

# Improving Public Safety and Traffic with AI

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[Teresa Meek](#)



Modern cities are abuzz with traffic, and the heavier it is, the more people try to take dangerous shortcuts. Hazardous situations multiply as cars swerve to avoid jaywalkers and buses park at odd angles, jutting into the street because motorcycles occupy their loading zones.

Many cities have installed traffic-light cameras at major intersections, allowing them to address some violations. But these cameras are expensive and miss problems on side streets, as well as damaged infrastructure and dangerous behavior on buses, such as a driver nodding off.

[Martin Ting, CEO of 7StarLake, a Taiwanese company that makes high-performance computing equipment and developed a sensor system for the country's semi-autonomous shuttles](#), learned all about city traffic problems when meeting with government and transportation officials in Taiwan, Canada, and the U.S.

“They always asked me one question: ‘Can you help us prevent accidents and improve public safety?’” he says.

In response, 7StarLake developed a [bus-mounted edge AI computer vision system](#) that spots both traffic problems and dangerous bus driver behavior in real time, issuing warnings of impending hazards. By analyzing data from the system over time, city officials gain in-depth

knowledge of traffic and behavioral patterns, helping them improve public safety and traffic management.

## Preventing Accidents with Smart Buses

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Like many cities, Taiwan has cameras mounted at main intersections—Taipei, for example, has 14,000. But they cost \$150,000 apiece to install and an equal amount for annual maintenance. And they can't interpret information in real time or spot dangerous situations outside their limited field of vision. Obtaining thorough coverage would require an average large city to install 100,000 cameras, Ting explains.

In contrast, 7StarLake's Time Eye Smart Traffic Solution installs much less expensive computer vision cameras—plus a GPS sensor—on buses, capturing both exterior and interior information that can help prevent accidents. For example, if a driver's eyes are closing, the seat can vibrate in alert. Data is also sent to transit officials, who can issue a warning.

Exterior cameras capture traffic activity, including trucks illegally parked on side streets and buses unable to enter loading zones occupied by other vehicles **(Video 1)**.



Watch Video At: <https://youtu.be/PW4gALYEndo>

Video 1. 7StarLake's Time Eye computer vision cameras identify vehicles and capture information about traffic violations. (Source: [7StarLake](#))

These incidents can cause drivers to dart around the larger vehicles without seeing what's on the other side—an extremely dangerous situation.

In Taiwan, accidents involving trucks and buses are the major cause of traffic fatalities. Time Eye instantly relays information about serious violations to officials, who can issue tickets or arrange a tow if necessary. For less serious infractions, the system records license plate numbers and, in some cases, sends tickets without having to summon an officer.

Time Eye's cameras also relay information about infrastructure hazards, such as rocks or tree limbs blocking a street or missing manhole covers on sidewalks. Cities can immediately notify maintenance crews and alert bus drivers to slow down or avoid hazardous areas.

By analyzing #data from the system over time, city officials gain in-depth knowledge of #traffic and behavioral patterns, helping them improve public #safety and traffic management. 7 StarLake Co. Ltd. via @insightdottech

## Computer Vision Cameras Reveal the Truth

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In attempting to avoid an accident, a bus driver may speed up or stop suddenly, which could cause a passenger to fall. Fall claims are a frequent source of municipal lawsuits in Taiwan.

Time Eye computer vision cameras capture time, traffic conditions, bus location, acceleration, and braking. They also show whether passengers are standing or seated with seatbelts fastened, as required by law except when boarding or exiting. This information serves as an objective source of truth, streamlining investigations and legal proceedings. After adopting Time Eye, a city in south Taiwan experienced an 80% decline in passenger lawsuits, according to Ting.

While cameras record passenger activity, they do not use facial recognition software. Data is encrypted and sent to city computers through VPNs with enterprise-grade security.

## Smarter Traffic Management Improvements

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7StarLake customizes its system for cities, which choose the information they want to collect. Engineers use the Intel® Distribution of OpenVINO™ Toolkit to save time in training algorithms to recognize traffic conditions, vehicles, and human behaviors.

“OpenVINO has thousands of pre-trained algorithms and can do about 70% of the AI model development, so my engineers don't have to build it from scratch,” Ting says. “We can save a lot of time, and I don't need as many engineers.”

A city bus can capture an enormous amount of information—up to a terabyte a day. City administrators receive real-time data and images of up to 2 megabytes, relayed by high-speed Intel® Core™ processors. The rest is conveyed later and stored on city computers, where officials can analyze it to learn about traffic problems at specific locations and times. They can then better allocate resources to improve traffic flow and public safety, whether that means posting signs, sending police to the right locations, or creating new parking facilities.

## The 5G Smart Traffic Management Future

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As more cities adopt 5G connectivity and bandwidth costs decrease, higher transmission speed and low latency will allow systems like Time Eye to deliver even more information in real time—a capability city officials are clamoring for, Ting says. Transit authorities and emergency technicians will be able to view not just data and still images but full video footage of events as they unfold, helping them better understand and respond to critical incidents.

“Smart traffic management can help cities deploy resources better and save lives,” Ting says. “I firmly believe that once 5G is fully deployed, it will take off.”

*This article was edited by Christina Cardoza, Associate Editorial Director for insight.tech.*