

Retail's Climate Change Responsibility



Think Big ...

But Start with the Low-hanging Fruit

The pressure for retailers to lower their carbon emissions dramatically and swiftly has never been greater. There are tremendous opportunities for near-term reduction in transportation-related emissions that can be realized in under 12 months. Here we explore leading rapid emissions reduction strategies and tactics.

Carbon Footprint Reduction is Rapidly Becoming the Top Sustainability Goal for Many Enterprises

Retailers' sustainability efforts are typically very broad, often defined as ESG (Environmental, Social, Governance) goals. Environmental goals include things like reducing carbon and water footprint, pollution, waste reduction/circular economy, and biodiversity. Among these, carbon footprint reduction is rising to the top in priority, as the need to tackle the climate crisis becomes more clear and more critical every year.

Our House is on Fire!

The first installment of the IPCC's Sixth Assessment Report, released on February 28, 2022, provides a comprehensively researched, dire appraisal of the current situation, concluding that climate impacts are already worse than expected, that risks will escalate quickly with each small further increase in average global temperature, that adaption is crucial, and some impacts are already too severe to adapt to.

As the climate crisis becomes more unequivocal, grim, and urgent we expect continued increasing emphasis of public attitudes to more climate change activism, including an increase in the role that a brand's climate policies and actions play in consumers' buying decisions.





People Are Demanding Measurable Improvement Now

More and more consumers are demanding that retailers and brands report on their carbon footprint and lower their emissions now. They are increasingly not letting brands off the hook. Consider these data points:

- A study found that 45% of shoppers would stop buying their favorite brands if those brands refused to measure their product carbon footprint.
- A study by Deloitte found that 42% of consumers have changed consumption habits because of their stance on the environment.
- Research by Oliver-Wyman found that 74% of Americans regard corporate carbon commitments as either “important” or “very important” and more than half of U.S. consumers say emissions commitments will influence their willingness to buy goods from companies.
- A study by Appinio of European consumers found that 50% of consumers pay attention to information on the CO2 emissions of products and over 60% try to buy only environmentally friendly products.

A broad set of research indicates that carbon footprint is playing a significant and increasingly vital role in consumers’ product purchasing decisions and their loyalty to specific brands and retailers. Governments and investors are also increasingly mandating that businesses meet specific GHG (Greenhouse Gas) reduction goals. Here we look at steps retailers can take to address these issues today.

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Demand for supply chain sustainability is coming from three distinct parties consumers, governments, and financial institutions as environmental concerns gain greater attention among societal, political, and economic agendas.

**Jorge A. Lopera, Vice President,
Head of Global Strategy ·
FarEye**

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Near-Term Carbon Footprint Reduction

Retail's Ambitious Climate Commitments Require Massive Investments

The IPCC's 2018 Special Report says that global emissions need to reach net zero by 2050 in order to minimize the chances of exceeding 1.5°C of warming. Many retailers have signed The Climate Pledge, the BRC Climate Action Roadmap, or otherwise have publicly committed to reach net zero or carbon neutral emissions by 2040 (or sooner) for their scope 1 and scope 2 emissions. This includes Ahold Delhaize, Amazon, Best Buy, H&M, IKEA, Marks & Spencer, Sainsbury's, Walmart, 60 retailers in the British Retail Consortium, and many others.

Reaching these goals will require massive, sustained, multi-decade investments such as replacing entire private fleets with electric vehicles, installing solar power, retrofitting or constructing new buildings that are much more energy efficient, redesigning packaging, and reducing embodied carbon (scope 3) through establishing programs with suppliers to reduce their emissions and building circular economy capabilities into product design and return/reuse processes. While these are all critical investments to reach net zero over the long run, it is also vitally important to do everything possible to start reducing emissions right now ... not years in the future. So, what can be done to make an impact within the next 12 months?





Starting with the Low Hanging Fruit

One of the biggest opportunities for immediate reduction in carbon emissions for retailers and brands is optimizing transportation, delivery, and reverse logistics—in particular truck transport, since the vast majority of U.S. retail goods are moved by truck. Even for imported goods, a large portion of their transport carbon footprint is in domestic ground transportation, due to the much higher carbon-efficiency of ocean transport. There are a variety of techniques for reducing middle- and last-mile carbon footprint, such as:



Continuous Transportation Optimization Reducing Miles Driven and Carbon Emitted



Tracking Carbon Emissions, Not Just Miles Driven



Supporting the Increasing Variety of Delivery Vehicles and Modes



Leveraging Telematics to Improve Driving Behavior and Vehicle Performance



Minimizing and Optimizing Returns



Increasing First-attempt Delivery Rates



Consolidation and Mix-Mode Strategies



Integrating Private/Dedicated Fleet Optimization with Purchased Transportation



Improved Forecast Accuracy and Inventory Optimization for Hyper-local Distribution



Encouraging Customer Pickup

In the remainder of this piece, we examine each of these opportunities.

Continuous Transportation Optimization Reducing Miles Driven and Carbon Emitted

Route optimization software is used to plan and optimize the sequence of stops for vehicles and drivers in a private or dedicated fleet. Route optimization attempts to achieve the best balance of potentially conflicting goals (e.g., cost, service levels, utilization) within real-world constraints such as travel times, operational constraints (e.g., vehicle size, hours of operation, etc.), and resource availability (e.g., personnel, vehicles, dock doors, etc.). Some route optimization software also includes minimizing carbon footprint as one of the goals that can be prioritized. These tools can make a significant near-term difference in lowering the total carbon footprint for a delivery-intensive organization within months or weeks, for a modest cost (especially compared with major capital outlays such as electrifying a fleet). An example of a system that provides this kind of capability is FarEye's Intelligent Delivery Orchestration.

Traditionally, optimization was done in a batch mode overnight before the day of the deliveries. As these computationally intensive tasks took many hours, the cutoff time for accepting new orders could be during the afternoon or early evening of the day before delivery. Some systems can now execute continuous optimization, accepting and optimizing each order as they come in, incrementally building out and adjusting routes as more orders arrive. This gives the system multiple days to compute better optimization, resulting in a further reduction in miles driven and carbon emissions, while enabling a considerably later cutoff time for accepting the last orders, since only a small amount of additional computation is needed to incorporate those final orders.

Continuous optimization can also be used in customer-facing websites during order taking. It enables the system to understand which available slots are the greenest, with the lowest number of miles driven and/or carbon emitted. That information can be presented to users, to encourage them to pick those more optimal slots.

Optimization software and/or collaboration systems may also be used to minimize wasted 'empty miles', especially empty backhaul, to further reduce carbon emissions.





Tracking Carbon Emissions, Not Just Miles Driven

It is reasonable to ask, “if a route optimization system minimizes miles driven, isn’t that the same as minimizing carbon emissions?” Minimizing miles driven helps reduce emissions, but it misses many other factors that impact emissions, such as the type and gas mileage of the vehicle, load weight, idling time (e.g., stopped at traffic lights), road speeds, terrain, and many other factors. Different systems vary in the degree of sophistication and granularity with which they consider all the various factors impacting carbon emissions, so this is something worth asking about when selecting route optimization software.

Supporting the Increasing Variety of Delivery Vehicles and Modes

The continual robust growth of e-commerce, along with the demand for ever-shorter delivery times, is driving a fundamental shift in distribution networks to more hyperlocal delivery and micro-fulfillment centers. As well, companies are transitioning their fleets to hybrid and electric vehicles. These two trends have caused the variety of delivery modes and vehicle types to explode. This may include the full variety of vehicle sizes and formats with traditional internal combustion engine, hybrid, and fully electric drive systems. It may also include delivery via bicycles, on foot, autonomous robots and drones, motorcycles and scooters, and more. A modern delivery optimization system incorporates a wide and easily extensible variety of vehicles and modes, as well as understanding the carbon emissions of each.



Leveraging Telematics to Improve Driving Behavior and Vehicle Performance

Driving behavior, such as hard acceleration, hard braking, and excessive idling, can make a substantial difference in fuel consumption and thereby carbon emissions. A good training program is a key element of improving driving habits. Telematics, such as from mandated ELD devices, can also help. ELDs provide data such as Engine RPM, motion status, mileage, engine hours, and much more. These can be combined with GPS data to reliably record when the vehicle is in motion and directly measure the habits of each driver, including acceleration, braking, idling, cornering, gear shifting patterns, and route compliance. These measurements can be used to identify drivers that need additional training and pinpoint the specific habits that need to be improved.

Telematics, combined with driver inspections, maintenance, and route data, can also be used to detect maintenance issues (such as an improperly tuned engine), as well as predict future failures. A program of consistent vehicle inspections is a key piece of this puzzle. A mobile app that makes it quick and easy for the driver to check and record tire pressure and other aspects of vehicle condition can help ensure inspections are done consistently.

Minimizing and Optimizing Returns

As the number of returns has skyrocketed, the ability for retailers to reduce unnecessary returns and optimize the returns planning process is another opportunity to reduce carbon footprint. An avoided return saves both the outbound and return shipments. E-commerce website design can go a long way to reducing the number of returns through things such as making it extremely intuitive to find the right size and providing the right descriptions and tools to ensure customers know that what they are ordering is exactly what they intended to buy.

A program to continuously reduce the number of unnecessary returns should be put in place. Such a program could include monitoring the rate of returns, evaluating the reasons for and causes of returns, and crafting and implementing strategies to address those specific causes. Analytics can help identify carriers, routes, and drivers that have a higher rate of damaged goods. Retailers can work with those carriers and drivers to diagnose and rectify the issues. Insufficient or improper packaging and packing can be identified and remedied. Suppliers that have high defect rates can be notified and provided with information and incentives to fix the issues.

Most retailers also have ample room to improve their own returns and reverse logistics operations. This includes various methods to consolidate returns, such as the use of third-party partners as drop-off points, as well as encouraging customers to make returns at stores by making it extremely convenient (e.g., curbside drop-off or other no-wait solution). Store replenishment deliveries should be coordinated with returns to utilize the same trucks that are returning to the DC anyway. Analytics can determine the most profitable course of action for each return request, such as: a) let the customer keep the item, b) redeploy or dispose at the store, c) transship to another store, d) return to DC. This can help further reduce reverse logistics volumes and carbon emissions.



Increasing First-attempt Delivery Rates

First-attempt delivery rate (FADR) is an important metric. For deliveries that don't require a signature there are a few things that can help improve FADR, such as incorporating order-time shipping address validation into the website, easy-to-use ways for customers to indicate special instructions (e.g., specific door, porch, etc. for drop-off), and the ability to accumulate institutional knowledge on how to successfully deliver to confusing or difficult locations. Photo-based proof-of-delivery allows the driver to drop-off with confidence.

For deliveries that require a signature, or over-the-threshold or white-glove delivery, coordination with the customer becomes critical. It starts with a UI design that ensures the customer clearly understands what drop-off window they are agreeing to at the time of order placement. Then non-intrusive reminders of an upcoming delivery via the customer's channel of choice (text, phone call, email, etc.) with the ability for the customer to confirm or change the delivery window. Finally, providing the option for the customer to have real-time visibility on the day of delivery; an accurate view of where the delivery vehicle is and when to expect arrival. This can also be an opportunity for a final confirmation. A good example of improving FADR is how parcel carrier Blue Dart increased their first attempt delivery rates by 22% using FarEye's Intelligent Delivery Visibility and Intelligent Delivery Orchestration solutions to provide better visibility to customers and improving their route planning and optimization.

If delivery is going to be delayed beyond or accelerated before the agreed window, then the customer must be notified as early as possible, preferably by a live operator. Intelligent routing and dispatching systems will detect deviations early, to give the customer as much early warning as possible. These systems accommodate adjustments during the day of delivery, including coordinating in-the-field transfers of specific shipments between vehicles, resulting in increased FADR. Improving a company's FADR results in lower carbon emissions, reductions in fuel consumption, lower driver labor costs, and increased customer satisfaction. Intelligent Customer Experience provides many of these capabilities.

Consolidation and Mix-Mode Strategies:

Zone Skipping, Pool Distribution, and Inbound Consolidation

Consolidating shipments can reduce carbon emissions by defragmenting shipment patterns and increasing vehicle utilization. For parcel or LTL shipments that are bound for the same region, retailers may implement zone skipping or pool distribution. Instead of sending multiple individual shipments, a single full truckload is sent to either a parcel hub or to a consolidator. The parcel carrier or consolidator/pool distribution service provider then takes care of the final delivery.

Inbound consolidation is a similar concept, consolidating inbound shipments from suppliers within a specific region into a single full trailer to the retailer. Inbound consolidation typically requires coordination by the retailer.

Using rail whenever possible can also lower carbon emissions considerably, since rail transport emits four to six times fewer GHGs per ton-mile compared with truck transport. Rail and these other strategies will not work for every shipment. All deliveries—whether to a DC, store, or end customer—have a required delivery time window. The route optimization system needs to take into account whether the service window constraints can be met when deciding which, if any, of these consolidation and mode-mixing strategies should be used.





Integrating Private/Dedicated Fleet Optimization with Purchased Transportation

Private or dedicated fleets are typically managed separately from for-hire transportation, creating isolated 'islands of capacity' and missed opportunities to optimize across modes. By integrating fleet routing and for-hire transportation management systems (TMS), new opportunities are realized, often through seemingly counter-intuitive choices, using carriers where you previously used the private fleet or vice-versa. This not only reduces costs but lowers carbon emissions as well.



Forecast Accuracy and Inventory Optimization for Hyperlocal Distribution

The trend to hyperlocal distribution and micro-fulfillment centers increases inventory fragmentation in the distribution network, i.e., smaller pockets of inventory stocked across many more locations. That fragmentation greatly increases forecasting and inventory optimization challenges. When inventory is not held in the right place, it increases the distance to ship to the customer, thereby increasing the carbon footprint of delivery. Improvements to hyperlocal forecasts and inventory optimization reduce wasted moves (transshipments and returns) thereby further reducing the carbon footprint. A better forecast reduces the carbon emissions resulting from reverse logistics and the wasted embodied carbon for products that are returned for liquidation or disposal.



Encouraging Customer Pickup

Companies may encourage customers to pick up orders at stores or delivery lockers by providing and incentivizing free and user-friendly click and collect options. Customer pickup lowers the carbon footprint of the retailer, compared with home delivery. However, the question of whether customer pickup results in a lower overall delivery carbon footprint is a more complicated one. Retailers may provide customers with simple tools to calculate the lowest carbon delivery option for their specific order.

Emissions Tracking Dashboard and Reports

Retailers that are serious about reducing carbon emissions will implement an emissions dashboard and reporting system. Such a system should allow different views, slicing and dicing in dimensions such as by product line, geography, and lifecycle view (e.g., manufacturing, transport, storage, use, disposal, etc.). The drill down for emissions from transportation should support all modes, including multi-mode shipments, and provide further segmentation by region, distribution center, driver, and mode.

The system should support GHG measurement and reporting standards, such as the GHG Protocol Corporate Accounting and Reporting Standard and ISO 14064. Reports should help measure progress for specific programs and initiatives, to ensure stated goals are being met. These kinds of tracking systems are key to continual improvements, as well as supporting transparency and visibility to all stakeholders, including consumers, investors/owners, regulatory bodies, and employees. To this end, it is helpful to find transportation optimization systems that accurately measure carbon emissions for each shipment.

FarEye is an example of a last-mile solution provider that provides very capable transportation emissions tracking and a wide array of transportation GHG emissions reduction tools, including long-haul and last-mile route optimization with green vehicle capabilities, carrier allocation, vehicle inspection, delivery visibility, and returns management.



Reducing Emissions is Good for Business

The good news is that virtually all of these methods for reducing GHG emissions, also increase profits by reducing miles driven, optimizing maintenance, improving safety, and reducing returns. Furthermore, they help the company demonstrate, in a concrete measurable way, their contributions to tackling climate change. Reducing emissions is good for the triple bottom line (financial, environmental, society) and can help drive the growth of the company.



Sustainable supply chains grant companies benefits beyond reduced carbon footprints and operational costs. They can boost consumer loyalty and satisfaction, improve investor relations, and even attract employee talent, all of which provide compelling competitive advantages across industries."

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