

The National Academies of
SCIENCES • ENGINEERING • MEDICINE

Sustainable and Resilient Supply Chains with Emerging Technologies: Workshop Series
February 2021

Overview: The workshop series will address opportunities, challenges, and environmental implications of increasing local inclusion and community participation in global value chain networks by using new technologies to strengthen resilience and sustainability in the face of recurring disruptions (e.g., natural disasters, disease outbreaks, demand/supply shifts). The discussions will explore the feasibility of introducing advanced manufacturing, logistics and decision-making under alternative supply chain scenarios in different sectors, with a view of strengthening the resilience of communities and adopting far more environmentally and economically sustainable consumption and production approaches in support of the United Nations Sustainable Development Goals.

Workshop IV: Consumers and Civil Society
Thursday, February 18, 2021
(all times are U.S. Eastern Time)

Brief Background: Significant supply chain activities are moving through e-commerce, with changes in consumer expectations and choices. The competitive dynamic of consumer-facing supply chains has had a tremendous impact on communities and the infrastructure needed to support these distribution networks. Yet, infrastructure planners do not have a real-time, comprehensive, multi-modal data set to gather and analyze these trends with sufficient accuracy. The pandemic has revealed the high degree of digital exclusion, such as lack of access to affordable broadband, on-line learning, and medical services, and an increasing reliance on delivery services including Uber Eats, Instacart, and Amazon. This final workshop will focus on new opportunities envisioned by technologies, the likely future trajectories of supply chain automation and resilience, the role of local governments and megaregions for linking local, regional, national, and global scales related to infrastructure and skills, and the need for private sector investment assisting in this transition.

- | | |
|----------|--|
| 12:00 pm | Welcome and Goals for the Workshop Series Klaus Tilmes (Chair), Senior Policy Adviser and Economic Development Consultant Franklin Carrero-Martinez, National Academies of Sciences, Engineering, and Medicine |
| 12:05 pm | Panel I: COVID-19 Impact on E-Commerce, Consumer Behavior, and Mobility as a Service Moderator: Catherine Ross, Georgia Institute of Technology <ul style="list-style-type: none">• David Estrada, Nuro (Autonomous Vehicles)• Seleta Reynolds, Los Angeles Department of Transportation (Economic Development, Land Use, and Transportation for the Future) |
| 12:40 pm | Panel II: Technology, Equity, and Community Development Moderator: Klaus Tilmes (Chair), Senior Policy Adviser and Economic Development Consultant <ul style="list-style-type: none">• Adjo Amekudzi-Kennedy, Georgia Institute of Technology (Engineering Perspective)• Jerry Hultin, Global Futures Group (Smart Cities and Supply Chains)• Dara O'Rourke, Amazon (Sustainability Planning of Supply Chains) |

- 1:30 pm **Workshop Synthesis: Future Needs and Opportunities for Sustainable and Resilient Supply Chains**
Moderator: Klaus Tilmes (Chair), Senior Policy Adviser
Key Themes from Each Workshop:
- Sarah Thorn, Walmart (Workshop I)
 - Patricia Gruber, Independent Consultant and Paul Pisano, Independent Consultant for Transportation Operations (Workshop II)
 - Banning Garrett, Singularity University (Workshop III)
 - Catherine Ross, Georgia Institute of Technology and Klaus Tilmes (Chair), Senior Policy Adviser and Economic Development Consultant (Workshop IV)
- 1:50 pm **Summary Remarks**
Klaus Tilmes (Chair), Senior Policy Adviser and Economic Development Consultant
- 2:00 pm **Workshop Series Conclusion**

The National Academies of
SCIENCES • ENGINEERING • MEDICINE

Sustainable and Resilient Supply Chains with Emerging Technologies

Workshop IV: Consumers and Civil Society
Thursday, February 18, 2021

Moderator and Speaker Biographical Information

KLAUS TILMES (Planning Committee Chair) is a Senior Policy Adviser and Economic Development Consultant who most recently worked with the Office of the World Bank President to develop the institution's strategy on emerging technologies and scaling adoption through financial assistance, policy advice, and partnerships. He also works closely with the African Center for Economic Transformation and the United Nations Science Technology and Innovation (STI) Forum. Previously, Mr. Tilmes served as Director of the Trade and Competitiveness Global Practice at the World Bank, overseeing operations in Sub-Saharan Africa and the Middle East and global teams on Trade and Competition Policy and Innovation and Entrepreneurship. During his 30-year career at the World Bank, Mr. Tilmes held positions as Director of Strategy and Operations in the Financial and Private Sector Development Network; Knowledge Strategy Advisor; Manager at the Independent Evaluation Group; and Advisor, Corporate Strategy Group. He holds a Master's degree in Public Administration from Harvard University and a Master's in Economics from the University of Mannheim.

ADJO AMEKUDZI-KENNEDY is a professor and associate chair for Global Engineering Leadership and Entrepreneurship at Georgia Institute of Technology (Georgia Tech). She studies systems problems on the integrated built, natural, and social environments to understand how to make better decisions on built systems to promote sustainable development. Dr. Amekudzi-Kennedy is co-author of *Fundamentals of Systems Engineering with Economics, Probability and Statistics*, Second Edition. She is a member of the National Academy of Construction, a fellow of the American Society of Civil Engineers (ASCE), founding chair of the ASCE Committee on Sustainability and the Environment and co-founder the Global Engineering Leadership Minor at Georgia Tech. She serves on the editorial boards for the *International Journal of Sustainable Transportation* and the *Journal of Sustainability and Climate Change*. Dr. Amekudzi-Kennedy holds a bachelor's degree in civil engineering from Stanford University, a master's degree in civil engineering from Florida International University, and a master's in civil infrastructure systems and a Ph.D. in civil and environmental engineering from Carnegie Mellon University.

FRANKLIN CARRERO-MARTINEZ (Staff) joined the National Academies of Sciences, Engineering, and Medicine in 2018 where he directs the Global Sustainability and Development and the Science and Technology for Sustainability program within the division of Policy and Global Affairs. Prior to this appointment, he was the Acting Deputy Science and Technology Adviser to the Secretary of State. Dr. Carrero-Martínez holds a B.S. in biology, with honors from the University of Puerto Rico (UPR), a Ph.D. in cell and developmental neurobiology, and a certificate in business administration from the University of Illinois at Urbana-Champaign. Previously, Dr. Carrero-Martínez held appointments as associate professor at the UPR, Mayagüez, Adjunct Professor at the UPR Medical Science Campus, and as visiting scholar at Duke University, Massachusetts Institute of Technology, and Japan's Institute of Genetics. Dr. Carrero-Martínez started his career in science diplomacy and policy as the American Association for the Advancement of Science's Roger Revelle Fellow in Global Stewardship. He served this prestigious fellowship with a joint appointment between the Office of the Science and Technology Adviser to the Secretary of State (STAS) and the National Academy of Sciences. At the end of his fellowship, he served as program director at the National Science Foundation supporting the foundation's diplomatic and representational obligations, while managing a portfolio of international basic science collaboration grants

before returning to STAS in 2016. In this role he provided senior officials with analysis, guidance, recommendations and strategic planning to anticipate the foreign policy impacts of emerging STI issues, built STI capacity within the Department, and engaged the National Security Innovation Base to promote Department priorities.

DAVID ESTRADA is Chief Legal and Policy Officer at Nuro, where he oversees the company's public policy, legal affairs, safety, and communications teams. Mr. Estrada has spent his career helping Fortune 500 companies and rapidly growing ventures navigate legal and regulatory challenges while launching and scaling innovative products. Before joining Nuro, he held executive positions at Bird, Kitty Hawk, and Lyft during their formative and growth stages. Mr. Estrada began his journey in emerging transportation policy as the Legal Director for Google X, where he pioneered some of the first state laws and regulations governing autonomous vehicles. Mr. Estrada holds a B.A. in political science from the University of California at Santa Barbara, and a J.D. from the University of California at Berkeley.

BANNING GARRETT (Planning Committee Member) is Faculty of Global Policy and Development at Singularity University. He is a Washington-based strategic thinker, writer, keynote speaker, and entrepreneur who focuses on the impact of exponential technologies and their intersection with long-term global trends, urbanization, and geopolitics. Dr. Garrett was founding director of the Atlantic Council's Strategic Foresight Initiative and created and led the Council program on the implications of emerging technologies and its Urban World 2030 program. He was Director of the Council Asia Program (2003-2012) and in 2006 established and subsequently led the Council's cooperation with the National Intelligence Council (NIC) in production of the NIC unclassified, quadrennial long-term global trends assessments, including *Global Trends 2025: A Transformed World* (2008) and *Global Trends 2030: Alternative Worlds* (2012). Dr. Garrett has also worked on US-China relations since the 1970s and has made sixty trips to China since 1981 for consultations with Chinese officials and analysts as well as numerous similar visits to Russia, Taiwan, Japan, and South Korea. He also traveled with the National Intelligence Council on more than a dozen trips to most of the G-20 countries in Asia, Africa, Latin America, and Europe for global trends consultations. Dr. Garrett received his B.A. in the History of Social Thought and Institutions from Stanford University and his Ph.D. in Politics from Brandeis University.

PATRICIA GRUBER (Planning Committee Member) is a science and technology consultant who most recently served as the Technical Director for the Office of Naval Research Global, an organization within the US Department of Navy. In this capacity, she led a group of technical experts who facilitate international research collaboration and act as liaisons to operational fleet/forces in support of naval missions. She previously served as the Director of Research at the Office of Naval Research, providing overall coordination of the US Navy and Marine Corps. fundamental research portfolio. Dr. Gruber has served as the Vice President, Maritime Systems at Battelle and as the Deputy Director, Applied Research Laboratory at the Pennsylvania State University. She has held a number of technical management and business development positions at AT&T, Lucent and Marconi Communications. She holds a B.S. in meteorology from the Pennsylvania State University and a M.S. and Ph.D. in applied marine physics from the University of Miami.

JERRY HULTIN is the chair and co-founder of the Global Futures Group, a consulting, media, and financial advisory firm that supports the use of 21st-century technology to create smart communities and improve the quality of life of citizens around the world. His work has allowed him to meet with and advise leaders in almost all of the major countries of the world. He is Chair of the New York Academy of Sciences; Executive-in-Residence for Innovation at Arizona State University; co-founder of Smart Cities NY, the largest smart cities summit in North America; an adviser on urban innovation and infrastructure for the World Economic Forum (Davos) and the Global Federation of Competitiveness Councils; and the Chair of Educational Housing Services. Mr. Hultin has extensive experience, especially concerning

economic growth, innovation and geo-political strategy, with some of the world's leading universities and defense agencies. He served as President of Polytechnic University (now the Tandon School of Engineering of New York University) and as Under Secretary of the Navy for President Clinton and member of the Defense Business Board for President Obama. As President of Polytechnic, Mr. Hultin lead the strategic process that transformed the university from traditional engineering to innovation-based engineering; he teamed up with the Bloomberg administration in leading the high-tech transformation of NYC; and he negotiated and consummated the transformational merger of Polytechnic University with New York University (NYU). He was an architect of NYU's Center for Urban Progress, an adviser on the design and creation of NYU's global campuses in Abu Dhabi and Shanghai, and global representative on innovation and urbanization for NYU. Mr. Hultin is a graduate of Yale Law School and Ohio State University.

DARA O'ROURKE is an associate professor at the University of California, Berkeley, the co-founder of GoodGuide, and a Senior Principal Scientist working with Amazon.com. Dr. O'Rourke studies the environmental, social, and health impacts of global production systems and new strategies of governance. He is currently conducting research on a number of global supply chains—from resource extraction, to manufacturing, to use and disposal. Dr. O'Rourke is interested in governmental and non-governmental strategies for monitoring and accountability over production systems, and new models of public participation in environmental and labor policy. He is also leading a team of researchers focused on analyzing and improving the quality of information available to consumers on the social, environmental, and health impacts of products and companies; researching the impacts of this information on consumer behavior; and developing tools to better deliver information to consumers that actually supports behavior change. Dr. O'Rourke currently teaches courses on environmental policy, environmental justice, sustainable consumption, and global supply chains. Dr. O'Rourke received his Ph.D. in Energy and Resources from University of California, Berkeley and his S.B. in Mechanical Engineering from Massachusetts Institute of Technology.

PAUL PISANO (Planning Committee Member) is an independent consultant for transportation operations. Previously, Mr. Pisano was the Team Leader of the Road Weather and Work Zone Management Team in the Federal Highway Administration (FHWA), Office of Transportation Operations. Mr. Pisano worked for the FHWA for over 32 years and was responsible for programs that address the effects of weather on transportation safety and operations, and that seek to improve transportation safety and mobility in and around work zones. Mr. Pisano also served as the Team Leader of the Road Weather Management, in addition to the Traffic Safety Research Team at FHWA. Mr. Pisano is the recipient of the 2016 Kenneth C. Spengler Award from the American Meteorological Society, and his education is in Civil Engineering, holding Bachelor of Science and Master of Science degrees from the University of Maryland.

SELETA REYNOLDS is General Manager of the Los Angeles Department of Transportation (LADOT), the second largest municipal transportation agency in the country. Reynolds is responsible for 1,300 employees and 52 different business lines—from parking meters to traffic signals to buses. Ms. Reynolds was appointed by Los Angeles Mayor Eric Garcetti in 2014 to implement the Mayor's vision of safe and sustainable transportation choices for all. Under Ms. Reynolds' leadership, LADOT has installed hundreds of data-driven safety improvements in high needs locations, launched the largest scooter program in the world, launched the largest electric vehicle car-share program in the country, and created a first-of-its-kind digital platform to manage for-profit mobility companies.

CATHERINE ROSS (Planning Committee Member) is the Regents' Professor and Harry West Chair in the School of City and Regional Planning and Civil and Environmental Engineering at Georgia Institute of Technology. Dr. Ross is an internationally recognized expert on transportation systems planning, urban and regional planning, resiliency, and analytics. She has extensive experience in both the

public and private sectors and directs the Georgia Institute of Technology's Center for Quality Growth and Regional Development. She is a member of the National Academy of Public Administration and past president of the National Association of Collegiate Schools of Planning. Dr. Ross has served on numerous National Academies committees including the Transportation Research Board Executive Committee, University Transportation Centers Program, and on the board of directors of the Eno Transportation Foundation. In July 2009, Dr. Ross advised the Obama Administration on the first-ever White House Office of Urban Affairs. She is the editor of *Megaregions: Planning for Global Competitiveness* (Island Press, 2009) and the co-author of *The Inner City: Urban Poverty and Economic Development in the Next Century* (1997). Her most recent book *Health Impact Assessment* was published in 2014. Dr. Ross researches transportation and urban planning and how to make cities, neighborhoods, and regions safer, healthier places to live. Dr. Ross earned a master's degree and a Ph.D. in City and Regional Planning from Cornell University and completed post-doctorate work at the University of California, Berkeley.

SARAH THORN (Planning Committee Member) is Senior Director of Global Government Affairs at Walmart, primarily responsible for managing global government relations related to supply chain and trade issues. In this capacity, she advocates for Walmart priorities in legislation and trade negotiations that impact the company's worldwide sourcing, e-commerce and retail distribution rights. She also leads a team that drives global public policy in support of Walmart's responsible sourcing commitments. Most recently, Ms. Thorn has expanded her portfolio to manage Walmart's UK government relations, focused on BREXIT negotiations. Before joining Walmart, Ms. Thorn worked for seven years at the Grocery Manufacturers Association where she led the food, beverage and consumer products industry advocacy on international trade issues. She has also worked as a consultant for PricewaterhouseCoopers on business mobility issues and served as an international relations representative with AMP Incorporated. She holds a Master of Arts degree in law and diplomacy from the Fletcher School of Law and Diplomacy at Tufts University and a Bachelor of Arts degree in comparative area studies and comparative literature cum laude from Duke University. She serves as co-chair of the board of the U.S. Global Leadership Coalition and Secretary of the Board of the Washington International Trade Association.