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Global Quantum Computing in Automotive Market Size Study & Forecast, by Technology Type (Superconducting Quantum Computing, Quantum Annealing, Photonic Quantum Computing) and Application (Autonomous Driving, Traffic Optimization), and Regional Forecasts 2025-2035

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Abstracts

The Global Quantum Computing in Automotive Market is valued at approximately USD 0.56 billion in 2024 and is projected to expand at a striking CAGR of 31.13% over the forecast period of 2025–2035. This market represents a decisive inflection point where advanced computational science begins to reshape the automotive value chain from the ground up. Quantum computing, once confined to academic laboratories, is now being gradually woven into automotive R&D, engineering, and operations to tackle problems that classical systems struggle to compute efficiently. From optimizing complex vehicle architectures to modeling battery chemistry at the molecular level, quantum technologies are setting the stage for a new era of intelligent, data-driven mobility solutions that evolve continuously over time.

The accelerating push toward autonomous, electric, and software-defined vehicles has significantly amplified the demand for exponentially higher computing power. Automotive OEMs and technology partners are increasingly leaning into quantum-enabled platforms to work through highly complex simulations, optimization challenges, and probabilistic models that underpin next-generation vehicle systems. Cloud-based quantum access, strategic alliances between automakers and quantum technology vendors, and rising investments from governments and private institutions are collectively scaling up experimentation and early-stage commercialization. While the ecosystem is still maturing, the momentum is unmistakable, as early adopters race to

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lock in intellectual property advantages and future-proof their technology roadmaps amid intensifying competition.

The detailed segments and sub-segments included in the report are:

By Technology Type:

Superconducting Quantum Computing

Quantum Annealing

Photonic Quantum Computing

By Application:

Autonomous Driving

Traffic Flow Optimization

Vehicle Design Simulation

Battery Chemistry Modeling

Predictive Maintenance

Supply Chain and Logistics Optimization

By Component:

Quantum Processors

Quantum Software Platforms

Quantum Sensors

Quantum Algorithms

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By Deployment Type:

- Cloud-Based Quantum Solutions
- On-Premise Quantum Systems

By End-User:

- OEMs (Original Equipment Manufacturers)
- Tier 1 Suppliers
- Fleet Operators
- R&D Institutions

Among all applications, autonomous driving is expected to dominate the Global Quantum Computing in Automotive Market over the forecast period. The development of self-driving systems demands enormous computational throughput to process sensor fusion, real-time decision-making, and scenario-based risk modeling under constantly changing conditions. Quantum computing offers a compelling pathway to solve these multi-variable optimization problems faster and more accurately, enabling automakers to shorten development cycles while enhancing safety and reliability. As autonomy inches closer to large-scale deployment, quantum-backed algorithms are likely to become a critical differentiator in competitive positioning.

In terms of revenue contribution, superconducting quantum computing currently leads the market. This segment benefits from comparatively higher technological maturity, stronger industry backing, and broader availability through cloud-based delivery models. Leading technology providers are actively rolling out superconducting systems as a service, which allows automotive players to experiment and scale without heavy upfront infrastructure investments. While quantum annealing continues to gain relevance in optimization-heavy use cases and photonic quantum computing holds long-term promise, superconducting platforms presently account for the largest share of commercial and pilot revenues across the automotive quantum landscape.

Regionally, North America dominates the Global Quantum Computing in Automotive

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Market, driven by a robust concentration of quantum technology developers, automotive innovators, and well-funded research institutions. The region's collaborative ecosystem enables rapid prototyping and early adoption of quantum use cases across vehicle design, logistics, and autonomy. Europe follows closely, supported by strong OEM participation, cross-border research initiatives, and regulatory encouragement for advanced mobility technologies. Asia Pacific is anticipated to emerge as the fastest-growing region during the forecast period, fueled by aggressive investments in quantum research, expanding automotive manufacturing capacity, and government-led innovation programs across countries such as China, Japan, and South Korea.

Major market players included in this report are:

IBM Corporation

Google LLC

Microsoft Corporation

Intel Corporation

NVIDIA Corporation

Amazon Web Services, Inc.

D-Wave Systems Inc.

Rigetti Computing, Inc.

Honeywell International Inc.

Qualcomm Incorporated

Robert Bosch GmbH

BMW Group

Toyota Motor Corporation

Volkswagen AG

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Tesla, Inc.

Global Quantum Computing in Automotive Market Report Scope:

Historical Data – 2023, 2024

Base Year for Estimation – 2024

Forecast period – 2025–2035

Report Coverage – Revenue forecast, Company Ranking, Competitive Landscape, Growth factors, and Trends

Regional Scope – North America; Europe; Asia Pacific; Latin America; Middle East & Africa

Customization Scope – Free report customization (equivalent to up to 8 analysts' working hours) with purchase. Addition or alteration to country, regional & segment scope*

The objective of the study is to define market sizes of different segments and countries in recent years and to forecast their values over the coming decade. The report is structured to integrate both qualitative insights and quantitative rigor, shedding light on the technological, commercial, and strategic forces shaping quantum adoption in the automotive sector. It also outlines critical drivers, emerging challenges, and untapped opportunities within micro-markets, while delivering a detailed assessment of the competitive landscape and product strategies of key industry participants.

Key Takeaways:

Market estimates and forecasts spanning 2025–2035.

Annualized revenues with regional and segment-level analysis.

In-depth geographical assessment with country-level insights.

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Comprehensive competitive landscape of leading market players.

Strategic evaluation of business approaches and future market pathways.

Balanced demand-side and supply-side analysis of the market.

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Contents

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CHAPTER 4. GLOBAL QUANTUM COMPUTING IN AUTOMOTIVE INDUSTRY ANALYSIS

CHAPTER 5. GLOBAL QUANTUM COMPUTING IN AUTOMOTIVE MARKET SIZE & FORECASTS BY TECHNOLOGY TYPE 2025-2035

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CHAPTER 6. GLOBAL QUANTUM COMPUTING IN AUTOMOTIVE MARKET SIZE & FORECASTS BY APPLICATION 2025-2035

CHAPTER 7. GLOBAL QUANTUM COMPUTING IN AUTOMOTIVE MARKET SIZE & FORECASTS BY COMPONENT 2025–2035

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CHAPTER 11. COMPETITIVE INTELLIGENCE

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List Of Tables

LIST OF TABLES

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List Of Figures

LIST OF FIGURES

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