Interreg North Sea

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ShareDiMobiHub

Carsharing Impact Tool **Manual** – Reference Values for Policy Makers

Add-on to DELIVERABLE WP2 3.1

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Summary sheet

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Project partners

Organisation	Abbrevia-tion	Country
Province of Utrecht	ProvU	Netherlands
Capital Region of Denmark	CRD	Denmark
Vestfold County	VTFK	Norway
Subpartner: Statens vegvesen	SVV	Norway
Subpartner: Tønsberg kommune	TK	Norway
Promotion of Operation Links with Integrated Services	POLIS	Belgium
City of Amsterdam	AMS	Netherlands
City of Leuven	LEU	Belgium
University of Antwerp	UAntw	Belgium
Transport Authority for the Amsterdam Region	VRA	Netherlands
Mpact	Mpact	Belgium
Autodelen.net	Auto	Belgium
City of Rotterdam	ROT	Netherlands
Hamburg University of Applied Sciences	HAW	Germany
University of Applied Sciences Utrecht	HU	Netherlands

Document history

Version	Date	Organisation	Main area of changes	Comments
0.1	18-08-2025	HU	Review	
0.2	29-07-2025	MPact, HU	Review	
1.0	25-09-2025	HU	Finalization after review	

Table of Contents

Disclaimer

This tool, developed for the ShareDiMobiHub project, offers indicative insights into the potential impacts of shared mobility. Data and methods may be updated as improved versions become available.

A detailed socio-economic analysis is typically required for accurate local impact estimates. Users should consult current academic and professional literature to stay aligned with the latest research.

The tool is freely available for scientific use and may be adapted for research. It is not intended for commercial use.

Aim of the tool

The tool is complementary to the ShareDiMobiHub deliverable *'In Search for Reference Values for Policy Makers: The Impact of Shared Mobility Amid the Transition to e-Mobility'* and enables the swift search for estimates of the car replacement ratio in the literature and provides an entry-level opportunity to calculate the environmental impact of shared car use. For a thorough description of the literature and calculation methods please consult the deliverable document.

Using the tool

This tool can be used with spreadsheet programs such as MS Excel, LibreOffice, or similar. It contains no macros, and all cells are unlocked to allow users to modify or adapt it for personal or future use.

As the tool lacks safeguards against unintended changes, users are advised to work with a copy to preserve the original version.

Users are encouraged to explore and experiment with the tool. Some outputs are repeated intentionally to help guide users through the analytical process.

In the worksheets:

- Yellow cells are for user input.
- White cells display current or intermediate results.
- Red cells are input fields populated from other worksheets.

With the table-alike notation, in most cases the search function of a text editor lead the user in the manual to the brief explanation of the worksheet cell of interest.

Of the 13 worksheets the first three are relevant for the analysis. The other worksheets contain data, which can be updated by the user along the process or in time.

- ***Management Dashboard*** gives an overview of the study outcomes
- ***CRR – Calculators*** enable the estimation of the car replacement ratio (CRR) in two ways: via the Rebel Group approach [1]or based on the literature.
- ***NL Area Impact Dashboard*** enables the adaption of the CRR based on the ODIN classification of neighborhoods. These apply for the Netherlands only.

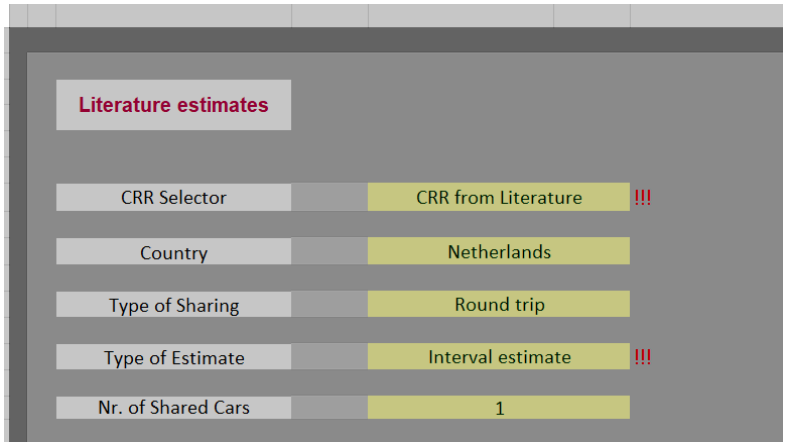
Worksheet: Management Dashboard

The worksheet ***Management Dashboard*** gives an overview of the study outcomes. It shows the estimates on the impact of shared cars on public space, travel distances and emission reduction. The user can make choices about which CRR selector is used, the country, type of carsharing, type of estimate and can indicate for which number of shared cars the calculation should be made. Users interested in the impact of shared cars in a specific Dutch town can make use of more accurate estimates.

The **Literature estimates** section (left-hand side) provides estimates calculated in the worksheet **CRR – Calculators**.

User Input (yellow cells):

As the next visualization shows, opening the Management Dashboard will let the user select the model's parameters.



[1] For a description of this approach check deliverable *'In Search for Reference Values for Policy Makers: The Impact of Shared Mobility Amid the Transition to e-Mobility'*

Visualization 1: Screenshot of the first selectors of the Management Dashboard

Here the user can, for instance, choose between countries and the type of car sharing. The selectors and other cells are described per cell in more detail below.

Cell:	F8	**Function:**	List selector
Description:	Allows selection between estimates calculated based on the Rebel Group method or those found in the literature (listed in the models' 3 Car Replacement Ratio Data worksheets		

Cell:	F10	**Function:**	List selector
Description:	To select the **country** under consideration.		

Cell:	F12	**Function:**	List selector
Description:	To select the **type of car sharing** under consideration. The use can choose Round trip, Free floating or Peer-to-peer.		

Cell:	F14	**Function:**	List selector
Description:	To select the type of estimate obtained, **point versus interval estimate**. A point estimate gives a single best guess of a parameter, whereas an interval estimate provides a range of values. It depends on the values listed in the models' Car Replacement Ratio Data worksheets whether a point estimate will be presented. (Example: A point estimate for the United Kingdom can be found in Appendix A of the report, as well as in the worksheet titled "Car Replacement Ratio RT"		

Important! Current estimates are drawn from the database shown in the "Car Replacement Ratio Data RT/FF/P2P" tabs (see **Visualization 2** on next page). As of September 2025, coverage is

incomplete, some countries lack estimates because no relevant studies have been published. Where studies are available, they have been incorporated, for example:

- Round-trip: Belgium, Germany, the Netherlands, and Norway (interval estimates); France and the United Kingdom (point estimates)
- Free-floating: Germany and Malta (interval estimates); Austria, Belgium, Denmark, Finland, France, Italy, the Netherlands, Portugal, Spain and the United Kingdom (point estimates)
- Peer-to-peer: Germany (point estimate)

The user can contribute additional estimates to expand the dataset and make the tool more useful for everyone. Once new data are added, the system automatically recalculates the EU-wide interval estimate, in **rubin**, updating both the lowest and highest bounds to reflect the expanded information.

Visualization 2: screenshot of the tabs of worksheets with data regarding round trip (RT), free floating (FF) and peer-to-peer car sharing (P2P).

Cell:	F16	**Function:**	Numerical input cell
Description:	Input cell for the entry of the **number of shared cars** to be considered in the tool.		

Cell:	F28/J28	**Function:**	List selector
Description:	To select the type of **power source** of the shared car utilized. Via cell F28 the level of emission reduction can be estimated based on the relevant emission factors of the energy source selected. Only when Electricity is selected in cell F28, the **grid selection** in cell J28 matters.		

Emission Reduction with shared car on	ELECTRICITY	with	The grid network	Dutch e-Grid (2021)
Δ CO2 emission level	-3490246 g		0 g	-12215860 g
Δ Nox emission level	-2479 g		0 g	-8675 g
Δ PM emission level	-3647 g		0 g	-12763 g

Visualisation 3: Example of the impact on emissions by selecting Electricity as power source.

Results (white cells):

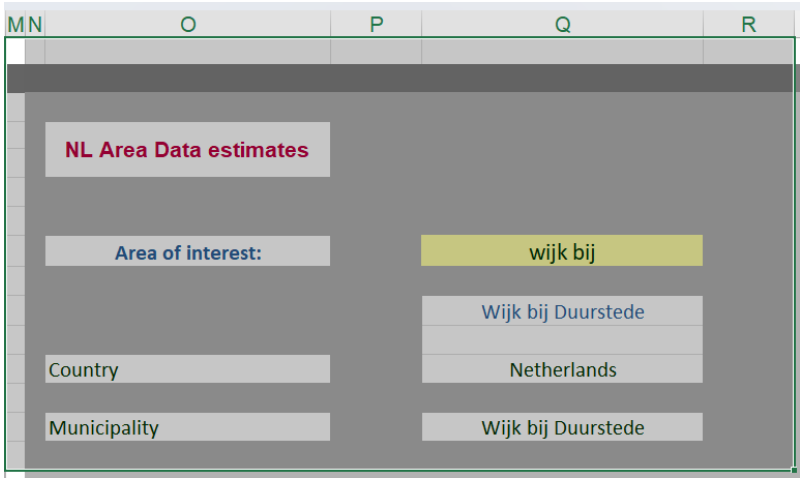
Cell:	F21/H21/J21	**Function:**	Numerical output cell
Description:	In these cells the **Car Replacement Ratio** estimates can be found.		

Cell:	F23/H23/J23	**Function:**	Numerical output cell
Description:	In these cells the **Reclaimed public space** estimates can be found.		

Cell:	F25/H25/J25	**Function:**	Numerical output cell
Description:	In these cells the **Reduction travel distance p.a.** estimates can be found, indicating the reduced travel km by participating households per year (p.a.)		

Cell:	F30/H30/J30 F31/H31/J31 F32/H32/J32	**Function:**	Numerical output cell
Description:	The **CO_2 emission reduction with shared car** estimates are presented in Cell F30/H30/J30, **NO_x and PM_{10}** in Cell F31/H31/J31 respectively Cell F32/H32/J32		

In **NL Area Data estimates** section (right-hand side) the Dutch situation can be explored in more detail based on CBS bureau of statistics data of village characteristics. It starts with selecting the area of interest, as the next visualization shows:



Visualization 4: the search for the area of interest in the Netherlands.

Cell:	Q8	**Function:**	Syntactical input cell
Description:	To type the name of the (part of the) **city** of village under consideration. The user can type partly the name of the place with an * to search in the worksheet CBS – kwb-2024 - NL area data (Example: Culem* to find Culemborg)		

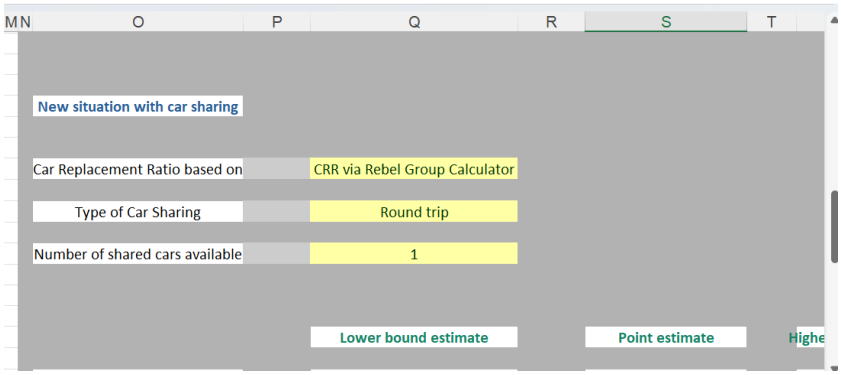
Cell:	Q10	**Function:**	Syntactical output cell
Description:	In this cell the result of the input of cell Q8 can be found (Example: Culemborg)		

Cell:	Q12 / Q14	**Function:**	Informative cell
Description:	In these cells indicate that this section of the tool is only relevant for application in the Netherlands.		

Cell:	Q23	**Function:**	Numerical output cell
Description:	This cell indicates the total **Public space needed for parking** for the place selected in cell Q8. This is based on the number of private cars in the selected place and the average size of the parking spot (See worksheet NL_Area_Impact_Dashboard, cell G130 and worksheet Public Space Data, cell F26 for more information.)		

Cell:	Q25	**Function:**	Numerical output cell
Description:	This cell indicates the estimated total of **km driven** by households per year without shared car use.		

Cell:	Q30/Q31/Q32	**Function:**	Numerical output cell
Description:	These cells present the estimated level of **CO_2, NO_x and PM_{10} emissions** due to the km driven by households per year **without shared car use**.		



Visualization 5: Choosing the type of method to calculate the car replacement ratio and the number of shared cars under consideration.

Cell:	Q41	**Function:**	List selector
Description:	Allows selection between estimates calculated based on the Rebel Group method or those found in the literature (listed in the models' 3 Car Replacement Ratio Data worksheets		

Cell:	Q43	**Function:**	List selector
Description:	To select the **type of car sharing** under consideration. The use can choose Round trip, Free floating or Peer-to-peer.		

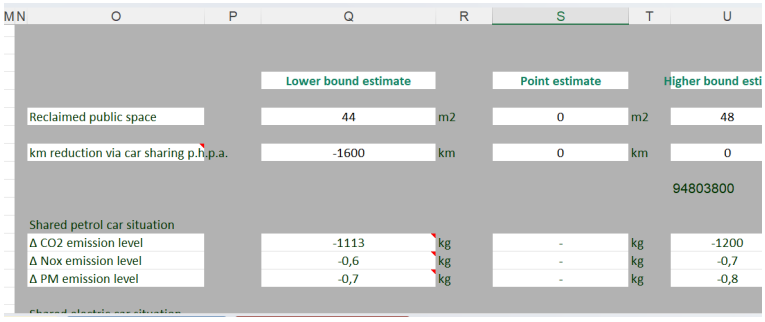
Cell:	Q45	**Function:**	Numerical input cell
Description:	Input cell for the **entry of the number of shared cars** to be considered in the tool.		

Cell:	Q51/S 51/U51	**Function:**	Numerical output cell
Description:	These cells indicates the total **Reclaimed Public space** in the neighborhood as a result of the availability of car sharing**.**		

Cell:	Q53/S53/U53	**Function:**	Numerical output cell
Description:	These cells indicates the total **Reduction of km driven** by the neighborhood households as a result of the availability of car sharing**.**		

Cell:	Q58/S58/U58 Q59/S59/U59 Q60/S60/U60	**Function:**	Numerical output cell
Description:	These cells present the estimated level of **CO_2, NO_x and PM_{10} emissions** due to the km driven by the neighborhood households per year with the **presence of a petrol shared car**.		

Cell:	Q63/S63/U63 Q64/S64/U64 Q65/S65/U65	**Function:**	Numerical output cell
Description:	These cells present the estimated level of **CO_2, NO_x and PM_{10} emissions** due to the km driven by the neigborhood households per year **with the presence of an electric shared car**. The emission factors stem from worksheet Energy Emission Factors, row 15 (Dutch e-grid, 2021)		



MN	O	P	Q	R	S	T	U
			Lower bound estimate		Point estimate		Higher bound esti
	Reclaimed public space		44	m2	0	m2	48
	km reduction via car sharing p.h.p.a.		-1600	km	0	km	0
							94803800
	Shared petrol car situation						
	Δ CO2 emission level		-1113	kg	-	kg	-1200
	Δ Nox emission level		-0,6	kg	-	kg	-0,7
	Δ PM emission level		-0,7	kg	-	kg	-0,8

Visualization 6: An example of the results.

Worksheet: CRR – Calculators

This worksheet contains the core calculation logic used to estimate the impact of shared mobility based on selected parameters.

The first part of this worksheet enables to obtain a car replacement ratio (CRR) estimate. It provides two options, viz.:

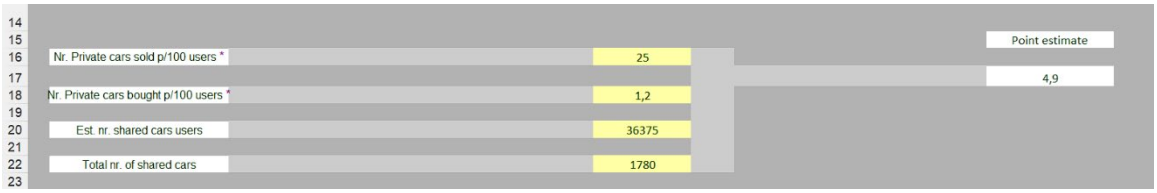
- calculating the CRR based on the Rebel Group approach (rows 16-39). When information is present of the nr. of private cars bought and sold (p/100 users), on the one hand, and the estimated nr. of shared cars and shared cars users, on the other hand the user can calculate CRR themselves.
- an estimate based on the literature

This may be a point or interval (with a lower and higher bound) estimate.

<u>The Rebel Group approach:</u>

Deriving a **point estimate**:

Cell:	F16/F18	**Function:**	Numerical input cell
	F20/F22		
Description:	These cells enable to calculate the CRR as a **point estimate** in cell R16.		



Visualisation 7: An example of the calculation of a point estimate via the Rebel Group approach

Deriving an **interval estimate**:

Cell:	H30/H32	**Function:**	Numerical input cell
	J26/J28		
	N26/N28		
Description:	These cells enable to calculate the CRR as an **interval estimate** in cells P27 and T27.		

Visualisation 8: An example of the calculation of an interval estimate via the Rebel Group approach

While the calculation of the CRR depends on the neighborhood characteristics, the user must insert the relevant information into the cells themself and refresh it for the calculation of the CRR for another neighborhood.

Cell:	H39	**Function:**	List selector
Description:	Allows **selection between the point and interval estimates** calculated based on the Rebel Group method. This selection determines the impact estimates calculated in the remaining of this worksheet.		

CRR based on results in literature:

Another option to calculate the impact of shared cars is via the CRR estimated in the literature. Row 52 shows the preset based on

- cell F12 of worksheet Management Dashboard regarding the type of car sharing
- cell F10 of worksheet Management Dashboard of the country under study

In section **Car Replacement Ratio Selector** the user gets insights into the impact of car sharing on the environment as a point or interval estimate.

Depending on the value of cell F61 and H75 (which are based on the value of cell F8 and F16 in worksheet Management Dashboard) the impact of car sharing is calculated for

- **reclaimed public space** in row 75
- **change in traffic intensity** in row 79, 81 and 86.

Cell D97 and F97 form the basis for calculating three types of emissions, viz. CO_2, NO_x and PM_{10}. It is a benchmark from which an alternative scenario can be tested on its impact.

Cell:	J97/L97/N97 J99/L99/N99 J101/L101/N101	**Function:**	Numerical output cell
Description:	These cells present the estimated level of **CO_2, NO_x and PM_{10} emissions** due to the km driven with private cars per year by the neighborhood households **before switching to car sharing**. It serves as a benchmark for the comparison with the estimates obtained with an available petrol or electric shared car in rows 111-115.		

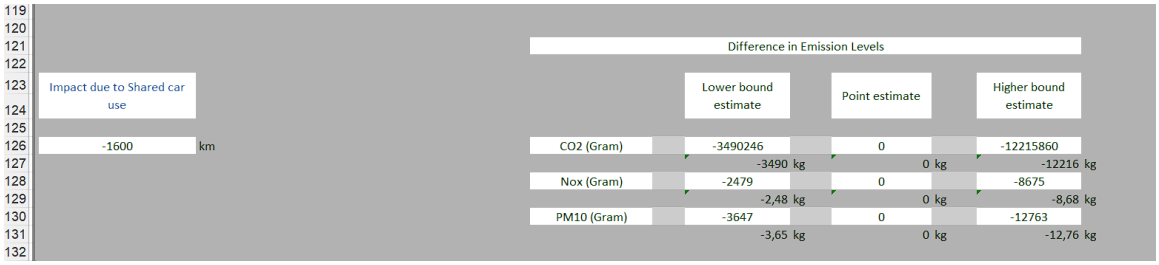
Cell D111 and F111 form the basis for calculating three types of emissions, viz. CO_2, NO_x and PM_{10} as the alternative scenario. It depends on the values selected at cell F28 and J28 of worksheet Management Dashboard whether the impact of a switch by households to a petrol or electric shared car is estimated.

105								
106					Lower bound estimate	Point estimate	Higher bound estimate	
107								
108								
109	Shared car use switchers p/yr			Car Replacement Ratio	4,0	0,0	14,0	
110								
111	7500	km	ELECTRICITY	CO2 (Gram)	1960800	0	6862800	
112								
113			CAR_FEV - ELECTRICITY	NO x (Gram)	524	0	1835	
114								
115			Dutch e-Grid (2021)	PM10 (Gram)	5	0	18	
116								
117								

Visualisation 9: An example of the estimated emissions based on the values selected in F28 and F28 and J28 of worksheet Management Dashboard.

Cell:	J111/L111/N111	**Function:**	Numerical output cell
	J113/L113/N113		
	J115/L115/N115		
Description:	These cells present the estimated level of CO_2, NO_x and PM_{10} emissions due to the km driven by the neighborhood households **after switching to car sharing** with petrol or electric shared cars.		

For the sake of convenience, the difference in emission estimates between the benchmark and alternative scenario is represented in rows 126, 128 and 130 (see next visualisation).



Visualisation 10: An example of the difference in emission estimates between the benchmark and alternative scenario.

Cars need parking facilities. Section **Obligatory Nr. Parking Lots** enables Dutch policy makers to get a quick insight into the minimum requirements for various types of houses.

Cell:	H139	**Function:**	Numerical input cell
Description:	Input cell for the entry of **the number of houses** to be considered in this section of the tool.		

Cell:	H141	**Function:**	List selector
Description:	To select the **type of house**.		

Cell:	H143	**Function:**	List selector

Description:	To select the **type of area** in which the house is situated.

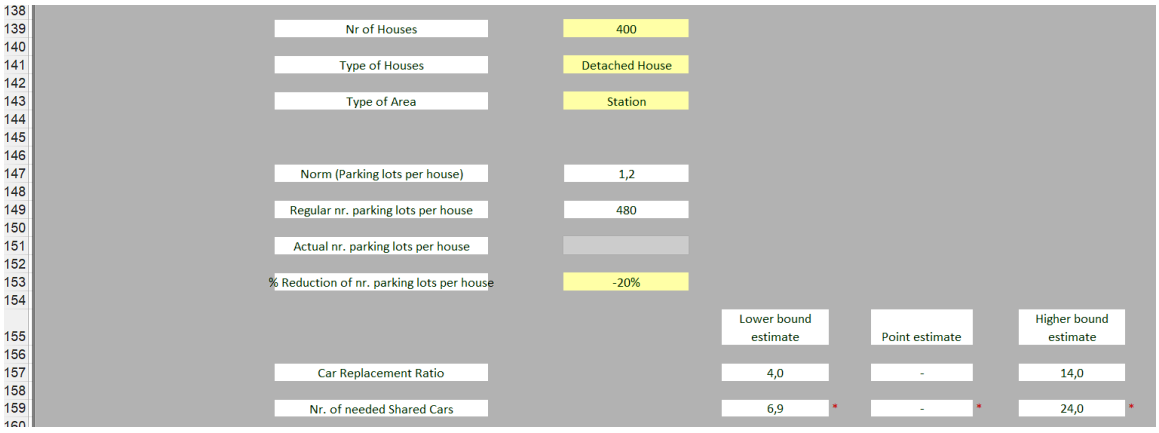
Cell:	H147	**Function:**	Numerical output cell
Description:	This cell present the Dutch **norm per house-area type**.		

Cell:	H149	**Function:**	Numerical output cell
Description:	This cell present the **minimum number of parking spots** per house-area type based on the Dutch parking norms.		

In certain circumstances the norm can be altered. In this worksheet this can be done via cell H153. Standard selection values are -10% and -20%.

Cell:	H153	**Function:**	List selector
Description:	This cell presents the possibility to alter the parking norm.		

Cell:	J159/L159/N159	**Function:**	Numerical output cell
Description:	Based on the earlier estimated CRR values (see row 157) this cell presents the **required minimum number of shared cars** in this (part of this) neighborhood based on the Dutch parking norms.		



Visualisation 11: An example of the models feature to get an impression of the impact of the minimal requirements of the Dutch parking norms.

In the section **Cost Private vs Shared Car Calculator** the user can find links to 3rd party information about the cost of shared car use in various countries. The user can add additional URL-links here.

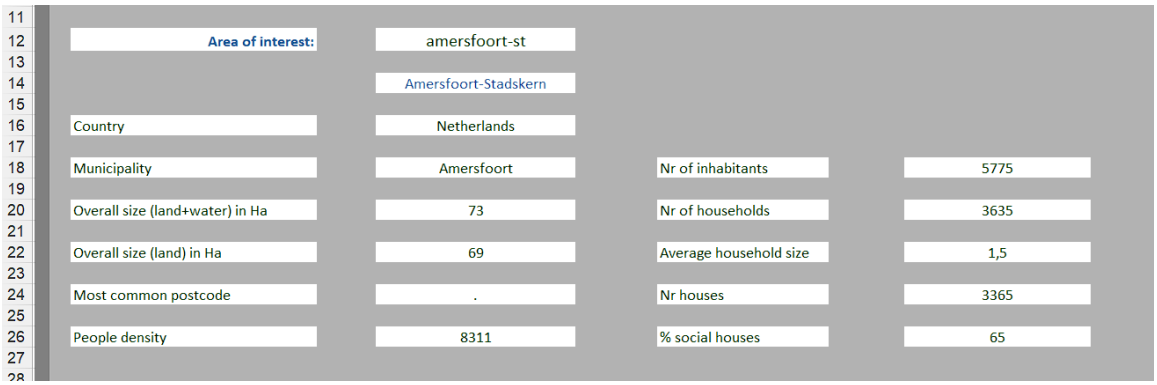
Visualisation 12: Some of the URLs available for the user to find additional information about the costs of car sharing.

Worksheet: NL_Area_Impact_Dashboard

This worksheet provides a dashboard-style overview of the impact of shared mobility across specific areas in the Netherlands. It integrates neighborhood characteristics from the CBS KWB database and the ODIN classification, enabling a more context-sensitive analysis. This approach allows the Car Replacement Ratio (CRR) to be tailored to the mobility needs of different user groups. For instance, residents in city centers generally exhibit lower car ownership compared to those in suburban or rural areas.

By leveraging the ODIN classification, the CRR can be further refined to reflect spatial and demographic variations between neighborhoods. However, in some cases, a neighborhood may lack an ODIN classification. In such instances, it is necessary to identify a comparable neighborhood - one with similar characteristics and an existing ODIN classification - to serve as a proxy in the analysis.

Based on the CBS data of worksheet CBS – kwb-2024 NL area data together with the name inserted at cell D8 of worksheet Management Dashboard the characteristics of the selected neighborhood is presented in cells in rows 16-38.



Area of interest:	amersfoort-st			
	Amersfoort-Stadskern			
Country	Netherlands			
Municipality	Amersfoort	Nr of inhabitants	5775	
Overall size (land+water) in Ha	73	Nr of households	3635	
Overall size (land) in Ha	69	Average household size	1,5	
Most common postcode	.	Nr houses	3365	
People density	8311	% social houses	65	

Visualisation 13: A partial presentation of this module showing the socio-economic characteristics of the selected Dutch village: Amersfoort-Stadskern

With the entries made in cells Q41, Q43 and Q45 in worksheet Management Dashboard **the CRR is presented in row 71**.

Cell:	G71/J71/M71	**Function:**	Numerical output cell
Description:	The at worksheet CRR – Calculators estimated **CRR values** are repeated in these output cells.		

Cell:	G75/J75/M75	**Function:**	Numerical output cell
Description:	Based on the cells G71/J71/M71 the reclaimed **public space** is estimated with the availability of a shared car, in general.		

Cell:	G81/J81/M81 G83/J83/M83 G87/J87/M87	**Function:**	Numerical output cell
Description:	Based on the cells G71/J71/M71 the change in **traffic intensity** is estimated with the availability of a shared car, in general.		

The aforementioned output cells between rows 71-87 present a brief overview of the analysis at worksheet Management Dashboard based on the Rebel Group approach or literature. The second section, Scenario estimates, starts with a benchmark scenario: an estimation of the mobility need of the neighborhood without the presence of shared cars.

Cell:	G119	**Function:**	Numerical output cell
Description:	This cell indicates the level of car mobility of the neighborhood under study without shared car facilities.		

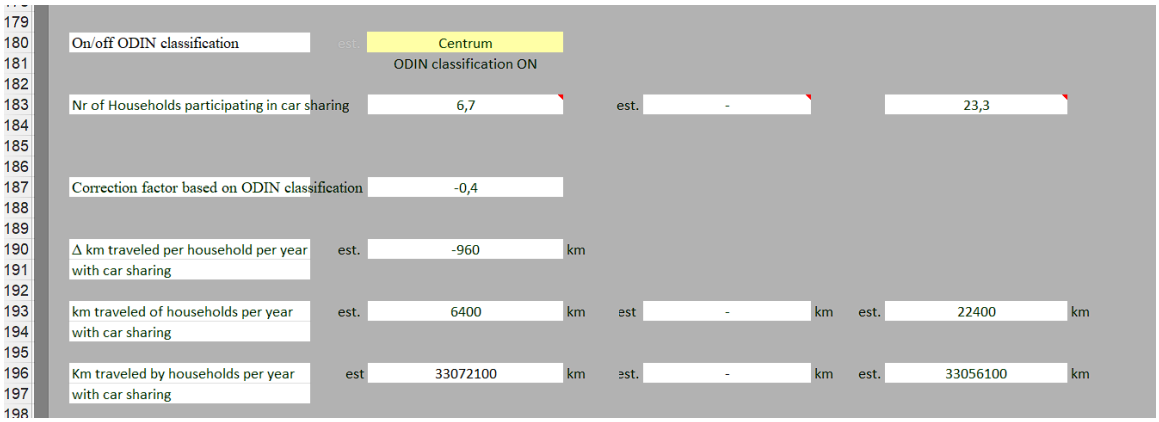
Cell:	G123/G124/G125	**Function:**	Numerical output cell
Description:	This cell indicates the level of **CO_2, NO_x and PM_{10} emissions** due to car mobility of the neighborhood under study without shared car facilities.		

Cell:	G135	**Function:**	Numerical output cell
Description:	This cell indicates the level of parking space needed for car mobility of the neighborhood under study without shared car facilities.		

From row 142 onwards a scenario is considered where a shared car is available in the neighborhood under study. In this part of the worksheet the user can choose between the earlier described estimation of the impact variables (by selecting NL standard av. In cell G180).

Cell:	G180	**Function:**	List selector
Description:	This cell enables the user to switch between the Rebel Group and literature calculation of the CRR, on the one hand, or on the ODIN classification adapted CRR, on the other.		

Changing the value of cell G180 will result in a change of the CRR estimates in cell G183/J183/M183 affecting the rest of the analysis (e.g., the outputs cells G190, G193 and G196/J/196/M196).



Visualisation 14: The selection of a value other than NL standard av. in cell G180 will result in the using the ODiN classification in the calculation of the estimates.

Cell:	G190	**Function:**	Numerical output cell
Description:	This cell indicates the annual **reduction of car km** due to a household switching to shared car mobility.		

Cell:	G193/J193/M193	**Function:**	Numerical output cell
Description:	This cell indicates the **average car km** traveled by a household per annum switching to shared car mobility.		

The presence of shared cars result in a change in the level of car use by households. The relevant estimates can be found in cells of row 196.

Cell:	G196/J196/M196	**Function:**	Numerical output cell
Description:	This cell indicates the **level of car mobility** of the neighborhood under study with shared car facilities.		

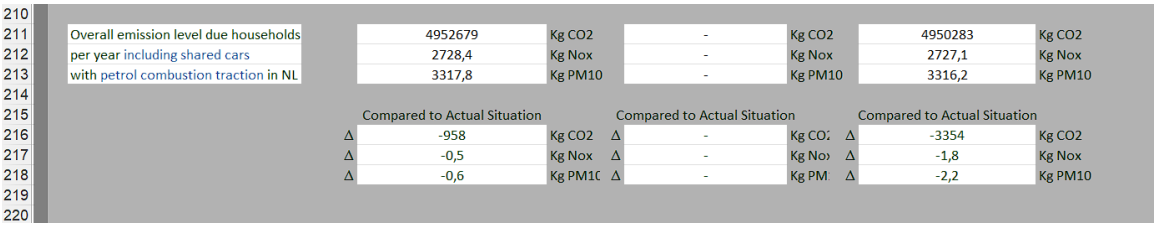
Over the past decade shared cars were commonly modern medium-size petrol engine cars. Nowadays, the trend is to switch to more sustainable electric equivalents. The third section of the

worksheet, **Type of Shared Cars vs. Emission Levels**, considers the (change in) emission levels between two categories of shared cars, viz. petrol and electric ones.

Cell:	G211/J211/M211	**Function:**	Numerical output cell
	G212/J212/M212		
	G213/J213/M213		
Description:	These cells indicates the **level of emissions** of the neighborhood under study in case of the utilization of a petrol shared car.		

The difference in the level of emissions between the actual (benchmark) situation and the one of the alternative scenario (with a shared petrol car) is presented in the cells G216 till M218. See the next table for more information:

Cell:	G216/J216/M216	**Function:**	Numerical output cell
	G217/J217/M217		
	G218/J218/M218		
Description:	This cell indicates the **change in the level of emissions** of the neighborhood compared to the benchmark situation in case of the utilization of a **petrol shared car**.		



Visualisation 15: An example of the calculated emission estimates and their difference compared to the benchmark ones.

The last part of this worksheet considers the (change in) emission levels that coincide with the availability of an electric shared car.

Cell:	G222/J222/M222	**Function:**	Numerical output cell
	G223/J223/M223		
	G224/J224/M224		
Description:	These cells indicate the **change in the level of emissions** of the neighborhood compared to the benchmark situation in case of the utilization of an **electric shared car**.		

The difference in the level of emissions between the actual (benchmark) situation and the one of the alternative scenario (with a shared electric car) is presented in the cells G227 till M229.

Cell:	G227/J227/M227	**Function:**	Numerical output cell
	G228/J228/M228		
	G229/J229/M229		
Description:	These cells indicates the **change in the level of emissions** of the neighborhood under study in case of the utilization of a comparable electric shared car. These show the difference in emissions between the benchmark scenario (private cars only) and the alternative one with an electric shared car.		

Worksheet: CBS – kwb-2024 – NL area data

This worksheet provides data on the characteristics of neighborhoods in the Netherlands.

To enhance usability, unnecessary columns from the original dataset have been removed. The original and future versions of the dataset can be obtained from the Dutch national statistics bureau (CBS) via: https://www.cbs.nl/en-gb/faq/infoservice/where-can-i-find-district-and-neighbourhood-data-.

The value in the merged cell C9/D9 is sourced from cell G12 in the worksheet NL_Area_Impact_Dashboard.

Users are not expected to modify any cells in this worksheet.

Column D presents a summary of the relevant data used in the model analysis for the neighborhood specified in C9/D9.

7									
8									
9		Search:		amersfoort-st		gwb_code_10	gwb_code_8	regio	gm_naam	recs
10						NL00	0000	Nederland	Nederland	Land
11		Legenda				GM0014	0014	Groningen	Groningen	Gemeente
12		CBS – area 10 nrs code	gwb_code_10	WK030701		WK001400	001400	Centrum	Groningen	Wijk
13		CBS – area 8 nrs code	gwb_code_8	030701		BU00140000	00140000	Binnenstad-Noord	Groningen	Buurt
14		Area (Location/neighborhood)	regio	Amersfoort-Stadskern		BU00140001	00140001	Binnenstad-Zuid	Groningen	Buurt
15		Municipality	gm_naam	Amersfoort		BU00140002	00140002	Binnenstad-Oost	Groningen	Buurt
16		Type of area	recs	Wijk		BU00140003	00140003	Binnenstad-West	Groningen	Buurt
17		CBS - file code	gwb_code	WK030701		BU00140004	00140004	Noorderplantsoen	Groningen	Buurt
18		CBS - area mutation	ind_wbi	1		BU00140005	00140005	Hortusbuurt-Ebbingekwa	Groningen	Buurt
19		Nr of inhabitants	a_inw	5775		BU00140007	00140007	UMCG	Groningen	Buurt
20		Nr. of men	a_man	2830		BU00140008	00140008	Stationsgebied	Groningen	Buurt
21		Nr of women	a_vrouw	2945		WK001401	001401	Oud-Zuid	Groningen	Wijk
22		Age 0-14	a_00_14	390		BU00140100	00140100	De Meeuwen	Groningen	Buurt
23		Age 15-24	a_15_24	840		BU00140101	00140101	Oosterpoort	Groningen	Buurt
24		Age 25-44	a_25_44	2140		BU00140102	00140102	Herewegbuurt	Groningen	Buurt

Visualisation 16: An impression of the CBS kwb-2024 data base data

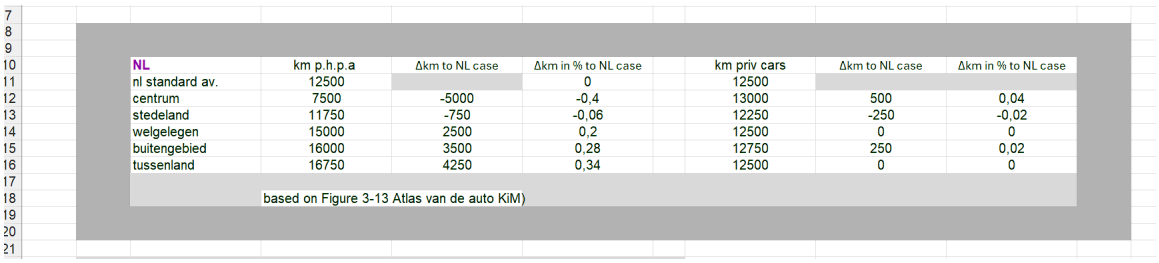
Worksheet: ODIN classification

This worksheet presents data derived from Figure 3-13 of the document Atlas van de Auto (see: https://www.kimnet.nl/atlas-van-de-auto).

It focuses on the classification of neighborhoods according to the ODIN system, which defines five categories: Centrum, Stedeland, Welgelegen, Buitengebied, and Tussenland.

However, not all neighborhoods are classified within this system. This introduces a degree of uncertainty in the analysis, as users must identify alternative neighborhoods that share similar characteristics to the one under study.

Users are not expected to modify any cells in this worksheet. When more accurate data becomes available, cells E11-E16 can be altered as desired.



NL	km p.h.p.a	Δkm to NL case	Δkm in % to NL case	km priv cars	Δkm to NL case	Δkm in % to NL case
nl standard av.	12500		0	12500		
centrum	7500	-5000	-0,4	13000	500	0,04
stedeland	11750	-750	-0,06	12250	-250	-0,02
welgelegen	15000	2500	0,2	12500	0	0
buitengebied	16000	3500	0,28	12750	250	0,02
tussenland	16750	4250	0,34	12500	0	0

based on Figure 3-13 Atlas van de auto KiM)

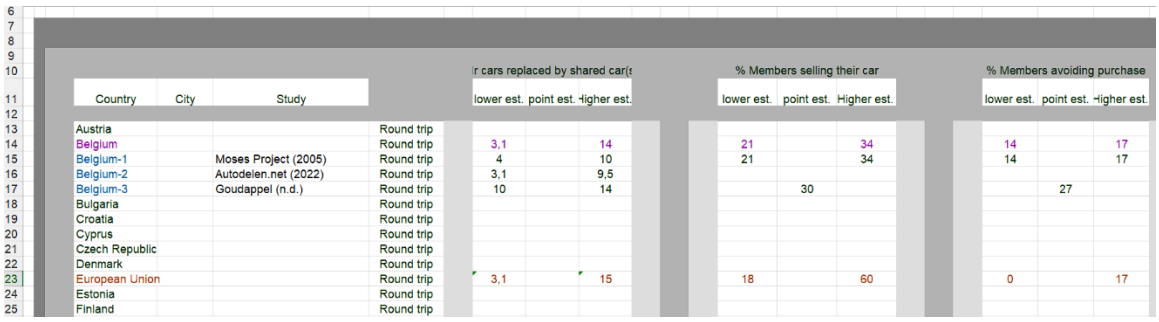
Visualisation 17: The correction factors used to enable the use of the ODiN classification of Dutch villages in the model.

Worksheet: Car Replacement Ratio Data RT

This worksheet contains outcome estimates from literature on round-trip shared car usage.

When multiple estimates are available for a single country, they are listed in **blue**. In the current version of the tool, an aggregate interval estimate, representing the range between the lowest and highest values, is used in the analysis for each country. In the worksheet, these minimum and maximum values are highlighted in **purple**, while the individual estimates remain in blue.

Users are not expected to modify any cells that already contain estimates. However, they are welcome to add new estimates from additional sources as needed.



Country	City	Study		r cars replaced by shared car(s		% Members selling their car			% Members avoiding purchase		
				lower est.	point est.	Higher est.	lower est.	point est.	Higher est.	lower est.	point est.	Higher est.
Austria			Round trip									
Belgium			Round trip	3,1		14	21		34	14		17
Belgium-1		Moses Project (2005)	Round trip	4		10	21		34	14		17
Belgium-2		Autodelen.net (2022)	Round trip	3,1		9,5						
Belgium-3		Goudappel (n.d.)	Round trip	10		14		30			27	
Bulgaria			Round trip									
Croatia			Round trip									
Cyprus			Round trip									
Czech Republic			Round trip									
Denmark			Round trip									
European Union			Round trip	3,1		15	18		60	0		17
Estonia			Round trip									
Finland			Round trip									

Visualisation 18: A partial presentation of the worksheet with literature estimates of round trip car sharing

Worksheet: Car Replacement Ratio Data FF

This worksheet contains outcome estimates from literature on free floating shared car usage.

When multiple estimates are available for a single country, they are listed in blue. However, in the current version of the tool, only the first estimate per country is used in the analysis.

Users are not expected to modify any cells that already contain estimates. However, they are welcome to add new estimates from additional sources as needed.

Worksheet: Car Replacement Ratio Data P2P

This worksheet contains outcome estimates from literature on peer-to-peer shared car usage.

When multiple estimates are available for a single country, they are listed in **blue**. In the current version of the tool, an aggregate interval estimate, representing the range between the lowest and highest values, is used in the analysis for each country. In the worksheet, these minimum and maximum values are highlighted in **purple**, while the individual estimates remain in blue.

Users are not expected to modify any cells that already contain estimates. However, they are welcome to add new estimates from additional sources as needed.

Worksheet: Public Space Data

This worksheet contains outcome estimates from literature on the size of parking spaces (in m^2).

It is important to note that parking space dimensions can vary significantly due to differing national regulations and design standards, whether on streets, in parking garages, or other contexts.

Users are not expected to modify any cells that already contain estimates. However, they are welcome to add new estimates from additional sources as needed.

	Country	Av Size Parking Spot (m2)	Remarks
6	Austria		
7	Belgium	11,5	
8	Bulgaria		
9	Croatia		
10	Cyprus		
11	Czech Republic		
12	Denmark		
13	Estonia		
14	European Union	14	
15	Finland		
16	France		
17	Germany		
18	Greece		
19	Hungary		

Visualisation 19: A partial presentation of the worksheet Public Space Data

Worksheet: Vehicle Specs

This worksheet contains outcome estimates from literature on the energy consumption of various vehicle types per 100 km, based on a tank-to-wheel (TTW) approach.

In general, these values are derived from WLTP (Worldwide Harmonized Light Vehicles Test Procedure) test results.

The tool uses these publicly available estimates to calculate vehicle emissions. Please note that TTW values reflect only the energy used during vehicle operation and do not include upstream processes such as fuel production or electricity generation.

Users are welcome to add new estimates or update existing ones using additional sources. For more realistic, real-world values, users may consider replacing WLTP-based estimates with practical consumption data, such as those available from the Autoweek Verbruiksmonitor (https://www.autoweek.nl/verbruiksmonitor/)

Nr.	Mode of Transport	Reference type	Initial Fuel cons. p/100km	kWh consumption p/100km
1	WALK - MANUAL	-	0	0
2	BIKE - MANUAL	-	0	0
3	MOPED_2_STROKE - PETROL		3,4	0
2	MOPED_4_STROKE - PETROL			
3	MOTOR_BIKE_2_STROKE - PETROL			
4	MOTOR_BIKE_4_STROKE - PETROL		3,6	0
5	eBIKE - ELECTRICITY		0	
6	eSCOOTER - ELECTRICITY		0	2,5
7	SEGWAY - ELECTRICITY		0	4,6

Visualisation 20: A partial presentation of worksheet Vehicle Specs

Worksheet: Energy Emission Factors

This worksheet contains outcome estimates from open-source literature on the emission levels of various energy sources used in mobility, expressed in grams per liter or per kilowatt-hour (kWh).

Users are encouraged to add new estimates or update existing ones using additional sources. For more accurate and up-to-date insights, users may consider replacing the listed values with more recent or real-world data where available. However, it must be kept in mind the dynamic inter-connected electricity market and its influence of the grid mix, even on a daily basis. Average values on a yearly basis seems to be best to use in an analysis (e.g., https://www.nowtricity.com/)

	Energy Type	EF reference	EF CO2 g/Ltr	EF NOx g/Ltr	EF PM10 g/Ltr
Fuel	PETROL		2269	1,25	1,52
	DIESEL		2650	11	2,58
	CNG		1092	3,63	0,05
	LPG		1610	96	97
	HYDROGEN		0	0	0
Electricity			EF CO2 g/kWh	EF NOx g/kWh	EF PM10 g/kWh
	Dutch e-Grid (2011)		516	0,5	0,01
	Dutch e-Grid (2021)		344	0,092	0,0009
	GREEN GRID		0	0	0
	HOME PV panels		0	0	0

Visualisation 21: A partial presentation of worksheet Energy Emission Factors

Worksheet: Parking Norm

This table presents the parking norm matrix used in urban planning or real estate development in the Netherlands. It outlines the required or recommended number of parking spots per housing unit, depending on:

- Type of housing (e.g., detached house, apartment, tiny house)
- Location type (e.g., station area, inner city, suburban, rural)
- User group (inhabitants vs. visitors)

For more information, check Overheid.nl. (n.d.). Nota Parkeernormen 2021., see https://lokaleregelgeving.overheid.nl/CVDR673849/1 .

	1	2	3	4	5	6	7	8	
5	Function	Station	Innercity	Suburban	Visitors	Other	Rural Area	Visitors	
6									nr. parking spots
7	Target Group		Inhabitants			Inhabitants			
8	Detached House	1,2	1,3	1,4	0,2	1,7	1,7	0,3	House
9	Semi-Detached House Small (<275 m2	1,2	1,3	1,3	0,2	1,4	1,5	0,3	House
10	Semi-Detached House Large (>275 m2	1,2	1,3	1,3	0,2	1,5	1,6	0,3	House
11	Between/Corner House	1,2	1,3	1,3	0,2	1,4	1,4	0,3	House
12	Personal/Rental Apartment (<50m2)	0,6	0,7	0,7	0,2	0,7	1	0,3	House
13	Social Apartment (>50m2)	0,7	0,8	0,8	0,2	0,8	1,2	0,3	House
14	Personal/Free Sector Apartment (50-7	0,7	0,8	0,9	0,2	1,1	1,2	0,3	House

Visualisation 22: A partial presentation of worksheet Parking Norm

Worksheet: Lists

This worksheet contains drop-down lists with pre-selective cell inputs.

To ensure the proper working of the tool users are NOT expected to modify the cells in this worksheet.

The ShareDiMobiHub Consortium

The consortium of ShareDiMobiHub consists of 13 partners and 4 subpartners with multidisciplinary and complementary competencies. This includes European cities and regions, universities, network partners and transport operators.

For further information please visit https://www.interregnorthsea.eu/sharedimobihub