

Transport Energy Granular Data – Asset Level



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What do we need to know?

We know we cannot put transport into the 10% *de minimis*.

So now we need to carry out an “asset level” energy footprint.

What information do we need to collect?

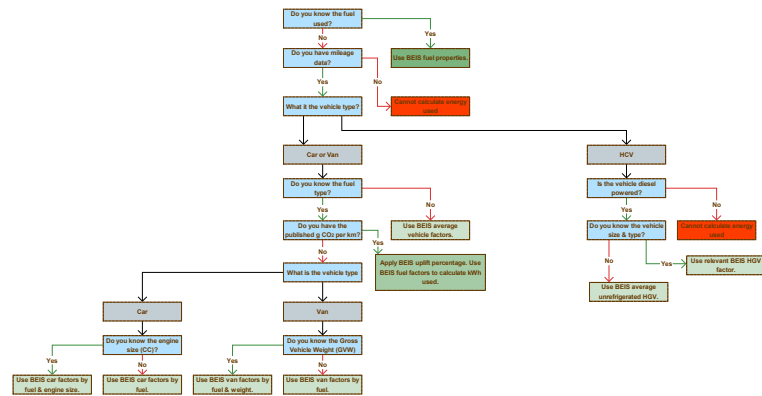
What is the best way to collect this information?

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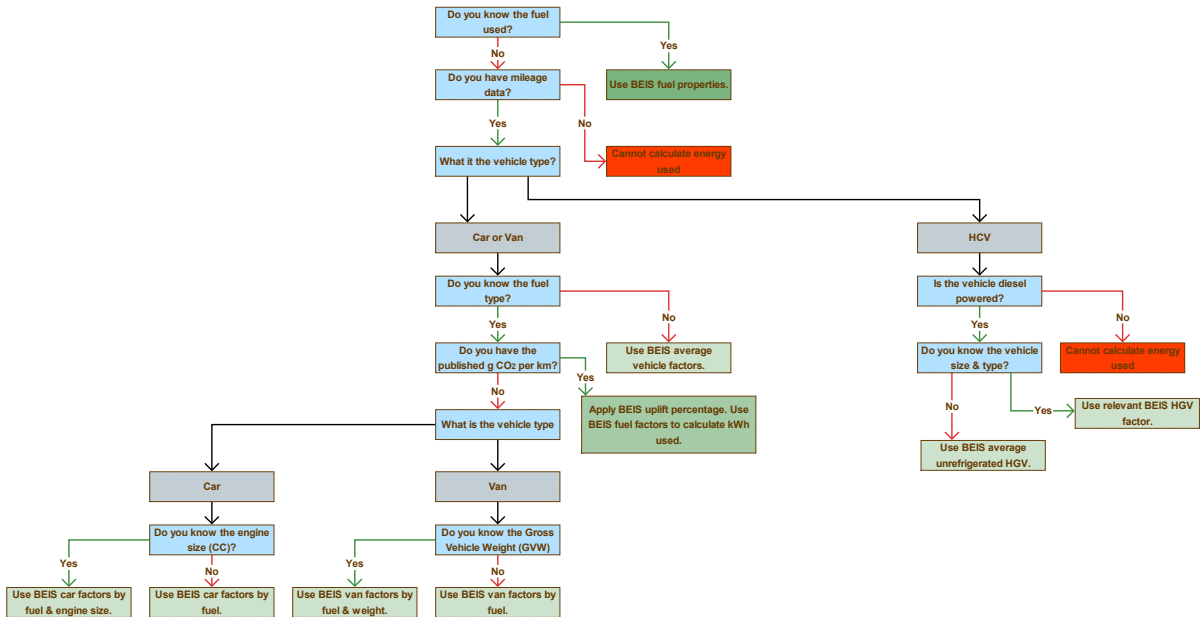
What to do with the data?

Use the best readily available data to calculate kWh



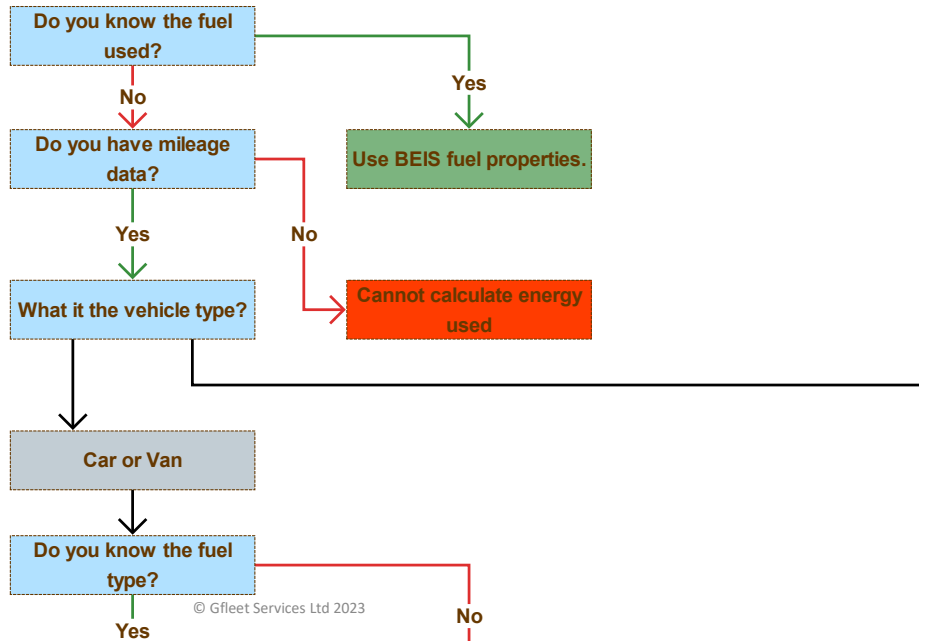
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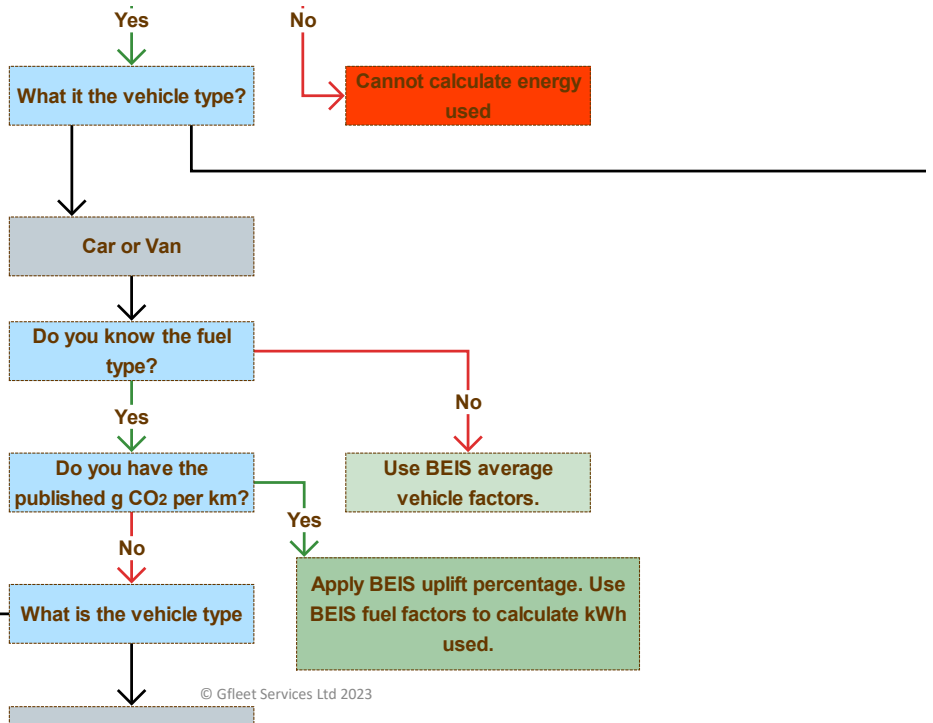


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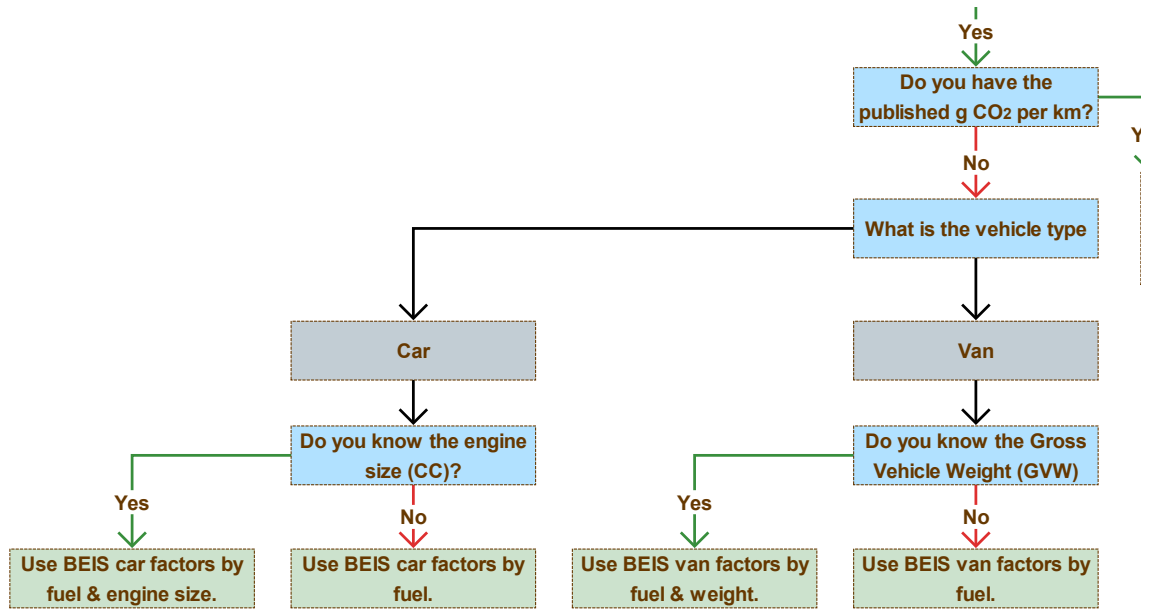
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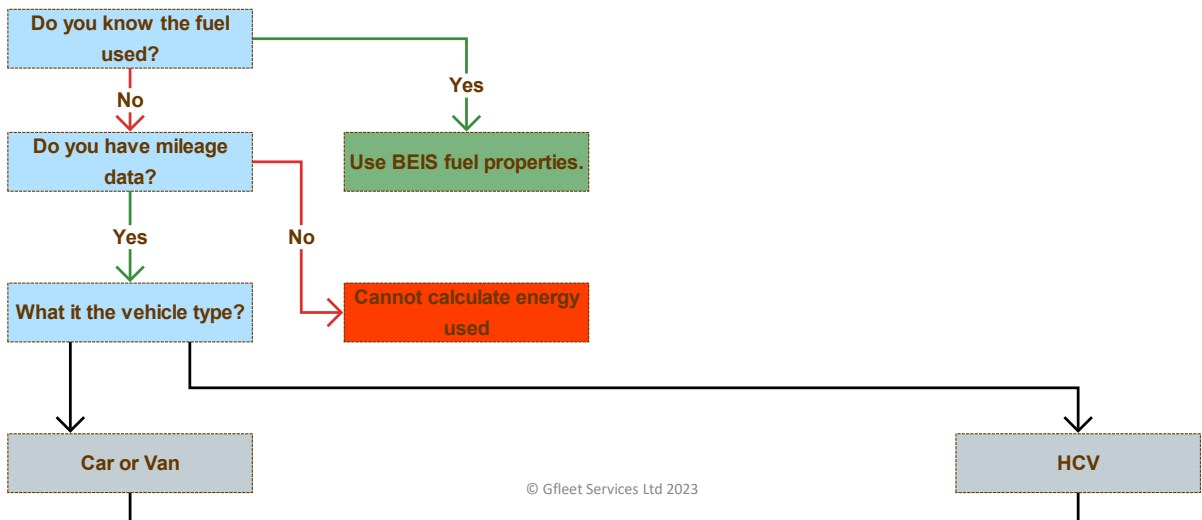


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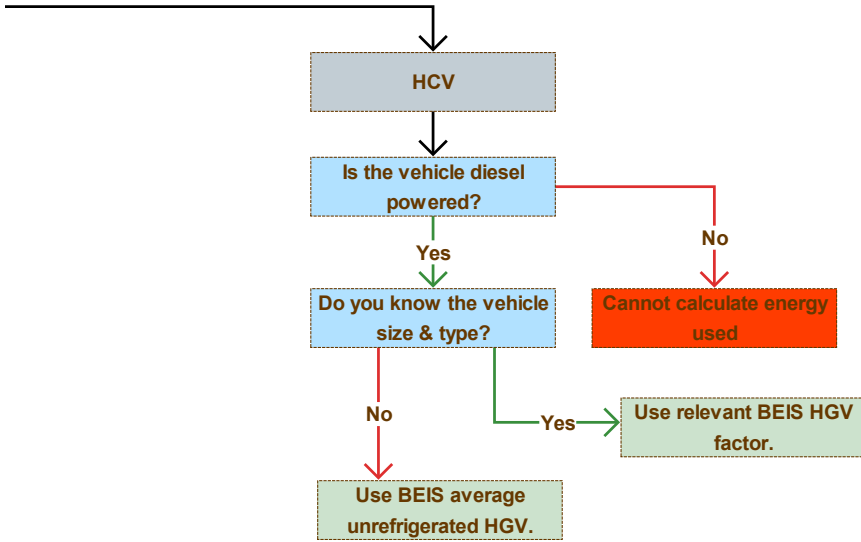
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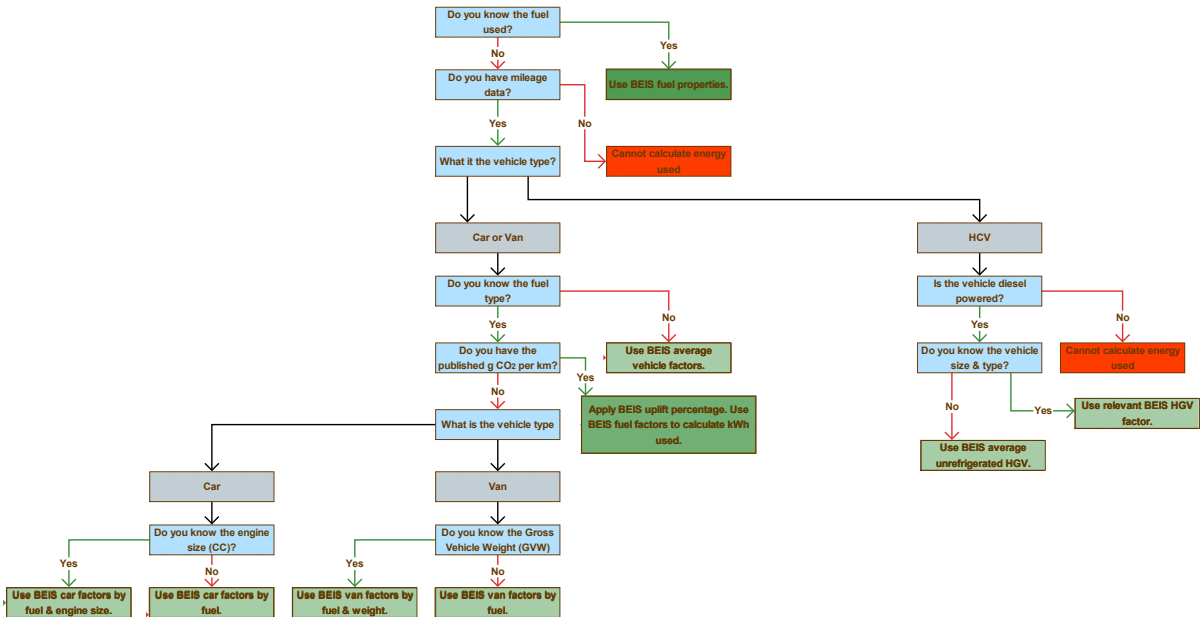


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Cars	Vans	HGVs	Accuracy	Linked to real world
Use BEIS fuel properties.			High	Yes
Apply BEIS uplift percentage. Use BEIS fuel factors to calculate kWh used.				Yes
Use BEIS car factors by fuel & engine size.	Use BEIS van factors by fuel & weight.	Use relevant BEIS HGV factor.		Slightly
Use BEIS car factors by fuel.	Use BEIS van factors by fuel.			No
Use BEIS average vehicle factors.		Use BEIS average unrefrigerated HGV.	Low	No

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Individual Exercise 3: Vehicle Factors

- The mythical “ABC Construction” regional company.
- Have a sample of their vehicles & only mileage.
- Need to find the relevant factors for each measure.
- Then calculate energy consumption of each vehicle
- Feedback the total energy consumption of the vehicles.

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Answers Exercise 3: Vehicle Factors

Category	Body Type	Fuel	Distance	Units	Factor	kWh	Factor Description
Car	Estate	Diesel	10,000	miles	0.87937	8,794	Car < 1.7 litre diesel
Car	Hatchback	Petrol-Hybrid	5,000	miles	0.67783	3,389	Car < 1.4 litre petrol
LCV	Panel Van	Electric	12,000	miles	0.47574	5,709	LCV Average Electric
LCV	Tipper	Diesel	8,000	miles	1.64332	13,147	LCV Class III Diesel
HCV	Rigid 2 Axle	Diesel	25,000	km	1.94098	48,525	HCV Rigid > 3.5 - 7.5 tonne Average Load
HCV	Rigid Tipper	Diesel	12,000	km	3.87311	46,477	HCV Rigid > 17 tonne Average Load
HCV	Artic 44 tonne	Diesel	75,000	km	4.17948	313,461	HCV Artic > 33 tonne Average Load Refrigerated
Car	Unknown	Petrol Plug-in Hybrid	8,000	miles	0.65008	5,201	Car Large Plug-in Hybrid (Two fuels)
						444,702	

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Collecting fuel data

Energy consumption

Metrics for efficiency

Vehicle details

Bulk fuel | Fuel cards | Credit Cards & Expenses

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Collecting fuel data

Energy consumption

Metrics for efficiency

Vehicle details

Bulk fuel | Fuel cards | Credit Cards & Expenses

Key ID	Key Name	Date	Time	Quantity	Driver	Site
BF01	AB01HGA	07/11/2022	15:16:36	50.81	Jane Doe	Main Depot
BF01	AB01HGA	15/12/2022	10:14:23	65.34	Jane Doe	Main Depot
BF01	AB01HGA	16/10/2022	13:45:20	51.30	Jane Doe	Main Depot
BF01	AB01HGA	19/07/2022	16:48:16	46.97	Jane Doe	Main Depot
BF01	AB01HGA	29/08/2022	15:06:52	64.46	John Smith	Main Depot
BF01	AB01HGA	01/11/2022	15:53:46	63.32	John Smith	Main Depot
BF01	AB01HGA	26/10/2022	12:45:08	55.17	John Smith	Central Store
BF01	AB01HGA	23/11/2022	06:42:17	50.33	John Smith	Central Store

Should have records of every litre dispensed.

Can cross check with delivery notes / invoices.

Can also contain AdBlue™.

Date & time allow observation of seasonal patterns.

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Collecting fuel data

Energy consumption

Metrics for efficiency

Vehicle details

Bulk fuel | **Fuel cards** | Credit Cards & Expenses

Card ID	Card VRM	Transaction VRM	Date	Time	Product Type	Product Description	Quantity
FC01	AB01HGA	AB01HGA	27/04/2022	14:56:29	Fuel & Oils	Diesel	55.14
FC01	AB01HGA	AB01HGA	30/12/2022	09:36:06	Fuel & Oils	Premium Diesel	53.13
FC01	AB01HGA	AB01HGA	24/04/2022	15:28:52	Fuel & Oils	Premium Diesel	55.24
FC01	AB01HGA	AB01HGA	03/11/2022	16:55:43	Fuel & Oils	Diesel	60.79
FC01	AB01HGA	AB01HGA	08/04/2022	14:58:03	Fuel & Oils	Diesel	59.57
FC01	AB01HGA	AB01HGA	02/02/2023	17:27:40	Fuel & Oils	Petrol	4.63
FC01	AB01HGA	AB01HGA	10/06/2022	17:35:00	Fuel & Oils	Diesel	46.76
FC01	AB01HGA	AB01HGA	06/03/2023	12:34:05	Fuel & Oils	Diesel	48.14

Transaction report will show every litre dispensed.

Cannot cross check with delivery notes / invoices.

Can also contain non-fuel purchases – AdBlue™, Screen Wash, Oils.

Date & time allow observation of seasonal patterns.

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Collecting fuel data

Energy consumption
Metrics for efficiency
Vehicle details

Bulk fuel | Fuel cards | Credit Cards & Expenses

Card ID	Card VHM	Transaction VHM	Date	Time	Product Type	Product Description	Quantity
PC01	AB01HGA	AB01HGA	21/04/2022	14:06:29 Fuel & Oils	Diesel		55.24
PC01	AB01HGA	AB01HGA	05/11/2022	09:06:06 Fuel & Oils	Premium Diesel		53.23
PC01	AB01HGA	AB01HGA	24/04/2022	15:58:52 Fuel & Oils	Premium Diesel		55.24
PC01	AB01HGA	AB01HGA	01/11/2022	19:05:43 Fuel & Oils	Diesel		46.79
PC01	AB01HGA	AB01HGA	06/04/2022	14:08:02 Fuel & Oils	Diesel		58.57
PC01	AB01HGA	AB01HGA	01/01/2023	17:27:40 Fuel & Oils	Petrol		4.85
PC01	AB01HGA	AB01HGA	16/04/2022	17:25:00 Fuel & Oils	Diesel		46.79
PC01	AB01HGA	AB01HGA	04/01/2023	12:04:05 Fuel & Oils	Diesel		46.24

Cost of fuel – not actual use.
Cannot cross check with delivery notes / invoices.
May also include non-fuel purchases – AdBlue ™, Screen Wash, Oils.
If present, date & time allow matching to average fuel costs.

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Collecting mileage data

Energy consumption
Metrics for efficiency
Vehicle details

Telemetry | Tracking | Odometer Readings | Expense Claims

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Collecting mileage data

Energy consumption
Metrics for efficiency
Vehicle details

Telemetry | Tracking | Odometer Readings | Expense Claims

Card ID	Card VMM	Transaction VMM	Date	Time	Product Type	Product Description	Quantity
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PC01	AB01HGA	AB01HGA	26/12/2022	09:58:06	Fuel & Oils	Premium Diesel	53.23
PC01	AB01HGA	AB01HGA	24/04/2022	15:58:52	Fuel & Oils	Premium Diesel	55.24
PC01	AB01HGA	AB01HGA	01/11/2022	14:05:43	Fuel & Oils	Diesel	60.79
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PC01	AB01HGA	AB01HGA	01/02/2023	17:27:40	Fuel & Oils	Petrol	6.85
PC01	AB01HGA	AB01HGA	10/04/2022	17:25:00	Fuel & Oils	Diesel	46.76
PC01	AB01HGA	AB01HGA	06/02/2023	12:04:05	Fuel & Oils	Diesel	46.54

Plugged into the CanBUS of the vehicle.
Cannot cross check with delivery notes / invoices.
May include Mileage, Fuel, GPS positions, PTO, breaking, weights.

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Collecting mileage data

Energy consumption
Metrics for efficiency
Vehicle details

Telemetry | **Tracking** | Odometer Readings | Expense Claims

Card ID	Card VMM	Transaction VMM	Date	Time	Product Type	Product Description	Quantity
PC01	AB01HGA	AB01HGA	21/04/2022	14:06:29	Fuel & Oils	Diesel	55.24
PC01	AB01HGA	AB01HGA	26/12/2022	09:58:06	Fuel & Oils	Premium Diesel	53.23
PC01	AB01HGA	AB01HGA	24/04/2022	15:58:52	Fuel & Oils	Premium Diesel	55.24
PC01	AB01HGA	AB01HGA	01/11/2022	14:05:43	Fuel & Oils	Diesel	60.79
PC01	AB01HGA	AB01HGA	06/04/2022	14:08:02	Fuel & Oils	Diesel	58.57
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PC01	AB01HGA	AB01HGA	10/04/2022	17:25:00	Fuel & Oils	Diesel	46.76
PC01	AB01HGA	AB01HGA	06/02/2023	12:04:05	Fuel & Oils	Diesel	46.54

GPS position only.
Cross check with other mileage sources.
Accuracy can be an issue, particularly in urban operation.

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Collecting mileage data

Energy consumption
Metrics for efficiency
Vehicle details

Telemetry | Tracking | Odometer Readings



GPS based vehicle route



Actual vehicle route

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Collecting mileage data

Energy consumption
Metrics for efficiency
Vehicle details

Telemetry | Tracking | Odometer Readings | Expense Claims

Card ID	Card VMM	Transaction VMM	Date	Time	Product Type	Product Description	Quantity
PC01	AB01040A	AB01040A	21/04/2022	14:36:29	Fuel & Oils	Diesel	55.34
PC01	AB01040A	AB01040A	26/12/2022	09:58:06	Fuel & Oils	Premium Diesel	53.23
PC01	AB01040A	AB01040A	24/04/2022	09:58:06	Fuel & Oils	Premium Diesel	55.24
PC01	AB01040A	AB01040A	05/11/2022	17:08:43	Fuel & Oils	Diesel	46.75
PC01	AB01040A	AB01040A	06/04/2022	17:08:43	Fuel & Oils	Diesel	54.57
PC01	AB01040A	AB01040A	05/02/2023	05:07:40	Fuel & Oils	Petrol	4.85
PC01	AB01040A	AB01040A	10/04/2022	17:20:00	Fuel & Oils	Diesel	46.75
PC01	AB01040A	AB01040A	06/02/2023	12:04:05	Fuel & Oils	Diesel	46.54

GPS position only.
Cross check with other mileage sources.
Accuracy can be an issue, particularly in urban operation.

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Collecting mileage data

Energy consumption
Metrics for efficiency
Vehicle details

Telemetry | Tracking | **Odometer Readings** | Expense Claims

Registration	MILEAGE 2019	DATE 2019	MILEAGE 2020	DATE 2020	MILEAGE 2021	DATE 2021
					6844	2021-09-08 09:20:11
	134882	2019-01-24 17:30:26	139202	2020-02-08 08:14:28	141710	2021-01-20 11:27:43
	23099	2019-08-05 13:34:42	23946	2020-07-31 15:40:39	24537	2021-08-03 11:40:08
	86830	2019-11-25 17:23:36	88728	2020-11-03 15:07:42	89643	2021-11-08 16:24:11
	44752	2019-02-01 10:54:05	47222	2020-02-12 12:06:55	48144	2021-03-03 16:03:49
	10908	2019-03-29 14:21:16	14013	2020-03-07 11:40:28	15095	2021-03-18 09:24:32
	136993	2019-06-21 14:41:39	139634	2020-06-10 10:05:28	141303	2021-06-23 12:00:49

Can come from a range of sources, with varying accuracy.

More accurate: Telemetry data

Less accurate: Bulk Fuel, MoT, Service Records

Least accurate: Fuel cards

May not be congruent with your reporting period

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Collecting mileage data

Energy consumption
Metrics for efficiency
Vehicle details

Telemetry | Tracking | Odometer Readings | **Expense Claims**

Vehicle ID	Vehicle Type	Engine Size / Fuel Type	Purpose of the Trip	Business Distance	Distance Unit	1st Date of Trip
AB03WWD	Car	Car (Petrol - 1401cc to 2000cc)	Research visit to the National Library of Wales	100 Miles		Apr 11, 2022
AB03WWD	Car	Car (Petrol - 1401cc to 2000cc)	Research at National Archives	145 Miles		May 27, 2022
AB03WWD	Car	Car (Petrol - 1401cc to 2000cc)	Archive research	145 Miles		Jun 8, 2022
AB03WWD	Car	Car (Petrol - 1401cc to 2000cc)	Archive research	145 Miles		Jun 14, 2022
AB03WWD	Car	Car (Petrol - 1401cc to 2000cc)	Research	145 Miles		Aug 10, 2022
1	Car	Car (Petrol - 1401cc to 2000cc)	Data collection	154 Miles		Mar 9, 2022
1	Car	Car (Petrol - 1401cc to 2000cc)	Data collection	15 Miles		Mar 11, 2022

Will normally be exported from the expense system – talk to HR / Finance

What data is available will depend on what data the client collects

Best data: Employee ID, VRM, Date and time, start and end location, interim stops, and reason

Worst data: Total £ paid in reporting period

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Collecting performance data

Energy consumption
Metrics for efficiency
Vehicle details

Mileage data | Fleet manager

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Collecting performance data

Energy consumption
Metrics for efficiency
Vehicle details

Mileage data | Fleet manager

Card ID	Card VMM	Transaction VMM	Date	Time	Product Type	Product Description	Quantity
PC01	AB01HGA	AB01HGA	27/04/2022	14:06:29	Fuel & Oils	Diesel	55.24
PC01	AB01HGA	AB01HGA	06/12/2022	09:58:06	Fuel & Oils	Premium Diesel	53.23
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PC01	AB01HGA	AB01HGA	10/04/2022	17:35:00	Fuel & Oils	Diesel	46.76
PC01	AB01HGA	AB01HGA	04/02/2022	12:04:05	Fuel & Oils	Diesel	46.24

If you have fuel, then this will give you mpg / litres per 100km
kWh per km for mixed fuel fleets

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Collecting performance data

Energy consumption
Metrics for efficiency
Vehicle details

Mileage data | Fleet manager

Card ID	Card VMM	Transaction VMM	Date	Time	Product Type	Product Description	Quantity
PC01	AB01HGA	AB01HGA	21/04/2022	14:06:29	Fuel & Oils	Diesel	55.24
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PC01	AB01HGA	AB01HGA	04/01/2023	12:04:05	Fuel & Oils	Diesel	46.24

What data you want will depend on the vehicle
For delivery and transportation of goods: tonne km
For delivery and transportation of people: passenger km

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Collecting vehicle details

Energy consumption
Metrics for efficiency
Vehicle details

DVLA | Fleet manager

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Collecting vehicle details

Energy consumption
Metrics for efficiency
Vehicle details

DVLA | Fleet manager

Make	Model	Date First Registered	Fuel	Engine CC	Engine kW	Colour	CO ₂	Euro
SKODA	OCTAVIA	30/03/2005	DIESEL	1,896	77	RED	nd	E3
FORD	FOCUS	21/06/2013	DIESEL	1,560	70	SILVER	nd	E5
FORD	TRANSIT	25/06/2010	DIESEL	2,402	84	WHITE	nd	E4
ALFA ROMEO	164	31/10/1995	PETROL	1,995	109	RED	nd	E1
FORD	FIESTA	05/01/2007	PETROL	1,388	59	SILVER	nd	E4
HONDA	Unknown Model	01/07/2020	PETROL	471	nd	GREY	nd	E4
MAZDA	5	16/12/2002	DIESEL	nd	nd	SILVER	nd	nd
MAZDA	BONGO FRIENDEE	01/04/2014	PETROL	2,494	119	WHITE	nd	E2

Basic information about the vehicle

Type of vehicle

Weight and engine size

Fuel type

Year of manufacture

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Collecting vehicle details

Energy consumption
Metrics for efficiency
Vehicle details

DVLA | Fleet manager

Registration	Make	Model	Date on fleet	Date off fleet	Category	W80T	Base location	Department	Fuel Type	Battery Size kWh	Fuel Card?	Bulk Fuel?	Tireless Fleet?	Comments/Notes
ABDCE	Peugeot Eagle	Elite 8	31/04/2015	05/04/2023	HGV - Refuse Collection	No	Quent 1	Waste	Diesel	nd	No	No	No	EXAMPLE

Anything the DVLA don't know

Some basic information to sense check the DVLA response

Specialist fit outs?

Is it wheelchair accessible?

Is it used as a mobile toolkit?

Where is the vehicle based?

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Lunch
Back at 14:00

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Group Exercise: Improving Data Collection

- We have two example companies
- Data collection in each company is described
- What would your suggestions be to improve data quality?
- Pick a spokesperson to feedback your suggestions

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