7 GENERAL POPULATION EVACUATION TIME ESTIMATES (ETE)

This section presents the ETE results of the computer analyses using the DYNEV II System described in Appendices B, C and D. These results cover 55 evacuation regions within the Beaver Valley Power Station EPZ and the 14 evacuation scenarios discussed in Section 6.

The ETE for all evacuation cases are presented in Table 7-1 and Table 7-2. These tables present the estimated times to clear the indicated population percentages from the evacuation regions for all evacuation scenarios. The ETE of the 2-mile region in both staged and un-staged regions are presented in Table 7-3 and Table 7-4. Table 7-5 and Table 7-6 defines the evacuation regions considered. The tabulated values of ETE are obtained from the DYNEV II System outputs which are generated at 5-minute intervals.

7.1 Voluntary Evacuation and Shadow Evacuation

"Voluntary evacuees" are people within the EPZ in sub-areas for which an Advisory to Evacuate has not been issued, yet who elect to evacuate. "Shadow evacuation" is the voluntary outward movement of some people from the Shadow Region (outside the EPZ) for whom no protective action recommendation has been issued. Both voluntary and shadow evacuations are assumed to take place over the same time frame as the evacuation from within the impacted evacuation region.

The ETE for the Beaver Valley Power Station EPZ addresses the issue of voluntary evacuees in the manner shown in Figure 7-1. Within the EPZ, 20 percent of people located in sub-areas outside of the evacuation region who are not advised to evacuate, are assumed to elect to evacuate. Similarly, it is assumed that 20 percent of those people in the shadow region will choose to leave the area.

Figure 7-2 presents the area identified as the Shadow Region. This region extends radially from the plant to cover a region between the EPZ boundary and approximately 15 miles. The population and number of evacuating vehicles in the Shadow Region were estimated using the same methodology that was used for permanent residents within the EPZ (see Section 3.1). As discussed in Section 3.2, it is estimated that a total of 136,962 people reside in the Shadow Region; 20 percent of them would evacuate. See Table 6-5 for the number of evacuating vehicles from the Shadow Region.

Traffic generated within this Shadow Region, traveling away from the Beaver Valley Power Station, has a potential for impeding evacuating vehicles from within the evacuation region. All ETE calculations include this shadow traffic movement.

7.2 Staged Evacuation

As defined in NUREG/CR-7002, staged evacuation consists of the following:

1. Sub-areas comprising the 2 mile region are advised to evacuate immediately.

2. Sub-areas comprising regions extending from 2 to 5 miles downwind are advised to shelter in-place while the 2 mile region is cleared.
3. As vehicles evacuate the 2 mile region, people from 2 to 5 miles downwind continue preparation for evacuation while they shelter.
4. The population sheltering in the 2 to 5 mile region is advised to evacuate when approximately 90% of the 2 mile region evacuating traffic crosses the 2 mile region boundary.
5. Non-compliance with the shelter recommendation is the same as the shadow evacuation percentage of 20%.

See Section 5.4.2 for additional information on staged evacuation.

7.3 Patterns of Traffic Congestion during Evacuation

Figure 7-3 through Figure 7-9 illustrate the patterns of traffic congestion that arise for the case when the entire EPZ (region R03) is advised to evacuate during the summer, midweek, midday period under good weather conditions (scenario 1).

Traffic congestion, as the term is used here, is defined as Level of Service (LOS) F. LOS F is defined as follows (HCM 2010, page 5-5):

> The HCM uses LOS F to define operations that have either broken down (i.e., demand exceeds capacity) or have exceeded a specified service measure value, or combination of service measure values, that most users would consider unsatisfactory. However, particularly for planning applications where different alternatives may be compared, analysts may be interested in knowing just how bad the LOS F condition is. Several measures are available to describe individually, or in combination, the severity of a LOS F condition:
>
> • *Demand-to-capacity ratios* describe the extent to which capacity is exceeded during the analysis period (e.g., by 1%, 15%, etc.);
>
> • *Duration of LOS F* describes how long the condition persists (e.g., 15 min, 1 h, 3 h); and
>
> • *Spatial extent measures* describe the areas affected by LOS F conditions. These include measures such as the back of queue, and the identification of the specific intersection approaches or system elements experiencing LOS F conditions.

All highway "links" which experience LOS F are delineated in these figures by a thick red line; all others are lightly indicated. Congestion develops rapidly around concentrations of population and traffic bottlenecks. Figure 7-3 displays the developing congestion within the population centers of Monaca Borough and Beaver Township within the EPZ, and in Crescent Township and New Cumberland within the Shadow Region at 30 minutes after the Advisory to Evacuate (ATE).

At 1 hour after the ATE, Figure 7-4 displays fully-developed congestion within the study area. Pronounced congestion exists in the population centers of Aliquippa, Beaver, Beaver Falls,

Crescent, and Monaca in Pennsylvania; Calcutta and East Liverpool in Ohio; and Chester and New Cumberland in West Virginia. Congestion also exists in sub-area P-2 along State Route (SR) 168 northbound at the traffic control point at the intersection with Tuscarawas Rd as SR 168 jogs to the west. All evacuees from Midland Borough evacuate northbound on SR 168 and traverse this intersection. This congestion does not propagate into the 2-mile region. There are never LOS F conditions in the 2-mile region. Congestion has also developed farther north on SR 168 at the intersection with SR 251 and southbound on SR 168 at the intersection with SR 18 in sub-area P-12. Congestion also exists in New Manchester in sub-area W-3 as vehicles are using County Highway 2/6 southbound toward the reception center in Weirton to avoid the congestion on SR 2.

At 2 hours and 10 minutes after the ATE, as shown in Figure 7-5, traffic congestion within the 5-mile region clears along SR 168 clears northbound leaving sub-area P-2. Congestion has cleared in Chester and East Liverpool; however, pronounced congestion persists in Aliquippa, Beaver, Calcutta and Monaca. Pronounced congestion also persists in New Cumberland as most evacuation routes servicing the West Virginia portion of the EPZ end up on SR 2 which is a single lane, low speed, and low capacity route through New Cumberland. This congestion propagates northbound along SR 2 for approximately 6½ miles, but does not penetrate the EPZ boundary. Congestion persists along SR 168 northbound through sub-area P-7 and southbound in sub-area P-12. I-376 is congested in both directions east of the plant. Those evacuation routes with access ramps to I-376 – especially Tuscarawas Rd eastbound along the periphery of sub-area P-3 – are also heavily congested.

At 3 hours after the ATE, as shown in Figure 7-6, traffic congestion in the 5-mile region persists along the boundary of sub-area P-3 along Tuscarawas Rd eastbound. The Ohio portion of the EPZ is clear of traffic congestion at this time. Congestion has cleared in Beaver and Monaca in Pennsylvania. Pronounced congestion persists along SR 2 through New Cumberland and on westbound county highways which intersect SR 2. Congestion along SR 168 has cleared in both directions. I-376 is still congested in both directions, but is beginning to clear. There is significant congestion in the Shadow Region to the northeast in Rochester and to the southeast in the vicinity of the Pittsburgh International Airport. SR 51 southbound is congested from the EPZ boundary (Crescent Township) to Aliquippa.

At 4 hours and 30 minutes (the completion of mobilization time) after the ATE (Figure 7-7), the last of the traffic congestion within the EPZ clears along SR 51 southbound in Crescent Township. Congestion still persists in the Shadow Region east of the plant along I-376 eastbound where it merges with the Airport Expressway. Congestion is still exhibited in New Cumberland; however, this congestion is in the Shadow Region and does not impact ETE.

Figure 7-8 shows the last remaining congestion in the study area along SR 2 southbound at 5 hours after the ATE. The last of this congestion clears at 15 minutes later at 5 hours and 15 minutes after the ATE as shown in Figure 7-9.

7.4 Evacuation Rates

Evacuation is a continuous process, as implied by Figure 7-10 through Figure 7-23. These Figures indicate the rate at which traffic flows out of the indicated areas for the case of an evacuation of the full EPZ (region R03) under the indicated conditions. One figure is presented for each scenario considered.

As indicated in Figure 7-10, there is typically a long "tail" to these distributions. Vehicles begin to evacuate an area slowly at first, as people respond to the ATE at different rates. Then traffic demand builds rapidly (slopes of curves increase). When the system becomes congested, traffic exits the EPZ at rates somewhat below capacity until some evacuation routes have cleared. As more routes clear, the aggregate rate of egress slows since many vehicles have already left the EPZ. Towards the end of the process, relatively few evacuation routes service the remaining demand.

This decline in aggregate flow rate, towards the end of the process, is characterized by these curves flattening and gradually becoming horizontal. Ideally, it would be desirable to fully saturate all evacuation routes equally so that all will service traffic near capacity levels and all will clear at the same time. For this ideal situation, all curves would retain the same slope until the end – thus minimizing evacuation time. In reality, this ideal is generally unattainable reflecting the spatial variation in population density, mobilization rates and in highway capacity over the EPZ.

7.5 Evacuation Time Estimates (ETE) Results

Table 7-1 through Table 7-2 present the ETE values for all 55 evacuation regions and all 14 evacuation scenarios. Table 7-3 through Table 7-4 present the ETE values for 2-mile region for both staged and un-staged 5-mile regions. They are organized as follows:

Table	Contents
7-1	ETE represents the elapsed time required for 90 percent of the population within a region, to evacuate from that region. All scenarios are considered, as well as staged evacuation scenarios.
7-2	ETE represents the elapsed time required for 100 percent of the population within a region, to evacuate from that region. All scenarios are considered, as well as staged evacuation scenarios.
7-3	ETE represents the elapsed time required for 90 percent of the population within the 2-mile region, to evacuate from that region with both concurrent and staged evacuations.
7-4	ETE represents the elapsed time required for 100 percent of the population within the 2-mile region, to evacuate from that region with both concurrent and staged evacuations.

The animation snapshots described above reflect the ETE statistics for the concurrent (un-staged) evacuation scenarios and regions, which are displayed in Figure 7-3 through Figure 7-9. Most of the congestion is located beyond the 2-mile region; this is reflected in the ETE statistics:

- The 90th percentile ETE for region R01 (2-mile region) is 2:00 or less for all non-snow scenarios.
- The 90th percentile ETE for region R02 (5-mile region) are about 25 minutes longer than R01, on average, due to the congestion on the boundary of sub-area P-3 trying to access I-376, shown in Figure 7-5.
- The 90th percentile ETE for region R03 (full EPZ) are about 45 minutes longer than R02 on average due to the pronounced congestion beyond the 5-mile region, primarily in Aliquippa and along I-376 westbound, as shown in Figure 7-6.

The 100th percentile ETE for all regions and for all scenarios are approximately equal to mobilization time. This fact implies that the congestion within the EPZ dissipates prior to the end of mobilization, as displayed in Figure 7-7.

Comparison of scenarios 3 and 13 in Table 7-1 indicates that the Special Event – the Hookstown Fair – has no material impact on ETE for the 90th percentile, which increase by at most 10 minutes; the 100th percentile ETE are unchanged. The additional 413 vehicles present for the special event increase congestion on the local roads in sub-area P-6, but do not cause congestion that persists longer than the congestion in Aliquippa.

Comparison of scenarios 1 and 14 in Table 7-1 indicates that the roadway closure – one lane westbound on I-376 – has a significant impact on 90th percentile ETE, which increase by as much as 35 minutes for regions with wind directions from the southwest and west (regions R26 – R28). Winds from the southwest and west carry the plume over Beaver and Monaca. Evacuees from these areas primarily use I-376 westbound. With a lane closed on I-376 westbound in the Beaver township area, the capacity is reduced in half, increasing congestion and prolonging ETE. Regions with winds from the north and east would not be using I-376 westbound to evacuate and are not materially impacted by the decreased capacity westbound along I-376. The 100th percentile ETE are unchanged by the roadway closure.

7.6 Staged Evacuation Results

Table 7-3 and Table 7-4 present a comparison of the ETE for the 2-mile area compiled for concurrent (un-staged) and staged evacuation of regions extending to 5 miles. Note that regions R07 through R15 and region R02 are the same geographic areas as regions R46 through R55, respectively.

To determine whether the staged evacuation strategy is worthy of consideration, one must show that the ETE for the 2-mile region can be reduced without significantly affecting the region between 2 miles and 5 miles. As shown in Table 7-3 and Table 7-4, the ETE for the 2-mile are unchanged when implementing a staged evacuation. The 2-mile region ETE are the same regardless of which sub-areas beyond 2 miles evacuate. As shown in Figure 7-3 through Figure

7-9, traffic congestion (LOS F) does not propagate into the 2-mile region. Thus, staging evacuation to reduce congestion from 2 to 5 miles does not change congestion patterns for the 2-mile region.

While staging evacuation does not provide any benefits to evacuees within 2 miles of the BVPS, staging produces a negative impact on ETE for those evacuating from within the 2 to 5-mile area. A comparison of ETE between regions R07 and R46; R08 and R47; R09 and R48; R10 and R49; R11 and R50; R12 and R51; R13 and R52; R14 and R53; R15 and R54; and R02 and R55, reveals that staging retards the 90th percentile evacuation time for those in the 2 to 5-mile area by up to 1 hour and 5 minutes (See Table 7-1). This extending of ETE is due to the delay in beginning the evacuation trip, experienced by those who shelter, plus the effect of the trip-generation "spike" (significant volume of traffic beginning the evacuation trip at the same time – see Figure 5-5) that follows their eventual ATE, in creating congestion within the EPZ area beyond 2 miles.

In summary, staged evacuation does not reduce the ETE for the 2-mile region, while prolonging the ETE for those evacuees beyond 2 miles by as much as 1 hour and 5 minutes. Staged evacuation is not beneficial for the BVPS EPZ.

7.7 Guidance on Using ETE Tables

The user first determines the percentile of population for which the ETE is sought (The NRC guidance calls for the 90th percentile). The applicable value of ETE within the chosen Table may then be identified using the following procedure:

1. Identify the applicable **scenario**:
   - Season
     - Summer
     - Winter (also Autumn and Spring)
   - Day of Week
     - Midweek
     - Weekend
   - Time of Day
     - Midday
     - Evening
   - Weather Condition
     - Good Weather
     - Rain
     - Snow
   - Special Event
     - Hookstown Fair
     - Road Closure (A lane on I-376 WB is closed)
   - Evacuation Staging
     - No, Staged Evacuation is not considered
     - Yes, Staged Evacuation is considered

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 the tables. For these conditions, scenarios (2) and (4) apply.
- The conditions of a winter evening (either midweek or weekend) and rain are not explicitly identified in the tables. For these conditions, scenarios (7) and (10) for rain apply.
- The conditions of a winter evening (either midweek or weekend) and snow are not explicitly identified in the tables. For these conditions, scenarios (8) and (11) for snow apply.
- The seasons are defined as follows:
  - Summer assumes that public schools are not in session.
  - Winter (includes Spring and Autumn) considers that public schools are in session.
- Time of Day: Midday implies the time over which most commuters are at work or are travelling to/from work.

2. With the desired percentile ETE and scenario 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 degrees: from 350 - 11, 12 - 34, 35 - 56, ...
   - 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)
     - to 5 miles (regions R02, R07 through R15)
     - to EPZ Boundary (regions R03, R16 through R45)
   - Enter Table 7-5 and identify the applicable group of candidate regions based on the distance that the selected region extends from the Beaver Valley Power Station. Select the evacuation region identifier in that row, based on the azimuth direction of the plume, from the first column of the Table.
3. Determine the **ETE table** based on the **percentile** selected. Then, for the **scenario** identified in Step 1 and the **region** identified in Step 2, proceed as follows:
   - The columns of Table 7-1 are labeled with the scenario numbers. Identify the proper column in the selected Table using the scenario number defined 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 from 35 – 56 degrees.
- Wind speed is such that the distance to be evacuated is judged to be a 5-mile radius and downwind to 10 miles (to EPZ boundary).
- The desired ETE is that value needed to evacuate 90 percent of the population from within the impacted region.
- A staged evacuation is not desired.

Table 7-1 is applicable because the 90th percentile ETE is desired. Proceed as follows:

1. Identify the scenario as summer, weekend, evening and raining. Entering Table 7-1, 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 7-5 and locate the region described as "Evacuate 5-Mile Region and Downwind to the EPZ Boundary" for wind direction from 35 – 56 degrees and read region R33 in the first column of that row.
3. Enter Table 7-1 to locate the data cell containing the value of ETE for scenario 4 and region R33. This data cell is in column (4) and in the row for region R33; it contains the ETE value of 2:30.

Table 7-1. 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	Weekend	Midweek
Scenario:	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
Region	Midday		Midday		Evening	Midday			Midday			Evening	Midday	Midday
	Good Weather	Rain	Good Weather	Rain	Good Weather	Good Weather	Rain	Snow	Good Weather	Rain	Snow	Good Weather	Special Event	Roadway Impact
Entire 2-Mile Region, 5-Mile Region, EPZ, and States														
R01	2:00	2:00	1:45	1:45	1:50	2:00	2:00	2:40	1:55	1:55	2:40	1:55	1:45	2:00
R02	2:25	2:25	2:25	2:25	2:20	2:20	2:20	2:55	2:10	2:10	2:45	2:10	2:25	2:25
R03	3:05	3:20	2:50	3:10	2:40	3:05	3:20	3:50	2:50	3:05	3:35	2:40	2:55	3:30
R04	3:10	3:30	2:55	3:15	2:50	3:10	3:30	4:00	2:55	3:10	3:40	2:45	3:00	3:35
R05	2:20	2:25	2:15	2:20	2:15	2:25	2:30	3:00	2:15	2:20	2:50	2:15	2:15	2:20
R06	2:25	2:25	2:25	2:25	2:20	2:25	2:25	2:55	2:15	2:15	2:50	2:10	2:25	2:25
2-Mile Region and Keyhole to 5 Miles														
R07	2:05	2:05	1:55	1:55	1:55	2:05	2:05	2:45	1:55	1:55	2:45	1:55	1:55	2:05
R08	2:05	2:05	1:50	1:50	1:55	2:05	2:05	2:45	1:55	1:55	2:45	1:55	1:50	2:05
R09	2:30	2:30	2:35	2:35	2:25	2:25	2:25	2:50	2:15	2:15	2:45	2:15	2:35	2:30
R10	2:30	2:30	2:40	2:40	2:25	2:25	2:25	2:50	2:15	2:15	2:45	2:20	2:40	2:30
R11	2:30	2:30	2:30	2:30	2:20	2:25	2:25	2:55	2:15	2:15	2:45	2:15	2:30	2:30
R12	2:30	2:30	2:35	2:35	2:25	2:25	2:25	2:55	2:15	2:15	2:45	2:15	2:35	2:30
R13	2:25	2:25	2:30	2:30	2:20	2:20	2:20	2:55	2:15	2:15	2:45	2:15	2:30	2:25
R14	2:10	2:10	1:55	1:55	1:55	2:10	2:10	2:50	2:00	2:00	2:45	2:00	1:55	2:10
R15	2:05	2:05	1:50	1:50	1:55	2:05	2:05	2:45	1:55	1:55	2:45	1:55	1:50	2:05
2-Mile Region and Keyhole to EPZ Boundary														
R16	2:25	2:30	2:25	2:30	2:15	2:20	2:30	3:00	2:15	2:20	2:55	2:15	2:35	2:25
R17	2:25	2:30	2:25	2:30	2:20	2:25	2:25	3:00	2:15	2:20	2:55	2:15	2:35	2:25
R18	2:25	2:25	2:20	2:25	2:15	2:20	2:25	2:55	2:15	2:15	2:50	2:10	2:25	2:25
R19	2:25	2:30	2:25	2:30	2:20	2:25	2:30	3:00	2:15	2:25	2:55	2:15	2:30	2:25
R20	2:30	2:35	2:25	2:35	2:25	2:25	2:35	3:00	2:20	2:25	2:55	2:20	2:30	2:30
R21	2:25	2:30	2:20	2:25	2:20	2:25	2:30	3:00	2:15	2:25	2:50	2:20	2:20	2:25
R22	2:25	2:30	2:20	2:25	2:20	2:25	2:30	3:00	2:15	2:25	2:50	2:20	2:20	2:25
R23	2:30	2:35	2:25	2:35	2:25	2:25	2:35	3:05	2:20	2:30	2:55	2:20	2:25	2:40

	Summer		Summer		Summer	Winter			Winter			Winter	Summer	Summer
	Midweek		Weekend		Midweek Weekend	Midweek			Weekend			Midweek Weekend	Weekend	Midweek
Scenario:	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
Region	Midday		Midday		Evening	Midday			Midday			Evening	Midday	Midday
	Good Weather	Rain	Good Weather	Rain	Good Weather	Good Weather	Rain	Snow	Good Weather	Rain	Snow	Good Weather	Special Event	Roadway Impact
R24	2:30	2:40	2:25	2:35	2:25	2:30	2:40	3:05	2:20	2:30	3:00	2:25	2:25	2:40
R25	2:50	3:00	2:35	2:50	2:35	2:50	3:00	3:30	2:30	2:45	3:10	2:30	2:35	3:00
R26	3:05	3:25	2:55	3:10	2:45	3:10	3:25	3:55	2:55	3:10	3:35	2:45	2:55	3:35
R27	3:10	3:30	2:55	3:15	2:45	3:10	3:25	4:00	2:55	3:10	3:40	2:45	2:55	3:40
R28	3:05	3:25	2:50	3:10	2:45	3:05	3:25	3:50	2:55	3:05	3:35	2:45	2:55	3:40
R29	2:45	3:00	2:30	2:45	2:40	2:45	3:00	3:35	2:30	2:45	3:20	2:35	2:30	3:00
R30	2:35	2:40	2:30	2:35	2:30	2:35	2:40	3:25	2:25	2:25	3:15	2:35	2:30	2:35
5-Mile Region and Keyhole to EPZ Boundary														
R31	2:30	2:30	2:30	2:35	2:20	2:25	2:30	3:00	2:15	2:20	2:55	2:15	2:35	2:30
R32	2:30	2:30	2:30	2:35	2:20	2:25	2:25	3:00	2:20	2:20	2:55	2:15	2:35	2:30
R33	2:25	2:30	2:25	2:30	2:20	2:20	2:25	3:00	2:15	2:15	2:50	2:15	2:30	2:25
R34	2:25	2:30	2:25	2:30	2:20	2:25	2:30	3:00	2:15	2:20	2:50	2:15	2:30	2:25
R35	2:25	2:30	2:25	2:30	2:20	2:25	2:30	3:00	2:20	2:25	2:55	2:20	2:30	2:30
R36	2:25	2:30	2:20	2:25	2:20	2:25	2:30	2:55	2:15	2:20	2:50	2:15	2:20	2:25
R37	2:25	2:30	2:20	2:25	2:20	2:25	2:30	3:00	2:15	2:20	2:50	2:15	2:20	2:25
R38	2:30	2:40	2:25	2:35	2:20	2:30	2:40	3:05	2:20	2:30	2:55	2:20	2:25	2:40
R39	2:30	2:40	2:25	2:35	2:25	2:30	2:40	3:05	2:20	2:30	2:55	2:20	2:25	2:40
R40	2:50	3:00	2:35	2:50	2:30	2:50	3:00	3:30	2:30	2:45	3:10	2:30	2:35	3:00
R41	3:05	3:25	3:00	3:15	2:45	3:10	3:25	3:55	2:55	3:05	3:35	2:45	3:00	3:35
R42	3:10	3:30	3:00	3:15	2:45	3:10	3:30	3:55	2:55	3:10	3:40	2:45	3:00	3:35
R43	3:00	3:25	2:55	3:05	2:45	3:05	3:25	3:55	2:55	3:05	3:30	2:40	2:55	3:35
R44	2:50	3:00	2:45	3:00	2:40	2:55	3:05	3:40	2:40	2:55	3:30	2:45	2:45	3:05
R45	2:35	2:45	2:35	2:40	2:30	2:35	2:45	3:20	2:25	2:30	3:10	2:30	2:40	2:35

	Summer		Summer		Summer	Winter			Winter			Winter	Summer	Summer
	Midweek		Weekend		Midweek Weekend	Midweek			Weekend			Midweek Weekend	Weekend	Midweek
Scenario:	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
Region	Midday		Midday		Evening	Midday			Midday			Evening	Midday	Midday
	Good Weather	Rain	Good Weather	Rain	Good Weather	Good Weather	Rain	Snow	Good Weather	Rain	Snow	Good Weather	Special Event	Roadway Impact
Staged Evacuation - 2-Mile Region and Keyhole to 5 Miles														
R46	2:30	2:30	2:30	2:30	2:30	2:30	2:30	3:20	2:30	2:30	3:20	2:30	2:30	2:30
R47	2:30	2:30	2:25	2:30	2:30	2:30	2:30	3:15	2:30	2:30	3:15	2:30	2:25	2:30
R48	2:35	2:35	2:40	2:40	2:30	2:35	2:35	3:20	2:30	2:30	3:20	2:30	2:40	2:35
R49	2:35	2:35	2:40	2:40	2:30	2:35	2:35	3:20	2:30	2:30	3:20	2:30	2:40	2:35
R50	2:50	3:00	2:55	3:00	2:50	2:55	3:00	3:45	2:50	2:55	3:45	2:50	2:55	2:50
R51	2:50	3:00	2:55	3:00	2:50	2:55	3:00	3:50	2:55	3:00	3:50	2:55	2:55	2:55
R52	2:45	2:55	2:50	2:55	2:45	2:50	2:55	3:40	2:50	2:55	3:45	2:50	2:50	2:50
R53	2:50	2:55	2:50	2:55	2:50	2:50	2:50	3:45	2:50	2:55	3:45	2:50	2:50	2:55
R54	2:30	2:30	2:30	2:30	2:30	2:30	2:30	3:20	2:30	2:30	3:20	2:30	2:30	2:30
R55	2:45	2:50	2:50	2:55	2:45	2:45	2:50	3:35	2:45	2:45	3:40	2:45	2:50	2:45

Table 7-2. Time to Clear the Indicated Area of *100* Percent of the Affected Population

	Summer		Summer		Summer	Winter			Winter			Winter	Summer	Summer
	Midweek		Weekend		Midweek Weekend	Midweek			Weekend			Midweek Weekend	Weekend	Midweek
Scenario:	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
Region	Midday		Midday		Evening	Midday			Midday			Evening	Midday	Midday
	Good Weather	Rain	Good Weather	Rain	Good Weather	Good Weather	Rain	Snow	Good Weather	Rain	Snow	Good Weather	Special Event	Roadway Impact
Entire 2-Mile Region, 5-Mile Region, EPZ, and States														
R01	4:30	4:30	4:30	4:30	4:30	4:30	4:30	6:00	4:30	4:30	6:00	4:30	4:30	4:30
R02	4:35	4:35	4:35	4:35	4:35	4:35	4:35	6:05	4:35	4:35	6:05	4:35	4:35	4:35
R03	4:40	5:00	4:40	4:40	4:40	4:40	4:50	6:10	4:40	4:40	6:10	4:40	4:40	4:40
R04	4:40	4:50	4:40	4:40	4:40	4:40	4:50	6:10	4:40	4:40	6:10	4:40	4:40	4:40
R05	4:40	4:40	4:40	4:40	4:40	4:40	4:40	6:10	4:40	4:40	6:10	4:40	4:40	4:40
R06	4:40	4:40	4:40	4:40	4:40	4:40	4:40	6:10	4:40	4:40	6:10	4:40	4:40	4:40
2-Mile Region and Keyhole to 5 Miles														
R07	4:35	4:35	4:35	4:35	4:35	4:35	4:35	6:05	4:35	4:35	6:05	4:35	4:35	4:35
R08	4:35	4:35	4:35	4:35	4:35	4:35	4:35	6:05	4:35	4:35	6:05	4:35	4:35	4:35
R09	4:35	4:35	4:35	4:35	4:35	4:35	4:35	6:05	4:35	4:35	6:05	4:35	4:35	4:35
R10	4:35	4:35	4:35	4:35	4:35	4:35	4:35	6:05	4:35	4:35	6:05	4:35	4:35	4:35
R11	4:35	4:35	4:35	4:35	4:35	4:35	4:35	6:05	4:35	4:35	6:05	4:35	4:35	4:35
R12	4:35	4:35	4:35	4:35	4:35	4:35	4:35	6:05	4:35	4:35	6:05	4:35	4:35	4:35
R13	4:35	4:35	4:35	4:35	4:35	4:35	4:35	6:05	4:35	4:35	6:05	4:35	4:35	4:35
R14	4:35	4:35	4:35	4:35	4:35	4:35	4:35	6:05	4:35	4:35	6:05	4:35	4:35	4:35
R15	4:35	4:35	4:35	4:35	4:35	4:35	4:35	6:05	4:35	4:35	6:05	4:35	4:35	4:35
2-Mile Region and Keyhole to EPZ Boundary														
R16	4:40	4:40	4:40	4:40	4:40	4:40	4:40	6:10	4:40	4:40	6:10	4:40	4:40	4:40
R17	4:40	4:40	4:40	4:40	4:40	4:40	4:40	6:10	4:40	4:40	6:10	4:40	4:40	4:40
R18	4:40	4:40	4:40	4:40	4:40	4:40	4:40	6:10	4:40	4:40	6:10	4:40	4:40	4:40
R19	4:40	4:40	4:40	4:40	4:40	4:40	4:40	6:10	4:40	4:40	6:10	4:40	4:40	4:40
R20	4:40	4:40	4:40	4:40	4:40	4:40	4:40	6:10	4:40	4:40	6:10	4:40	4:40	4:40
R21	4:40	4:40	4:40	4:40	4:40	4:40	4:40	6:10	4:40	4:40	6:10	4:40	4:40	4:40
R22	4:40	4:40	4:40	4:40	4:40	4:40	4:40	6:10	4:40	4:40	6:10	4:40	4:40	4:40
R23	4:40	4:40	4:40	4:40	4:40	4:40	4:40	6:10	4:40	4:40	6:10	4:40	4:40	4:40

	Summer		Summer		Summer	Winter			Winter			Winter	Summer	Summer
	Midweek		Weekend		Midweek Weekend	Midweek			Weekend			Midweek Weekend	Weekend	Midweek
Scenario:	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
Region	Midday		Midday		Evening	Midday			Midday			Evening	Midday	Midday
	Good Weather	Rain	Good Weather	Rain	Good Weather	Good Weather	Rain	Snow	Good Weather	Rain	Snow	Good Weather	Special Event	Roadway Impact
R24	4:40	4:40	4:40	4:40	4:40	4:40	4:40	6:10	4:40	4:40	6:10	4:40	4:40	4:40
R25	4:40	4:40	4:40	4:40	4:40	4:40	4:40	6:10	4:40	4:40	6:10	4:40	4:40	4:40
R26	4:40	4:45	4:40	4:40	4:40	4:40	4:45	6:10	4:40	4:40	6:10	4:40	4:40	4:40
R27	4:40	4:55	4:40	4:40	4:40	4:40	4:50	6:10	4:40	4:40	6:10	4:40	4:40	4:40
R28	4:40	4:55	4:40	4:40	4:40	4:40	4:50	6:10	4:40	4:40	6:10	4:40	4:40	4:40
R29	4:40	4:40	4:40	4:40	4:40	4:40	4:40	6:10	4:40	4:40	6:10	4:40	4:40	4:40
R30	4:40	4:40	4:40	4:40	4:40	4:40	4:40	6:10	4:40	4:40	6:10	4:40	4:40	4:40
5-Mile Region and Keyhole to EPZ Boundary														
R31	4:40	4:40	4:40	4:40	4:40	4:40	4:40	6:10	4:40	4:40	6:10	4:40	4:40	4:40
R32	4:40	4:40	4:40	4:40	4:40	4:40	4:40	6:10	4:40	4:40	6:10	4:40	4:40	4:40
R33	4:40	4:40	4:40	4:40	4:40	4:40	4:40	6:10	4:40	4:40	6:10	4:40	4:40	4:40
R34	4:40	4:40	4:40	4:40	4:40	4:40	4:40	6:10	4:40	4:40	6:10	4:40	4:40	4:40
R35	4:40	4:40	4:40	4:40	4:40	4:40	4:40	6:10	4:40	4:40	6:10	4:40	4:40	4:40
R36	4:40	4:40	4:40	4:40	4:40	4:40	4:40	6:10	4:40	4:40	6:10	4:40	4:40	4:40
R37	4:40	4:40	4:40	4:40	4:40	4:40	4:40	6:10	4:40	4:40	6:10	4:40	4:40	4:40
R38	4:40	4:40	4:40	4:40	4:40	4:40	4:40	6:10	4:40	4:40	6:10	4:40	4:40	4:40
R39	4:40	4:40	4:40	4:40	4:40	4:40	4:40	6:10	4:40	4:40	6:10	4:40	4:40	4:40
R40	4:40	4:40	4:40	4:40	4:40	4:40	4:40	6:10	4:40	4:40	6:10	4:40	4:40	4:40
R41	4:40	4:55	4:40	4:40	4:40	4:40	4:50	6:10	4:40	4:40	6:10	4:40	4:40	4:40
R42	4:40	5:00	4:40	4:40	4:40	4:40	4:50	6:10	4:40	4:40	6:10	4:40	4:40	4:40
R43	4:40	5:00	4:40	4:40	4:40	4:40	4:50	6:10	4:40	4:40	6:10	4:40	4:40	4:40
R44	4:40	4:50	4:40	4:40	4:40	4:40	4:50	6:10	4:40	4:40	6:10	4:40	4:40	4:40
R45	4:40	4:40	4:40	4:40	4:40	4:40	4:40	6:10	4:40	4:40	6:10	4:40	4:40	4:40

	Summer		Summer		Summer	Winter			Winter			Winter	Summer	Summer
	Midweek		Weekend		Midweek Weekend	Midweek			Weekend			Midweek Weekend	Weekend	Midweek
Scenario:	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
Region	Midday		Midday		Evening	Midday			Midday			Evening	Midday	Midday
	Good Weather	Rain	Good Weather	Rain	Good Weather	Good Weather	Rain	Snow	Good Weather	Rain	Snow	Good Weather	Special Event	Roadway Impact
Staged Evacuation - 2-Mile Region and Keyhole to 5 Miles														
R46	4:35	4:35	4:35	4:35	4:35	4:35	4:35	6:05	4:35	4:35	6:05	4:35	4:35	4:35
R47	4:35	4:35	4:35	4:35	4:35	4:35	4:35	6:05	4:35	4:35	6:05	4:35	4:35	4:35
R48	4:35	4:35	4:35	4:35	4:35	4:35	4:35	6:05	4:35	4:35	6:05	4:35	4:35	4:35
R49	4:35	4:35	4:35	4:35	4:35	4:35	4:35	6:05	4:35	4:35	6:05	4:35	4:35	4:35
R50	4:35	4:35	4:35	4:35	4:35	4:35	4:35	6:05	4:35	4:35	6:05	4:35	4:35	4:35
R51	4:35	4:35	4:35	4:35	4:35	4:35	4:35	6:05	4:35	4:35	6:05	4:35	4:35	4:35
R52	4:35	4:35	4:35	4:35	4:35	4:35	4:35	6:05	4:35	4:35	6:05	4:35	4:35	4:35
R53	4:35	4:35	4:35	4:35	4:35	4:35	4:35	6:05	4:35	4:35	6:05	4:35	4:35	4:35
R54	4:35	4:35	4:35	4:35	4:35	4:35	4:35	6:05	4:35	4:35	6:05	4:35	4:35	4:35
R55	4:35	4:35	4:35	4:35	4:35	4:35	4:35	6:05	4:35	4:35	6:05	4:35	4:35	4:35

Table 7-3. Time to Clear *90* Percent of the 2-Mile Area within the Indicated Region

	Summer		Summer		Summer	Winter			Winter			Winter	Summer	Summer
	Midweek		Weekend		Midweek Weekend	Midweek			Weekend			Midweek Weekend	Weekend	Midweek
Scenario:	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
Region	Midday		Midday		Evening	Midday			Midday			Evening	Midday	Midday
	Good Weather	Rain	Good Weather	Rain	Good Weather	Good Weather	Rain	Snow	Good Weather	Rain	Snow	Good Weather	Special Event	Roadway Impact
Un-staged Evacuation - 2-Mile Region and 5-Mile Region														
R01	2:00	2:00	1:45	1:45	1:50	2:00	2:00	2:40	1:55	1:55	2:40	1:55	1:45	2:00
R02	2:00	2:00	1:45	1:45	1:50	2:00	2:00	2:40	1:55	1:55	2:40	1:55	1:45	2:00
Un-staged Evacuation - 2-Mile Region and Keyhole to 5 Miles														
R07	2:00	2:00	1:45	1:45	1:50	2:00	2:00	2:40	1:55	1:55	2:40	1:55	1:45	2:00
R08	2:00	2:00	1:45	1:45	1:50	2:00	2:00	2:40	1:55	1:55	2:40	1:55	1:45	2:00
R09	2:00	2:00	1:45	1:45	1:50	2:00	2:00	2:40	1:55	1:55	2:40	1:55	1:45	2:00
R10	2:00	2:00	1:45	1:45	1:50	2:00	2:00	2:40	1:55	1:55	2:40	1:55	1:45	2:00
R11	2:00	2:00	1:45	1:45	1:50	2:00	2:00	2:40	1:55	1:55	2:40	1:55	1:45	2:00
R12	2:00	2:00	1:45	1:45	1:50	2:00	2:00	2:40	1:55	1:55	2:40	1:55	1:45	2:00
R13	2:00	2:00	1:45	1:45	1:50	2:00	2:00	2:40	1:55	1:55	2:40	1:55	1:45	2:00
R14	2:00	2:00	1:45	1:45	1:50	2:00	2:00	2:40	1:55	1:55	2:40	1:55	1:45	2:00
R15	2:00	2:00	1:45	1:45	1:50	2:00	2:00	2:40	1:55	1:55	2:40	1:55	1:45	2:00
Staged Evacuation - 2-Mile Region and Keyhole to 5 Miles														
R46	2:00	2:00	1:45	1:45	1:50	2:00	2:00	2:40	1:55	1:55	2:40	1:55	1:45	2:00
R47	2:00	2:00	1:45	1:45	1:50	2:00	2:00	2:40	1:55	1:55	2:40	1:55	1:45	2:00
R48	2:00	2:00	1:45	1:45	1:50	2:00	2:00	2:40	1:55	1:55	2:40	1:55	1:45	2:00
R49	2:00	2:00	1:45	1:45	1:50	2:00	2:00	2:40	1:55	1:55	2:40	1:55	1:45	2:00
R50	2:00	2:00	1:45	1:45	1:50	2:00	2:00	2:40	1:55	1:55	2:40	1:55	1:45	2:00
R51	2:00	2:00	1:45	1:45	1:50	2:00	2:00	2:40	1:55	1:55	2:40	1:55	1:45	2:00
R52	2:00	2:00	1:45	1:45	1:50	2:00	2:00	2:40	1:55	1:55	2:40	1:55	1:45	2:00
R53	2:00	2:00	1:45	1:45	1:50	2:00	2:00	2:40	1:55	1:55	2:40	1:55	1:45	2:00
R54	2:00	2:00	1:45	1:45	1:50	2:00	2:00	2:40	1:55	1:55	2:40	1:55	1:45	2:00
R55	2:00	2:00	1:45	1:45	1:50	2:00	2:00	2:40	1:55	1:55	2:40	1:55	1:45	2:00

Table 7-4. Time to Clear *100* Percent of the 2-Mile Area within the Indicated Region

	Summer		Summer		Summer	Winter			Winter			Winter	Summer	Summer
	Midweek		Weekend		Midweek Weekend	Midweek			Weekend			Midweek Weekend	Weekend	Midweek
Scenario:	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
Region	Midday		Midday		Evening	Midday			Midday			Evening	Midday	Midday
	Good Weather	Rain	Good Weather	Rain	Good Weather	Good Weather	Rain	Snow	Good Weather	Rain	Snow	Good Weather	Special Event	Roadway Impact
Un-staged Evacuation - 2-Mile Region and 5-Mile Region														
R01	4:30	4:30	4:30	4:30	4:30	4:30	4:30	6:00	4:30	4:30	6:00	4:30	4:30	4:30
R02	4:30	4:30	4:30	4:30	4:30	4:30	4:30	6:00	4:30	4:30	6:00	4:30	4:30	4:30
Un-staged Evacuation - 2-Mile Region and Keyhole to 5 Miles														
R07	4:30	4:30	4:30	4:30	4:30	4:30	4:30	6:00	4:30	4:30	6:00	4:30	4:30	4:30
R08	4:30	4:30	4:30	4:30	4:30	4:30	4:30	6:00	4:30	4:30	6:00	4:30	4:30	4:30
R09	4:30	4:30	4:30	4:30	4:30	4:30	4:30	6:00	4:30	4:30	6:00	4:30	4:30	4:30
R10	4:30	4:30	4:30	4:30	4:30	4:30	4:30	6:00	4:30	4:30	6:00	4:30	4:30	4:30
R11	4:30	4:30	4:30	4:30	4:30	4:30	4:30	6:00	4:30	4:30	6:00	4:30	4:30	4:30
R12	4:30	4:30	4:30	4:30	4:30	4:30	4:30	6:00	4:30	4:30	6:00	4:30	4:30	4:30
R13	4:30	4:30	4:30	4:30	4:30	4:30	4:30	6:00	4:30	4:30	6:00	4:30	4:30	4:30
R14	4:30	4:30	4:30	4:30	4:30	4:30	4:30	6:00	4:30	4:30	6:00	4:30	4:30	4:30
R15	4:30	4:30	4:30	4:30	4:30	4:30	4:30	6:00	4:30	4:30	6:00	4:30	4:30	4:30
Staged Evacuation - 2-Mile Region and Keyhole to 5 Miles														
R46	4:30	4:30	4:30	4:30	4:30	4:30	4:30	6:00	4:30	4:30	6:00	4:30	4:30	4:30
R47	4:30	4:30	4:30	4:30	4:30	4:30	4:30	6:00	4:30	4:30	6:00	4:30	4:30	4:30
R48	4:30	4:30	4:30	4:30	4:30	4:30	4:30	6:00	4:30	4:30	6:00	4:30	4:30	4:30
R49	4:30	4:30	4:30	4:30	4:30	4:30	4:30	6:00	4:30	4:30	6:00	4:30	4:30	4:30
R50	4:30	4:30	4:30	4:30	4:30	4:30	4:30	6:00	4:30	4:30	6:00	4:30	4:30	4:30
R51	4:30	4:30	4:30	4:30	4:30	4:30	4:30	6:00	4:30	4:30	6:00	4:30	4:30	4:30
R52	4:30	4:30	4:30	4:30	4:30	4:30	4:30	6:00	4:30	4:30	6:00	4:30	4:30	4:30
R53	4:30	4:30	4:30	4:30	4:30	4:30	4:30	6:00	4:30	4:30	6:00	4:30	4:30	4:30
R54	4:30	4:30	4:30	4:30	4:30	4:30	4:30	6:00	4:30	4:30	6:00	4:30	4:30	4:30
R55	4:30	4:30	4:30	4:30	4:30	4:30	4:30	6:00	4:30	4:30	6:00	4:30	4:30	4:30

Table 7-5. Description of Evacuation Regions

		Sub-Area																		
		Pennsylvania												Ohio				West Virginia		
Region	Description	P-1	P-2	P-3	P-4	P-5	P-6	P-7	P-8	P-9	P-10	P-11	P-12	O-1	O-2	O-3	O-4	W-1	W-2	W-3
R01	2-Mile Region	X																		
R02	5-Mile Region	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
R04	PA	X	X	X	X	X	X	X	X	X	X	X	X							
R05	OH													X	X	X	X			
R06	WV																	X	X	X

Evacuate 2-Mile Region and Downwind to 5 Miles

		Sub-Area																		
		Pennsylvania												Ohio				West Virginia		
Region	Wind Direction From:	P-1	P-2	P-3	P-4	P-5	P-6	P-7	P-8	P-9	P-10	P-11	P-12	O-1	O-2	O-3	O-4	W-1	W-2	W-3
R07	350-11, 12-34	X			X	X	X													
R08	35-56	X				X	X													
R09	57-79, 80-101	X	X			X	X							X						
R10	102-124	X	X				X							X						
R11	125-146, 147-169	X	X	X			X							X						
R12	170-191	X	X	X																
R13	192-214	X	X	X	X															
R14	215-236, 237-259, 260-281	X		X	X															
R15	282-304, 305-326, 327-349	X			X	X														

Evacuate 2-Mile Region and Downwind to EPZ Boundary

		Sub-Area																		
		Pennsylvania												Ohio				West Virginia		
Region	Wind Direction From:	P-1	P-2	P-3	P-4	P-5	P-6	P-7	P-8	P-9	P-10	P-11	P-12	O-1	O-2	O-3	O-4	W-1	W-2	W-3
R16	350-11	X			X	X	X					X	X						X	X
R17	12-34	X			X	X	X					X	X					X	X	X
R18	35-56	X				X	X						X	X	X			X	X	X
R19	57-79	X	X			X	X						X	X	X	X		X	X	X
R20	80-101	X	X			X	X	X					X	X	X	X	X	X	X	X
R21	102-124	X	X				X	X						X	X	X	X	X	X	
R22	125-146	X	X	X			X	X						X	X	X	X	X		
R23	147-169	X	X	X			X	X	X					X	X	X	X			
R24	170-191	X	X	X				X	X							X	X			

Region	Description	Sub-Area																		
		Pennsylvania												Ohio				West Virginia		
		P-1	P-2	P-3	P-4	P-5	P-6	P-7	P-8	P-9	P-10	P-11	P-12	O-1	O-2	O-3	O-4	W-1	W-2	W-3
R25	192-214	X	X	X	X			X	X	X							X			
R26	215-236	X		X	X			X	X	X	X									
R27	237-259	X		X	X			X	X	X	X	X								
R28	260-281	X		X	X				X	X	X	X								
R29	282-304, 305-326	X			X	X				X	X	X	X							
R30	327-349	X			X	X					X	X	X							

Evacuate 5-Mile Region and Downwind to the EPZ Boundary

Region	Wind Direction From:	Sub-Area																		
		Pennsylvania												Ohio				West Virginia		
		P-1	P-2	P-3	P-4	P-5	P-6	P-7	P-8	P-9	P-10	P-11	P-12	O-1	O-2	O-3	O-4	W-1	W-2	W-3
R31	350-11	X	X	X	X	X	X					X	X	X					X	X
R32	12-34	X	X	X	X	X	X					X	X	X				X	X	X
R33	35-56	X	X	X	X	X	X						X	X	X			X	X	X
R34	57-79	X	X	X	X	X	X						X	X	X	X		X	X	X
R35	80-101	X	X	X	X	X	X	X					X	X	X	X	X	X	X	X
R36	102-124	X	X	X	X	X	X	X						X	X	X	X	X	X	
R37	125-146	X	X	X	X	X	X	X						X	X	X	X	X		
R38	147-169	X	X	X	X	X	X	X	X					X	X	X	X			
R39	170-191	X	X	X	X	X	X	X	X					X		X	X			
R40	192-214	X	X	X	X	X	X	X	X	X				X			X			
R41	215-236	X	X	X	X	X	X	X	X	X	X			X						
R42	237-259	X	X	X	X	X	X	X	X	X	X	X		X						
R43	260-281	X	X	X	X	X	X		X	X	X	X		X						
R44	282-304, 305-326	X	X	X	X	X	X			X	X	X	X	X						
R45	327-349	X	X	X	X	X	X				X	X	X	X						

Sub-Area(s) Shelter-in-Place until 90% ETE for R01, then Evacuate | **Sub-Area(s) Shelter-in-Place** | **Sub-Area(s) Evacuate**

Table 7-6. Description of Staged Evacuation Regions

Staged Evacuation - 2-Mile Region Evacuates, then Evacuate Downwind to 5 Miles																			
		Sub-Area																	
		Pennsylvania												Ohio				West Virginia		
Region	Wind Direction From:	P-1	P-2	P-3	P-4	P-5	P-6	P-7	P-8	P-9	P-10	P-11	P-12	O-1	O-2	O-3	O-4	W-1	W-2	W-3
R46	350-11, 12-34	X			X	X	X													
R47	35-56	X				X	X													
R48	57-79, 80-101	X	X			X	X							X						
R49	102-124	X	X				X							X						
R50	125-146, 147-169	X	X	X			X							X						
R51	170-191	X	X	X																
R52	192-214	X	X	X	X															
R53	215-236, 237-259, 260-281	X		X	X															
R54	282-304, 305-326, 327-349	X			X	X														
R55	5-Mile Region	X	X	X	X	X	X							X						
Sub-Area(s) Shelter-in-Place until 90% ETE for R01, then Evacuate				Sub-Area(s) Shelter-in-Place										Sub-Area(s) Evacuate						

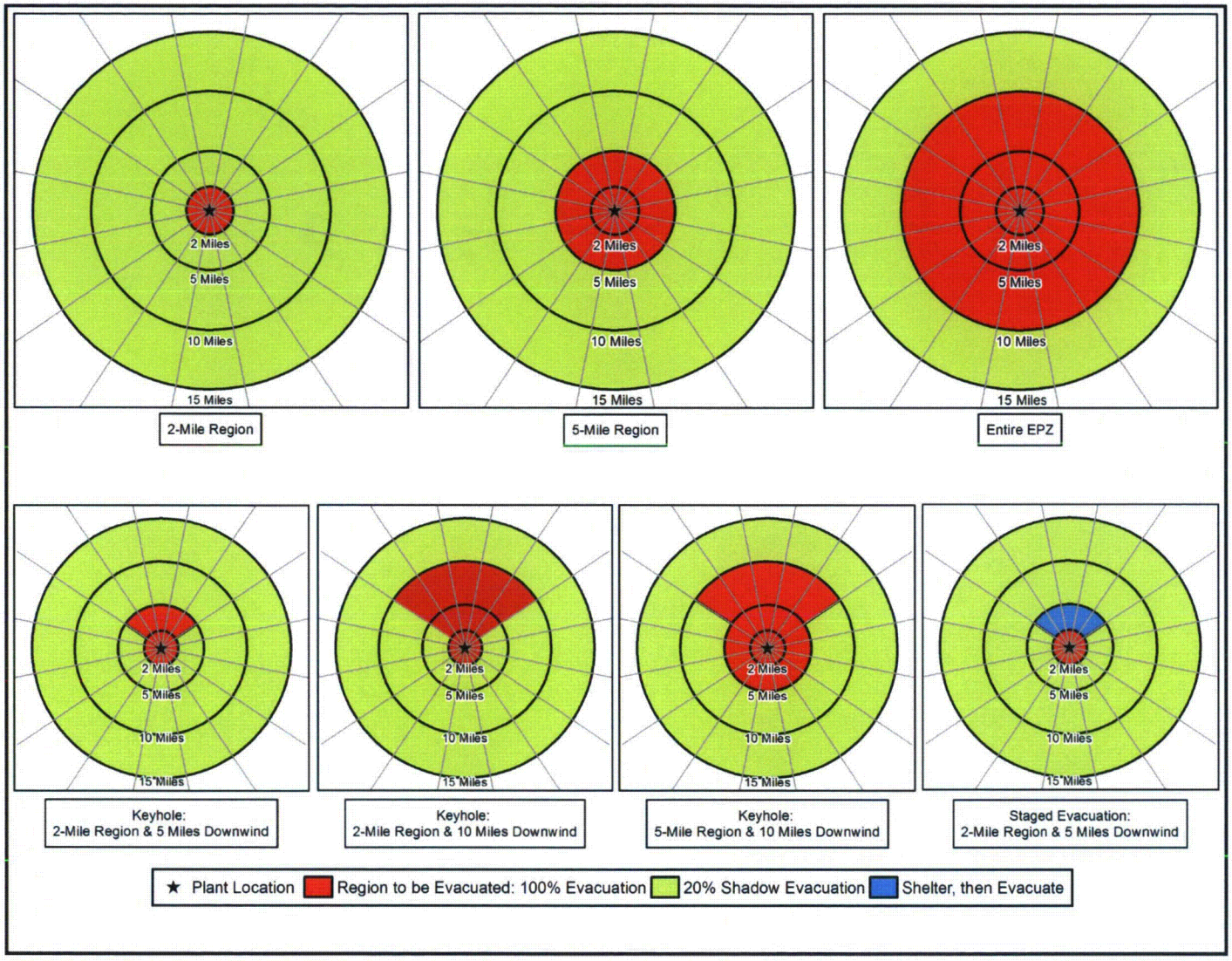


Figure 7-1. Voluntary Evacuation Methodology

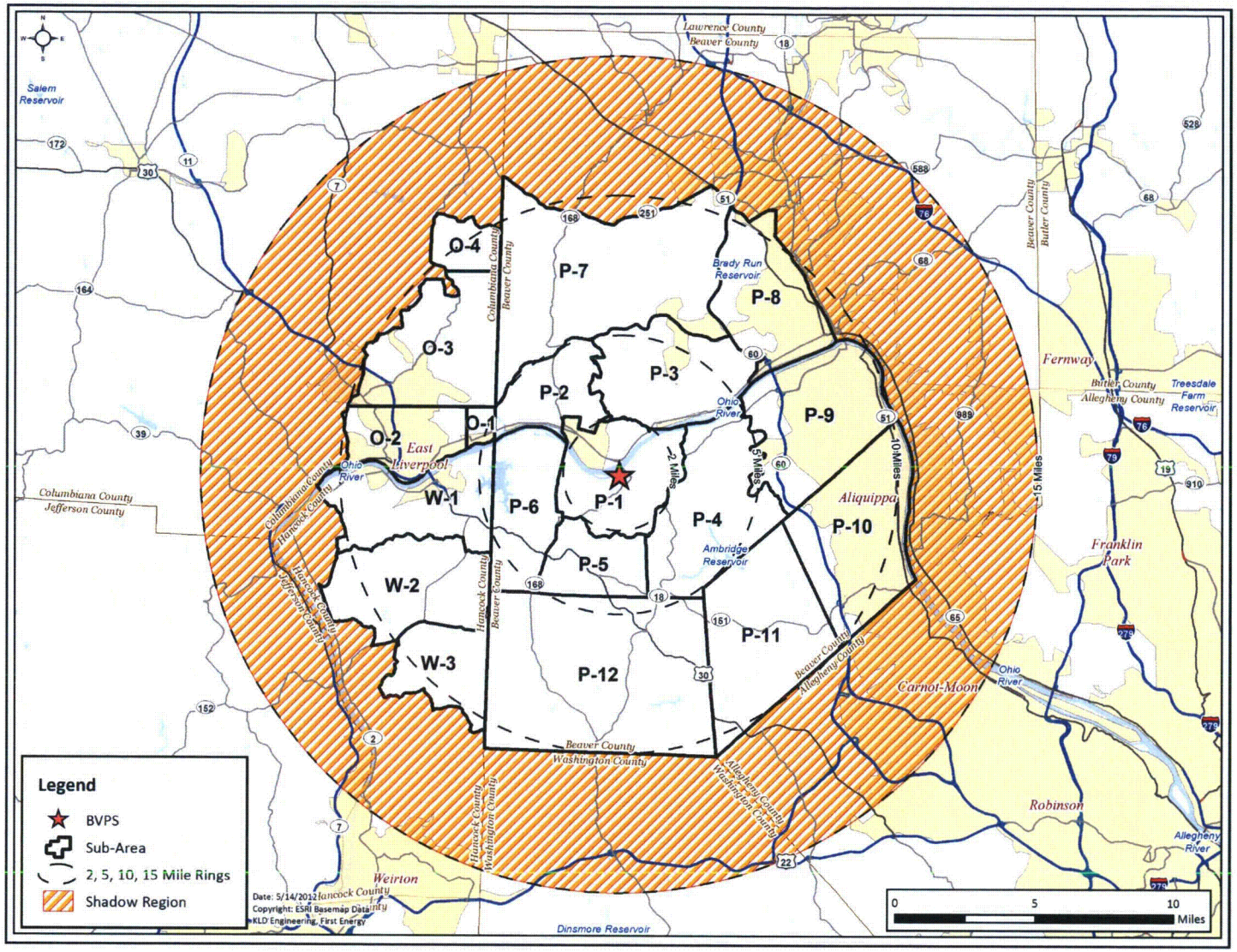


Figure 7-2. Beaver Valley Power Station Shadow Region

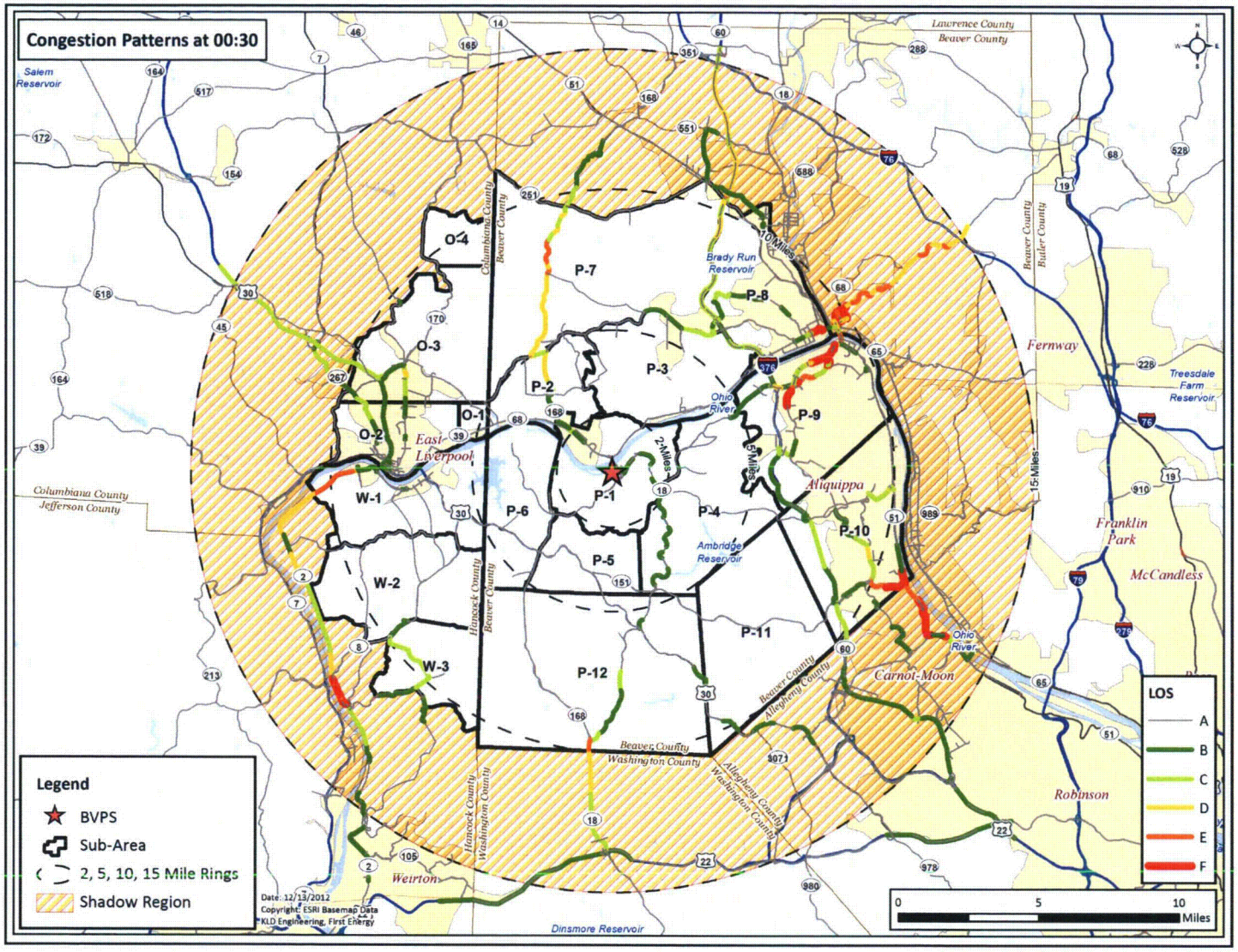


Figure 7-3. Congestion Patterns at 30 Minutes after the Advisory to Evacuate

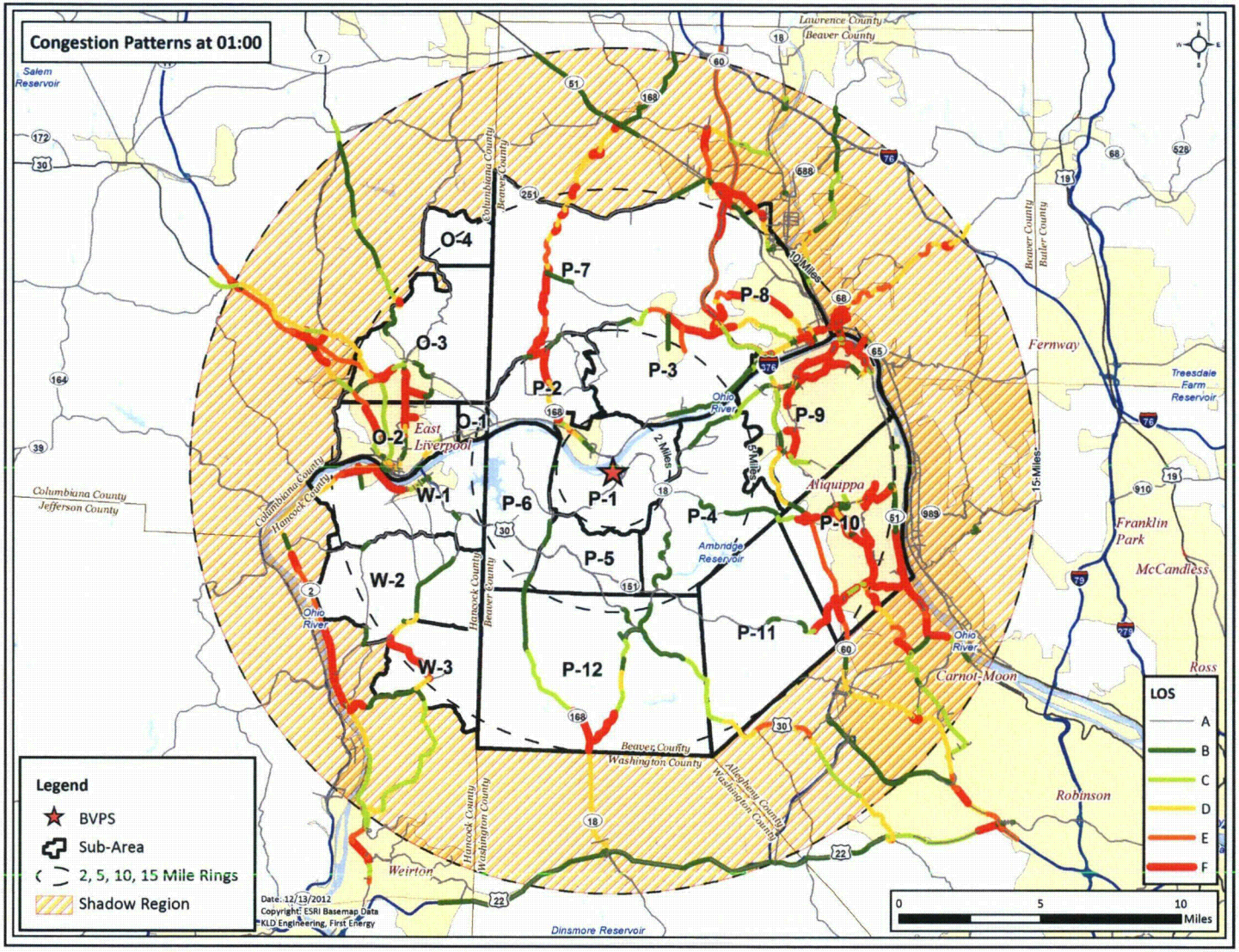


Figure 7-4. Congestion Patterns at 1 Hour after the Advisory to Evacuate

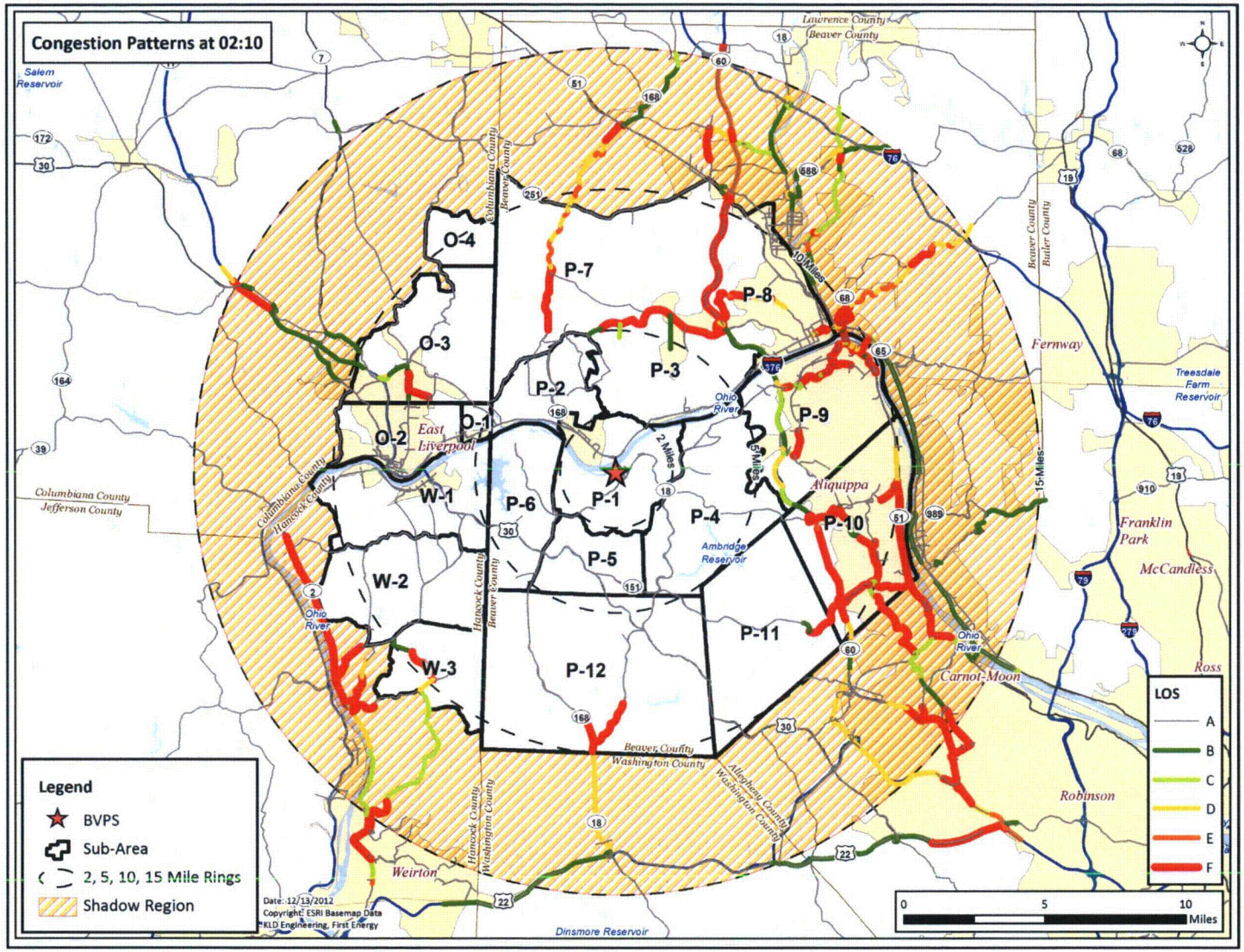


Figure 7-5. Congestion Patterns at 2 Hours, 10 Minutes after the Advisory to Evacuate

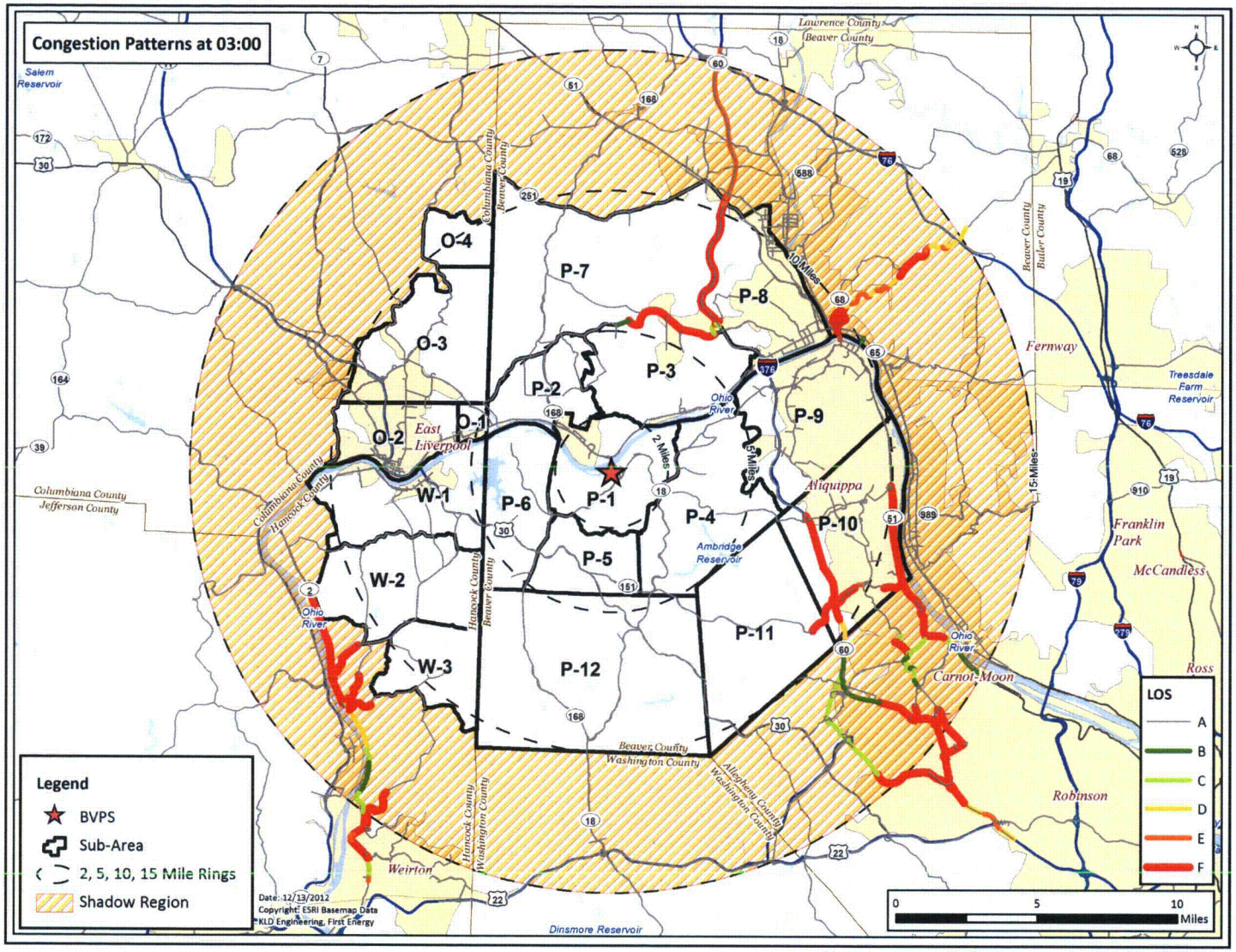


Figure 7-6. Congestion Patterns at 3 Hours after the Advisory to Evacuate

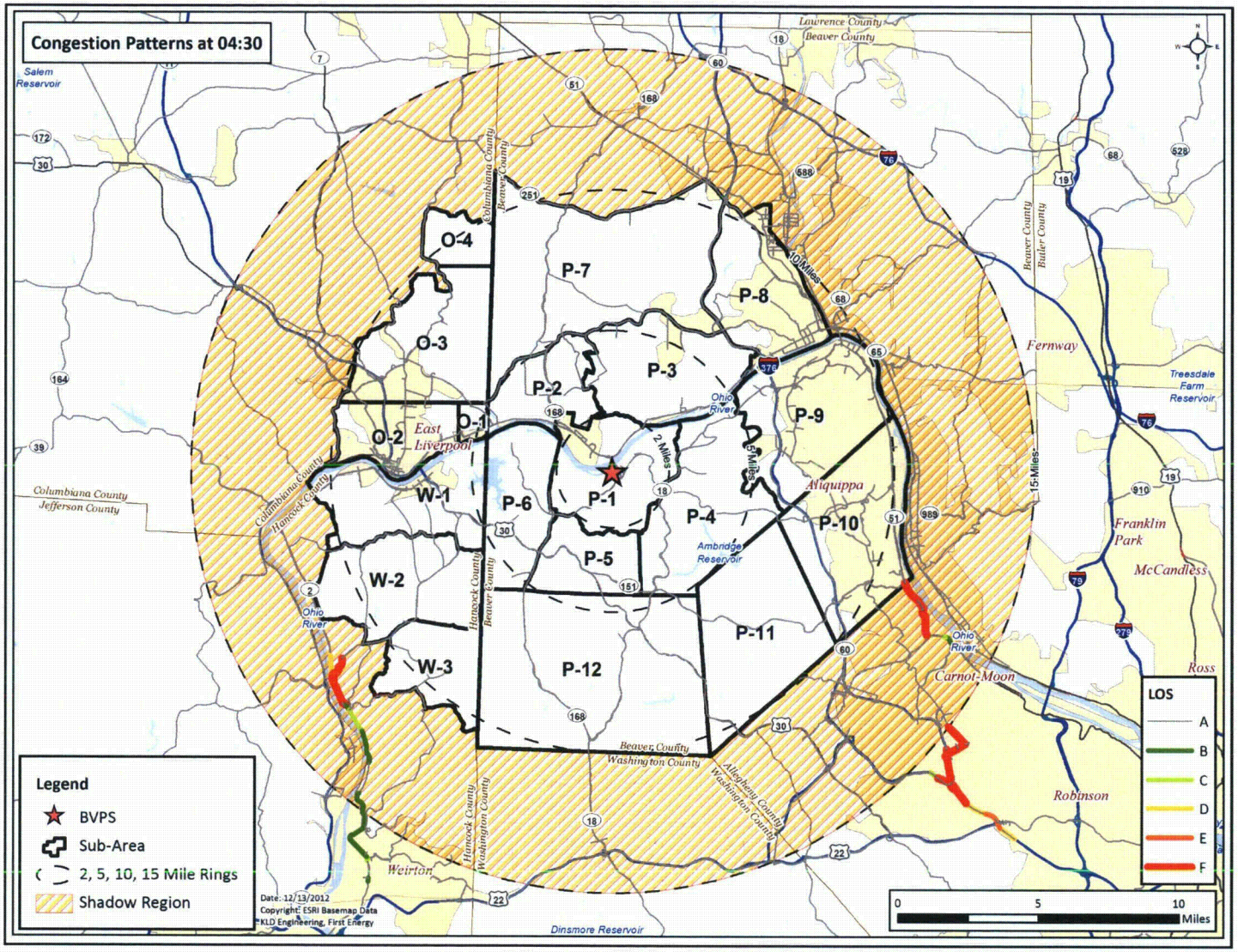


Figure 7-7. Congestion Patterns at 4 Hours, 30 Minutes after the Advisory to Evacuate

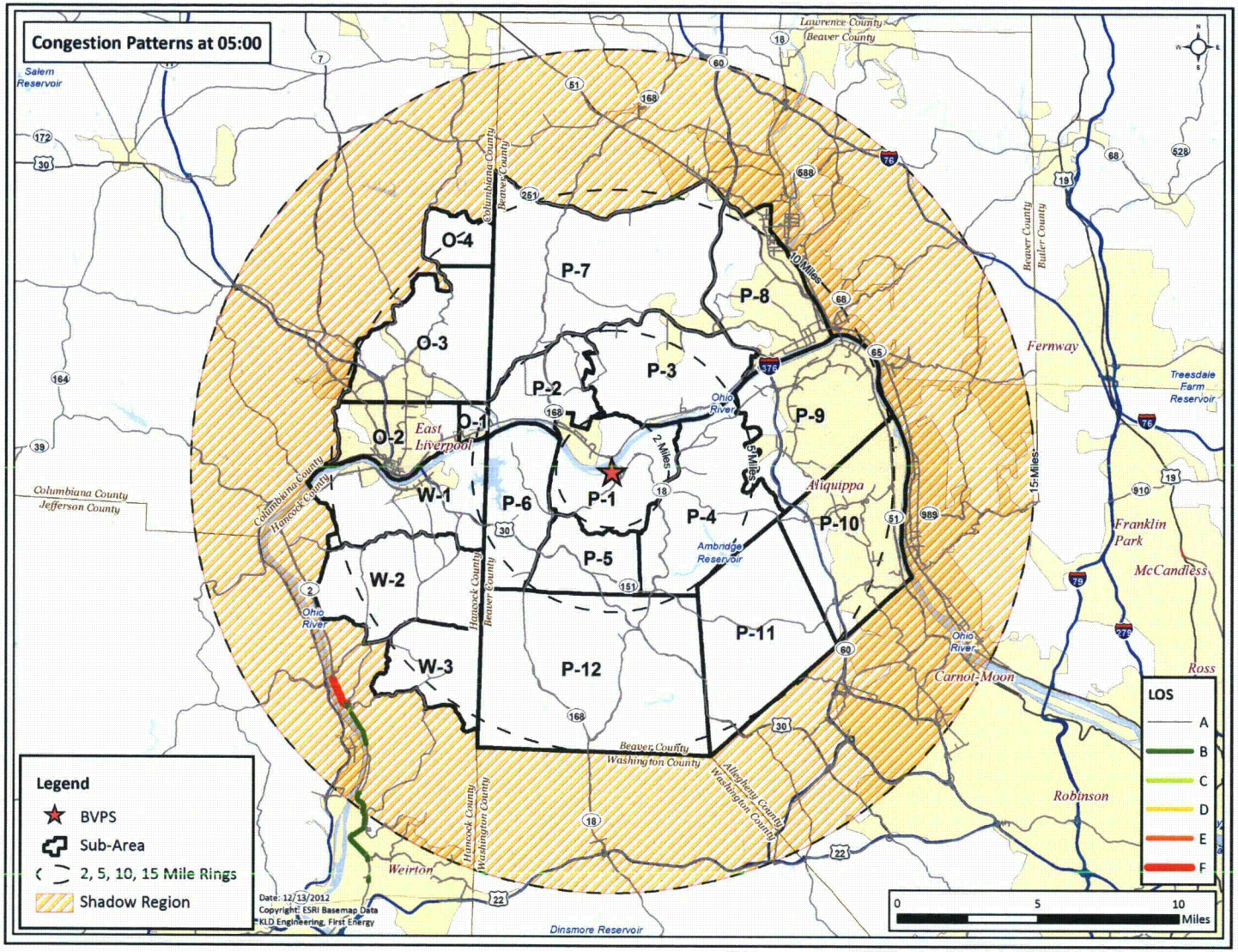


Figure 7-8. Congestion Patterns at 5 Hours after the Advisory to Evacuate

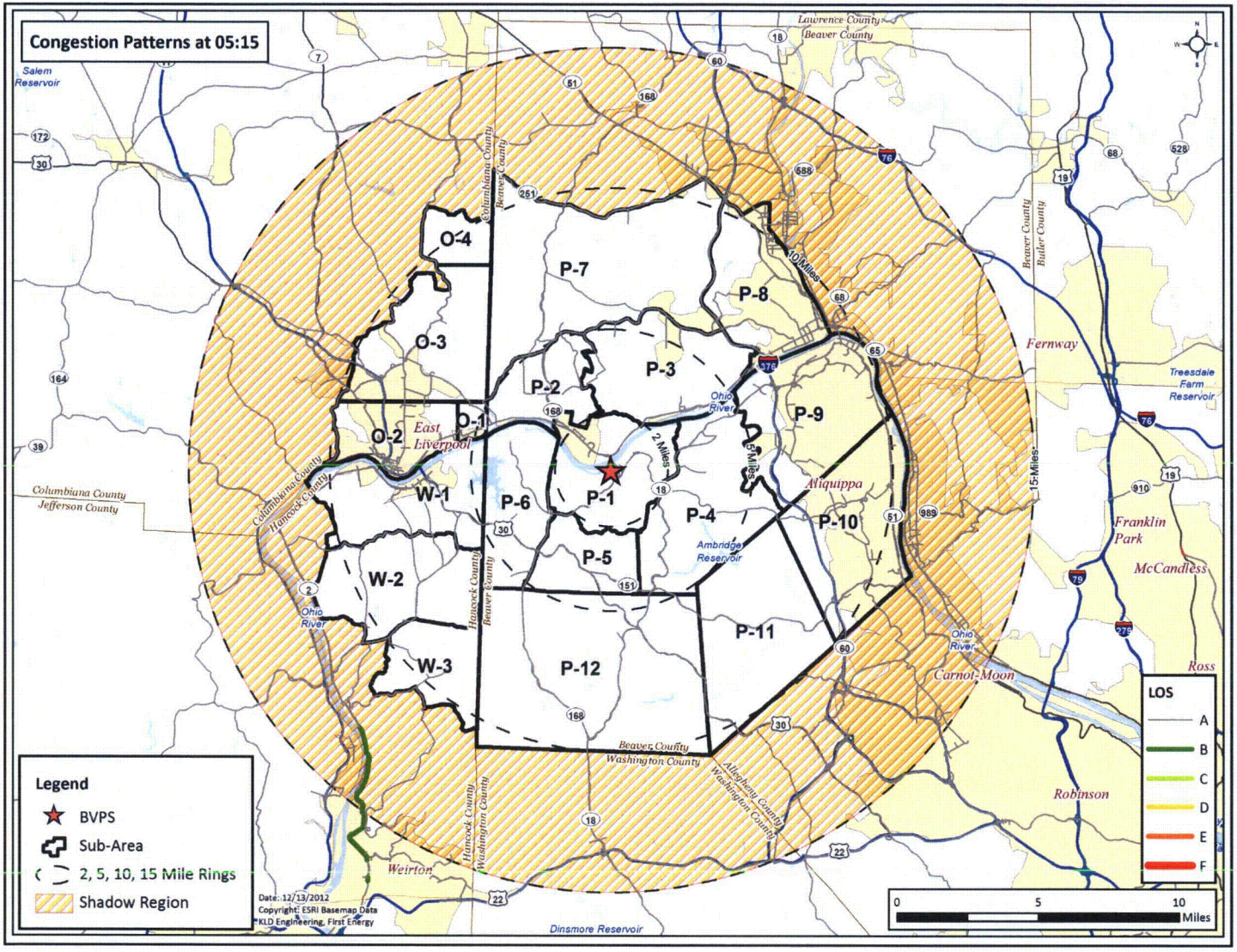


Figure 7-9. Congestion Patterns at 5 Hours, 15 Minutes after the Advisory to Evacuate

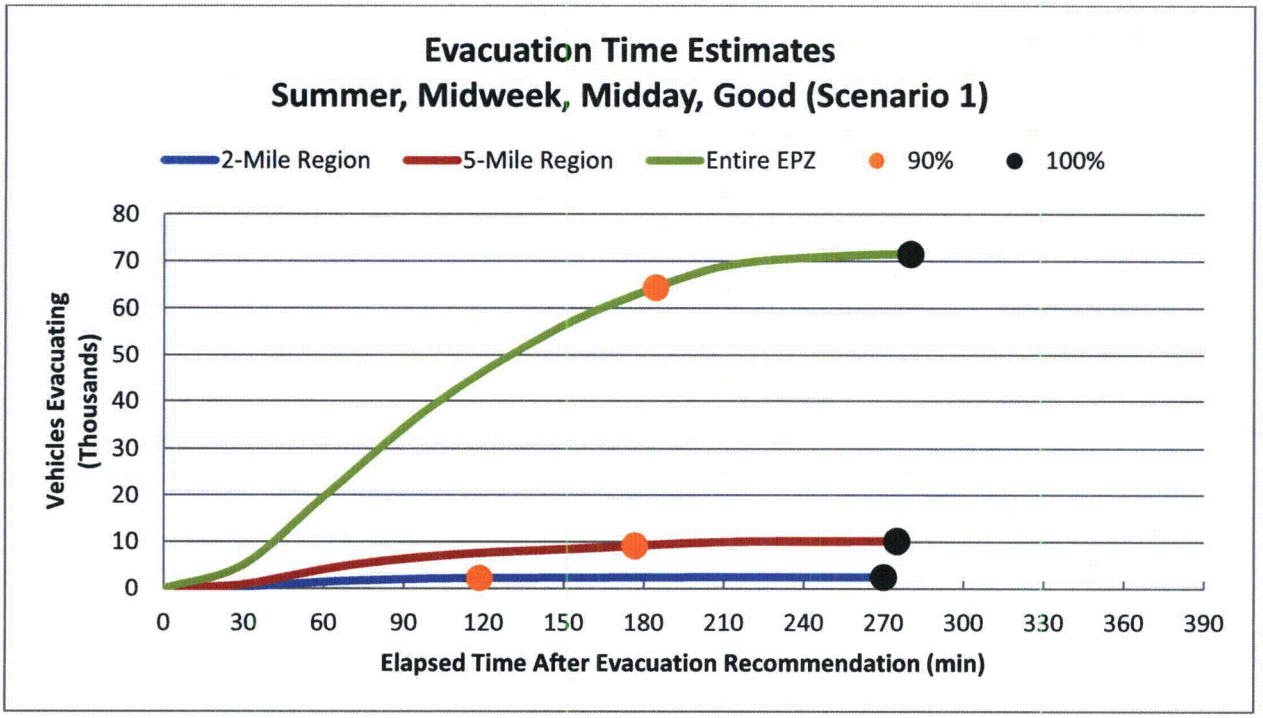


Figure 7-10. Evacuation Time Estimates - Scenario 1 for Region R03

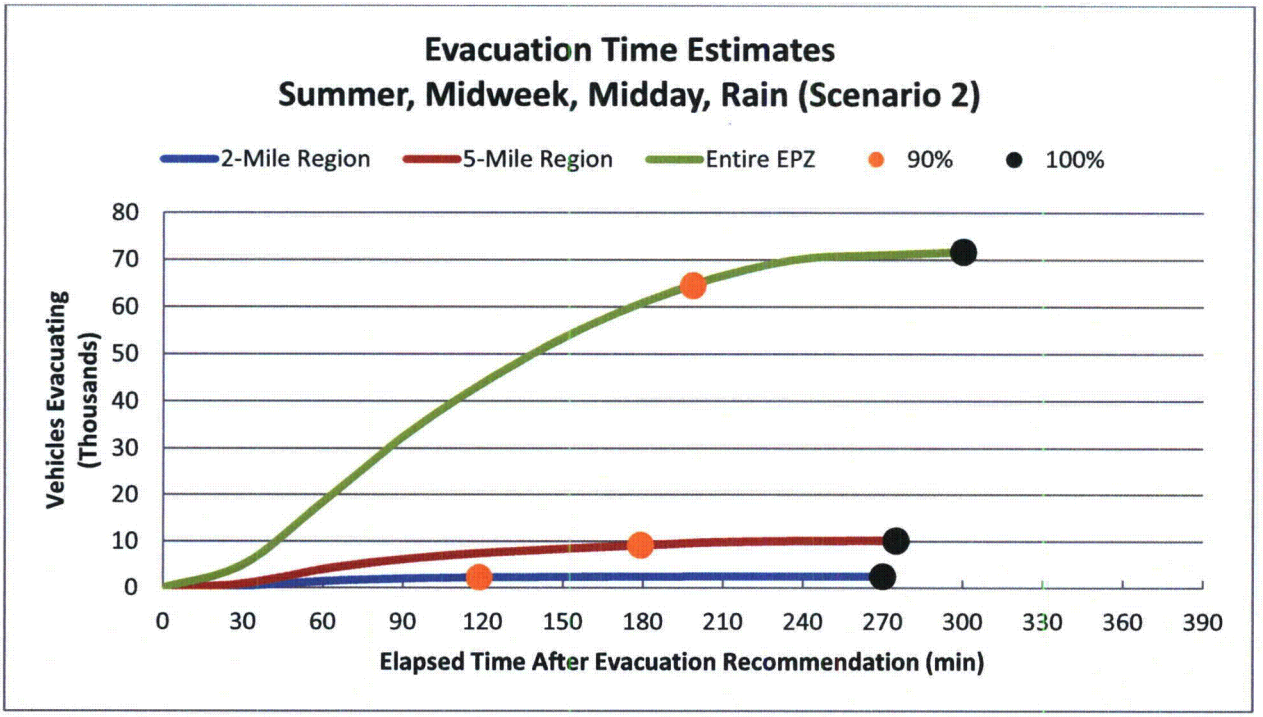


Figure 7-11. Evacuation Time Estimates - Scenario 2 for Region R03

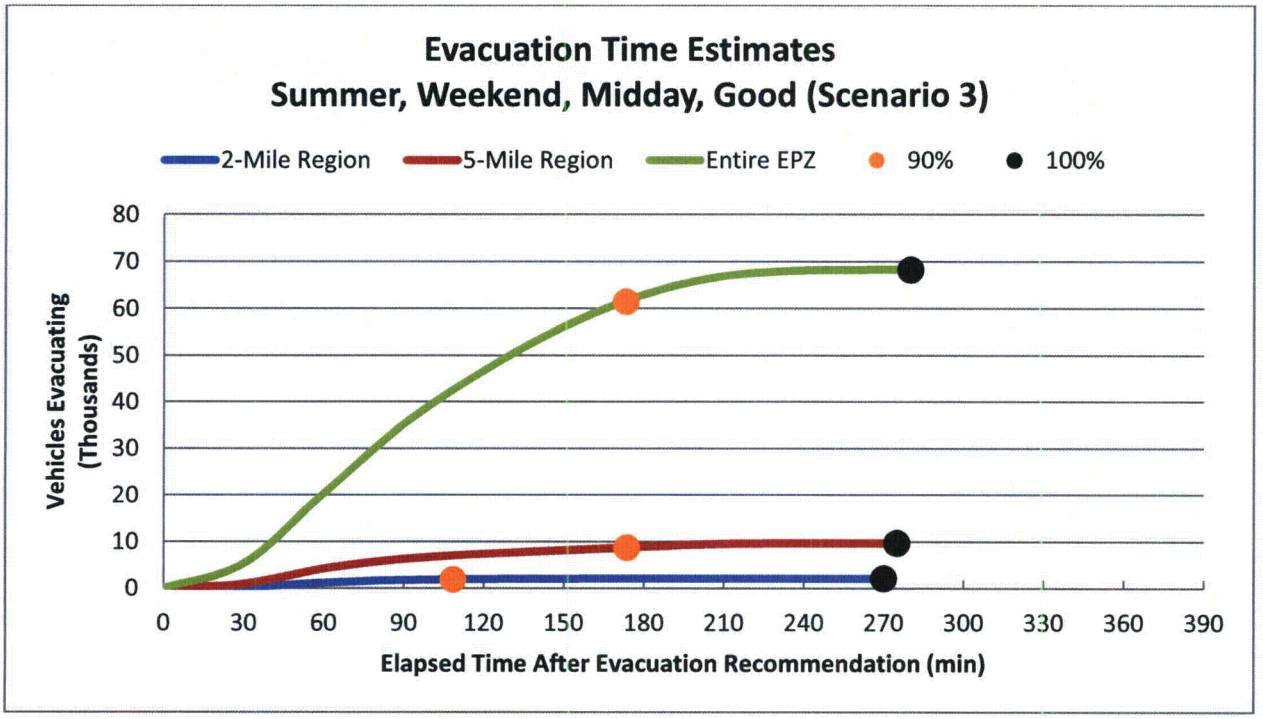


Figure 7-12. Evacuation Time Estimates - Scenario 3 for Region R03

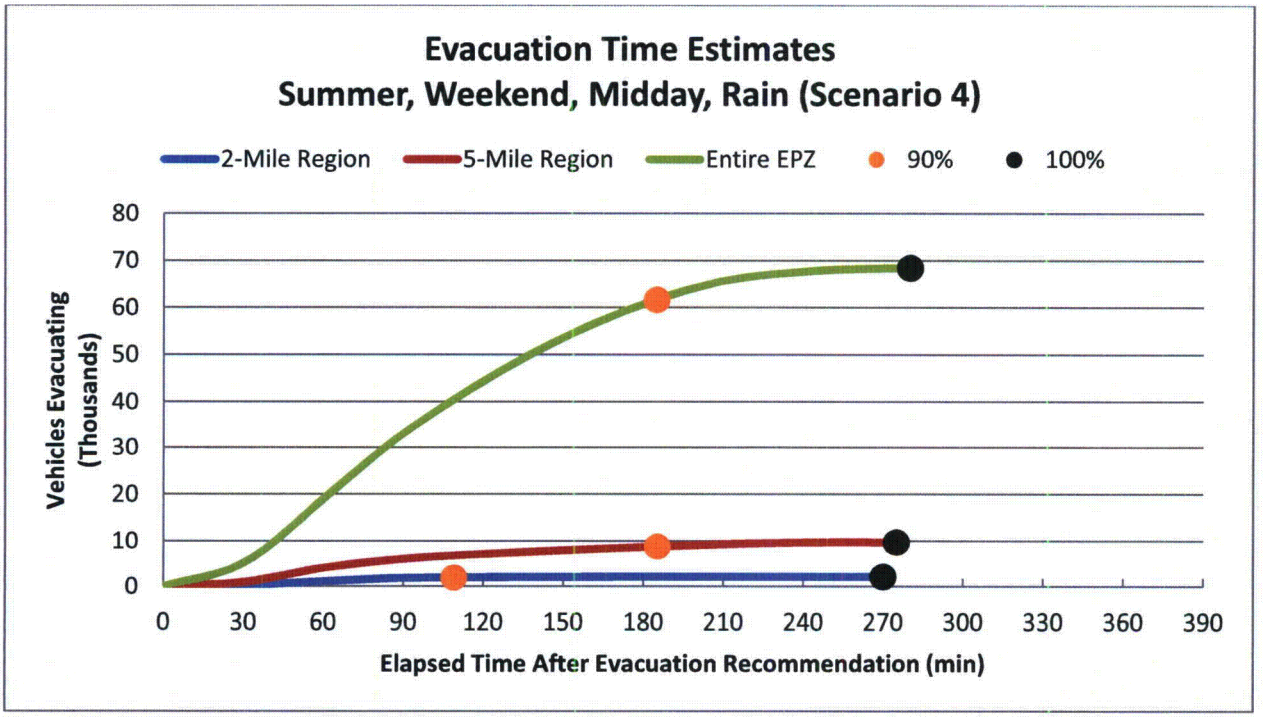


Figure 7-13. Evacuation Time Estimates - Scenario 4 for Region R03

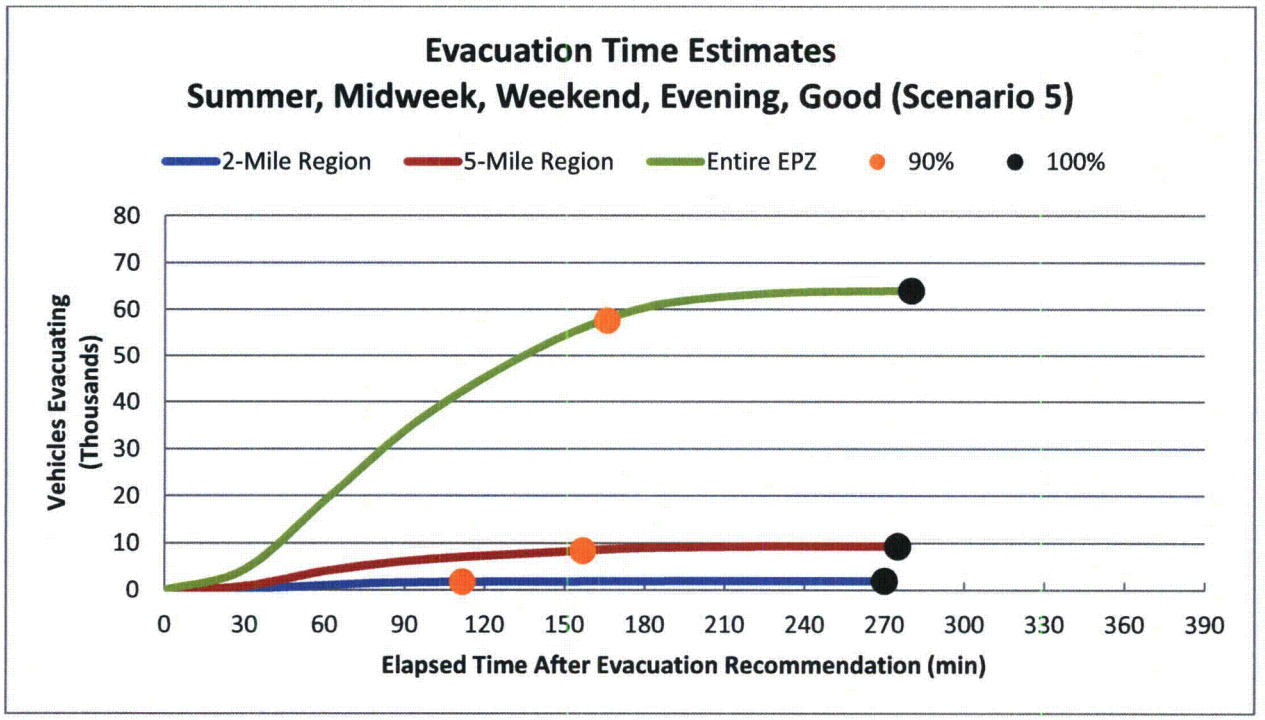


Figure 7-14. Evacuation Time Estimates - Scenario 5 for Region R03

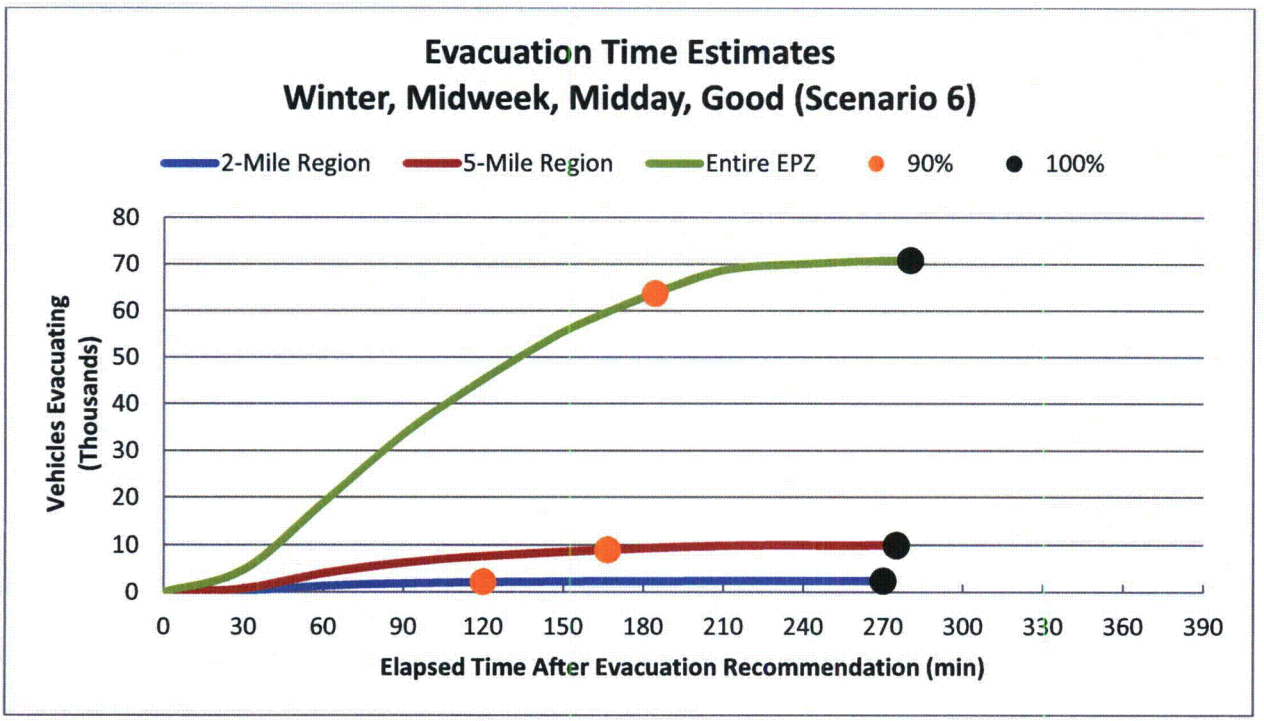


Figure 7-15. Evacuation Time Estimates - Scenario 6 for Region R03

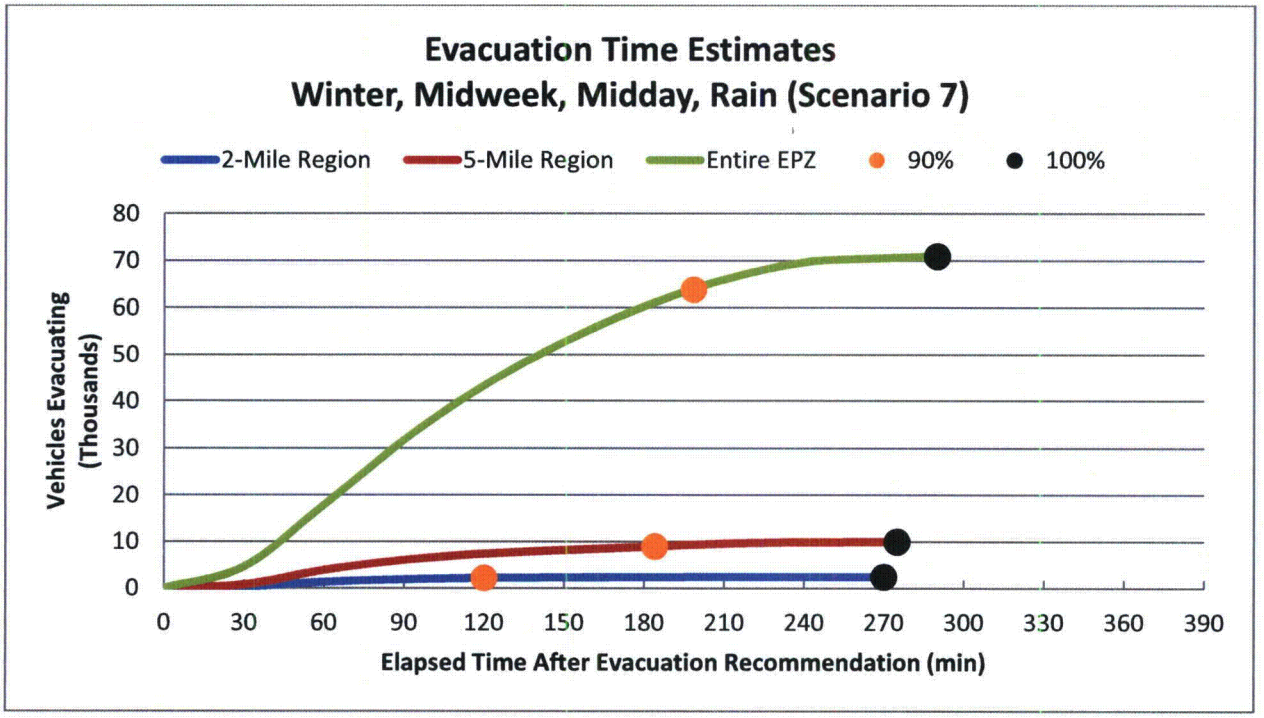


Figure 7-16. Evacuation Time Estimates - Scenario 7 for Region R03

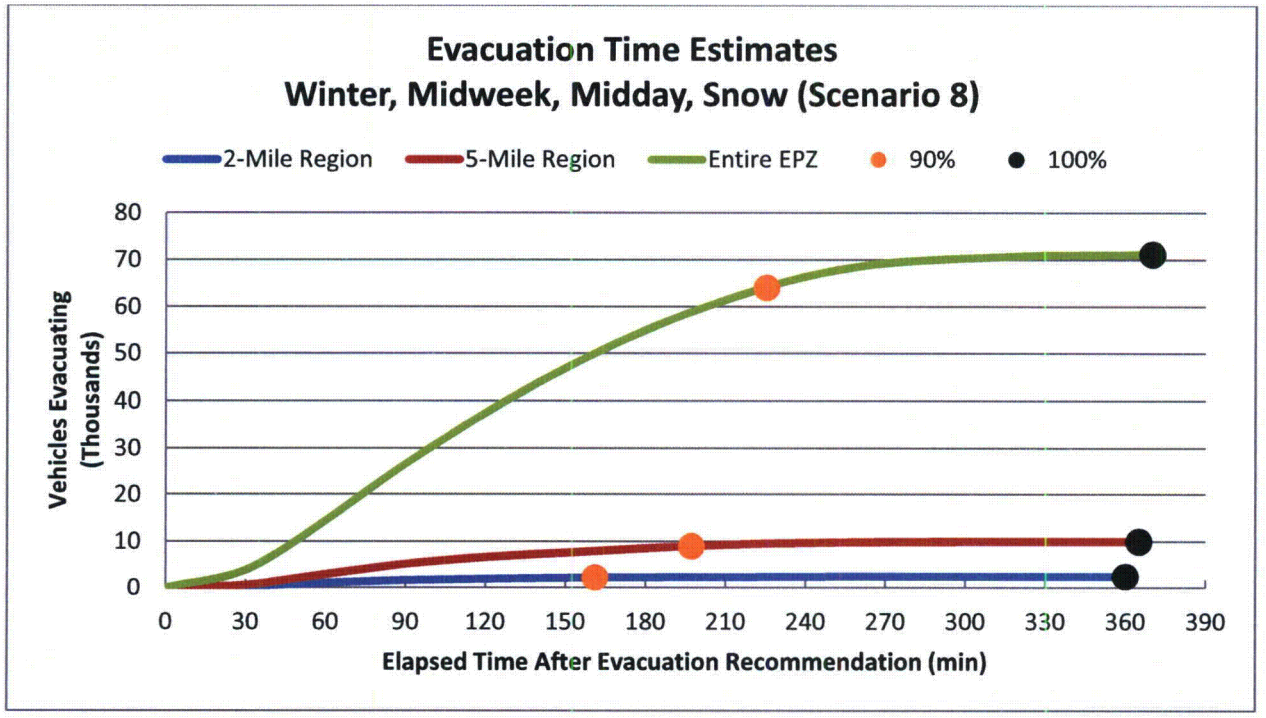


Figure 7-17. Evacuation Time Estimates - Scenario 8 for Region R03

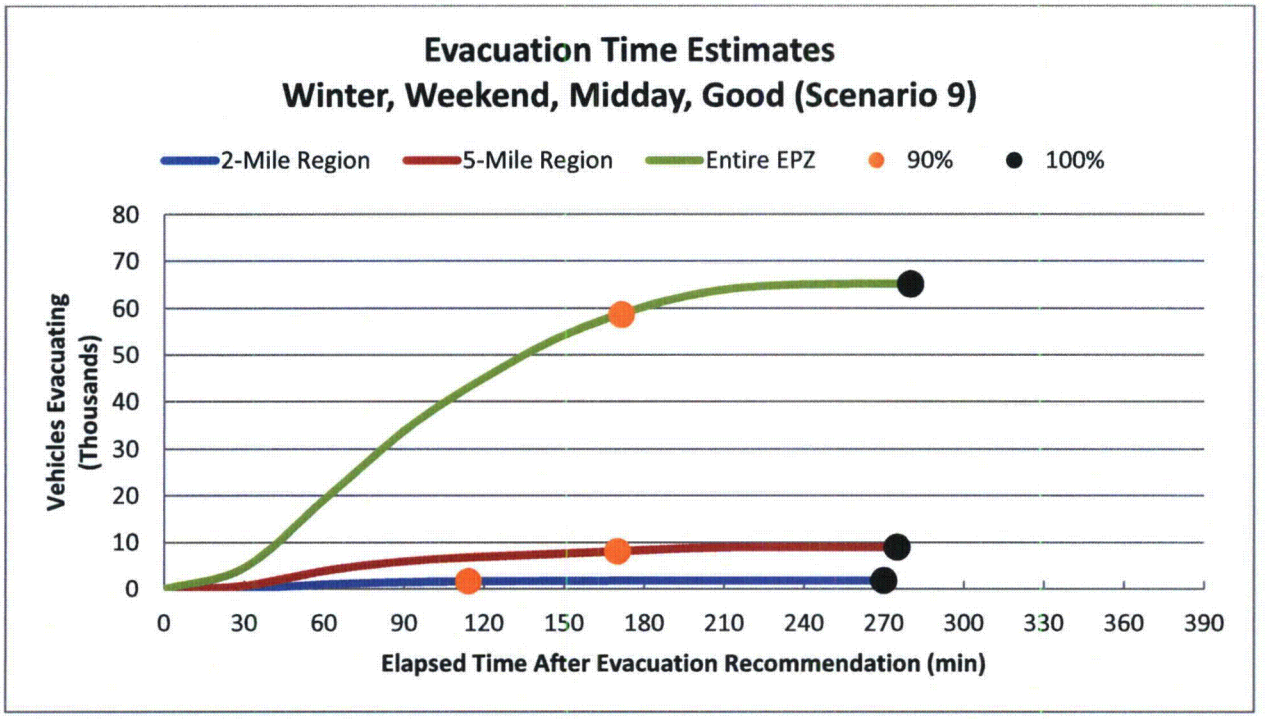


Figure 7-18. Evacuation Time Estimates - Scenario 9 for Region R03

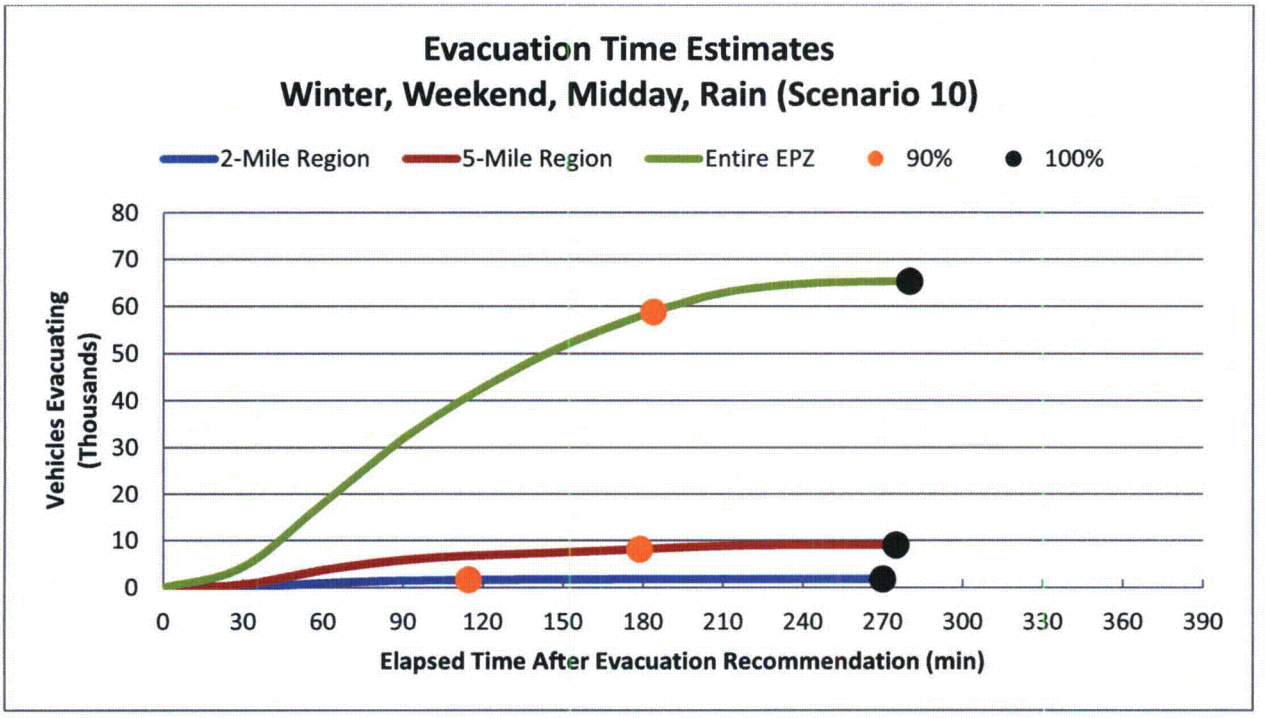


Figure 7-19. Evacuation Time Estimates - Scenario 10 for Region R03

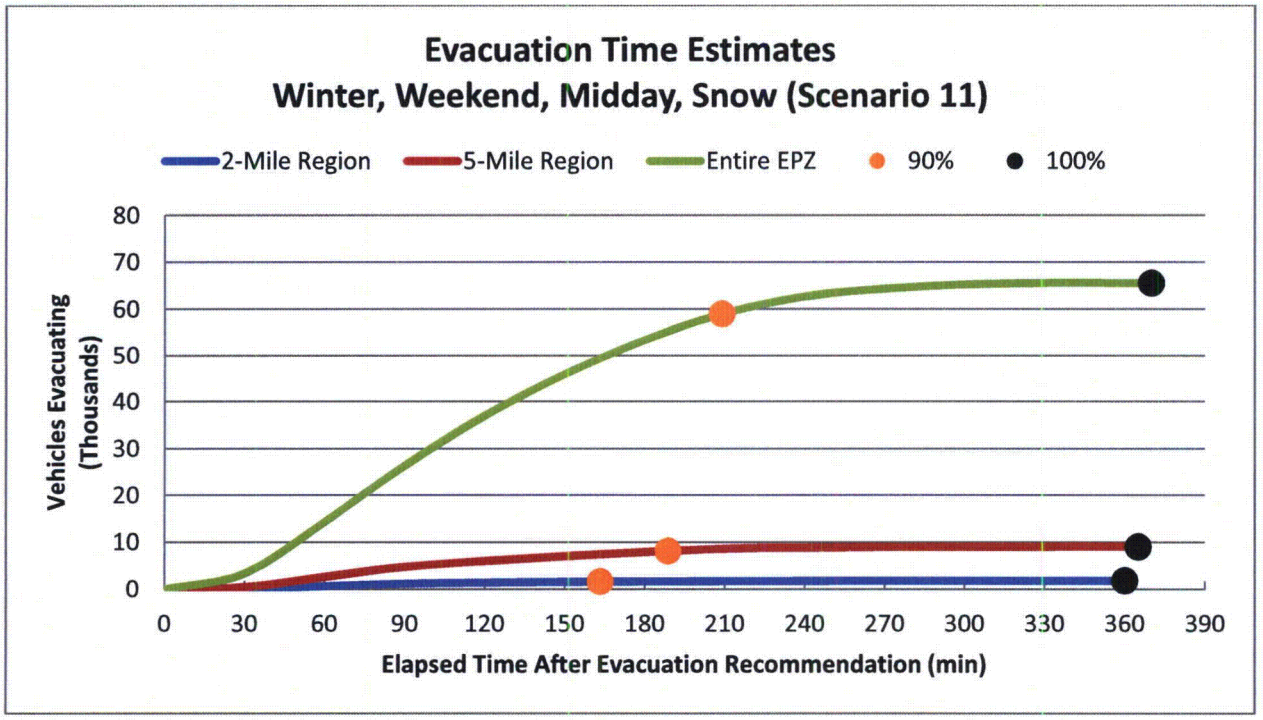


Figure 7-20. Evacuation Time Estimates - Scenario 11 for Region R03

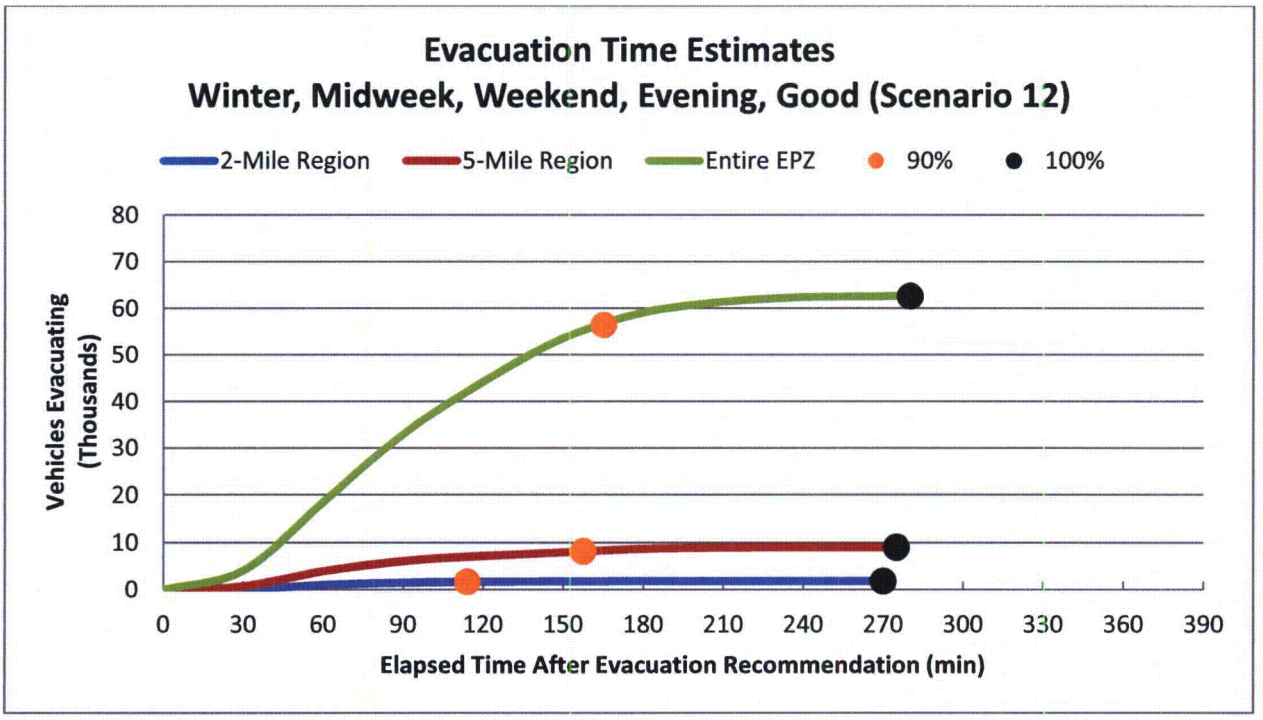


Figure 7-21. Evacuation Time Estimates - Scenario 12 for Region R03

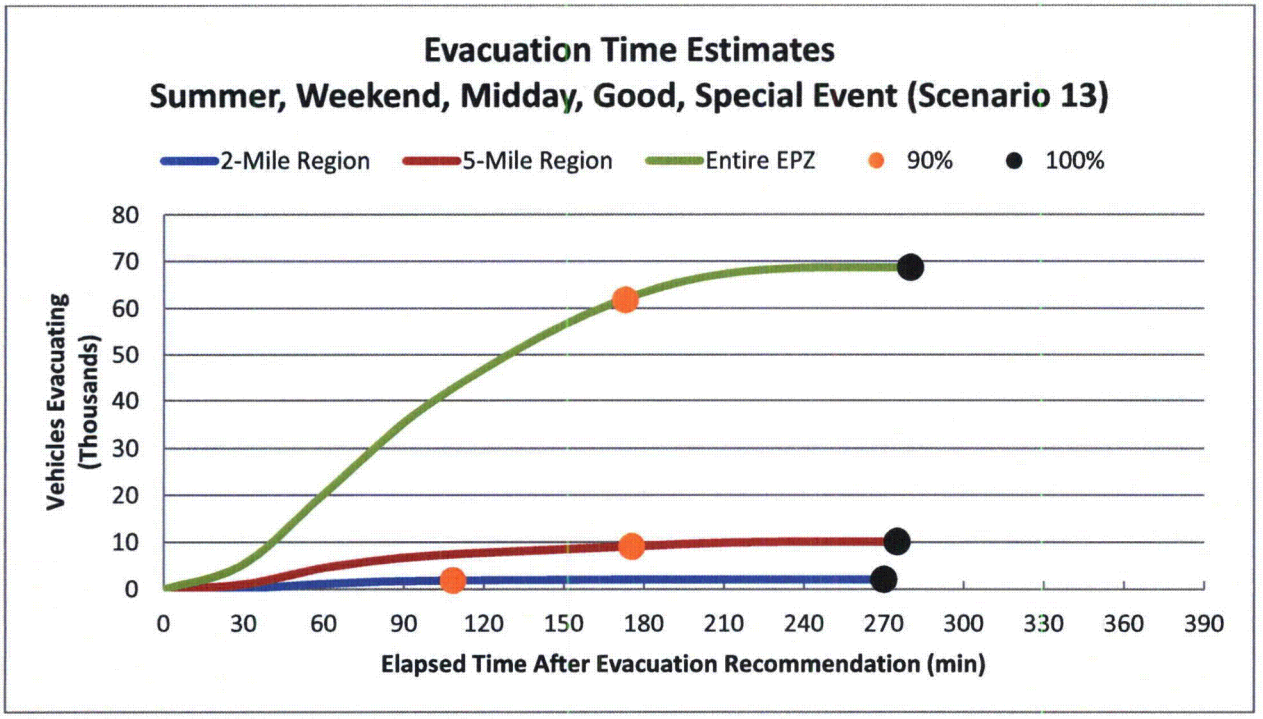


Figure 7-22. Evacuation Time Estimates - Scenario 13 for Region R03

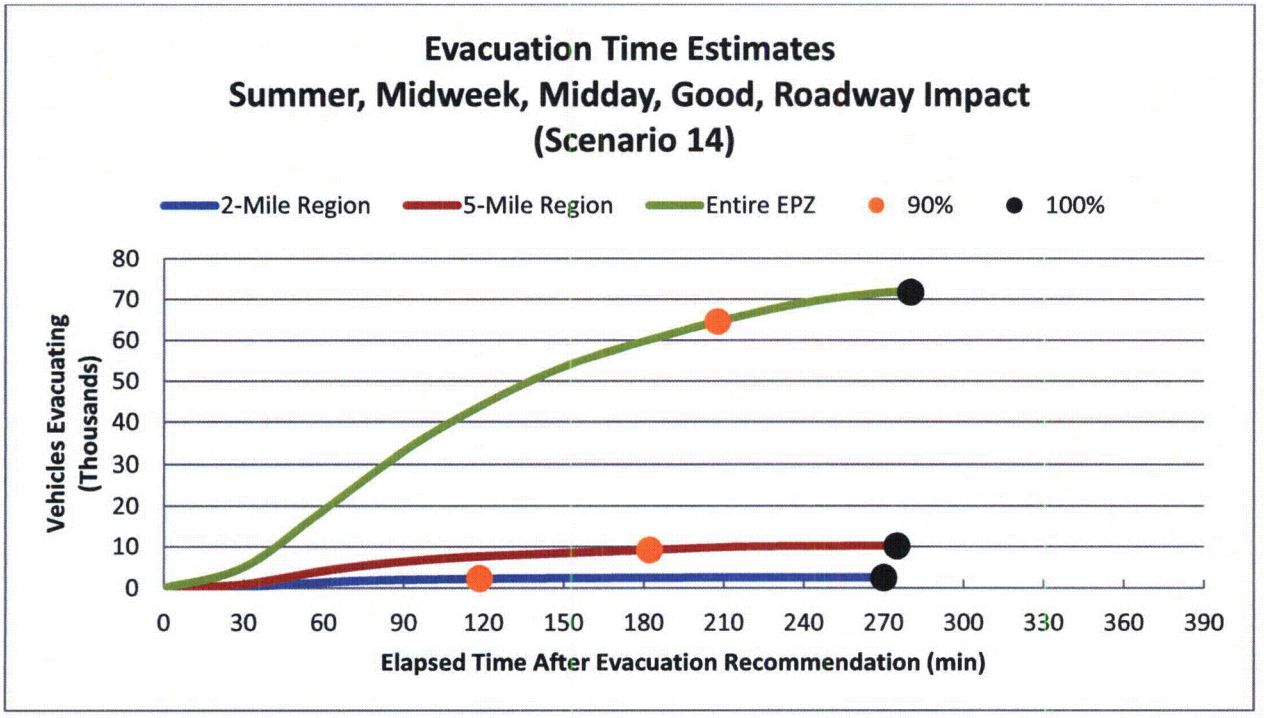


Figure 7-23. Evacuation Time Estimates - Scenario 14 for Region R03

8 TRANSIT-DEPENDENT AND SPECIAL FACILITY EVACUATION TIME ESTIMATES

This section details the analyses applied and the results obtained in the form of evacuation time estimates for transit vehicles. The demand for transit service reflects the needs of three population groups: (1) residents with no vehicles available; (2) residents of special facilities such as schools and medical facilities; and (3) homebound special needs population.

These transit vehicles mix with the general evacuation traffic that is comprised mostly of "passenger cars" (pc's). The presence of each transit vehicle in the evacuating traffic stream is represented within the modeling paradigm described in Appendix D as equivalent to two pc's. This equivalence factor represents the longer size and more sluggish operating characteristics of a transit vehicle, relative to those of a pc.

Transit vehicles must be mobilized in preparation for their respective evacuation missions. Specifically:

- Bus drivers must be alerted
- They must travel to the bus depot
- They must be briefed there and assigned to a route or facility

These activities consume time. Based on discussion with the offsite agencies, it is estimated that bus mobilization time will average approximately 90 minutes extending from the Advisory to Evacuate, to the time when buses first arrive at the facility to be evacuated.

During this mobilization period, other mobilization activities are taking place. One of these is the action taken by parents, neighbors, relatives and friends to pick up children from school prior to the arrival of buses, so that they may join their families. Virtually all studies of evacuations have concluded that this "bonding" process of uniting families is universally prevalent during emergencies and should be anticipated in the planning process. The current public information disseminated to residents of the Beaver Valley Power Station EPZ indicates that schoolchildren will be evacuated to host schools at the emergency action level of General Emergency, and that parents should pick schoolchildren up at host schools. As discussed in Section 2, this study assumes a fast breaking general emergency. Therefore, children are evacuated to host schools. Picking up children at school could add to traffic congestion at the schools, delaying the departure of the buses evacuating schoolchildren, which may have to return in a subsequent "wave" to the EPZ to evacuate the transit-dependent population. Based on discussions with FirstEnergy and the OROs, this report provides estimates of buses under the assumption that all schoolchildren will be evacuated by bus (no children will be picked up by their parents and no high school students will evacuate in personal vehicles) to present an upper bound estimate of buses required. It is assumed that children at day-care centers are picked up by parents or guardians and that the time to perform this activity is included in the trip generation times discussed in Section 5.

The procedure for computing transit-dependent ETE is to:

- Estimate demand for transit service

- Estimate time to perform all transit functions
- Estimate route travel times to the EPZ boundary and to the reception centers

8.1 Transit Dependent People Demand Estimate

The telephone survey (see Appendix F) results were used to estimate the portion of the population requiring transit service:

- Those persons in households that do not have a vehicle available.
- Those persons in households that do have vehicle(s) that would not be available at the time the evacuation is advised.

In the latter group, the vehicle(s) may be used by a commuter(s) who does not return (or is not expected to return) home to evacuate the household.

Table 8-1 presents estimates of transit-dependent people. Note:

- Estimates of persons requiring transit vehicles include schoolchildren. For those evacuation scenarios where children are at school when an evacuation is ordered, separate transportation is provided for the schoolchildren. The actual need for transit vehicles by residents is thereby less than the given estimates. However, estimates of transit vehicles are not reduced when schools are in session.
- It is reasonable and appropriate to consider that many transit-dependent persons will evacuate by ride-sharing with neighbors, friends or family. For example, nearly 80 percent of those who evacuated from Mississauga, Ontario who did not use their own cars, shared a ride with neighbors or friends. Other documents report that approximately 70 percent of transit dependent persons were evacuated via ride sharing. **We will adopt a conservative estimate that 50 percent of transit dependent persons will ride share, in accordance with NUREG/CR-7002.**

The estimated number of bus trips needed to service transit-dependent persons is based on an estimate of average bus occupancy of 30 persons at the conclusion of the bus run. Transit vehicle seating capacities typically equal or exceed 60 children (roughly equivalent to 40 adults). If transit vehicle evacuees are two thirds adults and one third children, then the number of "adult seats" taken by 30 persons is 20 + (2/3 x10) = 27. On this basis, the average load factor anticipated is (27/40) x 100 = 68 percent. Thus, if the actual demand for service exceeds the estimates of Table 8-1 by 50 percent, the demand for service can still be accommodated by the available bus seating capacity.

$$\left[20 + \left(\frac{2}{3} \times 10\right)\right] \div 40 \times 1.5 = 1.00$$

Table 8-1 indicates that transportation must be provided for 2,771 people. Therefore, a total of 93 buses are required to transport this population to reception centers.

To illustrate this estimation procedure, we calculate the number of persons, P, requiring public transit or ride-share, and the number of buses, B, required for the Beaver Valley EPZ:

$$P = No.of\ HH\ \times \sum_{i=0}^{n} \{(\%\ HH\ with\ i\ vehicles) \times [(Average\ HH\ Size) - i]\} \times A^i C^i$$

Where,

A = Percent of households with commuters

C = Percent of households who will not await the return of a commuter

$$P = 47{,}261 \times [0.032 \times 1.26 + 0.334 \times (1.61 - 1) \times 0.52 \times 0.52 + 0.433 \times (2.69 - 2) \times (0.52 \times 0.52)^2] = 5{,}542$$

$$B = (0.5 \times P) \div 30 = 93$$

These calculations are explained as follows:

- All members (1.26 avg.) of households (HH) with no vehicles (3.2%) will evacuate by public transit or ride-share. The term 47,261 (number of households) x 0.032 x 1.26, accounts for these people.
- The members of HH with 1 vehicle away (33.4%), who are at home, equal (1.61-1). The number of HH where the commuter will not return home is equal to (47,261 x 0.334 x 0.52 x 0.52), as 52% of EPZ households have a commuter, 52% of which would not return home in the event of an emergency. The number of persons who will evacuate by public transit or ride-share is equal to the product of these two terms.
- The members of HH with 2 vehicles that are away (43.3%), who are at home, equal (2.69 – 2). The number of HH where neither commuter will return home is equal to 47,261 x 0.433 x $(0.52 \times 0.52)^2$. The number of persons who will evacuate by public transit or ride-share is equal to the product of these two terms (the last term is squared to represent the probability that neither commuter will return).
- Households with 3 or more vehicles are assumed to have no need for transit vehicles.
- The total number of persons requiring public transit is the sum of such people in HH with no vehicles, or with 1 or 2 vehicles that are away from home.

The estimate of transit-dependent population in Table 8-1 far exceeds the number of registered transit-dependent persons in the EPZ as provided by the counties (discussed below in Section 8.5). This is consistent with the findings of NUREG/CR-6953, Volume 2, in that a large majority of the transit-dependent population within the EPZs of U.S. nuclear plants do not register with their local emergency response agency.

8.2 School Population – Transit Demand

Table 8-2 presents the school population and transportation requirements for the direct evacuation of all schools within the EPZ for the 2011-2012 school year. This information was provided by the local county emergency management agencies and through phone calls to individual schools. The column in Table 8-2 entitled "Buses Required" specifies the number of buses required for each school under the following set of assumptions and estimates:

- No students will be picked up by their parents prior to the arrival of the buses.
- While many high school students commute to school using private automobiles (as discussed in Section 2.4 of NUREG/CR-7002), the estimate of buses required for school evacuation do not consider the use of these private vehicles.
- Bus capacity, expressed in students per bus, is set to 70 for primary schools and 50 for middle and high schools. Columbiana County uses a bus capacity of 50 students for all their schools.
- All staff members accompany the students on the buses in Columbiana and Hancock Counties.
- Those staff members who do not accompany the students in Beaver County will evacuate in their private vehicles.
- No allowance is made for student absenteeism, typically 3 percent daily.

The counties in the EPZ could introduce procedures whereby the schools are contacted prior to the dispatch of buses from the depot to ascertain the current estimate of students to be evacuated. In this way, the number of buses dispatched to the schools will reflect the actual number needed. Those buses originally allocated to evacuate schoolchildren that are not needed due to children being picked up by their parents (although they are not advised to do so) can be gainfully assigned to service other facilities or those persons who do not have access to private vehicles or to ride-sharing.

Table 8-3 presents a list of the host schools for each school in the EPZ. Students will be transported to these host schools where they will be subsequently retrieved by their respective families.

8.3 Special Facility Demand

Table 8-4 presents the census of special facilities in the EPZ. The capacity and current census for each facility were provided by the county emergency management agencies and through phone calls to individual facilities. This data includes the number of ambulatory, wheelchair-bound and bedridden patients at each facility. Based on the data provided, there are 1,724 people living in or being treated in these facilities.

The transportation requirements for the special facility population are also presented in Table 8-4. The number of ambulance runs is determined by assuming that 2 patients can be accommodated per ambulance trip; the number of wheelchair bus runs assumes 15 wheelchairs per trip and the number of bus runs estimated assumes 30 ambulatory patients per trip.

8.4 Evacuation Time Estimates for Transit Dependent People

EPZ bus resources are assigned to evacuating schoolchildren (if school is in session at the time of the ATE) as the first priority in the event of an emergency. In the event that the allocation of buses dispatched from the depots to the various facilities and to the bus routes is somewhat "inefficient", or if there is a shortfall of available drivers, then there may be a need for some buses to return to the EPZ from the reception center after completing their first evacuation trip, to complete a "second wave" of providing transport service to evacuees. For this reason, the ETE for the transit-dependent population will be calculated for both a one wave transit evacuation and for two waves. Of course, if the impacted evacuation region is other than R03 (the entire EPZ), then there will likely be ample transit resources relative to demand in the impacted region and this discussion of a second wave would likely not apply.

When school evacuation needs are satisfied, subsequent assignments of buses to service the transit-dependent should be sensitive to their mobilization time. Clearly, the buses should be dispatched after people have completed their mobilization activities and are in a position to board the buses when they arrive at the pick-up points.

Evacuation Time Estimates for transit trips were developed using both good weather and adverse weather conditions. Figure 8-1 presents the chronology of events relevant to transit operations. The elapsed time for each activity will now be discussed with reference to Figure 8-1.

Activity: Mobilize Drivers (A→B→C)

Mobilization is the elapsed time from the Advisory to Evacuate until the time the buses arrive at the facility to be evacuated. Based on discussions with the county emergency management agencies, for a rapidly escalating radiological emergency with no observable indication before the fact, drivers would likely require 90 minutes to be contacted, to travel to the depot, be briefed, and to travel to the transit-dependent facilities. Mobilization time is slightly longer in adverse weather – 100 minutes when raining, 110 minutes when snowing. Mobilization time for bus routes servicing transit-dependent pick-up points is dependent on mobilization time of the evacuees and is discussed later in this section.

Activity: Board Passengers (C→D)

Based on discussions with offsite agencies, a loading time of 15 minutes (20 minutes for rain and 25 minutes for snow) for school buses is used.

For multiple stops along a pick-up route (transit-dependent bus routes) estimation of travel time must allow for the delay associated with stopping and starting at each pick-up point. The time, t, required for a bus to decelerate at a rate, "a", expressed in ft/sec/sec, from a speed, "v", expressed in ft/sec, to a stop, is t = v/a. Assuming the same acceleration rate and final speed following the stop yields a total time, T, to service boarding passengers:

$$T = t + B + t = B + 2t = B + \frac{2v}{a},$$

Where B = Dwell time to service passengers. The total distance, "s" in feet, travelled during the deceleration and acceleration activities is: $s = v^2/a$. If the bus had not stopped to service passengers, but had continued to travel at speed, v, then its travel time over the distance, s, would be: $s/v = v/a$. Then the total delay (i.e., pickup time, P) to service passengers is:

$$P = T - \frac{v}{a} = B + \frac{v}{a}$$

Assigning reasonable estimates:

- B = 50 seconds: a generous value for a single passenger, carrying personal items, to board per stop
- v = 25 mph = 37 ft/sec
- a = 4 ft/sec/sec, a moderate average rate

Then, P ≈ 1 minute per stop. Allowing 30 minutes pick-up time per bus run implies 30 stops per run, for good weather. It is assumed that bus acceleration and speed will be less in rain; total loading time is 40 minutes per bus in rain, 50 minutes in snow.

Activity: Travel to EPZ Boundary (D→E)

School Evacuation

Transportation resources available were provided by the EPZ county emergency management agencies and through phone calls to individual facilities. They are summarized in Table 8-5. Also included in the table are the number of buses needed to evacuate schools, medical facilities, transit-dependent population, and homebound special needs population (discussed below in Section 8.5). These numbers indicate there are sufficient resources available to evacuate all population groups in a single wave.

The buses servicing the schools are ready to begin their evacuation trips at 105 minutes after the ATE – 90 minutes mobilization time plus 15 minutes loading time – in good weather. The UNITES software discussed in Section 1.3 was used to define bus routes along the most likely path from a school being evacuated to the EPZ boundary, traveling toward the appropriate school reception center. This is done in UNITES by interactively selecting the series of nodes from the school to the EPZ boundary. Each bus route is given an identification number and is written to the DYNEV II input stream. DYNEV computes the route length and outputs the average speed for each 5 minute interval, for each bus route. The specified bus routes are documented in Table 8-6 (refer to the maps of the link-node analysis network in Appendix K for node locations). Data provided by DYNEV during the appropriate timeframe depending on the mobilization and loading times (i.e., 100 to 105 minutes after the ATE for good weather) were used to compute the average speed for each route, as follows:

$$Average\ Speed\ \left(\frac{mi.}{hr}\right) = \left[\frac{\sum_{i=1}^{n} length\ of\ link\ i\ (mi)}{\sum_{i=1}^{n} Delay\ on\ link\ i\ (min.) + \frac{length\ of\ link\ i\ (mi.)}{current\ speed\ on\ link\ i\ \left(\frac{mi.}{hr.}\right)} \times \frac{60\ min.}{1\ hr.}}\right] \times \frac{60\ min.}{1\ hr.}$$

The average speed computed (using this methodology) for the buses servicing each of the schools in the EPZ is shown in Table 8-7 through Table 8-9 for school evacuation, and in Table 8-11 through Table 8-13 for the transit vehicles evacuating transit-dependent persons, which are discussed later. The travel time to the EPZ boundary was computed for each bus using the computed average speed and the distance to the EPZ boundary along the most likely route out of the EPZ. The travel time from the EPZ boundary to the host school was computed assuming an average speed of 45 mph, 40 mph, and 35 mph for good weather, rain and snow, respectively. Bus speeds in Pennsylvania were reduced in Table 8-7 through Table 8-9 and in Table 8-11 through Table 8-13 to 45 mph for good weather, 40 mph for rain -- 10% decrease, and 35 mph for snow – 20% decrease, for those calculated bus speeds which exceed 45 mph, 40 mph, and 35 mph for good weather, rain, and snow, respectively.

Table 8-7 (good weather), Table 8-8 (rain) and Table 8-9 (snow) present the following evacuation time estimates (rounded up to the nearest 5 minutes) for schools in the EPZ: (1) The elapsed time from the Advisory to Evacuate until the bus exits the EPZ; and (2) The elapsed time until the bus reaches the host school. The evacuation time out of the EPZ can be computed as the sum of times associated with Activities A→B→C, C→D, and D→E (For example: 90 min. + 15 + 41 = 2:30 for South Side Elementary School, with good weather). The average one-wave ETE for schools is less than the 90th percentile general population ETE (Table 7-1) for an evacuation of the entire EPZ (region R03). The evacuation time to the host school is determined by adding the time associated with Activity E→F (discussed below) to this EPZ evacuation time.

Evacuation of Transit-Dependent Population

The buses dispatched from the depots to service the transit-dependent evacuees will be scheduled so that they arrive at their respective routes after their passengers have completed their mobilization. As shown in Figure 5-4 (Residents with no Commuters), 90 percent of the evacuees will complete their mobilization when the buses will begin their routes, approximately 120 minutes (130 minutes for rain, 140 minutes for snow) after the Advisory to Evacuate. Monaca Borough and Hopewell Township have high transit-dependent populations and require more buses than any other areas (Table 8-10). As such, two groups of buses are dispatched for Monaca Borough (Route Number 19) and three groups for Hopewell Township (Route Number

22). These groups of buses are separated by 20 minute headways, as shown in Table 8-11 through Table 8-13.

Those buses servicing the transit-dependent evacuees will first travel along their pick-up routes, then proceed out of the EPZ. Transit-dependent pick-up locations, within the Beaver County portion of the EPZ, are provided annually to EPZ residents in the Beaver County Public Safety Calendar. Columbiana County and Hancock County define transit-dependent pick-up locations in their county plans. The 34 bus routes shown graphically in Figure 8-2 through 8-4, and described in Table 8-10, were designed by KLD to service the major routes through each sub-area and to service the pre-defined pick-up locations identified in the county plans. It is assumed that residents will walk to and congregate at these pre-designated pick-up locations, and that they can arrive at the stops within the 120 minute bus mobilization time (good weather).

As previously discussed, a pickup time of 30 minutes (good weather) is estimated for 30 individual stops to pick up passengers, with an average of one minute of delay associated with each stop. Longer pickup times of 40 minutes and 50 minutes are used for rain and snow, respectively.

The travel distance along the respective pick-up routes within the EPZ is estimated using the UNITES software. Bus travel times within the EPZ are computed using average speeds computed by DYNEV, using the aforementioned methodology that was used for school evacuation.

Table 8-11 through Table 8-13 present the transit-dependent population evacuation time estimates for each bus route calculated using the above procedures for good weather, rain and snow, respectively.

For example, the ETE for the bus route (Route Number 1) servicing Midland Borough (sub-area P-1) is computed as 120 + 49 + 30 = 3:20 for good weather (rounded up to nearest 5 minutes). Here, 49 minutes is the time to travel 11.5 miles at 14.1 mph, the average speed output by the model for this route. The average one-wave ETE for transit-dependent buses is comparable to the 90th percentile general population ETE (Table 7-1) for an evacuation of the entire EPZ (region R03). The ETE for a second wave (discussed below) is presented in the event there is a shortfall of available buses or bus drivers, as previously discussed.

Activity: Travel to Reception Centers (E→F)

The distances from the EPZ boundary to the reception centers are measured using GIS software along the most likely route from the EPZ exit point to the reception center. The reception centers are mapped in Figure 10-1. For a one-wave evacuation, this travel time outside the EPZ does not contribute to the ETE. For a two-wave evacuation, the ETE for buses must be considered separately, since it could exceed the ETE for the general public. Assumed bus speeds of 45 mph, 40 mph, and 35 mph for good weather, rain, and snow, respectively, will be applied for this activity for buses servicing the transit-dependent population.

Activity: Passengers Leave Bus (F→G)

A bus can empty within 5 minutes. The driver takes a 10 minute break.

Activity: Bus Returns to Route for Second Wave Evacuation (G→C)

The buses assigned to return to the EPZ to perform a "second wave" evacuation of transit-dependent evacuees will be those that have already evacuated transit-dependent people who mobilized more quickly. The first wave of transit-dependent people depart the bus, and the bus then returns to the EPZ, travels to its route and proceeds to pick up more transit-dependent evacuees along the route. The travel time back to the EPZ is equal to the travel time to the reception center.

The second-wave ETE for the Route Number 1 servicing Midland Borough (sub-area P-1) is computed as follows for good weather:

- Bus arrives at reception center at 3:57 in good weather (3:20 to exit EPZ + 37 minute travel time to reception center).
- Bus discharges passengers (5 minutes) and driver takes a 10-minute rest: 15 minutes.
- Bus returns to EPZ and completes second route: 37 minutes (equal to travel time to reception center) + 18 minutes (11.5 miles @ 39.7 mph) = 55 minutes
- Bus completes pick-ups along route: 30 minutes.
- Bus exits EPZ at time 3:20 + 0:37 + 0:15 + 0:55 + 0:30 = 5:40 (rounded up to nearest 5 minutes) after the Advisory to Evacuate.

The ETE for the completion of the second wave for all transit-dependent bus routes are provided in Table 8-11 through Table 8-13. The average ETE for a two-wave evacuation of transit-dependent people, if needed, would exceed the ETE for the general population at the 90th percentile.

The relocation of transit-dependent evacuees from the reception centers to congregate care centers, if the counties decide to do so, is not considered in this study.

Evacuation of Special Facilities

The bus operations for this group are similar to those for school evacuation except:

- Buses are assigned on the basis of 30 patients to allow for staff to accompany the patients.
- The passenger loading time will be longer at approximately one minute per ambulatory patient, 5 minutes per wheelchair bound patient, and 15 minutes per bedridden patient, to account for the time to move patients from inside the facility to the vehicles.

Table 8-4 indicates that 47 buses, 39 wheelchair buses and 41 ambulances are needed to evacuate all of the special facilities in the EPZ. According to Table 8-5, the counties can collectively provide 702 buses, 42 vans, 135 wheelchair accessible buses, 20 wheelchair

accessible vans and 450 ambulances. Thus, there are ample resources to evacuate the all patients from the special facilities in a single wave.

As is done for the schools, it is estimated that mobilization time averages 90 minutes. Specially trained medical support staff (working their regular shift) will be on site to assist in the evacuation of patients. Additional staff (if needed) could be mobilized over this same 90 minute timeframe.

Table 8-14 through Table 8-16 summarize the ETE for medical facilities within the EPZ for good weather, rain, and snow. Based on the locations of the medical facilities in Figure E-4, it is estimated that buses will have to travel 5 miles, on average, to leave the EPZ. Average speeds output by the model, capped at 45 mph (40 mph for rain and 35 mph for snow), are used to compute travel time to EPZ boundary. The ETE is the sum of the mobilization time, total passenger loading time, and travel time out of the EPZ. Concurrent loading on multiple buses, wheelchair buses/vans, and ambulances at capacity is assumed such that maximum loading times are 30 minutes, 75 minutes, and 30 minutes, respectively. All ETE are rounded to the nearest 5 minutes. For example, the calculation of ETE for the ambulatory patients residing at medical facilities in sub-area P-8 for good weather is:

ETE: 90 + 30 x 1 + 13 = 133 min. or 2:15 rounded up to the nearest 5 minutes.

The travel time to the EPZ boundary (13 min) is determined by dividing the estimated 5 mile travel distance by the route speed output by the DYNEV model capped at the maximum speed limit (45 mph). It is assumed that special facility population is directly evacuated to appropriate host medical facilities. Relocation of this population to permanent facilities and/or passing through the reception center before arriving at the host facility is not considered in this analysis. The average one-wave ETE for special facilities is less than the 90th percentile general population ETE (Table 7-1) for an evacuation of the entire EPZ (region R03).

8.5 Special Needs Population

Based on data provided by FirstEnergy, there are an estimated 36 homebound special needs people within the Beaver County portion of the EPZ, who require wheelchair transportation assistance to evacuate. Data for homebound special needs population within the Columbiana County and Hancock County portions of the EPZ were not provided.

ETE for Homebound Special Needs Persons

Table 8-17 summarizes the ETE for homebound special needs people, broken down by weather condition. The table takes into consideration the deployment of multiple vehicles to reduce the number of stops per vehicle. It is conservatively assumed that wheelchair bound special needs households are spaced 3 miles apart. Bus speeds approximate 20 mph between households in good weather (10% slower in rain, 20% slower in snow). Mobilization times of 90 minutes were used (100 minutes for rain, and 110 minutes for snow). The last HH is assumed to be 5 miles from the EPZ boundary, and the network-wide average speed, capped at 45 mph (40 mph for rain and 35 mph for snow), after the last pickup is used to compute travel time. ETE is computed by summing mobilization time, loading time at first household, travel to subsequent

households, loading time at subsequent households, and travel time to EPZ boundary. All ETE are rounded to the nearest 5 minutes.

For example, assuming no more than one special needs person per HH implies that 36 wheelchair bound households need to be serviced. While only 3 wheelchair buses are needed from a capacity perspective, if 6 buses are deployed to service these special needs HH, then each would require 6 stops. The following outlines the ETE calculations:

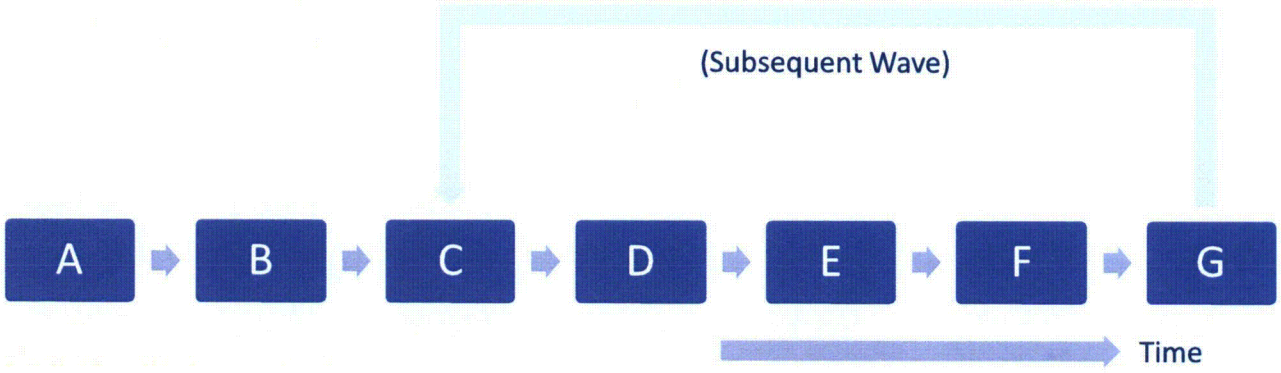
1. Assume 6 wheelchair buses are deployed, each with 6 stops, to service a total of 36 HH.
2. The ETE is calculated as follows:
    a. Wheelchair buses arrive at the first pickup location: 90 minutes
    b. Load HH members at first pickup: 5 minutes
    c. Travel to subsequent pickup locations: 5 @ 9 minutes (3 miles at 20 mph) = 45 minutes
    d. Load HH members at subsequent pickup locations: 5 @ 5 minutes = 25 minutes
    e. Travel to EPZ boundary: 15 minutes (5 miles at 20.3 mph).

    ETE: 90 + 5 + 45 + 25 + 15 = 3:00

As indicated in Table 8-5, there are sufficient transit resources available to evacuate all transit-dependent people in a single wave. Thus, a second wave of evacuation is not needed for the homebound special needs population. The average one-wave ETE for homebound special needs population is comparable to the 90th percentile general population ETE (Table 7-1) for an evacuation of the entire EPZ (region R03).

8.6 Correctional Facilities

As detailed in Table E-7, there is one correctional facility within the EPZ – Beaver County Jail. The total inmate population at this facility is 300 persons. The Beaver County Operations Plan indicates the Beaver County Jail would not be evacuated; rather persons would be given potassium iodide (KI) and shelter in place. Thus, ETE are not computed for this facility.



Event	
A	Advisory to Evacuate
B	Bus Dispatched from Depot
C	Bus Arrives at Facility/Pick-up Route
D	Bus Departs for Reception Center
E	Bus Exits Region
F	Bus Arrives at Reception Center/Host Facility
G	Bus Available for "Second Wave" Evacuation Service
Activity	
A→B	Driver Mobilization
B→C	Travel to Facility or to Pick-up Route
C→D	Passengers Board the Bus
D→E	Bus Travels Towards Region Boundary
E→F	Bus Travels Towards Reception Center Outside the EPZ
F→G	Passengers Leave Bus; Driver Takes a Break

Figure 8-1. Chronology of Transit Evacuation Operations

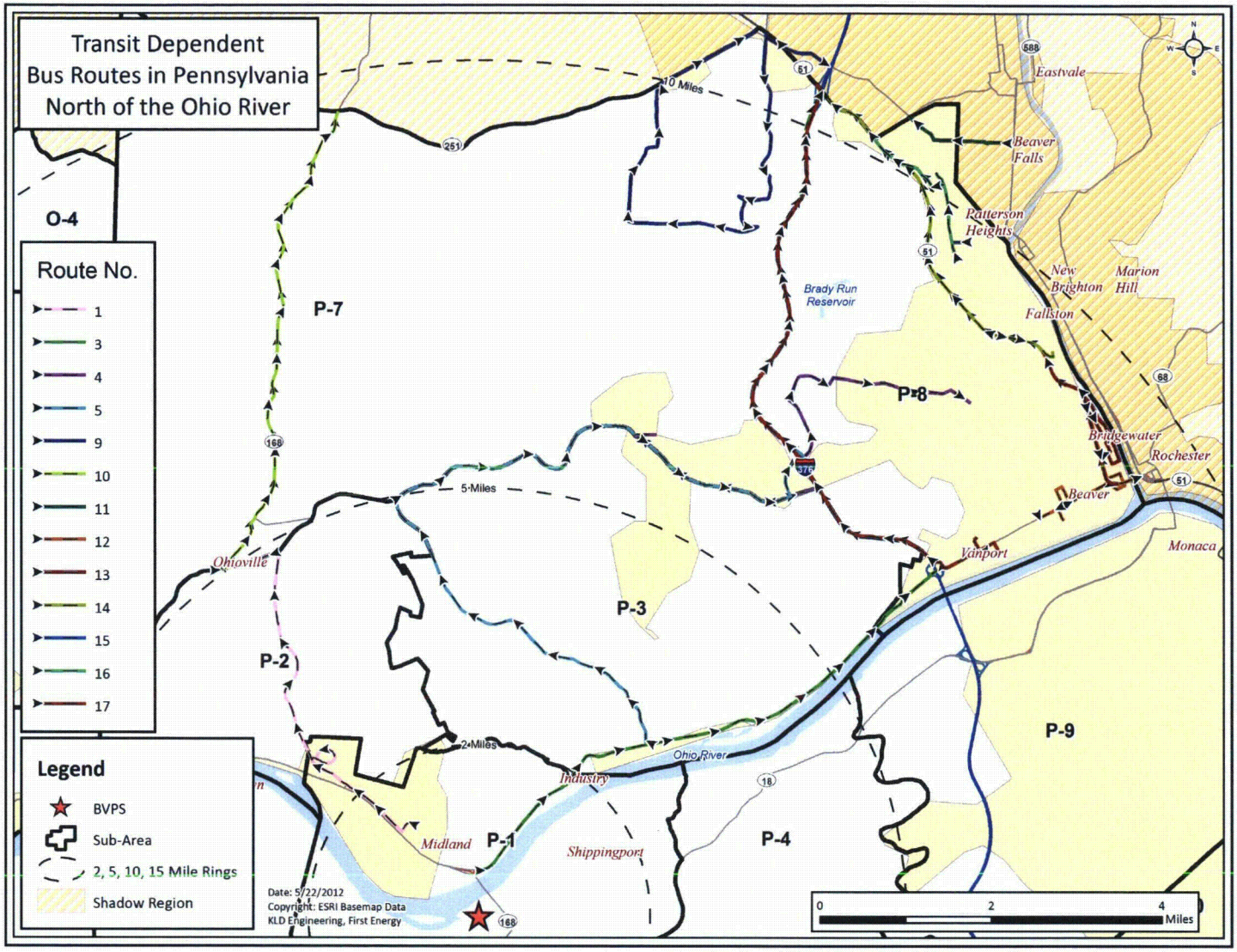


Figure 8-2. Transit-Dependent Bus Routes in Pennsylvania, North of the Ohio River

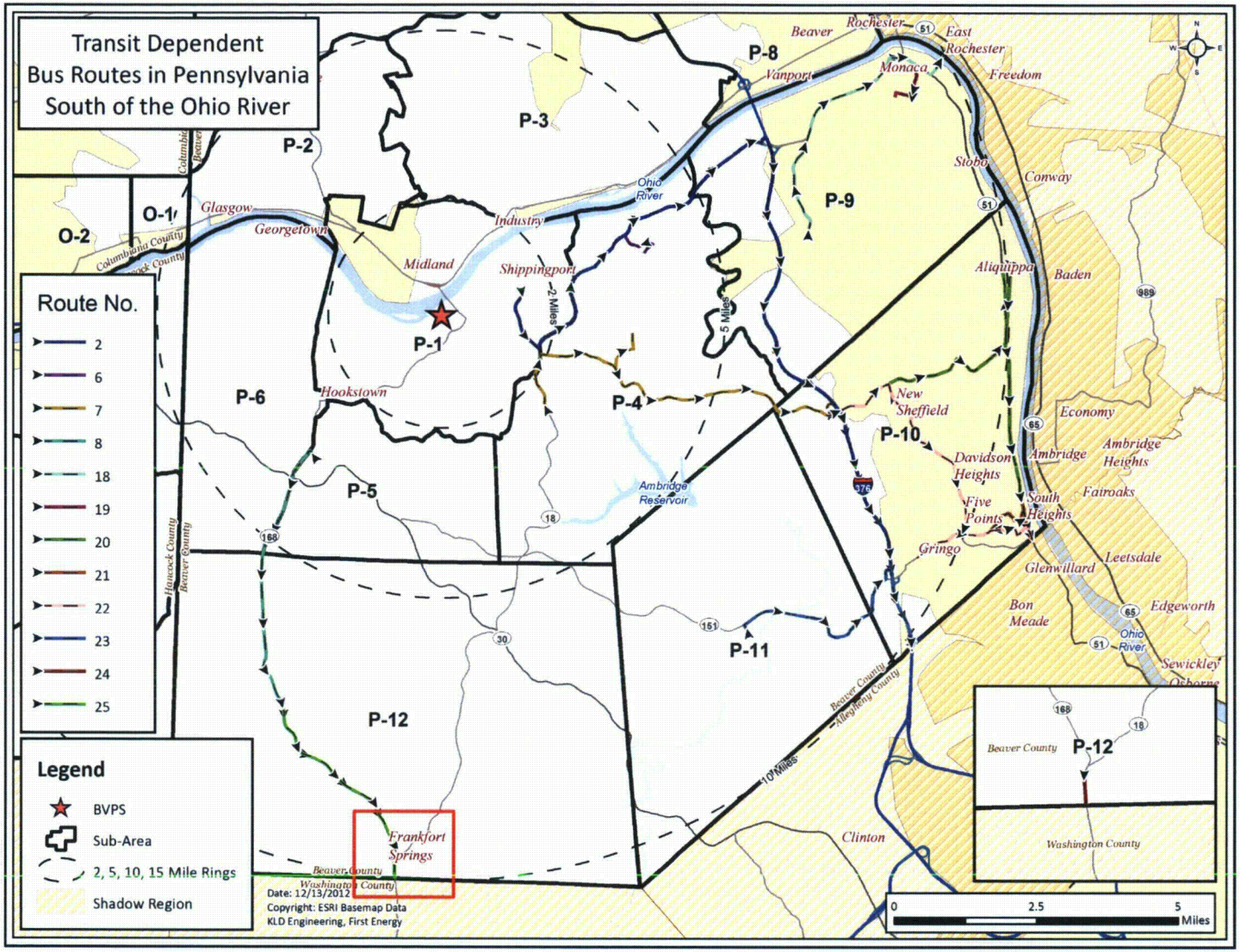


Figure 8-3. Transit-Dependent Bus Routes in Pennsylvania, South of the Ohio River

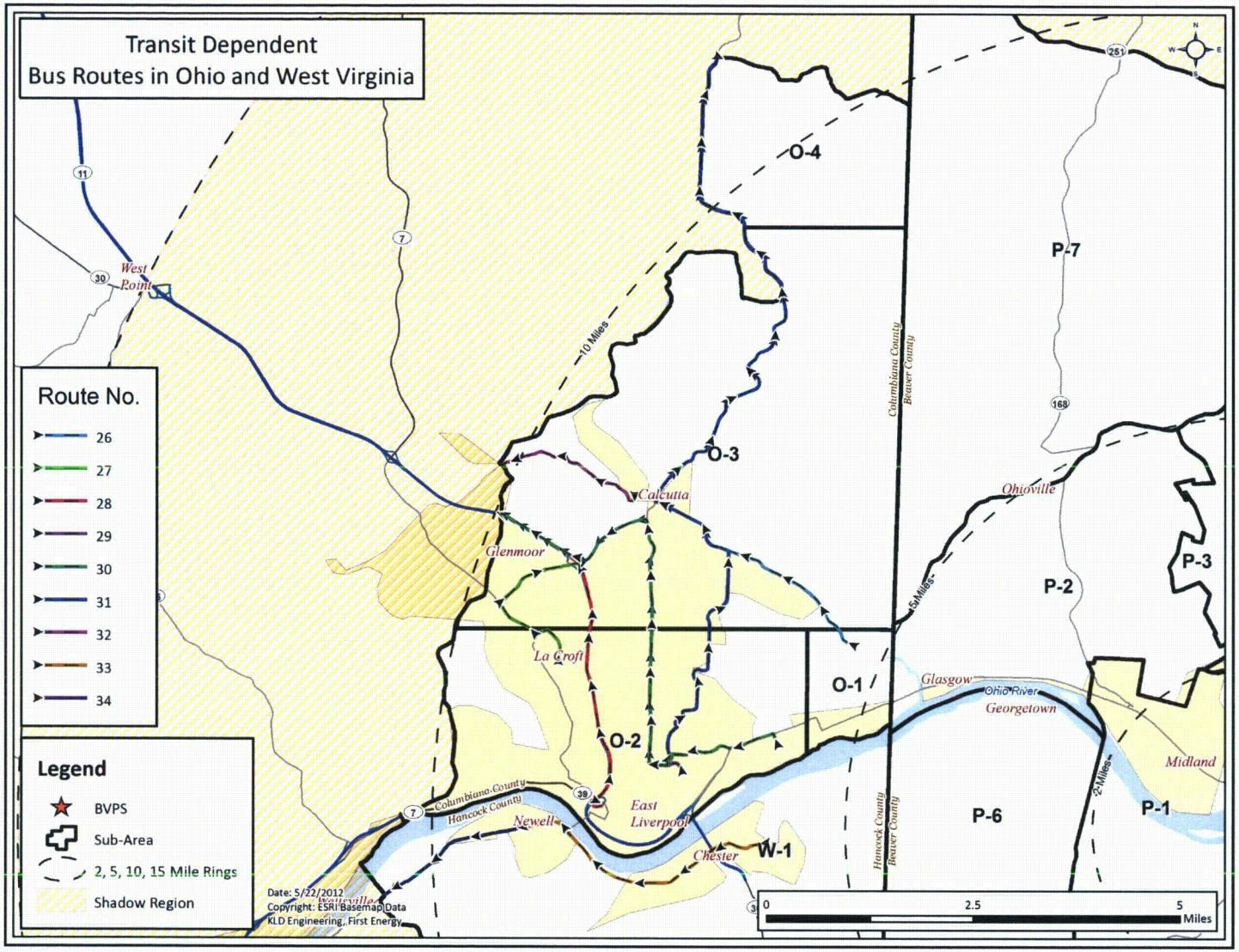


Figure 8-4. Transit-Dependent Bus Routes in Ohio and West Virginia

Table 8-1. Transit-Dependent Population Estimates

2010 EPZ Population	Survey Average HH Size with Indicated No. of Vehicles			Estimated No. of Households	Survey Percent HH with Indicated No. of Vehicles			Survey Percent HH with Commuters	Survey Percent HH with Non-Returning Commuters	Total People Requiring Transport	Estimated Ridesharing Percentage	People Requiring Public Transit	Percent Population Requiring Public Transit
	0	1	2		0	1	2						
113,427	1.26	1.61	2.69	47,261	3.2%	33.4%	43.3%	52%	52%	5,542	50%	2,771	2.4%

Table 8-2. School Population Demand Estimates

Sub-Area	School Name	Enrollment	Staff***	Buses Required
P-1	Midland Neel Elementary/Middle School	375	Staff evacuate in personal vehicles.	7
P-1	Lincoln Park Performing Arts Charter School	600		10
P-1	Prima Learning Center	120		2
P-3	Western Beaver Junior-Senior High School	385		7
P-4	Bethel Christian School	50		1
P-5	South Side Elementary School	604		10
P-5	South Side High School	463		9
P-5	South Side Middle School	333		6
P-7	Blackhawk Intermediate School	625		13
P-7	Fairview Elementary School	365		6
P-7	Highland Middle School	483		10
P-8	Beaver Area Academic Charter School	79		2
P-8	Beaver Area High School	735		16
P-8	Beaver Area Middle School	336		8
P-8	College Square Elementary School	442		7
P-8	Dutch Ridge Elementary	610		10
P-8	Patterson Primary School	221		6
P-8	Sts. Peter and Paul School	195		3
P-9	Beaver County Career & Technology Center	317		7
P-9	Center Grange Primary School	615		8
P-9	Central Valley High School	853		14
P-9	Central Valley Middle School	630		11
P-9	St. John the Baptist School	233		5
P-9	Todd Lane Elementary School	541		9
P-10	Aliquippa Elementary School	472		7
P-10	Aliquippa Jr./Sr. High School	728		10
P-10	Hope Christian Academy	22		1
P-10	Hopewell Elementary School	345		5
P-10	Hopewell Junior High School	740		11
P-10	Hopewell Senior High School	880		13
P-10	Margaret Ross Elementary School	200		3
P-10	Our Lady of Fatima School	202		3
P-11	Independence Elementary School	310		5
P-12	Pleasant Hills Wesleyan Academy	12		1
O-2	American Spirit Academy	151	22	4
O-2	East Liverpool High School	975	81	22
O-2	East Liverpool Jr. High School	742	62	17

Sub-Area	School Name	Enrollment	Staff***	Buses Required
O-2	LaCroft Elementary School	504	50	10
O-2	North Elementary School	439	40	10
O-2	Westgate Middle School	327	60	8
O-3	Calcutta Elementary School	390	30	9
O-3	Employment Development Center	80	20	2
W-1	Allison Elementary School	439	26	10
W-2	Oak Glen High School	600	39	14
W-2	Oak Glen Middle School	627	41	14
W-3	New Manchester Elementary School	391	24	7
	TOTAL:	**19,786**	**495**	**373**
P-9	Community College of Beaver County *	2,800		-
P-9	Penn State - Beaver Campus *	870		-
O-2	Kent State University *	1,400		-
S.R.	Ambridge Sr. High School **	762		-
S.R.	Ambridge Jr. High School **	411		-
S.R.	Blackhawk High School **	1,073		-
S.R.	Economy Elementary School **	636		-
S.R.	Highland Elementary School **	606		-
S.R.	New Brighton Area Elementary School **	729		-
S.R.	New Brighton Area Middle School **	408		-
S.R.	New Brighton Area High School **	553		-
S.R.	North Hills Christian School **	81		-
S.R.	Northwestern Primary School **	331		-
S.R.	Quigley Catholic High School **	220		-
S.R.	State Street Elementary School **	308		-
S.R.	John D. Rockefeller Career Center **	460		-
	TOTAL (USE PERSONAL VEHICLES TO EVACUATE OR SHELTER IN PLACE):	**11,648**	**-**	**-**

* Students use personal vehicles to evacuate.

** These schools are identified in the county emergency plans; however, students shelter in place.

***As noted in Section 8.2, all staff members accompany the students on the buses in Columbiana and Hancock Counties.

Table 8-3. Host Schools

School	Host School
Blackhawk Intermediate School	Blackhawk High School
Highland Middle School	
South Side Elementary School	Canon-McMillan High School
South Side High School	
South Side Middle School	
Beaver County Career & Technology Center	
Center Grange Primary School	
Central Valley High School	
Central Valley Middle School	
St. John the Baptist School	
Todd Lane Elementary School	
Pleasant Hills Wesleyan Academy	
LaCroft Elementary School	Columbiana County Career Center
American Spirit Academy	David Anderson High School
East Liverpool High School	
Aliquippa Elementary School	Independence Middle School
Aliquippa Jr./Sr. High School	
Hope Christian Academy	
Patterson Primary School	Northwestern Primary School
Beaver Area Academic Charter School	Slippery Rock Jr./Sr. High School
Beaver Area High School	
Beaver Area Middle School	
College Square Elementary School	
Dutch Ridge Elementary	
Sts. Peter and Paul School	
Bethel Christian School	South Park Senior High School
Hopewell Elementary School	
Hopewell Junior High School	
Hopewell Senior High School	
Margaret Ross Elementary School	
Our Lady of Fatima School	
Independence Elementary School	
Lincoln Park Performing Arts Charter School	Union Area Middle/Sr. High School
Midland Neel Elementary/Middle School	
Prima Learning Center	
Western Beaver Junior-Senior High School	
Fairview Elementary School	
Oak Glen High School	Weir High School

School	Host School
Allison Elementary School	Weir Middle School
Oak Glen Middle School	
New Manchester Elementary School	
East Liverpool Jr. High School	Columbiana County Career and Technical Center or Lisbon David Anderson High School
North Elementary School	
Westgate Middle School	
Calcutta Elementary School	
Employment Development Center	
Ambridge Sr. High School	These schools are listed in the County emergency plans; however, all of these schools shelter in place
Ambridge Jr. High School	
Blackhawk High School	
Economy Elementary School	
Highland Elementary School	
New Brighton Area Elementary School	
New Brighton Area Middle School	
New Brighton Area High School	
North Hills Christian School	
Northwestern Primary School	
Quigley Catholic High School	
State Street Elementary School	
John D. Rockefeller Career Center	
Community College of Beaver County	Students use personal vehicles to evacuate.
Kent State University	
Penn State - Beaver Campus	

Table 8-4. Special Facility Transit Demand

Sub-Area	Facility Name	Municipality	Cap-acity	Current Census	Ambu-latory	Wheel-chair Bound	Bed-ridden	Bus Runs	Wheel-chair Bus Runs	Ambulance
BEAVER COUNTY, PA										
P-7	Beaver Meadows	Beaver	83	70	46	24	0	2	2	0
P-7	Beaver Valley Nursing & Rehabilitation	Beaver	83	69	60	9	0	2	1	0
P-7	Lakeview Personal Care	Darlington	70	69	66	3	0	3	1	0
P-8	Cambridge Village	Beaver Falls	100	78	58	20	0	2	2	0
P-8	Friendship Ridge	Beaver	589	548	352	163	33	12	11	17
P-8	Heritage Valley - Beaver	Beaver	250	220	140	66	14	5	5	7
P-8	Trinity Oaks Care Center	Beaver	24	18	13	5	0	1	1	0
P-9	Gateway Rehabilitation Center	Aliquippa	148	132	132	0	0	5	0	0
P-9	Gateway Rehabilitation Center - Moffett House	Beaver Falls	25	24	24	0	0	1	0	0
P-10	Beaver Elder Care & Rehabilitation Center	West Aliquippa	67	53	35	16	2	2	2	1
P-10	Hunter's Personal Care	West Aliquippa	21	15	12	1	2	1	1	1
S.R.[1]	Elmcroft of Chippewa	Beaver Falls	85	70	53	17	0	2	2	0
Beaver County Subtotal:			***1,545***	***1,366***	***991***	***324***	***51***	***38***	***28***	***26***

[1] This facility is listed in the Beaver County REP Plan and will evacuate.

Sub-Area	Facility Name	Municipality	Cap-acity	Current Census	Ambu-latory	Wheel-chair Bound	Bed-ridden	Bus Runs	Wheel-chair Bus Runs	Ambulance
COLUMBIANA COUNTY, OH										
O-2	East Liverpool City Hospital	East Liverpool	154	67	42	15	10	2	1	5
O-2	East Liverpool Convalescent Center #1	East Liverpool	50	37	15	19	3	1	2	2
O-2	Nentwick Nursing Home	East Liverpool	100	71	45	22	4	2	2	2
O-3	Calcutta Health Care	East Liverpool	121	99	63	30	6	3	2	3
Columbiana County Subtotal:			***425***	***274***	***165***	***86***	***23***	***8***	***7***	***12***
HANCOCK COUNTY, WV										
W-1	The Orchard at Fox Crest	Chester	137	84	24	55	5	1	4	3
Hancock County Subtotal:			***170***	***111***	***41***	***64***	***6***	***2***	***5***	***4***
TOTAL:			**2,017**	**1,724**	**1,180**	**465**	**89**	**47**	**39**	**41**

Table 8-5. Summary of Transportation Resources

Transportation Resource	Buses	Vans	Wheelchair Buses	Wheelchair Vans	Ambulances
Resources Available					
BEAVER COUNTY, PA					
Midland Neel Elementary/Middle School	2	-	-	-	-
Western Beaver Junior-Senior High School	6	-	-	-	-
South Side Elementary School	25	-	-	-	-
South Side High School		-	-	-	-
South Side Middle School		-	-	-	-
Blackhawk Intermediate School	13	-	-	-	-
Fairview Elementary School	6	-	-	-	-
Highland Middle School	10	-	-	-	-
Beaver Area High School	1	-	-	-	-
College Square Elementary School	7	-	-	-	-
Dutch Ridge Elementary	10	-	-	-	-
Patterson Primary School	6	-	-	-	-
Beaver County Career & Technology Center	7	-	-	-	-
Center Grange Primary School	8	-	-	-	-
Central Valley High School	14	-	-	-	-
Central Valley Middle School	11	-	-	-	-
Todd Lane Elementary School	9	-	-	-	-
Aliquippa Elementary School	7	-	-	-	-
Aliquippa Jr./Sr. High School	10	-	-	-	-
Hopewell Elementary School	5	-	-	-	-
Hopewell Junior High School	11	-	-	-	-
Hopewell Senior High School	1	-	-	-	-
Margaret Ross Elementary School	3	-	-	-	-
Independence Elementary School	5	-	-	-	-
Beaver Meadows	1	1	-	-	-
Beaver Valley Nursing & Rehabilitation	-	1	1	-	-
Elmcroft of Chippewa	1	-	-	-	-
Friendship Ridge	-	2	-	-	-
Gateway Rehabilitation Center - Moffett House	-	1	-	-	-
Hunter's Personal Care	-	-	-	1	-
Lakeview Personal Care	-	1	-	-	-
Economy Ambulance	-	-	-	-	3
Hanover VFD	-	-	-	-	1

Transportation Resource	Buses	Vans	Wheelchair Buses	Wheelchair Vans	Ambulances
Northwestern Ambulance Auxiliary	-	-	-	-	2
Medic Rescue	-	-	-	-	25
Independence Ambulance	-	-	-	-	1
Ambulance companies in Allegheny County	-	-	-	-	290
Butler Ambulance Service	-	-	-	-	10
Buffalo Twp. EMS	-	-	-	-	3
Chicora UFD	-	-	-	-	1
Cranberry Ambulance	-	-	-	-	2
East Butler	-	-	-	-	2
Harmony EMS	-	-	-	-	3
Petrolia EMS	-	-	-	-	2
Portersville EMS	-	-	-	-	2
Saxonberg EMS	-	-	-	-	3
Slippery Rock Rescue	-	-	-	-	3
Medevac	-	-	-	-	10
Enon Valley VFD/EMS	-	-	-	-	1
New Wilmington VFD/EMS	-	-	-	-	2
Noga Ambulance Service	-	-	-	-	12
North Beaver VFD Ambulance	-	-	-	-	1
Pulaski Rescue VFD	-	-	-	-	1
Ambulance & Chair - Washington	-	-	-	-	11
Bentworth Ambulance	-	-	-	-	2
Brownsville Ambulance	-	-	-	-	4
Canonsburg General Hospital Ambulance	-	-	-	-	5
Fort Cherry Ambulance	-	-	-	-	6
Mon Valley EMS	-	-	-	-	1
Morris Township VFD	-	-	-	-	1
Tri-Community Ambulance	-	-	-	-	3
Ambulance Service	-	-	-	-	3
Expressway Travel Center	48	-	-	-	-
Ferguson Transportation Co.	32	5	-	-	-
Lenzer Coach Lines	33	5	-	-	-
McCarter Transit, Inc.	87		-	-	-
Southside Garage	30	13	-	3	-
R.J. Rhodes	161	9	12	3	-
Beaver County Subtotal:	***570***	***38***	***13***	***7***	***416***

Transportation Resource	Buses	Vans	Wheelchair Buses	Wheelchair Vans	Ambulances
COLUMBIANA COUNTY, OH					
Columbiana County	-	-	51	4	-
E. Liverpool School Buses	19	2	4	-	-
East Liverpool Convalescent Center #1	1	-	-	-	-
Community Action Agency	-	-	22	1	-
Robert Bycroft	-	-	23	8	-
Columbiana County Education Service Center	-	-	10	-	-
Beaver County Local School Buses	28	2	2	-	-
Lifeteam EMS, Inc.	-	-	-	-	4
Tri-County EMS	-	-	-	-	5
Columbiana EMS	-	-	-	-	2
East Palestine EMS	-	-	-	-	4
N. Waterford EMS	-	-	-	-	2
Negley EMS	-	-	-	-	2
EMT	-	-	-	-	2
North Star	-	-	-	-	3
KLG	-	-	-	-	2
Leetonia EMS	-	-	-	-	2
Columbiana County Subtotal:	***48***	***4***	***112***	***13***	***28***
HANCOCK COUNTY, WV					
Hancock County Public Schools	42	-	9	-	-
New Cumberland Ambulance Service	-	-	-	-	1
Weirton Area Ambulance & Rescue Squad	-	-	-	-	5
Brooke County Public Schools	42	-	1	-	-
Hancock County Subtotal:	***84***	***0***	***10***	***0***	***6***
TOTAL:	**702**	**42**	**135**	**20**	**450**
Resources Needed					
Schools (Table 8-2):	373	-	-	-	-
Medical Facilities (Table 8-4):	47	-	39	-	41
Transit-Dependent Population (Table 8-10):	93	-	-	-	-
Homebound Special Needs (Section 8.5):	-	-	6	-	-
Correctional Facilities (Section 8.6):	-	-	-	-	-
TOTAL TRANSPORTATION NEEDS:	**513**	**0**	**45**	**0**	**41**

Table 8-6. Bus Route Descriptions

Route Number	Description	Nodes Traversed from Route Start to EPZ Boundary
1	Transportation pick-up points in Midland Borough	68, 67, 66, 65, 60, 58, 259, 59, 75, 76, 77, 78, 79, 80, 521, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 95, 96, 97, 98, 99, 100, 101, 102, 103
2	Transportation pick-up points in Shippingport Borough	1950, 1955, 1960, 1965, 1970, 3000, 3005, 226, 227, 228, 229, 239, 241, 247, 242, 243, 245, 246, 248, 251, 255, 252, 337, 254, 325, 320, 315, 310, 56
3	Transportation pick-up points in Glasgow Borough	1880, 1875, 1870, 1865, 1860, 1855, 1850, 1845, 1842, 1840, 1835, 1830, 1825, 1820, 1815, 1805, 1803, 1795, 1786, 1787, 1790, 340, 342, 340, 342, 34
4	Transportation pick-up points in Brighton Township	512, 511, 225, 353, 354, 356, 346, 360, 362, 365, 370, 375, 380, 385, 163
5	Transportation pick-up points in Industry Borough	574, 573, 514, 513, 512, 511, 225, 353, 354, 356, 346, 360, 362, 365, 370, 375, 380, 385, 163
6	Transportation pick-up points in Potter Township	229, 239, 241, 247, 242, 243, 245, 246, 248, 251, 255, 252, 337, 254, 325, 320, 315, 310, 566, 567, 305, 300, 195, 1290, 190, 187, 185, 180, 175, 170, 165
7	Transportation pick-up points in Raccoon Township	1980, 538, 539, 541, 542, 543, 544, 546, 547, 548, 549, 551, 552, 559, 553, 554, 556, 557, 558, 1305, 1290, 190, 187, 185, 180, 175, 170, 165
8	Transportation pick-up points in Greene Township and Georgetown Borough	5205, 5200, 5210, 944, 178, 179, 181, 182, 183, 184, 186, 188, 189, 191, 4050, 4045
9	Transportation pick-up points in Chippewa Township	114, 116, 371, 139, 148, 154, 156, 161, 162
10	Transportation pick-up points ins in Ohioville Borough	85, 86, 87, 88, 89, 90, 91, 92, 95, 96, 97, 98, 99, 100, 101, 102, 103
11	Transportation pick-up points in South Beaver Township	754, 756, 746, 953, 747, 748
12	Transportation pick-up points in Beaver Borough	1670, 1675, 361, 177, 176, 174, 368, 173, 172, 171, 169, 168, 167, 166, 162
13	Transportation pick-up points in Bridgewater Borough	1670, 1675, 361, 177, 176, 174, 368, 173, 172, 171, 169, 168, 167, 166, 162
14	Transportation pick-up points in Fallston Borough	174, 368, 173, 172, 171, 169, 168, 167, 166, 162

Route Number	Description	Nodes Traversed from Route Start to EPZ Boundary
15	Transportation pick-up points in Patterson Heights Borough	168, 167
16	Transportation pick-up points in Patterson Township	168, 167
17	Transportation pick-up points in Vanport Township	1779, 1778, 1780, 1785, 1787, 1790, 340, 342, 345, 350, 355, 360, 362, 365, 370, 375, 380, 385, 163
18	Transportation pick-up points in Center Township	1225, 1220, 1217, 1210, 1205, 1190, 1088, 1185, 1192, 1197, 1183, 989, 1180, 1177, 1170, 1169, 1196, 1167, 1165, 1160, 1158, 1155, 1152, 1150, 817
19	Transportation pick-up points in Monaca Borough	1167, 1165, 1160, 1158, 1155, 1152, 1150, 817
20	Transportation pick-up points in Aliquippa City	1310, 1390, 1395, 1400, 1405, 1410, 1425, 1420, 1115, 1110, 1105, 1100, 1095, 1090, 1087, 1085
21	Transportation pick-up points in South Heights Borough	284, 285, 286, 287, 1087, 1085
22	Transportation pick-up points in Hopewell Township	1265, 1320, 1426, 1325, 1330, 1427, 1340, 611, 1345, 1350
23	Transportation pick-up points in Independence Township	299, 298, 297, 296, 295, 294, 293, 292, 291, 1455, 1456, 1460, 175, 170, 165
24	Transportation pick-up points in Frankfort Springs Borough	4050, 4045
25	Transportation pick-up points in Hanover Township	183, 184, 186, 188, 189, 191, 4050, 4045
26	Transportation pick-up point at Hall China in Sub-Area O-1	1131, 1129, 1128, 821
27	Transportation pick-up point at LaCroft Elementary School in Sub-Area O-2	702, 701, 1, 698, 6285, 6255, 6260, 6265, 6090, 6095
28	Transportation pick-up point at West Gate Elementary School in Sub-Area O-2	6820, 6065, 6055, 6058, 6060, 6045, 6070, 6050, 6075, 6080, 6085, 6090, 6095
29	Transportation pick-up point at East Liverpool H.S. in Sub-Area O-2	6735, 6715, 6710, 6700, 6695, 6690, 6685, 6680, 6675, 689, 6670, 6660, 6655, 6650, 6278, 6280, 6275, 6270, 6260, 6265, 6090, 6095
30	Transportation pick-up point at East Elementary School in Sub-Area O-2	6715, 6710, 6700, 6695, 6690, 6685, 6680, 6675, 689, 6670, 6660, 6655, 6650, 6278, 6280, 6275, 6270, 6260, 6265, 6090, 6095

Route Number	Description	Nodes Traversed from Route Start to EPZ Boundary
31	Transportation pick-up point at Dixonville Fire Department in Sub-Area O-2	6297, 6295, 6300, 6310, 6315, 6320, 6325, 6330, 6335, 6340, 6345, 6350, 6355, 6360, 6365, 6370, 6375, 6380, 6385, 6390, 6395, 6400, 6405, 6410, 6415, 6420, 6436, 6425, 6430, 6435
32	Transportation pick-up point at Calcutta Fire Dept. in Sub-Area O-3	6640, 6290, 6280, 6275, 6270, 6260, 6265, 6090, 6095, 6100
33	Transportation pick-up point at Lawrenceville Volunteer Fire Dept. in Sub-Area W-1	5275, 5280, 5282, 5285, 5287, 5305, 5320, 5325, 5340, 5347, 5345, 5350, 5355, 5360, 5375, 5380, 5385, 5390
34	Transportation pick-up point at Newell Volunteer Fire Dept. in Sub-Area W-1	5360, 5375, 5380, 5385, 5390
35	LaCroft Elementary School	702, 701, 699, 1
36	Allison Elementary School	5282, 5285, 5287, 5305, 5320, 5325, 5340, 5347, 5345, 5350, 5355, 5360, 5375, 5380, 5385, 5390
37	Calcutta Elementary School, Employment Development Center	6290, 6280, 6275, 6270, 6260, 6265, 6090, 6095
38	Westgate Middle School	6065, 1103, 6055, 6058, 6060, 6045, 6070, 6050, 6075, 6080, 6085, 6090, 6095
39	North Elementary School, East Liverpool High School, East Liverpool Jr. High School	6720, 6715, 6735, 6740, 6785, 6790, 6795, 723, 6780, 6755, 6818, 6760, 6058, 6060, 6045, 6070, 6050, 6075, 6080, 6085, 6090, 6095
40	American Spirit Academy	722, 6765, 654, 726, 6030, 6035, 6040, 6045, 6070, 6050, 6075, 6080, 6085, 6090, 6095
41	Aliquippa Elementary School, Aliquippa Jr./Sr. High School, Hope Christian Academy	1400, 1405, 1410, 1425, 1420, 1115, 1110, 1105, 1100, 1095, 1090, 1087, 1085
42	Fairview Elementary School	87, 88, 89, 90, 91, 92, 95, 96, 97, 98, 99, 100, 101, 102, 103
43	Pleasant Hills Wesleyan Academy	266, 4000, 4005, 4010, 4015, 4020, 4025, 4030, 4035, 4040, 4050, 4045
44	Patterson Primary School	744, 756, 746, 953, 747, 748
45	South Side Elementary School, South Side Middle School, South Side High School	3090, 3085, 3095, 4000, 4005, 4010, 4015, 4020, 4025, 4030, 4035, 4040, 4050, 4045
46	St. John the Baptist School	1152, 1150, 817

Route Number	Description	Nodes Traversed from Route Start to EPZ Boundary
47	Bethel Christian School	309, 3055, 3071, 3060, 3065, 3072, 3070, 1079, 3080, 5125, 5120, 5117, 5115, 5110, 5105, 5100, 5095, 5093, 5090, 5126, 5085, 5080
48	Western Beaver Junior-Senior High School	574, 573, 514, 513, 512, 511, 225, 353, 354, 356, 346, 360, 362, 365, 370, 375, 380, 385, 163
49	Midland Neel Elementary/Middle School, Lincoln Park Performing Arts Charter School, Prima Learning Center	63, 65, 60, 58, 259, 59, 75, 76, 77, 78, 79, 80, 521, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 95, 96, 97, 98, 99, 100, 101, 102, 103
50	Hopewell Elementary School	1340, 611, 1345, 1350, 1362, 1365, 1370, 1375, 1380
51	Hopewell Junior High School	1340, 611, 1345, 1350, 1362, 1365, 1370, 1375, 1380
52	Margaret Ross Elementary School	591, 589, 1340, 611, 1345, 1350, 1362, 1365, 1370, 1375, 1380
53	Hopewell Senior High School, Our Lady of Fatima School	611, 1345, 1350, 1362, 1365, 1370, 1375, 1380
54	Independence Elementary School	299, 298, 297, 296, 295, 294, 293, 292, 291, 1455, 1456, 1460, 175, 170, 165
55	Beaver County Career & Technology Center, Todd Lane Elementary School, Central Valley Middle School, Central Valley High School	1225, 1230, 983, 1235, 563, 562, 569, 564, 1084, 568, 567, 305, 300, 195, 1290, 190, 187, 185, 180, 175, 170, 165
56	Highland Middle School, Blackhawk Intermediate School	116, 371, 139, 148, 147
57	Center Grange Primary School	40, 1230, 983, 1235, 563, 562, 569, 564, 1084, 568, 567, 305, 300, 195, 1290, 190, 187, 185, 180, 175, 170, 165
58	Dutch Ridge Elementary	329, 331, 332, 333, 334, 336, 339, 341, 343, 344, 347, 346, 360, 362, 365, 370, 375, 380, 385, 163
59	Sts. Peter and Paul School	1720, 1730, 1745, 321, 322, 324, 326, 327, 328, 329, 331, 332, 333, 334, 336, 339, 341, 343, 344, 347, 346, 360, 362, 365, 370, 375, 380, 385, 163
60	Beaver Area Academic Charter School, Beaver Area Middle School, Beaver Area High School	1745, 321, 322, 324, 326, 327, 328, 329, 331, 332, 333, 334, 336, 339, 341, 343, 344, 347, 346, 360, 362, 365, 370, 375, 380, 385, 163
61	College Square Elementary School	1710, 1730, 1745, 321, 322, 324, 326, 327, 328, 329, 331, 332, 333, 334, 336, 339, 341, 343, 344, 347, 346, 360, 362, 365, 370, 375, 380, 385, 163, 164, 395

Route Number	Description	Nodes Traversed from Route Start to EPZ Boundary
62	New Manchester Elementary School	5840, 5730, 5735
63	Oak Glen Middle School, Oak Glen High School	5993, 5825, 5835, 5840, 5730, 5735
64	Sub-Area P-7 medical facilities	362, 360, 355, 350, 345, 342, 340, 338, 335, 330, 337, 254, 325, 320, 315, 310, 566, 567, 305, 300, 195, 1290, 190, 187, 185, 180, 175, 170, 165
65	Sub-Area P-10 medical facilities	1440, 1445, 1450, 1452, 1456, 1460, 175, 170, 165
66	Sub-Area P-8 medical facility	350, 345, 342, 340, 338, 335, 330, 337, 254, 325, 320, 315, 310, 566, 567, 305, 300, 195, 1290, 190, 187, 185, 180, 175, 170, 165
67	Sub-Area P-9 medical facility	568, 567, 305, 300, 195, 1290, 190, 187, 185, 180, 175, 170, 165
68	Sub-Area O-2 medical facilities	6030, 6035, 6040, 6045, 6070, 6050, 6075, 6080, 6085, 6090, 6095, 6100
69	Sub-Area O-3 medical facility	6295, 6290, 6280, 6275, 6270, 6260, 6265, 6090, 6095, 6100
70	Sub-Area W-1 medical facility	5245, 6010, 6005, 6000, 5995, 5910, 5900, 5895, 5890, 5991, 5992, 5993, 5825, 5835, 5840, 5730, 5735

Table 8-7. School Evacuation Time Estimates - Good Weather

School	Driver Mobilization Time	Loading Time (min)	Dist. To EPZ Bdry (mi.)	Average Speed (mph)	Travel Time to EPZ Bdry (min.)	ETE (hr:min)	Dist. EPZ Bdry to H.S. (mi.)	Travel Time from EPZ Bdry to H.S. (min)	ETE to H.S. (hr:min)
BEAVER COUNTY, PA									
Lincoln Park Performing Arts Charter School	90	15	10.4	11.8	53	**2:40**	24.7	33	**3:15**
Midland Neel Elementary/Middle School	90	15	10.4	11.8	53	**2:40**	24.7	33	**3:15**
Prima Learning Center	90	15	10.4	11.8	53	**2:40**	24.7	33	**3:15**
Western Beaver Junior-Senior High School	90	15	9.3	7.9	71	**3:00**	24.7	33	**3:30**
Bethel Christian School	90	15	10.9	43.9	15	**2:00**	30.1	41	**2:45**
South Side Elementary School	90	15	8.8	13.0	41	**2:30**	25.4	34	**3:00**
South Side High School	90	15	8.8	13.0	41	**2:30**	25.4	34	**3:00**
South Side Middle School	90	15	8.8	13.0	41	**2:30**	25.4	34	**3:00**
Blackhawk Intermediate School	90	15	1.6	29.6	4	**1:50**	0.3	1	**1:50**
Fairview Elementary School	90	15	6.0	11.0	33	**2:20**	24.7	33	**2:55**
Highland Middle School	90	15	2.3	29.6	5	**1:50**	0.3	1	**1:55**
Beaver Area Academic Charter School	90	15	9.7	8.6	68	**2:55**	58.9	79	**4:15**
Beaver Area High School	90	15	9.7	8.6	68	**2:55**	58.9	79	**4:15**
Beaver Area Middle School	90	15	7.4	7.6	59	**2:45**	58.9	79	**4:05**
College Square Elementary School	90	15	9.7	8.8	66	**2:55**	58.9	79	**4:10**
Dutch Ridge Elementary	90	15	7.8	7.9	60	**2:45**	58.9	79	**4:05**
Patterson Primary School	90	15	3.0	16.7	11	**2:00**	4.2	6	**2:05**
Sts. Peter and Paul School	90	15	10.1	8.8	69	**2:55**	58.9	79	**4:15**

School	Driver Mobilization Time	Loading Time (min)	Dist. To EPZ Bdry (mi.)	Average Speed (mph)	Travel Time to EPZ Bdry (min.)	ETE (hr:min)	Dist. EPZ Bdry to H.S. (mi.)	Travel Time from EPZ Bdry to H.S. (min)	ETE to H.S. (hr:min)
Beaver County Career & Technology Center	90	15	10.0	12.3	49	**2:35**	40.6	55	**3:30**
Center Grange Primary School	90	15	9.1	12.3	45	**2:30**	40.6	55	**3:25**
Central Valley High School	90	15	9.7	12.3	48	**2:35**	40.6	55	**3:30**
Central Valley Middle School	90	15	9.7	12.3	48	**2:35**	40.6	55	**3:30**
St. John the Baptist School	90	15	0.5	6.0	5	**1:50**	40.5	54	**2:45**
Todd Lane Elementary School	90	15	3.9	14.2	17	**2:05**	40.5	54	**3:00**
Aliquippa Elementary School	90	15	5.9	2.9	123	**3:50**	25.8	35	**4:25**
Aliquippa Jr./Sr. High School	90	15	5.0	2.6	117	**3:45**	25.8	35	**4:20**
Hope Christian Academy	90	15	3.8	2.4	98	**3:25**	25.8	35	**4:00**
Hopewell Elementary School	90	15	2.7	10.8	16	**2:05**	30.1	41	**2:45**
Hopewell Junior High School	90	15	2.8	10.8	16	**2:05**	30.1	41	**2:45**
Hopewell Senior High School	90	15	3.0	11.8	16	**2:05**	30.1	41	**2:45**
Margaret Ross Elementary School	90	15	3.1	8.3	23	**2:10**	30.1	41	**2:50**
Our Lady of Fatima School	90	15	2.3	11.8	12	**2:00**	30.1	41	**2:40**
Independence Elementary School	90	15	6.2	4.3	87	**3:15**	30.1	41	**3:55**
Pleasant Hills Wesleyan Academy	90	15	6.2	9.5	40	**2:25**	25.4	34	**3:00**
COLUMBIANA COUNTY, OH									
American Spirit Academy	90	15	4.7	45.0	7	**1:55**	12.6	17	**2:10**
East Liverpool High School	90	15	5.8	43.2	9	**1:55**	12.6	17	**2:15**
East Liverpool Jr. High School	90	15	5.8	43.2	9	**1:55**	12.5	17	**2:15**
East Liverpool Jr. High School	90	15	5.8	43.2	9	**1:55**	12.5	17	**2:15**
LaCroft Elementary School	90	15	4.7	11.1	26	**2:15**	12.4	17	**2:30**
North Elementary School	90	15	5.5	43.2	8	**1:55**	12.4	17	**2:10**

School	Driver Mobilization Time	Loading Time (min)	Dist. To EPZ Bdry (mi.)	Average Speed (mph)	Travel Time to EPZ Bdry (min.)	ETE (hr:min)	Dist. EPZ Bdry to H.S. (mi.)	Travel Time from EPZ Bdry to H.S. (min)	ETE to H.S. (hr:min)
North Elementary School	90	15	5.5	43.2	8	**1:55**	12.6	17	**2:10**
Westgate Middle School	90	15	4.6	45.0	7	**1:55**	12.4	17	**2:10**
Westgate Middle School	90	15	4.6	45.0	7	**1:55**	12.6	17	**2:10**
Calcutta Elementary School	90	15	2.2	45.0	3	**1:50**	12.4	17	**2:05**
Calcutta Elementary School	90	15	2.2	45.0	3	**1:50**	12.6	17	**2:05**
Employment Development Center	90	15	2.4	45.0	4	**1:50**	12.4	17	**2:10**
Employment Development Center	90	15	2.4	45.0	4	**1:50**	12.6	17	**2:10**
HANCOCK COUNTY, WV									
Allison Elementary School	90	15	4.9	31.4	10	**1:55**	16.8	23	**2:20**
Oak Glen High School	90	15	4.3	45.0	6	**1:55**	11.1	15	**2:10**
Oak Glen Middle School	90	15	2.4	45.0	4	**1:50**	11.1	15	**2:05**
New Manchester Elementary School	90	15	1.3	40.0	2	**1:50**	11.1	15	**2:05**
					Maximum for EPZ:	**3:50**		**Maximum:**	**4:25**
					Average for EPZ:	**2:20**		**Average:**	**2:55**

Table 8-8. School Evacuation Time Estimates - Rain

School	Driver Mobilization Time	Loading Time (min)	Dist. To EPZ Bdry (mi.)	Average Speed (mph)	Travel Time to EPZ Bdry (min.)	ETE (hr:min)	Dist. EPZ Bdry to H.S. (mi.)	Travel Time from EPZ Bdry to H.S. (min)	ETE to H.S. (hr:min)
BEAVER COUNTY, PA									
Lincoln Park Performing Arts Charter School	100	20	10.4	11.0	57	**3:00**	24.7	38	**3:35**
Midland Neel Elementary/Middle School	100	20	10.4	11.0	57	**3:00**	24.7	38	**3:35**
Prima Learning Center	100	20	10.4	11.0	57	**3:00**	24.7	38	**3:35**
Western Beaver Junior-Senior High School	100	20	9.3	6.9	81	**3:25**	24.7	38	**4:00**
Bethel Christian School	100	20	10.9	40.0	17	**2:20**	30.1	46	**3:05**
South Side Elementary School	100	20	8.8	13.1	41	**2:45**	25.4	39	**3:20**
South Side High School	100	20	8.8	13.1	41	**2:45**	25.4	39	**3:20**
South Side Middle School	100	20	8.8	13.1	41	**2:45**	25.4	39	**3:20**
Blackhawk Intermediate School	100	20	1.6	26.9	4	**2:05**	0.3	1	**2:05**
Fairview Elementary School	100	20	6.0	10.1	36	**2:40**	24.7	38	**3:15**
Highland Middle School	100	20	2.3	26.9	6	**2:10**	0.3	1	**2:10**
Beaver Area Academic Charter School	100	20	9.7	7.6	77	**3:20**	58.9	89	**4:50**
Beaver Area High School	100	20	9.7	7.6	77	**3:20**	58.9	89	**4:50**
Beaver Area Middle School	100	20	7.4	7.1	63	**3:05**	58.9	89	**4:35**
College Square Elementary School	100	20	9.7	7.9	75	**3:15**	58.9	89	**4:45**
Dutch Ridge Elementary	100	20	7.8	6.8	69	**3:10**	58.9	89	**4:40**
Patterson Primary School	100	20	3.0	9.4	20	**2:20**	4.2	7	**2:30**

School	Driver Mobilization Time	Loading Time (min)	Dist. To EPZ Bdry (mi.)	Average Speed (mph)	Travel Time to EPZ Bdry (min.)	ETE (hr:min)	Dist. EPZ Bdry to H.S. (mi.)	Travel Time from EPZ Bdry to H.S. (min)	ETE to H.S. (hr:min)
Sts. Peter and Paul School	100	20	10.1	7.8	78	**3:20**	58.9	89	**4:50**
Beaver County Career & Technology Center	100	20	10.0	11.3	54	**2:55**	40.6	61	**3:55**
Center Grange Primary School	100	20	9.1	11.2	49	**2:50**	40.6	61	**3:50**
Central Valley High School	100	20	9.7	11.3	52	**2:55**	40.6	61	**3:55**
Central Valley Middle School	100	20	9.7	11.3	52	**2:55**	40.6	61	**3:55**
St. John the Baptist School	100	20	0.5	16.0	2	**2:05**	40.5	61	**3:05**
Todd Lane Elementary School	100	20	3.9	11.0	22	**2:25**	40.5	61	**3:25**
Aliquippa Elementary School	100	20	5.9	2.6	136	**4:20**	25.8	39	**4:55**
Aliquippa Jr./Sr. High School	100	20	5.0	2.3	129	**4:10**	25.8	39	**4:50**
Hope Christian Academy	100	20	3.8	2.0	114	**3:55**	25.8	39	**4:35**
Hopewell Elementary School	100	20	2.7	9.5	18	**2:20**	30.1	46	**3:05**
Hopewell Junior High School	100	20	2.8	9.5	18	**2:20**	30.1	46	**3:05**
Hopewell Senior High School	100	20	3.0	10.7	17	**2:20**	30.1	46	**3:05**
Margaret Ross Elementary School	100	20	3.1	8.4	23	**2:25**	30.1	46	**3:10**
Our Lady of Fatima School	100	20	2.3	10.7	13	**2:15**	30.1	46	**3:00**
Independence Elementary School	100	20	6.2	3.7	102	**3:45**	30.1	46	**4:30**
Pleasant Hills Wesleyan Academy	100	20	6.2	8.8	43	**2:45**	25.4	39	**3:25**
COLUMBIANA COUNTY, OH									
American Spirit Academy	100	20	4.7	45.0	7	**2:10**	12.6	19	**2:30**
East Liverpool High School	100	20	5.8	39.7	9	**2:10**	12.6	19	**2:30**
East Liverpool Jr. High School	100	20	5.8	39.7	9	**2:10**	12.5	19	**2:30**
East Liverpool Jr. High School	100	20	5.8	39.7	9	**2:10**	12.5	19	**2:30**

School	Driver Mobilization Time	Loading Time (min)	Dist. To EPZ Bdry (mi.)	Average Speed (mph)	Travel Time to EPZ Bdry (min.)	ETE (hr:min)	Dist. EPZ Bdry to H.S. (mi.)	Travel Time from EPZ Bdry to H.S. (min)	ETE to H.S. (hr:min)
LaCroft Elementary School	100	20	4.7	11.8	24	**2:25**	12.4	19	**2:45**
North Elementary School	100	20	5.5	39.7	9	**2:10**	12.4	19	**2:30**
North Elementary School	100	20	5.5	39.7	9	**2:10**	12.6	19	**2:30**
Westgate Middle School	100	20	4.6	45.0	7	**2:10**	12.4	19	**2:30**
Westgate Middle School	100	20	4.6	45.0	7	**2:10**	12.6	19	**2:30**
Calcutta Elementary School	100	20	2.2	45.0	3	**2:05**	12.4	19	**2:25**
Calcutta Elementary School	100	20	2.2	45.0	3	**2:05**	12.6	19	**2:25**
Employment Development Center	100	20	2.4	45.0	4	**2:05**	12.4	19	**2:25**
Employment Development Center	100	20	2.4	45.0	4	**2:05**	12.6	19	**2:25**
HANCOCK COUNTY, WV									
Allison Elementary School	100	20	4.9	29.2	11	**2:15**	16.8	26	**2:40**
Oak Glen High School	100	20	4.3	45.0	6	**2:10**	11.1	17	**2:25**
Oak Glen Middle School	100	20	2.4	45.0	4	**2:05**	11.1	17	**2:25**
New Manchester Elementary School	100	20	1.3	36.0	3	**2:05**	11.1	17	**2:20**
					Maximum for EPZ:	**4:20**		**Maximum:**	**4:55**
					Average for EPZ:	**2:40**		**Average:**	**3:20**

Table 8-9. School Evacuation Time Estimates - Snow

School	Driver Mobilization Time	Loading Time (min)	Dist. To EPZ Bdry (mi.)	Average Speed (mph)	Travel Time to EPZ Bdry (min.)	ETE (hr:min)	Dist. EPZ Bdry to H.S. (mi.)	Travel Time from EPZ Bdry to H.S. (min)	ETE to H.S. (hr:min)
BEAVER COUNTY, PA									
Lincoln Park Performing Arts Charter School	110	25	10.4	13.3	48	**3:05**	24.7	43	**3:50**
Midland Neel Elementary/Middle School	110	25	10.4	13.3	48	**3:05**	24.7	43	**3:50**
Prima Learning Center	110	25	10.4	13.3	48	**3:05**	24.7	43	**3:50**
Western Beaver Junior-Senior High School	110	25	9.3	6.7	84	**3:40**	24.7	43	**4:25**
Bethel Christian School	110	25	10.9	35.5	19	**2:35**	30.1	52	**3:30**
South Side Elementary School	110	25	8.8	12.3	43	**3:00**	25.4	44	**3:45**
South Side High School	110	25	8.8	12.3	43	**3:00**	25.4	44	**3:45**
South Side Middle School	110	25	8.8	12.3	43	**3:00**	25.4	44	**3:45**
Blackhawk Intermediate School	110	25	1.6	24.8	4	**2:20**	0.3	1	**2:20**
Fairview Elementary School	110	25	6.0	8.8	41	**3:00**	24.7	43	**3:40**
Highland Middle School	110	25	2.3	24.8	6	**2:25**	0.3	1	**2:25**
Beaver Area Academic Charter School	110	25	9.7	7.3	80	**3:35**	58.9	101	**5:20**
Beaver Area High School	110	25	9.7	7.3	80	**3:35**	58.9	101	**5:20**
Beaver Area Middle School	110	25	7.4	6.8	66	**3:25**	58.9	101	**5:05**
College Square Elementary School	110	25	9.7	7.5	78	**3:35**	58.9	101	**5:15**
Dutch Ridge Elementary	110	25	7.8	6.6	71	**3:30**	58.9	101	**5:10**
Patterson Primary School	110	25	3.0	16.8	11	**2:30**	4.2	8	**2:35**

School	Driver Mobilization Time	Loading Time (min)	Dist. To EPZ Bdry (mi.)	Average Speed (mph)	Travel Time to EPZ Bdry (min.)	ETE (hr:min)	Dist. EPZ Bdry to H.S. (mi.)	Travel Time from EPZ Bdry to H.S. (min)	ETE to H.S. (hr:min)
Sts. Peter and Paul School	110	25	10.1	8.0	76	**3:35**	58.9	101	**5:15**
Beaver County Career & Technology Center	110	25	10.0	9.5	64	**3:20**	40.6	70	**4:30**
Center Grange Primary School	110	25	9.1	9.4	59	**3:15**	40.6	70	**4:25**
Central Valley High School	110	25	9.7	9.5	62	**3:20**	40.6	70	**4:30**
Central Valley Middle School	110	25	9.7	9.5	62	**3:20**	40.6	70	**4:30**
St. John the Baptist School	110	25	0.5	12.5	3	**2:20**	40.5	70	**3:30**
Todd Lane Elementary School	110	25	3.9	9.0	26	**2:45**	40.5	70	**3:55**
Aliquippa Elementary School	110	25	5.9	2.2	161	**5:00**	25.8	45	**5:45**
Aliquippa Jr./Sr. High School	110	25	5.0	2.0	150	**4:45**	25.8	45	**5:30**
Hope Christian Academy	110	25	3.8	1.8	129	**4:25**	25.8	45	**5:10**
Hopewell Elementary School	110	25	2.7	10.9	15	**2:30**	30.1	52	**3:25**
Hopewell Junior High School	110	25	2.8	10.9	16	**2:35**	30.1	52	**3:25**
Hopewell Senior High School	110	25	3.0	12.6	15	**2:30**	30.1	52	**3:25**
Margaret Ross Elementary School	110	25	3.1	9.9	19	**2:35**	30.1	52	**3:30**
Our Lady of Fatima School	110	25	2.3	12.6	11	**2:30**	30.1	52	**3:20**
Independence Elementary School	110	25	6.2	3.9	96	**3:55**	30.1	52	**4:45**
Pleasant Hills Wesleyan Academy	110	25	6.2	8.8	43	**3:00**	25.4	44	**3:45**
COLUMBIANA COUNTY, OH									
American Spirit Academy	110	25	4.7	40.0	8	**2:25**	12.6	22	**2:45**
East Liverpool High School	110	25	5.8	35.1	10	**2:25**	12.6	22	**2:50**
East Liverpool Jr. High School	110	25	5.8	35.1	10	**2:25**	12.5	22	**2:50**
East Liverpool Jr. High School	110	25	5.8	35.1	10	**2:25**	12.5	22	**2:50**

School	Driver Mobilization Time	Loading Time (min)	Dist. To EPZ Bdry (mi.)	Average Speed (mph)	Travel Time to EPZ Bdry (min.)	ETE (hr:min)	Dist. EPZ Bdry to H.S. (mi.)	Travel Time from EPZ Bdry to H.S. (min)	ETE to H.S. (hr:min)
LaCroft Elementary School	110	25	4.7	9.5	30	**2:45**	12.4	22	**3:10**
North Elementary School	110	25	5.5	35.1	10	**2:25**	12.4	22	**2:50**
North Elementary School	110	25	5.5	35.1	10	**2:25**	12.6	22	**2:50**
Westgate Middle School	110	25	4.6	40.0	7	**2:25**	12.4	22	**2:45**
Westgate Middle School	110	25	4.6	40.0	7	**2:25**	12.6	22	**2:45**
Calcutta Elementary School	110	25	2.2	40.0	4	**2:20**	12.4	22	**2:45**
Calcutta Elementary School	110	25	2.2	40.0	4	**2:20**	12.6	22	**2:45**
Employment Development Center	110	25	2.4	40.0	4	**2:20**	12.4	22	**2:45**
Employment Development Center	110	25	2.4	40.0	4	**2:20**	12.6	22	**2:45**
HANCOCK COUNTY, WV									
Allison Elementary School	110	25	4.9	30.7	10	**2:25**	16.8	29	**2:55**
Oak Glen High School	110	25	4.3	40.0	7	**2:25**	11.1	20	**2:45**
Oak Glen Middle School	110	25	2.4	40.0	4	**2:20**	11.1	20	**2:40**
New Manchester Elementary School	110	25	1.3	32.0	3	**2:20**	11.1	20	**2:40**
					Maximum for EPZ:	**5:00**		**Maximum:**	**5:45**
					Average for EPZ:	**2:55**		**Average:**	**3:45**

Table 8-10. Summary of Transit-Dependent Bus Routes

Route No.	No. of Buses	Route Description	Length (mi.)
1	2	Servicing transportation pick-up points in in Midland Borough	11.5
2	1	Servicing transportation pick-up points in Shippingport Borough	17.4
3	1	Servicing transportation pick-up points in Glasgow Borough	13.9
4	2	Servicing transportation pick-up points in Brighton Township	11.3
5	2	Servicing transportation pick-up points in Industry Borough	15.2
6	1	Servicing transportation pick-up points in Potter Township	14.0
7	1	Servicing transportation pick-up points in Raccoon Township	12.5
8	2	Servicing transportation pick-up points in Greene Township and Georgetown Borough	9.0
9	2	Servicing transportation pick-up points in Chippewa Township	10.9
10	2	Servicing transportation pick-up points ins in Ohioville Borough	6.0
11	1	Servicing transportation pick-up points in South Beaver Township	1.3
12	4	Servicing transportation pick-up points in Beaver Borough	11.3
13	3	Servicing transportation pick-up points in Bridgewater Borough	7.8
14	1	Servicing transportation pick-up points in Fallston Borough	4.7
15	1	Servicing transportation pick-up points in Patterson Heights Borough	1.9
16	1	Servicing transportation pick-up points in Patterson Township	2.1
17	3	Servicing transportation pick-up points in Vanport Township	8.5
18	5	Servicing transportation pick-up points in Center Township	5.3
19	10	Servicing transportation pick-up points in Monaca Borough	2.2
20	3	Servicing transportation pick-up points in Aliquippa City	9.5
21	2	Servicing transportation pick-up points in South Heights Borough	2.4
22	13	Servicing transportation pick-up points in Hopewell Township	7.0
23	2	Servicing transportation pick-up points in Independence Township	5.2
24	1	Servicing transportation pick-up points in Frankfort Springs Borough	0.3

Route No.	No. of Buses	Route Description	Length (mi.)
25	2	Servicing transportation pick-up points in Hanover Township	5.4
26	1	Servicing transportation pick-up point at Hall China in Sub-Area O-1	10.0
27	3	Servicing transportation pick-up point at LaCroft Elementary School in Sub-Area O-2	3.6
28	3	Servicing transportation pick-up point at West Gate Elementary School in Sub-Area O-2	4.7
29	3	Servicing transportation pick-up point at East Liverpool H.S. in Sub-Area O-2	5.6
30	2	Servicing transportation pick-up point at East Elementary School in Sub-Area O-2	7.0
31	1	Servicing transportation pick-up point at Dixonville Fire Department in Sub-Area O-2	11.1
32	4	Servicing transportation pick-up point at Calcutta Fire Dept. in Sub-Area O-3	2.0
33	4	Servicing transportation pick-up point at Lawrenceville Volunteer Fire Dept. in Sub-Area W-1	5.0
34	4	Servicing transportation pick-up point at Newell Volunteer Fire Dept. in Sub-Area W-1	5.4
TOTAL:	**93**		

Table 8-11. Transit-Dependent Evacuation Time Estimates - Good Weather

Route Number	No. of Buses	One-Wave						Two-Wave						
		Mobilization (min)	Route Length (miles)	Speed (mph)	Route Travel Time (min)	Pickup Time (min)	ETE (hr:min)	Distance to Rec. Ctr (miles)	Travel Time to Rec. Ctr (min)	Unload (min)	Driver Rest (min)	Route Travel Time (min)	Pickup Time (min)	ETE (hr:min)
1	2	120	11.5	14.1	49	30	**3:20**	28.0	37	5	10	55	30	**5:40**
2	1	120	17.4	24.1	43	30	**3:15**	37.8	50	5	10	74	30	**6:05**
3	1	120	13.9	21.5	39	30	**3:10**	19.4	26	5	10	44	30	**5:05**
4	2	120	11.3	9.1	74	30	**3:45**	41.4	55	5	10	70	30	**6:35**
5	2	120	15.2	11.1	82	30	**3:55**	19.4	26	5	10	47	30	**5:50**
6	1	120	14.0	21.3	40	30	**3:10**	37.8	50	5	10	69	30	**5:55**
7	1	120	12.5	15.4	49	30	**3:20**	30.4	41	5	10	57	30	**5:45**
8	2	120	9.0	23.8	23	30	**2:55**	24.4	33	5	10	45	30	**4:55**
9	2	120	10.9	12.4	53	30	**3:25**	19.4	26	5	10	41	30	**5:15**
10	2	120	6.0	12.2	30	30	**3:00**	7.4	10	5	10	20	30	**4:15**
11	1	120	1.3	25.8	3	30	**2:35**	20.4	27	5	10	30	30	**4:15**
12	4	120	11.3	41.1	16	30	**2:50**	41.4	55	5	10	70	30	**5:40**
13	3	120	7.8	41.1	11	30	**2:45**	41.4	55	5	10	66	30	**5:30**
14	1	120	4.7	41.3	7	30	**2:40**	41.4	55	5	10	61	30	**5:20**
15	1	120	1.9	45.0	3	30	**2:35**	19.4	26	5	10	28	30	**4:15**
16	1	120	2.1	45.0	3	30	**2:35**	19.4	26	5	10	29	30	**4:15**
17	3	120	8.5	12.4	41	30	**3:15**	41.4	55	5	10	67	30	**6:00**
18	5	120	5.3	9.4	34	30	**3:05**	47.1	63	5	10	71	30	**6:05**
19	5	120	2.2	6.9	19	30	**2:50**	47.1	63	5	10	67	30	**5:45**
	5	140	2.2	7.8	17	30	**3:10**	48.1	64	5	10	69	30	**6:05**
20	3	120	9.5	4.6	124	30	**4:35**	28.4	38	5	10	51	30	**6:50**
21	2	120	2.4	6.5	22	30	**2:55**	28.4	38	5	10	43	30	**5:00**

Route Number	No. of Buses	One-Wave						Two-Wave						
		Mobilization (min)	Route Length (miles)	Speed (mph)	Route Travel Time (min)	Pickup Time (min)	ETE (hr:min)	Distance to Rec. Ctr (miles)	Travel Time to Rec. Ctr (min)	Unload (min)	Driver Rest (min)	Route Travel Time (min)	Pickup Time (min)	ETE (hr:min)
22	5	120	7.0	15.8	27	30	**3:00**	28.4	38	5	10	50	30	**5:10**
	4	140	7.0	32.5	60	30	**3:55**	28.4	38	5	10	50	30	**6:05**
	4	160	7.0	34.6	60	30	**4:15**	28.4	38	5	10	50	30	**6:25**
23	2	120	5.2	4.7	67	30	**3:40**	19.4	26	5	10	33	30	**5:25**
24	1	120	0.3	5.3	3	30	**2:35**	24.4	33	5	10	33	30	**4:25**
25	2	120	5.4	14.6	22	30	**2:55**	24.4	33	5	10	40	30	**4:50**
26	1	120	10.0	37.5	16	30	**2:50**	3.0	4	5	10	20	30	**3:55**
27	3	120	3.6	18.8	11	30	**2:45**	3.9	5	5	10	10	30	**3:45**
28	3	120	4.7	55.0	5	30	**2:40**	5.5	7	5	10	14	30	**3:45**
29	3	120	5.6	19.0	18	30	**2:50**	3.9	5	5	10	15	30	**3:55**
30	2	120	7.0	19.3	22	30	**2:55**	3.5	5	5	10	16	30	**4:00**
31	1	120	11.1	37.5	18	30	**2:50**	3.0	4	5	10	22	30	**4:00**
32	4	120	2.0	52.4	2	30	**2:35**	2.8	4	5	10	6	30	**3:30**
33	4	120	5.0	36.4	8	30	**2:40**	16.8	22	5	10	31	30	**4:20**
34	4	120	5.4	51.5	6	30	**2:40**	16.8	22	5	10	30	30	**4:15**
						Maximum ETE:	**4:35**						**Maximum ETE:**	**6:50**
						Average ETE:	**3:05**						**Average ETE:**	**5:05**

Table 8-12. Transit-Dependent Evacuation Time Estimates - Rain

Route Number	No. of Buses	One-Wave						Two-Wave						
		Mobilization (min)	Route Length (miles)	Speed (mph)	Route Travel Time (min)	Pickup Time (min)	ETE (hr:min)	Distance to Rec. Ctr (miles)	Travel Time to Rec. Ctr (min)	Unload (min)	Driver Rest (min)	Route Travel Time (min)	Pickup Time (min)	ETE (hr:min)
1	2	130	11.5	12.9	54	40	**3:45**	28.0	42	5	10	61	40	**6:25**
2	1	130	17.4	21.3	49	40	**3:40**	37.8	57	5	10	80	40	**6:55**
3	1	130	13.9	19.4	43	40	**3:35**	19.4	29	5	10	48	40	**5:45**
4	2	130	11.3	8.0	85	40	**4:15**	41.4	62	5	10	77	40	**7:30**
5	2	130	15.2	9.6	95	40	**4:30**	19.4	29	5	10	53	40	**6:45**
6	1	130	14.0	18.9	44	40	**3:35**	37.8	57	5	10	75	40	**6:45**
7	1	130	12.5	9.0	84	40	**4:15**	30.4	46	5	10	63	40	**7:00**
8	2	130	9.0	20.6	26	40	**3:20**	24.4	37	5	10	49	40	**5:40**
9	2	130	10.9	12.3	53	40	**3:45**	19.4	29	5	10	45	40	**5:55**
10	2	130	6.0	8.6	42	40	**3:35**	7.4	11	5	10	22	40	**5:05**
11	1	130	1.3	10.9	7	40	**3:00**	20.4	31	5	10	33	40	**5:00**
12	4	130	11.3	37.2	18	40	**3:10**	41.4	62	5	10	77	40	**6:25**
13	3	130	7.8	37.2	13	40	**3:05**	41.4	62	5	10	73	40	**6:15**
14	1	130	4.7	36.5	8	40	**3:00**	41.4	62	5	10	68	40	**6:05**
15	1	130	1.9	40.0	3	40	**2:55**	19.4	29	5	10	32	40	**4:50**
16	1	130	2.1	40.0	3	40	**2:55**	19.4	29	5	10	32	40	**4:50**
17	3	130	8.5	11.0	46	40	**3:40**	41.4	62	5	10	73	40	**6:50**
18	5	130	5.3	10.4	31	40	**3:25**	47.1	71	5	10	80	40	**6:50**
19	5	130	2.2	8.1	16	40	**3:10**	47.1	71	5	10	76	40	**6:30**
	5	150	2.2	17.8	7	40	**3:20**	47.1	71	5	10	76	40	**6:40**
20	3	130	9.5	3.8	151	40	**5:25**	28.4	43	5	10	58	40	**8:00**
21	2	130	2.4	5.2	28	40	**3:20**	28.4	43	5	10	47	40	**5:45**

Route Number	No. of Buses	One-Wave						Two-Wave						
		Mobilization (min)	Route Length (miles)	Speed (mph)	Route Travel Time (min)	Pickup Time (min)	ETE (hr:min)	Distance to Rec. Ctr (miles)	Travel Time to Rec. Ctr (min)	Unload (min)	Driver Rest (min)	Route Travel Time (min)	Pickup Time (min)	ETE (hr:min)
22	5	130	7.0	12.2	35	40	**3:25**	28.4	43	5	10	55	40	**6:00**
	4	150	7.0	20.9	20	40	**3:35**	28.4	43	5	10	55	40	**6:05**
	4	170	7.0	31.9	13	40	**3:45**	28.4	43	5	10	55	40	**6:20**
23	2	130	5.2	3.7	85	40	**4:15**	19.4	29	5	10	36	40	**6:15**
24	1	130	0.3	4.8	4	40	**2:55**	24.4	37	5	10	37	40	**5:05**
25	2	130	5.4	12.5	26	40	**3:20**	24.4	37	5	10	44	40	**5:35**
26	1	130	10.0	34.2	18	40	**3:10**	3.0	5	5	10	23	40	**4:30**
27	3	130	3.6	22.4	10	40	**3:00**	3.9	6	5	10	11	40	**4:15**
28	3	130	4.7	50.0	6	40	**3:00**	5.5	8	5	10	15	40	**4:15**
29	3	130	5.6	13.4	25	40	**3:20**	3.9	6	5	10	16	40	**4:35**
30	2	130	7.0	15.9	26	40	**3:20**	3.5	5	5	10	17	40	**4:35**
31	1	130	11.1	34.2	19	40	**3:10**	3.0	5	5	10	25	40	**4:35**
32	4	130	2.0	47.5	3	40	**2:55**	2.8	4	5	10	7	40	**4:00**
33	4	130	5.0	30.7	10	40	**3:00**	16.8	25	5	10	34	40	**4:55**
34	4	130	5.4	38.0	9	40	**3:00**	16.8	25	5	10	32	40	**4:55**
						Maximum ETE:	**5:25**						**Maximum ETE:**	**8:00**
						Average ETE:	**3:30**						**Average ETE:**	**5:50**

Table 8-13. Transit Dependent Evacuation Time Estimates - Snow

Route Number	No. of Buses	One-Wave						Two-Wave						
		Mobilization (min)	Route Length (miles)	Speed (mph)	Route Travel Time (min)	Pickup Time (min)	ETE (hr:min)	Distance to Rec. Ctr (miles)	Travel Time to Rec. Ctr (min)	Unload (min)	Driver Rest (min)	Route Travel Time (min)	Pickup Time (min)	ETE (hr:min)
1	2	140	11.5	14.2	48	50	**4:00**	28.0	48	5	10	70	50	**7:05**
2	1	140	17.4	16.0	65	50	**4:20**	37.8	65	5	10	95	50	**8:00**
3	1	140	13.9	16.0	52	50	**4:05**	19.4	33	5	10	57	50	**6:40**
4	2	140	11.3	7.1	96	50	**4:50**	41.4	71	5	10	90	50	**8:35**
5	2	140	15.2	9.0	102	50	**4:55**	19.4	33	5	10	60	50	**7:30**
6	1	140	14.0	14.2	59	50	**4:10**	37.8	65	5	10	89	50	**7:50**
7	1	140	12.5	10.0	75	50	**4:30**	30.4	52	5	10	74	50	**7:40**
8	2	140	9.0	20.0	27	50	**3:40**	24.4	42	5	10	57	50	**6:25**
9	2	140	10.9	9.8	67	50	**4:20**	19.4	33	5	10	52	50	**6:50**
10	2	140	6.0	8.2	44	50	**3:55**	7.4	13	5	10	26	50	**5:40**
11	1	140	1.3	18.1	4	50	**3:15**	20.4	35	5	10	38	50	**5:35**
12	4	140	11.3	33.9	20	50	**3:30**	41.4	71	5	10	90	50	**7:20**
13	3	140	7.8	33.9	14	50	**3:25**	41.4	71	5	10	84	50	**7:05**
14	1	140	4.7	33.9	8	50	**3:20**	41.4	71	5	10	79	50	**6:55**
15	1	140	1.9	35.0	3	50	**3:15**	19.4	33	5	10	37	50	**5:30**
16	1	140	2.1	35.0	4	50	**3:15**	19.4	33	5	10	37	50	**5:30**
17	3	140	8.5	8.8	58	50	**4:10**	41.4	71	5	10	86	50	**7:50**
18	5	140	5.3	9.4	34	50	**3:45**	47.1	81	5	10	91	50	**7:45**
19	5	140	2.2	15.8	8	50	**3:20**	47.1	81	5	10	86	50	**7:15**
	5	160	2.2	8.1	16	50	**3:50**	47.1	81	5	10	86	50	**7:40**
20	3	140	9.5	2.9	198	50	**6:30**	28.4	49	5	10	66	50	**9:30**
21	2	140	2.4	4.2	35	50	**3:45**	28.4	49	5	10	64	50	**6:45**

Route Number	No. of Buses	One-Wave						Two-Wave						
		Mobilization (min)	Route Length (miles)	Speed (mph)	Route Travel Time (min)	Pickup Time (min)	ETE (hr:min)	Distance to Rec. Ctr (miles)	Travel Time to Rec. Ctr (min)	Unload (min)	Driver Rest (min)	Route Travel Time (min)	Pickup Time (min)	ETE (hr:min)
22	5	140	7.0	9.2	45	50	**4:00**	28.4	49	5	10	63	50	**6:55**
	4	160	7.0	15.3	27	50	**4:00**	28.4	49	5	10	63	50	**6:55**
	4	180	7.0	22.1	19	50	**4:10**	28.4	49	5	10	63	50	**7:10**
23	2	140	5.2	3.7	84	50	**4:35**	19.4	33	5	10	42	50	**6:55**
24	1	140	0.3	4.3	4	50	**3:15**	24.4	42	5	10	43	50	**5:45**
25	2	140	5.4	12.4	26	50	**3:40**	24.4	42	5	10	51	50	**6:15**
26	1	140	10.0	30.1	20	50	**3:30**	3.0	5	5	10	25	50	**5:10**
27	3	140	3.6	16.5	13	50	**3:25**	3.9	7	5	10	13	50	**4:50**
28	3	140	4.7	45.0	6	50	**3:20**	5.5	9	5	10	17	50	**4:50**
29	3	140	5.6	16.1	21	50	**3:35**	3.9	7	5	10	18	50	**5:05**
30	2	140	7.0	16.3	26	50	**3:40**	3.5	6	5	10	20	50	**5:10**
31	1	140	11.1	30.0	22	50	**3:35**	3.0	5	5	10	27	50	**5:10**
32	4	140	2.0	42.3	3	50	**3:15**	2.8	5	5	10	8	50	**4:35**
33	4	140	5.0	29.7	10	50	**3:25**	16.8	29	5	10	39	50	**5:35**
34	4	140	5.4	41.2	8	50	**3:20**	16.8	29	5	10	38	50	**5:30**
						Maximum ETE:	**6:30**						**Maximum ETE:**	**9:30**
						Average ETE:	**3:55**						**Average ETE:**	**6:35**

Table 8-14. Special Facility Evacuation Time Estimates - Good Weather

Medical Facility	Patient	Mobiliza-tion	Loading Time (per person)	People	Total Loading Time (min)	Travel Time to EPZ Boundary (minutes)	ETE
Sub-Area P-7 medical facilities	Ambulatory	90	1	172	30	12	**2:15**
	Wheelchair bound	90	5	36	75	12	**3:00**
Sub-Area P-8 medical facilities	Ambulatory	90	1	616	30	13	**2:15**
	Wheelchair bound	90	5	271	75	13	**3:00**
	Bedridden	90	15	47	30	13	**2:15**
Sub-Area P-9 medical facilities	Ambulatory	90	1	156	30	18	**2:20**
Sub-Area P-10 medical facilities	Ambulatory	90	1	47	30	81	**3:25**
	Wheelchair bound	90	5	17	75	81	**4:10**
	Bedridden	90	15	4	30	81	**3:25**
Sub-Area O-2 medical facilities	Ambulatory	90	1	102	30	7	**2:10**
	Wheelchair bound	90	5	56	75	7	**2:55**
	Bedridden	90	15	17	30	7	**2:10**
Sub-Area O-3 medical facility	Ambulatory	90	1	63	30	7	**2:10**
	Wheelchair bound	90	5	30	75	7	**2:55**
	Bedridden	90	15	6	30	7	**2:10**
Sub-Area W-1 medical facility	Ambulatory	90	1	41	30	7	**2:10**
	Wheelchair bound	90	5	64	75	7	**2:55**
	Bedridden	90	15	6	30	7	**2:10**
						Maximum ETE:	**4:10**
						Average ETE:	**2:40**

Table 8-15. Special Facility Evacuation Time Estimates - Rain

Medical Facility	Patient	Mobilization	Loading Time (per person)	People	Total Loading Time (min)	Travel Time to EPZ Boundary (minutes)	ETE
Sub-Area P-7 medical facilities	Ambulatory	100	1	172	30	13	**2:25**
	Wheelchair bound	100	5	36	75	16	**3:15**
Sub-Area P-8 medical facilities	Ambulatory	100	1	616	30	14	**2:25**
	Wheelchair bound	100	5	271	75	17	**3:15**
	Bedridden	100	15	47	30	14	**2:25**
Sub-Area P-9 medical facilities	Ambulatory	100	1	156	30	19	**2:30**
Sub-Area P-10 medical facilities	Ambulatory	100	1	47	30	81	**3:35**
	Wheelchair bound	100	5	17	75	67	**4:05**
	Bedridden	100	15	4	30	81	**3:35**
Sub-Area O-2 medical facilities	Ambulatory	100	1	102	30	8	**2:20**
	Wheelchair bound	100	5	56	75	8	**3:05**
	Bedridden	100	15	17	30	8	**2:20**
Sub-Area O-3 medical facility	Ambulatory	100	1	63	30	8	**2:20**
	Wheelchair bound	100	5	30	75	8	**3:05**
	Bedridden	100	15	6	30	8	**2:20**
Sub-Area W-1 medical facility	Ambulatory	100	1	41	30	8	**2:20**
	Wheelchair bound	100	5	64	75	8	**3:05**
	Bedridden	100	15	6	30	8	**2:20**
						Maximum ETE:	**4:05**
						Average ETE:	**2:50**

Table 8-16. Special Facility Evacuation Time Estimates - Snow

Medical Facility	Patient	Mobilization	Loading Time (per person)	People	Total Loading Time (min)	Travel Time to EPZ Boundary (minutes)	ETE
Sub-Area P-7 medical facilities	Ambulatory	110	1	172	30	19	**2:40**
	Wheelchair bound	110	5	36	75	24	**3:30**
Sub-Area P-8 medical facilities	Ambulatory	110	1	616	30	20	**2:40**
	Wheelchair bound	110	5	271	75	26	**3:35**
	Bedridden	110	15	47	30	20	**2:40**
Sub-Area P-9 medical facilities	Ambulatory	110	1	156	30	29	**2:50**
Sub-Area P-10 medical facilities	Ambulatory	110	1	47	30	88	**3:50**
	Wheelchair bound	110	5	17	75	91	**4:40**
	Bedridden	110	15	4	30	88	**3:50**
Sub-Area O-2 medical facilities	Ambulatory	110	1	102	30	9	**2:30**
	Wheelchair bound	110	5	56	75	9	**3:15**
	Bedridden	110	15	17	30	9	**2:30**
Sub-Area O-3 medical facility	Ambulatory	110	1	63	30	9	**2:30**
	Wheelchair bound	110	5	30	75	9	**3:15**
	Bedridden	110	15	6	30	9	**2:30**
Sub-Area W-1 medical facility	Ambulatory	110	1	41	30	9	**2:30**
	Wheelchair bound	110	5	64	75	9	**3:15**
	Bedridden	110	15	6	30	9	**2:30**
						Maximum ETE:	**4:40**
						Average ETE:	**3:05**

Table 8-17. Homebound Special Needs Population Evacuation Time Estimates

Vehicle Type	People Requiring Vehicle	Vehicles deployed	Stops	Weather Conditions	Mobilization Time (min)	Loading Time at 1st Stop (min)	Travel to Subsequent Stops (min)	Total Loading Time at Subsequent Stops (min)	Travel Time to EPZ Boundary (min)	ETE (hr:min)
Wheelchair Buses	36	6	6	Normal	90	5	45	25	15	**3:00**
				Rain	100		50		17	**3:20**
				Snow	110		55		17	**3:35**