



ITCTC

ITHACA-TOMPKINS
COUNTY
TRANSPORTATION
COUNCIL

Ithaca Tompkins County Transportation Council (ITCTC) - Software Programs & Data Sources

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Transportation Data Analyst

Presentation Outline

- ▶ **Inventory of Data Tools: Internal & Partner Usage and Potential Future Usage**
 - ▶ ArcGIS Pro
 - ▶ Replica
 - ▶ NYSDOT CLEAR Crash Data Viewer
 - ▶ U.S. Census: American Community Survey (ACS) 5 Yr Data & Decennial 10 Yr Data
- ▶ **Analysis & Takeaways**
- ▶ **Q&A**

Software Programs & Usage

MPO Needs & Activities

Mapping, Urban Planning/Design & Transportation Data Collection

ESRI Software Products:

1. ArcMap/ArcGIS Pro - *Recently completed the transition to ArcGIS Pro
2. ArcGIS Urban & CityEngine - Synergistic ESRI mapping tools currently not in use by the MPO

Other Software Projects:

1. Replica - *New software which uses cellphone data.
2. NYSDOT CLEAR Crash Data Viewer - MPO source for crash data downloads

Demographic Data & Analysis

United States Census Products: *Also has transportation data

1. American Community Survey (ACS) 5 Yr Data - Data updated Annually
2. Decennial Census (DC) Data - Updated every 10 yrs

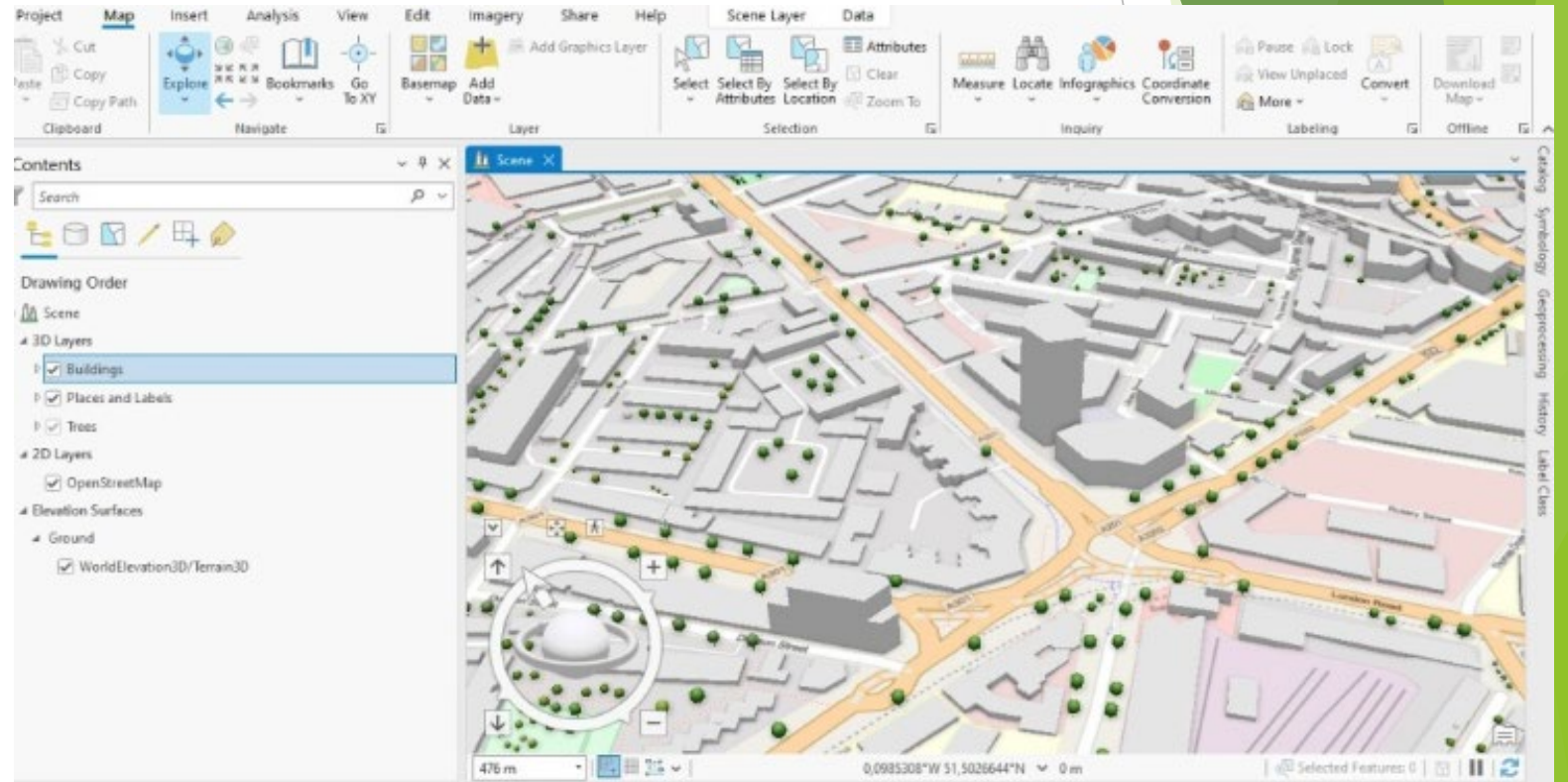
ArcGIS Pro: Overview

Summary:

ArcGIS Pro is a desktop geographic information system (GIS) application for urban planners. Users can maintain spatial data effectively; generate 2D, 3D, & 4D visualizations; & conduct advanced mapping analytics.

Key Features:

- ▶ **Exploration & Visualization:** Using 3D mapping & data analysis
- ▶ **Imagery & Remote Sensing:** Visualize, manage, & analyze data from drones, satellites, LiDAR, etc....
- ▶ **Data Management:** Store, edit, & manage spatial data—including big & real-time data.
- ▶ **Customize & Create:** Reimagine & customize ArcGIS Pro with add-ins and



ArcGIS Pro: Usage in the MPO

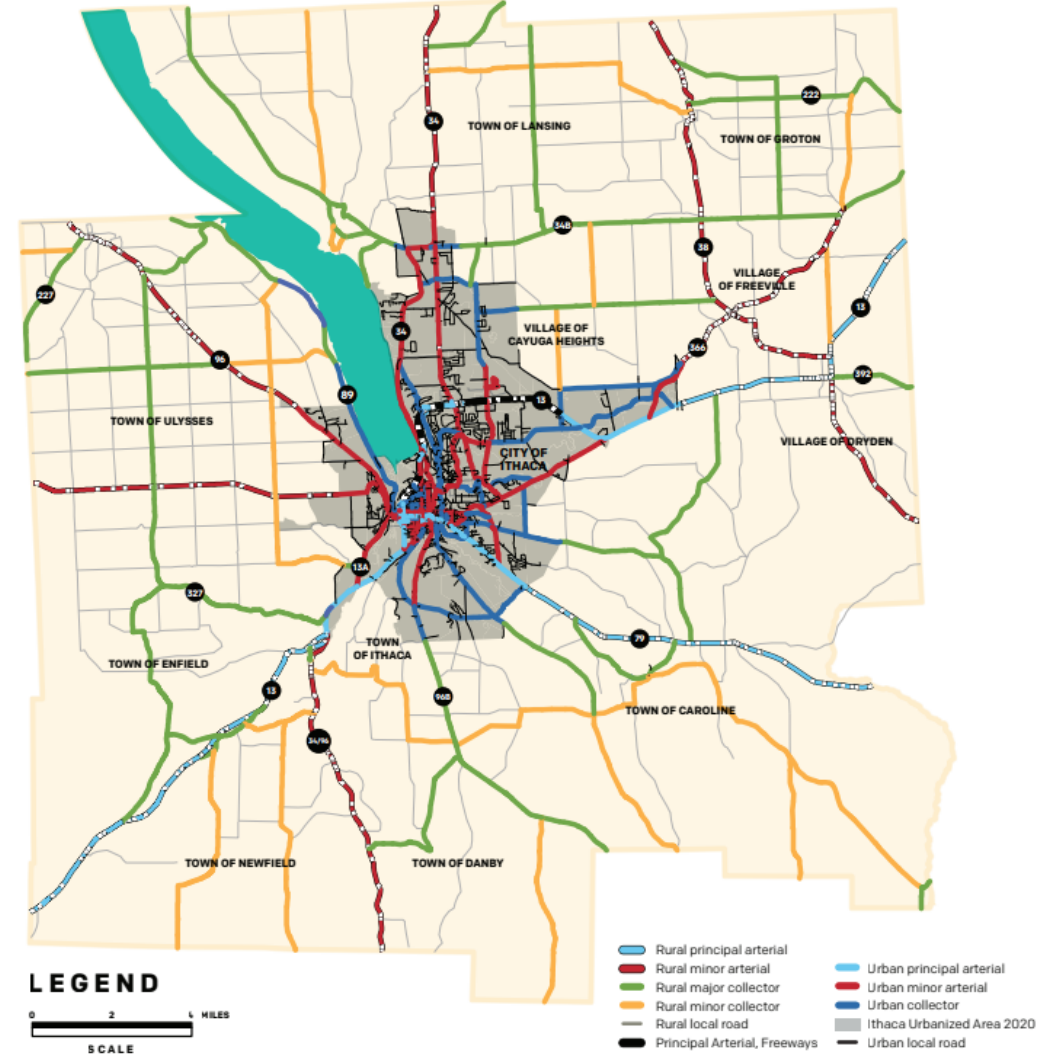
ArcMap Projects

1. Tompkins County Highway Functional Classification System Map
2. Tompkins County Census Block Population Density Map
3. Biannual Bike Suitability Map
4. Tompkins County Sidewalk Inventory Map
5. Unique Natural Areas Map
6. Priority Trails Map
7. Complete Streets Network Map
8. Location of Parking Areas City of Ithaca Map
9. Tompkins County Intermodal Facilities Map
10. TCAT Bus Route System Ridership Map
11. Historic Bridges Maps Map
12. Multi-Use Trails Network in Tompkins County Map
13. Structurally Deficient Bridges Map

Other Use Cases

1. Traffic Crash Data & Map Requests
2. Traffic Volume Data & Map Requests

2020 TOMPKINS COUNTY HIGHWAY FUNCTIONAL CLASSIFICATION SYSTEM COUNTY WIDE



ArcGIS Pro: Pros/Cons & Future Usage

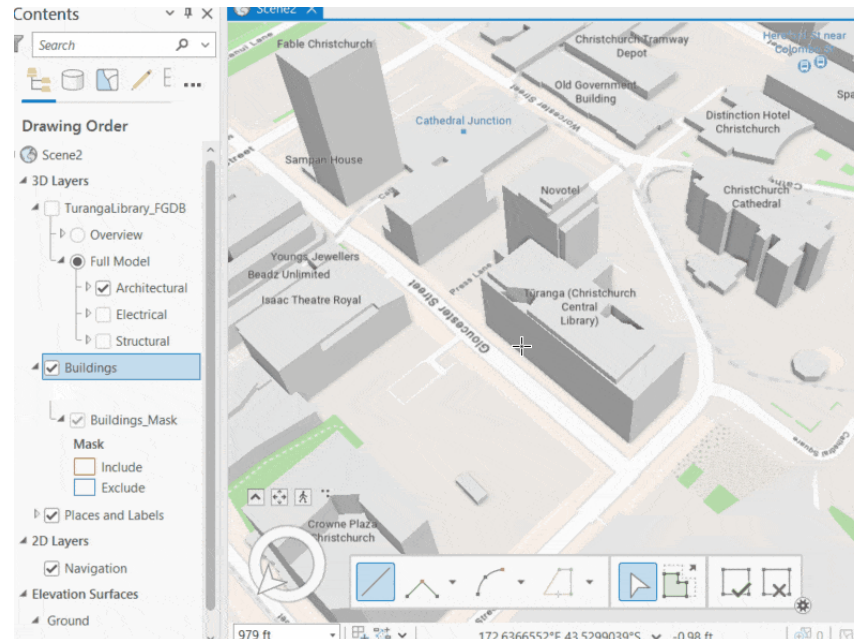
Pros

1. More realistic 2D & 3D maps than ArcMaps
2. Allows users to incorporate multiple maps into one project
3. Projects can be augmented through CityEngine & ArcGIS Urban to be more realistic



Cons

1. Requires more MPO staff training hours
2. Not as realistic as City Engine or ArcGIS Urban



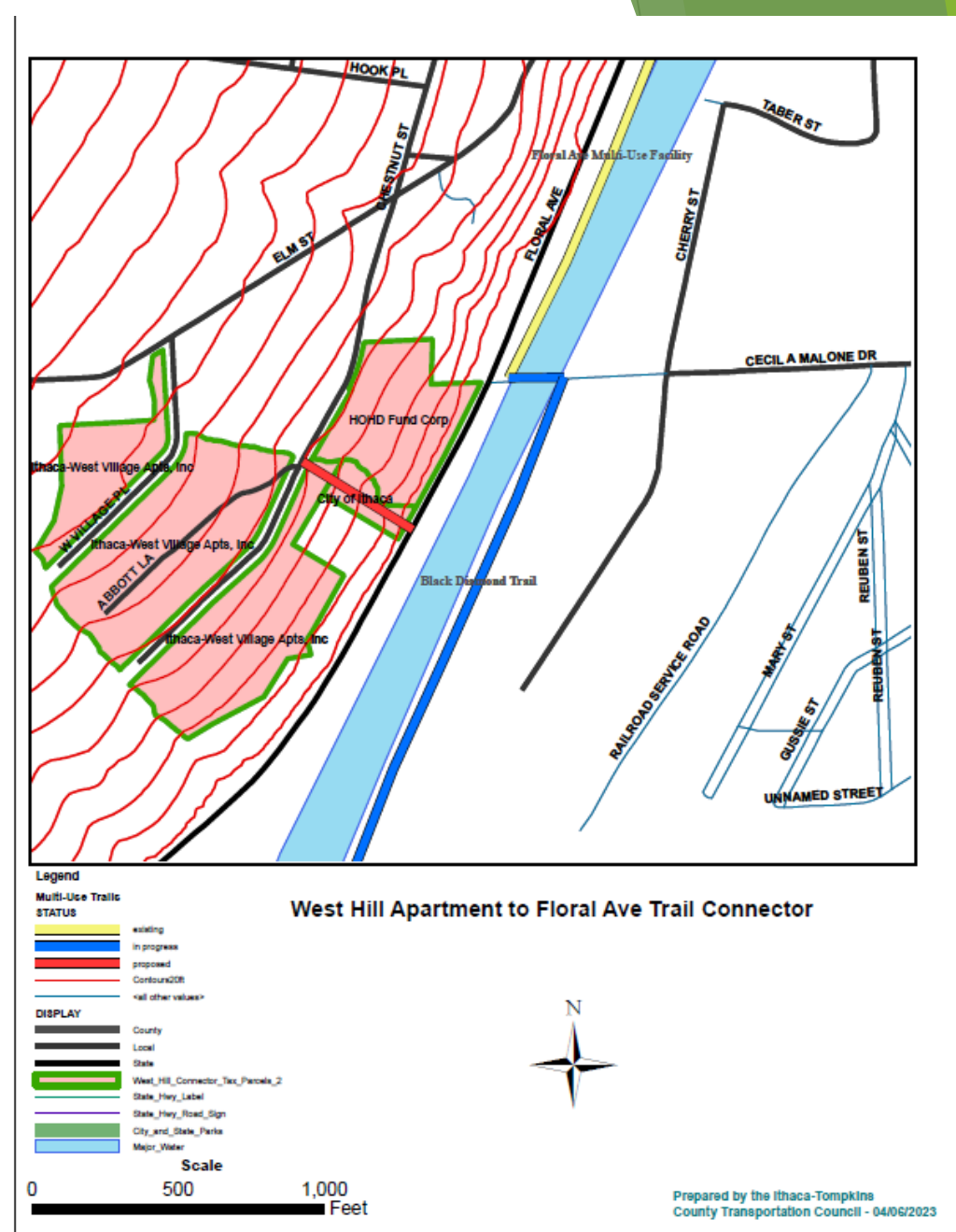
Future Uses

1. Create 3D versions of MPO maps
2. ESRI is making improvements & adding capabilities based on user feedback: more traffic modeling capabilities could be possible

ArcGIS Pro and Our Partner Organizations

Sample Projects:

- ▶ Intersection Crash Analysis Map Requests
- ▶ Corridor Crash Analysis Map Requests
- ▶ Trail Project Proposal Maps
 - ▶ i.e., West Hill Apartment to Floral Ave Trail Connector Map



West Hill Apartment to Floral Ave Trail Connector Map

ArcGIS Urban & CityEngine Background

These two tools will be made available soon to the MPO as part of its Esri subscription at nominal extra cost. The MPO is evaluating these tools and their potential use in the following areas...

1. 3D Map visualization
2. Design scenario planning
3. Modeling



ArcGIS Urban Overview

Summary:

ArcGIS Urban applies GIS technology to streamline plan creation, analyze the impact of plans, visualize projects, and facilitate public engagement.

Key Features:

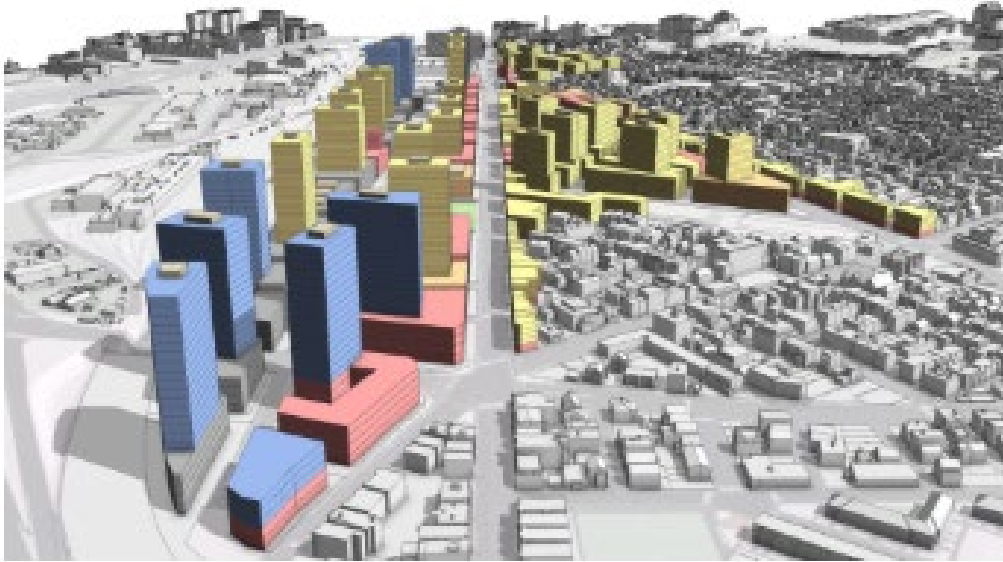
- ▶ **3D scenario modeling:** Generate 3D ArcGIS Maps
- ▶ **Data-driven analysis:** Understand the impacts of policy and development changes with urban visuals.
- ▶ **Project e-submission:** Manage the urban development pipeline as part of a city digital twin
- ▶ **Collaborative urban planning:** Communicate proposals and increase buy-in with easy-to-understand visualizations and metrics.



CityEngine Overview

Summary:

ArcGIS CityEngine is an Esri 3D city generator for creating urban environments and scenarios.



Sample: 3D Urban Design Map with CityEngine

Key Features:

- ▶ Accelerate urban planning workflows
- ▶ Real-world 3D urban context models
- ▶ Create & iterate on urban development projects
- ▶ Elevate architectural designs
- ▶ Create realistic building models
- ▶ View structures to analyze planning factors
- ▶ Create detailed experiences: integration with industry-leading game engines
- ▶ Connect CityEngine to animation tools for realistic 3D projects



South Sabah, Al-Ahmad Masterplan, Kuwait

Future Uses for ESRI Services and Applications

- ▶ The ITCTC is currently exploring using ESRI tools to replace the traffic analysis capabilities of TransCAD.
- ▶ Utilizing ESRI to its fullest extent would allow the MPO to maximize its existing resources with little to no extra cost.
- ▶ The MPO will continue to evaluate ESRI GIS capabilities and further explore its capabilities.

Replica Platform: Overview

Summary:

Replica provides mobile location data to inform decisions about the built environment, urban planning, and transportation systems. Replica simplifies travel patterns, impact of infrastructure projects, and support data-driven planning for urban development, equity, & sustainable transportation.

Key Features:

- ▶ Replica integrates anonymous demographic, land-use, and economic cell-phone location data
- ▶ Supports Urban Planning & Policy
- ▶ Enables Scenario Planning

For more information, please visit - [Learn More About Replica's Solutions for MPOs](#)

TRIP LENGTH BY TRIP MODE IN TOMPKINS COUNTY NY 2023

DISTANCE	ANNUAL PERSON TRIPS (IN THOUSANDS)							TOTAL TRIPS	% OF ALL TRIPS BY DISTANCE	% TRIPS BELOW DISTANCE
	TRIP MODE, DERIVED									
	WALK	BICYCLE	ALL PRIVATE VEHICLES**	TAXI/TNC	COMMERCIAL VEHICLE	PUBLIC TRANSIT	OTHER***			
LESS THAN .5 MILES*	31,802	1,229	9,231	99	584	8	3,088	46,041	11.7%	11.7%
.5-1 MILE	22,439	1,186	20,511	876	645	412	0	46,069	11.7%	23.3%
1-2 MILES	27,322	1,574	39,561	1,380	984	2,718	14	73,553	18.6%	42.0%
2-4 MILES	8,796	1,940	60,357	1,298	1,171	2,729	183	76,474	19.4%	61.3%
4-8 MILES	91	1,171	68,260	763	1,540	1,887	86	73,798	18.7%	80.0%
8-16 MILES	1	373	68,285	250	1,324	629	77	70,939	18.0%	98.0%
16-32 MILES	6	5	7,645	37	149	81	2	7,925	2.0%	100.0%
32-64 MILES	0	0	21	0	0	0	0	21	0.0%	100.0%
ALL TRIPS	90,457	7,478	273,871	4,703	6,397	8,464	3,450	394,820		
	22.9%	1.9%	69.4%	1.2%	1.6%	2.1%	0.9%	100%		

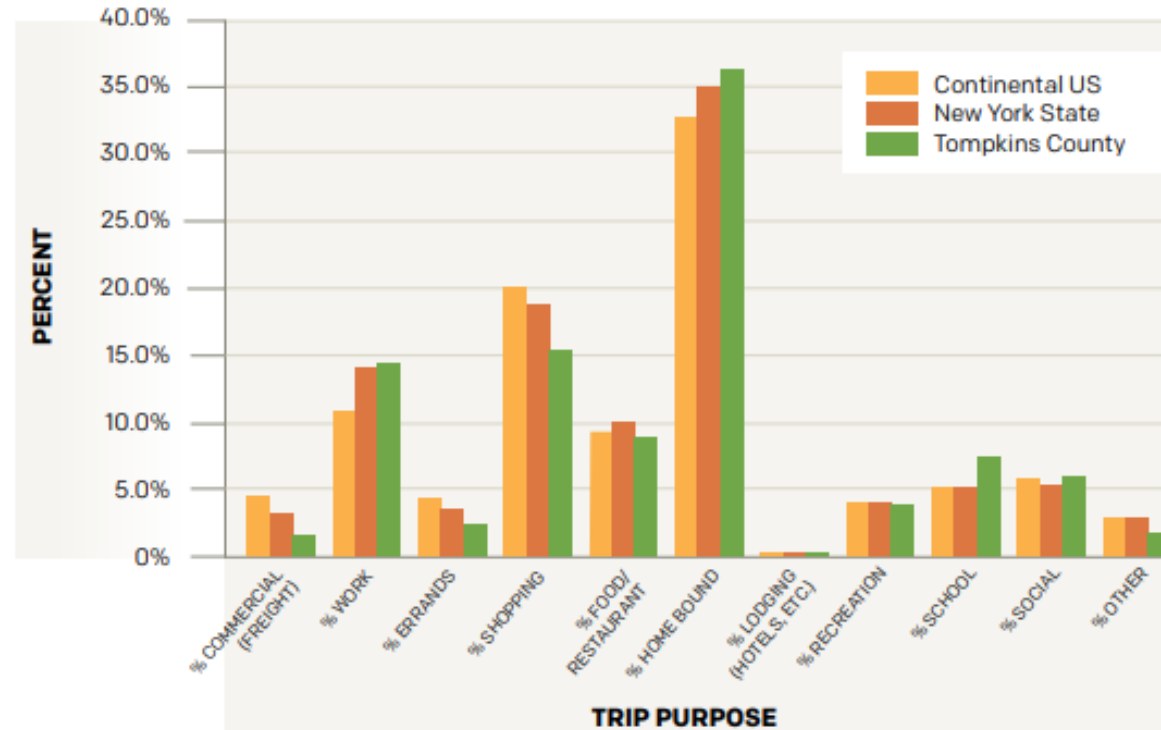
*Note: Trip distance in miles, collected from cellphone data
 ** "Private Vehicles" includes Cars, SUVs, Vans, Pickup Trucks, RVs and Motorcycles
 *** "Other" includes Paratransit, Private Bus, Limo/Uber/Lyft, and Rental Car
 Source: 2023 Replica Data Platform Data

Replica: Usage in the MPO

ArcMap Projects

1. Person Trips Per Day By Trip Purpose 2022 Table
2. Person Trips Per Day By Trip Purpose 2022 Graph
3. Person Trips Per Day By Mode of Transportation: 2019 AND 2022 Estimates Table
4. Trip Length By Trip Mode In Tompkins County NY 2023

PERSON TRIPS PER DAY BY TRIP PURPOSE 2022



Modal Datasets

1. Primary Mode (Modal Breakdown)
2. Trip Purpose
3. Trip Starting Hour
4. Trip Duration (Minutes) Counties
5. Trip Distance (Miles)
6. Origin-Destination Pairs (Counties)
7. Vehicle Fuel Type
8. Transit Routes
9. Transit Stops
10. Residential VMT by County

Demographic Datasets

1. Household Income
2. Race & Ethnicity
3. Private Auto Availability
4. Age
5. Employment Status
6. Work from Home
7. Education
8. Tenure
9. Residence Building Type

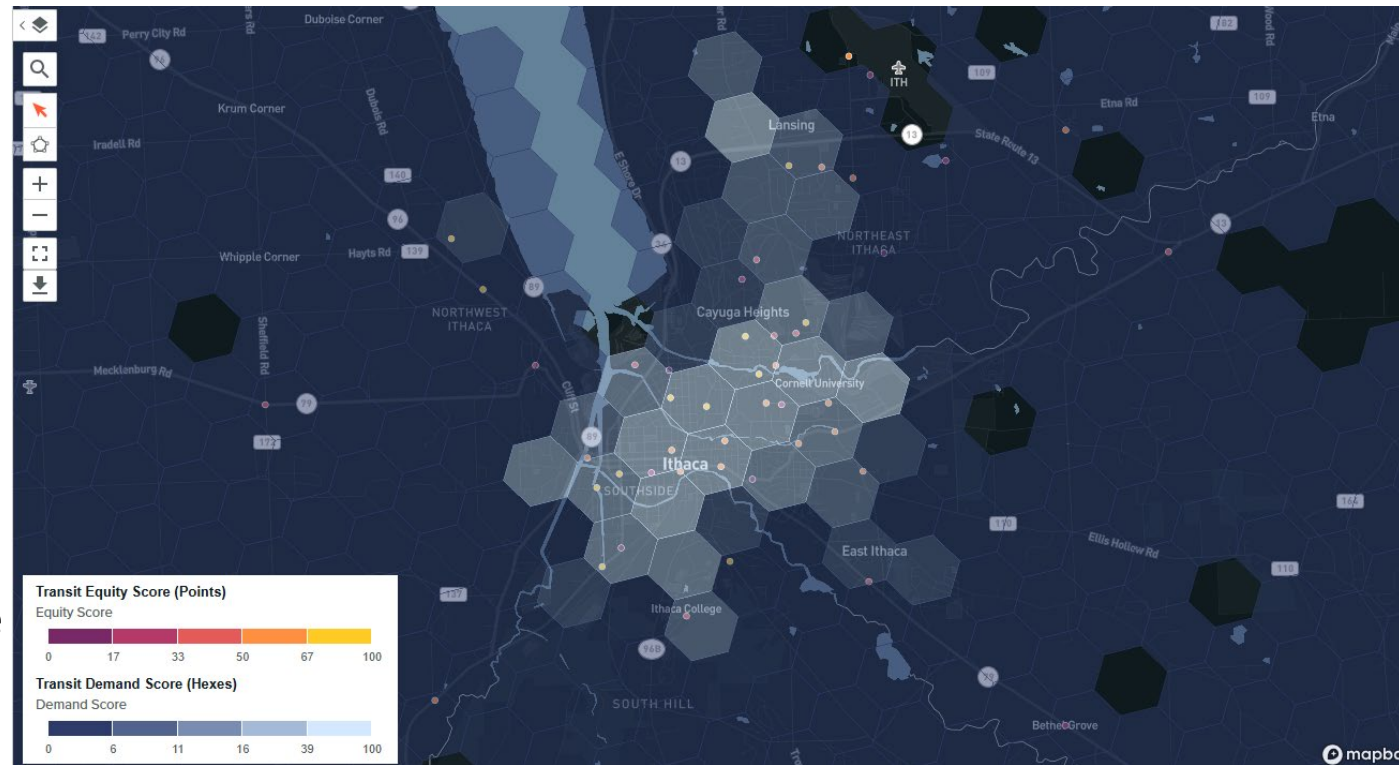
Replica: Uses and Limitations

Pros

1. Comprehensive & easy to access datasets
2. Great source of information for the Long-Range Transportation Plan

Limitations

1. Gives a snapshot of transportation data for only one day of the year.
2. Uses mobile data, which is not as accurate as Census Data
3. Unable to conduct traffic flow analysis
4. Certain tools/capabilities are unavailable to the MPO under the existing subscription



City of Ithaca Transit Equity Score Map

Future Uses

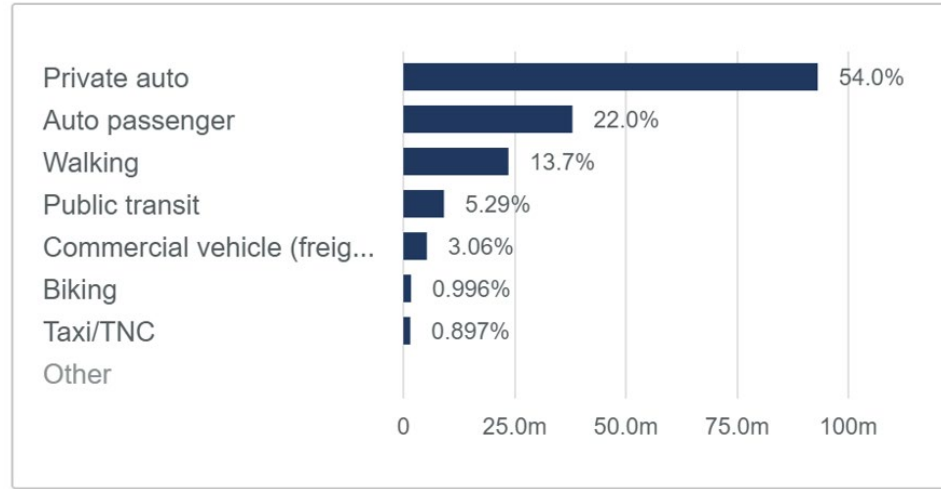
1. Evaluating transit and alternative transportation demand to evaluate potential new TCAT Routes and bike lanes/sidewalks
2. Create daily traffic and hourly volume maps for the LRTP.
3. Create County level speed maps for major roadways for the LRTP

Replica and Our Partner Organizations

Sample Projects & Requests

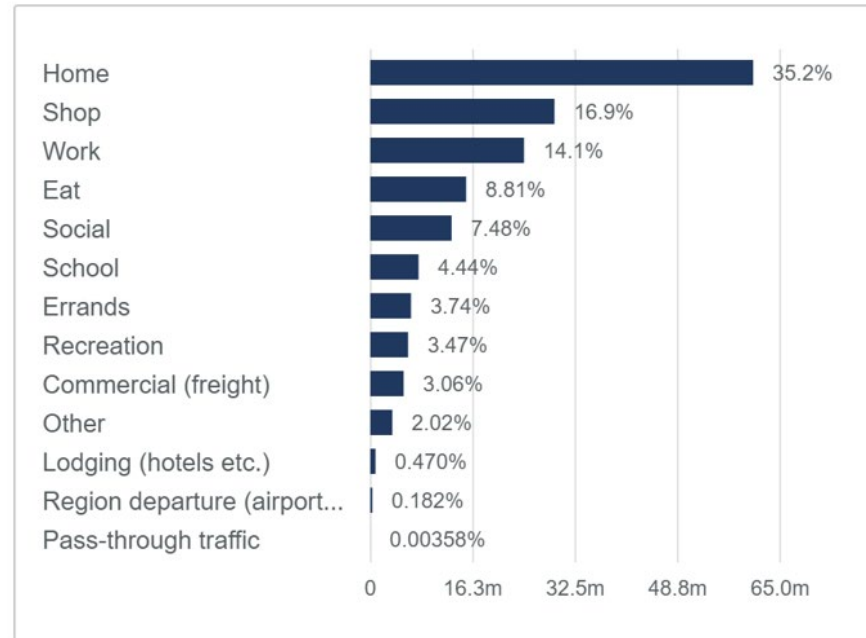
- ▶ Primary Mode Data for Tompkins County
- ▶ Trip Purpose Data for Tompkins County
- ▶ Trip Distance (Miles) in Tompkins County

Primary Mode



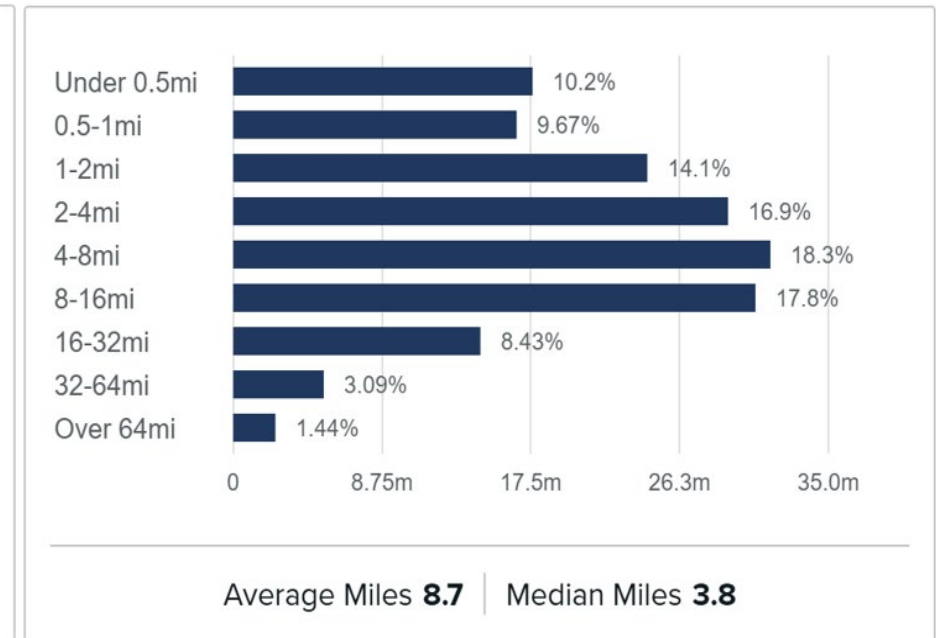
Primary Mode for All Trip Types - Tompkins County 2025

Trip Purpose



Trip Purpose - Tompkins County 2025

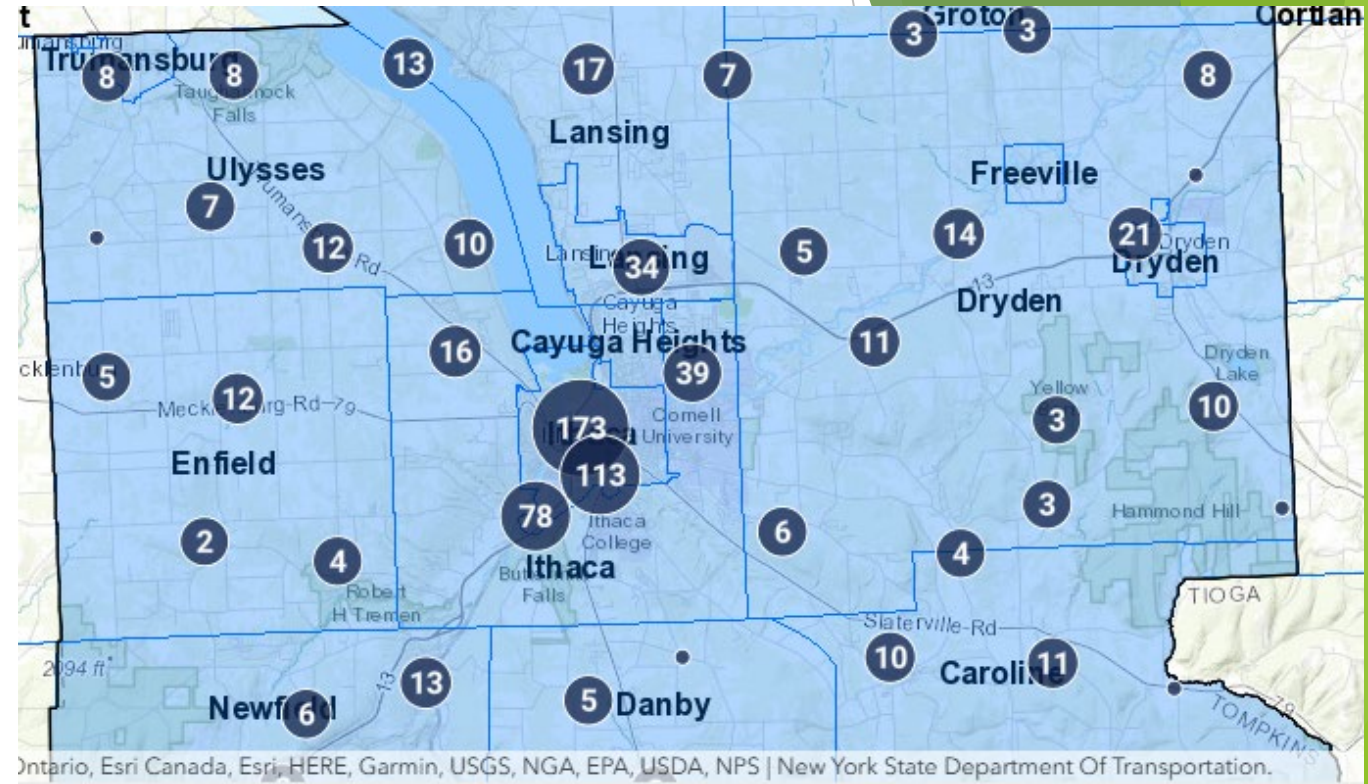
Trip Distance (Miles)



Primary Mode for All Trip Types - Tompkins County 2025

NSYDOT CLEAR Crash Data Viewer

- ▶ The NYSDOT CLEAR Crash Data Viewer is the MPO's main source of vehicle, bicycle, and pedestrian crash data
- ▶ ArcGIS Shapefiles and Excel Data Spreadsheets are available to download through CLEAR



CLEAR Crash Query Map - Tompkins County 2022

Query Results						
Crash Level Details <						
<input type="checkbox"/>		Case Number	Crash Severity	X Coordinate	Y Coordinate	Max Injury in Crash
<input type="checkbox"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
<input type="checkbox"/>	<input type="text"/>	40784080	PROPERTY DAMAGE	390683.27744376	4704992.95019936	U - UNKNOWN
<input type="checkbox"/>	<input type="text"/>	40784632	INJURY	385196.0483826	4690199.11063338	A - SERIOUS INJURY
<input type="checkbox"/>	<input type="text"/>	40784642	INJURY	386483.3803512	4695429.15284716	A - SERIOUS INJURY

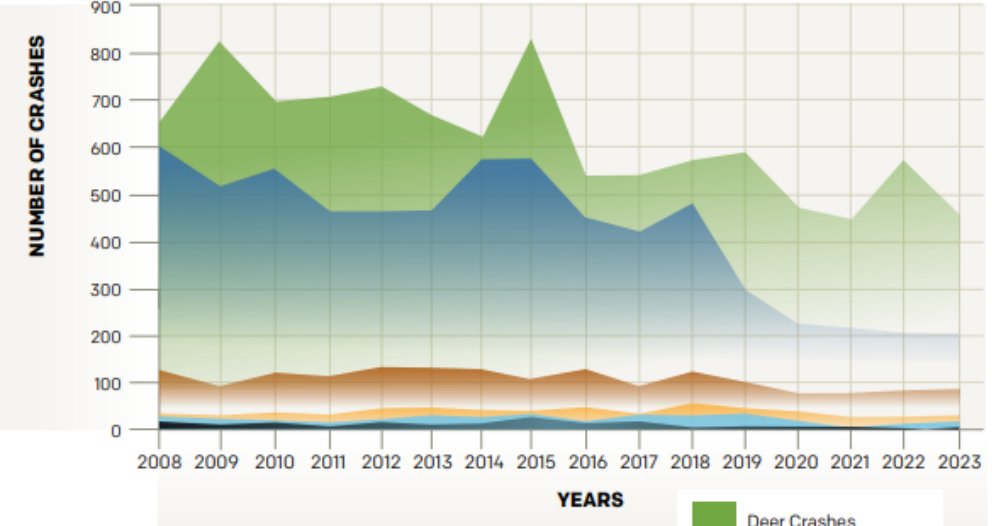
CLEAR Crash Data Points

CLEAR Crash Data MPO Products

Datasets Used within the Long-Range Transportation Plan (LRTP)

- ▶ Traffic Crashes in Tompkins County 2008-2023 - LRTP Page 42 & 43
- ▶ Crash Factors Ven Diagram - LRTP Page 43

TRAFFIC CRASHES IN TOMPKINS COUNTY 2008-2023



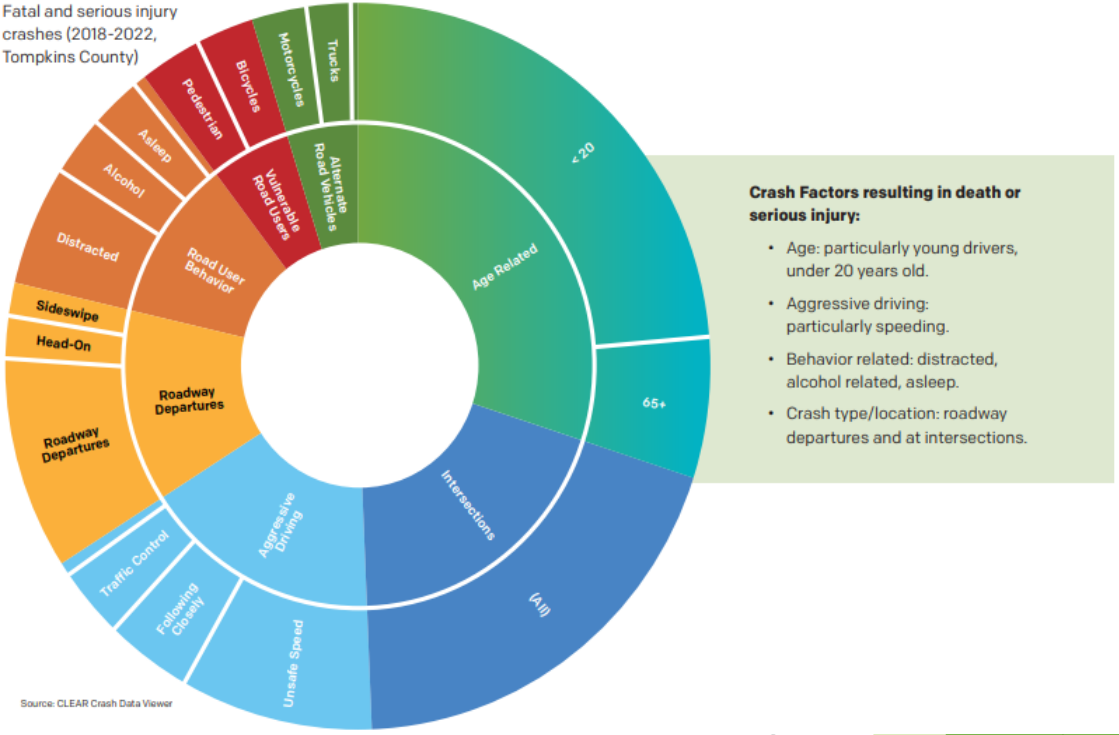
Source: New York State DOT - ALIS and CLEAR Data

*Serious Injuries include: skull fractures, internal injuries, broken or distorted limbs, unconsciousness, severe lacerations, and unable to leave the scene without assistance.

- Deer Crashes
- Crashes with Injuries
- Serious Injuries*
- Pedestrian Crashes
- Bicycle Crashes
- Crashes with Fatalities

CRASH FACTORS

Fatal and serious injury crashes (2018-2022, Tompkins County)



Source: CLEAR Crash Data Viewer

CLEAR & Our Partner Organizations

Sample Data Requests

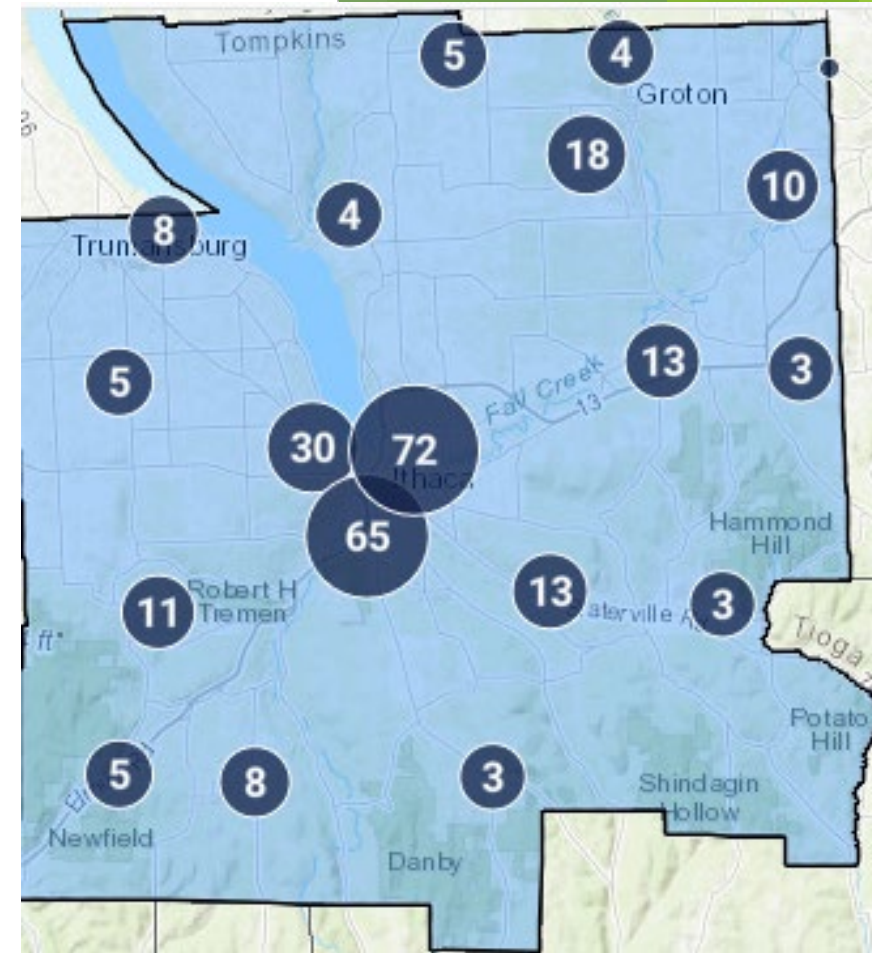
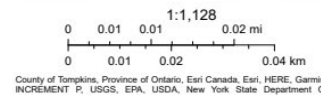
- ▶ Intersection Crash Data Requests
- ▶ 5-year Tompkins County Crash Data Requests

CLEAR Crash Query Map - Green Street & Seneca Street Crashes



11/10/2025
 Results Layer
 ● Results Layer

— Interstates	— State Routes
— US Highways	— Streets



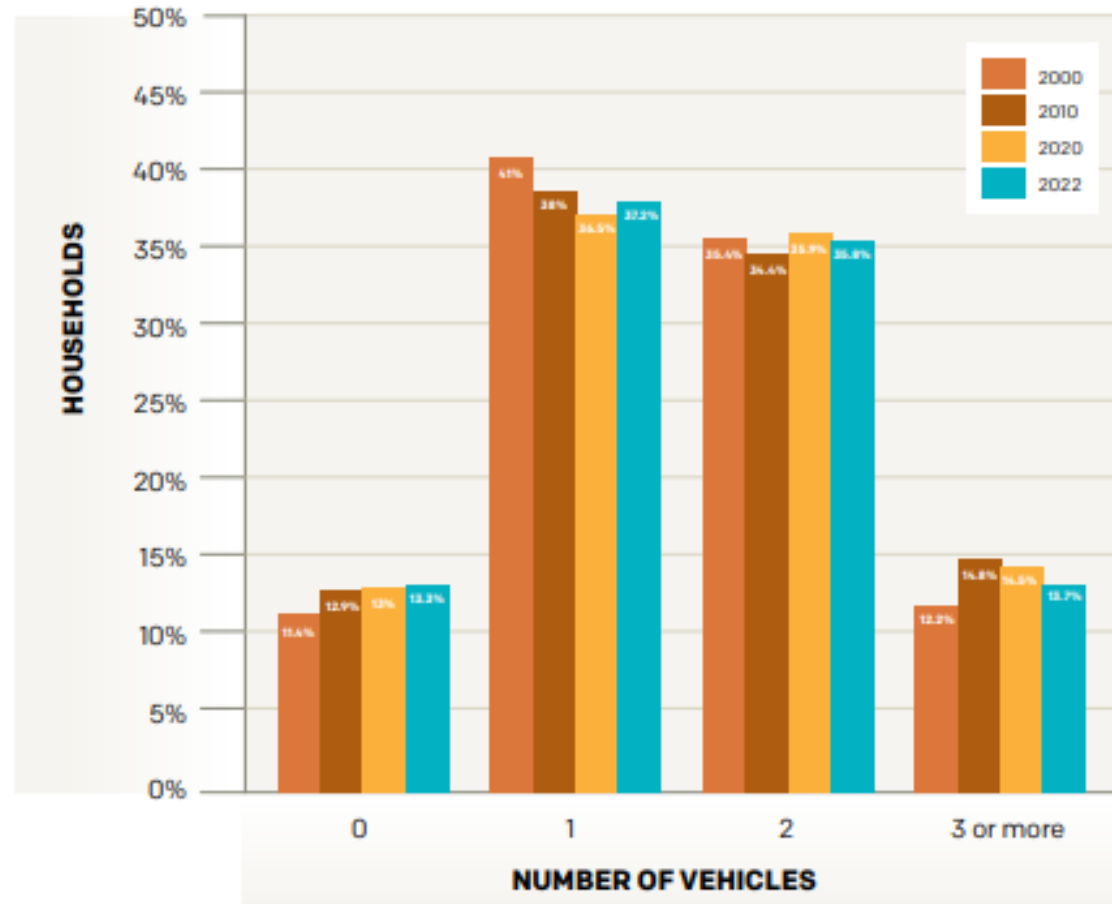
CLEAR Crash Query Map - Tompkins County 2022

U.S. Census: American Community Survey (ACS) 5 Yr Data & Decennial 10 Yr Data

- ▶ American Community Survey 5yr Data - [American Community Survey 5-Year Data \(2009-2023\)](#).

- ▶ Decennial 10yr Data - [Decennial Census of Population and Housing](#).

NUMBER OF VEHICLES PER HOUSEHOLD TOMPKINS COUNTY NY



SOURCE: 2000 & 2010 Decennial Census and 2020 & 2022 5 Yr American Community Survey

U.S. Census Survey Tools: Usage in the MPO

Datasets in the Long-Range Transportation Plan (LRTP)

- ▶ Population Totals tables (DC) - Pgs 28 & 29
- ▶ Urban & Rural Population Trends Table (DC) - Pg. 29
- ▶ Persons per Household in Tompkins County (ACS) - Page 30
- ▶ Tompkins County Household Size (ACS) - Pg. 30
- ▶ Tompkins County Age of Population (ACS & DC) - Pg. 30
- ▶ Basic Economic Data graphics (ACS & DC) - Pg. 31
- ▶ Tompkins County Regional Commute In Commutes by Mode within Tompkins County graphics (ACS) - Pg. 36g Patterns Table - Pg. 35

TOMPKINS COUNTY REGIONAL COMMUTING PATTERNS

COMMUTING PATTERNS	TOTAL 2020
A. TOTAL DAILY WORKERS IN TOMPKINS COUNTY (C+F)	60,763
B. TOTAL WORKERS WHO LIVE IN TOMPKINS COUNTY (C+D)	49,608
C. WORKERS WHO LIVE AND WORK IN TOMPKINS COUNTY (B-D)	45,028
D. TOTAL OUT COMMUTERS (B-C)	4,580
E. TOTAL IN COMMUTERS (A-C)	15,735
F. NET COMMUTERS (D-E)	11,155
PERSONS LIVING IN TOMPKINS COUNTY AND WORKING IN:	
TOMPKINS COUNTY	45,028
BROOME COUNTY	198
CAYUGA COUNTY	365
CHEMUNG COUNTY	508
CORTLAND COUNTY	1,423
ONONDAGA COUNTY	233
SCHUYLER COUNTY	234
SENECA COUNTY	98
STEBEN COUNTY	238
TIOGA COUNTY	305
OTHER	978
PERSONS WORKING IN TOMPKINS COUNTY AND LIVING IN:	
TOMPKINS COUNTY	45,028
BROOME COUNTY	611
CAYUGA COUNTY	2,189
CHEMUNG COUNTY	1,266
CORTLAND COUNTY	3,309
ONONDAGA COUNTY	484
SCHUYLER COUNTY	1,782
SENECA COUNTY	1,238
STEBEN COUNTY	189
TIOGA COUNTY	3,314
OTHER	1,353

Source: 2022 5 American Community Survey (ACS)
2022 5 American Community Survey (ACS)

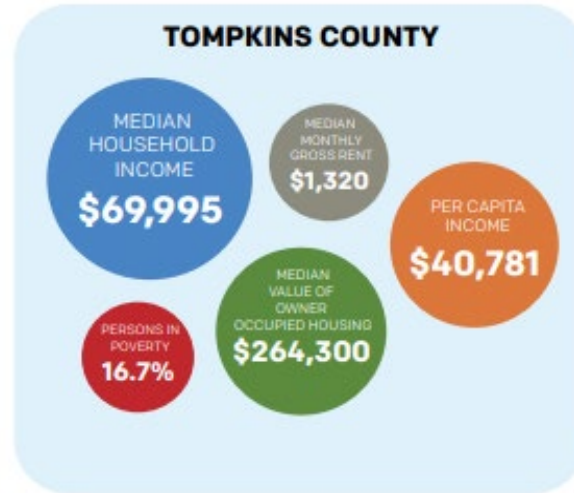
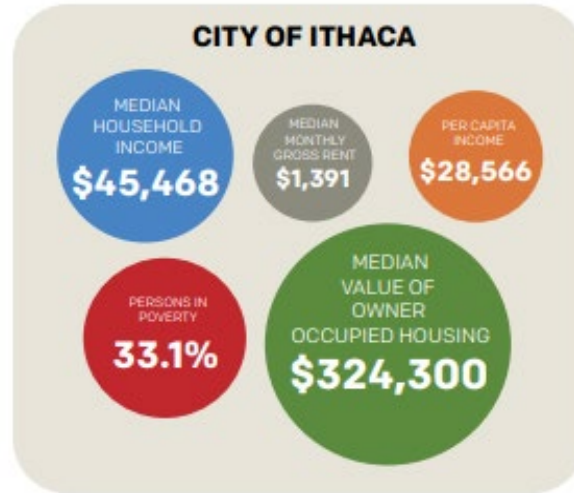
- Commutes by Mode to & from Tompkins County (ACS) Pg. 37
- Means of Transportation to Work 2022 (ACS) - Pg. 39
- Number of Vehicles per Household Tompkins County NY (ACS & DC) - Pg. 40
- Travel Time to Work Bar Graph (ACS & DC) - Page 41
- Mean Travel Time to Work (ACS & DC) - Pg. 41
- Household Income by Mode to Work - Tompkins County (ACS) - Pg. 44
- Commute Mode within Tompkins County 2022 (ACS) - Pg. 44
- Federal Aid Road System - Descriptive Statistics (DC) - Pg. 52
*The 2020 Functional Classification System is based on the 2020 Decennial Census

U.S. Census Data and Our Partner Organizations

Sample Data Requests

- ▶ Tompkins County Demographic Data
 - ▶ I.e., Ethnic composition by municipality
- ▶ Economic & Household data
 - ▶ Household Income by Mode
- ▶ Vehicle Ownership Data
- ▶ Mode to Work Data

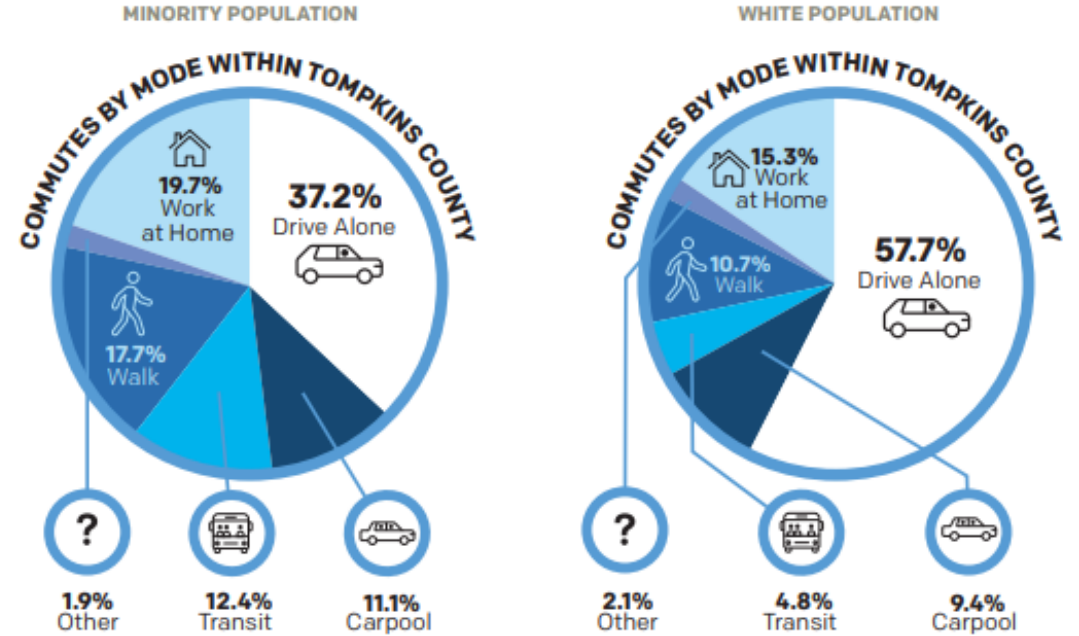
BASIC ECONOMIC DATA



SOURCE: 2020 Decennial Census and 2022 5 Census American Community Survey (ACS)

2020 Decennial Census and 2022 Census American Community Survey (ACS)

COMMUTE MODE WITHIN TOMPKINS COUNTY 2022



Source: 2022 5 Yr ACS DATA

2022 5 yr ACS Data



Analysis & Takeaways

We developed a comprehensive inventory of current ITCTC data tools, products and services.

- ▶ What did we learn?
- ▶ How will we apply this learning to support the MPO's mission?

Takeaway #1: Robust Capacity

The ITCTC maintains a large amount of data has robust capacity for data analysis.

Takeaway #2: From Passive to Proactive

Data and reports are published to the website and used in the LRTP and various reports.



We would like to take a more proactive role in:

Understanding the needs of our members and how we can help with data.

Tailoring our data products and services to your needs.

More proactively promoting our data-related services.

Takeaway #3: Expanding Future Capacity

- ▶ We have access to additional data tools within ArcGIS and Replica that we are considering expanding our use of in the future.

Takeaway #4: Knowledge Transfer

Institutional knowledge for many of our data services still lies with Tom Mank.

Knowledge transfer in process:

- ▶ Transition completed: TIP Maps, Performance Measures, Complete Streets Maps, etc...
- ▶ Transition in process: Transportation Snapshot, etc.
- ▶ Future transition: Functional Class Map, Mode-to-Work Tables/Pie Charts, Traffic Count Report 2025, etc...



Q&A

Start: Are there analyses or data services that you think we should start doing that we are not doing now?

Stop: Are there things that we have done in the past that are less valuable, or that you think we should stop doing?

Modeling: If the ITCTC were to rebuild its capacity to support transportation demand modeling, would that be valued?