



Travel in a Post-COVID World: A Few Speculations

Presentation in the “Post-COVID Travel &
CECCS’ Air Travel Report” Panel Session
Adams Sustainability Celebration
University of Toronto
November 3, 2020

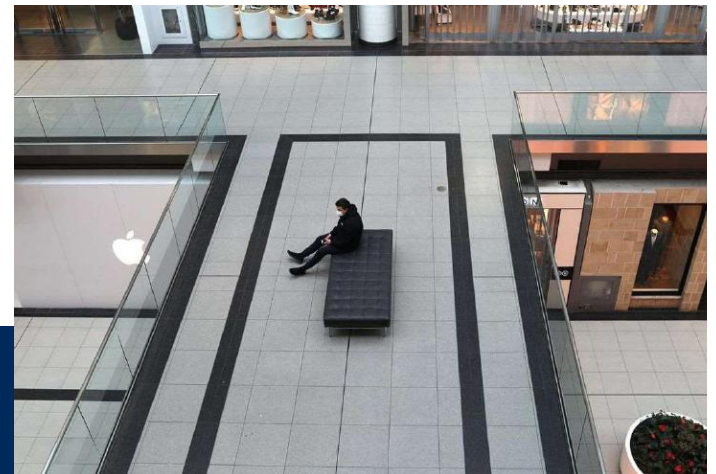


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COVID-19 Disruption

- As with every other aspect of our society, COVID-19 has seriously disrupted our urban transportation system:
 - Disastrous declines in transit ridership & revenues.
 - Shifts to auto usage.
 - Exacerbated inequities.
 - On the positive side:
 - Reduced GHGs & air pollution.
 - Increased walking & biking.
 - Experimentation with alternative street usage.



Density & Social Distancing

- COVID is a “direct attack” on the whole *raison d’être* of cities to bring people together to interact.

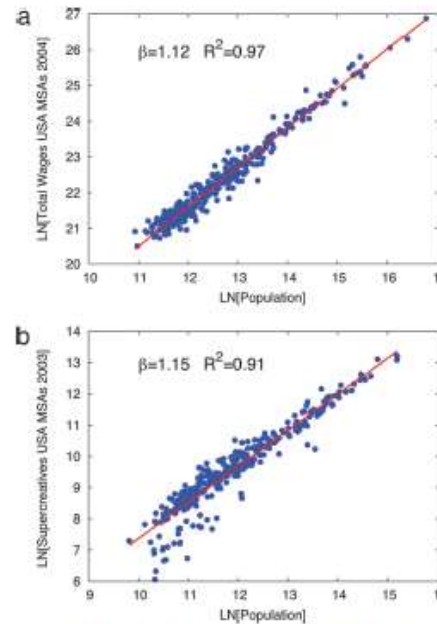


Fig. 1. Examples of scaling relationships. (a) Total wages per MSA in 2004 for the U.S. (blue points) vs. metropolitan population. (b) Supercreative employment per MSA in 2003, for the U.S. (blue points) vs. metropolitan population. Best-fit scaling relations are shown as solid lines.

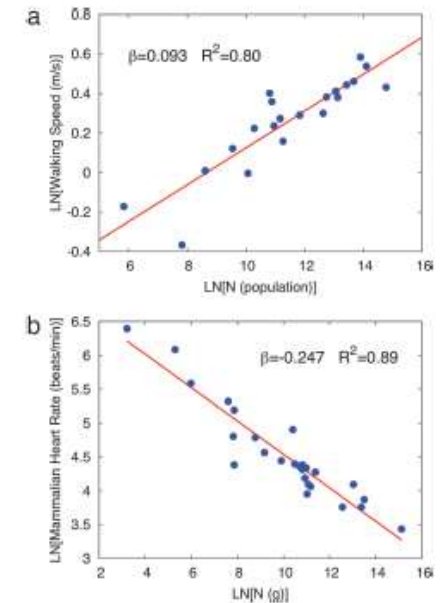
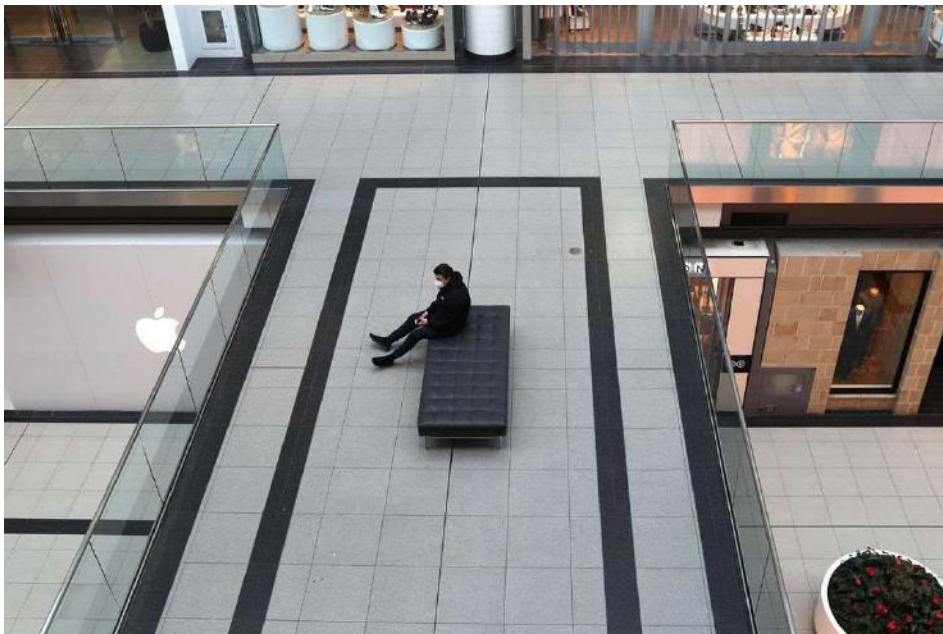
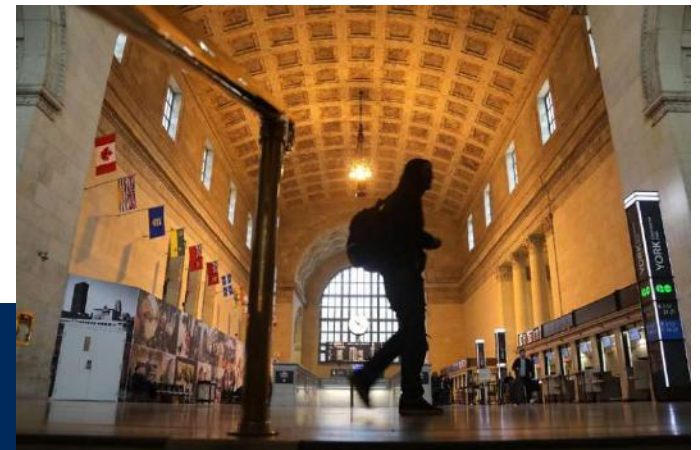


Fig. 2. The pace of urban life increases with city size in contrast to the pace of biological life, which decreases with organism size. (a) Scaling of walking speed vs. population for cities around the world. (b) Heart rate vs. the size (mass) of organisms.



Long-term impacts of COVID-19? (1)

- More working from home?
- Increased suburbanization (or even “ex-urbanization”)?
- Permanent loss of transit ridership?
- Increased use of ridehailing services?
- Reduced activity in central cities?

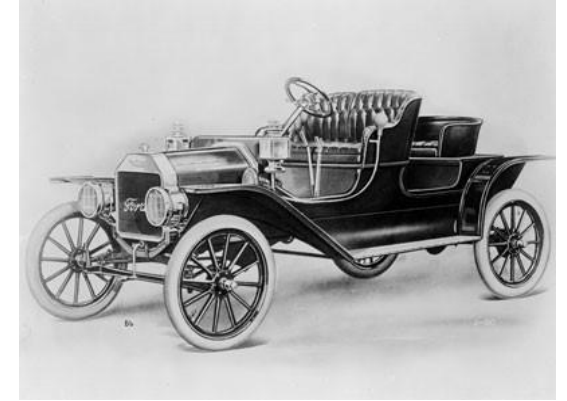


Long-term impacts of COVID-19? (2)

- The future is very difficult to foresee.
- Some shifts will undoubtedly occur; e.g., some people will continue to work at home.
- But current consensus seems to be that there will be very strong pressures to “return to normal”.
- Cities are very resilient; there are good reasons for why they are constructed the way they are:
 - “Containers of civilization”.
 - Markets.
 - Agglomeration.
 - Innovation.



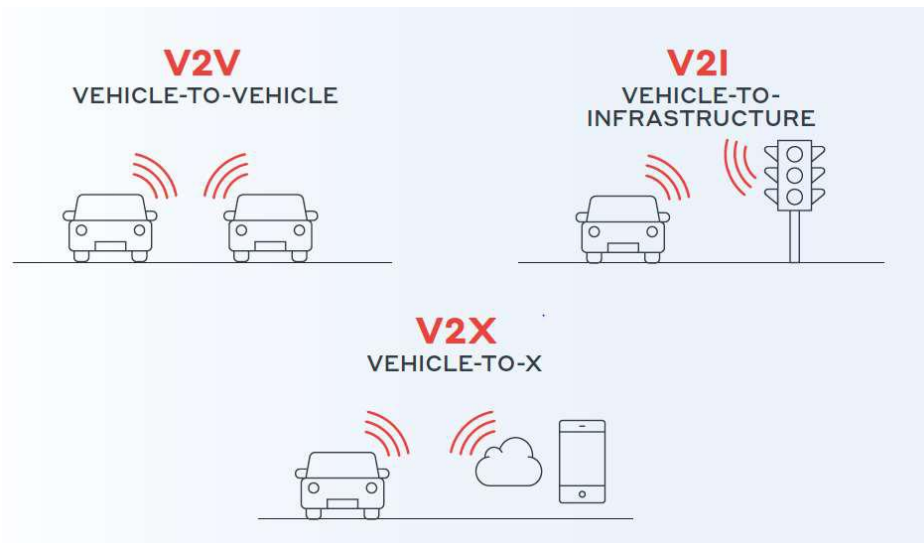
On-going disruption



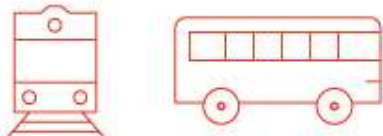
- But the transportation system was undergoing significant & numerous disruptions pre-COVID and will continue to be shaped by these post-COVID.
- Just as COVID is the biggest public health crisis in a century, we are in the midst of the biggest change in transportation & mobility in a century (since the early 1900's).



Disruptions (1): New technologies & services



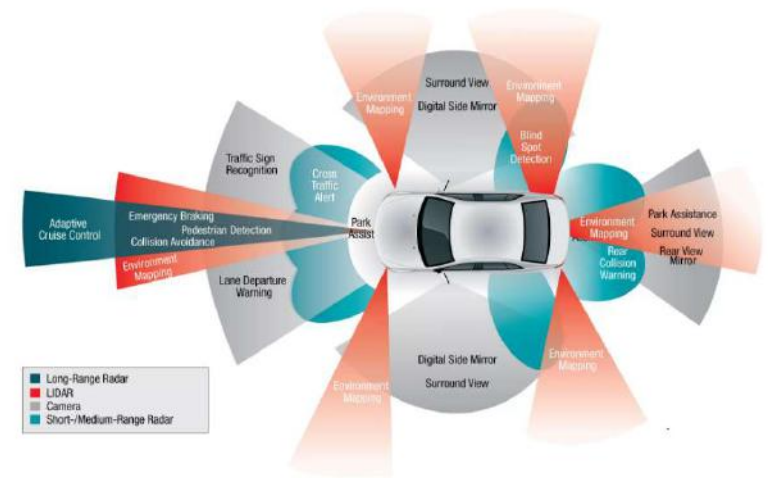
Traditional public transportation services, such as buses and trains



Vanpools, carpools, shuttles, transport network companies (TNCs) and rideshare pools



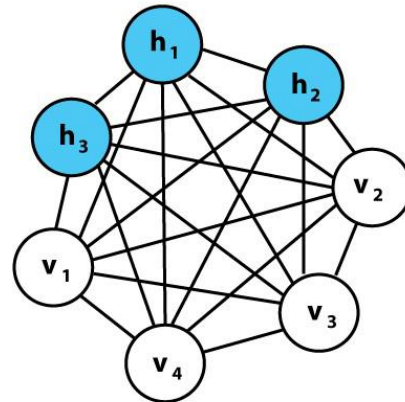
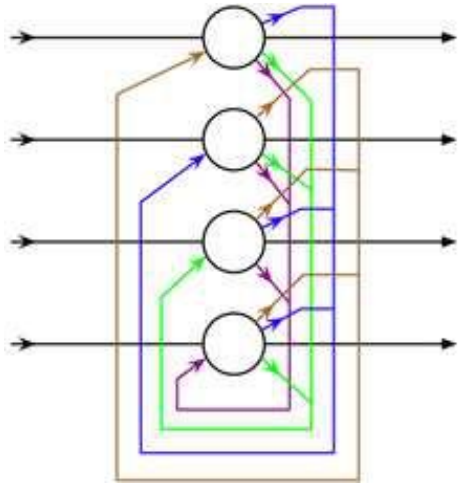
Carsharing, bikesharing, scooter sharing in all its forms



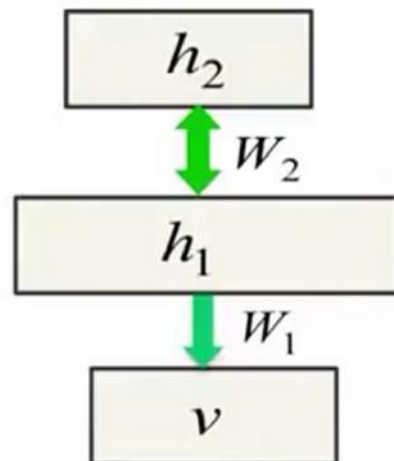
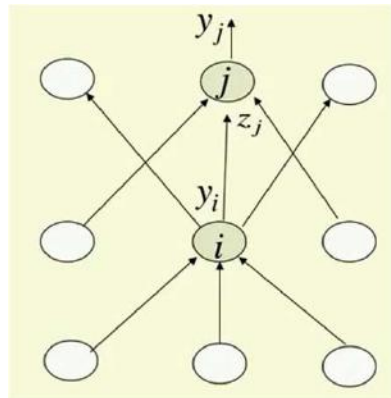
- Connected
- Autonomous
- Electric



Disruptions (2): ICT, IoT, AI & Big Data

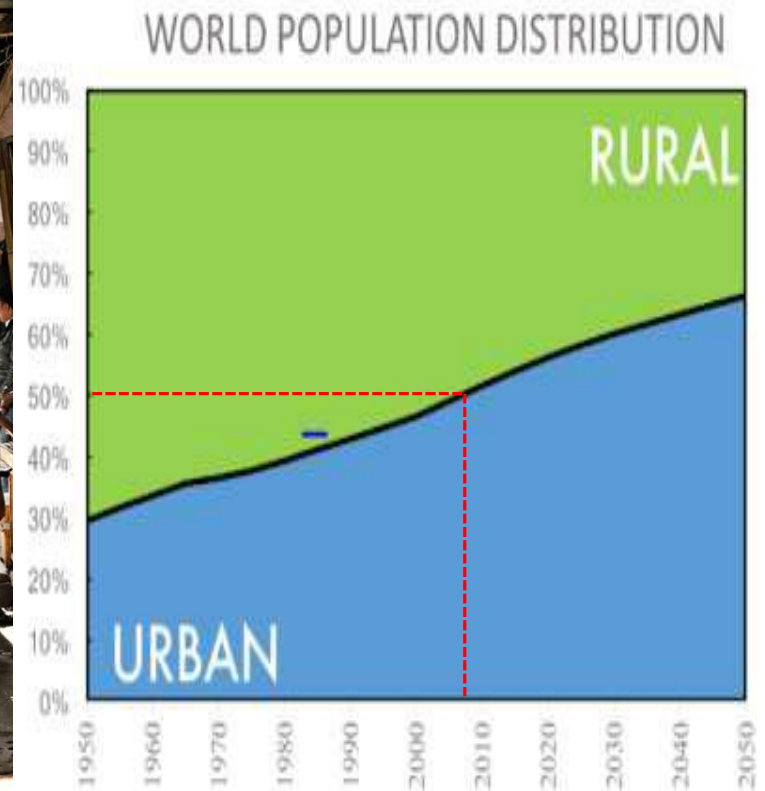
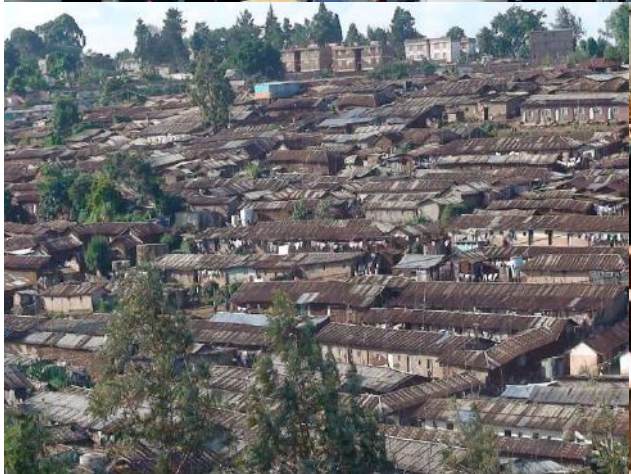


- At the same time, the technology that is so disrupting transportation services is also generating massive amounts of new data about travel behaviour that potentially will allow us to view travel in new ways:
 - Very large samples.
 - Dynamic, time-series.
 - But (usually) lacking socio-economics.
- New analysis and computing methods are enabling the analysis of these huge new datasets (machine learning, etc.) that will provide exciting new insights into how to design & operate our systems,



Disruptions (3): Global Urbanization

- The challenge of planning/building the world's emerging cities & mega-cities is enormous, but world stability, etc., etc. depends on getting the 21st century urban world “right”.
- A “first-order” world-wide problem that is not being adequately addressed in most cases.





Disruptions (4): The quest for social & economic equity



The search for sustainability ...

- Transportation & sustainability – the “triple bottom line” is still calling us:

- Environmental:

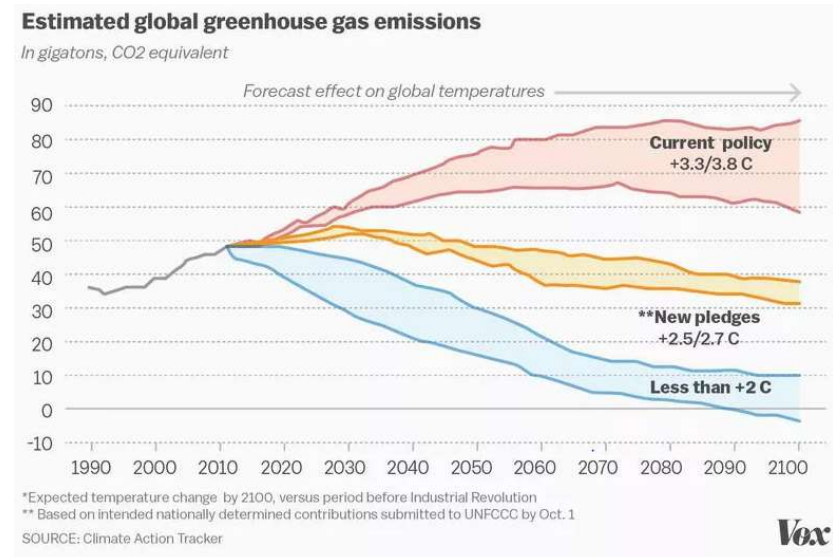
- GHGs.
- Air pollution.
- Land use.

- Social:

- Equitable access.
- Environmental justice.

- Economic/fiscal:

- System affordability.
- Sustaining the urban economy.

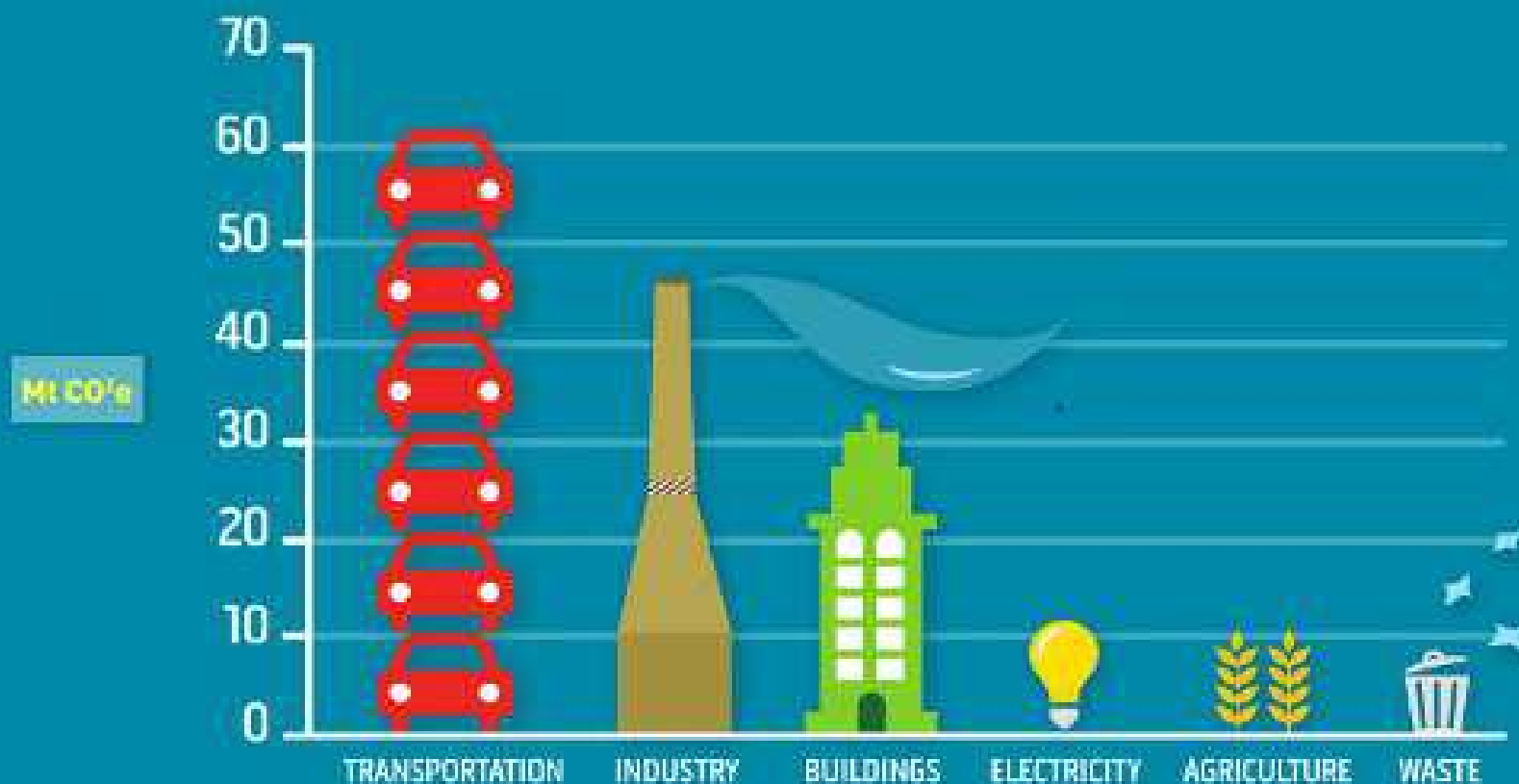


- Despite all the technological developments, at the end of the day, we still have three basic ways of moving people in cities:

- Automobile (whether autonomous or not, electric or not, privately owned or not).
- Public transit (what is its future in the face of technological change?)
- Active transportation (walking, biking; not sure e-scooters qualify, ...)



GREENHOUSE GAS EMISSIONS IN ONTARIO BY SECTOR – 2013

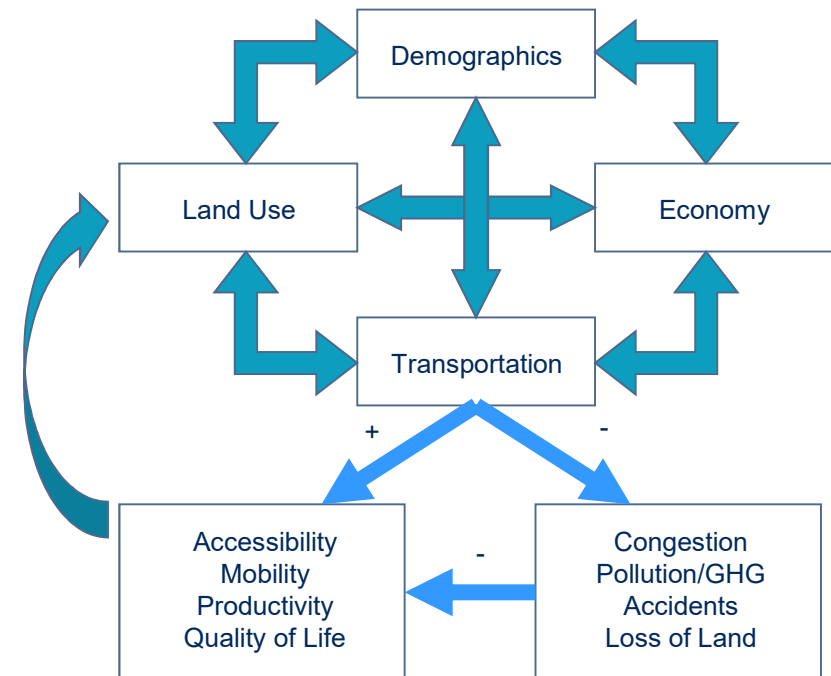


Urban Form



Kennedy, C.A., E.J. Miller, A.S. Shalaby, H. MacLean and J. Coleman (2005). "The Four Pillars of Sustainable Urban Transportation", *Transport Reviews*, 25:4, 393-414.

- The transportation – land use interaction remains fundamental & critical.
- How we build urban form determines what we can do (effectively, efficiently, equitably) with transportation.
- Urban design at both the micro (neighbourhood) and macro (city/region) levels is critical.
- How we accommodate continuing urban growth in terms of urban design – integrated with “smart” transportation design will largely determine the overall sustainability & resilience of our world.



The ILUTE
research team
throughout the
years & in
happier times.

May we see
these days
again!

LET'S DISCUSS!



*Integrated, Land-Use,
Transportation,
Environment*

