Transportation Infrastructure Resiliency

A Butte County Perspective

2017 Oroville Spillway Disaster

2018 Camp Fire

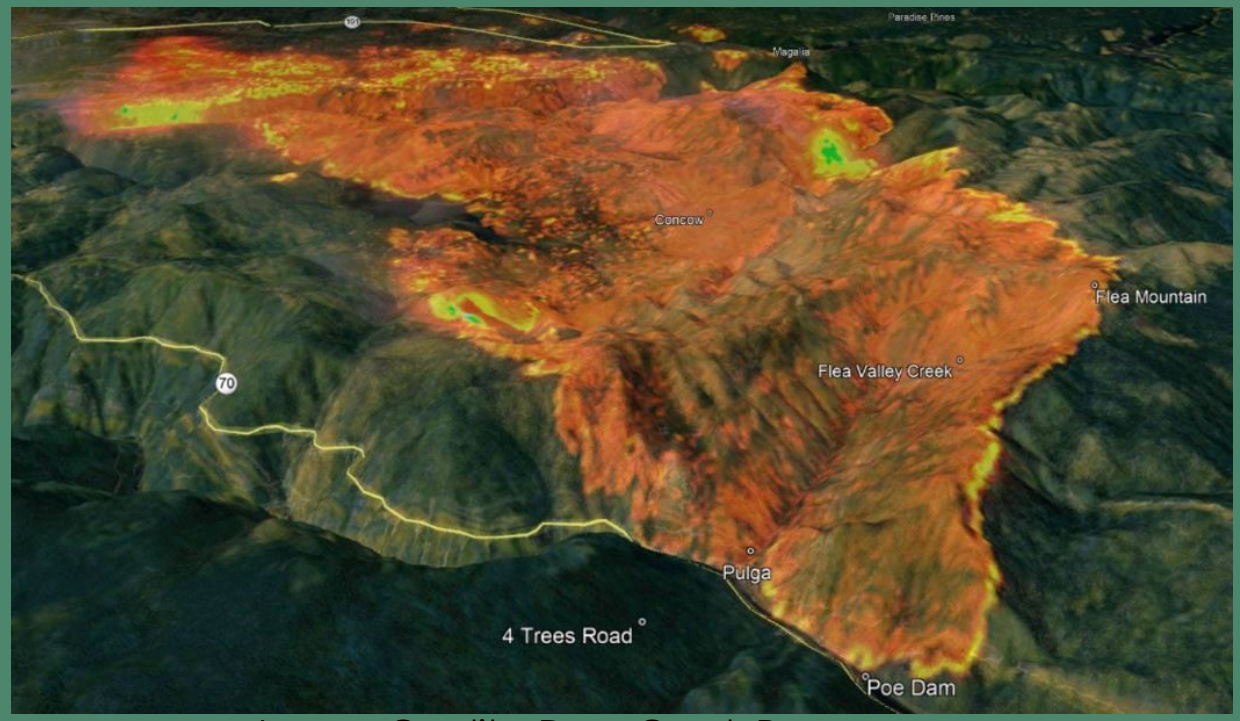


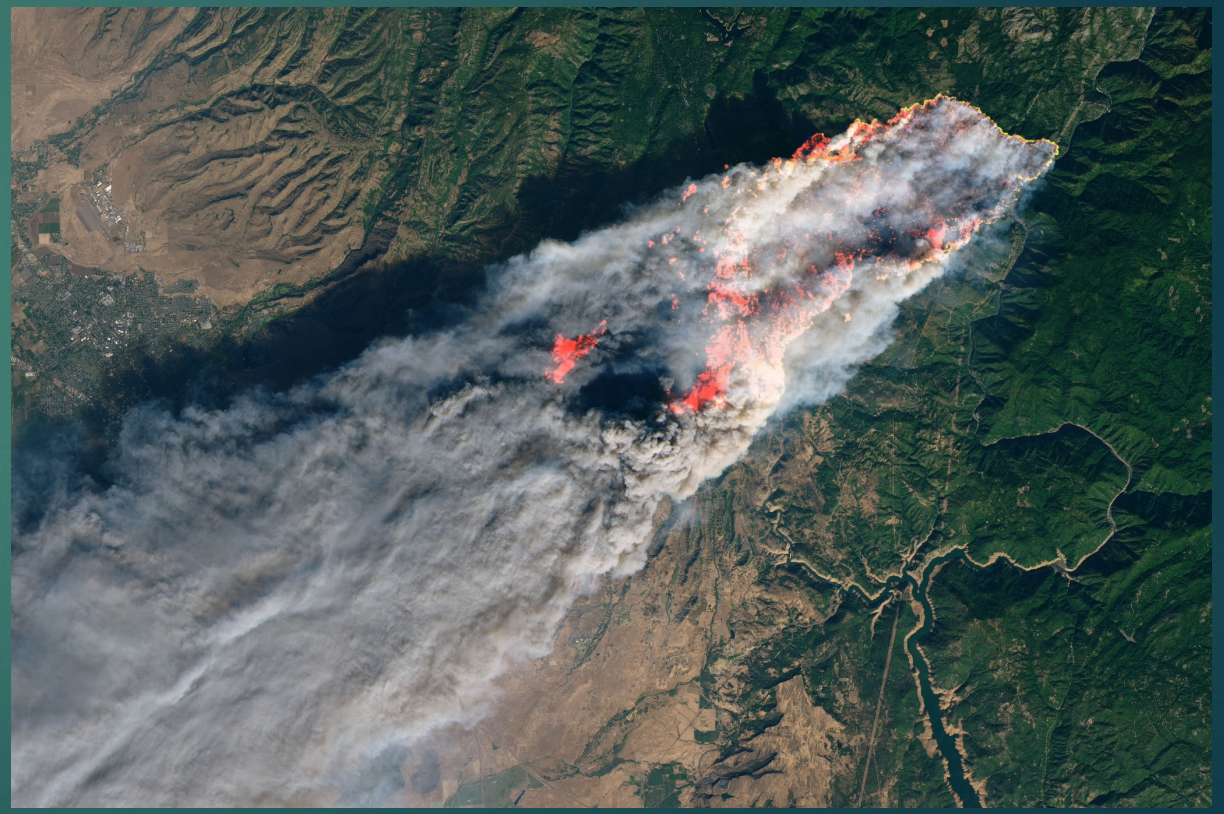
Image Credit – Deer Creek Resources

Presented by: Dennis Schmidt,
Butte County Director of Public Works

A Tale of Two Disasters

- 2017 Oroville Spillway Failure

2018 Camp Fire



Common Element of These Disasters

- Massive Evacuations Required across jurisdictional lines
- Completely Unplanned Events
- Oroville Dam Spillway – built in 1966, 51 years old at failure
- Camp Fire – PG&E Transmission Tower that Failed causing the resulting inferno and the death of 85 people – was nearly 100 years old

3 Legislative Recommendations

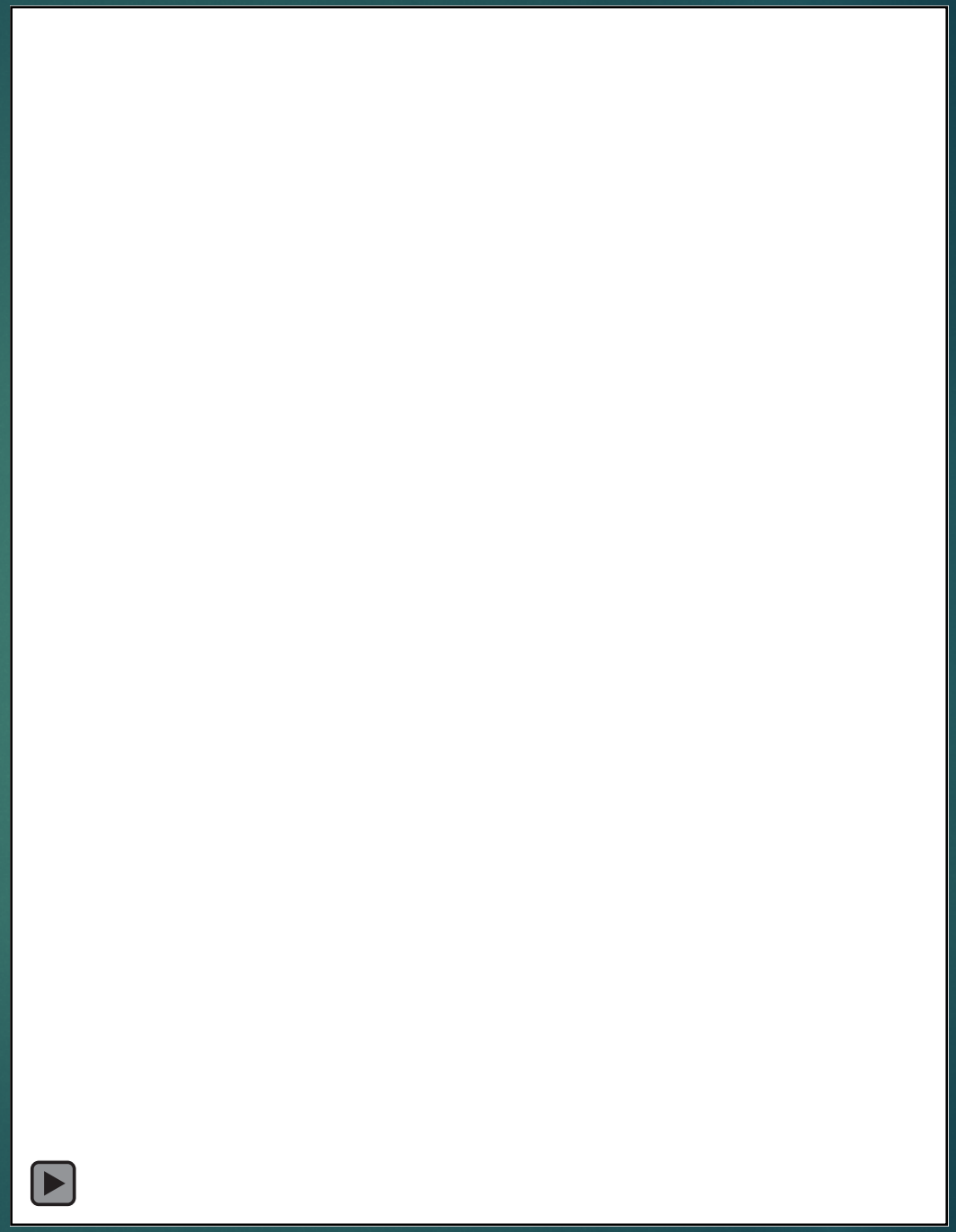
- Encourage hardening of Evacuation Routes across all jurisdictional lines
- Encourage "Boots on the Ground" Multi-County Evacuation Planning Efforts
- Funding for maintenance of infrastructure should be based on a plausible, logical maintenance schedule – not "here is what is left, do the best you can with it"

Lessons Learned from the November 8th, 2018 Camp Fire

- 85 lives lost
- 18,000 structures lost
- 50,000 people evacuated
- Massive homelessness as the local real estate market is turned upside down
- Massive damage to Utilities
- Over 60,000 mature trees killed by the heat of the trees need to be removed ASAP

Hardening of Evacuation Routes

Hardening of Evacuation Routes (Cont.)

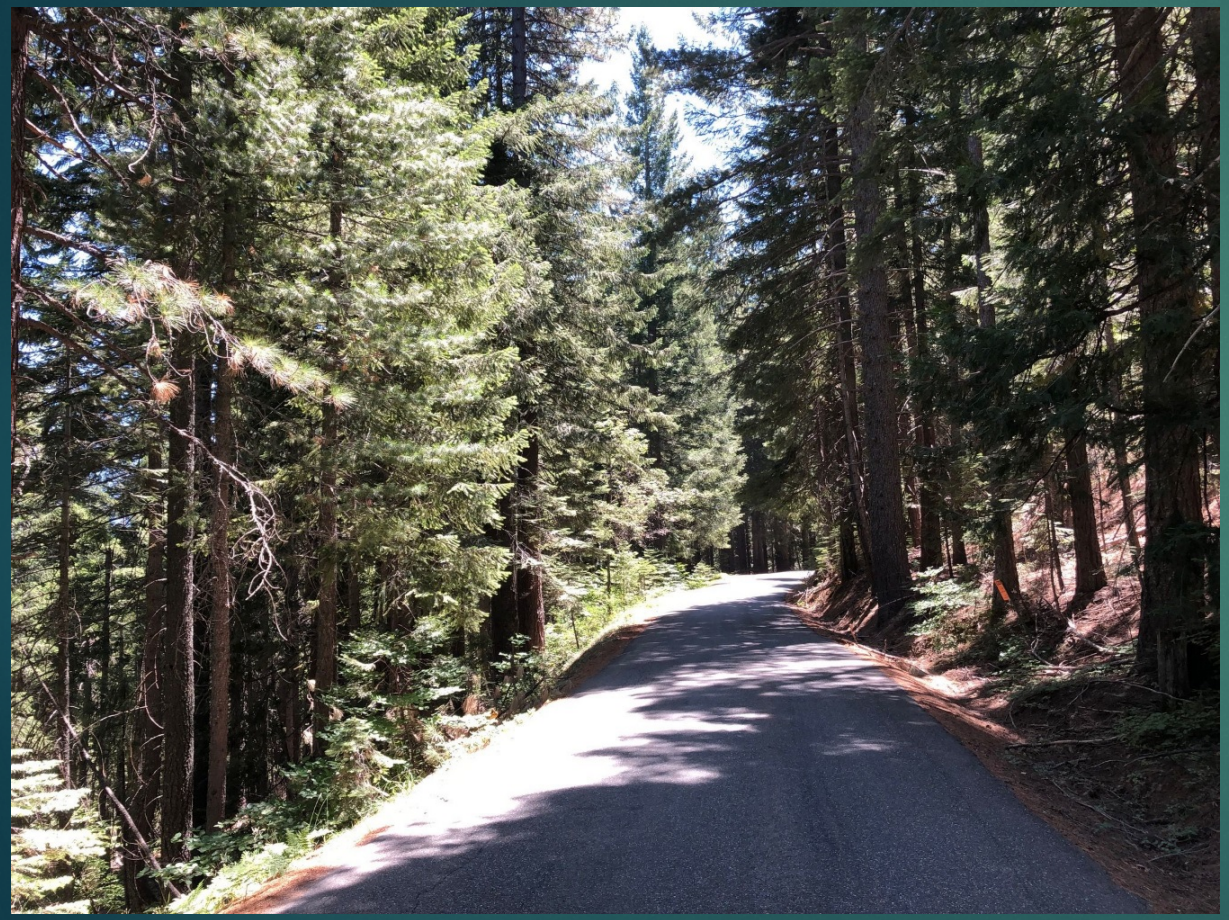


Video Credit
Tim O'Connell.

Hardening of Evacuation Routes (Cont.)

Hardening of Evacuation Routes (Cont.)

Removal of Roadside Fuels



New Access Roads, Widening of Roadways and Improved Shoulders

Photo Credit Ty Barbor, Chico Enterprise Record

Multi-County Evacuation Planning

Town of Paradise & Upper Ridge

Wildfire "Ready, Set, Go" Evacuation Plan

Get ready!

Prepare your family...

Create an evacuation plan that includes:

- A designated emergency meeting location outside the fire or hazard area. This is critical to determine who has safely evacuated from the affected area.
- Several different escape routes from your home and community. Drive these often so everyone in your family is familiar in case of emergency.
- An evacuation plan for pets and large animals such as horses and other livestock.
- A Family Communication Plan that designates an out-of-area friend or relative as a point of contact to act as a single source of communication among family members in case of separation. (It is easier to call or message one person and let them contact others than to try and call everyone when phone, cell, and internet systems can be overloaded or limited during a disaster.)
- Sign up for Emergency Notifications at www.buttecounty.net/massnotification

Be Prepared:

- Have fire extinguishers on hand and train your family how to use them (check expiration dates regularly).
- Keep your gas tank at least half full.
- Assemble a Go Bag (emergency supply kit) for each person, as recommended by the American Red Cross.
- Maintain a list of emergency contact numbers posted near your phone and in your emergency supply kit.
- Obtain street maps for the city and county; keep them in your car. Or, download to your smart device.
- Keep a Go Bag in your car in case you cannot get to your home because of fire or other emergency.
- Ensure that your family knows where your gas, electric, and water main shut-off controls are located and how to safely shut them down in an emergency.
- Make your home/property more fire safe; find resources at www.buttefiresafe.net and www.readyforwildfire.org

Our household safety plan *(complete before a wildfire emergency):*

Our address: _____ Phone _____

In the event of a wildfire evacuation, we will meet at _____

Animals: North Valley Animal Disaster Group Hotline: 530-895-0000

During a wildfire, we'll take our animals to _____

Local contact (neighbor/relative): In the event that roads are closed, our local contact to care for children and pets is

Name _____ Phone _____

Out of area contact/phone _____ School phone _____

Other important contacts _____

We have neighbors who may need help *(persons with disabilities or persons with access and functional needs)* _____

Nationwide Infrastructure Maintenance Funding Shortfall

Note: Both of these multi-Billion dollar disasters, were caused for the FAILURE to properly maintain infrastructure.

Cumulative Infrastructure Needs by System Based on Current Trends, Extended to 2025

ALL VALUES IN BILLIONS OF CONSTANT 2015 DOLLARS

2016–2025 (10 YEARS) Infrastructure Systems	Total Needs	Estimated Funding	Funding Gap
Surface Transportation[1]	$2,042	$941	$1,101
Water/Wastewater Infrastructure[1]	$150	$45	$105
Electricity[1]	$934	$757	$177
Airports[1]	$157	$115	$42
Inland Waterways & Marine Ports[1]	$37	$22	$15
Dams[2]	$45	$5.6	$39.4
Hazardous & Solid Waste[3]	$7	$4	$3
Levees[4]	$80	$10	$70
Public Parks & Recreation[5]	$114.4	$12.1	$102.3
Rail[6]	$154.1	$124.7	$29.4
Schools[7]	$870	$490	$380
TOTALS	**$4,590**	**$2,526**	**$2,064**

1 Data taken from ASCE's *Failure to Act: Closing the Infrastructure Investment Gap for America's Economic Future* (2016).
2 Total needs are federal and non-federal high-hazard dams.
3 Funding only includes publicly funded remediation, not funds from private sector.
4 Total needs number based on discussions with the National Committee on Levee Safety
5 Does not include backlog and estimated spending for U.S. Army Corps of Engineers and city parks.
6 Needs and funding estimates based on market projections and current investment trends.
7 Data from *State of Our Schools: America's K–12 Facilities* (2016). 21st Century School Fund, Inc., U.S. Green Building Council, Inc., and the National Council on Schools Facilities.

*numbers may not add up due to rounding

California Infrastructure Maintenance Funding Shortfall

- CALIFORNIAS INFRASTRUCTURE REPORT CARD
- BRIDGES C-
- ROADS D
- TRANSIT C-

Infrastructure Destroyed by the Camp Fire

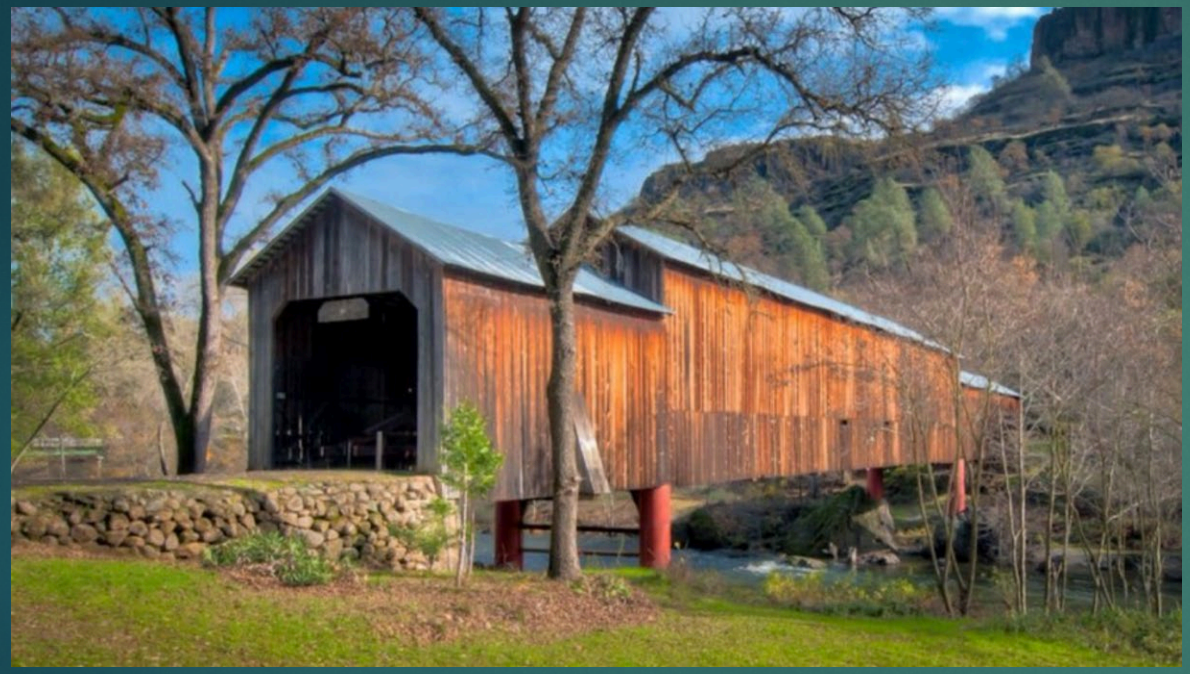
Burned Signs –

Roadway Damage by Heavy Equipment

Damage by Tree Crews

Damage by Log Decks

Honey Run Covered Bridge Destroyed by Fire



Damage by Debris Flows Following the Fire (2 Separate Events)

Damage by Debris Flows

Damage by Fire Debris Trucks and Equipment

How much damage?

Comparing Normal Verse Cleanup/Construction Traffic

Pentz					
ADT	Timing	Percent Trucks	Trucks/Day	LEF	Daily ESALs
1822	Current	19%	346.18	2.36	817
2256	Pre-Fire	7%	155.664	0.91	142

4.75 Extra years of damage per year of cleanup at this rate

8.00 Extra years of damage per year of construction at this rate

Neal					
ADT	Timing	Percent Trucks	Trucks/Day	LEF	Daily ESALs
1298	Current	35%	454.3	2.36	1072
1310	Pre-Fire	23%	294.75	0.91	268

3.00 Extra years of damage per year of cleanup at this rate

5.25 Extra years of damage per year of construction at this rate

Creating this type of structural damage makes the road more susceptible to water and environmental damage – further/rapidly exacerbating the damage!

How to Fix this Damage?

CONDITION CATEGORY	PAVEMENT CONDITION INDEX (PCI)		GENERAL TREATMENTS TRATEGY
	Upper Limit	Lower Limit	
Excellent	100	86	Do Nothing/Corrective Maintenance
Good	85	75	Preventative Maintenance
Fair	74	58	Resurface
Poor	57	40	Rehabilitation
Failed	39	0	Reconstruction

What does this all mean

- Additional Resources Needed
- FEMA/CalOES may be part of the solution
- Could be $150 to 300 million dollars to rehab 150 miles of County Roads
- Dwarfed only by the cost to remove hazard trees with the potential to impact the right of way – estimated to be on the order $90 to 120 million dollars.
- Total potential cost for Butte County Public Works – over $400,000,000

Thank you

- Questions???