



Enhanced HTML-based Client-side Visualization Tools in TexPACK V3.0

HAO PANG (*TEXAS A&M TRANSPORTATION INSTITUTE*)

TAMMYE FONTENOT (*TAMMYE.FONTENOT@TXDOT.GOV*)

YUHAN GAO (*TEXAS A&M TRANSPORTATION INSTITUTE*)

BEHRUZ PASCHAI (*TEXAS A&M TRANSPORTATION INSTITUTE*)

KEVIN HALL (*TEXAS A&M TRANSPORTATION INSTITUTE*)



Agenda



Background and Challenges



Workflow and Architecture



Live Demos (3 HTML-based reports)



Q&A

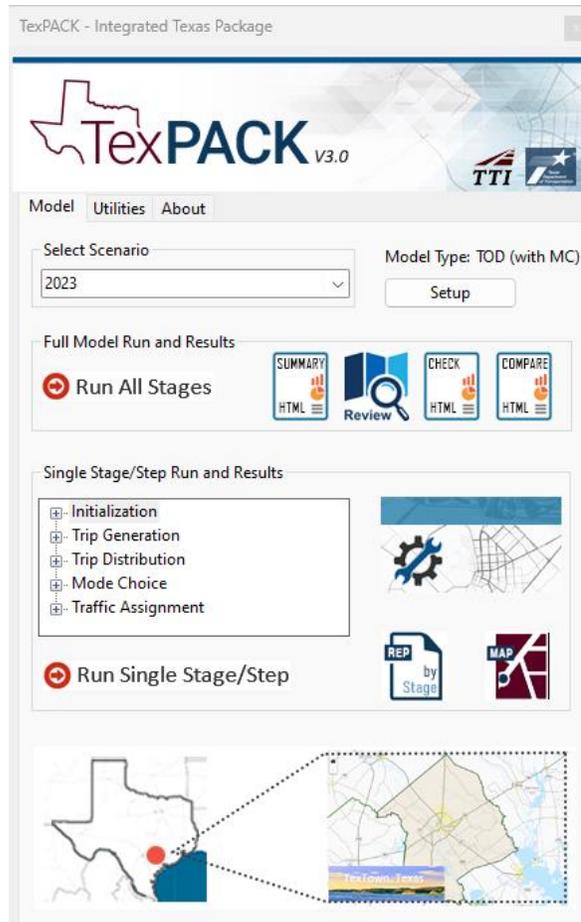
Challenges with the Traditional Approach



Most users of travel demand model data:

- Do not have the vendor developed software;
- Can not filter and manipulate the large amount of data produced;
 - Do not have the time
 - Do not have the specialized skills and background
 - *Reduce opportunities for error propagation*
- Can not analyze and summarize the results.
 - Easy to get lost in isolated and static information
 - Can not build a connection and relationship between different data

What is TexPACK V3.0?



- **TexPACK: *Integrated Texas Travel Demand Model Package System***
- **Used by more than 20 MPOs in Texas**
- **Version V2.5 (current) => V3.0 (to be finished by 2025)**
- **Three major client-side HTML-based reporting features:**
 - **Scenario Summary Report**
 - **Scenario Comparison Report**
 - **Model Check Report**

Why client-based for TDMs?

Client-based

Portability:

- Can be opened locally or shared as static files.

Reduced server load:

- Server only stores static assets or logics;
- All processing happens in the browser.

Scalability:

- Each report is an independent application.

Local access:

- Not rely on a server connection (if data is embedded).
- Backend is processed locally, and data can be embedded in the report directly.

Server-based

Requires server infrastructure:

- Needs backend setup and maintenance.
- The calculation/processing capability is mainly determined by the server and connection.

Higher latency:

- Each interaction requires a round-trip to the server.

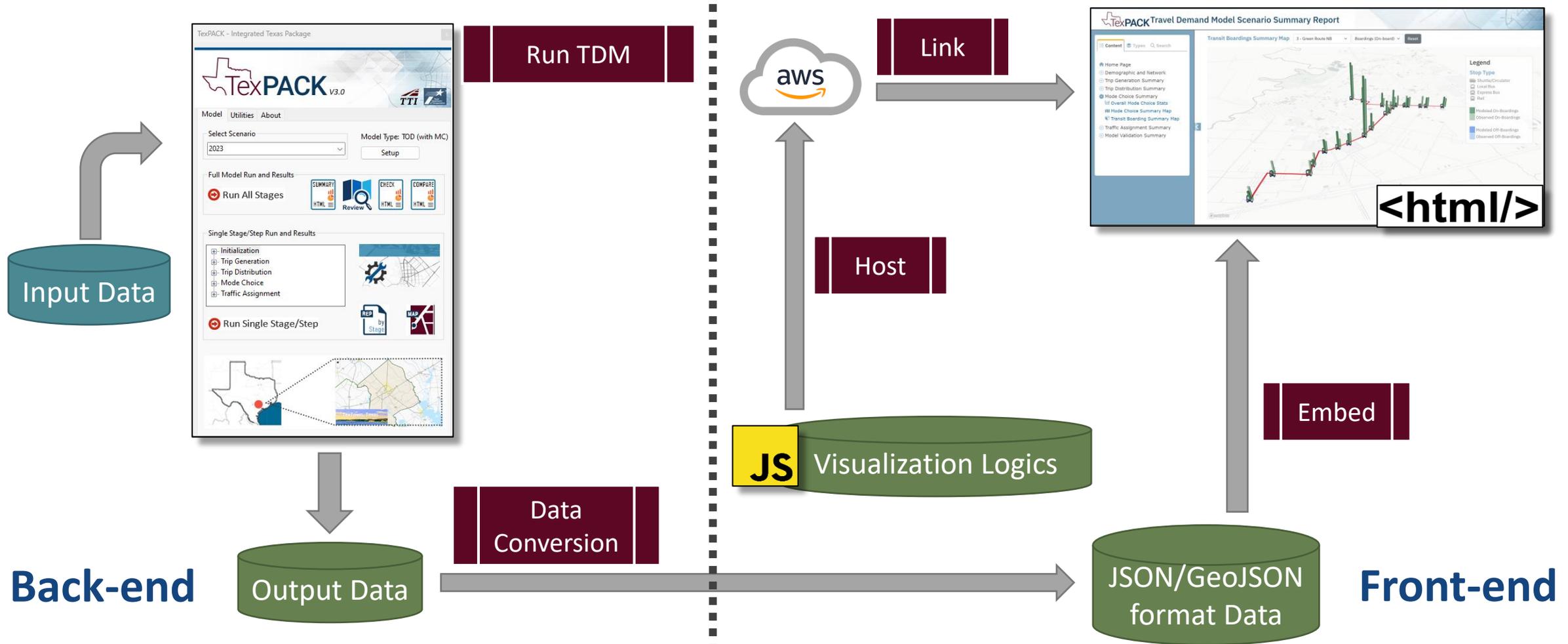
Scalability concerns:

- High user loads increase server demand.

Local access is very limited:

- Requires an active internet connection and server availability.
- The backend is usually maintained on the server. Data created from local needs to be hosted on the server first.

From Raw Data to Visual Narratives



User-side: One-click Approach

TexPACK - Integrated Texas Package

TexPACK V3.0

Model Utilities About

Select Scenario: 2023

Model Type: TOD (with MC)

Full Model Run and Results

Run All Stages

SUMMARY HTML | Review | CHECK HTML | COMPARE HTML

Single Stage/Step Run and Results

- Initialization
- Trip Generation
- Trip Distribution
- Mode Choice
- Traffic Assignment

Run Single Stage/Step

REP by Stage | MAP

Map of Texas showing the study area.

HTML Scenario Summary Report

HTML Model Check Report

HTML Scenario Comparison Report

HTML Model Check Report

Select stages to be checked:

Select	Report Stage
<input checked="" type="checkbox"/>	Demographic
<input checked="" type="checkbox"/>	Trip Generation
<input checked="" type="checkbox"/>	Trip Distribution
<input checked="" type="checkbox"/>	Mode Choice
<input checked="" type="checkbox"/>	Traffic Assignment
<input checked="" type="checkbox"/>	Model Validation

Run Cancel Select All

HTML Scenario Comparison Report

Please select scenarios:

Select	Scenario
<input checked="" type="checkbox"/>	2023
<input checked="" type="checkbox"/>	2050
<input checked="" type="checkbox"/>	2050A

Run Cancel Select All

Explore HTML Scenario Summary Report

TexPACK Travel Demand Model Scenario Summary Report

Welcome to TexPACK Scenario Summary Report!

This scenario summary report is produced by the Integrated Texas Package (TexPACK). Specifically, TexPACK (Version 3.0) is a comprehensive travel demand model package. The default model is a 3-step Daily model. But it can also be used to develop: 3-step Time-of-Day, 4-step Daily, and 4-step Time-of-Day model. Below contains the basic setting information for this scenario run:

Study Area: Victoria (VIC)

Model Type: 4-Step Time of Day

Scenario Year Information: 2012 | Base Year

Validation Settings: Real Counts | Min Counts = 1000

Report Created on: Friday October 8, 2022 (10:45 PM)

Scenario Directory: C:\TxDOT\TT\2012\

Scenario Description: Initial run for Victoria (Base Year 2012)



Model Settings from Creator:

Person or Vehicle Trip:

Person Trip

Demographic Distribution Curve:

Raw (unsmoothed)

Truck Trip Purpose:

Combined (no Truck split)

External Trip Purpose:

Split (Auto | Truck)

University Trips:

Not defined as a trip purpose

Total Number of Trip Purposes:

12 (8 INTL | 2 EXLO | 2 THRU)

Dimensions for Trip Production:

2-Dimension (HHSIZE, MEDINC)

Settings from Scenario Manager

Total Number of Zones::

237

Total Number of Internal Zones:

225

Consumer Price Index:

6.839

Median Household Income:

52500

Number of Sectors:

23

Number of Area Types:

5

Truck Value-of-Time (VOT):

0.4388

Mode Run Type and Iterations:

Feedback (5 Iterations)

Integrated Texas Package System (TexPACK)
Version 3.0 20221008 (64-bit)

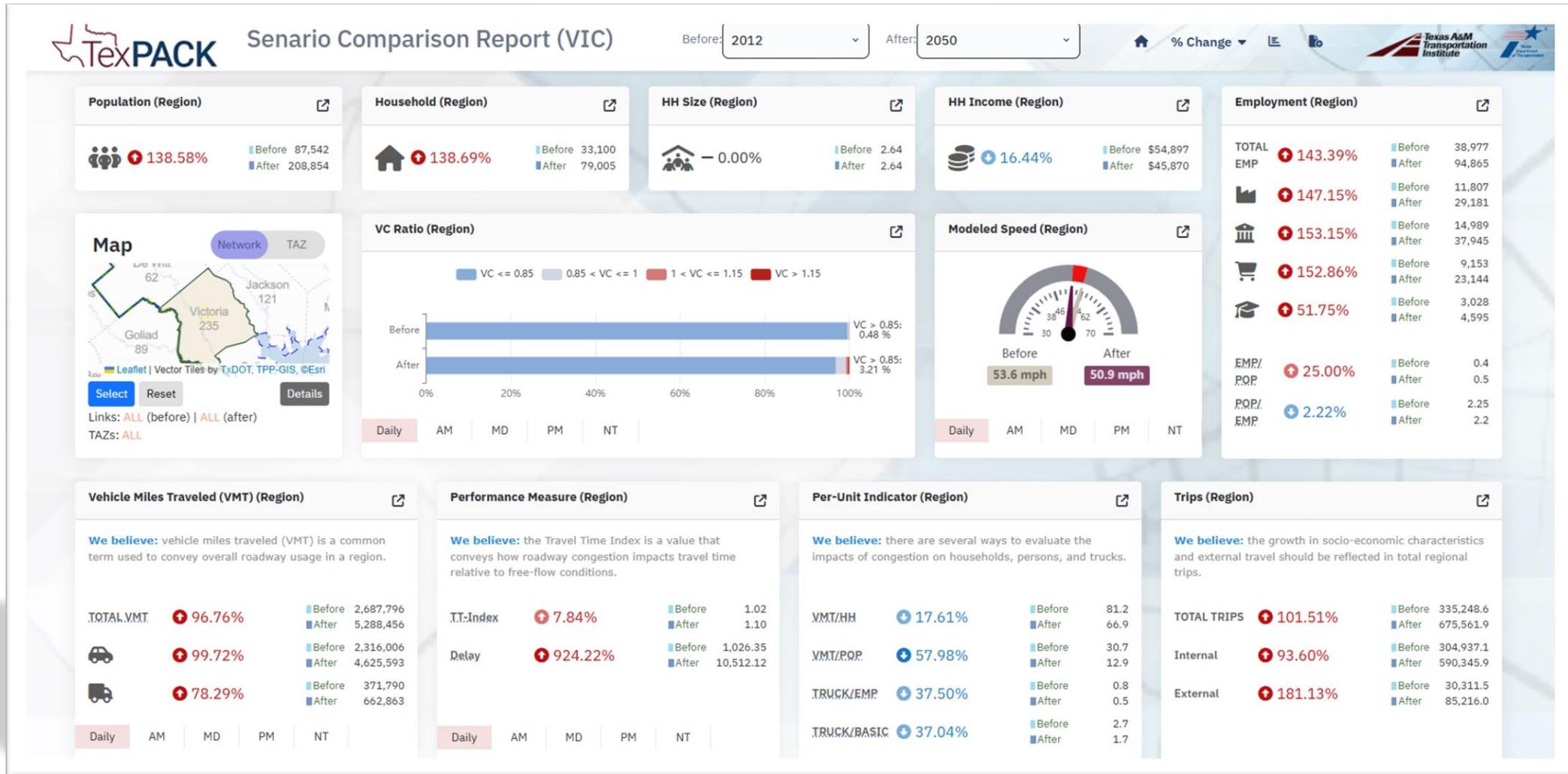
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Developed for:
Texas Department of Transportation
Transportation Planning and Programming Division
Traffic Analysis Section
6230 E Stassney Ln
Austin, TX 78744
(512) 486-5115
<http://www.txdot.gov>

Prepared by:
Texas A&M Transportation Institute
Travel Forecasting Program (HTF)
(512) 486-5177
tpp-transcad-helpdesk@tti.tamu.edu
<http://www.tti.tamu.edu>



Explore HTML Scenario Comparison Report



Explore HTML Model Check Report

TexPACK Travel Demand Model Checking Report: TT (2023)

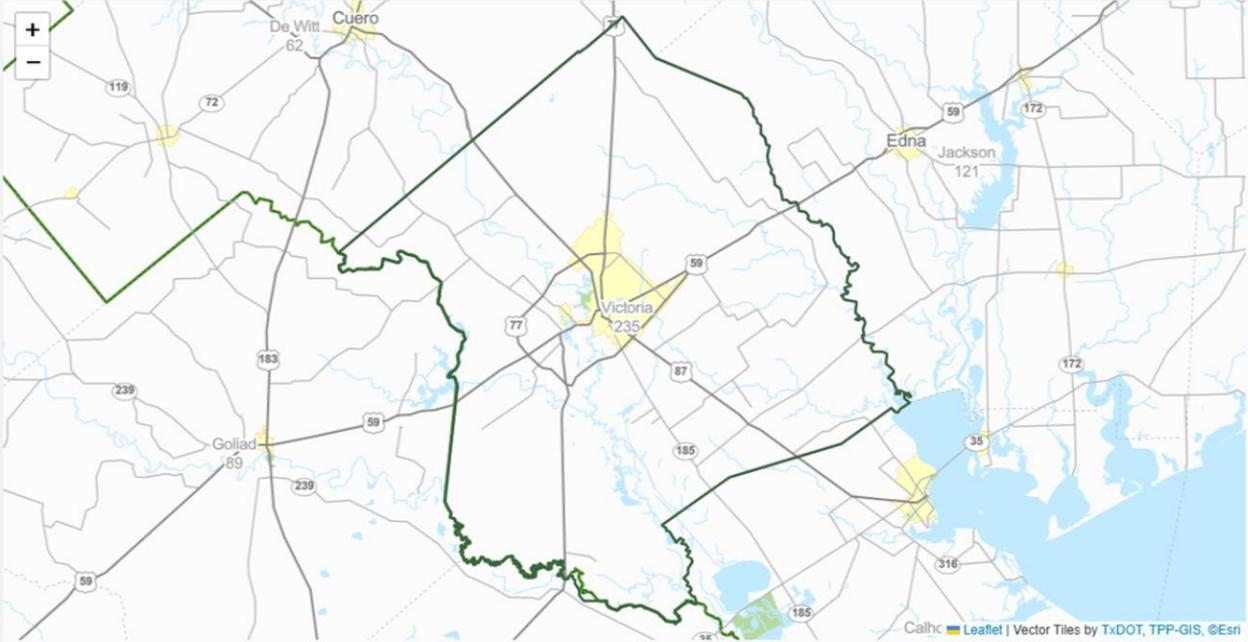
Issues Only 

56.8 /100

Overall: **FAIL**

Overall Comments:

- Not all Scaling Factors are within acceptable range.
- EXLO SGP in internal TAZs are found. It is an error.
- Not all Average Trip Lengths are within acceptable range.
- Not all Intrazonal Trip Percentages are within acceptable range.
- At least one purpose' Friction Factors are NOT constantly decreasing.
- Modeled & Count VMT Match (%) is 110.58% (acceptable maximum: 103%)



Calhc | Leaflet | Vector Tiles by TxDOT, TPP-GIS, ©Esri

14

DEMOGRAPHIC ✓ 100

This part checks results of demographic data including household and employment characteristics.

3

TRIP GENERATION ✗ 72

This part checks results of trip generation including trip production, trip attraction, and purpose splits.

3

TRIP DISTRIBUTION ✗ 62

This part checks results of trip distribution including average trip lengths, intra-zonal trips and fraction factors.

3

MODE CHOICE ! 86

This part checks results of mode share for different transportation modes.

TRAFFIC ASSIGNMENT ✓ 100

This part checks results of traffic assignment including volume capacity ratio and vmt per capita.

5

MODEL VALIDATION ✗ 58

This part checks all model validation metrics for base year scenario.



Thanks!

Texas A&M Transportation Institute

1111 RELLIS Parkway

Bryan, TX 77807

info@tti.tamu.edu

979-317-2000

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