LiDAR-Based Traffic Management for Smart City Planning

QORTEXDTC™ & M8™ LiDAR Sensor Reduce Traffic Congestion

Overview

As the global population grows and migrates to urban areas, traffic congestion problems in cities continue to worsen. In addition to economic costs, the pollutants emitted by vehicles in traffic jams contribute to poor air quality and impact public health. In an effort to reduce traffic congestion, government officials in the city of Adelaide in South Australia went searching for a technology that would provide a solution to the growing concerns of traffic congestion.

Problem

City officials in Adelaide saw increasing traffic issues arising throughout the city as the population continued to grow. After realizing that the addition of lanes and constructing more roads, tunnels and bridges would not resolve the problem, officials came to the conclusion that they would need a new, smart solution that could address a complex range of factors. They intended to find a system that would provide data about the movement of vehicles and pedestrians as they cross and approach a given intersection. They also needed the technology to provide reports indicating how congestion could be measured at the intersection, specifically on a lane-by-lane basis. Both of these pieces of information were necessary for assisting officials in their city planning.

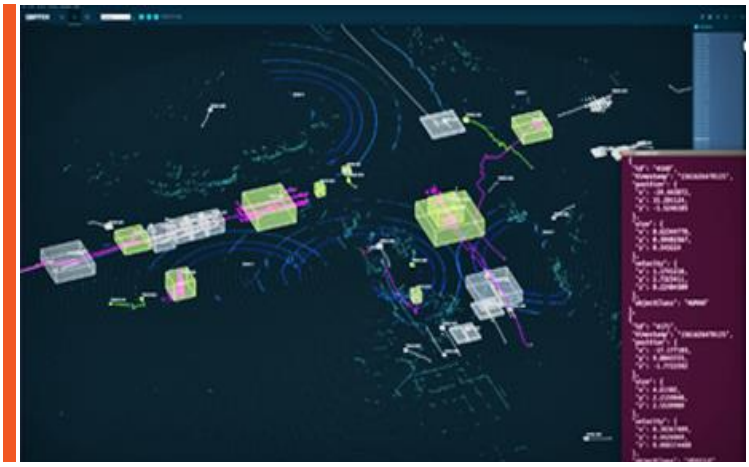
Solution

Adelaide officials chose Quanergy's technology, in partnership with Cisco Australia, to deploy a system using six Quanergy M8 lidar sensors and the QORTEX DTC™ (Detection, Tracking and Classification) solution to gather a range of information about traffic approaching the intersection of Grenfell and Pulteney streets in Adelaide.

QORTEX DTC™ was able to detect and identify people walking in the intersection and vehicles as far as 70m from the intersection as moving "objects." Once an object is detected, the technology then classifies it into two groups: "vehicle" and "human." The QORTEX DTC solution was able to identify the location and speed of vehicles as well as provide location and movement data about pedestrians.

Using QuantumIT data processing, Quanergy's QORTEX DTC™ technology provided real-time object information to traffic signal controllers which reduced traffic congestion. Specifically, the technology was able to determine average speed per lane, vehicle count per lane, vehicle dwell time, people count and average person speed. With this information, the traffic system can infer – based on frequency queues of vehicles and pedestrians at an intersection – when to change traffic light intervals to positively influence vehicle and pedestrian queue length.

Intersection of Grenfell and Pulteney streets in Adelaide



QORTEX DTC™ view of intersection. Object boxes detect track and classify vehicles and pedestrians. QORTEX DTC also calculates object position, size and, velocity

Conclusion

This Smart City pilot provided the city of Adelaide with the necessary information it needed for improved traffic planning. Quanergy's M8 LiDAR sensors and QORTEX DTC software technology made it possible to detect and classify pedestrians and vehicles of different shapes and sizes, from a small street sweeper to large buses and trucks. These classification details gave city officials insight into the frequency and time of day that larger and smaller vehicles are traveling throughout the city. When this data is combined with information about pedestrians walking through or waiting at intersections, city officials can more efficiently make road structure and planning decisions. The rich data collected from Quanergy's system of sensors and QORTEX software are helping cities like Adelaide to identify and solve the biggest mobility challenges as well as prioritize spending as they begin planning the cities of the future.