Shipping the Right Snacks with the Fewest Vehicles and at the Lowest Cost

Mondelēz calculates shipping schedules in a fraction of the time it took them to do it by hand.

Mondelēz International

Mondelēz International empowers people to snack right in over 150 countries around the world, leading the future of snacking with iconic global and local brands. Mondelēz has operations in more than 80 countries and employs around 80,000 in their factories, offices, and research and development facilities.

Industry: Food and Beverage
Location: Europe
Use Cases: Logistics, Routing, Supply Chain
Website: mondelezinternational.com

Results

- Efficient and cost-effective schedules
- Automated tool that calculates shipping schedules
- Time saved versus making schedules by hand

Mondelēz International is one of the largest snack companies in the world—producing biscuits, chocolate, gum, and candy. Mondelēz Turkey produces the top-selling products in each of the snack brands. Its production facility, located in Gebze near Istanbul, is one of the largest factories of Mondelēz Europe and Mondelēz International.

Maximizing Shipping

Mondelēz Turkey transports all its products from one factory, in Gebze, to cities throughout Turkey. To deliver their products quickly and cost-efficiently, they must develop a shipment plan that makes the best use of the least number of vehicles, at the lowest cost.

This creates a complex challenge, especially since they must factor in variables like capacity, lead time, delivery time, route and vehicle availability, and product-based constraints. And when you consider pre-defined routes and sending orders by full- and partial-truckloads, the possible shipping combinations quickly grow into the millions.

Mondelēz was trying to assign the shipments to vehicles and routes manually. This process proved to be time-consuming and couldn't guarantee the optimal solution. With ever-growing shipment lists and constraints, Mondelēz decided to look for a provider who could deliver results in a reasonable time.

Helping to Move Food Faster

That's where Arute Solutions comes in. As a routing optimization provider in Istanbul, Arute Solutions uses machine learning and operations research to help organizations optimize their supply chain. For Mondelēz, Arute Solutions developed a Mixed Integer Programming (MIP) model to solve the daily shipping assignment problem.

> " Gurobi runs our model up to 92% faster than the other commercial solver."

Mehmet Arikkan
CEO, Arute Solutions

Solver Runtime

> **" The solution quality increased significantly, and the solving time decreased dramatically by switching to Gurobi. "**
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> **Mehmet Arikkan**
> *CEO, Arute Solutions*

"Before Gurobi, we solved the model with another commercial solver; however, the solution quality was not satisfactory. In most cases, no optimal or near-optimal solutions could be found within the defined time limits," explained Mehmet Arıkkan, CEO of Arute Solutions.
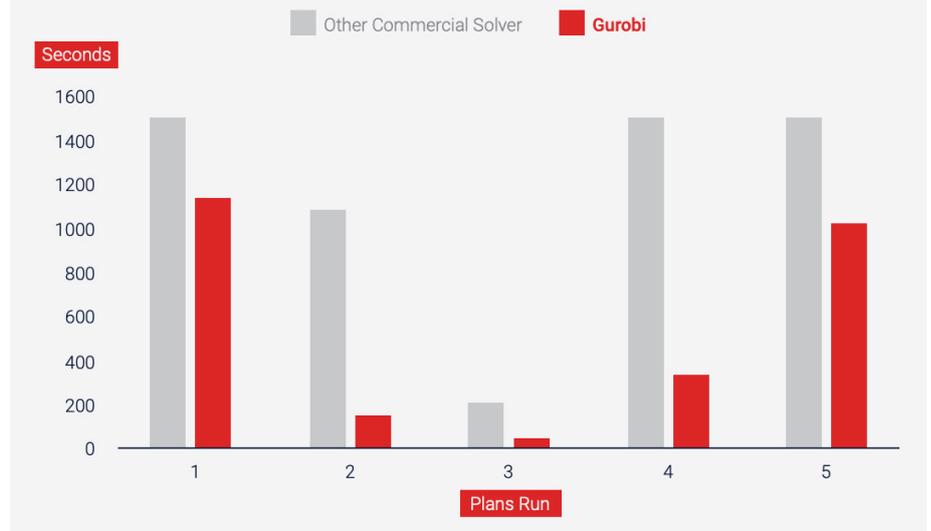
"Once we started using Gurobi, the model was advanced to a level that creates the optimal or near-optimal solutions within a very short amount of time," he added. "The solution quality increased significantly, and the solving time decreased dramatically by switching to Gurobi."

Solving in Half the Time

With their Arute-designed model, powered by Gurobi, Mondelēz now has an automated tool that calculates shipping schedules in a fraction of the time it took them to do it by hand. And they can have confidence that the proposed schedule is the most efficient and cost-effective option possible.

"Gurobi runs our model up to 92% faster than the other commercial solver. It provides a huge advantage and performance improvement," Arıkkan said.

"What's more, Gurobi improves the solution quality by 7% on average, compared to the other solver—including the quality of vehicle assignments, vehicle utilization, and total costs," Arıkkan explained. "We plan to use Gurobi for all of our future routing and assignment projects and customers."

> **" Gurobi provides a huge advantage and performance improvement [over other commercial solvers]. "**
>
> **Mehmet Arikkan**
> *CEO, Arute Solutions*

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