# Leveraging Real-Time Data and the Network Effect for Next Level Time Slot Management

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# Vision, Experience, Answers for Industry

When it comes to keeping trucks on-time at a warehouse or distribution center of an industry or retail company, technology plays an essential role. Transportation management systems and real-time visibility solutions have generated the majority of attention for streamlining the process of getting a truck to the dock, loading or unloading it, and getting it back on the road. However, an integral part to this process is the use of a time slot management application.

Time slot management helps to organize warehouse resources to prepare for an incoming truck. The warehouse needs to know who is coming and when, which begins with the estimated time of arrival. Beyond that, warehouse workers need updates on which dock the truck is arriving at, when the truck is loaded, what papers they will pick up, what needs to be signed, and when they are leaving the warehouse or yard. Time slot management applications do work as a stand-alone application, but it is more valuable when it is integrated with other applications on a common platform, such as warehouse and yard management, or visibility solutions.

Another component of time slot management is understanding the difference between industries. For example, a retail goods recipient has very specific needs depending on the products and the time for a slot to unload, while chemical companies have constraints such as what materials drivers can carry, what materials can be loaded or unloaded near other materials, and other regulations around the equipment that is used.



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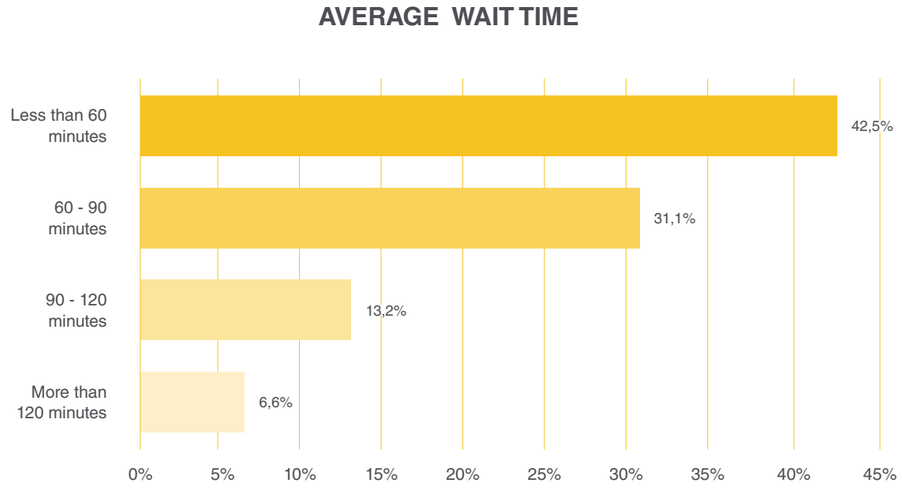
ARC Advisory Group conducted a survey with Transporeon to look at the benefits of time slot management. Additionally, I interviewed Transporeon's CEO Stephan Sieber to get more insight into the trends in time slot management.

# Wait times and Costs Can Add Up Quickly

As part of this research, we surveyed 106 individuals with or without a Time Slot Management system across a variety of industries and countries. When looking at waiting times, it is important to know how long a company's drivers or carrier's drivers are waiting per appointment from check-in to the beginning of loading or unloading the truck. The majority of survey respondents indicated the average wait time is less than 60 minutes, followed by wait times between 60 and 90 minutes. The average wait time for all respondents was about 70 minutes.




As Stephan Sieber pointed out in his interview, in Europe, 50 percent of carriers spend three or more hours of waiting per week and 20 percent spend 5 or more hours waiting. This all adds up over time, and there are costs associated with these wait times.

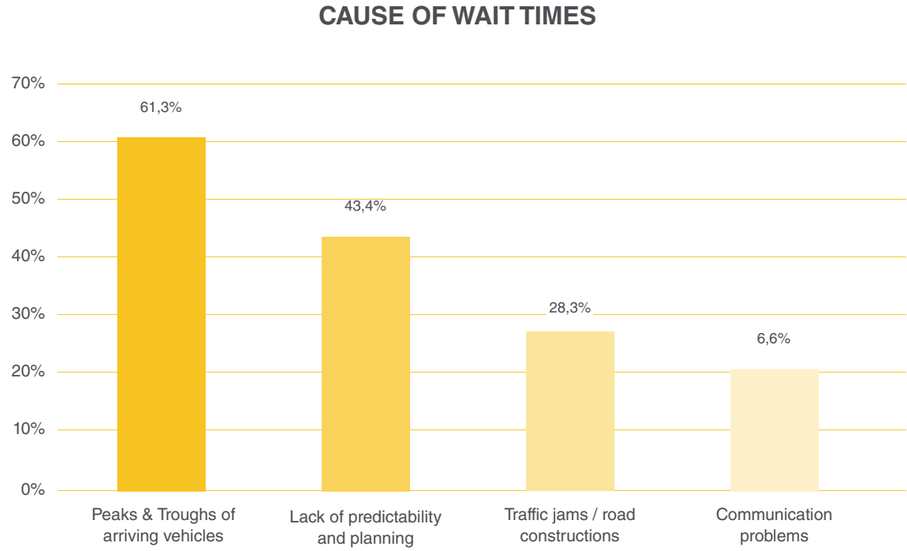
**Stephan Sieber,**
CEO Transporeon





The question then needs to be asked, what is causing delays and increased wait times? The most common cause for wait times at warehouses, as reported by survey respondents is peaks and troughs of arriving. For many warehouses and distribution centers, a lack of visibility into which trucks are coming and when can lead to congestion. This congestion can be exacerbated by trucks that are running late or early and arriving at unexpected times.

The second most common cause for wait times is a lack of predictability and planning. As warehouses and yards cannot predict when a truck will arrive, they are unable to streamline the process. Traffic jams and road construction, which are another leading cause for wait times can be minimized with proper planning and real-time ETAs.




# Change Happens

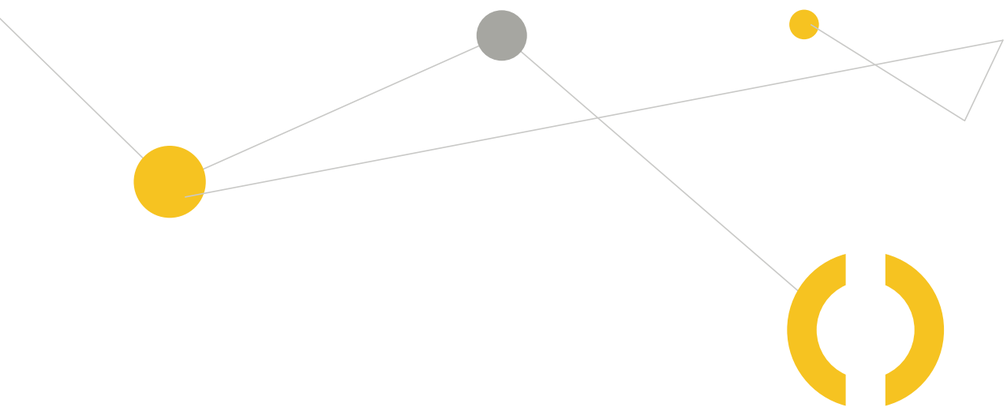
As mentioned above, there are elements that are out of your control which will impact shipments. It is really just a matter of how much of an impact will be felt. Time slot management applications can help shippers and goods recipients to reduce the impact of changes.

Whether it is due to traffic jams, missed appointments, or a variety of other reasons, loadings and unloadings will need to be rescheduled on any given day. For all respondents, about 11 percent of loadings or unloadings will need to be rescheduled throughout the day. Those numbers can add up quickly and add to the backlog at the yard, especially if there are restrictions on the trucks and trailers that need to be rescheduled.

The network effect is at the heart of supply chain transformation. Essentially, the network effect exists when all components of the supply chain technology ecosystem work together to improve the performance of the end-to-end supply chain. To that end, time slot management applications should not operate as a stand-alone solution. While companies can use the technology
in a silo, it will only diminish the potential results.

The network effect also relies on communication between applications to more efficiently match loads with capacity. Sustainability is a byproduct of the network effect, load consolidation and route optimization mean less trucks on the road to deliver the same freight, which is critical to reducing carbon emissions. Within that context, time slot management applications can promote sustainability, as less idle time in the yard or at the warehouse means lower emissions. While this may not seem like much on a per-truck basis, it adds up over time. Improved dock scheduling makes for quicker stopovers, reducing the time on the road, further reducing emissions.

Time slot management, while a critical solution for yards and warehouses, needs to be part of the larger supply chain network, which includes transportation execution, procurement, and real-time data for enhanced visibility. This is where the true power of time slot management exists. By using real-time data for tracking of assets on the move, warehouses can be better prepared for arriving trucks. Depending on congestion or whether a truck is going to be early or late, dock assignments can be adjusted based on the new ETA.







However, these updates will only prove beneficial to warehouses and drivers if the updates are made automatically. According to the survey, nearly two-thirds of respondents handle rescheduling completely manually, while close to a third of respondents reschedule appointments manually but with the use of rebooking recommendations. Less than 6 percent of respondents handle rescheduling automatically. This is certainly a technology gap that needs to be addressed to improve efficiencies.

When these changes happen, shippers and goods recipients need to be proactive. Technology can help to play a big role in this process. However, too many companies do not have adequate technology in place and have to rely on manual processes to make updates.

Stephan Sieber highlighted the importance of the network effect on loading and unloading trucks. He pointed out that the process always has at least two points: there is no loading without unloading, and there is no unloading without loading. With a complete view on the network of outbound and inbound, you can start to look at time slots like pairs: when you book a timeslot for loading, with in-transit visibility and historical data for transit times, you can look at how it impacts the unloading process. At many times, it is obvious that even at the time of loading, the unloading time cannot be met anymore, which is already past the point where organizations need to know a change will be needed.

If you control the whole chain or network, you can correct such anomalies from the beginning. You can also start to combine inbound and outbound logistics, so you can receive incoming trucks and reallocate their loading slot on the outbound side; this is just one step toward smarter transportation allocation. Additionally, if you don’t reallocate the truck to the outbound side yourself, you have connecting loads waiting for carriers when  they arrive to optimize asset utilization across different transport legs.






# The Value of Time Slot Management

When it comes to value, the integration of real-time data with a time slot management application is important. Real-time data can be used for enhanced visibility into a truck's ETA. The visibility data can be integrated with the carrier's telematics solution, the carrier's TMS, or an app. The carriers in turn are tracking the ELD devices on their trucks or via an app on the driver's smartphone. There are a variety of external data streams that also play a role in providing better visibility and improved ETAs.

Stephan Sieber stressed that over the last few years, time slot management tools have been used to plan for loading and unloading. When the time slot is booked for loading or unloading, that is usually hours, if not days, before the process happens, and in between, delays and changes can happen (traffic jams, tech issues, changed customer requirements, etc.). When companies combine the planning aspect of time slot management with real-time visibility data, they can use the platform to update loading and unloading sequences to optimize in real-time these processes. This leads to benefits for all participants.

For industry and retail companies, they know more accurately who is coming, who is waiting, when they are leaving, and how to best prepare the staff and necessary equipment at the dock. For carriers, they can reduce waiting time, increase asset utilization, and improve overall processes. Unfortunately, nearly 60 percent of respondents are not integrating real-time data for enhanced ETAs with their time slot management application.

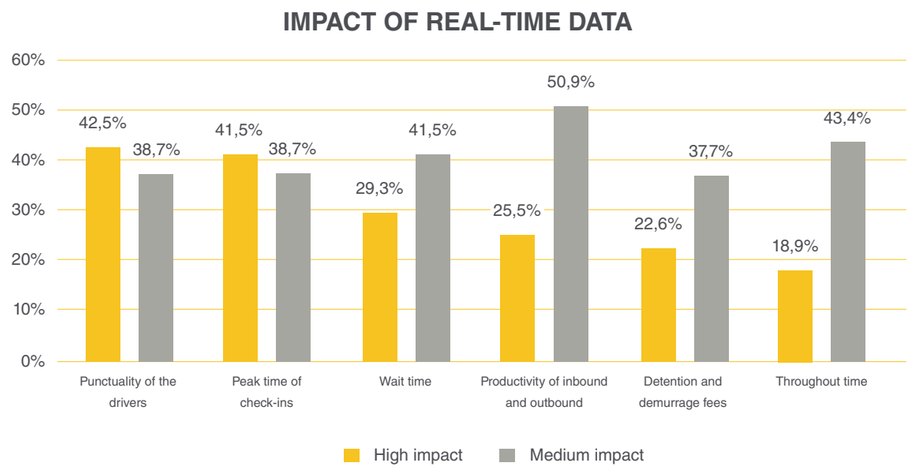
The issue then becomes assessing the impact of real-time data in time slot and yard management processes. Survey respondents were asked to rate categories between high impact and medium impact on these processes. The biggest impact identified by respondents was the punctuality of drivers regarding the arrivals and departures made on time. Real-time data integration allows for better tracking of assets on the move; when there are delays or also when a truck is too early – the time slot management application can automatically adjust which dock the truck will go to upon arrival and can reallocate resources as needed.

The second most impactful part of the process is peak time of check-ins. For many carriers, getting an early time slot to unload is beneficial so they can get back on the road for either the next leg of the trip or for a new load altogether. Real-time visibility of when trucks will be arriving and any special provisions they may need, especially at peak-times for the yard, is important for reducing delays as much as possible.



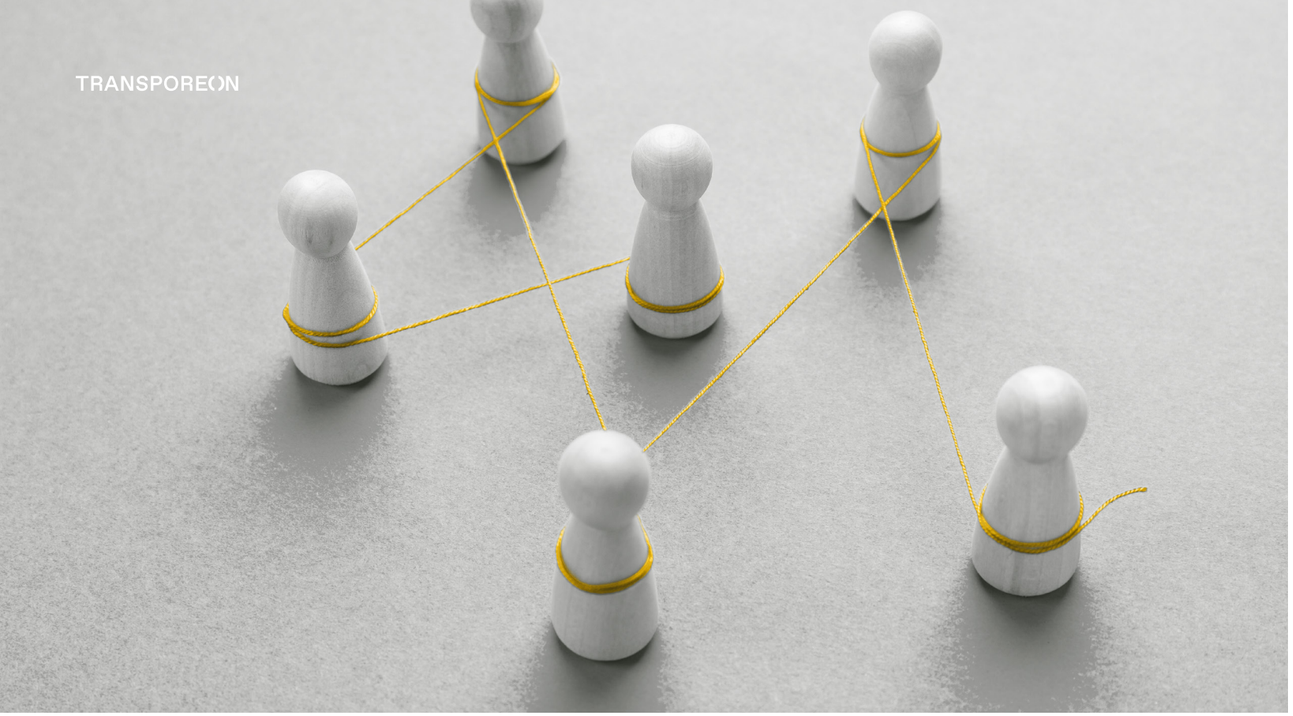


Survey respondents highlighted a number of areas that are less impactful parts of the process, but still important from a real-time data perspective. These include the time a truck is waiting from registration to the beginning of loading or unloading (wait time), productivity of inbound and outbound, detention and demurrage fees, and the time from when a truck is loaded until it departs (throughput time).




One of the main benefits of time slot management is the ability to save time, which saves money on labor costs and allows a better utilization of the available driving times. On average, survey respondents reduced wait times by 61 minutes.

Stephan Sieber highlighted what he felt were the top benefits of a time slot management application. First and foremost, better planning and organization of the loading and unloading process leads to improved utilization of assets for shippers and carriers. This helps the warehouse to be ready in time for carriers arriving, whether they are early or late, and to react appropriately. For carriers, the main benefit is reduced waiting times and less congestion at terminals. Overall, anyone that is around the loading and unloading stations will benefit.




According to survey respondents, the biggest potential in time slot management systems for the future is the combination of time slots with real-time data. This data point shows that while barely 40 percent of respondents are currently using real-time data for enhanced ETAs as part of their time slot management application, the benefit of doing so is not lost on them. Machine learning is working with real-time visibility solutions to learn more about constraints (such as capacity, regulations, and hours of service) and then using that information to give a much better ETA for shipments.

The use of real-time data for more informed ETAs can also make a big impact when taking other constraints into consideration. If a truck is going to arrive early or late, warehouse workers need to know which constraints to be aware of. For example, if a truck is already at a dock, and an early arriving truck is carrying materials that cannot be loaded or unloaded near that truck, updates to the dock scheduling can be made earlier, and the driver will know where to go upon arrival without the worry of being re-routed upon arrival.

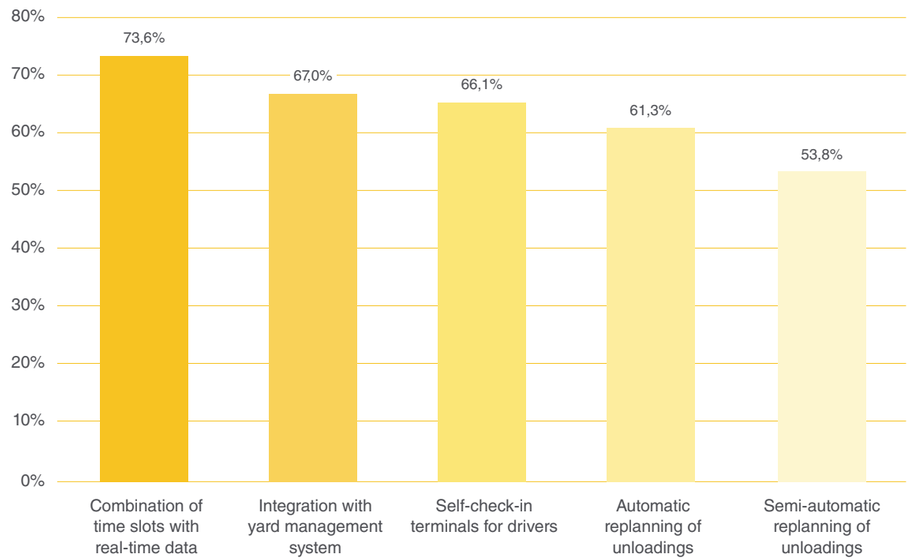




Survey respondents also highlighted the integration of time slot management applications with yard management systems (e.g. automated gate control systems) as an area of future potential. This integration will help to streamline the check-in process, reduce wait times and throughput times, and make sure that the staffing levels are appropriate for a given time frame.

Finally, survey respondents indicated that advanced self-check-in technology for drivers and automating replanning processes for late arrivals represent key future benefits.

## THE FUTURE OF TIME SLOT MANAGEMENT



Stephan Sieber highlighted the areas where he sees time slot management going in the near-term future. For now, and in the next one to two years, he talked about the importance of real-time data. Companies need to use real-time data more effectively to change from a single point of view of only looking at the outbound or inbound, to looking at it from a complete network perspective. In the next three to five years, new technologies will become available, such as connected and autonomous supply chains. The yards of the world will be first to see the impact of autonomous trucks, as they are able to navigate through the highly congested areas to move from check-in to the loading dock and beyond.

Autonomous trucks are not going to replace human drivers, at least not any time soon. However, in the yard, when dock assignments are updated in real-time, autonomous vehicles can navigate through the yard, responding to real-time updates. This allows the driver to perform other tasks that may need to be performed such as filling out paperwork and getting a new route assignment. This can speed up the throughput time of the truck, saving time and money.

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# Next steps

No matter where your company may be in the time slot management maturity curve, there are additional steps that can be taken to improve throughput, reduce wait times, and save money. Below are a few recommendations to help you move to the next level of time slot management.

**1.** According to the survey, 16 percent of respondents do not have a time slot management application in place. First and foremost, this needs to be addressed. A time slot management application helps to organize warehouse resources to prepare for an incoming truck. This can improve throughput times, reduce waiting times, and reduce overall congestion. It will also enable companies to better manage warehouse labor resources for loading and unloading trucks.

**2.** For companies that have a time slot management application in place, the next step is three-fold.

- First, leverage the network effect. The network effect exists when all components of the supply chain technology ecosystem work together to improve the performance of the end-to-end supply chain. Time slot management is a piece of the larger puzzle. Companies need to integrate time slot management with transportation management, warehouse management, yard management, and other essential supply chain tools

- Second, commit to using real-time data. There are a variety of external data streams that play a role in providing better visibility and improved ETAs. Companies are partnering with data aggregators to get a better idea of when shipments will arrive. This includes port data, social media, news, event and weather (SNEW) data, traffic data, and other available sources to provide an accurate ETA to warehouses. Currently, only 40 percent of respondents are using real-time data integration for enhanced ETAs.
- Third, combine across the individual supply chains on a vertical level. This means creating the pairs between outbound and inbound slots to automate the booking process and in combination with point b, react dynamically to changes and events within the supply chain.

3. Finally, for those companies that are already leveraging the network effect and using real-time data, the key is to continue to innovate. This means using advanced technology such as artificial intelligence, machine learning, and IoT. Machine learning is working with real-time visibility solutions to learn more about constraints (such as capacity, regulations, and hours of service) and then using that information to give a much better ETA for shipments to warehouses. This also allows the automatic replanning of Time Slots. For a truer ETA, companies are using IoT data from trucks to get a better understanding of driver behavior, such as typical driving speeds and times, as well as how they operate in heavily congested areas. Companies can take sensor data from trucks and incorporate hours of service rules to know when, where, and for how long a driver needs to stop.





# Conclusion

Congestion at a warehouse or DC can cause a lot of stress for shippers, recipients, carriers, warehouse workers, and drivers. As congestion increases, so do the costs associated with wait times and demurrage charges. However, a time slot management application, in conjunction with real-time visibility tools, can reduce congestion, wait times, and costs. On average, those survey respondents that are using a time slot management application have reduced daily wait times by 61 minutes.

Time slot management is a key component of the network effect that enables a streamlined end-to-end supply chain. While the application can help to reduce yard congestion, as part of the larger solution, it can enhance visibility, reduce manual tasks, and provide more value as part of the larger supply chain ecosystem.
The future of time slot management applications hinges on the use of real-time data to improve ETAs which will increase efficiencies during the check-in, loading, unloading, and departure processes.

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