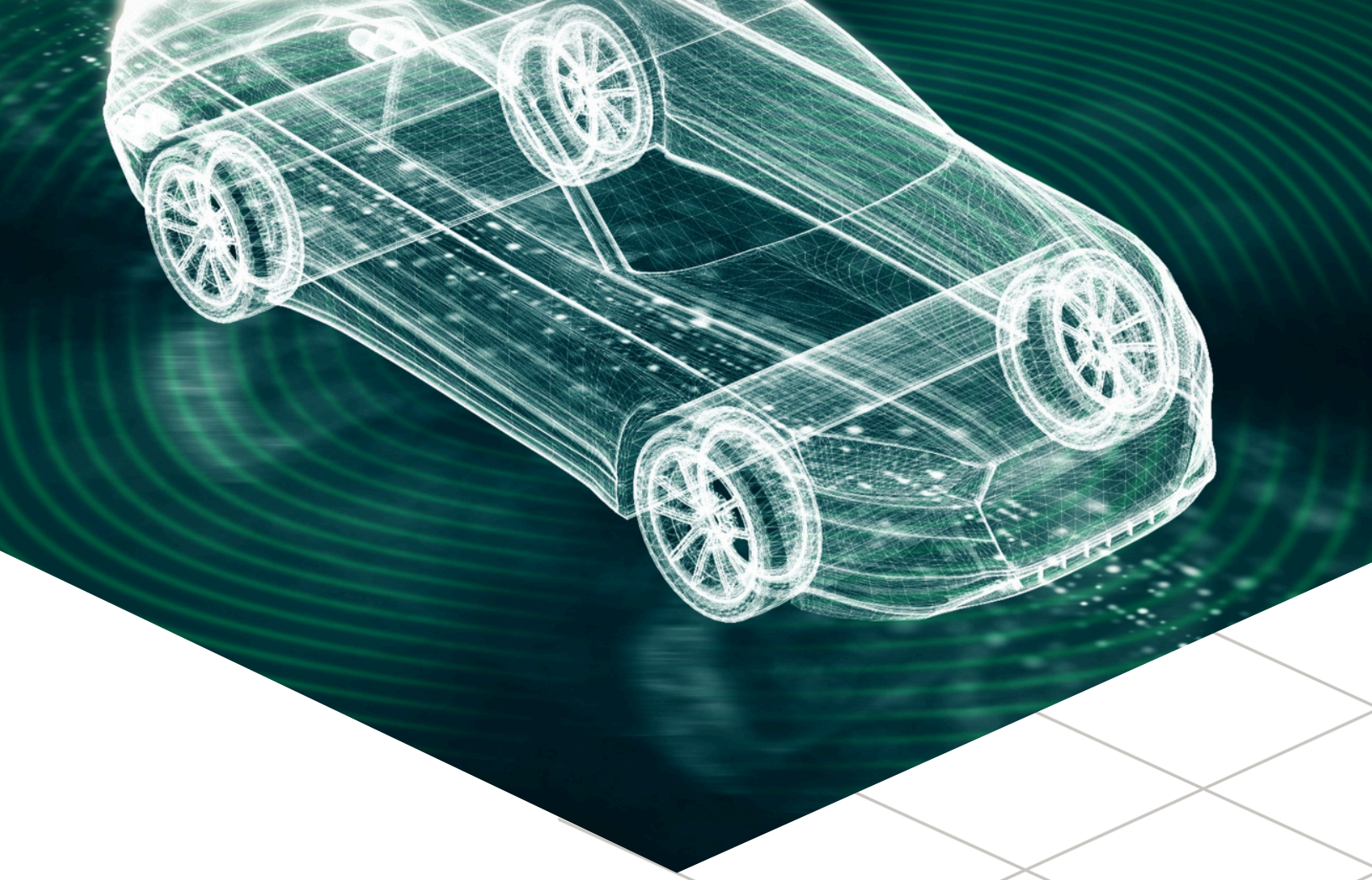

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Scanning LiDAR vs. Tracking Radar in Automated Traffic Enforcement

Automated traffic enforcement relies on sensor technologies to detect, track, and measure vehicle speeds accurately. Two leading technologies used in enforcement solutions are tracking radar and scanning LiDAR. Each has its strengths and is suited for different enforcement scenarios.

Scanning LiDAR

How It Works:

- Uses laser pulses to scan the environment and create a 3D point cloud representation.
- Measures the time it takes for the laser to return from the target, allowing for high-precision tracking.
- Differentiates between vehicles based on shape, position, and lane.

Advantages:

- High accuracy and precision – Pinpoints vehicle speed and position with centimeter-level accuracy.
- Multi-lane differentiation – Identifies and tracks vehicles in specific lanes accurately.
- Detailed vehicle classification – Can distinguish between cars, trucks, buses, and motorcycles.
- Ideal for dense urban areas – Works well where vehicles are close together or at intersections.
- Narrow angular resolution allows to differentiate between vehicles travelling close together and placing overlay on target vehicles in photos defensible in court.

Limitations:

- Performance impacted by heavy rain, fog, and snow – Visibility issues can reduce effectiveness.
- Shorter range than radar – Typically used for medium-range applications.
- Higher cost – More expensive than radar-based systems.

Best Use Cases for Scanning LiDAR:

- Enforcement in dense traffic and high-speed areas
- Multi-lane highways requiring precise vehicle tracking and classification.
- Highway workzone enforcement
- Urban areas with heavy congestion, where differentiating vehicles is necessary.

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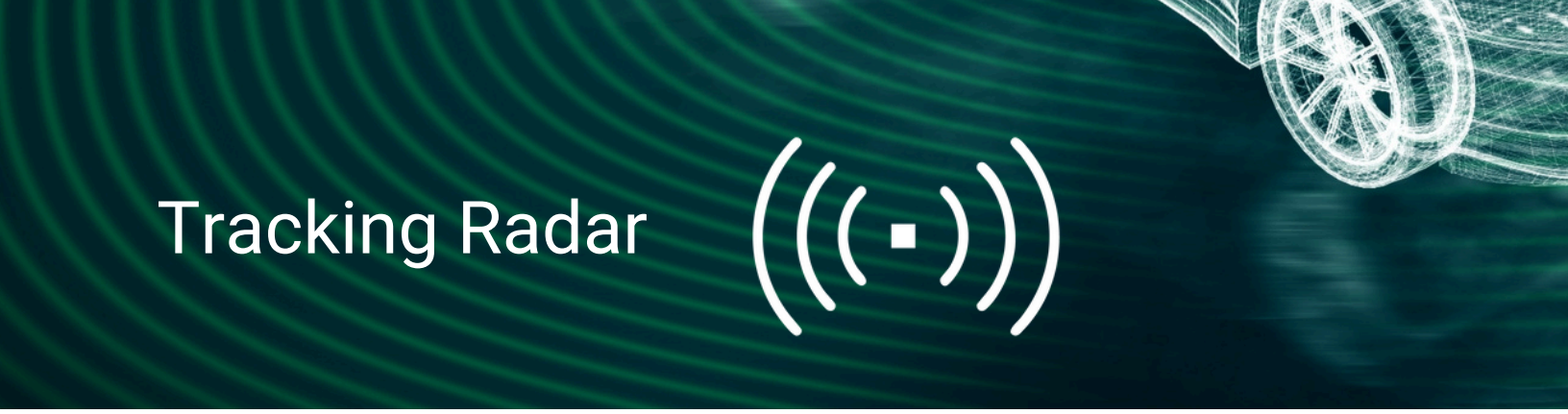

Tracking Radar

How It Works:

- Uses radio waves to detect and track moving vehicles.
- Continuously measures speed and distance by analyzing the Doppler effect (frequency shift of the returning signal).
- Works effectively in all weather conditions, including rain, fog, and snow.

Advantages:

- Reliable in all weather – Tracking radar signals are unaffected by fog, heavy rain, or dust.
- Superior Performance in Low-Light & Night Conditions - tracking radar functions perfectly even in complete darkness.
- Long-range detection – Can track vehicles from several hundred feet away.
- Cost-effective – Typically more affordable than LiDAR systems.
- Highly Resistant to Jamming & Interference – Difficult to disrupt, ensuring reliable and consistent speed enforcement.

Limitations:

- Less precise vehicle separation – Can struggle to differentiate closely spaced vehicles.
- Limited lane discrimination – Identifies multiple targets but may have difficulty assigning them to specific lanes.
- Lower resolution – Does not provide detailed vehicle shape or classification.

Best Use Cases for Tracking Radar:

- Fixed and mobile speed enforcement on highways and open roads.
- Red-light enforcement
- All-weather conditions where visibility may be an issue.
- Cost-conscious enforcement programs requiring long-range detection..

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Choosing The Right Technology

Scenario	Recommended Technology	Reasoning
Speed enforcement on highways	Scanning LiDAR	Vehicle tracking and violator identification at high speeds and in dense traffic.
Red-light enforcement at intersections	Tracking Radar	Wide tracking area is ideal for large intersections with multiple movements.
Multi-lane urban enforcement	Scanning LiDAR	Ability to separate and track vehicles accurately in dense traffic.
Mobile enforcement units	Scanning LiDAR	Easily adaptable to new locations and user alignment does not impact accuracy.
All-weather enforcement	Tracking Radar	Performs well in poor visibility conditions.
Automated tolling and congestion monitoring	Scanning LiDAR	Provides accurate vehicle identification and lane differentiation.
School Zone and 1 - 2 lane roadways	Tracking Radar	Versatile and cost effective

The Verdict

- For highway speed enforcement and mobile setups: Scanning LiDAR is the preferred choice due to its ability to identify high speed violators in dense traffic.
- For intersection enforcement and poor weather conditions: Tracking Radar is better suited because of its large tracking area and minimal impact by inclement weather conditions.

Explore the right enforcement solution for your needs. Learn more at Elovate.com