WHAT THE WINE COUNTRY FIRES OF 2017 TEACH US ABOUT COMMUNITY DESIGN

(CIVIL ENGINEERS NEED TO HELP BUILD MORE RESILIENT COMMUNITIES)

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Introduction

Fires in the Wine Country of California recently took the lives of over 40 people. Many are still missing and the death toll will grow. This tragic disaster took place shortly after 2 devastating storms. (Hurricane Harvey flooded huge parts of Houston. Hurricane Irma destroyed a swath up the West Coast of Florida.)

What do these recent natural disasters teach us about the design of resilient communities in California?

Two (2) Lessons from Wine Country Fires

There are a couple of key lessons from the fires in Wine Country.

The first lesson is that natural disasters have the nasty habit of devastating places we consider "safe". In Santa Rosa, wildfires jumped from rural areas over highways to torch homes in urban neighborhoods. Many of these looked like a desolate moonscape after the flames had finished. Very few people expected fires to wreck damage right inside a Northern California city.

The second lesson is that infrastructure needs to be better designed with disaster resiliency in mind. This includes thinking about the evacuation of large crowds. It also includes reducing the costs of reconstruction. In the Wine Country fires damage to cell phone towers wiped out communications. People died because they couldn't quickly navigate the road system to stay in front of the fires.

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The Key Role Of Engineers In Building Tougher Communities

Engineers (with the support of land surveyors) play a key role in making California communities tougher. Engineers can do this in 3 key ways:

1) Design better buildings. In areas prone to severe storms, we should make flimsy homes. In areas prone to flooding, living spaces and appliances should be raised well above ground level. In areas susceptible to fire, we need to think more about fire resistant building materials.

2) Design better infrastructure. We should have flood and fire proof communication towers that operate without a connection to the electrical grid. Our road systems should be able to handle mass evacuations and provide alternative routes around choke points.

3) Let the free market system provide realistic pricing and allocation of risk. One reason we fail to build more resilient communities is because we spread the costs of disaster recovery to all tax payers. This sets up a perverse incentive system built on the strong desire to help our neighbors. In this incentive system, middle class and low-income tax payers foot the bill for the reconstruction of expensive beachfront homes. We need to make people pay the real costs to insure against fire, earthquakes, and floods. This would mean more building in the right places, and less building in the wrong places.

Conclusion

I never thought I'd see more than 40 civilians die during a fire near my home. This brings great sadness, but also a reminder that the role engineers play in the design of communities can save (or cost) human lives.

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