

REDUCING SYSTEM DWELL TIME THROUGH COLLABORATION



Trading Partner Alliance
FMI and GMA

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INTRODUCTION/ABSTRACT:

Carriers and drivers are growing more particular about the quality of the facility at which they pick up or deliver loads. In 2018, 78% of carriers lost the opportunity of at least one load per month due to detention time¹, while almost half (49%) lost more than one load per month, according to data compiled by the Owner-Operator Independent Drivers Association (OOIDA). Dwell time¹ is included in HOS (Hours of Service) maximums, which means delays reduce the number of hours drivers are legally permitted to drive before having to stop for a rest break. For the average long-haul shipment, one hour of dwell is roughly equivalent to 50 miles of distance traveled. Increased dwell time also strains carrier relationships with receivers further down the supply chain or ruins carrier relationships with brokers resulting in permanently lost capacity. Additionally, shippers who make a driver wait for more than two hours must pay detention fees of between \$50 and \$100 per occurrence.

Especially considering the ongoing capacity crunch facing the industry today, having a large number of facilities of choice -- and by extension, achieving distinction as a shipper of choice -- can pave the way to attracting the best carriers, optimizing performance at facilities, and ultimately ensuring higher customer satisfaction across the board. In contrast, failure to streamline facility performance (and to achieve distinction as a facility of choice) can create a negative feedback loop as facilities' inability to attract quality carriers causes performance to suffer, which in turn impacts carrier willingness to work with that facility in the future.

In achieving distinction as facility of choice, two factors stand out as candidates for improvement: lower dwell times and improved driver experience.

The **Trading Partner Alliance (TPA)**, a joint industry leadership group formed by the **Grocery Manufacturers Association** and the **Food Marketing Institute**, saw an opportunity to address the first: dwell time. With thought leadership and technology partner **FourKites**, the team saw an opportunity to give four pilot facilities (Coca-Cola, Auburndale, FL; Land O'Lakes, US Cold, Quakertown, PA; Giant Eagle, Crafton, PA; Wegmans, Rochester, NY) the visibility and data they needed to understand the root causes of dwell time and work to mitigate them over time. The pilot lasted for a duration of three months.

¹Dwell time is the total time for which a driver has been at the facility to deliver or pick up a load. Detention time is the additional time beyond the limit of 2 hours for which the driver had to wait due to delays at the facility.

In our research, we examined six months' (pre and post pilot kick-off) worth of real-world dwell time data from the four facilities, with the aim of:

- Reducing dwell times at pilot facilities through enhanced collaboration and visibility.
- Identifying tracking metrics and other factors that are associated with high dwell times throughout the industry.
- Highlighting the most impactful levers that can be applied to reduce dwell rates over time.

Lowering dwell times can have profound positive impacts on a company's supply chain, reaching far beyond carrier satisfaction and distinction as a facility or shipper of choice. With the advent of technologies like dynamic load matching tools, global supply chains have never been so interconnected, nor so fast-paced. While these developments have the potential to boost efficiency, they also carry the risk of compounding delays which could reverberate through a company's supply chain. Amid this highly dynamic and constantly changing landscape, we believe an analysis of dwell times and how to mitigate them to be long overdue.

Over the course of the pilot, our analysis has provided the following high-level insights:

- Improper load balancing, which leads to increased dwell, can be remediated by flexible staffing and using a strict and better appointment scheduling system, which also takes into consideration the product type/complexity of the load.
- Carrier arrival delays create a domino effect by substantially increasing congestion in subsequent slots. Along with this, inefficient processes at a facility contribute to increased dwell. Capturing granular data and having robust reporting in place to identify key bottlenecks is critical.

METHODOLOGY:

For the purposes of this study, we tracked several key metrics pertaining to the dwell time performance of a load, evaluating them against a custom-developed 'Dwell Scorecard.'²

[Tier 1 Metrics]

- Number of loads/appointments
- Median dwell time
- % non-compliant³ loads (in terms of dwell time)
- % of delayed carrier arrivals
- Average delay of delayed arrival loads

[Tier 2 Metrics]

- Week
- Day of week
- Time of day
- Carrier
- Inbound/Outbound
- Customer/Supplier
- Live/Drop
- Warehouse
- Temperature class/product type

²The Dwell Scorecard is a part of FourKites' Facility Manager reporting section which provides the ability for the sites to analyze historical Warehouse Management System (WMS) data and identify operational bottlenecks.

³A load is considered non-compliant if it exceeds the dwell threshold set, which is 2 hours for a live load and 1 hour for a drop load.

Along with the above metrics, all the loads with the highest dwell times are highlighted, so that facilities can work with their operations team to identify the root cause.



Exhibit. 1: FourKites Dwell Scorecard (part of Facility Manager tool)

Each week during this study, FourKites received WMS data from all four facilities, which included key attributes of the load such as load number, live/drop, product type, etc. along with the timestamps for key events that took place each day within the facility (e.g. Gate In, Loading Started, Loading Completed, Gate Out, etc.). This information was used to refresh the Dwell Scorecard and provide an updated, accurate snapshot of the facility’s dwell performance. Twenty-five weeks of data with approximately 48,500 loads across 500 carriers was analyzed.

A select group of supply chain managers and directors from Wegmans, Land O’Lakes, Giant Eagle, Inc., and Coca-Cola North America, along with several carrier partners, participated in weekly calls, during which time they shared their insights and brainstormed as a team to identify new opportunities to optimize dwell time performance.

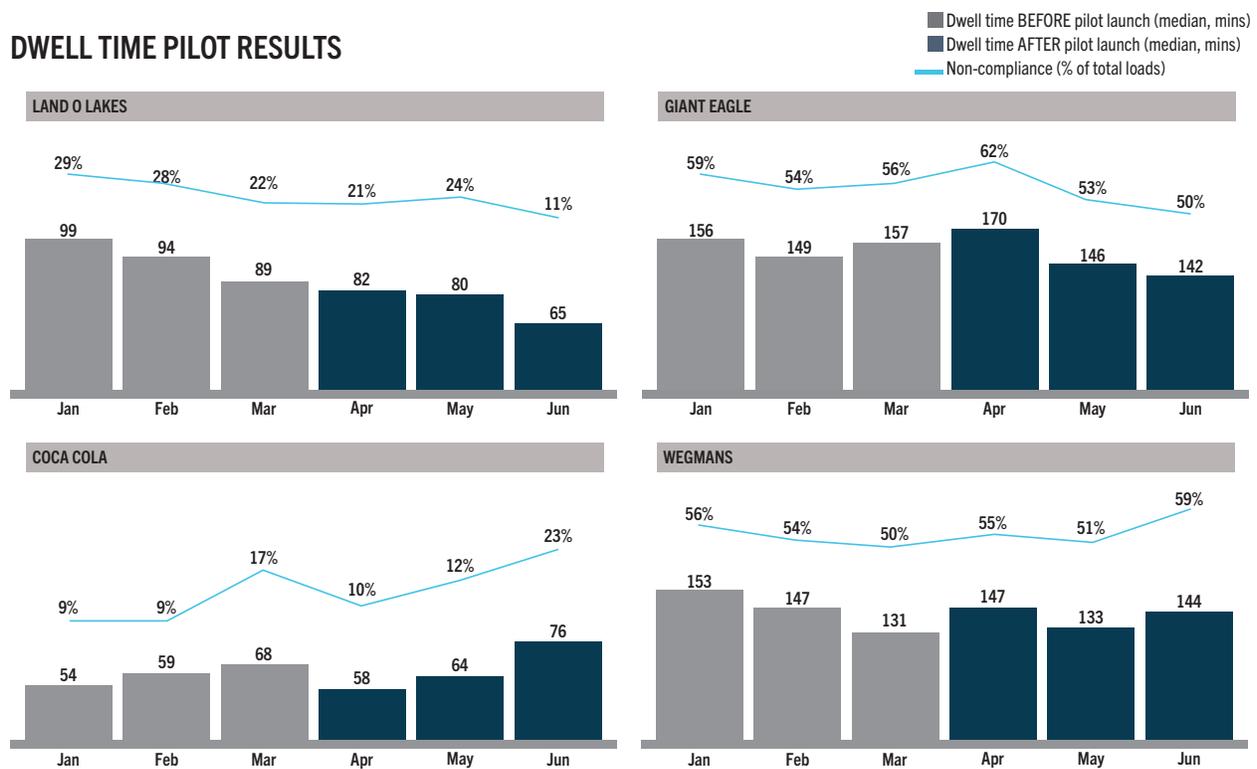
FINDINGS AND RECOMMENDATIONS

Post-pilot kick-off, each facility observed a slight improvement in dwell performance across the board. These improvements were the result of initiatives taken by the facilities to optimize delivery performance (though high load volume and labor shortages throughout the observation period led to several isolated spikes). From an initial median dwell time of approximately 1.2 hours for manufacturers, and approximately 2.5 hours for retailers; and a rate of non-compliant live loads of roughly 18% for manufacturers and 55% for retailers, post-pilot kick-off numbers showed that slight weekly improvements were achieved over the course of the study.

Some of the strategies and initiatives adopted by the pilot facilities include:

- Coca-Cola Auburndale has moved the check-in and check-out process to a consolidated Guard Shack instead of shipping and receiving office (as this will expedite the check-in process and bring down the dwell time).
- Land O'Lakes already offered a digital check-in option at their Quakertown facility, which had the fastest check-in process throughout the observation period. Therefore, we can conclude that automating check-in procedures is key to reducing driver on-site time.
- Giant Eagle Crafton and Land O'Lakes Quakertown found a direct correlation between high load volume and increased dwell. They are each working on a load-balancing initiative, attempting to reduce dwell times by balancing out inbound and outbound load volumes across the days of the week to bring down the dwell.
- Wegmans Rochester identified issues with complex loads, such as mixed-pallet loads, and are working on an initiative to see if multiple Purchase Orders with the same item can be grouped into a single order to lower complexity and therefore reduce dwell.

DWELL TIME PILOT RESULTS



Company Name	Pre-pilot median dwell (in minutes)	Post-pilot median dwell (in minutes)
Giant Eagle, Crafton, PA	154	141
Wegmans, Rochester, NY	142	139
Coca-Cola, Auburndale, FL	62	64
Land O'Lakes, Quakertown, PA	89	70

Exhibit. 2: Evolution of Dwell Time Performance of all pilot participants

Over the course of the six-month pilot, we identified several key factors contributing to increased dwell times throughout the facilities. Mitigating these dwell factors is key to reducing dwell times and achieving distinction as a facility of choice. Our general recommendations call for establishing a common understanding of root causes of high dwell times; launching an industry standard dwell time tracking app/interface; and defining standard on-time-in-full (OTIF) measurement criteria. With the availability of facility-specific data, however, dwell factors can be identified and reduced.

Some of the most prominent dwell factors we observed include:

- Imbalance in load volume by time of day and day of week.
- Carrier arrival delays.
- Inefficient on-site processes such as check-in, dock assignments etc.

Each of these factors is listed in greater detail in the subsequent sections.

LOAD BALANCING

Opportunities for improvement were detected in how loads were being scheduled, both across time slots throughout the day and by day of the week. Our data displayed a median dwell time of 2.6 hours for full truckload and 2.1 hours for less-than-truckload, but those numbers fluctuated significantly over the course of a day and a week. For example, we observed a direct correlation between overbooked days and time slots and increased dwell times at delivery.

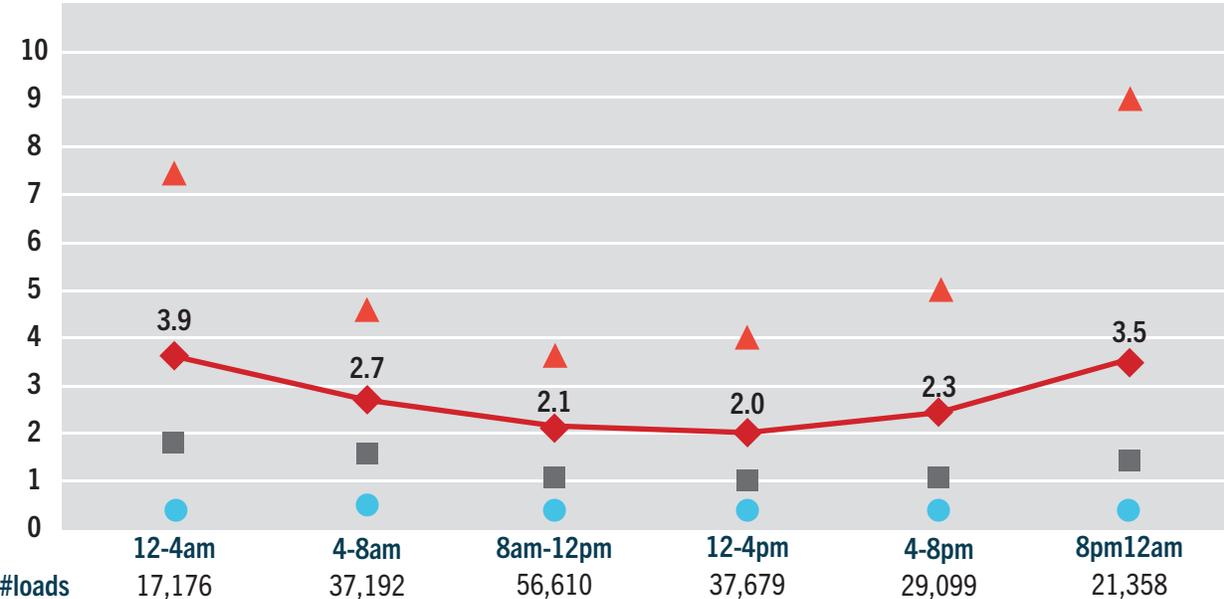


Exhibit 3: Dwell Time (in hrs.) By the Time of Day

- Facility management is most efficient during peak load hours, with the lowest dwell times occurring between the hours of 8am-12pm, 12pm-4pm and 4pm-8pm.
- At distribution centers where facilities have limited staff on ‘third shifts,’ increased turnaround time was observed for individual loads.
- Recommend using the lean hours of the night to fill drop trailers and open more appointments at night to lower dwell times during the day.

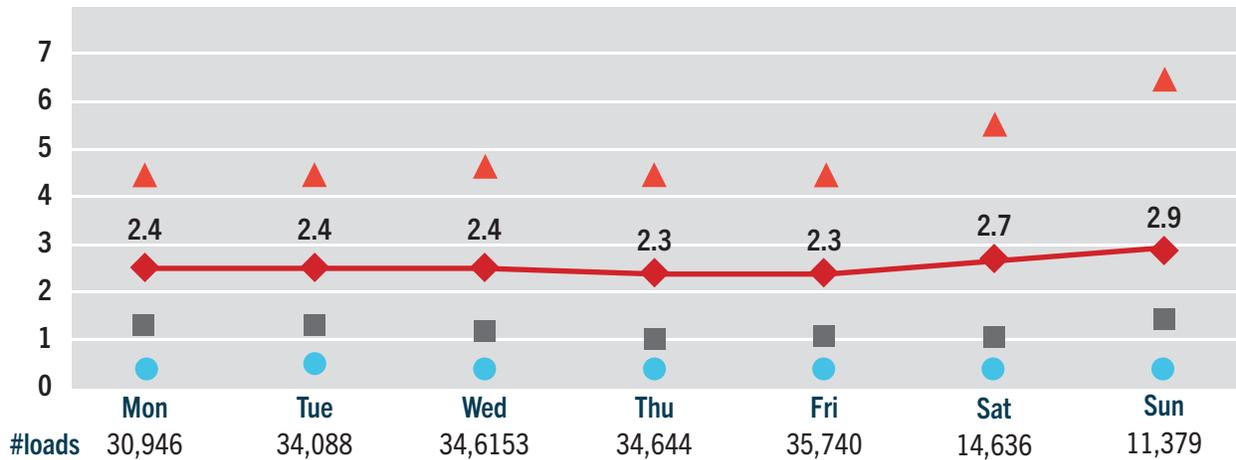


Exhibit 4: Dwell Time (in hrs.) By Day of The Week

- Dwell time increased over weekends compared to weekdays.
- Trend correlates directly with reduced staffing at facilities over weekends.
- Excess deliveries remaining from weekday deliveries also played a role.
- Recommend evaluating data to determine lowest- highest-volume delivery on weekends, and reallocate staff accordingly.

RECOMMENDATIONS

- **Balancing Load Volume:** Ensure balanced load volume across days of the week and time slots taking into consideration the availability of staff. This is key to dwell time reduction at the point of delivery.
- **Flexible staffing:** Dwell performance can be improved by having the number of staff or employees in proportion to the load volume that needs to be handled. Having a predefined number of employees across all shifts might not work in having consistent performance of improved dwell time.
- **Appointments based on complexity:** Many automated scheduling systems simply consider the maximum or permissible number of appointments per timeslot or day; adjusting them to better account for variations in key complexity plays an important role in further diminishing dwell times.
- **Product Type:** Account for the product type and complexity of the load (e.g. converting mixed pallets, dealing with damaged product, loose items, etc.) while giving appointment slots to carriers.

CARRIER ARRIVAL DELAYS/ON-TIME PERFORMANCE

Long transit times and delays in carrier arrival are major contributors to high dwell times. In fact, within the manufacturing industry we found that loads with delayed carrier arrivals have approximately 60% higher dwell time compared to carriers who are arriving on-time. In the retail industry, we observed a less extreme (but still significant) increase of 20% over dwell times observed for on-time loads. Late arrivals cause congestion in the subsequent time slots and therefore increased dwell for the remaining loads as well.

Loads that arrive outside their scheduled arrival time can strain operations in different ways. For example, early arrivals can consume valuable manpower and space at the facility waiting for their slots to arrive, while late arrivals have the potential to disrupt DC receipts, making them less efficient. Depending on the industry, very late arrivals could disrupt production or cause stockouts, creating a ripple-effect that expands beyond the facility in question and might even impact end-customers directly.

RECOMMENDATIONS

- **Work with carriers to improve on-time performance:** Improving on-time performance is a major factor in bringing down dwell times, and all facilities are working with carriers to improve their on-time performance.
 - Find agreement on metrics for on-time performance⁴ and determine targets and parameters as part of the carrier contracting process.
 - Having visibility into specific route and carrier combinations with higher dwell times is important, so shippers can work with carrier partners to improve on-time performance. (FourKites, as a result of this pilot, has developed a carrier performance dashboard tool to provide this visibility.)
 - Over the course of a month, identify carriers who have a high percentage of delayed arrivals and have high dwell time at the facility. Work with these carriers and drivers to determine if the appointment time slots being given to them are feasible for arriving on time.

INEFFICIENT ON-SITE PROCESSES

Outliers on the driver’s end can be telling as well. Driver-driven processes, both routine (arrival and check-in, unload, completing paperwork, exit procedures) and exception-based (waiting for available door/dock, delay due to full dock, wait for delayed driver) collectively contributed 30-35% of a truck’s total on-site time. Check-in processes are highly manual, paperwork-dependent systems with multiple driver touchpoints, leading to inefficiencies and increasing the likelihood that the dwell time will be higher and final delivery to the end customer (for outbound loads) will be delayed.

Arrival/Check-In	0:17
Wait for Door	0:56
Delay (Dock Full)	0:12
Unload	0:55
Complete Paperwork	0:06
Wait for Driver	0:24
Exit	0:08
Total	3:01

Exhibit 5: Individual breakdown for each process on final delivery/dwell time

⁴See “Defining ‘on-time, in-full’ in the consumer sector,” McKinsey & Company, June 2019

As the processes in which bottlenecks occur can vary widely by facility, time of day, and other factors, having greater visibility into which processes cause delays on a facility-by-facility basis is the first step in effectively reallocating staff to improve delivery performance. Monitoring dwell performance across different attributes such as day of the week, carrier, customer, product type etc. is critical in identifying the key bottlenecks.

This could be remedied by assigning docks at security, co-locating scheduler at site, and reallocating staff to quality assurance stations in order to speed activities and avoid creating bottlenecks.

RECOMMENDATIONS

- **Consolidated check-in/check-out process:** Though it depends on the layout of the facility, our observation is that instead of drivers having to gate-in at the security office and then head to the shipping/receiving office for paperwork and dock assignments, having a consolidated guard shack where both paperwork and dock assignments can be done will make the process more efficient and reduce dwell time. (See Exhibit 6 - drivers generally wait for ~50 min for dock assignments). Digitizing the gate-in process paves the way for an expedited check-in and improve, dwell performance as can be seen from U.S. Cold, Quakertown facility.
- Carriers/drivers need to ensure they have the **requisite documents**/appointment number to enter the facility.
- Have at least **2 entry lanes** to account for hold-ups by some drivers (depending on facility size).
- **Real-time visibility of in-transit loads:** Loading and unloading contributes to ~35% of truck on-site time. Most of this time is spent in shifting the product from warehouse racks to docks. Having real-time visibility of the next set of loads which are going to arrive at the facility will help in planning the staging area in advance for a faster loading process.

SIGNIFICANCE OF OUTLIERS

Outliers that result in excessive dwell time are often overlooked as exceptions. However, analyzing these outliers gave us key insights into the operational opportunities of each facility. For example, one facility identified that mixed pallet loads tended to have longer unload times than single-product pallets, leading to unusually high dwell times. In other examples, labor challenges, damaged product, bad/damaged pallet wood and inspection processes were often cited as factors in higher dwell times. It is worth investigating these outliers as it might unearth process inefficiencies.

CONCLUSION & NEXT STEPS

Successful reduction in dwell times throughout the transportation sector at large has the potential to create an additional 2-4% transportation capacity, by improving the dwell time of trucks performing below median expected levels. Clearly, taking the steps outlined above to reduce dwell can make a significant difference in a facility's operations, and bring it considerably closer to facility of choice status.

Facilities are working toward becoming more proactive in analyzing the dwell performance of their loads. Most facilities we examined did not have a robust reporting tool to track key metrics and identify operational inefficiencies, real-time data was often unavailable, and facilities were forced to react when carriers did not show up on time.

If shippers want to have a larger number of 'facilities of choice,' these things will have to change. In addition to analyzing the past week's data, capturing more granular data at a facility will enable them to identify and extrapolate trends into the future, becoming more proactive by making use of real-time data. Shippers could assign standardized ratings to each facility, based on dwell time performance, driver ratings, available amenities, etc.

One natural next step is developing a common list of metrics to track and coming up with a methodology for standardized facility rating for identifying facilities of choice. The rating methodology will take into consideration various parameters such as delivery procedures, dwell performance, paperwork, amenities available at the facility for drivers, ratings provided by the drivers, etc. As data becomes more available and accessible, the mobile tools and shared technology platforms will become a reliable source for facility dwell time, benchmarked across industries, to facilitate collaboration between drivers and facilities.

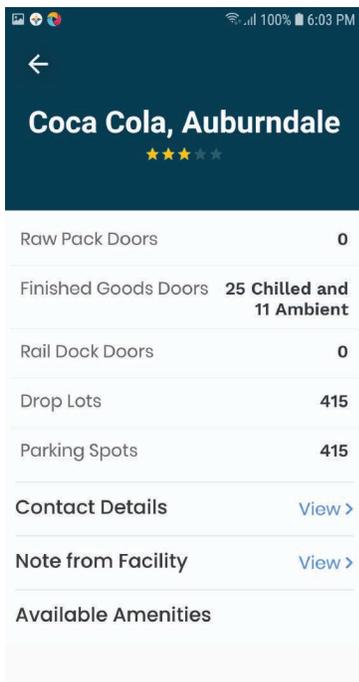
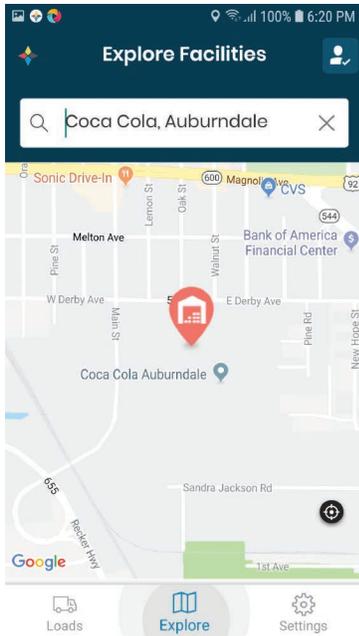


Exhibit 6: FourKites CarrierLink app for drivers to view facility amenities and rate them



About the Food Marketing Institute

Food Marketing Institute proudly advocates on behalf of the food retail industry, which employs nearly 5 million workers and represents a combined annual sales volume of almost \$800 billion. FMI member companies operate nearly 33,000 retail food stores and 12,000 pharmacies. FMI membership includes the entire spectrum of food retail venues; single owner grocery stores, large multi-store supermarket chains, pharmacies, online and mixed retail stores. Through programs in public affairs, food safety, research, education, health and wellness and industry relations, FMI offers resources and provides valuable benefits to almost 1,000 food retail and wholesale member companies and serves 85 international retail member companies. In addition, FMI has almost 500 associate member companies that provide products and services to the food retail industry.

Find out more at www.fmi.org.



About the Grocery Manufacturers Association

The Grocery Manufacturers Association represents the world's leading consumer packaged goods companies. The CPG industry plays a unique role as the single largest U.S. manufacturing employment sector, delivering products vital to the wellbeing of people's lives every day. GMA's mission is to empower the industry to grow and thrive.

For more information, visit gmaonline.org.



About FourKites

FourKites is the largest predictive supply chain visibility platform, delivering real-time visibility and predictive analytics for the broadest network of Global 1000 companies and third-party logistics firms. Using a proprietary algorithm to calculate shipment arrival times, FourKites enables customers to lower operating costs, improve on-time performance and strengthen end-customer relationships. With a network of more than four million GPS/ELD devices, FourKites covers all modes, including truckload, LTL, ocean, rail, intermodal, last mile and parcel. The platform is optimized for mobile and equipped with market-leading end-to-end security.

Facility Manager is a product that combines real-time tracking information with yard activities to provide insights into a facility's processes and performance. The tool aims to plan yard activities based on real-time predictive ETA of loads, provide in-yard asset visibility, identify key process bottlenecks in yard operations through reporting and reduce congestion by digitizing check-in forms.

Find out more at <https://www.fourkites.com>



About the Trading Partner Alliance

The Trading Partner Alliance (TPA) is a joint industry affairs-industry relations leadership group that was formed by the Grocery Manufacturers Association (GMA) and the Food Marketing Institute (FMI) in January 2009. The TPA exists to develop a shared retailer-manufacturer agenda on supply chain efficiency issues, the application of information technology, the adoption of environmentally friendly business practices and other issues. This common agenda is executed jointly by the FMI and GMA staffs and is overseen by the boards of directors of both organizations.