SHARED TRANSIT SERVICE PLANNING AND ANALYTICS INITIATIVE

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AVAIL

transpogroup

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THE RESEARCH TEAM

Recommendations

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

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

Study Overview and High-Level Recommendations

Transit Planning Community of Practice and Analysis Playbook

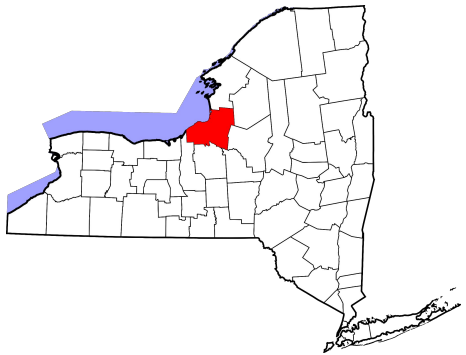
- Convene a Community of Practice of transit planners to share practices and encourage analysis efforts
- Maintain and update the products of this research as new analyses are conducted
- Make playbook available via web-hosting

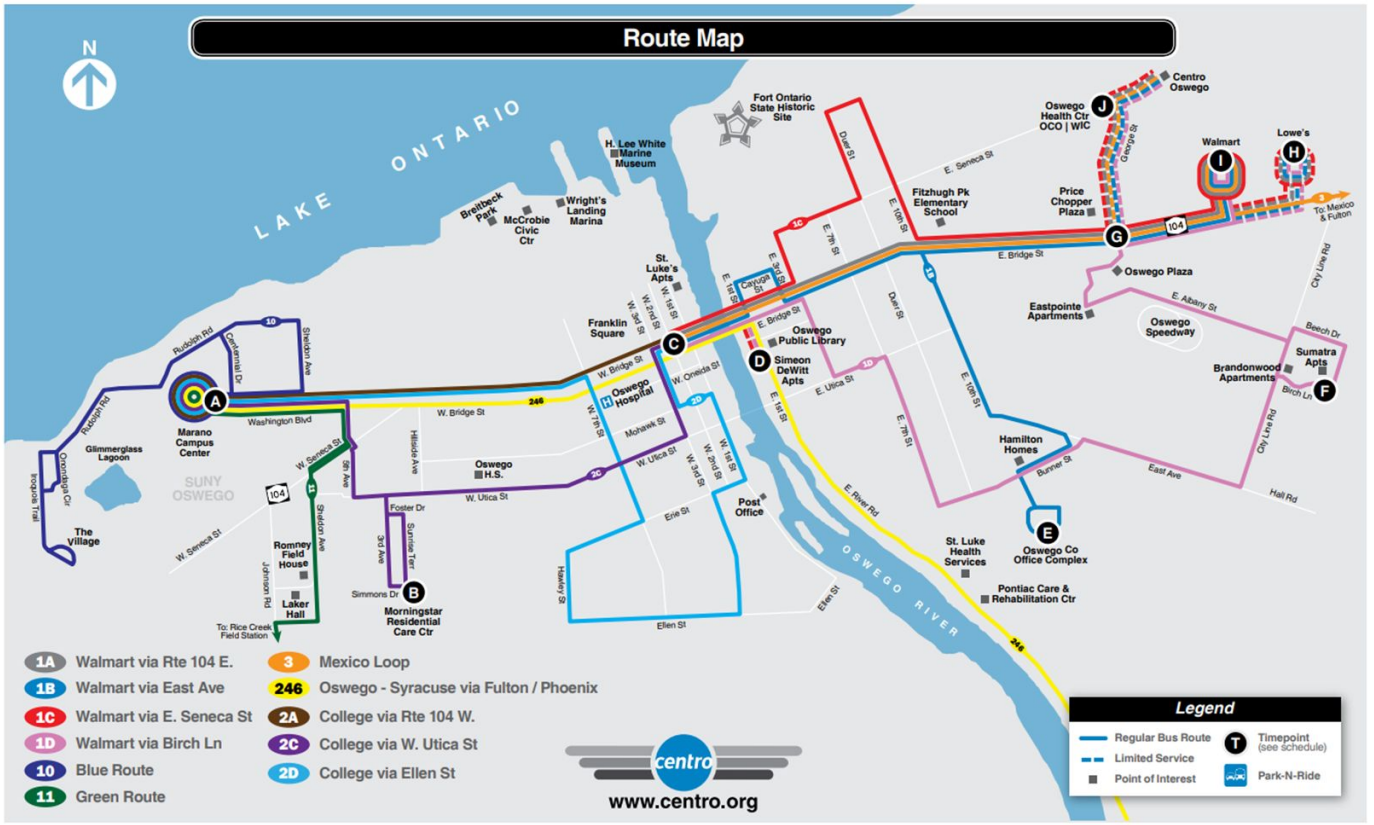
Technical Agenda

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?

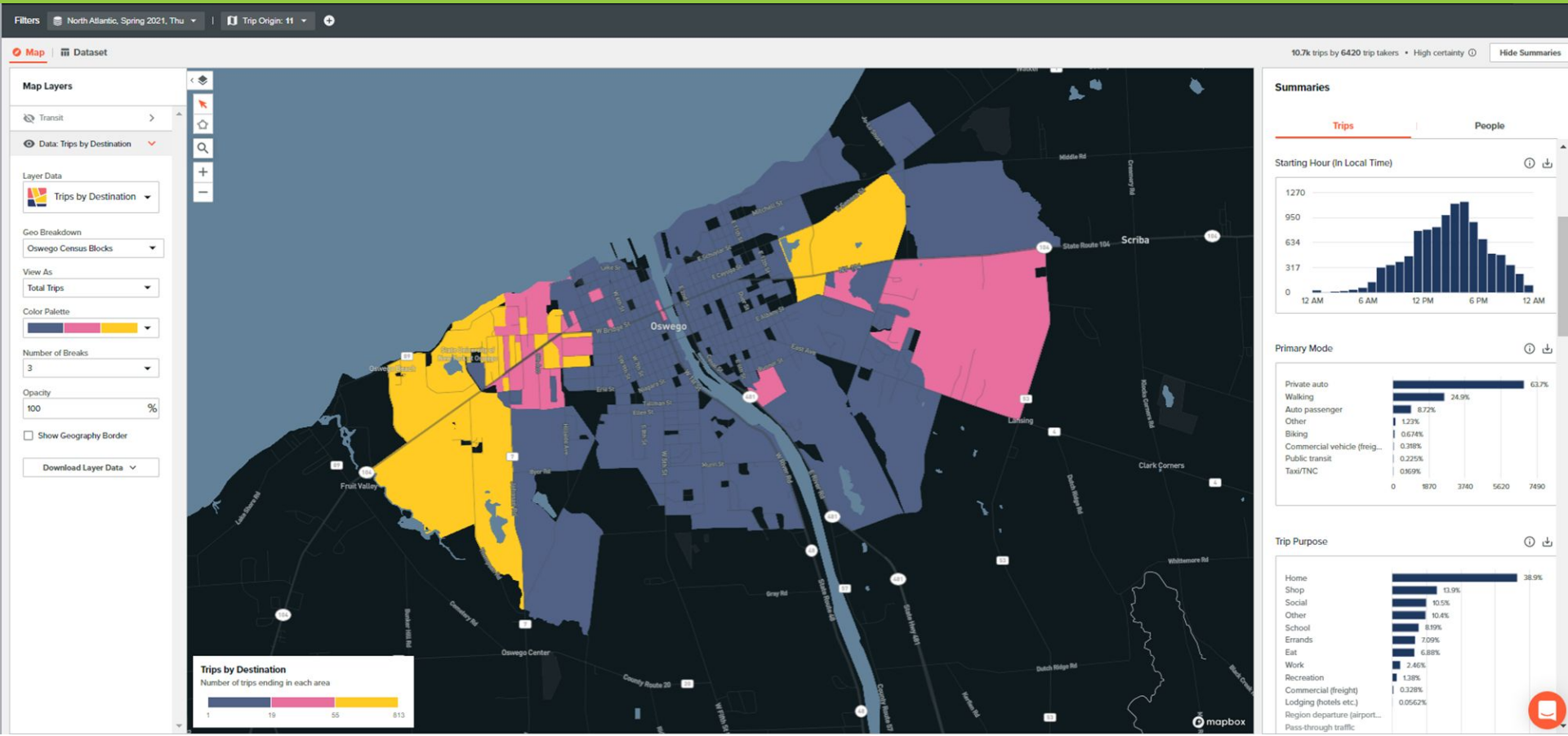
Analyses Performed

- 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.

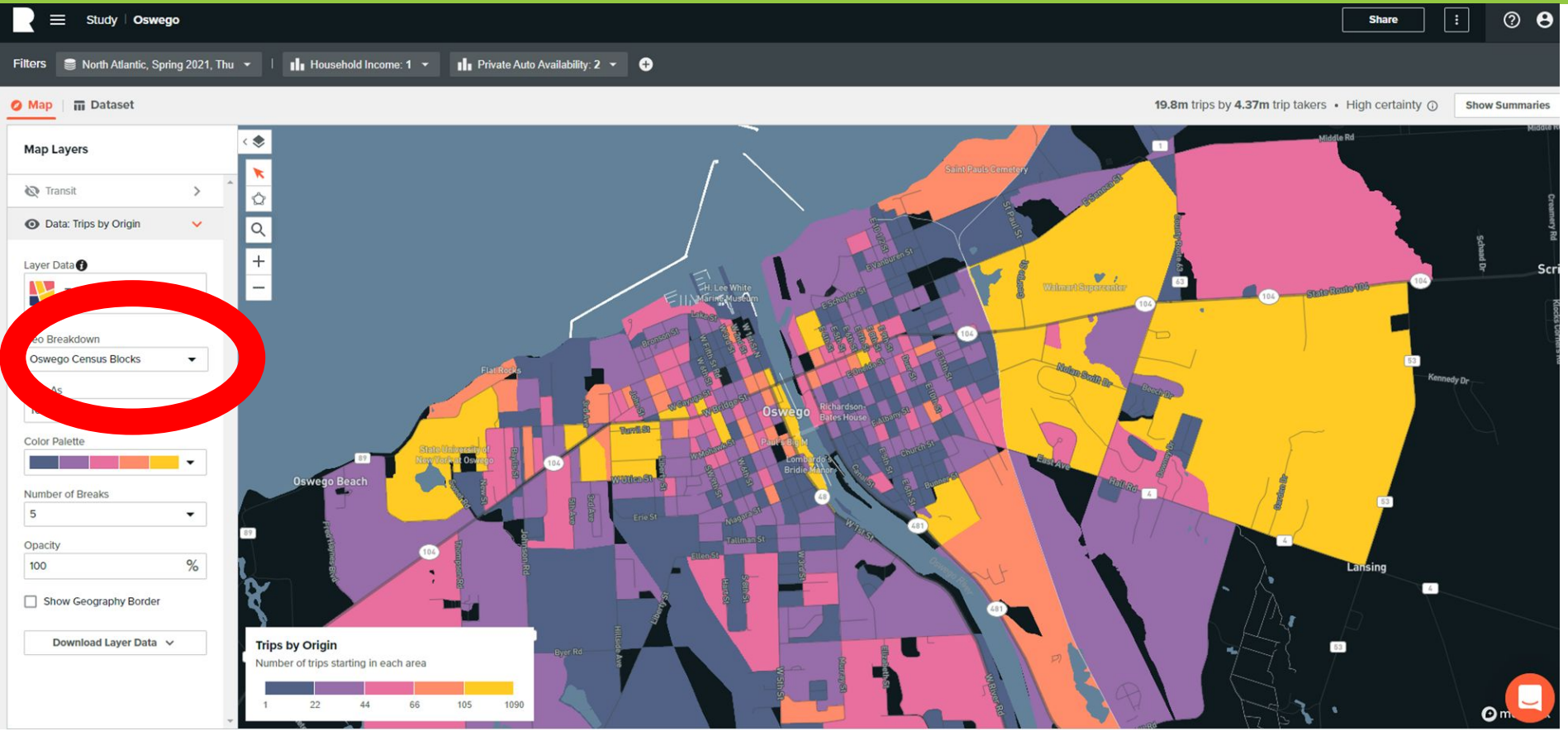
Software Used

- Replica
- ESRI ArcMap
- Excel
- STOPS
- GTFSed

Centro Oswego Pilot Project

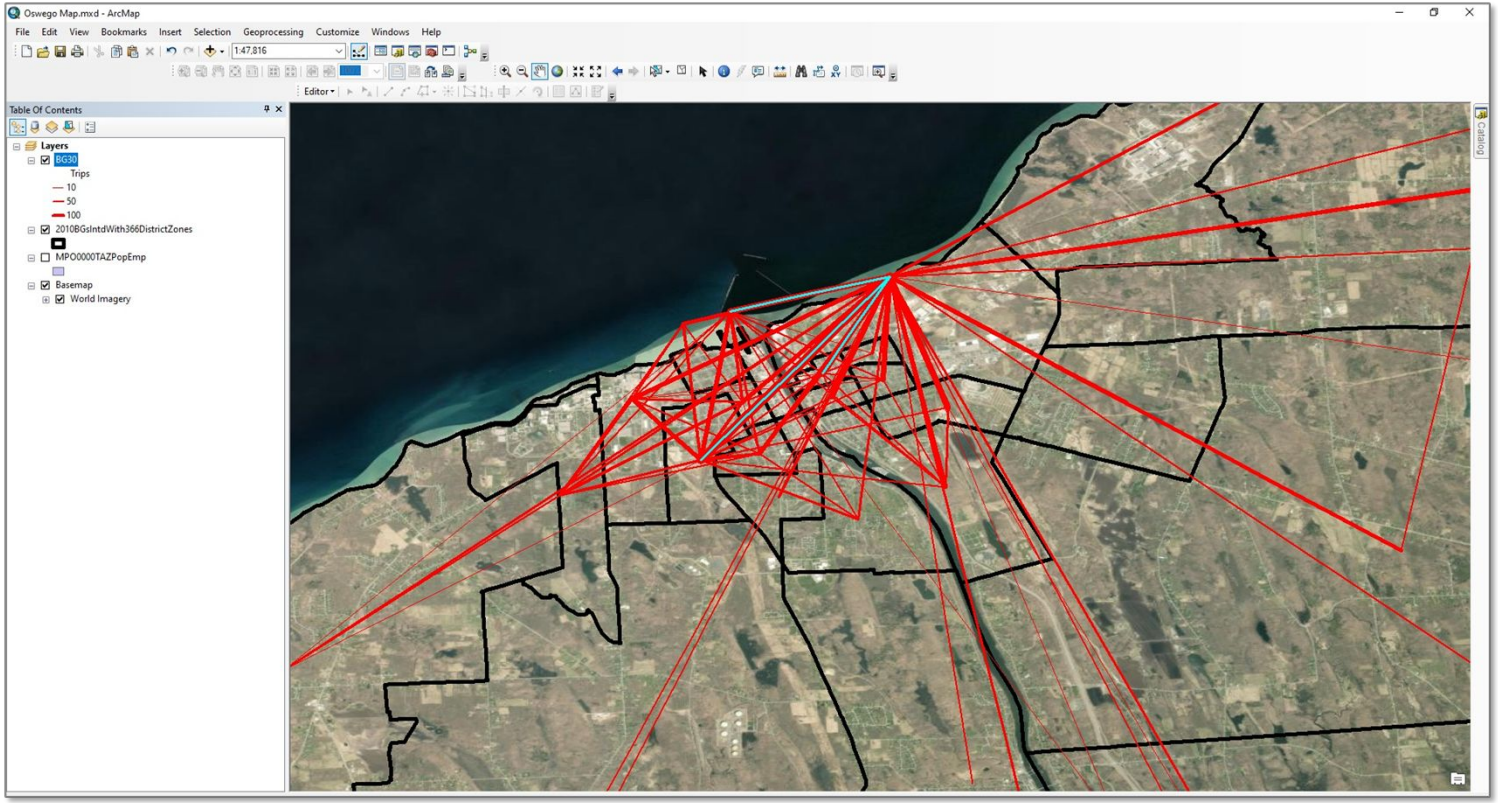


Centro Pilot - Replica: Travel by people with Income <$30K; 0/1-car HHs



Centro Pilot - Use of Replica in Region with No Model

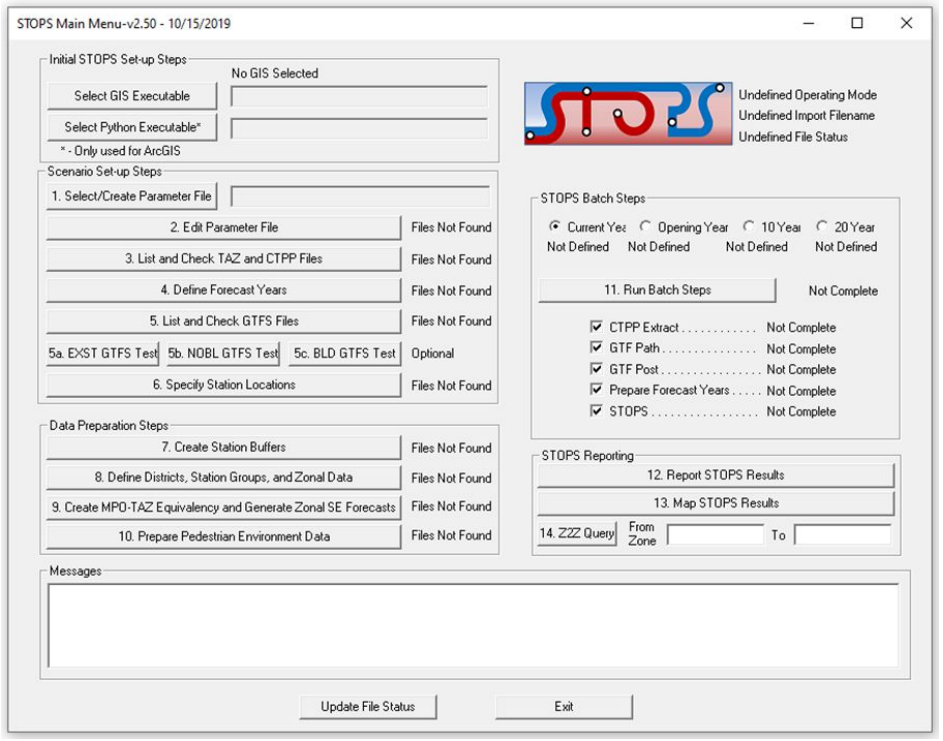
Custom Transit Propensity Index, using linked Os and Ds



Centro Pilot - FTA's STOPS software

- Off-the-shelf no-cost software for generating transit-ridership forecasts:

  1. Applicable nationally, and self-calibrates
  2. Draws on as much local data as is available, with more local data → more reliable forecasts
  3. Designed for analyzing capital improvements to major transit systems (Oswego case study is towards small end of known STOPS applications)

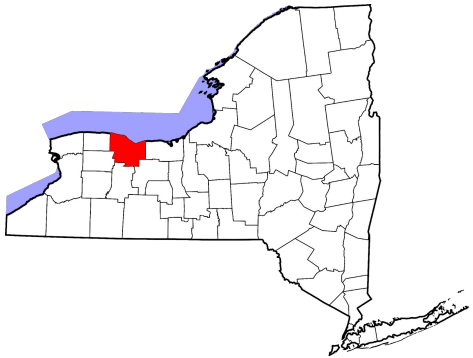


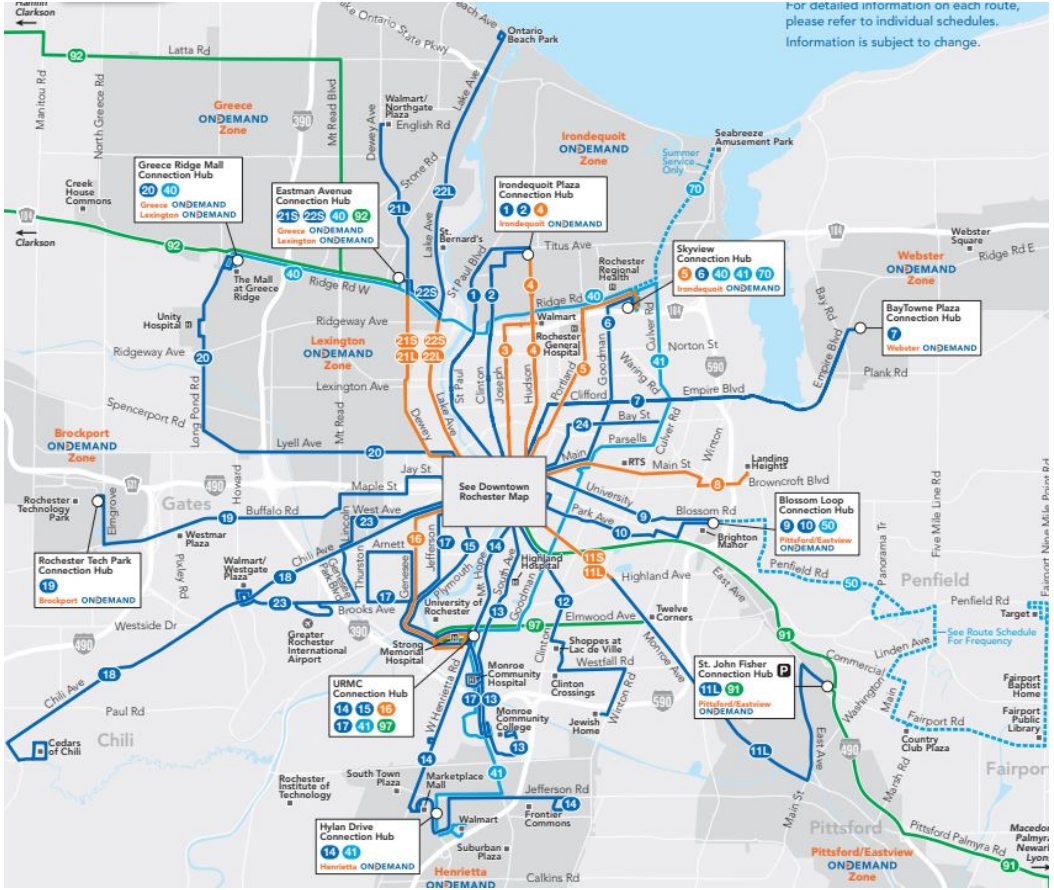
Key result for this System Redesign is daily ridership summarized by route

***** 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

			Y2022 EXISTING				Y2022 NO-BUILD				Y2022 BUILD			
Route_ID	--Route Name	Count	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	0	26	1	0	27
99992	--SthRtWB-South Route WB	0	0	0	0	0	0	0	0	0	19	6	0	25
Test1	--Test1-SUNY to Walmart	0	0	0	0	0	0	0	0	0	26	1	0	26
Test2	--Test2-Walmart to SUNY	0	0	0	0	0	0	0	0	0	330	23	0	353
Total		442	407	35	0	442	407	35	0	442	401	31	0	432

RTS Rochester Pilot





RTS Rochester Pilot

Needs Met

- I need to understand who is being served by the current routes of interest.
- I need to determine the impact to ridership of each fixed route's frequency increase.
- I need to compare results and validate outputs.

Questions Answered

- What demographics are each of the routes of interest currently serving?
- What fixed-routes routes would an increase in service frequency be most beneficial to focused demographics?
- How do the two individual outputs compare with each other?

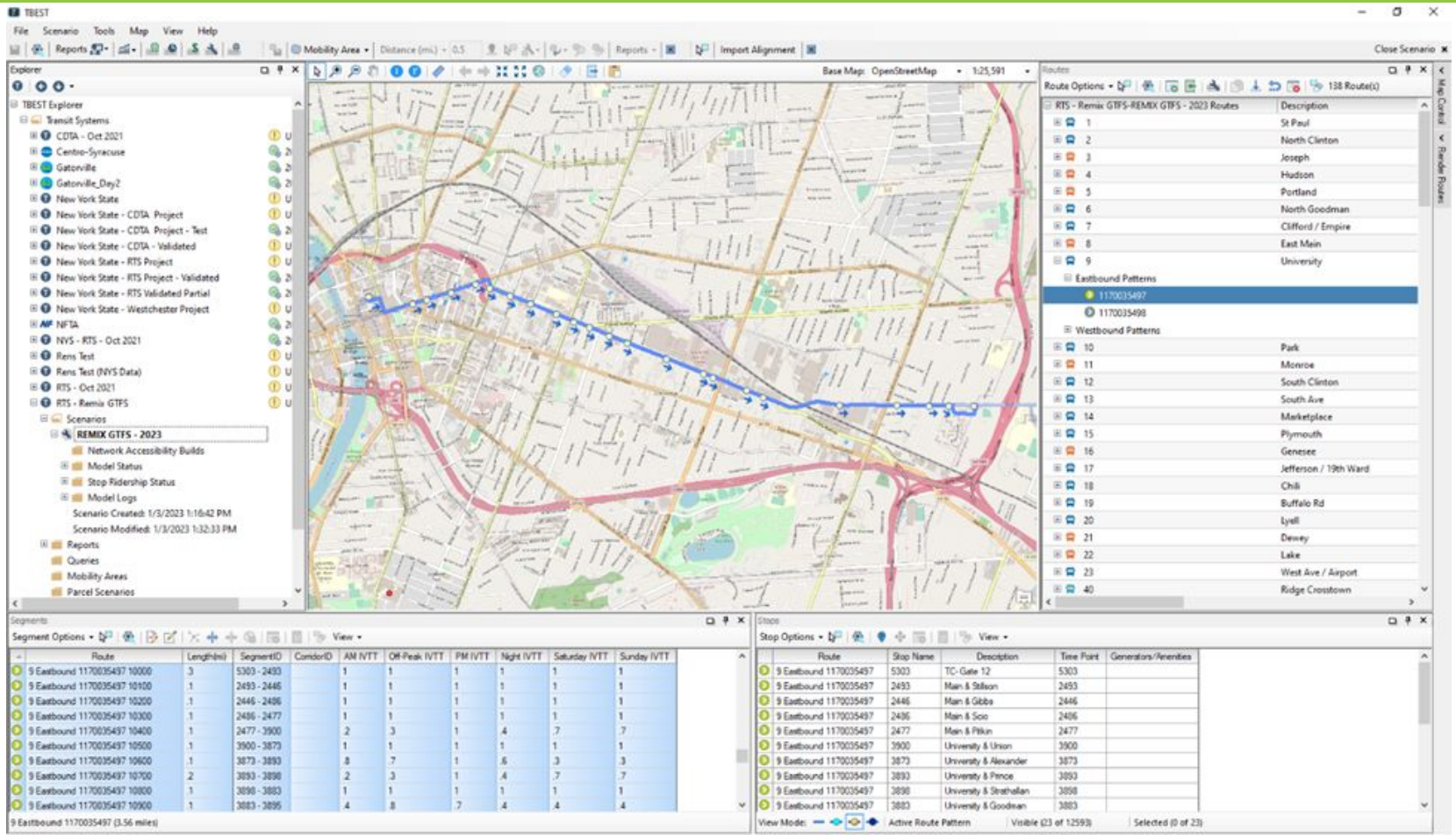
Analyses Performed

- Existing Conditions of Demographics Served
- Route Frequency Increase Cost Assessment
- Evaluate and compare each route with a composite score that incorporates all relevant attributes.

Software Used

- Remix
- TBEST
- Excel (Post-Processing)

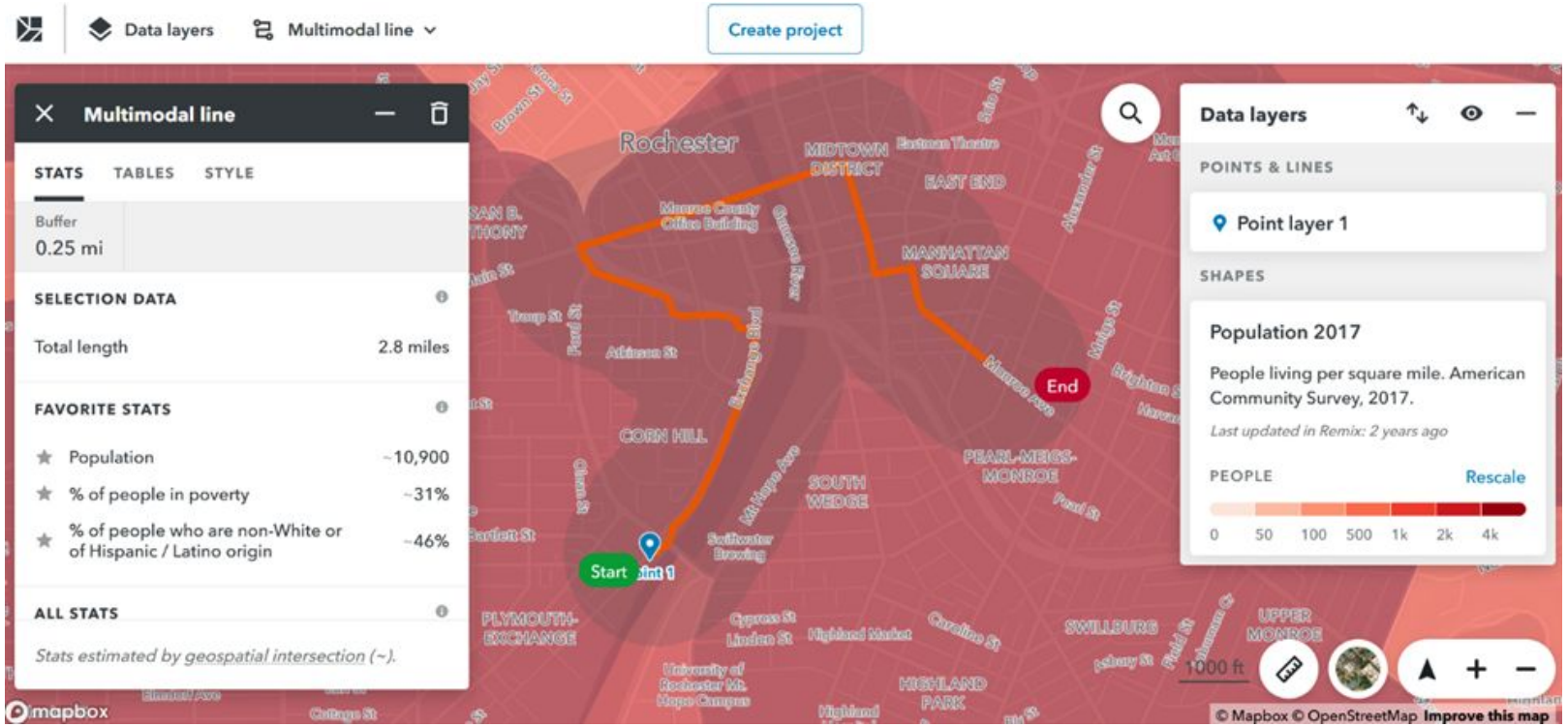
RTS Pilot - TBEST Stop-Level Demographics



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	59	168	0	49	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	59	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 - Patt	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	1,197	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	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	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	1,387	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
270 Maplewood Charlotte / Prince ... Pa	2,029	84	318	0	98	5	41	0	24	328	310	147	6,495	2,687	4,666	3,257

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	po					
1 St Paul - Pattern A	366	39.51262065	112	5.1						
2 North Clinton - Pattern A	480	53.3306178	76	4.7						
3 Joseph - Pattern A	536	59.98973531	61	3.6						
4 Hudson - Pattern A	537	60.12310845	60	4.1						
5 Portland - Pattern A	496	55.22104523	70	4.9						
6 North Goodman - Pattern A	420	46.00923006	98	5.0						
7 Clifford / Empire - Pattern A	484	53.74266824	73	7.5						
8 East Main - Pattern A	299	31.42198501	121	4.2						
9 University - Pattern A	396	43.11792577	103	3.6						
10 Park - Pattern A	423	46.3578121	96	4.2						
11 Monroe - Pattern A	312	32.99338949	119	9.5						
12 South Clinton - Pattern A	315	33.32446621	117	6.1						
13 South Ave - Pattern A	418	45.75671433	99	6.1						
14 Marketplace - Pattern A	323	34.25444521	114	10.2						
15 Plymouth - Pattern A	615	69.59959393	44	4.8						
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	

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
	workers who take public transit to work normalized	20
Service by Mile Normalized	essential jobs (work) normalized	20
$20K-$24.9K by Mile Normalized	people within 125% of the poverty threshold normalized	1
$25K-$29.9k by Mile Normalized	people within 150% of the poverty threshold normalized	1
$30K-$34.9K by Mile Normalized	people within 185% of the poverty threshold normalized	1
$35K-$39.9K by Mile Normalized	people within 200% of the poverty threshold normalized	1
	public housing buildings	1
	hospitals	10
	urgent care facilities	10
	nursing homes	10
	pharmacies	10
	Schools: Childcare and K-12	10
	colleges / universities	0
	supplemental colleges	0
	SNAP Retailer Supermarkets 2020	10
Commercial by Mile Normalized		0

RTS Pilot – Remix Results vs TBEST Results

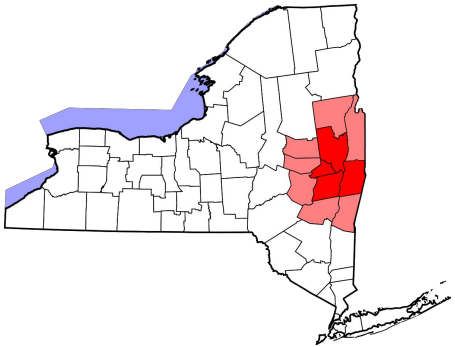
REMIX				TBEST		
Line	Composite Score	Composite Score Normalized	Rank	Composite Score Normalized	Composite Score	Line
753 19th Ward-Plym-City SE / Monroe - Pattern A	866.8	100.0	1	100.00	847.9	753 19th Ward-Plym-City SE / Monroe - Pattern A
450 N Goodman-Portland / Genesee - Pattern A	852.8	98.3	2	98.27	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

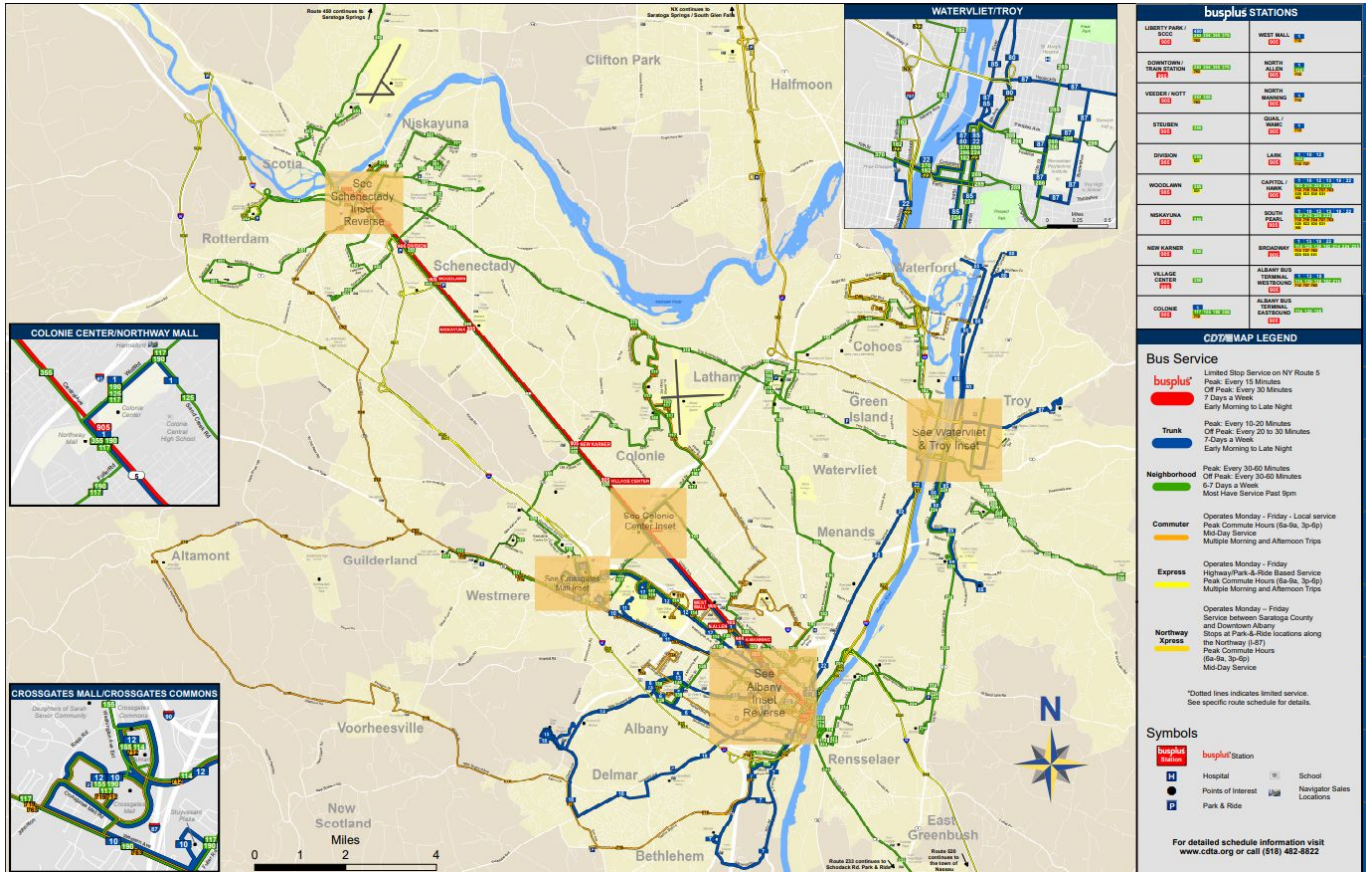
RTS Pilot – Remix Results vs TBEST Results

Takeaways

- 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





CDTA Troy Pilot

Needs Met

- I need to reconfigure the transit routes to better serve the population.
- I need to test the efficacy of the new system.

Questions Answered

- Where is the latent transit ridership in Troy, NY?
- How would ridership change based on the proposed route modifications?

Analyses Performed

- Conduct a gap analysis to determine where there is a mismatch between transit supply and demand.
- Conducted an origin-destination (O/D) analysis to understand prominent travel flows.
- Develop baseline ridership model that accurately reflects existing ridership.
- Develop modifications to existing service based on the gap and O/D analyses.
- Create a new ridership model for the modified service and compare it to the baseline model.

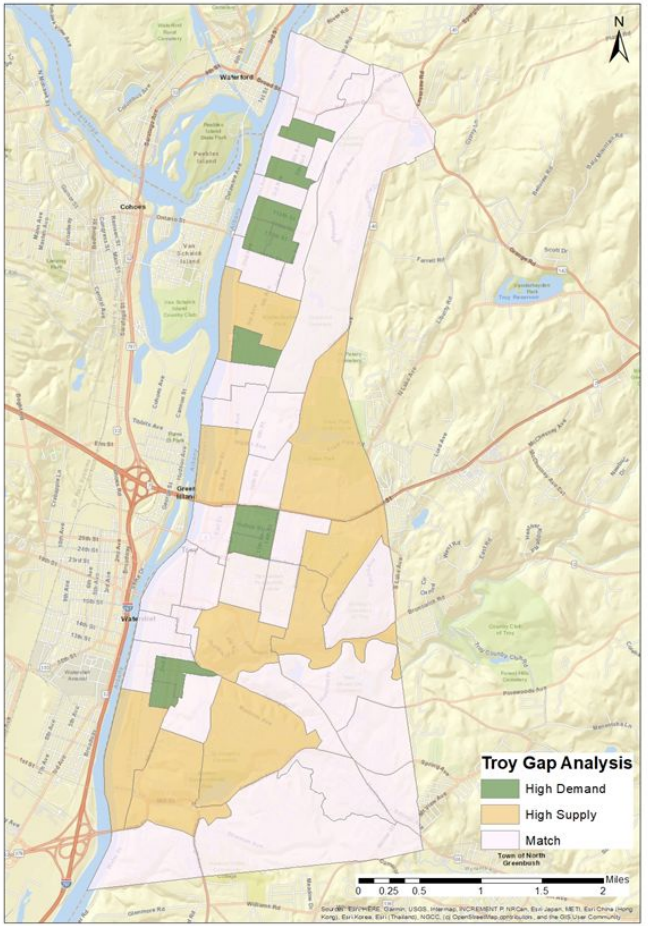
Software Used

- ESRI ArcGIS
- Remix
- TBEST

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

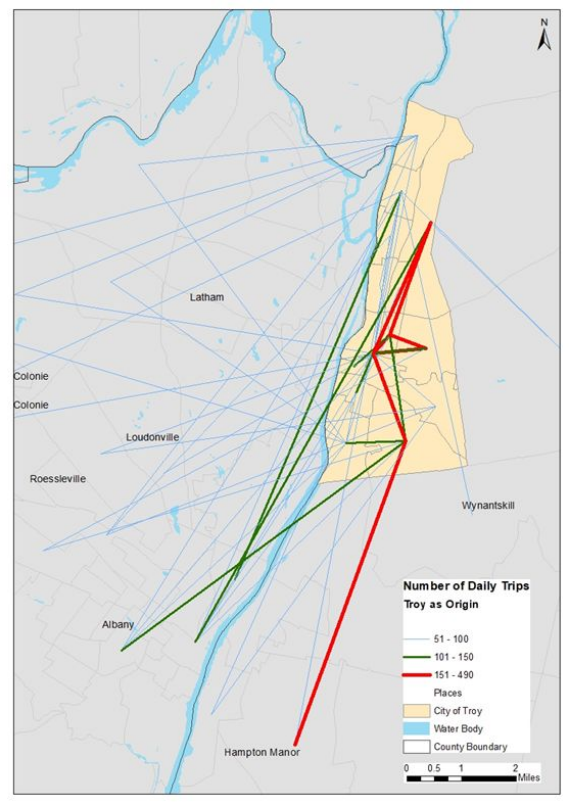


CDTA Troy Pilot - Origin/Destination Analysis

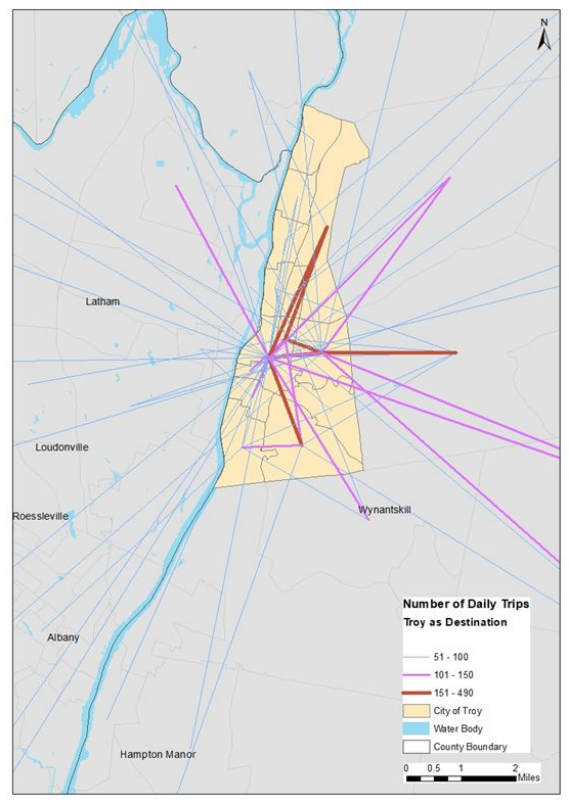
Objective: Identify the most prominent O/D links between Troy and all other communities in the Capital District.

- 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



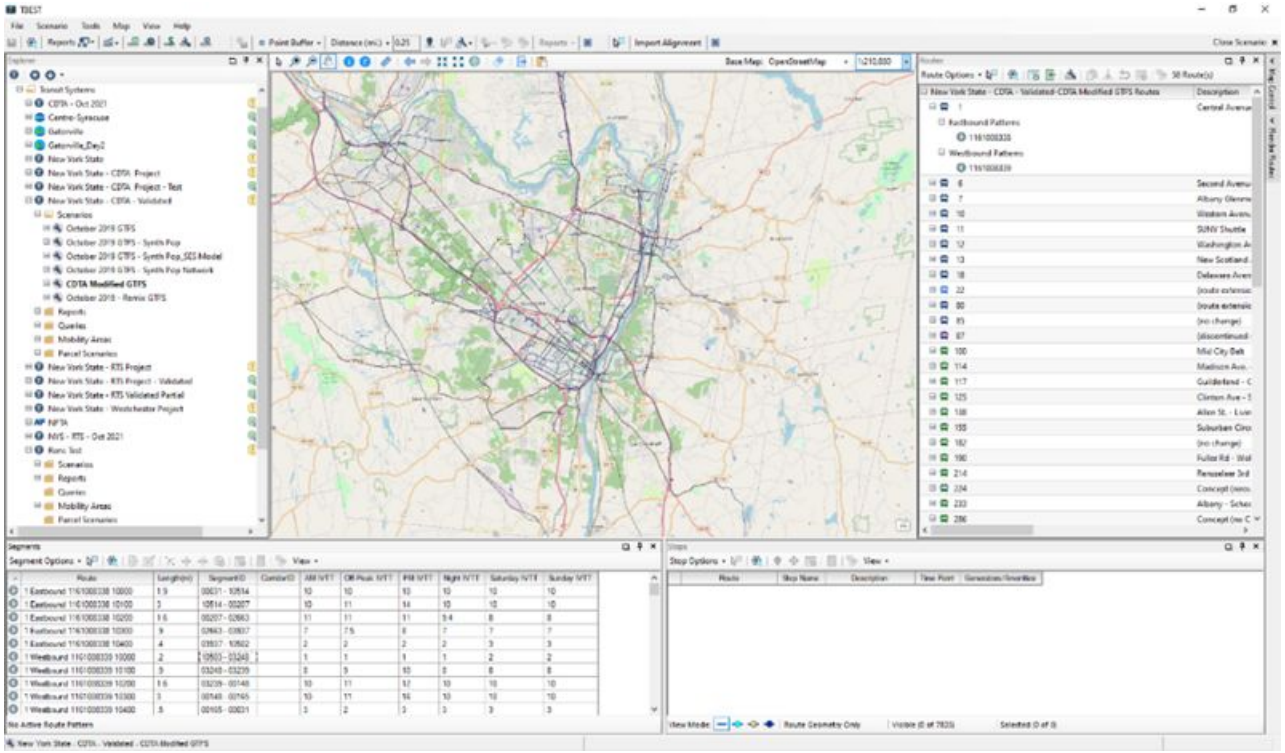
Troy as a Destination



CDTA Troy Pilot - Baseline Ridership Model

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

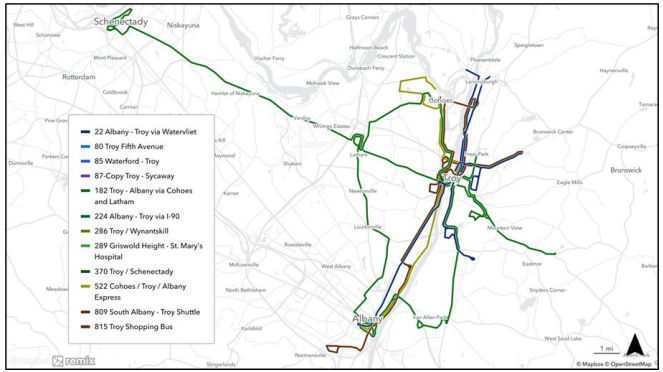
- Performed a sensitivity analysis by systematically adjusting TBEST's ridership model coefficients to align outputs with CDTA APC.



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.



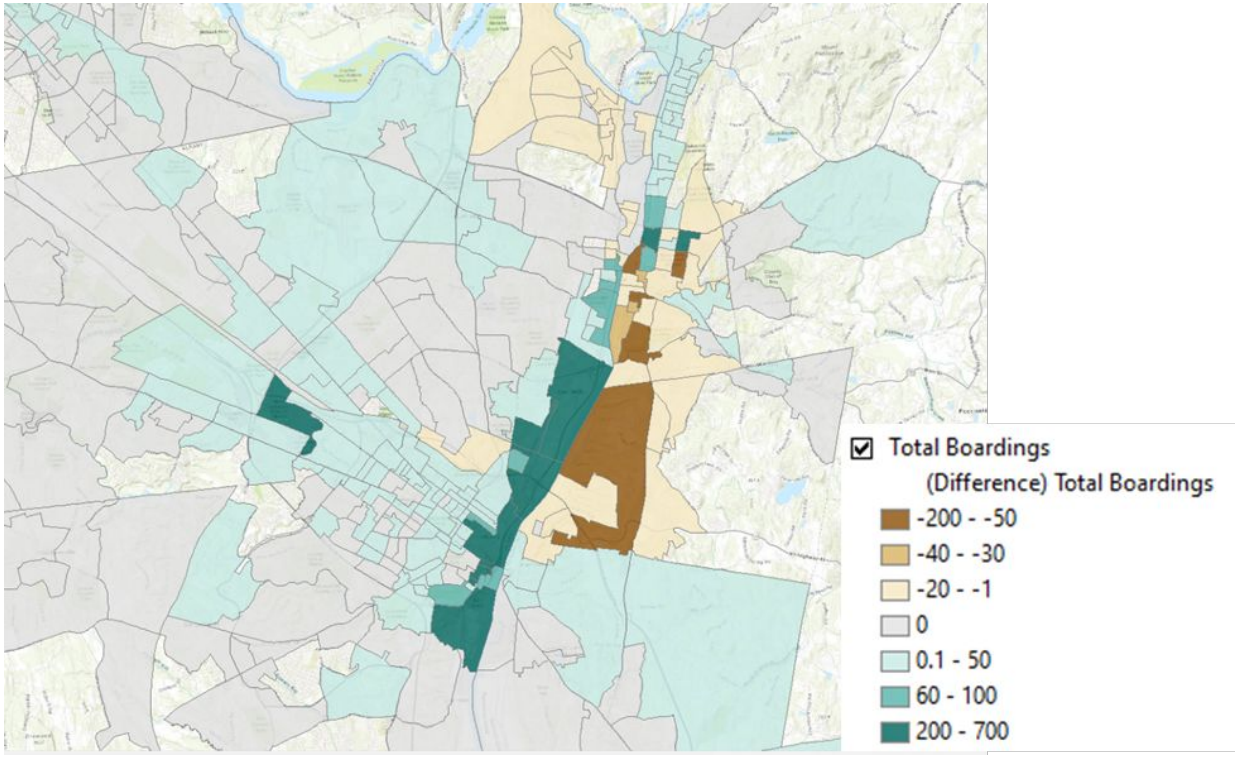
Troy Routes (October 2019)

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

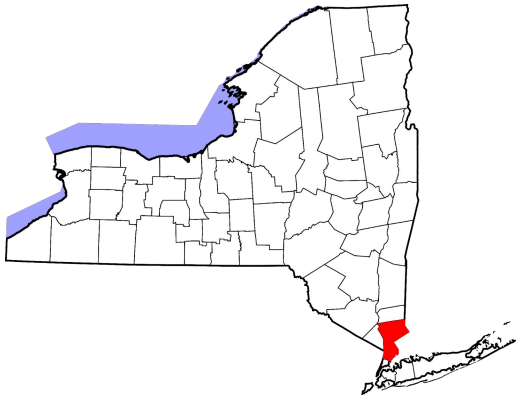
CDTA Troy Pilot - Ridership Projection Model

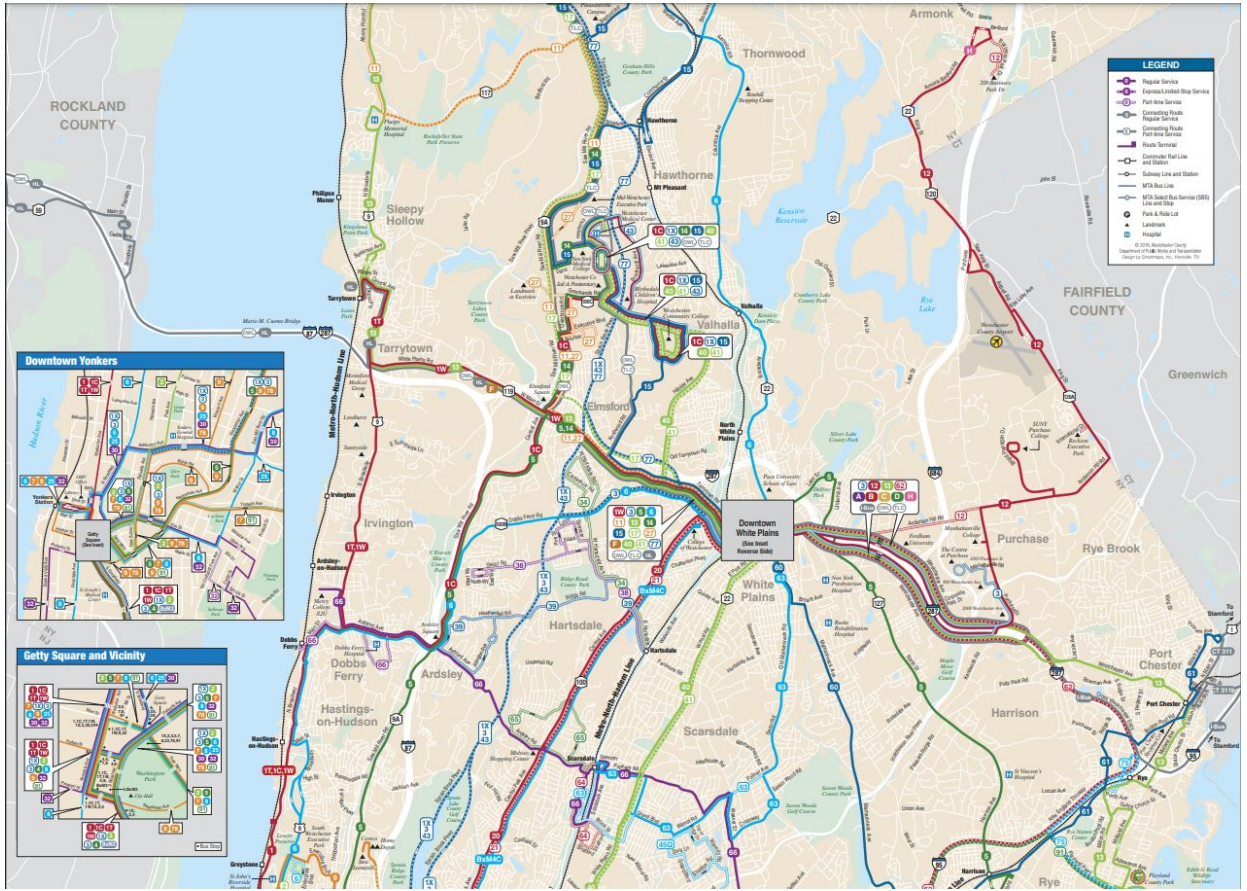
Objective: create a new ridership model for the modified service and compare it to the baseline model.

- 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

- I need to determine what systemic travel times impacts occur if a specific route is changed.
- I need to create a transit network ecosystem to better understand systemic changes.

Questions Answered

- How long does it take to travel to and from select O-D in the current system?
- What systemic travel time changes occur if a select route is truncated or removed?

Analyses Performed

- Create a transit network ecosystem.
- Construct an existing conditions baseline of travel times from select O-Ds.
- Adjust the GTFS network to reflect route variants: removal and truncation.
- Compare the GTFS variants to the baseline O-D travel times.

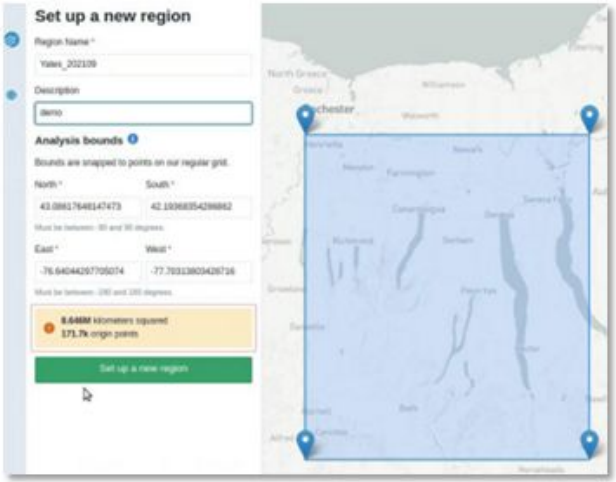
Software Used

- Conveyal
- Excel

Westchester Pilot - Conveyal Transit Network Ecosystem

GTFS Bundling

Setting Geographic Boundaries

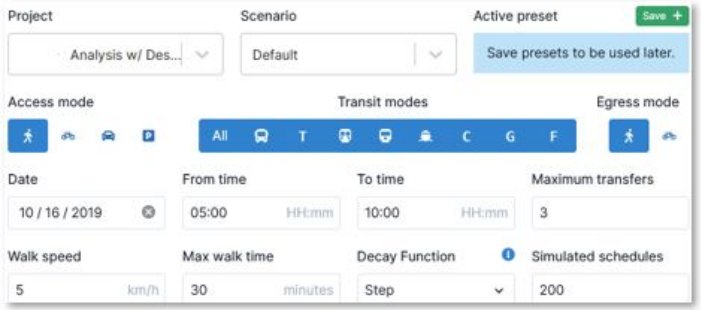


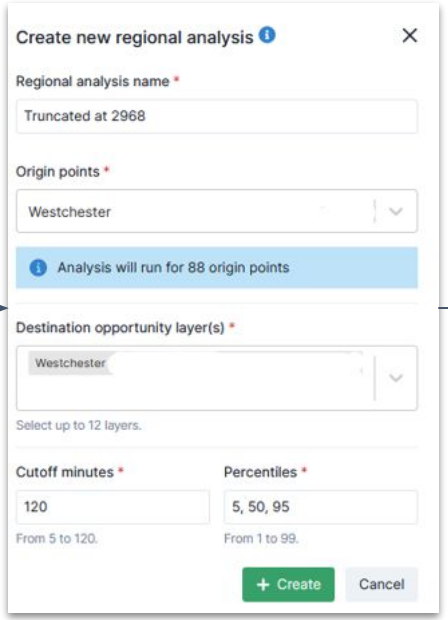
Identifying Key Origin and Destinations

	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





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

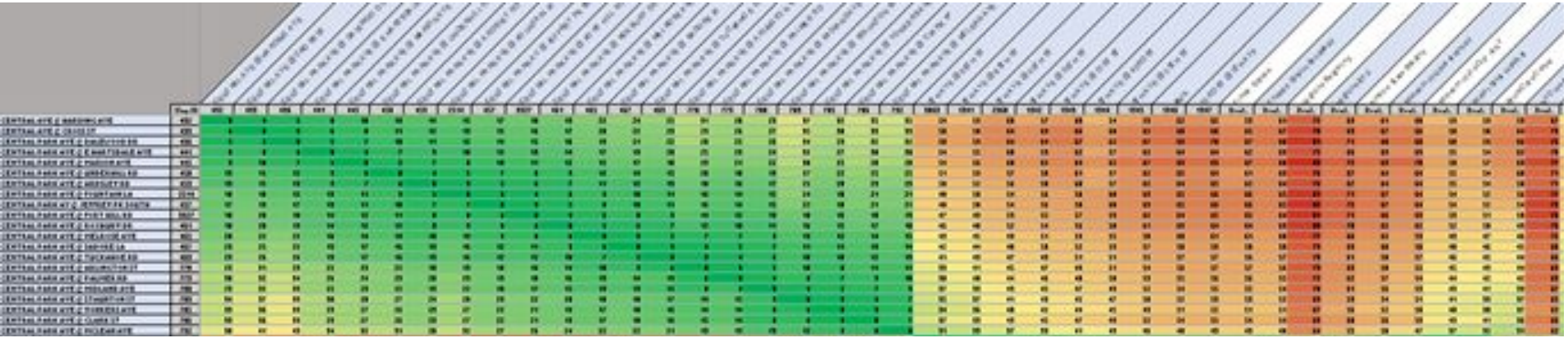
Constructing Travel Time Matrices

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
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

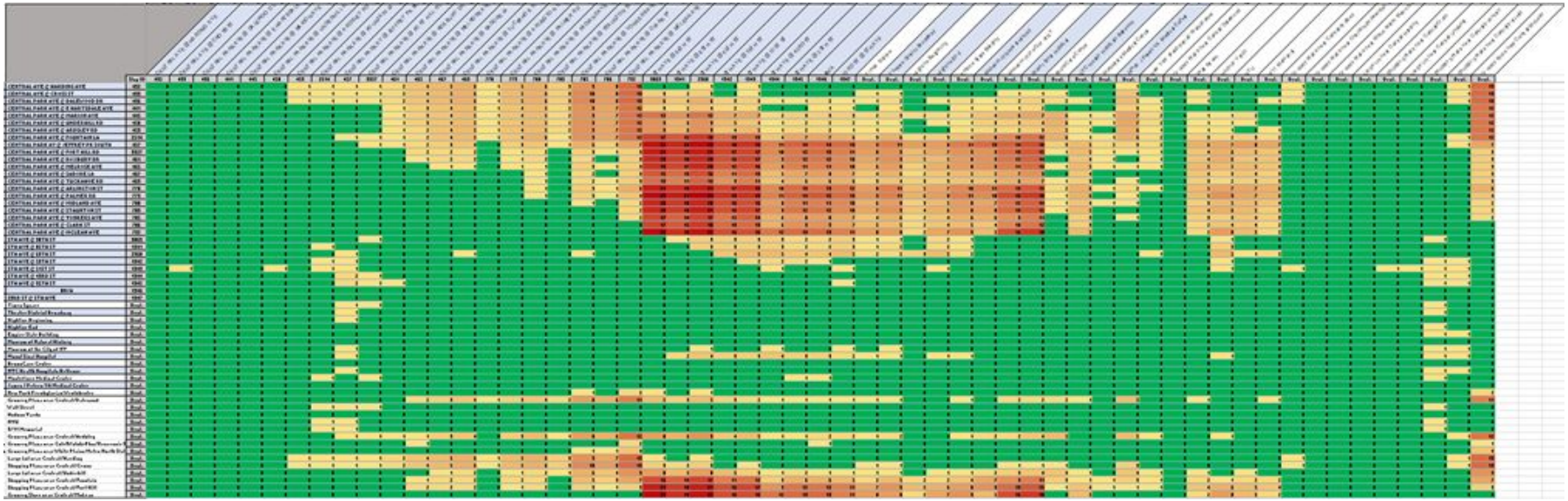
Westchester Pilot - Conveyal Existing Conditions Analysis

A Full Travel Time Matrix



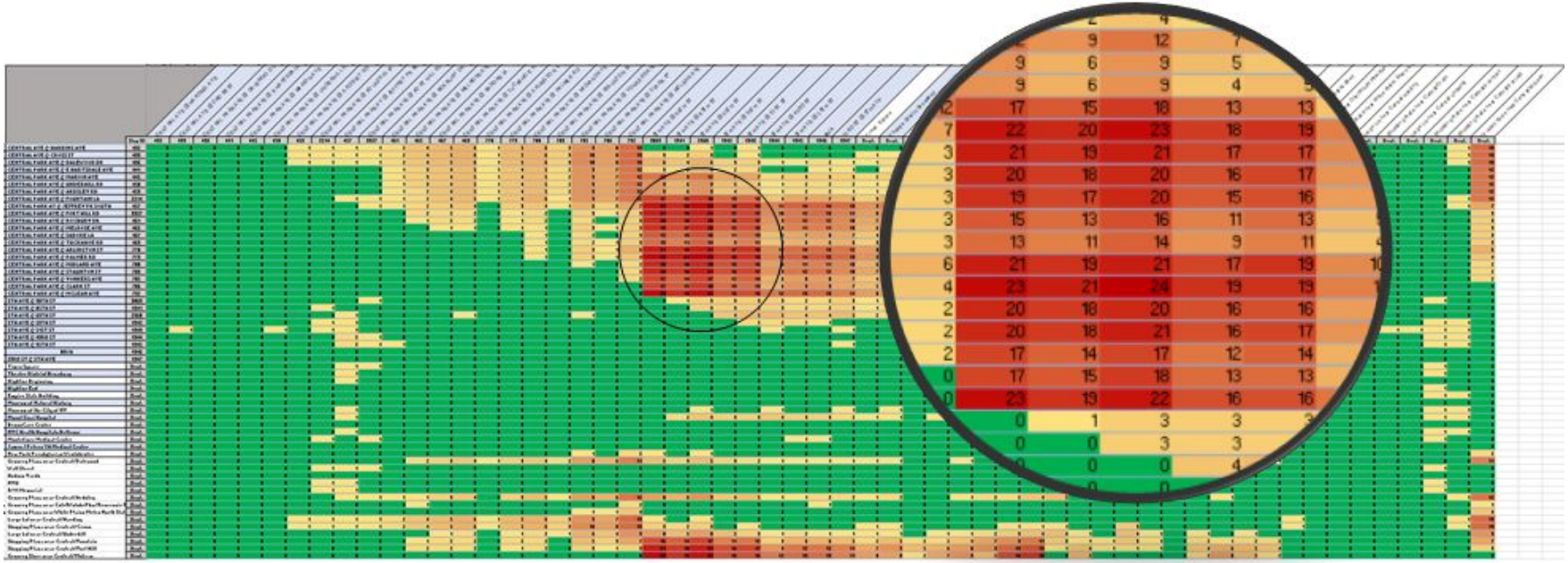
Westchester County - Travel Time Difference Matrices

Difference Between Existing Condition and Route Removal

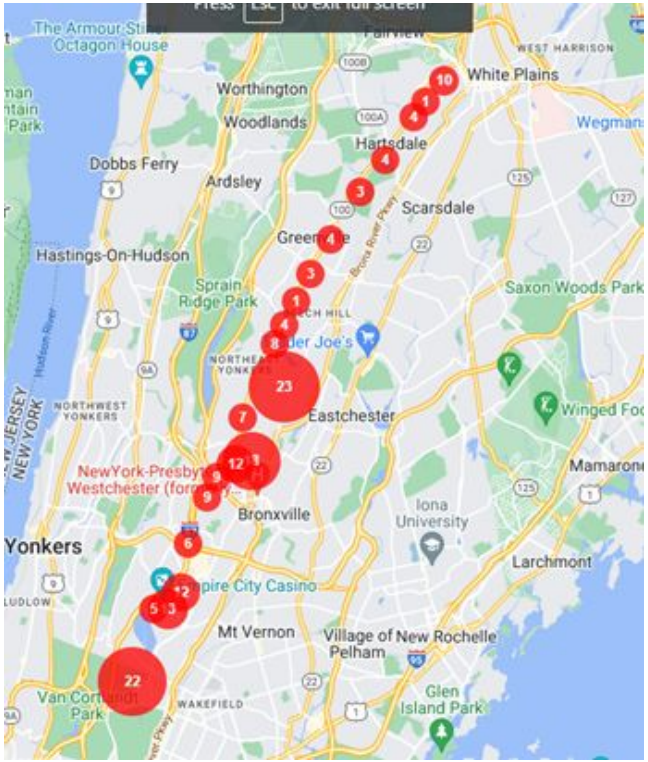


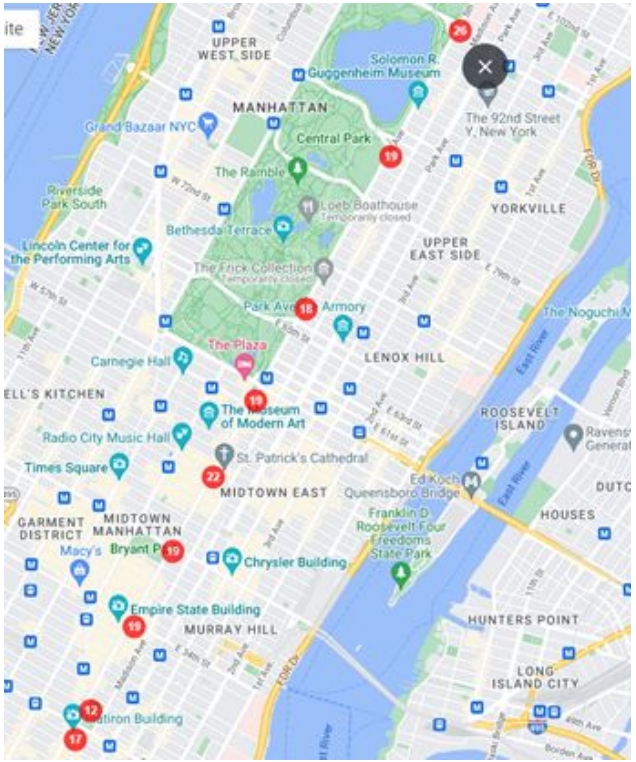
Westchester County - Travel Time Difference Matrices

Difference Between Existing Condition and Route Removal



Westchester County - Travel Time Difference Matrices

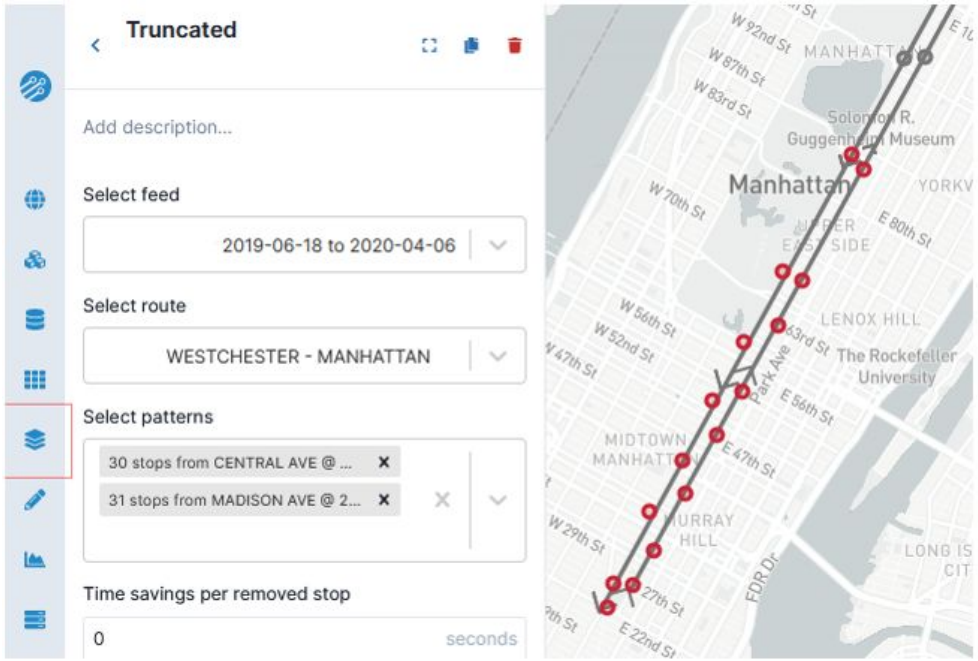




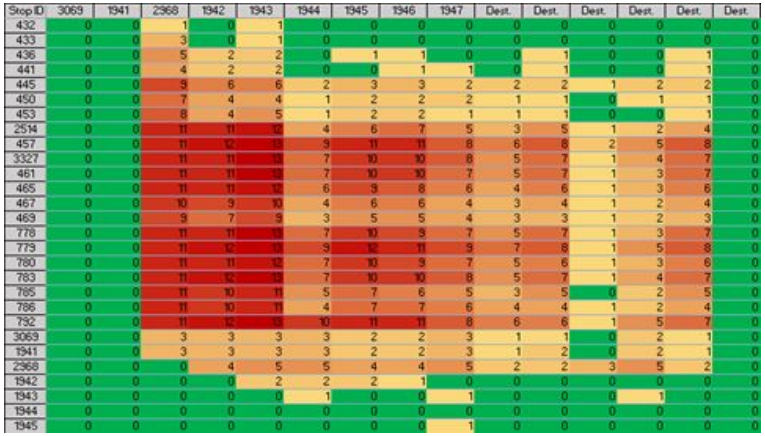
Westchester County - Conveyal Route Modification

Modification Scenarios

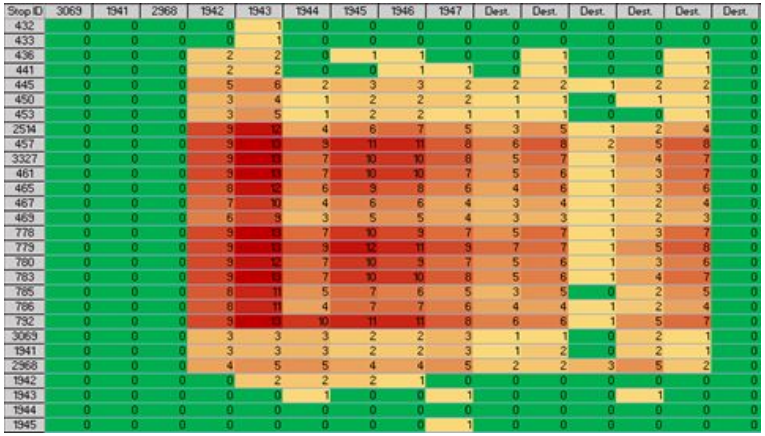
- Truncation at Stop 3069
- Truncation at Stop 1941
- Truncation at Stop 2968
- Truncation at Stop 1942
- Truncation at Stop 1943
- Entire Route Removal



Westchester County - Truncation Sensitivity Analysis



Stop ID	3069	1941	2968	1942	1943	1944	1945	1946	1947	Dest.	Dest.	Dest.	Dest.	Dest.	Dest.
432	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0
433	0	0	3	0	1	0	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	1	0	0	1	0
445	0	0	9	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	12	4	6	7	5	3	5	1	2	4	0
457	0	0	11	12	13	9	11	11	8	6	8	2	5	8	0
3327	0	0	11	11	13	7	10	10	8	5	7	1	4	7	0
461	0	0	11	11	13	7	10	10	7	5	7	1	3	7	0
465	0	0	11	11	12	6	9	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	9	3	5	5	4	3	3	1	2	3	0
778	0	0	11	11	13	7	10	9	7	5	7	1	3	7	0
779	0	0	11	12	13	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	13	7	10	10	8	5	7	1	4	7	0
785	0	0	11	10	11	5	7	6	5	3	5	0	2	5	0
786	0	0	11	10	11	4	7	7	6	4	4	1	2	4	0
792	0	0	11	12	13	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
2968	0	0	0	4	5	5	4	4	5	2	2	3	5	2	0
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	0	1	0	0	0	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	2968	1942	1943	1944	1945	1946	1947	Dest.	Dest.	Dest.	Dest.	Dest.	Dest.
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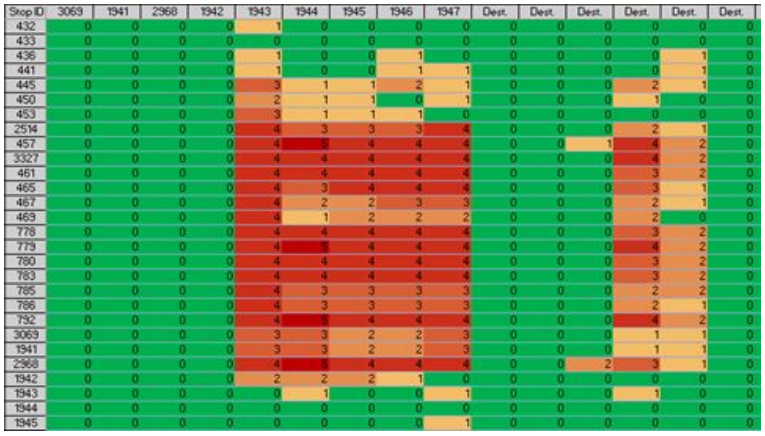
433	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
436	0	0	0	2	2	0	1	1	0	0	1	0	0	1	0
441	0	0	0	2	2	0	0	1	1	0	1	0	0	1	0
445	0	0	0	5	6	2	3	3	2	2	2	1	2	2	0
450	0	0	0	3	4	1	2	2	2	1	1	0	1	1	0
453	0	0	0	3	5	1	2	2	1	1	1	0	0	1	0
2514	0	0	0	9	12	4	6	7	5	3	5	1	2	4	0
457	0	0	0	9	13	9	11	11	8	6	8	2	5	8	0
3327	0	0	0	9	13	7	10	10	8	5	7	1	4	7	0
461	0	0	0	9	13	7	10	10	7	5	6	1	3	7	0
465	0	0	0	8	12	6	9	8	6	4	6	1	3	6	0
467	0	0	0	7	10	4	6	6	4	3	4	1	2	4	0
469	0	0	0	6	9	3	5	5	4	3	3	1	2	3	0
778	0	0	0	9	13	7	10	9	7	5	7	1	3	7	0
779	0	0	0	9	13	9	12	11	9	7	7	1	5	8	0
780	0	0	0	9	12	7	10	9	7	5	6	1	3	6	0
783	0	0	0	9	13	7	10	10	8	5	6	1	4	7	0
785	0	0	0	8	11	5	7	6	5	3	5	0	2	5	0
786	0	0	0	8	11	4	7	7	6	4	4	1	2	4	0
792	0	0	0	9	13	10	11	11	8	6	6	1	5	7	0
3069	0	0	0	3	3	3	2	2	3	1	1	0	2	1	0
1941	0	0	0	3	3	3	2	2	3	1	2	0	2	1	0
2968	0	0	0	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	0	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	2968	1942	1943	1944	1945	1946	1947	Dest.	Dest.	Dest.	Dest.	Dest.	Dest.
432	0	0	0	0	1	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	1	0	0	1	0	0	0	0	0	1	0
441	0	0	0	0	1	0	0	1	1	0	0	0	0	1	0
445	0	0	0	0	3	1	1	2	1	0	0	0	2	1	0
450	0	0	0	0	2	1	1	0	1	0	0	0	1	0	0
453	0	0	0	0	3	1	1	1	0	0	0	0	0	0	0
2514	0	0	0	0	4	3	3	3	4	0	0	0	2	1	0
457	0	0	0	0	4	4	4	4	4	0	0	1	4	2	0
3327	0	0	0	0	4	4	4	4	4	0	0	0	4	2	0
461	0	0	0	0	4	4	4	4	4	0	0	0	3	2	0
465	0	0	0	0	4	3	4	4	4	0	0	0	3	1	0
467	0	0	0	0	4	2	2	3	3	0	0	0	2	1	0
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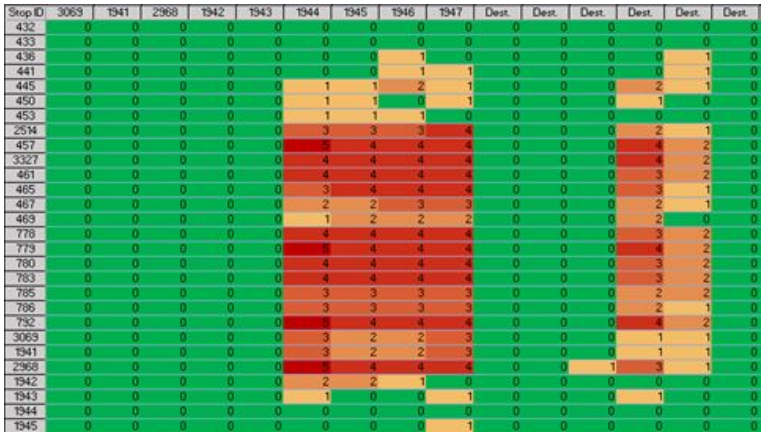
780	0	0	0	0	4	4	4	4	4	0	0	0	3	2	0
783	0	0	0	0	4	4	4	4	4	0	0	0	3	2	0
785	0	0	0	0	4	3	3	3	3	0	0	0	2	2	0
786	0	0	0	0	4	3	3	3	3	0	0	0	2	1	0
792	0	0	0	0	4	5	4	4	4	0	0	0	4	2	0
3069	0	0	0	0	3	3	2	2	3	0	0	0	1	1	0
1941	0	0	0	0	3	3	2	2	3	0	0	0	1	1	0
2968	0	0	0	0	4	5	4	4	4	0	0	2	3	1	0
1942	0	0	0	0	2	2	2	1	0	0	0	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	0	1	0	0	0	0	0



Stop ID	3069	1941	2968	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	1	0	0	0	0	0	1	0
441	0	0	0	0	0	0	0	1	1	0	0	0	0	1	0
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450	0	0	0	0	0	1	1	0	1	0	0	0	1	0	0
453	0	0	0	0	0	1	1	1	0	0	0	0	0	0	0
2514	0	0	0	0	0	3	3	3	4	0	0	0	2	1	0
457	0	0	0	0	0	5	4	4	4	0	0	0	4	2	0
3327	0	0	0	0	0	4	4	4	4	0	0	0	4	2	0
461	0	0	0	0	0	4	4	4	4	0	0	0	3	2	0
465	0	0	0	0	0	3	4	4	4	0	0	0	3	1	0
467	0	0	0	0	0	2	2	3	3	0	0	0	2	1	0
469	0	0	0	0	0	1	2	2	2	0	0	0	2	0	0
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780	0	0	0	0	0	4	4	4	4	0	0	0	3	2	0
783	0	0	0	0	0	4	4	4	4	0	0	0	3	2	0
785	0	0	0	0	0	3	3	3	3	0	0	0	2	2	0
786	0	0	0	0	0	3	3	3	3	0	0	0	2	1	0
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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

The Playbook

A Decision Support Tool for Planners and Analysts

Needs Met

Questions Answered

Analyses Performed

Software Used

Playbook - Overview

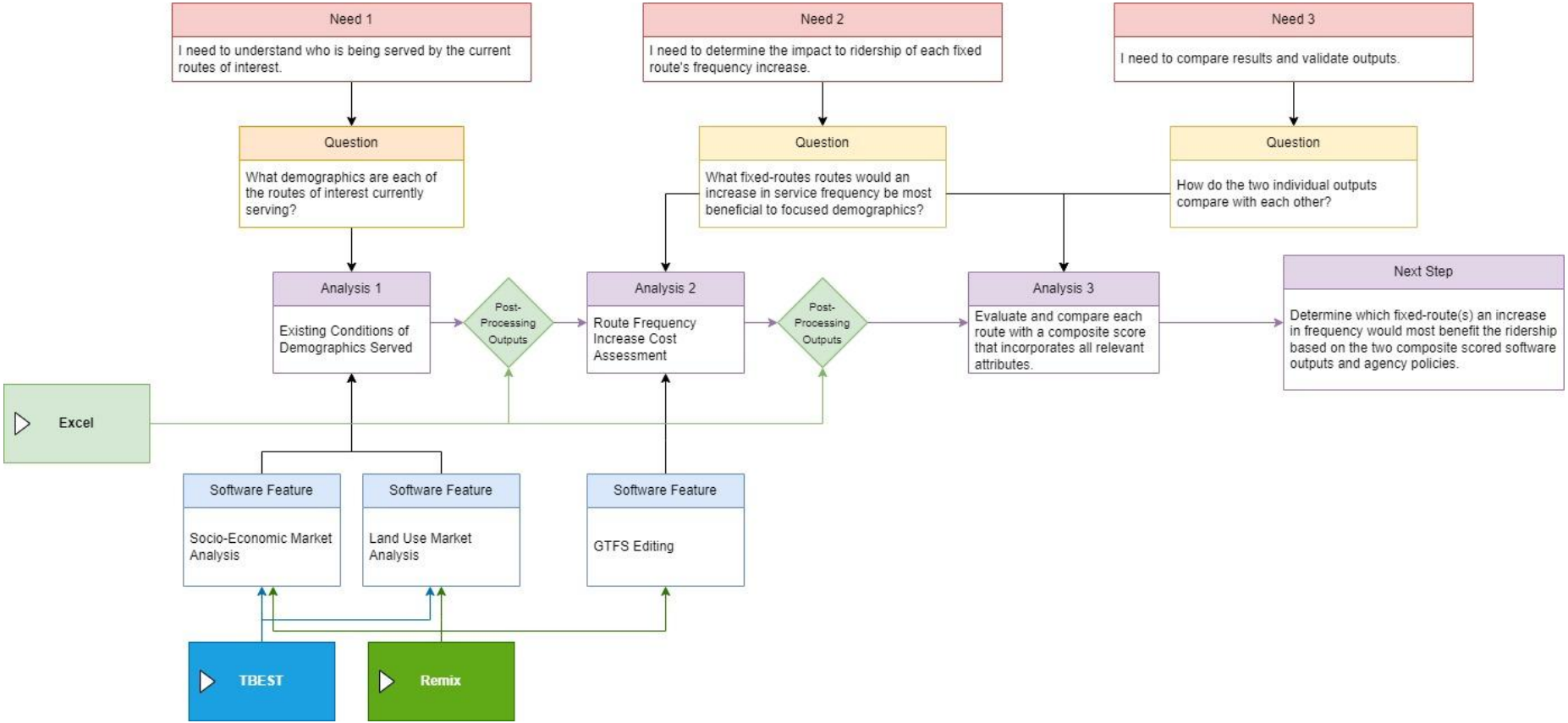
- The Playbook is a catalog of replicable transit analysis workflows intended as a reference for planners and analysts.

- Designed as a living document to centralize and standardize valuable workflows across the state.

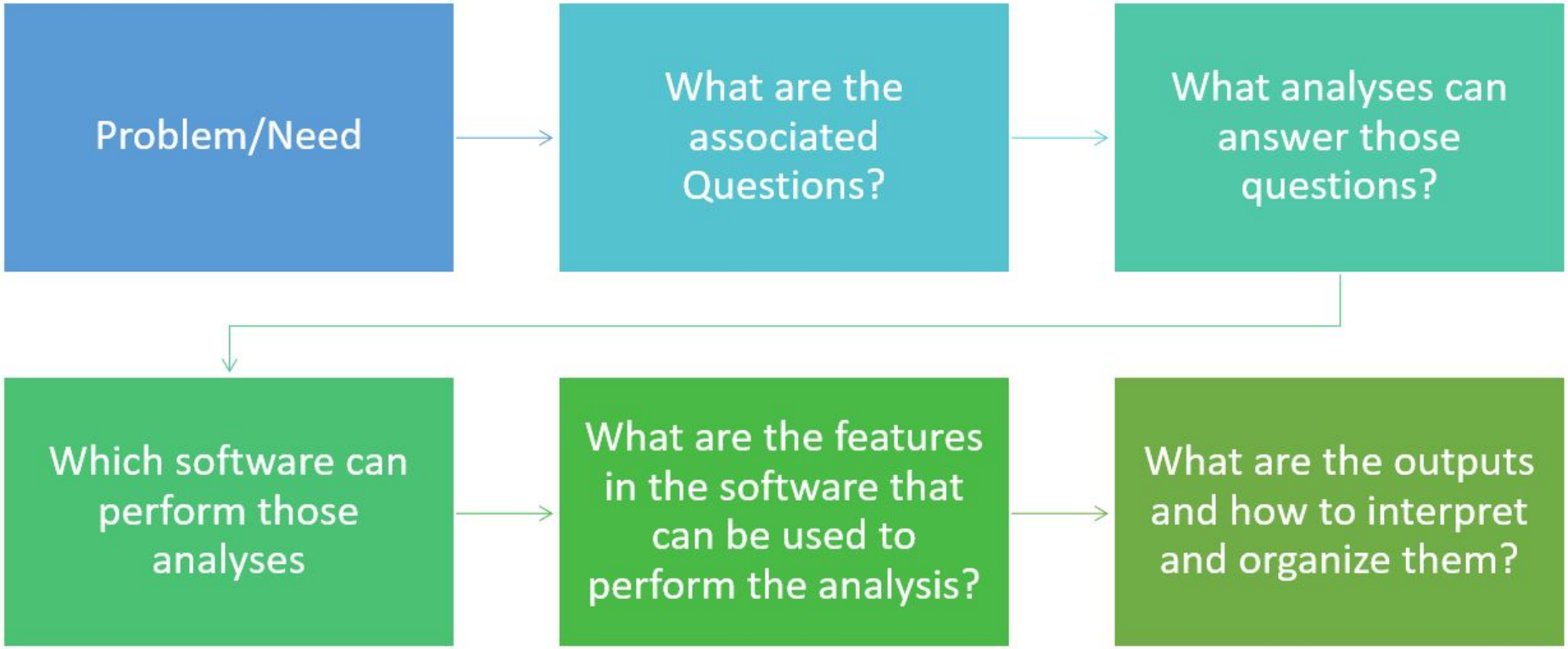
- Rubric for Transit Planning Analyses
  - **Needs Met**
  - **Questions Answered**
  - **Analyses Performed**
  - **Software Used**

- 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

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

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

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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