Critical issues with critical infrastructure

Aging infrastructure and an onslaught of motorists have made it increasingly difficult for DOTs to maintain our roadways and keep them safe. This has led to an unwieldy backlog of problems that need to be addressed—often in real time. The goal of these ITS devices is to enable faster, more accurate action that can reduce car crashes, decrease traffic congestion, and save lives.

A safer, more efficient future

ITS devices include high-definition pan-tilt-zoom video cameras, vibration and weather sensors, speed monitors, and digital signage. The data from these devices needs to be transmitted to remote operations centers where it is analyzed and acted upon—often in real time. The goal of these ITS devices is to enable faster, more accurate action that can reduce car crashes, decrease traffic congestion, and save lives.

38,000
The number of people who lost their lives in traffic crashes in 2019.

25%
Percentage of CO2 emissions from motor vehicle transportation in the United States.

$50B
The annual cost to the U.S. due to traffic and congestion.

99hrs
The number of hours Americans lost due to traffic in 2019, costing them nearly $68 billion.

The Adaptive Network provides a resilient foundation

Traditional network architecture supporting ITS devices is complex and time-consuming to manage. Ciena’s Adaptive Network™ provides the technology foundation needed for DOTs to simplify, scale, and automate today’s ITS and make our roads smarter and safer. It is built on three key components:

1. Programmable Infrastructure
2. Analytics and Intelligence
3. Software Control and Automation

Programmable Infrastructure

A programmable packet and optical infrastructure supports existing bandwidth requirements and can scale to accommodate future capacity needs. It also eliminates the need for unwieldy legacy protocols, thus simplifying the network. The infrastructure is accessed and configured via common open interfaces; is highly instrumented, with the ability to export real-time network performance data to enable rapid decision-making by central operations personnel; and can adjust its resources on the fly as needed to meet the demands of the applications running on top of it.

Analytics and Intelligence

Collecting network performance data, and analyzing this data using machine learning and Artificial Intelligence (AI) gives DOTs the resiliency required to more accurately predict and resolve potential network problems and anticipate trends by turning mountains of data into actionable insights. Leverage these insights can help DOTs develop smarter, data-driven network policies that enable them to securely adapt to network fluctuations and traffic abnormalities in real-time.

Software Control and Automation

DOTs can automate network management and control tasks and virtualize network functions through the implementation of Software-Defined Networking (SDN) and Network Functions Virtualization (NFV). Multi-Domain Service Orchestration (MDSO) enables an open, vendor-agnostic approach to managing multiple network operating systems and vendors, reducing the workload of IT staff and freeing them to focus on higher-value tasks.

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