DIGITAL INFRASTRUCTURE:
Technology as a Force Multiplier for a Safer, Greener, Smarter, More Equitable Future

WHAT IS DIGITAL INFRASTRUCTURE?

The U.S. transportation system has evolved from paved roads and concrete bridges to sensors, data, software, and algorithms. With advances and rapid deployments in automation, connected technologies, mobility on demand, and sustainable and resilient technologies, a future of transportation – the digital infrastructure age – uses technology and innovation to advance future mobility that is safer, greener, smarter, and more equitable.

This new era links the physical system to a digital layer, allowing us in real-time to communicate, share, store, analyze, and use information to save lives, provide faster emergency response, help mitigate impacts of extreme weather, improve resiliency, reduce emissions, enhance mobility, and distribute services equitably. Digital infrastructure is the operating system for the future of mobility. Below are some examples that show how digital infrastructure advances safety, sustainability, and equity.

IMPROVING SAFETY

Connected vehicle technologies and automated driving systems among other ITS technologies help dramatically reduce the number of deaths on our roads, advancing our Vision Zero goals.

Connected vehicle technologies allow vehicles to communicate real-time information directly with other vehicles, infrastructure, and vulnerable road users to prevent traffic crashes, relieve congestion, and reduce environmental impacts. The National Highway Traffic Safety Administration estimates these technologies could mitigate or prevent up to 80 percent of non-impaired vehicle crashes. Companies like Spoke Safety use connected vehicle technology to help vehicles detect nearby pedestrians and bicyclists to prevent crashes and save lives.

Artificial intelligence, or AI, is being used in states like Nevada to analyze crash data to identify areas so that law enforcement can more readily respond to crashes. Using data from connected vehicles, Las Vegas uses AI to more quickly predict when crashes occur and more rapidly deploy emergency services, resulting in a 2-minute reduction in emergency response times and a 43 per cent decrease in speeding and 18 percent fewer crashes in the corridors of focus.

ITS AMERICA

CREATING A MORE SUSTAINABLE & RESILIENT SYSTEM

ITS technologies include sustainable technologies like zero-emission vehicles (ZEVs), congestion mitigation, and resilient infrastructure technologies to advance our climate goals.

Dynamic charging allows a battery-operated electric vehicle to be continuously charged while being driven. By placing charging panels in roadways, dynamic charging technology extends an electric vehicles range while reducing time spent at a charging station. This strategy is being piloted across the country, including the Indiana and Michigan departments of transportation.

Active traffic management (ATM) technologies dynamically manage traffic using real-time traffic data and traffic signal technologies to re-route traffic and time signals to reduce congestion and vehicle emissions. States like Georgia and Minnesota use these technologies to reduce congestion and provide more realistic travel time predictions. North Carolina used Iteris' connected vehicle technology, probe sensors, and data integration to help plan for climate events and natural disasters by overlaying maps of the transportation system with weather systems to help reroute traffic and plan well in-advance of events. This allowed the state to reroute traffic during Hurricanes Matthew and Florence, saving lives and quickly responding to climate events.

PROVIDING ACCESS & OPPORTUNITY

Transportation is a critical component of economic opportunity. ITS technologies help create opportunities for people to access jobs, education, healthcare, and other services.

Digital mobility wallet technology allows users to access rides, find more affordable fares, and pay for trips, making transportation easier and seamless across different providers. Los Angeles Metro is piloting a universal basic mobility (UBM) 'wallet' allowing riders to access bikes, scooters, rideshare services, buses, and trains by using a 'one-stop shop' app.

Central Ohio Transit Authority "COTA Plus" is an on-demand, ADA-accessible micro-transit service in underserved areas where riders use mobile apps and new software to schedule trips, pay fares, and access public transportation, providing more access in rural areas and expanding paratransit to students, aging in place communities, and under-served neighborhoods cut-off by interstates. COTA has provided more than 300,000 trips with this new program where the average response time is seven minutes - riders rate it 4.8 out of 5 stars.

FINALLY, WHY NOW?

This is a unique moment in history. We are investing in our nation's infrastructure at historic levels and are seeing rapid expansion of technological innovation. We need to do more than just repair and expand existing roads, bridges, and buildings. We need connectivity, automation, data, code, and software to operate those physical assets more effectively. When we invest in concrete in one city, it only benefits that community - when we invest in software and data, it helps communities across the country. We must build smarter not harder infrastructure, leveraging technology to ensure we deliver community-driven outcomes, thinking toward the needs of today and tomorrow. Digital infrastructure helps create a safer, greener, smarter world that provides more access and opportunity - now and for generations to come.