busworld EUROPE 2025 CONGRESS
BRUSSELS, BELGIUM 6-9 OCT 2025
in collaboration with: European Commission

EUROPEAN ZERO EMISSION BUS CONFERENCE 7th - 9th Oct 2025 @ Busworld Europe Brussels

Organised by

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SESSION #11

13:30 – 14:45

Servicing and Maintaining Zero Emission Bus Ecosystems

BREAKOUT SESSION

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Infrastructure Challenges of Heavier Buses: Learnings from Stockholm

Kenneth Domeij

Senior Specialist Bus Infrastructure,
Region Stockholm

Malin Hedberg

System Owner Bus,
Region Stockholm

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Battery buses increases the weight

Kenneth Domeij, Senior bus specialist
Malin Hedberg, System owner bus

Passager capacity
Curb weight
Axle load
Hauling

The area of Region Stockholm

- 2,3 million inhabitants
- 26 municipalities
- Metro, tram, bus, commuter train and boat in the same system

Region Stockholm

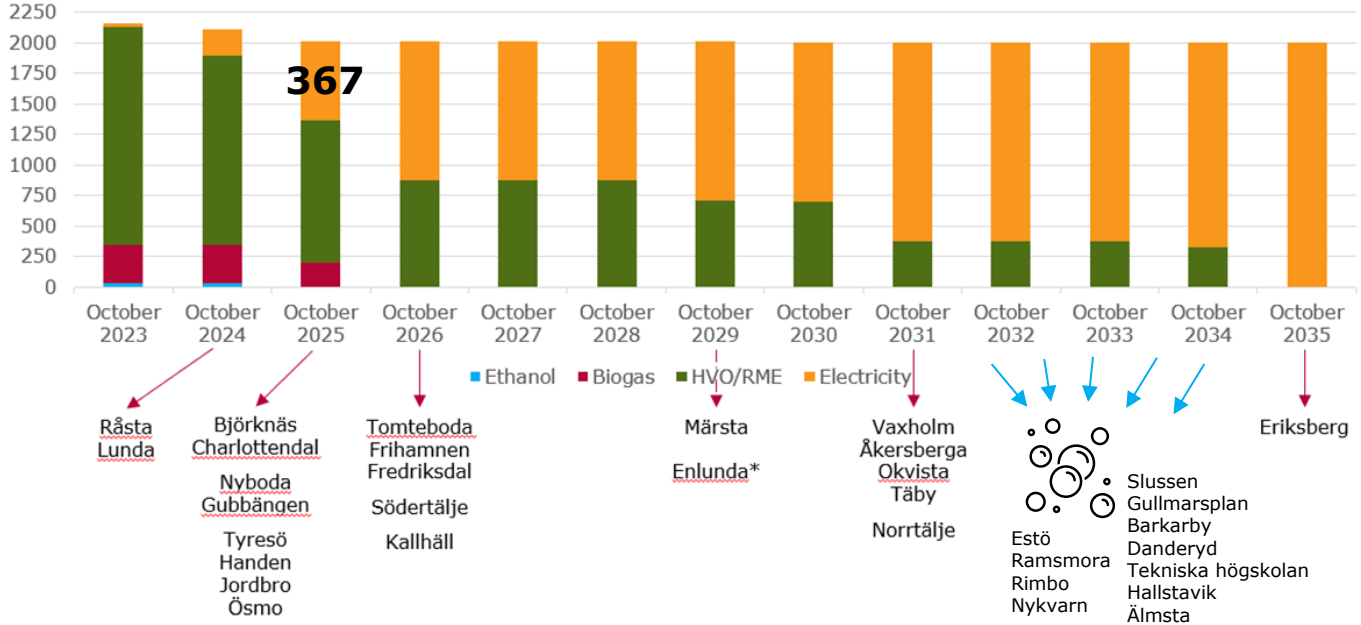
The future is electric

- Further reduction of climate footprint compared to biofuels:
  - Zero local emissions (and low overall emissions in our case)

- Half of fleet electrified by 2027
- Fully electrified by 2035 (2030)

Step-by-step introduction with new procurements

Planned fuel distribution (bus fleet) year 2023-2035



Battery buses – bigger and heavier

MAN battery bus versus MAN diesel bus

Passenger capacity

Load capacity class for buses

BK2 (weight class 2)	2 axles	3 axles
Gross weight	19.5 ton	”26” ton
Axle load	10 ton	10 or 16 ton

Variation depending on axle length

BK1 (weight class 2)	2 axles	3 axles
Gross weight	19.5 ton	28 ton
Axle load	10 or 11.5 ton	11.5 or 16 ton

Passenger capacity

Increased curb weight and axle load

		Axle load kg none passangers			Weight kg none travellers	Axle load kg with travellers			Total weight	Travellers weight	No of travellers	No of kg per traveller
BRAND	**TYPE**	**Axle 1**	**Axle 2**	**Axle 3**		**Axle 1**	**Axle 2**	**Axle 3**				
Solaris	15m nE	5210	9630	5040	**19850**	7100	18900		26000	6150	**70**	88
Volvo	15m diesel				**15095**	7100	17250		24350	9252	**105**	88
MAN	18m CE	5910	7165	9764	**22600**	7100	11500		30000	7400	**103**	72
MAN	18m diesel				**16199**	7245	11500		28000	11801	**146**	80
MAN	12m CE	6175	8613		**14918**	8000	11500		19500	5082	**66**	77
MAN	12m diesel				**12313**	7245	11500		18745	7187	**87**	82

Type	Traveller capacity	
15 m	Solaris Volvo	diff= 67%
18 m	MAN	diff= 70%
12 m	MAN	diff = 75%

Weight difference none travellers
4755
6401
2605

The bus fleet in Stockholm

June 2025

500 12 m | 600 15 m | 900 18 m

2000 buses



Increase >40%

June 2030/35

667 12 m | 895 15 m | 1286 18 m

2848 buses



Increased hauling weights and axle load

Tow truck weight kg	Lifted bus model	Axle load tow truck				Axle load bus	
		Axle 1	Axle 2	Axle 3	Axle 4	Axle 2	Axle 3
25000	Solaris 15m	3890	5335	**13285**	8140	9665	8255
27000	Solaris 15m	5080	5810	**11905**	**14340**	9885	7835
20000	MAN 12m	4655	**13410**	8770			
27000	MAN 12m	5675	6360	**11575**	**13580**	**10685**	
20000	MAN 18m	5105	**13025**	7985		9220	9880
27000	MAN 18m	5775	6515	**11675**	**12935**	9075	9940

BK2 (weight class 2)	2 axles	3 axles
Gross weight	19.5 ton	”26” ton
Axle load	10 ton	10 or 16 ton

BK1 (weight class 1)	2 axles	3 axles
Gross weight	19.5 ton	28 ton
Axle load	10 or 11.5 ton	11.5 or 16 ton

Influences

Buses influence on Stockholm city

- Streets and bridges
  unclear which endure 7-10 % higher total weight
  The service weight is also much high

Buses influnece on Traffic Department SL

- Depots and terminals
- Battery buses accessibility
- Capacity for each bus
- Traffic planning
- Procurement (vehicle demands)
- Hauling

Influence on Stockholm city

The combination of heavy battery buses and weak knowledge regarding state of bearing capacity on many bridges, increase the risk of loosing existing dispensations for driving there

SCOPE
Buslines and detouring
All bus types can be used for all buslines
Road authoritys infrastructure

MAN battery bus verces MAN diesel bus

Risks – possible consequenses

The increased weight
=> Traffic operator do not get dispensions (BK2) for some places/roads

=> Buslines has to be changed (less travellers and more buses)

Bridges are assessed to not endure higher weights
(Stockholm city might also miss relevant information)
=> Stockholm city will not approve buses with higher weight

=> Buses weight needs to be limited (smaller batteries or fewer travellers)

Preparations are not taken care of in advance and surprises could occur quickly
=> Suddenly disconnections and revisions

Risks – possible consequenses

Too late action on above so Traffic operator purchase buses with maximized battery capacity

=> In rush hour can not all travellers enter the bus

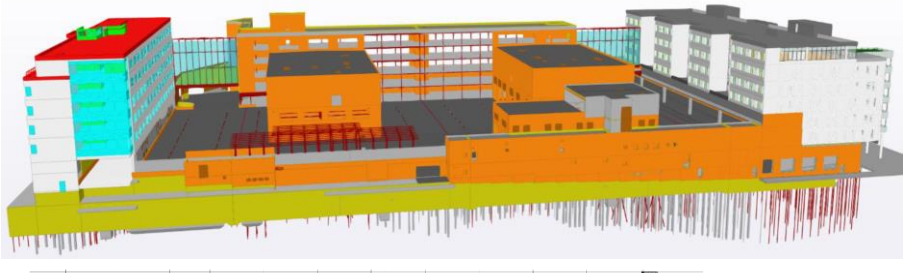
=> The capacity will decrease on that line and will increase the load on other buslines

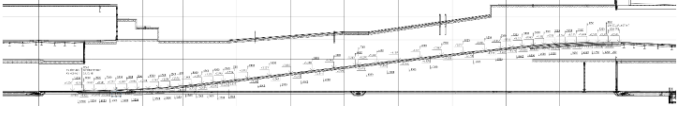
=> Higher frequency of turns and more buses are needed

=> Lack of space at depots and terminals might arise

Risk that analyz will be wrong if not above will be taken care of

Influence on Traffic Department SL



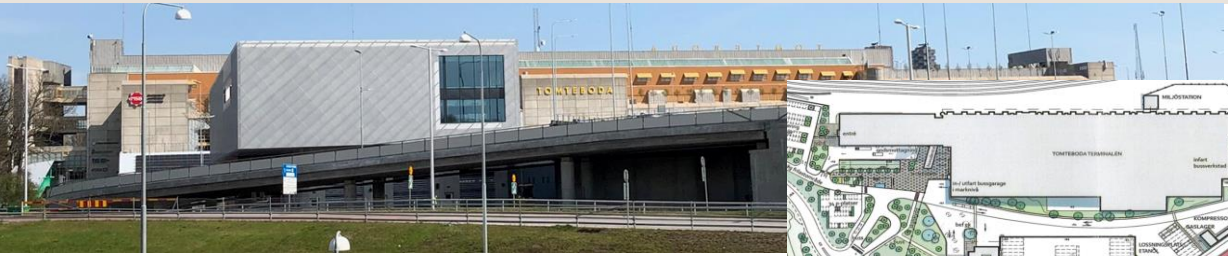


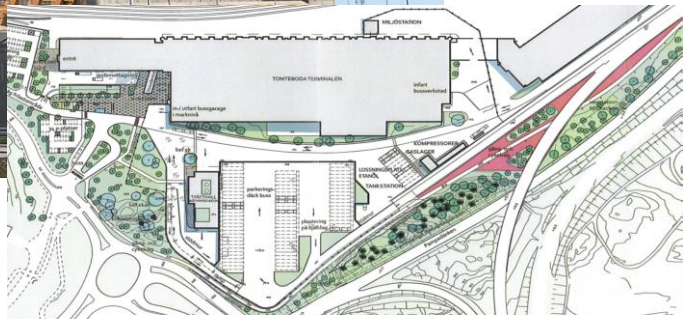
Busdepot Fredriksdal

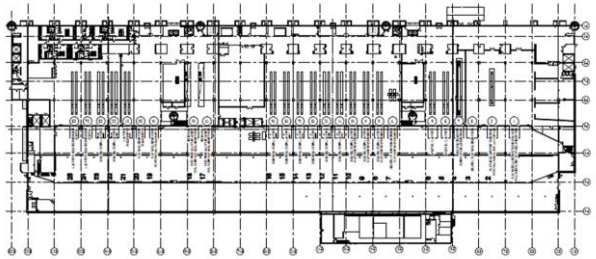
Built 2016
120 buses (Now 100 buses)
12 workshops

Constructed for BK2
Reinforced driving ramp for axle load 16 ton

Today hauling down to parking level 1 is not allowed Hauling through emegency exit from parking level 1 out on the harbour area







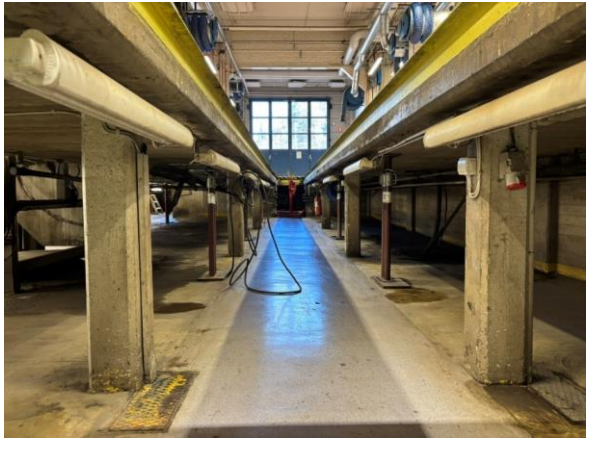
Busdepot Tomteboda

Built 2021
230 buses (Now 110)
25 workshops in remodeled building

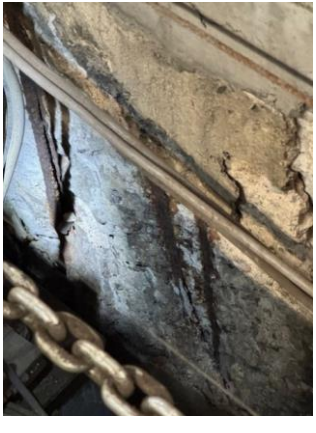
Constructed for BK2
No batterybuses on parking level 2 outside
Hauling drop on driving area outside workshop gates
Every workshop place needs to be strenghten for axle load 16 ton

Workshop in busdepot Råsta

Built 1963 for 220 buses (now 170 buses)
25 workshops
Every workshop pit needs to endure 16 ton axle load
Price 300.000 euro for each pit



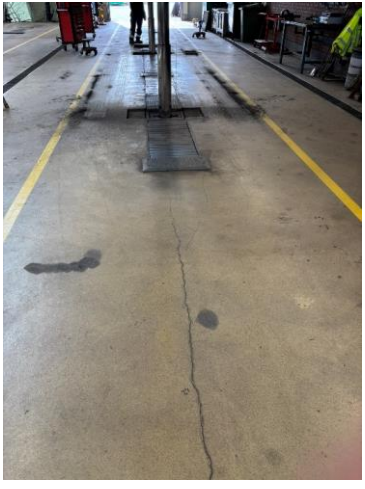
Temporary struts to manage
today bus weightes



Influence on Traffic Department SL

Built 2009 for 74 buses (Now 72 buses)
8 workshop places
Every workshop with column lifts needs to endure 16 ton axle load
Cracks in the concrete
Price 300.000 euro for workshop place

Workshop in busdepot Lunda



Region Stockholm

Thank you

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Transforming Depots for a Fuel Cell Bus Fleet

Arnaud Mozziconacci

Head of Maintenance, RATP

Eric Austruy

Hydrogen & Solar Project Manager, RATP

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PANEL DISCUSSION

Questions for the panel?
Ask them on mentimeter.com:

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Riccardo Schiavo

Moderator

Sustainable Bus

Benjamin Roelands

Panellist

STIB

Andreas Holmberg

Panellist

Lulea Lokaltrafic AB

Malin Hedberg

Panellist

Region Stockholm

Who we are

Sustainable Bus is the only international media fully focused on **innovation** and sustainability in the field of public transport.

Founded in 2018, it has established itself as an essential **tool for professionals** involved in the planning and implementation of low/zero emission public transport projects and operations.

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Coffee Break

Learn more at our sponsor's booths:
Yutong - Hall 3, Booth 305

Final plenary session starts at 15:00 in Room 1123:

"The Future of Manufacturing Zero Emission Buses in Europe"

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