

RHODE ISLAND HURRICANE EVACUATION STUDY

TRANSPORTATION ANALYSIS SUPPORT DOCUMENTATION

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Prepared For:

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SECTION ONE

INTRODUCTION

1.1 PURPOSE

The purpose of the Transportation Analysis is to estimate roadway clearance times for coastal Rhode Island communities and affected coastal communities in Bristol County, Massachusetts¹ under a variety of hurricane evacuation scenarios. Clearance time is defined as the amount of time required for all vehicles to clear the roadways after a regional or state level hurricane evacuation recommendation is disseminated to the public. During an evacuation, a large number of vehicles have to travel on a road system in a relatively short period of time. A number of different vehicle trips are possible, varying by trip origination, time of departure, and trip destination. The number of vehicle trips becomes particularly significant for an area such as Rhode Island's coast because its land areas are highly urbanized with many residents living near the immediate shore. The number of evacuating vehicles varies depending upon the intensity of the hurricane, actions taken by local authorities, and certain human behavioral response characteristics of the area's population. Motorists evacuating their homes and intermixing with traffic from people leaving work or traveling for other trip purposes can lead to significant traffic congestion and backups, ultimately delaying the evacuation.

The Transportation Analysis is one element of a much broader study entitled the Rhode Island Hurricane Evacuation Study (HES). The Rhode Island HES Technical Data Report presents the results of several technical analyses to provide emergency management officials with realistic data quantifying the major factors involved in hurricane evacuation decision-making. The technical data presented in the Study is not intended to replace the detailed operations plans developed by the State and communities. Rather, the data is intended to provide a framework within which each jurisdiction can update and revise hurricane evacuation plans and from which operation procedures and guides can be developed for future hurricane threats. Because the Transportation Analysis builds upon results from other analyses of the Study, in this report, reference is frequently made to information that is presented in the Technical Data Report (TDR).

A transportation modeling methodology and a roadway representation were developed for all coastal communities in Rhode Island and southeastern Massachusetts within the study area to conduct the analysis and estimate clearance times. This analysis establishes the clearance time portions of evacuation times. Clearance time is one component of the total time required for a regional hurricane evacuation to be completed. An additional time component, which considers the amount of time necessary for public officials to notify people to evacuate, must be combined with clearance time to determine the total evacuation time. More information on how decision-makers can use the results of this analysis is discussed in detail in Chapter Eight, Decision Analysis, of the TDR.

1.2 STUDY AREA

The study area for the Transportation Analysis includes the entire State of Rhode Island and Bristol County, Massachusetts as illustrated in Figure 1-1. Bristol County, Massachusetts is included as part of

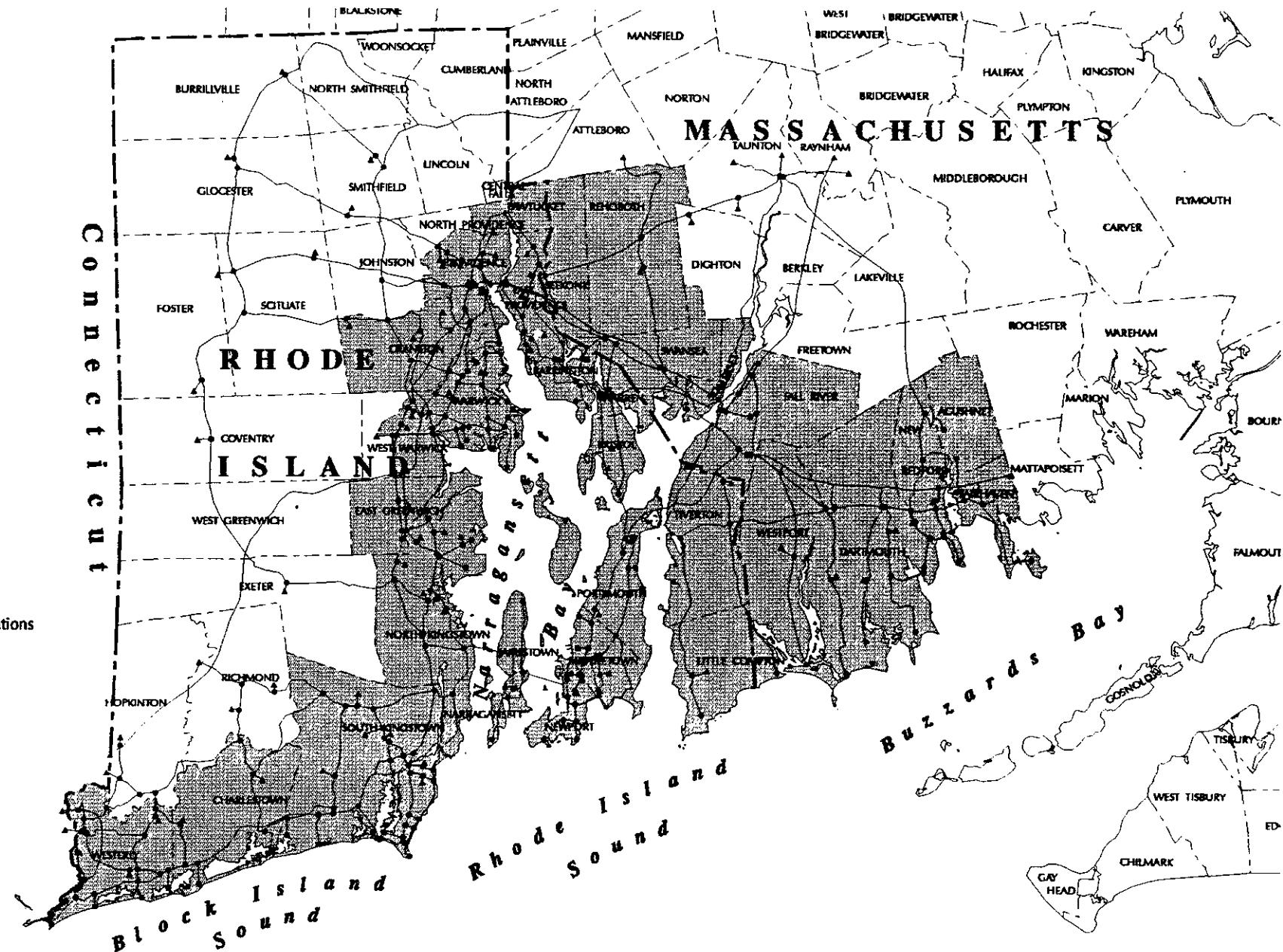


FIGURE 1-1: STUDY AREA

the Rhode Island Transportation Analysis because of the interdependence and inseparability of the eastern Rhode Island and southern Massachusetts roadway systems. The vastness of the Rhode Island and Bristol County, Massachusetts study area required that the region be divided into two approximately equal sized areas and analyzed individually. The two networks were defined as the "West Bay/Rhode Island Network" and the "East Bay/Massachusetts Network". The West Bay/Rhode Island Network extends from approximately the Connecticut-Rhode Island State Line eastward to Narragansett Bay. The East Bay/Massachusetts Network extends from approximately the Fairhaven-Mattapoisett, Massachusetts town line westward to Narragansett Bay.

The study area does not include the community of New Shoreham (Block Island) and Prudence Island. It is the intention of the community of New Shoreham and the Rhode Island Emergency Management Agency to evacuate all non-permanent residents from Block Island by ferry boat or other means possible in response to a hurricane threat. Currently, the Rhode Island Emergency Management Agency, in conjunction with the community of New Shoreham, is developing an Emergency Operations Plan which will include provisions for evacuating non-permanent residents from the island. Shelter space will be provided on the island for permanent residents at an ARC Mass Care Facility located at the New Shoreham High School. No permanent residents live on Prudence Island.

The road system under examination includes major State maintained highways from the Connecticut state line to the Fairhaven-Mattapoisett, Massachusetts town line, extending approximately 15 miles inland from the coast. The analysis assumes evacuees originate from the various coastal communities and safe destinations include locations within coastal communities as well as locations farther inland, or in adjacent States. The Transportation Analysis was done at a state level, or macro scale, rather than at a community level because the intermixing of traffic from one community to the next was considered perhaps a leading contributor to delays in evacuations.

1.3 METHODOLOGY

The Behavioral Analysis discussed in Chapter Four of the TDR presents information about which destination types evacuees are most likely to choose during an evacuation in Rhode Island. The analysis concludes that people who evacuate surge areas are most likely to seek safe destinations at public shelters, friends'/relatives' homes, or hotels/motels. Although behavioral data provided in Chapter Four can give some guidance in predicting the actual geographic areas people will evacuate to and the evacuation routes people may use to reach their destinations, assumptions of this nature tend to be subjective. This is caused by the vast number of possible destinations and routes available to evacuees in highly populated areas. Clearance time calculations are further complicated by the affects of significant and varying amounts of "background" traffic that will be present on roadways as an evacuation progresses ("background" traffic refers to vehicle trips by people who leave work early and return home, people who travel through the region, and trips made by people preparing for the arrival of hurricane conditions or engaged in normal activities).

The study considered several approaches to estimate clearance times for the Rhode Island study area. The first approach considered was the one used by the Corps of Engineers and the FEMA to complete hurricane

evacuation studies in the Gulf and southern Atlantic coast states. This approach assigns destinations and evacuation routes for the evacuating population by matching probable evacuee destinations (determined by a behavioral analysis) with the land uses known for the region. A mathematical model of the study area's roadway system is then used to calculate clearance times based on the trip distributions assumed for the evacuation. The time required for all evacuees to reach their predetermined destination is considered the clearance time. As reported in a post-hurricane assessment of Hurricane Hugo in 1989, the transportation analyses conducted for the North Carolina and South Carolina Hurricane Evacuation Studies were found to be very accurate in that the clearance times experienced during evacuations were very near predicted times. These results give evidence that this approach is accurate for study areas with limited alternative roadway systems and where adequate behavioral data and landuse information is suitable to identify evacuation routes and predict the destinations of evacuees. The following paragraphs explain some differences in the Rhode Island study area in comparison to other areas, and give the reasons why the Corps of Engineers employed an alternative transportation modeling approach for Rhode Island and Bristol County, Massachusetts.

One concern in using the transportation modeling approach discussed above for the Rhode Island study area was the appropriateness of assuming specific zonal evacuee destinations and evacuation routes. Inundation areas in Rhode Island and Bristol County, Massachusetts are relatively narrow, but densely populated. The complex system of interconnecting freeways, undivided state routes, and numerous local streets offer evacuees, and others on the roadways, many possible travel routes to reach their destinations. The region is generally characterized by diverse land uses in small geographic areas. Hotels and motels are sporadically located in most communities, friends' and relatives' homes could well be distributed over the entire area, and Rhode Island communities tend to open public shelters to accommodate their individual demands. The Study concluded that it was not practical to use the behavioral information developed for Rhode Island and Bristol County, Massachusetts to derive specific assumptions about evacuee destinations and evacuation routes. The study did conclude that the behavioral response curves presented in the Behavioral Analysis, and used in other hurricane evacuation studies, are useful when estimating the general response and destinations sought by residents who live in surge vulnerable areas.

The second concern in using the modeling approach used in other studies was the representation of the relationship between the number of people evacuating from vulnerable areas in comparison to the number of background vehicles that would be on the roadways during evacuations. Although surge areas are densely populated, the relatively small land areas that they encompass include only a fraction of the region's total population. When viewing the region's roadways as an entire transportation system, most of the traffic on roadways during initial and mid stages of an evacuation is likely to be from people leaving work early and from daily vehicles passing through the region. The problem during evacuations is that evacuating vehicles are forced to compete for roadway capacity with a larger amount of background traffic. This can cause increased congestion, potentially delaying the overall evacuation. Because background traffic will travel in both directions on nearly all roadways during evacuations, the Study determined that the transportation methodology for Rhode Island should not focus on assuming assigned evacuation routes as has been done in other study areas. Instead, the methodology should focus on analyzing the influence that background traffic can have on the overall evacuation.

To address the unique behavioral and transportation issues of the Rhode Island study area, an alternative modeling strategy was used. A mathematical model of the road system was developed and calibrated to simulate the traffic flows of a normal week day. Empirical traffic engineering studies and local traffic count data from the State's Department of Transportation (DOT) were used to establish various existing traffic flow conditions within the study area. The transportation modeling methodology used for this study assumes that the preferences of evacuees to travel on given routes are related to the traffic patterns of a normal day, except where it is clear that evacuees will travel directly to public shelters. The large portion of vehicles associated with background traffic enables the methodology to neglect assigning specific destinations and evacuation routes to evacuees traveling to hotels/motels and friends'/relatives' homes. Large business districts and confined hurricane surge areas in most coastal communities in Rhode Island and Bristol County, Massachusetts will give rise to evacuations involving mostly traffic generated by people leaving work rather than people evacuating surge areas. Analysis of traffic data collected on the days of Hurricanes Gloria and Bob further support this assumption. Accordingly, the modeling strategy used in the Rhode Island study focuses on estimating clearance times which qualitatively measure how competition by evacuating traffic may affect, and possibly delay, the movement of all traffic during an evacuation.

1.4 NETVAC2 TRAFFIC SIMULATION SOFTWARE

The NETVAC2 evacuation simulation software was used to create a mathematical model representing the study area's road system. NETVAC2 is a special purpose, network evacuation computer model designed by the Massachusetts Institute of Technology in cooperation with HMM Associates, Incorporated (now EARTH TECH). It was specifically designed to represent traffic flows over a transportation system during an emergency evacuation. This particular model was selected from several available models because it can be easily applied to model hurricane evacuations conducted in areas with complex roadway systems such as that in coastal Rhode Island and Bristol County, Massachusetts.

NETVAC2 represents roadways as links and intersections connecting two or more roadways as nodes. Physical characteristics about representative links and nodes, and the logic connecting them are inputs to the model used in computing vehicle capacity constraints and legal turning movements. Traffic flows at nodes are subject to intersection approach capacity constraints, whereas traffic flow assignments on outbound links are subject to the volume capacities of the modeled roads. Capacities are based on the Highway Capacity Manual (Highway Research Board) and Interim Material on Highway Capacity (Transportation Research Board).

A complementary program for use with NETVAC2, entitled POPDIS, converts the population that is assigned to enter onto roadways to an equivalent number of vehicles. The user enters the vehicle occupancy rates and the number of people assigned to enter the network at each node. As many as five different population types can be specified. POPDIS aggregates the population input for each entry node and in turn computes the effective average vehicle loading rate per minute at each node.

As vehicles are modeled to move throughout the road networks, NETVAC2 utilizes dynamic programming theory to update vehicle densities, speeds, flows, queues, spillbacks and other relevant traffic information at

a fixed time step prescribed by the user. Traffic assignments from links entering and emanating nodes are made with each time step. One main feature of the model is that link assignments are made based upon the relative combinations of route preferences input for each node. The model also uses dynamic route selection such that route preferences are modified if significant backups exist at one or more emanating links. Vehicles preferring to travel on links undergoing heavy flows or large queues will be rerouted to another link of second preference. This is an important consideration when simulating hurricane evacuations because evacuees are not likely to wait in traffic for long periods of time if less restrictive, alternate routes are available to them.

Simulations terminate after vehicles exit the road system. NETVAC2 model results include computer print files of node and link time history flow and queue data, departing vehicle summaries, total simulation time, and total vehicles on the road system at specified report intervals.

SECTION TWO

MODEL DEVELOPMENT

2.1 GENERAL

The following sections discuss the coding assumptions made in applying NETVAC2 for modeling the hurricane evacuations in Rhode Island. The NETVAC2 User's Manual² gives specific data format instructions and a complete description of all parameters required by the model.

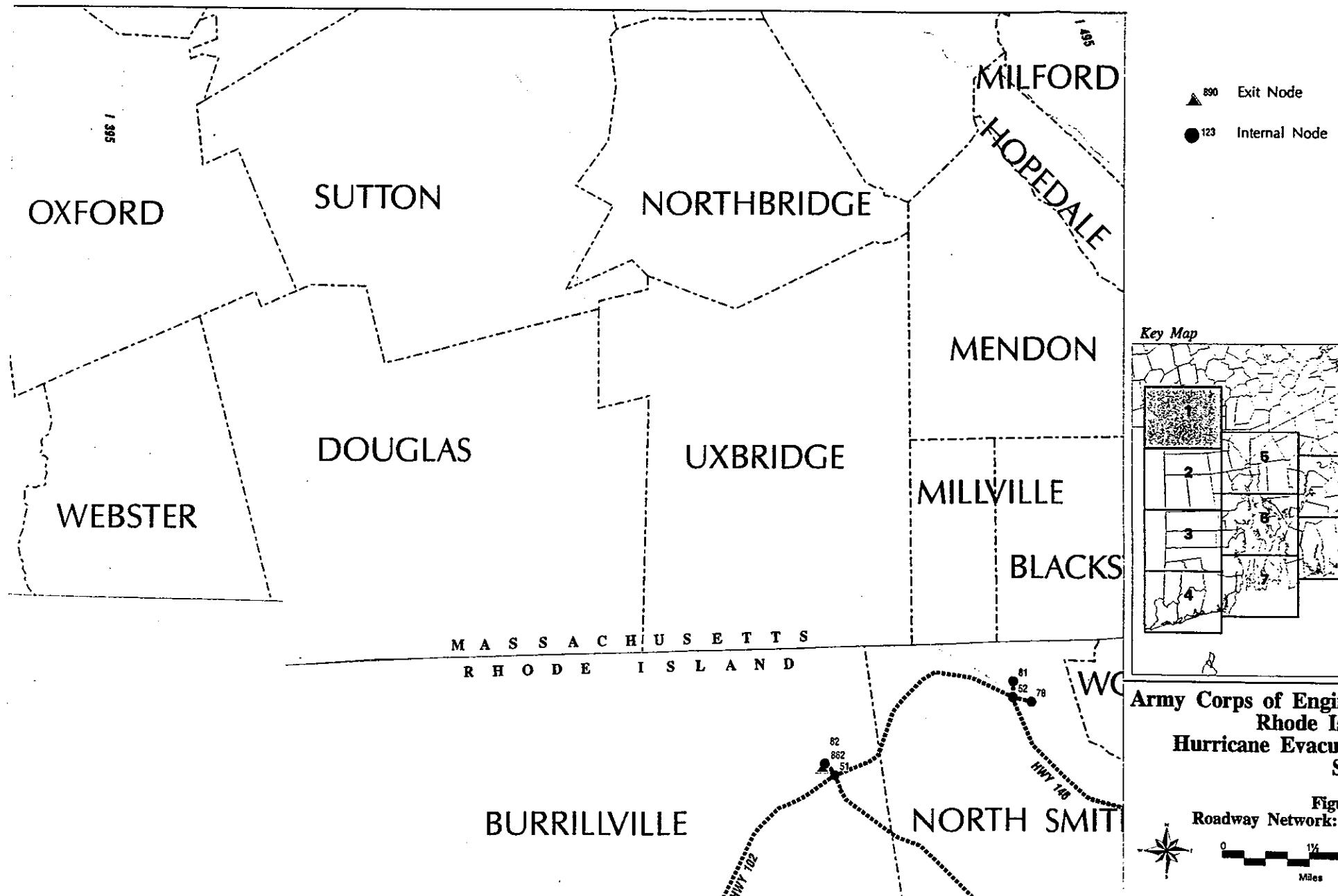
The Rhode Island DOT provided information for the roadway and intersection data used for model development. Roadway and intersection data was retrieved from printouts of state routes extracted from a study by Louis Berger Associates provided by the RI DOT⁷. The study contained detailed information such as the number of travel lanes and auxiliary lanes, lane widths, and intersection approach widths. The total length of each road segment was measured from a scaled map of the roadway network. Functional classification of routes and land use information are also listed. As networks were created, field surveys conducted at several locations verified that the modeling strategy and data input in the models were consistent with physical conditions.

2.2 ROAD NETWORKS

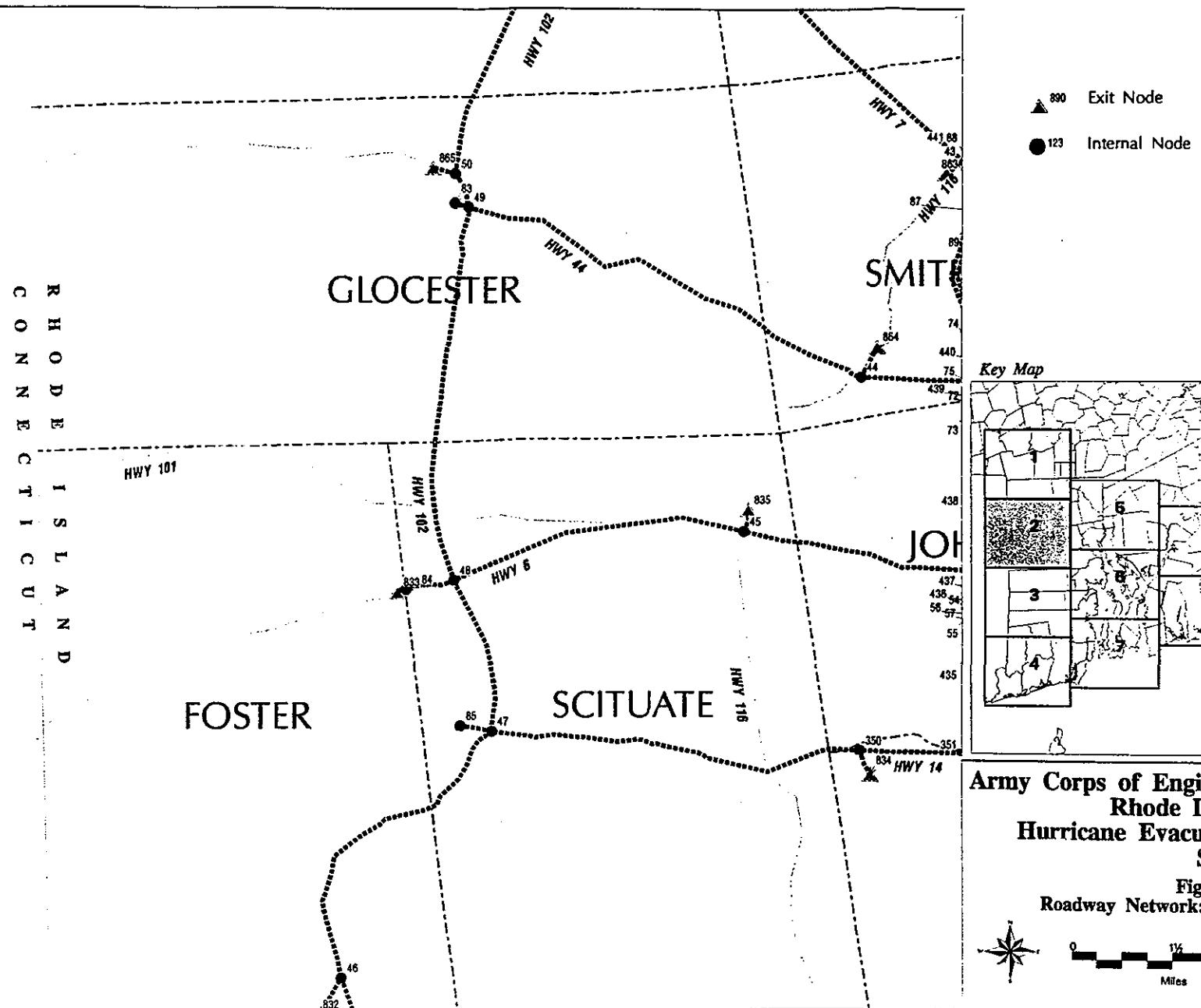
The NETVAC2 program allows networks with up to 500 links and 1000 nodes to be constructed. The vastness of the Rhode Island and Bristol County, Massachusetts study area required that the region be divided into two approximately equal sized areas and analyzed individually. The two networks were defined as the "West Bay/Rhode Island Network" and the "East Bay/Massachusetts Network". The West Bay/Rhode Island Network extends from approximately the Connecticut-Rhode Island state line eastward to Narragansett Bay. The East Bay/Massachusetts Network extends from approximately the Fairhaven-Mattapoisett, Massachusetts town line westward to Narragansett Bay. In the NETVAC2 model, roadways and intersections in the study area are represented by a link-node network as shown in Figures 2-1 through 2-9.

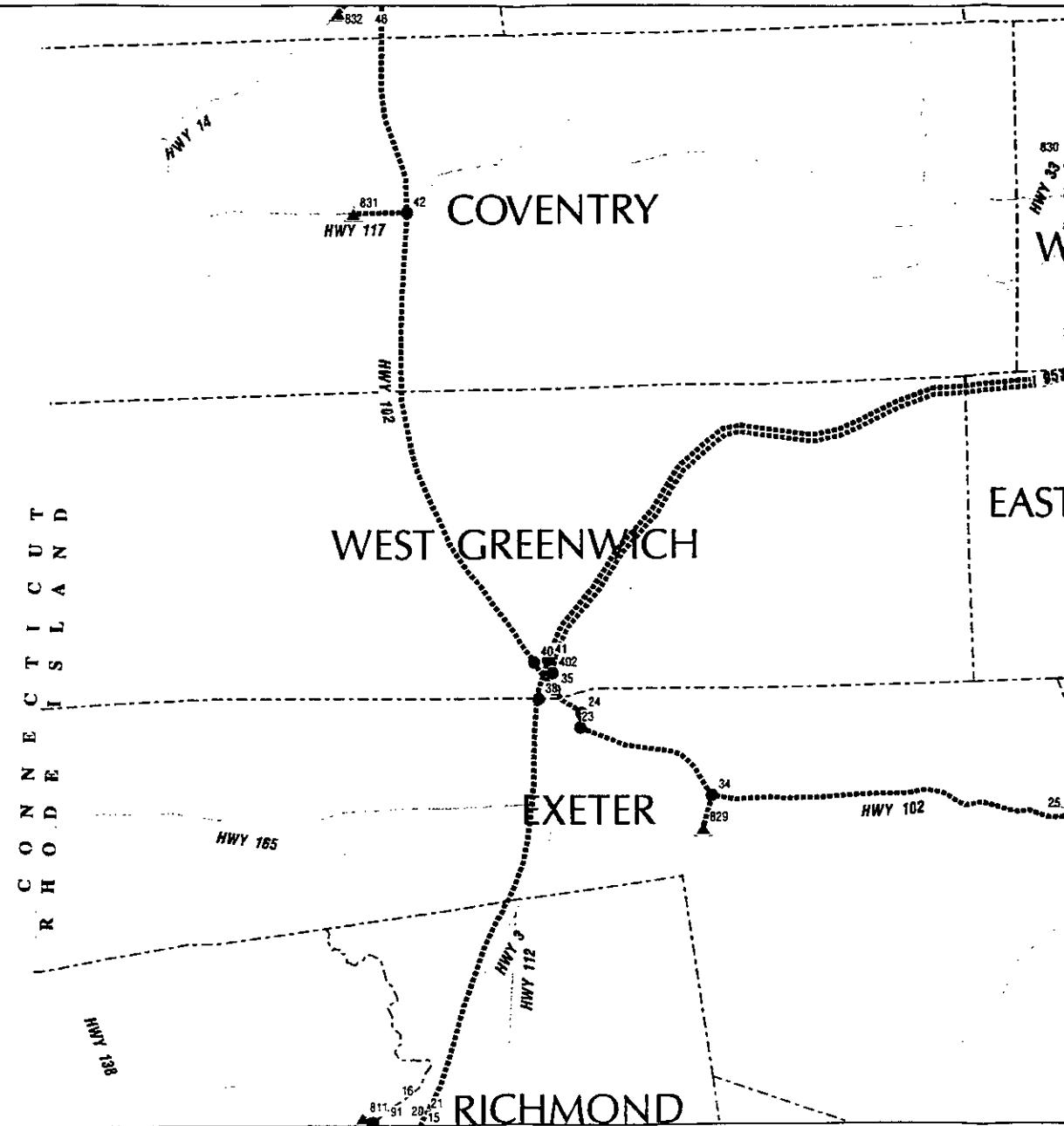
For each link, the actual number of lanes, lane widths, total roadway length in feet, roadway type, surrounding land use, and lateral clearances from roadside obstructions were entered into a computer link file. Values for roadway lateral clearances were input such that link capacities were not influenced by roadside obstructions except in cases where a particular link represented a highway bridge with a restrictive road shoulder. The logical turning movements from one link to the next and route preferences controlling traffic flow onto each link were also specified.

Single nodes were used to identify intersections of two or more undivided state roads, or to represent significant changes in roadway characteristics. Traffic flowing through intersections modeled using single nodes is forced to compete for the right of way with opposing traffic from other approaches. Major interchanges connecting divided and undivided highways, or connecting two undivided highways were modeled with four nodes per interchange. A greater number of nodes at these interchanges were needed to replicate non-opposing continuous traffic flow characteristic of highway on-ramps and off-ramps.



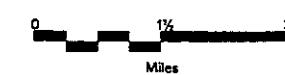
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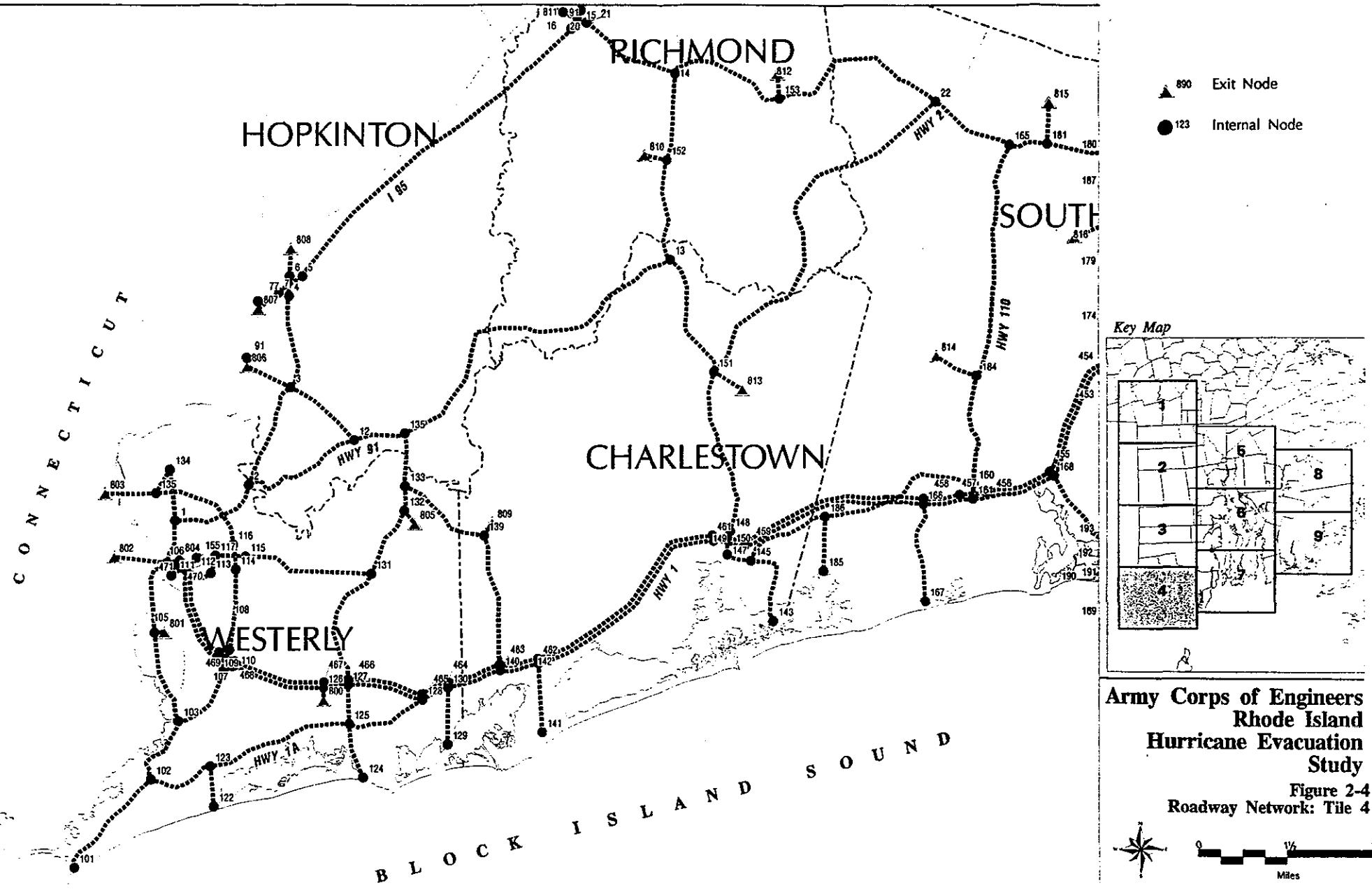




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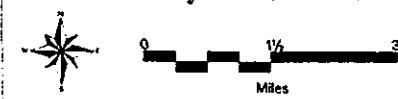
Figure 2-3
 Roadway Network: Tile 3

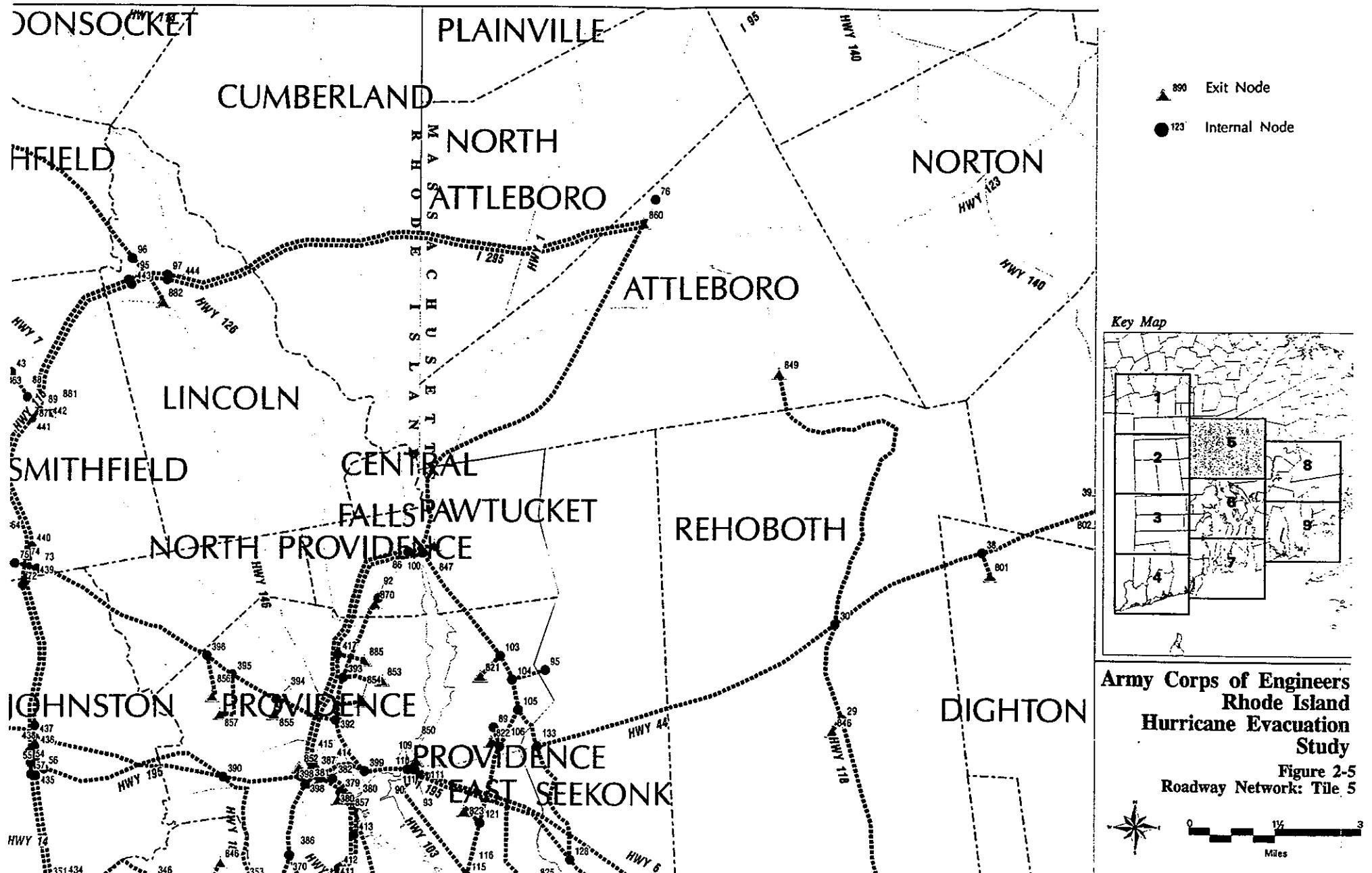


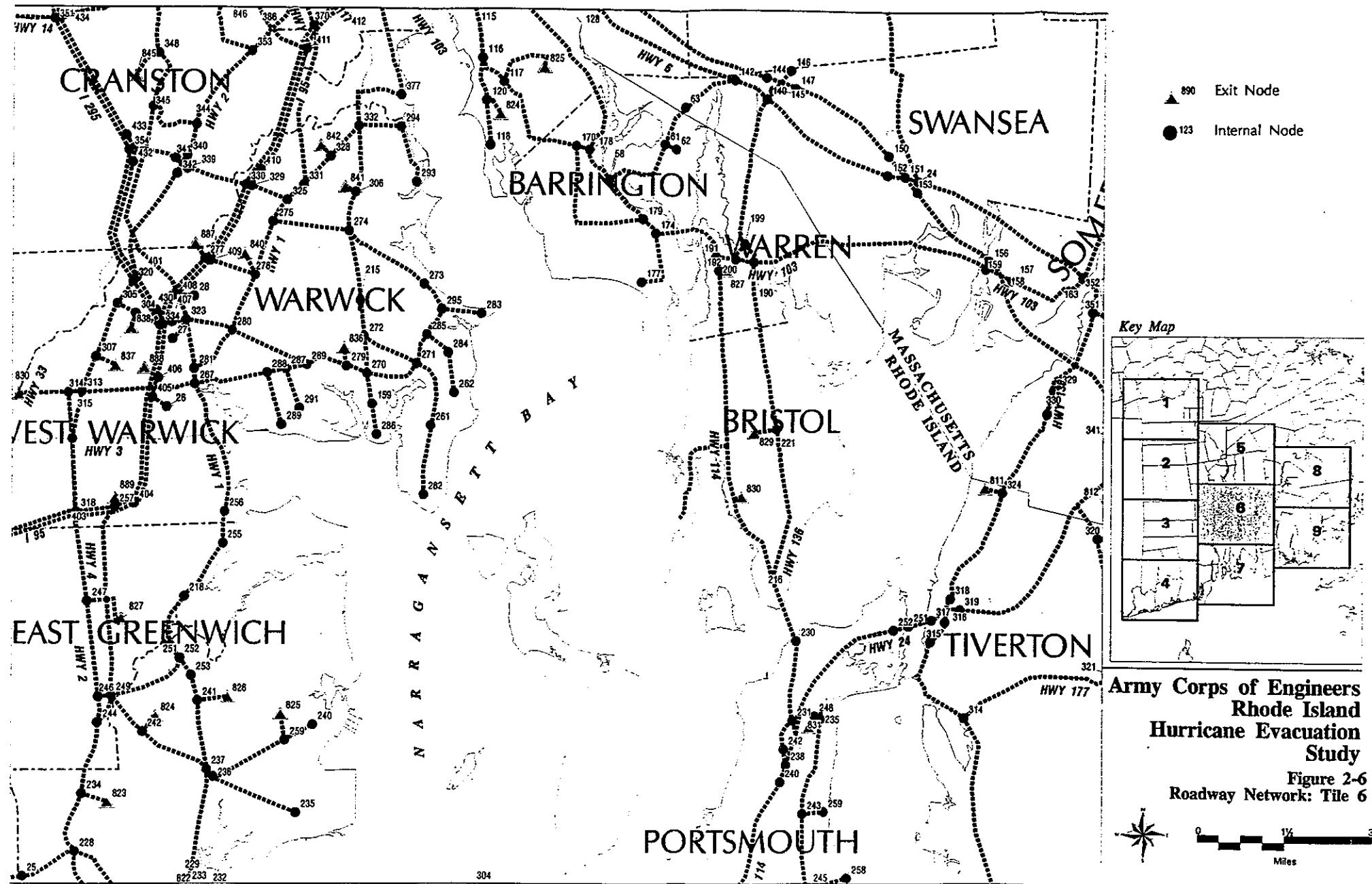


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Figure 2-4
Roadway Network: Tile 4

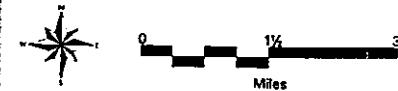


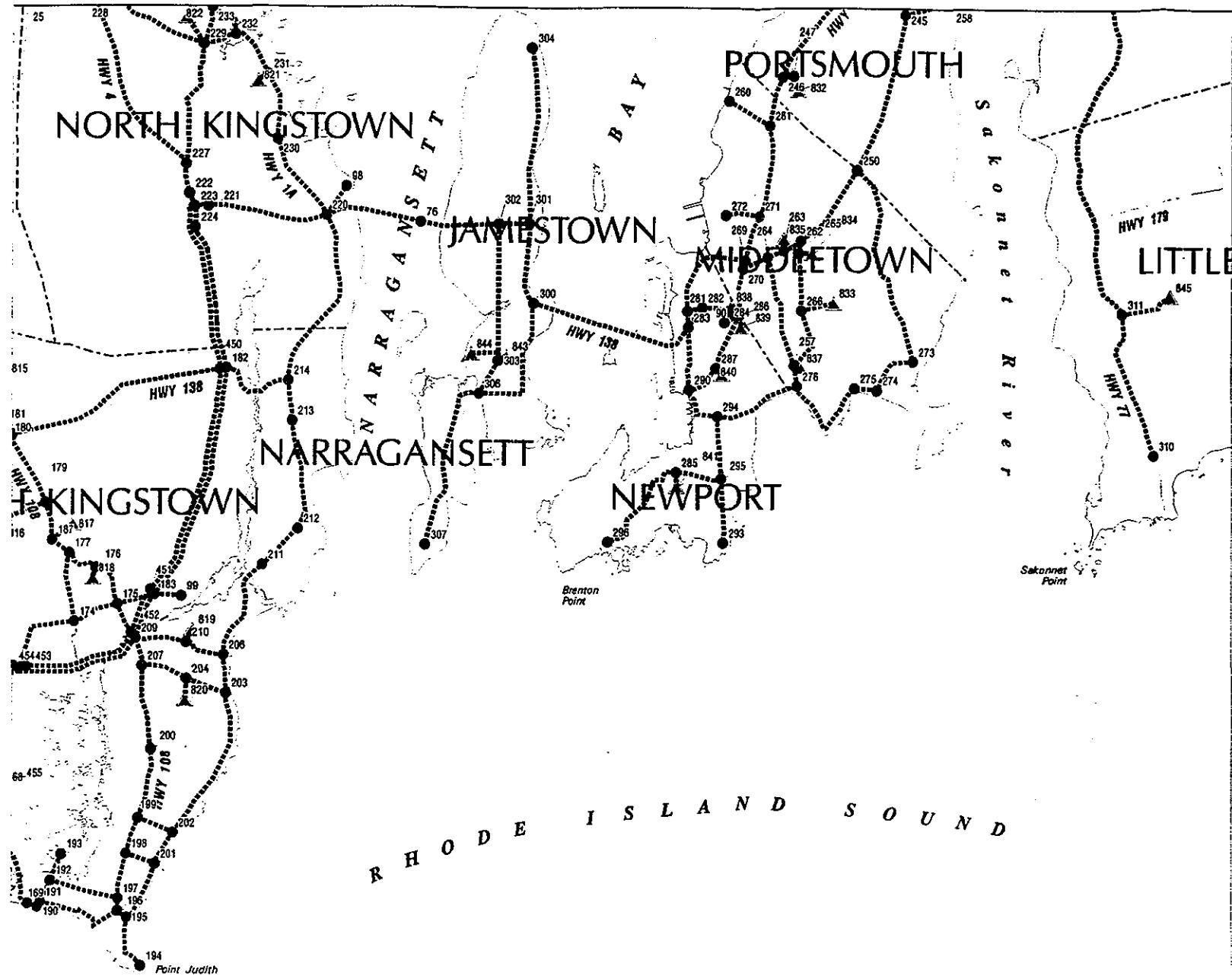




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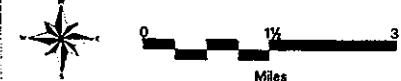
Figure 2-6
Roadway Network: Tile 6

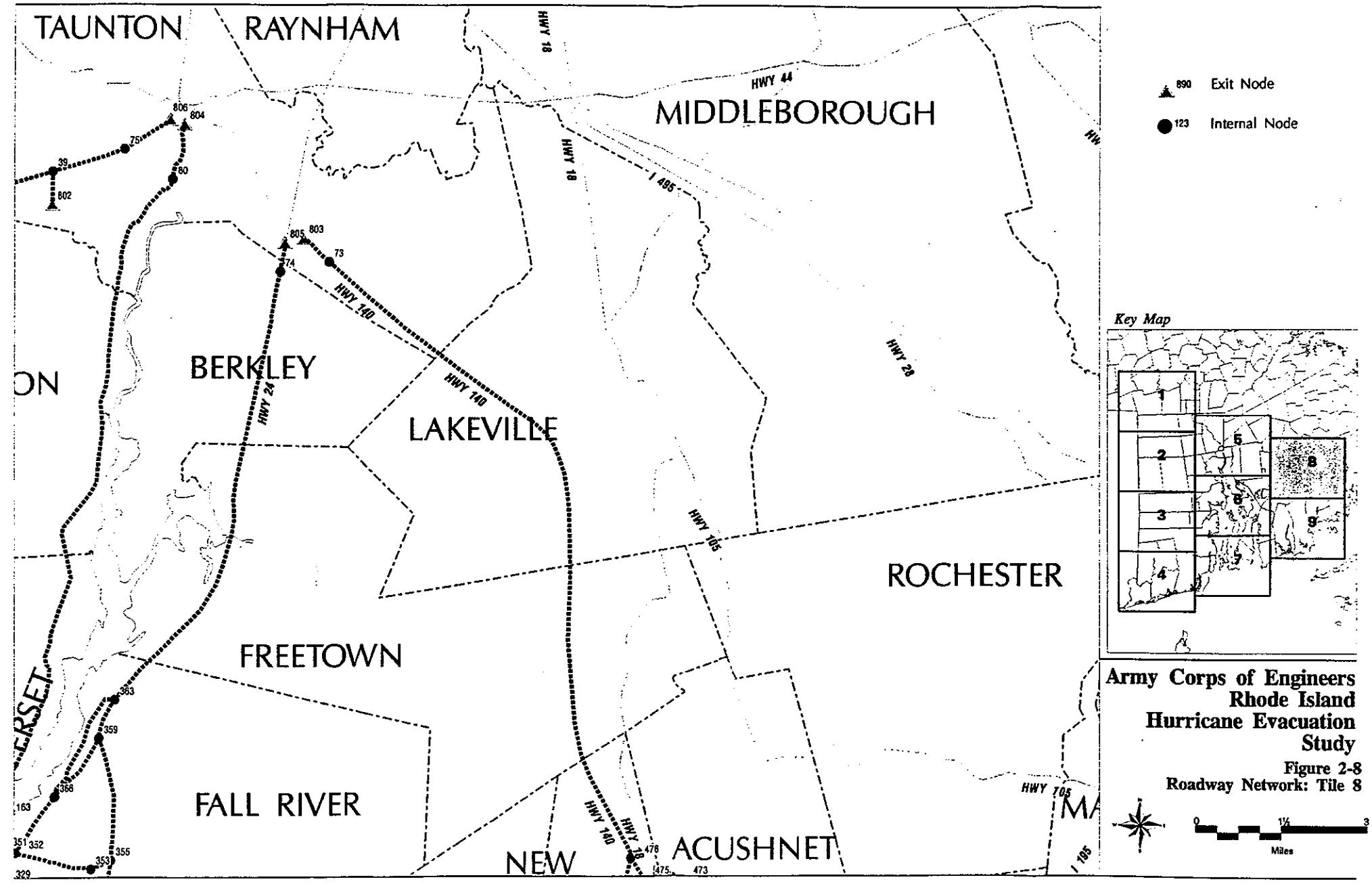




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**Figure 2-7
Roadway Network: Tile 7**



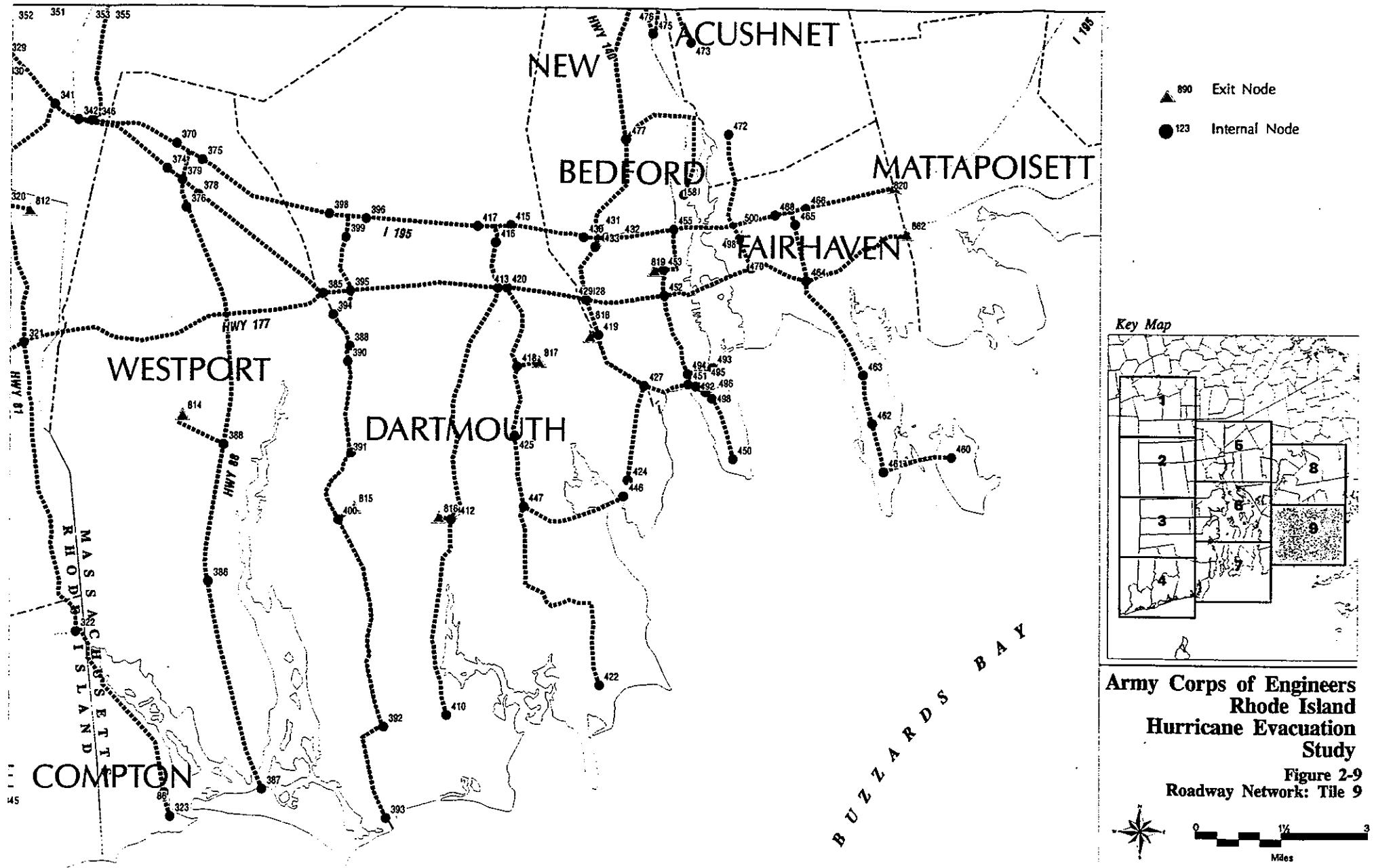


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Figure 2-8

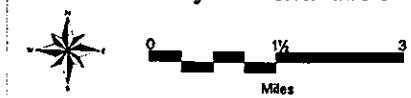
Roadway Network: Tile 8

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Figure 2-9
Roadway Network: Tile 9



Because areas along the immediate coast lack direct access to state routes, evacuees leaving these areas would first travel on local streets before entering onto state routes. Therefore, areas immediately along the coast, which do not have state routes passing nearby, were provided network access by links representing local streets. The information entered for these links idealized the capacities of several local streets rather than any particular street. The majority of evacuees were programmed to enter networks from local streets extending into coastal areas. However, some evacuees were assigned to enter directly onto the networks at nodes positioned along state routes near the coast.

As a starting point, intersection approaches were all initially coded as equal priority. Coding the model in this manner assumes that at signalized intersections the green time for a particular intersection approach is directly proportional to the relative amount of traffic volume from its approach, relative to the cumulative volume of traffic from all other approaches. In turn, this forces vehicles to compete for the right of way which is typical of normal traffic conditions. Accordingly, more green time is allotted to approaches with the highest volumes.

NETVAC2 allows vehicles to exit networks at specified nodes, designated as sink nodes. Exits were created within each study area's interior to represent locations of available public shelters (locations are illustrated by the squares in Figures 2-1 through 2-9).

The following presents the rationale used to develop an estimate of the general destinations of evacuees from study area communities. The report entitled Hurricane Evacuation Behavior in the Middle Atlantic and Northeast States (HEB Report) indicated the following:

- In the northeast, 55 to 79% of the evacuating population stay within their local town.
- In the northeast, between 83 and 100% of the evacuating population reach their destination in approximately 30 minutes.
- In the northeast between 3 and 23% of the evacuating population uses public shelters.

A second source, the Federal Emergency Management Agency (FEMA), has a standard for public sheltering capacity of 20%. A third source in determining the approach for this study was the actual shelter capacities in the affected communities. It was calculated that the vulnerable communities in total have capacity to shelter approximately 50 to 60% of the total evacuating population. Based on the above, the following approach for determining which exit nodes are assigned priorities was used:

- Assign 15% of the evacuating population to exit nodes corresponding to public shelters within the community (this is slightly higher than would be expected in the northeast but in line with the FEMA 20% planning basis).
- Assign an additional 40% of the evacuating population to exit nodes within the community from which they evacuate. Many of these exit nodes will be the same location as the public shelters. This brings the total evacuating population which stays within their

community up to 55% between public shelters and other destinations (consistent with the 55-79% which stay within their town).

- Assign 25% of the evacuating population to interior exit nodes outside the affected communities but within 15 miles of the coast (corresponding to 30 minute travel time). This brings the total within 30 minutes travel time up to 80% (slightly lower than with the 83-100% anticipated in the northeast but tends to be conservative).
- Assign 20% of the evacuating population to exterior exit nodes, roughly 15 miles or more from the inundation areas.

2.3 MODEL CALIBRATION

Before evacuation simulations were run, each network was first calibrated for its study area. Calibration is performed for two primary reasons. First, it establishes the route preferences that will be used by all vehicles during an evacuation simulation. Route preferences control the numbers of vehicles assigned to travel on each road. Second, calibration determines how many vehicles must be loaded at a given loading rate to achieve traffic patterns typical of a normal day. Before an evacuation takes place, the modeling methodology assumes traffic patterns of a normal day occur. Therefore, NETVAC2 was programmed to simulate normal traffic patterns at peak, mid-peak, and off peak conditions at the start of all model runs. Only after a hurricane threat becomes imminent, and people begin responding to warnings, are changes in normal day traffic anticipated. The following paragraphs describe how traffic counts recorded for average daily periods were used to calibrate each study area network.

Average Daily Traffic (ADT) volume data (i.e., 24-hour period) are collected along most state and interstate roadways in Rhode Island, by the Rhode Island Department of Transportation, and in Massachusetts by the Massachusetts Highway Department. In addition to the 24-hour counts, detailed hourly counts are conducted on a continuous basis at central stations in both Rhode Island⁵ and Massachusetts⁶.

The following sources of data were used to develop estimates of the existing, typical traffic volume levels along the study area roadways:

- "State Highway Map of Rhode Island, Traffic Flow Map", Rhode Island Department of Transportation, 1994 (showing 1993 Annual 24-hour Average Daily Traffic)
- "1993 Traffic Volumes for the Commonwealth of Massachusetts", Massachusetts Highway Department, 1994
- Automatic Traffic Counter Records (hourly summaries) for the following locations, from the Rhode Island Department of Transportation:
 - I-295 Southbound, Johnston
 - I-295 Northbound, Cumberland

- I-95 Northbound, Exeter
- I-95 Southbound, Exeter

- Route 1 Northbound, South Kingstown
- Route 1 Southbound, South Kingstown

- I-195 Eastbound, East Providence
- I-195 Westbound, East Providence

Hourly counts for I-195 in Dartmouth, MA were also obtained from the Massachusetts Highway Department⁶.

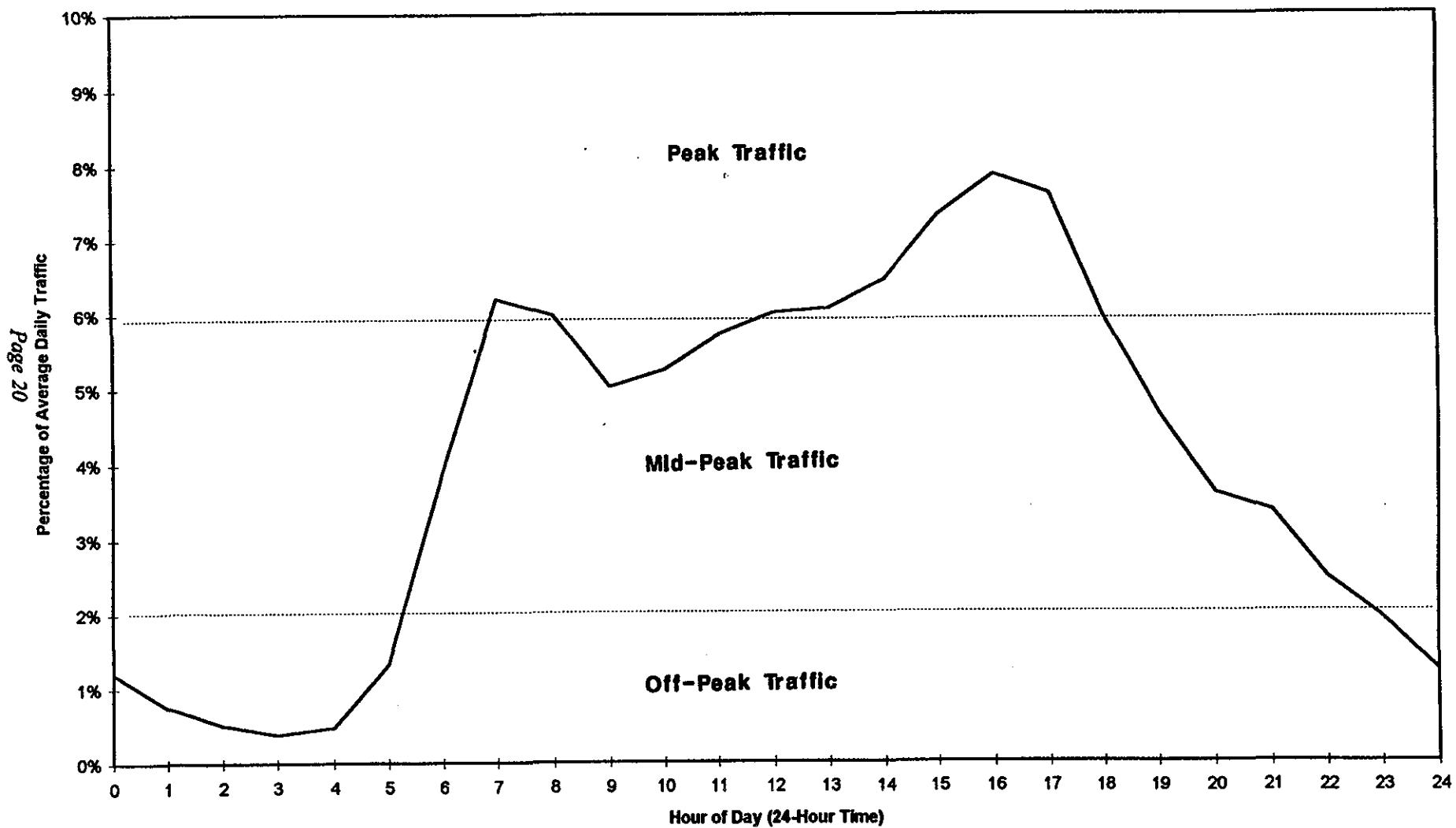
The distribution of ADT over a 24-hour period varies with each hour and day of the week. In general, the percentage of ADT is usually many times greater during peak traffic periods compared with times of off-peak traffic. Figure 2-10 plots weighted averages of the hourly weekday ADT volume recorded at traffic monitoring stations in Johnston, RI; Exeter, RI; South Kingstown, RI; East Providence, RI; and Dartmouth, MA. The distribution of hourly ADT at each location was found to vary in terms of magnitude, but overall trends and variations are generally similar.

In Figure 2-10, dashed lines delineate approximate levels of ADT corresponding to off-peak, mid-peak, and peak traffic. For the most part, off-peak traffic refers to light traffic volumes that typically occur late at night or in the early morning. Mid-peak traffic refers to moderate traffic conditions similar to that generally experienced in the late morning or early afternoon on weekdays, or on weekend days. Peak traffic represents the volume of traffic that is typical during weekday afternoon rush hour.

Although the distribution of ADT in Figure 2-10 may not reflect all of the local traffic patterns for each road in the study area, it does however provide a reasonable representation of how most of the vehicle trips in Rhode Island and Bristol County, Massachusetts are distributed over a normal day. Therefore, Figure 2-10 was used as a basis by which all the roadways within networks were calibrated.

For the final calibration tests, focus was placed on 31 key roadway links in Rhode Island and Southeastern Massachusetts to evaluate overall results. The actual unidirectional ADT at exterior nodes was entered as vehicles, and programmed to flow throughout each system. As simulation progressed, printouts every hour of simulation time reported the cumulative link departures and link speeds, as well as any spill backs and queues found at nodes. Calibration was accomplished using an iterative process of running NETVAC2, comparing modeled two-way ADTs to actual two-way ADTs for the 31 links, then adjusting link preference factors and adding traffic onto the network where appropriate before rerunning the model. During this process, a loading distribution that approximated average actual conditions was developed. The entire portion of major corridors such as I-95, I-195 and Route 1 were also reviewed in detail to ensure that the identified "check" locations were not isolated spots where ADT was correlated. The transportation methodology assumed calibration was complete when the volume of vehicles on each of the 31 links matched its corresponding actual two-way ADT by $\pm 10\%$ for Principal Arterials and 15% for Major Collectors⁸, and the distribution of hourly traffic approximated actual conditions.

FIGURE 2-10: AVERAGE OF HOURLY ADT ALONG MAJOR ROUTES IN RHODE ISLAND AND BRISTOL COUNTY, MASSACHUSETTS



The results of the calibrated network analyses for these key links are represented in Tables 2-1 and 2-2, for the West Bay/Rhode Island and East Bay/Massachusetts networks.

**TABLE 2-1: WEST BAY/RHODE ISLAND NETWORK
CALIBRATION ANALYSIS**

RHODE ISLAND NETWORK CHECKPOINTS

ROUTE	TOWN	ACTUAL ADT	MODELED ADT	% DIFFERENCE
14	Scituate	2,400	2,316	-4%
102	W. Greenwich/Coventry	4,100	4,633	+13%
2	Charlestown	4,300	4,482	+4%
6	Scituate	5,200	4,810	-8%
7	Smithfield	6,400	6,710	+5%
1	Charlestown	10,600	12,059	+14%
44	Glocester	10,800	12,446	+15%
1	East Greenwich/Warwick	16,100	17,246	+7%
1	South Kingstown	18,600	20,341	+9%
1	Westerly	20,600	17,831	-13%
295	Cumberland/N. Attleboro	29,600	27,690	-6%
95	Richmond/Exeter	34,100	37,504	+10%
295	Cranston	44,200	48,236	+9%
295	Johnston	51,400	48,132	-6%
195	Providence	60,300	58,066	-3%
95	Providence/N. Providence	120,600	112,231	-7%
95	Cranston/Providence	159,000	153,978	-3%

**TABLE 2-2: EAST BAY/MASSACHUSETTS NETWORK
CALIBRATION ANALYSES**

SOUTHEASTERN MASSACHUSETTS NETWORK CHECKPOINTS

ROUTE	TOWN	ACTUAL ADT	MODELED ADT	% DIFFERENCE
114	Portsmouth	13,600	12,477	-8%
24	Portsmouth	19,600	19,769	+1%
77	Little Compton	2,800	2,795	0%
87	Tiverton	3,200	3,056	-4%
177	Westport	5,000	4,708	-6%
88	Westport	7,200	7,294	+1%
6	Dartmouth	16,000	14,462	-10%
195	Dartmouth	50,000	51,602	+3%
6	Fairhaven	28,000	28,640	+2%
195	Fairhaven	33,400	35,982	+8%
24	Berkley	30,000	32,088	+1%
138	Dighton	11,300	11,074	-2%
44	Taunton	16,000	15,320	-4%
195	East Providence	60,300	64,481	+7%

SECTION THREE

DEVELOPMENT OF TRAFFIC DATA

3.1 CLASSIFICATION OF MOTORISTS

After road networks were developed, the next steps of the analysis were to estimate the total number of vehicles that will load onto roadways, and determine the rates at which vehicles will load onto roadways over the course of an evacuation. To facilitate the development of this information, vehicles were classified as belonging to one of four major categories listed below:

- (1) **Surge Vulnerable Evacuees**: Permanent and seasonal residents living in evacuation zones who evacuate when directed to do so by authorities.
- (2) **Non-Surge Vulnerable Evacuees**: Permanent and seasonal residents, excluding mobile home residents, living outside evacuation zones who choose to evacuate. Most of the evacuees of this category leave their homes because of perceived dangers and not necessarily because of real flooding threats. However, in some cases, officials may deem it necessary to evacuate small groups of people who live in substandard housing units particularly vulnerable to hurricane winds, or those who live in or near areas that may be exposed to freshwater flooding.
- (3) **Mobile Home Evacuees**: All permanent and seasonal mobile home residents of coastal communities. The analysis assumes all mobile home residents will be told to evacuate by local officials due of their high risk to strong winds from storms of even modest intensities.
- (4) **Background Vehicles**: The population associated with all remaining vehicle trip purposes. Examples are: Trips made by people who leave work early and return home, people who travel through the region, and trips made by persons preparing for the arrival of hurricane conditions or engaged in normal activities. This traffic can also include transit vehicles (vans/buses) used to pick up evacuees without personal transportation.

The number of vehicles assumed to participate during an evacuation from each group listed is an important factor in estimating clearance times. Human behavioral information developed in Chapter Four, Behavioral Analysis, in the TDR, gives clear estimates of the participation that can be expected from the first three groups. The fourth group, Background Vehicles, is not addressed by the Behavioral Analysis. However, motorists belonging to this group mostly comprise of people making shopping trips or commuting, which is related to the ADT distribution shown in Figure 2-10.

For Rhode Island, Tables 3-1 and 3-2 list estimates made of the numbers of permanent and seasonal people who were assumed to evacuate their homes by population type for two levels of hurricane threat. Table 3-1 refers to evacuations for a weak hurricane scenario, and Table 3-2 gives similar estimates for a severe hurricane scenario. The same information for Bristol County, Massachusetts is provided in Tables 3-3 and 3-4. Estimates were made by applying evacuation participation behavioral assumptions to community population data (see TDR).

TABLE 3-1:
RHODE ISLAND EVACUATING POPULATION FOR A
WEAK HURRICANE SCENARIO

Community	Permanent	Seasonal	Population	Population	Population	Total
	Population	Population	Mobile Homes	Evacuating	Surge Areas	Non-Surge Areas
Barrington	15,850	180	0	8,970	40	9,010
Bristol	21,630	400	20	2,980	330	3,330
Charlestown	6,480	4,010	330	1,330	160	1,820
Cranston	76,060	200	50	1,600	1,480	3,130
East Greenwich	11,870	60	110	720	210	1,040
East Providence	50,380	110	170	4,740	860	5,770
Jamestown	5,000	1,070	10	1,640	70	1,720
Little Compton	3,340	920	190	650	60	900
Middletown	19,460	240	450	840	350	1,640
Narragansett	14,990	4,850	10	6,080	220	6,310
New Shoreham	840	1,880	0	670	40	710
Newport	28,230	1,640	0	7,300	390	7,690
North Kingstown	23,790	630	540	5,240	330	6,110
Pawtucket	72,640	70	880	540	1,420	2,840
Portsmouth	16,860	1,380	1,080	4,280	230	5,590
Providence	160,730	330	90	490	3,200	3,780
South Kingstown	24,630	6,610	460	3,850	510	4,820
Tiverton	14,310	450	720	1,670	230	2,620
Warren	11,390	270	10	4,650	80	4,740
Warwick	85,430	900	210	17,840	1,150	19,200
Westerly	21,610	3,570	210	4,150	380	4,740
TOTALS	685,520	29,770	5,540	80,230	11,740	97,510

TABLE 3-2:
RHODE ISLAND EVACUATING POPULATION
FOR A SEVERE HURRICANE SCENARIO

Community	Permanent	Seasonal	Population	Population	Population	Total
	Population	Population	Mobile	Evacuating	Non-Surge	Evacuating
			Homes	Surge Areas	Areas	Population
Barrington	15,850	180	0	12,500	110	12,610
Bristol	21,630	400	20	4,780	840	5,640
Charlestown	6,480	4,010	330	1,960	400	2,690
Cranston	76,060	200	50	2,050	3,700	5,800
East Greenwich	11,870	60	110	1,010	540	1,660
East Providence	50,380	110	170	6,530	2,150	8,850
Jamestown	5,000	1,070	10	2,130	190	2,330
Little Compton	3,340	920	190	870	160	1,220
Middletown	19,460	240	450	1,420	880	2,750
Narragansett	14,990	4,850	10	8,110	540	8,660
New Shoreham	840	1,880	0	760	90	850
Newport	28,230	1,640	0	9,530	960	10,490
North Kingstown	23,790	630	540	6,540	830	7,910
Pawtucket	72,640	70	880	600	3,560	5,040
Portsmouth	16,860	1,380	1,080	4,910	590	6,580
Providence	160,730	330	90	910	8,000	9,000
South Kingstown	24,630	6,610	460	4,970	1,260	6,690
Tiverton	14,310	450	720	2,130	580	3,430
Warren	11,390	270	10	6,760	210	6,980
Warwick	85,430	900	210	25,700	2,880	28,790
Westerly	21,610	3,570	210	5,960	960	7,130
TOTALS	685,520	29,770	5,540	110,130	29,430	145,100

TABLE 3-3
BRISTOL COUNTY, MASSACHUSETTS EVACUATING POPULATION
FOR A WEAK HURRICANE SCENARIO

Community	Permanent Population	Seasonal Population	Population Evacuating	Population Evacuating	Population Evacuating	Total
			Mobile Homes	Surge Areas	Non-Surge Areas	Evacuating Population
Acushnet	9,550	30	570	0	160	730
Dartmouth	27,240	1,130	130	2,700	490	3,320
Fairhaven	16,130	1,150	50	3,850	100	4,000
Fall River	92,700	150	90	2,520	1,760	4,370
New Bedford	99,920	140	170	1,680	1,600	3,450
Rehoboth	8,660	50	10	410	160	580
Seekonk	13,050	50	0	330	250	580
Somerset	17,660	50	10	2,960	280	3,250
Swansea	15,410	170	10	4,270	210	4,490
Westport	13,850	1,830	90	1,550	270	1,910
	314,170	4,750	1,130	20,270	5,280	26,680

TABLE 3-4
BRISTOL COUNTY, MASSACHUSETTS EVACUATING POPULATION
FOR A SEVERE HURRICANE SCENARIO

Community	Permanent	Seasonal	Population	Population	Population	Total
	Population	Population	Mobile	Evacuating	Non-Surge	Evacuating
			Homes	Surge	Areas	
Acushnet	9,550	30	570	820	410	1,800
Dartmouth	27,240	1,130	130	3,200	1,230	4,560
Fairhaven	16,130	1,150	50	11,100	250	11,400
Fall River	92,700	150	90	4,370	4,400	8,860
New Bedford	99,920	140	170	17,710	4,010	21,890
Rehoboth	8,660	50	10	580	400	990
Seekonk	13,050	50	0	480	630	1,110
Somerset	17,660	50	10	3,320	700	4,030
Swansea	15,410	170	10	4,810	510	5,330
Westport	13,850	1,830	90	1,740	680	2,510
TOTALS	314,170	4,750	1,130	48,130	13,220	62,480

3.2 BEHAVIORAL RESPONSE OF MOTORISTS

Perhaps one of the most critical assumptions that must be considered when estimating clearance times is the timing at which evacuees load onto roadways. Behavioral data from research obtained from past hurricane evacuations show that mobilization and actual departures of the evacuating population occur over a period of many hours and sometimes several days³. For Rhode Island, evacuation simulations were tested for three evacuation rates that are summarized by the response curves in Figure 3-1. Behavioral response curves describe the percentages of the evacuating population who leave their homes and load onto roadways at hourly intervals relative to when an evacuation recommendation is disseminated to the public.

The behavioral response curves are intended to include the most probable range of public responses that will be experienced in a future hurricane evacuation. The rapid response curve depicts the quickest mobilization response by evacuating households. For analysis purposes, the rapid response curve includes two hours of response time occurring before the evacuation recommendation is disseminated to the public and four hours after it is disseminated. For the moderate response curve, three hours of response time is assumed before dissemination of the evacuation recommendation, and six hours after. The slow response curve includes four hours of response time before notification of the evacuation recommendation, and eight hours after. The public's response before evacuation accounts for people who choose to evacuate their homes before being directed to do so by authorities. Regardless of the behavioral response curve used, 85 percent of all people who will eventually leave their homes are assumed to leave after being directed to do so by officials. This is an important point because people's timeliness in responding to a hurricane evacuation is extremely dependent upon the aggressiveness of authorities to encourage them to leave⁴.

3.3 VEHICLE USAGE

The behavioral analysis conducted for Rhode Island estimated that approximately 75 percent of the vehicles available to evacuees will be used during future evacuations⁴. For the most part, families usually evacuate using one vehicle for fear of separation, but some households evacuate using two or more vehicles depending upon how many are available to them. Differences in vehicle ownership may vary with variations in access to public transportation, household income, and other socio-economic characteristics of the region.

The first column of Table 3-5 list permanent population by community. The second and third columns list the numbers of available vehicles per owner and renter - occupied housing units, respectively. This information was obtained from socio-economic data reported in the 1980 census⁹. The fourth column of the Table gives the number of available vehicles per person, and the fifth column gives the calculated average numbers of people that will travel in each evacuating vehicle, assuming 75 percent of the available vehicles are used. Similar information for Bristol County, Massachusetts is provided in Table 3-6. A sample calculation of the assumed persons per evacuating vehicle for Westerly, Rhode Island is shown below.

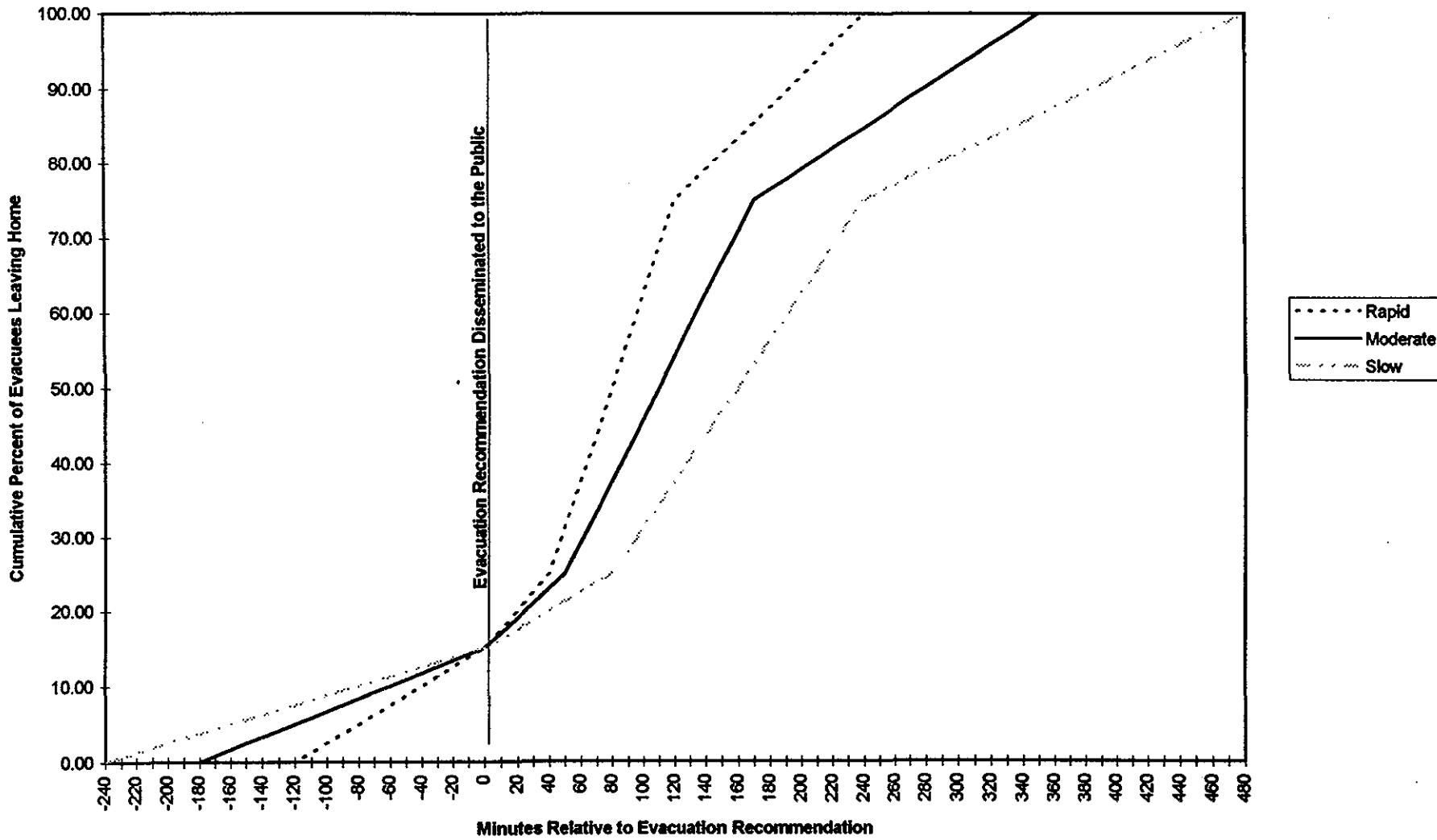
FIGURE 3-1: BEHAVIORAL RESPONSE CURVES

TABLE 3-5:
ASSUMED VEHICLE USAGE RATES BY COMMUNITY (RHODE ISLAND)

Community	Permanent Population	Available Vehicles in Owner Occupied	Available Vehicles in Renter Occupied	Persons per Evacuating Vehicle (75% Usage)	
		Housing Units	Housing Units		
Barrington	15,850	10,400	890	0.71	1.88
Bristol	21,630	9,970	3,670	0.63	2.12
Charlestown	6,480	3,790	1,020	0.74	1.80
Cranston	76,060	37,370	12,210	0.65	2.05
East Greenwich	11,870	7,300	1,230	0.72	1.85
East Providence	50,380	22,500	9,240	0.63	2.12
Jamestown	5,000	3,240	730	0.79	1.69
Little Compton	3,340	2,250	490	0.82	1.63
Middleton	19,460	6,220	5,060	0.58	2.30
Narragansett	14,990	7,010	4,520	0.77	1.73
New Shoreham	840	540	240	0.93	1.43
Newport	28,230	8,140	8,020	0.57	2.34
North Kingstown	23,790	13,560	3,690	0.73	1.83
Pawtucket	72,640	24,430	18,410	0.59	2.26
Portsmouth	16,860	9,290	2,850	0.72	1.85
Providence	160,730	35,470	37,140	0.45	2.96
South Kingstown	24,630	10,900	3,380	0.58	2.30
Tiverton	14,310	9,230	1,360	0.74	1.80
Warren	11,390	5,080	2,390	0.66	2.02
Warwick	85,430	49,670	10,760	0.71	1.88
Westerly	21,610	10,500	4,530	0.70	1.90

TABLE 3-6
ASSUMED VEHICLE USAGE RATES BY COMMUNITY (MASSACHUSETTS)

Community	Permanent Population	Available Vehicles in Occupied Housing	Available Vehicles in Renter Occupied Housing	Vehicles Per Person	Persons per Evacuating Vehicle (75% Usage)
		Units	Units	Person	
Acushnet	9,550	5,820	690	0.68	1.96
Dartmouth	27,240	13,970	2,180	0.59	2.26
Fairhaven	16,130	7,840	2,290	0.63	2.12
Fall River	92,700	20,450	24,590	0.49	2.72
New Bedford	99,920	27,130	19,430	0.47	2.84
Rehoboth	8,660	5,730	520	0.72	1.85
Seekonk	13,050	8,730	820	0.73	1.83
Somerset	17,660	10,800	1,540	0.70	1.90
Swansea	15,410	9,930	800	0.70	1.90
Westport	13,850	8,510	1,480	0.72	1.85

Permanent Population	= 21,610 people
Available vehicles	= 10,500 + 4,500 = 15,030 vehicles
Vehicles per person	= <u>15,030 vehicles</u> = 0.70 <u>vehicles</u> 21,610 person person

$$\begin{aligned} \text{Persons per evacuating vehicle, assuming 75\% usage} &= \frac{1}{0.70 \text{ vehicles/person} \times 0.75} \\ &= 1.90 \text{ persons per vehicle} \end{aligned}$$

The transportation methodology used the information in Table 3-5 and 3-6 to determine the vehicles that would load onto roadways during evacuations. The user enters the vehicle occupancy rates and the number of people assigned to enter the network at each node. NETVAC2's complimentary program, POPDIS, aggregates the population input for each entry node and in turn computes the effective average vehicle loading rates per minute to be input into NETVAC2 at network entry locations.

SECTION FOUR

EVACUATION SCENARIOS

Since all hurricanes differ from one another in some respect, it becomes necessary to set forth clear assumptions about storm characteristics and evacuees' expected response before transportation modeling can begin. Not only does a storm vary in its track, intensity and size, but also in the way it is perceived by residents in potentially vulnerable areas. These factors cause a wide variance in the behavior of the vulnerable population. Even the time of day at which a storm makes landfall influences the time parameters of an evacuation response. The transportation analysis computes clearance times based on sets of assumed conditions and behavioral responses. It is likely that an actual storm will differ from a simulated storm for which clearance times are calculated in this report. Therefore, key input parameters were varied to derive a range of evacuation scenarios idealizing many possible situations officials may have to contend with. The three major parameters that were varied with each simulation are described below.

- (1) **Hurricane Severity:** Storms are classified as either weak or severe hurricanes. Evacuating population estimates (see Tables 3-1 through 3-4) are significantly greater (approximately double) for an evacuation due to severe hurricanes when compared with that for weak hurricanes. Category 5 hurricanes were not considered because the cooler waters of the Northeast can not sustain hurricanes of this intensity.
- (2) **Behavioral Response:** The time in which evacuees mobilize to leave their homes and enter onto the roadway system is characterized by the behavioral response curves shown in Figure 3-1. Behavioral response curves are defined for rapid, moderate, and slow responses.
- (3) **Background Traffic Condition:** The traffic condition at the start of an evacuation will depend upon the time of day the evacuation begins as well as other factors that may influence initial traffic conditions. As the NETVAC2 models were run, initial traffic conditions corresponding to off-peak, mid-peak, and peak ADT levels were analyzed. Figures 4-1a through 4-1c illustrate background vehicle distributions assumed for the following three conditions.
 - a. **Off-peak:** The off-peak traffic condition refers to light traffic volumes that typically occur late at night or in the early morning.
 - b. **Mid-peak:** The mid-peak traffic condition refers to moderate traffic conditions similar to that generally experienced in the two hour period occurring before and after the AM and PM peak conditions.
 - c. **Peak:** The peak traffic condition replicates the "rush hour" volume of traffic that is typical of the two hour period from 4:00 - 6:00 PM.

As noted above, background vehicles refer to motorists who travel roadways during an evacuation with trip purposes other than for evacuating their homes. At the start of an evacuation, the number of background

Figure 4-1a: Off-Peak Background Traffic Distribution

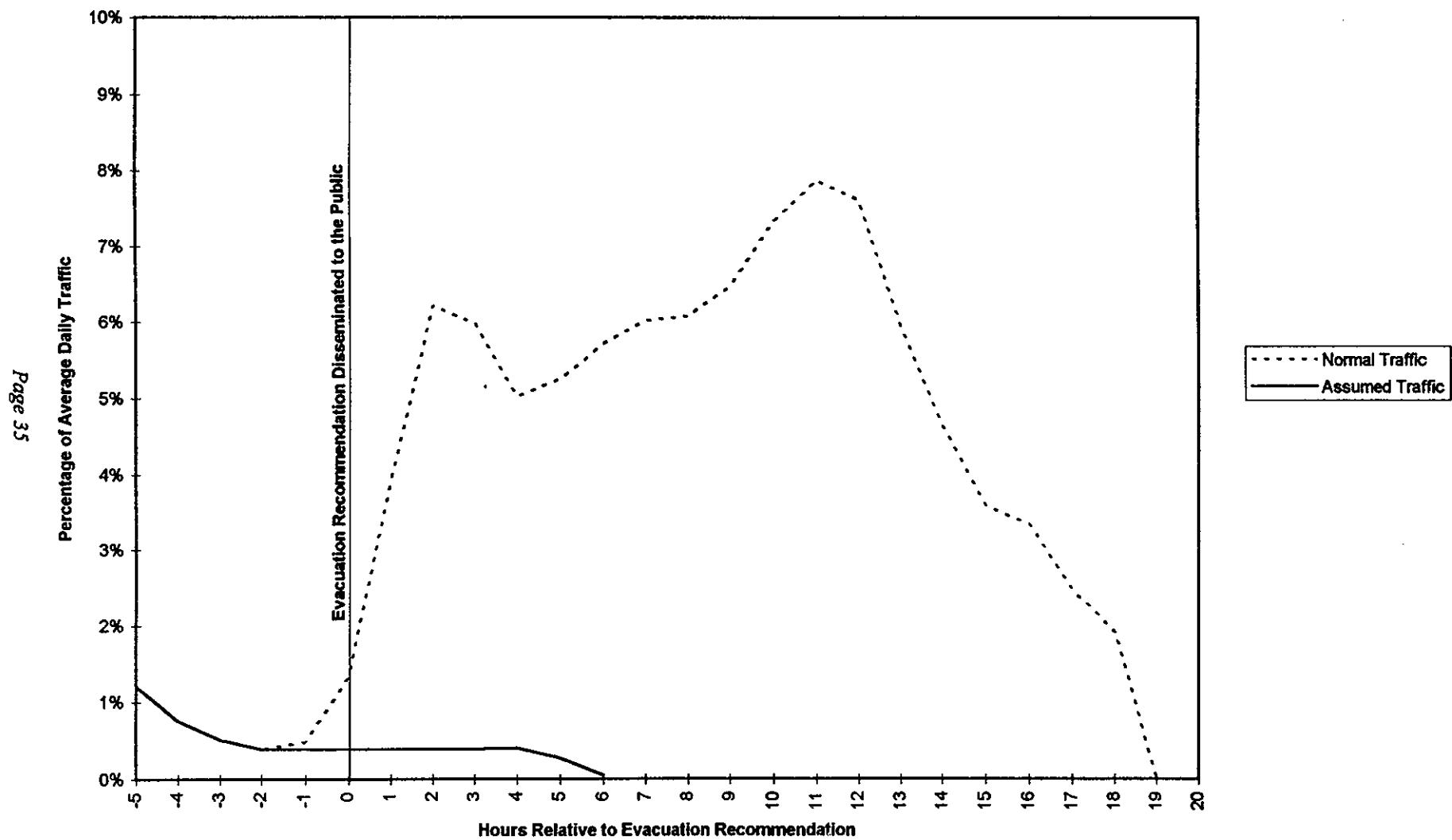


Figure 4-1b: Mid-Peak Background Distribution

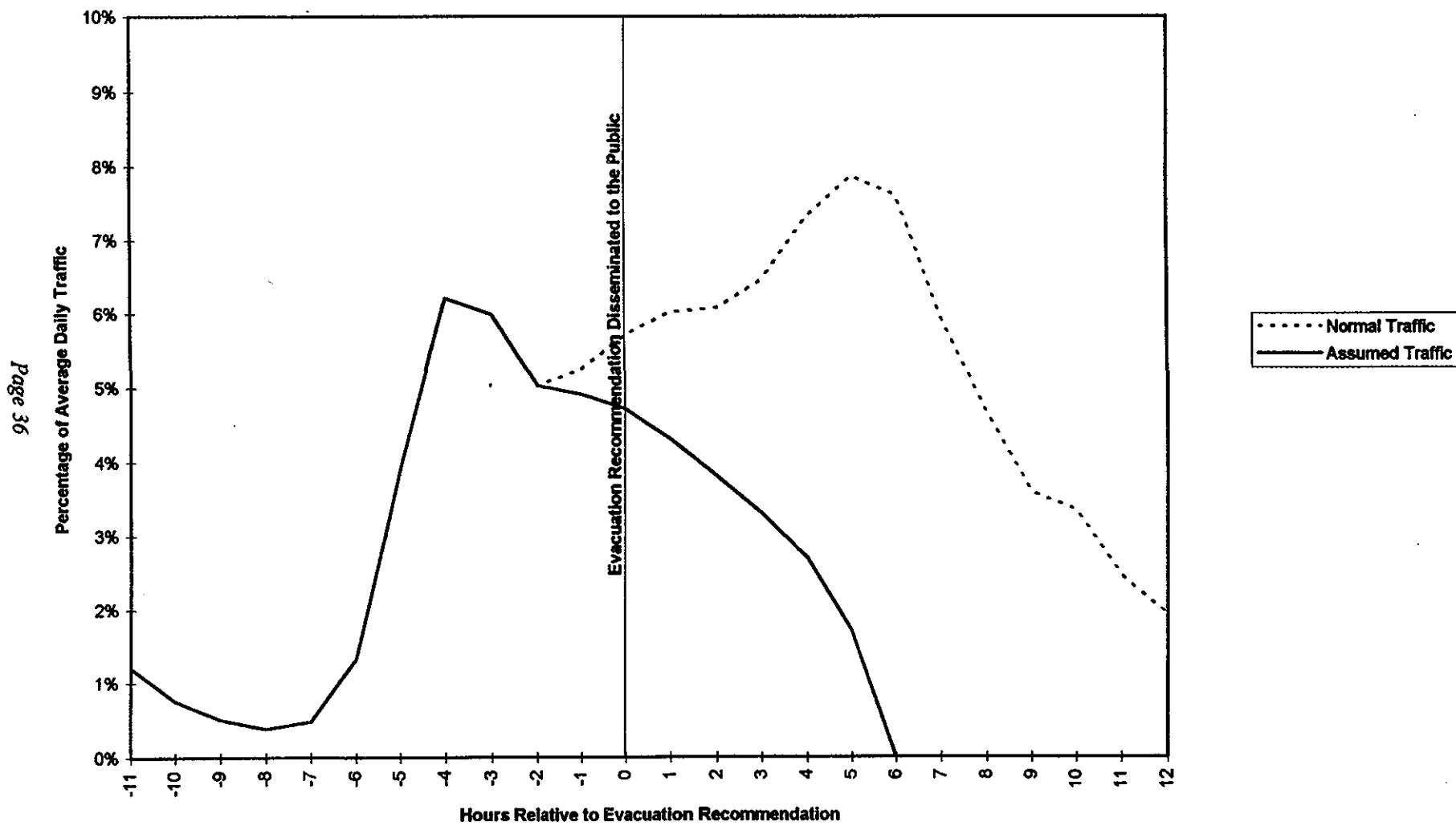
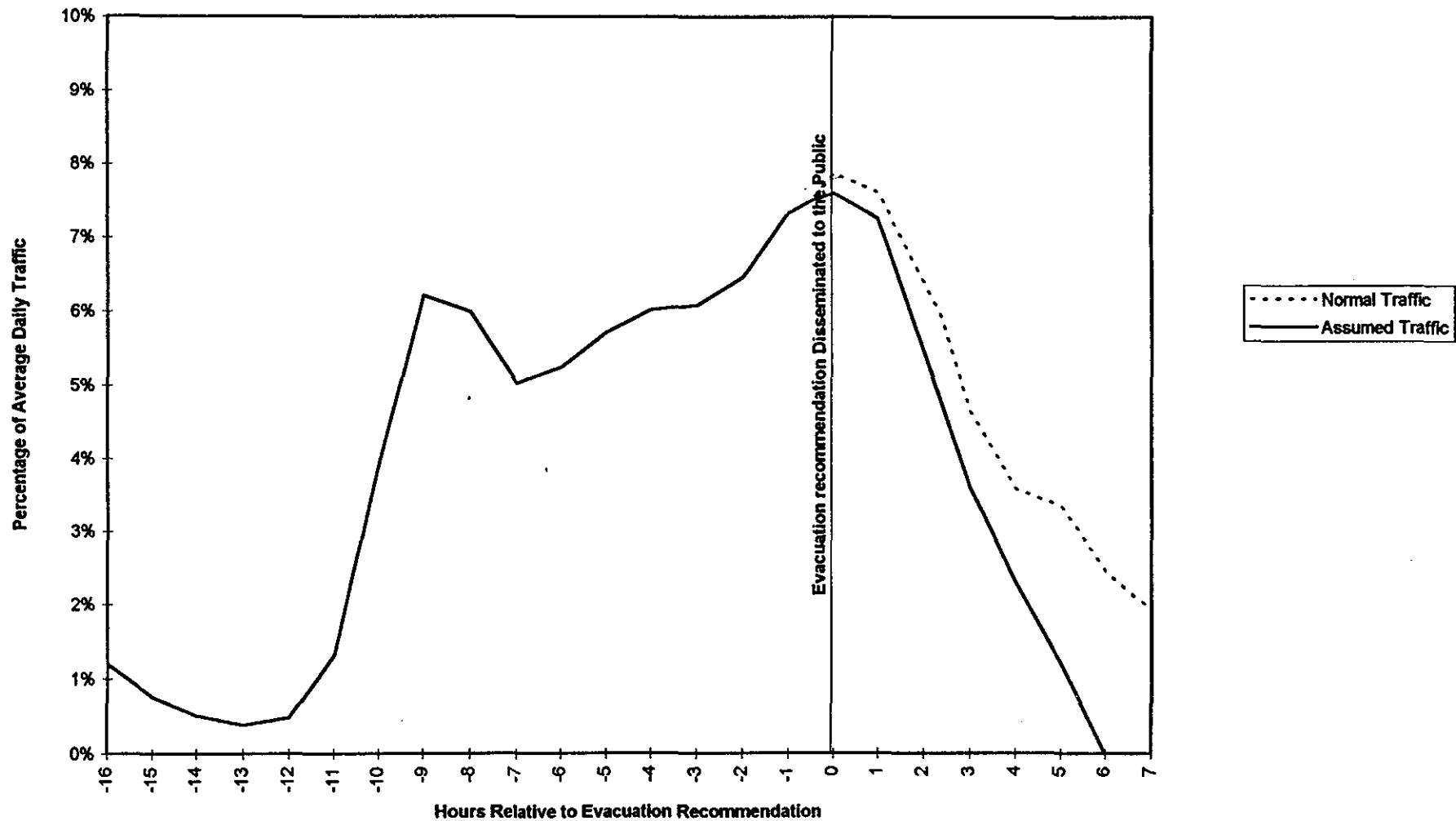


Figure 4-1c: Peak Background Distribution

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vehicles assumed to exist on a particular road was taken as the ADT for that road on a normal day. As an evacuation progressed, the initial ADT assumed was slowly decreased until approximately zero background vehicles were on the roads at the completion of the evacuation.

Referring to the ADT distribution shown in Figure 2-10, the Transportation Analysis simulated evacuations occurring coincident with rush hour by programming evacuees to load onto roadways that were initially set at peak ADT volumes. Conversely, an evacuation occurring at times of light traffic, such as late at night or in the early morning, was modeled by running the model with background vehicles initially set at off-peak ADT volumes. Simulations run with background traffic at mid-peak ADT volumes represented moderate traffic volumes typical of mid-morning and mid-afternoon on weekdays or weekends.

The Transportation Analysis assumed the background traffic distributions shown in Figures 4-1a through 4-1c to apply to evacuations assuming a moderate behavioral response by evacuees. Background traffic distributions used for evacuations assuming a rapid or a slow behavioral response (not shown) follow the same curves shown in Figures 4-1a through 4-1c. The only exception is that evacuees are programmed to load onto roadways slightly before or after background traffic starts its decline. The number of background vehicles on any roadway during a model run will vary depending upon each road's particular ADT and the hourly percentage of ADT assumed for the traffic condition modeled. A key point in using Figure 2-10 to derive background traffic conditions is that all traffic conditions are derived from actual traffic patterns observed for Rhode Island and Bristol County, Massachusetts rather than assumed hypothetical conditions.

Combinations of these key input parameters were used in developing 18 possible scenarios. For each of the networks, simulations were run for evacuations assuming weak hurricanes and severe hurricanes. Initial traffic conditions imparted on the road network followed the background distributions for off-peak, mid-peak, and peak traffic. Evacuees entered road networks at prescribed time intervals defined by the rapid, moderate, and slow behavioral responses.

Seasonal resident population and transient population visiting the area (i.e., tourism) varies widely in the study area, based upon the time of year, weather conditions, etc. The evacuating population used during simulations included seasonal residents as estimated from the 1990 census¹⁰ from seasonal housing unit information. Coastal Rhode Island's seasonal population was found to be less than 12 percent of its permanent population. Although the varying transient conditions were not specifically evaluated for all scenarios, they were inherently addressed in a sensitivity analysis which focused on an evaluation of varying increases in study area population (refer to Section 5.3).

SECTION FIVE

ANALYSIS

5.1 GENERAL

Clearance time and dissemination time are two major considerations in deciding when an evacuation recommendation should be issued. The combination of these times defines a region's total evacuation time. Clearance time begins when an evacuation recommendation is clearly disseminated to the threatened public, and ends when the last evacuees clear the road system. This time includes the time required by evacuees to secure their homes and prepare to leave (mobilization time), the time spent by evacuees traveling along the road network (travel time), and the time lost due to traffic congestion (queuing delay time). Clearance time does not relate solely to the time any one vehicle spends traveling on the road system.

Dissemination time is the amount of time required by officials to notify the public to evacuate after the decision has been made. These values may differ by region depending on the communication and warning procedures utilized by State and local officials in their areas, and can best be estimated by the responsible state and local officials. The times calculated by the Transportation Analysis include only the clearance time component of evacuation time, and officials using this information must determine the dissemination time appropriate for their areas. Failure to add dissemination time to clearance time will underestimate total evacuation time, which could result in insufficient time for all evacuees to safely clear the hazard area.

Evacuations should be completed before the arrival of gale force winds (34 knot/39 mph) and/or storm surge. Vehicle accidents and reduced travel speeds from inclement weather can impede traffic flows, and potentially disrupt the evacuation. Therefore, the transportation modeling assumes that evacuations will occur well enough before a hurricane to preclude possible delays caused by significant weather. Moreover, the analysis assumes that provisions would be made for removal of vehicles in distress during the evacuation. The Decision Arc Method, outlined in Chapter Eight of the TDR, explains how the clearance times, used in conjunction with the dissemination times specified by officials, can provide guidance in hurricane evacuation decision-making. The time at which gale force winds arrive has been incorporated into the decision-making process of the Decision Arc Method and, therefore, does not need to be factored into the calculation of clearance time.

Evacuations for 18 combinations of storm strength, background traffic conditions, and evacuee response were simulated using the NETVAC2 computer model for both the West Bay/Rhode Island and the East Bay/Massachusetts networks. The simulated evacuations were reviewed to identify locations and duration of vehicle queuing delays (congestion), as well as to determine clearance times. The results of the simulated evacuations are presented below.

5.2 RESULTS

The NETVAC2 program presents information on traffic operations throughout the course of the simulated evacuation, including reports on vehicle arrivals and departures, roadway link speeds, and the total number of vehicles on the network for each reporting interval specified by the user. The total number of vehicles on

a network can be plotted versus time to display graphically how quickly vehicles evacuate the roadway network. Figures 5-1 through 5-4 are such graphs, plotted from analysis results for the West Bay/Rhode Island and East Bay/Massachusetts networks under weak and severe hurricane evacuation scenarios, respectively. A moderate behavioral response curve was assumed for all scenarios presented in these figures. In each graph, the curves depict the numbers of vehicles remaining on a network, throughout the course of the evacuation, for evacuations starting with off-peak, mid-peak, and peak background traffic conditions.

For modeling purposes, evacuations were considered complete when the evacuating vehicles reached safe destinations. One limitation when calibrating networks to traffic patterns of a normal day is that near the completion of simulations, when most of the vehicles on the network are from evacuees rather than background traffic, vehicles adhere to turning movements of a normal day instead of seeking the most logical exit nodes. The remaining percentage on the network (2 percent) accounts for this difference. It is expected that evacuees leaving homes immediately before storm arrival will seek safe destinations of the shortest travel time. Free flow conditions are verified up to one hour before model termination to ensure the last evacuees experience light traffic free from queuing.

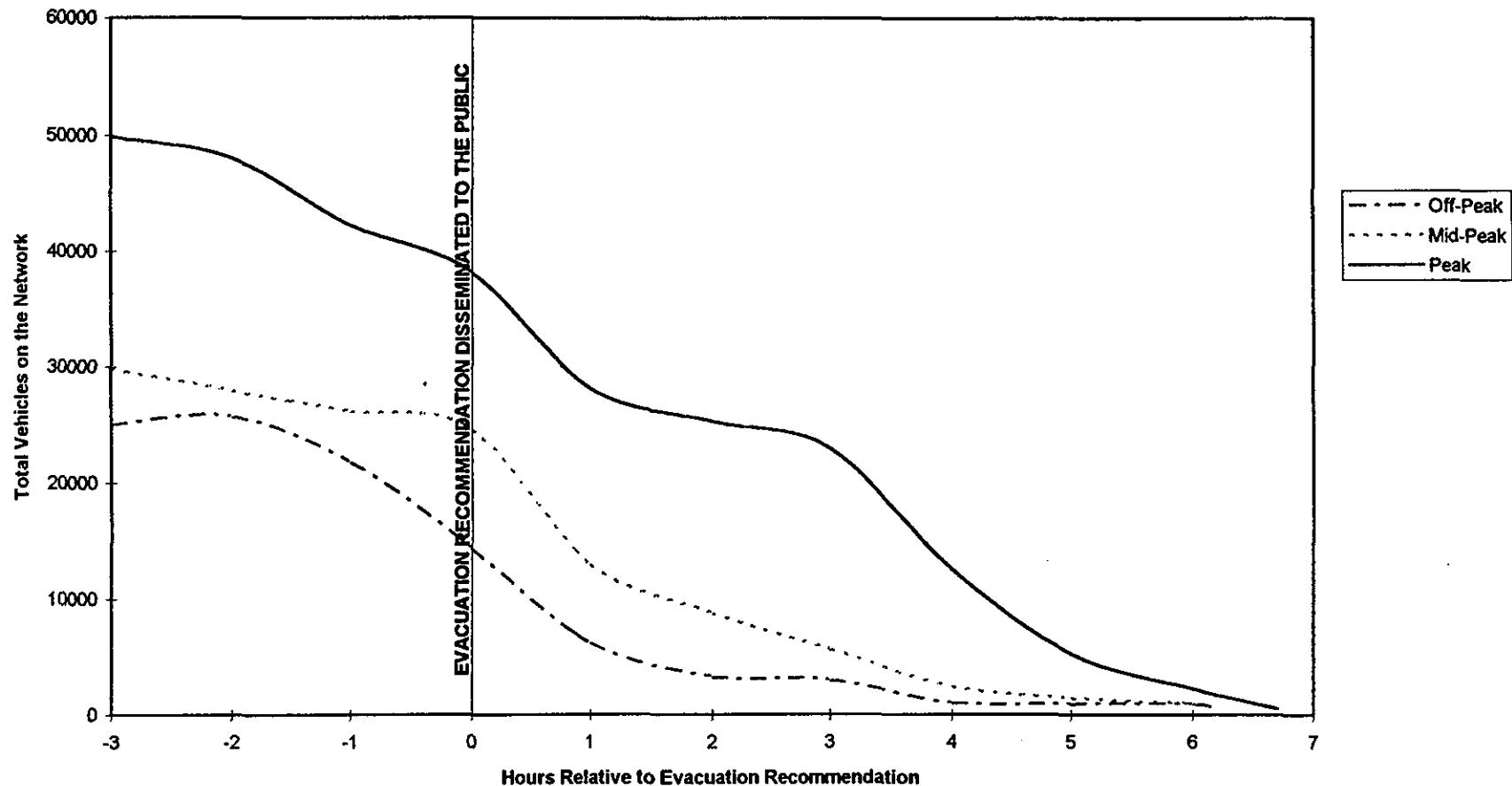
Tables 5-1 and 5-2 present the clearance times estimated for the West Bay/Rhode Island and East Bay/Massachusetts networks for weak and severe hurricane scenarios, respectively. Times are organized by intensity of hurricane, by the rate of response of the evacuating population, and by the level of background traffic at the start of the evacuation.

The clearance times were calculated assuming that each community is capable of sheltering their individual demands. The Transportation Analysis assessed how inadequate shelter capacity might influence clearance times, through sensitivity testing discussed in Section 5.3. Results showed that deficiencies in shelter capacity have a minimal affect on clearance time. This point is explained by the fact that the number of vehicles determined to travel to public shelters is very small in comparison to all vehicles on roadways. Consequently, the clearance times provided in Tables 5-1 and 5-2 are considered valid for the existing condition of deficient community shelter capacities and in the future if community sheltering capabilities improve.

Clearance times ranged from a minimum of approximately 4 hours and 15 minutes for an off-peak traffic condition under a weak hurricane scenario, to a maximum of about 9 hours and 35 minutes for a peak traffic condition under a severe hurricane scenario. The longer clearance times for the West Bay/Rhode Island network can be attributed to queuing along Route 1 from Providence to North Kingstown, as well as congestion on roads feeding into Route 1 along this same roadway section.

A summary of the evacuation clearance times for the West Bay/Rhode Island and East Bay/Massachusetts networks is presented in Tables 5-1 and 5-2.

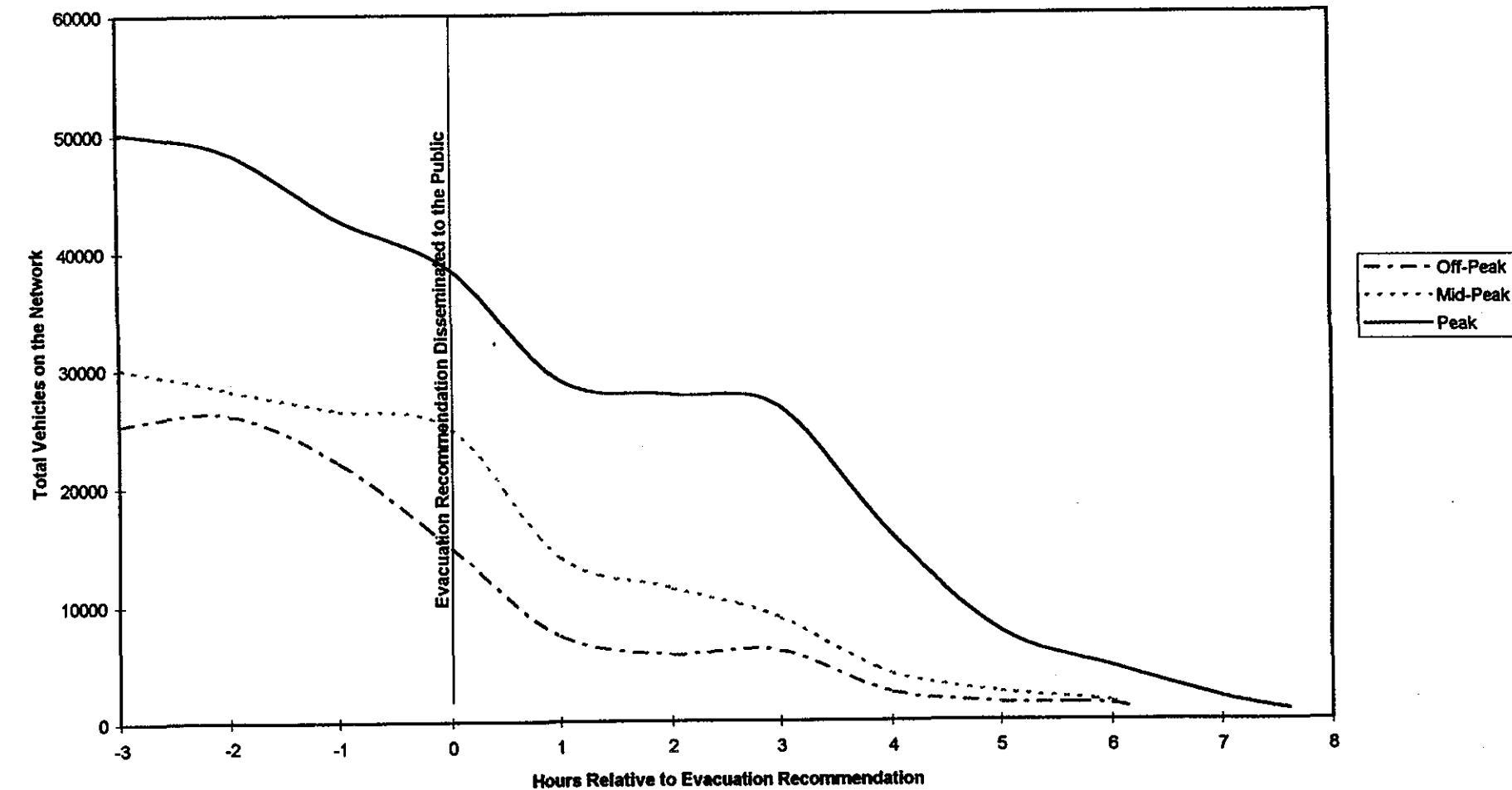
FIGURE 5-1:
WEST BAY/RHODE ISLAND NETWORK PLOTTED RESULTS
FOR MODERATE BEHAVIORAL RESPONSE (WEAK HURRICANE)



Note: About 540 vehicles were on the network at the end of simulation
for all background runs.

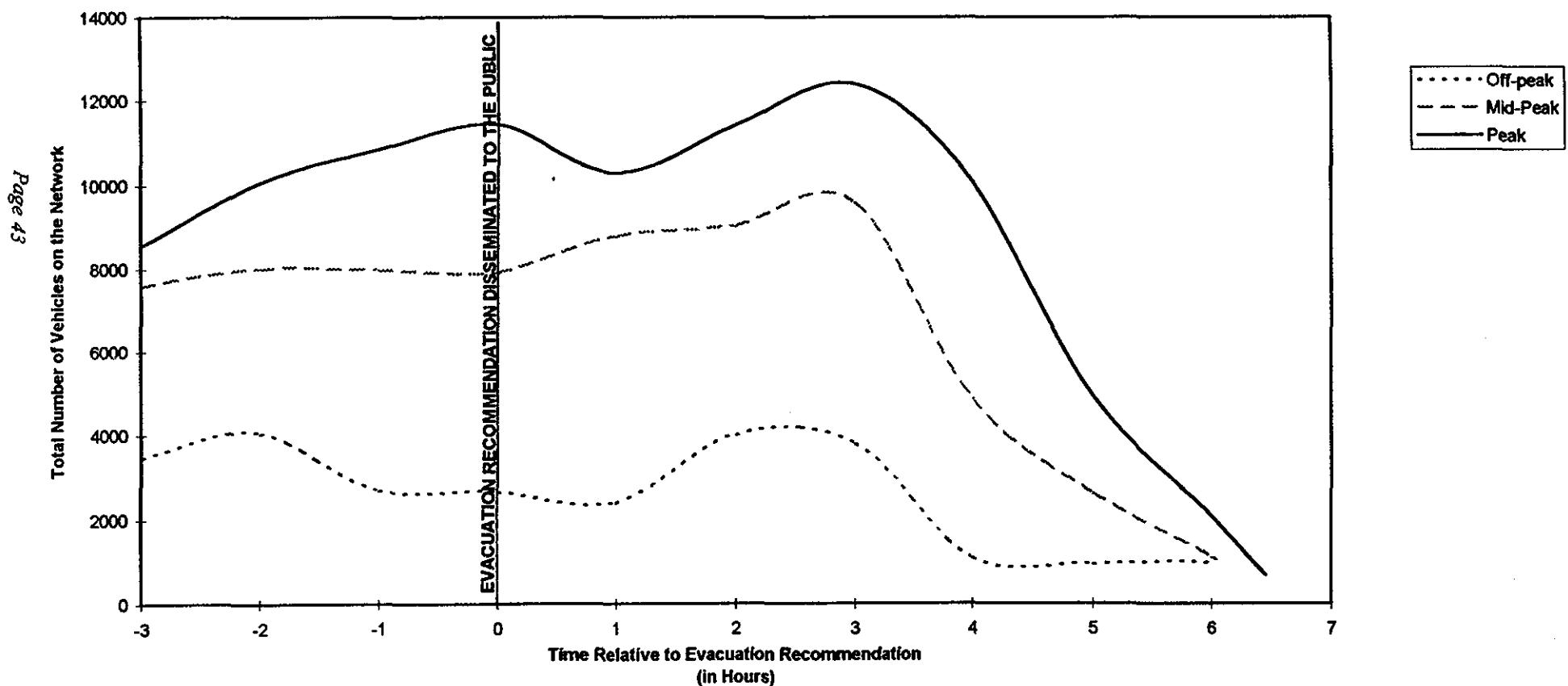
FIGURE 5-2:

**WEST BAY/RHODE ISLAND NETWORK PLOTTED RESULTS
FOR MODERATE BEHAVIORAL RESPONSE (SEVERE HURRICANE)**



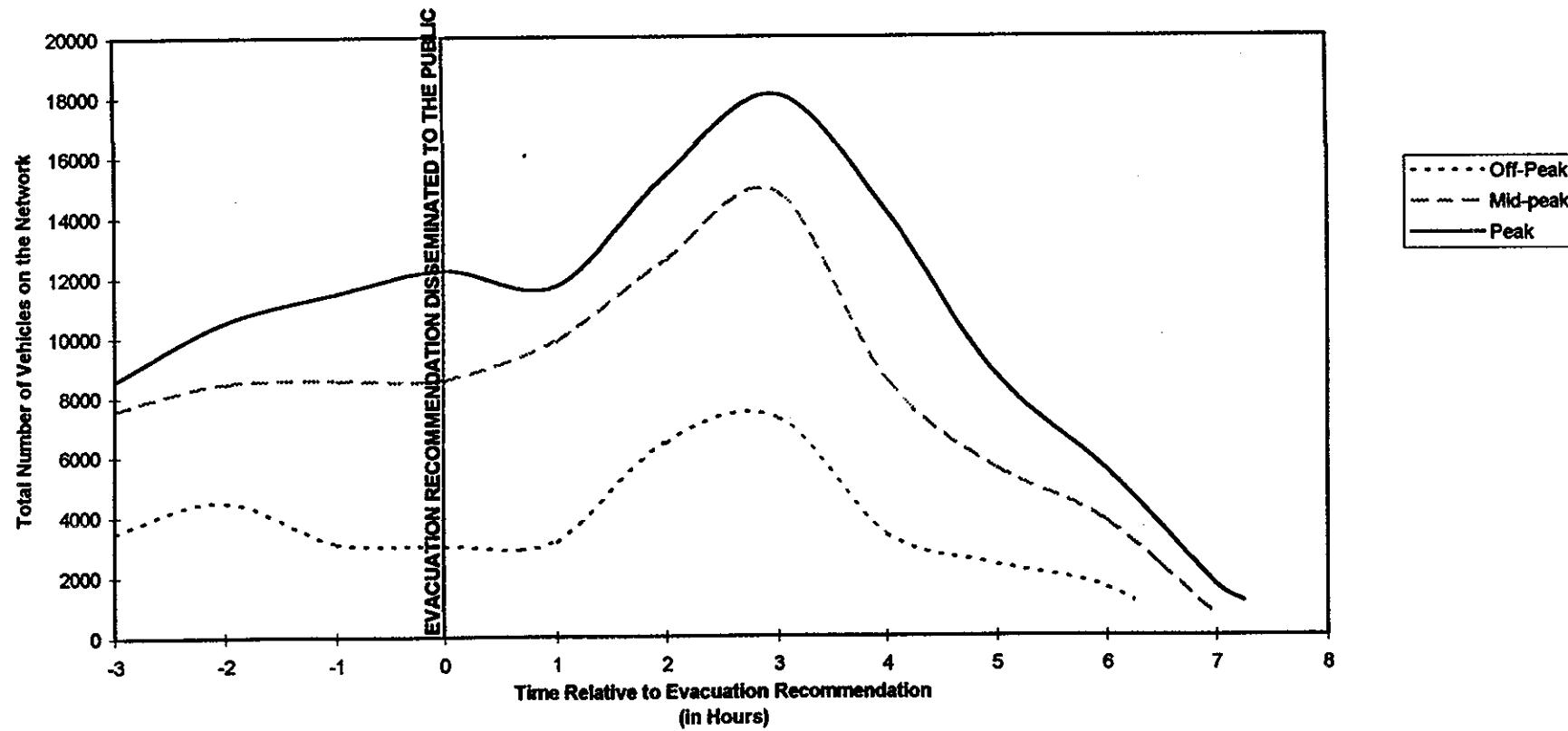
Note: About 860 vehicles were on the network at the end of simulation
for all background traffic conditions.

FIGURE 5-3:
EAST BAY/MASSACHUSETTS NETWORK PLOTTED RESULTS
FOR MODERATE BEHAVIORAL RESPONSE (WEAK HURRICANE)



Note: About 690 vehicles were on the network at the end of simulation
for all background runs.

FIGURE 5-4:
EAST BAY/MASSACHUSETTS NETWORK PLOTTED RESULTS
FOR MODERATE BEHAVIORAL RESPONSE (SEVERE HURRICANE)



Note: About 1140 vehicles were on the network at the end of simulation
for all background runs.

TABLE 5-1
SUMMARY OF CLEARANCE TIMES (Weak Hurricane Scenario)

	BACKGROUND TRAFFIC CONDITION		
	Off-peak	Mid-peak	Peak
<u>WEST BAY/RHODE ISLAND NETWORK</u>	Hrs:Min		
Rapid Response	4:21	4:24	4:42
Moderate Response	6:10	6:11	6:43
Slow Response	8:04	8:04	8:38
<u>EAST BAY/MASSACHUSETTS NETWORK</u>	Hrs:Min		
Rapid Response	4:15	4:41	5:08
Moderate Response	6:06	6:10	6:28
Slow Response	8:01	8:02	8:22

TABLE 5-2
SUMMARY OF CLEARANCE TIMES (Severe Hurricane Scenario)

	BACKGROUND TRAFFIC CONDITION		
	Off-peak	Mid-peak	Peak
<u>WEST BAY/RHODE ISLAND NETWORK</u>	Hrs:Min		
Rapid Response	4:35	4:42	5:33
Moderate Response	6:10	6:13	7:37
Slow Response	8:04	8:04	9:36
<u>EAST BAY/MASSACHUSETTS NETWORK</u>	Hrs:Min		
Rapid Response	5:07	5:33	5:44
Moderate Response	6:06	6:47	7:15
Slow Response	8:03	8:11	8:36

West Bay/Rhode Island Network

For the West Bay/Rhode Island network, clearance times ranged from a minimum of approximately 4 hours and 20 minutes to a maximum of approximately 9 hours and 35 minutes. For this network, the evacuation clearance times for off-peak and mid-peak conditions under both weak and severe hurricane scenarios are only slightly higher than the response times, indicating that the response times are the primary factor influencing the total clearance times for these conditions. For the off-peak and mid-peak conditions under both the weak and severe hurricane scenarios, simulated traffic conditions are mostly free flow, with no long-term congestion along the network. For these conditions, some intermittent queuing occurs along Route 2 in East Greenwich; Route 1 in North Kingstown and Warwick and along Route 117 and 117A in Warwick; as well as some off ramps to I-95 in Warwick and Providence. The simulations for the off peak conditions showed limited congestion along I-95 and Route 1 north of Warwick.

West Bay/Rhode Island Network clearance times for all of the peak conditions reflect more congestion and lower travel speeds in numerous areas, compared to the off-peak and mid-peak conditions. Extended queuing is predicted to occur along Route 1, from Providence to North Kingstown, along I-95 in Warwick and Providence, as well as along most ramps accessing I-95 in these communities for extended periods during the evacuation. A moderate amount of congestion is also expected to occur along Route 138, between Route 102 and the Jamestown Bridge, as well as along Routes 2 and 4 in East Greenwich. Intermittent vehicle queuing and congestion would also occur along Routes 110 and 108 in South Kingstown, and Routes 117 and 117A in Warwick. For the peak conditions, Route 1 in Warwick is the one link expected to experience the highest level of overall congestion. Route I-95 in Warwick is also expected to experience prolonged delays during portions of the evacuation, with travel speeds lowering to 25-40 miles per hour. Along Route 1, travel speeds are predicted to decrease to 15 to 25 miles per hour for much of the time after the evacuation recommendation is disseminated.

In summary, the controlling factor for clearance of the West Bay/Rhode Island network is evacuee response time for off-peak and mid-peak conditions, while increased congestion in the peak case has an impact on extending the evacuation time, over the response time, by up to approximately 1 hour and 30 minutes. The difference in clearance times between the weak hurricane and severe hurricane storm scenarios are generally less than 1 hour, indicating that the number of evacuees and available roadway capacities are not the major influence on the clearance time for the West Bay/Rhode Island network.

East Bay/Massachusetts Network

For the East Bay/Massachusetts network, clearance times range from a minimum of 4 hours and 15 minutes, to a maximum of approximately 8 hours and 35 minutes. The evacuation clearance times for off-peak and mid-peak conditions under the weak hurricane scenario are only slightly higher than the response times, indicating that the background traffic conditions are the primary factor influencing total clearance times for these conditions.

Evacuation traffic conditions for off-peak, mid-peak, and peak rapid response conditions under the weak hurricane scenario generally result in free flow conditions, except for portions of Route 6 in Swansea, and Fall River, MA, and sections of Route 114 through Portsmouth and Middleton, RI and sections of 103

through Barrington and Warren. The level of congestion however, is more prominent for the mid-peak and peak rapid response scenarios. In these locations, intermittent vehicle queuing temporarily slows travel speeds to approximately 20 to 25% of the posted travel speeds. However, for these conditions, the intermittent congestion corresponds to the loading intervals for evacuating traffic. This indicates that the intermittent congestion and reductions in travel speeds are directly related to the assumed rate at which evacuees load onto roadways.

Evacuation traffic conditions for off-peak, mid-peak, and peak rapid response conditions under the severe hurricane scenarios has greater congestion problems along Route 6 in East Providence, Swansea and Fall River; Route 103 in Barrington and Warren and sections of Route 114 through Portsmouth and Middleton, RI, particularly during the rapid response condition. This intermittent congestion also corresponds to the loading intervals for evacuating traffic.

For peak conditions under the weak hurricane scenario, and most conditions under the severe hurricane scenario, increased vehicle queuing and congestion is expected along portions of Routes 6 in Swansea, MA, and sections of Route 114 through Portsmouth and Middleton, RI. Congestion is also predicted around the major urban centers subsequent to the evacuation recommendation, including key connectors such as Routes 6, 103 and 138 in the vicinities of East Providence, RI, Fall River, MA, Somerset, MA, Swansea, MA, Bristol, RI, and Barrington, RI. The roadways which will experience the most significant vehicle queuing are Route 6, between Fall River, MA and East Providence, and Route 114, between the Mount Hope Bridge and Route 6 in East Providence, RI. Congestion is also expected along Route 103 in Barrington and Warren.

In summary, evacuation clearance times for the East Bay/Massachusetts network, for the off-peak and mid-peak, moderate and slow response conditions under the weak and severe hurricane scenarios are generally defined by the response time. Although some intermittent queuing is expected, the major factor influencing these clearance times are the times associated with behavioral response. Simulations of most of the remaining weak storm and severe storm conditions indicate that prolonged vehicle queuing and congestion will have more of an impact in defining the overall clearance time. Specifically, congestion and vehicle queuing are predicted along major arterials, such as Route 6 in New Bedford, MA, and urban roadways such as Routes 114 and 24, and 103 in the bay communities, adding up to 1 hour and 45 minutes over the response time to the rapid response scenario.

A comparison of the clearance times for the East Bay/Massachusetts network indicates that the difference in evacuating population between a weak and severe storm would generally add an hour or less to the total clearance time. This indicates that even for the mid-peak and off-peak conditions, the response time is a substantial component of the overall clearance time.

5.3 SENSITIVITY ANALYSIS

5.3.1 Overview

The purpose of the sensitivity analysis was to evaluate the impact of simulated clearance times to key parameters that may vary from the base conditions discussed earlier. The key parameters considered in this analysis are:

- Population - to evaluate the impact of increased levels of the evacuating population on simulated clearance times
- Response Time - to access the sensitivity of a reduced response time for the rapid response condition
- Evacuation Shelter Use - to see how a reduction in community shelter use would impact simulated clearance times

The intent of the sensitivity analysis was not to simulate all cases and scenarios, but rather to evaluate a range of conditions which would define appropriate bounds from which conclusions for all conditions could be drawn.

Simulations for these three sensitivity analysis conditions were evaluated first for the severe hurricane scenario. If appropriate, for cases where a significant impact was found, the weak hurricane scenario would be considered. To limit the number of simulations, only scenarios that could be considered as defining the "upper" and "lower" bounds of clearance time were considered. From the base condition results, these scenarios were determined to be rapid and slow evacuee conditions during off-peak and peak background scenarios.

5.3.2 Sensitivity to Population Increases

The effect of population increases of up to 20% on clearance times were evaluated for the conditions outlined above. The simulated results for the cases analyzed are presented in Annex C, Table AC-1.

The results indicate that, for the severe hurricane scenario, several analysis conditions are sensitive to population increases of this magnitude. The most significant increases would be associated with the peak conditions (up to an 80 minute increase for the West Bay/Rhode Island network, and up to a 60 minute increase for the East Bay/Massachusetts network).

For the off-peak slow response scenario, the 20% increase in population had little effect on the clearance time for both networks. The 20% increase in population for the off-peak rapid response condition added up to 40 minutes to the clearance time.

In summary, an increase of total evacuating population of 20% for the severe hurricane scenario would have an appreciable effect on clearance times for the peak conditions. For the West Bay/Rhode Island network the most significant increase in clearance time would occur during the rapid response condition, whereas for the East Bay/Massachusetts network the most significant increase would occur for the slow response condition. Increases for the moderate response condition would be expected to be appreciable for both networks. These differences (i.e., between the East Bay/Massachusetts, and West Bay/Rhode Island

network results) are associated with differences in the ability of the networks to accommodate the added traffic under the various loading scenarios.

Overall, it can be stated that for the defining cases, a 20% increase in population will result in an increase of clearance times of up to 80 minutes (up to 1 hour with a 10% increase).

5.3.3 Sensitivity to Shorter Rapid Response Time

A shorter rapid response time was evaluated to determine how sensitive the assumptions on rapid response were to clearance times. A 2-hour decrease in rapid response time (or a total response time of 2 hours) was used for the sensitivity analysis, for the severe hurricane scenario. The results of the sensitivity analysis simulations are presented in Annex C, Table AC-2.

The results indicate that, under the severe hurricane scenario, for both the West Bay/Rhode Island and East Bay/Massachusetts network, reduced rapid response assumptions have little effect on overall clearance times. For both off-peak and peak conditions, the shorter response times produced results within approximately 50 minutes of the base condition results.

It can be concluded that for the West Bay/Rhode Island and East Bay/Massachusetts networks, a reduction in the assumed rapid response time will have little effect on the overall clearance times. When the response time is reduced to 2 hours, the roadway network and capacity constraints become more of a constraining factor influencing the total clearance time.

5.3.4 Sensitivity to a Reduction in Community Shelter Use

An analysis was also performed to determine if the assumption on the number of persons expected to use community shelters could have an appreciable effect on the clearance times. Specifically, the intent was to determine if less evacuees used the shelters than predicted, would the additional traffic on the evacuating roadways have a significant effect on the clearance times.

The analysis was conducted for the severe hurricane scenario, assuming that only half of the evacuees assumed to use shelters under the base condition would actually use the shelters. The results, presented in Annex C, Table AC-3, indicate that for this condition, the impact would be nominal for most scenarios. The greatest increase in clearance time would be approximately 35 minutes for the West Bay/Rhode Island network, and 20 minutes for the East Bay/Massachusetts network. For most other conditions, the increased times resulting from decreased shelter use was about 10 minutes or less. Accordingly, it can be concluded that for most conditions under the severe hurricane scenario, the impact of a 50% reduction in community shelter use will not have an appreciable impact on clearance times.

It can also be concluded that for the weak hurricane scenario conditions, a reduction in community shelter use would generally have a nominal impact on clearance times.

SECTION SIX

SUMMARY

The Rhode Island Transportation Analysis is one element of a more comprehensive study entitled the Rhode Island Hurricane Evacuation Study. Two major considerations in hurricane evacuation planning are: 1) how much time will it take to notify people that they must leave their homes after authorities have determined an evacuation is necessary (dissemination time), and 2) how much time will it take for people who evacuate their homes to travel roadways and reach safe destinations (clearance time). Evacuation time is defined as the combination of these two times. The overall objective of the Transportation Analysis is to develop estimates of clearance times under a variety of hurricane evacuation scenarios for coastal Rhode Island. Clearance times and the results from other technical analyses are compiled in the Technical Data Report of the Rhode Island Hurricane Evacuation Study offering State and local officials state-of-the-art information for which hurricane preparedness plans can be updated.

An evacuation simulation computer model entitled NETVAC2 was used to create a mathematical representation of the road system in Rhode Island and Bristol County, Massachusetts. The model was calibrated to the traffic patterns of a normal day (a day for which no hurricanes are forecasted) using traffic and roadway data obtained from the Rhode Island Department of Transportation and Massachusetts Highway Department. Estimates of the numbers of seasonal and permanent residents that would evacuate prior to future hurricanes were made using estimates of the total vulnerable population and application of human behavioral characteristics assumed for the study area. During evacuation simulations, evacuating vehicles were programmed to enter roadways at prescribed loading rates and compete for roadway and intersection capacities with other vehicles of different trip purposes.

Evacuation scenarios, idealizing some of the possible situations officials may be faced with while contending with the decision to issue an evacuation, were outlined. Key parameters of evacuation scenarios include the intensity or severity of the hurricane, the behavioral response of evacuees to mobilize and leave their homes, and the time of day an evacuation takes place. Because Rhode Island and Bristol County, Massachusetts support an industrial and commercial base employing many people in and near inundation areas, evacuations are complicated by the presence of commuter traffic which varies at different times of the day. A total of 18 different scenarios formulated from combinations of key parameters were analyzed using the NETVAC2 model.

For the West Bay/Rhode Island network, results showed that in situations where people left their homes over a moderate to long period of time (6 to 8 hours after being told to do so by authorities), the density and capacity of the roadway system are such that evacuating traffic clears the network in slightly greater time than response times. For the rapid response condition (where people leave their homes within 4 hours of being told to do so by authorities) during peak background traffic, vehicle queuing and congestion can add up to 1 hour and 45 minutes to the clearance time.

For off-peak and mid-peak conditions under both weak and severe hurricane scenarios, simulated traffic conditions are mostly free flow with no long-term congestion throughout the network. However, clearance times for all of the peak conditions reflect greater congestion and lower travel speeds in Providence,

Warwick, East Greenwich, and North Kingstown. However, the congestion does clear soon after the loading period.

The lowest clearance time calculated was approximately 4 hours and 30 minutes for the weak hurricane scenario assuming rapid response and off-peak background traffic in the West Bay/Rhode Island and East Bay/Massachusetts networks. The highest clearance time of about 9 hours and 35 minutes was calculated for the West Bay/Rhode Island network, for the severe hurricane scenario assuming slow evacuee response during peak background traffic conditions.

All scenarios assuming slow evacuee response resulted in clearance times ranging from approximately 8 hours to 9 hours and 35 minutes in both networks, independent of the severity of the hurricane or background traffic conditions.

A sensitivity analysis has been performed to evaluate the impact of key assumptions and parameters to evacuation clearance times. This analysis has indicated the following:

- An increase of total evacuating population of 20% for the severe hurricane scenario would add up to about 80 minutes for the West Bay/Rhode Island network and up to about 60 minutes for the East Bay/Massachusetts network. For the majority of cases, the increase in clearance times associated with a 20% increase in population results in a predicted increase in clearance times of less than 10%.
- Reductions in the assumed rapid response times will have little effect on the overall clearance times, for all conditions. When the response times are reduced to 2 hours, the roadway network and capacity constraints become more of a constraining factor influencing the total clearance time.
- A reduction in the assumed use of community shelters will generally have little effect on clearance times for most conditions. The greatest increase in clearance times for both the West Bay/Rhode Island and East Bay/Massachusetts network would be about 35 minutes for the peak condition. For most other conditions, the increased times resulting from decreased shelter use would be 10 minutes or less.

As stated before, the clearance times calculated in the analysis comprise only a portion of total evacuation times. An additional time component is required for officials to effectively disseminate evacuation recommendations to the public. Dissemination time may differ by region depending on communication and warning procedures utilized by State and local officials in a particular area, and can best be estimated by the responsible state and local officials. Failure to add this component to clearance times will underestimate evacuation times which could result in insufficient time for all evacuees to safely clear the hazard area. Evacuation times can be determined by adding an appropriate amount of time for dissemination to the clearance times estimated for Rhode Island in this analysis. This topic is discussed more fully in Chapter Seven, Evacuation Times, of the Technical Data Report.

REFERENCES

1. USACOE, New England Division, Rhode Island Hurricane Evacuation Study, Inundation Map Atlas; May 1993.
2. Sheffi, Mahmassani, Powell, Klimm, NETVAC2 User Manual; 1980.
3. USACOE, Mobile District, Tri-State Hurricane Evacuation Study, Appendix C, Transportation Analysis; June 1986.
4. Hazards Management Group, Inc., Hurricane Evacuation Behavior in Middle Atlantic and Northeast States; 1989.
5. US Department of Transportation Federal Highway Administration, State Highway Map of Rhode Island (Traffic Flow Map); 1993.
6. Massachusetts Highway Department, 1993 Traffic Volumes for the Commonwealth of Massachusetts; 1994.
7. Rhode Island, Department of Transportation Highway Intersection Data; 1994.
8. Per guidance presented in "Calibration and Adjustment of System Planning Models, Federal Highway Administration", December 1990, Washington, D.C.
9. US Department of Commerce, Bureau of the Census, 1980 Census of Population and Housing Summary Tape File 3A; July 1983.
10. US Department of Commerce, Bureau of the Census, 1990 Census of Population and Housing Summary Tape File; 1990.

ANNEX A:
RHODE ISLAND NETWORK COMPUTER INPUT FILES

West Bay/Rhode Island Network Link Card Files

101	10211246	11 11	2 1 1 7 4 30	100	103	123
102	103 6283	11 11	2 1 1 7 4 30	75	105	107
102	123 5385	10 10	2 1 1 7 4 30	25	125	
103	105 7800	11 11	2 1 1 7 4 30	80	106	801
103	107 6600	11 11	2 1 1 7 3 50	20	108	110
104	803 6000	11 11	2 1 1 7 3 50	100		
105	801 1000	11 11	2 1 1 3 3 20	40		
105	106 4963	11 11	2 1 1 4 1 30	80	001	111
106	001 6000	11 11	2 1 1 4 1 40	1	134	002
106	802 1000	22 11	6 2 1 5 3 40	99		
106	111 3009	22 11	6 2 1 5 3 40	100	112	
107	108 1000	22 11	2 2 1 8 3 50	90	114	
107	110 1000	11 11	2 1 1 1 3 30	10	126	
108	11414520	22 11	2 2 1 8 3 50	90	116	115
108	469 1000	11 11	2 1 1 1 3 30	10	470	
469	470 6600	22 11	6 2 1 5 3 40	100		471
109	110 1000	22 11	6 2 1 5 3 40	100	126	126
468	108 1000	22 11	2 2 1 1 3 25	1	114	
468	469 1000	22 11	6 2 1 5 3 40	99	470	
110	126 9750	22 11	2 2 1 8 3 40	100	127	800
111	112 500	22 11	6 2 1 5 3 40	100	113	109
111	106 3000	22 11	6 2 1 5 3 40	99	802	001
471	804 500	11 11	2 1 1 5 1 25	1		
112	113 4500	22 11	6 2 1 5 3 40	1	117	880
470	471 500	22 11	6 2 1 5 3 40	1		804
112	109 6600	22 11	6 2 1 5 3 40	99	110	
113	117 2690	11 11	2 1 1 4 3 30	80	115	
113	880 1000	11 11	2 1 1 5 3 25	20		
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114	115 1000	11 11	2 1 1 4 3 35	20	131	117
114	116 1500	22 11	2 2 1 5 2 50	80	104	
115	116 1000	11 11	2 1 1 8 2 50	50	104	
115	117 750	11 11	2 1 1 4 2 30	25	113	
115	13112000	11 11	2 1 1 4 4 35	25		132
116	104 9000	22 11	2 2 1 8 2 50	20	803	
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466	467 1480	22 11	2 2 1 8 4 50	100	468	
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129	130 2965	10 10	2 1 1 7 4 50	100		140
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130	140 4490	22 11	2 2 1 8 4 40	90	142	139
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131	132 7500	11 11	2 1 1 4 4 35	50		805
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133	135 6000	22 11	4 2 1 6 4 35	90		013
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139	133 8250	11 11	2 1 1 7 4 40	50		132
133	139 8250	11 11	2 1 1 7 4 40	50	140	809
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139	14010500	11 11	2 1 1 7 4 35	40		142
139	809 1000	11 11	2 1 1 5 4 25	60		
140	13910500	11 11	2 1 1 7 4 35	50	133	809
140	142 4225	22 11	6 2 1 8 4 40	50	149	
141	142 4800	10 10	2 1 1 7 4 50	100		149
462	463 4225	22 11	6 2 1 8 4 50	50	464	139
142	14920275	22 11	6 2 1 8 4 40	50	147	
143	144 4065	11 11	4 1 1 5 2 30	100	145	
144	145 3000	11 11	4 1 1 5 2 30	100	146	186

West Bay/Rhode Island Network Link Card Files

145 146 3000 11 11	4 1 1 5 2 30	80 147	
145 186 8250 11 11	4 1 1 7 4 30	20 160	
146 147 500 11 11	4 1 1 5 2 30	100	150
147 150 3000 22 11	6 2 1 8 4 40	15 166	
148 150 1000 22 11	6 2 1 8 4 40	50 166	
460 461 1000 22 11	6 2 1 8 4 50	90 462	
149 147 1500 22 11	6 2 1 8 4 40	50 150	151
461 462 20275 22 11	6 2 1 8 4 50	50 463	
147 151 15000 12 12	4 1 1 7 4 40	9 013	813
459 460 1500 22 11	6 2 1 8 4 50	75 461	
459 151 1000 11 11	2 1 1 5 4 25	25 013	022
150 166 16000 22 11	6 2 1 8 4 40	50 162	
151 813 1000 11 11	2 1 1 5 4 25	60	
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151 02234500 12 12	4 1 1 7 4 40	5	153
151 14815000 12 12	4 1 1 7 4 40	90	150
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152 810 1000 11 11	2 1 1 5 4 25	20	
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153 812 1000 11 11	2 1 1 5 4 25	05	
153 01410500 12 12	4 1 1 7 4 40	75 021	
153 02217400 12 12	4 1 1 7 4 40	23 165	
155 112 3000 22 11	4 1 1 5 4 40	100 109	
159 270 3000 10 10	2 1 1 4 4 35	100 272	279
160 161 500 11 11	4 1 1 7 4 35	20 162	
457 458 4500 22 11	6 2 1 8 4 50	95 459	
160 184 9000 11 11	4 1 1 7 4 35	80 165	814
161 162 250 22 11	4 2 1 7 4 40	50 168	
162 168 7500 22 11	6 2 1 8 4 40	50 170	
455 456 7500 22 11	6 2 1 8 4 50	50 457	160
165 181 3000 11 11	2 1 1 7 4 35	50 180	815
165 022 7500 11 11	2 1 1 7 4 35	50 153	
166 162 3900 22 11	6 2 1 8 4 40	90 168	
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456 457 250 11 11	4 1 1 8 4 50	65 458	
167 166 9000 10 10	2 1 1 7 4 50	100	162
168 170 9900 22 11	6 2 1 8 4 40	50 172	
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173 174 4500 11 11	2 1 1 7 4 40	100 175	177
174 175 3900 11 11	2 1 1 7 4 40	50 183	176
174 177 5250 10 10	2 1 1 5 3 30	50	176 187
175 176 1500 11 11	2 1 1 5 3 35	50 177	818
175 183 3000 11 11	2 1 1 5 3 40	50 182	
176 818 1000 11 11	2 1 1 5 4 25	20	
176 177 3000 11 11	2 1 1 5 1 35	40	187
176 175 1500 11 11	2 1 1 5 1 35	40	183
177 187 750 11 11	2 1 1 5 1 30	70 179	817
177 176 3000 11 11	2 1 1 5 1 35	30 175	818
161 160 500 11 11	4 1 1 7 4 35	05 184	
179 816 1000 11 11	2 1 1 5 2 25	20	
179 187 3750 11 11	2 1 1 4 2 25	10 177	817
179 180 4725 11 11	2 1 1 4 2 25	80	181
180 181 4500 11 11	2 1 1 4 4 35	75 165	815
180 18218510 11 11	2 1 1 4 4 40	25 214	
181 165 3000 11 11	2 1 1 7 4 35	80 022	224
181 815 1000 11 11	2 1 1 5 4 25	30	
181 180 4500 11 11	2 1 1 4 4 35	10 182	
182 22412000 22 11	6 2 1 8 4 40	100 222	221
182 214 6750 11 11	2 1 1 5 4 35	30	220
182 18018510 11 11	2 1 1 5 4 40	5 181	
450 451 19500 22 11	6 2 1 8 4 50	95 452	
183 18219500 22 11	6 2 1 8 4 40	100 224	
183 175 3000 11 11	2 1 1 5 3 40	1	176
451 452 4500 22 11	6 1 1 8 3 50	99 453	175
184 160 9000 11 11	4 1 1 7 4 35	5 161	
184 814 1000 11 11	2 1 1 5 4 25	15	
184 16522500 11 11	4 1 1 4 4 35	75	181 022

West Bay/Rhode Island Network Link Card Files

185	186	5250	11	11	4	1	1	5	4	35	100	160	
186	16014250	11	11		2	1	1	7	4	25	100	161	184
187	177	750	11	11	2	1	1	5	1	30	100		176
187	179	3900	11	11	2	1	1	4	2	25	80	180	816
187	817	1000	11	11	2	1	1	5	2	25	15		
188	168	3900	11	11	2	1	1	5	4	40	100	170	
189	188	1800	11	11	2	1	1	5	4	40	100	168	
190	196	7500	22	11	2	2	1	6	4	50	75		197
190	191	1000	22	11	2	2	1	6	4	50	25	192	
191	192	1000	22	11	2	2	1	6	4	50	100	197	
192	197	6000	22	11	2	2	1	6	4	45	100		198
193	192	1000	11	11	2	1	1	7	4	30	100		197
194	195	5100	10	10	2	1	1	4	4	30	100	201	
195	201	6000	11	11	2	1	1	5	4	35	50	202	
195	196	1000	22	11	2	2	1	6	4	50	50	197	
196	197	1000	22	11	2	2	1	6	4	50	100	198	
197	198	1000	22	11	2	2	1	6	4	45	100	199	201
198	201	2400	20	10	2	2	1	6	4	35	25		202
198	199	2250	22	11	2	2	1	6	4	35	75	200	202
199	202	2400	22	11	2	2	1	6	4	35	25		203
199	200	6900	22	11	2	2	1	6	4	35	75	207	
200	207	6750	22	11	2	2	1	6	4	30	100	209	204
201	202	1800	11	11	2	1	1	4	4	30	100	203	
202	203	13500	11	11	2	1	1	4	4	35	100	206	
203	204	4500	11	11	2	1	1	5	4	40	100	207	820
203	206	4500	11	11	2	1	1	5	4	25	50	211	210
204	207	2400	11	11	2	1	1	5	4	40	100	209	
204	203	4500	11	11	2	1	1	5	4	40	50		206
206	211	8400	11	11	2	1	1	5	2	25	50	212	
206	210	3900	10	10	2	1	1	4	2	30	50	209	819
207	204	2400	11	11	2	1	1	5	4	40	80	203	
207	209	2100	22	11	2	2	1	6	4	40	100	183	
209	175	3000	11	11	2	1	1	5	3	35	20	176	183
209	183	3000	11	11	2	1	1	8	4	40	75	182	
209	210	3000	22	11	2	2	1	6	4	35	25	206	819
452	453	12000	22	11	6	2	1	8	4	50	25	454	
210	206	3750	10	10	2	1	1	4	2	30	5		211
210	209	4000	10	10	2	1	1	4	2	30	80	175	183
210	819	1000	11	11	2	1	1	5	4	25	95		
211	212	1000	11	11	2	1	1	5	2	25	100	213	
212	213	9000	11	11	2	1	1	5	2	25	100	214	
213	214	3300	11	11	2	1	1	5	2	30	100	220	
214	220	15000	11	11	2	2	1	5	2	45	25	230	844
214	182	6750	11	11	2	1	1	5	2	35	75	180	224
215	274	6000	22	11	2	2	1	4	1	40	100	306	
216	217	14400	10	10	2	1	1	4	4	40	100	218	
217	218	2400	22	11	2	2	1	6	4	30	100	255	251
218	255	2700	22	11	2	2	1	5	4	40	75	256	
218	251	6000	22	11	2	2	1	5	1	40	100	252	
220	230	8400	11	11	2	1	1	4	1	35	50	231	
220	221	9750	24	12	6	2	1	8	4	50	40	223	
221	220	9750	24	12	6	2	1	8	4	50	40	844	
220	214	15000	11	11	2	1	1	4	1	35	5		182
220	844	4500	24	12	6	2	1	8	4	50	20		
221	222	1800	11	11	2	1	1	4	2	25	75		227
221	223	1500	24	12	6	2	1	8	4	50	25		450
222	227	2700	22	11	6	2	1	5	4	40	50	229	
223	450	15000	24	12	6	2	1	8	4	50	100		180
224	221	1500	11	11	2	1	1	4	2	25	25	220	
225	853	2100	11	11	2	1	1	5	4	25	100		
226	393	1500	22	11	6	2	1	5	1	40	100		853
226	358	12000	22	11	2	2	1	5	1	40	100	386	
227	228	18600	11	11	2	1	1	7	4	50	10	234	
204	820	1000	11	11	2	1	1	5	4	25	70		
224	222	1000	22	11	6	2	1	8	4	40	75	227	
227	229	9300	22	11	6	2	1	5	4	40	90	233	
228	234	4500	22	11	2	2	1	4	4	35	50	244	823
228	025	5400	11	11	2	1	1	4	4	35	50	034	
228	227	18600	11	11	2	1	1	7	4	50	50	222	895
229	228	12000	11	11	2	1	1	4	4	35	30	025	234
229	233	5000	11	11	2	1	1	4	4	35	65	238	
229	822	1000	11	11	2	1	1	5	4	25	5		
230	231	4500	11	11	2	1	1	4	2	30	100	232	821
231	232	3900	11	11	2	1	1	4	2	30	80	229	
231	821	1000	11	11	2	1	1	5	4	25	20		

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232	233	3750	11	11	2	1	1	4	2	30	50	238	
232	229	3300	11	11	2	1	1	4	2	30	50	228	
233	23811100	22	11	6	2	1	5	4	40	100	241	242	
234	244	6000	22	11	2	2	1	7	4	35	75	246	245
234	823	3900	11	11	2	1	1	5	4	25	20		
234	228	4500	11	11	2	1	1	7	4	35	80	227	025
234	244	6000	11	11	2	1	1	7	4	35	75	245	246
235	236	6900	11	11	2	1	1	4	1	35	100	237	242
236	237	1000	11	11	2	1	1	4	1	35	5	241	
236	238	1000	11	11	2	1	1	4	1	35	5	242	
236	242	6900	11	11	2	1	1	4	1	35	90	249	824
237	241	6000	10	10	2	1	1	4	1	40	100	253	826
238	242	6750	11	11	2	1	1	4	1	35	20	249	824
239	236	6600	24	12	6	2	1	8	1	50	80	238	237
239	825	2400	11	11	2	1	1	5	4	25	20		
240	239	3900	10	10	2	1	1	4	1	40	100	236	825
241	253	4500	22	11	6	2	1	5	4	40	90	252	
241	826	1500	11	11	2	1	1	5	4	25	10		
242	824	1500	11	11	2	1	1	5	4	25	1		
242	249	6600	11	11	2	1	1	4	1	25	99	250	
244	234	6000	22	11	2	2	1	4	4	35	25	228	823
244	245	3000	22	11	2	2	1	1	4	35	50	250	
244	246	5250	22	11	2	2	1	4	4	35	50	247	
245	250	5250	24	12	6	2	1	8	4	50	100	404	
246	247	6600	22	11	2	2	1	4	4	35	100	317	827
247	827	3900	11	11	2	1	1	5	4	25	15		
247	317	8700	22	11	2	2	1	4	4	35	80	315	318
248	249	1000	11	11	2	1	1	1	2	25	100	250	
248	254	6000	11	11	2	1	1	1	4	35	100	252	
249	248	1000	11	11	2	1	1	1	2	25	100	254	
249	250	1000	11	11	2	1	1	1	4	25	100	404	
250	249	1000	11	11	2	1	1	1	4	25	100		248
250	40412900	24	12	6	2	1	8	2	50	100	405		
251	218	6000	22	11	6	2	1	5	1	40	100	255	
251	252	1000	22	11	6	2	1	5	1	40	50	253	254
252	254	3000	11	11	2	1	1	5	3	40	10	248	
001	002	5250	11	11	2	1	1	4	4	35	100	003	012
001	106	6000	11	11	2	1	1	4	4	30	100		802
001	134	3000	22	11	2	1	1	4	4	30	100	104	
002	003	9000	11	11	2	1	1	4	4	35	75	004	806
002	01211100	11	11	4	1	1	4	4	30		25	135	
002	001	5250	11	11	2	1	1	4	4	35	100		106
003	004	9000	11	11	2	1	1	4	4	35	100	006	005
003	806	1000	11	11	2	1	1	5	4	25	20		
003	002	9000	11	11	2	1	1	4	4	35	80	001	
004	006	1000	11	11	2	1	1	4	4	35	99	808	007
004	005	1000	11	11	2	1	1	1	4	25	1	020	
004	003	9000	11	11	2	1	1	4	4	35	100		806
005	007	1000	36	12	6	3	1	8	4	55	100	807	
005	02033000	36	12	6	3	1	8	4	55	100	015	021	
005	006	1000	11	11	2	1	1	1	4	25	10		808
006	808	1000	11	11	2	1	1	5	4	25	100		
006	004	1000	11	11	2	1	1	4	4	35	1	003	
006	007	1000	11	11	2	1	1	1	4	25	99		807
007	807	1000	36	12	6	3	1	8	4	55	100		
012	00211100	11	11	2	1	1	4	4	30	100		003	001
012	135	3900	11	11	4	1	1	4	4	30	100	013	
013	13530750	11	11	4	1	1	4	4	30	100	012		
013	152	9000	11	11	4	1	1	4	4	30	100	014	810
014	152	6750	11	11	4	1	1	4	4	30	100		810
014	021	9600	11	11	2	1	1	4	4	40	100	016	015
014	15312000	11	11	2	1	1	4	4	40	100	022	812	
015	020	1000	36	12	6	3	1	8	4	55	60	005	
015	016	1000	12	12	6	1	1	1	4	25	40		811
015	40133000	36	12	6	3	1	8	4	55	100	402	035	
016	811	1000	11	11	2	1	1	5	4	25	100		
016	020	1000	11	11	2	1	1	1	4	25	1		005
016	021	1000	11	11	2	1	1	4	4	40	99	014	
020	015	1000	36	12	6	3	1	8	4	55	99	401	
020	021	1000	11	11	2	1	1	1	4	25	1		014
020	00533000	36	12	6	3	1	8	4	55	100	007		
021	016	1000	11	11	2	1	1	4	4	40	98	811	020
021	015	1000	11	11	2	1	1	1	4	25	2		401
021	014	9600	11	11	2	1	1	4	4	40	100	153	
022	16512000	11	11	2	1	1	4	4	40	50	181		

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022 15315000 11 11	2 1 1 4 4 40	50 014	812	
023 024 1000 11 11	4 1 1 4 4 30	100		035
023 03411250 11 11	2 1 1 7 4 45	100 025		829
024 023 1000 11 11	4 1 1 4 4 30	100	034	
007 005 1000 36 12	6 3 1 8 4 55	100 020		
024 035 3300 11 11	2 1 1 7 4 45	100 040		
025 228 5100 11 11	2 1 1 7 4 45	100		234
025 03427000 11 11	2 1 1 7 4 45	100 023		829
034 02311250 11 11	2 1 1 7 4 45	9 024		
034 02527000 11 11	2 1 1 7 4 45	100 228		
034 829 1000 11 11	2 1 1 5 4 25	96		
035 040 1000 11 11	2 1 1 7 4 45	75 042		
401 402 1000 36 12	6 3 1 8 4 55	99 403		
401 035 1000 11 11	2 1 1 1 4 25	1	024	
038 01533000 36 12	6 3 1 8 2 55	100 020	016	
035 024 3300 11 11	2 1 1 7 4 45	100	023	
040 035 1000 11 11	2 1 1 7 4 45	25 024		
040 038 1000 11 11	2 1 1 7 4 25	50 015		
040 04233000 11 11	2 1 1 7 4 55	100 046		831
041 038 1000 36 12	6 3 1 8 2 55	99 015		
041 040 1000 12 12	6 1 1 1 2 45	1	042	
402 40349500 36 12	6 3 1 8 2 55	100 404		
042 831 1000 11 11	2 1 1 5 4 25	30		
042 04615000 11 11	2 1 1 7 4 55	35 047		832
042 04033000 11 11	6 1 1 7 4 45	35 035	038	
046 832 1000 11 11	2 1 1 5 4 25	92		
046 04727000 11 11	6 1 1 7 4 55	80 048		
046 04215000 11 11	6 1 1 7 4 55	8 040	831	
047 046 2700 11 11	6 1 1 7 4 55	75 042		
047 35028500 12 12	6 1 1 7 4 40	100 349	834	
047 04812000 11 11	6 1 1 7 4 55	100 049	045	833
048 04712000 11 11	6 1 1 7 4 55	80	046	
048 833 1000 11 11	2 1 1 5 4 25	80		
048 04930000 11 11	6 1 1 7 4 55	65 050	044	
049 04830000 11 11	6 1 1 7 4 55	25 047	833	045
049 04436000 22 11	6 2 1 7 4 55	25 075		864
049 050 3600 11 11	6 1 1 7 4 55	50 051		865
050 049 3600 11 11	6 1 1 7 4 55	80 048		044
050 865 1000 11 11	2 1 1 5 4 25	60		
050 05130000 11 11	6 1 1 7 4 55	40	043	862
051 05030000 11 11	6 1 1 7 4 55	80	865	049
051 862 1000 11 11	2 1 1 5 4 25	80		
051 04336000 22 11	6 2 1 7 4 55	50 088	863	
048 04524000 22 11	6 2 1 7 4 55	40 059		835
052 05121000 11 11	6 1 1 7 4 45	100 050	862	043
052 09637000 22 11	6 2 1 7 4 50	100	095	444
054 057 4500 24 12	6 2 1 8 4 55	100 351		
058 054 1000 24 12	6 2 1 8 4 55	100 057		
056 436 1000 11 11	2 1 1 1 4 25	100 437		
056 057 1000 11 11	2 1 1 1 4 25	100 351		
056 38918000 24 12	6 2 1 8 4 55	100	374	
435 056 1000 11 11	2 1 1 1 4 25	100 389		
057 35112000 24 12	6 2 1 1 4 55	100 355		
060 058 1000 24 12	6 2 1 8 4 55	100 054		
059 04518000 24 12	6 2 1 6 4 55	100 048	835	
059 061 1000 24 12	6 2 1 6 4 55	70 390		
059 058 1000 11 11	2 1 1 1 3 25	30 054		
060 059 1000 11 11	2 1 1 1 4 25	100 045		
061 39022500 24 12	6 2 1 6 4 55	100 398		
061 059 1000 24 12	6 2 1 6 4 55	100 045		
072 06015000 24 12	6 2 1 8 4 55	100 058	059	
074 072 1000 24 12	6 2 1 8 4 55	75 060		
073 075 1000 22 11	6 2 1 7 4 55	75 044	072	
073 440 1000 11 11	2 1 1 1 4 25	25 441		
073 396 1500 24 12	6 2 1 6 4 55	100 395	856	
074 075 1000 11 11	2 1 1 1 4 25	25	044	
075 072 1000 24 12	6 2 1 6 4 55	50	060	
075 044 9000 24 12	6 2 1 6 4 55	100 049	864	
075 073 3000 24 12	6 2 1 6 4 55	50 396		
076 09745000 24 12	6 2 1 8 4 55	100 095	096	
077 007 3000 36 12	6 3 1 8 4 55	100 005		
078 052 3000 11 11	6 1 1 7 4 45	100 051		
079 234 3000 22 11	2 2 1 4 4 35	100	244	
081 052 3000 11 11	6 1 1 7 4 45	100 096		
082 051 3000 22 11	6 2 1 7 4 55	100 043		

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083	049	3000	22	11	6	2	1	7	4	55	100	044
084	048	3000	22	11	6	2	1	7	4	55	100	045
085	047	3000	12	12	6	1	1	7	4	40	100	350
086	35915000	48	12		6	4	1	8	2	55	100	383
087	07413500	24	12		6	2	1	6	4	55	50	072
088	087	1000	11	11	2	1	1	1	4	25	100	074
088	043	3000	22	11	6	2	1	7	4	55	100	051
088	442	1500	11	11	2	1	1	1	4	25	50	443
089	087	1000	24	12	6	2	1	6	4	55	90	074
089	088	1000	24	12	6	2	1	6	4	55	10	043
090	397	6000	36	12	6	3	1	8	4	55	100	382
091	016	3000	11	11	2	1	1	4	4	40	100	021
092	39315000	22	11		6	2	1	5	4	40	100	226
095	08915000	24	12		6	2	1	8	4	55	100	087
096	05237000	22	11		6	2	1	7	4	50	100	051
096	095	1000	11	11	2	1	1	1	2	25	99	089
096	444	1000	11	11	2	1	1	1	2	25	1	860
097	095	1000	24	12	6	2	1	8	4	55	40	089
097	096	1000	11	11	2	1	1	1	2	25	20	052
098	220	3000	24	12	6	2	1	8	4	50	100	221
099	451	3000	24	12	2	1	1	5	3	40	100	452
043	088	5250	22	11	6	2	1	7	4	55	80	087
043	863	1000	22	11	6	2	1	7	4	55	20	
043	05136000	22	11		6	2	1	7	4	55	100	862
044	075	7500	22	11	6	2	1	7	4	55	80	073
044	864	1000	22	11	6	2	1	7	4	55	40	
044	04936000	22	11		6	2	1	7	4	55	60	050
045	05918000	22	11		6	2	1	7	4	55	80	061
045	835	1000	22	11	6	2	1	7	4	55	80	
045	04824000	22	11		6	2	1	7	4	55	25	833
252	251	1000	22	11	6	2	1	7	4	40	50	218
252	253	1000	22	11	6	2	1	7	4	40	90	241
253	252	1000	22	11	6	2	1	7	4	40	50	251
254	248	3000	22	11	2	2	1	8	2	35	100	249
254	252	3000	11	11	2	1	1	5	3	40	100	253
255	256	2700	22	11	6	2	1	5	2	40	100	265
255	218	2700	22	11	6	2	1	5	2	50	100	251
256	255	2700	22	11	6	2	1	5	2	40	100	218
256	826	1000	11	11	2	1	1	5	4	25	5	
256	265	3900	22	11	6	2	1	5	2	40	95	266
404	40510500	36	12		6	3	1	8	2	55	100	406
257	25012900	24	12		6	2	1	8	1	50	90	245
257	318	6000	36	12	6	2	1	8	1	55	15	041
261	271	6000	10	10	2	1	1	5	3	40	100	272
262	284	3000	10	10	2	1	1	5	3	40	100	285
265	266	3750	22	11	6	2	1	5	2	40	100	267
265	256	3900	24	12	6	2	1	8	2	50	100	255
266	265	3900	22	11	6	2	1	5	2	40	100	256
266	267	3300	24	12	6	2	1	8	2	50	100	281
267	281	1000	24	12	6	2	1	8	3	50	80	322
267	308	3750	22	11	2	2	1	4	2	35	20	310
268	267	1800	22	11	2	2	1	4	2	35	100	308
269	280	6900	22	11	2	2	1	4	2	35	75	300
269	287	1500	22	11	2	2	1	4	2	35	25	288
270	279	3000	22	11	2	2	1	4	2	35	50	269
270	272	3000	22	11	2	2	1	4	2	35	50	215
271	272	4500	22	11	2	2	1	4	2	35	34	215
271	270	3300	22	11	2	2	1	4	2	35	33	279
271	285	3000	10	10	2	1	1	7	2	30	33	295
272	215	3600	22	11	2	2	1	4	3	35	100	274
273	274	8100	22	11	2	2	1	4	3	35	100	275
274	306	3900	10	10	2	1	1	5	3	30	75	332
274	275	8400	11	11	2	1	1	5	2	35	25	325
275	325	2250	22	11	6	2	1	5	2	40	90	327
275	276	1800	22	11	6	2	1	5	2	40	100	280
276	275	2100	22	11	6	2	1	5	2	40	90	325
276	278	9000	24	12	6	2	1	8	2	20	10	302
276	280	6000	22	11	6	2	1	5	2	40	90	281
276	840	1000	11	11	2	1	1	5	4	25	1	
278	302	6000	48	12	6	4	1	8	3	55	70	309
409	410	9000	48	12	6	4	1	8	3	50	100	411
278	302	5700	48	12	6	4	1	8	3	50	100	309
279	269	4500	22	11	2	2	1	4	2	35	80	287
276	409	7500	11	11	2	1	1	4	25	9	410	280
279	836	1000	11	11	2	1	1	5	4	25	20	

West Bay/Rhode Island Network Link Card Files

280	276	6300	22	11	6	2	1	5	1	40	90	275	278	840
280	300	6300	22	11	2	2	1	4	2	35	10	301	408	
281	322	4500	24	12	6	2	1	8	3	40	5	323		839
281	280	5250	22	11	6	2	1	5	3	40	95	276		300
282	261	3000	10	10	2	1	1	5	4	40	100	271		
283	295	2700	10	10	2	1	1	5	4	40	100		273	285
284	285	2250	10	10	2	1	1	5	4	40	100		295	
286	159	3000	22	11	2	2	1	4	2	35	100	270		
285	295	3750	11	11	2	1	1	5	2	35	50		273	
285	271	4000	11	11	2	1	1	5	2	35	100	270		
287	288	2700	22	11	2	2	1	4	2	35	100	268		
288	268	3000	22	11	2	2	1	4	2	35	100	267		
289	288	2250	10	10	2	1	1	5	4	30	100		268	
290	291	1800	10	10	2	1	1	5	4	30	100	287		
291	287	2700	10	10	2	1	1	5	4	30	100		288	
293	294	5400	24	12	6	2	1	8	4	50	100			332
294	332	3900	24	12	6	2	1	8	4	50	100	328		
295	273	3000	22	11	2	2	1	4	2	35	50	274		
300	408	1000	11	11	2	1	1	1	4	25	100	409		
300	301	1000	11	11	2	1	1	1	4	25	100		302	
301	302	1000	11	11	2	1	1	1	4	25	100	309		
408	409	5250	48	12	6	4	1	1	2	55	100	410		
302	309	9300	48	12	6	4	1	1	2	50	100	311	310	888
304	333	1000	22	11	2	2	1	6	1	40	100	324		
304	838	1800	11	11	2	1	1	5	4	25	20			
304	305	2250	22	11	2	2	1	6	1	40	80	319	307	
305	319	2100	22	11	2	2	1	6	1	40	100	335		
305	304	2250	22	11	2	1	1	6	1	40	20	333	838	
305	307	5250	22	11	2	1	1	6	1	40	80	312		837
306	841	1000	11	11	2	1	1	5	4	25	20			
306	332	6000	10	10	2	1	1	5	3	30	80		328	
306	274	3900	10	10	2	1	1	5	3	30	80	275		
307	837	1000	11	11	2	1	1	5	4	25	20			
307	312	2400	22	11	2	1	1	1	4	40	80	313		
307	305	5250	22	11	2	1	1	5	4	25	100	319	304	
308	406	1000	11	11	2	1	1	1	4	25	50	407		
308	310	1800	22	11	2	2	1	4	2	35	50	313		
309	310	1000	11	11	2	1	1	5	2	35	10	313		
406	407	2250	48	12	6	4	1	8	2	55	100	408		430
309	311	6000	48	12	6	4	1	8	2	55	60	257		
310	313	5250	22	11	2	2	1	4	2	35	100	314		
310	311	1000	11	11	2	1	1	5	2	25	100	318		
405	406	2250	48	12	6	4	1	8	2	55	100	407		
311	318	15000	36	12	6	3	1	8	2	55	100	041		
311	257	6000	48	12	6	4	1	8	2	55	100	318	889	250
312	313	1000	11	11	2	1	1	1	4	25	100	314		
295	285	3000	10	10	2	1	1	7	2	30	50	271		
313	310	6000	22	11	2	2	1	4	2	35	20		311	
313	314	1000	22	11	2	2	1	4	2	35	100	830		
314	830	4500	11	11	2	1	1	5	2	25	20			
314	313	1000	22	11	2	2	1	4	2	35	80	310		
315	307	6000	22	11	2	2	1	6	3	40	80	305	837	
315	314	2400	11	11	2	1	1	5	3	40	20		830	
317	315	5000	11	11	2	1	1	5	3	40	50	314	307	
317	318	1000	11	11	2	1	1	1	4	25	100	041		
318	0414	9500	36	12	6	3	1	8	2	55	100	038	040	
403	4044	49500	36	12	6	3	1	8	2	55	100	405		
319	335	5250	24	12	6	2	1	8	2	55	25	337		336
320	321	7200	11	11	2	1	1	1	2	25	100	309		
407	408	4500	48	12	6	4	1	8	4	55	75	409		
407	430	7200	24	12	6	2	1	8	4	55	25	431	890	
321	309	2250	24	12	6	2	1	8	2	55	100		310	
322	839	1000	11	11	2	1	1	5	4	25	20			
322	323	1000	11	11	2	1	1	4	4	40	80	336		
323	336	11400	24	12	6	2	1	6	4	40	25	345		
323	324	1000	11	11	2	1	1	1	4	25	75	300		
324	300	1000	22	11	2	1	1	6	1	40	100		408	
324	280	1000	22	11	2	1	1	6	1	40	10	276		
325	326	3000	11	11	2	1	1	1	4	25	5	329		
325	327	1800	22	11	6	2	1	5	4	40	95	331		
326	329	1800	24	12	6	2	1	6	4	50	100	339		410
327	331	3000	22	11	6	2	1	5	4	40	100		370	
327	326	1000	11	11	2	1	1	1	4	25	50	329		
328	842	1000	11	11	2	1	1	5	4	25	20			
328	331	2700	24	12	6	2	1	8	4	50	80	327	370	

West Bay/Rhode Island Network Link Card Files

329	410	1000	11	11	2	1	1	1	4	25	75	411
329	339	6900	24	12	6	2	1	6	4	50	25	341
410	41111250	48	12		6	4	1	8	2	50	100	412
330	27812000	48	12		6	4	1	8	2	55	75	302
331	370	9000	22	11	6	2	1	5	2	40	50	386
331	327	2400	22	11	6	2	1	5	2	50	100	325
332	328	3000	11	11	2	1	1	5	2	50	100	326
332	376	7000	11	11	2	1	1	5	2	50	100	377
333	324	3000	11	11	2	1	1	5	2	25	100	280
334	309	6000	24	12	6	2	1	8	4	55	100	311
335	337	3000	22	11	6	2	1	1	2	40	50	338
336	345	9600	11	11	2	1	1	5	3	35	100	346
337	338	2700	24	12	6	2	1	6	2	45	100	340
338	340	1000	24	12	6	2	1	6	2	45	100	344
339	341	1500	24	12	6	2	1	6	2	45	100	354
340	341	1000	11	11	2	1	1	2	25		100	354
341	354	2700	24	12	6	2	1	6	2	50	100	433
344	353	7500	22	11	2	2	1	6	3	40	100	386
344	340	3600	24	12	6	2	1	6	2	50	25	341
340	344	3600	24	12	6	2	1	6	2	50	75	353
344	345	6000	22	11	2	2	1	5	2	35	75	346
345	344	6000	22	11	2	2	1	5	2	35	100	353
346	347	5000	22	11	2	2	1	5	2	35	80	348
335	336	1000	11	11	2	1	1	1	2	25	50	345
315	317	5000	22	11	2	2	1	6	3	40	50	318
345	346	5250	22	11	2	2	1	5	2	35	100	347
346	845	3000	11	11	2	1	1	5	3	35	20	
346	345	5250	22	11	2	2	1	5	2	35	80	344
347	348	3000	22	11	2	2	1	5	2	35	100	349
347	346	5000	22	11	2	2	1	5	2	35	100	345
348	349	6750	22	11	2	2	1	5	2	35	100	350
349	348	6750	22	11	2	2	1	5	2	35	80	347
348	347	3000	22	11	2	2	1	5	2	35	100	346
349	351	1000	11	11	2	1	1	6	4	25	50	355
349	434	1000	11	11	2	1	1	6	4	25	20	435
349	350	13500	22	11	2	2	1	5	2	35	50	047
350	349	13500	22	11	2	2	1	5	2	35	80	348
350	834	1000	11	11	2	1	1	5	4	35	15	
350	04728500	12	12		6	1	1	7	4	40	85	048
353	846	8250	11	11	2	1	1	5	3	35	20	046
353	344	7500	22	11	2	2	1	6	3	40	80	340
353	386	6750	22	11	2	2	1	6	3	40	80	358
354	433	1500	11	11	2	1	1	1	3	25	100	434
351	35512000	24	12		6	2	1	8	4	55	100	357
355	35712000	24	12		6	2	1	8	4	55	100	320
357	32012000	24	12		6	2	1	8	4	55	100	334
320	334	4500	24	12	6	2	1	8	4	55	100	309
358	850	1000	11	11	2	1	1	4	1	30	20	
238	23311100	22	11		6	2	1	5	4	50	100	229
370	386	7500	22	11	2	2	1	5	1	40	20	358
370	371	1000	11	11	2	1	1	1	1	25	80	843
370	331	9000	22	11	6	2	1	6	2	40	100	327
371	372	2700	11	11	2	1	1	1	1	25	80	374
372	374	1000	22	11	2	2	1	1	1	40	50	389
412	413	9750	48	12	6	4	1	8	1	55	100	414
374	375	1000	11	11	2	1	1	1	1	25	100	330
375	33011250	48	12		6	4	1	8	2	55	100	278
411	412	1200	24	12	6	2	1	8	1	55	100	413
376	332	6000	24	12	6	2	1	6	2	50	100	328
376	377	1800	11	11	2	1	1	5	2	45	100	378
377	378	2100	11	11	2	1	1	5	2	45	100	379
378	379	5400	24	12	6	2	1	6	2	50	100	413
379	851	2400	11	11	2	1	1	5	2	25	20	
379	413	1000	11	11	2	1	1	1	4	25	80	414
413	414	5250	48	12	6	4	1	8	2	55	100	415
414	382	2100	12	12	2	1	1	8	1	50	20	397
414	415	1500	48	12	6	4	1	8	1	55	80	417
383	381	1500	48	12	6	4	1	8	1	55	100	380
382	397	2400	36	12	6	3	1	8	1	50	10	871
382	415	1800	12	12	2	1	1	8	1	50	80	417
383	87025500	48	12		6	4	1	1	4	50	100	
359	38325500	48	12		6	4	1	8	2	55	100	381
416	872	1000	48	12	6	4	1	8	4	55	100	
381	380	5250	48	12	6	4	1	8	2	55	100	373
380	373	9000	48	12	6	4	1	8	2	55	100	374

West Bay/Rhode Island Network Link Card Files

373	375	1200	48	12	6	4	1	8	2	55	90	330	
373	374	1000	11	11	2	1	1	1	2	25	10	389	
387	398	1000	24	12	6	2	1	6	1	45	100	390	852
389	37413500	24	12		6	2	1	6	1	50	100		375
389	391	2700	24	12	6	2	1	8	1	55	100	056	
390	06115900	24	12		6	2	1	6	2	55	20	059	
391	05615600	24	12		6	2	1	6	2	55	100	057	
389	05618000	24	12		6	2	1	8	4	55	100		436
392	397	3600	22	11	2	2	1	4	1	40	95	871	
392	854	3000	11	11	2	1	1	5	1	30	05		
358	392	9000	22	11	2	2	1	5	1	40	100	226	394
392	394	5250	22	11	2	2	1	5	3	40	35	395	855
393	853	3750	11	11	2	1	1	5	1	30	05		
393	870	9000	22	11	2	2	1	5	1	40	95		
393	226	1500	22	11	2	2	1	5	1	40	95	392	
394	392	5250	22	11	2	2	1	5	3	40	100	397	854
394	855	1000	11	11	2	1	1	5	4	30	20		
394	395	3900	22	11	2	2	1	5	3	40	80	396	857
395	394	3900	22	11	2	2	1	5	3	40	100	392	855
395	857	4500	11	11	2	1	1	5	4	30	20		
395	396	5250	22	11	2	2	1	5	3	40	80	073	856
396	856	3000	11	11	2	1	1	5	4	30	20		
396	07315000	22	11		2	2	1	5	4	40	80	075	440
396	395	3000	22	11	2	2	1	5	4	40	80	394	857
397	871	6000	36	12	6	3	1	8	1	50	100		
398	852	1000	11	11	2	1	1	5	1	10	20		
398	390	6750	24	12	6	2	1	6	1	45	80	061	391
390	398	6750	24	12	6	2	1	6	1	45	80		852
390	391	1000	11	11	2	1	1	5	1	25	80		056
386	358	2000	22	11	2	2	1	5	1	40	50	392	850
358	386	2000	22	11	2	2	1	5	1	40	80	370	353
386	353	6750	11	11	2	1	1	5	1	30	10	344	846
386	370	7500	22	11	6	2	1	5	1	40	90	331	
374	38914000	22	11		2	2	1	1	1	40	100		056
372	412	1000	11	11	2	1	1	1	1	25	50		413
371	843	500	11	11	2	1	1	5	1	25	20		
054	056	1000	11	11	2	1	1	1	4	25	100	389	
226	870	1000	22	11	2	2	1	7	1	50	1		
337	325	1500	24	12	6	2	1	7	2	50	50	275	
325	275	1500	24	12	6	2	1	5	2	40	100	276	
280	281	5250	22	11	6	2	1	5	3	40	4		266
281	266	9000	22	11	6	2	1	5	3	40	95	265	
253	241	6000	22	11	6	2	1	5	3	40	100	238	826
241	238	6500	22	11	6	2	1	5	4	40	90	233	
233	229	3000	22	11	6	2	1	7	4	40	100	227	
229	227	9000	22	11	6	2	1	5	4	50	100	222	
227	222	4500	22	11	6	2	1	7	4	40	100	224	
222	224	1500	22	11	6	2	1	8	4	50	50	450	
224	45012000	22	11		6	2	1	8	4	50	100	451	180
463	464	6000	22	11	6	2	1	8	4	50	100	465	
238	241	6500	22	11	6	2	1	5	4	40	85	253	
266	281	9000	22	11	6	2	1	5	3	40	100		280
327	325	1000	22	11	6	2	1	7	3	40	50	275	
392	226	1500	22	11	6	2	1	7	3	40	100	393	
392	358	9000	22	11	6	2	1	7	3	40	100	386	
382	381	1500	22	11	2	2	1	4	3	35	10	380	
383	382	1500	22	11	2	2	1	4	3	35	100	397	
397	392	6000	22	11	2	2	1	5	3	40	100	394	
397	382	6000	36	12	6	3	1	8	1	50	100		415
398	387	1500	24	12	6	2	1	6	1	45	90	382	
387	382	1500	24	12	6	2	1	8	4	55	100	397	
226	392	1500	22	11	6	2	1	5	1	40	99	358	
026	405	6000	24	12	2	2	1	4	2	40	100	406	
027	407	6000	24	12	2	2	1	4	2	40	100	408	
028	408	6000	24	12	2	2	1	4	2	40	100	409	
029	409	6000	24	12	2	2	1	4	2	40	100	410	
415	41712000	48	12		6	4	1	4	2	55	100	416	885
417	41612000	48	12		6	4	1	4	2	55	70	872	
417	885	3000	24	12	2	2	1	4	2	45	30		
430	431	3000	24	12	6	2	1	8	4	55	80	432	891
431	43212000	24	12		6	2	1	8	4	55	80	433	
432	433	1500	24	12	6	2	1	8	4	55	100	434	
433	43413500	24	12		6	2	1	8	4	55	100	435	349
434	43510500	24	12		6	2	1	8	4	55	96	436	056
434	349	1000	11	11	2	1	1	1	4	25	4		350

West Bay/Rhode Island Network Link Card Files

435	436	3000	24	12	6	2	1	8	4	55	100	437		
436	437	1500	24	12	6	2	1	8	4	55	100	438	061	
437	061	1000	11	11	2	1	1	1	4	25	15	390		
437	438	1500	24	12	6	2	1	8	4	55	85	439		
438	439	15000	24	12	6	2	1	8	4	55	100	440		
439	440	1000	24	12	6	2	1	8	4	55	90	441	075	
439	073	1000	11	11	2	1	1	1	4	25	10	396		
440	441	113500	24	12	6	2	1	8	4	55	85	442	881	088
440	075	1000	11	11	2	1	1	5	1	25	15	044		
441	881	1000	11	11	2	1	1	5	1	25	40			
441	442	1000	24	12	6	2	1	8	4	55	40	443		
441	088	1000	11	11	2	1	1	5	1	25	10			
442	443	15000	24	12	6	2	1	8	4	55	100	444	882	
443	882	1000	11	11	2	1	1	5	1	25	40			
443	444	1000	24	12	6	2	1	8	3	55	100	860		
444	860	42000	24	12	6	2	1	8	3	55	100			
278	887	3000	24	12	6	2	1	8	3	55	30			
330	886	3000	24	12	6	2	1	8	3	55	20			
309	888	3000	24	12	6	2	1	8	3	55	25			
257	889	3000	24	12	6	2	1	8	3	55	46			
030	386	8300	22	11	2	2	1	5	1	40	100	370		
450	18018510	11	11	2	1	1	4	4	40		5	181		
167	458	9000	10	10	2	1	1	7	4	50	100	459		
463	13910500	11	11	2	1	1	7	4	35		30	133		
141	462	4800	10	10	2	1	1	7	4	50	100		463	
466	13110830	11	11	2	1	1	4	4	50		40	132	115	
250	245	5250	24	12	6	2	1	8	4	50	100	244		
245	244	3000	24	12	6	2	1	8	4	50	100	243		
244	243	1000	24	12	6	2	1	8	4	50	100	234		
243	234	1000	24	12	6	2	1	8	4	50	100	228	823	
129	464	6000	24	12	6	2	1	5	4	30	100		465	
456	160	1000	11	11	4	1	1	7	4	35	35	184		
430	890	3000	24	12	6	2	1	8	2	55	20			
431	891	3000	24	12	6	2	1	8	2	55	25			
452	175	3000	24	12	6	2	1	5	2	35	25	176		
227	895	3000	24	12	6	2	1	5	2	35	75			
454	897	3000	24	12	6	2	1	5	2	40	20			
093	090	3000	36	12	6	3	1	8	4	55	100	397		
99999														

POPOTP1 Rhode Island Strong Storm Off-Peak Traffic, Rapid Response

&files

```

filename(1)='strong_w.dat'
filename(2)='mnsst_w.dat'
filename(3)='backgr_w.dat'
outfile='popout1.dat'
output='popout1.prt'
/

```

&poptype

```

atype(1)='vulnerable'
atype(2)='nonvul+mob'
atype(3)='backgrd'
/

```

&fraction

```

frc(1,1)=0.15 frc(1,2)=0.10 frc(1,3)=0.50 frc(1,4)=0.25
frc(2,1)=0.15 frc(2,2)=0.10 frc(2,3)=0.50 frc(2,4)=0.25
frc(3,1)=0.09 frc(3,2)=0.09 frc(3,3)=0.06 frc(3,4)=0.02
/

```

&timeint

```

int1(2)=270.0 int1(2)=390.0 int1(3)=400.0 int1(4)=510.0 int1(5)=630.0
int2(1)=0.0 int2(2)=75.0 int2(3)=150.0 int2(4)=225.0 int2(5)=300.0
/

```

```

194,155,331,129,467,092,030,370,274,077,086,359,383,381,078,079,083,084,387,085,076,057,081,082,0
90,091,098,099,126,185,167,209,266,281,280,276,275,325,331,151,250,235,397,169,026,027,028,029,24
2,250,072

```

POPOPT2 Rhode Island Strong Storm Off-Peak Traffic, Moderate Response

&files

```

filename(1)='strong_w.dat'
filename(2)='mnsst_w.dat'
filename(3)='backgr_w.dat'
outfile='popout2.dat'
output='popout2.prt'
/

```

&poptype

```

atype(1)='vulnerable'
atype(2)='nonvul+mob'
atype(3)='backgrd'
/

```

&fraction

```

frc(1,1)=0.15 frc(1,2)=0.10 frc(1,3)=0.50 frc(1,4)=0.25
frc(2,1)=0.15 frc(2,2)=0.10 frc(2,3)=0.50 frc(2,4)=0.25
frc(3,1)=0.09 frc(3,2)=0.09 frc(3,3)=0.06 frc(3,4)=0.02
/

```

&timeint

```

int1(2)=120.0 int1(2)=300.0 int1(3)=360.0 int1(4)=480.0 int1(5)=660.0
int2(1)=0.0 int2(2)=75.0 int2(3)=150.0 int2(4)=225.0 int2(5)=300.0
/

```

```

194,155,331,129,467,092,030,370,274,077,086,359,383,381,078,079,083,084,387,085,076,057,081,082,0
90,091,098,099,126,185,167,209,266,281,280,276,275,325,331,151,250,235,397,169,026,027,028,029,24
2,250,072

```

POPOPT3 Rhode Island Strong Storm Off-Peak Traffic, Slow Response

```
&files
filename(1)='strong_w.dat'
filename(2)='mnsst_w.dat'
filename(3)='backgr_w.dat'
outfile='popout3.dat'
outprint='popout3.prt'
/
&poptype
atype(1)='vulnerable'
atype(2)='nonvul+mob'
atype(3)='backgrnd'
/
&fraction
frc(1,1)=0.15 frc(1,2)=0.10 frc(1,3)=0.50 frc(1,4)=0.25
frc(2,1)=0.15 frc(2,2)=0.10 frc(2,3)=0.50 frc(2,4)=0.25
frc(3,1)=0.09 frc(3,2)=0.09 frc(3,3)=0.06 frc(3,4)=0.02
/
&timeint
int1(2)=0.0 int1(2)=240.0 int1(3)=320.0 int1(4)=480.0 int1(5)=720.0
int2(1)=0.0 int2(2)=75.0 int2(3)=150.0 int2(4)=225.0 int2(5)=300.0
/
194,155,331,129,467,092,030,370,274,077,086,359,383,381,078,079,083,084,387,085,076,057,081,082,0
90,091,098,099,126,185,167,209,266,281,280,276,275,325,331,151,250,235,397,169,026,027,028,029,24
2,250,072
```

POPOPT4 Rhode Island Strong Storm Mid-Peak Traffic, Rapid Response

```
&files
filename(1)='strong_w.dat'
filename(2)='mnsst_w.dat'
filename(3)='backgr_w.dat'
outfile='popout4.dat'
outprint='popout4.prt'
/
&poptype
atype(1)='vulnerable'
atype(2)='nonvul+mob'
atype(3)='backgrnd'
/
&fraction
frc(1,1)=0.15 frc(1,2)=0.10 frc(1,3)=0.50 frc(1,4)=0.25
frc(2,1)=0.15 frc(2,2)=0.10 frc(2,3)=0.50 frc(2,4)=0.25
frc(3,1)=0.05 frc(3,2)=0.34 frc(3,3)=0.13 frc(3,4)=0.10
/
&timeint
int1(2)=840.0 int1(2)=960.0 int1(3)=1000.0 int1(4)=1080.0 int1(5)=1200.0
int2(1)=0.0 int2(2)=240.0 int2(3)=540.0 int2(4)=690.0 int2(5)=840.0
/
194,155,331,129,467,092,030,370,274,077,086,359,383,381,078,079,083,084,387,085,076,057,081,082,0
90,091,098,099,126,185,167,209,266,281,280,276,275,325,331,151,250,235,397,169,026,027,028,029,24
2,250,072
```

POPOPT5 Rhode Island Strong Storm Mid-Peak Traffic, Moderate Response

```
&files
filename(1)='strong_w.dat'
filename(2)='mnsst_w.dat'
filename(3)='backgr_w.dat'
outfile='popout5.dat'
output='popout5.prt'
/
&potype
atype(1)='vulnerable'
atype(2)='nonvul+mob'
atype(3)='background'
/
&fraction
frc(1,1)=0.15 frc(1,2)=0.10 frc(1,3)=0.50 frc(1,4)=0.25
frc(2,1)=0.15 frc(2,2)=0.10 frc(2,3)=0.50 frc(2,4)=0.25
frc(3,1)=0.05 frc(3,2)=0.34 frc(3,3)=0.13 frc(3,4)=0.10
/
&timeint
int1(2)=660.0 int1(2)=840.0 int1(3)=900.0 int1(4)=1020.0 int1(5)=1200.0
int2(1)=0.0 int2(2)=240.0 int2(3)=540.0 int2(4)=690.0 int2(5)=840.0
/
194,155,331,129,467,092,030,370,274,077,086,359,383,381,078,079,083,084,387,085,076,057,081,082,0
90,091,098,099,126,185,167,209,266,281,280,276,275,325,331,151,250,235,397,169,026,027,028,029,24
2,250,072
```

POPOPT6 Rhode Island Strong Storm Mid-Peak Traffic, Slow Response

```
&files
filename(1)='strong_w.dat'
filename(2)='mnsst_w.dat'
filename(3)='backgr_w.dat'
outfile='popout6.dat'
output='popout6.prt'
/
&potype
atype(1)='vulnerable'
atype(2)='nonvul+mob'
atype(3)='background'
/
&fraction
frc(1,1)=0.15 frc(1,2)=0.10 frc(1,3)=0.50 frc(1,4)=0.25
frc(2,1)=0.15 frc(2,2)=0.10 frc(2,3)=0.50 frc(2,4)=0.25
frc(3,1)=0.05 frc(3,2)=0.34 frc(3,3)=0.13 frc(3,4)=0.10
/
&timeint
int1(2)=480.0 int1(2)=720.0 int1(3)=800.0 int1(4)=960.0 int1(5)=1200.0
int2(1)=0.0 int2(2)=240.0 int2(3)=540.0 int2(4)=690.0 int2(5)=840.0
/
194,155,331,129,467,092,030,370,274,077,086,359,383,381,078,079,083,084,387,085,076,057,081,082,0
90,091,098,099,126,185,167,209,266,281,280,276,275,325,331,151,250,235,397,169,026,027,028,029,24
2,250,072
```

POPOPT7 Rhode Island Strong Storm Peak Traffic, Rapid Response

&files

```
filename(1)='strong_w.dat'  
filename(2)='mnsst_w.dat'  
filename(3)='backgr_w.dat'  
outfile='popout7.dat'  
outprint='popout7.prt'  
/
```

&poptype

```
atype(1)='vulnerable'  
atype(2)='nonvul+mob'  
atype(3)='background'  
/
```

&fraction

```
frc(1,1)=0.15 frc(1,2)=0.10 frc(1,3)=0.50 frc(1,4)=0.25  
frc(2,1)=0.15 frc(2,2)=0.10 frc(2,3)=0.50 frc(2,4)=0.25  
frc(3,1)=0.05 frc(3,2)=0.35 frc(3,3)=0.31 frc(3,4)=0.12  
/
```

&timeint

```
int1(2)=870.0 int1(2)=990.0 int1(3)=1030.0 int1(4)=1110.0 int1(5)=1230.0  
int2(1)=0.0 int2(2)=240.0 int2(3)=540.0 int2(4)=720.0 int2(5)=870.0  
/
```

```
194,155,331,129,467,092,030,370,274,077,086,359,383,381,078,079,083,084,387,085,076,057,081,082,0  
90,091,098,099,126,185,167,209,266,281,280,276,275,325,331,151,250,235,397,169,026,027,028,029,24  
2,250,072
```

POPOPT8 Rhode Island Strong Storm Peak Traffic, Moderate Response

&files

```
filename(1)='strong_w.dat'  
filename(2)='mnsst_w.dat'  
filename(3)='backgr_w.dat'  
outfile='popout8.dat'  
outprint='popout8.prt'  
/
```

&poptype

```
atype(1)='vulnerable'  
atype(2)='nonvul+mob'  
atype(3)='background'  
/
```

&fraction

```
frc(1,1)=0.15 frc(1,2)=0.10 frc(1,3)=0.50 frc(1,4)=0.25  
frc(2,1)=0.15 frc(2,2)=0.10 frc(2,3)=0.50 frc(2,4)=0.25  
frc(3,1)=0.05 frc(3,2)=0.35 frc(3,3)=0.31 frc(3,4)=0.12  
/
```

&timeint

```
int1(2)=690.0 int1(2)=870.0 int1(3)=930.0 int1(4)=1050.0 int1(5)=1230.0  
int2(1)=0.0 int2(2)=240.0 int2(3)=540.0 int2(4)=720.0 int2(5)=870.0  
/
```

```
194,155,331,129,467,092,030,370,274,077,086,359,383,381,078,079,083,084,387,085,076,057,081,082,0  
90,091,098,099,126,185,167,209,266,281,280,276,275,325,331,151,250,235,397,169,026,027,028,029,24  
2,250,072
```

POPOPT9 Rhode Island Strong Storm Peak Traffic, Slow Response

```
&files
filename(1)='strong_w.dat'
filename(2)='mnsst_w.dat'
filename(3)='backgr_w.dat'
outfile='popout9.dat'
output='popout9.prt'
/
&poptype
atype(1)='vulnerable'
atype(2)='nonvul+mob'
atype(3)='background'
/
&fraction
frc(1,1)=0.15 frc(1,2)=0.10 frc(1,3)=0.50 frc(1,4)=0.25
frc(2,1)=0.15 frc(2,2)=0.10 frc(2,3)=0.50 frc(2,4)=0.25
frc(3,1)=0.05 frc(3,2)=0.35 frc(3,3)=0.31 frc(3,4)=0.12
/
&timeint
int1(2)=510.0 int1(2)=750.0 int1(3)=830.0 int1(4)=990.0 int1(5)=1230.0
int2(1)=0.0 int2(2)=240.0 int2(3)=540.0 int2(4)=720.0 int2(5)=870.0
/
194,155,331,129,467,092,030,370,274,077,086,359,383,381,078,079,083,084,387,085,076,057,081,082,0
90,091,098,099,126,185,167,209,266,281,280,276,275,325,331,151,250,235,397,169,026,027,028,029,24
2,250,072
```

POPOPT10 Rhode Island Weak Storm Off-Peak Traffic, Rapid Response

```
&files
filename(1)='weak_w.dat'
filename(2)='mnswk_w.dat'
filename(3)='backgr_w.dat'
outfile='popout10.dat'
output='popout10.prt'
/
&poptype
atype(1)='vulnerable'
atype(2)='nonvul+mob'
atype(3)='backgrd'
/
&fraction
frc(1,1)=0.15 frc(1,2)=0.10 frc(1,3)=0.50 frc(1,4)=0.25
frc(2,1)=0.15 frc(2,2)=0.10 frc(2,3)=0.50 frc(2,4)=0.25
frc(3,1)=0.09 frc(3,2)=0.09 frc(3,3)=0.06 frc(3,4)=0.02
/
&timeint
int1(2)=270.0 int1(2)=390.0 int1(3)=430.0 int1(4)=510.0 int1(5)=630.0
int2(1)=0.0 int2(2)=75.0 int2(3)=150.0 int2(4)=225.0 int2(5)=300.0
/
194,155,331,129,467,092,030,370,274,077,086,359,383,381,078,079,083,084,387,085,076,057,081,082,0
90,091,098,099,126,185,167,209,266,281,280,276,275,325,331,151,250,235,397,169,026,027,028,029,24
2,250,072
```

POPOPT11 Rhode Island Weak Storm Off-Peak Traffic, Moderate Response

&files

```
filename(1)='weak_w.dat'  
filename(2)='mnswk_w.dat'  
filename(3)='backgr_w.dat'  
outfile='popout11.dat'  
outprint='popout11.prt'  
/
```

&poptype

```
atype(1)='vulnerable'  
atype(2)='nonvul+mob'  
atype(3)='backgrd'  
/
```

&fraction

```
frc(1,1)=0.15 frc(1,2)=0.10 frc(1,3)=0.50 frc(1,4)=0.25  
frc(2,1)=0.15 frc(2,2)=0.10 frc(2,3)=0.50 frc(2,4)=0.25  
frc(3,1)=0.09 frc(3,2)=0.09 frc(3,3)=0.06 frc(3,4)=0.02  
/
```

&timeint

```
int1(2)=120.0 int1(2)=300.0 int1(3)=360.0 int1(4)=480.0 int1(5)=660.0  
int2(1)=0.0 int2(2)=75.0 int2(3)=150.0 int2(4)=225.0 int2(5)=300.0  
/
```

```
194,155,331,129,467,092,030,370,274,077,086,359,383,381,078,079,083,084,387,085,076,057,081,082,0  
90,091,098,099,126,185,167,209,266,281,280,276,275,325,331,151,250,235,397,169,026,027,028,029,24  
2,250,072
```

POPOPT12 Rhode Island Weak Storm Off-Peak Traffic, Slow Response

&files

```
filename(1)='weak_w.dat'  
filename(2)='mnswk_w.dat'  
filename(3)='backgr_w.dat'  
outfile='popout12.dat'  
outprint='popout12.prt'  
/
```

&poptype

```
atype(1)='vulnerable'  
atype(2)='nonvul+mob'  
atype(3)='backgrnd'  
/
```

&fraction

```
frc(1,1)=0.15 frc(1,2)=0.10 frc(1,3)=0.50 frc(1,4)=0.25  
frc(2,1)=0.15 frc(2,2)=0.10 frc(2,3)=0.50 frc(2,4)=0.25  
frc(3,1)=0.09 frc(3,2)=0.09 frc(3,3)=0.06 frc(3,4)=0.02  
/
```

&timeint

```
int1(2)=0.0 int1(2)=240.0 int1(3)=320.0 int1(4)=480.0 int1(5)=720.0  
int2(1)=0.0 int2(2)=75.0 int2(3)=150.0 int2(4)=225.0 int2(5)=300.0  
/
```

```
194,155,331,129,467,092,030,370,274,077,086,359,383,381,078,079,083,084,387,085,076,057,081,082,0  
90,091,098,099,126,185,167,209,266,281,280,276,275,325,331,151,250,235,397,169,026,027,028,029,24  
2,250,072
```

POPOPT13 Rhode Island Weak Storm Mid-Peak Traffic, Rapid Response

```
&files
filename(1)='weak_w.dat'
filename(2)='mnswk_w.dat'
filename(3)='backgr_w.dat'
outfile='popout13.dat'
output='popout13.prt'
/
&poptype
atype(1)='vulnerable'
atype(2)='nonvul+mob'
atype(3)='backgrnd'
/
&fraction
frc(1,1)=0.15 frc(1,2)=0.10 frc(1,3)=0.50 frc(1,4)=0.25
frc(2,1)=0.15 frc(2,2)=0.10 frc(2,3)=0.50 frc(2,4)=0.25
frc(3,1)=0.05 frc(3,2)=0.34 frc(3,3)=0.13 frc(3,4)=0.10
/
&timeint
int1(2)=840.0 int1(2)=960.0 int1(3)=1000.0 int1(4)=1080.0 int1(4)=1200.0
int2(1)=0.0 int2(2)=240.0 int2(3)=540.0 int2(4)=690.0 int2(5)=840.0
/
194,155,331,129,467,092,030,370,274,077,086,359,383,381,078,079,083,084,387,085,076,057,081,082,0
90,091,098,099,126,185,167,209,266,281,280,276,275,325,331,151,250,235,397,169,026,027,028,029,24
2,250,072
```

POPOPT14 Rhode Island Weak Storm Mid-Peak Traffic, Moderate Response

```
&files
filename(1)='weak_w.dat'
filename(2)='mnswk_w.dat'
filename(3)='backgr_w.dat'
outfile='popout14.dat'
output='popout14.prt'
/
&poptype
atype(1)='vulnerable'
atype(2)='nonvul+mob'
atype(3)='backgrnd'
/
&fraction
frc(1,1)=0.15 frc(1,2)=0.10 frc(1,3)=0.50 frc(1,4)=0.25
frc(2,1)=0.15 frc(2,2)=0.10 frc(2,3)=0.50 frc(2,4)=0.25
frc(3,1)=0.05 frc(3,2)=0.34 frc(3,3)=0.13 frc(3,4)=0.10
/
&timeint
int1(2)=660.0 int1(2)=840.0 int1(3)=900.0 int1(4)=1020.0 int1(5)=1200.0
int2(1)=0.0 int2(2)=240.0 int2(3)=540.0 int2(4)=690.0 int2(5)=840.0
/
194,155,331,129,467,092,030,370,274,077,086,359,383,381,078,079,083,084,387,085,076,057,081,082,0
90,091,098,099,126,185,167,209,266,281,280,276,275,325,331,151,250,235,397,169,026,027,028,029,24
2,250,072
```

POPOPT15 Rhode Island Weak Storm Mid-Peak Traffic, Slow Response

```
&files
filename(1)='weak_w.dat'
filename(2)='mnswk_w.dat'
filename(3)='backgr_w.dat'
outfile='popout15.dat'
outputprt='popout15.prt'
/
&poptype
atype(1)='vulnerable'
atype(2)='nonvul+mob'
atype(3)='background'
/
&fraction
frc(1,1)=0.15 frc(1,2)=0.10 frc(1,3)=0.50 frc(1,4)=0.25
frc(2,1)=0.15 frc(2,2)=0.10 frc(2,3)=0.50 frc(2,4)=0.25
frc(3,1)=0.05 frc(3,2)=0.34 frc(3,3)=0.13 frc(3,4)=0.10
/
&timeint
int1(2)=480.0 int1(2)=720.0 int1(3)=800.0 int1(4)=960.0 int1(5)=1200.0
int2(1)=0.0 int2(2)=240.0 int2(3)=540.0 int2(4)=690.0 int2(5)=840.0
/
194,155,331,129,467,092,030,370,274,077,086,359,383,381,078,079,083,084,387,085,076,057,081,082,0
90,091,098,099,126,185,167,209,266,281,280,276,275,325,331,151,250,235,397,169,026,027,028,029,24
2,250,072
```

POPOPT16 Rhode Island Weak Storm Peak Traffic, Rapid Response

```
&files
filename(1)='weak_w.dat'
filename(2)='mnswk_w.dat'
filename(3)='backgr_w.dat'
outfile='popout16.dat'
outputprt='popout16.prt'
/
&poptype
atype(1)='vulnerable'
atype(2)='nonvul+mob'
atype(3)='background'
/
&fraction
frc(1,1)=0.15 frc(1,2)=0.10 frc(1,3)=0.50 frc(1,4)=0.25
frc(2,1)=0.15 frc(2,2)=0.10 frc(2,3)=0.50 frc(2,4)=0.25
frc(3,1)=0.05 frc(3,2)=0.35 frc(3,3)=0.31 frc(3,4)=0.12
/
&timeint
int1(2)=870.0 int1(2)=990.0 int1(3)=1030.0 int1(4)=1110.0 int1(5)=1230.0
int2(1)=0.0 int2(2)=240.0 int2(3)=540.0 int2(4)=720.0 int2(5)=870.0
/
194,155,331,129,467,092,030,370,274,077,086,359,383,381,078,079,083,084,387,085,076,057,081,082,0
90,091,098,099,126,185,167,209,266,281,280,276,275,325,331,151,250,235,397,169,026,027,028,029,24
2,250,072
```

POPOPT17 Rhode Island Weak Storm Peak Traffic, Moderate Response

```
&files
filename(1)='weak_w.dat'
filename(2)='mnswk_w.dat'
filename(3)='backgr_w.dat'
outfile='popout17.dat'
outputprt='popout17.prt'
/
&poptype
atype(1)='vulnerable'
atype(2)='nonvul+mob'
atype(3)='background'
/
&fraction
frc(1,1)=0.15 frc(1,2)=0.10 frc(1,3)=0.50 frc(1,4)=0.25
frc(2,1)=0.15 frc(2,2)=0.10 frc(2,3)=0.50 frc(2,4)=0.25
frc(3,1)=0.05 frc(3,2)=0.35 frc(3,3)=0.31 frc(3,4)=0.12
/
&timeint
int1(2)=690.0 int1(2)=870.0 int1(3)=930.0 int1(4)=1050.0 int1(5)=1230.0
int2(1)=0.0 int2(2)=240.0 int2(3)=540.0 int2(4)=720.0 int2(5)=870.0
/
194,155,331,129,467,092,030,370,274,077,086,359,383,381,078,079,083,084,387,085,076,057,081,082,0
90,091,098,099,126,185,167,209,266,281,280,276,275,325,331,151,250,235,397,169,026,027,028,029,24
2,250,072
```

POPOPT18 Rhode Island Weak Storm Peak Traffic, Slow Response

```
&files
filename(1)='weak_w.dat'
filename(2)='mnswk_w.dat'
filename(3)='backgr_w.dat'
outfile='popout18.dat'
outputprt='popout18.prt'
/
&poptype
atype(1)='vulnerable'
atype(2)='nonvul+mob'
atype(3)='background'
/
&fraction
frc(1,1)=0.15 frc(1,2)=0.10 frc(1,3)=0.50 frc(1,4)=0.25
frc(2,1)=0.15 frc(2,2)=0.10 frc(2,3)=0.50 frc(2,4)=0.25
frc(3,1)=0.05 frc(3,2)=0.35 frc(3,3)=0.31 frc(3,4)=0.12
/
&timeint
int1(2)=510.0 int1(2)=750.0 int1(3)=830.0 int1(4)=990.0 int1(5)=1230.0
int2(1)=0.0 int2(2)=240.0 int2(3)=540.0 int2(4)=720.0 int2(5)=870.0
/
194,155,331,129,467,092,030,370,274,077,086,359,383,381,078,079,083,084,387,085,076,057,081,082,0
90,091,098,099,126,185,167,209,266,281,280,276,275,325,331,151,250,235,397,169,026,027,028,029,24
2,250,072
```

West Bay/Rhode Island Network Population Files

Background Traffic

NR1ANB	3	2900	1.00	194	100
WE1NB	3	10300	1.00	155	100
WA1NB	3	4000	1.00	331	100
WE1SB	3	3500	1.00	129	100
WE1SB	3	3000	1.00	467	100
PW1SB	3	5000	1.00	092	100
WA1SB	3	10000	1.00	030	77 370 23
WAAPR	3	2500	1.00	274	100
HO95NB	3	17050	1.00	077	100
PW95SB	3	86000	1.00	086	55 359 10 383 10 381 25
BU102S	3	6300	1.00	078	100
NK2NB	3	10000	1.00	079	100
GL44EB	3	3500	1.00	083	100
SC6EB	3	1000	1.00	084	100
SC6WB	3	3600	1.00	387	100
SC14EB	3	1200	1.00	085	100
NA295S	3	17800	1.00	076	83 072 17
CR295S	3	5000	1.00	057	100
NS146S	3	6000	1.00	081	100
BU7SB	3	1	1.00	082	100
PR195W	3	30150	1.00	090	100
RI138E	3	5900	1.00	091	100
NR138W	3	8700	1.00	098	100
NK1SB	3	1	1.00	099	100
WEINB	3	10000	1.00	126	100
CHRT1B	3	4000	1.00	185	100
CHRT1B	3	2500	1.00	167	100
SKRT1B	3	7000	1.00	209	100
WART1B	3	4000	1.00	266	100
WART1B	3	4000	1.00	281	100
WART1B	3	4000	1.00	280	100
WART1B	3	4000	1.00	276	100
WART1B	3	8000	1.00	275	100
WART1B	3	4000	1.00	325	100
WART1B	3	4000	1.00	331	100
CH2SB	3	3300	1.00	151	100
EG4NB	3	35000	1.00	250	100
EGQP	3	5000	1.00	235	100
PR195W	3	20000	1.00	397	100
SKETL	3	1000	1.00	169	100
WA95NL	3	12000	1.00	026	100
WA95NL	3	15000	1.00	027	100
WA95NL	3	15000	1.00	028	100
WA95NL	3	15000	1.00	029	100
NK4NB	3	35000	1.00	242	50 250 50

Severe Storm Surge Vulnerable Population File

1	1	333	2.96	378	100
7	1	4	2.96	379	100
34	1	33	2.96	225	100
35	1	166	2.96	093	100
37	1	374	2.96	093	100
134	1	1133	2.05	294	50 377 50
135	1	368	2.05	378	100
136	1	409	2.05	371	100
138	1	94	2.05	330	100
139	1	47	2.05	330	100
149	1	5	2.26	101	100

Severe Storm Surge Vulnerable Population File (con't.)

Weak Storm Surge Vulnerable Population File

1	1	148	2.96	378	100			
7	1	2	2.96	379	100			
34	1	30	2.96	225	100			
35	1	147	2.96	093	100			
37	1	166	2.96	093	100			
134	1	952	2.05	294	50	377	50	
135	1	267	2.05	378	100			
136	1	259	2.05	371	100			
138	1	83	2.05	330	100			
139	1	42	2.05	330	100			
149	1	4	2.26	101	100			
152	1	2	2.26	101	100			

West Bay/Rhode Island Network Population Files

Weak Storm Surge Vulnerable Population File (con't.)

Severe Storm Mobile Home and Non-Surge Vulnerable Population File

WESTE	2	1170	1.90	107	20	131	20	113	20	132	20	127	20
CHARL	2	730	1.80	139	25	013	25	140	25	148	25		
S.KIN	2	1720	2.30	022	20	165	20	184	20	179	20	182	20
NARRA	2	550	1.73	198	20	199	20	200	20	204	20	207	20
N.KIN	2	1370	1.83	227	25	228	25	229	25	234	25		
E.GRE	2	650	1.85	244	25	246	25	247	25	403	25		
WARWI	2	3090	1.88	305	20	307	20	318	20	315	20	404	20
CRANS	2	3750	2.05	433	20	434	20	347	20	346	20	345	20
PROVI	2	8090	2.96	386	20	390	20	394	20	395	20	396	20
PAWTU	2	4440	2.26	392	50	416	50						

West Bay/Rhode Island Network Population Files

Weak Storm Mobile Home and Non-Surge Vulnerable Population File

WESTE	2	590	1.90	107	20	131	20	113	20	132	20	127	20
CHARL	2	490	1.80	139	25	013	25	140	25	148	25		
S.KIN	2	970	2.30	022	20	165	20	184	20	179	20	182	20
NARRA	2	230	1.73	198	20	199	20	200	20	204	20	207	20
N.KIN	2	870	1.83	227	25	228	25	229	25	234	25		
E.GRE	2	320	1.85	244	25	246	25	247	25	403	25		
WARWI	2	1360	1.88	305	20	307	20	318	20	315	20	404	20
CRANS	2	1530	2.05	433	20	434	20	347	20	346	20	345	20
PROVI	2	3290	2.96	386	20	390	20	394	20	395	20	396	20
PAWTU	2	2300	2.26	392	50	416	50						

ANNEX B:

EAST BAY/MASSACHUSETTS NETWORK COMPUTER INPUT FILES

East Bay Massachusetts Network Link Card Files

001	848	600	11	11	2	1	1	5	2	25	15	
070	00131150	24	12		6	2	1	8	2	55	100	100
100	001	2100	24	12	6	2	1	8	2	55	75	860
100	101	500	24	12	6	2	1	8	2	55	25	851
101	100	500	11	11	2	1	1	1	2	25	75	001
101	102	500	11	11	2	1	1	1	2	25	25	103
102	847	3600	11	11	2	1	1	5	2	25	20	
102	10312000	11	11		2	1	1	5	2	30	25	104
102	101	500	11	11	2	1	1	5	2	25	55	100
103	10212000	11	11		2	1	1	5	2	30	55	101
103	821	3000	11	11	2	1	1	5	2	25	02	
103	104	2700	11	11	2	1	1	5	2	30	25	105
104	103	3000	11	11	2	1	1	5	2	30	75	102
104	105	2700	11	11	2	1	1	5	2	30	25	133
105	106	5100	11	11	2	1	1	5	2	30	30	107
105	133	5400	11	11	2	1	1	5	2	30	30	131
106	105	5100	11	11	2	1	1	5	2	30	40	133
106	107	2100	11	11	2	1	1	5	2	30	40	108
106	822	300	11	11	2	1	1	5	2	25	15	
107	106	2100	11	11	2	1	1	5	2	30	50	105
107	108	2100	11	11	2	1	1	5	2	30	50	121
108	124	2250	22	11	2	2	1	5	2	30	30	127
108	121	2100	11	11	2	1	1	5	2	30	20	122
108	113	1800	22	11	2	2	1	5	2	30	30	112
108	107	2100	11	11	2	1	1	5	2	30	20	106
124	127	6900	22	11	4	2	1	6	2	40	40	128
124	108	2250	22	11	2	2	1	5	2	30	40	113
131	129	2250	11	11	2	1	1	5	2	30	15	128
129	128	2250	11	11	2	1	1	5	2	30	50	127
129	131	2250	11	11	2	1	1	1	4	25	20	133
130	129	1000	11	11	2	1	1	1	4	25	20	128
022	02312000	36	12		6	3	1	8	2	55	100	031
021	022	1000	36	12	6	3	1	8	2	55	90	023
021	131	1000	11	11	2	1	1	5	2	25	10	
130	132	1000	36	12	6	3	1	8	2	55	40	144
131	133	9000	11	11	2	1	1	5	2	30	05	105
131	022	1000	11	11	2	1	1	5	2	25	80	023
105	104	2700	11	11	2	1	1	5	2	30	40	103
106	133	5250	11	11	2	1	1	7	2	30	05	030
129	132	1000	11	11	2	1	1	1	2	25	30	
109	002	750	11	11	5	2	1	5	2	30	75	852
109	11512000	11	11		2	1	1	5	2	30	25	116
110	114	8250	36	12	6	3	1	8	2	55	100	125
002	112	3000	22	11	2	2	1	5	2	30	50	113
112	002	3000	22	11	2	2	1	5	2	30	50	852
112	113	1500	22	11	2	2	1	5	2	30	50	108
113	112	1500	22	11	2	2	1	5	2	30	40	002
113	108	1800	22	11	2	2	1	5	2	30	40	124
114	125	6000	36	12	6	3	1	8	2	55	50	130
031	850	6000	36	12	6	3	1	8	2	55	100	
115	116	3300	11	11	2	1	1	5	2	30	25	120
115	122	1800	11	11	2	1	1	5	2	30	75	121
116	115	3300	11	11	2	1	1	5	2	30	25	122
116	117	2700	11	11	2	1	1	5	2	30	75	
116	120	2100	11	11	2	1	1	5	2	30	100	
117	825	4500	11	11	2	1	1	5	2	25	02	
117	116	2700	11	11	2	1	1	5	2	30	80	115
118	120	5250	11	11	2	1	1	5	2	30	100	116
119	117	7000	11	11	2	1	1	5	2	30	100	825
120	824	1000	11	11	2	1	1	5	2	30	03	116

East Bay Massachusetts Network Link Card Files

120	116	2100	11	11	2	1	1	5	2	30	80	115	117	
121	108	1800	11	11	2	1	1	5	2	30	40	107	124	113
121	823	1000	11	11	2	1	1	5	2	25	20			
121	122	2700	11	11	2	1	1	5	2	30	40	115		
122	115	1800	11	11	2	1	1	5	2	25	30	116		
122	121	2700	11	11	2	1	1	5	2	25	30	108		823
122	123	4500	11	11	2	1	1	5	2	30	40	178		
123	126	4500	11	11	2	1	1	1	4	25	100	023		
124	023	2000	11	11	2	1	1	5	2	25	20	031		
023	031	6000	36	12	6	3	1	8	2	55	100	850		
125	13012000	36	12	6	3	1	8	2	55	80	132	129		
126	023	3900	11	11	2	1	1	1	4	25	30	031		
127	128	2100	22	11	2	2	1	5	2	30	50	141	129	
127	124	5400	22	11	2	2	1	5	2	30	50	108	023	
128	127	2100	22	11	2	2	1	5	2	30	40	124		
128	14112900	22	11	4	2	1	6	4	30		40	142		
132	14421000	36	12	6	3	1	8	2	55		100	147		
133	131	9000	11	11	2	1	1	5	2	30	10	129		
133	105	5400	11	11	2	1	1	5	2	30	10	104		106
133	03030000	12	12	6	1	1	7	4	50		40	039		849
133	106	5250	12	12	6	1	1	7	4	50	40	822	105	107
128	129	2000	12	12	6	1	1	7	4	40	20	131	132	
113	114	1000	11	11	2	1	1	1	2	25	20		125	
140	145	1000	11	11	4	1	1	4	2	35	10	146	147	
140	15215900	22	11	4	2	1	5	2	30		40	151	153	
140	142	3300	11	11	2	1	1	5	2	30	40	141		
141	12812900	22	11	2	2	1	5	2	30		50	127	129	
141	142	3750	22	11	2	2	1	5	2	30	50	140		
142	141	3750	22	11	2	2	1	5	2	30	50	128		
142	140	3300	22	11	2	2	1	5	2	30	50	152	145	
144	147	1000	36	12	6	3	1	8	4	55	50	150		
145	146	1000	11	11	4	1	1	4	2	35	50	020		
146	020	1000	11	11	2	1	1	1	2	25	100	021		
145	147	1000	11	11	2	1	1	1	2	25	50	150		
020	02121000	36	12	6	3	1	8	2	55		100	022	131	
147	150	1000	36	12	6	3	1	8	2	55	50	153		
019	020	1000	36	12	6	3	1	8	2	55	90	021		
018	01914400	36	12	6	3	1	8	2	55		100	020		
150	153	1000	36	12	6	3	1	8	2	55	50	156		
151	018	1000	11	11	2	1	1	1	2	25	30	019		
151	152	1000	22	11	4	2	1	4	2	35	30	140		
152	153	1000	11	11	2	1	1	1	2	25	10	156		
152	14015900	22	11	4	2	1	5	2	30		45	142		
152	151	1000	22	11	4	2	1	4	2	35	45	024	018	
153	15610000	36	12	6	3	1	8	2	55		50	158		
017	018	1000	36	12	6	3	1	8	2	55	90	019		
017	151	1000	11	11	2	1	1	1	2	30	10		024	152
143	159	2700	11	11	4	1	1	4	2	40	100	157	158	
156	158	1000	36	12	6	3	1	8	2	55	50	358		
157	162	7500	11	11	4	1	1	4	2	25	100		163	
015	157	1000	11	11	2	1	1	1	2	30	10		162	
015	016	1000	36	12	6	3	1	8	2	55	90	017		
158	35824000	36	12	6	3	1	8	2	55		40	341		
159	157	1000	11	11	2	1	1	1	2	30	50	162		016
159	158	1000	11	11	2	1	1	1	2	25	50	358		
162	163	3000	11	11	4	1	1	4	4	25	100	164	350	024
163	024	8750	22	11	4	2	1	5	2	30	55	151	025	
163	16422500	12	12	6	1	1	6	4	45		20	036	810	
163	350	1000	24	12	6	2	1	6	2	40	25	351		
164	03613500	12	12	6	1	1	4	2	45		95	037	808	

East Bay Massachusetts Network Link Card Files

164	16322500	12	12	6	1	1	6	4	45	80	350		
151	024	1000	24	12	6	2	1	6	4	45	40	163	025
164	810	1000	11	11	2	1	1	5	4	25	05		
145	146	1000	11	11	4	1	1	4	2	50	80	020	
016	01710000	36	12	6	3	1	8	2	55	100	018	151	
170	171	3900	11	11	2	1	1	4	4	35	20		826
170	119	4500	11	11	2	1	1	4	4	35	80		117
171	170	3900	11	11	2	1	1	4	4	35	80		119
171	826	1000	11	11	2	1	1	5	4	25	20		
172	171	3000	11	11	2	1	1	4	4	35	95	170	826
172	179	6750	11	11	2	1	1	4	4	35	5		058
173	172	3300	11	11	2	1	1	4	4	35	100	171	
174	179	1000	11	11	2	1	1	4	4	35	50		172
174	064	3000	10	10	4	1	1	4	4	30	50	191	
175	174	2250	11	11	2	1	1	4	4	35	100	179	064
176	175	2100	11	11	2	1	1	4	4	35	100	174	
177	176	1800	11	11	2	1	1	4	4	35	100		175
178	170	1500	11	11	2	1	1	4	4	35	40	119	171
179	058	5400	11	11	2	1	1	4	4	35	50	178	
179	172	6750	11	11	2	1	1	4	4	35	50		171
190	199	1500	11	11	4	1	1	4	4	35	50		057
190	198	6000	11	11	4	1	1	4	4	35	50	143	853
191	200	1000	11	11	4	1	1	4	4	40	40		199
192	191	1250	11	11	4	1	1	4	2	40	30		200
192	193	3000	11	11	4	1	1	4	2	40	30	828	194
192	195	1500	11	11	4	1	1	4	2	40	40	197	827
193	190	1000	11	11	4	1	1	4	2	40	70		198
193	194	1500	11	11	4	1	1	4	2	40	10	196	
194	193	1500	11	11	4	1	1	4	2	40	75	190	828
194	19610500	11	11	4	1	1	4	2	40	25		221	
195	192	1500	11	11	4	1	1	4	2	40	40	191	
195	827	1000	11	11	2	1	1	5	2	25	20		
195	197	9900	11	11	4	1	1	4	2	40	40	383	
196	194	9600	11	11	2	1	1	4	2	35	80	193	
196	221	2100	11	11	2	1	1	4	2	35	20	210	829
193	828	1000	11	11	2	1	1	5	2	25	50		
198	853	1000	11	11	2	1	1	4	2	35	50		
199	057	2250	11	11	4	1	1	4	2	35	60	140	
199	190	2000	11	11	4	1	1	4	2	25	20	198	
200	199	2000	11	11	4	1	1	4	2	45	70	057	
197	195	9900	11	11	4	1	1	5	4	35	50	192	827
197	383	4500	11	11	4	1	1	5	4	35	50	211	
198	190	6000	11	11	2	1	1	5	4	35	5		199
198	143	9900	11	11	4	1	1	5	4	40	80	159	
210	221	5100	11	11	2	1	1	5	2	35	75	196	829
210	212	3300	11	11	2	1	1	5	2	35	25	214	
211	383	3300	11	11	4	1	1	5	4	35	40	197	
211	215	5250	11	11	2	1	1	5	2	35	40	216	
211	830	1000	11	11	2	1	1	5	4	25	20		
212	210	3600	11	11	2	1	1	5	2	35	95	221	
212	214	1500	11	11	2	1	1	5	2	35	5	216	
214	212	1500	11	11	2	1	1	5	2	35	95	210	
214	216	3750	11	11	2	1	1	5	2	35	5	230	
215	211	5250	11	11	2	1	1	5	4	35	60	383	830
215	216	3600	11	11	2	1	1	5	2	35	40	230	
216	215	3600	11	11	2	1	1	5	2	35	35	211	
216	214	3750	11	11	2	1	1	5	2	35	30	212	
216	230	6000	11	11	2	1	1	5	2	35	35	231	
221	196	2100	11	11	2	1	1	5	4	35	55	194	
221	829	1000	11	11	2	1	1	5	4	25	20		

East Bay Massachusetts Network Link Card Files

221	210	5100	11	11	2	1	1	5	4	35	25	212		
230	216	6000	11	11	2	1	1	5	2	35	50	215	214	
230	231	6750	22	11	2	2	1	5	4	35	50	242		248
231	230	6750	22	11	2	2	1	5	4	35	40	216		
231	242	4500	22	11	2	2	1	5	4	35	40	240		
231	248	5250	22	11	2	2	1	5	4	35	20	235	831	
234	235	5250	11	11	2	1	1	5	4	35	25	251		248
234	243	3300	11	11	2	1	1	5	4	35	25	245		
235	251	7500	11	11	2	1	1	5	4	35	5	252	239	
235	234	5250	11	11	2	1	1	5	4	35	25	243		
235	248	1000	11	11	2	1	1	5	4	35	75	231		831
237	24615600	24	12		2	2	1	5	2	35	50	261		247
239	25112750	24	12		6	2	1	8	2	55	50	252		
239	240	1000	11	11	2	1	1	1	2	25	50	237		
240	239	1000	11	11	2	1	1	1	2	25	100	251		
240	237	2500	11	11	2	1	1	4	4	35	100	246		
238	239	1000	11	11	2	1	1	1	2	25	50	251		
238	242	1000	11	11	2	1	1	1	2	25	50	231		
242	231	3900	22	11	2	2	1	5	2	35	75	248		230
237	238	1800	11	11	2	1	1	1	2	25	50	239		242
382	383	1200	11	11	4	1	1	5	4	35	100	211	211	197
242	240	3000	22	11	2	2	1	4	4	35	25	237		
243	234	3300	11	11	2	1	1	5	2	35	50	235		
243	245	6000	11	11	2	1	1	5	2	35	50	244		
244	245	5250	11	11	2	1	1	5	2	35	25	243		
244	250	7800	11	11	2	1	1	5	2	35	75	262		
244	247	8250	11	11	2	1	1	5	2	35	25	246		832
245	243	6000	11	11	2	1	1	5	2	35	75	234		
245	244	5250	11	11	2	1	1	5	2	35	25	250	247	
246	247	1000	11	11	2	1	1	5	2	35	20		832	
246	23715600	11	11		2	1	1	5	2	35	40	238		
246	261	6750	24	12	2	2	1	5	2	35	40	271		
247	246	1000	11	11	2	1	1	5	2	35	5		237	
247	832	1000	11	11	2	1	1	5	2	25	100			
248	231	5250	11	11	2	1	1	4	2	35	40		230	
248	235	1000	11	11	2	1	1	4	2	35	5		234	
248	831	1000	11	11	2	1	1	5	2	25	40			
250	244	7800	11	11	2	1	1	4	2	35	75	245		
250	262	8100	11	11	2	1	1	4	2	35	25			265
251	23912750	24	12		6	2	1	6	4	55	5	240		
252	317	4800	24	12	6	2	1	6	4	55	60	319	316	
252	251	3750	24	12	6	2	1	6	4	55	40		239	
259	243	2250	11	11	2	1	1	4	4	35	100		234	
258	245	2250	11	11	2	1	1	4	4	35	100		243	
260	261	3750	11	11	2	1	1	4	4	35	100		271	246
261	246	6750	11	11	2	1	1	4	4	35	50	237	247	
261	271	8100	24	12	2	2	1	4	4	35	50	269		
262	250	8100	11	11	2	1	1	4	4	35	75	244		
262	265	1000	11	11	2	1	1	4	4	35	25	266		834
264	263	1200	11	11	2	1	1	4	4	35	75			835
264	270	1800	11	11	2	1	1	4	4	35	25		269	286
265	262	1000	11	11	2	1	1	4	2	35	75		250	
265	266	3600	11	11	2	1	1	4	2	35	5	267		833
265	834	1000	11	11	2	1	1	5	2	25	20			
266	265	3600	11	11	2	1	1	4	2	35	75	262	834	
266	267	4500	11	11	2	1	1	4	2	35	5		268	837
266	833	1000	11	11	2	1	1	5	2	25	20			
263	835	1000	11	11	2	1	1	5	2	25	100			
251	252	3750	24	12	6	2	1	6	4	55	80		317	
267	268	4250	11	11	2	1	1	5	4	30	75	401		

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267	276	1250	11	11	2	1	1	5	4	30	5	292
267	837	1000	11	11	2	1	1	5	4	30	20	
268	401	3750	11	11	2	1	1	5	4	30	75	264
268	267	4250	11	11	2	1	1	5	4	30	25	276
269	271	3750	11	11	2	1	1	5	4	35	80	261
269	270	1000	11	11	2	1	1	1	4	25	20	286
270	269	1000	11	11	2	1	1	1	4	25	34	271
270	286	3900	11	11	2	1	1	5	4	30	34	287
270	264	3000	11	11	2	1	1	1	4	25	33	263
271	261	8100	11	11	2	1	1	5	4	35	60	246
271	269	3750	24	12	2	2	1	5	4	35	40	270
272	271	3300	11	11	2	1	1	5	4	35	100	269
273	25019500	11	11		2	1	1	5	4	25	100	244
274	275	4500	11	11	2	1	1	5	4	30	100	276
275	276	7500	11	11	2	1	1	5	4	30	100	267
276	292	3000	22	11	2	2	1	6	4	40	50	294
276	267	1250	11	11	2	1	1	5	4	30	50	268
280	269	5400	11	11	2	1	1	5	4	30	100	270
281	282	1500	11	11	2	1	1	5	4	30	50	284
281	283	3000	24	12	2	2	1	5	4	40	50	300
282	284	1000	11	11	2	1	1	5	4	30	50	286
282	281	1500	11	11	2	1	1	5	4	30	50	283
283	282	3000	11	11	2	1	1	5	4	30	50	281
284	286	1000	11	11	2	1	1	5	4	30	40	287
284	838	1000	11	11	2	1	1	1	4	25	20	
284	282	1000	11	11	2	1	1	5	4	30	40	281
286	287	5100	11	11	2	1	1	5	4	25	25	290
286	284	1000	11	11	2	1	1	5	4	30	25	282
286	270	3900	11	11	2	1	1	5	4	30	30	269
287	286	5100	11	11	2	1	1	5	4	25	75	270
287	290	2100	11	11	2	1	1	5	4	25	5	289
287	840	1000	11	11	2	1	1	5	4	25	20	
288	281	2100	11	11	2	1	1	5	4	30	75	282
288	289	1000	11	11	2	1	1	5	4	30	25	290
289	290	2250	11	11	2	1	1	5	4	30	10	291
289	288	1000	11	11	2	1	1	5	4	30	90	281
290	291	1500	22	11	2	2	1	6	4	30	25	294
290	289	2250	11	11	2	1	1	5	4	30	75	288
290	287	2100	11	11	2	1	1	5	4	25	5	286
291	290	1500	22	11	2	2	1	6	4	40	75	289
291	294	2400	22	11	2	2	1	6	4	40	25	292
283	30015600	11	11		4	1	1	7	4	45	50	301
286	839	1000	11	11	2	1	1	5	4	25	20	
292	276	3000	22	11	2	2	1	6	4	40	95	267
292	294	3300	22	11	2	2	1	6	4	40	5	291
293	295	5100	11	11	2	1	1	5	4	25	100	294
294	291	1800	22	11	2	2	1	5	4	25	50	290
294	292	3300	22	11	2	2	1	5	4	25	50	276
295	294	4500	11	11	2	1	1	5	4	25	50	292
295	285	3000	11	11	2	1	1	5	4	25	50	841
285	295	3000	11	11	2	1	1	5	4	25	60	294
285	842	1000	11	11	2	1	1	5	4	25	20	
285	841	1200	11	11	2	1	1	5	4	25	20	
310	31111400	11	11		4	1	1	5	4	35	100	312
311	845	3900	11	11	4	1	1	5	4	25	20	
311	312	9000	11	11	4	1	1	5	4	35	80	313
312	311	9000	11	11	4	1	1	5	4	35	40	845
312	31315750	11	11		4	1	1	5	4	35	60	314
313	31215750	11	11		4	1	1	5	4	35	40	311
313	31416500	11	11		4	1	1	5	4	35	50	315
											380	

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314	31316500	11	11	4	1	1	5	4	35	30	312		
314	38012750	11	11	4	1	1	5	4	35	30	321	813	
314	315 9000	11	11	4	1	1	5	4	35	40	316		
315	316 1200	11	11	4	1	1	5	4	35	50	318	319	
315	314 9000	11	11	4	1	1	5	4	35	50	313	380	
316	315 1200	11	11	4	1	1	5	4	35	40	314		
316	319 1000	11	11	2	1	1	1	4	25	30	328		
316	318 1000	11	11	2	1	1	5	4	35	30	324		
317	319 1000	24	12	6	2	1	8	2	55	60	328		
317	316 1000	11	11	2	1	1	1	4	25	10	315		
318	316 1000	11	11	4	1	1	5	4	35	40	315	319	
318	32410500	11	11	4	1	1	5	2	40	50	330	811	
318	317 1000	11	11	4	1	1	1	2	30	10	252		
319	318 1000	11	11	2	1	1	1	4	25	10	324		
319	32815750	24	12	6	2	1	8	2	55	45	326		
320	32112600	12	12	4	1	1	5	4	40	40	322	380	482
320	812 1000	11	11	2	1	1	5	4	25	05			
320	327 2400	12	12	4	1	1	5	4	40	40	326		
321	32012600	12	12	4	1	1	5	4	40	10	327	812	
321	380 1000	12	12	4	1	1	5	4	40	40	314	813	
321	48218000	11	11	4	1	1	5	4	35	40	484	483	
482	484 1000	11	11	4	1	1	5	4	35	30	385	485	
482	483 1000	11	11	2	1	1	1	4	25	70	388		
482	32118000	11	11	4	1	1	5	4	35	40	320	322	
484	385 9000	11	11	4	1	1	5	4	35	50	395		
484	482 1000	11	11	4	1	1	5	4	35	40	321	483	
321	32233000	11	11	4	1	1	5	4	35	10	890		
322	890 1000	11	11	2	1	1	5	4	25	20			
322	32133000	11	11	4	1	1	5	4	35	80	320	482	380
296	285 9000	11	11	4	1	1	5	4	25	100	295	841	842
323	32218000	10	10	4	1	1	5	4	40	100	321		
086	32218000	10	10	4	1	1	5	4	40	100	321		
324	330 9900	11	11	3	1	1	5	2	40	50	329		
324	811 1000	11	11	2	1	1	5	4	25	20			
324	31810500	11	11	4	1	1	5	2	40	30	316	317	
326	340 6900	24	12	6	2	1	8	2	55	80	014	341	
326	328 2700	24	12	6	2	1	8	2	55	20	319		
327	326 2100	11	11	2	1	1	1	2	25	50	340		
327	320 2400	12	12	4	1	1	5	4	40	50	321		
328	326 3000	24	12	6	2	1	8	2	55	50	340		
328	31915750	24	12	6	2	1	8	2	55	50	317	318	
329	351 8100	11	11	4	1	1	7	2	45	90	350	352	
329	330 3000	11	11	4	1	1	7	2	45	10	324		
330	329 3000	11	11	4	1	1	7	2	45	90	351		
330	324 9900	11	11	4	1	1	7	2	45	10	318	811	
340	326 6750	24	12	6	2	1	8	2	55	20	328		
340	341 1000	11	11	2	1	1	1	2	25	40	346		
340	014 2700	11	11	2	1	1	1	2	25	40	015		
013	014 1000	36	12	6	3	1	8	2	55	90	015		
341	346 4500	36	12	6	3	1	8	2	55	60	347		
012	013 1000	36	12	6	3	1	8	2	55	100	014	340	
342	35312000	11	11	4	1	1	4	2	40	30	354	352	
342	343 1500	24	12	6	2	1	8	2	55	40	377		
343	344 1000	11	11	2	1	1	1	2	25	40	355		
343	377 7500	24	12	6	2	1	8	2	55	30	378	376	
343	342 1500	22	11	4	2	1	8	2	55	30	353		
344	35512000	24	12	6	2	1	8	2	55	20	357		
344	342 1000	11	11	2	1	1	1	2	25	20	353		
344	343 1000	11	11	2	1	1	1	2	25	20	377		
344	012 1000	11	11	2	1	1	1	2	25	20	013		

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012	013	4500	36	12	6	3	1	8	2	55	100	014	
346	347	1000	36	12	6	3	1	8	2	55	50	370	
347	370	7500	36	12	6	3	1	8	2	55	40	375	891
011	344	1000	11	11	4	1	1	1	2	25	25	355	
011	012	1000	36	12	6	3	1	8	2	55	40	013	
350	163	1500	12	12	6	1	1	6	2	45	50	024	164
350	351	2100	24	12	6	2	1	7	2	45	50	329	352
351	350	2100	11	11	4	1	1	7	2	45	45		163
351	352	1500	24	12	6	2	1	6	2	35	45	353	
351	329	7800	11	11	4	1	1	7	2	45	10	330	
352	351	1500	24	12	6	2	1	6	2	35	50		350
352	353	7800	24	12	6	2	1	6	2	35	50	354	342
353	354	1000	24	12	6	2	1	6	2	35	40	357	
353	352	7800	12	12	6	1	1	6	2	35	20	351	
354	357	4000	11	11	2	1	1	1	4	25	50		359
355	344	12000	24	12	6	2	1	8	2	55	100	347	012
354	353	3750	12	12	6	1	1	6	2	35	10	352	
357	359	10500	24	12	6	2	1	8	2	55	100	365	
014	015	18000	36	12	6	3	1	8	2	55	100	016	157
358	341	1000	36	12	6	3	1	8	2	55	45	346	
358	340	1000	11	11	2	1	1	1	2	25	10	326	
359	365	2250	24	12	6	2	1	8	2	55	60	363	
359	357	11500	24	12	6	2	1	8	2	55	40	355	354
342	344	1000	11	11	2	1	1	1	4	25	30	355	
355	357	3000	24	12	6	2	1	8	4	55	90	359	
354	357	2500	11	11	2	1	1	1	4	25	50		359
362	363	1000	11	11	2	1	1	1	4	25	100		035
365	363	1000	11	11	2	1	1	1	4	25	80	035	
365	359	2250	24	12	6	2	1	8	2	55	20	357	
363	035	9300	24	12	6	2	1	8	4	55	40	805	809
363	365	1000	11	11	2	1	1	1	4	25	40	359	
366	362	9750	11	11	2	1	1	5	2	25	100		363
367	366	1000	11	12	2	1	1	5	2	25	50	362	
367	365	10500	24	12	6	2	1	8	2	55	50	363	
010	011	7500	36	12	6	3	1	8	2	55	50	012	344
370	375	6000	36	12	6	3	1	8	2	55	80	398	
370	374	1000	11	11	2	1	1	1	4	25	27	379	
374	375	1000	11	11	2	1	1	1	4	25	35		398
374	010	7200	11	11	2	1	1	1	4	25	35	011	
374	379	3000	22	11	2	2	1	1	4	40	40	376	377
375	398	14250	36	12	6	3	1	8	2	55	40	396	892
376	379	2700	11	11	4	1	1	7	4	45	40	374	
376	378	1000	11	11	2	1	1	1	4	25	40		385
376	485	11000	11	11	4	1	1	7	2	35	30	483	482
377	378	1000	22	11	4	2	1	8	4	55	50	385	379
377	376	1000	11	11	4	1	1	1	3	25	20	485	
377	343	9000	22	11	4	2	1	8	3	55	40	342	344
483	388	12000	11	11	4	1	1	7	2	35	20	386	
378	377	1000	22	11	4	2	1	8	4	55	45	343	
378	379	1000	11	11	2	1	1	1	4	25	100	374	
379	374	3000	22	11	2	2	1	1	4	40	40	010	375
379	376	2700	11	11	4	1	1	7	4	45	60	485	378
379	377	1000	11	11	2	1	1	1	4	25	10	343	
380	321	2250	11	11	4	1	1	5	4	35	40	482	320
380	314	12750	11	11	4	1	1	5	4	35	40		313
380	813	1000	11	11	2	1	1	5	4	25	20		
382	383	3000	11	11	4	1	1	5	4	35	100		197
383	197	4500	11	11	4	1	1	5	4	35	100	195	
383	211	3300	11	11	4	1	1	5	4	35	100	215	
385	378	15750	22	12	4	2	1	6	4	55	45	377	830
											379		

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385	484	9000	11	11	2	1	1	5	4	35	08	482	485	
386	38810800	11	11		4	1	1	7	2	35	100	483		814
386	890	1000	11	11	2	1	1	5	4	25		20		
388	38610800	11	11		4	1	1	7	2	35		40		890
387	38621000	11	11		4	1	1	7	2	35	100	388		
087	38621000	11	11		4	1	1	7	2	35	100	388		
388	48312000	11	11		4	1	1	7	2	35		40	485	484
388	814	1000	11	11	2	1	1	1	4	25		05		
389	390	1000	11	11	4	1	1	7	4	35		10		391
389	394	3900	11	11	4	1	1	7	4	35		90		395
390	389	1000	11	11	4	1	1	7	4	35		90		394
390	391	9300	11	11	4	1	1	7	4	35		10		400
391	390	9300	11	11	4	1	1	7	4	35		80		389
391	400	6750	11	11	4	1	1	7	4	35		20		815
392	40025800	11	11		4	1	1	7	4	35	100	391		
393	392	9600	11	11	4	1	1	7	4	35		100		400
394	395	3000	11	11	4	1	1	7	4	35	100	399		413
395	399	6000	12	12	6	1	1	5	2	45		10	009	385
395	385	2250	22	11	6	2	1	6	2	40		45	378	
395	41314400	22	11		6	2	1	6	2	40		50	420	411
378	38515750	22	11		6	2	1	6	2	40		20	395	
385	395	2250	22	11	6	2	1	6	2	40		45	413	
398	396	2400	36	12	6	3	1	8	4	55		45	417	
399	396	1000	11	11	2	1	1	1	4	25		40		417
399	009	1000	11	11	2	1	1	1	4	25		40	010	
009	01014250	36	12		6	3	1	8	2	55		45	011	
400	815	1000	11	11	2	1	1	5	4	25		20		
400	391	6750	11	11	4	1	1	7	4	35		80		390
401	264	1000	11	11	4	1	1	5	4	35		60		270
401	836	1000	11	11	2	1	1	5	4	25		20		
401	268	3750	11	11	2	1	1	5	4	35		20	267	
410	41218000	11	11		4	1	1	7	4	35	100	411		816
411	412	1500	11	11	4	1	1	7	4	35		20		
411	41321000	11	11		4	1	1	7	4	35	80	416		420
412	816	1000	11	11	2	1	1	5	4	25		29		
413	41121000	11	11		2	1	1	7	4	35		10		412
413	420	1000	22	11	6	2	1	6	2	40		45	428	418
413	39514400	22	11		6	2	1	6	2	40		40	385	
413	416	5250	12	12	6	1	1	5	2	45		5		415
415	430	5100	36	12	6	3	1	8	2	55		30	432	
416	415	1000	11	11	2	1	1	1	2	25		50	430	
416	008	1500	11	11	2	1	1	1	2	25		50	009	
008	00911400	36	12		6	3	1	8	2	55	100		010	
417	415	2250	36	12	6	3	1	8	2	55		40	430	
396	41711400	36	12		6	3	1	8	2	55		30	415	
418	420	7500	11	11	4	1	1	7	4	35		80		428
418	817	1000	11	11	2	1	1	1	4	25		20		
419	428	3300	10	10	4	1	1	4	2	30		80		420
419	818	1000	11	11	2	1	1	1	4	25		20		
420	413	1000	22	11	6	2	1	6	2	35		40	395	416
420	428	3300	22	11	6	2	1	6	2	35		40	429	
420	418	7500	11	11	4	1	1	7	4	35		5		817
421	423	6000	11	11	4	1	1	7	4	35	100		447	
422	421	7200	11	11	4	1	1	7	4	35		100		423
423	447	6900	11	11	4	1	1	7	4	35	100		425	
424	426	4500	10	10	4	1	1	4	2	30	100		427	
426	427	4500	10	10	4	1	1	4	2	30		100		491
425	418	7800	11	11	4	1	1	7	4	35	100	420		817
412	411	1500	11	11	4	1	1	7	4	35		80		413
427	419	6000	10	10	4	1	1	4	2	30		75	428	818

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427	491	1500	10	10	4	1	1	4	2	30	25	490			
428	429	1000	22	11	2	2	1	6	4	35	50	452			
428	420	3300	22	11	2	2	1	6	4	35	50	413	899		
429	428	1000	22	11	2	2	1	6	2	30	45	420			
429	433	2700	24	12	4	2	1	8	2	55	10	431	432		
429	452	7200	24	12	6	2	1	6	2	35	45	499		453	
430	432	2100	36	12	6	2	1	8	2	55	30	032		431	898
431	007	1000	11	11	2	1	1	1	4	25	50	008			
007	008	5100	36	12	6	3	1	8	2	55	70	009			
431	477	9750	24	12	6	2	1	1	2	55	50	476			
006	007	2100	36	12	6	3	1	1	4	50	90	008			
432	431	1000	11	11	2	1	1	1	4	25	5	477			
432	032	5000	36	12	6	3	1	8	2	55	40	455			
032	888	1000	24	12	6	2	1	8	2	55	20				
032	455	1000	36	12	6	3	1	8	2	55	100	467			
433	431	2100	24	12	6	2	1	8	2	55	75	477			
433	432	1000	11	11	2	1	1	1	4	25	25	032			
446	447	9900	10	10	4	1	1	4	4	30	100		425		
447	425	4500	10	10	4	1	1	4	4	30	100	418			
448	496	1000	10	10	4	1	1	4	2	30	100	495			
449	452	3600	10	10	4	1	1	4	2	30	100	453	499		
450	448	4500	10	10	4	1	1	4	2	30	100	496			
451	490	1000	10	10	4	1	1	4	2	30	50	491			
451	494	1000	10	10	4	1	1	4	2	30	50	459			
452	453	3300	10	10	4	1	1	4	2	30	20		480	819	
452	429	7200	22	11	2	2	1	6	2	30	40	428	433		
452	499	6750	22	11	2	2	1	6	2	30	40	470			
453	452	3300	10	10	4	1	1	4	2	30	30		429	499	
453	480	1800	10	10	4	1	1	4	2	30	50		454		
453	819	1000	11	11	2	1	1	5	2	25	20				
454	455	1000	11	11	2	1	1	1	2	25	100		467		
455	467	9600	36	12	6	3	1	8	2	55	40	466			
457	477	6900	12	12	4	1	1	5	2	30	100		476		
458	457	5700	12	12	4	1	1	5	2	30	100		477		
459	449	2250	10	10	4	1	1	4	2	30	100	452			
460	461	6000	10	10	2	1	1	4	2	30	100		462		
461	462	3900	10	10	2	1	1	4	2	30	100	463			
462	463	6000	10	10	2	1	1	4	2	30	100	464			
463	464	6000	10	10	2	1	1	4	2	30	100	465	469		
464	465	5250	10	10	2	1	1	4	2	30	10	004	466		
464	469	3300	22	11	4	2	1	6	4	35	90	862			
464	497	3300	22	11	4	2	1	6	2	35	55	470			
465	466	1000	11	11	2	1	1	1	4	25	40	820			
465	004	1000	12	12	6	1	1	1	4	25	50	005			
005	006	6000	36	12	6	3	1	8	4	50	100	007	431		
006	431	1000	12	12	6	1	1	1	4	25	20		477		
465	464	5250	10	10	2	1	1	4	2	30	10		497	469	
466	820	5400	24	12	6	2	1	8	4	50	40				
003	004	1000	36	12	6	3	1	8	4	50	90	005			
003	465	1000	12	12	6	1	1	1	4	25	10	464			
467	466	1000	36	12	6	3	1	8	4	50	60	820			
467	465	1000	12	12	6	2	1	1	4	25	10	464			
004	005	9000	36	12	6	3	1	8	4	50	100	006			
469	464	3300	22	11	2	2	1	6	4	35	100	497	465		
469	862	6300	22	11	2	2	1	6	4	35	100				
470	499	1500	22	11	4	2	1	6	2	35	50	452			
470	497	2100	22	11	4	2	1	6	2	35	50	464			
471	500	6000	10	10	2	1	1	4	4	30	100	470			
472	471	3900	10	10	2	1	1	4	2	30	100	500			
473	474	5400	11	11	4	1	1	4	4	30	100		475		

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474	475	3000	11	11	4	1	1	4	4	30	100	476	
475	476	3750	11	11	4	1	1	4	4	30	100	803	
476	80372000	24	12	6	2	1	8	4	50	50			
477	431	9750	24	12	6	2	1	8	2	50	50	007	
477	47612900	24	12	6	2	1	8	4	50	50	803		
480	454	1800	10	10	4	1	1	4	2	30	100	455	
483	485	1000	11	11	4	1	1	7	2	35	40	376	
483	484	1000	11	11	4	1	1	1	2	25	10	385	
484	485	1000	11	11	4	1	1	1	2	25	10	376	
485	37611000	11	11	4	1	1	7	2	35	50	379	378	
485	483	1000	11	11	4	1	1	7	2	35	40	388	
485	482	1000	11	11	4	1	1	1	2	25	10	321	
490	451	1200	10	10	4	1	1	4	2	30	50	494	
490	491	3000	10	10	4	1	1	4	2	30	50	427	
491	427	1500	10	10	4	1	1	4	2	30	75	419	
491	490	1500	10	10	4	1	1	4	2	30	25	451	
492	451	1000	10	10	4	1	1	4	2	30	100	490	
493	494	2100	10	10	4	1	1	4	2	30	100	459	
494	459	1000	10	10	4	1	1	4	1	30	100	449	
495	492	1000	10	10	4	1	1	4	2	30	100	451	
496	495	1000	10	10	4	1	1	4	2	30	100	492	
497	470	2250	22	11	4	2	1	6	2	35	50	499	
497	464	3300	22	11	4	2	1	6	2	35	50	469	
498	500	1000	10	10	2	1	1	4	4	30	100	470	
499	470	1500	22	11	4	2	1	6	2	35	50	497	
499	452	6750	22	11	4	2	1	6	1	30	50	429	
500	470	4500	10	10	2	1	1	4	4	30	100	499	
071	003	7500	36	12	6	3	1	8	4	50	100	004	
072	46910000	22	11	4	2	1	6	4	35	100	464		
073	47672000	24	12	6	2	1	8	4	50	100	477		
074	03536750	24	12	6	2	1	8	4	35	100	363	809	
075	03819500	12	12	6	1	1	7	2	50	100	039	802	
076	30220100	12	12	4	1	1	7	2	40	100	301		
001	86031150	11	11	2	1	1	5	4	25	60			
001	100	2100	24	12	6	2	1	8	2	55	25	101	
025	026	1000	11	11	2	1	1	5	2	35	75	027	
025	02410500	24	12	6	2	1	6	2	55	25	163	151	
024	151	1000	12	12	6	1	1	6	2	40	45	152	
024	02510500	24	12	6	2	1	6	2	40	10		026	
024	16318750	12	12	6	1	1	6	2	40	45	350	164	
026	025	1000	11	11	2	1	1	4	4	35	25	024	
026	02713800	11	11	2	1	1	4	4	35	75		028	
027	02613800	11	11	2	1	1	4	4	35	100		025	
027	028	1000	11	11	2	1	1	4	4	35	100	029	
028	027	1000	11	11	2	1	1	4	4	35	100	026	
028	029	6900	11	11	2	1	1	4	4	35	100	030	846
029	028	6900	11	11	2	1	1	4	4	35	80		027
029	030	9900	11	11	2	1	1	4	4	35	80	849	039
030	03914250	12	12	6	1	1	7	4	50	40	038	801	
030	84935250	11	11	2	1	1	4	4	35	10			
030	13330000	12	12	6	1	1	7	4	50	40	106	105	
030	029	9900	11	11	2	1	1	4	4	35	10	028	846
035	80536750	24	12	6	2	1	8	4	35	45			
035	809	1000	11	11	2	1	1	1	1	25	15		
035	363	9300	24	12	6	2	1	8	4	55	40	365	
036	03718900	12	12	6	1	1	4	4	45	40		807	
036	808	1000	11	11	2	1	1	4	4	25	20		
036	16413500	12	12	6	1	1	4	2	45	40	163	810	
037	80415000	12	12	6	1	1	4	2	45	40			
037	03618900	12	12	6	1	1	4	4	45	40	164	808	

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037	807	1000	11	11	2	1	1	5	4	25	20		
038	03911100	12	12		6	1	1	4	4	50	40	030	801
038	802	1000	11	11	2	1	1	5	4	25	15		
038	80619500	12	12		6	1	1	5	4	50	45		
039	03014250	12	12		6	1	1	5	4	50	50	133	849
039	03811100	12	12		6	1	1	5	4	50	50	806	802
039	801	1000	11	11	2	1	1	5	4	25	15		
029	846	1000	11	11	2	1	1	5	4	25	20		
057	14012000	11	11		4	1	1	4	2	35	90	145	152
058	178	3300	11	11	4	1	1	4	2	35	40	123	170
059	060	3000	11	11	4	1	1	4	2	35	100		061
060	061	3000	11	11	4	1	1	4	2	35	100	063	
062	061	2100	11	11	4	1	1	4	2	35	100		063
061	063	2250	11	11	4	1	1	4	2	35	100	142	141
063	141	2000	11	11	4	1	1	4	2	35	25		128
063	142	9000	11	11	4	1	1	4	2	35	75		140
064	174	2100	10	10	4	1	1	4	4	30	50		179
064	191	4500	11	11	4	1	1	4	4	40	50	192	200
300	28315000	24	12		6	2	1	7	4	45	50	281	282
300	301	6000	24	12	4	2	1	7	4	45	50	302	
300	305	6200	10	10	4	1	1	4	2	30	10		306
301	302	2200	11	11	4	1	1	7	4	45	100	863	303
302	301	2200	11	11	4	1	1	7	4	45	40		300
302	86310000	11	11		4	1	1	7	4	45	40		
303	30210000	10	10		4	1	1	4	4	30	40		301
304	30115000	11	11		4	1	1	7	4	45	100	300	302
305	300	6200	10	10	4	1	1	4	4	30	100	301	283
305	306	2800	10	10	4	1	1	4	4	30	50		303
306	305	2800	10	10	4	1	1	4	4	30	50		300
307	30612000	10	10		4	1	1	4	4	30	100	305	303
303	843	1000	11	11	2	1	1	5	4	25	20		
303	844	1000	11	11	2	1	1	5	4	25	20		
301	300	6000	24	12	4	2	1	7	4	45	50	283	305
302	30310000	10	10		4	1	1	4	4	30	20		844
306	303	2800	10	10	4	1	1	4	4	30	50	302	843
101	851	500	11	11	2	1	1	5	4	25	100		
080	03715000	12	12		6	1	1	4	2	45	100	036	807
088	133	3000	12	12	6	1	1	7	4	50	100	030	
089	10610000	11	11		2	1	1	5	2	30	100	107	
093	104	3000	11	11	2	1	1	5	2	30	100	105	
090	28610000	11	11		2	1	1	5	4	30	100	270	
091	239	3000	24	12	6	2	1	8	2	55	100	251	
094	314	3000	11	11	4	1	1	5	4	35	100	380	
095	484	3000	11	11	4	1	1	5	4	35	100	482	
096	431	3000	24	12	6	2	1	8	2	55	100	477	
178	058	4000	12	12	6	1	1	4	2	45	30	179	059
058	179	6000	12	12	6	1	1	4	2	45	40	174	
058	059	1000	11	11	4	1	1	4	2	40	20	060	
179	174	1000	11	11	2	1	1	4	4	35	20	064	
191	192	1250	11	11	4	1	1	4	2	40	30	195	193
178	12315000	11	11		4	1	1	4	2	40	20	126	
126	123	6000	11	11	4	1	1	4	2	25	30	178	
123	17815000	11	11		4	1	1	4	2	40	30	058	
125	126	3900	11	11	2	1	1	1	4	25	20	123	
353	34212000	11	11		4	1	1	4	2	40	40	343	
357	355	3000	24	12	6	2	1	8	4	55	50	344	
357	354	4000	11	11	2	1	1	1	4	25	50	353	
319	317	1000	24	12	6	2	1	8	2	55	45	252	
317	252	4800	24	12	6	2	1	6	4	55	30	251	
092	340	3000	24	12	6	2	1	8	2	55	100	326	

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191	064	4500	11	11	4	1	1	4	4	40	30	174		
126	124	2500	11	11	2	1	1	1	4	30	40	023	127	
123	122	4500	11	11	2	1	1	5	2	30	40		121	115
140	057	12000	11	11	4	1	1	4	2	35	10	199		
057	199	2250	11	11	4	1	1	4	2	35	40		200	190
199	200	2000	11	11	4	1	1	7	4	45	20	191		
200	191	1000	11	11	4	1	1	4	4	40	30		064	192
109	115	12000	11	11	2	1	1	5	2	30	50		116	122
111	002	10000	11	11	2	1	1	5	2	30	100	112	109	
002	109	750	11	11	5	2	1	5	2	30	10	115		
002	852	3000	11	11	2	1	1	5	2	30	100			
398	399	1000	11	11	2	1	1	1	4	25	15	395		
476	477	12900	24	12	6	2	1	8	4	50	50	431		
399	395	6000	12	12	6	1	1	5	2	45	30		385	413
097	357	3000	24	12	6	2	1	8	2	55	100	359		
098	234	3000	11	11	2	1	1	5	4	35	100	231		
099	197	3000	11	11	4	1	1	5	4	35	100	383		
234	231	6000	11	11	2	1	1	5	4	35	50	230		
081	327	6000	12	12	4	1	1	5	4	40	100	320		
082	413	3000	22	11	2	2	1	6	2	30	100	395		
083	385	3000	22	11	6	2	1	6	2	40	100	395		
084	452	3000	22	11	2	2	1	6	2	30	100	499		
420	899	3000	22	11	2	2	1	6	4	35	15			
430	433	1000	12	12	6	1	1	1	2	35	10	429		
433	429	2700	24	12	4	2	1	8	2	55	50		452	
085	396	5000	36	12	6	3	1	8	2	55	100	417		
432	898	5000	36	12	6	3	1	8	2	55	15			
157	016	1000	11	11	2	1	1	1	2	30	100	017		
013	340	1000	11	11	2	1	1	1	2	25	20	326		
344	347	1000	36	12	6	3	1	8	2	55	40	370		
269	280	5000	24	12	2	2	1	5	4	40	50	281		
280	281	3000	24	12	2	2	1	5	4	40	50	283		
283	281	3000	24	12	2	2	1	5	4	40	60	280		
281	280	3000	24	12	2	2	1	5	4	40	50	269		
370	891	1000	24	12	6	2	1	8	2	55	30			
398	892	1000	24	12	6	2	1	8	2	55	34			
99999														

POPOPT1 Rhode Island Strong Storm Off-Peak Traffic, Rapid Response

&files

```
filename(1)='strong_w.dat'  
filename(2)='mnsst_w.dat'  
filename(3)='backgr_w.dat'  
outfile='popout1.dat'  
outprint='popout1.prt'  
/
```

&poptype

```
atype(1)='vulnerable'  
atype(2)='nonvul+mob'  
atype(3)='backgrd'  
/
```

&fraction

```
frc(1,1)=0.15 frc(1,2)=0.10 frc(1,3)=0.50 frc(1,4)=0.25  
frc(2,1)=0.15 frc(2,2)=0.10 frc(2,3)=0.50 frc(2,4)=0.25  
frc(3,1)=0.09 frc(3,2)=0.09 frc(3,3)=0.06 frc(3,4)=0.02  
/
```

&timeint

```
int1(2)=270.0 int1(2)=390.0 int1(3)=400.0 int1(4)=510.0 int1(5)=630.0  
int2(1)=0.0 int2(2)=75.0 int2(3)=150.0 int2(4)=225.0 int2(5)=300.0  
/
```

```
194,155,331,129,467,092,030,370,274,077,086,359,383,381,078,079,083,084,387,085,076,057,081,082,0  
90,091,098,099,126,185,167,209,266,281,280,276,275,325,331,151,250,235,397,169,026,027,028,029,24  
2,250,072
```

POPOPT2 Rhode Island Strong Storm Off-Peak Traffic, Moderate Response

&files

```
filename(1)='strong_w.dat'  
filename(2)='mnsst_w.dat'  
filename(3)='backgr_w.dat'  
outfile='popout2.dat'  
outprint='popout2.prt'  
/
```

&poptype

```
atype(1)='vulnerable'  
atype(2)='nonvul+mob'  
atype(3)='backgrd'  
/
```

&fraction

```
frc(1,1)=0.15 frc(1,2)=0.10 frc(1,3)=0.50 frc(1,4)=0.25  
frc(2,1)=0.15 frc(2,2)=0.10 frc(2,3)=0.50 frc(2,4)=0.25  
frc(3,1)=0.09 frc(3,2)=0.09 frc(3,3)=0.06 frc(3,4)=0.02  
/
```

&timeint

```
int1(2)=120.0 int1(2)=300.0 int1(3)=360.0 int1(4)=480.0 int1(5)=660.0  
int2(1)=0.0 int2(2)=75.0 int2(3)=150.0 int2(4)=225.0 int2(5)=300.0  
/
```

```
194,155,331,129,467,092,030,370,274,077,086,359,383,381,078,079,083,084,387,085,076,057,081,082,0  
90,091,098,099,126,185,167,209,266,281,280,276,275,325,331,151,250,235,397,169,026,027,028,029,24  
2,250,072
```

POPOPT3 Rhode Island Strong Storm Off-Peak Traffic, Slow Response

&files

```
filename(1)='strong_w.dat'  
filename(2)='mnsst_w.dat'  
filename(3)='backgr_w.dat'  
outfile='popout3.dat'  
output='popout3.prt'  
/
```

&poptype

```
atype(1)='vulnerable'  
atype(2)='nonvul+mob'  
atype(3)='backgrnd'  
/
```

&fraction

```
frc(1,1)=0.15 frc(1,2)=0.10 frc(1,3)=0.50 frc(1,4)=0.25  
frc(2,1)=0.15 frc(2,2)=0.10 frc(2,3)=0.50 frc(2,4)=0.25  
frc(3,1)=0.09 frc(3,2)=0.09 frc(3,3)=0.06 frc(3,4)=0.02  
/
```

&timeint

```
int1(2)=0.0 int1(2)=240.0 int1(3)=320.0 int1(4)=480.0 int1(5)=720.0  
int2(1)=0.0 int2(2)=75.0 int2(3)=150.0 int2(4)=225.0 int2(5)=300.0  
/
```

```
194,155,331,129,467,092,030,370,274,077,086,359,383,381,078,079,083,084,387,085,076,057,081,082,0  
90,091,098,099,126,185,167,209,266,281,280,276,275,325,331,151,250,235,397,169,026,027,028,029,24  
2,250,072
```

POPOPT4 Rhode Island Strong Storm Mid-Peak Traffic, Rapid Response

&files

```
filename(1)='strong_w.dat'  
filename(2)='mnsst_w.dat'  
filename(3)='backgr_w.dat'  
outfile='popout4.dat'  
output='popout4.prt'  
/
```

&poptype

```
atype(1)='vulnerable'  
atype(2)='nonvul+mob'  
atype(3)='backgrnd'  
/
```

&fraction

```
frc(1,1)=0.15 frc(1,2)=0.10 frc(1,3)=0.50 frc(1,4)=0.25  
frc(2,1)=0.15 frc(2,2)=0.10 frc(2,3)=0.50 frc(2,4)=0.25  
frc(3,1)=0.05 frc(3,2)=0.34 frc(3,3)=0.13 frc(3,4)=0.10  
/
```

&timeint

```
int1(2)=840.0 int1(2)=960.0 int1(3)=1000.0 int1(4)=1080.0 int1(5)=1200.0  
int2(1)=0.0 int2(2)=240.0 int2(3)=540.0 int2(4)=690.0 int2(5)=840.0  
/
```

```
194,155,331,129,467,092,030,370,274,077,086,359,383,381,078,079,083,084,387,085,076,057,081,082,0  
90,091,098,099,126,185,167,209,266,281,280,276,275,325,331,151,250,235,397,169,026,027,028,029,24  
2,250,072
```

POPOPT5 Rhode Island Strong Storm Mid-Peak Traffic, Moderate Response

&files

filename(1)='strong_w.dat'
filename(2)='mnsst_w.dat'
filename(3)='backgr_w.dat'
outfile='popout5.dat'
outprint='popout5.prt'

/

&poptype

atype(1)='vulnerable'
atype(2)='nonvul+mob'
atype(3)='background'

/

&fraction

frc(1,1)=0.15 frc(1,2)=0.10 frc(1,3)=0.50 frc(1,4)=0.25
frc(2,1)=0.15 frc(2,2)=0.10 frc(2,3)=0.50 frc(2,4)=0.25
frc(3,1)=0.05 frc(3,2)=0.34 frc(3,3)=0.13 frc(3,4)=0.10

/

&timeint

int1(2)=660.0 int1(2)=840.0 int1(3)=900.0 int1(4)=1020.0 int1(5)=1200.0
int2(1)=0.0 int2(2)=240.0 int2(3)=540.0 int2(4)=690.0 int2(5)=840.0

/

194,155,331,129,467,092,030,370,274,077,086,359,383,381,078,079,083,084,387,085,076,057,081,082,0
90,091,098,099,126,185,167,209,266,281,280,276,275,325,331,151,250,235,397,169,026,027,028,029,24
2,250,072

POPOPT6 Rhode Island Strong Storm Mid-Peak Traffic, Slow Response

&files

filename(1)='strong_w.dat'
filename(2)='mnsst_w.dat'
filename(3)='backgr_w.dat'
outfile='popout6.dat'
outprint='popout6.prt'

/

&poptype

atype(1)='vulnerable'
atype(2)='nonvul+mob'
atype(3)='background'

/

&fraction

frc(1,1)=0.15 frc(1,2)=0.10 frc(1,3)=0.50 frc(1,4)=0.25
frc(2,1)=0.15 frc(2,2)=0.10 frc(2,3)=0.50 frc(2,4)=0.25
frc(3,1)=0.05 frc(3,2)=0.34 frc(3,3)=0.13 frc(3,4)=0.10

/

&timeint

int1(2)=480.0 int1(2)=720.0 int1(3)=800.0 int1(4)=960.0 int1(5)=1200.0
int2(1)=0.0 int2(2)=240.0 int2(3)=540.0 int2(4)=690.0 int2(5)=840.0

/

194,155,331,129,467,092,030,370,274,077,086,359,383,381,078,079,083,084,387,085,076,057,081,082,0
90,091,098,099,126,185,167,209,266,281,280,276,275,325,331,151,250,235,397,169,026,027,028,029,24
2,250,072

POPOPT7 Rhode Island Strong Storm Peak Traffic, Rapid Response

```
&files
filename(1)='strong_w.dat'
filename(2)='mnsst_w.dat'
filename(3)='backgr_w.dat'
outfile='popout7.dat'
output='popout7.prt'
/
&poptype
atype(1)='vulnerable'
atype(2)='nonvul+mob'
atype(3)='background'
/
&fraction
frc(1,1)=0.15 frc(1,2)=0.10 frc(1,3)=0.50 frc(1,4)=0.25
frc(2,1)=0.15 frc(2,2)=0.10 frc(2,3)=0.50 frc(2,4)=0.25
frc(3,1)=0.05 frc(3,2)=0.35 frc(3,3)=0.31 frc(3,4)=0.12
/
&timeint
int1(2)=870.0 int1(2)=990.0 int1(3)=1030.0 int1(4)=1110.0 int1(5)=1230.0
int2(1)=0.0 int2(2)=240.0 int2(3)=540.0 int2(4)=720.0 int2(5)=870.0
/
194,155,331,129,467,092,030,370,274,077,086,359,383,381,078,079,083,084,387,085,076,057,081,082,0
90,091,098,099,126,185,167,209,266,281,280,276,275,325,331,151,250,235,397,169,026,027,028,029,24
2,250,072
```

POPOPT8 Rhode Island Strong Storm Peak Traffic, Moderate Response

```
&files
filename(1)='strong_w.dat'
filename(2)='mnsst_w.dat'
filename(3)='backgr_w.dat'
outfile='popout8.dat'
output='popout8.prt'
/
&poptype
atype(1)='vulnerable'
atype(2)='nonvul+mob'
atype(3)='background'
/
&fraction
frc(1,1)=0.15 frc(1,2)=0.10 frc(1,3)=0.50 frc(1,4)=0.25
frc(2,1)=0.15 frc(2,2)=0.10 frc(2,3)=0.50 frc(2,4)=0.25
frc(3,1)=0.05 frc(3,2)=0.35 frc(3,3)=0.31 frc(3,4)=0.12
/
&timeint
int1(2)=690.0 int1(2)=870.0 int1(3)=930.0 int1(4)=1050.0 int1(5)=1230.0
int2(1)=0.0 int2(2)=240.0 int2(3)=540.0 int2(4)=720.0 int2(5)=870.0
/
194,155,331,129,467,092,030,370,274,077,086,359,383,381,078,079,083,084,387,085,076,057,081,082,0
90,091,098,099,126,185,167,209,266,281,280,276,275,325,331,151,250,235,397,169,026,027,028,029,24
2,250,072
```

POPOPT9 Rhode Island Strong Storm Peak Traffic, Slow Response

```
&files
filename(1)='strong_w.dat'
filename(2)='mnsst_w.dat'
filename(3)='backgr_w.dat'
outfile='popout9.dat'
outprint='popout9.prt'
/
&poptype
atype(1)='vulnerable'
atype(2)='nonvul+mob'
atype(3)='background'
/
&fraction
frc(1,1)=0.15 frc(1,2)=0.10 frc(1,3)=0.50 frc(1,4)=0.25
frc(2,1)=0.15 frc(2,2)=0.10 frc(2,3)=0.50 frc(2,4)=0.25
frc(3,1)=0.05 frc(3,2)=0.35 frc(3,3)=0.31 frc(3,4)=0.12
/
&timeint
int1(2)=510.0 int1(2)=750.0 int1(3)=830.0 int1(4)=990.0 int1(5)=1230.0
int2(1)=0.0 int2(2)=240.0 int2(3)=540.0 int2(4)=720.0 int2(5)=870.0
/
194,155,331,129,467,092,030,370,274,077,086,359,383,381,078,079,083,084,387,085,076,057,081,082,0
90,091,098,099,126,185,167,209,266,281,280,276,275,325,331,151,250,235,397,169,026,027,028,029,24
2,250,072
```

POPOPT 10 Rhode Island Weak Storm Off-Peak Traffic, Rapid Response

```
&files
filename(1)='weak_w.dat'
filename(2)='mnswk_w.dat'
filename(3)='backgr_w.dat'
outfile='popout10.dat'
outprint='popout10.prt'
/
&poptype
atype(1)='vulnerable'
atype(2)='nonvul+mob'
atype(3)='backgrd'
/
&fraction
frc(1,1)=0.15 frc(1,2)=0.10 frc(1,3)=0.50 frc(1,4)=0.25
frc(2,1)=0.15 frc(2,2)=0.10 frc(2,3)=0.50 frc(2,4)=0.25
frc(3,1)=0.09 frc(3,2)=0.09 frc(3,3)=0.06 frc(3,4)=0.02
/
&timeint
int1(2)=270.0 int1(2)=390.0 int1(3)=430.0 int1(4)=510.0 int1(5)=630.0
int2(1)=0.0 int2(2)=75.0 int2(3)=150.0 int2(4)=225.0 int2(5)=300.0
/
194,155,331,129,467,092,030,370,274,077,086,359,383,381,078,079,083,084,387,085,076,057,081,082,0
90,091,098,099,126,185,167,209,266,281,280,276,275,325,331,151,250,235,397,169,026,027,028,029,24
2,250,072
```

POPOPT 11 Rhode Island Weak Storm Off-Peak Traffic, Moderate Response

&files

```
filename(1)='weak_w.dat'  
filename(2)='mnswk_w.dat'  
filename(3)='backgr_w.dat'  
outfile='popout11.dat'  
outprint='popout11.prt'  
/
```

&poptype

```
atype(1)='vulnerable'  
atype(2)='nonvul+mob'  
atype(3)='backgrd'  
/
```

&fraction

```
frc(1,1)=0.15 frc(1,2)=0.10 frc(1,3)=0.50 frc(1,4)=0.25  
frc(2,1)=0.15 frc(2,2)=0.10 frc(2,3)=0.50 frc(2,4)=0.25  
frc(3,1)=0.09 frc(3,2)=0.09 frc(3,3)=0.06 frc(3,4)=0.02
```

/

&timeint

```
int1(2)=120.0 int1(2)=300.0 int1(3)=360.0 int1(4)=480.0 int1(5)=660.0  
int2(1)=0.0 int2(2)=75.0 int2(3)=150.0 int2(4)=225.0 int2(5)=300.0
```

/

```
194,155,331,129,467,092,030,370,274,077,086,359,383,381,078,079,083,084,387,085,076,057,081,082,0  
90,091,098,099,126,185,167,209,266,281,280,276,275,325,331,151,250,235,397,169,026,027,028,029,24  
2,250,072
```

POPOPT12 Rhode Island Weak Storm Off-Peak Traffic, Slow Response

&files

```
filename(1)='weak_w.dat'  
filename(2)='mnswk_w.dat'  
filename(3)='backgr_w.dat'  
outfile='popout12.dat'  
outprint='popout12.prt'  
/
```

&poptype

```
atype(1)='vulnerable'  
atype(2)='nonvul+mob'  
atype(3)='backgrnd'  
/
```

&fraction

```
frc(1,1)=0.15 frc(1,2)=0.10 frc(1,3)=0.50 frc(1,4)=0.25  
frc(2,1)=0.15 frc(2,2)=0.10 frc(2,3)=0.50 frc(2,4)=0.25  
frc(3,1)=0.09 frc(3,2)=0.09 frc(3,3)=0.06 frc(3,4)=0.02
```

/

&timeint

```
int1(2)=0.0 int1(2)=240.0 int1(3)=320.0 int1(4)=480.0 int1(5)=720.0  
int2(1)=0.0 int2(2)=75.0 int2(3)=150.0 int2(4)=225.0 int2(5)=300.0
```

/

```
194,155,331,129,467,092,030,370,274,077,086,359,383,381,078,079,083,084,387,085,076,057,081,082,0  
90,091,098,099,126,185,167,209,266,281,280,276,275,325,331,151,250,235,397,169,026,027,028,029,24  
2,250,072
```

POPOPT13 Rhode Island Weak Storm Mid-Peak Traffic, Rapid Response

&files

```
filename(1)='weak_w.dat'  
filename(2)='mnswk_w.dat'  
filename(3)='backgr_w.dat'  
outfile='popout13.dat'  
outprint='popout13.prt'
```

/

&poptype

```
atype(1)='vulnerable'  
atype(2)='nonvul+mob'  
atype(3)='backgrnd'
```

/

&fraction

```
frc(1,1)=0.15 frc(1,2)=0.10 frc(1,3)=0.50 frc(1,4)=0.25  
frc(2,1)=0.15 frc(2,2)=0.10 frc(2,3)=0.50 frc(2,4)=0.25  
frc(3,1)=0.05 frc(3,2)=0.34 frc(3,3)=0.13 frc(3,4)=0.10
```

/

&timeint

```
int1(2)=840.0 int1(2)=960.0 int1(3)=1000.0 int1(4)=1080.0 int1(4)=1200.0  
int2(1)=0.0 int2(2)=240.0 int2(3)=540.0 int2(4)=690.0 int2(5)=840.0
```

/

194,155,331,129,467,092,030,370,274,077,086,359,383,381,078,079,083,084,387,085,076,057,081,082,0
90,091,098,099,126,185,167,209,266,281,280,276,275,325,331,151,250,235,397,169,026,027,028,029,24
2,250,072

POPOPT14 Rhode Island Weak Storm Mid-Peak Traffic, Moderate Response

&files

```
filename(1)='weak_w.dat'  
filename(2)='mnswk_w.dat'  
filename(3)='backgr_w.dat'  
outfile='popout14.dat'  
outprint='popout14.prt'
```

/

&poptype

```
atype(1)='vulnerable'  
atype(2)='nonvul+mob'  
atype(3)='backgrnd'
```

/

&fraction

```
frc(1,1)=0.15 frc(1,2)=0.10 frc(1,3)=0.50 frc(1,4)=0.25  
frc(2,1)=0.15 frc(2,2)=0.10 frc(2,3)=0.50 frc(2,4)=0.25  
frc(3,1)=0.05 frc(3,2)=0.34 frc(3,3)=0.13 frc(3,4)=0.10
```

/

&timeint

```
int1(2)=660.0 int1(2)=840.0 int1(3)=900.0 int1(4)=1020.0 int1(5)=1200.0  
int2(1)=0.0 int2(2)=240.0 int2(3)=540.0 int2(4)=690.0 int2(5)=840.0
```

/

194,155,331,129,467,092,030,370,274,077,086,359,383,381,078,079,083,084,387,085,076,057,081,082,0
90,091,098,099,126,185,167,209,266,281,280,276,275,325,331,151,250,235,397,169,026,027,028,029,24
2,250,072

POPOPT15 Rhode Island Weak Storm Mid-Peak Traffic, Slow Response

```
&files
filename(1)='weak_w.dat'
filename(2)='mnswk_w.dat'
filename(3)='backgr_w.dat'
outfile='popout15.dat'
output='popout15.prt'
/
&poptype
atype(1)='vulnerable'
atype(2)='nonvul+mob'
atype(3)='background'
/
&fraction
frc(1,1)=0.15 frc(1,2)=0.10 frc(1,3)=0.50 frc(1,4)=0.25
frc(2,1)=0.15 frc(2,2)=0.10 frc(2,3)=0.50 frc(2,4)=0.25
frc(3,1)=0.05 frc(3,2)=0.34 frc(3,3)=0.13 frc(3,4)=0.10
/
&timeint
int1(2)=480.0 int1(2)=720.0 int1(3)=800.0 int1(4)=960.0 int1(5)=1200.0
int2(1)=0.0 int2(2)=240.0 int2(3)=540.0 int2(4)=690.0 int2(5)=840.0
/
194,155,331,129,467,092,030,370,274,077,086,359,383,381,078,079,083,084,387,085,076,057,081,082,0
90,091,098,099,126,185,167,209,266,281,280,276,275,325,331,151,250,235,397,169,026,027,028,029,24
2,250,072
```

POPOPT16 Rhode Island Weak Storm Peak Traffic, Rapid Response

```
&files
filename(1)='weak_w.dat'
filename(2)='mnswk_w.dat'
filename(3)='backgr_w.dat'
outfile='popout16.dat'
output='popout16.prt'
/
&poptype
atype(1)='vulnerable'
atype(2)='nonvul+mob'
atype(3)='background'
/
&fraction
frc(1,1)=0.15 frc(1,2)=0.10 frc(1,3)=0.50 frc(1,4)=0.25
frc(2,1)=0.15 frc(2,2)=0.10 frc(2,3)=0.50 frc(2,4)=0.25
frc(3,1)=0.05 frc(3,2)=0.35 frc(3,3)=0.31 frc(3,4)=0.12
/
&timeint
int1(2)=870.0 int1(2)=990.0 int1(3)=1030.0 int1(4)=1110.0 int1(5)=1230.0
int2(1)=0.0 int2(2)=240.0 int2(3)=540.0 int2(4)=720.0 int2(5)=870.0
/
194,155,331,129,467,092,030,370,274,077,086,359,383,381,078,079,083,084,387,085,076,057,081,082,0
90,091,098,099,126,185,167,209,266,281,280,276,275,325,331,151,250,235,397,169,026,027,028,029,24
2,250,072
```

POPOPT17 Rhode Island Weak Storm Peak Traffic, Moderate Response

```
&files
filename(1)='weak_w.dat'
filename(2)='mnswk_w.dat'
filename(3)='backgr_w.dat'
outfile='popout17.dat'
outputprt='popout17.prt'
/
&poptype
atype(1)='vulnerable'
atype(2)='nonvul+mob'
atype(3)='background'
/
&fraction
frc(1,1)=0.15 frc(1,2)=0.10 frc(1,3)=0.50 frc(1,4)=0.25
frc(2,1)=0.15 frc(2,2)=0.10 frc(2,3)=0.50 frc(2,4)=0.25
frc(3,1)=0.05 frc(3,2)=0.35 frc(3,3)=0.31 frc(3,4)=0.12
/
&timeint
int1(2)=690.0 int1(2)=870.0 int1(3)=930.0 int1(4)=1050.0 int1(5)=1230.0
int2(1)=0.0 int2(2)=240.0 int2(3)=540.0 int2(4)=720.0 int2(5)=870.0
/
194,155,331,129,467,092,030,370,274,077,086,359,383,381,078,079,083,084,387,085,076,057,081,082,0
90,091,098,099,126,185,167,209,266,281,280,276,275,325,331,151,250,235,397,169,026,027,028,029,24
2,250,072
```

POPOPT18 Rhode Island Weak Storm Peak Traffic, Slow Response

```
&files
filename(1)='weak_w.dat'
filename(2)='mnswk_w.dat'
filename(3)='backgr_w.dat'
outfile='popout18.dat'
outputprt='popout18.prt'
/
&poptype
atype(1)='vulnerable'
atype(2)='nonvul+mob'
atype(3)='background'
/
&fraction
frc(1,1)=0.15 frc(1,2)=0.10 frc(1,3)=0.50 frc(1,4)=0.25
frc(2,1)=0.15 frc(2,2)=0.10 frc(2,3)=0.50 frc(2,4)=0.25
frc(3,1)=0.05 frc(3,2)=0.35 frc(3,3)=0.31 frc(3,4)=0.12
/
&timeint
int1(2)=510.0 int1(2)=750.0 int1(3)=830.0 int1(4)=990.0 int1(5)=1230.0
int2(1)=0.0 int2(2)=240.0 int2(3)=540.0 int2(4)=720.0 int2(5)=870.0
/
194,155,331,129,467,092,030,370,274,077,086,359,383,381,078,079,083,084,387,085,076,057,081,082,0
90,091,098,099,126,185,167,209,266,281,280,276,275,325,331,151,250,235,397,169,026,027,028,029,24
2,250,072
```

East Bay Massachusetts Network POPDIS Input Files

Background Traffic

114SOUTH	3	15000	1.00	089	15	093	45	099	40
114NORTH	3	12000	1.00	090	50	098	50		
24SOUTH	3	22500	1.00	074	70	092	30		
24NORTH	3	11500	1.00	091	71	097	29		
77SOUTH	3	300	1.00	315	100				
77NORTH	3	1600	1.00	310	100				
81NORTH	3	1600	1.00	086	100				
81SOUTH	3	2000	1.00	081	100				
88NORTH	3	3500	1.00	087	100				
88SOUTH	3	1000	1.00	376	100				
6EAST	3	31000	1.00	111	45	083	13	084	42
6WEST	3	17000	1.00	072	85	082	15		
195EAST	3	30150	1.00	110	99	085	01		
195WEST	3	16700	1.00	071	100				
140SOUTH	3	13000	1.00	073	100				
140NORTH	3	7000	1.00	096	100				
138NORTH	3	13500	1.00	076	64	164	36		
138SOUTH	3	7000	1.00	080	100				
44WEST	3	8000	1.00	075	100				
44EAST	3	5000	1.00	088	100				
177EAST	3	1000	1.00	094	100				
177WEST	3	2800	1.00	095	100				
95SOUTH	3	0	1.00	070	100				

Severe Storm Surge Vulnerable Population File

101.01	1	91	2.12	103	100				
101.02	1	149	2.12	103	100				
102	1	193	2.12	110	100				
103	1	795	2.12	105	50	125	50		
104	1	372	2.12	109	100				
105.01	1	611	2.12	124	50	126	50		
105.02	1	84	2.12	123	100				
106	1	2596	2.12	118	34	119	33	120	33
107.01	1	144	2.12	117	100				
107.02	1	1492	2.12	119	100				
301	1	2267	1.88	170	25	171	25	172	25
302	1	2685	1.88	178	34	179	33	058	33
303	1	4127	1.88	059	16	060	16	061	17
304	1	3417	1.88	173	20	174	20	175	20
305	1	3256	2.02	190	20	191	20	192	20
306.01	1	2129	2.02	190	25	198	25	199	25
306.02	1	1371	2.02	192	50	193	50		
307	1	941	2.12	112	100				
308	1	1439	2.12	215	100				
309.01	1	502	2.12	196	100				
309.02	1	1895	2.12	282	34	283	33	382	33
401.01	1	3535	1.85	230	20	231	20	235	20
401.02	1	1213	1.85	251	20	252	20	284	20
401.03	1	158	1.85	230	100				
402	1	338	2.30	260	50	272	50		
403.02	1	291	2.30	267	100				
403.03	1	107	2.30	261	50	271	50		
404	1	680	2.30	274	25	275	25	276	25
405	1	860	2.34	281	50	282	50		
406	1	156	2.34	287	100				
407	1	356	2.34	276	50	292	50		
408	1	81	2.34	292	100				
409	1	2909	2.34	294	25	295	25	296	25

Severe Storm Surge Vulnerable Population File(con't.)

410	1	1562	2.34	290	50	291	50								
411	1	1795	2.34	283	34	288	33	289	33						
412	1	1809	2.34	280	34	281	33	283	33						
413	1	2131	1.69	304	20	301	20	300	20	305	20	307	20		
414	1	869	1.63	311	100										
416.01	1	337	1.80	324	100										
416.02	1	592	1.80	319	100										
417	1	1197	1.80	313	50	314	50								
6322	1	482	1.83	128	100										
6332	1	579	1.85	141	100										
6403	1	394	2.72	324	100										
6404	1	82	2.72	330	100										
6405	1	257	2.72	330	100										
6409	1	653	2.72	329	25	330	75								
6410	1	841	2.72	329	100										
6420	1	613	2.72	351	100										
6421	1	1392	2.72	366	34	367	33	350	33						
6422	1	138	2.72	366	100										
6441	1	3324	1.90	159	34	162	33	163	33						
6451	1	4807	1.90	142	20	140	20	198	20	153	20	133	20		
6461	1	1744	1.85	387	50	323	50								
6503	1	849	2.84	457	100										
6504	1	372	2.84	458	100										
6506	1	712	2.84	458	100										
6507	1	525	2.84	455	100										
6511	1	23	2.84	455	100										
6512	1	1053	2.84	454	50	455	50								
6513	1	37	2.84	453	100										
6518	1	314	2.84	452	100										
6519	1	1639	2.84	449	50	459	50								
6520	1	1618	2.84	449	50	459	50								
6521	1	100	2.84	449	100										
6524	1	1433	2.84	451	50	490	50								
6525	1	2661	2.84	427	34	490	33	491	33						
6526	1	3006	2.84	492	34	493	33	494	33						
6527	1	2176	2.84	495	34	496	33	448	33						
6528	1	1190	2.84	448	25	450	75								
6532	1	157	2.26	426	50	393	50								
6533	1	3043	2.26	421	16	422	16	423	17	410	17	424	17	446	17
6541	1	681	1.96	473	100										
6542	1	133	1.96	472	100										
6551	1	1161	2.12	465	50	470	50								
6552	1	2890	2.12	498	34	499	33	500	33						
6553	1	2627	2.12	464	25	497	25	499	25	470	25				
6554	1	4419	2.12	460	20	461	20	462	20	463	20	469	20		

Weak Storm Surge Vulnerable Population File

101.01	1	48	2.12	103	100						
101.02	1	66	2.12	103	100						
102	1	91	2.12	110	100						
103	1	353	2.12	105	50	125	50				
104	1	242	2.12	109	100						
105.01	1	470	2.12	124	50	126	50				
105.02	1	74	2.12	123	100						
106	1	2158	2.12	118	34	119	33	120	33		
107.01	1	110	2.12	117	100						
107.02	1	1128	2.12	119	100						
301	1	1270	1.88	170	25	171	25	172	25	173	25

East Bay Massachusetts Network POPDIS Input Files

Weak Storm Surge Vulnerable Population File(con't.)

302	1	1722	1.88	178	34	179	33	058	33						
303	1	3668	1.88	059	16	060	16	061	17	062	17	063	17	064	17
304	1	2305	1.88	173	20	174	20	175	20	176	20	177	20		
305	1	2210	2.02	190	20	191	20	192	20	193	20	199	20	200	20
306.01	1	1569	2.02	190	25	198	25	199	25	057	25				
306.02	1	869	2.02	192	50	193	50								
307	1	429	2.12	112	100										
308	1	743	2.12	215	100										
309.01	1	400	2.12	196	100										
309.02	1	1410	2.12	282	34	283	33	382	33						
401.01	1	3088	1.85	230	20	231	20	235	20	251	20	252	20		
401.02	1	1078	1.85	251	20	252	20	284	20	258	20	259	20		
401.03	1	117	1.85	230	100										
402	1	226	2.30	260	50	272	50								
403.02	1	129	2.30	267	100										
403.03	1	48	2.30	261	50	271	50								
404	1	438	2.30	274	25	275	25	276	25	273	25				
405	1	714	2.34	281	50	282	50								
406	1	69	2.34	287	100										
407	1	233	2.34	276	50	292	50								
408	1	72	2.34	292	100										
409	1	2188	2.34	294	25	295	25	296	25	293	25				
410	1	962	2.34	290	50	291	50								
411	1	1595	2.34	283	34	288	33	289	33						
412	1	1469	2.34	280	34	281	33	283	33						
413	1	1636	1.69	304	20	301	20	300	20	305	20	307	20		
414	1	652	1.63	311	100										
416.01	1	174	1.80	324	100										
416.02	1	526	1.80	319	100										
417	1	974	1.80	313	50	314	50								
6322	1	328	1.83	128	100										
6332	1	408	1.85	141	100										
6403	1	253	2.72	324	100										
6404	1	46	2.72	330	100										
6405	1	182	2.72	330	100										
6409	1	293	2.72	329	25	330	75								
6410	1	554	2.72	329	100										
6420	1	273	2.72	351	100										
6421	1	855	2.72	366	34	367	33	350	33						
6422	1	61	2.72	366	100										
6441	1	2955	1.90	159	34	162	33	163	33						
6451	1	4273	1.90	142	20	140	20	198	20	153	20	133	20		
6461	1	1550	1.85	387	50	323	50								
6503	1	1	2.84	457	100										
6504	1	1	2.84	458	100										
6506	1	1	2.84	458	100										
6507	1	1	2.84	455	100										
6511	1	1	2.84	455	100										
6512	1	1	2.84	454	50	455	50								
6513	1	1	2.84	453	100										
6518	1	1	2.84	452	100										
6519	1	1	2.84	449	50	459	50								
6520	1	1	2.84	449	50	459	50								
6521	1	1	2.84	449	100										
6524	1	374	2.84	451	50	490	50								
6525	1	1	2.84	427	34	490	33	491	33						
6526	1	1	2.84	492	34	493	33	494	33						
6527	1	243	2.84	495	34	496	33	448	33						

Weak Storm Surge Vulnerable Population File(con't.)

6528	1	1058	2.84	448	25	450	75								
6533	1	2560	2.26	421	16	422	16	423	17	410	17	424	17	446	17
6541	1	1	1.96	473	100										
6542	1	1	1.96	472	100										
6551	1	1032	2.12	465	50	470	50								
6552	1	1	2.12	498	34	499	33	500	33						
6553	1	1	2.12	464	25	497	25	499	25	470	25				
6554	1	2815	2.12	460	20	461	20	462	20	463	20	469	20		

Severe Storm Mobile Home and Non-Surge Vulnerable Population File

ACUSHN	2	980	1.96	471	33	472	33	473	34	476					
DARTMH	2	1360	2.26	394	20	418	20	412	20	392	20	391	20		
FAIRH	2	300	2.12	463	25	464	25	497	25	469	25				
FALLR	2	4490	2.72	344	20	352	20	035	20	012	20	013	20		
NEWBED	2	4180	2.84	432	20	007	20	431	20	477	20	415	20		
REHOB	2	410	1.85	030	25	029	25	028	25	027	25				
SEEK	2	630	1.83	133	50	128	50								
SOMER	2	750	1.90	164	33	163	33	162	34						
SWAN	2	680	1.90	142	33	025	33	156	34						
WEST	2	770	1.85	388	33	386	33	400	34						
BARR	2	110	1.88	170	20	172	20	176	20	060	20	063	20		
BRIS	2	860	2.12	214	20	210	20	221	20	196	20	197	20		
E.PROV	2	2320	2.12	023	20	021	20	122	20	130	20	125	20		
JAMES	2	200	1.69	304	33	301	33	306	34						
L.COMP	2	340	1.63	311	50	312	50								
MIDDLE	2	1330	2.30	261	25	271	25	266	25	250	25				
NEWP	2	969	2.34	295	20	294	20	287	20	284	20	280	20		
PORT	2	1670	1.85	244	20	247	20	245	20	243	20	230	20		
TIVER	2	1300	1.80	321	33	319	33	320	34						
WAR	2	220	2.02	198	33	057	33	190	34						

Weak Storm Mobile Home and Non-Surge Vulnerable Population File

ACUSHN	2	830	1.96	471	33	472	33	473	34	476					
DARTMH	2	620	2.26	394	20	418	20	412	20	392	20	391	20		
FAIRH	2	150	2.12	463	25	464	25	497	25	469	25				
FALLR	2	1850	2.72	344	20	352	20	035	20	012	20	013	20		
NEWBED	2	1770	2.84	432	20	007	20	431	20	477	20	415	20		
REHOB	2	170	1.85	030	25	029	25	028	25	027	25				
SEEK	2	250	1.83	133	50	128	50								
SOMER	2	290	1.90	164	33	163	33	162	34						
SWAN	2	220	1.90	142	33	025	33	156	34						
WEST	2	360	1.85	388	33	386	33	400	34						
BARR	2	40	1.88	170	20	172	20	176	20	060	20	063	20		
BRIS	2	350	2.12	214	20	210	20	221	20	196	20	197	20		
E.PROV	2	1330	2.12	023	20	021	20	122	20	130	20	125	20		
JAMES	2	80	1.69	304	33	301	33	306	34						
L.COMP	2	250	1.63	311	50	312	50								
MIDDLE	2	800	2.30	261	25	271	25	266	25	250	25				
NEWP	2	390	2.34	295	20	294	20	287	20	284	20	280	20		
PORT	2	1310	1.85	244	20	247	20	245	20	243	20	230	20		
TIVER	2	950	1.80	321	33	319	33	320	34						
WAR	2	90	2.02	198	33	057	33	190	34						

ANNEX C:

**WEST BAY/RHODE ISLAND AND EAST BAY/MASSACHUSETTS
NETWORK SENSITIVITY ANALYSIS SUPPORT**

TABLE AC-1:

SUMMARY OF CLEARANCE TIME SENSITIVITY TO A 20% INCREASE
IN EVACUATING TRAFFIC (SEVERE HURRICANE SCENARIO)

	BACKGROUND TRAFFIC CONDITION					
	Off-peak		Mid-peak		Peak	
<u>WEST BAY/RHODE ISLAND NETWORK</u>	B.C.*	S.A.**	B.C.*	S.A.**	B.C.*	S.A.**
Rapid Response	4:35	5:15	4:42	***	5:33	6:57
Moderate Response	6:10	***	6:13	***	7:37	***
Slow Response	8:04	8:06	8:04	***	9:38	10:00
<u>EAST BAY/MASSACHUSETTS NETWORK</u>						
Rapid Response	5:07	5:45	5:33	***	5:44	6:20
Moderate Response	6:06	***	6:47	***	7:15	***
Slow Response	8:03	8:08	8:11	***	8:36	9:35

* B.C. = Base Condition

** S.A. = Sensitivity Analysis

*** = Scenario was not simulated

TABLE AC-2:

SUMMARY OF CLEARANCE TIME SENSITIVITY TO A 2-HOUR
DECREASE IN EVACUEE RESPONSE TIME (SEVERE HURRICANE SCENARIO)

	BACKGROUND TRAFFIC CONDITION					
	Off-peak		Mid-peak		Peak	
<u>WEST BAY/RHODE ISLAND NETWORK</u>	B.C.*	S.A.**	B.C.*	S.A.**	B.C.*	S.A.**
2-Hour Decrease In Rapid Response Time	4:35	4:28	4:35	***	5:33	5:33
<u>EAST BAY/MASSACHUSETTS NETWORK</u>						
2-Hour Decrease In Response Time	5:07	4:21	4:26	***	5:44	5:16

* B.C. = Base Condition

** S.A. = Sensitivity Analysis

*** = Scenario was not simulated

TABLE AC-3:

SUMMARY OF CLEARANCE TIME SENSITIVITY TO A 50% REDUCTION
IN COMMUNITY SHELTER USE (SEVERE HURRICANE SCENARIO)

	BACKGROUND TRAFFIC CONDITION					
	Off-peak		Mid-peak		Peak	
<u>WEST BAY/RHODE ISLAND NETWORK</u>	B.C.*	S.A.**	B.C.*	S.A.**	B.C.*	S.A.**
Rapid Response	4:35	4:39	4:42	***	5:33	6:09
Moderate Response	6:10	***	6:13	***	7:37	***
Slow Response	8:04	8:06	8:04	***	9:38	10:14
<u>EAST BAY/MASSACHUSETTS NETWORK</u>						
Rapid Response	5:07	5:10	5:33	***	5:44	6:04
Moderate Response	6:06	***	6:47	***	7:15	***
Slow Response	8:03	8:04	8:11	***	8:36	8:41

* B.C. = Base Condition

** S.A. = Sensitivity Analysis

*** = Scenario was not simulated