INFRASTRUCTURE RECOVERY AFTER DISASTER
2018 CAMP FIRE

Marc Mattox, PE
Public Works Director/Town Engineer
Town of Paradise
Leveraging Resources

$25,000

$300,000,000
2018 Camp Fire

- Most destructive wildfire in California history
- Globe’s most expensive disaster of 2018
- At least 85 fatalities
- 153,336 acres burned and 18,000 structures destroyed, most of which occurring in the first 12 hours
- Paradise lost 90-95% of all structures
- 2018 population reduced from 27,000 to about 4,000 overnight
Initial Shock

- Immediately following the fire, infrastructure damage was concerning
  - Roads
  - Culverts
  - Hardscape
  - Guardrails
  - Trees

- Town of Paradise the municipal corporation had just lost nearly all population and associated revenues for at least two decades

- Financial solvency was a top concern
Infrastructure Recovery Arms of Government at Work
Damage Still to Come

- Debris removal from 11,200 structures

- Tree removal associated with in utility, local, state and federal programs
  - Estimated 500,000+ trees removed
North Valley Community Foundation

Housing
Children & Youth Services
Health & Wellness
Education
Community Development
Business Recovery
Direct Assistance

$72M Raised, $57M Granted
December 2019

- Debris Removal Operations scheduled to start any day
- ARRB Van was scheduled for California already
- Town didn’t have certain funding or time to procure a vendor
- Town approached NVCF to ask for $25,000 to pay ARRB for the first of two data collection cycles
- Existing relationships between the non-profit and Town staff were key to approval
Driving Data

- 5 digital cameras and laser system measuring:
  - Google-maps based imagery
  - Deflection bowls and slopes
  - Cracking
  - Rutting
  - Roughness
  - Pavement Distress
  - Friction

- 10,000+ unique measurements
DEBRIS REMOVAL OPERATIONS

• 3.7 million tons removed
  • 10,900 participating properties
  • 4 Golden Gate Bridges

• 28.2 million road miles traveled
  • 305,000 loads
  • 59 round trips to the moon

• Although debris removal operations were continuing and tree removal operations hadn’t started, a second data collection cycle was required before September 30, 2019
9 MONTH BEFORE & AFTER
VISUAL AND TABULAR DATA
Analysis

- Using the critical data, analysis was performed by a team of civil and geotechnical engineers to quantify the percent change along each roadway corridors for the two primary factors:
  - Surface area cracking
  - Pavement rutting/deflection
- Damage Assessment Forms were revised and submitted accordingly
First $100M Approved

- On-system roads approved through Caltrans, Federal Highways Administration (FHWA) under the Emergency Relief Program
- Off-system roads approved through Federal Emergency Management Agency (FEMA) under the Public Assistance process.
- A net total of $100M work has been approved and is planned for construction starting in 2022 through 2025.
  - Dig-outs, overlays, mill & fill, and full depth reclamation
Concurrent EDA Grant

• 7-Months post-fire Town of Paradise adopted a Long-Term Recovery Plan (also funded by NVCF)

Safer!
• Improve Evacuation Routes
• Establish Interconnected Path System
• Resolve Long, Dead-End Streets
• Underground Utilities

• January 2020, EDA approves $1.8M Grant for development of Town Transportation Master Plan
Concurrent EDA Grant

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- Safer!
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Lesson’s Learned Session tomorrow at 4:15
TMP Process

- Workshops
- Technical Analysis
- Regional Coordination
- Surveys

50 projects
$600M in Need
Projects

• Installation of unobstructed safety turn lanes (increases evacuation capacity)
• Connecting dead-end roads
• Increasing circulation with new roadway connections
• Installation of Class I Bike Paths (doubles as emergency asset)
CDBG-DR Infrastructure Funding

- Congressionally appropriated funding Disaster Recovery funds to support recovery process
- 2018 Allocation for Infrastructure was $317M
- Paradise submitted 60 projects including match requirements through FEMA Public Assistance, Hazard Mitigation and Emergency Relief – totaling $800m
# August 19 Funding Announcement

<table>
<thead>
<tr>
<th>Local Jurisdiction</th>
<th>Total Awarded</th>
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<tr>
<td>Butte County</td>
<td>$72,722,679.61</td>
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<tr>
<td>City of Chico</td>
<td>$12,388,409.65</td>
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<td>City of Malibu</td>
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<td>City of Shasta Lake</td>
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<td>Los Angeles County</td>
<td>$3,788,157.86</td>
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<td><strong>Town of Paradise</strong></td>
<td><strong>$199,592,735.75</strong></td>
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<tr>
<td><strong>Total</strong></td>
<td><strong>$317,428,488.00</strong></td>
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</table>
Leveraging Resources
It’s all connected!

$300,000,000

$25,000
What Else is Happening in Paradise?

- Undergrounding utilities town-wide
- Early warning system
- Defensible space projects (public and private)
- Wrapping EIR for potential 18-mile sewer connection to the City of Chico
- IBHS Wildfire Prepared Homes
- Rebuild Activity
  - 3000+ applications
  - 1800+ rebuilt
Leveraging From Experience

- Work together
- Identifying the best and highest use of a given resource
- Maximizing potential and efficiency
- Analyzing risks and taking some
- Plan ahead... carefully
- Make decisions... quickly
- Make mistakes... and learn from them
- Build relationships before disasters!
QUESTIONS?

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Town of Paradise