

CAL FIRE Single Access Subdivision Study

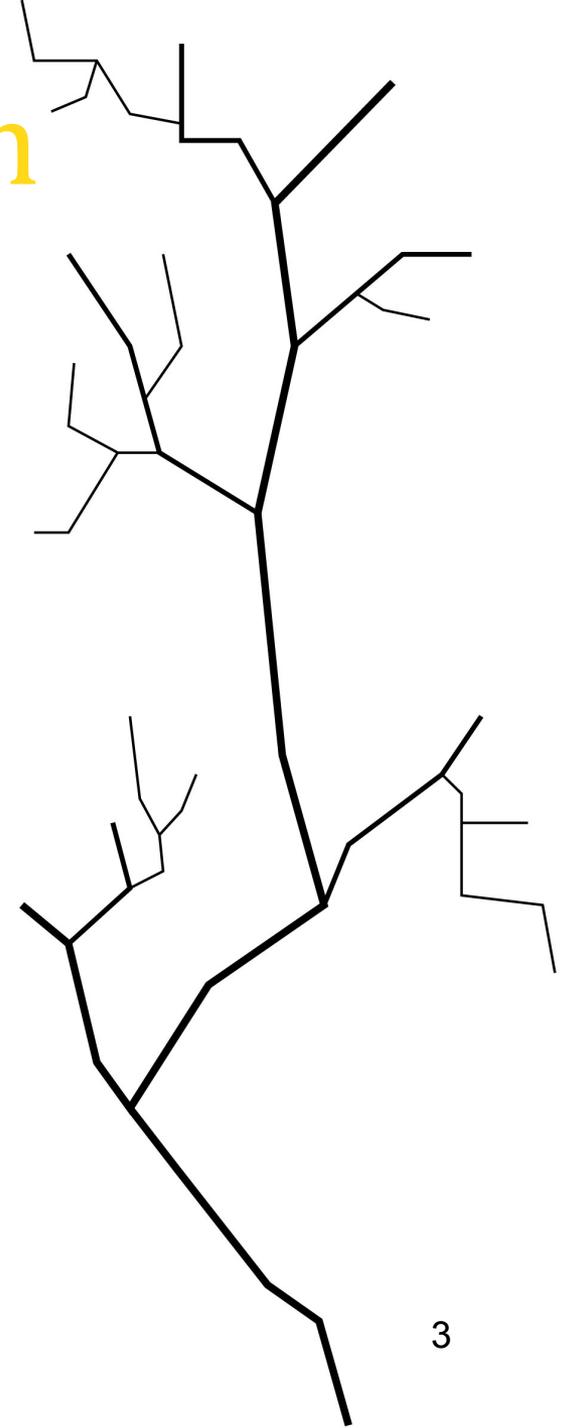
Cal Poly San Luis Obispo Department of City and Regional Planning

Single-Access Subdivision Assessment Project:

Developing a Planning Tool for Evaluating Proposed
Developments Accessible by Dead-End Roads

Outline of Presentation

1. Introduction
2. Problem Statement
3. Purpose of Study
4. Methodology
5. Conclusion
6. Recommendations
7. Afterthought





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Director, Cal Poly support team for preparation of 2013 and 2018 California State Multi-Hazard Mitigation Plans

44 years of experience at UCLA, Virginia tech, and Cal Poly as a faculty member, administrator, and consultant



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Developer of Access Model



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Maximum Lengths of Single-Access Roads (Current Standards)

Parcels zoned for less than one acre	800 feet
Parcels zoned for 1 acre to 4.99 acres	1320 feet
Parcels zoned for 5 acres to 19.99 acres	2640 feet
Parcels zoned for 20 acres or larger	5280 feet

Current Standards Too Simplistic?

Land use

Demographics

Road system

Fire hazard

Unsafe intersection

Purpose of Study

Scientifically defensible basis for

- Assessing current standards
- Recommending changes, if any, that are needed to meet the regulatory intent

Methodology

Develop simple-to-use access
planning tool

Assess current standards by applying tool to
hypothetical subdivision configurations and
actual case studies

Simplified fire behavior modeling

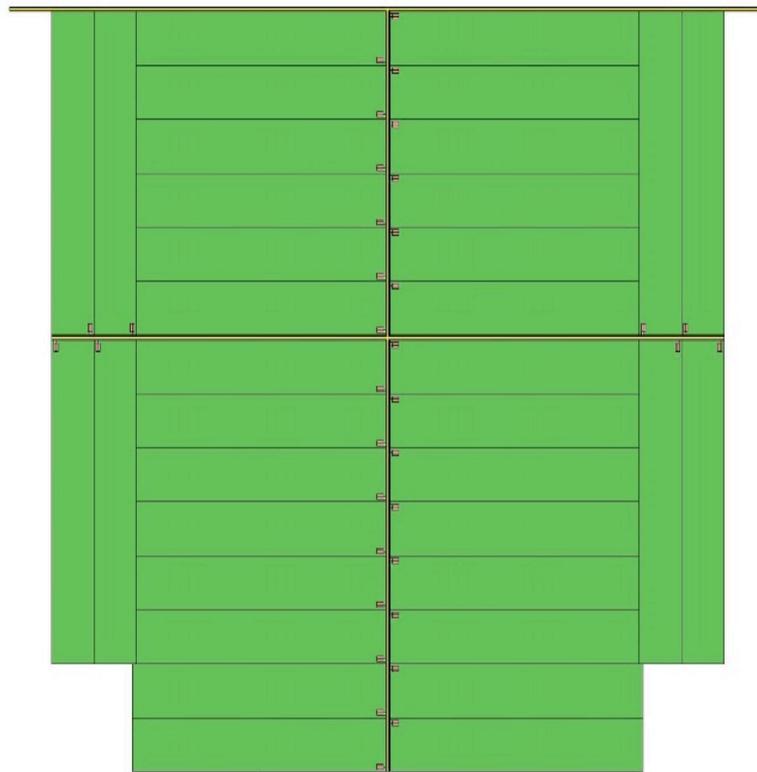
Methodology Issues

1. Access tool focused only on egress
2. Direct linkage of access model with fire behavior model precluded
3. Simplified fire behavior model incapable of serving as a sound predictor of site specific fire behavior

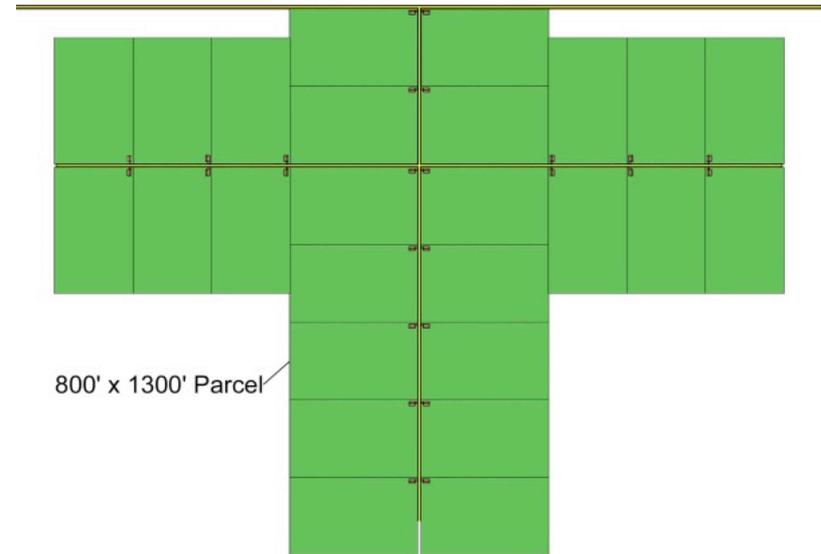
Plausible Configurations

(Hypothetical)

Parcel Size ≥ 20 Acres

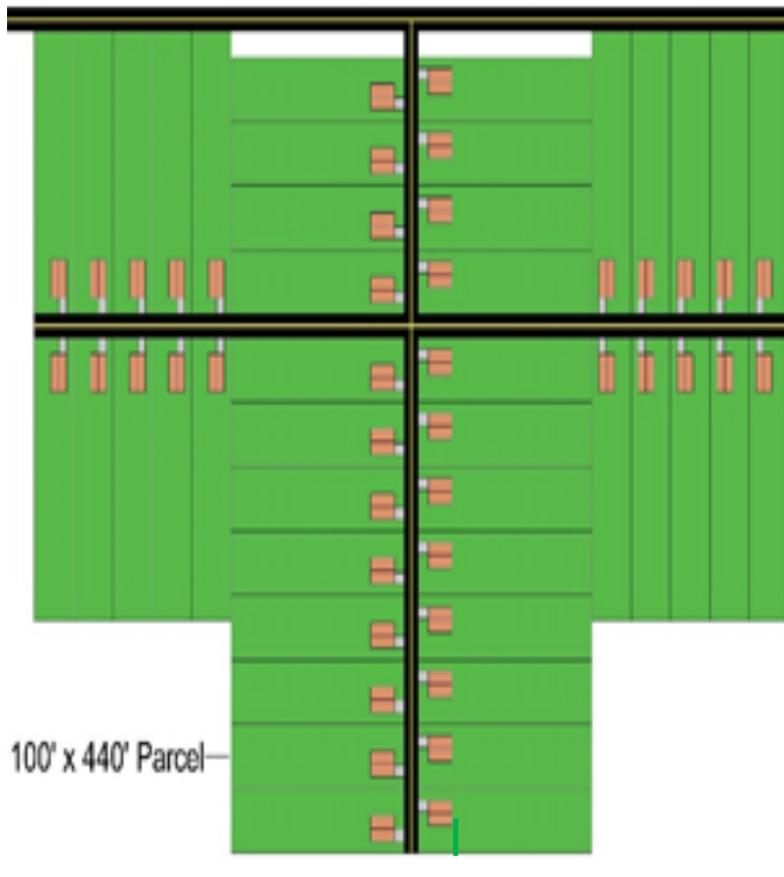


400' x 2400' Parcel



800' x 1300' Parcel

Parcel Size 1 to 4.99 Acres (Hypothetical)



44 Dwelling units

Clearance Time:

No Delay = 6 min

With Delay = 34 min

Parcel Size <1 Acre (Hypothetical)



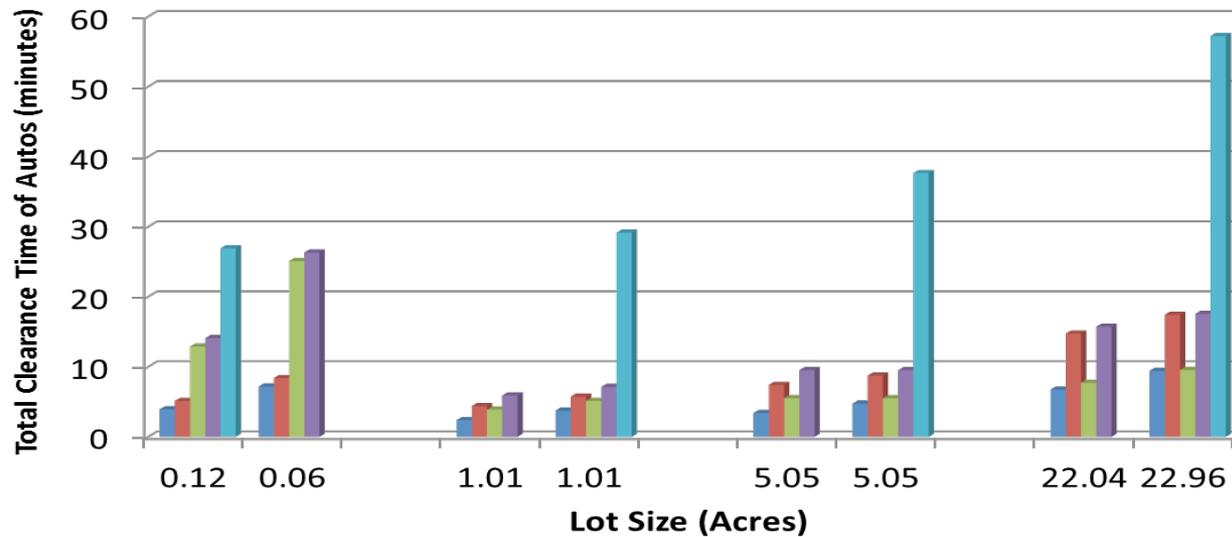
120 Dwelling units

Clearance Time:

No Delay = 13 min

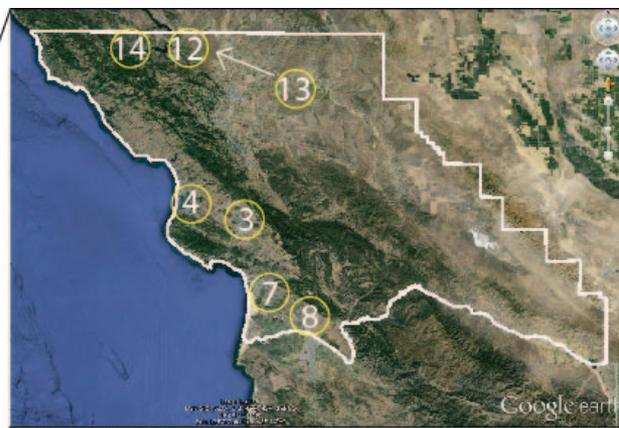
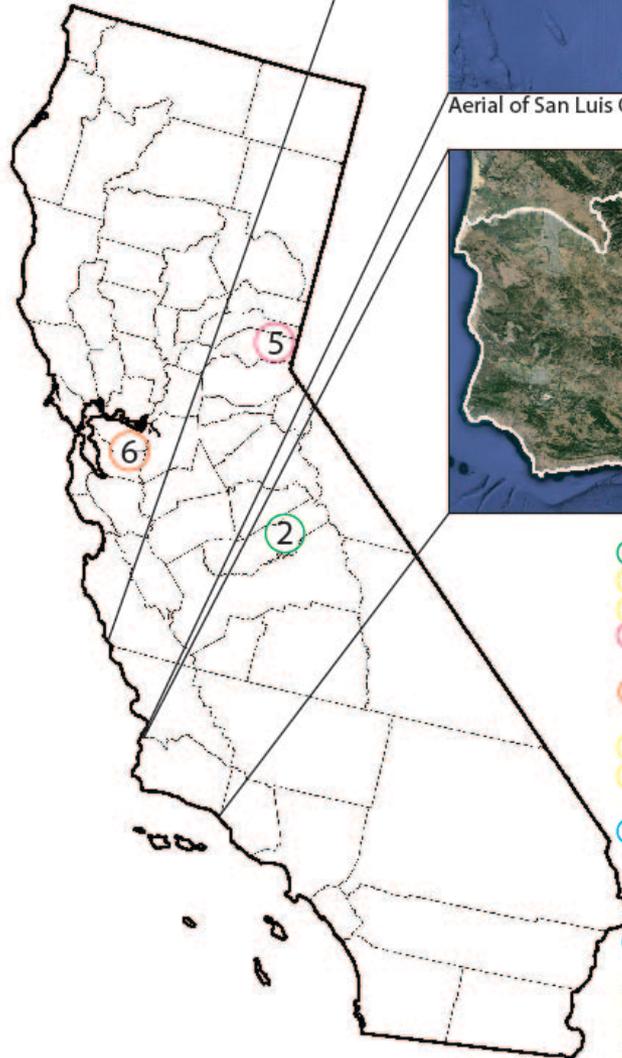
With Delay = 87 min

Comparative Times to Clear Occupants under Various Lot Configurations (Hypothetical)

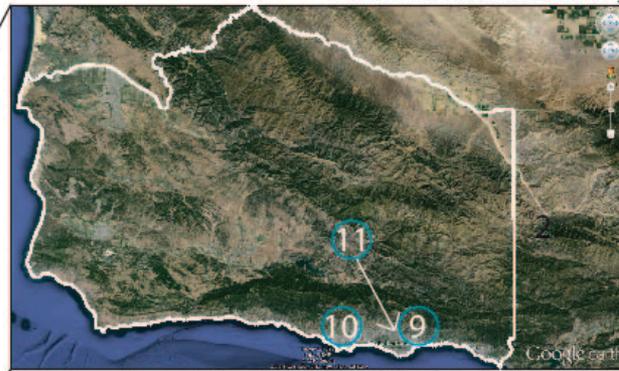


- One-street, single access dead-end road scenario Unconstrained
- One-street, single access dead-end road scenario Congested
- Stacked, single access dead-end road scenario Unconstrained
- Stacked, single access dead-end road scenario Congested
- Stacked, single access w/ elementary school Congested

Case Study Locations



Aerial of San Luis Obispo County



Aerial of Santa Barbara County

- 1 Conceptual Sketch (no location)
- 2 Oakhurst, Madera County
- 3 Foothill Blvd, San Luis Obispo, SLO County
- 4 Atascadero Road, Morro Bay, SLO County
- 5 Northwest Lake Tahoe, Northstar area, Truckee, Placer County
- 6 Norris Canyon, San Ramon, Contra Costa County
- 7 Pismo Heights, Pismo Beach, SLO County
- 8 Highway 101 and Laetitia, Nipomo, SLO County
- 9 Mission Canyon, Santa Barbara, Santa Barbara County
- 10 Winchester Canyon, Goleta, Santa Barbara County
- 11 Santa Barbara Riviera, Santa Barbara, SB County
- 12 Heritage Ranch, Paso Robles, SLO County
- 13 River Oaks, Lake Nacimiento, SLO County
- 14 Oak Shores, Lake Nacimiento, SLO County

Mission Canyon

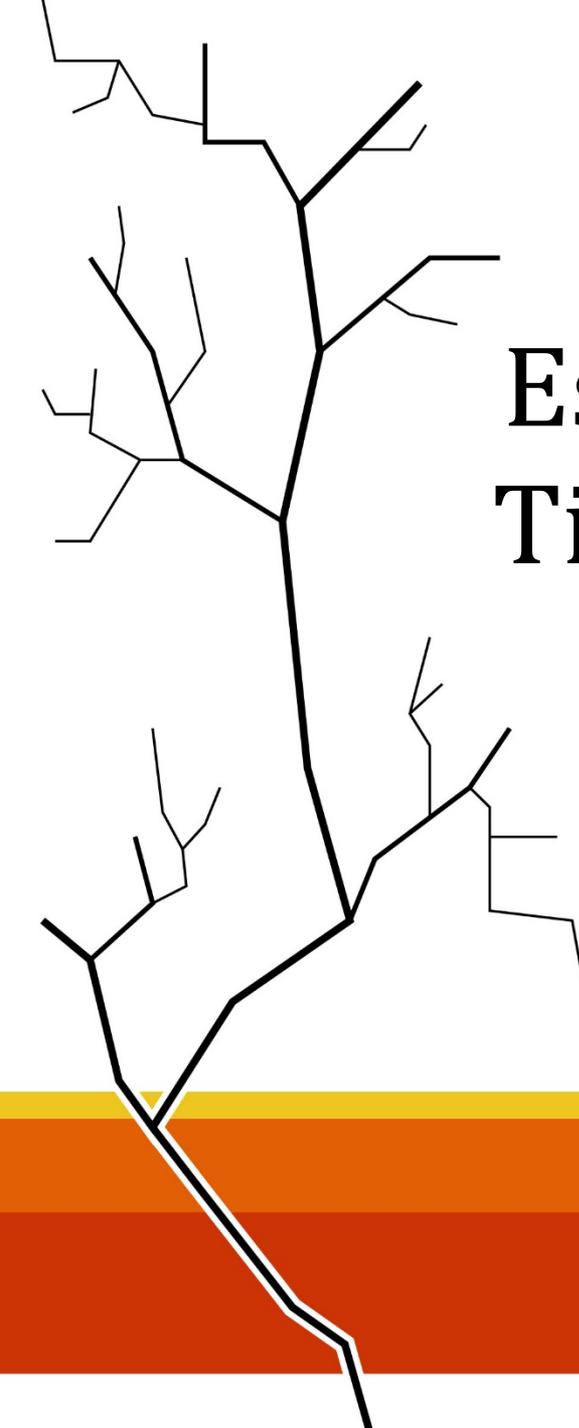


Mission Canyon, Santa Barbara, Santa Barbara County – A stacked single-access development in hilly terrain with residences that are not reachable by large emergency vehicles.

Foothill Boulevard and O'Connor Way - Mixed Use



Foothill Boulevard and O'Connor Way, San Luis Obispo County – A mixed-use single-access subdivision with several short branches from the primary spine road (O'Connor Way). Land uses include homes, schools, and churches: The Agape Church with a congregation of 400 to 440 people, Temple Ner Shalom, and the Laureate School with a population of 120.



Estimated Clearance Times (Uncongested)

14 Cases

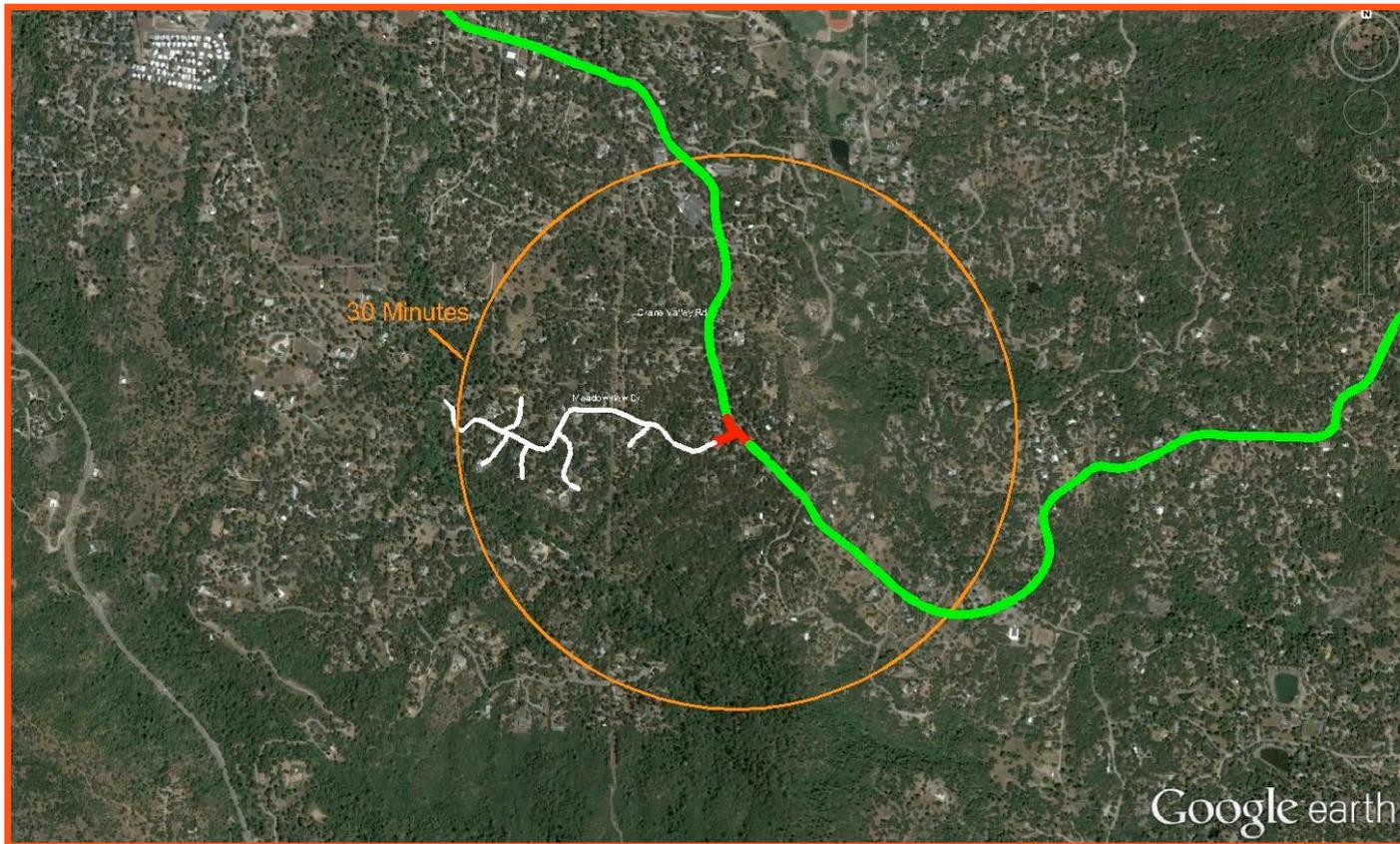
8 cases > 30 mins

13 cases > 10 mins

Application of Fire Behavior Model

Although imprecise, model may give decision-makers a sense of the time available for safe evacuation.

Conceptual Area of Fire Influence within 30 Minutes of Access Point (Oakhurst)



Potential Spread of Fire at 30-mph Wind Speed from 500 Feet West of Oakhurst



Conclusion

Based on hypothetical subdivision configurations and actual case studies:

Current standards fail to meet the regulatory intent of providing for safe ingress and egress of occupants and fire personnel/equipment during a wildfire

Recommendations

1. Amend existing standards
 - Eliminate existing table of maximum road lengths for dead-end roads
 - Address other factors in addition to lot size, including potential land uses, with attention paid to likely occupancy, now and in the future
 - Eliminate open-ended loophole wording, such as “regardless of number of lots”

Recommendations cont.

- Limit the stacking of multiple roadways within maximum road length limits
- Take into account the maximum evacuation traffic generation potential of all land uses, including commercial uses, apartments, and schools
- Address potential long-term land use intensification

Recommendations cont.

2. Require analysis using access tool of any proposed **single-access** subdivision in an SRA or locally adopted LRA
3. Even when **secondary access** is available, require analysis using access tool of any proposed subdivision in an SRA categorized as a high or very high FHSZ

Recommendations cont.

4. Fully implement provisions of SB 1241 (2012)
 - Require mandatory finding that the design and location of proposed subdivision is consistent with PRC 4290
5. Strengthen mechanisms to bring about more uniform compliance
 - Establish appeal process

Meeting Regulatory Intent with Planning Tool

1. Time required to evacuate occupants in event of fire is estimated
2. Agency having jurisdiction decides whether time exceeds that needed for occupants to be evacuated safely
3. Cannot avoid deciding **explicitly or implicitly** on evacuation time considered to be safe

Mitigation

1. If necessary, repeat analysis with mitigation measures added
2. Examples of mitigation include
 - Change in land use affecting occupancy
 - Change in capacity of access roads
 - Use of fuel modification to slow spread of fire

Afterthought

Important that fire personnel and land use planners have a **mutual understanding** of the issues addressed in this study



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