



The Future of the Urban Airscape

Carleton University
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Transport
Canada

Transports
Canada

Canada

What's driving the interest in taking city traffic to the air?

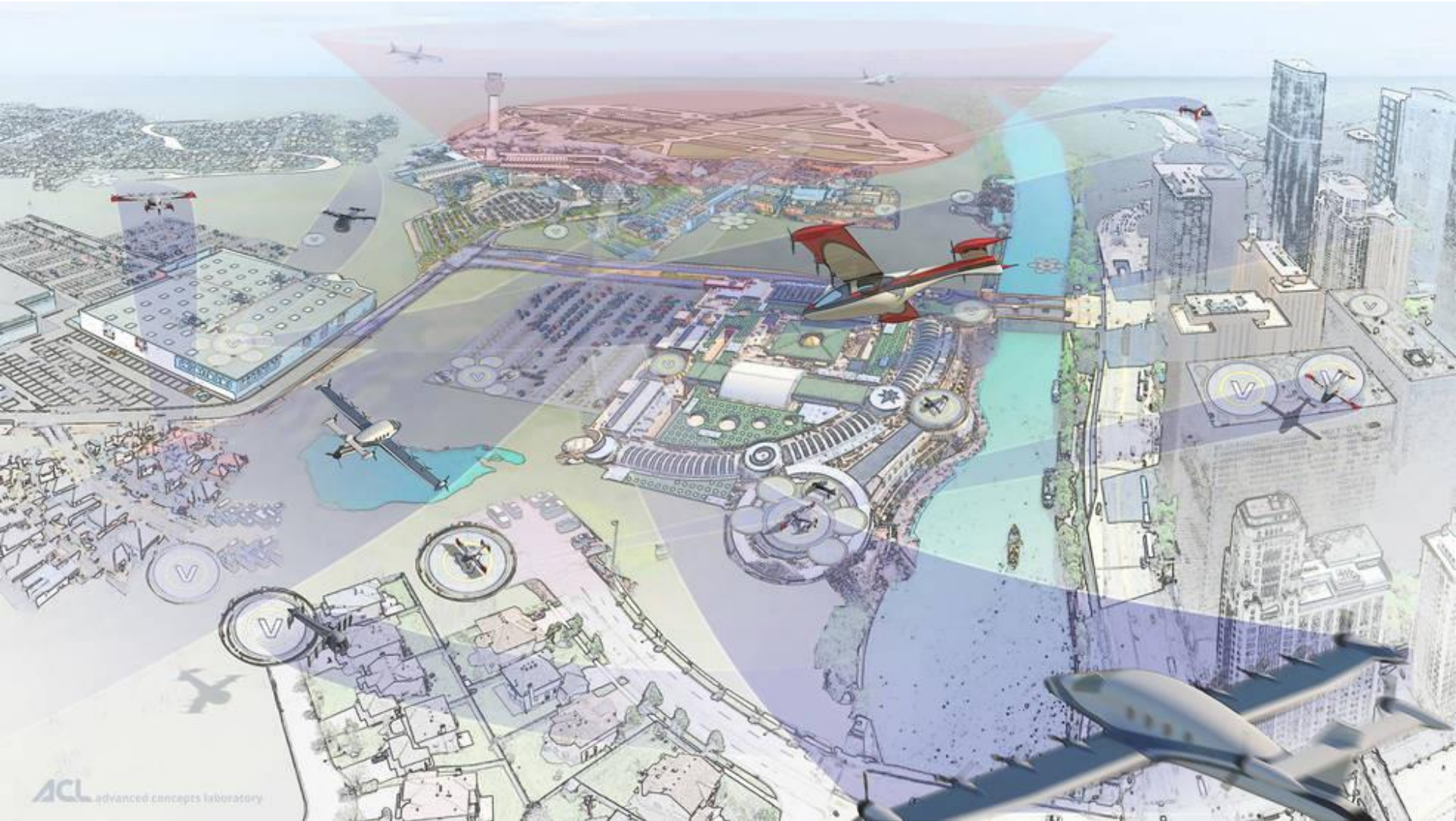
Global urbanization

- More than half of the global population lives in cities and rapidly growing
- In 2016, over 80% of Canadians lived in urban areas
- The population density of cities is increasing
- Increases the demands on a relatively static amount of space and infrastructure

Urban areas need to **adapt and evolve** transportation systems to

- Be able to move people and goods safely and efficiently
- Reduce the impact of transportation on the environment
- Prepare systems & infrastructure for future increases in population density

Ideal Scenario?



ACL advanced concepts laboratory

Image credit: NASA/Advanced Concepts Laboratory

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Ideal Scenario

- RPAS are integrated into the urban transportation system in a way that doesn't interfere with other air traffic, reduces congestion and improves supply chains
- RPAS are a cleaner, quieter, greener option to other modes of transportation for "last-mile" travel
- RPAS are safe to fly over lots of people and in all weather
- The public sees the benefit of RPAS and accepts their widespread deployment

Getting there is not a done deal



██████████ 3 months ago

How long before someone hacks one and flies it into a building?

👍 1 🗨️ REPLY



██████████ 3 months ago

We'll all need to walk around with huge helmets or steel shields over our heads. Not a great idea... many will either drop what they are carrying, or crash down. Good for population control, perhaps...

👍 1 🗨️ REPLY



██████████ 3 months ago

If you shoot them down, can you keep the cargo? Like a prize.

👍 1 🗨️ REPLY

How can we

- *governments*
- *industry*
- *academia*

set Canada on the right path?

Transport Canada's role

Safe & secure

Efficient

Green & innovative

- ✓ RPAS less than 25 kg can be flown visual line-of-sight if the RPAS is registered with TC and the pilot has a Basic or Advanced certificate.
- ✓ Larger RPAS and flying beyond visual line-of-sight requires a Special Flight Operations Certificate.
- ✓ Proposed regulations for low-risk BVLOS are coming.

The ideal scenario must be safe for other aircraft & people on the ground

Key safety developments will need to include:

- developing regulations for beyond visual line of sight operations,
- ensuring RPAS can see and be seen to allow for traffic management, and
- developing a certification framework for the safety of aircraft & systems in high-risk environments

Economic Policy & Regulation

- Emerging industries can be quite volatile
- How do we know when government policy or regulation might be needed to address market failures or market trends that might be counter to Canadian priorities?
- What are Canada's priorities for the development of the RPAS sector?
- In aviation, we regulate foreign ownership and operation. Is there a similar argument to be made for the RPAS sector?

Keeping it green

- Noise levels: the increasing use of RPAS over populated areas brings with it some of the same concerns as commercial flight paths
 - RPAS flight paths may be more flexible – good for re-routing potential but also means a greater number of people could be impacted
- Energy source
 - Trend has been towards re-chargeable electric power – need to keep looking at life-cycle analyses of battery technology as it changes
- Environmental impact of an incident, particularly in sensitive areas

But there's more...

- What's the best way to manage increased air traffic?
 - Highways in the sky?
 - Air zoning?
 - Who gets access to the highways/zones?
 - How does this all interact with existing systems of air traffic management in controlled airspace (often overlapping large cities)?



In Canada, air traffic services in controlled airspace are provided by NAV CANADA, a private, not-for-profit corporation.

How will urban design & planning need to change?

Where can RPAS take-off and land: Rooftops?
Yards? Sidewalks?

What about re-charging? Private or public infrastructure? Where?



What will the role of cities, provinces, territories, and the federal government be in this new infrastructure discussion?

Drones are data-collecting devices

Are our privacy laws (federal and/or provincial) sufficient to deal with this new reality?

Are companies (and governments) ready to properly store, use and dispose of the huge volumes of data?

Critical policy research and analysis will go hand in hand with technological developments in moving us in the right direction...

UP!

Thank You

Questions?