

SCAG MTF TransCAD Presentation

Caliper Corporation

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www.caliper.com

TransCAD 9.0

Some Recent Caliper Project Work

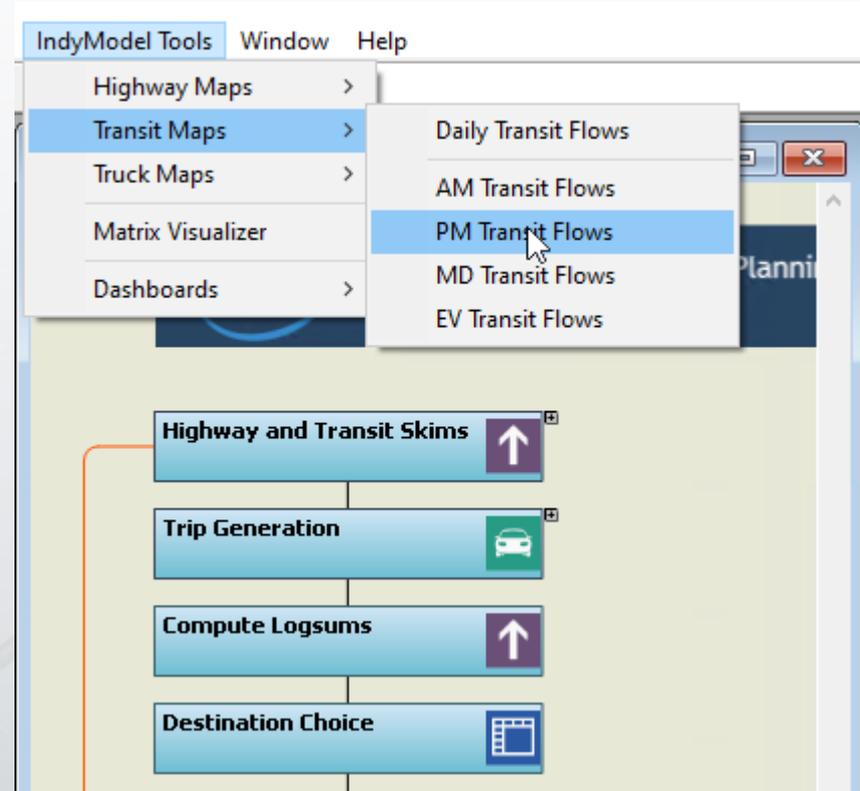
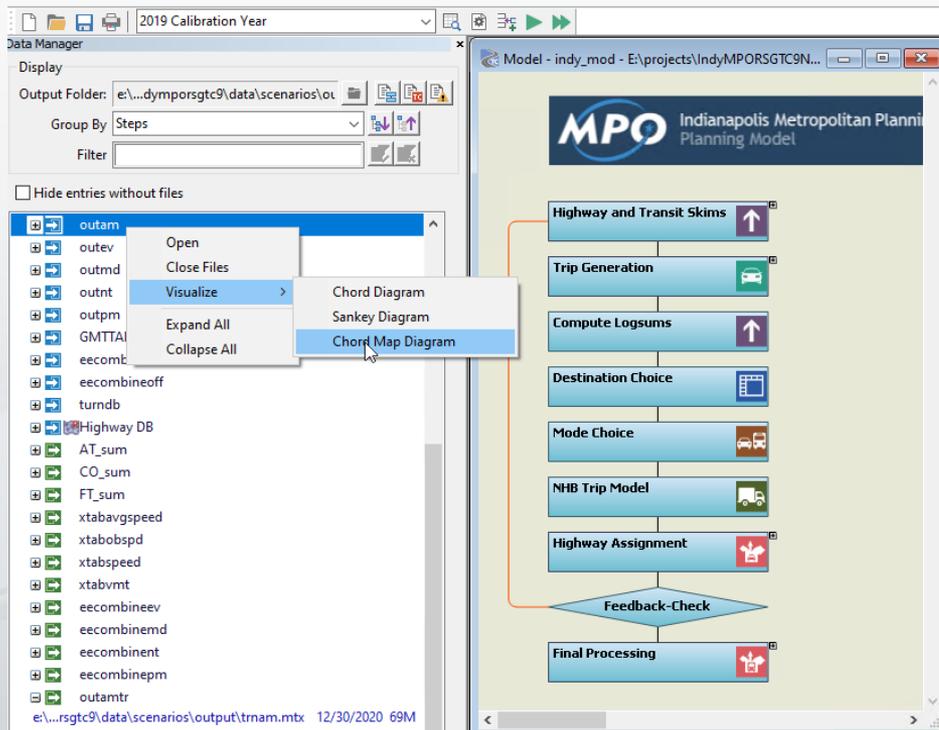


New Features in TransCAD 9.0

- **Flowchart Menus, Toolboxes, and Organization**
- **Web Diagrams**
- **Dashboards**
- **Destination Choice Estimation**
- **Population Synthesis**
- **Modeling API**
- **Support for R and Python**

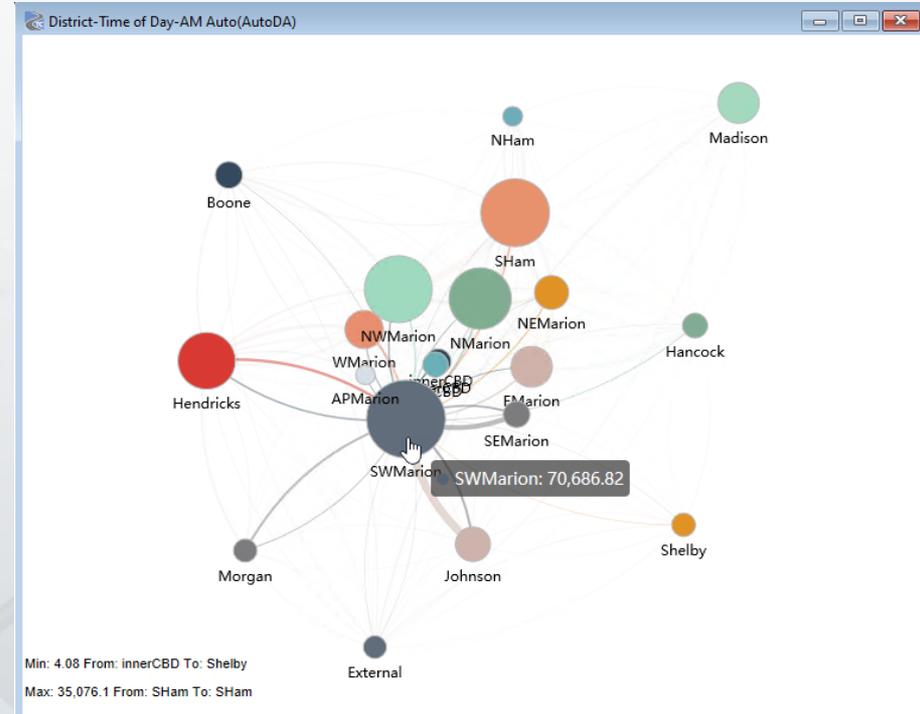
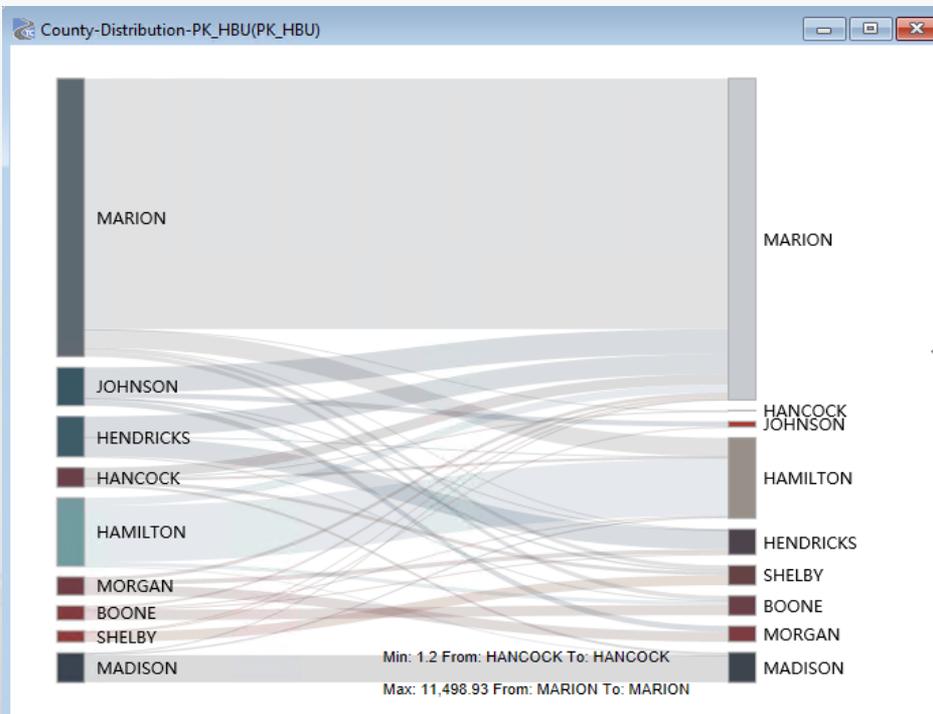
New Features in TransCAD 9.0

- **Flowchart Innovations**



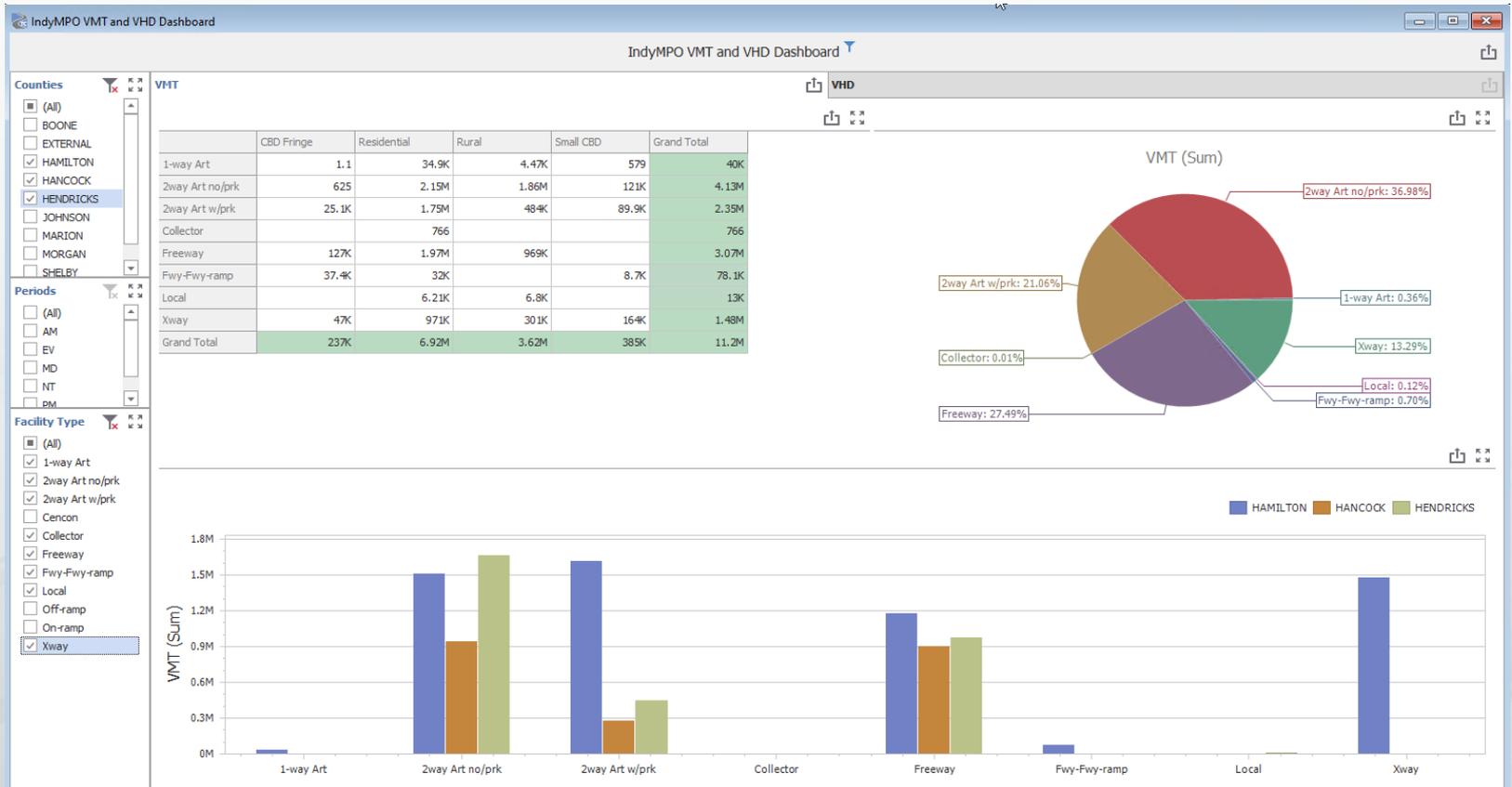
New Features in TransCAD 9.0

- Web Diagrams



New Features in TransCAD 9.0

- Dashboards



New Features in TransCAD 9.0

- Destination Choice Model Parameter Estimation

Destination Choice Model Estimation - hbw.dcm

Model Management
 Model Name:
 Segment:

Utilities | Estimate

Field	Coefficient	Fix	Tracts
Availability	--		Avail.Avail
Beta_IJ	0.000000	<input type="checkbox"/>	IZ.IJ_Dummy
Beta_Time	0.000000	<input type="checkbox"/>	Skim.Weighted_Core
Beta_Density	0.000000	<input type="checkbox"/>	Tracts.Intersection_Density
Beta_Size	0.000000	<input type="checkbox"/>	Tracts.Size_Var

Starting Model Parameters

Parameter	Value	Scale	Fixed	Description
Beta_IJ	0.0000	1.0000		
Beta_Time	0.0000	206.9155		
Beta_Density	0.0000	383.2535		
Beta_Size	0.0000	9.8031		

Maximum likelihood converged after 10 iterations.

Estimation results

Parameter	Estimate	Std. Error	t Test	Global Corr
Beta_IJ	0.554649	0.134621	4.1201	9.8031
Beta_Time	-0.090034	0.003061	-29.4179	9.8031
Beta_Density	-0.001715	0.000585	-2.9305	9.8031
Beta_Size	0.743687	0.036190	20.5497	9.8031

Log-Likelihood at Zero	-4381.8129
Log-Likelihood at Start	-4381.8129
Log-Likelihood at End	-3266.9062
-2 (LL(Zero) - LL(End))	2229.8133
-2 (LL(Start) - LL(End))	2229.8133
Asymptotic rho squared	0.2544
Adjusted rho squared	0.2535

Run

More Effective and Rapid Population Synthesis

- Support for matching both household and population marginals as well as multiple geographies.

The screenshot displays the 'Population Synthesis' software interface. It features several windows and panels:

- Population Synthesis (Main Window):** Includes tabs for 'Seed', 'Marginals', 'Synthesis', 'IPU', 'Options', and 'Output'. It has sections for 'Household Marginals' and 'Person Marginals' with 'Choose IPU Seed Fields' buttons.
- Household Marginals Table:**

Seed Field	Marginals
NP	...
VEH	...
IncomeCategory	...
- Person Marginals Section:** Includes a checked 'Include Person Marginals' box and a 'Choose IPU Seed Fields' button.
- Person Marginals Table:**

Seed Field	Marginals
AGEP	...
SEX	...
- Marginals for SEX Window:** Shows 'Marginal View' set to 'Popsyn_BlockGroupMarginals' and 'Marginal Fields' with a 'Choose Marginal Fields' button.
- Marginal Fields Table:**

Marginal Field	Low (>=)	High (<)
Male	0	1
Female	1	2
- Background Data Table:**

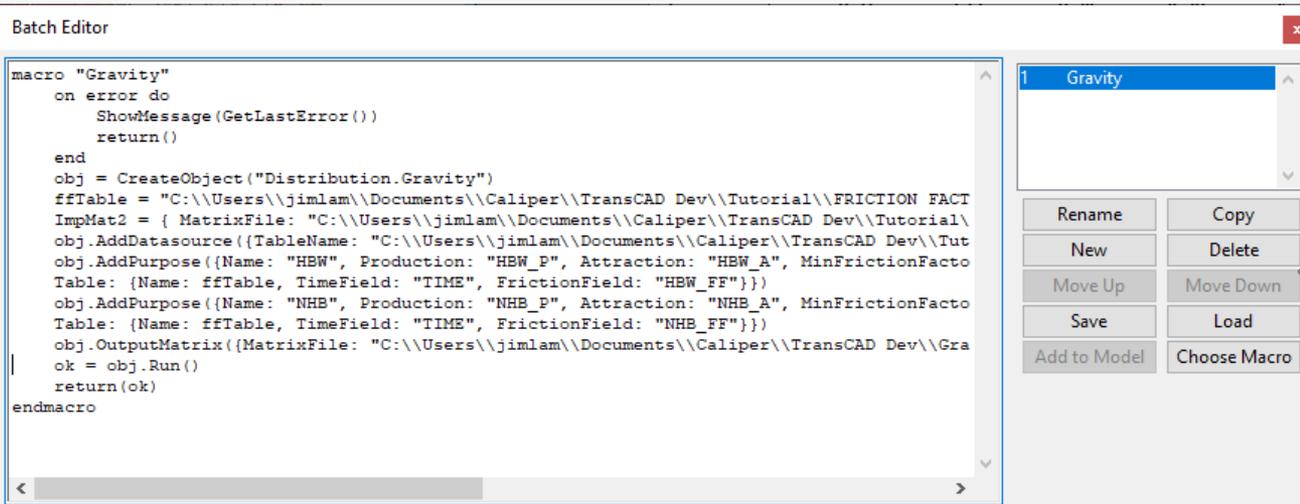
5302	830
5302	688
5302	406
5302	447
5302	...
- Bottom Data Table:**

0007080.0000	1	5301
0007256.0000	1	5301
0007411.0000	1	5301

- Create synthetic populations in minutes rather than hours. Update synthetic populations for scenarios.

Python and R Integration

- Updated API for programming procedures and common TransCAD operations in Python and R
- Integration into Batch Mode evolving



The screenshot shows the 'Batch Editor' window. On the left is a text area containing a macro definition for 'Gravity'. On the right is a panel with a list of macros, currently showing 'Gravity' as the selected item, and a set of control buttons.

```
macro "Gravity"  
  on error do  
    ShowMessage(GetLastError())  
    return()  
  end  
  obj = CreateObject("Distribution.Gravity")  
  ffTable = "C:\\Users\\jimlam\\Documents\\Caliper\\TransCAD Dev\\Tutorial\\FRICTION FACT  
  ImpMat2 = { MatrixFile: "C:\\Users\\jimlam\\Documents\\Caliper\\TransCAD Dev\\Tutorial\  
  obj.AddDatasource({TableName: "C:\\Users\\jimlam\\Documents\\Caliper\\TransCAD Dev\\Tut  
  obj.AddPurpose({Name: "HBW", Production: "HBW_P", Attraction: "HBW_A", MinFrictionFacto  
  Table: {Name: ffTable, TimeField: "TIME", FrictionField: "HBW_FF"}}}  
  obj.AddPurpose({Name: "NHB", Production: "NHB_P", Attraction: "NHB_A", MinFrictionFacto  
  Table: {Name: ffTable, TimeField: "TIME", FrictionField: "NHB_FF"}}}  
  obj.OutputMatrix({MatrixFile: "C:\\Users\\jimlam\\Documents\\Caliper\\TransCAD Dev\\Gra  
  ok = obj.Run()  
  return(ok)  
endmacro
```

The right panel shows a list with 'Gravity' selected. Below the list are buttons: Rename, Copy, New, Delete, Move Up, Move Down, Save, Load, Add to Model, and Choose Macro.

Python and R Integration

- **caliperR**
 - An R package for running Caliper software
 - Access to any GISDK function or Macro (including your own)
 - Convert caliper views into data frames (and back again)
 - Bring matrices into the R working environment (e.g. skims)
 - Control GISDK classes
 - Fully documented including vignettes
- **CaliperPy Module**
 - Lets you access not only TransCAD, but also the .NET framework via any program written in 3.x
 - Access to GISDK macro calls, binary and other tables, logging, debugging, vectors, matrices and procedures

Updated and New Datasets

- ACS 2015-2019
- 2020 Census Block geography
- New Caliper national road layer designed for representing external networks for MPOs and use in statewide models and national models
- Up-to-date HERE data for CA and nationwide available for license with all streets, travel speeds, and points of interest
- Lane level networks for U.S. Interstates and major roads of many cities (for TransModeler).

Some Recent & Current Caliper Project Work

- **NPMRDS**
- **Virginia DOT Accessibility Calculator**
- **Activity Based Modeling**
- **Dynamic Traffic Assignment**
- **FHWA Freight Analysis Framework**

VDOT Accessibility Calculator

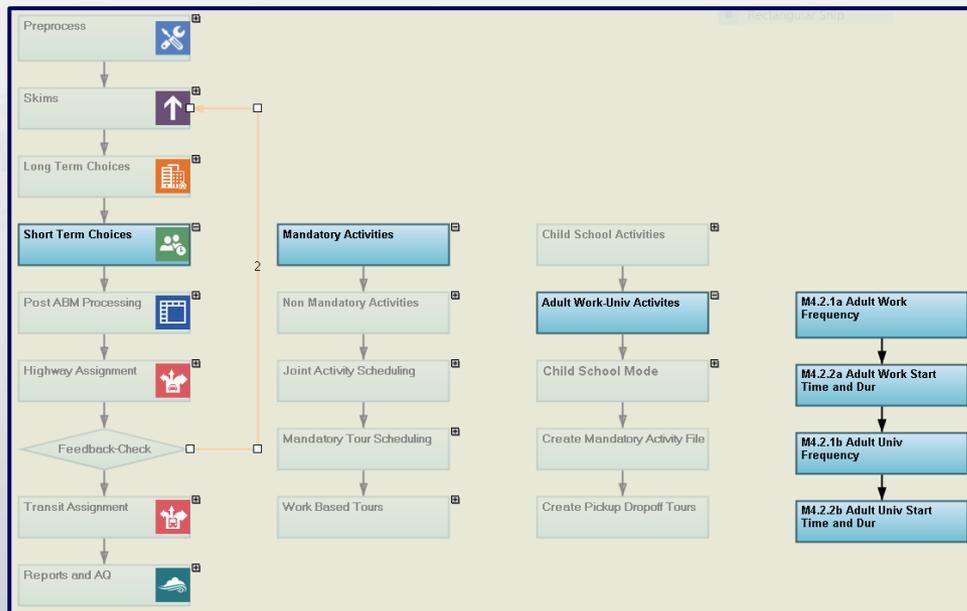
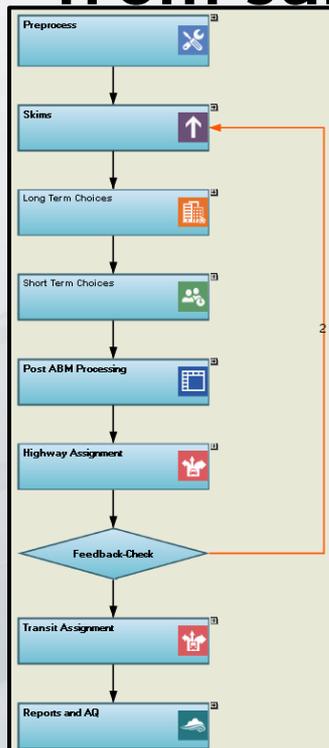
- **Performs SmartScale Project Analysis**
- **Covers all of Virginia plus 30 mile radius**
 - **Over 2 million HERE streets, 260,000 blocks, 150,000 points of interest**
 - **Auto, Transit, Walk and Bike accessibilities**
 - **Compares project vs no project accessibilities to employment and points of interests**

New Native TransCAD ABM Software

- High performance model components
- Can flexibly model all types of ABMs
- A uniquely capable and easy to use UI
- Many types of data visualization
- First implementation is for the three Central CA Coast MPOs

Central Coast ABM

- A more realistic choice structure
- Achieves model consistency w/o iteration
- Model components successively estimated from survey data rather than asserted.



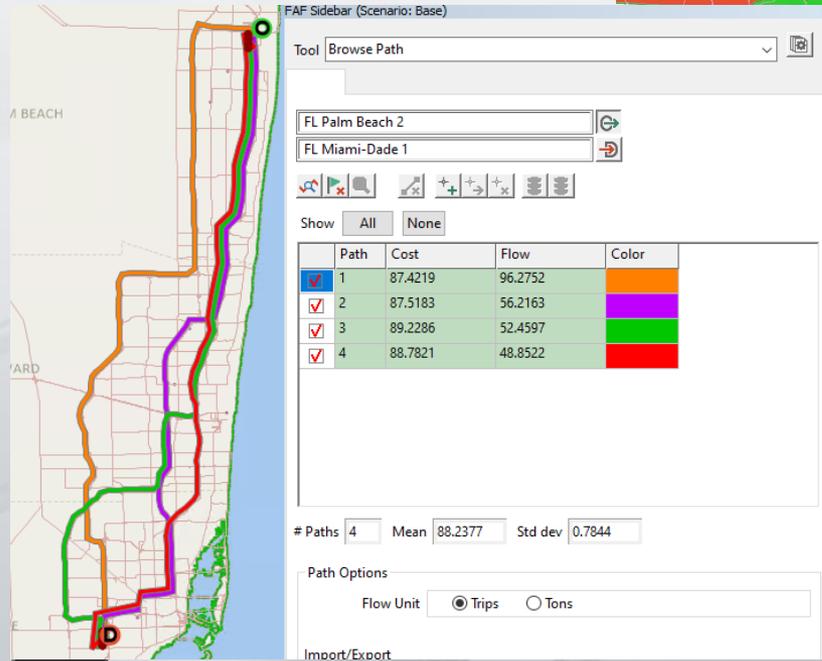
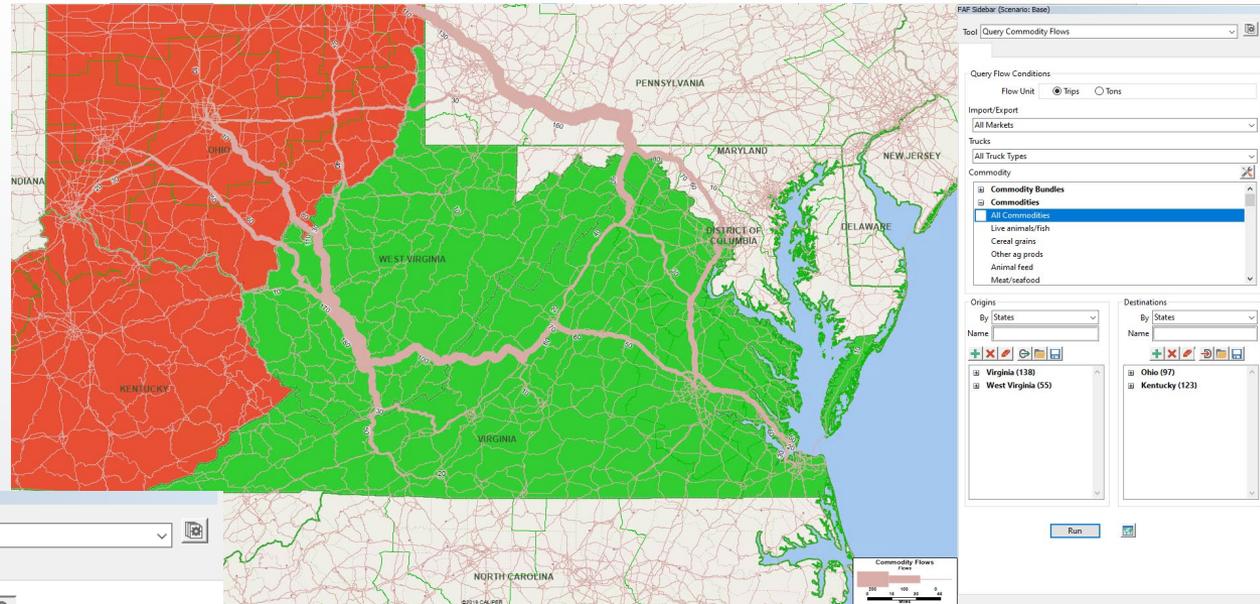
Dynamic Traffic Assignment & Simulation

- **Many successful and unprecedented wide-area DTA deployments with TransModeler**
- **Microscopic and Mesoscopic Models with Dynamic Pricing for Managed Lanes**
- **Support for Connected and Automated Vehicle Alternatives**
- **TransDNA for the largest meso DTAs**
- **ABM-DTA Integration now supported**

FHWA Freight Analysis Framework

- Disaggregates FAF 5 OD Tonnages into truck trips by counties, subcounties, and ports
- Assignment using logit multi-path assignment method
- Visualizer displays flows and paths by commodities at county, FAF, and state level

FHWA Freight Analysis Framework



For More Information

- See our publications

<https://www.caliper.com/press/transportationlibrary.htm>

- Our most recent newsletter

<https://www.caliper.com/transcad/newsletter/winter-2020-2021.htm>

- Email Jim Lam (jimlam@caliper.com) or
Howard Slavin (howard@caliper.com)