# Cities, Mobility, & Complexity in a Post-Pandemic World

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## Abstract

As Jane Jacobs famously observed, “cities are problems in organized complexity”. They are systems of systems that interconnect and interact. Nowhere is this more true than in the case of transportation and urban built form. If we are to move our urban regions towards greater environmental, social and economic sustainability, a systematic understanding of the two-way “transportation-land use interaction” is essential for both transportation and more general urban planning. An essential but still emerging component of this understanding is to be found in the relatively new field of “city science”, rooted in complex systems theory.

The starting point for this talk is the role of transportation technology in historically shaping cities. It is argued that two technology-based “revolutions” in transportation and associated urban form have occurred: the 19th century mechanization of (public) transport and the 20th century rise of auto dominance/dependency. In complex systems terms, these represent two competing “attractors” driving travel behaviour and system performance, as well as land development. Understanding these competing attractors is critical to dealing with the “sustainability challenge” facing urban regions: how to accommodate continuing growth while improving environmental, social, economic and fiscal sustainability. In particular, it is important to develop a new urban system attractor that significantly reduces cities’ carbon footprint while at the same time improving social equity, overall quality of life and economic performance. It is proposed that, unlike the first two revolutions, this third revolution will not be technology-driven per se. Rather, a much more nuanced, pro-active and effective approach to integrated transport – land use urban design (which exploits technology and urban informatics where appropriate) than has previously been attempted is required that can holistically and systematically enable urban regions to achieve their goals in the coming decades.

## About the speaker

Eric Miller has been a faculty member in the Department of Civil & Mineral Engineering, University of Toronto (UofT) since 1983, where he is currently Professor and Founding Director Emeritus of Mobility Network, the UofT Transportation Research Institute. He is past-Chair of the U.S. Transportation Research Board (TRB) Committee on Travel Behavior and Values, the International Association for Travel Behaviour Research (IATBR) and the TRB Sub-Committee on Integrated Transportation – Land Use Modeling, and is Member Emeritus of the TRB Transportation Demand Forecasting Committee. He served on the TRB Task Force on Moving Activity-Based Approaches to Practice and the US National Academy of Sciences Committee for Determination of the State of the Practice in Metropolitan Area Travel Forecasting. He has chaired or been a member of over 50 urban and intercity travel demand modelling peer review panels throughout North America. Most recently, he chaired the San Francisco Bay Area Link21 demand modelling peer review panel. Professor Miller is the recipient of the 2009 Wilbur S. Smith Distinguished Educator Award from the Institute of Transportation Engineers, inaugural winner of the University of British Columbia Margolese National Design for Living Award (2012), the 2018 IATBR Lifetime Achievement Award and the 2020 UofT Faculty of Applied Science and Engineering Safwat Zaky Research Leader Award.

Professor Miller is the developer of GTAModel, a state-of-the-art activity-based microsimulation regional travel demand modeling system used by numerous Canadian municipalities to forecast travel demand, and ILUTE, an integrated land use – travel demand model system. He is a global leader in the application of agent-based microsimulation to model urban socio-economic systems  His international experience includes transit planning in Cairo, regional master planning in Mumbai and Hyderabad, India, and developing urban mobility solutions for Latin American cities, including a current project implementing GTAModel in Monterrey, Mexico.  He is a co-author of the textbook Urban Transportation Planning: A Decision-Oriented Approach, currently in its third edition.