Statement of

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America

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Mr. Chairman, Members of the Committee, I am Laurie Tolson, Chief Digital Officer for GE Transportation. Thank you for the opportunity to testify before the Committee today on Emerging Technologies That Will Move America.

Background on GE and GE Transportation

I am thrilled to be here to highlight some of the innovations that are happening in transportation.   GE Transportation is a leading global technology supplier of equipment, services and digital solutions to the rail, mining, marine, stationary power and drilling industries.   As the company's Chief Digital Officer, I see innovations in our own business as well as across the GE Company. From pioneering traffic management for drones, developing hybrid-electric propulsion to bringing the first Tier 4 locomotive to market, GE is at the forefront of technology.   Exciting new manufacturing techniques like 3D printing and advancements in lightweight materials will transform the way we travel, making transportation safer, more efficient and environmentally sensitive than today. When we pair state of the art hardware with cutting-edge software solutions, the possibilities for our customers are endless. Today I will talk about one of our most exciting digital success stories – the Port Optimizer.

As GE has looked to focus its business on Aviation, Power and Renewable Energy, we have been looking for a new home for the GE Transportation business. You may have seen coverage of our intent to merge with Wabtec. Wabtec is a natural partner -- great for our customers, great for our employees, and great for the communities in which we operate.

GE Transportation and Wabtec's businesses are complementary, and the merger allows us to accelerate innovation and reduce costs, providing our customers with better solutions.

GE Transportation provides digital solutions to many different areas across our industry, from train performance to transportation logistics. With applications in asset performance, train handling, network optimization and supply chain visibility, we've seen digital solutions deliver results such as 10-25% reduction in mainline failures, average 10% in fuel savings, 10% improvement in network velocity and 40% increase in rail volume.

For example, Trip Optimizer, our smart, automated cruise control system for the rail industry, saves ~1 million gallons of fuel per week. With over 10,000 units deployed, Trip Optimizer is the most widely used energy management system within the freight rail industry.

Looking more broadly about how we integrate our portfolio of solutions for impact across the supply chain, we are launching our new RailConnect Visibility and Planning, which provides a consolidated dashboard view of the railcar supply chain,

enabling cargo owners and railroads to plan more effectively and facilitate predictability and efficiency in freight rail.

Port Optimizer Solution
As I mentioned, one of the innovations we are most excited about is the digital transformation we are facilitating at our nation's ports. Think about this as I walk through what we are doing in ports: what if ports can have forward visibility to arriving vessels as far as two weeks ahead of arrival, as compared to just two days under the traditional process? We tested this at the Port of Los Angeles and found that this visibility allows for better planning and predictability, making for a more efficient supply chain – one in which our nation's shippers can better serve their customers and meet emerging needs.

As a result, the Port of Los Angeles was able to increase throughput by 10% and productivity by 8-12% for ground transportation. That is the power of digital solutions we are discussing today.

Port Changes

As you well know, 90% of global trade is waterborne. Seaport cargo activity accounts for 26% of U.S. GDP and 23 million American jobs. As the nation's gateways to the global economy, seaports are key enablers of U.S. job creation, economic prosperity and American competitiveness.

Yet, maritime shipping is undergoing unprecedented change – including the transition to ultra-large container vessels and the formation of cargo alliances. These changes create greater complexity in cargo sorting and handling at major US ports, leading to suboptimal allocation of equipment and labor, increased cost, and frustration for cargo owners.

In the wake of the West Coast congestion experienced in 2014-15, several multi-stakeholder efforts worked to identify solutions, including the Federal Maritime Commission Supply Chain Innovation Teams and the Department of Commerce Advisory Committee on Supply Chain Competitiveness. Consensus emerged that more efficient cargo handling was possible through improved information sharing and collaboration among supply chain actors. By eliminating the silos of data that currently exist along the maritime supply chain and providing timely information in one place, we can increase throughput efficiency at major port complexes and provide greater value (i.e., visibility and predictability) to cargo owners.

Developing digital solutions that drive efficiency by addressing increasing cargo volumes, capacity constraints, and other operational challenges at ports will result in game changing economic, environmental, and safety benefits for business, local and national economies, investors, and consumers.

Against this backdrop, GE Transportation (GET) saw an opportunity for this industry - to take a huge digital leap forward in the movement of goods. I want to tell you about our deployment of a visionary solution that promises to weave a digital thread across the entire global supply chain.

Port of Los Angeles Pilot

In late 2016, we partnered with the Port of Los Angeles to develop a common portal – now known as the GE Port Optimizer – that provides secure, real-time access to cargo data. The custom-built application was piloted at POLA's largest terminal, with the 2 largest shipping lines, Maersk and MSC. Pilot participants also included beneficial cargo owners (BCOs), trucking companies, the Class I railroads, chassis providers, and marine terminal operators.

Based on that 2017 pilot, the Port of Los Angeles estimates that port-wide implementation of the portal would yield a 10% improvement in throughput and an 8-12% increase in productivity as trucks reduce their turn times, railroads plan train schedules more effectively, cargo moves faster, and lower energy cost and air emissions as containers receive fewer "touches" throughout the process.

Port of Los Angeles Adoption

With the success of the pilot, we entered into a longer-term partnership with the Port of Los Angeles to develop and deploy what is now the Port Optimizer. The Port Optimizer is a cloud-based software solution that enhances supply chain performance and predictability by delivering real-time data-driven insights through a single portal to partners across the supply chain. By integrating data from across the port ecosystem, and combining machine learning and deep domain expertise, the Optimizer helps the supply chain monitor and respond to dynamic conditions, better align people and resources, and proactively communicate across functions. Key capabilities include:

- Greater visibility for improved asset utilization;
- Single portal to collaborate with supply chain partners;
- Reduced supply chain dislocations by anticipating issues; and
- Increased cargo velocity and improve service delivery

Port Optimizer leverages GET's cloud platform with automated data ingestion, modeling, API capabilities for more modern and real time data sharing & visibility, and advanced analytic capabilities. Additional features under development include export optimization, chassis availability and ordering, scheduling and truck reservations systems, empty container optimizations and returns management, container match back capability, rail optimization, and a Blockchain application pilot.

Port Optimizer is now being deployed to the rest of the San Pedro Bay Port Complex. We are not only expanding from our initial pilot at one terminal in Los Angeles to the entire Port, but also launching a pilot with three of the six terminals in the Port of Long Beach. We are continuing to add participants in Los Angeles, with agreement from 95 percent of the major shipping lines and marine terminal operators. And we are pursuing opportunities with other ports in the U.S. and globally. There is a tremendous interest in the port community for these types of cost effective digital solutions.

Our longer-term goal is to have a significant portion of ports around the world using this platform. As with many digital tools, especially those using AI and machine learning, the more participation we have, the richer the data pool and the more value and efficiencies we can deliver to the global supply chain.

Infrastructure Public Policy Considerations

Ports across the nation are in need of infrastructure investment. The American Association of Port Authorities (AAPA) estimates $66 billion in infrastructure needs at the nation's ports. Digital infrastructure should be part of the broader infrastructure discussions especially because solutions like the GE Port Optimizer enable more efficient use of existing freight infrastructure. They expand capacity at congested trade corridors and gateways at a fraction of the cost of building new "bricks and mortar" projects and deliver tremendous value for supply chain users.

As Congress considers infrastructure policies and funding, we encourage consideration of digital solutions for enhancing the operations of industrial and critical infrastructure. New digital industrial and critical infrastructure should complement a range of infrastructure modernization priorities – including energy infrastructure, as well as surface transportation, aviation, ports, and other intermodal freight facilities and systems.

We further encourage Members of Congress to consider the critical role of communications and wireless connectivity for industrial and critical infrastructure operators. Access to affordable spectrum for industrial site specific, private wireless networks will improve coverage, data capacity, infrastructure reliability and security. We are an active part of the IIoT Coalition (a group whose members collectively account for approximately 40% of the U.S. economy and includes entities such as Port of Los Angeles, FedEx, Union Pacific, Southern Linc and the Utilities and Petroleum industries), that is engaged with the FCC on finding meaningful policies for promoting industrial investment in the 3550-3700 MHz Band (or CBRS) for supporting the deployment of 5G services for use in industrial and critical infrastructure operations.

Digital industrial and critical infrastructure, a component of the Internet of Things (IoT), encompasses software solutions that optimize infrastructure and network performance and outcomes and advanced private wireless networks that enable

secure data communications and provide infrastructure operators with dedicated bandwidth for their operations. New infrastructure investment priorities should:

- Ensure eligibility of digital industrial infrastructure across all federal transportation and power funding and credit support programs.

- Encourage consideration of digital industrial applications – including software – as natural complements to further public investments in "traditional" brick, mortar, steel, and hard equipment assets to enhance system performance.

- Promote the importance of affordable access to wireless spectrum licenses for private wireless networks that allow infrastructure operators to deploy and operate dedicated, site-specific 5G networks for use in digital industrial and critical infrastructure operations.

- Support testing, evaluation, and deployment of all technologies that boost infrastructure performance, <u>including digital</u>, to maximize the value of public investments.

Conclusion
The innovation GE is driving with the Port Optimizer is unlocking huge operational capacity at our nation's Ports and across the supply chain. It is enables a dramatically more efficient use of existing physical infrastructure by harnessing Big Data analytics that can expand capacity at a relatively low cost and with much quicker deployment. This is truly the future happening now.

Thank you for your time and I look forward to your questions.