DataSet 13: Replacement Costs

Check-box

Date Status

DB 15/04/20

Sheet explanation
Imports data on vehicle costs as well as lifetime from Ricardo study for TfL
Calculates depreciated vehicle values using JAQU depreciation rates
Used in Sheets 2. Vehicle Values, 3a. Upgrade Costs IRR, 3a. Upgrade Costs ORR, 3a. Upgrade Costs CAZ D

Used in Sheets 2. Vehicle Values, 3a. Upgrade Costs IRR, 3a. Upgrade Costs ORR, 3a. Upgrade Costs C

1. Unit Cost of Vehicle Upgrade - Ricardo

														Ţ	Total Price includes n	argin VAT, purcha	ise tax					Total Price	includes margin VAT, purchase tax	<u>.</u>		
	Vehicle	Fuel	Lifetime (years) Mileage (Central)	Mileage (Low)	Mileage (High)	Cost (2010)	Cost (2	2020) Cost (2030)	Cost (2040)	Margin 2010	Margin 2020	Margin 2030	Margin 2040 T	Fotal Price 2010 Total	al Price 2020 Tota	al Price 2030 T	otal Price 2040 2010 C	Cost (2018 price year) 2020 Cos	st (2018 price year) 2030 Co	st (2018 price year) 2040 Cost	t (2018 price year) 2010 Total	Price (2018 Price Year) 2020 Total	Price (2018 Price Year) 2030 Total I	Price (2018 Price Year) 2040 Total F	Price (2018 Price Year)
med to be																										
	Car	Petrol		14 1300	12	000 150	00 £1	14,046	£15,093 £15,5			24.3%	24.3%	24.3%	£20,950	£22,513	£23,122	£23,485	£15,016	£16,136	£16,573	£16,833	£22,398	£24,069	£24,720	£25,1
	Car	Diesel		14 1300) 12	000 150	00 £1	14,622	£15,895 £16,2	2.0,.0		24.3%	24.3%	24.3%	£21,810	£23,709	£24,253	£24,596	£15,633	£16,994	£17,384	£17,630	£23,318	£25,348	£25,929	£26,2
	Car	BEV		14 1300	12	000 150	00 £3	33,874	£23,434 £20,1	£19,19	9 0.0%	12.2%	24.3%	24.3%	£40,649	£31,537	£30,026	£28,637	£36,215	£25,054	£21,521	£20,526	£43,458	£33,717	£32,101	£30,6
	LGV	Petrol		14 1800	15	000 280	00 £1	11,239	£12,149 £12,5	533 £13,02	26 24.3%	24.3%	24.3%	24.3%	£16,764	£18,121	£18,694	£19,430	£12,016	£12,988	£13,399	£13,926	£17,923	£19,374	£19,986	£20,7
	LGV	Diesel		14 1800	15	000 280	00 £1	12,068	£13,206 £13,5	2,00		24.3%	24.3%	24.3%	£18,000	£19,699	£20,254	£20,958	£12,902	£14,119	£14,517	£15,022	£19,244	£21,060	£21,654	£22,4
	LGV	BEV		14 1800	15	000 280	00 £2	29,958	£20,641 £17,7	730 £16,97	78 0.0%	12.2%	24.3%	24.3%	£35,950	£27,778	£26,446	£25,325	£32,029	£22,067	£18,956	£18,152	£38,435	£29,698	£28,274	£27,0
umed d vehicle																				202.00				22.4.222		
,	Private Hire Car			14 4500	38	700	00 £1	14,046	£15,093 £15,5 £15.895 £16,2	501 £15,74 260 £16,49	5 24.3%	24.3%	24.3%	24.3%	£20,950 £21,810	£22,513 £23,709	£23,122 £24,253	£23,485 £24,596	£15,016	£16,136	£16,573	£16,833	£22,398	£24,069	£24,720	£25,1
	Private Hire Car			14 4500	38	000 700		14,622	,	,		24.3%	24.3%	24.3%		£23,709	-	~= :,000	£15,633	£16,994	£17,384	£17,630	£23,318	£25,348	£25,929	£26,2
	Private Hire Car	r BEV		14 4500	38	000 700	~~	33,874	£23,434 £20,7	,		12.2%	24.3%	24.3%	£40,649	£31,537	£30,026	£28,637	£36,215	£25,054	£21,521	£20,526	£43,458	£33,717	£32,101	£30,6
	laxi	Diesel		15 4500	38	000 700		21,450	£23,318 £23,8	20 20 1,10		24.3%	2 11070	24.3%	£31,995 £31,995	£34,780 £34,780 £51,276	£35,578	£36,082	£22,933	£24,929	£25,501	£25,862	£34,206	£37,184	£38,037	£38,5 £38,5
	Taxi	Petrol		15 4500	38	000 700		21,450	£23,318 £23,8	~= :, : 0		24.3%		24.3%	£31,995	£34,780	£35,578	£36,082	£22,933	£24,929	£25,501	£25,862	£34,206	£37,184	£38,037	, , ,
	Taxi	BEV		15 4500	38	000 700		49,691	£34,377 £29,5 £33,184 £35.3			24.3%	24.3%	24.3%	£74,120	£51,276 £49,497	£44,046	£42,010	£53,126	£36,752	£31,570	£30,111	£79,243	£54,820	£47,090	£44,9
	Rigid Truck (3.5			12 2600	24	000 290		28,235	200,101	301 £37,32		24.3%	24.3%	24.3%	£42,116		£52,655	£55,673	£30,187	£35,477	£37,741	£39,904	£45,026	£52,918	£56,294	£59,5
rom ame EV rigid	Rigid Truck (3.5	5t-12tBEV		12 2600	24	000 290	00 £9	94,144	£63,838 £53,2	£48,78	30 24.3%	24.3%	24.3%	24.3%	£140,425	£95,221	£79,377	£72,760	£100,650	£68,250	£56,894	£52,151	£150,130	£101,802	£84,863	£//,/
Viigia	Articulated Truc	ck (> Diesel		9 7400) 60	000 990	00 £5	54 094	£66,209 £70,0)43 £72,75	24.3%	24.3%	24.3%	24.3%	£80,687	£98.757	£104,476	£108,516	£57 833	£70,785	£74.884	£77,780	£86 263	£105.583	£111 697	£116,0
	Articulated Truc	· \		9 7400	60	000 990	00 £18	54,094 30,364	,,	590 £95,07		24.3%		24.3%		£98,757 £189,985	£157,497	£141.820	£57,833 £192,830	£136,173	£112.887	£101.651	£86,263 £287.625	£203.116	£168.383	£151.6
artic and									2.2.,0.0	200,01			,		220,00	2.00,000	2.0.,	3.1.1,020	3.752,555			21,501				
	HGV	Diesel	1:	1.1 37435.	325	76.6 45676	5.7	4395.7	41051.8 4357	8.0 45764.	.6 0.2	0.2	0.2	0.2	51304.7	61232.9	65001.0	68262.5	36773.0 £145,788	43889.1	46589.9	48927.6	54850.6	65465.0	69493.5	72980
<u>E</u>	Bus	Diesel		15 6436	59	000 720	00 £13	36,364	£146,480 £150,6	£153,33	24.3%	24.3%	24.3%	24.3%	£203,400	£218,489	£224,717	£228,709	£145,788	£156,604	£161,068	£163,929	£217,458	£233,590	£240,248	£244,5
	Bus	BEV		15 6436	59	000 720	00 £21	18,979	£205,847 £197,2	£186,55	50 24.3%	24.3%	24.3%	24.3%	£326,630	£307,042	£294,275	£278,258	£234,114	£220,075	£210,924	£199,443	£349,205	£328,263	£314,614	£297,4
	Coach	Diesel		15 6436	59	000 720	00 £13	36,364	£146,993 £151,4	£155,59	92 24.3%	24.3%	24.3%	24.3%	£203,400	£219,255	£225,847	£232,081	£145,788	£157,153	£161,877	£166,346	£217,458	£234,409	£241,456	£248,1
om ne																										
liesel to BEV bus	Coach	BEV		15 6436	59	000 720		18,979	·	£189,30		24.3%	24.3%	2 1.070	£326,630	£308,118	£295,755	£282,360	£234,114	£220,846	£211,984	£202,384	£349,205	£329,414	£316,196	£301,8
Duo		ID ()	I	4EI EEO	\I	0001 60	UUI £	£6.211I	CC 13CI CC I	5401 £6.68	2/1 2/2/2/2	24 3%	24 3%	24.3%	£9 264	£9 5851	£9 756	£9.971	£6.640	£6.870	£6.9921	£7.147	£9 904 	£10.248	£10.430	£10 6
Vouc	PTW	Petrol		15 550	7	000	2	20,211	20,120 20,0	142 £7.02	=	24.3%	24.070	24.3%	£14.575	£11 732	£10,653	£10 472		£8 409			20,001	£10,243	£11.389	≈10,0

Source Ricardo study for TfL (2014): 'Environmental Support to the Development of a London Low Emission Vehicle Roadmap' (unpublished)

2. Unit cost of upgrade (hybrids)

Vehicle Fuel Type Size Cost

Car Petrol (efficient) A+B £16,3

Car Petrol (efficient) C £20,9

3. Unit cost of upgrade - JAQU Vehicle Values

Car Diesel (efficient) D+E £16,393
Car Petrol Average (2014 values) Average £18,689
Car Petrol Average (2018 values) Average £19,980

Source (PH hybrid): Cost for hybrid vehicles taken from: Ricardo Energy & Environment (forthcoming): Car Choice Model (CCM) summary report

Takes weighted average of rigid and artic HGV

Car Private Hire Car LGV Rigid HGV Articulated HGV HGV Single-decker Bus Double-decker Bus Bus Coach

£ 18,000.00 £ 18,000.00 £ 25,000.00 £ 68,000.00 £ 81,000.00 £ 71,719.30 £ 160,000.00 £ 215,000.00 £ 250,000.00

4. Selection of upgrade costs used for analysis

Source JAQU appraisal guidance

 Vehicle
 Fuel
 (Selected)
 JAQU
 REE

 Car
 Petrol
 £16,136
 £ 18,000.00
 £16,136

 Car
 Diesel
 £16,994
 £ 18,000.00
 £16,994

 LGV
 Petrol
 £12,988
 £ 25,000.00
 £12,988

 LGV
 Diesel
 £14,119
 £ 25,000.00
 £14,119

 LGV
 BEV
 £22,067
 £ 25,000.00
 £22,067

 HGV
 Diesel
 £43,889
 £ 71,719.30
 £43,889

 Taxi
 Petrol
 £24,929
 £ £24,929

 Taxi
 Diesel
 £156,604
 £ 187,500.00
 £156,604

 Coach
 Diesel
 £157,153
 £ 250,000.00
 £157,153

 PTW
 Petrol
 £6,870
 £ £6,870

 PTW
 Diesel
 £0
 £ £36,752

 Private Hire Car
 Petrol
 £36,752
 £ £36,752

 Private Hire Car
 Diesel
 £16,136
 £ 18,000.00
 £16,1994

 Private Hire Car
 <t

5. Vehicle values with annual depreciation

		Takes data from																					
			Progression in years																				
Unique id Vehicle	Fuel	0	1	2	3	4	5 6	7	8	9 10	11	12	13	14	15	16	17	18	19	20	21	22	23 24 25 26 27 28 29 30 31 32
CarPetrol Car	Petrol	£16,136	£11,497.73	£9,276.28	£7,473.92	£6,010.69	£4,938.44 £4,095	.41 £3,161.28	£2,467.05 £	,962.60 £1,581.76	£1,274.83	£1,027.45	£828.07	£667.39	£537.88	£433.51	£349.39	£281.59	£226.95	£182.91	£147.41	£118.81	£95.75 £77.17 £62.20 £50.13 £40.40 £32.56 £26.24 £21.15 £17.05 £13.74 CarPetrol
CarDiesel Car	Diesel	£16,994	£12,108.88	£9,769.35	£7,871.19	£6,330.19	£5,200.94 £4,313	.09 £3,329.32	£2,598.18 £	,066.93 £1,665.84	£1,342.59	£1,082.06	£872.09	£702.86	£566.47	£456.55	£367.96	£296.56	£239.01	£192.63	£155.25	£125.12	£100.84 £81.28 £65.50 £52.79 £42.55 £34.29 £27.64 £22.27 £17.95 £14.47 CarDiesel
LGV Petrol LGV	Petrol	£12,988	£7,515.23	£6,090.62	£4,984.02	£4,109.24	£3,337.23 £2,768	.75 £2,234.40	£1,916.36 £	,550.44 £1,269.32	£1,039.17	£850.75	£696.50	£570.21	£466.82	£382.18	£312.88	£256.15	£209.71	£171.68	£140.55	£115.07	£94.21 £77.12 £63.14 £51.69 £42.32 £34.65 £28.36 £23.22 £19.01 £15.56 LGVPetrol
LGV Diesel LGV	Diesel	£14,119	£8,169.43	£6,620.81	£5,417.88	£4,466.95	£3,627.74 £3,009	.77 £2,428.91	£2,083.18 £	,685.41 £1,379.81	£1,129.63	£924.81	£757.13	£619.85	£507.46	£415.45	£340.12	£278.45	£227.96	£186.63	£152.79	£125.09	£102.41 £83.84 £68.64 £56.19 £46.00 £37.66 £30.83 £25.24 £20.67 £16.92 LGV Diesel
LGVBEV LGV	BEV	£22,067	£22,067.43	£22,067.43	£22,067.43	£22,067.43	£22,067.43 £22,067	7.43 £22,067.43	£22,067.43 £2	2,067.43 £22,067.43	£22,067.43	£22,067.43	£22,067.43	£22,067.43	£22,067.43	£22,067.43	£22,067.43	£22,067.43	£22,067.43	£22,067.43	£22,067.43	£22,067.43	####### ###### ####### ####### ####### ####
HGV Petrol HGV	Petrol	£0	£0.00	£0.00	£0.00	£0.00	£0.00 £0.00	00.00	£0.00	£0.00	£0.00	£0.00	£0.00	£0.00	£0.00	£0.00	£0.00	£0.00	£0.00	£0.00	£0.00	£0.00	£0.00 £0.00 £0.00 £0.00 £0.00 £0.00 £0.00 £0.00 £0.00 HGVPetrol
HGV Diesel HGV	Diesel	£43,889	£28,991.90	£26,238.62	£20,815.11	£17,493.18	£13,546.43 £10,340).88 £7,955.56	£6,132.30 £	,973.09 £4,206.33	£3,557.80	£3,009.25	£2,545.28	£2,152.85	£1,820.92	£1,540.17	£1,302.70	£1,101.85	£931.97	£788.28	£666.74	£563.94	£476.99 £403.45 £341.24 £288.63 £244.13 £206.49 £174.65 £147.72 £124.95 £105.68 HGV Diesel
TaxiPetrol Taxi	Petrol	£24,929	£16,203.93	£13,287.22	£10,895.52	£8,934.33	£7,326.15 £6,007	.44 £4,926.10	£4,039.40 £	,312.31 £2,716.10	£2,227.20	£1,826.30	£1,497.57	£1,228.01	£1,006.96	£825.71	£677.08	£555.21	£455.27	£373.32	£306.12	£251.02	£205.84 £168.79 £138.41 £113.49 £93.06 £76.31 £62.58 £51.31 £42.08 £34.50 TaxiPetrol
TaxiDiesel Taxi	Diesel	£24,929	£16,203.93	£13,287.22	£10,895.52	£8,934.33	£7,326.15 £6,007	.44 £4,926.10	£4,039.40 £	,312.31 £2,716.10	£2,227.20	£1,826.30	£1,497.57	£1,228.01	£1,006.96	£825.71	£677.08	£555.21	£455.27	£373.32	£306.12	£251.02	£205.84 £168.79 £138.41 £113.49 £93.06 £76.31 £62.58 £51.31 £42.08 £34.50 TaxiDiesel
BusPetrol Bus	Petrol	£0	£0.00	£0.00	£0.00	£0.00	£0.00 £0.00	00.03	£0.00	£0.00	£0.00	£0.00	£0.00	£0.00	£0.00	£0.00	£0.00	£0.00	£0.00	£0.00	£0.00	£0.00	£0.00 £0.00 £0.00 £0.00 £0.00 £0.00 £0.00 £0.00 £0.00 BusPetrol
Bus Diesel Bus	Diesel	£156,604	£101,792.55	£83,469.89	£68,445.31	£56,125.16	£46,022.63 £37,738	3.56 £30,945.62	£25,375.40 £2),807.83 £17,062.42	£13,991.19	£11,472.77	£9,407.67	£7,714.29	£6,325.72	£5,187.09	£4,253.41	£3,487.80	£2,860.00	£2,345.20	£1,923.06	£1,576.91	£1,293.07 £1,060.31 £869.46 £712.96 £584.62 £479.39 £393.10 £322.34 £264.32 £216.74 BusDiesel
CoachPetrol Coach	Petrol	£0	£0.00	£0.00	£0.00	£0.00	£0.00 £0.00	00.03	£0.00	£0.00	£0.00	£0.00	£0.00	£0.00	£0.00	£0.00	£0.00	£0.00	£0.00	£0.00	£0.00	£0.00	£0.00 £0.00 £0.00 £0.00 £0.00 £0.00 £0.00 £0.00 £0.00 CoachPetrol
CoachDiesel Coach	Diesel	£157,153	£102,149.35	£83,762.47	£68,685.22	£56,321.88	£46,183.94 £37,870	0.83 £31,054.08	£25,464.35 £2),880.77 £17,122.23	£14,040.23	£11,512.99	£9,440.65	£7,741.33	£6,347.89	£5,205.27	£4,268.32	£3,500.02	£2,870.02	£2,353.42	£1,929.80	£1,582.44	£1,297.60 £1,064.03 £872.51 £715.45 £586.67 £481.07 £394.48 £323.47 £265.25 £217.50 CoachDiesel
Private Hire																							
CarHybrid Private Hire Car	Hybrid	£19,980	£14,236.89	£11,486.21	£9,254.47	£7,442.65	£6,114.95 £5,071	.07 £3,914.41	£3,054.79 £	,430.17 £1,958.60	£1,578.53	£1,272.22	£1,025.35	£826.38	£666.02	£536.78	£432.62	£348.67	£281.01	£226.48	£182.53	£147.11	£118.57 £95.56 £77.02 £62.07 £50.03 £40.32 £32.49 £26.19 £21.11 £17.01 Private Hire CarHybrid
TAXIBEV TAXI	BEV	£36,752	£36,752.46	£36,752.46	£36,752.46	£36,752.46	£36,752.46 £36,752	2.46 £36,752.46	£36,752.46 £3	6,752.46 £36,752.46	£36,752.46	£36,752.46	£36,752.46	£36,752.46	£36,752.46	£36,752.46	£36,752.46	£36,752.46	£36,752.46	£36,752.46	£36,752.46	£36,752.46	######## ####### ######## ######## #####
Private Hire																							
CarPetrol Private Hire Car	Petrol	£16,136	£11,497.73	£9,276.28	£7,473.92	£6,010.69	£4,938.44 £4,095	.41 £3,161.28	£2,467.05 £	,962.60 £1,581.76	£1,274.83	£1,027.45	£828.07	£667.39	£537.88	£433.51	£349.39	£281.59	£226.95	£182.91	£147.41	£118.81	£95.75 £77.17 £62.20 £50.13 £40.40 £32.56 £26.24 £21.15 £17.05 £13.74 te Hire CarPetrol
Private Hire																							
CarDiesel Private Hire Car	Diesel	£16,994	£12,108.88	£9,769.35	£7,871.19	£6,330.19	£5,200.94 £4,313	.09 £3,329.32	£2,598.18 £	,066.93 £1,665.84	£1,342.59	£1,082.06	£872.09	£702.86	£566.47	£456.55	£367.96	£296.56	£239.01	£192.63	£155.25	£125.12	£100.84 £81.28 £65.50 £52.79 £42.55 £34.29 £27.64 £22.27 £17.95 £14.47 Private Hire CarDiesel