



CITY OF RANCHO SANTA MARGARITA SB 99 ANALYSIS WHITE PAPER

Emergency Evacuation Route Analysis

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SB 99 Analysis White Paper

The City prepared an analysis consistent with Senate Bill 99 to identify residential developments in hazard areas that do not have at least two emergency evacuation routes. The analysis found that Robinson Ranch Road, Dove Canyon Drive, and Sycamore Canyon Drive appear to be the most vulnerable to slow exits due to the high number of residential parcels, single exit points, and long canyon roads. Additionally, Melinda Road, near the Highway 241 crossings may be impacted in an emergency situation. Although all the residential parcels in this area have multiple exit points, they all access Melinda Road. The following is an explanation of the methodology used to map the evacuation routes.

Definitions & Data Sources

Residential Developments

Parcel data obtained from the SCAG GIS Open Data Portal were used to determine the location of residential developments. This parcel set includes the general plan land use designations within the City of Rancho Santa Margarita. Parcels with general plan land uses of Low Density Residential, Medium Density Residential, Medium High Density Residential, and High Density Residential were considered Residential Developments for the purposes of this study.

Hazard Areas

High Hazard Zones were defined as areas that are in one or more of the following pre-defined hazard zones:

1. FEMA's 100-year flood zone
2. California OES dam inundation area (none within the city)
3. California Geological Survey's Map Sheet 58 Landslide Susceptibility classes 8, 9, or 10
4. California Geological Survey's Potential Liquefaction and Potential Landslide areas, mapped as part of the California Seismic Hazard Zonation Program
5. CalFire's High and Very High Fire Threat zones
6. CalFire's Very High Fire Hazard Severity Zones in Local Responsibility Areas

These hazard zones were combined into one single "Combined Hazard Area" using ArcGIS merge and dissolve geoprocessing tools.

Evacuation Routes

Road data obtained from the Orange County GIS Open Data Portal were utilized to identify points of exit from clusters (neighborhoods) of residential parcels. Road centerlines were divided into three main classes:

1. *State Highway* – Highway 241
2. *Arterials* – as defined by Orange County GIS data "Arterials"
3. *Minor/Residential Roads* – All other roads not considered "Arterial" by the Orange County GIS roads dataset. These roads are generally the first roads a resident will encounter when departing their residence.

Assumptions & Methodology

Identification of Residential Developments in Hazard Areas

Using ArcGIS, Residential Developments in Hazard Areas were identified by a running a location query to find the parcels with residential general plan designations that intersect the single Combined Hazard Area. All residential parcels were mapped; those parcels within the Combined Hazard Area are identified by a thicker, bolder outline.

Identification of Residential Subdivision Exit Points

The goal of this analysis was to find at least two separate points of exit from residential neighborhoods by following a rudimentary roadway network in which vehicles move from Minor/Residential Roads to Arterial, and eventually to a State Route. The following assumptions apply:

1. Residential Developments have immediate access to Minor/Residential Roads but are distant from the SR 241
2. Arterials connect Minor/Residential Roads to the SR 241
3. Residential Exit Points are the points where Minor/Residential Roads intersect Arterials, thereby providing eventual access to the SR 241

Using ArcGIS, a point file representing the intersections of Minor/Residential and Arterials roads was created.

Analysis

Upon visual analysis, residential parcels within the Combined Hazard Area were assigned to one of four categories:

1. One Exit Point with distance to a Single Arterial
2. One Exit Point directly onto a Single Arterial
3. Multiple Exit Points with access to a single Arterial (Loop Road)
4. Multiple Exit Points with access to multiple Arterials

Results

The City will continue to coordinate with OCFA and OCSD to ensure viable exit strategies are available for the following areas of the City:

1. Robinson Ranch Road, Dove Canyon Drive, and Sycamore Canyon Drive appear to be the most vulnerable to slow exits due to the high number of residential parcels, single exit points, and long canyon roads.
2. Melinda Road, near the Highway 241 crossings may be impacted in an emergency situation. Although all the residential parcels in this area have multiple exit points, they all access Melinda Road.