Caltrans District 7 Training

Topic: Post-processing

Feb 09, 2018

From 9:30 a.m. to 3:30 p.m.

AGENDA

1	Presentation (powerpoint slides)
	Why do we need to post-process?
	NCHRP methods
	Other techniques
	Q&A
2	Corridor forecasts Post-processing (examples)
	Traffic counts
	Balancing, timeperiods, vehicle classes etc….
	FHWA 13 veh. Classes to SCAG model vehicle classes
	Spreadsheet demonstrations
	Q&A
3	Lunch ~~~~~~
4	D12 post-processor spreadsheet tool (present & demonstrate)
	Q&A
5	POLA post-processing (segments & intersections)
	Methodology overview
	Tool demonstration
	Q&A
6	D11 post-processing methodology presentation
	PHV tool demonstration
	Q&A

CAMBRIDGE SYSTEMATICS

Think Forward

Post-Processing of Travel Demand Model Results

presented to

Caltrans District 7

presented by

Cambridge Systematics, Inc.

Ramesh Thammiraju & Chao Wang

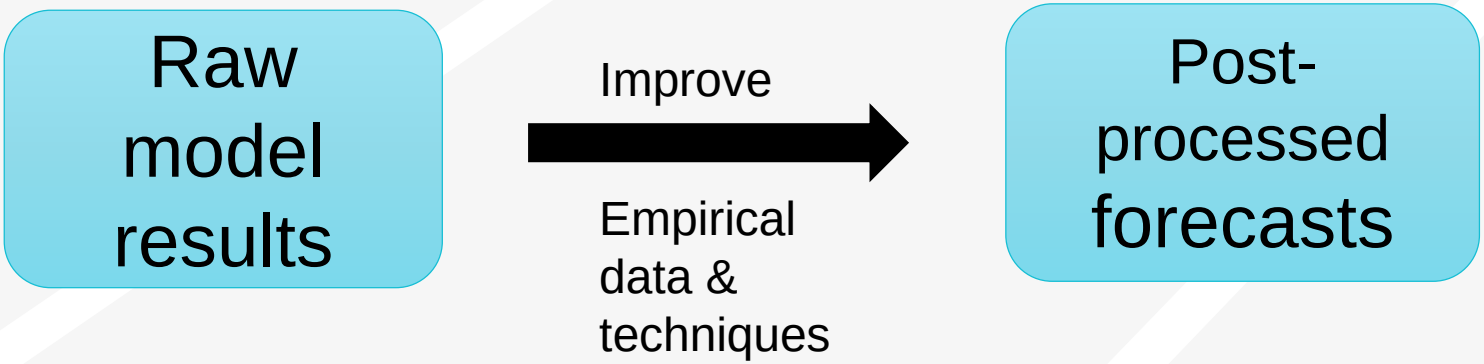
February 9, 2018

Agenda

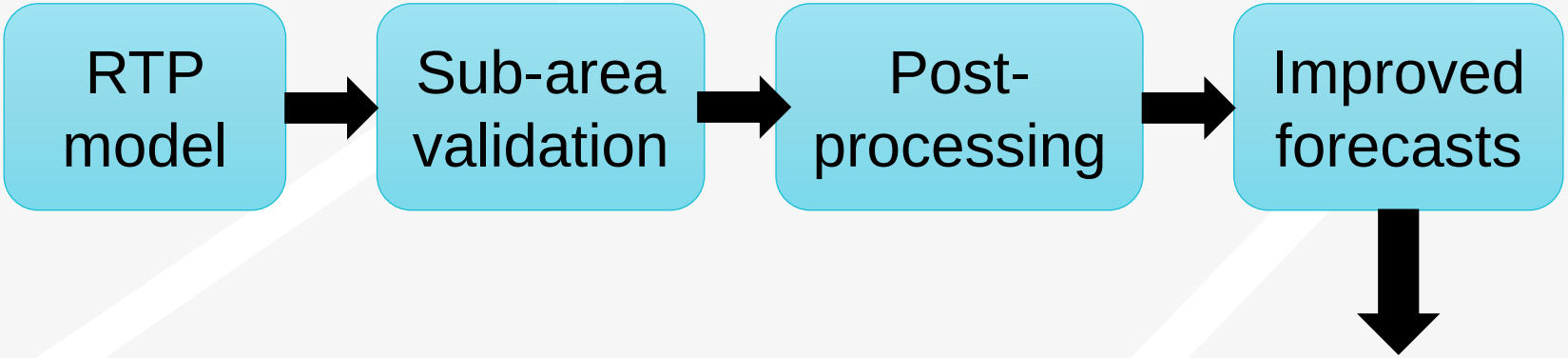
- Introductions
- Why post-processing?
- NCHRP methods
- Corridor forecasts post-processing
  - I-710 example
  - I-605 example
  - Intersection turn movements post-processing
  - D12 example (if time permits)
- D11 PHV Tool
  - Methodology/logic discussion
  - User Interface demonstration
- Q & A

Q&A along the way

Post-Processing?



Typical Process



- Traffic operations
- Design
- Dispersion modeling
- Air-quality & noise analysis
- Other

Travel Model

- Calibration, Validation, and Post-Processing

Real world **Modeled world** **Post-processed**

NCHRP Methods

- Difference method
- Ratio method
- Average method
  - Which one to use?

Other methods

- ODME
  - Sub-area
    - Base year
    - Future year

Corridor Post-Processing

- Project level forecasts
- Discuss the methodology and logic with examples
  - Counts
    - Balancing / flow-conservation
    - Vehicle classes
  - Time period specific post-processing
    - Peak period to peak hour factoring
  - Daily level post-processing
    - Temporal distributions

Intersection Post-Processing

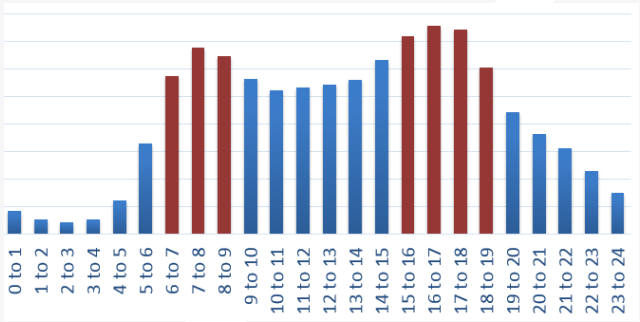
- Discuss & show examples
  - Ports (PortTAM & Post-processing tools)
  - I-605 intersections

D11 PHV Tool

Goal

- To adjust the raw model forecasts

1. To convert peak period flows to **peak hours flows**



Temporal distributions

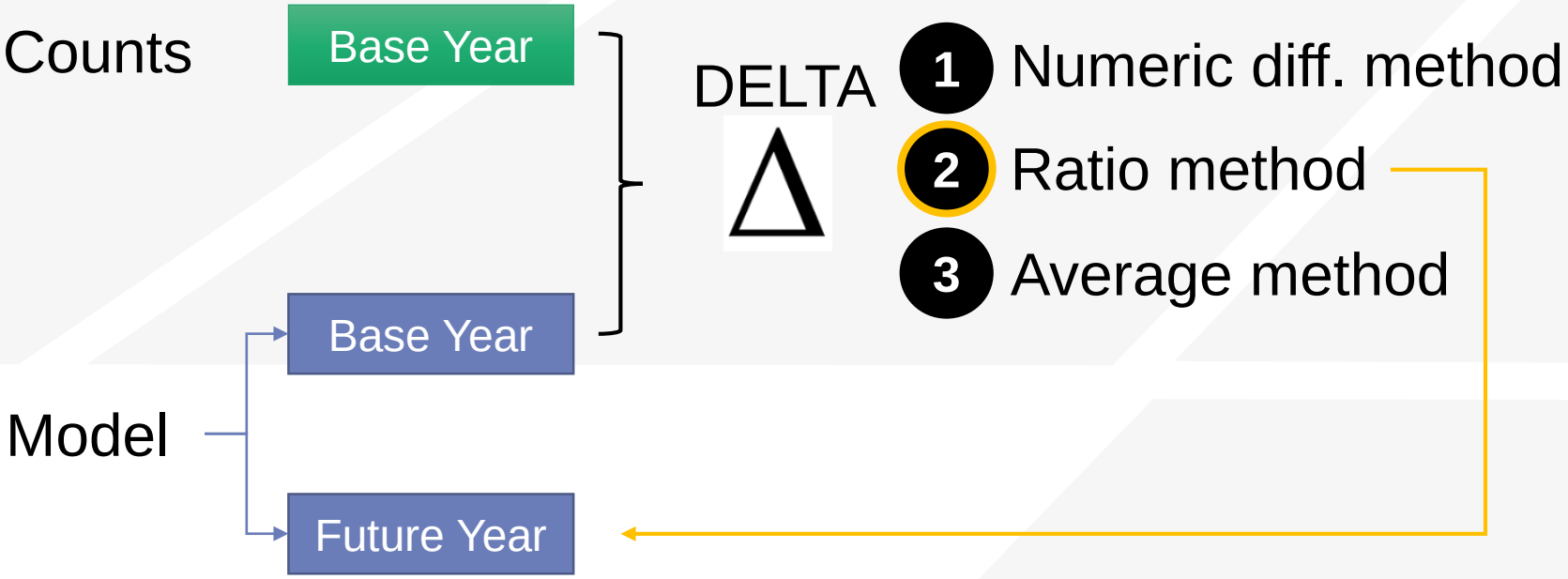
2. To **adjust** the peak hour flows to account for the differences between the model and counts

DELTA

Δ

Model vs. Counts

Adjustment Methodology



Key Logics

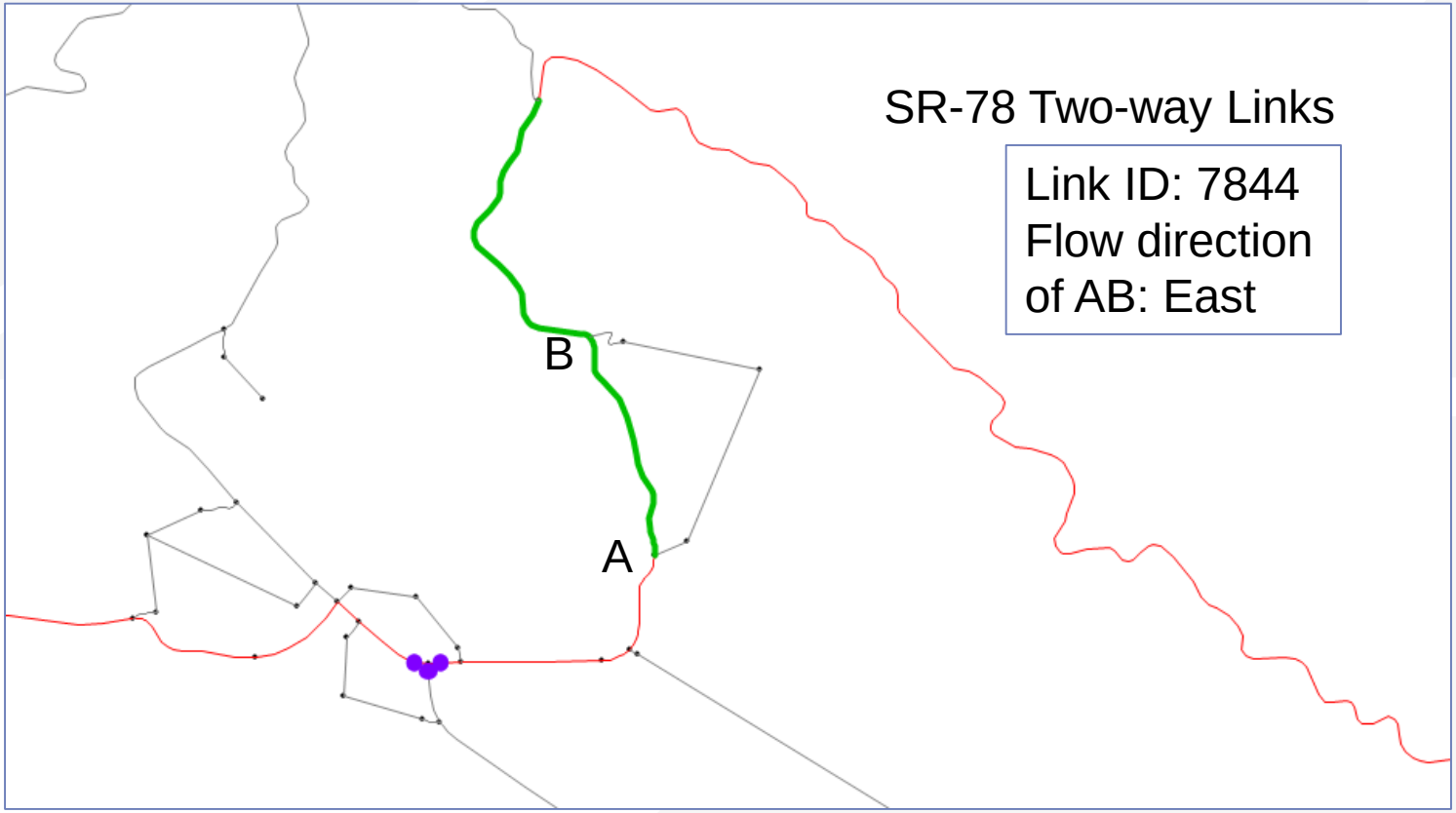
- Peak hour factors (PHFs) and adjustment ratios (ARs) are applied to roadway links based on the following logic
  - Freeways & state routes (Corridor links):
    - Count station specific PHFs and ARs
  - Arterials, collectors, local (Non-corridor links):
    - Regional average PHFs and ARs
  - Ramps
    - Freeway to freeway ramps — Count station specific PHFs and ARs
    - Arterial to freeway ramps — Regional average PHFs and ARs
    - Freeway to arterial ramps — Count station specific PHFs and ARs

Manual or Automated?

- All steps are automated
  - Identify corridor links based on road name and other information
  - Identify of corridor flow direction
  - Find which highway link each count station is located on
  - Identify ramp type
  - Match highway links to count stations
- Manual checks necessary for application
- Tool is in the testing stage

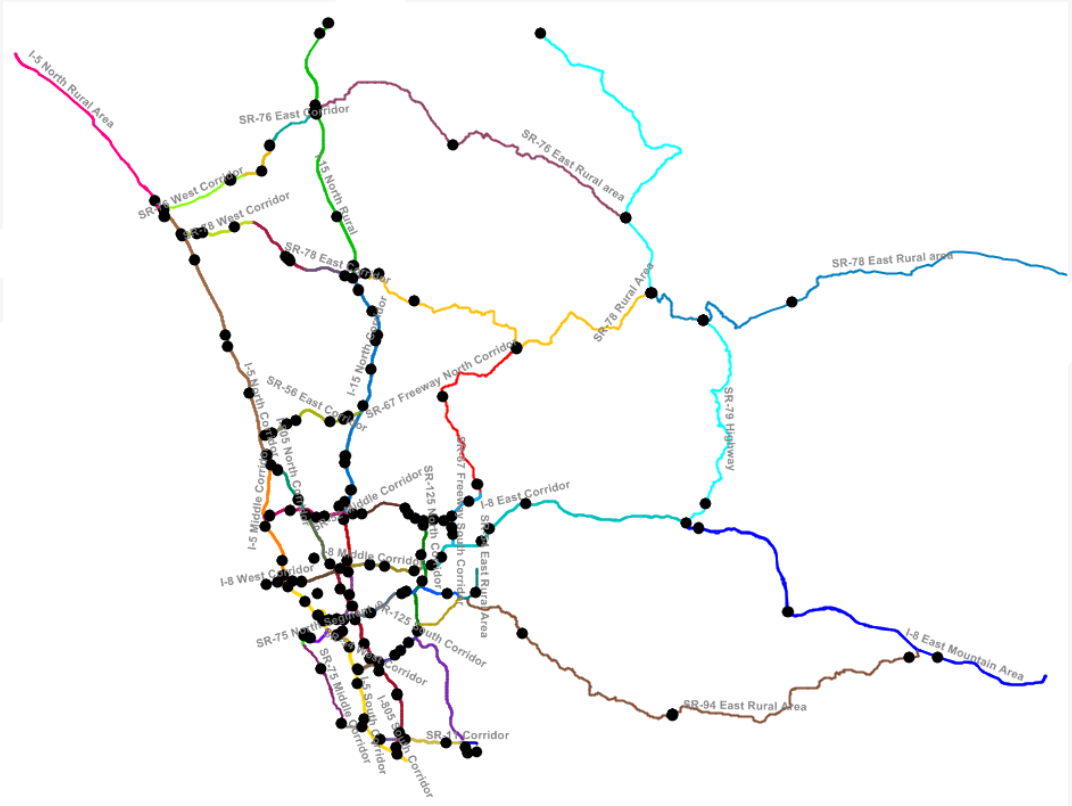
Details

- Corridor flow direction (not link direction)



Details

- Automated association of count stations and highway links



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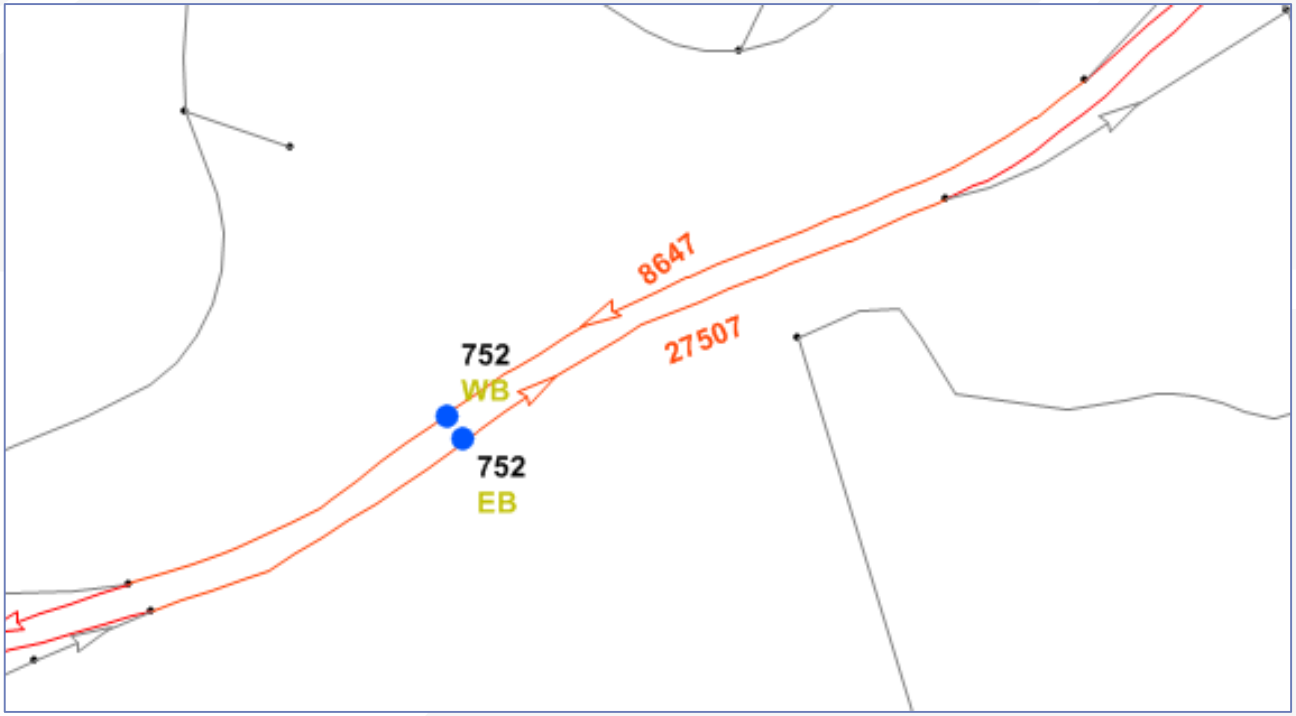
Details

Base Year

- For each count station, find the matching highway link



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Details - Lookup Table

- Process creates a lookup table with PHFs and ARs for each count station by time period and corridor flow direction.

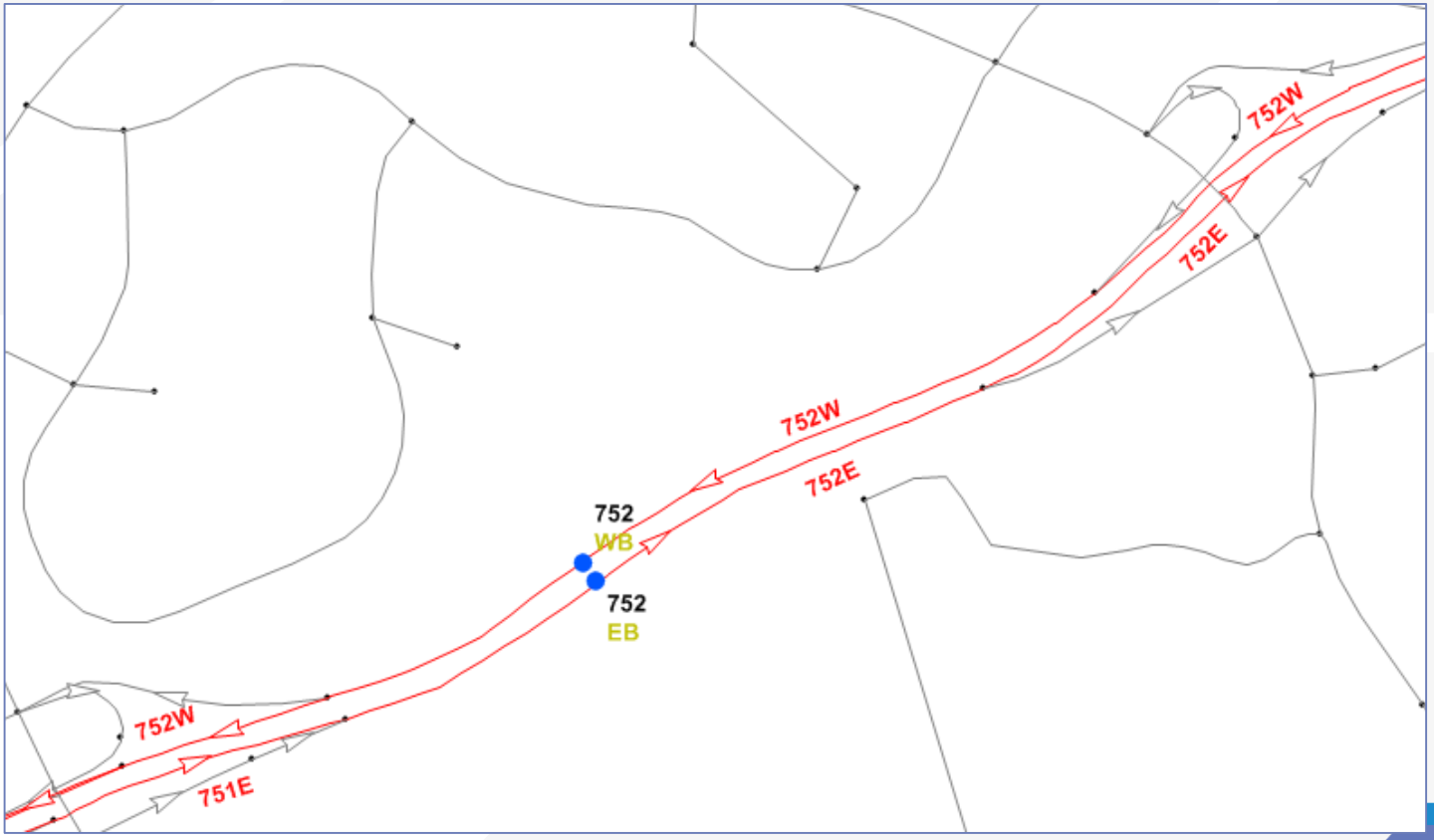
Dataview1 - PHF_AR_Lookup_Table

Costat	Costat2	Corridor_ID	hwycov_ID	Link_ID	Topology	PHF_AM	PHF_PM	AR_AM	AR_PM
101	101E	9	30561	30561	SF	0.354	0.290	0.750	0.750
101	101W	9	30561	30561	FS	0.384	0.337	0.750	0.750
126	126E	10	10003	10003		0.399	0.303	0.750	0.750
126	126W	10	10002	10002		0.339	0.301	0.759	0.771
501	501N	1	27694	27694		0.346	0.290	1.069	2.500
501	501S	1	27743	27743		0.343	0.287	2.500	1.586
502	502N	1	26279	26279		0.352	0.301	0.968	0.846
502	502S	1	30776	30776		0.360	0.301	1.033	0.943
621	621E	2	28269	28269		0.333	0.319	1.231	0.750
621	621W	2	28270	28270		0.330	0.317	0.750	1.783
661	661N	1	16275	16275		0.359	0.293	0.964	0.986
661	661S	1	16272	16272		0.335	0.303	0.900	1.005
677	677E	8	29182	29182		0.384	0.285	0.833	0.837
677	677W	8	29183	29183		0.370	0.302	0.875	0.796
682	682N	3	15230	15230		0.369	0.317	0.868	0.898

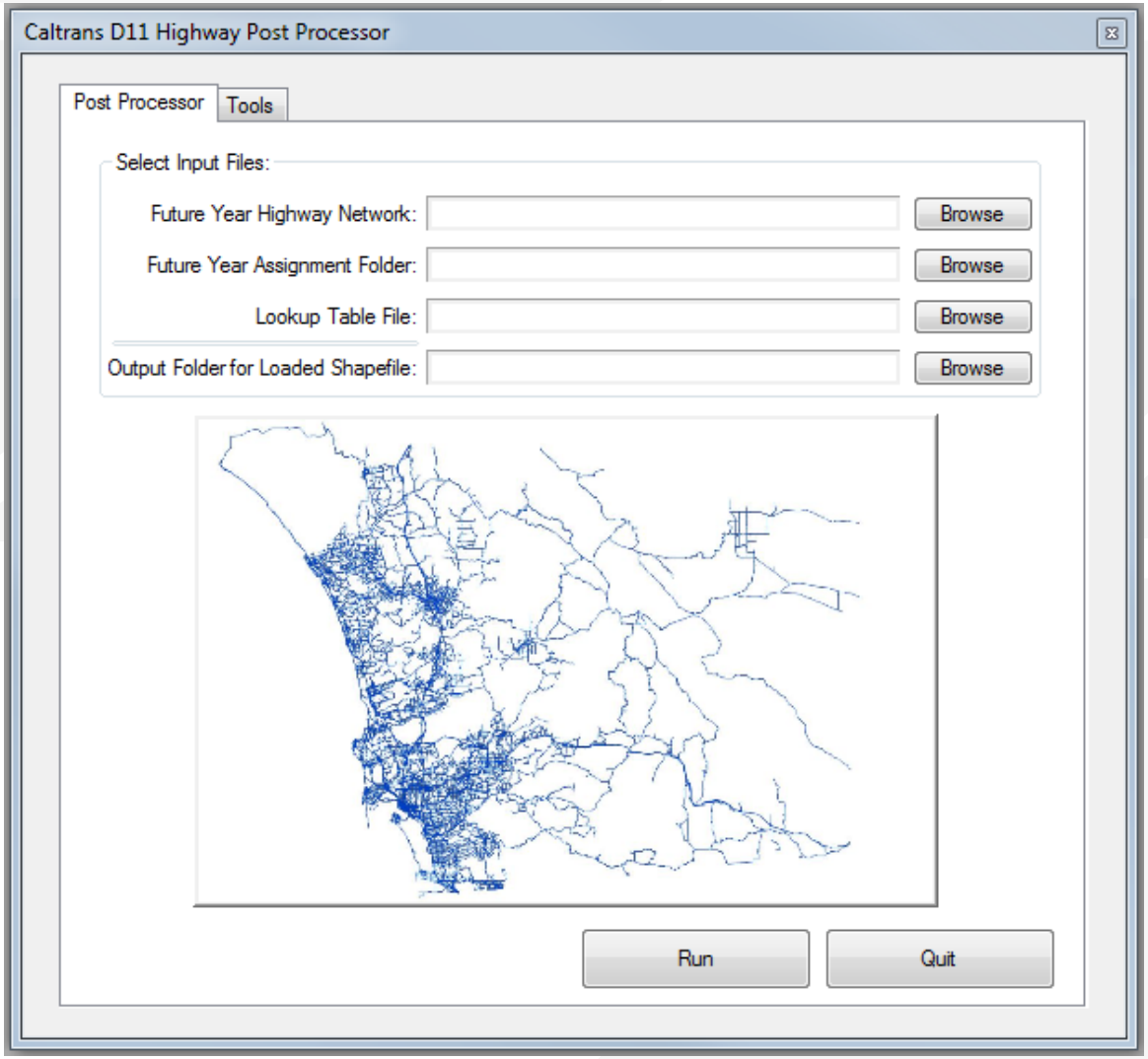
Details

Future Year

- For each corridor link, find the matching count station



User Interface



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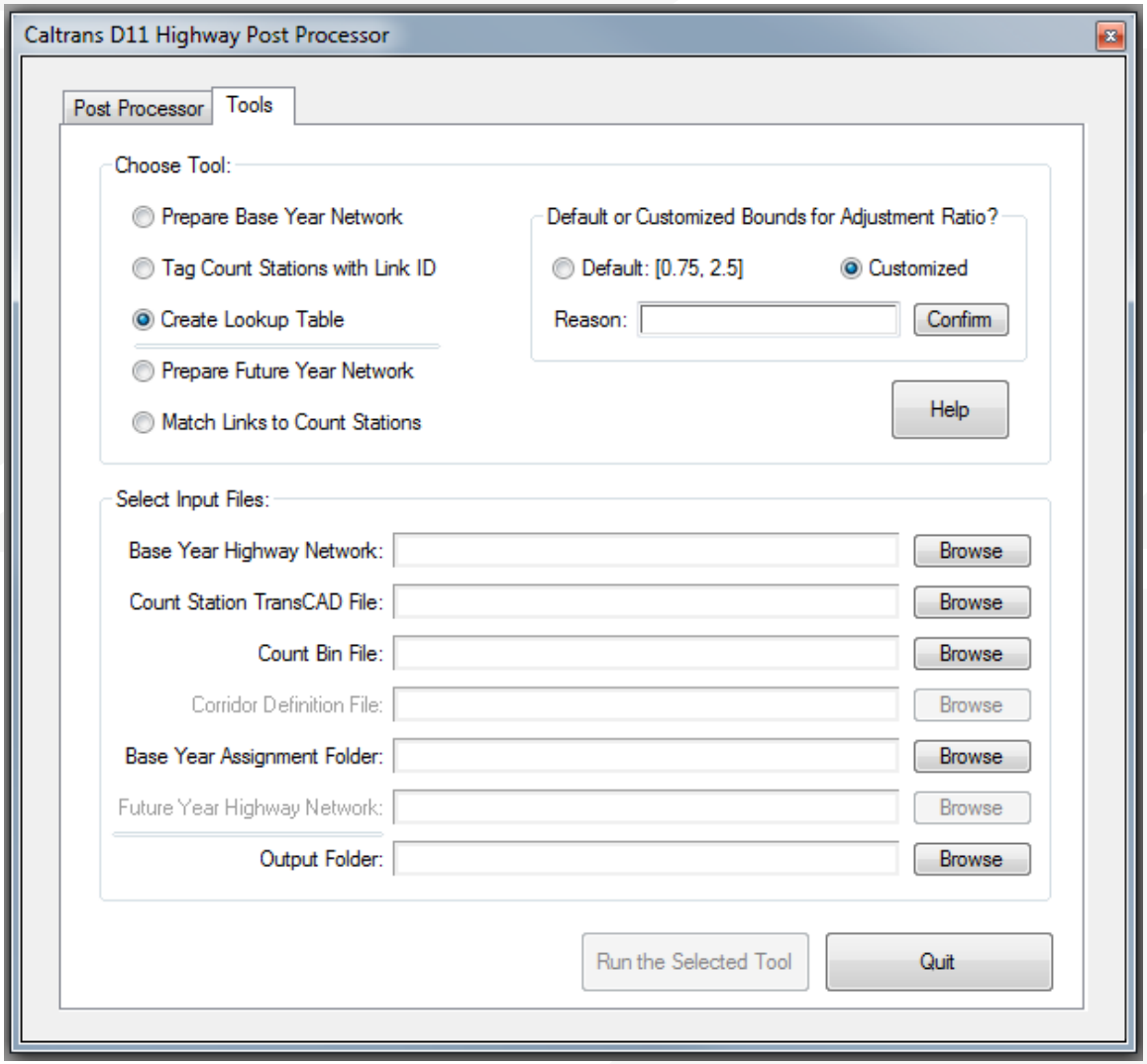
User Interface



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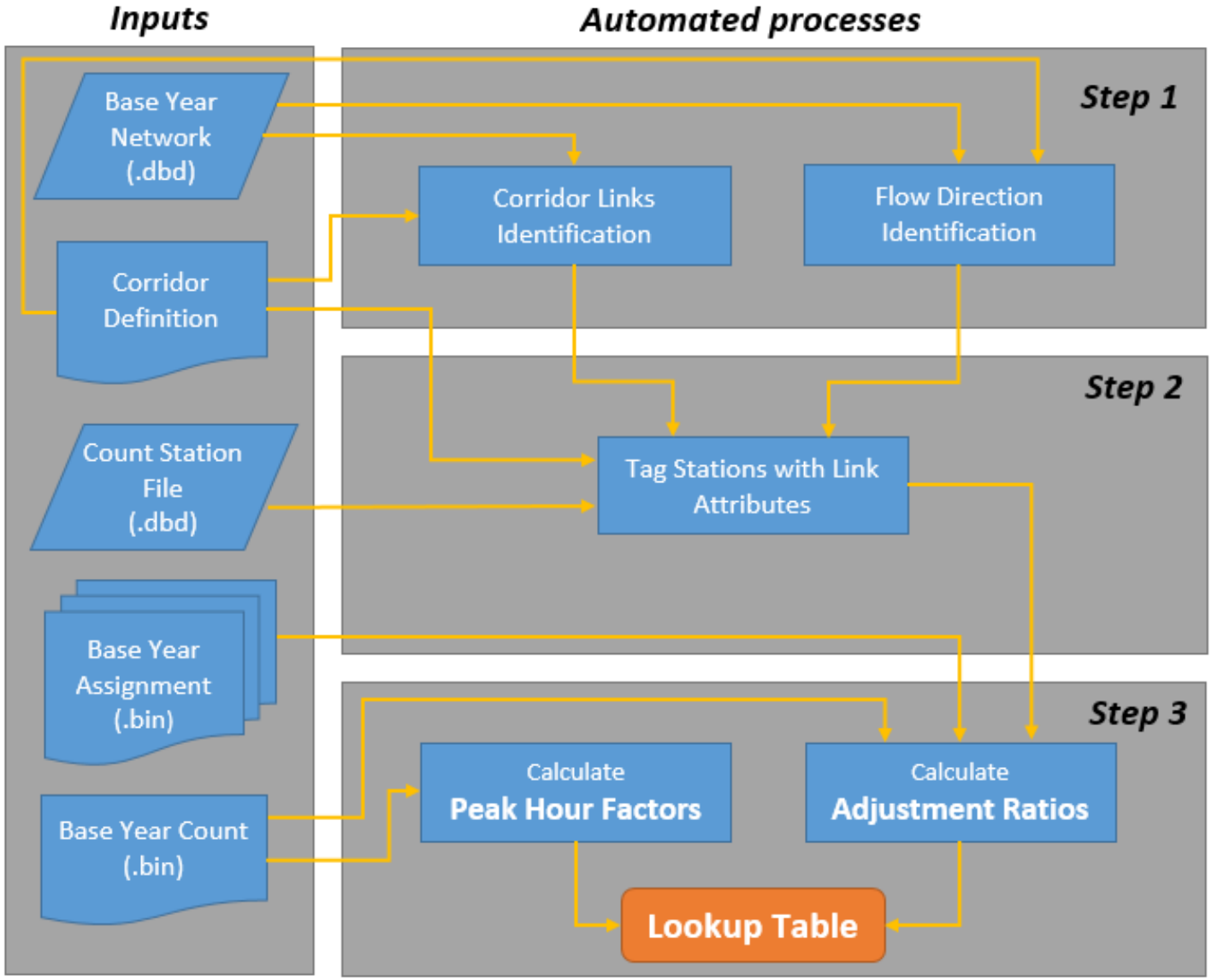
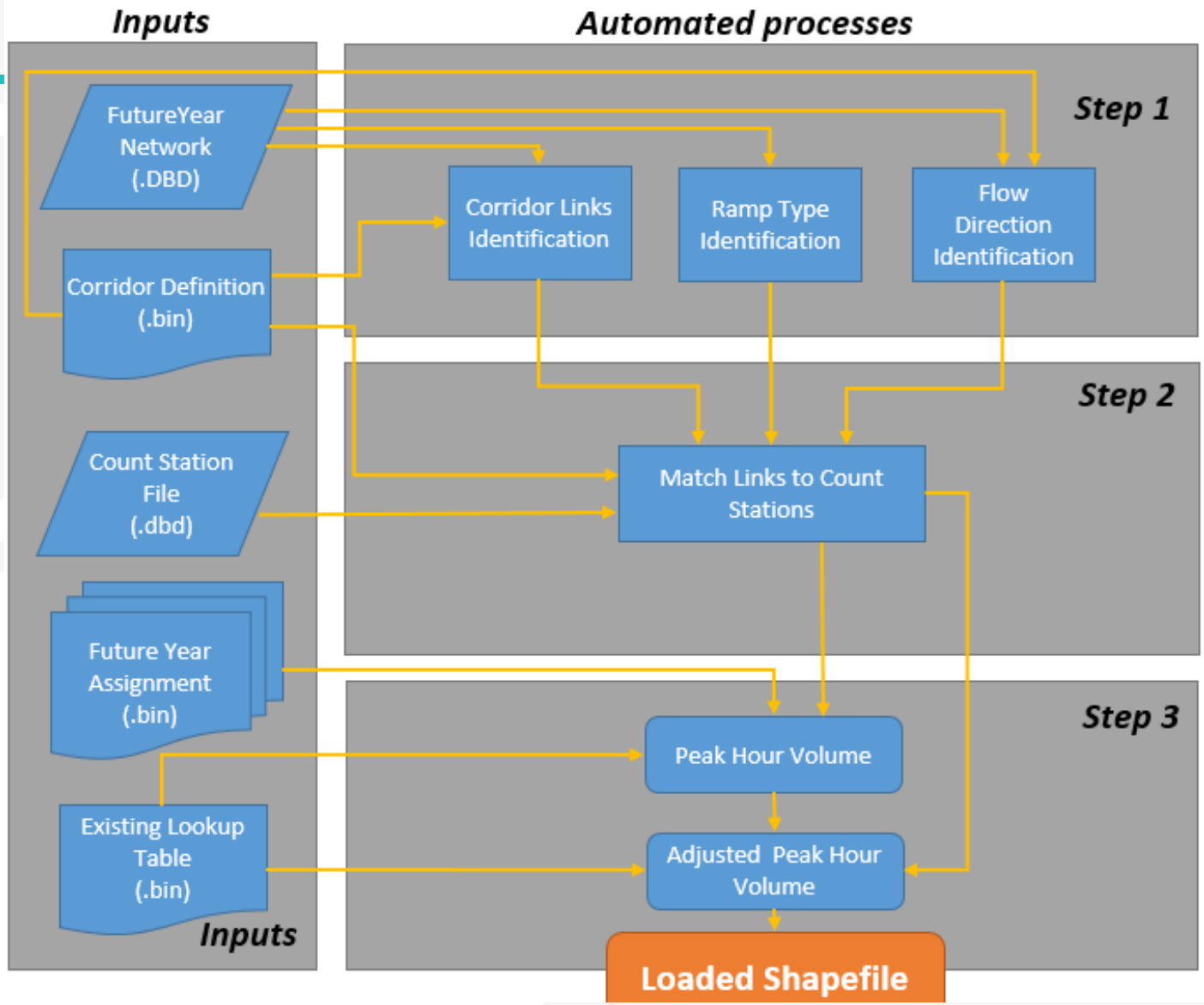
Q&A

Thank you!

Stage 1 processing



Stage 2 processing



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Think Forward

PortTAM and Caltrans D11 Post-processor

presented to

Caltrans D7

presented by

Cambridge Systematics, Inc.

Chao Wang & Ramesh Thammiraju

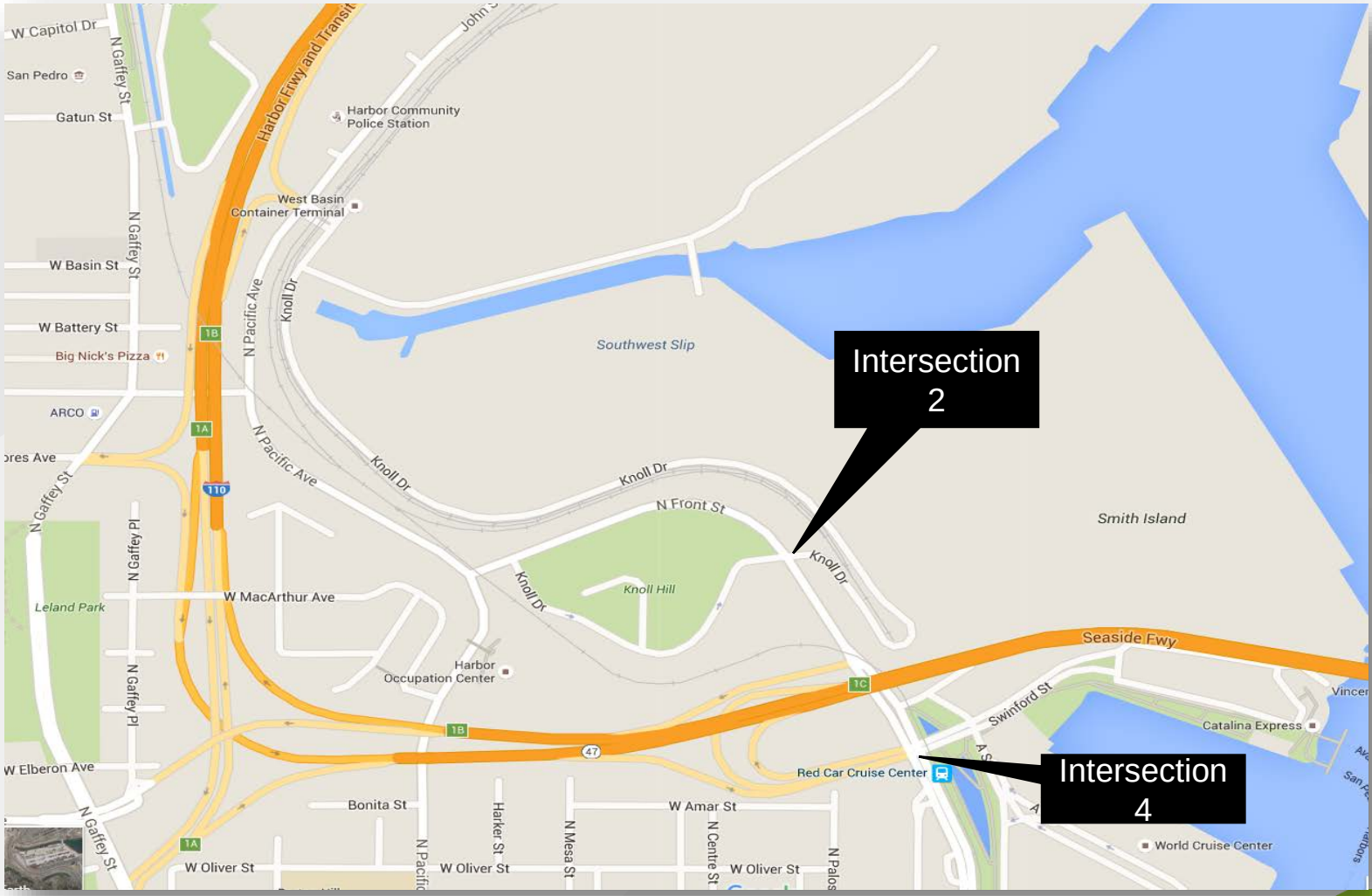
February 9, 2018

Agenda

- PortTAM post-processor
  - Post-processing segments
  - Post-processing intersection turning movements
- Caltrans D11 post-processor
  - Systemwide post-processing
- Q & A

PortTAM Post-processing needs

- Post-process the link volumes
- Post-process the turning movements at intersections



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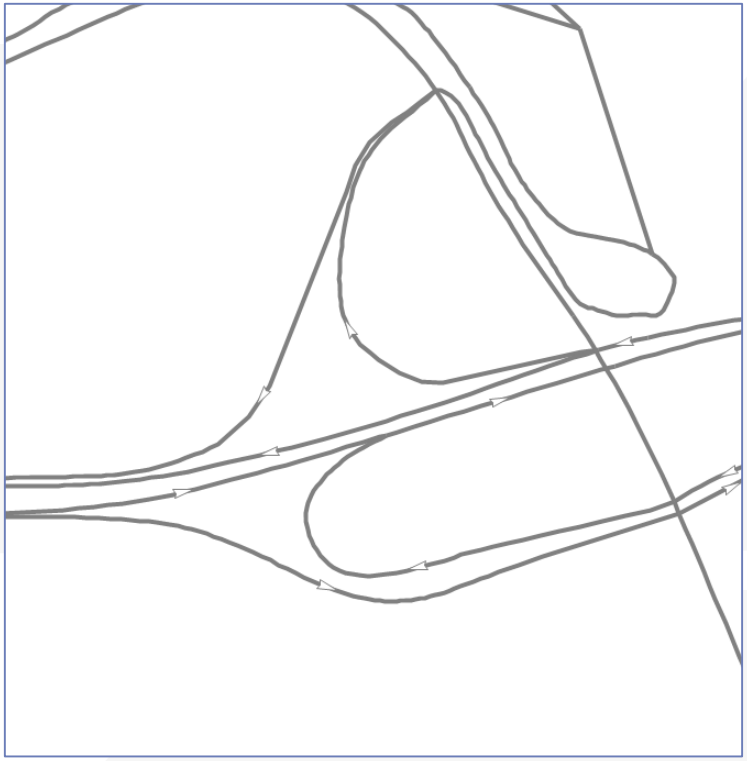
PortTAM Post-processing Examples

NO Build Scenario

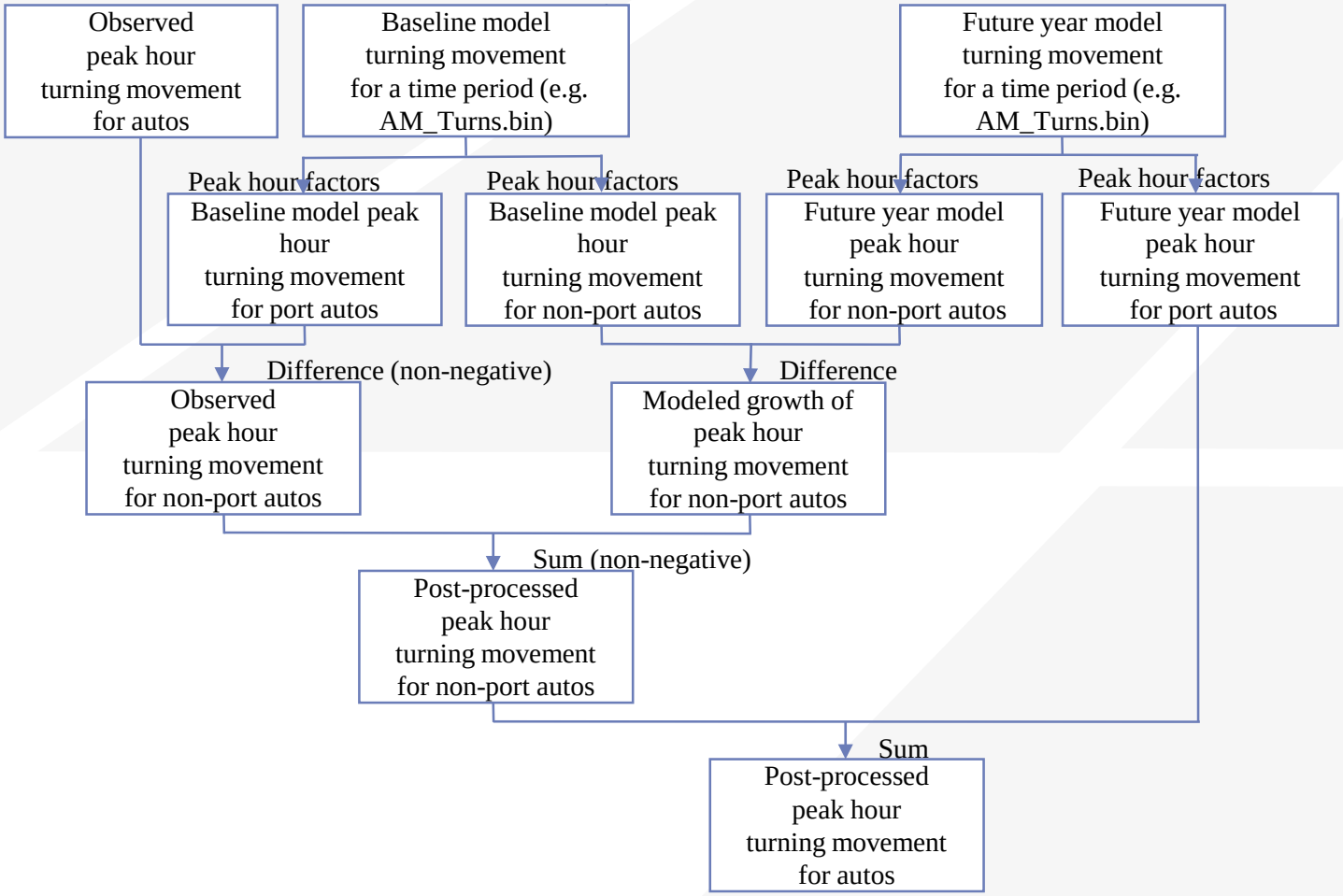


Build Scenario

Background

- Basic assumption:
  - The modeled port trips are accurate, and no post processing is needed
  - Only post-process non-port trips
- Challenge:
  - The traffic counts do not differentiate the port-trips and non-port trips
  - To solve this problem, use the modeled base year port trips as the observed port trips

Flow Chart



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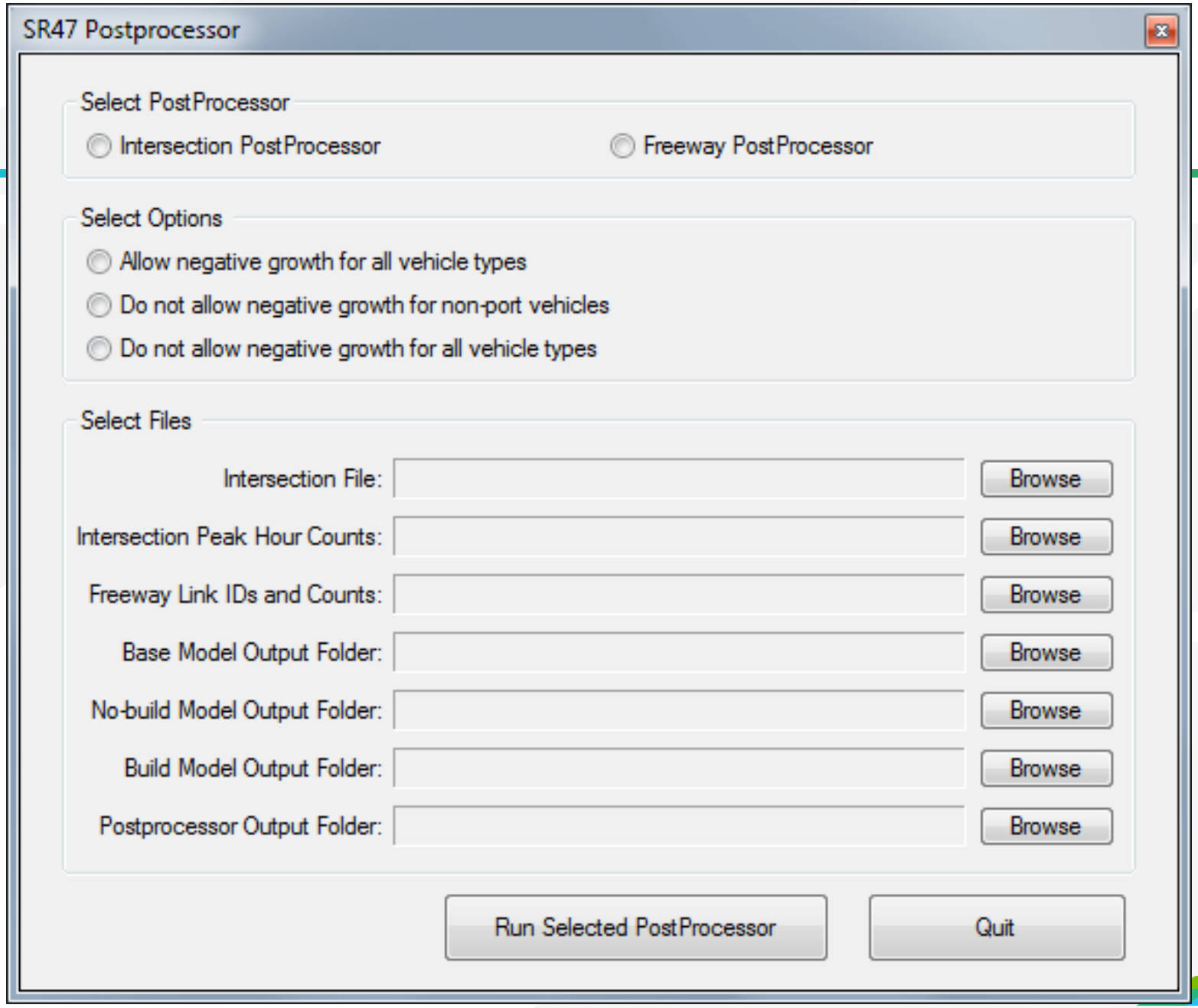

SR47 Postprocessor
Select PostProcessor
Intersection PostProcessor
Freeway PostProcessor
Select Options
Allow negative growth for all vehicle types
Do not allow negative growth for non-port vehicles
Do not allow negative growth for all vehicle types
Select Files
Intersection File:
Browse
Intersection Peak Hour Counts:
Browse
Freeway Link IDs and Counts:
Browse
Base Model Output Folder:
Browse
No-build Model Output Folder:
Browse
Build Model Output Folder:
Browse
Postprocessor Output Folder:
Browse
Run Selected PostProcessor
Quit

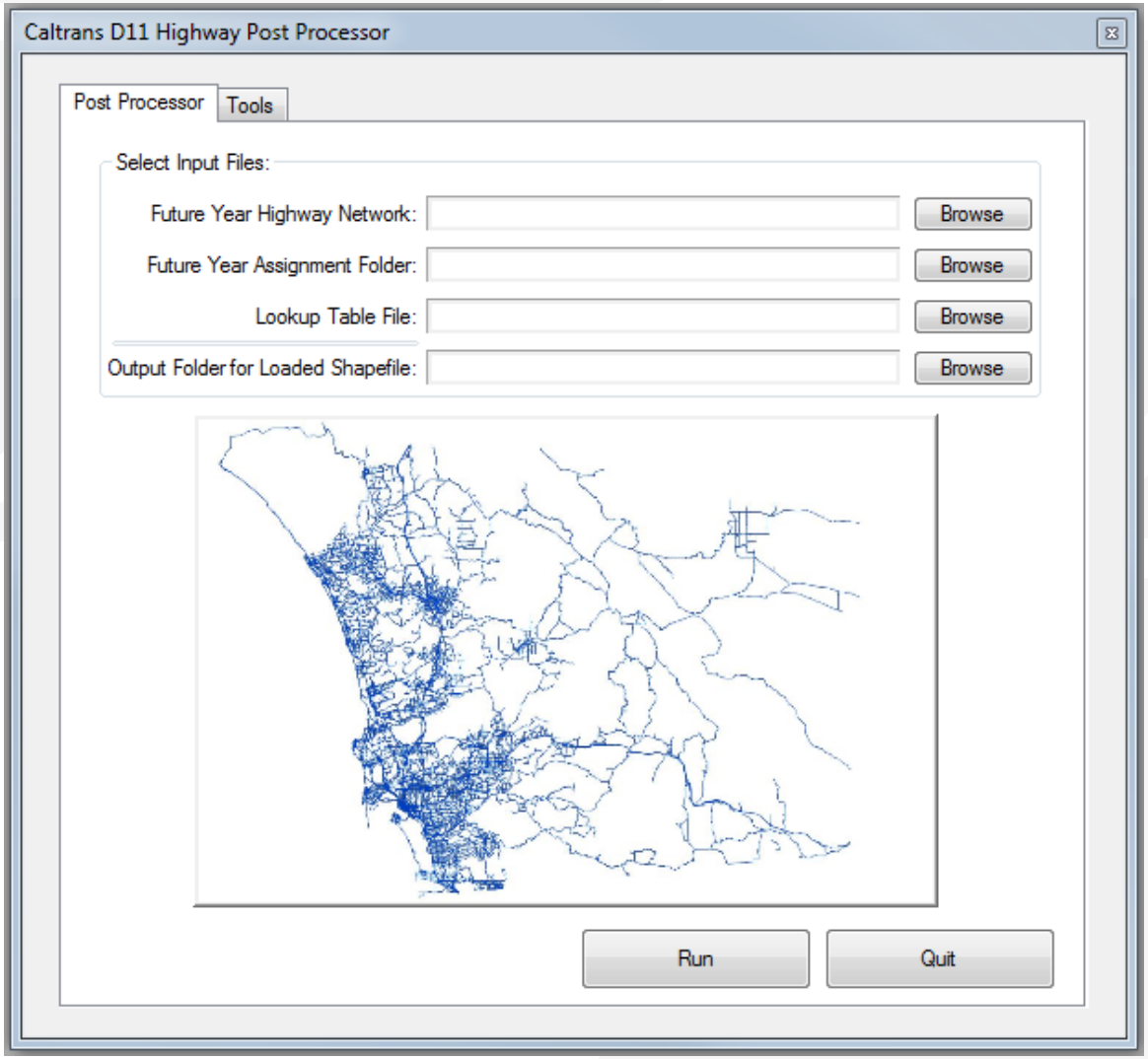
Agenda

- PortTAM post-processor
  - » Post-processing segments
  - » Post-processing intersection turning movements
- Caltrans D11 post-processor
  - » Systemwide post-processing
- Q & A

Caltrans D11 post-processor

- Post-process all major freeway corridors in San Diego County
- Caltrans D11 provides hourly counts over the region
- Use the ratio method
- Don’t care about the flow conservation

User Interface



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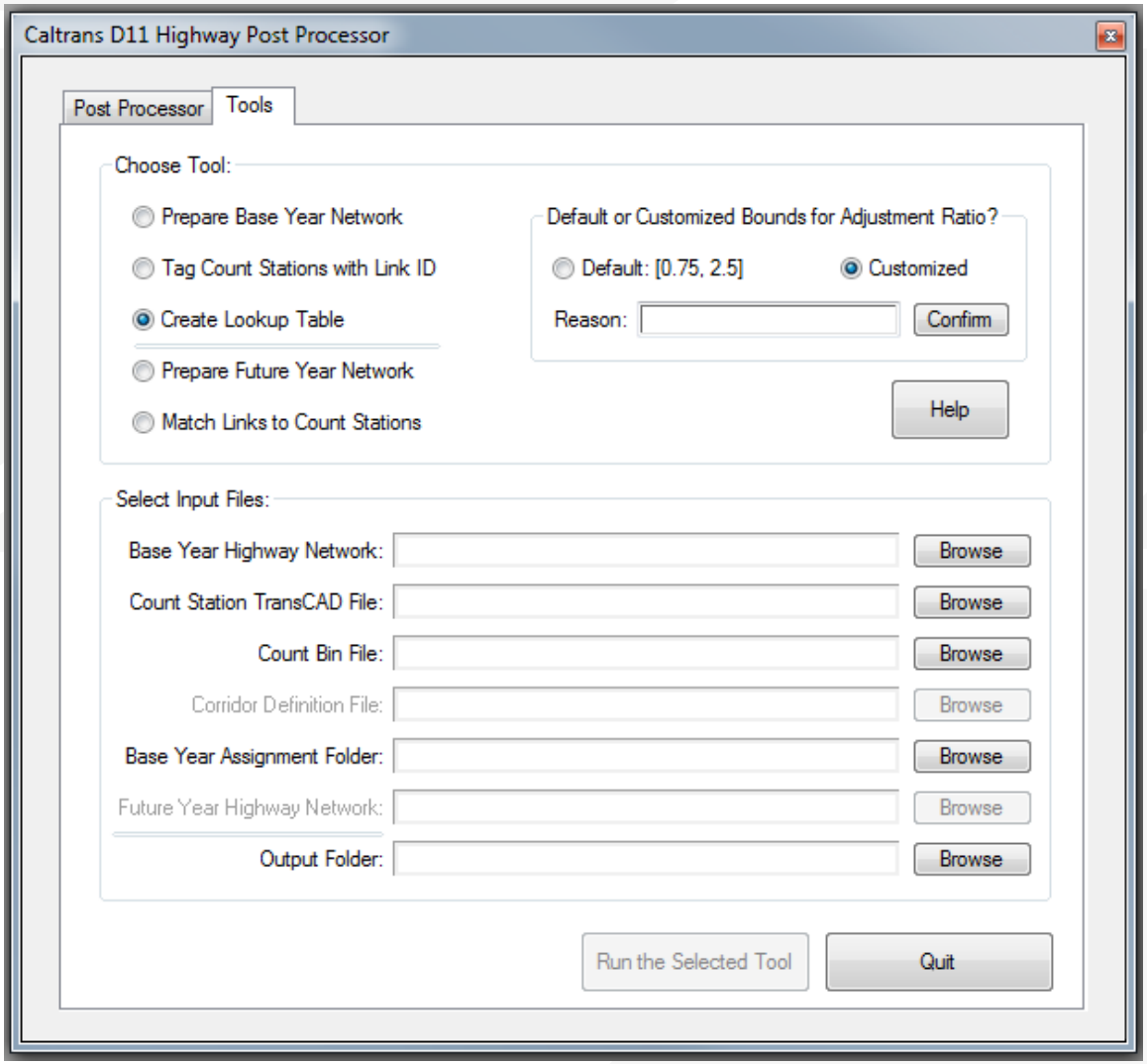
User Interface



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Q&A

Thank you!