

TACKLING ROUTE COMPLEXITY: QUANTUM OPTIMIZATION FOR EFFICIENT, SCALABLE LOGISTICS

Vehicle routing poses a complex challenge common for logistics, including last-mile delivery, emergency response, and fleet operations:

How can organizations effectively plan and optimize routes for multiple vehicles to ensure efficient deliveries, pickups, or services while considering factors like vehicle capacity, time constraints, ever-changing traffic conditions, and sustainability practices?

Logistics fleet operators need to adapt to dynamic conditions such as fluctuating traffic patterns, unexpected road closures, and unpredictable weather.

But as fleets grow and delivery destinations multiply, scalability becomes a challenge, making route planning increasingly difficult. For emergency services, finding the most optimal routes is critical due to immense time pressures. These organizations are also looking at better ways to manage fuel usage and driver time to both cut operational costs and minimize environmental impact.

QUANTUM OPTIMIZATION: A POWERFUL SOLUTION

Quantum-powered vehicle routing optimization can address a myriad of logistics-related pain points by simultaneously processing vast datasets to identify better, more efficient, and more sustainable options — all of which are increasingly beyond the reach of classical computing solutions. Quantum-optimized vehicle routing enables organizations to adapt in real-time to dynamic conditions to continuously refine routes as situations evolve. It is inherently scalable, capable of meeting the demands of extensive fleets and complex delivery networks. Furthermore, it can pinpoint more efficient routes, leading to reduced costs and improved delivery times.

With D-Wave, logistics operations can solve these and many other complex optimization problems through hybrid quantum computing solutions that utilize the best of classical and quantum computing technologies. D-Wave's annealing quantum computers, boasting over 5,000 qubits, are the largest in the world. They enable organizations to leverage quantum programming to develop advanced commercial applications. Through the Leap™ quantum cloud service, customers can access hybrid solvers capable of handling problems with millions of variables and hundreds of thousands of constraints. **This secure, real-time, production-grade service offers over 99% uptime and availability.**



BENEFITS OF QUANTUM-POWERED VEHICLE ROUTING

- Reduces downtime and optimizes routes, leading to timely deliveries and enhanced operational efficiency.
- Increases customer satisfaction by consistently meeting delivery expectations.
- Instantly adjusts routes in response to changing conditions.

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USE CASE: QUANTUM OPTIMIZATION IN ACTION AT MOMENTUM

Momentum Worldwide, part of the Interpublic Group of Companies, organizes over 18,000 brand experience events annually. The company worked with D-Wave on a project to optimize four tours across four different U.S. regions for one of its largest clients. The planning process considered several factors, including store square footage, ample parking space, building ownership, the absence of nearby movie theaters, ecological impact, and team comfort. Potential solutions were overwhelmingly high based on 4,567 store locations. Ordinarily, this would necessitate months of dedication from Momentum's event-planning team. However, D-Wave's hybrid quantum solution efficiently provided 100 fully optimized routes in under an hour.



"D-Wave worked to ensure that we had a tremendously positive experience in helping to translate the business challenges into these mathematical models."

— Jason Snyder, Momentum's Global CTO

GET STARTED NOW

Are you ready to explore how quantum optimization can meet your vehicle routing needs?

With our hands-on team of experts and our Launch™ program, it's easy to reap the benefits of quantum optimization now. Our team will guide you through every step of your journey: we'll validate your use case, offer an optimized and thoroughly tested solution, and ensure a smooth path to production deployment.

Sign up for a consultation today.

