TransModeler Training
3-Turning Movement Count

presented to

Caltrans, District 1-Eureka

presented by

Shaghayegh (Rira) Shabanian, CS

CAMBRIDGE SYSTEMATICS

Think Forward

June 2018

Creating universal traffic data format (UTDF)

- Input:

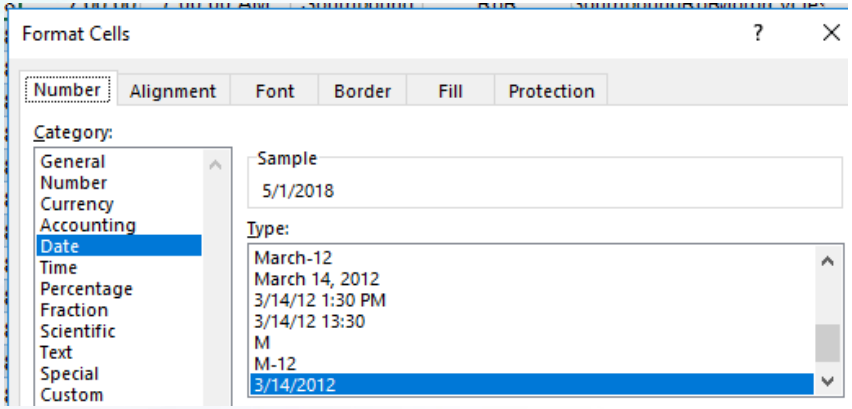
Interval	Approach	Movement	Class	Volume		Begin 5/1 AM
7:00 AM	Southbound	R	Motorcycles	0		
7:00 AM	Southbound	RoR	Motorcycles	0		
7:00 AM	Southbound	T	Motorcycles	0		
7:00 AM	Southbound	L	Motorcycles	1		
7:00 AM	Southbound	U	Motorcycles	0		

- Output:

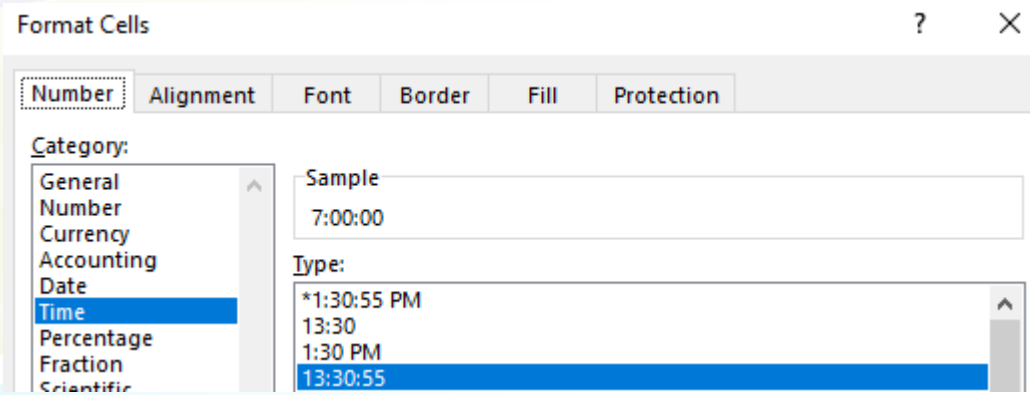
TIME	INTID	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
7:00 AM	21	211	449	0	0	621	112	275	0	304	0	0	0
7:00 AM	22	0	533	382	265	656	0	0	0	0	125	0	222
7:00 AM	7	0	0	0	0	0	0	0	0	0	0	0	0
7:00 AM	5	18	74	66	1	192	2	18	8	0	8	32	60
7:00 AM	6	31	125	0	0	235	35	90	0	33	0	0	0
7:00 AM	8	0	89	122	161	172	0	0	0	0	67	2	34

Creating Additional Columns

- Create date and time columns to split time and date in “Interval” column
  - insert a column for date, format the cells as date



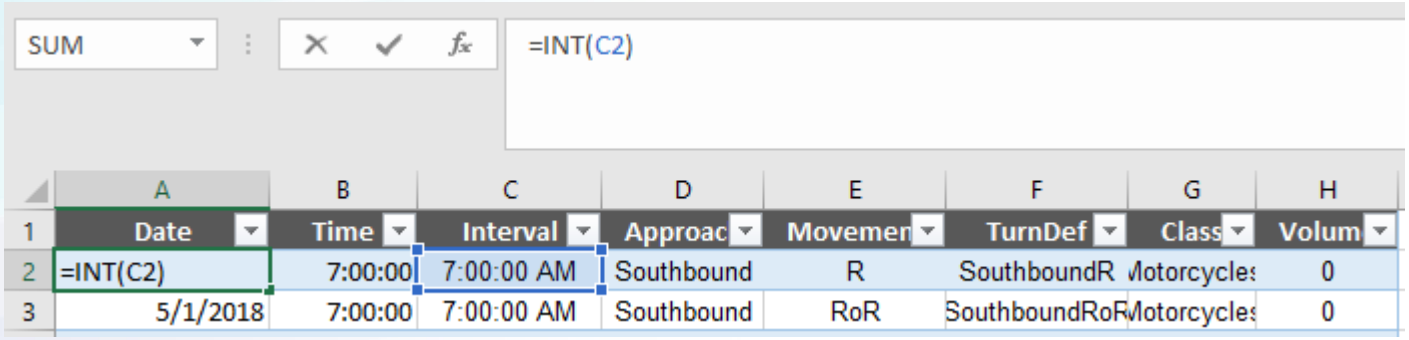
- insert a column for time, format the cells as time



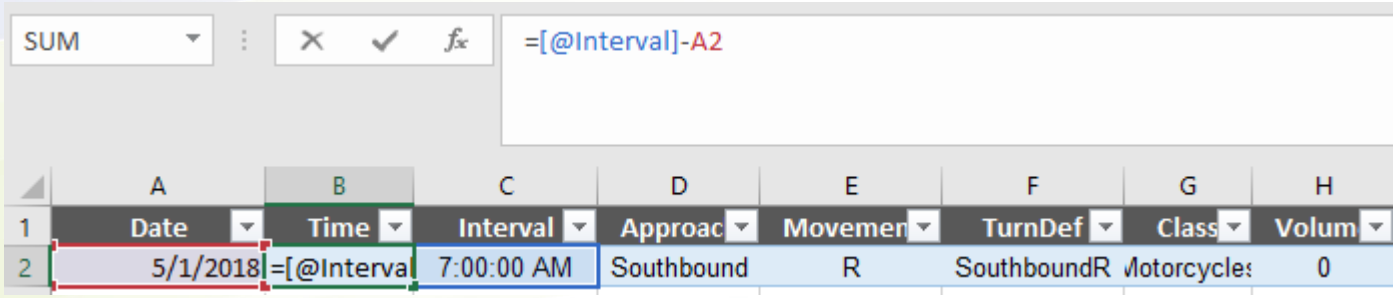
CAMBRIDGE SYSTEMATICS

Creating Additional Columns

- In Date column, type the formula:



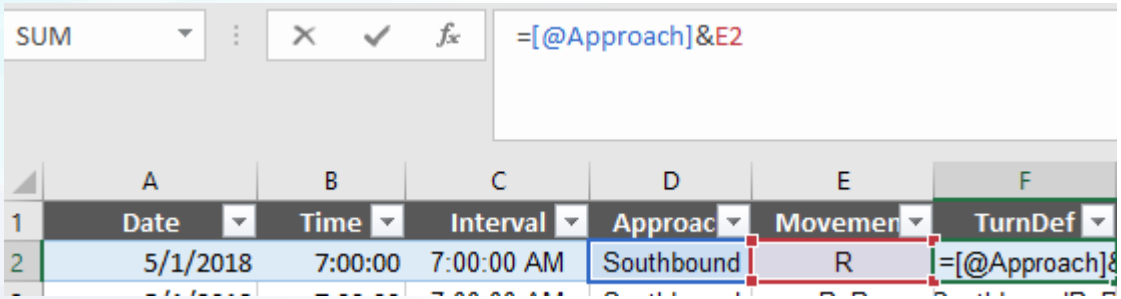
- In Time column, type the formula:



CAMBRIDGE SYSTEMATICS

Creating Additional Columns

- Create Turn Def column (combining approach and movement columns)



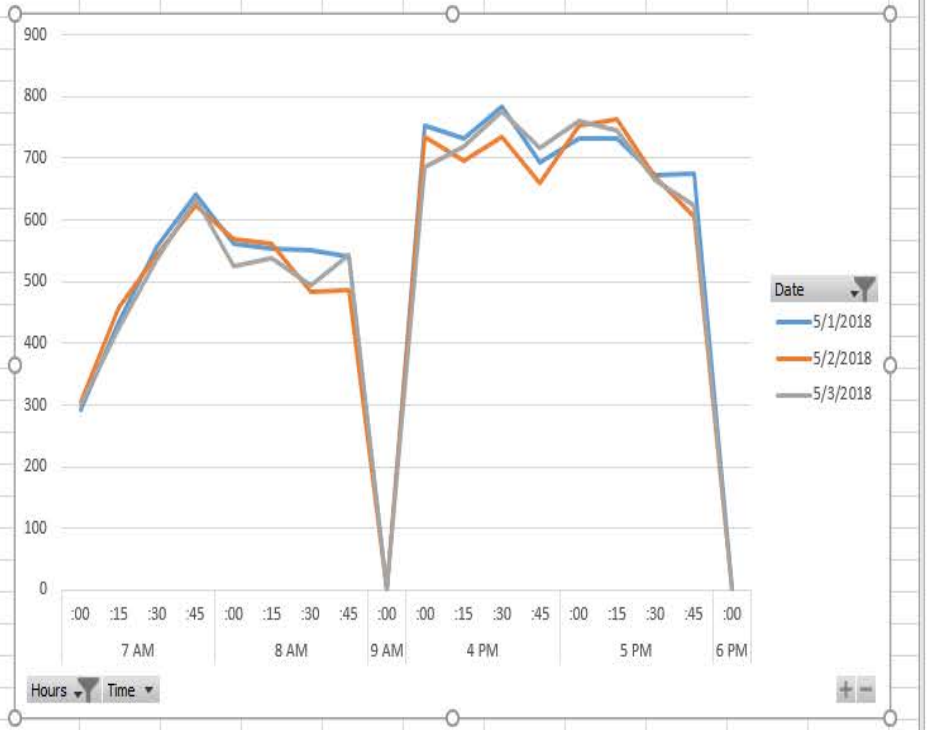
CAMBRIDGE SYSTEMATICS

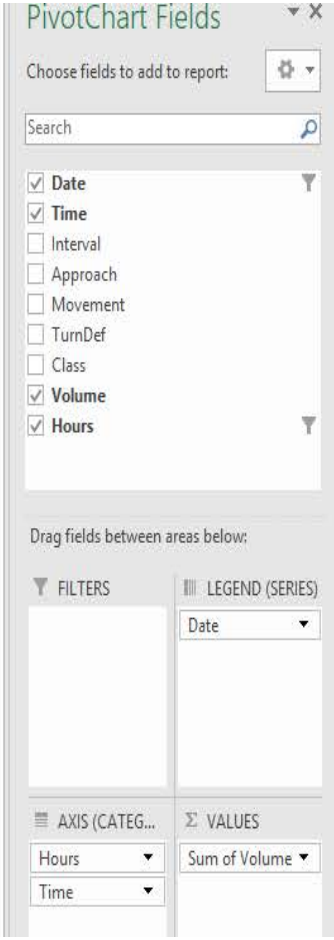
Create Simple Pivot Table

- The purpose is to observe day to day variation of the data
- Select all data range
- Click on insert→ Pivot Table
- Arrange the data as shown in the next slide

Create Simple Pivot Table

Sum of Volume	Column Labels			
Row Labels	5/1/2018	5/2/2018	5/3/2018	Grand Total
7 AM				
:00	293	304	300	897
:15	434	458	423	1315
:30	557	543	536	1636
:45	641	624	633	1898
8 AM				
:00	562	570	525	1657
:15	554	562	538	1654
:30	551	483	494	1528
:45	540	487	543	1570
9 AM				
:00	0	1	1	2
4 PM				
:00	753	735	685	2173
:15	732	696	720	2148
:30	784	735	777	2296
:45	694	661	716	2071
5 PM				
:00	733	752	761	2246
:15	732	763	746	2241
:30	673	669	665	2007
:45	675	605	623	1903
6 PM				
:00	2	0	1	3
Grand Total	9910	9648	9687	29245



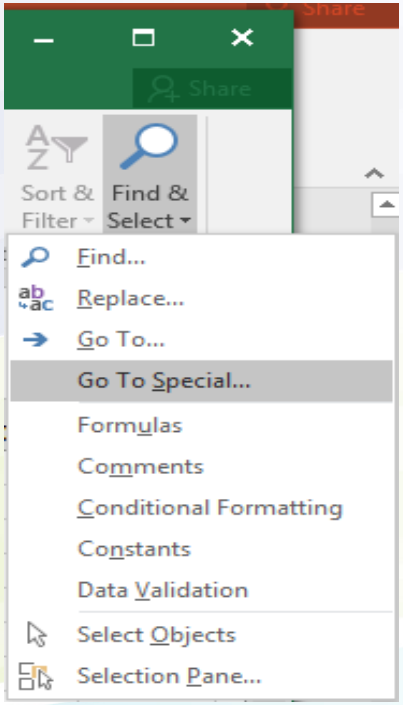


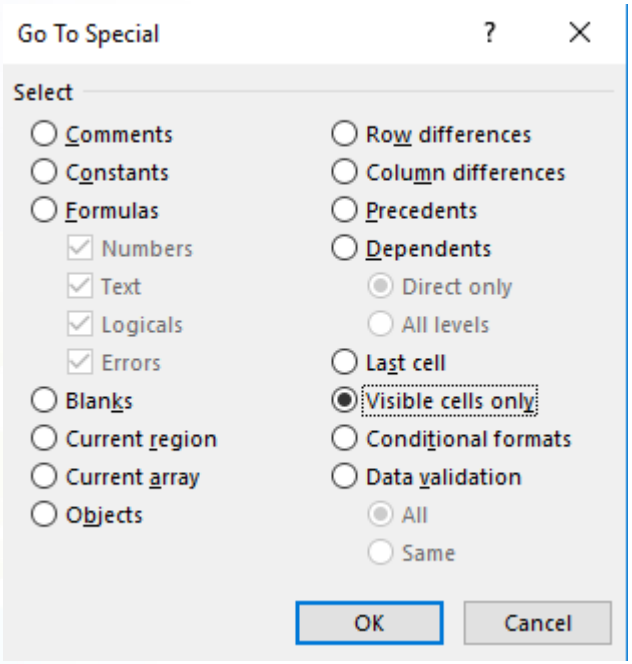
CAMBRIDGE SYSTEMATICS

Create Average Table

- create 3 separate work sheets for every date

Filter the column “date” for the desired day
Find&Select→ Go To Special
Select “Visible Cells Only”
Copy and paste the table in new worksheet





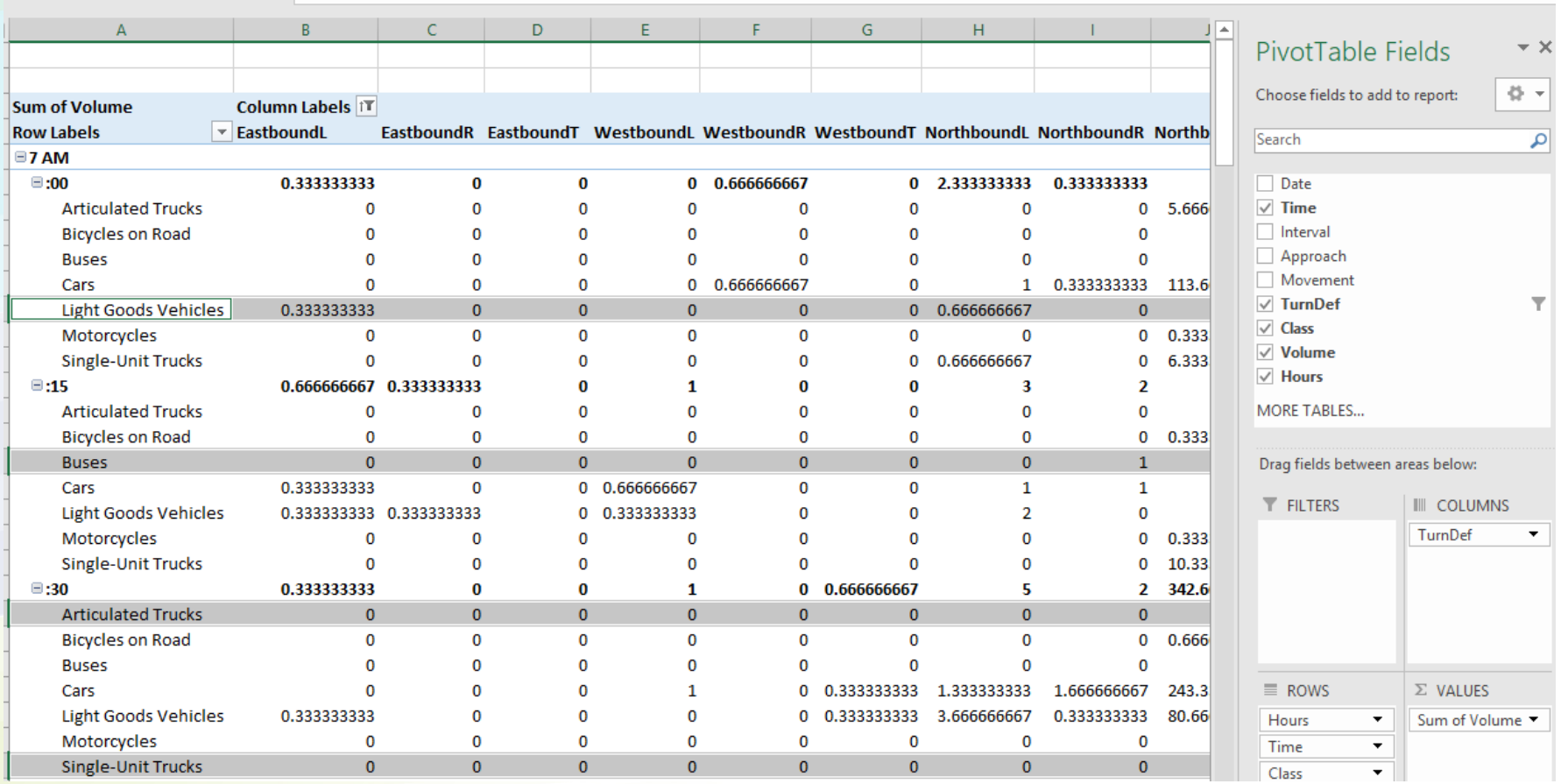
CAMBRIDGE SYSTEMATICS

Create Pivot table from the Average table

- create a new table where the column “Volume” is average (or rounded average) of 3 days.
- Create a pivot table based on this table.
- Make sure time is displayed in 15-mminute interval
- Group classes to passenger car (PC) and truck
- Sort the header (TurnDef) as appears in the UTDF format

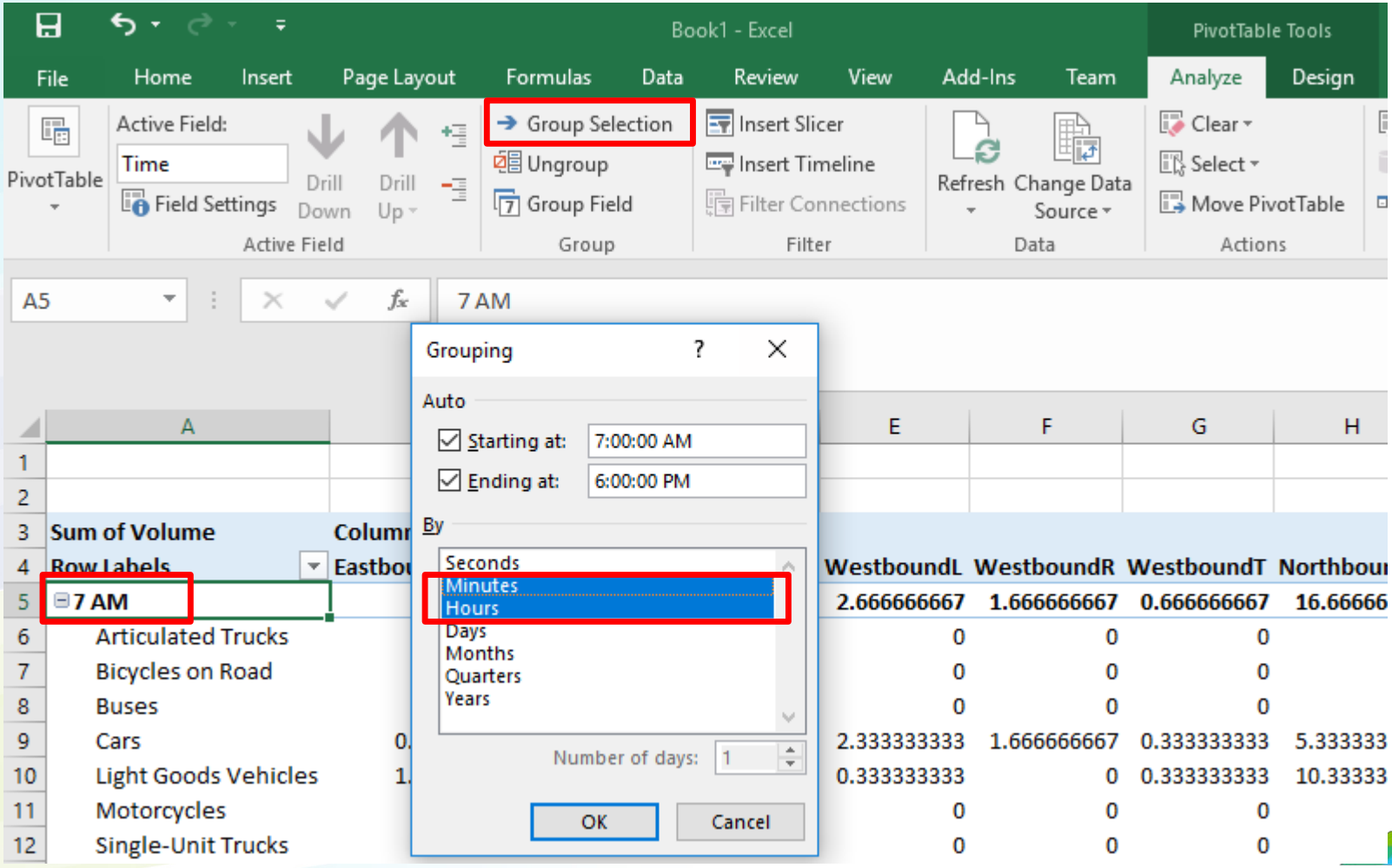
Pivot Table Field arrangement

Sum of Volume	Column Labels								
Row Labels	EastboundL	EastboundR	EastboundT	WestboundL	WestboundR	WestboundT	NorthboundL	NorthboundR	Northb
7 AM									
:00	0.333333333	0	0	0	0.666666667	0	2.333333333	0.333333333	
Articulated Trucks	0	0	0	0	0	0	0	0	5.666
Bicycles on Road	0	0	0	0	0	0	0	0	
Buses	0	0	0	0	0	0	0	0	
Cars	0	0	0	0	0.666666667	0	1	0.333333333	113.6
Light Goods Vehicles	0.333333333	0	0	0	0	0	0.666666667	0	
Motorcycles	0	0	0	0	0	0	0	0	0.333
Single-Unit Trucks	0	0	0	0	0	0	0.666666667	0	6.333
:15	0.666666667	0.333333333	0	1	0	0	3	2	
Articulated Trucks	0	0	0	0	0	0	0	0	
Bicycles on Road	0	0	0	0	0	0	0	0	0.333
Buses	0	0	0	0	0	0	0	1	
Cars	0.333333333	0	0	0.666666667	0	0	1	1	
Light Goods Vehicles	0.333333333	0.333333333	0	0.333333333	0	0	2	0	
Motorcycles	0	0	0	0	0	0	0	0	0.333
Single-Unit Trucks	0	0	0	0	0	0	0	0	10.33
:30	0.333333333	0	0	1	0	0.666666667	5	2	342.6
Articulated Trucks	0	0	0	0	0	0	0	0	
Bicycles on Road	0	0	0	0	0	0	0	0	0.666
Buses	0	0	0	0	0	0	0	0	
Cars	0	0	0	1	0	0.333333333	1.333333333	1.666666667	243.3
Light Goods Vehicles	0.333333333	0	0	0	0	0.333333333	3.666666667	0.333333333	80.66
Motorcycles	0	0	0	0	0	0	0	0	
Single-Unit Trucks	0	0	0	0	0	0	0	0	



CAMBRIDGE SYSTEMATICS

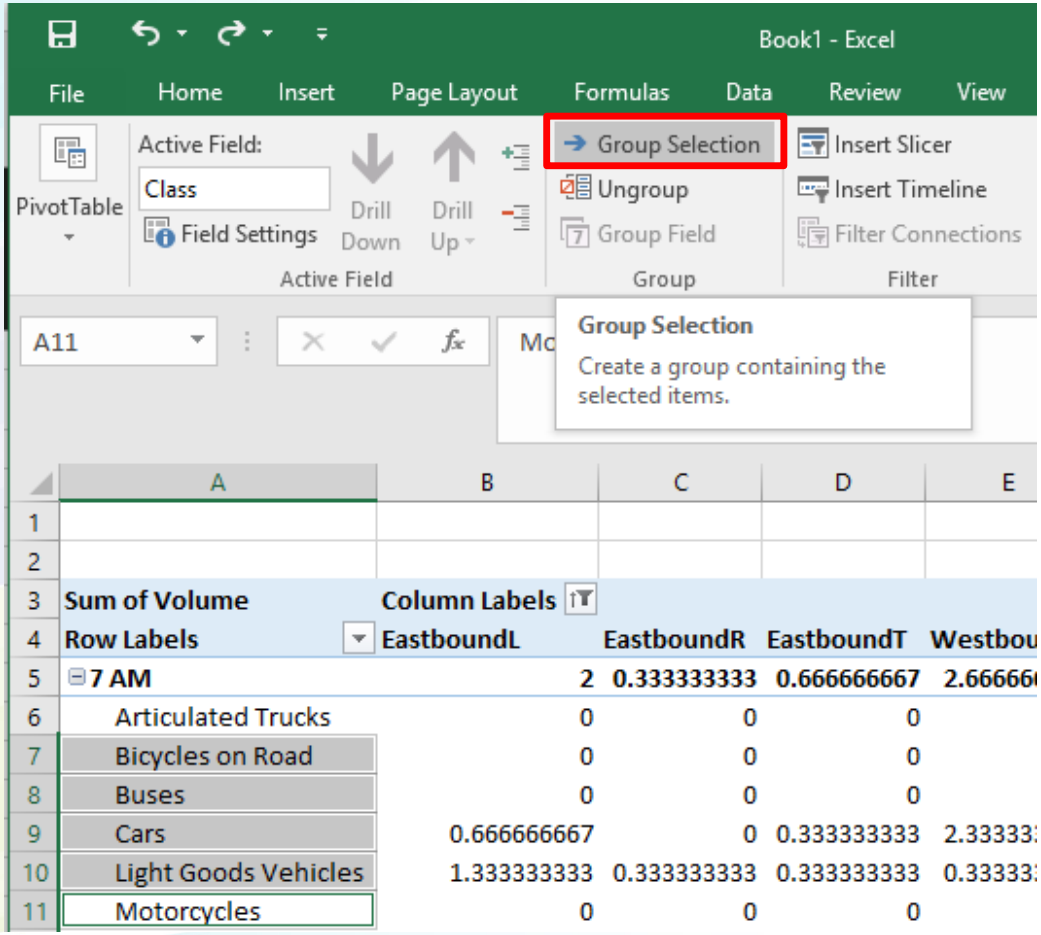
Desirable Time Aggregation



CAMBRIDGE SYSTEMATICS

Group Classes

- Click and hold Ctrl to select classes that you want together, click on Group Selection, and rename the selection. Create groups for PC and Truck



	A	B	C	D	E
1					
2					
3	Sum of Volume	Column Labels			
4	Row Labels	EastboundL	EastboundR	EastboundT	Westbou
5	7 AM	2	0.333333333	0.666666667	2.66666
6	Articulated Trucks	0	0	0	
7	Bicycles on Road	0	0	0	
8	Buses	0	0	0	
9	Cars	0.666666667	0	0.333333333	2.33333
10	Light Goods Vehicles	1.333333333	0.333333333	0.333333333	0.33333
11	Motorcycles	0	0	0	

Sort the Header

- Desired header sorting is:

EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR

- sort the header as desired somewhere.

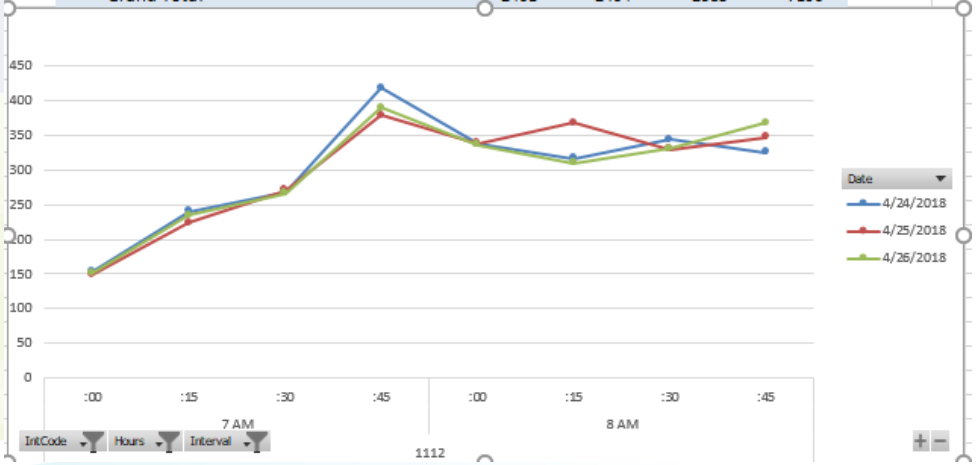
A	B	C	D	E	F	G	H	I	J	K	L
EastboundL	EastboundR	EastboundT	WestboundL	WestboundR	WestboundT	NorthboundL	NorthboundR	NorthboundT	SouthboundL	SouthboundR	SouthboundT

- File→ Options→ Advanced→ General→ Edit Custom Lists, select the range and click “Import”.
- Get back to the Pivot table, click on the header, sort from A to Z

Turning Movement Count

- Add date and intersection code to the raw table
- With pivot table, arrange the data as desired and evaluate the data consistency

Sum of Volume			Moveme			
Interval	Hours	Interval	4/24/2018	4/25/2018	4/26/2018	Grand Total
1112						
	7 AM					
		:00	154	149	151	454
		:15	240	223	234	697
		:30	267	270	266	803
		:45	418	379	389	1186
	8 AM					
		:00	337	338	336	1011
		:15	316	368	310	994
		:30	344	330	331	1005
		:45	325	347	368	1040
Grand Total			2401	2404	2385	7190

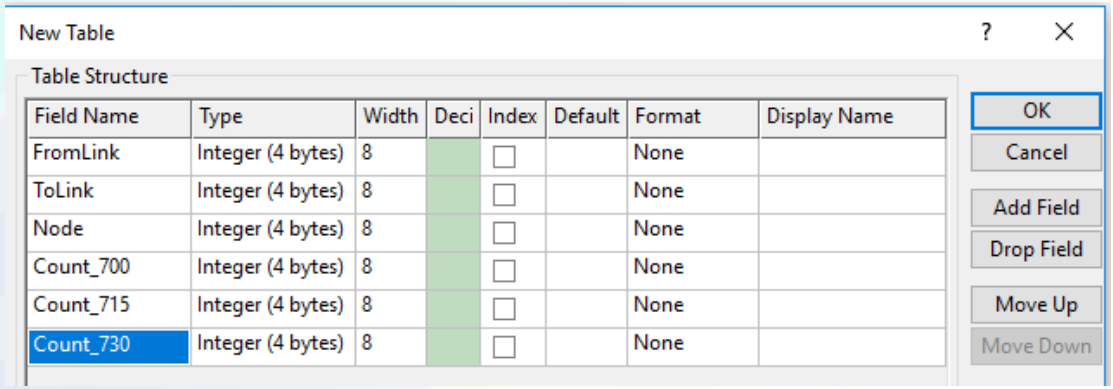


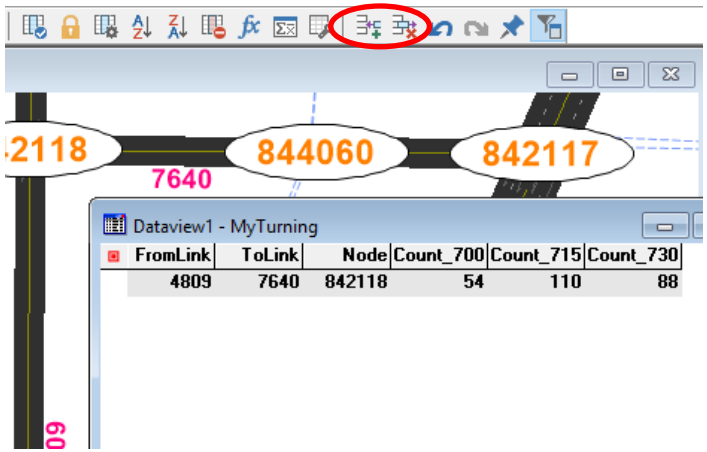
Day to day variation of AM Southbound Through

CAMBRIDGE SYSTEMATICS

Turning Movement Count Coding

- Create a .bin table: File→ New→ Table → Fixed_format binary
- Add these attributes: FromLink, ToLink, Node, Count_700, Count715, etc



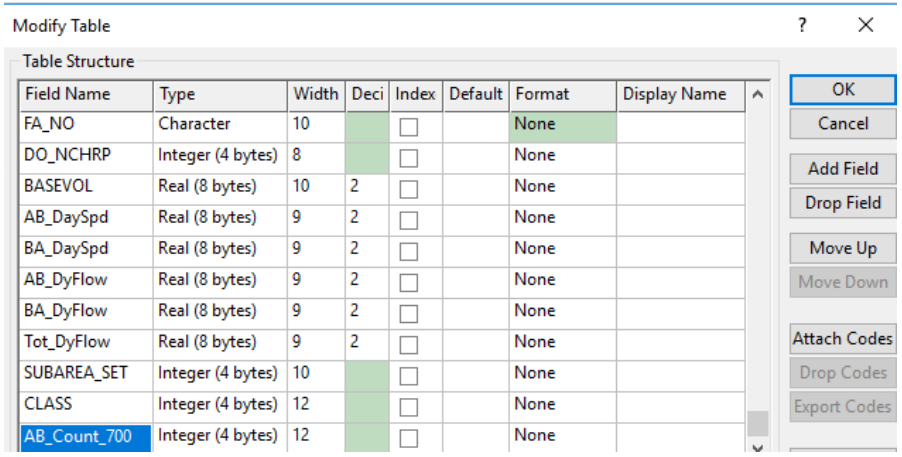


- Depends on how many counts collected, it might be easier to automatically create .bin files such as turning delay (created by TransModeler) and edit the file, instead of creating one from scratch.

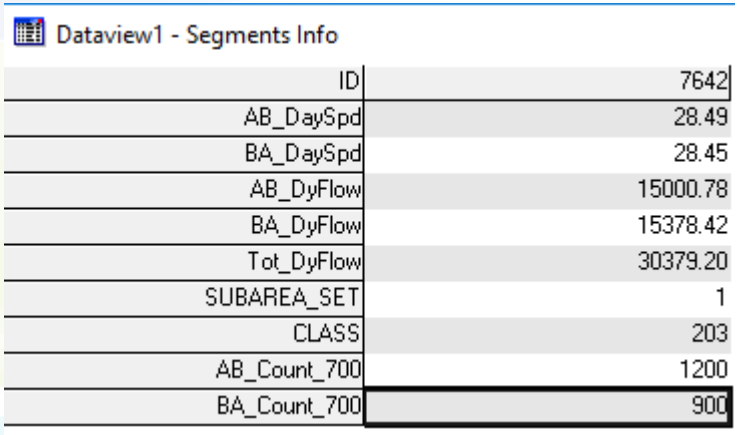
CAMBRIDGE SYSTEMATICS

Segment Count Coding

- Set the current layer to Segment
- Dataview→Table→ Modify
- Add attributes: AB_Count_700, BA_Count_700, AB_Count_7:15, BA_Count_715, etc,



- Fill them with available counts for the associated segment.

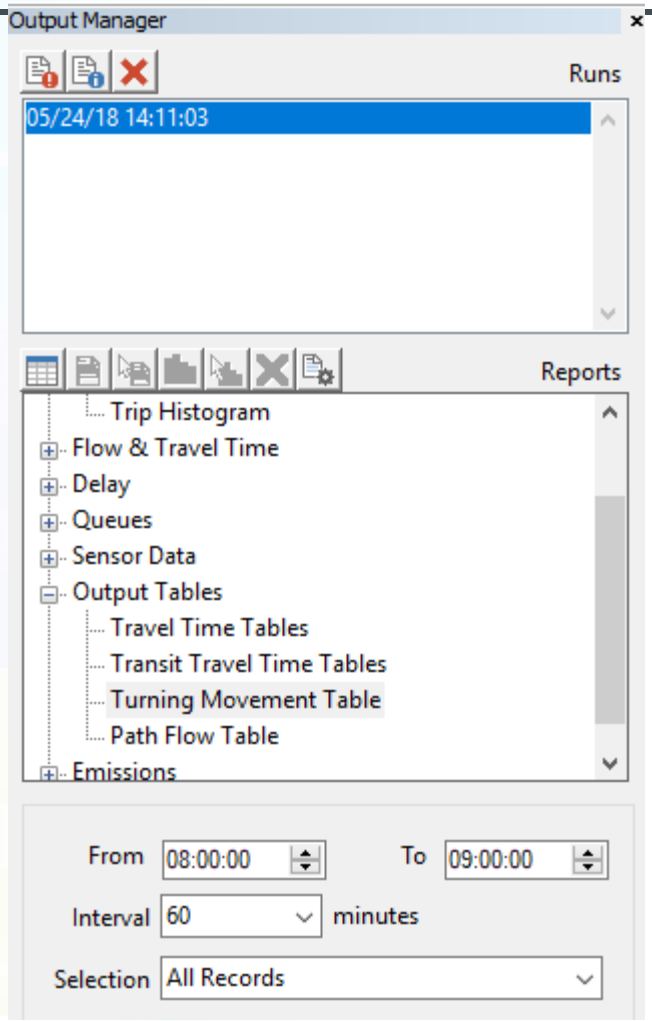


CAMBRIDGE SYSTEMATICS

Indirect segment Count

- Matrix estimation process does not produce turning volume output, but only segment volume output. Therefore, to see how well our turning movements are replicated, we need to generate segment count from the observed turning counts.
- TrnasModeler can create “link” count based on turning counts which is explained in next webinar. The counts can be added as attributes to link layer. Link layer then should be joined to the segment layer, so segment attributes for count could be filled with link count attribute (as discussed earlier, there is no 1-1 relation between link and segments, sometimes a link can include more than a segment)
- Segment counts should be spot checked to make sure link to segment join/attribute transfer is done properly.

Generating Turning movement Volume



CAMBRIDGE SYSTEMATICS

Generating Turning movement Volume

- Each Transmodeler simulation run, automatically produces a file “simulation name”+Turning Movement Volumes.bin that looks like this:

Dataview1 - Turning Movement Volumes

FromLink	Node	ToLink	Dir	Type	Facility	Vol_0600	Vol_0615	Vol_0630	Vol_0645	Vol_0700	Vol_0715	Vol_0730	Vol_0745	Vol_0800	Vol_0815	Vol_0830	Vol_0845	Vol
8102	1239	5815	W	R	--	0	0	0	0	0	0	0	0	0	0	0	0	0
8102	1239	5789	W	T	--	0	0	0	0	0	0	1	0	0	2	1	2	6
8102	1239	5791	W	L	--	1	1	0	0	1	0	1	0	1	6	3	5	19
5815	1239	5789	S	R	--	0	0	0	0	0	0	0	0	0	0	0	0	0
5815	1239	5791	S	T	--	0	0	0	0	0	0	0	0	0	0	0	1	1
5815	1239	8102	S	L	--	0	0	0	0	0	0	0	0	0	0	0	0	0
5789	1239	5815	E	L	--	0	0	0	0	0	0	0	0	0	0	0	0	0

- This bin file can generate volume for any user-specific time period, if generated through Output Manager: (you may be asked to identify the run based on which you want this output)

Generating Turning movement Volume

- Before running the simulation:

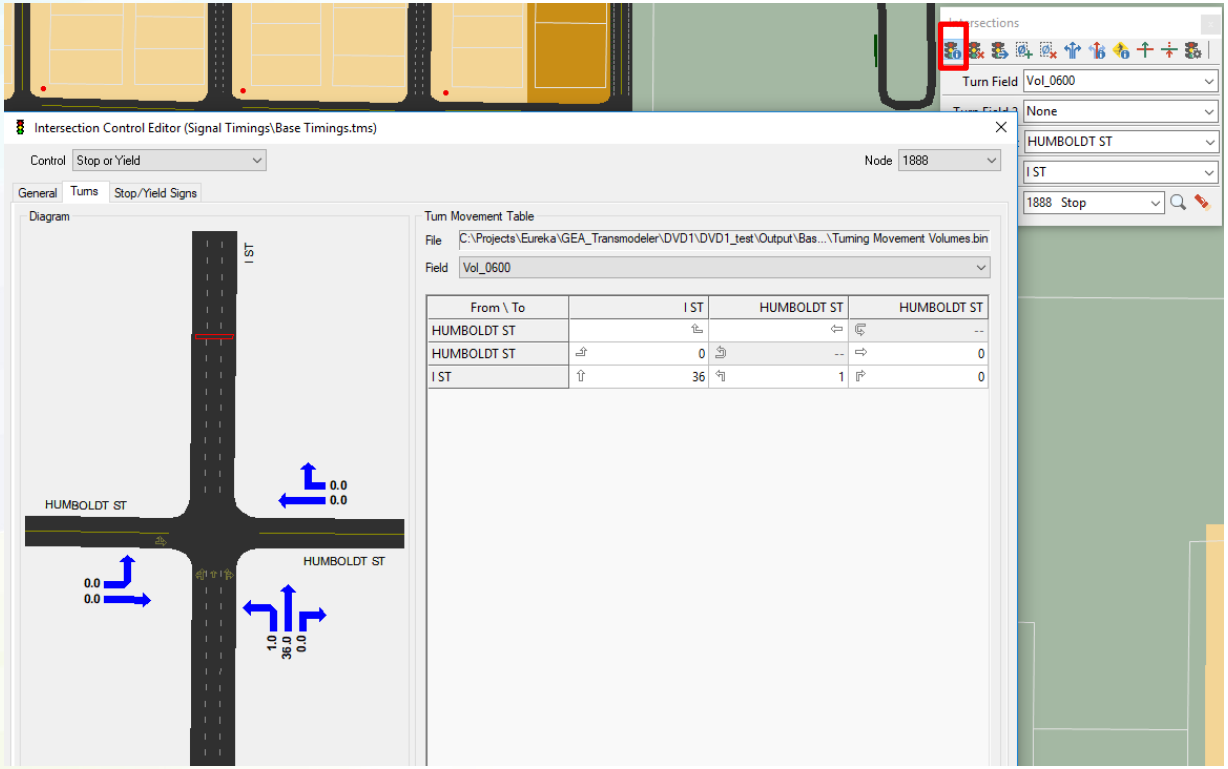
1- Identify how many runs are needed (more than 1 run is usually desired to smooth out the results and lower the variations between runs due to simulation stochasticity)

2- Make sure for each scenario, the inputs are correctly defined in Project Settings (network, trip matrix, signal timing file, historical travel time, parameter files)

If you input a TM table, you can visualize the values at any controlled intersection.
Project → Settings → Network → Turning Movement Variables browse and find the desired file, save the simulation database.

Generating Turning movement Volume

- Open the Intersection Toolbar. Click on any controlled intersection, under “Turn” tab, you can visualize the turning volume.



CAMBRIDGE SYSTEMATICS