CAMELOT
Management Consultants

Capacity Shortage in Transportation

A Guide to Avoiding Outages for Your Business

Study

Preface

Capacity shortage in transportation is nothing new. The impact, such as unaccepted transport orders on the carrier side, higher transport cost for shippers and delivery delays for shipper's customers as economic effects are well known. Most impressive is that shippers almost "accept" the situation and don't review or change their strategic and tactical transport management configuration to handle unpredictable situations proactively. Current and future supply chain interruptions, like a global pandemic, could become more frequent.

Preparing a "plan B" is mandatory to ensure a sustainable business - let's talk about it!

Capacity shortage in transportation – the new normal?

In 2018 and 2019, shippers faced an increased shortage on transport capacity in road transportation and other transport modes. This was followed by a heavy supply chain disruption in 2019/2020 due to Covid-19. There can be multiple reasons for capacity shortage like environmental causes, infrastructure shortages and driver shortage. One major environmental event was in 2018 when the low water level situation in European rivers impacted the barge traffic. The effect was so huge that BASF issued a 200 million Euro win warning message to its investors. Every chemical company that supplies its production sites with thousands of tons of raw material faced the same challenge in these times. Not to mention the latest pandemic impact when many new problems emerged. Some examples:

- No transport capacity from logistics service supplier available/possible on the market due to governmental shut down (s) in countries (Asia, Europe)
- Opacity of goods in transit
- Breakdown of vendor structure due to lock down, e.g. API supplier in CN Wuhan region, impacting or stopping production
- No supply chain risk contingency plan available with alternative vendors, routings and logistics suppliers for transportation

This, in combination with a shift from a former buyer market to a seller market, increased freight rates for the shipper and margin for the carriers.

For Camelot Management Consultants, this was the trigger to develop and process a survey on the topic to understand the current situation and how the shippers and carriers handled the situation.

We think it is important for both sides to develop new concepts to manage the situation properly through closer cooperation, enhanced strategies in transport management and sourcing, even with competing goals: the shipper likes to stabilize the delivery capability to his customer at reasonable cost while the carrier is keen to increase its margin and cleaning up his customer portfolio with a higher focus on profitability.

On the following pages you will get the key findings of the study, supplemented by latest insights from the consulting practice of Camelot Management Consultants.

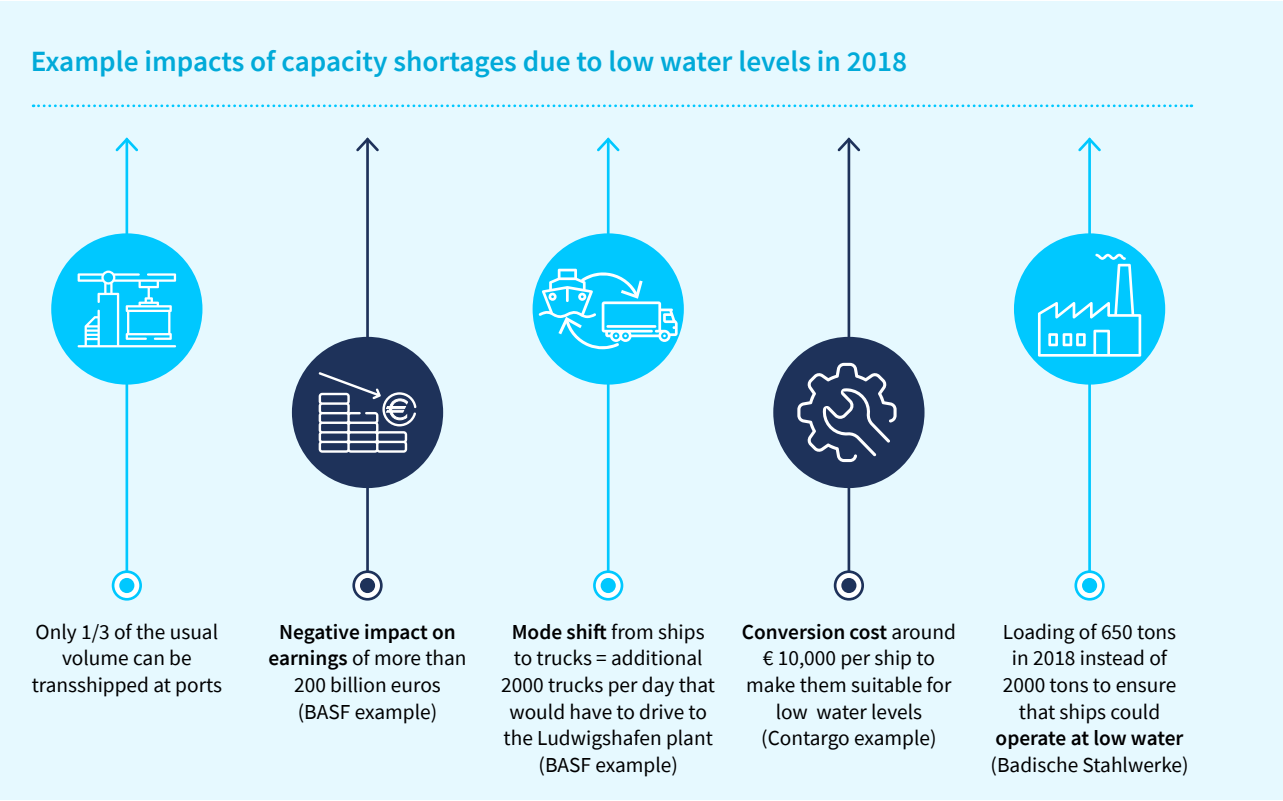


Figure 1: Economical impact of capacity shortage in transportation

The Situation

What is Causing Capacity Shortage and Why Should Businesses Manage it?

Capacity shortage is a result of an imbalanced demand and supply of transport capacity. One reason for capacity shortage lies in the limited scalability of transport equipment.

For **road transportation** in general, the transport equipment is rather unspecific and can be scaled up easier. However, the bottle neck here is that the number of retiring drivers is much higher than the number of new drivers entering the job market – even with the initiatives on driver training that took place on carrier side.

For **bulk road transportation**, the specific available equipment cannot be made available on short notice, as shown when the demand increased dramatically during the river low water situation in 2018. However, the COVID-19 pandemic situation highlights the urgent need to significantly improve supply chain management in 2021 to ensure supply chain resilience and transportation capacity.

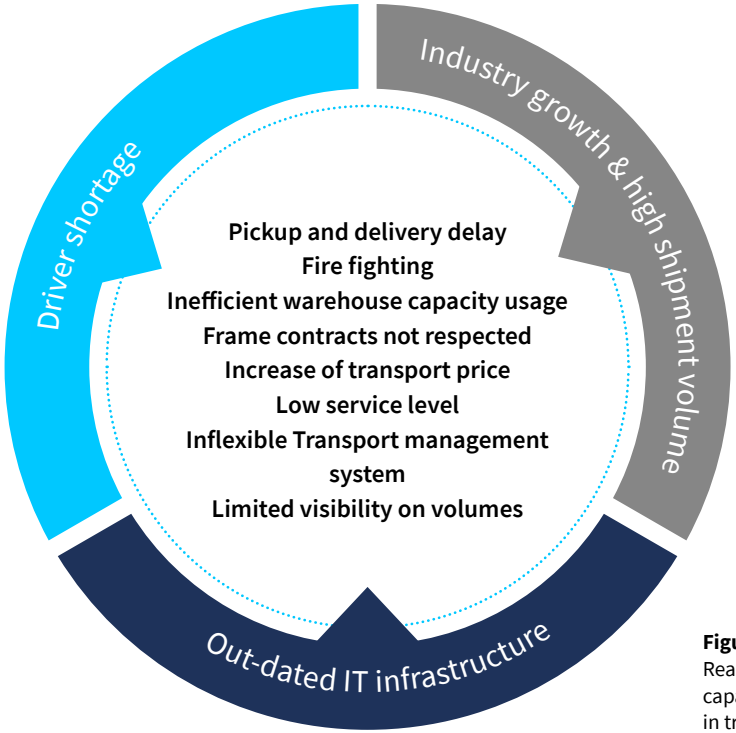


Figure 2:
Reasons for capacity shortage in transportation

The Survey

The survey was sent to logistic transport specialists, mainly based in Europe, on shipper and carrier side with an overall number of participants of 42 cross industry.

As a starting point, the survey asked, whether the survey participants experienced a capacity shortage in 2018 / 2019. The survey participants – 1/3 shippers and 2/3 carriers – are stating that they had have transport capacity shortages (see figure 3).

It is interesting to note that carriers had more capacity problems on the road, while shippers had more shortages in air and sea freight.

Figure 3: Capacity shortage in transportation is still a pressing topic

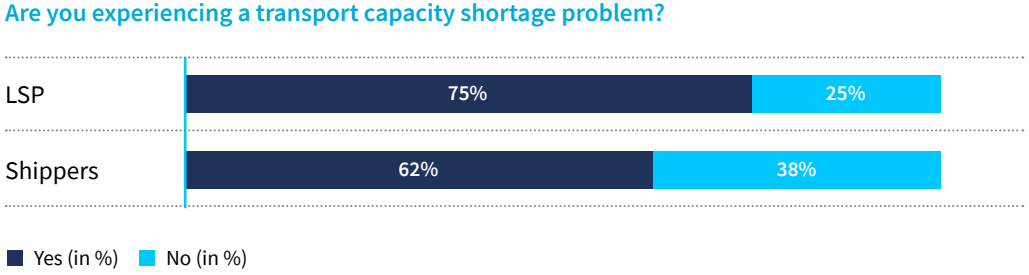
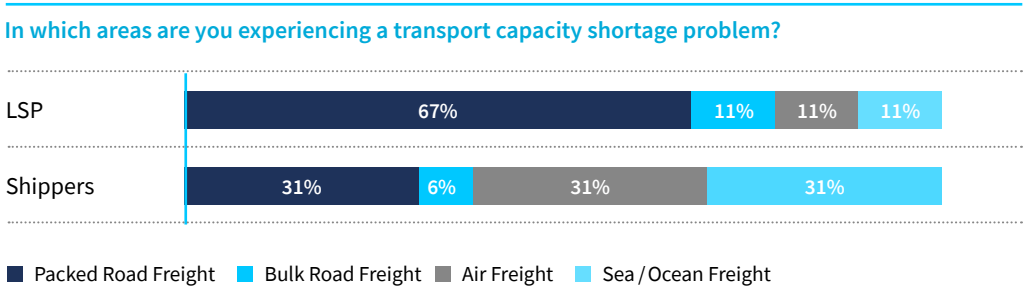


Figure 4: Carrier and shipper have different mode hot spots concerning capacity shortages

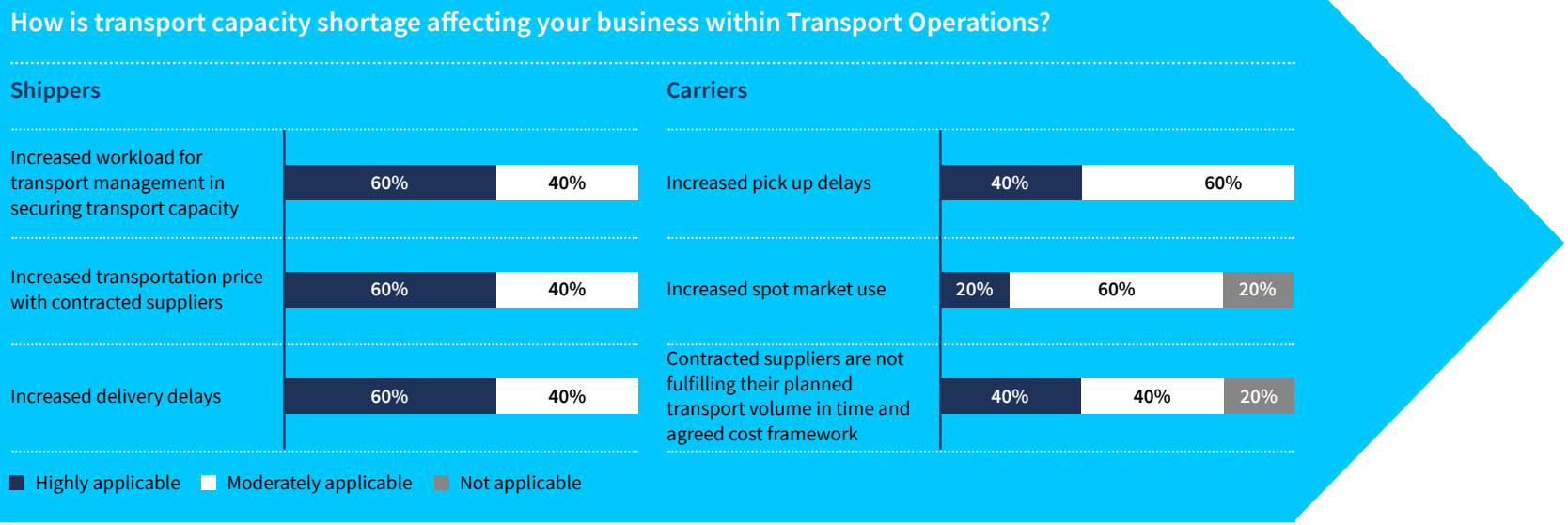


The Impact

Capacity shortage has an impact on transport and operational cost as it influences service levels negatively. In worst case an interruption of market or production supply occurs. Businesses potentially face an increased production cost depending on the case and increased logistics cost with a decrease of sales figures. This is not only leading to overall higher product costs but is also resulting in an increasing percentage of sales KPIs for logistics costs – action is required.

Cost levers are additional man hours for firefighting, higher transportation cost to get final transport capacity, additional movements at the warehouse, especially in the dispatch area as goods-in and -out area due to movement of pick-up/dispatch date and time. Not to underestimate is the additional effort for freight invoice control/audit due to working in exception mode, buying spot rates, and using transport providers not yet being in the service portfolio. Depending on the spot process and system integration this can be huge additional manual work.

Figure 5: How shippers/carriers see the impact on capacity shortage



The survey supports the general view on the current market situation with increasing freight rates and delayed pickups.

How did shippers react to the situation? Did they use spot markets to get further transport capacity? The survey shows that they are more flexible in pricing but not on the spot market but with their existing carriers contracted. This means, they are having a contract for purchased forecasted transport capacity with their carriers, however, raising prices to get the transport capacity required seems to be common. One could ask, what is a frame contract with a duration of one year with a carrier worth anymore? Is it time to rethink its sourcing and contracting strategy? The study is telling us YES, it is time to review the "old" setup.

The overall BVL (Bundesvereinigung Logistik, German Logistics Association) indicator for logistics in Germany for the third quarter of 2020 shows an upward trend again towards the index 100 but is still 20 points below maximum Index 120 in early 2018. This should result in a more relaxed transport capacity situation in the next months, especially for road, not including the actual backlog of goods volume caused by COVID-19[1] lately, impacting future ocean transport on the China-Europe and China-US Westcoast trade lanes.

A capacity shortage situation for sure will occur again, and it's best to be prepared to manage it even smarter in the future.

[1] Coronavirus – outbreak of novel coronavirus (2019-nCoV) that was first reported from Wuhan, China, on 31 December 2019

An Interpretation of the Survey Feedback

How Did the Survey Participants React and Manage the Situation?

Shipper side

- The classical sourcing approach to split the volume on more suppliers was applied. Higher prices were accepted, “flexing” the contractual agreed pricing in this period.
- Penalties and fixed booked volumes do not seem to be in place or considered in the sourcing strategy. This may reflect the non-acceptance of such setups in a seller driven market.
- Automation was driven forward for broader supplier selection, cascading, if load was refused, to another contracted and conceptual foreseen supplier.
- Direct interaction on the spot market was a rather uncommon, not used option. The question is whether the used Transport Management System (TMS) does not have a spot market sourcing option integrated, or the shippers lost the view on the freight forward market and left the capacity issue resolving with their carriers in exchange for a higher pricing.

Have you considered the following mitigation strategies to deal with transport capacity shortages? (Shippers)

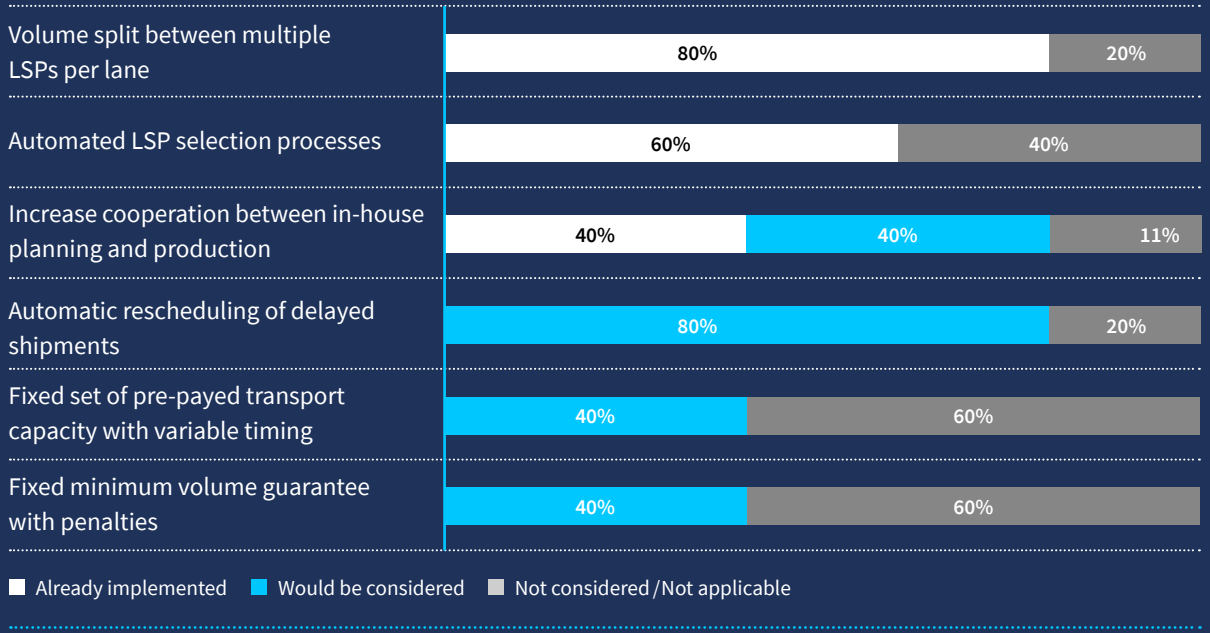


Figure 6: Mitigation Strategies implemented and considered by shippers

Carrier side

- Cooperation in planning activities with shippers and subcontractors to foresee and manage upcoming shortages. These activities can be enlarged and deeper integrated in the future.
- They plan to use more advanced transport planning methods like pattern analysis (data from the past) to select the most fitting algorithm to forecast demand.
- They started to work more with real time data / information whilst the full potential is not yet reached.
- They use and plan to expand the use of real time data / position for slot management to optimize capacity usage on warehouse, x-doc and on driver side.

Have you considered the following mitigation strategies to deal with transport capacity shortages? (Carriers)

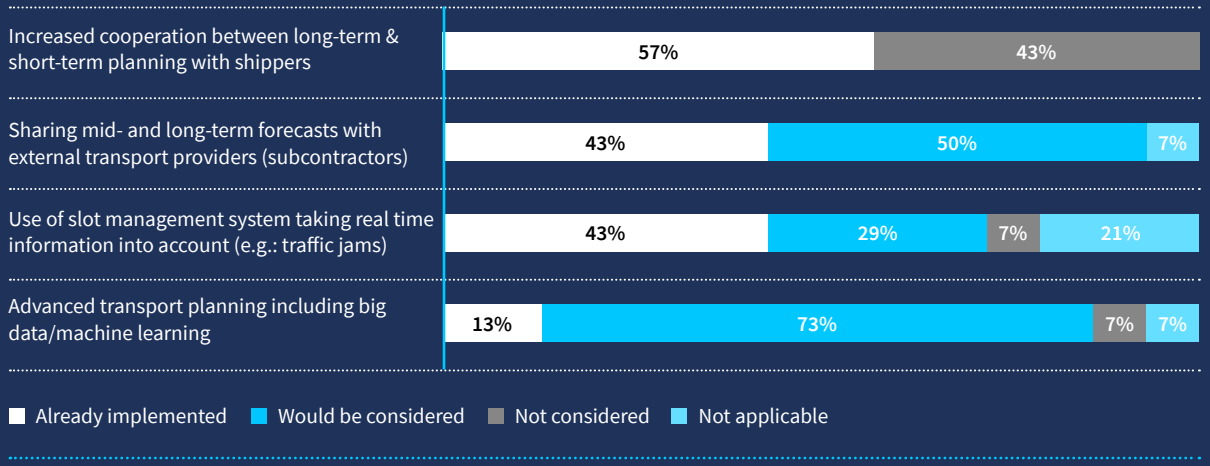


Figure 7: Mitigation Strategies implemented and considered by carriers

From a consultancy perspective, the basis is laid while the pace is not yet maxed to be ready for the next capacity shortage management. Digital Transformation offers a huge improvement potential in transport planning. For example, DDTP[2] in combination with DDMRP[3] can be used to build logistics units out of the demand forecast and translate it into transport capacity forecast.

Another example is continuous AI based shipping data pattern analysis to select the most accurate forecast algorithm. The merger of both approaches is very promising in terms of accuracy.

[2] DDTP – Demand-Driven Transport Planning
[3] DDMRP – Demand-Driven Material Requirements Planning

The Outlook

Shippers and carriers agree that the capacity shortage is a relevant issue, with a tendency to increase in road transport. The projected increase in rail transport may reflect the latest CO_2 reduction consideration to move from road to rail. However, a rail network with an affinity for mass goods would need a transition to a more modern infrastructure to cope with the requirements to be a time reliable and flexible alternative. Technology-based train control centers can contribute their part in increasing the transport capacity on the North-South axis in Germany to reach the harbors with higher volumes coping with the bottleneck situation of “Hinterlandverkehre/ Hinterland Traffic”. An increase in rail network mileage cannot be expected here.

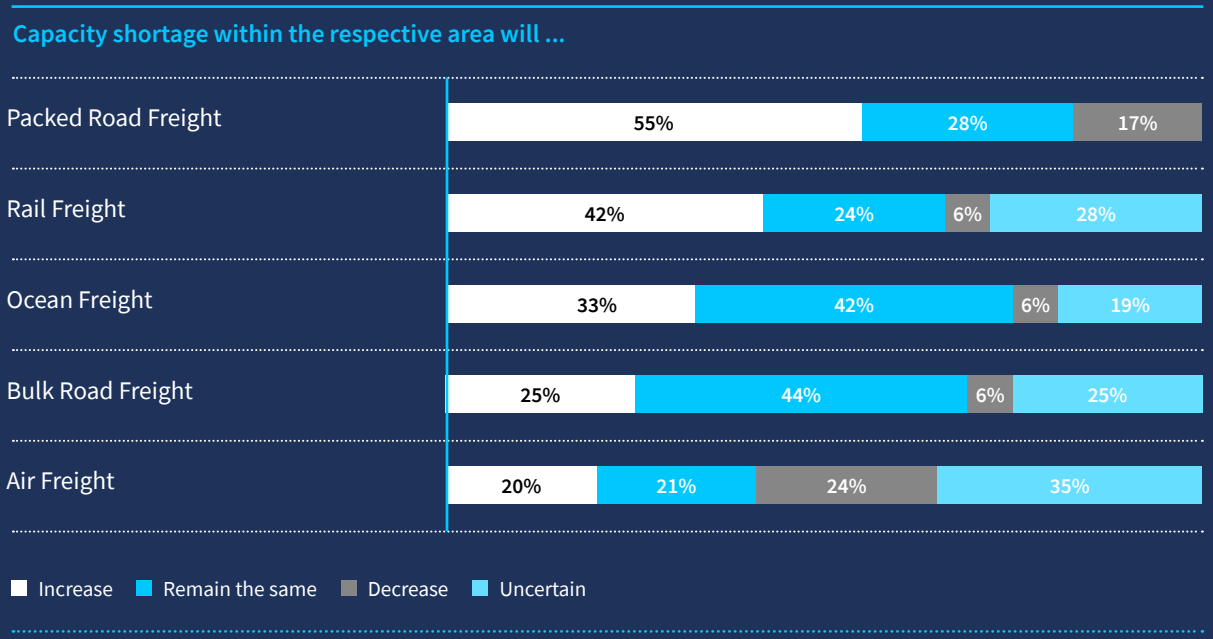


Figure 8: Capacity shortage within certain areas

Survey Key Findings Summary

Key findings of the survey

- Carriers notice capacity shortage issues more severely than shippers
- Capacity shortage for road packed freight is the most severely influenced by capacity shortage
- Future expectations indicate that the severity of capacity shortage within packed road freight will increase

Key mitigation actions used by shippers

- Improve cooperation between in-house planning and production
- Volume split between multiple carriers per lane
- Automated carrier selection processes

Key mitigation actions used by carriers

- Increased cooperation between long- and short-term planning with shippers
- Sharing mid- and long-term forecasts with subcontractors
- Extended usage of slot booking systems to reduce waiting times

Key opportunities for shipper

- Advanced transport planning including big data/machine learning
- Increased cooperation between long- and short-term planning with external transport service providers
- Use of slot management systems
- Automatic rescheduling of delayed shipments

Key opportunities for carriers

- Increased cooperation between long- and short-term planning with external transport service providers
- Usage of predictive analytics in transport management and planning
- New way of contract setup with shippers to be more flexible

Guideline to Manage Transport Capacity Shortage

Camelot developed a solution catalogue on tactical and operational level with process and IT related solution elements to bring organizations in the position to manage the “new normal”.

Key solution elements are:

- Development of a sustainable transport management strategy to manage capacity issues
- Enhance the functionality of Transport Management Systems via new (sub-) carrier selection models like DTM[4] and planning approach segmentation
- Usage of data analytics for enhanced and AI supported transport planning
- Usage of logistics platforms for a better horizontal and vertical integration and constant data exchange
- Dynamic flexing of fix contract vs. spot market share (adaptive sourcing model)

It is important to understand the overall impact on the supply chain caused by transport capacity shortage and what department is affected to implement a holistic solution.

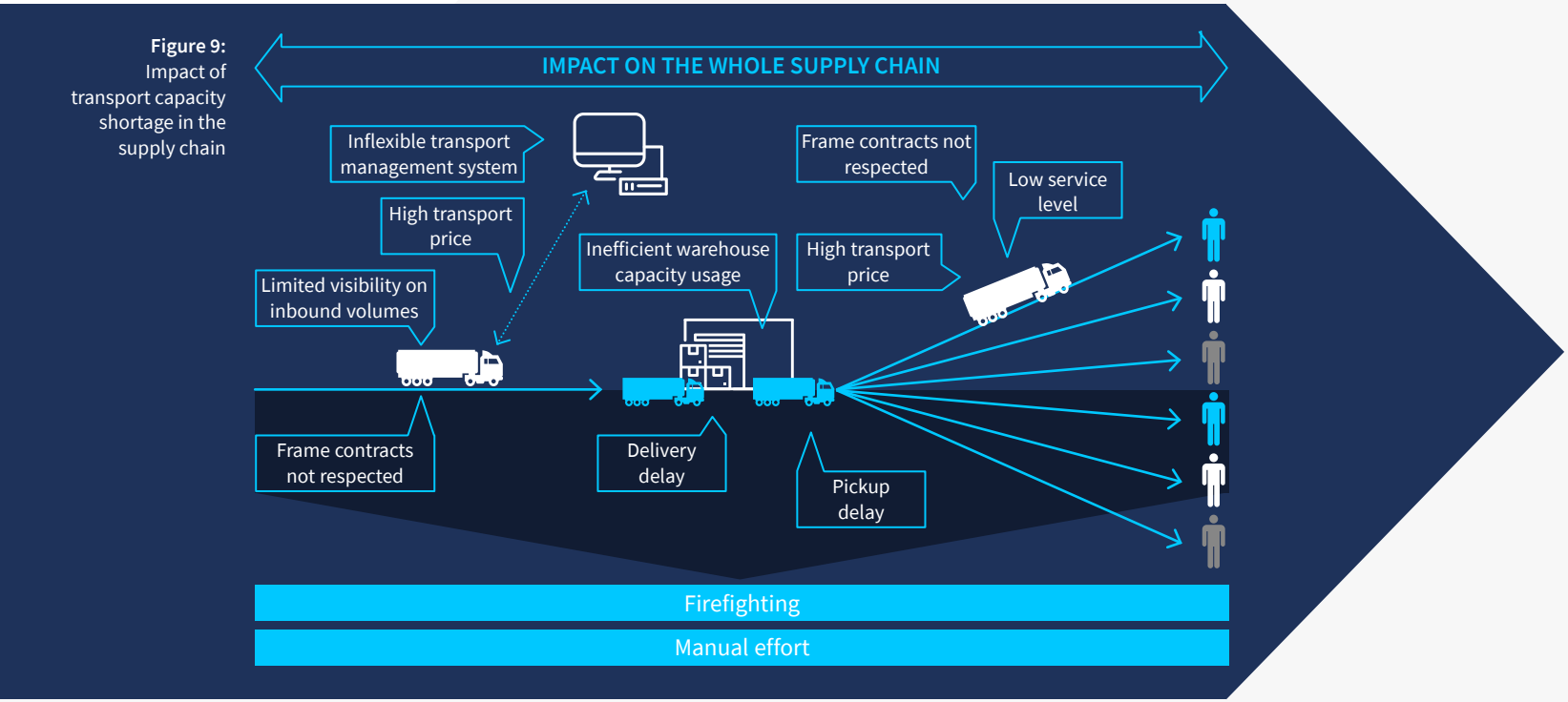


Figure 9: Impact of transport capacity shortage in the supply chain

[4] DTM – Dynamic Transport Management

Focus topic Transport Planning – how could this look like soon?

We see big advantages for all participants in transport sourcing, planning, ordering and processing by improved and content wise enhanced information exchange between all participant parties in the chain to match demand with supply concerning transport capacities. The foundation of the new transport planning concept are two forecast modules. The concept uses historical shipment data as one module and production forecast based on DDMRP[5] as second module. Matching the two sources results in a good outlook to identify upcoming transport volumes (demand) and potential transport capacity (supply) shortages. A four weeks forecast with a freezing corridor of 2-3 days before loading enables proper management of identified shortfalls in demand and supply of transport capacity.

Segmentation of transport planning solutions

Regardless of the forecast result, it is necessary to configure the carrier/freight forwarder selection method in TMS[6] depending on the shipment volume and shipment volatility. This segmentation can be done by source-sink (from-to) relation, product cluster and/or customer type based.

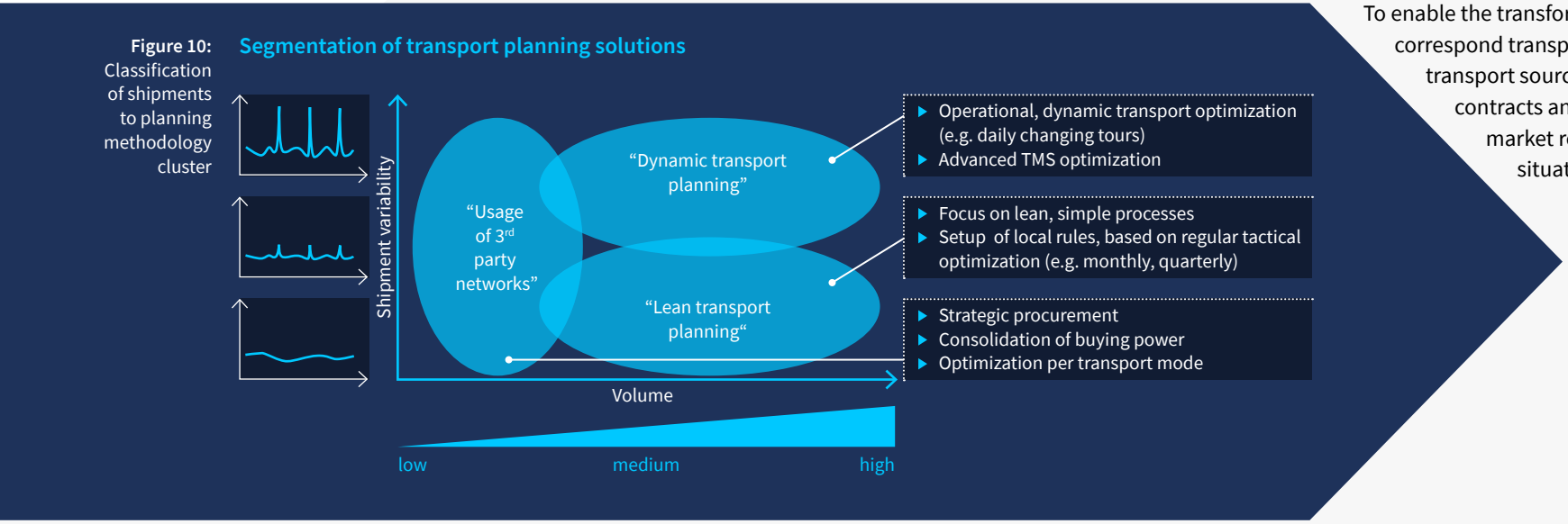


Figure 10: Classification of shipments to planning methodology cluster

To enable the transformation of the segmentation to correspond transport planning patterns your logistics transport sourcing team needs to setup according contracts and review the fix (contract) vs. spot market relation depending on the actual market situation.

[5] DDMRP – Demand-Driven Material Requirements Planning; The concept of DDMRP is a game changer in Digital Supply Chain Management. It is a new way of mastering variability to maximize contribution margin by increasing service levels, decreasing inventories, and delivering a significant competitive advantage

[6] TMS – Transport Management System

Is My Organization in a Good Shape to Manage the Next Shortfall?

To understand the actual situation in the company and to cope with capacity bottlenecks, an as-is analysis is the best base to evolve from. We call this a "Logistics Assessment."

The result of the assessment can be benchmarked with an actual best practice setup concerning the process, IT (TMS) and organization setup leading to a fit/gap analysis.

Knowing the gap triggers target process, IT and organization configuration to define actions to get there. An implementation roadmap is always a good guidance to supervise the realization to reach a new level of maturity in an organization.

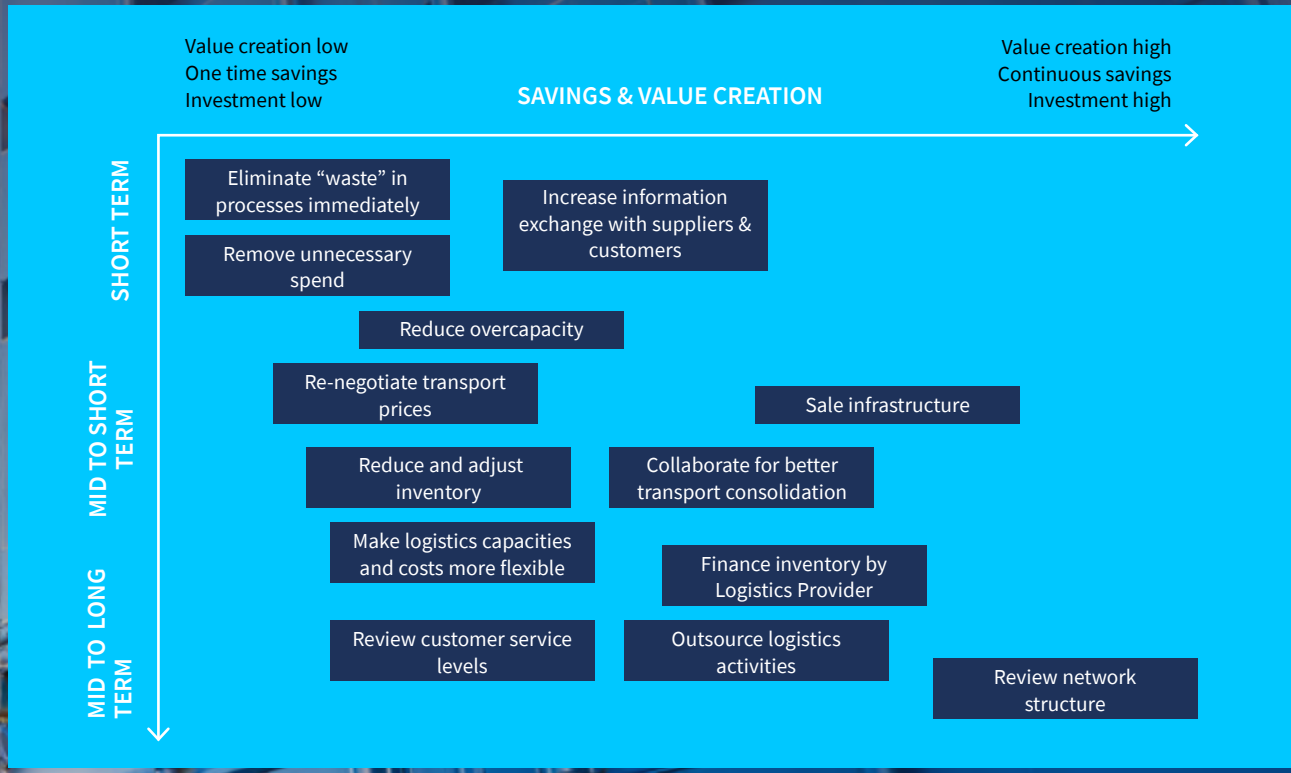


Figure 11: Potential areas to reduce cost for capacity shortage handling

Transport Management Strategy

Managing the capacity shortage implies to consider the specific logistics strategy to ensure supply and customer satisfaction in the future.

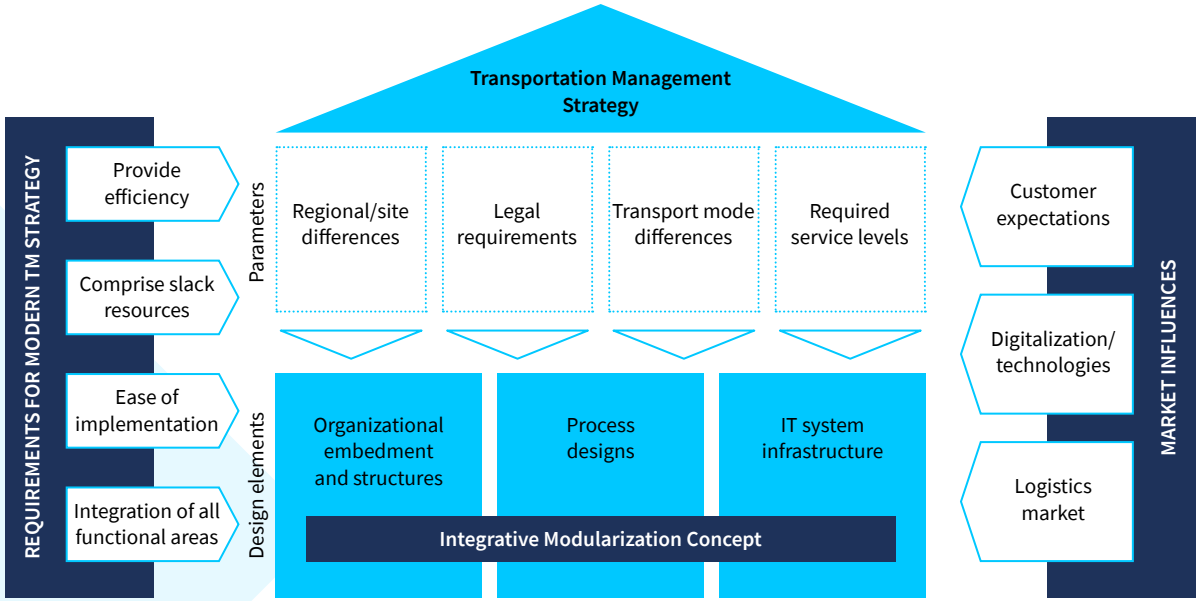


Figure 12: Transport Management Strategy in its environment

When did our company last review the TM strategy? In times of the VUCA[7] world the markets change fast and could deeply change the requirements for and expectations on your TM configuration. Customer expectations change as order behavior is over time. Digitalization and technology boost logistics productivity if used correctly. New service offerings from the carriers potentially add more value.

[7] VUCA – Volatility, Uncertainty, Complexity and Ambiguity

Transportation Management Strategy

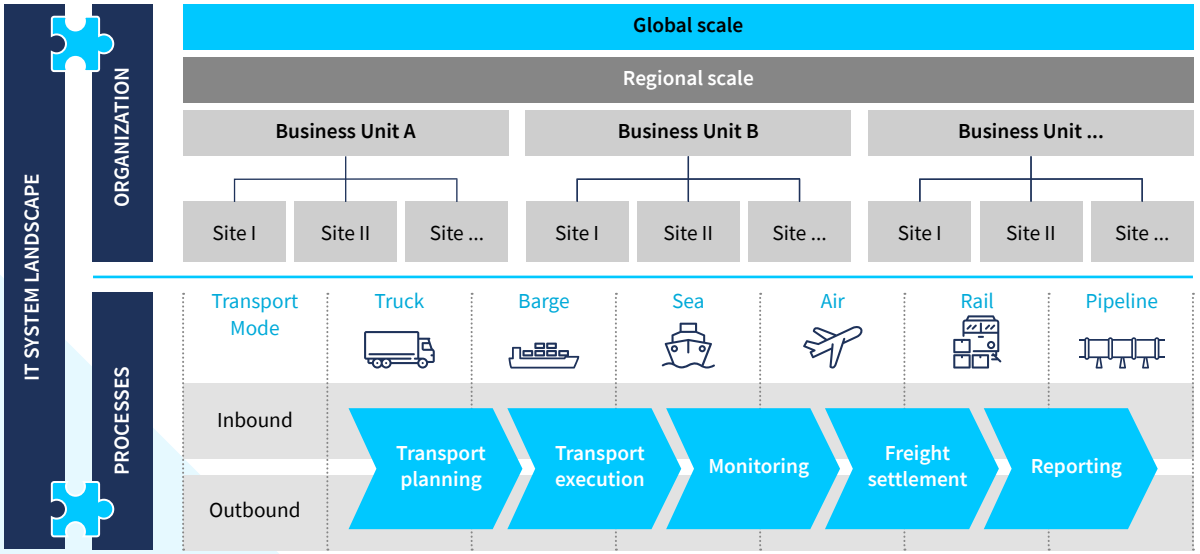


Figure 13: Camelot framework to setup a TM Strategy

Part of an enhanced transport management strategy could be to interact regularly with your customers to plan the arrival of the customer orders closer. This refers to the shift of a peak situation identified on the basis of the forecast or the build-up of a certain stock level on the customer side to bridge bottlenecks in transport capacity This could be additional TCs[8] on or closer to the customer delivery side or higher order volumes for a certain time. This would cover the MTS[9] products.

[8] TC – Tank Container
[9] MTS – Make to Stock

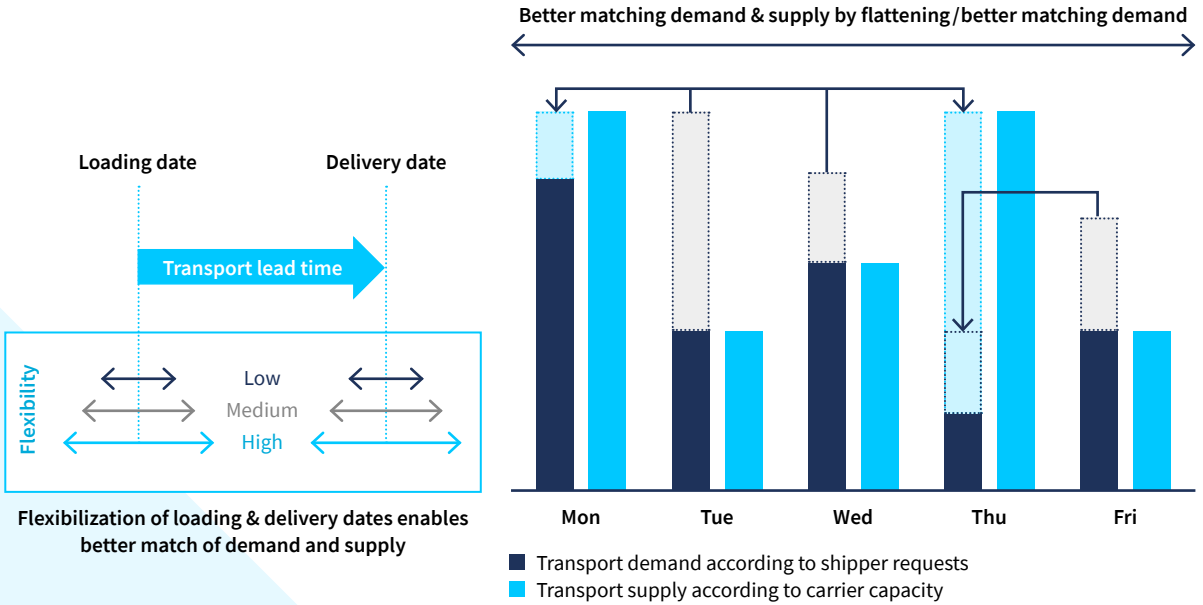


Figure 14: Matching transport demand and supply via flexing loading and delivery dates

For MTO[10] other strategies will be required like including the forecasted transport capacity shortage into the delivery time confirmation towards the customer. Alternatively, you can secure transport capacity via higher flexibility in pricing an early booking. Key of these strategies is a longer horizon in transport planning like described above.

It is important not to lose connection to the latest developments in logistics such as digital transformation and lates TMS functionalities. Key is to keep or improve the competitive advantage of your company through a Transport Management Strategy.

[10] MTO – Make to Order

Camelot Management Consultants

We are a global management and technology consulting firm focusing on value chain management. Our mission: turning our clients' value chains into a competitive advantage and creating lasting impact where our clients need it most. By combining our industry focus, value chain process expertise, and technology know-how, we guide our clients from strategy to sustainable technology adoption.

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