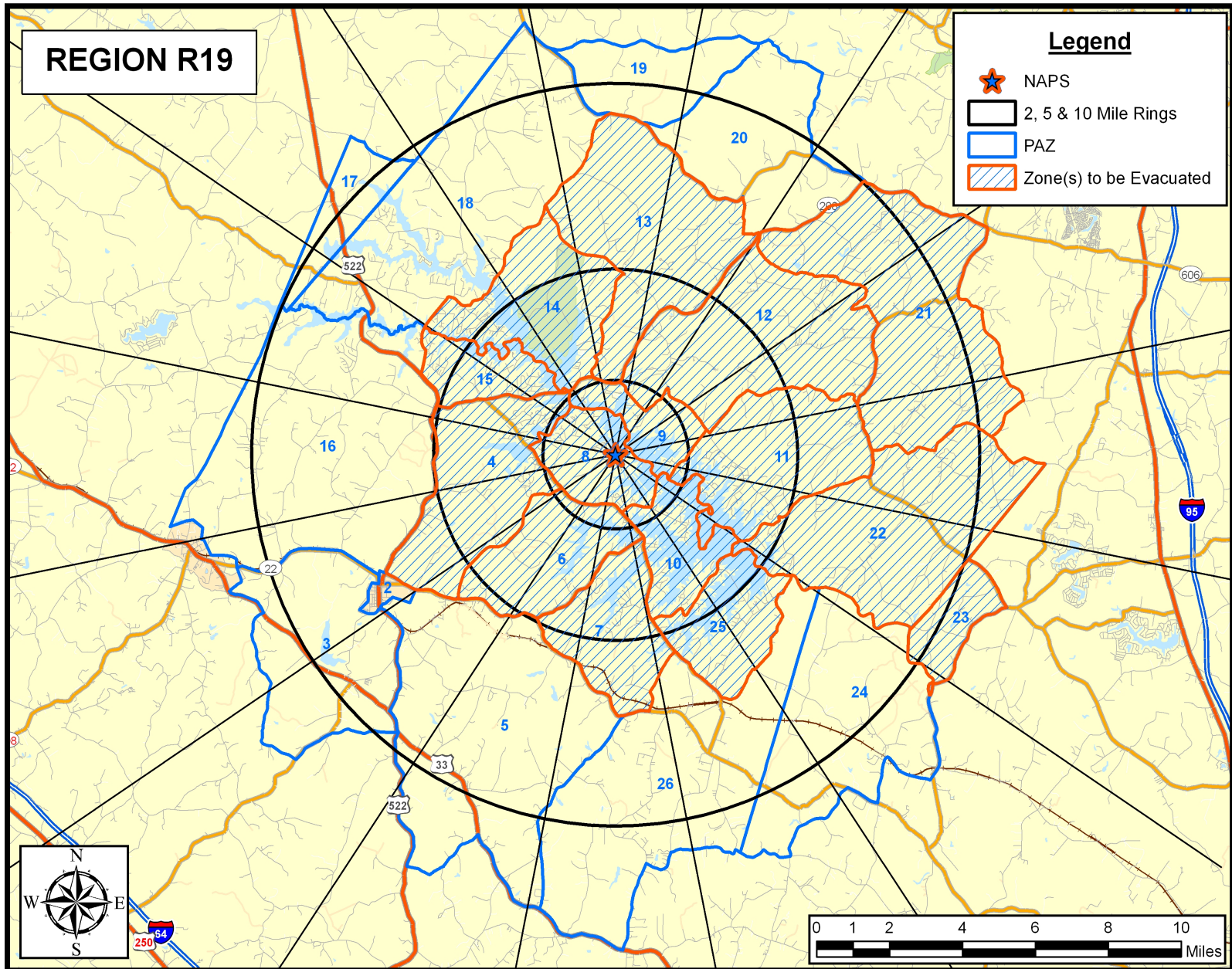
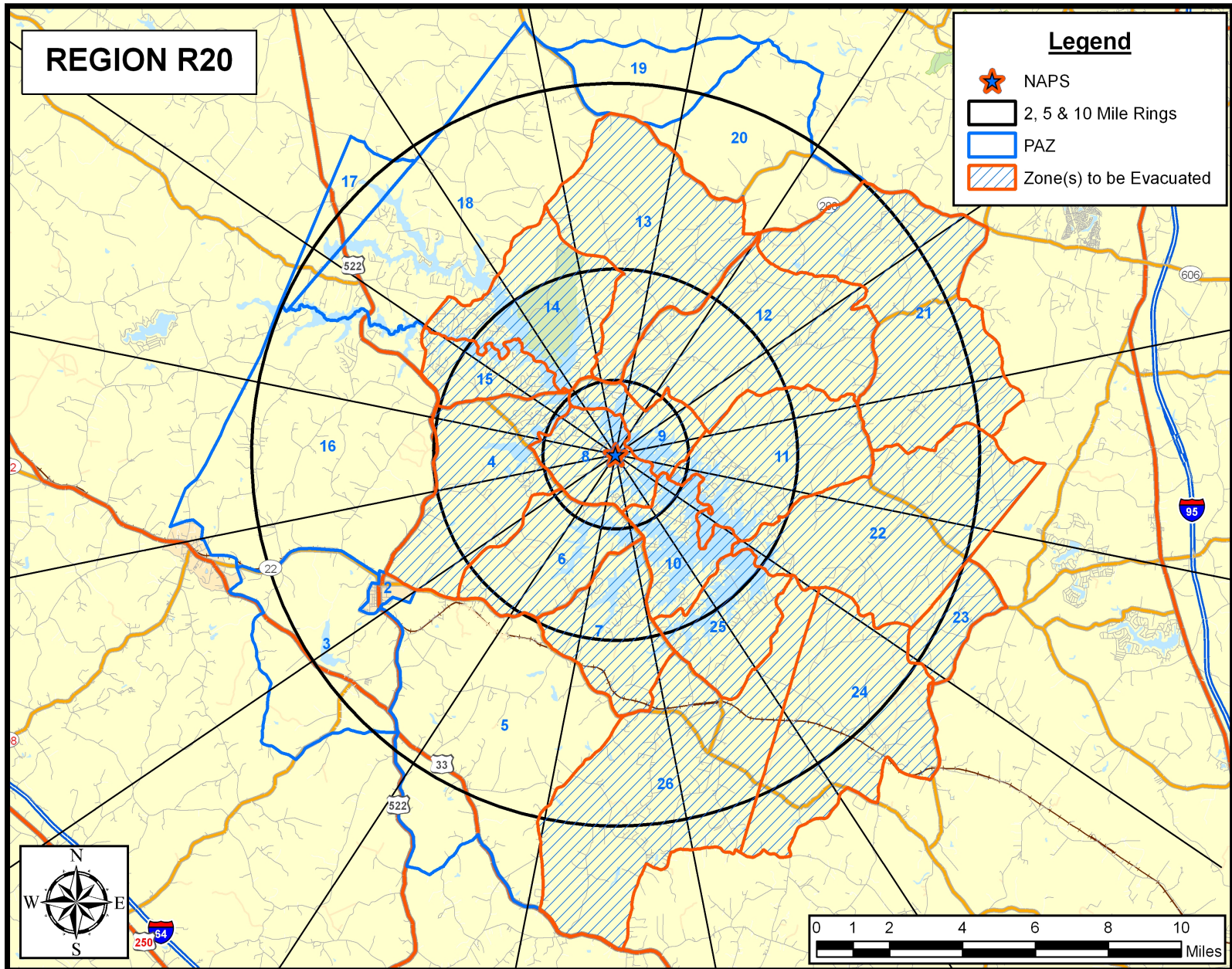
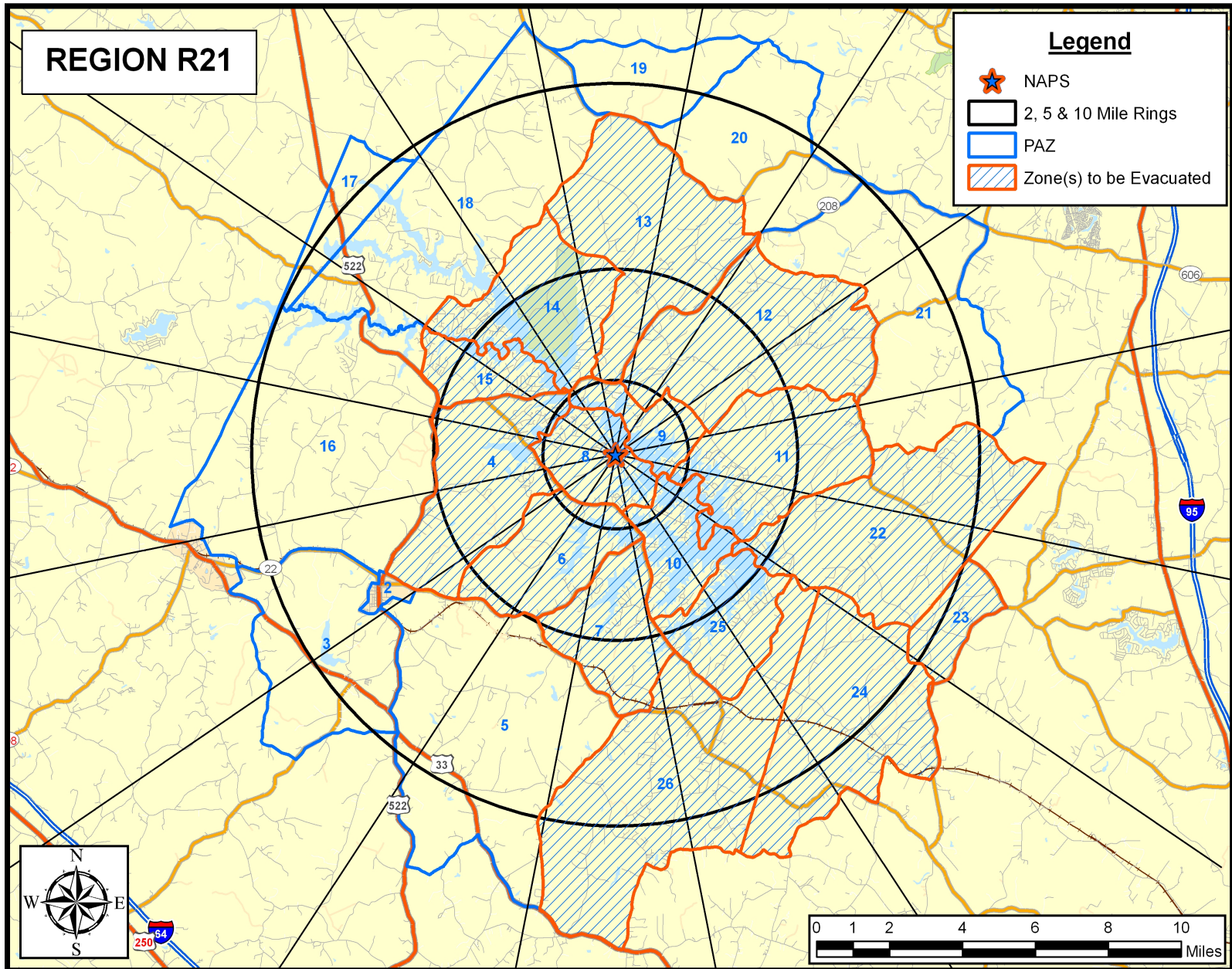
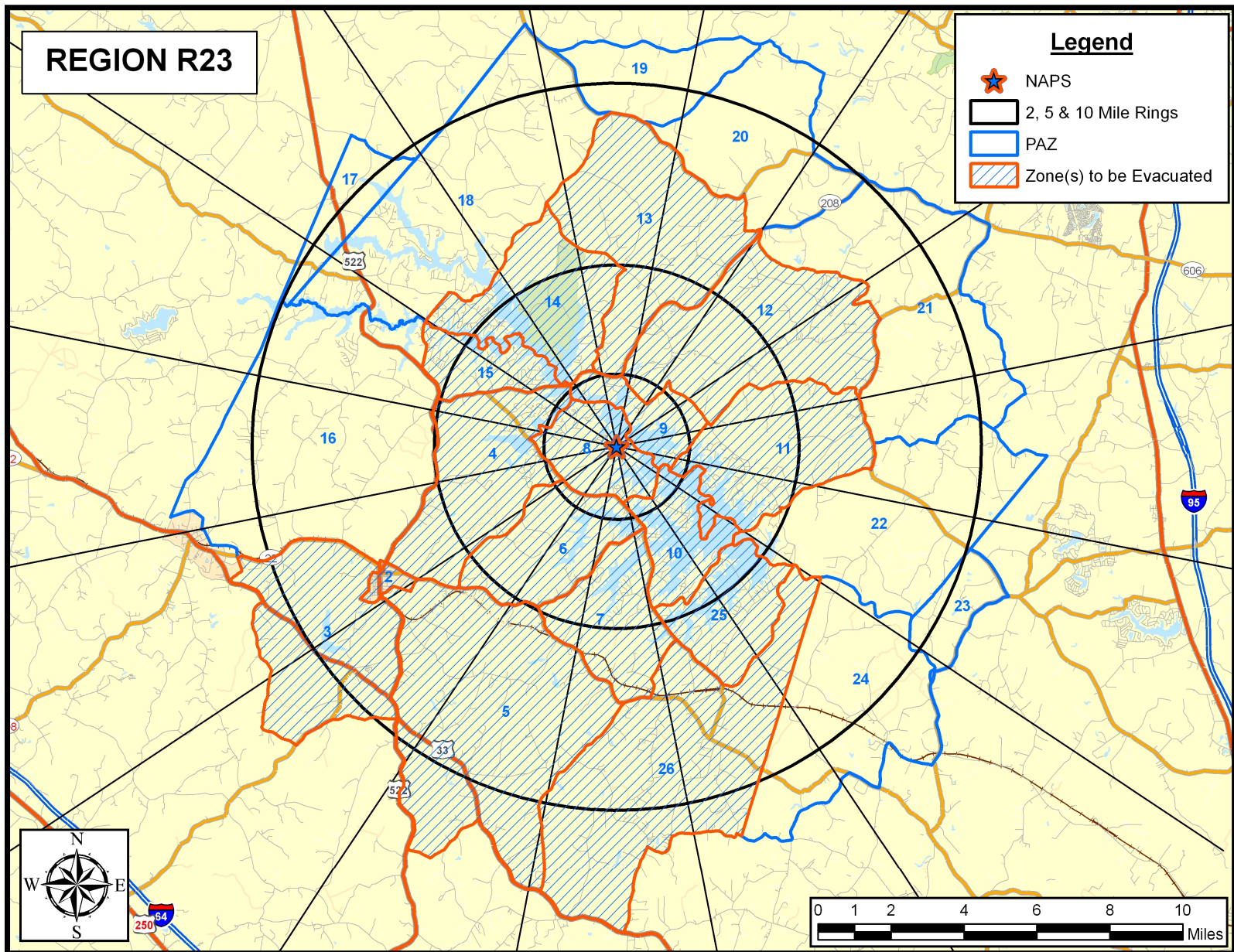
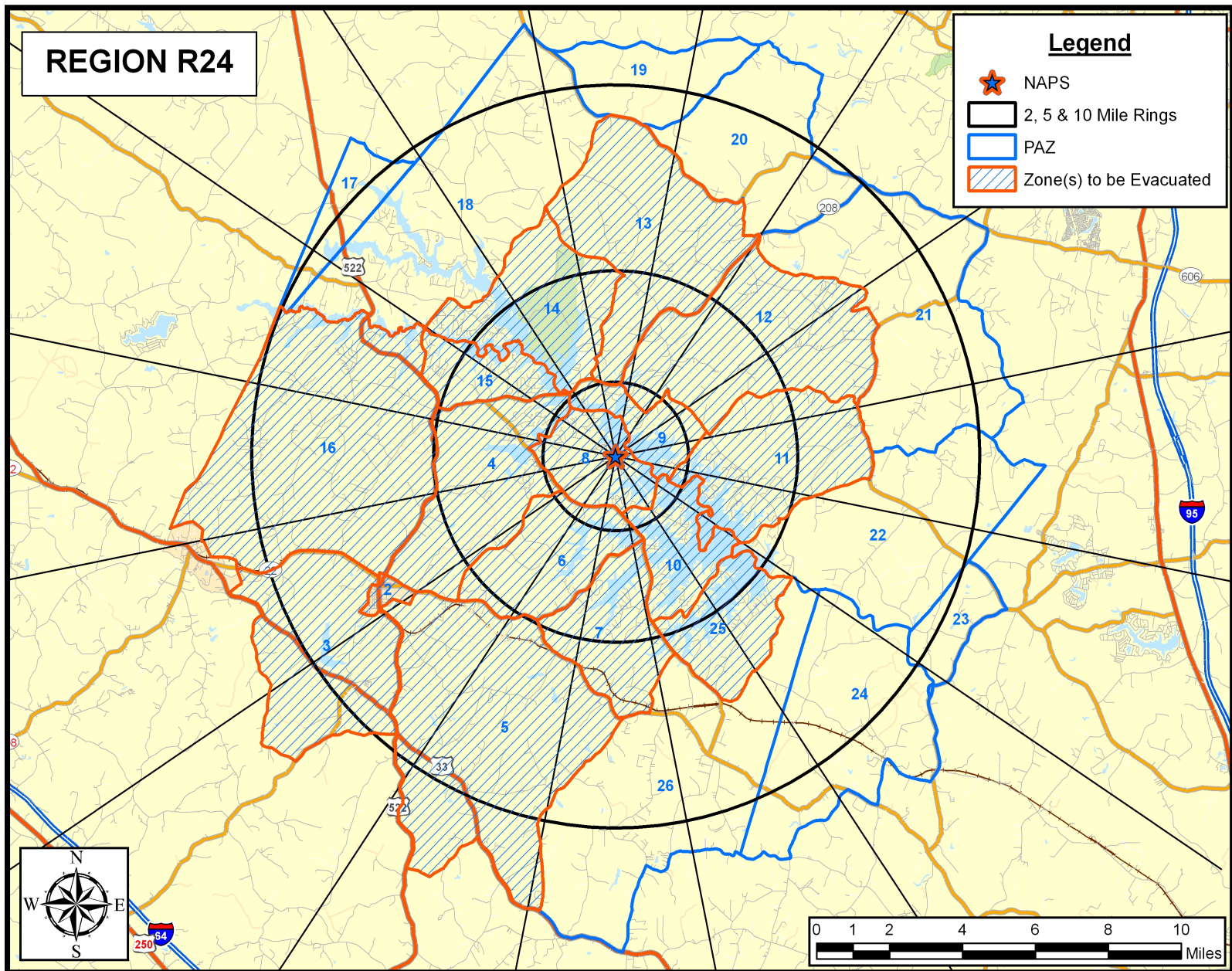


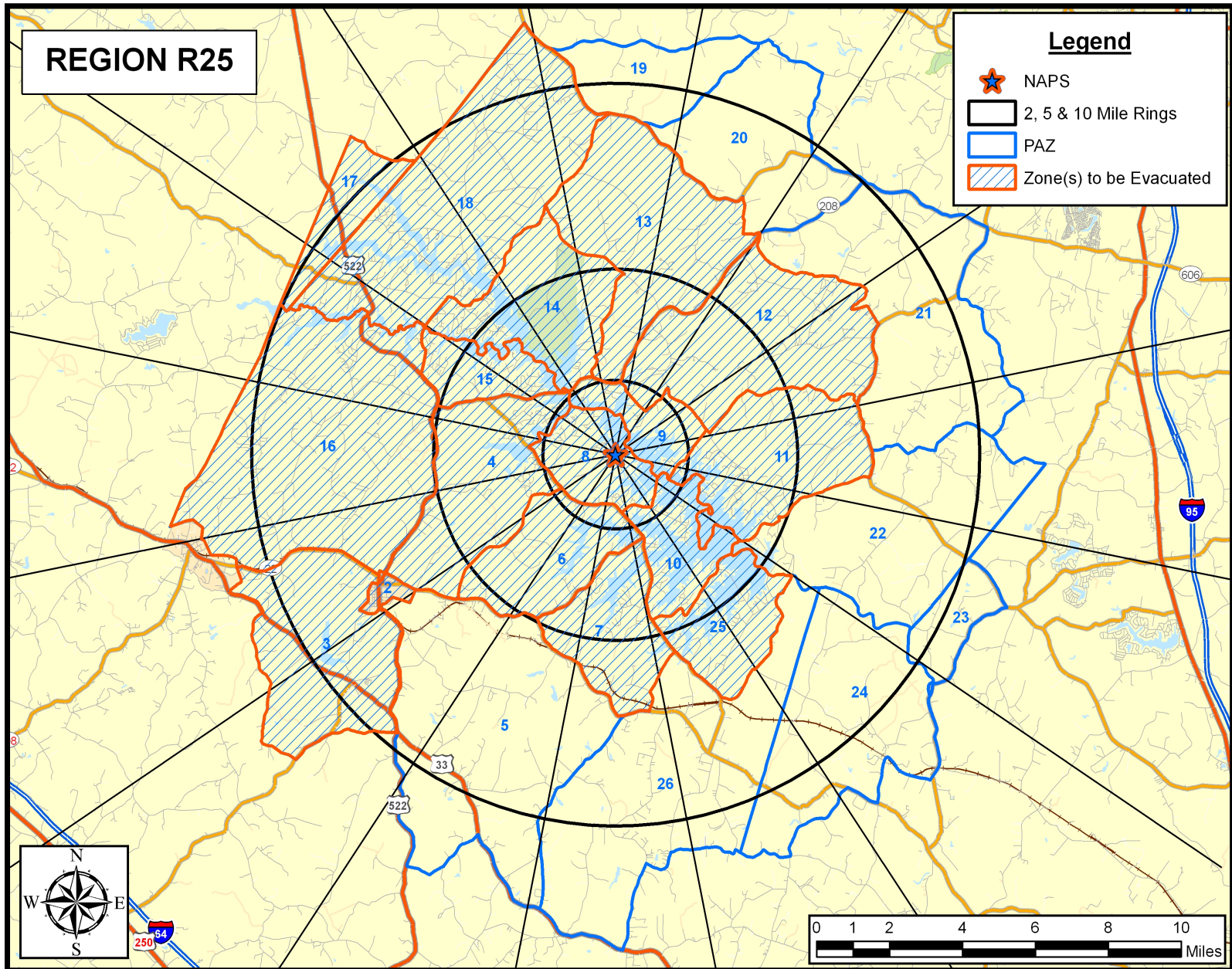


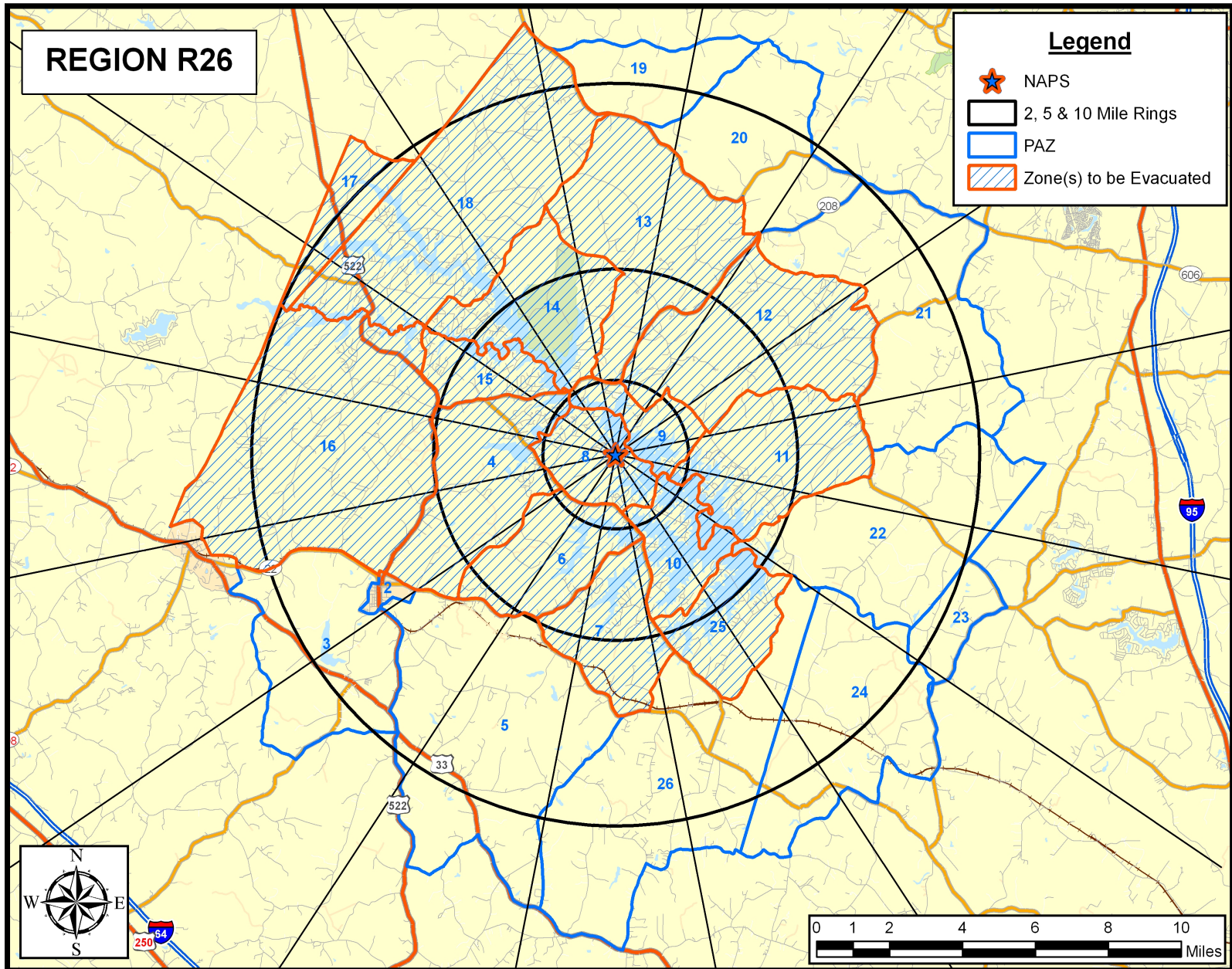


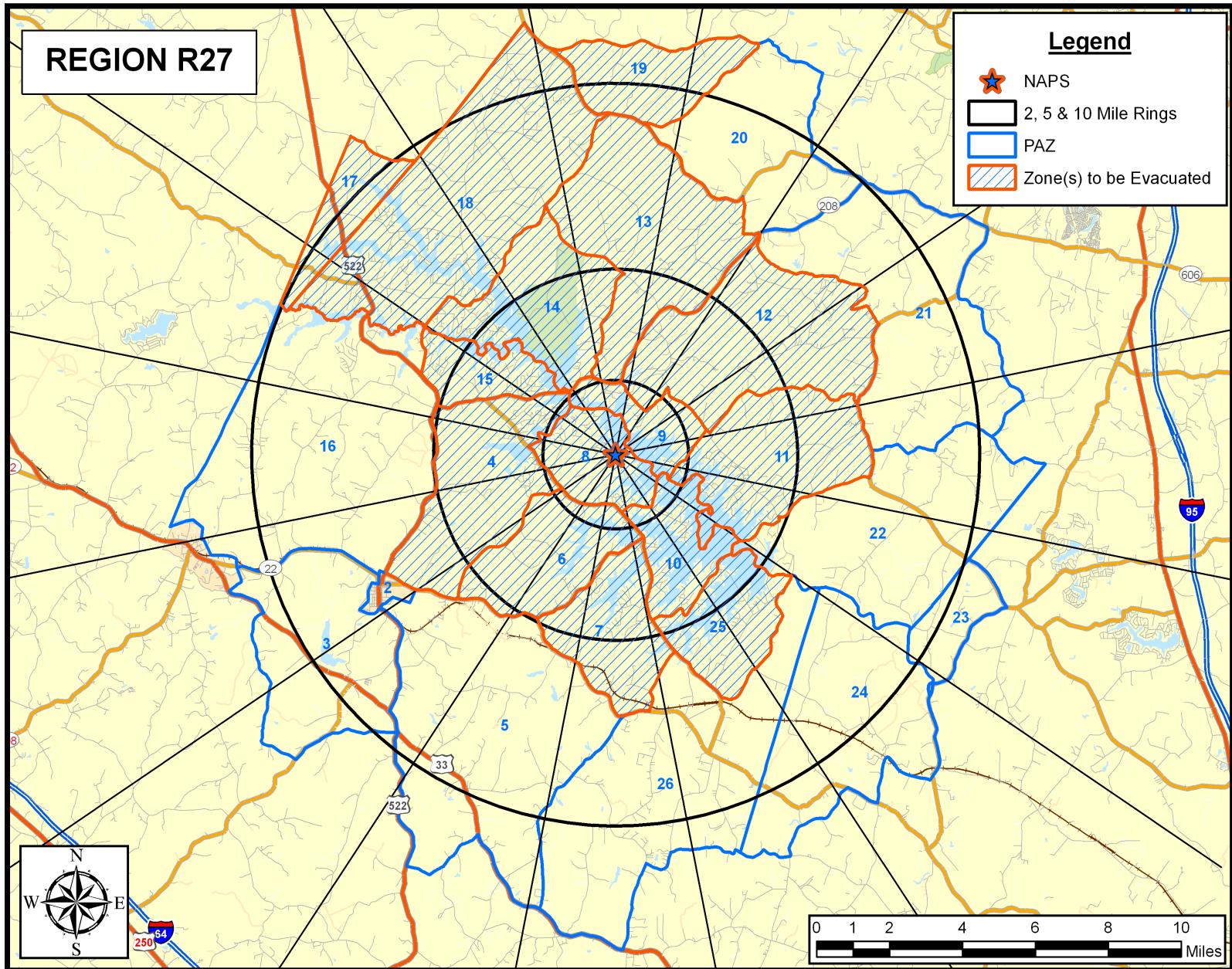












APPENDIX I

Evacuation Sensitivity Studies

APPENDIX I: EVACUATION SENSITIVITY STUDIES

A 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, midday, good weather evacuation for the entire EPZ. Table I-1 presents the results of this study.

Table I-1. Evacuation Time Estimates for Trip Generation Sensitivity Study			
Trip Generation Period	Evacuation Region		
	2-Mile Region (R01)	5-Mile Region (R02)	Entire EPZ (R03)
4 Hours	4:00	4:00	4:10
5 Hours (Base)	5:00	5:00	5:10
6 Hours	6:00	6:00	6:10

The results confirm the importance of accurately estimating the trip generation times. The evacuation time estimates closely mirror the values for the time the last evacuation trip is generated. The reason for this is that the limited traffic congestion within the EPZ does not extend beyond the trip generation period. The results indicate that programs to educate the public and encourage them toward faster responses for a radiological emergency can reduce evacuation time.

A sensitivity study was conducted to determine the effect on ETE of changes in the percentage of people who decide to relocate 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 case considered was Scenario 1, Region 3; a summer, midweek, midday, good weather evacuation for the entire EPZ with the percent of shadow evacuation ranging from 15% to 60%. Table I-2 presents the evacuation time estimates for each of these cases. The ETE for all regions remain unchanged as the percentage of people who decide to relocate from areas within the shadow region increases from 15% to 60%, showing the insensitivity of the ETE to shadow evacuation. The analysis indicates significant congestion in the Shadow Region; however, that congestion does not delay those evacuating from within the EPZ. There are a total of 32,048 people (17,759 vehicles) living in the Shadow Region, 30% of whom are assumed to evacuate (9,614 people).

Table I-2. Evacuation Time Estimates for Shadow Sensitivity Study					
Shadow Data			Evacuation Region		
Percent Shadow Evacuation	Number of Evacuating Shadow Residents	Number of Evacuating Shadow Resident Vehicles	2-Mile Region (R01)	5-Mile Region (R02)	Entire EPZ (R03)
15	4,807	2,664	5:00	5:00	5:10
30 (Base)	9,614	5,328	5:00	5:00	5:10
60	19,229	10,665	5:00	5:00	5:10

Data in the FEIS indicated that there can be as many as 4370 transients at the Lake Anna State Park during peak times. This number concurred with KLD's findings during a site visit. Spotsylvania County emergency management officials estimated that on a typical day there are likely to be 1,000 transients at the park. Given the potentially large variation in the number of transients at the park, it is prudent to perform a sensitivity study to determine the effect on the ETE of varying transient numbers.

The base case ETE presented in Table I-3 is for 4370 transients (1748 vehicles) and this is compared to 2000 and 1000 transients. Scenario 3, Region 3 (a summer, weekend, midday, good weather evacuation for the entire EPZ) was used. As indicated in Table I-3, fewer weekend vehicles at the park, 800 and 400 vehicles respectively, do not reduce the ETE at the 100th percentile; however, at the 95th percentile, the ETE are slightly lower. As shown in the mobilization time sensitivity study, the 100th percentile ETE is driven by mobilization time; thus, the ETE for 100th percentile is unchanged. The 95th percentile for the Entire EPZ is decreased by 10 minutes by halving the estimated peak number of vehicles at Lake Anna State Park.

Table I-3. Evacuation Time Estimates for Lake Anna State Park Sensitivity Study

Transients	Vehicles	95 th Percentile ETE			100 th Percentile ETE		
		2-Mile Region (R01)	5-Mile Region (R02)	Entire EPZ (R03)	2-Mile Region (R01)	5-Mile Region (R02)	Entire EPZ (R03)
1,000	400	2:50	3:00	3:10	4:00	4:40	4:50
2,000	800	2:50	3:00	3:10	4:00	4:40	4:50
4,370 (Base)	1,748 (Base)	2:50	3:00	3:20	4:00	4:40	4:50

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 27 Regions and all 14 Scenarios (Tables J-1A through J-1D).

Plots of Evacuating Vehicles vs. Elapsed Time leaving the 2-mile and 5-mile circular areas around NAPS and the entire EPZ for Region R03, for all 14 scenarios are presented. Each plot has points indicating the evacuation times corresponding to the 50th, 90th, and 95th percentiles of evacuated population.

J.1 Guidance on Using ETE Tables

Tables J-1A through J-1D present the ETE values for all 27 Evacuation Regions and all 14 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)
 - New Plant Construction
 - New Plant Construction plus Refueling of Operating Plant

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 (9) 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 North Anna Power Station. The applicable distances and their associated candidate Regions are given below:
 - 2 Miles (Region R01)
 - 5 Miles (Regions R02 and R04 through R14)
 - to EPZ Boundary (Regions R03 and R15 through R27)
- 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 NAPS. 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 *toward* the northeast (NE).
- 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 95-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 “Evacuate 5-Mile Ring and Downwind to EPZ Boundary”. Under “Wind Direction Toward:” identify the NE (northeast) azimuth and read REGION R17 in the first column of that row.
3. Enter Table J-1C to locate the data cell containing the value of ETE for Scenario 4 and Region R17. This data cell is in column (4) and in the row for Region R17; it contains the ETE value of **3:10**.

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

Scenario:	Summer		Summer		Summer	Scenario:	Winter			Winter			Winter	Scenario:	Summer	
	Midweek		Weekend		Midweek Weekend		Midweek			Weekend			Midweek Weekend		Midweek	Midweek
	(1)	(2)	(3)	(4)	(5)		(6)	(7)	(8)	(9)	(10)	(11)	(12)		(13)	(14)
	Midday		Midday		Evening		Midday			Midday			Evening		Midday	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:	New Plant Construction	New Plant Construction + Refueling
Entire 2-Mile Region, 5-Mile Region, and EPZ																
R01 2-mile ring	1:15	1:15	1:00	1:00	1:00	R01 2-mile ring	1:15	1:15	1:35	1:00	1:00	1:25	1:00	R01 2-mile ring	1:40	1:45
R02 5-mile ring	1:25	1:25	1:10	1:10	1:10	R02 5-mile ring	1:25	1:25	1:45	1:10	1:10	1:30	1:10	R02 5-mile ring	1:40	1:40
R03 Entire EPZ	1:40	1:45	1:35	1:35	1:25	R03 Entire EPZ	1:35	1:40	2:00	1:25	1:30	1:50	1:25	R03 Entire EPZ	1:55	1:55
2-Mile Ring and Downwind to 5 Miles																
R04 N,NNE	1:15	1:15	1:00	1:00	1:00	R04 N,NNE	1:20	1:20	1:40	1:00	1:00	1:20	1:00	R04 N,NNE	1:30	1:30
R05 NE	1:20	1:20	1:00	1:00	1:00	R05 NE	1:20	1:20	1:40	1:00	1:00	1:25	1:00	R05 NE	1:30	1:30
R06 ENE,E	1:20	1:20	1:00	1:00	1:00	R06 ENE,E	1:20	1:25	1:45	1:00	1:00	1:25	1:00	R06 ENE,E	1:35	1:35
R07 ESE,SE	1:25	1:25	1:05	1:05	1:10	R07 ESE,SE	1:20	1:25	1:40	1:05	1:10	1:30	1:10	R07 ESE,SE	1:45	1:45
R08 SSE,S	1:25	1:25	1:15	1:15	1:15	R08 SSE,S	1:25	1:25	1:45	1:10	1:15	1:30	1:15	R08 SSE,S	1:50	1:55
R09 SSW	1:20	1:20	1:10	1:10	1:10	R09 SSW	1:20	1:20	1:40	1:10	1:10	1:25	1:10	R09 SSW	1:45	1:50
R10 SW	1:20	1:25	1:15	1:15	1:10	R10 SW	1:25	1:25	1:45	1:15	1:15	1:30	1:10	R10 SW	1:50	1:55
R11 WSW	1:20	1:20	1:05	1:05	1:05	R11 WSW	1:20	1:20	1:45	1:05	1:05	1:25	1:05	R11 WSW	1:45	1:45
R12 W	1:20	1:25	1:05	1:10	1:05	R12 W	1:25	1:25	1:45	1:05	1:10	1:30	1:05	R12 W	1:45	1:45
R13 WNW,NW	1:20	1:20	1:05	1:05	1:05	R13 WNW,NW	1:20	1:25	1:40	1:05	1:05	1:25	1:05	R13 WNW,NW	1:35	1:40
R14 NNW	1:20	1:20	1:05	1:05	1:05	R14 NNW	1:20	1:20	1:40	1:05	1:05	1:25	1:05	R14 NNW	1:30	1:35
5-Mile Ring and Downwind to EPZ Boundary																
R15 N	1:35	1:35	1:30	1:35	1:20	R15 N	1:30	1:35	1:55	1:25	1:25	1:45	1:20	R15 N	1:55	1:55
R16 NNE	1:35	1:40	1:35	1:35	1:25	R16 NNE	1:35	1:35	1:55	1:25	1:30	1:45	1:20	R16 NNE	1:55	1:55
R17 NE	1:30	1:30	1:20	1:25	1:20	R17 NE	1:30	1:35	1:50	1:20	1:20	1:35	1:20	R17 NE	1:45	1:50
R18 ENE	1:30	1:35	1:20	1:25	1:20	R18 ENE	1:30	1:35	1:55	1:20	1:20	1:40	1:20	R18 ENE	1:45	1:50
R19 E	1:30	1:30	1:20	1:25	1:15	R19 E	1:30	1:35	1:55	1:15	1:20	1:35	1:15	R19 E	1:45	1:45
R20 ESE	1:30	1:35	1:20	1:25	1:20	R20 ESE	1:35	1:35	1:55	1:20	1:25	1:40	1:20	R20 ESE	1:45	1:45
R21 SE	1:30	1:30	1:15	1:15	1:15	R21 SE	1:30	1:30	1:55	1:15	1:15	1:35	1:15	R21 SE	1:40	1:45
R22 SSE,S	1:30	1:30	1:15	1:15	1:15	R22 SSE,S	1:30	1:30	1:55	1:15	1:15	1:35	1:15	R22 SSE,S	1:40	1:45
R23 SSW	1:30	1:30	1:15	1:15	1:15	R23 SSW	1:30	1:35	1:50	1:15	1:15	1:35	1:15	R23 SSW	1:40	1:45
R24 SW,WSW	1:30	1:30	1:15	1:20	1:15	R24 SW,WSW	1:30	1:35	1:50	1:15	1:15	1:35	1:15	R24 SW,WSW	1:45	1:45
R25 W	1:35	1:35	1:25	1:30	1:15	R25 W	1:30	1:35	1:55	1:20	1:25	1:40	1:15	R25 W	1:45	1:50
R26 WNW,NW	1:30	1:35	1:25	1:30	1:15	R26 WNW,NW	1:30	1:35	1:50	1:15	1:20	1:40	1:15	R26 WNW,NW	1:45	1:50
R27 NNW	1:30	1:35	1:25	1:30	1:15	R27 NNW	1:30	1:35	1:55	1:15	1:20	1:40	1:15	R27 NNW	1:50	1:50

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

	Summer		Summer		Summer		Winter			Winter			Winter		Summer	Summer
	Midweek		Weekend		Midweek Weekend		Midweek			Weekend			Midweek Weekend		Midweek	Midweek
Scenario:	(1)	(2)	(3)	(4)	(5)	Scenario:	(6)	(7)	(8)	(9)	(10)	(11)	(12)	Scenario:	(13)	(14)
Region Wind Toward:	Midday		Midday		Evening	Region Wind Toward:	Midday			Midday			Evening	Region Wind Toward:	Midday	
	Good Weather	Rain	Good Weather	Rain	Good Weather		Good Weather	Rain	Snow	Good Weather	Rain	Snow	Good Weather		New Plant Construction	New Plant Construction + Refueling
Entire 2-Mile Region, 5-Mile Region, and EPZ																
R01 2-mile ring	2:30	2:30	2:00	2:00	2:00	R01 2-mile ring	2:30	2:30	3:10	2:00	2:40	2:00	R01 2-mile ring	2:55	3:00	
R02 5-mile ring	2:40	2:40	2:10	2:20	2:10	R02 5-mile ring	2:40	2:40	3:20	2:10	2:15	2:40	2:10	R02 5-mile ring	3:15	3:25
R03 Entire EPZ	2:55	3:00	3:00	3:10	2:30	R03 Entire EPZ	2:50	2:55	3:30	2:40	2:50	3:20	2:30	R03 Entire EPZ	3:30	3:35
2-Mile Ring and Downwind to 5 Miles																
R04 N,NNE	2:30	2:30	2:00	2:00	2:00	R04 N,NNE	2:40	2:40	3:10	2:00	2:00	2:30	2:00	R04 N,NNE	2:50	2:55
R05 NE	2:40	2:40	2:00	2:00	2:00	R05 NE	2:40	2:40	3:20	2:00	2:00	2:40	2:00	R05 NE	2:50	2:55
R06 ENE,E	2:40	2:40	2:00	2:00	2:00	R06 ENE,E	2:40	2:40	3:20	2:00	2:00	2:40	2:00	R06 ENE,E	2:50	2:55
R07 ESE,SE	2:40	2:40	2:10	2:10	2:10	R07 ESE,SE	2:40	2:40	3:20	2:10	2:10	2:40	2:05	R07 ESE,SE	3:05	3:10
R08 SSE,S	2:40	2:40	2:20	2:20	2:10	R08 SSE,S	2:40	2:40	3:20	2:15	2:15	2:40	2:10	R08 SSE,S	3:10	3:20
R09 SSW	2:40	2:40	2:05	2:05	2:05	R09 SSW	2:40	2:40	3:20	2:05	2:05	2:40	2:05	R09 SSW	3:00	3:10
R10 SW	2:40	2:40	2:05	2:05	2:05	R10 SW	2:40	2:40	3:20	2:05	2:05	2:40	2:05	R10 SW	3:10	3:20
R11 WSW	2:40	2:40	2:00	2:00	2:00	R11 WSW	2:40	2:40	3:20	2:00	2:00	2:40	2:00	R11 WSW	3:05	3:15
R12 W	2:40	2:40	2:10	2:10	2:00	R12 W	2:40	2:40	3:20	2:05	2:05	2:40	2:00	R12 W	3:10	3:20
R13 WNW,NW	2:30	2:30	2:10	2:10	2:05	R13 WNW,NW	2:40	2:40	3:10	2:10	2:10	2:30	2:00	R13 WNW,NW	3:05	3:15
R14 NNW	2:30	2:30	2:05	2:05	2:00	R14 NNW	2:40	2:40	3:10	2:00	2:00	2:30	2:00	R14 NNW	3:00	3:05
5-Mile Ring and Downwind to EPZ Boundary																
R15 N	2:50	2:50	3:00	3:05	2:20	R15 N	2:50	2:50	3:20	2:30	2:35	3:00	2:20	R15 N	3:25	3:25
R16 NNE	2:50	2:55	3:00	3:05	2:25	R16 NNE	2:50	2:50	3:30	2:30	2:40	3:05	2:25	R16 NNE	3:25	3:30
R17 NE	2:50	2:50	2:35	2:40	2:20	R17 NE	2:50	2:50	3:20	2:25	2:30	3:00	2:20	R17 NE	3:25	3:30
R18 ENE	2:50	2:50	2:35	2:40	2:20	R18 ENE	2:50	2:50	3:25	2:25	2:30	3:00	2:20	R18 ENE	3:25	3:30
R19 E	2:40	2:50	2:30	2:35	2:20	R19 E	2:50	2:50	3:20	2:20	2:30	2:55	2:20	R19 E	3:20	3:25
R20 ESE	2:50	2:50	2:35	2:40	2:25	R20 ESE	2:50	2:50	3:30	2:25	2:35	3:05	2:25	R20 ESE	3:25	3:30
R21 SE	2:50	2:50	2:25	2:30	2:20	R21 SE	2:50	2:50	3:30	2:20	2:30	3:00	2:20	R21 SE	3:25	3:30
R22 SSE,S	2:40	2:50	2:25	2:30	2:20	R22 SSE,S	2:50	2:50	3:25	2:20	2:30	3:00	2:20	R22 SSE,S	3:25	3:30
R23 SSW	2:40	2:50	2:25	2:30	2:20	R23 SSW	2:50	2:50	3:20	2:20	2:25	2:55	2:20	R23 SSW	3:25	3:30
R24 SW,WSW	2:40	2:50	2:30	2:40	2:20	R24 SW,WSW	2:50	2:50	3:30	2:20	2:30	3:00	2:20	R24 SW,WSW	3:25	3:30
R25 W	2:45	2:55	3:00	3:10	2:25	R25 W	2:45	2:50	3:25	2:30	2:40	3:10	2:20	R25 W	3:25	3:30
R26 WNW,NW	2:45	2:55	3:00	3:10	2:20	R26 WNW,NW	2:40	2:50	3:25	2:30	2:40	3:10	2:20	R26 WNW,NW	3:25	3:30
R27 NNW	2:45	2:50	2:50	3:00	2:20	R27 NNW	2:45	2:50	3:20	2:25	2:30	3:00	2:20	R27 NNW	3:20	3:25

TableJ-1C. Time To Clear The Indicated Area of 95 Percent of the Affected Population																
Scenario:	Summer		Summer		Summer	Scenario:	Winter			Winter			Winter	Scenario:	Summer	Summer
	Midweek		Weekend		Midweek Weekend		Midweek			Weekend			Midweek Weekend		Midweek	Midweek
	(1)	(2)	(3)	(4)	(5)		(6)	(7)	(8)	(9)	(10)	(11)	(12)		(13)	(14)
	Midday		Midday		Evening		Midday			Midday			Evening		Midday	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:	New Plant Construction	New Plant Construction + Refueling
Entire 2-Mile Region, 5-Mile Region, and EPZ																
R01 2-mile ring	3:20	3:20	2:40	2:40	2:50	R01 2-mile ring	3:20	3:20	3:50	2:40	2:40	3:20	2:50	R01 2-mile ring	3:15	3:20
R02 5-mile ring	3:20	3:20	2:40	2:40	2:50	R02 5-mile ring	3:20	3:20	4:00	2:40	2:40	3:20	2:50	R02 5-mile ring	3:35	3:40
R03 Entire EPZ	3:30	3:30	3:20	3:30	3:00	R03 Entire EPZ	3:30	3:40	4:10	2:50	3:00	3:40	3:00	R03 Entire EPZ	3:50	3:55
2-Mile Ring and Downwind to 5 Miles																
R04 N,NNE	3:10	3:10	2:20	2:20	2:40	R04 N,NNE	3:20	3:20	3:50	2:30	3:10	2:40		R04 N,NNE	3:10	3:20
R05 NE	3:20	3:20	2:30	2:30	2:40	R05 NE	3:20	3:20	3:50	2:40	2:40	3:20	2:50	R05 NE	3:20	3:20
R06 ENE,E	3:20	3:20	2:40	2:40	2:50	R06 ENE,E	3:30	3:30	4:00	2:40	2:40	3:20	2:50	R06 ENE,E	3:20	3:20
R07 ESE,SE	3:20	3:20	2:40	2:40	2:50	R07 ESE,SE	3:20	3:20	4:00	2:50	2:50	3:20	2:50	R07 ESE,SE	3:20	3:25
R08 SSE,S	3:10	3:10	2:40	2:40	2:50	R08 SSE,S	3:20	3:20	4:00	2:50	2:50	3:30	2:50	R08 SSE,S	3:25	3:35
R09 SSW	3:20	3:20	2:40	2:40	2:50	R09 SSW	3:20	3:20	3:50	2:40	2:50	3:20	2:50	R09 SSW	3:20	3:25
R10 SW	3:20	3:20	2:40	2:40	2:50	R10 SW	3:20	3:20	4:00	2:50	2:50	3:30	2:50	R10 SW	3:25	3:35
R11 WSW	3:20	3:20	2:40	2:40	2:50	R11 WSW	3:20	3:20	4:00	2:40	2:40	3:30	2:50	R11 WSW	3:20	3:30
R12 W	3:20	3:20	2:30	2:30	2:50	R12 W	3:20	3:20	4:00	2:40	2:40	3:20	2:40	R12 W	3:25	3:35
R13 WNW,NW	3:10	3:20	2:30	2:30	2:40	R13 WNW,NW	3:20	3:20	3:50	2:40	2:40	3:20	2:50	R13 WNW,NW	3:30	3:35
R14 NNW	3:10	3:10	2:30	2:30	2:40	R14 NNW	3:20	3:20	3:50	2:40	2:40	3:20	2:50	R14 NNW	3:20	3:25
5-Mile Ring and Downwind to EPZ Boundary																
R15 N	3:20	3:20	3:20	3:30	2:50	R15 N	3:30	3:30	4:00	2:50	2:50	3:30	2:50	R15 N	3:35	3:45
R16 NNE	3:30	3:30	3:20	3:30	2:50	R16 NNE	3:30	3:30	4:00	2:50	3:00	3:30	3:00	R16 NNE	3:40	3:45
R17 NE	3:30	3:30	3:00	3:10	2:50	R17 NE	3:30	3:30	4:00	2:50	3:00	3:30	3:00	R17 NE	3:40	3:45
R18 ENE	3:30	3:30	3:00	3:10	2:50	R18 ENE	3:30	3:30	4:00	2:50	3:00	3:30	2:50	R18 ENE	3:40	3:45
R19 E	3:20	3:30	2:50	3:00	2:50	R19 E	3:30	3:30	4:00	2:50	2:50	3:30	2:50	R19 E	3:40	3:45
R20 ESE	3:30	3:30	2:50	3:00	3:00	R20 ESE	3:30	3:30	4:00	2:50	2:50	3:30	3:00	R20 ESE	3:45	3:50
R21 SE	3:30	3:30	2:40	2:50	2:50	R21 SE	3:30	3:30	4:00	2:50	2:50	3:30	3:00	R21 SE	3:45	3:50
R22 SSE,S	3:20	3:30	2:40	2:50	2:50	R22 SSE,S	3:30	3:30	4:00	2:50	2:50	3:30	2:50	R22 SSE,S	3:50	3:50
R23 SSW	3:20	3:20	2:40	2:50	2:50	R23 SSW	3:30	3:30	4:00	2:50	2:50	3:30	2:50	R23 SSW	3:50	3:50
R24 SW,WSW	3:20	3:20	3:00	3:00	2:50	R24 SW,WSW	3:30	3:30	4:00	2:50	2:50	3:30	2:50	R24 SW,WSW	3:45	3:50
R25 W	3:20	3:20	3:20	3:30	2:50	R25 W	3:30	3:30	4:00	2:50	3:00	3:30	2:50	R25 W	3:40	3:50
R26 WNW,NW	3:20	3:20	3:20	3:30	2:50	R26 WNW,NW	3:30	3:30	4:00	2:50	3:00	3:30	2:50	R26 WNW,NW	3:40	3:45
R27 NNW	3:20	3:20	3:20	3:20	2:50	R27 NNW	3:30	3:30	4:00	2:50	2:50	3:30	2:50	R27 NNW	3:35	3:45

Table J-1D. Time To Clear The Indicated Area of 100 Percent of the Affected Population																
Scenario:	Summer		Summer		Summer	Scenario:	Winter			Winter			Winter	Scenario:	Summer	Summer
	Midweek		Weekend		Midweek Weekend		Midweek			Weekend			Midweek Weekend		Midweek	Midweek
	(1)	(2)	(3)	(4)	(5)		(6)	(7)	(8)	(9)	(10)	(11)	(12)		(13)	(14)
	Midday		Midday		Evening		Midday			Midday			Evening		Midday	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:	New Plant Construction	New Plant Construction + Refueling
Entire 2-Mile Region, 5-Mile Region, and EPZ																
R01 2-mile ring	5:00	5:00	4:00	4:00	4:00	R01 2-mile ring	5:00	5:00	6:00	4:00	4:00	5:00	4:00	R01 2-mile ring	5:00	5:00
R02 5-mile ring	5:00	5:00	4:40	4:40	4:30	R02 5-mile ring	5:00	5:00	6:00	4:40	4:40	5:10	4:30	R02 5-mile ring	5:00	5:00
R03 Entire EPZ	5:10	5:10	4:50	4:50	4:50	R03 Entire EPZ	5:10	5:10	6:10	4:50	4:50	5:20	4:50	R03 Entire EPZ	5:10	5:10
2-Mile Ring and Downwind to 5 Miles																
R04 N,NNE	5:00	5:00	4:00	4:00	4:00	R04 N,NNE	5:00	5:00	6:00	4:00	4:00	5:00	4:00	R04 N,NNE	5:00	5:00
R05 NE	5:00	5:00	4:00	4:00	4:00	R05 NE	5:00	5:00	6:00	4:00	4:00	5:00	4:00	R05 NE	5:00	5:00
R06 ENE,E	5:00	5:00	4:00	4:00	4:00	R06 ENE,E	5:00	5:00	6:00	4:00	4:00	5:00	4:00	R06 ENE,E	5:00	5:00
R07 ESE,SE	5:00	5:10	4:00	4:10	4:00	R07 ESE,SE	5:00	5:00	6:00	4:00	4:00	5:00	4:00	R07 ESE,SE	5:00	5:00
R08 SSE,S	5:00	5:00	4:00	4:10	4:00	R08 SSE,S	5:00	5:00	6:00	4:00	4:00	5:10	4:00	R08 SSE,S	5:00	5:00
R09 SSW	5:00	5:00	4:00	4:10	4:00	R09 SSW	5:00	5:00	6:00	4:00	4:00	5:00	4:00	R09 SSW	5:00	5:00
R10 SW	5:00	5:00	4:00	4:10	4:00	R10 SW	5:00	5:00	6:00	4:00	4:10	5:00	4:00	R10 SW	5:00	5:00
R11 WSW	5:00	5:00	4:00	4:00	4:00	R11 WSW	5:00	5:00	6:00	4:00	4:00	5:00	4:00	R11 WSW	5:00	5:00
R12 W	5:00	5:00	4:00	4:00	4:10	R12 W	5:00	5:00	6:00	4:00	4:00	5:00	4:10	R12 W	5:00	5:00
R13 WNW,NW	5:00	5:00	4:40	4:40	4:40	R13 WNW,NW	5:00	5:00	6:00	4:40	4:40	5:00	4:40	R13 WNW,NW	5:00	5:00
R14 NNW	5:00	5:00	4:40	4:40	4:40	R14 NNW	5:00	5:00	6:00	4:40	4:40	5:00	4:40	R14 NNW	5:00	5:00
5-Mile Ring and Downwind to EPZ Boundary																
R15 N	5:00	5:10	4:50	4:50	4:50	R15 N	5:00	5:10	6:10	4:50	4:50	5:10	4:50	R15 N	5:00	5:00
R16 NNE	5:10	5:10	4:50	4:50	4:50	R16 NNE	5:10	5:10	6:10	4:50	4:50	5:20	4:50	R16 NNE	5:10	5:10
R17 NE	5:10	5:10	4:50	4:50	4:50	R17 NE	5:10	5:10	6:10	4:50	5:00	5:20	4:50	R17 NE	5:10	5:10
R18 ENE	5:10	5:10	4:40	4:50	4:50	R18 ENE	5:10	5:10	6:10	4:50	5:00	5:20	4:50	R18 ENE	5:10	5:10
R19 E	5:10	5:10	4:50	4:50	4:50	R19 E	5:10	5:10	6:10	4:50	4:50	5:10	4:50	R19 E	5:10	5:10
R20 ESE	5:10	5:10	4:50	4:50	4:50	R20 ESE	5:10	5:10	6:10	4:50	4:50	5:20	4:50	R20 ESE	5:10	5:10
R21 SE	5:10	5:10	4:50	4:50	4:50	R21 SE	5:10	5:10	6:10	4:50	4:50	5:20	4:50	R21 SE	5:10	5:10
R22 SSE,S	5:10	5:10	4:50	4:50	4:50	R22 SSE,S	5:10	5:10	6:10	4:50	4:50	5:20	4:50	R22 SSE,S	5:10	5:10
R23 SSW	5:10	5:10	4:50	4:50	4:50	R23 SSW	5:10	5:10	6:10	4:50	4:50	5:10	4:50	R23 SSW	5:10	5:10
R24 SW,WSW	5:10	5:10	4:50	4:50	4:50	R24 SW,WSW	5:10	5:10	6:10	4:50	4:50	5:10	4:50	R24 SW,WSW	5:10	5:10
R25 W	5:10	5:10	4:50	4:50	4:50	R25 W	5:10	5:10	6:10	4:50	4:50	5:10	4:50	R25 W	5:10	5:10
R26 WNW,NW	5:00	5:10	4:40	4:40	4:50	R26 WNW,NW	5:00	5:10	6:10	4:40	4:40	5:10	4:50	R26 WNW,NW	5:10	5:10
R27 NNW	5:00	5:10	4:40	4:40	4:50	R27 NNW	5:00	5:00	6:10	4:50	4:50	5:10	4:40	R27 NNW	5:00	5:00

Table J-2. Description of Evacuation Regions																										
Region	Description	Protective Action Zone (PAZ)																								
		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
R01	2 mile ring					X		X	X	X																
R02	5-mile ring			X		X	X	X	X	X	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
Evacuate 2 mile ring and 5 miles downwind																										
Region	Wind Direction Toward:	Protective Action Zone (PAZ)																								
		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
R04	N, NNE					X		X	X	X		X	X	X												
R05	NE					X		X	X	X	X	X	X													
R06	ENE, E					X		X	X	X	X	X														
R07	ESE, SE					X		X	X	X	X														X	
R08	SSE, S					X	X	X	X	X															X	
R09	SSW					X	X	X	X	X																
R10	SW			X		X	X	X	X	X																
R11	WSW			X		X		X	X	X																
R12	W			X		X		X	X	X					X											
R13	WNW, NW			X		X		X	X	X				X	X											
R14	NNW					X		X	X	X			X	X	X											
Evacuate 5 mile ring and downwind to EPZ boundary																										
Region	Wind Direction Toward:	Protective Action Zone (PAZ)																								
		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
R15	N			X		X	X	X	X	X	X	X	X	X	X			X	X	X					X	
R16	NNE			X		X	X	X	X	X	X	X	X	X	X			X	X	X	X				X	
R17	NE			X		X	X	X	X	X	X	X	X	X	X				X	X	X				X	
R18	ENE			X		X	X	X	X	X	X	X	X	X	X					X	X	X			X	
R19	E			X		X	X	X	X	X	X	X	X	X	X						X	X	X		X	
R20	ESE			X		X	X	X	X	X	X	X	X	X	X						X	X	X	X	X	X
R21	SE			X		X	X	X	X	X	X	X	X	X	X							X	X	X	X	X
R22	SSE, S			X	X	X	X	X	X	X	X	X	X	X	X									X	X	X
R23	SSW	X	X	X	X	X	X	X	X	X	X	X	X	X	X										X	X
R24	SW, WSW	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X									X	
R25	W	X	X	X		X	X	X	X	X	X	X	X	X	X	X	X	X							X	
R26	WNW, NW			X		X	X	X	X	X	X	X	X	X	X	X	X	X							X	
R27	NNW			X		X	X	X	X	X	X	X	X	X	X		X	X	X						X	

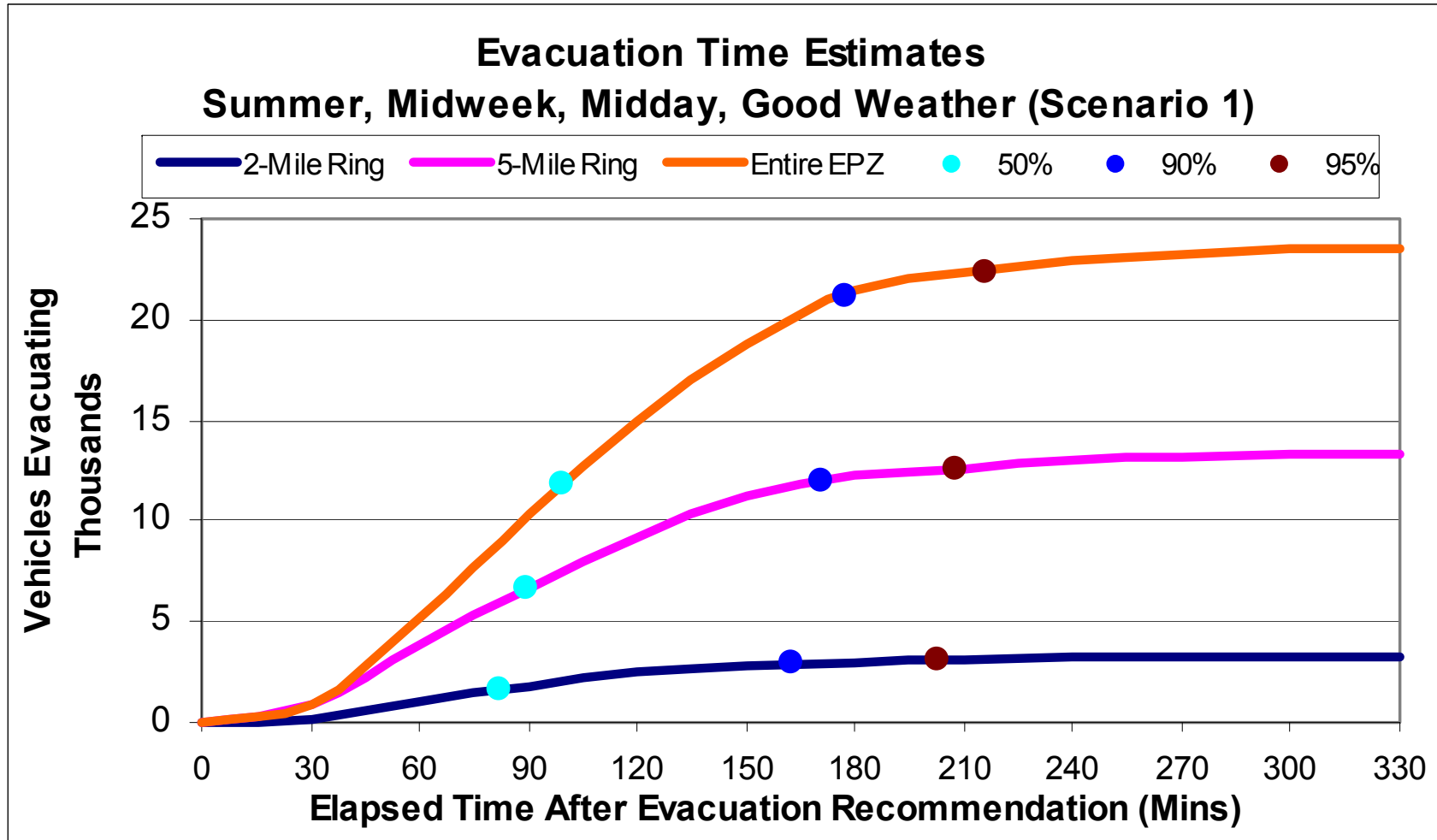


Figure J-1. Evacuation Time Estimates –
Scenario 1 for Region R03 (Entire EPZ)

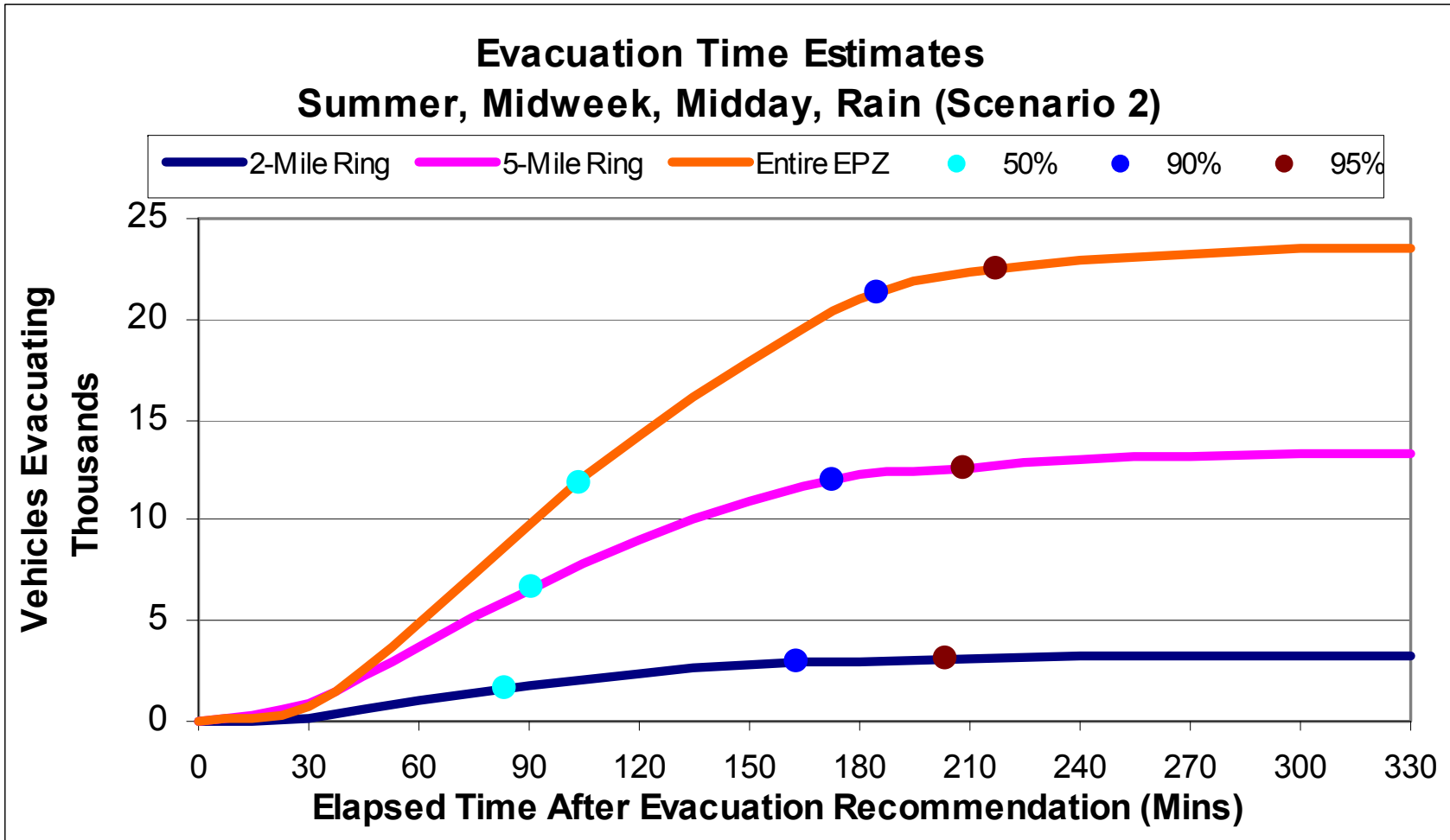


Figure J-2. Evacuation Time Estimates –
Scenario 2 for Region R03 (Entire EPZ)

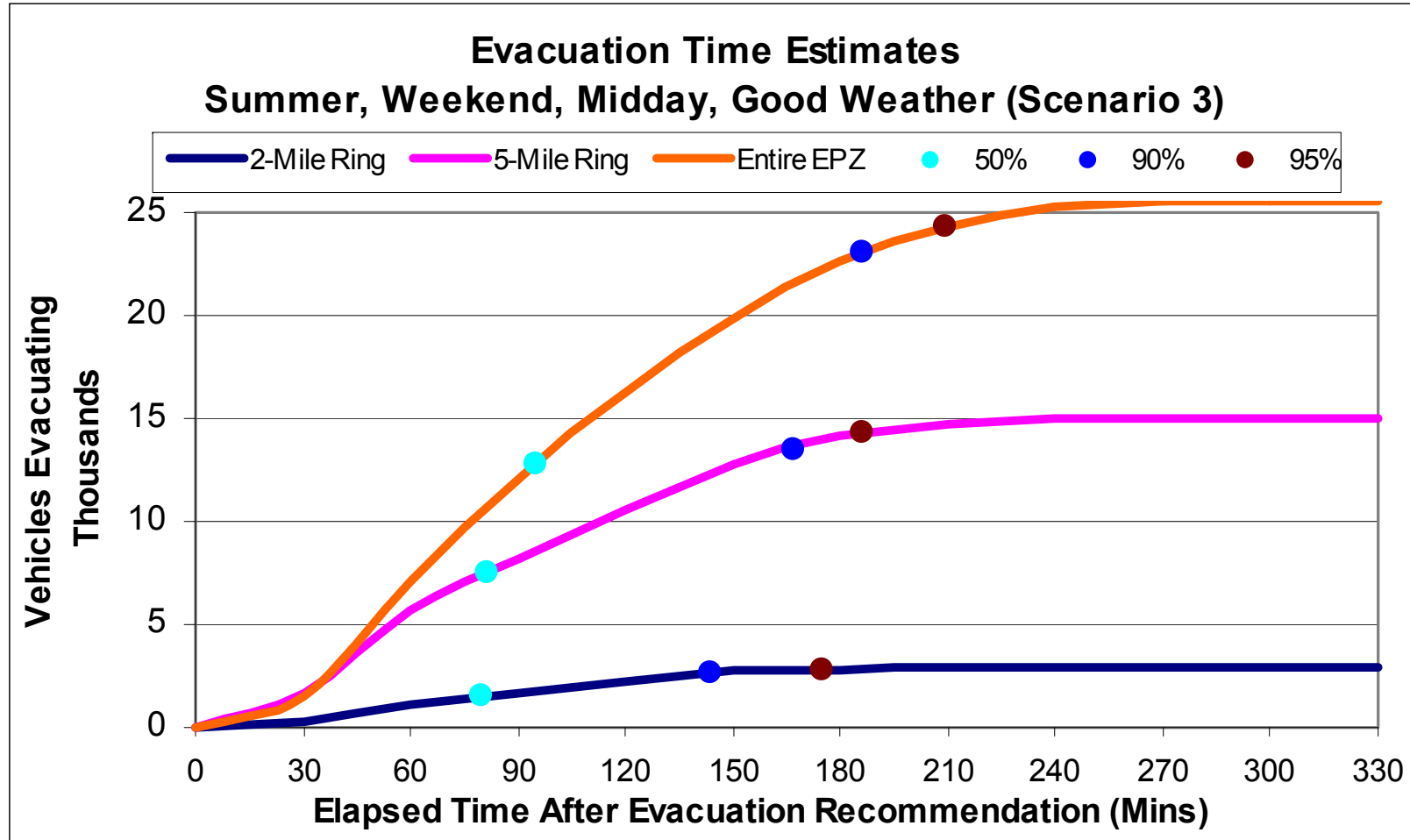


Figure J-3. Evacuation Time Estimates –
Scenario 3 for Region R03 (Entire EPZ)

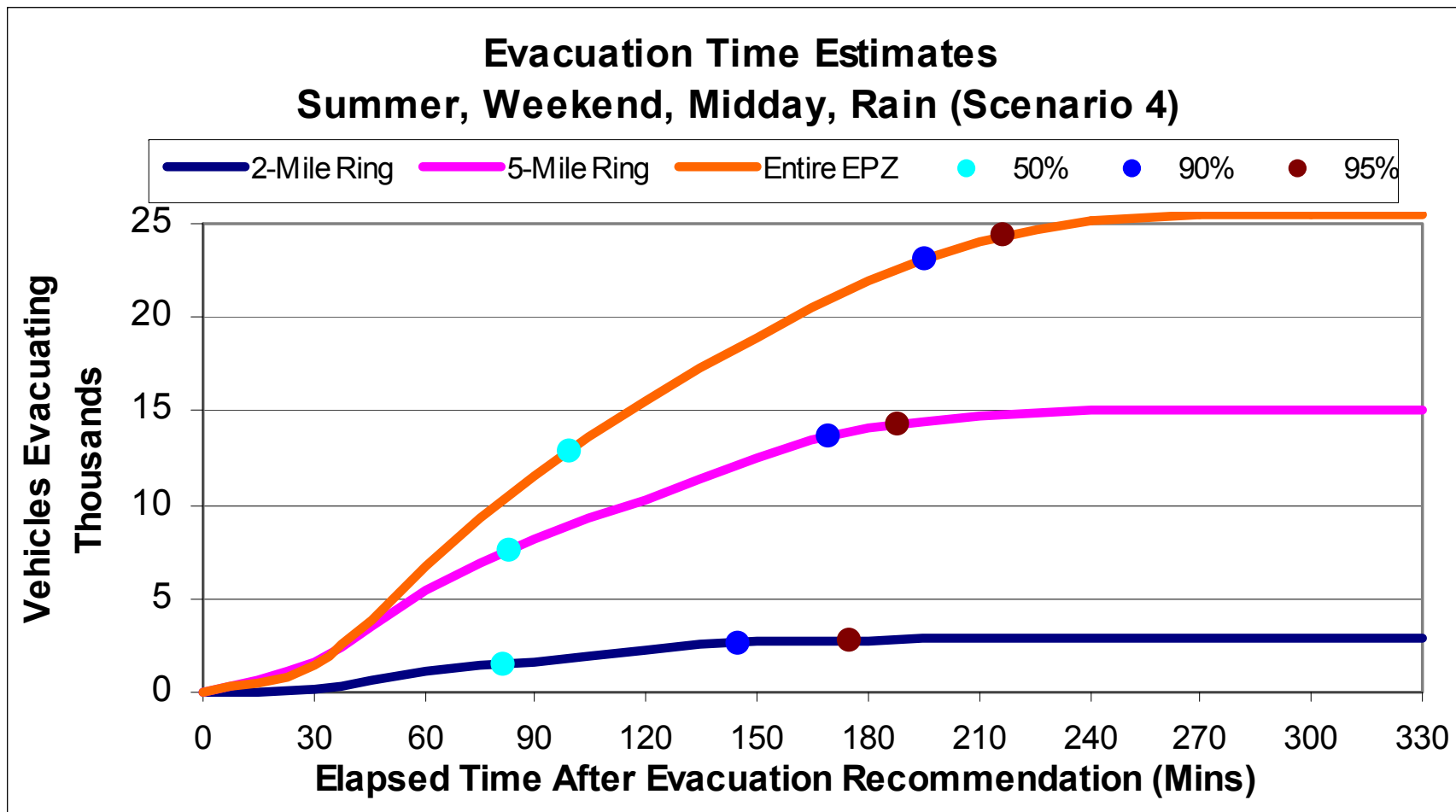


Figure J-4. Evacuation Time Estimates –
Scenario 4 for Region R03 (Entire EPZ)

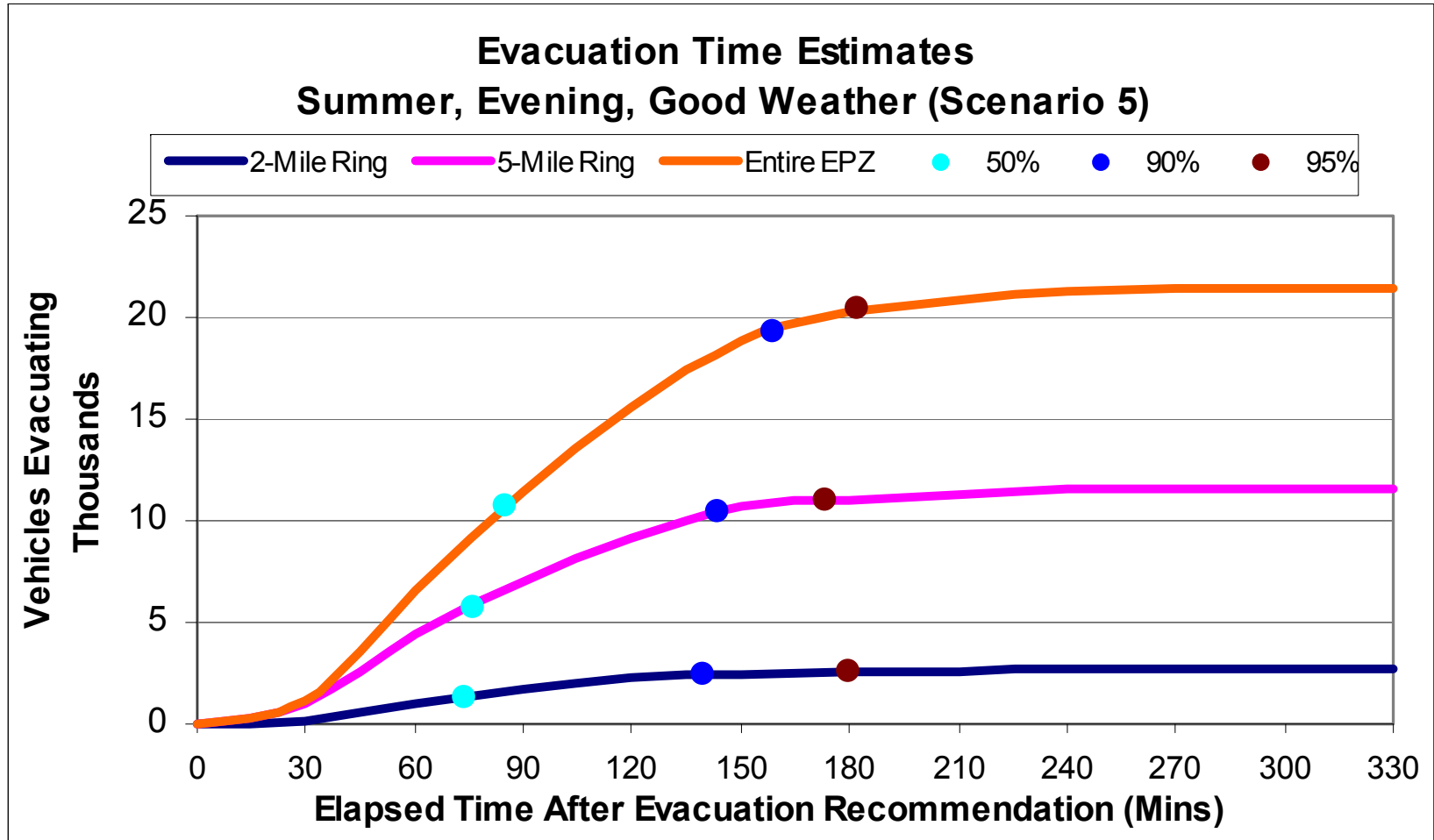


Figure J-5. Evacuation Time Estimates –
Scenario 5 for Region R03 (Entire EPZ)

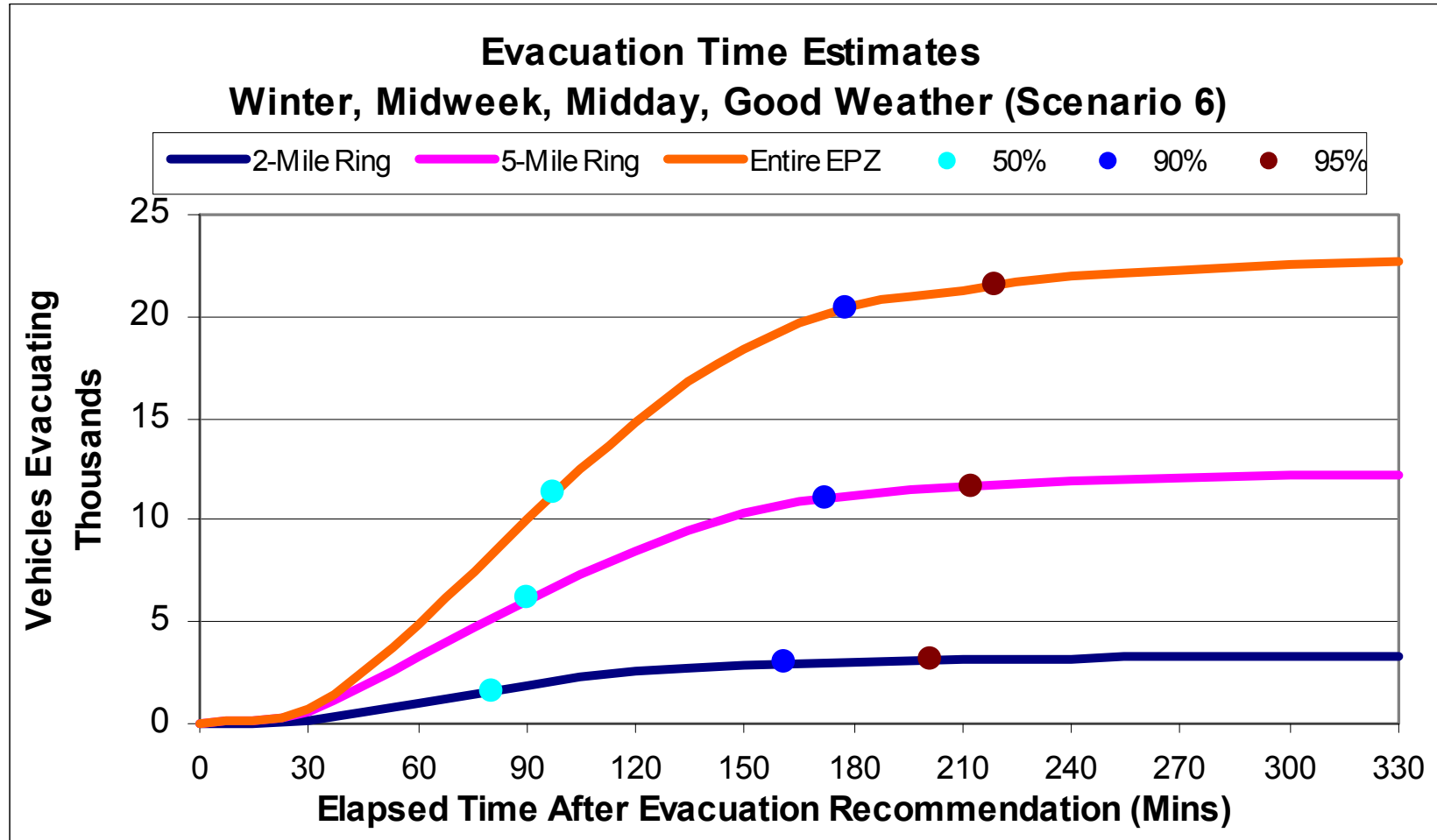


Figure J-6. Evacuation Time Estimates –
Scenario 6 for Region R03 (Entire EPZ)

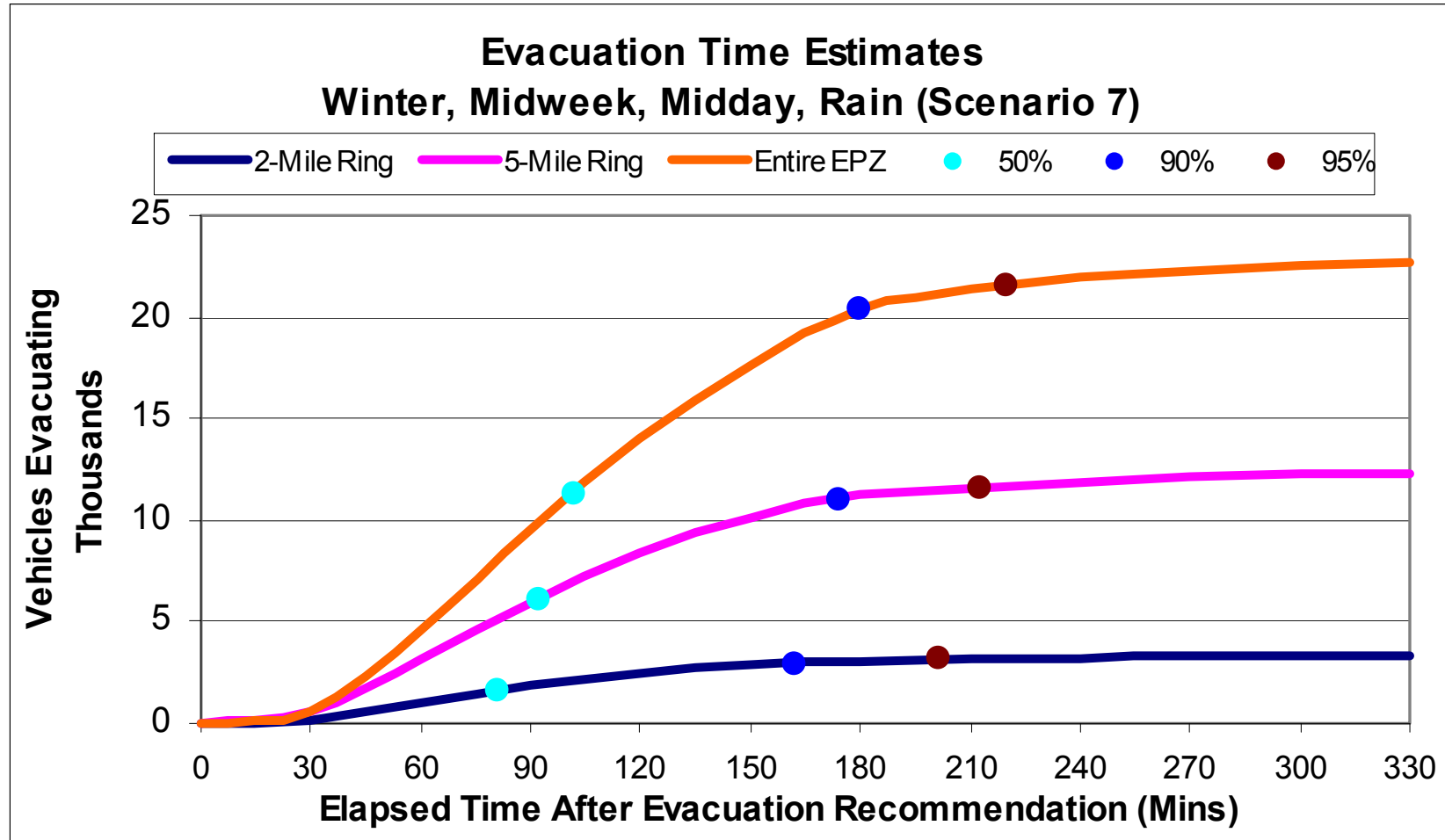


Figure J-7. Evacuation Time Estimates –
Scenario 7 for Region R03 (Entire EPZ)

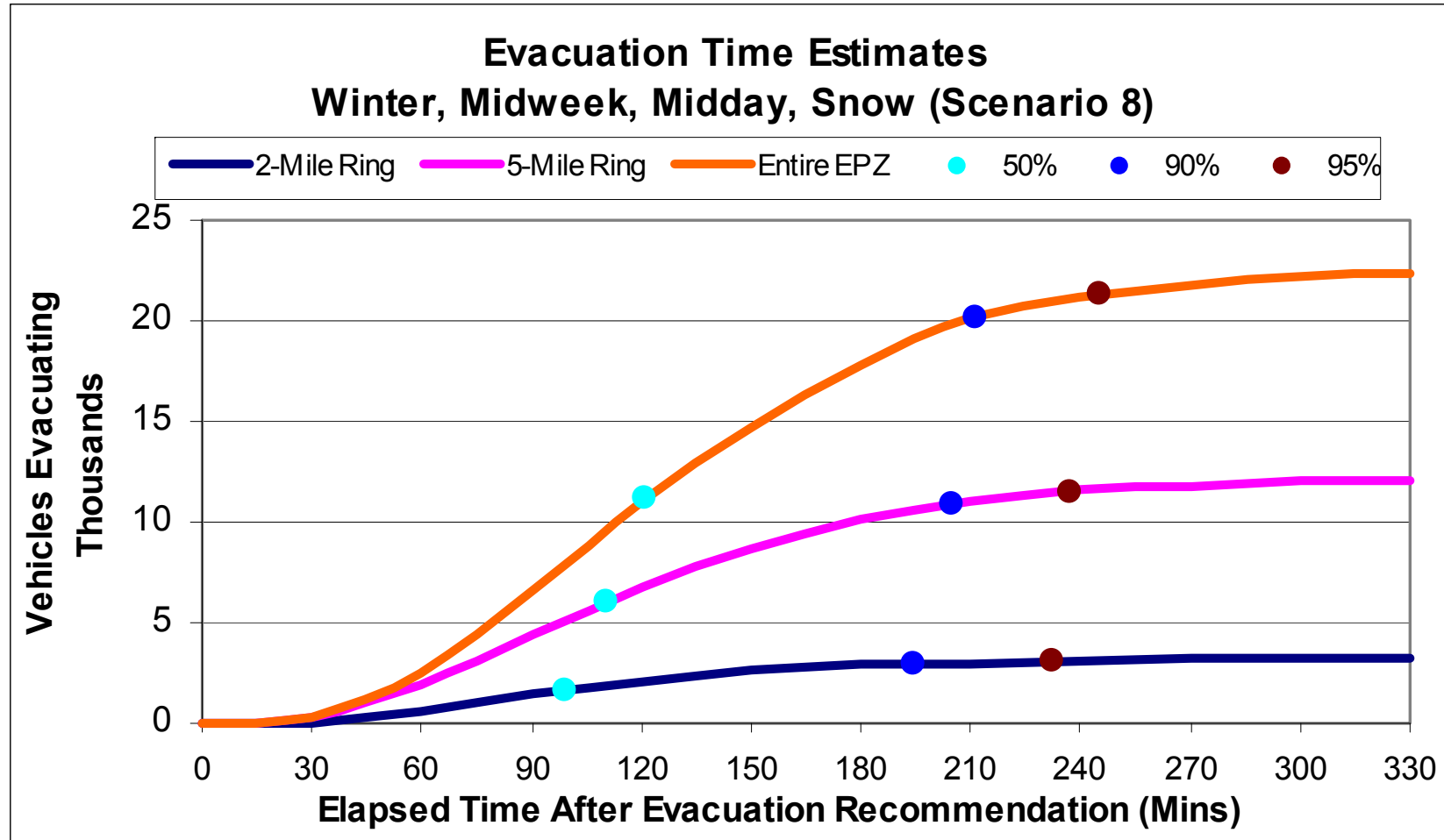


Figure J-8. Evacuation Time Estimates –
Scenario 8 for Region R03 (Entire EPZ)

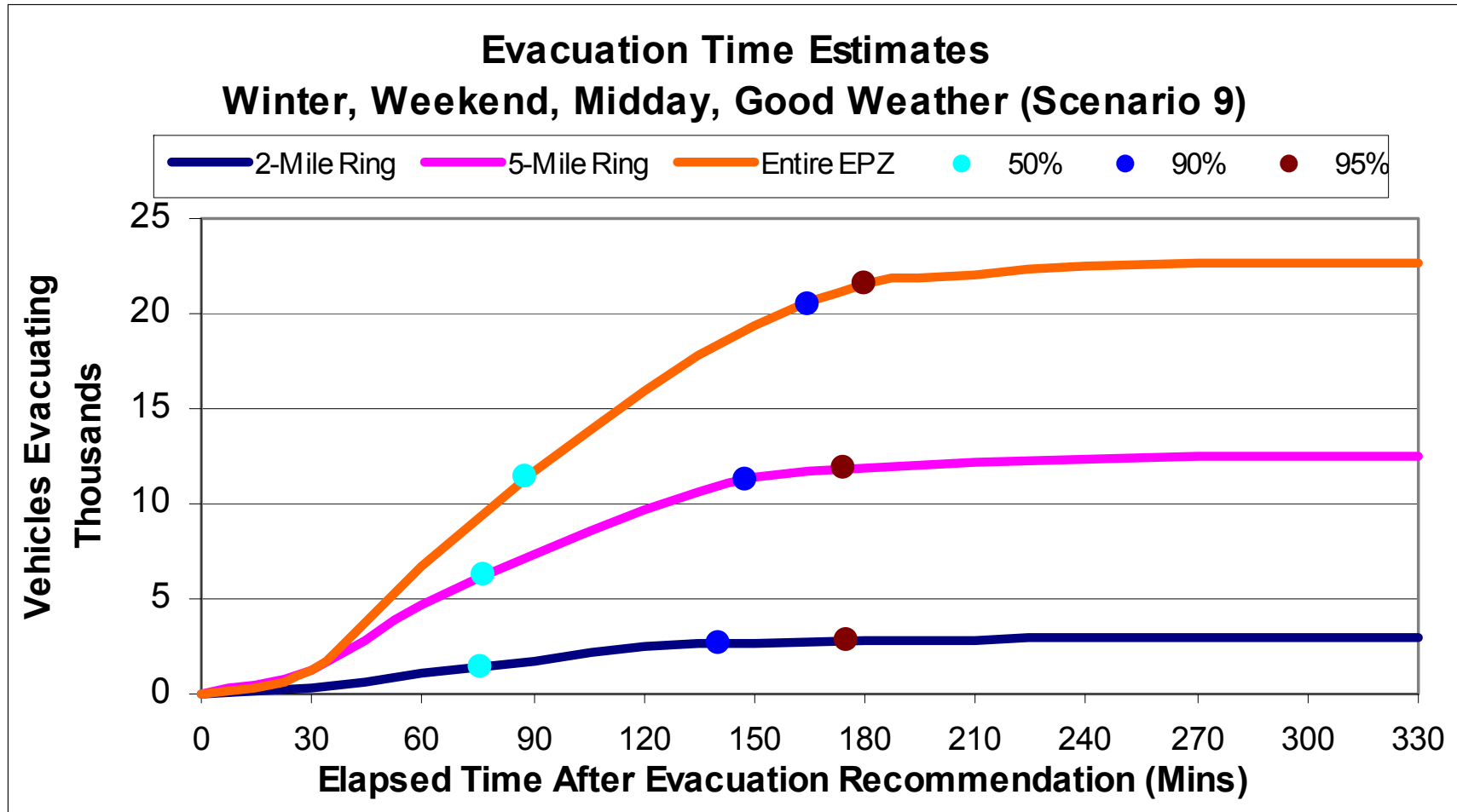


Figure J-9. Evacuation Time Estimates –
Scenario 9 for Region R03 (Entire EPZ)

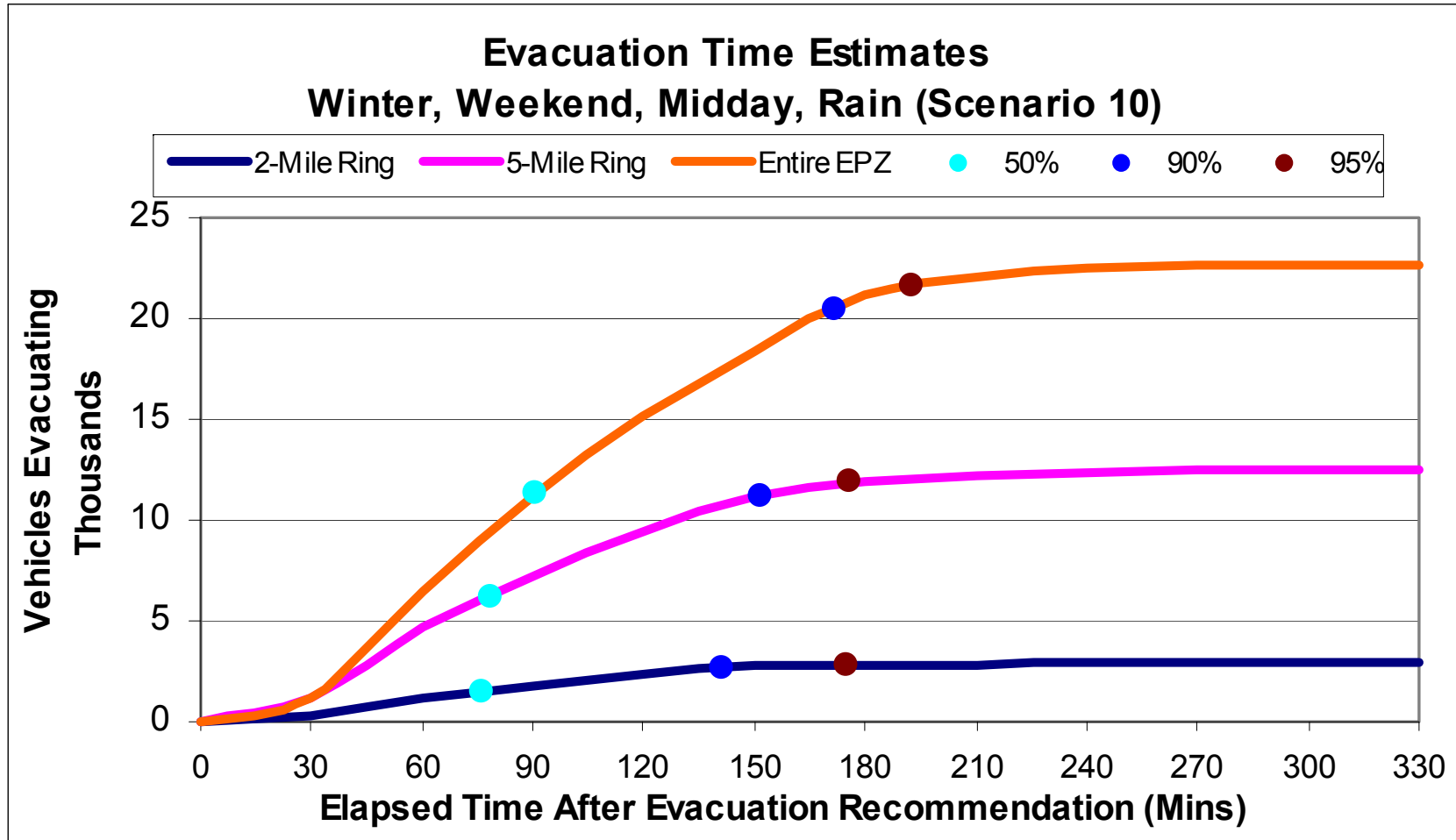


Figure J-10. Evacuation Time Estimates –
Scenario 10 for Region R03 (Entire EPZ)

Evacuation Time Estimates Winter, Weekend, Midday, Snow (Scenario 11)

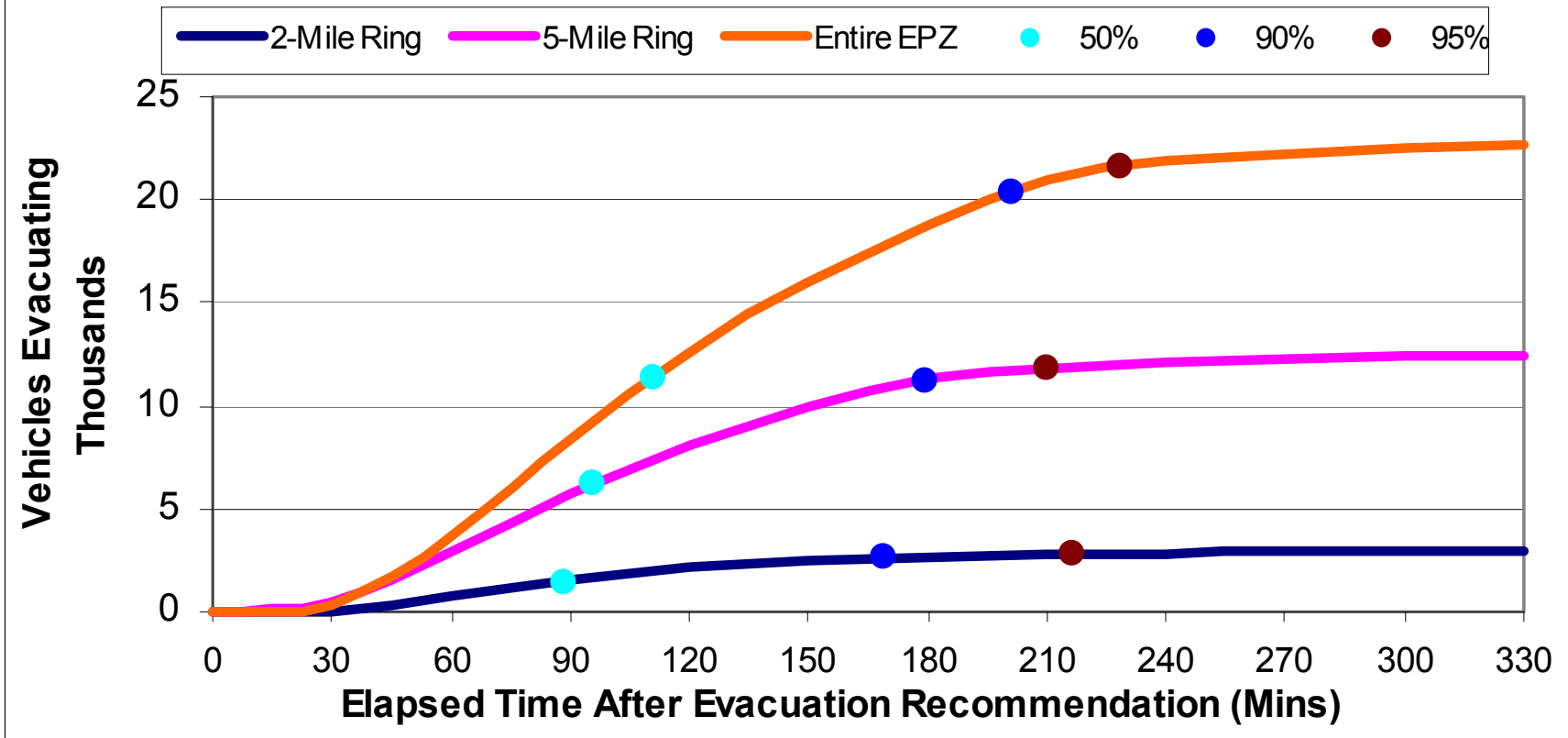


Figure J-11. Evacuation Time Estimates –
Scenario 11 for Region R03 (Entire EPZ)

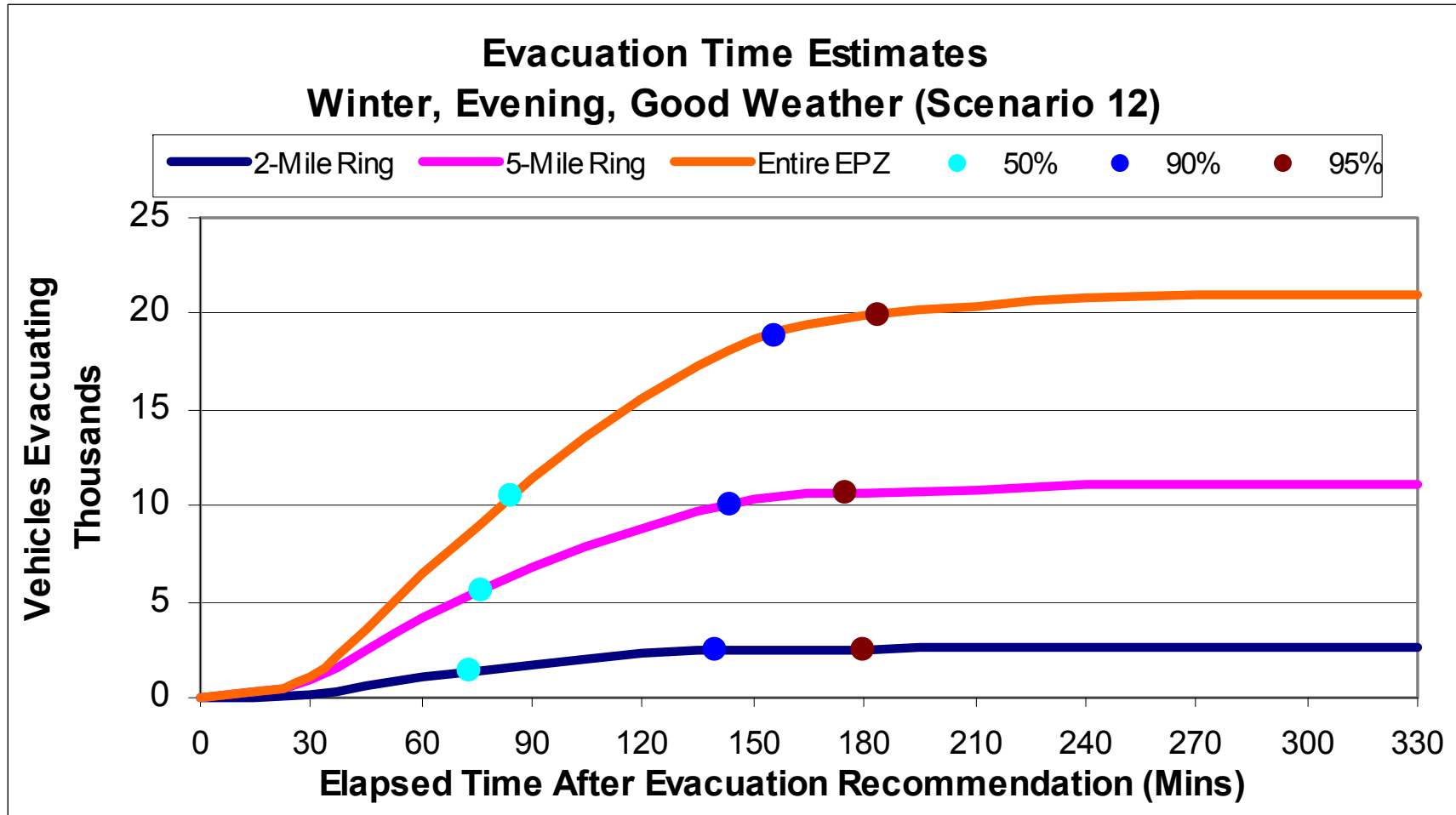


Figure J-12. Evacuation Time Estimates –
Scenario 12 for Region R03 (Entire EPZ)

Evacuation Time Estimates, Summer, Midweek, Midday, New Plant Construction (Scenario 13)

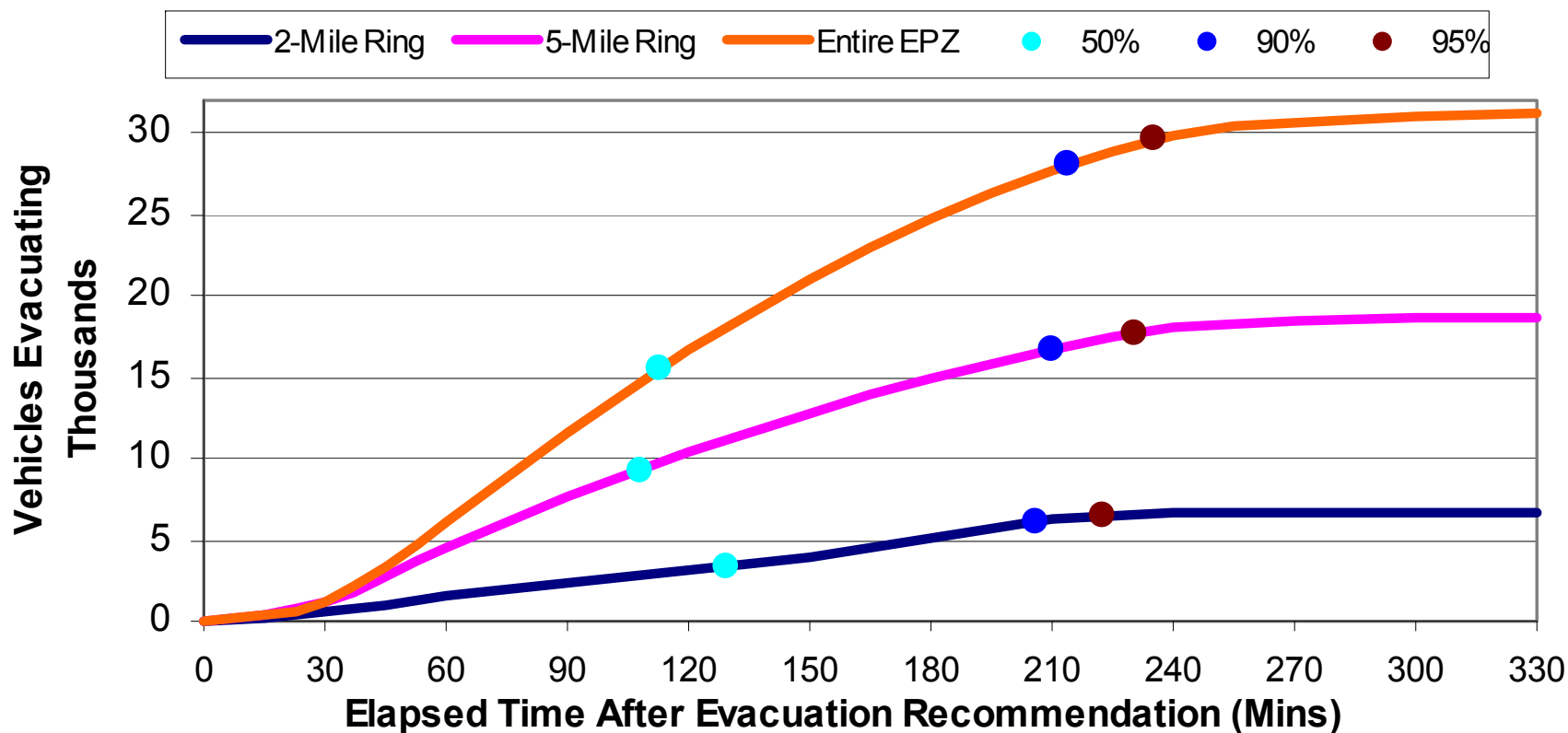


Figure J-13. Evacuation Time Estimates – Scenario 13 for Region R03 (Entire EPZ)

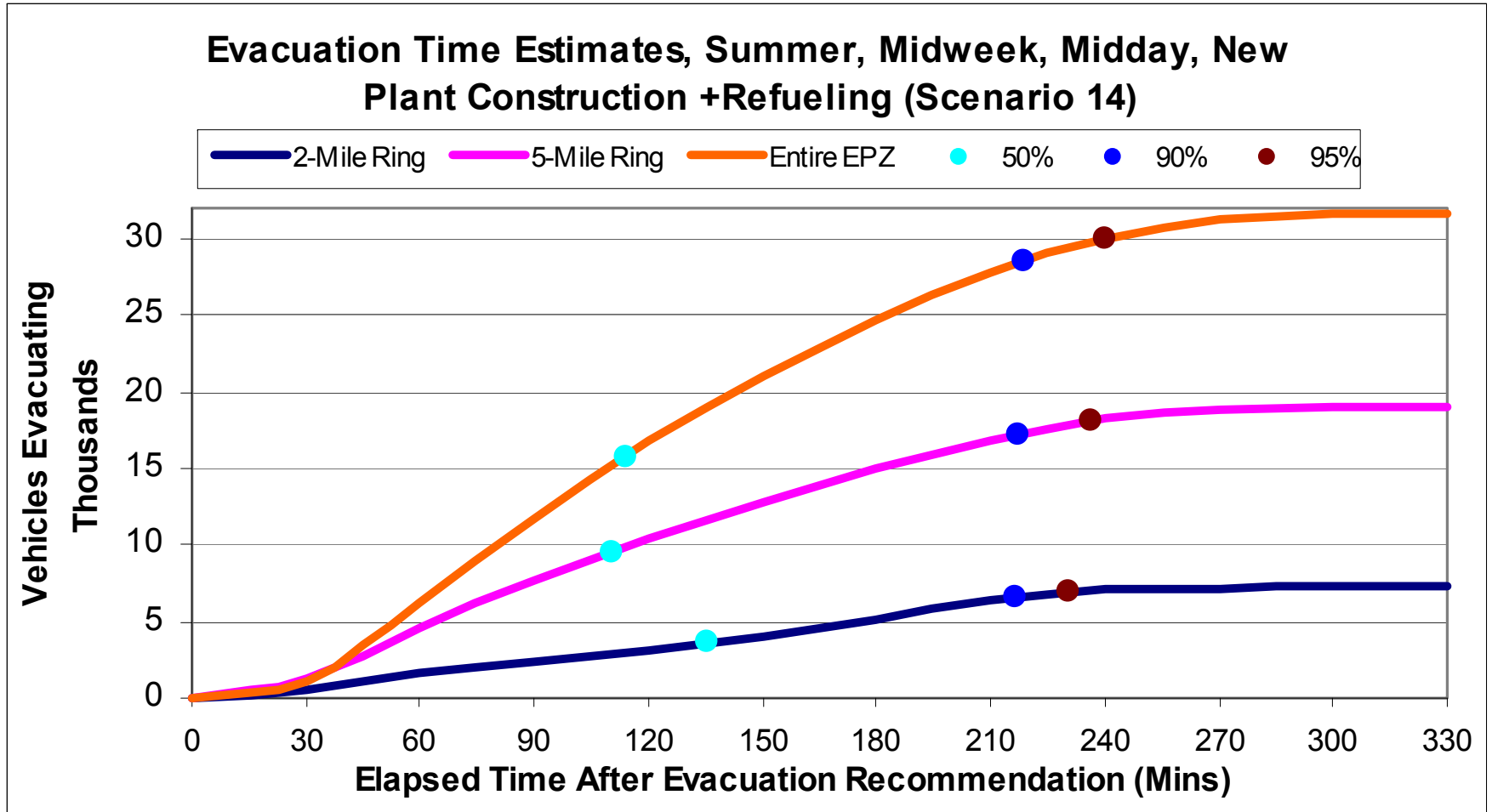


Figure J-14. Evacuation Time Estimates –
Scenario 14 for Region R03 (Entire EPZ)

APPENDIX K

Evacuation Roadway Network Characteristics

Upstream Node Number	Downstream Node Number	Length (Miles * 100)	Full Lanes	Saturation Flow Rate (Veh/hr/ln)	Free Flow Speed (MPH)
1	45	47	1	1714	55
2	194	65	1	1714	45
2	198	110	1	1714	60
2	231	61	1	1714	55
3	241	193	1	1714	40
3	299	37	1	1895	60
3	349	37	1	1714	50
4	347	89	1	1714	50
5	283	137	1	1714	60
6	276	97	1	1714	60
7	378	99	1	1714	60
8	9	126	1	1714	50
9	10	238	1	1714	50
9	379	101	1	1714	40
10	11	256	1	1714	55
10	181	188	1	1714	50
11	12	151	1	1714	55
12	288	38	1	1714	35
13	35	73	1	1714	60
14	482	108	1	1714	60
15	195	298	1	1714	60
16	232	88	1	1714	60
16	370	64	1	1714	60
17	16	75	1	1714	50
18	191	107	1	1714	50
18	311	184	1	1714	50
19	374	54	1	1714	50
19	373	113	1	1714	50
20	223	63	1	1714	45
20	190	197	1	1714	50
20	238	65	1	1714	50
21	193	106	1	1714	45
22	192	128	1	1714	40
23	489	130	1	1714	55
23	285	65	1	1714	55
24	310	54	1	1714	50
24	306	48	1	1714	45
25	308	131	1	1714	50

Upstream Node Number	Downstream Node Number	Length (Miles * 100)	Full Lanes	Saturation Flow Rate (Veh/hr/ln)	Free Flow Speed (MPH)
25	225	98	1	1714	45
26	307	55	1	1500	30
26	224	64	1	1714	55
27	26	61	1	1500	25
27	270	62	1	1714	45
28	255	108	1	1714	45
30	368	111	1	1714	60
30	213	83	1	1714	60
31	214	40	1	1714	40
31	215	107	1	1714	40
32	361	80	1	1714	60
33	359	177	1	1714	60
34	301	69	1	1200	40
35	300	36	1	1200	40
35	14	96	1	1714	60
36	425	48	1	1714	50
36	433	38	1	1714	45
36	199	44	1	1714	50
37	275	100	1	1714	50
37	60	75	1	1714	45
38	470	49	1	1714	50
39	471	17	1	1714	45
40	415	176	1	1714	40
41	42	183	1	1714	40
41	439	154	1	1714	45
42	304	102	1	1714	45
43	235	153	1	1714	45
43	44	75	1	1714	45
45	69	60	1	1714	55
46	298	42	1	1895	60
47	297	66	1	1500	40
48	335	11	1	1200	20
49	334	94	1	1714	55
50	51	57	1	1714	55
51	82	124	1	1714	55
51	52	35	1	1714	45
52	331	52	1	1714	45
53	296	133	1	1714	60

Upstream Node Number	Downstream Node Number	Length (Miles * 100)	Full Lanes	Saturation Flow Rate (Veh/hr/ln)	Free Flow Speed (MPH)
54	185	44	1	1714	60
55	97	182	1	1714	45
55	187	69	1	1714	60
56	48	55	1	1500	35
57	56	88	1	1714	40
58	274	75	1	1714	40
58	281	65	1	1714	45
59	314	63	1	1714	40
59	274	40	1	1714	40
60	248	33	1	1714	40
61	62	58	1	1714	45
62	409	72	1	1714	45
62	411	99	1	1714	45
63	64	110	1	1714	60
63	305	125	1	1714	50
64	312	56	1	1714	60
64	63	110	1	1714	60
65	66	37	1	1200	25
65	182	80	1	1714	45
66	166	9	1	1200	25
66	168	44	1	1200	25
66	65	37	1	1500	35
67	170	26	1	1200	25
67	338	86	1	1500	30
68	70	91	1	1714	55
68	73	83	1	1714	45
68	341	54	1	1714	55
69	124	112	1	1714	55
70	68	91	1	1714	55
71	140	76	1	1714	45
71	74	109	1	1714	40
72	71	143	1	1714	30
74	79	50	1	1714	40
74	125	54	1	1714	40
74	486	120	1	1714	40
75	76	176	1	1714	55
76	77	177	1	1714	50
77	78	144	1	1714	50

Upstream Node Number	Downstream Node Number	Length (Miles * 100)	Full Lanes	Saturation Flow Rate (Veh/hr/ln)	Free Flow Speed (MPH)
78	292	126	1	1714	50
79	91	54	1	1714	40
80	313	75	1	1714	45
81	50	133	1	1714	55
81	278	58	1	1714	40
82	83	99	1	1714	55
83	435	26	1	1714	55
84	85	120	1	1714	55
85	86	144	1	1714	55
86	87	101	1	1714	55
87	88	181	1	1714	55
88	89	194	1	1714	55
89	90	267	1	1714	55
90	445	126	1	1714	55
91	96	197	1	1714	40
92	93	111	1	1714	50
93	94	139	1	1714	50
94	277	95	1	1714	50
95	293	208	1	1714	50
96	99	161	1	1714	40
97	325	48	1	1714	45
98	294	77	2	2250	70
98	291	270	2	2250	70
99	100	56	1	1714	40
100	21	71	1	1714	45
101	102	69	1	1714	40
102	103	39	1	1714	40
103	22	53	1	1714	55
104	103	104	1	1714	55
105	10	46	1	1714	40
106	383	79	1	1714	50
107	406	154	1	1714	50
107	390	44	1	1714	50
108	405	31	1	1714	50
108	406	62	1	1714	50
109	110	174	1	1714	50
110	111	192	1	1714	45
111	118	97	1	1714	40

Upstream Node Number	Downstream Node Number	Length (Miles * 100)	Full Lanes	Saturation Flow Rate (Veh/hr/ln)	Free Flow Speed (MPH)
111	112	44	1	1714	45
112	113	93	1	1714	55
112	315	21	1	1714	45
113	114	179	1	1714	55
113	258	54	1	1714	40
114	115	154	1	1714	55
115	116	193	1	1714	55
116	287	123	1	1714	55
117	135	237	2	1714	60
117	302	120	2	1714	60
118	407	152	1	1714	40
119	286	153	1	1714	45
120	409	178	1	1714	40
120	416	184	1	1714	50
121	132	106	2	1714	60
121	260	71	2	1714	60
122	132	69	1	1714	40
122	318	72	1	1714	45
123	320	33	1	1714	55
124	123	200	1	1714	55
125	130	80	1	1714	40
126	127	90	1	1714	50
127	133	295	2	1714	60
127	134	140	2	1714	60
127	250	73	1	1714	55
128	149	37	3	2250	70
128	150	175	3	2250	70
130	136	158	1	1714	40
131	319	74	1	1714	40
132	121	106	2	1714	60
132	133	206	2	1714	60
132	254	23	1	1714	40
133	127	295	2	1714	60
133	132	206	2	1714	60
134	135	135	2	1714	60
134	127	140	2	1714	60
135	134	135	2	1714	60
135	117	237	2	2118	60

Upstream Node Number	Downstream Node Number	Length (Miles * 100)	Full Lanes	Saturation Flow Rate (Veh/hr/ln)	Free Flow Speed (MPH)
136	137	77	1	1714	40
137	138	43	1	1714	40
138	446	208	1	1714	40
138	139	135	1	1714	40
139	353	48	1	1714	40
140	141	50	1	1714	45
141	144	165	1	1714	45
142	8	212	1	1714	45
144	6	51	1	1714	45
145	167	58	1	1714	45
146	212	159	3	2250	70
147	207	202	3	2250	70
147	148	276	3	2250	70
148	147	276	3	2250	70
148	149	182	3	2250	70
149	128	37	3	2250	70
149	148	182	3	2250	70
150	128	175	3	2250	70
150	151	140	3	2250	70
151	208	192	3	2250	70
151	150	140	3	2250	70
152	267	124	3	2250	70
153	158	53	1	1714	45
154	41	136	1	1714	40
155	156	500	2	2250	70
155	291	55	2	2250	70
156	155	500	2	2250	70
156	290	66	2	2250	70
157	33	93	1	1714	60
158	159	57	1	1714	45
159	160	109	1	1714	40
160	6	35	1	1714	60
161	203	54	1	1714	45
162	215	133	1	1714	60
162	213	107	1	1714	60
163	165	111	1	1714	55
163	80	34	1	1714	55
164	163	41	1	1714	40

Upstream Node Number	Downstream Node Number	Length (Miles * 100)	Full Lanes	Saturation Flow Rate (Veh/hr/ln)	Free Flow Speed (MPH)
165	188	102	1	1714	55
166	170	16	1	1200	25
166	66	9	1	1200	25
166	178	15	1	1200	25
168	66	44	1	1200	25
168	183	48	1	1714	40
169	247	81	2	1714	50
170	67	26	1	1200	30
170	180	25	1	1200	25
170	166	16	1	1200	25
171	7	138	1	1714	60
172	4	87	1	1714	50
173	20	110	1	1714	50
174	8	74	1	1714	45
175	363	79	1	1714	40
176	28	75	1	1714	45
177	410	107	1	1714	45
178	180	12	1	1200	25
179	119	236	1	1714	45
180	168	28	1	1714	40
180	170	25	1	1200	25
181	27	134	1	1500	35
182	65	80	1	1500	35
182	342	64	1	1714	45
183	75	101	1	1714	45
183	168	48	1	1200	25
184	37	119	1	1714	50
185	55	68	1	1714	60
186	295	111	1	1714	45
188	81	97	1	1714	55
189	34	68	1	1200	40
190	20	197	1	1714	50
190	374	174	1	1714	50
191	376	53	1	1714	50
191	18	107	1	1714	50
192	458	65	1	1714	50
193	18	120	1	1714	45
194	2	65	1	1714	45

Upstream Node Number	Downstream Node Number	Length (Miles * 100)	Full Lanes	Saturation Flow Rate (Veh/hr/ln)	Free Flow Speed (MPH)
194	369	160	1	1714	60
195	2	46	1	1714	45
196	15	189	1	1714	60
197	350	49	1	1714	60
198	2	110	1	1714	45
198	366	67	1	1714	60
199	321	168	1	1714	50
200	199	83	1	1714	40
201	184	103	1	1714	40
202	36	26	2	1714	35
203	5	84	1	1714	60
203	282	83	1	1714	50
204	183	132	1	1714	40
205	13	48	1	1714	60
206	211	101	3	2250	70
206	212	107	3	2250	70
207	147	202	3	2250	70
207	269	98	3	2250	70
208	151	192	3	2250	70
208	266	58	3	2250	70
209	204	50	1	1714	40
209	216	44	1	1714	40
211	268	80	3	2250	70
211	206	101	3	2250	70
212	146	159	3	2250	70
212	206	107	3	2250	70
213	30	83	1	1714	60
213	162	107	1	1714	60
214	31	40	1	1714	40
215	162	133	1	1714	60
215	31	107	1	1714	40
216	217	101	1	1714	40
217	218	223	1	1714	40
218	277	91	1	1714	40
219	166	36	1	1200	25
220	219	59	1	1714	40
221	220	88	1	1714	40
222	221	93	1	1500	40

Upstream Node Number	Downstream Node Number	Length (Miles * 100)	Full Lanes	Saturation Flow Rate (Veh/hr/ln)	Free Flow Speed (MPH)
224	26	64	1	1500	25
224	226	70	2	1714	55
226	224	70	2	1714	55
227	222	220	1	1500	40
228	227	115	1	1714	45
228	448	199	1	1714	40
229	309	50	1	1714	50
230	233	62	1	1714	50
232	16	88	1	1714	60
233	25	38	1	1714	50
234	236	55	1	1714	50
236	237	94	1	1714	50
237	173	97	1	1714	50
238	20	65	1	1714	50
239	240	47	1	1714	60
240	196	148	1	1714	60
241	447	80	1	1714	45
242	243	91	1	1714	45
243	244	113	1	1714	40
244	245	71	1	1714	40
245	246	35	1	1714	40
246	312	101	1	1714	45
247	169	81	2	1714	50
247	249	39	2	1714	50
247	266	27	1	1714	50
248	271	104	1	1714	40
249	267	29	1	1714	50
249	302	47	2	1714	50
249	247	39	2	1714	50
250	128	22	1	1714	50
250	251	33	1	1714	40
251	149	25	1	1714	50
251	129	50	1	1714	50
252	268	26	1	1714	50
252	145	32	1	1714	45
253	252	32	1	1714	45
253	269	23	1	1714	50
254	143	92	1	1714	40

Upstream Node Number	Downstream Node Number	Length (Miles * 100)	Full Lanes	Saturation Flow Rate (Veh/hr/ln)	Free Flow Speed (MPH)
255	264	98	1	1714	40
256	257	48	1	1714	45
258	131	137	1	1714	40
259	1	59	1	1714	55
260	289	46	2	1714	60
260	121	71	2	1714	60
261	262	89	2	1714	60
261	288	98	2	1714	60
262	261	89	2	1714	60
262	263	81	2	1714	60
263	264	155	2	1714	60
263	262	81	2	1714	60
264	263	155	2	1714	60
264	265	41	2	1714	60
264	256	36	1	1714	40
265	264	41	2	1714	60
266	208	58	3	2250	70
266	267	44	3	2250	70
267	266	44	3	2250	70
267	152	124	3	2250	70
268	211	80	3	2250	70
268	269	41	3	2250	70
269	268	41	3	2250	70
269	207	98	3	2250	70
270	176	134	1	1714	45
271	272	34	1	1714	45
272	273	43	1	1714	45
273	59	92	1	1714	40
274	59	40	1	1714	40
274	58	75	1	1714	40
275	38	82	1	1714	50
276	171	139	1	1714	60
277	324	79	1	1714	50
278	92	74	1	1714	45
279	49	78	1	1714	50
280	50	63	1	1714	55
281	434	50	1	1714	45
281	58	65	1	1714	40

Upstream Node Number	Downstream Node Number	Length (Miles * 100)	Full Lanes	Saturation Flow Rate (Veh/hr/ln)	Free Flow Speed (MPH)
282	172	124	1	1714	50
283	160	51	1	1714	60
284	142	108	1	1714	50
285	284	94	1	1714	50
286	42	62	1	1714	45
287	302	78	1	1714	55
288	253	46	1	1714	45
288	289	91	2	1714	60
288	261	98	2	1714	60
289	288	91	2	1714	60
289	260	46	2	1714	60
290	330	159	2	2250	70
290	156	66	2	2250	70
291	155	55	2	2250	70
291	98	270	2	2250	70
292	322	55	1	1714	50
292	290	34	1	1714	50
293	155	39	1	1714	50
293	323	47	1	1714	40
294	98	77	2	2250	70
294	328	38	2	2250	70
295	327	41	1	1714	40
295	294	35	1	1714	50
296	54	163	1	1714	60
297	48	24	1	1500	35
298	47	95	1	1895	60
299	345	91	1	1895	65
300	189	43	1	1200	40
301	354	29	1	1200	40
302	117	120	2	1714	60
302	249	47	2	1714	50
302	303	124	2	1714	60
303	302	124	2	1714	60
304	43	124	1	1714	45
305	63	125	1	1714	50
305	335	27	1	1500	35
307	229	62	1	1714	45
308	24	149	1	1714	50

Upstream Node Number	Downstream Node Number	Length (Miles * 100)	Full Lanes	Saturation Flow Rate (Veh/hr/ln)	Free Flow Speed (MPH)
309	230	26	1	1714	50
310	234	43	1	1714	50
311	17	80	1	1714	50
312	64	56	1	1714	60
312	342	63	1	1714	45
313	65	101	1	1714	40
314	408	116	1	1714	40
315	316	134	1	1714	50
315	259	106	1	1714	55
316	126	180	1	1714	50
317	61	45	1	1714	40
318	121	12	1	1714	40
319	134	121	1	1714	40
320	122	103	1	1714	50
321	4	101	1	1714	50
322	156	46	1	1714	50
323	291	43	1	1714	50
324	95	95	1	1714	50
325	326	58	1	1714	45
326	186	46	1	1714	45
327	328	33	1	1714	50
328	329	154	2	2250	70
328	294	38	2	2250	70
329	328	154	2	2250	70
330	290	159	2	2250	70
331	332	44	1	1714	45
332	333	112	1	1714	45
333	53	80	1	1714	60
334	280	77	1	1714	55
335	305	27	1	1500	35
335	279	60	1	1500	35
336	335	12	1	1500	35
337	341	35	1	1714	55
337	340	118	1	1714	55
338	67	86	1	1500	30
338	339	103	1	1714	55
339	338	103	1	1714	55
339	340	51	1	1714	55

Upstream Node Number	Downstream Node Number	Length (Miles * 100)	Full Lanes	Saturation Flow Rate (Veh/hr/ln)	Free Flow Speed (MPH)
340	337	118	1	1714	55
340	339	51	1	1714	55
341	337	35	1	1714	55
341	68	54	1	1714	55
342	182	64	1	1714	45
342	312	63	1	1714	45
343	46	35	1	1895	60
344	343	34	1	1895	60
345	346	35	1	1895	60
346	344	77	1	1895	60
347	348	22	1	1714	50
348	3	36	1	1714	45
349	352	67	1	1714	60
350	351	65	1	1714	60
351	205	45	1	1714	60
352	197	79	1	1714	60
353	352	56	1	1500	35
354	355	130	1	1200	40
355	356	67	1	1714	50
356	357	52	1	1714	40
357	358	38	1	1500	40
358	157	28	1	1500	40
359	360	99	1	1714	60
360	32	83	1	1714	60
361	362	71	1	1714	50
362	175	56	1	1500	40
363	364	42	1	1714	40
364	365	55	1	1714	40
365	31	33	1	1714	40
366	367	55	1	1714	60
366	198	67	1	1714	60
367	368	53	1	1714	60
367	366	55	1	1714	60
368	30	111	1	1714	60
368	367	53	1	1714	60
369	370	48	1	1714	60
369	194	160	1	1714	60
370	369	48	1	1714	60

Upstream Node Number	Downstream Node Number	Length (Miles * 100)	Full Lanes	Saturation Flow Rate (Veh/hr/ln)	Free Flow Speed (MPH)
370	16	64	1	1714	60
371	311	82	1	1714	40
372	371	59	1	1714	40
373	19	113	1	1714	50
373	375	52	1	1714	50
374	19	54	1	1714	50
374	190	174	1	1714	50
375	376	34	1	1714	50
375	373	52	1	1714	50
376	375	34	1	1714	50
376	191	53	1	1714	50
377	174	48	1	1714	50
378	377	116	1	1714	50
379	380	51	1	1714	40
380	381	141	1	1714	40
381	309	109	1	1714	40
382	384	51	1	1714	45
383	382	42	1	1714	45
383	387	154	1	1714	40
384	385	98	1	1714	45
385	9	146	1	1714	45
386	105	51	1	1714	50
387	386	107	1	1714	50
388	106	42	1	1714	50
389	388	63	1	1714	50
390	389	73	1	1714	50
391	392	56	1	1714	40
392	397	29	1	1714	40
392	393	95	1	1714	40
393	394	35	1	1714	40
394	395	80	1	1714	40
394	422	93	1	1500	35
395	396	176	1	1714	40
396	108	25	1	1714	40
397	398	76	1	1714	40
398	399	70	1	1714	40
399	400	147	1	1714	40
399	153	149	1	1714	45

Upstream Node Number	Downstream Node Number	Length (Miles * 100)	Full Lanes	Saturation Flow Rate (Veh/hr/ln)	Free Flow Speed (MPH)
400	401	48	1	1714	40
400	490	103	1	1714	40
401	402	134	1	1714	40
402	403	83	1	1714	40
403	404	45	1	1714	40
404	107	25	1	1714	40
405	109	121	1	1714	50
406	107	154	1	1714	50
406	108	62	1	1714	50
407	179	69	1	1714	40
408	317	88	1	1714	40
409	177	86	1	1714	45
410	39	31	1	1714	45
411	412	172	1	1714	45
412	413	103	1	1714	45
412	436	33	1	1500	40
413	414	193	1	1714	45
414	86	43	1	1714	40
415	154	114	1	1714	40
416	417	49	1	1714	40
417	39	107	1	1714	40
418	416	38	1	1714	45
419	424	104	1	1714	40
420	419	50	1	1714	40
421	423	69	1	1714	40
422	421	24	1	1500	35
423	420	62	1	1714	40
424	418	156	1	1714	40
425	184	110	1	1714	50
426	202	19	1	1714	35
427	426	74	1	1714	35
428	429	82	1	1714	45
429	430	74	1	1714	45
430	431	48	1	1714	45
431	432	85	1	1714	45
432	434	82	1	1714	45
433	428	50	1	1714	45
434	57	71	1	1714	40

Upstream Node Number	Downstream Node Number	Length (Miles * 100)	Full Lanes	Saturation Flow Rate (Veh/hr/ln)	Free Flow Speed (MPH)
434	281	50	1	1714	45
435	84	139	1	1714	55
436	437	117	1	1714	40
437	435	109	1	1500	40
438	41	150	1	1714	45
439	440	151	1	1714	45
440	441	43	1	1714	45
441	442	126	1	1714	45
442	443	160	1	1714	45
443	444	124	1	1714	40
445	444	58	1	1714	55
446	35	45	1	1714	40
447	228	157	1	1714	40
447	242	93	1	1714	40
448	449	348	1	1714	40
449	337	283	1	1714	40
450	453	194	1	1714	40
450	451	189	1	1714	40
450	455	63	1	1714	40
451	452	235	1	1714	40
452	381	153	1	1714	40
453	454	124	1	1714	40
454	24	31	1	1714	40
455	456	171	1	1714	40
456	457	214	1	1714	40
457	458	137	1	1714	40
458	21	95	1	1714	40
459	460	103	1	1714	40
459	461	130	1	1714	40
460	124	128	1	1714	40
461	462	275	1	1714	40
461	463	126	1	1714	40
462	387	75	1	1714	40
463	464	137	1	1714	40
464	122	49	1	1714	40
465	87	83	1	1714	40
466	465	84	1	1714	40
467	466	64	1	1714	40

Upstream Node Number	Downstream Node Number	Length (Miles * 100)	Full Lanes	Saturation Flow Rate (Veh/hr/ln)	Free Flow Speed (MPH)
467	468	86	1	1714	40
468	469	73	1	1714	40
469	54	89	1	1714	40
470	120	93	1	1714	50
471	472	96	1	1714	40
471	40	99	1	1714	45
472	473	72	1	1714	40
473	474	190	1	1714	40
474	475	57	1	1714	40
475	476	119	1	1714	40
476	88	118	1	1714	40
477	201	107	1	1714	40
478	459	82	1	1714	40
479	480	77	1	1714	40
479	478	112	1	1714	40
480	481	39	1	1714	40
481	406	75	1	1714	40
482	239	54	1	1714	60
483	482	116	1	1714	40
484	483	47	1	1714	40
485	484	86	1	1714	40
486	101	85	1	1714	40
487	23	84	1	1714	40
488	171	81	1	1714	40
488	487	90	1	1714	40
489	104	144	1	1714	55
490	388	302	1	1714	40

APPENDIX L

Protective Action Zone Boundaries

APPENDIX L: PROTECTIVE ACTION ZONE BOUNDARIES

- Zone 1: Not Being Used
- Zone 2: Town of Mineral
- Zone 3: Area bounded on the north by Routes 22 and 208, south by Routes 605 and 643, east by Routes 33 and 522 and the Mineral town line, and west by Routes 644 and 33 and the Louisa town line.
- Zone 4: Area bounded on the north by Route 208, south by Routes 618 and 667, east by Lake Anna, Contrary Creek and Routes 652 and 700, and west by Routes 208 and 522.
- Zone 5: Area bounded on the north by Route 618, south by Routes 33 and 657, east by Route 609, and west by Routes 522 and 33.
- Zone 6: Area bounded on the north by Route 652, south by Route 618, east by Route 614, and west by Route 700.
- Zone 7: Area bounded on the northwest by Route 614, northeast by Route 652, east by Route 650, and southwest by Route 618.
- Zone 8: Area bounded on the northeast by Lake Anna, southeast by Route 614, northwest by Contrary Creek and southwest by Route 652.
- Zone 9: Area bounded on the north by Route 713 and northeast by Route 601, south by Lake Anna, east by Route 614, and west by Route 208 and Lake Anna.
- Zone 10: Area bounded on the north by Lake Anna, south by Route 622, east by Lake Anna and Route 622, and west by Routes 652 and 614.
- Zone 11: Area bounded on the north by Route 657, south by Route 622, east by Route 738, and west by Lake Anna and Route 614.
- Zone 12: Area bounded on the north by Bluff Run and Glebe Run, south by Routes 657, 614, 601 and 713, east by Route 738, and west by Route 208.
- Zone 13: Area bounded on the north by Route 606, south by Route 208, east by Routes 208 and 650, and west by Routes 612, 601, and 655.
- Zone 14: Area bounded on the north by Routes 601 and 612, south by Lake Anna and Route 208, east by Routes 655, and west by Routes 612, and 719.

- Zone 15: Area bounded on the north by Lake Anna, south by Route 208, east by Lake Anna, and west by Routes 522, and 719.
- Zone 16: Area bounded on the north by Lake Anna, south by Routes 22 and 208 and the Louisa town line, east by Routes 719, 522, and 208, and west by Colonial Pipeline.
- Zone 17: Area bounded on the north by Routes 653 and 629, south by Orange/Louisa County line (North Anna River), east by Orange/Spotsylvania County line, and west by Colonial Pipeline.
- Zone 18: Area bounded on the northeast by Routes 608 and 606, south by Spotsylvania/Louisa County line (North Anna River), east by Routes 612, and 719, and west by Spotsylvania/Orange County line.
- Zone 19: Area bounded on the north by Route 608, south by Route 606, east by Route 612, and west by Route 606.
- Zone 20: Area bounded on the north by Route 608, south by Route 208, east by Routes 649 and 606, and west by Routes 612, 606 and 650.
- Zone 21: Area bounded on the north by Routes 208 and 606, south by Route 605, east by Routes 647 and 738, and west by Bluff Run, Glebe Run, and Route 738.
- Zone 22: Area bounded on the north by Routes 604 and 605, south by North Anna River, east by Spotsylvania/Caroline County line, and west by Routes 622 and 738.
- Zone 23: Area bounded on the northeast by Route 738, south by North Anna River, east by Route 738, and west by Caroline/Spotsylvania County line.
- Zone 24: Area bounded on the north by North Anna River, south by Routes 608, 680, 729, 658, 715, 739 and 800, east by Route 738, and North Anna River, and west by Hanover/Louisa County line.
- Zone 25: Area bounded on the north by North Anna River, south by Routes 652, 701, and 601, east by Route 601, and west by Routes 622 and 652.
- Zone 26: Area bounded on the north by North Anna River, south by Routes 33, 655, 701 and 608, east by Louisa/Hanover County line, and west by Routes 609, 650, 652 and 601.