

Global LiDAR - Market Share Analysis, Industry Trends & Statistics, Growth Forecasts 2019 - 2029

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Report description:

The Global LiDAR Market size is estimated at USD 2.57 trillion in 2024, and is expected to reach USD 6.38 trillion by 2029, growing at a CAGR of 19.93% during the forecast period (2024-2029).

One of the primary factors augmenting the LiDAR market growth is the increasing use of LiDAR systems in UAVs, the use of LiDAR in engineering and construction applications, the use of LiDAR in geographical information systems (GIS) applications, the emergence of 4D LiDAR, and the loosening of regulations surrounding the use of commercial drones in various applications. The market's expansion is being held back by safety concerns around UAVs and autonomous vehicles, as well as the accessibility of affordable and lightweight photogrammetry devices.

Key Highlights

- Globally, and especially in developing nations, the size and scope of engineering and civil construction activities have greatly increased to accommodate the growing population. All stages of building activities, from surveying and mapping to conducting project feasibility studies, call for an increasing amount of technology. LiDAR technologies can easily and accurately give a detailed survey of vast areas. Additionally, global positioning system-assisted laser scanners and extremely sensitive cameras assist engineers in creating designs that meet project criteria and accurate feasibility assessments. Many LiDAR service providers have expanded as a result of this.
- According to US Census Bureau, between 2002 and 2021, the United States saw a huge increase in the value of public residential construction spending. In comparison to 2020, the public sector spent over USD 9 billion on residential development projects in 2021. The highest increase occurred in 2020, when public residential spending increased to USD 9.19 billion, a significant increase over USD 6.89 billion the previous year. The overall value of new residential construction in the US is expected to increase over the coming years.

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-In the oil and gas and mining sector, LiDAR technology allows scientists and mapping professionals to examine built and natural environments across a wide range of scales with greater accuracy, precision, and flexibility than ever before. The encouragement from the government in automation and the adoption of LiDAR in various government sector activities, like flood relief and management, are also driving the industry's growth. In India, the Transport Ministry mandated the use of LiDAR systems in surveying areas before constructing a new highway.

-For instance, in August 2021, A Bozeman, a high-tech laser company, scored a multimillion-dollar contract to scan and map methane emissions for one of the nation's largest gas utility companies. The company signed USD 12 million contract with Southern California Gas Company / SoCalGas to survey gas leaks with its LiDAR (Light Detection and Ranging) technology.

-The COVID-19 outbreak affected industries around the world. The automotive industry is one of the significant adopters of LiDAR. The outbreak has resulted in the shutdown of various production plants impacting the demand. Semiconductor materials scarcity has further aggravated the situation. The China Association of Automobile Manufacturers revised its predictions for 2020, projecting a 10% drop in sales for the first half of the year and 5% for the full year on account of the COVID-19 outbreak. According to the SMMT, car output was to fall by 18% in 2020 as a result of COVID-19 closing all the major UK plants.

LiDAR Market Trends

Robotic Vehicles are among the Factors Driving the Market

- This segment is considering using LiDAR technology in robotic cars, automotive guided vehicles (AGVs), uncrewed vehicles, and drones. ADAS (Advanced Driver Assist System) is an acronym for Advanced Driver Assist System. LiDAR is one of the most advanced technologies currently being used to develop self-driving cars and autonomous vehicles. LiDAR (Light Detection And Ranging) can be used by autonomous drones, robots, and vehicles for navigation, obstacle detection, and collision avoidance.

- LiDAR enables self-driving vehicles, AGVs, and other drones to make precise judgments without human error, making them less susceptible to crashes. This has increased in recent years due to technological advancements and the relative cost reduction of LiDAR sensors. A self-driving car can see the world with a continuous 360-degree view thanks to LiDAR. It also allows for highly accurate depth information.

- When mounted on an AGV, a LiDAR sensor sends out a series of laser pulses that measure the distance between objects and the vehicle. This compiled data creates a full 360 environmental map of the operational area. The resulting mapping allows the AGV to navigate the facility without additional infrastructure.

- Using LiDAR in robotic vehicles entails using multiple LiDARs to map the vehicle's surroundings. The use of LiDAR is required for a high level of sensor redundancy to ensure the safety of its passengers. The proper development of fully autonomous or robotic vehicles for passengers is still in the works, and LiDAR is expected to play a significant role in these as well.

- LiDAR for robotic navigation provides critical distance measurement information about the environment and the vehicle's position on objects. Rapidly expanding e-commerce and a greater emphasis on workplace safety are driving massive growth in the Autonomous Mobile Robot (AMR) and Automatic Guided Vehicle (AGV) markets. Such factors will drive up demand for LiDAR applications in robotic vehicles.

- For example, RoboSense, a Smart LiDAR Sensor Systems provider, held a new product launch in November 2022, RS-LiDAR-E1 (E1), a flash solid-state LiDAR that sees 360 based on its in-house, custom-developed chips, and flash technology platform. E1 will help partners bridge the gap in smart driving perception and improve the all-scenario perception capability of automated and autonomous vehicles as a critical piece to realizing the core functions of autonomous driving.

- Furthermore, mobile robots operating outside can rely on geolocation capabilities such as GPS, as well as sensing technologies such as Lidar, to determine where they are and where they are going. LiDAR sensors are classified as navigation or obstacle avoidance sensors. The demand for Robot vehicles is expected to increase as E-commerce sales increase due to their wide range of applications. The market for LiDARs for robotic vehicle applications will be fueled by an increase in E-commerce sales.

- For instance, Velodyne Lidar Inc. announced in June 2022 that Boston Dynamics would use its lidar sensors in its robots as part of

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a multi-year agreement. According to the company, its Lidar sensors enable mobile robots (AMR) to operate autonomously in a variety of conditions, including changing temperatures and rainstorms. Robots can use their sensors to obtain real-time 3D perception data for localization, mapping, object classification, and object tracking.

Latin America is Expected to Observe Significant Growth

- Latin America has dense forest cover and can be identified as a developing economy, indicating significant expansion and excavation opportunities. Owing to the native nature of the region, coupled with LiDAR technology, the region is expected to witness solid growth in the studied market.
- According to the Food and Agriculture Organization (FAO) of the United Nations, 49% of the total area of Latin America and the Caribbean is covered by forests. The region's forest cover includes 891 million hectares, representing approximately 22% of the global forest area. The region is home to 57% of the world's primary forests, which makes it vital for biodiversity and conservation.
- Research studies have been published showing the use of LiDAR technology for mapping the tree diversity in the tropical forest region of Choco-Columbia. The study published in April 2021 outlines the method to map various metrics integrating discrete light detection and ranging (LiDAR), among other technologies, which shows the possibility of integrating inventories of vegetation and remote sensing data for building accurate maps of tree diversity in tropical forest regions. Further, the study mentioned that using LiDAR data was instrumental in deriving the forest structural metrics associated with optical and SAR image data.
- Furthermore, according to FAO, 14% of the total forest area has been earmarked for productive functions. The region's significant forest resources create a wide-open prospect for the adoption of the Lidar technology for its adoption in forestry. LiDAR-equipped drones can be used over these forest areas to create 3D models that illustrate the impact of human activity. Furthermore, owing to the capacity of LiDAR to penetrate tree cover makes it exceptionally useful for the region's thick forest-covered area.
- In addition to the applications of technology in forestry, the region is marked for its farming lands. FAO has titled Latin America and the Caribbean as the pillar for world food security with a mission of driving the necessary agri-food systems transformation to feed 10 billion people by 2050. Such ambitious goals, coupled with increasing regional agricultural exports, are expected to support the adoption of the technology in the sector.

LiDAR Industry Overview

The LiDAR Market is fragmented due to many large and small players churning the competition in the market. Through product and technology launches, strategic partnerships, acquisitions, expansion, and collaboration, these players try to gain a competitive edge in the market. Key players in the market are Sick AG, Teledyne Optech, Quanergy Systems Inc., Velodyne LiDAR, 3D Laser Mapping Ltd, Denso Corporation, etc.

In June 2022, the new Leica Chiroptera-5 bathymetric LiDAR sensor offers a 40% higher point density, a 20% improvement in water depth penetration, and better topographic sensitivity to produce more precise hydrographic maps. This most recent mapping technology improves the sensor's topographic sensitivity, point density, and depth penetration compared to earlier generations. The new technology provides high-resolution LiDAR data to assist various applications, including nautical charting, coastal infrastructure design, environmental monitoring, and risk assessments for landslides and erosion.

In May 2022, Optical Phased Array (OPA) technology from Quanergy Systems Inc., LiDAR sensors, and smart 3D solutions supplier successfully detected objects at a distance of 250 meters. This advances the path towards the productization of its S3 Series LiDAR, a true solid-state sensor using an industry-first, scalable CMOS silicon manufacturing process created for cost-effective,

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mass-market production by increasing the range demonstrated earlier in the year by 2.5 times what was demonstrated in 2021.

Additional Benefits:

- The market estimate (ME) sheet in Excel format
- 3 months of analyst support

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