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Cost and benefit analysis of new vehicle safety technologies

Addendum: Technology package 'All technologies excluding AIF'

M Seidl, L Smith, D Palmer, C Baverstock, O Howes, J Radcliffe, B Gupta, M Jones, S Varadarajan, B But, P Martin

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Cathy Booth (Project Manager)	**Cathy Booth**	Phil Martin (Technical Reviewer)	**Phil Martin**

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1 Approach

This ad hoc report concerns the technology package 'All technologies excluding AIF':

	ADW	AIF	BSI	DAW	DIV	EBC	EBP	EBV	EDR	ELK	ESS	FFI	FOI	ISA	MOI	PSI	PWI	RMA	TPM
All technologies excluding AIF	■	□	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■

The results reported were created using the method and tools described in:

> **Seidl et al. (2024).** *Cost and benefit analysis of new vehicle safety technologies (CPR4125)*. TRL: Crowthorne

2 Cost effectiveness and primary impacts

Table 1: Central Estimate: Cost effectiveness and primary impacts, 2025–2039 (2025 prices, 2025 present values)

	KSIs prevented 2025–2039	Fitment costs (£ million)	Repair / maintenance costs (£ million)	BCR	CO_2 prevented (kilo-tonnes)	NOx prevented (tonnes)	PM_{10} prevented (tonnes)	Diesel saved (thousand litres)	Petrol saved (thousand litres)	Electricity saved (million kWh)	Journey time saved (million hours)
M1	9,953	1,001.4	72.8	4.8	143.0	0.0	0.0	18,832.7	40,482.0	502.4	0.0
M2M3	1,764	19.2	1.2	42.1	9.0	0.0	4.7	3,394.1	0.0	15.3	0.0
N1	923	143.7	8.9	3.5	73.1	0.0	41.0	27,259.7	489.1	164.3	0.0
N2N3	2,805	188.8	11.5	8.7	79.3	0.0	98.7	30,063.7	0.0	83.7	0.0
Total	**14,256**	**1,358.6**	**94.5**	**5.4**	**304.3**	**0.0**	**144.4**	**79,550.3**	**40,971.2**	**765.7**	**0.0**

Table 2: Optimistic scenario: Cost effectiveness and primary impacts, 2025–2039 (2025 prices, 2025 present values)

	KSIs prevented 2025–2039	Fitment costs (£ million)	Repair / maintenance costs (£ million)	BCR	CO_2 prevented (kilo-tonnes)	NOx prevented (tonnes)	PM_{10} prevented (tonnes)	Diesel saved (thousand litres)	Petrol saved (thousand litres)	Electricity saved (million kWh)	Journey time saved (million hours)
M1	10,324	603.4	45.8	11.2	327.8	56.8	31.5	42,967.5	93,061.1	1,077.7	157.8
M2M3	1,983	11.9	0.6	91.0	32.6	18.0	12.4	12,353.8	0.0	54.2	13.2
N1	969	86.7	5.6	10.8	159.1	49.1	91.0	59,315.6	1,090.7	348.2	31.2
N2N3	3,080	116.9	5.8	18.1	182.5	81.5	237.3	69,135.6	0.0	191.4	18.7
Total	**14,985**	**822.4**	**57.8**	**12.7**	**701.9**	**205.4**	**372.3**	**183,772.5**	**94,151.8**	**1,671.5**	**220.7**

Table 3: Pessimistic scenario: Cost effectiveness and primary impacts, 2025–2039 (2025 prices, 2025 present values)

	KSIs prevented 2025–2039	Fitment costs (£ million)	Repair / maintenance costs (£ million)	BCR	CO_2 prevented (kilo-tonnes)	NOx prevented (tonnes)	PM_{10} prevented (tonnes)	Diesel saved (thousand litres)	Petrol saved (thousand litres)	Electricity saved (million kWh)	Journey time saved (million hours)
M1	7,008	1,795.5	111.4	1.0	–48.4	–52.8	–29.0	–6,195.1	–13,911.4	–99.2	–146.1
M2M3	1,150	32.1	2.0	11.6	–14.7	–17.6	–3.2	–5,566.9	0.0	–23.6	–12.9
N1	642	278.0	13.5	0.0	–15.5	–45.3	–8.3	–5,760.4	–125.7	–25.2	–26.7
N2N3	1,857	344.7	18.2	2.3	–23.7	–79.3	–41.5	–8,998.9	0.0	–23.9	–18.3
Total	**9,918**	**2,459.6**	**145.3**	**1.0**	**–102.3**	**–194.9**	**–82.0**	**–26,521.2**	**–14,037.1**	**–171.9**	**–204.0**

3 Monetised impacts

Table 4: Monetised social impacts by scenario, 2025–2039 (£, 2025 prices, 2025 present values)

	Pessimistic scenario	Central estimate	Optimistic scenario
Casualties and collisions prevented	5,108,563,880	7,374,925,644	7,775,152,591
CO_2 prevented	–25,305,762	75,173,867	173,389,736
NO_x prevented	–1,919,981	0	1,854,592
PM_{10} prevented	–8,860,827	15,820,569	40,640,267
Diesel saved	–58,361,332	174,657,731	404,139,603
Petrol saved	–16,732,032	48,832,975	112,202,203
Electricity saved	–36,890,754	154,275,956	339,803,107
Journey time saved	–2,266,479,402	0	2,445,293,961
Fitment costs	2,459,584,375	1,358,647,671	822,435,260
Repair and maintenance costs	145,290,336	94,516,120	57,838,907

Table 5: Indirect taxation – petrol, diesel and electricity taxes lost, 2025–2039 (£, 2025 prices, 2025 present values)

	Pessimistic scenario	Central estimate	Optimistic scenario
Duty lost	–20,455,953	60,663,988	141,120,258
VAT lost	–1,537,177	5,565,296	12,585,073

Table 6: Breakdown of benefits from casualties and collisions prevented, 2025–2039 (£, 2025 prices, 2025 present values)

	Pessimistic scenario	Central estimate	Optimistic scenario
Casualties prevented – killed	752,600,728	1,178,567,191	1,236,422,495
Casualties prevented – serious	2,397,714,289	3,424,925,471	3,602,621,757
Casualties prevented – slight	686,221,094	971,150,454	1,029,332,226
Collisions prevented – killed	9,817,543	15,326,257	16,117,310
Collisions prevented – serious	68,135,148	96,991,348	102,191,588
Collisions prevented – slight	105,810,085	149,144,401	158,282,679
Collisions prevented – damage–only	1,088,264,993	1,538,820,522	1,630,184,537

4 Secondary impacts

While the above cost-effectiveness indicators contain the dominant safety, environmental, journey time and cost impacts, the technologies also cause secondary impacts, which are of less importance and/or for which sufficient data or valuations were unavailable to undertake a quantitative approach. Secondary economic, environmental, social and public accounts impacts were assessed in a qualitative manner on a seven-point scale of adverse, neutral or beneficial. The secondary impacts identified are summarised in Table 7. Where a secondary impact potentially has relevance for the Public Sector Equality Duty (PSED), this is indicated in the table.

Table 7: Summary of secondary impacts, their qualitative appraisals on seven-point scale (strongly adverse to strongly beneficial) and potential relevance for Public Sector Equality Duty (PSED)

Impacts		–3	–2	–1	0	+1	+2	+3	PSED relevant
Economic	Journey time reliability						■		No
	Technological capabilities					■			No
	Resources for research						■		No
Environmental	Traffic noise					■			No
	Water pollution					■			No
Social	Journey time reliability						■		No
	Active travel						■		No
	Crime				■				No
	Access to justice						■		No
	Affordability		■						Yes
	Accessible vehicles			■					Yes

Cost and benefit analysis of new vehicle safety technologies

Addendum: Technology package 'All technologies excluding AIF'

The objective of this study was to quantify the benefits and costs that would arise from mandating the fitment of up to 19 vehicle safety technologies to new cars, vans, lorries, buses and coaches in Great Britain. This will provide the Department for Transport with an evidence base to develop policy options for ministers that are cost-effective and impactful for Great Britain in order to enable safer and cleaner transport while minimising the negative impacts.

This addendum concerns the technology package 'All technologies excluding AIF'. The results reported were created using the method and tools described in the main report: Seidl et al. (2024). Cost and benefit analysis of new vehicle safety technologies (PPR2077). TRL: Crowthorne

It was found that the technology package 'All technologies excluding AIF' brings benefits outweighing the costs with a benefit-to-cost ratio of 5.4, i.e. it provides very high value for money, and takes advantage of synergies between different technologies, such as lower costs due to sensor sharing. Over the entire appraisal period, the package may be expected to prevent approximately 14,000 killed or seriously injured casualties on Great Britain's roads when compared to business as usual.

TRL
Crowthorne House, Nine Mile Ride,
Wokingham, Berkshire, RG40 3GA,
United Kingdom
T: +44 (0) 1344 773131
F: +44 (0) 1344 770356
E: enquiries@trl.co.uk
W: www.trl.co.uk

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