

# SHARED TRANSIT SERVICE PLANNING AND ANALYTICS INITIATIVE

June 22, 2023





THE  
RESEARCH  
TEAM

# Recommendations

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## Study Overview and High-Level Recommendations

### Software Recommendations

- Each software that was used in the study provides value for transit planning in NYS
- No software does everything a planner would need, therefore none is capable of being a transit planning enterprise software
- Each software has technical limitations that complicate adoption
- Software adoption may not be possible for agencies with resource constraints

# Recommendations

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## Study Overview and High-Level Recommendations

### Statewide Shared-Use Recommendations

- Continue to make software available via hosting, shared licenses, and/or through data availability
- Provide support mechanisms
  - Provide data processing and technical support for planners to support tool use
  - Solicit needs, design and conduct analyses for and with agencies

# Recommendations

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## Study Overview and High-Level Recommendations

### **Transit Planning Community of Practice and Analysis Playbook**

- Convene a Community of Practice of transit planners to share practices and encourage analysis efforts
- Maintain and update the products of this research as new analyses are conducted
- Make playbook available via web-hosting

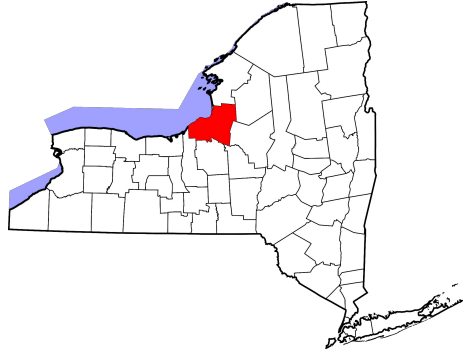
# Technical Agenda

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## Four Case Studies and the Playbook

- **Central New York Regional Transportation Authority (Centro), Oswego – Where are populations with transit propensity traveling to and from?**  
Scott Le Vine - Transpo
- **Rochester’s Regional Transit Service (RTS) – Which of my routes serve the intended populations?**  
Eric Krans - AVAIL
- **Westchester County – What are the travel time impacts of removing or truncating a route’s service?**  
Adam Tobey - AVAIL
- **Capital District Transportation Authority (CDTA), Troy – After making changes to the transit network, does modeled ridership change?**  
Dora Miketa - Sam Schwartz  
Adam Tobey - AVAIL
- **Introduce New “Playbook” Decision Support Tool**  
Eric Krans - AVAIL

# Centro Oswego Pilot Project



# Centro Oswego Pilot Project

## Needs Met

- I need to understand the region's potential ridership needs.
- (Optional) I need an MPO model to run STOPS.
- I need to identify the routes that can be changed to increase ridership and access while balancing costs.

## Questions Answered

- What areas within the service area have the highest propensity to use the transit system?
- What is the systemic impact on ridership of specific redesign changes?

## Analyses Performed

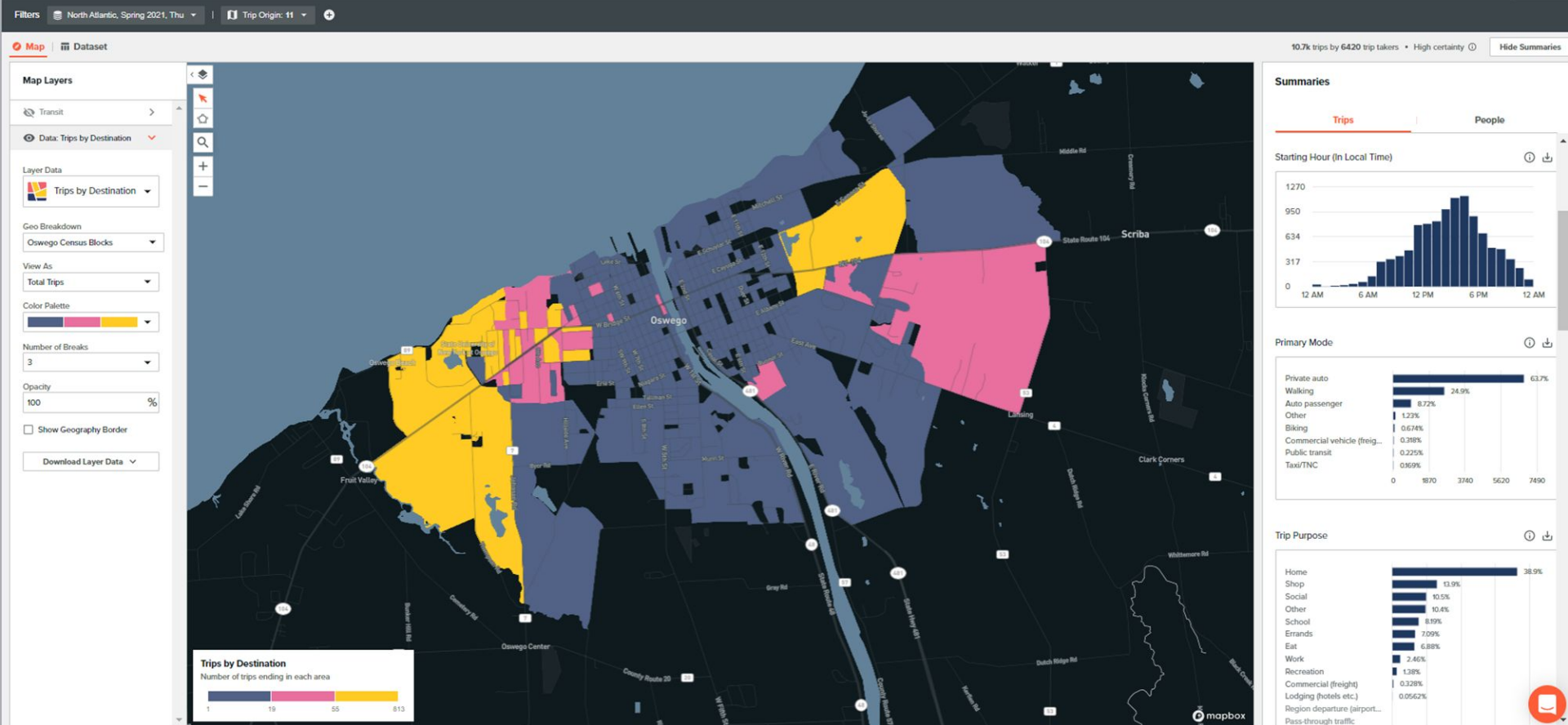
- Develop Enhanced Transit Propensity Index
- Demographics Sensitivity Analysis
- Construct a Geographic Zone-to-Zone System (in lieu of an MPO Travel Demand Model)
- Forecast Ridership for Each Change
- Validate system redesign insights with agency cost assessments and implement changes.

## Software Used

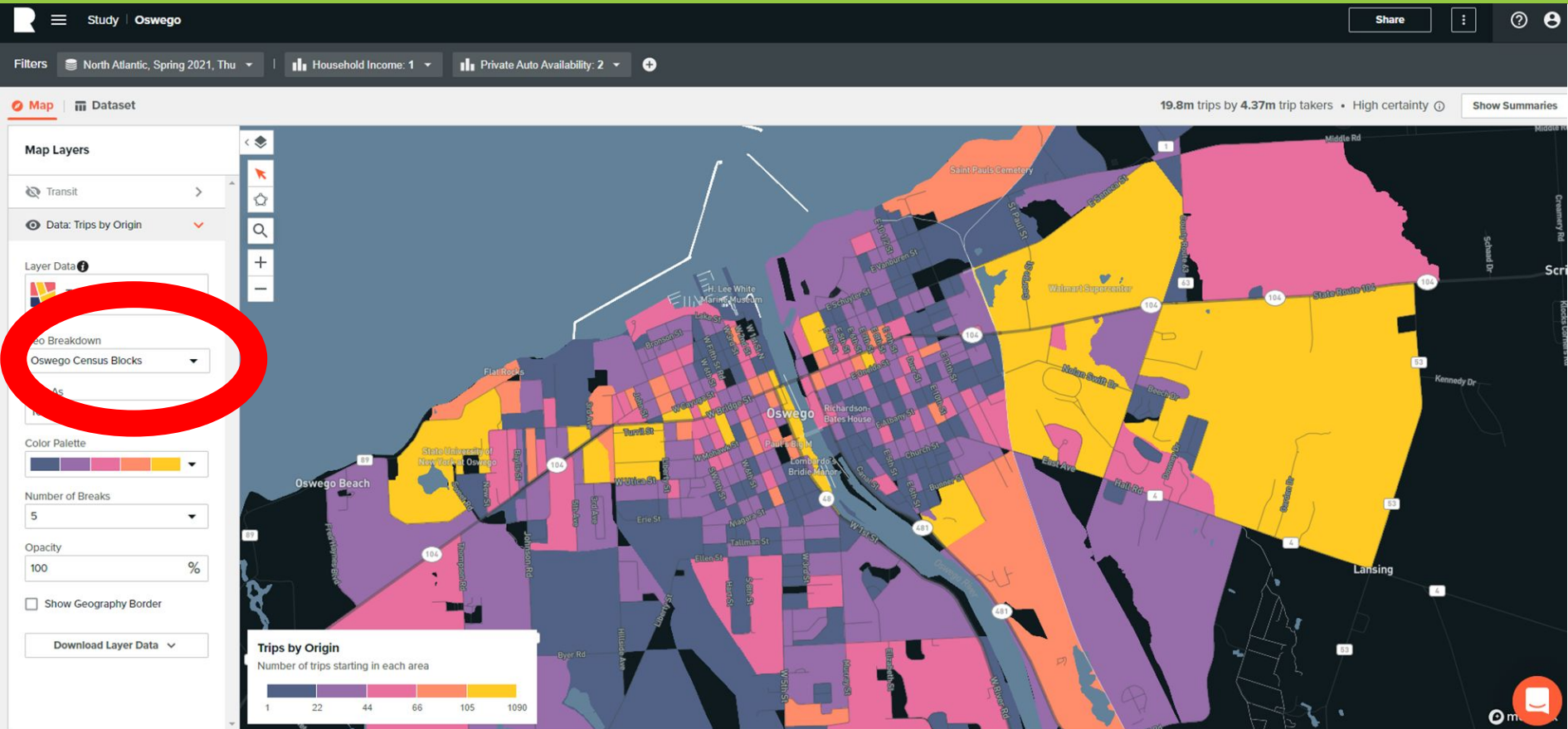
- Replica
- ESRI ArcMap
- Excel
- STOPS
- GTFSed



# Centro Oswego Pilot Project

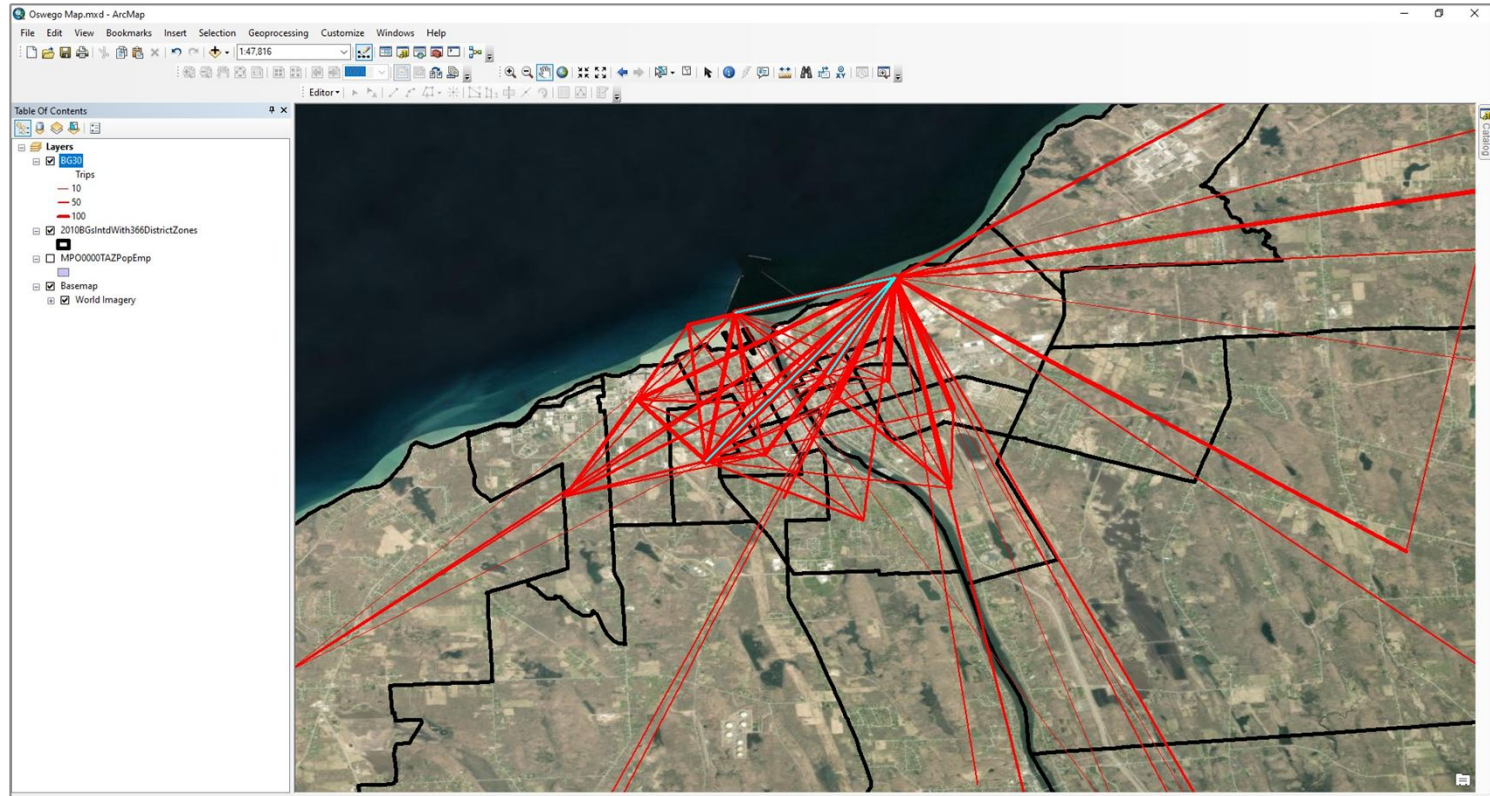


# Centro Pilot - Replica: Travel by people with Income <\$30K; 0/1-car HHs



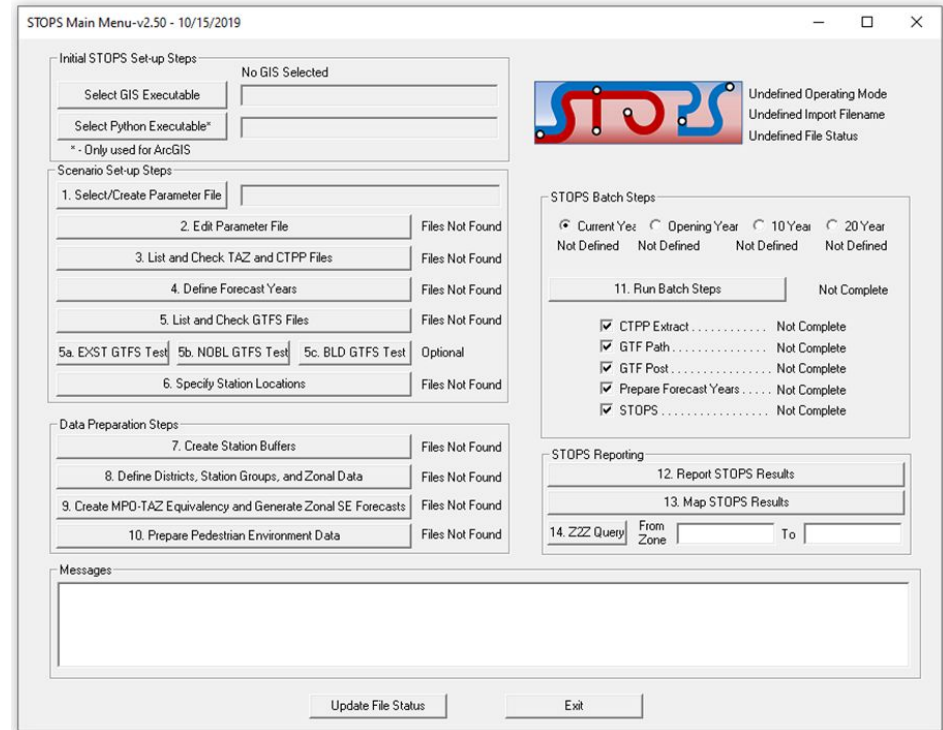
# Centro Pilot - Use of Replica in Region with No Model

## Custom Transit Propensity Index, using linked Os and Ds



# Centro Pilot - FTA's STOPS software

- Off-the-shelf no-cost software for generating transit-ridership forecasts:
  - Applicable nationally, and self-calibrates
  - Draws on as much local data as is available, with more local data → more reliable forecasts
  - Designed for analyzing capital improvements to major transit systems (Oswego case study is towards small end of known STOPS applications)



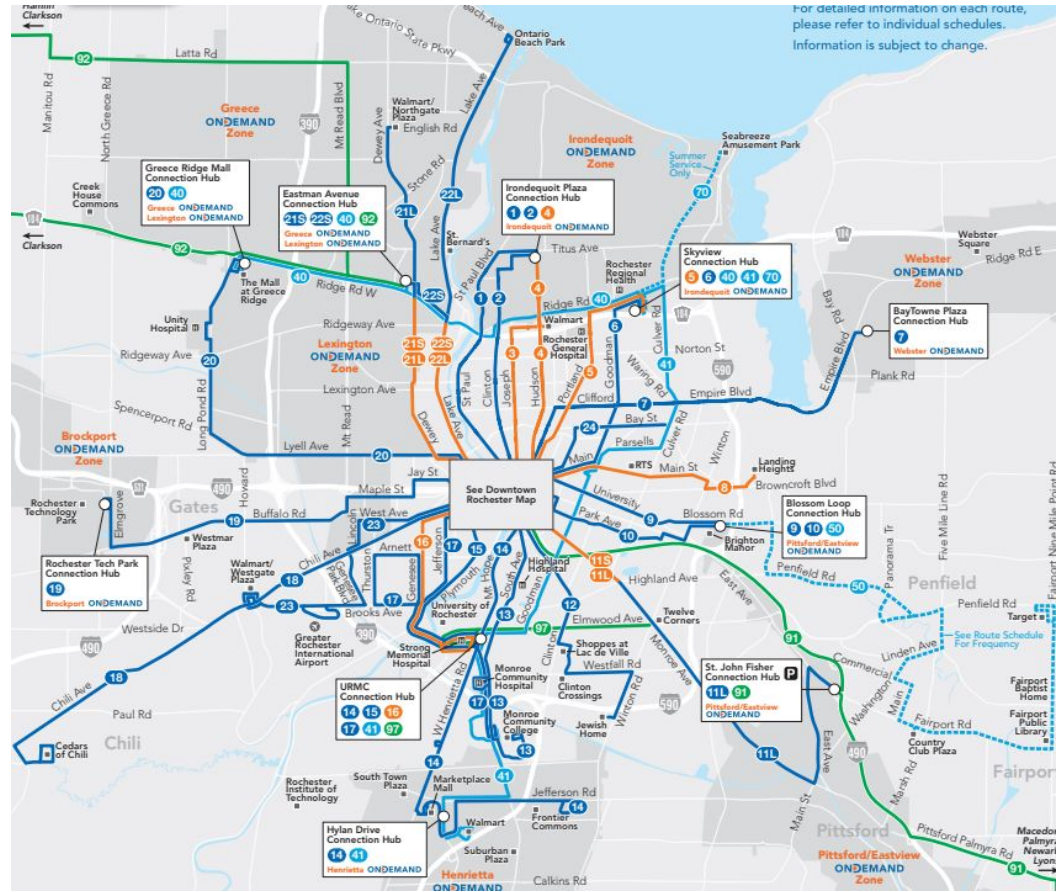
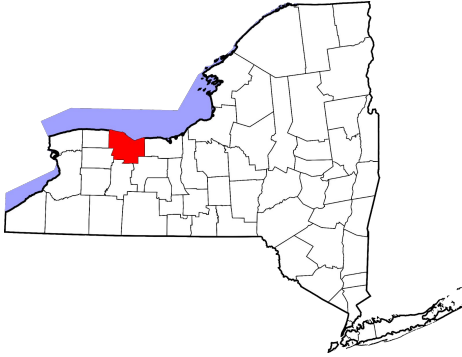
# Centro Pilot - FTA's STOPS software

Key result for this System Redesign is daily ridership summarized by route

\*\*\*\*\* AVG WEEKDAY ROUTE UTILIZATION ZONE BY (PRODUCTION-END) ACCESS TYPE \*\*\*\*\*  
 Comparison of Route Boardings by Scenario and Zone (Production-End) Mode-of-Access  
 Total Transit Trips

Route_ID	--Route Name	Count	Y2022 EXISTING				Y2022 NO-BUILD				Y2022 BUILD			
			WLK	KNR	PNR	ALL	WLK	KNR	PNR	ALL	WLK	KNR	PNR	ALL
18354	--Ful 4-Fulton - East	0	0	0	0	0	0	0	0	0	0	0	0	0
18355	--Ful 5-Fulton - West	0	0	0	0	0	0	0	0	0	0	0	0	0
18356	--Mex 3-Mexico - Fulton	0	0	0	0	0	0	0	0	0	0	0	0	0
18358	--Osw10-SUNY Oswego Blue Route	0	0	0	0	0	0	0	0	0	0	0	0	0
18359	--Osw11-SUNY Oswego Green Rout	0	0	0	0	0	0	0	0	0	0	0	0	0
18360	--Osw1A-Walmart via 104	50	8	1	0	9	8	1	0	9	0	0	0	0
18361	--Osw1B-Walmart - Hamilton Hom	31	63	6	0	69	63	6	0	69	0	0	0	0
18362	--Osw1C-Walmart via Seneca Str	15	59	1	0	59	59	1	0	59	0	0	0	0
18363	--Osw1D-Walmart via Brandonwoo	63	25	1	0	25	25	1	0	25	0	0	0	0
18364	--Osw2A-College via 104	164	61	2	0	63	61	2	0	63	0	0	0	0
18365	--Osw2C-College via West Utica	21	134	15	0	149	134	15	0	149	0	0	0	0
18366	--Osw2D-College via Ellen St	98	57	10	0	67	57	10	0	67	0	0	0	0
18367	--Osw46-Oswego - Syracuse	0	0	0	0	0	0	0	0	0	0	0	0	0
99991	--SthRtEB-South Route EB	0	0	0	0	0	0	0	0	26	1	0	0	27
99992	--SthRtWB-South Route WB	0	0	0	0	0	0	0	0	19	6	0	0	25
Test1	--Test1-SUNY to Walmart	0	0	0	0	0	0	0	0	26	1	0	0	26
Test2	--Test2-Walmart to SUNY	0	0	0	0	0	0	0	0	330	23	0	0	353
Total		442	407	35	0	442	407	35	0	442	401	31	0	432

# RTS Rochester Pilot



# RTS Rochester Pilot

Needs Met	Questions Answered
<ul style="list-style-type: none"><li>● I need to understand who is being served by the current routes of interest.</li><li>● I need to determine the impact to ridership of each fixed route's frequency increase.</li><li>● I need to compare results and validate outputs.</li></ul>	<ul style="list-style-type: none"><li>● What demographics are each of the routes of interest currently serving?</li><li>● What fixed-routes routes would an increase in service frequency be most beneficial to focused demographics?</li><li>● How do the two individual outputs compare with each other?</li></ul>
Analyses Performed	Software Used
<ul style="list-style-type: none"><li>● Existing Conditions of Demographics Served</li><li>● Route Frequency Increase Cost Assessment</li><li>● Evaluate and compare each route with a composite score that incorporates all relevant attributes.</li></ul>	<ul style="list-style-type: none"><li>● Remix</li><li>● TBEST</li><li>● Excel (Post-Processing)</li></ul>

# RTS Pilot - TBEST Stop-Level Demographics

TBEST

File Scenario Tools Map View Help

Reports Import Alignment

Mobility Area Distance (mi) 0.5

Base Map: OpenStreetMap 1:25,591

Close Scenario

Explorer

- Transit Systems
  - CTA - Oct 2021
  - Centro-Syracuse
  - Gatorville
  - Gatorville\_Day2
  - New York State
  - New York State - CDTA Project
  - New York State - CDTA Project - Test
  - New York State - CDTA - Validated
  - New York State - RTS Project
  - New York State - RTS Project - Validated
  - New York State - RTS Validated Partial
  - New York State - Westchester Project
  - NFTA
  - NYS - RTS - Oct 2021
  - Rens Test
  - Rens Test (NYS Data)
  - RTS - Oct 2021
  - RTS - Remix GTFS
- Scenarios
  - REMIX GTFS - 2023
    - Network Accessibility Builds
    - Model Status
    - Stop Ridership Status
    - Model Logs
    - Scenario Created: 1/3/2023 1:16:42 PM
    - Scenario Modified: 1/3/2023 1:32:33 PM
  - Reports
    - Queries
    - Mobility Areas
    - Parcel Scenarios

Routes

Route Options 138 Route(s)

- RTS - Remix GTFS-REMIX GTFS - 2023 Routes
  - 1 St Paul
  - 2 North Clinton
  - 3 Joseph
  - 4 Hudson
  - 5 Portland
  - 6 North Goodman
  - 7 Clifford / Empire
  - 8 East Main
  - 9 University
- Eastbound Patterns
  - 1170035497
  - 1170035498
- Westbound Patterns
  - 10 Park
  - 11 Monroe
  - 12 South Clinton
  - 13 South Ave
  - 14 Marketplace
  - 15 Plymouth
  - 16 Genesee
  - 17 Jefferson / 19th Ward
  - 18 Chili
  - 19 Buffalo Rd
  - 20 Lyell
  - 21 Dewey
  - 22 Lake
  - 23 West Ave / Airport
  - 40 Ridge Crossover

Segments

Segment Options

Route	Length(mi)	SegmentID	Combid	AM IVTT	Off-Peak IVTT	PM IVTT	Night IVTT	Saturday IVTT	Sunday IVTT
9 Eastbound 1170035497 10000	3	5303 - 2493		1	1	1	1	1	1
9 Eastbound 1170035497 10100	1	2493 - 2446		1	1	1	1	1	1
9 Eastbound 1170035497 10200	1	2446 - 2486		1	1	1	1	1	1
9 Eastbound 1170035497 10300	1	2486 - 2477		1	1	1	1	1	1
9 Eastbound 1170035497 10400	1	2477 - 3900	2	3	1	4	7	7	7
9 Eastbound 1170035497 10500	1	3900 - 3873	1	3	1	1	1	1	1
9 Eastbound 1170035497 10600	1	3873 - 3893	8	7	1	6	3	3	3
9 Eastbound 1170035497 10700	2	3893 - 3896	2	3	1	4	7	7	7
9 Eastbound 1170035497 10800	1	3896 - 3883	1	1	1	1	1	1	1
9 Eastbound 1170035497 10900	1	3883 - 3895	4	8	7	4	4	4	4

9 Eastbound 1170035497 (3.56 miles)

Stops

Stop Options

Route	Stop Name	Description	Time Point	Generators/Attributes
9 Eastbound 1170035497	5303	TC Gate 12	5303	
9 Eastbound 1170035497	2493	Man & Silson	2493	
9 Eastbound 1170035497	2446	Man & Gibbs	2446	
9 Eastbound 1170035497	2486	Man & Sco	2486	
9 Eastbound 1170035497	2477	Man & Pitkin	2477	
9 Eastbound 1170035497	3900	University & Union	3900	
9 Eastbound 1170035497	3873	University & Alexander	3873	
9 Eastbound 1170035497	3893	University & Pines	3893	
9 Eastbound 1170035497	3896	University & Strathallan	3896	
9 Eastbound 1170035497	3883	University & Goodman	3883	

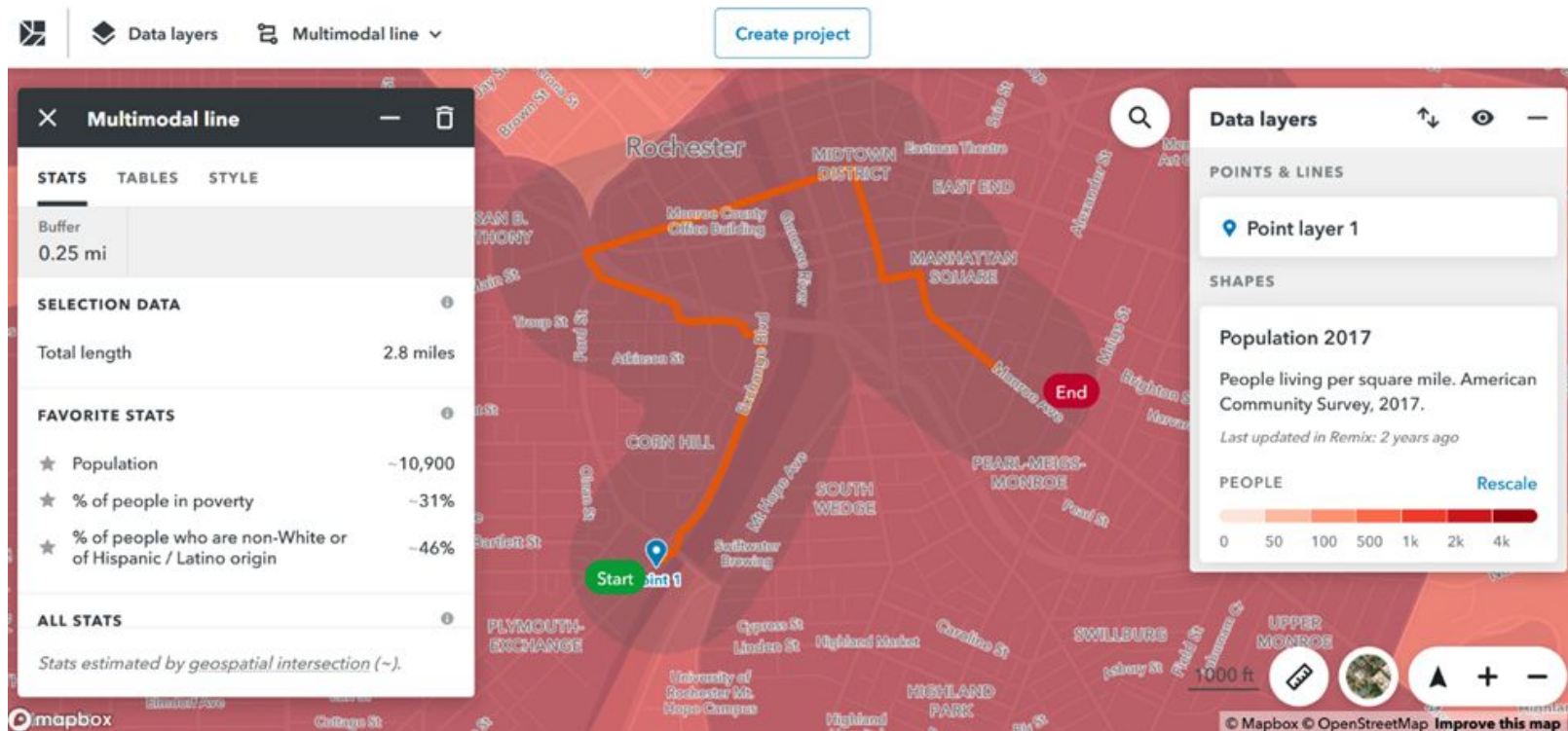
View Mode: Active Route Pattern Visible (23 of 12593) Selected (0 of 23)



# RTS Pilot - TBEST Stop-Level Demographics

Line	Spanish Speaking	Chinese Speaking	French Speaking	Korean Speaking	Arabic Speaking	German Speaking	Russian Speaking	Tagalog Speaking	Vietnamese Speaking	Other Asian Language	Other Indo-European Language	Other Unspecified Language	< 18 Years	18-24 Years	25-34 Years	35-44 Years
1 St Paul - Pattern A	1,109	29	52	0	17	0	17	0	0	102	21	35	3,328	1,507	2,111	1,354
2 North Clinton - Pattern A	1,861	61	138	0	28	0	19	0	1	157	35	58	4,399	1,858	2,647	2,079
3 Joseph - Pattern A	2,176	53	168	0	43	0	19	0	17	114	33	108	3,795	1,658	2,434	1,490
4 Hudson - Pattern A	1,678	46	86	0	53	0	31	0	25	75	60	114	3,732	1,891	2,288	1,802
5 Portland - Pattern A	1,488	39	58	0	15	0	124	0	0	51	137	27	4,062	2,427	2,512	1,658
6 North Goodman - Pattern A	1,199	48	40	0	53	0	64	0	27	54	105	107	4,223	2,296	2,899	1,991
7 Clifford / Empire - Pattern A	1,122	38	59	0	28	0	32	0	3	51	146	31	4,446	2,334	3,092	2,083
8 East Main - Pattern A	369	43	48	0	4	0	21	0	9	17	62	14	2,229	1,840	2,810	1,560
9 University - Pattern A	242	31	33	0	0	0	156	0	5	36	26	0	873	2,195	2,934	1,153
10 Park - Pattern A	199	72	43	0	0	0	139	0	10	40	5	0	1,105	3,550	4,866	1,694
11 Monroe - Pattern A	220	104	41	9	0	1	49	0	14	46	74	58	2,973	3,890	4,784	2,271
12 South Clinton - Pattern A	196	143	33	20	15	15	60	0	37	32	152	17	1,644	1,689	3,513	1,642
13 South Ave - Pattern A	286	315	33	0	7	17	4	0	11	71	211	38	1,495	2,869	4,002	1,456
14 Marketplace - Pattern A	280	267	37	4	13	15	5	4	6	76	184	78	1,221	2,759	3,720	1,284
15 Plymouth - Pattern A	342	232	76	11	57	0	0	0	14	44	55	143	3,296	4,595	3,807	1,788
16 Genesee - Pattern A	476	186	89	6	15	0	0	0	0	30	45	87	3,888	3,823	3,586	1,791
17 Jefferson / 19th Ward - Pattern A	629	377	90	11	46	0	0	0	4	69	113	153	7,697	6,704	6,265	3,286
18 Chili - Pattern A	346	38	59	0	4	0	31	0	16	7	36	75	4,640	1,968	3,527	2,242
19 Buffalo Rd - Pattern A	568	43	64	0	12	0	18	0	32	61	70	29	3,082	1,527	2,293	1,516
20 Lyell - Pattern A	647	35	31	0	1	0	141	0	132	118	216	8	2,886	1,741	2,783	1,669
21 Dewey - Pattern A	1,100	47	140	0	15	20	32	0	39	354	568	67	5,934	2,794	4,295	2,877
22 Lake - Pattern A	752	55	167	0	2	5	36	0	1	278	279	32	2,927	1,790	3,390	2,097
23 West Ave / Airport - Pattern A	330	38	57	0	0	0	0	0	0	10	4	53	3,973	1,826	2,865	1,765
40 Ridge Crosstown - Pattern A	1,137	34	23	0	53	0	74	0	0	170	62	114	3,341	1,101	2,405	2,010
41 Culver / Goodman Crosstown - Pattern A	766	362	74	10	61	0	107	8	43	140	272	147	5,947	4,980	9,226	4,054
50 Fairport / Penfield - Pattern A	30	64	0	0	5	2	89	2	0	60	197	85	3,612	1,299	2,666	1,843
70 Seabreeze Seasonal - Pattern A	91	0	0	0	0	28	27	0	0	46	63	15	1,247	413	1,157	673
71 Public Market Special - Pattern A	645	85	52	0	93	0	0	0	23	19	56	112	2,104	1,565	1,646	1,007
91 Newark / Lyons Commuter - Pattern A	447	71	34	0	10	13	38	0	29	17	65	36	4,863	4,627	7,253	3,706
92 Hilton / Hamlin Commuter - Pattern A	440	23	0	0	27	0	104	0	59	60	175	34	5,338	1,954	3,396	3,253
97 Elmwood Commuter - Pattern A	108	219	0	16	2	0	46	0	0	48	105	36	875	1,987	1,743	715
98 Lexington Commuter - Pattern A	776	5	90	0	3	0	22	0	77	309	421	77	4,431	1,844	2,584	2,255
970 Meadowdale Charlotte / Prince Georges	2,029	84	39	0	98	5	41	0	24	328	310	147	6,495	2,687	4,666	3,957

# RTS Pilot – Remix Route Level Demographics



# RTS Pilot - Excel - Data Processing and Score Calculation

Line	Composite Score	Composite Score Normalized	Composite Score Ranked	AVG Length	Composite Score Builder					
					TBEST Variable		Remix Variable		Score Modifier	
					In Poverty by Mile Normalized		people in poverty normalized			1
					Zero Vehicle by Mile Normalized		households that are car free normalized			1
					Disabled by Mile Normalized		people living with a disability normalized			1
1 St Paul - Pattern A	366	39.51262065	112	5.1			workers who take public transit to work normalized			20
2 North Clinton - Pattern A	480	53.3306178	76	4.7	Service by Mile Normalized		essential jobs (work) normalized			20
3 Joseph - Pattern A	536	59.98973531	61	3.6	\$20K-\$24.9K by Mile Normalized		people within 125% of the poverty threshold normalized			1
4 Hudson - Pattern A	537	60.12310845	60	4.1	\$25K-\$29.9k by Mile Normalized		people within 150% of the poverty threshold normalized			1
5 Portland - Pattern A	496	55.22104523	70	4.9	\$30K-\$34.9K by Mile Normalized		people within 185% of the poverty threshold normalized			1
6 North Goodman - Pattern A	420	46.00923006	98	5.0	\$35K-\$39.9K by Mile Normalized		people within 200% of the poverty threshold normalized			1
7 Clifford / Empire - Pattern A	484	53.74266824	73	7.5			public housing buildings			1
8 East Main - Pattern A	299	31.42198501	121	4.2			hospitals			10
9 University - Pattern A	396	43.11792577	103	3.6			urgent care facilities			10
10 Park - Pattern A	423	46.3578121	96	4.2			nursing homes			10
11 Monroe - Pattern A	312	32.99338949	119	9.5			pharmacies			10
12 South Clinton - Pattern A	315	33.32446621	117	6.1			Schools: Childcare and K-12			10
13 South Ave - Pattern A	418	45.75671433	99	6.1			colleges / universities			0
14 Marketplace - Pattern A	323	34.25444521	114	10.2			supplemental colleges			0
15 Plymouth - Pattern A	615	69.59959393	44	4.8	Commercial by Mile Normalized		SNAP Retailer Supermarkets 2020			10
16 Genesee - Pattern A	668	76.02663424	30	4.7	18,002	31,960	35%	1406		8.72625698
17 Jefferson / 19th Ward - Pattern A	740	84.65813451	17	9.5	30,493	34,412	31%	1084		6.92737430
18 Chili - Pattern A	417	45.65166868	100	9.7	17,947	11,334	23%	501		3.67039106
19 Buffalo Rd - Pattern A	291	30.4387169	122	8.2	12,238	9,856	38%	585		4.13966480
20 Lyell - Pattern A	467	51.70573427	78	8.4	14,381	16,262	27%	503		3.68156425

# RTS Pilot – Remix Results vs TBEST Results

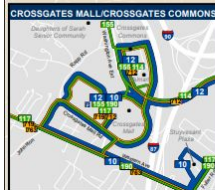
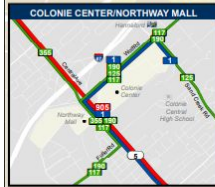
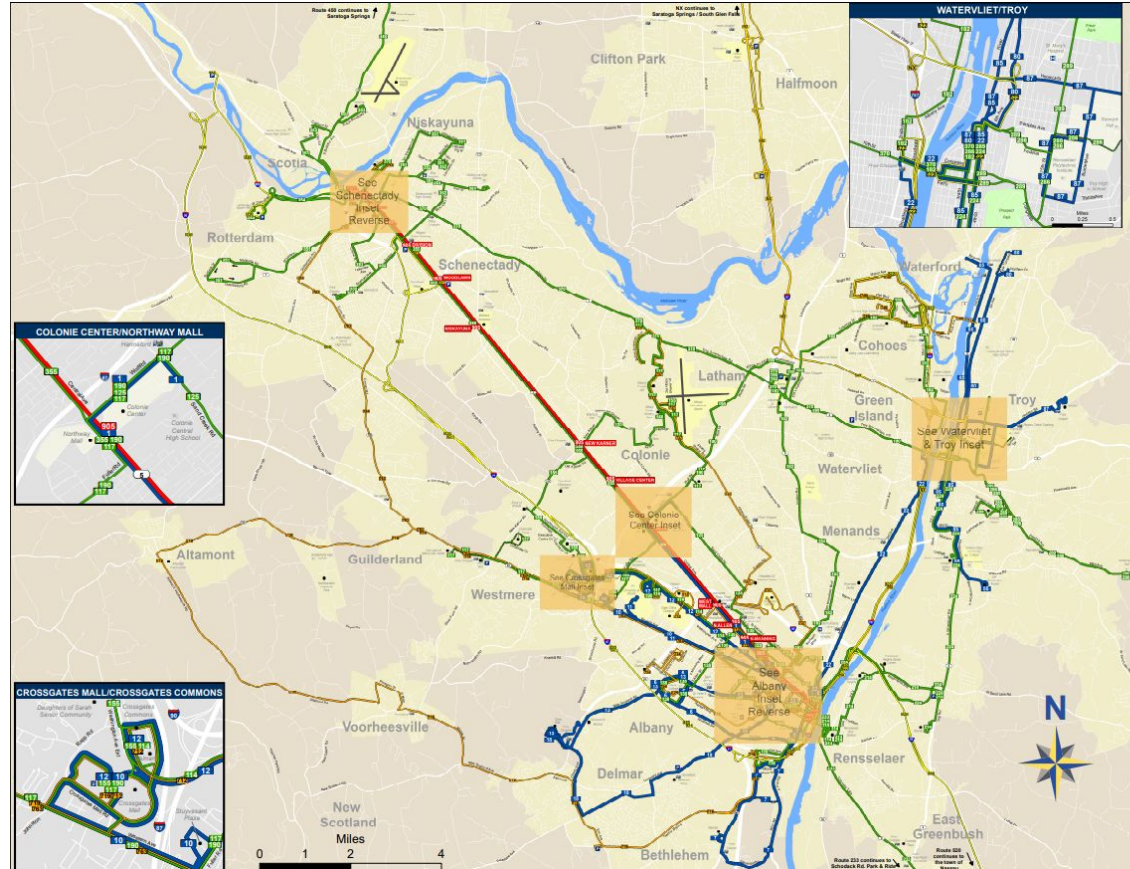
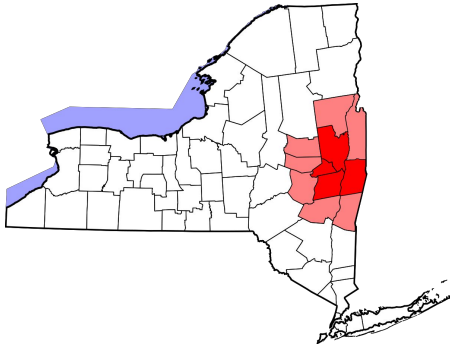
REMIX				TBEST		
Line	Composite Score	Composite Score Normalized	Rank	Composite Score Normalized	Composite Score	Line
753 19th Ward-Plym-City SE / Monroe - Pattern A	866.8	100.0	1	100.00	847.9	753 19th Ward-Plym-City SE / Monroe - Pattern A
450 N Goodman-Portland / Genesee - Pattern A	852.8	98.3	2	98.27	833.9	450 N Goodman-Portland / Genesee - Pattern A
443 Joseph-Hudson / Genesee - Pattern A	851.7	98.2	3	97.89	830.9	443 Joseph-Hudson / Genesee - Pattern A
436 City SE / Norton - Pattern A	844.0	97.2	4	96.16	816.9	768 N Win Vill-Beechwood / Monroe - Pattern A
784 19th Ward NW-Plymouth / Lake - Pattern A	825.8	95.1	5	96.15	816.8	785 City SE / Lake - Pattern A
635 Plym-Jef-19thNE / Fernwood Park - Pattern A	825.4	95.0	6	95.98	815.5	436 City SE / Norton - Pattern A
785 City SE / Lake - Pattern A	820.0	94.3	7	95.97	815.3	635 Plym-Jef-19thNE / Fernwood Park - Pattern A
368 City SE / Colfax - Pattern A	815.6	93.8	8	95.58	812.2	784 19th Ward NW-Plymouth / Lake - Pattern A
276 19th Ward SE / Prince - Pattern A	815.3	93.8	9	94.93	807.0	368 City SE / Colfax - Pattern A
447 City SE / Genesee - Pattern A	810.6	93.2	10	93.68	796.9	276 19th Ward SE / Prince - Pattern A

## Takeaways

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- **Remix and TBEST both provide similar results.**
- **TBEST is stop level. Remix aggregated to the route**
- **Remix is easier to use.**
  - **Data is updated annually**
  - **Web-based, user-friendly, no install necessary**
  - **Remix pricing is by population area so sharing between Transit Agencies and MPOs is possible**
- **TBEST is freely available**

# CDTA Troy Pilot - Overview



busplus STATIONS	
LIBERTY PARK ROCK	WEST WALL
DOWNTOWN TRINITY CENTER	NORTH ALLEN
VEEDER HOTT	NORTH MANHATTAN
STUBBS	WEST WALL
DIVISION	LAIN
WOODLAWN	CANTON MARK
MEDICINA	SOUTH PEARL
NEW KANON	BIRCHWOOD
VILLAGE CENTER	ALBANY BUS TERMINAL WESTBOUND
COLONIE	ALBANY BUS TERMINAL EASTBOUND

CDTA MAP LEGEND	
<b>Bus Service</b>	Limited Stop Service on NY Route 5 Peak: Every 15 Minutes Off Peak: Every 30 Minutes 7 Days a Week Early Morning to Late Night
<b>Trunk</b>	Peak: Every 10-20 Minutes Off Peak: Every 20 to 30 Minutes 7 Days a Week Early Morning to Late Night
<b>Neighborhood</b>	Peak: Every 10-15 Minutes Off Peak: Every 30-40 Minutes 6,7 Days a Week Most Have Service Past 9pm
<b>Commuter</b>	Operates Monday - Friday - Local service Peak Commute Hours (8a-9a, 3p-4p) Mid-Day Service Multiple Morning and Afternoon Trips
<b>Express</b>	Operates Monday - Friday Highway/Park & Ride Based Service Peak Commute Hours (8a-9a, 3p-4p) Multiple Morning and Afternoon Trips
<b>Northway Express</b>	Operates Monday - Friday Service between Saratoga County and Downtown Albany Stops at Park & Ride locations along the Northway (I-87) Peak Commute Hours (8a-9a, 3p-4p) Mid-Day Service

\*Dotted lines indicates limited service.  
See specific route schedule for details.

Symbols	
	busplus Station
	Hospital
	School
	Points of Interest
	Park & Ride
	Navigator Sales Locations

For detailed schedule information visit [www.cdta.org](http://www.cdta.org) or call (518) 482-8822

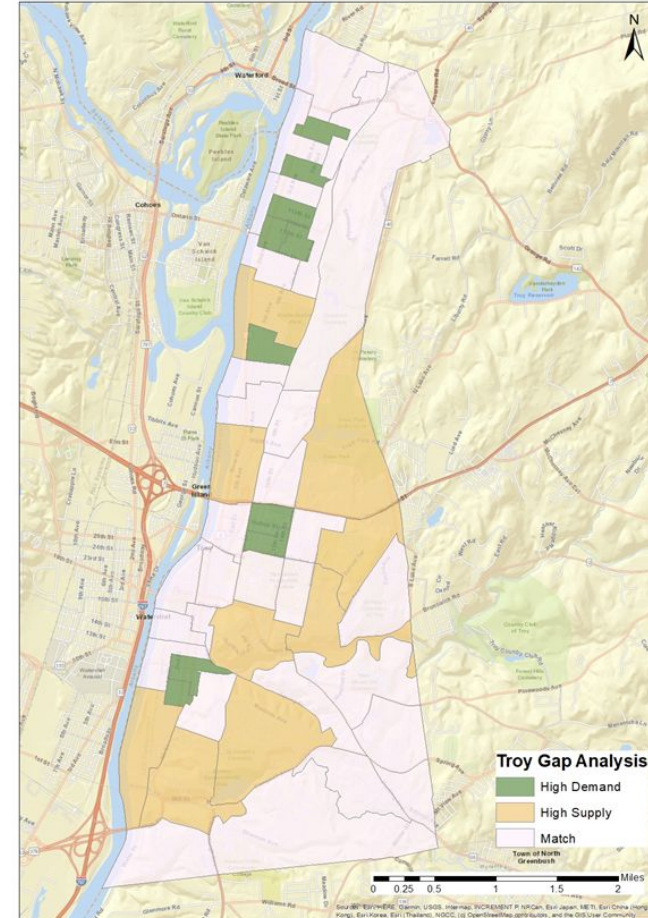
# CDTA Troy Pilot

Needs Met	Questions Answered
<ul style="list-style-type: none"><li>● I need to reconfigure the transit routes to better serve the population.</li><li>● I need to test the efficacy of the new system.</li></ul>	<ul style="list-style-type: none"><li>● Where is the latent transit ridership in Troy, NY?</li><li>● How would ridership change based on the proposed route modifications?</li></ul>
Analyses Performed	Software Used
<ul style="list-style-type: none"><li>● Conduct a gap analysis to determine where there is a mismatch between transit supply and demand.</li><li>● Conducted an origin-destination (O/D) analysis to understand prominent travel flows.</li><li>● Develop baseline ridership model that accurately reflects existing ridership.</li><li>● Develop modifications to existing service based on the gap and O/D analyses.</li><li>● Create a new ridership model for the modified service and compare it to the baseline model.</li></ul>	<ul style="list-style-type: none"><li>● ESRI ArcGIS</li><li>● Remix</li><li>● TBEST</li></ul>

# CDTA Troy Pilot - Gap Analysis

Objective: Identify gaps between transit supply and demand

- Both transit supply and demand are calculated at the Census Block Group level within the City of Troy
  - Demand is determined by using CDTA's 2019 Transit Propensity Index (TPI)
  - Supply is calculated using CDTA's October 2019 service frequency at each bus stop, assuming 0.25-mile buffer around stops



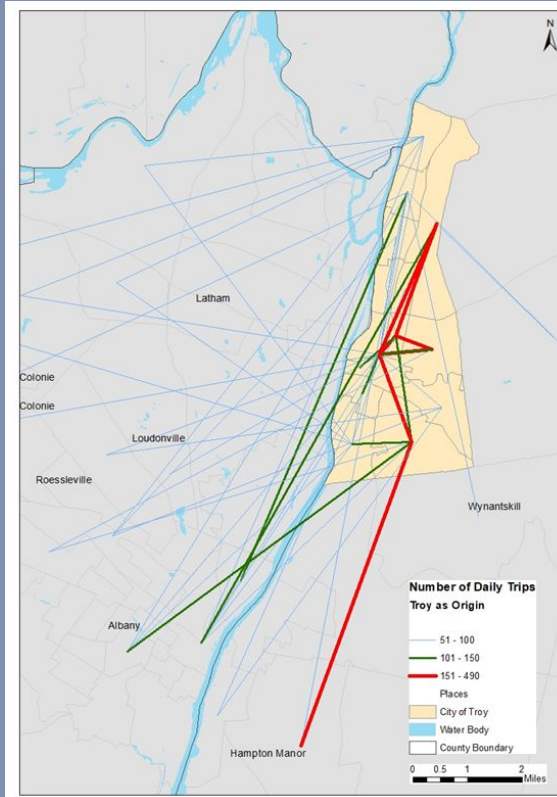


# CDTA Troy Pilot - Origin/Destination Analysis

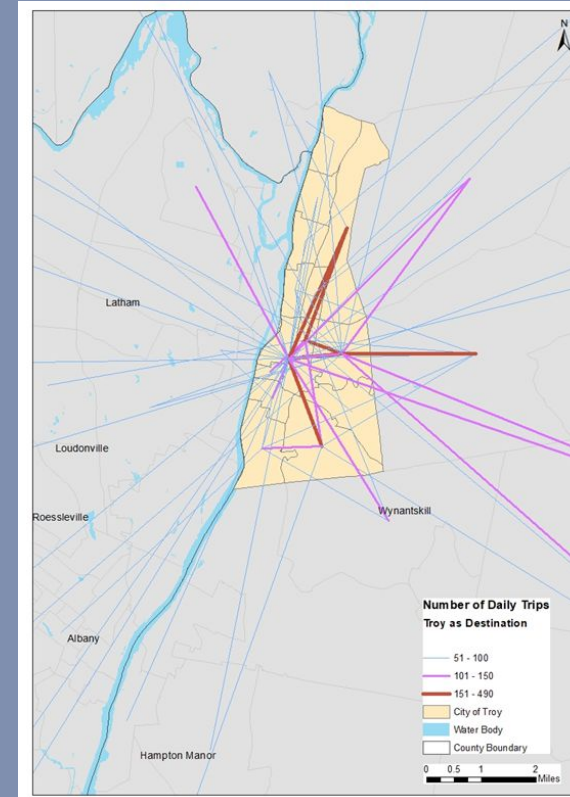
Objective: Identify the most prominent O/D links between Troy and all other communities in the Capital District.

- O/Ds reflect journey to work data from the US Census (2012-2016 CTPP).
- Analysis accounts for trips to/from census tracts within the City of Troy.

Troy as an Origin



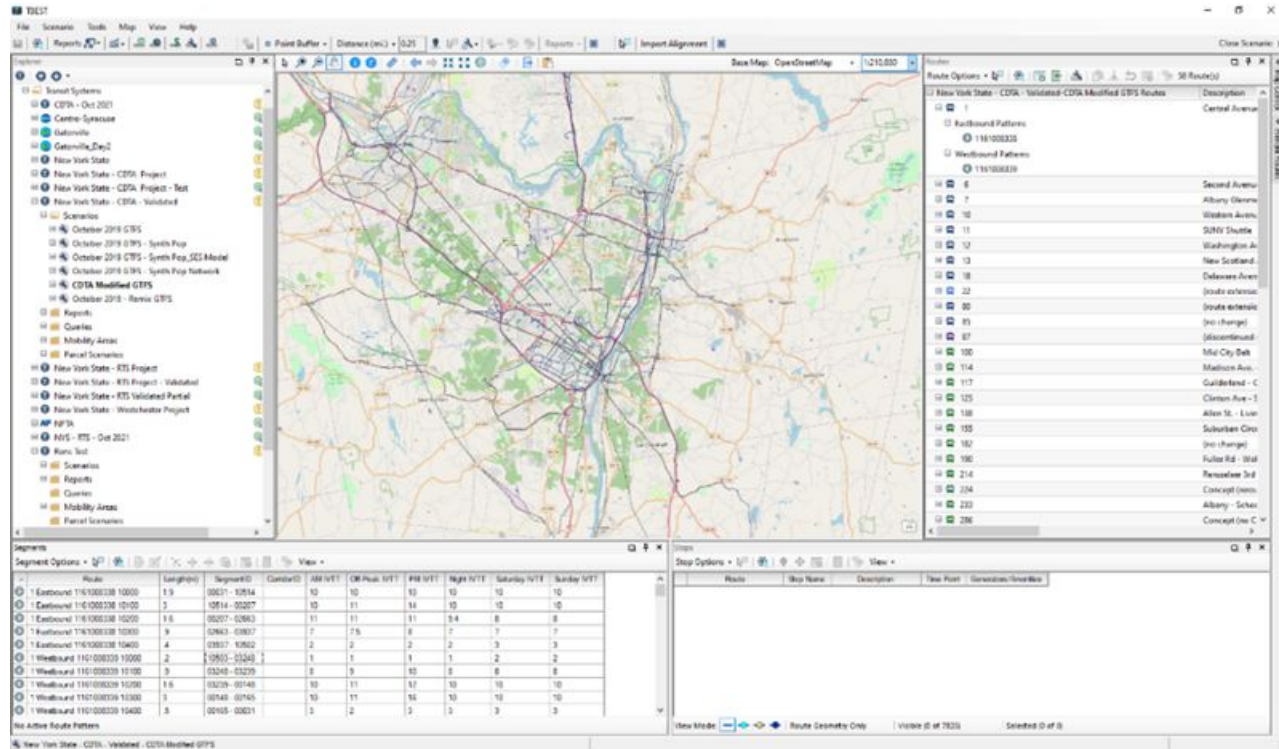
Troy as a Destination



# CDTA Troy Pilot - Baseline Ridership Model

Objective: develop baseline ridership model that accurately reflects October 2019 ridership.

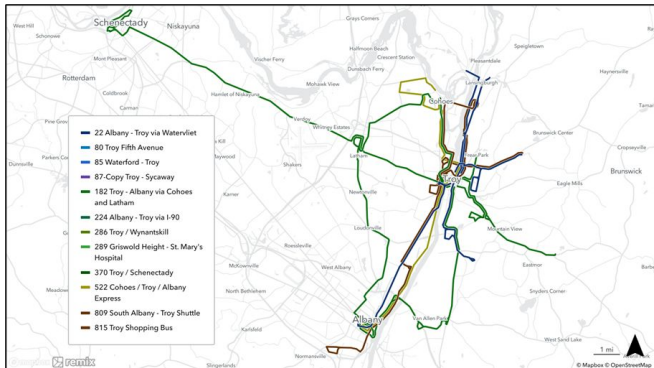
- Performed a sensitivity analysis by systematically adjusting TBEST's ridership model coefficients to align outputs with CDTA APC.



# CDTA Troy Pilot - Service Restructuring Concepts

Objective: modify existing bus service based on the gap and O/D analyses.

- Concepts are preliminary by design, intended to feed into the TBEST ridership model only, not as recommended service changes.



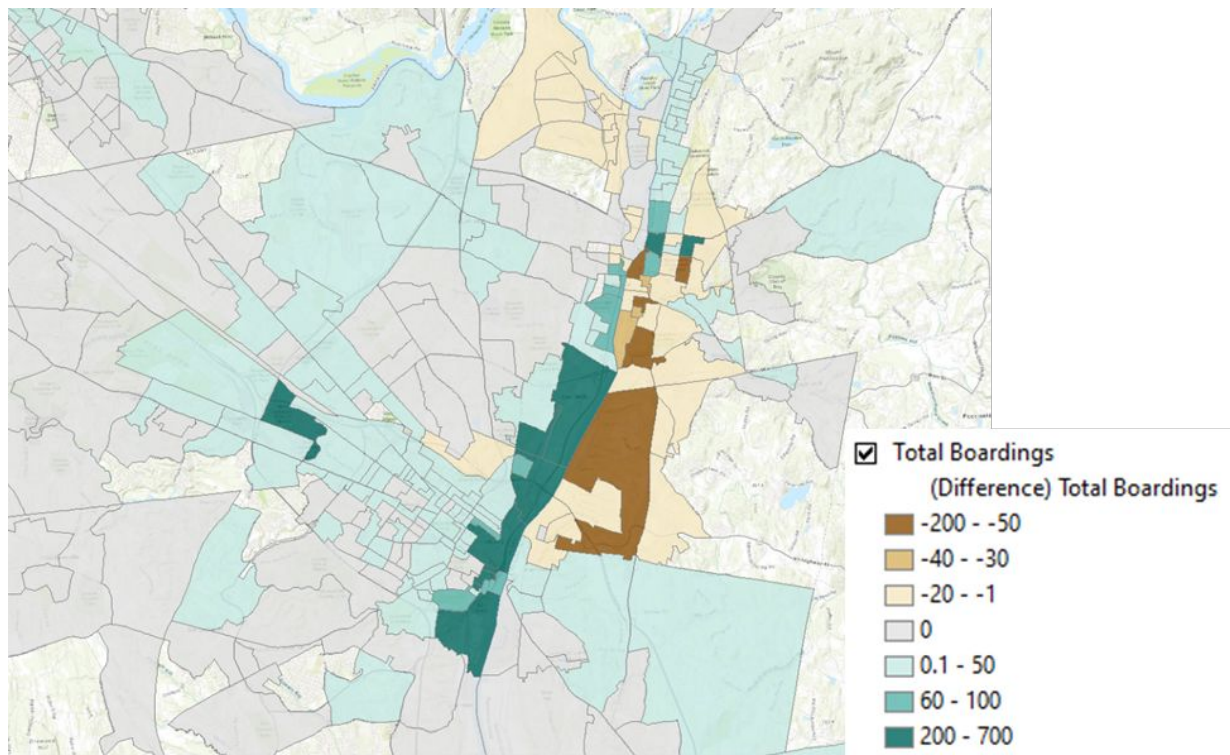
Troy Routes (October 2019)

Route	Routing Change	Schedule Change
22	Extend route in Troy	none
87	Eliminate Samaritan Hospital diversion	none
80	Extend route between Troy and Albany	none
85	none	none
182	none	none
224	Reroute to link Troy and Hampton Manor	none
286	none	none
289	none	Increase peak frequency to 30 min
370	none	none
522	none	none
809	none	none
815	none	none

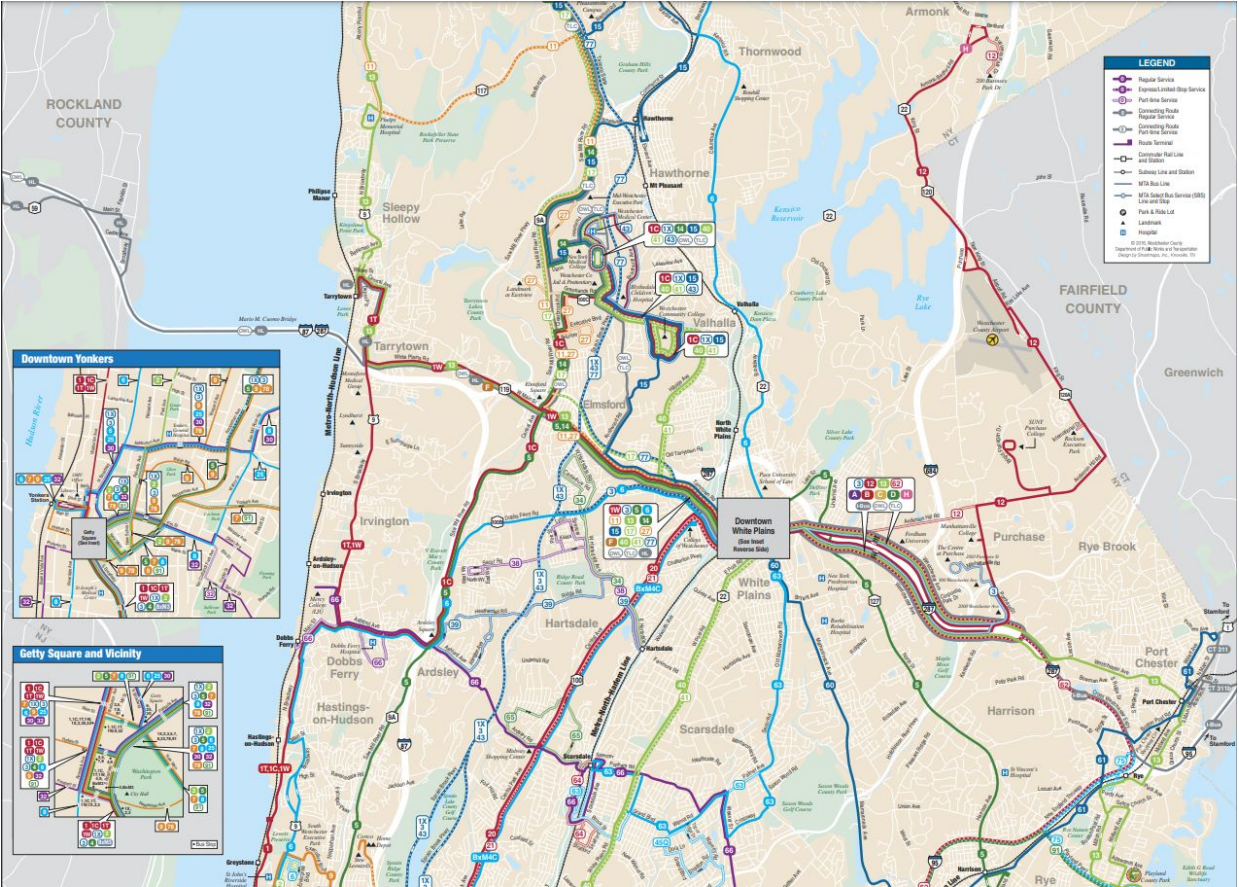
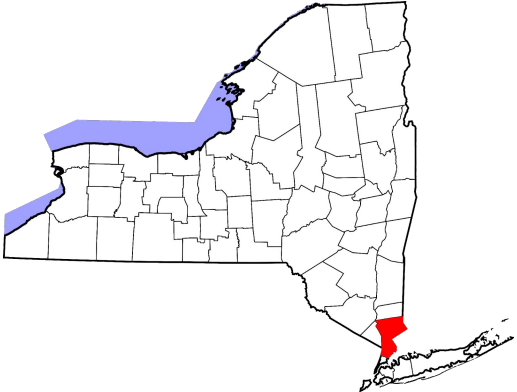
# CDTA Troy Pilot - Ridership Projection Model

Objective: create a new ridership model for the modified service and compare it to the baseline model.

- Regional Analysis by block group.
- The differences between the two models were mapped by block group showing that modified service would reduce ridership in Troy, but increase system-wide ridership.



# Westchester County Bee Line Pilot



# Westchester County Bee Line Pilot

Needs Met	Questions Answered
<ul style="list-style-type: none"><li>● I need to determine what systemic travel times impacts occur if a specific route is changed.</li><li>● I need to create a transit network ecosystem to better understand systemic changes.</li></ul>	<ul style="list-style-type: none"><li>● How long does it take to travel to and from select O-D in the current system?</li><li>● What systemic travel time changes occur if a select route is truncated or removed?</li></ul>
Analyses Performed	Software Used
<ul style="list-style-type: none"><li>● Create a transit network ecosystem.</li><li>● Construct an existing conditions baseline of travel times from select O-Ds.</li><li>● Adjust the GTFS network to reflect route variants: removal and truncation.</li><li>● Compare the GTFS variants to the baseline O-D travel times.</li></ul>	<ul style="list-style-type: none"><li>● Conveyal</li><li>● Excel</li></ul>

# Westchester Pilot - Conveyal Transit Network Ecosystem

## GTFS Bundling



## Setting Geographic Boundaries

**Set up a new region**

Region Name \*  
York\_202209

Description  
demo

**Analysis bounds**

Bounds are snapped to points on our regular grid.

North \* South \*  
43.08617648147473 42.1036835438882

Must be between -90 and 90 degrees

East \* West \*  
-76.64044357709274 -77.70333805426726

Must be between -180 and 180 degrees

8,688 kilometers squared  
173.7k origin points

Set up a new region

## Identifying Key Origin and Destinations

	A	B	C
1	stop_id	stop_lat	stop_lon
2	1941	40.78059	-73.9612
3	1942	40.76435	-73.9735
4	1943	40.75927	-73.9772
5	1944	40.75398	-73.9806
6	1945	40.7496	-73.9843
7	1946	40.74334	-73.9884
8	1947	40.74128	-73.9891

# Westchester Pilot - Conveyal Existing Conditions Analysis

## Assessing Baseline Conditions Using Conveyal Travel Time Matrix Export

Project: Analysis w/ Des... Scenario: Default Active preset: Save + Save presets to be used later.

Access mode: Transit modes: All T C G F Egress mode

Date: 10 / 16 / 2019 From time: 05:00 To time: 10:00 Maximum transfers: 3

Walk speed: 5 km/h Max walk time: 30 minutes Decay Function: Step Simulated schedules: 200

Create new regional analysis

Regional analysis name: Truncated at 2968

Origin points: Westchester

Analysis will run for 88 origin points

Destination opportunity layer(s): Westchester

Select up to 12 layers.

Cutoff minutes: 120 Percentiles: 5, 50, 95

From 5 to 120. From 1 to 99.

+ Create Cancel

origin	destination	percentile	time
1941	1941	5	0
1941	1942	5	11
1941	1943	5	13
1941	1944	5	15



# Westchester Pilot - Conveyal Existing Conditions Analysis

## Constructing Travel Time Matrices

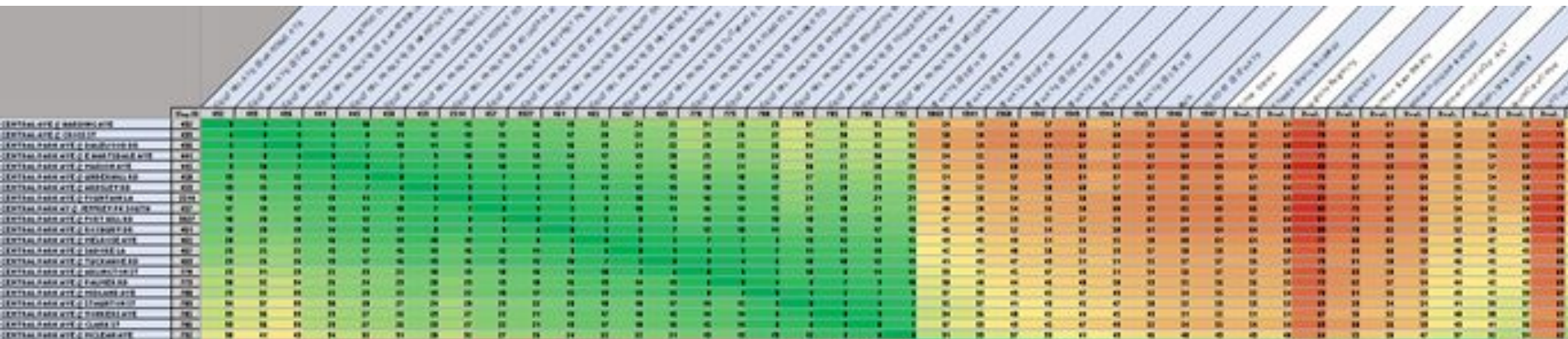
origin	destination	percentile	time
1941	1941	5	0
1941	1942	5	11
1941	1943	5	13
1941			

Stop ID	432	433	436	441
432	0	4	5	8
433	6	0	3	6
436	5	5	0	5
441	8	8	6	0

Stop ID	432	433	436	441
445	9	10		
450	13	15		
453	13	15		
2514	18	18		
457	17	19		
3327	18	20		
461	18	20		
Stop ID	432	433	436	441
432	0	4	5	8
433	6	0	3	6
436	5	5	0	5
441	8	8	6	0
445	9	10	7	5
450	13	15	12	9
453	13	15	13	9
2514	18	18	15	13
457	17	19	17	13
3327	18	20	18	14
461	18	20	19	14

# Westchester Pilot - Conveyal Existing Conditions Analysis

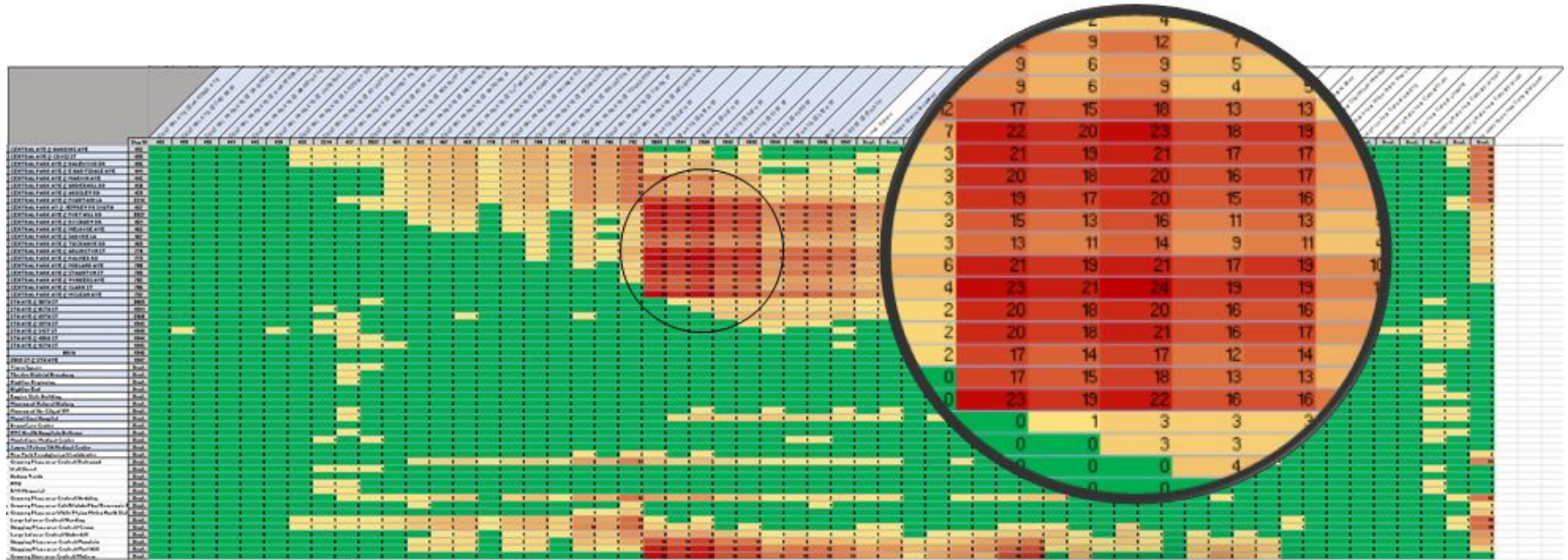
## A Full Travel Time Matrix



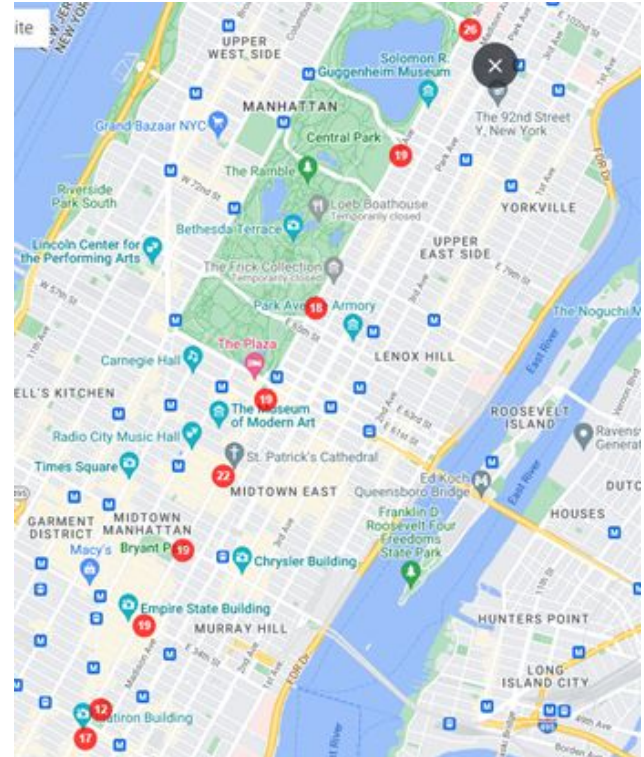
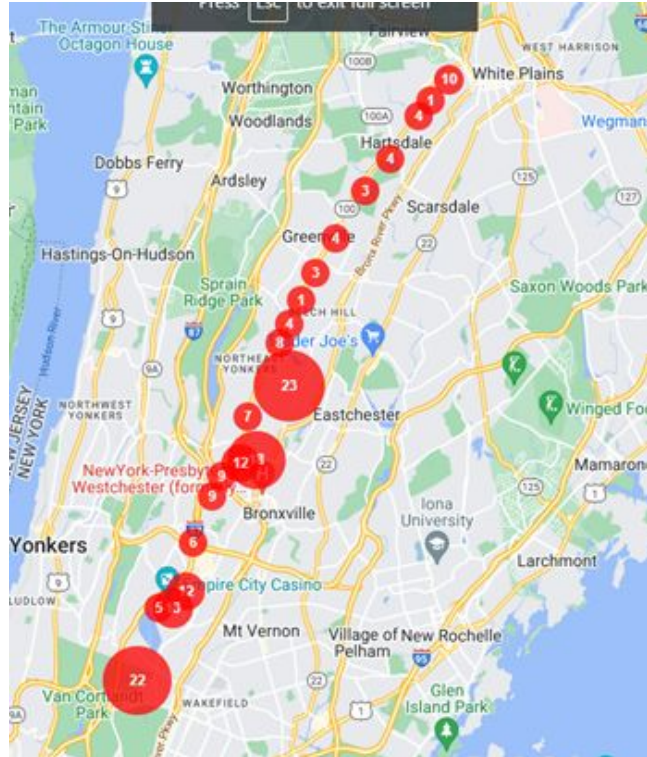


# Westchester County - Travel Time Difference Matrices

## Difference Between Existing Condition and Route Removal



# Westchester County - Travel Time Difference Matrices



# Westchester County - Conveyal Route Modification

## Modification Scenarios

- Truncation at Stop 3069
- Truncation at Stop 1941
- Truncation at Stop 2968
- Truncation at Stop 1942
- Truncation at Stop 1943
- Entire Route Removal

The image displays a software interface for route modification on the left and a corresponding map of Manhattan on the right. The interface, titled "Truncated", includes a sidebar with various tool icons, a description field, and several selection menus. The "Select feed" menu is set to "2019-06-18 to 2020-04-06". The "Select route" menu is set to "WESTCHESTER - MANHATTAN". The "Select patterns" menu contains two entries: "30 stops from CENTRAL AVE @ ..." and "31 stops from MADISON AVE @ 2...". A "Time savings per removed stop" field is currently set to "0 seconds". The map on the right shows a street grid of Manhattan with a red line representing a route. Red dots along the route indicate specific stops or truncation points. Key landmarks like the Guggenheim Museum and The Rockefeller University are visible.

# Westchester County - Truncation Sensitivity Analysis

Stop ID	3069	1941	2368	1942	1943	1944	1945	1946	1947	Dest.	Dest.	Dest.	Dest.	Dest.	Dest.
432	0	0	0	1	1	1	0	0	0	0	0	0	0	0	0
433	0	0	0	3	1	1	0	0	0	0	0	0	0	0	0
436	0	0	5	2	2	0	1	1	0	0	1	0	0	1	0
441	0	0	4	2	2	0	0	1	1	0	0	0	0	1	0
445	0	0	3	6	6	2	3	3	2	2	2	1	2	2	0
450	0	0	7	4	4	1	2	2	2	1	1	0	1	1	0
453	0	0	8	4	5	1	2	2	1	1	1	0	0	1	0
2514	0	0	11	11	10	4	6	7	5	3	5	1	2	4	0
457	0	0	11	12	10	9	11	11	8	6	8	2	5	8	0
3327	0	0	11	11	10	7	10	10	8	5	7	1	4	7	0
461	0	0	11	11	10	7	10	10	7	5	7	1	3	7	0
465	0	0	11	11	10	6	8	8	6	4	6	1	3	6	0
467	0	0	10	9	10	4	6	6	4	3	4	1	2	4	0
469	0	0	9	7	3	3	5	5	4	3	3	1	2	3	0
776	0	0	11	11	10	7	10	9	7	5	7	1	3	7	0
775	0	0	11	12	10	9	12	11	9	7	8	1	5	8	0
780	0	0	11	11	12	7	10	9	7	5	6	1	3	6	0
783	0	0	11	12	10	7	10	10	8	5	7	1	4	7	0
785	0	0	11	10	11	5	7	6	5	3	5	1	2	5	0
786	0	0	11	10	11	4	7	7	6	4	4	1	2	4	0
792	0	0	11	12	10	10	11	11	8	6	6	1	5	7	0
3069	0	0	3	3	3	3	2	2	3	1	1	0	2	1	0
1941	0	0	3	3	3	3	2	2	3	1	2	0	2	1	0
2368	0	0	4	4	5	5	4	4	5	2	2	3	5	2	0
1942	0	0	0	0	2	2	2	1	0	0	0	0	0	0	0
1943	0	0	0	0	0	1	0	0	1	0	0	0	1	0	0
1944	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1945	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0

Stop ID	3069	1941	2368	1942	1943	1944	1945	1946	1947	Dest.	Dest.	Dest.	Dest.	Dest.	Dest.
432	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
433	0	0	0	0	0	3	1	0	0	0	0	0	0	0	0
436	0	0	0	0	0	2	2	0	1	1	0	0	0	1	0
441	0	0	0	0	0	2	0	0	1	1	0	0	0	1	0
445	0	0	0	0	0	5	6	2	3	3	2	2	1	2	2
450	0	0	0	0	0	3	4	1	2	2	2	1	1	0	1
453	0	0	0	0	0	3	5	1	2	2	1	1	1	0	0
2514	0	0	0	0	0	3	10	4	6	7	5	3	5	1	2
457	0	0	0	0	0	9	11	9	11	8	6	8	2	5	8
3327	0	0	0	0	0	9	11	7	10	10	8	5	7	1	4
461	0	0	0	0	0	9	11	7	10	10	7	5	6	1	3
465	0	0	0	0	0	8	10	6	8	8	6	4	6	1	3
467	0	0	0	0	0	7	10	4	6	6	4	3	4	1	2
469	0	0	0	0	0	6	9	3	5	5	4	3	3	1	2
776	0	0	0	0	0	9	11	7	10	9	7	5	7	1	3
775	0	0	0	0	0	9	12	9	12	11	9	7	7	1	5
780	0	0	0	0	0	9	12	7	10	9	7	5	6	1	3
783	0	0	0	0	0	9	12	7	10	10	8	5	6	1	4
785	0	0	0	0	0	8	11	5	7	6	5	3	5	0	2
786	0	0	0	0	0	8	11	4	7	7	6	4	4	1	2
792	0	0	0	0	0	9	12	10	11	11	8	6	6	1	5
3069	0	0	0	0	0	3	3	3	2	2	3	1	1	0	2
1941	0	0	0	0	0	3	3	3	2	2	3	1	2	0	2
2368	0	0	0	0	0	4	5	4	4	5	2	2	3	5	2
1942	0	0	0	0	0	2	2	2	1	0	0	0	0	0	0
1943	0	0	0	0	0	1	0	0	1	0	0	0	1	0	0
1944	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1945	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0

Stop ID	3069	1941	2368	1942	1943	1944	1945	1946	1947	Dest.	Dest.	Dest.	Dest.	Dest.	Dest.
432	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
433	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
436	0	0	0	0	0	1	0	0	1	0	0	0	0	0	1
441	0	0	0	0	0	0	0	1	1	0	0	0	0	0	1
445	0	0	0	0	0	3	1	1	2	1	0	0	0	2	1
450	0	0	0	0	0	2	1	1	0	1	0	0	0	1	0
453	0	0	0	0	0	3	1	1	1	0	0	0	0	0	0
2514	0	0	0	0	0	4	3	3	3	4	0	0	0	2	1
457	0	0	0	0	0	4	4	4	4	4	0	0	1	4	2
3327	0	0	0	0	0	4	4	4	4	4	0	0	0	4	2
461	0	0	0	0	0	4	4	4	4	4	0	0	0	3	2
465	0	0	0	0	0	4	3	4	4	4	0	0	0	3	1
467	0	0	0	0	0	4	2	2	3	3	0	0	0	2	1
469	0	0	0	0	0	4	1	2	2	2	0	0	0	2	0
776	0	0	0	0	0	4	4	4	4	4	0	0	0	3	2
775	0	0	0	0	0	4	4	4	4	4	0	0	0	4	2
780	0	0	0	0	0	4	4	4	4	4	0	0	0	3	2
783	0	0	0	0	0	4	4	4	4	4	0	0	0	3	2
785	0	0	0	0	0	4	3	3	3	3	0	0	0	2	2
786	0	0	0	0	0	4	3	3	3	3	0	0	0	2	1
792	0	0	0	0	0	4	3	4	4	4	0	0	0	4	2
3069	0	0	0	0	0	3	3	2	2	3	0	0	0	1	1
1941	0	0	0	0	0	3	3	2	2	3	0	0	0	1	1
2368	0	0	0	0	0	4	4	4	4	4	0	0	2	3	1
1942	0	0	0	0	0	2	2	2	1	0	0	0	0	0	0
1943	0	0	0	0	0	1	0	0	1	0	0	0	0	1	0
1944	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1945	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0

Stop ID	3069	1941	2368	1942	1943	1944	1945	1946	1947	Dest.	Dest.	Dest.	Dest.	Dest.	Dest.
432	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
433	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
436	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0
441	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0
445	0	0	0	0	0	0	0	0	0	1	1	2	2	0	2
450	0	0	0	0	0	0	1	1	0	1	0	0	0	0	0
453	0	0	0	0	0	0	1	1	1	0	0	0	0	0	0
2514	0	0	0	0	0	0	3	3	3	4	0	0	0	0	2
457	0	0	0	0	0	0	4	4	4	4	0	0	0	4	2
3327	0	0	0	0	0	0	4	4	4	4	0	0	0	4	2
461	0	0	0	0	0	0	4	4	4	4	0	0	0	3	2
465	0	0	0	0	0	0	3	4	4	4	0	0	0	3	1
467	0	0	0	0	0	0	2	2	3	3	0	0	0	2	1
469	0	0	0	0	0	0	1	2	2	2	0	0	0	2	0
776	0	0	0	0	0	0	4	4	4	4	0	0	0	3	2
775	0	0	0	0	0	0	4	4	4	4	0	0	0	4	2
780	0	0	0	0	0	0	4	4	4	4	0	0	0	3	2
783	0	0	0	0	0	0	4	4	4	4	0	0	0	3	2
785	0	0	0	0	0	0	3	3	3	3	0	0	0	2	2
786	0	0	0	0	0	0	3	3	3	3	0	0	0	2	1
792	0	0	0	0	0	0	3	4	4	4	0	0	0	4	2
3069	0	0	0	0	0	0	3	2	2	3	0	0	0	1	1
1941	0	0	0	0	0	0	3	2	2	3	0	0	0	1	1
2368	0	0	0	0	0	0	4	4	4	4	0	0	1	3	1
1942	0	0	0	0	0	0	2	2	1	0	0	0	0	0	0
1943	0	0	0	0	0	0	1	0	0	1	0	0	0	1	0
1944	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1945	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0

# The Playbook

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**A Decision Support Tool  
for Planners and Analysts**



A 2x2 grid of colored squares. The top-left square is light red and contains the text 'Needs Met'. The top-right square is yellow and contains the text 'Questions Answered'. The bottom-left square is purple and contains the text 'Analyses Performed'. The bottom-right square is light green and contains the text 'Software Used'.

**Needs Met**

**Questions Answered**

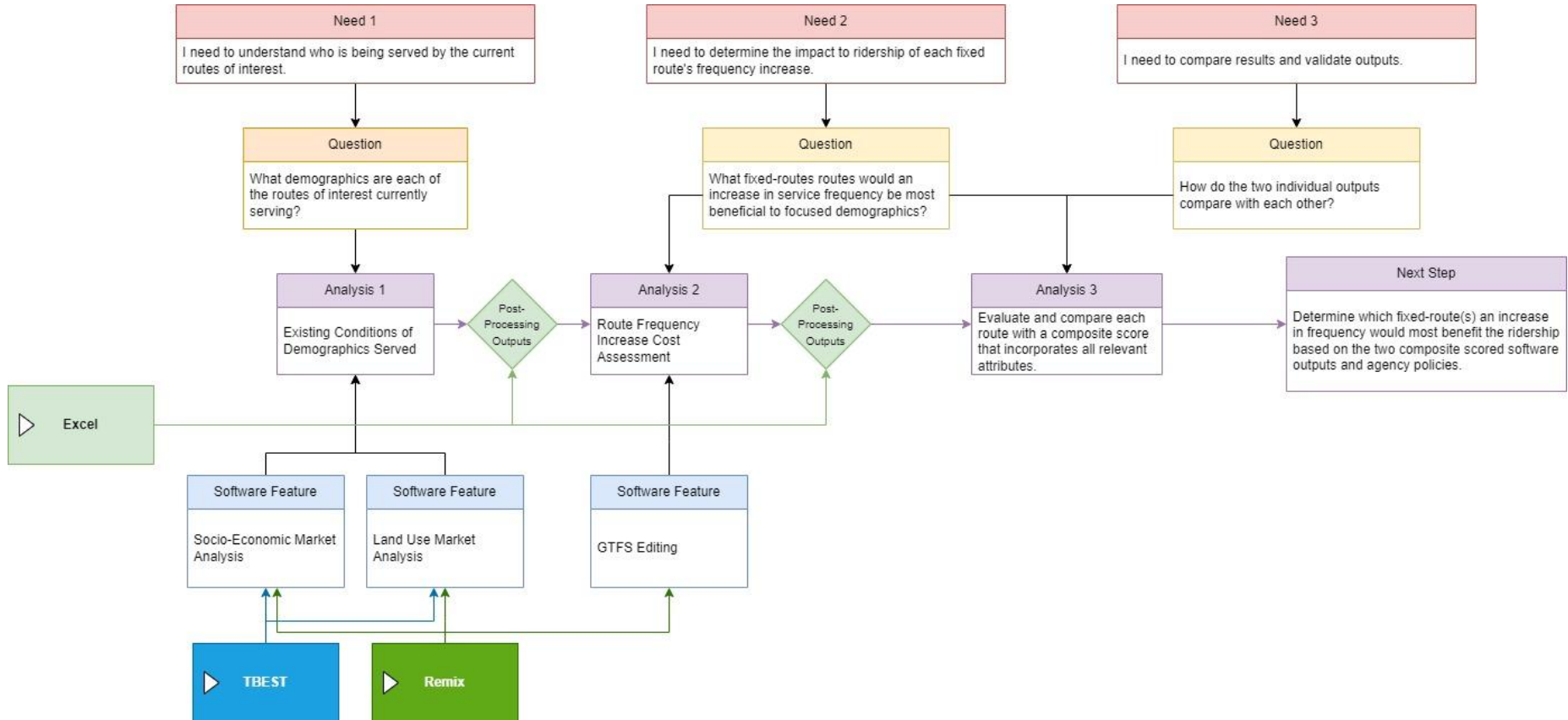
**Analyses Performed**

**Software Used**

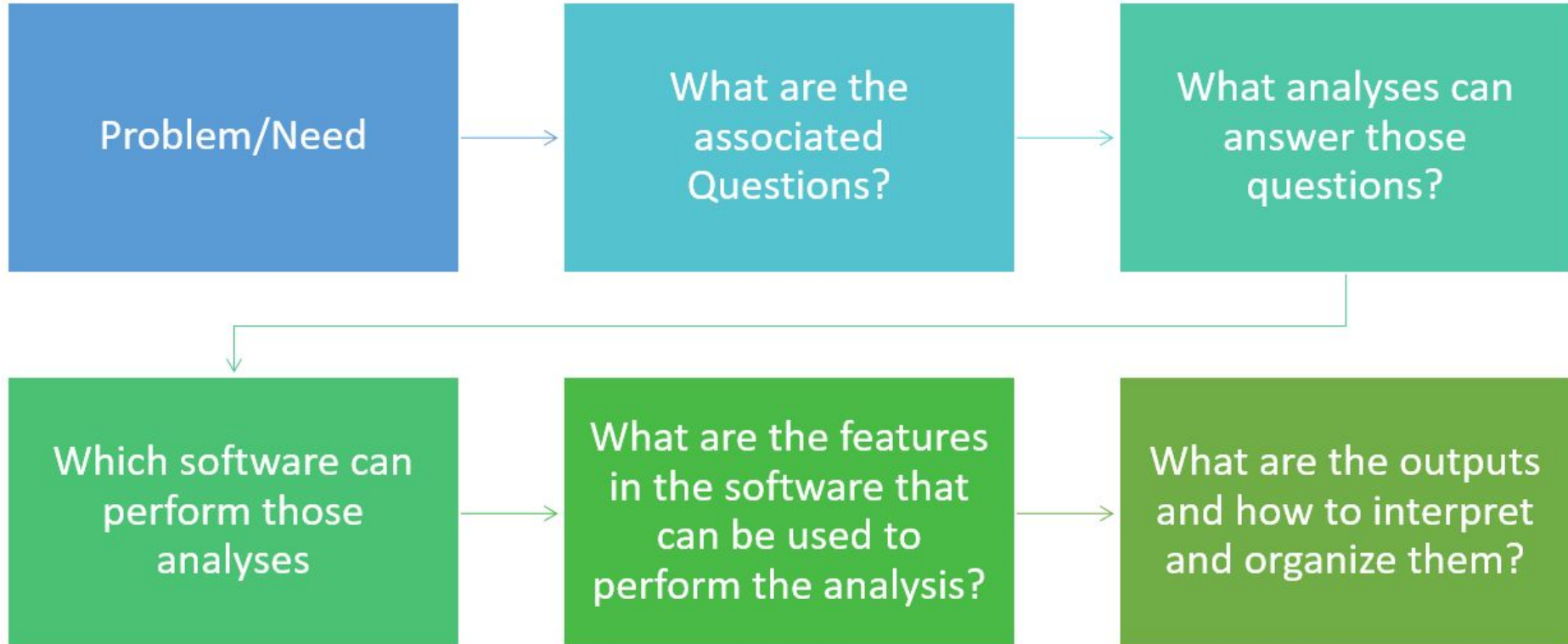
# Playbook - Overview

- The Playbook is a catalog of replicable transit analysis workflows intended as a reference for planners and analysts.
- Designed as a living document to centralize and standardize valuable workflows across the state.
- Rubric for Transit Planning Analyses
  - **Needs Met**
  - **Questions Answered**
  - **Analyses Performed**
  - **Software Used**
- Organized into three discrete sections:
  - **Workflow** - Flowchart Depicting the Process of Navigating from a Need to an Output
  - **Narrative** - High-level Overview Language Describing the Workflow
  - **Technical Analysis** - Detail Oriented, Step-by-Step Instructions for Replicating the Workflow

# Playbook - Example Workflow



# Playbook - Problem to Solution Analysis Workflow



# Open Forum



# Open Forum 1

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## Case Studies and Software Tools

### **Transpo**

Scott Le Vine & Chris Titze

### **Sam Schwartz**

Dora Miketa & Elad Mokady

### **AVAIL**

Eric Krans & Adam Tobey

### **Case Study Agency Representatives**

Centro / SMTC

Westchester Bee-Line / NYMTC

RTS / GTC

CDTA / Capital Region Transportation Council

# Open Forum 2

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## Institutional Challenges and Opportunities

**Capital Region Transportation  
Council**

Sandra Misiewicz & Carrie Ward

**Marlene Connor Associates**

Marlene Connor

**Transpo**

Chris Titze & Scott Le Vine

**NYSDOT**

Jim Davis

**AVAIL**

Catherine T. Lawson & Eric Krans

# Wrap-Up and Next Steps

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Project documents are available on the NYSAMPO website  
<https://www.nysmpos.org/shared-cost-initiative>

- Market Analysis White Paper
- Four Case Study Reports
- Transit Planning Recommendations
- Final Report
- Transit Planning Analysis Playbook



# Contact

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Eric Krans - [ekrans@albany.edu](mailto:ekrans@albany.edu)  
Carrie Ward - [cward@cdtcmbo.org](mailto:cward@cdtcmbo.org)