

Moving New Zealand Forward

The Future of Heavy Vehicles

IRTENZ 19th International Conference

Learnings from HVTI18

- **18th International Symposium on Heavy Vehicle Transport and Technology**
- **Quebec City - May 25 – 29**
- **Trucking toward S²MART transport (Sustainable, Safe, Modern, Adaptable, Resilient and Trustworthy)**

- **Conferences are hard work....**



HVTT18: Trucking toward S²MART transport

Sustainable, Safe, Modern, Adaptable, Resilient, and Trustworthy
First announcement and call for abstracts

May 26-29, 2025
Québec City, Canada

















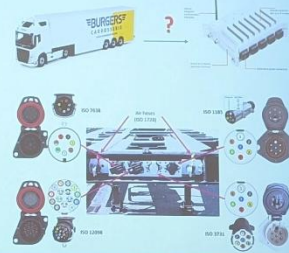
Data Availability

- Data sources (through EBS-TCAN):

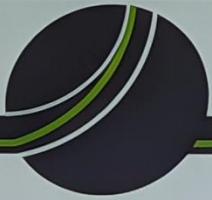
- Trailer EBS system data
- Truck CAN-bus (ISO 11992)
- Tyre Pressure Monitoring System (TPMS) in accordance with UN ECE-R 141 (2024)

- Data acquisition:

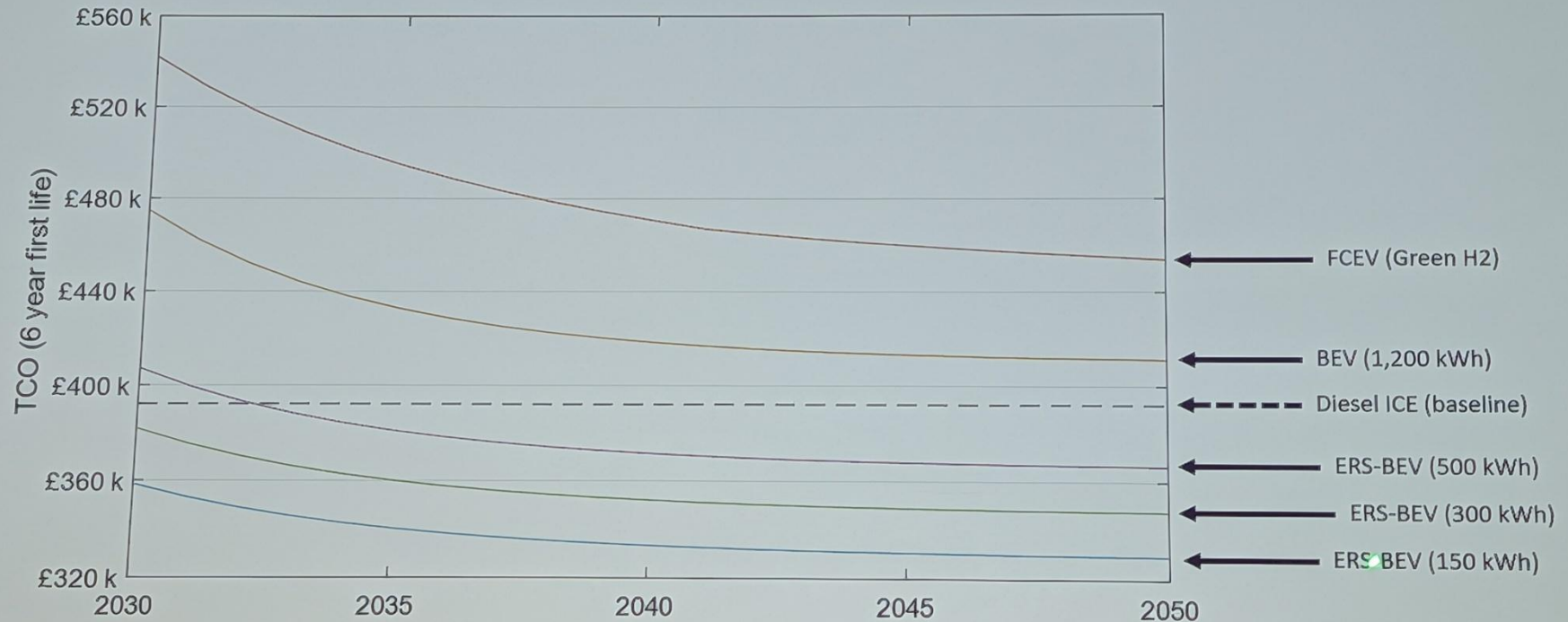
- GO Control (acquisition + controller) connected to TCAN
- Live data feed send to MQTT servers though IoT-sim



Faculté d'économie
Université
LAV



Total Cost of Ownership (TCO)







Trucking toward S²MART transport (Sustainable, Safe, Modern, Adaptable, Resilient and Trustworthy)

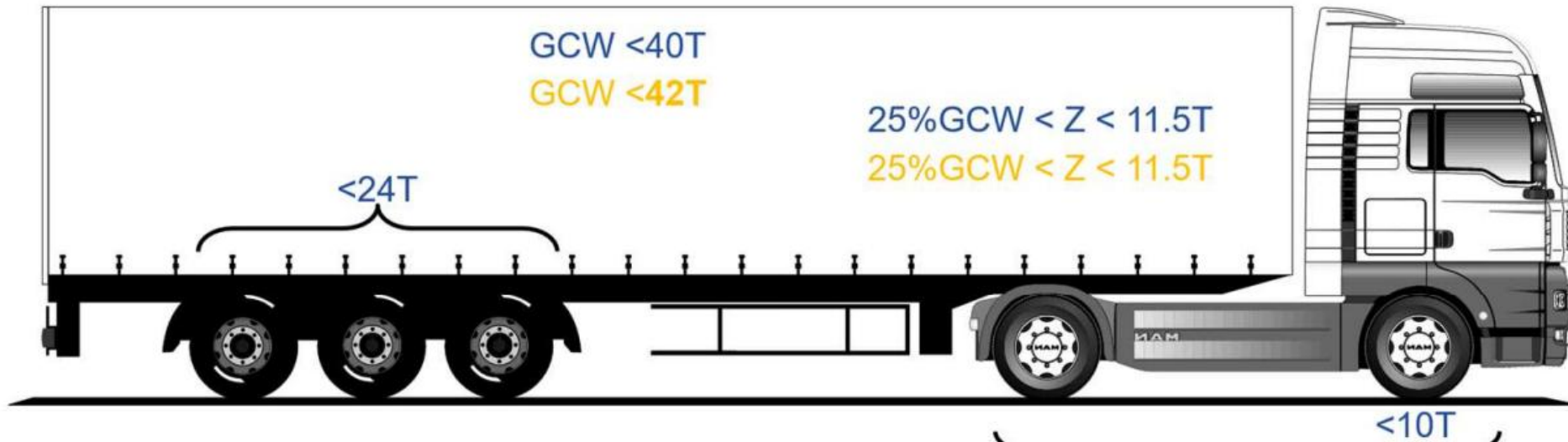
Resilient road freight transport systems, including in cold regions and remote areas	Climate change mitigation and adaptation for heavy vehicle systems and infrastructure	Policies, pilot projects, and prototypes toward sustainable road freight transport: managing energy transitions and decarbonization
Innovations in heavy vehicle systems, instrumentation, and materials	Smart integration of heavy vehicles and resilient transport infrastructure	Advances in heavy vehicle safety
Economics of heavy vehicle transportation systems	Reliable supply chains during disruptive events	Improving road freight transport practices through training, education, and good governance
Heavy vehicle weights and dimensions policies, regulatory harmonization, permitting, and compliance	Integration of long haul and local deliveries, urban freight network planning, and logistics	

66 papers presented across 4 days

Trucking toward S²MART transport (Sustainable, Safe, Modern, Adaptable, Resilient and Trustworthy)

Decarbonisation – Tyres and rolling resistance

- **New challenges for tyres on BEV** (In EU GCW has been increased by 2 tonne for BEV, with a further increase to 4 tonne in the coming years)
- **Most of the extra mass will be on the steer axle, steer axle loads increase from 7 tonne to 8.5 tonne**
- **Tyres may have to be redesigned to be as safe as today, but with more load**
- **Electrified trucks have more torque available = more wear under tractive torque**
- **An electric truck will brake (regen) more with its drive tyres only = more wear under braking torque**
- **Tyres need significant performance improvements to perform as well on BEV trucks as they do on ICE trucks**
- **Tyre pressure monitoring systems (TPMS) mandated on all trucks and trailers in EU - 2024**



Loads (t) USAGE / LIMIT	Steer axle	Drive axle	GVW tractor	Trailer axle	Total GCW
Current ICE	7 / 10	11 / 11.5	18 / 18	22 / 24	40 / 40
Current BEV	8.5 / 10	11.5 / 11.5	20 / 20	22 / 24	42 / 42

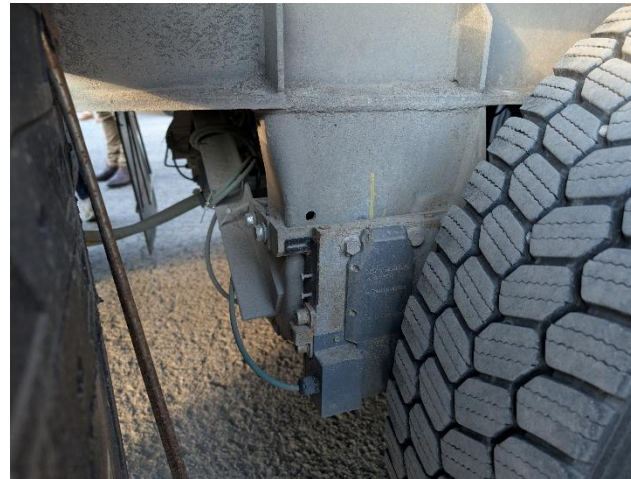
GVW < 18T
GVW < 20T

Trucking toward S²MART transport (Sustainable, Safe, Modern, Adaptable, Resilient and Trustworthy)

Decarbonisation – Tyres and rolling resistance

- Real world testing of tyre rolling resistance found:
 - More rolling resistance variation within pavement types than between them
 - Thermal cracking on flexible pavements increased rolling resistance by 0.8 kg/tonne
 - Slab faulting on rigid pavements increased rolling resistance by 0.3 kg/tonne

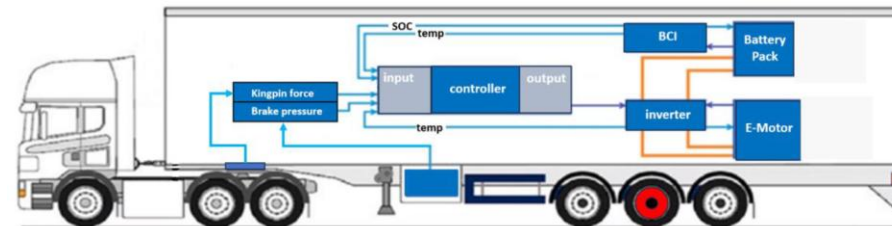
Accuracy of ± 0.1
kg/tonne)



Trucking toward S²MART transport (Sustainable, Safe, Modern, Adaptable, Resilient and Trustworthy)

Vehicle Design & dynamics/Infrastructure Design

- Semi trailers, 10% CO₂ reduction required by EU regulations
 - Lift axles
 - Low rolling resistance tyres
 - e-trailers (tractive trailers)
 - Needs to be interoperable and independent of tractor CAN data
 - Load-sensing kingpin coupling
 - Vehicle state estimation
 - Data from trailer EBS



Trucking toward S²MART transport (Sustainable, Safe, Modern, Adaptable, Resilient and Trustworthy)

Heavy Vehicle Regulation/Performance Based Standards

- **Evaluating Electronic Stability Control Technologies in PBS Vehicles**
 - **How should ESC/RSC technologies be incorporated in PBS standards**
- **A-doubles replacing truck and dog combinations as the most popular PBS vehicles in Australia**
- **Lack of uniformity in assessment and classification of the infrastructure network (Australia)**
- **Some PBS vehicle in Australia have not been successful (short AB doubles and Trac-axle)**







- **Decarbonisation is being tackled on many fronts. i.e.**
 - **Low rolling resistance tyres**
 - **Understanding real world rolling resistance**
 - **Lift axles**
 - **BEV/Gas/H2 vehicles**
 - **ERS**

HVTT18 – Key learnings



- Decisions about pavement strength on our key freight routes will need to consider the types of vehicles and axles loads that will be going on them in 10 years time



HVTT18 – Key learnings



- NZ needs to be doing the research to find out what technologies will work best in the NZ context i.e. ERS, BEV, H2, CNG/LNG, Biomethane
- There is still a lot we can do to improve freight productivity, need to refine and use PBS more

The place of Canada
Heavy haul
transportation

Given current economic landscape:
Is Canada's trucking competitive vs
international?

Country	Tractor/semi trailer Configuration	GVW (t)
Finland	10-axle	76
Sweden	11-axle	90
Australia	11-axle	82.5
Australia	10-axle	79
Canada	10-axle	78.3
NZ	9-axle	58





- **Need to be doing more with regulation to improve the uptake of new and existing technologies that reduce CO2 emissions**

Lift axles, TPMS, low rolling resistance tyres