



CASE STUDY

# A smarter way to ship snacks

How Mondelez helps keep shelves stocked



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

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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

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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.

"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 Arikkan, 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."

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Gurobi provides a huge advantage over other commercial solvers.

**MEHMET ARIKKAN**  
CEO, ARUTE SOLUTIONS

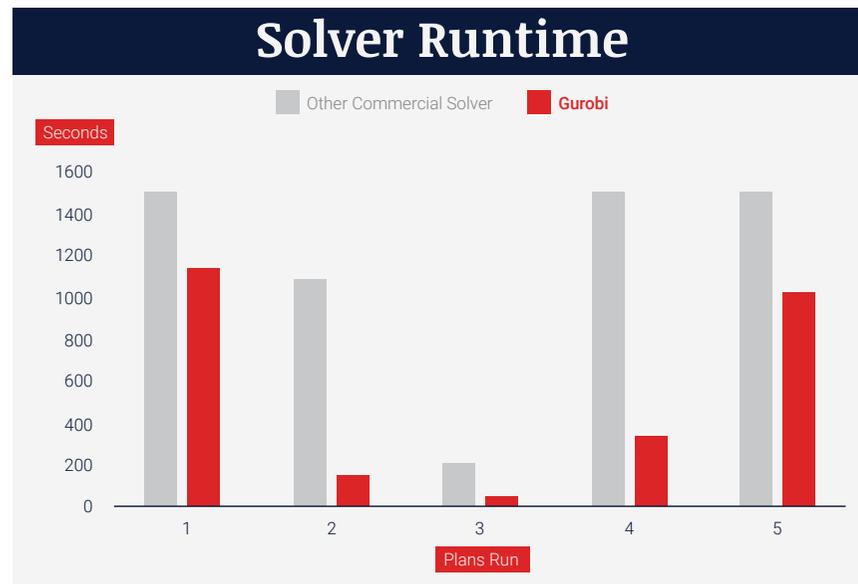
# Solving in half the time

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,” Arikkan 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,” Arikkan explained.

“We plan to use Gurobi for all of our future routing and assignment projects and customers,” he added.



Gurobi’s time-to-solution was faster than the competition, for each plan Arute Solutions ran.

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We’ll be using Gurobi for all our future routing and assignment projects and customers.

**MEHMET ARIKKAN**  
CEO, ARUTE SOLUTIONS

For more  
information

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[www.gurobi.com](http://www.gurobi.com)

