Workshop-Tennessee Project Implementation in Shelby County, TN

WISE Workshop

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TN TDOT Department of Transportation

THE UNIVERSITY OF MEMPHIS

Outline

- Data preparation
- Nexta/DynusT
- WISE Input
- Ongoing efforts

Steps

Extract (sub)network and demand from TransCAD

Use ArcGIS and or Matlab for error checking and excel prep

Fix node2link errors and import network/demand in Nexta and run DynusT

Create workzones/strategies (either in Nexta or in Excel file and convert to xml)

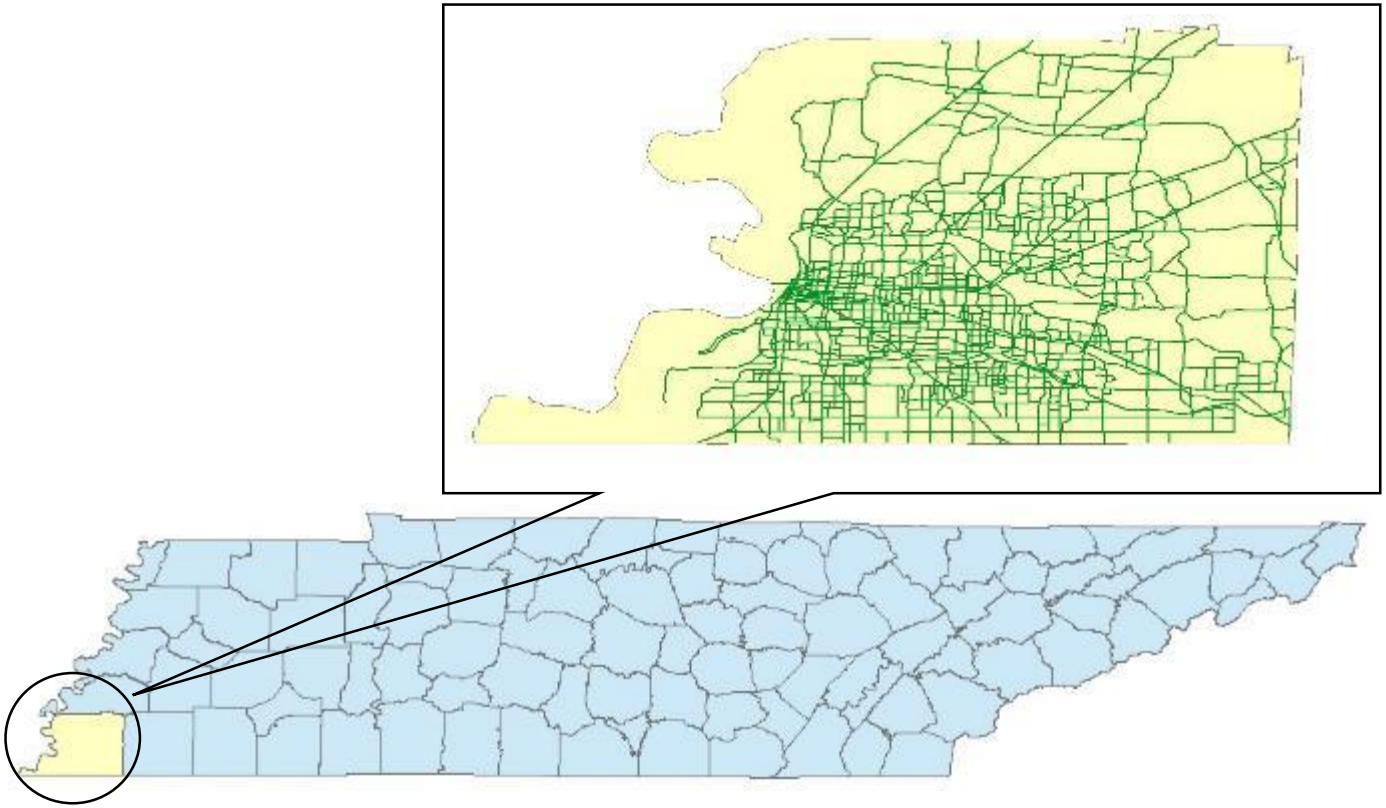
Input data to WISE and run

Testbed
Shelby County Network

SHELBY COUNTY

Frequency of Roadway Segments

Rural Interstates	**2**
Urban Interstates	**73**
Rural Principle Arterials	**16**
Urban Principle Arterials	**218**
Urban Freeways/Expressways	**62**
Rural Minor Arterials	**8**
Urban Minor Arterials	**501**
Rural Major collectors	**3**
Urban Collectors	**572**
Rural Minor Collector	**47**
Local Roads	**14661**



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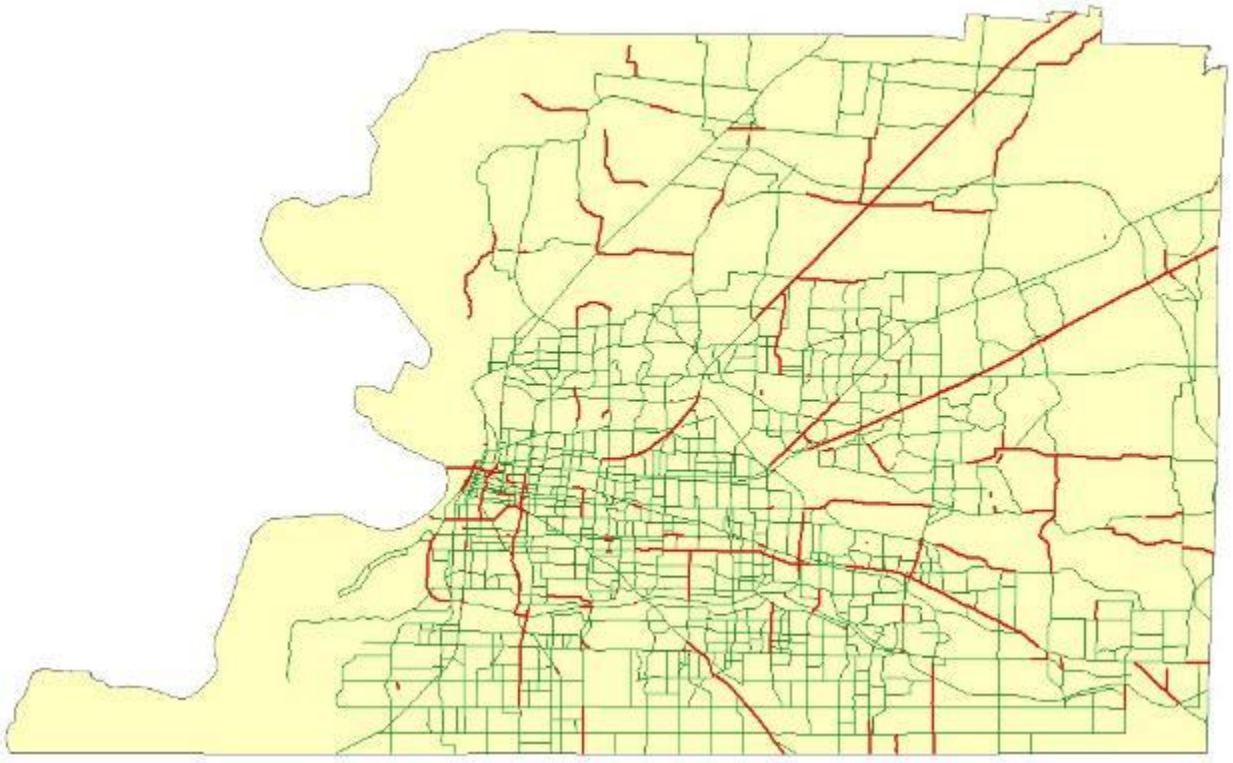
Testbed

Work zones

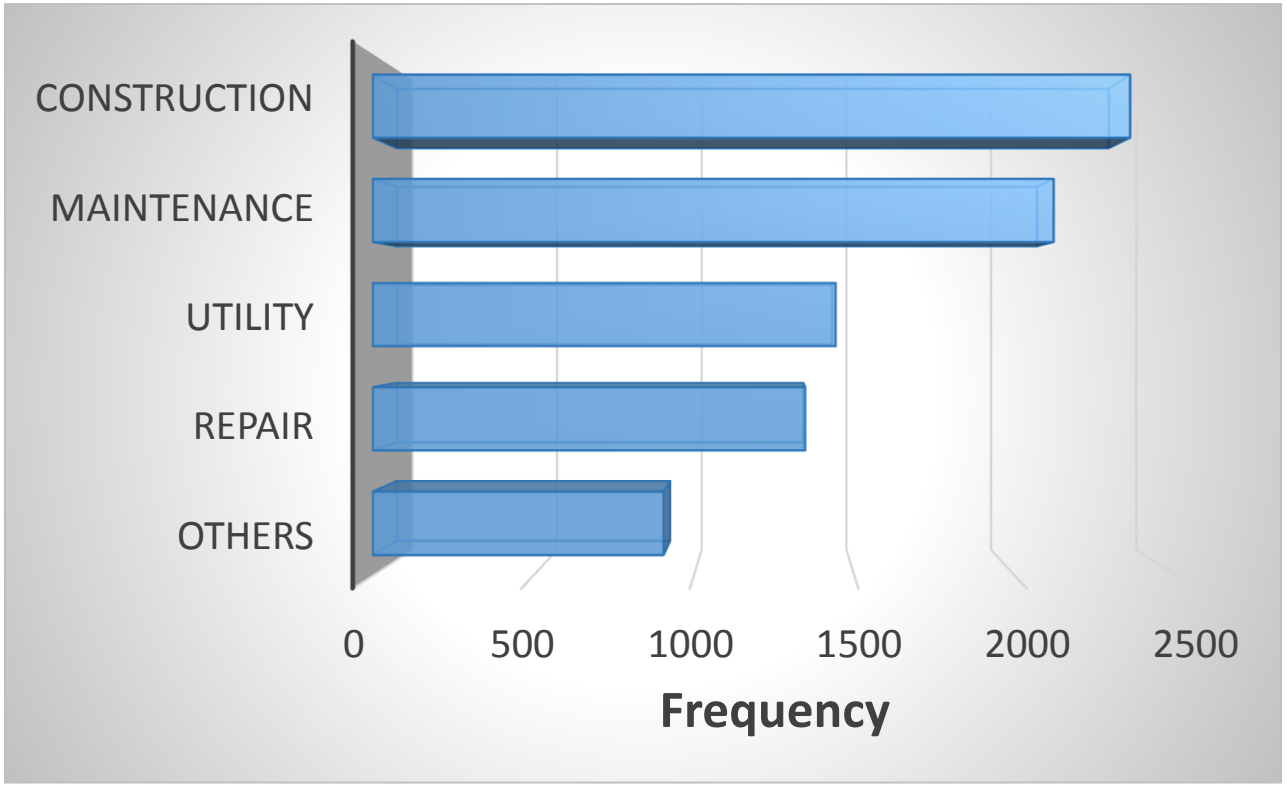
WORKZONES IN SHELBY COUNTY

Work Zone Type	Frequency
ACTIVE	487
LET	51
Total	**538**



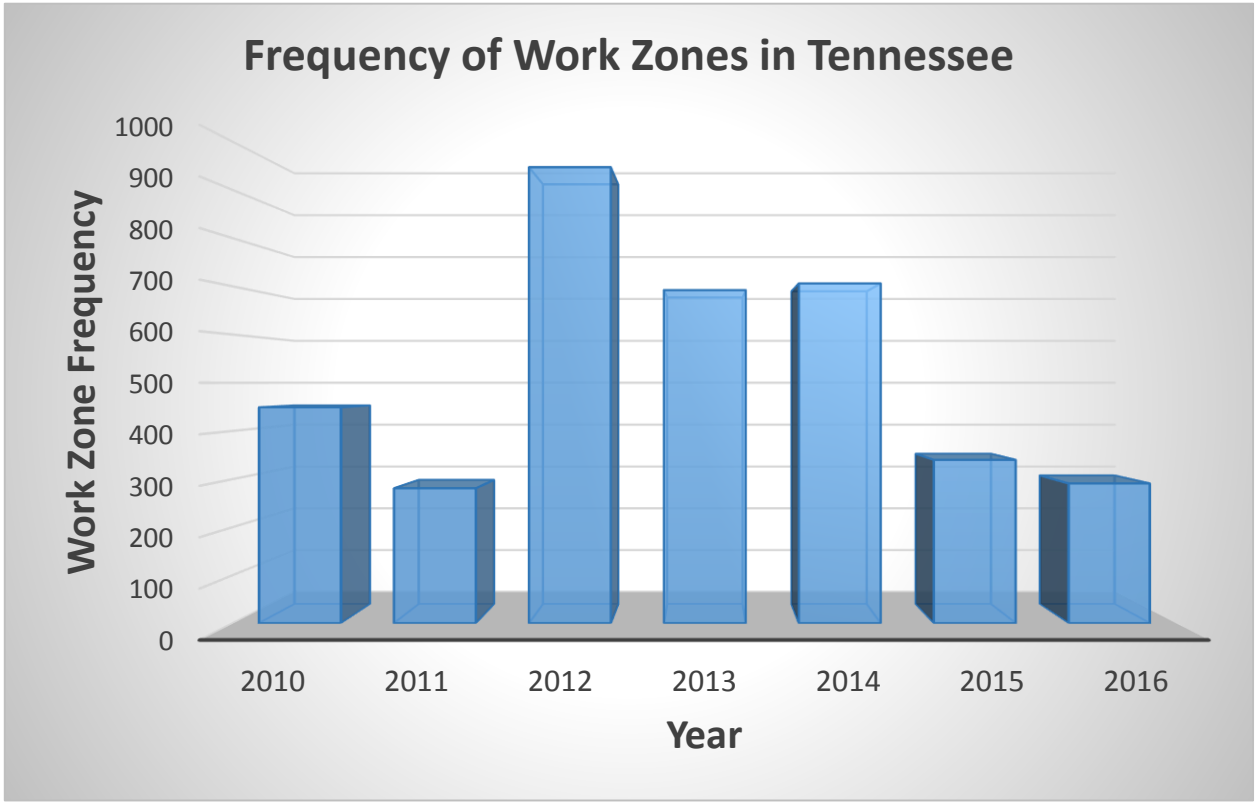
Testbed

Work zone characteristics



Testbed

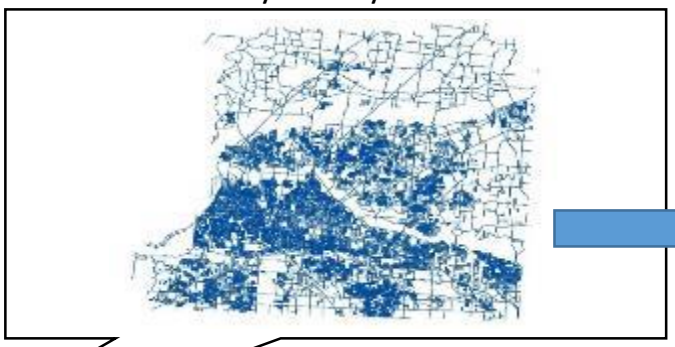
Work zone characteristics



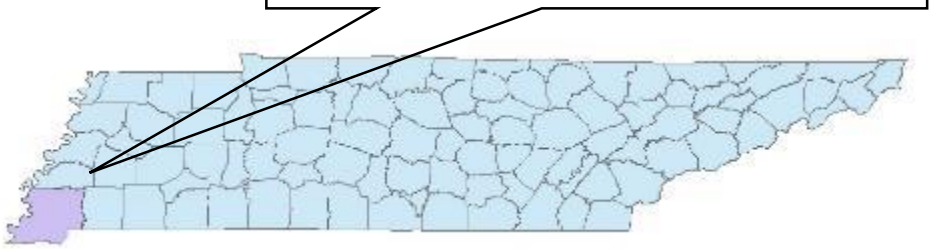
Testbed

Demand/Network Extraction

Shelby county in network

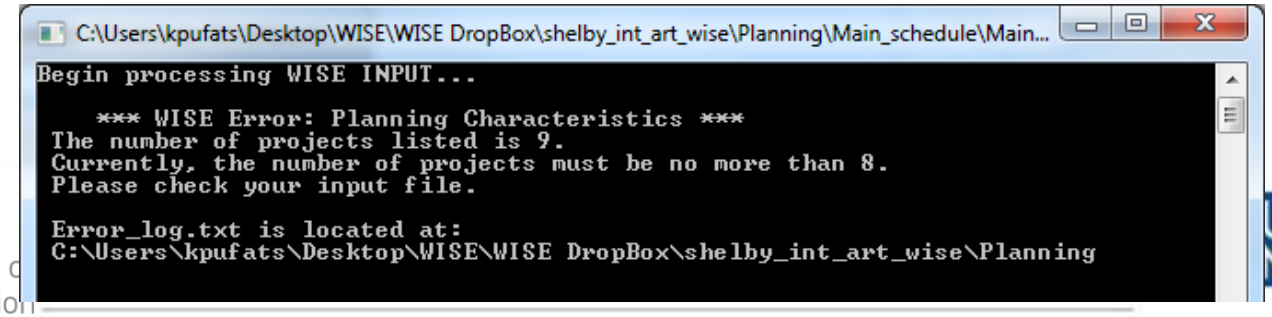


Abstract network



Shelby county in Tennessee

- **Demand: ODME or SubArea Analysis**
- **Export net in shape file**
- **Export demand in table (from, to, demand)**
- **NexTA limits: links (23,000), work zones (8)**



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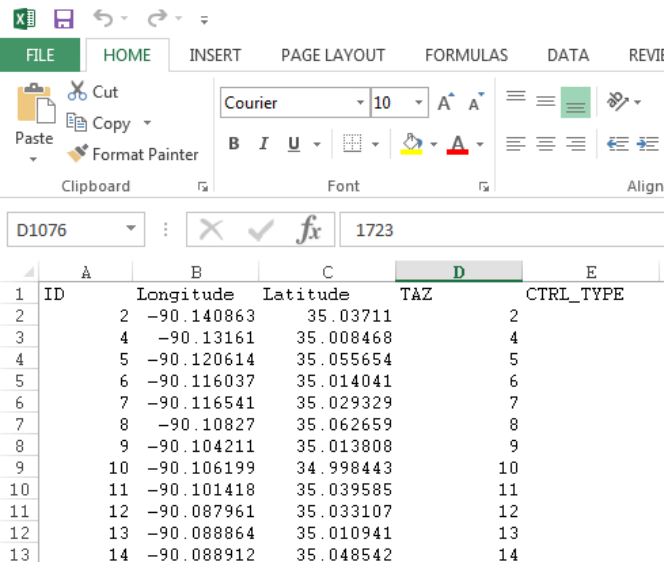
Nexta/DynusT

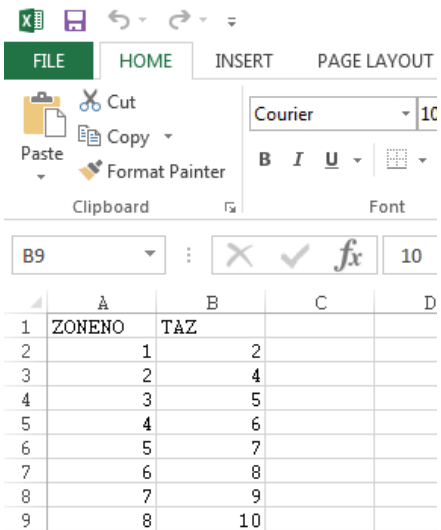
Nodes, Links, Zones, Signals

NODES



	A	B	C	D	E
1	ID	Longitude	Latitude	TAZ	CTRL_TYPE
2	2	-90.140863	35.03711	2	
3	4	-90.13161	35.008468	4	
4	5	-90.120614	35.055654	5	
5	6	-90.116037	35.014041	6	
6	7	-90.116541	35.029329	7	
7	8	-90.10827	35.062659	8	
8	9	-90.104211	35.013808	9	
9	10	-90.106199	34.998443	10	
10	11	-90.101418	35.039585	11	
11	12	-90.087961	35.033107	12	
12	13	-90.088864	35.010941	13	
13	14	-90.088912	35.048542	14	

ZONES TO TAZ



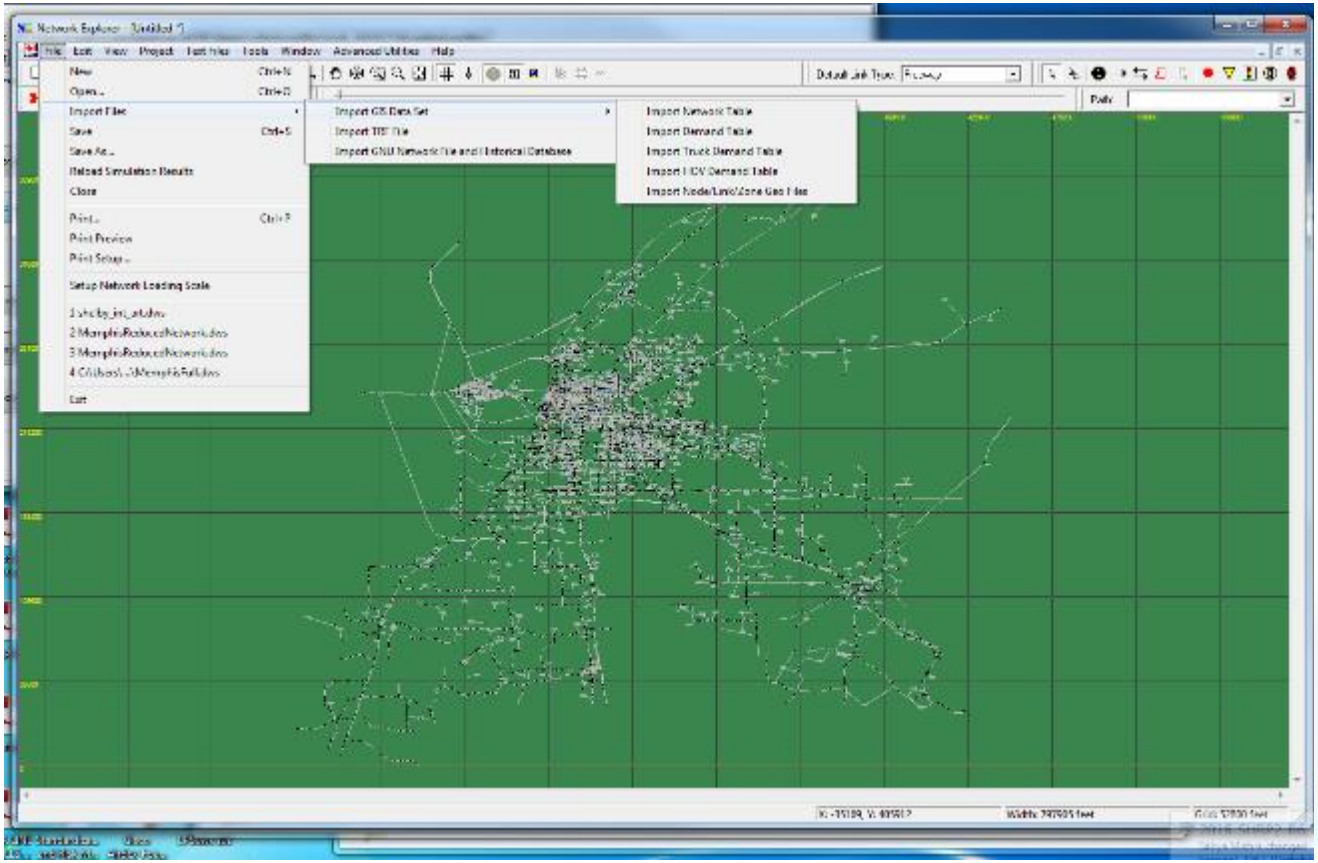
	A	B	C	D
1	ZONENO	TAZ		
2	1	2		
3	2	4		
4	3	5		
5	4	6		
6	5	7		
7	6	8		
8	7	9		
9	8	10		
10	9	11		
11	10	12		
12	11	13		
13	12	14		
14	13	15		
15	14	16		
16	15	19		

LINKS

	A	B	C	D	E	F	G	H
1	ID	Length	Dir	TYPE	LANES	TAZ	From_ID	To_ID
2	286	5060.183	1		1	1	2	104778
3	273	4652.477	1		1	1	4	100761
4	275	6683.435	1		1	1	4	116511
5	4748	2502.63	1		1	1	5	104777
6	4751	2502.414	1		1	1	5	104765
7	285	3345.535	1		1	1	7	105648
8	4744	2683.317	1		1	1	7	104776
9	4747	2322.551	1		1	1	7	124079
10	4758	6103.796	1		1	1	8	114685
11	5146	3418.335	1		1	1	8	104775
12	5594	2494.335	1		1	1	8	104765
13	5602	4576.535	1		1	1	8	104763
14	5738	2207.024	1		1	1	9	104801
15	5745	2564.459	1		1	1	9	113866
16	4762	2143.632	1		1	1	10	104636
17	4763	2802.165	1		1	1	10	104800
18	4767	2969.736	1		1	1	10	214350
19	5585	1564.253	1		1	1	11	113690

Nexta/DynusT

Create Network/Load DTA Demand

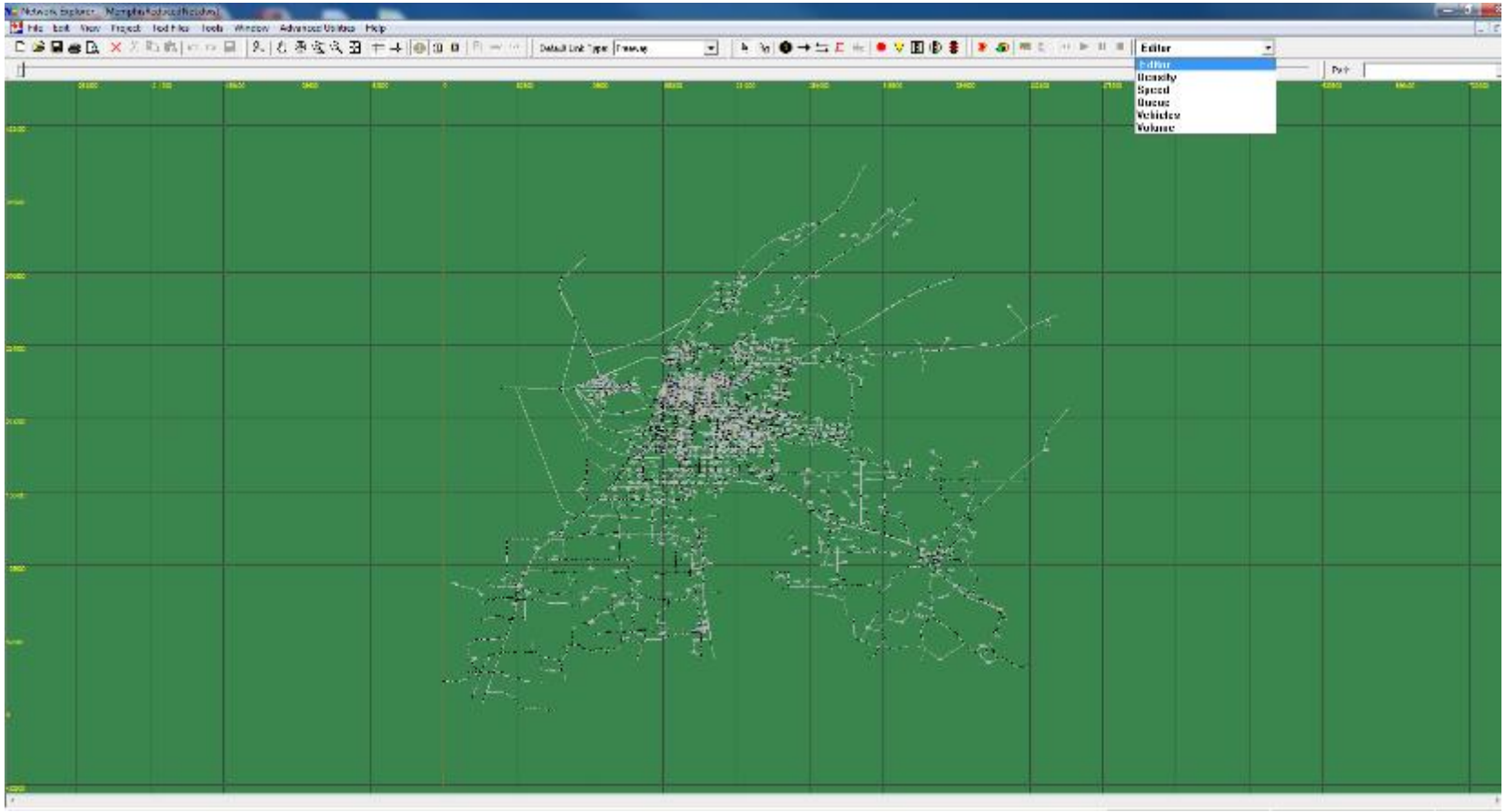


File Edit Format View Help

```
//# of OD demand zones

1783

//# of demand intervals

3

// length of demand interval

60

0.25 0.5 0.25


1,1,17.048342
1,2,0.270135
1,3,0.127261
1,4,0.103830
1,5,0.708613
1,6,0.143627
1,7,0.621479
1,8,0.033488
1,9,0.387423
1,10,0.129321
1,11,0.468115
1,12,0.260829
1,13,0.162640
1,14,0.251610
1,15,0.341884
```

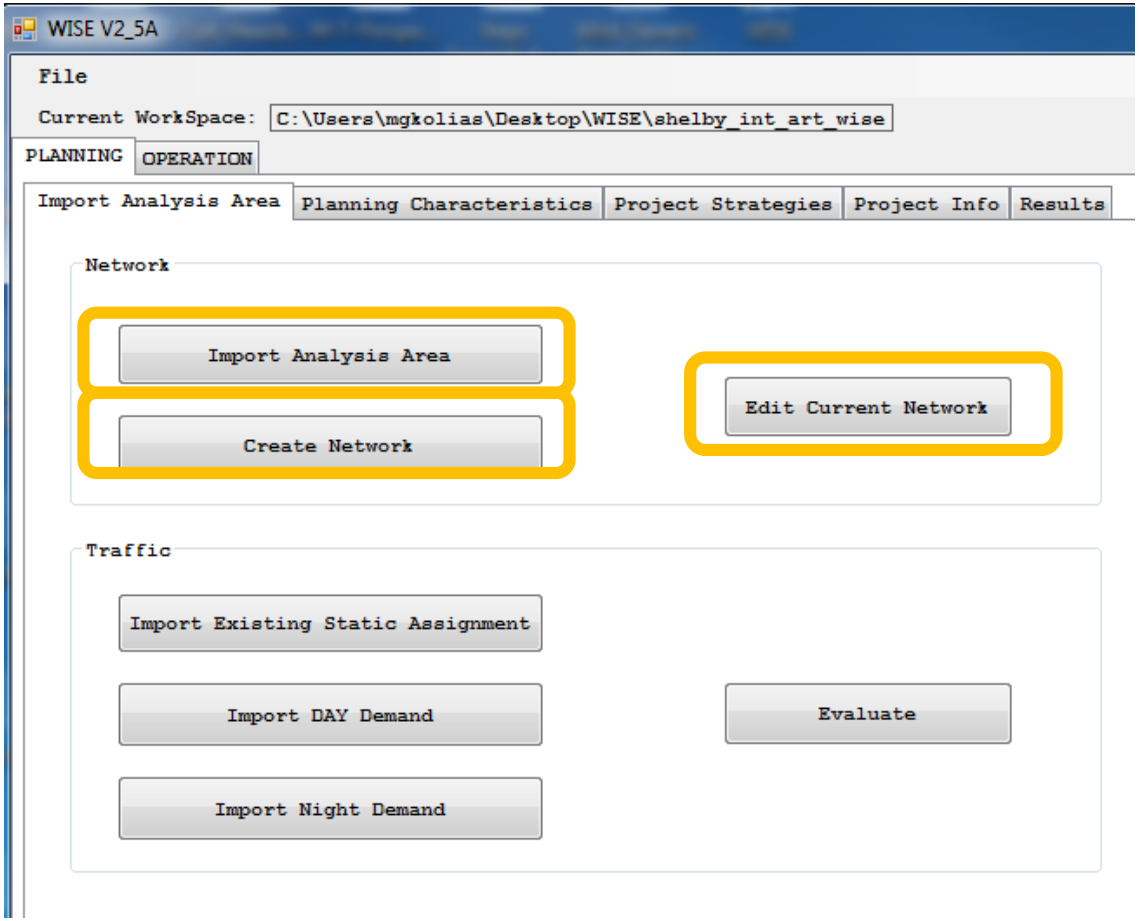
Nexta/DynusT

DTA Output



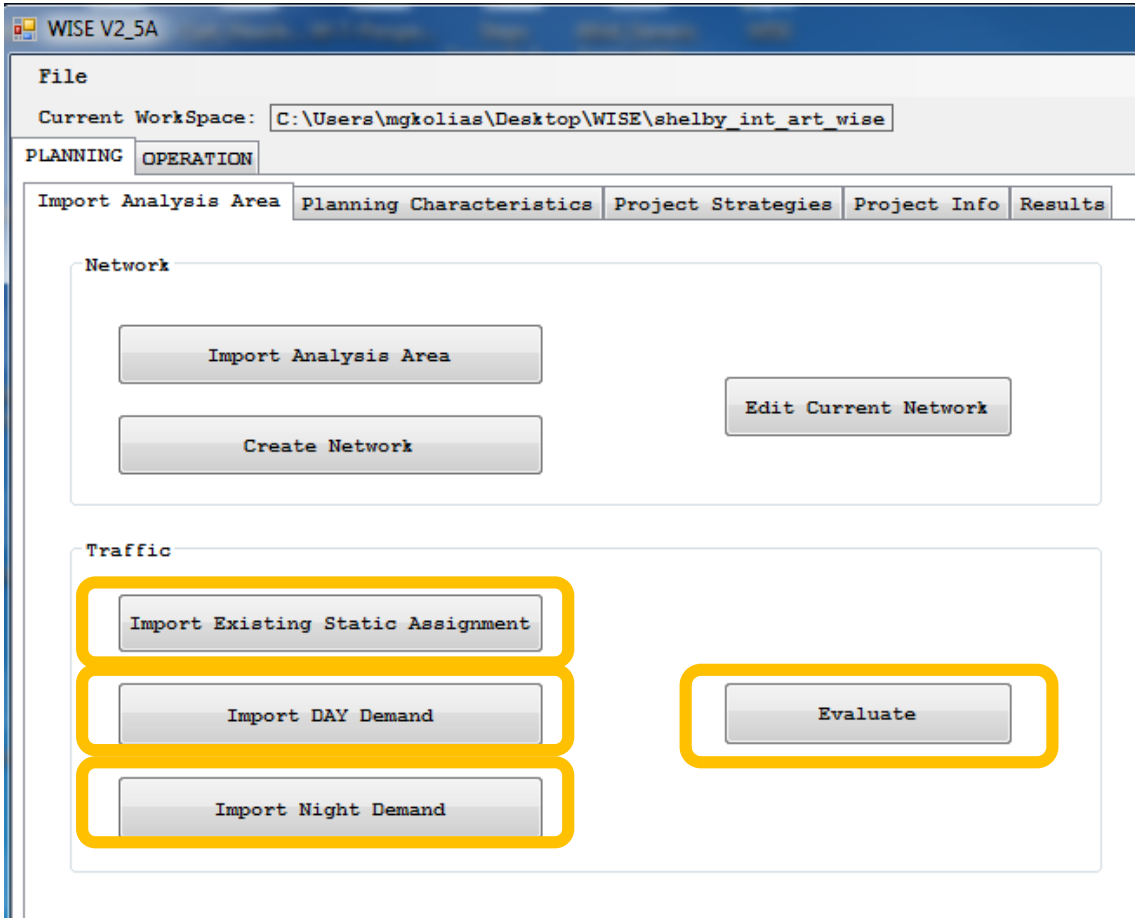
WISE: Traffic Diversion Analysis

Import network from Nexta



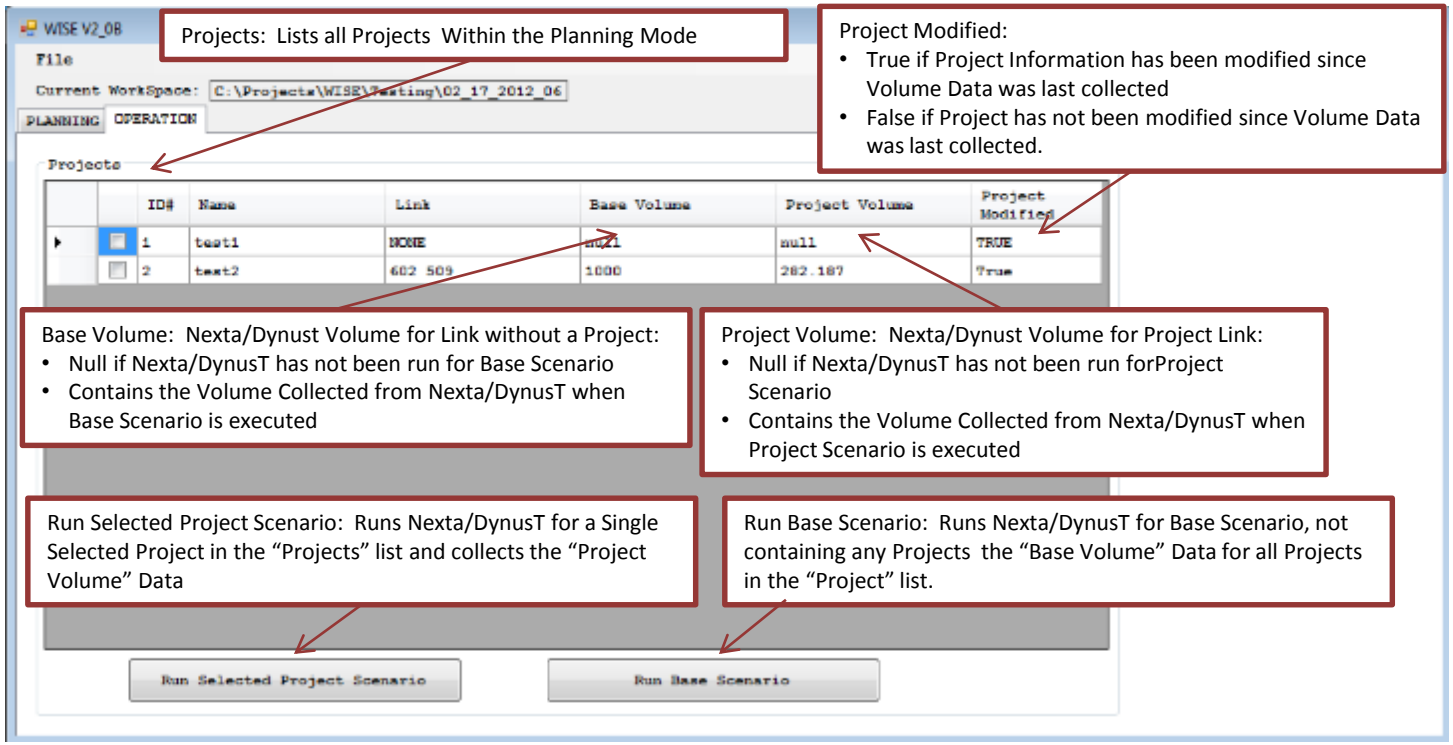
WISE: Create workspace

Planning or User Defined Mode



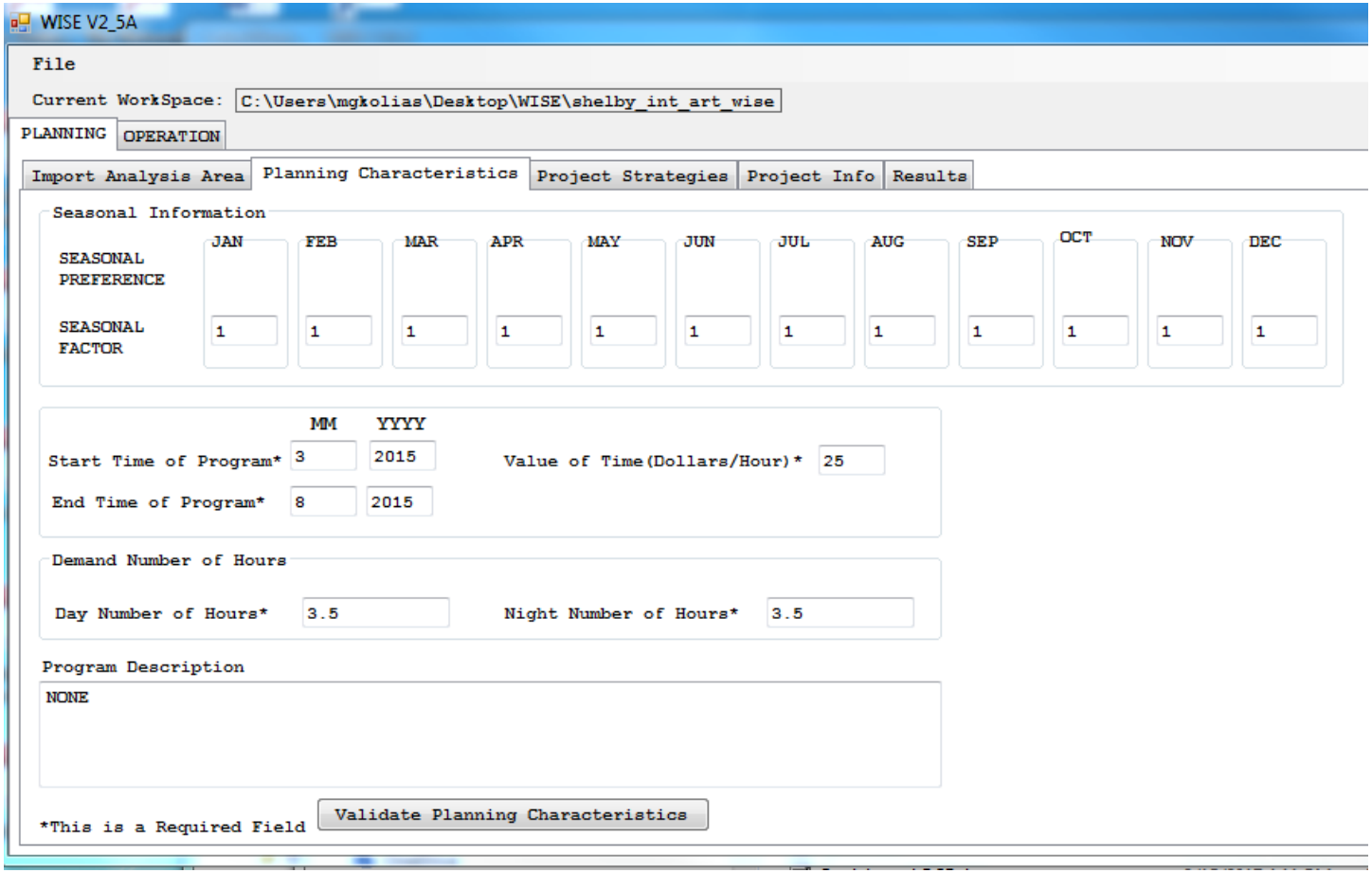
WISE: Traffic Diversion

Operation Mode



WISE

Planning Data



WISE

Project Strategies

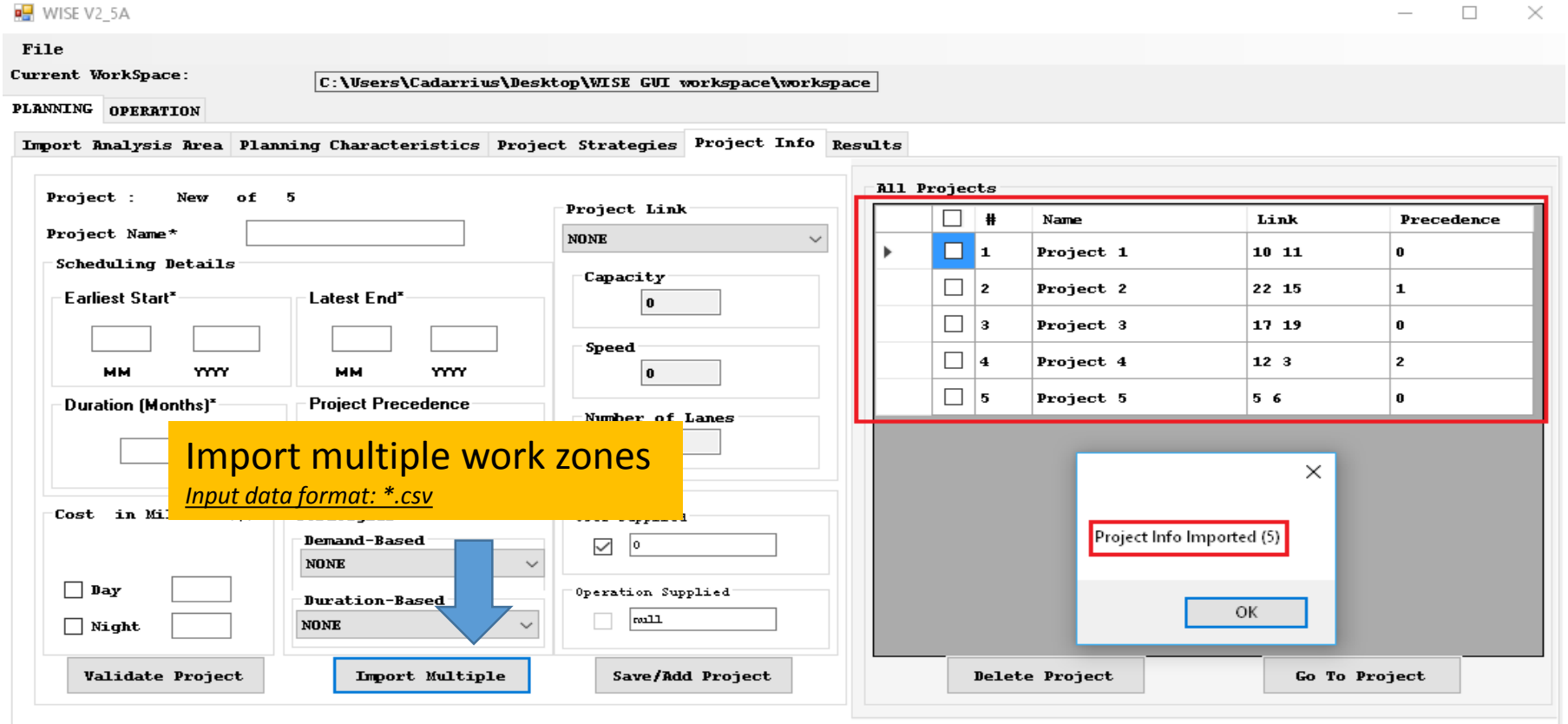
WISE V2_5A

```
<?xml version="1.0" encoding="UTF-8"?>
- <ArrayOfStrategy xmlns:xsd="http://www.w3.org/2001/XMLSchema" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance">
  - <Strategy>
      <StrategyType>Demand-Based Strategy</StrategyType>
      <StrategyName> s1</StrategyName>
      <PercentReduction>2</PercentReduction>
      <Radius>2</Radius>
      <Cost>150000</Cost>
      <DollarPerDay>0</DollarPerDay>
      <DurationReduction>0</DurationReduction>
      <SNo>0</SNo>
    </Strategy>
  - <Strategy>
      <StrategyType>Duration-Based Strategy</StrategyType>
      <StrategyName> s2</StrategyName>
      <PercentReduction>0</PercentReduction>
      <Radius>0</Radius>
      <Cost>0</Cost>
      <DollarPerDay>100000</DollarPerDay>
      <DurationReduction>1</DurationReduction>
      <SNo>0</SNo>
    </Strategy>
</ArrayOfStrategy>
```

Ongoing: Import multiple strategies from csv file

WISE

Work zone data



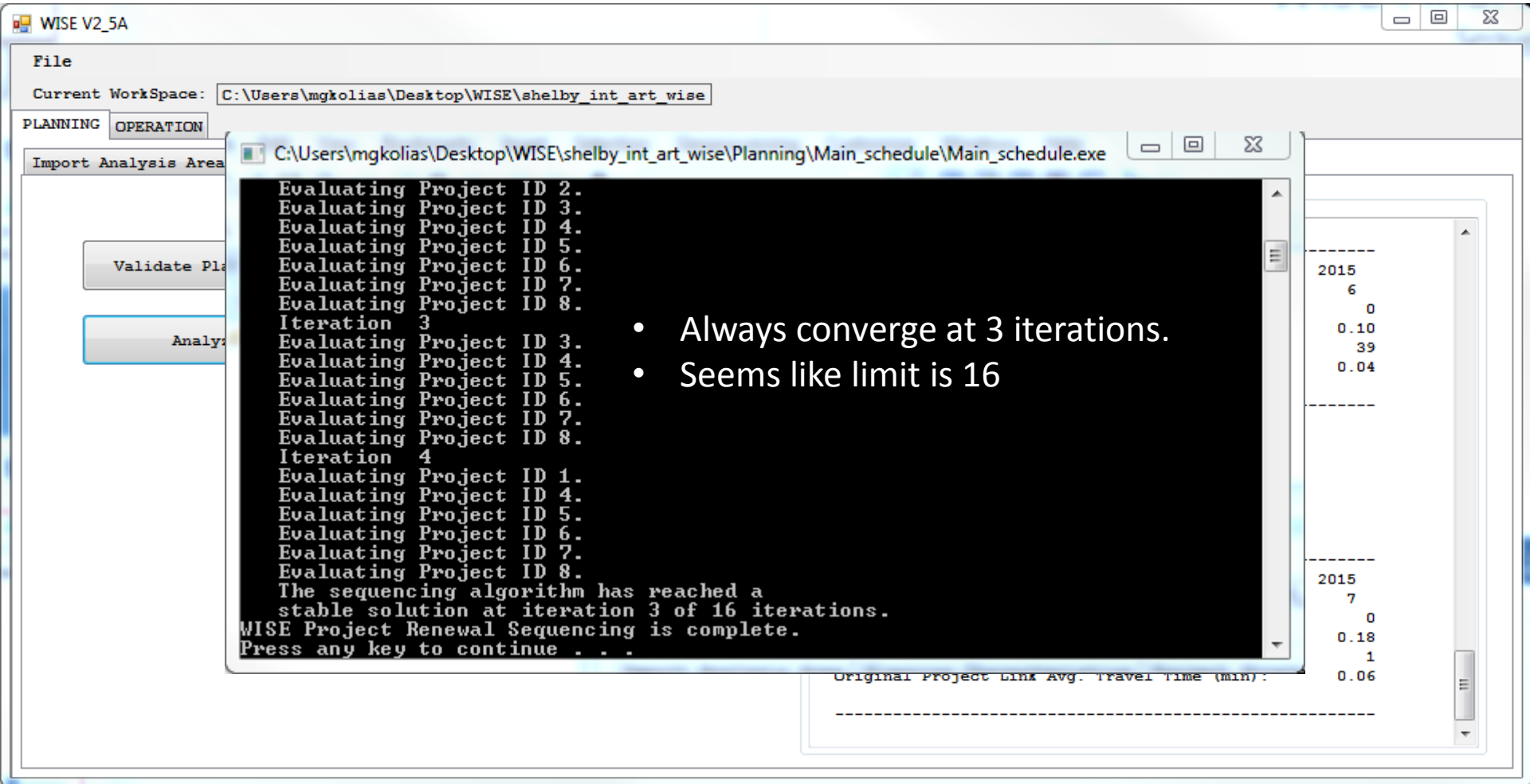
Import multiple work zones

*Input data format: *.csv*

If a project is deleted and then added again the xml file may have to be modified by hand (projectID is not updated unless you exit the program)

WISE Final Step

Sequencing



- Always converge at 3 iterations.
- Seems like limit is 16

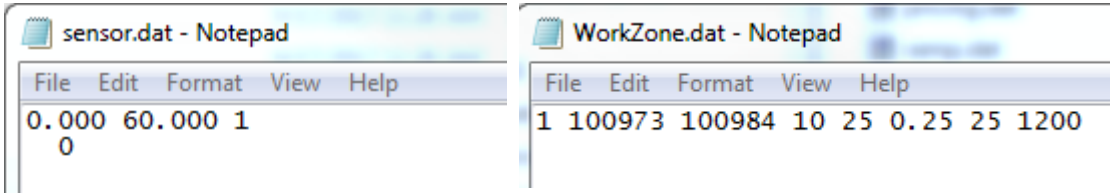
Findings

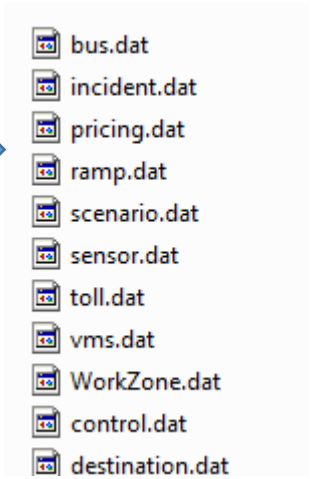
To date

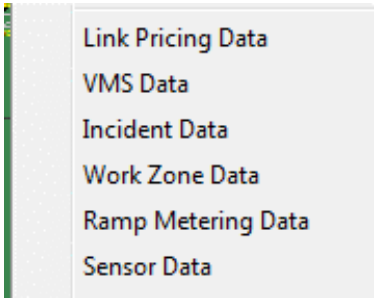
- Major limitation: 8 work zones
  - Action: investigating on how to increase the number of work zones
  - We cannot do (meaningful) sensitivity analysis otherwise
- Network development: Most time consuming
- Errors with no explanation
- User manual needs improvement (part of this project)

Current Efforts

- User manual with example network
  - Step by step
  - Error handling
- Newer version of Nexta/DynusT
- Automate/Simplify Input







THANK YOU FOR YOUR TIME

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