

# Presentation at the DTALite Training Workshop

## 6/28/2017, University of Maryland, College Park



# DTALite

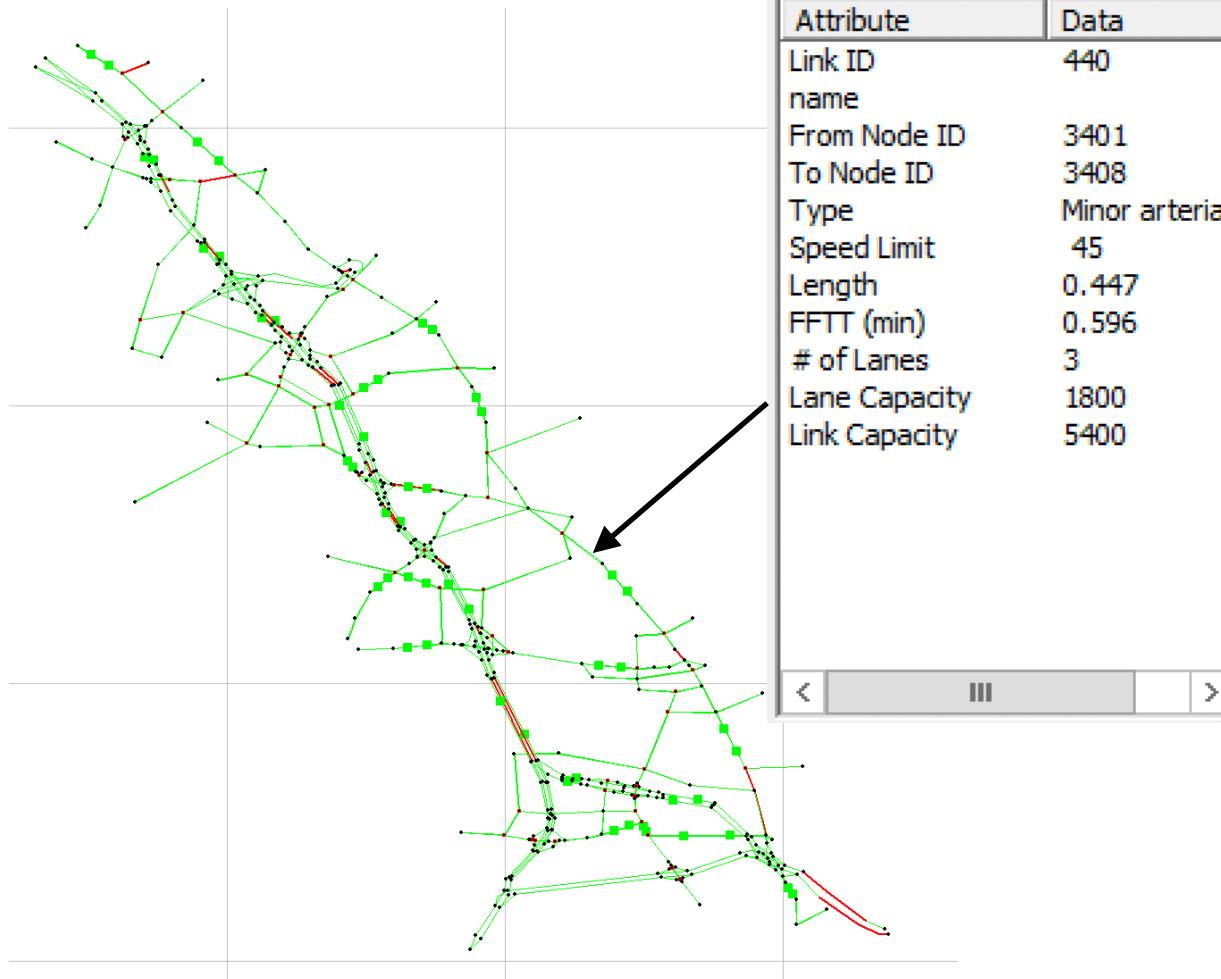
# Model Calibration

# Recommended Diagnostic Procedures

1. Macroscopic capacity may not be appropriate for mesoscopic capacity constraints
2. Geometry details matter
  - Number of lanes; speed limits
3. Adjust capacity before OD demand estimation
4. Signal importation
5. OD Matrix Estimation (ODME)
6. Start with fewer capacity constraints to remove possible unrealistic bottlenecks
  - Point queue → Spatial queue → Shock wave → Speed-density relationships

# Network Data Coding/Debugging

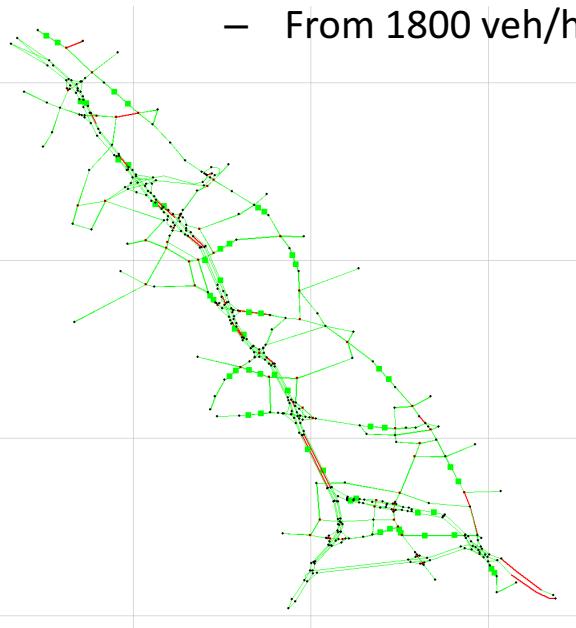
- Visualization and Validation
- Checking the Queue Lengths



- Unrealistic lane capacity for MD-355

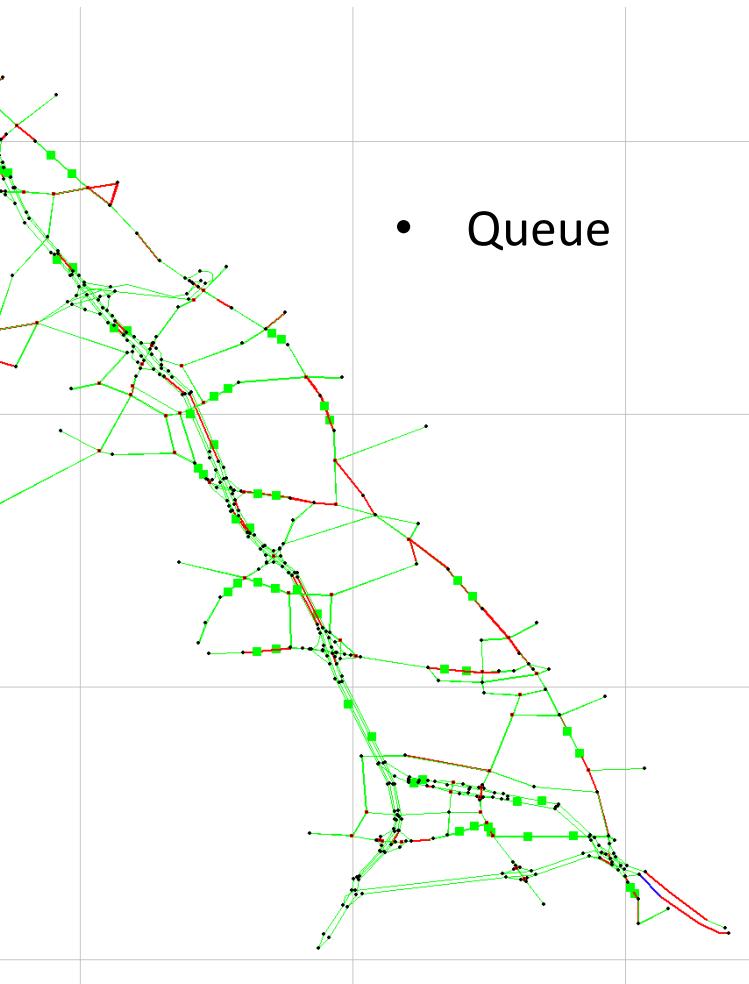
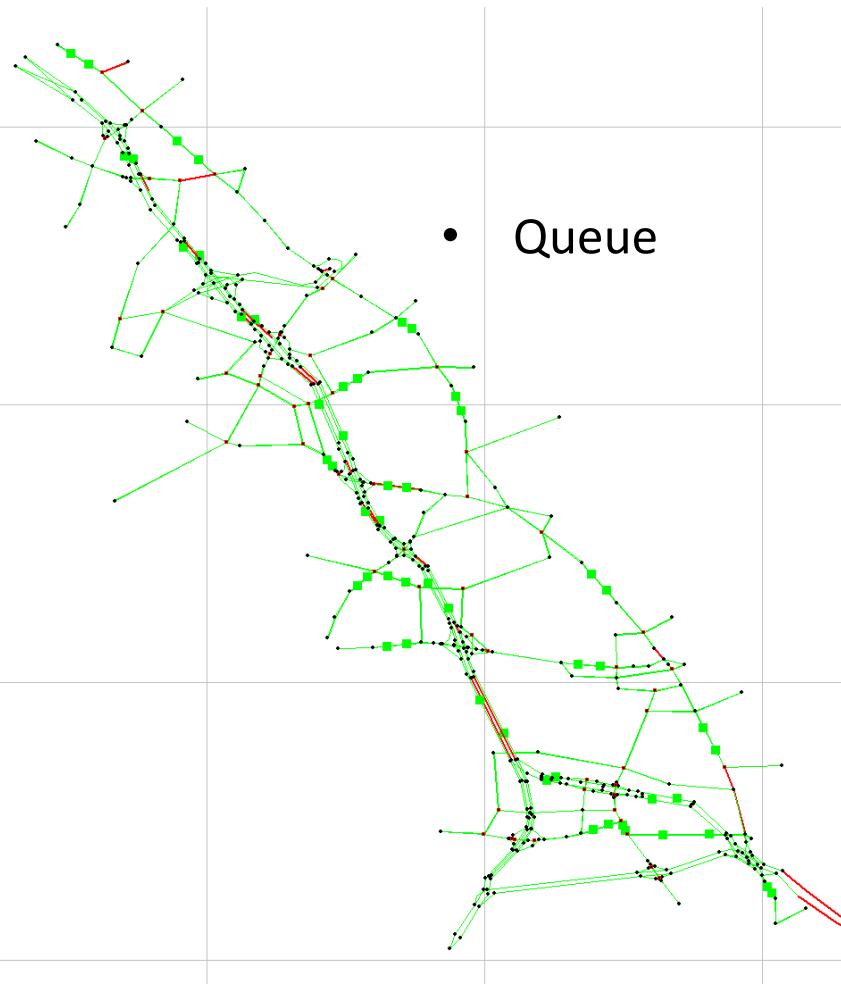
# Network Data Coding/Debugging

- Edit the link file: input\_link.csv
- Revise the lane capacity for roadway type: “Minor Arterials”
  - From 1800 veh/hr/lane to 900 veh/hr/lane



key	speed_se	count_ser	from_nod	to_node	link_type	direction	length	number_c	number_c	speed_l	lane_capa	link_type	jam_dens	wave_spe	demand
	142->146	142	146	Minor arter	1	0.13788	3	0	55	900	5	180	12		
	143->141	143	141	Minor arter	1	0.10833	3	0	55	900	5	180	12		
	144->143	144	143	Minor arter	1	0.05189	3	0	55	900	5	180	12		
	146->140	146	140	Minor arter	1	0.1267	3	0	55	900	5	180	12		
	3321->144	3321	144	Minor arter	1	0.18939	3	0	55	900	5	180	12		
	2->3284	2	3284	Minor arter	1	0.33542	1	0	45	900	5	180	12		
	92->3716	92	3716	Minor arter	1	0.08258	2	0	45	900	5	180	12		
	93->98	93	98	Minor arter	1	0.13163	2	0	45	900	5	180	12		
	95->92	95	92	Minor arter	1	0.11023	2	0	45	900	5	180	12		
	98->101	98	101	Minor arter	1	0.14186	2	0	45	900	5	180	12		
	100->95	100	95	Minor arter	1	0.13958	2	0	45	900	5	180	12		
	101->3714	101	3714	Minor arter	1	0.13409	2	0	45	900	5	180	12		
	103->100	103	100	Minor arter	1	0.08674	2	0	45	900	5	180	12		
	108->3835	108	3835	Minor arter	1	0.68428	3	0	45	900	5	180	12		
	141->3325	141	3325	Minor arter	1	0.18447	3	0	45	900	5	180	12		
	282->3818	282	3818	Minor arter	1	0.04129	3	0	45	900	5	180	12		
	283->3797	283	3797	Minor arter	1	0.06212	3	0	45	900	5	180	12		
	285->3428	285	3428	Minor arter	1	0.33561	3	0	45	900	5	180	12		
	3055->308	3055	3083	Minor arter	1	0.31534	3	0	45	900	5	180	12		
	3055->332	3055	3325	Minor arter	1	0.23295	3	0	45	900	5	180	12		
	3083->305	3083	3055	Minor arter	1	0.31534	3	0	45	900	5	180	12		

# Network Data Coding/Debugging

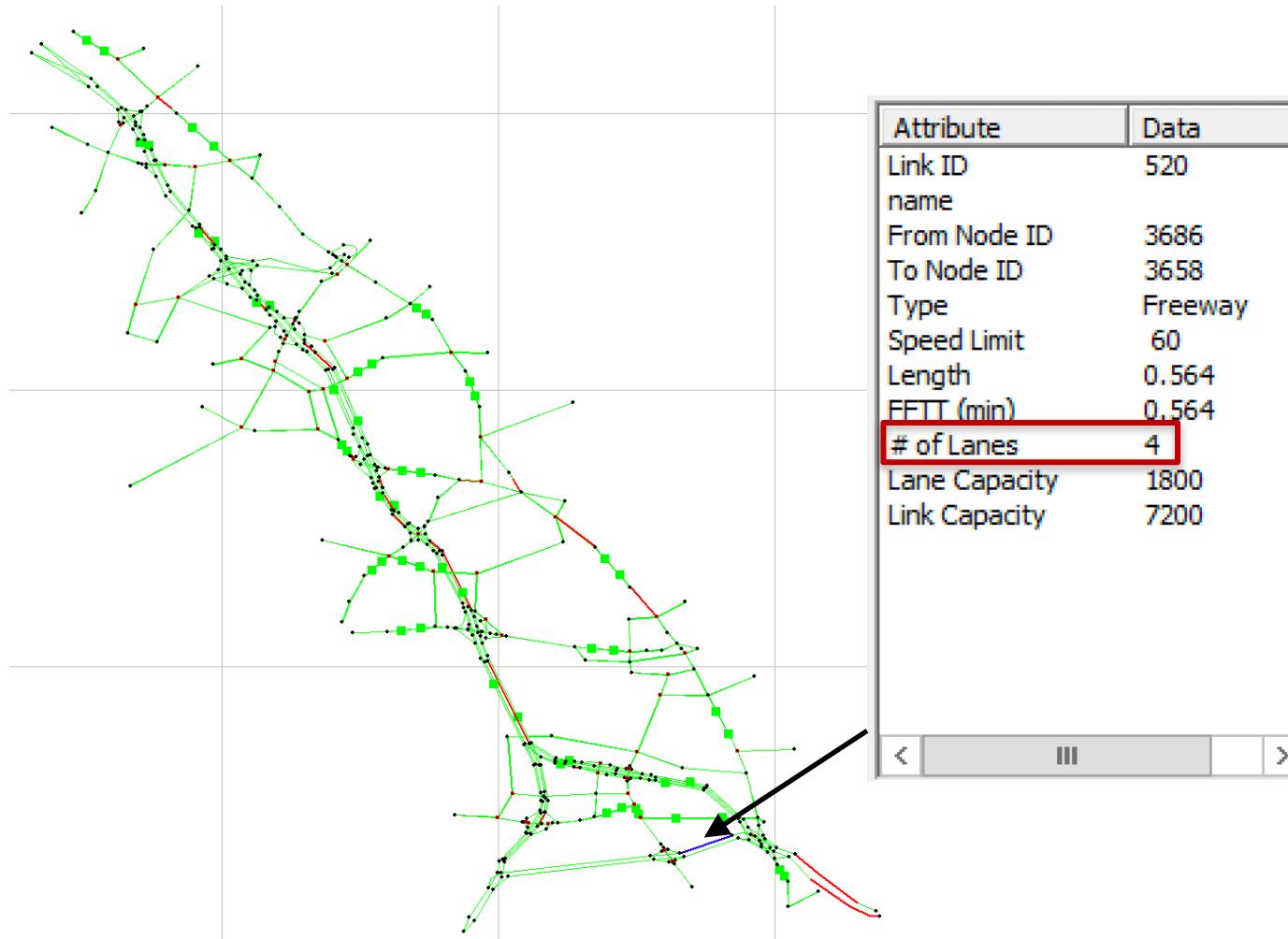


• Before correcting the capacity

• After correcting the capacity

# Network Data Coding/Debugging

- Checking the number of lanes

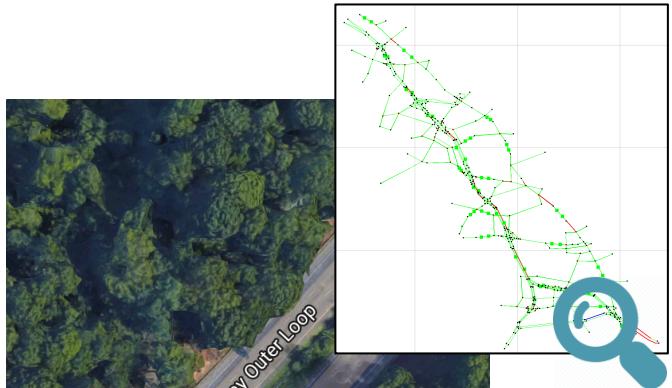


# Network Data Coding/Debugging

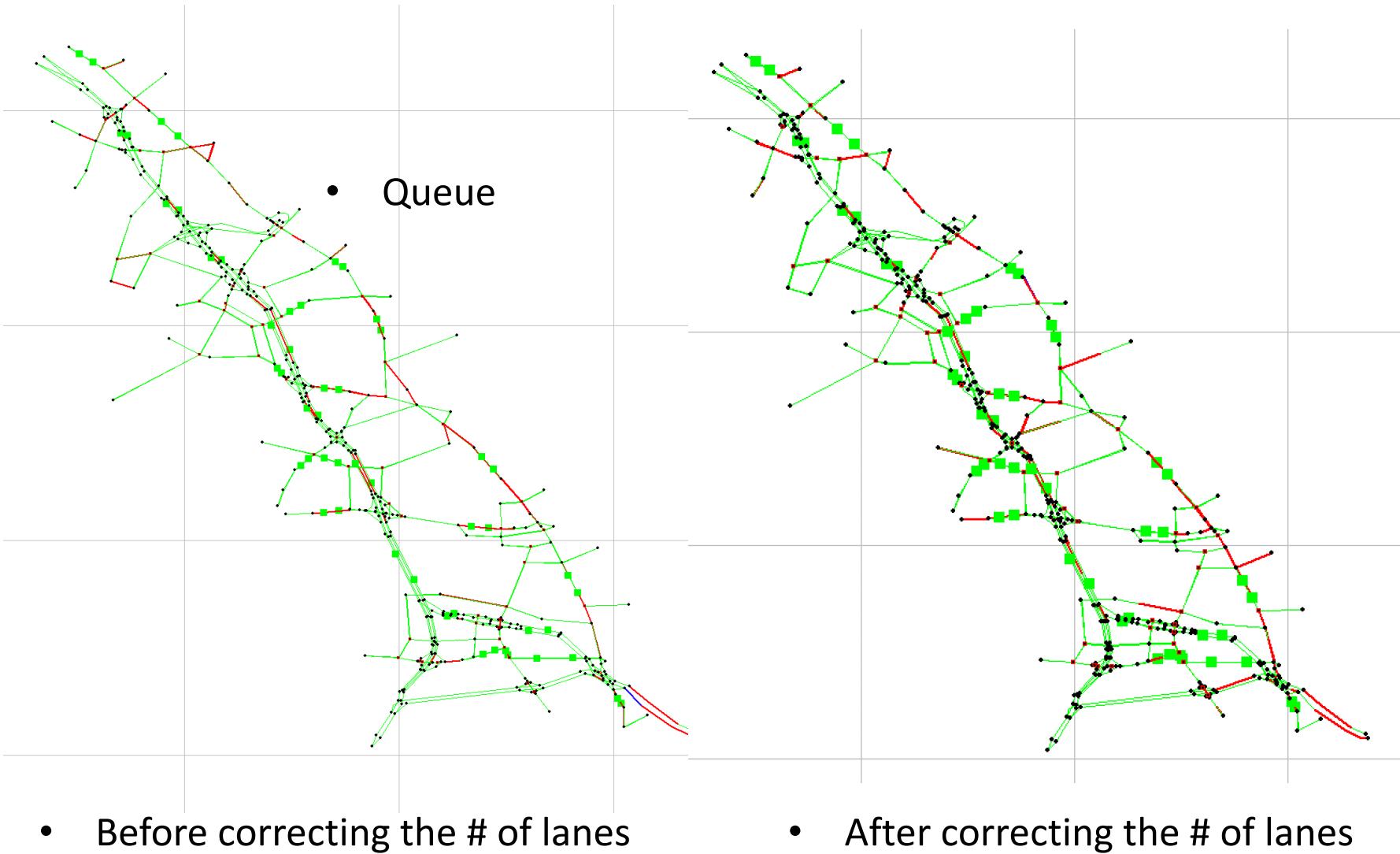
- Checking the number of lanes
- A three-lane freeway segment has been coded with four lanes
- Overestimated capacity



Geometry Details



# Network Data Coding/Debugging



# OD Matrix Estimation (ODME)

1. ODME Data Preparation
  - Count data collection
  - sensor\_count.csv
2. Parameter Settings
  - input\_scenario\_settings.csv
3. Result Analysis
4. See the ODME handout for details

# ODME Data Preparation

**Internet Traffic Monitoring System (I-TMS)**

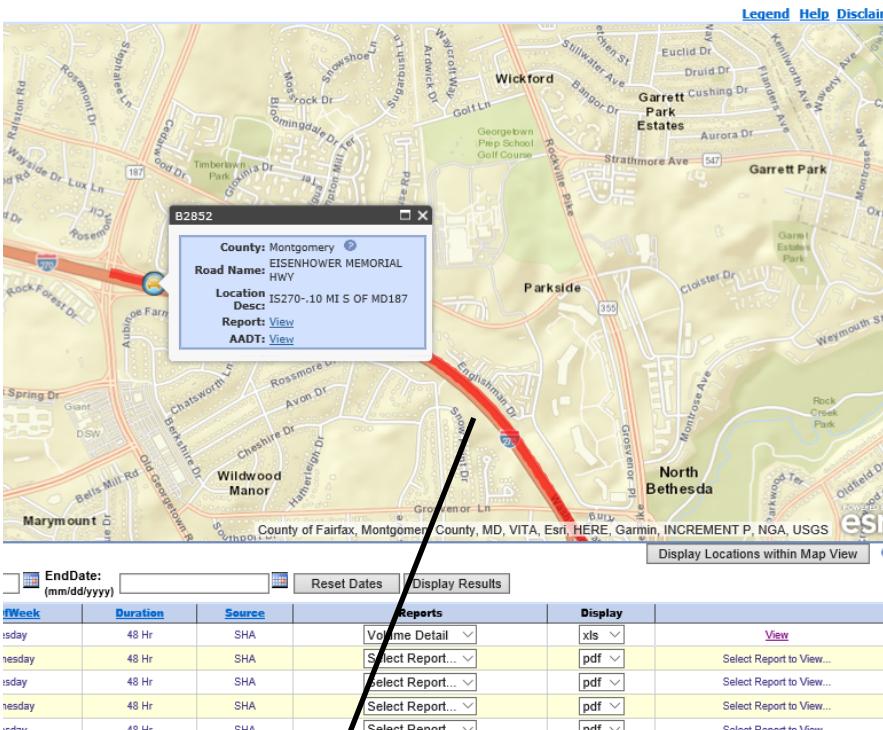
**Results Reports AADT Data**

Location	StartDate: (mm/dd/yyyy)	EndDate: (mm/dd/yyyy)	Reset Dates	Display Results				
IS270-10 MI S OF MD187	10/13/2015	10/14/2015	Tuesday	48 Hr	SHA	Select Report... <input checked="" type="checkbox"/>	pdf <input type="checkbox"/>	Select Report...
IS270-10 MI S OF MD187	11/07/2012	11/08/2012	Wednesday	48 Hr	SHA	Select Report... <input checked="" type="checkbox"/>	pdf <input type="checkbox"/>	Select Report...
IS270-10 MI S OF MD187	09/01/2009	09/02/2009	Tuesday	48 Hr	SHA	Select Report... <input checked="" type="checkbox"/>	pdf <input type="checkbox"/>	Select Report...
IS270-10 MI S OF MD187	08/24/2005	08/25/2005	Wednesday	48 Hr	SHA	Select Report... <input checked="" type="checkbox"/>	pdf <input type="checkbox"/>	Select Report...
IS270-10 MI S OF MD187	04/09/2002	04/10/2002	Tuesday	48 Hr	SHA	Select Report... <input checked="" type="checkbox"/>	pdf <input type="checkbox"/>	Select Report...

**ODME Data Source Examples:**  
**CATT Lab RITIS Data System (Data Archive)**  
<https://www.ritis.org>  
**SHA Online Data Base**  
[http://maps.roads.maryland.gov/itms\\_public/](http://maps.roads.maryland.gov/itms_public/)

# ODME Data Preparation

- Feeding Data into “sensor\_count.csv” for DTALite



**Volume Count Detail Report**

**Location :** B2852  
**Location :** IS270-10 MI S OF MD187  
**Date Range:** 10/13/2015 to 10/14/2015  
**Date:** 10/11/2015      **Direction:** Northbound

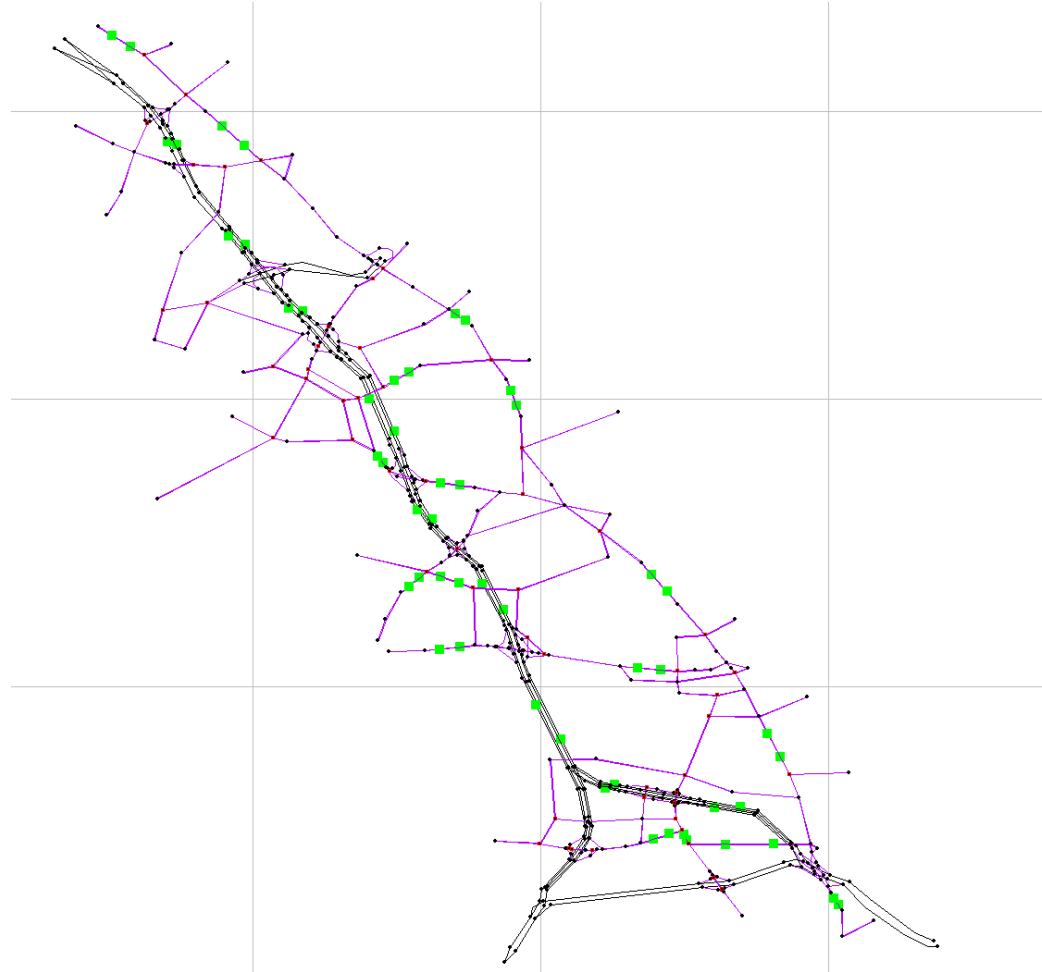
Beginning	Sun	Mon	Tue	Wed	Thu	Fri	Sat	Daily Avg	Weekday Avg	Weekend
0: 00	0	0	377	401	0	0	0	389	389	0
1: 00	0	0	280	333	0	0	0	307	307	0
2: 00	0	0	232	231	0	0	0	232	232	0
3: 00	0	0	198	217	0	0	0	208	208	0
4: 00	0	0	331	351	0	0	0	341	341	0
5: 00	0	0	1,041	1,092	0	0	0	1,067	1,067	0
6: 00	0	0	2,151	2,153	0	0	0	2,152	2,152	0
7: 00	0	0	3,245	2,922	0	0	0	3,084	3,084	0
8: 00	0	0	2,812	2,988	0	0	0	2,900	2,900	0
9: 00	0	0	1,852	3,791	0	0	0	2,822	2,822	0
10: 00	0	0	2,318	3,100	0	0	0	2,709	2,709	0
11: 00	0	0	2,994	2,871	0	0	0	2,933	2,933	0
12: 00	0	0	3,192	3,074	0	0	0	3,133	3,133	0
13: 00	0	0	3,133	3,223	0	0	0	3,178	3,178	0
14: 00	0	0	3,727	3,568	0	0	0	3,648	3,648	0
15: 00	0	0	3,715	4,083	0	0	0	3,899	3,899	0
16: 00	0	0	4,032	4,325	0	0	0	4,179	4,179	0
17: 00	0	0	3,954	4,100	0	0	0	4,027	4,027	0

Table 2. Sample data in sensor\_count.csv

count_sensor_id	from_node_id	to_node_id	day_no	start_time_in_min	end_time_in_min	link_count	speed	travel_time_in_min	lane_density
5010->4958	5010	4958	1	990	1050	49.5			
4958->5010	4958	5010	1	990	1050	74.5			
4952->5022	4952	5022	1	990	1050	221.5			

# ODME Data Preparation

- Network with Count Sensors shown in Green Dots



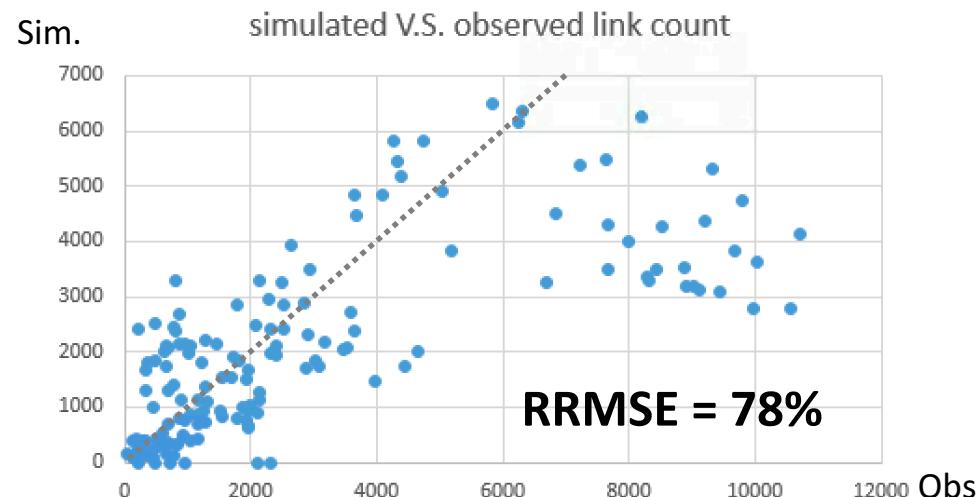
# Parameter Settings

- Revise the parameters in “input\_scenario\_settings.csv”

Data Field	Value	Notes
number_of_iterations	50	The total number of iterations for ODME
traffic_flow_model	1	This parameter defines a specific traffic flow model used in both assignment and ODME of DTALite; 1 indicates a point queue model in this example. The selection of Newell's KW model is also feasible.
signal_representation_model	0	This parameter defines a specific signal control for DTALite.
traffic_assignment_method	3	This assignment method of “3” is dedicated to ODME
ODME_start_iteration	20	It defines the first iterative assignment period to converge to the user equilibrium state, and could generate a sufficient number of paths for path flow adjustment. The iteration number also indicate that ODME will begin at the 21th iteration.
ODME_end_iteration	50	It defines that ODME will end at the 50the itration.
ODME_max_percentage_deviation_wrt_hist_demand	40	The maximum percentage of demand deviation from base-line dynamic demand.
ODME_step_size	0.05	Moving size of each step in path flow adjustment algorithm
calibration_data_start_time_in_min	990	This and the following parameter specify the time window for ODME to use the sensor data. Note that, users can prepare a long period of sensor data, say from 0 to 24 hours, but only use part of sensor data, say between min 990 and 1050, for calibration.
calibration_data_end_time_in_min	1050	

# Result Analysis

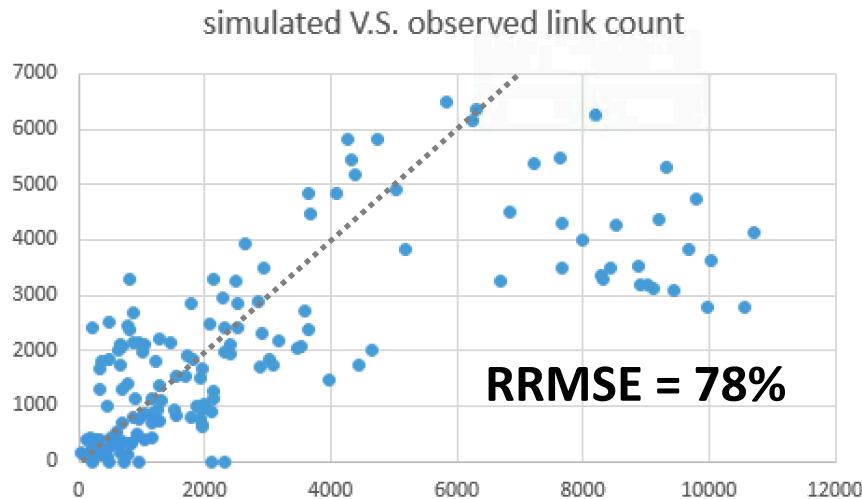
- The performance measure of count matching for each simulation iteration is stored in ODME\_link\_based\_log.csv
  - Rename the file to ODME\_before.csv and run DTALite to perform the ODME
  - Plot the comparison result in EXCEL
  - Calculate the Relative Root Mean Squared Error (RRMSE)



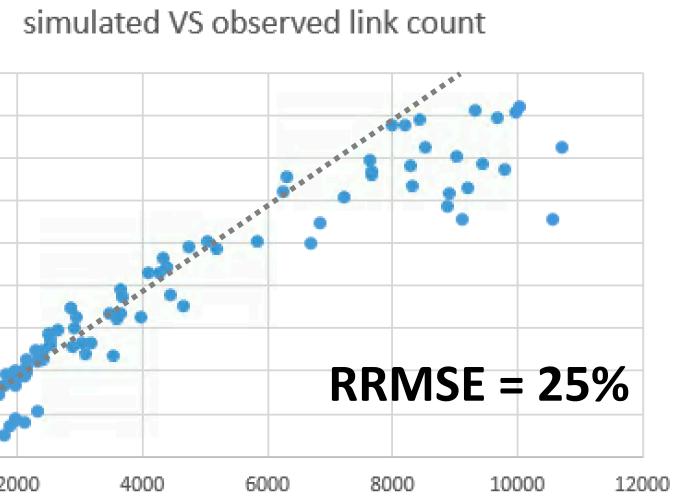
- Traffic Count Comparison Before the ODME

# Result Analysis

- When the ODME is done, perform the count comparison again:



- Before the ODME



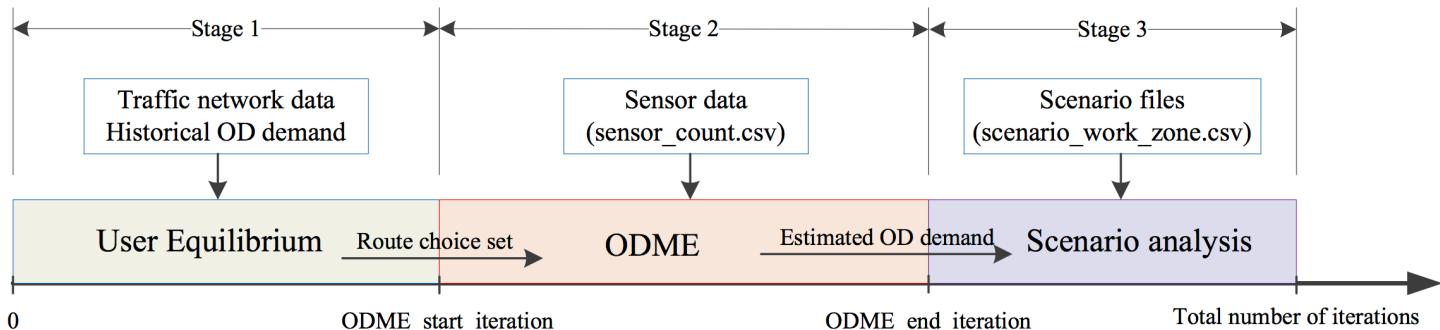
- After the ODME

# Result Analysis



# How to Use the Calibrated Model

- **Method:** Scenario analysis using one simulation



- Step 1: revise `input_scenario_settings.csv`

A screenshot of an Excel spreadsheet titled "input\_scenario\_settings - Excel". The spreadsheet has a standard ribbon menu at the top. The first row contains column headers: "scenario\_id", "number\_of\_assignment", "number\_of\_traffic\_flo", "signal\_repair\_time", "traffic\_assignment\_random\_seed", "ODME\_start\_iteration", "ODME\_end\_iteration", "ODME\_max\_iteration", and "ODME\_stop\_criteria". The second row contains values: "1", "test1", "51", "1", "1", "0", "3", "1", "100", "20", "50", "40", and "0.9". The cell containing "51" is highlighted with a green border.

- Step 2: revise `scenario_work_zone.csv`

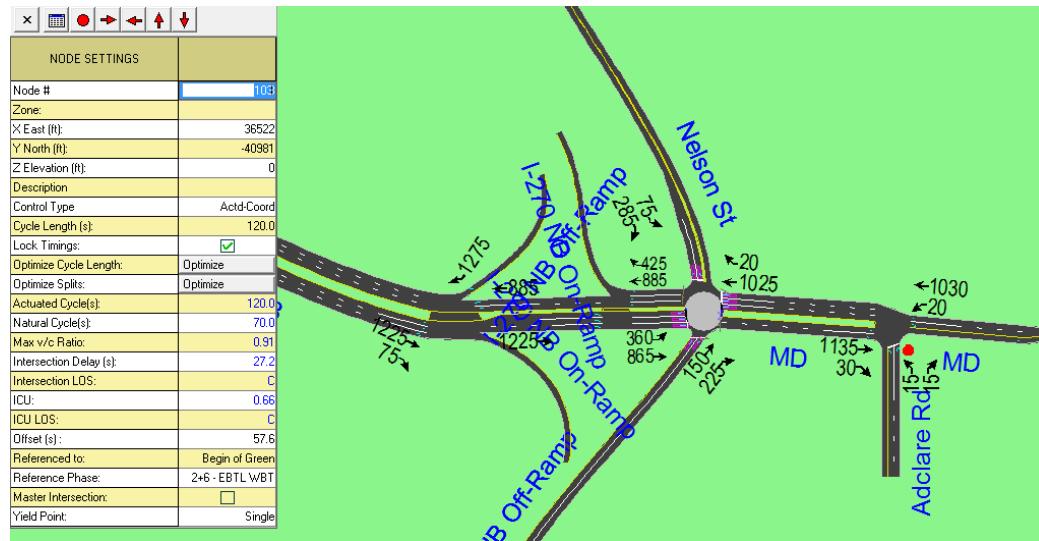
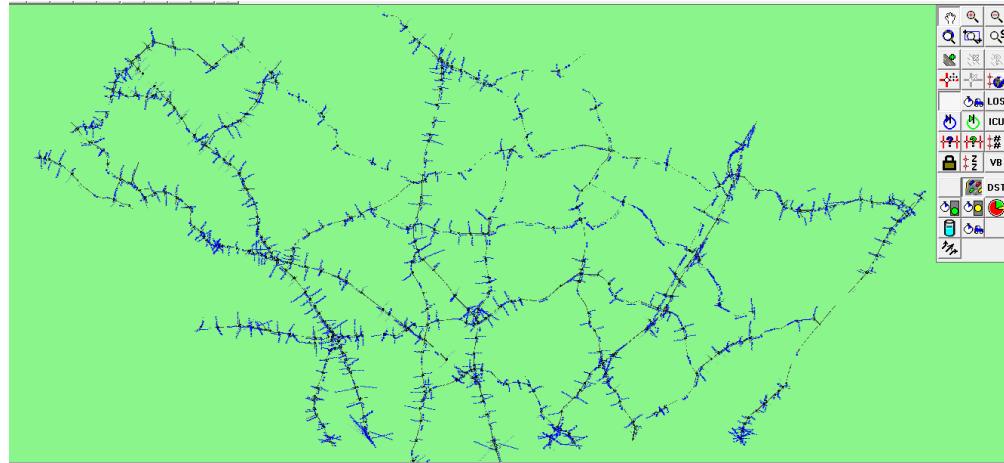
Table 5. Input data of Scenario\_Work\_Zone.csv

Link	Scenario No	Start Day	End Day	Start Time in Min	End Time in min	Capacity Reduction Percentage (%)	Speed Limit
[5112,5589]	0	51	51	0	1440	50	50
[5589,5114]	0	51	51	0	1440	50	50

# Synchro Signal Dataset

## Existing Data

### (1) Synchro Files



Settings:

- ✓ Node Settings
- ✓ Lane Settings
- ✓ Volume Settings
- ✓ Timing Settings
- ✓ Phasing Settings

# Dataset

## Existing Data

### (1) Synchro Files (\*.syn)

LANE SETTINGS	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lanes and Sharing (#RL)	↑	↑↑			↑↑↑					↑		↑
Traffic Volume (vph)	360	865	0	0	1025	20	0	150	225	75	0	285
Street Name	MD 28			MD 28			I-270 NB Off-Ramp			Nelson St		
Link Distance (ft)	—	164	—	—	368	—	—	777	—	—	687	—
Link Speed (mph)	—	30	—	—	30	—	—	30	—	—	30	—
Set Arterial Name and Speed	—	EB	—	—	WB	—	—	NB	—	—	SB	—
Travel Time (s)	—	3.7	—	—	8.4	—	—	17.7	—	—	15.6	—
Ideal Satd. Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)	—	0	—	—	0	—	—	0	—	—	0	—
Area Type CBD	—	□	—	—	□	—	—	□	—	—	□	—
Storage Length (ft)	0	—	0	0	—	0	0	—	510	0	—	125
Storage Lanes (#)	—	—	—	—	—	—	—	—	1	—	—	1
Right Turn Channelized	—	—	None	—	—	None	—	—	None	—	—	None
Curb Radius (ft)	—	—	—	—	—	—	—	—	—	—	—	—
Add Lanes (#)	—	—	—	—	—	—	—	—	—	—	—	—
Lane Utilization Factor	1.00	0.95	—	—	0.91	—	—	1.00	1.00	1.00	—	1.00
Right Turn Factor	1.000	1.000	—	—	0.997	—	—	1.000	0.850	1.000	—	0.850
Left Turn Factor (prot)	0.950	1.000	—	—	1.000	—	—	1.000	1.000	0.950	—	1.000

### Settings:

- ✓ Node Settings
- ✓ Lane Settings
- ✓ Volume Settings
- ✓ Timing Settings
- ✓ Phasing Settings

# Dataset

## Existing Data

### (1) Synchro Files (\*.syn)

VOLUME SETTINGS	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lanes and Sharing (#RL)	1	2						1				
Traffic Volume (vph)	360	865	0	0	1025	20	0	150	225	75	0	285
Conflicting Peds. (#/hr)	0	—	0	0	—	0	0	—	0	0	—	0
Conflicting Bicycles (#/hr)	—	—	0	—	—	0	—	—	0	—	—	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	2	2	2	2	2	2	2	2	2	2	2	2
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Adj. Parking Lane?	□	□	□	□	□	□	□	□	□	□	□	□
Parking Maneuvers (#/hr)	—	—	—	—	—	—	—	—	—	—	—	—
Traffic from mid-block (%)	—	0	—	—	0	—	—	0	—	—	0	—
Link OD Volumes	—	EB	—	—	WB	—	—	—	—	—	—	—
Adjusted Flow (vph)	391	940	0	0	1114	22	0	163	245	82	0	310
Traffic in shared lane (%)	—	—	—	—	—	—	—	—	—	—	—	—
Lane Group Flow (vph)	391	940	0	0	1136	0	0	163	245	82	0	310

Settings:

- ✓ Node Settings
- ✓ Lane Settings
- ✓ Volume Settings
- ✓ Timing Settings
- ✓ Phasing Settings

# Dataset

## Existing Data

### (1) Synchro Files (\*.syn)

NODE SETTINGS		TIMING SETTINGS													
		EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	PED	HOLD
Node #:	103														
Zone:															
X East (ft):	36522														
Y North (ft):	-40981														
Z Elevation (ft):	0														
Description:															
Control Type:	Actd-Coord														
Cycle Length (s):	120.0														
Lock Timings:	<input checked="" type="checkbox"/>														
Optimize Cycle Length:	Optimize														
Optimize Spfts:	Optimize														
Actuated Cycle(s):	120.0														
Natural Cycles(s):	70.0														
Max v/c Ratio:	0.91														
Intersection Delay (s):	27.2														
Intersection LOS:	C														
ICU:	0.66														
ICU LOS:	C														
Offset (s):	57.6														
Referenced to:	Begin of Green														
Reference Phase:	2+6 - EBTL WBT														
Master Intersection:	<input type="checkbox"/>														
Yield Point:	Single														
?		81 s													
?															
?		23 s													
?															
?		50 s													
?															

## Settings:

- ✓ Node Settings
- ✓ Lane Settings
- ✓ Volume Settings
- ✓ Timing Settings
- ✓ Phasing Settings

# Dataset

## Existing Data

### (1) Synchro Files (\*.syn)

NODE SETTINGS		PHASING SETTINGS					
		2-EBL	5-EBL	6-WBT	8-NBT	9-SBL	
Node #	103	10.0	3.0	10.0	3.0	3.0	
Zone:		21.0	9.0	21.0	21.0	8.0	
X East (ft):	36522	81.0	23.0	58.0	21.0	18.0	
Y North (ft):	-40981	4.0	4.0	4.0	4.0	4.0	
Z Elevation (ft):	0	1.0	1.0	1.0	1.0	1.0	
Description		—	□	✓	—	—	
Control Type	Actd-Coord	—	✓	✓	—	—	
Cycle Length (s):	120.0	3.0	3.0	3.0	3.0	3.0	
Lock Timings:	✓	3.0	3.0	3.0	3.0	3.0	
Optimize Cycle Length:	Optimize	0.0	0.0	0.0	0.0	0.0	
Optimize Splits:	Optimize	0.0	0.0	0.0	0.0	0.0	
Actuated Cycle 90th (s):	120.0	C-Max	None	C-Max	None	None	
Actuated Cycle 70th (s):	120.0	Pedestrian Phase	□	□	✓	□	□
Actuated Cycle 50th (s):	120.0	Walk Time (s)	—	—	2.0	—	—
Actuated Cycle 30th (s):	120.0	Flash Don't Walk (s)	—	—	2.0	—	—
Actuated Cycle 10th (s):	120.0	Pedestrian Calls (#/hr)	—	—	0	—	—
Natural Cycle(s):	70.0	Dual Entry?	✓	□	✓	✓	□
Max v/c Ratio:	0.91	Inhibit Max?	✓	✓	✓	✓	✓
Intersection Delay (s):	27.2	90th %ile Green Time (s)	76 cd	18 mx	53 cd	16 mx	13 mx
Intersection LOS:	C	70th %ile Green Time (s)	76 cd	18 mx	53 cd	16 mx	13 gp
ICU:	0.66	50th %ile Green Time (s)	78 cd	20 mx	53 cd	16 mx	11 gp
ICU LOS:	C	30th %ile Green Time (s)	80 cd	22 mx	53 cd	16 gp	9 gp
Offset (s):	57.6	10th %ile Green Time (s)	85 cd	19 gp	62 cd	13 gp	7 gp

### Settings:

- ✓ Node Settings
- ✓ Lane Settings
- ✓ Volume Settings
- ✓ Timing Settings
- ✓ Phasing Settings

# Dataset

## Existing Data

### (2) Synchro Exported Files (\*.csv )

	A	B	C	D	E	F	G
1	[Network]						
2	Network Settings						
3	RECORDNAME	DATA					
4	Metric		0				
5	yellowTime		4				
6	allRedTime		1				
7	Walk		5				
8	DontWalk		11				
9	HV		0.02				
10	PHF		0.92				
11	DefWidth		12				
12	DefFlow		1900				
13	vehLength		25				
14	growth		1				
15	PedSpeed		4				
16	LostTimeAdjust		0				
17	ScenarioDate		11/7/2011				
18	ScenarioTime		8:00 AM				
19							

Sections:

- ✓ [Network]
- ✓ [Nodes]
- ✓ [Links]
- ✓ [Lanes]
- ✓ [Timeplans]
- ✓ [Phases]

# Dataset

## Existing Data

### (2) Synchro Exported Files (\*.csv )

[Nodes]										
Node Data										
INTID	TYPE	X	Y	Z	DESCRIPTION	CBD	Inside Radius	Outside Radius	Roundabout	Circle Speed
1	1	105026	-30571	0						
2	1	103164	-48410	0						
3	2	83174	-38297	466						
4	2	83844	-37684	459						
5	2	85015	-37379	472						
6	2	86243	-38458	416						
7	1	100227	-42310	0						
8	1	99783	-43062	0						
9	1	100609	-42570	0						
10	2	88438	-37380	478						
11	1	98098	-44090	0						
12	1	102457	-48723	0						
13	1	88526	-55797	0						
14	2	89958	-35498	470						
15	1	107268	-49134	0						
16	2	92465	-36305	457						
17	2	93703	-37703	423						
18	2	94433	-39245	411						
19	2	96033	-40616	390						
20	2	98500	-41348	442						
21	2	100518	-43478	379						
22	2	101291	-44287	374						

### Sections:

- ✓ [Network]
- ✓ [Nodes]
- ✓ [Links]
- ✓ [Lanes]
- ✓ [Timeplans]
- ✓ [Phases]

# Dataset

## Existing Data

### (2) Synchro Exported Files (\*.csv )

[Links]									
Link Data									
RECORDNAME	INTID	NB	SB	EB	WB	NE	NW	SE	SW
Up ID	1					5027			
Lanes	1				*1				
Name	1								
Distance	1					451			
Speed	1					30			
Time	1					10.3			
Grade	1					0			
Median	1					0			
Offset	1					0			
TWLTL	1					0			
Crosswalk Wi	1					16			
Mandatory Di	1					200			
Mandatory Di	1					1320			
Positioning l	1					880			
Positioning l	1					1760			
Curve Pt X	1					105195			
Curve Pt Y	1					-30608			
Curve Pt Z	1					0			

### Sections:

- ✓ [Network]
- ✓ [Nodes]
- ✓ [Links]
- ✓ [Lanes]
- ✓ [Timeplans]
- ✓ [Phases]

# Dataset

## Existing Data

### (2) Synchro Exported Files (\*.csv )

[Lanes]															
Lane Group Data															
RECORDNAME	INTID	NBU	NEL2	NBL	NET	NBR	NBR2	SBL2	SEL	SBT	SBR	SBR2	EBU	EBL2	EBL
Up Node	36	13		13	13	13				255	255	255	508		508
Dest Node	36	13		508	255	65				65	13	508	508		255
Lanes	36	0		0	1	0				0	1	0	0		0
Shared	36			0	2					0	2		0		0
Width	36	12		12	12	12				12	12	12	12		12
Storage	36														
Taper	36														
StLanes	36														
Grade	36														
Speed	36			30						30					
SignControl	36			1						1					
IdealFlow	36	1600		1600	1600	1600				1600	1600	1600	1600		1600
SatFlow	36	0		0	1518	0				0	1424	0	0		0
SatFlowPerm	36	0		0	1518	0				0	1424	0	0		0
Allow RTOR	36	1		1	1	1				1	1	1	1		1
SatFlowRTOR	36	0		0	0	0				0	0	0	0		0
Volume	36	0		0	65	20				0	30	65	0		0
Peds	36	0		0	0	0				0	0	0	0		0
Bicycles	36	0		0	0	0				0	0	0	0		0

## Sections:

- ✓ [Network]
- ✓ [Nodes]
- ✓ [Links]
- ✓ [Lanes]
- ✓ [Timeplans]
- ✓ [Phases]

# Dataset

## Existing Data

### (2) Synchro Exported Files (\*.csv )

[Timeplans]		
Timing Plan Settings		
RECORDNAME	INTID	DATA
Control Type	47	3
Cycle Length	47	150
Lock Timings	47	0
Referenced To	47	0
Reference Phas	47	1
Offset	47	0
Master	47	0
Yield	47	0
Node 0	47	47
Node 1	47	0
Control Type	102	3
Cycle Length	102	120
Lock Timings	102	1
Referenced To	102	0
Reference Phas	102	206
Offset	102	19.2
Master	102	0
Yield	102	0
Node 0	102	102
Node 1	102	0
Control Type	103	3

### Sections:

- ✓ [Network]
- ✓ [Nodes]
- ✓ [Links]
- ✓ [Lanes]
- ✓ [Timeplans]
- ✓ [Phases]

# Dataset

## Existing Data

### (2) Synchro Exported Files (\*.csv )

[Phases]	INTID	D1	D2	D3	D4	D5	D6	D7	D8	D9	D10	D11	D
Phasing Data													
RECORDNAME	INTID	D1	D2	D3	D4	D5	D6	D7	D8	D9	D10	D11	D
ERP	47	111	112	211	212	121	122	221	222				
MinGreen	47	7	5										
MaxGreen	47	109	30										
VehExt	47	3	3										
TimeBeforeReduc	47	0	0										
TimeToReduce	47	0	0										
MinGap	47	3	3										
Yellow	47	4	4										
AllRed	47	2	1										
Recall	47	3	3										
Walk	47	2											
DontWalk	47	2											
PedCalls	47	10											
MinSplit	47	22	22										
DualEntry	47	1	1										
InhibitMax	47	1	1										
Start	47	0	115										
End	47	115	0										
Yield	47	109	145										
Yield170	47	107	145										
LocalStart	47	0	115										
LocalYield	47	109	145										

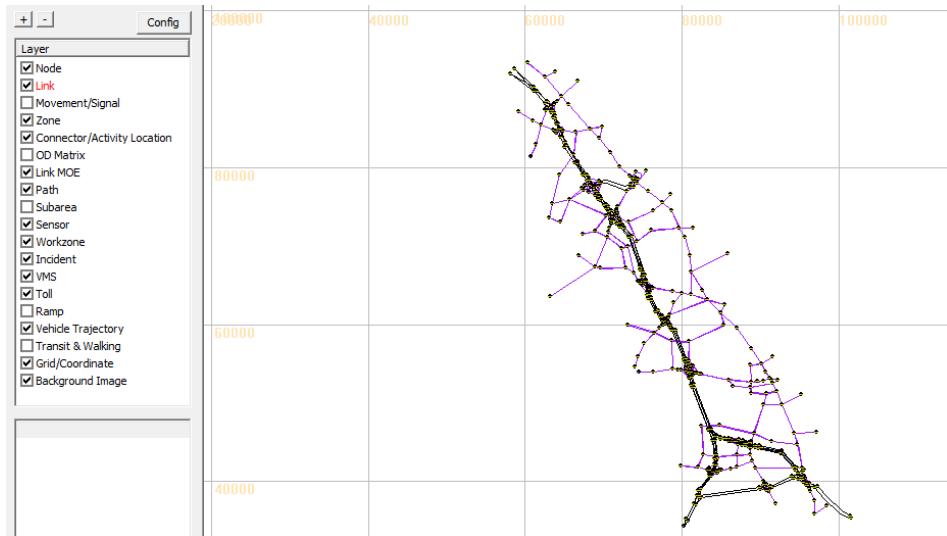
### Sections:

- ✓ [Network]
- ✓ [Nodes]
- ✓ [Links]
- ✓ [Lanes]
- ✓ [Timeplans]
- ✓ [Phases]

# Dataset

## Existing Data

(2) DTALite Files (\*.tnp )



Data:

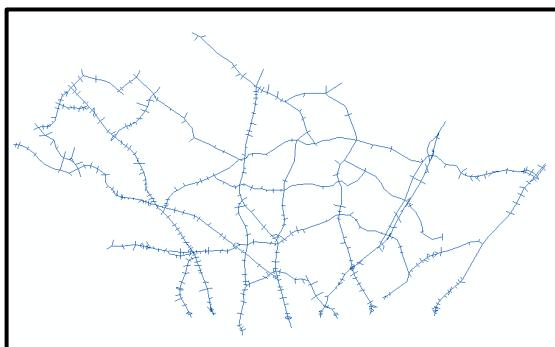
- ✓ Node
- ✓ Link
- ?

Missing Data about  
Signal Settings  
(e.g. movement, signal)

# Dataset

## What should we do?

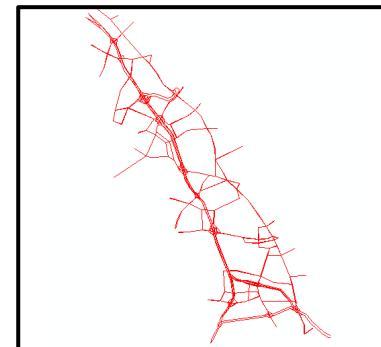
- obtain the necessary dataset of signalized intersections from Synchro exported file
- Prepare input files for simulation in DTALite



Synchro Net  
(dataset)

Nodes, Links, Phases...  
→

necessary dataset for  
signalized intersections  
in subarea



DTALite Input Files  
(subarea)

# Dataset

## Necessary Input Files in DTALite

- Input\_movement.csv

node_id	up_node_id	dest_node_id	turn_type	prohibited_flag
5	1	2	Left	0
5	2	3	Left	0
5	3	4	Left	0
5	4	1	Left	0
5	1	3	Through	0
5	2	4	Through	0
5	3	1	Through	0
5	4	2	Through	0

# Dataset

## Necessary Input Files in DTALite

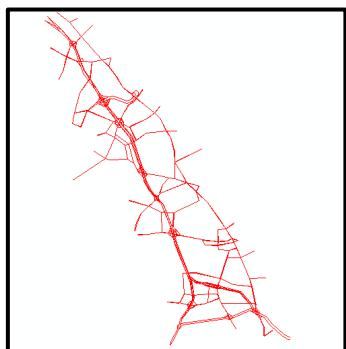
- Input\_signal.csv

from_node_id	to_node_id	plan_no	plan_starttime_in_sec	plan_endtime_in_sec	to_node_cycle_in_sec	to_node_offset_in_sec	through_saturation_flow_rate_per_hour_per_lane	through_green_start_time_in_sec	through_green_end_time_in_sec	left_saturation_flow_rate_per_hour_per_lane	left_green_start_time_in_sec	left_green_end_time_in_sec
1	5	1	1	86400	190	0	1800	1	118	1800	1	118
2	5	1	1	86400	190	0	1800	126	186	1800	126	186
3	5	1	1	86400	190	0	1800	1	118	1800	1	118
4	5	1	1	86400	190	0	1800	126	186	1800	126	186

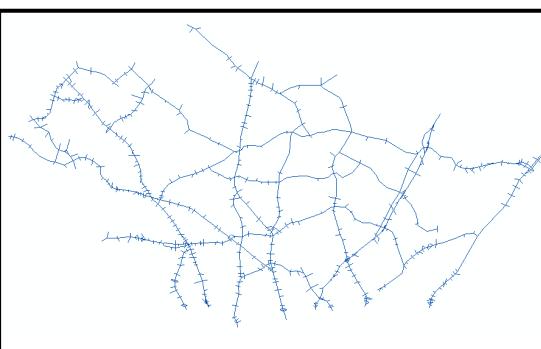
# Dataset

## Data Deficiency

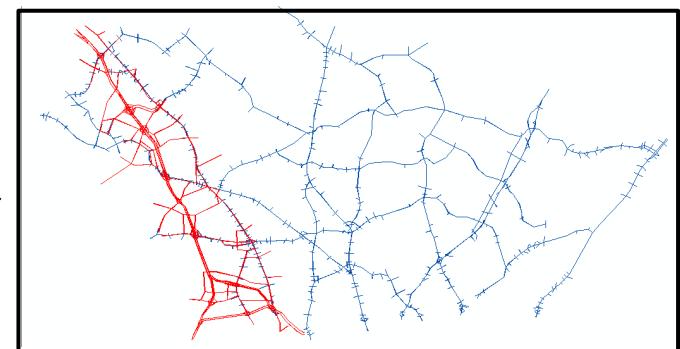
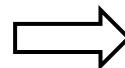
Transfer Synchro network (\*.syn) and DTALite network (\*.tnp ) to GIS files respectively, and match them in the same interface



DTALite Net



Synchro Net

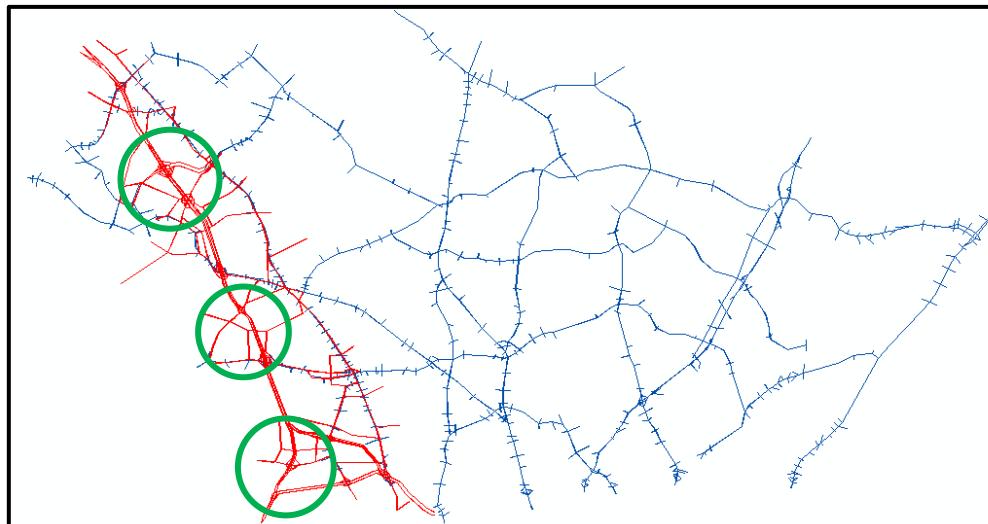


Match in ArcGIS

# Dataset

## Data Deficiency

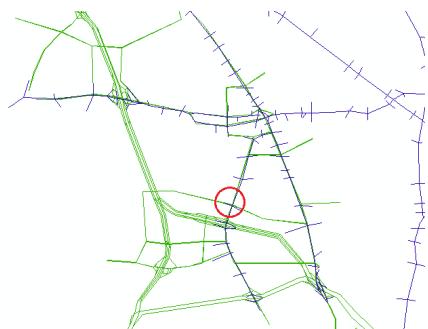
But not all dataset of intersections in subarea is available from Synchro network ( as shown in green circles blew)



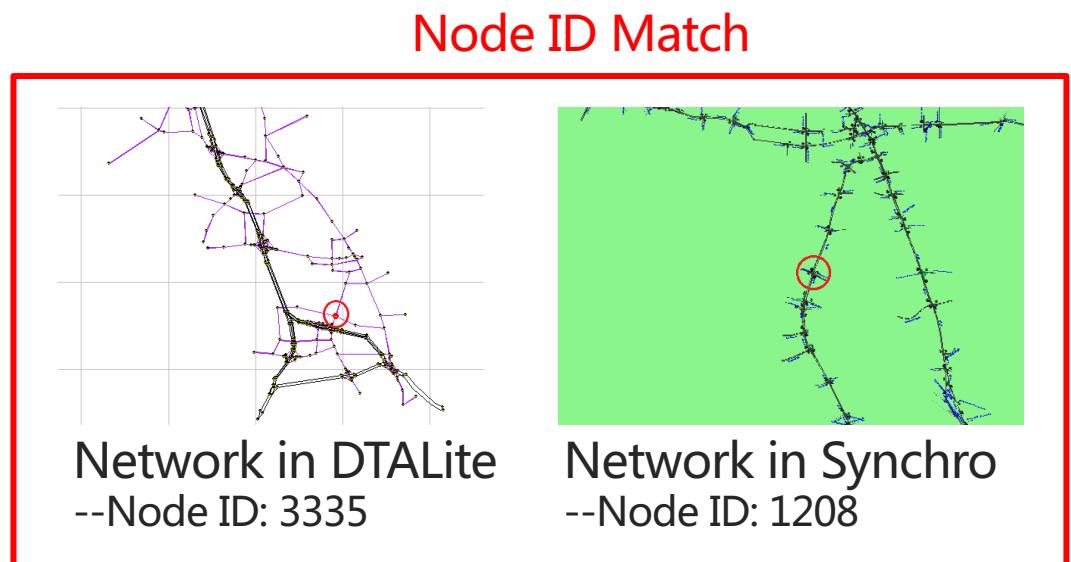
# Data Extraction

## Step1: Node ID Match

Match Node ID for intersections in subarea



Sample intersection in ArcGIS  
--DTALite Net (Green)  
--Synchro Net (Blue)



# Data Extraction

## Step2: Movement Match

VOLUME SETTINGS											
Lanes and Sharing (HPL)											
Traffic Volume (vph)	315	525	105	615	175	70	140	1265	135	50	1845
Conflicting Peds (#/hr)	0	—	0	0	—	0	0	—	0	0	0
Conflicting Bicycles (#/hr)	—	—	0	—	—	0	—	—	0	—	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	2	2	2	2	2	2	2	2	2	2	2
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0
Ad. Parking Lane?	□	□	□	□	□	□	□	□	□	□	□
Parking Maneuvers (#/hr)	—	—	—	—	—	—	—	—	—	—	—
Traffic from mid-block (%)	—	0	—	—	0	—	—	0	—	—	0
Link OD Volumes	—	—	—	—	—	—	NB	—	SB	—	—
Adjusted Flow (vph)	342	571	114	668	190	76	152	1375	147	54	2005
Traffic in shared lane (%)	—	—	—	—	—	—	—	—	—	—	—
Lane Group Flow (vph)	342	685	0	668	190	76	152	1375	147	54	2141
Lane Group Flow (vph)	342	685	0	668	190	76	152	1375	147	54	0

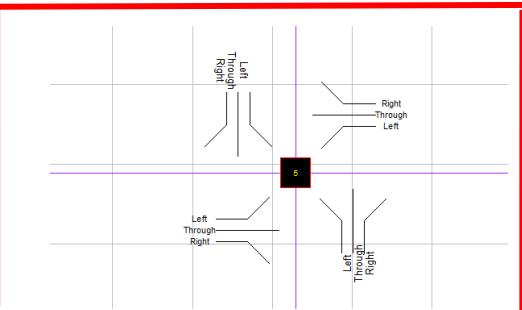
[Lanes]											
Lane Group Data											
RECORDNAME	INTID	NBL1	NBL2	NEL	NET	NER	NER2	SEL1	SEL	SET	SER
Up Node	36	13	—	13	13	13	—	255	255	255	255
Dest Node	36	13	—	508	255	65	—	65	13	508	—
Lanes	36	0	—	0	1	0	—	0	1	0	—
Shared	36	—	—	0	2	—	—	0	2	—	—
Width	36	12	—	12	12	12	—	12	12	12	—
Storage	36	—	—	—	—	—	—	—	—	—	—
Taper	36	—	—	—	—	—	—	—	—	—	—
StLanes	36	—	—	—	—	—	—	—	—	—	—
Grade	36	—	—	—	—	—	—	—	—	—	—
Speed	36	—	—	—	30	—	—	—	30	—	—
SignControl	36	—	—	—	1	—	—	—	1	—	—
IdealFlow	36	1600	—	1600	1600	1600	—	1600	1600	1600	—
SatFlow	36	0	—	0	1518	0	—	0	1424	0	—
SatFlowPerm	36	0	—	0	1518	0	—	0	1424	0	—
Allow RTOR	36	1	—	1	1	1	—	1	1	1	—

Synchro Data

Intersection Node ID  
Up Node ID  
Dest Node ID  
Number of Lanes

Input\_movement.csv

Node ID  
Up Node ID  
Dest Node ID  
Turn Type

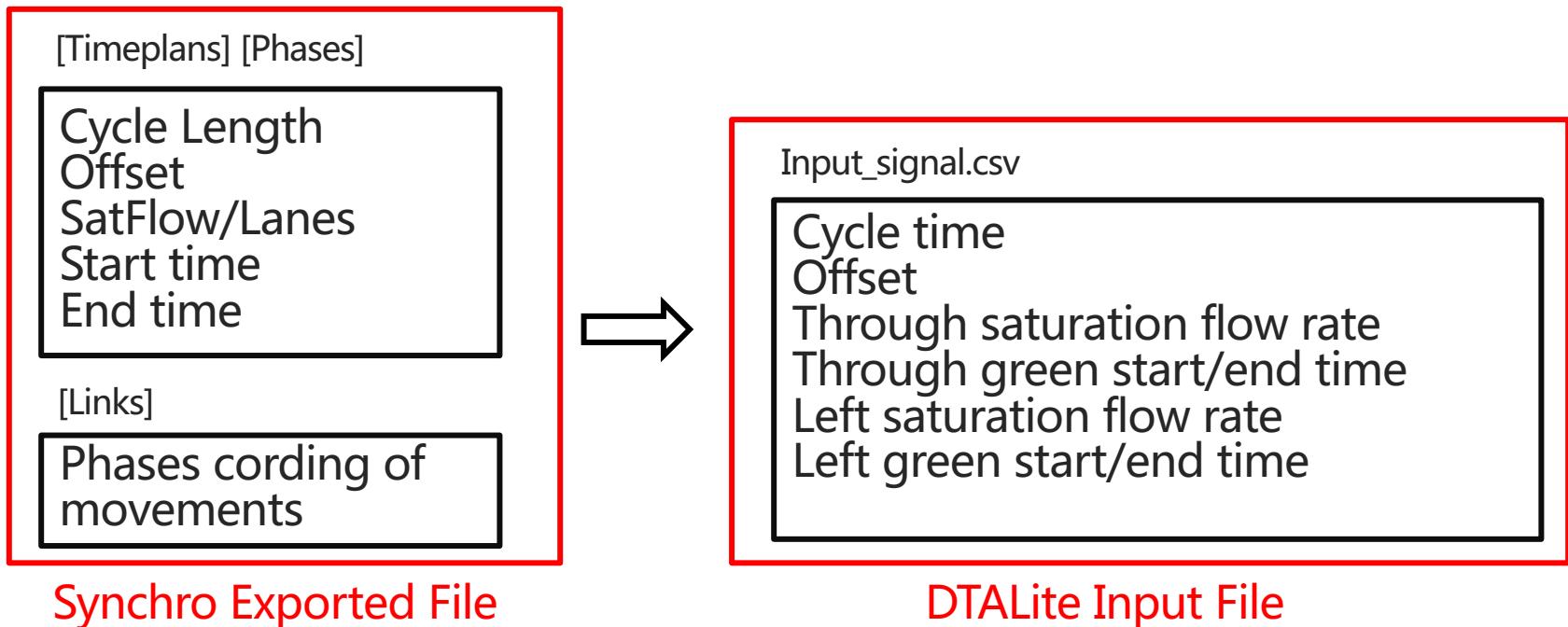


A	B	C	D	E	F
node_id	up_node_id	dest_node_id	name	turn_type	prohibited_flag
103	1081	1081	U-Turn	1	
103	1081	1003	Left	1	
103	1081	1080	Through	0	
103	1081	1004	Right	0	
103	1080	1004	Left	0	
103	1080	1081	Through	1	
103	1080	1003	Right	0	
103	1003	1003	U-Turn	1	
103	1003	1080	Left	0	
103	1003	1004	Through	0	
103	1003	1081	Right	1	
103	1004	1004	U-Turn	1	
103	1004	1081	Left	1	
103	1004	1003	Through	0	
103	1004	1080	Right	1	

DTALite Data

# Data Extraction

## Step3: Signal Data Match



# Data Extraction

# Step 4: Input Files Preparation

## Input\_movement.csv

	A	B	C	D	E	F	G	H
1	node_id	up_node_id	dest_node_id	name	turn_type	prohibited_flag		
2	103	1081	1081		U-Turn	1		
3	103	1081	1003		Left	1		
4	103	1081	1080		Through	0		
5	103	1081	1004		Right	0		
6	103	1080	1004		Left	0		
7	103	1080	1081		Through	1		
8	103	1080	1003		Right	0		
9	103	1003	1003		U-Turn	1		
10	103	1003	1080		Left	0		
11	103	1003	1004		Through	0		
12	103	1003	1081		Right	1		
13	103	1004	1004		U-Turn	1		
14	103	1004	1081		Left	1		
15	103	1004	1003		Through	0		
16	103	1004	1080		Right	1		

## Input signal.csv