

# CHELAN AREA

## Transmission Line Fire Protection

August 20, 2018



CHELAN COUNTY

# Objective of this presentation:

**We are not looking for a Board decision today.**

The purpose of this presentation is to start the discussion of a potential fire protection transmission project

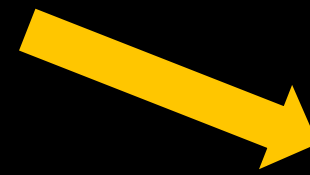
Project aligns with the District Strategic Plan

# Why we are here...

Chelan County PUD  
Strategic Plan 2015 – 2019



Shaping our **utility**  
to do the **best**,  
for the **most**,  
for the **longest**



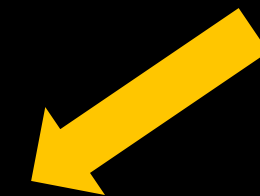
## Reinvestment



Our customer-owners were most interested in replacing or rerouting some electric lines to protect against fire and weather risks. Other high-ranking items included partnering with some customers to underground electrical lines, consolidating Chelan PUD's industrial facilities, and creating partnerships or programs to develop the skills of local job applicants. The Board confirms their commitment to reinvesting in the core, value-creating assets of hydro projects, distribution systems, facilities and people as the top priority and will use the *Owner's Guide* (<http://www.ourpublicpower.org/guide>) feedback to help prioritize reinvestment options. Increased reinvestment projects and programs will be reflected in our

Chelan County PUD Strategic Plan 2015 – 2019

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## 2018-2022 District-wide Business Plan

w) Harden transmission system to protect against fire/weather
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**2015 Chelan Fire**





# Operational Experience – 2015 Chelan Fire

- Fire caused an outage of 4 of the 5 substations in Chelan area
- Twelve transmission structures on two different lines
- Significant customer impacts:
  - Water, gasoline, internet, cell service, refrigeration, commerce, etc.
- **30 hours** to repair the first transmission line
- **13 days** to repair the second



# Fire Risk Assessment (2017)

Completed in 2017 with consulting firm HDR, Inc.

Validated actual experience from the 2015 fire

Extensive damage in Area 2

Area 1: 18 miles of line; 210 structures

- Geographic diversity (lines farther apart)
- Configurability (able to sectionalize long sections of line for repair with minimal customer impact)

Area 2: 7.5 miles of line; 70 structures

- Two lines are parallel for approximately 3.5 miles
- Both lines burned at the same time in 2015 fire
- Connection to the power source

Proposed Project Focus Area:

- Area 2 provides greatest benefit to customer reliability



# Benefits of Steel Transmission Lines

- 2014 South Malaga fire, seven wood lines burn, one steel line maintains power to Alcoa
- 2018 fire near Rocky Reach, fire burns through steel line. The line remained in service the entire time

## What if one of the Chelan transmission lines would have been constructed in steel?

- The line would have either remained in service the entire time, or
- Would have been de-energized for a short while to allow the fire to pass, then re-energized. Typically a matter of hours



# Steel Pole Construction / Aesthetics

- Proposed projects replace wood poles with steel poles
- Same alignment as before
- Some poles may be higher
- Same general look and feel as original

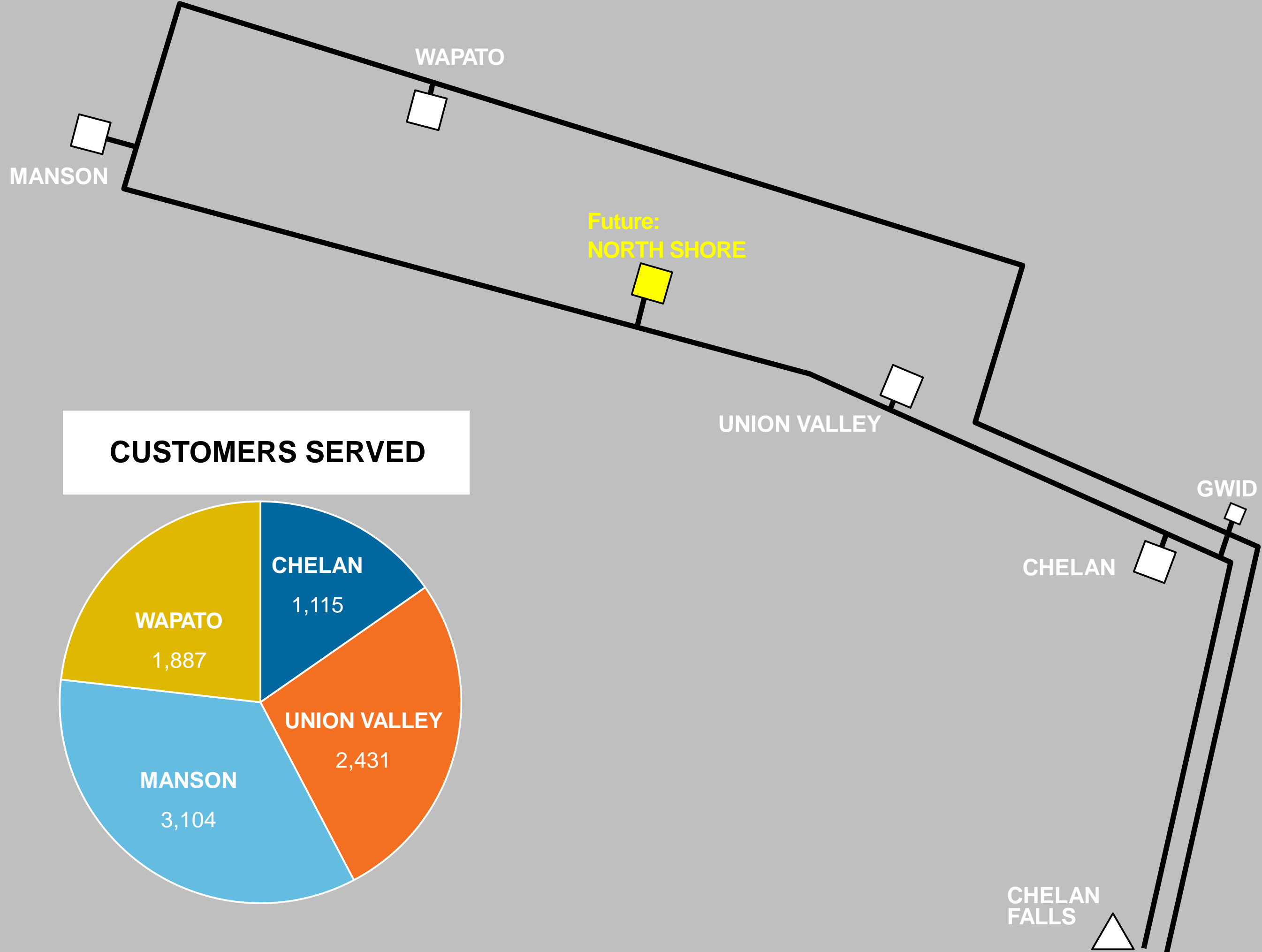
(Center Structure below is steel)



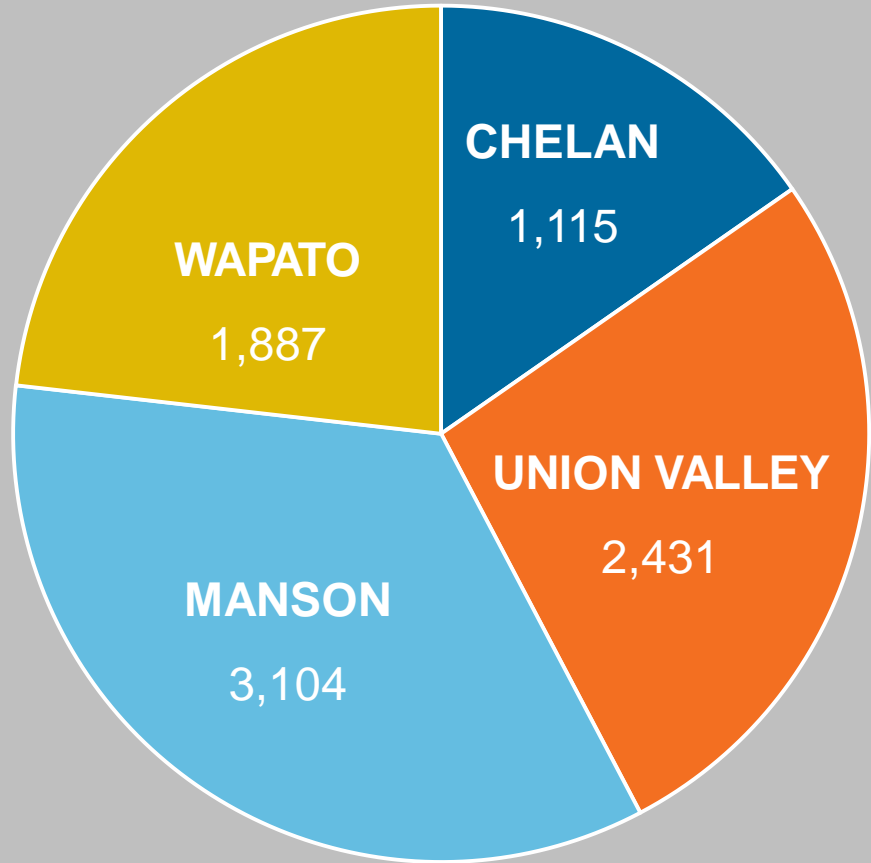


# The Chelan Loads

- Fed directly from Chelan Falls Switchyard near Chelan Hydro
- Four existing substations
- 8537 customers
- Future North Shore substation
- Large Irrigation Districts



**CUSTOMERS SERVED**





# Approach 1: Rebuild to Union Valley Substation

Direct benefit to 3546 customers  
(Chelan and Union Valley  
Substations)

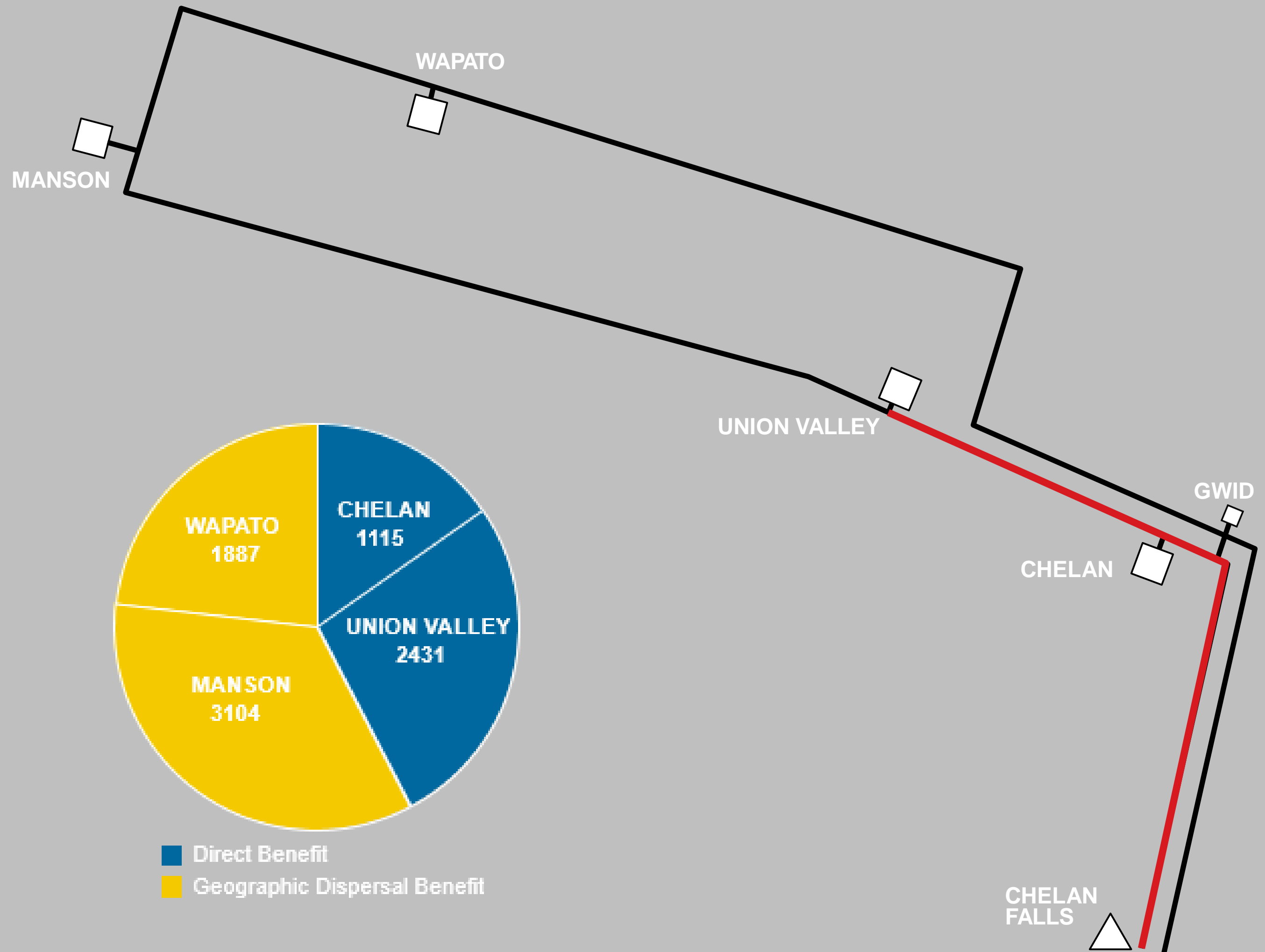
Extended benefit to 4991  
customers (Manson & Wapato  
Substations)

4 miles and 35 structures

Most expensive (\$3 – 4.5 M)

## 2015 Fire Impacts if Steel

- Outage time zero to a few hours





# Approach 2: Rebuild to Chelan Substation

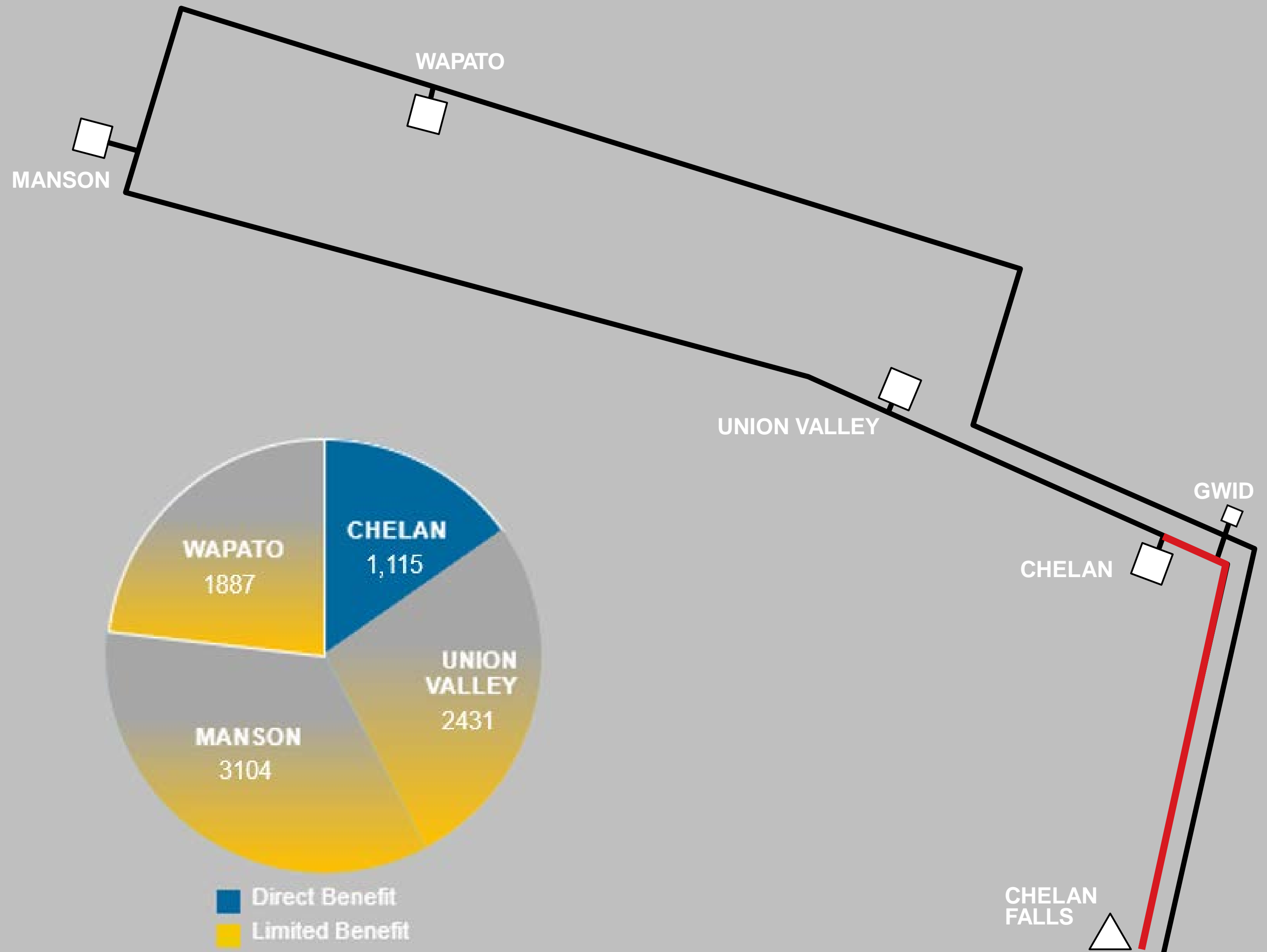
Direct benefit to 1115 customers  
(Chelan Substation)

2.7 miles and 22 structures

Expensive (\$2 – 3 M)

## 2015 Fire Impacts if Steel

- Outage time zero to a few hours
- If fire had been in the parallel section not constructed in steel, outage times would increase as structure replacement would be required





# Approach 3: Replace only “Critical” Structures with Steel

Direct benefit: None

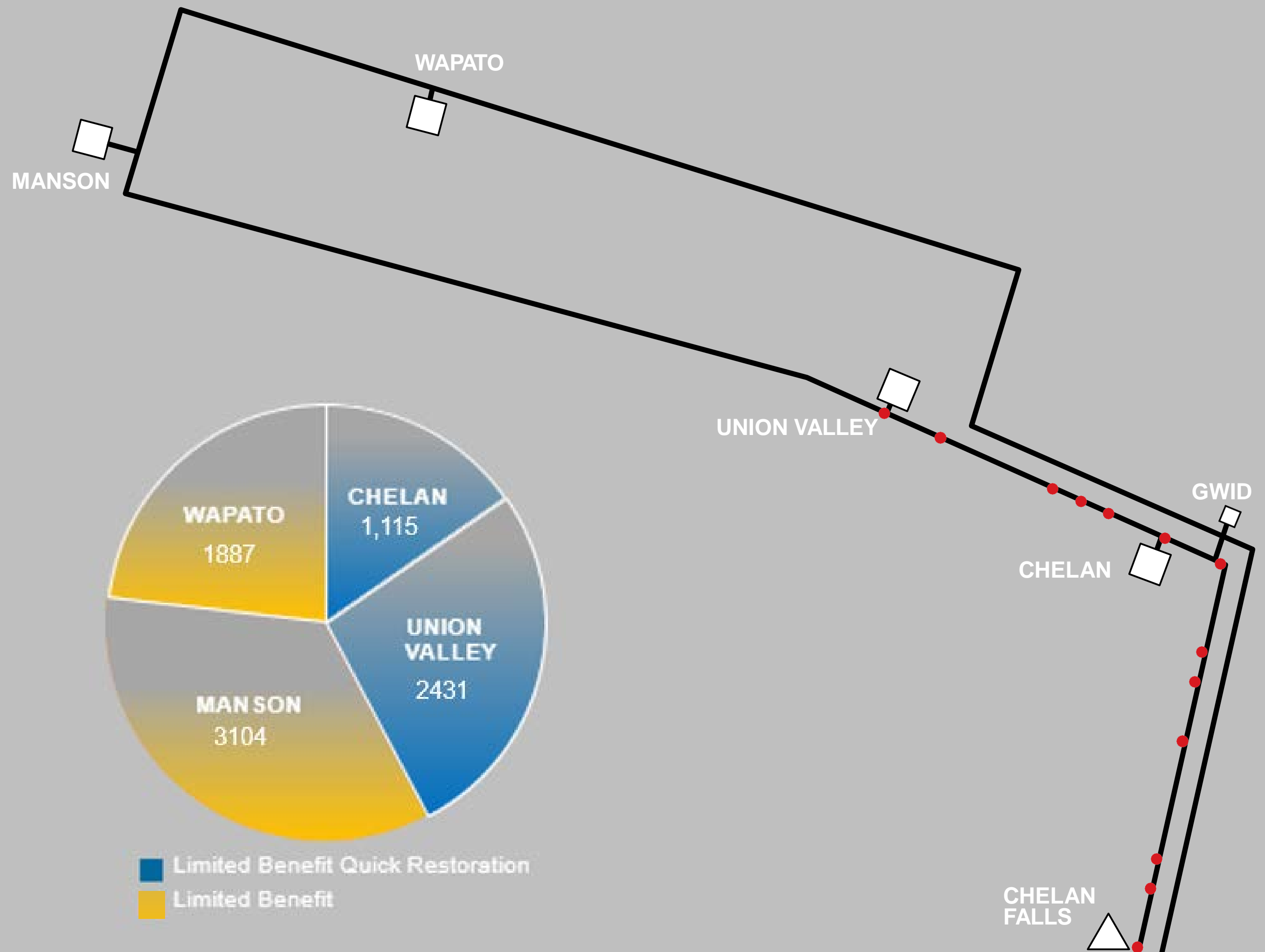
Marginal benefit to 8537  
customers (Chelan, Union Valley,  
Manson and Wapato Substations)

21 structures replaced

Low cost (\$1.7 – 2.9 M)

## 2015 Fire Impacts if Steel

- Some wood structures may still need replacement
- Outage time 24+ hours



# Approach 4: **Do Nothing**

No project related costs (\$0)

Poles are not at end of life

Wood structures remain

No reliability improvements, both  
lines remain at existing fire risk





# Comparing Approaches

Approach	# of Customers Directly Benefited	Potential Downtime Reduction due to Fires	Project Cost
1	3546	<ul style="list-style-type: none"> <li>• 2 substations served directly from steel transmission</li> <li>• Other 2 substations benefit from geographic diversity</li> <li>• Outage duration none to several hours for fire safety</li> </ul>	\$3M - \$4.5M
2	1115	<ul style="list-style-type: none"> <li>• 1 substation served directly from steel transmission</li> <li>• Reduced geographic diversity benefit</li> <li>• Outage duration none to several hours for fire safety</li> </ul>	\$2M – \$3M
3	0	<ul style="list-style-type: none"> <li>• No substations served entirely from steel transmission</li> <li>• No geographic diversity benefit</li> <li>• Significant outage duration, dependent on fire severity. 24+ hours based on 2015 benchmark event</li> </ul>	\$1.7M - \$2.9M
4 (do nothing)	0	<ul style="list-style-type: none"> <li>• No reduction</li> </ul>	\$0

# Next Steps:

2018

Customer Outreach

Continue infrastructure  
protection evaluation

Determine if board and  
community are supportive

