

CONNECTED VEHICLE DATA

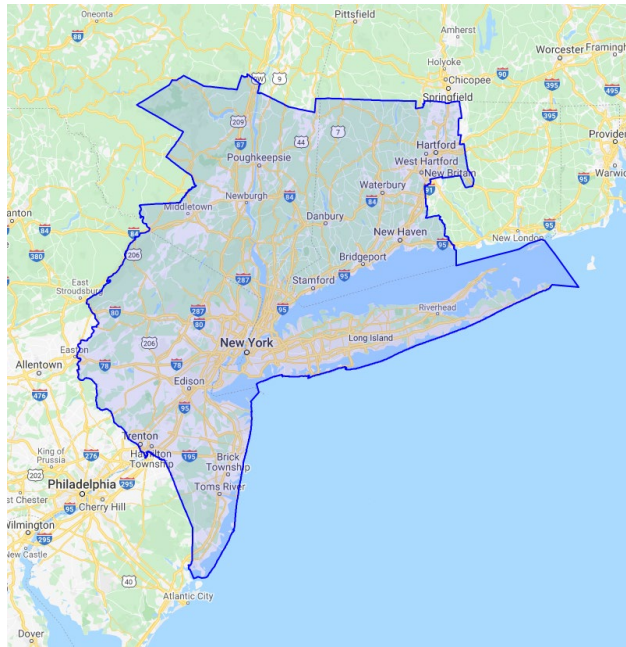
Origin/Destination

ITS-NY CROWDSOURCING WEBINAR

May 19, 2021

CHALLENGES WITH CV DATA

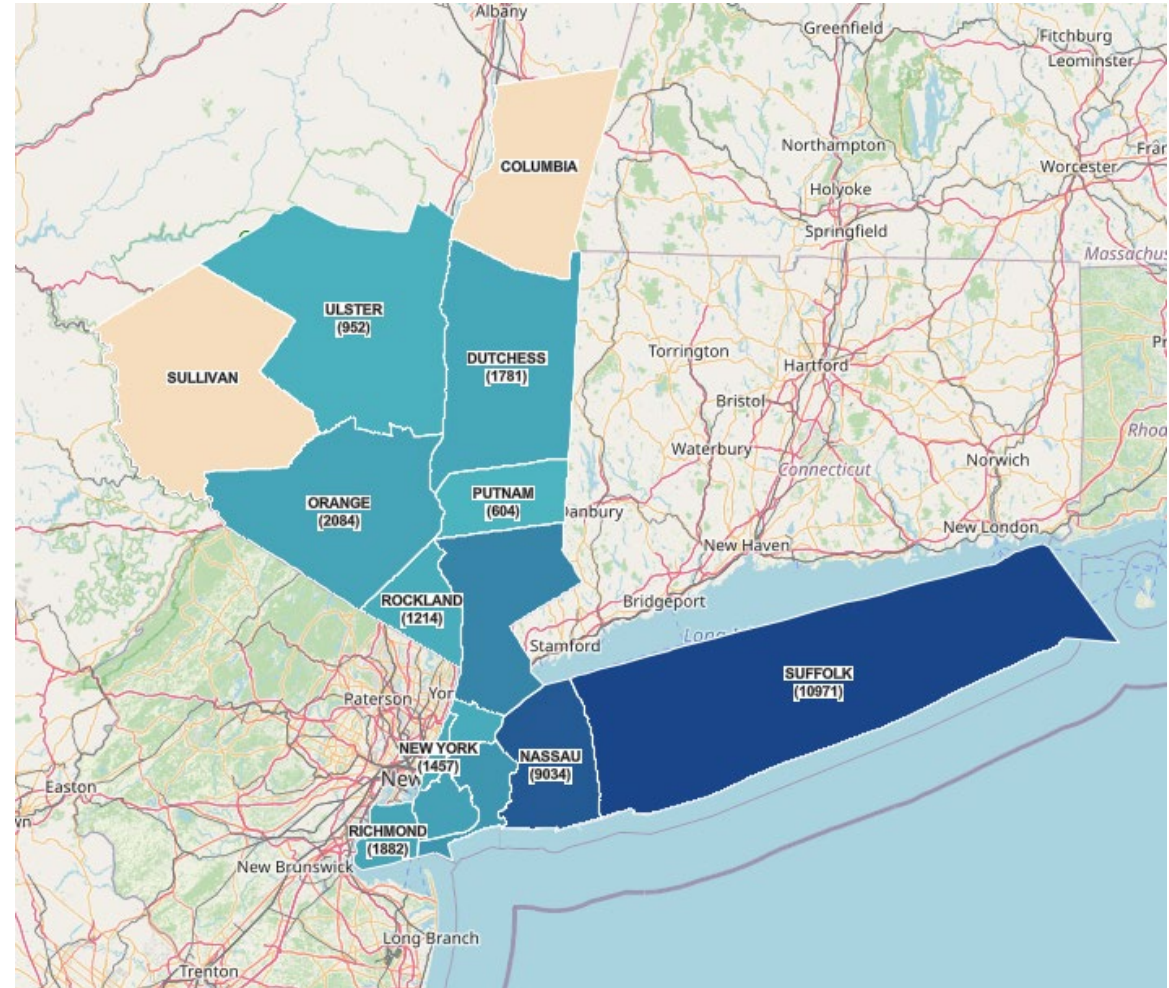
- Three months of data for the NYC Metropolitan Area
 - Every three seconds
- Ingesting, processing and rendering CV data
- Real-time Conflation
- Privacy – Priority for public transportation agencies and planning organizations



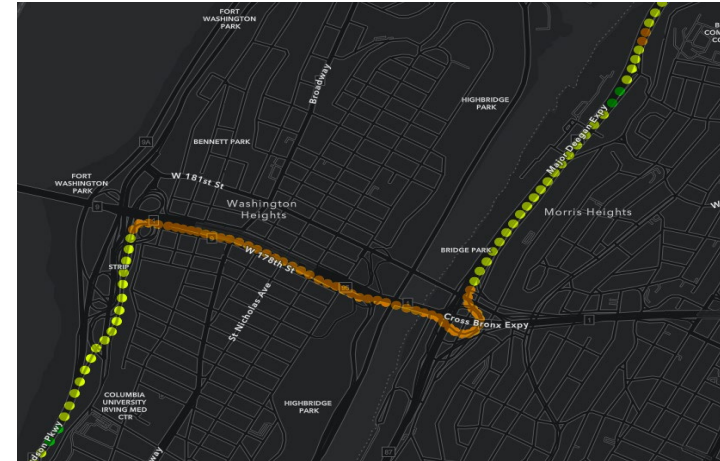
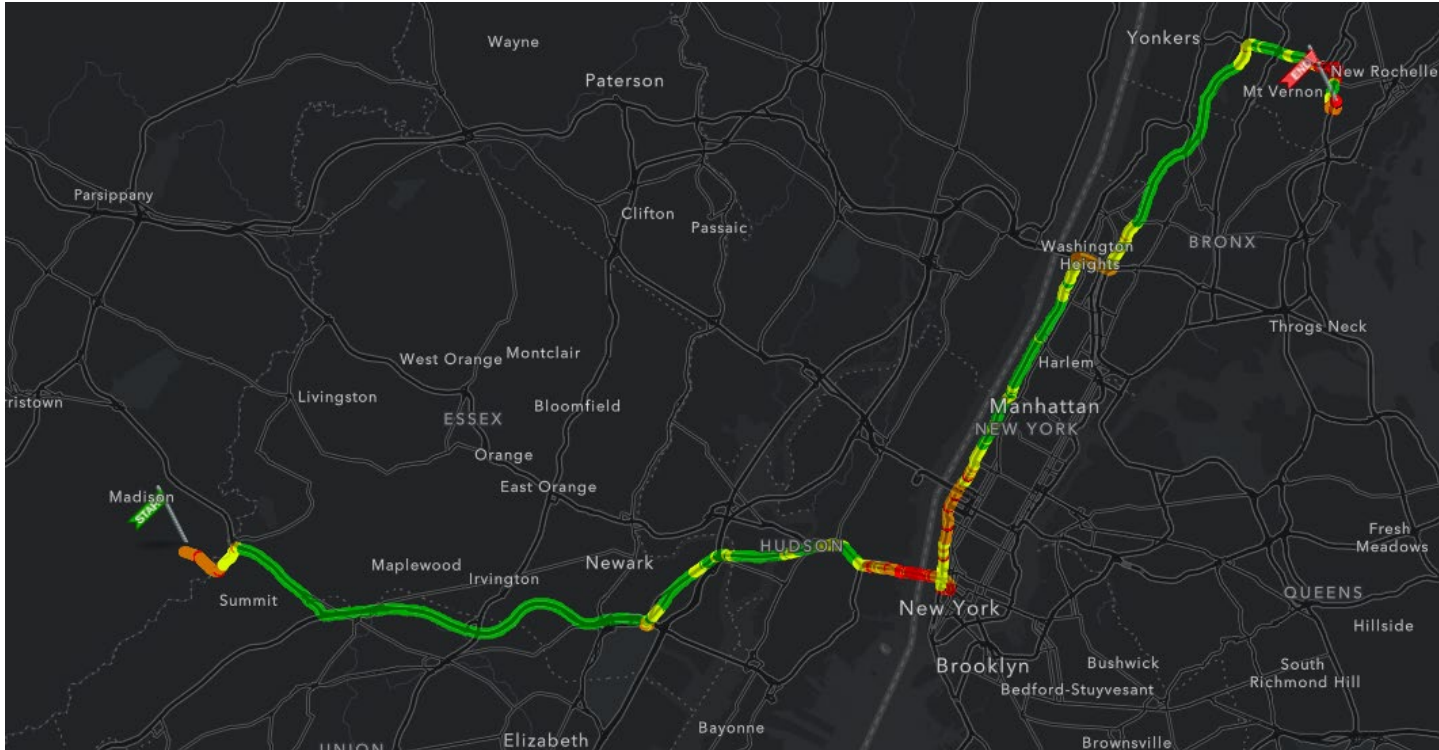
Waypoints/Day	560,000,000
Journeys/Day	1,800,000
Waypoints/rush hour (4 hours)	160,000,000
Journeys/rush hour (4 hours)	560,000
Files Processed/Day	8,160,000
Files Processed/rush hour (4 hours)	2,110,000
Database Size/Day	160 GB

CHALLENGES WITH CV DATA THAT IS CURRENTLY INTEGRATED CONT.

- Real Time Conflation of data
 - Speed / Waypoint – ~30 Seconds
 - Origin and Destination -- 15 minutes - Hour
- Various Visualization Systems
 - Open-source Business Intelligence (BI)
 - Custom Dashboards
- Integrate CV Data using open source and paid map services

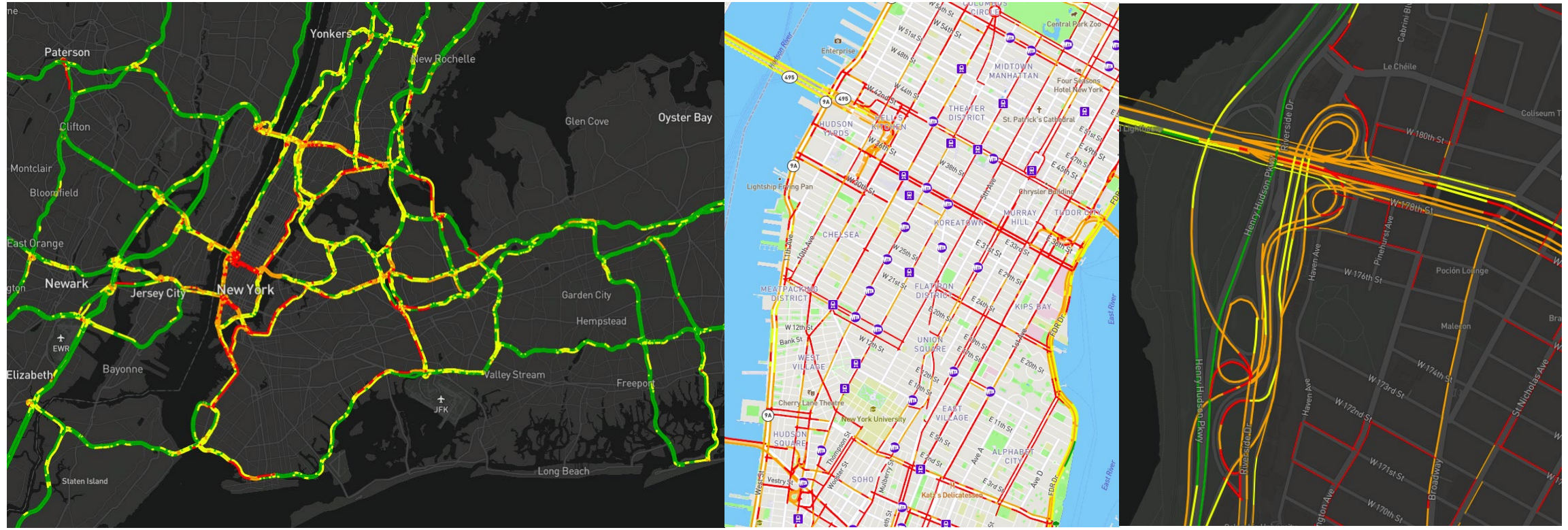


WAYPOINTS



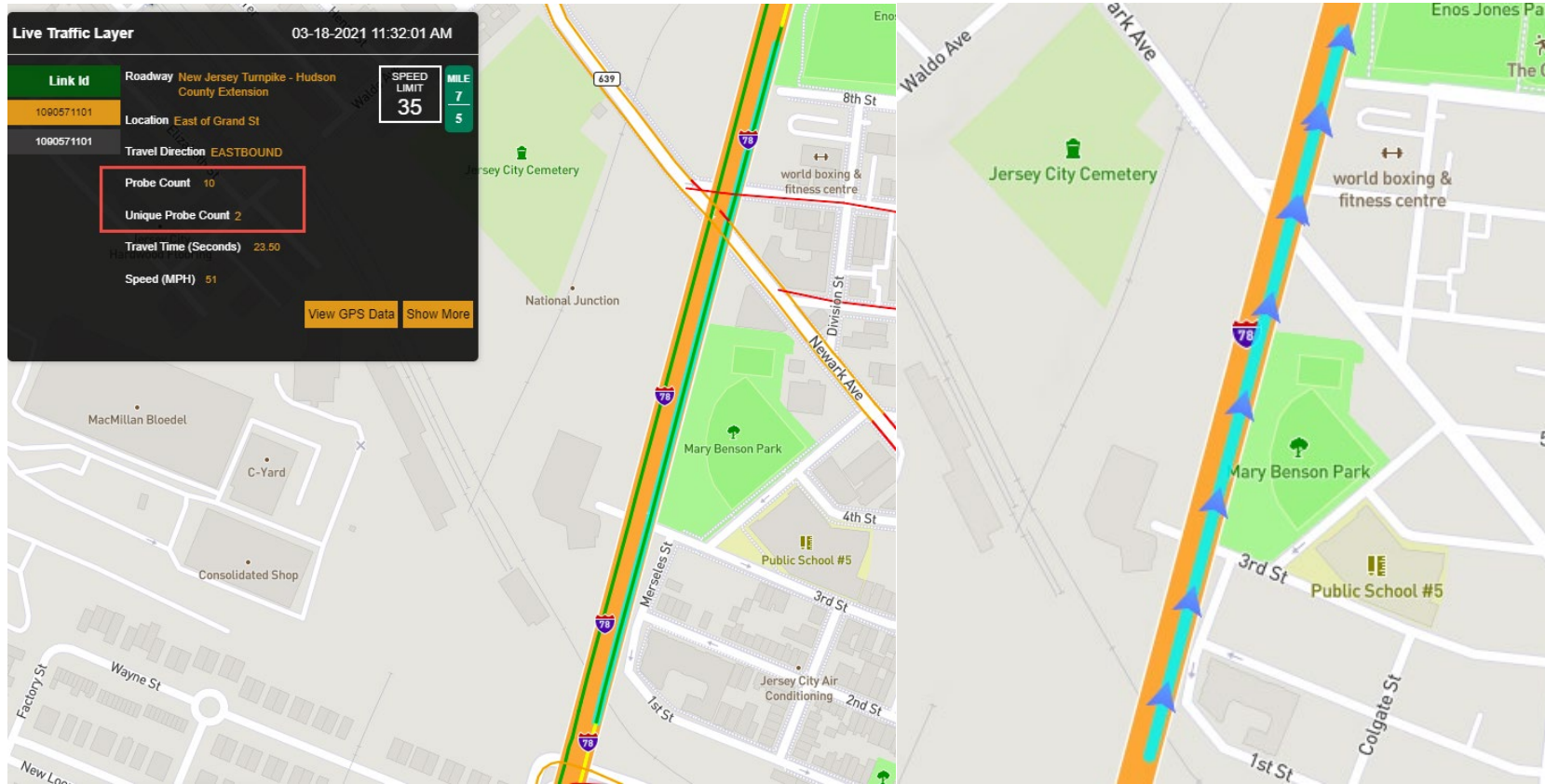
LIVE SPEED LAYER

- Live Speed Layer – Refreshes every minute
- Conflating data to map segments in real-time



LIVE SPEED LAYER – CONT.

Live Speed Layer – Refreshes every minute
Conflating data to map segments in real-time

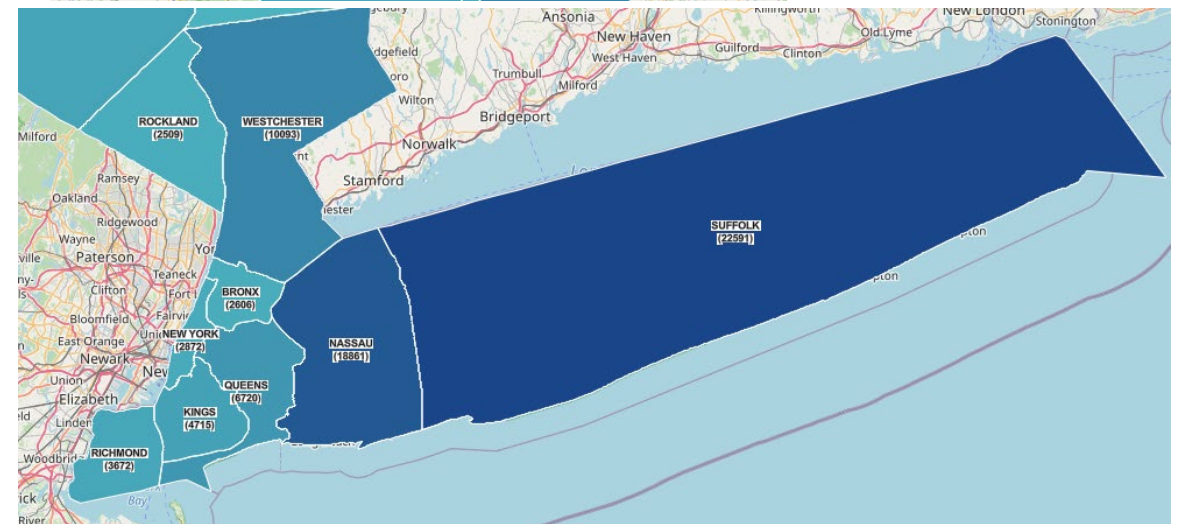
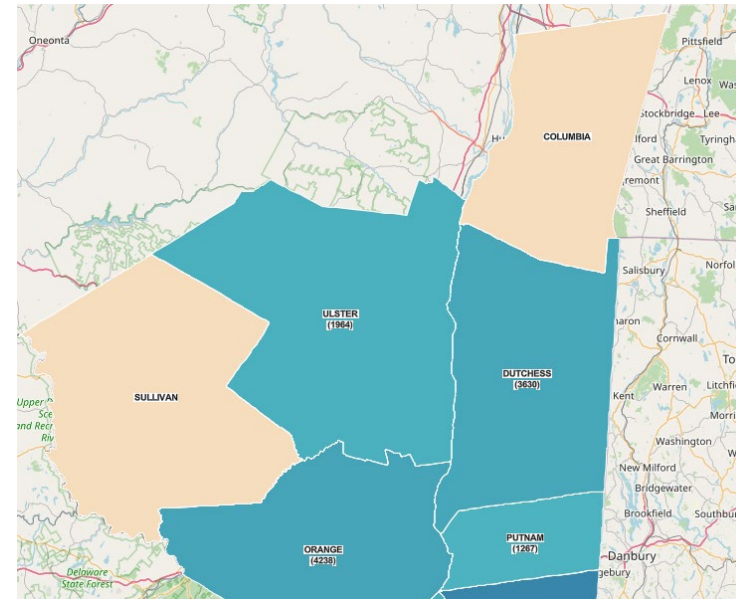


O-D ANALYSIS – TRIPS ORIGINATED ALL COUNTIES

Trips originated from counties between 4/21/2021 07:30 AM
- 4/21/2021 09:30 AM

Originated County	Trips
New York, NY	2872
Richmond, NY	3672
Kings, NY	4715
Queens, NY	6720
Bronx, NY	2606
Nassau, NY	18861
Suffolk, NY	22591

Originated County	Trips
Westchester, NY	10093
Rockland, NY	2509
Putnam, NJ	1267
Orange, NY	4238
Dutchess, NY	3630
Ulster, NY	1964

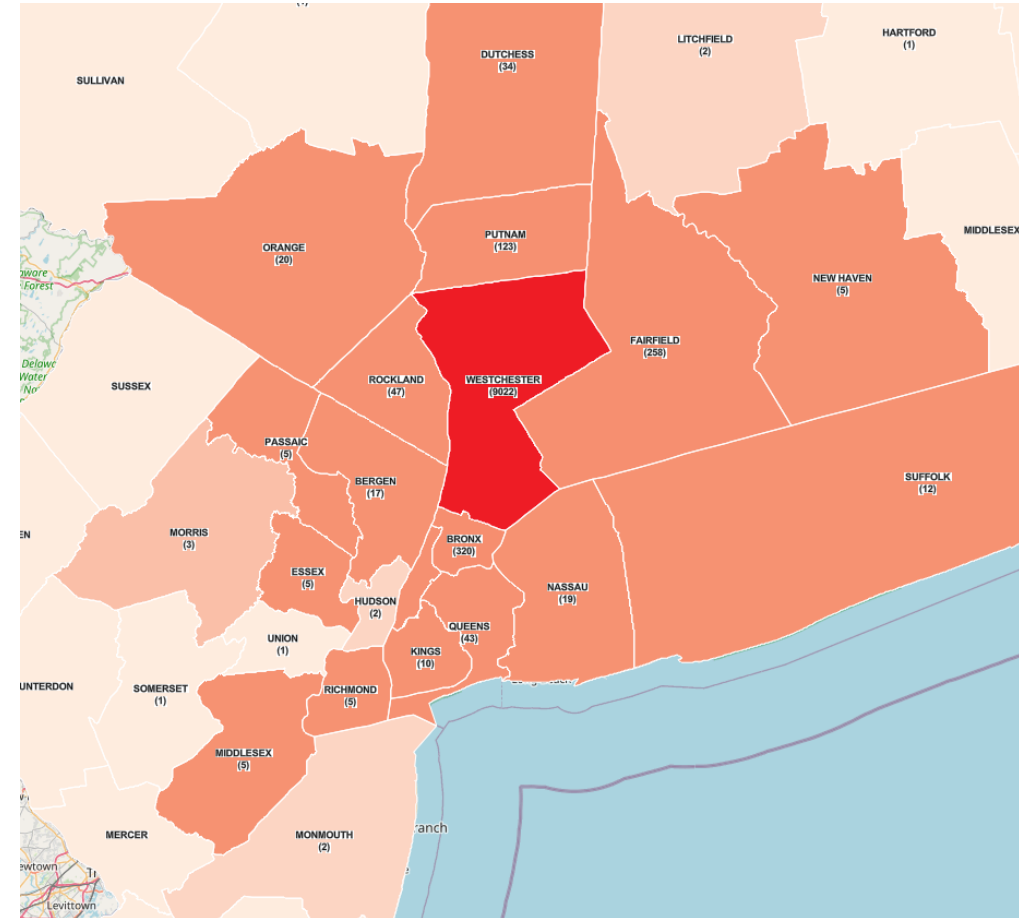


O-D ANALYSIS – BETWEEN COUNTIES (Westchester, NY TO ALL COUNTIES)

Trips originated from Westchester County, NY between 4/21/2021 07:30 AM - 4/21/2021 09:30 AM

Destination County	Trips
Bergen, NJ	17
Essex, NJ	5
Hudson, NJ	2
Middlesex, NJ	5
Monmouth, NJ	2
Morris, NJ	3
Passaic, NJ	5
Somerset, NJ	1
Union, NJ	1
Fairfield, CT	258
New Haven, CT	5
Litchfield, CT	2
Hartford, CT	1

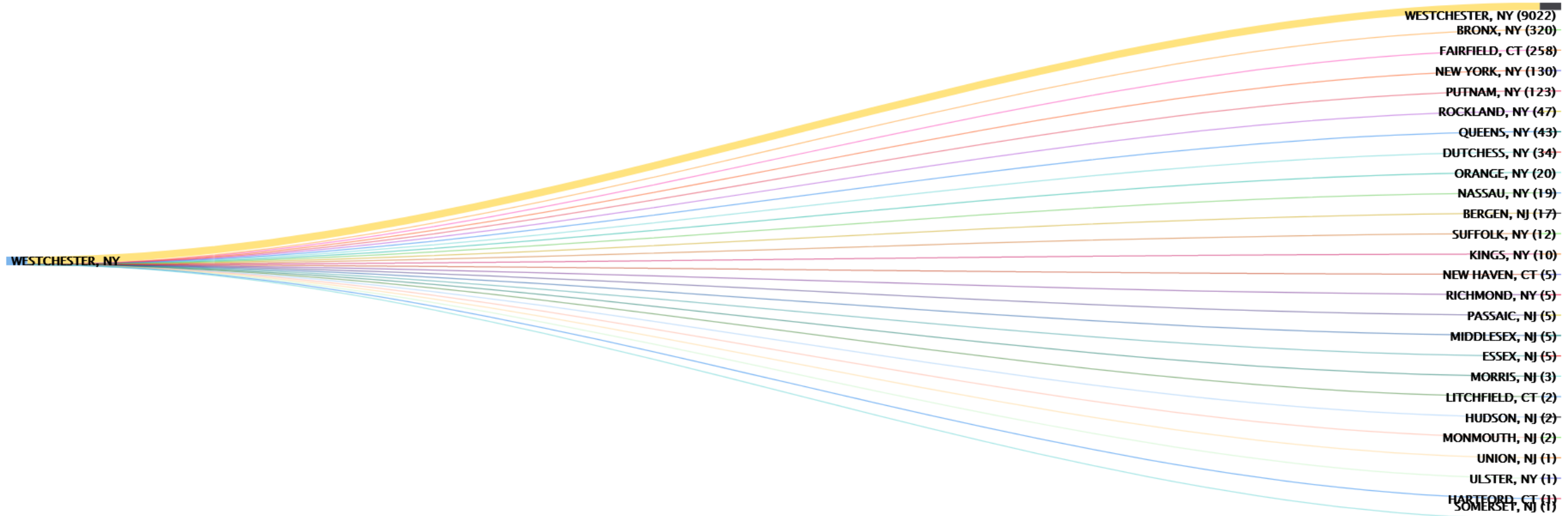
Destination County	Trips
Bronx, NY	320
Dutchess, NY	34
Kings, NY	10
Nassau, NY	19
New York, NY	130
Orange, NY	20
Putnam, NY	123
Queens, NY	43
Richmond, NY	5
Rockland, NY	47
Suffolk, NY	12
Ulster, NY	1
Westchester, NY	9022



O-D ANALYSIS – BETWEEN COUNTIES (Westchester, NY TO ALL COUNTIES)

Trips originated from Westchester County , NY between 4/21/2021 07:30 AM - 4/21/2021 09:30

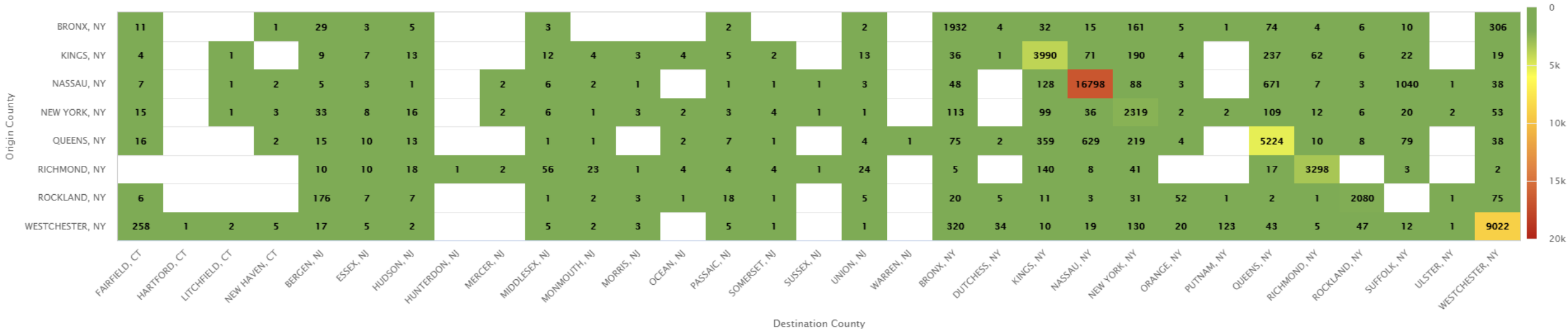
Origin County: WESTCHESTER, NY



O-D ANALYSIS – BETWEEN COUNTIES

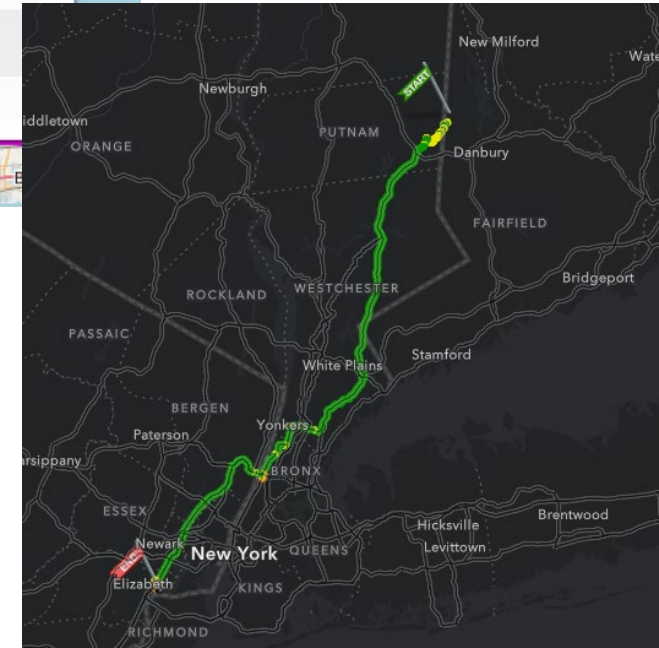
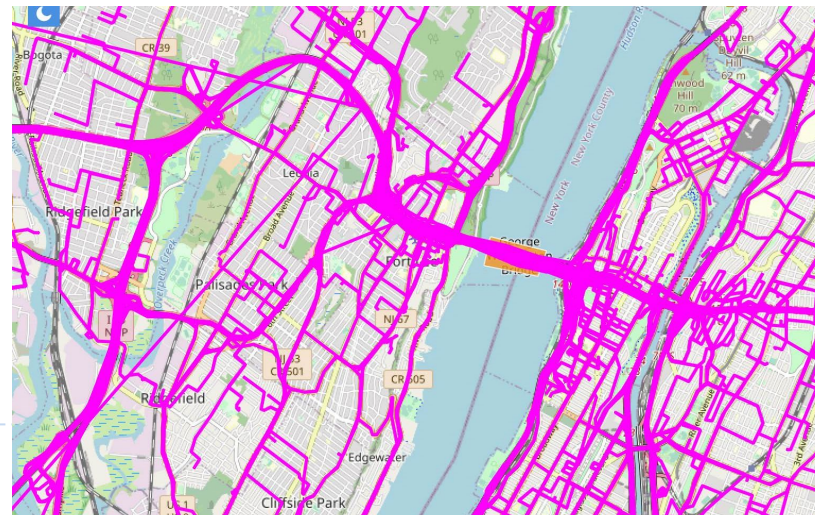
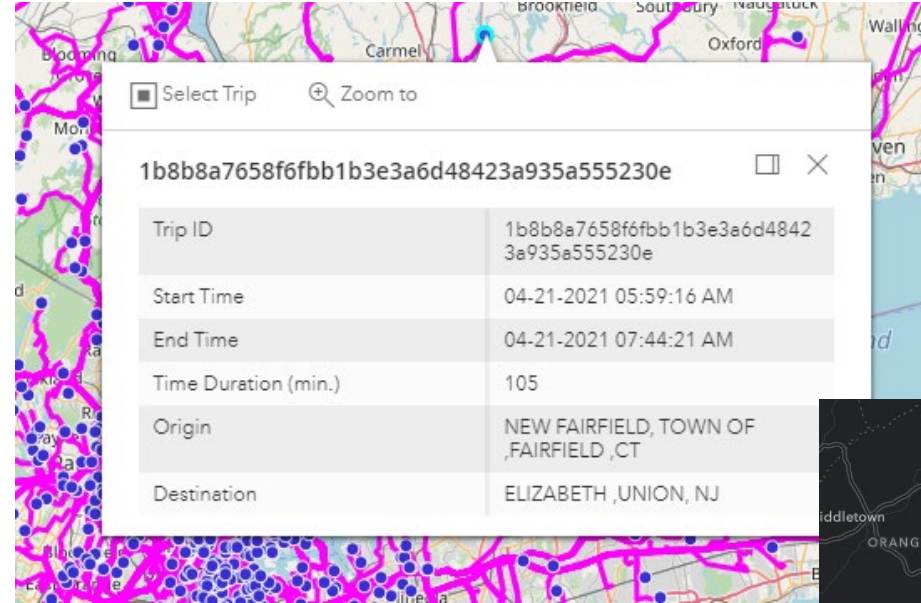
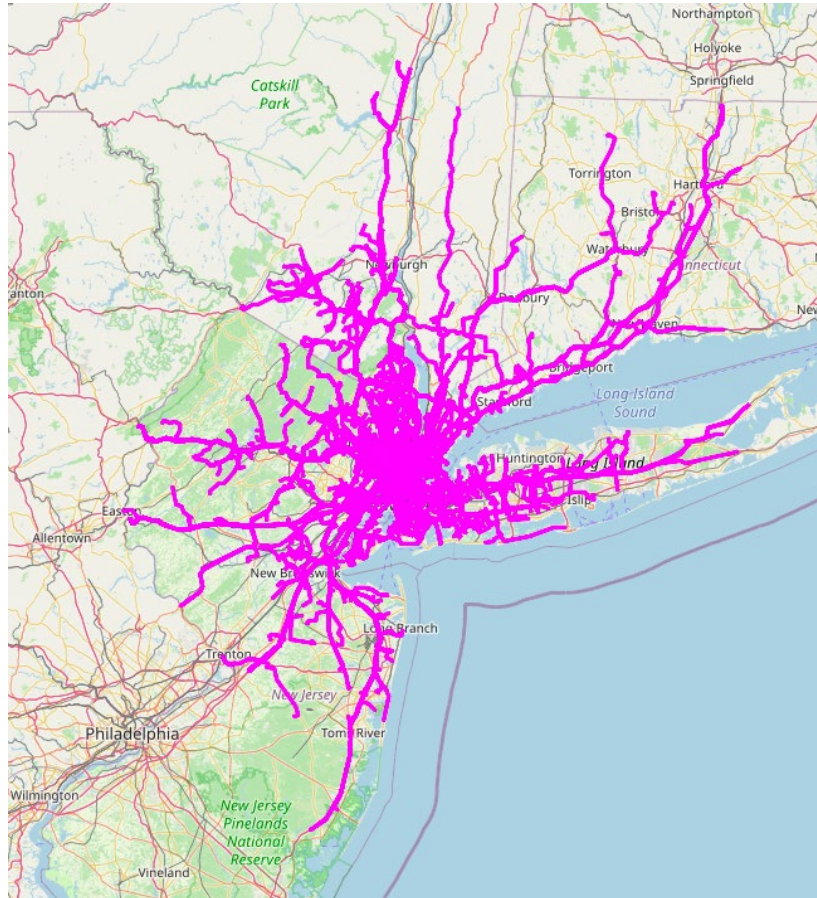
4/21/2021 07:30 AM - 4/21/2021 09:30 AM

Origin -> Destination By County



O-D ANALYSIS – TRIPS THROUGH

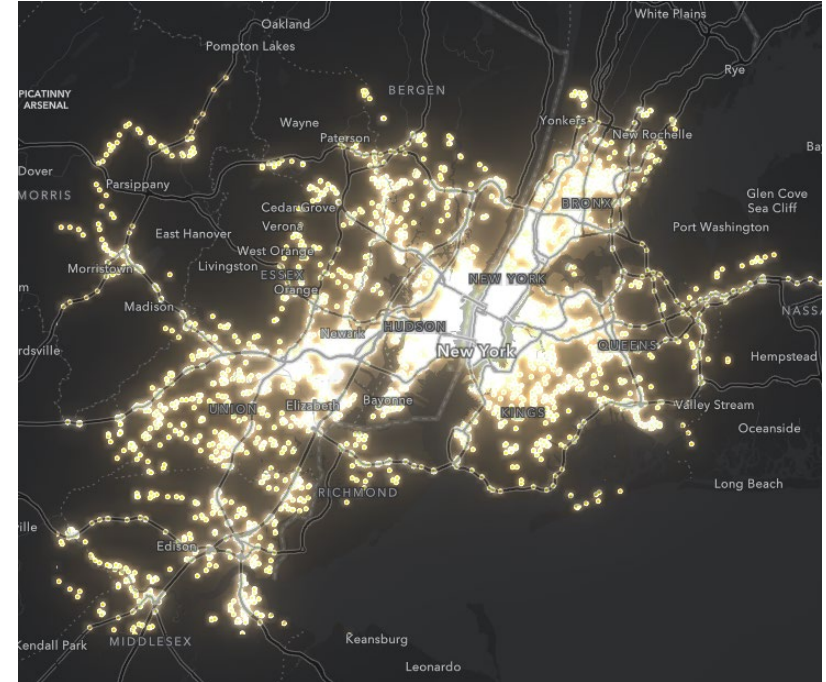
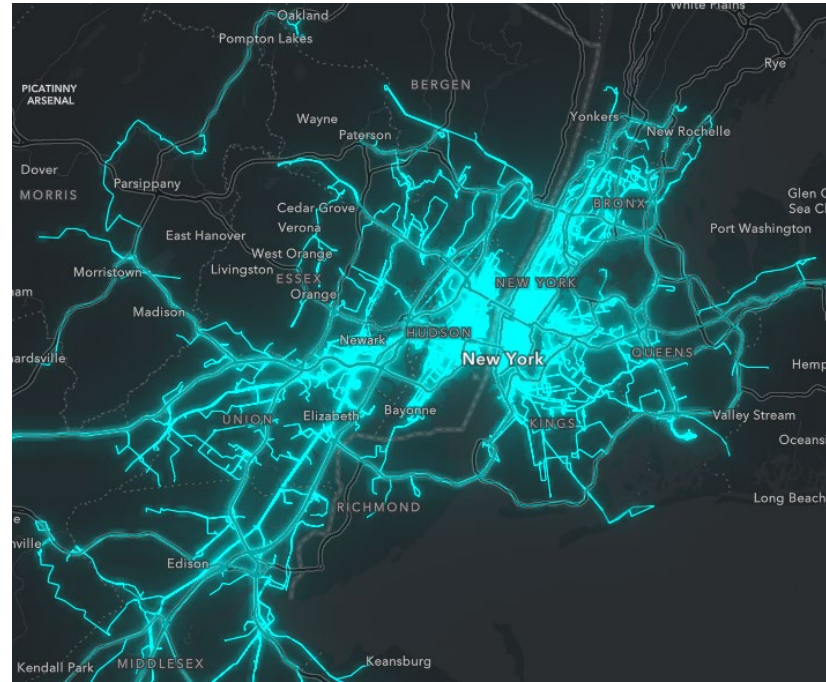
Trips through George Washington Bridge 4/21/2021
07:30 AM - 4/21/2021 09:30 AM



DEMONSTRATION O/D AND TRIPS

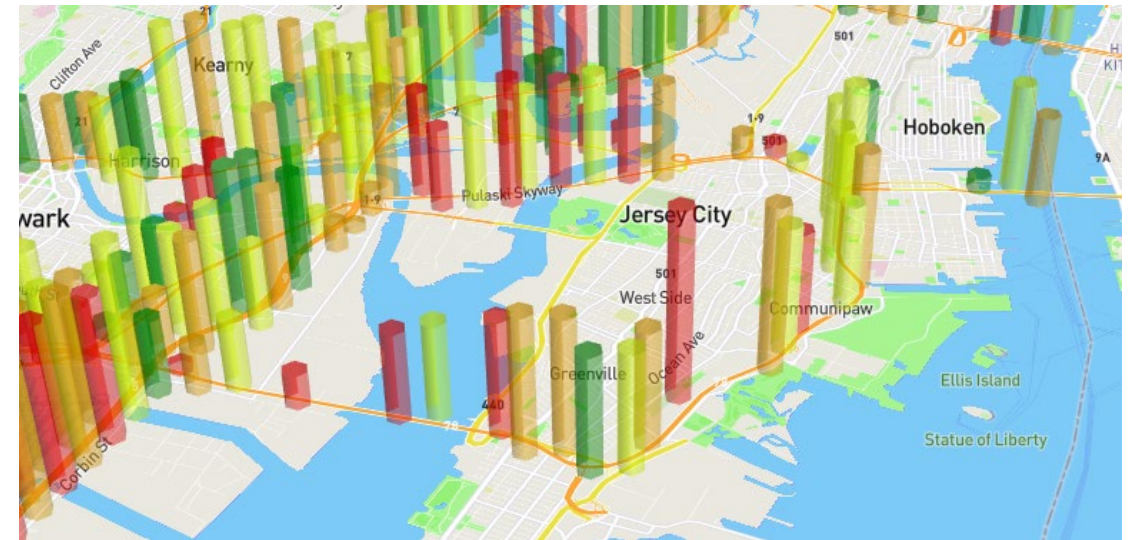
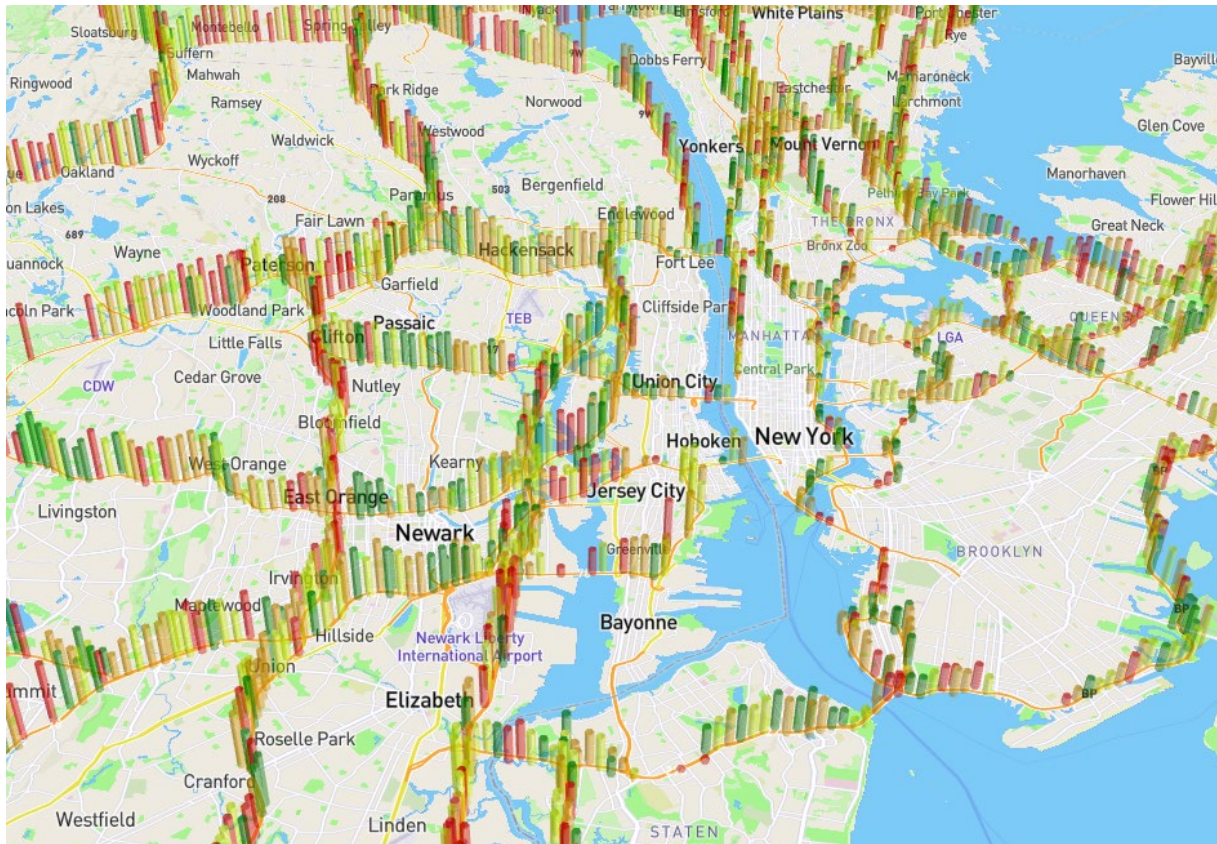
VISUALIZATION TOOLS

- Various Visualization Systems
 - Open-source (BI)
 - Custom Dashboards



Visualization

3D Map showing speed by color and waypoints by height



POSSIBLE ADDITIONAL USES

- Traffic Volume analysis using AADT, including real-time volume
- Mobility patterns, changes and comparisons (weather events, special events, week to week, etc.)
- Impact Monitoring tool (Effects of Reduced Speed Ahead, Alternate Routes on DMS, Road Closures, etc.)
- Signalized corridor monitoring and analysis
- Parking Capacity
- Journeys to POIs (Stadiums, transit hubs, arenas, county parks, and more!)
- Integrate Driver behavior data sets