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ORAL REMARKS

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HEARING ON BUILDING A RESILIENT ECONOMY: SHORING UP SUPPLY
SENATE COMMITTEE ON BANKING, HOUSING, AND URBAN AFFAIRS

MARCH 22, 2022

Thank you Chairman Brown, Ranking Member Toomey, and Members of the Committee.

Early during the pandemic, I spoke with a medium-sized U.S. medical supplier capable of manufacturing nine million masks per month. Surprisingly, their most challenging bottleneck was elastic ear loops. When discussing critical technologies, we wouldn't ordinarily think elastic; yet during those early months of intense supply shortages, that lack of elastic cost our country millions of masks *a week*.

A similar story could be told in how the current shortage in semiconductors is stopping cars from being produced and leading to job losses in Michigan.

The solutions to these problems are not as simple as just stockpiling masks or reshoring manufacturing. In the case of elastic, what was missing was the capability to pivot: adapt the equipment, change the elastic, change the mask to not require elastic, change the regulations. In semiconductors, what's needed is to redesign the chips.

I will highlight three steps toward building a resilient economy, and the cross-mission critical technology analytics our country needs to implement these steps.

<u>First</u>, the U.S. must build timely situational awareness, otherwise we will be flying blind

At the time of the COVID outbreak, the last data collected by the Economic Census on all domestic manufacturers was 2017. While the government convened leading companies, they estimated they had the capability to meet only half of domestic demand. What they needed, however, was not more firms but better tools: Leveraging automated text analysis of public data, my colleagues and I created timely situational awareness of U.S. domestic manufacturers entering, pivoting into, and scaling up in response to the COVID crisis, particularly small and medium sized firms unknown to government. Within two weeks we revealed significantly greater domestic mask and respirator manufacturing capacity than known before.

The government needs these modern analytic capabilities. Figuring out which products and supply chains have sufficient national value to be tracked preemptively will require cross-mission valuation that aggregates across defense, health, labor, equity, and commercial interests.

<u>Second,</u> the U.S. must create the supply chains of tomorrow, not fix the supply chains of yesterday.

Innovation can transform supply chains and our competitive position therein.

Most batteries for electric vehicles require significant cobalt, the majority of which is mined in the Congo and refined in China. As the world scales up electric vehicle production, innovations - such as in cobalt-free batteries - could reduce and even eliminate such region-specific risks.

Semiconductor chips used in transportation and defense systems are highly heterogeneous and custom designed to single manufacturing facilities. Government funding of common design platforms would reduce the cost of switching between facilities, and increase supply chain resiliency. It would also increase the aggregate market power of these sectors critical to security and the economy.

<u>Third,</u> the U.S. needs to rebuild its manufacturing ecosystem through investments in infrastructure

In our research on domestic manufacturers pivoting during the pandemic, what was left of the U.S. manufacturing ecosystem was central to the U.S. response. In Wisconsin, the founder of a waste management and construction company macgyvered broken mask manufacturing machines into working for commercial-scale production. In Indiana, a company leveraged its expertise in filtration materials and oil absorbent products to pivot into making meltblown polymer for masks and later also making N95 masks themselves.

These pivoting companies' previous experience in waste management, construction, and water or oil infrastructure strengthens my belief that the greatest promise for rebuilding our manufacturing ecosystem may be equitable country-wide investments in infrastructure of the future. Infrastructure - for transit, energy, communications and data - address needs of society *and* manufacturing. Done right, investments in smart, climate-resilient infrastructure of the future can build national capabilities in the companies and skilled workers who become the manufacturing workforce of the future.

<u>Going forward,</u> the U.S. needs to build the analytic capacity to identify win-wins across missions.

Our research shows that certain innovations in areas critical to national security (including high-end semiconductors for communications and cobalt-free batteries) also offer better jobs for hard working high school graduates.

Similarly, in the case of the current semiconductor shortage in safety-critical applications, government funding of design platforms that embrace commonalities (but leave room for differences) across the technological demands of the defense and commercial sectors can lead to a solution where the sum is greater than the parts for U.S. security, economic, labor, and equity interests.

To ensure future U.S. security, competitiveness, and access to critical supply, the U.S. must establish a forward-looking, cross-mission critical technology analytics program able to build timely situational awareness, quantify the value of innovations that transform geopolitical dependencies, and identify win-wins pathways across national missions.

Congress has recognized the urgency of addressing critical technology and supply chain issues, as reflected in USICA, COMPETES, and the hearing today. I urge Congress to establish a national capability for cross-mission critical technology analytics as part of your historic bipartisan innovation act. A provision that would create such such a capability is contained in COMPETES.