Santa Maria General Plan

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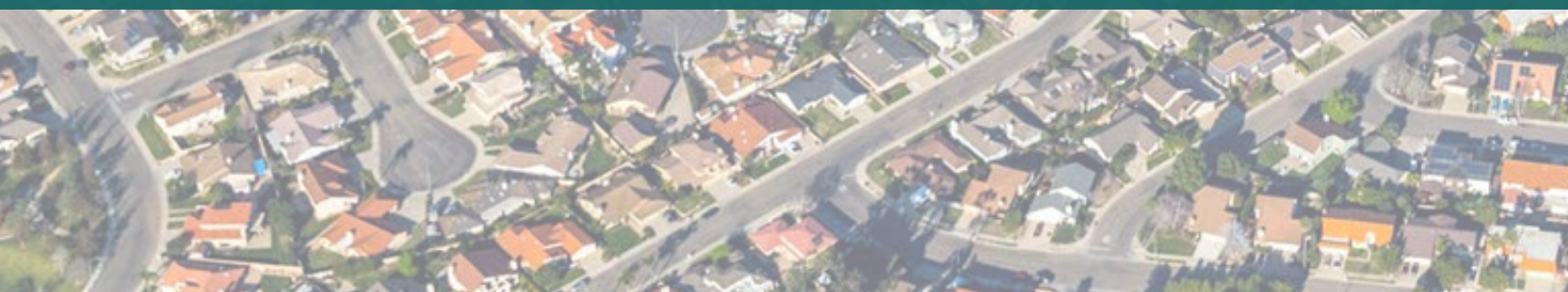
Appendix E: Emergency Evacuation Analyses



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Rincon Consultants, Inc.
180 North Ashwood Avenue
Ventura, California 93003
805-644-4455

August 6, 2025
Project No: 19-07303

Dana Eady, Planning Division Manager
City of Santa Maria
110 South Pine Street Suite 101
Santa Maria, California 93458

Subject: City of Santa Maria Emergency Evacuation Analysis

Dear Ms. Eady:

This supplemental evacuation analysis was prepared in support of the City of Santa Maria General Plan Update. This study is intended to provide the City with a broad planning level assessment of the capacity of the transportation system during a citywide evacuation event and serves to build upon the City's 2017 Hazard Mitigation Plan and 2025 Safety Element Update.[1] It identifies residential developments with a single entrance and exit, and evaluates the potential consequences of large evacuation events on the roadway system under various hazard scenarios in keeping with the following two statutes:

- **Senate Bill 99** (SB 99) requires that the Safety Element of the General Plan identify any residential developments in any hazard area that does not have at least two evacuation routes. This is a requirement for all safety element updates included upon the revision of the housing element on or after January 1, 2020.
- **Assembly Bill 747** (AB 747) requires that the Safety Element be reviewed and updated to identify evacuation routes and their capacity, safety, and viability under a range of emergency scenarios. This will be a requirement for all safety elements or updates to a hazard mitigation plan completed after January of 2022.

These scenarios are intended to model a potential range of different evacuation scenarios, but not all possible scenarios. Emergency evacuations can occur due to any number of events and at any location beyond those specifically identified in this report. In addition, emergency movement is unpredictable, and the specific conditions of an emergency evacuation could result in evacuation behavior that diverges from the assumptions used in this analysis. This analysis serves only to represent informed estimates of likely potential evacuation scenario footprints and capacity constraints based on available data and does not guarantee that evacuations will follow modeling that is used for analysis purposes. Emergency evacuation assessment is an emerging field, and the legislative requirement does not specify a standard methodology to follow, nor has guidance yet been provided by the State. The methodology used in this evaluation is based upon best practices and the professional experience and knowledge of Rincon staff. Rincon is not responsible for any damage to life or property that might occur based on the results of the evacuation analyses herein, and any accompanying recommendations.

[1] Santa Maria, City of. 2017. *City of Santa Maria Hazard Mitigation Plan.* https://www.cityofsantamaria.org/home/showpublisheddocument/20735/636888426953500000 (accessed January 2025)

SB 99 Analysis – Single Entrance/Exit Neighborhoods

Per SB 99, the Safety Element of the General Plan is required to identify residential neighborhoods in any hazard area that does not have at least two evacuation routes. For this analysis, a single entrance/exit neighborhood is defined as 30 or more dwelling units located in a residential general plan land use designation that only have a single route to access a collector or arterial road based on California Fire Code Appendix D107.1[2]. As shown in Figure 1 and noted in Table 1, there are 13 total neighborhoods within the City's Sphere of Influence that have a single entry or exit point, of which eight are located within City boundaries and five are located outside City boundaries. Additionally, there are two CAL FIRE subdivisions in the City of Santa Maria Sphere of Influence. CAL FIRE subdivisions are areas with 30 or more dwelling units located in the State Responsibility Area (SRA) or a Very High Fire Hazard Severity Zone (VHFHSZ) without a secondary means of egress route that are at significant fire risk.[3] The 13 single-access neighborhoods are distributed throughout the City's Sphere of Influence and within City boundaries, located mostly in the southwestern portion of the city along US-101, Santa Maria Way, and South Miller Street. Of these 13 single-access neighborhoods, three feature a locked emergency gate, which may be unlocked during an emergency scenario, creating a secondary ingress/egress route and granting access to emergency vehicles:

1. At Whippoorwill Drive and South College Drive, there is a locked gate that connects to an RV storage facility next door.
2. At Sunrise Drive, between Santa Maria Way and Santa Barbara Street, at the Mission Creek Village community, there is a locked gate that can be accessed via Sunrise Drive.
3. At Larch Avenue and South Bradley Road, there is a locked emergency gate at the end of Cherry Hill Road, which would allow secondary ingress/egress for residents and emergency vehicles.

One single access neighborhood is located in the northern portion of the city along US-101 and State Route (SR)-166. In the case of an evacuation event, these single entry/exit neighborhoods would likely use US-101, SR-135, SR-166, West/East McCoy Lane, South College Drive, or Santa Maria Way to evacuate depending on the location of the evacuation area. Some neighborhoods could also use alternative evacuation routes, such as South Bradley Road, East Betteravia Road, South Miller Street, North Railroad Avenue, West/East Donovan Road, and East Main Street, depending on the severity of traffic congestion or the location of the evacuation area. More evacuation-specific information will be discussed in the AB 747 Emergency Evacuation Analysis to follow.

Table 1 Single Access Neighborhood Locations

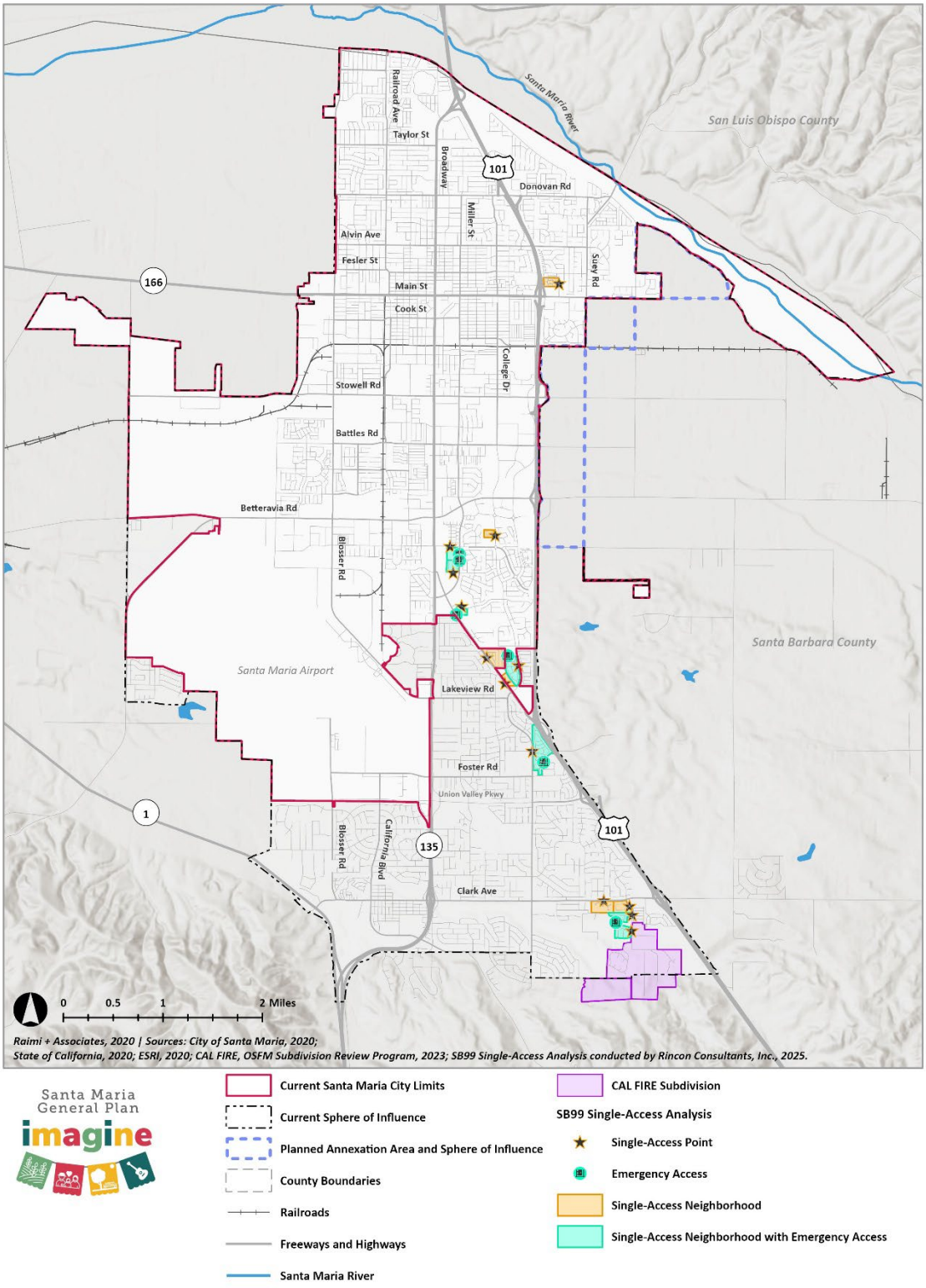
Type	Location/Cross Streets	Emergency Access	Jurisdiction
Single-Access	Santa Maria Way & College Drive		City of Santa Maria
Single-Access with Emergency Access	Whippoorwill Drive & South College Drive	Emergency Access (Not Gated)	City of Santa Maria
Single-Access	Sunrise Drive, between Santa Maria Way and Santa Barbara Street	Emergency Access (Not Gated)	City of Santa Maria
Single-Access	Knightbridge Drive & San Ysidro Street	Emergency Access (Gated)	City of Santa Maria
Single-Access with Emergency Access	East McCoy Lane, between South Broadway Street and South Miller Street	Emergency Access (Not Gated)	City of Santa Maria

[2] 2022 California Fire Code, Title 24, Part 9. Accessed at: https://codes.iccsafe.org/content/CAFC2022P1/appendix-d-fire-apparatus-access-roads. (Accessed February 2025)

[3] CAL FIRE. 2025. Subdivision Review Program. https://www.fire.ca.gov/osfm/what-we-do/community-wildfire-preparedness-and-mitigation/subdivision-review-program. (Accessed January 2025)

Single-Access	East Riddering Street & South College Drive		City of Santa Maria
Single-Access	Stonebridge Drive & Concord Avenue		City of Santa Maria
Single-Access	Del Cielo Estates Trail & Santa Maria Way		Sphere of Influence
Single-Access with Emergency Access	Larch Avenue & South Bradley Road	Emergency Access (Not Gated)	Sphere of Influence
Single-Access	Oakridge Park Road & East Clark Avenue		Sphere of Influence
Single-Access	Ashbrook Lane & Stillwell Road		Sphere of Influence
Single-Access with Emergency Access	Jensen Ranch Road & Stillwell Road	Emergency Access (Not Gated)	Sphere of Influence
Single-Access with Emergency Access	Canyon Creek Road & Stillwell Road	Emergency Access (Not Gated)	Sphere of Influence

Figure 1 Single Entry/Exit Neighborhoods



Next Steps

In compliance with SB 99, we have identified two CAL FIRE subdivisions and 13 other neighborhoods that have a single entry or exit point throughout the city. Three of these 13 neighborhoods feature an alternative locked emergency gate, which may be utilized as an evacuation or access route for residents and emergency vehicles. The AB 747 analysis will show that major roadways and evacuation routes could become affected thus prompting emergency traffic management and the use of alternative evacuation routes during emergency events. In accordance with AB 747, a range of potential hazard scenarios will be modeled and discussed as part of the City of Santa Maria's Emergency Evacuation Analysis. Hazard scenarios were selected in consultation with City staff and are based on a review of past hazard assessments, and by considering the potential likelihood, magnitude, and spatial extent of various hazards. These hazard scenarios include an earthquake/liquefaction scenario, riverine and stormwater flooding scenario, and hazardous materials release scenario. Results of this analysis are still in process and will be delivered to the City promptly. It is recommended that the results of these analyses be considered to frame supportive goals, policies, and implementation actions in the City's Safety Element of the General Plan Update. These policies can be used to identify potential evacuation capacity and resiliency improvements throughout the city.

Sincerely,
Rincon Consultants, Inc.

Della Acosta
Supervising Environmental Planner

Rincon Consultants, Inc.
180 North Ashwood Avenue
Ventura, California 93003
805-644-4455

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Dana Eady, Planning Division Manager
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Subject: City of Santa Maria Emergency Evacuation Analysis

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- **Assembly Bill 747** (AB 747) requires that the Safety Element be reviewed and updated to identify evacuation routes and their capacity, safety, and viability under a range of emergency scenarios. This will be a requirement for all safety elements or updates to a hazard mitigation plan completed after January of 2022.

While Rincon has made every effort to ensure the accuracy and reliability of the information provided, these scenarios are intended to model a potential range of different evacuation scenarios, but not all possible scenarios. Emergency evacuations can occur due to any number of events and at any location, beyond those specifically identified in this report. In addition, emergency movement is unpredictable, and the specific conditions of an emergency evacuation could result in evacuation behavior that diverges from the assumptions used in this analysis. This analysis serves only to represent informed estimates of likely potential evacuation scenario footprints and capacity constraints based on available data and does not guarantee that evacuations will follow modeling that is used for analysis purposes. Emergency evacuation assessment is an emerging field, and the legislative requirement does not specify a standard methodology to follow. Rincon is not responsible for any damage to life or property that might occur based on the results of the evacuation analyses herein, and any accompanying recommendations. AB 747 Analysis – Evacuation Scenarios

In accordance with AB 747, the following analysis and results outline the potential outcomes of a variety of hazard events requiring emergency evacuation.

Evacuation Scenarios

In accordance with AB 747, a range of potential hazard scenarios are presented in this evacuation analysis. Hazard scenarios were selected by City staff and are based on a review of past hazard

[1] Santa Maria, City of. 2017. *City of Santa Maria Hazard Mitigation Plan.* https://www.cityofsantamaria.org/home/showpublisheddocument/20735/636888426953500000 (accessed January 2025).

assessments, and by considering the potential likelihood, magnitude, and spatial extent of various hazards.

Scenario 1 Earthquake/Liquefaction Scenario

Scenario 1 would involve a magnitude 7.2 earthquake occurring via the San Andreas Fault near the City of Santa Maria, which would likely result in significant damage to City property and lead to residents evacuating.

The city is built on unconsolidated alluvium (sand) which would result in sifting effect, creating foundational instability and shifting of buildings. Additionally, severe liquefaction may result from the earthquake, especially in the vicinity of the Santa Maria Public Airport. Although the City would encourage residents to shelter in place, it is likely that residents will evacuate via the US 101 and SR 135.

- Timing: Peak Weekday Afternoon Traffic Hours
- Evacuation Points: South of city limits along US-101
- Evacuation Zone: 1

Scenario 2 Riverine and Stormwater Flooding Scenario

Scenario 2 would involve an extreme rain event that causes localized flooding, causing immediate evacuation of low-lying areas in the city. This event would also cause potential inundation of the Santa Maria Levee above the city via the Sisquoc River and cause intense flooding east to west through the northern portions of the city along the Santa Maria Levee. 100-year and 500-year flood zones would become inundated, forcing evacuations north and south out of the city.

- Timing: Peak Weekday Afternoon Traffic Hours
- Evacuation Points: North of city limits along US-101 and south along US-101
- Evacuation Zone: 2

Scenario 3 Hazardous Materials Release Scenario

Scenario 3 would involve a hazardous materials release via active hazardous materials sites within the city, along West Main Street/SR-166, and the release of hazardous materials from the City's natural gas pipeline along South/North Railroad Avenue in the same vicinity as the active hazardous materials sites. This event would result in the immediate evacuation of the surrounding areas, which feature predominantly dense residential areas, leading to heavy congestion along West Main Street/SR-166 as residents flee westward towards the town of Guadalupe and north along US-101 North.

- Timing: Peak Weekday Traffic Hours
- Evacuation Points: West and north of City limits along SR-166 and US-101 North
- Evacuation Zone: 3

Methodology

This section describes the methods, tools, and data sources utilized to establish the transportation network, the approach to distributing the Santa Maria population within the city, average roadway capacity, and evacuation modeling.

Transportation Network

The transportation network was created by enhancing the city's roadway layer with ESRI's StreetMap Premium[2], which includes detailed basemap data and a network dataset for routing, both of which were used in the evacuation analyses. StreetMap Premium is a comprehensive dataset that provides enriched network data based on commercial street reference data from leading global and local street data suppliers: HERE and GeoTechnologies, Inc. This dataset is well-suited for emergency evacuation analysis because it includes a comprehensive network of roads, baseline traffic data, and is regularly updated to ensure that it remains accurate and current. In addition, the network data models the movements of automobiles by obeying one-way roads, speed limits, avoiding illegal turns, and other rules specific to automobiles, and finds solutions that optimize travel time.

Population Modeling

The population of Santa Maria was modeled using ESRI's Enrich Layer Tool. The Enrich Layer Tool appends demographic and landscape variables to any input polygon feature class for further analysis, modeling, and reporting. The input polygon layer used for Santa Maria were US census tracts within the city. The Enrich Layer Tool is then used to add daytime population data to the city census tracts. Daytime population data was from ESRI's daytime population data estimates, which are generated using a mix of inputs from ESRI's U.S. Updated Demographics, the decennial census, the American Community Survey (ACS), and business data from Data Axle, a full-service data provider. ESRI's daytime population is an estimate of the population that includes residents and workers in the city on weekdays during standard workday hours, between 9:00 a.m. and 5:00 p.m. Daytime population was used to best represent the number of individuals in the city at the time of an evacuation scenario.

After the values of daytime population were assigned to the census tracts, the city's building footprints[3] were used to concentrate the daytime population into places where the population would typically be present, such as residential areas, shopping centers, schools, and corporate offices and buildings. This was done by randomly distributing total daytime population values to be within building footprints within each census tract. The daytime population points that intersect the evacuation area represent the individuals that are evacuating, and where they start their evacuation from. These points serve as evacuation origin points.

Evacuation Modeling

Evacuation routes and traffic volumes during an emergency evacuation event were modeled using ArcGIS's Closest Facility tool included in the Network Analyst extension. The Closest Facility tool enables finding the closest facility (e.g., hospital, fire station, or gas station) to a given location or set of locations. The Closest Facility tool can also be customized to include other factors that affect travel time, such as speed limits and road closures. For this evacuation analysis, the "facilities" analyzed were points of safety and designated evacuation locations on roads along evacuation routes, including SR-166, US-101, and SR-135, located outside the Santa Maria City boundaries. After distributing the daytime population throughout the city, the evacuation model was run to simulate the level of traffic volumes on roads and major highways during each evacuation scenario assuming simultaneous departure of all populations from the evacuation area to the nearest designated evacuation locations within the transportation network.

[2] ArcGIS StreetMap Premium. Accessed at: https://www.esri.com/en-us/arcgis/products/arcgis-streetmap-premium/overview.
[3] The City of Santa Maria's building footprint data was sourced from Federal Emergency Management Agency (FEMA) data, which displays footprints for all structures (buildings) greater than 450 square feet in the United States and its territories. Accessed at: https://fema.maps.arcgis.com/home/item.html?id=0ec8512ad21e4bb987d7e848d14e7e24#overview.

To depict the level of traffic volumes associated with each evacuation scenario, average daily traffic (ADT) was assigned to highways, arterial streets, and local roads within the city. ADT values for the highways, arterial streets, and some local roads were provided by the City and include ADT counts and locations from November 2022 performed by Iteris. ADT data for highways in Santa Maria were calculated using Caltrans 2022 ramp ADT data. For local roads where ADT was not provided, an ADT value was assigned based on the average ADT value of all local roads provided by City staff. For this analysis, road capacity was estimated using road classifications and the number of lanes traveling in the direction of the evacuation. Grade separated highways (SR-166) were assumed to have a traffic flow of 2,200 vehicles per lane per hour, arterial roads were assumed to have an ideal traffic flow of 1,900 vehicles per lane per hour, and collector and local roads were assumed to have an ideal traffic flow of 950 vehicles per lane per hour. On average, peak hour traffic ranges between 6-10 percent of ADT, according to the US Department of Transportation (DOT) Federal Highway Administration.[4] For this analysis, a median-range value of about 8 percent of ADT[5] was used to get the baseline volume of traffic on the roads, based on the suburban nature of the city. For the baseline scenario, baseline traffic volume is compared to the road capacity to get the baseline volume to capacity (V/C) ratio. For the evacuation scenarios, the number of evacuation routes that traveled along a particular road—moving from the evacuation origin to the nearest evacuation point outside the city limits—will be added to the baseline volume of traffic already assumed to be traveling on the roads and compared to the road capacity to get the evacuation V/C ratios. V/C ratios less than 0.9 depict uncongested traffic, V/C ratios between 0.9 and 1 depict moderately congested traffic, and V/C ratios greater than 1 depict heavily congested traffic, or over-capacity traffic.

Assumptions and Limitations

The results of this analysis are intended to show roads that could experience increased traffic volumes during an emergency evacuation scenario. The model assumes that the daytime population within the evacuation area is going to exit the hazard area at the nearest evacuation point during typical traffic conditions.

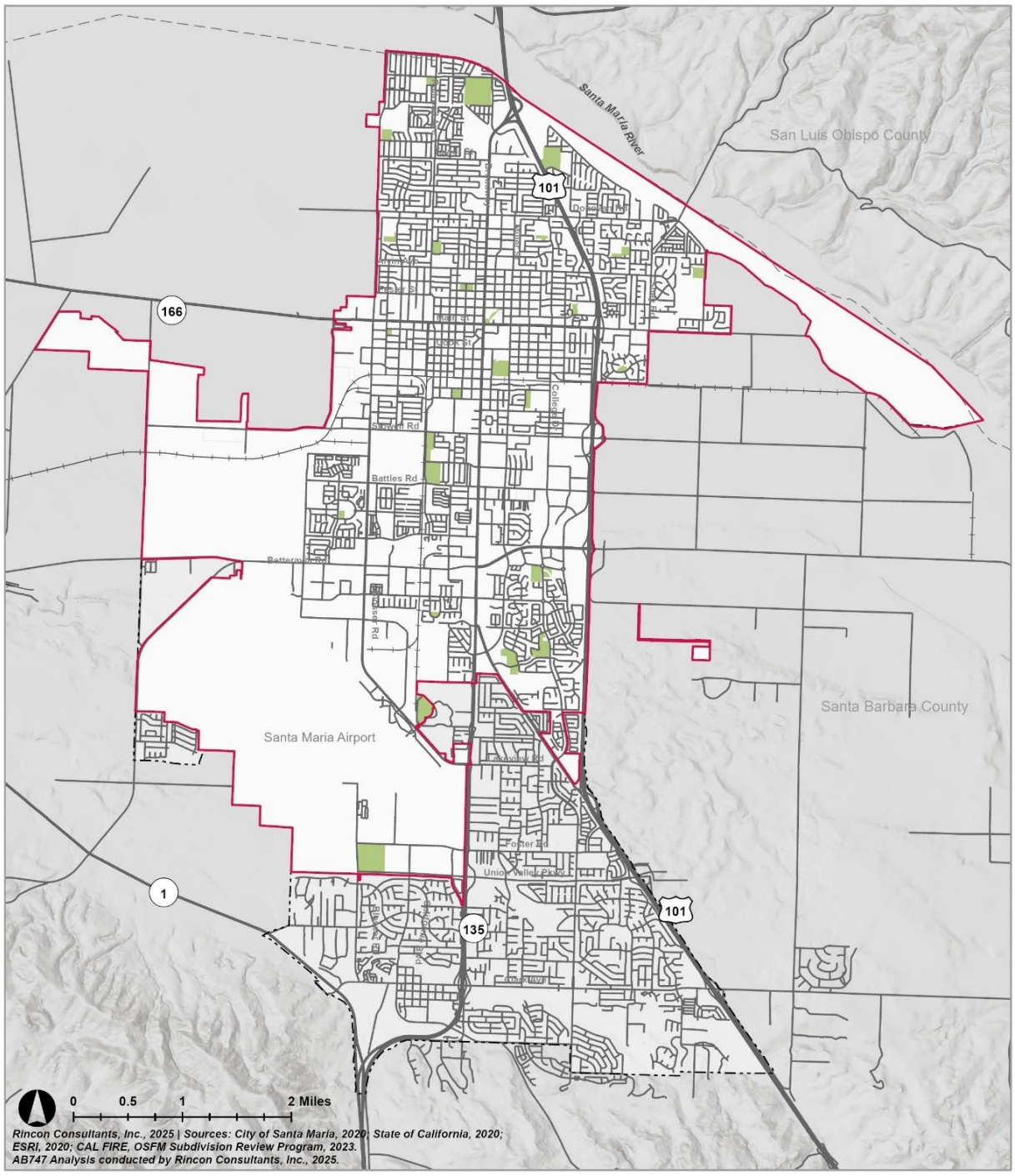
Evacuation Assessment Results

Baseline (Weekday evening traffic hours)

The baseline scenario evaluates typical traffic volumes in the city during peak, weekday traffic hours (e.g., Thursday at 5 P.M.), assuming around 8 percent of ADT. After being compared to the road capacity, the resulting V/C ratio is used as the basis of comparison against each modeled evacuation scenario. As shown in Figure 1, there is no road congestion within the city under baseline conditions. All expected evacuation routes/locations occur outside city limits on major transportation routes, especially US-101, SR-135, and SR-166.

[4] US DOT Federal Highway Administration. Traffic Data Computation Method Pocket Guide. Accessed at: https://www.fhwa.dot.gov/policyinformation/pubs/pl18027_traffic_data_pocket_guide.pdf.
[5] The peak hour volume is generally between 6 percent and 10 percent of the ADT. https://www.precisiontrafficsafety.com/solutions/traffic-studies/.

Figure 1 Baseline Traffic Conditions



Scenario 1 Earthquake/Liquefaction Event

This scenario assumes a Magnitude 7.2 earthquake via the San Andreas, Rinconada, Hosgri, or Santa Ynez Fault. This earthquake event may result in evacuations out of the city due to infrastructure and residential damage, as well as to avoid potential aftershock earthquakes. Additionally, a large portion of the city is built upon unconsolidated alluvium (sand), which would result in a sifting effect following an earthquake. This sifting effect may lead to foundation instability and shifting of buildings, especially near the Santa Maria Public Airport, an area known for shallow groundwater, making it vulnerable to damage from liquefaction, depicted in Figure 2. A liquefaction event near the airport would result in extensive damage and limit the ability for airborne travel to and from the City of Santa Maria. As such, it is expected roadway congestion will occur from the earthquake/liquefaction emergency scenario.

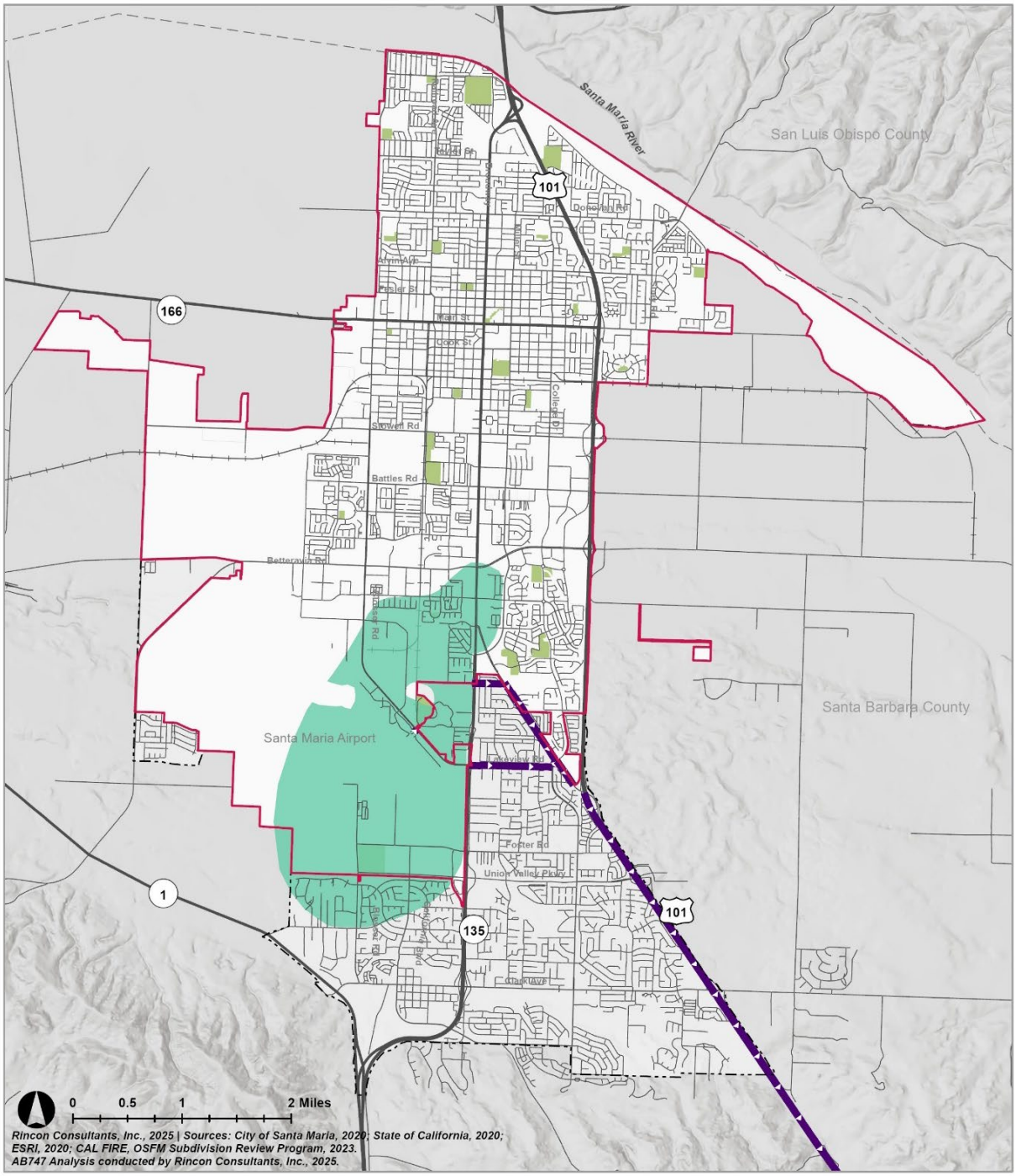
Table 1 lists the expected traffic volumes and congestion resulting from emergency evacuation due to earthquake and liquefaction. Figure 2 shows the extent of the proposed earthquake/liquefaction evacuation area and expected increased traffic volumes resulting from simultaneous departure throughout various points from the evacuation area. It is assumed that all evacuees will be travelling towards the designated evacuation destinations to highways outside of city limits, especially south via US-101. Due to the liquefaction vulnerability around the airport, evacuation routes near the liquefaction zone are significantly impacted and exhibit V/C scores greater than 1, denoting that these routes are over capacity. These evacuation routes include Airpark Lane, South Santa Maria Way, East Waller Lane, Waller Lane, South Bradley Road, Lakeview Road, US-101 South Ramp, and US-101 South.

Due to this, evacuation responders could consider activating evacuation traffic management along these roadways, especially those with the largest lengths of congestion. South Santa Maria Way features 1.35 miles of over-capacity congestion and US-101 South features 5.44 miles of over-capacity congestion. In the event of an earthquake/liquefaction scenario, evacuation responders could implement contra-flow lane reversal on northbound US-101 and eastbound South Santa Maria Way to allow both sides of the roadways to be used for evacuation southward out of the city.

Table 1 Earthquake/Liquefaction Scenario

Roadway	Congested (miles)	Over Capacity (miles)	Baseline Congested or Over Capacity?
Airpark Lane	0.00	0.03	0.00
South Santa Maria Way	0.00	1.35	0.00
East Waller Lane	0.00	0.25	0.00
Waller Lane	0.00	0.02	0.00
US-101 South	0.00	5.44	0.00
South Bradley Road	0.00	0.07	0.00
Lakeview Road	0.00	0.73	0.00
US-101 South Ramp	0.00	0.31	0.00

Figure 2 Earthquake/Liquefaction Event



Scenario 2 Riverine and Stormwater Flooding Event

This scenario assumes extreme flooding due to a significant rain event, causing localized flooding, and triggering evacuations of low-lying areas of the city. In the event of this 100-year and 500-year storm event, heavy precipitation could result in the inundation of the Santa Maria Levee, especially along the deficient area from Blosser Road to the Bradley Canyon Confluence east of the city. These areas along the Santa Maria River are known for significant sedimentation, which has impacted flow and permeability, causing fragile segments of the levee, which may be more prone to inundation. In the event of a significant rain event which might cause a levee inundation, there would be sufficient warning to the public, allowing successful evacuation of low-lying and vulnerable areas throughout the city, as noted in Figure 3.

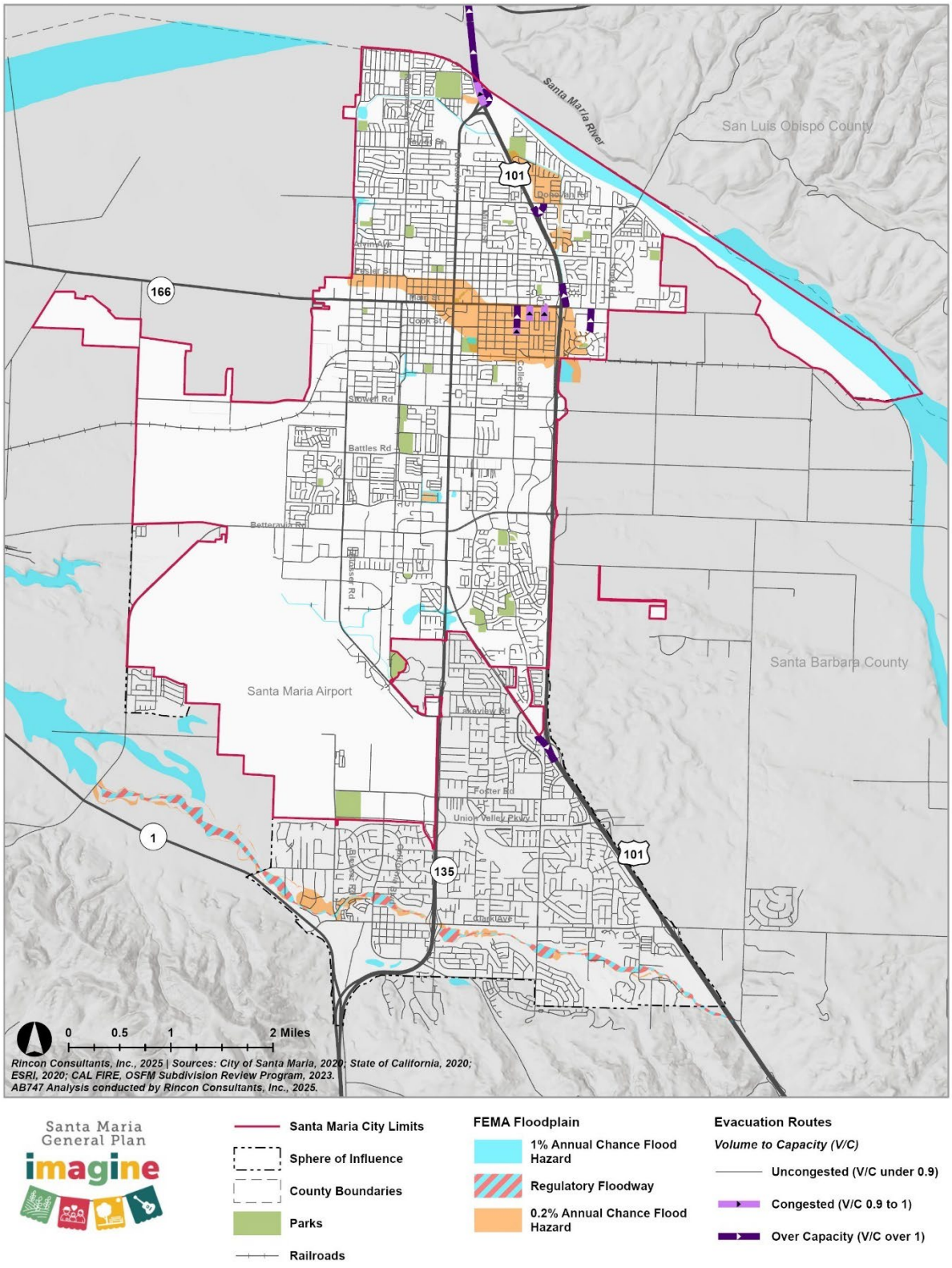
A 100-year flood event (1% annual chance flood hazard) would inundate areas largely outside of city limits, especially along the Santa Maria River and Orcutt Creek. A 500-year flood event (0.2% annual flood hazard), however, would result in flooding within city limits, causing more extensive evacuation to occur. Flooding would especially occur in low-lying areas of the city along West Fesler Street, extending east along SR-166/West Main Street to the neighborhood along Joe White Park. This area, depicted in Figure 3, encompasses a large portion of the northern part of the city, including major transportation routes such as SR-166/East Main Street, US-101, South/North Broadway, and West/East Cook Street. Flooding along these transportation routes would cause extensive damage within the city and lead to large evacuations in these neighborhoods, resulting in congested traffic. Table 2 lists the evacuation route congestion and capacity under the riverine and stormwater flooding event, including specific roadways affected.

Figure 3 shows the extent of the proposed flooding evacuation area and expected increased traffic congestion resulting from simultaneous departure throughout various points from the evacuation area. The largest traffic volumes, where traffic levels are expected to have a V/C greater than 1, or heavily congested traffic, occur along US-101 North, US-101 South, South College Drive, South Palisade Drive, and SR-135, as evacuees converge towards the evacuation destination areas along US-101 outside city limits. Evacuation would be constrained north and south of the city due to the lack of emergency services east and west, and due to the Santa Maria River flood zones to the west of the city. As such, most of the congested traffic would occur in the northern portion of the city where the 500-year flood event would inundate low-lying neighborhoods and transportation routes. However, more congestion is expected to occur along the US-101 North where the route crosses over the Santa Maria Levee. Here, evacuation responders could consider activating evacuation traffic management to mitigate traffic in especially vulnerable flooding zones. In this scenario, responders could implement contra-flow lane reversal on southbound US-101 over the Santa Maria River to prevent potential casualties from stopped traffic in expected flood areas.

Table 2 Riverine and Stormwater Flooding Scenario

Roadway	Congested (miles)	Over Capacity (miles)	Baseline Congested or Over Capacity?
South Concepcion Avenue	0.15	0.00	0.00
US-101 North	0.24	2.82	0.00
South College Drive	0.07	0.21	0.00
South Ranch Street	0.14	0.00	0.00
South Palisade Drive	0.00	0.23	0.00
US-101 South Ramp	0.00	0.31	0.00
US-101 North Ramp	0.00	0.57	0.00
SR-135	0.00	0.16	0.00

Figure 3 Riverine and Stormwater Flooding Scenario



Scenario 3 Hazardous Materials Release Event

This scenario assumes a hazardous materials release event along the western portion of the city, where there exists a dense population of active hazardous materials sites and a natural gas pipeline. The Santa Maria Fire Department does not have a certified hazardous materials response unit, so an immediate evacuation would be necessary to prevent casualties from such a hazardous materials release event. In this scenario, a potential hazardous release could come from any of the existing active hazardous materials sites, depicted in the Hazardous Materials Release Area in Figure 4. Most notably, the potential for the release of anhydrous ammonia via Nutrien Ag Solutions within the mapped Hazardous Materials Release Area would result in the immediate evacuation of housing units and high-density residential complexes downwind of this facility, resulting in heavy traffic congestion along nearby transportation routes. Similarly, a natural gas release via the pipeline along South/North Railroad Avenue would result in the immediate, rapid evacuation of all residents within the Hazardous Materials Release Area west along West Main Street/SR-166 towards the town of Guadalupe.

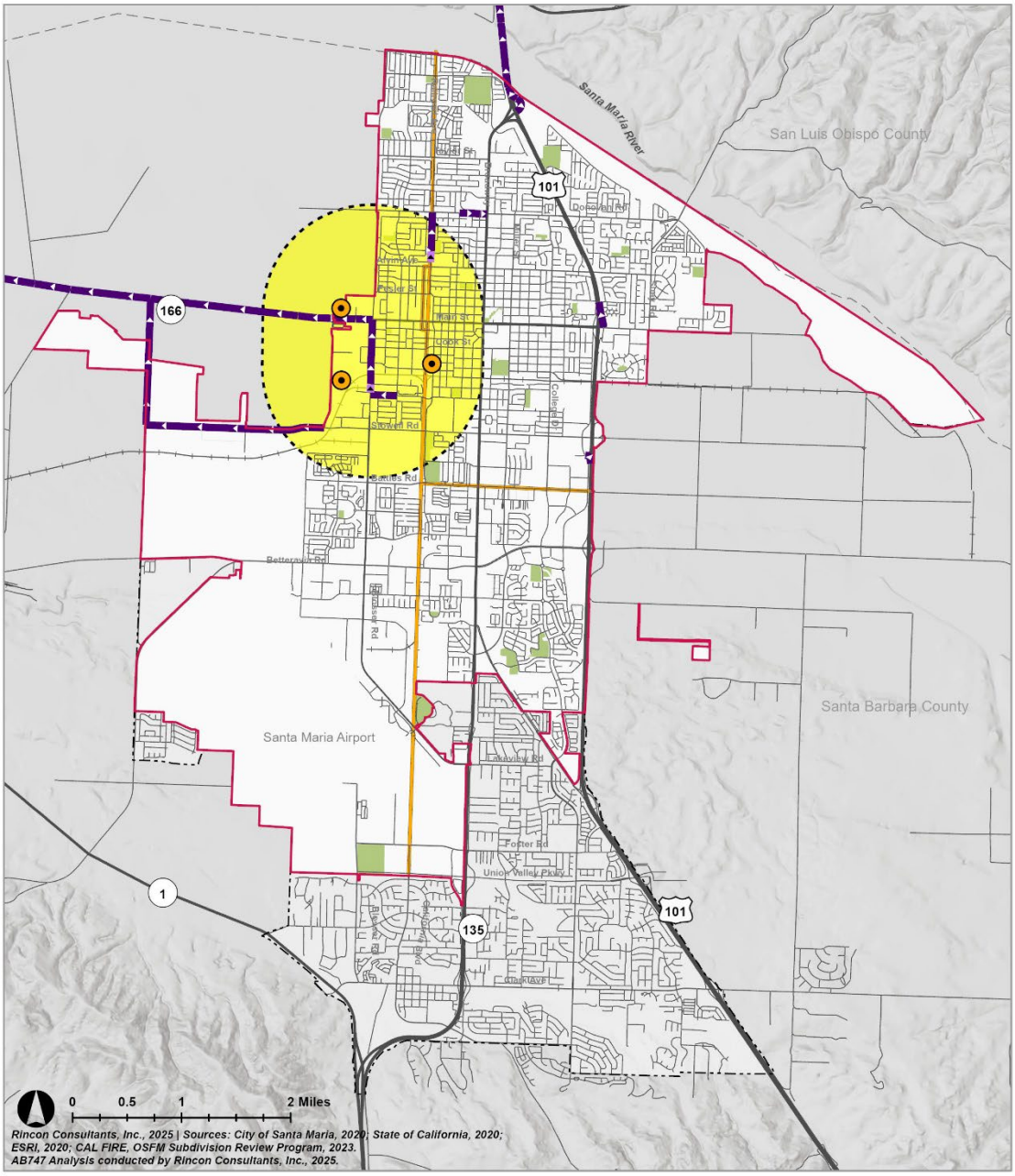
Most of the land within the Hazardous Materials Release Area is residential, ranging from single family homes to multi-residential high-density housing complexes. Additionally, there exists a number of schools within the area, including Eagles Christian Academy, El Camino Junior High School, Fairlawn Elementary School, John Muir Charter School, Sanchez Elementary School, and Santa Maria High School. As such, immediate evacuation of these areas would be necessary to protect residents from potential exposure to hazardous materials and related health complications from such exposure.

Table 3 lists the expected traffic conditions during the hazardous materials release scenario and Figure 4 shows the extent of the evacuation area and expected increased traffic congestion resulting from simultaneous departure throughout various points from the evacuation area. The Hazardous Materials Release Area in Figure 4 extends south to north about 2.5 miles from Battles Road to West Donovan Road and east to west about two miles from South Broadway Street to outside city limits. Over-capacity traffic congestion, or areas expected to have a V/C greater than 1, are expected to occur westbound along West Main Street/SR-166 for 6.28 miles, as residents evacuate westward towards the town of Guadalupe. Similarly, there is expected to be over-capacity congestion along West Stowell Road for 1.63 miles, as residents seek to move westward and connect with SR-166. US-101 North is also expected to experience over-capacity traffic congestion as residents in the northern portion of the Hazardous Materials Release Area flee northward from the city. The critical areas to maintain in this scenario would include all possible exit points surrounding the Hazardous Materials Release Area, especially along West Main Street/SR-166, West Stowell Road, Black Road, and US-101 North. Like the previous scenarios, evacuation responders could consider activating evacuation traffic management on the heavily congested roadways such as West Main Street/SR-166 and US-101 North and contra-flow lane reversal on heavily affected arterial roads like West Stowell Road and Black Road, if necessary, to aid in swift movement towards the major evacuation routes.

Table 3 Hazardous Materials Release Scenario

Roadway	Congested (mile[s])	Over Capacity (mile[s])	Baseline Congested or Over Capacity?
North Railroad Avenue	0.1	0.34	0.00
South Blosser Road	0.07	0.58	0.00
West Donovan Road	0.00	0.24	0.00
West Morrison Avenue	0.00	0.24	0.00
US-101 North	0.00	2.82	0.00
Black Road	0.00	1.16	0.00
West Stowell Road	0.00	1.63	0.00
West McElhaney Avenue	0.00	0.05	0.00
West Main Street	0.00	6.28	0.00
SR-166	0.00	0.01	0.00
US-101 South Ramp	0.00	0.11	0.00
US-101 North Ramp	0.00	0.37	0.00
SR-135	0.00	0.15	0.00

Figure 4 Hazardous Materials Release Event



Conclusion

Santa Maria's transportation network allows for evacuation north, south, and west during a disaster, if necessary. However, due to the City's location relative to the Santa Ynez and San Rafael Mountains, evacuation to the east is constrained. Evacuation north and south is constrained to US-101 and SR-135, while evacuation west is constrained to West Main Street/SR-166 and West Stowell Road. Following major hazard events such as heavy precipitation and earthquakes, roadway closures and heavy traffic congestion can occur along major transportation routes such as US-101. These impacts are likely to worsen as infrastructure ages and due to the growing threat of climate change-related hazard, prompting emphasis on the importance of a sound emergency evacuation plan for the City. Additionally, due to the City's population density, an evacuation event could put a burden on the transportation network. The AB 747 analysis shows that major roadways and evacuation routes could become affected thus prompting emergency traffic management and the use of alternative evacuation routes during emergency events.

The earthquake and liquefaction scenario will burden the southern evacuation routes, namely US-101 South, as residents flee the liquefaction area around Santa Maria Public Airport. The riverine and stormwater flooding event will impact the northeast section of the city and a large section in the northern portion of the city, which will cause congestion along US-101 North. The hazardous materials release event will cause an immense and immediate evacuation in the western portion of the city and cause large traffic congestion along SR-166/West Main Street and West Stowell Road. Implementing traffic management strategies will aid in efficient and expeditious flow of evacuation traffic, which is the most critical and challenging element in a successful evacuation. Communication during an evacuation event is found to be an extreme challenge due to the coordination between agencies responsible for communication. Improved training, procedures, platforms, and public education are all strategies that can occur pre-emptively to improve communication among entities involved in the management of response, and communication between the City and the general public. These strategies are consistent with recommended policies and programs for increasing evacuation route and location capacity, as outlined by the California Governor's Office of Land Use and Climate Innovation, previously known as the Office of Planning and Research, Evacuation Planning Technical Advisory. Vulnerability of residents should be considered in determining which areas may need to be prioritized by first responders during an evacuation. Areas within the city with a greater percentage of individuals with high outdoor exposure, individuals facing societal barriers, individuals with chronic health conditions, and under-resourced individuals require a greater amount of support during an evacuation. Other vulnerable groups, such as those identified in the City's General Plan Update, should be evaluated relative to evacuation route vulnerability.

It is recommended that the results of these analyses be considered to frame supportive policies for the Safety Element Update. These policies can be used to identify potential evacuation capacity and resiliency improvements throughout the city.

Sincerely,
Rincon Consultants, Inc.

Della Acosta
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