MONMOUTH COUNTY
COASTAL EVACUATION ROUTES STUDY

Executive Summary

Prepared for:
Monmouth County Planning Board.

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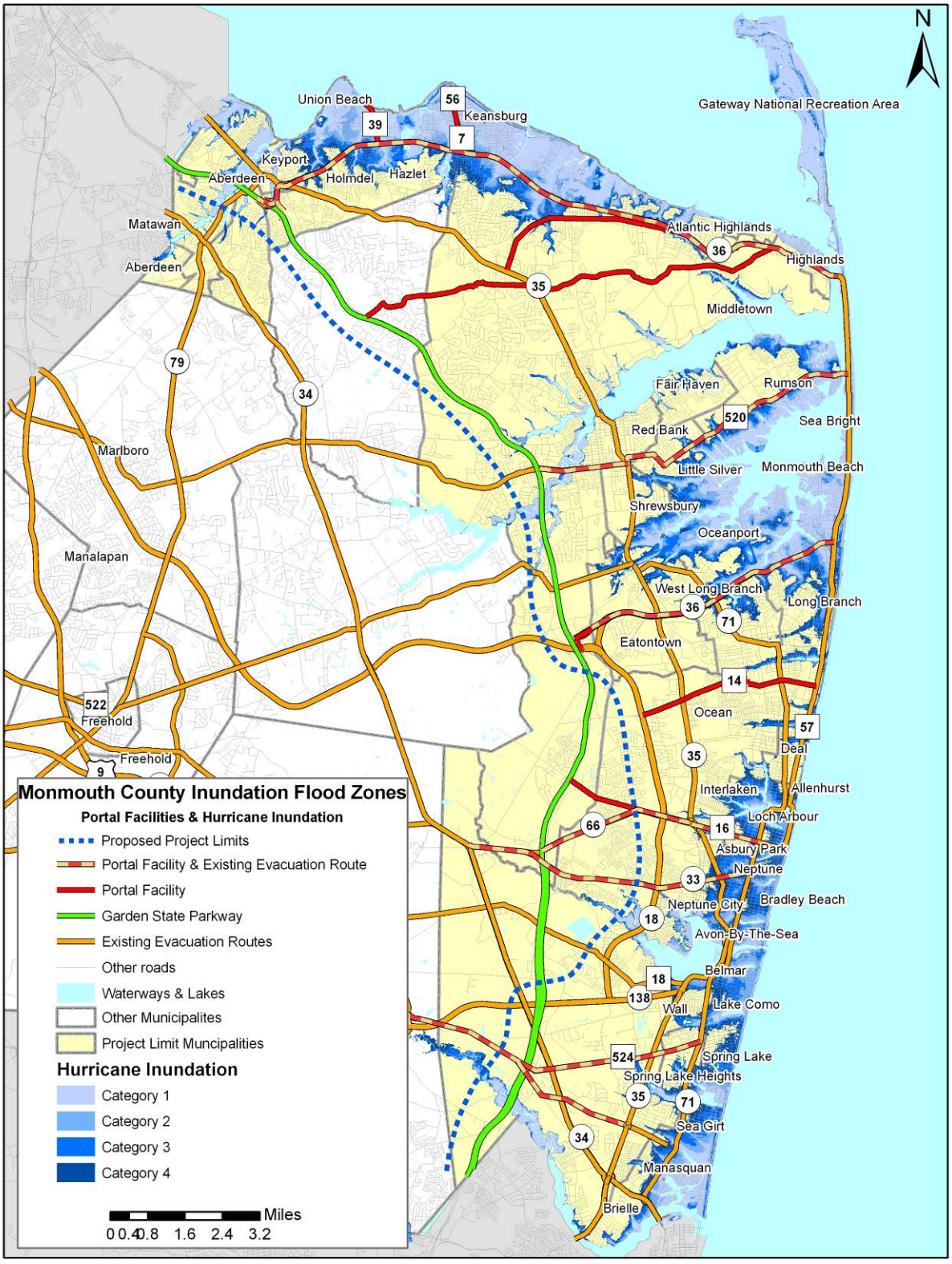

Monmouth County Inundation Flood Zones

Executive Summary

Study Purpose:

One of Monmouth County's finest assets, its 27 miles of sand beaches and 26 miles of bay coastline, is also a potential liability as low-lying coastal areas are subject to flooding from wave action and weather, particularly during hurricane events. In recent years, Monmouth County has taken several measures to mitigate the harm from coastal flooding. These efforts have been based on existing flood records as well the possibility of increased flooding caused by climate change. For example, The County's Office of Emergency Management is working with state, federal, and other municipal agencies to coordinate responses and to plan for emergencies.

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 (see Figure E-1). Its purpose: to evaluate how the current coastal evacuation route system can be improved and possibly expanded to help move people away from the flood zones. This work involved the following:

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

The objectives, experience and recommendations of municipalities and other involved stakeholders were incorporated into the project. Many of the final project recommendations will rely on these agencies for implementation.

The report will 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 specific roadway sections show 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 information need not be used to initiate new projects. It can also be used to supplement the background data for projects that are already under consideration.

Definition of technical terms and acronyms may be found directly following this executive summary.

Portal Selection:

Twelve portal routes were selected based on a two-step process. The initial screening process generally eliminated roads with a functional classification no higher than minor collector. These arteries constitute most of the County's roadway mileage and simply can not handle the kind of volumes needed for an evacuation route.

As a result, the portal candidates that passed the initial screening were largely part of the County or State roadway system. The County roadway system generally incorporates the higher classification roadways, such as major collectors and arterials, which are typically more conducive to efficient movement of relatively higher traffic volumes. These facilities provide interconnected and continuous travel corridors. They can handle higher travel speeds. The State Route (SR) system, a portion of which already forms the core of Monmouth County's Evacuation Route network, has already been designed to effectively function as portal corridors for hurricane evacuation. Other thoroughfares with the potential to function as a portal corridor given capital improvement upgrades were also considered as valued assets and were advanced for further study.

A matrix format was used to score, rank, and select the final 12 candidates. Cumulative scores, based on physical, operational, and geographical criteria, were weighted to an index for each candidate route. Seven key criteria are summarized below:

1. Roadway Alignment: How directly does it lead away from Flood Zones?
2. Supplement the Existing Portal Network: Does the route improve connections with the existing evacuation network?
3. Provide Area-wide Coverage. Are there gaps in the network? Each portal was evaluated based on its spacing relative to other portals.
4. Have Potential for Improved Capacity: A portal candidate that meets the three aforementioned criteria but has limited capacity, a narrow cross section, and poor alignment should be given a preference.
5. Reach Isolated Areas: does the route to provide alternative access for departing an isolated area such as a peninsula or barrier spit?
6. Avoid Merging of Traffic Streams: Merging traffic streams could result in an over-capacity condition, generating a choke point where traffic flow would be constrained. Therefore, the evaluation of routes with parallel alignments to
7. Make Use of the County System: As a County project, consideration was given to selecting County Routes.

Input from the Technical Advisory Committee (TAC) provided the final adjustments to the final 12-portal list.

The Portal Routes selected were as follows:

1. CR 39 between Florence Avenue and SR 36,
2. CR 7/CR 56 between Beachway, Campview Point and SR 36,
3. SR 36 between Highlands Bridge Over Shrewsbury River and the GSP,
4. CR 516/CR 50 between SR 36 and SR 35,
5. CR 8A/12A/12
6. CR 520 between Ocean Avenue and GSP,
7. SR 36 (near Oceanport) between the SR 36/CR 57 junction and GSP,
8. Park Avenue between SR 71 and SR 18,
9. CR 16 between SR 71 and GSP and SR 66 between CR 16 and SR 33,
10. SR 33 between SR 71 and SR 34,
11. CR 524 between SR 71 and I-195 and
12. CR 524 Spur between SR 71 and I-CR 524.

The Portal Routes are illustrated in Figure E- 1, below.

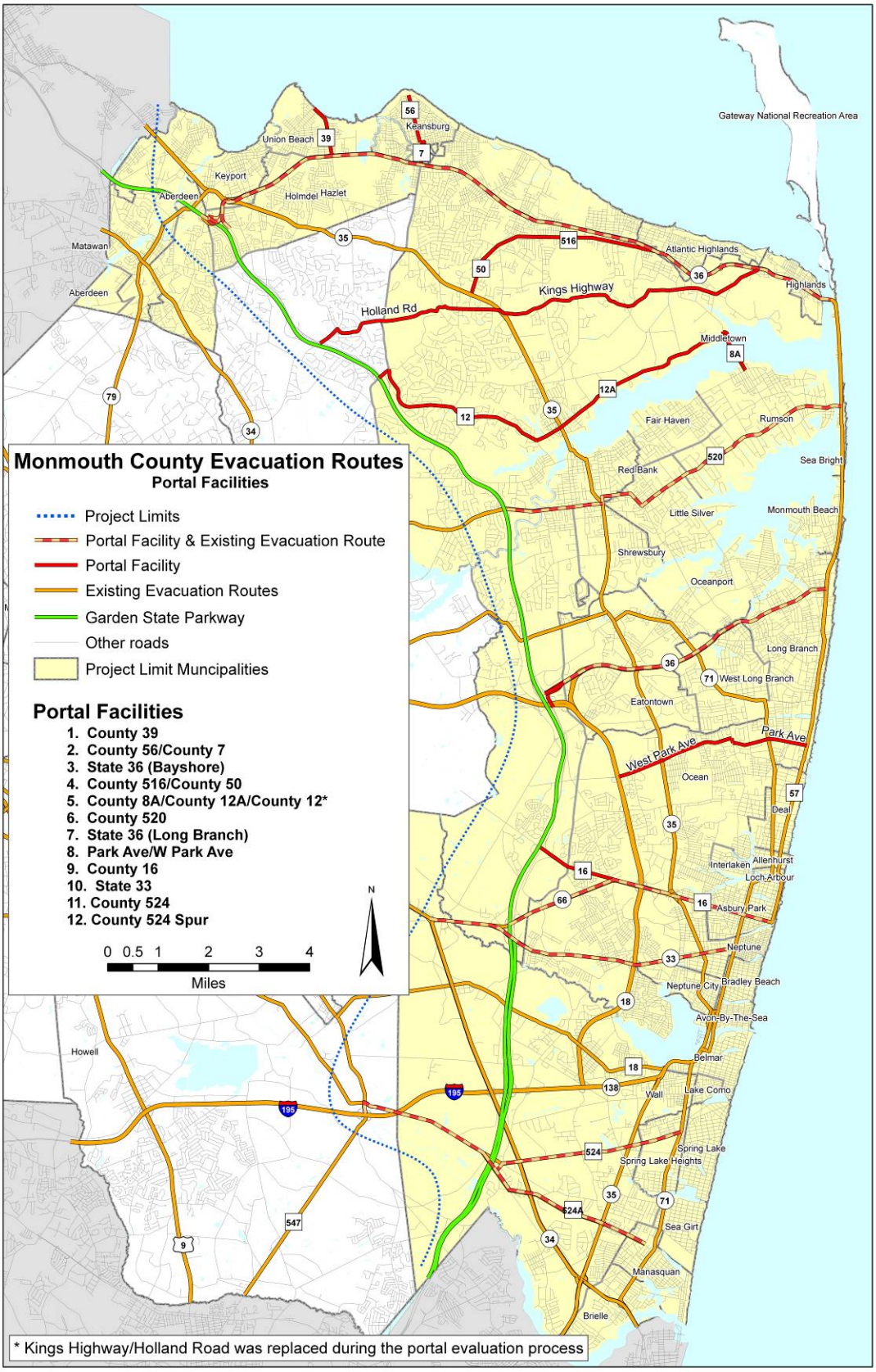

Figure E- 1, Evacuation Routes

Existing and Future Conditions:

A wide range of physical information was collected that described the corridor infrastructure both within the roadbed as well as adjacent to the roadway. Pavement widths, available mainline travel lanes, turning lanes, shoulder widths, medians, at-grade railroad crossings, interchanges, bridges, aerial utilities and driveways were documented for every roadway section. Operational aspects that were documented included posted travel speeds, signalized intersection locations, on-street parking lanes, presence of evacuation signage and adjacent land uses. Proposed Transportation Improvement Program (TIP) improvements throughout the County were also examined to identify if any actions were targeted for any portal candidate.

These data provided the background for undertaking two critical tasks:

- Highlighting locations where roadway capacities could be insufficient to process volumes generated under an evacuation scenario or where disruptions in traffic flow could occur, and
- Identifying roadway elements that could limit the range of potential improvements.

In addition to the above, data included the functioning of anticipated entry points and exit points between the surrounding local street system and the portal corridor. Alternative travel paths that include roads already on the State evacuation roadway network and other nearby portal candidates were identified for use by evacuees in the event a diversion is necessary to avoid a blockage that interrupts traffic flow. Some portals exhibit flooding – even under minor storm conditions. Locations of minor flooding are also noted.

Volume and distribution of traffic across the twelve portal routes were estimated for the evacuation condition based on a number of volume adjustment and loading source factors, and a scenario under which an advanced six-hour evacuation order would be implemented.

Portal volumes were estimated based on a methodology that applied Monmouth County Planning Board's Municipality population growth rates at the census tract level, automobile ownership and auto occupancy characteristics, the presence of competing routes, and an hourly distribution that assumed that the affected population cohort would leave the flood inundation zones in a pattern similar to a normal distribution, resulting in a peak hour of travel occurring within the six-hour evacuation order. These variables were converted into factors for estimating number of vehicles at different points along each portal route.

Portal Routes – Physical and Operating Characteristics:

Three of the twelve portal finalists, including State Route (SR) 36 north, SR 36 central corridor (Joline Avenue) and SR 33, are state roads that function as principal arterials in the County. They are high capacity arteries typically carrying four travel lanes along their mainline with full shoulders. Their alignments enhance sight lines and also provide direct

paths away from the flood zone. Travel constraints are associated with active driveways that line these arteries and one-lane exit ramps connecting to other regional facilities where congestion develops under high demand conditions.

Operationally, the state roads provide excellent travel conditions with well-defined pavement marking and signage. However, they also attract higher traffic volumes which can result in congested conditions along approaches to signalized intersections, particularly along roadway sections that cross higher density areas near the coast where signals are more numerous.

Seven of the portals are part of the County roadway system and include County Road (CR) 39, combined 7/56, 520, 516, 16, 524, and 524 Spur. These roads generally provide continuous east-west or north-south movement with fewer locations where conflicting traffic movements are significant. The alignments of these roads are typically well marked and generally provide connections to the state highway system. However, capacity is generally limited to one travel lane in each direction and only partial shoulders are provided for emergencies. In addition, limited sections along these roads are curved and require the placement of "reduce speed" warning signs.

The remaining two initial portals, Park Avenue and Kings Highway, are collector roads and are not part of the County system. They both provide continuous east-west service and lead to regional roadway facilities. However, capacities and shoulder areas are limited. Flooding, severe curves and reverse curves in particular, affect travel conditions along certain sections of Kings Highway. The number and seriousness of problems along Kings Highway were such that it was decided to remove Kings Highway from this study, and to substitute County Routes 8A, 12A, and 12, providing a path from Rumson to the Garden State Parkway.

Evacuation Scenario Issues:

Travel conditions along each portal candidate were evaluated using a variety of investigative tools including field surveys, photo log inventories, state straight line diagrams, and transportation evaluation methodologies such as the Highway Capacity Manual (HCM) Software procedures. This work resulted in the identification of Initial Priority Locations within each portal, which would be considered for advanced study.

Under an evacuation scenario for 2007, traffic operations would reach saturated conditions along most of the proposed new portals given an evacuation order with a six hour clearance time in the peak period. Volumes along the north and central corridors of SR 36, CR 520, CR 16, and CR 33 would exceed 2000 vehicles per hour and result in breakdown travel conditions along these arteries. Traffic traveling south along CR 39 and CR 7 would be unable to enter the SR 36 due to Level of Service (LOS) F conditions that would occur on SR 36's westbound travel lanes. LOS F describes poor traffic operations where there are frequent drops in speed to nearly zero mph as a result of stop-and-go conditions, high travel delays within queues, and the ability to pass or change lanes is difficult. Acceptable traffic flow conditions would still occur along CR 516, Kings Highway (which would later be removed as a Portal Route), Park Avenue, CR 524

(Allaire Road) and CR 524 Alternate (Atlantic Avenue). Under a year 2030 evacuation event, travel conditions would deteriorate throughout the system. Travel speeds would decline significantly along all proposed portals and significant delays and congestion would occur at signalized intersections and along road segments with physical alignment constraints.

The above problems were determined to be caused by physical, geometric, operational, or traffic demand conditions. Examples include poor horizontal curvature, awkward intersection angles, and numerous traffic signals, absence of shoulders, restricted sight lines, or significant traffic generators such as active commercial areas or freeway entrance locations. Each initial priority location list was refined to a group of sites, where, it was estimated that targeting improvements would likely result in substantial benefits. Benefits would include increased roadway capacity, balanced travel demand, and improved safety along the length of each portal route. Those locations recommended for further investigation are detailed in Parts 1 and 2 and summarized in Table E-1 below.

Toolbox Approach:

After studying the evacuation issues associated with the twelve portal routes, it became clear that certain treatments would be applicable to most if not all routes, but at different points. A set of treatments were developed –a "toolbox"- that could be applied in a fairly consistent manner. The toolbox approach allowed the team to work efficiently, and helped assure that some treatments would not be overlooked. This set of improvements is listed in Table E-2 below.

Portal Listings:

Each of the twelve portals is discussed in detail in Part 2, along with maps, photographs, diagrams, and treatment tables. With a clear set of problems for each portal route, treatments were developed, explained, and listed. A complete data listing is included in Appendix E, including the general problem addressed, the treatment, unique ID (for spot improvements), cost estimate, coordinating agency, and coordinates for Geographic Reference purposes.

Community Outreach:

Meetings were held with each of three Stakeholder groups, representing the north, central, and southern sections of the study areas. The Monmouth County Planning Board staff contacted all municipalities within the study area and provided guidance as to how to select and nominate members to the community stakeholder groups. Each participating municipality selected up to three representatives from a pool of municipal planners, elected officials, council members, planning board members, municipal engineers, municipal traffic safety officers, and emergency management coordinators.

Table E-1, Priority Locations

Portal Route	Priority Location	Priority Issue
CR 39 (Union Ave.)	CR 39/SR 36 Intersection	Capacity, Flooding
CR 7/CR 56 (Palmer Ave.)	CR 7/SR 36 Intersection	Capacity, Flooding
SR 36 (North Coast)	CR 8A/SR 36 Intersection	Capacity
	CR 7/ SR 36 Intersection	Capacity, Flooding
	Cr 39/SR 36 Intersection	Capacity
	Broad St./SR 36 Intersection	Capacity
	CR 36/CR 35 Connection	Capacity, Flooding
CR 516/CR 50	SR 35/CR 516 Connection	Capacity
	Cherry Tree Farm Rd./CR 516	Safety (sight lines)
	RR crossing at Naval Station	Safety
Kings Highway* *Deleted from Study due to Environmental Impacts and number of deects. Replaced with CR 8A/12/12A	Locust Ave./CR 516 (4-way stop)	Safety (awkward crossing angles)
	Hillside Ave. – Sleepy Hollow Rd. Segment	Safety (sharp horizontal curvature,
	CR 35/CR 516 Connection	Capacity
	RR crossing at Naval Station	Safety
CR 8A, 12A Substitute Portal for Kings Highway	Oceanic Bridge	Bridge Loading, Age
	GSP On-Ramp	Capacity
CR 520	Rumson Ave. Bridge	Capacity
	CR 520/Seven Bridges Rd Intersection	Capacity
	T-intersections at Branch Ave., Pinckney Rd.,	Safety (turning movement conflicts), Capacity
Broad St.	Maple Ave./Broad St/Intersection	Capacity
	RR crossing near Shrewsbury Ave.	Capacity, Safety
	GSP on-ramp	Capacity
SR 36 (Mid Coast)	Cluster of signalized intersections bet. Ocean Ave. and CR 29	Capacity, Flooding at Sea Bright
	At-grade RR crossing near Cr 29	Safety

Table E-1, Priority Locations (cont'd)

Portal Route	Priority Location	Priority Issue
	SR 71/SR 33 Intersection	Capacity
	CR 547/SR 36 Intersection	Capacity
	GSP On-ramp	Capacity
Park Avenue	At-grade RR crossing near Woodgate Ave.	Safety
	SR 71/Park Ave. Intersection	Capacity
	Park Ave./CR 15 T-intersection	Safety (turning movement conflicts)
	CR 35/Park Ave. connection	Capacity
CR 16/SR 66	CR 71/CR 16 Intersection	Capacity, Flooding
	SR 35 (Neptune Boulevard)/CR 16 Intersection	Capacity
SR 33	Cluster of signals bet. SR 71 and Atkins Ave.	Capacity
	SR 35/SR 33 Intersection	Capacity
	Lane reduction approaching Fortunato Pl.	Safety (merging maneuvers),
	GSP On-ramp	Capacity
	SR 66/SR 33 Intersection	Capacity
	CR 34/SR 33 Intersection	Safety (lane changing), Capacity
CR 524 (Allaire Road)	SR 71/Allaire Road Intersection	Capacity
	Allaire Rd./Warren Avenue	Safety (awkward crossing angles)
	Allenwood Road bet. SR 34 and CR 524 Alt.	Safety (sharp horizontal curvature)
	Allaire Rd./CR 524 Alt. T-Intersection	Safety (conflicting turning movements), capacity
CR 524 Alt.	SR 35 Traffic Circle	Safety, Capacity
	SR 34 On-Ramp	Capacity
	CR 524 Alt./Ramshorn Drive Intersection	Safety (crossing angle)

Stakeholder meetings provided a work-group setting in which the project technical team could learn about relevant local issues and concerns; discuss specific project alternatives and concepts, and establish appropriate methods and approaches to advancing project activities and findings. The project continued to receive written comments, both on paper and through the interactive website. Most comments were accommodated within this document. A few of the community-driven issues and solutions that were indicated at these meetings include:

- A possible low-lying area where State Routes 35 and 36 meet the Garden State Parkway
- Use of Normandy Road as an Alternate Evacuation Route
- General signing of "Alternate Evacuation Routes" to help where designated evacuation routes become congested.

Technical Advisory Committee

A Technical Advisory Committee (TAC) was formed before the consultant was selected for the Study. This team consisted on representatives from County Departments, including Planning, Engineering, Transportation, and GIS. In addition, representatives from NJDOT, and NJTPA actively participated. NJ Transit was invited to join the TAC, but a representative attended only 1 meeting. The TAC has numerous meetings and reviewed all draft documents as they became available.

Public Input

Meetings were held with each of three Stakeholder groups, representing the north, central, and southern sections of the study areas. The Monmouth County Planning Board staff contacted all municipalities within the study area and provided guidance as to how to select and nominate members to the community stakeholder groups. Each participating municipality selected up to three representatives. In general, the stakeholders were Emergency Management personnel and Police/Public Safety Officers.

Final Project Recommendations:

Part 2 of the report contains the final set of recommendations. Fine tuning of improvements involved weighing the positive aspects of these improvements against any potential negative impacts. As an example, raising a roadway's profile will make it less susceptible to flooding. But a raised profile can cause problems in connecting to cross streets and service to driveways. Driveways that previously sent water down to the roadway could experience stormwater traveling down from the roadway to the property. Such an outcome is not acceptable.

Part 2 contains specific recommendations. But it is important to recognize those problems and treatments that represent "global" conditions and applications. All problems associated with coastal evacuation can be placed in two categories:

A. Flooding – Rising of the sea level such that areas are quickly inundated, and therefore not passable or useful as an evacuation route

B. Capacity – Volumes of evacuating vehicles become so large that a particular route becomes congested, losing its ability to move traffic.

There were two basic approaches to flooding:

1. Raising the elevation of the facility, thereby bringing it above the flood level- This type of treatment was generally very expensive, and should be treated as a longer-range type of solution, or one that could be approached if a facility is already scheduled for capital improvement. Bridge replacement projects should consider increased heights, especially given predictions of rising sea levels due to climate change.
2. Recognizing those areas with a higher likelihood of flooding, and coordinating emergency management efforts to provide the earliest attention for first responders and public notice. These System Management techniques occur in the planning stages of coastal evacuation, are least costly, and probably the most effective in counteracting the worst consequences of coastal flooding.

Table E- 2 - Treatment "Toolbox"

Issue	Treatment Category	Treatment	Timeframe	Unit	Cost per unit
Capacity	Operational	Restriping	Short	roadway-ft	$5
Capacity	Physical	Minor widening <3 feet	Intermediate	MILE	$150,000
Capacity	Physical	New Bridge	Long	Sq Foot	$220
Capacity	Physical	Rehabilitate Bridge	Long	Sq Foot	$150
Capacity	Physical	Relocate aerial utilities	Long	MILE	$100,000
Capacity	Technological	Portable traffic signals	Intermediate	Location	
Capacity	Operational	Allow evacuees to wait in emergency shelters until traffic clears	During Emergency	Location	No cost
Capacity	Physical	Reverse On-Ramp	Long	Location	$500,000
Capacity	Physical	Widening - add lane	Long	Lane-Mile	$2,100,000
Capacity	System Management	No Parking Legislation	Short	NA	$0
Capacity	Technological	Install LED's, UPS's	Intermediate	Location	$7,000
Capacity	Technological	Upgrade signals for wireless control	Intermediate	Location	$23,000
Capacity	Highway Advisory Radio	Transmitter, two signs	Intermediate	Area	$35,000
Capacity	Technological	Portable traffic signals	Intermediate	Location	$60,000

Table E-2, Treatment "Toolbox" (cont'd)

Issue	Treatment Category	Treatment	Timeframe	Unit	Cost per unit
Capacity	System Management	Dissemination of public information about emergency shelters	Short	NA	$0
Flooding	Operational	Plan to focus on intense inundation areas	During Emergency	Area	$0
Flooding	Operational	Police assistance	During Emergency	Officer/day	$500
Flooding	Physical	Modify sign	Short	Mile	$600
Flooding	Physical	New signs	Short	Mile	$1,500
Flooding	Physical	Raise roadway - 1 foot	Long	Lane- foot	$720

Capacity solutions also fell into a number of treatment types:

1. Creation or widening of shoulders – These are capital improvements that provide additional through capacity during evacuation, while providing possible bicycle use during normal periods.
2. Minor widening or changes in parking restrictions to allow for a second outbound lane during evacuations – In some cases, only two or three additional feet were necessary to have enough total roadway width to allow a second outbound lane.
3. Sign to preclude parking in times of evacuation – similar to a snow emergency, this restriction often would create an additional evacuation lane, or assure that a designated lane would remain clear.
4. Ramp reversals – prepare the approaches to Garden State Parkway southbound lanes that may have to be reversed to northbound lanes.
5. Provide battery backup and wireless control for key signalized intersections – allowing officials to move outbound traffic very quickly under rare conditions.
6. Operational Improvements to be implemented at the time of evacuation – these require use of emergency management personnel (mostly police), to control key intersections. Services would include functions such as assisting in the reversal of approach ramps, closing off some intersections so that others would operate more efficiently, and patrolling "No Parking During Evacuation" zones.

Lead Organizations / Future Programming:

Once the improvement scope and locations were determined, the project team determined which agency might be the "Lead Organization". This determination was made in cooperation with the Monmouth County Planning Board. In some cases, the solution would involve two or more agencies, such as State and County or County and Municipality, and were so listed. With an understanding of the problem, possible solutions, scope, cost, lead agency, and timing; the County now has the ability to consider incorporation of these solutions into their operating and capital programs. As part of the North Jersey Transportation Planning Authority, projects may be included in the multi-year Transportation Improvement Program, or slated for additional study under the Annual Work Program.

This Study developed a Treatment Toolkit, enabling it to recommend a set of improvements tied to individual Portals. However, this same toolkit may be applied globally to assist in programming and policy decisions. It can provide a focus for setting short and long range infrastructure goals relating to coastal evacuation. Although improvements are listed by route, the County can also take a functional or global approach. Improvements can be implemented by type.

Some physical improvements can be applied fairly easily and cheaply on an area-wide basis. Evacuation signing, lane re-striping, and conversion of traffic signals to LED's are a first step.

Operational Improvements that should be put in place quickly include setting severe inundation zones as priority areas, preparation to place first responders at key intersections and "choke points", and coordination of highway advisory radio among municipalities.

Longer Term Improvements, such as widening and elevating of roads and bridges need to be integrated into ongoing planning programs. Evacuation improvement should be factored into the process for evaluating larger construction projects.

As a General Reference, **municipalities can use the project data** (populations affected, toolkit, methodologies, appendices) to support municipal evacuation programs. The individual route descriptions and analyses can support improvements recommendations on a corridor or intersection basis. The route tables and maps provide a handy reference. The searchable database is a good starting point for developing local evacuation route programs.

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GLOSSARY

TERM	ACRONYM	DEFINITION
Changeable Message Sign	CMS	Traffic control devices designed to display variable messages in a sequence. Changeable message signs are meant to display pertinent traffic operational and guidance information only, not advertising. In this report, permanently-mounted CMS's are defined as Dynamic Message Signs; while portable CMS's are defined as Variable Message Signs.
County Road	CR	These roads are usually, but not always, maintained by the counties and are denoted by three digits in the 500 to 699 range.
Dynamic Message Sign	DMS	Permanently-mounted Changeable Message Sign
Environmental Assessment	EA	A report subject to the requirements of the National Environmental Policy Act (NEPA) that identifies the environmental impacts of project alternatives. The EA can lead to a Finding of No Significant Impact (FONSI) or an Environmental Impact Statement (EIS).
Environmental Impact Statement	EIS	An investigative report issued to comply with the requirements of the National Environmental Policy Act (NEPA) that identifies in detail the environmental impacts of a project.
Environmental Justice	EJ	Federal requirements that minority and low-income populations be specifically taken into account in the planning of federally-funded facilities.
Evacuation Analysis Zone	EAZ	The study area is divided into three geographic areas identified as the North Coast, Mid Coast and South Coast. This segmentation is based on area drainage basins, travel patterns, and development patterns.
Feasibility Assessment	FA	A phase of work in the NJTPA's PDWP in which a potential project derived from Concept Development is further studied to determine if a solution is feasible in light of environmental, engineering, budgetary and community constraints.
Federal Emergency Management Agency	FEMA	The federal agency responsible for organizing responses to human or natural disasters.

TERM	ACRONYM	DEFINITION
Federal Highway Administration	FHWA	The agency of the USDOT that administers the federal program of financial assistance to state departments of transportation.
Geographic Information System	GIS	A computer system that can spatially manage, analyze and present mapped geographic data.
Highway Advisory Radio	HAR	Highway Advisory Radio - HAR - Highway Advisory Radio is a service for drivers that typically provides roadway, weather, and emergency information.
Intelligent Transportation Systems	ITS	Technology to better manage traffic and transit resources, increase the capacity capabilities of the nation's highways, enhance safety and reduce accidents and more effectively handle toll collection, safety inspection, log maintenance, licensing and vehicle registration. Applications of ITS technology include computerized traffic signal systems, traffic management systems, satellite vehicle tracking systems, electronic toll collection, electronic weigh in motion and safety inspection of commercial vehicles, automatic container tracking systems, in-vehicle route guidance devices, emergency and incident response and Mayday systems in vehicles that automatically alert police, fire or other emergency services if an accident should occur.
Level of Service	LOS	A set of characteristics that indicate the quality and quantity of transportation service provided. Characteristics are based on mode. A facility's LOS is often given as a numerical rating. Leverage Lease Funds LEV LEASE Private funds obtained by NJ Transit from the sale and leaseback of capital assets.
Metropolitan Planning Organization	MPO	The forum for cooperative transportation decision making for a metropolitan area. As designated by federal law, the Board of Trustees consists of local elected officials. The MPO has the responsibility for developing transportation plans and programs for urbanized areas of 50,000 people or more.

TERM	ACRONYM	DEFINITION
National Environmental Policy Act	NEPA	The National Environmental Policy Act of 1969 (NEPA) aims to help the public understand the environmental consequences of major projects. NEPA requires planners to develop an assessment of the environmental impacts of a project and to consider alternatives and mitigation measures.
New Jersey Department of Transportation	NJDOT	The state agency responsible for maintenance, construction, and operation of State and Interstate highways in New Jersey. New Jersey Transit NJ Transit The state agency responsible for maintenance, construction, and operation of public transit facilities.
North Jersey Transportation Planning Authority	NJTPA	The federally-authorized Metropolitan Planning Organization (MPO) for the 15 sub-regions of Northern New Jersey. The Board of Trustees is composed of representatives of the counties of Bergen, Essex, Hudson, Hunterdon, Middlesex, Monmouth, Morris, Ocean, Passaic, Somerset, Sussex, Union and Warren; the cities of Newark and Jersey City; as well as from: NJDOT, NJ Transit, the PANYNJ; the Governor's office; and a citizen's representative.
Office of Emergency Management	OEM	A group established by a government agency (State, County, City, etc) that is responsible for preparing and managing emergency conditions such as flooding, evacuation, and other incidents.
Planning and Development Work Program	PDWP	The schedule of activities and anticipated products which are focused at bringing projects from a conceptual phase to a more specific development phase or feasibility assessment.
Portal Route	Portal Route	A route whose purpose is to bring people from a hazardous (flood) zone to a safe area.
Portal Route Profile	Portal Route Profile	A listing of critical properties of a portal route including common name, limits, length, and physical and operating aspects,
Priority Location	Priority Location	An area or spot along a portal route that would need improvement in order to operate properly under evacuation conditions. The type of problems associated with priority locations are usually either a flooding condition or a travel restriction.

TERM	ACRONYM	DEFINITION
Project Prioritization	Project Prioritization	A process for ranking proposed projects to determine whether they warrant inclusion in the TIP. The process assigns scores to each potential project based on how well it fulfills a variety of criteria and performance standards related to each of the six goals established in the RTP. The project prioritization process then considers other factors such as funding availability and scheduling.
Public Participation	Public Participation	Federal regulations require MPOs to provide early and continuing opportunities for public input into major decision processes.
Regional Transportation Plan	RTP	The federally-mandated long range Regional Transportation Plan, based on extensive public participation and data driven analysis. The plan forms the basis for transportation decision-making. The RTP is produced by the MPO every 4 years.
Segment Ratio	Segment Ratio	A measure of how much available capacity is being used by traffic crossing a mainline section. Segment ratios over .9 indicate a potential for congestion.
Stakeholders	Stakeholders	Different groups including communities, government officials, MPOs, etc. affected by decisions regarding transportation projects, studies, and initiatives.
State Emergency Evacuation Routes	State Emergency Evacuation Routes	Routes that have been incorporated into New Jersey's Emergency Evacuation Route System.
State Transportation Improvement Program	STIP	The STIP, in New Jersey, represents the combination of MPO capital investment programs (TIPs) from around the state: South Jersey (SJTPO), North Jersey (NJTPA) and the Delaware Valley (DVRPC). State Wide Investment SWI A series of coordinated smaller-scale projects in multiple locations, and in multiple phases of work, that address a specific mobility issue.
Sub-regional Transportation Planning Program	STP	Program Planning activities funded by the NJTPA and carried out by the 13 counties and two major cities in North Jersey.

TERM	ACRONYM	DEFINITION
System Management	System Management	Projects and programs that optimize the performance of the transportation network. Examples of system management projects would include: exclusive bus lanes, reversible lanes, "smart" traffic signs and signals, and intersection improvements.
Transit Dependent Population	Transit Dependent Population	Groups likely to require public transportation services, including those of advanced age, limited income, or with limited or no access to an automobile.
Transportation Control Measure	TCM	A measure that seeks to influence the public's travel choices, including mode, vehicle miles traveled, and timing in order to reduce congestion and pollution, as mandated by the CAAA in 1990.
Transportation Enhancement	TE	Enhancements to transportation facilities such as pedestrian, scenic, historic and other improvements. A separate TE funding program has been established by federal law.
Transportation Improvement Program	TIP	A 4-year prioritized program of transportation projects to be implemented in appropriate stages over the 4 years of the program. The projects are drawn from the NJTPA Regional Transportation Plan (RTP). All federally funded projects and programs must be included in the TIP.
Travel Demand Management	TDM	Programs designed to maximize the people-moving capacity of the transportation system by increasing the number of people using existing transportation facilities, or by influencing the time of, or need to, travel.
Unified Planning Work Program	UPWP	The schedule of activities and anticipated products which guides MPO efforts. This document, which is updated annually, summarizes all activities and budgets of the NJTPA staff, the sub-regions and other transportation agencies in the region.
United States Department of Transportation	USDOT	The USDOT is the main federal agency that develops and coordinates policies pertaining to the national transportation system. The USDOT includes the Federal Highway Administration (FHWA) and the Federal Transit Administration (FTA).
Variable Message Sign	VMS	A portable Changeable Message Sign

TERM	ACRONYM	DEFINITION
Vehicle Miles Traveled	VMT	One mile traveled by one vehicle equals one vehicle mile traveled. VMT is used to calculate traffic congestion, fuel consumption, and other key transportation-related indicators.
Vulnerable Population	Vulnerable Population	The number of persons present in an area subject to flooding, both residents and non-residents (visitors, employees, etc),
Travel Demand Management	TDM	Programs designed to maximize the people-moving capacity of the transportation system by increasing the number of people using existing transportation facilities, or by influencing the time of, or need to, travel.