



Evacuation Study Summary Document

Clearance Time Scenarios



Evacuation Model Scenarios

There are literally thousands of possible combinations of variables that can be applied using the evacuation transportation model, which will result in thousands of possible outcomes. For the purposes of this analysis, two distinct sets of analyses were conducted using the SRESP evacuation transportation model, including one set of analysis for growth management purposes and one set of analysis for emergency management purposes. The two sets of analysis include the following:

- **Base Scenarios** – The base scenarios were developed to estimate a series of worst-case scenarios and are identical for all ten RPCs across the State. These scenarios assume 100 percent of the vulnerable population evacuates and includes impacts from counties outside of the RPC area. These scenarios are generally designed for growth management purposes, to ensure that all residents that choose to evacuate during an event can do so; and,
- **Operational Scenarios** – The operational scenarios were developed by the RPCs in coordination with local county emergency managers and are designed to provide important information to emergency management personnel to plan for different storm events. These scenarios are different from region to region and vary for each evacuation level.

Because of the numerous possible combinations of variables that can be applied in the model, the evacuation transportation model is available for use through the Regional Planning Council (RPC) to continue testing combinations of options and provide additional information to emergency managers.

Base Scenarios

A total of ten base scenarios were developed through discussions with the SRESP Statewide Work Group and are identical for all ten RPCs. The SRESP requires a consistent set of base scenarios that will be used by all regions across the State to provide a consistent background between regions. The base scenarios also allow the results to be used consistently from region to region for other purposes, such as growth management. The ten base scenarios were developed to include the following assumptions:

- **Analysis Time Period** – Five scenarios for the 2020 time period and five scenarios for the 2025 time period. The five scenarios for each time period include one for each of the five evacuation levels, A, B, C, D, and E;
- **Highway Network** – The five 2020 scenarios use the 2020 network, and the five 2025 scenarios use the 2025 network, which includes planned roadway capacity improvement projects expected to be implemented by 2025;
- **One-Way Evacuation Operations** – The base scenarios do not include implementation of any one-way evacuation operations;
- **Emergency Shoulder Use** – The base scenarios do not include implementation of any emergency shoulder use evacuation operations;

- **University Population** – The base scenarios use the fall/spring semester data to estimate evacuation trips by the student population. This data was provided by each RPC as part of the demographic small area data;
- **Tourist Occupancy Rates** – The base scenarios use the default hotel/motel occupancy rates to estimate tourist evacuation trips. This data was provided by each RPC as part of the demographic small area data;
- **Shelters** – The base scenarios assume all designated primary shelters within each county in the model network are open. The base scenarios do not include shelters that are designated as other shelters, only primary shelters;
- **Response Curve** – The 12-hour response curve is used for all ten base scenarios;
- **Evacuation Phasing** - All counties that are evacuating begin at same time, within 1 hour of the evacuation order being given;
- **Behavioral Response** - For all five evacuation levels (A, B, C, D, or E) in both the 2020 and 2025 time periods, the behavioral response for the base scenarios includes the following:
 - 100% response in evacuation zones for both mobile homes and site-built homes for the counties in the RPC, plus one coastal county on either side of the R P C region
 - 100% response for mobile homes in inland areas for the counties in the RPC, plus one coastal county on either side of the RPC region;
 - Planning Assumption response (shadow evacuation) for site-built homes in inland areas for the counties in the RPC plus one coastal county on either side of the region; and,
 - For the remaining counties outside of the RPC Region but within the Region's modeling capability, no evacuations are assumed, including shadow evacuations.

Operational Scenarios

The transportation analysis also included region wide operational scenarios selected by the county emergency managers and RPC staff for the RPC Region. While the base scenarios required that the basic assumptions were consistent between scenarios except for the year and the evacuation level, this is not the case for the operational scenarios. The only requirement for each region is that two operational scenarios are developed for each evacuation level (two for Level A, two for Level B, etc.). Otherwise, the assumptions and characteristics between the operational scenarios can be different for each scenario.

Clearance Time Definitions

The determination of clearance time is one of the most important outcomes from the evacuation transportation analysis. Calculated clearance times are used by county emergency managers as one input to determine when to recommend an evacuation order. This calculation can include the population-at-risk, shadow evacuees, as well as evacuees from other counties anticipated to pass through the county. Clearance time is developed to include the time required for evacuees to secure their homes and prepare to leave, the time spent by all vehicles traveling along the evacuation route network, and the additional time spent on the road caused by traffic and road congestion. Clearance time does not relate to the time any one vehicle spends traveling along the evacuation route network, nor does it guarantee vehicles will safely reach their destination once outside the County or Region. The four clearance times that are calculated as part of the evacuation transportation analysis include the following:

Clearance Time to Shelter - The time necessary to safely evacuate vulnerable residents and visitors to a "point of safety" within the county based on a specific hazard, behavioral assumptions, and evacuation scenario. Calculated from the point in time when the evacuation order is given to the point in time when the last vehicle reaches a point of safety within the county. Key points to remember for clearance time to shelter include: All in-county trips reach their destination within the county; and,

- This definition does not include any out of county trips.

In-County Clearance Time - The time required from the point an evacuation order is given until the last evacuee can either leave the evacuation zone or arrive at safe shelter within the county. This does not include those evacuees leaving the county on their own. Key points to remember for in-county clearance time include:

- All in-county trips reach their destination within the county;
- All out of county trips exit the evacuation zone, but may still be located in the county; and
- This definition does not include out-of-county pass-through trips from adjacent counties, unless they evacuate through an evacuation zone.

Out of County Clearance Time - The time necessary to safely evacuate vulnerable residents and visitors to a "point of safety" within the county, and all out of county evacuees have left the county but may still be evacuating based on a specific hazard, behavioral assumptions and evacuation scenario. Calculated from the point an evacuation order is given to the point in time when the last vehicle assigned an external destination exits the county. Key points to remember for out of county clearance time include:

- The roadway network within the county is clear;
- All out of county trips exit the county, including out of county pass-through trips from adjacent counties; and,
- All in-county trips reach their destination.

Regional Clearance Time - The time necessary to safely evacuate vulnerable residents and visitors to a "point of safety" within the (RPC) region, and evacuees that have left the (RPC) Region may still be evacuating based on a specific hazard, behavioral assumptions and evacuation scenario. Calculated from last vehicle assigned an external destination exits the region. Key points to remember for regional clearance time include:

- The roadway network within the RPC is clear;
- All out of county trips exit the RPC, including out of county pass-through trips from adjacent counties;
- All in-county trips reach their destination; and,
- Regional clearance time is equal to the largest out of county clearance time for a given scenario for any of the counties within the RPC, since the out of county clearance time includes out of county pass through trips from adjacent counties.