Appendix A

Data Collection and Review Summary Report

Date:

June 30, 2021

Monmouth County

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Executive Summary

Monmouth County is home to a variety of events and tourist destinations, including beaches, concert venues, golf courses, parks, marinas, orchards, racetracks, theaters, and theme parks which attract visitors and create a significant benefit to the local and regional economy. However, traffic congestion generated by some venues and events negatively affects the travel experience of visitors and residents, the local economy, and the environment. Visitors use the same state, county, and local routes to access major attractions that residents and others travel every day. This overlap is due to the proximity and interdependence of residential and commercial uses with tourist and event destinations, as well as the fact that most venues are not served end-to-end by limited access freeways.

While summer typically generates the most significant traffic congestion, there are many events held in Monmouth County year-round that affect local travel. Events such as flower festivals in spring, apple picking and Halloween related events in fall, and entertainment events year-round can create high travel demand, particularly on weekends. Monmouth County residents who travel by car in the summer and during events are known to change their travel behavior to deal with the increased congestion. Municipalities and event sponsors recognize congestion as a hindrance to visitors and residents year-round and have taken steps to mitigate it within their jurisdictions. However, with applications such as Waze, more visitor vehicles are being pushed to local streets to avoid congested areas.

The purpose of Monmouth Within Reach, the Monmouth County Tourism and Events Travel Demand Management Study, is to develop strategies and best practices for managing travel demand in order to help people get where they need and want to go. As part of the study, the Project Team will evaluate event and tourism destinations across the County and utilize evaluation criteria to screen the potential locations to ultimately select five to seven locations that would be advanced for further evaluation as well as the development of specific travel demand management (TDM) plans. These plans will result in a set of actionable recommendations for peak tourism periods and events to reduce congestion and to improve the travel experience for tourists and Monmouth County residents. Recommendations may include but are not limited to strategies such as scheduling for reduced conflicts, shuttles and other transit, and technology improvements, among others. Furthermore, the plans will be developed in a manner that could allow the policies and recommendations to be adapted at other types of event and tourism locations within the County.

Study Vision, Value Statement and Mobility Goals

Study Vision: Making every travel day better

Study Value Statement: Enhance the travel experience for tourists and Monmouth County residents by reducing event and tourism-related congestion through a set of actionable travel demand management strategies to make travelling on a Friday in summer more like travelling on a Friday in winter for County residents and visitors.

Mobility Goals:

- Reduce peak tourism and event-related congestion.
- Create attractive and convenient opportunities to share rides and travel without a car when visiting Monmouth County.

- Improve awareness of transportation options for County residents and visitors
- Reduce parking-related frustration and congestion.

What is a Travel Demand Management (TDM) Study?

Travel Demand Management (TDM) is the use of strategies and policies that help give the traveler more choices providing information, incentives, resources, services, and support to change when and how they travel. The goal of the TDM Study is to develop a plan that provides sufficient modal strategies, each aimed at changing a small part of the overall travel behaviors, resulting in reduced congestion during peak tourism periods as well as before and after large events in Monmouth County. TDM strategies help to reduce congestion by making it easier to use other transportation options, such as transit, carpooling, vanpooling, ridesharing, walking, cycling, as well as by encouraging people to travel during off-peak times.

Purpose of the Data Collection and Review Summary Report

As noted in the Study Methodology section, the first step to the development of a TDM study is understanding existing conditions, including existing infrastructure, existing sources of data, previous studies, and environmental justice and transportation equity considerations, and TDM best practices. This Data Collection and Review Summary Report documents this initial process of understanding current conditions within the County, as well as the current state of practice related to event and tourism TDM.

Next Steps

The information contained in this report will be used to develop evaluation criteria which will be used to select five to seven event/tourist locations to advance further into the study to the development of mitigation plans. Furthermore, the TDM practices discussed in this report will be utilized to develop specific TDM strategies for each of the selected sites. This document is intended to become a component of the final report.

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Introduction

Introduction to the Monmouth Within Reach Study

What is the Monmouth Within Reach Study?

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Purpose of the Data Collection and Review Summary Report

As noted in the Study Methodology section, the first step to the development of a TDM study is understanding existing conditions, including existing infrastructure, existing sources of data, previous studies, environmental justice and transportation equity considerations, and TDM best practices. This Data Collection and Review Summary Report documents this initial process of understanding current conditions within the County, focusing on event and tourism-related transportation issues, and includes the following sections:

- Existing County-Wide Conditions
    - Transportation Demand Management in Monmouth County
    - Transportation Infrastructure
    - Existing Sources of Traffic Data
    - Existing ITS Infrastructure
- Environmental Justice Needs Assessment
- Literature Review
    - County and Subregional Studies
    - Review of Best Practices

Existing County-Wide Conditions

This section documents the preliminary identification and evaluation of existing TDM programs, transportation infrastructure, ITS infrastructure, and sources of traffic volume data.

Transportation Demand Management in Monmouth County

In New Jersey, transportation demand management (TDM) and related services are primarily provided by Transportation Management Associations (TMAs) which are non-profit, public-private partnerships that work with business and local government to provide commuter information and services. The primary goal of TMA's in the state is to enhance mobility, economic opportunities, and quality of life all while reducing traffic congestion and improving air quality through programs like shuttle services, carpool and vanpool support, promoting walking and biking, as well as providing information on transit services.

EZ Ride, formerly known as Meadowlink, is the TMA that provides services to Monmouth County, as well as Union County, Bergen County and parts of Essex and Sussex Counties. EZ Ride provides several services in these counties, including:

- Shuttle services that provide last-mile connections to and from transit stations. Currently EZ Ride provides approximately 20 shuttle routes. However, none of the routes are within Monmouth County. EZ Ride used to provide the ShoreLink, which was a shuttle service that connected rail stations with beaches in the County. However, it was not financially supported and was discontinued. EZ Ride also received a grant to operate a shuttle between the Middletown train station and Sandy Hook, but was stalled due to the COVID-19 pandemic.
- Carpool formation and ride matching, which helps residents and employees find existing carpools to join or start a new carpool. In addition to assisting with ride matching and formation of new carpools, EZ Ride provides an emergency ride home program which guarantees carpoolers a ride home from work when unexpected circumstances occur, such as illness, family crisis, or unscheduled overtime, free of charge to registered members.
- Vanpool formation and ride matching, similar to carpool services, helps residents and employees join existing vanpools or start a new vanpool. When forming new vanpools, EZ Ride provides guidance to recruit additional riders and procure a seven or 15 passenger van and assistance with applying for a leased van from a NJ Transit approved vanpool provider. In addition, EZ Ride provides information regarding potential financial incentives, such as employer subsidies, as well as provides empty seat subsidies for new vanpools. The emergency ride home program is also available to all registered vanpool riders.
- Ryde4Life is a program that helps adults, particularly those that are elderly or do not have access to a car, on-demand rides utilizing service providers, such as Uber and Lyft, to get to medical appointments or run errands, such as grocery shopping. Rides are provided at a reduced price and can be scheduled on-demand by calling EZ Ride; thus, no smart phone is needed.
- Flex-T Mobility is a program that provides transportation for people with disabilities to get to work, health care, and run errands.

- The Bicycle and Pedestrian Program partners with government agencies, private foundations, non-profits, and others to help communities identify funding sources and prioritize bicycle and pedestrian improvements. EZ Ride provides several services including presentations and other events related to the benefits of bicycling and walking, partners with NJTPA to conduct safety education and enforcement campaigns, helps assess walking or biking routes to schools, develop improvement plans and assist with obtaining funding, manage bike lockers at NJ TRANSIT rail stations, and host award events to celebrate schools and municipalities that promote safe walking and biking.

The above-listed services are oriented to commuters as well as to those that do not have access to a vehicle or cannot drive. There are no current programs that provide services for events or tourism destinations. However, given that EZ Ride currently operates shuttle services, they should be considered a potential partner in the eventual implementation of shuttle services for events.

Transportation Infrastructure

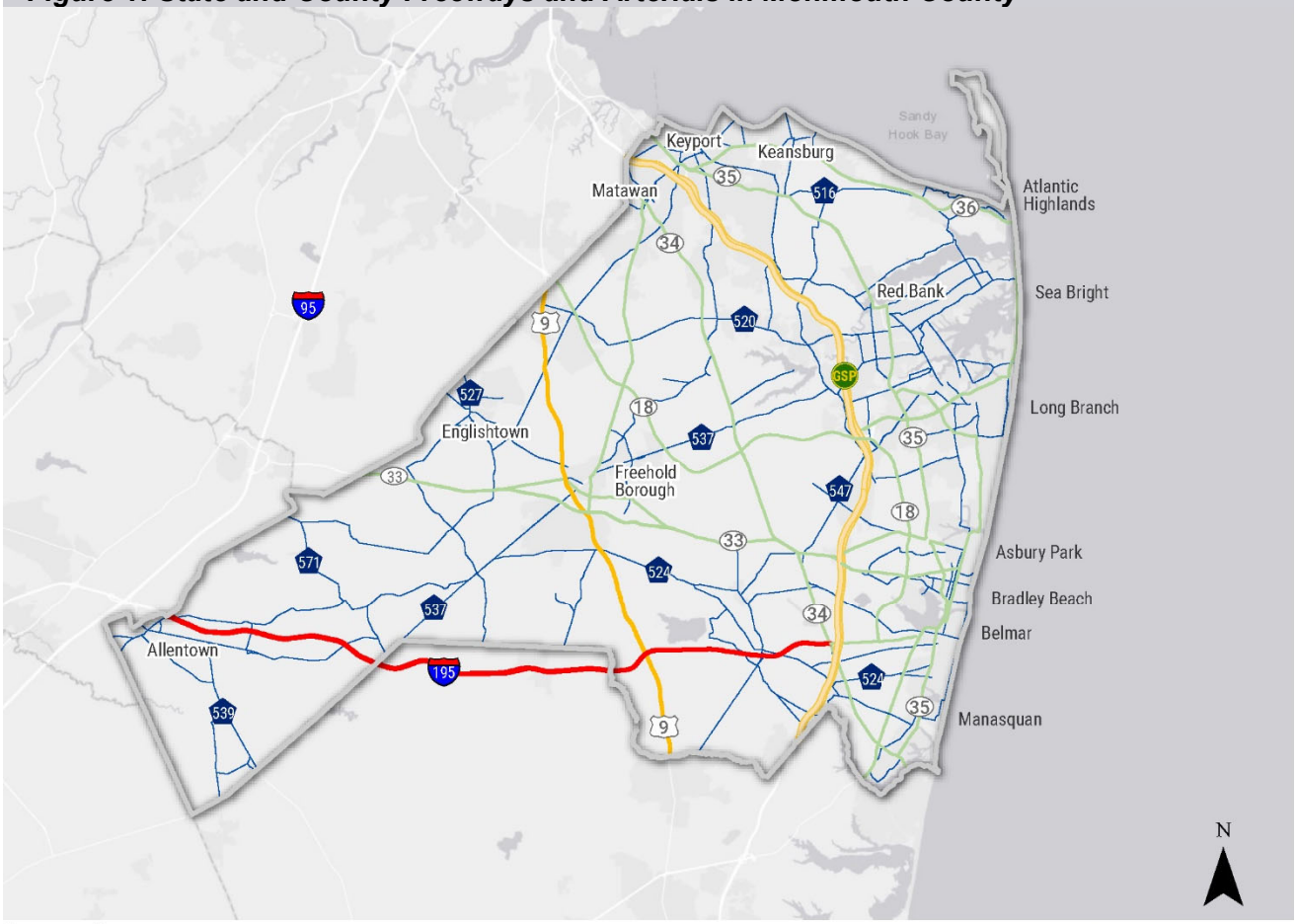
Monmouth County is served by a variety of transportation modes, including freeways, state routes, County routes, and local roadways, NJ TRANSIT bus and rail, Academy Bus, ferry service, and bicycle and pedestrian facilities.

Roadway Network

The roadway network in Monmouth County consists of two freeways, the Garden State Parkway and I-195, nine state roadways, over 70 County roadways, and many local/municipal streets (see

Figure 1). Major routes within the County are described in Table 1, below.

Figure 1: State and County Freeways and Arterials in Monmouth County



Legend

Monmouth County

Route Type

- Garden State Parkway
- I-95
- US Route 9
- State Highways
- County Roads

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Table 1: Major Roadways within Monmouth County

Route Number	Length (miles)	Description
Garden State Parkway	26	The Garden State Parkway is a north-south toll road owned and operated by the New Jersey Turnpike Authority that spans the entire state from Cape May, NJ to the New York State line. Within Monmouth County the roadway is approximately 26 miles long and runs between the municipalities of Wall Township and Aberdeen Township and has nine interchanges. Tolls are collected at one mainline barrier location and on six ramps.
I-195/NJ 138	26	I-195 is an east-west freeway that connects I-295 near Trenton to the Garden State Parkway in Wall Township. Within the County, it is approximately 26 miles long, including the portion that passes through the northern edge of Ocean County. There are nine interchanges along this segment, including the interchange with the Garden State Parkway. East of the Parkway, the roadway becomes NJ 138 which continues to NJ 35/NJ 18.
US 9	14	US 9 is a north-south roadway that traverses the length of New Jersey from the George Washington Bridge to Cape May. However, unlike the Garden State Parkway, most of US 9 is an arterial with traffic signals. Within the county it is classified as an urban principal arterial and is approximately 14 miles in length. It also serves as an important commuter corridor for the central parts of Monmouth County, particularly for NJ TRANSIT buses. A large number of bus routes operate along the corridor, providing commuter connections between Monmouth and Ocean Counties and employment centers to the north, like Newark and New York City.
NJ 18	23	NJ 18 is a north-south state route that connects I-287 in Piscataway with NJ 138 and the Jersey Shore. Most of the corridor is limited-access with grade-separated interchanges. Within Monmouth County, it is approximately 23 miles long and is classified as a freeway/expressway.
NJ 33	21	NJ 33 is an east-west state route that connects US 130 and the NJ Turnpike, near Hightstown, and terminates in Neptune City. Within the County, it is approximately 21 miles long and is classified as an urban principal arterial. A small segment of the roadway is limited access on a bypass around Freehold. The NJ 33/NJ 34 traffic circle in Wall Township is known to generate significant delays on both corridors.
NJ 34	22.5	NJ 34 is a north-south state route that runs between US 9 in Old Bridge Township (Middlesex County) and Wall Township. Within the County, it is classified as an urban principal arterial and is approximately 22.5 miles in length. As noted in the description of the NJ 33 corridor, the NJ 33/NJ 34 traffic

Route Number	Length (miles)	Description
		circle in Wall Township is known to generate significant delays on both corridors. The Allaire Road Circle, also in Wall Township, is also known for delays.
NJ 35	29	NJ 35 is a north-south state route that runs between NJ 27 in Rahway Township, to the north, and South Seaside Park/Island Beach State Park, to the south. Within Monmouth County, the roadway is classified as an urban principal arterial that is approximately 29 miles in length, running between the northwest corner of the County to the southeast corner of the County.
NJ 36	24.4	NJ 36 is an urban principal arterial that lies solely in Monmouth County. It is considered a north-south roadway, although it makes a U-shape between Garden State Parkway Interchange 117 in the northwestern corner of the County. Along the Bayshore area to Sandy Hook Gateway National Recreation Area, it turns in a north-south direction, running along the coast from Seabright to Long Branch. In Long Branch, the corridor turns and travels in an east-west direction and terminates at Garden State Parkway Interchange 105.
NJ 71	16.8	NJ 71 is a north-south state roadway that lies solely in Monmouth County and runs between NJ 35/CR 537 in Eatontown and NJ 35 in Brielle. It is classified as an urban principal arterial between Brielle and Belmar. North of Belmar, it is classified as an urban minor arterial.
NJ 79	12.13	NJ 79 is a north-south state roadway that lies solely in Monmouth County, running between NJ 34 in Matawan to the north, and US 9 in Freehold Township to the south. The roadway is classified as an urban principal arterial.
CR 520	19.8	CR 520 is an east-west County roadway that travels between US 9 on the west side of the County to Sea Bright, on the east side of the County. It is classified as an urban minor arterial for much of its length, except for a short section in Red Bank, where it is classified as an urban principal arterial.
CR 524	33.5	CR 524 is an east-west County roadway and is also the longest Monmouth County route, running between Allentown to the west and Spring Lake Heights to the east. Most of the corridor is classified as an urban major collector. Sections that lie within Allentown, Freehold and Spring Lake Heights are classified as an urban minor arterial.
CR 537	29	CR 537 traverses over 29 miles of the County, running between Long Branch to the northeast and the Burlington/Ocean County line to the southwest. It also serves as the primary route between I-195 and Freehold. The roadway is

Route Number	Length (miles)	Description
		generally classified as an urban minor arterial, except for the segment that passes through Freehold, where it is classified as an urban principal arterial.

Transit

Monmouth County is served by a variety of transit options including NJ TRANSIT commuter rail, NJ TRANSIT bus, Academy bus (a private bus carrier), and NY Waterway and Seastreak ferries.

Commuter Rail

Monmouth County is served by the North Jersey Coast Line (NJCL), operated by NJ TRANSIT. The line runs from New York Penn Station to the north and Bayhead to the south. There are 14 stops on the NJCL with over 10,000 weekday boardings on average. Commuter trips to New York Penn Station vary from approximately 1 hour from the Aberdeen-Matawan Station to almost two hours from the Manasquan Station. The NJCL is electrified from Long Branch to the north. A transfer to a diesel train was required to continue south on the corridor. However, NJ TRANSIT has invested in dual-mode locomotives that can operate under both diesel and electric propulsion, thus eliminating this transfer for some trips.

The NJCL operates with 31 northbound departures to New York Penn Station, from Long Branch and stations to the north, each weekday at headways ranging from 15 to 20-minute peak headways and one-hour headways midday and overnight. South of Long Branch, the NJCL provides 17 departures to New York Penn Station at peak headways of 20 to 40 minutes and off-peak headways of two hours. On weekends, from Long Branch to the north, there are approximately 22 northbound departures and 23 southbound arrivals. Of the 22 trains, 17 are designated as bicycle accessible, allowing for up to 12 bicycles/segways on the weekend train. Service to the south of Long Branch is much less frequent, with 13 departures and arrivals. Furthermore, there are long headways and gaps in service that make it difficult to line up the service north of Long Branch with that south of Long Branch. This makes it an inconvenient option for people wishing to access shore communities via transit.

NJ TRANSIT Bus

NJ TRANSIT operates 20 bus routes in Monmouth County, 13 of which can be classified as long-distance routes that connect Monmouth County with regional destinations, including Newark, New York City, and Philadelphia (**Figure 2**). The US 9 corridor experiences the majority of bus ridership due to multiple routes to Newark and New York City. The Route 139 service to New York City is the most heavily used with almost 10,000 boardings per day. Table 2 lists the NJ TRANSIT bus routes serving Monmouth County.

Commuter Park and Ride

Bus operations within the County are supported by a number of commuter park-and-ride facilities that are aligned along the two major north-south corridors in the County: US 9 and the Garden State

Parkway (**Figure 2**). NJ TRANSIT owns or operates most of the park-and-ride facilities along the US 9 corridor, many of which are located on private property, such as within shopping center parking lots. NJ TRANSIT works with the property owner to allow a section of parking to be designated for commuter parking. The commuter parking areas along the Garden State Parkway are owned and operated by NJTA, including a commuter parking area within the Monmouth Service area, as well as at interchanges including, 91, 98, 105, 109, and 116. Most of these facilities are served by Academy Bus.

Figure 2: Transit in Monmouth County

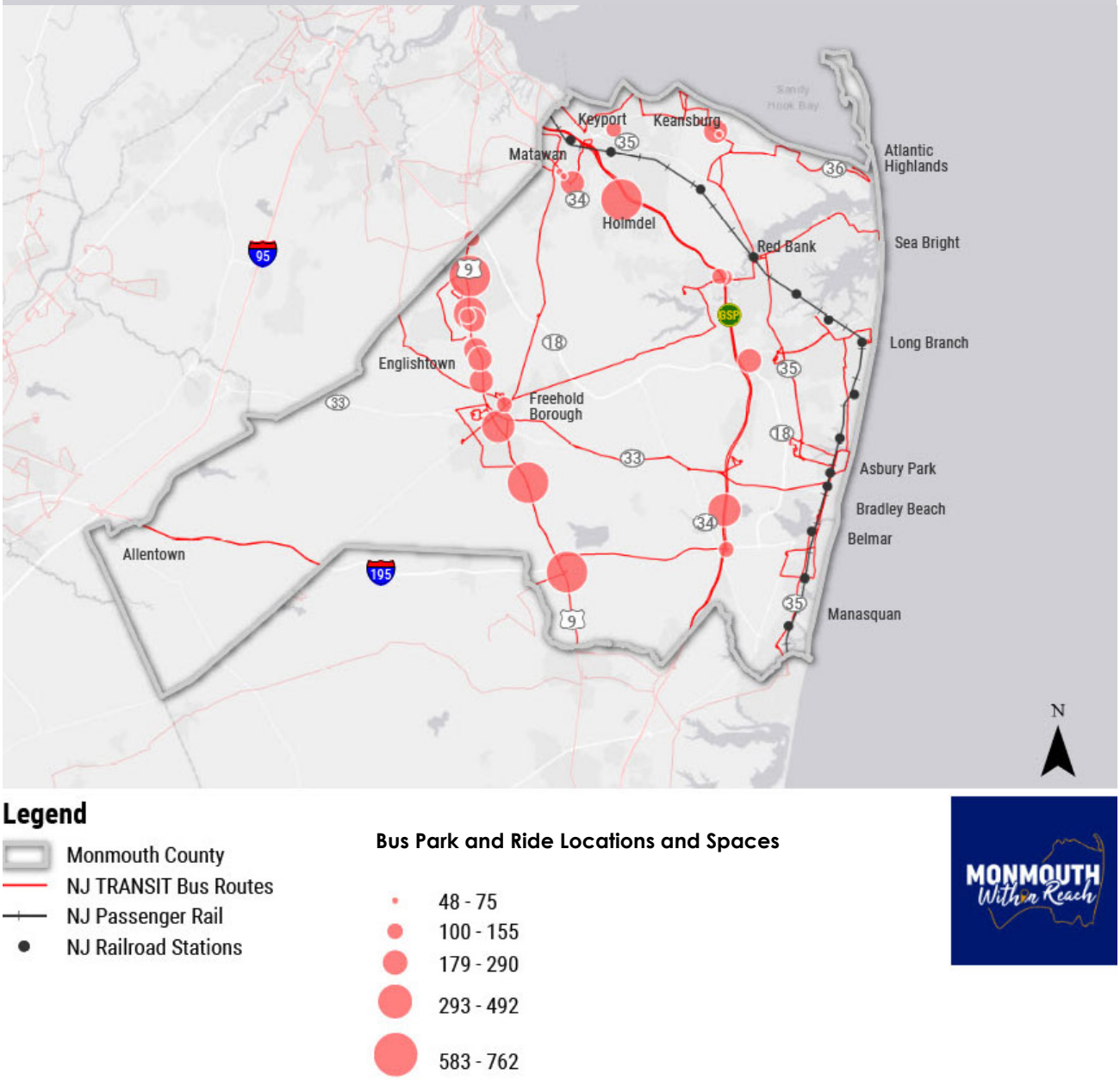

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Table 2: NJ TRANSIT Bus Routes within Monmouth County

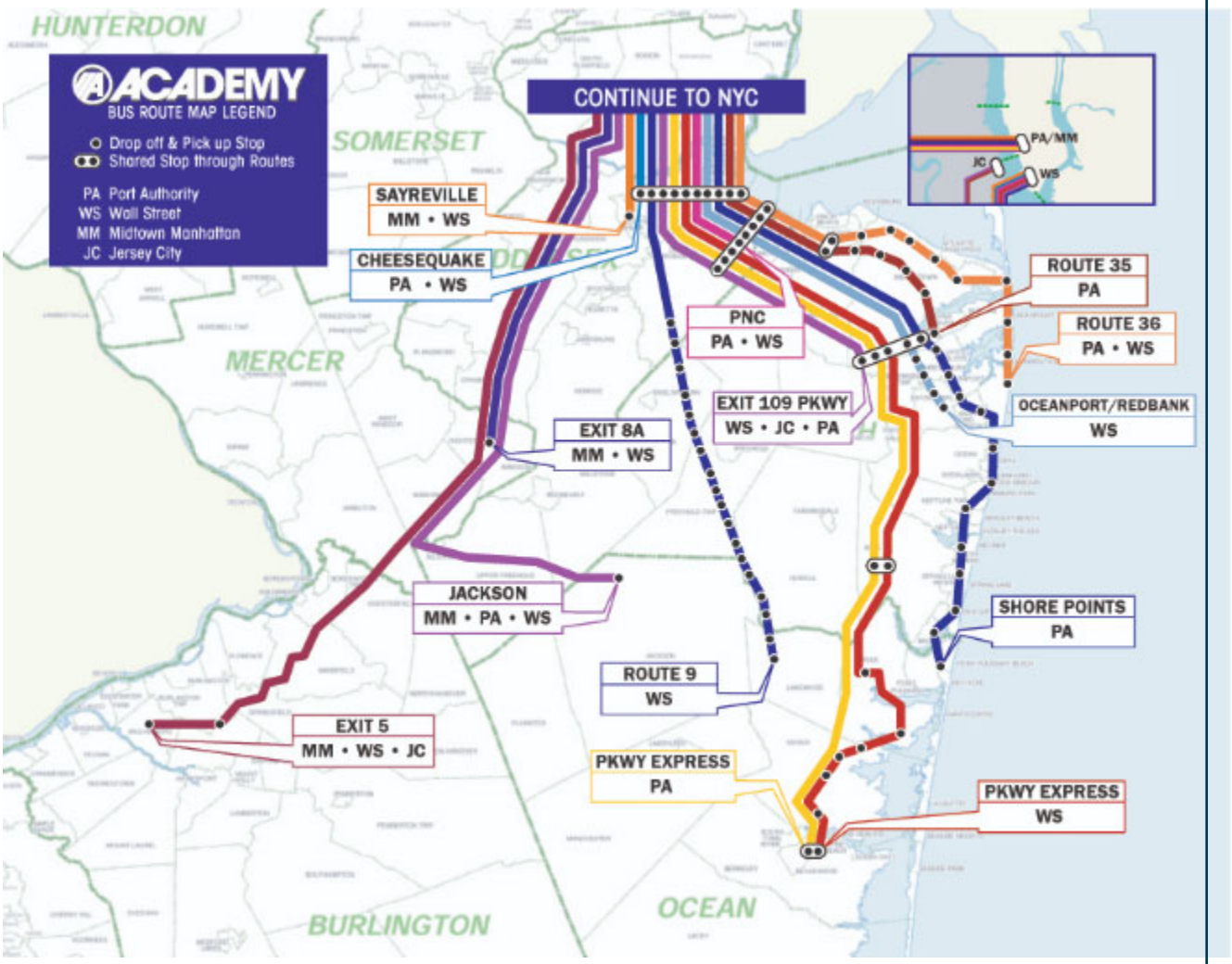
Route Number	Route Type	Route Name	Weekday Service	Weekend Service
63	To/From Hudson County/Newark	Lakewood – Jersey City – Weehawken	Peak Hours Only	None
64				
67		Toms River – Lakewood – Newark	Limited Peak and Off-Peak Service @ 30 min – 2 hr headways	Saturdays @ 2-3 hr headways
67X		Jersey City – Newark – Atlantic City	None	Sundays (Freehold Mall) @ 2 hr headways
130	To/From New York City	Lakewood – Old Bridge – New York	All Day Service @ 10 min peak headways, 15 – 30 min off-peak, 1-hr late night	Saturday and Sunday Service @ 15 – 20 min headways
132				
136				
139				
131		Freehold – Matawan – Sayreville – New York	Peak Hours Only	None
135				
133		Old Bridge – Aberdeen – New York	Peak Hours Only	None
317	To/From Philadelphia	Asbury Park – Fort Dix – Philadelphia	Daily @ 2 hr headways	Saturday and Sunday @ 2 hr

Route Number	Route Type	Route Name	Weekday Service	Weekend Service
				headways
817	Intercounty	Perth Amboy – Campbell's Junction	Daily @ 1 hr headways	Saturdays @ 1 hr headways
830	Local Service within Monmouth County	Asbury Park – Point Pleasant Beach	Daily @ 1 hr headways	Saturdays @ 1 hr headways
831		Red Bank – Monmouth Mall – Long Branch	Daily @ 1 hr headways	Saturday and Sunday @ 1 hr headways
832		Red Bank – Monmouth Mall – Asbury Park	Daily @ 1 hr headways	Saturday and Sunday @ 1 hr headways
834		Red Bank – Highlands	Daily @ 1 hr headways	Saturdays @ 1 hr headways
836		Asbury Park – Freehold Raceway Mall – Centra State	Daily @ 1 hr headways	Saturday and Sunday @ 2.5 hr headways
837		Long Branch – Asbury Park – Seaview Square	Daily @ 1 hr headways	Saturdays @ 1 hr headways
838		Freehold – Red Bank – Sea Bright	Daily @ 1 hr headways	Saturdays @ 1.5 hr headways

Academy Bus

Academy Bus operates several long-distance commuter routes between Monmouth County and New York City Port Authority Bus Terminal and Wall Street destinations (see ***Figure 3***). The services are offered primarily on weekdays and are focused on the AM and PM peak periods.

Figure 3: Academy Bus Route Map



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Ferry Service

The County's Bayshore communities are served by two different ferry providers that connect the County with destinations in Hudson County and New York City. NY Waterway operates service from Belford with stops in Jersey City as well as Midtown, Wall Street, and Brookfield Place in Manhattan. Prior to the COVID-19 pandemic, NY Waterway operated 24 inbound and 24 outbound trips on an average weekday. The Seastreak Ferry also provides service between Highlands and Atlantic Highlands and Manhattan. Prior to the COVID-19 pandemic, Seastreak provided 20 inbound and

outbound trips to/from E 35th Street in Manhattan and 16 inbound and 16 outbound trips to/from Pier 11 in Manhattan. In addition, the Seastreak service also provided four inbound and four outbound seasonal trips between Manhattan and Sandy Hook Gateway National Recreation Area.

Active Transportation Network

Monmouth County is home to over 130 miles of trails that are open to a variety of modes, including walking, running, and biking. However, most trails are located within the Monmouth County Park system and are not utilized for commuting or other transportation-related purposes. However, it should be noted that this data is not exhaustive of all bicycle lanes. In addition to bicycle lanes, the map also shows several multi-use trails, the most significant of which is the Henry Hudson Trail which connects Freehold to Aberdeen, as well as Keyport to Atlantic Highlands. The County is currently working with NJ TRANSIT to complete the missing section of trail between Aberdeen and Keyport to create a continuous trail from Freehold to the Bayshore which could potentially be a tourist attraction. In addition, the planned connection would also provide a connection to the Aberdeen-Matawan station on the NJCL, which could encourage commuters to utilize the trail to access the rail service.

Sources of Traffic Data

Several agencies including, NJDOT, NJTA, and Monmouth County collect traffic volume data at various locations within the County on an annual basis, and much of this data is available online or by request. Available traffic data includes volume data from automatic traffic recorders (ATR), permanent count stations, and intersection turning movement counts. Vehicle classification data is also available at specific locations and INRIX travel time data can also be obtained for major roadways within the County. Table 3 summarizes the existing sources of data available within the County.

Table 3: Sources of Traffic Data

Source	Type of Data	Comments
NJDOT	Traffic Volume (ATR) Intersection Turning Movement Count Vehicle Classification Weigh-in-Motion	Data downloadable through NJDOT Traffic Management System (TMS) website (***https://www.njtms.org/map/***). There are over 1,600 downloadable data files available within Monmouth County. Additional data that was collected as part of NJDOT-sponsored studies may be available by request.
NJTA	Traffic Volume (permanent count stations and temporary ATRs) Vehicle	NJTA maintains an in-pavement wireless data collection system referred to as Sensys along the Garden State Parkway and New Jersey Turnpike. There is a total of 23 Sensys locations within Monmouth County. Data from these locations is available upon request. However, it

Source	Type of Data	Comments
	Classification Vehicle Speed Detector Occupancy	should be noted that some locations are not functional. In addition, NJTA also collects ATR data on ramps without toll plazas typically at least two times per year. Finally, toll plaza volume data can also be obtained for all mainline and ramp toll plaza locations.
Monmouth County	Traffic Volume (ATR) Intersection Turning Movement Count	Monmouth County collects ATR (with classification and speed) and turning movement count data for transportation analyses, projects, and other needs. This data is available upon request. Additional data may also be available from studies performed within the County.
INRIX	Travel Time/Speed	INRIX data is available for most of the major corridors in Monmouth County and can be accessed for transportation-related studies and projects through NJDOT and NJTPA.
Waze	Travel Time/Speed	Monmouth County is registered as a Waze partner which allows the County to access traffic congestion information from the Waze platform. In addition, the County can report events, road closures, construction, etc. to Waze.

Existing ITS Infrastructure

Intelligent Transportation Systems (ITS) infrastructure refers to the utilization of technology, including computers, communications, and detection, to collect and disseminate traffic information to make travel smarter, faster, safer, and more convenient. ITS is essential for managing traffic on major roadways within Monmouth County to alert the travelling public to issues such as roadway congestion, traffic accidents, and special events. For example, in-pavement vehicle detectors along the Parkway collect and measure travel speeds and communicate that information back to a central computer system at the NJTA traffic management center (TMC). The data can then be used to update the dynamic message signs (DMS) to alert drivers as to the travel time to a specific destination or if there is congestion ahead.

Utilizing ITS infrastructure is a critical component to effectively managing event and tourism related traffic before, during, and after congestion forms. ITS infrastructure, like DMS, can be used to direct travelers to specific routes to access an event, such as the Monmouth County Fair or a concert at the PNC Bank Arts Center, in an effort to limit congestion on specific roadways. If congestion does occur, detectors can monitor travel speeds on area roadways and that information can be provided to travelers to divert to alternate routes, or if they have not started their trip, to wait until congestion subsides to travel.

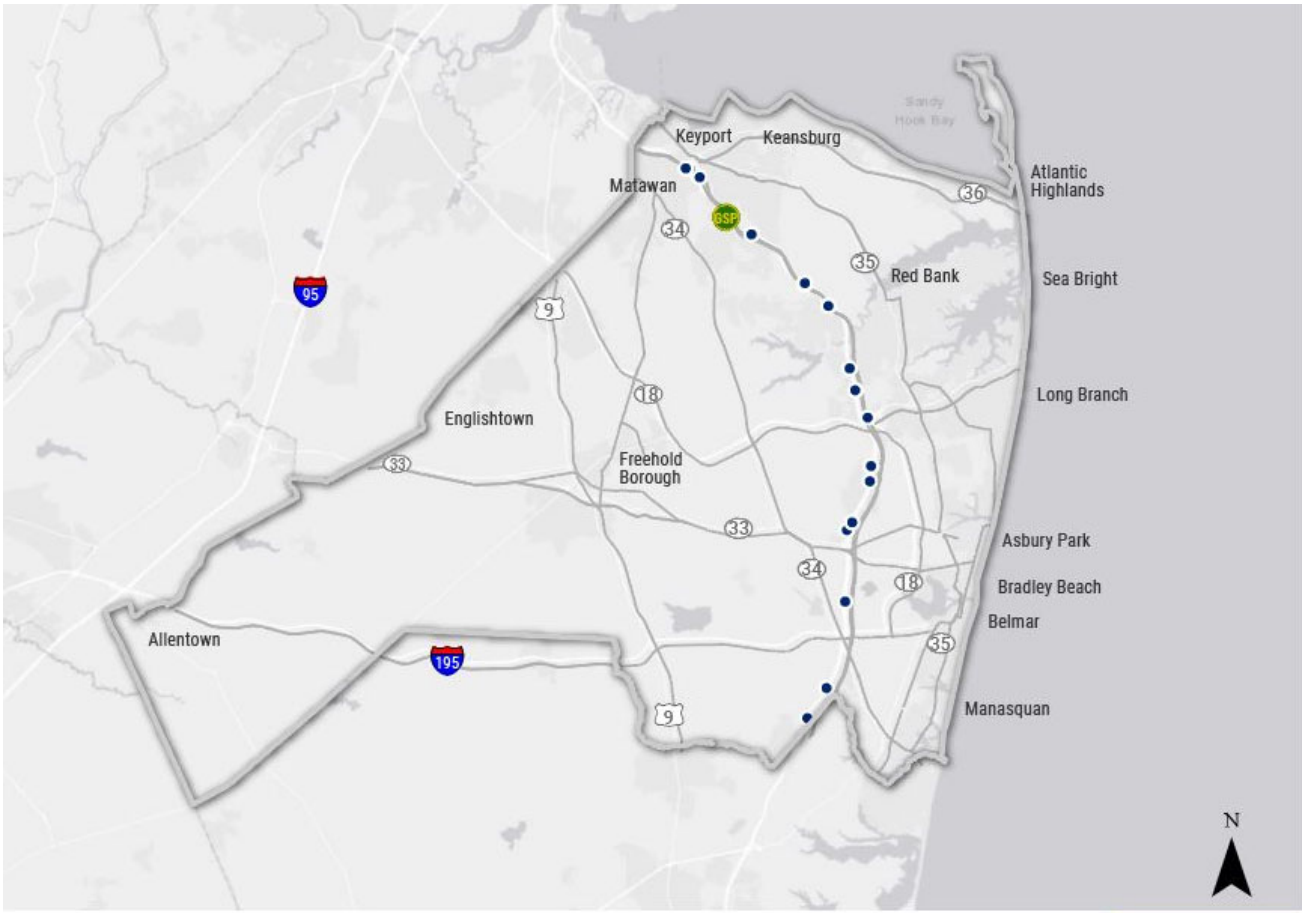
The ITS infrastructure in Monmouth County is primarily owned/operated by either NJTA or NJDOT. As discussed in the Sources of Traffic Data section, NJTA utilizes in-pavement vehicle detectors, called Sensys, to monitor traffic conditions on the Parkway which are capable of measuring volume, vehicle classification, travel speed, and occupancy, and the amount of time a vehicle is positioned over the detector which can be used as a measure to identify congestion. The detectors are co-located with other ITS-related infrastructure such as a DMS and traffic camera. The camera is used by staff in the TMC to visually verify conditions on the Parkway if detectors show low travel speeds and/or high detector occupancy. The DMS is utilized to disseminate traveler information such as alerts to congestion or roadway incidents, travel time to certain destinations or interchanges, and general traveler information, among other messages. **Figure 4** shows the locations of the Sensys and DMS on the Parkway within the County.

NJDOT also maintains a variety of devices on State roadways, including I-195 and US 9, throughout the County. According to NJDOT's ITS device inventory, there are approximately 159 devices in the County.

Figure 5 depicts the locations of the devices. ITS devices in the County include:

- Camera Surveillance Systems (CSS) – cameras used to observe traffic conditions on the roadway.
- Controlled Traffic Signal System Devices (CTSS) – traffic signal controllers, detectors, and communications used to support adaptive signal systems.
- Dynamic Message Signs (DMS) – signs that can display specific messages to travelers.
- Roadway Weather Information System (RWIS) – devices that measure atmospheric, pavement, and/or water level conditions.
- System Loops (SDET) – midblock vehicle detectors between signalized intersections in a connected adaptive signal system.
- Travel Time Sensor Type C – Bluetooth (TTSC) – Bluetooth detectors that are used to measure vehicle travel time along a corridor.
- Traffic Volume System (TVS) – permanent count stations that record vehicle volumes.
- Weigh-in-Motion (WIM) – detectors that measure vehicle weight.

Figure 4: Vehicle Detection and DMS Locations on the Garden State Parkway



Legend

Monmouth County

State and Local Roads

Sensys/DMS Locations

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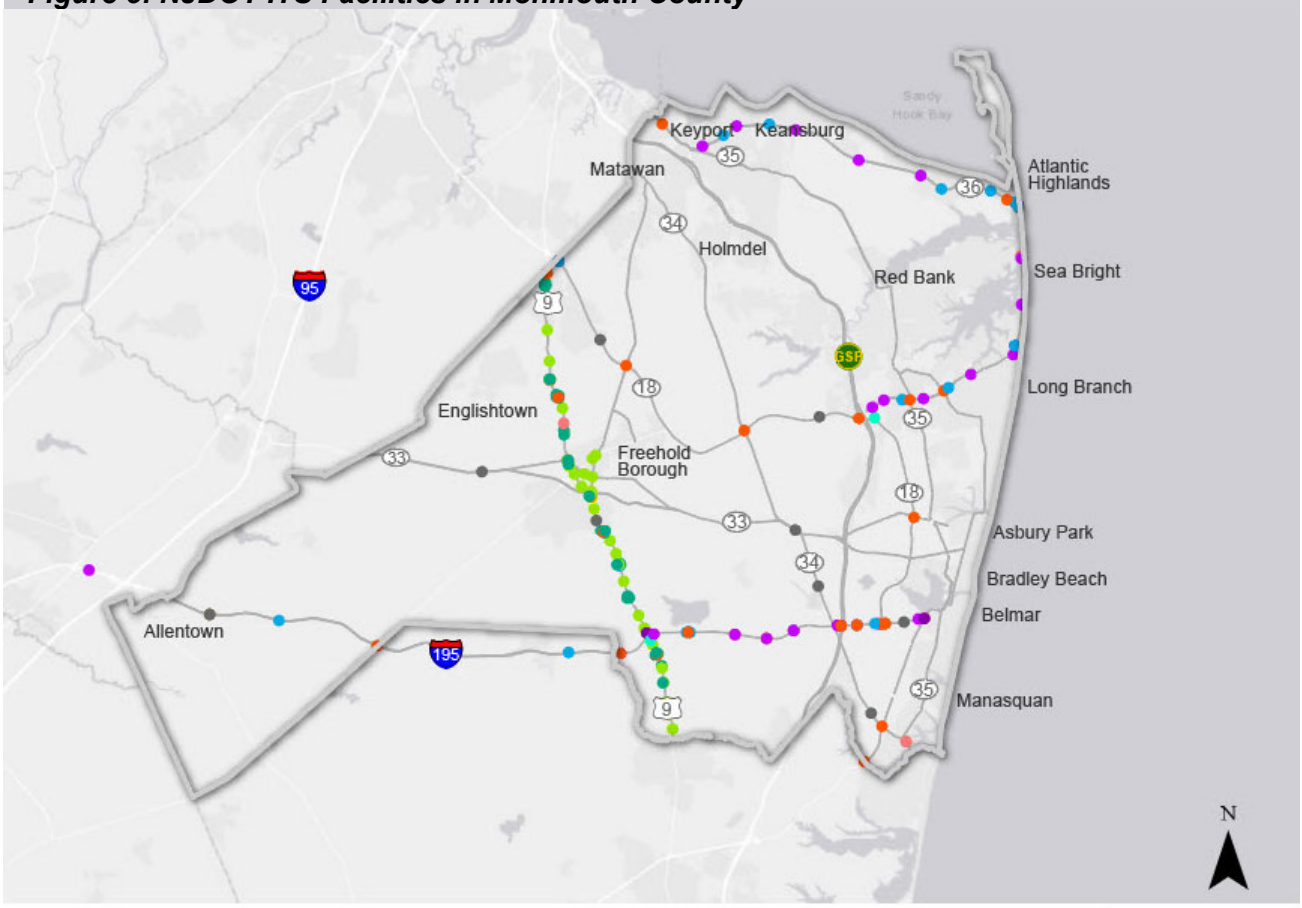
Figure 5: NJDOT ITS Facilities in Monmouth County



Legend

- Monmouth County

Device Type

- Camera Surveillance System (CSS)
- Controlled Traffic Signal System Device (CTSS)
- Dynamic Message Sign (DMS)
- Fiber Optic Cable Conduit (FOCC)
- Communication Hubs (HUB)
- Roadway Weather Info System (RWIS)
- System Loop (SDET)
- Travel Time Sensor Type C (TTSC)
- Traffic Volume System (TVS)
- Weight in Motion (WIM)

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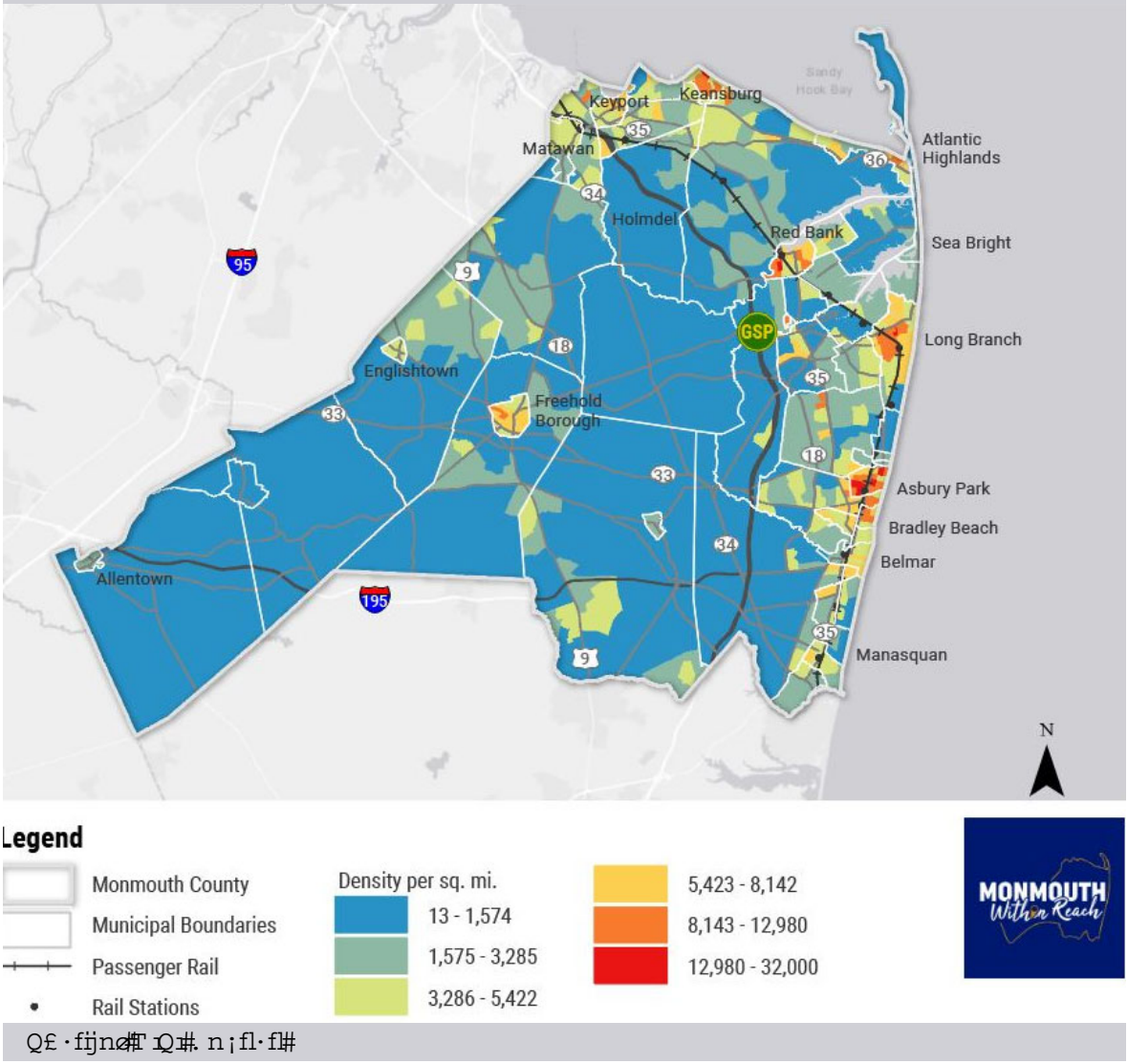
Environmental Justice Assessment

Study Area Demographics

This section examines the population make up of Monmouth County, NJ by census block group. Monmouth County has a total land area of 472 square miles which includes 27 miles of Atlantic Ocean coastline and 26 miles of Raritan Bay coastline. The County is situated on the Atlantic Seaboard between New York City and Philadelphia. The County is home to 53 municipalities, ranging from 0.1 square miles (Shrewsbury Township) to 62.1 square miles (Howell Township). With a total population of over 623,000, the population density is approximately 1,321 people per square mile, with municipal totals ranging from 242 residents in the Village of Loch Arbour to 65,475 residents in Middletown Township (**Figure 6**).

Figure 6: Monmouth County Population Density by Census Block Group



According to data collected from U.S. Census American Community Survey, Monmouth County was ranked as the 41st wealthiest county in the United States, with 25.7 percent of households earning more than $150,000 per year (2018).

Figure 7 provides general population statistics for the County. Tables 4 through 8 compare the Population, Poverty Levels, English Proficiency, Minority Populations, Populations Over 64, and Households with No Vehicles to the NJTPA region and the entire state. Based on the comparison, Monmouth County Residents are more affluent and have a smaller percentage of population with limited English Proficiency. The age of the population is consistent with the state and NJTPA region and more Monmouth County households have access to a vehicle.

Figure 7: General Makeup of the Population of Monmouth County

Population by Race			
Total	627,551	100%	0
Population Reporting One Race	615,160	98%	5,021
White	515,213	82%	1,431
Black	45,144	7%	1,196
American Indian	967	0%	222
Asian	34,255	5%	570
Pacific Islander	249	0%	91
Some Other Race	19,332	3%	1,511
Population Reporting Two or More Races	12,391	2%	1,171
Total Hispanic Population	66,481	11%	0
Total Non-Hispanic Population	561,070		
White Alone	473,037	75%	319
Black Alone	42,037	7%	856
American Indian Alone	463	0%	167
Non-Hispanic Asian Alone	34,053	5%	547
Pacific Islander Alone	199	0%	74
Other Race Alone	1,533	0%	530
Two or More Races Alone	9,748	2%	928
Population by Sex			
Male	305,192	49%	123
Female	322,359	51%	123
Population by Age			
Age 0-4	31,705	5%	49
Age 0-17	137,851	22%	1,247
Age 18+	489,700	78%	2,779
Age 65+	101,128	16%	1,662

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Purpose of the Environmental Justice (EJ) Needs Assessment

Equity is an important topic as it relates to transportation improvements. Historically, Environmental Justice (EJ) and Title VI communities have been underrepresented in decision making related to the location of public infrastructure projects and services and are disproportionately exposed to their

negative impacts. In order to avoid this, equity will receive considerable focus throughout the Monmouth Within Reach study. Title VI of the Civil Rights Act of 1964 prohibits discrimination within Federally assisted programs based on race, color, or national origin. Environmental Justice refers to an Executive Order to address non-discrimination by federal agencies as it relates to low-income and minority populations, assuring fair treatment and meaningful engagement.

The purpose of this Environmental Justice Needs Assessment is to identify concentrations of traditionally underserved populations, such as low-income, minority, limited English proficient, older than 64, and zero vehicle household populations in Monmouth County, the study area. The analysis will be used to identify any locations within Monmouth County that may be adversely or disproportionately impacted by tourism and/or event-related congestion as well as the proposed improvement strategies. In addition, the study will ensure that outreach materials, such as the study website and survey, are tailored to incorporate environmental justice populations by eliminating barriers to their participation in the study process.

This study examined the demographic characteristics of Monmouth County and will be further refined as individual study areas are identified. For this study, federal regulations on Environmental Justice were utilized as the basis for defining and evaluating area demographics.

Legislation

The concept of Environmental Justice is rooted in Title VI of the Civil Rights Act of 1964, which prohibits discrimination based on race, color and national origin, and the National Environmental Policy Act (NEPA) of 1969 which requires federal agencies to integrate environmental values into their decision-making processes. Presidential Executive Order 12898 (EO 12898) of February 11, 1994 further focused federal agency attention on these issues with respect to minority and low-income populations.

The U.S. Department of Transportation (DOT) and the Federal Highway Administration (FHWA) provide guidance to ensure compliance with EO 12898 in the following documents. Both documents describe the process for incorporating environmental justice principles into all existing programs, projects, and activities under their respective authorities.

- Final DOT Environmental Justice Order (Order 5610.2(a)), updates to original 1997 Order 5610.2
- FHWA Actions to Address Environmental Justice in Minority Populations and Low-Income Populations (Order 6640.23A), updates to original 1998 Order 6640.23

Evaluation Process & Definitions

This EJ assessment follows the definition of minority population as set forth by the U.S. Department of Transportation and the U.S. Census. This population also includes geographically dispersed or transient persons, such as migrant workers or Native Americans, if circumstances warrant. US DOT defines minorities as any persons belonging to any of the following groups:

- Black, Not of Hispanic Origin – A person having origins in any of the black racial groups of Africa.
- Hispanic – a person of Mexican, Puerto Rican, Cuban, Central or South American or other Spanish culture or origin, regardless of race.

- Asian American – a person having origins in any of the original peoples of the Far East, Southeast Asia, the Indian subcontinent, or the Pacific Islands.
- American Indian and Alaskan Native – a person having origins in any of the original people of North America and who maintains cultural identification through tribal affiliation or community recognition.

US DOT defines low-income as those having "household income at or below the Department of Health and Human Services poverty guidelines", which is comparable to an annual income below the annual statistical poverty threshold as determined by the U.S. Census Bureau's Current Population Reports, Series on Income and Poverty.

In identifying minority and low-income populations, care will be taken that "pockets" of minorities and low-income individuals are not masked by aggregated data. Every reasonable effort will be made to determine the existence and location of minority and low-income communities within the study's reach. In addition, neighborhood and community boundaries will be considered in all project development activities, whether or not minority or low-income populations are present.

This study considered the following factors in determining the EJ impacts:

1. Low-Income
2. Limited English Proficiency
3. Minority Populations
4. Place of Birth
5. Population over 64 years
6. Zero Vehicle Households

Information used in this report was acquired from the American Community Survey (ACS) (www.census.gov/programs) and the EPA's EJ Screen: Environmental Justice Screening and Mapping Tool.

Environmental Justice Factors

Low-Income

While Monmouth County ranks 41st in the ranking of wealthiest counties in the U.S., nearly 37,000, or 6 percent of households have income below the poverty level. This is lower than the State average of 10 percent (see Table 4). US DOT defines low-income as those having "household income at or below the Department of Health and Human Services poverty guidelines," which is comparable to an annual income below the annual statistical poverty threshold as determined by the U.S. Census Bureau's Current Population Reports, Series on Income and Poverty ($20,160 in 2016 for a family of three).

In identifying minority and low-income populations, care will be taken that "pockets" of minorities and low-income individuals are not masked by aggregated data. Every reasonable effort will be made to determine the existence and location of minority and low-income communities within the study's

reach. This will be accomplished by reviewing recommendations using detailed demographic information for each location, which will help ensure that these “pockets” are not overlooked.

Table 4: Percentage of Population Below Poverty Level

Monmouth County	6%
NJTPA Region	6%
New Jersey	10%

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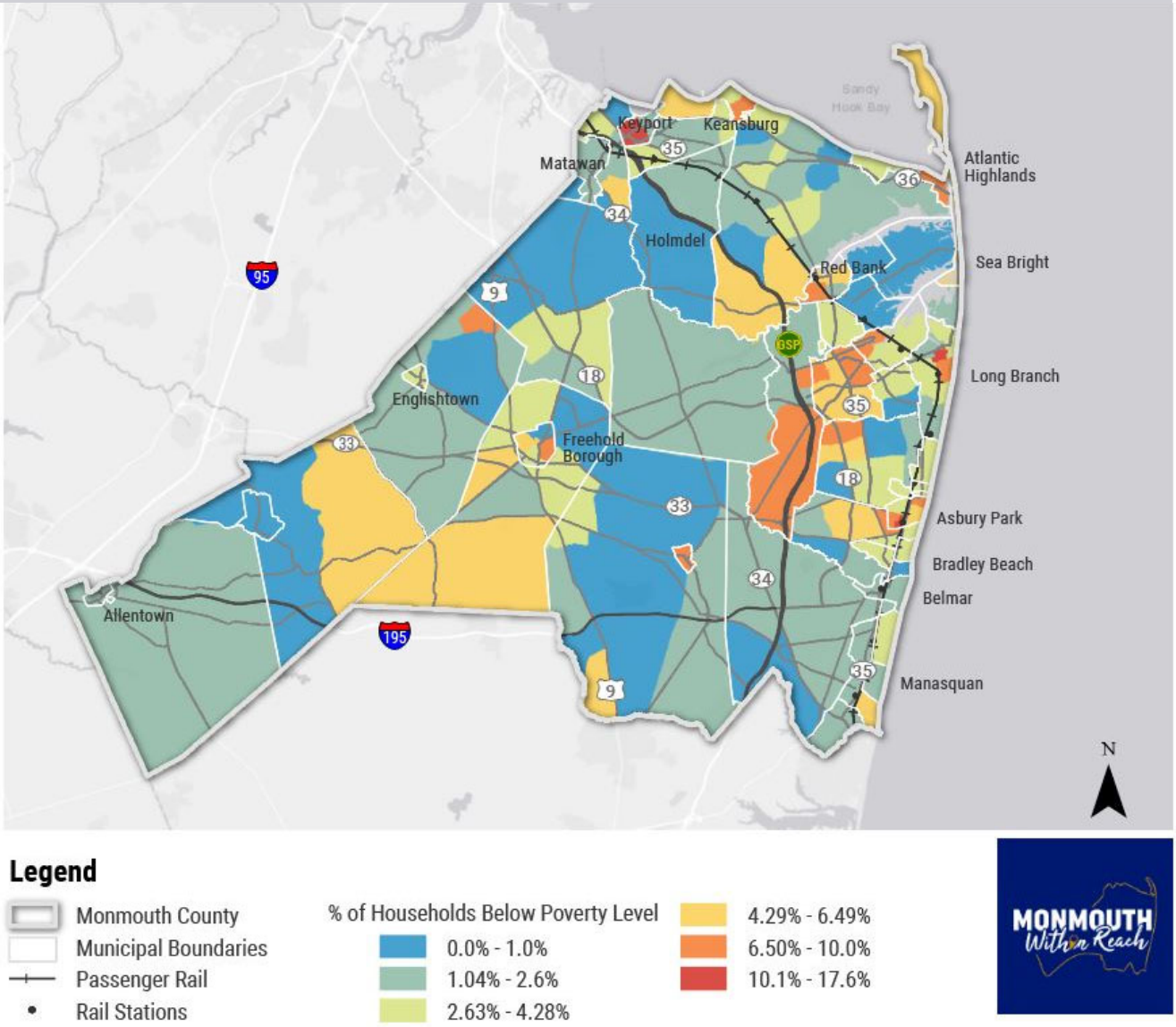
Figure 8 shows the percentage of households below the poverty level by census block group. The towns of Union Beach, Keansburg, Long Branch, Asbury Park, and Freehold have the highest concentrations of low-income population in the County. Some of these towns also tend to experience a significant increase in tourism and event-related congestion during the peak summer season, as well as for events, such as the Monmouth County Fair. Low-income households may not have access to the internet at home to view the study website or participate in the survey. To combat this, the website and survey are able to be viewed utilizing a mobile device. In addition, consideration to low-income populations should be given when discussing potential strategies, such as parking policy and fee changes, which may disproportionately impact these communities.

Figure 8: Percentage of Households Below Poverty Level by Census Block Group



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Limited English Proficiency

Approximately 5 percent of Monmouth County residents are considered to have limited English proficiency, which is below the NJTPA region and the state averages (see Table 5). **Figure 9** depicts where the percentage of the population with limited English proficiency reside by census block group. Similar to the poverty level analysis, areas of Keyport, Union Beach, Red Bank, Long Branch, Asbury Park, and Freehold have some of the highest percentages of population with limited English proficiency in the County. Spanish is spoken in these areas (per EPA's EJ Screen: Environmental Justice Screening and Mapping Tool). In anticipation of this, the study website, survey, and other outreach materials have been made available in English and Spanish.

Table 5: Percentage of Linguistically Isolated Households

Monmouth County	5%
NJTPA Region	8%
New Jersey	7%

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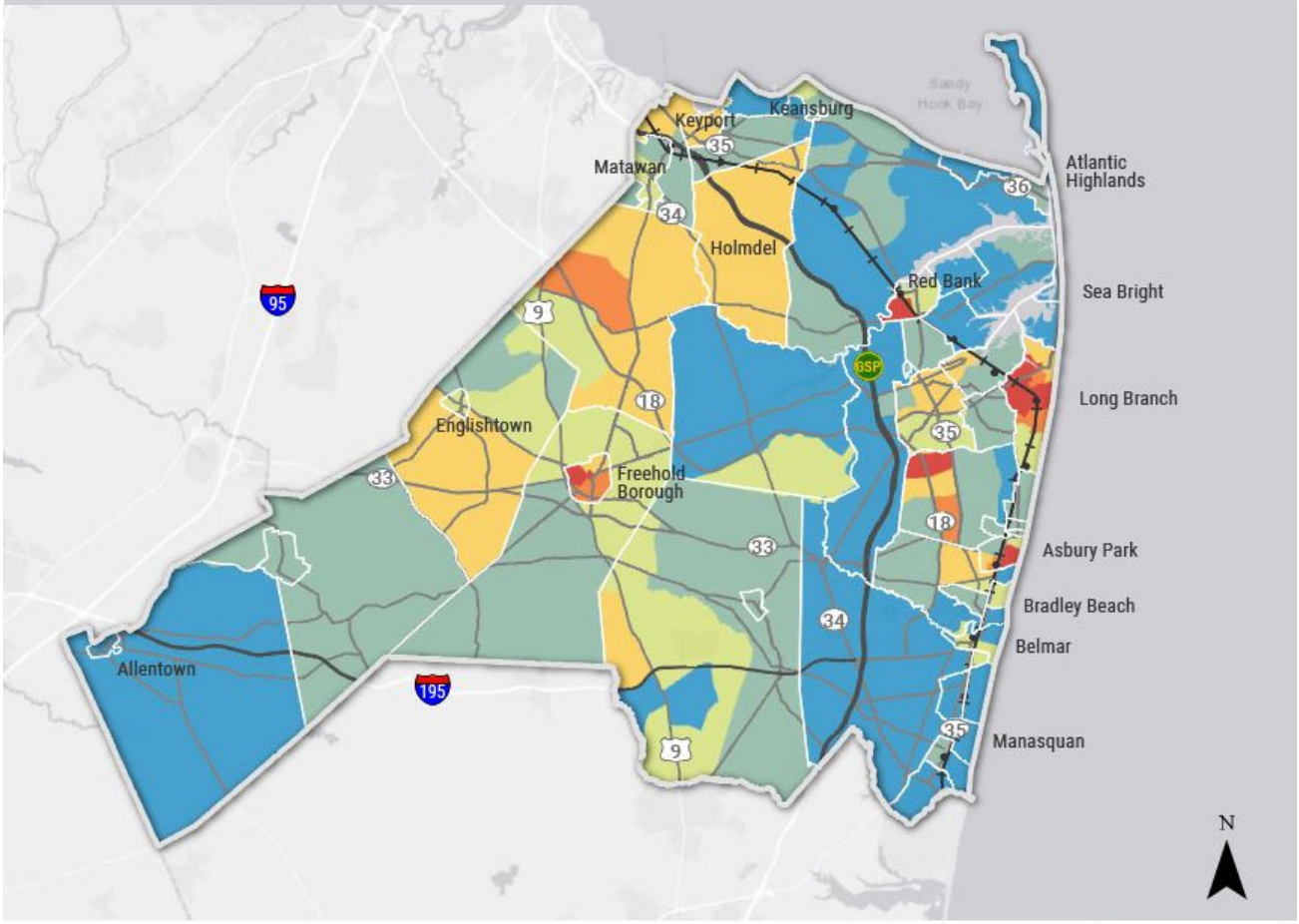
Figure 9: Percentage of Non-English-Speaking Households by Census Block Group



Legend

- Monmouth County
- Municipal Boundaries
- Passenger Rail
- Rail Stations

% Non English Speaking

- 1.9% - 10.4%
- 10.5 - 19%
- 19.1% - 30%
- 30.5% - 52%
- 52.6% - 87%
- 87.1% - 100%

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Minority Populations

Monmouth County has a population consisting of 74.9 percent White, 11.1 percent Hispanic, 6.7 percent Black and 5.3 percent Asian (see Table 6). **Figure 10** illustrates where the highest concentration of minority populations live in Monmouth County. Again, areas of Keyport, Union Beach, Red Bank, Long Branch, Asbury Park, and Freehold have some of the highest percentages of minority population. Any projects near or affecting travel in these areas must be cognizant of these populations, particularly as it pertains to modifications to transportation infrastructure, parking policies, and transit service.

Table 6: Percentage of Population by Race

	White	Hispanic	Black	Asian	Other
Monmouth County	75%	11%	7%	5%	2%
NJTPA Region	60%	18%	13%	7%	2%
New Jersey	55%	20%	13%	10%	5%

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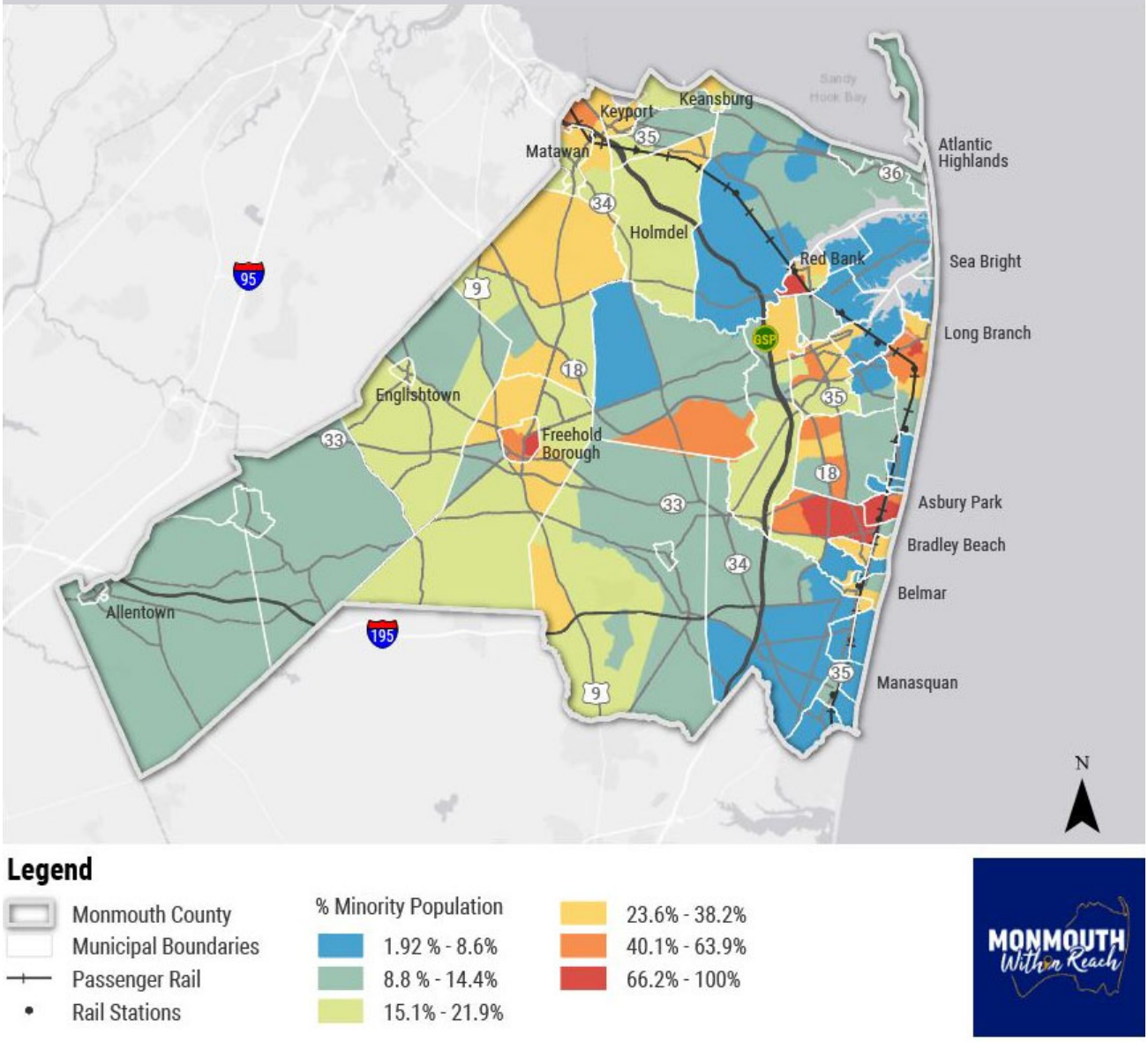
Figure 10: Percentage of Minority Population by Census Block Group



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Place of Birth

Approximately 13% of Monmouth County residents are foreign-born, with 70% being naturalized citizens and 30% not a citizen of the United States. Of the 13% that were not born in the United States, 38% were born in Latin America, 31% were born in Asia, and 25% were born in Europe.

In identifying minority populations, care will be taken that “pockets” of individuals were are foreign-born. Every reasonable effort will be made to determine the existence and location of foreign-born communities within the study’s reach. This will be accomplished by reviewing recommendations using detailed demographic information for each location, which will help ensure that these “pockets” are not overlooked.

Table 7: Place of Birth

	Monmouth County	NJTPA Region	New Jersey
Europe	25%	11%	14%
Asia	31%	31%	32%
Africa	5%	5%	6%
Oceania	0%	1%	0%
Latin America	38%	51%	47%
Northern America	1%	1%	1%

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Population Over the Age of 64

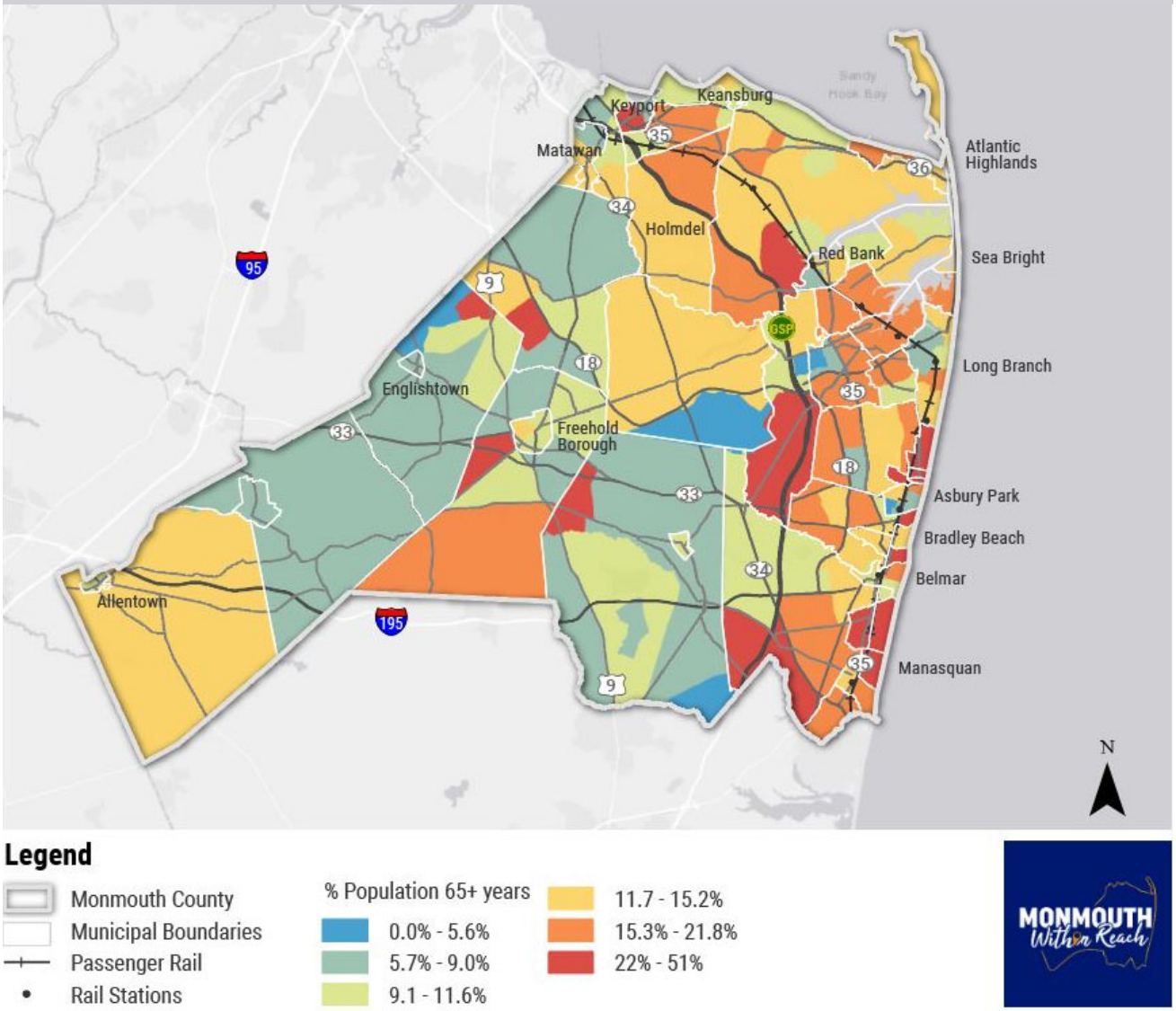
Monmouth County is now the home to numerous retirement communities. Approximately 16 percent of the population is over 64, which is equal to that of the NJTPA region and the state (Table 8). **Figure 11** shows the population over the age of 64 by census block group. As can be seen in the figure, there are significant concentrations of older populations on the east side of the County, and in areas that are impacted by seasonal tourism and event traffic. Thus, the Project Team will be cognizant of concentrations of these populations when making recommendations to the transportation and mobility infrastructure.

Table 8: Percentage of Population Over the Age of 64*

Monmouth County	16%
NJTPA Region	16%
New Jersey	16%

* Source: American Community Survey (ACS) (www.census.gov/programs)

Figure 11: Percentage of Persons Aged 65 and Older by Census Block Group



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Households with No Vehicles

Figure 12 shows the percentage of occupied housing units that report no vehicles available by census block group. Residents of these housing units must rely on alternative means of transportation including walking, bicycling, ride share, and other options. Approximately 6 percent of households in the County do not have access to a vehicle. This is about half of the NJTPA region (12 percent) and the state (11 percent) (Table 9). Data for four census block groups located in Asbury Park, Freehold Borough, Red Bank, and Long Branch indicated a minimum of one in three occupied housing units have zero vehicles available. For projects that may be located in these specific areas and others where there are high numbers of households who have no access to personal vehicles, consideration will be given to impacts to transit services, in particular. Enhancing transit service, particularly on weekends, as part of the recommendations of this study would benefit these populations. However, reducing or eliminating existing transit services to a low auto-ownership area should be avoided.

Table 9: Percentage of Households with No Vehicles

Monmouth County	6%
NJTPA Region	12%
New Jersey	11%

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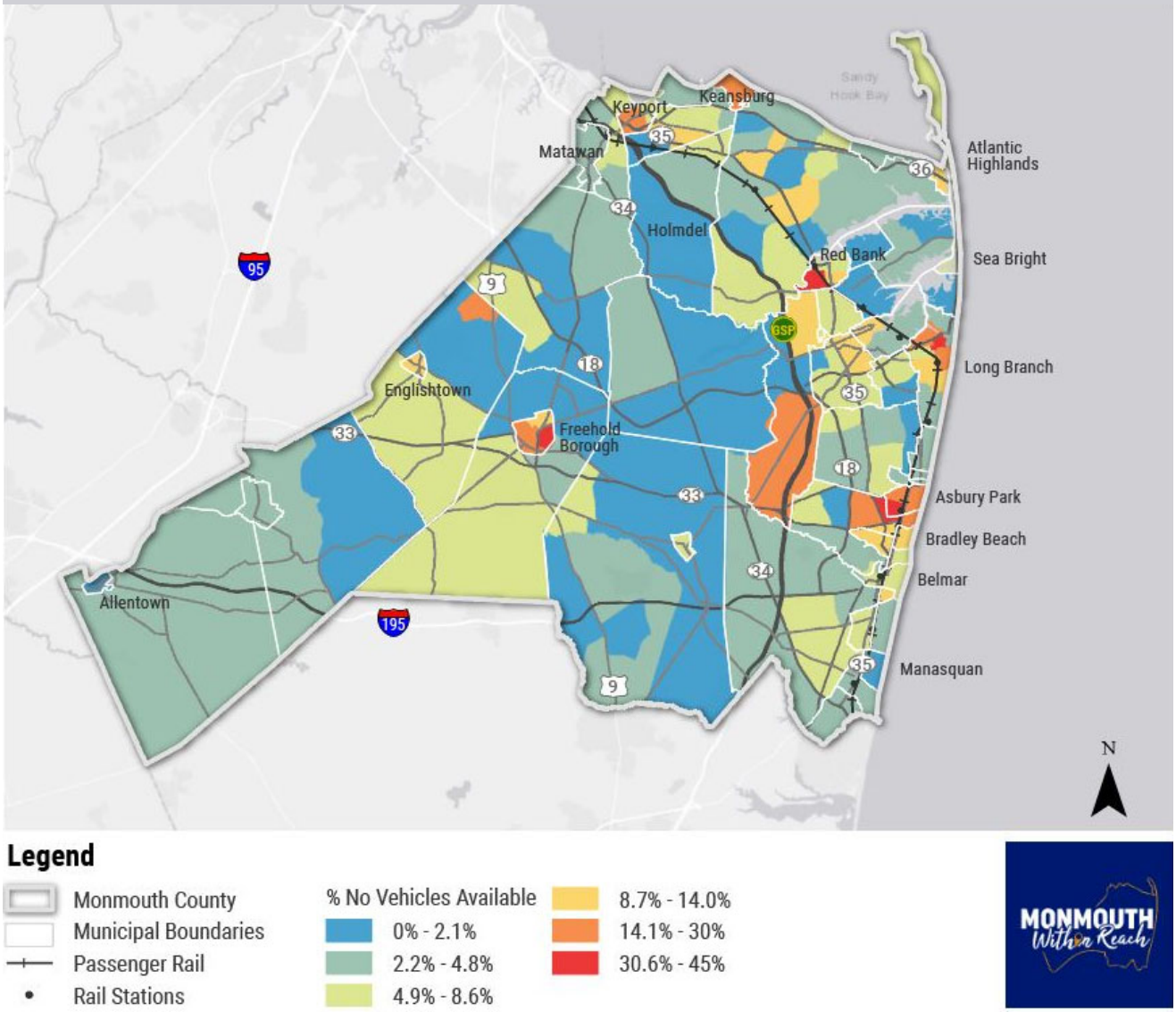
Figure 12: Percentage of Occupied Housing Units with No Vehicle Available by Census Block Group



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Conclusions

As the study progresses and projects are defined, the Project Team will consider the needs of all the identified populations (e.g., minority, low-income, limited English proficiency and senior populations) when conducting outreach (website and survey) and when making recommendations. The data summarized in this report indicate that many areas that experience higher impacts due to tourism and event-related traffic, including Asbury Park, Keyport, Union Beach, Red Bank, Long Branch, and Freehold Borough, also have relatively high concentrations of EJ populations compared to the rest of Monmouth County. Therefore, the selection of locations to study further and the resulting recommendations must consider the needs of these populations. In particular, the study should consider how various Travel Demand Management (TDM) strategies can be leveraged to provide a benefit to both visitors and EJ populations and ensure that recommendations do not disproportionately affect these communities.

Literature Review

A literature review was conducted to establish an understanding of the study area through a review of relevant previous studies conducted in the County, as well as to inform the development of the future mitigation plans by reviewing best practices in event and tourism TDM.

Previous County and Subregional Studies

Western Monmouth CR 537 Study (January 2004)

The goal of the Western Monmouth County Route 537 Corridor Study was to establish an action plan to help address the changing balance between land use development and transportation needs along the CR 537 corridor. The Western Monmouth County Route 537 Corridor Study assembled a Project Team composed of several Monmouth County Engineering and Planning divisions with a range of expertise in land use, transportation, environmental, development review and long-range planning capabilities. The study area extended from Six Flags in Ocean County to Freehold.

A baseline and future conditions assessment revealed that there are several location-specific issues in the study area. These issues include but are not limited to:

- Heavy traffic volumes and high travel speeds;
- Multiple intersections operating at or near capacity;
- Inefficient and undesirable operating conditions;
- Relatively high number of crashes;
- Limited public transportation service to key activity centers, such as Freehold Raceway Mall and Centra State Medical Center, and undesirable transit facility conditions; and
- Pedestrian facility issues, including gaps in the sidewalk system, unidentifiable pedestrian crossings, and missing pedestrian signage/signals.

Recommended improvements vary by location and include:

- Travel lane, roadway signage, and signal improvements;
- Roadway/bridge widening and restriping;
- Roadway realignment and interchange/intersection modifications;
- Transit enhancements; and
- Pedestrian improvements.

Monmouth County Coastal Evacuation Routes Study (June 2009)

Monmouth County has taken measures to mitigate the harm from coastal flooding and those efforts have been primarily based on existing flood records, as well the possibility of increased flooding caused by climate change. As part of its overall effort to further protect residents and visitors from the hazards of coastal flooding, Monmouth County's Planning Board undertook a one-year study to evaluate how the current coastal evacuation route system can be improved and possibly expanded to

help move people away from the flood zones before an emergency occurs. The study involved the following tasks:

- Identifying a set of routes that would bring people from a hazardous (flood) zone to a safe area;
- Examining physical and operational problem areas and spots that could be targeted for improvements; and,
- Proposing near-term, intermediate, and long-range solutions.

The purpose of the report is to be used by the County and Municipalities to plan and program operations and system improvements that will make evacuation from flood areas safer and more efficient. The evaluation shows what problems can be expected during a flood evacuation and what projects and actions can be taken to reduce those problems. The information allows government agencies to consider implementation or programming. Each suggested improvement covers the problem (flooding or capacity), the specific location, the improvement type, an estimated cost, an estimated time frame, and the lead agency. Improvements range from showing where police might be dispatched to control a specific intersection during an evacuation, to reconstruction of bridges and widening of roadways to make them more flood-proof or to handle increased evacuating traffic.

The study identified twelve portal routes, some of which were already part of existing evacuation routes, to provide dedicated facilities for coastal and flood area evacuations. These twelve routes include:

- CR 39 between Florence Avenue and NJ 36
- CR 7/CR 56 between Beachway, Campview Point and NJ 36
- NJ 36 between Highlands Bridge Over Shrewsbury River and the Garden State Parkway
- CR 516/CR 50 between NJ 36 and NJ 35
- CR 8A/12A/12
- CR 520 between Ocean Avenue and the Garden State Parkway
- NJ 36 (near Oceanport) between the NJ 36/CR 57 junction and the Garden State Parkway
- Park Avenue between NJ 71 and NJ 18
- CR 16 (Asbury Avenue) between NJ 71 (Main Street) and GSP and NJ 66 between CR 16 (Asbury Avenue) and NJ 33
- NJ 33 between NJ 71 (Main Street) and NJ 34
- CR 524 between NJ 71 and I-195
- CR 524 Spur between NJ 35 and CR 524.

A toolbox of improvement strategies was developed for the twelve routes that include capacity improvements, safety enhancements, and improvements to drainage.

Coastal Monmouth Plan (August 2010)

The Coastal Monmouth Plan (CMP) was initiated by the Monmouth County Planning Board (MCPB) to develop a plan for the future development and natural resource conservation of the County‘s Atlantic

coastal region. The goal of the study is to plan for sustainable development, balancing growth with protecting the unique environmental resources of the Coastal Monmouth Region (CMR). Working collaboratively with regional stakeholders, five major issue areas were identified: Regional Cooperation, Housing, Economy, Transportation and the Environment.

The following transportation-related issues and recommendations are included in the study:

- Address roadway congestion. The roadway segments of Route 36 (MP 0.00 - 5.78), Route 138 (MP 0.00 - 3.52), Route 66 (MP 0.00 - 3.62), and Route 35 (MP 12.93 - 43.11) were noted to be congested state highway locations. These segments experience a considerable amount of congestion, which in turn causes motorists to utilize local roadways as cut-throughs to circumvent bottlenecks. This disrupts resident's quality of life, decreases safety, and causes traffic congestion that cannot be handled at local intersections. Furthermore, as seen in the population projections for the CMR, the traffic volumes on these state corridors will continue to grow.
- Improve train service. The length of trip time to and from major destinations and employment centers like Manhattan, especially with the transfer at Long Branch and delays in the schedule, were noted by municipal representatives to be too long. Specific improvements include decreasing train headways, improving crossings and increasing train capacity. The proposed use of dual engine locomotives to eliminate the need for the transfer between electric and diesel trains would reduce travel delays and provide a one-seat ride.
- Improve bus service. Specifically, improved bus service was identified as a need in the Two Rivers area (Navesink River and Shrewsbury River).
- Improve local alternative transportation services, including ferry service, water taxis, shuttles, jitneys, pedicabs, carsharing, and bike rentals. These service modes should be coordinated and are considered an important element to support the CMR economic objectives.
- Increase waterborne transportation opportunities. This also includes improvements to transit service between Sea Bright and Monmouth Beach to the existing ferry services currently operating from the Highlands and Belford to New York.

Monmouth County Transportation Audit and Sustainable Transportation Plan (June 2011)

The Monmouth County Transportation Audit and Sustainable Transportation Plan was prepared to help Monmouth County understand the contribution of transportation-related greenhouse gas emissions (GHG) to climate change, inventory the transportation-related GHG emissions related to county government operations and the county as a whole, and develop recommendations for reducing GHG emissions. The project also included the creation of a "toolbox" to assist Monmouth County municipalities with undertaking their own GHG emissions inventories and emissions reduction planning activities.

This study addressed the transportation-related GHG emissions from the Monmouth County's vehicle fleet, employee commuters and the Monmouth County transportation system as a whole. The 2009 base year emissions estimates prepared as part of this study provides an important benchmark against which the relative success of future energy consumption and GHG reduction activities can be measured. The study also provided a comprehensive review of the available strategies, policies and projects that could be considered to reduce transportation-related GHG emissions. The GHG mitigation options considered included changes in fleet management practices and incentives to

encourage the use of alternative transportation by county employees. Monmouth County also developed a prioritized list of recommended planning and alternative transportation projects to reduce GHG emissions. The results of this study will be useful not only to Monmouth County government, but will also aid in the GHG mitigation efforts of Monmouth County's municipalities. This study included the development of "toolbox" of resources and guidance to assist municipalities in planning, funding and implementing their own transportation-related GHG emissions reduction efforts.

BRT Opportunities Report (January 2015)

This study provides an overview of BRT features and strategies that could potentially be implemented as a means of enhancing existing bus transit service. While a full-fledged BRT system may not be immediately realistic or feasible in Monmouth County, many of the features and strategies commonly associated with BRT systems, such as queue jumpers, transit signal priority, limited stops, etc., could enhance the existing transit system. Additionally, the study examines existing and potential future transit nodes to identify those suitable for further development. The process of developing these nodes in the future would include cost-benefit calculations and estimates ridership increases. If potential features and strategies show positive economic and ridership value, then they could be implemented using a phased approach combining BRT features at transit node locations with BRT features and strategies on bus transit operations. Together, as improvements progress the overall bus system could start to resemble a modern BRT system.

To identify the range of possible BRT features, the Project Team conducted an analysis of the existing strengths and weaknesses, future opportunities, and threats (SWOT) associated with bus service in Monmouth County. Factors were categorized as either impacting the transit service, physical characteristics, or socio-economic conditions. Strong ridership on commuter bus services, extensive coverage of the local bus network, and concentrated areas of residential and commercial development were cited as strengths. The overall lack of frequent service with high-quality passenger amenities and the long distance and travel times between some destinations were notes as weaknesses. Future opportunities to improve bus transit include investing in new amenities, testing more frequent service, and developing new partnerships.

The analysis provided the basis for the five main recommendations in the study:

- Invest in bus transit – focus investments that result in higher ridership and improve the cost-effectiveness of the service.
- Enhance local bus service – increase frequency and hours of operation and expand some service to operate on Sundays.
- Add BRT features system-wide – add BRT features such as enhanced stations/stops, passenger amenities, improvements to station access, dedicated bus lanes, queue jumps, transit signal priority, modern vehicles, etc., as funding becomes available and build toward a modern BRT system over time.
- Develop future bus transit nodes – develop transit nodes that can serve as the backbone for a future BRT service. Potential nodes include locations such as Asbury Park, Freehold, Long Branch, Red Bank, Aberdeen Matawan, and Keansburg.
- Integrate bus transit into the Master Plan – include bus transit in the transportation, land use, and other elements of the Master Plan.

Monmouth County Master Plan – Transportation & Mobility 2016

The Monmouth County Master Plan has identified multiple transportation goals for the county. They are as follows:

- Continue to develop and implement regional corridor studies through New Jersey Transportation Planning Authority's (NJTPA) Subregional Studies Program (SSP) and work with other county departments and agencies in identifying viable SSP and pilot projects with NJ TRANSIT and NJTPA that further the Goals, Principles, and Objectives (GPOs) of the Monmouth County Master Plan, the Monmouth County Comprehensive Economic Development Strategy (CEDS) (2014), and the county's capital improvement needs.
- Finalize, disseminate, and maintain the Monmouth County Transit Map and create a Monmouth County Multimodal Transportation Guide.
- Work on implementing recommendations found in the Monmouth County Bus Rapid Transit Opportunities Study (2015) to improve bus service along critical corridors in Monmouth County, and eventually expand upon these efforts toward the development of a complete Bus Rapid Transit (BRT) approach.
- Proceed with efforts to develop a Travel Demand Model (TDM) to assist the county and the New Jersey Transportation Planning Authority (NJTPA) in coordinating regional and subregional transportation planning studies and projects.
- Review and amend the Monmouth County Transportation Council's (MCTC) purpose and mission to align its programming with the Goals, Principles, and Objectives (GPOs) of the Monmouth County Master Plan.
- Provide an online "one stop transportation resource shop" for all transit information in the county including a geographic information system (GIS)-based, online mapping resource for the existing Monmouth County Bicycle Map, transit infrastructure and routes, and recreational resources.
- Coordinate planning activities with the Monmouth County Department of Public Works and Engineering to help identify and prioritize transportation-related projects and assist with developing and implementing the county's capital improvement program.

NJTPA Inventory and Assessment of Waterborne Transportation Resources Study December 2016

The North Jersey Transportation Planning Authority (NJTPA) initiated an assessment of the region's critical land resources to support waterborne freight and passenger transportation in August 2015. The study was completed in December 2016. In Monmouth County, overflow alternatives to Belford/Harbor Way Ferry Terminal were suggested in the Town of Long Branch and Earle Naval Base in Colts Neck.

Relevance to the Monmouth Within Reach Study

Although the above referenced studies are not directly related to event and tourism-related traffic, many of the issues and recommendations identified in these studies, such as roadway congestion spilling over to local streets, the need for improved/expanded transit services, improved mobility options (shuttles, bikeshare, carshare, etc.), are directly applicable to event and tourism management.

For example, enhancing transit services can make it easier for visitors to get to popular destinations, and local mobility options can provide the ability for visitors to move around tourist areas without needing a car. The Monmouth Within Reach Study will consider the needs and recommendations from these studies in the development of the mitigation plans.

Review of Best Practices

Synthesized FHWA documents and other studies are summarized below. This section will also describe how the strategies and recommendations developed in these studies will be used to develop improvement strategies for Monmouth County.

Studies Conducted by Others

Travel Choices and Links to Transportation Demand Management: Case Study at Ohio State University

(Akar, Fynn, Namgung, Transportation Research Record January 2012)

This research found that in a university campus context proximity to bicycle lanes and trails and bus stops increased the propensity to choose these modes. Students were more likely to travel by alternative modes than faculty and staff members. Individuals concerned about travel time, flexibility of departure time, safety, and the ability to stop on the way to and from campus were more likely to drive alone to campus.

www.mobilitylab.org

Mobility Lab is a research and communications center funded through a number of public agencies in Virginia to measure impacts of TDM strategies in Arlington County VA. As they note, "TDM is a strategy many places dabble in, but few have comprehensive programs." #

They cite seven parts to a strategy ranked from least powerful to most impactful:

7. Information

6. Marketing business benefits to employers

5. Comprehensive Programs with mutually reinforcing services

4. Incentives for transit and other modes

3. Disincentives for driving (such as congestion pricing and parking fees

2. Ordinances and development conditions

1. Trip caps of maximum average vehicle occupancy.

Arlington County, VA has an active TDM monitoring program that has five goals to change travel behaviors through 18 measures. In a 2015 review of regional TDM programs,

they found that CMAQ funding accounted for 59 percent of the funding totals but that research showed that people over 30 chose their modal travel based on factors that are not aligned with CMAQ requirements. The major factors were total travel time, travel time reliability, affordability and flexibility of the mode rather than traffic congestion or environmental impact.

Victoria Transport Policy Institute

The VTPI (» » » ı″ ‡« vı£ fit ¼‡l ~ ¼) has an encyclopedic list of TDM or mobility management measures listed against specific objectives or intentions. This online resource list every possible objective and corresponding TDM measures as well as the ranking of appropriateness to different stakeholders. The online encyclopedia lists options in four main categories:

1. Improves Transport Options
2. Incentives
3. Land Use Management
4. Policies and Programs

For tourism TDM, a best practices list states that planning should:

- Make it affordable, convenient, and enjoyable to visit a resort community without using a private automobile.
- Coordinate stakeholders (tourist agencies, transportation providers, hotels, resorts) to provide and promote car-free travel packages.
- Provide detailed information on the travel choices that are available and how to use them.
- Take into account visitors' transport needs and preferences, including baggage requirements and the need to accommodate changing schedules.
- Provide benefits to visitors who arrive without a car, such as priority access for buses.
- Include Commute Trip Reduction programs to reduce employee trips.
- Create functional and attractive pedestrian and cycling facilities.
- The website cites a number of pre-2005 international and North American studies and papers.

Transportation Demand Management: State of the Practice

(Nelson/ Nygaard, 2013 for Smart Growth America)

This baseline study for inclusion into several Detroit based plans (**https://smartgrowthamerica.org/app/legacy/documents/state-of-the-practice-tdm.pdf**) indicates that the leading practices from a city building perspective include:

- Integrated TDM programs across multiple employers and institutions closely coordinated with the municipality and transit authorities;
- Strong regional leadership and coordination of transportation demand management strategies, often including mode split targets with regular measurement and reporting of performance and progress;
- Pricing and incentives to influence mode choice and travel demand;

- Adoption of public policies that imbed transportation demand management (and predictability) into the land development process; and
- Broad and effective public outreach and promotion programs that not only improve the public's awareness of alternative modes, but actively assist them in their day to day travel planning and choices.

The study cites many of the standard parameters for success including a local champion, diversified alternate mode options, better decision-making information for trip planning, parking management, education and outreach, but is more focused upon daily commuters than single trip users who may be coming into Monmouth county.

Planning Transportation for Recreational Areas

(Anne Dunning, October 21, 2016, University of Kansas)

This seminar-based look at recreation areas notes the typical characteristics of tourist-focused areas where travel demand exceeds the ability of local governments to fund solutions through property taxes and the local general fund. The author notes that there are different travelers to consider (permanent, seasonal workforce and commuters, and metropolitan visitors) where typically more than 50 percent of travelers are visiting for the first time with an expectation of a vacation-quality service. She notes that peak activity typically occurs in summer or winter, on weekends, at mealtimes and at sunset. The National Park Service has a long-range transportation planning process to maintain and preserve their assets and the visitor experience that looks at investment versus prioritization and includes performance monitoring. One of the most underestimated aspects of planning is communication and providing information prior to the trip. Transit information and route structure should be as simple as possible to reduce confusion. Having one central hub from which multiple routes depart helped reduce visitor confusion in Acadia National Park, Maine. ITS information provide via websites and DMS was cited by 80 percent of those survey at the park with making a decision to use transit. The seminar's conclusions included the following:

- Recreational travelers are highly distracted but have high expectations of the transportation network.
- The scale of congestion is often out of scale with resources available to the permanent population.
- Locals have a heightened consideration for protecting natural and cultural resources.
- Planning processes need to allow engagement from those stakeholders who feel heavily invested in local stewardship.
- Communication is essential but undervalued.

FHWA Active Travel Demand Management Program Brief

FHWA has developed the concept of an active travel demand management (ATDM) toolbox, which consists of a series of strategies related to active demand management, active traffic management, and active parking management:

Active Demand Management	Active Traffic Management	Active Parking Management
Dynamic Ridesharing	Dynamic Lane Use Control	Dynamically Priced Parking
On-Demand Transit	Dynamic Speed Limits	Dynamic Parking Reservation
Dynamic Pricing	Queue Warning	Dynamic Way-Finding
Predictive Traveler Information	Adaptive Ramp Metering	Dynamic Parking Capacity

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Active demand management aims to change the total number of vehicles on the road during peak periods by encouraging guests to travel at off-peak times, on different routes, or via different modes. Active traffic management uses strategies to reduce traffic congestion, such as changing lane direction, warning travelers of upcoming queues, or ramp metering to restrict the number of vehicles allowed to enter a highway. Active parking management includes area-specific parking pricing or reservation strategies, in which sensors are used to provide travelers with information on their parking locations and options, occupancy, and routes, to minimize the time spent searching for available parking. This activity is one of the major contributors to congestion in urban areas, and at sports facilities or at resorts.

The ATDM Brief on the *International Influence on ATDM in the United States* focuses on the need to use dynamic signage and wayfinding to direct travelers to specific destinations and make them aware of congested routes and available alternatives.

The ADTM *Program Brief on Linking Demand Management and Traffic Management* includes analysis of traffic conditions and work zone activity to identify the worst-case scenarios, rather than typical event conditions. A range of scenarios are developed, from the worst-case scenario with severe weather and work zone impacts, to less severe scenarios with lesser impacts from these factors. Historical traffic trends determine seasonal adjustment factors. The trends also provide insights into the influence of major and/or special events (sports and concerts, marathons, major street closures for public festivals and parades, for example). While the output analyses identify the worst-case conditions, most analyses focus on mitigating typical conditions, since the improvements will likely improve all scenarios. It can be difficult for operators to implement multiple plans for multiple conditions.

The FHWA document *Mitigating Traffic Congestion: The Role of Demand-Side Strategies* categorizes these strategies as either demand-side or supply-side. Demand side strategies aim to change traveler behavior. This can be achieved using travel time incentives, financial incentives, marketing, and technology implementations. The key is to make travelers aware of these strategies, and to ensure that direct, personalized information can be provided to travelers where possible. Financial incentives can include telecommuting, transit, shared ride, or off-peak travel tax incentives for employers.

The FHWA desk reference on *Integrating Demand Management into the Transportation Planning Process* starts with creating an understanding of overall mobility patterns, to determine their influence on regional congestion during peak periods. This includes freight mobility, non-commuter trips (e.g., recreation, shopping, and school), travel outside the peak, and identification of less congested alternatives to the seemingly “best” option for traveling through a congested area. It can also include policies to encourage better sharing of information on real-time congestion, expected and unexpected road closures (e.g., due to inclement weather), and the use of custom roadway utilization strategies for highways, such as high-occupancy vehicle (HOV) or high-occupancy toll (HOT) lanes to disperse

and mitigate traffic congestion. App providers such as Waze, Google Maps, and rideshare companies such as Uber and Lyft should be part of the solution.

Park City Transportation Demand Management Final Report 2016

Undertaken by Fehr + Peers, this report focuses on two separate groups: residents and visitors for different programs. A peer review of Whistler, Aspen, Tahoe and Boulder found that most successful TDM programs were based on private/public partnerships rather than punitive measures. Key strategies focused upon cycling programs (bike share, trails, secure parking) and parking (regulation and pricing). The report also concluded that that the majority of standard TDM measures for resort areas had no peer reviewed research available.

Highlighted strategies included:

- Real time information
- Parking for rideshare, car and van pools
- Charter buses for larger events
- Transit priority
- Improved cycling facilities
- Curbside management for rideshare via hangtag permits
- The full report is available here: https://www.parkcity.org/home/showdocument?id=41938

Previous Event and Tourism Area Studies

Stantec has also prepared several reports that describe a combination of travel demand management strategies. Several documents published in the past two years are publicly available.

Belmont Arena Transportation Management Plan

Stantec recently authored documents for the redevelopment of a new arena for the New York Islanders adjacent to Belmont Park in Elmont, New York. This plan includes three sections, the first of which is a travel demand management plan that included strategies to reduce vehicular traffic volumes. This includes use of parking permits to encourage carpools, background traffic diversions, use of custom navigation apps like Waze, transit improvements, incentives to arrive early (outside the peak hour), and off-site park and ride operations. An operations plan shows the movement of vehicles, pedestrians, transit shuttles, and rideshare vehicles on the site, the location of parking areas, staff allocation, and traffic management strategies at key locations. The operations plan is intended to be a visual document that can be used by stakeholders to confirm the in-field operations matches the intended plan. Finally, a monitoring plan provides a framework for evaluating operations in the field, sharing the results, and developing adjustment measures as needed.

The plan, Belmont Park Redevelopment Project Transportation Management Plan, can be viewed here: » » » ınfll ı¡ ‰ ıt £ ”¼ flv ¥ nfl½ l nsa · }¾ sv} nfl½ « « n ¡ l v ‚ Î ¨ ˘ ? ı « l s

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Sarasota-Manatee Barrier Islands Traffic Study

The set of barrier islands (Coon Key, St. Armands, Lido Key, Longboat Key, and Anna Maria Island) that sit off of the Florida coast between Sarasota and Bradenton have long white sand beaches that make them an ideal tourist paradise. Between Thanksgiving and Easter there is an influx of visitors that make regular travel for residents to and from the islands via the three connecting points a major challenge. During the peak of The Season (from Thanksgiving through to Easter), traffic jams can take hours to resolve as people flock to the beaches and struggle to find adequate parking. Each Island has a distinct character but the connection between these islands becomes choked with traffic trying to find the best way on and off the islands.

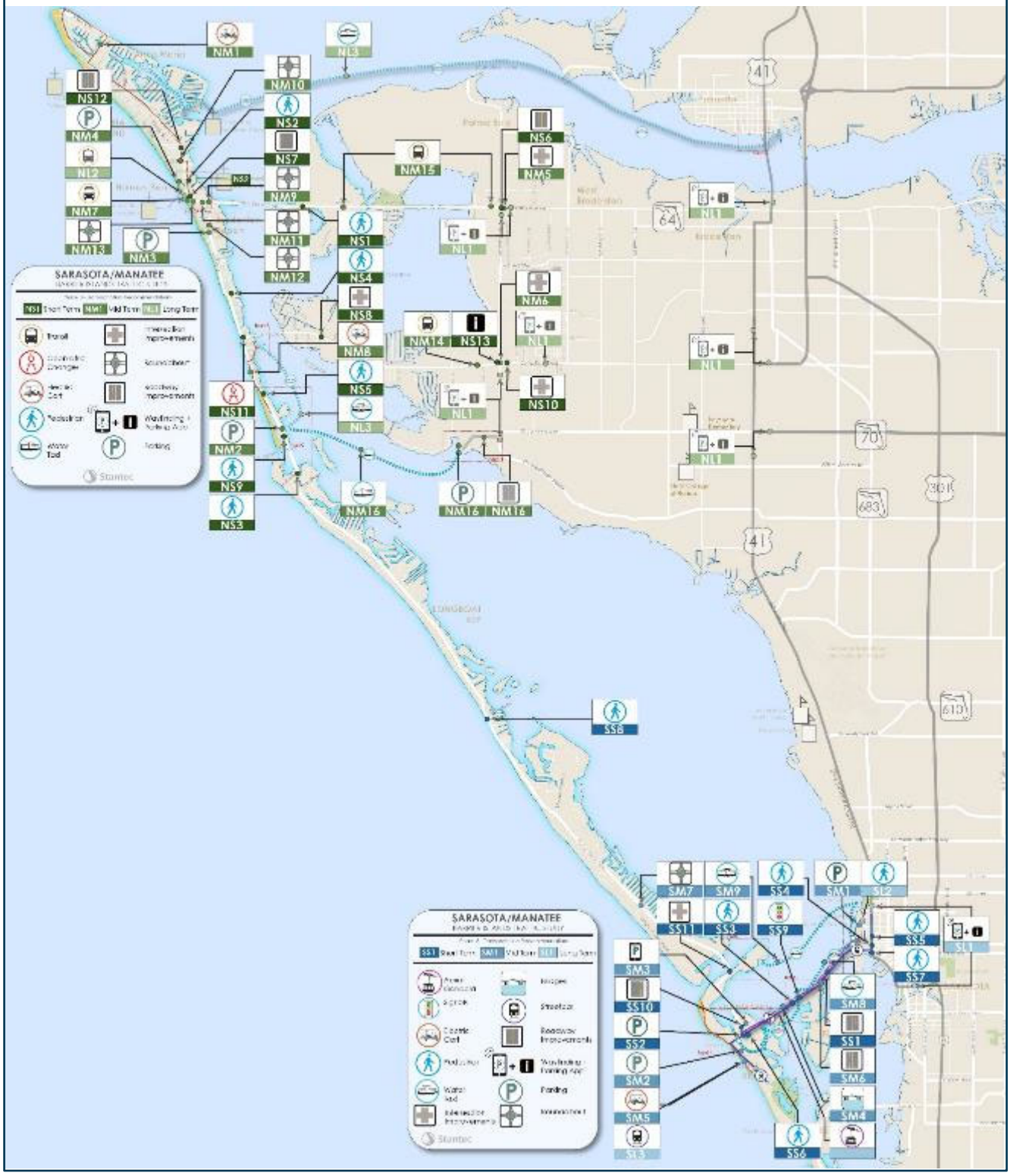
For this study, Stantec took a strategic, multimodal approach that stems from our transit master planning and major event/tourism approach to understand the potential solutions as a package of options rather than a single solution. Our goal was not to study the problem from an 'we can build our way out of the problem' viewpoint, as had been done on many occasions in the past, but to find real solutions that can be implemented.

Stantec reviewed the data analytics from transit, Bluetooth capture locations, traffic data, and location based data (Streetlight) to understand when and where people were moving and what the key issues were for different locations in the study area. Changes to transit, the review of parking, creating mainland based mobility hubs with connections to island shuttles, aerial tramways, waterborne shuttles, street car, car share, autonomous shuttles, electric cart operations on street and on beaches have all been considered in the development of more than 80 mobility solutions. The goal was the delivery of an integrated mobility plan to address the special event nature of the seasonal visitors from November to April for a 20-mile area from Lido Key to Anna Maria Island.

To do this Stantec created a multiple account evaluation process that allowed us to evaluate the 80+ options and identify those that had the greatest potential impacts for the short, medium and long-range time periods. This resulted in a package of transportation/traffic solutions to mitigate the need to bring additional vehicles onto the islands, reduce congestion on the islands, address parking issues, and create more mobility choices (**Figure 13**). The transportation plan addresses congestion relief, park and ride strategies, the use of alternative transit modes such as trolleys, water taxis/ferries, aerial gondolas, low speed electric shuttles, and ITS to provide traveler-related and parking information to the population. Our key takeaway is that a collective program of strategies that perform together allow the counties, FDOT, and municipalities to complete projects within their control in order to collaboratively move towards reduced congestion and improved visitor and resident experiences.

The report can be viewed here: **http://swflroads.com/sarasotamanateebarrierislands/**

Figure 13: Recommendations from the Barrier Islands Plan Showing Location and Typology



Lake Tahoe Multimodal Corridor Management Plan

The Lake Tahoe Basin draws millions of visitors each year with surges in the winter and summer months. Mobility in the region is extremely challenging and travel around the 72-mile lake is predominately by two-lane roads, public and private bus, and to a limited extent on- and off-road bikeways. Significant environmental constraints make expanding the roadway capacity impossible. With seasonal congestion beyond tolerance, policymakers needed a better understanding of the problem areas and more progressive solutions.

Stantec conducted a comprehensive investigation of zoning, land use, existing and planned infrastructure, AADTs, crash data, recreation, and transit services available from two local agencies, one regional provider, and several private companies for the study area encompassing five counties, one city, and state and federal land management agencies.

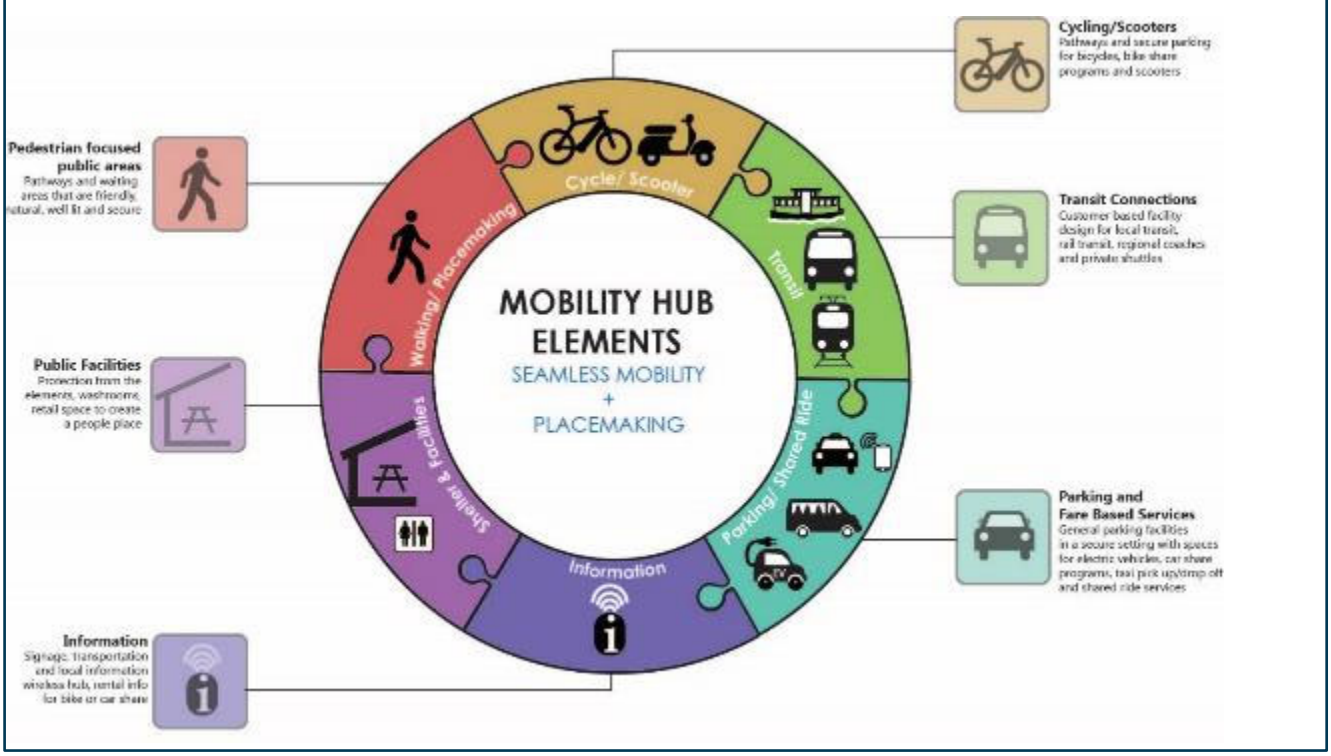
With this depth of seamless travel pattern data, Stantec revealed annual visitation estimates was off by 250 percent: 24 million vs.8-10 million estimated. Basin agencies were undercounting due to VRBOs, transient oriented tax collections, and small sample sizes from intercept surveys. Transit ridership was 1.4 percent; bicycle and pedestrian mode share even smaller. Most importantly, transit services were focused on the needs of winter users and ski resort employees, not the tremendous number of summer visitors.

Stantec created two deliverables: Linking Tahoe Transit Master Plan and the Linking Tahoe Corridor Connection Plan, together referred to as the Comprehensive Multimobility Transportation Plan. After calculating how many potential vehicles would be removed from the roadway network with each 5 percent incremental increase in transit ridership, the TTD Board unanimously approved the “20 in 20” goal of striving to achieve 20 percent active mode share in 20 years.

The Comprehensive Corridor Multimodal plan can be viewed here: **https://www.tahoetransportation.org/wp-content/uploads/2020/05/2017-Sept-Linking_Tahoe_CCP-Adopted.pdf**

The Transit Master Plan can be viewed here: **https://www.tahoetransportation.org/wp-content/uploads/2020/09/2017-June-6_Tahoe_TMP_adopted.pdf**

Figure 14: Elements of a Mobility Hub



One of the foundations of the plan was the use of mobility hubs to intercept people at the earliest opportunity (**Figure 14**). Three different size hubs were proposed to allow regional trips to be intercepted, as people entered the basin and then within the towns themselves. Each hub was to a be a different size based on combining park and ride with transit and different modes to allow transfer opportunities to other modes to occur.

Other Studies

Other studies that are not publicly available include the NFL Ingress and Egress Toolkit, which Stantec assembled over several years of observations at all facilities in the League, and the recommendations for improving operations at The Ohio State University. Each of these documents include dozens of recommendations on specific strategies to improve the guest experience.

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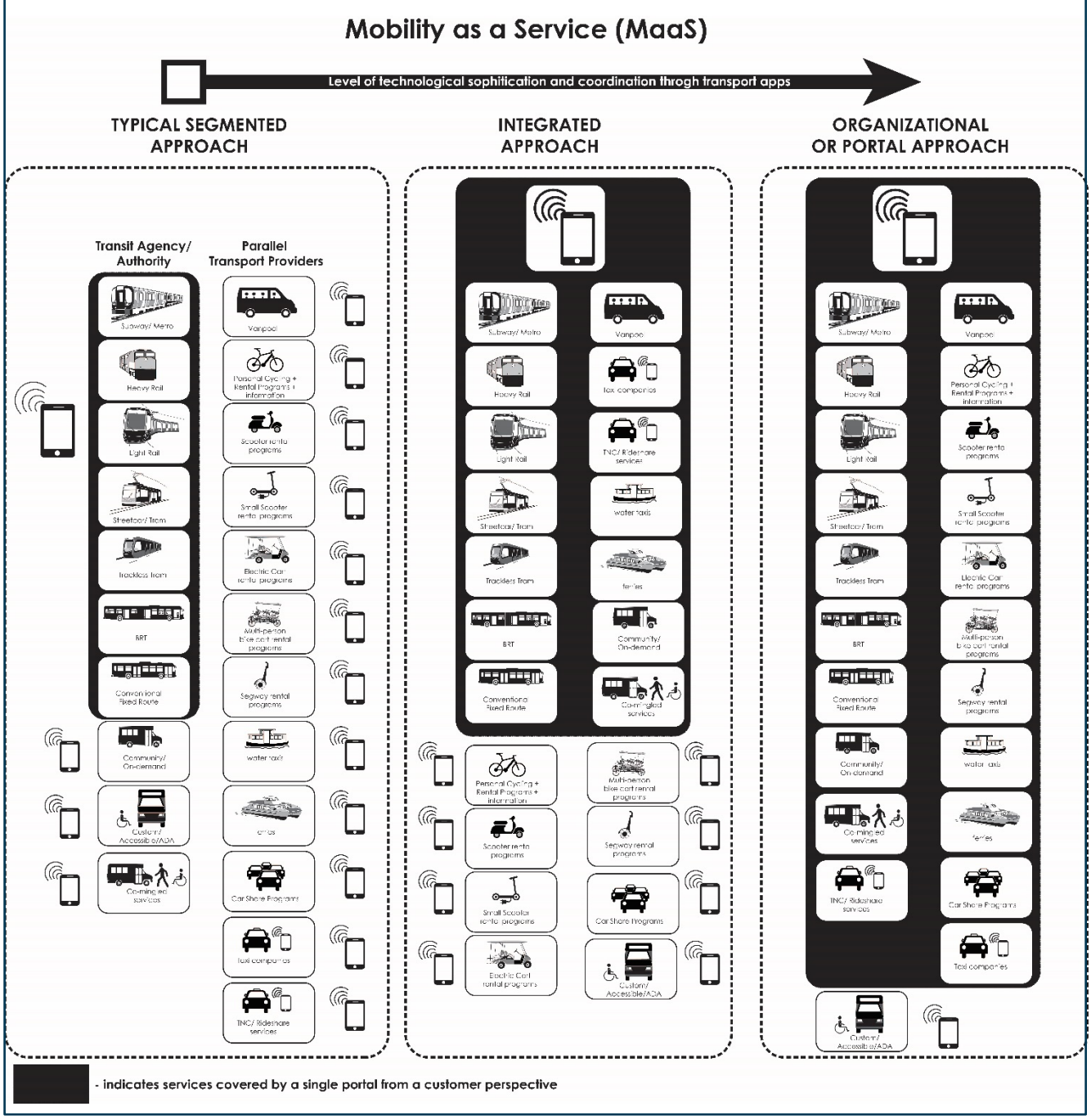
TDM for Monmouth County

Utilizing the information obtained in the review documented in the previous section, as well as the Project Team's experience with event and tourism TDM, the team will develop TDM mitigation plans for each selected event or tourism location based on the principles and strategies described in this section.

The principles and strategies of TDM for the County should be looked at as a package of options that can be deployed countywide, within specific municipalities, at venues, or on specific days. Think of a deck of cards with each card being a different strategy used to change travel behavior for a specific reason (**Figure 15**). These strategies should be considered ways to enhance the travel experience by creating choices and enriching the amount of pre-travel information that is available to make travel a positive experience that is part of the overall visitation experience. Each destination may have a different set of strategies that will apply but the overall program may consist of the entire deck. TDM is also often known by other names such as Smart Mobility, Mobility as a Service (MaaS) or First Mile/Last Mile (FM/LM) (**Figure 16**).

Figure 15: TDM Strategy Card Deck

Figure 16: Mobility as a Service



The TDM deck is a summary of the main modal, transportation network and communication options that have been utilized over the past decade in resort and venue-based areas to encourage and force changes in travel to reduce the impact of the trip on the tourist-based experience. The Project Team has identified a deck of strategies that can be divided into five suits:

- Travel Behavior
- Communications

- Improve Existing Services
- New Options for Modality
- Parking

This next section will review each of the Categories and options within that “suit”.

Travel Behavior

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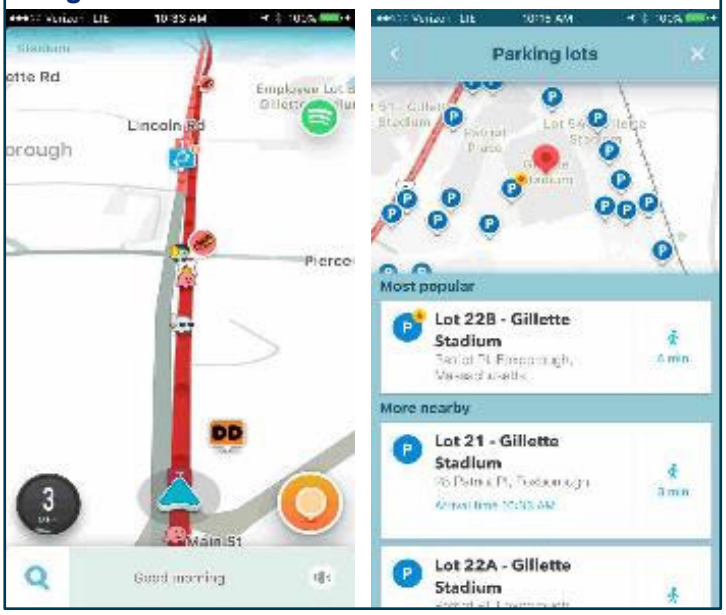
Traveler’s patterns can be changed through incentives, information, or infrastructure. This can include on-street operational changes, new forms of information, using traffic apps to change the way people use the road network, creating priority infrastructure for transit and cycling or diverting background traffic (regional and local through traffic not related to tourist trips) onto new paths.

Change Travel Patterns with Apps

Custom navigation apps such as Waze can be used to change user’s travel patterns. These crowd-sourced navigation apps provide current traffic conditions based on observed travel speeds from hundreds or thousands of travelers using these apps. They can also be used to identify the locations of user-reported incidents or hazards. Finally, the Waze platform allows the County to define their own travel patterns. This can be used, for example, to designate street closures near event venues on major event days, or to provide custom routing patterns to different parking areas.

Figure 17: WAZE App Information from the New England Patriots



The use of Waze and Google Maps have become more widespread for users to plan their routes (**Figure 17**). Cities and regions can work with Waze to ensure that during event days, vehicles pushed to use different routes to spread out demand.

Dallas allows fans to put in their home zip code and parking lot and generate customized directions. Minneapolis uses a color-coded parking system to allow guests to reserve parking based on their arrival route, then gives them specific directions to that lot (**Figure 18**).

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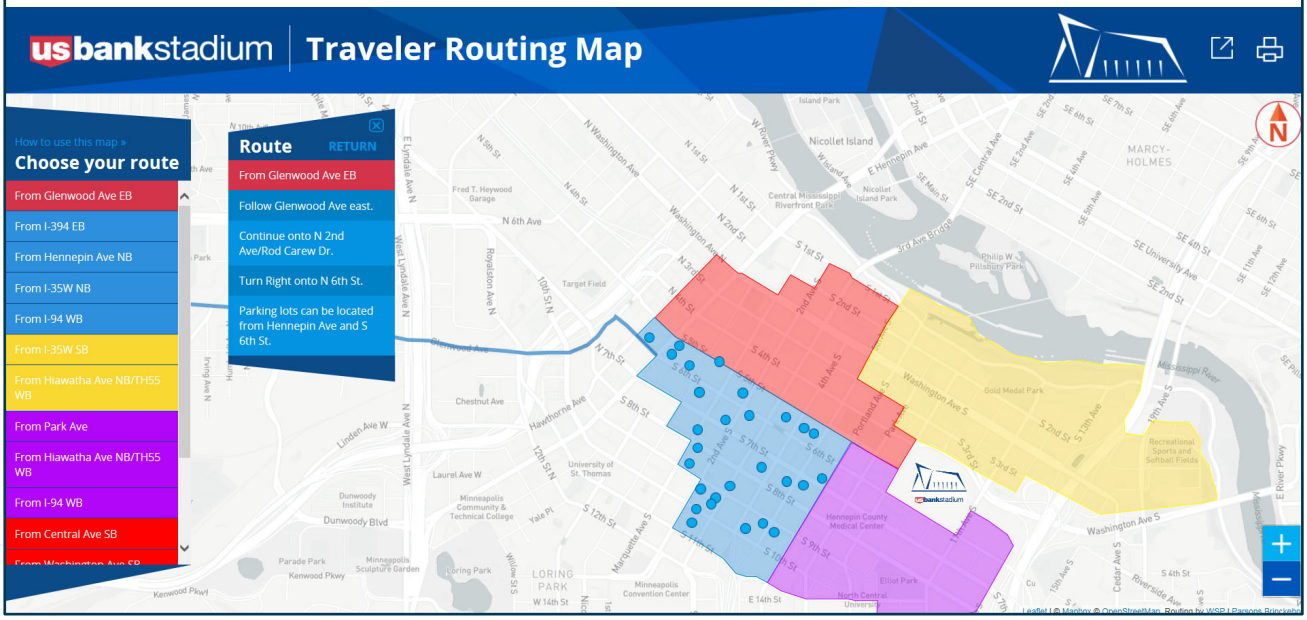
Figure 18: Minnesota Vikings Parking Map#



Operational Strategies

Operational strategies include signal optimization, manual traffic override, lane closures, and ramp metering. These strategies sync roadway capacity with the projected demand. An arterial with primarily one-way flow, for example, can be set to counter-flow all lanes in that direction (or most lanes, with provisions for one emergency entry lane to respond to incidents). Signal optimization strategies are dependent on the types of traffic controllers available. Modern traffic controllers can be

synchronized along a corridor to improve coordination and provide additional signal timing to the peak ingress or egress movements. Automated signal control manages the flow movements, so traffic management staff can conduct other critical activities, such as “don’t block the box” operations, or pedestrian management.

Example

Use a combination of orange barrels, signs, and staff to create a pedestrian crossing at mid-block points (**Figure 19**). The visibility of this crossing reduces informal mid-block crossings and makes drivers more aware of the managed crossing.

Figure 19: Example of a Temporary Mid-Block Crosswalk in Arizona

Traffic Diversions

It is our experience that many travelers will continue to use the congested roadways to a major destination even when better options are available. This is particularly true when the travelers are unfamiliar with the area. A background traffic diversion strategy can identify these alternate routes and make drivers aware of them at key decision points. Diversion routes are intended to allow pass-through traffic to reach their destination faster, and the volume of diverted traffic will also improve conditions for vehicles destined for the event site.

Example

Pittsburgh has effective counter-flow on many of the roadways surrounding the stadium site (**Figure 20**). These are generally lower-speed roads, with surrounding businesses that generate some drop-off activity. Counter-flow is implemented using a network of cones and ground-mounted signs defining the start and end of the counter-flow measures.

Figure 20: Counter-Flow Operations in Pittsburgh, PA#

Arrive Early / Leave Late

Early arrival / late departure incentives can be useful to reduce the volume of traffic arriving in the peak hour. Incentives for those that arrive early can be monetary, such as discounts to dining, retail, or parking. Late departure incentives can include smaller post-events. Many facilities use smaller-scale concerts or organized post-event party hubs to encourage some guests to stay late. These guests get to extend their experience, enjoy a relatively uncongested trip out from the site after the event, and, because they do not depart during the peak, they help reduce peak hour congestion as well.

Carpool Incentives

The average vehicle occupancy at many events has declined over the past two or three decades. Data from the NY Giants show that this reduction has been nearly half a person, from around 3.0 persons per vehicle to 2.5. This is likely due to changes in the family structure, and friends and family meeting on-site, rather than carpooling. Incentive programs can help reverse some of this trend by reducing parking fares for higher-occupancy vehicles, and/or offering preferential parking for these groups.

Example

The NY Giants implemented a tiered parking system to simplify the traffic and parking operation. Instead of five to six tiers of parking, they now have two major tiers, and fans can find parking in their tier based on where they enter the site (**Figure 21**). For example, there is no Lot M pass, but fans that enter on the west side with a blue parking permit will be directed to one of the blue lots on that side of the Stadium.

A similar approach could be used in resort areas with parking defined in rings outside the main attraction. Cost of parking could be tied to distance from the attraction and better access to parking closer to the defined destination area could be provided for carpools or pre-paid higher daily rates.

Figure 21: NY Giants Tiered Parking Map

Promote Traffic Apps

One of the strategies includes using navigation apps to provide personalized directions to parking lots by location of lot and the direction the visitor is arriving from. The effectiveness of these apps is directly based on the size of the user base. A coordinated effort to encourage guests to download these apps and use them to plan their event day travel can be easily implemented by adding links to these apps on event websites, point of sale, or via signage on the site itself. On-site signage is effective for repeat guests and for travelers who choose to use that app for egress on the same trip.

Transit and Bicycle Priority

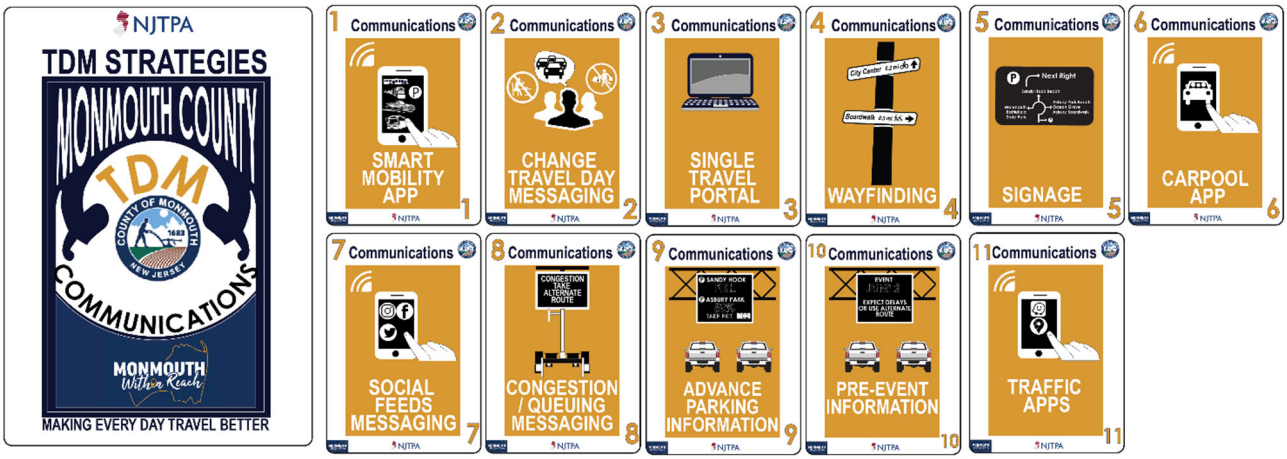
To provide incentives for alternative modes, it is important to explore opportunities to make the travel time on these modes competitive with the personal automobile. Prioritization at signals can be an effective strategy. The transit vehicle or bicycle platoon is detected using in-ground sensors, cameras, or two-way communication technology. The signal sequence is then pre-empted to prioritize these flows as they approach the intersection. Priority can be advanced light signals, queue jump lanes and signals to allow the vehicles access to the intersection prior to general traffic.

Example

Dedicate bike lanes, like the ones shown here in Victoria BC, help to encourage bicycle use even during congested periods by providing a designated or separated space for cyclists of all ages and abilities (**Figure 22**).

Figure 22: Dedicate Bike Facilities in Victoria, BC

Communications



Providing information at decision points in the journey to allow informed decision-making is critical to allow visitors to understand their options. This can be pre-travel communications, information received enroute, wayfinding approaching tourist areas or venues and proper signage.

Smart Mobility App

Smart mobility providers, such as autonomous shuttle providers, e-scooter companies, bikeshare, and rideshare, may provide their own app. There is an opportunity to communicate travel messages via these apps. E-scooter companies, for example, can prohibit scooter pick-ups and drop-offs in areas with high pedestrian activity. In areas where these do not have this type of limitation, abandoned scooters impede pedestrian flow and/or cause safety concerns. Autonomous shuttle providers can be asked to provide more capacity, especially for on-demand shuttle routes, during peak event periods.

Change Travel Day Messaging

Event day messaging can inform event attendees of the recommended travel routes and can also be used to divert background traffic. Signage forms include dynamic signage (using permanent, overhead variable message signs), temporary roadside signs that are deployed on the day of the event, fold-down signs attached to light poles, or static signs that are deployed on the day of the event. A consistent theme on event signs draws users' attention and helps them identify upcoming event day signage as they travel towards the event.

Example

Figure 23 and **Figure 24** depict examples of dynamic signs for event management.

Figure 23: Limited Highway Signage leading to MetLife Stadium in New Jersey

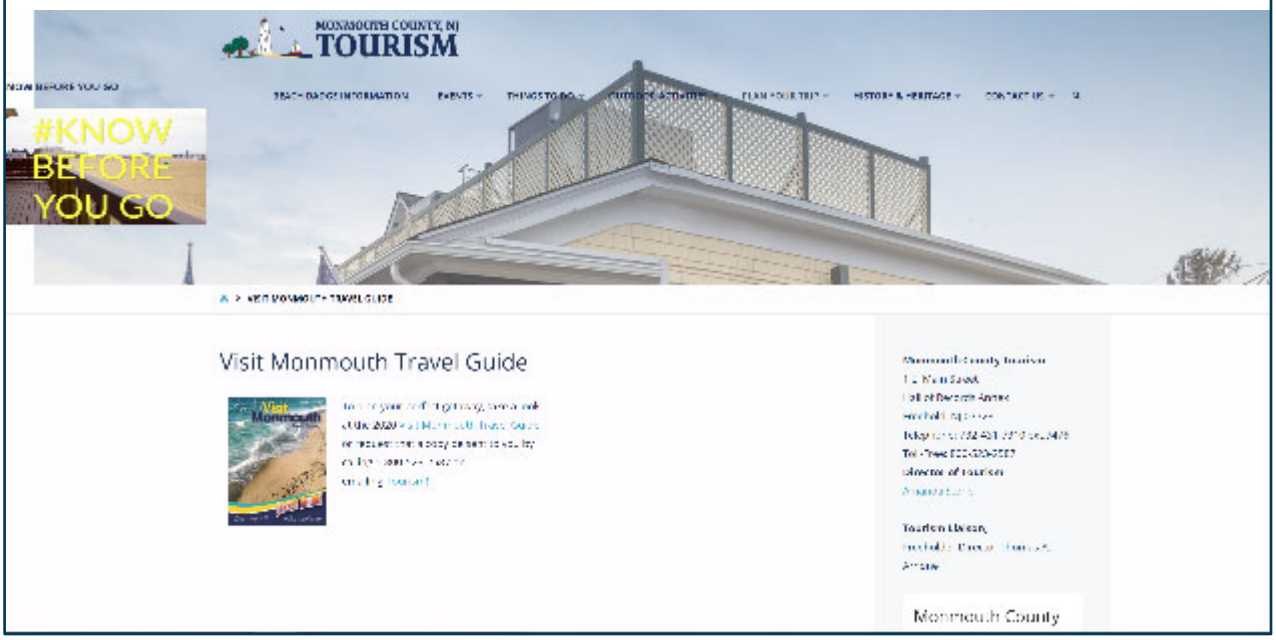
Figure 24: Parking Messages from Kansas City Approaching Arrowhead Stadium

Single Travel Portal

Multiple travel options, each with their individual app/website, can make it difficult and/or challenging for visitors to plan their end-to-end travel experience. A consolidated travel portal that includes information on airport connections, ferries, buses, trains, and shuttle bus operators would significantly enhance the attractiveness of choosing more sustainable travel options than the personal vehicle. A single travel portal provides visitors with an opportunity to communicate directly with providers to learn of park-and-ride lot locations, and carpool or off-peak incentives. Ideally, the user enters an origin and destination and is presented with the door-to-door travel options, travel times and costs.

The goal of the single portal is to allow access to all the information in one place rather than simple links. The NJ Tourism website has a link to information that you can request as a travel guide or a link to Google Maps for directions. The Monmouth County tourism site is a collection of links that requires the user to go to multiple locations to plan a trip. The County's tourism portal has a travel guide that can be sent out but may benefit from an active transportation portal for planning purposes by trip (**Figure 25**).

Figure 25: Monmouth County Tourism Website



Signage and Wayfinding

One of the most cost-effective improvement strategies is signage and wayfinding (**Figure 26** and **Figure 27**). Beyond just individual signs, wayfinding is a comprehensive strategy that includes the location of signs, their clarity, sequential organization, and thematic representation, relative to all the other non-event day signs on the road. An audit can be conducted by a non-technical user to determine if he/she can understand the signage, have enough time to comprehend and respond to the directions, and can reach a desired destination. In many situations, there are gaps in the signage sequence, so that a highway exit is signed but there is no follow-up signage at the top or bottom of the ramp directing visitors which way to turn to their destination. There can be issues trying to create the appropriate signage throughout the journey due to different jurisdictional policies that may prevent the use of logos or actual names of a private facility.

Examples

Figure 26: Tourist Signage in Ardmore, Ireland

Figure 27: Legible London Tourist Informational Sign, London UK

Carpool / Vanpool App

Incentives described above can be used to encourage friends and family to carpool. A matchmaking service can be used to bring together other users who are interested in a shared ride to the event. This type of service is typically set up by asking users to enter their origins, destinations, and travel times, and find matching users. NJRideshare.com provides ride matching support, but is focused on working commuters. Ride matching for events can be difficult to coordinate for working commuters.

However, for a single event, it is significantly easier to find matches; all that is necessary is an incentive to do so. To encourage users to sign up for this service, it can be offered on event websites, and at the point of sale. Venue/event operators can encourage the app usage through promotions, prize drawings and/or significantly increased parking costs at event venues. The Project Team understands this runs counter-intuitive to event operators. However, a partnership of the objectives for the larger community and event operators must be established to solve the congestion problem collaboratively. There are providers that specialize in providing the platform or additional services such as Rideamigos and Via (**Figure 28**).

Figure 28: Rideamigos and Via Websites

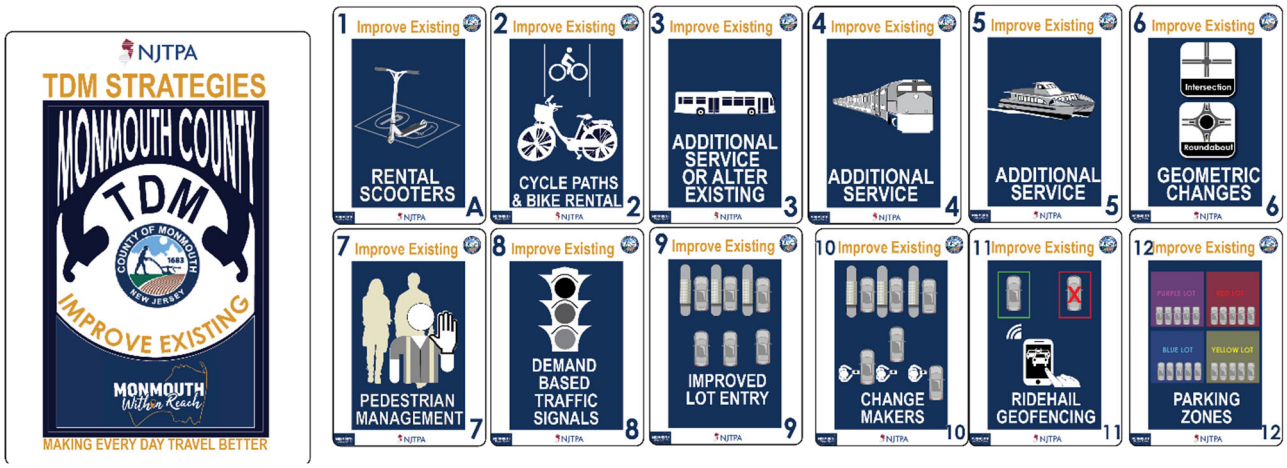
Social App Messaging

To maximize the number of communications options, a social media strategy should be considered. Unlike other websites or apps, social media requires a relatively small commitment. The audience for an event or agency is already established, and a communications platform (e.g., Twitter or Instagram) exists. Social media messages can be used to reinforce other communication channels, and disseminate information on event patterns, congestion, road closures, incidents, weather, and/or construction patterns.

Congestion Queuing/ Messaging

Congestion queueing is given its own sub-category in this hierarchy because it aims to influence visitor behavior by informing travelers of the relative travel times on different routes (e.g., best route – Garden State Parkway – 15 minutes – other routes-expect delays up to 40 minutes). This type of differential messaging informs travelers of the reason(s) detours are recommended rather than simple awareness of detour routes.

Improve Existing Facilities and Services



Changes to existing modal options can be made to encourage different choices. This may include making shared rental programs more widely available, adding service to existing public and private transportation services during busy weekends, key changes to problematic intersections to improve flow, managing pedestrians at key crossings, or temporarily altering traffic signal operations to reflect changes in peak travel demand. These options all exist. The goal is to make travelers more aware of them and customize existing facilities and services to benefit the major event day or seasonal peak experiences.

Rental Scooters and Bike Programs

Rental scooter and bike programs are in place in areas like Asbury Park. Improvement to these programs is to increase awareness of these mode options and work closer with vendors to ensure adequate supplies to meet the historical and projected demand. These programs also can be integrated into centralized travel websites or apps. As park-and-ride and alternate mode services are introduced and/or expanded geographically, they will help travelers move around more easily without a personal vehicle. In addition, improvements to bicycle infrastructure, such as local to regional trail connections and on-street bike lanes will help County residents travel without a car and encourage visitors to bring or rent bikes to move throughout the selected destinations safely without needing to get back into the car and drive.

Additional Transit Service

NJ TRANSIT services are primarily scheduled to support commuter patterns and other local circulation needs with limited adjustments intended to serve event and tourism (seasonal) demand. In our experience, NJ TRANSIT will provide additional service to meet demand, especially on weekend days when there are not as many constraints on the rolling stock. The key is to demonstrate that there is a concerted effort to make travelers – both employees and visitors – aware of the increased service. Transit utilization is correlated to service frequency and travel time, so more frequent service can help increase that mode share option. Additional ferry service can be similarly encouraged if an agreement is in place with the ferry operator to increase service in response to demand.

Geometric Changes

Minor intersection reconfigurations can be used to calm traffic flows and increase capacity. Roundabout conversions may be considered at locations with high turning volumes. As part of Stantec's recommendations for the Sarasota-Manatee Barrier Islands Study, a major 4-legged intersection in Sarasota with multiple turn lanes will be converted to a roundabout to improve safety and decrease congestion. Turn lane reassignments include conversion of a through lane into a left or right turn lane to facilitate turning movement demand. Allowing for increased turning movement can be accomplished with signage, traffic management staff, and/or cones since the lane assignments are temporary for event day operations. Another example is physically modifying the roadway to add turn pockets at major intersections to accommodate demand. This change may require additional right-of-way at the intersection approach.

Pedestrian Management

The flow of pedestrians near a popular destination or event venue can significantly influence traffic patterns. Best practices include the delineation of pedestrian flow corridors, road closures to create pedestrian spaces, and pedestrian management staff to speed up crossings. Designating pedestrian flow corridors is relatively simple and cost effective: tape, pavement markings ("follow the red line to the Arena"). New pedestrian crossings may be created to match desire lines (for example, at mid-block locations between intersections). Road closures can provide an open pedestrian space, which can be programmed for other activities that support the primary guest experience (for example, a fan fest near an event facility), while lane closures can be used to "widen" the sidewalk in areas where pedestrian demand exceeds sidewalk supply. Pedestrian management staff should be trained with specific responsibilities (for example, preventing pedestrians from crossing out of phase). **Figures 30 through 32** show examples of pedestrian management.

Figure 29: Carolina Panthers Pedestrian Management Using Policing

Figure 30: New England Patriots Provided Marked Pedestrian Routes

Figure 31: Pedestrian Spaces Separated Visually in Queenstown, NZ by Using Different Colored Brick Pavers

Demand Based Traffic Signals

Traffic signal optimization can be tied to projected demand, or it can be based on observed demand, using sensors to determine the length of queues on different approaches. As discussed above, automated traffic signals can allow staff who would otherwise operate the signal box to be assigned to other roles.

New Modal Options

Create or encourage new modal options that do not currently exist for events, venues or areas that attract large crowds. These can include new connectivity to the County or improve travel within the County.

For Hire Scooters and Carts

For-hire scooters and carts can be used to provide first- and last-mile connectivity or to improve travel throughout a popular destination or within an event site (**Figure 32**). Partnerships with the private sector can be leveraged to provide these services. In some resort destinations, business owners might provide bikes for guests or may have for-hire electric carts. There is no obligation for riders to visit the business, but it is seen as a sign of good will, and they report that many riders do choose to visit their establishments.

Figure 32: Rental Bikes and Carts in Anna Maria Island, FL

Local Water Taxi

A ferry operation typically requires a minimum depth and a dedicated terminal to accommodate these larger vehicles (**Figure 33**). Water taxis, by comparison, typically carry smaller passenger loads. This allows them to operate in shallow waters, and service locations where a terminal is unavailable or infeasible. Water taxis can be used to provide connectivity between shore destinations and/or transit hubs, park-and-ride lots, and destinations with the use of small docks. This may be an option along the shore.

Figure 33: Water Taxi in Victoria, BC

Short-Range Shuttles

Shuttles can provide mobility for visitors who chose to travel via alternate modes, or to use a park-and-ride lot. These visitors, who no longer have their vehicle, do not have the ability to travel between destinations. Shuttles provide this missing connectivity. They connect specific event facilities and/or site-specific destinations to transit hubs. Electric beach or boardwalk shuttles maintain connectivity along waterfront areas and provide the option to bypass congested roads with vehicular traffic. These types of shuttles can also be used to service visitors with accessible needs or those with limited

mobility. A hop-on, hop-off shuttle serves multiple destinations, and encourages visitors and guests to extend their stay or drop by destinations they might not have visited on their own (**Figure 34**).

Figure 34: Private 'by donation' shuttle on Anna Maria Island, FL

Counter Flow Operations

Counter-flow operations include the reversal of one or more lanes for traffic flow. The intent is to match roadway capacity to actual demand. This strategy is highly recommended if there are long queues in the direction guests use to leave an event. Counter-flow the inbound lanes that are mostly empty. For a four-lane facility (two lanes per direction), counter-flow can increase capacity by 50 percent with one counter-flow lane, or 100 percent if all lanes are counter-flowed. Considerations for emergency ingress during a peak egress condition typically necessitates at least one lane for "normal" flow, although this requirement can be relaxed if there are dedicated emergency ingress routes on other roads.

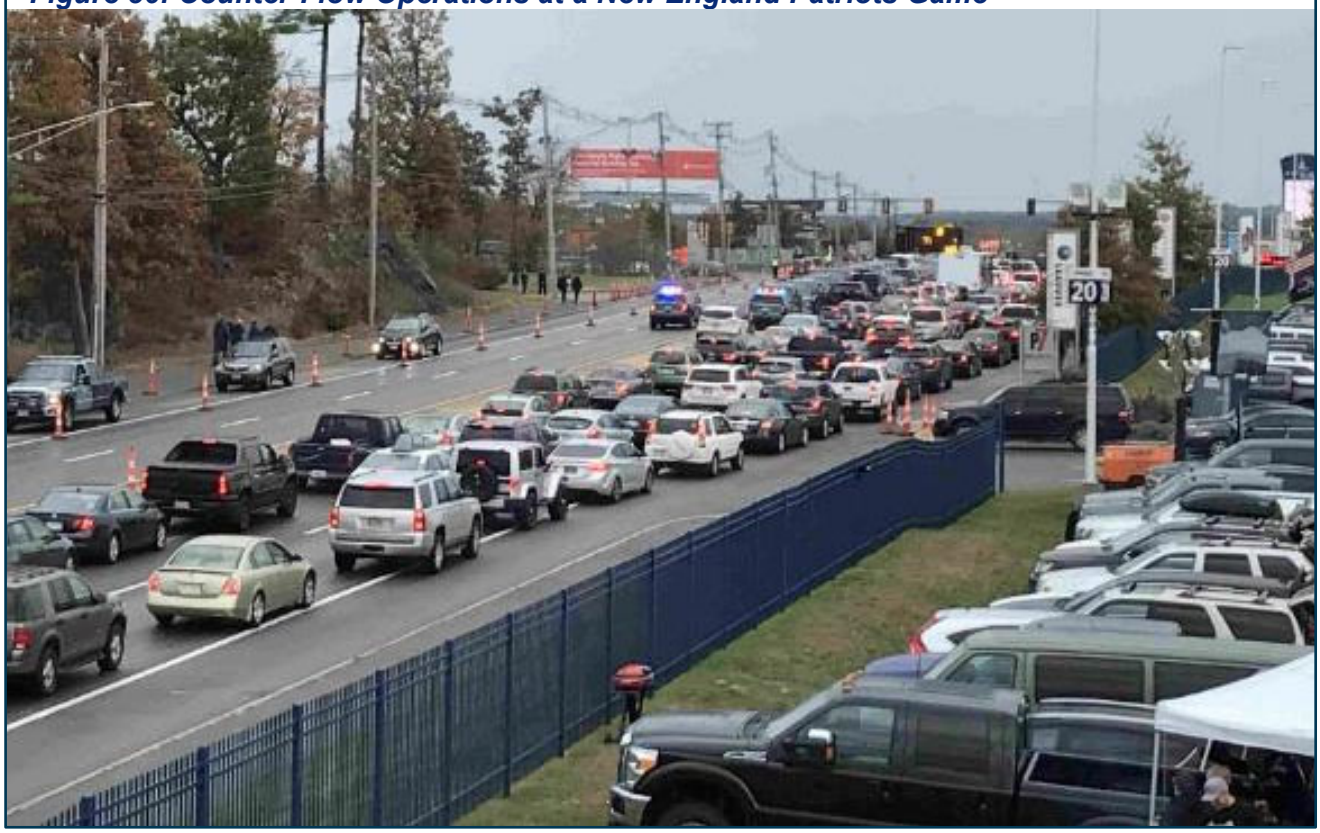
Example

Pittsburgh has effective counter-flow on many of the roadways surrounding the site (**Figure 35**). These are generally lower-speed roads, with surrounding businesses that generate some drop-off activity. Counter-flow is implemented using a network of cones and ground-mounted signs defining the start and end of the counter-flow measures.

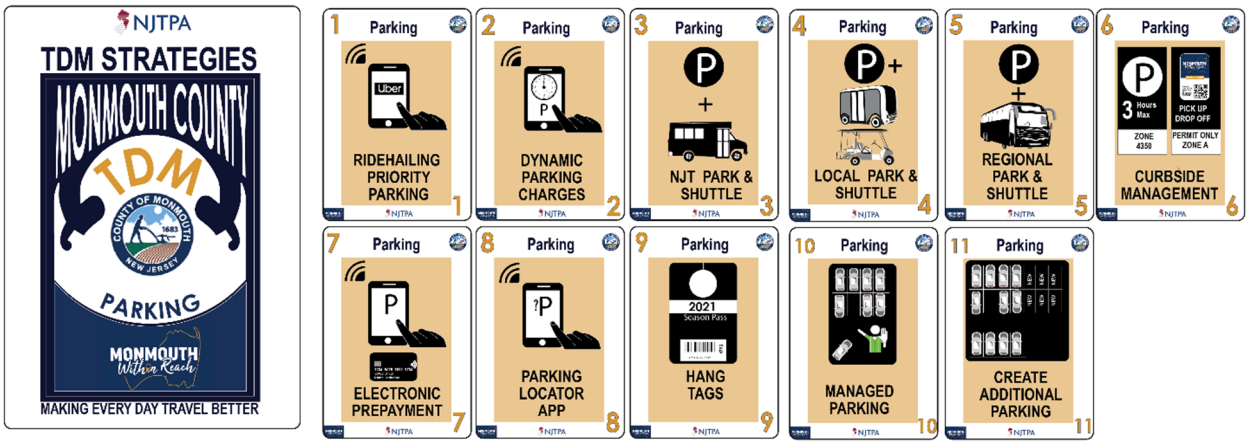
Figure 35: Counter Flow Operations in Pittsburgh, PA

A network of cones, stanchions, VMSs, static signs, and staff define the counter-flow operation on Route 1 in New England for Patriot Games (**Figure 36**). Out of six travel lanes, one is reserved for normal flow, and for easier emergency vehicle access. Signs help vehicles get into the right lanes at crossover points in the counter-flow operation, so, for example, vehicles that need to turn left to enter a lot are notified that they need to be in the counter-flow lane to make that turn downstream.

Figure 36: Counter-Flow Operations at a New England Patriots Game



Parking

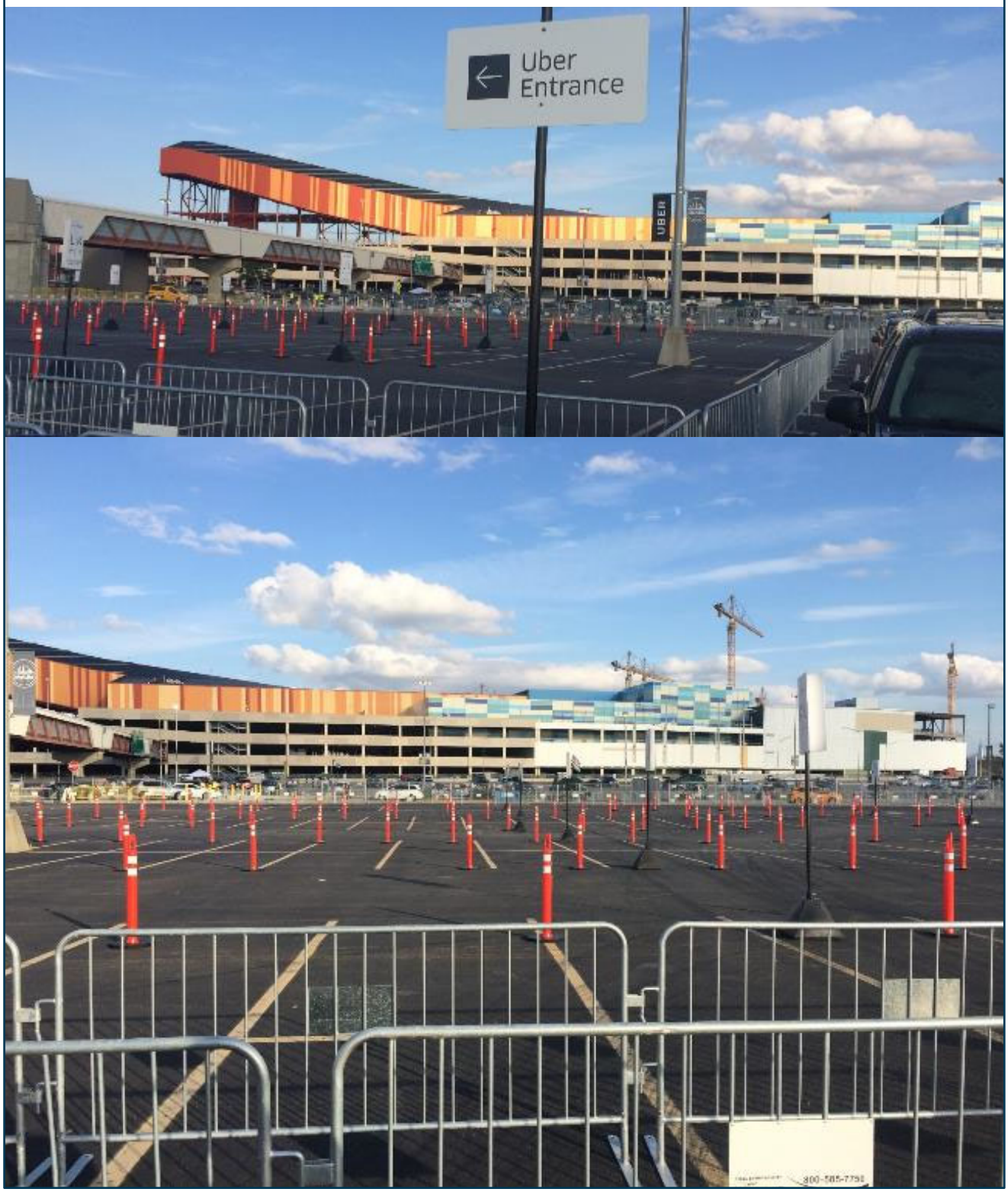


Parking is identified as a special area of interest in the travel demand management deck. Even with alternate mode strategies, most visitors will choose to drive to their destination. In resort communities, vehicles circulating for a parking space are a significant source of congestion. In our study in the Sarasota-Manatee Barrier Islands, Stantec determined that drivers spent up to 30 minutes circulating for the elusive parking space. Visitors that are “location-agnostic” (they just want to visit a beach, not necessarily a specific beach) are more likely to circulate and re-circulate over longer distances to find parking spaces.

Rideshare Priority Parking

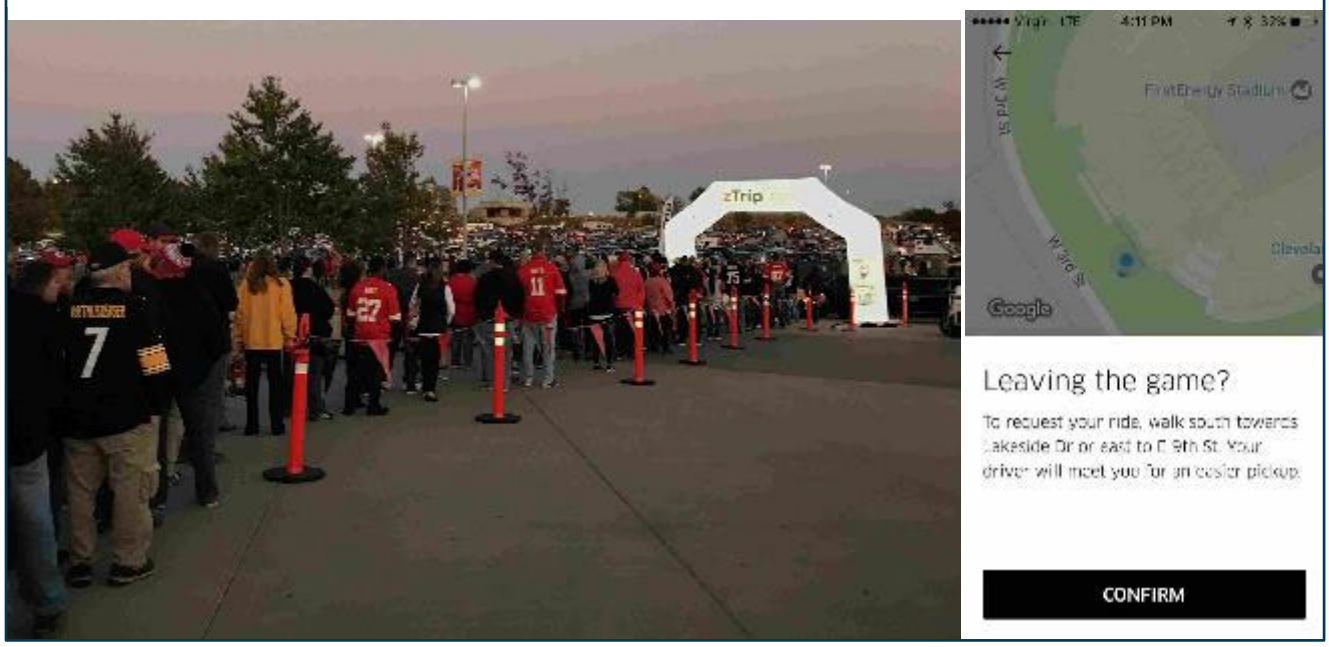
Rideshare pick-up and drop-off activities can put an additional demand on the limited curb space in resort areas. In many situations, rideshare drivers may choose to drop off in a moving lane of traffic, rather than look for an available curbside space. In both scenarios, the rideshare activity can disrupt the normal flow of traffic and create additional complexities by dropping off visitors at locations not originally designed to accommodate them. During egress periods, when rideshare demands are more concentrated, pedestrian and vehicle queues disrupt traffic flow. An alternative is to provide designated, off-street/off site rideshare pick-up and drop-off areas. These areas – typically repurposed parking lots – should include off-street queuing space for vehicles, multiple parallel pick-up locations and serpentine queuing areas for pedestrians (**Figure 37**).

Figure 37: Dedicated Rideshare Lot at MetLife Stadium, NJ



They should be supported by rideshare staff and signage to direct passengers and motorists to these locations. Geofencing can also be used in rideshare apps. In a geofenced operation, a passenger requesting a ride would be directed to the closest rideshare lot and would not be able to request a pick-up until they are in the lot (Figure 40). The app therefore serves as another form of communication for rideshare passengers and significantly aids in travel flow.

Figure 38: Fans Queueing for Rideshare Pick-Up Area in Kansas City



Dynamic Parking Charges

Parking fees influence guest behavior. Free parking may encourage visitors to continue to drive to their destinations; however, there is understandable concern related to implementing new parking fees. To address these concerns, parking fares can be implemented only in the highest-demand locations and/or in peak seasons, or in areas where alternative, free parking is available in outer lying areas with connecting shuttle service. Another option is to charge higher fares for long-term parking only and free parking for the first hour or so. Dynamic parking cost strategies adjust the parking fee based on the projected demand at specific locations and times. The highest-demand locations would be charged the highest parking fees. These are another deterrent to travelers from driving into congested areas. To be most effective, these higher fees must be communicated to travelers in advance as they plan their trip. Implementation of these strategies in larger cities nationwide suggest greater public acceptance of this approach and be coupled with strategies that increase other transportation options.

Medium and Long-Range Intercept Service

Shuttle services can be one of the most effective tools to manage congestion relief. These services “extend” the parking field by providing connectivity to remote lots, including NJ TRANSIT park-and-ride locations or local parking hubs (or improvised parking areas). The objective is to encourage people to park in these remote locations, and then take shuttles to their destination. The benefit to the

traveler is a faster trip to the destination, and less time spent looking for parking while contributing to congestion. These benefits must be clearly conveyed to travelers through communications channels described above. Regional park and rides can host longer-duration shuttle services located along the major approach routes to Monmouth County where transit to the destination does not already exist. These locations may be leveraged by providing signage to intercept travelers on their way to Monmouth County. Parking may be full at specific locations or the messaging may inform drivers of traffic congestion and encourage usage. If a large network of shuttle buses is established, their travel time benefits will be enhanced by fewer individual automobiles and/or dedicated rights-of-way may be constructed for these services to make them more attractive and a time-saving option. In the not-too-distant future, autonomous shuttles can be used to provide first- and last-mile connectivity between nearby locations, at a lower cost and more efficiently than traditional shuttles.

Curbside Management

Curbside management policies are intended to maximize the utilization of the curb for multiple purposes, including parking, deliveries, shuttle buses, and drop-offs. Curbside management policies include limited parking periods to encourage more turnover – and therefore serve more users with the same curb space, no parking restrictions on heavy shuttle corridors, and payment policies that are based on the type of curbside use – a drop-off or delivery that uses the curb for a minute would pay a different fee than a vehicle parked there for two hours, for example.

Parking Locator App

A parking locator app or website is a means of disseminating information to travelers on their parking options. These tools can be used pre-emptively with pre-paid parking policies to allocate parking to different users. They are most effective with real-time information; however, if the app/website gives travelers an understanding of available parking in different facilities (or indicate that they are full) and provides the expected walk times from that parking facility to specific destinations, more people are like to use a parking locator app. Travelers using them choose to park further away from a destination and walk, rather than spending more time looking for a limited number of parking spaces.