Step 15.
This activity implements the changes in control treatments or in the assignment of destinations associated with one or more origins in order to improve the representation of traffic flow over the network. These treatments can also include the consideration of adding roadway segments to the existing analysis network to improve the representation of the physical system.

Step 16.
Once the treatments have been identified, it is necessary to modify the simulation model input stream accordingly. At the completion of this effort, the procedure returns to Step 13 to execute the simulation model again.

Step 17.
The simulation results are analyzed, tabulated and graphed. The results are then documented, as required.

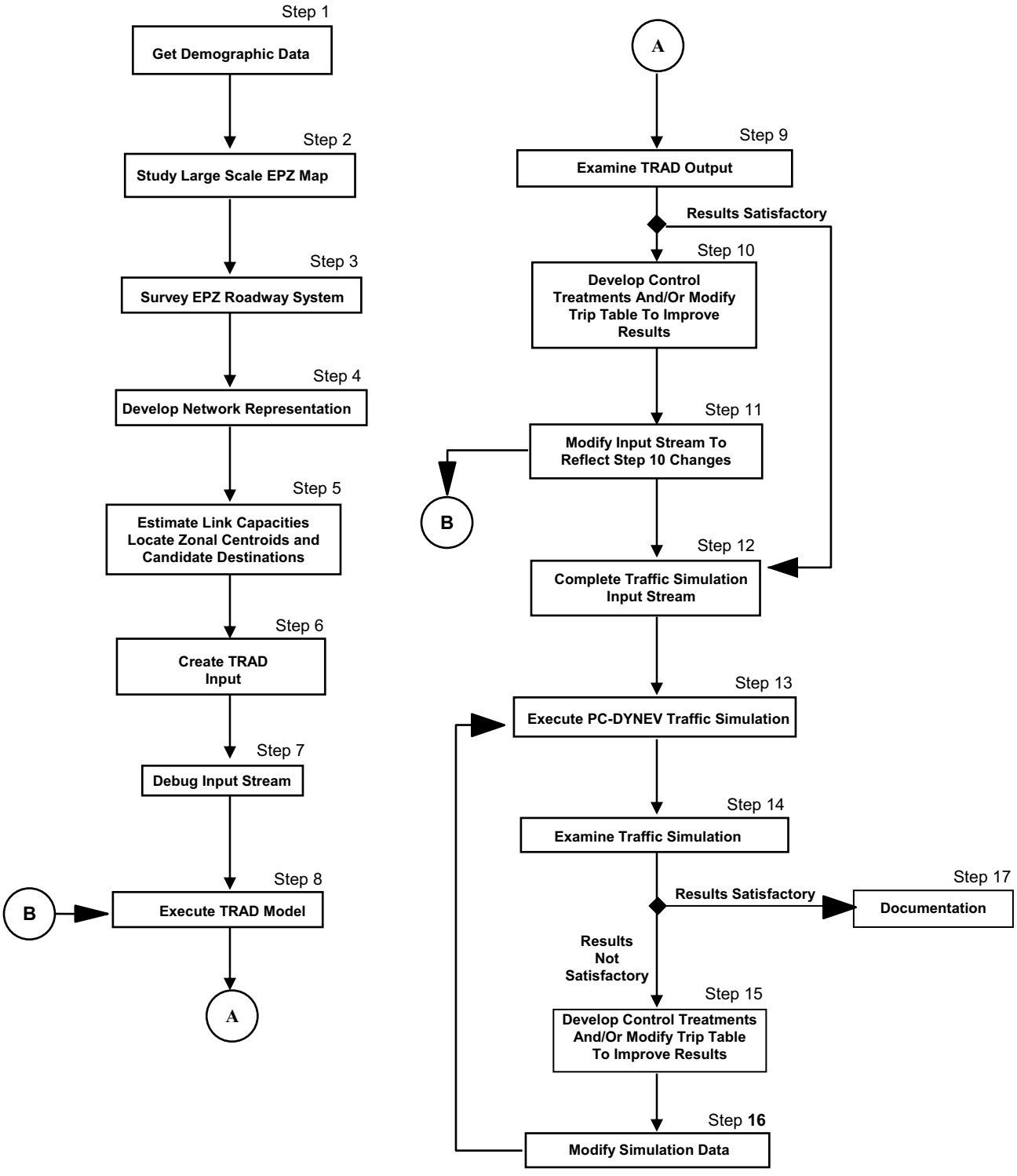


Figure D-1. Flow Diagram of Activities

APPENDIX E

Special Facility Data

APPENDIX E: SPECIAL FACILITY DATA

The following tables list population information for special facilities that are located within the SSES/Bell Bend EPZ. Special facilities are defined as schools, medical care facilities, correctional facilities, and major employers. Transient population data are included in the tables for parks, hotels and motels, hunting, fishing and campgrounds. Each table is grouped by county. The location of the facility is described by its straight-line distance (miles) and direction (magnetic bearing) from the existing SSES site.

SSES/BELL BEND EPZ: Schools (Page 1 of 2)							
Distance (miles)	Dir-ection	School Name	Street Address	City/Town	Phone	Student Enrollment	Staff
LUZERNE COUNTY							
4.2	N	Garrison Memorial Elementary School	43 W Vine St	Shickshinny	(570) 542-7001	160	13
4.5	SW	Salem Elementary School	810 E 10th St	Berwick	(570) 759-6400	462	30
6.7	N	Northwest Area High School	243 Thorne Hill Rd	Shickshinny	(570) 542-4126	668	44
7.6	N	Hunlock Creek Elementary School	21 Sunset Lake Rd	Shickshinny	(570) 256-3649	284	19
7.9	SE	Keystone Job Corp High School	P.O.Box 37	Hazleton	(570) 788-0255	600	18
8.0	SE	Valley Elementary/Middle School	79 Rock Glen Rd	Sugarloaf	(570) 788-6044	1109	67
8.3	NW	Huntington Mills Elementary School	417 Shickshinny Lake Rd	Shickshinny	(570) 864-3461	308	18
9.4	SE	Drums Elementary/Middle School	85 S Old Turnpike Rd	Drums	(570) 788-1991	731	39
9.6	NE	K M Smith Elementary School	25 Robert St	Nanticoke	(570) 735-3740	322	16
9.8	E	Rice Elementary School	3700 Church Rd	Mountain Top	(570) 868-3161	790	45
9.9	NE	The Learning Station School	133 Alden St	Nanticoke	(570) 735-7998	42	2
9.9	N	Muhlenburg Christian Academy	362 Hunlock-Harveyville Rd	Hunlock Creek	(570) 256-3378	75	15
10.4	NE	Pope John Paul II Catholic School	518 S Hanover St	Nanticoke	(570) 735-7935	320	16
11.1	NE	GNA Elementary School	601 Kosciuszko St	Nanticoke	(570) 735-1320	443	27
11.1	NE	JFK Elementary School	513 Kosciuszko St	Nanticoke	(570) 735-6450	132	7
11.1	NE	GNA Educational Center	600 E. Union St	Nanticoke	(570) 732-2770	324	18
11.2	NE	Greater Nanticoke High School	425 Kosciuszko St	Nanticoke	(570) 735-7781	953	47
					Sub-total:	**7,723**	**441**

SSES/BELL BEND EPZ: Schools (Page 2 of 2)							
COLUMBIA COUNTY							
Distance (miles)	**Direction**	**School Name**	**Street Address**	**City/Town**	**Phone**	**Student Enrollment**	**Staff**
4.5	SW	Nescopeck Elementary School	315 Dewey St	Nescopeck	(570) 759-6426	276	20
4.6	SW	Berwick Area Middle School	1100 Evergreen Dr	Berwick	(570) 759-6400	897	61
4.7	SW	Berwick Senior High School	1100 Fowler Ave	Berwick	(570) 759-6400	992	74
5.0	SW	Heritage Christian Academy	1112 Butternut St	Berwick	(570) 759-2951	24	5
5.4	SW	Fourteenth Street Elementary School	1401 N Market St	Berwick	(570) 759-6429	214	16
5.4	SW	Mulberry Street Elementary School	Sixth St and Mulberry St	Berwick	(570) 759-4372	88	19
6.0	SW	Holy Family Consolidated School	728 Washington St	Berwick	(570) 752-2021	67	9
6.0	SW	Orange Street Elementary School	845 Orange St	Berwick	(570) 759-6422	386	29
12.5	SW	Beaver Main Elementary School	245 Beaver Valley Rd	Bloomsburg	(570) 784 0309	104	18
					Sub-total:	**3,048**	**251**
					Total:	**13,406**	**1,277**

SSES/BELL BEND EPZ: Colleges								
Distance (miles)	**Direction**	**School Name**	**Street Address**	**Municipality**	**Phone**	**Student Enrollment**	**Transient Students**	**Staff**
LUZERNE COUNTY								
9.6	SE	Penn State Hazleton	76 University Dr	Hazleton	(570) 450-3000	1232	757	210
10.7	NE	Luzerne County Community College - Nanticoke	1333 S Prospect St	Nanticoke	(800) 377-5222	1403	1403	375
					Sub-total:	**2,635**	**2,160**	**585**
COLUMBIA COUNTY								
5.3	SW	Luzerne County Community College - Berwick	107 South Market St	Berwick	(570)759-3900	100	100	6
					Sub-total:	**100**	**100**	**6**
					Total:	**2,735**	**2,260**	**591**

Note: There are 475 students residing on campus at Penn State Hazelton. The remaining 757 students and all students at Luzerne County Community College (1403 – Nanticoke, 100 – Berwick) are treated as transients using 1 vehicle per person, resulting in a total of 2260 transient vehicles.

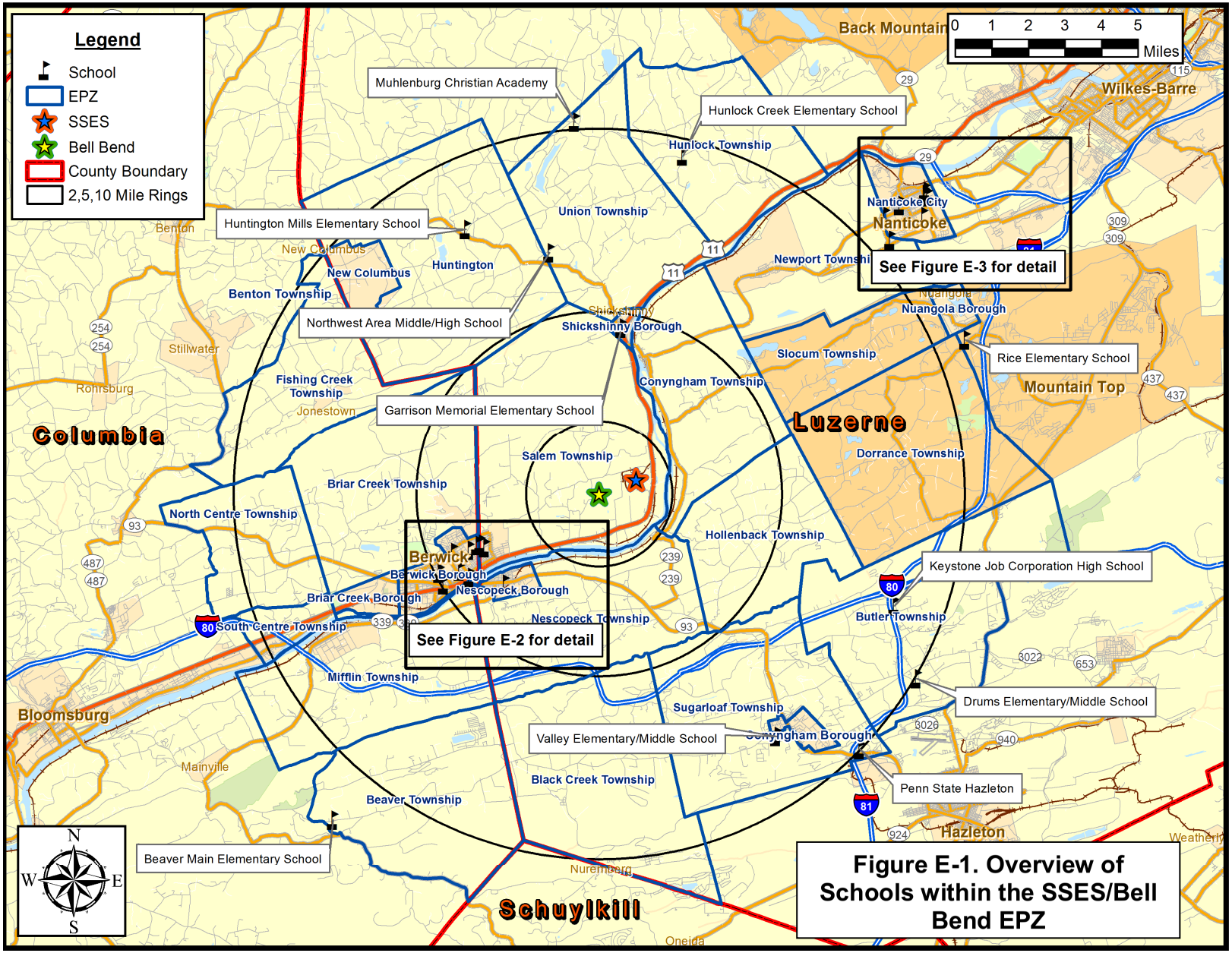
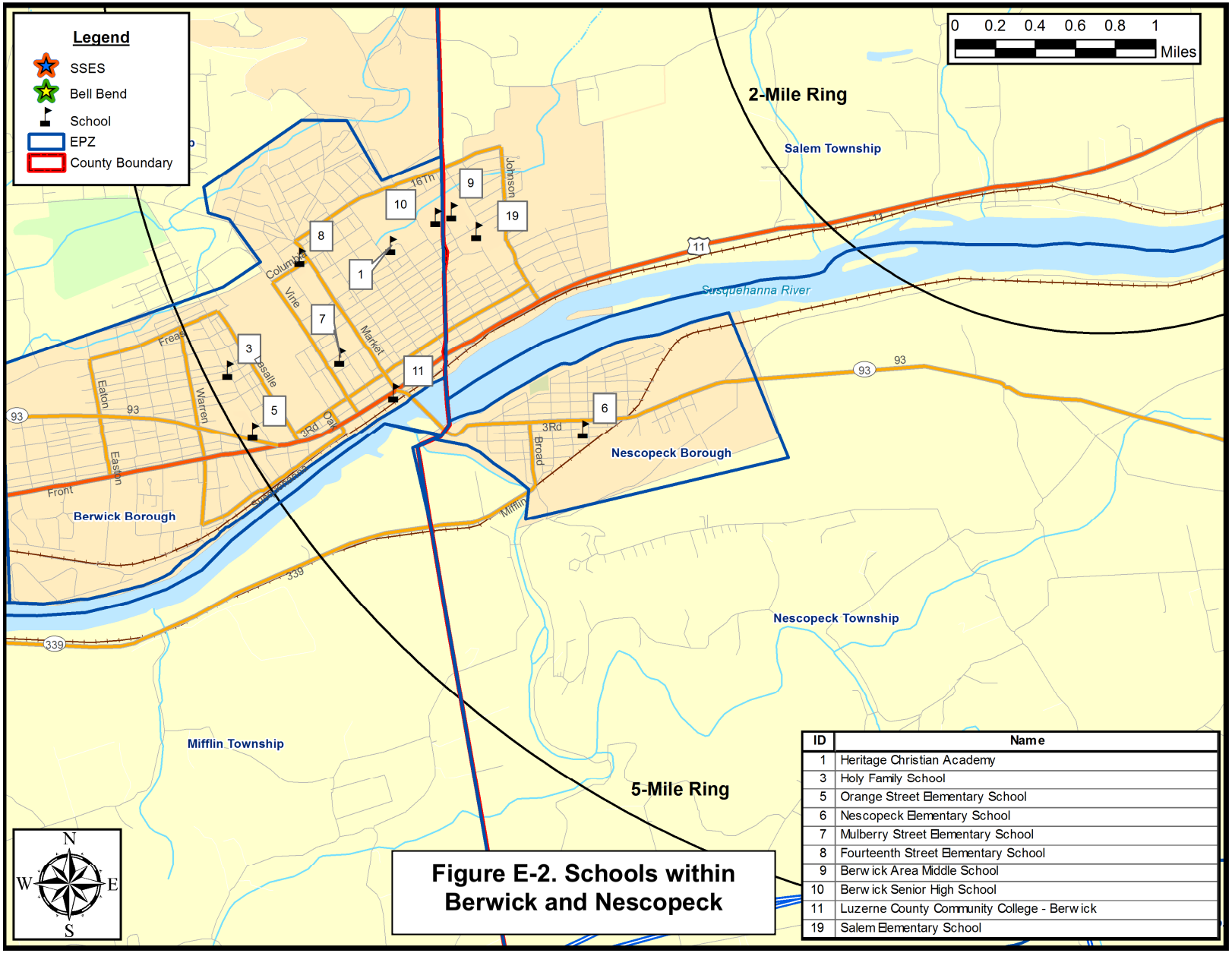


Figure E-1. Overview of Schools within the SSES/Bell Bend EPZ



ID	Name
1	Heritage Christian Academy
3	Holy Family School
5	Orange Street Elementary School
6	Nescopeck Elementary School
7	Mulberry Street Elementary School
8	Fourteenth Street Elementary School
9	Berwick Area Middle School
10	Berwick Senior High School
11	Luzerne County Community College - Berwick
19	Salem Elementary School

Figure E-2. Schools within Berwick and Nescopeck

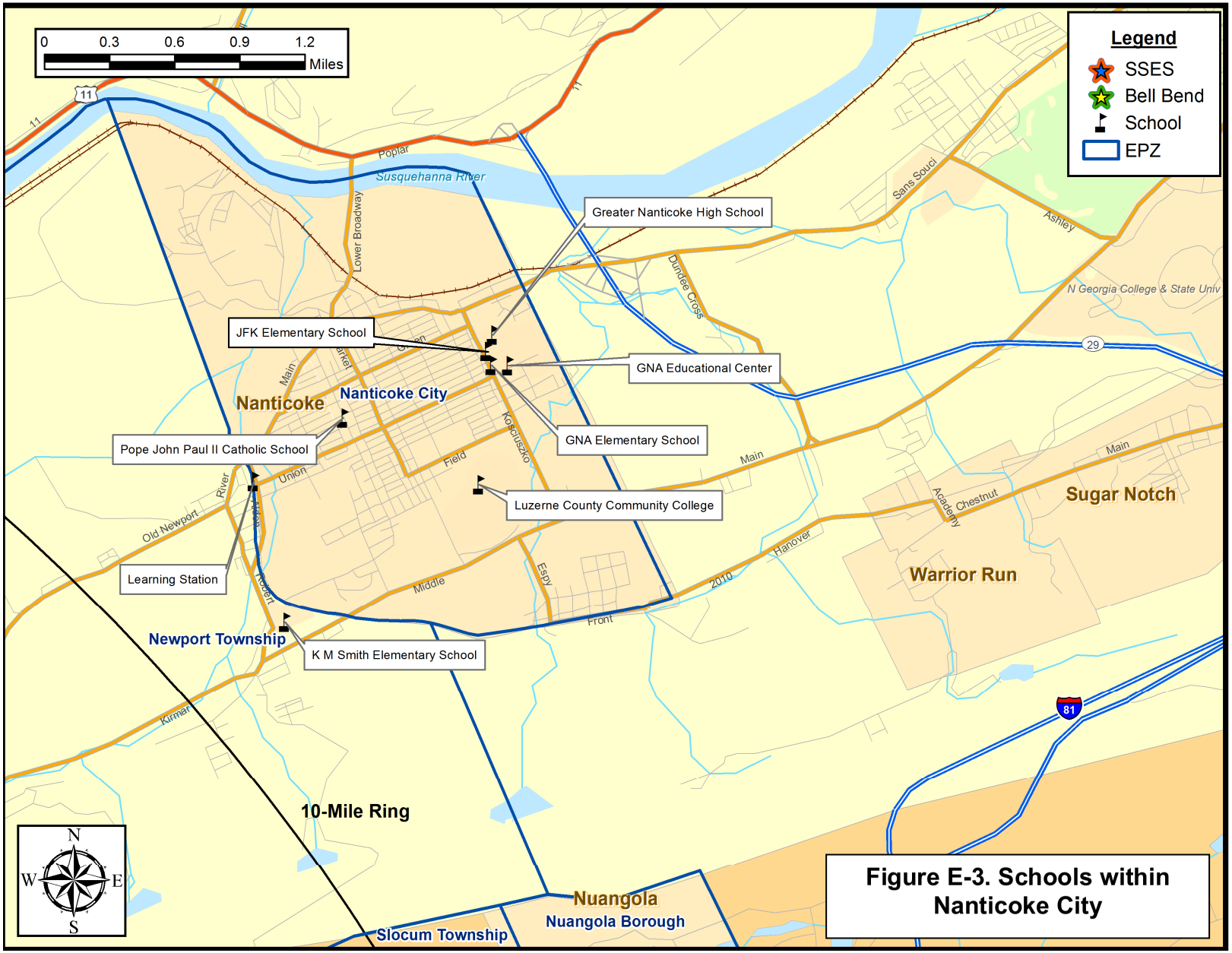


Figure E-3. Schools within Nanticoke City

SSES/BELL BEND EPZ: Major Employers							
Distance (miles)	**Dir-ection**	**Name of Facility**	**Street Address**	**Municipality**	**Phone**	**Total Employees**	**Commuting Employees into EPZ**
LUZERNE COUNTY							
0.0	-	SSES	634 Salem Blvd	Berwick	(866) 832-3312	1,460	424
9.6	SE	Penn State Hazelton	76 University Dr	Hazleton	(570) 450-3000	210	210
10.7	NE	Luzerne Community College	1333 S Prospect St	Nanticoke	(800) 377-5222	375	375
COLUMBIA COUNTY							
4.5	W	Berwick Hospital Center	701 E 16th St	Berwick	(570) 759-5000	600	142
4.5	W	Berwick Retirement Village	801 E 16th St	Berwick	(570) 759-5400	131	31
5.7	SW	Deluxe Building Systems	499 West Third St	Berwick	(866) 891-7310	300	71
6.1	SW	Wise Foods, Inc.	228 Rasely St	Berwick	(570) 759-4100	700	165
7.1	SW	Berwick Offray	2015 West Front St	Berwick	(570) 752-5934	700	165
						4,476	**1,583**

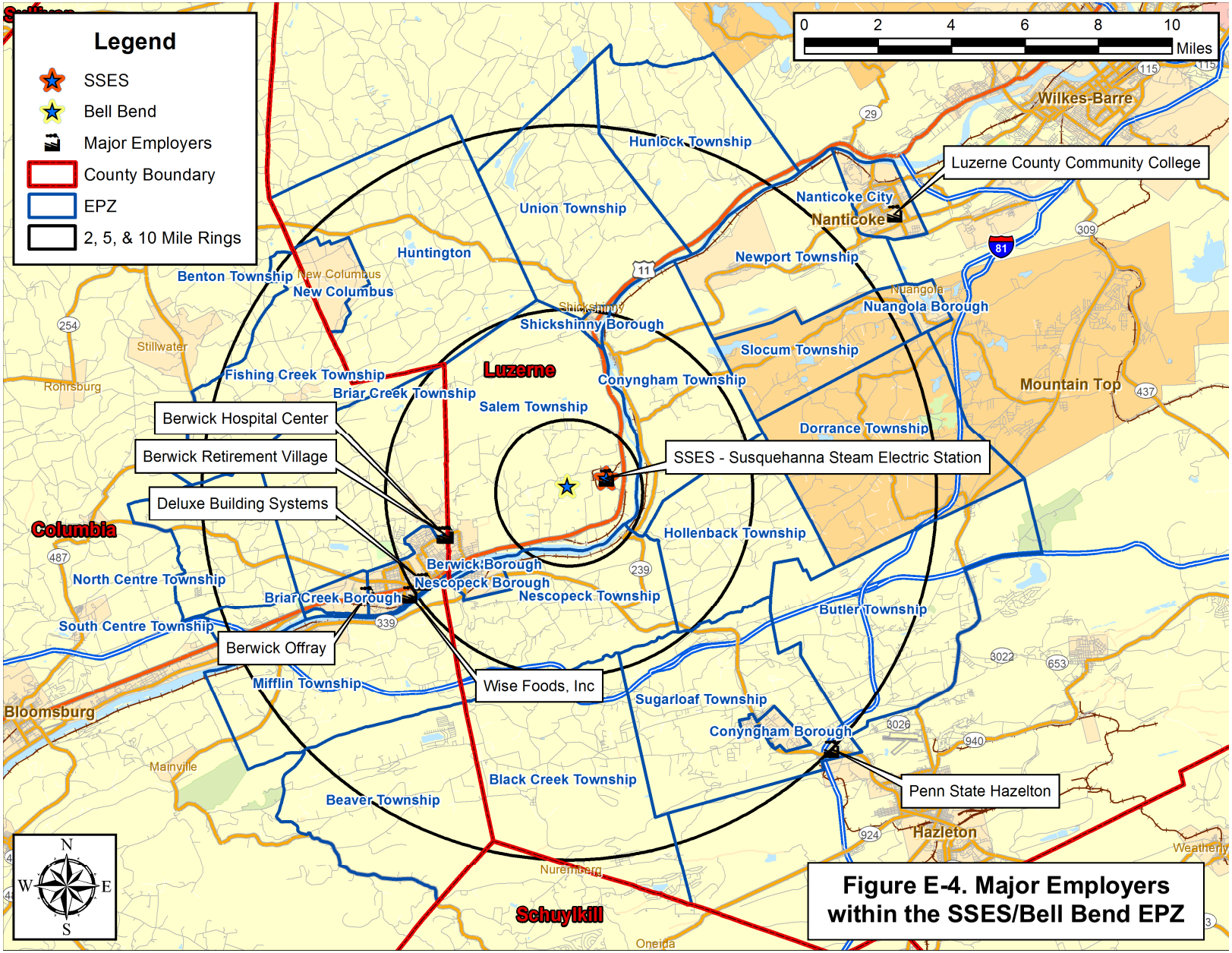
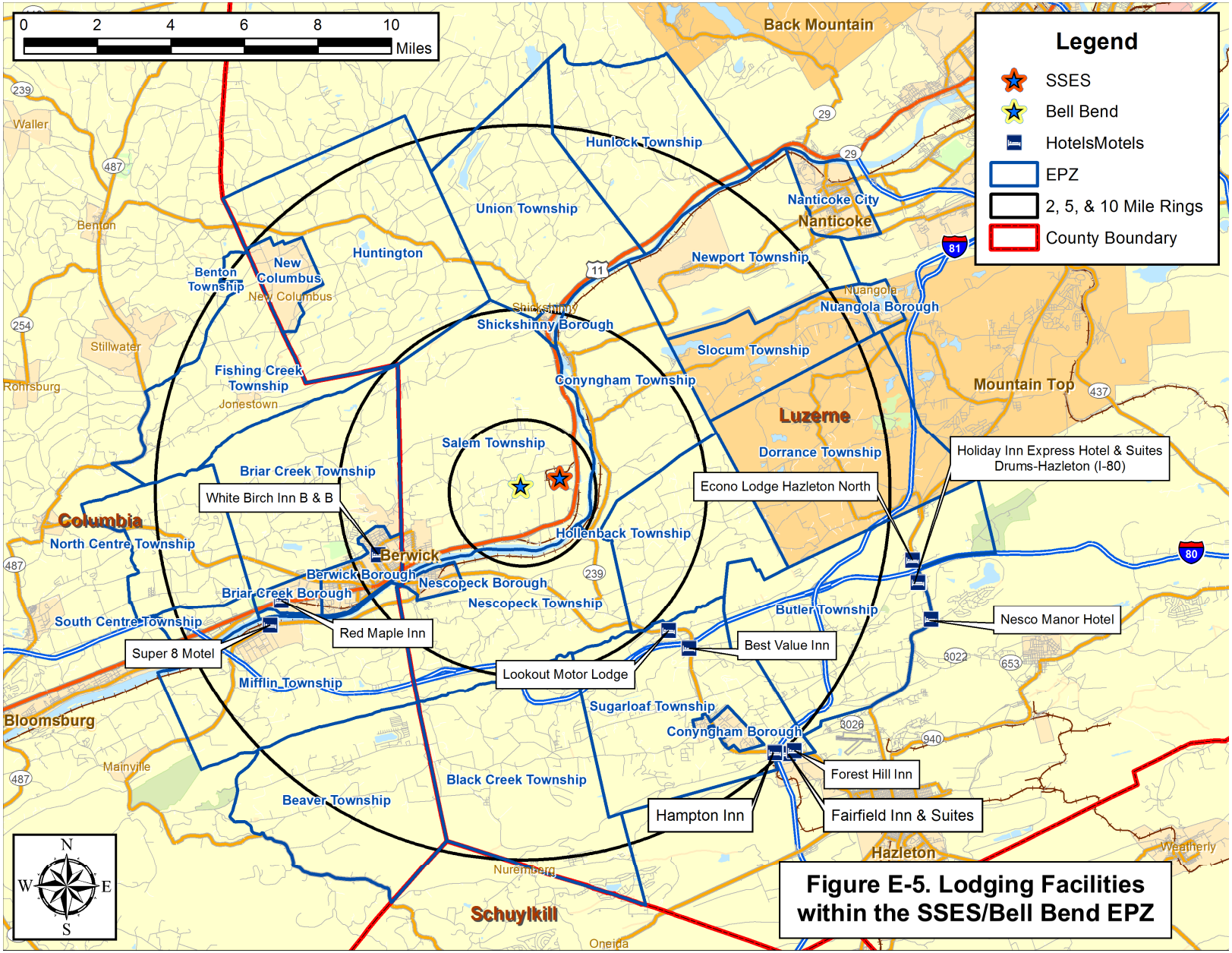


Figure E-4. Major Employers within the SSES/Bell Bend EPZ

SSES/BELL BEND EPZ: LODGING									
Distance (miles)	Dir-ection	Name of Facility	Street Address	Municipality	Phone	# of Rooms	Peak Occupancy Rate[1]	Transients[2]	Transient Vehicles[3]
LUZERNE COUNTY									
5.2	SE	Lookout Motor Lodge	1279 State Route 93	Drums	(570) 788-4131	19	89%	34	17
5.9	SE	Best Value Inn	1064 State Route 93	Drums	(570) 788-5887	63	89%	112	56
9.5	SE	Hampton Inn	1 Top of the 80s Rd	Hazleton	(570) 454-3449	123	90%	222	111
9.8	SE	Fairfield Inn and Suites	1 Woodbine St	Hazleton	(570) 453-0300	100	90%	180	90
9.9	SE	Forest Hill Inn	3 Forest Hill Rd	Hazleton	(570) 459-2730	40	65%	52	26
10.0	E	Econo Lodge Hazleton North	10 Woodmere Dr	Drums	(570) 788-4121	42	100%	84	42
10.1	SE	Holiday Inn Express	1 Corporate Dr	Drums	(877) 863-4780	123	89%	220	110
10.8	SE	Nesco Manor Hotel	214 N Hunter Hwy	Drums	(570) 788-2452	5	89%	10	5
COLUMBIA COUNTY									
5.2	W	White Birch Inn B & B	1303 N Market St	Berwick	(570) 759-8251	5	50%	6	3
8.1	W	Red Maple Inn	7545 Columbia Blvd	Berwick	(570) 752-6220	18	72%	52	26
8.7	W	Super 8 Motel	450 W 3rd St	Mifflinville	(570) 759-6778	55	100%	110	55
					Total:	**593**	**89%**	**1,082**	**541**

[1]Data not available for Lookout Motor Lodge, Best Value Inn, Holiday Inn Express and Nesco Manor Hotel. Weighted Average Peak Occupancy Rate (total number of occupied rooms divided by total number of rooms) for those hotels which did provide data was used for those hotels where data was not available.
[2]2 people per occupied room, except for Red Maple Inn which has 4 people per occupied room.
[3]1 vehicle per occupied room, except for Red Maple Inn which has 2 vehicles per occupied room.


0 2 4 6 8 10
Miles
Legend
SSES
Bell Bend
HotelsMotels
EPZ
2, 5, & 10 Mile Rings
County Boundary
Back Mountain
Hunlock Township
Union Township
Nanticoke City
Nanticoke
Newport Township
Huntington
Benton Township
New Columbus
Benton
Waller
Stillwater
Rohrsburg
Jonestown
Fishing Creek Township
Shickshinny
Shickshinny Borough
Nuangola
Nuangola Borough
Slocum Township
Conyngham Township
Mountain Top
Luzerne
Dorrance Township
Salem Township
Briar Creek Township
White Birch Inn B & B
Holiday Inn Express Hotel & Suites Drums-Hazleton (I-80)
Econo Lodge Hazleton North
Columbia
North Centre Township
Hollenback Township
Berwick
Berwick Borough
Nescopeck Borough
Nescopeck Township
Briar Creek Borough
South Centre Township
Red Maple Inn
Super 8 Motel
Butler Township
Nesco Manor Hotel
Best Value Inn
Lookout Motor Lodge
Mifflin Township
Sugarloaf Township
Conyngham Borough
Bloomsburg
Mainville
Forest Hill Inn
Black Creek Township
Beaver Township
Hampton Inn
Fairfield Inn & Suites
Hazleton
Weatherly
Nuremberg
Schuylkill
Oneida
N
W
E
S
Figure E-5. Lodging Facilities within the SSES/Bell Bend EPZ

SSES/BELL BEND EPZ: CAMPGROUNDS										
Distance (miles)	Dir-ection	Name of Facility	Address	Town	Phone	Available Campsites	Peak Occupancy Rate	% Transients	Transients[3]	Transient Vehicles[4]
LUZERNE COUNTY										
1.6	E	Council Cup Campground	212 Ruckle Hill Rd	Wapwallopen	(570) 379-2566	250	65%	50%	326	82
4.3	W	Moyers Grove Campground	309 Moyers Grove Rd	Wapwallopen	(570) 379-3375	175	90%	50%	316	79
9.3	N	Hidden New Lake Campground	745 Hunlock Harveyville Rd	Schickshinny	(570) 256-7383	25	76%[1]	53%[2]	40	10
COLUMBIA COUNTY										
9.5	NW	Whispering Pines Camping	1557 N Bendertown Rd	Stillwater	(570) 925-6810	60	80%	75%	144	36
					Total:	**510**	**76%**	**53%**	**826**	**207**

[1]Data not available for Hidden New Lake Campground. Weighted Average Peak Occupancy Rate (total number of occupied campsites divided by total number of available campsites) for those campgrounds which did provide data was used for this facility.
[2]Data not available for Hidden New Lake Campground. Weighted Average % Transients (total number of transients divided by total number of campers) for those campgrounds which did provide data was used for this facility.

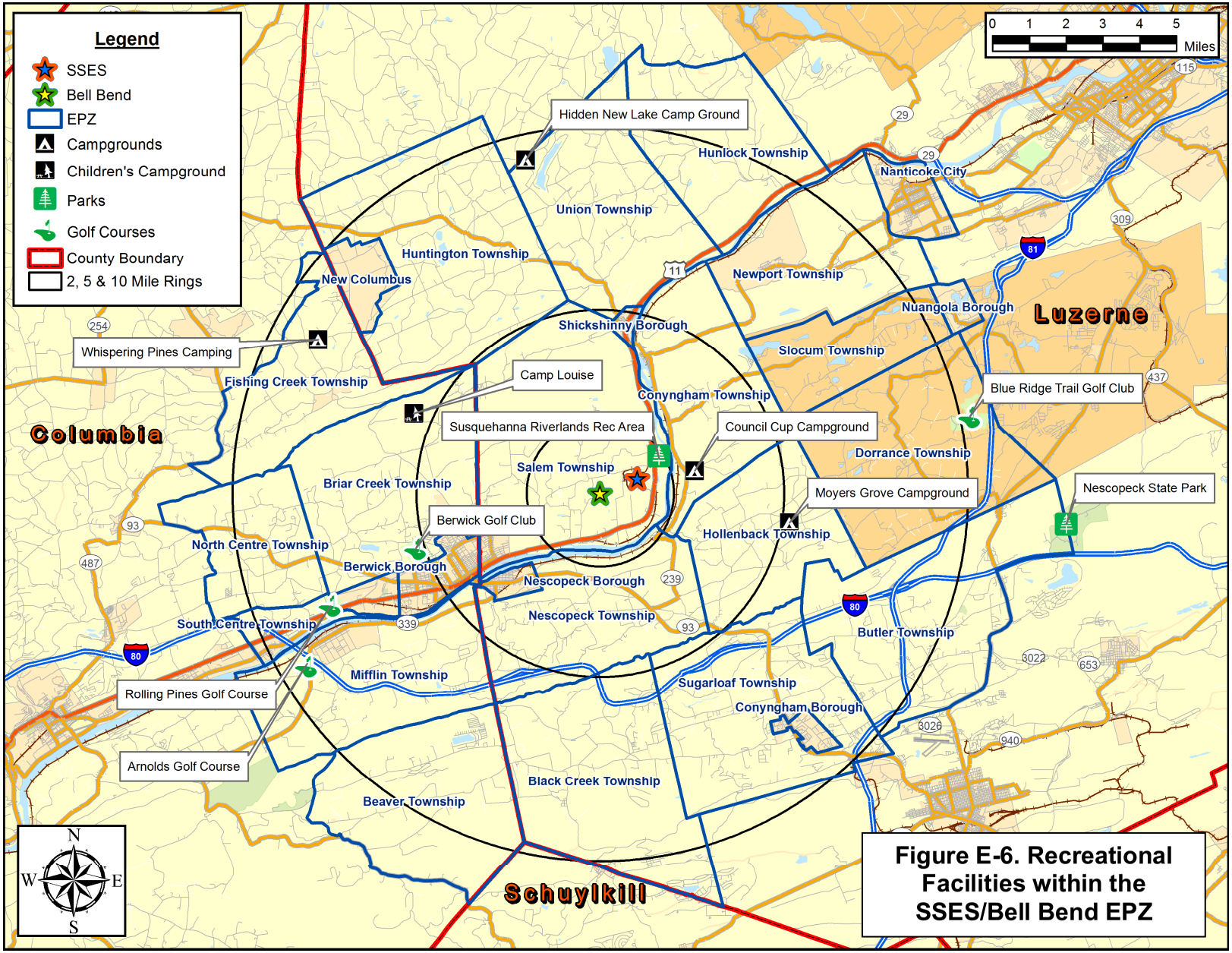
SSES/BELL BEND EPZ: PARKS									
Distance (miles)	Dir-ection	Name of Facility	Address	City	Phone	Peak Population	Percent Transients[1]	Transients	Transient Vehicles
LUZERNE COUNTY									
11.7	E	Nescopeck State Park	1137 Honey Hole Road	Drums	(570) 403-2006	239*	53%	127	50
0.7	NE	Susquehana Riverlands Recreational Area	634 Salem Blvd	Berwick	(866) 832-3312	300	53%	159	63
					Total:	539	53%	286	113

[1]Data not available for parks. Percent transients adapted from average data for campgrounds.
*Figure based on the number of parking spaces determined using aerial imagery, applying a 76% occupancy rate adapted from campground data and a vehicle occupancy equal to the average household size of 2.52 from the telephone survey (see Figure F-1).

SSES/BELL BEND EPZ: GOLF COURSES									
Distance (miles)	Dir-ection	Name of Facility	Address	Town	Phone	Peak Population	% Transients	Transients	Transient Vehicles[1]
LUZERNE COUNTY									
9.2	E	Blue Ridge Trail Golf Club	260 Country Club Drive	Mountain Top	(570) 868-4653	175	25%	44	22
COLUMBIA COUNTY									
6.4	W	Berwick Golf Club	473 Martzville Road	Berwick	(570) 752-2506	110	40%	44	22
9.0	W	Rolling Pines Golf Course	355 Golf Course Road	Berwick	(570) 752-1000	100	70%	70	35
10.3	SW	Arnolds Golf Course	490B West 3rd Street	Mifflinville	(570) 752-7022	75	5%	4	2
					Total:	**460**	**35%**	**162**	**81**

[1]2 people per vehicle.

SSES/BELL BEND EPZ: CHILDREN'S CAMPS							
Distance (miles)	Dir-ection	Name of Facility	Address	Town	Phone	Children	Staff
COLUMBIA COUNTY							
6.2	NW	Camp Louise	195 Hawk Rd	Schickshinny	(570) 759-8236	176	25
					Total:	**176**	**25**


Legend
SSES
Bell Bend
EPZ
Campgrounds
Children's Campground
Parks
Golf Courses
County Boundary
2, 5 & 10 Mile Rings
0 1 2 3 4 5
Miles
Hidden New Lake Camp Ground
Hunlock Township
Nanticoke City
Union Township
Huntington Township
New Columbus
Newport Township
Nuangola Borough
Luzerne
Shickshinny Borough
Whispering Pines Camping
Slocum Township
Camp Louise
Fishing Creek Township
Conyngham Township
Blue Ridge Trail Golf Club
Columbia
Susquehanna Riverlands Rec Area
Council Cup Campground
Dorrance Township
Salem Township
Briar Creek Township
Moyers Grove Campground
Nescopeck State Park
Berwick Golf Club
Hollenback Township
North Centre Township
Berwick Borough
Nescopeck Borough
Nescopeck Township
South Centre Township
Butler Township
Mifflin Township
Rolling Pines Golf Course
Sugarloaf Township
Conyngham Borough
Arnolds Golf Course
Black Creek Township
Beaver Township
Schuylkill
N
W
E
S
Figure E-6. Recreational Facilities within the SSES/Bell Bend EPZ

SSES/BELL BEND EPZ: HUNTING						
Distance (miles)	Dir-ection	Name of Facility	Township	Acreage within EPZ[1]	Transients[2]	Transient Vehicles[3]
LUZERNE COUNTY						
7.0	NNE	State Game Lands 224	Hunlock	486	18	9
10.6	E	State Game Lands 187	Butler	880	33	17
3.5	N	State Game Lands 260	Salem	3,127	117	59
COLUMBIA COUNTY						
11.0	SW	State Game Lands 58	Mifflin	1,194	45	23
8.4	NW	State Game Lands 55	Fishing Creek	2,471	93	47
			Total:	8,158	306	155[4]

[1]Acreage estimated using GIS software

[2]The following calculation is used: $Transients = Acreage \times \frac{900{,}000\ licenses \times 7\ days/season}{61\ days/\ season \times 1.46\ million\ acres} \times 53\% = 0.071$

There are currently 900,000 hunting licenses issued within Pennsylvania, which has an estimated 1.46 million acres of game lands. It is assumed that hunters hunt for 7 days per season, on average. Based on information provided by the IO for the PGC, the peak hunting season is during the months of November and December, a total of 61 days. The percentage of hunters who are not EPZ residents is not available; a transient factor of 53% is adapted from campground data.

[3]2 transients per vehicle adapted from golf course data as both activities are recreational sports.

[4]Note that this number is not equal to the number of transients divided by 2 due to rounding for the individual game lands.

SSES/BELL BEND EPZ: FISHING								
Distance (miles)	Dir-ection	Name of Facility	Town	Parking Spaces	Peak Occupancy[1]	% Transients[2]	Transients	Transient Vehicles[3]
LUZERNE COUNTY								
4.8	NE	Lily Lake	Schickshinny	68	76%	53%	55	28
COLUMBIA COUNTY								
7.1	W	Susquehanna River, North Branch	Berwick	34	76%	53%	27	14
7.2	W	Briar Creek Lake	Berwick	40	76%	53%	32	16
			Total	**142**	**76%**	**53%**	**114**	**58**

[1]Data not available. Peak occupancy percentage adapted from campground data.
[2]Data not available. % Transients adapted from campground data.
[3]2 transients per vehicle adapted from golf course data as both activities are recreational sports.

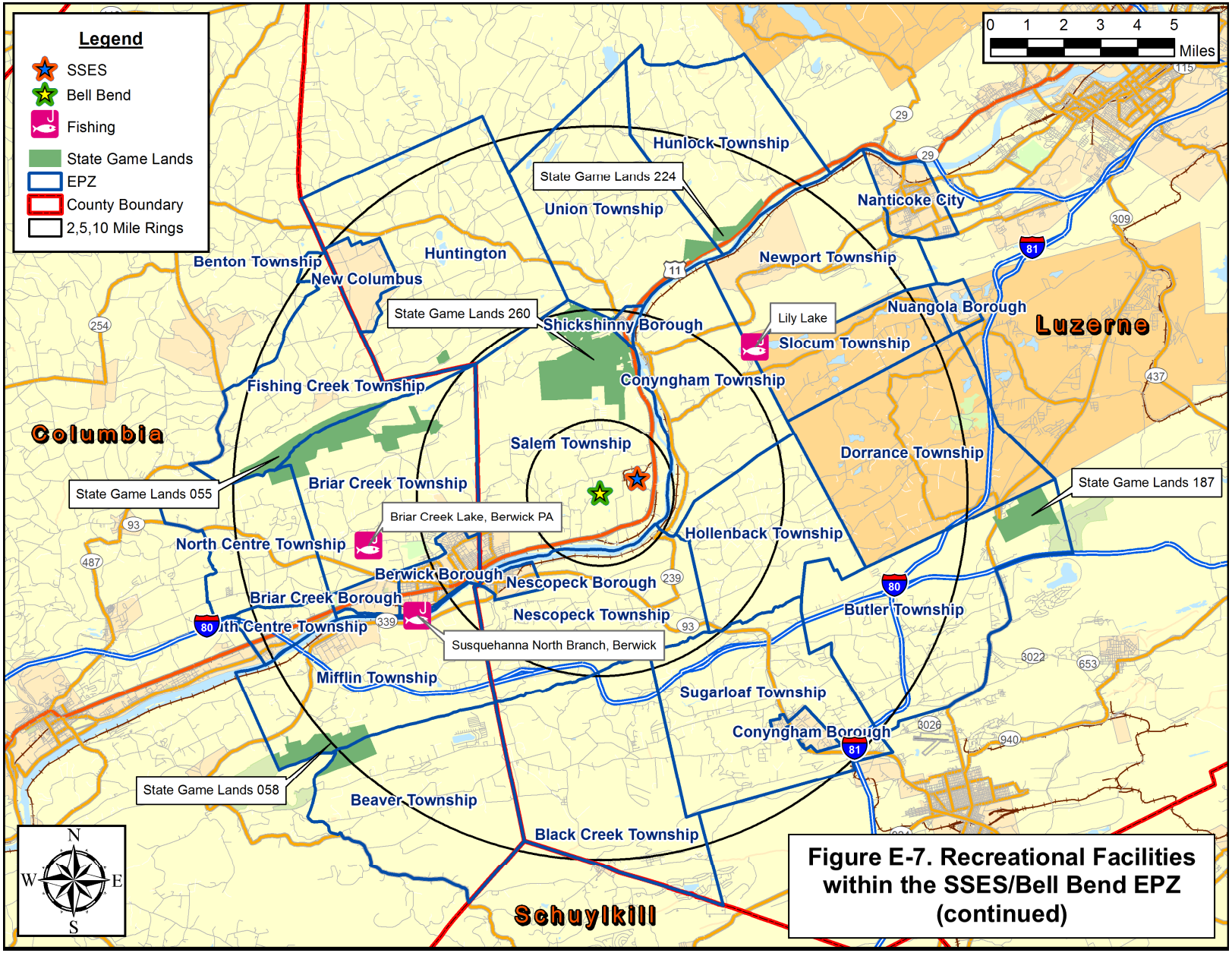


Figure E-7. Recreational Facilities within the SSES/Bell Bend EPZ (continued)

SSES/BELL BEND EPZ: Correctional Facilities						
Distance (miles)	**Direction**	**Name of Facility**	**Address**	**Town**	**Phone**	**Inmates**
LUZERNE COUNTY						
7.4	NE	SCI Retreat	660 State Route 11	Hunlock Creek	(570) 735-8754	980

SSES/BELL BEND EPZ: Medical Facilities & Nursing Homes										
Distance (miles)	**Direction**	**Facility Name**	**Street Address**	**Town/City**	**Phone**	**Capacity**	**Census**	**Ambulances Needed**	**Buses Needed**	**Vans Needed**
LUZERNE COUNTY										
3.8	E	Johnson Personal Care Home	897 Hobbie Rd	Wapwallopen	(570) 379-3673	18	18	0	0	2
9.6	NE	Guardian Elder Care Center	147 Old Newport St	Nanticoke	(570) 735-7300	110	100	11	0	7
9.6	SE	Fritzingertown Senior Living Community	1162 South Old Turnpike Rd	Drums	(570) 788-4178	168	148	20	2	3
10.3	NE	Mercy Special Care Hospital	128 W Washington St	Nanticoke	(570) 735-5000	32	24	12*	0	1
10.3	NW	Bonham Nursing Center	477 Bonnieville Rd	Stillwater	(570) 864-3174	77	70	18	1	0
10.4	NE	Northeast Counseling	West Washington St	Nanticoke	(570) 735-7590	17	12	0	0	1
10.5	E	Butler Valley Manor Home	463 N. Hunter Hwy	Drums	(570) 788-4175	37	36	10	0	2
10.8	NE	Birchwood Nursing Home	395 East Middle Rd	Nanticoke	(570) 735-2973	120	110	10	1	5
10.9	NE	Villa Personal Care	50 N. Walnut St	Nanticoke	(570) 735-8080	76	50	0	1	1
					Luzerne County Total	**655**	**568**	**81**	**5**	**22**
COLUMBIA COUNTY										
4.5	W	Berwick Hospital Center and Retirement Village	701 E 16th St	Berwick	(570) 759-5000	268	268	4	5	5
5.0	SW	Elmcroft Of Berwick	2050 West Front St	Berwick	(570) 759-3155	Day Care Only. No Transportation Needed				
					Columbia County Total	**268**	**268**	**4**	**5**	**5**
					EPZ Total	**923**	**836**	**85**	**10**	**27**

* A high percentage of the patients at this facility are special needs; therefore, an ambulance capacity of 1 patient is used for this facility.

TABLE 8-4A RISK MUNICIPALITY MEDICAL TRANSPORTATION REQUIREMENTS

Municipality	People Requiring Ambulance	Total Ambulance Requirement	Available Ambulance Resources Countywide[1]
COLUMBIA COUNTY			
Berwick Borough	28	14	
Beaver Township	2	1	
Briar Creek Borough	2	1	
Briar Creek Township	2	1	
Fishing Creek Township	0	0	12
Mifflin Township	2	1	
North Centre Township	0	1	
South Centre Township	0	1	
Special Facilities (see Table 8-4)	8	4	
TOTAL	44	24	12
LUZERNE COUNTY			
Black Creek Township	1	1	
Butler Township	2	1	
Conyngham Borough	4	2	
Conyngham Township	8	4	
Dorrance Township	6	3	
Hollenback Township	4	2	
Hunlock Township	2	1	
Huntington Township/New Columbus Borough	0	1	
Nanticoke City	10	5	
Nescopeck Borough	4	2	107
Nescopeck Township	4	2	
Newport Township	12	6	
Nuangola Borough	0	1	
Salem Township	4	2	
Shickshinny Borough	4	2	
Slocum Township	2	1	
Sugarloaf Township	0	0	
Union Township	2	1	
Special Facilities (see Table 8-4)	150	81	
TOTAL	219	118	107
EPZ Total	263	142	119

[1] Additional ambulances are available from neighboring counties. See the Emergency Medical Services (EMS) Vehicles section above and Table 8-7 for additional information.

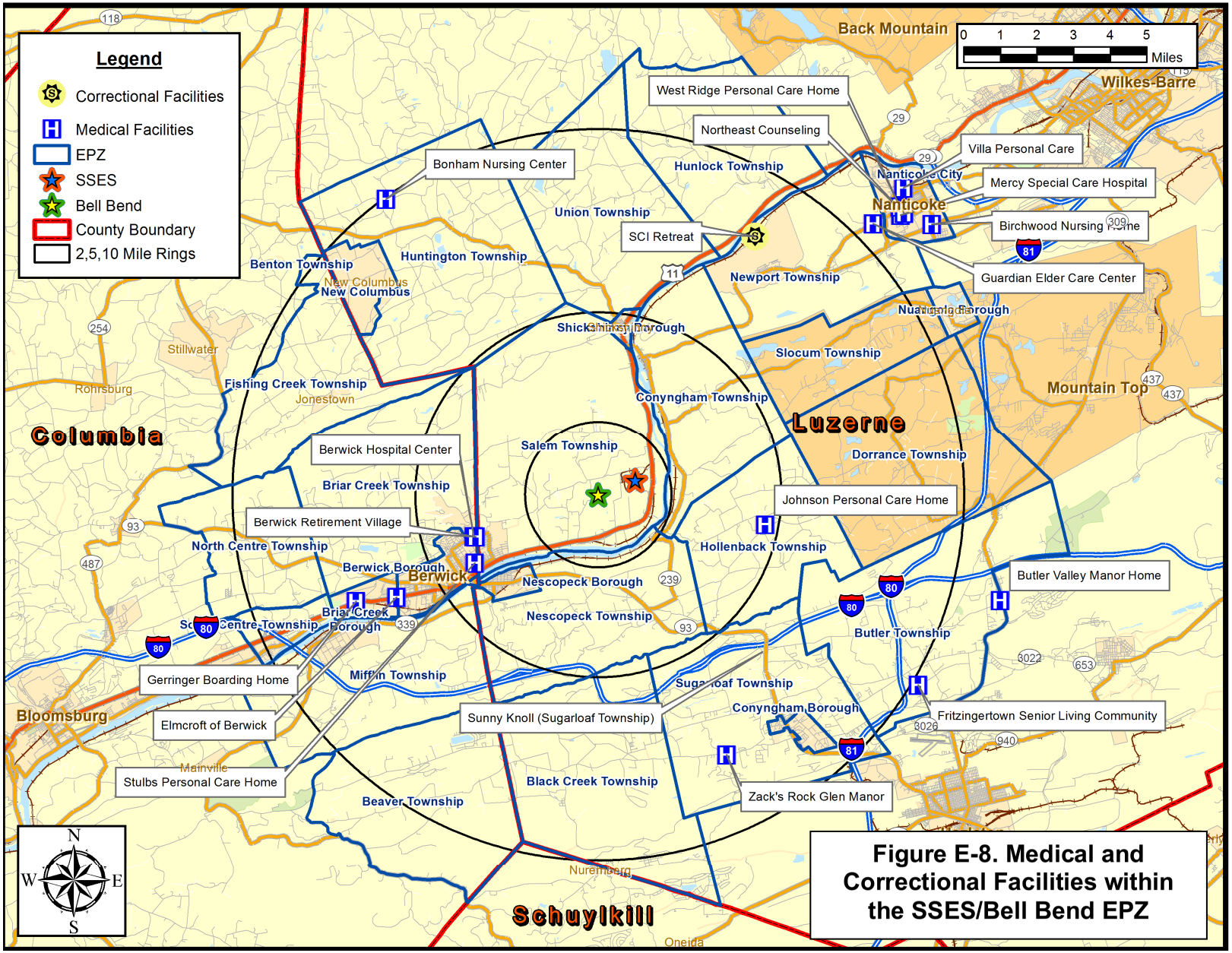


Figure E-8. Medical and Correctional Facilities within the SSES/Bell Bend EPZ

APPENDIX F

Telephone Survey

APPENDIX F: TELEPHONE SURVEY

1. INTRODUCTION

The development of evacuation time estimates for the Emergency Planning Zone (EPZ) of the SSES/Bell Bend Nuclear Power Plant requires the identification of travel patterns, car ownership and household size of the population within the EPZ. Demographic information is obtained from Census data. The use of this data has several limitations when applied to emergency planning. First, the census data do not encompass the range of information needed to identify the time required for preliminary activities that must be undertaken prior to evacuating the area. Secondly, the census data do not contain attitudinal responses needed from the population of the EPZ and consequently may not accurately represent the anticipated behavioral characteristics of the evacuating populace.

These concerns are addressed by a telephone survey. The survey is designed to elicit information from the public concerning family demographics and estimates of response times to well defined events. The design of the survey includes a limited number of questions of the form “What would you do if …?” and other questions regarding activities with which the respondent is familiar (“How long does it take you to …?”).

2. SURVEY INSTRUMENT AND SAMPLING PLAN

Attachment A presents the final survey instrument. A draft of the instrument was submitted to PPL, UniStar and the EPZ Counties for comment. Comments were received and the survey instrument was modified accordingly.

Following the completion of the survey instrument, a sampling plan was developed. A sample size of approximately 575 completed survey forms yields results with an acceptable sampling error. The sample must be drawn from the EPZ population. Consequently, a list of EPZ zip codes was developed. This list is shown in Table F-1. Along with each zip code, an estimate of the population in each area was determined, based on average household size provided by Census data. The proportional number of the desired completed survey interviews for each zip code area was identified, as shown in Table F-1.

Table F-1. Survey Sampling Plan
SSES/Bell Bend Telephone Survey
Sampling Plan

Zip Code	EPZ Population in Zip Code[1] (2000)	Households in EPZ	Required Sample
17814	765	282	6
17815	913	358	8
17859	557	219	5
17878	160	64	1
17985	358	128	3
18202	561	52	1
18219	1348	553	12
18222	4263	1403	30
18246	1672	658	14
18249	4243	1616	34
18603	19696	8145	173
18617	2728	835	18
18621	2167	812	17
18622	130	50	1
18631	1278	535	11
18634	13223	5800	123
18635	3359	1362	29
18655	5217	2057	44
18660	1914	710	15
18707	3919	1466	31
Total	**68,471**	**27,105**	**575**
Average Household Size		**2.50**	
Total Sample Required		**575**	

[1] EPZ population estimate based on SSES EPZ boundary definition

The sampling plan used for the telephone survey presented in Table F-1 was based on the SSES EPZ. This EPZ was updated subsequently based on the proposed Bell Bend site. The sample size for this new SSES/Bell Bend EPZ is the same as for the SSES EPZ due to the small change in population of approximately 1.8% (SSES/Bell Bend EPZ population estimate = 69,718, SSES EPZ population estimate = 68,471).

The required sample size for each zipcode is similar for each EPZ; therefore it is assumed that the telephone survey results for the SSES EPZ are applicable for the combined SSES/Bell Bend EPZ.

3. SURVEY RESULTS

The results of the survey fall into two categories. First, the household demographics of the area can be identified. Demographic information includes such factors as household size, automobile ownership, and automobile availability. The distributions of the time to perform certain pre-evacuation activities are the second category of survey results. These data are processed to develop the trip generation distributions used in the evacuation modeling effort.

Household Demographic Results

Household Size

Figure F-1 presents the distribution of household size within the EPZ. The average household contains 2.52 people. The estimated household size (2.50 persons) used to determine the survey sample (Table F-1) was drawn from Census data.

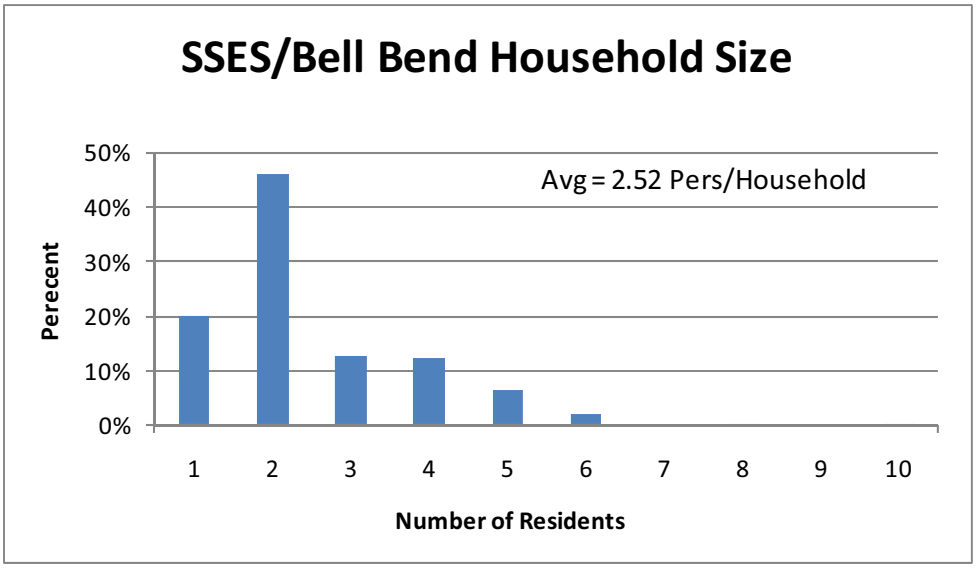


Figure F-1. Household Size in the EPZ

Automobile Ownership

The average number of automobiles per household in the EPZ is 1.91. The distribution of automobile ownership is presented in Figure F-2. Figures F-3 and F-4 present the automobile availability by household size; approximately 5.4 percent of households do not have access to an automobile. The majority of households without access to a car are single person households; nearly all households of 2 or more people have access to at least one vehicle.

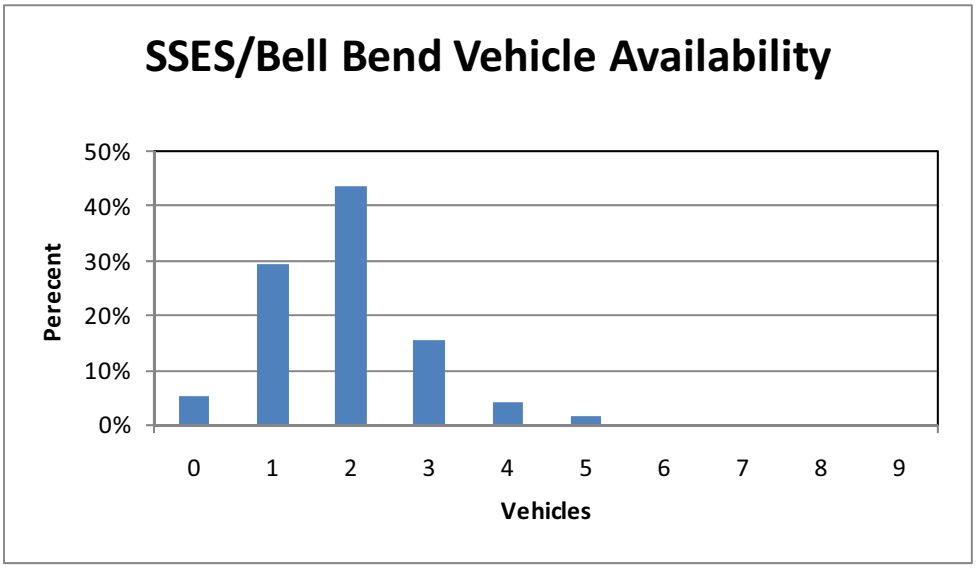


Figure F-2. Household Vehicle Availability

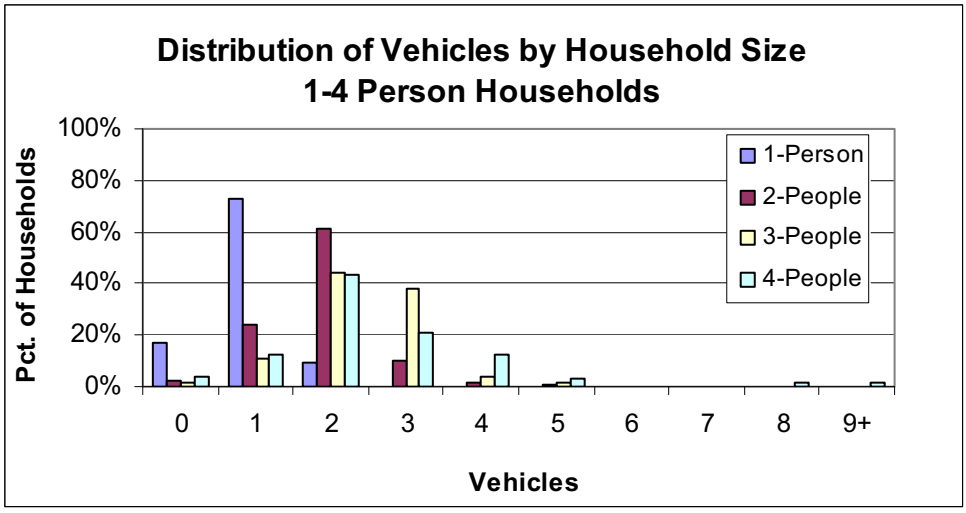


Figure F-3. Vehicle Availability – 1 to 4 Person Households

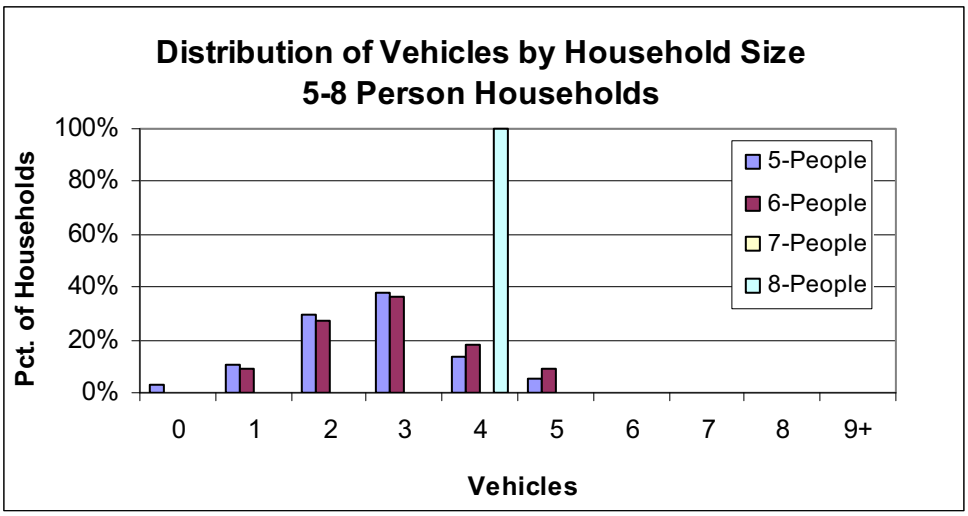


Figure F-4. Vehicle Availability – 5 to 8 Person Households

School Children

The average number of school children per household identified by the survey is 1.47. Figure F-5 presents the distribution of school children.

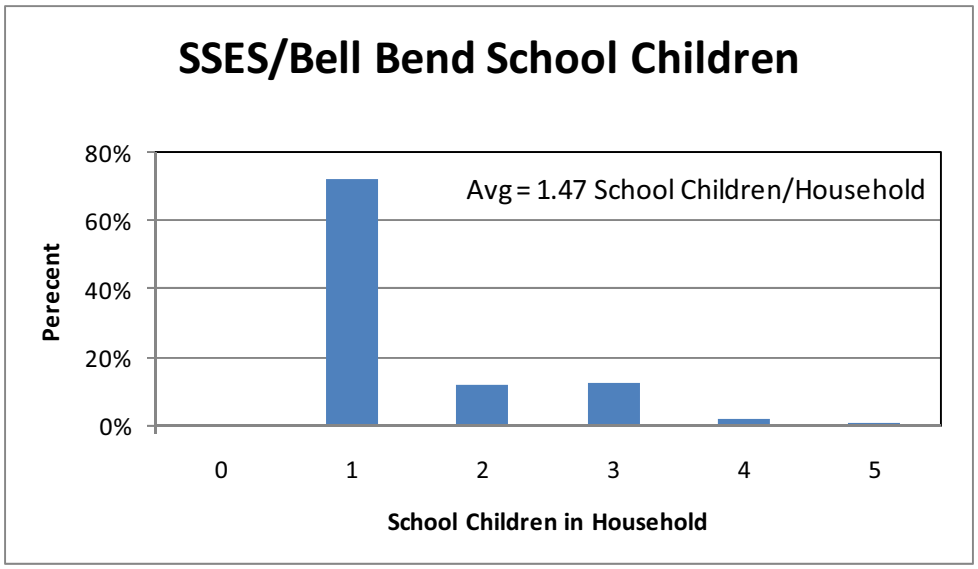


Figure F-5. School Children in Households

Commuters

Figure F-6 presents the distribution of the number of commuters in each household. The data show an average of 0.92 commuters in each household in the EPZ.

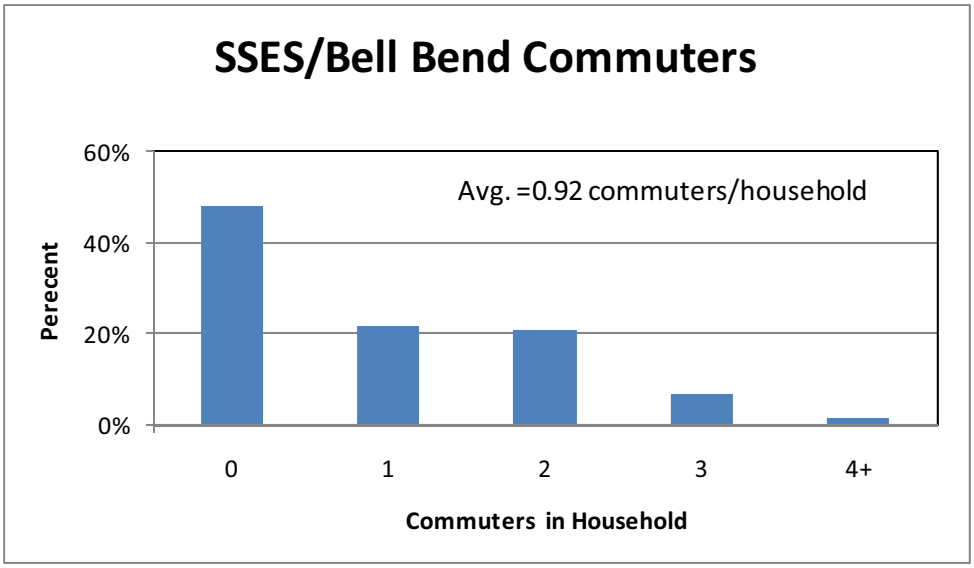


Figure F-6. Commuters in Households in the EPZ

Commuter Travel Modes

Figure F-7 presents the mode of travel that commuters use on a daily basis. The vast majority of commuters use their private automobiles to travel to work or school.

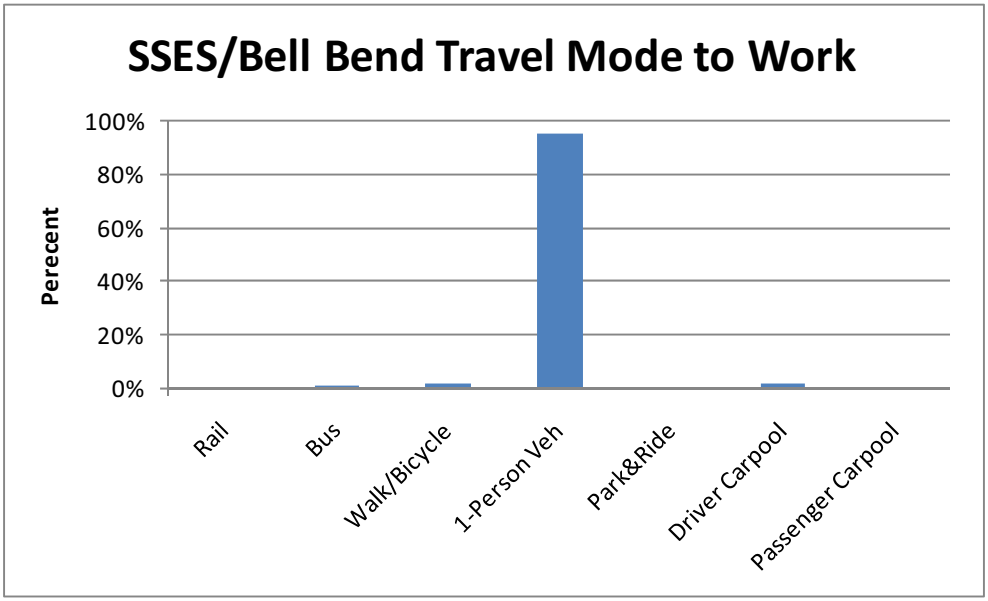


Figure F-7. Modes of Travel to Work by EPZ Residents

Evacuation Response

Several questions were asked which are used to gauge the population's response to an emergency. The first of these asked "How many of the vehicles that are usually available to the household would your family use during an evacuation?" The response is shown in Figure F-8. On average, 1.30 vehicles per household would be used for evacuation purposes.

The second evacuation response question asked was "When the commuters are away from home, is there a vehicle at home that is available for evacuation during any emergency?" Of the survey participants who responded, 58 percent said that there was another vehicle available to evacuate in, while 42 percent answered that there would be no additional vehicle available for evacuation.

The third evacuation response question was "Would your family await the return of other family members prior to evacuating the area?" Of the survey participants who responded, 60 percent said they would await the return of other family members before evacuating and 40 percent indicated that they would not await the return of other family members.

The fourth evacuation response question was "Would you take household pets with you if you were asked to evacuate the area?" As shown in Figure F-9, 54 percent of respondents said they would take their pets; 9 percent would not. The remaining 37 percent of people either did not have a pet, or did not give a definitive answer.

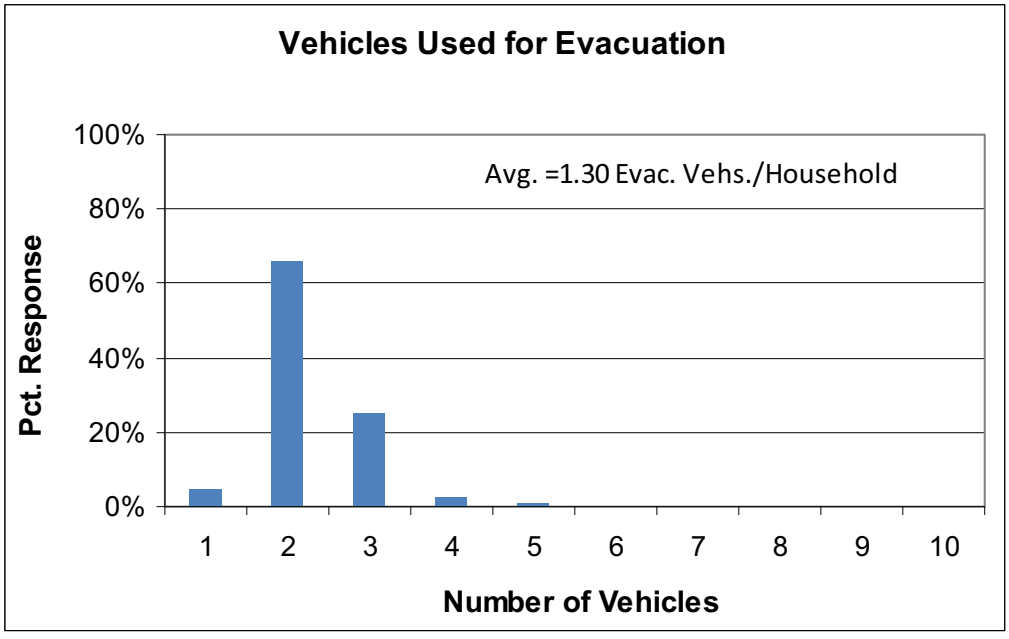


Figure F-8. Number of Vehicles Used for Evacuation

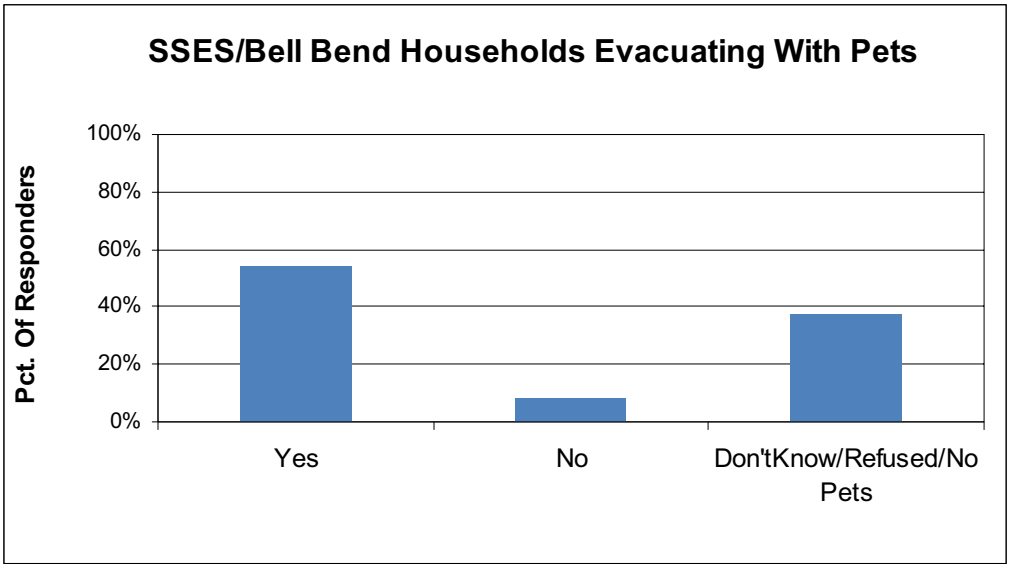


Figure F-9. Households Evacuating With Pets

Time Distribution Results

The survey asked several questions about the amount of time it takes to perform certain pre-evacuation activities. These activities involve actions taken by residents during the course of their day-to-day lives. Thus, the answers fall within the realm of the responder's experience.

How long does it take the commuter to complete preparation for leaving work? Figure F-10 presents the cumulative distribution. Sixty seven percent can leave within 15 minutes, over 80 percent within 30 minutes and nearly all within one hour

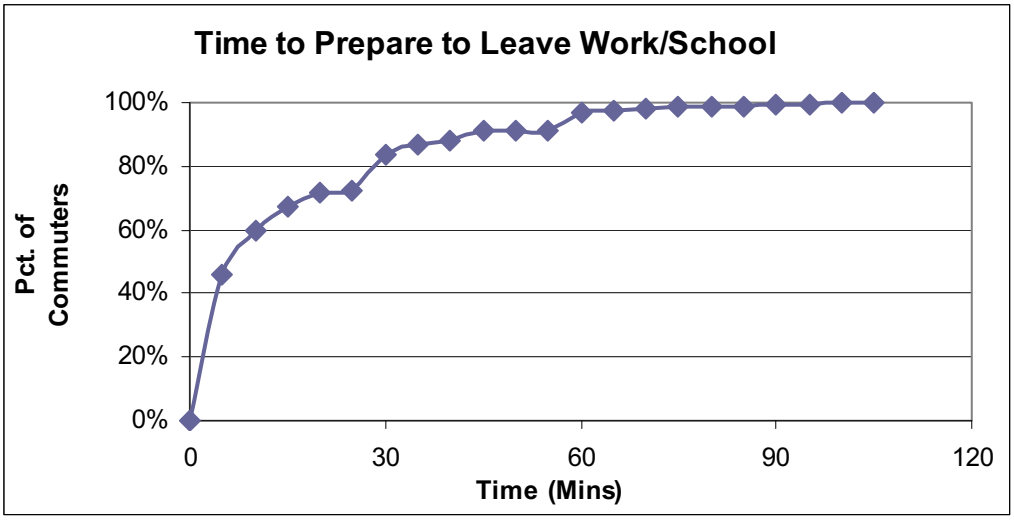


Figure F-10. Time Required to Prepare to Leave Work/School

How long would it take the commuter to travel home?

Figure F-11 presents the work to home travel time. In all cases, over 80 percent of commuters can arrive home within about 30 minutes of leaving work; nearly all within 60 minutes.

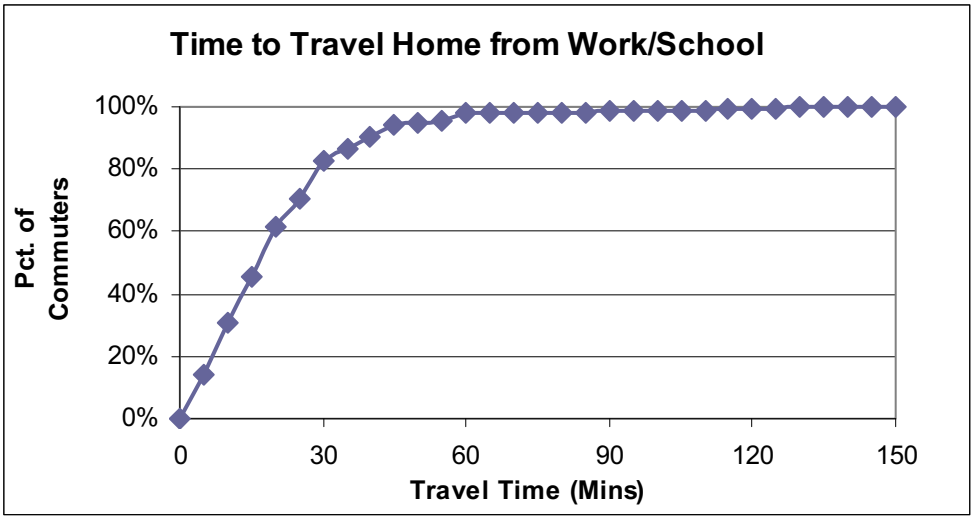


Figure F-11. Work to Home Travel Time

How long would it take the family to pack clothing, secure the house, and load the car?

Figure F-12 presents the time required to prepare for leaving on an evacuation trip. In many ways this activity mimics a family's preparation for a short holiday or weekend away from home. Hence, the responses represent the experience of the responder in performing similar activities.

The distribution shown in Figure F-12 has a long "tail." Nearly 86 percent of households can be ready to leave home within an hour, nearly all within 2 hours.

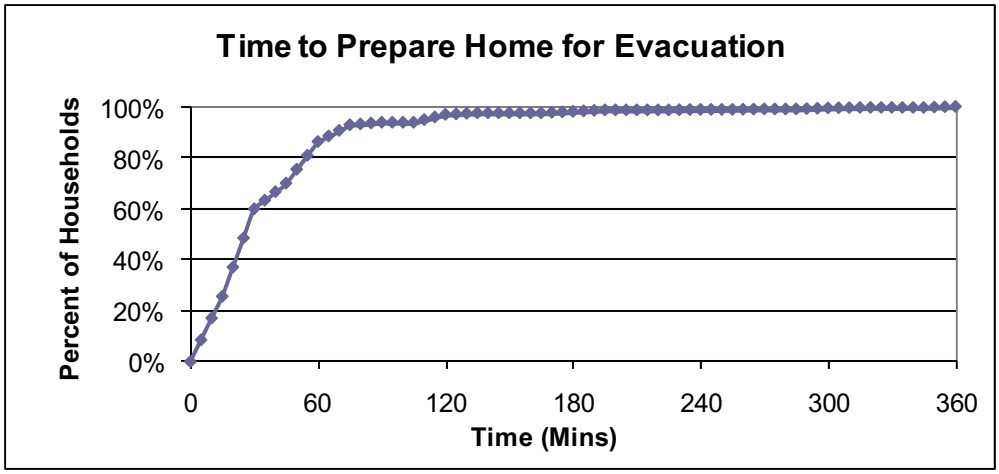


Figure F-12. Time to Prepare Home for Evacuation

How long would it take you to clear 6 to 8 inches of snow?

During adverse, snowy weather conditions an additional activity must be performed before residents can depart on the evacuation trip. Although snow scenarios assume that the roads and highways have been plowed and are passable (albeit at lower speeds and capacities), it would be necessary to clear a private driveway prior to leaving the home so that the vehicle can access the street. Figure F-13 presents these results. The time distribution for clearing the driveway has a long tail; about 88 percent of driveways are passable within 1 hour. However, the last driveway is cleared 3 hours and 15 minutes after the start of this activity.

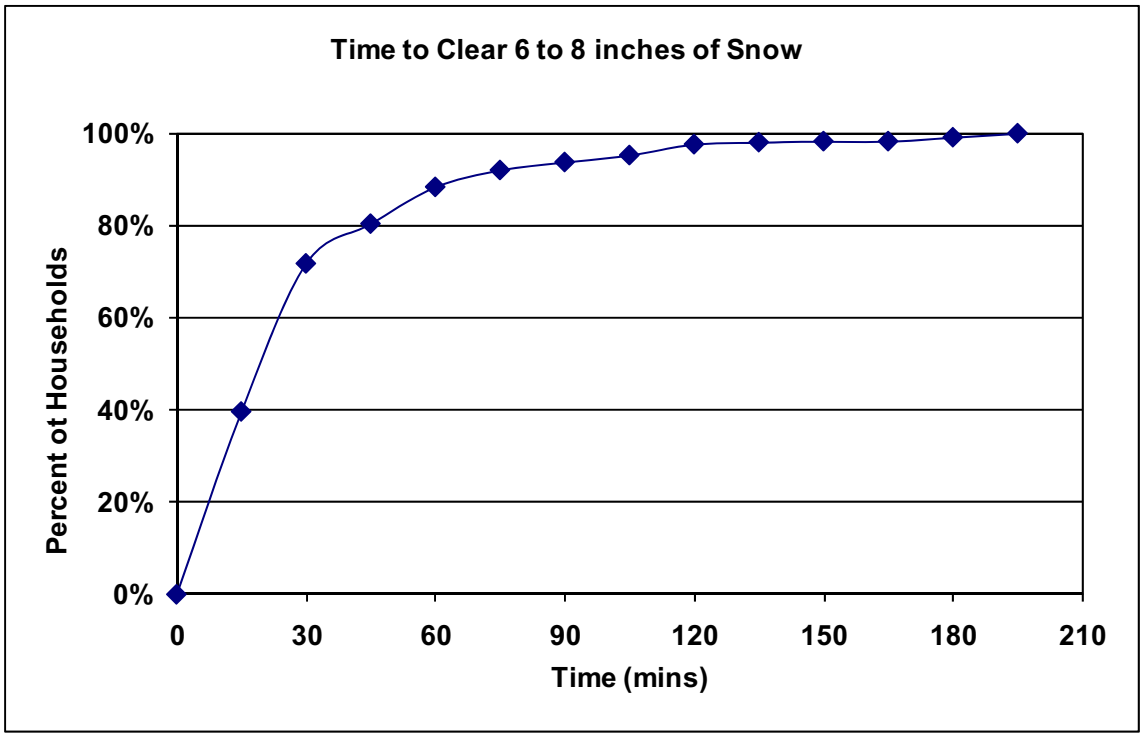


Figure F-13. Time to Clear 6 to 8 Inches of Snow

4. CONCLUSIONS

The telephone survey provides valuable, relevant data that have been used to quantify "mobilization time" which can influence evacuation time estimates.

ATTACHMENT A

Telephone Survey Instrument

Survey Instrument

Hello, my name is _____ and I'm working on a survey being made for [insert marketing firm name] designed to identify local travel patterns in your area. We are conducting the survey to help the county and local municipalities with their evacuation plans for all types of potential events. Your participation in this survey will greatly enhance the county's emergency preparedness program.

COL.1 Unused
COL.2 Unused
COL.3 Unused

Sex **COL. 8**
1 Male
2 Female

INTERVIEWER: ASK TO SPEAK TO THE HEAD OF HOUSEHOLD OR THE SPOUSE OF THE HEAD OF HOUSEHOLD. (Terminate call if not a residence)

DO NOT ASK:

1A. Record area code. To Be Determined

COL. 9-11

1B. Record exchange number. To Be Determined

COL. 12-14

---

2. What is your home Zip Code — **Col. 15-19**

---

3. In total, how many cars, or other vehicles are usually available to the household? (DO NOT READ ANSWERS.)

COL.20
1 ONE
2 TWO
3 THREE
4 FOUR
5 FIVE
6 SIX
7 SEVEN
8 EIGHT
9 NINE OR MORE
0 ZERO (NONE)
X REFUSED

---

4. How many people usually live in this household? (DO NOT READ ANSWERS.)

COL.21
1 ONE
2 TWO
3 THREE
4 FOUR
5 FIVE
6 SIX
7 SEVEN
8 EIGHT
9 NINE

COL.22
0 TEN
1 ELEVEN
2 TWELVE
3 THIRTEEN
4 FOURTEEN
5 FIFTEEN
6 SIXTEEN
7 SEVENTEEN
8 EIGHTEEN
9 NINETEEN OR MORE
X REFUSED

5. How many children living in this household go to local public, private, or parochial schools? (DO NOT READ ANSWERS.)

COL.23	
0	ZERO
1	ONE
2	TWO
3	THREE
4	FOUR
5	FIVE
6	SIX
7	SEVEN
8	EIGHT
9	NINE OR MORE
X	REFUSED

---

6. How many people in the household commute to a job, or to college, at least 4 times a week?

COL.24		SKIP TO
0	ZERO	Q. 12
1	ONE	Q. 7
2	TWO	Q. 7
3	THREE	Q. 7
4	FOUR OR MORE	Q. 7
5	DON'T KNOW/REFUSED	Q. 12

INTERVIEWER: For each person identified in Question 6, ask Questions 7, 8, 9, and 10.

7. Thinking about commuter #1, how does that person usually travel to work or college? (REPEAT QUESTION FOR EACH COMMUTER.)

	Commuter #1 COL.25	Commuter #2 COL.26	Commuter #3 COL.27	Commuter #4 COL.28
Rail	1	1	1	1
Bus	2	2	2	2
Walk/Bicycle	3	3	3	3
Driver Car/Van	4	4	4	4
Park & Ride (Car/Rail, Xpress_bus)	5	5	5	5
Driver Carpool-2 or more people	6	6	6	6
Passenger Carpool-2 or more people	7	7	7	7
Taxi	8	8	8	8
Refused	9	9	9	9

---

8. What is the name of the city, town or community in which Commuter #1 works or attends school? (REPEAT QUESTION FOR EACH COMMUTER.) (FILL IN ANSWER.)

COMMUTER #1			COMMUTER #2			COMMUTER #3			COMMUTER #4		
City/Town		State	City/Town		State	City/Town		State	City/Town		State
COL.29	COL.30	COL.31	COL.32	COL.33	COL.34	COL.35	COL.36	COL.37	COL.38	COL.39	COL.40
0	0	0	0	0	0	0	0	0	0	0	0
1	1	1	1	1	1	1	1	1	1	1	1
2	2	2	2	2	2	2	2	2	2	2	2
3	3	3	3	3	3	3	3	3	3	3	3
4	4	4	4	4	4	4	4	4	4	4	4
5	5	5	5	5	5	5	5	5	5	5	5
6	6	6	6	6	6	6	6	6	6	6	6
7	7	7	7	7	7	7	7	7	7	7	7
8	8	8	8	8	8	8	8	8	8	8	8
9	9	9	9	9	9	9	9	9	9	9	9

9. How long would it take Commuter #1 to travel home from work or college? (REPEAT QUESTION FOR EACH COMMUTER.) (DO NOT READ ANSWERS.)

COMMUTER #1

COL.41		COL.42	
1	5 MINUTES OR LESS	1	46-50 MINUTES
2	6-10 MINUTES	2	51-55 MINUTES
3	11-15 MINUTES	3	56 - 1 HOUR
4	16-20 MINUTES	4	OVER 1 HOUR, BUT LESS THAN 1 HOUR 15 MINUTES
5	21-25 MINUTES	5	BETWEEN 1 HOUR 16 MINUTES AND 1 HOUR 30 MINUTES
6	26-30 MINUTES	6	BETWEEN 1 HOUR 31 MINUTES AND 1 HOUR 45 MINUTES
7	31-35 MINUTES	7	BETWEEN 1 HOUR 46 MINUTES AND 2 HOURS
8	36-40 MINUTES	8	OVER 2 HOURS (SPECIFY _____)
9	41-45 MINUTES	9	
		0	
		X	DON'T KNOW/REFUSED

COMMUTER #2

COL.43		COL.44	
1	5 MINUTES OR LESS	1	46-50 MINUTES
2	6-10 MINUTES	2	51-55 MINUTES
3	11-15 MINUTES	3	56 - 1 HOUR
4	16-20 MINUTES	4	OVER 1 HOUR, BUT LESS THAN 1 HOUR 15 MINUTES
5	21-25 MINUTES	5	BETWEEN 1 HOUR 16 MINUTES AND 1 HOUR 30 MINUTES
6	26-30 MINUTES	6	BETWEEN 1 HOUR 31 MINUTES AND 1 HOUR 45 MINUTES
7	31-35 MINUTES	7	BETWEEN 1 HOUR 46 MINUTES AND 2 HOURS
8	36-40 MINUTES	8	OVER 2 HOURS (SPECIFY _____)
9	41-45 MINUTES	9	
		0	
		X	DON'T KNOW/REFUSED

COMMUTER #3

COL.45		COL.46	
1	5 MINUTES OR LESS	1	46-50 MINUTES
2	6-10 MINUTES	2	51-55 MINUTES
3	11-15 MINUTES	3	56 - 1 HOUR
4	16-20 MINUTES	4	OVER 1 HOUR, BUT LESS THAN 1 HOUR 15 MINUTES
5	21-25 MINUTES	5	BETWEEN 1 HOUR 16 MINUTES AND 1 HOUR 30 MINUTES
6	26-30 MINUTES	6	BETWEEN 1 HOUR 31 MINUTES AND 1 HOUR 45 MINUTES
7	31-35 MINUTES	7	BETWEEN 1 HOUR 46 MINUTES AND 2 HOURS
8	36-40 MINUTES	8	OVER 2 HOURS (SPECIFY _____)
9	41-45 MINUTES	9	
		0	
		X	DON'T KNOW/REFUSED

COMMUTER #4

COL.47		COL.48	
1	5 MINUTES OR LESS	1	46-50 MINUTES
2	6-10 MINUTES	2	51-55 MINUTES
3	11-15 MINUTES	3	56 - 1 HOUR
4	16-20 MINUTES	4	OVER 1 HOUR, BUT LESS THAN 1 HOUR 15 MINUTES
5	21-25 MINUTES	5	BETWEEN 1 HOUR 16 MINUTES AND 1 HOUR 30 MINUTES
6	26-30 MINUTES	6	BETWEEN 1 HOUR 31 MINUTES AND 1 HOUR 45 MINUTES
7	31-35 MINUTES	7	BETWEEN 1 HOUR 46 MINUTES AND 2 HOURS
8	36-40 MINUTES	8	OVER 2 HOURS (SPECIFY _____)
9	41-45 MINUTES	9	
		0	
		X	DON'T KNOW/REFUSED

10. Approximately how long does it take Commuter #1 to complete preparation for leaving work or college prior to starting the trip home? (REPEAT QUESTION FOR EACH COMMUTER.) (DO NOT READ ANSWERS.)

COMMUTER #1

COL. 49	COL.50
1 5 MINUTES OR LESS	1 46-50 MINUTES
2 6-10 MINUTES	2 51-55 MINUTES
3 11-15 MINUTES	3 56 - 1 HOUR
4 16-20 MINUTES	4 OVER 1 HOUR, BUT LESS THAN 1 HOUR 15 MINUTES
5 21-25 MINUTES	5 BETWEEN 1 HOUR 16 MINUTES AND 1 HOUR 30 MINUTES
6 26-30 MINUTES	6 BETWEEN 1 HOUR 31 MINUTES AND 1 HOUR 45 MINUTES
7 31-35 MINUTES	7 BETWEEN 1 HOUR 46 MINUTES AND 2 HOURS
8 36-40 MINUTES	8 OVER 2 HOURS (SPECIFY _____)
9 41-45 MINUTES	9
	0
	X DON'T KNOW/REFUSED

COMMUTER #2

COL.51	COL. 52
1 5 MINUTES OR LESS	1 46-50 MINUTES
2 6-10 MINUTES	2 51-55 MINUTES
3 11-15 MINUTES	3 56 - 1 HOUR
4 16-20 MINUTES	4 OVER 1 HOUR, BUT LESS THAN 1 HOUR 15 MINUTES
5 21-25 MINUTES	5 BETWEEN 1 HOUR 16 MINUTES AND 1 HOUR 30 MINUTES
6 26-30 MINUTES	6 BETWEEN 1 HOUR 31 MINUTES AND 1 HOUR 45 MINUTES
7 31-35 MINUTES	7 BETWEEN 1 HOUR 46 MINUTES AND 2 HOURS
8 36-40 MINUTES	8 OVER 2 HOURS (SPECIFY _____)
9 41-45 MINUTES	9
	0
	X DON'T KNOW/REFUSED

COMMUTER #3

COL. 53	COL. 54
1 5 MINUTES OR LESS	1 46-50 MINUTES
2 6-10 MINUTES	2 51-55 MINUTES
3 11-15 MINUTES	3 56 - 1 HOUR
4 16-20 MINUTES	4 OVER 1 HOUR, BUT LESS THAN 1 HOUR
5 21-25 MINUTES	15 MINUTES –
6 26-30 MINUTES	5 BETWEEN 1 HOUR 16 MINUTES AND 1 HOUR 30 MINUTES
7 31-35 MINUTES	6 BETWEEN 1 HOUR 31 MINUTES AND 1 HOUR 45 MINUTES
8 36-40 MINUTES	7 BETWEEN 1 HOUR 46 MINUTES AND 2 HOURS
9 41-45 MINUTES	8 OVER 2 HOURS (SPECIFY _____)
	9
	0
	X DON'T KNOW/REFUSED

COMMUTER #4

COL. 55	COL. 56
1 5 MINUTES OR LESS	1 46-50 MINUTES
2 6-10 MINUTES	2 51-55 MINUTES
3 11-15 MINUTES	3 56 - 1 HOUR
4 16-20 MINUTES	4 OVER 1 HOUR, BUT LESS THAN 1 HOUR
5 21-25 MINUTES	15 MINUTES
6 26-30 MINUTES	5 BETWEEN 1 HOUR 16 MINUTES AND 1 HOUR 30 MINUTES
7 31-35 MINUTES	6 BETWEEN 1 HOUR 31 MINUTES AND 1 HOUR 45 MINUTES
8 36-40 MINUTES	7 BETWEEN 1 HOUR 46 MINUTES AND 2 HOURS
9 41-45 MINUTES	8 OVER 2 HOURS (SPECIFY _____)
	9
	0
	X DON'T KNOW/REFUSED

---

11. When the commuters are away from home, is there a vehicle at home that is available for evacuation during any emergency?

Col. 57	
1	Yes
2	No
3	Don't Know/Refused

12. Would you await the return of family members prior to evacuating the area?

Col. 58	
1	Yes
2	No

3 Don't Know/Refused

---

13. How many of the vehicles that are usually available to the household would your family use during an evacuation? (DO NOT READ ANSWERS.)

COL.59
1 ONE
2 TWO
3 THREE
4 FOUR
5 FIVE
6 SIX
7 SEVEN
8 EIGHT
9 NINE OR MORE
0 ZERO (NONE)
X REFUSED

---

14. How long would it take the family to pack clothing, secure the house, load the car, and complete preparations prior to evacuating the area? (DO NOT READ ANSWERS.)

COL.60
1 LESS THAN 15 MINUTES
2 15-30 MINUTES
3 31-45 MINUTES
4 46 MINUTES - 1 HOUR
5 1 HOUR TO 1 HOUR 15 MINUTES
6 1 HOUR 16 MINUTES TO 1 HOUR 30 MINUTES
7 1 HOUR 31 MINUTES TO 1 HOUR 45 MINUTES
8 1 HOUR 46 MINUTES TO 2 HOURS
9 2 HOURS TO 2 HOURS 15 MINUTES
0 2 HOURS 16 MINUTES TO 2 HOURS 30 MINUTES
X 2 HOURS 31 MINUTES TO 2 HOURS 45 MINUTES
Y 2 HOURS 46 MINUTES TO 3 HOURS

COL.61
1 3 HOURS TO 3 HOURS 15 MINUTES
2 3 HOURS 16 MINUTES TO 3 HOURS 30 MINUTES
3 3 HOURS 31 MINUTES TO 3 HOURS 45 MINUTES
4 3 HOURS 46 MINUTES TO 4 HOURS
5 4 HOURS TO 4 HOURS 15 MINUTES
6 4 HOURS 16 MINUTES TO 4 HOURS 30 MINUTES
7 4 HOURS 31 MINUTES TO 4 HOURS 45 MINUTES
8 4 HOURS 46 MINUTES TO 5 HOURS
9 5 HOURS TO 5 HOURS 15 MINUTES
0 5 HOURS 16 MINUTES TO 5 HOURS 30 MINUTES
X 5 HOURS 31 MINUTES TO 5 HOURS 45 MINUTES
Y 5 HOURS 46 MINUTES TO 6 HOURS

COL.62
1 DON'T KNOW

---

15. How long would it take you to clear 6-8" of snow to move the car from the driveway or curb to begin the evacuation trip? Assume the roads are passable. (DO NOT READ RESPONSES.)

COL.63
1 LESS THAN 15 MINUTES
2 15-30 MINUTES
3 31-45 MINUTES
4 46 MINUTES - 1 HOUR
5 1 HOUR TO 1 HOUR 15 MINUTES
6 1 HOUR 16 MINUTES TO 1 HOUR 30 MINUTES
7 1 HOUR 31 MINUTES TO 1 HOUR 45 MINUTES
8 1 HOUR 46 MINUTES TO 2 HOURS
9 2 HOURS TO 2 HOURS 15 MINUTES
0 2 HOURS 16 MINUTES TO 2 HOURS 30 MINUTES
X 2 HOURS 31 MINUTES TO 2 HOURS 45 MINUTES
Y 2 HOURS 46 MINUTES TO 3 HOURS

COL.64
1 MORE THAN 3 HOURS
2 DON'T KNOW

16. Would you take household pets with you if you were asked to evacuate the area?

Col. 65	
1	Yes
2	No
3	No Pets
4	Don't Know/Refused

Thank you very much. _____

(TELEPHONE NUMBER CALLED)

If requested:
For Additional information contact:

County	EMA Phone
(In Luzerne County) Luzerne County EMA	570-820-4400
(In Columbia County) PPL	866-832-3312

If there are any questions on who is funding the survey, the response should be:

PPL funded the survey to support and update the evacuation plans of the county and local municipalities. If there are any additional questions please contact PPL at 866-832-3312

ANNEX B
Code of Data Collection Standards With Notes Section
Market Research Association

P.O. Box 230 • Rocky Hill, CT 06067-0230 • 860-257-4008 • Fax: 860-257-3990

Code Approved May 1997
Notes Added September 1999

RESPONSIBILITIES TO RESPONDENTS

Data Collection Companies ...

1. will make factually correct statements to secure cooperation and will honor promises to respondents, whether verbal or written;
2. will not use information to identify respondents without the permission of the respondent, except to those who check the data or are involved in processing the data. If such permission is given, it must be recorded by the interviewer at the time the permission is secured;
3. will respect the respondent's right to withdraw or to refuse to cooperate at any stage of the study and not use any procedure or technique to coerce or imply that cooperation is obligatory;
4. will obtain and document respondent consent when it is known that the name and address or identity of the respondent may be passed to a third party for legal or other purposes, such as audio or video recordings;
5. will obtain permission and document consent of a parent, legal guardian or responsible guardian before interviewing children 12 years old or younger;
6. will give respondents the opportunity to refuse to participate in the research when there is a possibility they may be identifiable even without the use of their name or address (e.g., because of the size of the population being sampled).

Interviewers ...

1. will treat the respondent with respect and not influence him or her through direct or indirect attempts, including the framing of questions and/or a respondent's opinion or attitudes on any issue;
2. will obtain and document permission from a parent, legal guardian or responsible guardian before interviewing children 12 years old or younger. Prior to obtaining permission, the interviewer should divulge the subject matter, length of the interview and other special tasks that will be required.

RESPONSIBILITIES TO CLIENTS

Data Collection Companies ...

1. will ensure that each study is conducted according to the client's exact specifications;
2. will observe confidentiality with all research techniques or methodologies and with information considered confidential or proprietary. Information will not be revealed that could be used to identify clients or respondents without proper authorization;
3. will ensure that companies, their employees and subcontractors involved in data collection take all reasonable precautions so that more than one survey is not conducted in one interview without explicit permission from the Client
4. will report research results accurately and honestly;
5. will not misrepresent themselves as having qualifications, experience, skills or facilities that they do not possess;
6. will refrain from referring to membership in the Marketing Research Association as proof of competence, since the Association does not certify any person's or organization's competency or skill level.

RESPONSIBILITIES TO DATA COLLECTORS

Clients ...

1. will be responsible for providing products and services that are safe and fit or their intended use and disclose/label all product contents;
2. will provide verbal or written instructions;
3. will not ask our members who subcontract research to engage in any activity that is not acceptable as defined in this Code or that is prohibited under any applicable federal, state, local laws, regulations and/or ordinances.

RESPONSIBILITIES TO THE GENERAL PUBLIC AND BUSINESS COMMUNITY

Data Collection Companies ...

1. will not intentionally abuse public confidence in marketing and opinion research;
2. will not represent a non-research activity to be marketing and opinion research, such as:
    - questions whose sole objective is to obtain personal information about respondents, whether for legal, political, private or other purposes,
    - the compilation of lists, registers or data banks of names and addresses for any non-research purposes (e.g., canvassing or fundraising),
    - industrial, commercial or any other form of espionage,
    - the acquisition of information for use by credit rating services or similar organizations,
    - sales or promotional approaches to the respondent,
    - the collection of debts;
3. will make interviewers aware of any special conditions that may be applicable to any minor (18 years old or younger).

These notes are intended to help users of the Code to interpret and apply it in practice. Any questions about how to apply the Code in a specific situation should be addressed to MRA Headquarters.

RESPONSIBILITIES TO RESPONDENTS

Data Collection Companies ...

1. will make factually correct statements to secure cooperation and honor promises to respondents, whether oral or written; *Interviewers will not knowingly provide respondents with information that misrepresents any portion of the interviewing process, such as; length of the interview, scope of task involved, compensation, or intended use of the information collected.*
2. will not use information to identify respondents without the permission of the respondent, except to those who check the data or are involved in processing the data. If such permission is given, it must be recorded by the interviewer at the time the permission is secured; *Respondent information will be linked to data collected only for research purposes such as validation, evaluating data in aggregate based on demographic information, modeling. Providing respondent information is not permissible for any purpose other than legitimate research purposes as mentioned above. If anyone requests respondent identifiable information it will only be provided upon receipt of written declaration of and agreement of some intended use. Such use shall be determined by the provider to qualify as legitimate research use. (i.e. validation, planned recalls, modeling, demographic analysis.) No other use of this information falls within the boundaries of the Code. This applies to all types of respondent sample sources including client supplied lists.*
3. will respect the respondent's right to withdraw or to refuse to cooperate at any stage of the study and not use any procedure or technique to coerce or imply that cooperation is obligatory. *Respondent cooperation is strictly on a voluntary basis. Respondents are entitled to withdraw from an interview at any stage or to refuse to cooperate in a research project. Interviewers should never lead respondents to believe they have no choice in their participation.*
4. will obtain and record respondent consent when it is known that the name and addresses or identity of the respondent may be passed to a third party for legal or other purposes, such as audio or video recordings; *By documenting the respondent's consent for a defined specific use of his/ her name and address we are confirming the respondent realizes we are asking something new of them, i.e., possible participation in another research project.*
5. will obtain permission and document consent of a parent, legal guardian or responsible guardian before interviewing children 12 years old or younger; *Interviewers must take special care when interviewing children or young people. The informed consent of the parent or responsible adult must first be obtained for interviews with children.*
6. will give respondents the opportunity to refuse to participate in the research when there is a possibility they may be identifiable even without the use of their name or address (e.g., because of the size of the population being sampled.) *Respondent cooperation is strictly on a voluntary basis. Respondents are entitled to withdraw from a research project. Company policies and/or interviewer instructions should state the interviewer must give respondents the opportunity to not participate for any reason.*

Interviewers ...

1. will treat the respondent with respect and not influence him or her through direct or indirect attempts, including the framing of questions, a respondent's opinion or attitudes on any issue. *Interviewers cannot ask questions in a way that leads or influences respondents' answers, nor can they provide their own opinions, thoughts or feelings that might bias a respondent and therefore impact the answers they give.*
2. will obtain and document permission of a parent, legal guardian or responsible guardian before interviewing children 12 years old or younger. Prior to obtaining permission, the interviewer should divulge the subject matter, length of interview and other special tasks that will be required. *Interviewers must take special care when interviewing children and young people. The informed consent of the parent or responsible adult must first be obtained for interviews with children. Parents or responsible adults must be told some specifics about the interview process and special tasks, such as audio or video recording, taste testing, respondent fees and special tasks, before permission is obtained.*

RESPONSIBILITIES TO CLIENTS

Data Collection Companies ...

1. will ensure that each study is conducted according to the client's specifications; *Procedures are implemented to conform or verify that client specifications are being followed.*
2. will observe confidentiality with all research techniques or methodologies and with information considered confidential or proprietary. Information will not be revealed that could be used to identify clients or respondents without proper authorization; *Respondent information will be linked to data collected only for research purposes and will not be used for any purpose other than legitimate research. Protect the confidentiality of anything learned about the respondent and/or his or her business.*
3. will ensure that companies, their employees and subcontractors involved in data collection take all reasonable precautions so that no more than one survey is conducted in one interview without explicit permission from the sponsorship company or companies; *Company policies or procedures indicate the practice of conducting more than one survey within an interview is not done without specific permission from the relevant clients.*
4. will report research results accurately and honestly; *Describe how the research was done in enough detail that a skilled researcher could repeat the study; provide data representative of a defined population or activity and enough data to yield projectable results; present the results understandably and fairly, including any results that may seem contradictory or unfavorable.*
5. will not misrepresent themselves as having qualifications, experience, skills or facilities that they do no possess; *If regularly subcontracting data collection, should not infer to clients and prospective clients that they possess this capability "in house"; claim only legitimate academic degrees, clients and other qualifications.*
6. will refrain from referring to membership in the Marketing Research Association as proof of competence, since the Association does not certify any person's or organization's competency or skill level. *MRA does not currently have a certification program for marketing research competency, therefore while members can state their membership in the Association, they cannot claim that this automatically conveys a message of their competency to carry out the marketing research process.*

RESPONSIBILITIES TO DATA COLLECTORS

Clients ...

1. will be responsible for providing products and services that are safe and fit for their intended use and disclose/label all product contents; *It is the client's responsibility to ensure that all test products are in compliance with all safety standards and that all product contents information is provided to the data collectors. Data Collectors should request in writing all pertinent information as well as emergency numbers for respondents and themselves.*
2. will provide oral or written instructions; *To ensure the success of the research, detailed instructions are to be provided prior to the start of any project. These instructions must be written and then confirmed orally for: understanding, ability of the agency to implement and agreement to comply.*
3. will not ask our members who subcontract research to engage in any activity that is not acceptable as defined in this Code or that is prohibited under any applicable federal, state and local laws, regulations and ordinances. *All MRA Members have agreed to comply with the Code as written and thus will not agree to, or ask anyone else to, knowingly violate any of the points of the Code.*

RESPONSIBILITIES TO THE GENERAL PUBLIC AND BUSINESS COMMUNITY

Data Collection Companies ...

1. will not intentionally abuse public confidence in marketing and opinion research; *Marketing research shall be conducted and reported for the sole purpose of providing factual information upon which decisions will be made. At no time is marketing research information to be used to intentionally mislead public opinion. Instances of abuse of public confidence undermine the credibility of our Industry.*
2. will not represent a non-research activity to be marketing and opinion research, such as:
    - questions whose sole objective is to obtain personal information about respondents, whether for legal, political, private or other purposes,
    - the compilation of lists, registers or data banks of names and addresses for any non-research purposes (e.g., canvassing or fundraising),
    - industrial, commercial or any other form of espionage,
    - the acquisition of information for use by credit rating services or similar organizations,
    - sales or promotional approaches to the respondent,

APPENDIX G

Traffic Management

APPENDIX G: TRAFFIC MANAGEMENT

This appendix presents suggested traffic control measures to facilitate the evacuation of the SSES/Bell Bend Nuclear Power Plant EPZ. Pages G-4 through G-7 provide detailed Traffic Control Point (TCP) schematics; TCPs are established to facilitate the flow of evacuee traffic from within the EPZ. Table G-1 summarizes the TCP and the manpower and equipment needed to implement traffic control. Figure G-1 provides detailed mapping of the location of each traffic control point identified based on the results of this ETE study.

The intersections listed in Table G-1 were identified based on the simulation of the evacuation traffic. As mentioned in Section 7.2, the majority of congestion in the EPZ is in the Borough of Berwick and the City of Nanticoke. The major evacuation routes servicing these areas, Route 11 and Route 93 in Berwick, and Route 11 and Kirmar Pkwy in Nanticoke exhibit bottlenecks and prolonged congestion at these intersections.

The county and local municipal emergency plans identify 100 TCPs and 36 ACPs throughout the EPZ and on the periphery of the EPZ. These intersections have also been mapped in Figure G-1.

There are likely to be manpower and equipment shortages in an emergency situation. Prioritization of TCP/ACP and the use of ITS technologies, as outlined in Section 9, will aid in overcoming manpower shortages.

With reference to the discussion of Section 2.3, these TCP serve many vital functions, but are not considered in specifying the inputs to the I-DYNEV system used to calculate ETE. Consequently, the results presented in Section 7 and in Appendix J do not reflect the presence of these TCP.

Table G-1 List of Traffic Control Points					
TCP ID	*Municipality*	*Intersection*	*Priority*	*# of Guides*	*# of Cones*
1	Orangeville	Route 93 and Route 487	1	1	3
2	Light Street	Fowlersville Road and Highway 487	1	2	9
3	Nanticoke	Kirmar Parkway, Kirmar Avenue	1	2	6
4	Berwick	Walnut Street and 2nd Street	1	1	6
			Total:	5	24

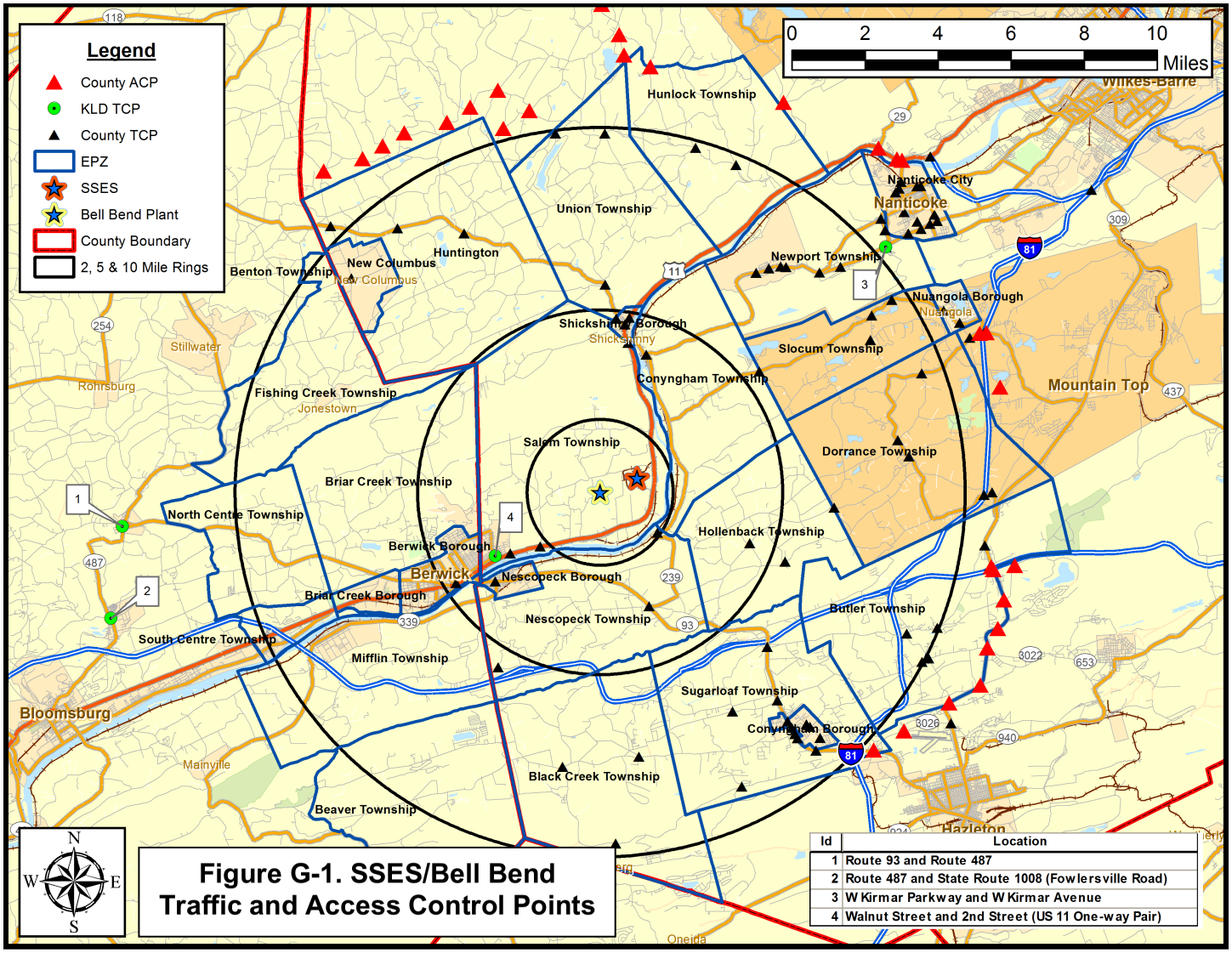


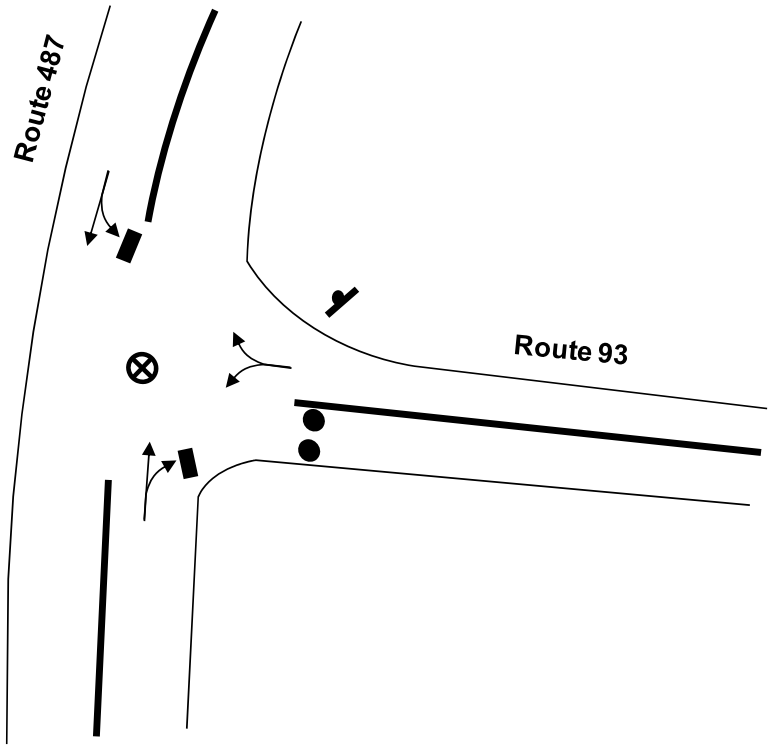
Figure G-1. SSES/Bell Bend Traffic and Access Control Points

TCP

MUNICIPALITY: Orangeville

LOCATION: Route 93 & Route 487

TCP ID: 1

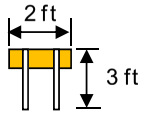


N

****Traffic Guide should position himself safely**

KEY

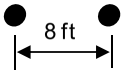
- MOVEMENT FACILITATED
- MOVEMENT DISCOURAGED/DIVERTED
- TRAFFIC GUIDE
- STOP SIGN
- TRAFFIC BARRICADE



2 PER LANE (LOCAL ROADS AND RAMPS)

4 PER LANE (FREEWAY AND RAMPS)

- TRAFFIC SIGNAL
- TRAFFIC CONES SPACED TO DISCOURAGE TRAFFIC BUT ALLOW PASSAGE (3 PER LANE):



ACTIONS TO BE TAKEN

1. Discourage eastbound movement on Route 93

MANPOWER/EQUIPMENT ESTIMATE

1 Traffic Guide(s)
3 Traffic Cones

LOCATION PRIORITY

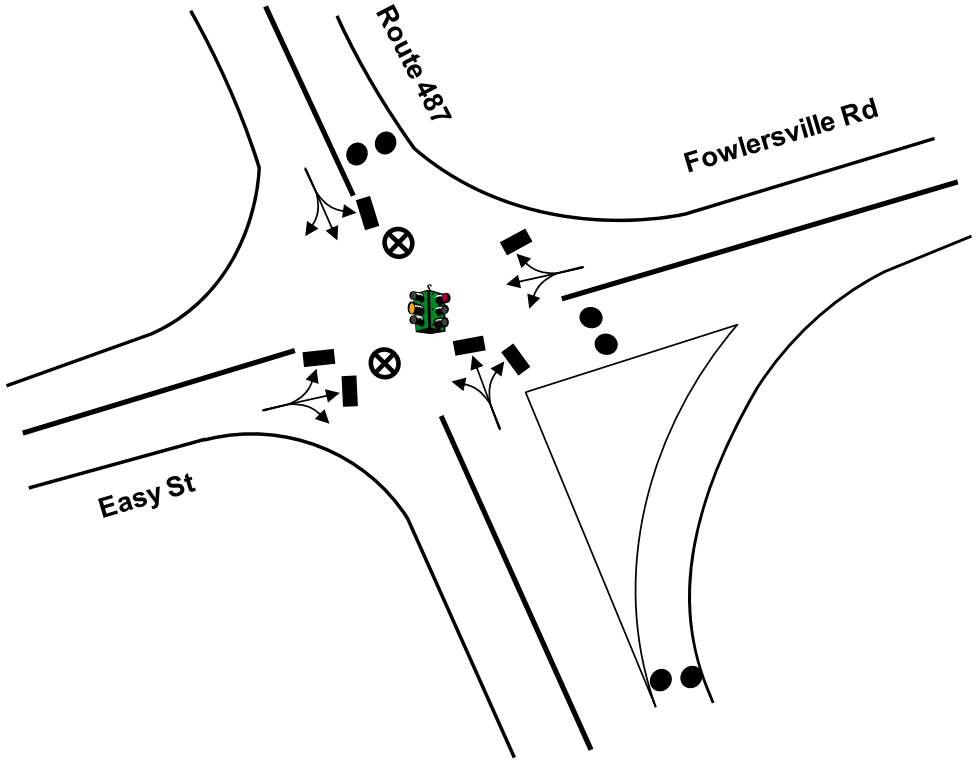
1

TCP

MUNICIPALITY: Light Street

LOCATION: Fowlersville Rd & Route 487

TCP ID: 2

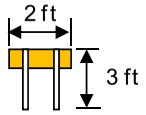


N

****Traffic Guide should position himself safely**

KEY

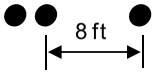
- MOVEMENT FACILITATED
- MOVEMENT DISCOURAGED/DIVERTED
- TRAFFIC GUIDE
- STOP SIGN
- TRAFFIC BARRICADE



2 PER LANE (LOCAL ROADS AND RAMPS)

4 PER LANE (FREEWAY AND RAMPS)

- TRAFFIC SIGNAL
- TRAFFIC CONES SPACED TO DISCOURAGE TRAFFIC BUT ALLOW PASSAGE (3 PER LANE):



ACTIONS TO BE TAKEN

1. Discourage eastbound movement on Fowlersville Rd
2. Discourage northbound movement on Route 487
3. U-turn northbound movement on Route 487 to south
4. Discourage westbound movement on Easy St

MANPOWER/EQUIPMENT ESTIMATE

2 Traffic Guide(s)
9 Traffic Cones

LOCATION PRIORITY

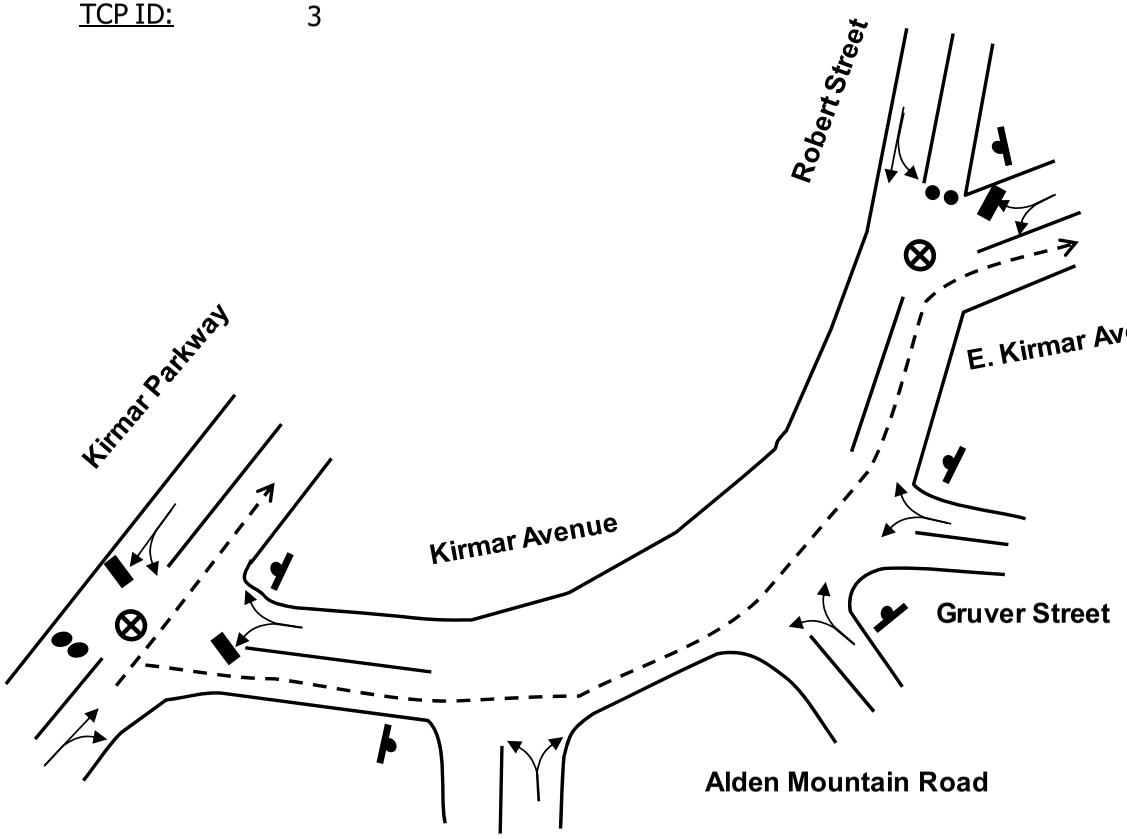
1

TCP

MUNICIPALITY: Nanticoke

LOCATION: Kirmar Pkwy, Kirmar Ave & Robert St

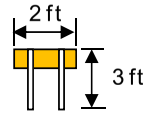
TCP ID: 3



****Traffic Guide should position himself safely**

KEY

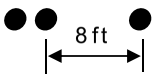
- MOVEMENT FACILITATED
- MOVEMENT DISCOURAGED/DIVERTED
- TRAFFIC GUIDE
- STOP SIGN
- TRAFFIC BARRICADE



2 PER LANE (LOCAL ROADS AND RAMPS)

4 PER LANE (FREEWAY AND RAMPS)

- TRAFFIC SIGNAL
- TRAFFIC CONES SPACED TO DISCOURAGE TRAFFIC BUT ALLOW PASSAGE (3 PER LANE):



ACTIONS TO BE TAKEN

1. Balance traffic between Kirmar Parkway and E.Kirmar Avenue
2. Discourage southbound movement on Kirmar Parkway
3. Discourage northbound movement on Robert Street

MANPOWER/EQUIPMENT ESTIMATE

2 Traffic Guide(s)
6 Traffic Cones

LOCATION PRIORITY

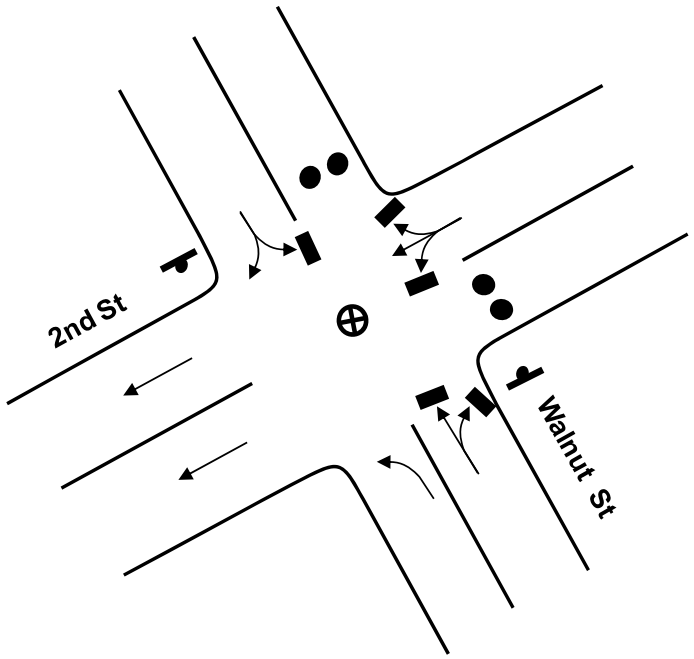
1

TCP

MUNICIPALITY: Berwick

LOCATION: Walnut St, 2nd St

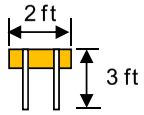
TCP ID: 4



****Traffic Guide should position himself safely**

KEY

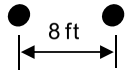
- MOVEMENT FACILITATED
- MOVEMENT DISCOURAGED/DIVERTED
- TRAFFIC GUIDE
- STOP SIGN
- TRAFFIC BARRICADE



2 PER LANE (LOCAL ROADS AND RAMPS)

4 PER LANE (FREEWAY AND RAMPS)

- TRAFFIC SIGNAL
- TRAFFIC CONES SPACED TO DISCOURAGE TRAFFIC BUT ALLOW PASSAGE (3 PER LANE):



ACTIONS TO BE TAKEN

1. Detour northbound movement on walnut street towards southwest on 2nd St.
2. Discourage eastbound movement on 2nd St.
3. Discourage southeastbound movement walnut St.

MANPOWER/EQUIPMENT ESTIMATE

2 Traffic Guide(s)
6 Traffic Cones

LOCATION PRIORITY

1

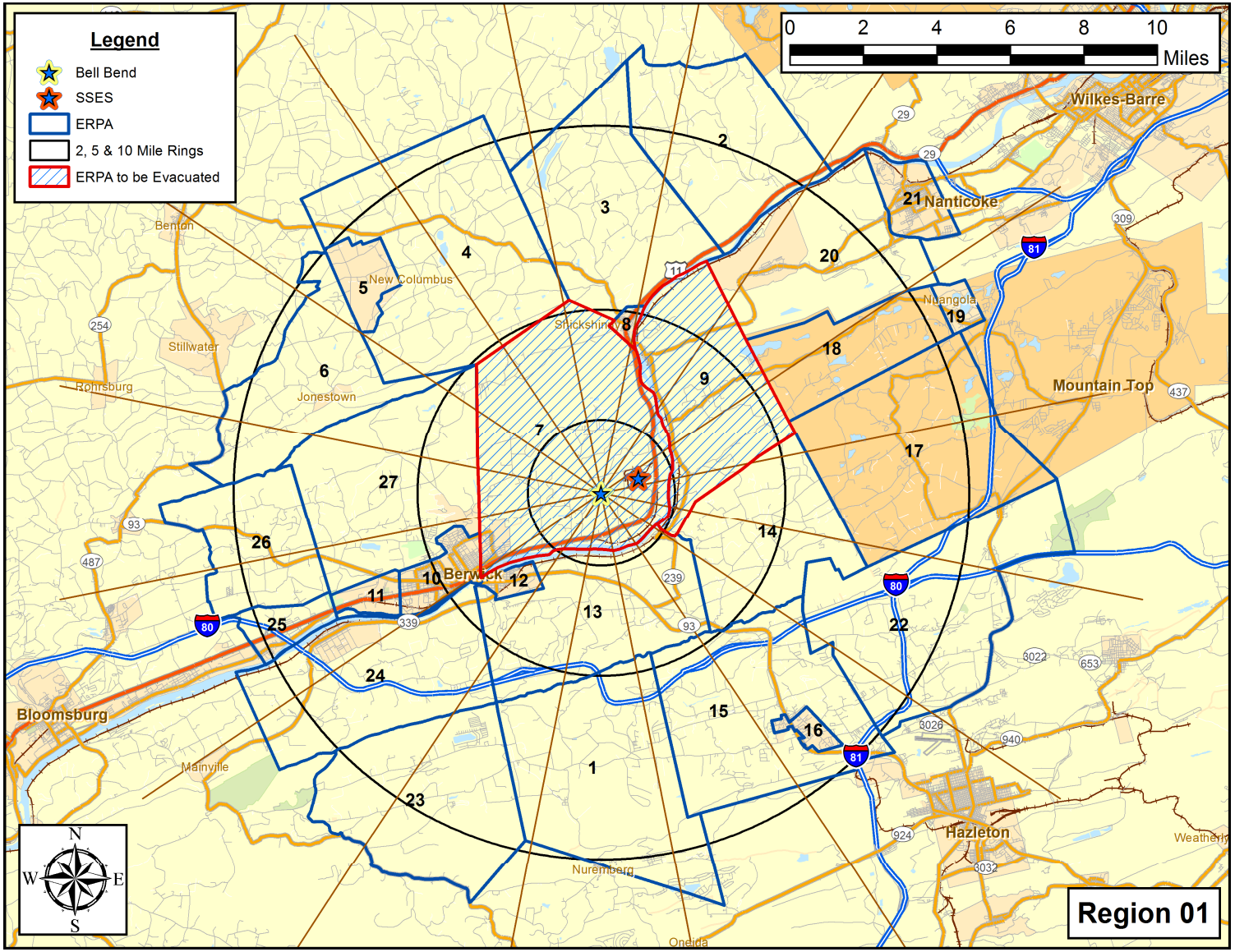
APPENDIX H

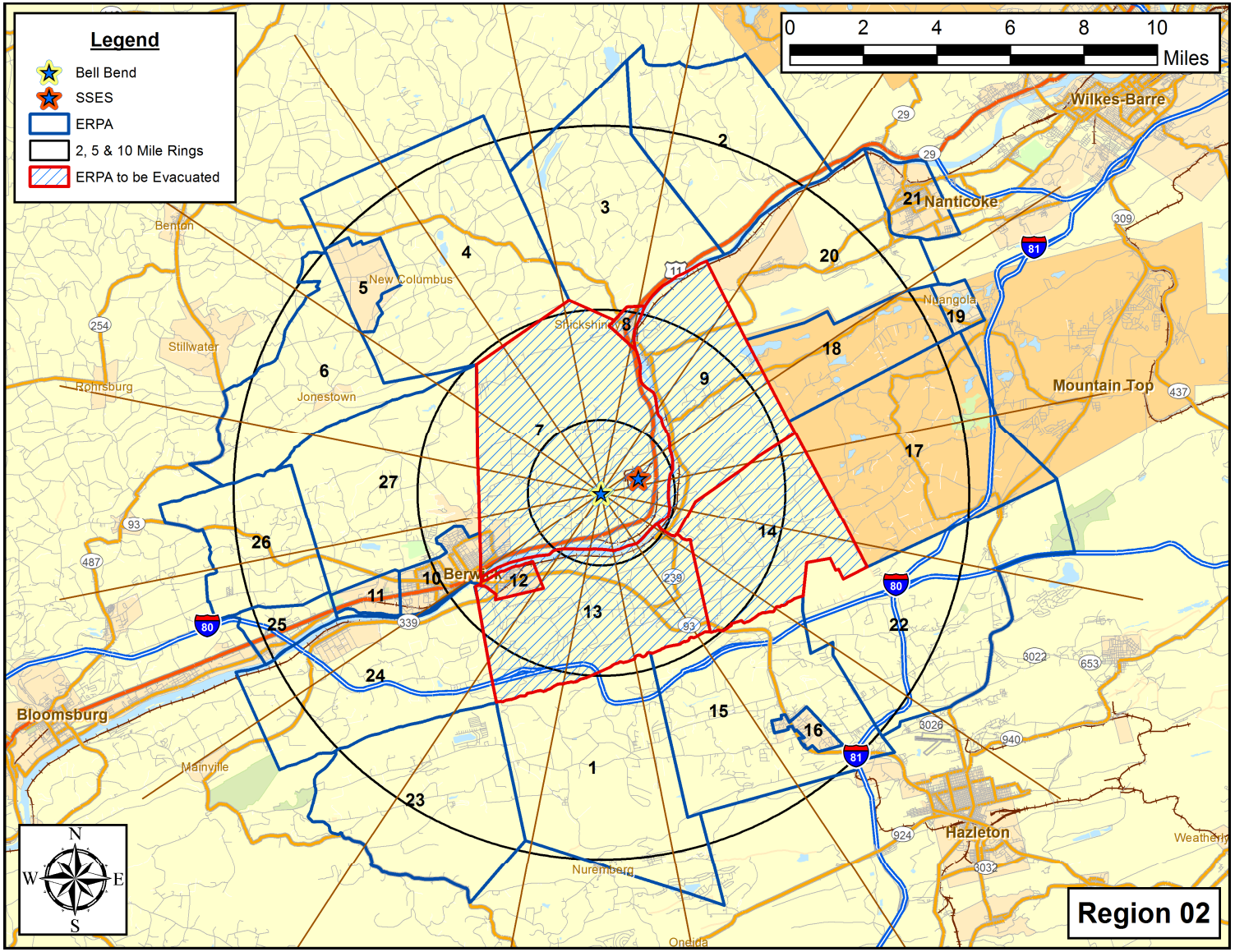
Evacuation Regions

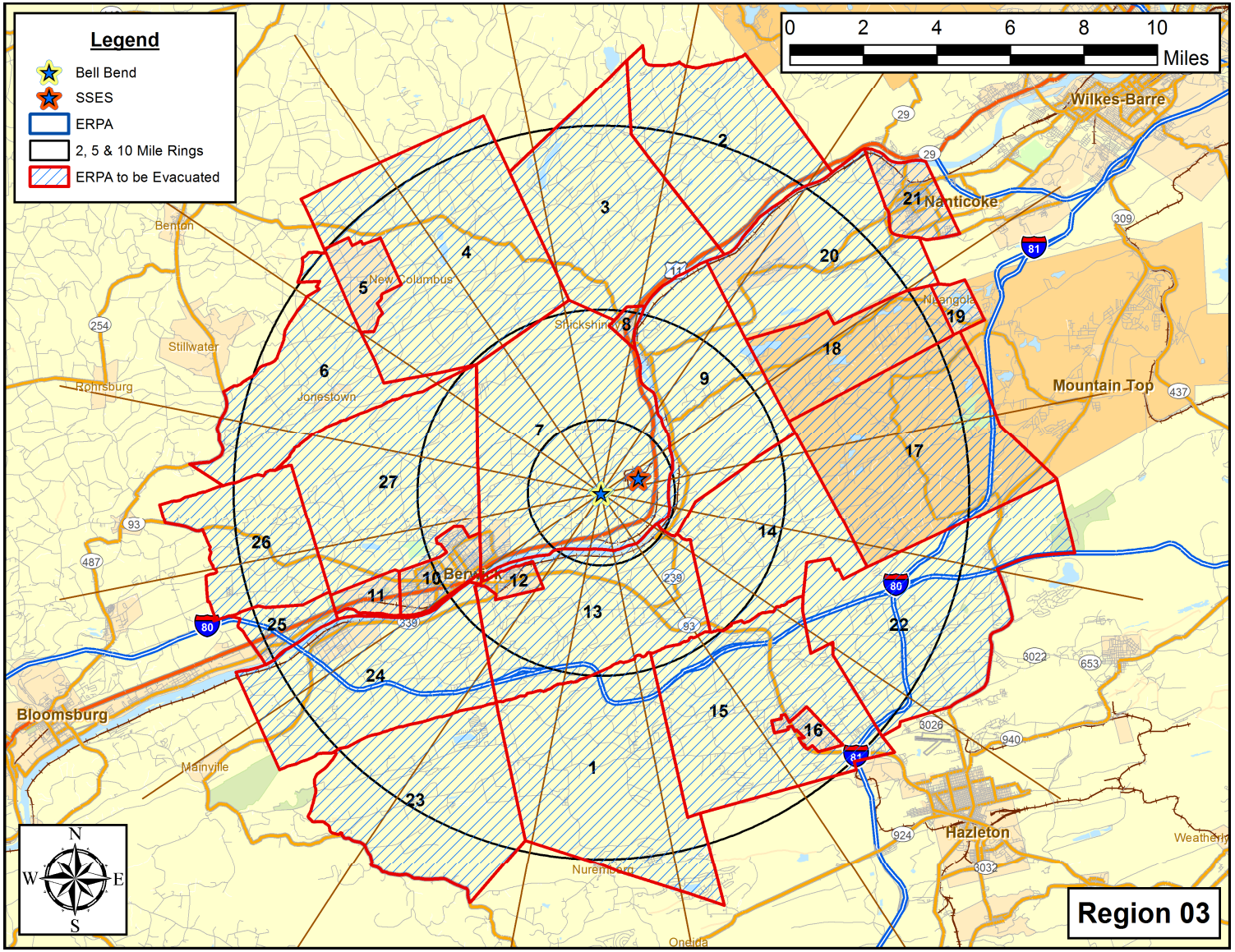
APPENDIX H: EVACUATION REGIONS

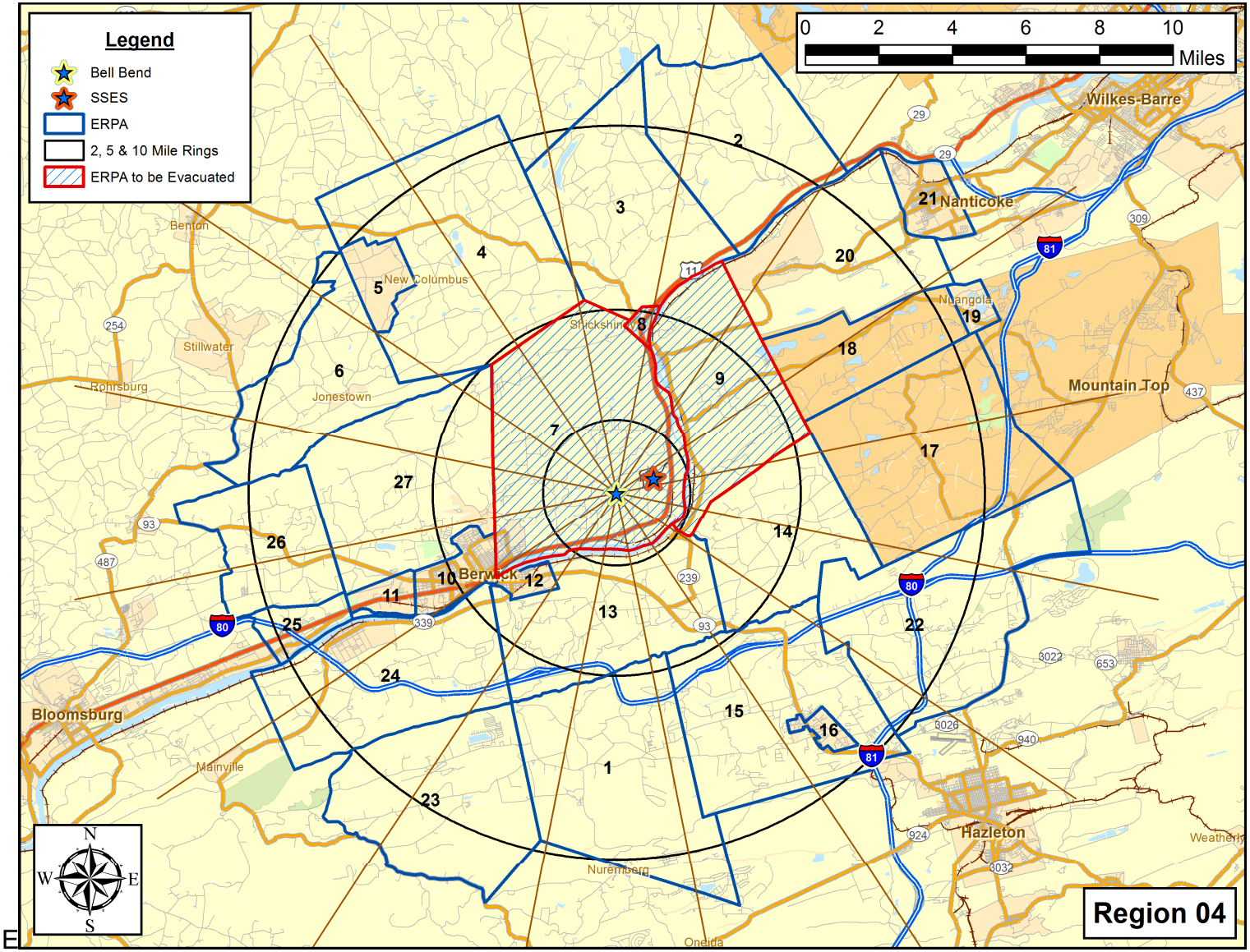
This appendix presents maps of all Evacuation Regions. Table H-1 lists the percentage of population within each emergency response planning area (ERPA) or municipality which evacuates for each of the 22 Regions identified in Section 6.

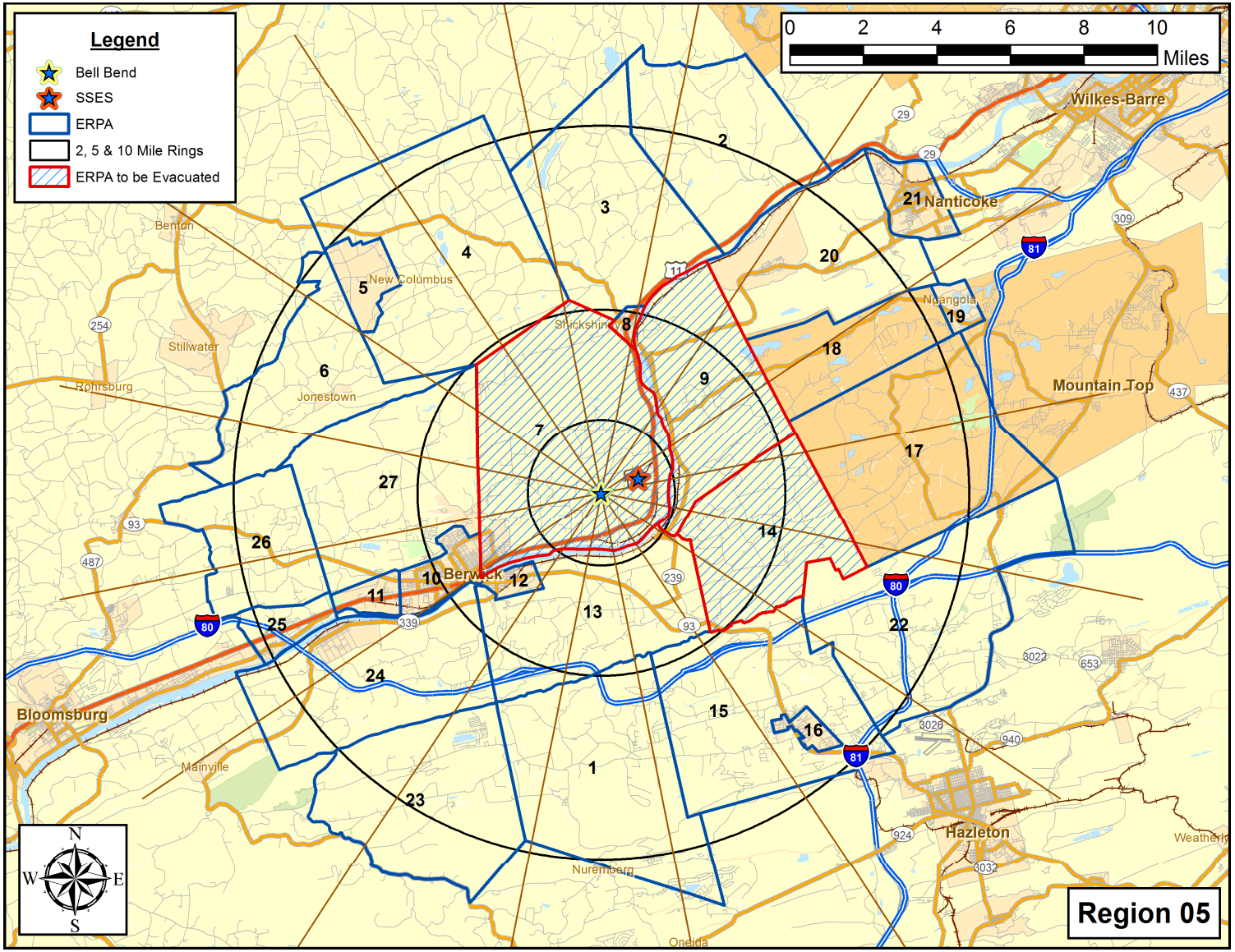
Table H-1. Percent of ERPA Population Evacuating for Each Region																						
	REGION																					
	2-Mile Ring, 5-Mile Ring, Entire EPZ			2-Mile Radius and Downwind to 5-Miles				5-Mile Radius and Downwind to EPZ Boundary														
ERPA	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
1	35%	35%	100%	35%	35%	35%	35%	50%	50%	50%	50%	50%	50%	100%	100%	100%	100%	50%	50%	50%	50%	50%
2	35%	35%	100%	35%	35%	35%	35%	100%	100%	100%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	100%
3	35%	35%	100%	35%	35%	35%	35%	100%	100%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	100%	100%
4	35%	35%	100%	35%	35%	35%	35%	100%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	100%	100%	100%	100%
5	35%	35%	100%	35%	35%	35%	35%	100%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	100%	100%	100%	100%
6	35%	35%	100%	35%	35%	35%	35%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	100%	100%	100%	100%	50%
7	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
8	35%	100%	100%	100%	50%	50%	50%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
9	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
10	35%	35%	100%	35%	35%	35%	35%	50%	50%	50%	50%	50%	50%	50%	50%	50%	100%	100%	100%	50%	50%	50%
11	35%	35%	100%	35%	35%	35%	35%	50%	50%	50%	50%	50%	50%	50%	50%	50%	100%	100%	100%	50%	50%	50%
12	35%	100%	100%	50%	50%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
13	35%	100%	100%	50%	50%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
14	35%	100%	100%	50%	100%	100%	50%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
15	35%	35%	100%	35%	35%	35%	35%	50%	50%	50%	50%	50%	100%	100%	100%	50%	50%	50%	50%	50%	50%	50%
16	35%	35%	100%	35%	35%	35%	35%	50%	50%	50%	50%	50%	100%	100%	100%	50%	50%	50%	50%	50%	50%	50%
17	35%	35%	100%	35%	35%	35%	35%	50%	50%	100%	100%	100%	100%	50%	50%	50%	50%	50%	50%	50%	50%	50%
18	35%	35%	100%	35%	35%	35%	35%	50%	100%	100%	100%	100%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%
19	35%	35%	100%	35%	35%	35%	35%	50%	50%	100%	100%	100%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%
20	35%	35%	100%	35%	35%	35%	35%	100%	100%	100%	100%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%
21	35%	35%	100%	35%	35%	35%	35%	50%	100%	100%	100%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%
22	35%	35%	100%	35%	35%	35%	35%	50%	50%	50%	100%	100%	100%	100%	50%	50%	50%	50%	50%	50%	50%	50%
23	35%	35%	100%	35%	35%	35%	35%	50%	50%	50%	50%	50%	50%	50%	100%	100%	100%	100%	50%	50%	50%	50%
24	35%	35%	100%	35%	35%	35%	35%	50%	50%	50%	50%	50%	50%	50%	50%	100%	100%	100%	100%	50%	50%	50%
25	35%	35%	100%	35%	35%	35%	35%	50%	50%	50%	50%	50%	50%	50%	50%	50%	100%	100%	100%	50%	50%	50%
26	35%	35%	100%	35%	35%	35%	35%	50%	50%	50%	50%	50%	50%	50%	50%	50%	100%	100%	100%	100%	50%	50%
27	35%	35%	100%	35%	35%	35%	35%	50%	50%	50%	50%	50%	50%	50%	50%	50%	100%	100%	100%	100%	100%	50%

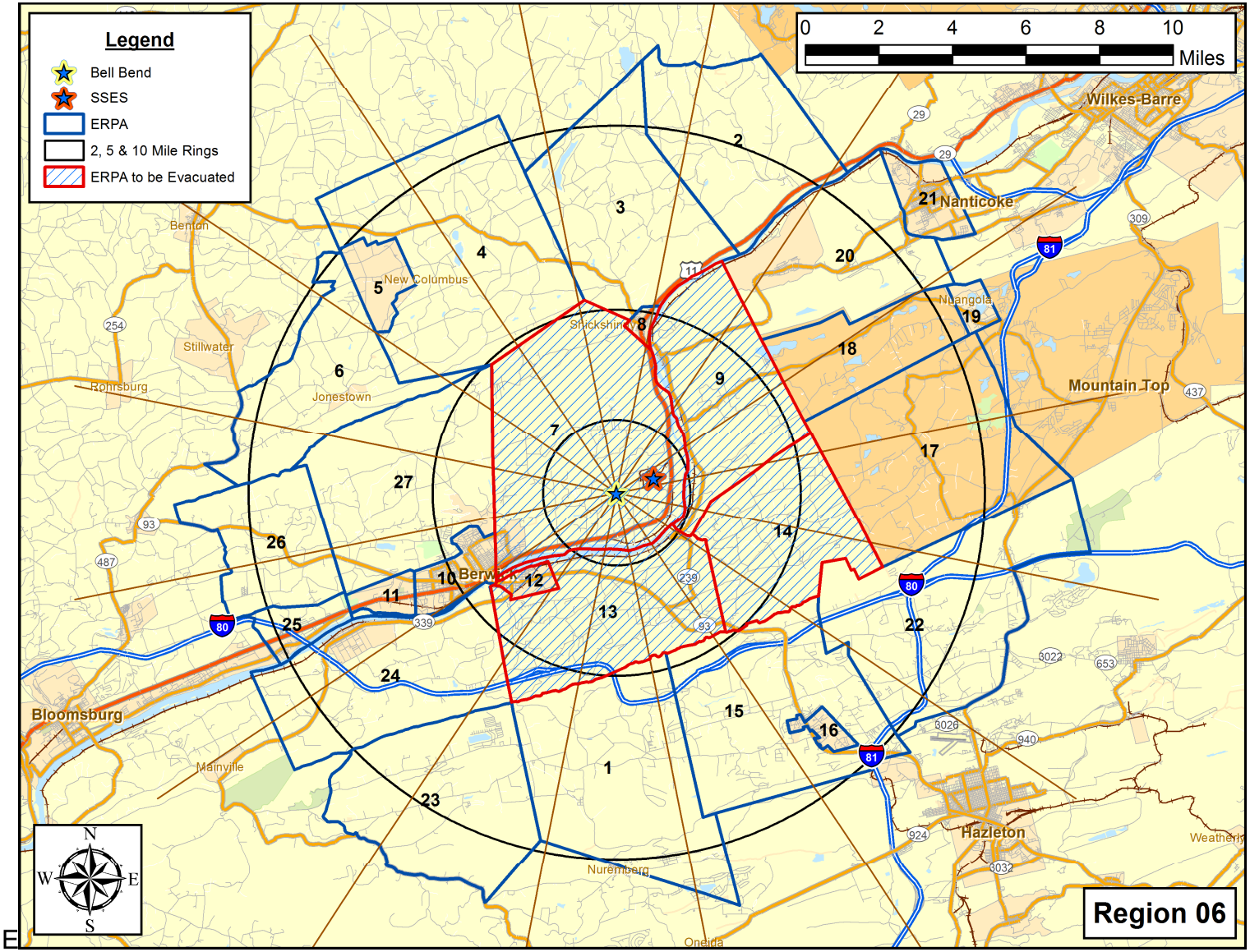

Legend
Bell Bend
SSES
ERPA
2, 5 & 10 Mile Rings
ERPA to be Evacuated
0 2 4 6 8 10
Miles
Wilkes-Barre
Nanticoke
Benton
New Columbus
Shickshinny
Nuangola
Stillwater
Rohrsburg
Jonestown
Mountain Top
Berwick
Bloomsburg
Mainville
Nuremberg
Hazleton
Weatherly
Oneida
Region 01

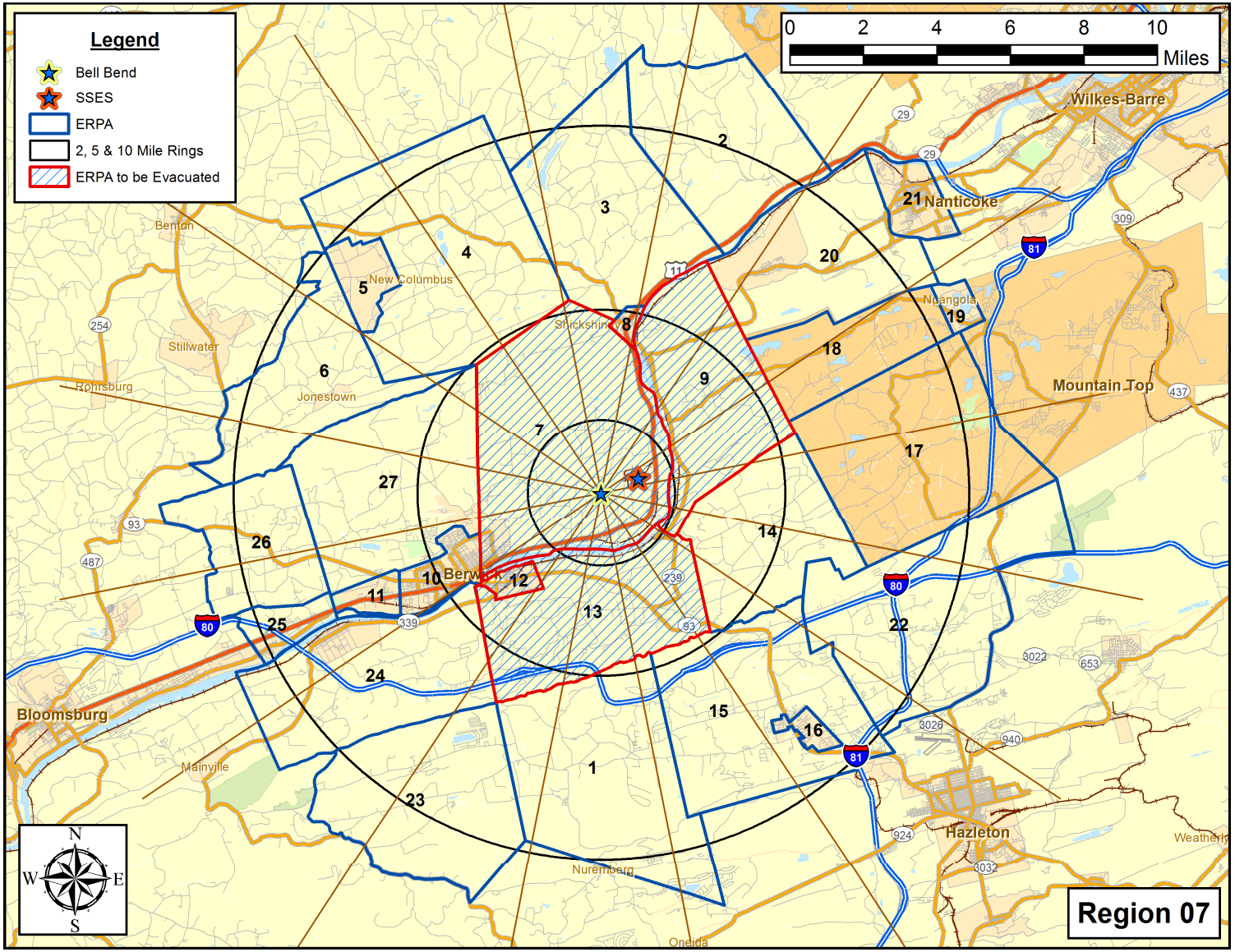

Legend
Bell Bend
SSES
ERPA
2, 5 & 10 Mile Rings
ERPA to be Evacuated
0 2 4 6 8 10
Miles
Wilkes-Barre
Nanticoke
Mountain Top
Hazleton
Bloomsburg
Berwick
New Columbus
Benton
Stillwater
Rohrsburg
Jonestown
Shickshinny
Nuangola
Mainville
Nuremberg
Oneida
Weatherly
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
N
W
E
S
Region 02

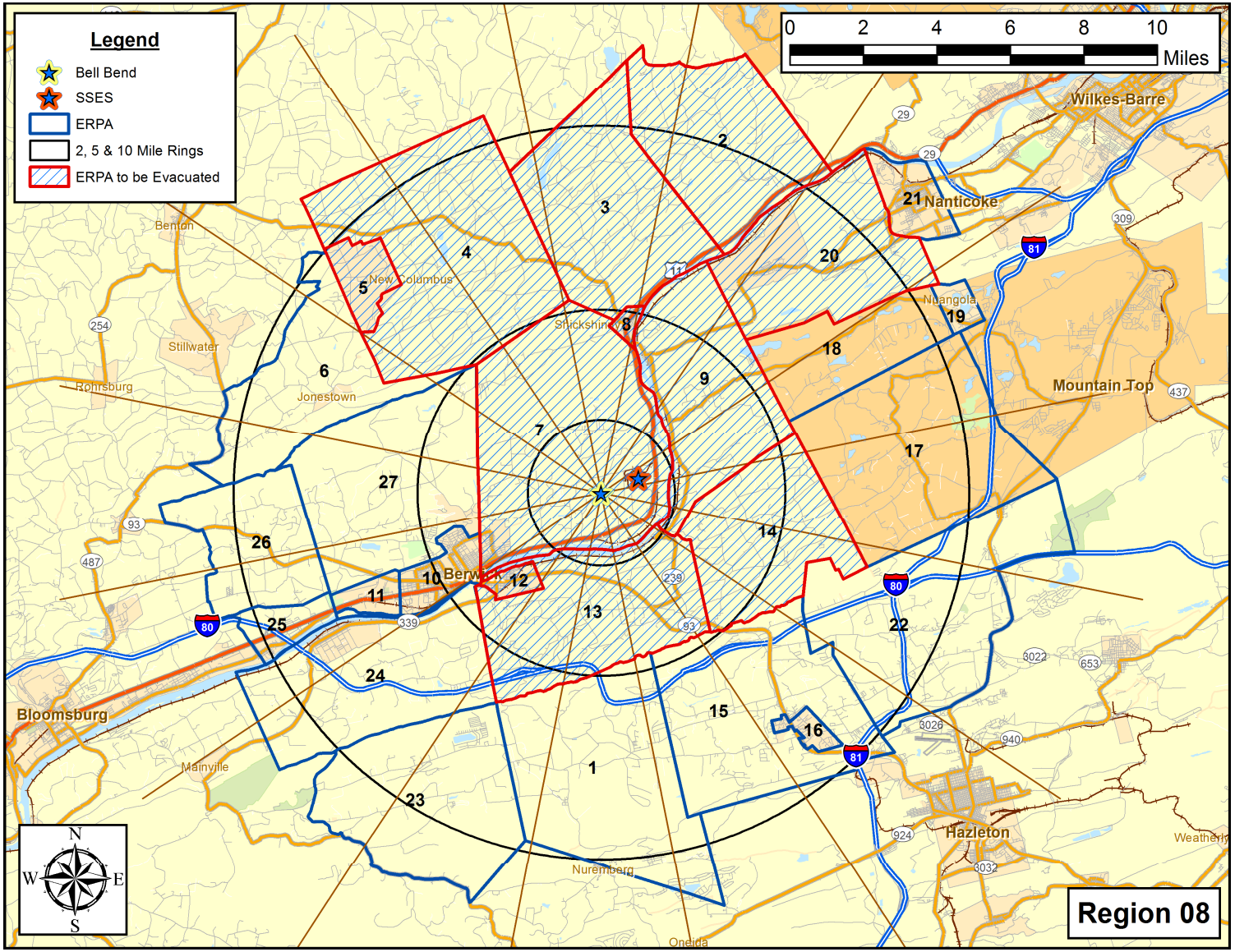

Legend
Bell Bend
SSES
ERPA
2, 5 & 10 Mile Rings
ERPA to be Evacuated
0 2 4 6 8 10
Miles
Wilkes-Barre
Nanticoke
Mountain Top
Hazleton
Bloomsburg
Berwick
Benton
New Columbus
Stillwater
Rohrsburg
Jonestown
Shickshinny
Mainville
Nuremberg
Oneida
Weatherly
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
N
W
E
S
Region 03

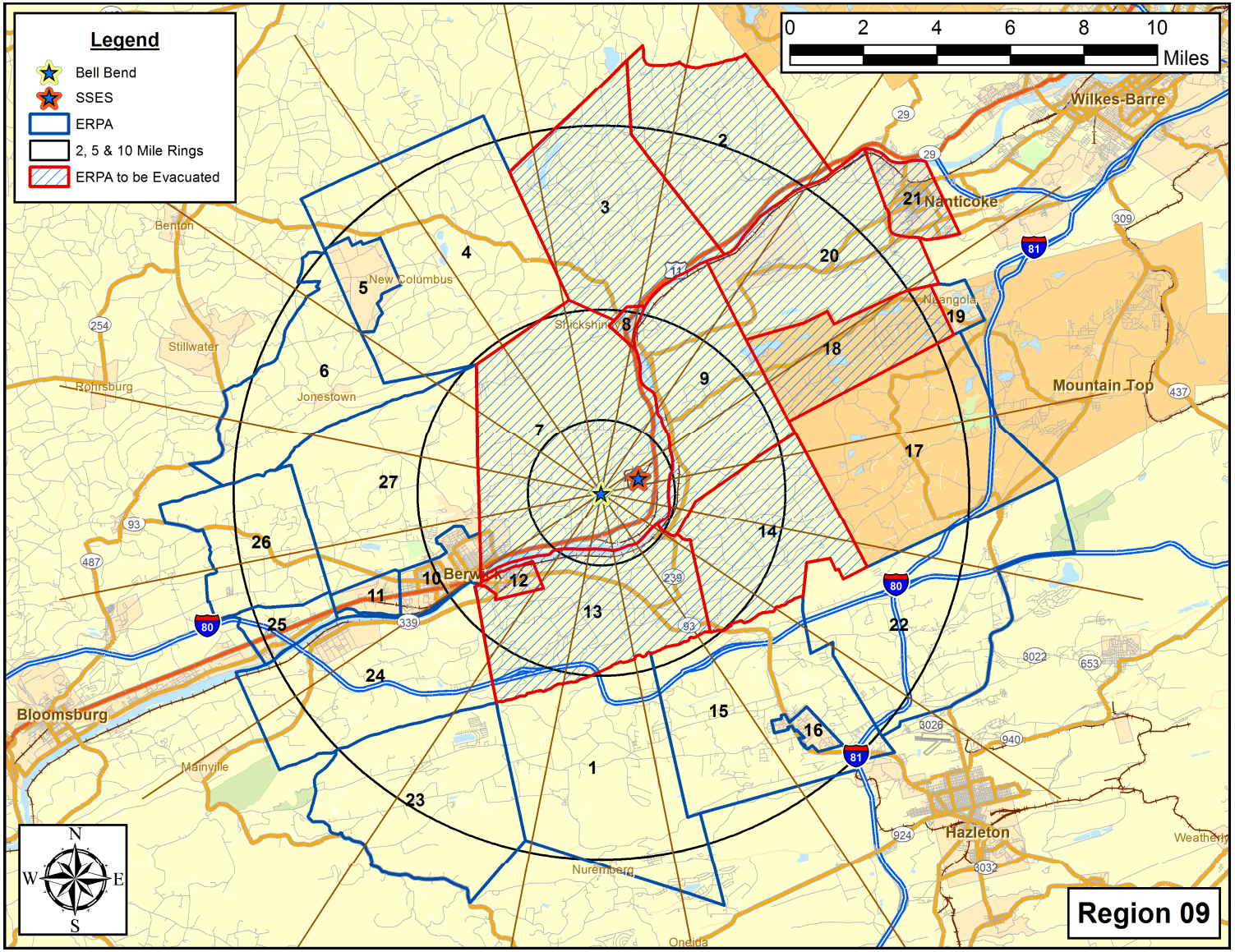

Legend
Bell Bend
SSES
ERPA
2, 5 & 10 Mile Rings
ERPA to be Evacuated
0 2 4 6 8 10
Miles
Wilkes-Barre
Nanticoke
Mountain Top
Berwick
Bloomsburg
Hazleton
Benton
New Columbus
Stillwater
Rohrsburg
Jonestown
Shickshinny
Nuangola
Mainville
Nuremberg
Oneida
Weatherly
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
N
W
E
S
Region 04

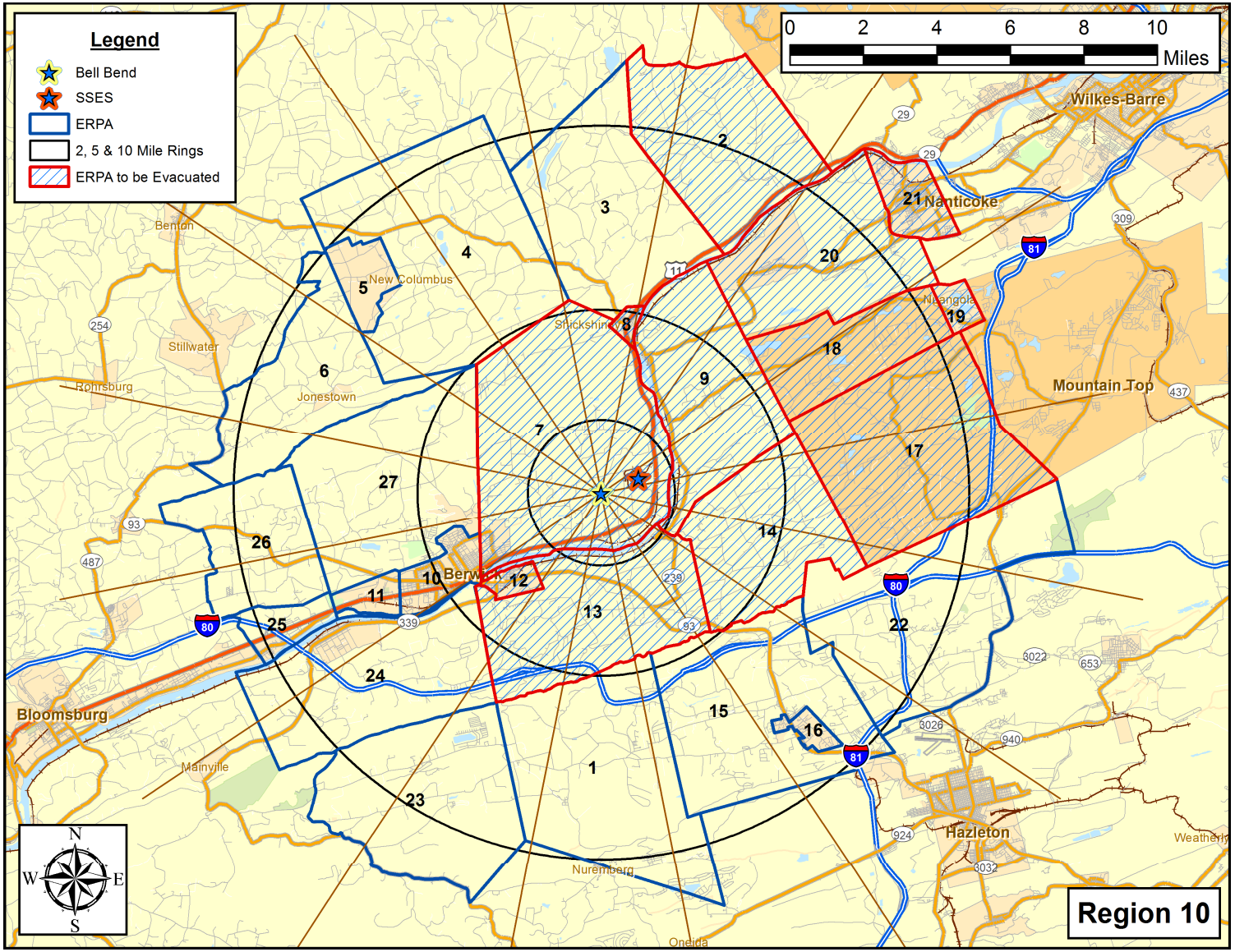

Legend
Bell Bend
SSES
ERPA
2, 5 & 10 Mile Rings
ERPA to be Evacuated
0 2 4 6 8 10
Miles
Wilkes-Barre
Nanticoke
Mountain Top
Berwick
Bloomsburg
Hazleton
Benton
New Columbus
Stillwater
Rohrsburg
Jonestown
Shickshinny
Nuangola
Mainville
Nuremberg
Oneida
Weatherly
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
N
W
E
S
Region 05

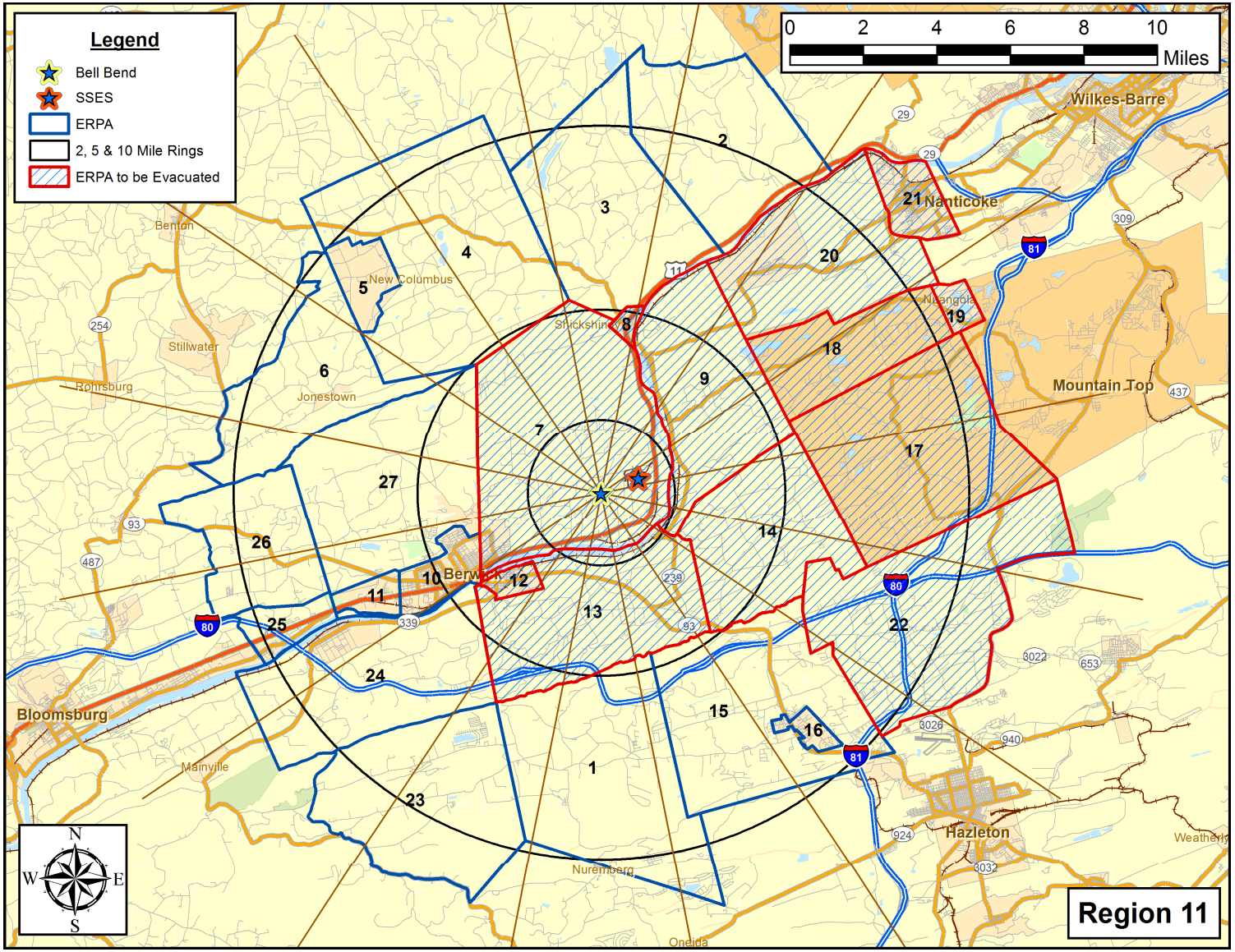

Legend
Bell Bend
SSES
ERPA
2, 5 & 10 Mile Rings
ERPA to be Evacuated
0 2 4 6 8 10
Miles
Wilkes-Barre
Nanticoke
Mountain Top
Berwick
Bloomsburg
Hazleton
Benton
New Columbus
Stillwater
Rohrsburg
Jonestown
Shickshinny
Nuangola
Mainville
Nuremberg
Oneida
Weatherly
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
N
W
E
S
Region 06

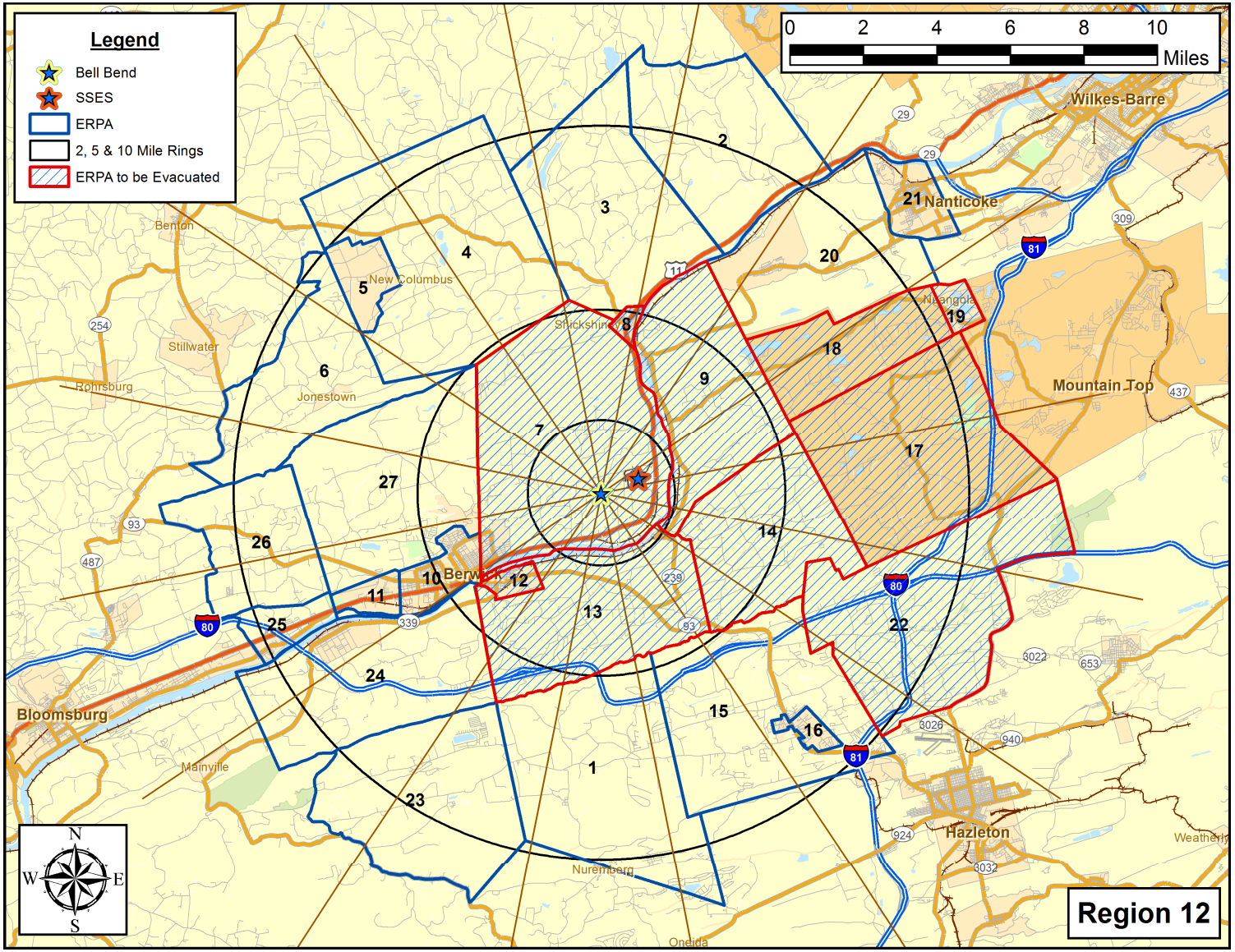

Legend
Bell Bend
SSES
ERPA
2, 5 & 10 Mile Rings
ERPA to be Evacuated
0 2 4 6 8 10
Miles
Wilkes-Barre
Nanticoke
Benton
New Columbus
Shickshinny
Nuangola
Stillwater
Rohrsburg
Jonestown
Mountain Top
Berwick
Bloomsburg
Mainville
Hazleton
Weatherly
Nuremberg
Oneida
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
N
W
E
S
Region 07

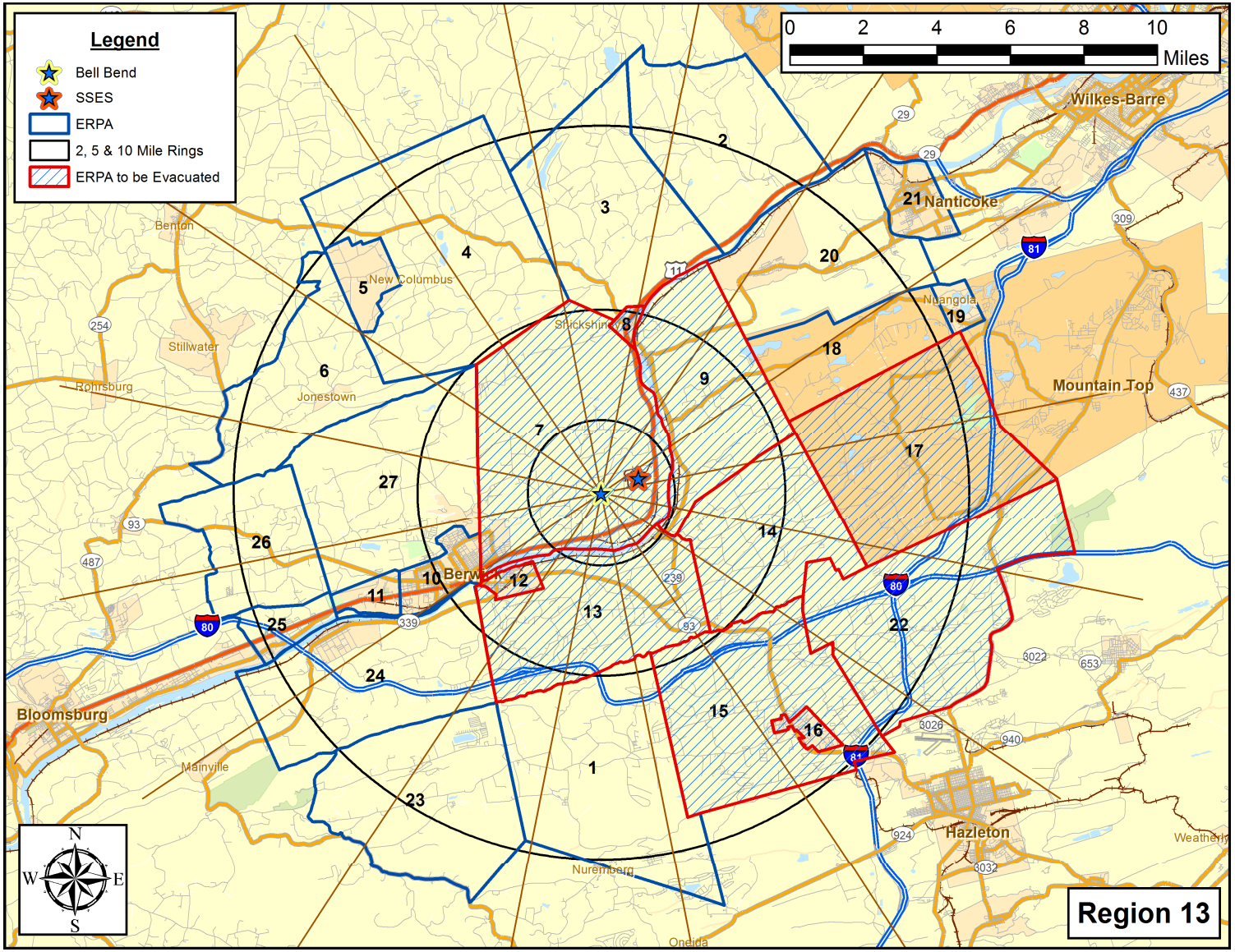

Legend
Bell Bend
SSES
ERPA
2, 5 & 10 Mile Rings
ERPA to be Evacuated
0 2 4 6 8 10
Miles
Wilkes-Barre
Nanticoke
Benton
New Columbus
Shickshinny
Nuangola
Stillwater
Rohrsburg
Jonestown
Mountain Top
Berwick
Bloomsburg
Mainville
Nuremberg
Hazleton
Weatherly
Oneida
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
N
W
E
S
Region 08

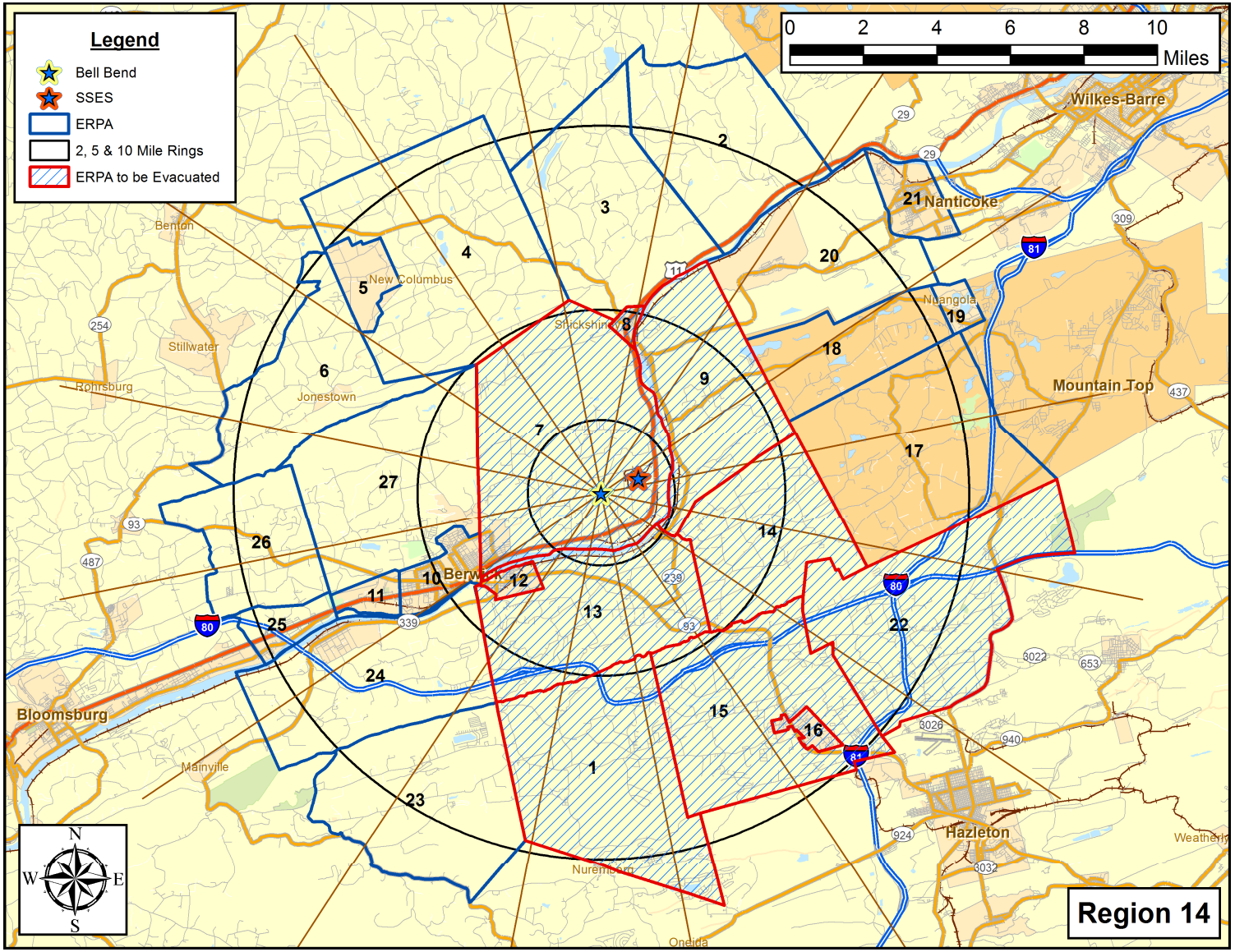

Legend
Bell Bend
SSES
ERPA
2, 5 & 10 Mile Rings
ERPA to be Evacuated
0 2 4 6 8 10
Miles
Wilkes-Barre
Nanticoke
Mountain Top
Hazleton
Bloomsburg
Berwick
New Columbus
Benton
Stillwater
Rohrsburg
Jonestown
Shickshinny
Nuangola
Mainville
Nuremberg
Oneida
Weatherly
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
N
W
E
S
Region 09

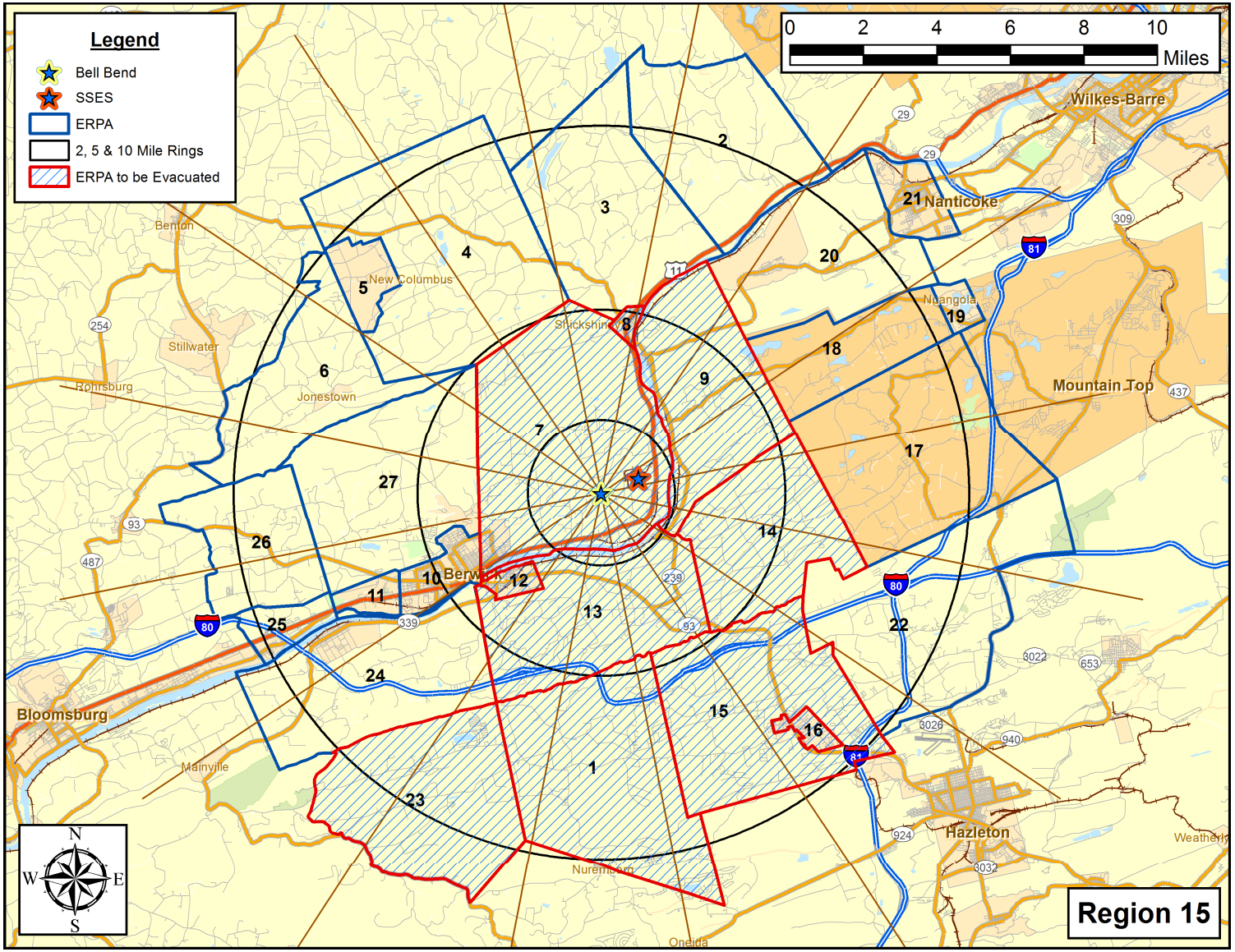

Legend
Bell Bend
SSES
ERPA
2, 5 & 10 Mile Rings
ERPA to be Evacuated
0 2 4 6 8 10
Miles
Wilkes-Barre
Nanticoke
Mountain Top
Berwick
Bloomsburg
Hazleton
New Columbus
Stillwater
Rohrsburg
Jonestown
Benton
Shickshinny
Mainville
Nuremberg
Oneida
Weatherly
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
N
W
E
S
Region 10

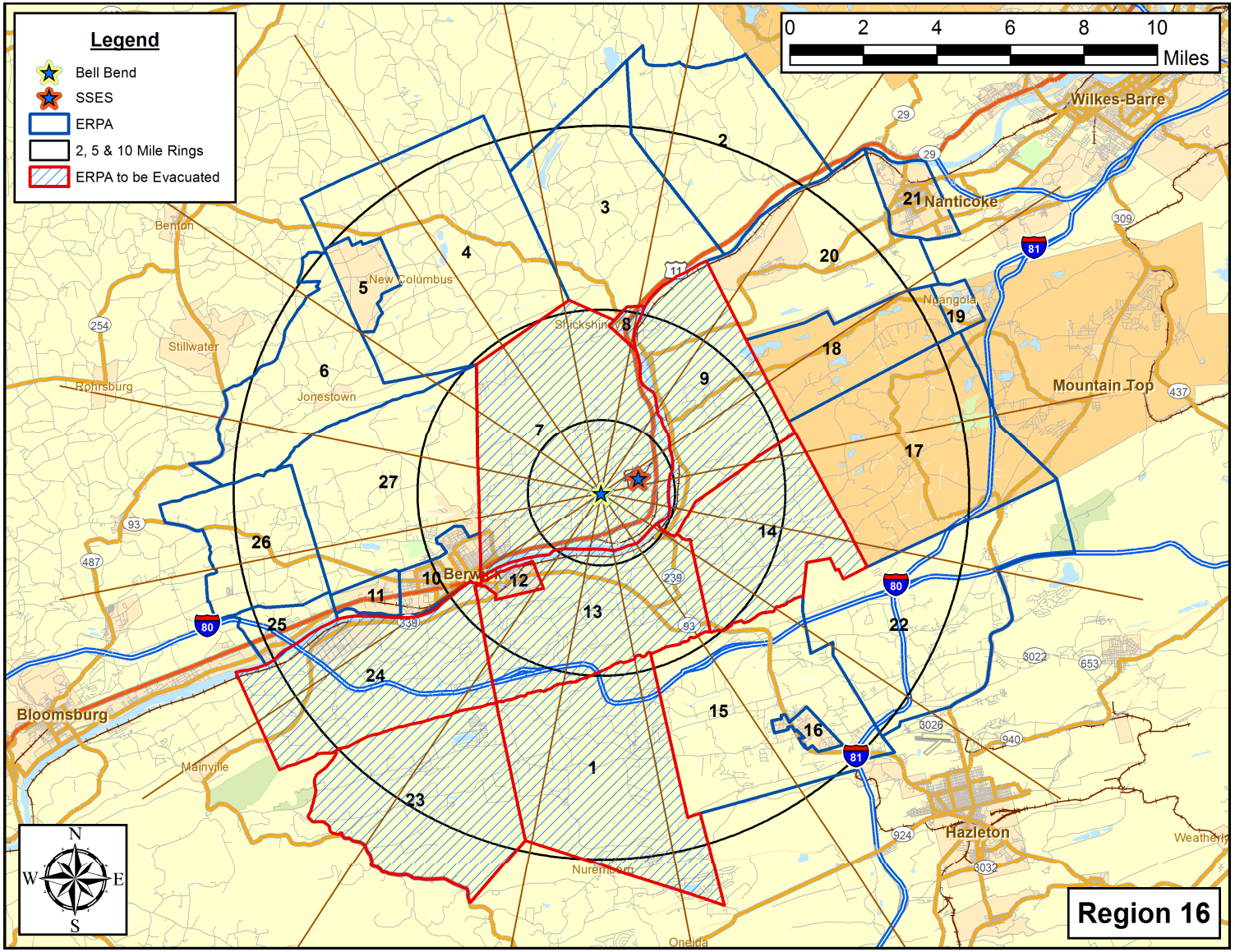

Legend
Bell Bend
SSES
ERPA
2, 5 & 10 Mile Rings
ERPA to be Evacuated
0 2 4 6 8 10
Miles
Wilkes-Barre
Nanticoke
Mountain Top
Berwick
Bloomsburg
Hazleton
New Columbus
Stillwater
Rohrsburg
Jonestown
Benton
Shickshinny
Mainville
Nuremberg
Oneida
Region 11

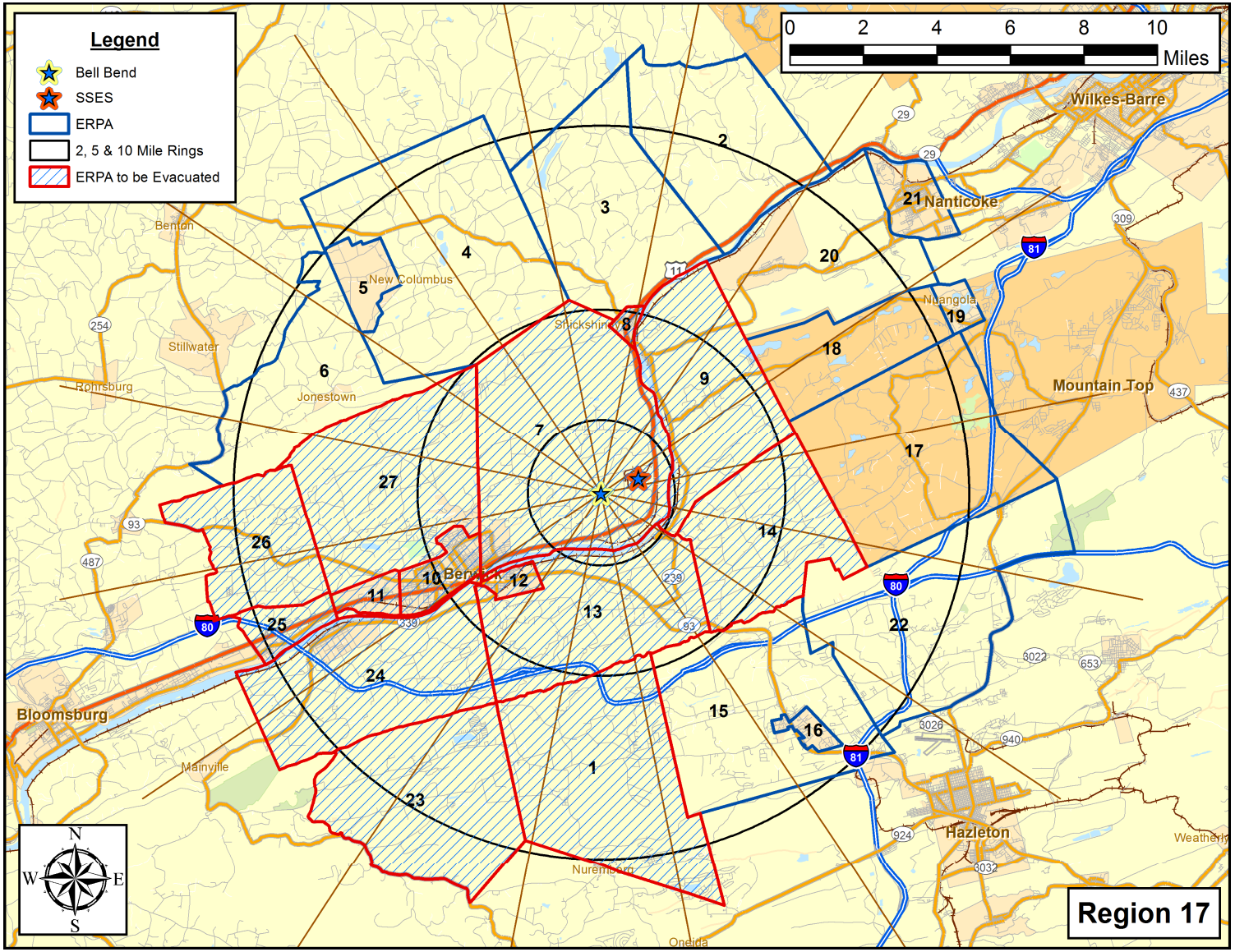

Legend
Bell Bend
SSES
ERPA
2, 5 & 10 Mile Rings
ERPA to be Evacuated
0 2 4 6 8 10
Miles
Wilkes-Barre
Nanticoke
Mountain Top
Berwick
Bloomsburg
Hazleton
New Columbus
Stillwater
Jonestown
Benton
Rohrsburg
Mainville
Nuremberg
Oneida
Shickshinny
Nuangola
Weatherly
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
N
W
E
S
Region 12

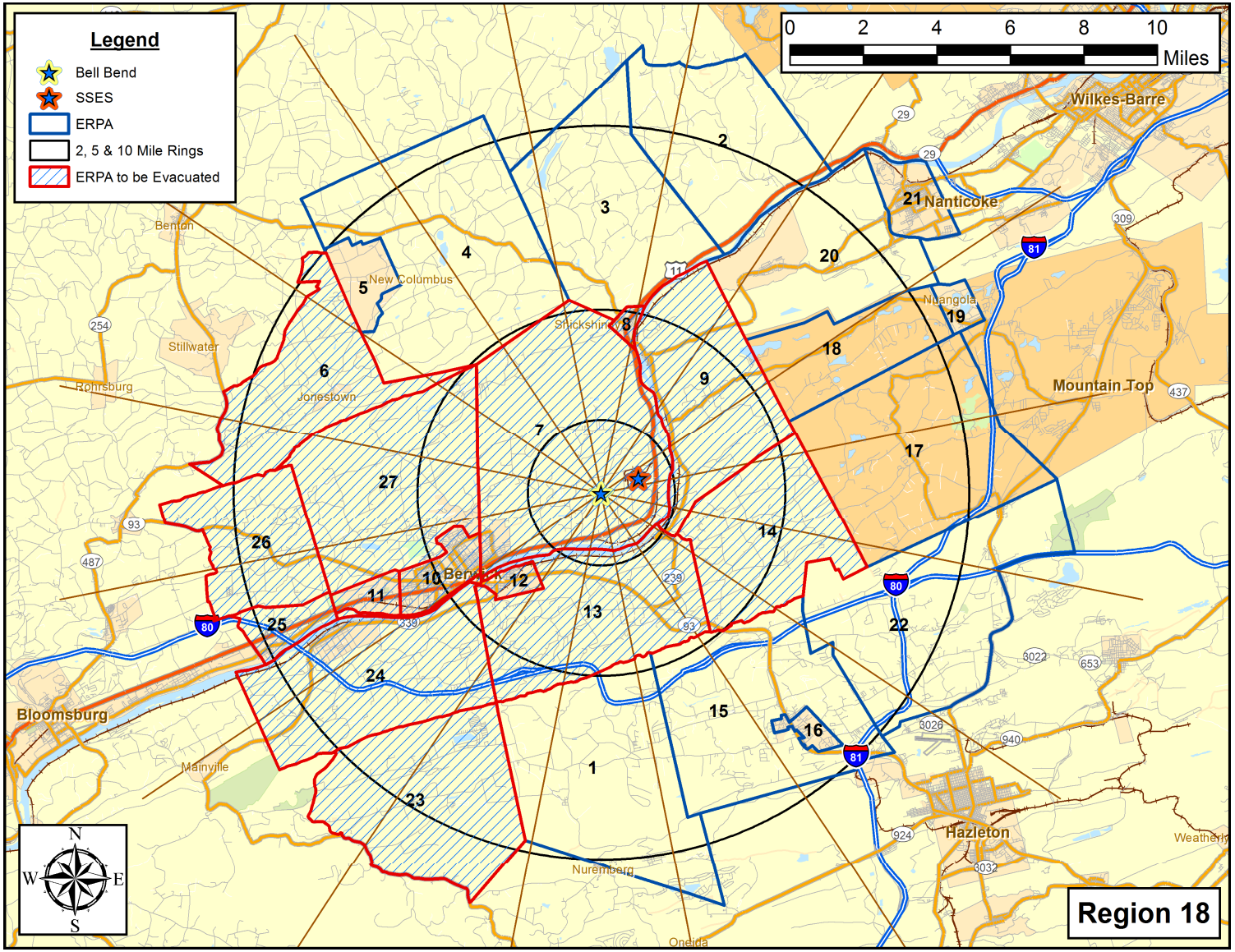

Legend
Bell Bend
SSES
ERPA
2, 5 & 10 Mile Rings
ERPA to be Evacuated
0 2 4 6 8 10
Miles
Wilkes-Barre
Nanticoke
Mountain Top
Hazleton
Berwick
Bloomsburg
Benton
New Columbus
Stillwater
Rohrsburg
Jonestown
Shickshinny
Nuangola
Mainville
Nuremberg
Oneida
Weatherly
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
N
W
E
S
Region 13

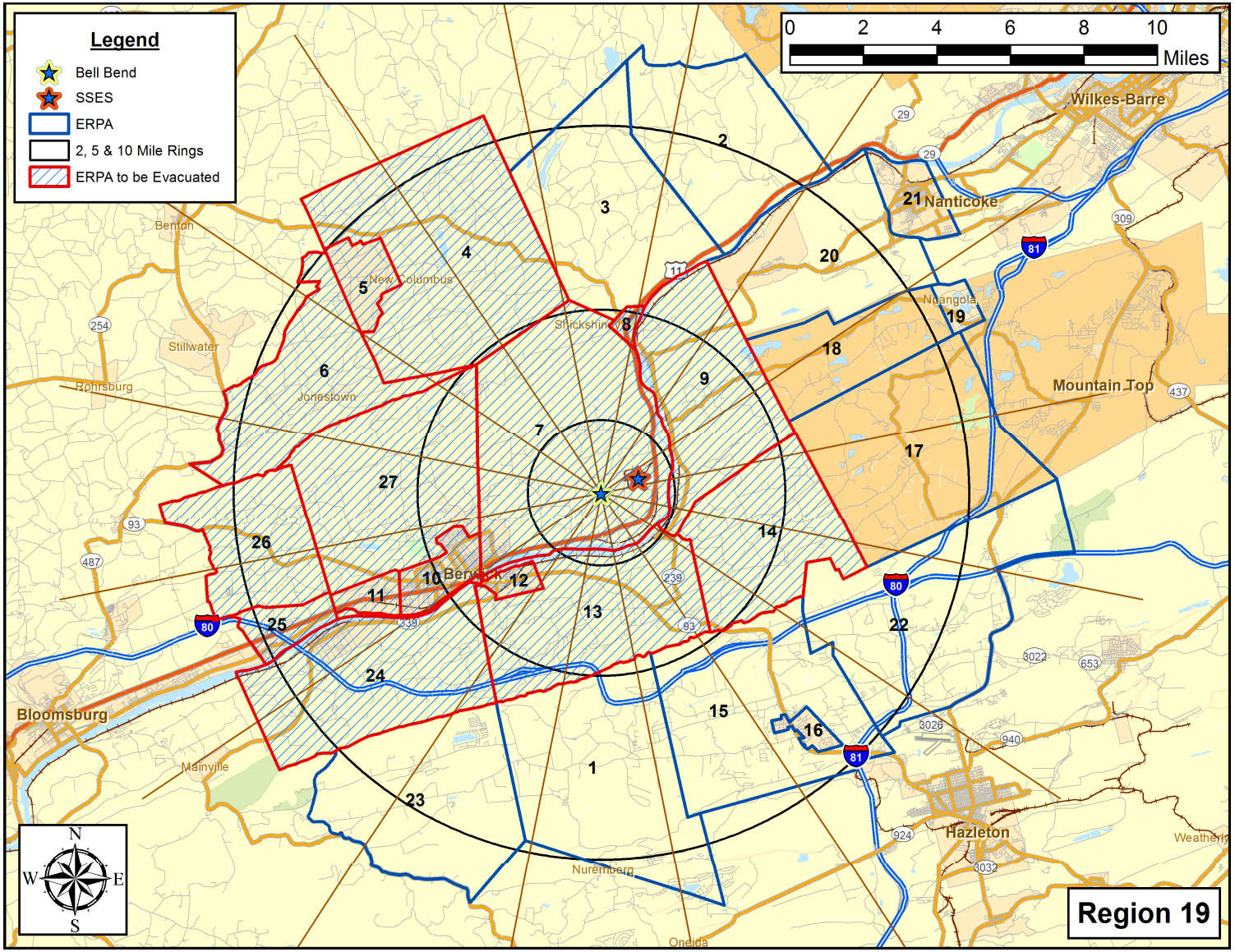

Legend
Bell Bend
SSES
ERPA
2, 5 & 10 Mile Rings
ERPA to be Evacuated
0 2 4 6 8 10
Miles
Wilkes-Barre
Nanticoke
Benton
New Columbus
Shickshinny
Nuangola
Stillwater
Rohrsburg
Jonestown
Mountain Top
Berwick
Bloomsburg
Mainville
Hazleton
Weatherly
Nuremberg
Oneida
N
W
E
S
Region 14

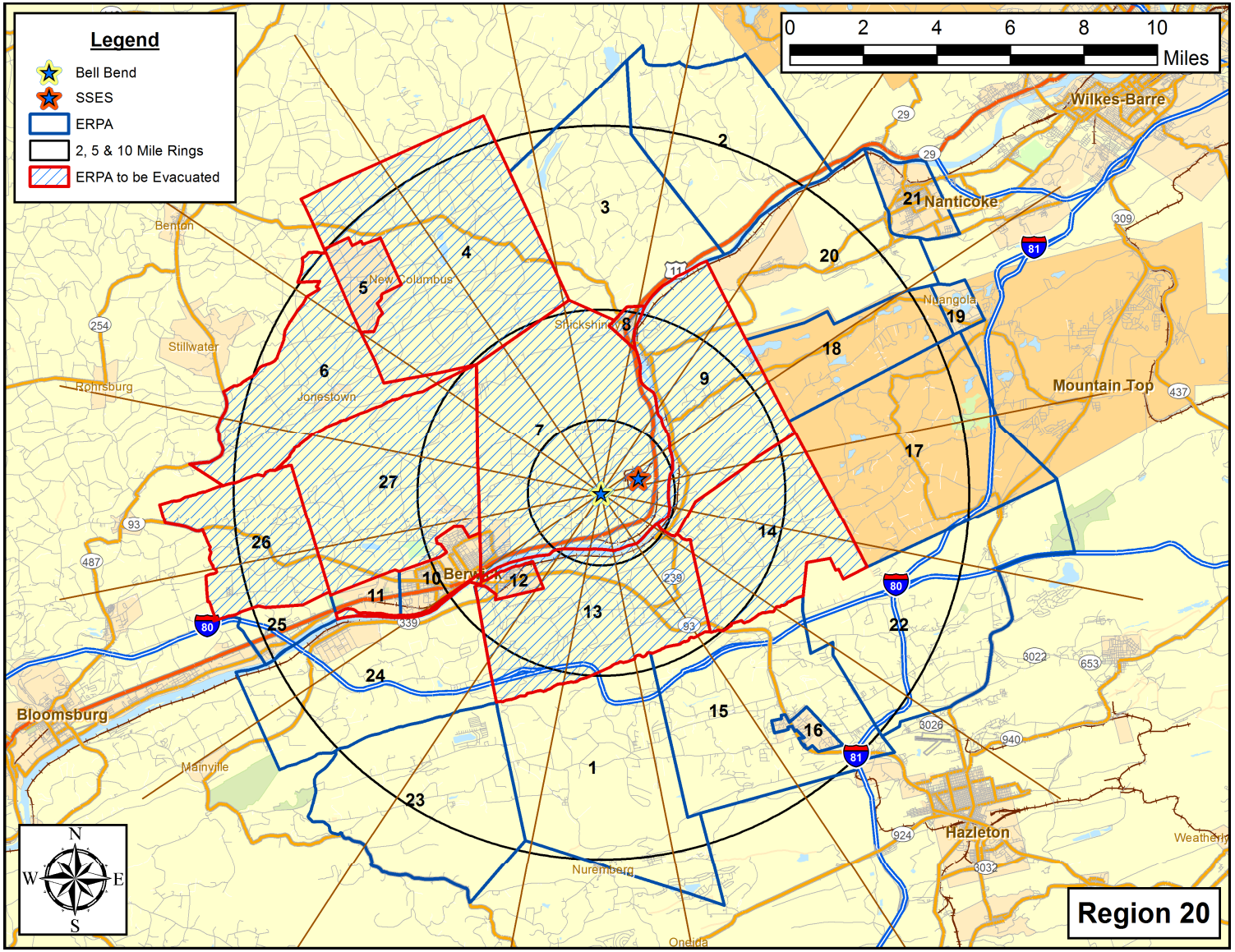

Legend
Bell Bend
SSES
ERPA
2, 5 & 10 Mile Rings
ERPA to be Evacuated
0 2 4 6 8 10
Miles
Wilkes-Barre
Nanticoke
Nuangola
Mountain Top
Benton
New Columbus
Stillwater
Rohrsburg
Jonestown
Shickshinny
Berwick
Bloomsburg
Mainville
Hazleton
Weatherly
Nuremberg
Oneida
N
W
E
S
Region 15

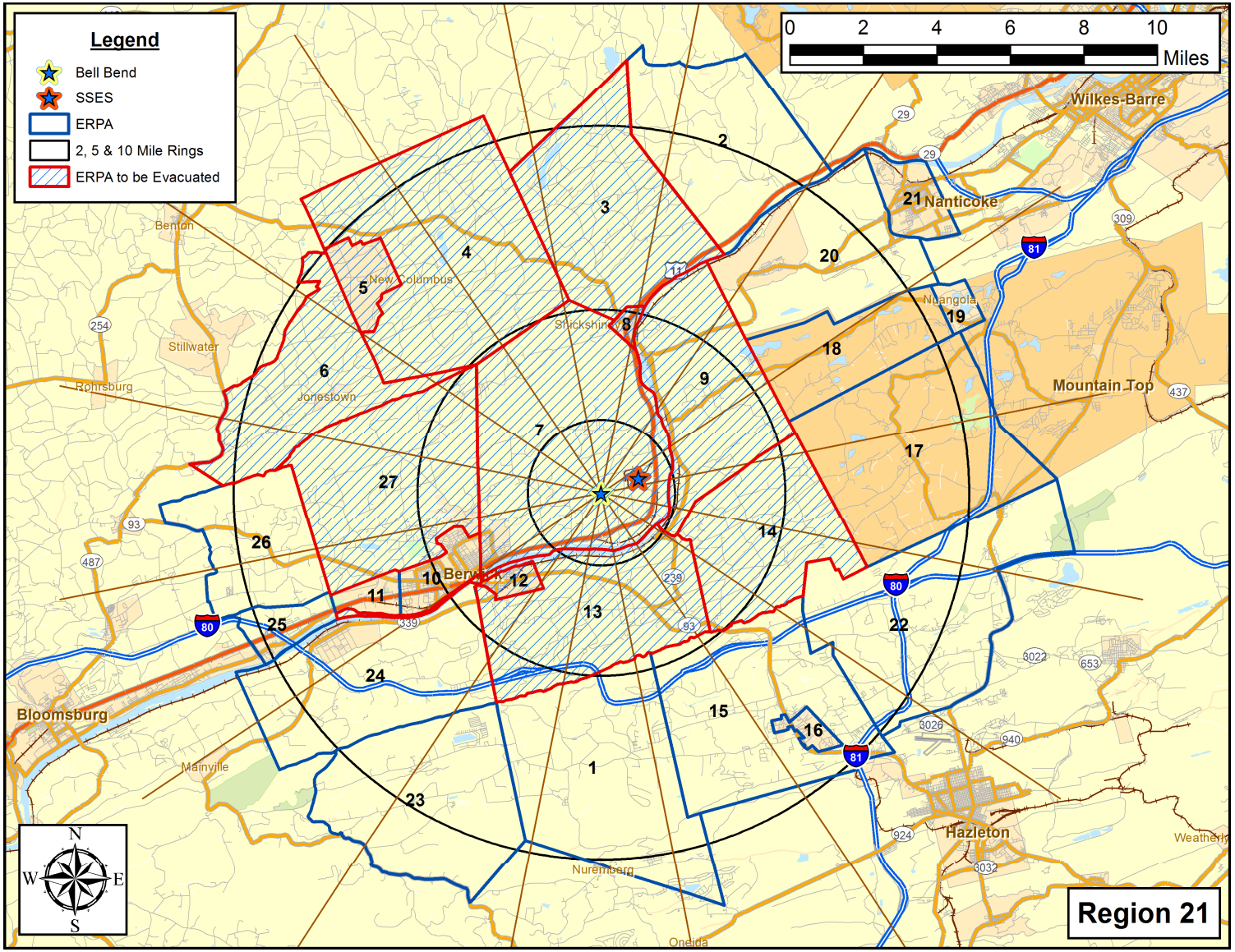

Legend
Bell Bend
SSES
ERPA
2, 5 & 10 Mile Rings
ERPA to be Evacuated
0 2 4 6 8 10
Miles
Region 16
Wilkes-Barre
Nanticoke
Mountain Top
Hazleton
Bloomsburg
Berwick
Benton
New Columbus
Stillwater
Rohrsburg
Jonestown
Shickshinny
Nuangola
Mainville
Nuremberg
Oneida
Weatherly

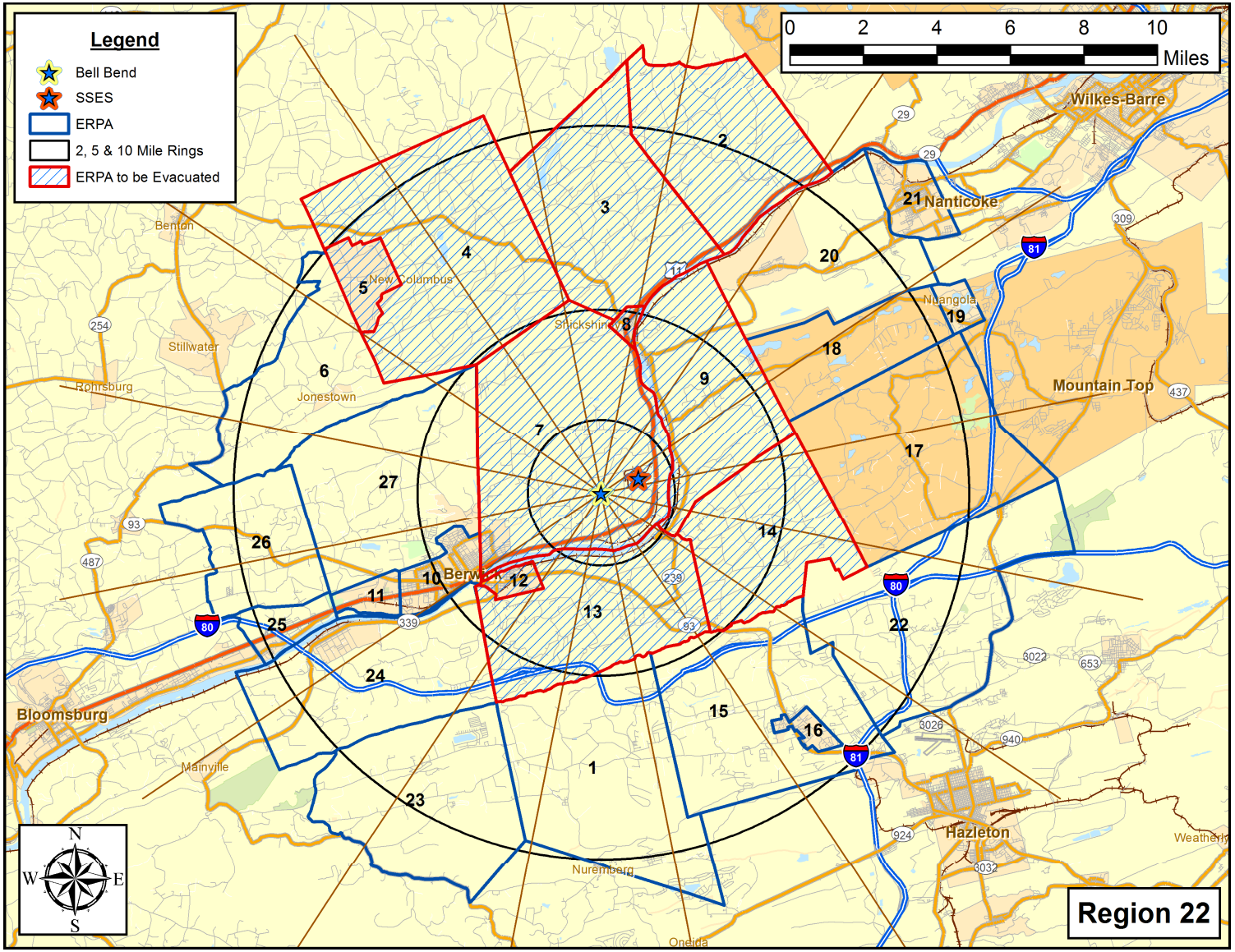

Legend
Bell Bend
SSES
ERPA
2, 5 & 10 Mile Rings
ERPA to be Evacuated
0 2 4 6 8 10
Miles
Wilkes-Barre
Nanticoke
Nuangola
Mountain Top
Benton
New Columbus
Shickshinny
Stillwater
Rohrsburg
Jonestown
Bloomsburg
Mainville
Hazleton
Weatherly
Nuremberg
Oneida
N
W
E
S
Region 17


Legend
Bell Bend
SSES
ERPA
2, 5 & 10 Mile Rings
ERPA to be Evacuated
0 2 4 6 8 10
Miles
Wilkes-Barre
Nanticoke
Mountain Top
Hazleton
Bloomsburg
Berwick
Benton
New Columbus
Stillwater
Rohrsburg
Jonestown
Shickshinny
Nuangola
Mainville
Nuremberg
Oneida
Weatherly
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
N
W
E
S
Region 18


Legend
Bell Bend
SSES
ERPA
2, 5 & 10 Mile Rings
ERPA to be Evacuated
0 2 4 6 8 10
Miles
Wilkes-Barre
Nanticoke
Nuangola
Mountain Top
Shickshinny
New Columbus
Benton
Stillwater
Rohrsburg
Jonestown
Berwick
Bloomsburg
Mainville
Nuremberg
Oneida
Hazleton
Weatherly
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
N
W
E
S
Region 19


Legend
Bell Bend
SSES
ERPA
2, 5 & 10 Mile Rings
ERPA to be Evacuated
0 2 4 6 8 10
Miles
N
W
E
S
Region 20
Wilkes-Barre
Nanticoke
Mountain Top
Hazleton
Bloomsburg
Berwick
Shickshinny
New Columbus
Benton
Stillwater
Rohrsburg
Jonestown
Nuangola
Mainville
Nuremberg
Oneida
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27


Legend
Bell Bend
SSES
ERPA
2, 5 & 10 Mile Rings
ERPA to be Evacuated
0 2 4 6 8 10
Miles
Wilkes-Barre
Nanticoke
Mountain Top
Hazleton
Bloomsburg
Berwick
Benton
New Columbus
Stillwater
Rohrsburg
Jonestown
Shickshinny
Nuangola
Mainville
Nuremberg
Oneida
Weatherly
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
N
W
E
S
Region 21


Legend
Bell Bend
SSES
ERPA
2, 5 & 10 Mile Rings
ERPA to be Evacuated
0 2 4 6 8 10
Miles
Wilkes-Barre
Nanticoke
Benton
New Columbus
Shickshinny
Nuangola
Stillwater
Rohrsburg
Jonestown
Mountain Top
Berwick
Bloomsburg
Mainville
Nuremberg
Hazleton
Weatherly
Oneida
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
N
W
E
S
Region 22

APPENDIX I

Evacuation Sensitivity Studies

APPENDIX I: EVACUATION SENSITIVITY STUDIES

A sensitivity study was conducted to determine the effects on ETE of changes in the percentage of people who decide to voluntarily evacuate from the shadow region. The movement of people in the shadow region has the potential to impede vehicles evacuating from an evacuation region within the EPZ. The Scenario 1, Region 3 (entire EPZ) case is used for this sensitivity study.

Table I-1 presents the evacuation time estimates for this study. The 95th percentile ETE are used in this comparison. The ETE for the 2 and 5 mile regions remain unchanged as the percentage of people who decide to voluntarily evacuate from within the shadow region varies from 15% to 60%; however, the ETE increases by 5 minutes for the Entire EPZ. There are a total of 89,312 people (46,073 vehicles) within the shadow region. The animation displays of the evacuation traffic environment indicate that congestion intensifies in the outer areas of the EPZ (where the effect of shadow evacuation is greatest) as the number of evacuees from the shadow region increases; however, the ETE only increases by 5 minutes.

Table I-1. Evacuation Time Estimates for Shadow Sensitivity Study

Shadow Data			Evacuation Region		
Percent Shadow Evacuation	**Number of Shadow Residents**	**Number of Shadow Evacuating Vehicles**	**2-Mile Region**	**5-Mile Region**	**Entire EPZ (R03)**
15	13,397	7,191	3:10	2:50	3:25
30 (Base)	26,794	14,381	3:10	2:50	3:25
60	53,587	28,762	3:10	2:50	3:30

A second sensitivity study was performed to determine whether changes in the estimated trip generation time have an effect upon the Evacuation Time Estimate (ETE) for the entire EPZ. The case considered was Scenario 1, Region 3; a summer, midweek (workday), midday (morning also), and good weather evacuation for the entire EPZ. Table I-2 presents the results of this study.

Table I-2. Evacuation Time Estimates for Trip Generation Sensitivity Study

Trip Generation (Mobilization) Period	Evacuation Region		
	2-Mile Region	5-Mile Region	Entire EPZ (R03)
5.5 Hours (Base)	5:30	5:30	5:40
4 Hours	4:00	4:05	4:20

As expected (see section 7-5) the ETE for the 100th percentile is dictated by the trip generation time. These results suggests that public outreach programs should emphasize the need for evacuees to minimize the time needed to prepare to evacuate (secure the home; assemble needed clothes, medicines, etc).

APPENDIX J

Evacuation Time Estimates for All Evacuation Regions and Scenarios
and
Evacuation Time Graphs for Region R03, for all Scenarios

APPENDIX J: EVACUATION TIME ESTIMATES FOR ALL EVACUATION REGIONS AND SCENARIOS

AND

EVACUATION TIME GRAPHS FOR REGION R03, FOR ALL SCENARIOS

This appendix presents the ETE Results for all 22 Regions and all 13 Scenarios (Tables J-1A through J-1D) and may be used as a convenient "pull-out" by decision-makers.

Plots of Evacuating Vehicles vs. Elapsed Time are presented for evacuees leaving the 2-mile and 5-mile circular areas around SSES/Bell Bend, and from the entire EPZ, (Region R03) for all 13 scenarios. Each plot has points indicating the evacuation times corresponding to the 50th, 90th, and 95th percentiles of evacuated vehicles.

J.1 Guidance on Using ETE Tables

Tables J-1A through J-1D present the ETE values for all 22 Evacuation Regions and all 13 Evacuation Scenarios. They are organized as follows:

Table	Contents
J-1A	ETE represents the elapsed time required for 50 percent of the population within a Region, to evacuate from that Region.
J-1B	ETE represents the elapsed time required for 90 percent of the population within a Region, to evacuate from that Region.
J-1C	ETE represents the elapsed time required for 95 percent of the population within a Region, to evacuate from that Region.
J-1D	ETE represents the elapsed time required for 100 percent of the population within a Region, to evacuate from that Region.

The user first determines the percentile of population for which the ETE is sought. The applicable value of ETE within the chosen Table may then be identified using the following procedure:

1. Identify the applicable **Scenario**:
    - The Season
        - Summer (schools not in session)
        - Winter (also Autumn and Spring)
    - The Day of Week
        - Midweek (work-day)
        - Weekend, Holiday

- The Time of Day
  - Midday (work and commuting hours)
  - Evening
- Weather Condition
  - Good Weather
  - Rain
  - Snow
- Special Event (if any)
  - Construction at Bell Bend site and refueling at SSES site

While these Scenarios are designed, in aggregate, to represent conditions throughout the year, some further clarification is warranted:

- The conditions of a summer evening (either midweek or weekend) and rain are not explicitly identified in Tables J-1A through J-1D. For these conditions, Scenario (4) applies.
- The conditions of a winter evening (either midweek or weekend) and rain are not explicitly identified in Tables J-1A through J-1D. For these conditions, Scenario (10) applies. For snow, scenario (11) applies.
- The seasons are defined as follows:
  - Summer implies that public schools are *not* in session.
  - Winter, Spring and Autumn imply that public schools *are* in session.
- Time of Day: Midday implies the time over which most commuters are at work.

2. With the Scenario (and column in the Table) identified, now identify the **Evacuation Region**:
   - Determine the projected azimuth direction of the plume (coincident with the wind direction). This direction is expressed in terms of compass orientation: *towards* N, NNE, NE…
   - Determine the distance that the Evacuation Region will extend from the nuclear power plant. The applicable distances and their associated candidate Regions are given below:
     - 2 Miles (Region R01)
     - 5 Miles (Regions R02, R04 through R07)
     - to EPZ Boundary (Regions R03, R08 through R22)
   - Enter Table J-2 and identify the applicable group of candidate regions based on the wind direction and on the distance that the selected region extends from SSES/Bell Bend. Select the evacuation region identifier in that row from the first column of the Table.

3. Determine the **ETE for the Scenario** identified in Step 1 and the Region identified in Step 2, as follows:
   - The columns of Table J-1 are labeled with the Scenario numbers. Identify the proper column in the selected Table using the Scenario number determined in Step 1.
   - Identify the row in this table that provides ETE values for the Region identified in Step 2.
   - The unique data cell defined by the column and row so determined contains the desired value of ETE expressed in hours:minutes.

Example

It is desired to identify the ETE for the following conditions:

- Sunday, August 10th at 4:00 AM.
- It is raining.
- Wind direction is *towards* the southwest (SW).
- Wind speed is such that the distance to be evacuated is judged to be 10 miles (to EPZ boundary).
- The desired ETE is that value needed to evacuate 95 percent of the population from within the impacted region.

Table J-1C is applicable because the 95th-percentile population is desired. Proceed as follows:

1. Identify the Scenario as summer, weekend, evening and raining. Entering Table J-1C, it is seen that there is no match for these descriptors. However, the clarification given above assigns this combination of circumstances to Scenario 4.

2. Enter Table J-2 and locate the group entitled “5-Mile Ring and Downwind to EPZ Boundary”. Scan down the second column of that group (with the heading, “Description”), to identify the row with “SW” (southwest azimuth) and read region “R17” in the first column of that row.

3. Enter Table 7-1C to locate the data cell containing the value of ETE for Scenario 4 and Region R17. This data cell is in the fifth column with the heading for Scenario (4) and in the row for Region R17 SW; it contains the ETE value of **3:30**.

Table J-1A. Time To Clear The Indicated Area of 50 Percent of the Affected Population

	Summer		Summer		Summer		Winter			Winter			Winter		Summer
	Midweek		Weekend		Midweek Weekend		Midweek			Weekend			Midweek Weekend		Midweek
Scenario:	(1)	(2)	(3)	(4)	(5)	Scenario:	(6)	(7)	(8)	(9)	(10)	(11)	(12)	Scenario:	(13)
	Midday		Midday		Evening		Midday			Midday			Evening		Midday
Region Wind Toward:	Good Weather	Rain	Good Weather	Rain	Good Weather	Region Wind Toward:	Good Weather	Rain	Snow	Good Weather	Rain	Snow	Good Weather	Region Wind Toward:	Bell Bend Construction and SSES Refueling
Entire 2-Mile Region, 5-Mile Region, and EPZ															
R01 2-Mile Region	1:20	1:20	1:05	1:05	1:05	R01 2-Mile Region	1:20	1:20	1:50	1:05	1:05	1:35	1:05	R01 2-Mile Region	1:30
R02 5-Mile Region	1:10	1:10	1:00	1:00	1:05	R02 5-Mile Region	1:10	1:10	1:25	1:00	1:00	1:20	1:05	R02 5-Mile Region	1:15
R03 Entire EPZ	1:30	1:35	1:20	1:25	1:25	R03 Entire EPZ	1:30	1:35	1:55	1:20	1:25	1:45	1:25	R03 Entire EPZ	1:35
2-Mile Ring and Downwind to 5 Miles															
R04 N,NNE,NNW	1:20	1:20	1:05	1:05	1:05	R04 N,NNE,NNW	1:20	1:20	1:50	1:05	1:05	1:35	1:05	R04 N,NNE,NNW	1:35
R01 NE,W,WNW,NW	See Region R01					R01 NE,W,WNW,NW	See Region R01							R01 NE,W,WNW,NW	See Region R01
R05 ENE,E,ESE	1:20	1:20	1:05	1:05	1:05	R05 ENE,E,ESE	1:20	1:20	1:50	1:05	1:05	1:35	1:05	R05 ENE,E,ESE	1:30
R06 SE,SSE	1:10	1:10	1:00	1:00	1:05	R06 SE,SSE	1:10	1:10	1:25	1:00	1:00	1:20	1:05	R06 SE,SSE	1:15
R07 S, SSW,SW,WSW	1:10	1:10	1:00	1:00	1:05	R07 S, SSW,SW,WSW	1:10	1:10	1:25	1:00	1:00	1:20	1:05	R07 S, SSW,SW,WSW	1:15
5-Mile Ring and Downwind to EPZ Boundary															
R08 N	1:20	1:20	1:10	1:10	1:10	R08 N	1:20	1:20	1:40	1:10	1:10	1:30	1:10	R08 N	1:25
R09 NNE	1:25	1:25	1:15	1:15	1:20	R09 NNE	1:25	1:30	1:45	1:15	1:15	1:40	1:20	R09 NNE	1:30
R10 NE	1:15	1:20	1:10	1:10	1:15	R10 NE	1:20	1:20	1:35	1:10	1:10	1:25	1:15	R10 NE	1:20
R11 ENE	1:15	1:15	1:10	1:10	1:15	R11 ENE	1:15	1:15	1:30	1:10	1:10	1:25	1:15	R11 ENE	1:15
R12 E	1:10	1:10	1:05	1:05	1:05	R12 E	1:10	1:10	1:20	1:05	1:05	1:20	1:05	R12 E	1:10
R13 ESE, SE	1:15	1:15	1:05	1:05	1:05	R13 ESE, SE	1:15	1:15	1:30	1:05	1:05	1:25	1:05	R13 ESE, SE	1:15
R14 SSE	1:15	1:15	1:05	1:05	1:05	R14 SSE	1:10	1:15	1:30	1:05	1:05	1:25	1:05	R14 SSE	1:15
R15 S	1:10	1:10	1:00	1:05	1:05	R15 S	1:10	1:10	1:25	1:00	1:05	1:20	1:05	R15 S	1:15
R16 SSW	1:20	1:25	1:10	1:10	1:10	R16 SSW	1:20	1:20	1:40	1:10	1:10	1:30	1:10	R16 SSW	1:25
R17 SW	1:35	1:35	1:20	1:25	1:25	R17 SW	1:35	1:35	2:00	1:20	1:25	1:50	1:25	R17 SW	1:40
R18 WSW	1:35	1:40	1:25	1:30	1:30	R18 WSW	1:35	1:40	2:00	1:25	1:30	1:50	1:30	R18 WSW	1:40
R19 W	1:35	1:40	1:25	1:25	1:30	R19 W	1:35	1:40	2:00	1:25	1:25	1:50	1:30	R19 W	1:40
R20 WNW	1:20	1:20	1:10	1:10	1:10	R20 WNW	1:20	1:20	1:40	1:10	1:10	1:30	1:10	R20 WNW	1:25
R21 NW	1:20	1:20	1:10	1:10	1:10	R21 NW	1:20	1:20	1:40	1:10	1:10	1:30	1:10	R21 NW	1:25
R22 NNW	1:15	1:20	1:05	1:05	1:10	R22 NNW	1:15	1:20	1:35	1:05	1:05	1:25	1:10	R22 NNW	1:25

Table J-1B. Time To Clear The Indicated Area of 90 Percent of the Affected Population

	Summer		Summer		Summer		Winter			Winter			Winter		Summer
	Midweek		Weekend		Midweek Weekend		Midweek			Weekend			Midweek Weekend		Midweek
Scenario:	(1)	(2)	(3)	(4)	(5)	Scenario:	(6)	(7)	(8)	(9)	(10)	(11)	(12)	Scenario:	(13)
	Midday		Midday		Evening		Midday			Midday			Evening		Midday
Region Wind Toward:	Good Weather	Rain	Good Weather	Rain	Good Weather	Region Wind Toward:	Good Weather	Rain	Snow	Good Weather	Rain	Snow	Good Weather	Region Wind Toward:	Bell Bend Construction and SSES Refueling
Entire 2-Mile Region, 5-Mile Region, and EPZ															
R01 2-Mile Region	2:45	2:45	2:00	2:00	2:00	R01 2-Mile Region	2:40	2:40	3:30	2:00	2:00	3:00	2:00	R01 2-Mile Region	3:00
R02 5-Mile Region	2:10	2:10	1:45	1:50	1:55	R02 5-Mile Region	2:10	2:15	2:55	1:45	1:50	2:30	1:55	R02 5-Mile Region	2:45
R03 Entire EPZ	3:05	3:15	2:50	3:00	2:55	R03 Entire EPZ	3:05	3:20	3:55	2:50	3:00	3:40	2:55	R03 Entire EPZ	3:25
2-Mile Ring and Downwind to 5 Miles															
R04 N,NNE,NNW	2:45	2:45	2:00	2:00	2:00	R04 N,NNE,NNW	2:45	2:45	3:35	2:00	2:00	3:00	2:00	R04 N,NNE,NNW	2:55
R01 NE,W,WNW,NW	See Region R01					R01 NE,W,WNW,NW	See Region R01							R01 NE,W,WNW,NW	See Region R01
R05 ENE,E,ESE	2:45	2:45	2:00	2:00	2:00	R05 ENE,E,ESE	2:40	2:40	3:35	2:00	2:00	3:00	2:00	R05 ENE,E,ESE	2:55
R06 SE,SSE	2:10	2:10	1:45	1:50	1:55	R06 SE,SSE	2:10	2:10	2:55	1:45	1:50	2:25	1:55	R06 SE,SSE	2:45
R07 S, SSW,SW,WSW	2:05	2:05	1:45	1:50	1:55	R07 S, SSW,SW,WSW	2:05	2:05	2:55	1:45	1:50	2:25	1:55	R07 S, SSW,SW,WSW	2:45
5-Mile Ring and Downwind to EPZ Boundary															
R08 N	2:40	2:45	2:10	2:20	2:20	R08 N	2:45	2:50	3:30	2:10	2:20	3:05	2:20	R08 N	3:05
R09 NNE	2:55	3:00	2:35	2:45	2:40	R09 NNE	3:00	3:10	3:45	2:35	2:45	3:25	2:40	R09 NNE	3:05
R10 NE	2:40	2:50	2:20	2:30	2:35	R10 NE	2:50	2:55	3:30	2:20	2:30	3:10	2:35	R10 NE	2:55
R11 ENE	2:30	2:40	2:10	2:15	2:25	R11 ENE	2:40	2:45	3:20	2:10	2:15	2:55	2:25	R11 ENE	2:40
R12 E	2:05	2:05	1:50	1:50	2:00	R12 E	2:05	2:10	2:50	1:50	1:50	2:25	2:00	R12 E	2:25
R13 ESE, SE	2:15	2:20	1:55	2:00	2:00	R13 ESE, SE	2:15	2:20	3:00	1:50	2:00	2:35	2:00	R13 ESE, SE	2:35
R14 SSE	2:20	2:20	1:55	1:55	2:00	R14 SSE	2:15	2:20	3:00	1:50	1:55	2:35	2:00	R14 SSE	2:35
R15 S	2:10	2:10	1:50	1:50	1:55	R15 S	2:10	2:10	2:55	1:45	1:50	2:25	1:55	R15 S	2:35
R16 SSW	2:50	2:55	2:35	2:35	2:30	R16 SSW	2:50	2:55	3:25	2:35	2:40	3:05	2:30	R16 SSW	3:00
R17 SW	3:10	3:25	3:05	3:15	3:00	R17 SW	3:15	3:25	4:05	3:05	3:15	3:50	3:00	R17 SW	3:35
R18 WSW	3:15	3:25	3:05	3:15	3:00	R18 WSW	3:15	3:25	4:05	3:05	3:15	3:50	3:00	R18 WSW	3:35
R19 W	3:10	3:20	3:00	3:10	3:00	R19 W	3:15	3:25	4:05	3:00	3:10	3:50	3:00	R19 W	3:35
R20 WNW	2:30	2:35	2:10	2:15	2:15	R20 WNW	2:30	2:35	3:15	2:10	2:15	2:55	2:15	R20 WNW	2:45
R21 NW	2:30	2:30	2:05	2:10	2:10	R21 NW	2:30	2:30	3:15	2:05	2:10	2:55	2:10	R21 NW	2:45
R22 NNW	2:40	2:45	2:05	2:15	2:20	R22 NNW	2:40	2:50	3:30	2:05	2:15	3:00	2:20	R22 NNW	3:05

Table J-1C. Time To Clear The Indicated Area of 95 Percent of the Affected Population

	Summer		Summer		Summer		Winter			Winter			Winter		Summer
	Midweek		Weekend		Midweek Weekend		Midweek			Weekend			Midweek Weekend		Midweek
Scenario:	(1)	(2)	(3)	(4)	(5)	Scenario:	(6)	(7)	(8)	(9)	(10)	(11)	(12)	Scenario:	(13)
	Midday		Midday		Evening		Midday			Midday			Evening		Midday
Region Wind Toward:	Good Weather	Rain	Good Weather	Rain	Good Weather	Region Wind Toward:	Good Weather	Rain	Snow	Good Weather	Rain	Snow	Good Weather	Region Wind Toward:	Bell Bend Construction and SSES Refueling
Entire 2-Mile Region, 5-Mile Region, and EPZ															
R01 2-Mile Region	3:10	3:10	2:45	2:45	2:45	R01 2-Mile Region	3:05	3:05	4:15	2:45	2:50	3:50	2:45	R01 2-Mile Region	3:15
R02 5-Mile Region	2:50	2:50	2:05	2:05	2:25	R02 5-Mile Region	2:50	2:50	3:45	2:05	2:05	3:00	2:25	R02 5-Mile Region	3:05
R03 Entire EPZ	3:25	3:40	3:15	3:25	3:15	R03 Entire EPZ	3:30	3:40	4:25	3:15	3:25	4:10	3:15	R03 Entire EPZ	3:55
2-Mile Ring and Downwind to 5 Miles															
R04 N,NNE,NNW	3:10	3:10	2:45	2:45	2:45	R04 N,NNE,NNW	3:10	3:10	4:15	2:45	2:45	3:50	2:45	R04 N,NNE,NNW	3:15
R01 NE,W,WNW,NW	See Region R01					R01 NE,W,WNW,NW	See Region R01							R01 NE,W,WNW,NW	See Region R01
R05 ENE,E,ESE	3:10	3:10	2:50	2:50	2:50	R05 ENE,E,ESE	3:05	3:05	4:20	2:50	2:50	3:55	2:50	R05 ENE,E,ESE	3:15
R06 SE,SSE	2:45	2:45	2:00	2:05	2:25	R06 SE,SSE	2:45	2:45	3:40	2:00	2:05	3:00	2:25	R06 SE,SSE	3:05
R07 S, SSW,SW,WSW	2:45	2:45	2:00	2:00	2:25	R07 S, SSW,SW,WSW	2:45	2:45	3:35	2:00	2:00	2:55	2:25	R07 S, SSW,SW,WSW	3:05
5-Mile Ring and Downwind to EPZ Boundary															
R08 N	3:10	3:15	2:45	2:45	2:55	R08 N	3:10	3:20	4:05	2:45	2:45	3:35	2:55	R08 N	3:35
R09 NNE	3:15	3:25	2:55	3:10	3:00	R09 NNE	3:20	3:30	4:15	2:55	3:10	4:00	3:00	R09 NNE	3:30
R10 NE	3:05	3:15	2:50	3:00	2:55	R10 NE	3:15	3:20	4:05	2:50	3:00	3:50	2:55	R10 NE	3:20
R11 ENE	3:00	3:10	2:40	2:50	2:55	R11 ENE	3:05	3:15	4:00	2:40	2:50	3:40	2:55	R11 ENE	3:05
R12 E	2:40	2:45	2:05	2:10	2:25	R12 E	2:40	2:45	3:30	2:05	2:10	2:55	2:25	R12 E	2:55
R13 ESE, SE	2:50	2:50	2:15	2:20	2:35	R13 ESE, SE	2:50	2:50	3:45	2:15	2:20	3:05	2:35	R13 ESE, SE	3:00
R14 SSE	2:50	2:50	2:15	2:20	2:35	R14 SSE	2:50	2:50	3:45	2:15	2:20	3:05	2:35	R14 SSE	3:00
R15 S	2:45	2:45	2:05	2:10	2:25	R15 S	2:45	2:45	3:40	2:05	2:10	3:00	2:25	R15 S	3:00
R16 SSW	3:15	3:15	3:00	3:00	2:55	R16 SSW	3:15	3:20	3:55	3:00	3:05	3:35	2:55	R16 SSW	3:20
R17 SW	3:30	3:45	3:20	3:30	3:20	R17 SW	3:35	3:45	4:30	3:20	3:30	4:10	3:20	R17 SW	4:00
R18 WSW	3:30	3:45	3:20	3:30	3:20	R18 WSW	3:35	3:45	4:30	3:20	3:30	4:15	3:20	R18 WSW	4:00
R19 W	3:30	3:45	3:20	3:30	3:20	R19 W	3:30	3:45	4:30	3:20	3:30	4:15	3:20	R19 W	4:00
R20 WNW	3:00	3:00	2:30	2:35	2:40	R20 WNW	3:00	3:00	4:00	2:30	2:35	3:25	2:40	R20 WNW	3:10
R21 NW	3:00	3:00	2:30	2:35	2:35	R21 NW	3:00	3:00	4:00	2:30	2:35	3:25	2:35	R21 NW	3:10
R22 NNW	3:10	3:10	2:45	2:45	2:55	R22 NNW	3:10	3:15	4:00	2:45	2:45	3:35	2:55	R22 NNW	3:30

Table J-1D. Time To Clear The Indicated Area of 100 Percent of the Affected Population

	Summer		Summer		Summer		Winter			Winter			Winter		Summer
	Midweek		Weekend		Midweek Weekend		Midweek			Weekend			Midweek Weekend		Midweek
Scenario:	(1)	(2)	(3)	(4)	(5)	Scenario:	(6)	(7)	(8)	(9)	(10)	(11)	(12)	Scenario:	(13)
	Midday		Midday		Evening		Midday			Midday			Evening		Midday
Region Wind Toward:	Good Weather	Rain	Good Weather	Rain	Good Weather	Region Wind Toward:	Good Weather	Rain	Snow	Good Weather	Rain	Snow	Good Weather	Region Wind Toward:	Bell Bend Construction and SSES Refueling
Entire 2-Mile Region, 5-Mile Region, and EPZ															
R01 2-Mile Region	5:30	5:30	5:00	5:00	5:00	R01 2-Mile Region	5:30	5:30	6:30	5:00	5:00	6:00	5:00	R01 2-Mile Region	5:30
R02 5-Mile Region	5:30	5:30	5:00	5:00	5:00	R02 5-Mile Region	5:30	5:30	6:30	5:00	5:00	6:00	5:00	R02 5-Mile Region	5:30
R03 Entire EPZ	5:40	5:40	5:10	5:20	5:10	R03 Entire EPZ	5:40	5:40	6:40	5:10	5:20	6:20	5:10	R03 Entire EPZ	5:40
2-Mile Ring and Downwind to 5 Miles															
R04 N,NNE,NNW	5:30	5:30	5:00	5:00	5:00	R04 N,NNE,NNW	5:30	5:30	6:30	5:00	5:00	6:00	5:00	R04 N,NNE,NNW	5:30
R01 NE,W,WNW,NW	See Region R01					R01 NE,W,WNW,NW	See Region R01							R01 NE,W,WNW,NW	See Region R01
R05 ENE,E,ESE	5:30	5:30	5:00	5:00	5:00	R05 ENE,E,ESE	5:30	5:30	6:30	5:00	5:00	6:00	5:00	R05 ENE,E,ESE	5:30
R06 SE,SSE	5:30	5:30	5:00	5:00	5:00	R06 SE,SSE	5:30	5:30	6:30	5:00	5:00	6:00	5:00	R06 SE,SSE	5:30
R07 S, SSW,SW,WSW	5:30	5:30	5:00	5:00	5:00	R07 S, SSW,SW,WSW	5:30	5:30	6:30	5:00	5:00	6:00	5:00	R07 S, SSW,SW,WSW	5:30
5-Mile Ring and Downwind to EPZ Boundary															
R08 N	5:30	5:30	5:00	5:00	5:10	R08 N	5:30	5:30	6:30	5:00	5:00	6:10	5:00	R08 N	5:30
R09 NNE	5:30	5:30	5:00	5:00	5:00	R09 NNE	5:30	5:30	6:30	5:00	5:10	6:10	5:00	R09 NNE	5:30
R10 NE	5:30	5:30	5:00	5:10	5:10	R10 NE	5:30	5:30	6:40	5:00	5:10	6:10	5:00	R10 NE	5:30
R11 ENE	5:30	5:30	5:10	5:10	5:10	R11 ENE	5:30	5:30	6:30	5:10	5:10	6:10	5:10	R11 ENE	5:30
R12 E	5:30	5:30	5:10	5:10	5:10	R12 E	5:30	5:30	6:30	5:10	5:10	6:00	5:10	R12 E	5:30
R13 ESE, SE	5:30	5:30	5:10	5:10	5:10	R13 ESE, SE	5:30	5:30	6:40	5:10	5:10	6:10	5:10	R13 ESE, SE	5:30
R14 SSE	5:30	5:30	5:10	5:10	5:10	R14 SSE	5:30	5:30	6:40	5:10	5:10	6:00	5:10	R14 SSE	5:30
R15 S	5:30	5:30	5:00	5:00	5:00	R15 S	5:30	5:30	6:30	5:00	5:00	6:00	5:00	R15 S	5:30
R16 SSW	5:30	5:40	5:10	5:10	5:10	R16 SSW	5:30	5:30	6:40	5:10	5:10	6:10	5:10	R16 SSW	5:30
R17 SW	5:40	5:40	5:10	5:20	5:10	R17 SW	5:40	5:40	6:40	5:10	5:20	6:10	5:10	R17 SW	5:40
R18 WSW	5:40	5:40	5:10	5:10	5:10	R18 WSW	5:40	5:40	6:40	5:10	5:10	6:10	5:10	R18 WSW	5:40
R19 W	5:40	5:40	5:10	5:10	5:10	R19 W	5:40	5:40	6:40	5:10	5:10	6:20	5:10	R19 W	5:40
R20 WNW	5:30	5:30	5:10	5:10	5:10	R20 WNW	5:40	5:40	6:40	5:10	5:10	6:10	5:10	R20 WNW	5:30
R21 NW	5:30	5:30	5:10	5:10	5:10	R21 NW	5:30	5:30	6:40	5:10	5:10	6:10	5:10	R21 NW	5:30
R22 NNW	5:30	5:30	5:00	5:00	5:00	R22 NNW	5:30	5:30	6:30	5:00	5:00	6:00	5:00	R22 NNW	5:30

Table J-2. Description of Evacuation Regions

Region	Description	ERPA 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27
R01	2 mile ring							x		x																		
R02	5-mile ring							x	x	x			x	x	x													
R03	Full EPZ	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
2-MileRing and 5-Mile Downwind																												
Region	Description	ERPA 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27
R04	N,NNE,NNW							x	x	x																		
-	NE,W,WNW,NW	Refer to Region R01																										
R05	ENE,E,ESE							x		x					x													
R06	SE, SSE							x		x			x	x	x													
R07	S, SSW,SW,WSW							x		x			x	x														
5-Mile Ring and Downwind to EPZ Boundary																												
Region	Description	ERPA 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27
R08	N		x	x	x	x		x	x	x			x	x	x						x							
R09	NNE		x	x				x	x	x			x	x	x				x		x	x						
R10	NE		x					x	x	x			x	x	x			x	x	x	x	x						
R11	ENE							x	x	x			x	x	x			x	x	x	x	x	x					
R12	E							x	x	x			x	x	x			x	x	x			x					
R13	ESE, SE							x	x	x			x	x	x	x	x	x					x					
R14	SSE	x						x	x	x			x	x	x	x	x						x					
R15	S	x						x	x	x			x	x	x	x	x							x				
R16	SSW	x						x	x	x			x	x	x									x	x			
R17	SW	x						x	x	x	x	x	x	x	x									x	x	x	x	x
R18	WSW						x	x	x	x	x	x	x	x	x									x	x	x	x	x
R19	W				x	x	x	x	x	x	x	x	x	x	x										x	x	x	x
R20	WNW				x	x	x	x	x	x			x	x	x												x	x
R21	NW			x	x	x	x	x	x	x			x	x	x													x
R22	NNW		x	x	x	x		x	x	x			x	x	x													

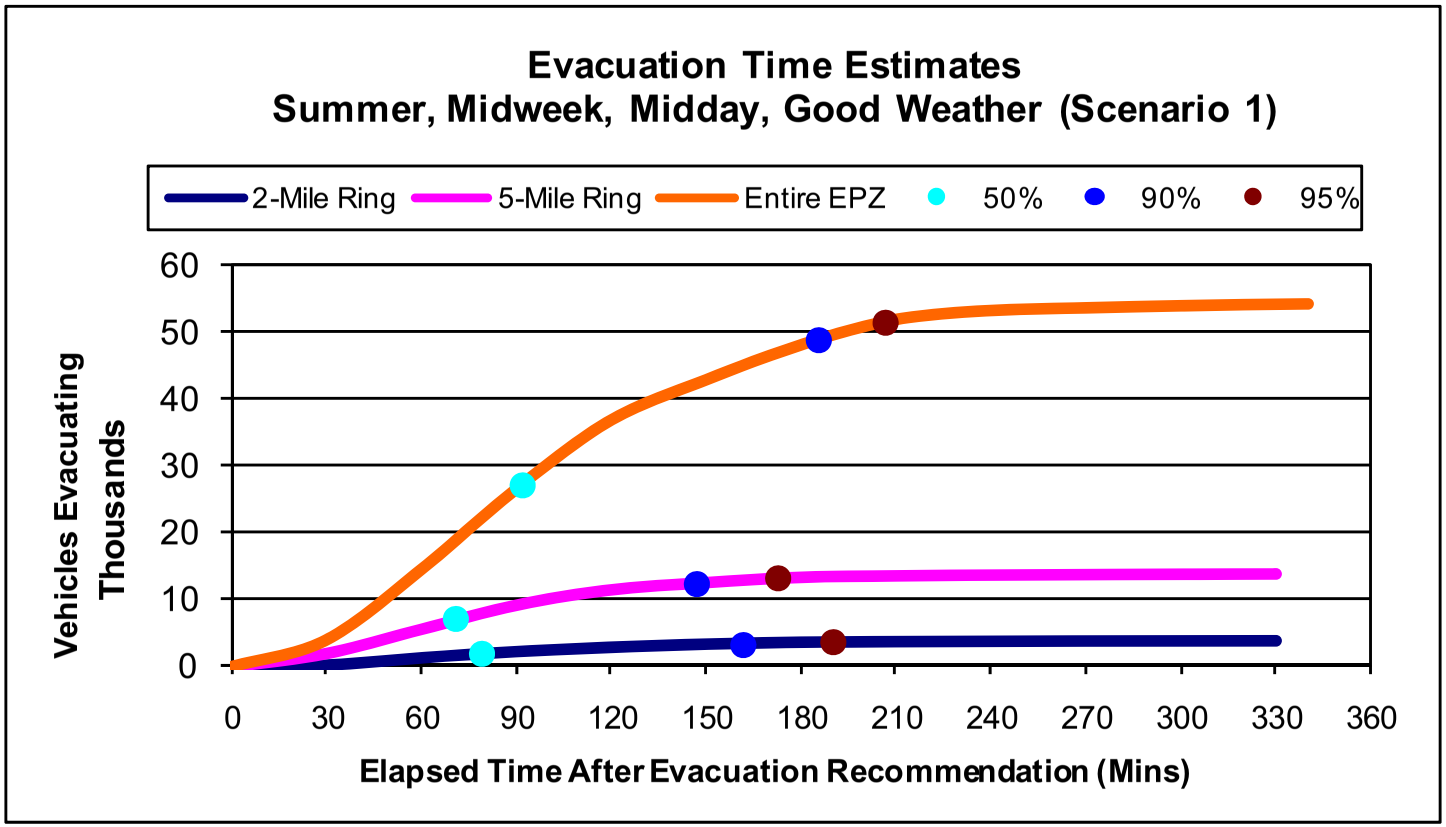


Figure J-1. Evacuation Time Estimates – Scenario 1 for Region R03 (Entire EPZ)

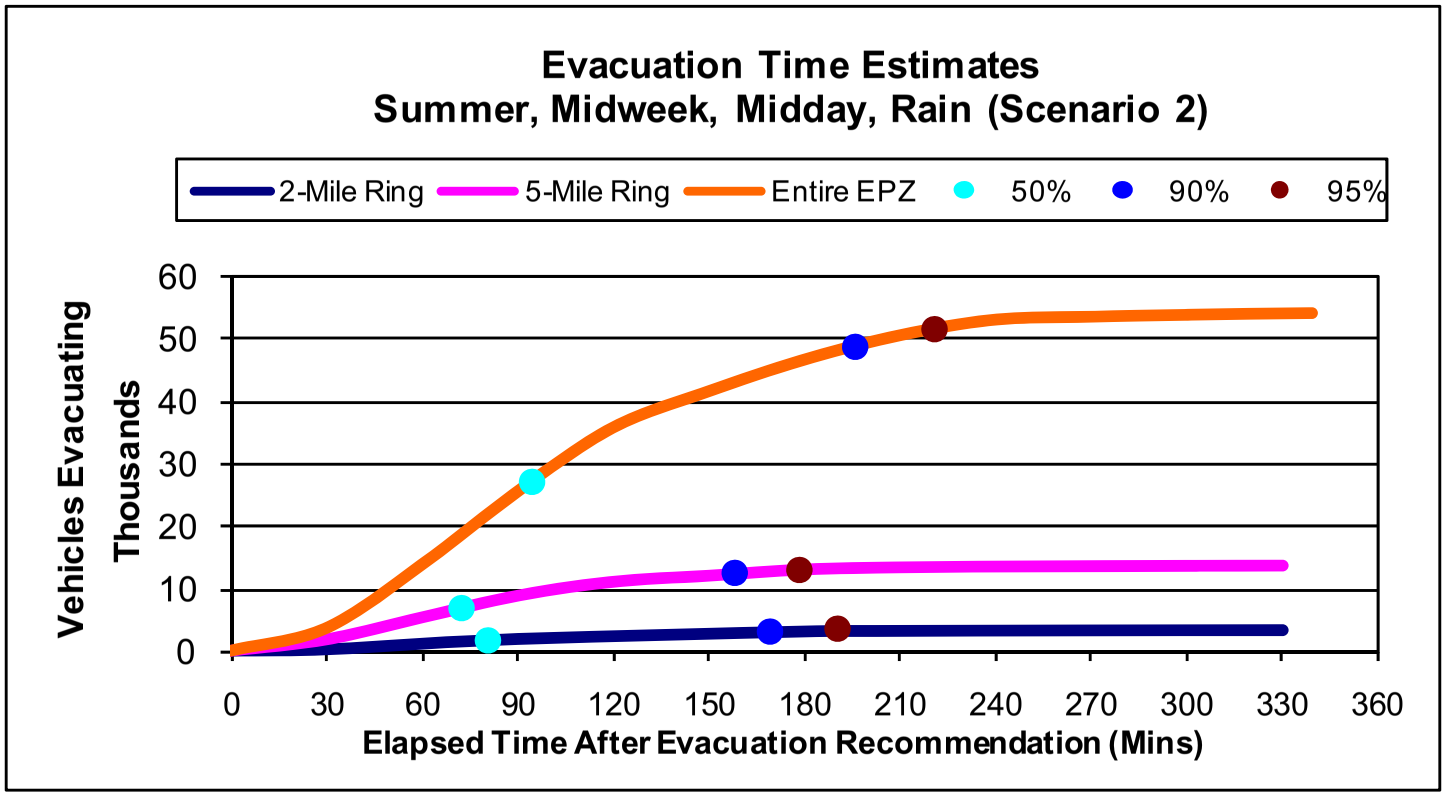


Figure J-2. Evacuation Time Estimates – Scenario 2 for Region R03 (Entire EPZ)

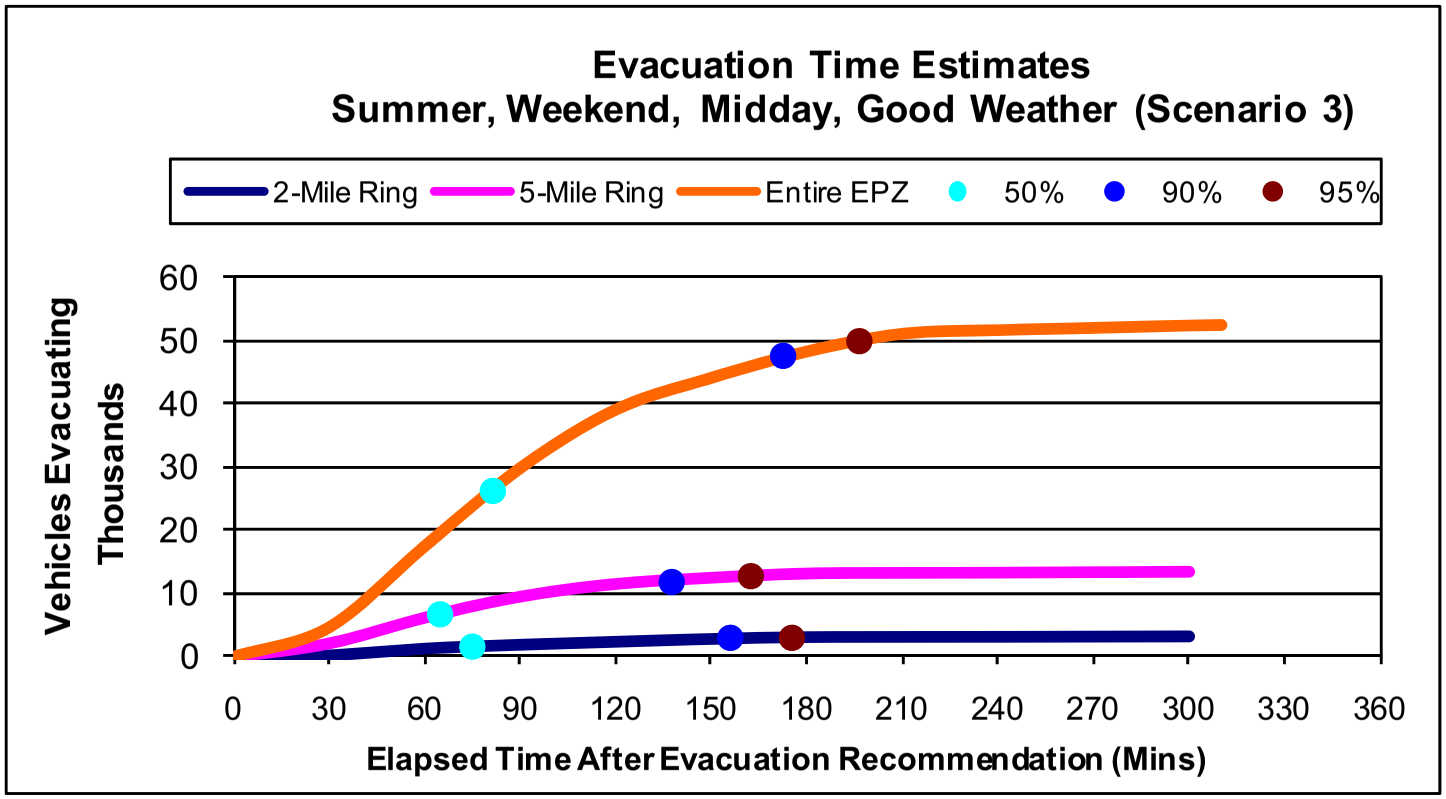


Figure J-3. Evacuation Time Estimates – Scenario 3 for Region R03 (Entire EPZ)

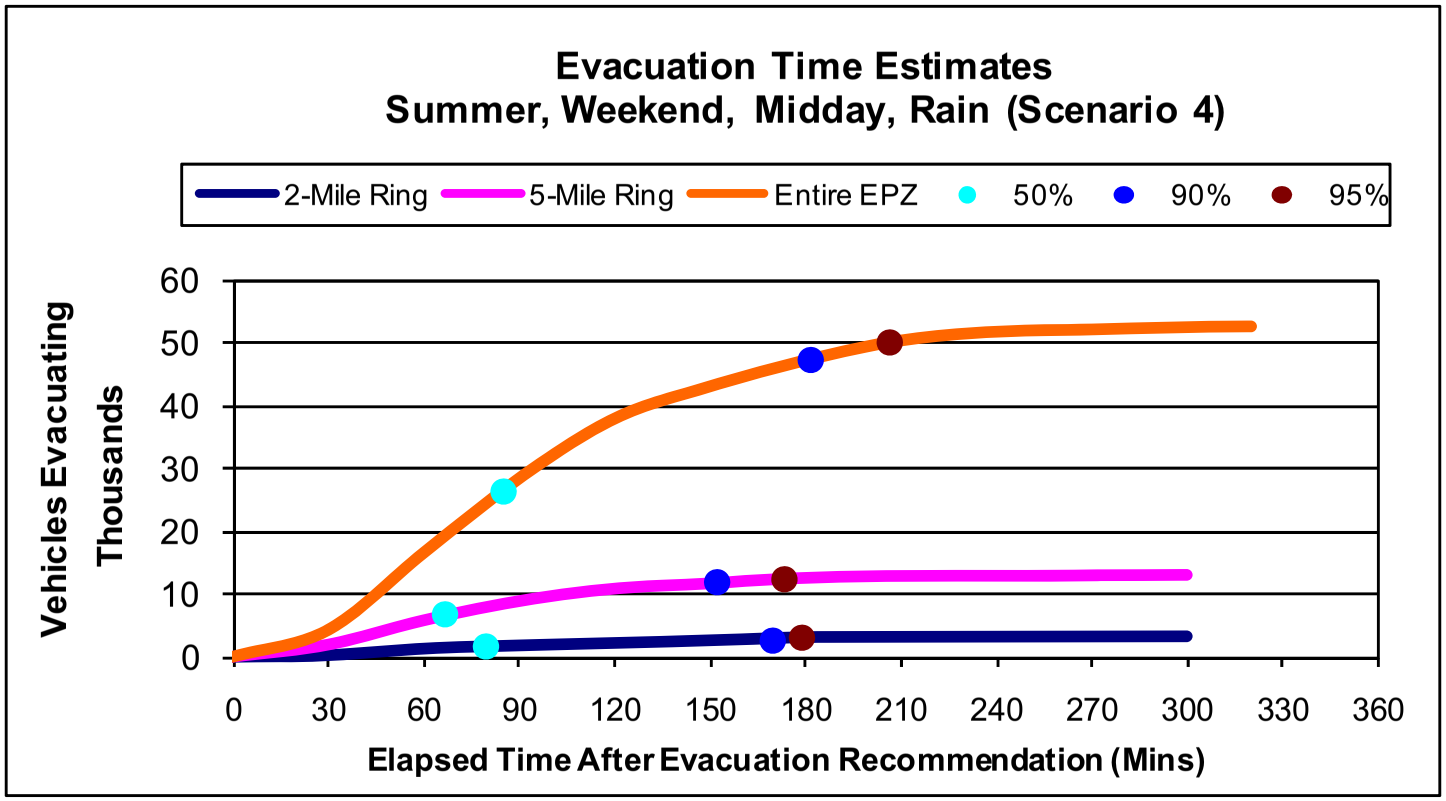


Figure J-4. Evacuation Time Estimates – Scenario 4 for Region R03 (Entire EPZ)

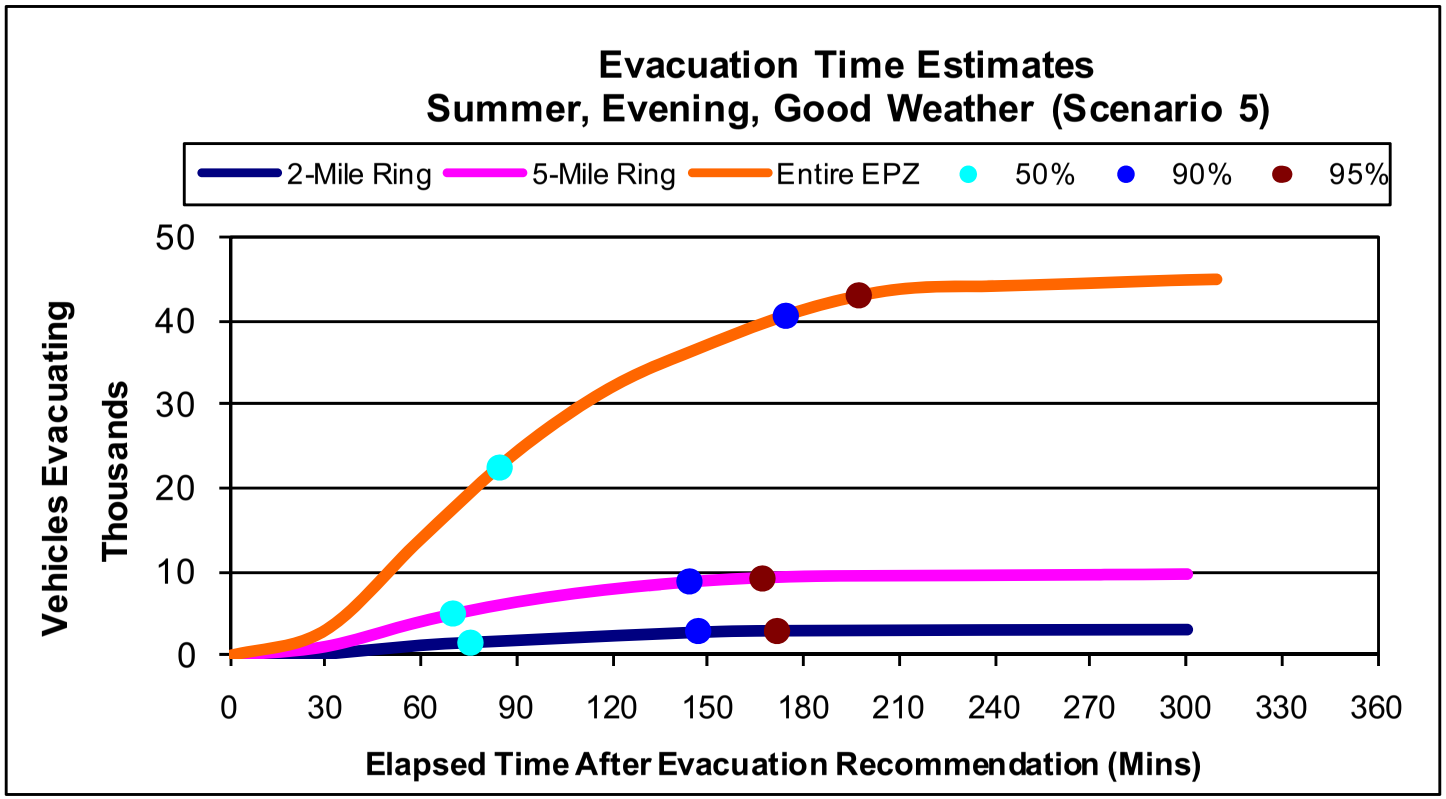


Figure J-5. Evacuation Time Estimates – Scenario 5 for Region R03 (Entire EPZ)

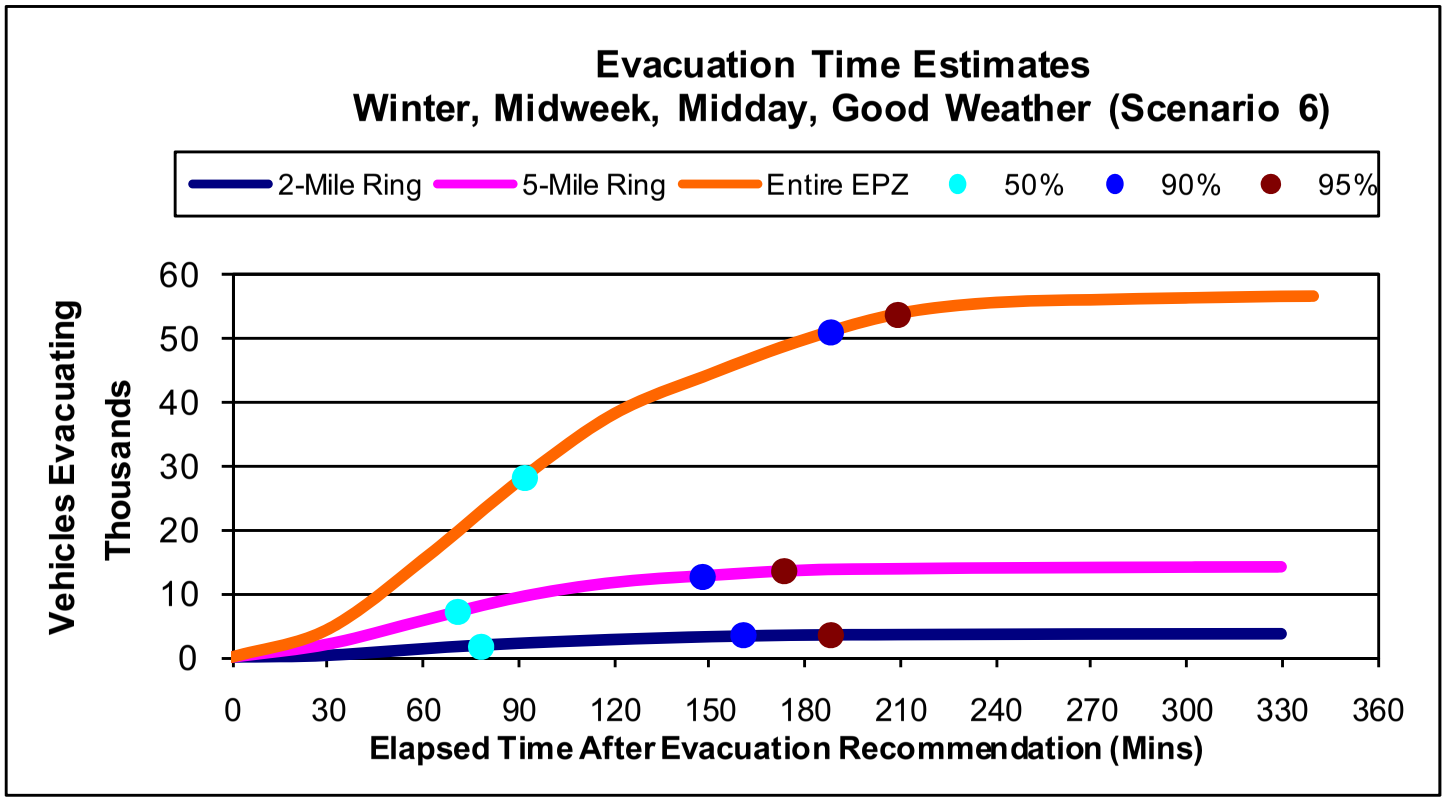


Figure J-6. Evacuation Time Estimates – Scenario 6 for Region R03 (Entire EPZ)

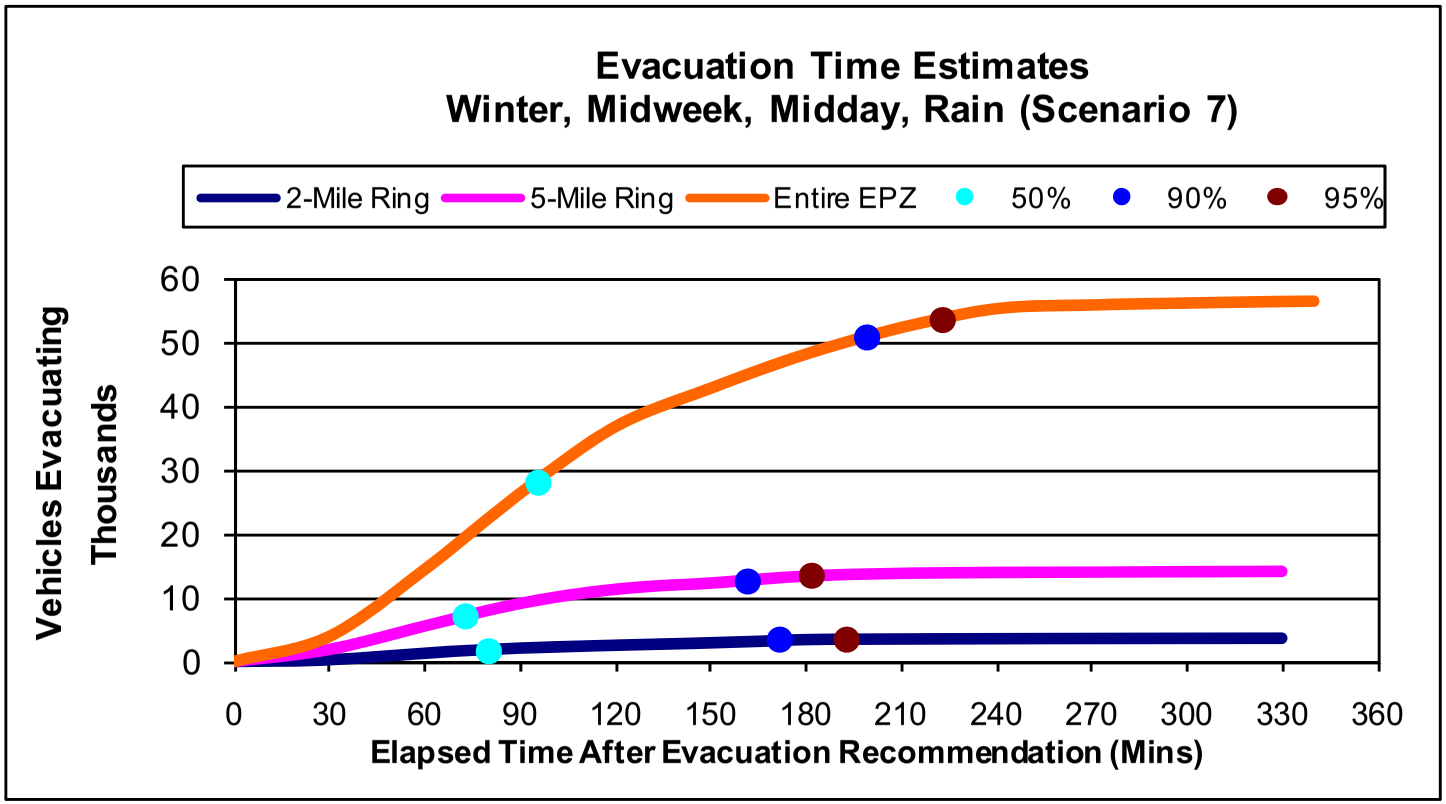


Figure J-7. Evacuation Time Estimates – Scenario 7 for Region R03 (Entire EPZ)

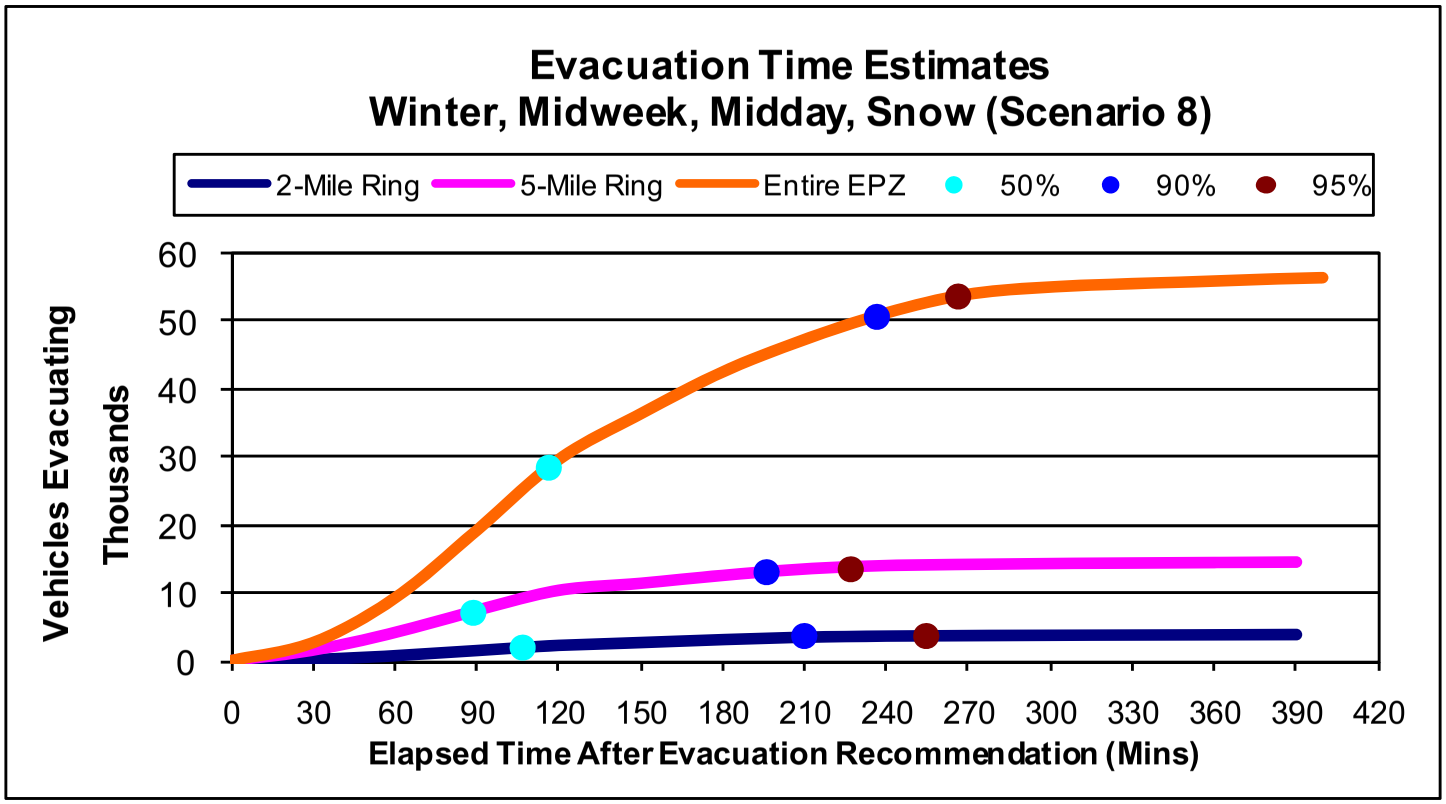


Figure J-8. Evacuation Time Estimates – Scenario 8 for Region R03 (Entire EPZ)

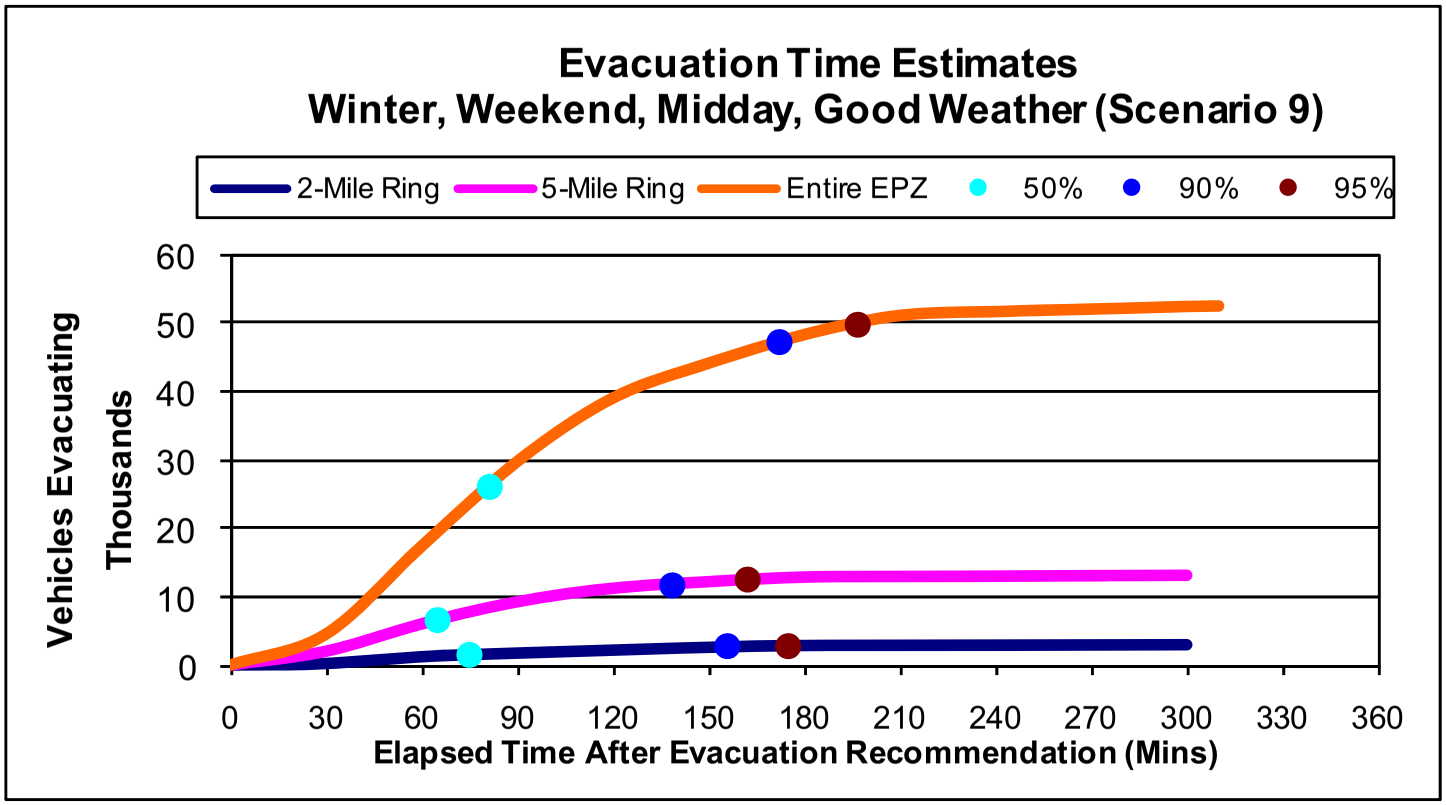


Figure J-9. Evacuation Time Estimates – Scenario 9 for Region R03 (Entire EPZ)

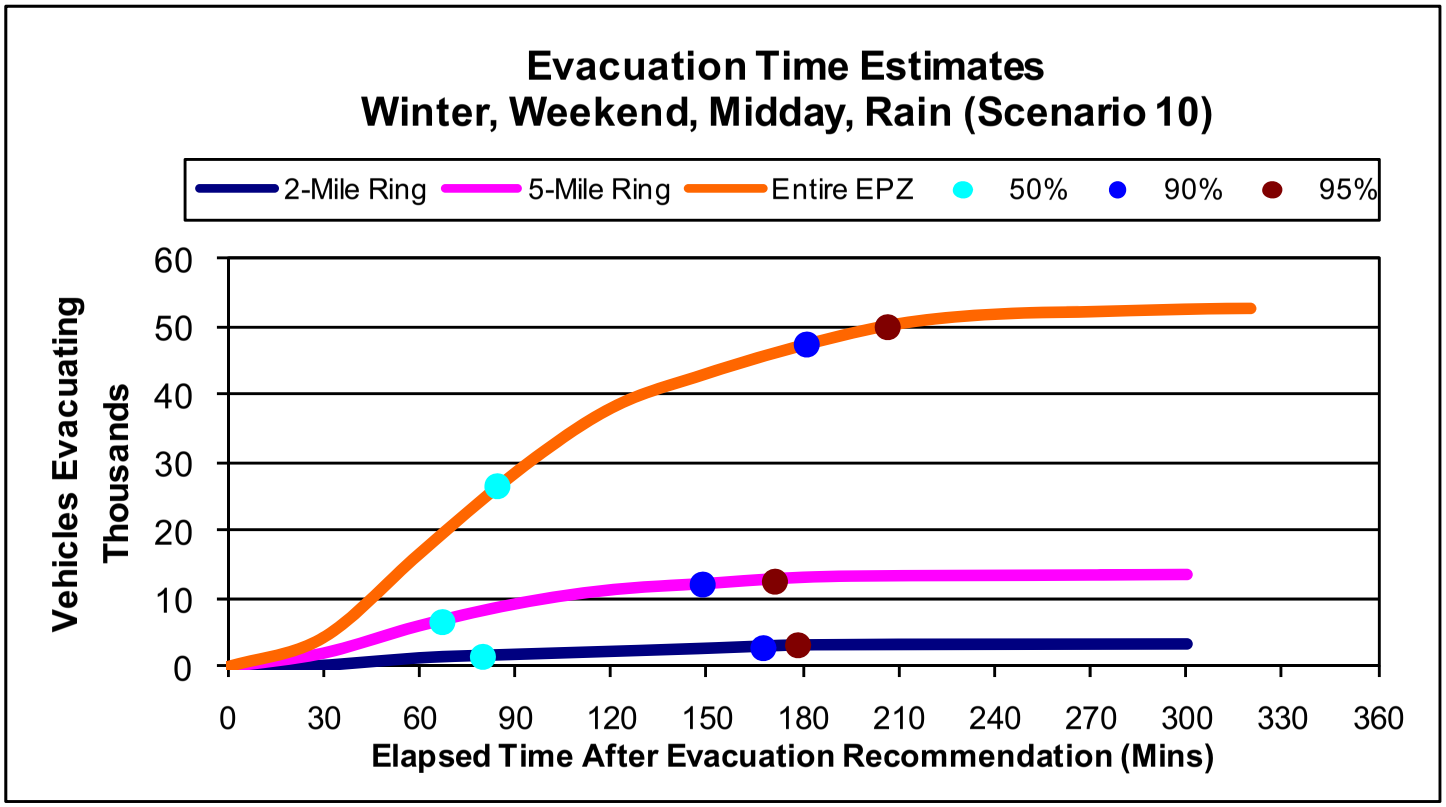


Figure J-10. Evacuation Time Estimates – Scenario 10 for Region R03 (Entire EPZ)

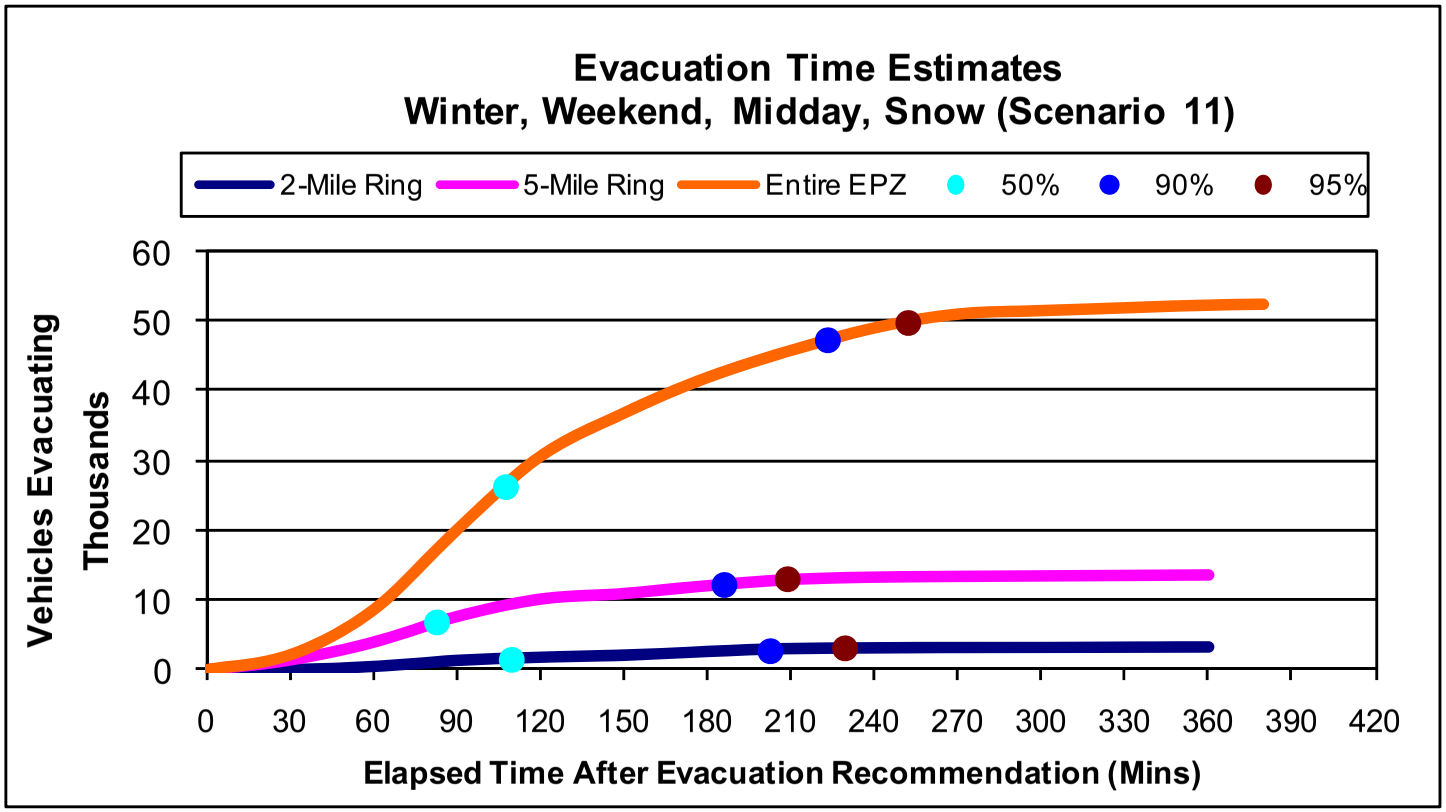


Figure J-11. Evacuation Time Estimates – Scenario 11 for Region R03 (Entire EPZ)

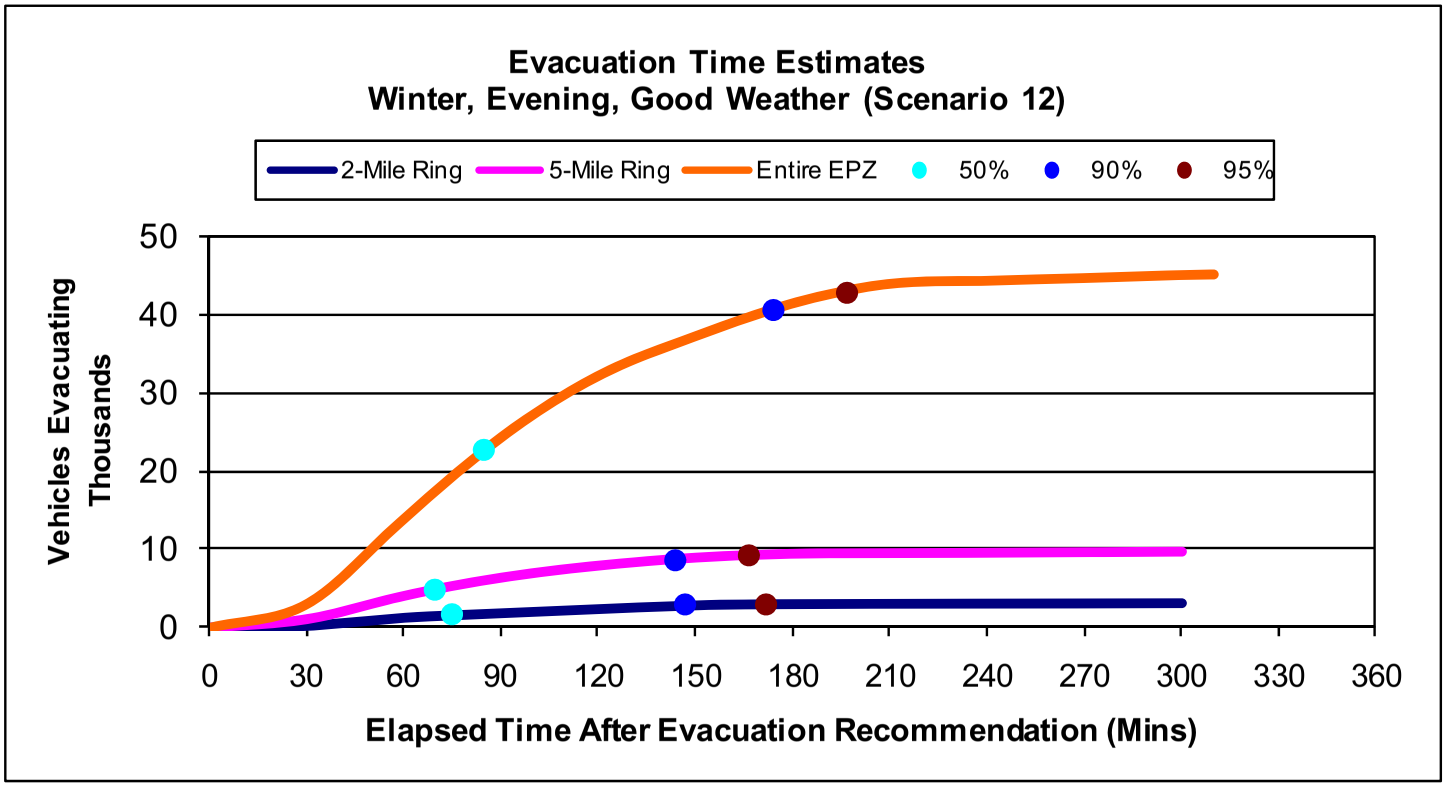


Figure J-12. Evacuation Time Estimates – Scenario 12 for Region R03 (Entire EPZ)

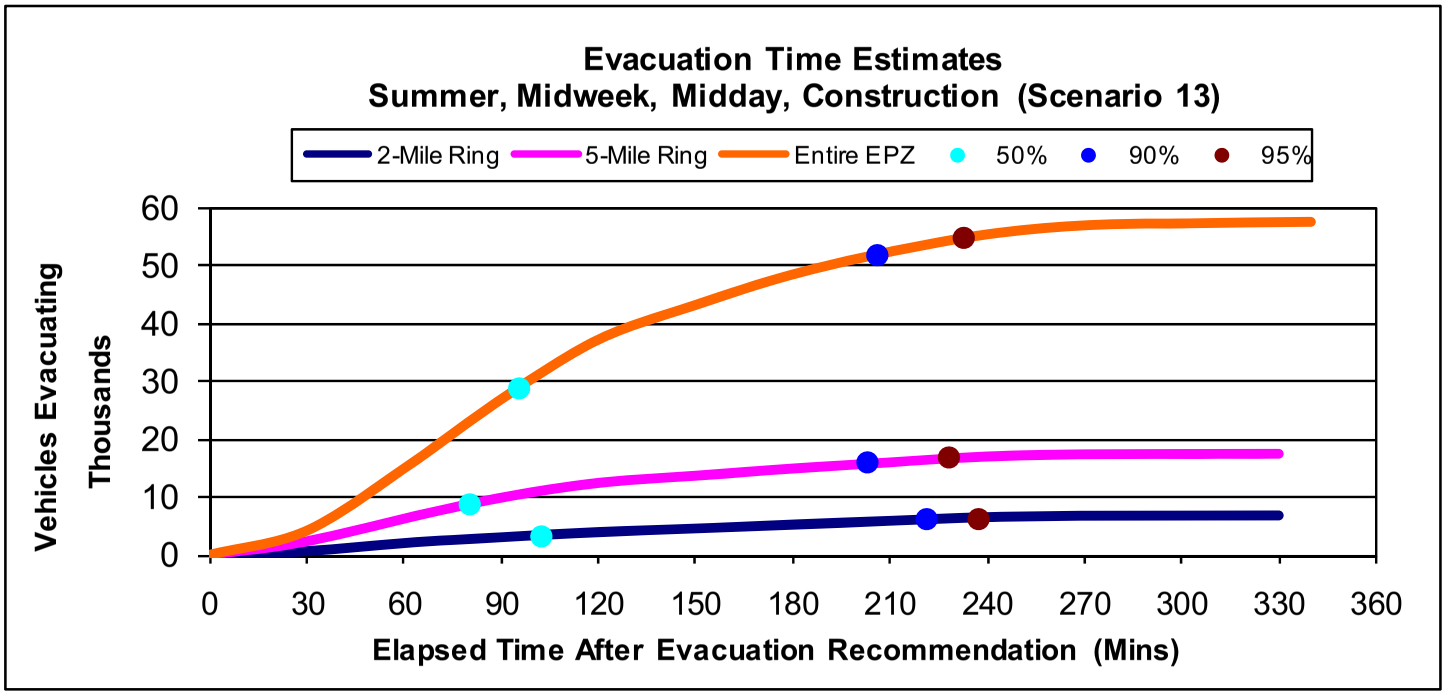


Figure J-13. Evacuation Time Estimates – Scenario 13 for Region R03 (Entire EPZ)

APPENDIX K

Evacuation Roadway Network

APPENDIX K: EVACUATION ROADWAY NETWORK

Table K-1 lists the characteristics of each roadway section modeled in the ETE analysis. Each link is identified by its upstream and downstream node numbers. These node numbers can be cross-referenced to the electronic version of Figure 1-2 to identify the geographic location of each link. As mentioned in Section 1-3, the roadway characteristics were observed during the roadway survey; key roadway sections and intersections were video archived during the survey, including audio recordings of the comments made during the survey. A tablet personal computer equipped with GIS and GPS technologies was also used to note key observations during the survey. GIS shapefiles of the roadway characteristics and traffic control devices observed were created based on field observations and on the audio and video recordings.

The term, “Full Lane” identifies the number of lanes that extend throughout the length of the link. Many links have additional lanes on the immediate approach to an intersection; these have been recorded and entered into the IDYNEV System input stream.

As discussed in Section 1.3, a computerized link-node analysis network was constructed to model the evacuation roadway network within the study area. Figure K-1 provides an overview of the link-node analysis network. The figure has been divided up into 18 more detailed figures (Figures K-2 through K-19) which show each of the links and nodes in the network.

The analysis network was calibrated using the observations made during the field survey conducted in June 2008. Table K-1 lists the characteristics of each roadway section modeled in the ETE analysis. Each link is identified by its upstream and downstream node numbers. These node numbers can be cross-referenced to Figures K-1 through K-19 to identify the geographic location of each link.

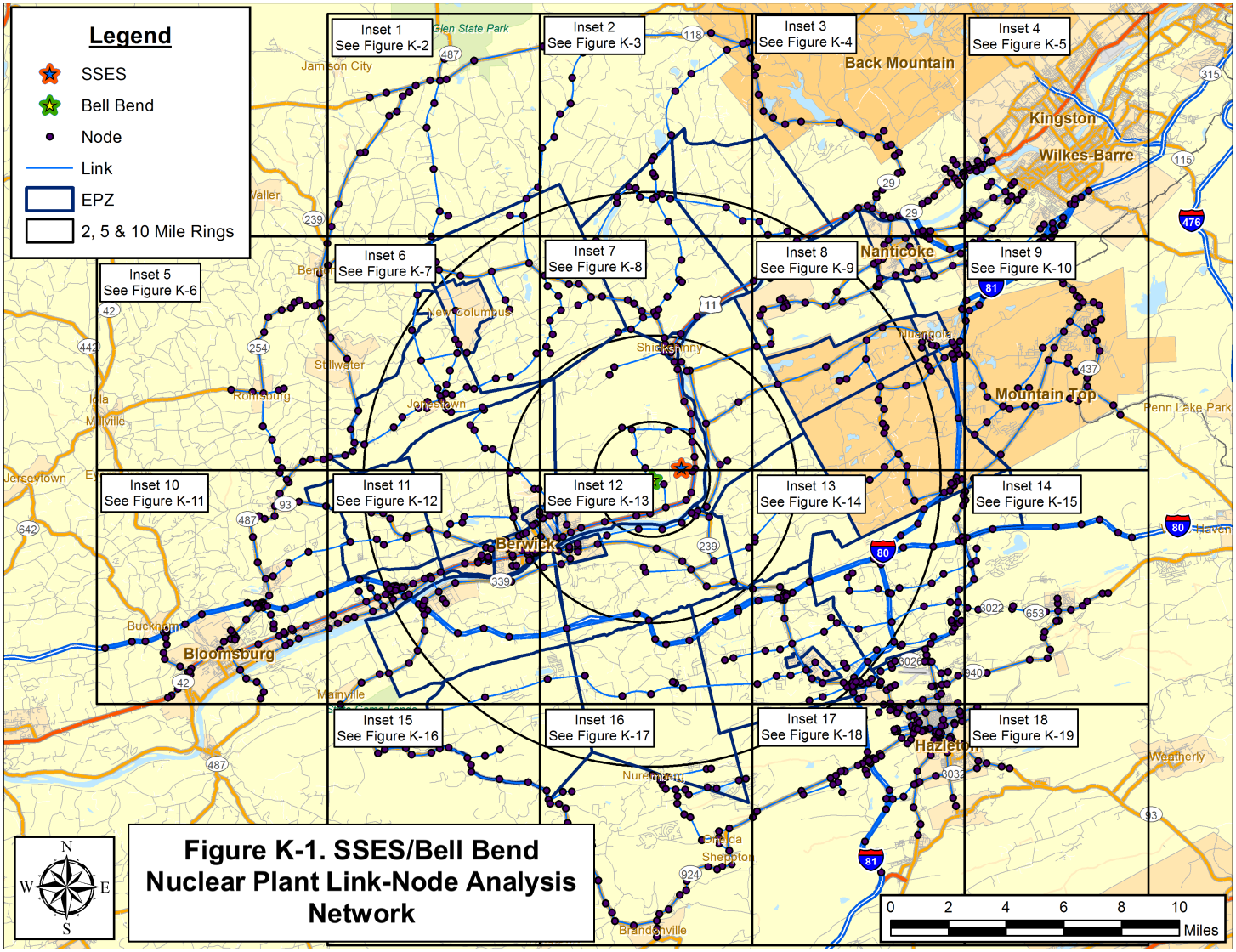
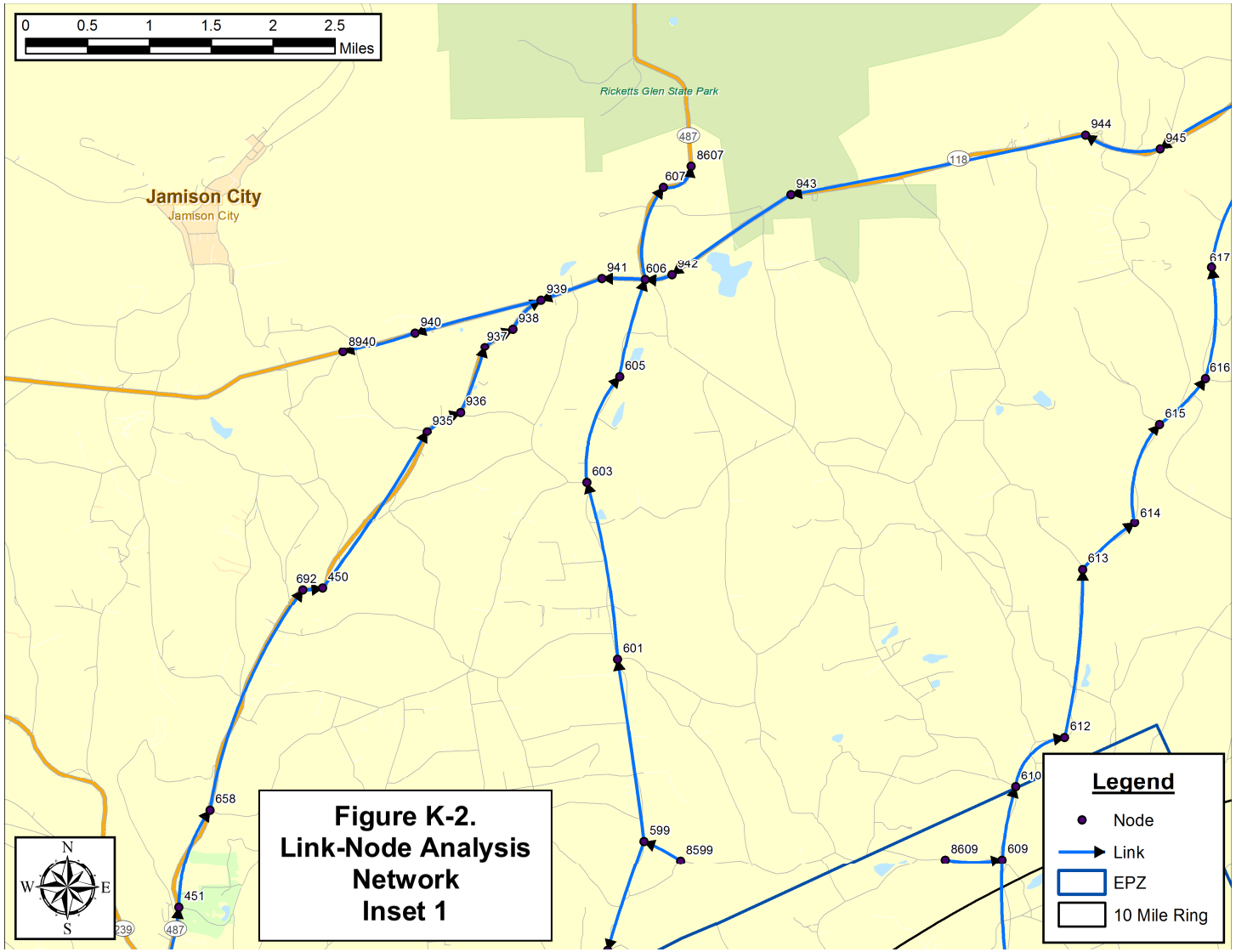


Figure K-1. SSES/Bell Bend Nuclear Plant Link-Node Analysis Network


0 0.5 1 1.5 2 2.5
Miles
Ricketts Glen State Park
Jamison City
Jamison City
487
8607
607
943
118
944
945
941
606
942
939
938
940
8940
937
936
935
605
603
617
616
615
614
613
612
610
609
8609
692
450
601
658
599
8599
451
487
239
N
W
E
S
Legend
Node
Link
EPZ
10 Mile Ring
Figure K-2.
Link-Node Analysis
Network
Inset 1

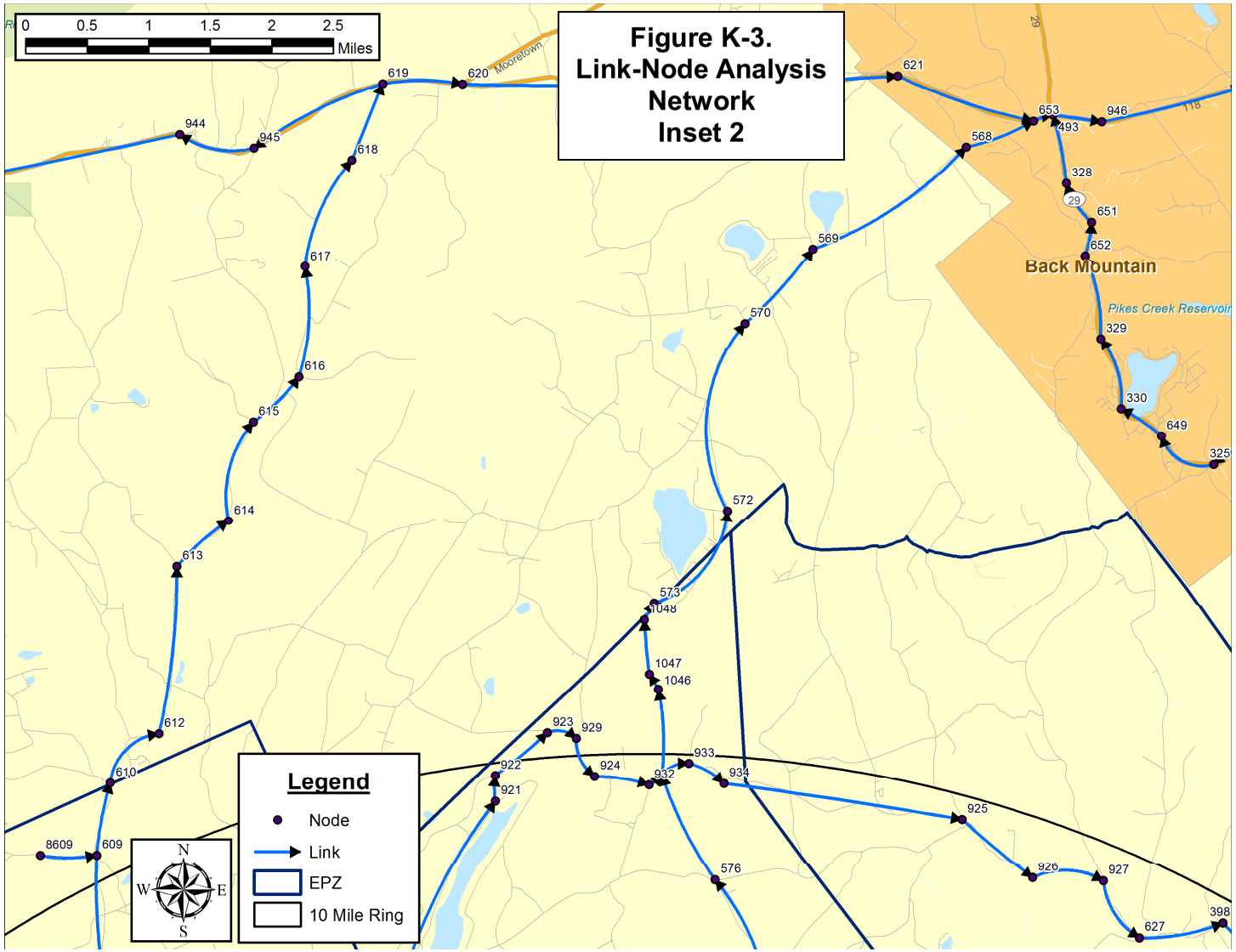


Figure K-3.
Link-Node Analysis
Network
Inset 2
0 0.5 1 1.5 2 2.5
Miles
Legend
Node
Link
EPZ
10 Mile Ring
N
W
E
S
Back Mountain
Pikes Creek Reservoir
Mooretown
944
945
618
619
620
621
617
616
615
614
613
612
610
609
8609
653
946
493
568
328
29
651
652
569
570
329
330
649
325
572
573
1048
1047
1046
923
929
922
924
933
932
934
921
925
576
926
927
627
398

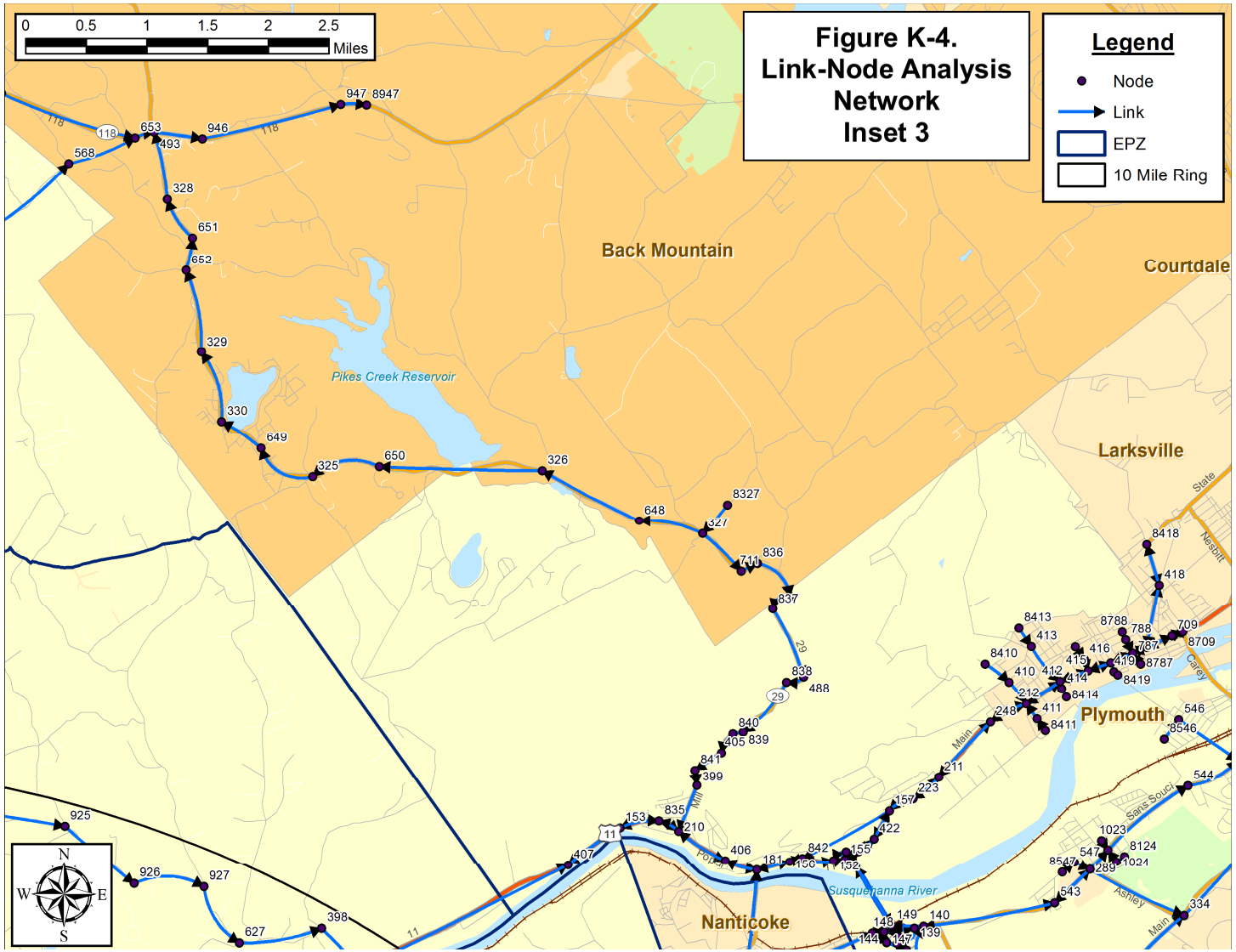


Figure K-4.
Link-Node Analysis
Network
Inset 3
Legend
Node
Link
EPZ
10 Mile Ring
0 0.5 1 1.5 2 2.5
Miles
Back Mountain
Courtdale
Larksville
Plymouth
Nanticoke
Pikes Creek Reservoir
Susquehanna River
N
W
E
S

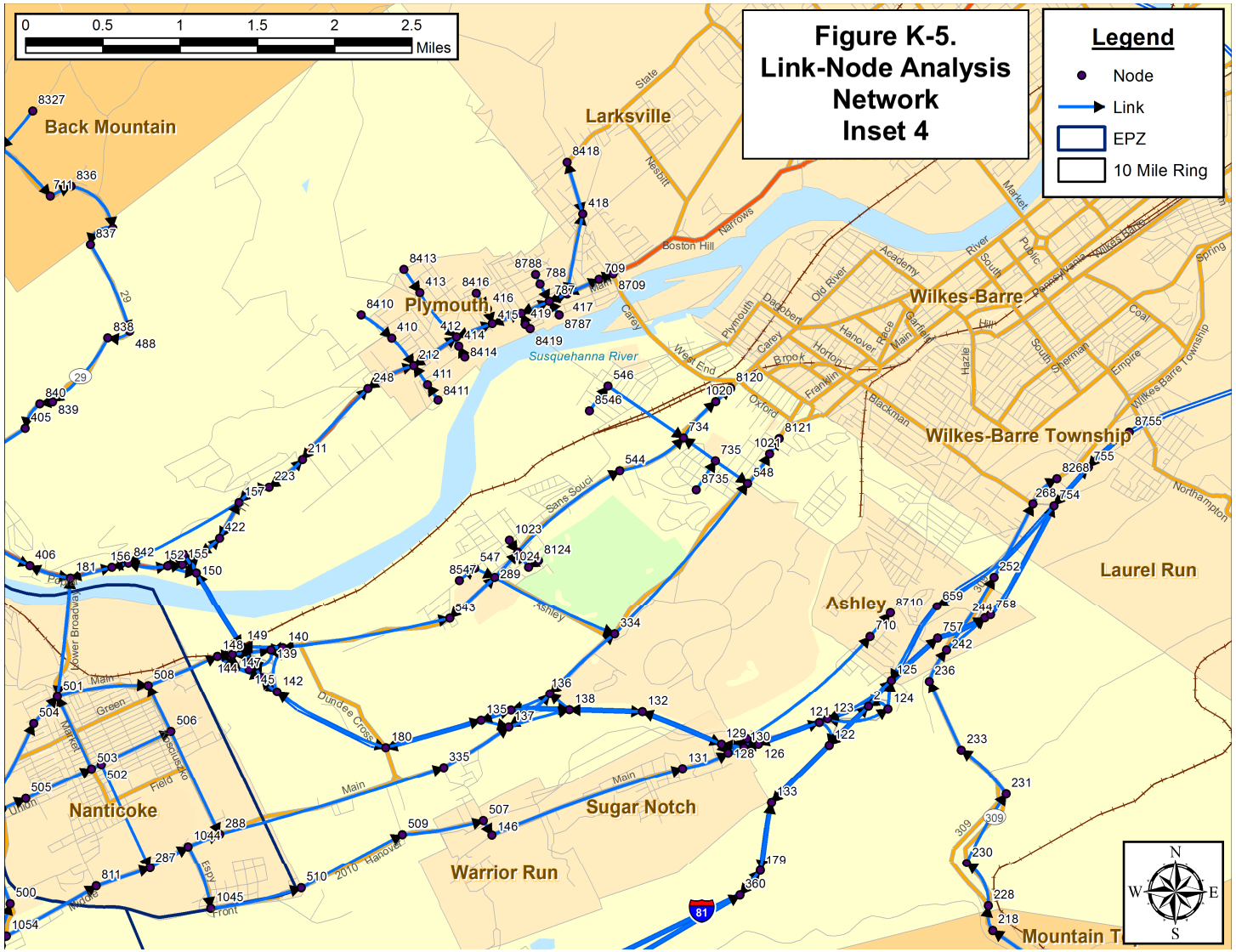
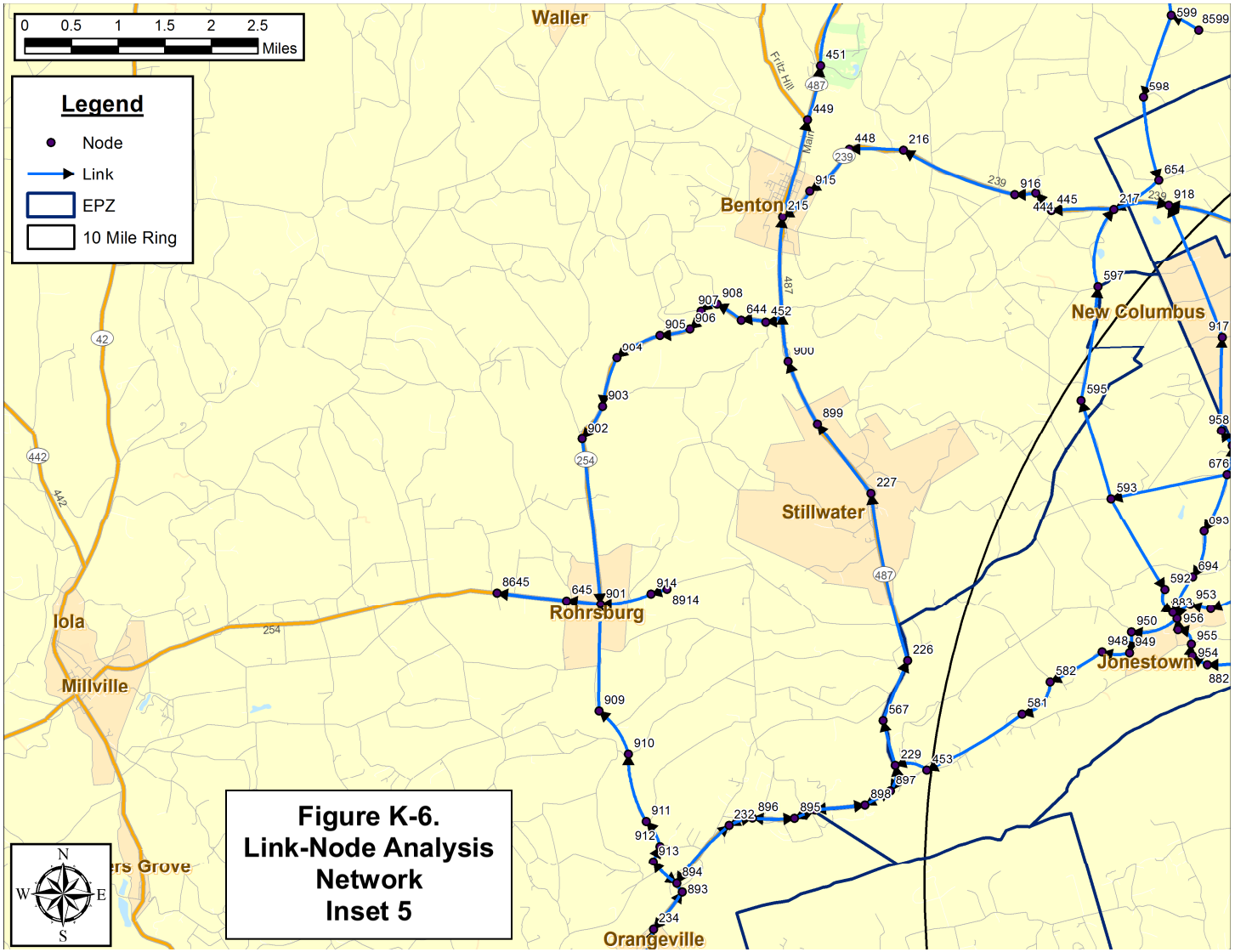


Figure K-5.
Link-Node Analysis
Network
Inset 4
Legend
Node
Link
EPZ
10 Mile Ring
0 0.5 1 1.5 2 2.5
Miles
Back Mountain
Larksville
Plymouth
Wilkes-Barre
Wilkes-Barre Township
Laurel Run
Ashley
Nanticoke
Sugar Notch
Warrior Run
Susquehanna River
N
S
E
W


0 0.5 1 1.5 2 2.5
Miles
Legend
Node
Link
EPZ
10 Mile Ring
Waller
Benton
New Columbus
Stillwater
Rohrsburg
Iola
Millville
Jonestown
Orangeville
Fritz Hill
Main
487
42
442
254
239
Figure K-6.
Link-Node Analysis
Network
Inset 5

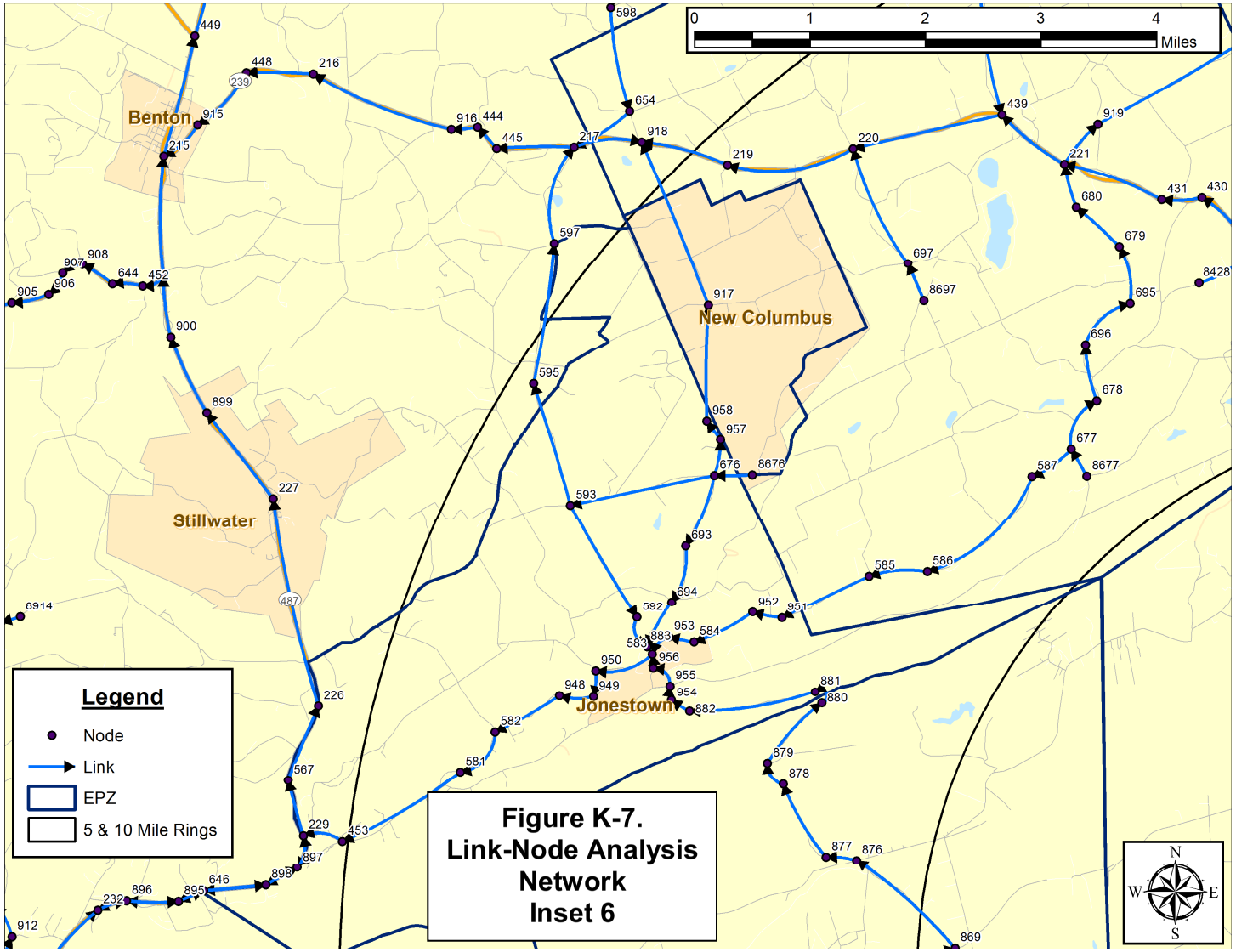


Figure K-7.
Link-Node Analysis Network
Inset 6

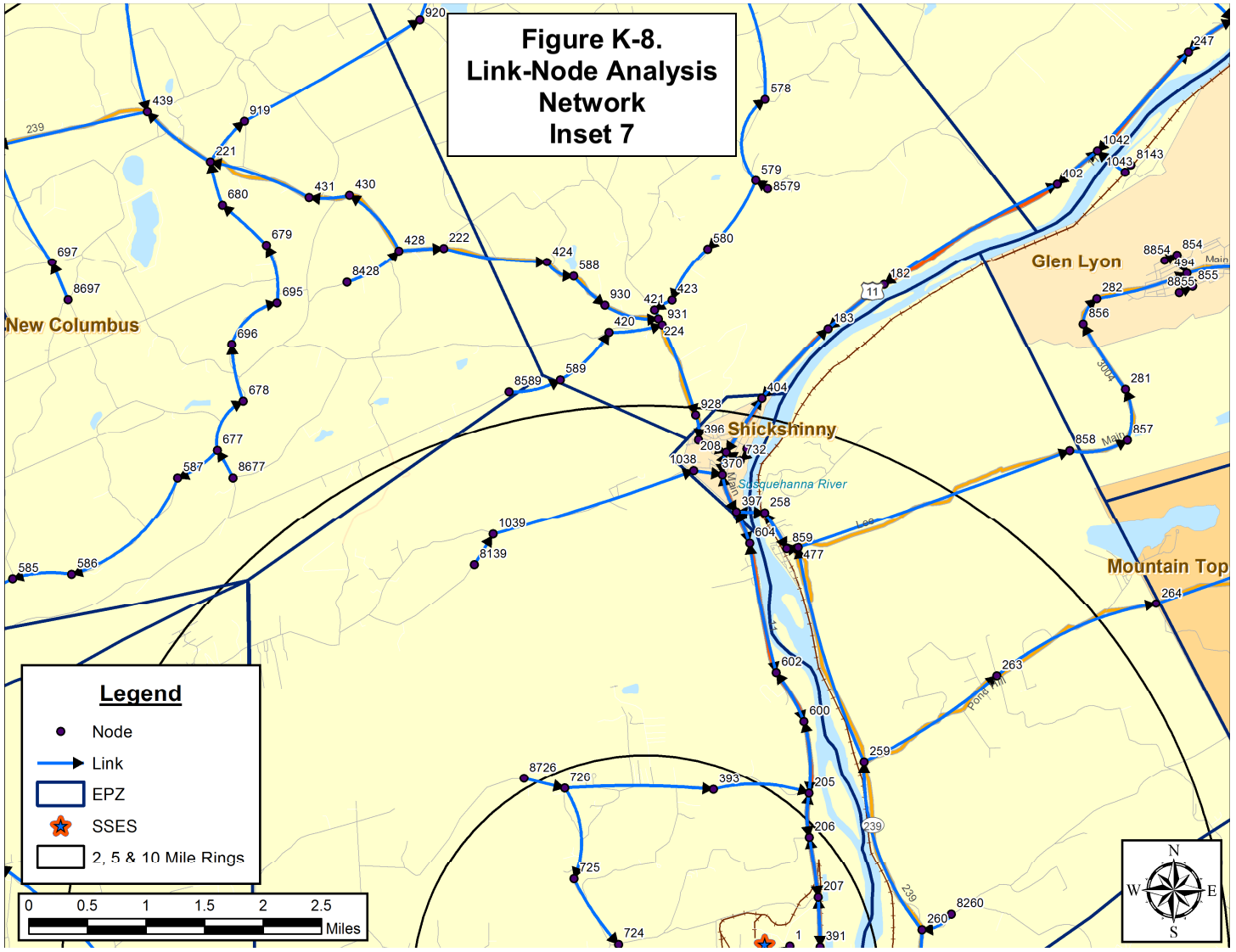


Figure K-8.
Link-Node Analysis
Network
Inset 7
New Columbus
Shicksinny
Glen Lyon
Mountain Top
Susquehanna River
Legend
Node
Link
EPZ
SSES
2, 5 & 10 Mile Rings
0 0.5 1 1.5 2 2.5
Miles
N
W
E
S

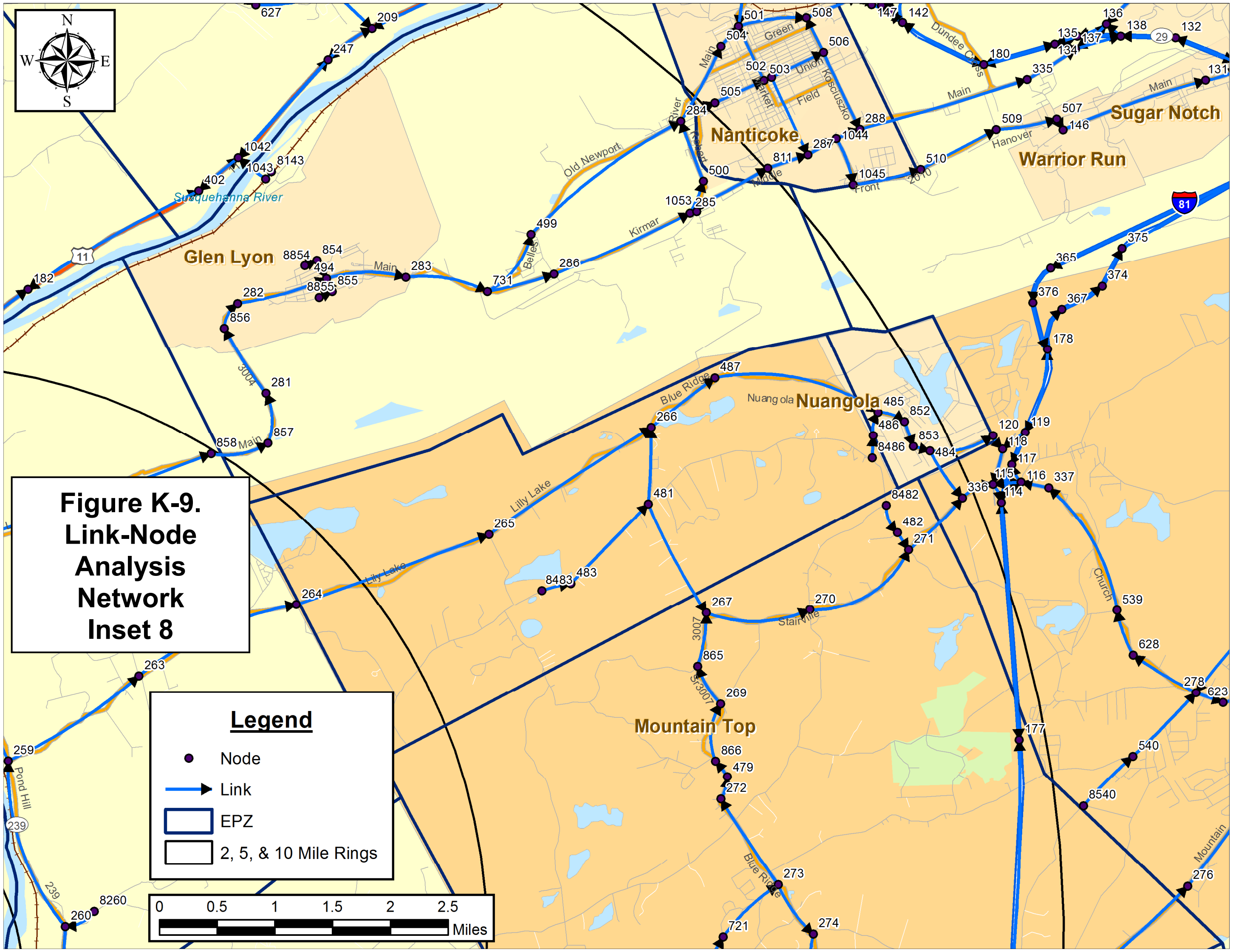


Figure K-9. Link-Node Analysis Network Inset 8

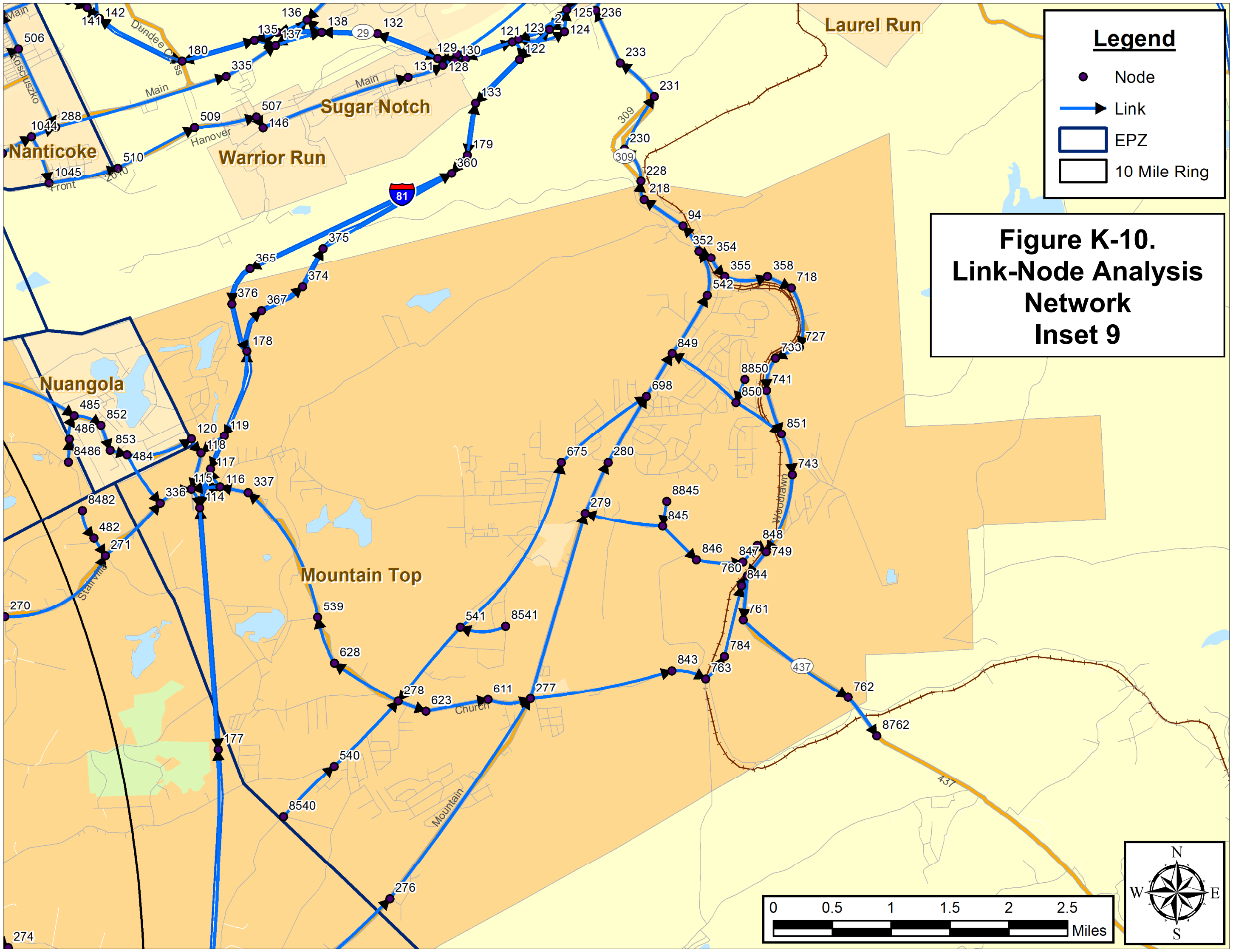


Figure K-10. Link-Node Analysis Network Inset 9

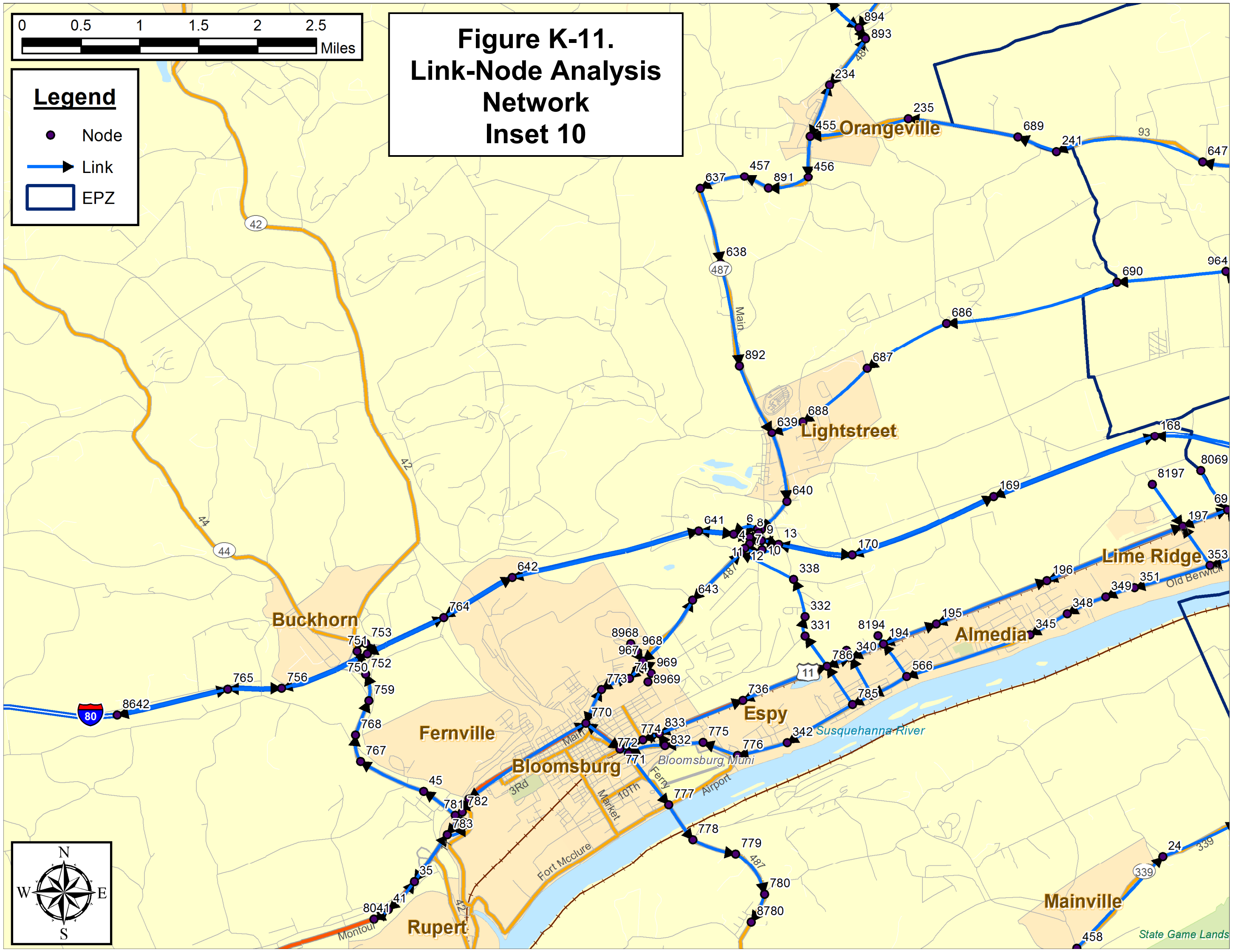


Figure K-11.
Link-Node Analysis
Network
Inset 10
0
0.5
1
1.5
2
2.5
Miles
Legend
Node
Link
EPZ
Orangeville
Lightstreet
Buckhorn
Fernville
Bloomsburg
Espy
Almedia
Lime Ridge
Mainville
Rupert
Susquehanna River
Bloomsburg Muni
State Game Lands

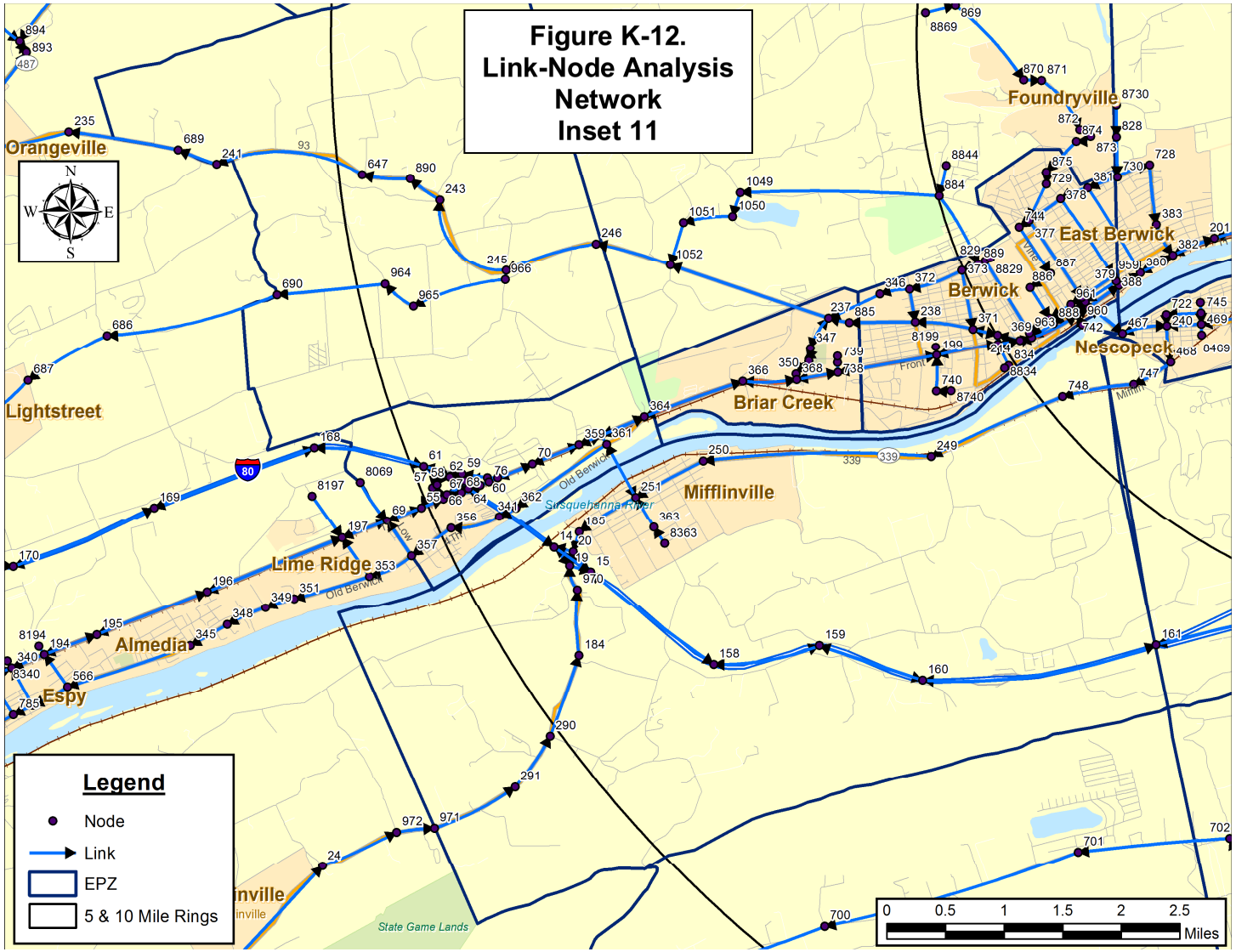
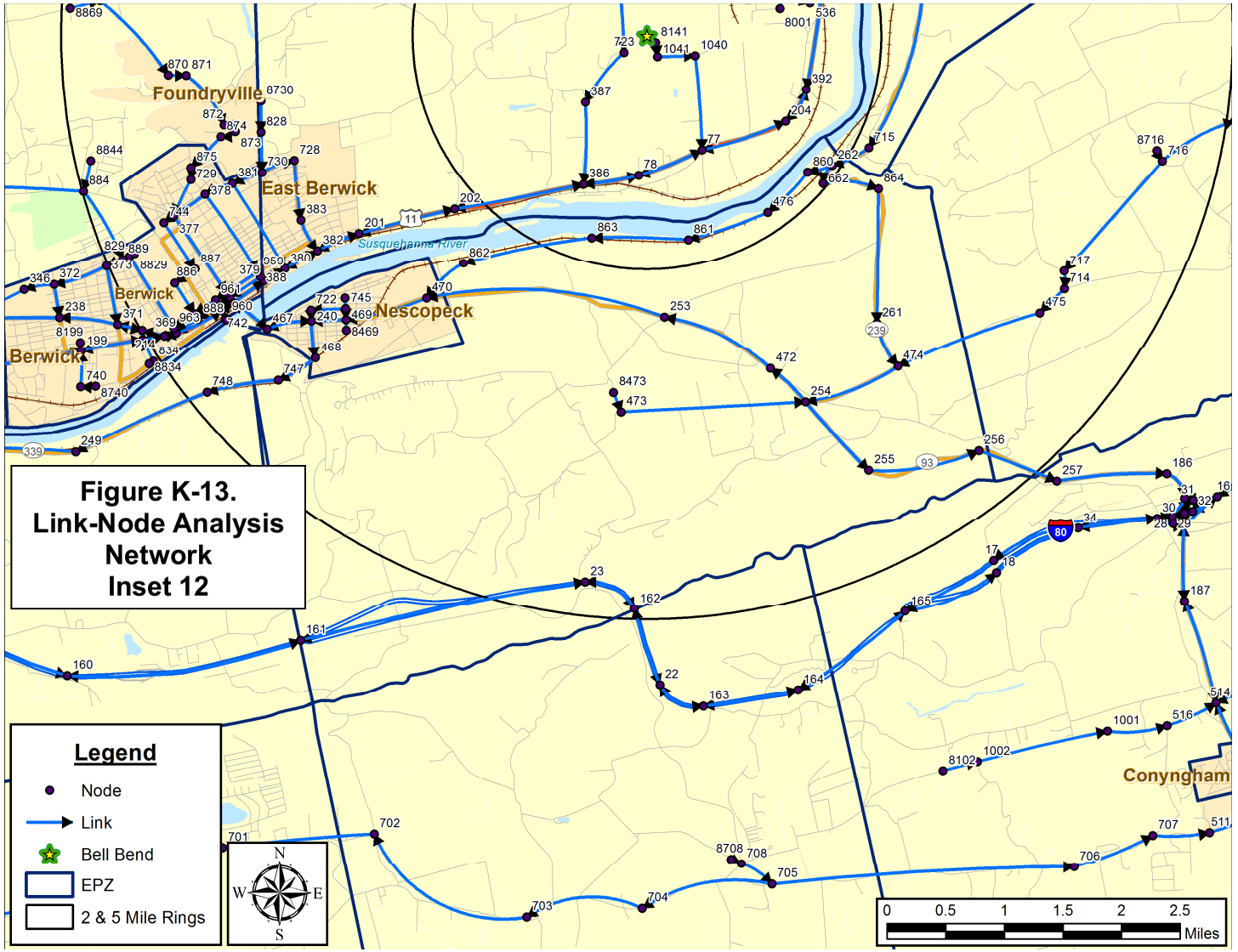


Figure K-12.
Link-Node Analysis
Network
Inset 11
Orangeville
Lightstreet
Lime Ridge
Almedia
Espy
Mifflinville
Briar Creek
Berwick
East Berwick
Nescopeck
Foundryville
Old Berwick
Susquehanna River
State Game Lands
Legend
Node
Link
EPZ
5 & 10 Mile Rings
0 0.5 1 1.5 2 2.5
Miles


Foundryville
East Berwick
Berwick
Berwick
Nescopeck
Susquehanna River
Conyngham
Figure K-13.
Link-Node Analysis
Network
Inset 12
Legend
Node
Link
Bell Bend
EPZ
2 & 5 Mile Rings
N
W
E
S
0
0.5
1
1.5
2
2.5
Miles

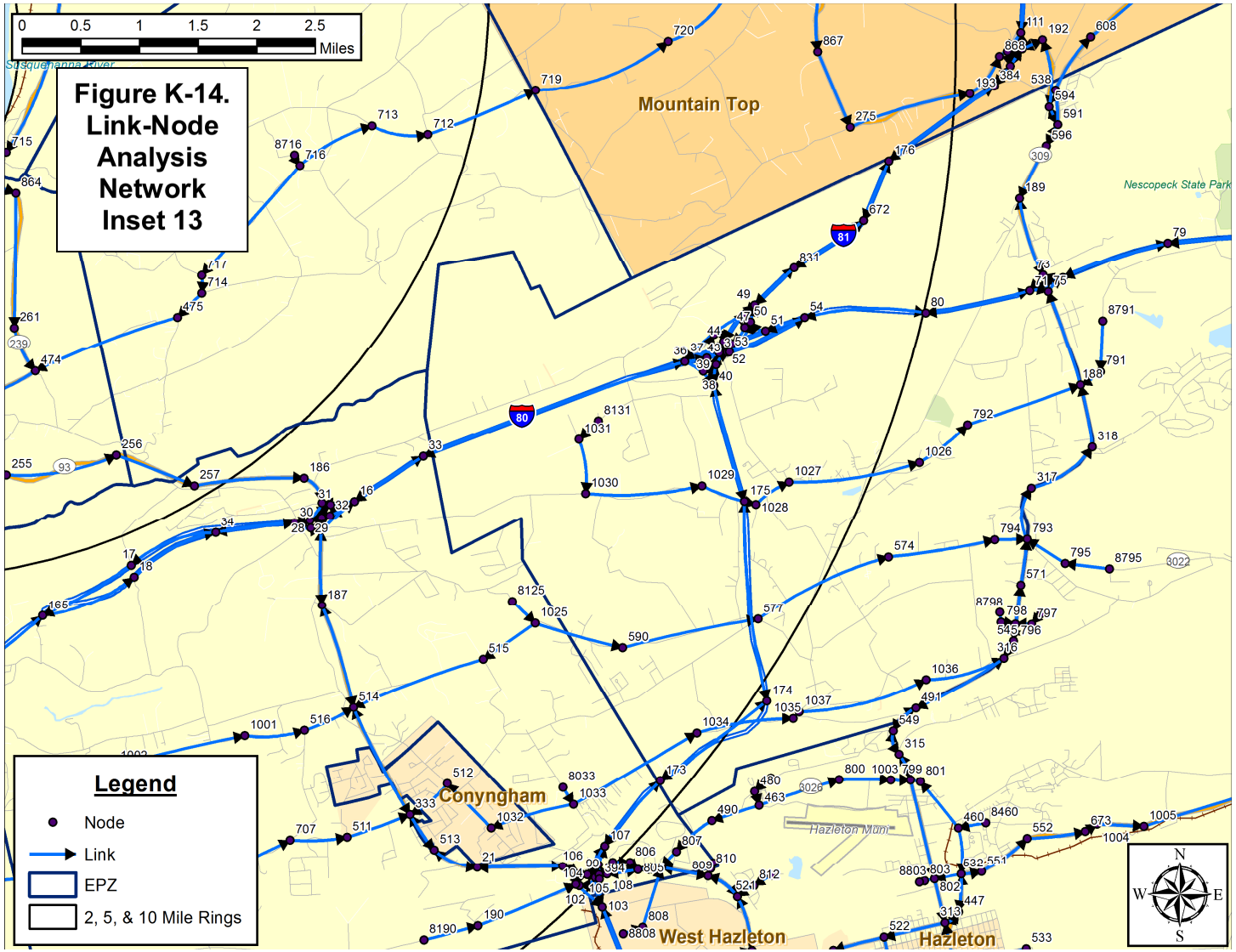


Figure K-14.
Link-Node
Analysis
Network
Inset 13
0 0.5 1 1.5 2 2.5
Miles
Susquehanna River
Mountain Top
Nescopeck State Park
Conyngham
West Hazleton
Hazleton
Hazleton Muni
Legend
Node
Link
EPZ
2, 5, & 10 Mile Rings
N
S
E
W

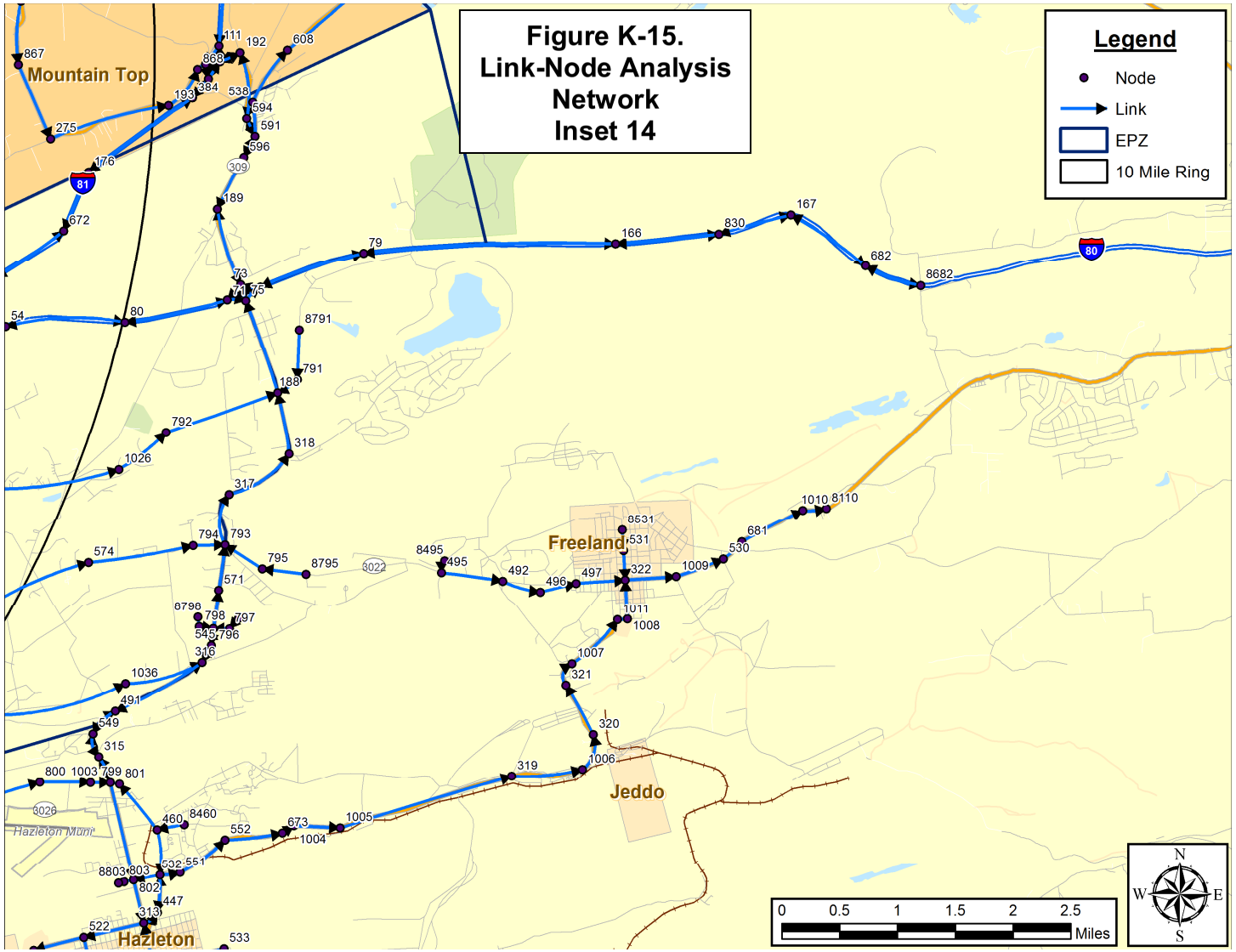


Figure K-15.
Link-Node Analysis
Network
Inset 14
Legend
Node
Link
EPZ
10 Mile Ring
Mountain Top
Freeland
Jeddo
Hazleton
0 0.5 1 1.5 2 2.5
Miles
N
W
E
S

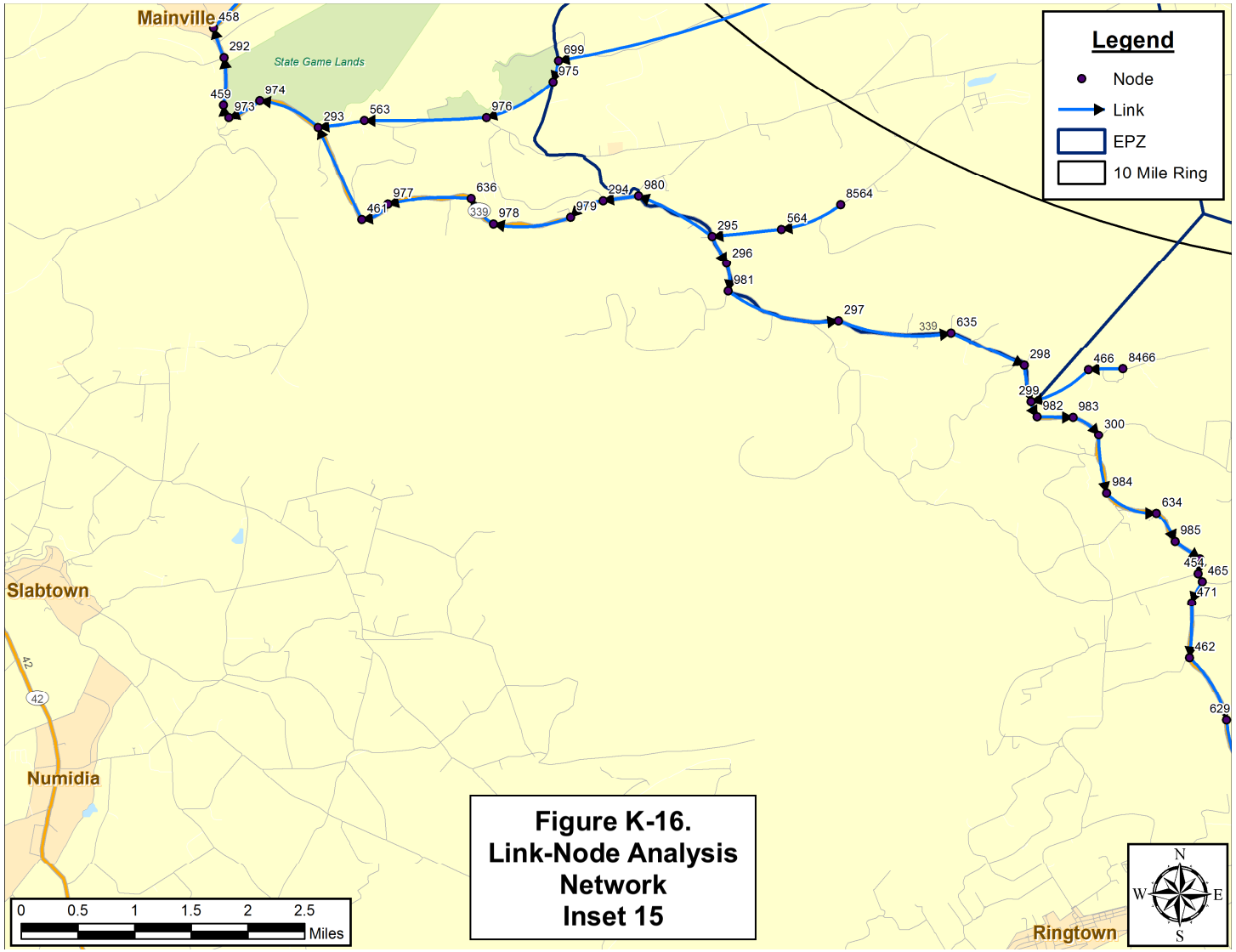


Figure K-16.
Link-Node Analysis
Network
Inset 15

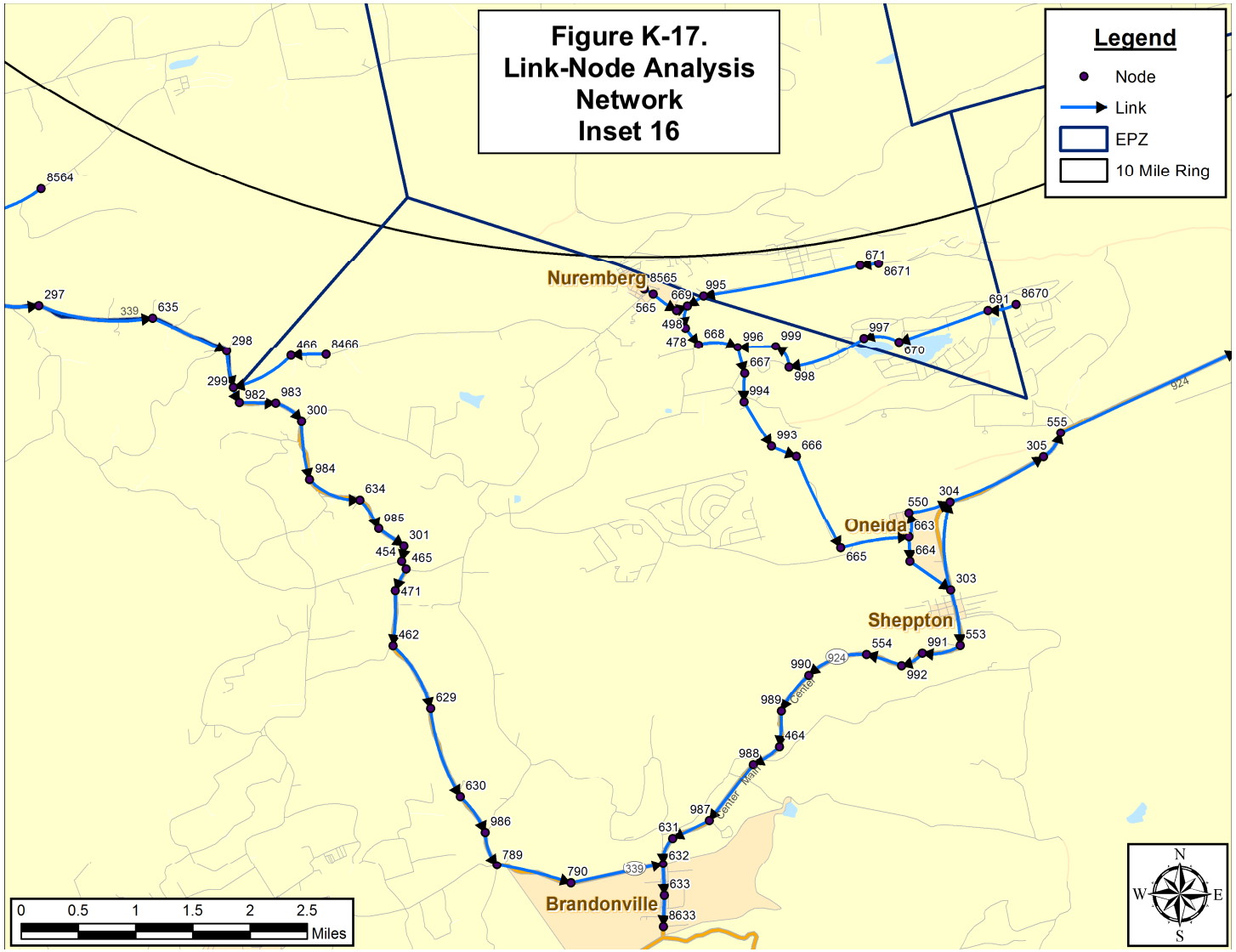


Figure K-17.
Link-Node Analysis
Network
Inset 16
Legend
Node
Link
EPZ
10 Mile Ring
Nuremberg
Oneida
Sheppton
Brandonville
Center Main
924
339
0 0.5 1 1.5 2 2.5
Miles
N
W
E
S

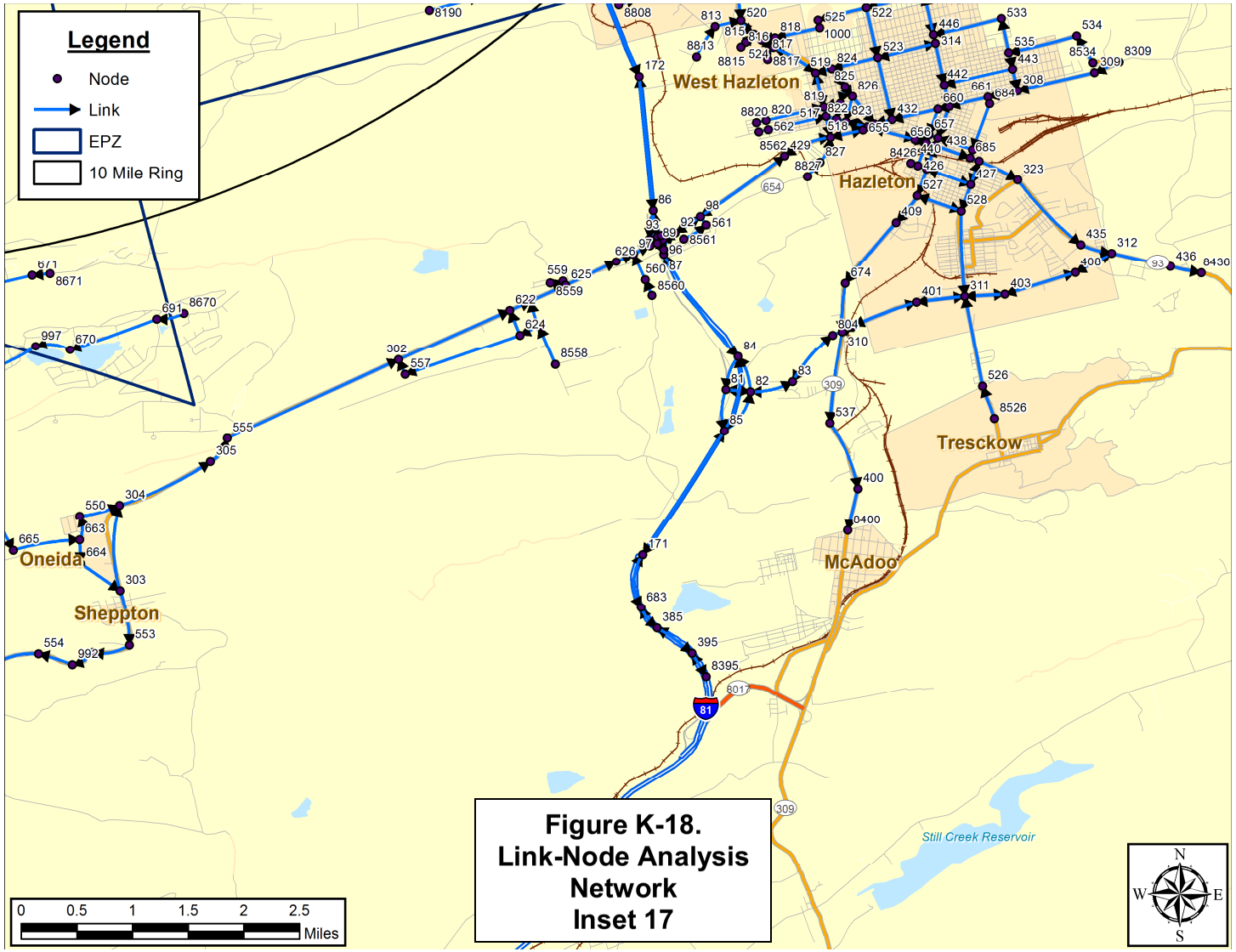


Figure K-18.
Link-Node Analysis Network
Inset 17

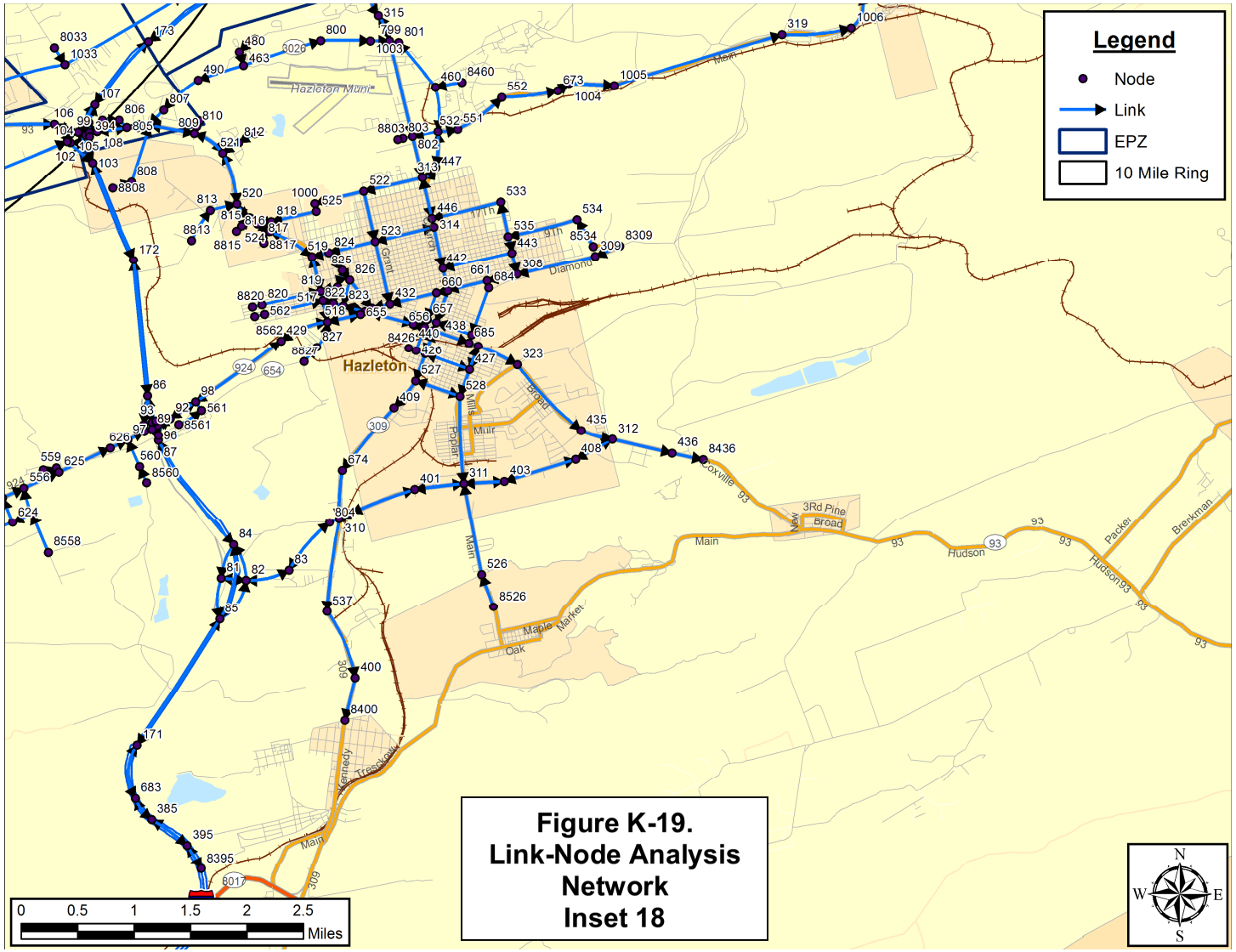


Figure K-19.
Link-Node Analysis
Network
Inset 18

Table K-1. Evacuation Roadway Network Characteristics

Upstream Node Number	Downstream Node Number	Length (Miles)	Full Lanes	Saturation Flow Rate (Veh/hr/ln)	Free Flow Speed (MPH)
1	536	0.20	1	1,714	40
2	122	0.51	3	2,250	65
2	124	0.26	1	1,500	30
2	125	0.25	2	2,250	65
3	39	0.16	3	2,250	60
3	44	0.09	2	2,250	60
4	7	0.10	2	2,250	70
4	641	0.33	2	2,250	70
5	8	0.07	1	1,714	45
5	4	0.26	1	1,714	50
6	8	0.09	1	1,500	30
7	6	0.11	1	1,500	30
7	9	0.13	2	2,250	70
7	4	0.10	2	2,250	70
8	5	0.07	1	1,714	50
8	11	0.12	2	1,714	45
9	7	0.13	2	2,250	70
9	10	0.08	1	1,500	30
9	13	0.08	2	2,250	70
10	11	0.14	1	1,500	30
11	8	0.12	1	1,714	45
11	12	0.05	2	1,714	45
12	13	0.28	1	1,714	50
12	11	0.05	1	1,714	45
12	339	0.06	1	1,714	40
13	170	0.68	2	2,250	70
13	9	0.08	2	2,250	70
14	64	0.91	2	2,250	70
14	19	0.23	1	1,714	30
14	15	0.41	2	2,250	70
15	158	1.29	2	2,250	70
15	20	0.27	1	1,714	40
15	14	0.41	2	2,250	70
16	32	0.17	2	1,500	30
16	25	0.28	1	1,714	40
16	33	0.69	2	2,250	70
17	165	0.80	2	2,250	70

Upstream Node Number	Downstream Node Number	Length (Miles)	Full Lanes	Saturation Flow Rate (Veh/hr/ln)	Free Flow Speed (MPH)
18	34	0.84	2	2,250	70
19	20	0.19	1	1,714	40
19	15	0.23	1	1,714	50
20	19	0.19	1	1,714	40
20	14	0.17	1	1,714	40
21	513	0.52	1	1,714	40
21	106	0.61	2	1,286	40
22	162	0.76	2	2,250	70
22	163	0.26	2	2,250	70
23	162	0.33	2	2,250	70
23	161	2.63	2	2,250	70
24	972	0.77	1	1,714	45
25	26	0.14	2	1,714	40
25	30	0.34	1	1,714	40
26	31	0.13	1	1,500	30
26	28	0.18	1	1,500	30
26	27	0.20	2	1,714	40
26	25	0.14	2	1,714	40
27	26	0.20	2	1,714	40
27	16	0.43	1	1,714	50
27	187	0.54	1	1,714	45
28	29	0.09	1	1,500	30
29	30	0.16	2	2,250	70
29	32	0.25	2	2,250	70
30	34	0.65	2	2,250	70
30	27	0.30	1	1,714	40
30	29	0.16	2	2,250	70
31	32	0.11	1	2,250	70
32	29	0.25	2	2,250	70
32	16	0.17	2	2,250	70
33	36	2.41	2	2,250	65
33	16	0.69	2	2,250	70
34	30	0.65	2	2,250	70
34	17	0.73	2	2,250	70
35	783	0.56	2	1,714	45
35	41	0.37	1	1,714	45
36	40	0.33	1	1,714	50
36	33	2.41	2	2,250	70

Upstream Node Number	Downstream Node Number	Length (Miles)	Full Lanes	Saturation Flow Rate (Veh/hr/ln)	Free Flow Speed (MPH)
36	37	0.17	2	2,250	60
37	52	0.31	3	2,250	60
38	37	0.09	1	1,200	25
39	40	0.16	2	2,250	60
39	53	0.39	1	1,714	50
39	38	0.11	1	1,200	25
39	3	0.16	2	2,250	60
40	175	0.98	2	2,250	70
40	39	0.16	2	2,250	60
41	35	0.37	1	1,714	45
42	36	0.23	2	2,250	60
42	43	0.15	1	1,200	20
43	44	0.13	1	1,200	20
44	3	0.09	3	2,250	60
44	46	0.28	2	2,250	60
45	767	0.69	1	1,714	50
46	44	0.28	2	2,250	60
46	47	0.11	1	1,500	30
46	49	0.16	2	2,250	60
46	36	0.63	1	1,714	50
47	48	0.18	1	1,500	30
48	42	0.26	3	2,250	60
49	831	0.48	3	2,250	70
49	46	0.16	2	2,250	60
50	49	0.15	2	1,714	40
51	48	0.25	2	2,250	60
51	50	0.13	1	1,714	40
52	53	0.10	2	2,250	60
52	50	0.28	1	1,714	40
53	54	0.76	2	2,250	70
54	80	0.84	2	2,250	70
54	51	0.60	2	2,250	70
55	69	0.24	1	1,714	45
55	66	0.20	2	1,714	45
56	60	0.22	2	1,714	45
56	70	0.21	1	1,714	55
57	55	0.15	2	1,714	35
58	343	0.17	3	1,714	45

Upstream Node Number	Downstream Node Number	Length (Miles)	Full Lanes	Saturation Flow Rate (Veh/hr/ln)	Free Flow Speed (MPH)
59	58	0.18	2	1,714	45
59	62	0.30	1	1,714	50
60	59	0.21	2	1,714	45
61	57	0.32	1	1,714	40
61	62	0.18	2	2,250	70
61	168	0.71	2	2,250	70
62	61	0.18	2	2,250	70
62	68	0.41	1	1,714	40
62	64	0.37	2	2,250	70
63	76	0.07	3	1,714	45
64	14	0.91	2	2,250	70
64	65	0.09	1	1,714	40
64	62	0.37	2	2,250	70
65	63	0.22	1	1,500	25
65	58	0.19	1	1,714	40
66	67	0.14	1	1,714	30
66	68	0.20	2	1,714	45
67	64	0.21	1	1,714	50
68	63	0.23	2	1,714	45
69	197	0.39	1	1,714	45
69	55	0.24	1	1,714	40
70	56	0.21	1	1,714	55
70	359	0.43	1	1,714	55
71	72	0.21	2	2,250	70
71	75	0.13	1	1,714	30
71	80	0.89	2	2,250	70
72	79	1.03	2	2,250	70
72	73	0.13	1	1,714	30
72	71	0.21	2	2,250	70
73	75	0.17	2	1,714	50
73	71	0.14	1	1,714	50
73	189	0.64	2	1,714	50
74	773	0.26	1	1,714	30
74	967	0.19	1	1,714	40
75	73	0.17	2	1,714	50
75	72	0.14	1	1,714	50
76	60	0.10	1	1,714	40
76	56	0.21	2	1,714	45

Upstream Node Number	Downstream Node Number	Length (Miles)	Full Lanes	Saturation Flow Rate (Veh/hr/ln)	Free Flow Speed (MPH)
77	204	0.54	1	1,714	55
77	78	0.69	1	1,714	50
78	386	0.52	1	1,714	50
78	77	0.69	1	1,714	50
79	166	2.27	2	2,250	70
79	72	1.03	2	2,250	70
80	71	0.89	2	2,250	70
80	54	0.84	2	2,250	70
81	85	0.33	1	1,714	50
81	82	0.26	1	1,714	40
82	84	0.42	1	1,714	50
82	81	0.26	1	1,714	40
82	83	0.38	1	1,714	50
83	82	0.38	1	1,714	40
83	804	0.58	1	1,714	50
84	87	0.93	2	2,250	70
84	85	0.74	2	2,250	70
84	81	0.38	1	1,714	30
85	171	1.43	2	2,250	70
85	84	0.74	2	2,250	70
85	82	0.43	1	1,714	30
86	90	0.24	2	2,250	70
86	95	0.23	1	1,714	40
86	172	1.18	2	2,250	70
87	96	0.21	1	1,714	40
87	90	0.34	2	2,250	70
87	84	0.94	2	2,250	70
88	95	0.09	1	1,500	30
88	89	0.05	2	1,714	40
89	95	0.10	1	1,500	30
89	91	0.08	2	1,714	45
90	87	0.34	2	2,250	70
90	86	0.24	2	2,250	70
91	93	0.08	1	1,714	40
91	92	0.07	2	1,714	45
91	89	0.08	2	1,714	40
92	91	0.07	2	1,714	45
92	98	0.32	2	1,714	60

Upstream Node Number	Downstream Node Number	Length (Miles)	Full Lanes	Saturation Flow Rate (Veh/hr/ln)	Free Flow Speed (MPH)
92	93	0.11	1	1,714	40
93	86	0.20	1	1,714	50
94	218	0.44	2	1,895	50
95	90	0.11	1	1,500	40
95	88	0.09	1	1,714	40
96	91	0.10	1	1,714	30
96	92	0.12	1	1,714	40
97	88	0.17	2	1,714	45
98	429	1.10	2	1,895	60
98	92	0.32	2	1,714	45
99	106	0.16	2	1,714	45
99	104	0.10	1	1,714	40
99	100	0.05	2	1,714	45
100	99	0.05	2	1,714	45
100	105	0.11	2	1,714	45
101	107	0.30	2	2,250	70
101	103	0.24	2	2,250	70
101	102	0.19	1	1,500	25
102	104	0.04	1	1,714	30
102	100	0.12	1	1,500	30
103	101	0.24	2	2,250	70
103	394	0.23	1	1,714	40
103	172	0.98	2	2,250	70
104	99	0.10	1	1,714	30
104	103	0.28	1	1,714	50
105	108	0.04	2	1,714	45
105	100	0.11	2	1,714	45
105	109	0.08	1	1,714	30
106	21	0.61	1	1,286	50
106	99	0.16	2	1,714	45
107	173	0.74	2	2,250	70
107	101	0.30	2	2,250	70
108	105	0.04	2	1,714	45
108	109	0.09	1	1,714	30
108	805	0.29	2	1,714	45
109	107	0.17	1	1,714	50
110	111	0.30	2	2,250	65
110	112	0.22	1	1,714	30

Upstream Node Number	Downstream Node Number	Length (Miles)	Full Lanes	Saturation Flow Rate (Veh/hr/ln)	Free Flow Speed (MPH)
110	384	0.21	2	2,250	65
111	177	2.07	2	2,250	65
111	113	0.18	1	1,714	30
111	110	0.30	2	2,250	65
112	111	0.13	1	1,714	50
112	113	0.17	1	1,714	40
112	192	0.15	1	1,714	30
113	110	0.15	1	1,714	50
113	112	0.17	1	1,714	40
114	116	0.33	1	1,714	30
114	117	0.47	2	2,250	65
114	177	1.94	2	2,250	65
115	116	0.29	1	1,714	40
115	114	0.31	1	1,714	50
116	115	0.29	1	1,714	40
116	117	0.19	1	1,714	50
117	114	0.47	2	2,250	65
117	119	0.30	3	2,250	65
118	115	0.32	1	1,714	40
119	117	0.30	2	2,250	65
119	118	0.26	1	1,714	30
119	178	0.58	3	2,250	65
120	118	0.16	1	1,714	40
121	123	0.16	2	1,895	50
121	126	0.32	2	2,250	60
121	122	0.23	1	1,500	50
122	133	0.41	3	2,250	65
122	2	0.51	2	2,250	65
123	121	0.16	2	2,250	65
123	124	0.48	1	1,500	30
124	123	0.48	1	1,500	30
124	125	0.29	1	1,500	50
125	2	0.25	2	2,250	65
125	123	0.55	1	1,714	40
125	757	0.39	2	2,250	65
126	127	0.09	1	1,714	30
126	130	0.05	2	2,250	60
126	121	0.32	3	2,250	65

Upstream Node Number	Downstream Node Number	Length (Miles)	Full Lanes	Saturation Flow Rate (Veh/hr/ln)	Free Flow Speed (MPH)
127	130	0.06	1	1,500	25
127	710	1.10	1	1,714	40
128	126	0.19	1	1,714	50
128	127	0.14	1	1,714	40
129	128	0.15	1	1,714	30
129	130	0.25	2	2,250	60
129	132	0.47	2	2,250	60
130	126	0.05	2	2,250	60
130	129	0.26	2	2,250	60
131	128	0.35	1	1,714	40
132	129	0.47	2	2,250	60
132	138	0.50	2	2,250	60
133	122	0.41	2	2,250	65
133	179	0.54	3	2,250	65
134	135	0.21	2	2,250	60
134	138	0.37	2	2,250	60
135	134	0.21	2	2,250	60
135	137	0.18	1	1,714	30
135	180	0.64	2	2,250	60
136	334	0.53	1	1,714	40
136	134	0.27	1	1,714	50
136	137	0.36	1	1,714	40
137	136	0.36	1	1,714	40
137	138	0.42	1	1,714	50
138	132	0.50	2	2,250	60
138	134	0.37	2	2,250	60
138	136	0.17	1	1,714	30
139	140	0.08	2	1,714	40
139	143	0.34	1	1,500	30
139	144	0.21	2	1,714	40
140	139	0.08	2	1,714	40
140	149	0.28	1	1,714	40
140	543	1.07	2	1,714	40
141	142	0.14	2	2,250	60
141	143	0.12	2	2,250	60
142	141	0.14	2	2,250	60
142	180	0.78	2	2,250	60
142	140	0.29	1	1,714	30

Upstream Node Number	Downstream Node Number	Length (Miles)	Full Lanes	Saturation Flow Rate (Veh/hr/ln)	Free Flow Speed (MPH)
143	141	0.12	2	2,250	60
143	145	0.05	1	1,500	25
143	149	0.15	2	2,250	60
144	139	0.21	3	1,714	40
144	148	0.11	2	1,714	40
145	144	0.23	1	1,500	25
146	131	1.27	1	1,714	30
147	141	0.20	1	1,714	40
148	144	0.11	2	1,714	40
148	147	0.10	1	1,714	30
149	143	0.15	2	2,250	60
149	150	0.55	2	2,250	60
150	149	0.55	2	2,250	60
150	151	0.15	1	1,500	30
150	154	0.13	1	1,714	40
151	150	0.15	1	1,714	40
151	152	0.16	1	1,714	40
152	150	0.19	1	1,714	40
152	155	0.06	2	1,714	40
152	842	0.24	1	1,714	40
153	407	0.60	1	1,714	40
153	835	0.26	1	1,714	40
154	422	0.16	2	1,714	40
154	155	0.18	1	1,714	40
155	151	0.16	1	1,500	30
155	154	0.18	2	1,714	40
156	181	0.29	1	1,714	40
156	842	0.10	2	1,714	40
157	223	0.25	2	1,714	40
157	422	0.28	1	1,714	40
157	842	0.83	1	1,714	40
158	159	0.92	2	2,250	70
158	15	1.29	2	2,250	70
159	158	0.92	2	2,250	70
159	160	0.94	2	2,250	70
160	159	0.94	2	2,250	70
160	161	2.04	2	2,250	70
161	23	2.63	2	2,250	70

Upstream Node Number	Downstream Node Number	Length (Miles)	Full Lanes	Saturation Flow Rate (Veh/hr/ln)	Free Flow Speed (MPH)
161	160	2.03	2	2,250	70
162	22	0.76	2	2,250	70
162	23	0.33	2	2,250	70
163	22	0.26	2	2,250	70
163	164	1.00	2	2,250	70
164	165	1.24	2	2,250	70
164	163	1.00	2	2,250	70
165	18	0.70	2	2,250	70
165	164	1.24	2	2,250	70
166	79	2.27	2	2,250	70
166	830	0.85	2	2,250	70
167	682	0.89	2	2,250	70
167	830	0.61	2	2,250	70
168	61	0.71	2	2,250	70
168	169	1.35	2	2,250	70
169	168	1.35	2	2,250	70
169	170	1.51	2	2,250	70
170	169	1.51	2	2,250	70
170	13	0.68	2	2,250	70
171	85	1.43	2	2,250	70
171	683	0.41	2	2,250	70
172	86	1.18	2	2,250	70
172	103	0.98	2	2,250	70
173	107	0.74	2	2,250	70
173	174	1.06	2	2,250	70
174	173	1.06	2	2,250	70
174	175	1.84	2	2,250	70
175	40	0.98	2	2,250	65
175	174	1.84	2	2,250	70
176	672	0.54	3	2,250	70
176	384	1.14	2	2,250	65
177	111	2.07	2	2,250	65
177	114	1.94	2	2,250	65
178	119	0.58	2	2,250	65
178	367	0.54	3	2,250	65
179	133	0.54	2	2,250	65
179	360	0.87	3	2,250	65
180	135	0.64	2	2,250	60

Upstream Node Number	Downstream Node Number	Length (Miles)	Full Lanes	Saturation Flow Rate (Veh/hr/ln)	Free Flow Speed (MPH)
180	142	0.78	2	2,250	60
181	156	0.29	1	1,714	40
181	406	0.27	1	1,714	40
181	501	0.78	1	1,714	30
182	183	0.62	1	1,714	60
182	402	1.80	1	1,714	60
183	182	0.61	1	1,714	60
183	404	0.79	1	1,714	60
184	970	0.54	1	1,714	40
185	20	0.19	1	1,714	40
186	25	0.21	1	1,714	40
187	27	0.54	1	1,714	40
187	514	0.94	1	1,714	40
188	75	0.84	2	1,714	50
189	73	0.64	1	1,714	50
189	596	0.56	2	1,714	50
190	104	0.81	1	1,714	40
191	805	0.20	2	1,714	45
191	809	0.40	2	1,714	45
192	112	0.15	1	1,714	40
192	594	0.52	1	1,714	40
193	868	0.33	1	1,714	40
194	195	0.48	1	1,714	50
194	340	0.30	2	1,714	50
195	194	0.48	2	1,714	50
195	196	1.00	1	1,714	55
196	195	1.00	1	1,714	55
196	197	1.26	1	1,714	55
197	196	1.26	1	1,714	55
197	69	0.39	1	1,714	45
198	359	0.21	1	1,714	55
198	361	0.09	1	1,714	40
198	364	0.38	1	1,714	50
199	203	0.54	1	1,714	35
199	738	0.86	1	1,714	35
200	379	0.32	2	1,714	30
200	389	0.06	2	1,714	30
200	467	0.35	1	1,714	30

Upstream Node Number	Downstream Node Number	Length (Miles)	Full Lanes	Saturation Flow Rate (Veh/hr/ln)	Free Flow Speed (MPH)
201	202	0.87	1	1,714	50
201	382	0.40	1	1,714	40
202	201	0.87	1	1,714	50
202	386	1.09	1	1,714	50
203	214	0.07	1	1,714	30
203	239	0.18	1	1,714	30
203	199	0.54	1	1,714	35
204	77	0.54	1	1,714	55
204	392	0.28	1	1,714	55
205	206	0.45	1	1,714	55
205	600	0.60	1	1,714	55
206	205	0.45	1	1,714	55
206	207	0.50	1	1,714	55
207	206	0.50	1	1,714	55
207	391	0.37	1	1,714	55
208	370	0.20	1	1,714	30
208	404	0.59	1	1,714	25
209	247	0.47	1	1,714	60
209	407	1.90	1	1,714	60
210	406	0.45	1	1,714	40
210	835	0.18	1	1,714	40
211	223	0.24	1	1,714	40
211	248	0.57	1	1,714	35
212	248	0.38	1	1,714	30
212	412	0.33	1	1,714	30
213	415	0.18	1	1,714	30
213	787	0.20	1	1,714	30
214	371	0.20	1	1,714	30
214	239	0.19	1	1,714	30
215	449	1.08	1	1,714	35
216	448	0.58	1	1,500	40
217	445	0.75	1	1,500	40
218	228	0.19	2	1,895	50
219	918	0.74	1	1,714	50
220	219	1.19	1	1,714	50
221	439	0.68	1	1,714	50
221	919	0.45	1	1,500	40
222	424	0.88	1	1,500	45

Upstream Node Number	Downstream Node Number	Length (Miles)	Full Lanes	Saturation Flow Rate (Veh/hr/ln)	Free Flow Speed (MPH)
223	157	0.24	2	1,714	40
223	211	0.23	1	1,714	40
224	931	0.08	1	1,500	40
225	215	1.04	1	1,714	35
225	452	0.16	1	1,714	45
226	227	1.83	1	1,714	45
227	899	0.84	1	1,714	55
228	230	0.35	2	1,895	50
229	567	0.53	1	1,714	45
229	897	0.23	1	1,714	45
230	231	0.47	2	1,895	50
231	233	0.41	2	1,895	50
232	894	0.79	1	1,714	55
232	896	0.23	1	1,714	55
233	236	0.51	2	1,895	50
234	455	0.45	1	1,714	30
234	893	0.50	1	1,714	50
235	455	0.80	1	1,714	40
236	242	0.28	2	1,714	50
237	347	0.27	1	1,714	35
237	1052	1.43	1	1,714	55
238	885	0.57	1	1,714	40
239	203	0.18	1	1,714	35
239	214	0.19	1	1,714	30
239	369	0.13	1	1,714	30
240	467	0.41	1	1,714	30
240	468	0.32	1	1,714	30
241	689	0.45	1	1,714	55
242	244	0.19	1	1,714	50
242	252	0.49	2	1,714	50
243	890	0.29	1	1,714	55
244	758	0.13	3	2,250	65
245	243	0.92	1	1,714	55
245	966	0.07	1	1,714	40
246	245	0.81	1	1,714	55
247	209	0.47	1	1,714	60
247	1042	1.16	1	1,714	60
248	211	0.57	1	1,714	40

Upstream Node Number	Downstream Node Number	Length (Miles)	Full Lanes	Saturation Flow Rate (Veh/hr/ln)	Free Flow Speed (MPH)
248	212	0.38	1	1,714	30
249	250	1.97	1	1,714	50
250	251	0.65	1	1,714	35
251	185	0.53	1	1,714	35
251	361	0.52	1	1,714	35
252	268	0.56	2	1,714	50
253	470	2.07	1	1,714	50
254	255	0.95	1	1,714	55
254	472	0.43	1	1,714	55
255	256	0.85	1	1,714	55
256	257	0.63	1	1,714	55
257	186	1.04	1	1,286	45
258	397	0.31	1	1,714	25
258	859	0.32	1	1,714	30
259	263	1.33	1	1,714	40
259	477	1.94	1	1,714	40
260	259	1.60	1	1,714	40
260	715	1.54	1	1,714	40
261	474	0.42	1	1,714	40
262	662	0.15	1	1,200	30
262	860	0.20	1	1,200	30
263	264	1.54	1	1,714	40
264	265	1.78	1	1,714	40
265	266	1.67	1	1,714	40
266	487	0.79	1	1,714	40
267	270	0.93	1	1,714	40
269	865	0.40	1	1,500	30
270	271	1.02	1	1,714	40
271	336	0.61	1	1,714	40
272	479	0.28	1	1,500	30
273	272	0.85	1	1,714	40
273	274	0.58	1	1,500	30
274	867	0.48	1	1,714	40
275	193	1.12	1	1,714	40
276	277	1.99	1	1,714	50
277	279	1.67	1	1,714	50
277	843	1.30	1	1,714	40
278	623	0.27	1	1,714	40

Upstream Node Number	Downstream Node Number	Length (Miles)	Full Lanes	Saturation Flow Rate (Veh/hr/ln)	Free Flow Speed (MPH)
278	628	0.61	1	1,714	40
279	280	0.38	1	1,714	45
280	698	0.72	1	1,714	45
281	856	0.72	1	1,714	40
282	494	0.77	1	1,714	30
283	731	0.70	1	1,714	45
284	504	0.75	1	1,714	30
285	1053	0.06	1	1,714	30
285	500	0.30	1	1,714	30
286	285	1.20	1	1,714	40
287	1044	0.27	1	1,714	30
288	335	1.54	1	1,714	40
289	334	0.82	1	1,714	40
289	543	0.44	2	1,714	40
289	1022	0.22	2	1,714	40
290	184	0.74	1	1,714	45
291	290	0.51	1	1,714	45
292	458	0.30	1	1,714	30
293	974	0.61	1	1,714	40
294	979	0.29	1	1,500	40
295	296	0.27	1	1,500	30
295	980	0.77	1	1,500	40
296	981	0.27	1	1,200	20
297	635	1.02	1	1,500	40
298	299	0.34	1	1,500	40
299	982	0.14	1	1,500	30
300	984	0.56	1	1,500	40
301	454	0.13	1	1,500	30
302	622	1.10	1	1,714	45
303	304	0.71	1	1,714	55
303	553	0.52	1	1,714	35
304	305	0.98	1	1,714	55
305	555	0.28	1	1,714	55
306	434	0.07	3	1,500	30
306	440	0.37	2	1,500	30
307	425	0.22	1	1,714	40
307	656	0.09	2	1,500	30
307	685	0.33	2	1,500	30

Upstream Node Number	Downstream Node Number	Length (Miles)	Full Lanes	Saturation Flow Rate (Veh/hr/ln)	Free Flow Speed (MPH)
308	661	0.29	1	1,500	30
309	308	0.68	1	1,500	30
310	804	0.08	2	1,714	50
310	537	0.87	2	1,895	50
310	746	0.08	1	1,714	50
311	401	0.40	1	1,714	50
311	403	0.39	1	1,714	60
312	408	0.36	1	1,714	50
312	436	0.55	1	1,714	40
313	446	0.35	1	1,714	30
313	447	0.15	1	1,714	40
313	522	0.53	1	1,500	30
314	442	0.38	1	1,714	30
314	523	0.53	1	1,500	30
315	549	0.23	1	1,714	60
315	799	0.20	2	1,714	40
316	545	0.20	1	1,714	40
316	491	0.92	2	1,714	60
317	318	0.69	2	1,714	45
318	188	0.54	1	1,714	50
319	1006	0.48	1	1,714	45
320	321	0.51	1	1,714	40
321	1007	0.19	1	1,714	30
322	1009	0.45	1	1,714	30
323	435	0.80	1	1,714	40
324	323	0.37	1	1,500	35
324	427	0.22	1	1,500	30
325	649	0.54	1	1,714	40
326	650	1.26	1	1,714	40
327	711	0.48	1	1,500	40
327	648	0.51	1	1,714	55
328	493	0.57	1	1,714	35
329	652	0.71	1	1,714	50
330	329	0.63	1	1,714	40
331	332	0.18	1	1,714	40
332	338	0.30	1	1,714	40
333	513	0.37	1	1,714	40
333	514	1.03	1	1,714	40

Upstream Node Number	Downstream Node Number	Length (Miles)	Full Lanes	Saturation Flow Rate (Veh/hr/ln)	Free Flow Speed (MPH)
334	136	0.53	1	1,714	40
334	548	1.35	1	1,714	40
335	137	0.45	1	1,714	40
336	115	0.26	1	1,714	40
337	116	0.26	1	1,714	40
338	339	0.54	1	1,714	40
339	643	0.55	1	1,714	45
339	12	0.06	1	1,714	45
340	194	0.30	1	1,714	50
340	786	0.22	2	1,714	45
341	356	0.37	1	1,714	40
342	776	0.60	1	1,714	40
343	57	0.11	2	1,714	45
343	67	0.12	1	1,714	40
344	347	0.13	1	1,714	35
344	350	0.17	1	1,714	35
345	566	1.13	1	1,714	40
346	237	0.48	1	1,714	45
347	237	0.27	1	1,714	40
347	344	0.13	1	1,714	35
348	345	0.35	1	1,714	40
349	348	0.37	1	1,714	40
350	344	0.17	1	1,714	35
350	368	0.07	1	1,714	35
351	349	0.33	1	1,714	40
352	94	0.29	1	1,714	50
352	354	0.13	1	1,714	45
353	197	0.39	1	1,714	25
353	351	0.59	1	1,714	40
354	355	0.24	1	1,714	45
355	358	0.29	1	1,714	45
356	357	0.40	1	1,714	40
357	69	0.36	1	1,714	30
357	353	0.40	1	1,714	40
358	718	0.26	1	1,714	45
359	70	0.43	1	1,714	55
359	198	0.21	1	1,714	50
360	179	0.86	2	2,250	65

Upstream Node Number	Downstream Node Number	Length (Miles)	Full Lanes	Saturation Flow Rate (Veh/hr/ln)	Free Flow Speed (MPH)
360	365	1.16	3	2,250	65
361	198	0.09	2	1,714	35
361	251	0.52	1	1,714	35
361	362	0.91	1	1,714	50
362	341	0.27	1	1,714	40
363	251	0.30	1	1,714	30
364	198	0.38	1	1,714	50
364	366	0.91	1	1,714	50
365	376	0.34	3	2,250	65
366	364	0.91	1	1,714	50
366	368	0.44	1	1,714	35
367	374	0.44	3	2,250	65
368	350	0.07	1	1,714	35
368	366	0.44	1	1,714	35
368	738	0.39	1	1,714	35
369	239	0.13	2	1,714	30
369	742	0.41	2	1,714	30
370	397	0.30	1	1,714	25
370	208	0.20	1	1,714	25
371	238	0.51	1	1,714	40
371	214	0.20	1	1,714	30
372	238	0.29	1	1,714	40
372	346	0.25	1	1,714	40
373	371	0.52	1	1,714	30
373	372	0.48	1	1,714	40
374	375	0.42	3	2,250	65
375	360	0.47	2	2,250	65
376	178	0.62	2	2,250	65
377	744	0.12	1	1,714	30
377	960	0.79	1	1,714	30
378	959	0.78	1	1,714	30
378	377	0.31	1	1,714	35
379	380	0.24	1	1,714	40
379	388	0.06	1	1,714	30
380	379	0.24	1	1,714	30
380	382	0.29	1	1,714	40
381	378	0.24	1	1,714	35
381	380	0.86	1	1,714	35

Upstream Node Number	Downstream Node Number	Length (Miles)	Full Lanes	Saturation Flow Rate (Veh/hr/ln)	Free Flow Speed (MPH)
382	201	0.40	1	1,714	40
382	380	0.29	1	1,714	40
383	382	0.29	1	1,714	35
384	110	0.20	2	2,250	65
384	176	1.13	2	2,250	70
385	683	0.26	2	2,250	70
385	395	0.38	2	2,250	70
386	202	1.09	1	1,714	50
386	78	0.52	1	1,714	50
387	386	0.67	1	1,714	35
388	389	0.32	2	1,714	30
389	200	0.06	2	1,714	30
389	390	0.12	2	1,714	30
390	742	0.05	1	1,714	30
390	888	0.21	2	1,714	30
391	207	0.37	1	1,714	55
391	392	0.95	1	1,714	55
392	204	0.28	1	1,714	55
392	391	0.95	1	1,714	55
393	205	0.81	1	1,714	35
394	105	0.04	1	1,714	30
394	108	0.06	1	1,714	40
395	385	0.38	2	2,250	70
396	208	0.25	1	1,714	25
397	258	0.31	1	1,714	30
397	370	0.30	1	1,714	30
397	604	0.33	1	1,714	25
398	209	0.46	1	1,500	40
399	210	0.38	1	1,714	40
401	746	0.68	1	1,714	50
401	311	0.40	1	1,714	50
402	182	1.80	1	1,714	60
402	1042	0.35	1	1,714	60
403	311	0.39	1	1,714	50
403	408	0.65	1	1,714	60
404	183	0.79	1	1,714	60
404	208	0.59	1	1,714	25
405	841	0.27	1	1,500	40

Upstream Node Number	Downstream Node Number	Length (Miles)	Full Lanes	Saturation Flow Rate (Veh/hr/ln)	Free Flow Speed (MPH)
406	181	0.27	1	1,714	40
406	210	0.45	1	1,714	40
407	153	0.60	1	1,714	40
407	209	1.90	1	1,714	60
408	403	0.65	1	1,714	60
408	312	0.36	1	1,714	40
409	674	0.74	2	1,714	40
410	212	0.24	1	1,714	30
411	212	0.20	1	1,714	30
412	212	0.33	1	1,714	30
412	415	0.27	1	1,714	30
413	412	0.43	1	1,714	30
414	412	0.12	1	1,714	30
415	213	0.18	1	1,714	30
415	412	0.27	1	1,714	30
416	415	0.19	1	1,714	30
417	787	0.13	1	1,714	30
417	418	0.46	1	1,714	30
417	709	0.20	1	1,714	40
418	417	0.46	1	1,714	30
419	213	0.08	1	1,714	30
420	931	0.42	1	1,714	40
421	224	0.10	1	1,500	40
422	154	0.16	1	1,714	40
422	157	0.28	2	1,714	40
423	421	0.17	1	1,500	40
424	588	0.31	1	1,500	45
425	307	0.22	1	1,714	30
425	427	0.42	1	1,500	30
425	527	0.25	1	1,714	30
426	425	0.09	1	1,714	40
426	656	0.23	1	1,500	30
427	425	0.42	1	1,714	40
427	528	0.27	1	1,500	30
427	324	0.22	1	1,500	30
428	222	0.42	1	1,714	45
428	430	0.60	1	1,714	45
429	98	1.10	2	1,714	60

Upstream Node Number	Downstream Node Number	Length (Miles)	Full Lanes	Saturation Flow Rate (Veh/hr/ln)	Free Flow Speed (MPH)
429	518	0.28	2	1,714	40
430	431	0.41	1	1,714	50
431	221	0.91	1	1,714	40
432	433	0.13	1	1,500	30
433	434	0.10	1	1,500	30
434	823	0.20	2	1,500	30
434	655	0.06	2	1,714	40
434	306	0.07	2	1,500	30
435	312	0.30	1	1,714	40
437	307	0.08	1	1,714	30
437	657	0.08	1	1,500	30
438	437	0.34	1	1,714	30
438	685	0.08	1	1,500	30
439	220	1.31	1	1,714	50
440	306	0.37	2	1,500	30
440	656	0.10	2	1,500	30
441	440	0.07	1	1,500	30
442	529	0.20	1	1,714	30
443	442	0.63	1	1,714	30
443	308	0.21	1	1,500	30
444	916	0.27	1	1,500	40
445	444	0.24	1	1,500	40
446	313	0.35	1	1,714	30
446	314	0.07	1	1,714	30
447	313	0.15	1	1,714	30
447	532	0.32	1	1,714	40
448	915	0.87	1	1,500	40
449	451	0.60	1	1,714	55
450	935	1.54	1	1,714	55
451	658	0.78	1	1,714	55
452	644	0.32	1	1,714	45
453	229	0.36	1	1,714	40
454	465	0.10	1	1,500	30
455	234	0.45	1	1,714	30
455	456	0.40	1	1,500	30
456	891	0.35	1	1,714	45
457	637	0.35	1	1,500	30
458	24	0.91	1	1,714	45

Upstream Node Number	Downstream Node Number	Length (Miles)	Full Lanes	Saturation Flow Rate (Veh/hr/ln)	Free Flow Speed (MPH)
459	292	0.44	1	1,500	45
460	532	0.43	1	1,714	40
460	801	0.48	1	1,714	40
461	293	0.85	1	1,500	40
462	629	0.61	1	1,500	40
463	490	0.59	1	1,714	40
463	800	0.66	1	1,714	40
464	988	0.31	1	1,714	55
465	471	0.20	1	1,500	40
466	299	0.58	1	1,500	40
467	200	0.35	1	1,714	30
467	240	0.41	1	1,714	30
468	747	0.34	1	1,714	40
469	240	0.29	1	1,714	30
470	469	0.72	1	1,714	30
471	462	0.49	1	1,500	40
472	253	1.00	1	1,714	55
473	254	1.58	1	1,714	40
474	254	0.81	1	1,714	40
475	474	1.32	1	1,714	40
476	861	0.68	1	1,714	40
477	858	2.50	1	1,714	45
477	859	0.12	1	1,714	30
478	668	0.18	1	1,500	30
479	866	0.35	1	1,500	30
480	463	0.16	1	1,714	40
481	266	0.71	1	1,714	40
481	267	1.13	1	1,714	40
482	271	0.25	1	1,714	40
483	481	0.96	1	1,714	40
484	336	0.45	1	1,714	40
484	120	0.49	1	1,714	40
485	852	0.26	1	1,714	30
486	485	0.23	1	1,714	30
487	485	1.41	1	1,714	45
488	838	0.15	1	1,500	40
489	837	0.17	1	1,500	30
490	807	0.30	2	1,714	40

Upstream Node Number	Downstream Node Number	Length (Miles)	Full Lanes	Saturation Flow Rate (Veh/hr/ln)	Free Flow Speed (MPH)
491	316	0.92	1	1,714	60
491	549	0.24	1	1,714	60
492	496	0.29	1	1,714	40
493	946	0.51	1	1,714	40
494	283	0.77	1	1,714	30
495	492	0.57	1	1,714	40
496	497	0.32	1	1,714	40
497	322	0.43	1	1,714	30
498	669	0.11	1	1,714	40
499	284	1.65	1	1,714	30
500	284	0.56	1	1,714	30
501	508	0.59	1	1,500	30
501	181	0.78	1	1,714	40
502	506	0.50	1	1,500	30
502	287	0.74	1	1,500	30
503	501	0.51	1	1,200	30
503	502	0.07	1	1,500	30
504	501	0.24	1	1,714	30
505	503	0.45	1	1,500	30
506	508	0.34	1	1,500	30
506	288	0.73	1	1,500	30
507	146	0.10	1	1,714	30
508	148	0.49	1	1,714	40
509	507	0.52	1	1,714	40
510	509	0.72	1	1,714	40
511	333	0.52	1	1,714	40
512	333	0.40	1	1,714	40
513	21	0.52	1	1,714	40
513	333	0.37	1	1,714	40
514	333	1.03	1	1,714	40
514	187	0.94	1	1,714	45
515	514	1.15	1	1,714	40
516	514	0.46	1	1,714	40
517	822	0.10	2	1,500	30
517	819	0.09	2	1,500	35
517	518	0.19	1	1,714	30
518	655	0.29	2	1,714	40
518	429	0.28	2	1,714	40

Upstream Node Number	Downstream Node Number	Length (Miles)	Full Lanes	Saturation Flow Rate (Veh/hr/ln)	Free Flow Speed (MPH)
519	819	0.32	2	1,500	35
519	816	0.44	2	1,714	45
520	521	0.47	2	1,714	45
520	814	0.17	2	1,714	45
521	809	0.30	2	1,714	45
521	520	0.47	2	1,714	45
522	523	0.45	1	1,500	30
522	1000	0.43	1	1,500	30
523	824	0.41	1	1,500	30
523	314	0.53	1	1,714	30
523	432	0.57	1	1,500	30
524	816	0.13	2	1,714	45
524	814	0.09	2	1,714	45
525	818	0.32	1	1,500	30
526	311	0.85	1	1,714	40
527	409	0.30	1	1,714	30
527	528	0.42	1	1,500	30
528	527	0.42	1	1,714	30
528	311	0.76	1	1,714	40
529	437	0.30	1	1,714	30
529	660	0.10	1	1,500	30
530	681	0.32	1	1,714	45
531	322	0.25	1	1,714	30
532	551	0.19	1	1,714	40
532	802	0.22	1	1,714	40
532	447	0.32	1	1,714	40
533	446	0.61	1	1,714	30
534	535	0.61	1	1,500	30
535	443	0.15	1	1,500	30
535	533	0.27	1	1,500	30
536	391	0.13	2	1,714	40
537	400	0.58	1	1,714	40
538	608	0.41	1	1,714	55
539	337	1.20	1	1,714	40
540	278	0.84	1	1,714	40
541	675	1.68	1	1,714	40
541	278	0.83	1	1,714	40
542	352	0.23	1	1,714	45

Upstream Node Number	Downstream Node Number	Length (Miles)	Full Lanes	Saturation Flow Rate (Veh/hr/ln)	Free Flow Speed (MPH)
543	140	1.07	2	1,714	40
543	289	0.44	2	1,714	40
544	734	0.48	2	1,714	40
545	316	0.20	1	1,714	40
545	796	0.13	1	1,714	40
546	734	0.58	1	1,714	40
547	1023	0.29	1	1,714	30
547	289	0.13	1	1,714	30
548	1021	0.22	1	1,714	40
549	491	0.24	1	1,714	60
549	315	0.23	1	1,714	60
550	304	0.26	1	1,714	40
551	552	0.51	1	1,714	45
552	673	0.45	1	1,714	45
553	991	0.37	1	1,714	55
554	990	0.54	1	1,714	55
555	302	1.69	1	1,714	45
556	625	0.34	1	1,714	45
557	302	0.15	1	1,714	30
558	556	0.24	1	1,714	30
558	624	0.17	1	1,714	30
559	625	0.12	1	1,714	30
560	97	0.26	1	1,714	30
561	98	0.08	1	1,714	30
562	517	0.53	1	1,500	30
563	293	0.37	1	1,500	40
564	295	0.60	1	1,500	40
565	498	0.31	1	1,500	30
566	194	0.35	1	1,714	30
566	737	0.30	1	1,714	40
567	226	0.67	1	1,714	55
568	653	0.50	1	1,714	40
569	568	1.47	1	1,500	40
570	569	0.88	1	1,500	40
571	793	0.48	2	1,714	45
572	570	1.65	1	1,500	40
573	572	1.00	1	1,500	40
574	794	0.83	1	1,714	40

Upstream Node Number	Downstream Node Number	Length (Miles)	Full Lanes	Saturation Flow Rate (Veh/hr/ln)	Free Flow Speed (MPH)
575	933	0.17	1	1,500	40
575	1046	0.70	1	1,500	40
576	575	0.98	1	1,500	40
577	574	1.23	1	1,714	40
578	576	1.43	1	1,500	40
579	578	0.77	1	1,500	40
579	580	0.72	1	1,500	40
580	423	0.49	1	1,500	40
581	453	1.11	1	1,500	40
582	581	0.63	1	1,500	40
583	950	0.53	1	1,500	40
584	953	0.36	1	1,500	40
585	951	0.85	1	1,500	40
586	585	0.54	1	1,500	40
587	586	1.28	1	1,500	40
588	930	0.43	1	1,500	45
589	420	0.74	1	1,714	40
590	577	1.33	1	1,714	40
591	538	0.45	2	1,714	55
591	594	0.19	1	1,714	40
591	596	0.17	2	1,714	50
592	883	0.28	1	1,714	40
593	592	1.11	1	1,714	40
593	595	1.13	1	1,714	40
594	591	0.19	1	1,714	40
594	192	0.52	1	1,714	30
595	597	1.14	1	1,714	40
596	591	0.17	2	1,714	50
596	189	0.56	1	1,714	50
597	217	1.14	1	1,714	50
598	654	0.88	1	1,714	40
599	598	0.93	1	1,714	40
599	601	1.52	1	1,714	40
600	205	0.60	1	1,714	55
600	602	0.48	1	1,714	55
601	603	1.48	1	1,714	40
602	604	1.13	1	1,714	55
602	600	0.48	1	1,714	55

Upstream Node Number	Downstream Node Number	Length (Miles)	Full Lanes	Saturation Flow Rate (Veh/hr/ln)	Free Flow Speed (MPH)
603	605	0.98	1	1,714	40
604	397	0.30	1	1,714	25
604	602	1.13	1	1,714	55
605	606	0.81	1	1,714	40
606	607	0.80	1	1,714	40
606	941	0.33	1	1,714	45
608	276	1.30	1	1,714	55
609	610	0.61	1	1,714	40
609	439	1.61	1	1,714	50
610	612	0.79	1	1,500	30
611	277	0.38	1	1,714	40
612	613	1.32	1	1,714	40
613	614	0.59	1	1,714	40
614	615	0.87	1	1,714	40
615	616	0.53	1	1,714	40
616	617	0.89	1	1,714	40
617	618	0.91	1	1,714	40
618	619	0.72	1	1,714	40
619	620	0.66	1	1,714	55
619	945	1.21	1	1,714	55
620	621	3.58	1	1,714	55
621	653	1.03	1	1,714	45
622	556	0.21	1	1,714	45
623	611	0.48	1	1,714	40
624	557	1.09	1	1,714	30
624	622	0.23	1	1,714	40
625	626	0.50	1	1,714	45
626	97	0.17	2	1,714	45
627	398	0.70	1	1,500	40
628	539	0.45	1	1,714	40
629	630	0.82	1	1,500	40
630	986	0.31	1	1,500	40
631	632	0.22	1	1,714	45
632	633	0.28	1	1,714	45
634	985	0.29	1	1,500	40
635	298	0.69	1	1,500	40
636	977	0.64	1	1,500	40
637	638	0.71	1	1,714	55

Upstream Node Number	Downstream Node Number	Length (Miles)	Full Lanes	Saturation Flow Rate (Veh/hr/ln)	Free Flow Speed (MPH)
638	892	0.79	1	1,714	55
639	640	0.58	1	1,714	50
640	5	0.32	1	1,714	50
641	4	0.33	2	2,250	70
641	642	1.56	2	2,250	70
642	641	1.56	2	2,250	70
642	764	0.74	2	2,250	70
643	967	0.69	1	1,714	40
643	339	0.55	1	1,714	40
644	908	0.28	1	1,714	45
646	898	0.50	1	1,714	55
646	895	0.31	1	1,714	55
647	241	1.28	1	1,714	55
648	326	0.99	1	1,714	55
649	330	0.41	1	1,714	40
650	325	0.55	1	1,714	40
651	328	0.41	1	1,714	50
652	651	0.24	1	1,714	50
653	493	0.26	1	1,714	40
654	217	0.46	1	1,714	50
655	518	0.29	2	1,714	40
655	306	0.11	1	1,500	30
655	434	0.06	2	1,500	30
656	307	0.09	2	1,200	30
656	440	0.10	2	1,500	30
657	656	0.07	1	1,500	30
657	441	0.11	1	1,500	30
658	692	2.00	1	1,714	55
659	125	0.45	2	2,250	65
660	657	0.25	1	1,500	30
660	432	0.42	1	1,500	30
661	529	0.35	1	1,714	30
661	684	0.09	1	1,500	30
662	864	0.49	1	1,714	20
663	664	0.20	1	1,500	40
663	550	0.22	1	1,500	30
664	303	0.43	1	1,714	35
665	663	0.62	1	1,500	30

Upstream Node Number	Downstream Node Number	Length (Miles)	Full Lanes	Saturation Flow Rate (Veh/hr/ln)	Free Flow Speed (MPH)
666	665	0.86	1	1,500	30
667	994	0.31	1	1,500	40
668	996	0.37	1	1,500	40
669	478	0.21	1	1,500	40
670	997	0.29	1	1,500	40
671	995	1.31	1	1,500	40
672	176	0.54	3	2,250	70
672	831	0.68	2	2,250	70
673	1004	0.19	1	1,714	45
674	310	0.40	2	1,714	40
675	698	0.87	1	1,714	40
676	593	1.26	1	1,714	40
676	693	0.65	1	1,714	40
676	957	0.31	1	1,714	30
677	587	0.41	1	1,500	40
677	678	0.62	1	1,500	40
678	696	0.48	1	1,500	40
679	680	0.63	1	1,714	40
680	221	0.39	1	1,714	40
681	1010	0.46	1	1,714	45
682	167	0.89	2	2,250	70
683	171	0.41	2	2,250	70
683	385	0.26	2	2,250	70
684	438	0.39	1	1,500	30
685	324	0.10	2	1,500	30
686	687	0.79	1	1,714	40
687	688	0.70	1	1,714	40
688	639	0.29	1	1,714	40
689	235	0.90	1	1,714	45
690	686	1.49	1	1,714	40
691	670	0.82	1	1,500	40
692	450	0.24	1	1,714	55
693	694	0.41	1	1,714	40
694	883	0.56	1	1,714	40
695	679	0.40	1	1,714	40
696	695	0.58	1	1,500	40
697	220	1.22	1	1,714	50
698	849	0.44	1	1,714	45

Upstream Node Number	Downstream Node Number	Length (Miles)	Full Lanes	Saturation Flow Rate (Veh/hr/ln)	Free Flow Speed (MPH)
699	975	0.20	1	1,714	40
700	699	2.06	1	1,714	40
701	700	2.27	1	1,714	40
702	701	1.27	1	1,714	40
703	702	1.64	1	1,714	40
704	703	0.89	1	1,714	40
705	704	1.30	1	1,714	40
705	706	2.57	1	1,714	40
706	707	0.72	1	1,714	40
707	511	0.54	1	1,714	40
708	705	0.30	1	1,714	40
709	417	0.20	1	1,714	30
711	836	0.15	1	1,500	25
712	719	0.90	1	1,714	40
713	712	0.51	1	1,714	40
714	475	0.32	1	1,714	40
715	262	0.36	1	1,714	40
716	713	0.70	1	1,714	40
716	717	1.23	1	1,714	40
717	714	0.15	1	1,714	40
718	727	0.44	1	1,714	45
719	720	1.31	1	1,714	40
720	721	0.69	1	1,714	40
721	273	0.68	1	1,714	40
722	240	0.14	1	1,714	30
723	387	0.56	1	1,714	35
724	723	0.56	1	1,714	35
725	724	0.61	1	1,714	35
726	393	1.33	1	1,714	35
726	725	0.87	1	1,714	35
727	733	0.32	1	1,714	45
728	383	0.52	1	1,714	30
729	377	0.31	1	1,714	35
730	381	0.26	1	1,714	30
730	728	0.29	1	1,714	30
731	499	0.60	1	1,714	40
731	286	0.65	1	1,714	45
732	208	0.15	1	1,714	25

Upstream Node Number	Downstream Node Number	Length (Miles)	Full Lanes	Saturation Flow Rate (Veh/hr/ln)	Free Flow Speed (MPH)
733	741	0.27	1	1,714	45
734	1020	0.32	2	1,714	40
735	548	0.25	1	1,714	40
735	734	0.26	1	1,714	40
736	786	0.77	1	1,714	45
736	833	0.76	2	1,714	45
737	340	0.37	1	1,714	30
737	785	0.21	1	1,714	40
738	199	0.86	1	1,714	35
738	368	0.39	1	1,714	35
739	738	0.09	2	1,714	25
740	199	0.34	1	1,714	35
741	851	0.28	1	1,714	45
742	200	0.12	2	1,714	30
743	749	0.75	1	1,714	50
744	887	0.48	1	1,714	30
745	469	0.13	1	1,714	30
745	722	0.29	1	1,714	30
746	310	0.08	2	1,714	50
746	401	0.68	1	1,714	50
747	748	0.54	1	1,714	50
748	249	1.29	1	1,714	50
749	760	0.30	1	1,714	50
750	764	0.73	2	1,714	40
750	756	0.75	2	2,250	70
751	753	0.15	1	1,500	30
752	751	0.17	2	1,714	45
753	750	0.14	1	1,500	50
754	659	0.90	2	2,250	65
754	755	0.50	2	2,250	65
755	754	0.50	2	2,250	65
756	765	0.43	2	2,250	70
756	750	0.75	2	2,250	70
757	244	0.22	2	2,250	65
758	754	0.64	2	2,250	65
759	752	0.28	2	1,714	50
760	761	0.40	1	1,714	50
761	762	1.12	1	1,714	50

Upstream Node Number	Downstream Node Number	Length (Miles)	Full Lanes	Saturation Flow Rate (Veh/hr/ln)	Free Flow Speed (MPH)
763	784	0.22	1	1,714	40
764	642	0.74	2	2,250	70
764	750	0.73	2	2,250	70
765	756	0.43	2	2,250	70
766	781	0.13	1	1,714	40
767	768	0.22	1	1,714	50
768	759	0.33	1	1,714	50
769	770	1.09	2	1,200	25
769	782	0.20	1	1,714	35
770	769	1.09	2	1,200	25
770	771	0.35	1	1,200	25
770	773	0.31	1	1,714	30
771	770	0.35	1	1,500	25
771	772	0.08	2	1,500	25
771	774	0.20	2	1,714	35
772	771	0.08	2	1,500	25
772	777	0.61	1	1,714	40
773	74	0.26	1	1,714	30
773	770	0.31	1	1,714	40
774	771	0.20	2	1,714	35
774	833	0.16	1	1,714	35
775	832	0.30	1	1,714	40
776	775	0.33	1	1,714	40
777	778	0.33	1	1,714	40
778	779	0.40	1	1,714	40
779	780	0.35	1	1,714	40
781	45	0.16	2	1,714	45
782	781	0.13	1	1,714	40
782	783	0.19	2	1,714	40
782	769	0.20	1	1,714	35
783	35	0.56	2	1,714	45
783	766	0.11	1	1,500	30
783	782	0.19	2	1,714	40
784	844	0.65	1	1,714	40
785	342	0.46	1	1,714	40
785	786	0.41	1	1,714	30
786	340	0.22	1	1,714	50
786	736	0.77	2	1,714	45

Upstream Node Number	Downstream Node Number	Length (Miles)	Full Lanes	Saturation Flow Rate (Veh/hr/ln)	Free Flow Speed (MPH)
786	331	0.30	1	1,714	40
787	213	0.20	1	1,714	30
787	417	0.13	1	1,714	30
788	787	0.17	1	1,714	30
789	790	0.69	1	1,714	40
790	632	0.81	1	1,714	40
791	188	0.21	1	1,714	40
792	188	1.00	1	1,714	40
793	317	0.37	2	1,714	45
794	793	0.28	1	1,714	40
795	793	0.38	1	1,714	40
796	545	0.13	2	1,714	40
796	571	0.25	1	1,714	40
797	796	0.14	1	1,714	30
798	796	0.12	1	1,714	30
799	315	0.20	2	1,714	40
799	802	0.87	2	1,714	40
800	1003	0.42	1	1,714	40
801	799	0.11	2	1,714	40
802	313	0.41	2	1,714	30
803	802	0.13	1	1,714	30
804	83	0.58	1	1,714	50
804	310	0.08	2	1,714	50
805	191	0.20	2	1,714	45
805	108	0.29	2	1,714	45
806	805	0.06	2	1,714	30
807	191	0.19	2	1,714	40
808	191	0.51	1	1,714	40
809	191	0.40	2	1,714	45
809	521	0.30	2	1,714	45
810	809	0.07	1	1,500	30
811	287	0.37	1	1,714	30
812	521	0.17	1	1,714	30
813	520	0.25	1	1,714	40
814	520	0.17	2	1,714	45
814	524	0.09	2	1,714	45
815	814	0.10	1	1,500	25
816	519	0.44	2	1,714	45

Upstream Node Number	Downstream Node Number	Length (Miles)	Full Lanes	Saturation Flow Rate (Veh/hr/ln)	Free Flow Speed (MPH)
816	524	0.13	2	1,714	45
817	816	0.08	1	1,500	30
818	524	0.12	1	1,500	35
818	816	0.09	1	1,500	30
819	517	0.09	2	1,500	35
819	519	0.32	2	1,500	35
820	819	0.52	1	1,500	30
821	819	0.15	1	1,500	30
821	822	0.14	1	1,500	30
822	517	0.10	2	1,500	30
822	823	0.09	2	1,500	30
823	822	0.09	2	1,500	30
823	434	0.20	2	1,500	30
824	825	0.19	1	1,500	30
824	519	0.17	1	1,500	30
825	821	0.17	1	1,500	30
825	826	0.11	1	1,500	30
826	433	0.34	1	1,500	30
826	823	0.25	1	1,500	30
827	518	0.23	1	1,714	40
828	730	0.35	1	1,714	30
829	889	0.06	1	1,714	30
829	963	0.70	1	1,714	30
830	167	0.61	2	2,250	70
830	166	0.85	2	2,250	70
831	49	0.48	2	2,250	70
831	672	0.68	3	2,250	70
832	772	0.31	1	1,714	35
832	833	0.12	1	1,714	30
833	736	0.76	1	1,714	45
833	774	0.16	1	1,714	35
834	203	0.23	1	1,714	35
835	153	0.26	1	1,714	40
835	210	0.18	1	1,714	40
836	489	0.38	1	1,500	25
837	488	0.63	1	1,500	25
838	839	0.51	1	1,500	40
839	840	0.12	1	1,500	40

Upstream Node Number	Downstream Node Number	Length (Miles)	Full Lanes	Saturation Flow Rate (Veh/hr/ln)	Free Flow Speed (MPH)
840	405	0.19	1	1,500	40
841	399	0.15	1	1,500	40
842	152	0.24	2	1,714	30
842	156	0.10	2	1,714	40
843	763	0.25	1	1,714	40
844	760	0.09	1	1,714	40
845	279	0.67	1	1,714	40
845	846	0.51	1	1,714	40
846	847	0.28	1	1,714	40
847	848	0.19	1	1,714	40
848	749	0.13	1	1,714	40
849	542	0.70	1	1,714	45
850	849	0.56	1	1,714	40
850	851	0.52	1	1,714	40
851	743	0.39	1	1,714	45
852	853	0.22	1	1,714	30
853	484	0.15	1	1,714	30
854	494	0.18	1	1,714	30
855	494	0.13	1	1,714	30
856	282	0.30	1	1,714	30
857	281	0.39	1	1,714	40
858	857	0.47	1	1,714	40
859	258	0.25	1	1,714	30
859	477	0.05	1	1,714	30
860	476	0.46	1	1,714	40
861	863	0.86	1	1,714	40
862	470	0.43	1	1,714	40
863	862	1.13	1	1,714	40
864	261	1.13	1	1,714	40
865	267	0.45	1	1,714	40
866	269	0.34	1	1,500	30
867	275	0.69	1	1,714	30
868	113	0.10	1	1,714	40
869	870	0.85	1	1,714	40
869	876	1.17	1	1,714	40
870	871	0.21	1	1,714	35
871	872	0.50	1	1,714	30
872	873	0.17	1	1,500	25

Upstream Node Number	Downstream Node Number	Length (Miles)	Full Lanes	Saturation Flow Rate (Veh/hr/ln)	Free Flow Speed (MPH)
873	874	0.19	1	1,500	25
874	875	0.31	1	1,714	35
875	729	0.14	1	1,714	35
876	877	0.25	1	1,714	40
877	878	0.71	1	1,500	40
878	879	0.27	1	1,500	40
879	880	0.78	1	1,500	35
880	881	0.10	1	1,200	20
881	882	1.21	1	1,500	30
882	954	0.21	1	1,500	30
883	583	0.13	1	1,500	40
884	1049	1.70	1	1,714	40
884	889	0.67	1	1,714	30
885	237	0.17	1	1,714	40
886	962	0.30	1	1,714	30
887	886	0.20	1	1,714	30
887	961	0.31	1	1,714	30
888	369	0.20	2	1,714	30
889	373	0.14	1	1,714	30
889	829	0.06	1	1,714	30
890	647	0.39	1	1,714	55
891	457	0.24	1	1,714	45
892	639	0.65	1	1,714	50
893	234	0.50	1	1,714	30
893	894	0.14	1	1,714	55
894	232	0.79	1	1,714	55
894	893	0.14	1	1,714	50
894	913	0.31	1	1,714	40
895	646	0.31	1	1,714	55
895	896	0.46	1	1,714	55
896	232	0.23	1	1,714	55
896	895	0.46	1	1,714	55
897	229	0.23	1	1,714	45
897	898	0.41	1	1,714	55
898	646	0.36	1	1,714	55
898	897	0.41	1	1,714	45
899	900	0.79	1	1,714	45
900	225	0.58	1	1,714	40

Upstream Node Number	Downstream Node Number	Length (Miles)	Full Lanes	Saturation Flow Rate (Veh/hr/ln)	Free Flow Speed (MPH)
901	645	0.45	1	1,714	45
902	901	1.84	1	1,714	40
903	902	0.32	1	1,714	45
904	903	0.59	1	1,714	45
905	904	0.44	1	1,714	45
906	905	0.43	1	1,714	45
907	906	0.26	1	1,714	45
908	907	0.17	1	1,714	45
909	901	1.10	1	1,714	40
910	909	0.45	1	1,714	45
911	910	0.85	1	1,714	45
912	911	0.40	1	1,714	45
913	912	0.22	1	1,714	40
914	901	0.69	1	1,714	40
915	215	0.17	1	1,714	40
916	216	1.26	1	1,500	40
917	918	1.51	1	1,714	50
918	217	0.48	1	1,714	50
919	920	1.73	1	1,500	40
920	921	1.48	1	1,500	40
921	922	0.22	1	1,500	40
922	923	0.58	1	1,500	40
923	929	0.25	1	1,500	40
924	932	0.47	1	1,500	40
925	926	0.73	1	1,500	40
926	927	0.60	1	1,500	40
927	627	0.57	1	1,500	40
928	396	0.22	1	1,714	30
929	924	0.35	1	1,500	40
930	224	0.34	1	1,500	40
931	928	0.82	1	1,500	40
932	575	0.13	1	1,500	40
933	934	0.41	1	1,500	40
934	925	1.91	1	1,500	40
935	936	0.32	1	1,714	55
936	937	0.52	1	1,714	55
937	938	0.30	1	1,714	45
938	939	0.30	1	1,714	40

Upstream Node Number	Downstream Node Number	Length (Miles)	Full Lanes	Saturation Flow Rate (Veh/hr/ln)	Free Flow Speed (MPH)
939	940	1.05	1	1,714	45
941	939	0.52	1	1,714	45
942	606	0.20	1	1,714	45
943	942	1.22	1	1,714	45
944	943	2.40	1	1,714	45
945	944	0.60	1	1,714	55
946	947	1.02	1	1,714	50
948	582	0.60	1	1,500	40
949	948	0.32	1	1,500	40
950	949	0.24	1	1,500	40
951	952	0.28	1	1,500	40
952	584	0.43	1	1,500	40
953	583	0.12	1	1,500	40
954	955	0.19	1	1,500	30
955	956	0.17	1	1,500	30
956	583	0.14	1	1,500	40
957	958	0.21	1	1,714	30
958	917	0.98	1	1,714	30
959	388	0.04	1	1,714	30
959	960	0.31	1	1,714	30
960	389	0.05	1	1,714	30
960	961	0.12	1	1,714	30
961	390	0.05	1	1,714	30
961	962	0.21	1	1,714	30
962	963	0.20	1	1,714	30
962	888	0.05	1	1,714	30
963	369	0.07	1	1,714	30
964	690	0.94	1	1,714	40
965	964	0.27	1	1,714	40
966	965	0.87	1	1,714	40
967	74	0.19	1	1,714	40
967	643	0.69	1	1,714	45
968	967	0.11	1	1,714	40
969	967	0.12	1	1,714	40
970	19	0.21	1	1,714	40
971	291	0.72	1	1,714	45
972	971	0.45	1	1,714	45
973	459	0.13	1	1,200	20

Upstream Node Number	Downstream Node Number	Length (Miles)	Full Lanes	Saturation Flow Rate (Veh/hr/ln)	Free Flow Speed (MPH)
974	973	0.31	1	1,500	20
975	976	0.65	1	1,714	40
976	563	1.09	1	1,714	40
977	461	0.38	1	1,500	30
978	636	0.37	1	1,500	25
979	978	0.74	1	1,500	40
980	294	0.30	1	1,500	40
981	297	1.01	1	1,500	40
982	983	0.31	1	1,500	40
983	300	0.27	1	1,500	40
984	634	0.46	1	1,500	40
985	301	0.27	1	1,500	40
986	789	0.38	1	1,500	30
987	631	0.30	1	1,714	55
988	987	0.64	1	1,714	55
989	464	0.31	1	1,714	55
990	989	0.40	1	1,714	55
991	992	0.21	1	1,714	55
992	554	0.36	1	1,714	55
993	666	0.27	1	1,500	40
994	993	0.42	1	1,500	40
995	669	0.22	1	1,500	40
996	667	0.18	1	1,500	40
997	998	0.72	1	1,500	40
998	999	0.21	1	1,500	40
999	996	0.33	1	1,500	40
1000	525	0.16	1	1,500	20
1001	516	0.51	1	1,714	40
1002	1001	1.12	1	1,714	40
1003	799	0.17	2	1,714	40
1004	1005	0.37	1	1,714	45
1005	319	1.59	1	1,714	45
1006	320	0.39	1	1,714	30
1007	1011	0.58	1	1,714	40
1008	322	0.33	1	1,714	30
1009	530	0.45	1	1,714	45
1011	1008	0.06	1	1,714	30
1022	544	0.83	2	1,714	40

Upstream Node Number	Downstream Node Number	Length (Miles)	Full Lanes	Saturation Flow Rate (Veh/hr/ln)	Free Flow Speed (MPH)
1023	1022	0.09	1	1,714	30
1024	1022	0.13	1	1,714	30
1025	515	0.56	1	1,714	40
1025	590	0.71	1	1,714	40
1026	792	0.48	1	1,714	40
1027	1026	1.18	1	1,714	40
1028	1027	0.34	1	1,714	40
1029	1028	0.50	1	1,714	40
1030	1029	0.99	1	1,714	40
1031	1030	0.47	1	1,714	40
1032	512	0.52	1	1,714	30
1033	1032	0.74	1	1,714	30
1033	1034	1.19	1	1,714	40
1034	1035	0.88	1	1,714	40
1035	1037	0.12	1	1,714	40
1036	316	0.70	1	1,714	40
1037	1036	1.04	1	1,714	40
1038	370	0.25	1	1,714	30
1039	1038	1.82	1	1,714	40
1040	77	0.91	1	1,714	40
1041	1040	0.47	2	1,714	40
1042	247	1.16	1	1,714	60
1042	402	0.35	1	1,714	60
1043	1042	0.30	1	1,500	30
1044	288	0.24	1	1,714	30
1044	1045	0.42	1	1,714	30
1045	510	0.61	1	1,714	30
1046	1047	0.16	1	1,500	40
1047	1048	0.46	1	1,500	40
1048	573	0.23	1	1,500	40
1049	1050	0.22	1	1,714	40
1050	1051	0.40	1	1,714	40
1051	1052	0.38	1	1,714	40
1052	246	0.66	1	1,714	55
1053	1054	0.07	1	1,714	30
1054	811	0.66	1	1,714	30

APPENDIX L

ERPA Boundaries

APPENDIX L - ERPA BOUNDARIES

Table L-1 defines the boundary of the 27 municipalities or emergency planning response areas (ERPA), which in aggregate comprise the Emergency Planning Zone (EPZ).

Table L-1. Description of Emergency Response Planning Areas (ERPA)

ERPA	Municipality	Bounded on the:	By:
1	Black Creek Township	North	This township is entirely within the EPZ
		South	
		West	
		East	
2	Hunlock Township	North	Pritchards Road (SR 4026)
		South	Hunlock Township Corporate Boundary
		West	Hunlock Township Corporate Boundary
		East	Hunlock Township Corporate Boundary
3	Union Township	North	This township is entirely within the EPZ
		South	
		West	
		East	
4	Huntington Township	North	This township is entirely within the EPZ
		South	
		West	
		East	
5	New Columbus Borough	North	This borough is entirely within the EPZ
		South	
		West	
		East	
6	Fishing Creek and Benton Townships	North	Strawberry Lane, Zaners Bridge Road (LR 19067), Ridge Rd, Frosty Hollow Rd
		South	Fishing Creek Township Corporate Boundary
		West	Fishing Creek Township Corporate Boundary and State Highway 487
		East	Columbia/Luzerne County Boundaries
7	Salem Township	North	This township is entirely within the EPZ
		South	
		West	
		East	

8	Shickshinny Borough	North	This borough is entirely within the EPZ
		South	
		West	
		East	
9	Conyngham Township	North	This township is entirely within the EPZ
		South	
		West	
		East	
10	Berwick Borough	North	This borough is entirely within the EPZ
		South	
		West	
		East	
11	Briar Creek Borough	North	This borough is entirely within the EPZ
		South	
		West	
		East	
12	Nescopeck Borough	North	This borough is entirely within the EPZ
		South	
		West	
		East	
13	Nescopeck Township	North	This township is entirely within the EPZ
		South	
		West	
		East	
14	Hollenback Township	North	This township is entirely within the EPZ
		South	
		West	
		East	
15	Sugarloaf Township	North	This township is entirely within the EPZ
		South	
		West	
		East	
16	Conyngham Township	North	This township is entirely within the EPZ
		South	
		West	
		East	

17	Dorrance Township	North	This township is entirely within the EPZ
		South	
		West	
		East	
18	Slocum Township	North	This township is entirely within the EPZ
		South	
		West	
		East	
19	Nuangola Borough	North	This borough is entirely within the EPZ
		South	
		West	
		East	
20	Newport Township	North	This township is entirely within the EPZ
		South	
		West	
		East	
21	Nanticoke City	North	This city is entirely within the EPZ
		South	
		West	
		East	
22	Butler Township	North	Butler Township Corporate Boundary
		South	Butler Township Corporate Boundary, State Highway 309, I-80
		West	Butler Township Corporate Boundary
		East	Butler Township Corporate Boundary
23	Beaver Township	North	Beaver Township Corporate Boundary
		South	Beaver Township Corporate Boundary
		West	Mifflin X Rd, Chapel Hill Road, Beaver Valley Road, State Highway 339
		East	Beaver Township Corporate Boundary
24	Mifflin Township	North	This township is entirely within the EPZ
		South	
		West	
		East	
25	South Centre Township	North	South Center Township Corporate Boundary
		South	South Center Township Corporate Boundary
		West	Lows Street
		East	South Center Township Corporate Boundary

26	North Centre Township	North	North Centre Township Corporate Boundary
		South	North Centre Township Corporate Boundary
		West	McDowell Hill Road, Ridge Road, Harris Road, Fowlersville Road, Cabin Run Road, SR 93
		East	North Centre Township Corporate Boundary
27	Briar Creek Township	North	This township is entirely within the EPZ
		South	
		West	
		East	