Automation & Autonomy: Regulatory Perspectives

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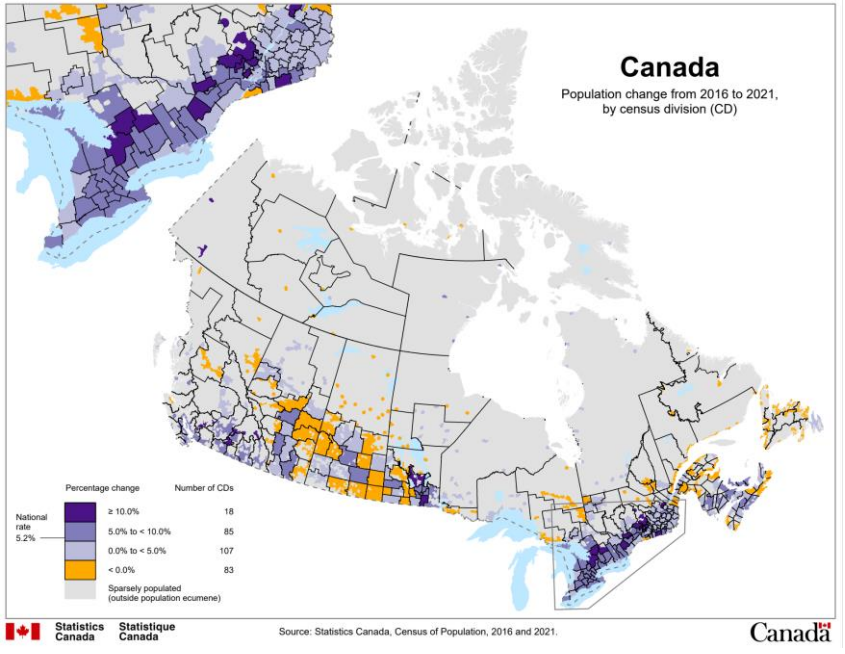
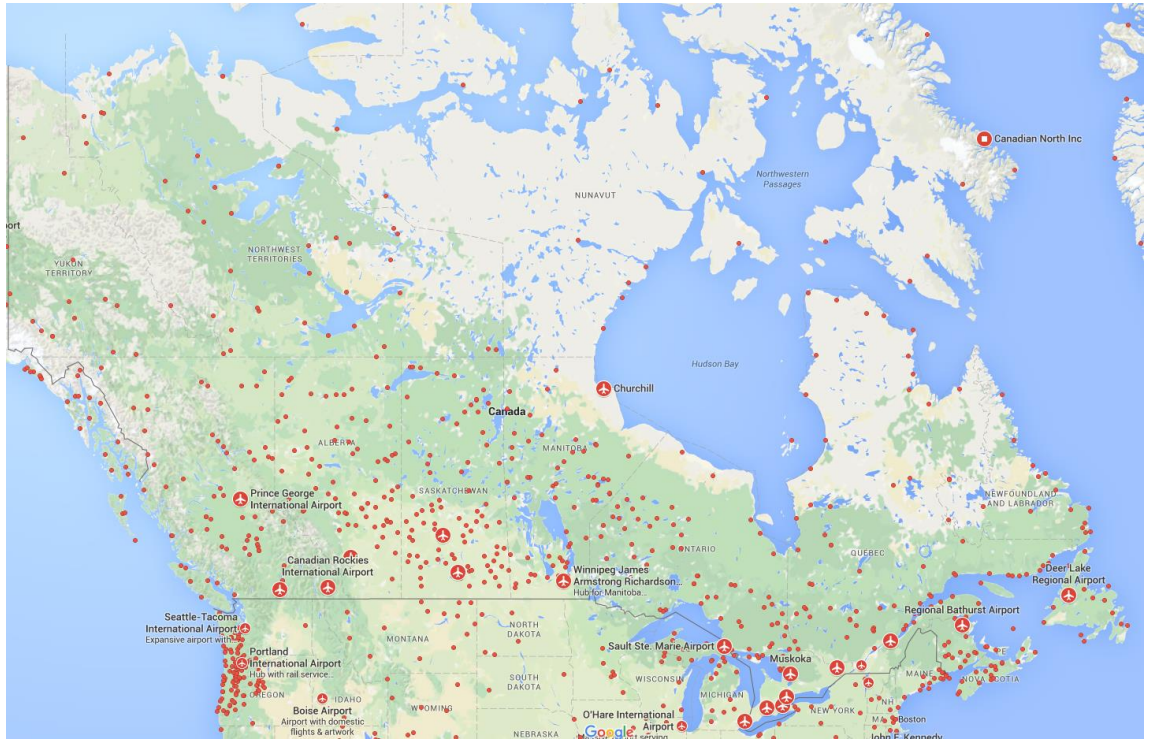
Automation in Canada

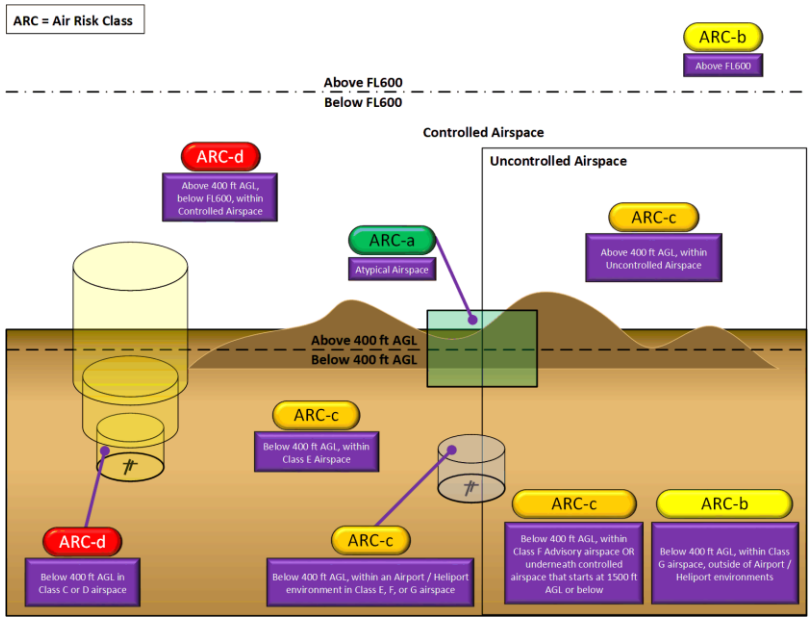
- The Canadian Operating Environment:
  - Large geographic area (long distances);
  - Concentrated pockets of population;
  - Significant aviation infrastructure; and
  - Limited communications coverage.



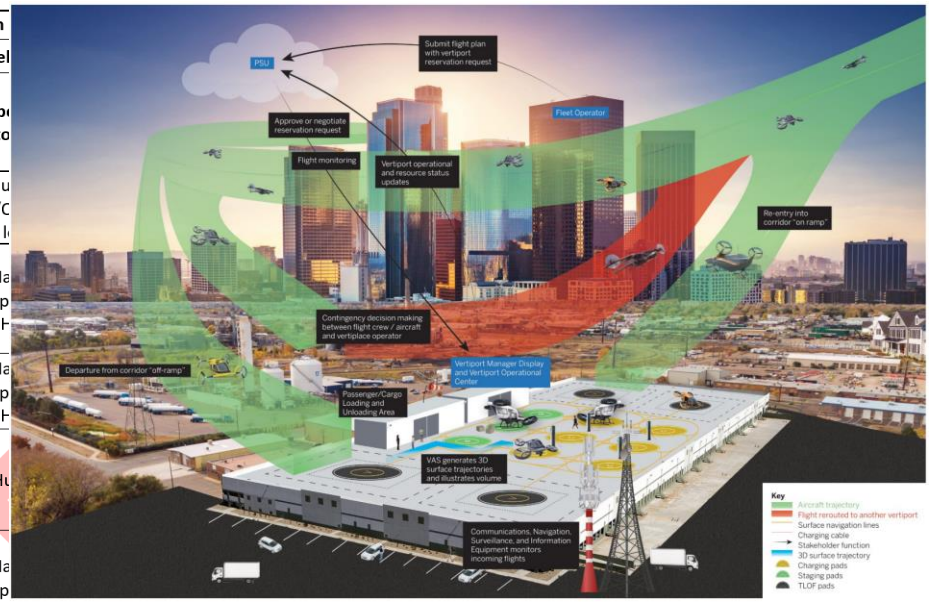


Dimensions of Automation

- Operational Risk;
- Airspace Systems;
- Aircraft Functional Architecture;
- Degree of Automation; and
- Technology maturity.

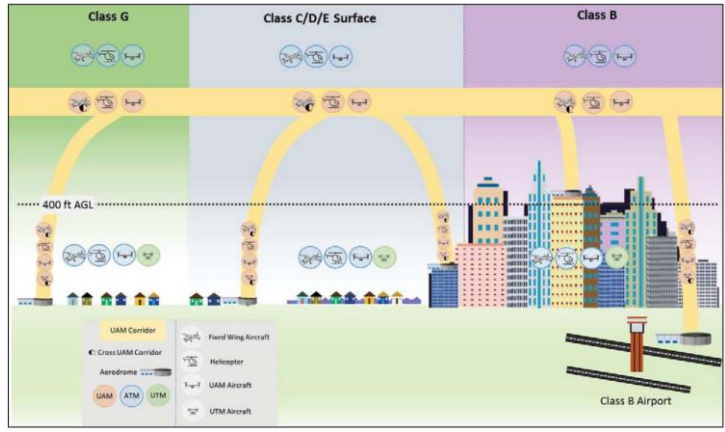


Functions \ Level	Level 0	Level 1	Level 2	Level
	Manual Operation	Assisted Operation	Task Reduction	Sup Auto
Human-Machine Teaming	Human led	Human-In-the-loop	Human-In-the-loop	Hu In/C
Sustained Aircraft Maneuver Control	Human	Human *AND* Machine	Machine (Managed by Human)	Ma (Sup by H
Object and Event Detection and Response (OEDR)	Human	Human	Machine (Managed by Human)	Ma (Sup by H
Fallback (Integrity Thresholds Exceeded)	Human	Human	Human	Hu
Communication with External Systems (Ground and Airspace systems)	Human	Human	Human *OR* Machine (Managed by Human)	Ma (Sup by Human)

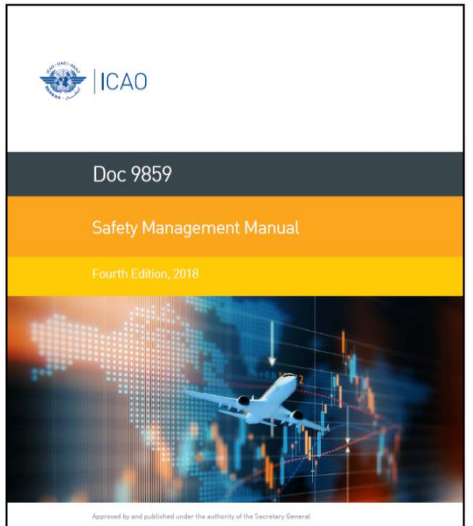
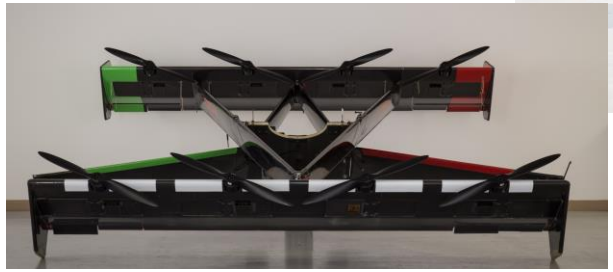


Addressing the Challenges

- Type Certification of autonomous aircraft remains the goal but there are significant challenges to overcome including:
  - Definition of operational environments;
  - SMS roles & responsibilities;
  - Certification Standards & Means of Compliance; and
  - Operationally specific configuration considerations.



- Transport Canada is working with the National Research Council Canada to develop an approach to safe certification of autonomous aircraft.



Thanks!