NORTHERN VIRGINIA TRANSPORTATION COMMISSION

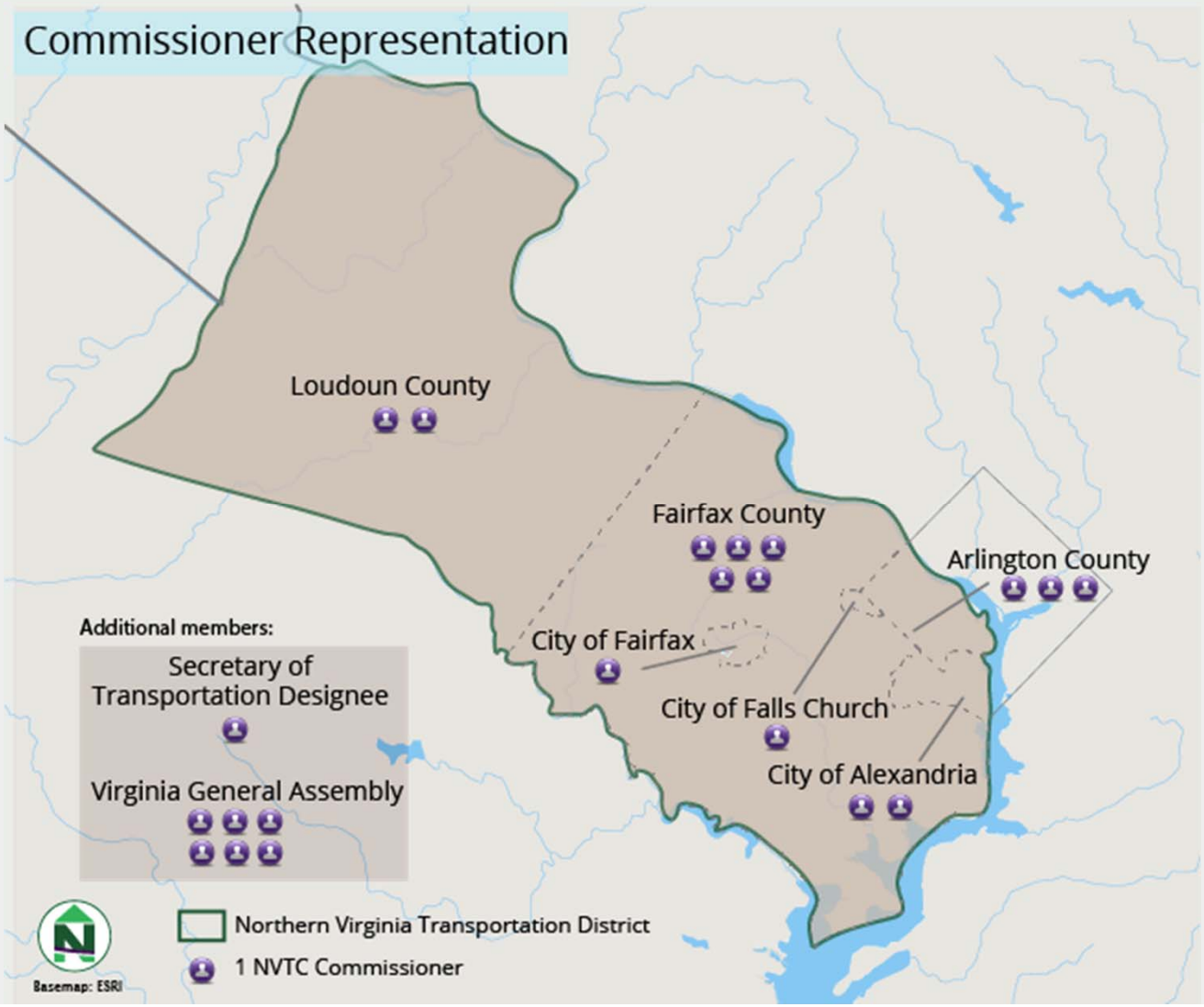
REGIONAL BUS AGENDA UPDATE & TBEST APPLICATION

PRESENTED TO: TPB REGIONAL PUBLIC TRANSPORTATION SUBCOMMITTEE

PRESENTED BY: DAN GOLDFARB, PE
TRANSIT PLANNER

NOVEMBER 27, 2018

Northern Virginia Transportation Commission



NVTC Jurisdictions:

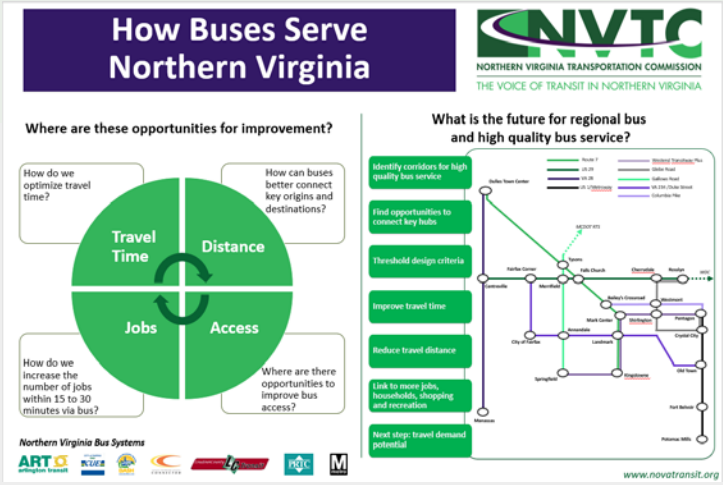
- Loudoun County
- Arlington County
- Fairfax County
- City of Alexandria
- City of Fairfax
- City of Falls Church

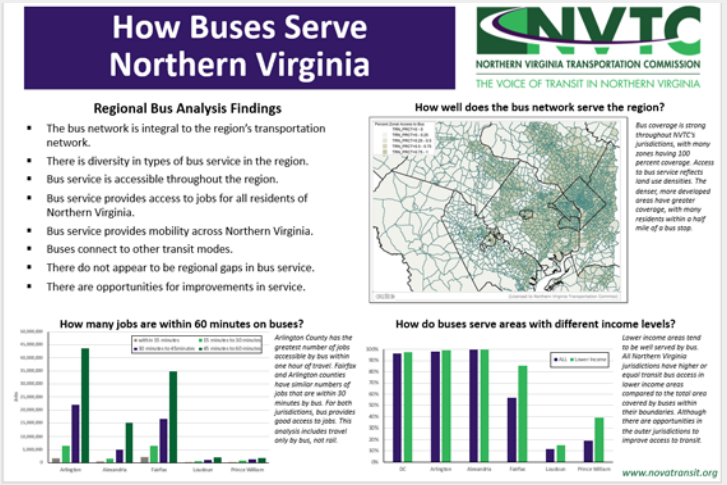
All of NVTC's jurisdictions are members of the Washington Metropolitan Area Transit Zone established by the WMATA Compact.

Northern Virginia Transportation Commission

Where we are with Regional Bus Agenda?

- Regional Bus Agenda 1.0 Completed
- Macro Level Evaluation
- Focus Regional Operations
- “Regional” is Northern Virginia





What were the findings?

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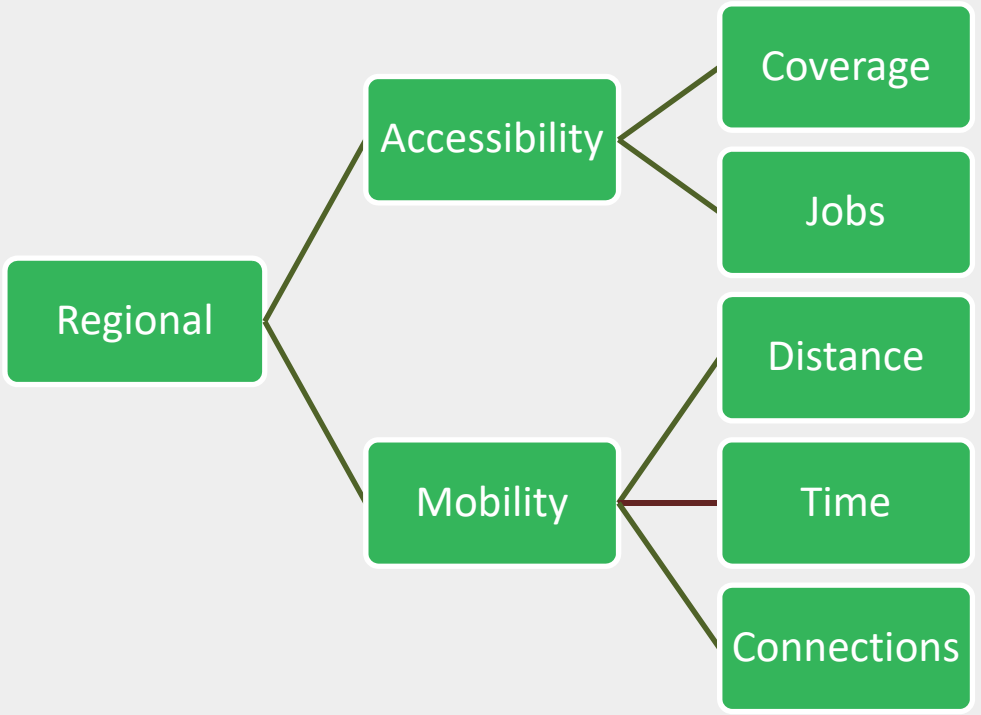
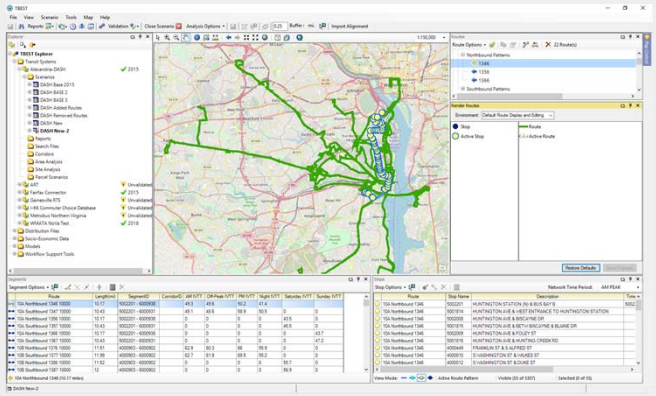
- ✓ Bus is an important mode in the region.
- ✓ There are many different types of bus service in the region.
- ✓ Bus service covers Northern Virginia's population well.
- ✓ Bus service provides access to jobs for all residents of Northern Virginia.
- ✓ Bus service provides mobility across Northern Virginia.
- ✓ Buses connect to other transit modes.
- ✓ There does not appear to be any regional gaps in bus service.
- ✓ There are opportunities for improvements in service.



What now…

- Regional Bus Agenda 2.0
- Builds On Regional Bus Agenda 1.0
- Three Initiatives
- Marco and Micro Analysis
- Regional in Scope



Regional Bus Agenda 2.0

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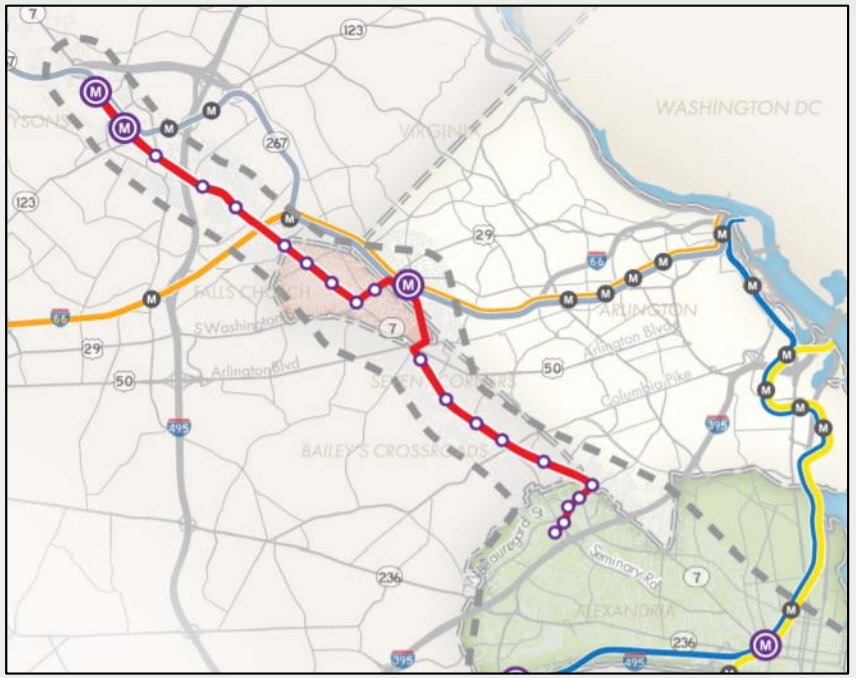
1st Initiative

- Envision Route 7
  - Feasibility (Phase I)
  - Mode & Alignment Refinements (Phase II)
  - **Conceptual Engineering Study (Phase III)**
  - Traffic Impacts (Phase IV)
  - Environmental (Phase (V)
  - Design (Phase V)
  - Service Planning (Phase VI)



Regional Bus Agenda 2.0

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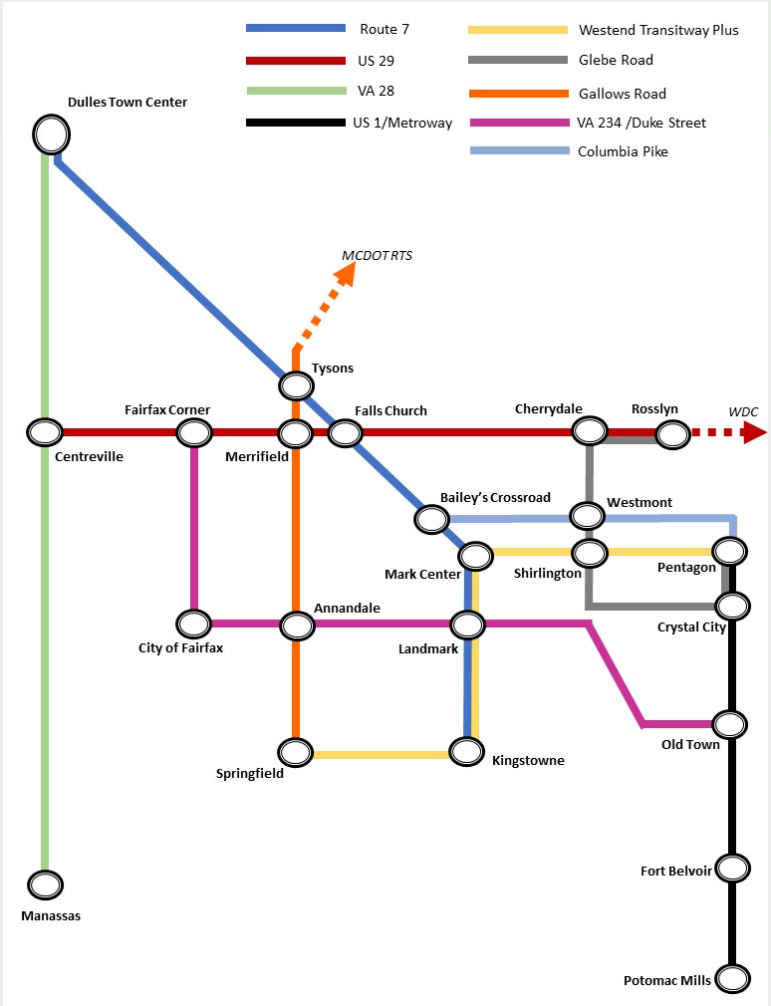
2nd Initiative

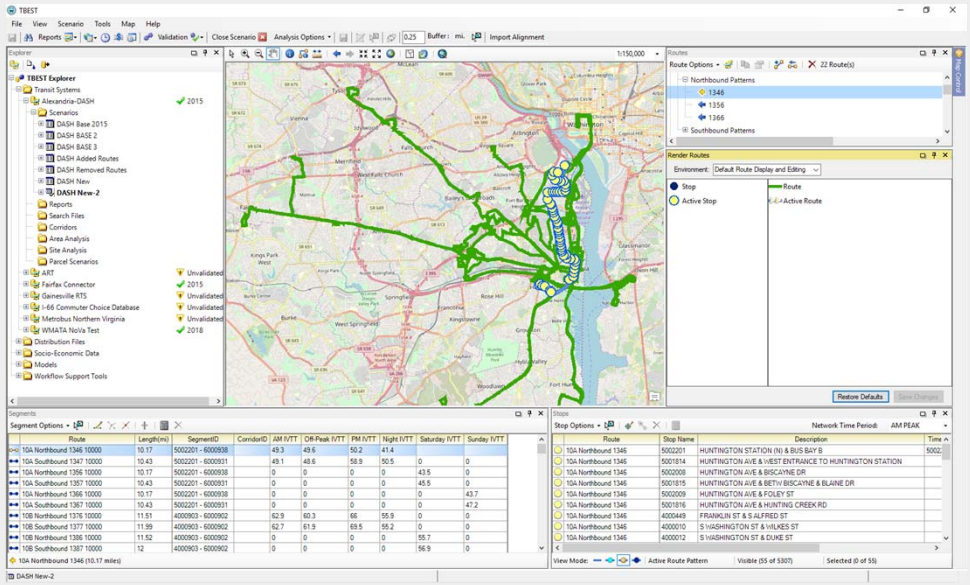
- Regional BRT
  - Included in TransAction
  - Coordination with other Regional Jurisdictions and Agencies
  - TPB Regional Public Transportation Subcommittee
  - NOVA BRT Network Developing Ridership Forecast, Shifts in Mode Share



Regional Bus Agenda 2.0

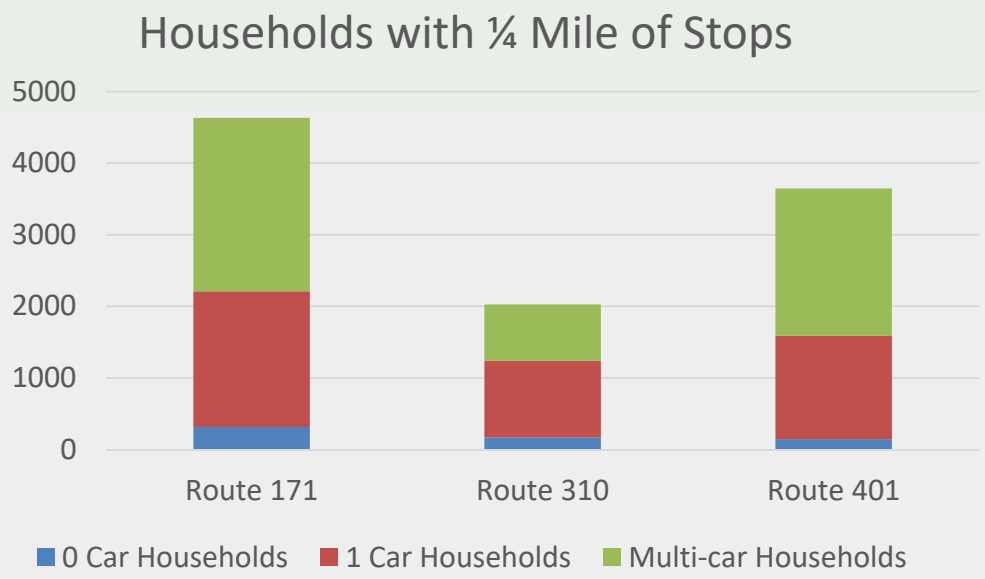
3rd Initiative

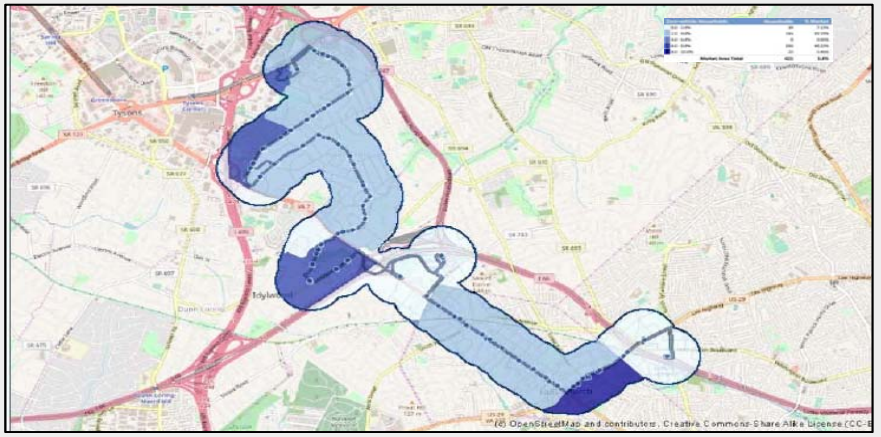
- Transit Database
  - Regional Database Bus Routes
  - Weekday, Saturday, and Sunday
  - Weekday AM, Midday, PM, Nighttime
  - Stop Level Ridership
  - Incorporate Ridership Model
  - TBEST – Transit Boarding Estimation and Simulation Tool



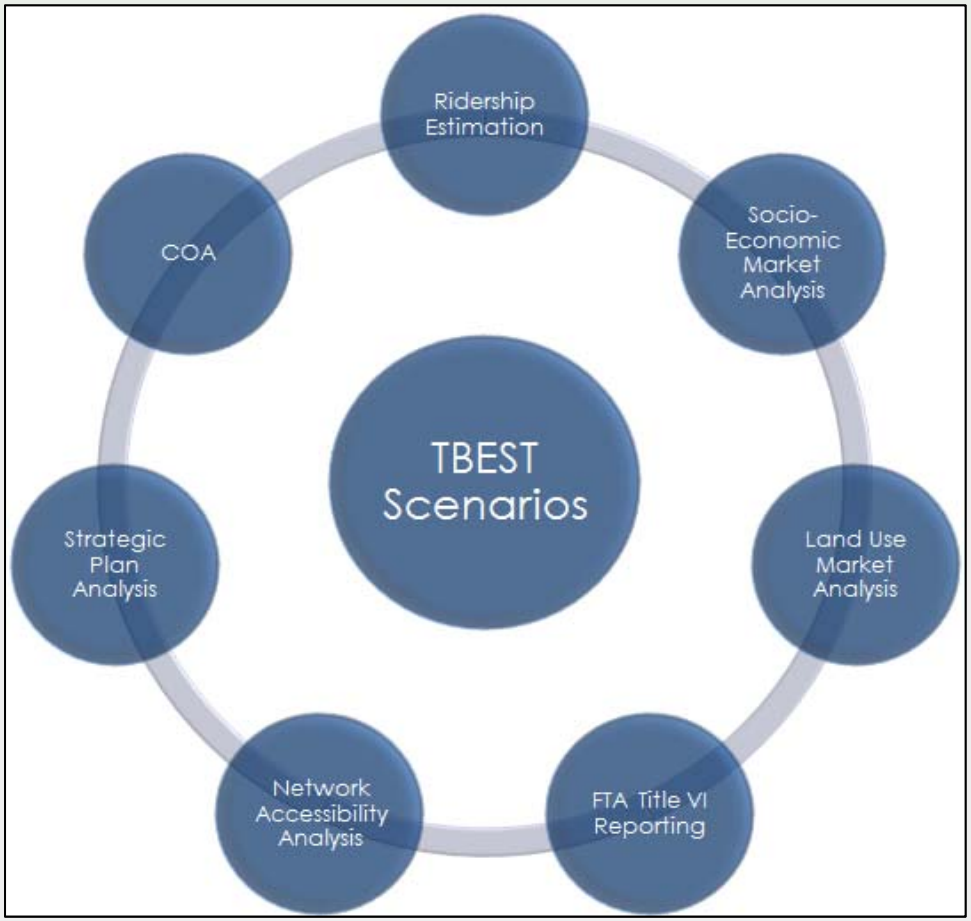
What is TBEST?

- Direct Modeling Tool
- Short Range Forecasting
- Inputs – Bus Network, Land Use, Socio-Economic Data
- Evaluate Changes in Services
  - Ridership
  - Cost
  - Socio-Economic Analysis (Title VI Environmental Justice Impacts)





NVTC's Objective



- Understand Bus Operations at the Regional Level (Northern Virginia)
- Non-Jurisdictional Focus
- Opportunities for Improved Connections and Mobility
- Support Regional Planning
- Support Jurisdictional Planning
- Valued Added Service

TBEST Overview

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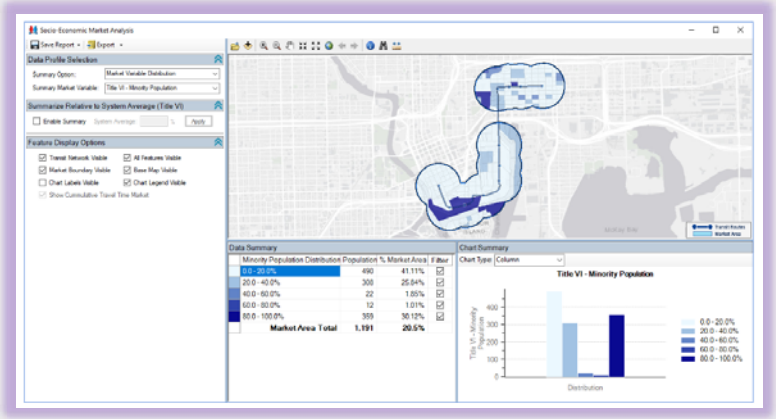
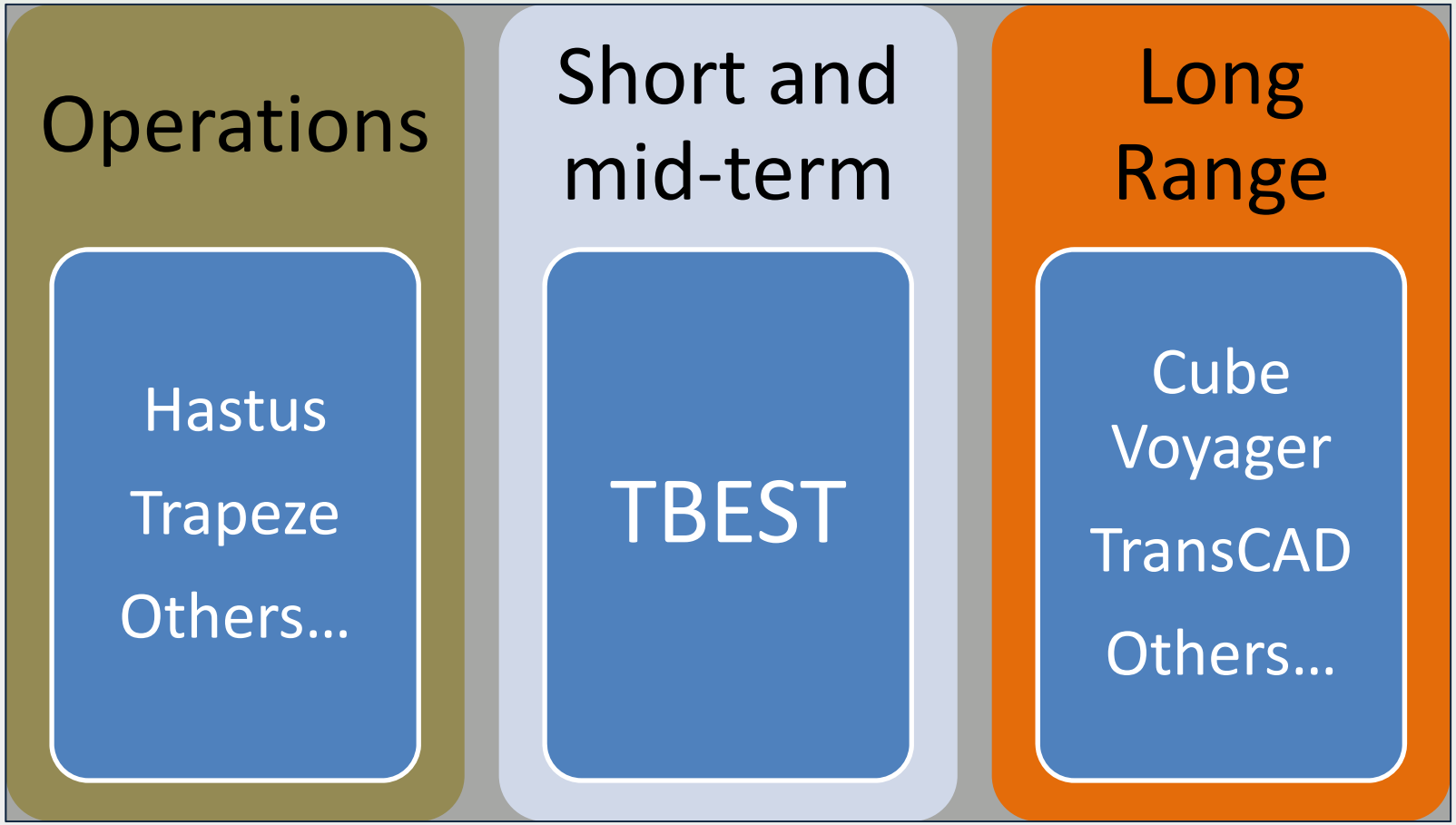
TBEST: Transit Boardings Estimation and Simulation Tool

- Comprehensive Transit Network Modeling, Management, and Analysis Tool
- Focus on Short to Mid-Term Planning
- Support Transit Development Plans (TDPs) and Comprehensive Operations Analysis (COA)
- Uniformed and Consistent Methodology
- Joint development FDOT and CUTR at University of South Florida



Transit Planning Tools



TBEST Model Data Requirements

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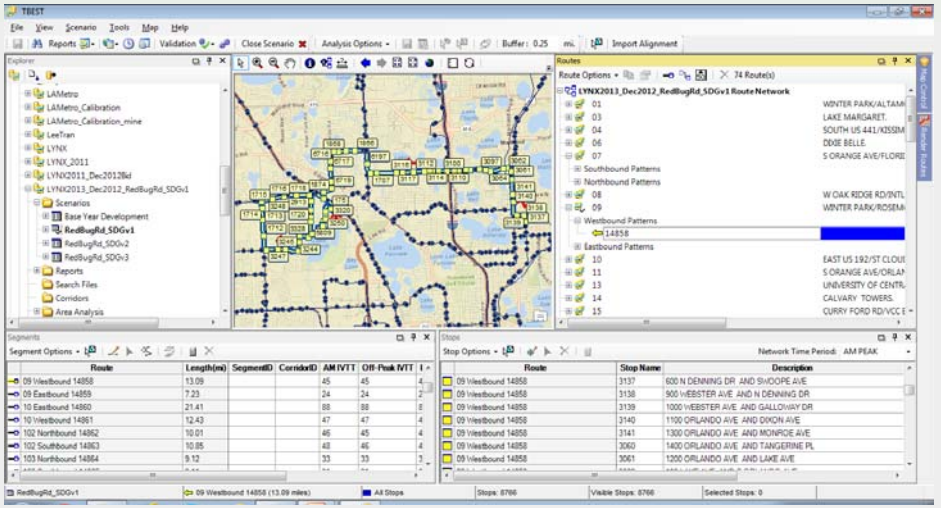
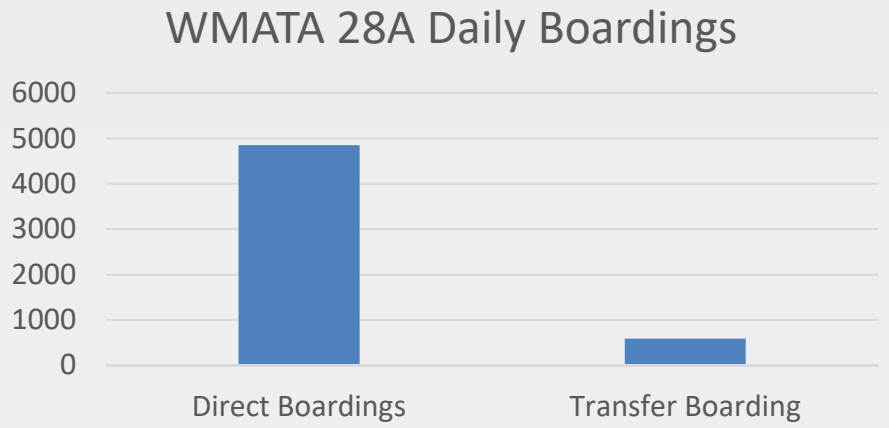
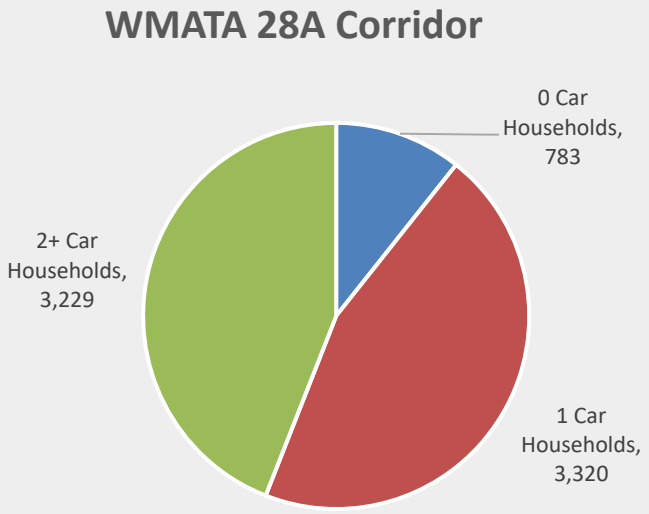
- Socio-demographic: Census 2010 and ACS
- Employment: InfoUSA or TPB Cooperative Land Use Forecast
- Land Use: parcel land use data from jurisdictions
- Transit Network (GTFS, shapefiles, or otherwise: routes, stops, schedules, fare)
- Special generators and stop amenities
- Socioeconomic growth rates (system-wide or zone-based)
- Observed ridership for validation (route level, stop level optional)

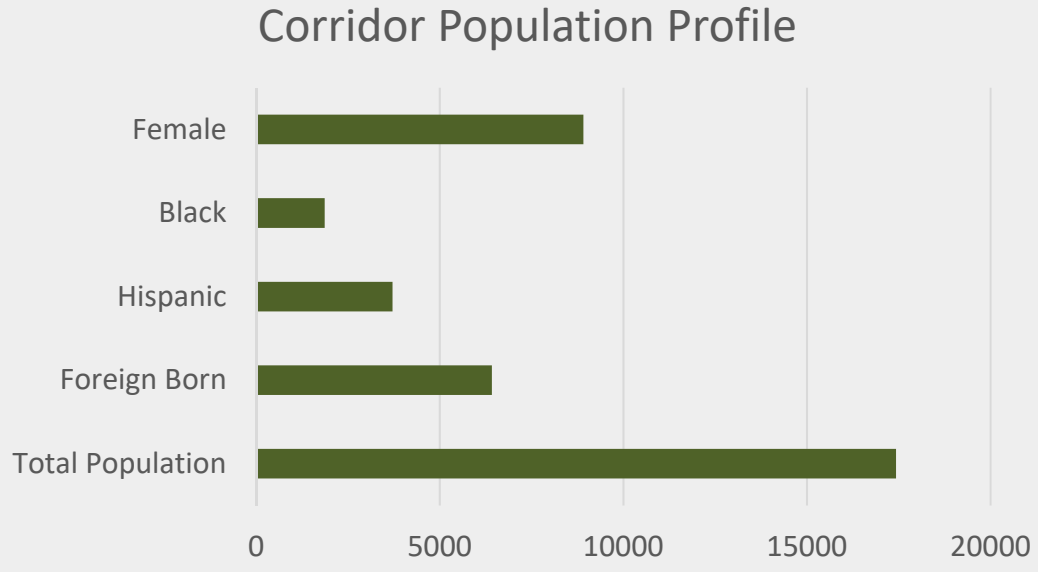


Output: Summary Report

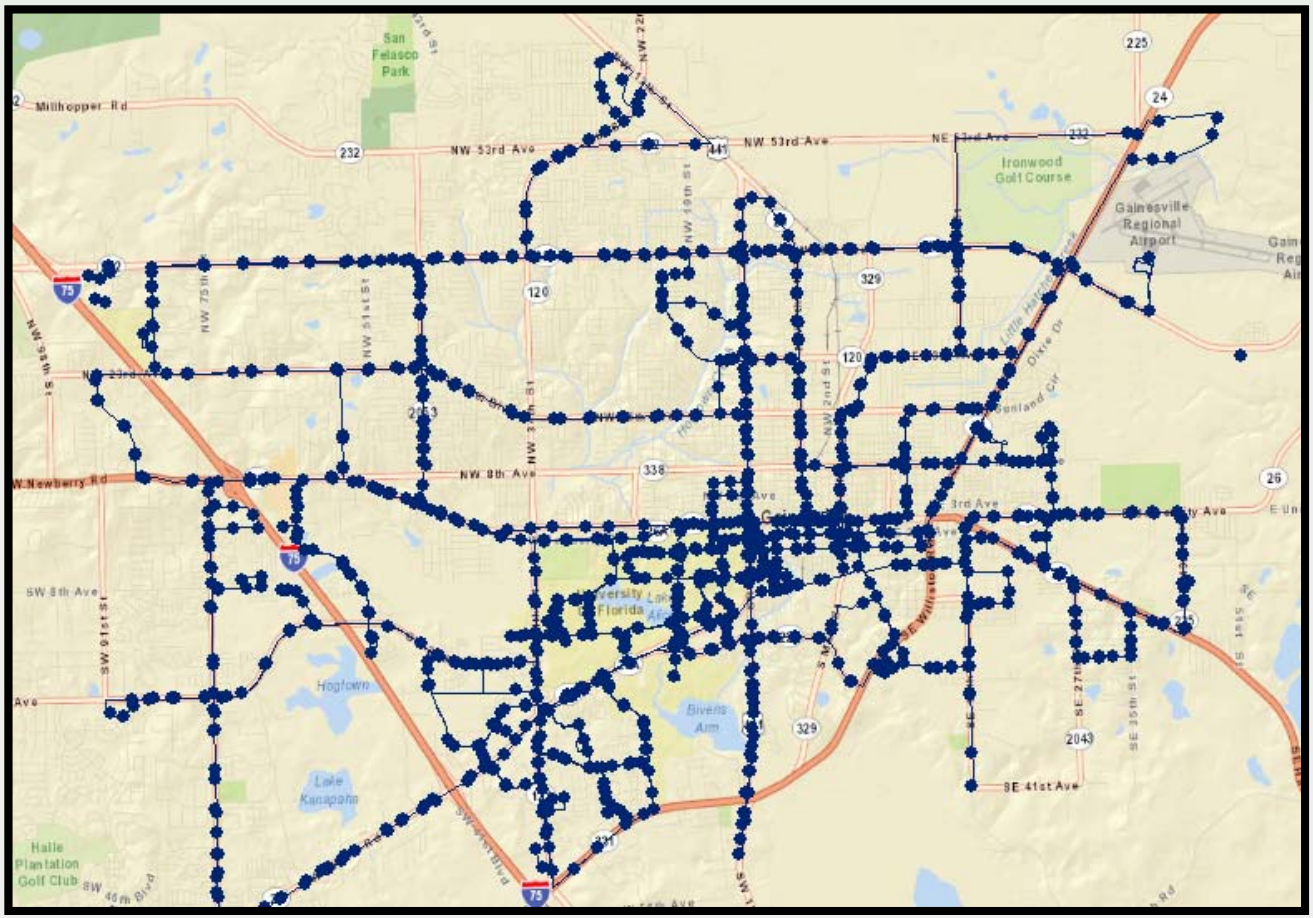
- Boarding (Direct, Transfer)
- Market population, employment, etc.
- Performance (e.g., boardings/service hr)
- Cost (e.g., route cost, cost/veh-mile)







Applications



EXAMPLE

- Gainesville, Florida
- 47 Bus Routes
- 184 Buses
- Population 188,000
- University of Florida

Socioeconomic Market Analysis

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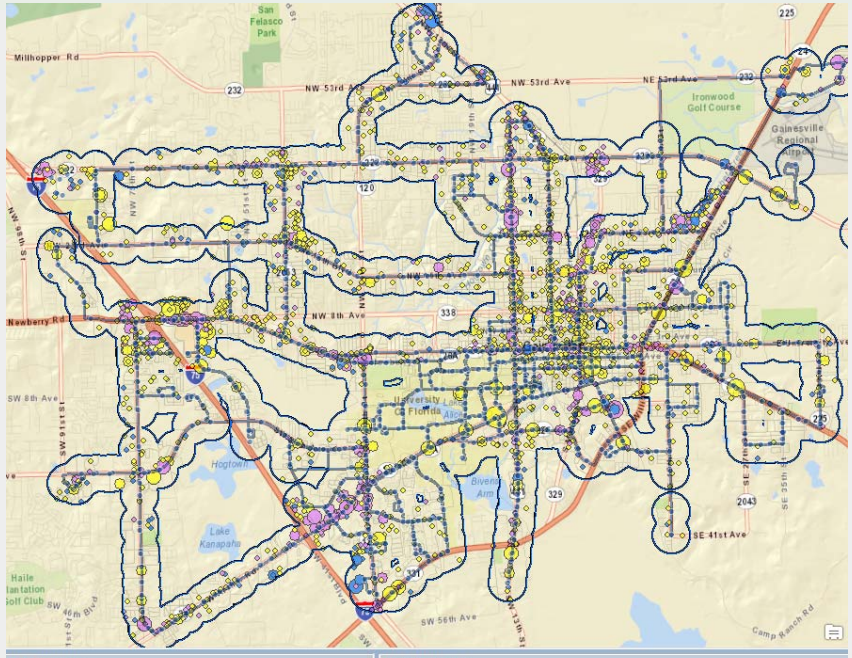
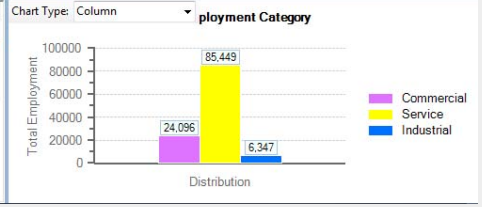
Employment Distribution



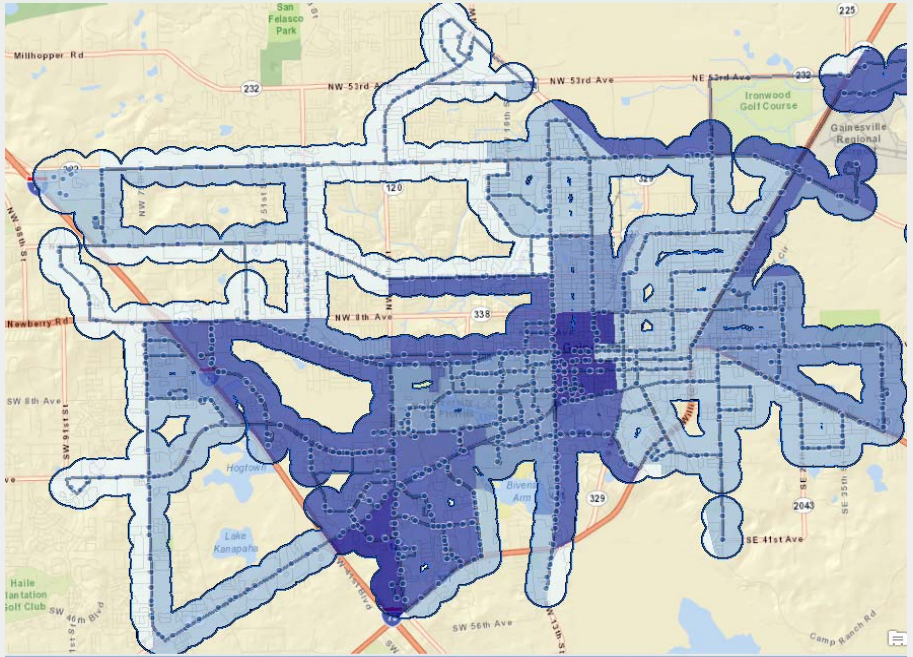
Data Summary

Employment Category	Employees	% Market Area	Filter
Commercial	24,096	20.79%	☑
Service	85,449	73.73%	☑
Industrial	6,347	5.48%	☑
Market Area Total	**115,892**	**100.0 %**	

Chart Summary



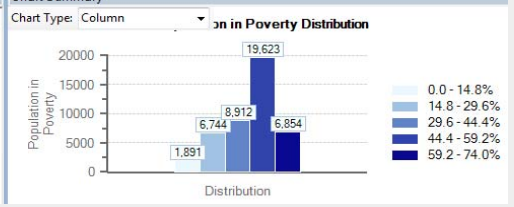
Population in Poverty



Data Summary

Population in Poverty Distribu	Popula	% Market A	Filter
0.0 - 14.8%	1,891	4.30%	☑
14.8 - 29.6%	6,744	15.32%	☑
29.6 - 44.4%	8,912	20.24%	☑
44.4 - 59.2%	19,623	44.57%	☑
59.2 - 74.0%	6,854	15.57%	☑
Market Area Total	**44,024**	**35.3 %**	

Chart Summary



Land Use Market Analysis

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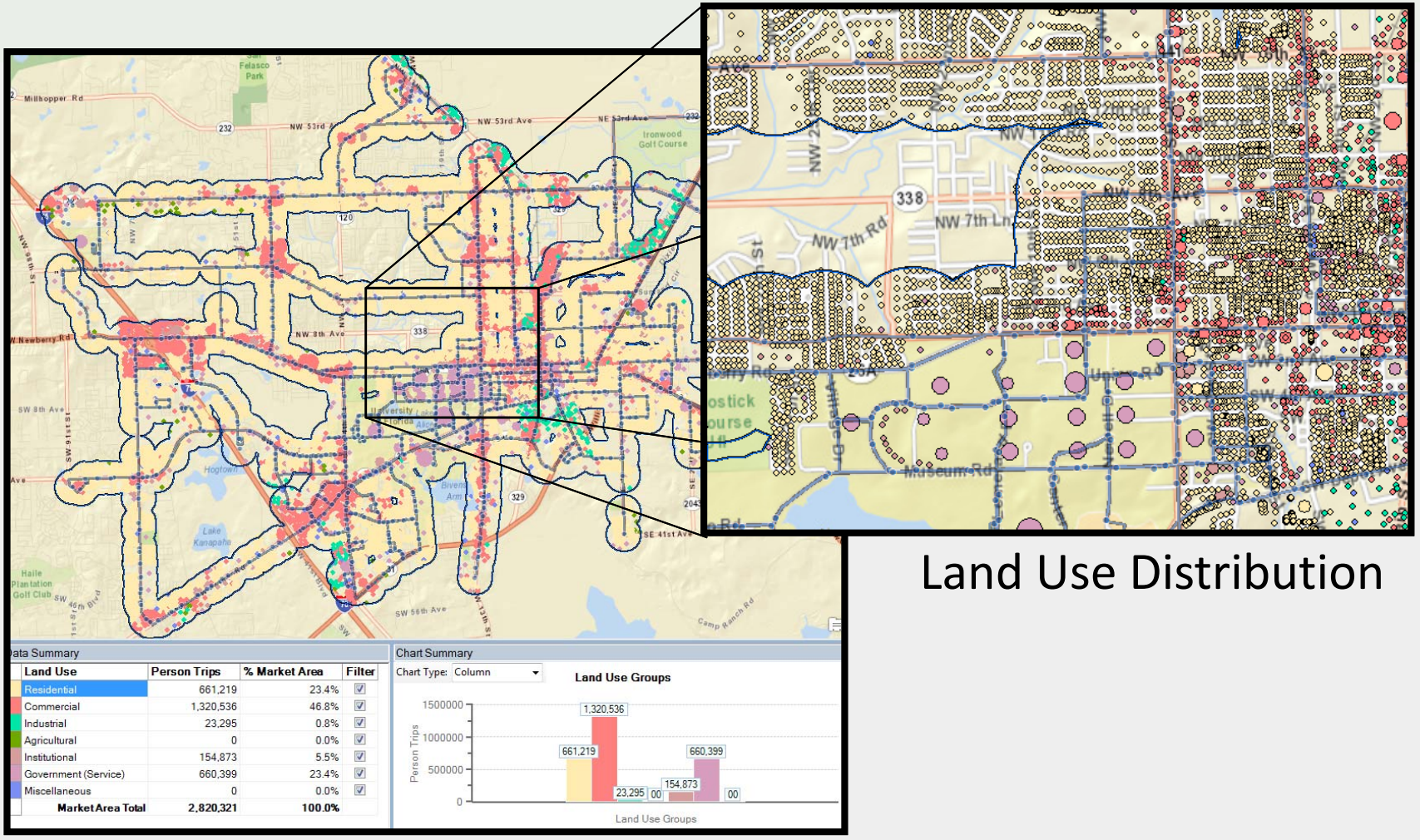

Land Use Distribution

Gainesville Regional Transit System
Base Year (Selected Routes)

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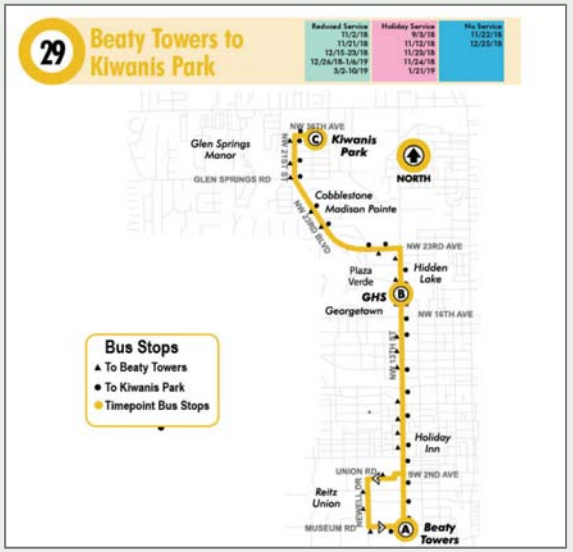
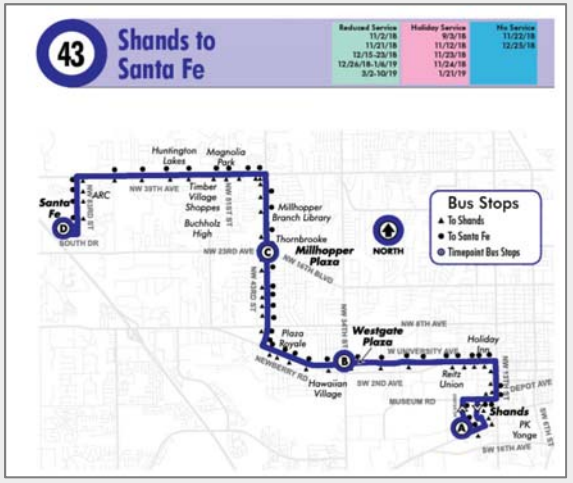
Route Name	Route 29	Route 43
Direct Boardings	318	886
Transfer Boardings	36	96
Total Boardings	355	982
Total Population	8,721	9,098
Black	911.4	739.9
Female	4,657.2	4,389.9
Foreign Born	819	899.1
Poverty Population	3,884.5	3,879.7
Total Employment	7,150.6	59,780.4
Boardings Per Service Hour	70.9	49.6
Boardings Per Service Mile	6.4	3.6
Boardings Per Service Trip	23.6	42.7
Avg Boardings Per Stop Visit	1.2	0.8





What if….

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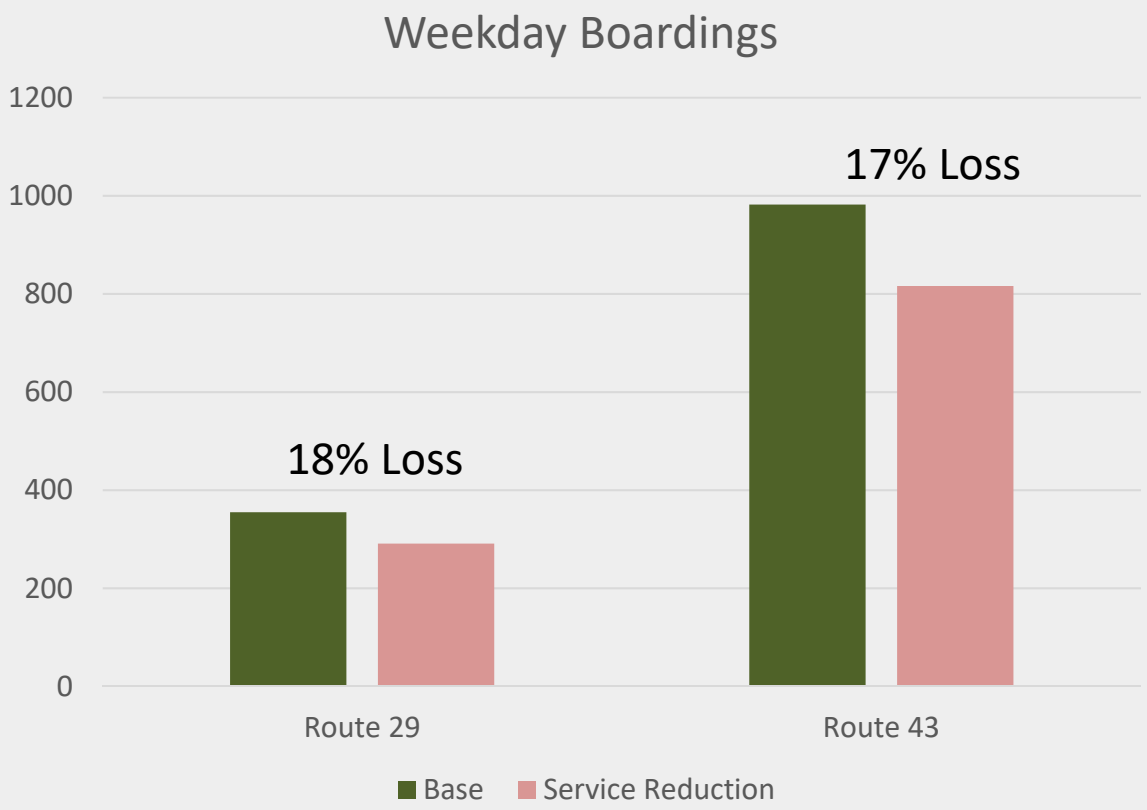
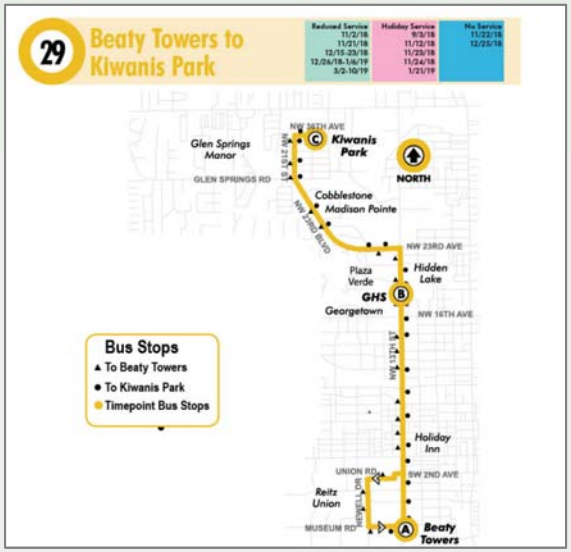
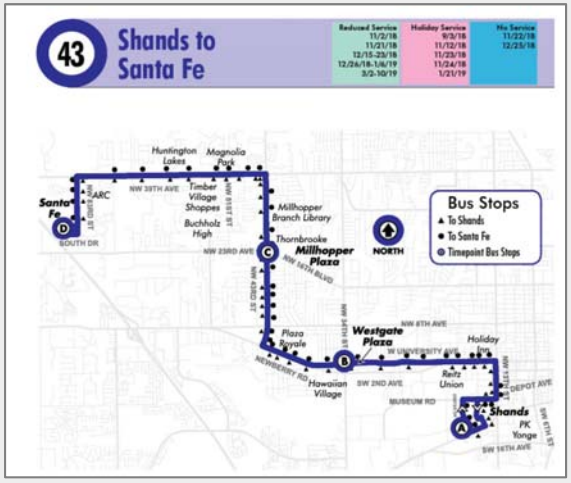
- 25% Service Frequency Reduction Systemwide







Cost Implications

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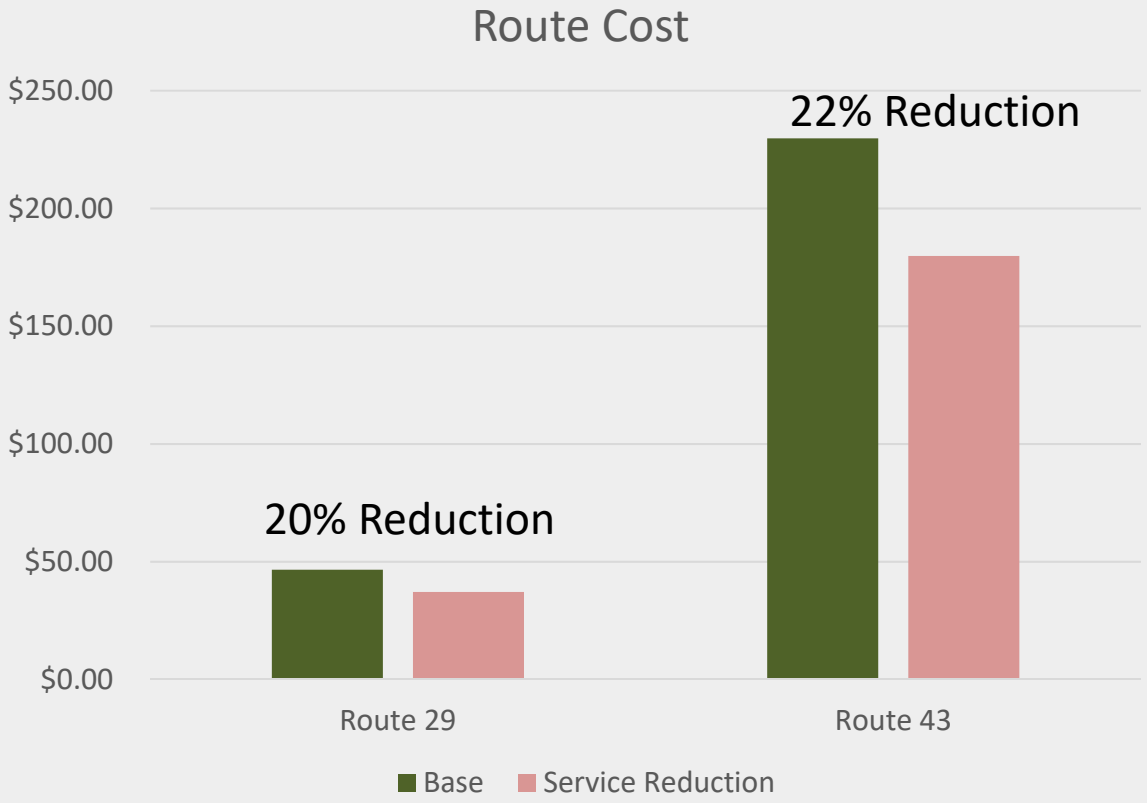
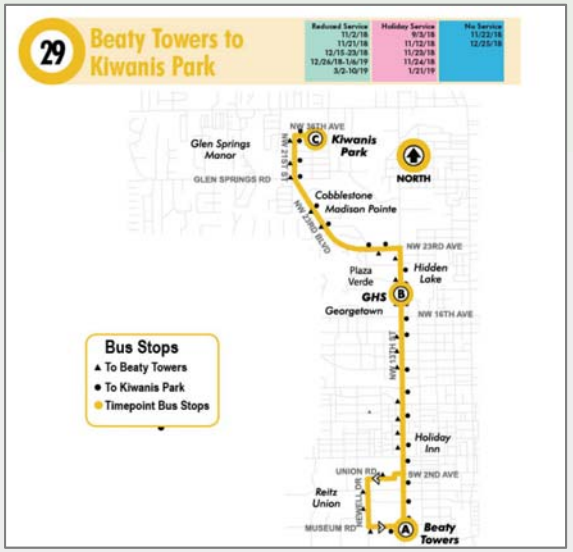
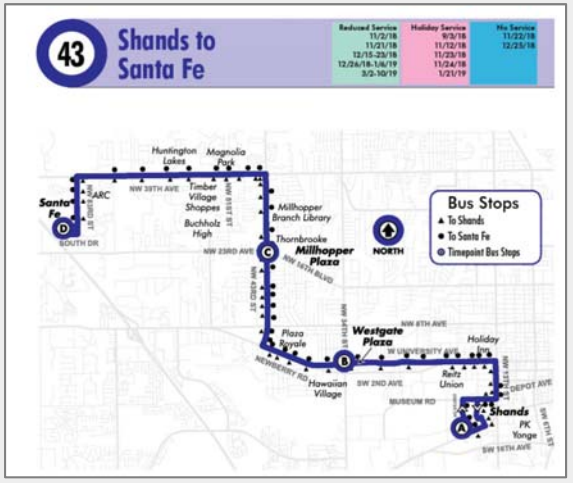
- 25% Service Frequency Reduction Systemwide







Gainesville RTS: Downtown Circulator

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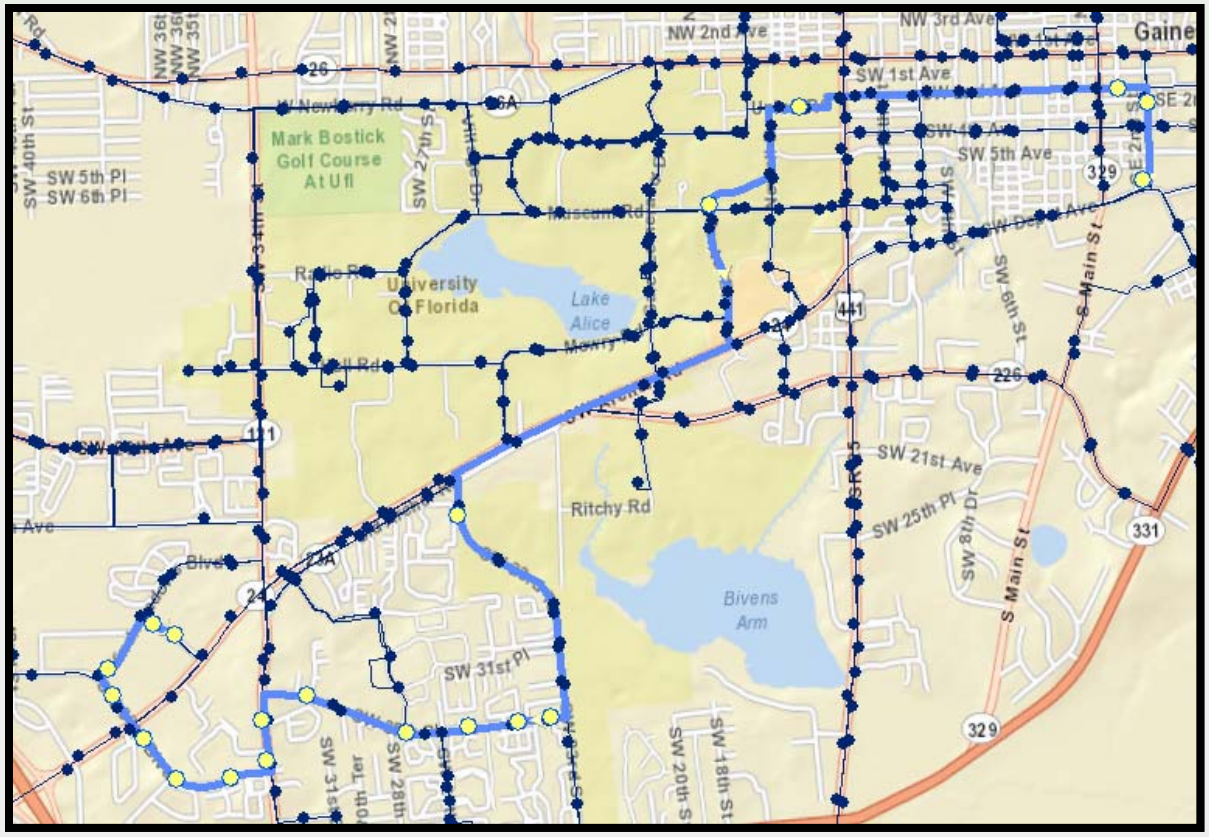
Variable	Parameter
Route Type	Circulator
Stops	50
Directions	2
Headway (wkdy)	30
Headway (wkend)	60
Dest’ns Served:	U. Florida
	Downtown
	RTS Terminal
	Residential

Gainesville RTS: Downtown Circulator

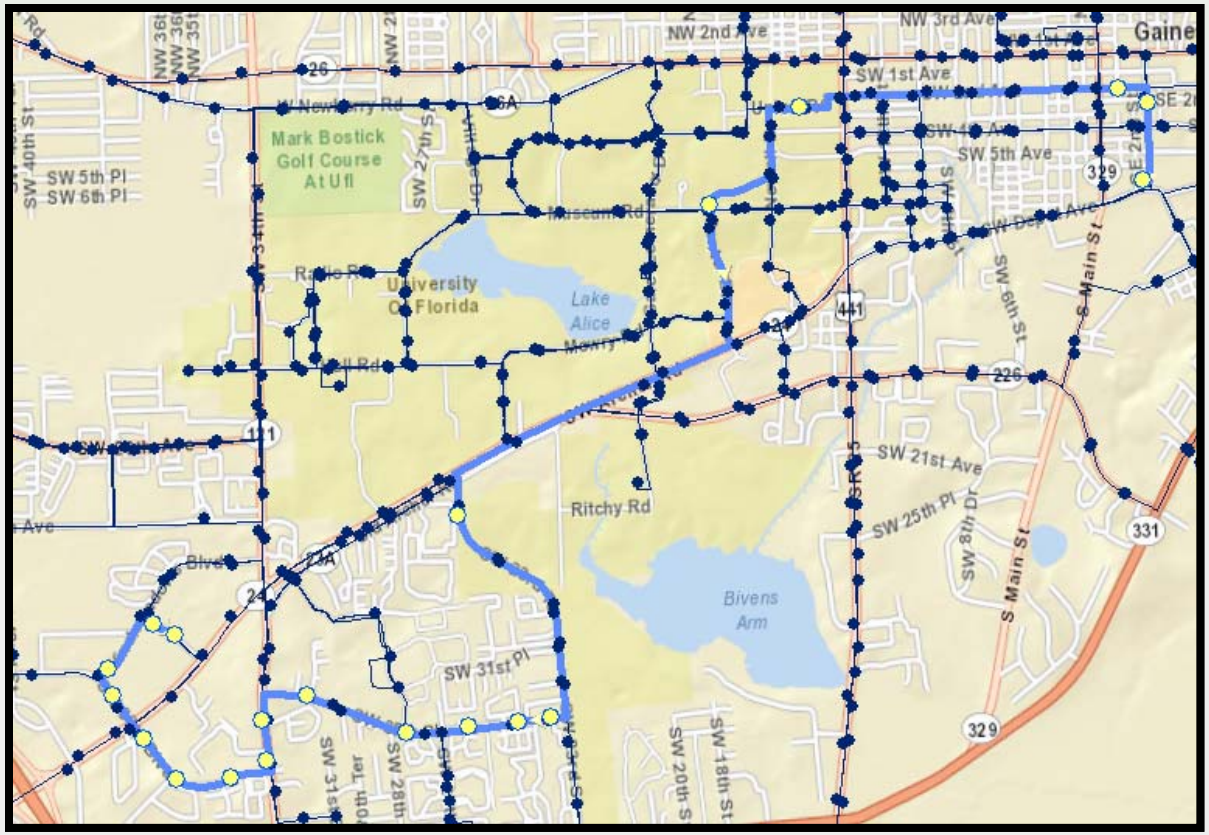
Variable	Parameter
Route Type	Circulator
Stops	50
Directions	2
Headway (wkdy)	30
Headway (wkend)	60
Dest'ns Served:	U. Florida
	Downtown
	RTS Terminal
	Residential
Total Boardings (CC)	1,358
Boardings/per trip	37.7

Gainesville RTS: University Express



Variable	Parameter
Route Type	Express
Stops	20
Directions	2
Headway (wkdy)	30
Headway (Sat)	60
Headway (Sun)	90
Dest'ns Served:	U. Florida
	Downtown
	Residential

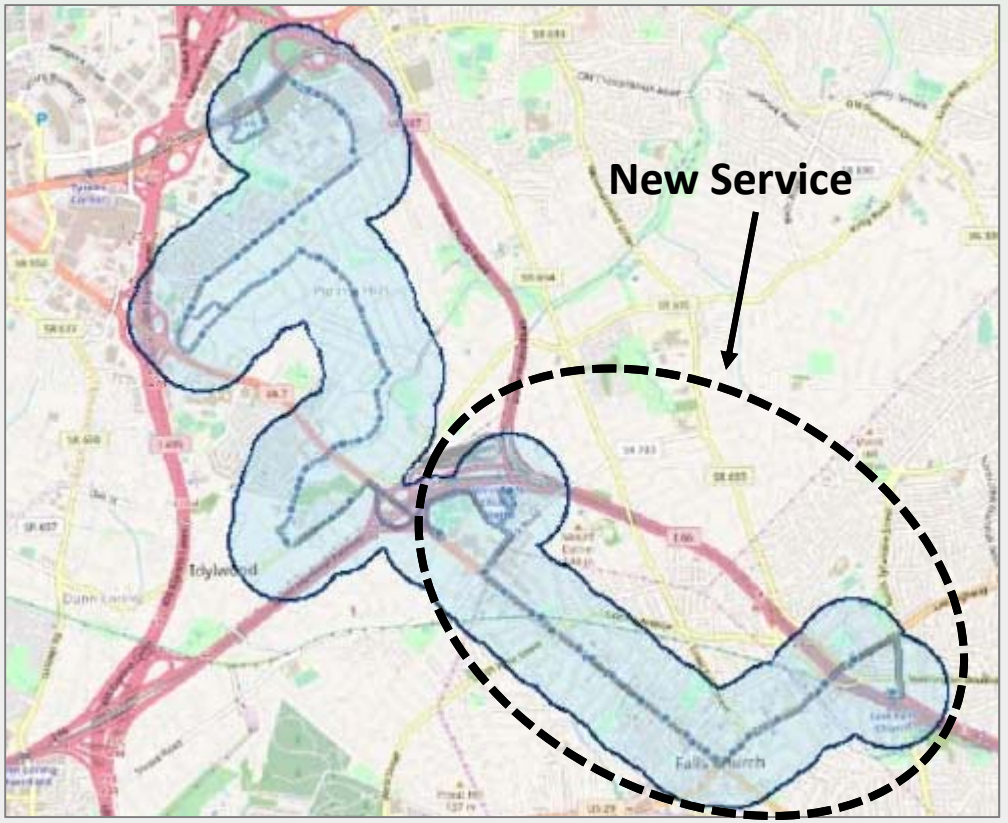
Gainesville RTS: University Express



Variable	Parameter
Route Type	Express
Stops	20
Directions	2
Headway (wkdy)	30
Headway (Sat)	60
Headway (Sun)	90
Dest'ns Served:	U. Florida
	Downtown
	Residential
Total Boardings	1,198
Boardings/per trip	21.4

NVTC Application

- 66 Commuter Choice – WMATA 3T Service Extension
- West Falls Church Metro to East Falls Church Metro
- Title VI Evaluation

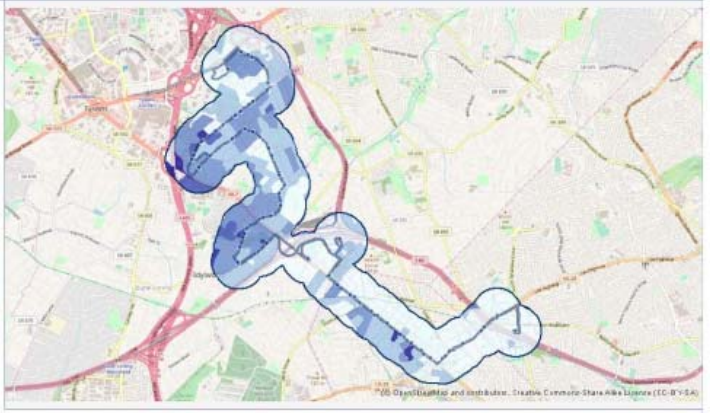


NVTC Application

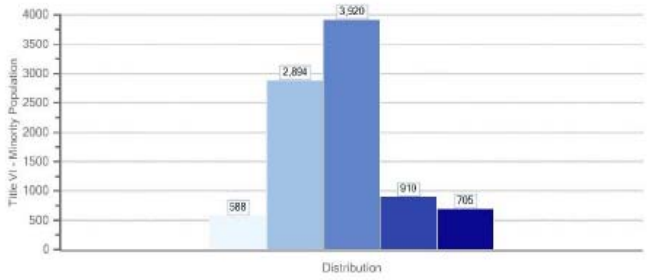
WMATA NoVa Test - 3T Extension

Market Variable Distribution - System-wide with 0.25 mile Walk Access

Minority Population Distribution	Population	% Market
0.0 - 20.0%	588	6.52%
20.0 - 40.0%	2,894	32.10%
40.0 - 60.0%	3,920	43.48%
60.0 - 80.0%	910	10.09%
80.0 - 100.0%	705	7.82%
Market Area Total	**9,017**	**32.7%**



- Provided Extended Route Profile to WMATA
- Showed Neutral Impacts
- No Need to Add Service Elsewhere



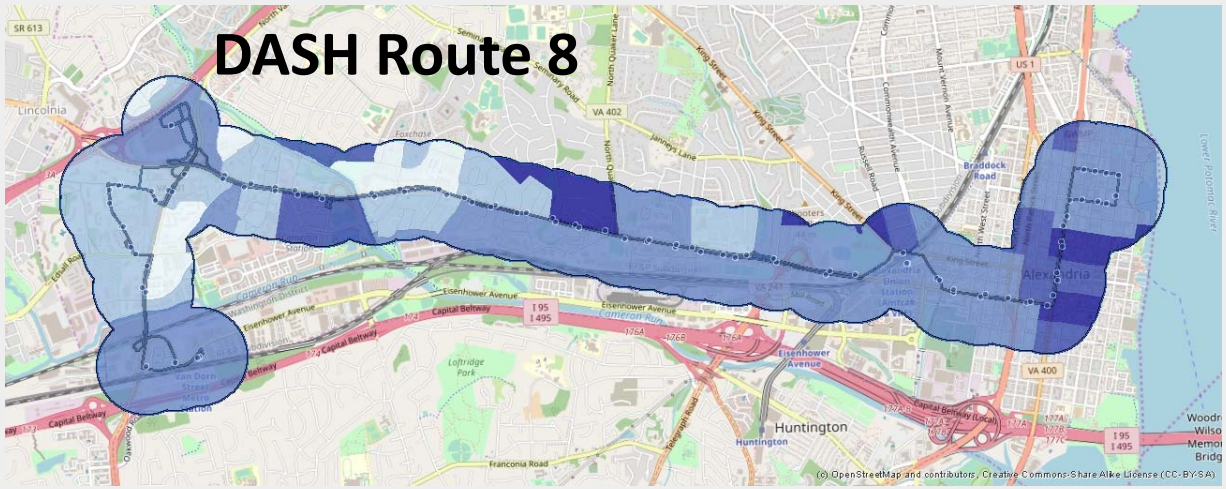
Population Data Source: Census and 5-Year Amercian Community Survey data grown to represent 2018 conditions
Employment Data Source: Local Zonal Data file

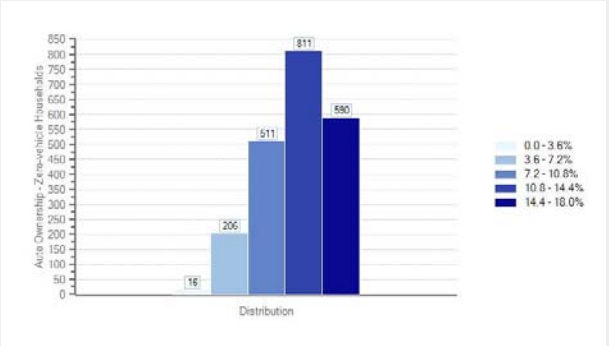
Application

Alexandria Transit Vision Plan

- Testing Scenarios
- Developing Ridership Forecast

- Title VI Impacts
- Provide Parcel Level Land Use Data
- Added Service to the Vision Plan





NVTC's TBEST Team

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TBEST Work Team

Nobuhiko Daito

- Compiled the Land Use
- Develop the Socio-Economic Data
- Initial Coding
- Sensitivity Testing

Matt Cheng

- Compiling Land Use
- Coding the Routes
- Calibration

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