

# Developing ArcGIS Pro OD Matrix Visualization Add-in

# Outline

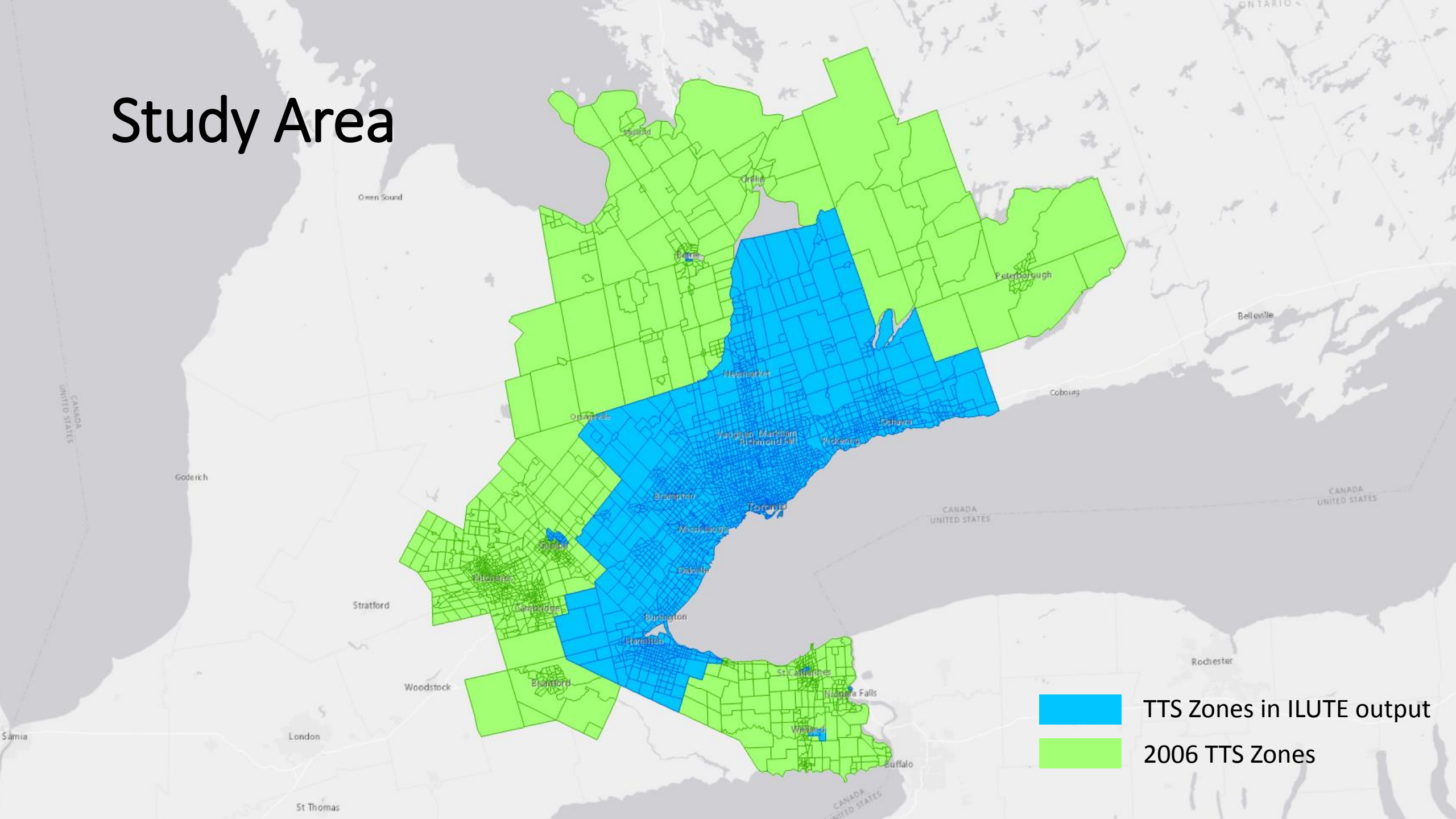
- ILUTE Project
- Study Area
- Sample Data
- Data Summary
- Data Workflow
- Visualization Challenges
- ArcGIS Pro Add-In Demo

# ILUTE Project

- **Integrated land use, transportation, environment (ILUTE) project by the University of Toronto Transportation Research Institute (UTTRI)**
- One of the model outputs is cost (money or time) of travel between zones in the greater Toronto-Hamilton area generated by agent-based simulation



# Study Area



# Sample OD Matrix

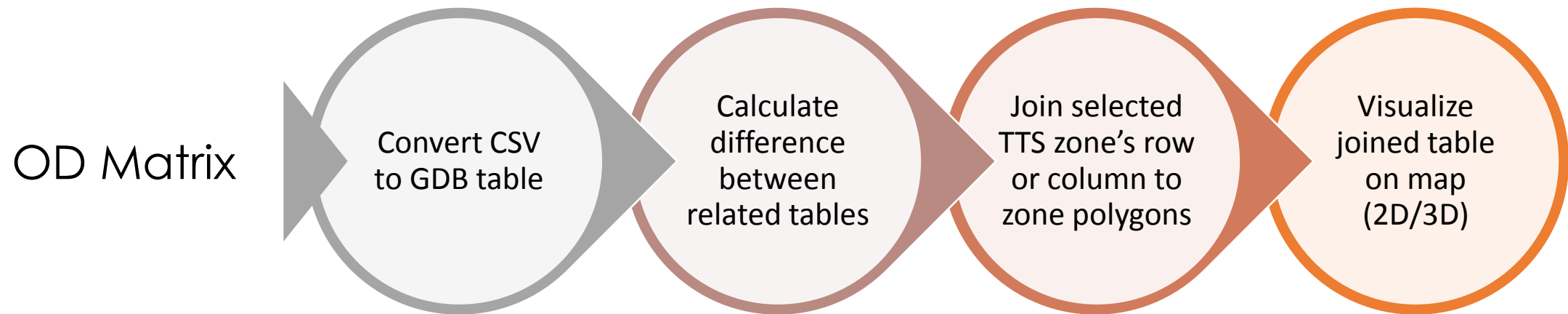
acost\_AM.csv

Zones O\D	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
1	0	0.172365	0.227514	0.356373	0.458939	0.489411	0.599534	0.476233	0.846921	0.692802	0.802214	0.782105	0.773223	0.78471	0.795896	0.7324	0.702095
2	0.172365	0	0.158668	0.186777	0.35469	0.253413	0.363536	0.240235	0.610923	0.456804	0.566216	0.546107	0.599562	0.638252	0.633056	0.687401	0.690988
3	0.225731	0.158668	0	0.109293	0.232661	0.257157	0.36728	0.243979	0.614667	0.460548	0.56996	0.549851	0.540969	0.565506	0.560311	0.509445	0.486231
4	0.353964	0.186777	0.109293	0	0.124596	0.122027	0.253804	0.250687	0.50119	0.347071	0.456484	0.436375	0.406035	0.429634	0.424438	0.422153	0.375542
5	0.485998	0.341163	0.232661	0.123899	0	0.106009	0.237786	0.286948	0.410294	0.256175	0.325173	0.305064	0.310484	0.340267	0.335072	0.382796	0.327688
6	0.483429	0.253413	0.26111	0.122027	0.106009	0	0.176306	0.185671	0.360457	0.206338	0.31575	0.295642	0.349096	0.387786	0.38259	0.436935	0.515355
7	0.589474	0.363536	0.367155	0.253804	0.237786	0.176306	0	0.295795	0.494019	0.3399	0.449313	0.429204	0.482658	0.521348	0.516153	0.570498	0.648917
8	0.466298	0.240235	0.243979	0.250687	0.286948	0.185671	0.295795	0	0.543181	0.389062	0.498475	0.478366	0.53182	0.57051	0.565315	0.61966	0.698079
9	0.843288	0.610923	0.620969	0.507618	0.418251	0.360457	0.494019	0.543181	0	0.154234	0.210766	0.190657	0.244112	0.287285	0.28209	0.336435	0.414854
10	0.681212	0.456804	0.458893	0.345542	0.256175	0.206338	0.3399	0.389062	0.154234	0	0.095687	0.075579	0.129033	0.172207	0.167011	0.221356	0.299776
11	0.750209	0.605374	0.527891	0.414539	0.325173	0.31575	0.449313	0.498474	0.210766	0.095687	0	0.097579	0.151033	0.194207	0.189011	0.243356	0.321775
12	0.730101	0.585266	0.507782	0.394431	0.305064	0.295642	0.429204	0.478366	0.190657	0.075579	0.097579	0	0.130925	0.174098	0.168902	0.223247	0.301667
13	0.749822	0.604987	0.527503	0.414152	0.324785	0.371931	0.50161	0.550772	0.271803	0.156725	0.178724	0.158616	0	0.152592	0.147397	0.15325	0.224868
14	0.765304	0.620469	0.542985	0.410279	0.340267	0.387413	0.517092	0.566254	0.287285	0.172207	0.194207	0.174098	0.152592	0	0.076989	0.074746	0.153166
15	0.760108	0.615273	0.53779	0.405083	0.335072	0.382217	0.511896	0.561058	0.28209	0.167011	0.189011	0.168902	0.147397	0.076989	0	0.087729	0.184604
16	0.703042	0.578876	0.480049	0.371287	0.29244	0.40765	0.554511	0.603673	0.336435	0.221356	0.243356	0.223247	0.15325	0.074746	0.087729	0	0.07621
17	0.705462	0.581296	0.482468	0.373707	0.29486	0.410069	0.541847	0.591009	0.414854	0.299776	0.321775	0.301667	0.224868	0.153166	0.184604	0.07621	0

# Data Summary

- We were provided with the following datasets, broken down as follows:
  - Four time ranges (6am to 9am, 9am to 3pm, 3pm to 7pm, 7pm to midnight)
    - Automobile
      - Auto cost
      - Toll cost
      - Travel time
    - Transit
      - Transit fare
      - Travel time (walking + waiting + in-vehicle time)
      - Boarding penalty
      - Congestion penalty

# Workflow for OD ArcGIS Pro Add-in





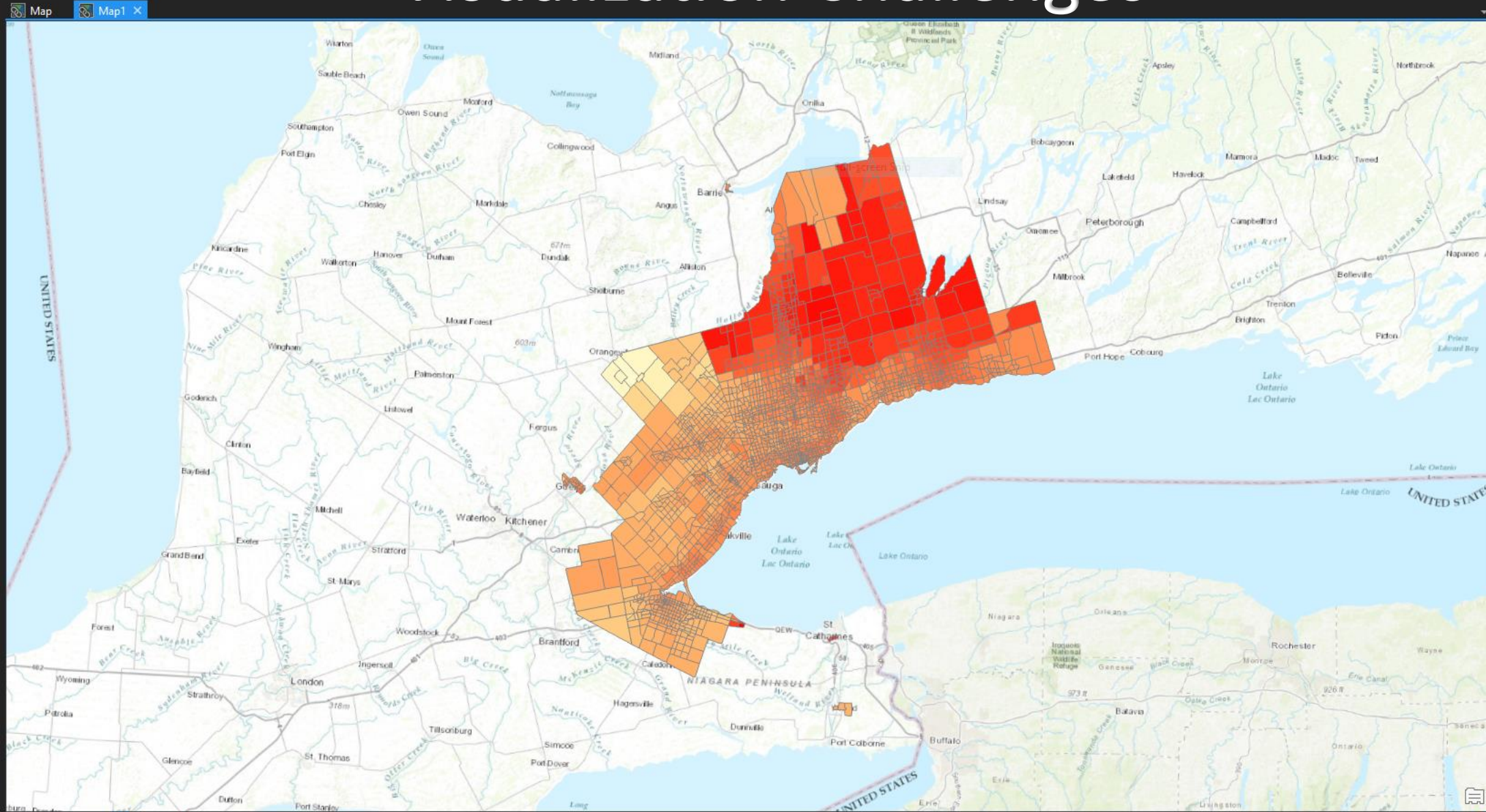
Project Map Insert Analysis View Edit Imagery Share ODViz Add-In Appearance Labeling Data

Layout 2D & 3D

Explore Select Origin Clear Flash Origin Solve Symbology

OD Visualization

# Visualization Challenges



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Drawing Order

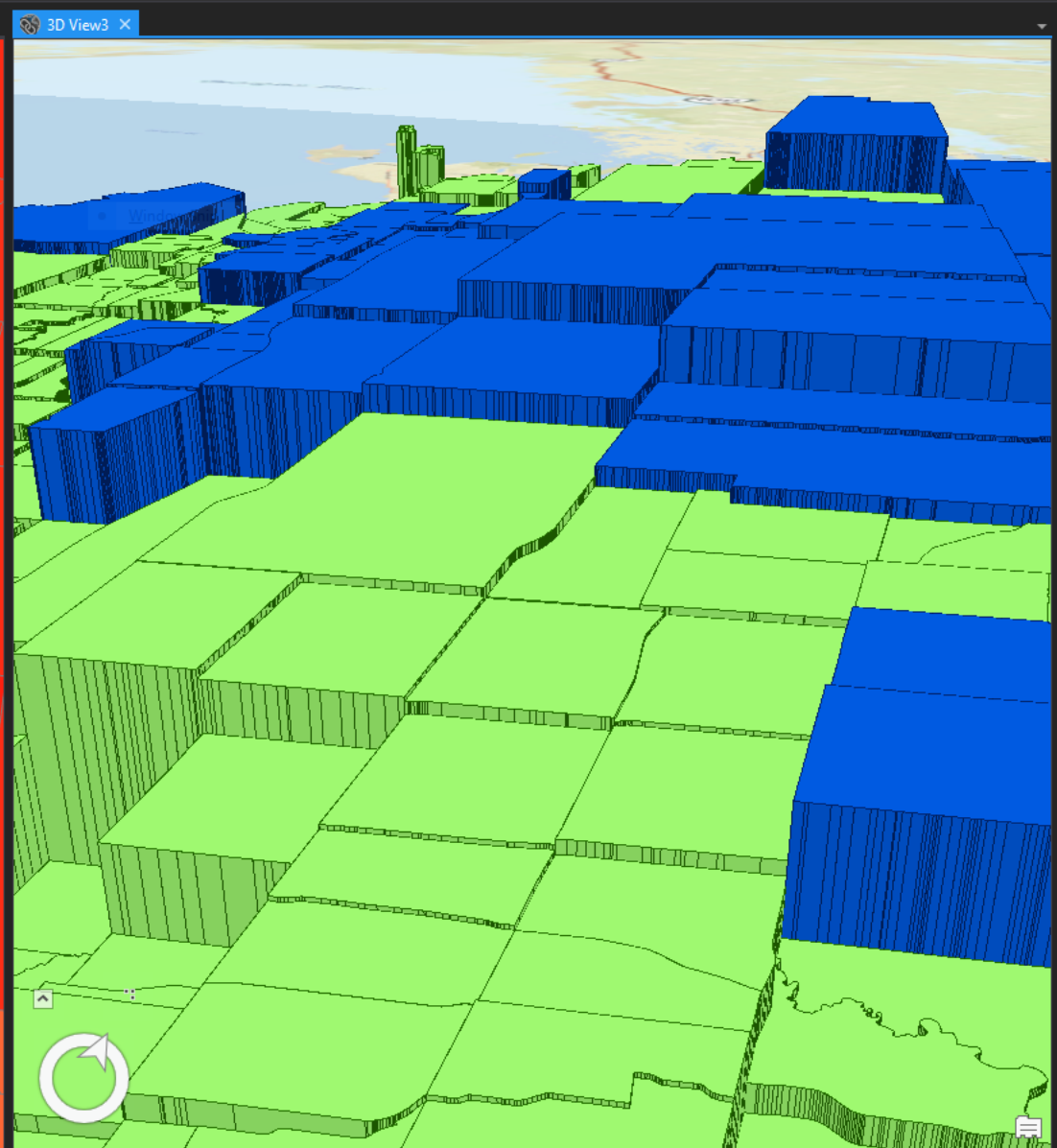
- Map1
  - Layer1293
    - F1293
      - 252
      - 27
    - Topographic



Layout 2D & 3D

Explore Select Origin Clear Flash Origin Solve Symbology

OD Visualization



Catalog

Contents

Search

Drawing Order

- 3D View3
  - 3D Layers
    - Layer3152
      - atime\_tivtt\_O\_F3152.Diff\_3D
        - Negative
        - 0
        - Positive
    - Layer1293
      - atime\_tivtt\_O\_F1293.Diff\_3D
        - Negative
        - 0
        - Positive
  - 2D Layers
    - Streets
  - Elevation Surfaces
    - Ground
      - WorldElevation3D/Terrain3D

Project | Map | Insert | Analysis | View | Edit | Imagery | Share | ODviz | Add-In | Appearance | Labeling | Data

Hossein (Education and Research)

Clipboard: Paste, Cut, Copy, Copy Path

Navigate: Explore, Bookmarks, Go To XY

Layer: Basemap, Add Data, Add Preset

Selection: Select, Select By Attributes, Select By Location, Attributes, Clear

Inquiry: Infographics, Measure, Locate

Labeling: Pause, View Unplaced, More, Convert To Annotation

Offline: Download Map, Sync, Remove

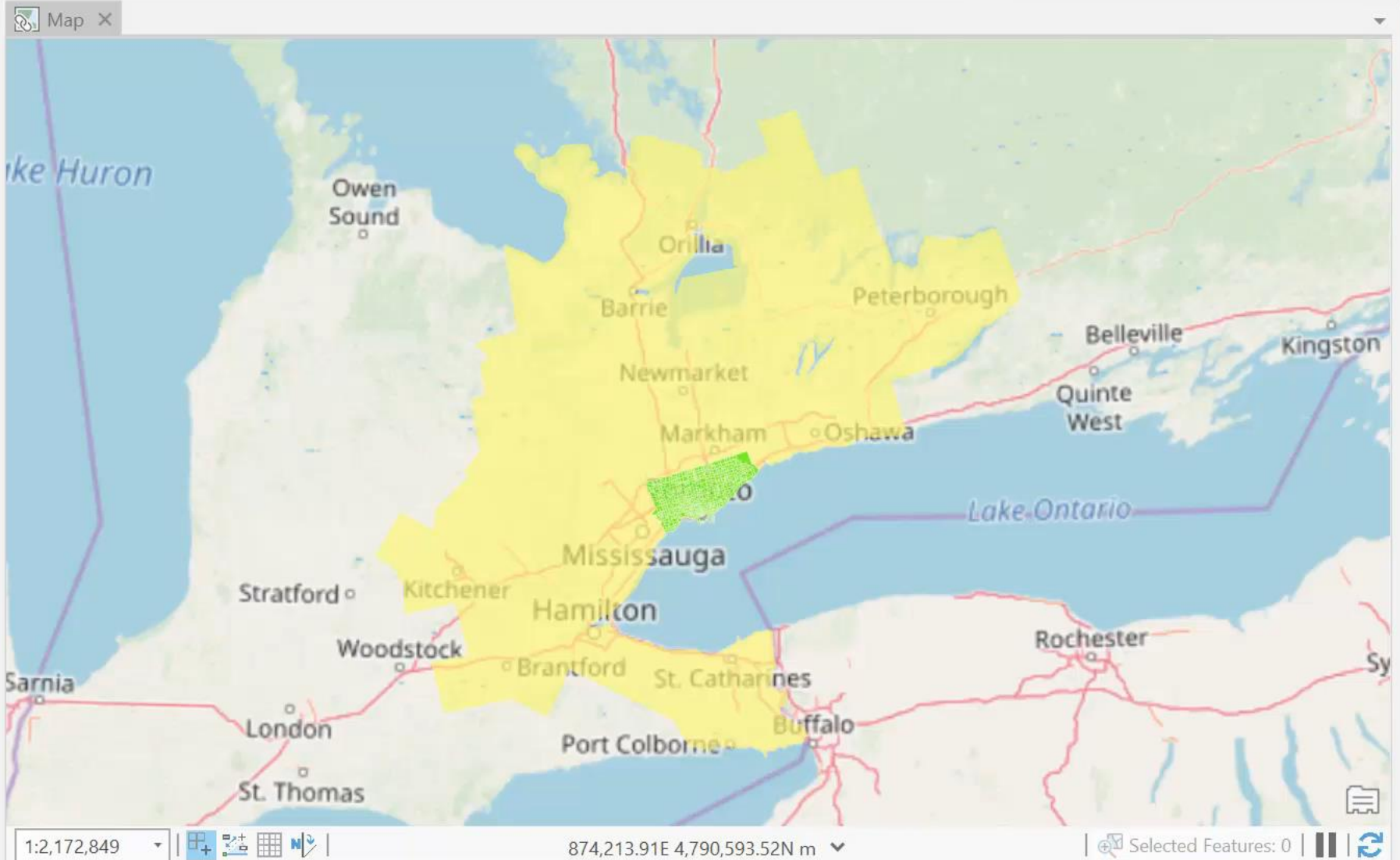
Contents

Search

Drawing Order

- Map
- ttsZones
- subway\_lines
- ttsZones2
- OpenStreetMap

OD Inputs



Catalog

Project | Portal | Favorites | ...

Search

- Maps
- Toolboxes
- Databases
- Layouts
- Styles
- Folders
- Locators

# Questions?

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