

QUESTION NO 9

**By Councillor by the Jim Campbell
for answer by the Convener of the
Transport and Environment
Committee at a meeting of the
Council on 10 February 2022**

I thank the Convener for copying me into the answer from Scotrail regarding the emissions profile of their Inter7City fleet.

I have used the reply, and other public sources of data, to construct the table "*Emissions in the Waverley Valley, a Comparison Between Train and Bus between Waverley Station and Haymarket Station*" below.

Question (1) Would the convener be surprised to learn that my estimates suggest a single Inter7City train travelling along the Waverley Valley from Waverley Station to Haymarket Station emits up to:

- 200 time more oxides of nitrogen (NOx) & Particulate Matter (PM)
- 50 times more high Hydrocarbons (HC)
- 17 time more Carbon monoxide (CO)

than a Lothian Buses Enviro 400XLB bus making the same journey?

Similarly, on a per seat per hour comparison with a Lothian Enviro 400XLB bus, a Inter7City train emits up to:

- 12 time more CO
- 36 time more HC
- 146 times more NOx
- 147 times more PM.

Answer (1)

Question (2) Would the Convener accept that advances in design, both of legal standards and engine technology, are the most important elements in reducing emissions, as illustrated by the comparison of train design dating back to the 1970's (and an engine standard back to the 2000s) with modern buses from the 2020s?

Answer (2)

**Emissions in the Waverly Valley, a Comparison Between Train and Bus
between Waverley Station and Haymarket Station**

	Inter7City Train				Enviro400XLB Bus			
transit time (minutes) ¹	5				10			
passengers (average seats)	286 ²				100			
power unit	2 x MTU 16V4000R41				Volvo D8K 350			
total power output (Kw)	4,400 ³				261			
emission standard & date	UIC II; 01/01/2003				EURO VI heavy-duty; 01/01/2013			
	CO	HC	NOx	PM	CO	HC	NOx	PM
permitted emissions (g/kWh)	3	0.8	9.9 ⁴	0.25	1.5	0.13	0.4	0.01
emissions per transit (g) ⁵	1,100	293	3630	92	65.3	5.7	17.4	0.4
emissions per seat per hour (g) ⁵	46	12.3	152	3.8	3.92	0.34	1.04	0.03

Notes: 1 LRT & Scotrail timetables; 2 weighted average 4 and 5 car trains; 3 combined power of both engines; 4 running at or under 1,000 rpm; 5 estimated from data above in table