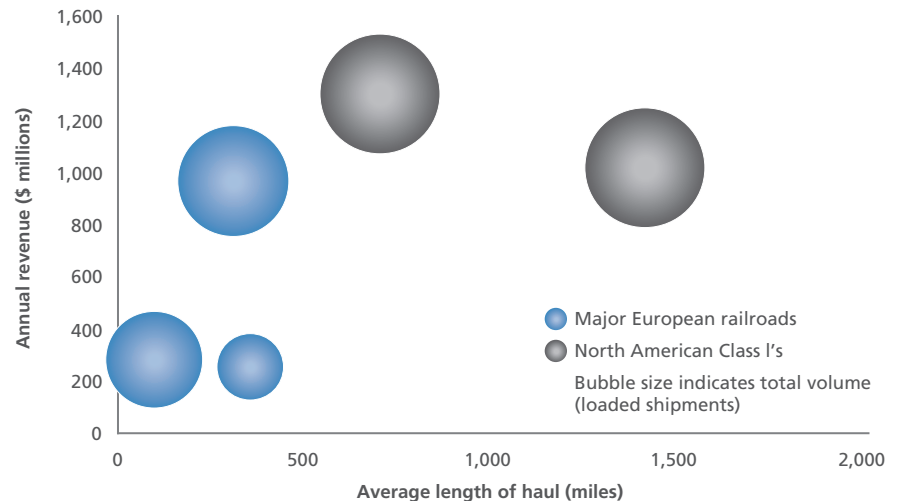
Source: Oliver Wyman analysis.

Domestic intermodal traffic is actually holding its position in a falling transportation market—a clear signal that such service is now structurally integrated in the transportation marketplace. Domestic intermodal business however is likely to evolve in a fashion very similar to container imports: comprising blocks of traffic (not full trains) moving over short distances, increasing operational complexity. The upside however is the opportunity for railroads to generate revenue from what is still a fairly new and growing market segment.

The future North American intermodal market may look much more like existing European intermodal markets. (Exhibit 1-3 shows the current US versus European market.) While European railroads support significantly shorter distances, they manage to create large revenue bases through high volumes and higher rates per container. While it is true that European trucking costs are also higher, many operators have capitalized on the congestion of European highways to entice volumes from road at attractive rates even for short distances.

Changing intermodal markets could lead to significant network restructuring in North America to capture new shorthaul revenue sources. It is important to highlight that this is not completely new territory, and that mature markets like Europe have developed large revenue bases in these highly competitive markets.

### Exhibit 1-3 US versus European Rail Market: Revenue, Volume, and Average Distance



Source: 2007 annual reports, Oliver Wyman analysis. Includes CSX, CP, DB, Cargonet, and UK carriers as representative railroads.

#### Network Capacity: Improving Usage, Increased Demands

Over the past three decades, Class I railroads worked diligently to reduce their overall network, primarily by spinning off lower-density lines to shorthaul partners. The rally in freight traffic over the past decade however has exposed bottlenecks in the system and created a need for capacity expansion. Such expansion is now being complicated by emerging public needs. While the freight railroads possess a similar mindset for negotiations around shared networks, the public has a very different set of objectives, and that gap has grown into a core strategic question that many railroad executive teams are still defining.

The recent experience of the CN acquisition of the EJ&E (in which CN was required to fund noise mitigation, safety fencing, and emergency response for two towns in Illinois), and the coming tsunami of passenger rail investment clearly demonstrate that network capacity is becoming an increasingly local issue. These very public interventions on the use of network capacity require sophisticated solutions that exceed the flexibility of most existing network sharing models. In response, the Class Is will need to ask themselves three key questions:

- Is owning all of the network still relevant to the business model?
- What further joint access capacity arrangements can be achieved between railroads on commercial terms?

- How much more capacity can be generated from the existing network; in particular, to support expanded passenger rail services?

#### **Determining Network Ownership and Control Requirements**

There was a time when railroads thought that they had to own or control all of the network over which they operated. But mergers and the proliferation of short lines have dramatically grown the level of joint access, and network sharing is now geographically widespread, involving most North American railroads. Many key mainlines are shared and even some of the most competitive corridors have more than one railroad on the track. These arrangements have been arrived at through commercial negotiations and terms, which have been used to expand the shared network well beyond any “forced access” required by the STB due to mergers.

The success of joint access raises the question of whether it is necessary for a railroad to retain exclusive control of the network on which it operates. While many rail executives insist that such control is still necessary, the general trend illustrates that is no longer an absolute. Longer-term, railroads are likely to see even more sophisticated network sharing models capable of ensuring efficient operations.

#### **Increasing Joint Access on Commercial Terms**

Although the expansion of joint operations was, for a time, driven by network reductions, recent developments of joint operations are being driven more by efficiency gains or overall growth opportunities. The rapid expansion of agreements in both scale and number suggests that openness to joint access is increasing significantly.

Norfolk Southern (NS) for example has recently sponsored two innovative, commercially-based joint operations models that will squeeze more capacity out of existing networks:

- Cooperative agreements that include investments in main line networks not owned by NS, including with CN (MidAmerica Corridor Initiative), Pan Am Railroads (Patriot Corridor), and Kansas City Southern (Meridian Speedway)
- In an attempt to foster the growth of short haul traffic, NS has provided access for its short line partners in upstate New York to interchange traffic directly with one another over NS's lines.

These examples indicate that commercial terms can be successfully broadened to improve the use of existing regional networks. Further, the MidAmerica Corridor Initiative (in which CN and NS will share track between Chicago, St. Louis, Kentucky, and Mississippi to estab-

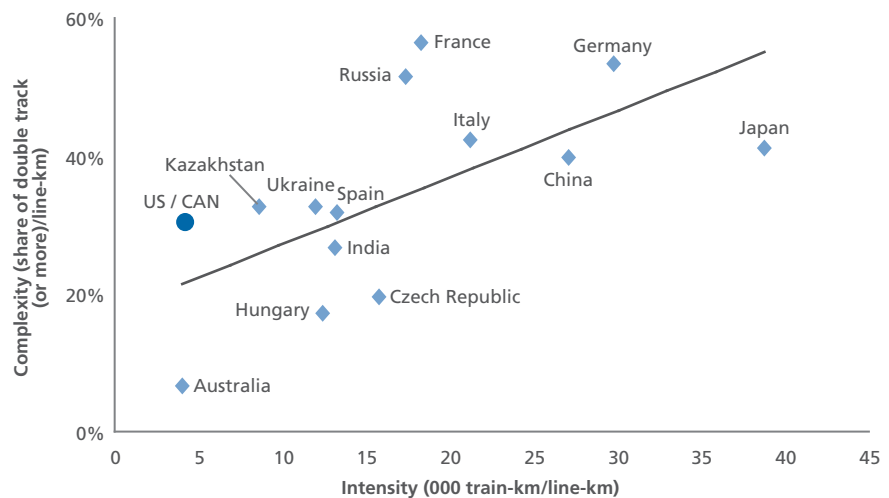
lish shorter and faster routes for traffic moving between the Midwest and Southeast) is providing the industry with a model for using regional networks creatively to unclog urban areas. This model may become increasingly important as expanding local train operations further congest large urban areas. It will be critical for Class I's to integrate commercially driven, regional-network based solutions into any future negotiations about capacity expansion.

### Expanding Capacity on the Existing Network

It should not be surprising that US railroads have some of the lowest rail rates in the world and accordingly operate some of the largest freight trains to compensate. What may not be as well known is that the North American network carries far fewer trains overall compared to countries with similar network structures.


As shown in Exhibit 1-4, the difference in train volumes per year is dramatic, reflecting the varying roles of these networks: whereas the North American network runs primarily freight trains with limited passenger/commuter rail services, countries such as Germany and Japan run extensive, high-frequency passenger services in addition to freight traffic. What the exhibit does not show of course is that many of these other networks are highly subsidized and their freight operations are largely uneconomic.

Exhibit 1-4 Complexity and Intensity of Major Rail Systems



Source: UIC: International Railway Statistics 2006, Oliver Wyman analysis.

This is an important point to keep in mind, as a new focus of public scrutiny in the US and Canada is determining what capacity is available from a given network or corridor to support both freight and passenger train service. Certain North American corridors do run high-



intensity mixed passenger and freight services (more than 10,000 trains per year), such as Toronto-Montreal (CN and VIA) and the California Capital Corridor between Oakland and Sacramento (Amtrak and UP). But these operations are only successful if the freight owner is sufficiently compensated for physical improvements and maintenance, and a high level of service for freight customers is maintained.

As governments and communities seek to expand passenger rail service, it will be important for Class I's to develop an objective process to explain the tradeoffs between increased train counts caused by new passenger operations and the resulting impacts on network and assets that will not show up in a simple train count/capacity analysis. If the Class I's hesitate too long, the weight of global case studies, together with recent pro-passenger rail regulatory changes, may create irreversible impacts on their financial and operational performance.

### **Steaming Ahead of the Curve**

The changing marketplace for intermodal and the profound changes coming in terms of rail network capacity demands require that railroads evolve their business models in preparation for a world of more complex train operations with more partners. In the short term, the recession is making it more challenging for the industry to maintain profitability, but it does offer a “silver lining” in the form of a brief respite for railroads to work through needed strategic decisions and set their long-term business objectives—before they find these objectives being set for them by others. ❖

## From the Mine to the Sea: Optimizing Multi-Party Logistics

Allan Kaulbach

Manny Hontoria

Jeffery Elliott

Robert Reid

---

Partners Allan Kaulbach and Robert Reid are based in Boston. Partners Manny Hontoria and Jeffery Elliott are based in Dubai and New York, respectively. They can be reached at [allan.kaulbach@oliverwyman.com](mailto:allan.kaulbach@oliverwyman.com), [manny.hontoria@oliverwyman.com](mailto:manny.hontoria@oliverwyman.com), [jeffery.elliott@oliverwyman.com](mailto:jeffery.elliott@oliverwyman.com), and [robert.reid@oliverwyman.com](mailto:robert.reid@oliverwyman.com).

Asset-intensive industries, including mining and industrial products, are often dependent on transportation and logistics assets that are owned or controlled by third parties. Developing an efficient, coordinated program to fund capacity expansion across each entity can involve a complex range of potentially conflicting objectives within each of these parties.

Optimizing multi-party logistics chains usually requires a high degree of investment coordination, as the individual parties will have different levels of access to capital and pricing power (i.e., ability to pass through costs to the ultimate customer). These disparities can lead to competing investment hurdle rates, which frequently impact contract negotiations over the amount, timing, and allocation of responsibility for necessary capital improvements. There are often opportunities, however, to optimize capital deployment throughout the entire logistics chain by working together in collaborative processes.

Recently, Oliver Wyman has advised clients in projects involving multi-party, asset-intensive logistics chains on developing a structured, analytically driven, and objective process for addressing these inherent challenges and opportunities. Key components of this process include:

- Leveraging international experience to establish utilization, capacity, and cost standards, adjusted for local conditions
- Ensuring that robust analytical methodologies are deployed to assess all of the logistics chain components and interfaces
- Assessing the relative benefits and risks of alternative investment and ownership/control options
- Examining opportunities to coordinate investment programs by each of the stakeholders, in order to identify alternative capacity expansion mechanisms that reduce the total capital required to achieve desired goals
- Developing and facilitating multi-party agreements that align investment objectives across all involved parties and provide coordination, transparency, and the ability to apply best practices (e.g., project structure and information sharing, relationship management, performance metrics and incentives)

## A Case Example: Growing Capacity for Export

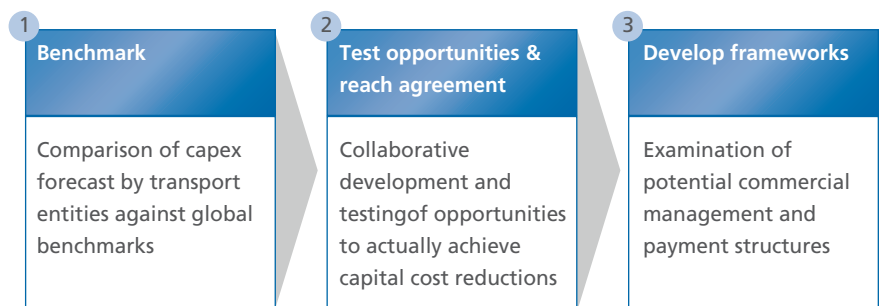
As an example, a large and growing mining company sought to increase its mining production by 50 percent over the next 10 years to take advantage of global demand for raw materials. This plan essentially resulted in a tripling in demand for capacity along the existing logistics chain, which involves material moving from mines via rail to a port terminal, where it is loaded onto vessels for export.

The railroad and port facilities are both owned by a transport holding company, which operates them as separate entities with individual charters and objectives. This separation has often led to conflict, as each entity has attempted to maximize its individual performance, developed expansion plans that influenced its own required capital investment, and competed for internal resources.

In this case, each developed a plan to meet the mining company's expanded transport capacity needs, but the resulting costs threatened the commercial viability of the mine's expansion. Accordingly, the mining company sought an objective assessment of the capital required to meet the increase in throughput, based on relevant benchmarks and "best practices" adjusted for local conditions. It also sought a mechanism to allocate investment by each of the parties at a commercially viable rate of return. Finally, it wanted to redesign the commercial relationship between itself and the rail and port service providers to allow for more visibility and constructive feedback from the mine to continually improve the performance of the logistics chain.

A three-step program was developed to help the client constructively engage in capacity expansion discussions with the transport entities, with a focus on required capital and appropriate allocation of risk.

### Exhibit 2-1 Phase I Multi-Party Capacity Expansion Approach

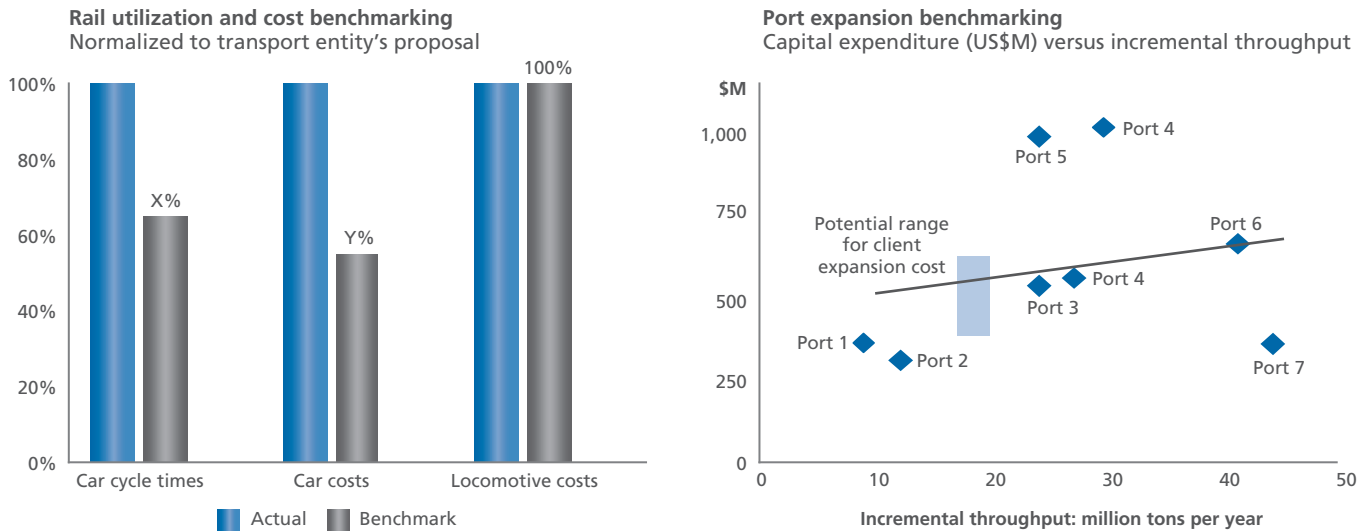


#### Benchmarking

Benchmarking is an essential first step in determining the practical incremental throughput that can be achieved for a given level of

investment in capacity enhancement. Benchmarking should focus on the productivity of individual assets and unit costs and their respective interdependence to ensure that the logistics chain is responsive to demand requirements.

## Exhibit 2-2 Benchmarking to Establish Capital Expenditure Requirements



Source: Oliver Wyman analysis.

In this case, international experience conclusively demonstrated that current utilization of rolling stock and the port terminal, adjusted for local conditions, was well below benchmarks. It was clear that improving utilization of these assets would significantly reduce the capex required for capacity expansion. Also, the initial proposed unit costs for purchasing additional rolling stock and the overall costs for port expansion were not supported by comparable benchmarks (Exhibit 2-2 above). The data-driven benchmarks furthermore provided a basis for the transportation entities to negotiate lower unit costs with their suppliers and to launch an in-depth technical feasibility study of the proposed capital expansion.

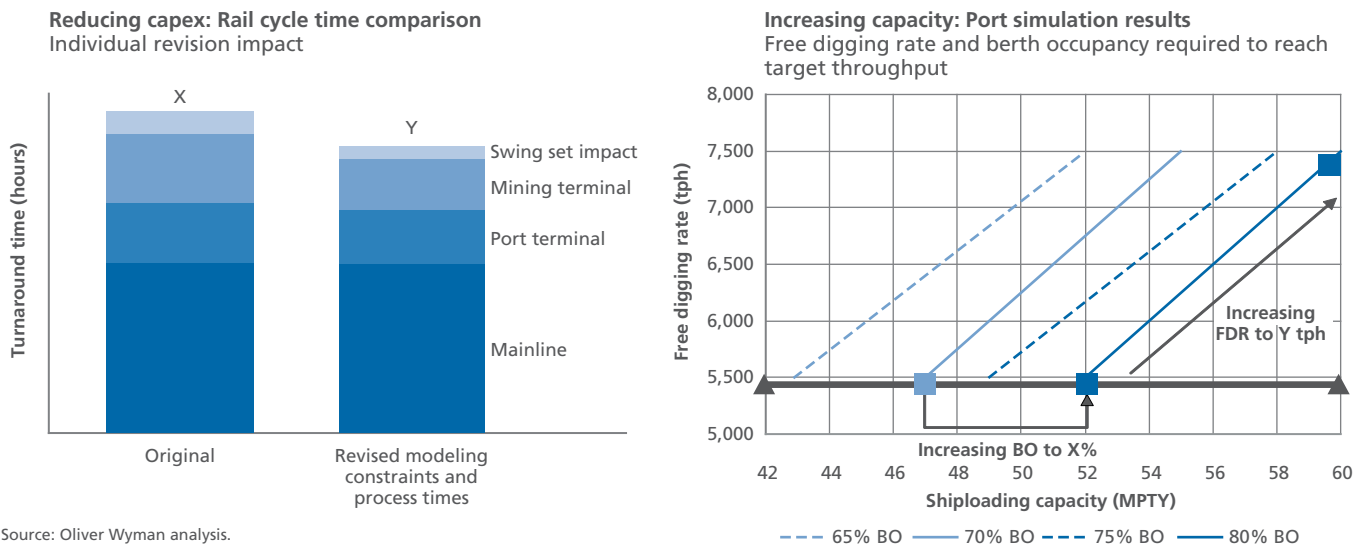
### Testing Opportunities and Reaching Agreement

Assessing and testing the technical feasibility of operational changes must be accomplished with the involvement of all parties through the establishment of joint teams (across entities and functions). These teams should be comprised of individuals with the requisite experience and collaborative know-how to develop and execute the project approach, timeline, and analyses, in order to ensure buy-in from all parties on the resulting findings and recommendations.

The teams in return should report to a steering committee made up of representatives of the project stakeholders who have requisite decision-making authority to resolve the inherent conflicts that can arise throughout the process.

In this case, the focus was on closing the gaps between benchmarks/ best practices and the existing performance levels driving the original capex proposals from the railroad and the port. On the rail side, technical feasibility studies uncovered operating issues (e.g., train schedules and operating performance, equipment availability, and utilization) that threatened throughput targets and inflated capital requirements. On the port side, the team identified throughput enhancements that would improve current performance and determined alternative capital expenditures that were needed to de-risk the planned operation and ensure reliability (Exhibit 2-3). These findings laid the groundwork for reaching subsequent commercial agreements and highlighted key decision and investment points.

### Exhibit 2-3 Results of Options Testing



Source: Oliver Wyman analysis.

### Developing Frameworks to Address Project Requirements

The third stage of the process involves formalizing the new operating model, finalizing estimates of operating expenses and capital expenditure requirements, building financial models to support negotiations, and developing protocols and agreements to support the coordination of long-lived capital investment programs.

In this case, based on the prior two work steps, the team developed an estimate of the tariff charges needed to support the level and timing of the proposed capacity-related investments and to provide a reason-

able rate of return for the transportation entities. In addition, options were developed around commercial terms between the parties that would minimize operational risks (Exhibit 2-4), as an input to developing a tariff model and a range of commercial and contractual risk-sharing and performance incentive options.

Exhibit 2-4 **Developing Frameworks: Options for Commercial Terms**

	Option 1	Option 2	Recommendation
1 Term length	<b>Short-term</b> <ul style="list-style-type: none"> <li>Typically 5-10 years</li> <li>Primarily service oriented</li> </ul>	<b>Long-term</b> <ul style="list-style-type: none"> <li>Typically 15-30 years</li> <li>High capital intensity</li> </ul>	<b>Long-term</b> <ul style="list-style-type: none"> <li>Goal: long-term partnership</li> <li>High capital intensity</li> </ul>
2 Tariff structure	<b>Fixed (no risk sharing)</b> <ul style="list-style-type: none"> <li>Lump sum tariff rate for full duration of contract</li> </ul>	<b>Variable (risk sharing)</b> <ul style="list-style-type: none"> <li>Tariff based on throughput, performance (incent. / pen.)</li> </ul>	<b>Variable (risk sharing)</b> <ul style="list-style-type: none"> <li>Numerous parties involved, tariff should reflect usage</li> </ul>
3 Payment scheme	<b>One-time</b> <ul style="list-style-type: none"> <li>Single payment for services provided</li> </ul>	<b>Ongoing</b> <ul style="list-style-type: none"> <li>Continuous payments based on actual usage</li> </ul>	<b>Ongoing</b> <ul style="list-style-type: none"> <li>Variable usage-based tariff</li> <li>Flexibility for change</li> </ul>
4 Performance monitoring	<b>Static</b> <ul style="list-style-type: none"> <li>Limited performance monitoring during term</li> </ul>	<b>Continuous</b> <ul style="list-style-type: none"> <li>Agreed performance criteria</li> <li>Metrics for term fulfillment</li> </ul>	<b>Continuous</b> <ul style="list-style-type: none"> <li>Partnership approach</li> <li>Clear performance metrics</li> </ul>
5 Contract review and adjustment	<b>Steady</b> <ul style="list-style-type: none"> <li>No changes to term length, structure, or payments</li> </ul>	<b>Periodic adjustment</b> <ul style="list-style-type: none"> <li>Changes based on events, milestones, volumes, etc.</li> </ul>	<b>Periodic adjustment</b> <ul style="list-style-type: none"> <li>Flexibility for change (demand fluctuations, etc.)</li> </ul>
6 Conflict resolution	<b>Escalation</b> <ul style="list-style-type: none"> <li>Arm's length relationships</li> <li>Political environments</li> </ul>	<b>Arbitrage</b> <ul style="list-style-type: none"> <li>Close partnerships / win-win</li> <li>Timely resolution / decision</li> </ul>	<b>Arbitrage</b> <ul style="list-style-type: none"> <li>Win-win relationship</li> <li>Time is of the essence</li> </ul>
7 Exit options	<b>Buy-out</b> <ul style="list-style-type: none"> <li>Buy-out of equipment / operations by one party</li> </ul>	<b>Renewal</b> <ul style="list-style-type: none"> <li>Extension of contract terms</li> <li>Adjustment for changes</li> </ul>	<b>Renewal</b> <ul style="list-style-type: none"> <li>Continuity of partnership</li> <li>Long-term win-win situation</li> </ul>

### Results

This collaborative effort led to an agreement on investment cost and funding mechanisms that were acceptable to both parties and provided the basis for a new commercial contract. The project was able to reduce the proposed tariff that the mining company would pay by nearly 40 percent and the overall capital required for the expansion by more than 20 percent, while still generating an attractive rate of return for all parties. The project also led to a better understanding of the real capacity constraints of individual components along the entire logistics chain, which became the basis for an agreement between the parties to form a joint operational team focused on optimizing the capacity of the entire export channel.



### **Summary: Rethinking Complex Logistics Chains**

The example above focuses on capital expansion issues for a logistics chain dominated by materials throughput and involving multiple entities. Operational coordination issues and the need for tradeoffs between capital and operating costs can arise both within a capital-intensive firm and between parties with large capital requirements that are part of the same logistics chain. The key to developing a result that maximizes effectiveness is to understand the operating and capacity relationships across all individual components of the logistics chain. Performance and capital benchmarking, a detailed understanding of the factors impacting optimization of the consolidated logistics chain, and an iterative process for framing and testing options can produce significant scale benefits for all parties involved and ensure the best use is made of scarce capital resources. ❖

# The Liner Shipping Downturn: Business as Usual or Something New?

Manny Hontoria  
Kristina Gerteiser

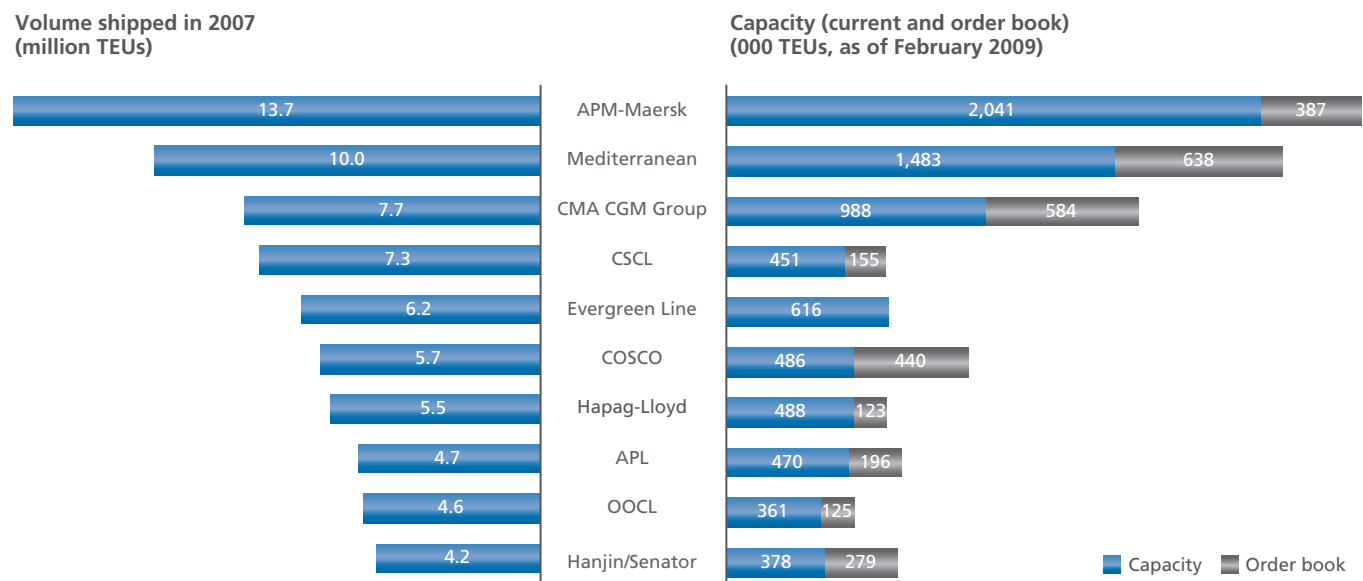
Manny Hontoria is a Dubai-based partner and Kristina Gerteiser is a Munich-based senior associate of Oliver Wyman. They can be reached at [manny.hontoria@oliverwyman.com](mailto:manny.hontoria@oliverwyman.com) and [kristina.gerteiser@oliverwyman.com](mailto:kristina.gerteiser@oliverwyman.com).

The liner shipping industry over the years has become used to high cyclicity, driven by major swings in demand, capacity, and pricing. Currently, the industry is not only well into a major downturn, but facing what many view as its largest crisis in memory. The causes are not only a worldwide recession, but a current and pending major increase in capacity, recently projected to grow by 9 percent per year from 2008 to 2012 (although this rate is now likely somewhat lower due to cancellations and order delays) (Exhibit 3-1).

The headlines in the trade press are full of bad news:

- Asia-Europe spot box rates dropped to an unheard-of zero dollars, with cargo owners just paying for fuel.
- Container volumes have dropped sharply: Singapore, the world's largest container port, handled only 1.9 million TEUs in February 2009, a 20 percent drop versus the same month a year ago.
- Containership charter rates dropped by about 50-60 percent between August and December 2008 (Exhibit 3-2).

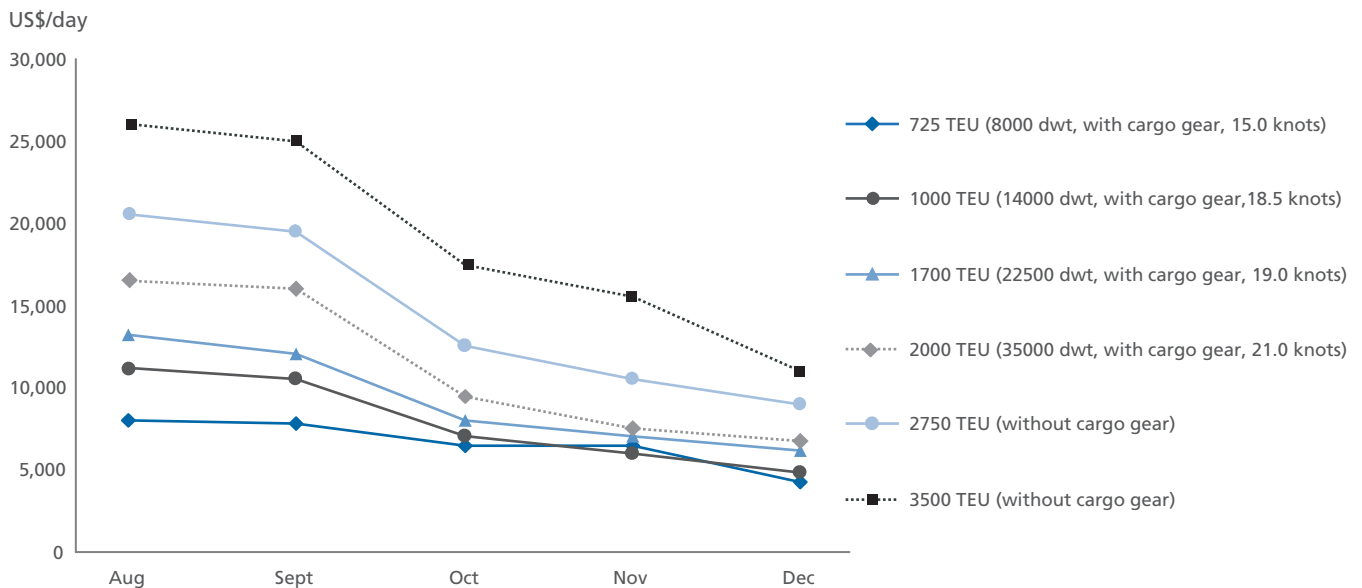
Exhibit 3-1 **Top 10 Container Lines: Shipping Volumes and Capacity**



Source: DVB/Dynamar, Alphaliner®.

- The creditworthiness of liner shipping companies has suffered; as an example, France-based CMA CGM's credit rating was cut from BBB- to BB+ by Standard & Poor's.
- Most lines are restructuring services, cutting capacity, slow steaming and laying up ships. For example, Maersk by the end of 2008 had laid up over 50,000 TEUs (8 vessels x 6,500 TEUs) of capacity in its Asia operations and more lay-ups are expected.

### Exhibit 3-2 Sample of Containership Rates, August-December 2008



Source: Clarksons Containership Rates, Internationale Transportzeitschrift.

The only small piece of “good news” was a reduction in bunker fuel prices through the first quarter of 2009, after the peak in mid-2008. For example, according to Tankerworld, Singapore 380 centistoke (cst) bunker fuel prices plummeted 64 percent from July 2008 to January 2009.

A couple of questions come to mind:

- Is this current downturn similar to those that occur in the industry every several years, or is it severe enough and driven by significantly different circumstances such that liner shipping companies should be considering a fundamental rethink of their strategies in order to survive?
- An interesting related question is: Will the well-publicized new EU regulation that denied a block exemption for liner shipping conferences as of October 2008 exacerbate the impact of the downturn?



## **The End of Conferences: More Price Competition?**

Let's focus on the impact of the change to conferences first: While the specifics vary by trade and geography, conferences have long since moved from their "price fixing" function (often with quite limited effect) to broader discussion agreements. Overall, changes in what conferences could or could not do to coordinate pricing in recent years had a relatively small impact on the level of overall competition, as lines continued to fight for share. This would suggest that the final abolition of conferences (and thus of their ability to price fix and regulate capacity) will add little to the impact of the downturn.

It is interesting, however, to consider the issue of surcharges (especially for fuel) in this context, as these represent a huge part of total freight rates, both for air and liner shipping. Some of the liner conferences still offered the capability to levy set surcharges and thereby kept these out of competitive pricing. Formally and legally, this will no longer be the case. Will liner shipping companies now compete on surcharges and the pass through of fuel costs? Even if they don't in principle, will the potential lack of a clearly set reference point for fuel and other surcharges mean that dramatic price swings for these charges might not be passed through as efficiently as they were in the past, potentially leading to a significant negative cost impact at a time when margins have all but disappeared?

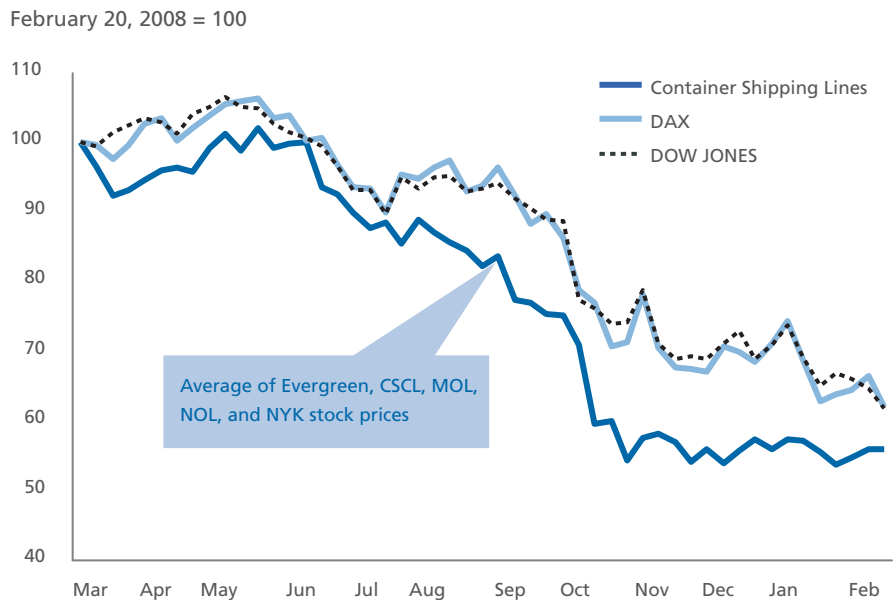
While this is certainly a new area, we do not believe, despite rapid and ongoing price cutting by lines, that shipping lines will utilize surcharges in an aggressive, competitive way. Freight rates are highly sensitive to market conditions and there is still room to maneuver in the negotiable part of freight rates, though that room has been greatly reduced of late, given how low rates have fallen. In addition, a number of lines have implemented fairly transparent pricing, which will further limit opportunities to "hide" additional revenues in the surcharge portion of freight rates. Margins are simply too thin (i.e., non-existent) and the impact of rapid changes in fuel prices too great, for lines to risk, even for a short-term increase in volume, changing the industry's competitive dynamics in such a potentially dangerous way.

## **A Bigger, Badder Downturn?**

This brings us back to the broader question of whether the current downturn is so severe that it will force lines to rethink the fundamentals of their business, or whether a short to mid-term focus on cost and capacity reduction will be sufficient to enable lines to weather the storm. While it is impossible at the moment to judge the full extent and timing of the global recession, we currently believe that—despite surely painful years ahead—the liner shipping industry as a whole

will continue to be viable long term. (For example, although stock prices have dropped in line with the overall market, they have stabilized—see Exhibit 3-3). There will likely be some shifts in manufacturing that could reduce shipping—although we think that these much talked about shifts will not be many, given the complexity and costs involved. But at some point, consumer spending will come back and global trade will start to move again. In the meantime, the contraction in the industry is also having a fairly dramatic impact on related sectors, such as ports and port operating companies, shipyards, charterers, etc. (See sidebar on competitive challenges for ports.)

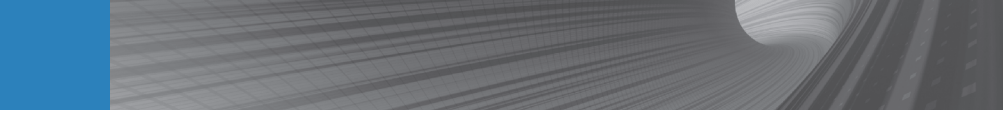
**Exhibit 3-3 Indexed Stock Prices of Listed Container Shipping Lines, Feb. 2008-Feb. 2009**



Source: Thomson One Banker, Oliver Wyman analysis.

Shippers, though experiencing their own recessionary pain, may be viewed as the primary beneficiaries of reduced rates. Before the expressions of glee get too loud, however, cargo owners should consider the potential risks to their overall supply chains should a turnaround in liner shipping fortunes not come soon. At some point, even if business failure is not the result, the pain in specific trades could well become too high as even marginal costs are no longer covered. Capacity also cannot be pulled down perfectly smoothly to match demand. Therefore, shippers may well find that certain origin-destination pairs are simply no longer served, with major implications for a well-functioning transport and distribution chain.

Some smaller or poorly capitalized lines likely will not survive. A number of dry bulk carriers have already filed for protection,



e.g., Ukraine's Industrial Carriers, New York-listed Britannia Bulk, Copenhagen-based Atlas Shipping, and Armada Singapore. There is much speculation around which liner shipping and charter companies will follow. Recently, Hong Kong's Great Ocean Container Lines (GOCL), which began providing a Far East-Europe service in April 2008 through slot buying, closed after less than a year of operations.

### **Strengthening Alliances and Getting Back to Basics**

So, what should be the short-term strategy of liner shipping companies? Clearly, a focus on costs will be paramount, including further restructuring in terms of staffing, asset purchases, etc. We do not see restructuring leading to or being driven by further major consolidation in the sector, given the expected poor performance of lines over the next several years, as well as a lack of available financing. The well publicized pullback of NOL from a potential acquisition of Hapag-Lloyd is an indication of this.

Furthermore, the next couple years might be a good time for lines to think more about increasing the impact and capabilities of strategic alliances, by pushing for stronger operational coordination and further exploiting economies of scale. Some recent examples of new levels of cooperation include:

- Pacific International Lines and Wan Hai Lines cut their transpacific service and joined K Line's existing PSW-1 service at the end of February 2009.
- Grand Alliance (GA) and New World Alliance (TNWA) teamed up on their Asia-US operations; New World Alliance's "New York Express" will move from an eight to nine ship loop, with the TNWA and GA providing five and four ships, respectively.
- Grand Alliance recently teamed up with Israel's Zim to continue to serve eastern Mediterranean and Black Sea destinations directly from Asia, through a slot charter arrangement with Zim.

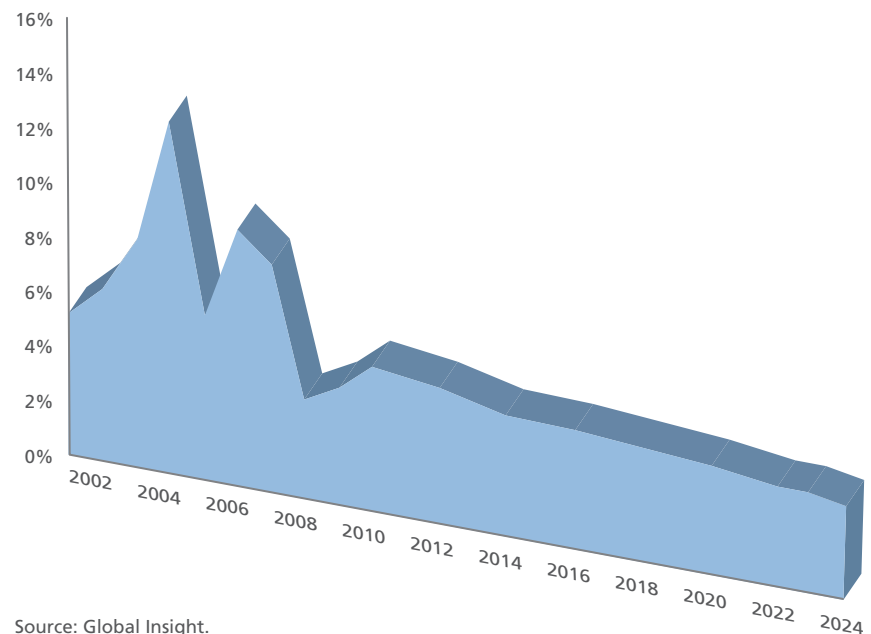
As these examples show, there are opportunities out there to exploit the power of partnerships. Lines will need to exercise some caution in how they utilize alliances, however, so as not to be accused of circumventing the abolition of the block exemption or pursuing forbidden antitrust activities on a different playing field.

Beside a focus on costs and operational efficiencies, we believe the time is ripe for liner shipping companies to think more carefully about their product and service mix. This would include more careful

selection of origin-destination pairs to increase the utilization of assets and market share for individual port pairs. Increasing returns even on a small percentage of the business is likely much more important now than offering broader geographic coverage in the hopes of carrying a few more TEUs—particularly with much slower growth in volumes projected over the next 15 years (Exhibit 3-4). Lines should also probably re-address the question of low-cost versus high-cost service, as it is becoming more and more difficult to justify premiums for high-cost service in general, a difficulty compounded in a recessionary climate.

### Exhibit 3-4 Projected Container Tonnage Through 2024

Change in metric tons



Source: Global Insight.

As is generally the case in this highly competitive and commoditized business, over the course of the next several difficult years major strategic moves will be less likely to ensure survival than a dedicated focus on improved execution of the basics and the building of a deeper understanding of customer segments. Gaining that understanding to enable a more finely tuned service offering (without adding costs which cannot be recovered) could represent an investment that will pay off well into the next recovery cycle. ❖

## Competitive Challenges for Ports

The current global economic downturn, coupled with rising energy prices, deteriorating infrastructure, and growing ship overcapacity, is leading to changes in sea trades that also will challenge ports and port operators to move beyond “business as usual” if they are to compete effectively in a more demanding world economy.

Three key issues that Oliver Wyman believes will have an accelerating impact over the next few years are:

- **Economic downturn and shipping sector volatility:** Increasing proximity to customers and closely monitoring and reducing transportation costs will become more important to the maritime sector during the downturn, particularly with the very low switching costs faced by shippers. More generally, the industry will likely experience increasing volatility, with rapid changes in throughput volumes, trade directions, and freight rates. In this environment, North American ports will find themselves under increased scrutiny and facing renewed demands for cost efficiency as government budgets tighten. Equally, they will need to focus on greater flexibility to ensure the best use of their assets, tied to a commercial approach that aggressively pursues the best business opportunities. Potential options could include key account management based on segmentation of customer throughputs and profitability, or pricing and incentive schemes that strike a balance between customer profitability and dependency.
- **Shifting manufacturing and demand patterns:** Another trend for ports to watch is the shifting of supply networks closer to home. In particular, volatile fuel and transportation costs, rising production costs in developing countries, and concerns about energy conservation are leading some manufacturers to move their activities closer to end customers/domestic markets. The impact on ports may likely be more emphasis on capacity

to meet regional and local needs, i.e., they will need to offer efficient connections to domestic transport modes, such as rail and truck, and may need to investigate value added services that will appeal to local producers, such as warehousing.

- **Continuing capacity bottlenecks:** Although economic downturn may ease the congestion problem slightly over the near term, capacity and operational bottlenecks will continue to be an issue for major North American ports, particularly the vital gateways of Long Beach and Los Angeles. This may create opportunities for other ports to develop specialized or niche traffic, such as has been done successfully at Baltimore and Jacksonville. Gulf Coast ports could also capture more incremental traffic, but doing so will require ensuring that they have necessary infrastructure and transportation connections in place to offer competitive service.

These trends will make it necessary for ports to think about both their short- and long-term business models, and which strategic options will preserve their market share, e.g.:

- Increasing flexibility to deal with short-term changes (customer-mix, pricing structure, traffic planning, etc.)
- Strategic/marketing/commercial alliances with other ports and transport providers
- Increasing use of public-private partnerships, e.g., sharing of port assets and facilities
- Reducing dependency on a few major customers
- Increasing operational efficiency and reducing costs to respond to decreasing traffic volumes
- More sophisticated capital spending, evaluation/prioritization techniques
- Countering pressure for increased regulation
- For smaller ports, focusing on the competitive advantages of shipping lines operating more point-to-point traffic and less transshipment ❖

# Don't Chance It: Getting More Out of Risk Modeling

Pablo Wangermann

Jim Bohlman

---

Pablo Wangermann and Jim Bohlman are Dallas-based partners of Oliver Wyman. They can be reached at [pablo.wangermann@oliverwyman.com](mailto:pablo.wangermann@oliverwyman.com) and [jim.bohlman@oliverwyman.com](mailto:jim.bohlman@oliverwyman.com).

Risk analysis and modeling can be an important tool to support deeper, more insightful management discussions about a wide range of strategic, operational, financial, and hazard risks. But it is often used improperly and poorly understood by senior managers. Promoting and embedding risk analysis into core management processes, however, can help resolve issues earlier (when they are usually cheaper to fix), enable better development of contingency plans that permit a rapid response to crises, and potentially identify opportunities to turn negative risks into avenues for future growth. Risk modeling and analysis should be an integral part of strategic and operational decision making, not a specialized expertise outside the mainstream of management processes.

## Room for Improvement

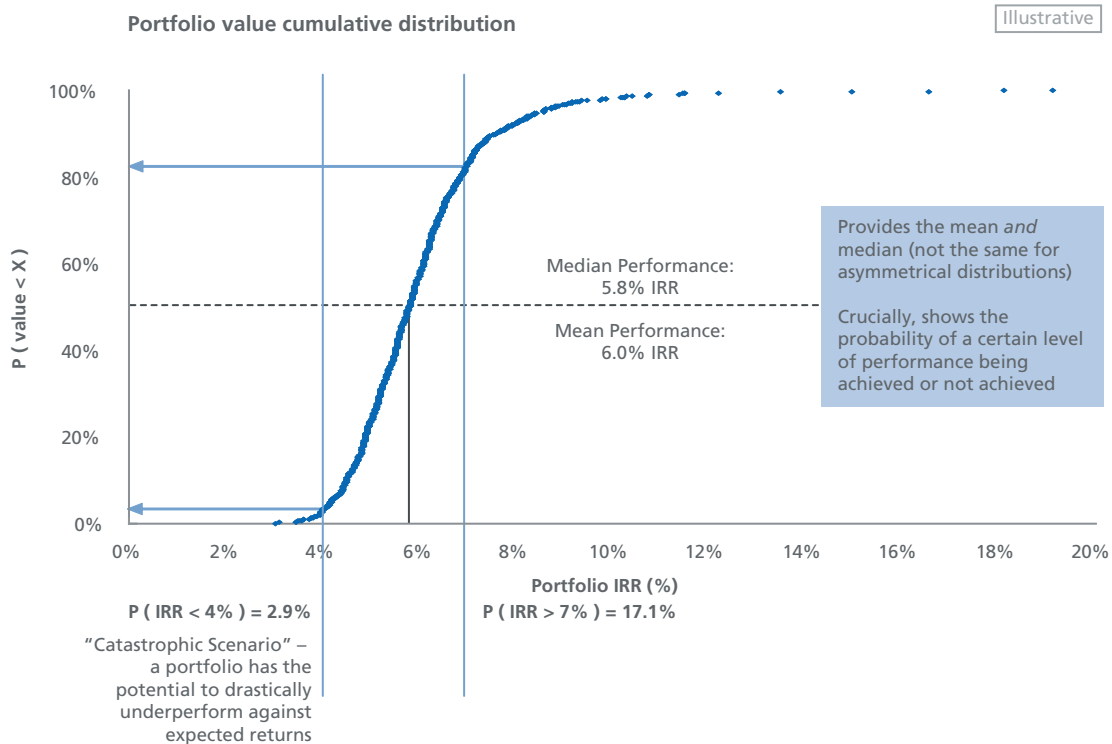
Risk modeling and analysis have become very sophisticated, thanks in part to continuing increases in computing power. Emphasis in modeling has shifted away from “deterministic,” single-answer models to “probabilistic” models such as Monte Carlo simulations, which enable a user to fully understand a range of outcomes and the probability of certain outcomes occurring.

As Exhibit 4-1 shows, a Monte Carlo model not only provides an estimate of the most likely outcome, but can provide answers that scenario-based analysis using a deterministic model cannot. What is the probability of an unacceptable outcome occurring (in the example below, a rate of return less than four percent)? What is the probability of a rate of return greater than seven percent? A deterministic model may tell you what combination of factors may *lead* to such a result, but not the *probability* of that combination of factors occurring. Unless management asks these types of questions of their risk analysts, however, the power of modern risk analysis will not be tapped. Despite improvements in modern risk analysis, there is plenty of evidence that companies are still failing to fundamentally progress in terms of how they manage risk:

- Investors in collateralized debt obligations (CDOs), for example, failed to understand the cascading of risk that would occur in the event of a downturn in the housing market and increased defaults by high-risk homebuyers.<sup>1</sup>

<sup>1</sup> See for example, “Behind AIG’s Fall, Risk Models Failed to Pass Real World Tests,” Wall Street Journal, October 31, 2008.

## Exhibit 4-1 Example Probabilistic Model: Monte Carlo Simulation



Source: Oliver Wyman analysis.

- The delays in development and production of the Airbus A380 and Boeing 787 are both examples of risk management failures. For the A380, Airbus failed to identify and manage the key risk of designing the wiring using different CAD systems in different plants. For the 787, Boeing failed to identify and manage the risk of creating its first lean and globally distributed supply chain system, and then the risk of accepting incomplete deliveries at its plant in Seattle.
- Structured finance products, such as aircraft securitizations, have fallen far short of their expected revenues despite analysis of the risk of these notes by ratings firms such as S&P and Moody's, indicating incomplete or deterministic risk modeling.

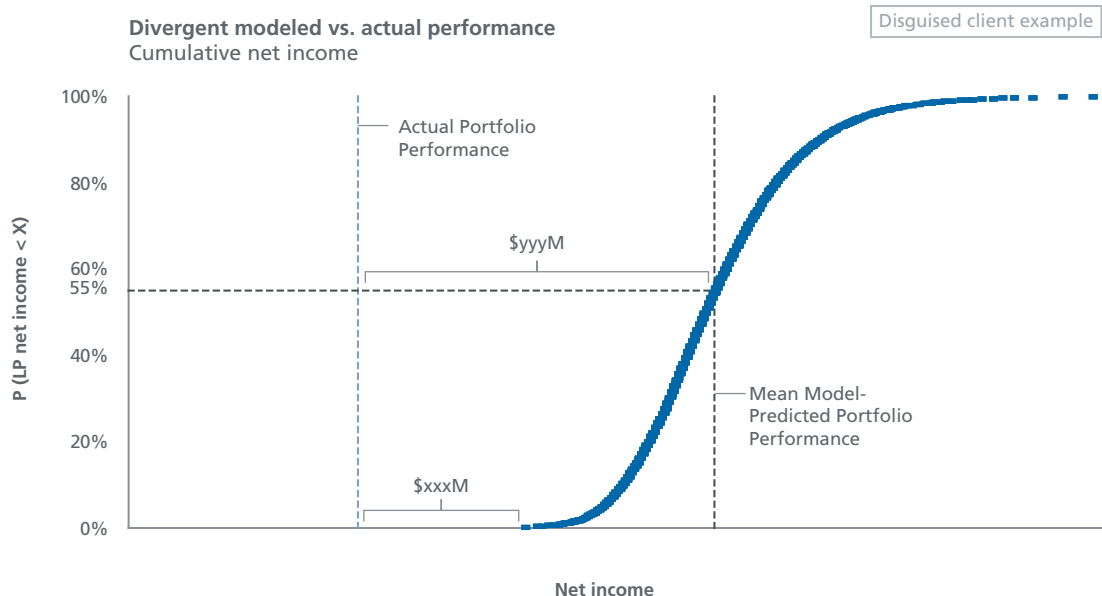
A key problem is that any model, no matter how sophisticated, requires a great many assumptions as part of its construction, e.g., about statistical data, about future changes in systems, about what is/will be important to model, analyze, and track. The output from a risk model thus can never be considered fully accurate and "finished"—rather risk modeling generates an estimate of the probabilities of different outcomes based on the assumptions made in the modeling process. As such, it functions best as an ongoing input into robust discussions

between the various parts of an organization. Those discussions should include regularly revisiting assumptions to check that they are still valid.

### Good Risk Modeling: Lessons Learned

Even simple readouts from the results of a risk modeling tool such as a Monte Carlo simulation can yield great insights into a portfolio's potential performance and risk profile. If the model is well constructed, actual performance should never be outside the range of modeled results. In the example shown in Exhibit 4-2, actual performance of an asset-backed financial instrument was outside the range of all outcomes generated by the Monte Carlo model. An appropriately constructed Monte Carlo model should, if run a sufficient number of iterations, generate results that cover the full range of potential real-life outcomes. In the case shown, the result was significantly outside the range indicated by 5,000 iterations of the model in question, strongly indicating serious flaws in the modeling process.

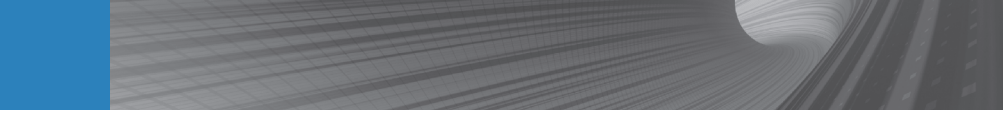
Exhibit 4-2 Example of Flawed Modeling



Source: Oliver Wyman example.

Key “lessons learned” for constructing a good model include:

- Clearly lay out model assumptions, discuss which ones are critical, and regularly return to them. Part of the challenge, given the number of assumptions made at different levels in constructing a model, is to review assumptions in a meaningful and insightful way.

- 
- Model both quantitative and semi-quantitative data/inputs. Even if there is not rich data about a particular effect, it can still be modeled—capturing the insights of industry experts is part of the art of risk modeling.
  - Employees in the operational parts of the business must have input into risk models and must sanity-check their outputs—risk analysis is too important to be left to just “risk experts,” who often do not have the front-line experience to understand the fundamental dynamics and underlying risks of the business being modeled.
  - Be aware of the purpose of the model—as with any model, the end user must be able to understand how it works and the results it generates. It should not be a “black box,” operated by experts, with no insight into the assumptions and logical workings of the model.
  - Don’t incorrectly focus on the mean case, best case, or a few specific scenarios; discussion should focus on the range of possible outcomes and the probability of specific outcomes. Understand the trade-offs between risk and performance.
  - Understand *all* of the risks—including contractual risks. There are risks both inside and outside the business, and contractual structures can both add significant risks for investors as well as mitigate them.

### **Enterprise-Wide Risk Management**

By paying attention to the fundamentals of good risk modeling, risk analysis can be instrumental in informing and supporting the management of a business or a transaction. But it is equally important to understand that it is just one part of a well-formed risk management process. No company should be without enterprise-wide risk management that includes:

- Strategic, comprehensive risk detection (including scenario planning, based on an in-depth understanding of the market sector in question as well as the financial structure of a business or financial instrument)
- Risk modeling/analysis and total risk profile development, including concentrations and correlations between risks
- Risk financing integration (e.g., integrated financing of hazard and financial risks)
- Incorporation of risks into strategic planning, performance measurement, and pricing decisions ❖

# Factoring Risk into Transportation and Logistics Sourcing

Eric Vratimos

Jeffery Elliott

Mark Robson

---

Eric Vratimos is a Chicago-based partner and Jeffery Elliott is a New-York based partner of Oliver Wyman. Mark Robson is director of Enterprise Risk Consulting at Oliver Wyman. They can be reached at [eric.vratimos@oliverwyman.com](mailto:eric.vratimos@oliverwyman.com), [jeffery.elliott@oliverwyman.com](mailto:jeffery.elliott@oliverwyman.com), and [mark.robson@oliverwyman.com](mailto:mark.robson@oliverwyman.com).

In the face of continued economic uncertainty and heightened cost and margin pressures across all industries, many shippers are taking a hard look at their transportation and logistics spend. With excess capacity across most transportation modes, a wave of strategic sourcing is beginning to emerge. Shippers are looking to obtain favorable rates; carriers are looking to strengthen relationships and secure volumes.

This round of sourcing, however, looks and feels different. Beyond the classic issues of carrier cost, service, and reliability, shippers for the first time are asking themselves questions about risk as part of their sourcing strategy:

- “How do I minimize the risk of disruption across the end-to-end supply chain?”
- “What carriers can I rely on through these turbulent times—which will emerge stronger?”
- “Can I both reduce costs and minimize risks—at the same time?”

These are all critical questions—answering them will require companies to “do their homework” and explicitly factor risk considerations into their overall sourcing and negotiations strategies with carriers.

## Current Status of Carriers and Logistics Operators

Recent declines in demand and economic pressure on carriers have led to significant disruption on the supply side. Service levels and operating costs are becoming more volatile as carriers aggressively cut costs and reduce capacity, and consolidation of carriers is increasing across all modes. A review of recent headlines only serves to reinforce these concerns (Exhibit 5-1).

The challenges are expected to remain in the months ahead and carriers are expected to continue to cut back on operations. Most predict that we’ve yet to see the worst and that normalcy in the freight markets won’t return until 2010.

## Risk Management and the Supply Chain

As shippers actively rethink their overall supply chain strategies, their relationships with carriers, and the costs associated with transportation and logistics, risk management will become increasingly critical.

## Exhibit 5-1 Recent Status of Transportation Providers

<b>Trucking</b>	<ul style="list-style-type: none"><li>• 25% of truckload carriers giving “serious consideration” to liquidating if tonnage does not increase (March 2009)</li><li>• Over half of shippers believe that one or more of their trucking partners were in or will be in bankruptcy proceedings shortly (March 2009)</li></ul>
<b>Rail</b>	<ul style="list-style-type: none"><li>• For the first 11 weeks of 2009, large US carriers saw overall railcar loads fall 15.6%</li><li>• Shortline traffic saw its worst percentage drop ever, falling 28% for the week ending March 21, 2009</li></ul>
<b>Maritime</b>	<ul style="list-style-type: none"><li>• US imports, which had been declining since the beginning of 2008, fell 10.5% in the last quarter of 2008</li><li>• Volume at major West Coast ports tumbled 35% in February; YTD decline totaled a 28.2% drop (February 2009)</li></ul>
<b>3PLs</b>	<ul style="list-style-type: none"><li>• Cass Shipment Freight Index slid 22% in March 2009 from a year ago; one of the worst readings since 1992</li><li>• 3PL revenues dropped 6.7% for the first quarter of 2009</li></ul>

Source: Journal of Commerce, Transport Capital Partners, PIERs Trade Horizons, AAR, RMI Rail Connect Index, Cass Freight Index, Armstrong & Associates survey.

The financial viability of the carrier base as well as of their key suppliers (including the risks of financial default), the potential for major operational disruptions, and the ongoing challenges associated with lead time and performance volatility all need to be understood and managed appropriately in the context of any shipper’s supply chain strategy.

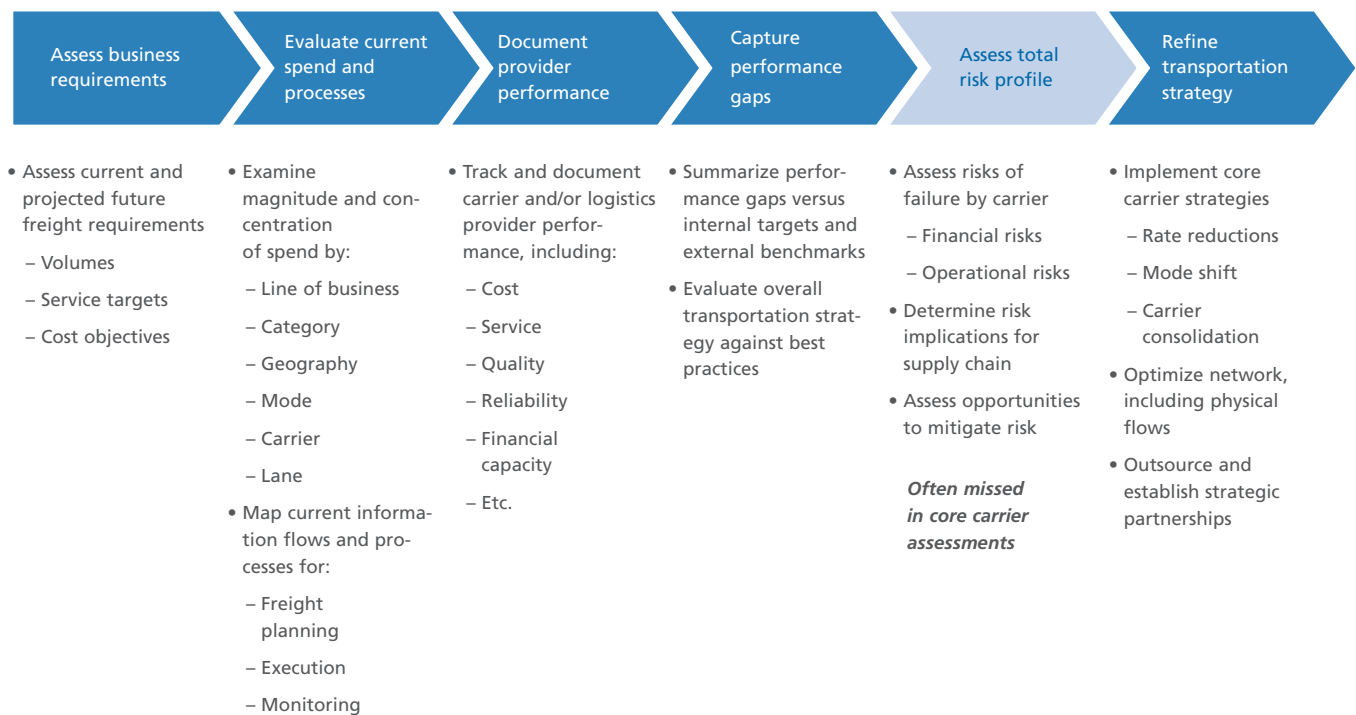
As a result, core carrier programs—where shippers look to better leverage their freight spend with a consolidated set of carriers, ease administration and processing costs, and improve reliability—will be as critical a component of shippers’ logistics strategies looking ahead as they have been in the past.

While determining the appropriate mix of carriers and best contracting mechanisms to meet the needs of the business will remain top-of-mind, the traditional approaches to analyzing and strategically managing freight spend will need to be integrated with a proactive risk mitigation mindset. One holistic approach, developed by Oliver Wyman, is shown in Exhibit 5-2. It combines an assessment of business requirements, current spend, and provider performance to determine gaps in sourcing performance with a “total risk” assessment. Together, these components are then used to refine the core carrier transportation strategy, optimize the network, and determine the best strategic partnerships.

In response to supply chains becoming more sophisticated and mounting uncertainties regarding the carrier base, a “total risk” approach can help shippers focus quickly on quantifying both the financial and operational risks for carriers and identifying implications related to the overall supply chain strategy. Specifically:

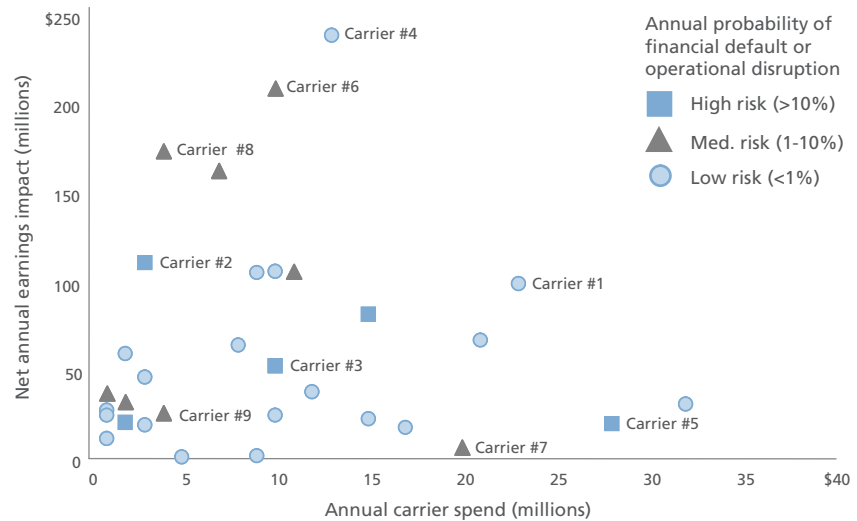
- **Financial risk** should include the probabilities of default over time—based on internal company data, third-party credit ratings, and financial/credit modeling for unrated carriers.
- **Operational risk** should include the probability of major operational disruptions as well as the volatility of performance (minor disruptions)—based on carrier performance history as tracked by the shipper, self-reported carrier performance, and public reporting of fleet and labor volatility.

### Exhibit 5-2 Core Carrier Program: Recommended Approach



Priorities and risk mitigation implications can then be determined by mapping carriers to projected company earnings and physical supply chain flows, as shown in the “heat map” below (Exhibit 5-3). These types of risk analytics—originally developed and applied by Oliver Wyman in industries with supply chains as complex as aerospace and aviation—have begun to see broader application across all industries.

### Exhibit 5-3 Example Carrier “Heat Map”



Source: Oliver Wyman analysis.

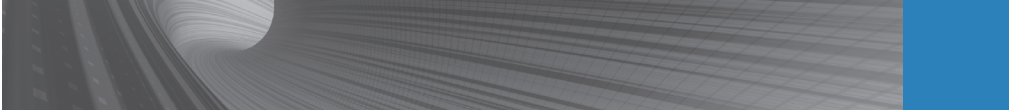
### The Benefits of Understanding “Total Risk”

In many cases, the highest risk carriers may not necessarily be the largest or most visible. An analytical approach as outlined above can help shippers and manufacturers:

- Highlight susceptibility to carrier defaults and disruptions in their operations
- Enable better risk oversight and monitoring of existing carriers
- Support strategy formulation regarding future supply chain development

In today’s market, a total risk approach also can help expose potential shortfalls in “good deals” during rate negotiations and can be used to negotiate lower prices with transportation and logistics providers. Such an approach enables shippers to prepare a “Plan B” to de-risk the supply chain and avoid the potential of a catastrophic event or supplier failure. Establishing redundancies in critical lanes, implementing alternative networks designs and physical flow paths, investing in a balance between private fleets and common carriers—these are just a few examples of risk mitigation techniques applied by transportation managers across industries.

Once an assessment of risks has been undertaken, an integrated transportation and logistics strategy can be established. In our experience, aggressive sourcing of transportation and logistics can yield a baseline 5-15 percent in annual cost savings and potentially more in



periods of excess capacity, such as we are experiencing now. These savings are typically driven by a mix of actions, including but not limited to:

- Carrier consolidation
- Mode mix optimization
- Rate benchmarking and lane-by-lane cost reductions
- Reduced expediting of freight
- Network and physical flow rationalization
- Third-party outsourcing

In addition to providing cost savings, a holistic approach increases strategic control and can lead to more integrated relationships with key carriers, thus helping to minimize the risk of supply chain disruption and ensuring that shippers continue to deliver cost-competitive, reliable service to their customers. When the current economic downturn ends, such strengthened relationships and the associated confidence in the supply chain will continue to deliver benefits, by supporting future growth and expansion. ❖

# Cracking the Yield Management Code

Scot Hornick

James Rider

Gilles Roucolle

---

Scot Hornick is a Toronto-based partner. Gilles Roucolle is a Paris-based partner and James Rider is a London-based associate partner of Oliver Wyman. They can be reached at [scot.hornick@oliverwyman.com](mailto:scot.hornick@oliverwyman.com), [gilles.roucolle@oliverwyman.com](mailto:gilles.roucolle@oliverwyman.com) and [james.rider@oliverwyman.com](mailto:james.rider@oliverwyman.com).

Declining traffic volumes, fuel cost variability, and increasing labor costs have made the past year a rough ride for freight transportation industries, and the near future appears even more uncertain. The one upside of the current situation is that while demand is a bit simpler to manage, this may be a good opportunity to focus on some fundamental structural changes—namely, the application of yield management principles—that could help freight transporters better manage variable costs and enhance revenue.

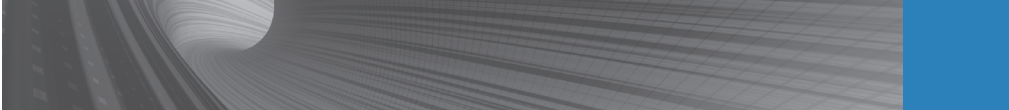
Yield management has been widely applied in the travel industry, including by airlines, cruise lines, and lodging and rental car companies. And while these concepts seem to be a natural fit for other industries with large, long-lived asset bases, adapting them to actually work outside the context of transactional, reservation-based businesses has often proven challenging, particularly given key differences in the freight transport environment.

As discussed in this article, these differences do not make yield management irrelevant for freight transport, but they do manifest themselves in a need for greater cross-functional integration and different types of data than is customarily used in yield management decision making. Freight operators also must pull a different combination of “levers” to balance supply and demand, and resulting decisions will have a broader scope and longer-term impact than is generally the case for transaction-based industries.

## What Yield Management Can Do

Yield management certainly has the potential to increase freight operator profitability. First, the freight industry, like many others that have benefited from yield management, has an extremely large fixed asset base. Every moment these assets are idle is a lost opportunity to produce revenues; in this sense, the freight industry has perishable resources—by now a familiar characteristic of yield management applications.

Second, freight industries are frequently capacity constrained: Air cargo for example has both weight and volume limits varying by route, time-of-day, and season. Wherever there is fixed capacity, there is an opportunity to increase yields when demand is high and drive volumes when demand is low.



With such perishable resources and capacity constraints, the freight industry would seem a natural place to apply yield management principles. But the freight industry is also fundamentally different from those industries that use conventional yield management. Key challenges in applying yield management for freight transport include:

- **Flexible capacity:** How should yield management account for the fact that resources and capacity can be resized and redeployed to dynamically balance demand, and that the variable costs of doing so are not negligible?
- **Deep customer relationships and contracts:** How do we apply yield management concepts in a non-transactional business, one where customer relationships are long and multi-year contracts constrain fluid pricing?
- **Uncontrolled access:** How do we manage demand without reservations or other methods of controlling access? How do we select higher-revenue demand in a world of “first come, first serve”?

The remainder of this article discusses our experience in overcoming these challenges by applying yield management principles to the freight industry, and the solutions that can deliver success.

### **Challenge 1: Flexible Capacity**

Traditional yield management assumes that demand is fixed. But while a passenger aircraft cannot tack on a few extra rows of seats to meet excess demand for a particular flight, railroads can add cars and locomotives to extend a train and extra sections of trucks can be deployed to meet unexpectedly high demand on a less-than-truckload network. (Air cargo would appear on the surface to be more similar to passenger aviation; however, the concentration of customers and “lumpiness” of demand means the economics of shifting capacity to meet demand is often attractive.)

This being the case, yield management tools, processes, and organization must be designed to both optimize pricing changes in a world of flexible capacity and to optimize this flexible capacity as well:

- **Tools:** Yield management algorithms and tools must be developed that correctly understand the variable cost of flexing capacity and the lost opportunity costs of capacity shifts, versus revenue gains for different capacity deployment scenarios. In our work with one freight railroad, for instance, we developed a directional/equipment pricing tool (see Exhibit 6-1) that considered the variable costs of deploying additional equipment in a particular freight lane,

including the round-trip costs of circulating that equipment back when freight flows were directionally imbalanced.

Exhibit 6-1 Illustrative Directional/Equipment Pricing Tool

### Inputs

- Train operations statistics
- Cost information
- Revenue information
- Price elasticity estimates
- Market fencing assumptions
- Equipment recirculation assumptions

### Decision support

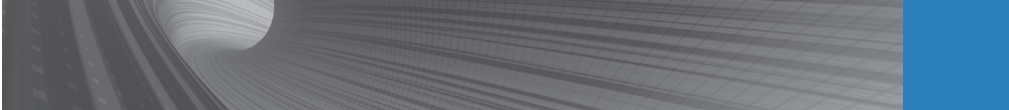
- Assessment of impact of flow imbalance
- Optimal price levels by type of equipment and direction
- Setting price-floor levels
- Estimates of incremental contribution over the period modeled
- What-if analysis
- Sensitivity analysis
- Prioritization of market growth initiatives
- Response to competitive actions

■ **Process/organization:** Pricing and revenue management must be fully integrated with other customer-facing functions, as well as with operational planning and capacity deployment functions. The critical lever here is a process that brings together the customer and market knowledge of the sales teams with the cost and capacity knowledge of service designers and asset managers, not merely over a longer-term, strategic planning horizon, but also on a week-to-week, tactical planning basis. Such cross-disciplinary “lane team” planning discussions can be used to rapidly and flexibly develop shorter-term capacity redeployments and/or tactical pricing initiatives to better balance demand with supply. The organization can support the process by assigning staff with specific responsibility for major asset classes and by developing robust margin reporting.

### Challenge 2: Deep Customer Relationships and Contracts

Most freight transportation businesses have deep customer relationships, with terms and pricing defined by multi-year contracts. For example, some freight rail contracts with steamship companies can have terms of 15 years or more, and extend across a very broad network of freight types. In the air cargo industry, for instance, freight forwarders are increasingly putting network-wide bid packages out to their core carriers, looking for the deal with the best overall network economics. Such decisions defy the simplicity of the traditional transactional decisions that get made in the travel industry with respect to single passenger bookings.

This complexity calls for yield management discipline to be applied much earlier in the process—long before a customer initiates a trans-



action to ship goods—to ensure that contracts do not limit the carrier’s ability to price dynamically or to say “no” to a shipment when capacity is too tight. This can be achieved in a number of ways:

- **Develop bid evaluation tools:** One key idea is to develop support tools tailored specifically to the decisions at hand when negotiating a contract. Such tools can consider and model diverse factors, such as the network cost and service impact of taking on new demand, the effects on asset/equipment flow in the network, and the propensity of customers to buy (or not) at a higher price. For example, a major US airline’s cargo subsidiary has developed a sophisticated bid evaluation tool to evaluate RFPs, which can assess the displacement cost impact of any given contract and analyze the operating cost implications (including for example special handling requirements, such as for perishable goods).
- **Track historical bid wins/losses:** Another enabler is simply tracking what has happened in historical bidding situations, so as to better assess win probabilities and freight realization rates as a function of the quoted price. A company can make better decisions regarding the optimal price levels in a given market by evaluating how different levels of pricing competitiveness have impacted past success. Importantly, success should be defined as the winning of profitable contracts, and this should provide insights on how to price to avoid contracts with poor levels of return (for example, due to low volumes or high delivery costs).
- **Prioritize “strategically important” customers:** Yield management decisions in the travel industry are typically made on a tactical, transactional basis. But it is also important to factor in long-term customer value and strategic importance. Considerations may include rates of growth, counter-cyclical shipping patterns (e.g., more value assigned to shippers/forwarders who are more active off-peak), and support for particular target lanes.

One of the more significant implications of these challenges is that the sales force is very much a part of the yield management process in a freight organization, unlike in a reservations-based travel business, where yield management decisions are made “behind the scenes” and are largely invisible to the sales force. As a consequence, the sales team’s performance goals should include yield-management-oriented metrics. As an example, one of our air freight clients gradually shifted its compensation scheme for the sales force toward an account contribution metric and away from an account revenue metric, to steer the team toward contribution maximizing behaviors.

### **Challenge 3: Managing Demand Without Controlled Access**

Too often, freight companies lack any real freight reservation system. In rail intermodal, for example, shippers often are told that as long as they can get their shipment to the ramp by a train's designated cut-off time, it will be loaded and transported to its destination according to the railroad's scheduled timetable. On peak days, however, demand can exceed capacity and freight must then be "rolled" until the next scheduled train. If too much rolled freight accumulates, the railroad may try to work in an extra unscheduled train around scheduled service. Either way, the result can be expensive, either directly, in terms of higher operating costs, or indirectly, in terms of disappointed customers. The resulting uncertainties—even for relatively more reliable intermodal service—can drive service-sensitive customers off the rails and onto the highways.

Similarly, many air cargo carriers still operate without a freight reservation system, to limit shipment commitments according to the space or payload capacity available on a carrier's flights. This can make it difficult to deliver priority service to preferred customers or to create differentiated "priority" products, if operationally there is no way to ensure that shipments sold as priority are actually delivered that way.

Some approaches to dealing with the issue of uncontrolled access include:

- **Reservations systems:** One obvious solution is to simply implement a reservations system and create "premium" services that leverage the ability of the system to provide more time-definite service commitments. The belly cargo operations of many passenger airlines have done this to great effect. More recently, some freight railroads have introduced premium services in selected intermodal lanes that allow a customer to reserve a slot on a train and, if needed, an intermodal container for time-definite transit across the rail network. Shipments of less service-sensitive (and usually more price-sensitive) customers can then be slotted around premium services.
- **Steering demand through price elasticity:** Another approach is to adjust prices on a somewhat more static basis to modulate demand according to available capacity. To do this properly, a freight carrier must have a sense of the elastic response of demand by service type and by shipping corridor. Options for gaining such insights may include analyzing market response to historical price moves to better understand price elasticity, building up a database of estimated elasticities by market, and determining optimal future price moves in the presence of capacity constraints. Needless to

say, freight demand can be “chunky,” as one customer decision may shift large pieces of business, and getting price levels exactly right so that demand and capacity are evenly matched remains a challenge. Price elasticity insights, however, can be an invaluable tool in achieving better demand/capacity balance.

### Case Examples

Oliver Wyman has recently worked with a number of freight companies to develop enhanced pricing and yield management solutions, not only as a means for carriers to improve performance in an increasingly challenging cost environment, but also to directly address the challenge of passing on variable costs (such as fuel cost) to customers in the most economically advantageous way.

#### Repricing Airline Cargo

As an example, Oliver Wyman worked with a major US passenger airline’s cargo division that was suffering from poor financial performance, with significant underpricing in many of the markets it served. The sales and marketing group lacked a centralized pricing management structure; instead, the field sales force negotiated spot prices based on past pricing practices, without determining whether the prices actually reflected the true all-in cost to provide the service or the actual value of providing the service to the client. Add in maintenance and fuel cost pressures, and contribution margins for certain routes and customers were significantly in the red.

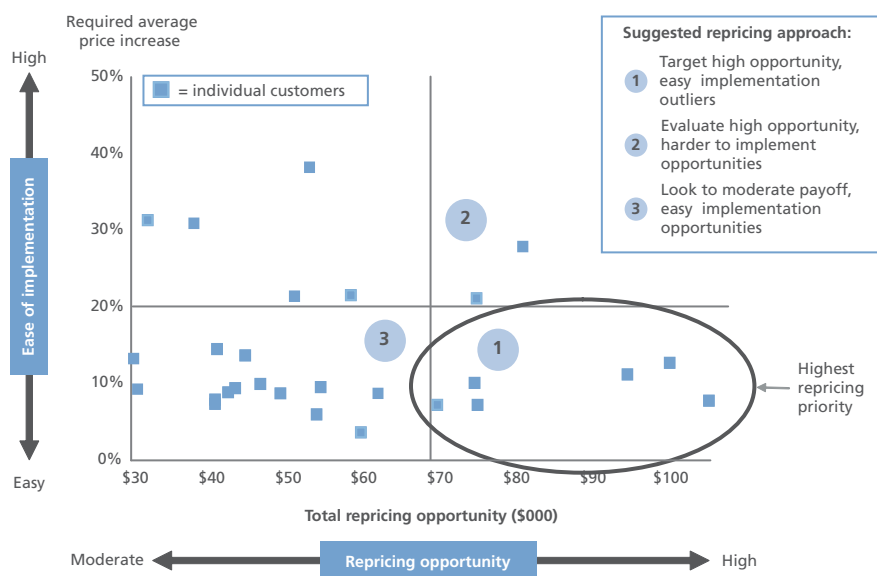
Oliver Wyman identified the most troubled routes and customer relationships, built a new activity-based cost model to support both short-term pricing decisions and medium-term revenue and yield management, and refined core yield management processes that cut across the organization. This project focused on three work streams:

- Analyzing systemic mis-pricings that were resulting in routes where price drivers actually had a negative correlation to price (i.e., it cost less to ship a package more miles). Targeted price increases were then recommended on a per customer and route basis.
- Assessing price/cost misalignment at the market level. The sum of all shipment costs was higher than the total revenue generated in certain markets; analysis determined this was likely due to the under-utilization of freight assets. Price increases and incentives to increase volume were recommended to increase profitability in these markets.
- Repricing “outliers” in the data set. Shipments were segmented in various ways—e.g., by customer, market, and product—to determine

the combinations that should be repriced when possible, and prioritized (Exhibit 6-2).

As a result of improving a core element of effective yield management—price rationalization—and implementing basic analytical tools and a formalized management process, the cargo division was able to achieve a dramatic turnaround in profitability, with margins increasing from -5 percent to 15 percent in a year.

**Exhibit 6-2 Illustrative: Prioritizing Outliers for Repricing**



Source: Oliver Wyman analysis.

### Pilot Program for Rail Intermodal

In another case, a major North American railroad was producing poor financial results. A merger had led to a service crisis, which paralyzed a large sector of the network and adversely impacted customer relations. Difficulty in integrating the cultures of the two companies further limited the ability of the combined entity to improve operational efficiency. Company management realized that it had to increase revenue and profitability in order to improve stock performance.

Oliver Wyman worked with the railroad to develop a pilot yield management program in its intermodal business, as a means of testing the applicability of such concepts to the railroad industry. As shown in Exhibit 6-3, we used screening criteria to develop six high-potential opportunities. Through more detailed analysis, we then recommended pursuing two opportunities for the pilot: intermodal day-of-week/directional pricing and empty car repositioning.

Exhibit 6-3 Illustrative: Yield Management Opportunity Identification

Yield Management Technique	Business Team		
	Agricultural Products	Industrial Products	Intermodal
Cross-Marketing		✓	✓
Directional Pricing		✓	✓
Empty Car Repositioning	✓	✓	✓
Car Bidding	✓	✓	
Time-Based Pricing	✓		✓
Slot Allocation	✓		✓

- Intermodal Day-of-Week and Directional Pricing
- Empty Car Repositioning
- Car Bidding
- Intermodal Slot Allocation
- Premium Manifest Ag. Products Train
- Cross-Market Flow Balancing

The returns from the pilot (the first of its kind in the freight rail industry) were compelling—yield management for one corridor alone generated more than \$1.3 million in incremental contribution over six months. Oliver Wyman then worked with the railroad to expand the program to the entire intermodal network and to plan for full yield management capabilities, including a complete suite of yield management applications, a new yield management organization, and new business process. The railroad credits the program with a significant part of the \$112 million improvement in annual contribution from its \$1.9 billion intermodal business over the past two years.

\* \* \* \* \*

Yield management still remains a challenging endeavor for the freight industry. But in this increasingly difficult economic environment of high costs and slowing demand, freight transporters can no longer afford to wait for someone else to crack the code. The application of better pricing and revenue tools can greatly enhance the fundamentals of marketing and selling freight services, resulting in rapid margin improvement regardless of economic conditions. ❖

## **Oliver Wyman**

With more than 2,900 professionals in over 40 cities around the globe, Oliver Wyman is the leading management consulting firm that combines deep industry knowledge with specialized expertise in strategy, operations, risk management, organizational transformation, and leadership development. The firm helps clients optimize their businesses, improve their operations and risk profile, and accelerate their organizational performance to seize the most attractive opportunities. Oliver Wyman is part of Marsh & McLennan Companies [NYSE: MMC].

## **Oliver Wyman's Surface Transportation Practice**

Oliver Wyman's Surface Transportation Practice, part of the Manufacturing, Transportation, and Energy (MTE) unit, is one of the largest consultancies in the world dedicated to the transportation industry, with a professional staff of more than 100 partners and consultants worldwide. It provides a comprehensive set of services and capabilities to transportation carriers, and to the users and regulators of transportation services, across the full range of the transportation sector.

## **Oliver Wyman's Corporate Finance and Restructuring Practice**

Oliver Wyman's Corporate Finance and Restructuring Practice, part of the Manufacturing, Transportation, and Energy (MTE) unit, provides a range of services to support investors and debt providers in transactions related to the automotive, manufacturing, transportation, and energy sectors. Our capabilities include support in M&A, structured finance, project finance, restructuring/workouts, and post-transaction integration.

### **For more information, please contact:**

■ **Gilles Roucolle, Transportation Practice Director**

[gilles.roucolle@oliverwyman.com](mailto:gilles.roucolle@oliverwyman.com)

■ **Allan Kaulbach, Corporate Finance & Restructuring Practice Director**

[allan.kaulbach@oliverwyman.com](mailto:allan.kaulbach@oliverwyman.com)

[www.oliverwyman.com](http://www.oliverwyman.com)

OWTL Editor: Rebekah E. Bartlett  
Copyright © Oliver Wyman. All rights reserved.



MARSH MERCER KROLL  
GUY CARPENTER OLIVER WYMAN