Q-Traf

A Macroscopic Road Traffic Model

Version 1203

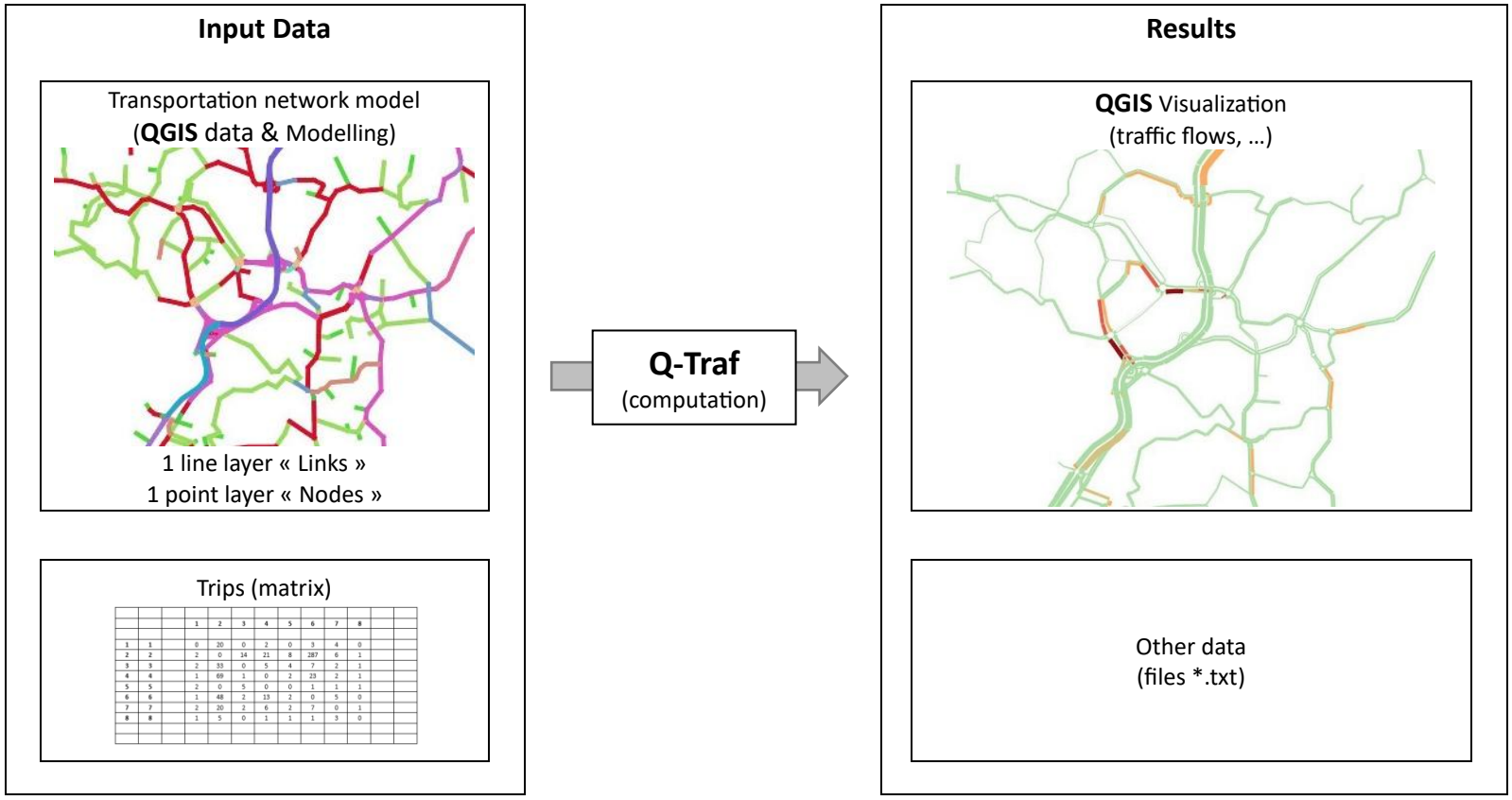
Users Manual

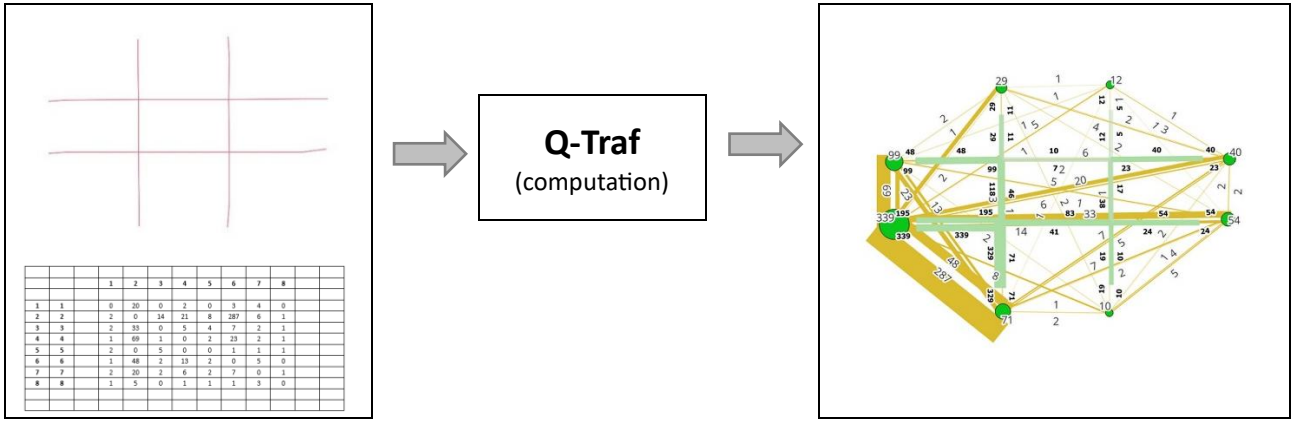
Table of contents

In this document, the examples and illustrations are given for these softwares :

- GIS : QGIS
- Spreadsheet software : OpenOffice and Excel

1. WHAT IS Q-TRAF ?

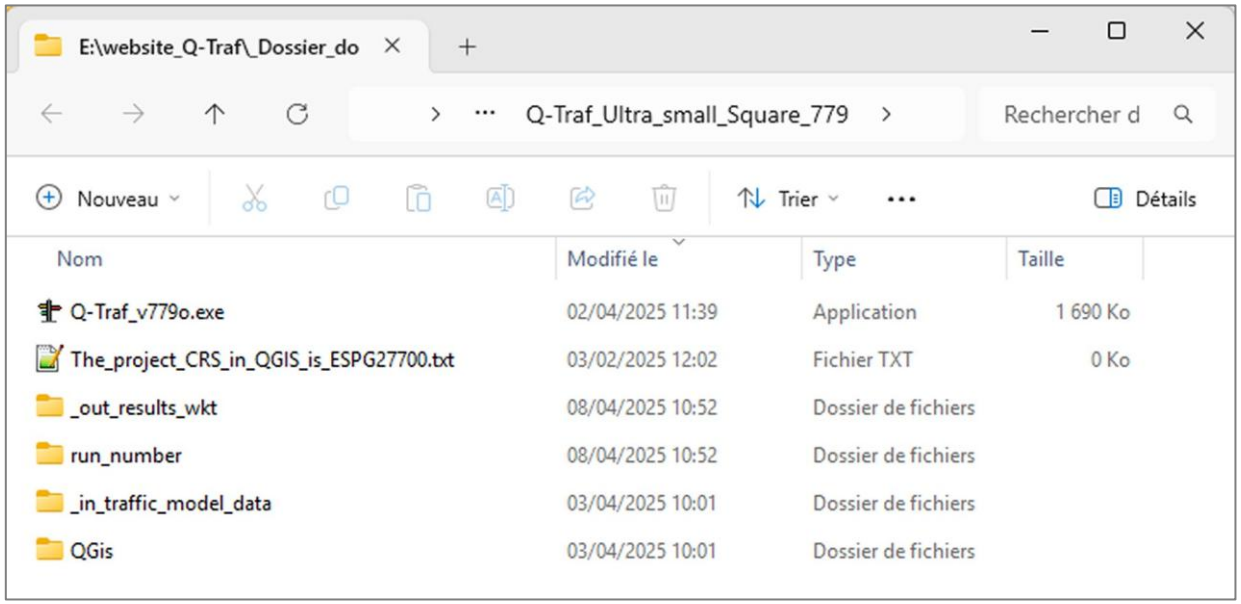



Q-Traf
(computation)

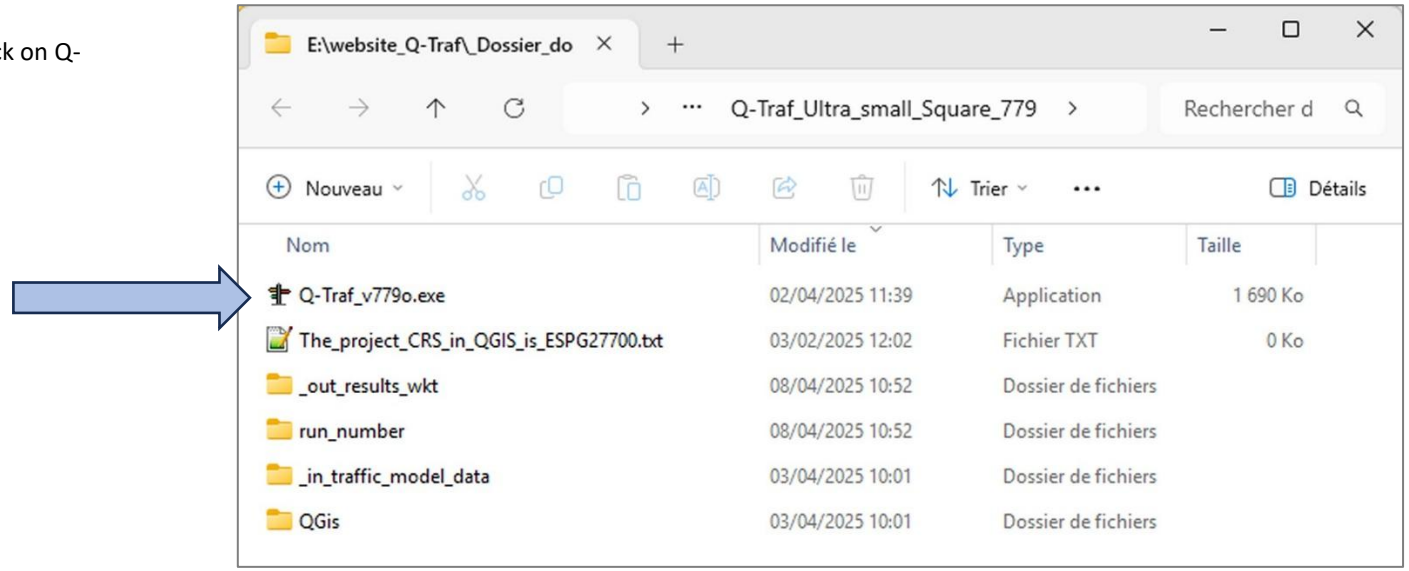
2. GET STARTED - CALCULATE YOUR FIRST ASSIGNMENT WITH ONE OF THE EXAMPLE PROVIDED

1. Download an example from the website
2. Unzip the folder
3. In the folder unzipped, run Q-Traf_vXXX.exe
4. The results are created in the folder « Results ». The results (*.csv files) can be open directly in QGIS (see “The file formats”).

Open the folder of your project, or one of the folder-example provided (here Ultra_small_square) :)

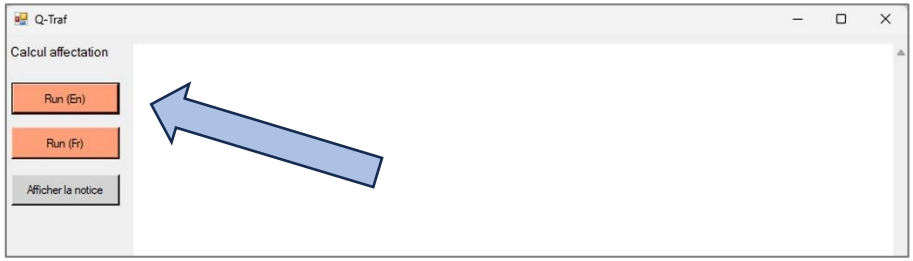


Launch Q-Traf (double click on Q-Traf_vxxx.exe) :



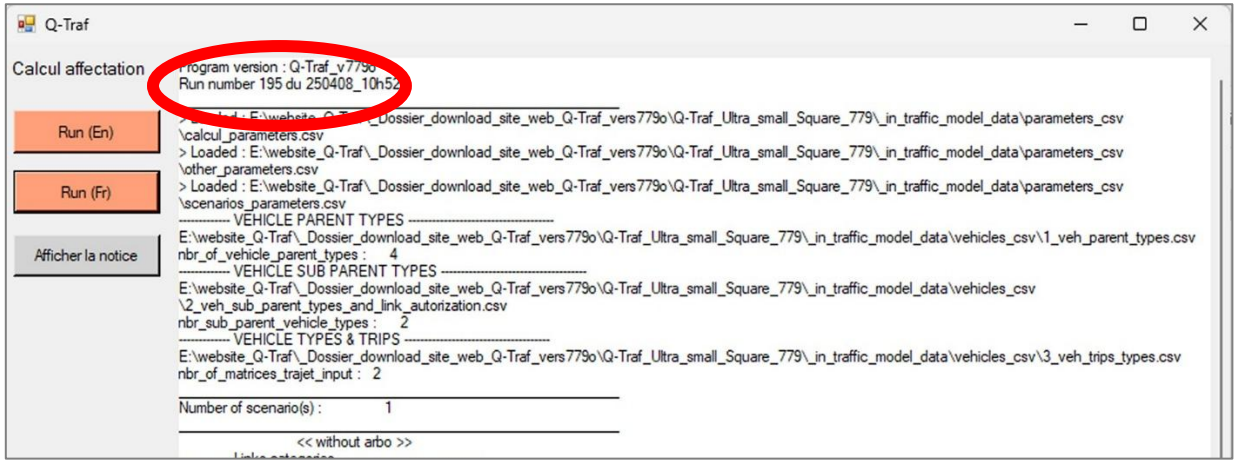
The window of the program Q-Traf pops-up :

Click « Run (En) » :

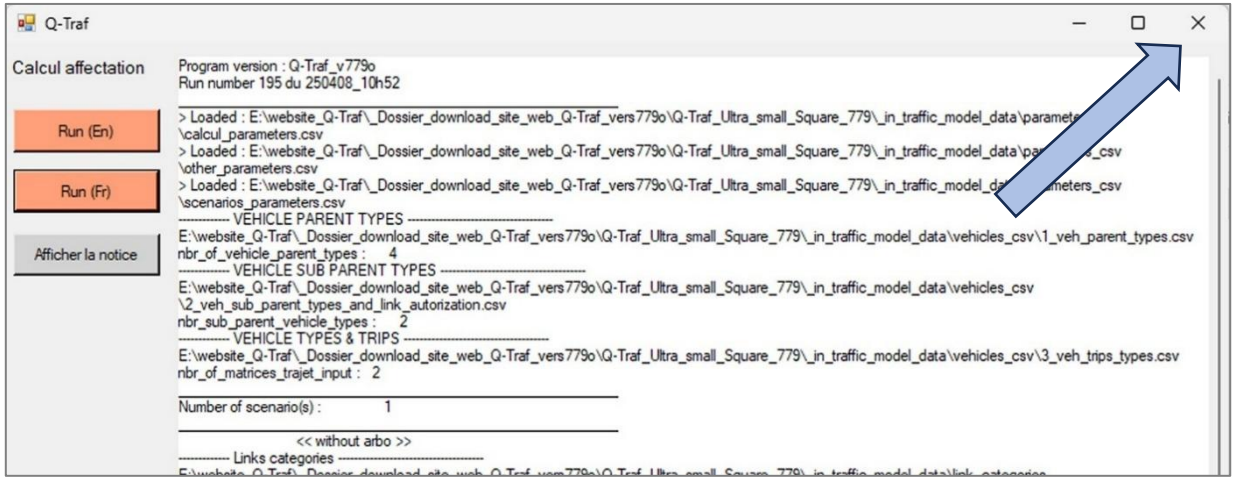


Wait (a few seconds) untill the calculations are finished :

Note the run number



Close the window :



3. THE FILE FORMATS – TXT, CSV AND WKT CSV (*TO DO*)

Q-Traf uses 3 types of files :

	format	File format	How to read it	
GIS layers - Links - Nodes - Results (flows, speed, level of service, …)	WKT CSV	*.csv	Import directly in QGIS or opened with a spreadsheet Software (Excel, LibreOffice, OpenOffice)	
Other input data / parameters (categories of vehicles, assignment parameters, …)	CSV	*.csv		A *.xlsx (Excel) copy is provided for each file. Not used by Q-Traf, these files are simpler to manipulate and can store graphic formatting
The Log file	TXT	*.txt		

The csv format

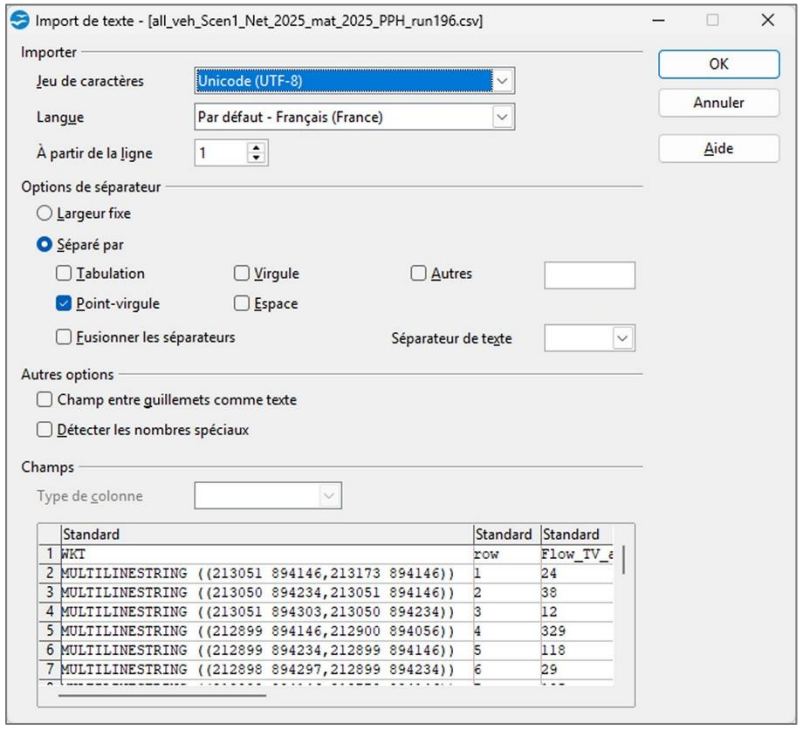
CSV, for « Comma-Separated Values », is a simple text file format used to store tables / tabular data, where each line represents a record, and columns / fields within that record are separated by commas. It is widely used for data exchange between applications, especially spreadsheets and databases, due to its human readability and ease of use.

An example of a csv file with 4 columns (and 3 lines) :

```
A,b,c,d
1,17,red,-92
89,2,ballon,17
```

How to manipulate a csv files with a spreadsheet software (LibreOffice, OpenOffice, Excel) - csv files ↔ xlsx files

With OpenOffice :



VERY IMPORTANT !

You need to choose the « semicolon » delimiter, as for now QTraf have been developed in french (😊)

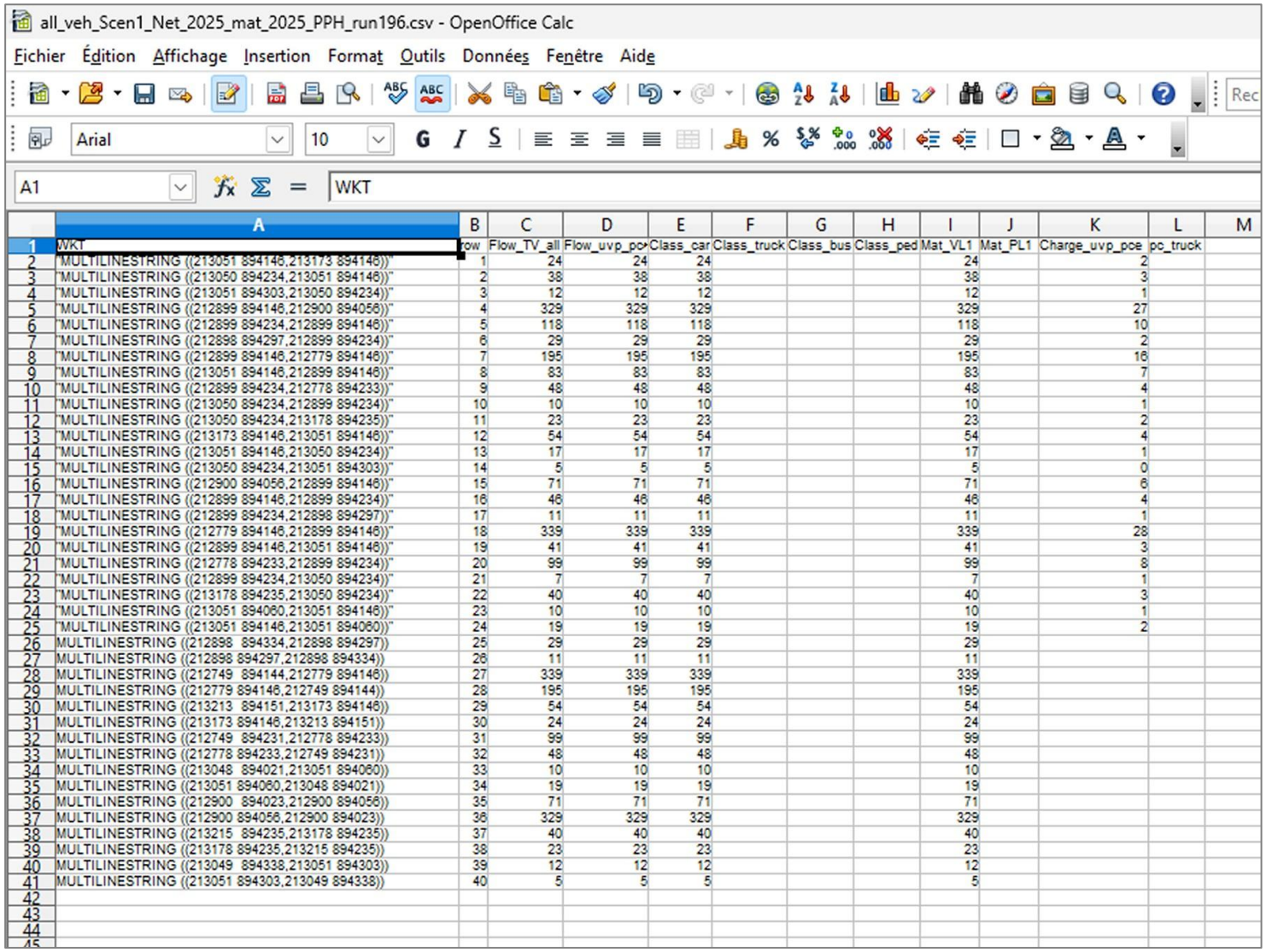
The wkt csv format

What is the format WKT (Well Known Text) for QGis ? An example (to correct)

Next is the content of the file « all_veh_Scen1_Net_2025_PPH_run196.csv ».
This file provides the flow for each link and each type of vehicles.

The lines
The first line contains the column headers / name of the fields.
Then there is one line for each link.
The first column contains the coordinates of the link, which can be read by QGis

The columns
Each column contains one type of data.

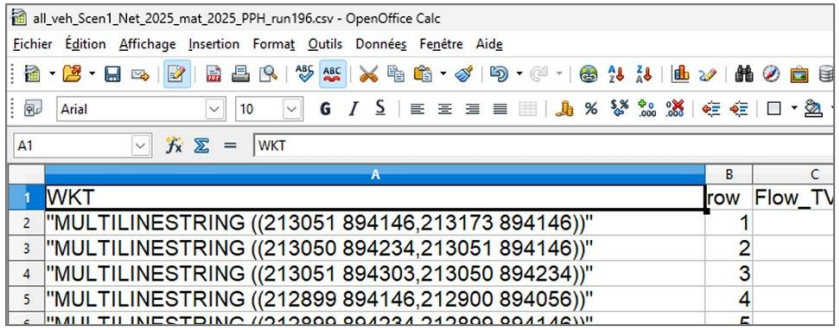

all_veh_Scen1_Net_2025_mat_2025_PPH_run196.csv - OpenOffice Calc

Fichier Édition Affichage Insertion Format Outils Données Fenêtre Aide

Arial 10

A1 WKT

	A	B	C	D	E	F	G	H	I	J	K	L	M
1	WKT	row	Flow_TV_all	Flow_uvp_pc	Class_car	Class_truck	Class_bus	Class_ped	Mat_VL1	Mat_PL1	Charge_uvp_pce	pc_truck	
2	"MULTILINESTRING ((213051 894146,213173 894146))"	1	24	24	24				24		2		
3	"MULTILINESTRING ((213050 894234,213051 894146))"	2	38	38	38				38		3		
4	"MULTILINESTRING ((213051 894303,213050 894234))"	3	12	12	12				12		1		
5	"MULTILINESTRING ((212899 894146,212900 894056))"	4	329	329	329				329		27		
6	"MULTILINESTRING ((212899 894234,212899 894146))"	5	118	118	118				118		10		
7	"MULTILINESTRING ((212898 894297,212899 894234))"	6	29	29	29				29		2		
8	"MULTILINESTRING ((212899 894146,212779 894146))"	7	195	195	195				195		16		
9	"MULTILINESTRING ((213051 894146,212899 894146))"	8	83	83	83				83		7		
10	"MULTILINESTRING ((212899 894234,212778 894233))"	9	48	48	48				48		4		
11	"MULTILINESTRING ((213050 894234,212899 894234))"	10	10	10	10				10		1		
12	"MULTILINESTRING ((213050 894234,213178 894235))"	11	23	23	23				23		2		
13	"MULTILINESTRING ((213173 894146,213051 894146))"	12	54	54	54				54		4		
14	"MULTILINESTRING ((213051 894146,213050 894234))"	13	17	17	17				17		1		
15	"MULTILINESTRING ((213050 894234,213051 894303))"	14	5	5	5				5		0		
16	"MULTILINESTRING ((212900 894056,212899 894146))"	15	71	71	71				71		6		
17	"MULTILINESTRING ((212899 894146,212899 894234))"	16	46	46	46				46		4		
18	"MULTILINESTRING ((212899 894234,212898 894297))"	17	11	11	11				11		1		
19	"MULTILINESTRING ((212779 894146,212899 894146))"	18	339	339	339				339		28		
20	"MULTILINESTRING ((212899 894146,213051 894146))"	19	41	41	41				41		3		
21	"MULTILINESTRING ((212778 894233,212899 894234))"	20	99	99	99				99		8		
22	"MULTILINESTRING ((212899 894234,213050 894234))"	21	7	7	7				7		1		
23	"MULTILINESTRING ((213178 894235,213050 894234))"	22	40	40	40				40		3		
24	"MULTILINESTRING ((213051 894060,213051 894146))"	23	10	10	10				10		1		
25	"MULTILINESTRING ((213051 894146,213051 894060))"	24	19	19	19				19		2		
26	MULTILINESTRING ((212898 894334,212898 894297))	25	29	29	29				29				
27	MULTILINESTRING ((212898 894297,212898 894334))	26	11	11	11				11				
28	MULTILINESTRING ((212749 894144,212779 894146))	27	339	339	339				339				
29	MULTILINESTRING ((212779 894146,212749 894144))	28	195	195	195				195				
30	MULTILINESTRING ((213213 894151,213173 894146))	29	54	54	54				54				
31	MULTILINESTRING ((213173 894146,213213 894151))	30	24	24	24				24				
32	MULTILINESTRING ((212749 894231,212778 894233))	31	99	99	99				99				
33	MULTILINESTRING ((212778 894233,212749 894231))	32	48	48	48				48				
34	MULTILINESTRING ((213048 894021,213051 894060))	33	10	10	10				10				
35	MULTILINESTRING ((213051 894060,213048 894021))	34	19	19	19				19				
36	MULTILINESTRING ((212900 894023,212900 894056))	35	71	71	71				71				
37	MULTILINESTRING ((212900 894056,212900 894023))	36	329	329	329				329				
38	MULTILINESTRING ((213215 894235,213178 894235))	37	40	40	40				40				
39	MULTILINESTRING ((213178 894235,213215 894235))	38	23	23	23				23				
40	MULTILINESTRING ((213049 894338,213051 894303))	39	12	12	12				12				
41	MULTILINESTRING ((213051 894303,213049 894338))	40	5	5	5				5				
42													
43													
44													
45													



	A	B	C
1	WKT	row	Flow_TV
2	"MULTILINESTRING ((213051 894146,213173 894146))"	1	
3	"MULTILINESTRING ((213050 894234,213051 894146))"	2	
4	"MULTILINESTRING ((213051 894303,213050 894234))"	3	
5	"MULTILINESTRING ((212899 894146,212900 894056))"	4	

The coordinates of the links, which can be directly imported in QGis

How to manipulate the wkt csv files

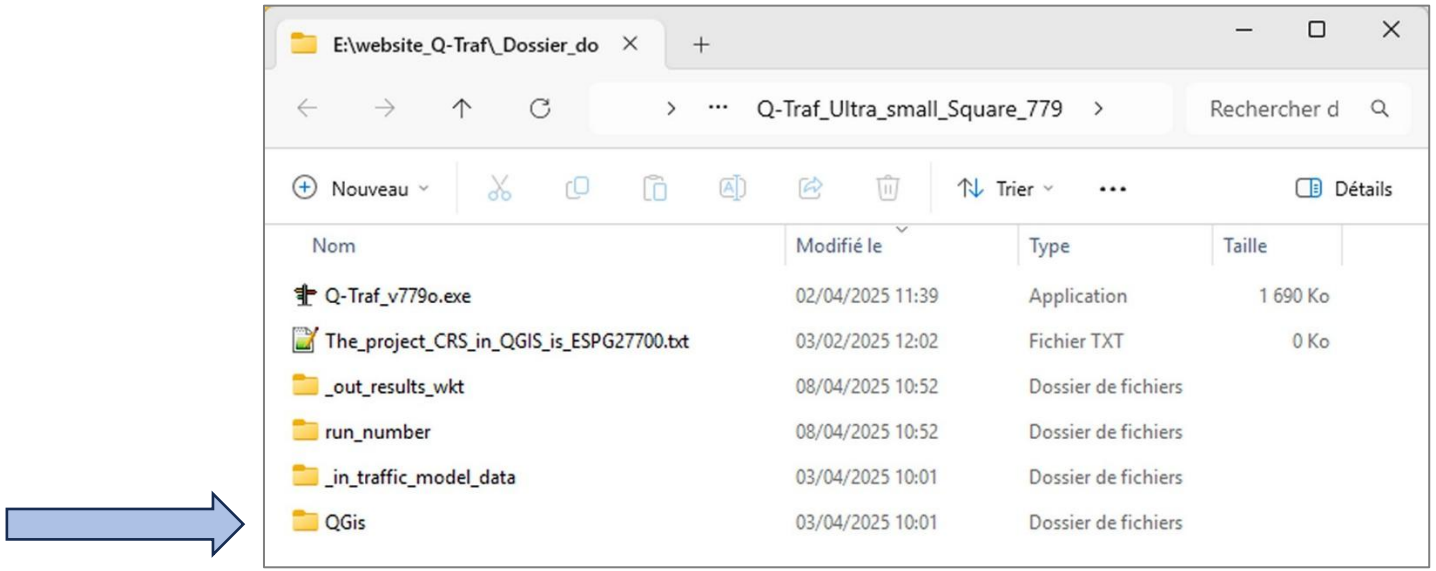
There are 2 ways to manipulate the wkt csv files :

With QGIS	↔	**Wkt csv file**	↔	With a spreadsheet Software

WKT csv files ↔ QGis layer

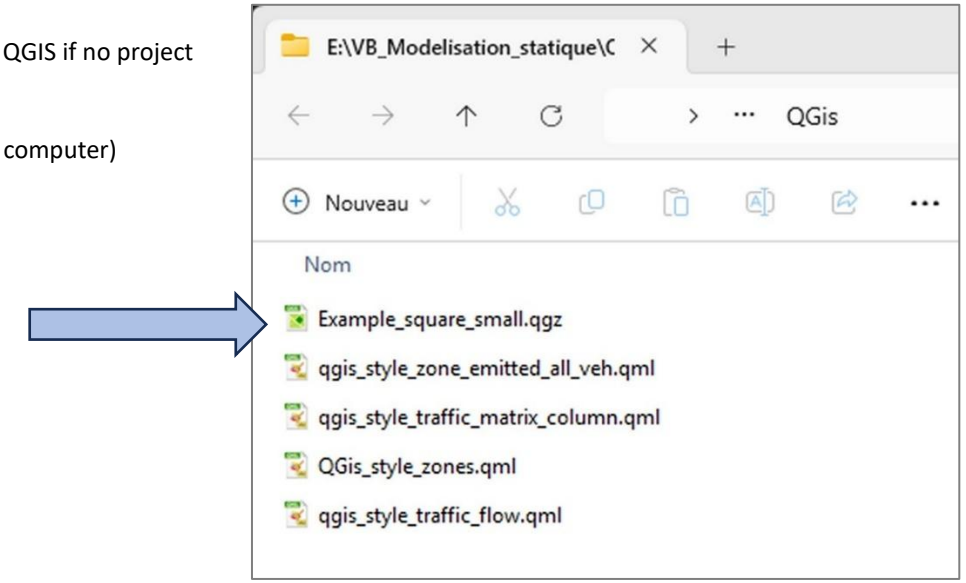
How to open (and visualize) a WKT csv files in QGis (links file, nodes file, results of an assignment)

1 – Open the folder QGIS



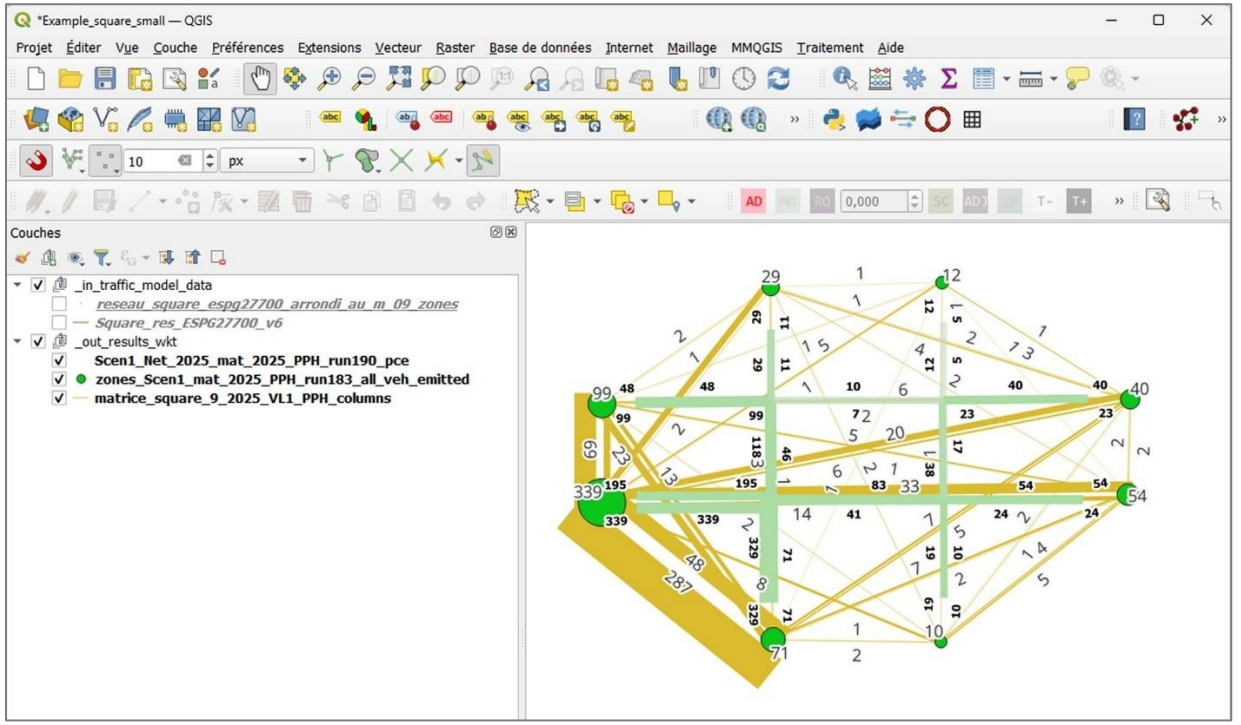
Open the project QGIS (or simply QGIS if no project have been created)

(QGIS need to be installed on the computer)



QGIS is now open with the project

(or without a project, in case of a first opening.
In this case, choose a CRS which will be your CRS by default -and the CRS of all the files- and save the project)

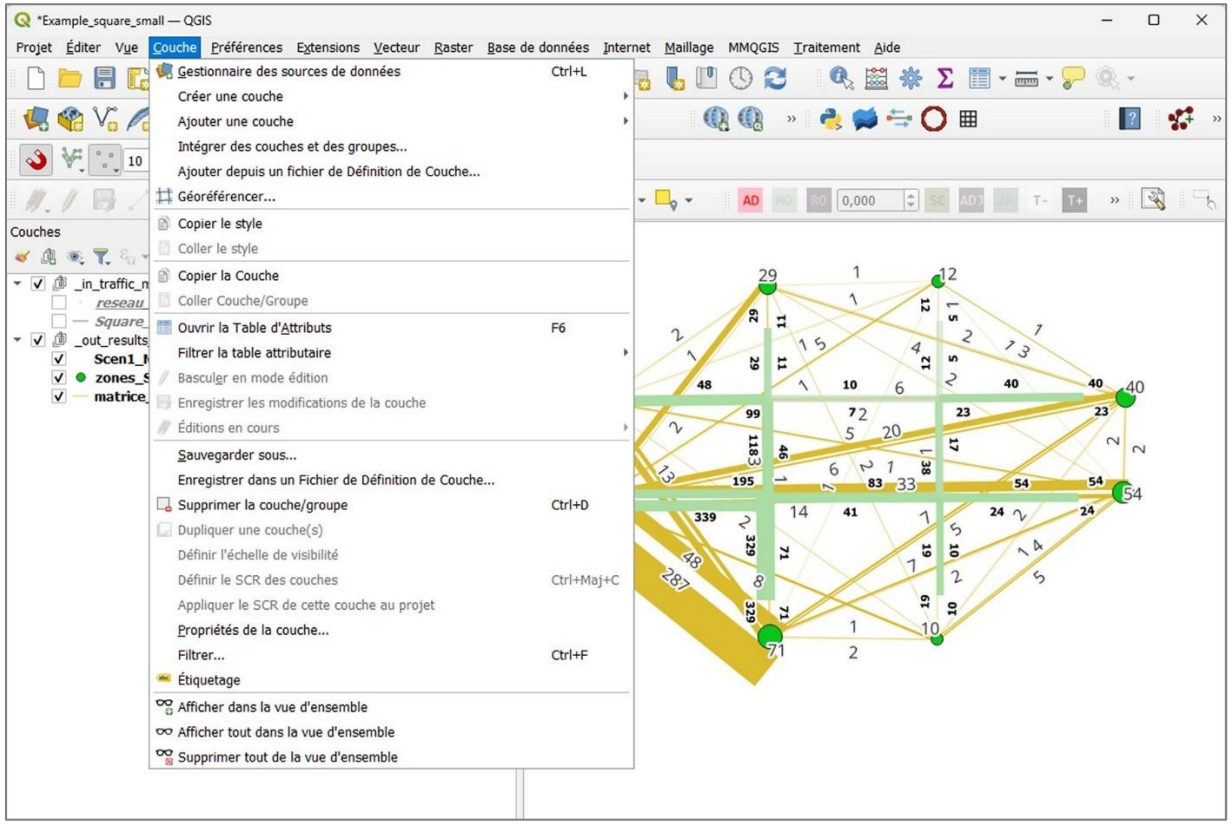


Import your wkt csv file (result, …)

Here we will choose the hourly traffic flow in pce (personal car equivalent) in the « Results » folder

Choose :

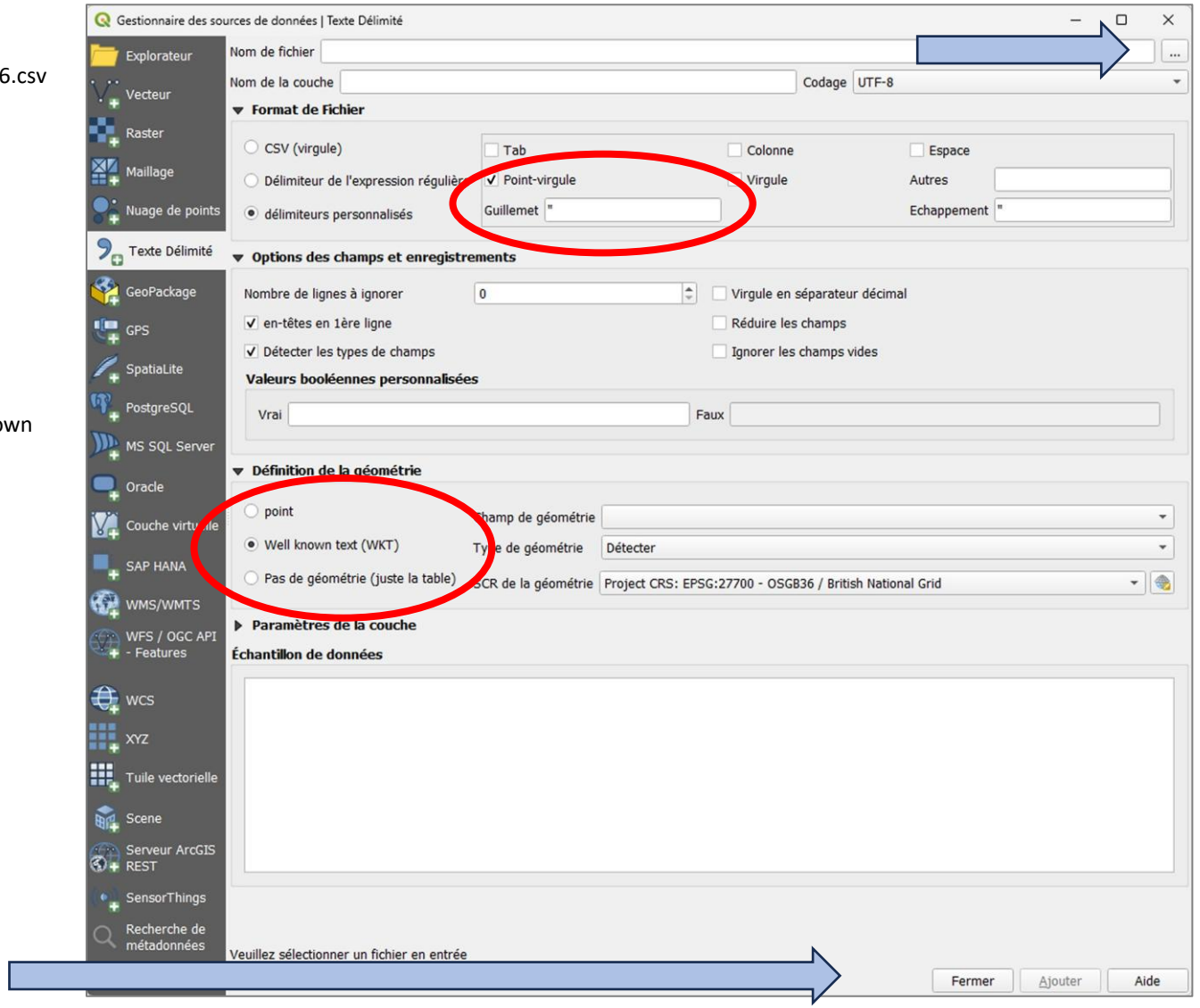
- Layer
- Add a layer
  (This opens the window on the right)
- Add a text delimited layer (which is the *.csv file)



Choose the file :
« pce_Scen1_Net_2025_mat_2025_PPH_run196.csv »

Beware of these 3 options to select :

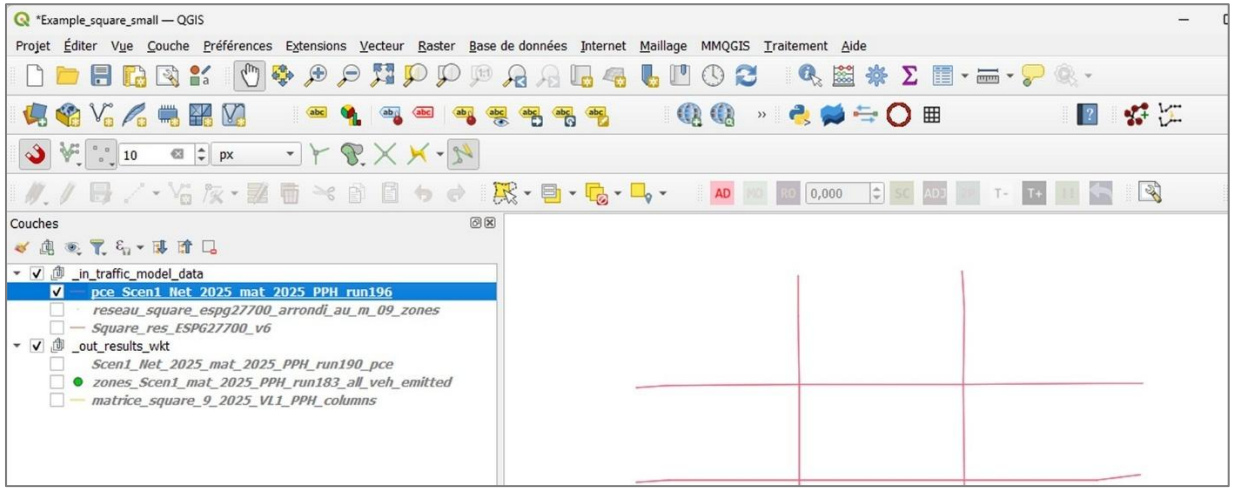
- « **semicolon** » is essential
- Well known text (WKT)
- SCR : Choose the SCR by default of the project, the second item in the drop down list



Then click « Add » then « Close »

The new file is then imported in your QGis project.

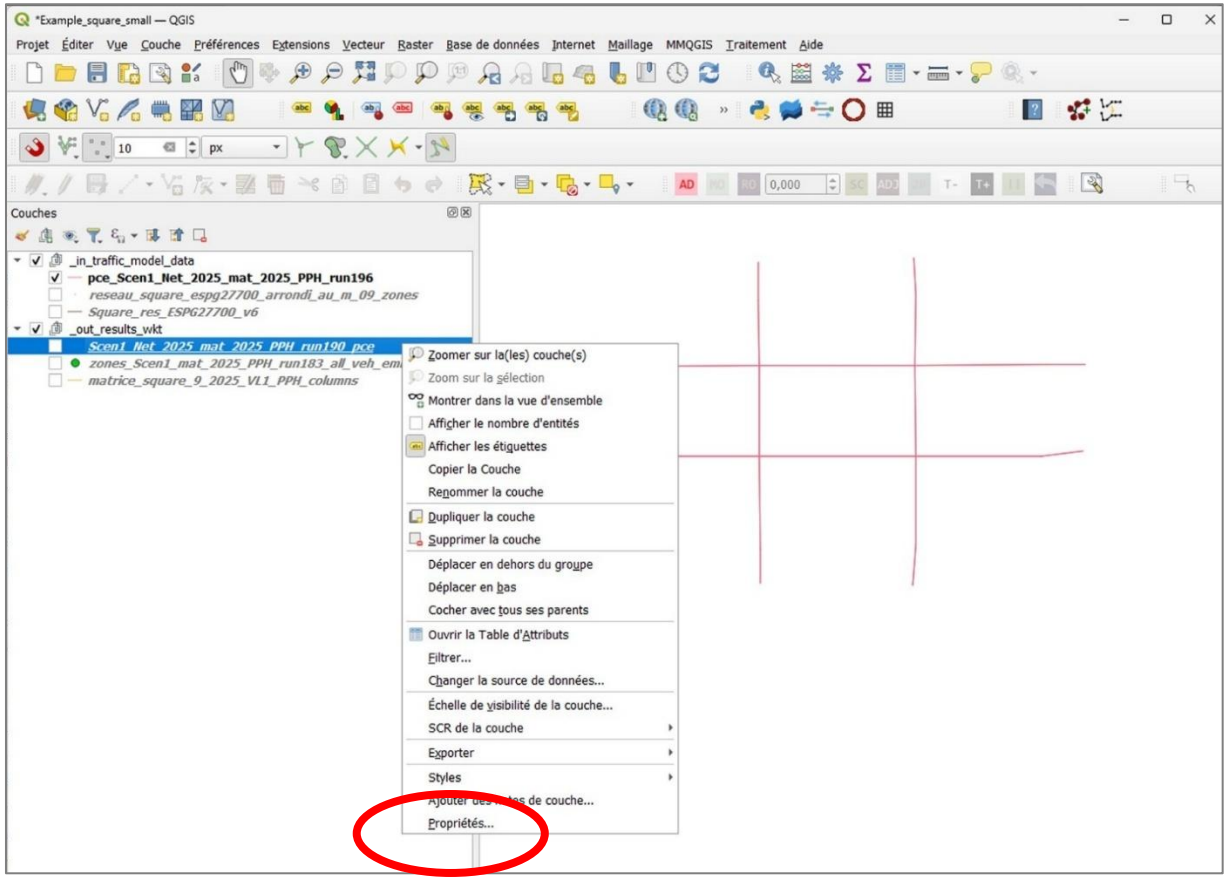
Note that only the lines are drawn.
The layer contains all the data, but they are not drawn, as there is no graphical parameters defined.



To apply the graphical parameters, you need to copy/paste them from a layer of the same type :

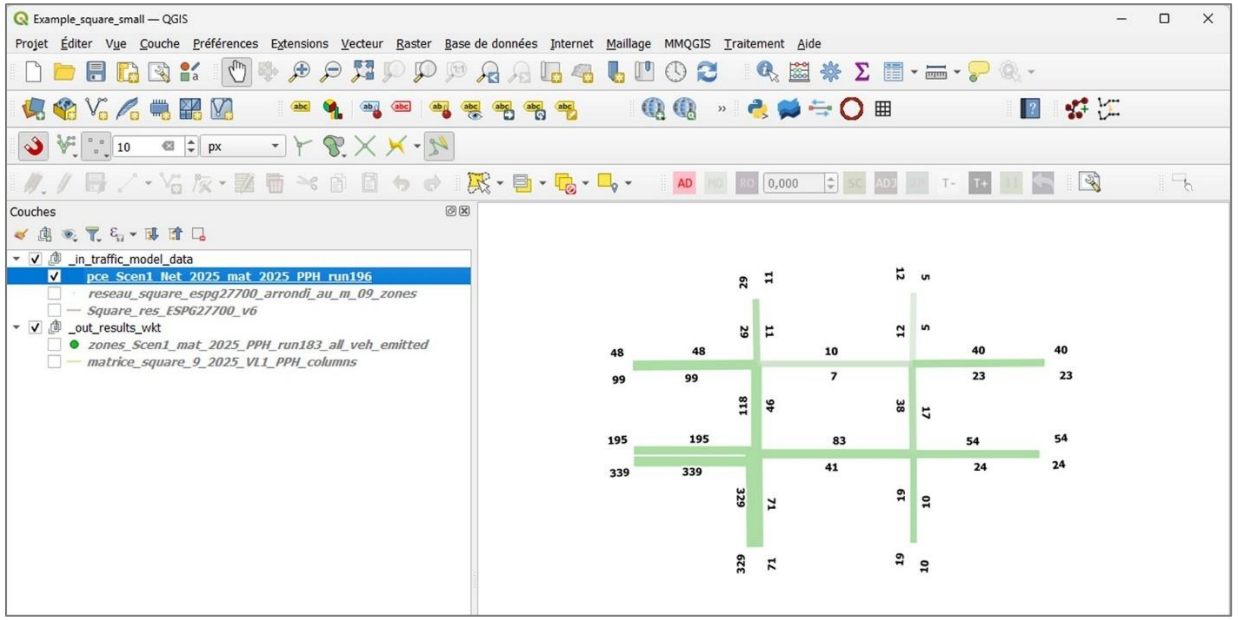
Right-click on an existed layer of the same type > Styles > copy

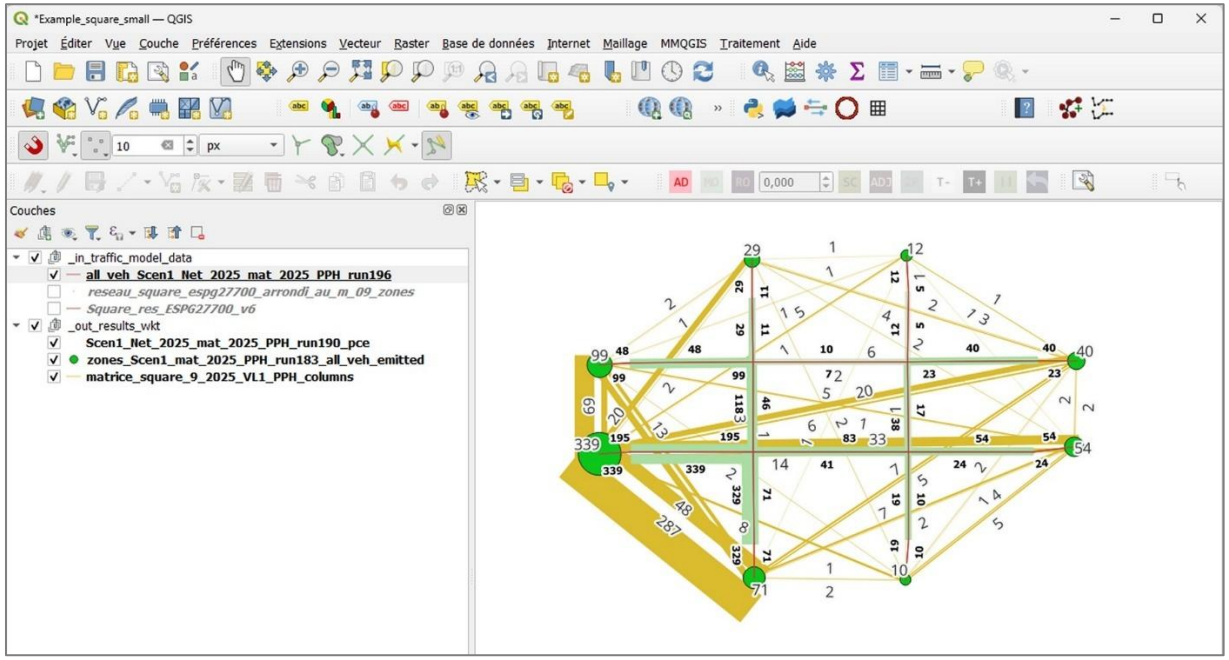
Then Styles > Paste on the new layer



…

Right-click on your newly imported layer, then choose « styles > Paste »

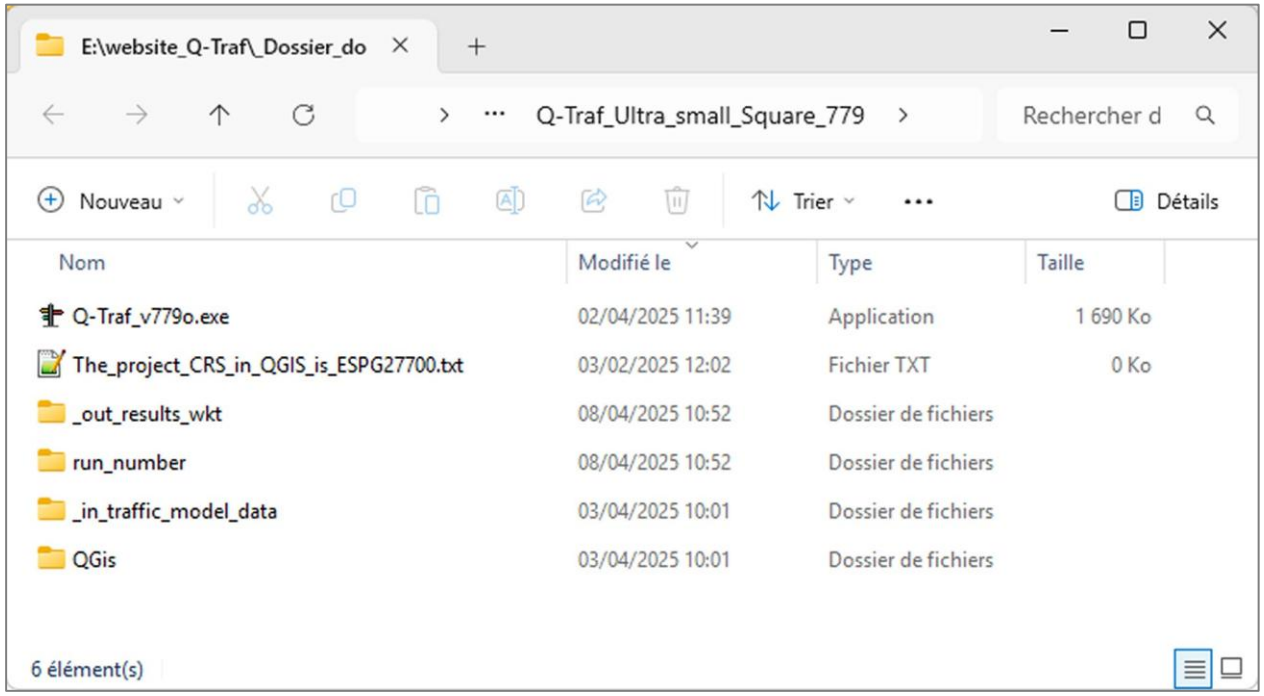




How to export / create a WKT csv files in QGis (links file, nodes file) (*to do*)

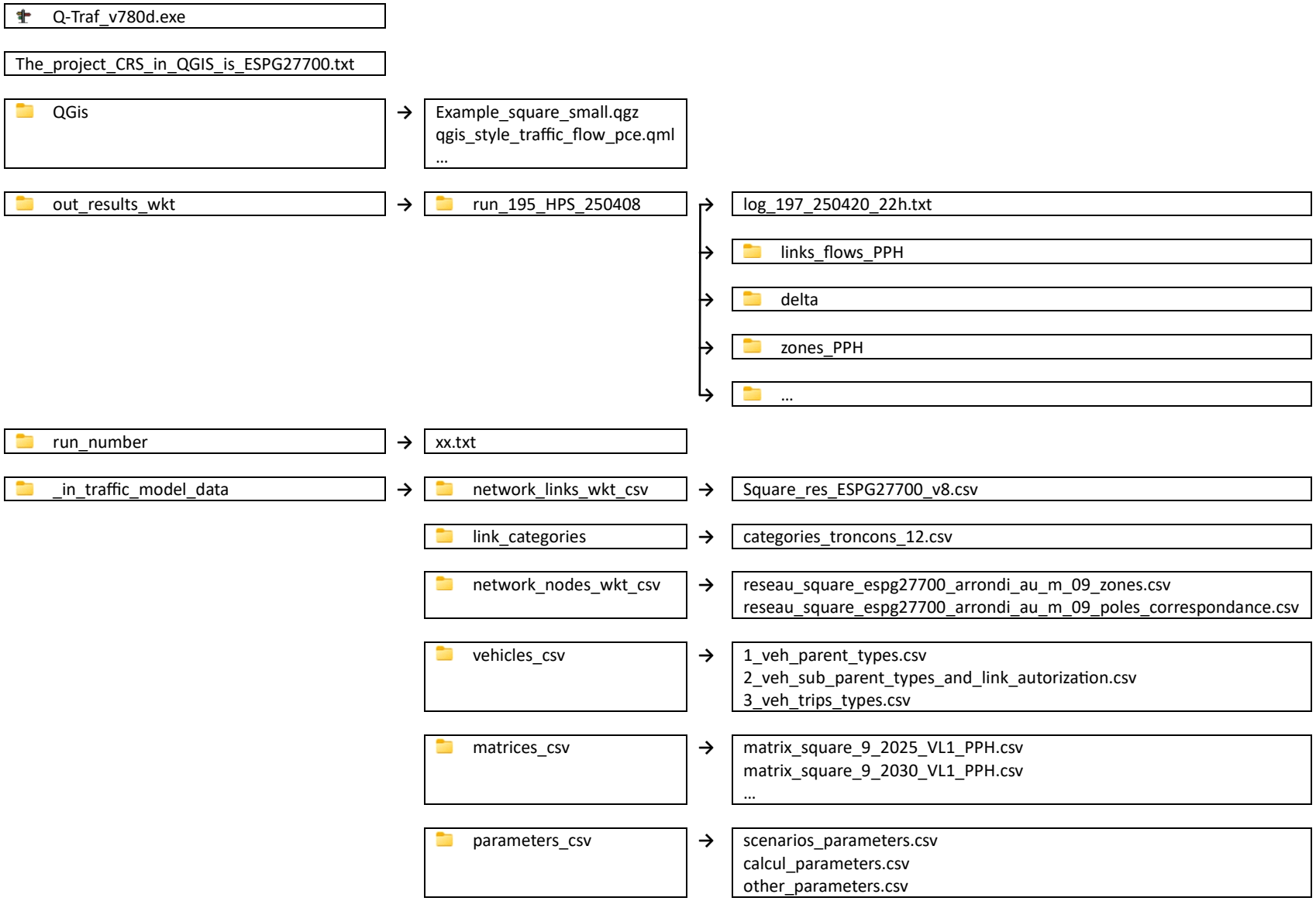
4. FOLDERS AND FILES

The folders tree structure



⇨ *You must **NOT** change the names :*

- « in_traffic_model_data »
- « out_results_wkt »
- « run_number »


Q-Traf_v780d.exe
The_project_CRS_in_QGIS_is_ESPG27700.txt
QGis
Example_square_small.qgz
qgis_style_traffic_flow_pce.qml
...
out_results_wkt
run_195_HPS_250408
log_197_250420_22h.txt
links_flows_PPH
delta
zones_PPH
...
run_number
xx.txt
_in_traffic_model_data
network_links_wkt_csv
Square_res_ESPG27700_v8.csv
link_categories
categories_troncons_12.csv
network_nodes_wkt_csv
reseau_square_espg27700_arrondi_au_m_09_zones.csv
reseau_square_espg27700_arrondi_au_m_09_poles_correspondance.csv
vehicles_csv
1_veh_parent_types.csv
2_veh_sub_parent_types_and_link_autorization.csv
3_veh_trips_types.csv
matrices_csv
matrix_square_9_2025_VL1_PPH.csv
matrix_square_9_2030_VL1_PPH.csv
...
parameters_csv
scenarios_parameters.csv
calcul_parameters.csv
other_parameters.csv

After all the data is completed, double-click on the program « Q-Traf_v….exe ». After a few seconds a sub-folder result « xxxx » is created in the folder « _out_results_wkt ».
The files in this sub-folder result are :

- WKT csv files, which can be import in a GIS
- Txt files

The result files

Files type

The files « result » are :

- Wkt csv for most of the files
- *.csv for the general results
- *.txt for the log file

All the *.csv files can be :

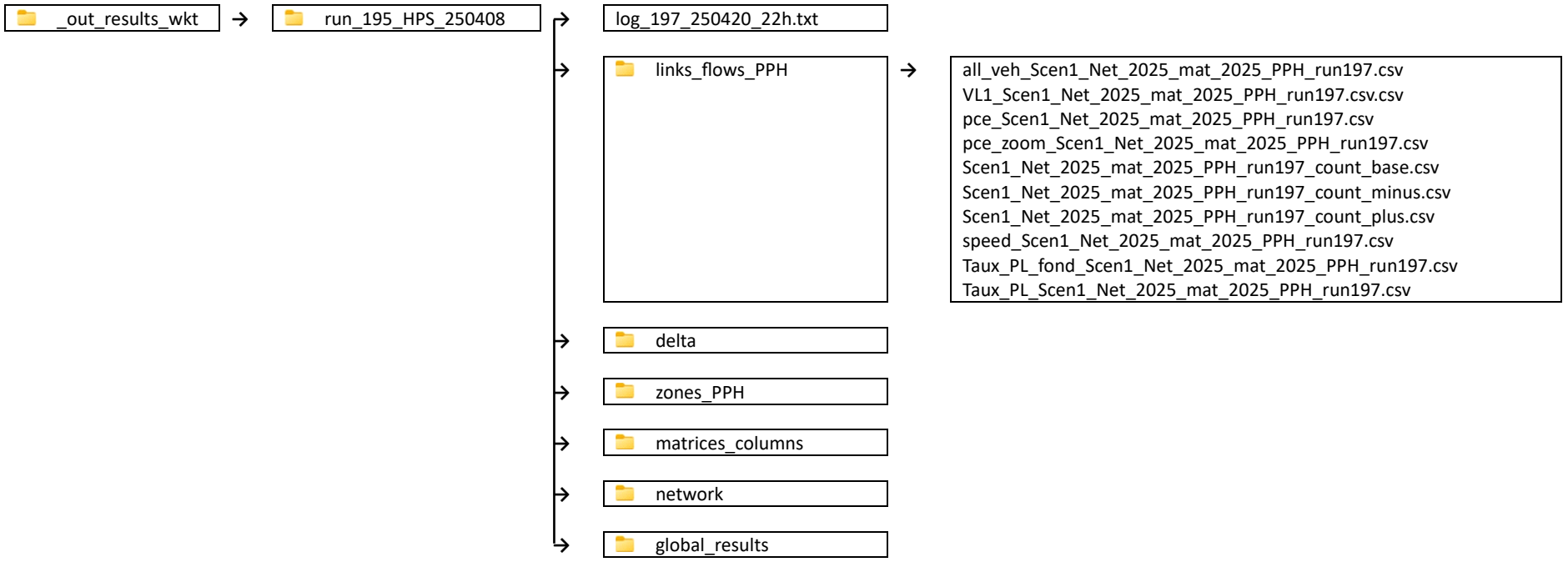
- directly imported in QGis (see « How to open the csv files in QGis ») without modification (except for the « Global results »). They are all in the format WKT (Well Known Text)

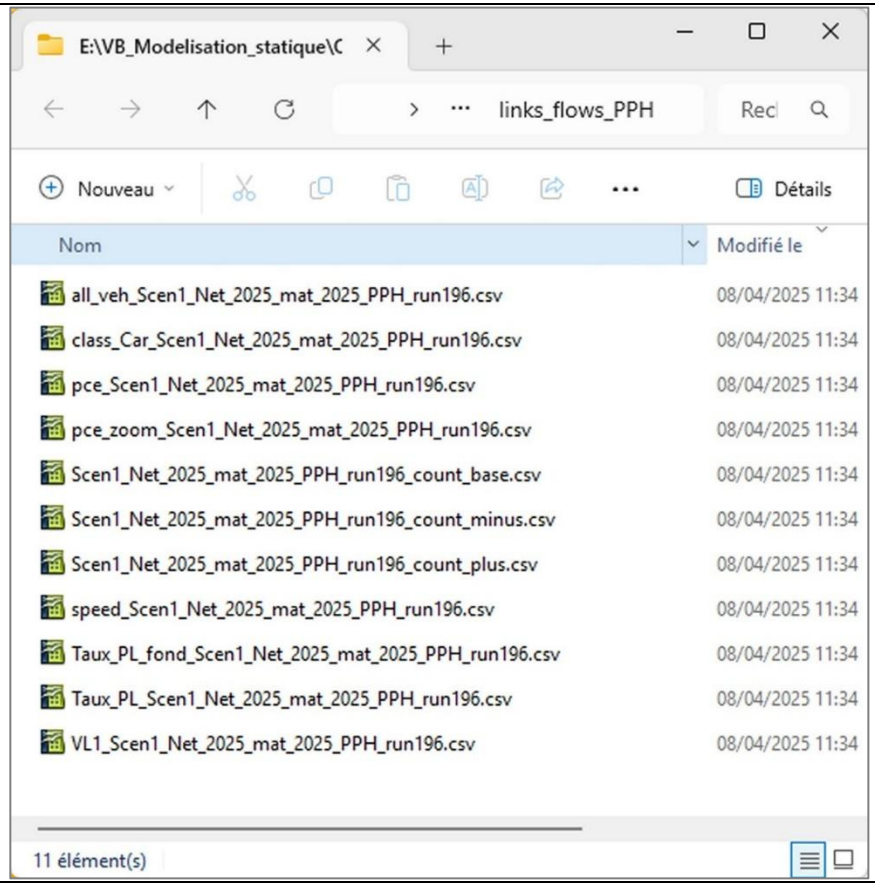
or

- opened with a spreadsheet Software (Excel, LibreOffice, OpenOffice)

Location of the files

The result files of the calculations are in the folder « _out_results_wkt » :



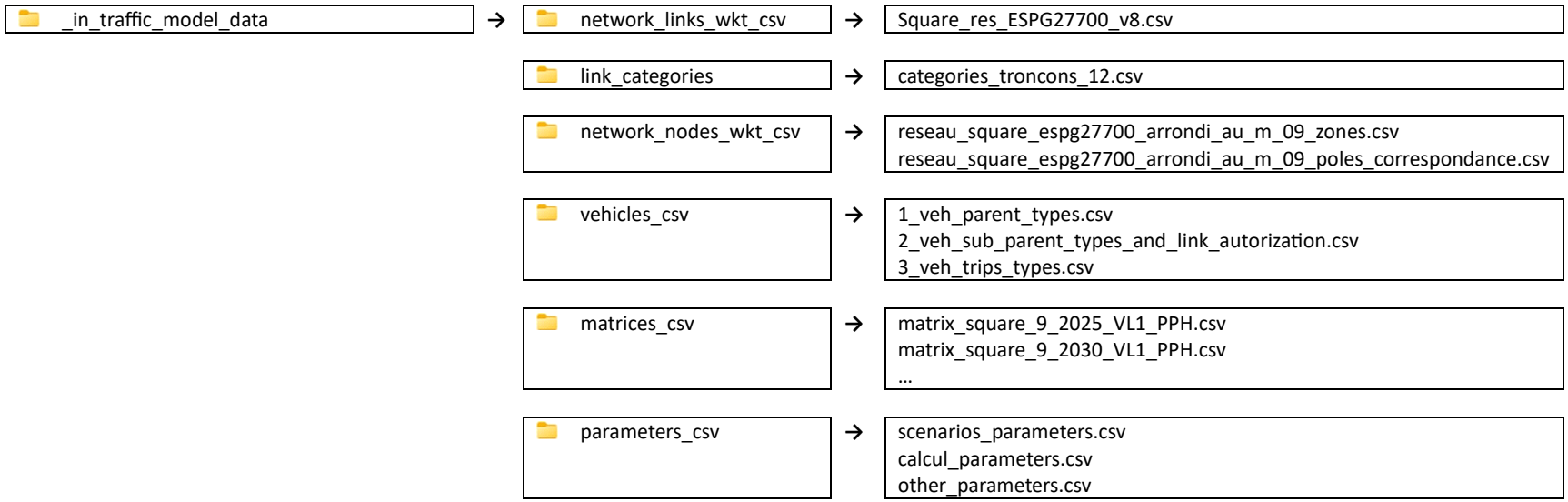

E:\VB_Modelisation_statique\C
links_flows_PPH
Rec
Nouveau
Détails
Nom
Modifié le
all_veh_Scen1_Net_2025_mat_2025_PPH_run196.csv 08/04/2025 11:34
class_Car_Scen1_Net_2025_mat_2025_PPH_run196.csv 08/04/2025 11:34
pce_Scen1_Net_2025_mat_2025_PPH_run196.csv 08/04/2025 11:34
pce_zoom_Scen1_Net_2025_mat_2025_PPH_run196.csv 08/04/2025 11:34
Scen1_Net_2025_mat_2025_PPH_run196_count_base.csv 08/04/2025 11:34
Scen1_Net_2025_mat_2025_PPH_run196_count_minus.csv 08/04/2025 11:34
Scen1_Net_2025_mat_2025_PPH_run196_count_plus.csv 08/04/2025 11:34
speed_Scen1_Net_2025_mat_2025_PPH_run196.csv 08/04/2025 11:34
Taux_PL_fond_Scen1_Net_2025_mat_2025_PPH_run196.csv 08/04/2025 11:34
Taux_PL_Scen1_Net_2025_mat_2025_PPH_run196.csv 08/04/2025 11:34
VL1_Scen1_Net_2025_mat_2025_PPH_run196.csv 08/04/2025 11:34
11 élément(s)

The input data files (to correct – to put after)

How to manipulate the input data files – Excel, the « .csv » format, the wkt csv files …

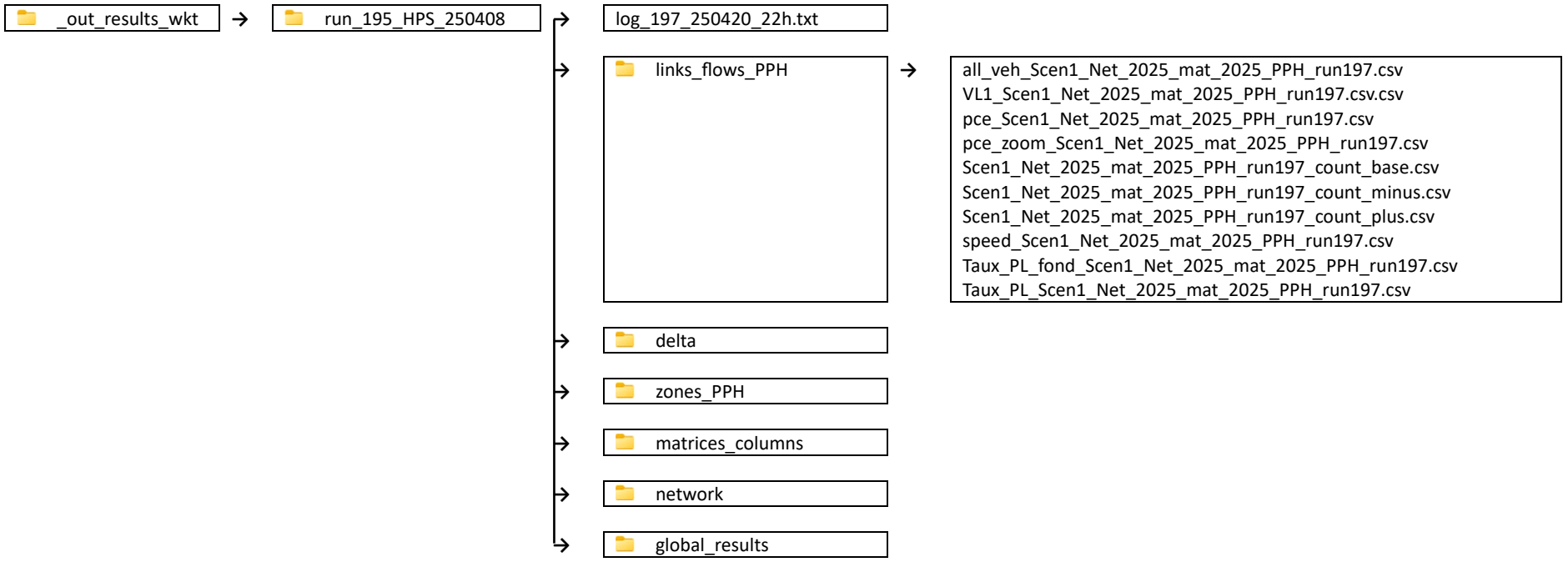
How to modify your input data

The Input data folder tree structure



⇨ *You must **NOT** change the names of these folders.*

The Results folder tree structure



5. THE INPUT PARAMETERS – LIST AND LOCATION

The 3 folders « vehicles_csv »

File : 1_veh_parent_types

Line	Number	Vehicle_type name EN	Fr
2	1	Car	*VL*
3	2	Truck	*PL*
4	3	Bus	*TC*
5	4	Pedestrian	*MaP*

⇨ You can call the « vehicles types » with the name of your choice. These names will only appear in the names of the results files.

File : 2_veh_sub_parent_types_and_link_autorization

Line	**Id - Authorization type**	**Name**	Parent_type - Id	Parent_type - Name	VEH	PCE
2	**1**	**VL1**	1	car	1	1
3			1			
4			1			
5						
6	**2**	**PL1**	2	truck	1	2
…						
		TC1	3	bus		
		MaP1	4	pedestrian		

⇨ You can only use the 1 .. 9 numbers (the number of sub_types is then limited to 9)

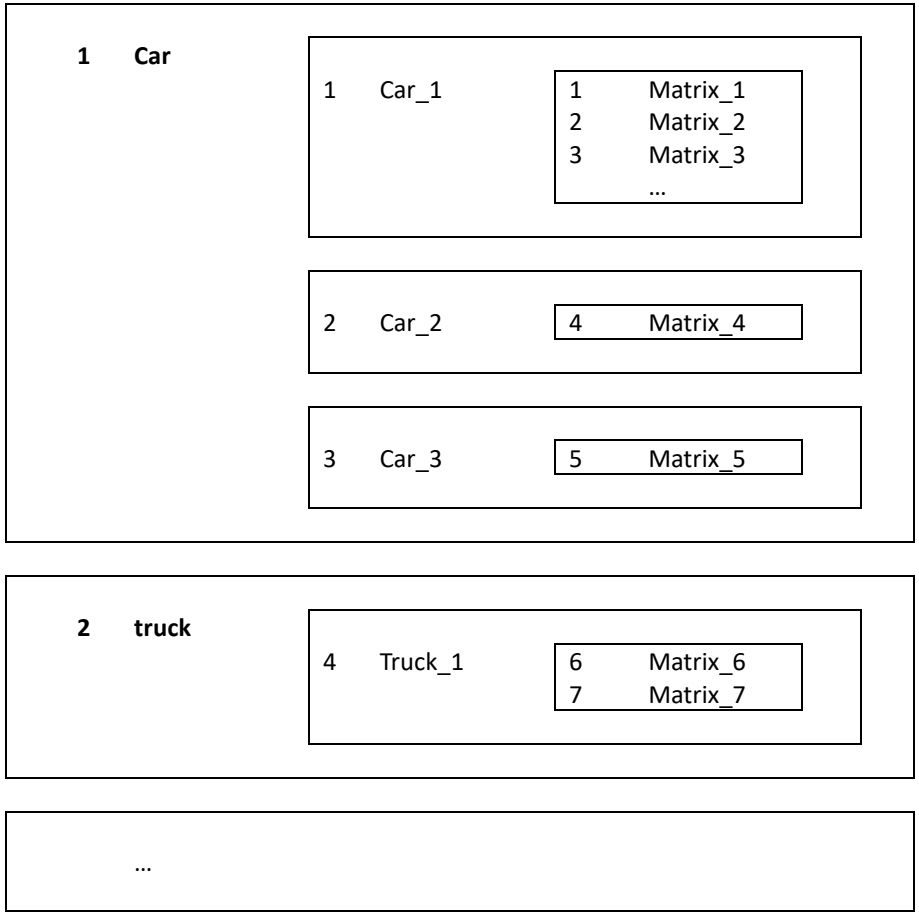
⇨ You can call the « sub vehicles types » with the name of your choice. These names will only appear in the names of the results files.

File : 3_veh_trips_types

Line	Id	matrix_name_suffix	matrix_%	Vehicle_sub_parent_type & Link_Authorization	Bimodal - 2d sub_parent_type & Link_Authorization	Pax	Matrice a caler
2	1	Matrix_1	100	1		1,2	1
3	2	Matrixe_2		2			
4	3	…					
5	4						
…	5						
	6						
	7						
	8						

⇨ You can call the matrixes with the name of your choice. These names will only appear in the names of the results files.

The « logic » behind the 3 folders « vehicles »



As we can see, it’s pretty straightforward. We can define several matrixes for each sub-category of vehicles, and several sub-categories of vehicles for each category of vehicles.

In this example, the « matrix_1 » contains trips of « car_1 » of category « car ». For each network, these trips :

- can only be done on the links authorized to « 1 » (Id of « car_1 »)
- will be aggregated in the traffic flow results as « car_1 » (as for the matrix_2 and matrix_3)
- will be aggregated in the traffic flow results as « car » (for instance with a « personal car unit » of 1, as « car_2 » and « car_3 »)

So, basically, these 3 data sets could have been define in one single file.
But there is a trick.

Par&Ride

The file « network_links_wkt_csv »

File : The name of the file is specified in the file scenarios_parameters

Line	WKT	Row_qgis	Nœud_A	Nœud_B	Longueur	category	PEN_VLx100	…
2	MULTILINESTRING ((213050 894146,213173 894146))	1			122	31		
3	MULTILINESTRING ((213050 894234,213050 894146))	2			88	31		
…	…							
	MULTILINESTRING ((213050 894234,213177 894235))	11			127	31		

Column	FIELD	TYPE	remark	Example
			In QGis, the names of the fields can only contain 8 characters (or less) *All the name longer are truncated.* *Hence the « network number 1 » must be renamed « Netwo_1 »* *The name of the fields are not important : The order of the fields must NOT be changed.*	
1	WKT	String / text	Necessary for QGis You must not rename this field	See above
2	Row_qgis	integer	Necessary	1
3	Nœud_A	Integer	Deprecated	
4	Nœud_B	Integer	Deprecated	
5	Longueur	Integer	Necessary (in meter)	237
6	category	Integer	Necessary Id links category	12
7	PEN_VLx100	Integer	empty or an integer Empty or 100 : No penalty 200 : Generalized cost x 2 50 : Generalized cost / 2	
8	PEN_PLx100	Integer	empty or an integer	
9	PEN_Tcx100	Integer	empty or an integer	
10	avec_arbo	Integer	empty or 1	

11	TV_HPM	Integer	empty or an integer	
12	perso1	Integer	empty or an integer	
13	TV_HPS	Integer	empty or an integer	
14	perso2	Integer	empty or an integer	
15	TV_JO	Integer	empty or an integer	
16	perso3	Integer	empty or an integer	
17	Netwo_1	Integer	List of authorized vehicles (cf « 2_veh_....csv » file) for each link of the network_1 Empty if the link is barred	12
18	Netwo_2	Integer	List of authorized vehicles (cf « 2_veh_....csv » file) for each link of the network_2 Empty if the link is barred	
…	…	…		
	RE_DELTA	integer	empty - deprecated	

⇨ The first column « WKT » is automatically calculated by QGis
⇨ The other columns must be completed by the user (with a spreadsheet Software (Excel, LibreOffice, OpenOffice) or with QGis)

The file « link_categories_csv » (to do)

The file « network_zones_wkt_csv »

⇨ The name of the nodes file to use is specified in the file « scenarios_parameters.csv »

Line	**WKT**	**Num**	**Name**	**X**	**Y**	**field_5_1**	**field_6_1**	**type**	**field_9**	**Netwo_1**	**Netwo _2**	**Netwo _3**
2	POINT (212898.195447096 894334.517873702)	1				zone	prio	1		1	1	1
3	POINT (212749.334210669 894144.399215944)	2				zone	prio	1		1	1	1
4	POINT (213213.758967013 894151.647141312)	3				zone	prio	1		1	1	1
…	POINT (212749.334210669 894231.931853094)	4				zone	prio	1		1	1	1
	POINT (213048.729281685 894021.184484669)	5				zone	prio	1		1	1	1
	POINT (212900.9831107 894023.414615552)	6				zone	prio	1		1	1	1
	POINT (213215.989097896 894235.277049418)	7				zone	prio	1		1	1	1
	…	…				…	…	…		…	…	

The file « network_poles_correspondances_wkt_csv » (or P&R) (to do)

⇨ The name of the « P+R » file to use is specified in the file « scenarios_parameters.csv »

WKT	id	name
POINT (445000 216000)	1	

The files « matrices_csv »

⇨ The name of the matrices must be : **« suffix » & « name of the matrix » & « name of the vehicles » & « period of analysis » & « .csv »**

- « suffix » is defined in the file « scenarios_parameters.csv »
- « name of the matrix » is defined in the file « scenarios_parameters.csv »
- « name of the vehicles » is the name defined in the file « 3_veh_....csv »
- « period of analysis » (hour or day) is the name defined in the file « scenarios_parameters.csv »

column	*2*	*3*	*4*	*4*								
Line												
2				**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	
3												
4	**1**	**1**		0	20	0	2	0	3	4	0	
5	**2**	**2**		2	0	14	21	8	287	6	1	
6	**3**	**3**		2	33	0	5	4	7	2	1	
	4	**4**		1	69	1	0	2	23	2	1	
	5	**5**		2	0	5	0	0	1	1	1	
	6	**6**		1	48	2	13	2	0	5	0	
	7	**7**		2	20	2	6	2	7	0	1	
	8	**8**		1	5	0	1	1	1	3	0	

Line 2 : Id zones Destination
Column 2 : Id zones Origine
As defined in the file « network_node.csv »

The file « calcul_parameters.csv »

All numbers are integer.

Line	Parameters		
2		Square	
3	nombre_d_iterations	5	1 for 1 iteration (quick) 2 for 4 iterations 3 for 18 iterations 4 for 3 steps and 6 iterations See « Method of assignment - Iterations »
4			
5	taille_supp_de_fichier_matrice	300	Important Do not change
6			
7			
8			
9	block_de_flux_OD_min_a_affecter	0,1	Smallest part of each OD trip to be assigned in each iteration (the biggest quicker is the program, the smallest more accurate is the assignment)
10	tps_en_s_de_parcours_min_d_un_troncon_a_vide	2	Do not change
11	longueur_max_chemin_1	200	Maximum number of links of a path between OD. Do not change but in case or a very large network and if a message indicates this number is reached
12			
13	nbre_max_troncons	1500	Max number of links in the network. Of course, this number must be superior to the actual number of links of the network. A smaller number can speed up the program.
14	nbre_max_de_noeuds		Max number of ends of link in the network. Of course, this number must be superior to the actual number of ends of link of the network. A smaller number can speed up the program.
15	num_id_noeud_max_limite	81000	Id max of ends of link
16			
17	nbre_max_category	80	Max number of link categories Do not change (or increase it if necessary)
18	Nbre_d_iterations_max	75	Do not change
19	cout_gen_trajet_max	99999999	Do not change Max generalized cost of trips

20	10 x tolerance_cout_gen_parcours_troncon	1	Do not change Precision of the generalized cost of trips (0.1)
21	cout_gener_troncon_max_par_defaut	99999999	Do not change Max generalized cost of links
22			
23			
24			
25	Coeff_tps_pour_cout_generalise_trajet	25	Time coefficient in the generalized cost of link : Length (in meter) * 25 travel time (in second)
26			
27	numero_max_categories	120	Id max of link categories Do not change (or increase it if necessary)
28	distance_min_entre_2_noeuds	5	Minimum distance (in meter) between ends of link. The program checks if there are ends of link nearer than that, and pops up a message (without stopping the program). The reason is sometimes 2 links seems graphically connected, but, when zoomed, are not, hence interrupting paths. It is advised to always draw separated ends of link more than 5 meters apart
29			
30			
31	ENTREES		
32			
33	cout_correspondance_entre_VP_et_TC_en_MaP_2sens_indifferencie	10000	Fixed generalized cost of a change « car <-> Bus » in a Park and Ride

The file « other_parameters.csv »

All numbers are integer.

Line	**Parametres**	**Jeux_de_scenario_a_executer**	
2		Square	
3			
4	y_inverses	2	Deprecated
5			
6	decalage_origine_x_en_metre	400	Deprecated
7	decalage_origine_y_en_metre	400	Deprecated
8	marge_des_graphes_en_metre	200	Deprecated
9			
10			
11			
12	noeud_isochrone	192	Deprecated
13	seuil_min_tracage_ligne_desir	8	Deprecated
14			
15			
16	num_colonne_du_premier_reseau_dans_fichier_reseau	17	Do not change Number of the first column of the first network in the file « network_links_wkt_csv »
17	num_colonne_du_premier_reseau_dans_fichier_zone	10	Do not change Number of the first column of the first network in the file « network_zones_wkt_csv »
18			
19	coeff_largeur_trait_x	60	Deprecated
20	taille_texte_numero_noeud	18	Deprecated
21	coeff_largeur_trait_flux	4	Deprecated
22	coeff_taille_noeud	5	Deprecated
23			
24			
25			
26			

27			
28	**Pour affichage des deltas**		
29	seuil_affichage_des_variations_en_pc	4	% under which values of links are not drawn (for the difference between scenarios)
30	seuil_affichage_des_variations_en_debit_min	200	Minimal traffic flow value drawn (for the difference between scenarios)

The file « scenarios_parameters.csv »

(***see the examples after the table***)
All numbers are integer.

This file has 2 parts. The first part is :

Line	**Parametres**	**Jeux_de_scenario_a_executer**		**Explications**
2		Square		
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				
15				
16				
17				
18				
19				
20				
21				
22				
23	Avec_calage	0		0 (or 1) Do not change See “calage”
24				
25	creer_les_fichiers_arbo_0_1_2	0	0 (aucun), 1 ou 2 (tous)	Arborescences 0 none – 1 Only specified – 2 All (only for small to medium networks; it takes a lot of space)

				Be cautious
26				
27	creer_les_fichiers_svg	0	0 ou 1	Deprecated
28				
29				
30	Time period / periode_jour_as_byte (prefixe nom mat 4)	2	1	The ID of the time period of the assignment
31	1	APH	hpm	Do not change the number of the first column; only the name of the 2d column if necessary AM Peak Hour
32	2	PPH	hps	PM Peak Hour
33	3	AADT	JO	Week day
34	4	AAWT	JA	All day
35		*ATTENTION sert au nom d entree et de sortie et pour les comptages*		
36				
37				
38				
39	file_name_13	categories_troncons_12		The name of the file « link_categories_csv
40	file_name_110	Square_res_ESPG27700_v6		The name of the file « network_links_wkt_csv »
41		reseau_square_espg27700_arrondi_au_m_09_zones		The name of the file « network_zones_wkt_csv »
42		reseau_square_espg27700_arrondi_au_m_09_poles_correspondance		The name of the file « network_poles_correspondances_wkt_csv »

The second part of the file is :

Line	SCENARIOS				
45					
46	Scenario ID		Base comparaison	Network Id	Matrix Id
47	1	1	1	1	1
48	2	1		2	2
49	3				
50	4				

51	5				
52	6				
53	7				
54	8				
55	9				
56	10				
57	11				
58	12				
59	13				
60	14				
61	15				
62	16				
63	17				
64	18				
65	19				
66	20				
67	21				
68	22				
69	23				
70	24				
71	25				
72	26				
73	27				
74	28				
75	29				
76	30				
77	31				
78	32				
79	33				
80	34				
81	35				
82	36				
83	37				
84	38				
85	39				
86	40				

87	41				
88					
89	**NETWORK**				
90					
91					
92					
93					
94	Network ID	Network name			
95	1	Net_2025			Name of the network
96	2	Net_2027			Name of the network
97	3	Net_2035			…
98	4	Net_2025_road_works			
99	5	Net_2035_bridge			
100	6	…			
101	7				
102	8				
103	9				
104	10				
105	11				
106	12				
107	13				
108	14				
109	15				
110	16				
111	17				
112	18				
113	19				
114	20				
115	21				
116	22				
117	23				
118	24				
119					

120	**MATRICES**	
121		
122		
123		
124	Matrix name Part 1 (for all matrices)	matrix_square_9_
125		
126	Matrix Id	Matrix Name Part 2
127	1	2025
128	2	2027
129	3	
130	4	
131	5	
132	6	
133	7	
134	8	
135	9	
136	10	
137	11	
138	12	
139	13	
140	14	
141	15	
142	16	
143	17	
144	18	
145	19	
146	20	
147	21	
148	22	
149	23	
150	24	
151	25	
152	26	
153	27	

154	28	
155	29	
156	30	
157	31	
158	32	
159	33	
160	34	
161	35	
162	36	
163	37	
164	38	
165	39	
166	40	
167	41	

Examples

For instance:
If you have 2 networks “Net_2025” and “Net_2027”

- You specify their name lines 95 and 96
- You specify the corresponding matrices lines 127 and 128
- You create the 2 scenarios lines 47 and 48

The program will create the 2 sets of assignment, for 2025 and 2027.

Warning

With the data of the table above, the matrices files have to be called :

matrix_square_9_2025_car1_pph.csv
matrix_square_9_2025_truck1_pph.csv

matrix_square_9_2027_car1_pph.csv
matrix_square_9_2027_truck1_pph.csv

The names of the matrices are built like this:

{matrix_square_9_} + {2027} + “_” + {car1} + “_” + {pph}.csv

Or

{Prefix of the matrix name in the file “Scenarios_parameters”} + {Name of the matrix in the file “Scenarios_parameters”} + “_” + {name of the matrix in the file “3_veh_trips_types”} + “_” + {Name of the Time period}.csv

6. How to create a network – With QGIS

How to modify a network (with QGIS)

How to save your modified « network.shp » file to the « network.csv » file

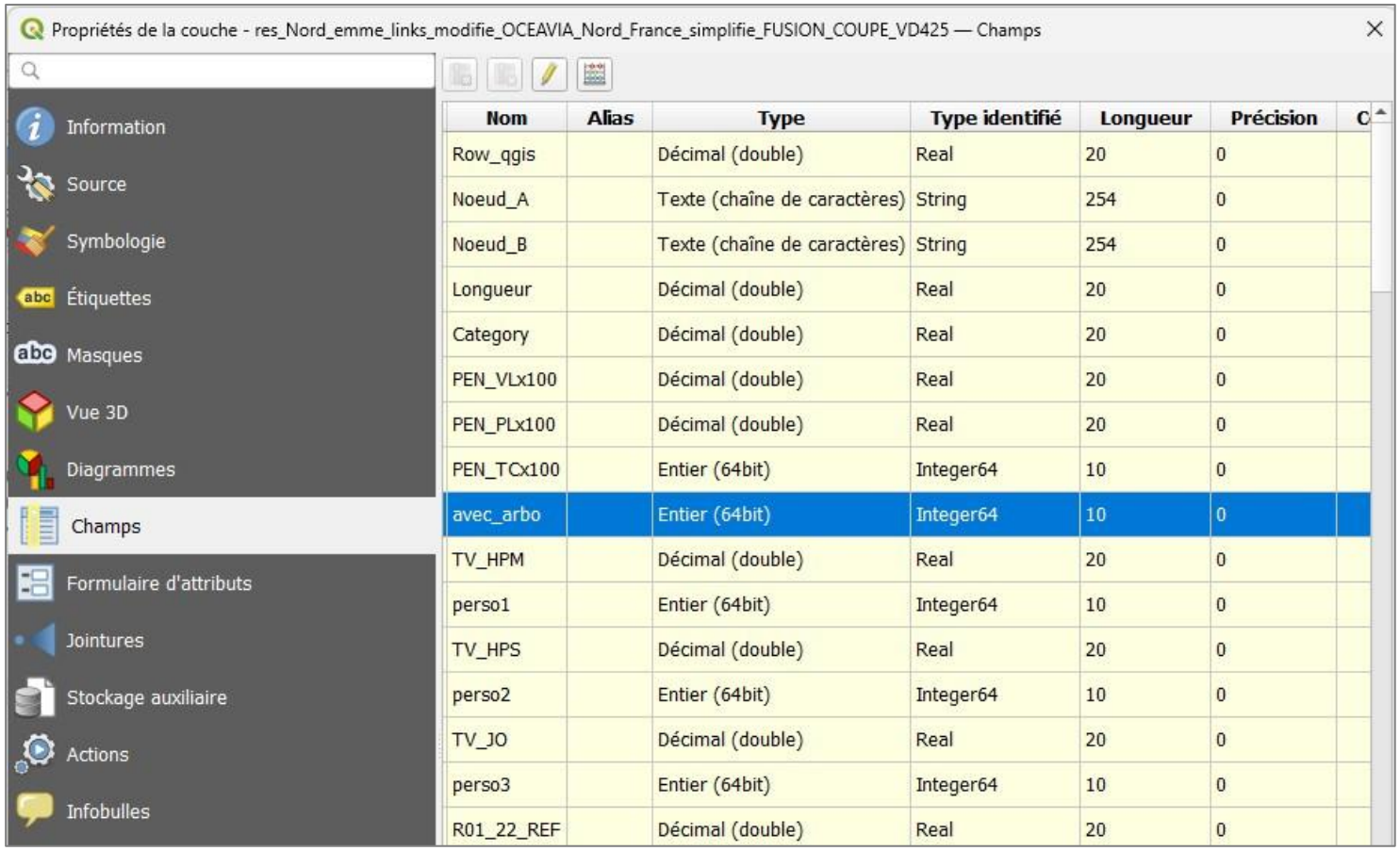
Once you have modified your network with QGIS (as a *.shp file), you need to export it as a *.csv file, which will be directly used by Q-Traf.

« network.shp »		« network.csv »

You need to do the 3 following steps :

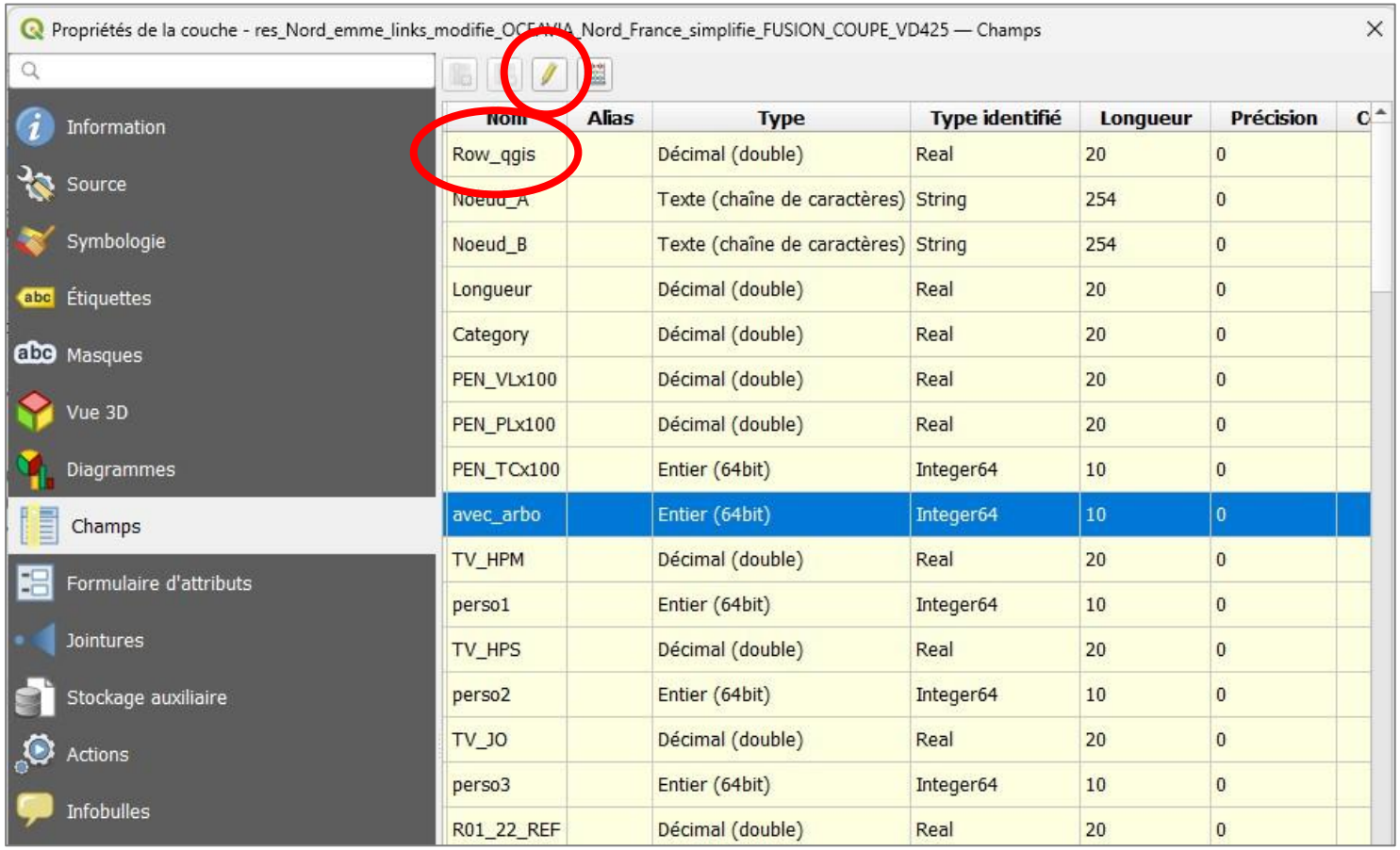
1. Recalculate the field « Row » (every time as a precaution, but theoretically only necessary in case of new links added)
   (round the coordinates)
2. Recalculate the field « length »
3. Export the file in « csv » format, with specific format

Select the network layer, then select « Layer properties », then « Fields » :



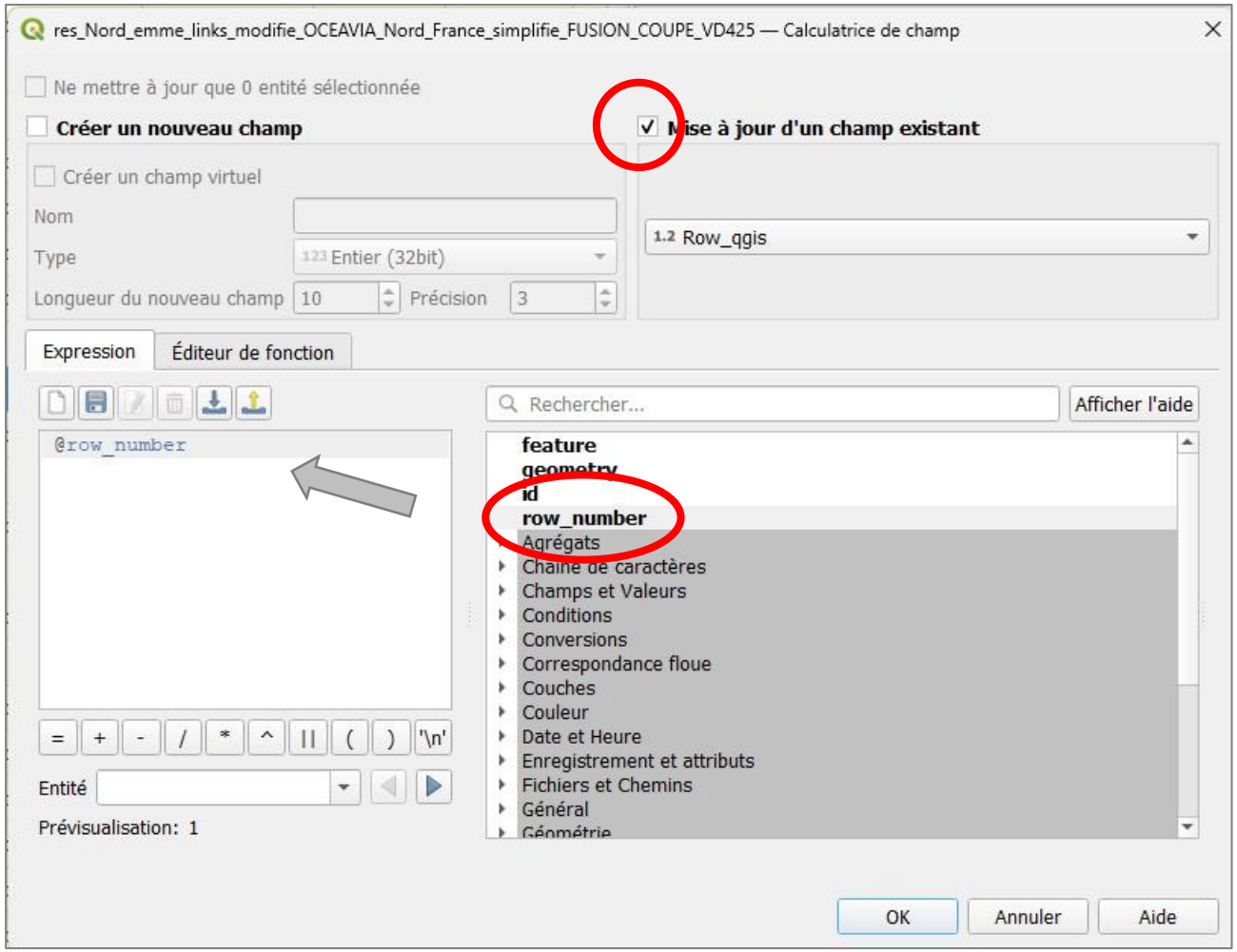
Nom	Alias	Type	Type identifié	Longueur	Précision	C
Row_qgis		Décimal (double)	Real	20	0	
Noeud_A		Texte (chaîne de caractères)	String	254	0	
Noeud_B		Texte (chaîne de caractères)	String	254	0	
Longueur		Décimal (double)	Real	20	0	
Category		Décimal (double)	Real	20	0	
PEN_VLx100		Décimal (double)	Real	20	0	
PEN_PLx100		Décimal (double)	Real	20	0	
PEN_TCx100		Entier (64bit)	Integer64	10	0	
avec_arbo		Entier (64bit)	Integer64	10	0	
TV_HPM		Décimal (double)	Real	20	0	
perso1		Entier (64bit)	Integer64	10	0	
TV_HPS		Décimal (double)	Real	20	0	
perso2		Entier (64bit)	Integer64	10	0	
TV_JO		Décimal (double)	Real	20	0	
perso3		Entier (64bit)	Integer64	10	0	
R01_22_REF		Décimal (double)	Real	20	0	

In « edit mode » (selected), select the field « Row_qgis » :

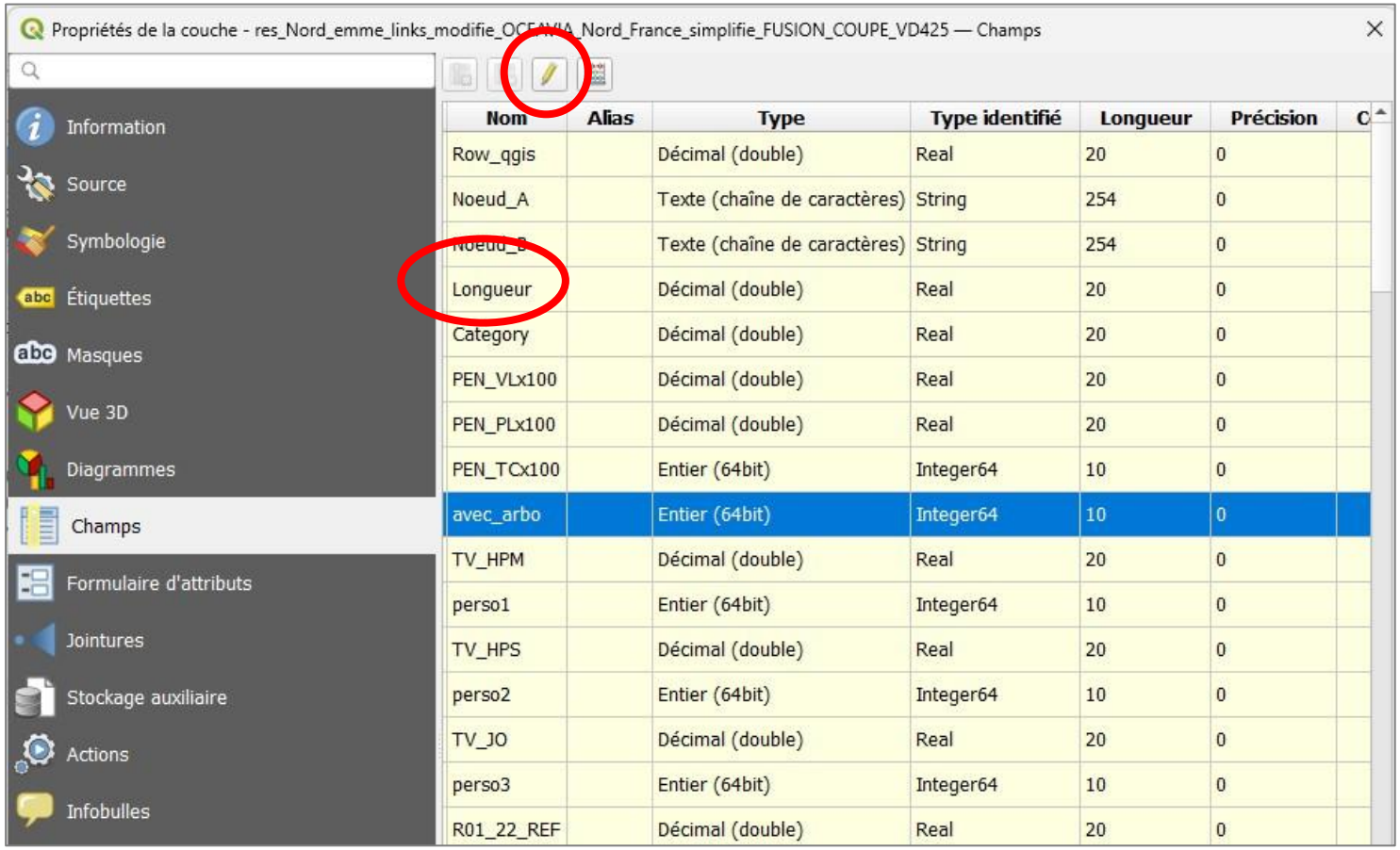


Nom	Alias	Type	Type identifié	Longueur	Précision	C
Row_qgis		Décimal (double)	Real	20	0	
Noeud_A		Texte (chaîne de caractères)	String	254	0	
Noeud_B		Texte (chaîne de caractères)	String	254	0	
Longueur		Décimal (double)	Real	20	0	
Category		Décimal (double)	Real	20	0	
PEN_VLx100		Décimal (double)	Real	20	0	
PEN_PLx100		Décimal (double)	Real	20	0	
PEN_TCx100		Entier (64bit)	Integer64	10	0	
avec_arbo		Entier (64bit)	Integer64	10	0	
TV_HPM		Décimal (double)	Real	20	0	
perso1		Entier (64bit)	Integer64	10	0	
TV_HPS		Décimal (double)	Real	20	0	
perso2		Entier (64bit)	Integer64	10	0	
TV_JO		Décimal (double)	Real	20	0	
perso3		Entier (64bit)	Integer64	10	0	
R01_22_REF		Décimal (double)	Real	20	0	

Activate « Update a field », then choose « row number » (by double-clicking), then click « OK » :

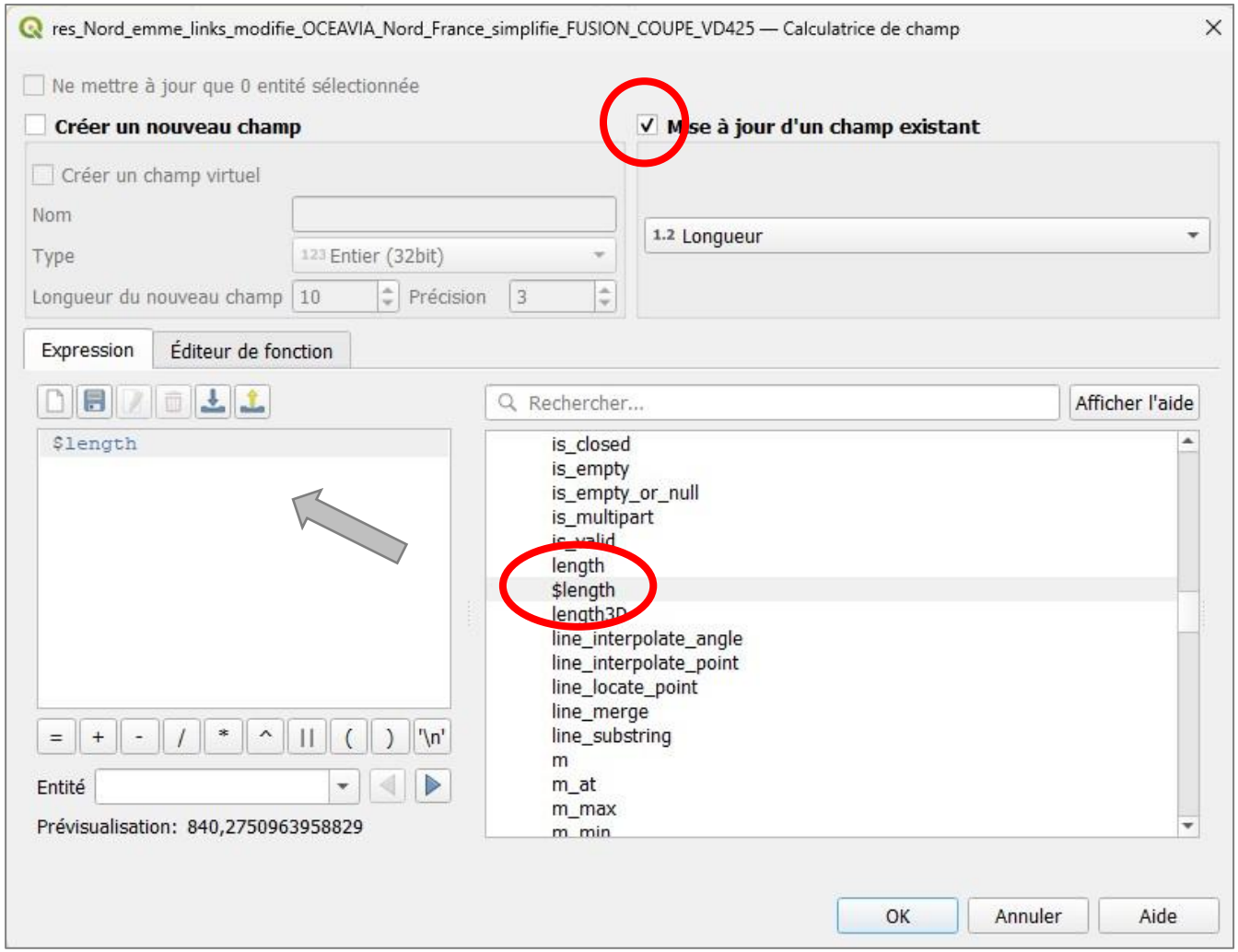


In « edit mode » ( ), select the field « Length » :

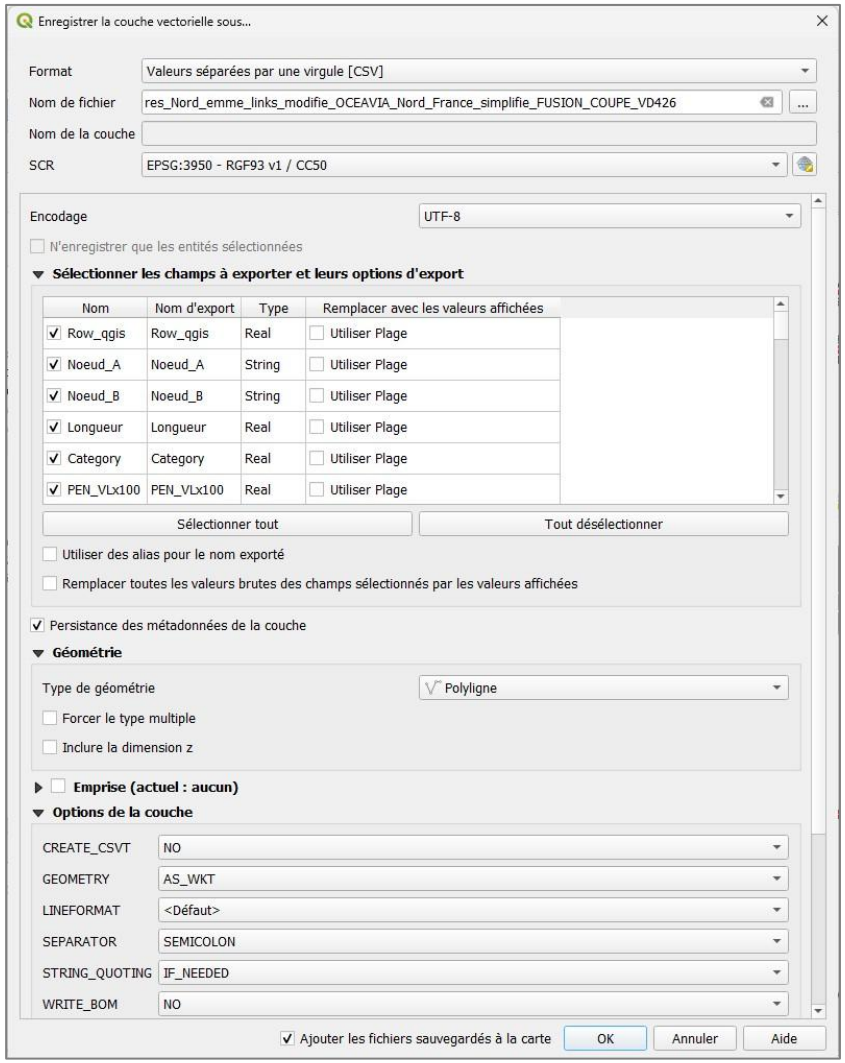


Nom	Alias	Type	Type identifié	Longueur	Précision	C
Row_qgis		Décimal (double)	Real	20	0	
Noeud_A		Texte (chaîne de caractères)	String	254	0	
Noeud_B		Texte (chaîne de caractères)	String	254	0	
Longueur		Décimal (double)	Real	20	0	
Category		Décimal (double)	Real	20	0	
PEN_VLx100		Décimal (double)	Real	20	0	
PEN_PLx100		Décimal (double)	Real	20	0	
PEN_TCx100		Entier (64bit)	Integer64	10	0	
avec_arbo		Entier (64bit)	Integer64	10	0	
TV_HPM		Décimal (double)	Real	20	0	
perso1		Entier (64bit)	Integer64	10	0	
TV_HPS		Décimal (double)	Real	20	0	
perso2		Entier (64bit)	Integer64	10	0	
TV_JO		Décimal (double)	Real	20	0	
perso3		Entier (64bit)	Integer64	10	0	
R01_22_REF		Décimal (double)	Real	20	0	

Activate « Update a field », then select « Geometry » then « $length » :



Select the network layer, then select « Export ». In the window :



Choose « CSV »
Rename your file

Choose « Polyline » or « multiline »

VERY IMPORTANT : Choose « AS_WKT » (the first column will contains the coordinates of the links)

VERY IMPORTANT : Choose « semicolon » (since developped in french, QTraf, for now, use semicolon instead of comma (😉)
Choose « If needed », otherwise QGis adds a lots of ‘ ” ‘

7. THE METHOD OF TRAFFIC ASSIGNMENT - AN INCREMENTAL ASSIGNMENT IN 1 OR 3 STEPS

Incremental assignment is a process in which fractions of traffic volumes are assigned by steps.
In each step, the program :

1. Identify the shortest paths for each OD (based on the generalized costs)
2. Assigns a % of each trips matrix on the shortest paths (only one path for each OD) (new link volumes)
3. Recalculate the generalized link costs (flow, travel time) of each link

Once all the steps are done, 100 % of each trips matrix are assigned.
The number of steps, and the % assigned in each step, are the following :

	Choice / Parameter « Assignment procedure »			
	1	**2**	**3**	**4**
Number of steps / iterations	**1 step**			**3 steps**
	1 iteration ("All-or-nothing" assignment)	4 iterations	18 iterations	*See next page*

	Step number				
% of trips matrix assigned	1	100 %	30 %	10 %	
	2		30 %	10 %	
	3		20 %	10 %	
	4		20 %	10 %	*See next page*
	5			10 %	
	6			10 %	
	7			10 %	
	8			5 %	
	9			5 %	
	10			5 %	
	11			5 %	
	12			2 %	
	13			2 %	
	14			2 %	
	15			2 %	
	16			1 %	

	17			1 %	
	18				

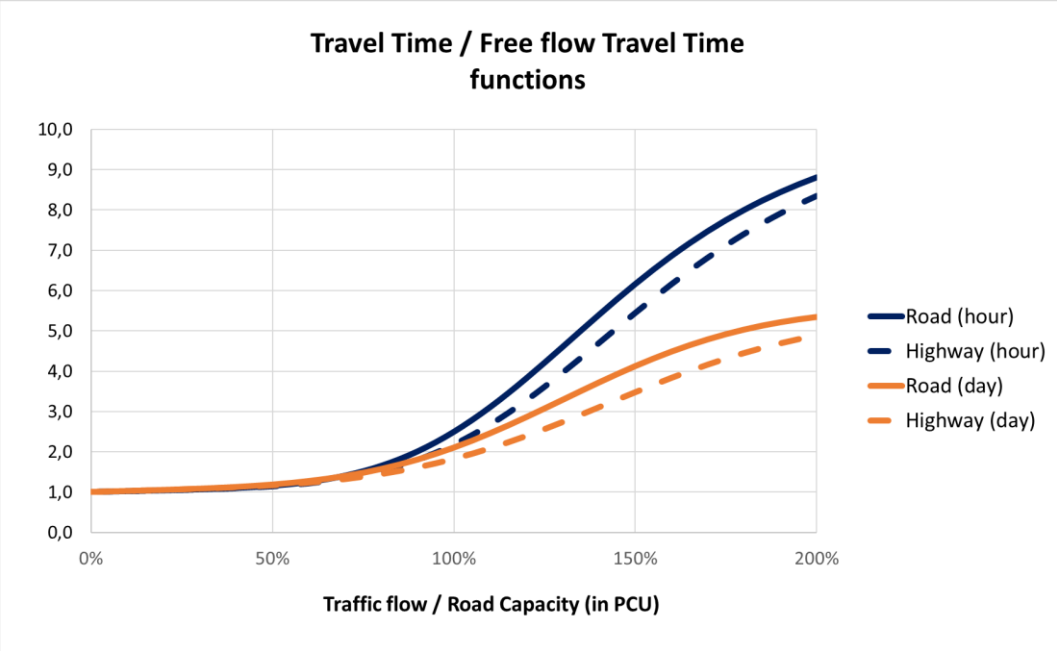
The drawback of this method is that the first steps are based on an empty (or almost empty) network (night traffic).

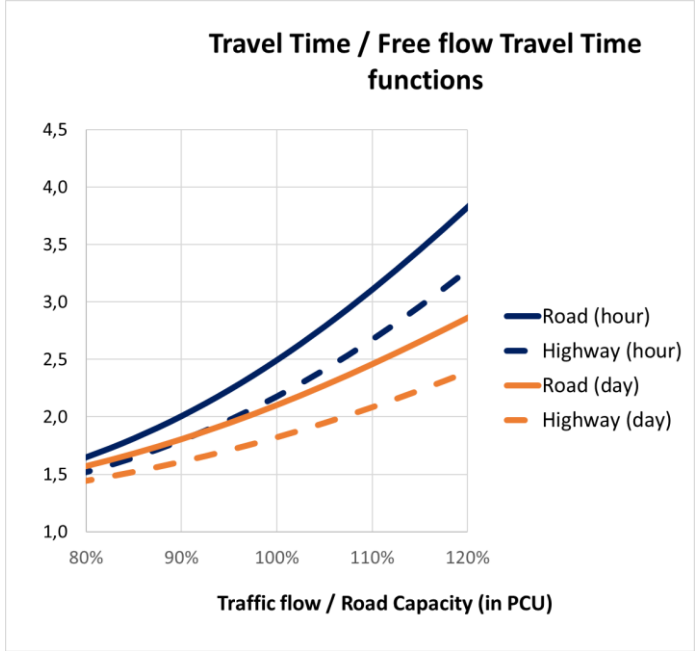
Although the result of this method is not the desired equilibrium, it is not far and perfectly justifiable in some conditions (the 20% / 40% of the first step(s) take the shortest path without traffic, which is more or less like without knowing what the shortest path really is).

This second method gives a better evaluation of the equilibrium, by replacing the first steps, based on an empty network, by new steps, based on an almost full network :

	Assignment procedure n°4 Step					
	1		**2**			**3**
1	20%	Based on a network with **0% of the trips**	⇨ *These 20% of trips and traffic flows are subtracted from the network*			
2	20 %	Based on a network with 20% of the trips				These 20% trips / traffic flows of the first step are subtracted from the network
3	20 %	Based on a network with 40% of the trips				
4	20 %	Based on a network with 60% of the trips				
5	10 %	Based on a network with 80% of the trips				
6	10 %	Based on a network with 90% of the trips				
		⇨ **100% of the traffic are assigned**				
			⇨ *The 20% of trips subtracted are then re-added*	5 %	Based on a network with **80% of the trips**	…
				5 %	Based on a network with 85% of the trips	
				5 %	Based on a network with 90% of the trips	
				5 %	⇨ **100% of the traffic are assigned**	

8. LINK TRAVEL TIME (FLOW RATE) FUNCTIONS





- ⇨ The increase of travel time is less important for highways; thus, in case of high traffic volume, highways attract relatively more traffic than other roads
- ⇨ The travel time for daily period is inferior to the travel time for hourly period. It is the consequence of the ponderation of low traffic (night) and heavy traffic (peak hours) in the average “Traffic Flow / Road Capacity” ratio (note that the daily capacity is also not 24xhourly capacity).