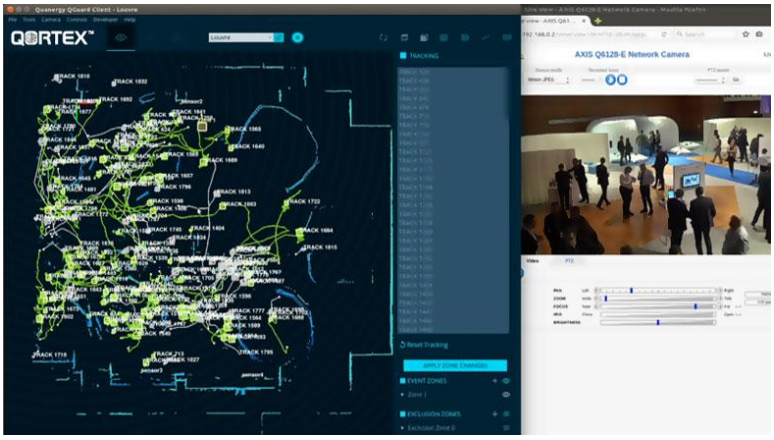
Why Use LiDAR in Smart Cities?

Quanergy's portfolio of 3D LiDAR sensors and perception software offers the most accurate and intelligent solutions for smart spaces.

Overview

Cities around the world are investing in technological solutions to efficiently plan for unprecedented urban growth. The challenges posed by such growth include the need to minimize traffic congestion, drastically reduce CO^2 concentrations and increase the general safety of citizens. Likewise, airports around the world are seeking ways to accommodate increased traffic flow and prevent longer wait times and passenger discontent. Effective solutions to these challenges must also protect the privacy of citizens and employees alike and utilize systems that operate reliably and accurately on a 24/7 basis under all weather conditions.

Traditional solutions based on cameras, radars and thermal sensors fall short of these objectives since they do not operate in all lighting conditions and cannot uniformly provide the required level of accuracy. Cameras, moreover, provide only 2D data and do not adequately protect people's privacy.



Quanergy People Counting at Museum

Quanergy's 3D LiDAR solutions provide unmatched benefits to smart city applications by:

- Operating in darkness or daylight and in challenging weather conditions
- Tracking hundreds of individual objects simultaneously
- Providing centimeter-accurate 3D data
- Providing anonymous data, thereby protecting individual privacy

Smart Public Traffic Management

Quanergy LiDAR for Hangzhou Smart City in China

Municipalities around the globe are investing in smart sensing systems to reduce traffic congestion, accelerate vehicle and people flows and help ensure public safety. Examples include:

- Traffic flow management (control of traffic lights, monitoring of intersections)
- Pedestrian safety (smart lights, jaywalking detection)

- Parking lots (parking space occupancy, monitoring of truck rest stops)
- Controlled autonomous vehicles (robotaxis, AV shuttles in reserved lanes)
- Vehicle detection (at toll booths, on-/off-ramps, etc.)
- Public transportation safety (subway/railway monitoring and alarms)
- Crowd flow management (at airports, sport arenas, etc.)

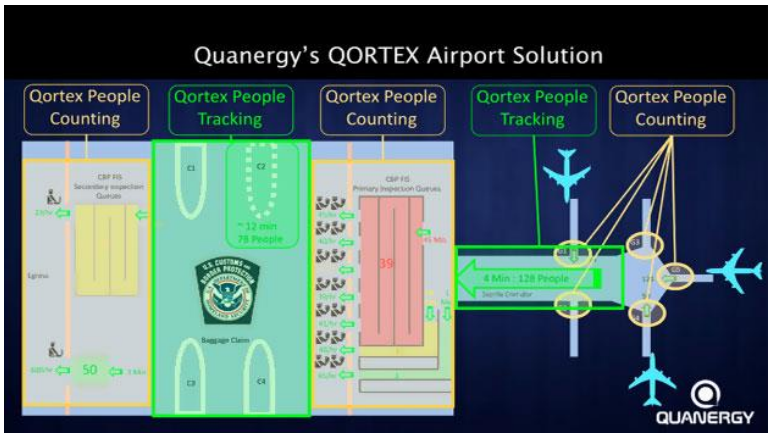
Quanergy's 3D LiDAR sensors and QORTEX™ DTC perception software track people and vehicles while providing real-time 3D object information to traffic system controllers. Quanergy's Smart City solution determines vehicle and people count, direction, speed, and location. With this information, traffic systems effectively manage vehicle and pedestrian flows, contributing to a safer

M8™ LiDAR sensor at Hangzhou, China

municipal environment. Quanergy has commercially deployed Smart City solutions around the world, including Las Vegas, Orlando, and Tampa in the United States, as well as Hangzhou, China, and Adelaide, Australia.

Smart Airports Passenger Management

Air travel has been on the rise since rebounding after the 2008 recession. Airports such as the Los Angeles International Airport (LAX) have seen annual passenger count grow by 60% since 2009. For LAX that means managing nearly 90 million passengers in 2019, up from 56 million in 2009. Chicago O'Hare and Midway, the busiest airport system in the US, handled over 105 million passengers in 2018, growing by over 4 million passengers in just one year! Dealing with millions of additional passengers within the same physical infrastructure every year requires far better tools for operational awareness and efficiency.



QORTEX™
Airport Solution

Moreover, wasting time in a line, in addition to frustrating passengers, limits the time they could be shopping or enjoying additional services, therefore limiting airports' revenue opportunities.

Smart LiDARs come to the rescue. Quanergy's 3D LiDAR AI-powered people-counting solution helps airports create intuitive dashboards and information services to visualize and manage real-time traffic flows. Quanergy and its partners, such as iinside and SITA, are deploying People Flow Management solutions at international and regional airports around the world. Airports in Indianapolis, Miami, Baltimore, Las Vegas, Jackson (Miss.), and Singapore, among others, have installed LiDAR-based indoor motion analytics solutions to better manage security checkpoints and improve passenger flow through their concourses.

M8™ LiDAR sensor at
Miami Airport

Conclusion

Quanergy's 3D LiDAR sensors and perception software offer unparalleled technology enabling modern smart cities to meet many pressing challenges of urban expansion. Vehicles and pedestrians can be classified and their movements tracked across a variety of traffic spaces, whether outdoor (intersections, parking lots, rest stops, on-/off-ramps, etc.) or indoor (airports, sports arenas, etc.). Quanergy's LiDAR-based technology offers advantages not available with more traditional technologies that rely on microwaves, thermal sensors, or video cameras. LiDAR provides:

- Unmatched accuracy and reliability in any weather or lighting conditions
- Real-time 3D data for enhanced classification and assessment capabilities
- Anonymity and privacy of detected objects

The rich data collected from Quanergy's M8™ LiDAR sensors and processed by the QORTEX DTC™ software technology allow city officials to more efficiently face major mobility challenges and prioritize spending when planning the cities of the future.

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