



Development of Evacuation Time Estimate Studies

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Evacuation Time Estimate

- **Evacuation Time Estimate (ETE) – the estimated time to evacuate the plume exposure pathway emergency planning zone (EPZ)**





ETEs Include General Assumptions

- Common assumptions found in current ETEs and guidance:
 - The ETE is measured from the time that instructions are first made available to the public within the EPZ (e.g., Emergency Alert System (EAS) broadcast).
 - Mobilization of the public begins after initial notification.
 - Schools and special facilities receive initial notification at the same time as the rest of the EPZ.
 - Evacuation time ends when the last vehicle has exited the EPZ.
 - Buses used to evacuate schools may be loaded to capacity.
 - A shadow evacuation may occur.





Roadway Characteristics

Roadway characteristics are needed for proper depiction of the transportation network.

In all cases, a field survey of the key routes within the EPZ should be performed to obtain:

- number of lanes;
- lane and shoulder width;
- Signal types and locations;
- Turn lanes; etc.





Network Capacity may be Controlled by Intersections

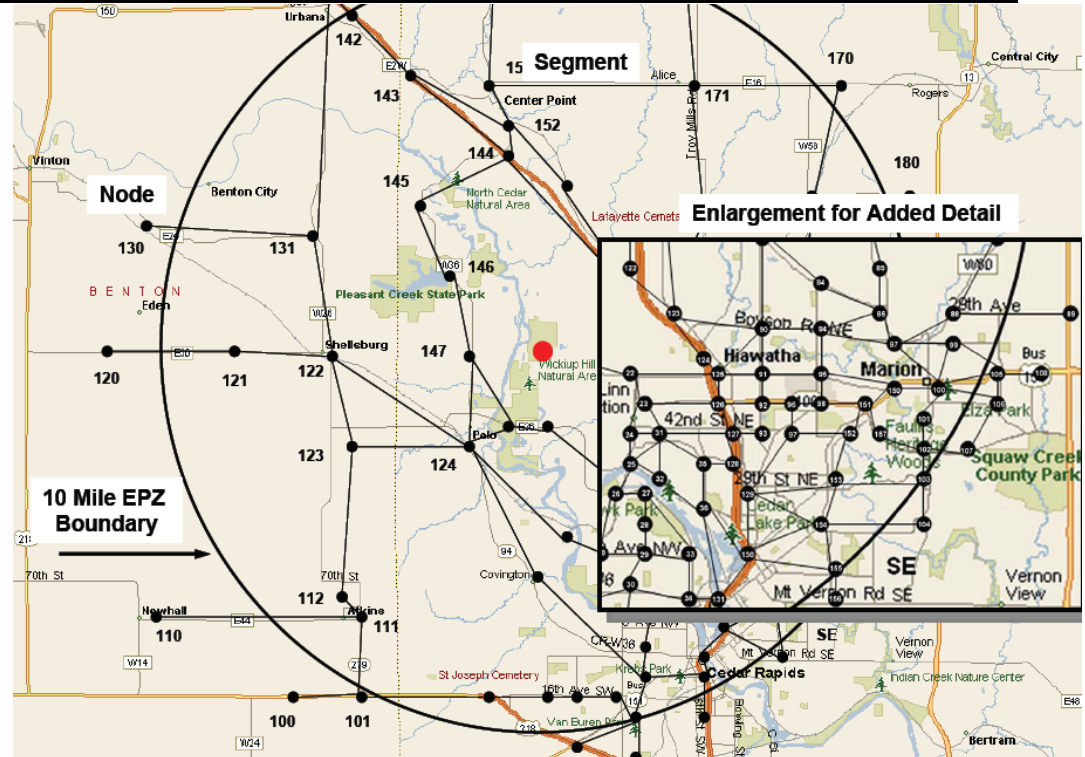
Some important characteristics of intersections include the number of lanes, left and right turn lanes, and effective green time.

Intersections may have actuated signals, non-actuated signals, or manned traffic control (during an evacuation) each of these controls have different efficiencies in traffic throughput.



Roadway Network Identifying Nodes and Segments

- A map of the nodal network is needed to support review of the input data.
- Characteristics of nodes and segments (links) can then be related to the roadway network to support review



Roadway Characteristics

Link #	U-Node	D-Node	Length	Lane Width	Number of Lanes	Roadway Type	Saturation Flow Rate	FFS
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Trip Generation Time (mobilization)

- The trip generation time may be a large time contributor depending upon the site and includes:
 - Notification of the public
 - Prepare to leave work or other activity
 - Travel to home
 - Prepare to leave for the evacuation





Trip Generation Time (continued)

- This becomes a series of time distributions used to develop the vehicle loading curves
- Depending on the population density and infrastructure within the EPZ, the Trip Generation Time may be the dominant time element of an evacuation.
 - As such, it is important that contributing elements to the trip generation time be well developed.



Special Facilities and Schools

- The evacuation of special facilities and schools requires developing information on the logistics of the evacuation:
 - Time to contact the drivers and for drivers to travel to the transit depot;
 - Time for briefing, receipt of radios, fueling of buses, etc., as applicable;
 - Inbound travel time to the special facilities;
 - Load and travel out of the EPZ.



Do not assume all wheelchairs fold up neatly for vehicle transport





Integration of Traffic Control Plans in the ETE

- Traffic control is an established technique routinely used to support evacuations
- Traffic control plans are an integral element emergency planning.
 - These plans typically identify the location where traffic control points will be established;
 - Just like other elements of the emergency plan that are included in the ETE analysis, traffic control must be considered.
 - Consider:
 - Manned traffic controlled intersections operate efficiently.
 - Actuated signals and non-signalized intersections may be expected to perform less efficiently than manned traffic controlled intersections.





Development of the ETE

- The ETE requires a substantial effort in obtaining information relevant to the EPZ.
 - The level of detail needed for an ETE necessitates that the analyst interact directly with information providers such as local and state agencies, hospitals, schools, etc.
- The data is compiled and processed for use in traffic simulation modeling.

