

# Travel Demand Model

McLean County Regional Planning Commission

**November 3, 2023**



CHAMPAIGN COUNTY  
REGIONAL PLANNING  
COMMISSION



MCLEAN COUNTY  
Regional Planning Commission

# Outline

- **Timeline**
- **TAZ Boundaries**
- **Data Collection**
  - Roads
  - Population
  - Economic Data
- **Data Review**
- **Future Plans**

# TDM Timeline

- Start Date
  - Jan 2022
- 18 moth process
- Data from 2019

**MCRPC TDM Development**

Project staff:  
 CUUATS: Rita Morocoima-Black, and Rafsun Mashraky  
 MCRPC: Raymond Lai, Jennifer Sicks, Francesca Lewis and Tania Barreto







[Reference document: ILMUG Travel Demand Modeling Development & Guidelines for Small & Medium Sized MPOs](#)

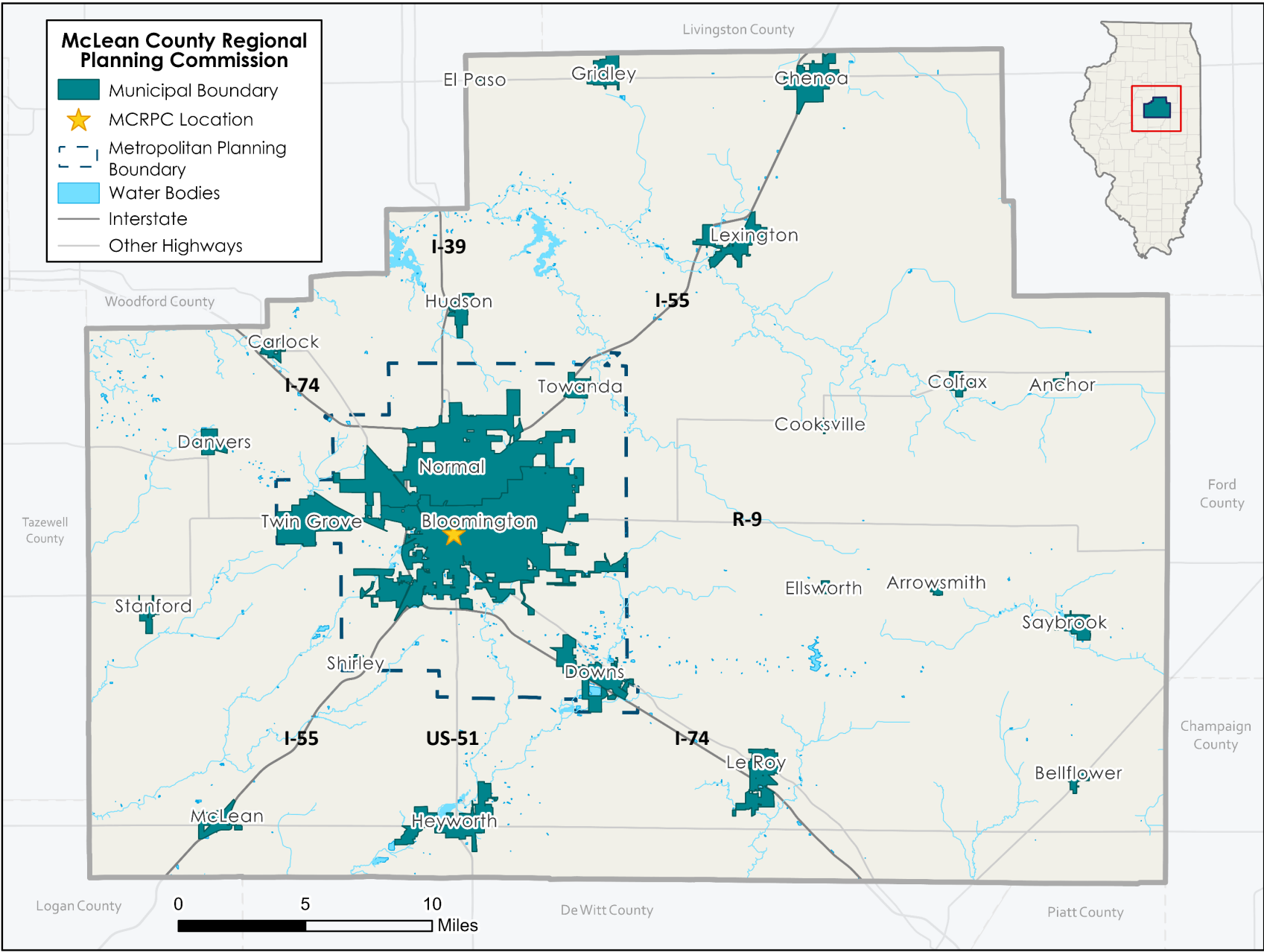
Start: Mon 1/24/2022  
 End: Fri 4/21/2023

Display: Monthly  
 Month: 1

W	Task	Responsibility	Planned Start	Planned End	Planned Work Days	Actual Start	Actual End	Actual Work Days	% Done
<b>1</b>	<b>Coordination and Communication</b>		Mon 1/24/2	Mon 1/24/2	1	Mon 1/24/2	Mon 1/24/2	1	53%
1.1	Kickoff Meeting	CUUATS/MCRPC	Mon 1/24/2	Mon 1/24/2	1	Mon 1/24/2	Mon 1/24/2	1	100%
1.1	Monthly Status Meetings (e.g. First Tuesday of every month @ 3PM)	CUUATS/MCRPC	Fri 4/05/19	Fri 4/05/19	1	Fri 4/05/19	Fri 7/09/21	1	6%
<b>1</b>	<b>Model Definition</b>		Mon 1/24/2	Mon 1/24/2	1	Mon 1/24/2	Mon 1/24/2	1	100%
1.1	Determine need for the model	MCRPC	Mon 1/24/2	Mon 1/24/2	1	Mon 1/24/2	Mon 1/24/2	1	100%
1.1	Model definitions (Geographic Limits, Analysis Years, Modes, etc)	MCRPC	Mon 1/24/2	Mon 1/24/2	1	Mon 1/24/2	Mon 1/24/2	1	100%
1.1	Trip purpose definitions	MCRPC	Mon 1/24/2	Mon 1/24/2	1	Mon 1/24/2	Mon 1/24/2	1	100%
1.1	Mode split/choice	MCRPC/CUUATS	Mon 1/24/2	Mon 1/24/2	1	Mon 1/24/2	Mon 1/24/2	1	100%
<b>1</b>	<b>TAZ Boundary Review and Refinement (Chapter 5, Chapter 7)</b>		Thu 1/27/22	Wed 4/06/2	49	Tue 1/25/22	Wed 4/20/2	61	0%
1.1	Review existing model TAZ boundaries or US Census TAZ boundaries	MCRPC	Tue 1/25/22	Mon 1/31/2	5	Tue 1/25/22	Mon 1/31/2	5	100%
1.1	Develop TAZ by aggregating parcels within census and barriers	MCRPC	Tue 2/01/22	Mon 2/14/2	10	Tue 2/01/22	Mon 2/14/2	10	100%
1.1	Identify special generators if any	MCRPC	Tue 2/15/22	Wed 2/23/2	6	Tue 2/15/22	Wed 2/23/2	6	100%
1.1	Develop baseline TAZ population data	MCRPC	Thu 2/24/22	Wed 3/09/2	10	Thu 2/24/22	Wed 4/20/2	40	100%
1.1	Develop baseline TAZ employment data	MCRPC	Thu 3/10/22	Wed 4/06/2	20	Thu 3/10/22	Wed 4/20/2	30	100%
1.1	Quality Assurance and Control	CUUATS/MCRPC	Thu 1/27/22	Wed 4/06/2	49	Thu 1/27/22	Wed 4/06/2	49	0%
<b>1</b>	<b>Network Link &amp; Node Development (Chapter 6)</b>		Thu 4/07/22	Mon 6/13/2	47	Thu 4/07/22	Fri 5/27/22	37	0%
1.1	Develop highway network	MCRPC	Thu 4/07/22	Thu 4/21/22	10	Thu 4/07/22	Thu 4/21/22	11	90%
1.1	Populate highway network attributes: name, No. of lanes, one way or	MCRPC	Fri 4/22/22	Fri 5/06/22	10	Fri 4/22/22	Fri 5/06/22	11	90%
1.1	Develop centroid connections	CUUATS	Mon 5/09/2	Fri 5/20/22	10	Mon 5/09/2	Fri 5/13/22	5	70%
1.1	Network connectivity and testing	CUUATS	Mon 5/23/2	Mon 6/06/2	10	Mon 5/16/2	Fri 5/20/22	5	20%
1.1	Estimate link lookup table attributes (Cap, Alpha, Beta, etc)	CUUATS	Tue 6/07/22	Mon 6/13/2	5	Mon 5/23/2	Fri 5/27/22	5	20%
1.1	Quality assurance and control	CUUATS	Thu 4/07/22	Mon 6/13/2	47	Thu 4/07/22	Fri 5/27/22	37	0%
<b>1</b>	<b>Turn Penalties (Chapter 6)</b>		Tue 6/14/22	Mon 7/11/2	19	Sat 5/28/22	Mon 6/20/2	15	0%
1.1	Develop default left turn penalties	CUUATS	Tue 6/14/22	Mon 6/27/2	10	Sat 5/28/22	Tue 6/07/22	6	20%
1.1	Alternative turn penalty files specification (if needed)	CUUATS	Tue 6/28/22	Mon 7/11/2	9	Wed 6/08/22	Mon 6/20/2	9	0%
1.1	Quality assurance and control	MCRPC/CUUATS	Tue 6/14/22	Mon 7/11/2	19	Tue 6/14/22	Mon 6/20/2	15	0%
<b>1</b>	<b>Cube Voyager: Network Impedance (Chapter 6)</b>		Tue 7/12/22	Wed 8/10/2	22	Tue 6/21/22	Thu 7/21/22	22	0%
1.1	Model set up	CUUATS	Tue 7/12/22	Tue 7/19/22	6	Tue 6/21/22	Tue 6/28/22	6	0%

### McLean County Regional Planning Commission

-  Municipal Boundary
-  MCRPC Location
-  Metropolitan Planning Boundary
-  Water Bodies
-  Interstate
-  Other Highways

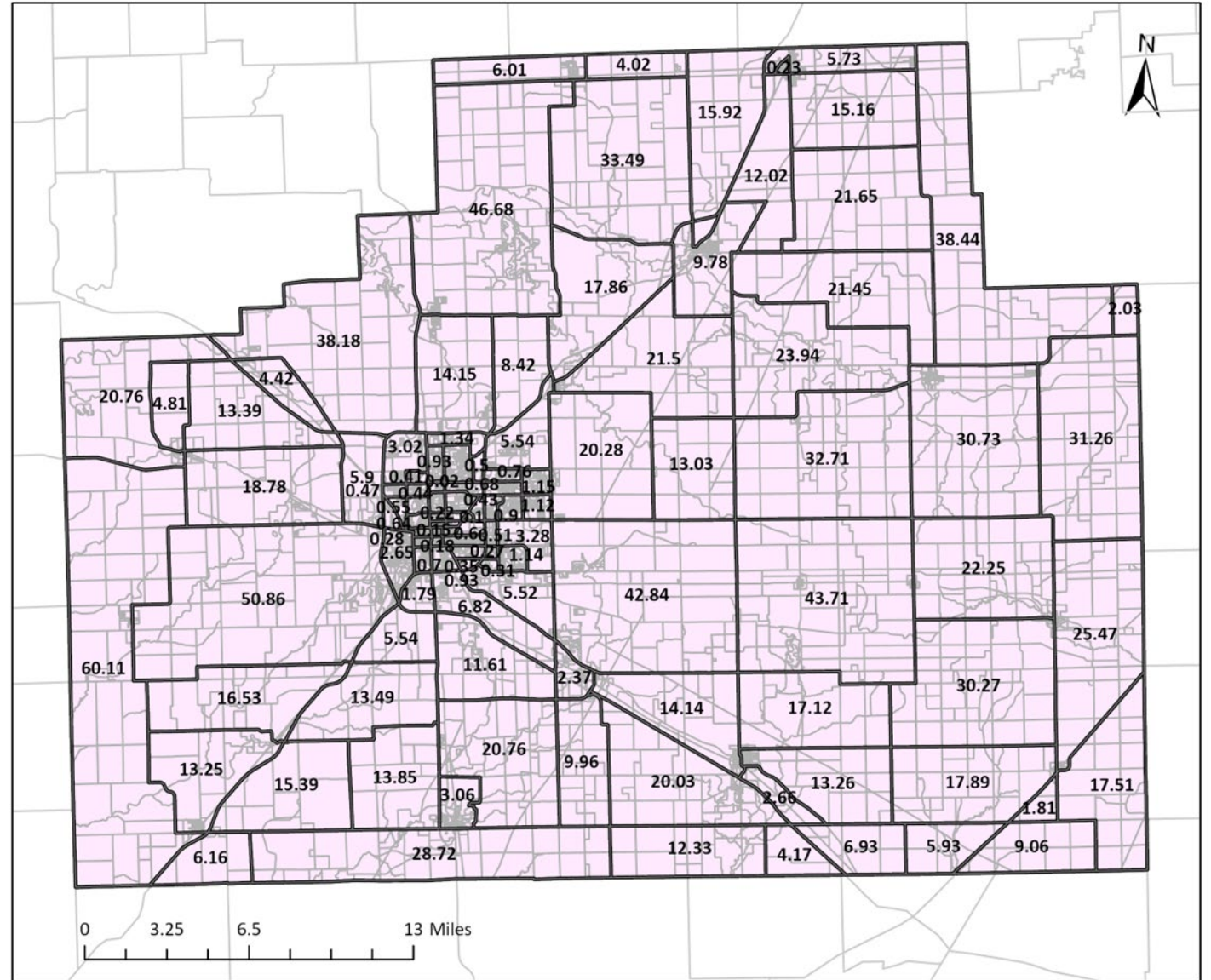


# Development of TAZs Boundaries

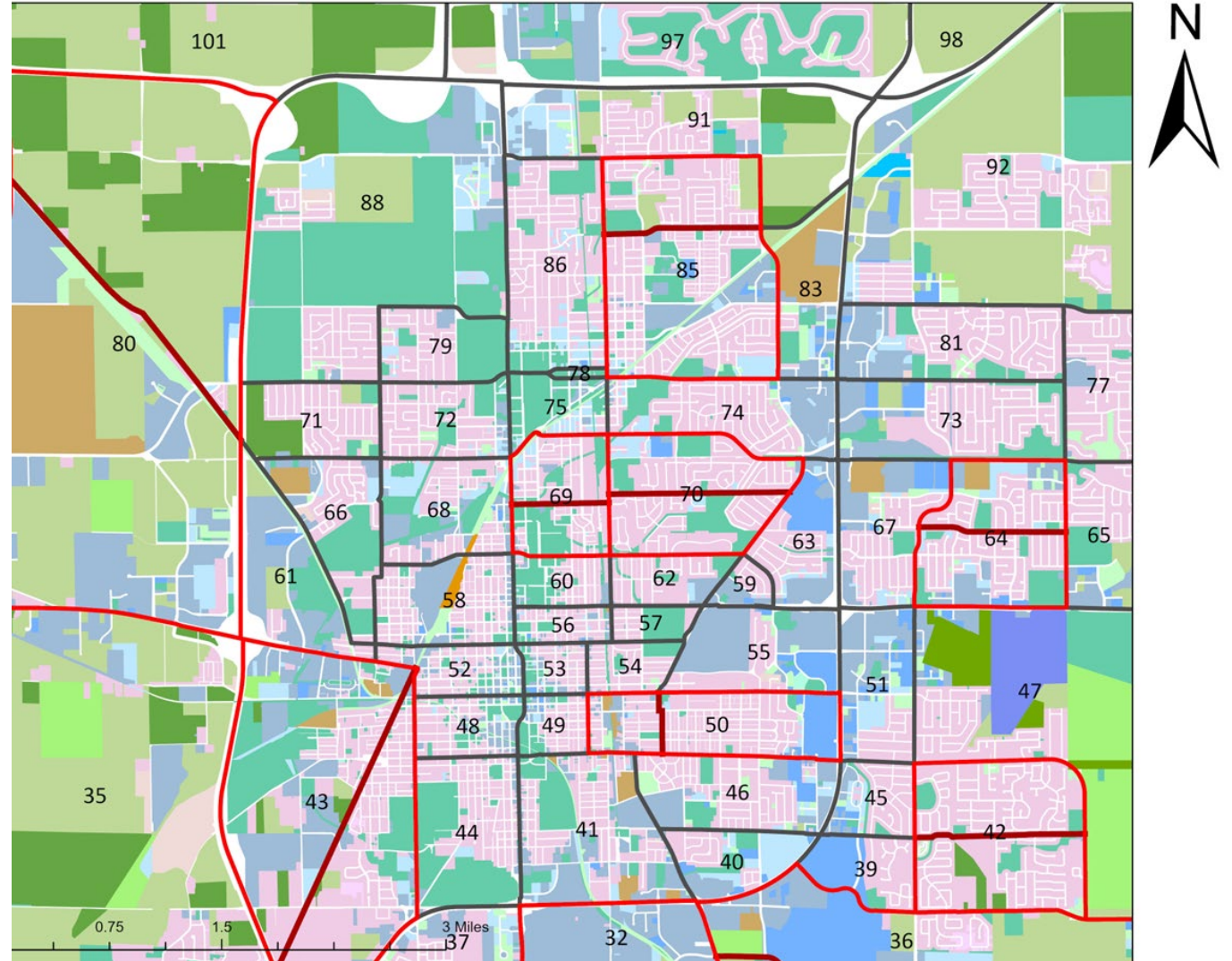
Downloaded from the Illinois Statewide Travel Demand Model (**ISTDM**)  
(CCRPC)

- Characteristics:
  - Regularly shaped
  - Bordered by major roadways, political/jurisdictional boundaries, and physical barriers
  - Consistent with a geographical unit
  - Between 600 and 3,000 people per TAZ
  - Between 0.25 and 1 mile in area
  - Similar land use per TAZ
  - Compatible with both the base year and future year roadway/transit network

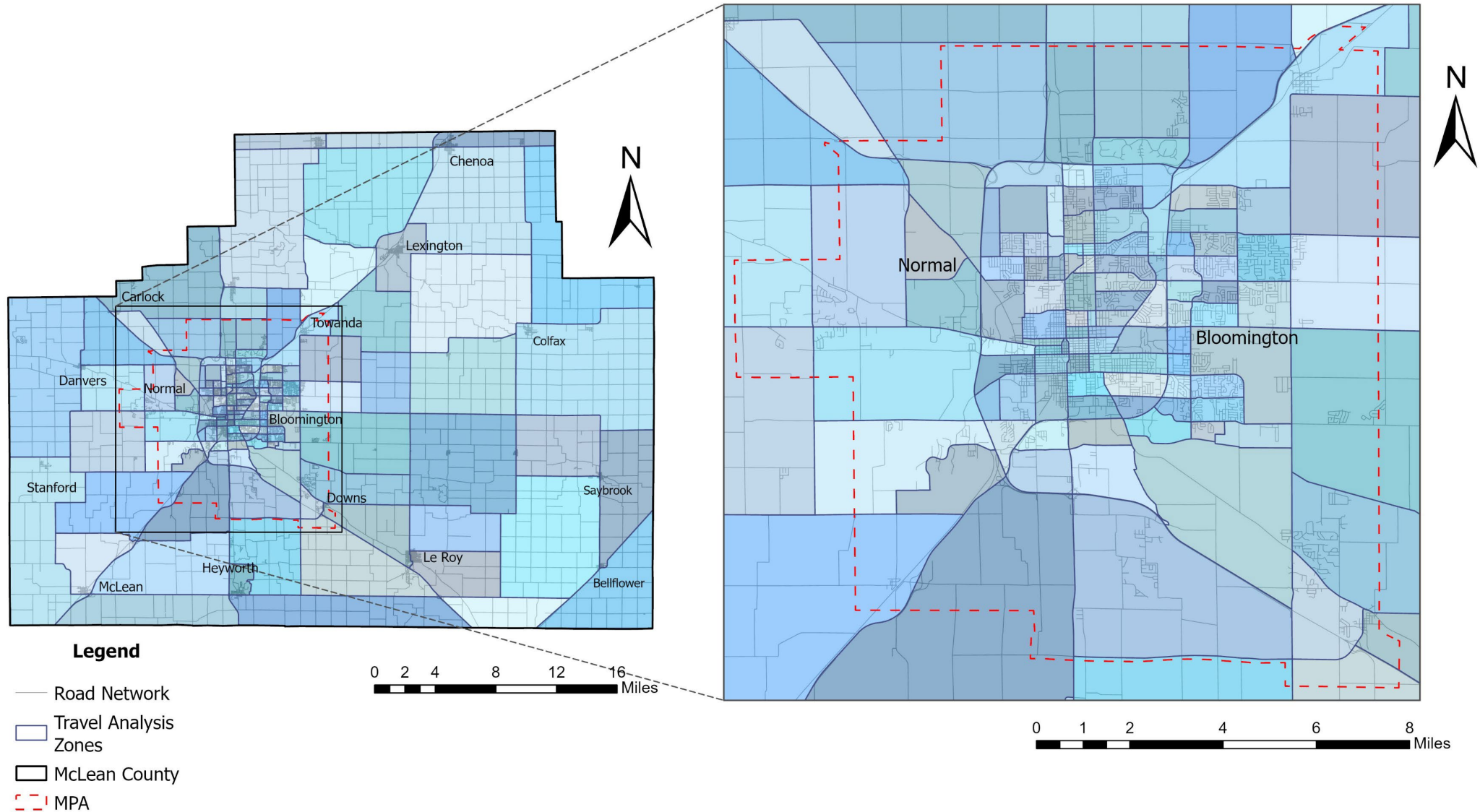
# Development of TAZs Boundaries – TAZs from ISTDM



# Development of TAZs Boundaries - Land Use Considerations



# McLean County TAZ Boundaries



# Road Network

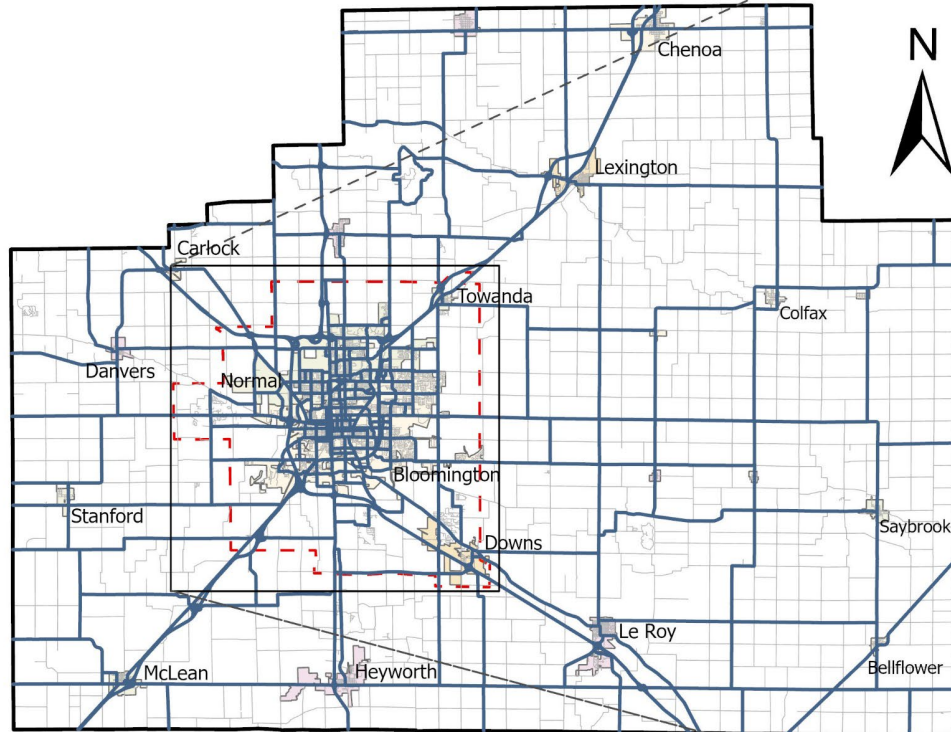
## Required info:

- Lanes
- Roadway right of way
- Two way left turning lane
- Facility type
- AADT
- Speed limits

## Downloaded from IDOT:

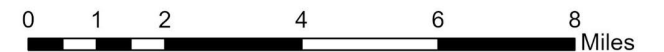
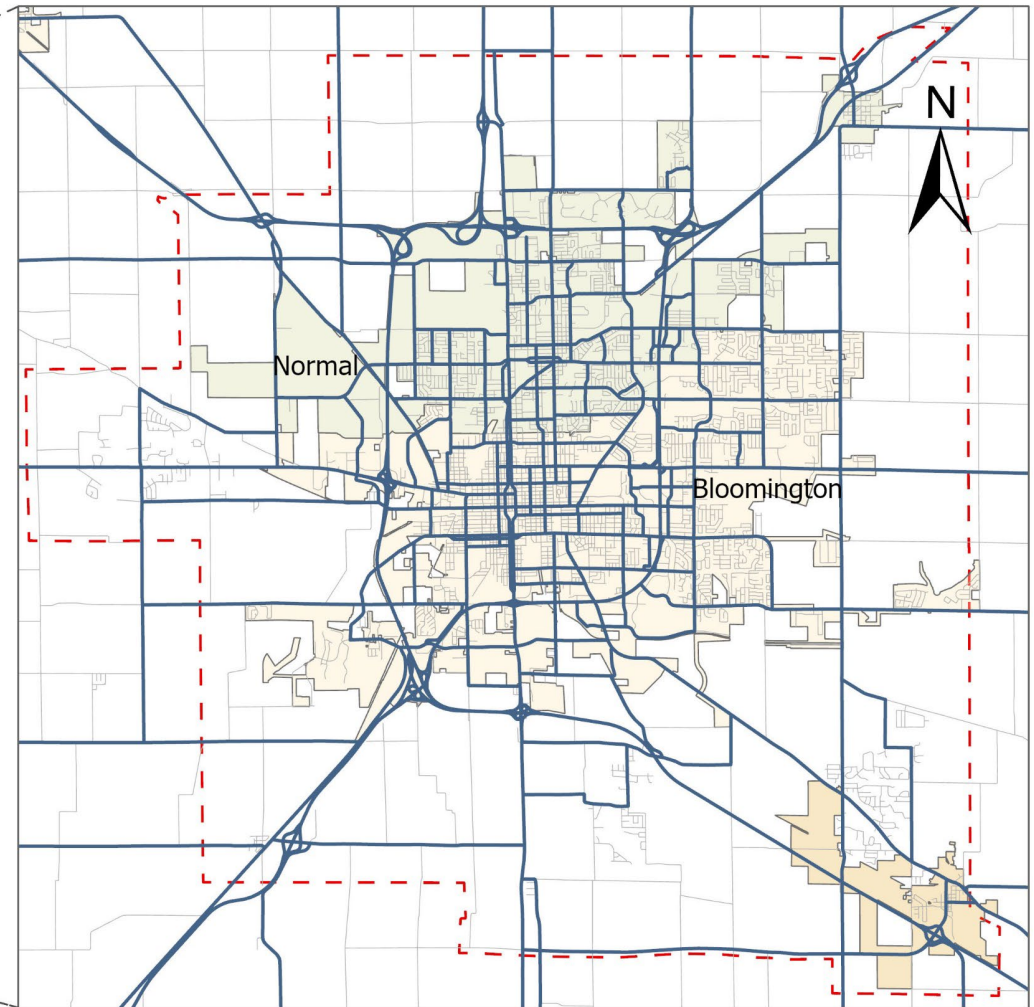
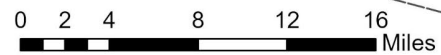
<http://apps.dot.illinois.gov/gist2/>

# Road Network



## Legend

- Road Network for TDM
- Road Network
- ▭ McLean County
- - - MPA



# Population & Household Data

## Required Info:

- Total Population
- HH1
- HH2
- HH3
- HH4+
- Total Households

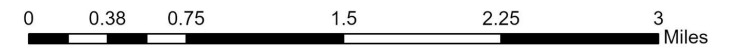
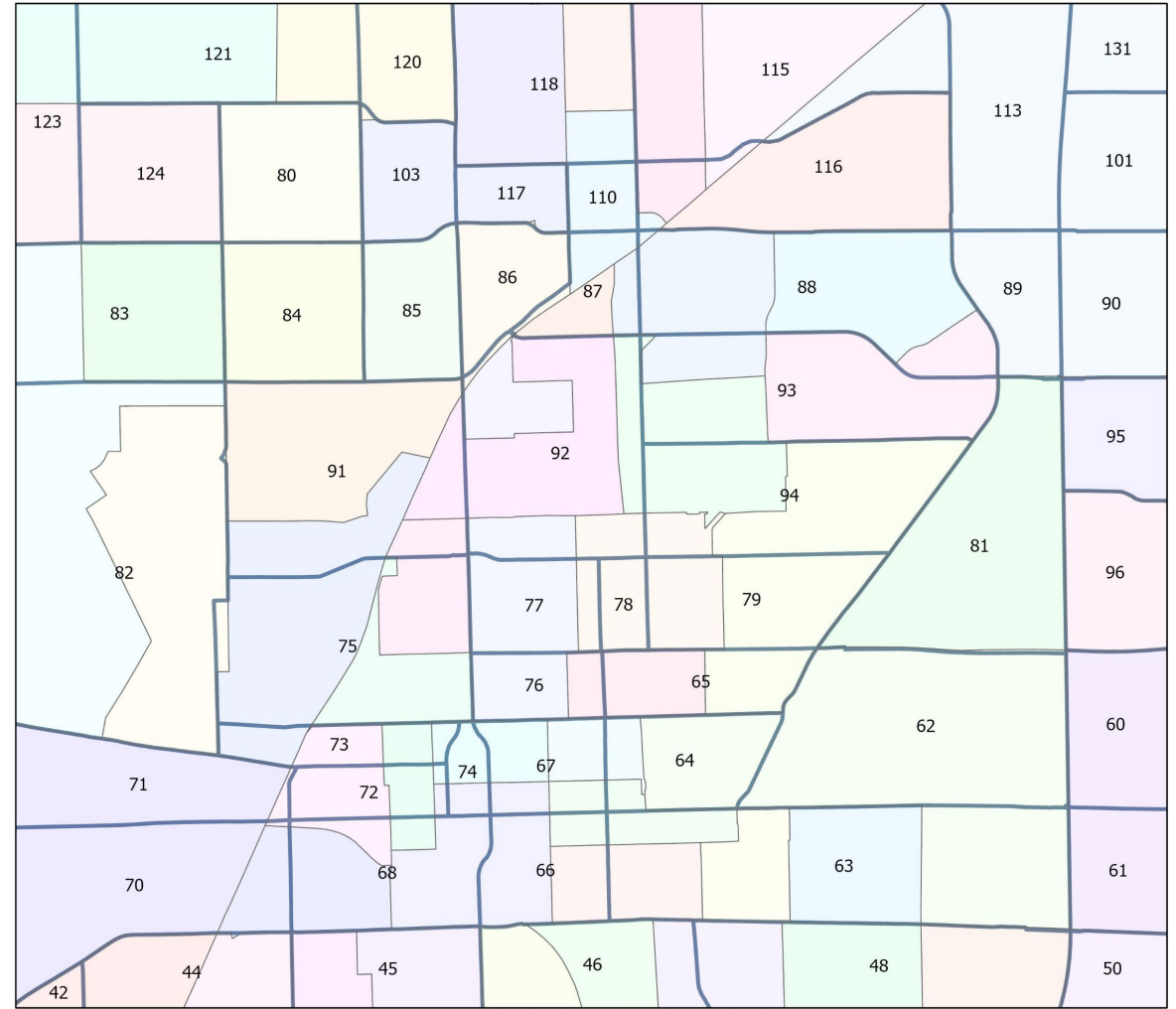
## Census and ACS Data (2019):

- Block level
  - Population Data
- Block Group Level
  - Household Data (Larger or limits did not coincide with TAZ's limits)

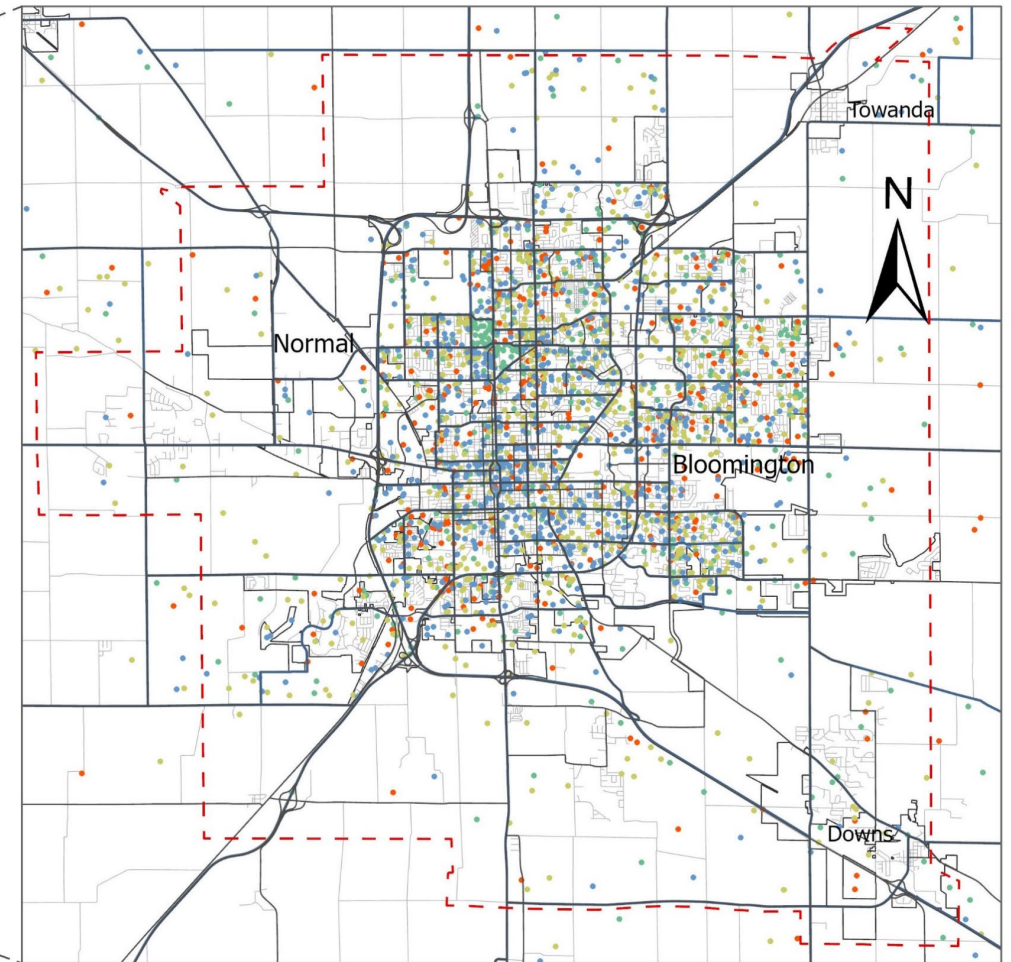
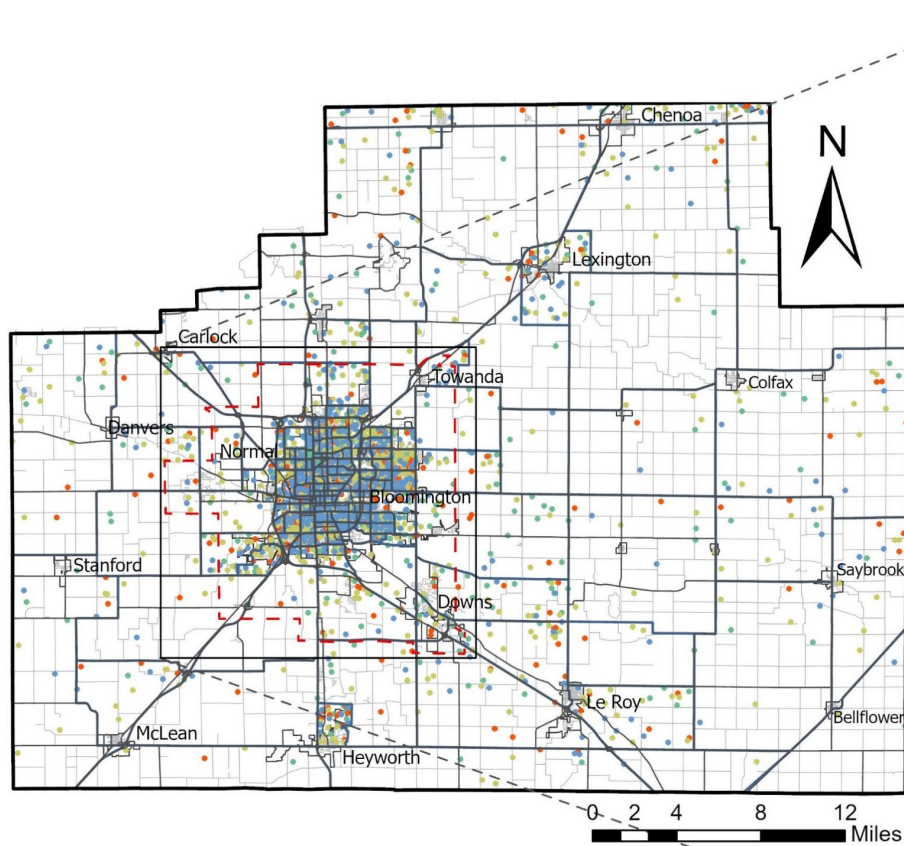
# Population & Household Data

## Considered:

- Area
- Land Uses



# Population & Household Data



## Legend

- |                       |                  |
|-----------------------|------------------|
| TAZs Household Data   | McLean County    |
| 1 Dot = 20 Households | MPA              |
| 1-Person HH           | Street Network   |
| 2-Person HH           | TAZs for TDM     |
| 3-Person HH           | Corporate_Limits |
| 4+-Person HH          |                  |



# Economic Data

## Required Info:

- Retail (RET)
- Service (SER)
- Other (OTH)
- Total Jobs (TEMP)

## LODES Data (2019)

- Block level

## Bloomington-Normal Economic Development Council

- Data to Review and compare

# Economic Data

- Considerations:
  - Land uses (Major traffic generators)
  - Local economic data (# employees of major industries)

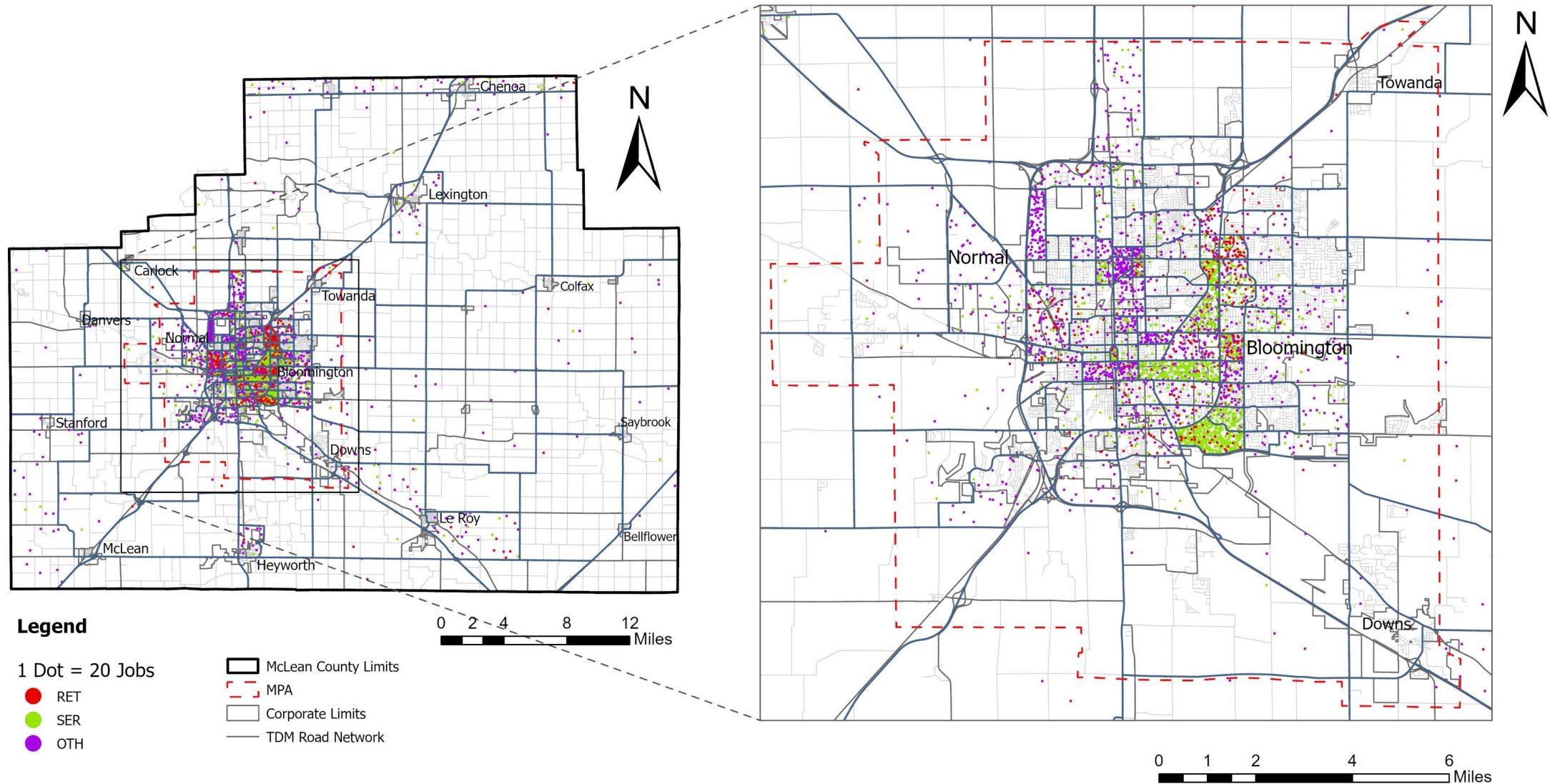
## MAJOR EMPLOYERS

Company	2018
State Farm Insurance Co.	14,200*
Illinois State University	3,319
COUNTRY Financial	2,034
Unit 5 Schools	1,600
OSF HealthCare	1,408
Advocate BroMenn Healthcare	1,337
McLean County, Government	846
Afni, Inc.	830
City of Bloomington	715
District 87 Schools	686
Illinois Wesleyan University	510
Heartland Community College	488
GROWMARK, Inc.	482
Heritage Operations Group	482
Bridgestone/Firestone Co.	451
Stark Industries	369
Town of Normal	367
The Snyder Companies	341
Ferrara Candy Company	325
Illinois Farm Bureau	324

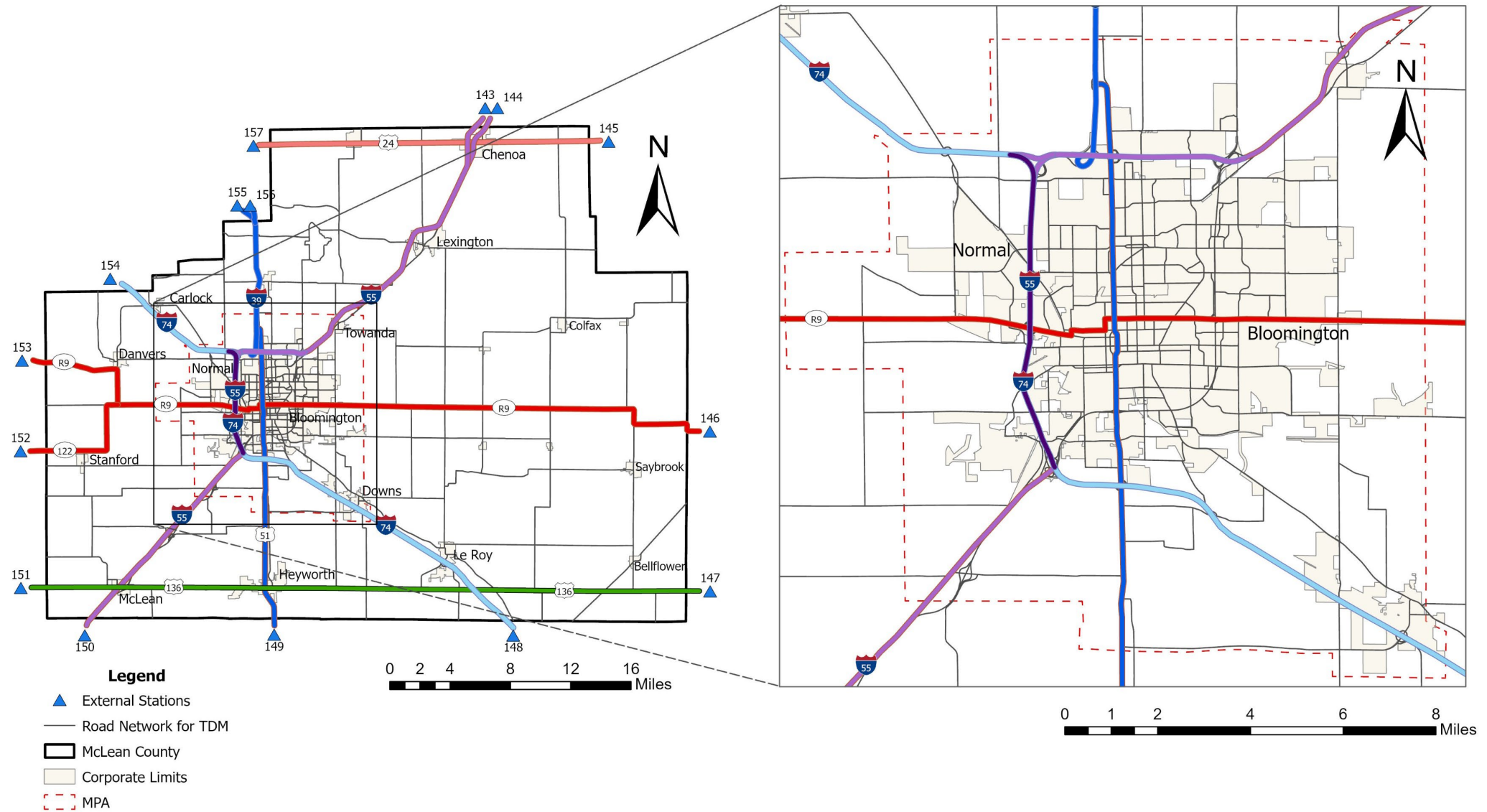
Source: HR Representatives from each company/organization. Figures are self-reported and non-scientific and not intended to be used as a time series. Full-time equivalents (FTE).

\* - Reported 2018 average

# Economic Data



# External Stations

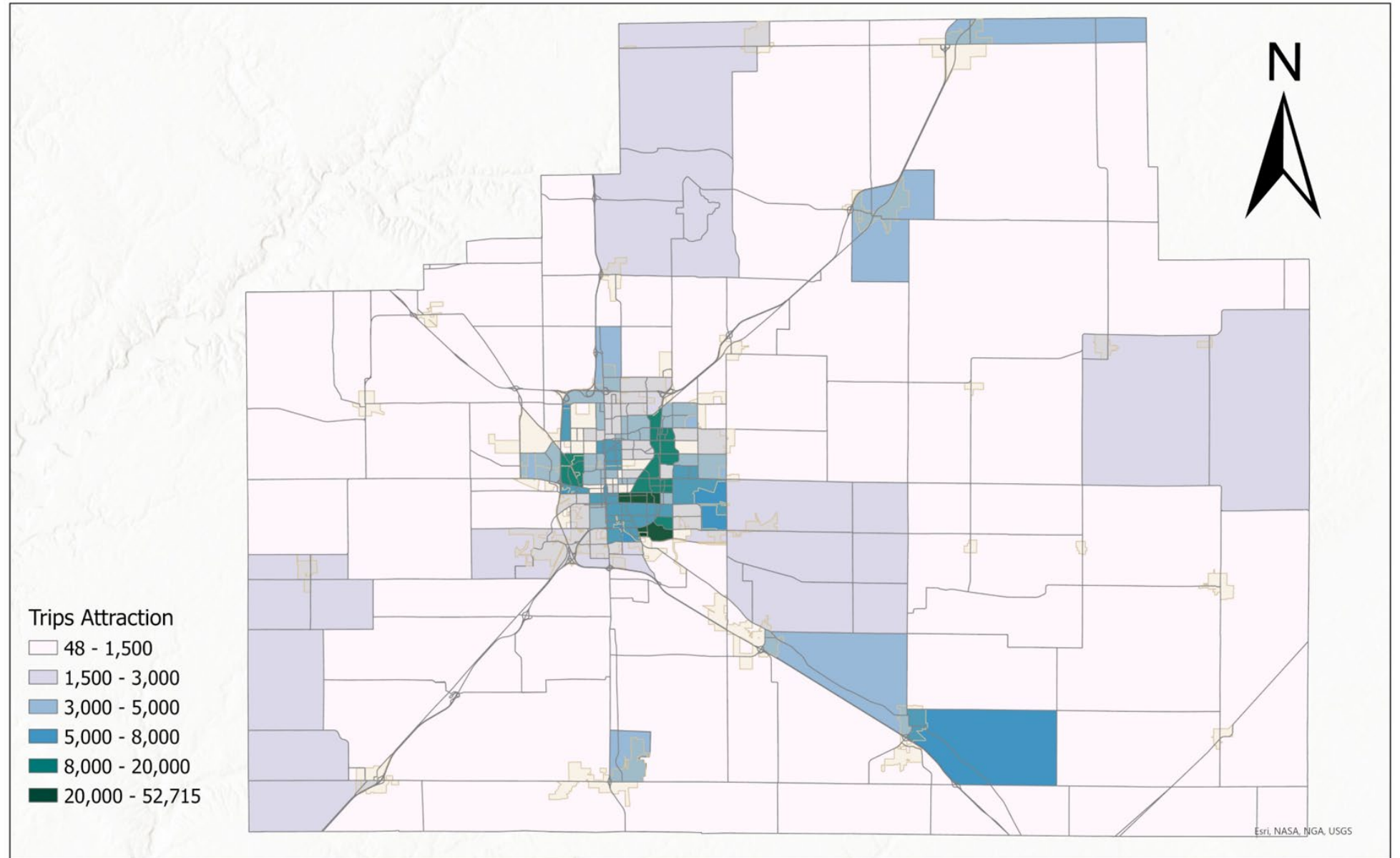


# Data Review

- Trip Generation
  - Attraction and Production
- Network verification
  - Roadway Capacity
  - Traveling Speeds (free flow)

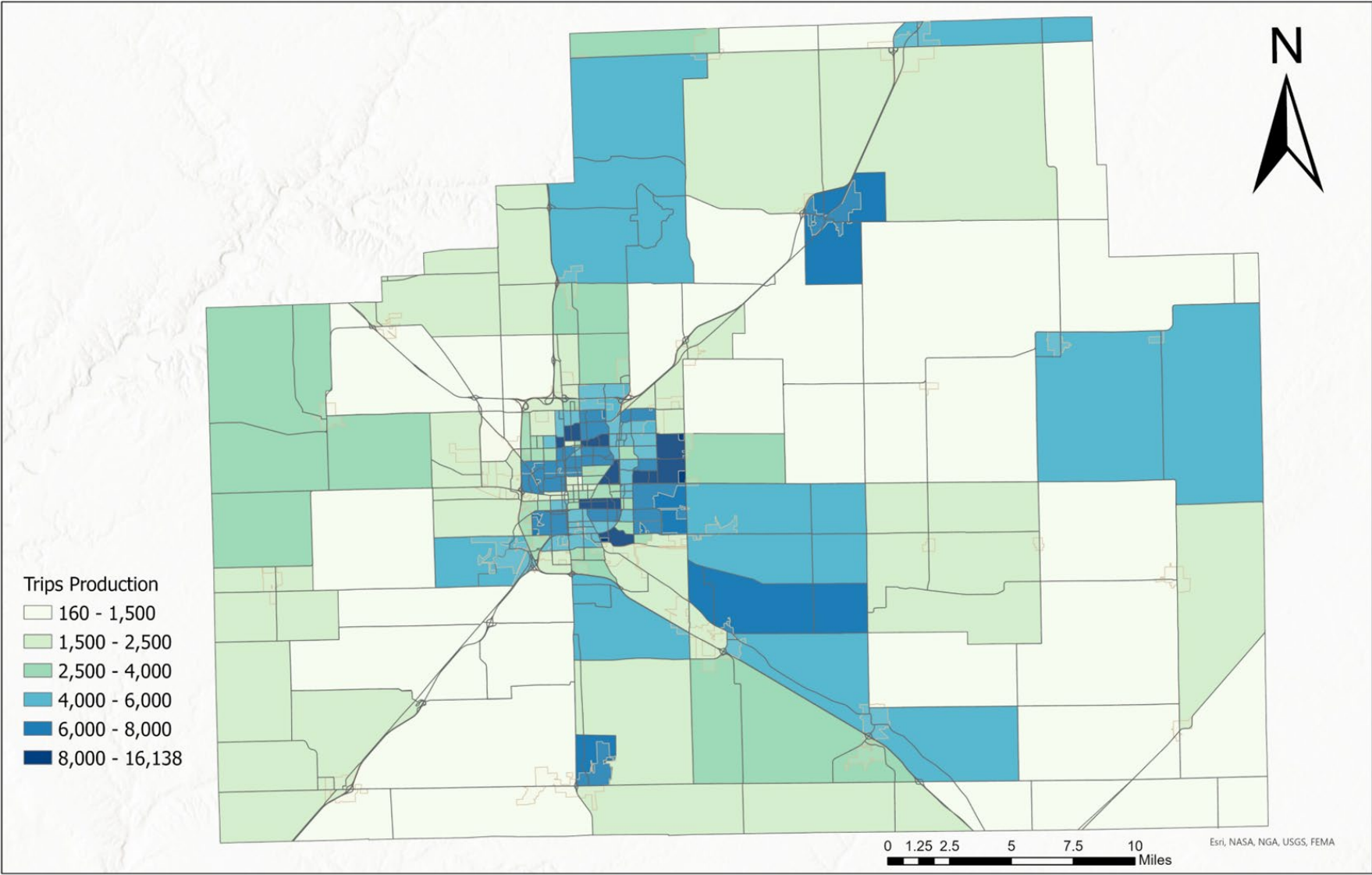
# Trip Generation Verification

## Trip Attraction



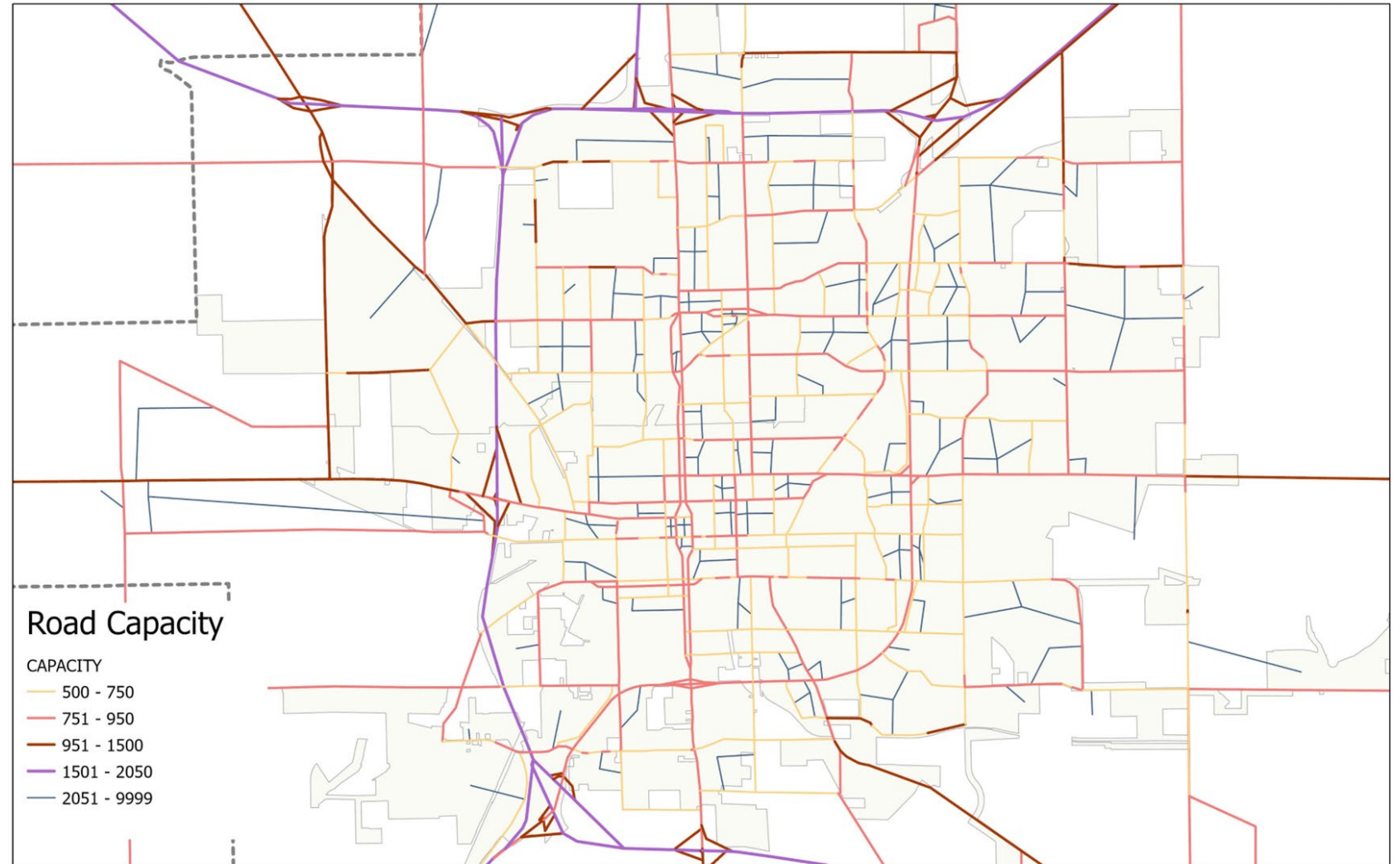
# Trip Generation Verification

## Trip Production



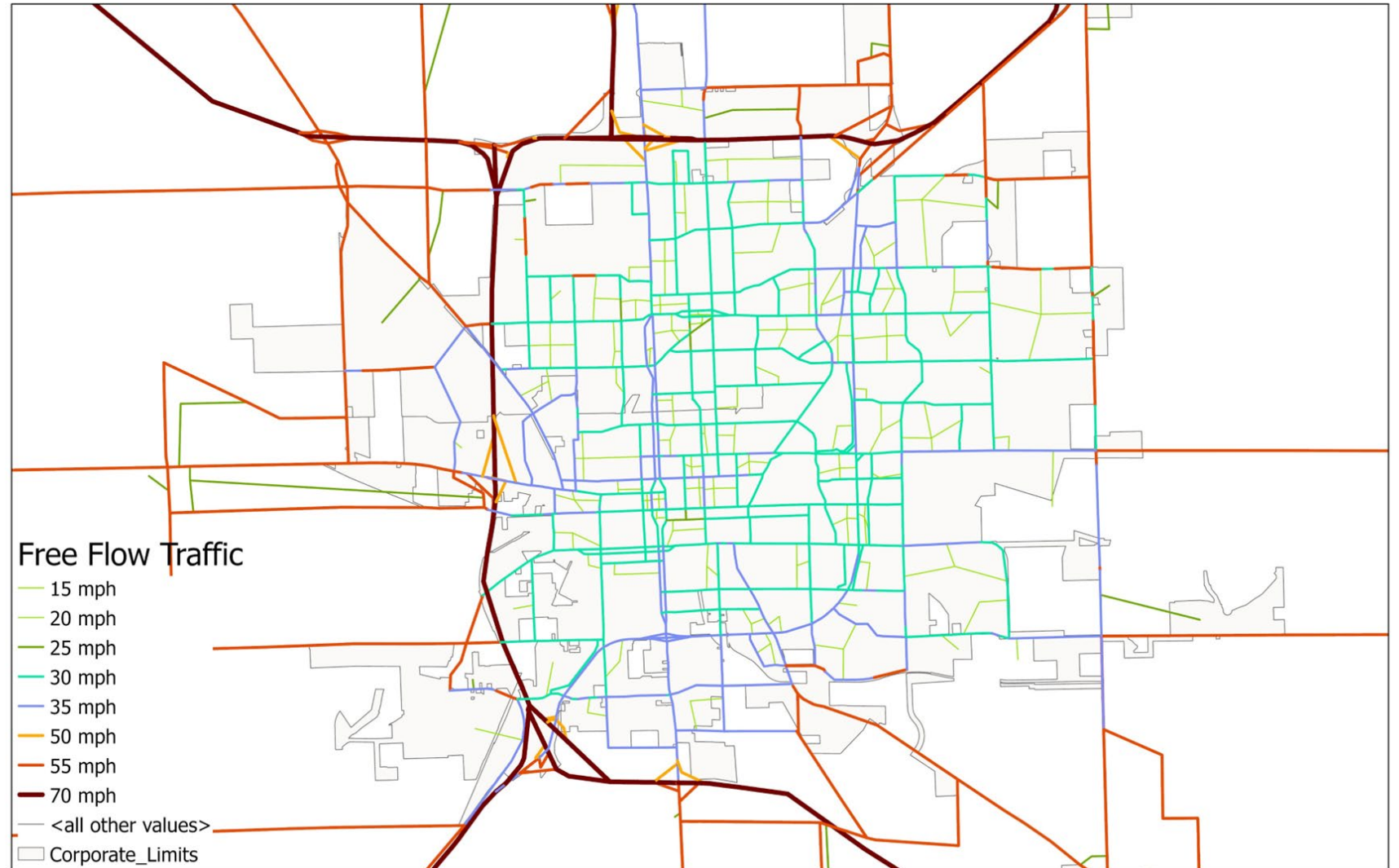
# Network Verification

## Road Capacity



# Network Verification

## Free Flow Traffic



# Summary

- Positive experience

## Challenges

- Data only available at Block Group level
  - Block Groups do not coincide with TAZs (Household Data)
- Data collected from different sources
  - Economic Data
- Keeping up with CUBE

# Ideas for Future Improvements

Include data from Specific Traffic Generators

- Rivian
  - Workforce 8,700
- Universities
  - ISU, Wesleyan & Heartland College
  - Total Student Population 25,000
- Transit
  - Small portion of population < 3%

Questions ?