

Air Lab

Bringing next-gen transit bus manufacturing to Durham Region

- ✓ Creating thousands of jobs
- ✓ Saving taxpayers \$1.4 billion
- ✓ Helping reduce GHGs

Durham Region Jobs

Projecting 5,000+ jobs over 5 years

Air Lab will bring transit bus manufacturing to Durham Region and create jobs in:

- ✓ Bus assembly;
- ✓ Parts/component supply chain (Tier 1 & 2);
- ✓ Engineering and prototyping;
- ✓ Professional services;
- ✓ Plant construction;
- ✓ Machine tool, assembly and office equipment; and,
- ✓ UOIT academic support and student engagement.

Saving Ontario taxpayers \$1.4 billion

TTC is on track to spend \$2.2 billion taxpayer dollars for a fleet of 2,000 foreign-built electric buses over the next 22 years.

Air Lab will manufacture buses for less - a lot less - and save Ontario taxpayers at least \$1.4 billion.



Made in China BYD electric bus - \$1.1 million each plus costly charging infrastructure.

The proposed Air Lab bus will use our proprietary hybrid pneumatic powertrain technology making it lighter, less costly to operate and maintain and will not require costly charging infrastructure.

Made in Durham Region Air Lab buses - \$399,000 each. No costly charging infrastructure required.

A Reality Check

- In their rush to meet C40 zero emission targets, TTC and many cities are overlooking “electric bus” shortcomings.
- A single-minded focus on battery electric buses (BEBs) shuts out newer, more effective and more economical GHG abatement technologies.



Air Lab offers a better bus solution



Reducing GHGs – at home and globally

Air Lab's hybrid pneumatic powertrain is a new way of powering a bus. It's based on proven technology that significantly reduces GHGs.

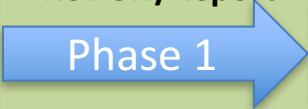
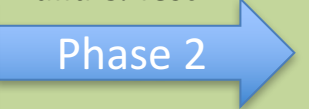
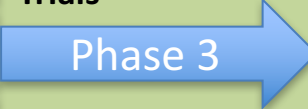

- ✓ Zero/ultra low emission in urban settings;
- ✓ 60g CO₂/km emissions in range-extended settings;
- ✓ Assist Ontario with a smooth transition to energy efficiencies over time; and,
- ✓ Air Lab technology – domestic and global transit bus markets.

Comparison of Solutions

Parameter (all figures average/typical)	Pure Pneumatic* Bus	Hybrid Pneumatic* Bus	Battery Electric (BEB) Bus	Diesel Bus	Diesel Hybrid Electric Bus	Plugin Hybrid Electric Bus	Hydrogen fuel cell Bus
Price per Bus (\$CAN)	\$399,000	\$399,000	\$1,500,000	\$717,000	\$1,140,000	\$1,140,000	\$1,700,000
Bus curb weight	12,000 lb. 6 tons	12,000 lb. 6 tons	22,000 lb. 11 tons	28,000 lb. 14 tons	42,000 lb. 21 tons	30,000 lb. 15 tons	34,000 17 tons
Emissions CO2 (g/mi) <small>Well-to-wheel</small>	400g/mi.	998g/mi.	650g/mi	2,680g/mi.	2,364g/mi	2,212g/mi	NA
Range	NA	300 miles	50 – 250 mi	300 miles	300 miles	300 miles	200-300mi
Operating cost (\$/mi)	\$0.15/mi	\$0.15/mi	\$0.19/mi	\$1.06/mi.	\$0.33/mi.	NA	NA
Maintenance Cost (\$/mi)	\$0.25/mi	\$0.25/mi	\$0.50/mi	\$0.81/mi	\$0.19/mi	\$0.32/mi	NA
Charging cycle time	5 minutes	5 minutes	2 – 8 hours	10 minutes	10 minutes	10 minutes	3 – 5 minutes
Charging Infrastructure costs (\$/Station)	\$25,000	Existing installation	\$75,000	Existing installation	\$50,000	\$50,000	\$600,000
Ontario jobs created	2,000 over 5 years	2,000 over 5 years	0	0	0	0	0
Local Supply Chain (%)	80%	80%	0%	0%	0%	0%	0%

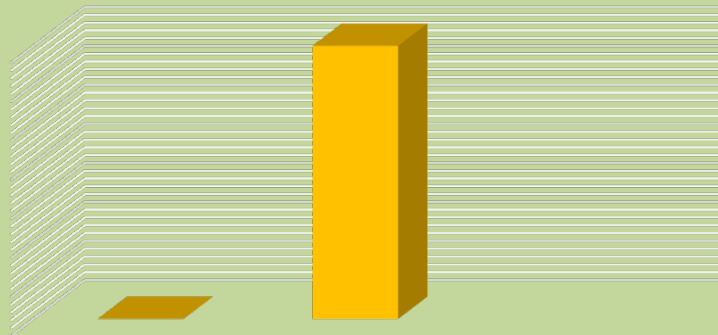
* Informed projections

Demonstration Project and Budget Roadmap

	Feasibility Review/Report  Joint effort between Air Lab & Academia	Trial Engineering Build & Test  Joint effort between Air Lab, Academia & Fabricator	Beta Test Unit Trials  Joint effort between Air Lab, Fabricator, Third Party Trial	Commercialization  Joint effort between Air Lab & Investor and Customer base	
Time Line	Q1 2019	Q2-Q4 2019	Q1-Q4 2020	Q1-Q2 2021	
Engineering and design	\$250,000	\$750,000	\$1,000,000	\$500,000	\$2,500,000
Prototyping	\$25,000	\$300,000	\$250,000	\$25,000	\$600,000
Testing	\$50,000	\$200,000	\$200,000	\$500,000	\$950,000
IP prosecution	\$50,000	\$500,000	\$700,000	\$250,000	\$1,500,000
Management and support	\$200,000	\$600,000	\$800,000	\$400,000	\$2,000,000
Materials and equipment	\$50,000	\$450,000	\$450,000	\$50,000	\$1,000,000
Facilities	\$30,000	\$120,000	\$150,000	\$60,000	\$360,000
Professional services	\$100,000	\$300,000	\$400,000	\$200,000	\$1,000,000
Other expenditures	\$25,000	\$10,000	\$10,000	\$45,000	\$90,000
Total	\$780,000	\$3,230,000	\$3,960,000	\$2,030,000	\$10,000,000

Invest \$10 million to save Ontario at least \$1.4 billion

Air Lab requests Government of Ontario support to demonstrate a pilot model of its pneumatic-powered transit bus as a step towards achieving objectives listed below.



Invest \$10 million and save at least \$1.4 billion

Return On Investment (ROI):

- ✓ Creating thousands of Durham Region jobs;
- ✓ Saving Ontario taxpayers at least \$1.4 billion; and
- ✓ Helping reduce domestic and global GHGs

Contact

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