THE FAST LANE TOWARD TRANSFORMATION

No matter the pace, we know the future is coming, and the right technology will maximize the efficiency and effectiveness of new physical infrastructure initiatives across the country.

WHERE TO GO

FALLING BEHIND:

THE IMPERATIVE TO UPGRADE AGING INFRASTRUCTURE

Even as citizens dream of driverless cars and robot-run intersections where traffic flows free and fast, agency leaders and planners are losing sleep over a much more fundamental issue: aging transportation infrastructure. Cloud tools and interoperability can't take the place of tons of steel and concrete, so how can technology make a difference in closing the enormous gap between where we are today and a fully realized vision of a connected transportation future?

The US was rated first in transportation infrastructure back in the 19th century—today that rank is #16.[1]

THE CALL OF CRISIS AND OPPORTUNITY

America has grown over the past century, but our roads, bridges, tunnels, rails, and ports haven't kept up with growth. Twenty-five percent of US bridges are unsuited for modern traffic, and similar gaps persist across the system.[2] Obsolete infrastructure does far more than simply slow and frustrate commuters, impacting public safety, economic productivity, and even disaster planning and recovery.

The windows of opportunity on proactively addressing these systemic weaknesses are closing fast and communities are already behind demographic trends. A 2016 report entitled *Failure to Act* by the American Society of Civil Engineers predicts that a failure to properly invest in reviving our infrastructure will cost the country a stunning $7.04B in lost productivity, in addition to 2.5M lost jobs, all due to overwhelmed surface transportation systems and resources.[3]

Communities are waking up to the challenges we face in planning for tomorrow with today's outdated infrastructure, and public and private sector organizations are working to provide solutions. Public agency leaders must take point on finding new ways to collaborate, new funding models, and drive economic and environmental sustainability.

Their expertise is proven: Under their stewardship, transportation efficiency and safety has radically improved over the past few decades. For example, seatbelt requirements and safer roadway design have combined to cut traffic deaths by 25 percent over the last 20 years, and airbags have saved more than 28,000 lives — proving that the opportunity to harness new ideas for improved transportation is rich in both lives and dollars saved.[4,5]

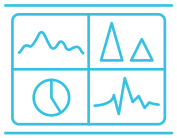
Lenovo

MOVING FORWARD FAST:

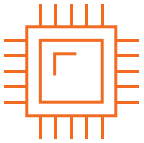
NOT JUST REBUILDING, BUT REINVENTING

American transportation has taken big steps forward before. Sweeping efforts to unite the nation with rail, the creation of the nation's commercial waterways, the construction of airports, and the big safety gains referenced earlier demonstrate what can happen when inspiration and determination combine with technological innovation.

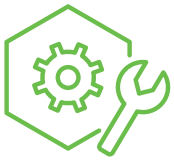
Where are the next big ideas around smarter, safer transportation going to come from? Some are emerging from cutting-edge research and cross-agency collaboration. And some are being borrowed from enterprise, and in some cases, built and nurtured directly by private sector expertise.



Digitizing traditional planning and production workflows are dramatically reducing the cost of completing critical infrastructure initiatives.



Embedded sensors and data capture equipment are helping traffic planners and managers control traffic flows in real-time, adapting to demands as they change.



New tools are helping improve the final product, building infrastructure that lasts longer and serves with less maintenance.

Video surveillance is helping agencies monitor operations and react more quickly in the event of crisis.

Intel Inside®. Powerful Productivity Outside.

Eighty-six percent of agency leaders recently surveyed said upcoming federal infrastructure funding needs to include both digital and physical.[6] Technology must be comprehensive, embedded deeply and implemented broadly across all systems.

Lenovo™

GETTING TO A WORLD OF CONNECTED TRANSPORTATION

Today's vision of smarter cities takes advantage of a broad digital universe where sensors and big data can be harnessed in that same way that innovations such as the seatbelt and safer roadways were in the past, to drive improved safety and efficiency. By better understanding our transportation patterns, we can change how we live, work, and move together. Information and efficiency can overcome collective daily challenges while giving time and money back to the community and radically changing how we live, work, and move together.

- Remote connectivity for workforces and school districts can dramatically impact traffic patterns and reduce congestion
- Those who do take to the road and/or rails are enjoying new services and system efficiencies made possible by big data and other technologies

CONNECTED TRANSIT AGENCIES: HIGHWAY, METRO, RAIL

- Connected vehicles and new crash avoidance technology
- Vehicle Automation and Driverless Cars[7]
- Intelligent Transportation Systems and GPS guidance

CONNECTED DEPARTMENTS OF MOTOR VEHICLES (DMV)

- Automated, one-stop virtual shop for registration, vehicle titles, certifications and voting, with information connected directly to automated vehicles
- Digital driver's licenses and ID cards
- Real-time ID verification

CONNECTED AIRPORTS

- Holistic management systems with analytical applications within an integrated airport framework
- The Next Generation Air Transportation System (NextGen) satellite-based air traffic control system[8]

CONNECTED PORT AUTHORITIES

- Freight: Advances in information and communications technologies will improve data collection and analysis capabilities of logistics firms and freight planners, enabling faster and more accurate analysis of freight routes, travel times, and infrastructure capacity.

Lenovo

IMPLICATIONS FOR AGENCIES

Technology has been reshaping transportation since the wheel was invented, and it remains an invaluable part of government strategy for upgrading transportation infrastructure across our cities and states. Agencies have lots of choices, but what makes technology meaningful to their challenges?

RELIABILITY

The more complex the world gets, the more critical it is that our technology foundations are designed for real durability. Agencies need reliable technology that reduces the risk of service disruptions and secures a steady flow of information between sensors and systems.

MOBILITY

In a connected city, technology needs to align to how people work today, in and out of the office. This sharpens productivity and collaboration while reducing facilities and commute costs, adding up to a leaner, greener community committed to exciting ways to grow.

SECURITY

Sensors, monitors, and connected vehicles create new sources of risk. If left unmanaged, this leads to highly publicized and ultimately devastating breaches and disruption. Security must be a collaborative partnership from the start, impacting every product and process put into action.

OPEN, INDUSTRY STANDARDS

Connected transportation requires an integrated plan in which the parts work together to drive confidence without complexity. With technology rapidly evolving, the key for agencies is to plan for and invest in technology that is built on open, industry standards.

DATA ANALYTICS

The rise of intelligent infrastructure and smart transportation grids is creating an increasing amount of information that can be turned into insight and decision-making. The first challenge is building a framework for capturing, collecting, and securely making the information usable to transportation planners and citizens.

SMART TECH PLANNING

Lenovo™ helps government agencies and departments meet mission-critical application requirements today while building an IT infrastructure that simply and securely scales to meet emerging and uncertain challenges.

- Supporting industry and government efforts to create open standards for emerging technologies
- IT Planning: Technology roadmaps, agency IT strategy and solution design

HOW LENOVO CAN HELP:

ROCK-SOLID TECHNOLOGY INFRASTRUCTURE

As a trusted technology partner to government agencies of all shapes and sizes, Lenovo has the deep experience and expertise gained from years of helping our clients create meaningful transformation that maximizes productivity while reducing the cost and cycle times traditionally associated with government transportation. We also have the most complete and comprehensive product portfolio on the market, stretching from device to data center and impacting every computing workload along the way.

LEADING RELIABILITY TRUSTED BY GOVERNMENT AGENCIES

- The broadest array of MIL-SPEC tested devices
- ThinkPad® notebooks undergo 200 quality checks and require 37% less repairs than competitors (TBR) [9]
- #1 x86 server reliability (ITIC) with a majority of servers achieving 99.999% availability[10]

MOBILE, EFFICIENT SOLUTIONS FOR GREATER PRODUCTIVITY

- Innovative form factors give users more ways to work
- WWAN options
- Energy-efficient products that don't sacrifice performance

SECURITY

- TAA-compliant, NIST- and TCG-secure product features that boost security, from fingerprint readers to lockable ports
- Global supply chain carefully managed for security and compliance

SOLUTIONS THAT SCALE TO THE FUTURE

- Hardware designed for easy expandability
- Efficient, open, and agile Unified Workspace solutions
- Innovative thin client and VDI solutions

Turn information into insight that can securely drive smarter, faster decision-making

- Newest Lenovo mobile workstations powered by the latest Intel® Xeon® processors, for robust ISV-ready design / GIS application performance on the go
- Lenovo partnerships with leading analytics tools providers such as Autodesk, ESRI, and Bentley for integrated solutions
- Video surveillance collection, storage, and sharing that is easy to support and scale
- Ultrafast Lenovo data center performance for important data analysis tools — from historical to predictive

Bentley Advancing Infrastructure

Autodesk

ESRI

ThinkPad P71

ThinkStation® P320 Tiny

ThinkStation® P910

ThinkStation® P410

For more information on Lenovo's government-ready portfolio, powered by the latest Intel® processors, visit www.lenovo.com/government.

Lenovo

FOOTNOTES

[1,2,4] U.S. Department of Transportation: Beyond Traffic 2045. Web.

[3] American Society of Civil Engineers: Failure to Act. (2016) Web.

[5] Traffic Technology Today: Thirty Years of saving lives: Happy Birthday to the Airbag. Web.

[6] Center for Digital Government Vertical Brief: Transportation & Infrastructure. March 2017.

[7] ENO Center for Transportation and ICF International: Emerging Technology Trends in Transportation. February 2016. Web.

[8] United States Department of Transportation Federal Aviation Administration: NextGen. Web.

[9] TBR Notebook Repair Rate Survey, January 2016.

[10] ITIC Global Server Hardware Reliability Report, 2016-2017.

For more information on Lenovo's government-ready portfolio, powered by the latest Intel® processors, visit www.lenovo.com/government.

© 2017 Lenovo. All rights reserved. Lenovo is not responsible for photographic or typographic errors. Lenovo, the Lenovo logo, ThinkPad, and ThinkStation are trademarks or registered trademarks of Lenovo. Intel, the Intel logo, the Intel Inside logo and Xeon are trademarks of Intel Corporation or its subsidiaries in the U.S. and/or other countries. All other trademarks are the property of their respective owners. Version 1.00, August 2017.

Lenovo