

Integrating Planning Models to Better Understand How Transportation, Land-use and Economic Systems Interact



Colin Belle, Metropolitan Planner - Region 1 Planning Council (R1PC)

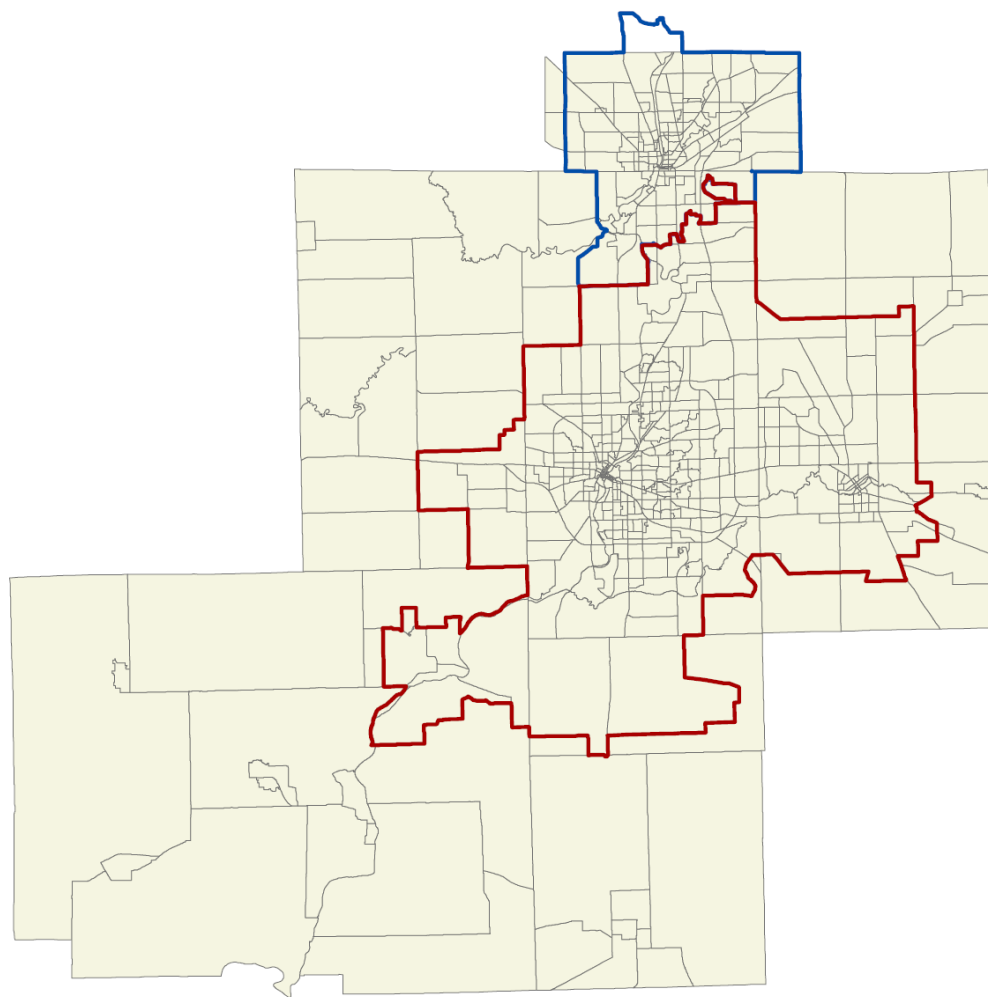
REMI Webinar: August 29, 2017



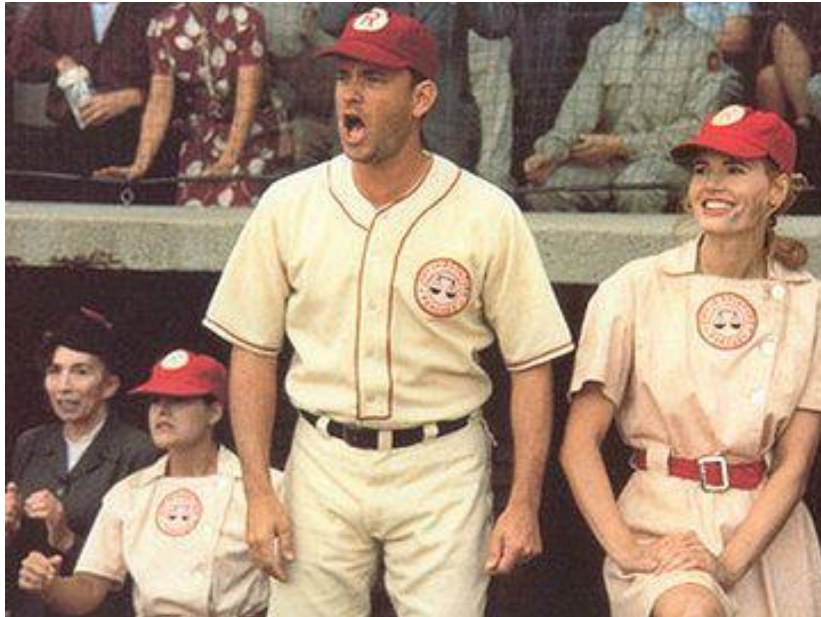
COLLABORATIVE PLANNING FOR NORTHERN ILLINOIS

Regional Context

- Rockford Metropolitan Agency for Planning (RMAP) transitioning from an MPO to an RPC – Region 1 Planning Council
- Population of 441,000
1,640+ sq/mi
- 80 miles NW Chicago, 60 miles from O'Hare Airport
- Past, economy was based on heavy industrial processes
- Today, health care, manufacturing, tourism, agriculture



Local Sports & Entertainment



Rockford Peaches
"There's no crying in baseball!"

Home of Cheap Trick
Rock & Roll Hall of Fame



REMI – Metro PI

Offers forecasting for sub-county geographies, Traffic Analysis Zones (TAZ)

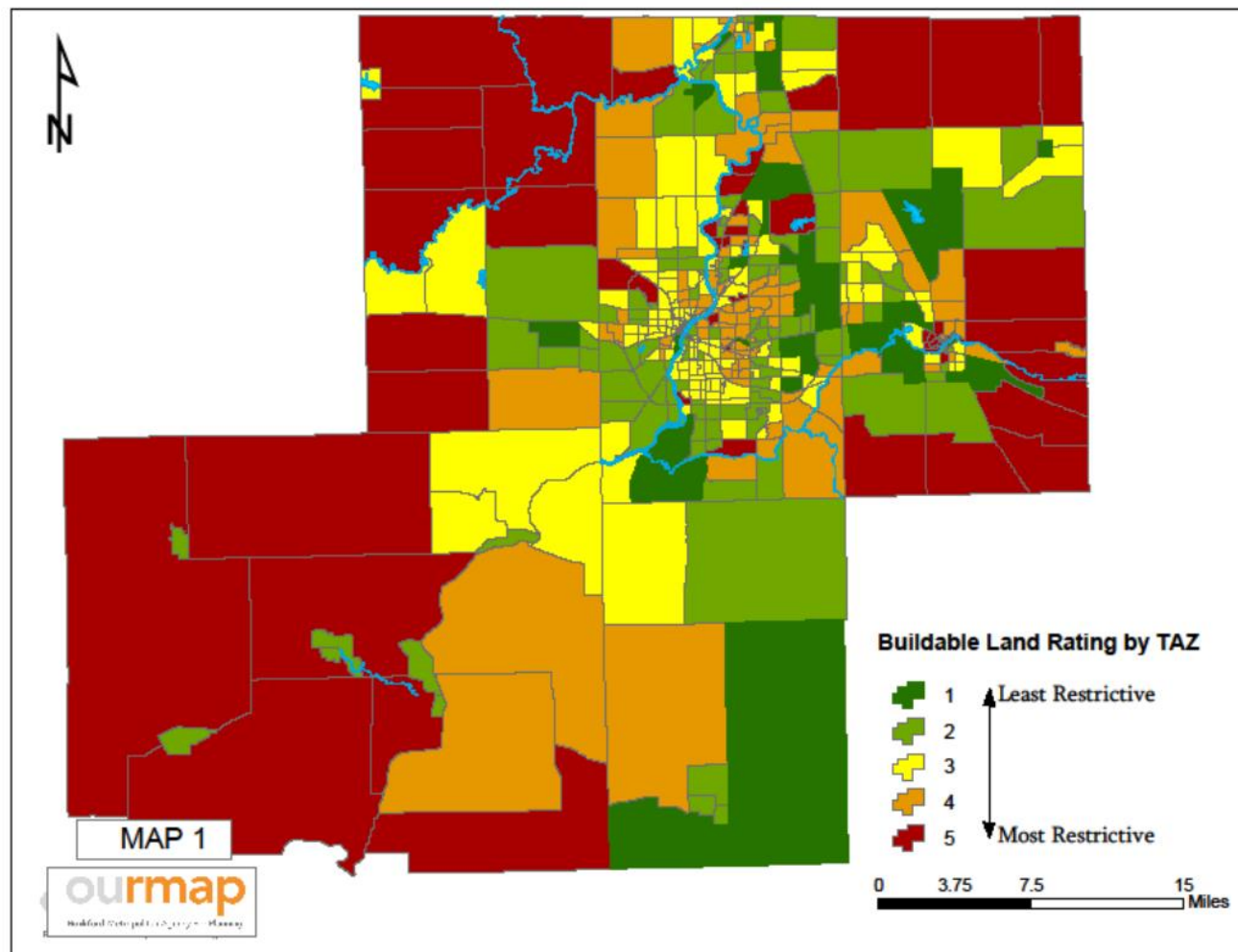
- Total of 518 TAZ's

Metro PI is calibrated with local data that is updated when available

- Employment
- Industry employment by NAICS classification (19 classes)
- Population (by household and group quarters)
- Number of households and median HH income
- Available labor force, total workers over 16
- Commuting Distance
- *Housing Price – still being calculated
- Build Ratings, Scale of 1-5, 1= suitable for development / 5= restricted to development

REMI – Metro PI Building Ratings

Development
Ratings by
Traffic Analysis
Zone (TAZ), Fall
2016



REMI – Metro PI

Used to calculate the economic impact of Projects of Regional Significance

- Swedish American Hospital Expansion
 - \$130 million
 - 600 temporary jobs and 96+ full time positions
- OSF Saint Anthony's Medical Center Update & Renovation
 - \$85 million
 - 700 temporary jobs
- Various Data Requests from partner agencies, grants, ADT, VMT, population & dwelling unit projections

REMI – TranSight

Forecasting results at the County and Regional geography

- Large scale projects with economic impacts that are far reaching
- May require construction of additional roadways/entrances
- Create a large number of long-term, permanent jobs
- Spur additional investment and new construction

TranSight integrates Economics with Travel Demand Modeling allowing for the input of Travel Demand changes into the model based on known future roadway improvement projects in the region.

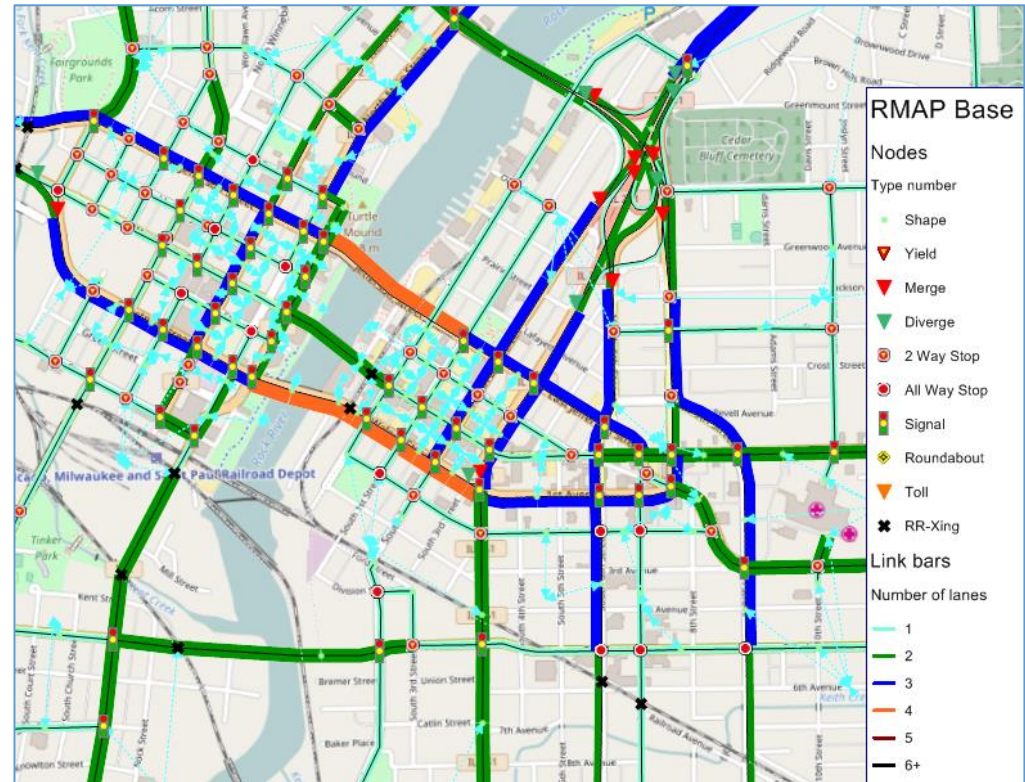
Project Example

- Mercy Health Hospital, new construction-\$485 million investment
- Amerock Building, Embassy Suites - \$64 million

VISUM- Travel Demand Model, TDM

- Travel Demand Model
 - Network of the transportation system
 - Socio-economic data as inputs, TAZ
 - Trips generated, distributed, projected 2040

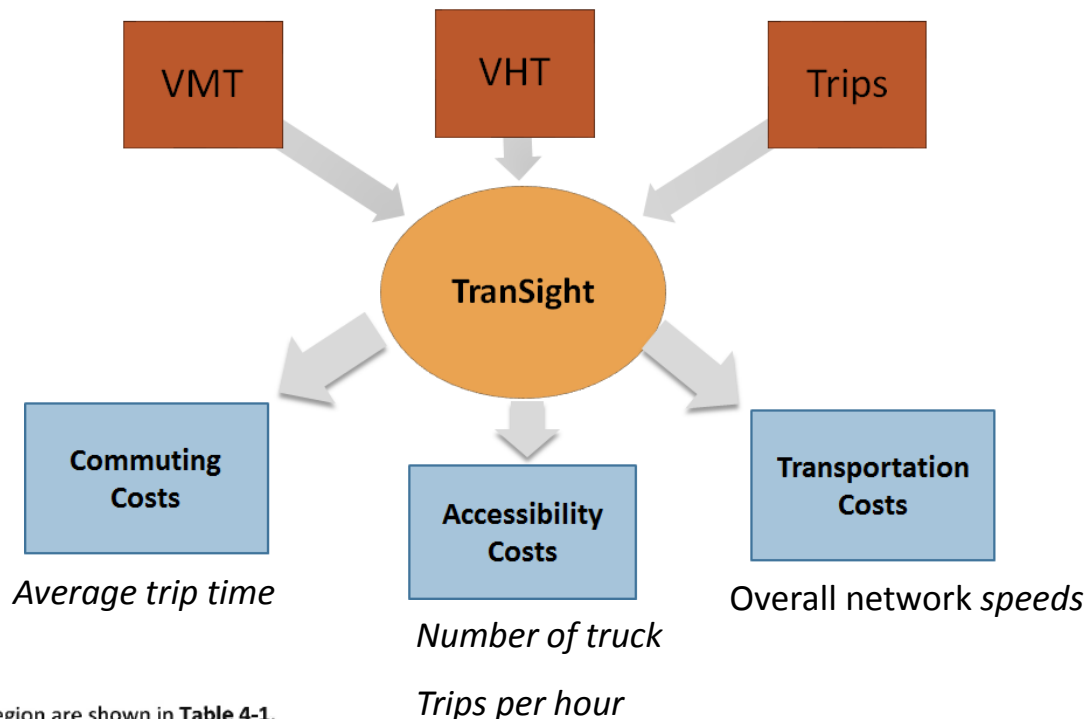
The two main inputs are the transportation network and socio- economic data for each TAZ.



VISUM and TranSight Integration

Visum Outputs needed
As inputs to TranSight

TranSight Calculates...



Population, household and employment forecasts for the RMAP region are shown in **Table 4-1**.

TABLE 4-1 HOUSEHOLDS AND EMPLOYMENT GROWTH SUMMARY

Area	Dwelling Units			Employment		
	2015	2040	Change	2015	2040	Change
Winnebago County	125,247	128,195	2,948	160,125	178,435	18,310
Boone County	19,575	20,475	900	22,085	22,440	355
Ogle County	22,390	22,884	494	21,969	23,568	1,599
Rock County (SLATS portion)	17,912	19,413	1,501	17,772	27,942	10,170
Total	187,139	193,007	5,868	223,966	254,425	30,459

VISUM – REMI Export Procedure

PTV Visum 64 Bit 15.00-17 - Network: RMAP Base-10-04-16a.ver - [Procedure sequence]

File Edit View Lists Filters Calculate Graphics Network Demand Scripts Windows Help Procedure sequence

Select filter... Procedure sequence

Network

Count: 311 Execution Active

	Execution	Active	Procedure	Reference object(s)	Variant/file	Comment
1			Group RMAP Model Procedures Updated 10-04-2016			RMAP Model Procedures Updated 10-04-2016
2			Group AirSage Matrix Analysis ...	3 - 35		AirSage Matrix Analysis
36			Group Count Attachment ...	37 - 66		Count Attachment
67			Group External Through Trip Computations ...	68 - 87		External Through Trip Computations
88		<input checked="" type="checkbox"/>	Group Network Hourly Capacity Calculations ...	89 - 113		Network Hourly Capacity Calculations
114		<input checked="" type="checkbox"/>	Group Trip Generation and Adjustments ...	115 - 170		Trip Generation and Adjustments
171			Group Iterative Distribution and Mode Choice ...	172 - 202		Iterative Distribution and Mode Choice
203			Group AM Final Assignment ...	204 - 217		AM Final Assignment
218			Group PM Final Assignment ...	219 - 236		PM Final Assignment
237			Group Daily Final Assignment ...	238 - 282		Daily Final Assignment
283			Group Adjust External-External ...	284 - 287		Adjust External-External
288		<input checked="" type="checkbox"/>	Group Assignment Analysis ...	289 - 298		Assignment Analysis
299			Group Truck Analysis ...	300 - 306		Truck Analysis
307		<input checked="" type="checkbox"/>	Group REMI Data Export	308 - 311		REMI Data Export
308		<input checked="" type="checkbox"/>	Combination of matrices and vectors	Matrix([NO]=2000):=Matrix ([NO]=100)		Copy Assigned Auto Trips to Matrix
309		<input checked="" type="checkbox"/>	Combination of matrices and vectors	Matrix([NO]=2001):=Matrix ([NO]=101)		Copy Assigned Truck Trips to Matrix
310		<input checked="" type="checkbox"/>	Combination of matrices and vectors	Matrix([NO]=2002):=Matrix ([NO]=102)		Copy Assigned Truck Trips to Matrix
311		<input checked="" type="checkbox"/>	Run script		Export_REMI.py	RMAP_2015 Base

Operations

- Create
- Create group
- Edit
- Delete
- Duplicate
- Up
- Down
- Set all active
- Set all inactive

View

- Expand group
- Reduce group
- Reduce all groups
- Expand all groups

Computation nodes

- Manage computation

Quick view (Zones)

Network editor List (Links) Junction editor Procedure sequence x List (Screenlines) List (Zones)

1:370881 2369558.0187 1978762.9110

Export Data to REMI
Format

VISUM – REMI Import Procedure

The screenshot displays the VISUM software interface for Regional Simulation 1 - REMI TranSight v4.0. The main window shows the 'Travel Demand' module selected in the left sidebar. A dialog box titled 'Travel Demand' is open, showing the 'Baseline' tab. The dialog box contains the following text:

Setting up the baseline Travel Demand data
You can also choose to import from your own transportation model or an existing Travel Demand File.
Please note that importing will overwrite any previously specified baseline VMT, VHT, and Trips data.

Model Type:

Path to Data: None

The left sidebar of the main window shows the following categories and tiles:

- Travel Demand
 - Travel Demand Changes
 - Travel Demand Parameters
 - Design and Construction
 - Operation and Maintenance
- Government Funding

At the bottom of the screen, a status bar indicates: 0 policy variable(s) active. Not Saved. Winnebago, Boone, and Ogle County (TS-WB) - 3 Region 70 Sector Model.

Right-click on a tile to select or de-select it as a favorite.

VISUM – REMI Modeling Framework

- VHT, VMT, Trips
- “Network” Effects

VISUM

Travel Demand
Model

TranSight

Macroeconomic
Model

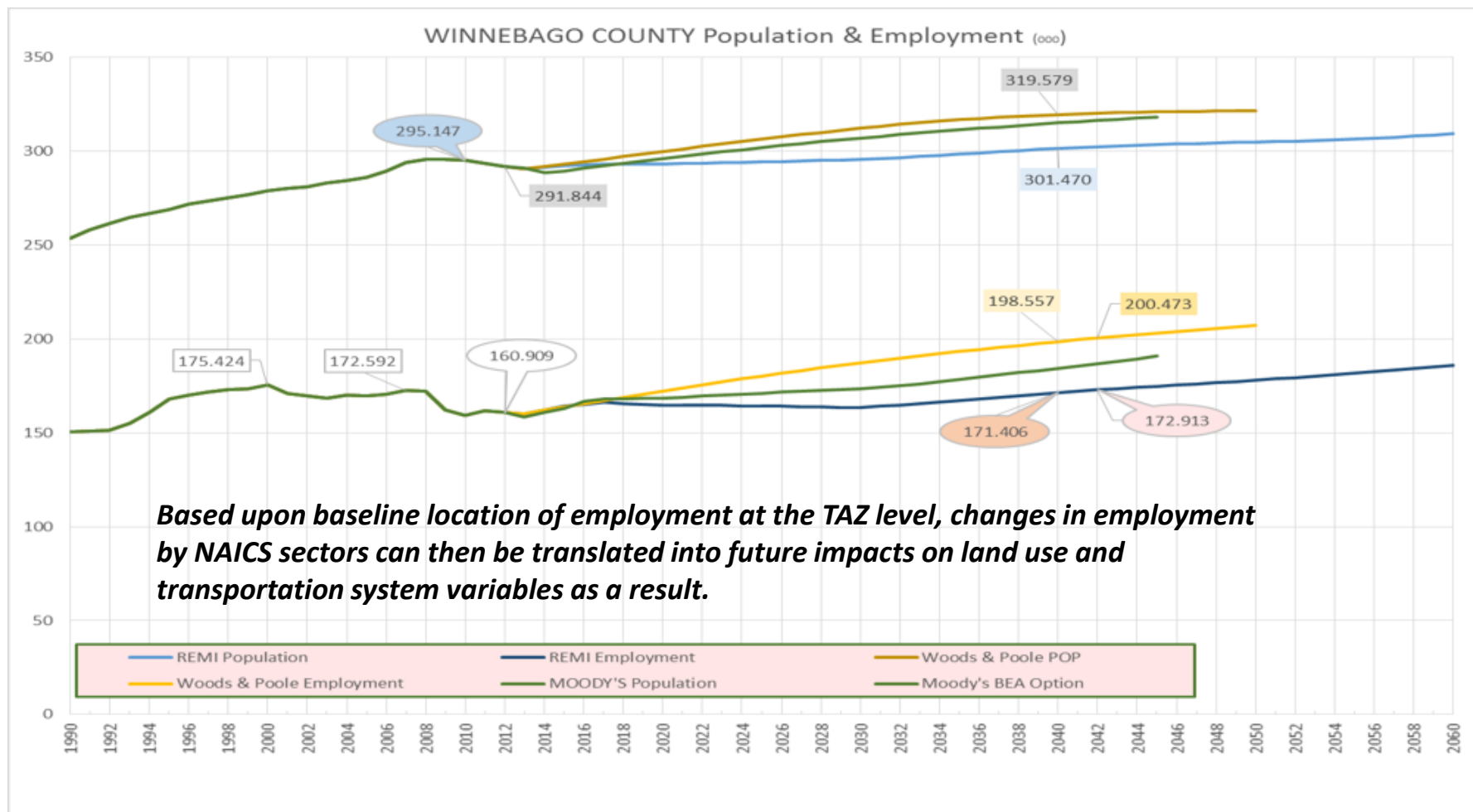
- Time & Money Savings
- Construction, O&M

Metro-PI

Local Economic Model

- Local Jobs
Distribution (by TAZ)
- Iterates with VISUM

Validate outputs with other sources!



Conclusions

- Travel Demand Model integration with TranSight gives planners a better understanding of economic drivers and impacts on transportation
- Tool to help influence investment for economic development and Regional Competitiveness
- Scenario planning can help planners and engineers better understand “what-if” scenarios such as new road connections, road closures, increased roadway capacity, etc
- Quantify public investment return on major transportation and capital improvement projects

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