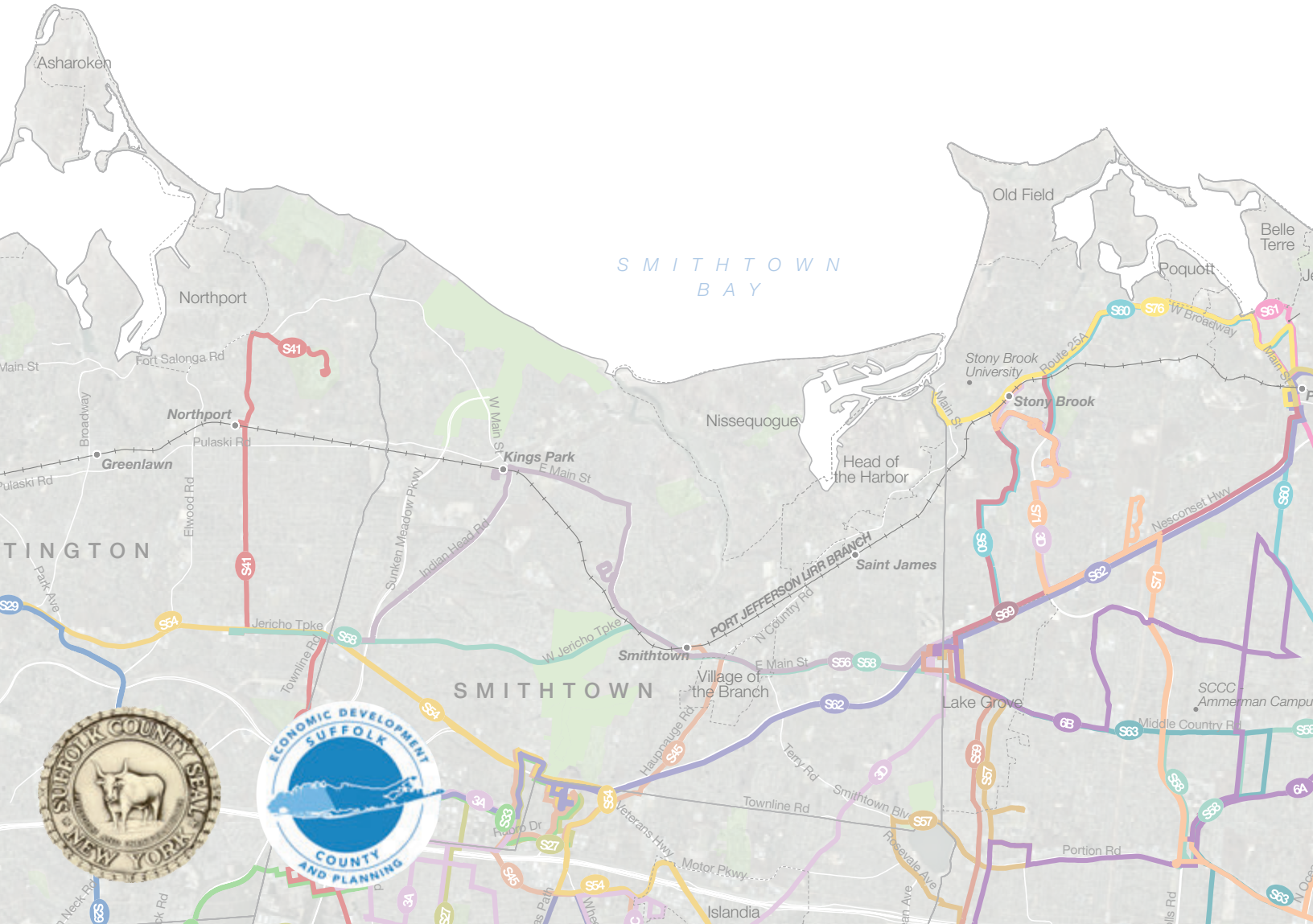
# Suffolk County Mobility Study :
## Strategies for Suburban Transportation

June 2018



# Acknowledgements

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# Executive Summary

Suffolk County occupies the central and eastern part of Long Island, in the extreme southeast of New York State. The eastern end of the county splits into two peninsulas, known as the North Fork and the South Fork. The county is surrounded by water on three sides, including the Atlantic Ocean and Long Island Sound, with 980 miles of coastline. It is divided into 10 towns: Babylon, Brookhaven, East Hampton, Huntington, Islip, Riverhead, Shelter Island, Smithtown, Southampton, and Southold. With a population of over 1.5 million people, Suffolk County plays an important role in the local, regional and state economy. It is home to important scientific and technological assets like Brookhaven National Lab, Stony Brook University and the high-tech Route 110 "innovation-Zone" corridor. Traditional family farms and wineries in Suffolk County's East End make it the biggest agricultural county in New York State.

Like many jurisdictions across the United States, Suffolk County has arrived at a turning point; repositioning itself from decades of low-density residential and commercial land use sprawl patterns to compact, walkable downtowns that balance urban and suburban living. In recent years, Suffolk County has responded to market demand for walkable downtowns, housing near transit, and increased mobility options to be more competitive as a region, and to attract residents and young high-skilled workers. These efforts are being realized through investments in mixed-use and transit-oriented developments, vibrant public spaces, and improved infrastructure. As the County more closely aligns land use planning with transportation investments, there is a unique opportunity to evaluate and re-envision how the transportation network can actively respond to the County's needs today, serve new communities as they emerge, and strengthen the region's transportation infrastructure.

The Connect Long Island Plan highlights that transit-oriented development and effective mass transit are necessary for Suffolk County and regional prosperity. It acknowledges that the economy will not grow

### Key Suffolk County Transit System Facts

- Suffolk County Department of Public Works (DPW) operates Suffolk County Transit (SCT) with a network of 43 bus routes, including two routes operating during summer only.
- SCT provides mobility and connectivity to over 1.5 million residents spread across a service area of 912 square miles.
- The five western towns in the Suffolk County have 91% of population over 62% of the County's total land area, with a density of 2,403 people per square mile, whereas the eastern towns have 9% of the population but are characterized by low-density with only 395 people per square mile.
- In 2017, SCT operated over 15.8 million revenue miles, serving nearly 4.28 million passengers on fixed route transit and approximately 700,000 passengers on Suffolk County Accessible Transportation (SCAT).
- SCT operational costs have continued to rise over the past decade from $49.1 million in 2008, to $65 million in 2013, to $77.2 million in 2016.
- In 2016, SCT's operating expenses were over $77 million total, including $44.8 million for fixed-route service and $32.4 million for SCAT demand-responsive service, while the system only generated about $9.3 million in revenues.
- System wide costs continue to outpace available state operating assistance (STOA funds), putting increased pressure on the County's budget and local taxpayers.


Figure ES.1: Suffolk County within the New York Metropolitan Transportation Council (NYMTC) Region
Source: NYMTC Coordinated Public Transit-Human Services Transportation Plan (2009)

in a long-term and meaningful manner if it relies on an outdated development model that is based on personal automobiles and adding more vehicles to the road as population and employment grows. However, the existing Suffolk County Transit system was designed over 30 years ago, when predominant land use patterns were still rooted in the paradigm of universal car-ownership and separation of uses. The existing network is characterized by a coverage-focused design and a one-size-fits -all, fixed-route solution despite the diverse geographic areas and distinctive mobility needs across the County.

The design of the current transit system has become unsustainable due to growing costs, declining ridership, limited efficiencies in service, and evolving rider needs and options. There is an urgent need to identify and pursue different mobility options that can better serve these unique markets and modernize the current system to align with the emerging technologies and trends in transportation.

## New Opportunities for Suburban Mobility

Over the past decade, evolving technologies and transportation options, adapted around smartphones, on-call or on-demand services, and real-time information offer a new range of possibilities for what transportation and mobility solutions are—and will be—available to consumer markets. A diverse range of new mobility and technology-based transportation services are currently being implemented across the U.S. and the globe, providing transformative, multimodal solutions.

This moment presents an opportunity to unlock transportation investments in coordination with land use decisions, optimize network performance to create efficiencies in the existing service, and explore the integration of emerging mobility services. Doing so will enable Suffolk County to provide better service to more people, more efficiently, and offer residents better alternatives to personal vehicle use. In addition, the incorporation of new technologies and mobility options may reduce operational costs of the existing

service, and establish a more fiscally resilient transportation system that will be better aligned with evolving technologies, flexible to growing consumer expectations, and adaptable to changing funding availability.

This report outlines related strategies and actions for improving suburban mobility to ensure Suffolk County is well-positioned to support existing riders, attract new riders, enhance economic competitiveness, support vibrant communities, leverage investments, and provide a foundation for sustainable growth in the County.

## Key Recommendations

- **Focus transit investments on high-performing "priority" fixed-route corridors with provisions for reallocating savings realized in order to support demand-response service areas or connections.** Some areas in the County are not ideal for fixed route service particularly those with high costs and low ridership. However, this presents opportunities to provide better service that is more aligned with user needs.

- **Unexpected Distribution of Potential Transit Markets Where Land Use is Not Transit Supportive.** Potential transit markets offer opportunities for the County to consider modes like microtransit or vanpooling to consolidate trips and provide better, more frequent service for trips not currently served, or served inefficiently, by the existing transit network.

- **Pivot the County's role as a fixed-route transit provider to a mobility services provider, creating opportunities to expand service, attract new riders, and realize cost efficiencies.** By utilizing new technologies and emerging modes, and identifying a range of mobility services to optimize and economize the network the County can provide more customized and higher quality transportation options to riders.

- **Utilize More Data and Technologies for Transit Planning** The County should continue to utilize technology and standardize data to inform decisions and build a resilient transportation system, collect and analyze data to inform service planning, identify rider patterns and needs, measure system performance, prioritize investments, create cost efficiencies, enhance system adaptability and improve user experience.

- **Engage Communities and Stakeholders through Technology and Strategic Partnerships** With today's technologies and real-time information, and in the age of ubiquitous smart phones, the County's outreach and marketing strategies should comprise a two-way dialogue with system riders, and a means to engage transit advocates and transportation partners to foster proactive communication, and receive input to help inform system decisions.

# 1. Planning Context

## 1.1 Transportation and the Economy

The existing *Connect Long Island* plan highlights that transit-oriented development and effective mass transit as necessary investments for prosperity in Suffolk County and throughout the region. The plan acknowledges that a sustainable economy in Suffolk County will not grow in a long-term and meaningful manner by adding more cars to roadways or center on an auto centric development model as the County's population and employment grow. In suburban areas today, limited transportation options are understood to be one of the most significant barriers to economic development.

Suffolk County's transit system was designed over 30 years ago, when predominant land use patterns were rooted in the paradigm of universal car ownership and separation of uses. As a result, the current bus transit network is characterized by a coverage-focused design that employs a one-size-fits –all, fixed-route solution to serve the County's diverse geographic areas and distinct user mobility needs. This current design limits the ability of the County to attract ridership, manage costs, and evolve to meet new demand –all of which yield a system that is quickly becoming unsustainable.

Suffolk County's outdated transportation system has resulted in traffic and transportation challenges similar to many postwar suburbs that experience saturation development conditions. In 2017, New York Metropolitan Transportation Council (NYMTC) estimated that each day the County drivers experience 293,417 vehicle hours of delay in traffic and it is expected to increase by 64.4% by 2045 to 482,490 daily vehicle hours of delay. The County reports the highest hours of delay, among the ten counties that comprise the NYMTC Planning Area, with an average commute time to work of 31.7 minutes.[1]

The ability to move to and through Suffolk County can be challenging not only for drivers, but also for households without access to automobiles. In 2016, Suffolk County had 28.3% of households with access to three or more vehicles and 24,464 households (5.2%) with no vehicle available. According to 2012-2016 American Community Survey 5-year estimates, 79.3% of working Suffolk County residents drove alone to work. Another 8% carpooled and 6.4% used public transportation. The remainder taxied, biked, walked or worked at home. On top of that, each decade since 1970, the percentage of working Suffolk County residents who work in New York City has decreased. U.S. Census Bureau data for multiple years shows the percentage of Suffolk County residents who worked in New York City was 16.8% in 1970, 14.5% in 1980, 12.2% in 1990, 11.9% in 2000, and 11.2% in 2006-2010.[2] According to U.S. Census Bureau 2009-2013 ACS 5-Yr data, only 11.2% of employed Suffolk residents worked in New York City (5.7% in Manhattan). Most Suffolk County residents work within the County's boundaries. 5.6% of working Suffolk County residents worked in the County, while 12% of Suffolk County workers live in Nassau County, and 1.9% live in Queens.[3]

1 "2017 Congestion Management Process Status Report," New York Metropolitan Transportation Council, September 10, 2017, https://web.archive.org/web/20170910134917/https://www.nymtc.org/Required-Planning-Products/Congestion-Management-Process/Congestion-Management-Status-Report.4,6]]}}}],"schema":"https://github.com/citation-style-language/schema/raw/master/csl-citation.json"}

2 "American Community Survey 2009-2013 5-Year Estimates" (U.S. Census Bureau, 2014). Analysis prepared by Peter Lambert, Suffolk County Planning, August 2015.

3 "American Community Survey 2012-2016 5-Year Estimates." Analysis prepared by Peter Lambert, Suffolk County Planning, January 2016.


Suffolk County Executive Steve Bellone, Ridesharing Press Conference 2017 Source: Suffolk County

## 1.2 Regional Plans and Investments

***Connect Long Island***, a regional transportation and development plan was released in 2012, setting forth an ambitious vision to advance planning, connectivity and non-auto-centric development initiatives in order to increase its competitiveness in the region. This vision was designed to create economic growth through investments in innovation, housing, and transportation. It calls for the creation of a network of vibrant downtowns filled with high-paying jobs linked together through a modern public transportation system connecting universities, research centers, recreational facilities, job centers, parks and more.

*Connect Long Island* encouraged the expansion and extension of the Long Island Rail Road's Double and Third Tracks projects well as electrification of critical train lines in Suffolk County, and supported East Side Access to give residents easier accessibility to the east side of New York City, making it more viable for local businesses and companies to attract from the highly qualified talent pool in New York City. *Connect Long Island* also called for modernization of the Suffolk County transportation system, including the development of the first North / South Bus Rapid Transit (BRT) routes linking all three lines of the Long Island Rail Road. By creating Suffolk County's first Bus Rapid Transit (BRT) system, key parts of the region will be connected to one another by mass-transit for the first time–making it possible to move around more of the County without having to use an automobile. Advancing innovative transportation initiatives such as BRT will help provide Long Island the space to grow its economy in a sustainable manner that will attract and retain young people, create high paying jobs and expand the tax base to help lessen the tax burden for all residents.

***Bus Rapid Transit*** is being advanced as the preferred mode for north-south rapid transit in Suffolk County, filling a gap in the regional transit network. Currently, preliminary engineering is underway for a Nicolls Road BRT, and project development for Route 110 BRT is expected to commence in 2018. A third corridor, the Sagtikos Parkway, was also identified for study in the *Suffolk County BRT Feasibility Study*.

The recommendations from *Connect Long Island* centered on the Nicolls Road corridor are focused on the ***Long Island Innovation Zone (I-Zone)***. The I-Zone plan seeks to build out a major innovation and transportation hub for the Long Island region that will make it once again attractive to young, educated, highly-skilled workers necessary to building an innovation economy. The I-Zone comprises four major elements: (1) The transformation of Nicolls Road into a Multimodal Corridor complete with Bus Rapid Transit and an extensive Hiking/Biking Network; (2) The full build-out of the Ronkonkoma area adjacent to the Ronkonkoma LIRR Train Station; (3) The establishment of a new train-to-plane connection between Long Island MacArthur Airport (LIMA) and Ronkonkoma LIRR Train Station; and (4) The relocation of the underutilized Yaphank LIRR Train Station to Brookhaven National Laboratory. The I-Zone and the *Connect Long Island* plan are critical to making it possible for companies to locate and grow, and for young people to move back to Long Island.

In 2014, the Suffolk County Legislature unanimously adopted ***Framework for the Future: Suffolk County Comprehensive Master Plan 2035***, the first comprehensive plan in over 44 years. ***Plan 2035*** highlighted the current trends, ideas and works in progress as a foundation for future strategies and actions in support of sustainable economic development. The plan established a range of interconnected priorities including economic development, environmental protection, transportation, housing diversity, public safety and energy usage. Strengthening the transit system was identified as one of the vital priority action areas in its recommendations, with an overall objective to enhance mobility and promote sustainable economic development while maintaining the high-quality environment that residents and visitors demand.

***Transit-Oriented Developments (TODs)*** have been underway in many communities in Suffolk County in recent years, including Wyandanch, Ronkonkoma, Brentwood, Speonk, Riverhead, Huntington Station and Patchogue. As these developments progress, they have the potential to simplify the provision of transit by concentrating large trip generators in a compact and walkable location. Providing high-quality transit lines to TOD areas can better align transportation routes and hubs with development and density, which can help increase ridership. In Patchogue, over 700 new residential units, 18,000 square feet of office space and 40,000 square feet of new retail space have been constructed over the past ten years. The Ronkonkoma Hub broke ground in the fall of 2017 on its first phase and will eventually comprise 1,450 residential units, 195,000 square feet of retail space, 360,000 square feet of office space and 60,000 square feet of flexible space. In Wyandanch, 177 residential units have been built, with 800 to 1,000 more projected.

The ***MTA and Long Island Rail Road*** are currently engaged in several infrastructure expansion programs that greatly enhance the regional transit network, including East Side Access, which will connect the Long Island Rail Road to a new LIRR terminal beneath Grand Central Terminal in Manhattan, and the Main Line Double Track and Third Track Programs, which enhance capacity, reliability, and ability for reverse commuting.

## 1.3 Previous Transit Studies in Suffolk County

***Abrams-Cherwony Group Comprehensive Bus Route Analysis and Service Development Report* (2010)** was a Countywide study proposing a ten-year plan with phased recommendations for improving fixed route bus service in Suffolk County. Proposals included adjusting coverage areas and routes for existing Suffolk County Transit routes, and adding 12 new bus routes: Walt Whitman Mall-Suffolk County Community College, Greenport-Tanger Outlet, Bridgehampton-Tanger Outlet, South Shore Mall-Hauppauge, North Shirley-Riverhead, SUNY Farmingdale-Ronkonkoma-Coram, Babylon-Roosevelt Field Express (to be operated by LI Bus), Patchogue-Hampton Bays-Southampton, Ronkonkoma-Northport, Babylon-Kings Park, Northport-Babylon and Brentwood-Ronkonkoma. The study proposed extending operating hours for existing routes, some to continue with the same service frequency and others to lower service frequencies. The study also proposed Sunday service for a limited number of routes.

***Volpe Center East End Transportation Study* (2009)** identified improvements for transportation service on the East End of Suffolk County. The report used the concept recommendation of a Coordinated Rail-Bus Network from the 2006 SEEDS report (see below) as a basis for its proposals. The study acknowledged key policy preference differences between towns in the North Fork and South Fork. Therefore its recommendations proposed a "dual concept" hybrid service providing different services for the North and South Forks. Recommendations for the South Fork were based around a Coordinated Rail-Bus Network. Recommendations for the North Fork were aligned around a Flexible Transit Network, which is focused on incremental bus and rail improvements.

As part of these networks, 12 demand-responsive service areas were identified to improve transportation service on the East End. The service areas for demand-responsive service were identified based on population, population density, presence of existing fixed route transit service, and priorities outlined by the study's Technical Advisory Group. These identified service areas included: Riverhead – Wading River; Southold – Mattituck; East Hampton – Springs, Amagansett, Montauk; Southampton – Hampton Bays, North Sea, Quogue, Quiogue, East Quogue, Westhampton – Westhampton Beach, Speonk, Remsenburg, Sag Harbor, Noyac; and Shelter Island. The *Volpe Center East End Study* also included recommendations on institutional and financial improvements, fare policy and collection, parking management, supportive land use strategies and environmental issues related to the East End.

***Sustainable East End Development Strategies (SEEDS) Report* (2006)** outlined East End transportation, land use and development strategies and developed recommendations for local improvements as part of a larger regional strategy to enhance mobility choices and connections. The recommendations were developed in tandem with a public outreach process throughout the study, which informed the key outputs of the study. The report called for an intermodal hub system consisting of primary, secondary and tertiary hubs to integrate and coordinate with improved rail service, land use and transportation investments. Expanded mobility choices were proposed to include rail, bus, demand-responsive service, feeder or shuttle bus service, park and ride facilities, bicycle parking, as well as passenger amenities at these intermodal hubs.

## 1.4 Suffolk County Public Transportation Working Group

***The Suffolk County Public Transportation Working Group*** was established in November 2016 by the Suffolk County Legislature through legislation co-sponsored by Legislator Bridget Fleming and Legislator Kate Browning following the elimination of eight fixed bus routes, to "evaluate the Suffolk County bus system in order to revise ineffective routes, increase ridership, and otherwise improve and enhance the region-wide provision of public transportation to meet the needs of the public, the commercial sector and the environment within the County's budgetary constraints."[1]

The working group comprises 15 members representing the County Executive; Suffolk County Department of Public Works; Suffolk County Transit; Public Works, Transportation and Energy Committee; Ways and Means Committee; Suffolk County Village Officers Association; County Supervisor's Association; East End Mayors and Supervisors Associations; Twin Forks Transit; Long Island Bus Riders' Union; Transportation Workers Union 252; Teamsters Local 202; Suffolk Bus Corp; Suffolk Independent Living Organization and Educational Bus Transportation (EBT). The working group has supported this project by recognizing and integrating relevant transit related concerns raised by the committee members and community transit advocates.

1 "RESOLUTION NO. 1017 -2016, Establishing a Working Group to Maximize the Level of Transportation Services Provided by Suffolk County" (Suffolk County, November 2016), https://www.scnylegislature.us/DocumentCenter/View/27119.

# 2. Project Background

# 2.1 Suffolk County Overview

## Land Uses

Suffolk County is part of the Long Island region, located at the southern tip of New York State and 15 miles east of New York City. The County is bordered by Nassau County to the west, by the Long Island Sound to the north, the South Shore bays and the Atlantic Ocean to the south, and the Peconic Bay System and Gardiner's Bay to the east. The eastern end of Suffolk County is divided into two peninsulas, the North Fork and the South Fork.

Suffolk County is the second largest county in New York State by geographic area, with approximately 912 square miles of land area. The County is 86 miles long and averages 15 miles wide, and is 26 miles across at its widest point. With shores on both the Atlantic Ocean and the Long Island Sound, Suffolk County's shoreline totals 980 linear miles.

The County is divided into ten towns: Babylon, Brookhaven, East Hampton, Huntington, Islip, Riverhead (county seat), Shelter Island, Smithtown, Southampton and Southold. As shown in Figure 2.1 major land uses in Suffolk County include: Residential; Recreational and Open Space; and Transportation, with a mix of seven other land uses making up the balance.

## Demographics

With a population nearing 1.5 million, Suffolk County is more populous than 11 U.S. states.[1] The 2012-2016 American Community Survey (ACS) 5-year estimates yield a population of 1,498,130 in Suffolk County. The County's population is projected to grow to 1.66 million by 2045, based on New York New York Metropolitan Transportation Council (NYMTC) population growth projections. As the population grows and changes, the range and diversity of transportation choices will need to evolve to best serve the needs of residents across the diverse land uses and densities that make up Suffolk County.

Even with these positive population growth projections, the region has been suffering for decades from what is commonly known as "brain drain." Since 2013, Suffolk County's overall population has been in

1 AKRF, Inc., "Framework for the Future: Suffolk County Comprehensive Master Plan 2035" (Suffolk County Department of Economic Development and Planning, July 2015).

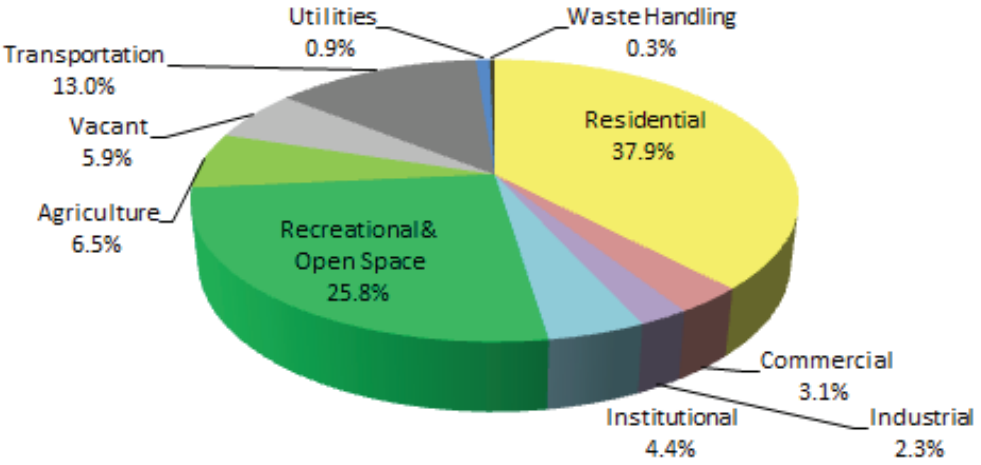


Figure 2.1: 2016 Suffolk County General Land Use Composition, by Percentage[1]
Source: Suffolk County Department of Economic Development and Planning, Division of Planning and Environment

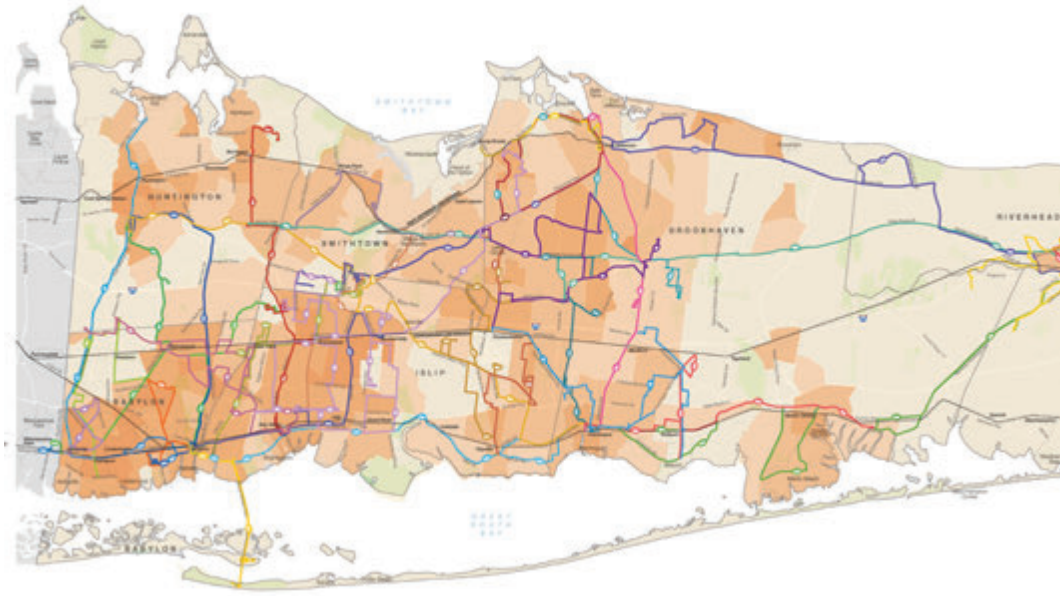


Figure 2.2: Existing Suffolk County Transit Routes and Population Density

decline. In 2016, the U.S. Census Bureau reported that 11,278 more people left Suffolk County for other parts of the country than moved to Suffolk from elsewhere.[2] A 2016 study conducted by the Long Island Index indicated that, for many years, young adults left Long Island due to higher costs, lack of quality affordable rental housing, shortage of quality high paying jobs and limited transportation options. The report cites these factors as a cause of Long Island losing a higher percentage of its young adults than other competitors in the Tri-state Region.[3] These trends date back to a 1978 Newsday series titled "Long Island at a Crossroads," which highlighted similar issues.[4] Forty years later, many of these same challenges continue to exist on Long Island.

In spite of these challenges, recent demographic trends show growth in specific population cohorts that illustrate the optimism for the County to attract and retain younger residents and workers. As part of a 2017 report focused on millenials on Long Island, the Long Island Association Research Institute describes a recent population increase of 20-34 year olds on Long Island, and the importance of continuing a growth trend for this desired population cohort:

"For the first time in more than two decades, the number of 20-34-year-olds living on Long Island has increased, according to the U.S. Census Bureau's population estimates. The number of Nassau-Suffolk

2 U.S. Census Bureau, "Estimates of the Components of Resident Population Change: April 1, 2010 to July 1, 2016," March 2017.

3 HR&A Advisors, Inc. and Regional Plan Association, "Long Island's Needs for Multifamily Housing: Measuring How Much We Are Planning to Build vs. How Much We Need for Long Island's Future" (Long Island Index: A Project of the Rauch Foundation, February 2016), http://www.longislandindex.org/wp-content/uploads/2016/02/LI-Index-Multifamily-Housing-Study-Final-Deliverable_2.2.2016_9.50AM.pdf.

4 "Long Island at the Crossroads: Newsday's 1978 Series," Newsday, March 19, 1978.


residents in that age group increased from 478,988 in 2010 to 515,391 in 2015, a rise of 36,403, or 7.6 percent. The 20-34-year-old age group is considered to be among the most important because it provides a large share of young workers -- often carrying freshly minted college degrees -- with high levels of energy and a willingness to innovate, take risks, start families, buy homes, and participate in civic life. Concerns have been expressed in recent years over the decline in the number of residents in the 20-34- year-old age group. Indeed, between 1990 and 2010 Long Island saw the number of residents aged 20-34 decline by 147,386. Thus, even though the increase over the last five years is positive, the region still has 100,000 fewer residents in this age group today than it did in 1990."[5]

The report also noted that an increase in the number of multiple-unit housing developments, often attractive to young adults, might have factored into the increase in the 20-34 year-old age group. Other explanations expressed in the report included maturation of the mini-baby boom that Long Island experienced in late 1980s and early 1990s. The report highlights the importance of continuing a population growth trend for this age cohort to ensure growth of the Long Island regional economy in the coming years.[6] According to the 2014 American Planning Association report "Investing in Place," 81% of millennials cite 'affordable and convenient alternatives to the car' as an important factor when deciding where to live and work.

5 "Long Island Demographic Update: Millennials Increase on Long Island, but We Still Need Many More of Them" (Long Island Association Research Institute, June 2017), https://chambermaster.blob.core.windows.net/userfiles/UserFiles/chambers/2181/CMS/Publications/Millennials20-34Year-Olds.pdf.

6 "Long Island Demographic Update: Millennials Increase on Long Island, but We Still Need Many More of Them."

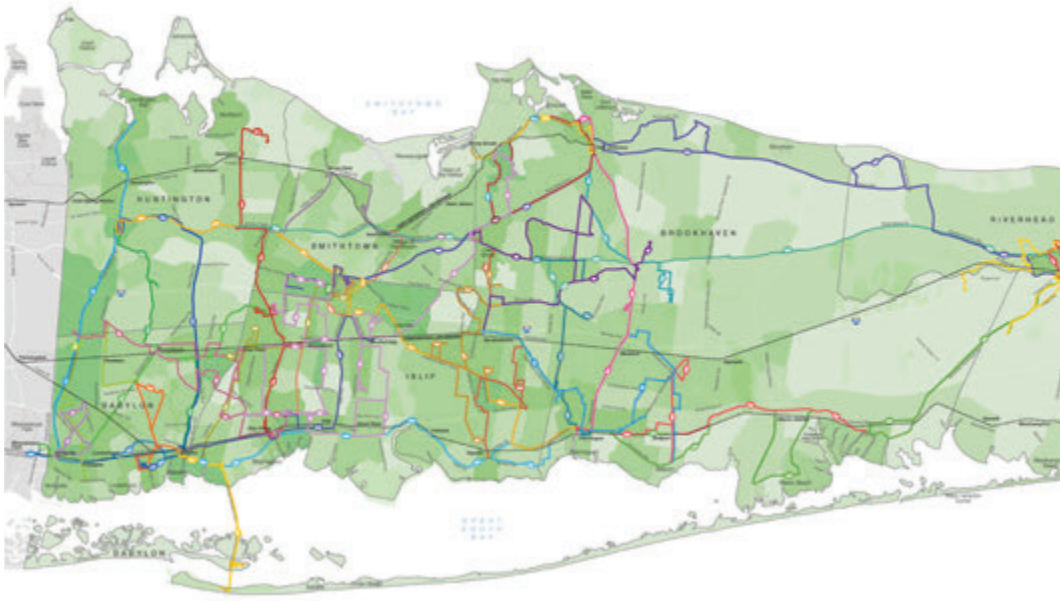

Figure 2.3 Existing Suffolk County Transit Routes and Employment Density

Millennials have shown both different locational choices and mobility preferences than previous generations, with key desires including mixed-use neighborhoods; walk, cycle and transit options; and flexibility and mobility.[7]

Suffolk County's population includes a wide spectrum of transportation needs and users. American Community Survey 2012-2016 5-year population estimates illustrate Suffolk County's population continues to age with residents aged 65 and over making up 15.3% of the County's population. In addition, 9.5% of County residents are recorded as having disabilities and 7.3% live below the poverty line. The average annual number of persons on Long Island living below the federal poverty line ($24,250 for a family of four) increased significantly from 32,953 in 2011 to 185,415 persons in 2015.[8] Each of these diverse demographic groups will require transportation services to meet their varying needs and mobility options that serve all ages, abilities and budgets.

## Employment

From 2014 to 2015, employment in Suffolk County grew at a rate of 0.81%, growing from 738,760 employees to 744,715 employees. Suffolk residents' occupations are comprised of 38.1%

7 "Millennials - Breaking the Myths" (The Nielsen Company, 2014), http://www.nielsen.com/content/dam/corporate/us/en/reports-downloads/2014%20Reports/nielsen-millennial-report-feb-2014.pdf; "Investing in Place for Economic Growth and Competitiveness: A Research Summary" (American Planning Association, May 2014), https://planning-org-uploaded-media.s3.amazonaws.com/legacy_resources/policy/polls/investing/pdf/pollinvestingreport.pdf.

8 "Poverty on Long Island: It's Growing" (Long Island Association Research Institute, March 2017).








management, professional or related occupations; 25.7% sales or office occupations, 17.4% service related occupations; 9.4% natural resources and construction; and 9.4% production, transportation and material moving.9 According to 2012-2016 ACS 5-year estimates, the industry breakdown of employment in the County is: 26.8% education, health and social services; 11.8% retail; and 11.2% professional, scientific, management administration and waste management. No other industry accounts for greater than ten percent. As highlighted in *Framework for the Future*, the employment base in Suffolk County has become much more diversified over the past fifteen years. Specific growth sectors in the County include: education, health, and social services; tourism; the arts; and emerging technology industries such as bioscience.

## 2.2 Suffolk County Transit Overview

### Suffolk County Transit Characteristics

Suffolk County Department of Public Works (DPW) operates Suffolk County Transit (SCT) with a network of 43 bus routes (including two routes operating during summer only), providing mobility and connectivity to a population of over 1.5 million residents spread across a service area of 912 square miles. In 2017, SCT operated over 15.8 million revenue miles, serving nearly 4.28 million passengers on fixed route transit and about 700,000 passengers on Suffolk County Accessible Transportation (SCAT). Operational costs for Suffolk County Transit have continued to increase

9 "American Community Survey 2012-2016 5-Year Estimates."

from $49.1 million in 2008 to $65 million in 2013 to $77.2 million in 2016, at "an alarming rate" as stated by the County's Transportation Working Group.[10]

SCT's operating expenses for the year 2016 were over $77 million with fixed routes costing nearly $44.8 million and SCAT demand-responsive services costing nearly $32.4 million, while the system only generated about $9.3 million in revenues. While the federal and state funds covered 35.3% of the operating expenses, the County still covered the remaining 52.7% of the operating expenses amounting to over $41.8 million. Furthermore, system-wide costs continue to outpace available state operating assistance (STOA funds), putting more pressure on the County's budget and local taxpayers.

The existing transit system was designed over 30 years ago and uses the same fixed route mobility solution for a large diverse geographic area with very distinct mobility needs. The five western towns in the Suffolk County have 91% of population and over 62% of the County's total land area, with a dense land use of 2,403 people per sq. mile; whereas the eastern towns have 9% of the population but are very wide-spread with only 395 people per square mile. There is a critical need to identify and pursue different mobility options that can better serve these unique markets and modernize the current system to align with the emerging technologies and trends in transportation.

Suffolk County Transit has recently made significant technology-related transit improvements that include the addition of 70 new transit buses to the fleet and ongoing installation of Automated Vehicle Locator (AVL) on the standard as well as paratransit buses. The TransLoc Rider App, showing real-time distance to stop and wait time to users, launched in fall 2017 reported immediate adoption by the public with over 5,000 unique users and over 80,000 hits for the month of November 2017 alone. Furthermore, mobile ticketing is currently being pursued in an effort to continue the modernization of the Suffolk County Transit system. These improvements will enable SCT to offer more reliable and comfortable experience for bus riders and equip the County to start collecting real-time data to inform future transit planning.[11]

## Challenges and Opportunities

The key challenges and opportunities for Suffolk County's transportation future identified and addressed as part of this study include the following:

### Existing Land Uses + Travel Patterns

***Challenge:*** Historical tendency of transit ridership to conflict with the existing suburban land uses and decades-long patterns of personal car ownership in Suffolk County.

***Opportunities:***

- Increase mobility and transportation investments in the County with context-sensitive solutions
- Implement Complete Streets designs and infrastructure.
- Continue investments in TODs, intermodal hubs, connections for pedestrians and bikes to enhance the transportation network and livability of Suffolk County.
- Optimize connection points at key origins and destinations and increase "last-mile" options
- Create a more diverse set of mobility options that are sustainable and supportive of one another.

10 "2016 Full Reporter Summary and Complete Set: Full Reporters" (Federal Transit Administration, U.S. DOT, October 13, 2017), https://cms.fta.dot.gov/ntd/2016-full-reporter-summary-and-complete-set-full-reporters.

11 Data provided by Suffolk County.

### Transportation Funding

***Challenge:*** Suffolk County wants to encourage and expand the use of mass transit and increase mobility options; however, available state and federal transit funding has not reflected increasing system costs.

***Opportunities:***

- Create a multimodal transportation system that has the ability to adapt and scale to evolving transit markets as well as funding availability.
- Optimize and modernize the existing transit system to better serve existing customers and also attract new riders, thereby increasing revenue.
- Identify cost-effective solutions to economize system operations—by 'paying for the ride, not the asset' by partnering with new mobility companies for specific services (such as last-mile service) or in certain areas (low-density) where fixed route service is not cost-effective for the County or efficient for the user.

### Unique Geographies + Transportation Markets

***Challenge:*** The current transit system is a fixed route, coverage-based system characterized by long travel and wait times, long headways and high costs that covers a diverse spectrum of land uses and densities between the West and East ends of the County.

***Opportunities:***

- Identify flexible mobility solutions to realign service offerings with rider needs and the diverse travel markets throughout the County.
- Identify specific transportation offerings that support lower density East End communities and seasonal transit demand.
- Incorporate innovative new modes into the transit system to better serve Title VI populations, and also attract new riders.

### Aligning Service with Demand

***Challenges:*** Outdated technology, coverage-based legacy routes and schedules, and lack of data-driven transit planning resulting in suboptimal system-wide performance and inefficiencies.

***Opportunities:***

- Create a data-driven transportation network that uses data to realign service offerings with today's user needs, preferences and technologies, and to track system performance and identify efficiencies.
- Engage the public and stakeholders through surveys and technologies to create more data points and enlist their feedback in redesigning a system that aligns with where riders want to go and how they want to get there.
- Create a system that is adaptable to the County's operations and funding availability.
- Seek partnerships with County agencies, universities and colleges on "open data" initiatives or technologies, or with private sector companies for the development of apps to support the County's transportation system and improve the user experience.

## 2.3 New Approach to Mobility for Suffolk County

Currently the transportation network in Suffolk County is oriented around "trunk" and "lifeline" routes and service that consists of transit corridors with diversions into neighborhoods. The service has varying headways, with areas of non-productive service and route redundancies, and some routes and terminals that are disconnected from traffic generators and destinations.

Suffolk County Executive Steve Bellone tasked the departments of Suffolk County Economic Development and Planning and Public Works with developing a better approach for suburban mobility. This new approach should be inclusive of regional transportation and development projects and planning initiatives and result in a data-driven system that can better serve current riders and attract new riders while offering system scalability and resiliency that can adapt over time to changes in the County and with evolving technologies. These goals can be achieved by outlining a clear vision for what a new mobility system should provide for Suffolk County residents, workers and visitors.

Key desired characteristics of a new mobility system in Suffolk County include:

- A modern, productive system that optimizes performance and processes, has built-in system efficiencies, and serves as a model for other suburban areas;
- A system that can easily respond to market demands, serving existing riders and attracting new riders, and also remain financially accessible to workforce and low income riders;
- Logical and easy-to-understand service routes and offerings;
- A flexible, cost-effective system that is fiscally adaptable and resilient;
- A system that incorporates data and technology into the transit planning process; and
- A system that acts to reduce individual vehicle miles travelled, in order to reduce fossil fuel emissions and concomitant impacts on climate change and air quality.

To set into motion a new approach to mobility and transportation services in Suffolk County, it is critical to understand the County's travel demand patterns to help better manage travel and provide riders with the choices and service options that they need on a day-to-day basis. A data-driven system would be developed to use a combination of data, technology and public engagement to realign service offerings with rider needs in Suffolk County. In doing so, the County can better identify mobility options to suit current and future riders and their travel patterns, instead of relying on fixed routes and legacy systems from decades past that no longer serve the County efficiently.

Transportation as a 'service' in tandem with technology has greatly changed the way we travel in recent years. Riders increasingly expect on-demand, fast and convenient travel whenever they want it.

This new approach will identify a more tailored suite of mobility services to optimize the system and to provide more customized and higher quality transportation options to riders. For the fixed route transit system, this may mean identifying priority corridors and local circulation areas, and then supplementing those with service area based, on-demand services; creating more direct, fast and reliable routes with fewer diversions, with more consistent and frequent headways and increased service spans. A new approach offers the opportunity to transform non-productive fixed route service into

productive service for riders by consolidating routes and offering a demand-based service for some areas of the County.

In addition, connectivity points and intermodal hubs throughout the County can not only support transportation links, but also help TODs thrive and provide multimodal transportation options for those who may elect not to own or drive a private vehicle. The new approach to mobility focuses on diversifying service offerings so that the County provides a wide range of transportation options to optimize trips across land uses and offers the best ride for lower costs; enhances the dialogue with riders; provides a seamless user experience from door to destination; and creates an adaptable and flexible mobility system that will support the County's residents and investments today and in the future.

## 2.4 Project Scope and Methodology

In 2016, Suffolk County engaged Arup to perform a system-wide review and develop recommendations to re-envision the transit system and develop new transportation offerings that help Suffolk County improve mobility, identify system-wide performance and cost efficiencies.

The study began in November 2016 and concluded in June 2018, and was completed in two stages: Route Review and Trip Pattern Analysis, and Development of Mobility Suite and Strategies. A workshop with Suffolk County Public Transportation Working Group was held during the second stage of the study to garner feedback and inform the final recommendations. Figure 2.4 illustrates major project tasks as well as opportunities for stakeholder input.

The two-stage study approach entailed detailed reviews, analyses and mode evaluations taking into consideration:

- *Existing Service* – Reviews of current SCT ridership, route revenues, service gaps and transfer areas.
- *Trip Patterns* – Identifying trip patterns using Transportation Analysis Zones (TAZ), identifying key areas, desire lines, origin and destination pairs, trip directions, trip distribution and length.
- *Demographics* – Drilling down into the relationship between the transportation system and the Suffolk County population data, employment data, Title VI communities, land use and other demographic factors.
- *Future Planning* – Reviewing the County's planned BRT routes and TODs; identifying potential transit markets where future transportation investments can best support the County's goals and meet user demand.
- *Coordination Efforts* – Reviewing LIRR ridership at key transfer hubs, upcoming investments and initiatives, and giving consideration to transportation characteristics specific to the County such as long rush hour periods and seasonal service considerations alongside system coordination goals such as increased operational and fiscal adaptability, route optimization opportunities and customizing mobility services and solutions nested within the broader system.

The key tasks performed during this study included:

- *Route Review and Trip Pattern Analysis*: Existing SCT system and route review, TAZ trip pattern analysis of work trips and findings to better understand commuting patterns and key destinations. The analysis and findings of the Suffolk County Transit route review have not been discussed in this report, as these will be utilized in Phase II of the project, which will entail development of a County-wide mobility implementation plan.

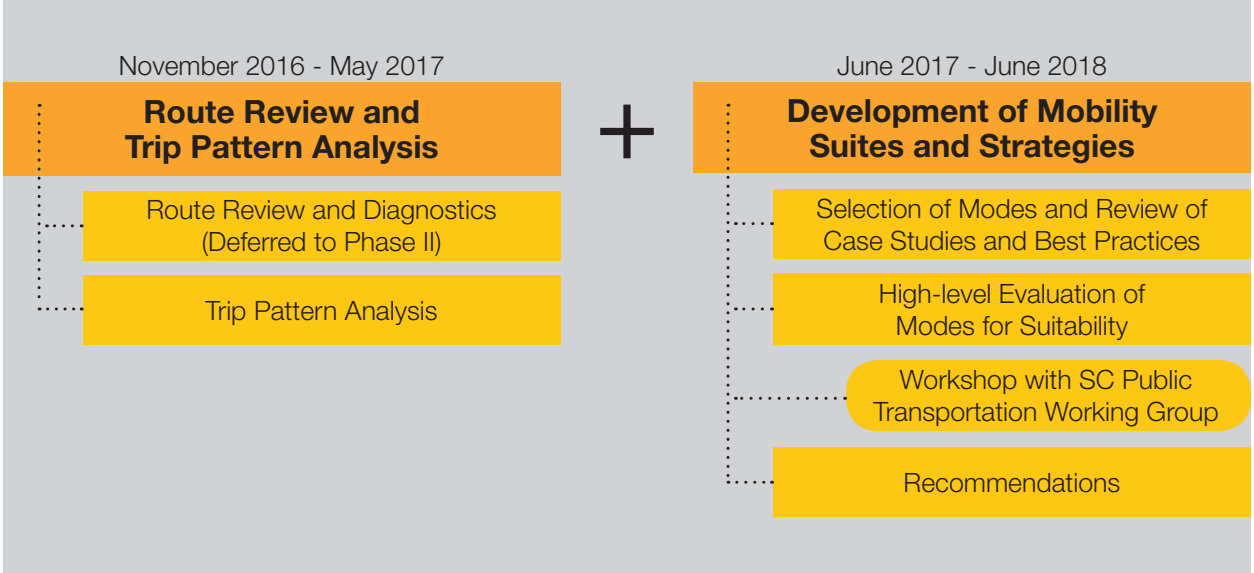


Figure 2.4: Study Process and Schedule

- *Development of Mobility Suite, Mode Selection and Case Studies*: Identification and definition of modes for review followed by nationwide case studies highlighting best practices for these modes and applicability to Suffolk County. The modes selected for review and evaluation included: transportation network companies (TNCs), vanpooling, microtransit and bikeshare, as well as an optimized transit scenario with consideration to improving the current SCT network.

- *Suitability Evaluation of Selected Modes*: High-level review and evaluation matrix of the selected modes to help Suffolk County identify which modes may be more (or less) suited to serve certain markets, help achieve system efficiencies and enhance mobility options and performance for users.

- *Mobility Workshop*: A mobility workshop was held with Suffolk County Economic Development & Planning and the Suffolk County Public Transportation Working Group to share initial analysis and findings and solicit input from the Working Group on behalf of County stakeholders to help inform the context and recommendations.

- *Final Report*: This report summarizes the research, best practices and analyses performed during the course of the study and makes recommendations for the County's consideration.

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# 3. Trip Pattern Analysis and Data Findings

## 3.1 Purpose and Methodology

### Purpose

As a first step in this study, a trip pattern analysis was undertaken to use a data-driven approach to better align mobility needs and service offerings. The analysis identified general work trip patterns throughout the County to help understand where people are traveling to and from, as well as the density of trips and trip patterns to understand how well (or poorly) existing trips are served by the current transit system.

### Data Inputs

Trip data was generated using the US Census Transportation Planning Package (CTPP 2006-2010 5-Year ACS) data set and represented single trips to work made by a single person at any time of the day. The CTTP data set contain information on trips to work at a high level of detail, for the primary mode used for each trip. For these analyses, all modes were included in the work trip data, to help identify commute patterns to observe both how the trip patterns aligned with the current transit routes and system, and also to identify how and where future transit and mobility investments might better serve these trip patterns and key destinations.

### Methodology

Transportation analysis zones (TAZ) are a unit of geography used for transportation planning models. Zone sizes can vary but typically include around 3,000 people and are derived from Census block data. TAZ trip data derived from the CTTP data sets were used to develop the trip pattern analysis. Initial selection for analysis consisted of the 12 TAZ zones in Suffolk County with highest trip volumes, which were prioritized from analysis outputs. The initial selection was expanded to 17 TAZ zones with consideration to transit supportive areas, East End representation, grouping adjacent zones (Ronkonkoma-MacArthur, Central Islip-Brentwood, and Greater Hauppauge) to recognize areas with regional impacts.

The final 17 key areas included in the analysis included: Babylon, Bay Shore, Ronkonkoma Hub-Long Island MacArthur Airport, Commack, East Hampton, Hauppauge, Huntington, Brentwood-Central Islip, Patchogue, Farmingdale, Riverhead, Suffolk County Community College, Smithtown, Southampton, Stony Brook, Wyandanch and Yaphank.

The TAZ data evaluation and selection for the trip pattern analyses began by predefining maximum distances between TAZ zones (10, 15, 20 miles) and predefining a minimum parameter of 1,000 trips to/from each zone to prioritize TAZs with higher trip volumes. From that, the total number of trips from TAZs to one another were identified at those predefined distances. The trip origin TAZs were ranked and selected by those that yielded up to 80% of the trips to the destinations, and were compared with the resulting number of trips to the predefined minimum number of trips (1,000). Trip density of those zones contributing 80% of the trips to each zone was then calculated. Trip density is calculated as the number of trips within 80% divided by sum of origin TAZ geographic area(s). The results were assessed using the predefined minimum trip origin density (20 trips/sq. mi) and the analysis outputs were evaluated and prioritized as the key analysis areas.

## 3.2 TAZ Analysis

Each TAZ analysis produced a series of data outputs including:

- Trip desire lines (normalized, straight line distances between TAZs)
- Dot density maps providing spatial maps of work trip origins and destinations
- Inbound and outbound trip patterns including mode share splits for all trips by direction and trip distances, and trip length distribution.

These TAZ analyses and data profiles offered insight into both the spatial distribution of work trips as well as gaps in the existing transit service offerings and coverage, and areas for potential new transit markets. The full set of 17 key area profiles and comparative data summaries can be found in Appendix A.

To illustrate the primary data outputs of the TAZ analysis, two data profiles are offered below, with one west end profile (Hauppauge) and one east end profile (East Hampton) to highlight the distinctive trip patterns and show the different and diverse transportation needs that will have to be addressed and implemented through the County's mobility solutions.

## Work Trip Origins and Destinations

Figure 3.1 illustrates the varying spectrum of work trips and destination densities in different geographies of the County by highlighting Hauppauge (top map) and East Hampton (bottom map). Work trips in East Hampton are generally localized and could be served by a wide variety of modes that facilitate shorter trips during commute hours, while longer commutes to the western half of the County may still be facilitated by

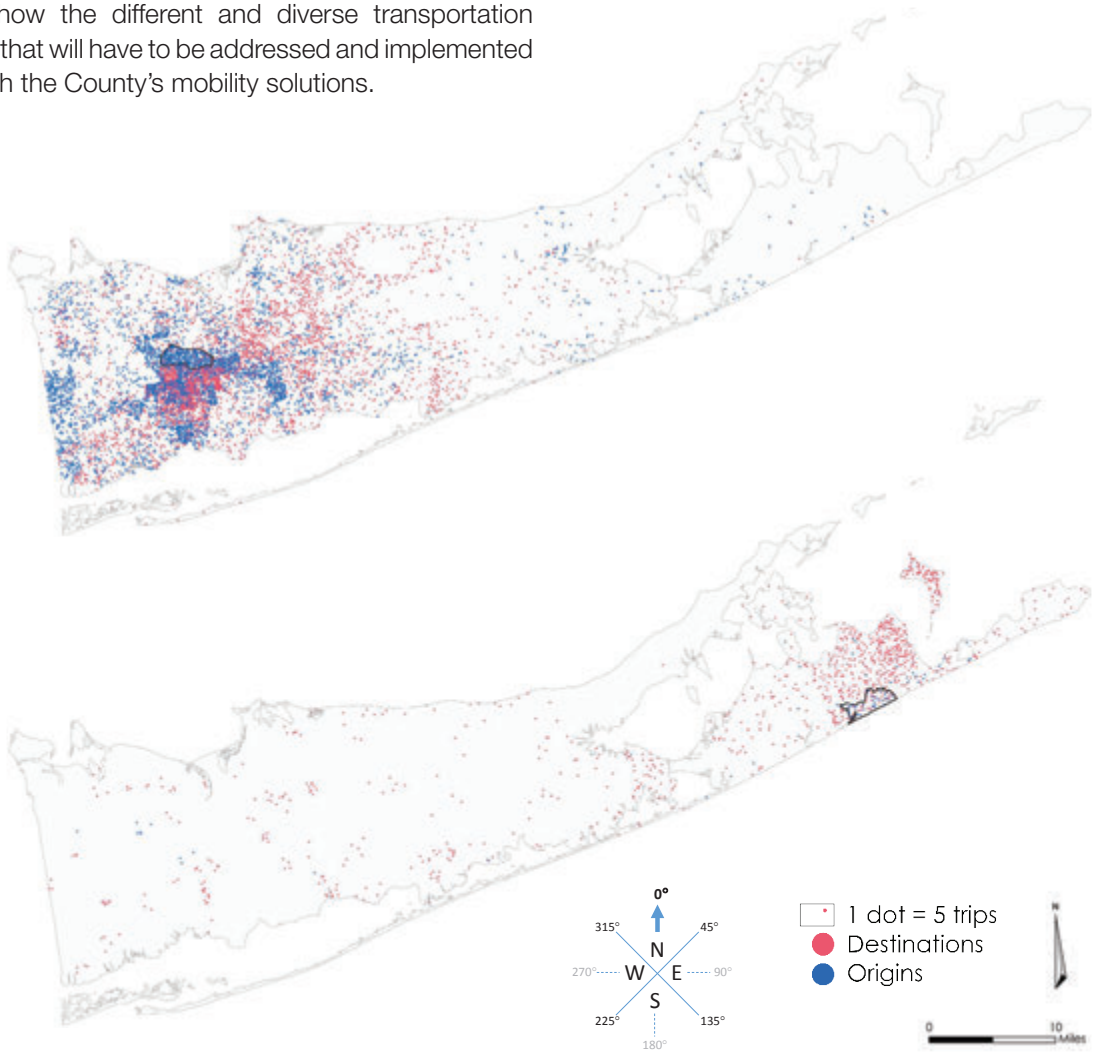



Figure 3.1: Work Trip Origins and Destinations for Hauppauge (top) and East Hampton (bottom)

private vehicles. Work trips in and out of Hauppauge are densely dispersed throughout the western and central area of the County and could be better served by high-quality, high-frequency transit routes connecting employees to their work destinations along strategic routes. These origin and destination patterns can guide the choices of mode, transit route alignment, length, and frequency to serve riders in the most attractive and economic way.

## Trip Distances

Figure 3.2 illustrates comparative trip distances for work trips into Hauppauge (top chart) and East Hampton (bottom chart). The majority of work trips made into Hauppauge are distances of 15 miles or less, indicating a potential for converting some single-occupancy vehicle trips into high-quality, high-frequency transit trips, and the opportunity to create a strategic transit network in and around this major employment hub. By comparison, the longest work trips being made to East Hampton are predictably from the west, but most other trips being made are within 10 miles signaling an opportunity to explore multimodal options for these short distance trips - such as microtransit or TNCs - to reduce trip miles and provide more customized and convenient mobility services in and around the South Fork area.

## Mode Share

Single-occupancy vehicles are still the predominant mode for work trips across the County. Even in two distinctive geographic areas like Hauppauge (top chart) and East Hampton (bottom chart) this tendency is evident, as seen in Figure 3.3. This presents a market potential to develop a multimodal strategy in the County and rethink mobility to promote more shared trips (further encouraging patterns of carpooling, as seen below), grow transit ridership, offer more first/last mile service, and create a more seamless and attractive experience for users by utilizing new modes and technologies.

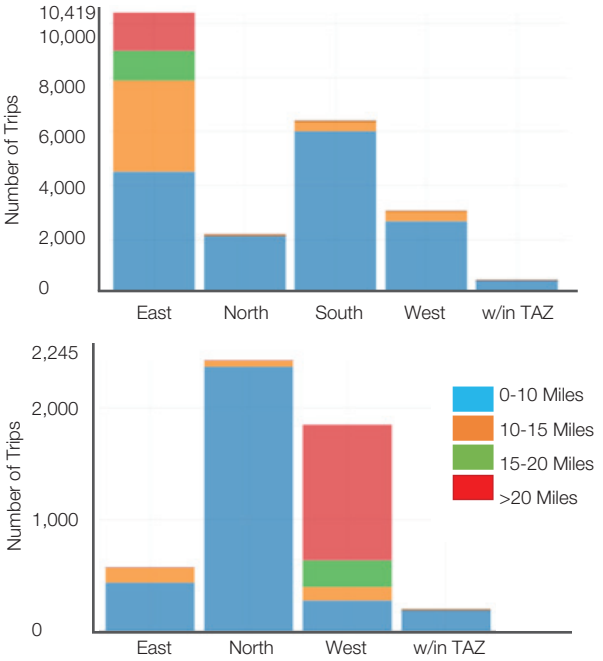



Figure 3.2: Trip Distances for work trips into Hauppauge (top) and East Hampton (bottom)

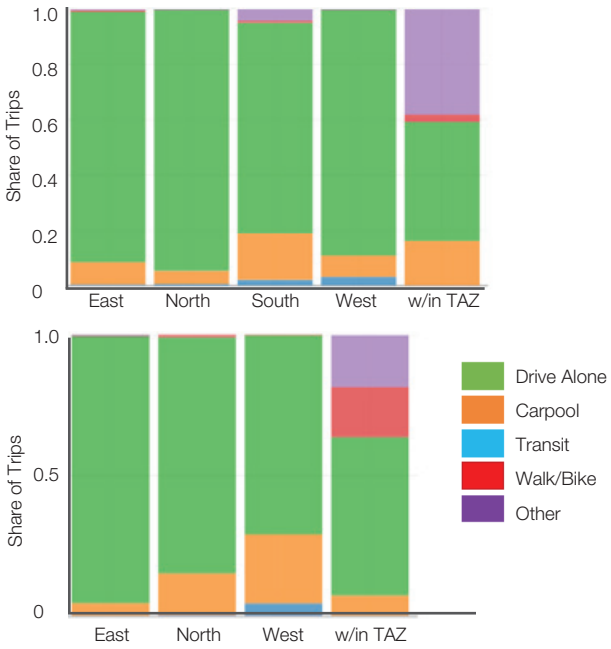



Figure 3.3 Mode Share for work trips into Hauppauge (top) and East Hampton (bottom)

# 3.3 Key Findings

### Focus Transit Investments on High-Performing "Priority" Fixed-Route Corridors with Provisions for Reallocating Cost Savings to Support Demand-Response Service Areas and Connections

Some areas in the County are not ideal for fixed route service, particularly those with high costs and low ridership. However, this presents opportunities to provide better service, and provide better service that is more aligned with user needs. This can be achieved by focusing transit investments on high-performing "priority" fixed-route corridors with provisions for reallocating resources from fixed route system savings to support demand-response service areas or connections, to provide better and more service those areas. The findings and geographies related to demand-responsive service areas, such as the East End, reinforce earlier recommendations, in the SEEDS and Volpe studies, that the County should explore and implement better and more customized demand-responsive service for these areas. Figure 3.4 is an illustrative map related to these findings.

### Opportunities Exist for the County to Attract New Riders by Expanding Offerings and Serving as a Mobility Services Provider

The County has an opportunity to pivot service, by continuing high-performing fixed routes and supplementing those with other mobility services to attract new riders and better serve existing riders. By transforming from being a fixed route service provider to being a "mobility services provider," the County should take into consideration data points, new technologies and new modes, and identify a more tailored suite of mobility services to optimize the system and to provide more customized and higher quality transportation options to riders. This opportunity also helps economize the system to provide improved and reliable service to areas of the County that would benefit from on-demand service such as TNCs, or small feeder routes such as microtransit that channel into larger transportation corridors like the Nicolls Road or Route 110 BRT.The County should identify where flexible mobility services can best serve rider markets, particularly with the development of TODs in the County that will create less auto dependency and may add to the data showing that 12% of County households have one or fewer cars (approximately 100,000 households) and 2.2% are car-free households (approximately 16,000 households). As with all the services offered by the County, new mobility services should be customized to meet specific mobility challenges outlined by area riders and aligned with the reality of funding and cost-effectiveness the County faces. Figure 3.5 is an illustrative map related to these findings.

### Unexpected Distribution of Potential Transit Markets Where Land Use is Not Transit Supportive

From the TAZ work trip analysis, pockets of potential transit markets were identified in areas of the County where land use is not supportive or efficient for fixed-routes. Potential transit markets were determined by target criteria in TAZs that combined household factors of: Car Ownership (one or fewer cars), Income (under $75k annually), and Specific Age Ranges (ages 16-35 and 65+) for those who may be more apt to use transit, or are reliant on transit service. On the East End, for example, potential transit market pockets may represent service workers with work destinations on the forks, who rely on public transportation. Additionally, there are pockets throughout the County where work trips are not currently being met by public transit service offerings, and these potential markets provide opportunities for the County to consider modes like microtransit or vanpooling to consolidate trips and provide better, more frequent service for work trips for potential transit markets not currently served by the existing system. Figure 3.6 is an illustrative map related to these findings.

Figure 3.4 TAZ Analysis: Illustrative map of work trip desire lines (20mi) and East Hampton O/D Trips

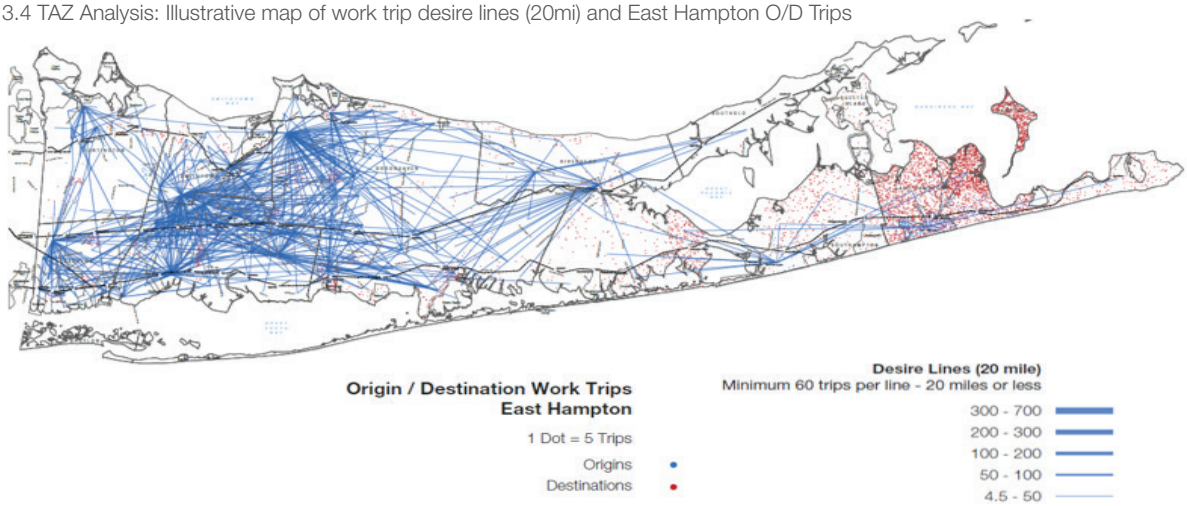



Figure 3.5: Potential Transit Market Households with One or Fewer Cars

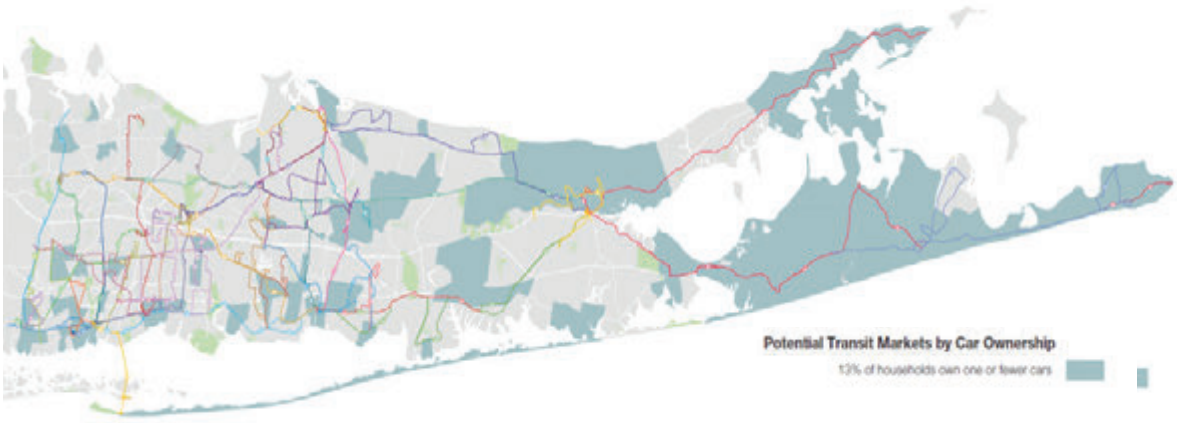
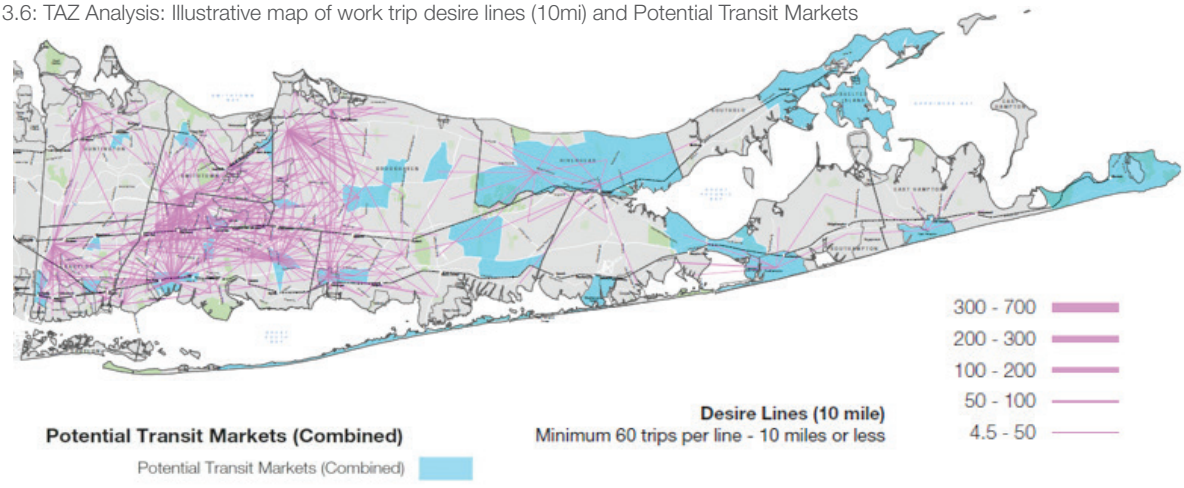



Figure 3.6: TAZ Analysis: Illustrative map of work trip desire lines (10mi) and Potential Transit Markets



# 4. Mobility Modes

## 4.1 Purpose and Mode Selection

This section defines and highlights several modes selected as part of a proposed mobility suite for Suffolk County. The intention of creating a mobility suite and evaluation matrix is to help the County plan, inform, and implement a more modern, efficient, and adaptable transportation system, and to prioritize transit decisions and investments in the case of diminishing or unstable funding as well as when resources are stable or growing. There are significant opportunities in exploring these modes: identifying new ways to achieve cost efficiencies for the County, taking advantage of data and technology to better deploy resources and services, creating more user-friendly service offerings, supporting County plans and growth, and setting a suburban model for excellence in transit and mobility services.

The following modes were proposed by the Arup team then discussed and selected by the County's project team for further exploration for application in Suffolk County with regards to feasibility:

- Optimized Transit
- Transportation Network Companies (TNCs)
- Vanpooling
- Microtransit
- Bikeshare

## 4.2 Mode Definitions

This section presents industry-standard definitions for these transportation modes, describing their key characteristics, and identifies examples of these modes in practice that will be discussed in more detail as case studies. The case studies illustrate national best practices in implementation.

### Transportation Network Companies (TNCs)

As TNCs are a relatively new mode, there are several definitions presented here as outlined by the U.S. Department of Transportation (USDOT), Federal Transit Administration (FTA), and university think tanks, all of which help create a full picture of this evolving 21st century transportation mode and technology.

TNCs use smartphone apps to connect users to drivers, providing point-to-point trips for riders. TNCs challenge conventional taxi services because they increase convenience for the user and typically provide more information on wait times, travel times, and pricing. TNCs also have the ability to incorporate some form of ridesharing or carpooling, typically increasing the travel time while reducing the cost of the trip for the user. This mode is commonly known as ride sourcing, on-demand ride services, and ride-hailing (Adapted from US DOT 2015 OST-R Transportation Technology Scan: A Look Ahead).[1]

Definition from University of California Transportation Center (2014): "In recent years, advances in information and communication technology have enabled new services that provide a wide variety of real-time and demand-responsive trips. Companies such as Lyft, Sidecar, and Uber (specifically uberX) have emerged offering smartphone applications to link riders with community drivers. Passengers request a ride from a private passenger vehicle driven by a (usually) non-commercially licensed driver through the mobile application, which then communicates the passenger's location to drivers via GPS. These apps charge a distance variable fare, approximately 80 percent of which goes to the driver, with the remaining to the ride-sourcing service."[2]

1 "Research & Technology," Text, U.S. Department of Transportation, accessed April 6, 2018, https://www.transportation.gov/research-technology.

2 Lisa Rayle et al., "App-Based, On-Demand Ride Services: Comparing Taxi and Ridesourcing Trips and User Characteristics in San Francisco" (University of California

Definition from Federal Transit Administration,[3] adapted from TCRP Research Report 188:[4] "Use of online platforms to connect passengers with drivers and automate reservations, payments, and customer feedback. Riders can choose from a variety of service classes, including drivers who use personal, non-commercial, vehicles; traditional taxicabs dispatched via the providers' apps; and premium services with professional livery drivers and vehicles. Ride-sourcing has become one of the most ubiquitous forms of shared mobility."

***Examples***: Uber, Lyft, Sidecar

### Bikeshare

Definition from Federal Transit Administration,[5] adapted from TCRP Research Report 188:[6] "Short-term bike rental, usually for individual periods of an hour or less over the course of a membership (periods which can range from a single ride, to several days, to an annual membership). Information technology-enabled public bikesharing provides real-time information about the location and demand for bikes at docking stations throughout a community."

Bikeshare systems can include fixed stations or be a dockless system, which is sometimes called a free-floating bikeshare system.

***Examples***: Spin, Zagster, Social Bicycles, Dropbike

### Vanpooling

Definition from Federal Transit Administration,[7] adapted from TCRP Research Report 188:[8] "Ridesharing involves adding passengers to a private trip in which driver and passengers share a destination. Such an arrangement provides additional transportation options for riders while allowing drivers to fill otherwise empty seats in their vehicles. Traditional forms of ridesharing include carpooling and vanpooling."

***Examples***: King County Metro Vanpool, 511 NY Rideshare

### Microtransit

Definition from Federal Transit Administration,[9] adapted from TCRP Research Report 188:[10] "IT-enabled private multi-passenger transportation services that serve passengers using dynamically generated routes, and may expect passengers to make their way to and from common pick-up or drop-off points. Vehicles can range from large SUVs to vans to shuttle buses. Because they provide transit-like service but on a smaller, more flexible scale, these new services have been referred to as microtransit."

***Examples***: Chariot, Split, Via

### Optimized Transit

While there is not a standard definition of "optimized transit," for the purposes of this study, this mode has been included and defined as: "The network

Transportation Center (UCTC) Working Paper, November 2014), https://www.its.dot.gov/itspac/dec2014/ridesourcing-whitepaper_nov2014.pdf.

3 "Shared Mobility Definitions," Text, Federal Transit Administration, January 13, 2017, https://www.transit.dot.gov/regulations-and-guidance/shared-mobility-definitions.

4 Sharon Feigon and Colin Murphy et al., Shared Mobility and the Transformation of Public Transit (Washington, D.C.: Transportation Research Board, 2016), https://doi.org/10.17226/23578.

5 "Shared Mobility Definitions," Text, Federal Transit Administration, January 13, 2017, https://www.transit.dot.gov/regulations-and-guidance/shared-mobility-definitions.

6 Murphy et al., Shared Mobility and the Transformation of Public Transit.

7 "Shared Mobility Definitions," Text, Federal Transit Administration, January 13, 2017, https://www.transit.dot.gov/regulations-and-guidance/shared-mobility-definitions.

8 Murphy et al., Shared Mobility and the Transformation of Public Transit.

9 "Shared Mobility Definitions," Text, Federal Transit Administration, January 13, 2017, https://www.transit.dot.gov/regulations-and-guidance/shared-mobility-definitions.

10 Murphy et al., Shared Mobility and the Transformation of Public Transit.

redesign of existing fixed routes which provide more people with access to more frequent transit service without costing more to operate. These new service patterns may include more direct routes and faster service, increased frequency during peak ridership times, fewer diversions, and route connectivity with high priority given to traffic generators and intermodal nodes.

This approach takes into consideration that there are areas that are not ideal for fixed-route service (high cost, low ridership routes) and that resources should be deployed more strategically to serve more people with more productive and frequent service. Areas where fixed-route service is not deemed to be optimal, would be considered for some type of demand-responsive service to offer mobility options scaled to the needs of that area.

***Examples***: Houston Metro Bus Network Redesign, San Diego Transit Optimization Plan

## 4.3 Case Studies and Best Practices

This section highlights potential advantages and disadvantages of the selected modes, and identifies best practices and case studies that illustrate how these modes could be applicable to Suffolk County. Some are selected to be consistent with the County's size and suburban characteristics, others are exemplary models or best practices of a successful program that could be scaled to be applicable for the County. Some modes are relatively new and based on technology that will continue to evolve quickly. Therefore, while the infrastructure or operations known today may be vastly different in a few years, the current case studies or best practices included in this section provide a road map for the County to consider how new services and technologies might be integrated into its existing network.

Some of these modes have been previously investigated or recommended to varying degrees. For example, demand-responsive services were recommended in previous Suffolk County studies, including the *Sustainable East End Development Strategies Report* (June 2006) recommending use of feeder/distributor shuttle services in connection with the implementation of an intermodal hub to improve connectivity on the East End. Additionally, the *Volpe Center East End Transportation Study* (September 2009) noted key policy and operational needs between the North Fork and South Fork, for which a hybrid service concept was proposed to meet these needs. Twelve demand-responsive service areas were identified in the study, which could serve as a path forward for a future pilot locations to employ TNCs, vanpooling or microtransit as a mobility solution to serve the unique needs of this area.

In June 2017, Suffolk County released a Request for Information (RFI) for a proposed regional bikeshare system in an effort to explore how bikeshare could become part of the larger transportation network in the County. The selected case studies in bikeshare in this section are highlighted to illustrate similar suburban bikeshare systems that serve comparable population densities and provide insight on potential funding partnerships and scalability.

The County can consider opportunities to pilot these modes and mobility services, in tandem with current or upcoming transportation initiatives, such as the LIRR East End Service Improvements proposed for implementation in spring and summer 2018. Thinking about these opportunities together, engaging the public and allocating resources to bolster the success of new services and cross-agency collaboration could yield optimal outcomes. Throughout, the collection and analysis of data on how pilot projects or pilot services perform will be critical to measuring success and seeing where refinements can be made over time, or addressed when implemented on a larger scale.

## Transportation Network Companies (TNCs)

Existing partnerships between TNCs and transit agencies, while relatively new, have been established for a diverse spectrum of purposes, including: facilitating first/last mile trips to transit, providing "replacement" service coverage for under-utilized fixed routes, improving access to 2nd and 3rd shift jobs, joint marketing/mobile app service to enable multimodal planning, supporting paratransit by providing same-day trip planning and reducing operational costs, and facilitating subsidized trips for specific customer groups or service areas.

Partnering with TNCs can provide transit agencies with more options and agility to meet specific travel demands and make adjustments as needed through smart technology, is a more convenient and user-friendly service for customers, and at day's end, the transit agency can dedicate more resources to paying for the "ride," not the asset. It behooves transit agencies to also ensure that these partnerships include data sharing terms and requirements, so that the agency and jurisdiction can fully understand the use patterns of their riders, the cost-benefit of the service, the actual impacts of TNCs to the network and service, and where this type of service may be most efficiently employed. The variety of partnerships that currently exist and are being formed between transit agencies and TNCs to date can generally be grouped into three primary typologies:[11]

- ***Subsidized Rides/Monetary Investments*** – providing rides/offers that are not available to the public or are only available within a specific geographic catchment areas or nodes (for example, to support first/last mile trips at end of the line stations) that can be set by the transit agency.
- ***App Integration / Custom Discount Codes*** – partnerships focused on the service providing some type of application programming interface (API) integration or a discount code to riders (discounts that are available to the riding public) as outlined by a transit agency.
- ***Proposed / Pilots*** – partnerships that are being vetted or negotiated, for example using TNCs service providers to provide transportation for "non-critical 911" calls. For example, Washington, D.C. has proposed using TNCs to provide transportation services for "non-critical 911" callers to hospitals in an event where ambulance service is not warranted.

### Potential Advantages

- Offer services seamlessly where fixed route transit is inefficient, expensive or otherwise difficult to provide.
- Provide feeder services in low-density areas that connect passengers to other higher utilized modes, such as the LIRR or provide first/last mile service to and from their origin or destination to the larger network.
- Offer more consistent and on-demand service during off-peak hours.
- Improve equity and access to opportunities for Title VI populations and others populations underserved by existing transportation services. New research is beginning to explore how transit agencies might start to assess the efficiencies of TNCs as an equity tool. For example, a 2017 report from the Center for American Progress describes a method to create a subsidized TNC program to serve areas with low transit accessibility.[12]

11 "How Are Uber and Lyft Working With Public Transportation Authorities?," New York Public Transit Association, Inc., accessed April 6, 2018, https://nytransit.org/resources/transit-tncs/205-transit-tncs.

12 Kevin DeGood and Andrew Schwartz, "Can New Transportation Technologies Improve Equity and Access to Opportunity?," Center for American Progress (blog), April 27, 2016, https://www.americanprogress.org/issues/economy/

- Provide a transportation option that can accommodate short-term and long-term shifts in rider behaviors.
- Increase mode choice flexibility and in turn, reduce transportation costs for individuals by allowing them to choose the most cost-effective option.
- Reduce dependence on car ownership and offer increased mobility for non-drivers (e.g., teenagers or seniors). For example, the Kansas City Transportation Authority's program, described in the case studies section below, provides on-demand rides for members of the general public and those protected by the Americans with Disabilities Act.
- Improve transportation planning efforts through the provision of data from mobility providers.
- Utilize technology to provide subsidized trips for riders in specific geographies or zones (transit deserts, for example) wherein the subsidy will only be applied if trips begin or end in those zones. For example, the City of Summit, NJ has a partnership with Lyft, detailed in the case study section below, that limits participation in the program to rides that begin or end at the NJ Transit train station and have an origin or destination in the City of Summit.

**Potential Disadvantages**

- Emerging mobility services cannot replace high-quality mass transit as the most efficient service in high-density corridors.
- Although these services can provide first- and last-mile service, they should not be used as a substitute for pedestrian- and transit-focused urban design (dense, mixed-use, transit-oriented development).
- Recent data and studies have shown that in some urban areas, TNCs have drawn riders away from mass transit and led to increased traffic congestion due to added TNC trips.[13]
- By reducing the opportunity cost of self-driving for the user, TNCs may support or reinforce low-density development patterns that are difficult to serve by mass transit.
- TNCs are generally less accessible to those without access to smart phones.
- Existing taxi services and organizations representing the taxi industry have frequently resisted the introduction of TNC services to an area.
- Data may be hard to obtain from TNCs if not written carefully into the original contract or reporting is completed irregularly. Absent actual, frequent utilization data, continued proactive transportation planning efforts and adaptability of the transit system will be hindered.

**Case Studies**

The case studies highlighted in this section are intended to be those most relevant to Suffolk County, wherein partnerships between public transit agencies were established with TNC or on-demand transit providers to replace or supplement inefficient fixed-route transit. Publicly available information on the specific terms, conditions and agreements between the providers and the agencies is not available.

reports/2016/04/27/135425/can-new-transportation-technologies-improve-equity-and-access-to-opportunity/."plainCitation":"Kevin DeGood and Andrew Schwartz, "Can New Transportation Technologies Improve Equity and Access to Opportunity?," Center for American Progress (blog

13 Regina R. Clewlow and Gouri Shankar Mishra, "Disruptive Transportation: The Adoption, Utilization, and Impacts of Ride-Hailing in the United States" (Institute of Transportation Studies, University of California, Davis, October 2017).

When TNC providers were contacted directly, they were not able to provide this information due to confidentiality with the contracted agencies and noted that each arrangement with a jurisdiction tends to be unique, as they are looking to solve different mobility issues.

### *Pinellas Suncoast Transit Authority (St Petersburg, FL)*

Beginning in 2016, the Pinellas Suncoast Transit Authority (PSTA) partnered with Uber, Lyft, local taxi services, and wheelchair transportation services to provide a pilot service branded as "Direct Connect" in the Pinellas Park and East Lake sections of Pinellas County.

The pilot program divided the County into eight Direct Connect zones, and provided a subsidy of up to $5 to riders that hailed a ride in one of the zones traveling to or from a bus stop in the same zone. Planners of the system projected an average $1 per trip out-of-pocket expense for riders.

The program had a $100,000 budget for the first six months and included service for riders with disability.

In the first year of the program, it was reported that 3,167 riders utilized the service, with an average cost to PSTA of $11.48 per ride. Deemed a success by PSTA the program was expanded in 2017 to operate throughout all of Pinellas County, seven days a week, with service offered from 6am to 11pm.[14] PSTA has estimated that the partnership program has saved the authority approximately $100,000 annually.[15]


PSTA Uber Partnership
Source: https://www.uber.com/blog/tampa-bay/psta-expansion/

After rolling out the program, planners realized that many riders were transit-dependent and unfamiliar with ride-hailing apps. As a follow-up recommendation, PSTA sought to develop an education campaign to help inform users on how to use TNC apps.[16]

### *Kansas City Transportation Authority*

In May 2017, the Kansas City Area Transportation Authority (KCATA) partnered with Transdev—a French public-private transportation operator—to launch the RideKC Freedom On-Demand program. The program builds on the RideKC Freedom program by creating an On-Demand app- or phone call-based ride hailing program. This program provides a particular advantage over the RideKC Freedom

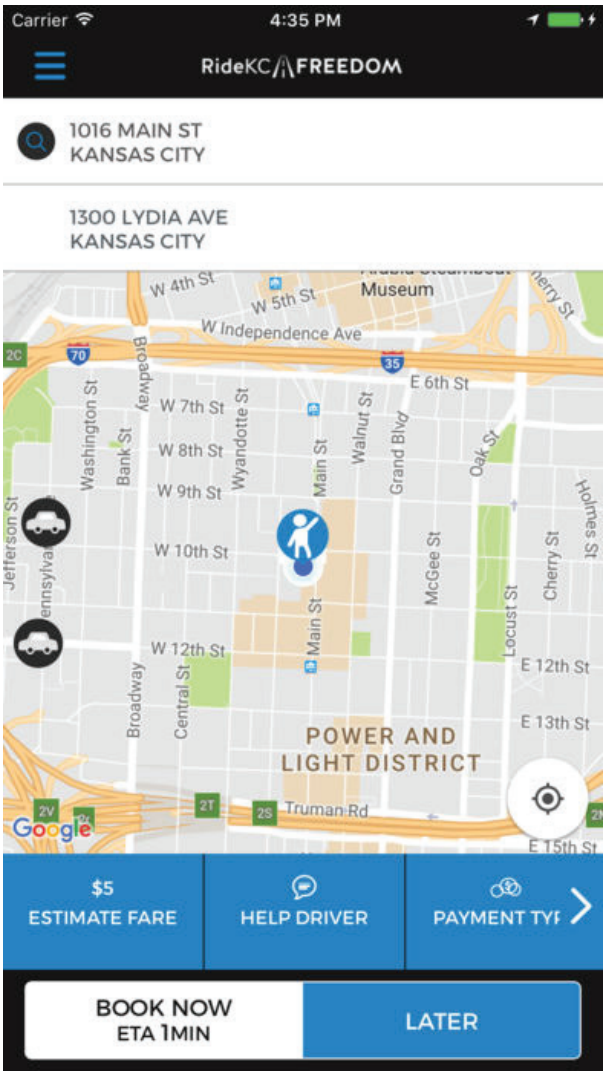
14 "PSTA Expands Transit Partnership with Uber, Lyft Across Pinellas County" (Pinellas Suncoast Transit Authority, 2016), https://www.psta.net/about-psta/press-releases/2016/psta-expands-transit-partnership-with-uber-lyft-across-pinellas-county/.

15 Janelle Irwin, "PSTA Widens Its Reach with United Taxi, Uber Partnership," Tampa Bay Business Journal, January 19, 2017, https://www.bizjournals.com/tampabay/news/2017/01/19/psta-widens-its-reach-with-taxi-uber-partnership.html.

16 "PSTA Brings Together Uber and Taxi to Get People on the Bus" (Pinellas Suncoast Transit Authority, 2017), https://www.psta.net/about-psta/press-releases/2017/psta-brings-together-uber-and-taxi-to-get-people-on-the-bus/.

program for riders with disabilities because it no longer requires a reservation to be made at least 24 hours in advance.[17]

For members of the general public, rides are priced at $10 for the first five miles and $2 for each additional mile. The KCATA receives a portion of the fare of rides taken by the general public and uses that money to provide subsidized fares for riders who qualify under the Americans with Disabilities Act - $3 for the first eight miles and $2 for each additional mile.[18]




KCATA RideKCFreedom. Source: Apple App Store Screenshot

17 Sam Hartle, "New RideKC Service Allows Users to Use App to Hail a Ride," KSHB Kansas City, April 26, 2017, https://www.kshb.com/news/local-news/new-ridekc-service-allows-users-to-use-app-to-hail-a-ride.

### *City of Summit, NJ*

In October 2016, City of Summit partnered with Uber for a six-month pilot program to provide door-to-door service between a location in the City and the NJ Transit Summit Train station.

The pilot program's goal was to reduce existing parking demand at the train station's parking lot. To that end, the City guaranteed $2 fare per trip for users, which, if taken as a round trip as part of a daily commute, would be equal to the $4 daily parking fee for City residents. Residents with prepaid permits were eligible for free rides. Participation in the program was limited to the first 100 residents to sign up.

Following the conclusion of the pilot program in March 2017, the City announced a one-year extension of the program, this time in partnership with Lyft. The new partnership program, slated to begin December 2017, extends the hours of the service later into the evening, expands the program from 100 to 300 residents, adds the ability to schedule rides up to seven days in advance, and maintains the pricing structure of $2 per trip for those without prepaid permits and free trips for those with prepaid permits.[19]

### *Lyft and Amtrak Partnership (nationwide)*

In August 2017, Lyft announced Amtrak as a partnership that will enable customers to use the Amtrak app to access the Lyft app in order to address

18 "RideKC Freedom On-Demand," RideKC, 2018, http://ridekc.org/mobility-services/ridekc-freedom-ondemand; Robert A. Cronkleton, "New Uber-like Ride-Hailing Service Helps Riders with Disabilities in KC," The Kansas City Star, April 25, 2017, http://www.kansascity.com/news/local/article146675834.html.

19 "Summit, New Jersey," Summit, NJ Official Website, accessed April 6, 2018, https://www.cityofsummit.org/.


Lyft / Amtrak Partnership. Source: blog.lyft.com

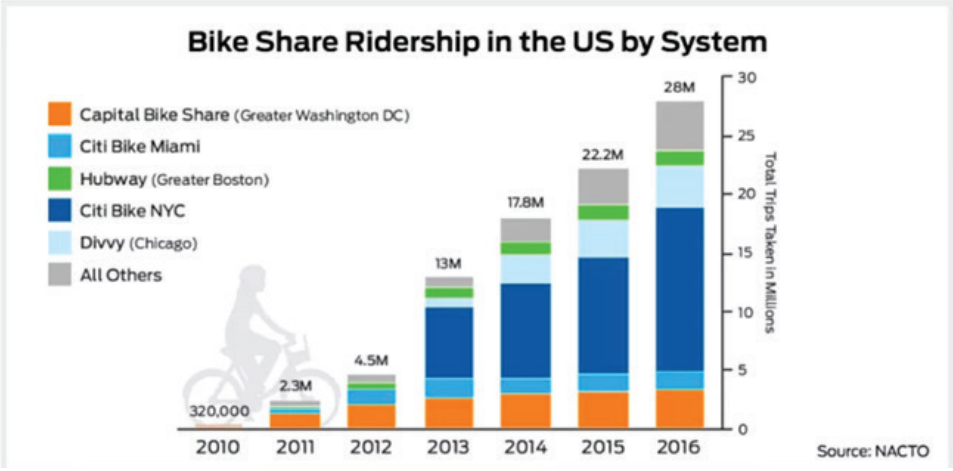
first/last mile service issues for riders. The effort is focused on improving the customer experience, seamless travel connections and providing more options for train travelers embarking on or debarking from their journey. Amtrak currently operates in 46 states and Lyft operates in 360 communities across the country that reach 97 percent of Amtrak riders.[20]

## Bikeshare

In recent years bikeshare has joined buses, taxis, and ridesharing as a staple of urban transportation systems across the globe, where it now exists in over 600 cities globally. In 2016, there were 28 million bikeshares trips in American cities — a twenty-five percent increase in just one year.[21] There is also a visible uptick in smaller and suburban bikeshare systems being introduced to increase mobility offerings outside of major U.S. cities.

Traditionally, bikeshare programs consist of a web of docking stations strategically sited across a city. Riders pay to unlock bikes—either for single use or through a monthly or yearly subscription—and return them to another docking station near their destination within a specified window of time. This arrangement offers users the advantage of predictability; like with a fixed-route transit network, users know exactly where they may enter and exit the system, and, in many cases, smartphone apps inform users of bike and dock availability so they may more predictably plan their trips. However, the disadvantage is a lack of flexibility, as origins and destinations located far from docks are not served by bikeshare.

Bikesharing systems are also evolving the means by which mobility is funded. The traditional transportation model of a partnership between a city, operator and




Bikeshare Ridership in the US by System (2010-2016)

20 "Amtrak and Lyft Announce Rideshare Partnership," Amtrak Media Center, August 1, 2017, https://media.amtrak.com/2017/08/amtrak-lyft-announce-rideshare-partnership/.

21 "Bike Share in the US: 2010-2016," National Association of City Transportation Officials, March 2017, https://nacto.org/bike-share-statistics-2016/.

sponsor has limited utility for bikeshare. Many cities are turning to grants, private sponsorships and user fees to make bikeshare programs financially feasible. Some bikeshare operators provide the "hardware and software" elements (bikes, stations, proprietary software) and then partner with a local partner, such as a non-profit to facilitate the operations of the system.

The City of Seattle, which does not currently offer a publicly-funded bikeshare system, is currently piloting multiple private sector bikeshare systems in tandem, with the city's initial role limited to permitting the dockless bikeshare systems, which do not use stations or docks. Seattle has also partnered with the bikeshare providers and the University of Washington in order to have UW's Transportation Data Collaborative group store, anonymize and consolidate bikeshare trip data from the various systems so the city can understand where trips are being made and to inform bicycle infrastructure investments.[22] The City is actively managing the pilot program by monitoring bikeshare use and permitting additional bikes with each of the providers in a scaled approach.

Kansas City's bikeshare system has a non-profit operator and crowd-sourced over $300,000 in funding for the system. In 2016, Kansas City's bikeshare was in its sixth year of operation and had over 16,000 trips.[23] This represents a 200 percent increase from a total ride count of 5,320 in 2012.[24] Austin's bikeshare system of forty stations currently operates without city assistance and no major donor.[25] As of April 2017, Austin's bikeshare has had over 590,000 trips.[26]

### Dockless Systems

In recent years, bikeshare technologies have evolved, and many systems are now incorporating dockless features. A number of technology providers such as Mobike and Spin have been piloting fully dockless bikeshare systems, which offer riders the flexibility to finish their trips and leave their bikes wherever they please. Already gaining popularity in cities across China, dockless systems have debuted in a number of US cities in 2017 including Seattle and Washington, D.C.


Users scan a QR code to unlock a bike. Source: straitstimes.com

22 Matt McFarland, "How Seattle Morphed from Bikeshare Failure to Industry Leader in Five Months," CNNMoney, August 18, 2017, http://money.cnn.com/2017/08/18/technology/business/seattle-bikeshare/index.html.

23 "BikeWalkKC's 2016 Annual Report" (BikeWalkKC), accessed April 6, 2018, https://bikewalkkc.org/about/reports-and-financials/2016-annual-report/.

24 "The 2012 BikeWalkKC Annual Report" (BikeWalkKC), accessed April 6, 2018, http://bikewalkkc.org/wp-content/uploads/2014/12/bikewalkkc2012annualreport.pdf.

25 Zak Stone, "The Business of Bike-Share," Next City, May 5, 2014, https://nextcity.org/features/view/bike-share-make-money-start-up-citi-bike-business-sharing-economy.

26 "Stats & Facts," Austin B-cycle, April 2017, https://austin-bcycle.com/about/stats-facts.

Similar to many existing bikeshare systems, customers use a smartphone app to locate the nearest available bike. However, they then pay for the bike remotely via an app, as opposed to at a station kiosk (at fees as low as $1 for every 30 minutes of usage) and unlock it by scanning a QR code on the bike itself or using some other access code provided by the app. When they finish their trip, riders leave the bike where they choose and immobilize it either manually or through the app. Locking the bike ends the trip and associated charges.

While fully dockless systems are currently being deployed in dense urban areas, dock-based bikeshare systems like Social Bicycles and Zagster have adopted a hybrid approach centered on station-based infrastructure ("smart dock" station) but also has an option for riders to take advantage of dockless technology ("smart lock" on the bike).[27] While users may begin and end their trips at bikeshare stations for the normal usage fees, these systems also offer the option to lock up bikes at any destination for a small additional fee. The built-in "smart lock" option also allows for mid-trip stops. After a period of time, bikes which remain locked up away from bikeshare docks are relocated by the system operator. Hybrid systems, while still being tested, offer the visibility and certainty associated with dock-based systems, as well as the flexibility afforded by dockless systems. These hybrid bikeshare systems have been implemented in cities including Hoboken, NJ, Rochester, NY and in College Park, MD on the University of Maryland campus.

***Potential advantages of systems with dockless features***

- Easier and less expensive deployment, negating the need for financing and planning for docking stations
- Improve transportation equity, as dockless or hybrid systems can serve all parts of a jurisdiction
- Ease of dropping off the bike directly at the final destinations helps solves last-mile problems
- Flexible and affordable pricing scheme removes barriers for potential users to join the bikeshare (such as high upfront cost of monthly or annual subscription)
- Offers a more competitive marketplace, as multiple providers can operate in the same city, often times in tandem with an existing system run by the city (e.g.; Washington, D.C.)

***Potential disadvantages of systems with dockless features***

- Access may be limited to those with a smart phone to access the app, QR code, or a bikeshare account.
- Less accountability for bicycle care (e.g.; reports of users storing bikes inappropriately)
- Lower-density areas face additional challenges in implementing a bikeshare because it may be difficult to reach a high enough concentration of destinations accessible by bicycle.
- Uneven bicycle distribution; harder to control locations of available bikes with absence of docking stations. Some operators either hire staff to redistribute bikes or offer incentives to customers to ride them to specific pre-determined areas.
- Existing legislation is limited regulating these services and their use of public space and creates challenges for many areas that have been less encouraging of dockless systems.

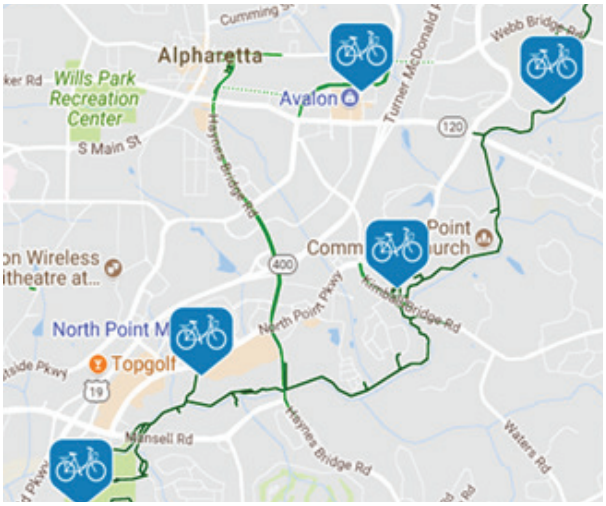
27 Tucker Gaegauf, "Bikeshare Technology White Paper: A Comparative Guide to the Different Technologies Offered by Bikesharing Vendors," June 25, 2014.

## Case Studies

Case studies herein were selected to share existing programs that have successfully illustrated minimum-medium density for suburban bikeshare and generally align with the average population density of Western Suffolk County (approx. 3,000 people / square mile) to illustrate resources, operations and implementation within a similar density scale, as well as partnership and sponsorship opportunities that may be useful to Suffolk County as it considers bikeshare as part of its larger mobility offerings.

### *Alpharetta, GA*

- Location: 30 miles north of Atlanta
- Population: 63,000




Alpharetta bikeshare station map
Source: http://bike.zagster.com/alpharetta/

- Population Density: 2,342/sq. mi

Launched in 2016, the Alpharetta Bikeshare Program includes five stations (expanded from three initially), spaced about 2.2 miles apart with 21 bikes. The system connects several local destinations including a shopping mall, two parks and a YMCA. The program is co-sponsored by the Avalon Mall and cities of Alpharetta and Roswell, Georgia. The city of Alpharetta paid $21,840 for a one-year contract with Zagster to implement and maintain the program.

Riders can select a $20 annual membership or a one-time day pass. The first three hours of usage are free, then users are charged $2/hour after that period.

Bikes can be located via a free Zagster Mobile App. Each bike has a unique number that riders enter into the app or the website to obtain a single-use code to open the lockbox on the back of the bike. A key, stored inside and tethered to the lockbox, allows a bike to be secured throughout the ride. The rental ends when a bike is returned to a station.

### *Longmont, Colorado*

- Location: 40 miles north of Denver
- Population: 90,000
- Population Density: 3,294/sq. mi

Launched 2017, the Longmont Bikeshare Program encompasses 10 stations and 50 bikes spread throughout an approximately 7-square mile area. Three of the stations are located in downtown Longmont, and the remainder connect key destinations outside of downtown such as a recreation center and commercial clusters. The program is sponsored by Oskar Blues Brewery, Envision Longmont, Longmont United Hospital, and the City of Longmont.

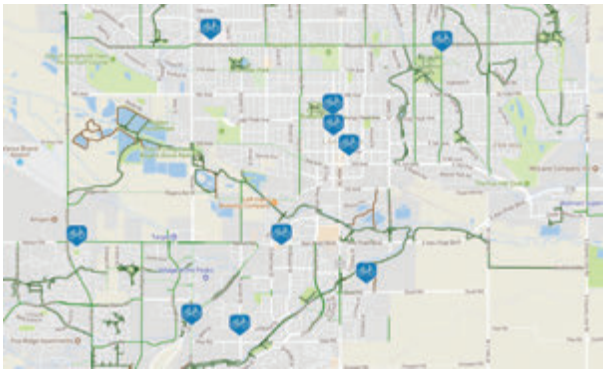
Riders can purchase a $60 annual membership or $15 monthly membership, both of which have no additional fee for trips under one hour. The price is $3 per hour for trips by members which exceed one hour and for each hour of a non-member trip.

Bikes can be located via a free Zagster Mobile App. Each bike has a unique number that riders enter into the app or the website to obtain a single-use code

to open the lockbox on the back of the bike. A key, stored inside and tethered to the lockbox, allows a bike to be secured throughout the ride. The rental ends when a bike is returned to a station.[28]

***Chattanooga, TN***

- Location: 100 miles southeast of Nashville
- Population: 178,000



Longmont bikeshare station map
Source: http://bike.zagster.com/longmont/

- Population Density: 1,223/sq. mi.

Launched in 2012, the Chattanooga bike transit system, operated by Motivate, has 38 stations and 300 bicycles in the system. Motivate operates many systems in the US, including New York City's CitiBike system. Unlike the other case studies in this section, the Chattanooga bikeshare is a dock system and bikes cannot be left at an area other than a bikeshare dock. The stations are located throughout downtown Chattanooga, along the Tennessee River's waterfront parks and trails, and on the University of Tennessee's Chattanooga campus. The system is sponsored by many local businesses and organizations including the local hospital, Chattanooga Area Chamber of Commerce, and the Tennessee Aquarium.

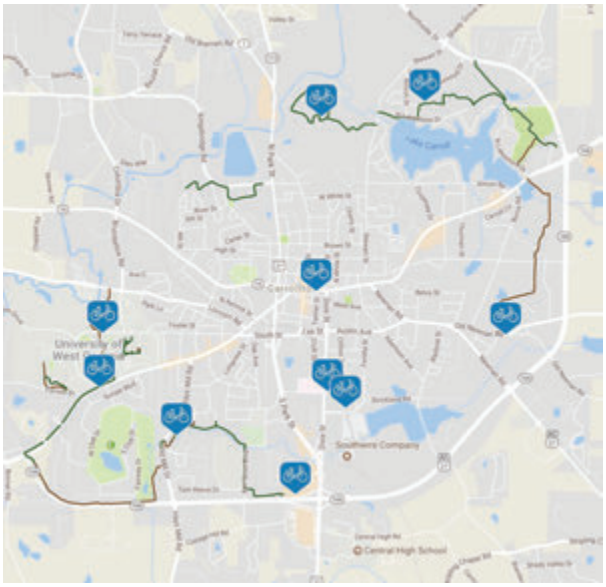
28 "Bike Share at Longmont," Zagster, 2017, http://bike.zagster.com/longmont/.

Riders can purchase a single day pass for $8, a three day pass for $15, or an annual pass for $50. Each pass allows for rides of up to 60 minutes at no additional charge, with fees assessed for rides with a longer duration.[29]

***Carrollton, GA***

- Location: 50 miles west of Atlanta
- Population: 24,000
- Population Density: 1,094/sq. mi

Launched in 2017, the Carrollton Bikeshare Program is a ten-station, 50-bike network with stations located near downtown Carrollton, the campus of the University of West Georgia, other key destinations, and bike trails and parks. The system is sponsored by Tanner Health System, the University of West Georgia, and Southwire.



Carrollton bikeshare station map
Source: http://bike.zagster.com/carrollton/

29 "Pricing: Pass Options for Everyone," Bike Chattanooga, accessed April 6, 2018, https://bikechattanooga.com/pricing/.

Riders can purchase an annual membership for $25, a monthly membership for $15, or ride as non-members, paying $3 per hour. Monthly and annual plan members receive the first hour free. The program also has special rates for individuals with University of West Georgia, Tanner Health System, and Southwire email addresses, providing one-hour trips for free and charging $3 for each additional hour.

Bikes can be located via a free Zagster Mobile App. Each bike has a unique number that riders enter into the app or the website to obtain a single-use code to open the lockbox on the back of the bike. A key, stored inside and tethered to the lockbox, allows a bike to be secured throughout the ride.[30]

***Fort Collins, CO***

- Location: 65 miles north of Denver
- Population: 161,000
- Population Density: 2,652/sq. mi

The Fort Collins Bikeshare Program is operated by Zagster and includes 91 bikes and 18 stations concentrated in downtown Fort Collins. Stations are located at Colorado State University's campus, downtown, multiple breweries, parks, and other key destinations. The bike share program is sponsored by numerous organizations, including the university, municipal government, and private businesses.

An annual membership costs $60, a weekly membership costs $15, and an hourly pass is $2 per hour. Colorado State University students are eligible for a $30, reduced price annual membership. Riders with annual and weekly memberships receive the first hour of their trip for free, and additional hours cost $2 per hour.

Bikes can be located via a free Zagster Mobile App. Each bike has a unique number that riders enter into the app or the website to obtain a single-use code to open the lockbox on the back of the bike. A key, stored inside and tethered to the lockbox, allows a bike to be secured throughout the ride.[31]

## Microtransit

Microtransit providers offer something of a hybrid between TNCs and traditional public transit by offering a dynamic-route, on-demand transportation service. To use a microtransit service, passengers enter their origin and destination into a smartphone app which employs a geographical algorithm to calculate an optimal route to pick up as many passengers as possible who are making similar trips. Riders may be instructed to walk to a nearby pickup point so vehicles do not need to divert off their planned route. This way, trips are faster and more efficient than public transit but less costly than private taxis.

**Potential Advantages**

- Dynamic routing capabilities based on rider demand can offer more efficient, flexible and direct service
- Can provide or improve off-peak service where demand is warranted
- Microtransit services can be useful for last-mile connections
- Minimizes vehicle miles traveled per capita through strategic multi-user ride sharing.
- Can be designed to serve specific zones or areas for riders who live and/or work in neighborhoods that are not well-served by fixed-route transit or other modes.

30 "Bike Share for The City of Carrollton," Zagster, 2017, https://bike.zagster.com/carrollton/.

31 "Bike Share in Fort Collins," Zagster, 2017, http://bike.zagster.com/fortcollins/.

### Potential Disadvantages

- Microtransit may need to continue to be refined and tested in dense, urban markets before it is introduced into more suburban, less dense areas to ensure market and operational feasibility.
- Fare costs may vary, and in some cases be higher than traditional transit fare, but trips could also be subsidized to mitigate this for specific users or trips to/from specific geographic zones.
- In denser areas, application and routes for microtransit should be reviewed carefully to ensure service complements, but does not complete or create redundancies with investments traditional public transit service offerings or routes.

### Case Studies and Operators

#### *Via*

Via is a microtransit service currently operating in select sections of New York, Chicago, and Washington D.C. In 2015, Via had raised $37 million in private funding (largely from corporations based in Israel, the founders' home country) to service the Manhattan market. By June 2017, that total had risen to over $137 million. In June 2017, Via partnered with NYC Taxi and Limousine Commission (TLC) and Verifone, the company that owns most NYC taxi meters, to offer ride sharing in yellow cabs. This partnership was the result of a call for proposals from the Taxi and Limousine Commission (TLC) to modernize New York City's cab fleet.[32]

Via operates with vehicles (often premium vans) that are owned by drivers. It initially launched in 2013 with rush-hour-only service in Manhattan, offering seats starting at $5 and varying based on number of passengers and length of trip.[33] Fares in Chicago and D.C. are slightly lower (starting at $3). In contrast to other ride-hailing services, Via drivers earn hourly—not fare-based— salaries, which can be enticing to potential drivers in new markets.

Via Microtransit vehicle Source: Via (facebook.com)

In addition to their single-fare rides, Via offers ViaPass, weekly and monthly passes for habitual users: $63 for one week of up to four daily rides, $179 for up to four daily rides between 6am–9pm for four weeks, or $229 for up to four daily rides 24/7 for four weeks.[34]

#### *Chariot*

Chariot currently operates in New York City, Austin, Seattle, and the San Francisco Bay Area, offering on-demand ridesharing via Ford Transit shuttles. The microtransit service operates along fixed routes, similar to buses, but typically make less stops. Chariot riders use a smart-phone based app to

32 Sara Ashley O'Brien, "Uber-like Carpooling Is Coming to NYC Taxis," CNNMoney, June 6, 2017, http://money.cnn.com/2017/06/06/technology/business/via-curb-nyc-taxi/index.html.

33 Matthew Flamm, "Yet Another Ride Service. Only This One Is Different," Crain's New York Business, May 24, 2015, http://www.crainsnewyork.com/article/20150524/TRANSPORTATION/150529933/yet-another-ride-service-only-this-one-is-different.

34 "What Is the ViaPass?," Via, February 28, 2018, http://support.ridewithvia.com/customer/en/portal/articles/2529342-what-is-the-viapass-?b_id=14393.


Chariot microtransit vehicle
Source: https://www.chariot.com/

reserve a seat on one of the shuttle buses and wait at a designated stop to board the bus. The app includes real-time GPS locations of the shuttles and an estimated arrival time.

Chariot is owned by Ford Smart Mobility, the company Ford founded to focus on mobility alternatives to vehicle ownership. Pricing varies by city. For illustrative purposes, fares in New York City are $4 per ride. A monthly pass of unlimited rides on all routes is $119. On all routes, service operates during the morning and evening rush hours.[35]

### Vanpooling

Unlike TNCs or microtransit, which have shared vehicles driven by an employee of the company, vanpooling programs typically involve riders who share a vehicle that is driven by a designated member of the vanpool. Ownership of the vehicle differs across programs, with some vehicles publicly-owned and others owned or leased by a vanpool participant. Many vanpool programs provide a limited number of Guaranteed Ride policies, which will cover the expenses for vanpool participants to get home in the event of an emergency or vehicle breakdown. Some vanpooling opportunities currently exist in Suffolk County through the NYS DOT "511 NY Rideshare" program, alongside carpool incentives and Guaranteed Rides home. The program yields minimal usage and its efforts are focused primarily on engaging large employers. However, vanpooling could play a more active role in supporting transit and mobility in the County by providing efficient, smaller scale, point-to-point and self-organized service.

For example, vanpooling could create smaller feeder routes to and from the proposed Bus Rapid Transit (BRT) on Nicolls Road and Route 110, connecting riders from their neighborhoods and communities to the BRT stations on the corridor. The below case studies highlight different vanpooling uses and operations that could be employed or scaled to help support mobility in the County with cost-saving measures for the system and riders, by employing technology and apps to coordinate riders/drivers, and featuring potential sponsorships that could be explored.

#### Potential Advantages

Relative to single-occupancy vehicles:

- Reduced travel time through use of HOV lanes where applicable.
- Reduced fuel and toll costs, and greenhouse gas emissions
- Fewer vehicles on the road
- "Greenest of motorized transportation" with average occupancy producing less CO2 per passenger mile than other modes[36]

Relative to fixed-route transit:

- Flexibility to serve specific individuals

35 "Chariot - Your Commute, Solved," Chariot, accessed April 9, 2018, https://www.chariot.com/routes.

36 Tina Hodges, "Public Transportation's Role in Responding to Climate Change" (Federal Transit Administration, U.S. DOT, January 2010), https://www.transit.dot.gov/sites/fta.dot.gov/files/docs/PublicTransportationsRoleInRespondingToClimate-Change2010.pdf.

- Door-to-door service is possible
- Lower demand and capacity requirements than traditional transit
- Lower operating and capital costs than standard transit vehicles

**Potential Disadvantages**

- Requires groups of people on a relatively similar timeline or schedules
- Typically fixed-routes, commuter / peak-hour focused service

**Case Studies**

***Pace Rideshare (Chicago suburbs)***

Pace Rideshare is operated in metropolitan Chicago by the suburban bus division of the Chicago Transit Authority. Interested individuals can join an existing vanpool rideshare or create a new vanpool if in a group of five or more. The monthly fare is paid per passenger and is based on distance and number of participants. For example, a vanpool of six passengers traveling 40 miles per day would pay $102 per month. The price can range from $73 to $174 per person. The primary driver does not pay to participate in the vanpool and may also use the vehicle for 300 miles of personal use. Backup drivers receive a $10 per month discount. Pace Rideshare provides the vehicle and covers the costs of fuel, tools, insurance, maintenance, roadside assistance, van washes, and a guaranteed ride home in the event of a breakdown.[37] In 2016, there were 718 active vanpools in the program.[38]


Pace Rideshare riders
Source: http://www.metroplanning.org/news/6607/Share-the-love-with-Pace-RideShare

***King County VanPool and VanShare***

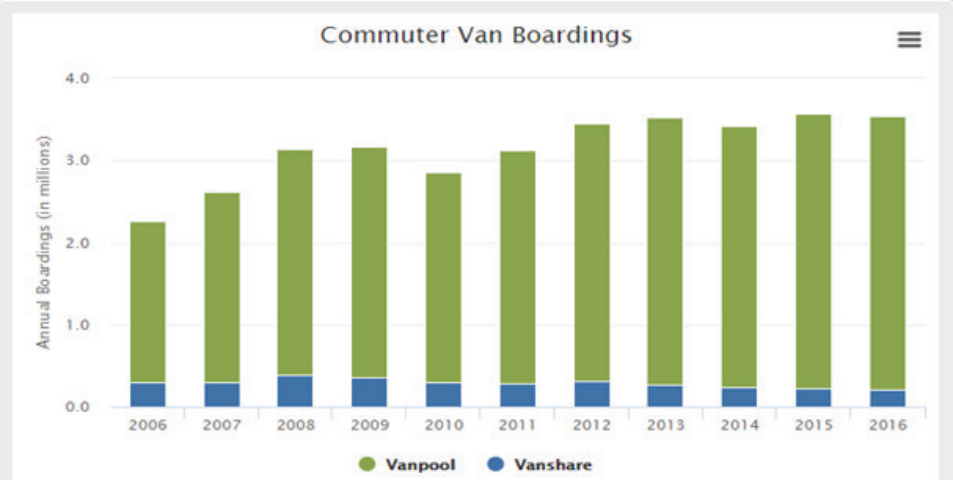
King County Metro operates VanPool, the largest publicly owned and operated vanpool program in the U.S. Interested individuals can join existing vanpools or create a new vanpool. 8-, 12-, and 15-person vans are available to vanpool participants, and costs per rider vary based on the size of the van and the number of miles traveled each day.


King County VanPool
Source: KC Metro Commuter Van Program (facebook.com)

Prices can range from $30 to $360, with a 12-person van traveling 50 miles costing $68 per rider. This monthly rate includes training, rider support services, maintenance, insurance, fuel, tires, and a guaranteed

37 "Vanpool Programs," Pace Suburban Bus, accessed April 6, 2018, http://www.pacebus.com/sub/vanpool/traditional_vanpool.asp.

38 "November Total Paratransit and Vanpool Ridership," Regional Transportation Authority Mapping and Statistics (RTAMS), accessed April 6, 2018, http://www.rtams.org/rtams/paceVanRidership.jsp.




King County VanPool Ridership
Source: King County Annual Measures Ridership Report

ride home in the event of a breakdown. Each vanpool includes a driver, backup driver, and bookkeeper. Primary drivers can use the service for free. Primary and backup drivers are allocated 40 miles per month (total) of personal use, plus up to 250 miles per month at a rate of 60 cents per mile.[39]

King County Metro operates a second program called VanShare, which provides vanpool services to Park-and-Ride locations, ferry landings, and Sounder commuter train service. The pricing and management of the VanShare program is similar to the VanPool program.[40]

King County Metro is piloting a program called TripPool in which volunteer drivers of a commuter van are hailed on-demand via a mobile app and pick up other riders while en route to the nearest Park-and-Ride or transit connection. Trips are free for the driver of the TripPool.[41]

### *Enterprise Vanpool*

Enterprise Rideshare operates vanpools by contracting with transit agencies as well as through supporting individual vanpool groups. Enterprise has contracts with many transit agencies including LA Metro, Georgia Regional Transportation Authority, and San Diego Association of Governments. Enterprise also works with individual employers to help form vanpool groups from among their employees, providing services to match employees and facilitating meetings to establish the vanpool. Enterprise manages an online portal that allows potential patrons to find existing vanpools or to form their own vanpool if they have a group of five or more.[42]

39 "Reinventing Your Wheels—Easy as 1, 2, 3!" (King County Metro Rideshare, n.d.).

40 "Rideshare: Vanshare Program," King County Metro Transit, 2018, http://metro.kingcounty.gov/tops/van-car/programs/vanshare/index.html.

41 "Rideshare: TripPool Program," King County Metro Transit, 2018, http://metro.kingcounty.gov/tops/van-car/programs/trippool/index.html.

42 "Enterprise Rideshare - Vanpool & Rideshare Services for Individuals, Employers & Government Agencies," Rideshare by Enterprise, accessed April 6, 2018, https://www.

## Optimized Transit

Continuing a familiar pattern, driving mileage has increased over the past five years according to the Federal Highway Administration (FHWA) in 2016, while transit ridership is decreasing in many U.S. cities. Transit service in Suffolk County and neighboring Nassau County has been adjusted over the past year to respond to ridership and budget reductions, resulting in the loss of some transit routes. As major U.S. cities and transit agencies seek to optimize and economize their transit service to adapt to today's riders and markets, some have taken bold moves to entirely redesign routes that were established decades ago. These initiatives have been accomplished in part, by capitalizing on new data, and innovative public feedback initiatives, to help cities and transit agencies better understand rider needs and desires. The end product in some cities has been an entire transit network redesign to better align existing resources with riders' needs to provide efficient and optimized transit service.

Similarly, suburban areas are also undertaking scaled efforts with a similar philosophy which will be useful to track over time. For example, Everett, Washington is currently in the process of a transit network redesign and long-range planning process to accommodate population and employment growth, and focus their service on high-capacity and high-frequency routes in higher-density corridors, as a means to optimize transit.[43]

Suffolk County engaged Arup to perform an initial trip pattern analysis for the County modeled after best practices in transit system redesign. An output of that work was to develop a suite of mobility options to see how the County could optimize fixed routes and complement those with other services that align with riders' needs and trip patterns and improve mobility services. These case studies illustrate the process and potential benefits of optimizing or redesigning bus networks as a holistic and participatory effort that realigns the service with available resources and user needs.

### Potential Advantages

- Increasing Connectivity – helps optimize the network, ensuring efficient connections within the network and other modes and transportation services.
- Concentrating resources – enables the transit authority and jurisdiction to assess resources and focus investments to meet today's system and rider needs in coordination with available resources.
- Improving dialogue with riders – invites community input into the "reset" of a transit system and in the creation of a new network that enables people to get to their destinations with clear, easy to understand, reliable service. Public engagement processes engages and educates stakeholders on the goals and constraints of the system, where transit can best serve or is not suited, and where other services could provide supplemental network support.
- Offering more equitable service – an opportunity to examine service offerings for transit dependent, lower income communities protected by Title VI and others by updating service offerings to be more reliable and inclusive of different rider needs and considerations.
- Increasing service spans and increasing ridership – creates an opportunity to increase service spans (such as late night or Sunday service) through system efficiencies and increase ridership by both retaining current customers who may choose transit more often, and by attracting new customers to the optimized service offerings.

enterpriserideshare.com/vanpool/en.html.

43 Stephen Fesler, "Everett Transit Kicks Off Long-Range Planning Process," The Urbanist, June 8, 2017, https://www.theurbanist.org/2017/06/08/everett-transit-kicks-off-long-range-planning-process/.

- Making the system easy to understand – a redesign of routes can help establish a clear hierarchy and concentrate services into predictable coverage areas that are easy for riders to understand and use, eliminate mid-route diversions, improve trip times, and reduce service redundancies.

**Potential Disadvantages**

- Significant undertaking to redesign the entire network at once.
- Politically challenging to gain the requisite buy-in of vested stakeholders at all levels to agree to an "all at once" planning and implementation approach.
- Change for riders can be difficult, but if they are well-informed and understand the trade-offs and improvements of improved service(s) available to them, and they are engaged in the process, the negative impacts of change can be mitigated.

**Case Studies**

***Houston Metro Bus Network Redesign***

Houston's bus network redesign is one example of a transit agency instituting an overhaul of their existing service and routes to improve service, within the existing budget parameters. The planning and outreach process occurred over two years (2013-2014), followed by METRO board approval in February 2015 and implementation of the new service was implemented in August 2015. The overall design move was to transform the service from a peak-oriented low-frequency radial network with significant coverage to a service focused within a grid-network providing all-day, every-day, high-frequency service.

Within months of implementation of the redesigned and optimized network, local bus ridership increased 4.3 percent and the agency recorded an 11 percent overall increase in ridership from the previous year. Average monthly ridership for METRO Houston's

Before and After: Houston Metro Bus Network Redesign
Source: http://humantransit.org/2017/07/can-you-tour-a-bus-network-redesign.html

bus network over the 10-month period beginning September 2015 was 3.3 percent higher than for the 10-month period prior—yielding an additional 175,000 passengers utilizing the bus network.[44] This was all achieved within the City's request that the alternative and redesigned system be cost neutral and in keeping with their existing budget.

44 Leah Binkovitz, "A Year After Bus Redesign, METRO Houston Ridership Is Up," The Kinder Institute for Urban Research, August 16, 2016, https://kinder.rice.edu/2016/08/16/a-year-after-redesign-metro-ridership-is-up.

The network redesign was based on three key principles:

- More Service – linking riders to more destinations and providing new frequent weekend service.
- Better Service – simpler routes with better connections
- Your Service – linking people and places to provide the best transit service possible and creating a sustainable system

These principles, and the resulting redesign, ensured that 95 percent of Houston's quite sprawled population is now within ¼ mile of a high-frequency bus service. About 75 percent of the Houston Metro's bus ridership occurs on those high-frequency routes.[45]

***Jacksonville Transportation Authority (Jacksonville, FL)***

Jacksonville's Route Optimization Initiative was instituted in December 2014 and has yielded a six percent increase in ridership since it was implemented. This initiative followed a top-to-bottom organizational review of the JTA, which revealed a need to improve technology, customer service, communication, on-time performance and measuring how the system was performing. The JTA Board shifted their thinking and priorities to focus on improving customer service, growing ridership among choice customers, and positioning the JTA to serve as a regional transportation provider in north east Florida. They also saw an opportunity to capitalize on planned improvements for a BRT system and began to look at the effectiveness of the local bus network as part of their overall strategy.

Key issues the JTA intended to address through this initiative included: low rate of riders per revenue mile (a key indicator of service effectiveness), low averages for riders per passenger mile, service span catering to workforce hours, poor service frequency (hourly or more), poor route coordination and connections, inconvenient transfers, and minimal technology offerings for customers.

The project was completed at a one-time cost of $2.1 million using operating and capital funding, and was an 18-month process from system assessment to the launch of the route optimization on the ground. This planning, feedback and implementation period included data collection, analysis, optimization framework, engagement and education strategies, branding initiatives, bus stop and safety improvements, technology upgrades, public and operator outreach, proposed route changes and final implementation.[46]

Key results from the Jacksonville Route Optimization Initiative:

- Six percent ridership increase since implementation, including choice riders
- Increased routes with 30-minute headways from two to 20
- Implemented ten routes with 15-minute frequencies (none prior)
- Doubled the number of routes operating after 11pm from 11 to 22
- Upgraded 128 bus stops to be ADA compliant

45 Binkovitz.

46 Jones Worley Communications, "Route Optimization Initiative Case Study" (Jacksonville Transportation Authority), accessed April 6, 2018, https://www.jtafla.com/media/Documents/General/Case%20Study/roi_casestudy/1022/roi_casestudy.pdf.

- Removal of 30 percent of bus stops to reduce travel time between stops
- Roll-out of real-time passenger information system-wide
- Increased route supervision, system branding, safety and security, new protocols for naming routes

***Central Ohio Transit Authority (Columbus, Ohio)***

Starting in 2013, Central Ohio Transit Authority (COTA), the Columbus-area transit authority spent four years and $9.4 million to study its bus network, gather data and feedback and put forth a comprehensive system redesign that shifted away from the original "spoke and wheel" design of the 40+ year old system. This effort was in response to significant changes that led COTA staff and management to rethink their entire system design. These factors included major population growth, sprawl, an economy reflecting new jobs wherein commuters were no longer commuting to a central downtown for work, and more people working on weekends. In May 2017, after significant stakeholder, public and board of trustees input, COTA rolled out its brand-new network. The redesigned network doubled the number of bus lines with service headways of 15 minutes or less, many of which were located on major corridors outside of the downtown and instead focused service on connectivity to the airport, malls, activity centers and employment hubs. The agency increased weekend service to support those working weekend jobs and to attract choice riders.[47]

According to COTA, the number of riders within a quarter mile of frequent bus service increased from 116,000 to 219,000 and the number of jobs within that same catchment area grew from 155,000 to 265,000. They focused efforts on redesigning their bus network to focus on reliable and frequency as the primary service characteristics, concentrating the service around density, activity and employment centers. COTA has a planned launch in early 2018 of a BRT on a priority corridor, and the network redesign is intended to support this investment. While the ridership numbers are still being recorded in the first six months of the redesign, this case study provides ample insight on the process, scale and level of effort to institute a full network redesign and work toward the benefits it will provide for the area riders and economy.[48]

Key benefits from the redesigned COTA network include:

- More frequent and consistent transit service, seven days/week
- Connecting more people to more jobs
- Shorter wait times
- Providing more travel options for a growing population

47 Daniel C. Vock, "Buses, Yes Buses, Are 'the Hottest Trend in Transit,'" GOVERNING, September 2017, http://www.governing.com/topics/transportation-infrastructure/gov-big-city-bus-systems.html.

48 "Transit System Redesign," Central Ohio Transit Authority (COTA), 2017, https://www.cota.com/initiatives/tsr/.

# 5. Evaluation of Mobility Modes

## 5.2 Purpose and Need

The evaluation matrix provides a high-level assessment of the suitability of the selected modes to help Suffolk County achieve goals and system efficiencies while enhancing mobility options and user experience. It is intended to evaluate each mode's overall ranking through performance and market criteria, resulting in integrated scores that will help the County inform decisions and share with public stakeholders where and why these modes may be more or less feasible as mobility solutions. The evaluation matrix and final scoreboard is intended primarily to surface strengths and weaknesses of selected modes, and to begin to inform a future implementation plan with detailed strategies for mobility delivery that will include engagement with the public, elected officials, property and business owners, civic and advocacy groups and other stakeholders.

The current transit system has extensive coverage but also long travel and wait times as well as high costs per passenger, which should be reviewed and restructured to optimize efficiencies and take advantage of opportunities offered by new data and technologies to inform service and system decisions. The existing transit system needs to improve its operational and financial adaptability and resiliency to better align service offerings with rider needs, attract new riders, and respond to increases or decreases in funding. Current service has no market segmentation and offers the same mobility solution to all types of travelers. A wider range of mobility options would offer riders more choices for a journey customized to their preferences and constraints, and may support operational and financial efficiencies for the County.

## 5.3 Methodology

The mode evaluation matrix uses qualitative and quantitative metrics to surface high-level strengths and weaknesses of how each mode might perform in certain markets and serve the County as a mobility solution. This integrated assessment took place over two stages.

Stage 1 evaluates how each mode relates to the County's goals for planning and service ("impact-performance"), representing the supply side. Stage 2 evaluates how the mode responds to travel patterns and potential user demand ("markets"). The final scoreboard provides an integrated evaluation of the modes, by synthesizing performance and market criteria into a final score for each mode to help the County inform decisions and share with stakeholders and the public where—and why—these modes may be more or less suitable as mobility solutions in specific markets. A detailed explanation of the evaluation matrix methodology, stages and scoring summaries tables are outlined in this section.

### Stage 1 – Mode Impact and Performance

In the first stage of evaluation, each mode was scored along a performance framework representative of the County's goals and vision for its public transportation system. This framework was structured in five impact and performance-focused themes: Planning and Policy Impact, Transportation Performance, Economic Feasibility, User Experience, and Environmental and Sustainability Performance. Each theme comprises multiple criteria for a total of 21 criteria across all themes, each of which was defined and used to score how the mode might perform with a designation of receiving either a failure, a poor, a moderate or a strong grade.

| Stage 1 Criteria Descriptions | | |
|---|---|---|
| **Evaluation Theme** | **Criteria** | **Description** |
| Planning and Policy Impacts | Supports Connect LI goals | Supports Connect LI goals of transportation investment, mixed-use communities/ TODs, and improved north-south connectivity |
| | Supports 2035 Master Plan transit and development goals | Supports 2035 Master Plan objectives to enhance mobility and promotes sustainable economic development, while maintaining a high quality environment |
| | Potential to support and/or enhance current or planned County investments | Mode choice has potential to support SC investments such planned TOD sites, BRT corridors, and the I-Zone |
| | Legislative/regulatory effort | Mode choice may require new or addititional legislative or regulatory authority to implement |
| | Ability to serve new and underserved transit markets | Mode choice yields new or increased capacity and convenience to serve new or underserved transit markets |
| Transportation Performance | Relative capacity | Relative capacity (number of persons per vehicle) and capacity efficiencies to other selected modes |
| | Relative travel time | Travel time relative to other selected modes |
| | Increases multimodal choices | Mode choice yields additional or new transportation choices and offerings for users |
| | Reliability | Frequency of delays of mode and measure of vehicle availability for pick-up |
| Environmental + Sustainability Performance | Congestion Mitigation | Mode choice mitigates roadway and traffic impacts, optimizes free flow traffic, and encourages efficiencies within the network |
| | Encourages Smart Growth development principles | Mode choice encourages a sustainable, walkable, bikeable environment and supports areas with mix of building types and uses, diverse housing and transportation options within existing neighborhoods |
| | Fuel Consumption | Mode choice yields reductions in fuel consumption |
| | Traffic Noise | Mode choice yields reductions in traffic noise levels |
| User Experience | Predictability | Mode choice yields a predictable and consistent user experience for riders relative to on-time performance |
| | Ease of use | Mode choice yields a relative ease of use for all users throughout the trip |
| | Comfort | Quality and convenience of service, including transactions, mode quality and in-vehicle comfort |
| | User cost | User cost is transparent and understandable, can be scaled or subsidized per current or future fare policies (student/senior passes) |
| Economic Feasibility | Ease of Implementation | Relative complexity of mode choice and delivery time frame to implement service. |
| | Potential for sponsorships / funding partnerships | Relative potential for private sponsorships or public/private funding partnerships to help pay for the service |
| | Available funding sources | Current funding sources are available that could be applicable to supporting this mode choice |
| | Financial scalability | Relative ability of this project to be scaled and delivered in incremental stages, in which demand builds over time and service is adjusted to meet observed demand or restructured to accommodate available funding resources. |



Table 5.1: Stage 1 –Criteria Descriptions

Using the criteria, and based on industry benchmarks and a conception of design for Suffolk County, each mode was graded for each criterion. After a numeric value between zero and 10 was assigned for each grade level, each mode received a numeric score for its themes calculated as the average of its relevant criteria grades. The final "impact-performance" for each mode is the average of its five theme scores. Modes were assigned the following rankings based on their impact or performance:

- *Strong*: This mode advances mobility and performance, beyond good practice. The mode may serve as a catalyst for new opportunities and advance the County's goals beyond mobility.
- *Moderate*: This mode generally meets mobility expectations and performs in line with existing conditions. The mode exceeds the minimum effort and implementation is generally feasible
- *Poor*: This mode does not advance or support mobility and performance improvements. This mode may require further development and acknowledges levels of uncertainty.
- *Failure*: This mode fails to advance or support mobility and performance improvements.

### Stage 2 – Market Evaluation

In Stage 2, the assessment covered how well each mode performs in relation to the different types of travel demand markets in Suffolk County. Travel demand manifests itself differently according to a wide range of factors that can loosely be grouped along two categories: trip purpose and land use (or activity) density. These two features are predominant in determining the key attributes of travel demand: period of occurrence, frequency, available time budgets, willingness to take on monetary cost and position in the chain of trips in a given day. The travel

**Summary Table - Average Rankings (Stage 1)**

| Average Scores (criteria ranking) | Existing Conditions | Optimized Transit | Van Pooling | TNCs | Micro-transit | Bikeshare |
|---|---|---|---|---|---|---|
| Planning and Policy Impacts | Poor | Moderate | Strong | Moderate | Strong | Strong |
| Transportation Performance | Poor | Moderate | Moderate | Strong | Strong | Poor |
| Environmental + Sustainability Performance | Poor | Moderate | Moderate | Failure | Moderate | Strong |
| User Experience | Poor | Strong | Moderate | Strong | Strong | Strong |
| Economic Feasibility | Moderate | Strong | Strong | Strong | Moderate | Strong |

Table 5.2: Stage 1 – Summary Scoring Table

| Activity Density | Trip Purpose |
|---|---|
| Trip Patterns (Medium to High Density) | Work |
| | Connectivity |
| | Commercial / Institutional / Recreational |
| | School (HS / College) |
| Trip Patterns (Low / Special Density) | Work |
| | Connectivity |
| | Commercial / Institutional / Recreational |
| | School (HS / College) |

Table 5.3: Travel Markets

| Threshold | 1000 / sq mi |
|---|---|
| **Activity Density Scenario A** | |
| **Low / Special Density** | **Medium to High Density** |
| Shelter Island | Brookhaven |
| East Hampton | Smithtown |
| Southold | Huntington |
| Southampton | Islip |
| Riverhead | Babylon |

Table 5.4: Activity Density Breakdown of High-Medium and Low-Special by Town

modes under assessment have different performance features, and thus meet each travel market at different levels of service.

**Market Definitions and Activity Densities**

The travel markets were defined as a combination of typical land use where the travel takes place, and purpose of trip. Two land use types, or "Activity Density" thresholds, were defined: Medium-high density, and low-special density. The trip purpose types were grouped into four categories: work, connectivity, commercial/institutional/recreational, and school (high school or college). The combination of two activity patterns, and four trip purposes resulted in the eight markets presented in Table 5.3.

The level of activity density is largely correlated with population density. In general terms, Suffolk County's higher density communities are to its Western part, with the Eastern part having its lower density communities; population density in Western Suffolk County is 2,403 persons per square mile, whereas Eastern Suffolk County has a population density of 395 persons per square mile (U.S. Census, 2010).

The activity density metric encompasses both population and number of jobs for each town (based on 2010 US Census Data) and creates an equal comparison by measuring these densities over geographic size of each town (square mile), so that an equal metric of density is available across towns in the measurement of "Activity Density / square

mile." Of the two activity densities outlined, the first is a "special/low activity density" and the other is "medium to high activity density." Special densities refer to recreational and open space, vacant land, and inactive land uses that register minimal or zero activity in the study data. The activity density breakdown by towns in outlined in Table 5.4.

This method also allows flexibility for different mobility solutions to be considered and applied in the future to areas of the County such as Riverhead, which have significant projected population growth as outlined in the County's *Framework for the Future 2035 Master Plan*. For example, in order accommodate future growth in Riverhead, the mobility solutions could shift from those proposed today in its current "special/low density" categorization into "medium to high activity" density solutions as the area grows and service needs evolve.

**Trip Purpose Type**

Types of trips are defined as follows:

- *Work*: Commute trips during peak travel hours, focused on trips within Suffolk County or connecting into Nassau County.
- *Connectivity*: Trips during peak travel hours that include first/last mile trips, transfers to other systems (LIRR) at which point users connect to complete a much longer trip (e.g., to NYC).
- *Commercial/Institutional/Recreational*: Off-peak trips consisting of shopping, medical, government or recreation-related trips.
- *School*: Late peak hours to include only high school or college related trips

Each mode was assessed against the travel demand markets and awarded a grade of "Poor", "Fair" or "Good." That grade resulted from an evaluation process that combined quantitative elements based on existing data, and qualitative aspects based on a professional assessment of how the future modes would meet the market demands should they be deployed. This dual approach incorporates both the revealed preferences of Suffolk County residents as indicated by their actual travel behaviors, and complementary consideration given to how riders might intend to engage with the new travel modes not currently offered.

**Quantitative Assessment**

Because the proposed modes currently do not exist in Suffolk County, or have been introduced recently, there is no data yet on how users utilize them. Therefore, to conduct a quantitative assessment on preference, existing modes from the available data sets were used as proxies, as detailed below:

- *Optimized transit*: Existing Transit trips
- *Vanpool*: Existing Carpool, Vanpool, Jitney trips
- *TNCs*: Existing Taxi and Escorting trips
- *Microtransit*: Existing Park & Ride, Kiss & Ride trips
- *Bikeshare*: Existing Cycling trips

The data source for the assessment was the New York/New Jersey Regional Household Travel Survey (RHTS) conducted in 2011 by the New York Metropolitan Transportation Council, which is used to support regional planning and the development of NYMTC's travel demand model. This dataset was selected for use in the evaluation matrix as it provides large amount of detail regarding trips and is able to distinguish all the separate segments of trips, resulting in the ability to identify trips that include specific modes in the journey segments and illustrating how travel demand manifests in detail for all types of trips and multiple modes used within a

single trip journey. Since an objective of the matrix is to understand details regarding trips and their separate components by trip purpose, but the level of detail required in geographic terms is relatively aggregate (high-medium/low-special activity density), RHTS data was considered the more appropriate dataset to use.

Based on the RHTS datasets, the Stage 2 quantitative assessment was conducted in two steps: one focusing on demand vis-à-vis trip length, and another focusing on aggregate mode share. The purpose of the trip length assessment was to identify which travel modes Suffolk County residents use when making trips of different lengths, and then compare these lengths with the typical trip lengths for the different markets. With this step, for example, bikeshare receives a low score for markets that typically show trips longer than two miles in length. Mode shares are analyzed similarly. The existing mode shares for each of the modes are estimated and assessed against a range of mode share values defined for each score. The idea is to understand if, based on current mode choices, the proposed modes would be likely to be feasible and successful in specific Suffolk County contexts and areas.

**Qualitative Assessment**

Because there are no data sets available or associated with the proposed new modes, a layer of qualitative assessment for Suffolk County was

Table 5.5: Stage 2 Summary Scoring Table

| | Summary Table - Average Rankings (Stage 2) | | Existing Conditions | Optimized Transit | Van Pooling | TNCs | Micro-transit | Bike-share |
|---|---|---|---|---|---|---|---|---|
| Ranking | Trips (Medium - High Activity Density) | Work | Fair | Good | Fair | Fair | Good | Poor |
| | | Connectivity | Fair | Good | Good | Good | Fair | Fair |
| | | Commercial/ Insitutional/ Recreational | Good | Good | Fair | Good | Good | Good |
| | | School (HS/ College) | Poor | Good | Fair | Fair | Fair | Poor |
| | Trips (Low / Special Activity Density) | Work | Fair | Good | Fair | Fair | Good | Poor |
| | | Connectivity | Fair | Good | Good | Good | Good | Poor |
| | | Commercial/ Insitutional/ Recreational | Fair | Good | Fair | Good | Good | Poor |
| | | School (HS/ College) | Poor | Fair | Fair | Fair | Fair | Poor |

included to bridge the delta between how the users elect the existing modes and how they might elect the proposed modes that are designed to respond better to specific travel demand needs. The grades "Poor," "Fair" and "Good" were awarded to each mode for each market, based on professional knowledge of benchmarks and best practices of successful implementation of these modes in other communities across the U.S., and transportation and land use knowledge of the County.

**Final Stage 2 Score**

The final Stage 2 score was awarded as the average of the quantitative and qualitative assessments, as this approach incorporates in equal measure revealed preference data and considerations of how those preferences would be affected by a new set of transportation options. The final scoreboard is presented in Table 5.5.

## 5.5 Integrated Mode Performance Final Scoring

The final scoreboard provides an integrated evaluation of the modes, assessing how each mode scores relating both to the County's goals for its infrastructure and service goals ("impact-performance"), and how the mode performs specific to the travel patterns and needs ("markets"). The final evaluation scores allow for a comparison across the modes for each market type. The final scoreboard sheds light on how different modes may be more or less feasible and conducive to optimizing mobility, as well as which modes may be better suited to the types of trips and different geographies in Suffolk County. The final scoring outputs for each mode are intended to help the County weigh strengths and weaknesses of each mode, inform discussion and implementation plans, and illuminate for stakeholders and the public where—and why—these modes may be more or less suitable as mobility solutions.

The final integrated performance score for each mode is defined between zero and 10 and is specific to each trip type within an activity density, denoting performance as ranked relative to the other modes for that specific trip type. See Tables 5.6 and 5.7 for final scoring and color coding indicating the higher, moderate and low performing modes for each trip type relative to one another.

Dark green scores indicate higher performing modes for that type of trip, relative to the other modes. Yellow scores indicate modes moderately suited compared to the other modes. Dark red scores indicate modes that perform least well within each trip type column, relative to the other modes. The benefit of highlighting the actual scoring numbers as well as the color coding, is to illustrate the nuances of how closely (or not) some modes perform to each other—with respect to performance and quality of service offered to riders for those trip types in specific geographies—helping the County identify which mode or modes, are better or less suited, or equally suitable relative to one another as mobility solutions.

## 5.6 Key Findings

The evaluation matrix and final integrated scoreboard results are intended primarily to surface strengths and weaknesses of selected modes and the suitability of each mode to meet the needs of specific trips and geographies, and to inform a future implementation plan. The implementation plan should include detailed strategies for mode and mobility delivery that includes feedback and engagement with the public, elected officials, property and business owners, civic and advocacy groups and other stakeholders.

| High to Medium Activity Density | | | | |
|---|---|---|---|---|
| Mode \ Trip Type | Work | Connectivity | Commercial / Institutional / Recreational | School (HS / College) |
| Existing Conditions | 2.0 | 2.0 | 3.1 | 1.0 |
| Optimized Transit | 6.6 | 5.7 | 6.6 | 5.7 |
| Van Pooling | 4.4 | 5.3 | 3.5 | 3.5 |
| TNCs | 3.3 | 5.8 | 5.8 | 3.3 |
| Microtransit | 5.5 | 4.6 | 5.5 | 3.6 |
| Bikeshare | 1.9 | 4.8 | 5.8 | 0.0 |

Table 5.6: Final Integrated Summary Scoreboard – High to Medium Activity Density

## Key Findings for High-Medium Activity Density Areas

- For all trip types in high-medium activity density areas, ***optimized transit*** scored highly as having potential to be a highly suited mobility solution for the County. Optimizing and redesigning the existing network to focus on high-performing routes that have higher ridership, and improving headways, service speeds, and user experience present significant benefits for riders, an opportunity to attract new riders, and to realize cost savings within the existing system and budget.

- Many of the high-performing routes are already located in higher-density areas of the County that have major employment centers and destinations. Decreasing headways and increasing reliability through ***transit optimization*** in higher-density areas could incentivize "choice riders" to shift modes from personal vehicles to optimized transit for some of their trips.

- Cost savings realized through ***transit optimization*** could be repurposed toward improving the commuter transit experience with apps, new vehicles and well-designed bus stops to better serve existing commuters on work trips and attract new commuters to an optimized service.

- ***Microtransit*** scores moderate and high in all trip categories, and can be employed in a variety of ways—serving major employment nodes, replacing low-performing fixed routes or segments and providing first/last mile feeder service to LIRR or BRT corridors. Service models can vary, and routes can be dynamic in order to customize the service offering. The County should focus on proposing microtransit service and/or routes that solve known transportation problems and also ensure riders understand the service to increase the likelihood of use.

- ***TNCs*** score highly for serving connectivity trips in high-density areas, and could be utilized for first/last mile service. If other markets serve as an example this mode will become more ubiquitous and well-utilized over time by consumers who want "on-demand" and direct service—whether that is trip provided by the public or private sector.

- Across all densities and trip types, the "highest and best performance" of ***bikeshare*** as a mobility service occurs within high-medium density

| Low Activity Density / Special Activity Density | | | | |
|---|---|---|---|---|
| Trip Type / Mode | Work | Connectivity | Commercial / Institutional / Recreational | School (HS / College) |
| Existing Conditions | 2.0 | 2.0 | 2.0 | 1.0 |
| Optimized Transit | 4.9 | 4.9 | 4.9 | 4.1 |
| Van Pooling | 4.4 | 5.3 | 3.5 | 3.5 |
| TNCs | 3.3 | 6.6 | 5.8 | 3.3 |
| Microtransit | 5.5 | 5.5 | 6.4 | 3.6 |
| Bikeshare | 0.0 | 0.0 | 0.0 | 0.0 |

Table 5.7: Final Integrated Summary Scoreboard – Low-Special Activity Density

areas in serving connectivity and commercial/ recreational trips. These areas and trip types should be prioritized as the County explores bikeshare providers and systems in conjunction with stakeholders. Siting bikeshare strategically and ensuring potential ridership exists within an area will be key to the mode's success.

- ***Vanpooling*** scores moderately as a mobility solution primarily serving work and connectivity trips, but it does not offer the dynamic routing and real-time features of microtransit or TNCs.

- ***Existing Conditions*** scores low for the plurality of trips including work, connectivity and commercial/ recreational/institutional even in higher-density areas where there is more coverage for riders. Maintaining the "status quo" as the County builds out TODs and encourages a shift away from auto-oriented development is not seen as a viable solution for meeting the demands of users today and in the future.

## Key Findings Low or Special Activity Density Areas

- ***Microtransit*** scores highly for low and special density activity areas against other modes, particularly for work, connectivity and commercial/ recreational/institutional trip types. It has the ability to provide a transit-like service in Suffolk County that is more efficient, fiscally feasible and attractive to riders than other modes, and can be operationally coordinated with planned improvements, such as increased LIRR frequencies being implemented on the East End, or provide supplemental service or specific demand-based routes to support tourism on the North and South Forks.

- Technology and service models for ***microtransit*** can vary and be designed around crowd-sourced routes with dynamic stops, and provides riders the ability to reserve a seat via a mobile app and have real-time arrival information, and with these features may attract new choice riders who would not elect to use existing public transit or jitneys..

- The County should focus on proposing ***microtransit*** service and/or routes that solve known mobility problems, engage low density communities that desire and will embrace the service, and educate riders about the service, to increase the likelihood of user adoption.

- ***TNCs*** score highly as a mobility solution suitable for commercial/institutional/recreational and connectivity trips, and scores moderately for work and school trips.

- ***TNCs*** have the potential to greatly improve first / last mile service connections for riders at LIRR stations. As outlined in the earlier best practices section, a partnership between a TNC provider and the County could be established to provide and subsidize trips to designated destinations (eg: LIRR stations or County building in Riverhead) within certain catchment areas, to provide better and easier service in lieu of fixed-route or traditional transit offerings. This could be implemented through the \suse of a smart phone app on the user end, to ensure a reliable mobility option at the beginning and end of each trip with real-time information and easy fare payment for the rider.

- ***Vanpooling*** scores moderately across all trip types in low-special activity density areas, but could be organized and more broadly advertised to serve specific mobility needs in this areas, whether shopping trips or work trips, introducing technology to "match" riders with destinations or general directions for shopping or recreational trips that may occur on the weekends, outside of traditional commuter vanpools on weekdays for work trips.

- ***Bikeshare***, as measured through the criteria of this evaluation, scores as a failure for low and special density areas, however dockless systems could be considered for seasonal and recreational use to provide local circulation and recreational mobility. That model would not necessarily be integrated with the larger network, but could still provide users with a new option for mobility, and perhaps even introduced to specific markets to support East End tourism by the private sector instead of requiring investment by the County.

- ***Existing Conditions*** transit service presents as a low-scoring mobility solution against other modes for low and special density activity areas, as it does not provide reliable or frequent service for riders, nor economical routes and service for the County to provide in lower density geographies and unique land uses, such as the North and South Forks.

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# 6. Recommendations and Next Steps

The following recommendations will guide and help Suffolk County achieve operational and funding efficiencies, better align service with rider needs through a publicly informed and data-driven process, and help establish standards to help Suffolk County improve the mobility system so it will be flexible and adaptable over time.

## 6.1 Continue to Invest in What's Working

### Reinvest in High Performing Fixed-routes

The County should capitalize on opportunities to optimize service, and build on existing and planned mobility and system improvements to support current and future growth. The County should preserve, prioritize and reinvest in high-performing fixed transit routes, particularly in areas with higher levels of transit ridership and high transit ridership potential. These routes would maintain and maximize connections to top destinations, traffic generators and connectivity nodes in the County to serve existing ridership and also generate new ridership. For the County, these may include: the LIRR stations, universities and community colleges, shopping centers, and large employers.

The County should look for opportunities to invest in operational and design improvements to ensure high-performing routes continue to perform well and attract new riders. This might include initiatives to speed up service on these routes by offering two-door boarding, evaluating bus stop distances and designs to improve and speed up movement onto and between buses, and offering new and faster fare payment methods, to decrease dwell times.

### Continue an Integrated Planning Approach in Coordination with Regional Transporation Investments

The County should continue taking into consideration ongoing mobility and transportation investments across agencies and initiatives within the County and the region while re-envisioning the transit system. These may include coordinating future mobility investments and services to align with LIRR Second Track and Third Track improvements, TOD sites and regional job centers.

The County should continue investing in mobilty options that help link employment to areas suitable for growth and areas with the potential to support and expand TODs in the County. Where possible,the County should identify and explore opportunities to partner with the LIRR, MTA, towns and villages and Nassau County for transportation and mobility projects that have shared regional impacts.

The next phase of this study, implementation planning, should take a comprehensive approach to provide mobility services that connect the LIRR, existing SCT routes, TODs and pedestrian and bicycle infrastructure (existing and planned). The implementation plan should optimize connection points at multimodal stations or transit stops, and identify opportunities to coordinate schedules, payment or pass systems, to help achieve a consistent and user-friendly transit experience of connecting to, and through, Suffolk County.

## 6.2 Pivot from Being a Transit Provider to Provider of Mobility Services

Pivoting from the role of being a fixed route transit provider to a provider of mobility services will enable Suffolk County to better serve existing markets, improve user experience, attract new riders and become a model for suburban mobility. Service types and modes need to be operationally and fiscally adaptable to respond to the reality of changing technologies and funding levels over time.

## Implement Unique and Flexible Mobility Solutions

A key recommendation of this study is encouraging the County to rethink its transportation system, and shift from being a fixed route transit and paratransit provider to being a "mobility provider" that offers riders, residents and visitors a menu of choices to get to where they want to go, by the means, costs, and time most suitable to their needs.

Developing and partnering with mobility providers to design and implement unique and flexible mobilty solutions like microtransit, bikeshares and vanpooling is an important step toward modernizing the County's transit system. Introducing modes that are scalable and adaptable to changing technologies and funding creates flexibility for the County to invest, pilot, and implement new mobility choices. New mobility not only entails brand new modes, but also re-envisions and redesigns the existing services to provide better service to existing transit riders. Optimizing the current transit system by offering more frequent headways and real-time information will enable riders to make better decisions and have confidence in bus arrival times or transfer connections.

The mobility suite developed as part of this study is a data-driven tool now available to the County to start discussions on potential pilots and implementation of the new mobility modes on a larger scale within the County. The high-level evaluation of the mode's performance and its suitability will empower the County to educate and engage public officials, property and business owners, civic and advocacy groups and other stakeholders in this dialogue.

## Develop and Implement Design Guidelines

The County should move forward with the development of planning and design guidelines for Complete Streets, BRT Corridors, Bus Stops and Intermodal Hubs as a step toward standardizing infrastructure and enshrining current design best practices. Design guidelines would help optimize connections and user experience at key stations and intermodal hubs, and ensure context-sensitive stops and infrastructure are built to the needs of a community or town. They will help the County achieve some of the *Framework for the Future* goals, by helping strengthen transit and mobility systems and increase "last mile" connectivity by improving pedestrian and bike infrastructure, providing standard designs and typologies that can be applied Countywide to ensure a consistent and reliable network for users.

Design standards and guidelines will also help measure the success or determine needs that arise from pedestrian, bike and Americans with Disabilities Act (ADA) audits at intermodal hubs and transit stops. Standardized design guidelines also serve to help with the development of TODs by coordinating and communicating a set of criteria and designs that developers can work from, as well as between County agencies to outline expectations for design and better coordinate and optimize investments.

## Institute Processes and Policies to Support a Modern Mobility System

The County should consider a review and overhaul of the existing processes and policies for planning, assessing and changing transportation services. Currently the County's threshold for a public hearing regarding service changes for fixed route transit occurs when there is a change to 10% or more of a route's mileage or there is more than a one hour change to service spans. Modifications to service currently do not require a public hearing. The existing thresholds offer a static, one-size-fits-all evaluation of routes and service changes that are diverse in nature and impacts.

In transforming toward a modern, 21st century transit system the County should develop and encourage a dynamic, data-driven process to evaluate and propose service changes and modifications, wherein standized metrics are regularly analyzed and

performance is monitored, to ensure that the routes and services are more responsive to real-time needs and conditions. This system should encourage a "two-way" dialogue with stakeholders and riders about service goals, performance and changes. The process should also seek to educate stakeholders and riders about the financial health of the system and tradeoffs to types of service so they remain engaged and informed about the resources, realities and decisions the County must make to adapt and preserve the system.

To achieve this, the County may wish to engage the public and stakeholders (internal and external) to set the following goals and policies (among others) to create even more clear and transparent processes and policies for how transit and mobliity services will be developed, deployed, measured and modified:

- Establish detailed goals and priorities for Suffolk County's 21st century transportation and mobility system with stakeholders. These might include goals related to: attracting riders, moving people efficiently, moving higher volumes of people, safety, utilizing technology to support and inform decisions, improving communication with riders, creating a seamless experience, system adaptability, operations, asset management and maintenance.

- Determine where exactly service in the County should be provided and focused, and what types of service are better suited for certain areas.

- Establish how much service the County wants to provide, including target or graduated service level goals to align with growth and development in the County, route and system productivity goals, Title VI goals and detailed connectivity goals derived from the high-level goals outlined in the *Connect Long Island* and *Framework for the Future* plans.

- Create a standardized route performance analysis to regularly monitor how service is performing, who is tasked with monitoring performance (beyond operators) to see if and how routes and service offerings are helping achieve the County's goals and to create a more dynamic assessment for service modifications.

- Identify how service should be changed and establish types of events that may spur service changes, such as increased or decreased investment or funding, or priority improvements or corridors that may impact service changes.

## 6.3 Utilize Data and Technology for Transit Planning

The County should utilize data and technology to inform decisions and build a resilient transportation system, collect and analyze data to inform service planning, identify rider patterns and needs, measure system performance, prioritize investments, create cost efficiencies, enhance system adaptability and improve user experience.

### Build on Technological Investments and Operational Efficiencies

In recent years, Suffolk County Transit has made significant investments in technological advances to improve the operational efficiency of the system, vehicles and rider experience. Automated Passenger Counter (APC) and Fast Farebox improvements now enable the County to collect and analyze boarding and alighting data on transit vehicles, to better understand pick-up points and detailed transactional data by type of riders and fares (eg; seniors, students) at a route level each month. Additionally, the data can indicate the fare type used, which can advance the County's efforts to diversify fare media types such as introducing Quick Response (QR) codes or mobile purchases of transit fare. Automated Vehicle Locator (AVL) technology is helping to provide riders with

real-time data during their trip and to provide data to inform rider apps that communicate service changes, delays and arrival information for passengers. It also enables operators to monitor the status of vehicles in real time, helping identify congestion hot spots along routes. The AVL technology can be customized and expanded to meet the County's data needs over time.

The critical next step after collecting these data points will be to analyze and review the data, and apply it to inform service decisions and financial decisions for the system. These investments in data and vehicle technologies will help the County optimize its service by tracking on-time performance to realign schedules to meet real-time service needs, using detailed boarding count and fare information to better match vehicles to route needs, thus identifying significant opportunities for cost and time savings measures that will benefit riders and the bottom line. The County is encouraged to continue coordination with the County's Open Data program, to identify partnerships or competitions that could help the County manage and analyze this data.

### Adopt Industry Standards and Metrics for Fixed Route Transit

Suffolk County Transit currently collects and maintains disaggregated data per route, which includes yearly revenue miles, yearly passengers, and cost per mile. While these data can be used to create proxy criteria for evaluation of routes like those developed for the peer review, they do not yield the level of detail and analysis of standard industry route evaluation metrics for fixed route bus transit systems.

Suffolk County Transit should begin using transit industry standard metrics, wherein route effectiveness and performance are measured *per unit*, in metrics such as "cost per revenue vehicle hour," "passengers per revenue vehicle hour," and "average vehicle speed." The more accurate and detailed transit data the County has, the more effectively it can make adjustments to better serve customers' needs, and the more agile it can be in short- and long-term planning and budgeting for the system. This will also help the County to identify and preserve high-performing routes, and to have a dialogue with stakeholders and the public about how low-performing routes might be better served by other modes or new mobilty services instead of fixed routes characterized by low ridership, revenue and frequency. This process needs to take into consideration the needs to preserve transit ridership in Title VI communities, improve rider education and utilize rider feedback to help inform service changes.

### Improve Data Collection and Analysis to Inform System Decisions

In addition to the current on-vehicle data tracking the County is collecting, it is critical to collect and analyze both transit and customer data to gain a nuanced understanding of service operations and performance and user patterns, in order to track and adapt service over time. Data also provide valuable enhanced capacity for forecasting purposes. More precise data points will help develop more accurate ridership projections and help Suffolk County understand network operations at a level of detail that can inform internal management decisions and ensure greater transparency when implementing or optimizing service and system costs. If the County looks to partner with new mobility providers, it is also critical that there should be clear terms and contractual agreements about data ownership, to ensure the County has access to data in order to measure and analyze the performance of newer types of services provided by private sector operators.

Ridership surveys and analysis are critical to understanding potential transit markets, rider needs and satisfaction, and in turn will inform Suffolk County on how to redesign more productive routes to achieve cost efficiencies, improve headways for fixed routes, adapt new mobililty services and resources to meet user needs and attract new riders. Both revealed

and stated preference surveys are useful tools for understanding why and where passengers are riding the system. Recommended data collection efforts may include demographic surveys of a sample of SCT riders, specific survey outreach to ESL (English as a Second Language) transit riders to ensure a full spectrum of users are represented, and continued data collection and attention specific to Title VI populations in the County to mitigate disparate impacts and minimize burdens for low-income and minority communities.

The County should consider sharing transportation data for further utilization, for open source development through its Open Source Data Initiative that may help create new smart phone apps, or by offering the data via a web platform that enables stakeholders to review monthly performance data and statistics. In keeping with the modernization of many transit agencies and providers, Suffolk County could also offer added transparency and improve the two-way dialogue with riders by developing a simple, attractive "transit stats dashboard" or a real-time audit of on-time performance on its webite to provide system and route performance to riders stakeholders in an accessible way. It might include operations data for specific routes, updates to how many bus shelters have been upgraded or are receiving new amenities, and promote the rollout of new routes. All of these tools contribute to improving decision-making, building a relationship with riders, and informing stakeholders and the public of mobility improvements, performance, or service changes coming online in Suffolk County in a pro-active manner.

## Implement Electronic Fare Payment Technology

Electronic fare payment systems allow for passengers to use an electronic method to use transit instead of tickets or tokens. In most cases, these electronic fare payment systems take the form of some sort of contactless card, which is held over a card reader. These contactless cards are increasingly integrated with other types of contactless payment methods, such as contactless credit and debit cards and mobile

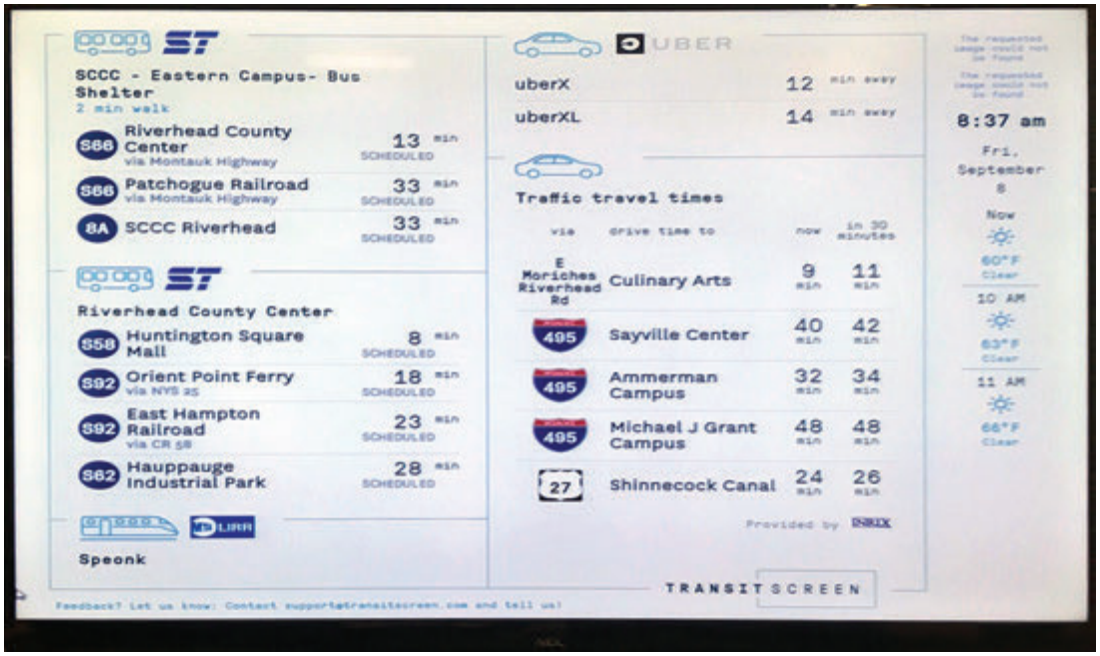



Figure 6.1: Suffolk Country Transit Screen
Source: Suffolk County

phone applications such as Apple Pay, meaning that transit users do not necessarily need a dedicated transit card issued by a service provider.

Electronic fare payment systems made conditions simpler for multiple transit providers and modes to consolidate fare payment systems. In the US and Canada, there are 40 electronic fare systems, of which 27 are multimodal and/or multiagency. The newly proposed New York regional fare system should be explored for the County to integrate itself with, as it looks to transition to new electronic fare payment systems at a regional level. The upgraded New York regional fare payment system will be a mass transit reader system similar to those currently installed in Chicago, Toronto and London, UK. The full system is anticipated to be in place and operational by 2020, providing a phase-out period for the MetroCards. It is expected that riders will be able to pay subway and bus fare on Metro-North and LIRR using the shared technology.

Given these planned efforts, lead time, and existing efforts for Suffolk County to engage partners like LIRR and NICE with coordinated initiatives, it would be a worthwhile investment for SCT to review the proposed technology to weigh the costs and benefits of joining a regional fare payment system that would provide a seamless transportation experience for users, enabling them to cross systems and jurisdictions with a single fare payment method.

## 6.4 Develop a Countywide Mobility Brand

### Establish Countywide Brand to Unify Service Offerings

Based on a high-level review of the existing brand, a key recommendation is to focus the initial efforts on a Suffolk County Transit brand revitalization, prioritizing and improving brand recognition to help modernize the SCT offerings and providing more “real-time” and “in-hand” resources via mobile phone apps and web tools that help package the County’s mobility and service offerings, real-time information, fare information and resources into a single, cohesive resource under a unified brand for users of the County’s mobility services.

As an example of transit rebranding and packaging investments, the Rochester-Genesee Regional Transportation Authority in New York embarked on a transit rebranding initiative in 2014. The transit rebranding initiative included an updated logo, new bus stop signage, simplification of the names of the various transit services in the region, and the launch of a new website. The completion of the rebranding initiative was timed to coincide with the opening of a new bus terminal—a major capital project in Downtown Rochester—in order to celebrate the new infrastructure and rebranded service as a cohesive investment for the city and the region.

In addition, a Countywide mobility brand could be developed to tie together several mobility services offered or subsidized by the County and would ideally be folded into a single tool (app or website) for simplicity of use and visibility. As an example of this type of “umbrella” brand for multiple mobility services, the city of Washington, D.C. provides a prime example of using a single brand for mobility services—sharing logos, color identity and a singular, recognizable brand presence applied to a local bus network DC Circulator, the Capital Bikeshare system, and the DC Taxi, all operated and regulated by the city. This type of effort can optimize the branding visibility across systems for users and also optimize the branding efforts and costs across systems, which is an approach recommended for Suffolk County to discuss and explore.

### Build Online Presence and Tools to Improve Dialogue with Riders

In order to achieve a greater marketing impact and increase the County’s dialogue with riders, upgrades to the SCT’s online presence is recommended. Basic updates to the SCT website would include

the addition of an interactive service map, real-time service information, social media links, such that there is a dedicated point of service information where customers can reliably find updates on service changes or delays.

As new modes or services are introduced, the County should consider developing a single website as a mobility information clearinghouse to include real-time information for riders related to timing and availability of mobility services, intermodal schedules related to MTA, NICE, 511 Rideshare, and LIRR, links to download relevant mobility apps—all framed in a single website URL with a catchier, simple to remember brand such as "GoSuffolkCounty.com" or "SCTMovesYou.org." This can be a low-cost, quick marketing tool and greatly improve the resources offered to users, and user experience, both on web and app platforms.

### Implement Focused Marketing Campaigns

The County should develop online and print marketing campaigns focused on specific themes as it unveils new technologies and mobility service offerings. Campaigns might be focused around themes such as:

- ***More Data, Better Service*** – Building a better system campaign to inform riders and customers of upgrades and how new AVL data will provide more reliability, offer riders real-time information through the existing TransLoc Rider app (or QR codes or "text/call by stop" numbers). Inform customers of smartphone options ("Find your SCT options on Google Maps") and highlight data or technology partnerships that may be identified and coordinated as part of the I-Zone or with university partners such as Suffolk County Community College (SCCC) to promote the County's technology capabilities as they relate to mobility services.
- ***Linking Long Island*** – Connectivity campaign to promote enhanced or new mobility services; explaining how these planned improvements or services integrate with NICE, HART, and LIRR for connections across the island and the region; working with partners and the MTA to make sure people know about all transportation options and how to access them; sharing improvements to the rider experience (customer information, fare media, transfer made easier). Demand-responsive services such as TNCs, vanpooling or microtransit service could be promoted under this type of campaign that would make the variety of connections within Suffolk and between Suffolk and the region more accessible and attractive.
- ***Listening and Letting You Know*** – Transparency and dialogue-focused campaign to engage and educate riders, transit advocates and community members about planned service changes; explaining how and why changes were needed in accessible language; holding community meetings or attending local community events, to hear from riders on what they need and want; creating a two-way communication line through social media or other means to engage riders on a day-to-day basis.
- ***Highlighting Seasonal Routes and/or Special Service Areas*** – Special campaigns for the Hamptons, Fire Island, Port Jefferson Ferry, Stony Brook, integration of bus routes, and hike and bike trails, as well as new mobility connections as ways for people to visit the County. While these campaigns have been used in previous years, it is suggested these might encompass and creating and/or offering an all-in-one campaign (inclusive of ferries, shuttles, etc.) and identifying budget for an app that would connect all modes and transportation choices into a single app to help riders navigate transfers between the various systems (LIRR, SCT, ferries) seamlessly.

# 6.5 Community Outreach through Technology and Strategic Partnerships

## Engage Riders and Share Information Through Technology

With today's technologies and real-time information, and in the age of ubiquitous smart phones, the County's outreach and marketing strategies should be considered a "dialogue" with the system's riders—both current and future—as well as vested stakeholders such as transit advocates and transportation partners to foster proactive communication and inform decisions about the system. Communicating data, strategies, and recommendations related to system modifications and system processes in a clear, transparent way will be imperative to the success of these initiatives, as well as the level of support received by a wide variety of stakeholders from riders, to transit advocates, to local and County representatives.

In addition to existing and traditional means of community outreach, such as public meetings and hearings, there is a diverse spectrum of technology-based public engagement tools available today to meaningfully bring communities, towns, villages and stakeholders into the process and to share information quickly and efficiently. Crowd sourcing and other public engagement tools—through the use of smartphones, websites, or in-person engagements—could significantly enhance the relationship between Suffolk County Transit and the public at critical points of planning and implementation. Crowd sourcing feedback and meaningfully engaging stakeholders are critical to communicating about large projects like the Nicolls Road and Route 110 BRT or LIRR East End Service Improvements, and ensuring SCT riders and customers (existing and future) are being engaged, informed and attracted to the service offerings.

## Introduce Transportation Demand Management as Part of the County's Mobility Toolkit

Transportation demand management is a common overarching "umbrella" program that provides riders and employers with information and incentives provided locally or regionally that help people understand and utilize all the transportation options and resources available to them, and encourages a more balanced, multimodal transportation system that supports livability, TODs, complete streets and walkable activity centers like those Suffolk is cultivating for a sustainable future. In application, this may range from informing riders and employers of guaranteed ride home programs, to smart phone apps, to developing a robust strategy for the County that engages a wide range of agencies, stakeholders and advocacy groups to improve mobility Countywide.

Many modern transportation agencies or authorities have a TDM employee on staff, typically in a half- or full-time position depending on resources. The County should consider implementing a TDM program with a dedicated staff person to manage and market transportation and mobility services, branding, data management, ensuring cross-agency collaboration and serving as a unified point of contact for partnerships and mobility stakeholders.

## Capitalize on Strategic County Partnerships

There are many excellent resources in the County to tap for expertise and potential partnerships. Stony Brook University has a SBU Smart Transit information system that shows real-time location of buses and times to next stop arrivals. It was developed through a partnership between the SBU Department of Transportation and Parking Operations, the Center of Excellence in Wireless and Information Technology (CEWIT) and the College of Engineering and Applied Sciences. The university may be a natural partner for the County to explore apps and technologies to not only improve the rider or user experience, but also increase market presence of these tools.

In addition, the County should work with TOD teams and developers to identify their willingness to sponsor or install real-time transportation information screens at key areas and intermodal hubs sited in or near their development. These can serve as a valuable amenity for residents and visitors by providing them with information to confidently make mobility choices in real-time and incentivizing them toward a transit trip over an auto trip by creating an easy, reliable, and seamless experience.

## 6.6 Utilization of Current Funding Sources

An initial high-level review of existing Suffolk County Transit funding sources was conducted at the request of Suffolk County to explore the adaptability and applicability of the funds to support the modes and improvements outlined in this study and the larger goal of a mobility suite of services. It is advised that any new uses or activities related to federal funds be confirmed directly with FTA and FHWA in advance to ensure they qualify under the detailed terms of the funding.

### FHWA Transportation Alternatives Program (TAP) Grant Funding

A competitive grants program wherein funding can be applied for to support pedestrian, bike, or ADA audits at intermodal hubs or transit stops in the County ensuring improved access and connectivity, as well as infrastructure to support multimodal users and ensure univeral accessibility, and any current projects the County is implementing with TAP funding.

### FTA Section 5310

FTA Section 5310 provides formula funding to states for the purpose of meeting the transportation needs of older adults and people with disabilities when the transportation service provided is unavailable, insufficient or inappropriate to meeting these needs. At least 55 percent of program funds must be used on capital or “traditional” 5310 projects. Within that, eligible activities that the County may wish to explore related to a mobility suite may include:

- Transit-related information technology systems including scheduling/routing/on-call systems
- Mobility management programs
- Acquisition of transportation services under a contract, lease, or other arrangement. Both capital and operating costs associated with contracted service are eligible capital expenses. User-side subsidies are considered one form of eligible arrangement. Funds may be requested for contracted services covering a time period of more than one year.

The remaining 45 percent is for other “non-traditional” projects. Under The Moving Ahead for Progress in the 21st Century Act (MAP-21), the program was modified to include projects eligible under the former 5317 New Freedom program. Eligible activities that the County may wish to explore related to a mobility suite may include:

- Building an accessible path to a bus stop including curb-cuts, sidewalks, accessible pedestrian signals or other accessible features
- Improving signage
- Wayfinding technology
- Incremental cost of providing same day service or door-to-door service
- Ridesharing and/or vanpooling programs
- Mobility management

### FTA Section 5307

FTA Section 5307 provides funding for transit capital and operating costs. Within these funds, eligible activities that the County may wish to explore related to a mobility suite include:

- Planning and evaluation of transit projects and other technical transportation-related studies
- Construction of maintenance and passenger facilities
- Certain expenses associated with mobility management programs are eligible under the program.
- All preventive maintenance and some ADA complementary paratransit service costs are considered capital costs.
- Modern web-based transit planning software (REMIX)

### New York State Operating Assistance (NYS STOA)

NYS STOA funding is provided by New York State to 130 transit operators across New York State. Within this funding source, eligible activities that the County may wish to explore related to a mobility suite, particularly with regards to "private non-profit" (bikeshare), "quasi-public transit" (vanpooling or microtransit) or "ridesharing providers" through 975.23 "Special Mobility Improvement Projects" to be confirmed through the detailed eligibility requirements.

### Advertising Revenues

Potential exists for revenues gained through the selling of advertisement space on buses, bus shelters or multimodal transit stations. Bus advertising revenue has potential application for bikeshare and vanpool modes. Future bikeshare stations and bikes could also be branded through a sponsorship agreement and as a possible stream of revenue.

### New York State Funding Suffolk Clipper

Suffolk Clipper runs between SUNY Farmingdale, various park and ride facilities along the Long Island Expressway and the Hauppauge Industrial Park. State funds allocated for the Suffolk Clipper Route (formerly S110 line) are route-specific. However, it may be worth exploring if these funds could be proposed and similarly dedicated to supporting transit routes that do—or will in the future—service areas such as Brookhaven National Laboratory and the I-Zone or other critical nodes surrounding the universities, colleges or major state-related employers.

### Fare Revenue

These include revenues accumulated through fares charged to use a transit service. Fare revenue could be earned through transit services that are owned and operated by a public agency. This may be applicable if the County is a partner in vanpooling or bikeshare program.

### Suffolk County Local Funds

Local funds appropriated by Suffolk County and/or local municipalities have potential applications to all identified modes. Strategies to leverage existing funding within the County may include pooling different local funding sources, or identifying future budget sources to support pilot projects or mobility services for specific areas. Opportunities to share benefits and costs of mobility services or improvements among local funds and municipalities are more feasible now through the New York State Shared Services Initiative.

# 6.7 Next Steps

## Utilizing data and technology to inform future transit planning

Suffolk County started installation of Automatic Vehicle Locator (AVL) technology to its fleet in 2014, with nearly all standard fleet and 80% of the paratransit fleet installed. The County will soon be in a position to collect data on the status of the entire fleet in real time, track on-time performance, identify congestion hot spots along the routes and realign schedules to meet real-time service needs. The TransLoc app introduced in late 2017 also provides the County with data on ridership and trip characteristics. Additionally, Automated Passenger Counter (APC) and Fast Farebox improvements now enable the County to collect and analyze boarding and alighting data on transit vehicles.The County will also explore its Open Data program to identify partnerships or competitions that could help the County manage and analyze this data with the help of partners.

## Pilot Programs for Demand-Responsive Mobility Service in Select Areas

### Bikeshare Pilot Program

Suffolk County EDP released a Request for Information (RFI) to gather industry insight and perspective on the various bikeshare models that have been implemented nationwide. In early 2018, SCEDP proceeded to release a Request for Proposals for a bikeshare vendor reflecting information gathered during the RFI process, and will also start work on developing a Countywide hike and bike masterplan in summer 2018. This presents a timely opportunity to pilot bikeshare systems at select locations within the County. The County will explore partnerships with bikeshare providers, universities and TOD developers to execute the pilot.

### Microtransit Pilot Program

The County will explore opportunities to develop and partner with a mobility provider to pilot microtransit programs at select locations within the County.

Throughout both pilot programs, the collection and analysis of data on how they perform will be conducted to measure the pilot's performance and identify refinements that can be undertaken when implemented on a larger scale.

## Mobility Implementation Plan (Phase II)

Phase-II of this study—Suffolk Countywide Mobility Implementation Plan—will build upon the analyses and findings of this study, particularly route review, trip pattern analysis and mobility suite recommendations. Phase II is scoped to entail the following:

### New Transit Maps and Rollout Plan

- Build on the Service Diagnostics and Evaluation findings (Deferred from Phase I)
- Revised Transit Network – fixed route service, BRT, demand-responsive services
- Service Specifications (span, frequency, transfer points, fleet specifications, passenger facility improvements)

### Marketing and Branding Plan

- Market Analysis and Marketing Plan
- Brand Development – Countywide Mobility Branding

### Community Outreach

- Outreach and Engagement Plan
- Community Education on new services – new demand-responsive mode, app

### Vision Zero Overlay

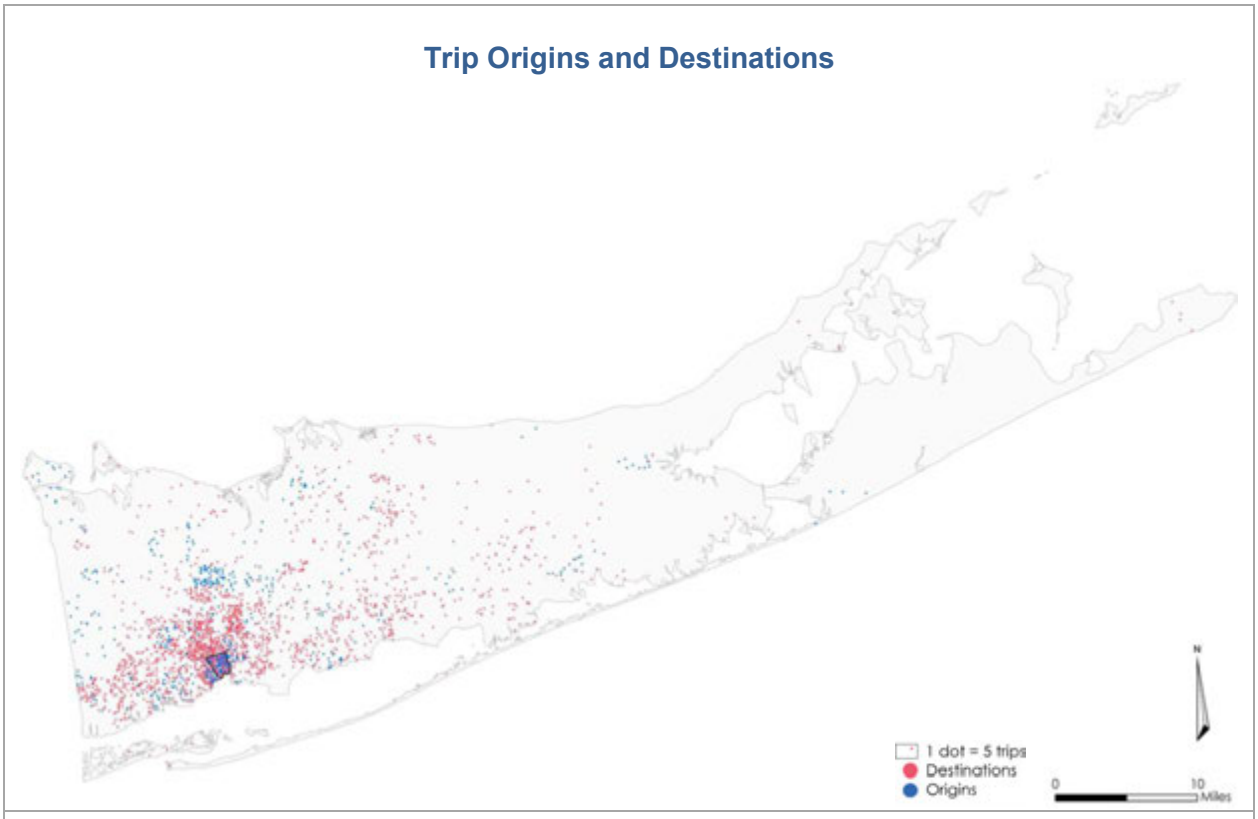
- Review of Pedestrian and Bicycle safety – crash data, community-level initiatives
- Identify strategies for achieving Vision Zero for Suffolk County

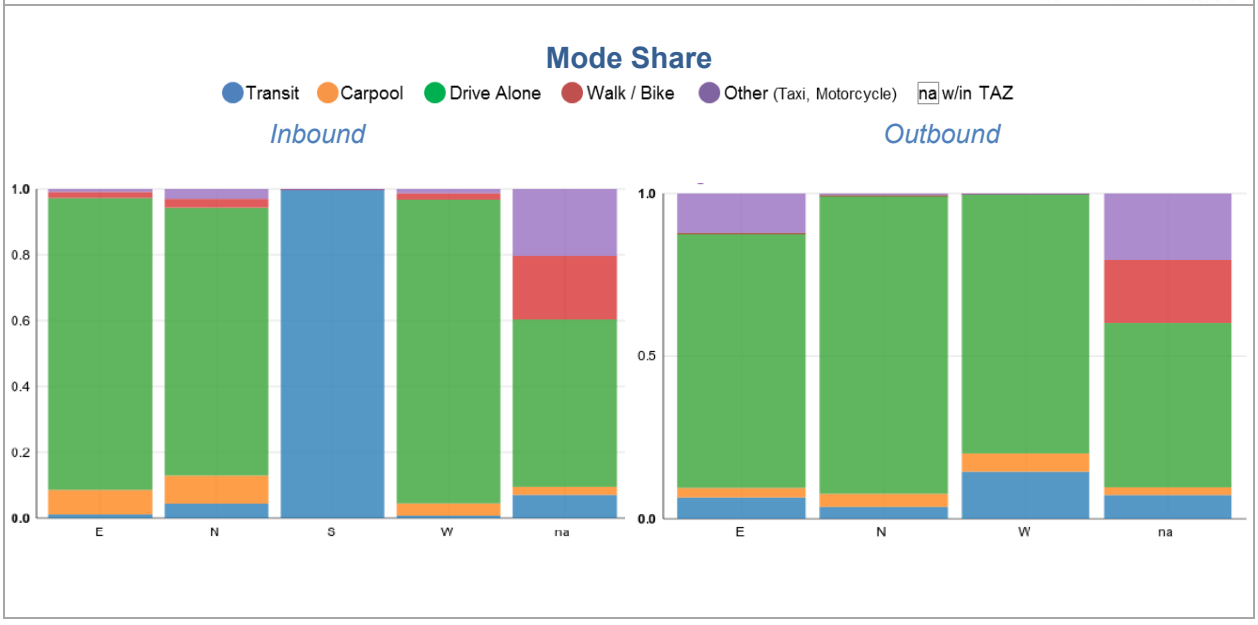
Suffolk County has secured $175,000 in FHWA/ FTA funding through NYMTC Unified Planning Work Program (UPWP) for the Phase II project.

# Appendix A: Transportation Analysis Zones (TAZ) Profiles

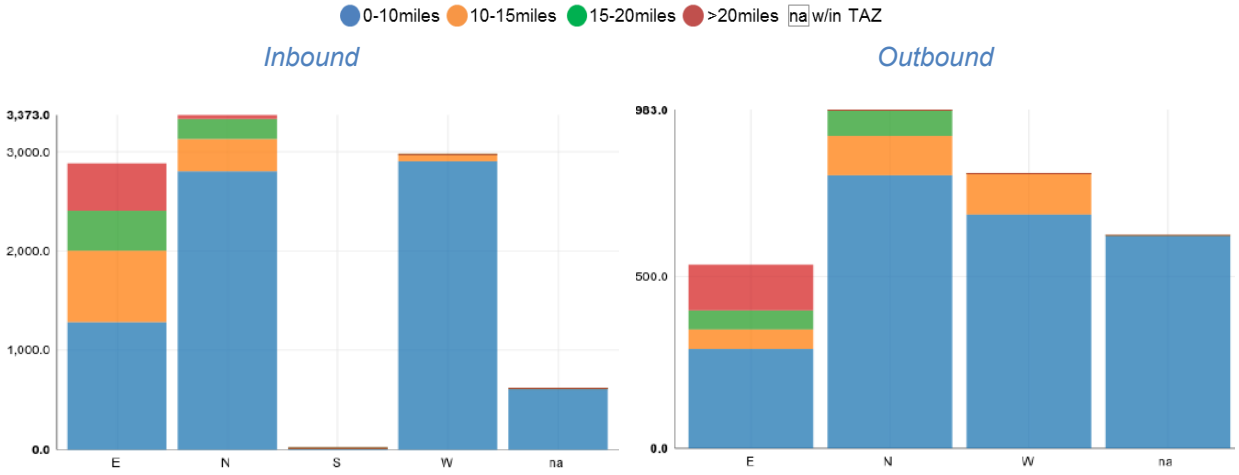
# A. Transportation Analysis Zones (TAZ) Profiles

## A.1 Bay Shore

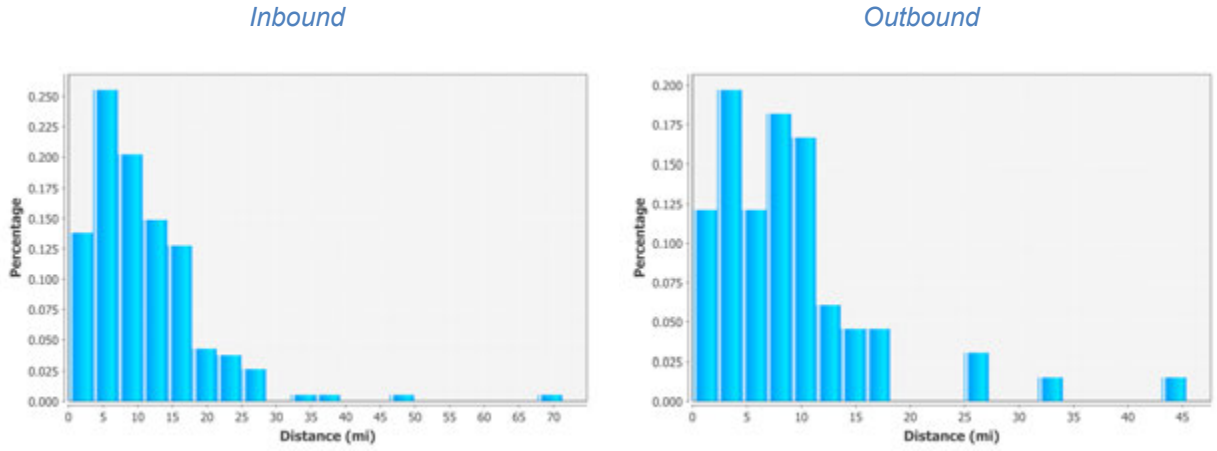


## Trips by Distance

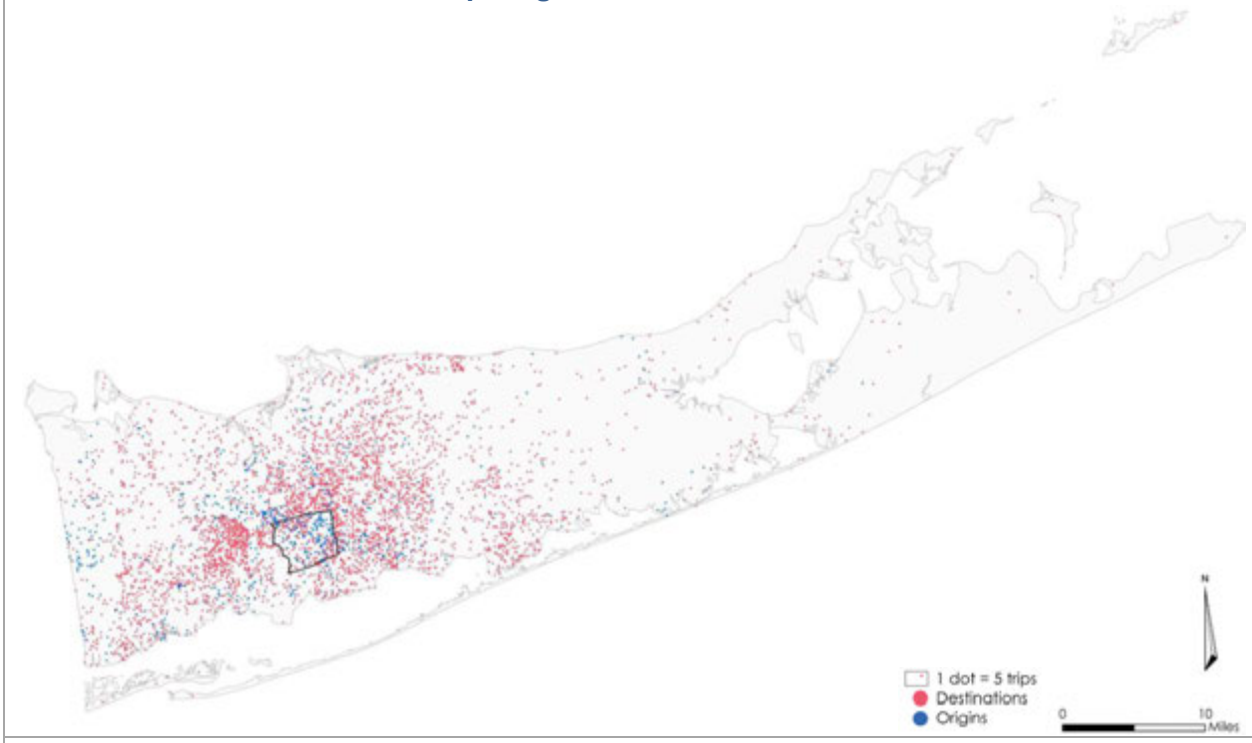



## Trip Length Distribution



## A.2 Ronkonkoma Hub / MacArthur Airport

### Trip Origins and Destinations

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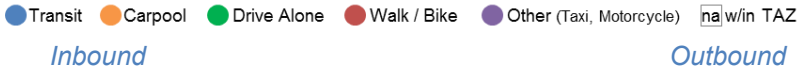
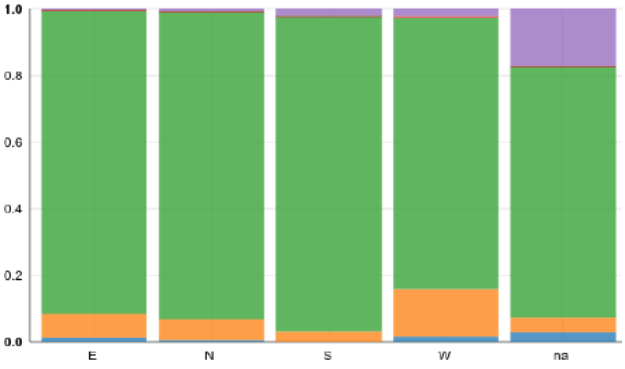
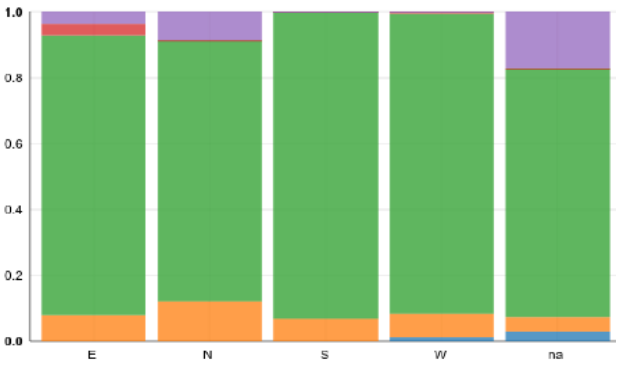


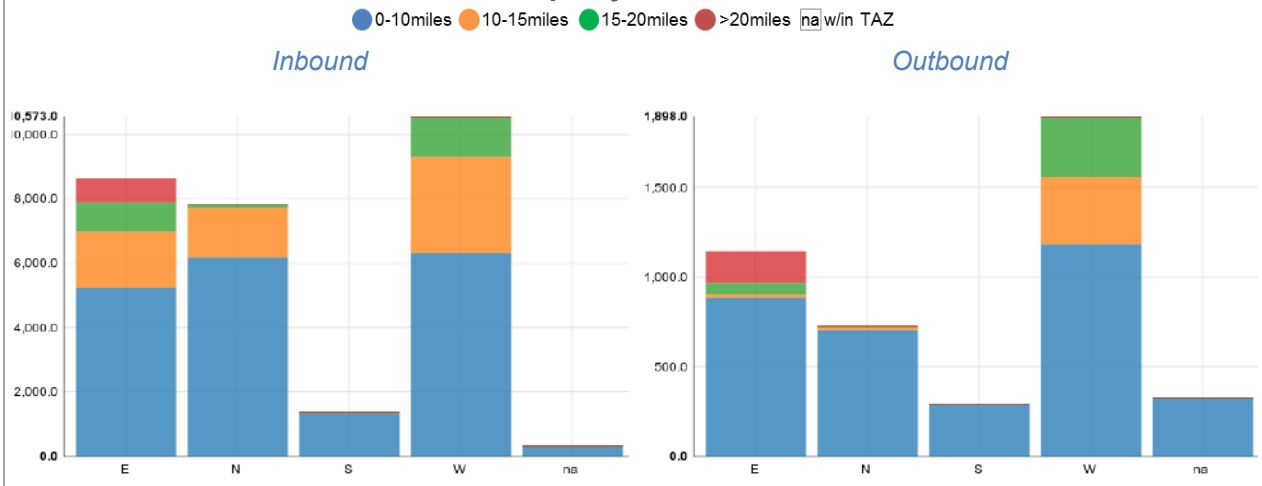

*Inbound*



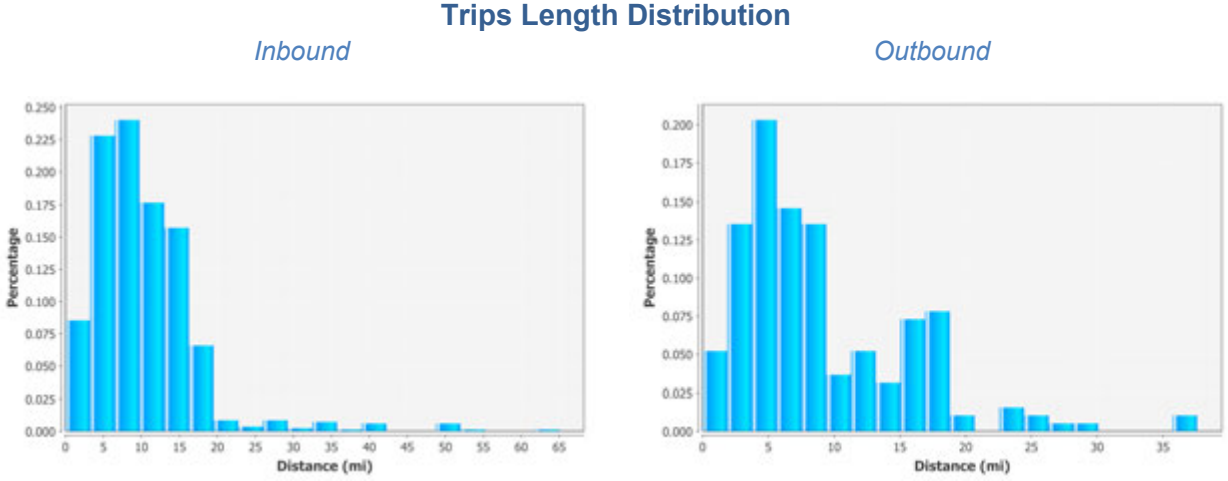

*Outbound*



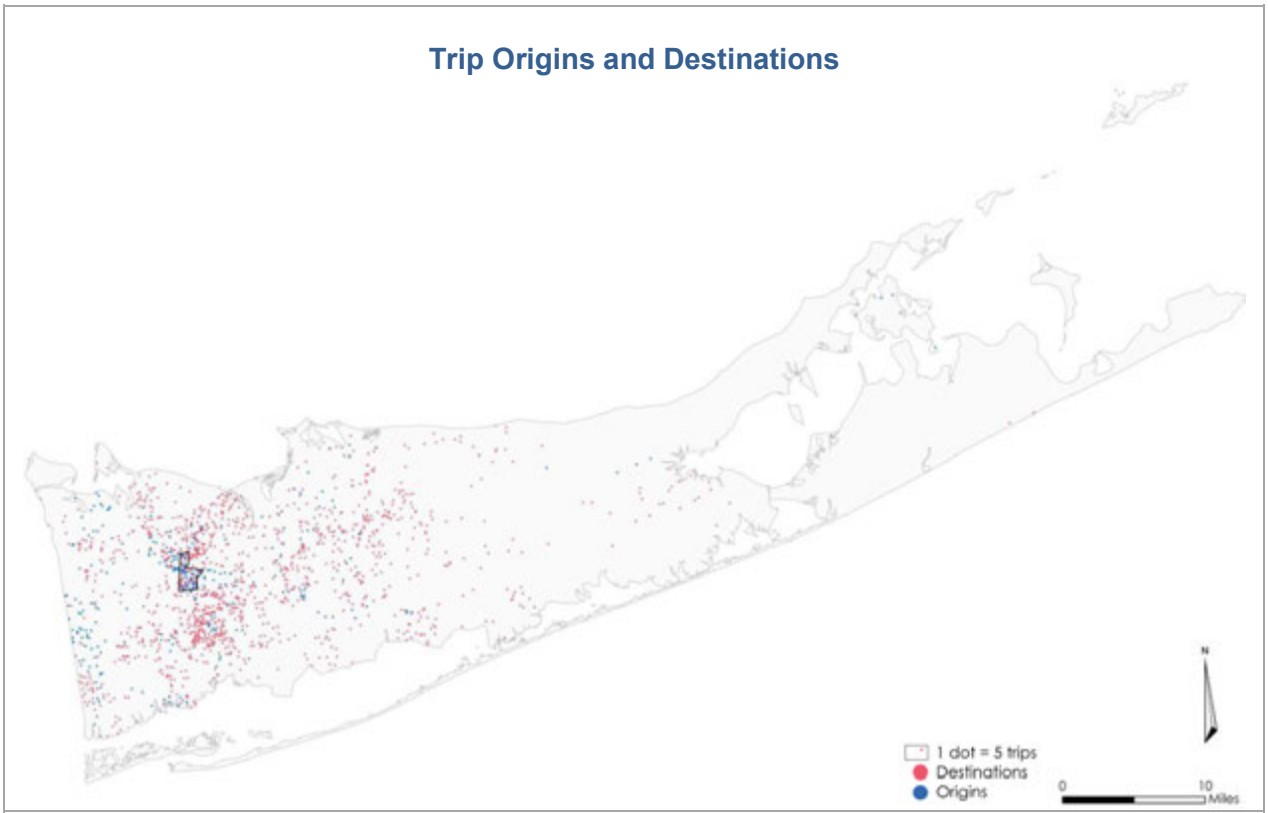
## Trips by Distance

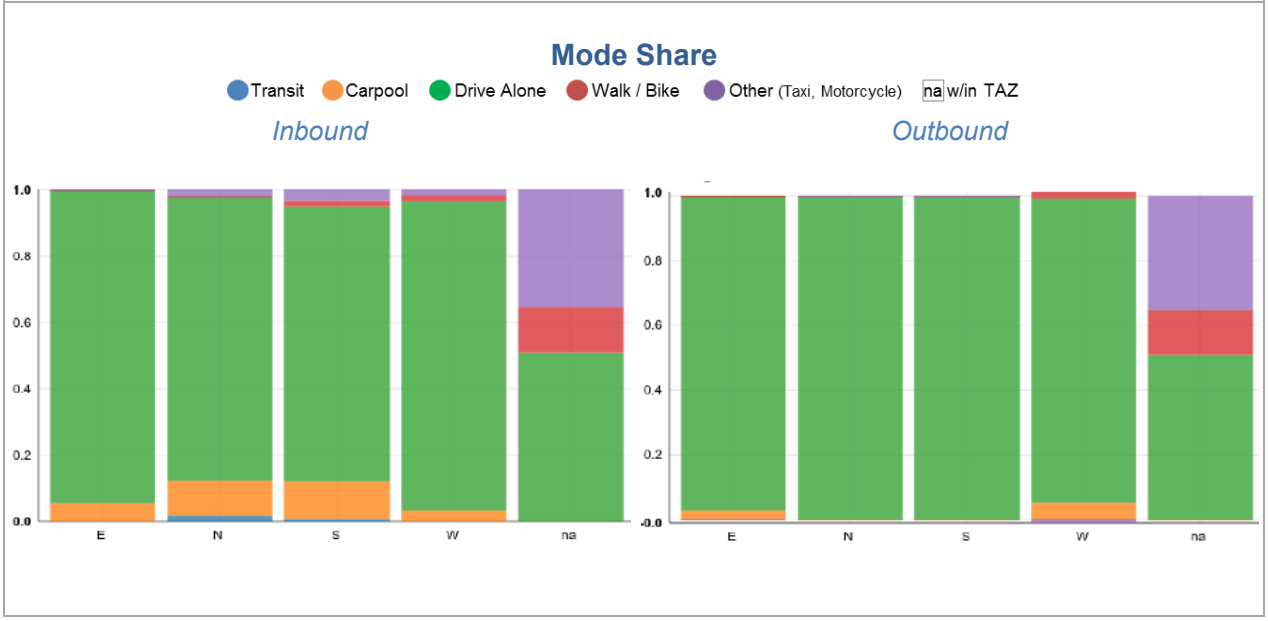



## Trips Length Distribution

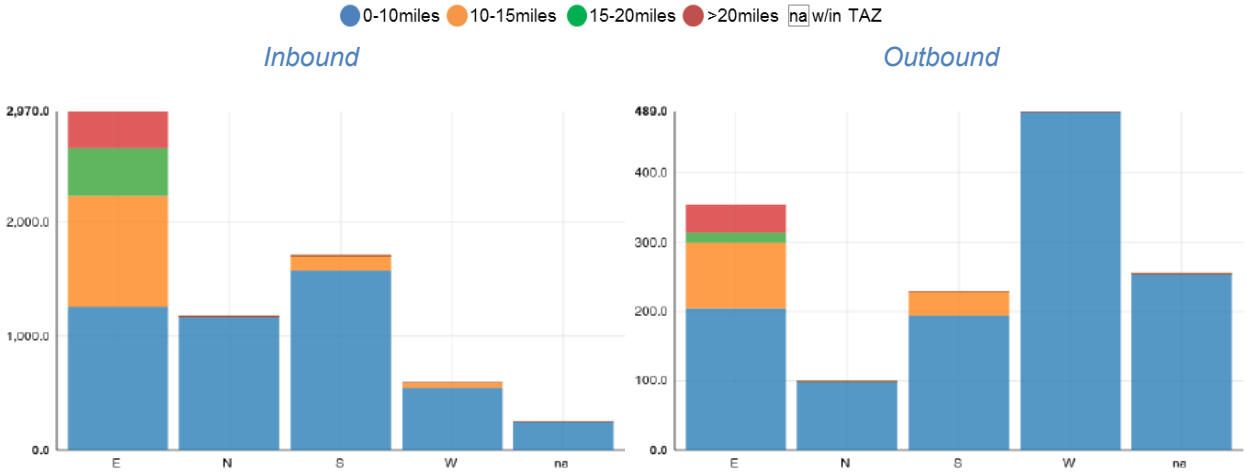


## A.3 Commack

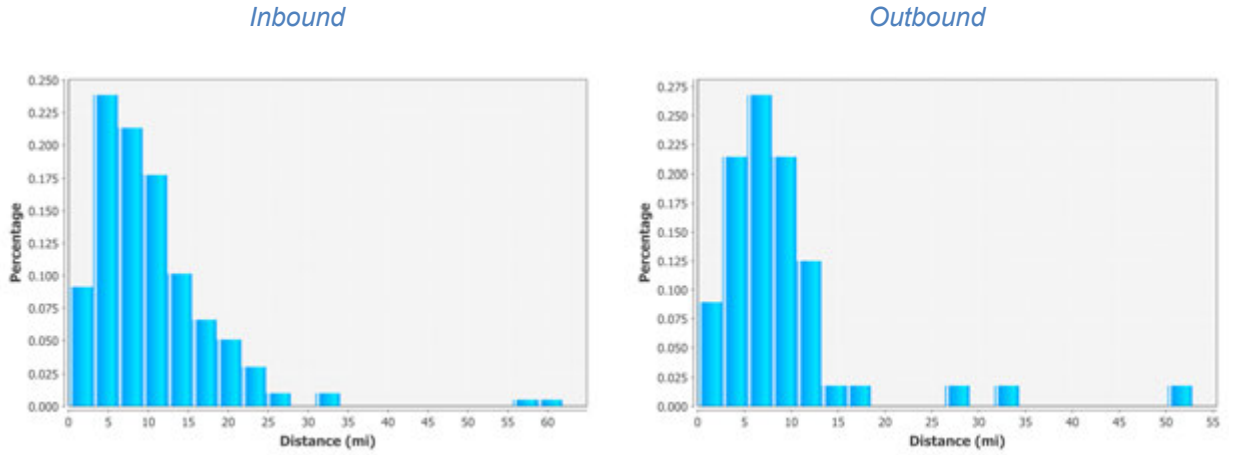

Trip Origins and Destinations
1 dot = 5 trips
Destinations
Origins
0
10
Miles
N


Mode Share
Transit
Carpool
Drive Alone
Walk / Bike
Other (Taxi, Motorcycle)
na w/in TAZ
Inbound
Outbound
1.0
0.8
0.6
0.4
0.2
0.0
E
N
S
W
na

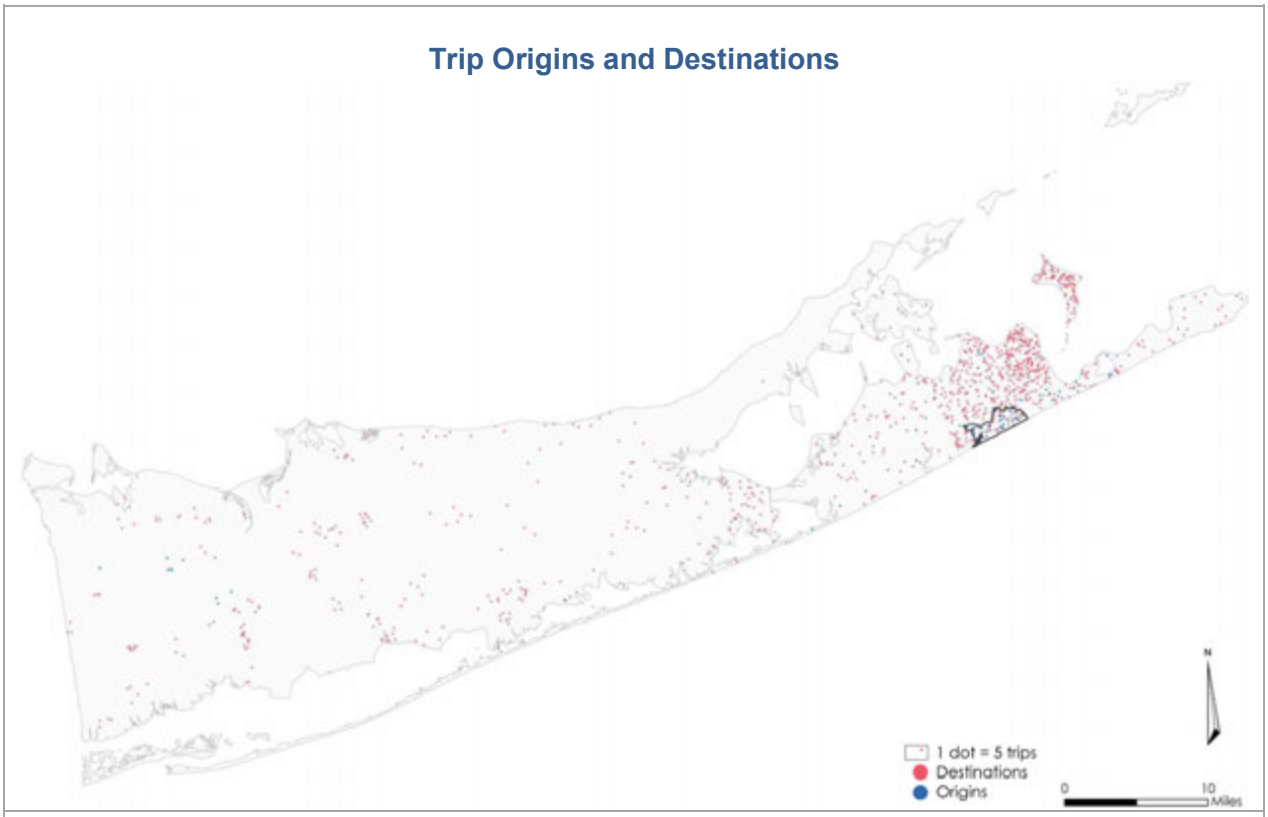
## Trips by Distance

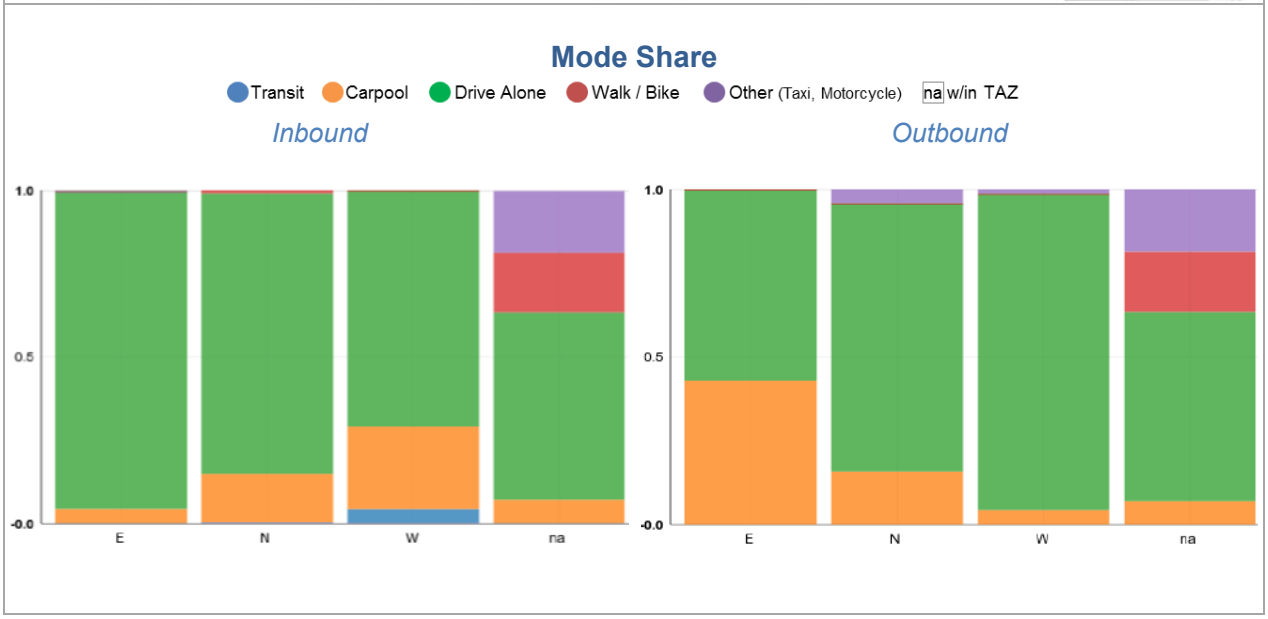



## Trip Length Distribution

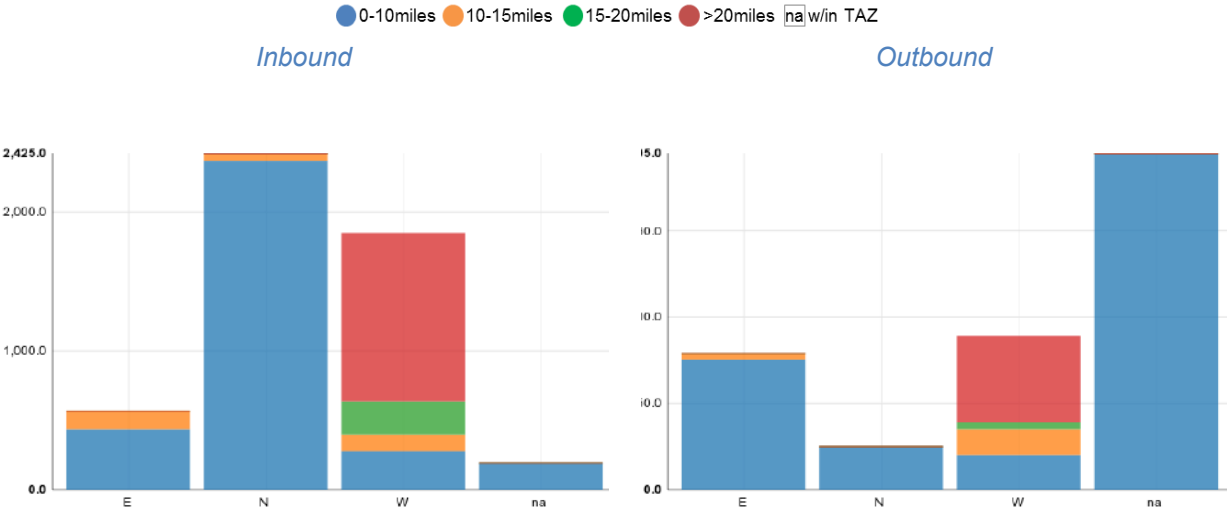


## A.4 East Hampton

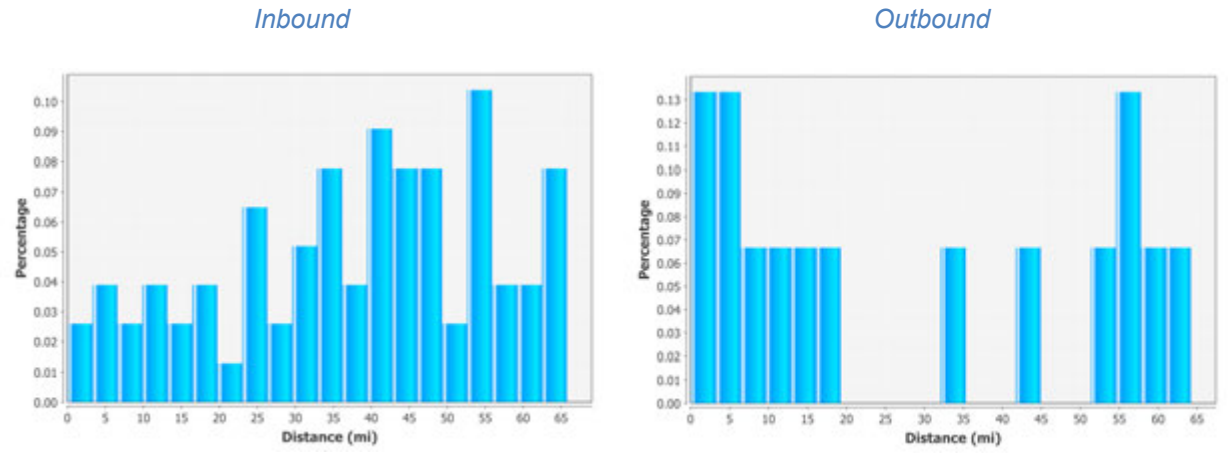


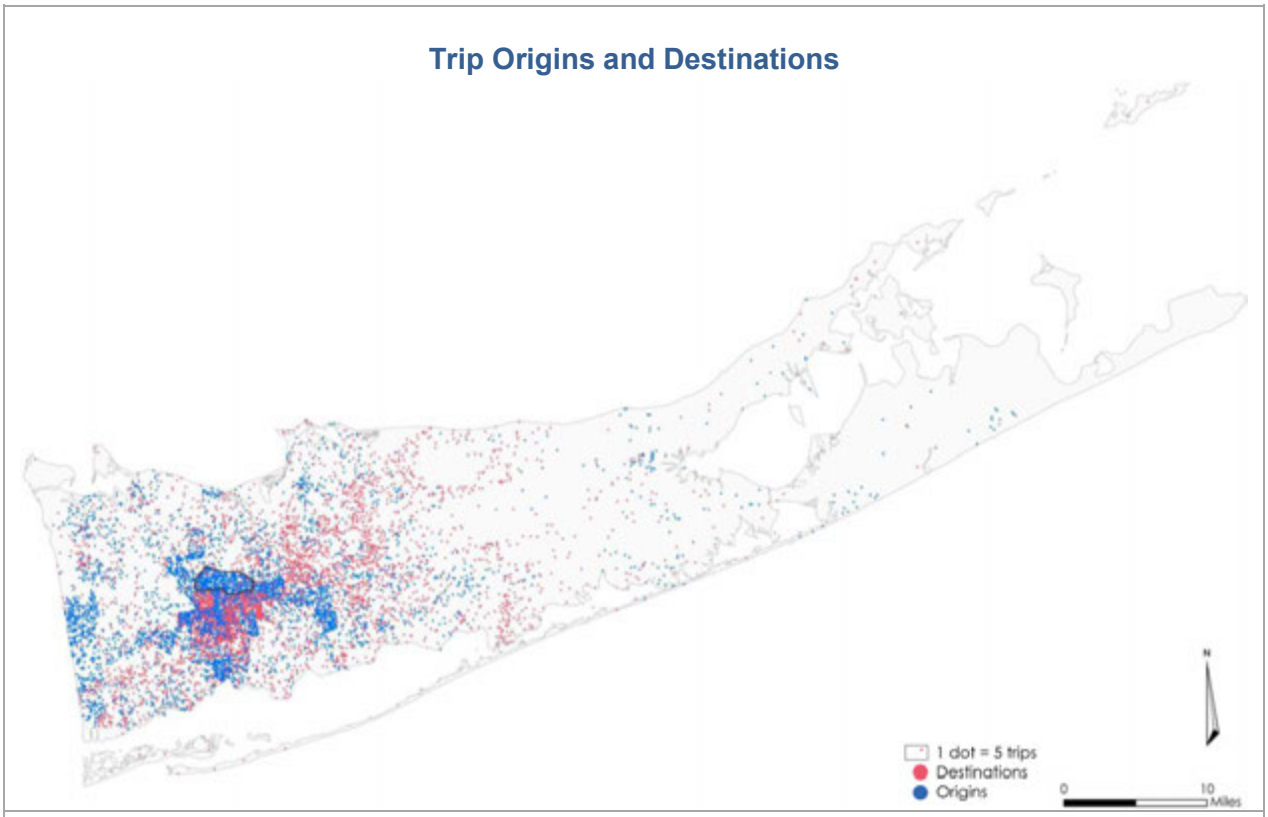
## Trips by Distance

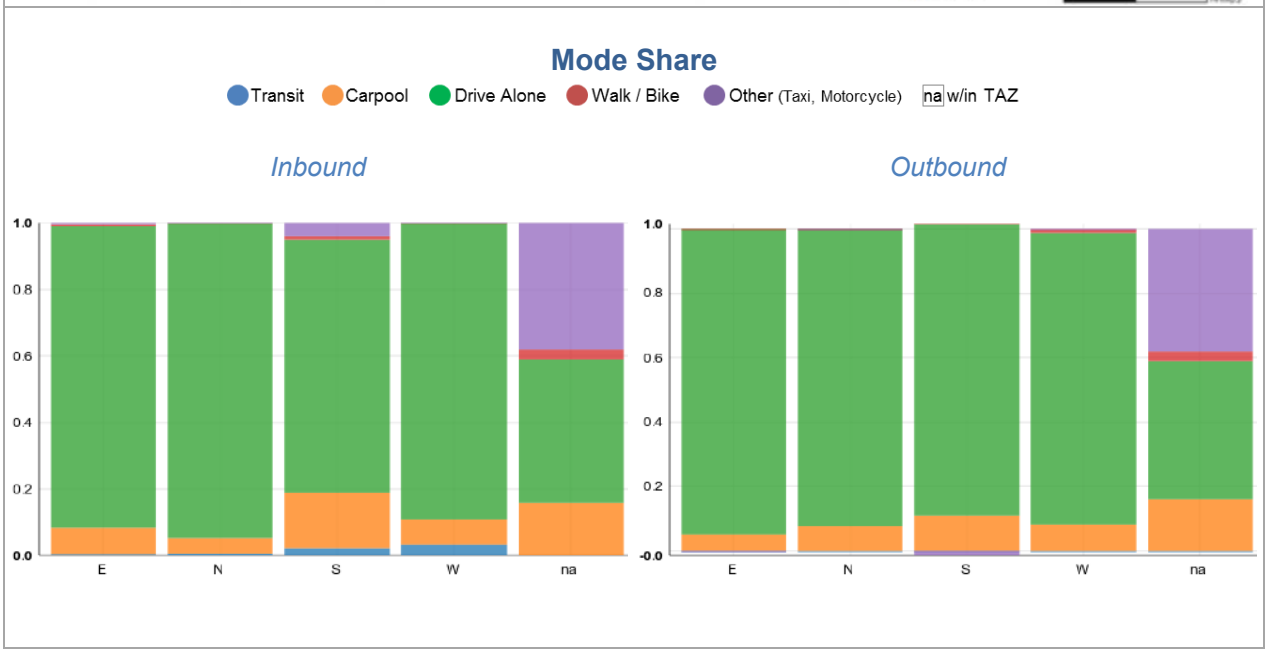



## Trip Length Distribution

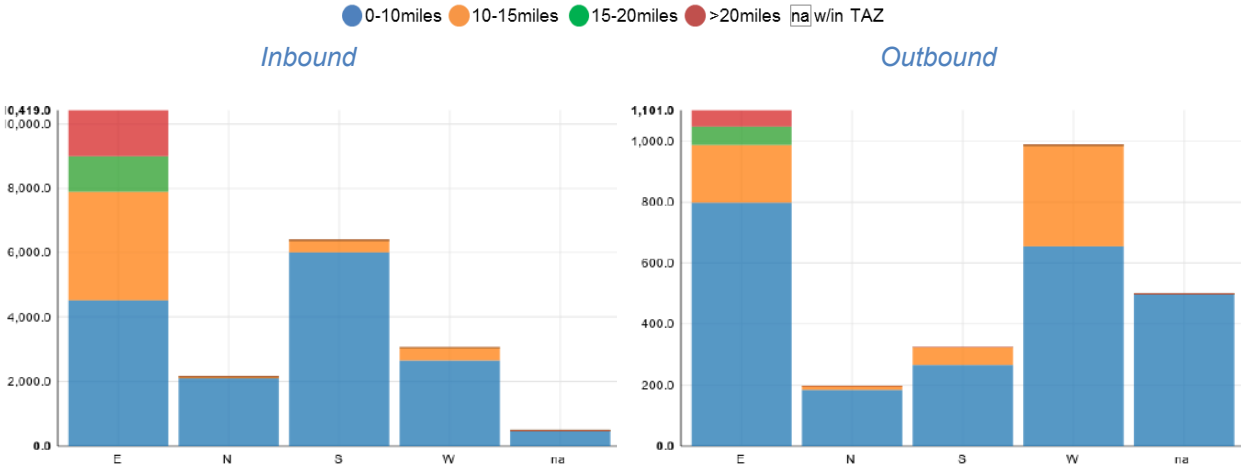


## A.5 Hauppauge



## Trips by Distance

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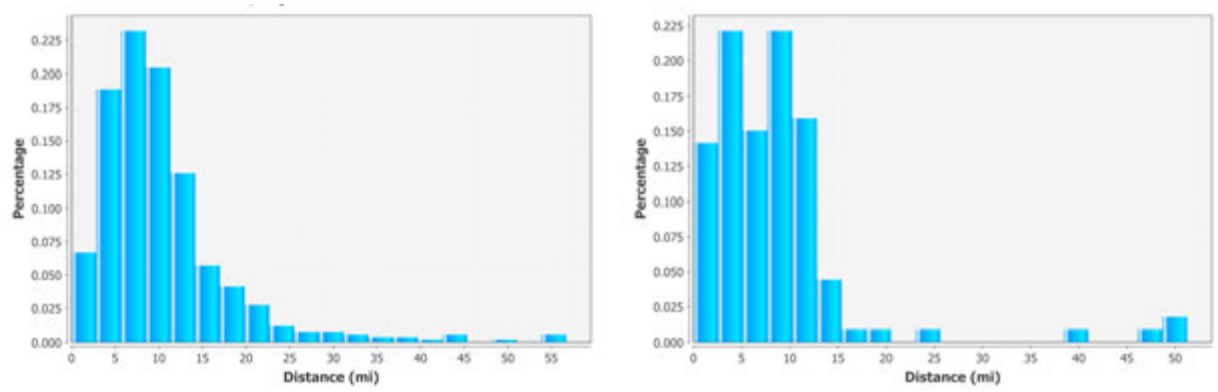
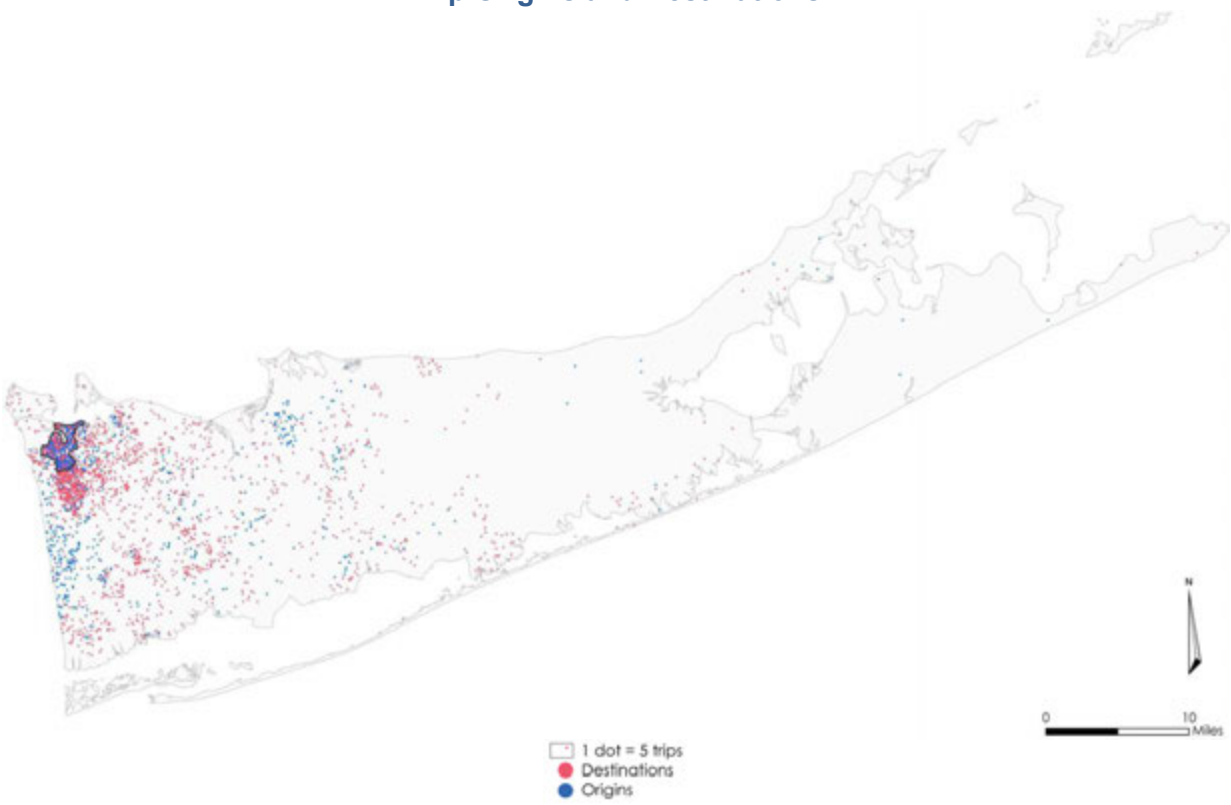
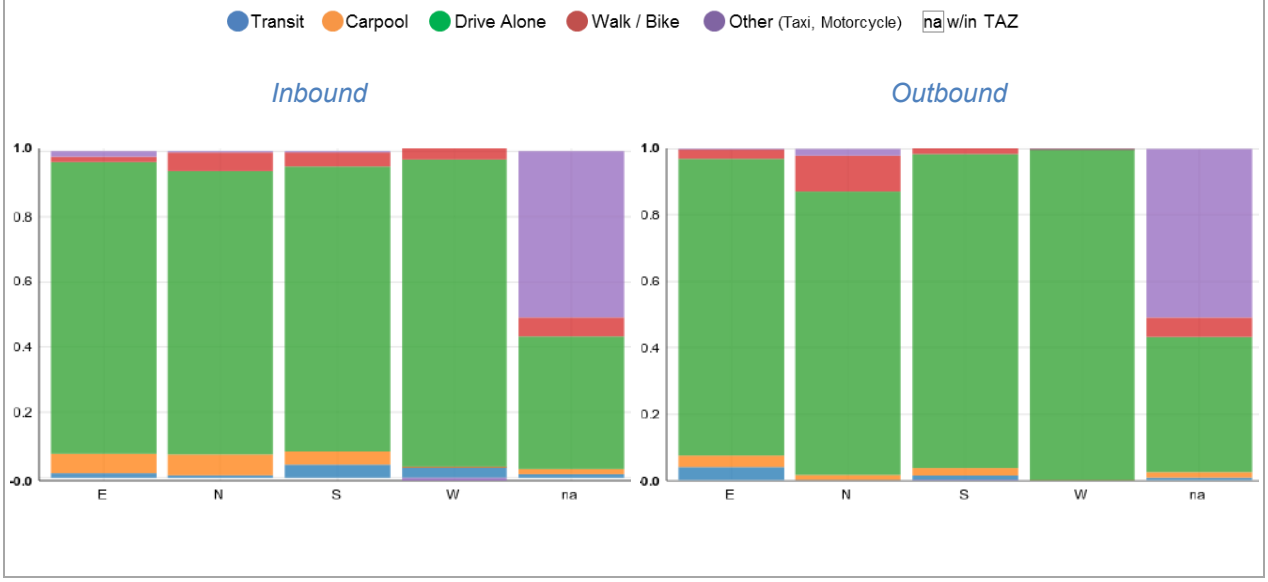


## A.6 Huntington

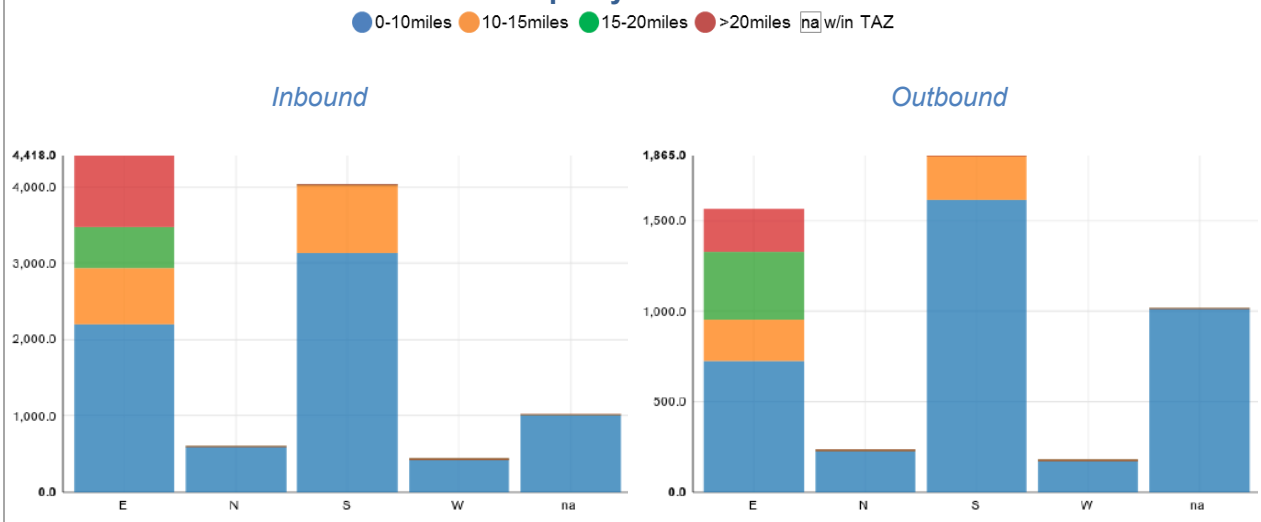
### Trip Origins and Destinations



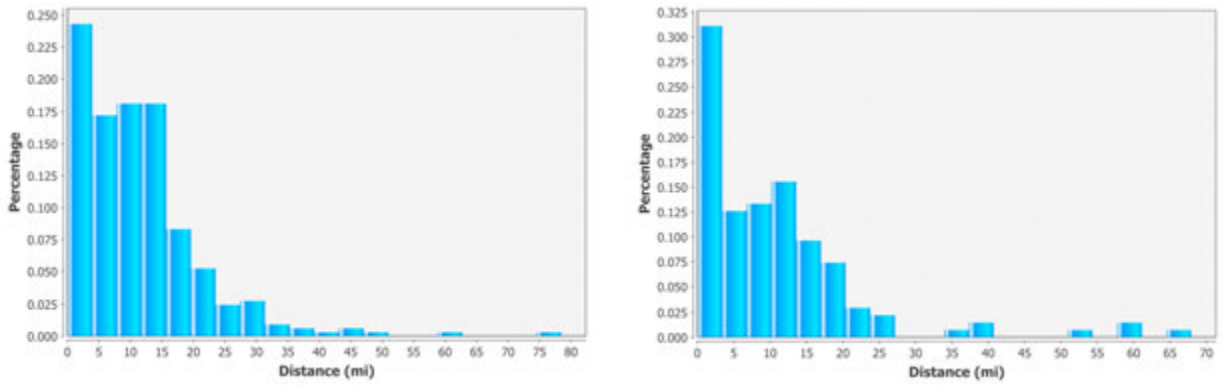

### Mode Share



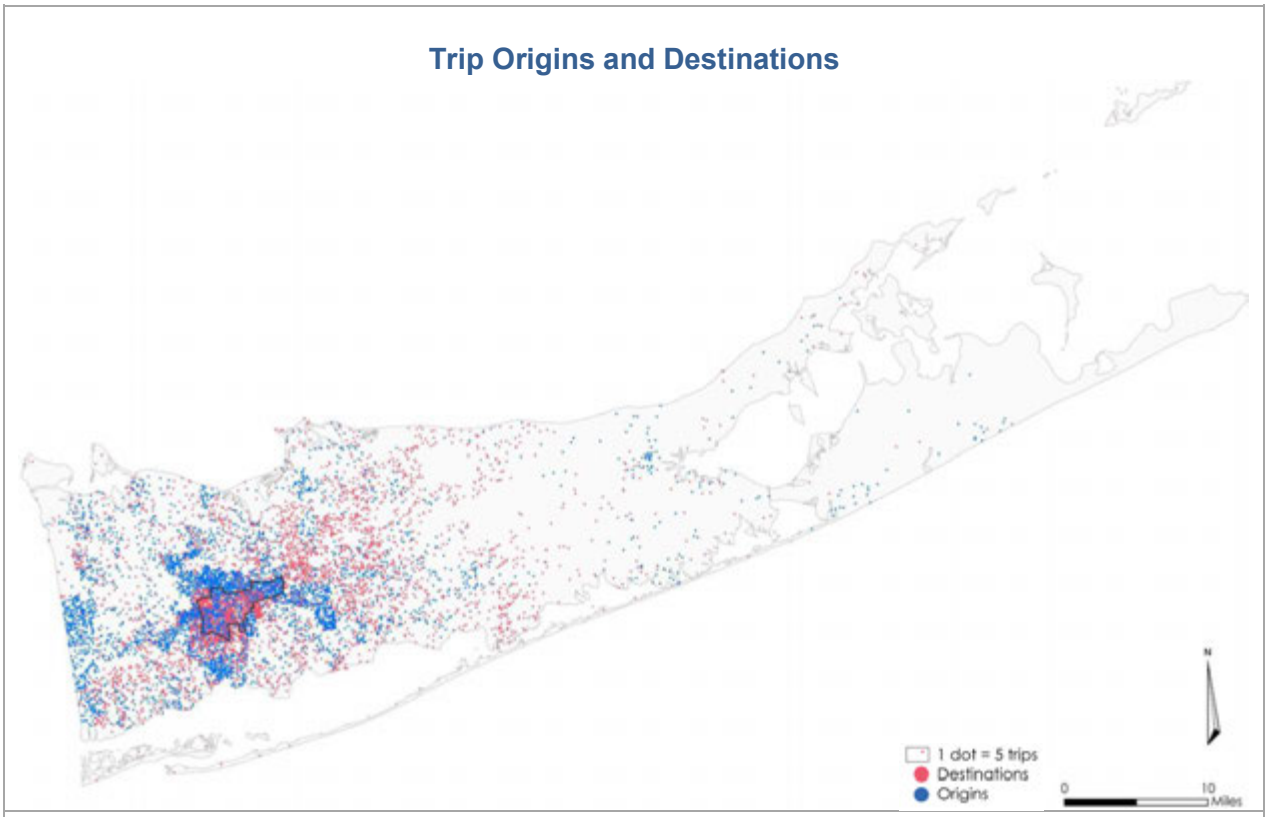
## Trips by Distance

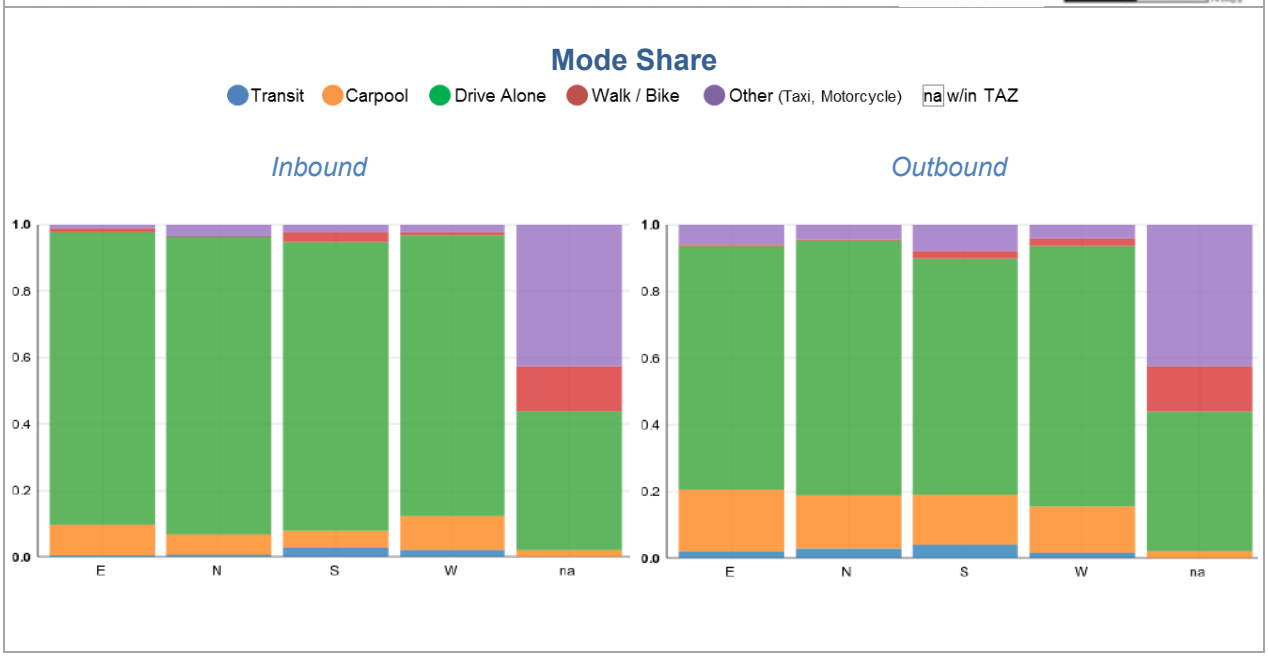



## Trip Length Distribution



## A.7 Central Islip - Brentwood

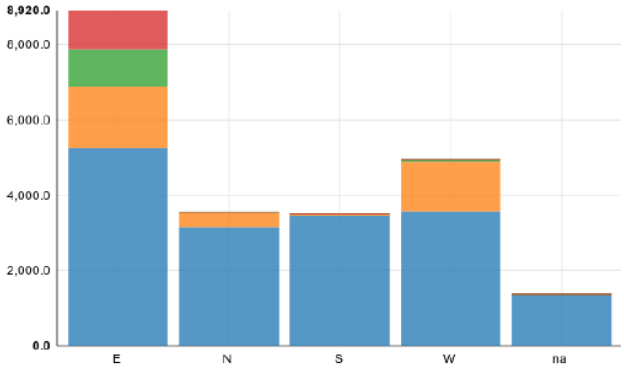


## Trips by Distance

0-10miles 10-15miles 15-20miles >20miles na w/in TAZ

*Inbound*

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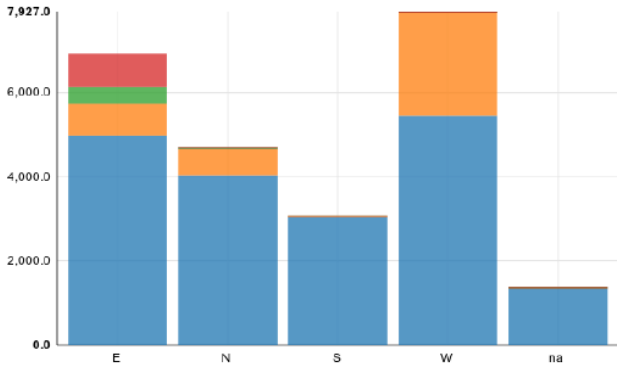


## Trip Length Distribution

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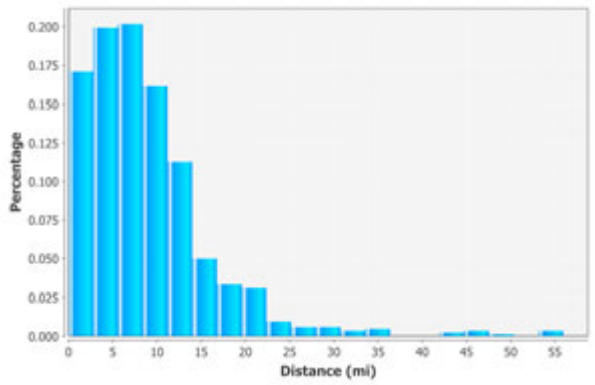
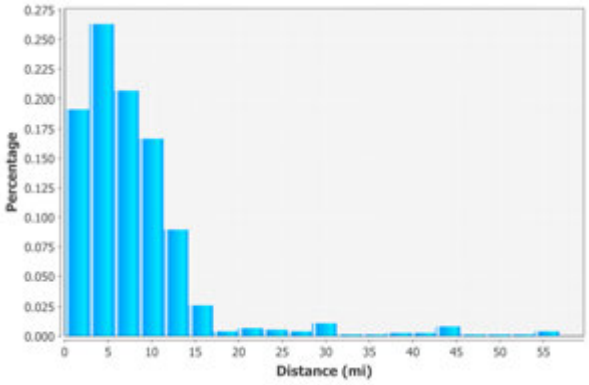
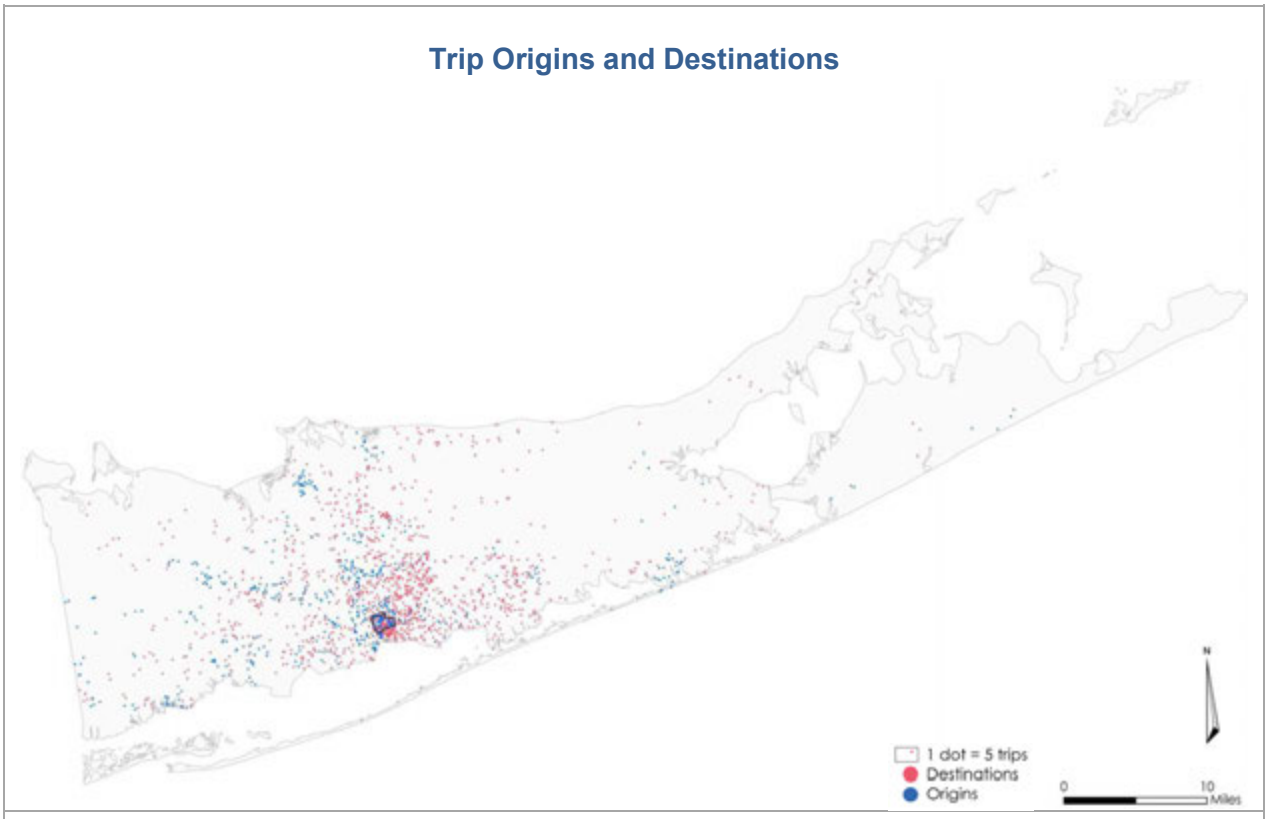
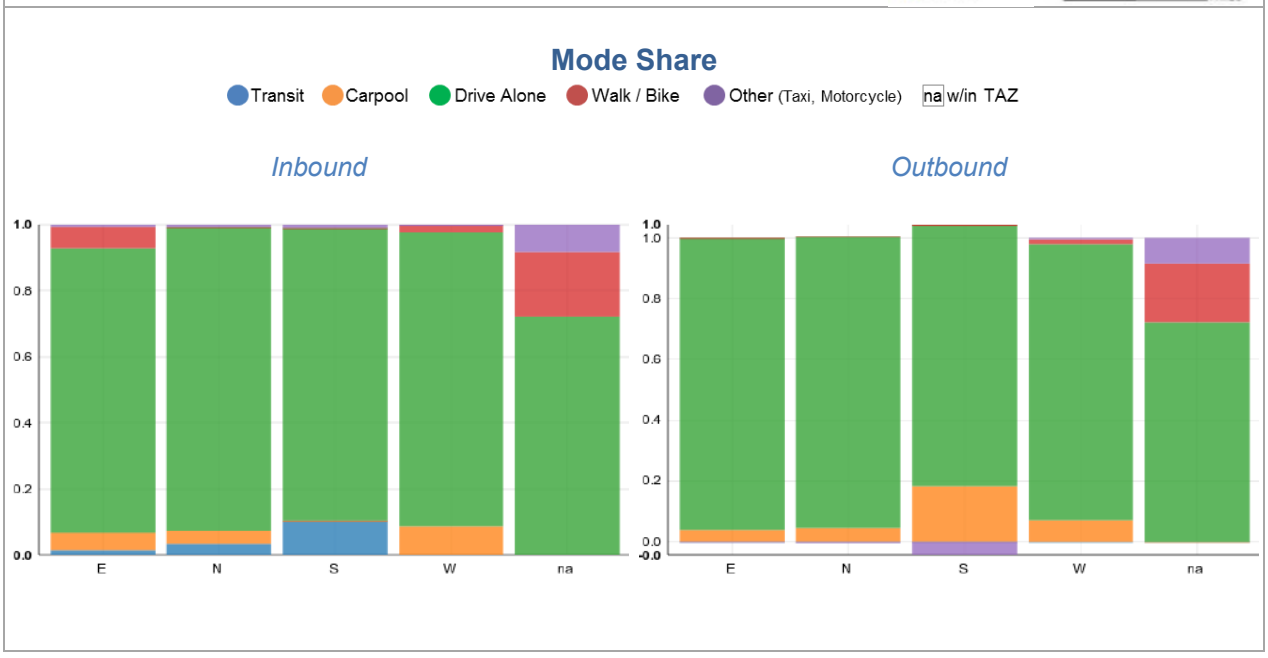



*Outbound*

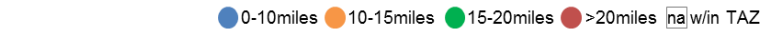


## A.8 Patchogue



## Trips by Distance

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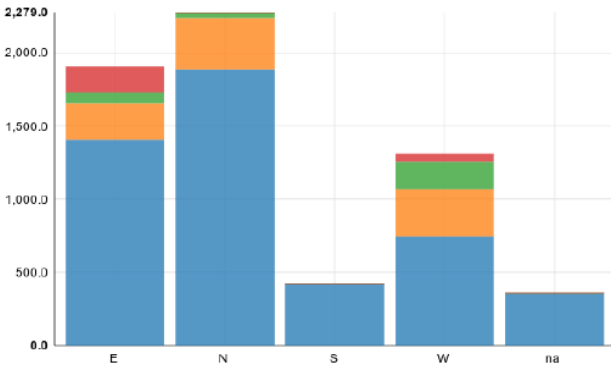
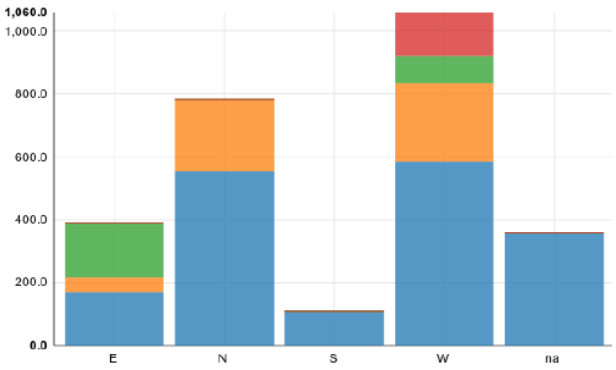



*Outbound*




## Trip Length Distribution

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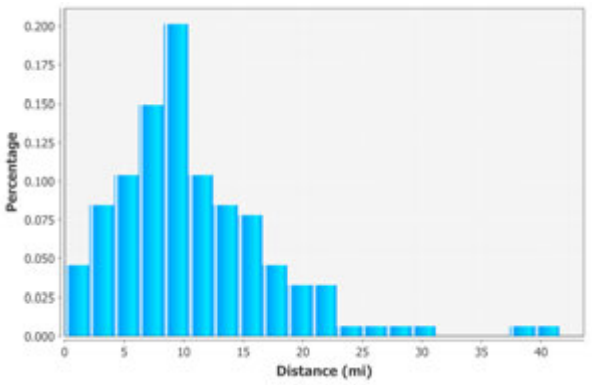


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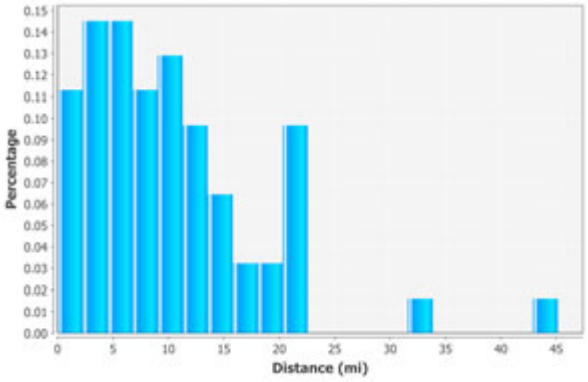
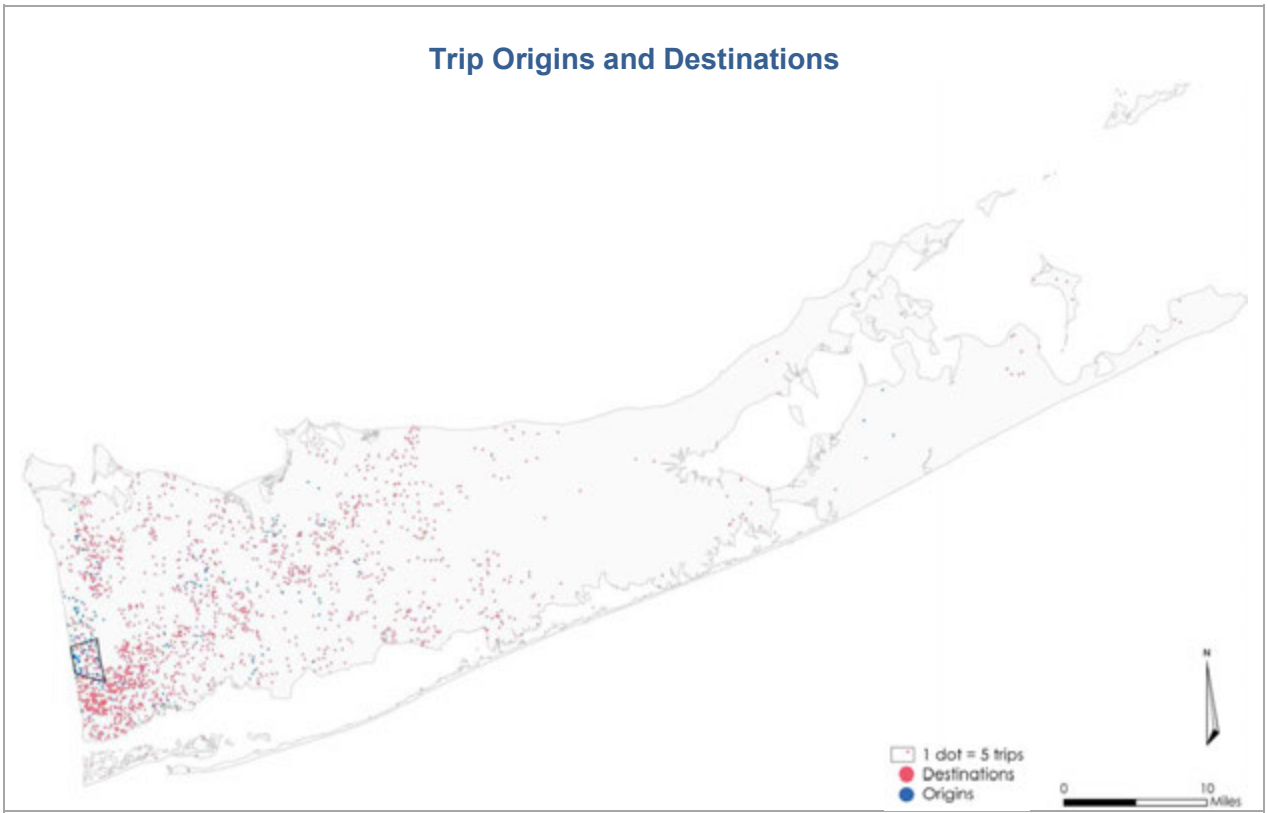
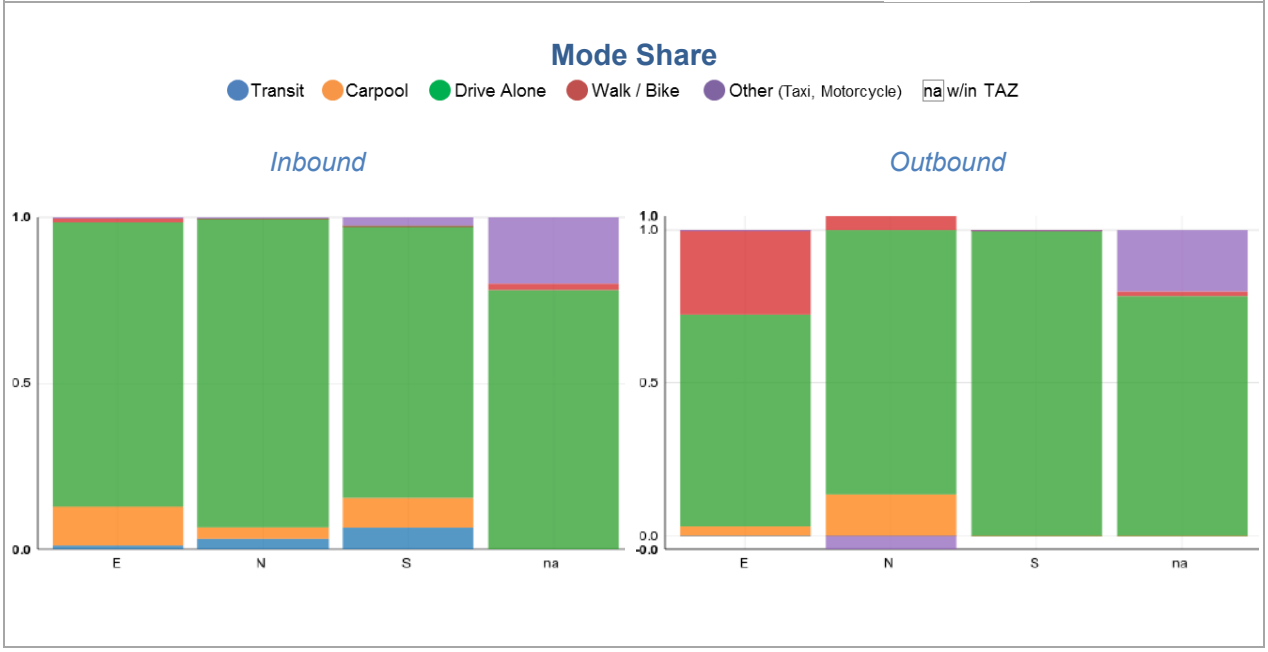
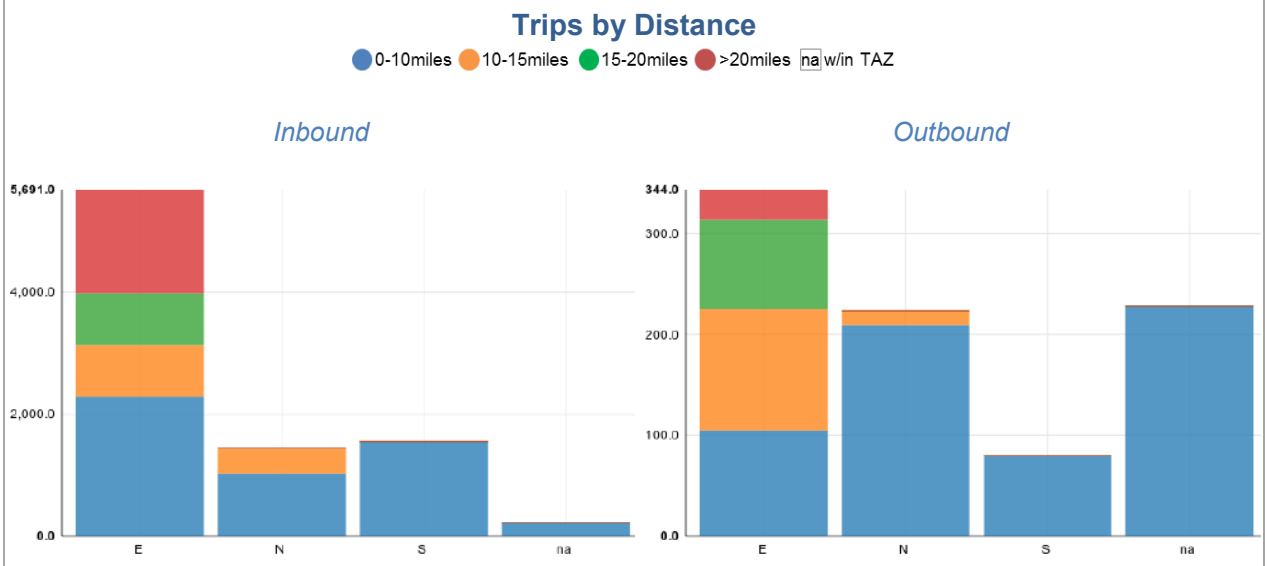


## A.9 Farmingdale

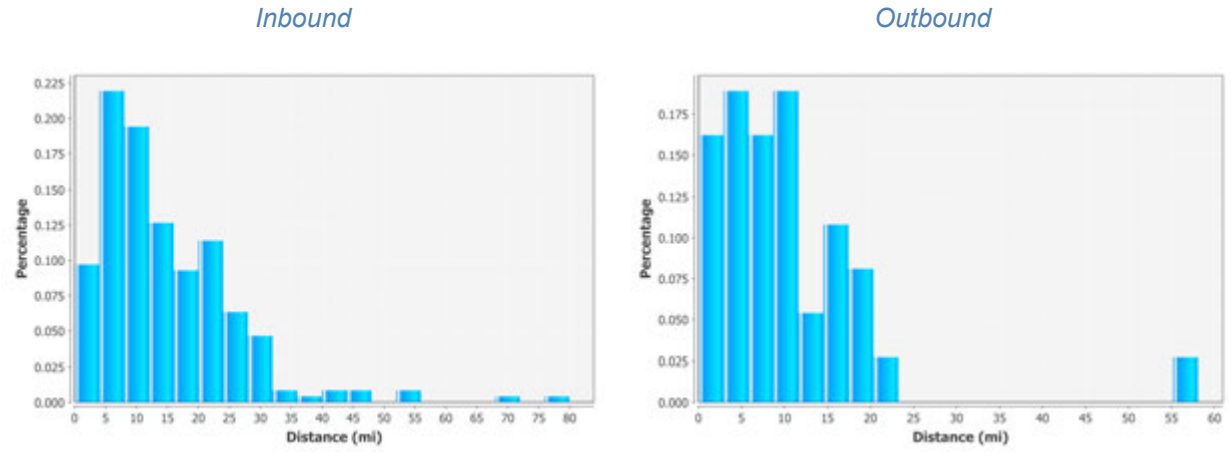


## Trips by Distance

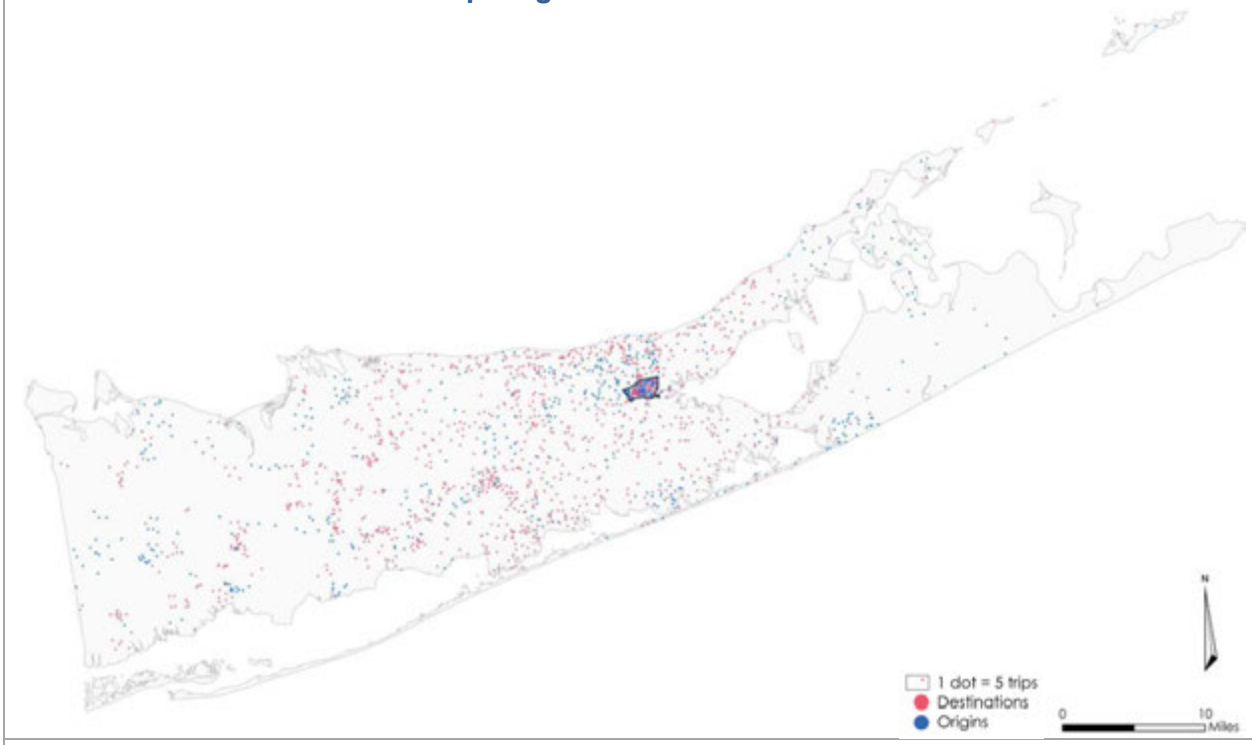



## Trip Length Distribution

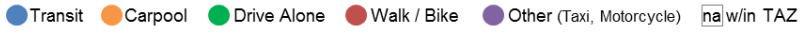


## A.10 Riverhead

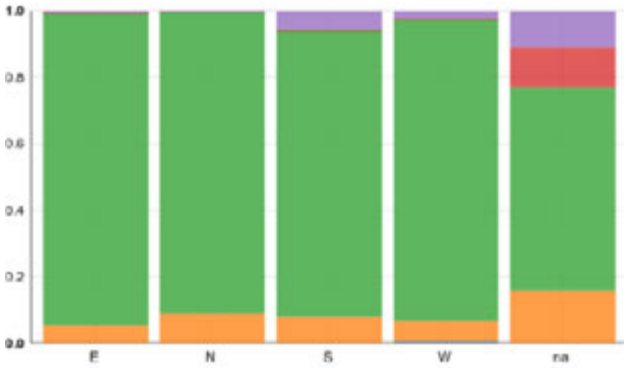
### Trip Origins and Destinations



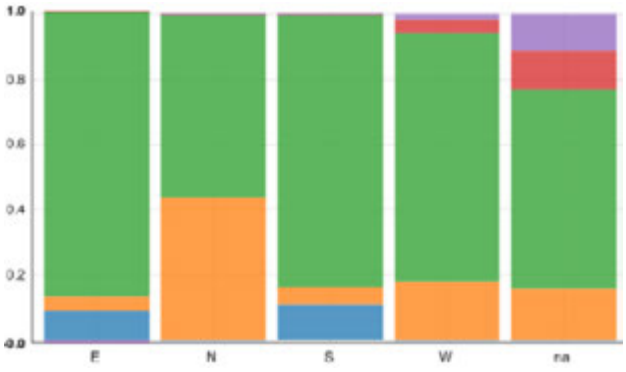

### Mode Share



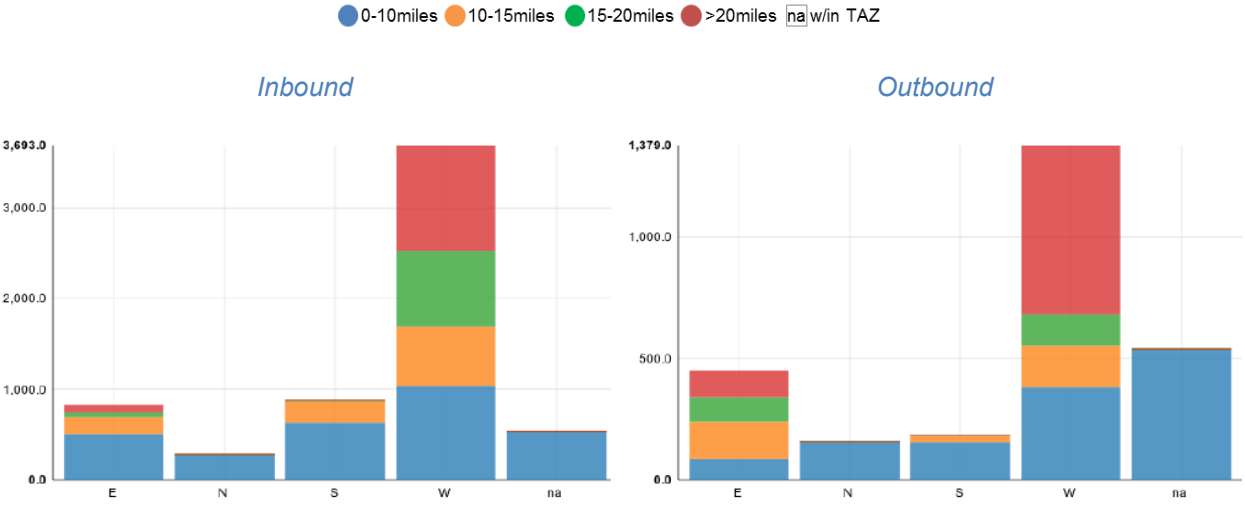

*Inbound*



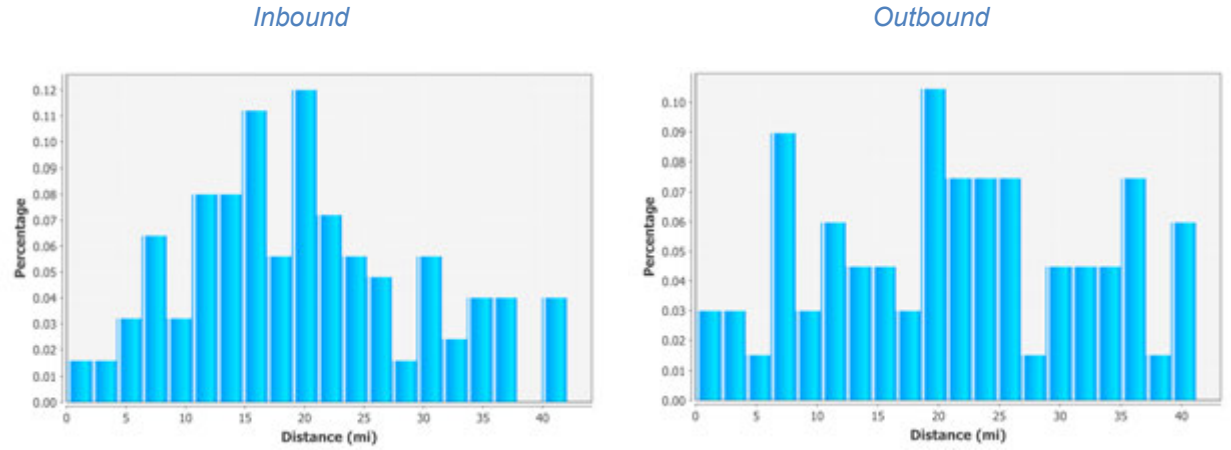

*Outbound*



## Trips by Distance

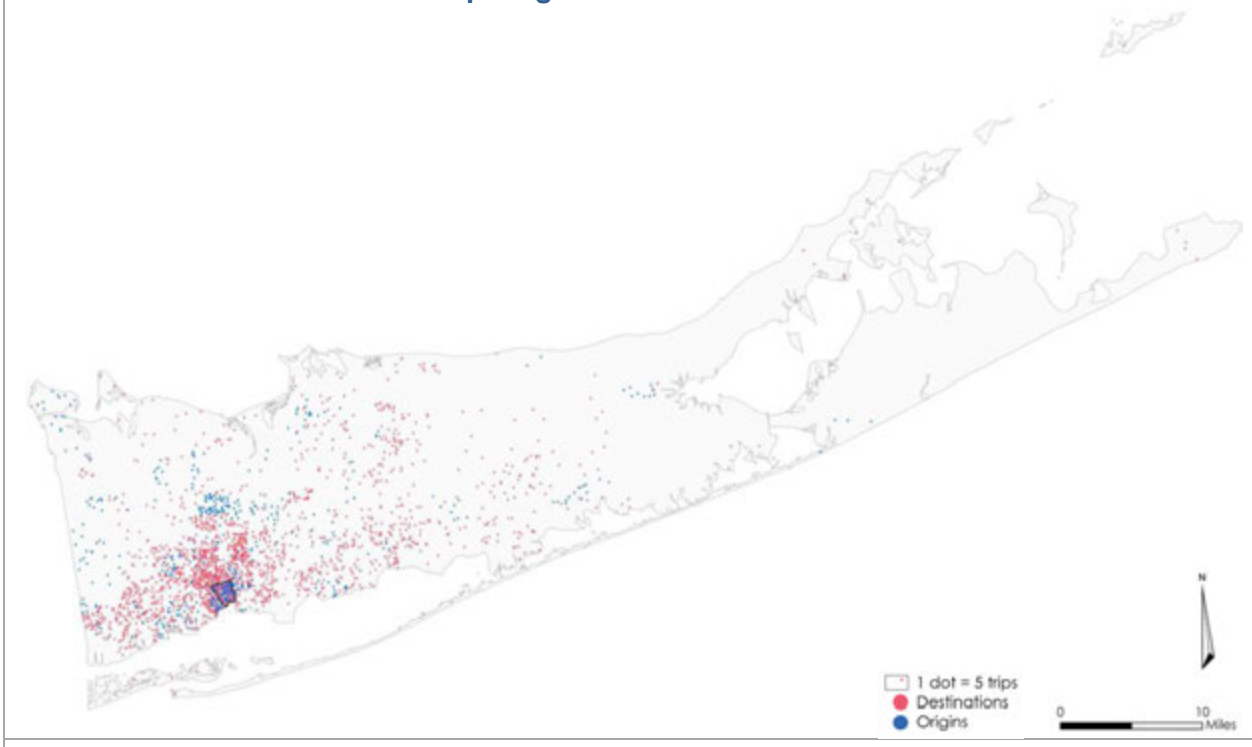



## Trip Length Distribution

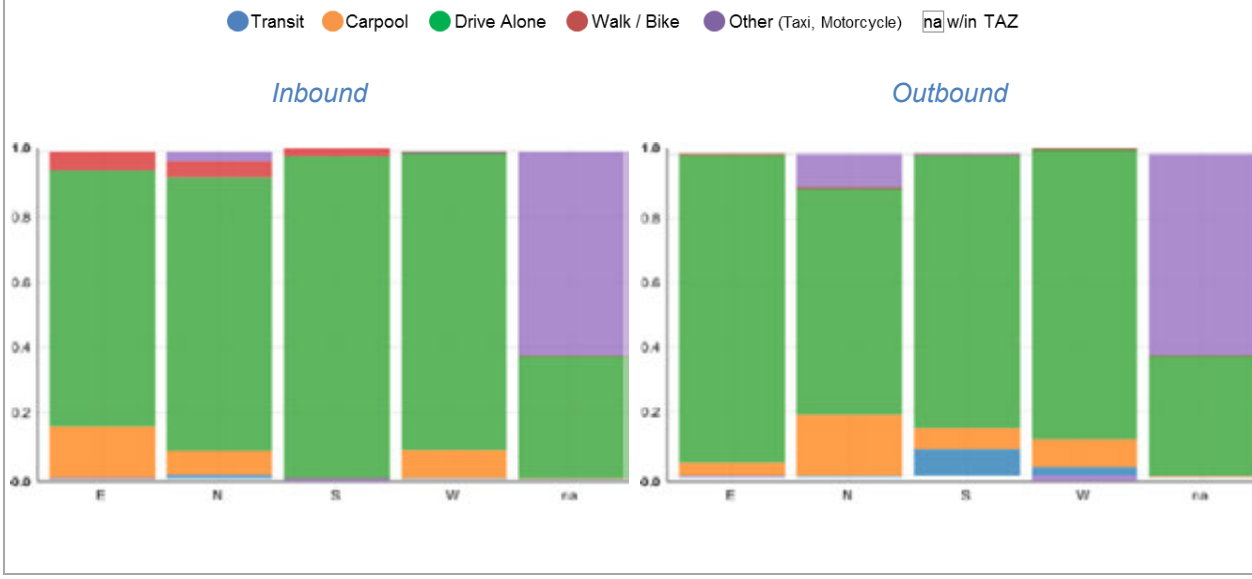


## A.11 Suffolk County Community College

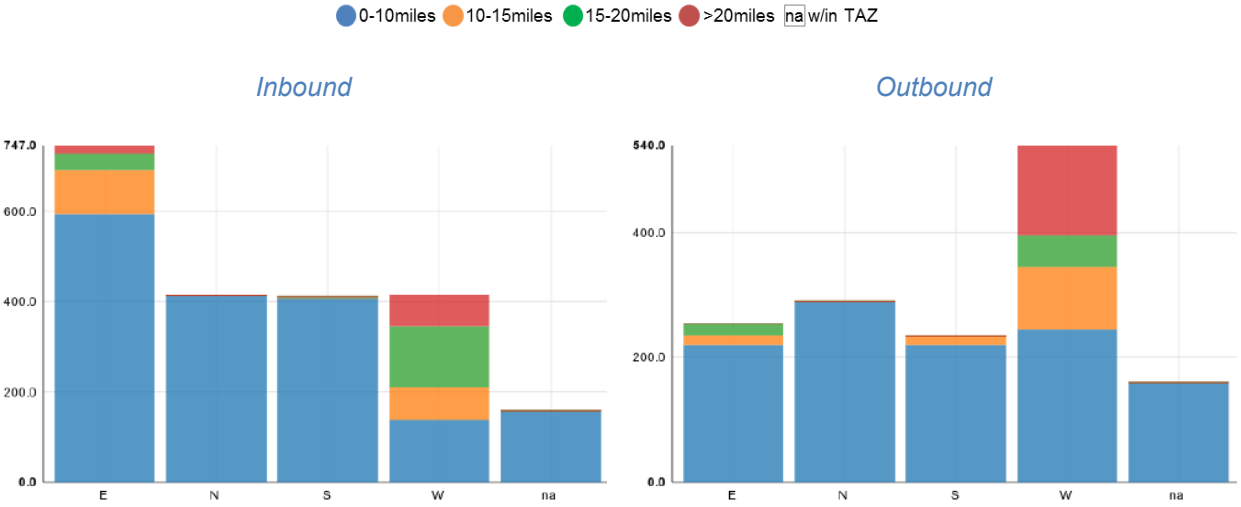
### Trip Origins and Destinations



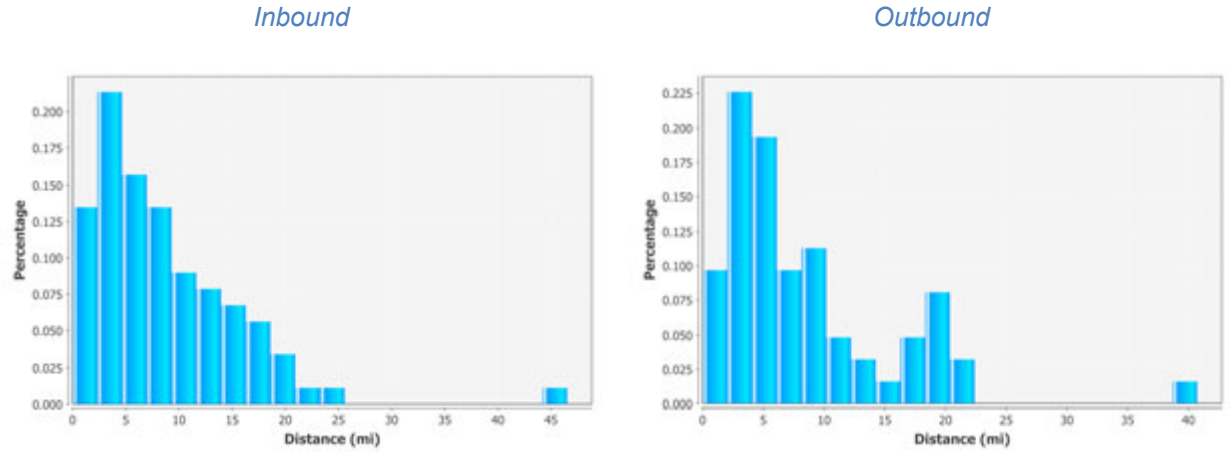

### Mode Share



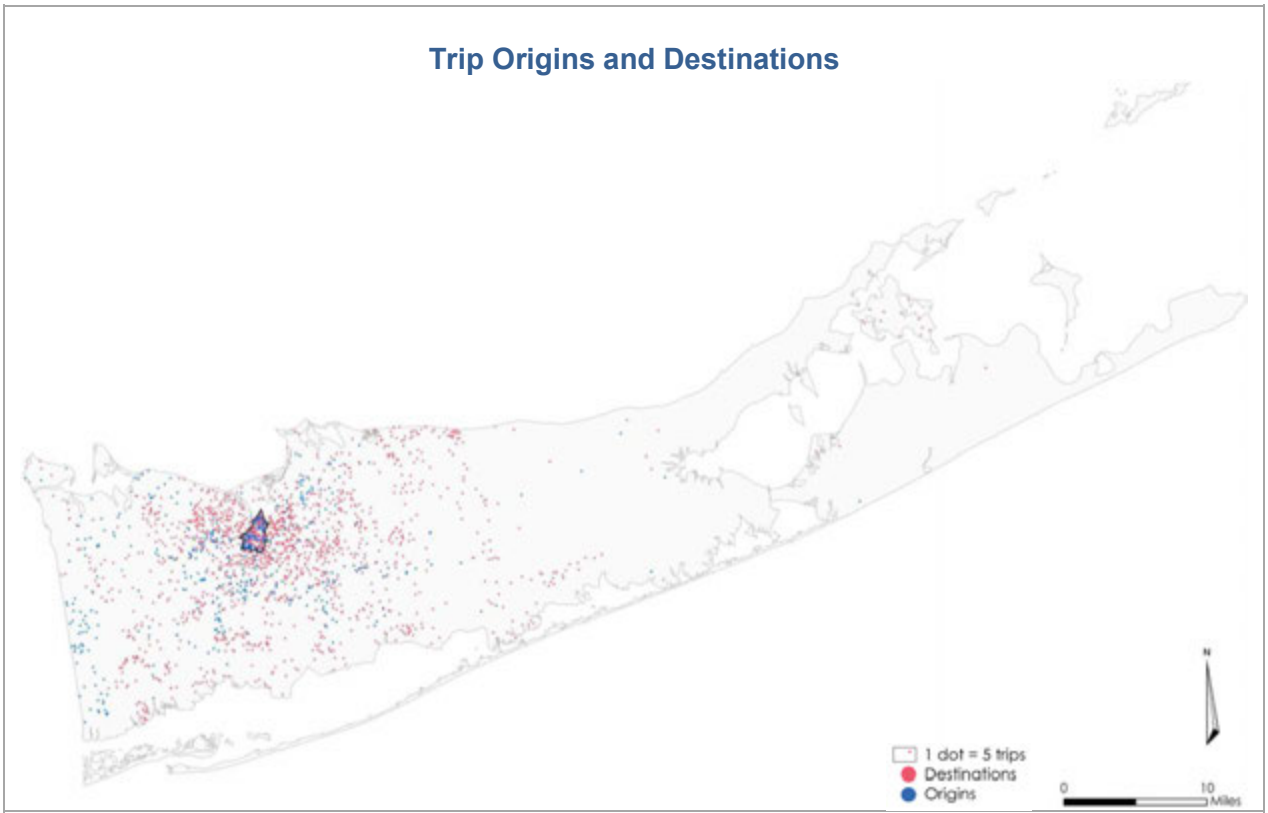
## Trips by Distance

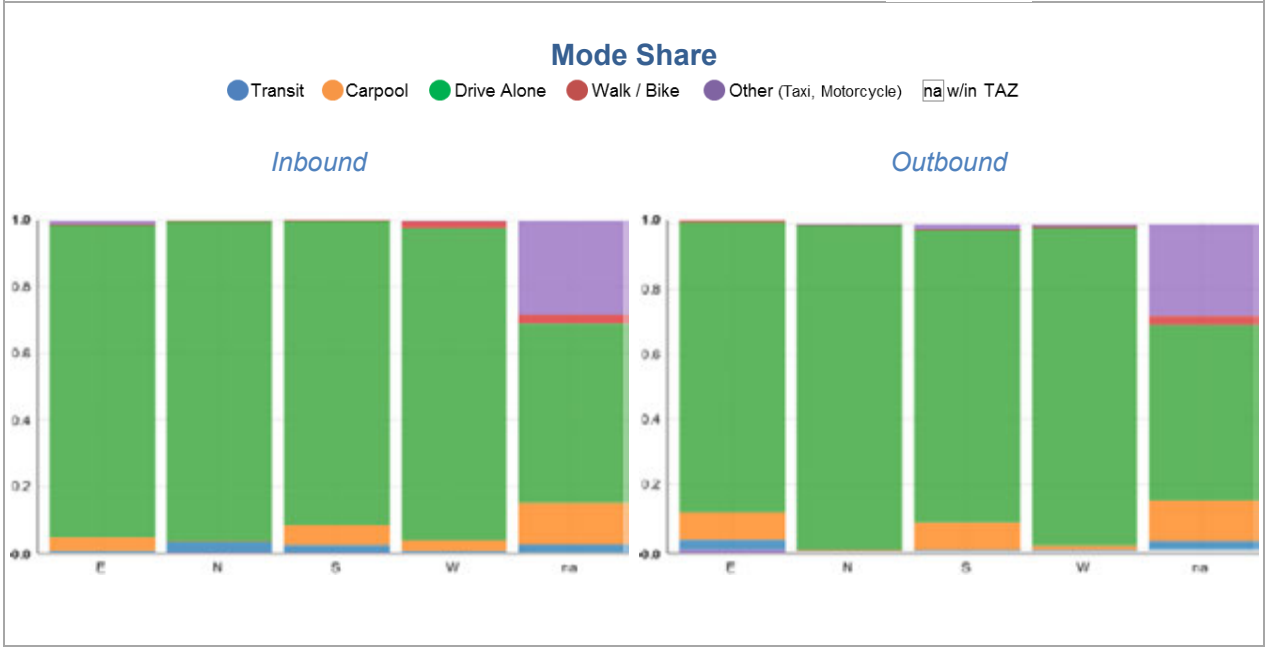



## Trip Length Distribution

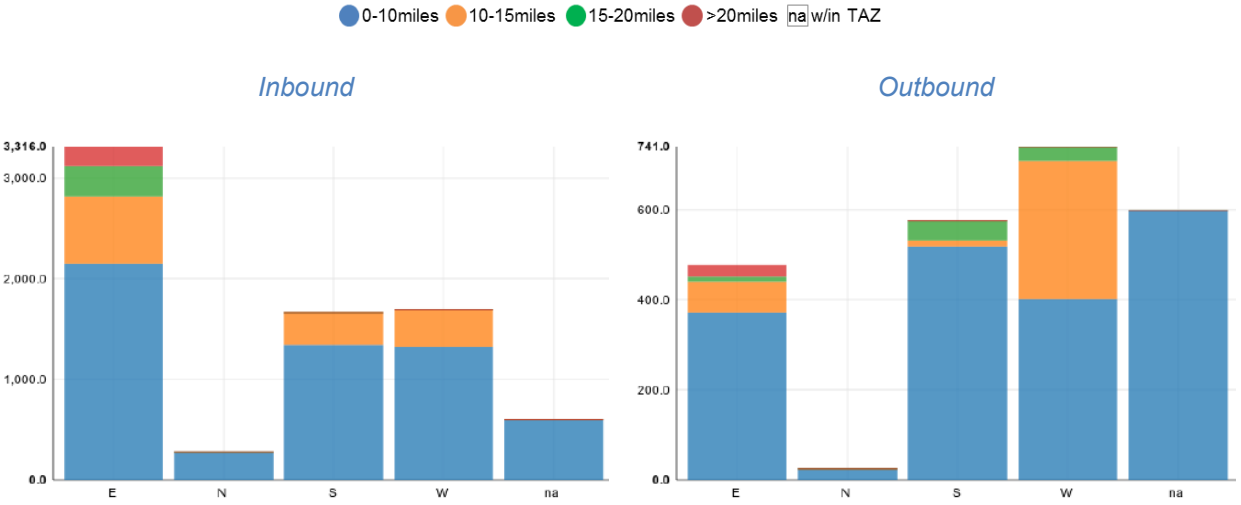


## A.12 Smithtown

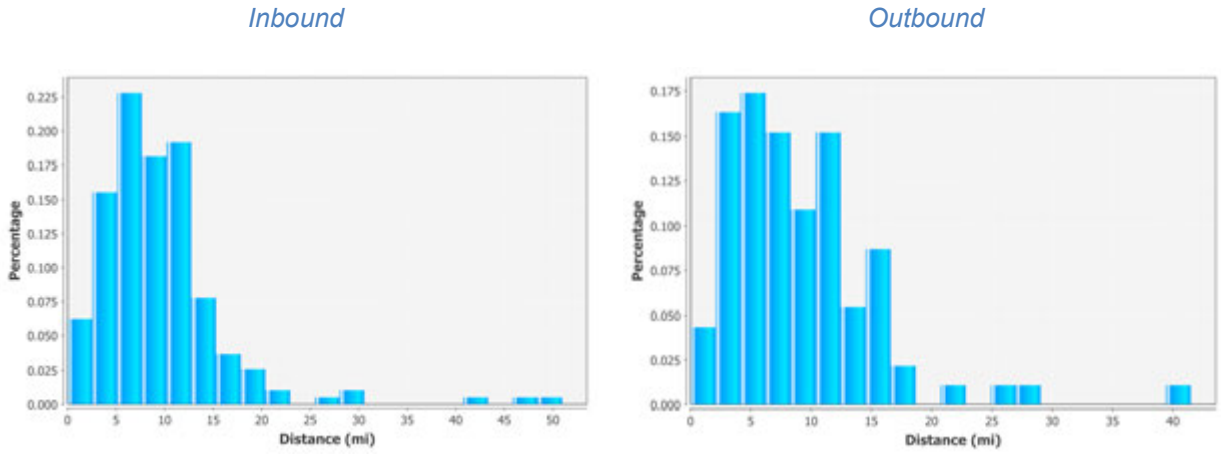


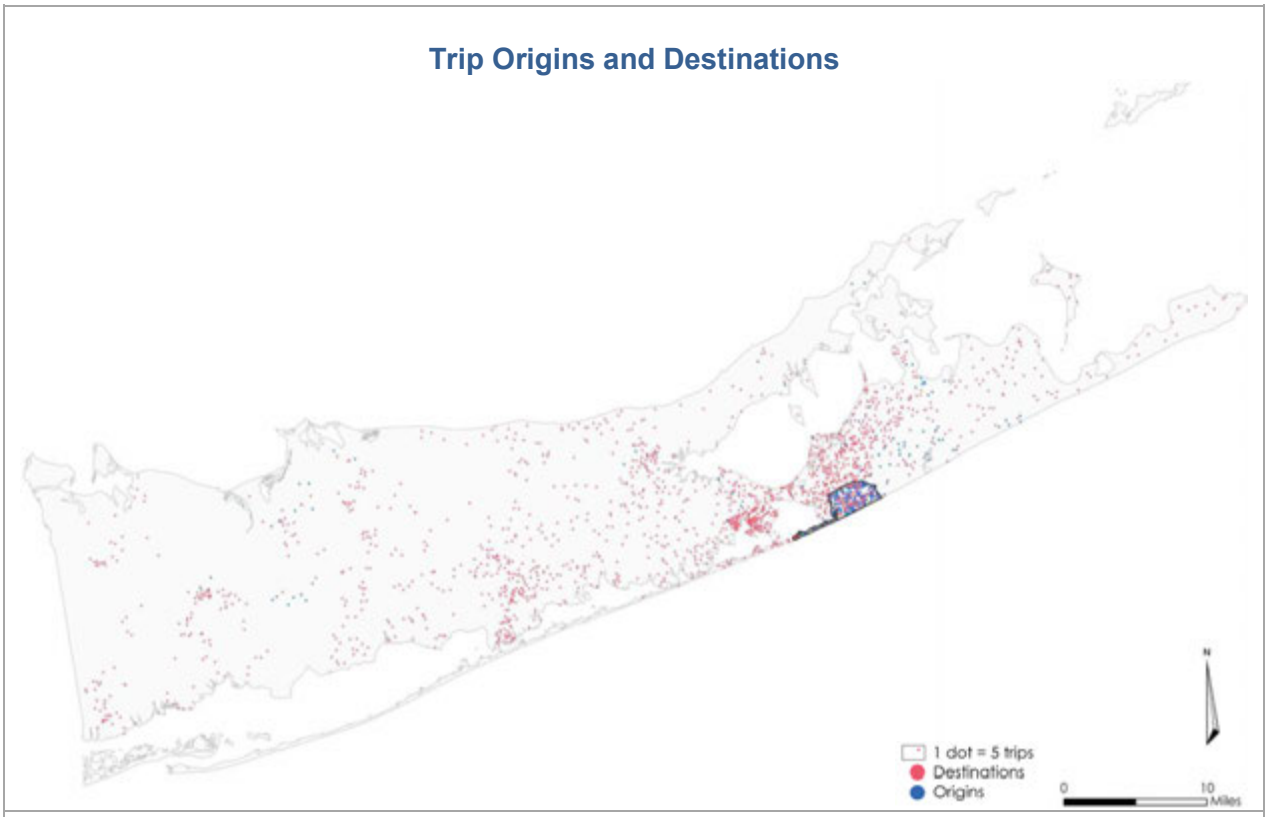
## Trips by Distance

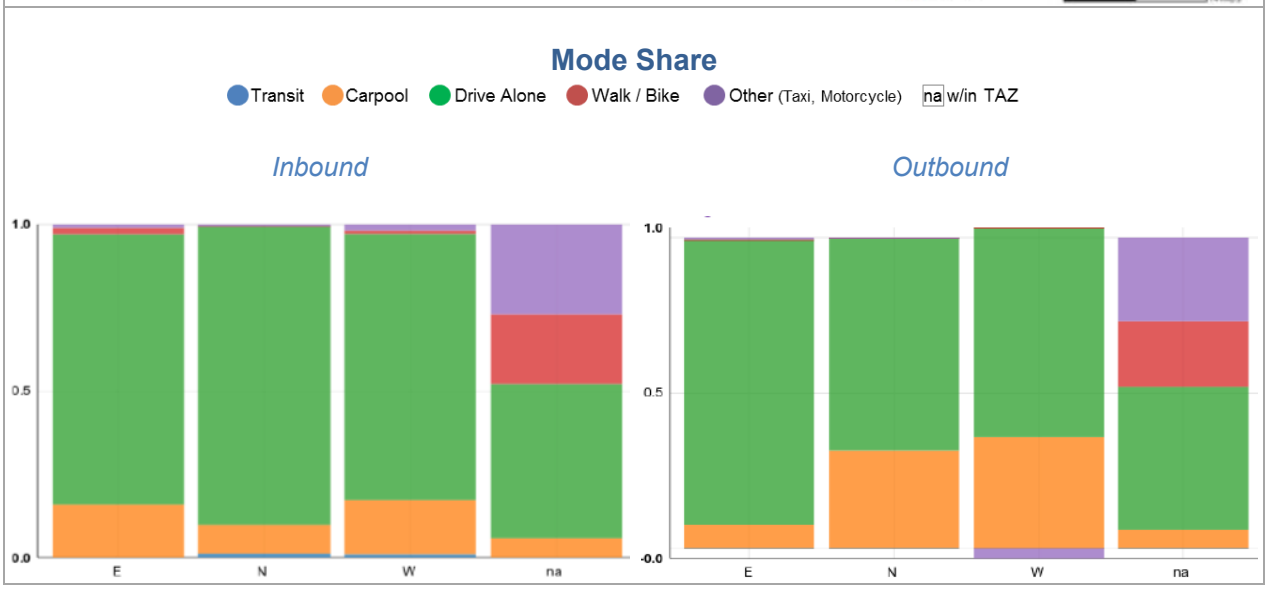



## Trip Length Distribution

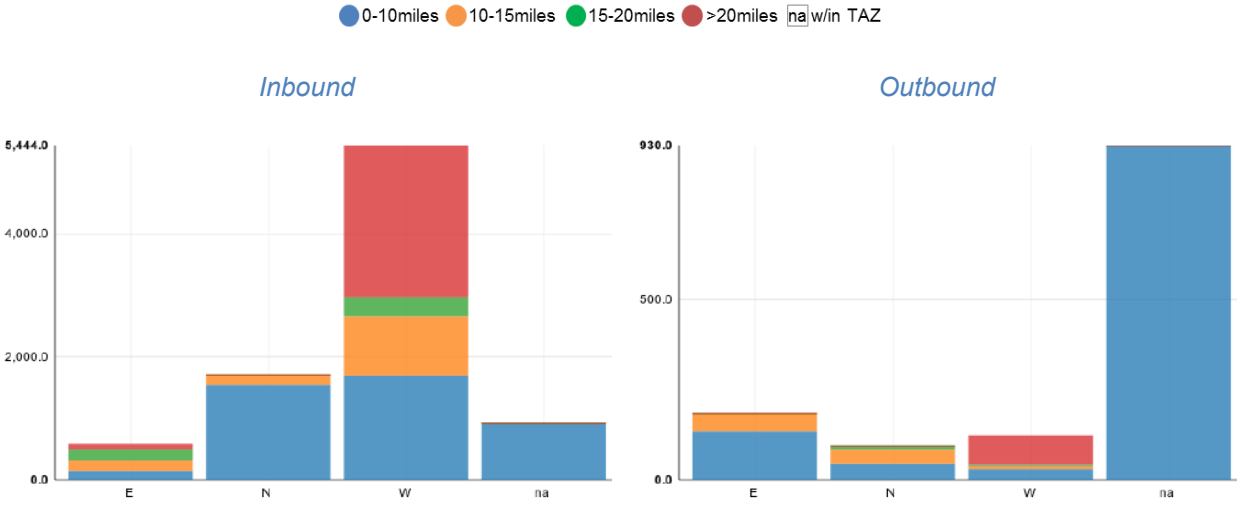


## A.13 Southampton

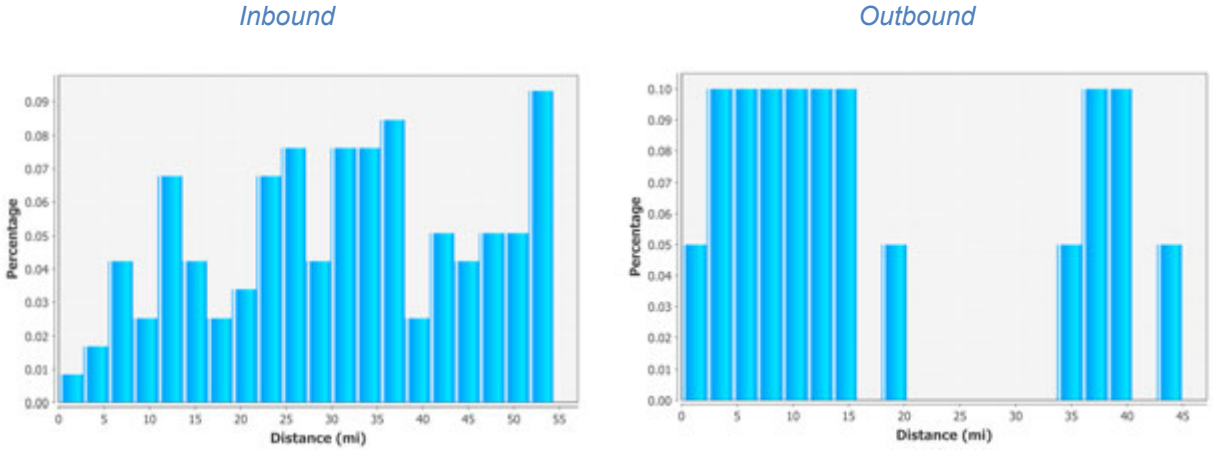


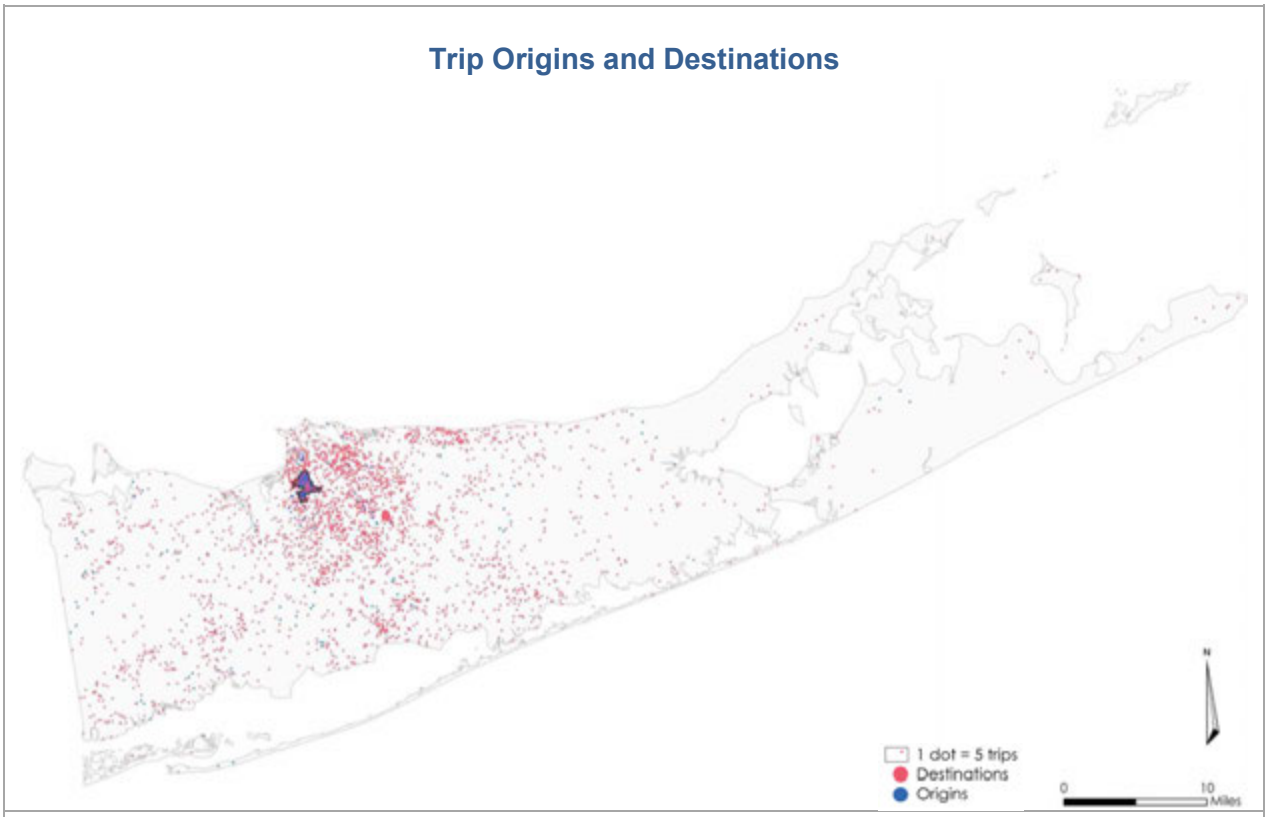
## Trips by Distance

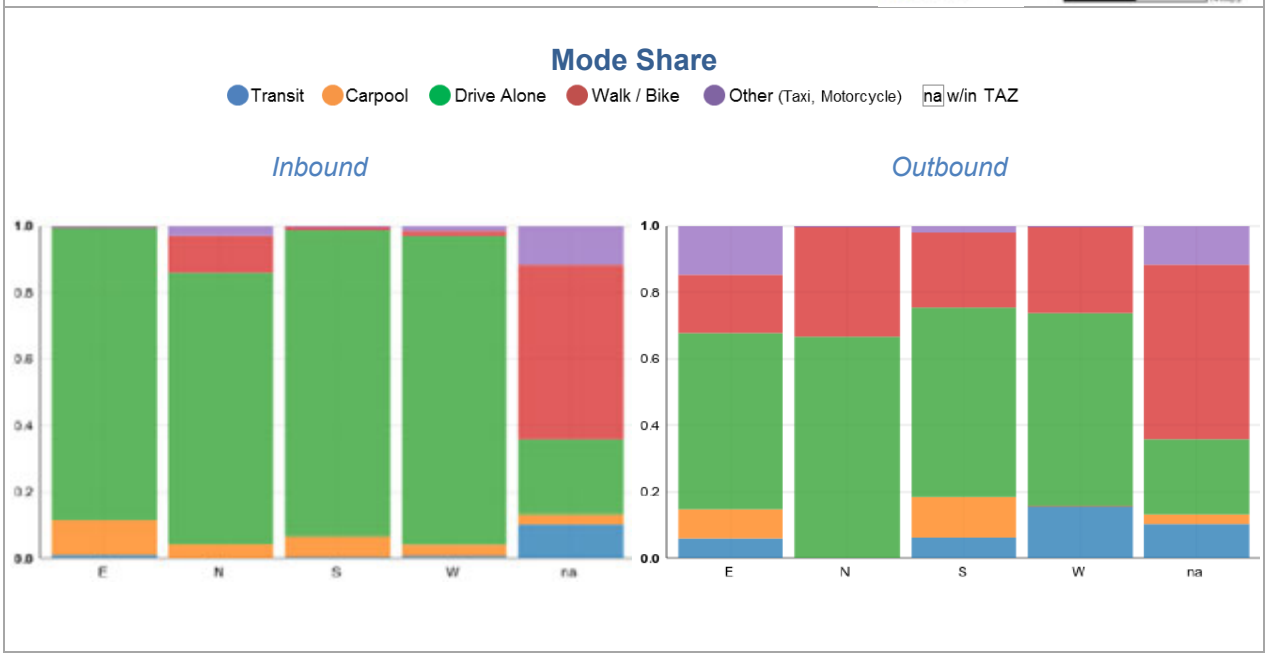



## Trip Length Distribution

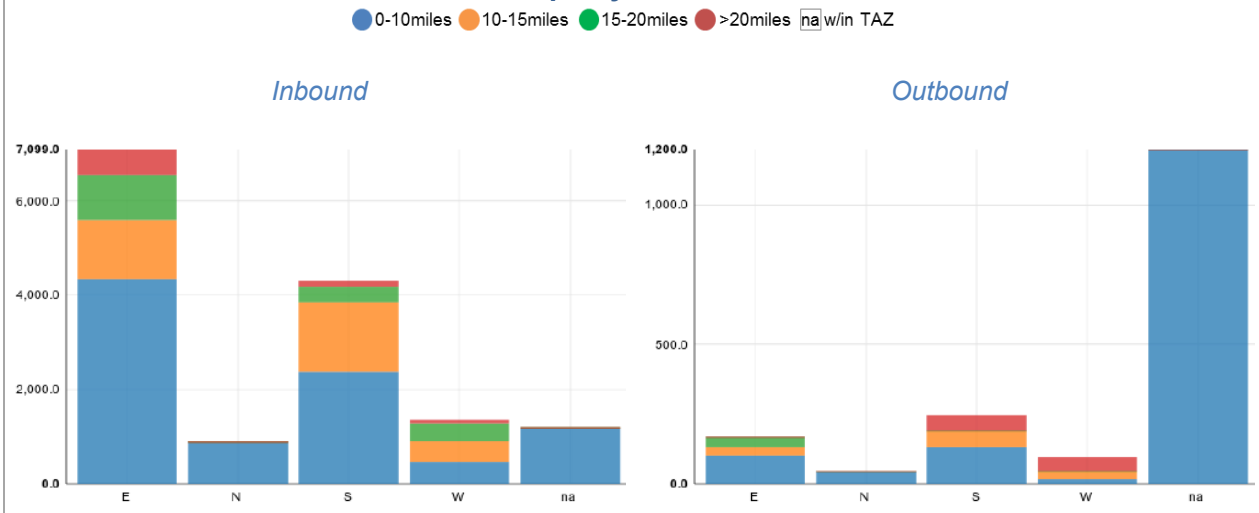


## A.14 Stony Brook

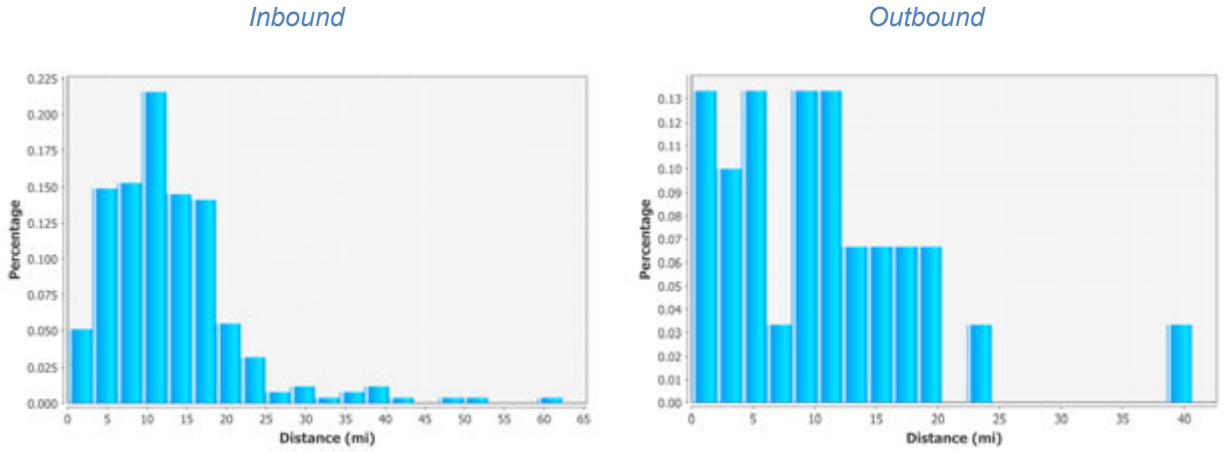


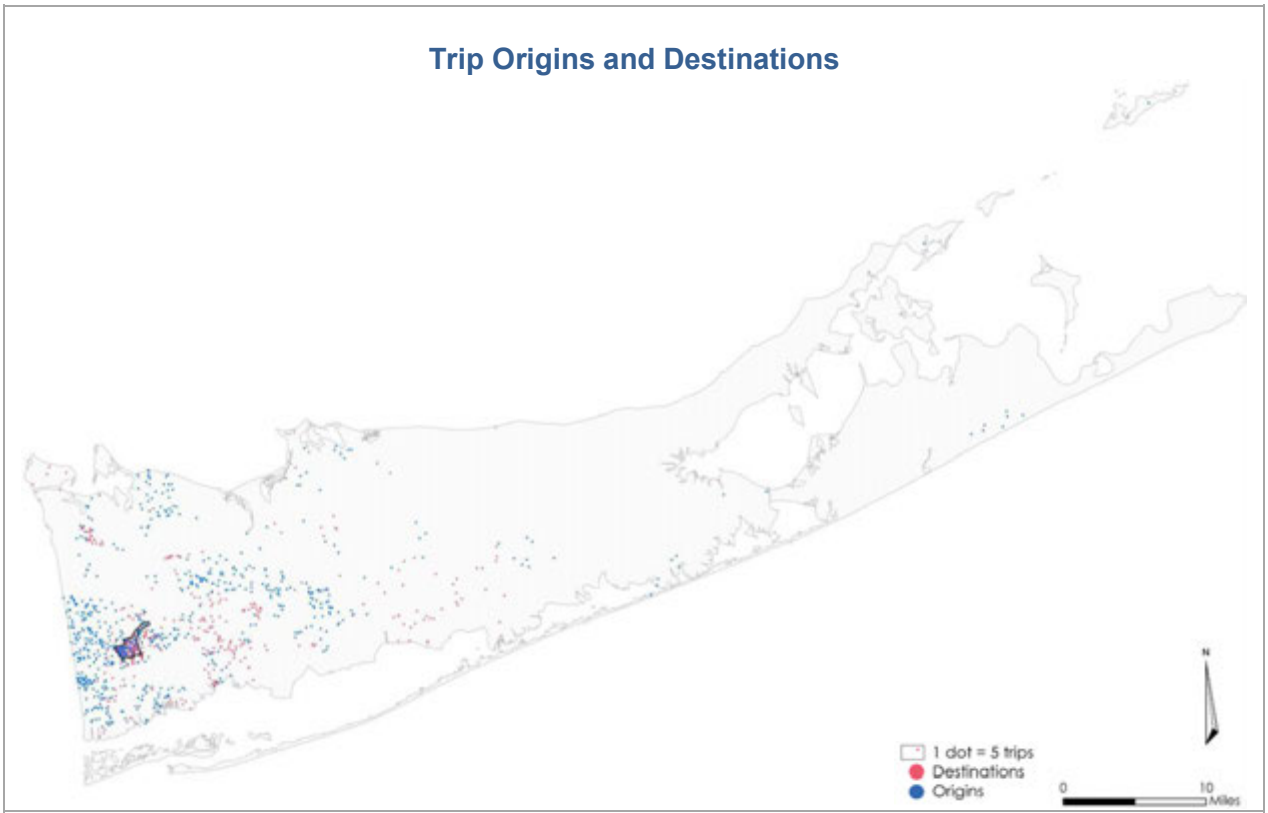
## Trips by Distance

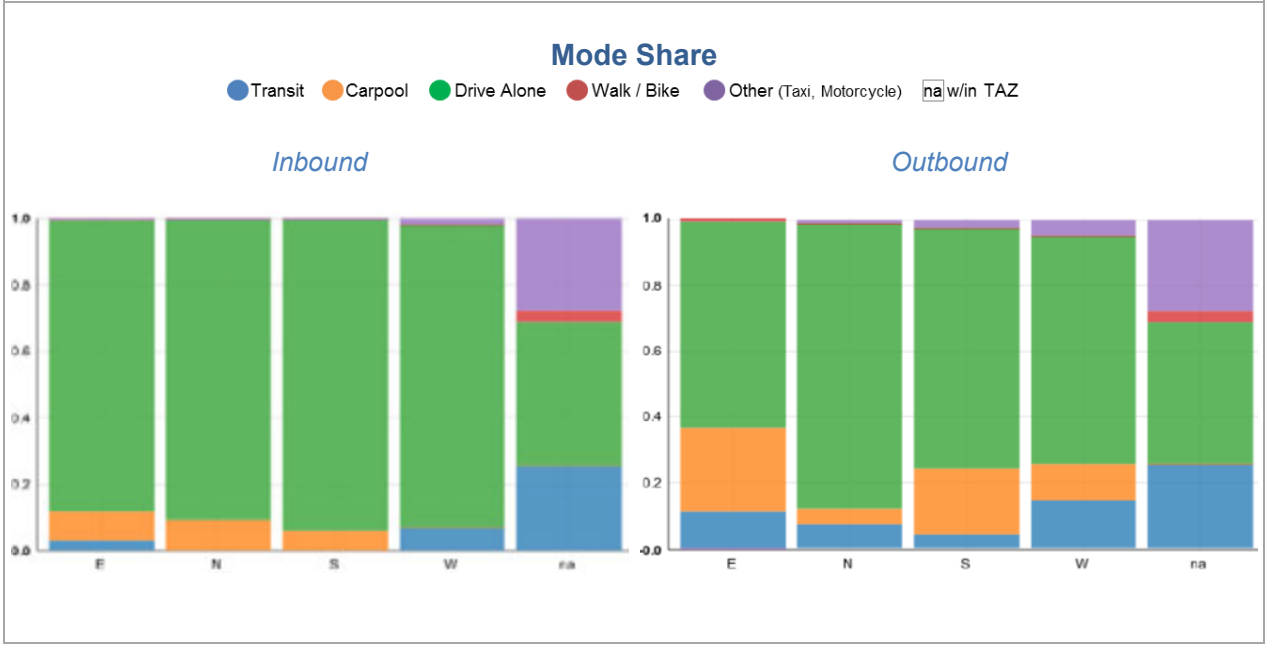



## Trip Length Distances

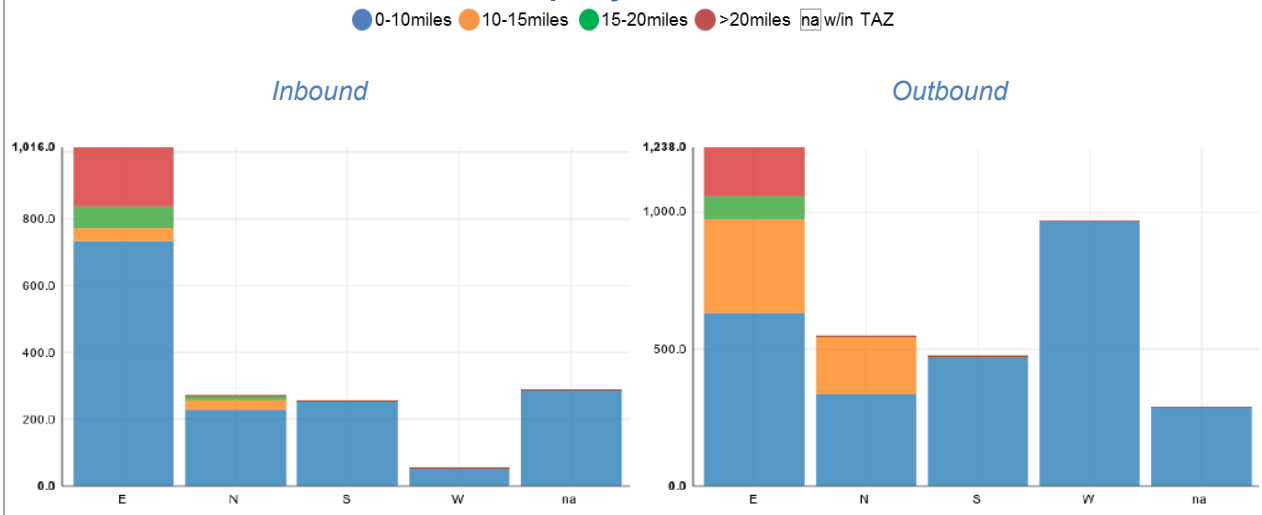


## A.15 Wyandanch

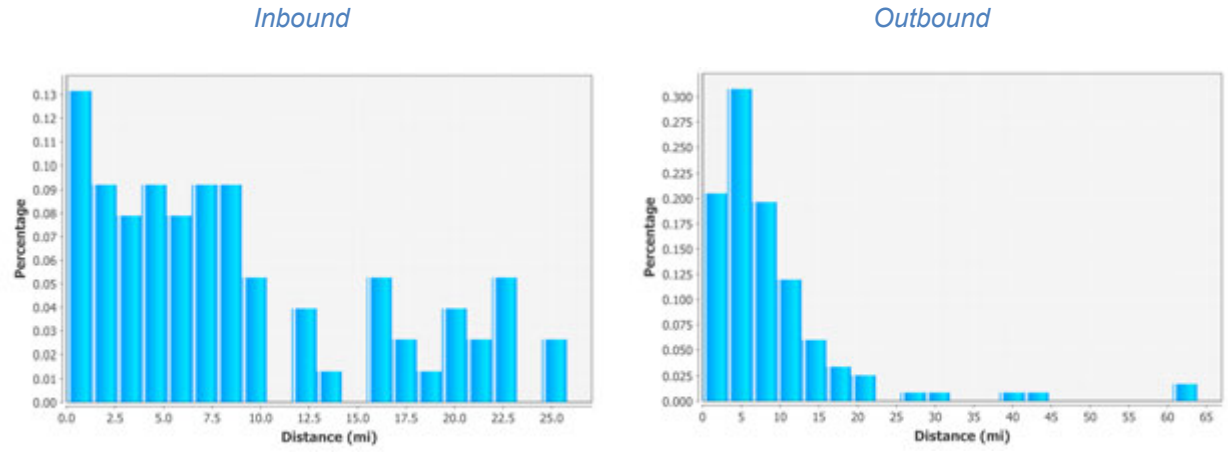


## Trips by Distance

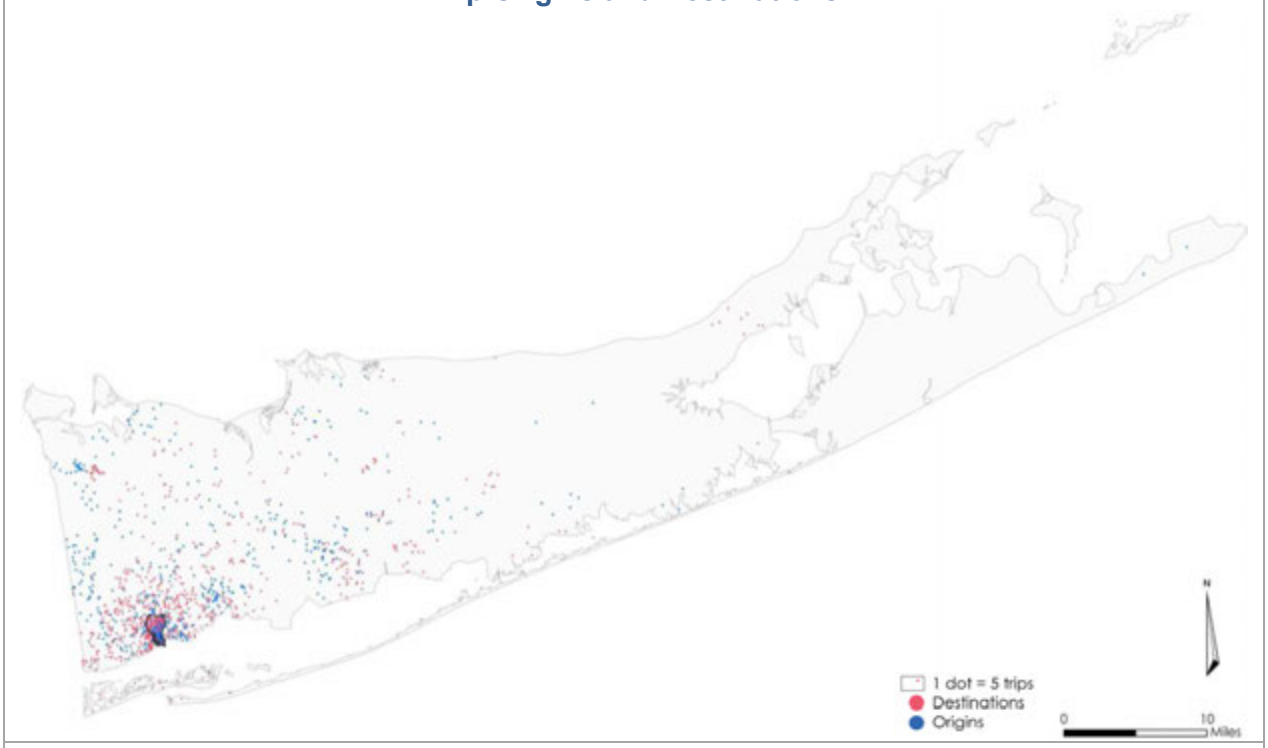



## Trip Length Distribution

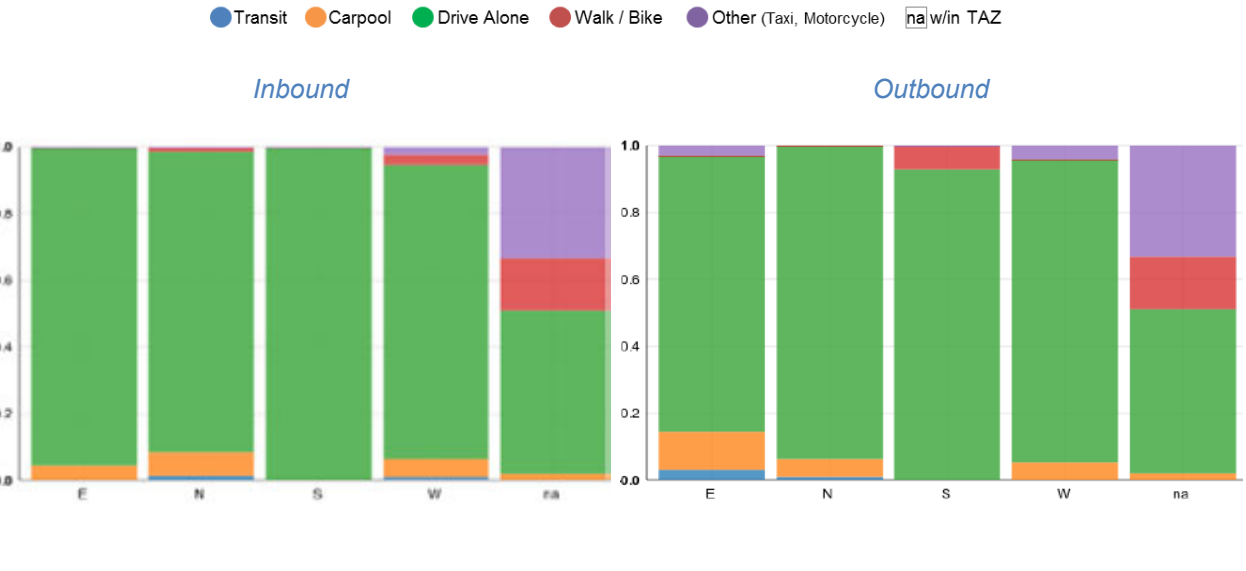


## A.16 Babylon

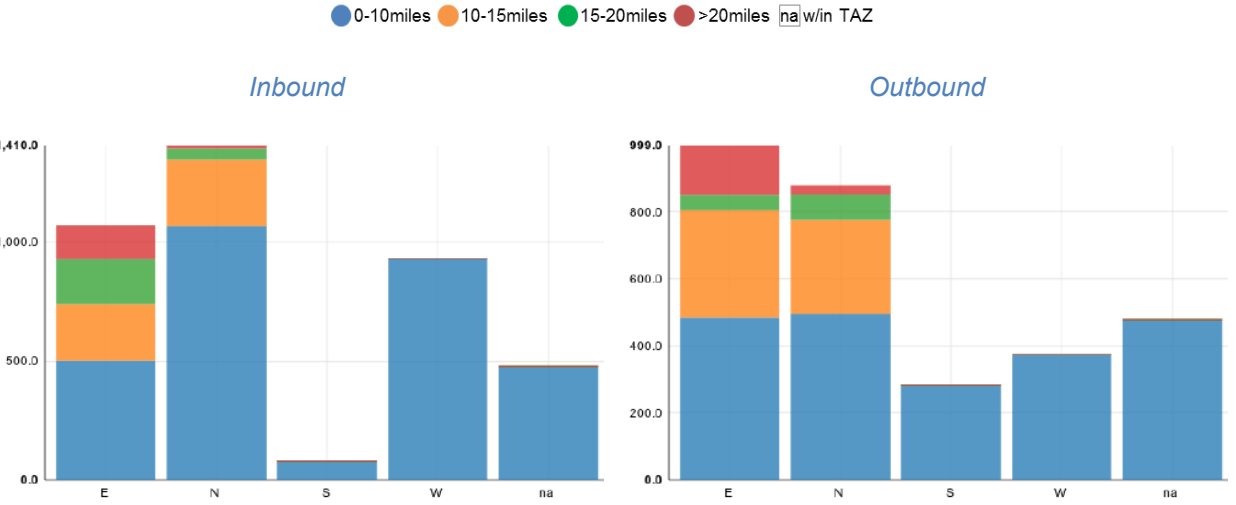
### Trip Origins and Destinations



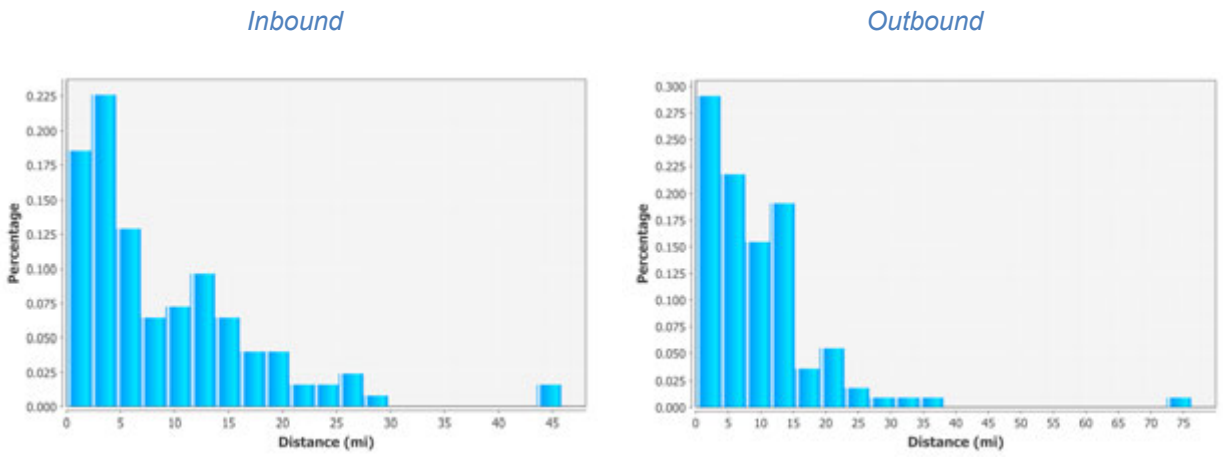

### Mode Share



## Trips by Distance

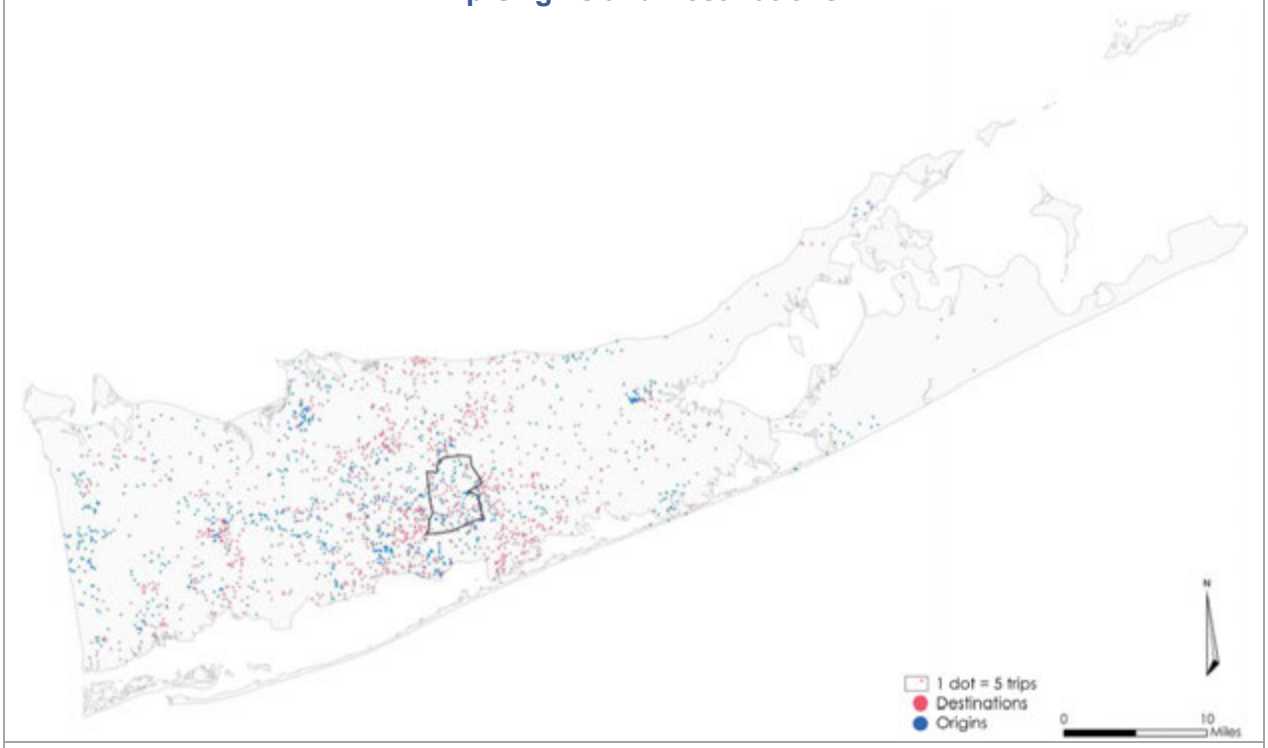



## Trip Length Distribution

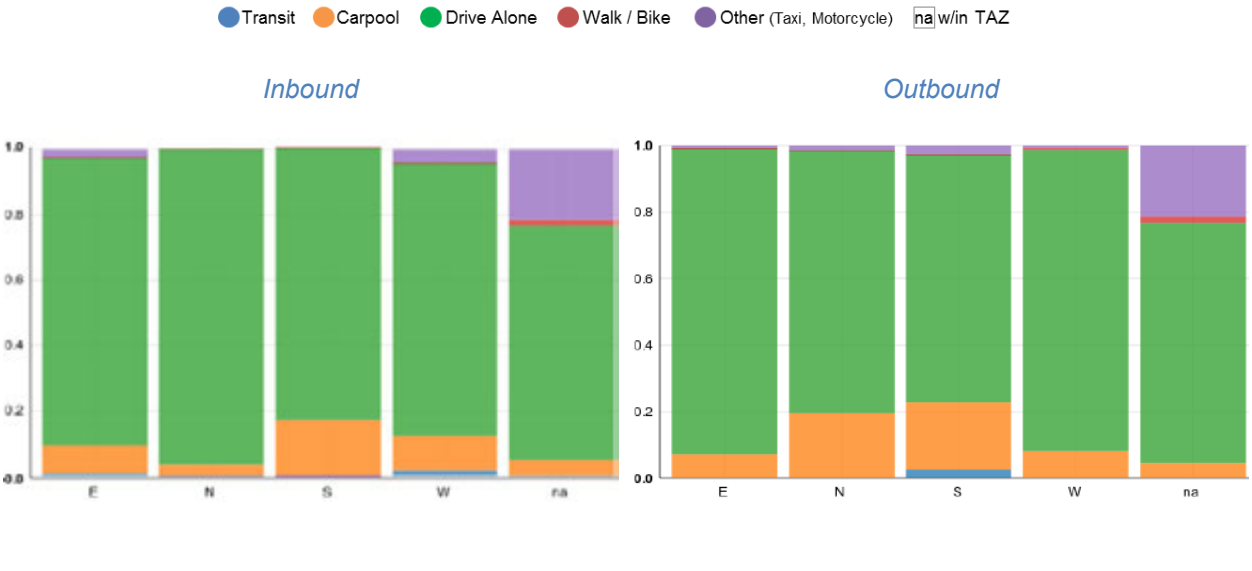


## A.17 Yaphank

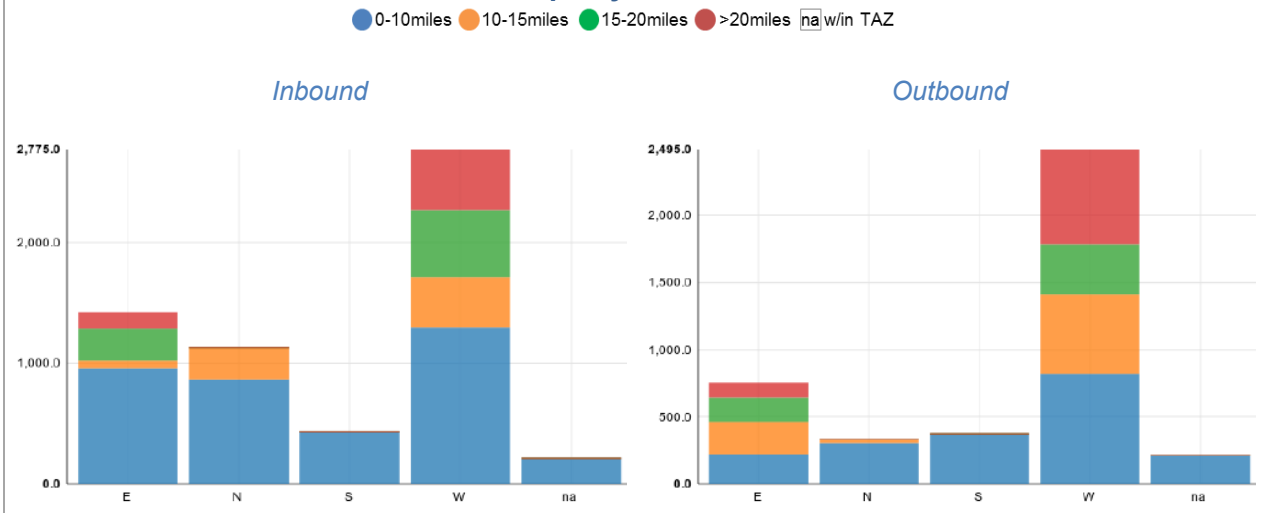
### Trip Origins and Destinations



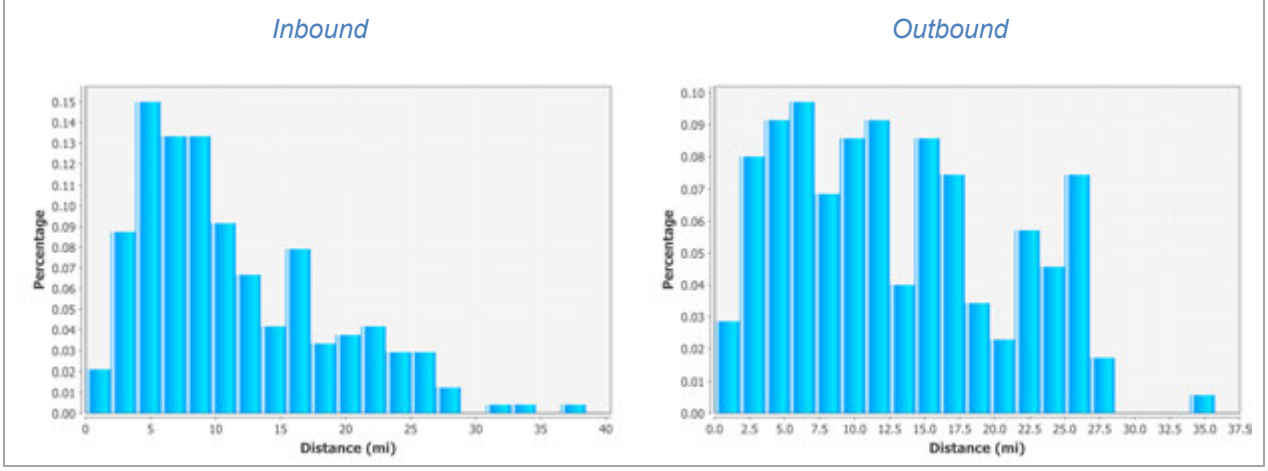

### Mode Share



## Trips by Distance




## Trip Length Distribution



## A.18 Mode Share Comparison (Number of Trips)

| TAZ Analysis Area | Inbound Number of Trips | | | | | |
|---|---|---|---|---|---|---|
| | Drove alone | Carpool | Other | Transit | Walk/ cycle | Total |
| Babylon | 3,435 | 207 | 20 | 30 | 124 | 3,816 |
| Bay Shore | 8,361 | 640 | 174 | 269 | 328 | 9,772 |
| Ronkonkoma Hub -MacArthur Airport | 25,298 | 2,656 | 340 | 340 | 58 | 28,692 |
| Commack | 5,914 | 504 | 95 | 30 | 75 | 6,618 |
| East Hampton | 4,016 | 852 | 15 | 90 | 55 | 5,028 |
| Hauppauge | 19,311 | 2,312 | 299 | 302 | 124 | 22,348 |
| Huntington | 8,846 | 478 | 87 | 243 | 360 | 10,014 |
| Brentwood -Central Islip | 18,877 | 1,751 | 490 | 265 | 423 | 21,806 |
| Patchogue | 5,530 | 309 | 34 | 150 | 225 | 6,248 |
| Farmingdale | 7,663 | 850 | 44 | 220 | 84 | 8,861 |
| Riverhead | 5,493 | 454 | 155 | 15 | 65 | 6,182 |
| SC Community College | 1,785 | 184 | 20 | 4 | 70 | 2,063 |
| Smithtown | 6,840 | 353 | 45 | 110 | 50 | 7,398 |
| Southampton | 6,779 | 1,173 | 100 | 88 | 254 | 8,394 |
| Stony Brook | 12,467 | 1,133 | 49 | 230 | 834 | 14,713 |
| Wyandanch | 1,553 | 130 | 15 | 109 | 14 | 1,821 |
| Yaphank | 5,203 | 536 | 135 | 55 | 4 | 5,933 |

| TAZ Analysis Area | Outbound Number of Trips | | | | | |
|---|---|---|---|---|---|---|
| | Drove alone | Carpool | Other | Transit | Walk/ cycle | Total |
| Babylon | 2,489 | 190 | 40 | 40 | 95 | 2,854 |
| Bay Shore | 2,277 | 114 | 95 | 230 | 120 | 2,836 |
| Ronkonkoma Hub -MacArthur Airport | 3,798 | 345 | 100 | 35 | 50 | 4,328 |
| Commack | 1,262 | 35 | 0 | 0 | 45 | 1,342 |
| East Hampton | 259 | 56 | 0 | 0 | 35 | 350 |
| Hauppauge | 2,638 | 264 | 0 | 0 | 25 | 2,927 |
| Huntington | 3,958 | 116 | 4 | 104 | 165 | 4,347 |
| Brentwood -Central Islip | 17,609 | 3,608 | 1,205 | 539 | 488 | 23,449 |
| Patchogue | 2,450 | 145 | 0 | 0 | 85 | 2,680 |
| Farmingdale | 692 | 40 | 0 | 0 | 109 | 841 |
| Riverhead | 2,028 | 430 | 15 | 60 | 120 | 2,653 |
| SC Community College | 1,200 | 125 | 35 | 35 | 0 | 1,395 |
| Smithtown | 2,027 | 169 | 4 | 29 | 19 | 2,248 |
| Southampton | 748 | 142 | 0 | 0 | 195 | 1,085 |
| Stony Brook | 585 | 80 | 30 | 165 | 755 | 1,615 |
| Wyandanch | 2,402 | 544 | 50 | 413 | 25 | 3,434 |
| Yaphank | 3,654 | 410 | 20 | 10 | 19 | 4,113 |

## A.19 Mode Share Comparison (Percentage of Trips)

| TAZ Analysis Area | Inbound Percentage of Trips | | | | |
|---|---|---|---|---|---|
| | Drove alone | Carpool | Other | Transit | Walk/ cycle |
| Babylon | 90.0% | 5.4% | 0.5% | 0.8% | 3.2% |
| Bay Shore | 85.6% | 6.5% | 1.8% | 2.8% | 3.4% |
| Ronkonkoma Hub -MacArthur Airport | 88.2% | 9.3% | 1.2% | 1.2% | 0.2% |
| Commack | 89.4% | 7.6% | 1.4% | 0.5% | 1.1% |
| East Hampton | 79.9% | 16.9% | 0.3% | 1.8% | 1.1% |
| Hauppauge | 86.4% | 10.3% | 1.3% | 1.4% | 0.6% |
| Huntington | 88.3% | 4.8% | 0.9% | 2.4% | 3.6% |
| Brentwood -Central Islip | 86.6% | 8.0% | 2.2% | 1.2% | 1.9% |
| Patchogue | 88.5% | 4.9% | 0.5% | 2.4% | 3.6% |
| Farmingdale | 86.5% | 9.6% | 0.5% | 2.5% | 0.9% |
| Riverhead | 88.9% | 7.3% | 2.5% | 0.2% | 1.1% |
| SC Community College | 86.5% | 8.9% | 1.0% | 0.2% | 3.4% |
| Smithtown | 92.5% | 4.8% | 0.6% | 1.5% | 0.7% |
| Southampton | 80.8% | 14.0% | 1.2% | 1.0% | 3.0% |
| Stony Brook | 84.7% | 7.7% | 0.3% | 1.6% | 5.7% |
| Wyandanch | 85.3% | 7.1% | 0.8% | 6.0% | 0.8% |
| Yaphank | 87.7% | 9.0% | 2.3% | 0.9% | 0.1% |

| TAZ Analysis Area | Outbound Percentage of Trips | | | | |
|---|---|---|---|---|---|
| | Drove alone | Carpool | Other | Transit | Walk/ cycle |
| Babylon | 87.2% | 6.7% | 1.4% | 1.4% | 3.3% |
| Bay Shore | 80.3% | 4.0% | 3.3% | 8.1% | 4.2% |
| Ronkonkoma Hub -MacArthur Airport | 87.8% | 8.0% | 2.3% | 0.8% | 1.2% |
| Commack | 94.0% | 2.6% | 0.0% | 0.0% | 3.4% |
| East Hampton | 74.0% | 16.0% | 0.0% | 0.0% | 10.0% |
| Hauppauge | 90.1% | 9.0% | 0.0% | 0.0% | 0.9% |
| Huntington | 91.1% | 2.7% | 0.1% | 2.4% | 3.8% |
| Brentwood -Central Islip | 75.1% | 15.4% | 5.1% | 2.3% | 2.1% |
| Patchogue | 91.4% | 5.4% | 0.0% | 0.0% | 3.2% |
| Farmingdale | 82.3% | 4.8% | 0.0% | 0.0% | 13.0% |
| Riverhead | 76.4% | 16.2% | 0.6% | 2.3% | 4.5% |
| SC Community College | 86.0% | 9.0% | 2.5% | 2.5% | 0.0% |
| Smithtown | 90.2% | 7.5% | 0.2% | 1.3% | 0.8% |
| Southampton | 68.9% | 13.1% | 0.0% | 0.0% | 18.0% |
| Stony Brook | 36.2% | 5.0% | 1.9% | 10.2% | 46.7% |
| Wyandanch | 69.9% | 15.8% | 1.5% | 12.0% | 0.7% |
| Yaphank | 88.8% | 10.0% | 0.5% | 0.2% | 0.5% |

## A.20 Trip Distance Comparison (Number of Trips)

| TAZ Analysis Area | Inbound Number of Trips | | | |
|---|---|---|---|---|
| | 0-10 miles | 10-15 miles | 15-20 miles | > 20 miles |
| Babylon | 3,066 | 520 | 234 | 234 |
| Bay Shore | 7,642 | 1,125 | 599 | 599 |
| Ronkonkoma Hub -MacArthur Airport | 19,415 | 6,305 | 2,302 | 2,302 |
| Commack | 4,803 | 1,164 | 415 | 415 |
| East Hampton | 3,275 | 310 | 239 | 239 |
| Hauppauge | 15,797 | 4,227 | 1,118 | 1,118 |
| Huntington | 7,402 | 1,634 | 548 | 548 |
| Brentwood -Central Islip | 16,817 | 3,375 | 1,110 | 1,110 |
| Patchogue | 4,823 | 921 | 306 | 306 |
| Farmingdale | 5,091 | 1,279 | 844 | 844 |
| Riverhead | 3,000 | 1,080 | 890 | 890 |
| SC Community College | 1,716 | 172 | 173 | 173 |
| Smithtown | 5,700 | 1,357 | 305 | 305 |
| Southampton | 4,320 | 1,285 | 514 | 514 |
| Stony Brook | 9,279 | 3,160 | 1,640 | 1,640 |
| Wyandanch | 1,561 | 69 | 78 | 78 |
| Yaphank | 3,761 | 757 | 818 | 818 |

| TAZ Analysis Area | Outbound Number of Trips | | | |
|---|---|---|---|---|
| | 0-10 miles | 10-15 miles | 15-20 miles | > 20 miles |
| Babylon | 2,119 | 600 | 120 | 180 |
| Bay Shore | 2,382 | 290 | 130 | 135 |
| Ronkonkoma Hub -MacArthur Airport | 3,393 | 416 | 403 | 174 |
| Commack | 1,242 | 130 | 15 | 40 |
| East Hampton | 315 | 19 | 4 | 50 |
| Hauppauge | 2,402 | 597 | 60 | 54 |
| Huntington | 3,776 | 472 | 382 | 237 |
| Brentwood -Central Islip | 18,855 | 3914 | 428 | 802 |
| Patchogue | 1,780 | 525 | 140 | 260 |
| Farmingdale | 623 | 135 | 89 | 30 |
| Riverhead | 1,319 | 360 | 225 | 809 |
| SC Community College | 1,135 | 145 | 130 | 70 |
| Smithtown | 1,916 | 391 | 86 | 27 |
| Southampton | 1,139 | 100 | 14 | 80 |
| Stony Brook | 1,490 | 120 | 105 | 40 |
| Wyandanch | 2,698 | 554 | 87 | 180 |
| Yaphank | 1,937 | 863 | 557 | 818 |

## A.21 Trip Distance Comparison (Percentage of Trips)

| TAZ Analysis Area | Inbound Percentage of Trips | | | |
|---|---|---|---|---|
| | 0-10 miles | 10-15 miles | 15-20 miles | > 20 miles |
| Babylon | 77% | 13% | 6% | 4% |
| Bay Shore | 77% | 11% | 6% | 5% |
| Ronkonkoma Hub -MacArthur Airport | 68% | 22% | 8% | 3% |
| Commack | 72% | 17% | 6% | 5% |
| East Hampton | 65% | 6% | 5% | 24% |
| Hauppauge | 70% | 19% | 5% | 6% |
| Huntington | 70% | 16% | 5% | 9% |
| Brentwood -Central Islip | 75% | 15% | 5% | 5% |
| Patchogue | 77% | 15% | 5% | 4% |
| Farmingdale | 57% | 14% | 9% | 19% |
| Riverhead | 48% | 17% | 14% | 20% |
| SC Community College | 80% | 8% | 8% | 4% |
| Smithtown | 75% | 18% | 4% | 3% |
| Southampton | 50% | 15% | 6% | 29% |
| Stony Brook | 62% | 21% | 11% | 5% |
| Wyandanch | 83% | 4% | 4% | 10% |
| Yaphank | 63% | 13% | 14% | 11% |

| TAZ Analysis Area | Outbound Percentage of Trips | | | |
|---|---|---|---|---|
| | 0-10 miles | 10-15 miles | 15-20 miles | > 20 miles |
| Babylon | 70% | 20% | 4% | 6% |
| Bay Shore | 81% | 10% | 4% | 5% |
| Ronkonkoma Hub -MacArthur Airport | 77% | 9% | 9% | 4% |
| Commack | 87% | 9% | 1% | 3% |
| East Hampton | 81% | 5% | 1% | 13% |
| Hauppauge | 77% | 19% | 2% | 2% |
| Huntington | 78% | 10% | 8% | 5% |
| Brentwood -Central Islip | 79% | 16% | 2% | 3% |
| Patchogue | 66% | 19% | 5% | 10% |
| Farmingdale | 71% | 15% | 10% | 3% |
| Riverhead | 49% | 13% | 8% | 30% |
| SC Community College | 77% | 10% | 9% | 5% |
| Smithtown | 79% | 16% | 4% | 1% |
| Southampton | 85% | 8% | 1% | 6% |
| Stony Brook | 85% | 7% | 6% | 2% |
| Wyandanch | 77% | 16% | 2% | 5% |
| Yaphank | 46% | 21% | 13% | 20% |

# Appendix B: Comments submitted by Suffolk County Legislature's Transportation Working Group

# B. Comments submitted by Suffolk County Legislature's Transportation Working Group on the Draft Report

The draft report for Suffolk County Mobility Study – Strategies for Suburban Transportation was shared with the Suffolk County Transportation Working Group on March 19, 2017. Members of the Transportation Working Group submitted their consolidated comments via email on April 4, 2017. Appendix B includes the Working Group's comments and corresponding responses from SCEDP.

## B.1 Comments of Legislator Bridget Fleming, 2nd District, Chair of Transportation Working Group

**Comment 1:**
*Correct geographic/political references: These identified service areas included: Riverhead - Wading River; Southold – Mattituck; East Hampton – Springs, Amagansett, Montauk; Southampton – Hampton Bays, North Sea, Quogue, Quiogue, East Quogue, Westhampton / Westhampton Beach, Speonk, Remsenburg, Sag Harbor, Noyac; and Shelter Island.*

**SCEDP Response 1: Incorporated**

**Comment 2:**
Suffolk County Public Transportation Working Group was established in November 2016 *by the Suffolk County Legislature through legislation co-sponsored* by Legislator Bridget Fleming *and Legislature Kate Browning following the wholesale elimination of eight fixed bus routes,* to "evaluate the Suffolk County bus system in order to revise ineffective routes, increase ridership, and otherwise improve and enhance the region-wide provision of public transportation to meet the needs of the public, the commercial sector and the environment within the County's budgetary constraints.

**SCEDP Response 2: Incorporated**

**Comment 3:**
Operational costs for Suffolk County Transit continue to rise *at an alarming rate*, from $49.1 million in 2008 to $65 million in 2013 to $77.2 million in 2016. SCT's operating expenses for the year 2016 were over $77 million with fixed routes costing nearly $44.8 million and SCAT demand responsive services costing nearly $32.4 million, while the system only generated about $9.3 million in revenues. While the federal and state funds covered 35.3% of the operating expenses, the County still covered the remaining 52.7% of the operating expenses amounting to over $41.8 million.

**SCEDP Response 3: Incorporated**

**Comment 4:**
*This increase in operating costs of more than 60% over nine years is particularly concerning as the routes and schedules for fixed routes have not been adjusted, with limited exceptions, in three decades.* Furthermore, system wide costs continue to outpace available state operating assistance (STOA funds), putting more pressure on the County's budget and local taxpayers.

**SCEDP Response 4: More details are required to support the language. Analysis of routes and schedule is included in key recommendations (See Section 6.1) and also scoped in the Mobility Implementation Plan Phase-II (See Section 6.7).**

**Comment 5:**
*As a result of advocacy efforts of the Executive and the Legislature, additional funds of $522,600 have been allocated for Suffolk County transportation in the 2019 New York State Budget. As this additional funding is modest relative to the multi-million dollar deficit that was identified as the rationale for the recent elimination of 10% of the County's fixed bus routes, it is critically important that careful analysis be undertaken as to the alarming rate of operating cost increases within the past decade, as well as consideration as to how the additional state funding might be best utilized to mitigate these challenges.*

**SCEDP Response 5: This information is too new to assess and include in the report. Further details on the use of funding are pending.**

**Comment 6:**
There is an urgent need *to review the routes and schedules of fixed-route buses which in many instances are out of step with land use and development changes in the 30 years since the routes were designed. Simple changes have already been identified by the Legislative Working Group, which promise to have a significant impact on ridership, and greatly enhance service to the public. Attention is also urgently needed* to identify and pursue different mobility options that can better serve these unique markets and modernize the current system to align with the emerging technologies and trends in transportation.

**SCEDP Response 6: Review of routes and schedules is included in the Mobility Implementation Plan Phase-II (See Section 6.7)**

**Comment 7:**
*Challenges and Opportunities - Insert: Analyze outdated routes and schedules to comport with AVL and other data, to reduce underused trips and increase ridership, and right-size the fixed route fleet*

**SCEDP Response 7: Agreed, this is a recommendation included in the study. (See Section 6.3)**

**Comment 8:**
Unique Geographies + Transportation Markets - Challenge: The current transit system is a fixed-route, coverage-based system characterized by long travel and wait times, long headways, and high costs that covers a diverse spectrum of land uses and densities between the West and East ends of the County. *Routes and schedules have not been analyzed or adjusted for three decades.*

**SCEDP Response 8: This has been addressed along with comment 10 (aligning service with demand - challenge)**

**Comment 9:**
Opportunities - *Identify and adjust outdated routes and schedules according to current land use patterns and ridership needs*

**SCEDP Response 9: This is part of the study recommendations (See Section 6.3)**

**Comment 10:**
Challenges: Outdated technology and lack of data-driven transit planning, *including outdated routes and schedules that no longer serve the needs of ridership*, resulting in suboptimal system-wide performance and efficiencies.

**SCEDP Response 10: Incorporated**

**Comment 11:**
Currently the transportation network in Suffolk County is oriented around "trunk" and "lifeline" service that consists of transit corridors with diversions into neighborhoods. *Routing is frequently based on land use and development patterns that have changed significantly over the years*. The service has varying headways; with areas of non-productive service and route redundancies; and some routes and terminals that are disconnected from traffic generators and destinations.

**SCEDP Response 11: Current limited coordination of routing with land use is described by the subsequent sentence – Some routes and terminals are disconnected from traffic generators and destinations.**

**Comment 12:**
A system that can easily responds to market demands, serving existing riders and attracting new Riders, *while remaining financially accessible to workforce and low income riders; A system that aims to reduce individual vehicle miles travelled, in order to reduce fossil fuel emissions and concomitant impacts on climate change and air quality*.

**SCEDP Response 12: Incorporated**

**Comment 13:**
*Any recommendations to implement new modes of transportation, prior to a detailed review of routes that are known to be failing in part because they have not been adjusted in decades, despite significant changes in land use patterns, should be viewed as preliminary, and evaluation of any such recommendations should be undertaken only after such review. It could be a mistake to jump at facile solutions based on a gig economy (that could price out certain riders, drain resources from public transport, and increase VMT), when obvious and basic failings of the current fixed-route system have not been considered. This is a general and very serious concern that is applicable throughout the draft study.*

**SCEDP Response 13: This report, which is the first part of a two phase study, explored the various demand responsive mobility options available to supplement the fixed route transit. Phase II will look into detailed route reviews and optimization opportunities (See Section 6.7). Route Optimization / Optimized Transit is examined as one of the five modes within the scope of this study (See Optimized Transit in Section 4.3).**

**Comment 14:**
*Key TAZ Analysis Findings - Some Areas of the County Are Not Ideal for Fixed Route Service: This broad conclusion is troubling and not clearly supported. There is no analysis of routes themselves, relative to land use patterns. In fact, East Hampton planners have identified an employment hub that is not adequately serviced by fixed route buses with a common sense schedule that connects with residential neighborhoods that have developed since routes were designed decades ago. Adjusting these deficiencies is being explored to increase ridership. This concern is applicable to repetitive references*

*throughout the document, urging transition to on-demand mobility solutions without an analysis of how woefully outdated higher capacity systems, with their lower costs and lower environmental impacts, might be adjusted to meet current needs. We must be very careful not, in a rush to economize the system, leave behind workforce and low income riders, and businesses that need low cost transit solutions for employees, or ignore environmental impacts of increased vehicle miles travelled.*

**SCEDP Response 14: This report, which is the first part of a two phase study, explored the various demand responsive mobility options available to supplement the fixed route transit. Phase II will look into detailed route reviews and optimization opportunities (See Section 6.7). Extensive travel pattern analysis (TAZ analysis) (See Sections 3.1 & 3.2) and Mode Evaluation and Suitability analysis (See Sections 5.3 and 5.4) was conducted as part of this study.**

**Comment 15:**
*Development of Mobility Suite - Purpose and Mode Selection: Note that neither the Legislature not the Transportation Working Group had an opportunity to review or comment prior to the selection of a proposed mobility suite.*

**SCEDP Response 15: The modes were presented and discussed at the Transportation Working Group Meeting held in November 2017. SCEDP received no comments from TWG on the presentation content.**

**Comment 16:**
*Unfortunately, TNC's were introduced without any exploration of partnerships proposed in this section. Serious consideration must be given to revisiting such negotiations. Similar partnerships may also be explored with existing taxi and Limousine companies, which are also beginning to employ digital technologies. References to the potential subsidized TNC programs must emphasize the importance of recognizing that TNC trips are often beyond the price reach of workforce and low income riders for routine daily trips.*

**SCEDP Response 16: This report, which is the first part of a two phase study, explored the various demand responsive mobility options available to supplement the fixed route transit and best practices across the nation. Phase II (See Section 6.7) will look into how they can be applicable and implemented in Suffolk County.**

**Comment 17:**
*Bikeshare is wholly unworkable for much of Suffolk County, particularly the East End outside incorporated villages and downtown areas, without significant infrastructure funding. With regard to relying on "grants, private sponsorships and user fees" to fund transportation: Although we must look for cost savings, we must be mindful of the importance to our economy of a robust, publicly-funded high capacity transportation system that meets the needs of our communities, workforce and business, while limiting negative environmental impacts of transportation options.*

**SCEDP Response 17: Grants and private partnerships are specifically only considered for bike share programs. The County is in the process of planning a County-wide regional bike share program and received responses to an RFP seeking qualified firms to design, build, finance, operate and maintain a regional bike share program in the County in March 2018. Responses are currently under review.**

**Comment 18:**
*Micro-Transit: The NYS budget includes additional funding for a "Southfork Commuter Connection" network supporting additional LIRR trips. This is an excellent opportunity to invest in partnership solutions to meet the community's transportation needs. Potential pilot micro-transit programs could be undertaken in conjunction with East End Towns and LIRR, as well as western operators who are exploring similar programs, to reduce initial capital costs. Fixed route on-demand systems could potentially fill critical needs. Up-front investment will be needed to meet software and other startup funding needs. These costs could be reduced through a shared service approach. This may be an excellent approach to investing the limited additional transportation funding in the NYS budget, by offering lower-cost solutions to mitigate service cuts while supporting a more robust, modern transportation system countywide. Members of the Legislative Transportation Working Group have been engaged in discussions of how to work with Towns to meet the last mile needs created by added train trips. The County would be well-served by playing a central role in coordinating a shared services approach in this area.*

**SCEDP Response 18: Undertaking a micro-transit pilot program is identified as a key next step following the completion of this study (See Section 6.7).**

**Comment 19:**
*Recommendations and Next Steps: Prior to any reinvestment, it is critically important that modest gains in state funding be utilized to mitigate the impacts of recent service cuts. Inattention to recent service cuts is a glaring omission in this draft study.*

**SCEDP Response 19: This report, which is the first part of a two phase study, explored various demand responsive mobility options that could potentially supplement the fixed route transit service. It also examined case studies and best practices from across the nation. Phase II (See Section 6.7) will look into how to optimize and redesign the existing network and introduce demand responsive modes where applicable in Suffolk County.**

**Comment 20:**
*There is not a single mention throughout the draft of enhancing rider experience with simple solutions like adequate bus shelters, in order to attract more riders. The Legislative Working Group is currently undertaking a shelter survey, with the goal of prioritized improvements to shelters countywide.*

**SCEDP Response 20: Route Optimization / Optimized Transit is examined as one of the five modes within the scope of this study (See Optimized Transit in Section 4.3). Phase II will look into detailed route reviews and optimization opportunities (See Section 6.7).**

**Comment 21:**
*Pivot from being a transit provider to provider of Mobility Services - This huge leap is premature, and not empirically supported. A rush to get out of higher capacity transportation may violate Title VI, fails to consider the threat of climate change, and may fail to fully consider the needs of workforce riders, employers, and low income riders. Solutions to such problems posed by moving away from higher capacity transportation must be clearly addressed before any such pivot should be proposed.*

**SCEDP Response 21: This is a recommendation of the current study, not an action plan. Applicability and implementation of these recommendations will be explored in Phase II.**

**Comment 22:**
*Build on Technological Investments and Operational Efficiencies - Before considering replacement of fixed routes with solutions that could be more expensive to end users and have potentially adverse environmental impacts, simple common sense approaches should be considered. For instance, communication with local planners can yield significant solutions for improving outdated routes, lowering per-ride costs, and increasing ridership. Where gig-economy solutions are proposed, the County must be critically aware of costs to ridership and environmental impacts. Micro-transit solutions, such as subsidized fixed-route on-demand service should be explored with these challenges in mind.*

**SCEDP Response 22: Undertaking a micro-transit pilot program is identified as a key next step following the completion of this study (See Section 6.7).**

### B.2 Comments of Legislator Al Krupski, by John Stype, Legislative Aide 1st District

**Comment 23:**
*Legislator Krupski and I have reviewed the ARUP report. It is very repetitive in mentioning the same terms and issues throughout the report. Most of this report seems to be a boiler plate that could fit any County. Again this is another report done similarly to the SEEDS (2005), Volpe (2009) and Cherwony (2010). What is going to change within the County to actually put forth these items? We do not have the money to do this, even with the NYMTC grant. Suffolk County Transportation could have written this same report and it would not have cost us over $100,000 to do. We have the AVL system which is supposed to give us more detailed data. You cannot manage an operation without proper data. This report is premature. Much emphasis is put on bikes. Most of Long Island towns do not have the bike lanes, shoulders or sidewalks to make this happen. Also the traffic travels to fast for safe bike travel. On pages 17 and 19, it shows where resident trips start and finish. In Easthampton Town, it shows that a majority of the trips end on Gardiners Island. This can't be since it is a private Island and the public is not allowed. Where were these people supposed to end up, Shelter Island? Did they pick the wrong Island? On a maintenance note, they should add two additional resolutions on the bottom of page 6 to add resolution's 139-2017 and 393-2017. This increased the number of members of the SC Transportation Committee to 15.*

**SCEDP Response 23: The scope of the current study is detailed in Section 2.4 and the scope for Phase-II of the study is discussed in Section 6.7. Regarding Gardiners Island: Transportation Analysis Zones (TAZs) is a unit of geography used for transportation planning models and is derived from census block data, with approx. 3000 population in each TAZ. The mapping outputs of the analysis – represents results for the entire TAZ. Gardiners Island is part of a TAZ and the distribution of origin/destinations is uniform across an entire TAZ. Hence, the origin and destination dots on the Island. This was noted and explained to the Transportation Working Group during the November 2017 meeting.**

### B.3 Comments of Marilyn Tucci, Advocacy & Outreach Coordinator, Suffolk Independent Living Organization

**Comment 24:**
*I read the report. Where is the $175,000 going? It stated the second phase. Is that another study?*

**SCEDP Response 24: Yes. It will be the Phase – II: Mobility Implementation Plan, which will be funded through NYMTC UPWP Funds.**

## B.4 Comments of Ray Grimaldi, VP Operations, Suffolk County Bus

**Comment 25:**
*Recently the County deployed an APP [TransLoc] that allows the Rider to track, in real-time, the scheduled arrival of the Transit Bus [TB] of their choice, county-wide. What is also very interesting about this APP is its ability to capture and retain ridership data such as patterns, time of day, day of the week and most important...where the rider Originates [prior to their travel] and where their End-Point is. Data like this is key for route planning and even seasonal route adjustments...all components that drive operating expenses. Microtransit & On-Demand Flex Routing are also technologies currently available that are designed to generate new ridership while helping to manage operating costs. On-Demand can be used to help replace some of the service that was eliminated in the recently affected areas.*

**SCEDP Response 25: No Response.**

## B.5 Comment of Geoff R. Lynch, President of Hampton Jitney, Inc.

**Comment 26:**
*As a private passenger carrier based on the East End of Long Island, Hampton Jitney would welcome the opportunity to partner with Suffolk County to help enhance the SCT system in our region. We are particularly interested in Last Mile "Connectivity" that would benefit our ridership on our service between NYC and the East End. I believe any potential pilot programs incorporating micro-transit or van-pooling operations could benefit the transit riding public on the East End and potentially could offset the loss of SCT transit routes in Southampton Town. Hampton Jitney would be willing to incorporate its facilities on County Rd 39A in Southampton as well as our facility on Edwards Avenue in Calverton as potential inter modal "hubs". I believe a public/private partnership that enhances transit options for both the local community as well as the seasonal tourists that our economy depends upon should be the goal.*

**SCEDP Response 26: No Response.**