

A Dynamic Evacuation Analysis Tool: to Handle Extreme Conditions in the City Planning Process

PRESENTED BY:

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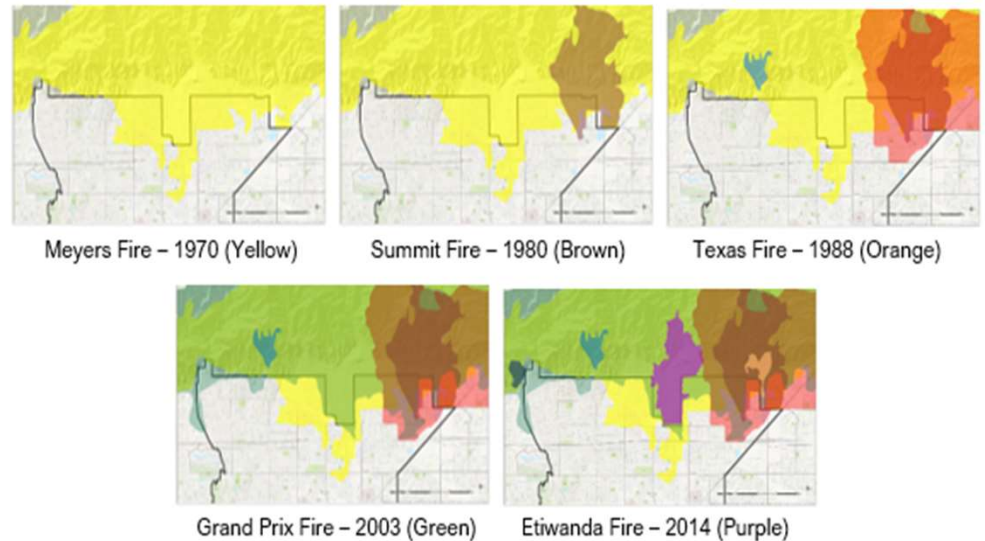
JULY 20, 2021

Contents

- Background
- Approach and Methodology
- Scenario Analysis
- Recommendations

Background for Evacuation Planning

- Increase in hazardous events associated with climate change
- Required by the City's comprehensive General Plan Update
 - The need to evaluate the capacity of the city's transportation system or evacuation routes, and estimated time
 - The need to identify "hot spots" and key routes with only one point of access during an evacuation event





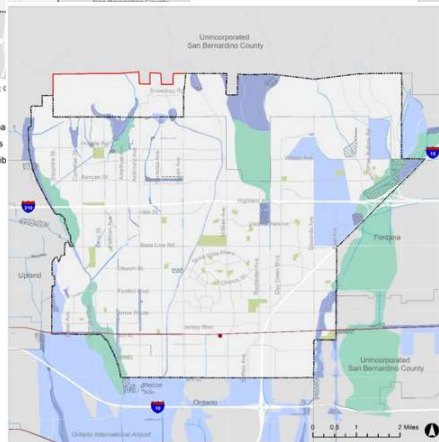
PLAN 3RC
Fire Hazard Severity Zones
 Rancho Cucamonga Wildland Urban Interface
 Cal Fire State Responsibility Areas
 National Forest (Federal Responsibility)



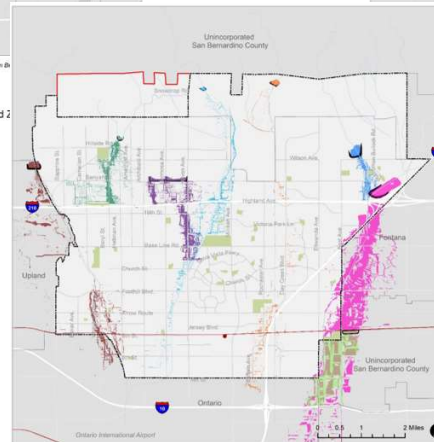
PLAN 3RC
Secondary Seismic Hazards
 Earthquake-Induced Landslide Hazard Zones
 Liquefaction Hazard Zones



PLAN 3RC
Fault Hazard Zones
 Alquist-Prilo Faults
 Alquist-Prilo Special Study Zone
 Red Hill Fault
 Red Hill Fault Special Study Zone

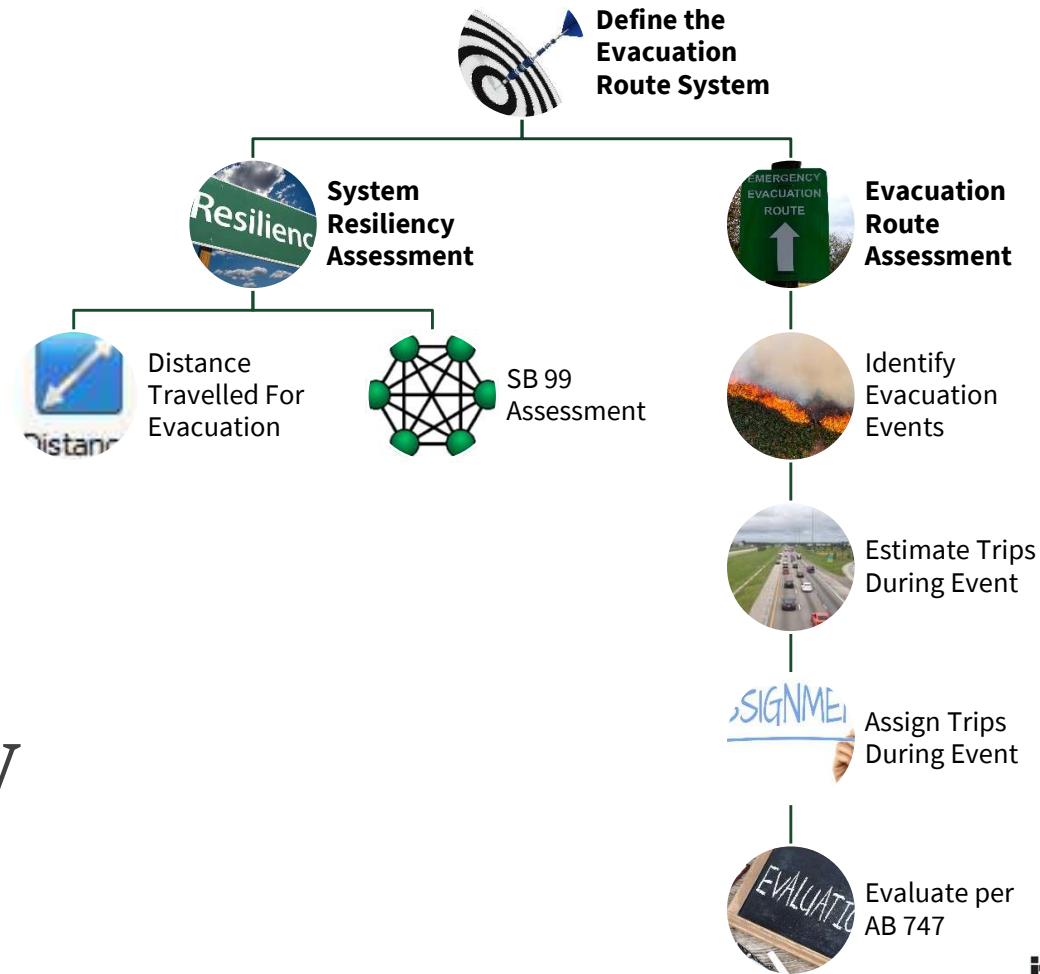


PLAN 3RC
Flood Hazard Zones
 Channels
 Basins and Dams
 100 Year Flood Zone
 500 Year Flood Zone
 500 Year Flood Zone (Protected By Levee)



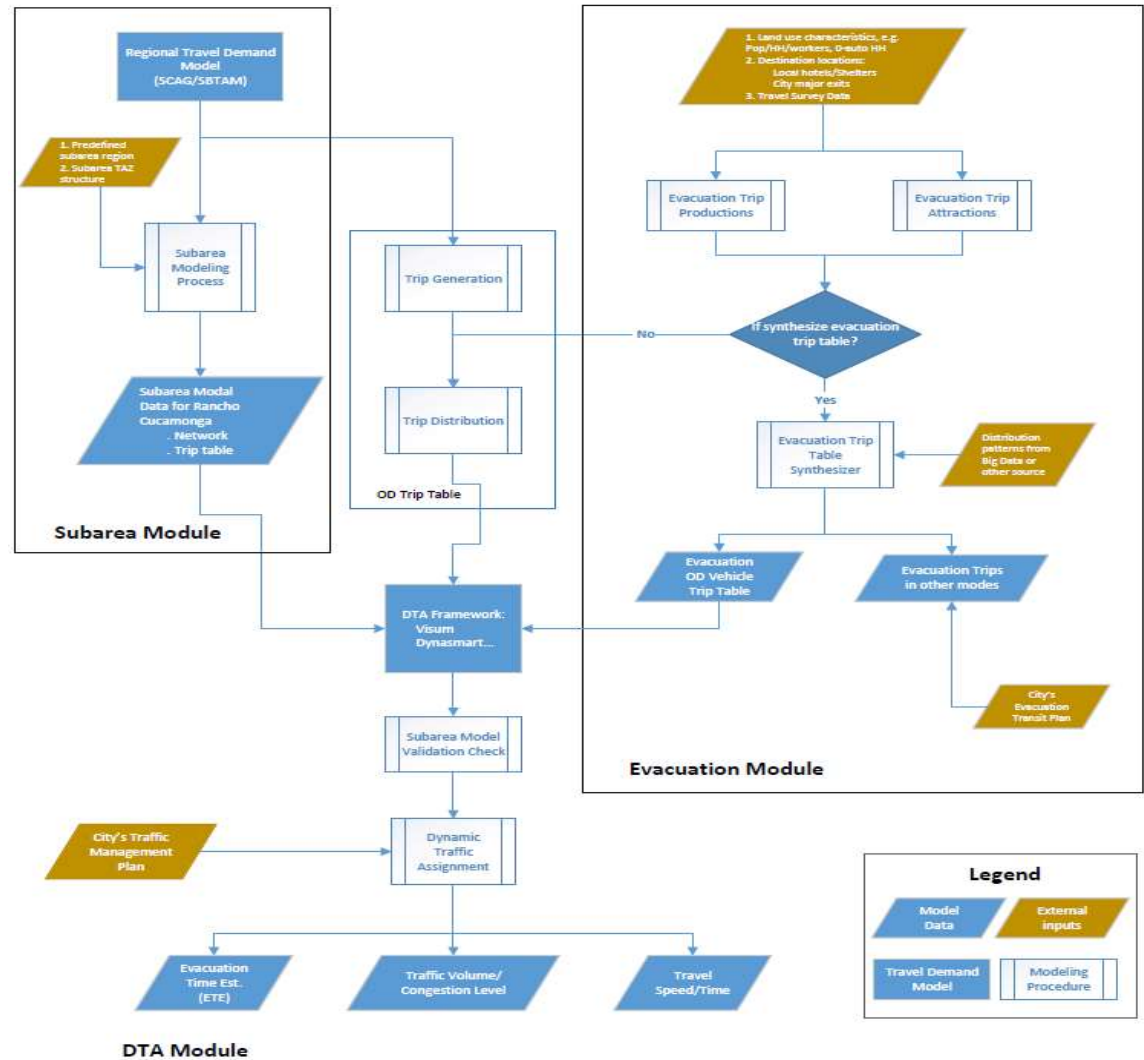
PLAN 3RC
Dam Inundation Zones
 Hickory Basin
 San Sevaline #5
 Etiwanda Basin
 Demens Creek
 Day Creek
 Deer Canyon
 Alta Loma Basins #1 & #2
 Cucamonga Creek

Approach & Methodology

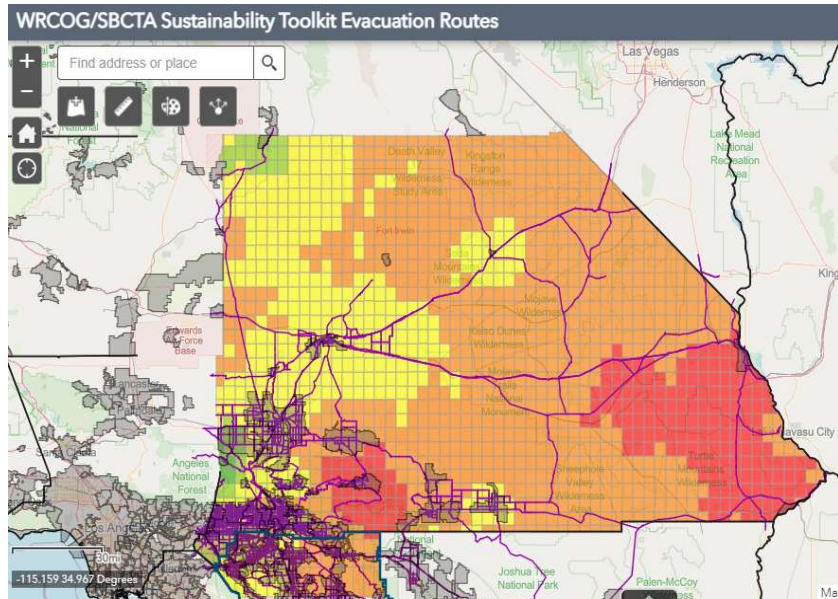


Dynamic Evacuation Tool

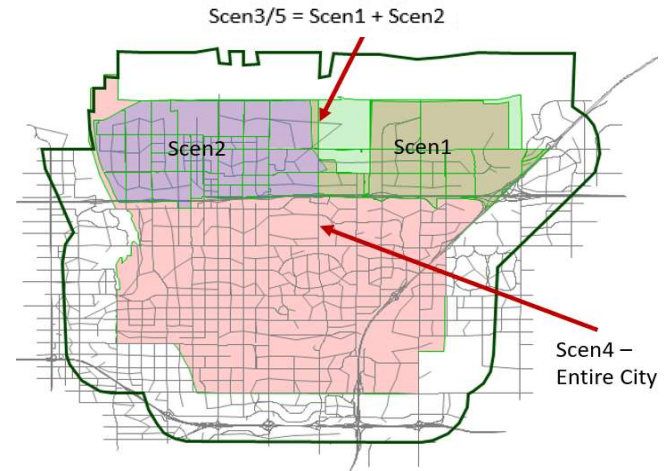
- Subarea Module
- Evacuation Module
- DTA Module

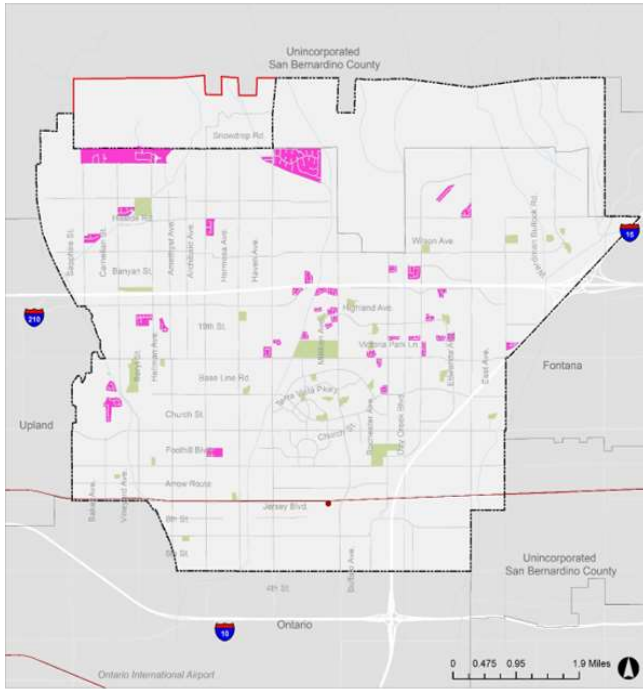


Scenario Analysis



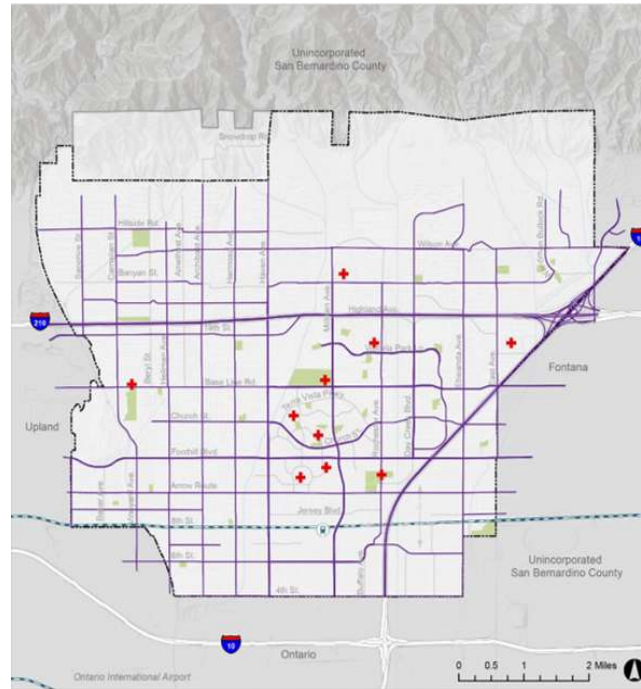
Criteria	Scenario 1	Scenario 2	Scenario 3	Scenario 4	Scenario 5
Description	A wildfire that starts east of the Fire District during Santa Ana wind conditions and takes 1-3 full days to arrive in the City	A wildfire that starts west of the Fire District with onshore winds and takes 6-24 hours to arrive in the City	A fire that starts in the Fire District during Santa Ana wind conditions	A major earthquake that causes at least several of the bridges across the SR-210 freeway to collapse between Euclid Avenue and I-15	Heavy rain or rapid snow melt that results in large scale flooding and flash flooding
TAZ Location	In the northeast part of the City, to the north of SR-210 and to the east of Milliken Avenue	North of SR-210	North of SR-210	Citywide. Scenario is run by closing off 50% of the bridges across SR-210	North of SR-210
Evacuation Time Window	6 AM - 8 AM	6 AM - 8 AM	6 AM - 7 AM	6 AM - 7 AM	6 AM - 8 AM





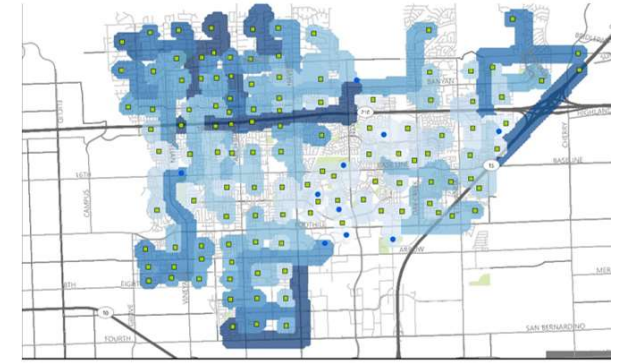
Raimi + Associates, 2020 | Sources: City of Rancho Cucamonga, 2020; SCAG, 2020; County of San Bernardino, 2020.

- Rancho Cucamonga City Limits
- Sphere of Influence
- Adjacent City Limits
- Parks
- Waterways
- Metrolink Station
- Metrolink
- SB 99 Parcels with One Ingress/Egress



Fehr & Peers, 2021

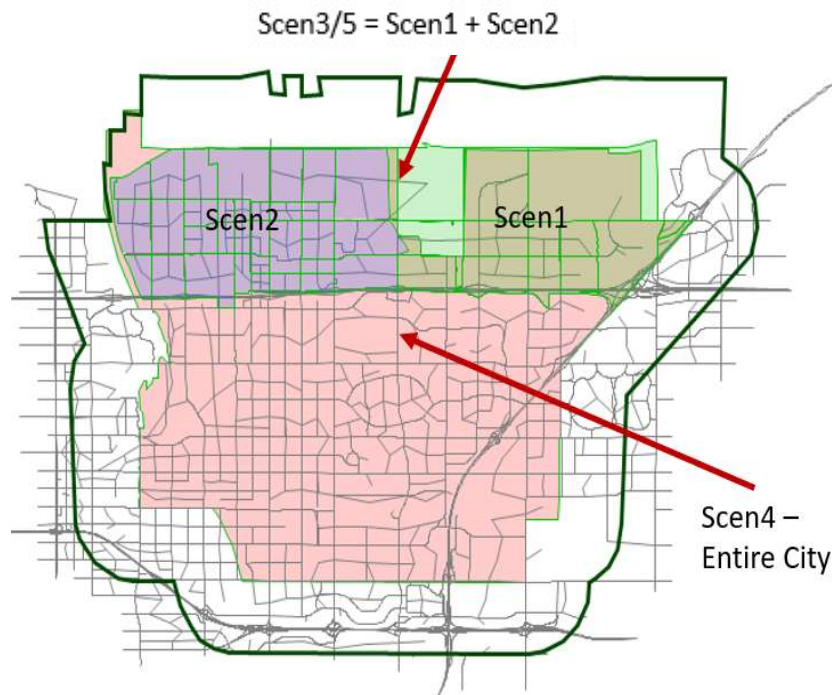
- Evacuation Routes
- Evacuation Shelters
- Metrolink Station
- Rancho Cucamonga City Limits
- Sphere of Influence
- Parks
- Waterways



- San_Bernardino_County
- Neighborhoods
- Evacuation_Shelters
- TAZ Centroid
- Distance from TAZ to Shelter (MI)
0 mi
4



- San_Bernardino_County
- Neighborhoods
- Gateway Outside City
- TAZ Centroid
- Distance from TAZ to Gateway outside City
0 mi
4



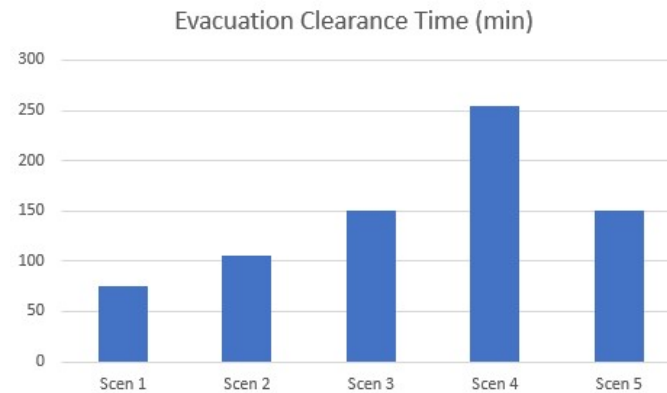
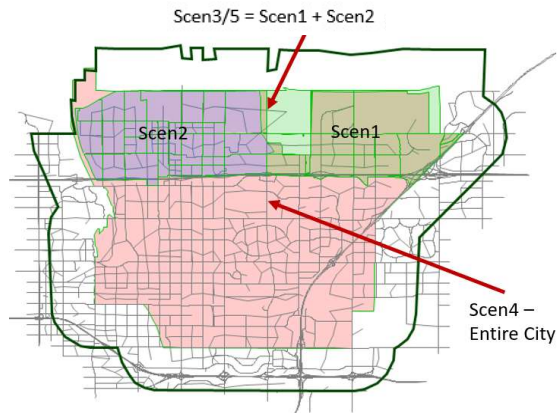
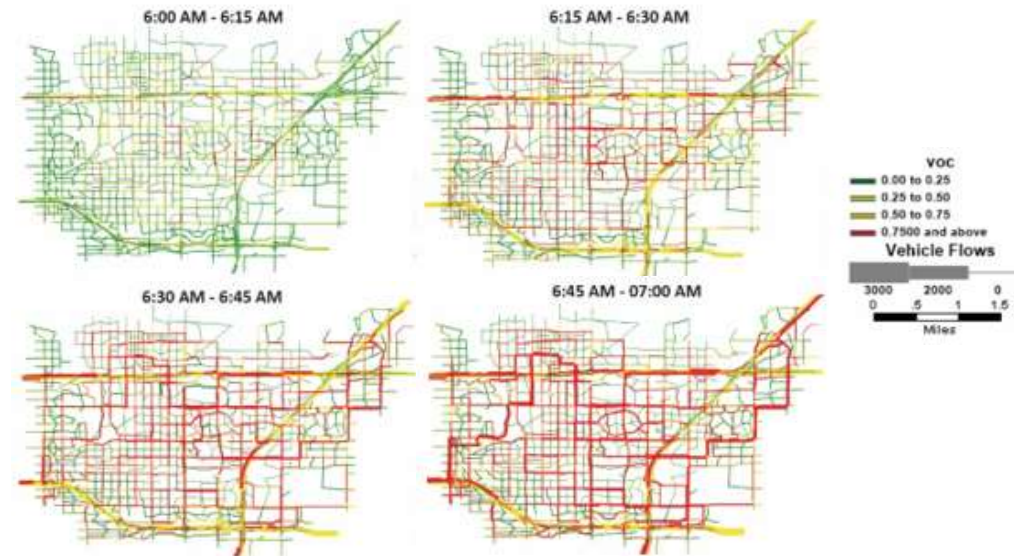
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Population	16,236	30,468	46,704	176,000	46,704
Household (HH)	4,496	9,495	13,991	56,603	13,991
Employment	2,525	5,035	7,560	88,144	7,560
Total Vehicle Trips	8,667	17,940	26,596	99,126	26,596
Vehicle Trips/HH	1.93	1.89	1.90	1.75	1.90

Source: Fehr & Peers, 2021.

Scenario Analysis

Outputs

- Dynamic traffic condition
 - Travel time/speed
 - Congestion level
 - Hot spots
- Evacuation clearance time



Recommendations

- Ensure redundancy of critical transportation routes
- Future roadway design should consider design treatments to facilitate additional capacity for evacuation purpose, e.g., creating reversible lanes.
- Implement transportation operations strategies for evacuation events.
- Ensure targeted evacuation management to the communities that do not have redundancy in critical transportation routes
- Provide an adequate amount of ingress/egress connections
- Increase connectivity through the use of easements, and emergency access roadways, if infeasible for additional new roadways or roadway extensions.
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Thank you!

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