User’s Manual

TOD Tolling Analysis Pack. Version 1.0

INDOT:
Business Owners: Roy Nunnally
Project Advisor: Samy Noureldin
Study Advisory Committee: Frank Baukert, Korey Chu, Emanuel Nsonwu, Bill Weinmann

Purdue Team:
PI: Satish V. Ukkusuri
Co-PI: Samuel Labi
Research Assistants: Feng Zhu, Tho Le, Fasil Sagir

06/21/2017
## Revision Sheet

<table>
<thead>
<tr>
<th>Release No.</th>
<th>Date</th>
<th>Revision Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rev. 0</td>
<td>06/21/2017</td>
<td>User’s Manual</td>
</tr>
</tbody>
</table>
I have carefully assessed the User’s Manual for the TOD Tolling Analysis Pack. This document has been completed in accordance with the requirements from INDOT.

MANAGEMENT CERTIFICATION - Please check the appropriate statement.

_____ The document is accepted.

_____ The document is accepted pending the changes noted.

_____ The document is not accepted.

We fully accept the changes as needed improvements and authorize initiation of work to proceed. Based on our authority and judgment, the continued operation of this project is authorized.

_______________________________  _____________________
NAME  DATE
Project Business owner

_______________________________  _____________________
NAME  DATE
Project Advisor

_______________________________  _____________________
NAME  DATE
Project PI

_______________________________  _____________________
NAME  DATE
Project Co-PI
### TABLE OF CONTENTS

**PART I. ADD-IN**........................................................................................................................................ 5

1  **GENERAL INFORMATION** ............................................................................................................. 3  
   1.1 Project Overview ....................................................................................................................... 3  
   1.2 Project Outputs .......................................................................................................................... 3  
   1.3 Authorized Use Permission ....................................................................................................... 4  
   1.4 Points of Contact ...................................................................................................................... 4  
      1.4.1 Information ............................................................................................................................ 4  
      1.4.2 Coordination ........................................................................................................................... 5  
   1.5 Organization of the Manual ....................................................................................................... 5  
   1.6 Acronyms and Abbreviations ................................................................................................... 5  

2  **ADD-IN SUMMARY** .................................................................................................................... 7  
   2.1 Add-in Configuration ................................................................................................................ 7  
   2.2 Data Flows .................................................................................................................................. 7  
   2.3 User Access Levels ..................................................................................................................... 7  

3  **GETTING STARTED** ..................................................................................................................... 9  
   3.1 Compile the Add-in .................................................................................................................. 9  
   3.2 Add-in Menu ............................................................................................................................. 10  
      3.2.1 About ................................................................................................................................. 11
3.2.2 General Settings ........................................................................................................................... 11
3.2.3 Network Scenario .......................................................................................................................... 12
3.2.4 Model Run ..................................................................................................................................... 12
3.2.5 Time-of-day Demand .................................................................................................................... 13
3.2.6 TOD Peak and Off-Peak ................................................................................................................ 13
3.2.7 Post Processors ............................................................................................................................... 14

3.3 Change the Add-in ............................................................................................................................ 14

3.4 Remove the Add-in ............................................................................................................................ 14

4 USING THE ADD-IN .......................................................................................................................... 16

4.1 TODT_AP Add-in ............................................................................................................................... 16

4.1.1 About ........................................................................................................................................... 16
4.1.2 General Settings ........................................................................................................................... 17
4.1.3 Network Scenario ......................................................................................................................... 17
4.1.4 Model Run ................................................................................................................................... 18
4.1.5 Time-of-day Demand .................................................................................................................... 18
4.1.6 TOD Peak and Off-Peak ............................................................................................................... 19
4.1.7 Post Processors ............................................................................................................................ 19

4.2 Caveats and Exceptions ................................................................................................................... 20

5 FREQUENTLY MADE MISTAKES ........................................................................................................... 22

5.1 Special Instructions for Error Correction ....................................................................................... 22
PART II. POST ANALYSIS ...................................................................................................................... 23

1 INTRODUCTION ................................................................................................................................... 25

1.1 Input Data ....................................................................................................................................... 25

1.2 Computation for Each Year .......................................................................................................... 25

1.3 Post Analysis Results ...................................................................................................................... 25

2 INPUT DATA .......................................................................................................................................... 27

2.1 Toll Scenarios and Value of Time ................................................................................................. 27

2.2 Linked Cell ...................................................................................................................................... 28

3 COMPUTATIONS FOR EACH SCENARIO ........................................................................................ 30

4 POST ANALYSIS ................................................................................................................................... 32

4.1 Revenue ........................................................................................................................................... 32

4.2 Monetary Saving ............................................................................................................................. 33

4.3 Travel Time and Speed .................................................................................................................. 34

4.4 VHT and VMT ................................................................................................................................ 35

4.5 Total Monetary Cost and Welfare Calculations .......................................................................... 36

4.6 County Level Welfare .................................................................................................................... 38

5 APPENDIX ............................................................................................................................................. 40
PART I. ADD-IN
1.0 GENERAL INFORMATION
1 GENERAL INFORMATION
1.1 Project Overview

Toll roads have diverse impacts on a region’s traffic, land use, economy, and citizens’ welfare. Traffic on state highways varies by the time of day and is sensitive to the toll amount. Time-of-day tolls impose different levels of tolls at different times of the day and typically are lower during off-peak hours. In addition to generating additional revenue for managing roadways, the goal of this strategy is to allow the highway use by drivers who need to travel and are willing to pay for it. Drivers who are not willing to pay a toll can change their travel time, route, mode, or choose not to travel.

In addition, due to increasing shortfalls in road construction and maintenance funding, federal, state, and local governments now seek new mechanisms of infrastructure financing. Time-of-day pricing is an important mechanism but its social cost and impacts need to be evaluated. Such evaluation requires reliable assessment of the impacts of the time-of-day tolls on other routes that receive the diverted traffic. Currently, INDOT’s planning models are unable to forecast the impact of time-of-day tolls. This information is critical not only for accurate planning forecasts but also for estimating the traffic flow on various roadways, the impacts due to spillover onto adjacent roadways and the additional revenue that can be generated. A tool is needed to understand the variations of the traffic with the time-of-day tolls to make planning decisions and strategic asset management decisions.

This research project developed a software named “TOD Tolling Analysis Pack” which seamlessly integrates with the INDOT planning model and computes the costs and impacts of the time-of-day tolling for Indiana’s roadways. The TOD Tolling Analysis Pack can be used to evaluate different network-wide impacts of alternative tolling scenarios. The application can be integrated with the existing TransCAD models that already exist at INDOT. The tool developed in this project can help assess the relationships between the time-of-day toll, and route choice, based on empirical data. Based on anticipated changes in route choice, the impact of the time-of-day toll on various neighboring roadways can be determined.

1.2 Project Outputs

There are significant benefits for INDOT by implementing this project:

(1) Reduced congestion and improved mobility
(2) Potential for increased revenue to INDOT due to toll receipts
(3) Enhance INDOT’s capability for modeling, planning, decision making, combined and systematic assessment of infrastructure impacts, and benefit to cost analyses on state roads.

(4) Greater reliability of travel time on highways for drivers

The deliverables for this project are:

(1) *A Final Report.* A comprehensive presentation of all tasks of the projects, methodology of the study, the developed TOD Tolling Analysis Pack, and results from impacts analysis under various time-of-day tolling scenarios.

(2) *Suite of software and User Manual.* This TOD Tolling Analysis Pack has been delivered to INDOT, and was followed by a Q&A session. The User’s Manual guides how to use the TOD Tolling Analysis Pack. The conduction of the impact analysis has been also delivered including two tutorial videos.

(3) *Spreadsheet tool for the impact evaluation.* The excel files were prepared as a support tool for post analysis of the revenue, monetary savings, travel times, speeds, VHT, VMT, and welfare. The inputs for those files are the results obtained from TOD Tolling Analysis Pack on TransCAD.

(4) *A training program for INDOT staff.* Training was carried out to deliver the items above.

### 1.3 Authorized Use Permission

The add-in is part of the outputs for SPR 3911: Evaluating the Impacts of Time-of-Day Tolling on Indiana Roadways Project. INDOT has all rights for giving access to other stakeholder.

### 1.4 Points of Contact

#### 1.4.1 Information

Satish V. Ukkusuri, Ph.D  
Professor of Civil Engineering  
Lyles School of Civil Engineering  
Purdue University  
HAMP G167D, 550 Stadium Mall Drive  
West Lafayette, IN 47907-2051  
P: (765) 494 2296  
F: (765) 496 7996  
E: sukkusur@purdue.edu

Samuel Labi, Ph.D  
Professor of Civil Engineering  
Lyles School of Civil Engineering  
Purdue University  
HAMP G175A, 550 Stadium Mall Drive  
West Lafayette, IN 47907-2051  
P: (765) 494-5926  
E: labi@purdue.edu

For any problem relating to the add-in, please directly contact the person-in-charge as mentioned above.
1.4.2 Coordination

Bridget E. Brunton
Administrative Assistant
Joint Transportation Research Program
Hampton Hall of Civil Engineering
Lyles School of Engineering
550 Stadium Mall Drive Room 4103
West Lafayette, Indiana 47907-2051
P: (765) 494-6508
E: bebrunto@purdue.edu

1.5 Organization of the Manual

The below provide a list of the major sections of the User’s Manual:
Part I. Add-in
1.0 General Information
2.0 Add-in Summary
3.0 Getting Started
4.0 Using the Add-in
5.0 Frequently made mistakes
Part II. Post Analysis
1.0 Introduction
2.0 Input data
3.0 Computations for each scenario
4.0 Post analysis
5.0 Appendix

1.6 Acronyms and Abbreviations

The below table provides a list of the acronyms and abbreviations used in this document and the meaning of each.

<table>
<thead>
<tr>
<th>Acronyms and Abbreviations</th>
<th>Meaning/Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>INDOT</td>
<td>Indiana Department of Transport</td>
</tr>
<tr>
<td>TOD</td>
<td>Time of day</td>
</tr>
<tr>
<td>Click</td>
<td>Left click (otherwise specified)</td>
</tr>
</tbody>
</table>
2.0 ADD-IN SUMMARY
2 ADD-IN SUMMARY

This section provides a general overview of the add-in which is developed in TransCAD Version 7.0 environment.

2.1 Add-in Configuration

We have developed an add-in in TransCAD version 7.0 to capture the impact of time-of-day tolls. The add-in is capable to take as input different vehicle classes and route choice. The TransCAD platform of the add-in is useful as it can be integrated with other planning models of INDOT on TransCAD.

2.2 Data Flows

The input data for the travel demand model used in this add-in has been provided by INDOT. Using the data, the project team generated and transferred the corresponding time-of-day travel demand for all years in order to save time for INDOT of running variety of scenarios.

2.3 User Access Levels

The add-in is part of the deliverables for SPR 3911: Evaluating the Impacts of Time-of-Day Tolling on Indiana Roadways Project. INDOT has all rights for giving access to other stakeholders.
3.0 GETTING STARTED
3.0 Getting Started

3 GETTING STARTED

This section provides a general walkthrough of the add-in from initialization until the end. The logical arrangement of the information shall enable the user to understand the sequence and flow of the add-in.

3.1 Compile the Add-in

Open TransCAD,

1. Click on the 'Compile to UI' icon.

2. To compile the *.RSC file double-click on the file.

3. Give directory to the istdm7 file and double click to replace by select Yes.
3.2 Add-in Menu

There are two TOD options in the current add-in. The first option, Option 1, is the analysis of three-hour blocks which includes three tabs, namely Time-of-day Demand (1), TOD Peak and Off-Peak (1), and Post Processors (1). The second option, Option 2, is the analysis of one-hour blocks which includes two tabs, namely Time-of-day Demand (2) and Post Processors (2).

**IMPORTANT NOTE:** Due to the similarity of the two options, the following part of this User’s Manual only explains how to use Option 1. To implement Option 2, simply follow the corresponding steps as in Option 1.
3.2.1 About

Provides general information about the project, such as the purpose of the add-in (TOD Tolling Analysis Pack), the project sponsor (INDOT) and the research team (Purdue University).

3.2.2 General Settings

Allows the user to provide general inputs to run the model.
3.2.3 Network Scenario

Allows the user to select the scenario of interest and other inputs for network analysis.

3.2.4 Model Run

Presents all the steps that need to be run in order to have the traffic assignment for the selected network.
3.2.5 Time-of-day Demand

Converts the traffic assignment from Daily OD to Hourly OD and then from Hourly OD to Time-of-day OD.

3.2.6 TOD Peak and Off-Peak

Allows the user to input tolls for peak and off-peak hours for autos and trucks. The model can be run separately different time periods or for the entire analysis period.
3.2.7 Post Processors

Allows users to carry out the post analysis, such as Visualize Traffic Volumes and display Top-10 Impacted Roads.

3.3 Change the Add-in

To change the add-in, just follow the procedures provided in the 3.1 Compile the add-in by compiling a new file.

3.4 Remove the Add-in

Click on the name of the add-in, TODT_AP, on the task bar, then navigate to and click on the Remove menu.
4.0 USING THE ADD-IN
This section provides a detailed description of the add-in from initialization until the end, explaining in detail the characteristics of required inputs and analysis outputs.

4 USING THE ADD-IN

After successfully compiling the add-in in TransCAD, the user must close and reopen TransCAD. To start, navigate to the add-in name TODT_AP in the task bar and select ‘Time-of-day Tolling’ to open the Time-of-day Tolling Model windows.

4.1 TODT_AP Add-in
4.1.1 About

Navigate to the About tab to obtain general information about the project, such as the purpose of the add-in (TOD Tolling Analysis Pack), the project sponsor (INDOT) and the research team (Purdue University).
4.0 Using the Add-in

4.1.2 General Settings

First, open statewide network shapefiles.

1. Using dropdown menu on TAZ layer select ISTDM…Zones
2. Under External trips, select the corresponding year to the TAZ layer selected from the dropdown menu.
3. Click on Model path button and then choose the ISTDM7_09152014 folder.
4. In Run Name, type name of the file you want to save your work as.

Then navigate to the Network Scenario tab.

4.1.3 Network Scenario

1. Select ISTDMnet from dropdown menu of Line Layer.
2. Select the scenario of the corresponding year from dropdown menu in Identify Network Scenario.
3. Click Load Scenario button and save to output folder with the same name as typed in Run Name in the ‘General Settings’ tab.
4. Leave the check box Reuse existing loaded Network unchecked.
5. Keep the check box of Save.net and OD matrix as checked.
6. Leave the check box of Save path file (requires OUE) unchecked.
7. In CFS Trips dropdown menu, select the corresponding year option to perform the analysis.
8. In No. of Trips Table to Assign, select 6 from the dropdown menu.
9. In Identify Indiana Freight Network, select the same scenario as in Step 2.

Navigate to the Model Run tab.
4.1.4 Model Run

1. Keep the check boxes of **Option 1 - Intersection Analysis** and **Option 2 – Speed/Capacity Analysis** as checked.
2. Run all the steps in sequence. There will be a pop-up message to notify whenever a task is completed. Then, Click **OK** to continue.

At the end of this process, extract the subnetwork to prepare for next step.

Then navigate to **Time-of-day Demand** tab.

4.1.5 Time-of-day Demand

Close the statewide network shapefiles then open the subnetwork shapefiles.

1. Click the **Daily OD - Hourly OD** button to convert daily OD to hourly OD.
2. Click the **Hourly OD - Time-of-day OD** button to convert hourly OD to time-of-day OD.

Navigate to the **TOD Peak and Off-Peak** tab.
4.0 Using the Add-in

4.1.6 TOD Peak and Off-Peak

1. Input the toll values for Auto Toll (Peak), Truck Toll (Peak), Auto Toll (Off-Peak) and Truck Toll (Off-Peak) using the dropdown menus and selecting the desired tolling price options.

2. Run the model separately for each time period by clicking at the corresponding button at Peak analysis or Off-Peak analysis buttons or run all analysis by clicking on Run All button.

Navigate to the Post Processors tab.

4.1.7 Post Processors

Close and reopen TransCAD. Open the geographic file from the output folder.

- In the Visualize Traffic Volumes box, user can display AM peak or PM peak traffic volumes.

- In Top-10 Impacted Roads box, user can display the top 10 impacted roads at AM peak or PM peak.

To integrate the current view with Google Maps, click on Tolls/Imagery/Web Map Layers/Google Map.
4.2 Caveats and Exceptions

- For the convenience of users, the Purdue Research Team has provided the files for travel demand (output) for each year of the analysis period. Therefore the user does not need to run the steps in Model Run tab for those years.
- After running the first scenario step by step as presented in 4.1. TODT_AP Add-in, the user may run other tolling-price scenarios using the below steps:
  - The user needs to go through the following tabs in the Add-in in sequence starting from General Settings, Network Scenario, and TOD Peak and Odd-Peak for Option 1.
  - For Option 2, begin from General Settings, Network Scenario, and Time-of-day Demand. There is no need to run Time of day OD matrix (Both Daily OD – Hourly OD and Hourly OD – Time-of-day OD) because the OD matrix has already been computed in the previous scenario.
5.0 FREQUENTLY MADE MISTAKES
5 FREQUENTLY MADE MISTAKES

5.1 Special Instructions for Error Correction

If the user mistypes the file name in Load Scenario, the user needs to go to the output folder to delete all files generated as the wrong name. Then the user should go back to Click Load Scenario and save file as preferred name.
PART II. POST ANALYSIS
1.0. INTRODUCTION
1 INTRODUCTION

This User’s guide for post analysis presents how to compute some post analysis measures from the TransCAD output. All the post analysis done using excel files has been organized as below.

1.1 Input Data

In general, the input data are in the first two sheets of the excel files. However, in some cases, the input data are in the tab before “computed sheets” (see next section for the definition). For future reference, the sheets having input data will be referred to as “linked sheets”.

1.2 Computation for Each Year

In general, for each year, there is a base case scenario and scenarios 1 to 8 that need to be computed. They are named as “Base_[year]” or “Scenario[x]_[year]”. For future reference, the sheets, which contain computed values, will be referred to as “computed sheets”.

1.3 Post Analysis Results

Revenue, monetary saving, and time and speed values are displayed on the last three sheets of each file, namely “Revenue_Sum”, “Monetary Saving”, “Time_Speed”, respectively.
2.0 INPUT DATA
2 INPUT DATA

The data in the linked sheets, in the orange-colored cells, are used in multiple tabs as input. The linked sheets are organized as follows:

2.1 Toll Scenarios and Value of Time

This worksheet, **Toll_Scenario & VOT**, presents the toll rates and value of time (VOT) which are entered by user:

- Toll rates: for each scenario and mode and for both peak and off-peak hours.
- VOT: Values of time ($ per vehicle hour) for Auto and Truck (averaged from VOT across all trip purposes.)
2.2 Linked Cell

This worksheet, **Linked_Cell**, has input values for length, free-flow time, and capacity of the links which is copied from TransCAD data view columns, namely Length, AB_FFTime, and PKHRCAPI, respectively.

![Linked_Cell tab](image_url)
3.0 COMPUTATIONS FOR EACH SCENARIO
3 COMPUTATIONS FOR EACH SCENARIO

For each scenario, input data area (bounded by dashed box) are linked to the “linked sheets” which include link length, link free-flow time, link capacity, toll rate, and VOT. The orange area contains the travel demand values which user has to copy from data view of TransCAD (bounded by continuous line box). For each scenario, travel demand values will be different.
4.0 POST ANALYSIS
4 POST ANALYSIS

4.1 Revenue

The revenue results are linked to the revenue computations of the corresponding scenarios and years.
4.2 Monetary Saving

The monetary costs table is built by linking each year-wise scenarios monetary costs calculated in the corresponding tabs and then monetary savings of each year for each scenario are computed by comparing the monetary costs of the given scenario with the monetary costs of the base scenario.
4.3 Travel Time and Speed

Travel time is first linked to the corresponding scenarios and years, and then speeds are computed.
4.4 VHT and VMT

VHT is computed while VMT is linked from corresponding scenarios.
4.5 Total Monetary Cost and Welfare Calculations

Total monetary cost for each road link is computed by adding the corresponding link level monetary cost of total travel time and the total toll levied, both of which are linked from each corresponding scenario and year.

![Welfare calculations Tab]

[Excel screenshot showing the Welfare calculations Tab]
The welfare at each link for every year and scenario is computed by comparing the total monetary cost with the total monetary cost of the base scenario.

<table>
<thead>
<tr>
<th>County</th>
<th>Total Monetary Cost (Base 2015)</th>
<th>Total Monetary Cost (S1 2015)</th>
<th>Total Monetary Cost (S2 2015)</th>
<th>Total Monetary Cost (S3 2015)</th>
<th>Total Monetary Cost (S4 2015)</th>
<th>Total Monetary Cost (S5 2015)</th>
<th>Total Monetary Cost (S6 2015)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Madison</td>
<td>375.0272</td>
<td>375.0237</td>
<td>375.0154</td>
<td>374.9918</td>
<td>374.9853</td>
<td>374.9574</td>
<td>374.9283</td>
</tr>
<tr>
<td></td>
<td>288.3258</td>
<td>288.3122</td>
<td>288.3016</td>
<td>288.2902</td>
<td>288.2824</td>
<td>288.2721</td>
<td>288.2633</td>
</tr>
<tr>
<td></td>
<td>440.8774</td>
<td>440.8704</td>
<td>440.8657</td>
<td>440.8489</td>
<td>440.8417</td>
<td>440.8320</td>
<td>440.8233</td>
</tr>
<tr>
<td></td>
<td>115.2973</td>
<td>115.2911</td>
<td>115.2870</td>
<td>115.2811</td>
<td>115.2811</td>
<td>115.2824</td>
<td>115.2824</td>
</tr>
<tr>
<td></td>
<td>188.1670</td>
<td>188.1600</td>
<td>188.1519</td>
<td>188.1400</td>
<td>188.1372</td>
<td>188.1312</td>
<td>188.1225</td>
</tr>
<tr>
<td></td>
<td>141.7720</td>
<td>141.7652</td>
<td>141.7576</td>
<td>141.7503</td>
<td>141.7453</td>
<td>141.7403</td>
<td>141.7358</td>
</tr>
<tr>
<td></td>
<td>38.2600</td>
<td>38.2604</td>
<td>38.2628</td>
<td>38.2628</td>
<td>38.2615</td>
<td>38.2589</td>
<td>38.2604</td>
</tr>
<tr>
<td>Madison</td>
<td>149.9331</td>
<td>149.9302</td>
<td>149.9276</td>
<td>149.9218</td>
<td>149.9190</td>
<td>149.9170</td>
<td>149.9170</td>
</tr>
<tr>
<td></td>
<td>568.4084</td>
<td>568.3975</td>
<td>568.3876</td>
<td>568.3658</td>
<td>568.3551</td>
<td>568.3234</td>
<td>568.3234</td>
</tr>
<tr>
<td></td>
<td>76.0879</td>
<td>76.0803</td>
<td>76.0851</td>
<td>76.0822</td>
<td>76.0808</td>
<td>76.0793</td>
<td>76.0793</td>
</tr>
<tr>
<td></td>
<td>152.0809</td>
<td>152.0860</td>
<td>152.0833</td>
<td>152.0775</td>
<td>152.0749</td>
<td>152.0695</td>
<td>152.0696</td>
</tr>
<tr>
<td></td>
<td>519.7108</td>
<td>519.7004</td>
<td>519.6913</td>
<td>519.6874</td>
<td>519.6815</td>
<td>519.6719</td>
<td>519.6635</td>
</tr>
<tr>
<td></td>
<td>604.0121</td>
<td>603.9850</td>
<td>603.9794</td>
<td>603.9694</td>
<td>603.9626</td>
<td>603.9601</td>
<td>603.9619</td>
</tr>
<tr>
<td></td>
<td>223.3960</td>
<td>223.3774</td>
<td>223.3747</td>
<td>223.3694</td>
<td>223.3621</td>
<td>223.3561</td>
<td>223.3542</td>
</tr>
<tr>
<td></td>
<td>196.0940</td>
<td>196.0940</td>
<td>196.0940</td>
<td>196.0940</td>
<td>196.0940</td>
<td>196.0940</td>
<td>196.0940</td>
</tr>
<tr>
<td></td>
<td>111.2546</td>
<td>111.2546</td>
<td>111.2546</td>
<td>111.2546</td>
<td>111.2546</td>
<td>111.2546</td>
<td>111.2546</td>
</tr>
</tbody>
</table>

Welfare calculations Tab
4.6 County Level Welfare

County-level welfare is computed by summing up all corresponding link-level welfare values. This can be done for each scenario and each year.
5.0 APPENDIX
5 APPENDIX

Users will find the description of each of the file names and their locations (File name directory) below.

<table>
<thead>
<tr>
<th>Name</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>In ‘hwy’ folder</td>
<td></td>
</tr>
<tr>
<td>MASTERNET_2010_09032014</td>
<td>Master network at statewide level of Indiana area</td>
</tr>
<tr>
<td>9Counties_Network</td>
<td>Network of nine counties</td>
</tr>
<tr>
<td>9Counties_TAZ_2010</td>
<td>TAZ of nine counties in 2010</td>
</tr>
<tr>
<td>9Counties_2010 (combined of ‘9Counties_Network’ and ‘9Counties_TAZ_2010’) (TransCAD map file)</td>
<td>Map file of nine counties in 2010</td>
</tr>
<tr>
<td>9Counties_TAZ_2015</td>
<td>TAZ of nine counties in 2015</td>
</tr>
<tr>
<td>9Counties_2015 (combined of ‘9Counties_Network’ and ‘9Counties_TAZ_2015’) (TransCAD map file)</td>
<td>Map file of nine counties in 2015</td>
</tr>
<tr>
<td>9Counties_TAZ_2025</td>
<td>TAZ of nine counties in 2025</td>
</tr>
<tr>
<td>9Counties_2025 (combined of ‘9Counties_Network’ and ‘9Counties_TAZ_2025’) (TransCAD map file)</td>
<td>Map file of nine counties in 2025</td>
</tr>
<tr>
<td>Network_area1</td>
<td>Network of subarea 1</td>
</tr>
<tr>
<td>Sub TAZ1</td>
<td>TAZ of subarea 1 (for 2010, 2015 and 2025 in respective folders)</td>
</tr>
<tr>
<td>Network_area2</td>
<td>Network of subarea 2</td>
</tr>
<tr>
<td>Sub TAZ2</td>
<td>TAZ of subarea 2 (for 2010, 2015 and 2025 in respective folders)</td>
</tr>
<tr>
<td>In ‘output’ folder</td>
<td></td>
</tr>
<tr>
<td>Master Network_2010 (OR ‘Master Network_2015’ OR ‘Master Network_2025’)</td>
<td>The output of statewide level model (up to ‘model run’) for 2010 (OR 2015 OR 2025)</td>
</tr>
<tr>
<td>9Counties_Base_O1 (OR ‘9Counties_Base_O2’)</td>
<td>The output of nine counties area for Base case and running for option 1 (OR for option 2)</td>
</tr>
<tr>
<td>9Counties_S1_O1 (OR ‘9Counties_S1_O2’)</td>
<td>The output of nine counties area for scenario 1 and running for option 1 (OR for option 2).</td>
</tr>
</tbody>
</table>
* **Note:** Outputs of other scenarios are named in the same way.

<table>
<thead>
<tr>
<th>Scenario</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>O1_Base_area1 (OR ‘O2_Base_area1’)</td>
<td>The output of subarea 1 for Base case and running for option 1 (OR for option 2)</td>
</tr>
<tr>
<td>O1_Scenario1_area1 (OR ‘O2_Scenario1_area2’)</td>
<td>The output of subarea 1 for scenario 1 and running for option 1 (OR for option 2).</td>
</tr>
<tr>
<td>O1_Base_area2 (OR ‘O2_Base_area2’)</td>
<td>The output of subarea 2 for Base case and running for option 1 (OR for option 2)</td>
</tr>
<tr>
<td>O1_Scenario1_area2 (OR ‘O2_Scenario1_area2’)</td>
<td>The output of subarea 2 for scenario 1 and running for option 1 (OR for option 2).</td>
</tr>
</tbody>
</table>

* **Note:** Outputs of other scenarios of subarea 1 are named in the same way.

* **Note:** Outputs of other scenarios of subarea 2 are named in the same way.

**In “Post Analysis” folder**

<table>
<thead>
<tr>
<th>File Name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Results_Opt1_9Counties (Results_Opt2_9Counties)</td>
<td>The post analysis results of option 1 (or option 2) of 9Counties for 2010, 2015 and 2025.</td>
</tr>
<tr>
<td>Results_Opt1_I465 (Results_Opt2_I465)</td>
<td>The post analysis results of option 1 (or option 2) of I-465 for 2010, 2015 and 2025</td>
</tr>
<tr>
<td>Results_Opt1_area1 (Results_Opt2_area1)</td>
<td>The post analysis results of option 1 (or option 2) of area 1 for 2010, 2015 and 2025</td>
</tr>
<tr>
<td>Results_Opt1_area2 (Results_Opt2_area2)</td>
<td>The post analysis results of option 1 (or option 2) of area 2 for 2010, 2015 and 2025</td>
</tr>
<tr>
<td>Results_Opt2_9counties_PkHr</td>
<td>The post analysis results of option 2 of 9 counties for 2010, 2015 and 2025</td>
</tr>
<tr>
<td>Results_Opt2_9counties_Scenario9_Postanalysis</td>
<td>The post analysis results of option 2 of 9 counties for scenario 9 for 2010, 2015 and 2025</td>
</tr>
<tr>
<td>VMT and VHT per user</td>
<td>Computing VMT and VHT per user</td>
</tr>
</tbody>
</table>