

## 2024 SmartWay Leader: ArcBest<sup>®</sup>

### ABOUT COMPANY

# ArcBest

ArcBest<sup>®</sup> is a multibillion-dollar integrated logistics company that leverages a variety of services to meet customer supply chain needs. Serving as an advisor, ArcBest connects shippers to logistics solutions and is committed to developing innovative technology that creates efficiencies and advances the global supply chain.

**For more information, visit our website:**  
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### SMARTWAY PROFILES IN LEADERSHIP AREA OF EMPHASIS.

Information System and Data Innovation — Recent innovations in the acquisition, integration/fusion, analysis, modeling, or visualization of freight data. Application of data tools that are adaptable and user-friendly freight systems that leverage innovative private and public data sources while preserving their proprietary nature (e.g., use of real-time transportation visibility data, digital dashboards, artificial intelligence, application program interfaces, integration of freight-efficiency modules into business systems).

**“With City Route Optimization (CRO) technology, we’re on the leading edge of AI initiatives within the transportation industry. CRO provides key insights for improving processes and removing friction points within our city operations while reducing costs, enhancing productivity and customer experiences, and supporting the more sustainable future we’re working toward. We’re confident Phase 2 will produce even more positive results.”**

- Seth Runser, ArcBest President

### CITY ROUTE OPTIMIZATION FOR LESS-THAN-TRUCKLOAD MOVEMENTS.

City Route Optimization (CRO) is a logistics technology developed and implemented by ArcBest<sup>®</sup> for their less-than-truckload (LTL) carrier, ABF Freight<sup>®</sup>. With over 40,000 assets operating out of 240 service centers across North America, ABF picks up and delivers thousands of shipments each day in their city operations, serving customers with efficient pickup and delivery processes to keep their supply chains moving.

The goal of CRO technology is to optimize ABF's LTL operations — striving to increase productivity, improve customer experiences and reduce environmental impact. Created internally by data scientists and operational specialists, it uses machine learning and artificial intelligence to create algorithms that build optimized city routes by leveraging legacy knowledge and information on existing routes. CRO's projected

outcomes were improved sustainability and efficiencies for ABF's city operations and their customers as well as improved experiences for ABF drivers.

### Building City Route Optimization

For ABF's city operations to run smoothly, each morning, a team of inbound supervisors' plan driver schedules for the day. In the past, they coordinated these complex routes, using legacy knowledge and data from past shipping patterns, to develop a schedule that enabled them to deliver and pick up as much freight as possible on that day. While historically this was effective, urban growth and expansion, combined with supply chain changes over time, have made route planning increasingly more complex. This resulted in challenges that impact customer satisfaction, including additional shipping fees, mediocre customer experiences and a gradually increasing environmental impact.

As a trusted partner to their LTL customers, ArcBest leveraged technology and innovation to create a solution that minimizes costs, optimizes routes, and better deploys the ABF fleet. In 2020, ArcBest's Technologies team began exploring a large, diverse set of historical and current city and fleet operations data and identified opportunities to enhance the utilization of the company's daily capacity while reducing miles driven.

In the early stages, ArcBest looked for external support but discovered there was no technology available with the capabilities needed to optimize routes for ABF's expansive, nationwide network. Due to scheduled delivery times and pickup requests that filter in throughout the day, their operations became complicated to the point that external vendors couldn't provide a solution. The company needed an analytical approach that incorporated delivery and pickup into a single model, enabling them to reduce expenses, improve service and ultimately increase productivity with the same number of drivers. This pushed the teams to brainstorm internally and build what they needed using their expert data scientists and operational specialists.

ArcBest relied heavily on applying the concept of the Traveling Salesman Problem — examining the daily routes of a group of ABF service centers and identifying more efficient routes to reduce miles driven between each stop. During this time, analysts also began using hexagonal geospatial technology — an innovative approach for determining geographic zones compared to standard ZIP codes. Hexagonal zoning technology enabled every point of latitude and longitude to be mapped throughout the network. Combining this with large, diverse datasets from each service center into a single database and using rigorous statistical A/B testing, promising results were achieved.

After a year of research and development, in late 2021, ABF Freight began testing Phase 1 — which involved prescribing daily static routes based on historical trends and data mined from each service center, tracking when the prescribed routes were used and analyzing how they improved the local freight environment. They started testing at one location and then added additional service centers until they were testing at 10 facilities. After monitoring these locations and seeing positive results, the company began a broader rollout throughout 2022, and today, it's using CRO technology at every ABF service center, completely transforming ABF's city operations.

## OUTCOME/ RESULT/ IMPACT

-  Since fully implementing CRO, ABF has seen positive business impacts including denser city routes, fewer miles driven, less fuel consumption, reduced carbon footprint and increased productivity.
  - Efficiency gains and optimized routes enabled ABF Freight to handle more shipments and provide capacity for growth.
-  Optimizing LTL delivery routes has the co-benefit of relieving some road congestion.
  - CRO's optimization of ABF's LTL network resulted in a projected 1.5 percent increase in street productivity and a 17 percent reduction in using local cartage agents. (1)
-  CRO's optimization resulted in a cost savings of over \$13M annually, with additional significant financial savings anticipated as refinement of the process continues.
-  Improved fleet deployment impacts equipment pools, enabling ArcBest to better service new and existing customers by offering the right capacity at the right time. This also creates opportunities for intermodal shifts where the movement requirements align with rail characteristics.

REFERENCES: (1) [https://arcb.com/sites/default/files/ArcBest-2023-Sustainability\\_Report.pdf](https://arcb.com/sites/default/files/ArcBest-2023-Sustainability_Report.pdf).

## “LEADING THE WAY”: TRANSFERABLE LESSON LEARNED.

As ArcBest developed CRO, it discovered a tension between theory and practice and a need to allow feedback loops from operations to increase model fidelity. The teams worked together diligently to determine an appropriate balance between the most efficient steps and incorporating employee feedback throughout the iterative development process — which involved a heavy emphasis on compliance reporting from ABF's city dispatchers — to ensure CRO would benefit everyone involved or using the company's city operations.

ArcBest and ABF are actively piloting additional phases, which includes plans for increased real-time visibility. The technology and algorithms being built will consider daily fluctuations in freight levels and freight characteristics, providing an even greater opportunity to optimize routes and improve productivity.

## Call-Out Benefit

By making LTL deliveries more efficient using route optimization technology, freight customers can also benefit by lowering their overall carbon footprint.

Route optimization approaches that use postal zip codes or "drawing circles" to determine routes don't account for natural barriers, create unrealistic delivery areas, or leave gaps in coverage. The use of a "hexagonal zone" approach can create delivery zones that better represent the reality on the ground and better align with the capabilities of the facility servicing the area.

## CONCLUSION

Route optimization can have a significant impact on the efficiency of deliveries with co-benefits of reduced road congestion. Route optimization tools can be expected to have even greater impacts on freight efficiency as the algorithms are refined and opportunities for incorporating real-time data bear fruit.

### **SmartWay Profiles in Leadership**

*Profiles in Leadership* is SmartWay's newest recognition initiative. Beginning this year, EPA will recognize freight sustainability leadership actions of SmartWay Affiliates and eligible SmartWay Partners (Logistics companies, Air carriers, Barge carriers and Rail carriers). EPA developed this recognition concept after hearing that Affiliates and Partners would like to see greater opportunities for recognition of sector leadership. EPA SmartWay created this new type of recognition to provide additional opportunity for advancing freight transportation sustainability.

SmartWay defines leadership in this context as the ability to drive change, influence industry, lead freight efficiency performance, and sustain freight-related environmental excellence. *Profiles in Leadership* is an official SmartWay program acknowledgement of leadership demonstrated by investments that are strategic, financial, and innovative, which will yield future environmental and efficiency benefits.