

SOLUTION OVERVIEW

# Ouster for intelligent transportation systems

Enabling safe and efficient mobility



## Safety and efficiency are top priorities

For decades, cities and federal agencies have worked to balance the need for road safety and traffic efficiency. The two are deeply intertwined, with one having a mirrored effect on the other. Reducing congestion decreases traffic accidents. Reducing traffic accidents decreases congestion. And while global initiatives like the United Nations Road Safety Collaboration and Vision Zero bring these issues to the forefront of our attention, the statistics simply aren't getting better. **Over 1.3 million lives worldwide continue to be lost each year due to preventable traffic accidents, with over half of those among vulnerable road users<sup>1</sup>.**



## Investing in connected technology leads to long-term, quantifiable outcomes

Sustainable change requires a comprehensive approach that considers street design, policies, and building intelligent infrastructure for safer mobility. This starts with making incremental improvements driven by connected technology. These investments can be implemented quickly and yield the highest positive returns in safety and efficiency.

For example, Colorado's Snowmass Canyon saw a 100% reduction in winter weather-related accidents after implementing an automated speed warning system<sup>2</sup>. In California, deploying a coordinated traffic signal control system across a 6-mile Connected Corridor reduced congestion, resulting in a 8% reduction of fuel emissions<sup>3</sup>.

**The success of these intelligent transportation systems relies on the underlying technology and detection systems that collect and make use of data. That data simply has to be accurate.**

Traditional detection systems (radar, cameras, loops) often do not provide the granularity and accuracy of data needed for effective transportation management. Camera-based systems, for example, struggle with depth perception, a critical requirement for identifying events like near-miss incidents. Just one false call or detection failure could result in dangerous conditions.

Using traditional detection systems requires many sensors and many types of sensors to outfit a single intersection. Supporting multiple traffic applications becomes complex: one sensor per lane for stop bar detection, one sensor for pedestrian detection, one sensor for bicycle detection, and the list goes on.

## This is where lidar comes in

A single lidar sensor can handle multiple applications, delivering better overall performance and increased detection accuracy across vehicles, pedestrians, and bicyclists.

With lidar, cities get a detection system that can perform reliably, scale economically, and address the changing needs of all road users and all forms of transportation while still delivering highly accurate data.

Performance capabilities	Lidar	Radar	Video	Thermal	Loops
Privacy-safe data	●	●	●	●	●
Accurately detects and classifies vehicles, pedestrians, and bicyclists	●	●	●	●	●
Accurately measures object speed and velocity	●	●	●	●	●
Accurately measures depth and distances	●	●	●	●	●
Reliably detects across changes in lighting (glare, nighttime, shadows) and temperature	●	●	●	●	●
Ability to read signs and differentiate color	●	●	●	●	●

## Lidar: Enabling smarter transportation systems

Lidar is commonly used to provide enhanced 3D vision to autonomous vehicles, delivering a level of spatial awareness and detection far more accurate than the human eye or other technologies alone.

**Lidar is one of the most advanced technologies today, and can be the driving force behind powering safer, more efficient mobility.**

Ouster lidar sensors deliver the capabilities of multiple traditional detection methods in a single sensor. They accurately detect and identify vehicles, pedestrians, and bicycles, as well as specific scenarios such as stop-bar detection, advanced vehicle detection, and pedestrian curb presence. Ouster does all of this with just one or two sensors per intersection, reducing total costs and installation and maintenance efforts.



# Ouster lidar solution: an all-in-one platform to support multiple ITS applications

Ouster's lidar-powered solution provides accurate 24/7 real-time detection and comprehensive data to support multiple traffic applications. The solution is upgradable through software, serving as a versatile system that combines the capabilities of multiple sensing technologies into a compact device.

All data is communicated in real-time to existing ITS systems, enabling advanced applications such as adaptive traffic signal timing, dynamic roadside signs, automated tolling, speed enforcement, and more.

## CAPABILITIES

### Intersections

Vehicle detection, classification, tracking, speed, trajectory

Stop bar, dilemma zone, setback detection

Wrong-way detection

### Highways

Traffic data per lane, including speed and volume

Queue detection

Automated speed enforcement

Automatic tolling

Truck height measurement

### Pedestrians and bicyclists

Pedestrian and bicyclists detection, counts, tracking, speed

Curb and crosswalk occupancy

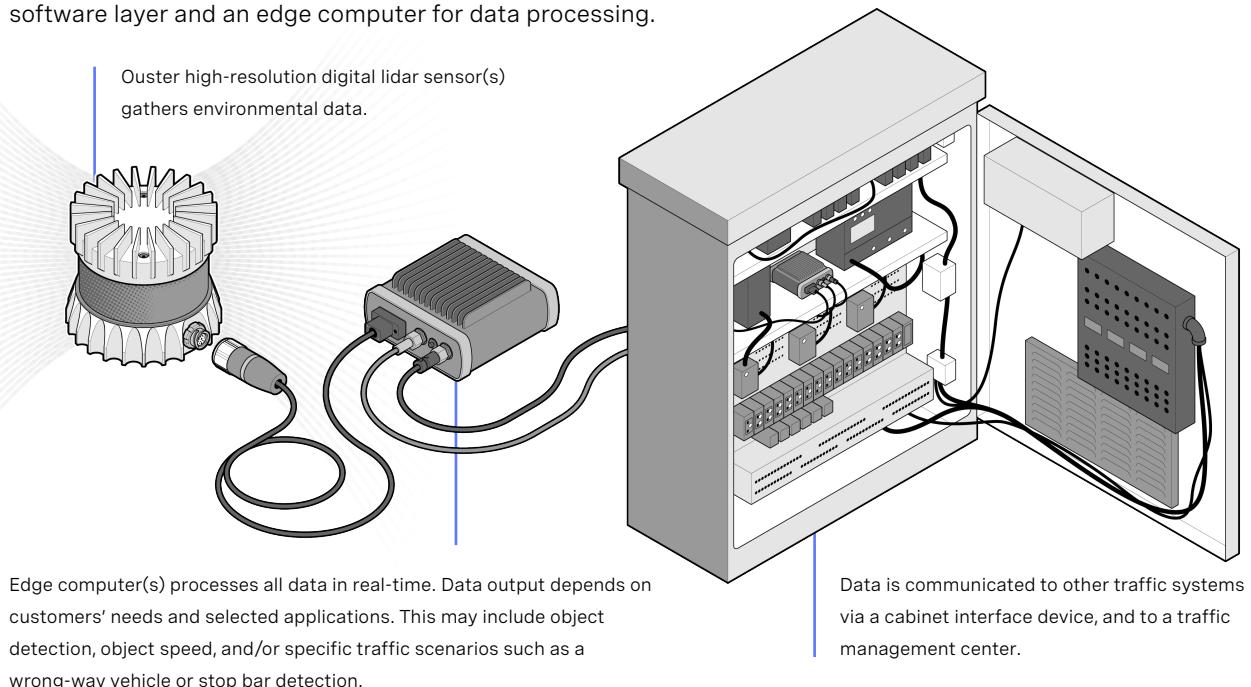
### Data collection and monitoring

Object detection, position speed, trajectory

Traffic movement patterns and counts

## Plug-and-play solution that integrates with other ITS devices

Ouster's ITS solution combines Ouster digital lidar sensors with a software layer and an edge computer for data processing.



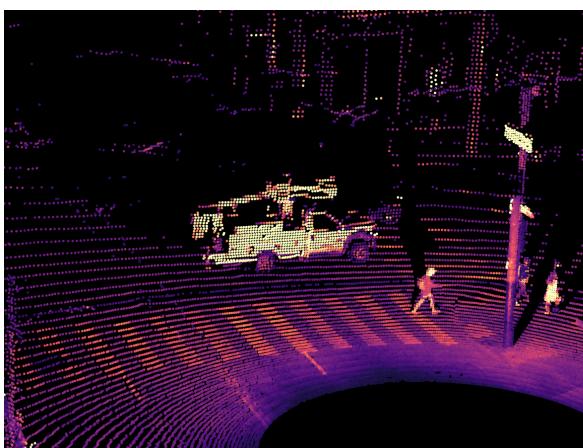
## Lidar provides more accurate, reliable, and useful data with fewer sensors

3D lidar enhances the spatial awareness of existing detection systems by providing accurate, robust data that is simply not available when using other traffic technologies alone. Lidar is also privacy friendly. It does not produce any personally identifiable information, so citizens' privacy is always protected.



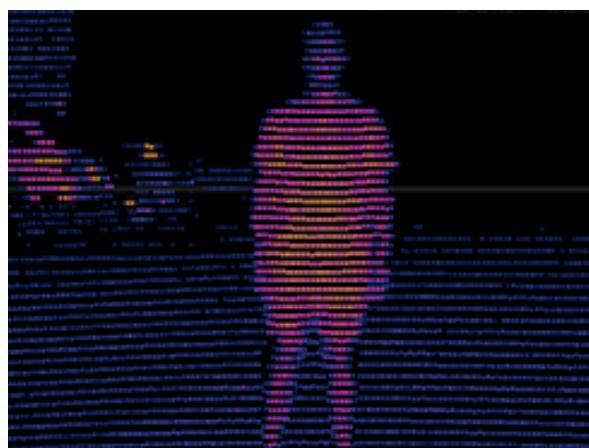
### Low-light, pitch darkness, glare... lidar sees through it all, 24/7

Unlike cameras, lidar maintains detection performance under all lighting conditions



### 360° view for more coverage and less sensors

Just two sensors can achieve full coverage of a typical intersection, optimizing your costs



### Privacy safe by design

Lidar never reveals any faces or other personally identifiable information, complying to international privacy regulations

# Why customers choose Ouster

Ouster invented digital lidar in 2015, introducing a proprietary digital approach that delivers high performance, reliability, and affordability. Our core digital lidar technology is a simple two-chip architecture that replaces the hundreds to thousands of discrete components commonly found in traditional analog lidar. The result is a low-cost, integrated digital lidar sensor with performance designed to steadily improve for years to come.

## Industry-leading reliability

Our patented ruggedized design is rated IP68/69K and field-tested to withstand direct sunlight, unpredictable weather conditions, and extended outdoor use.

## Operationally efficient

Ouster lidar sensors require minimal maintenance, reducing downtime and ongoing costs. And with fewer sensors to achieve the same coverage, you minimize your total costs of ownership.

## Manufactured in the United States

Ouster is the only lidar provider that offers Buy America and Buy American-compliant lidar sensors. We offer sensors that are considered 100% manufactured in the United States and made from 100% domestically sourced materials.

## Customizable integration

Ouster lidar sensors are compact with multiple integration and mounting options. Cover almost any environment and serve multiple traffic applications – all with just one or two sensors per typical intersection.

## Upgradeable through software

Performance of Ouster lidar sensors is designed to improve over time. Customers can add new traffic applications through software upgrades alone.

## Trusted long-term partner

Our global team consists of ex-ITS professionals and engineers who deeply understand the transportation industry. We work with local and state organizations on pilot projects and large deployments, enabling customers to see real results quickly.

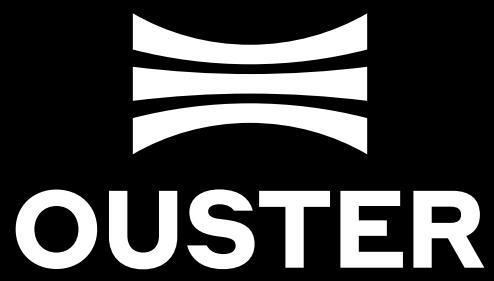


Upgrade your traffic detection today

Connect with an expert about how Ouster lidar solutions can transform your infrastructure.

[Ouster.com](https://Ouster.com)

Email an expert



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