

Eastern Treasure Valley Electrical Plan Update



Welcome

Jim Burdick
Engineering Leader
Idaho Power



Eastern Treasure Valley Electrical Plan Update



Meeting No. 2





Meeting No. 2 Agenda

- 9:00 a.m. – Welcome
- 9:15 a.m. – 2023 Community Goals and Siting Criteria
- 10:00 a.m. – Substation Connections and Reliability Criteria
- 10:30 p.m. – Small Group Mapping
- 12:00 p.m. – Lunch
- 12:30 p.m. – Small Group Mapping
- 2:50 p.m. – Next Steps and Wrap up
- 3:00 p.m. – Adjourn

Eastern Treasure Valley Electrical Plan Update



Community Goals and Siting Criteria

Rebecca Irwin
Senior Engineer
Idaho Power



Eastern Treasure Valley Electrical Plan Update



Reliability and Mapping

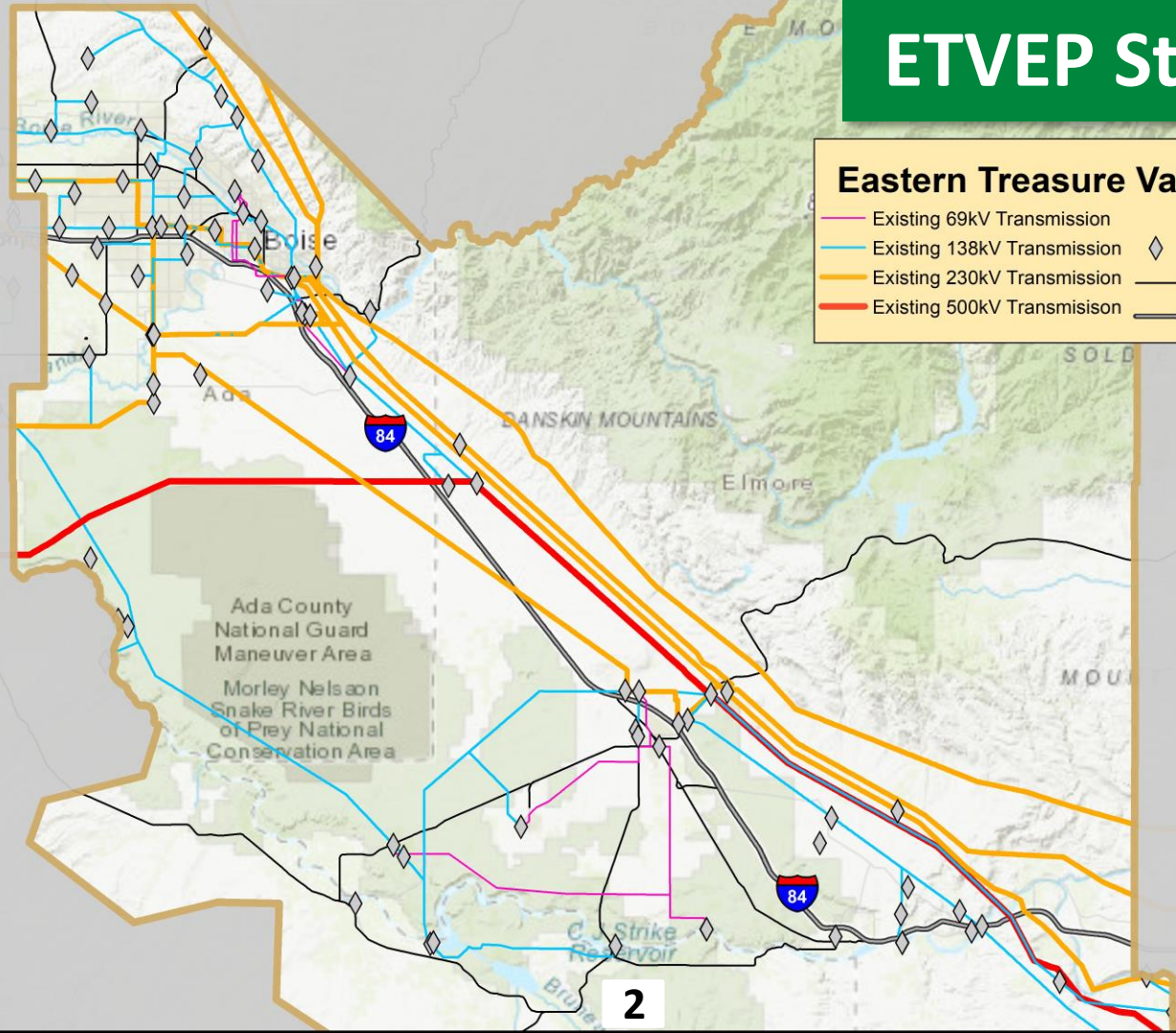
Dakota Pfaff
Technical Lead Engineer
Idaho Power



ETVEP Study Area

Eastern Treasure Valley Electrical Plan

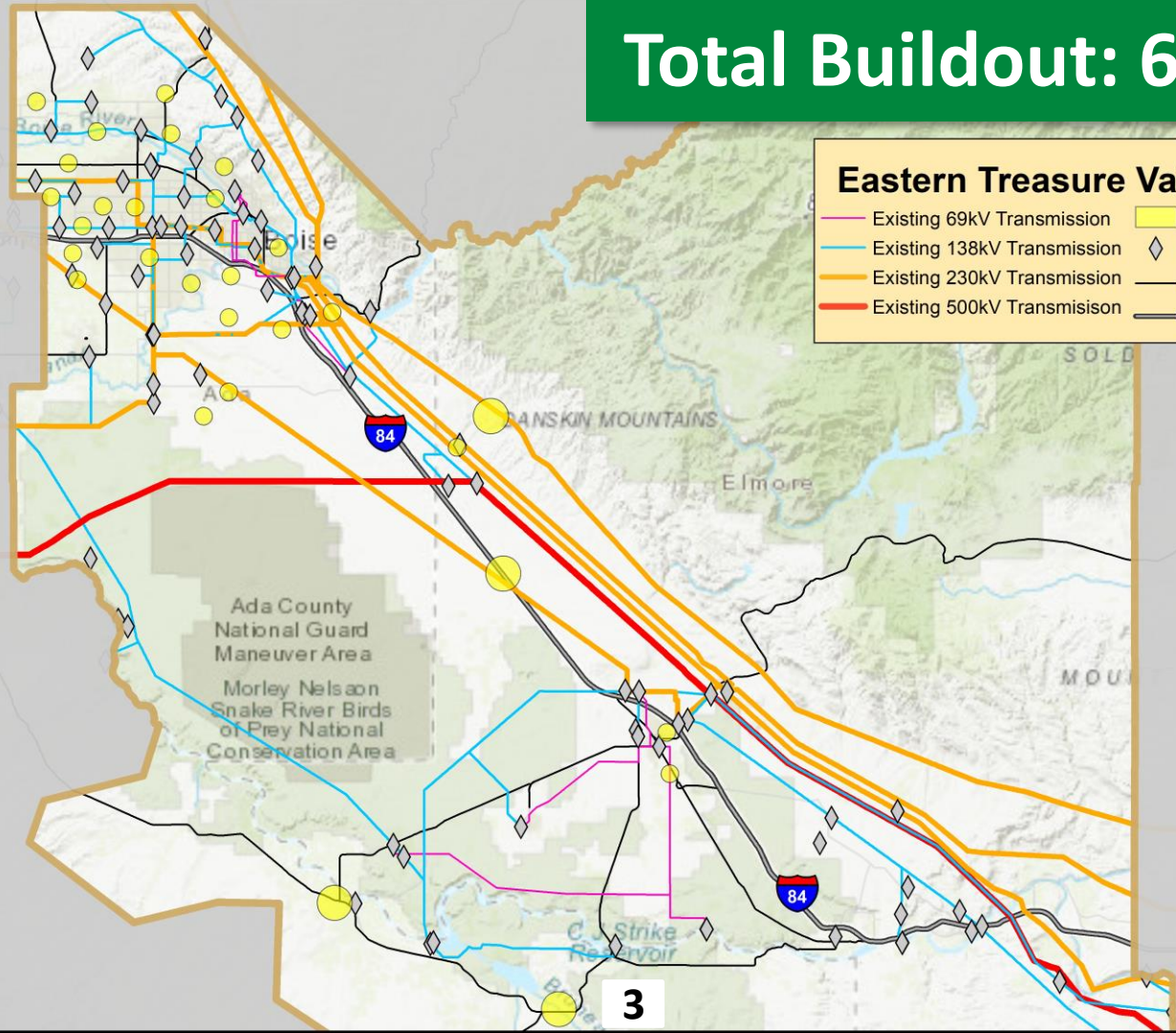
- Existing 69kV Transmission
- Existing 138kV Transmission
- Existing 230kV Transmission
- Existing 500kV Transmission
- Existing Distribution Substation
- Highway
- I-84



Total Buildout: 6,125 MW

Eastern Treasure Valley Electrical Plan

- Existing 69kV Transmission
- Existing 138kV Transmission
- Existing 230kV Transmission
- Existing 500kV Transmission
- Proposed Distribution Substation
- Existing Distribution Substation
- Highway
- I-84



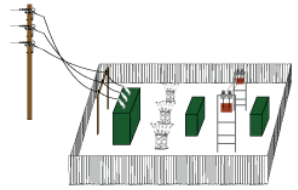
2023 ETVEP Update

Buildout Requirements



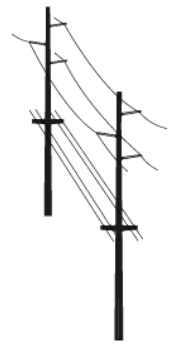
High Voltage Transmission

Minimum Two Lines Per Source Substation

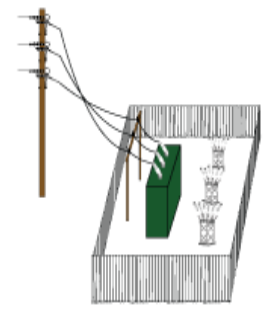


Source Substations

Six New Source Substations



138 kV Transmission

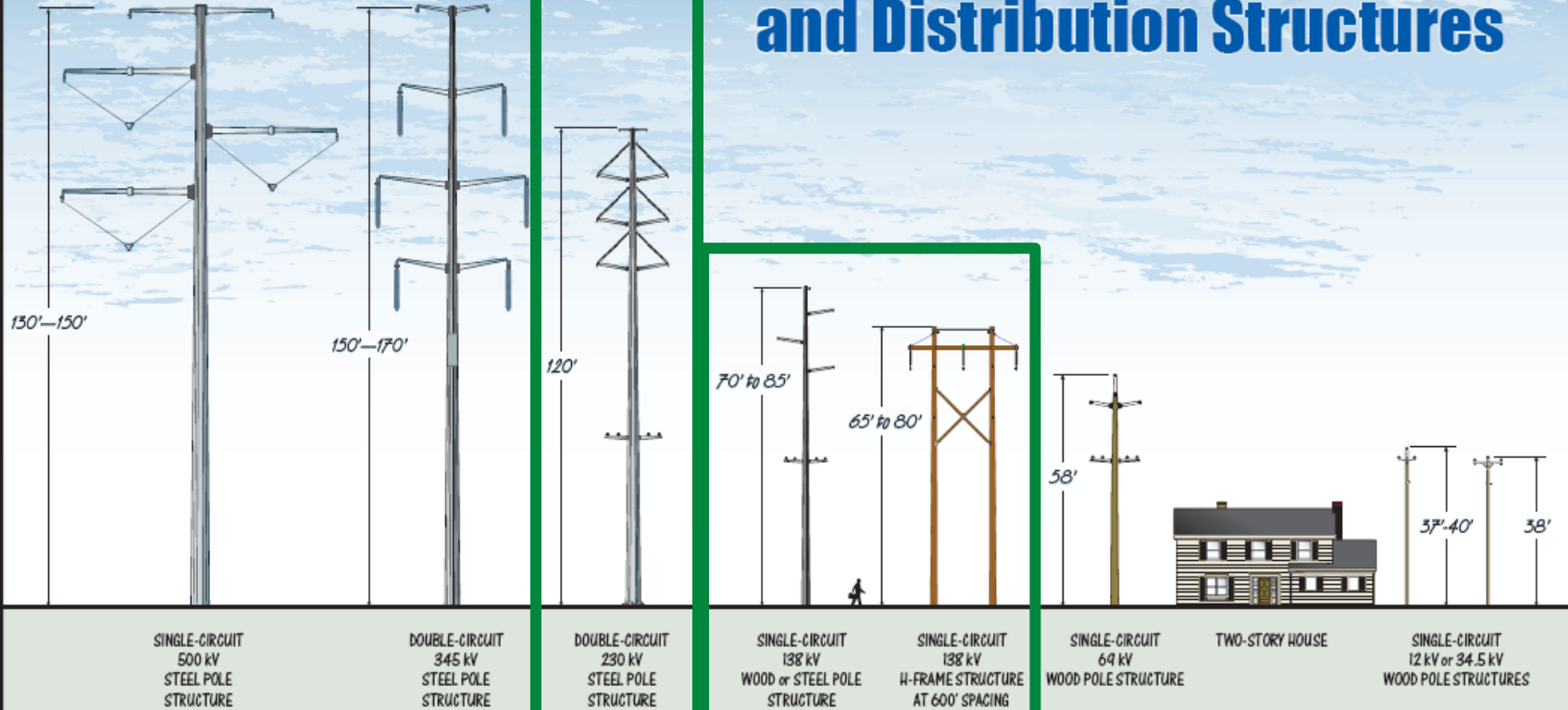


Distribution Substations

29 New Distribution Substations

In Scope

Typical Transmission and Distribution Structures



SINGLE-CIRCUIT
500 kV
STEEL POLE
STRUCTURE

DOUBLE-CIRCUIT
345 kV
STEEL POLE
STRUCTURE

DOUBLE-CIRCUIT
230 kV
STEEL POLE
STRUCTURE

SINGLE-CIRCUIT
138 kV
WOOD or STEEL POLE
STRUCTURE
AT 300' SPACING

SINGLE-CIRCUIT
138 kV
H-FRAME STRUCTURE
AT 600' SPACING

SINGLE-CIRCUIT
69 kV
WOOD POLE STRUCTURE

TWO-STORY HOUSE

SINGLE-CIRCUIT
12 kV or 34.5 kV
WOOD POLE STRUCTURES

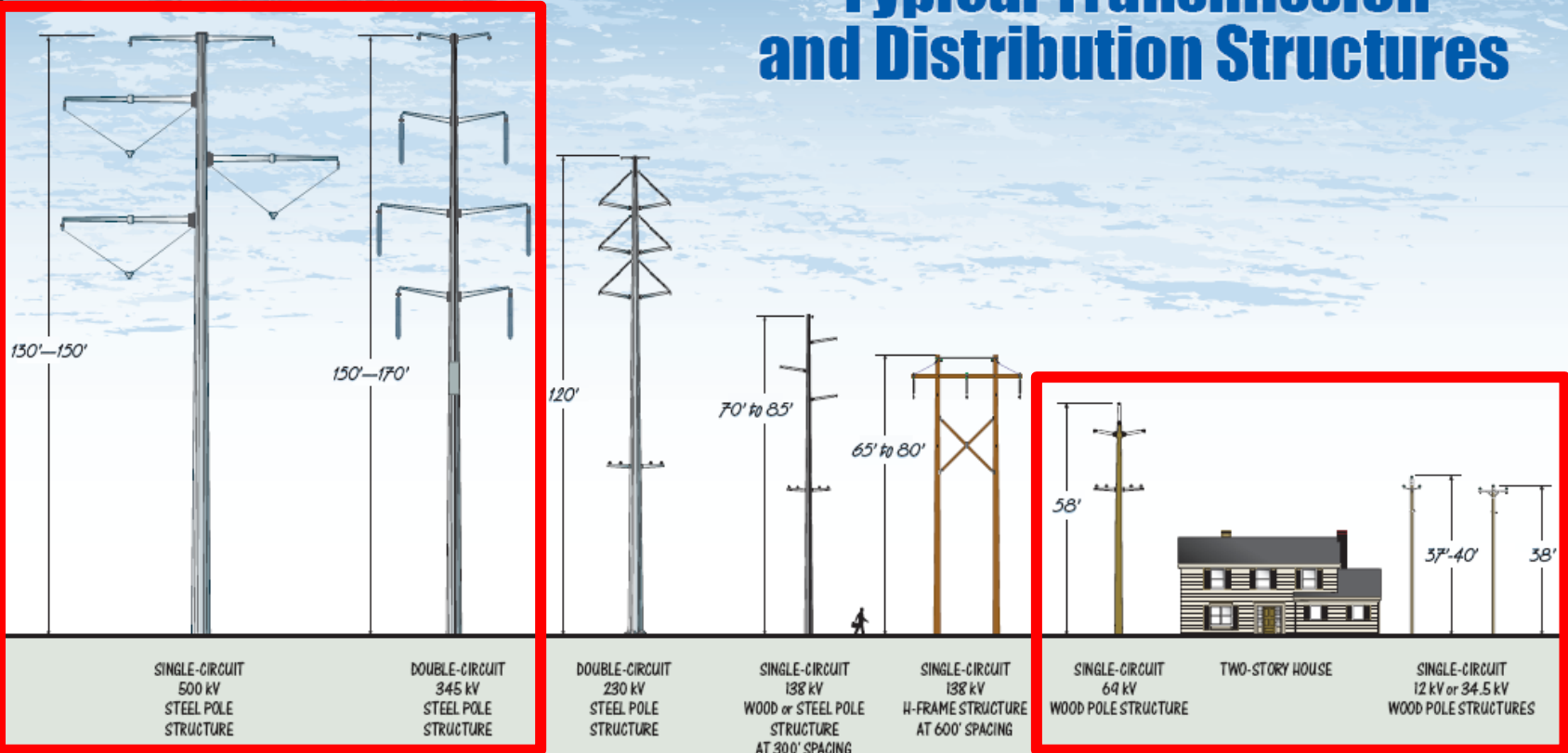


Transmission and Sub-Transmission Lines

Distribution Lines

Out of Scope

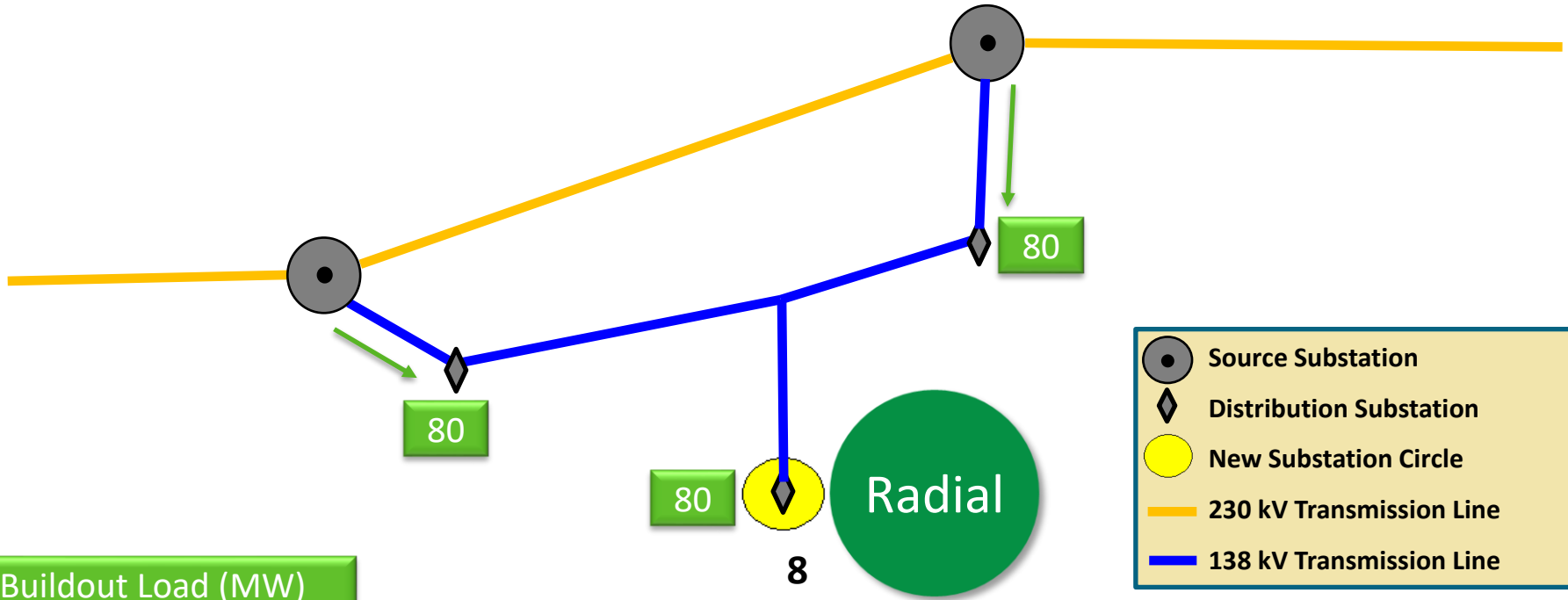
Typical Transmission and Distribution Structures



Substation Connections and Reliability Criteria



Substation Connections

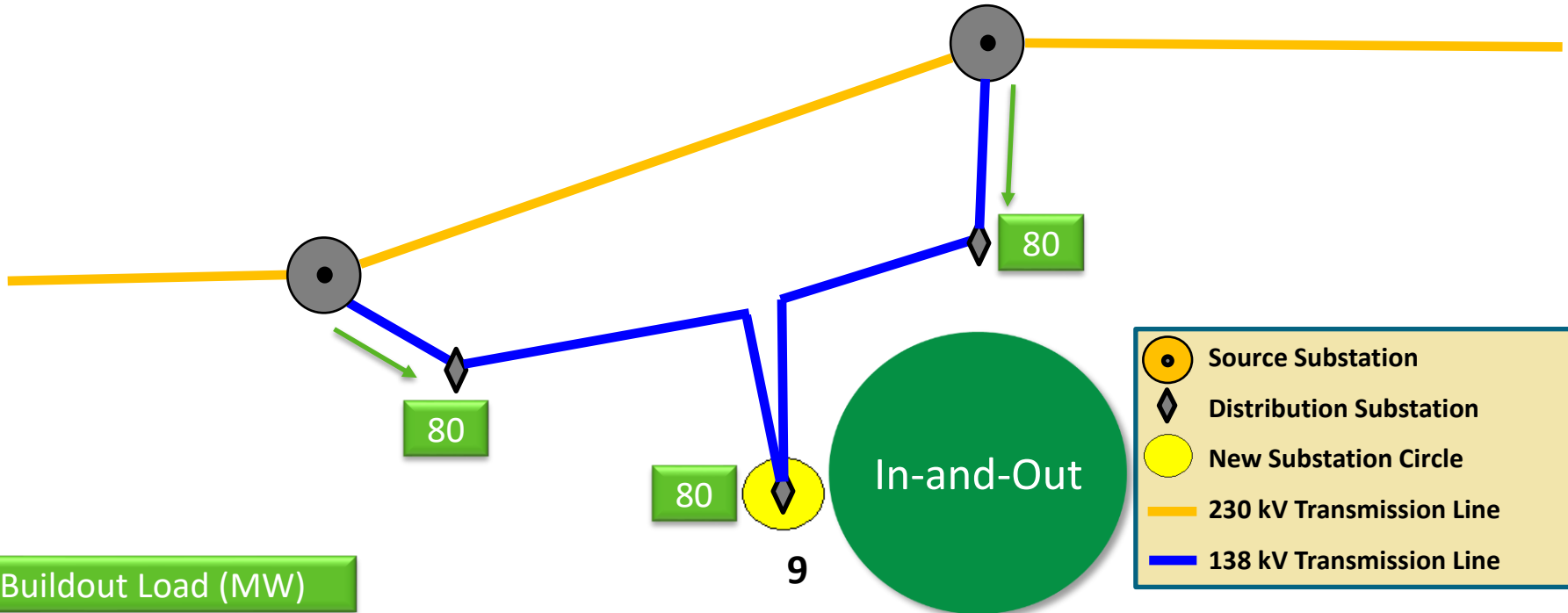


Buildout Load (MW)

Radial

- Source Substation
- ◆ Distribution Substation
- New Substation Circle
- 230 kV Transmission Line
- 138 kV Transmission Line

Substation Connections

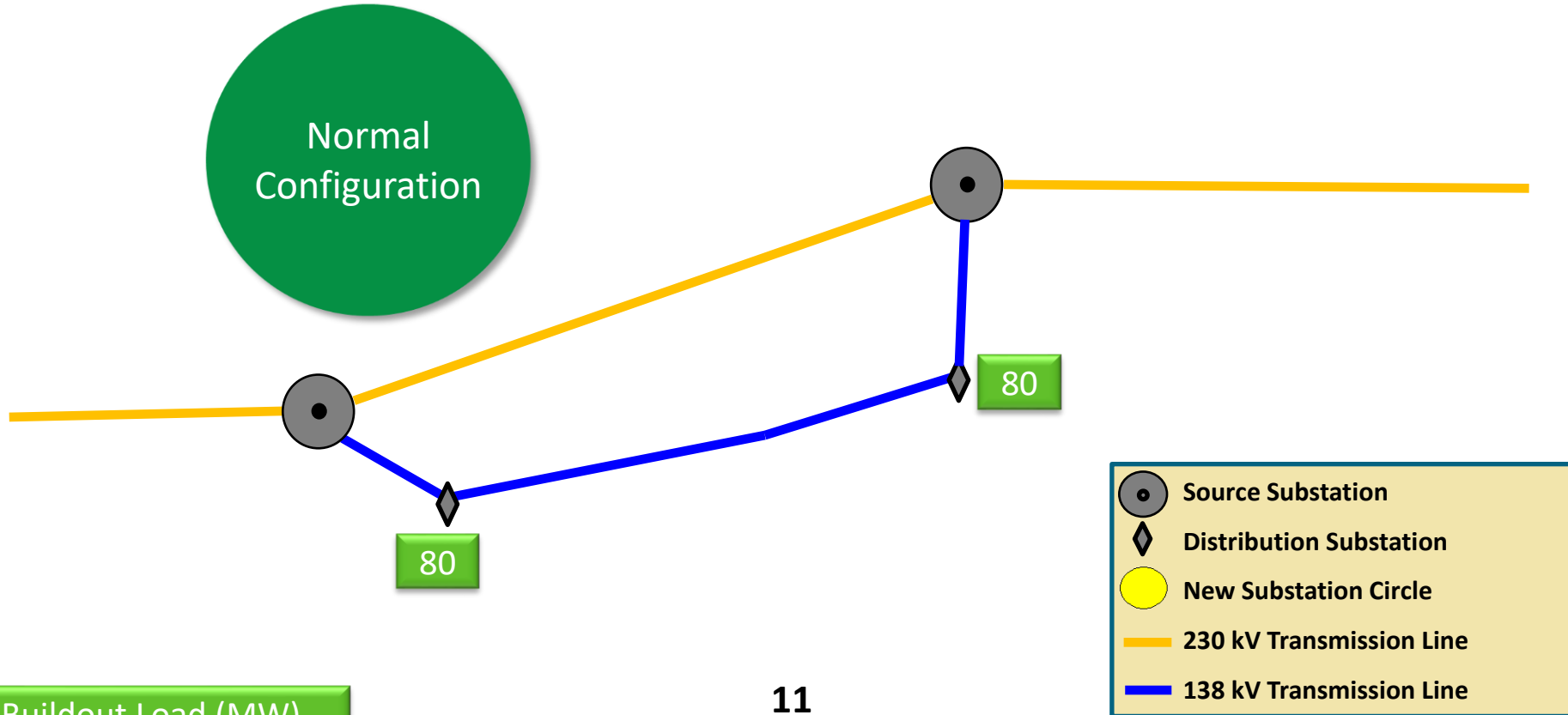




(N-1) Reliability Criteria

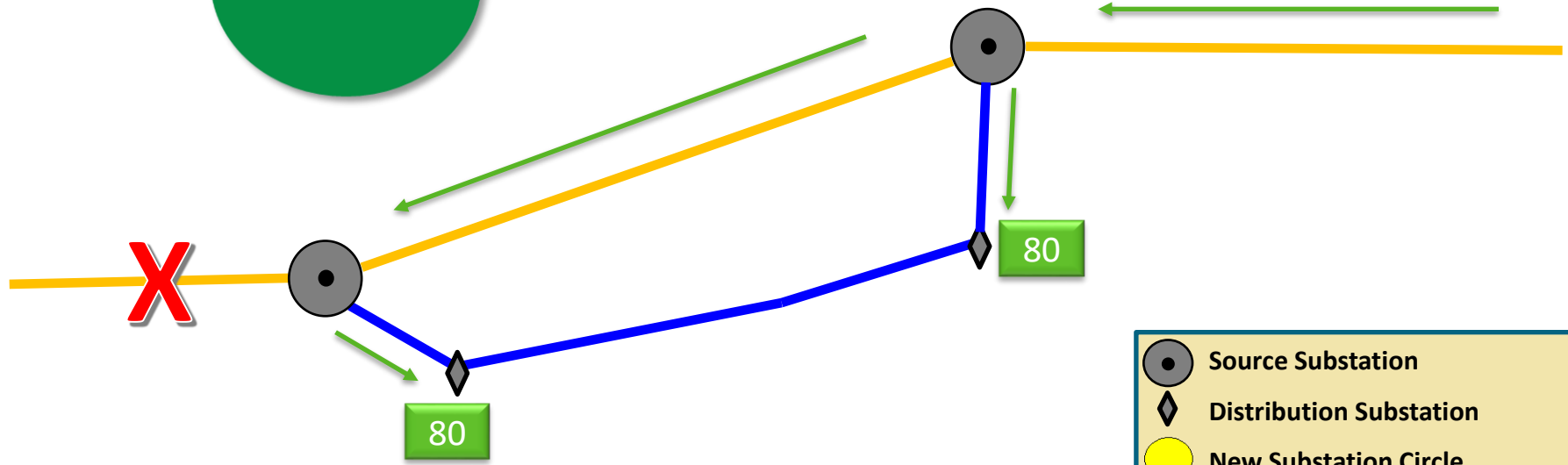
- ‘N’ stands for ‘normal’
- (N - 1) indicates the system is operating normally, but with the removal of a single transmission line or transformer
- Used to minimize impact to customers
 - Frequency
 - Duration
 - Number of customers

Reliability Example



Reliability Example

N - 1

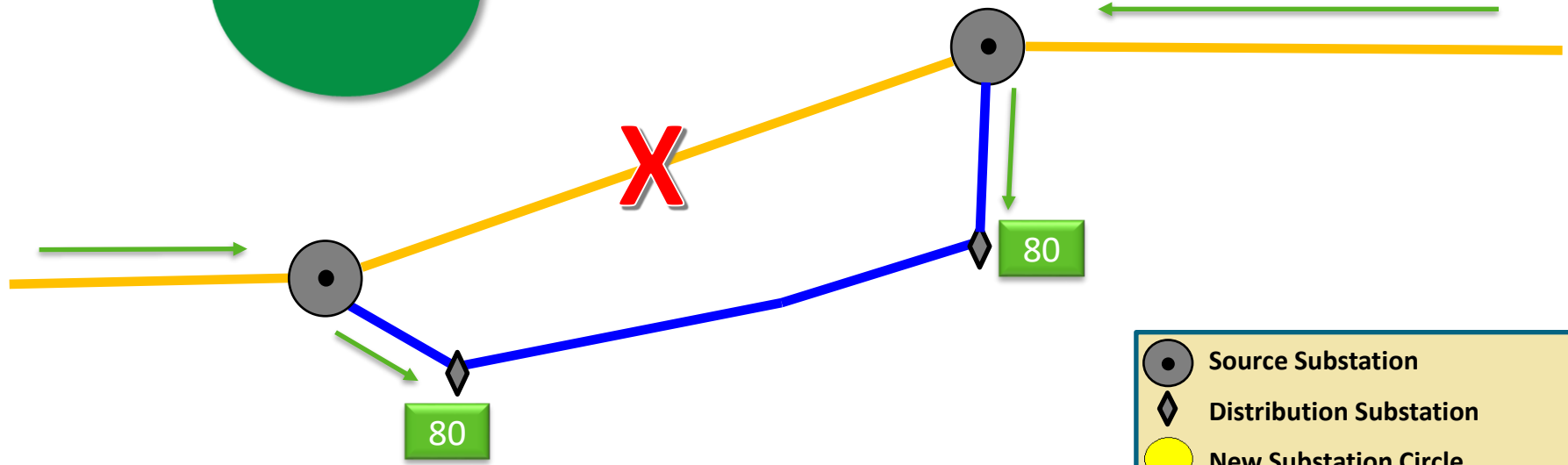


Buildout Load (MW)

- Source Substation
- ◆ Distribution Substation
- New Substation Circle
- 230 kV Transmission Line
- 138 kV Transmission Line

Reliability Example

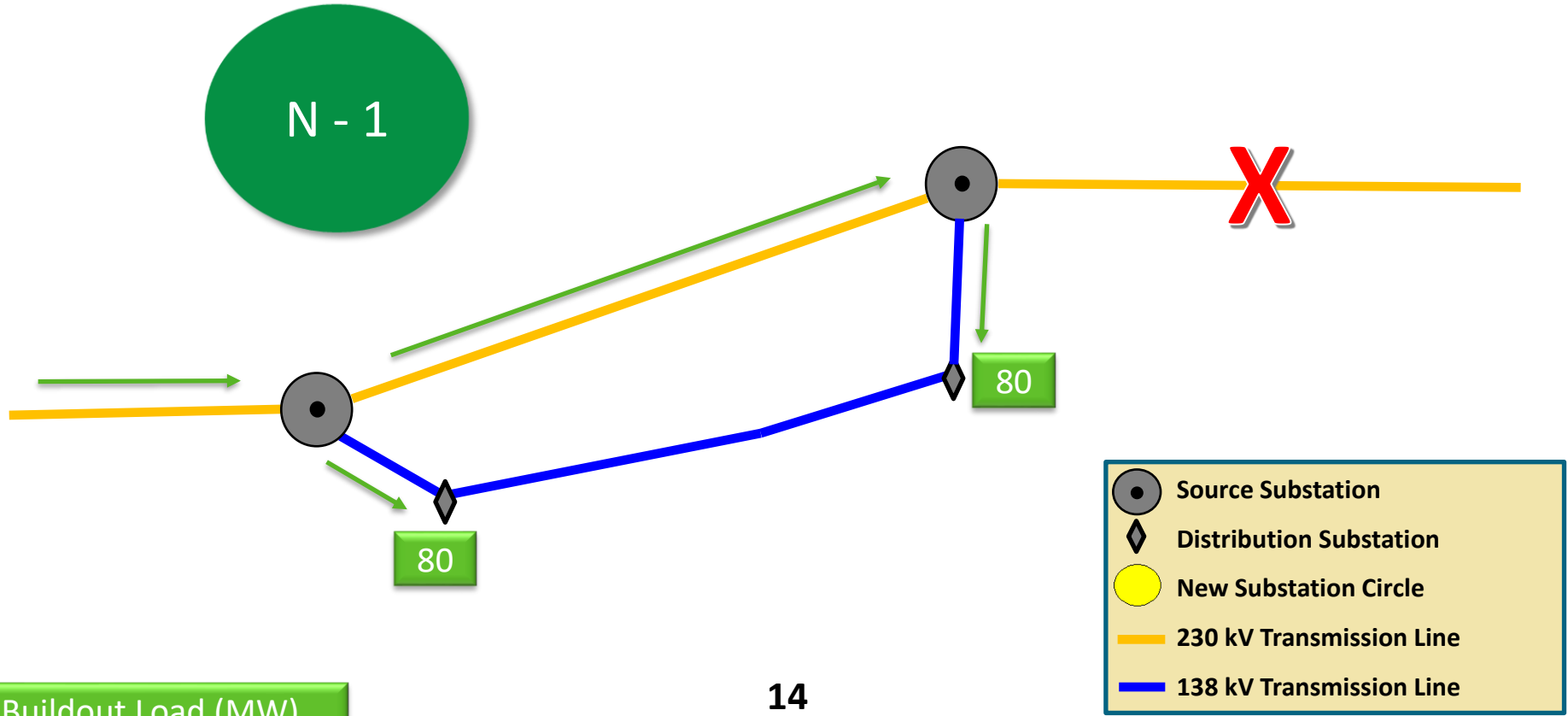
N - 1



- Source Substation
- ◆ Distribution Substation
- New Substation Circle
- 230 kV Transmission Line
- 138 kV Transmission Line

Buildout Load (MW)

Reliability Example

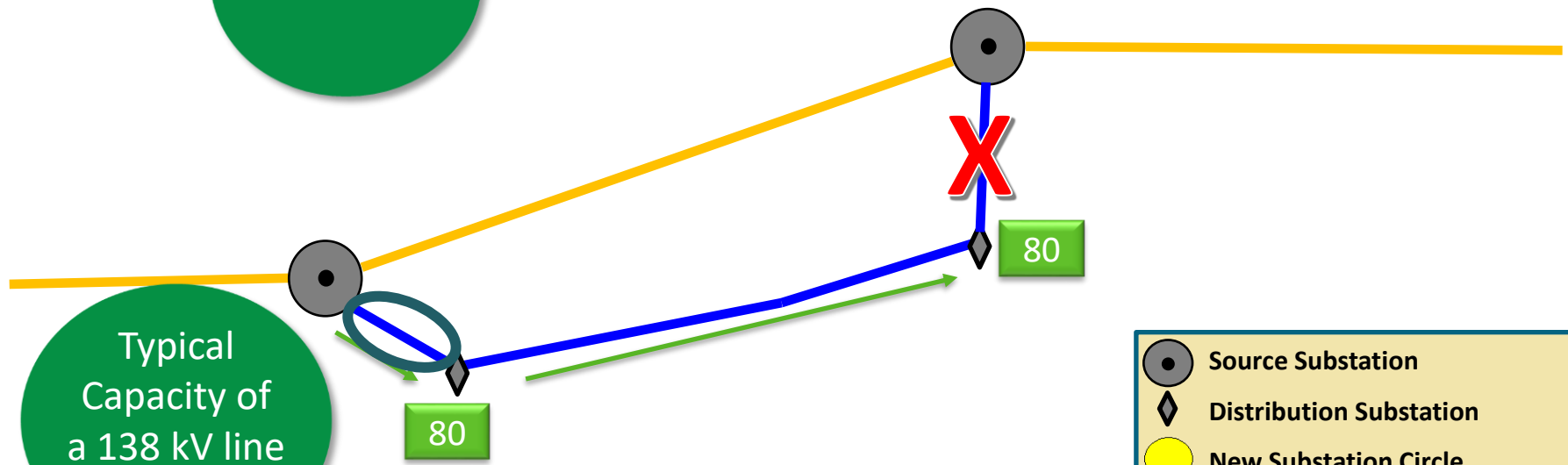


Reliability Example

N - 1

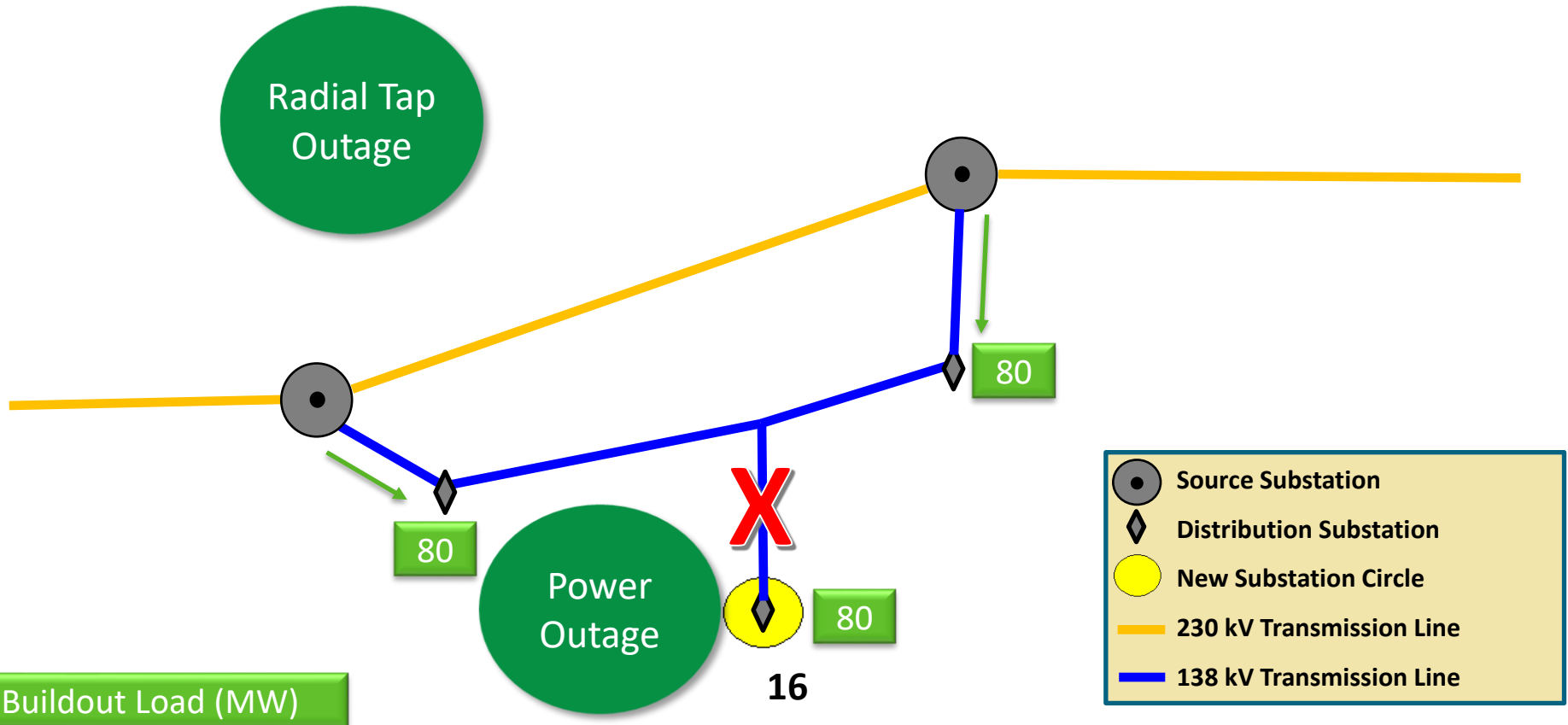
Typical Capacity of a 138 kV line is 200 MW

Buildout Load (MW)



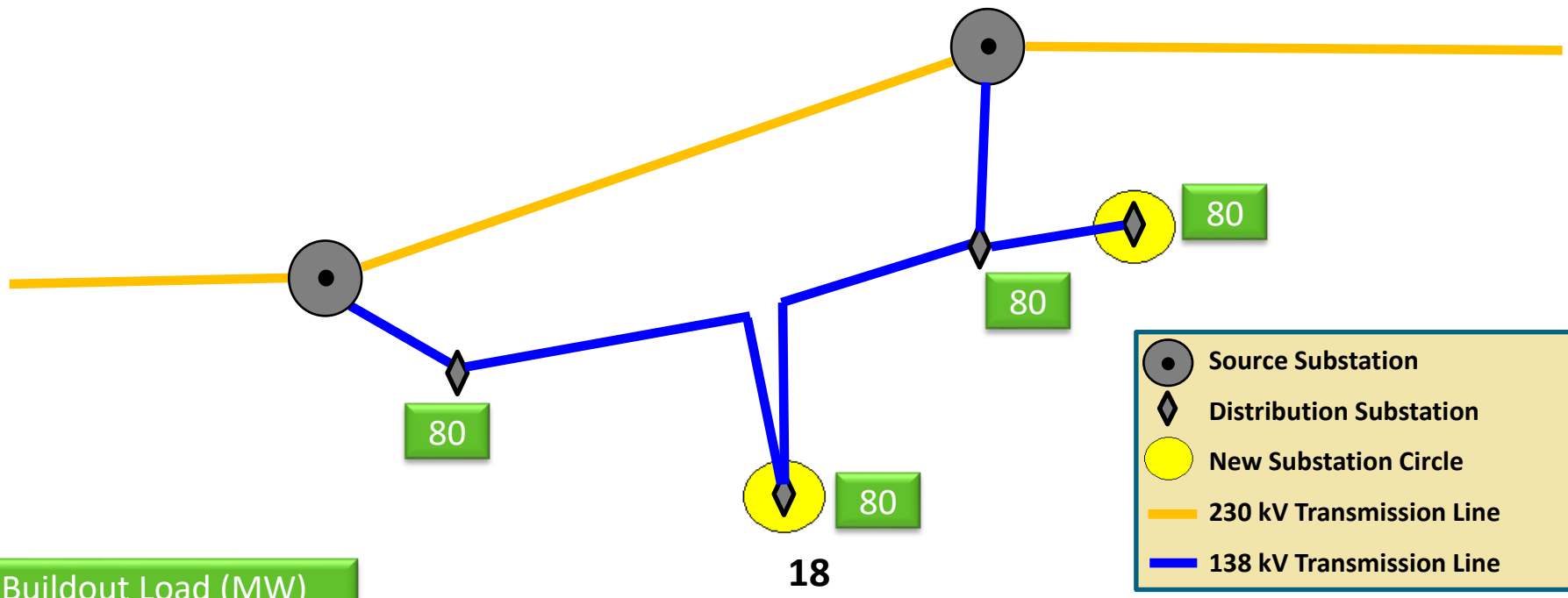
- Source Substation
- ◆ Distribution Substation
- New Substation Circle
- 230 kV Transmission Line
- 138 kV Transmission Line

Reliability Example



	Source Substation
	Distribution Substation
	New Substation Circle
	230 kV Transmission Line
	138 kV Transmission Line

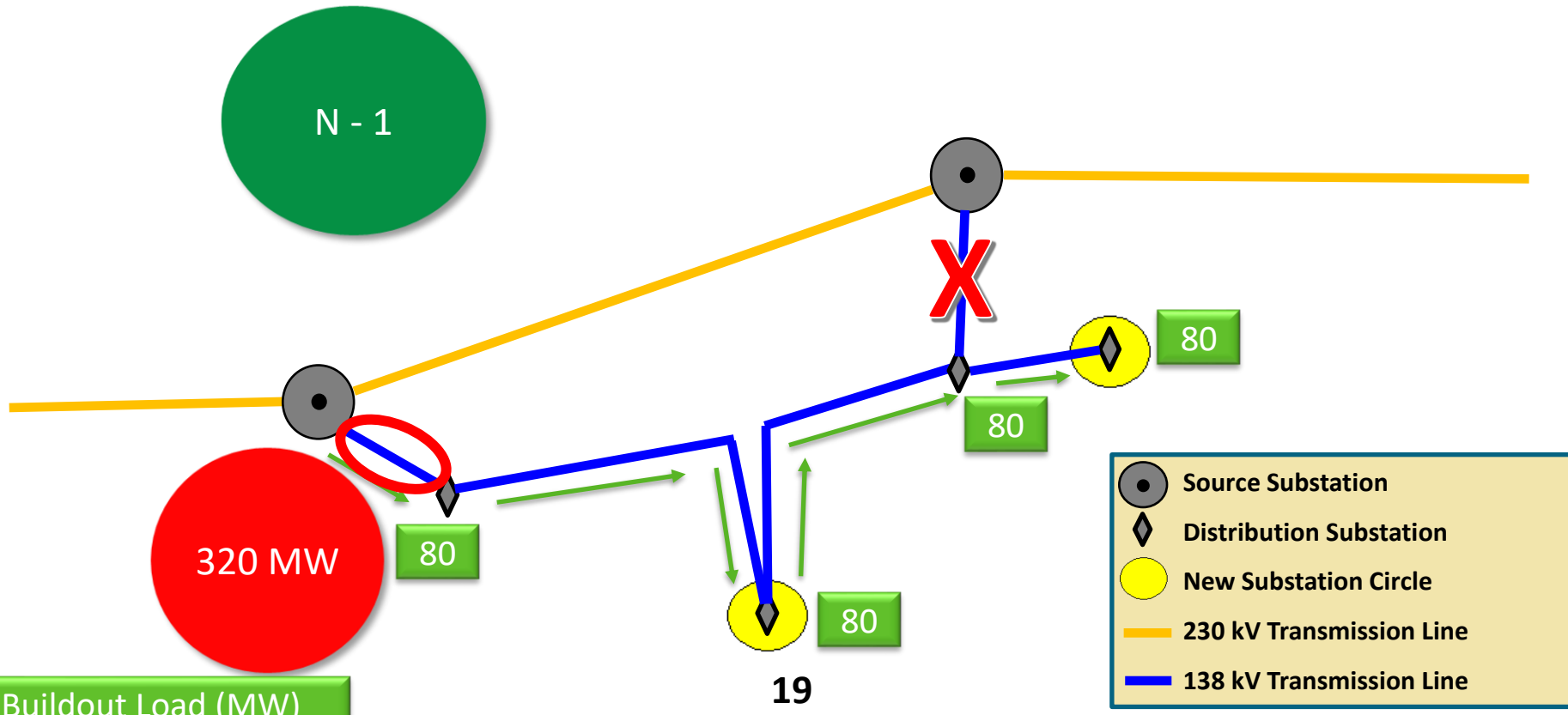
Mapping Example



Buildout Load (MW)

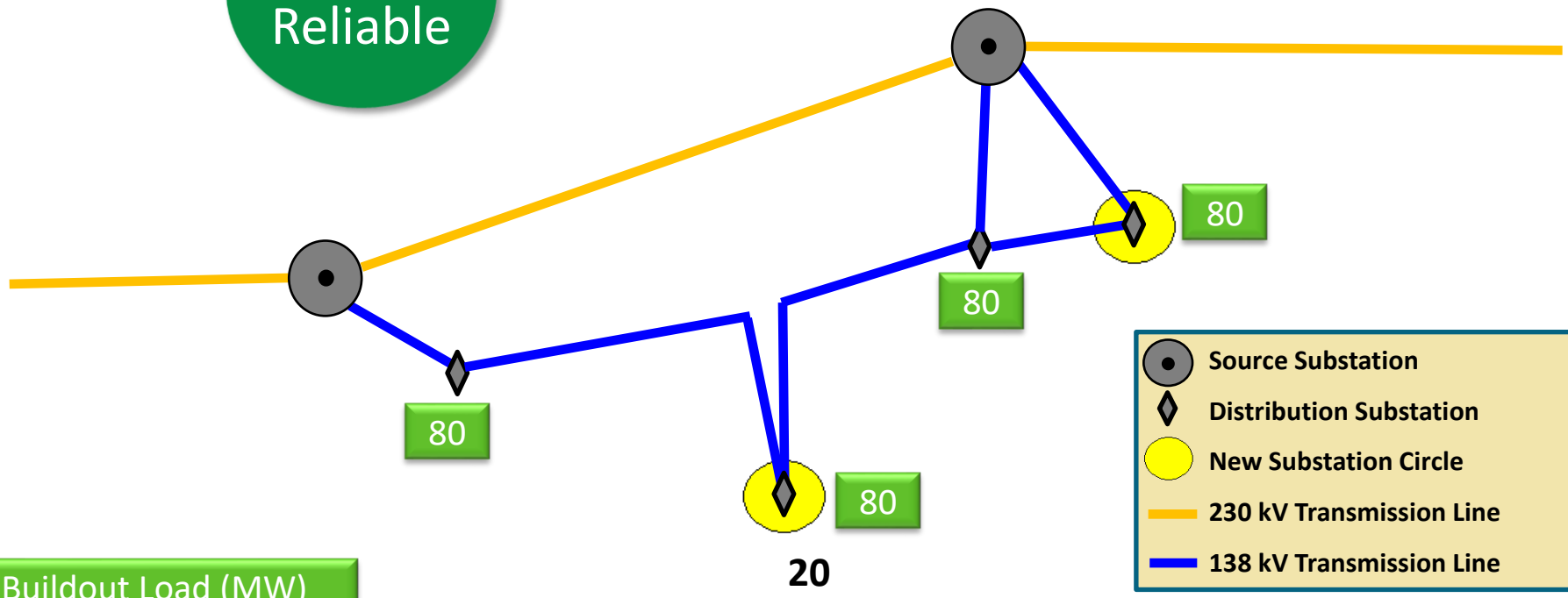
- Source Substation
- ◆ Distribution Substation
- New Substation Circle
- 230 kV Transmission Line
- 138 kV Transmission Line

Mapping Example



Mapping Example

More
Reliable



Buildout Load (MW)

- Source Substation
- ◆ Distribution Substation
- New Substation Circle
- 230 kV Transmission Line
- 138 kV Transmission Line

North Ada Area









2012 Eastern Treasure Valley Electrical Plan

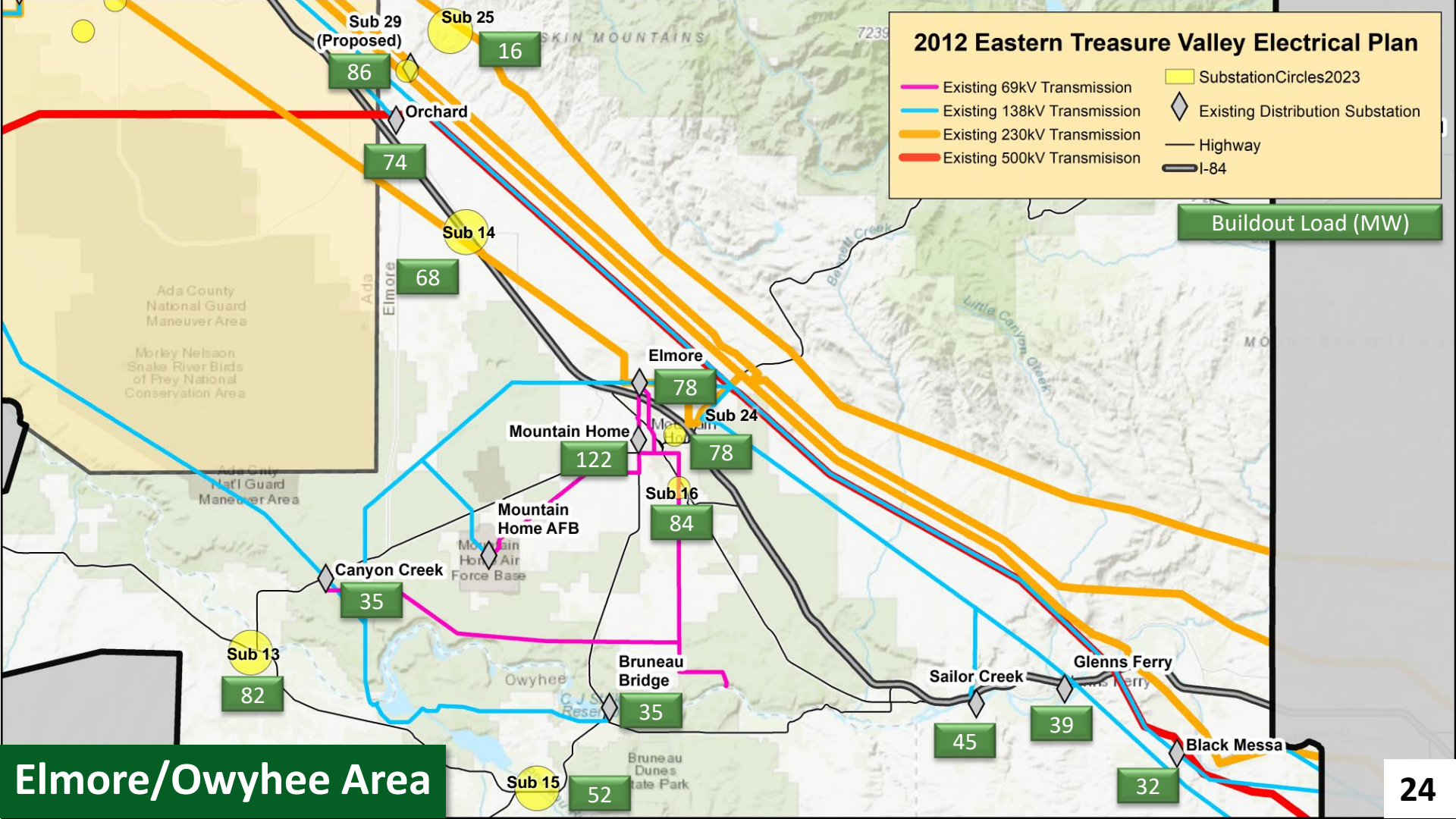
- Existing 69kV Transmission
- Existing 138kV Transmission
- Existing 230kV Transmission
- Existing 500kV Transmission
- Proposed Distribution Substation
- Existing Distribution Substation
- Highway
- I-84

Buildout Load (MW)



2012 Eastern Treasure Valley Electrical Plan

	Existing 69kV Transmission		SubstationCircles2023
	Existing 138kV Transmission		Existing Distribution Substation
	Existing 230kV Transmission		Highway
	Existing 500kV Transmission		I-84



Buildout Load (MW)

Elmore/Owyhee Area

Sub 29 (Proposed)
86

Sub 25
16

74

Sub 14
68

Elmore
78

Sub 24
78

Mountain Home
122

Sub 16
84

Mountain Home AFB

Canyon Creek
35

Sub 13
82

Bruneau Bridge
35

Sailor Creek
45

Glens Ferry
39

Sub 15
52

Black Mesa
32



Mapping Orientation

- See Appendix D in the ETVEP Update 2023 Binders



Committee Mapping Goal

- Propose a single preferred site for each future source substation, distribution substation and connecting transmission lines
 - Identify alternative sites



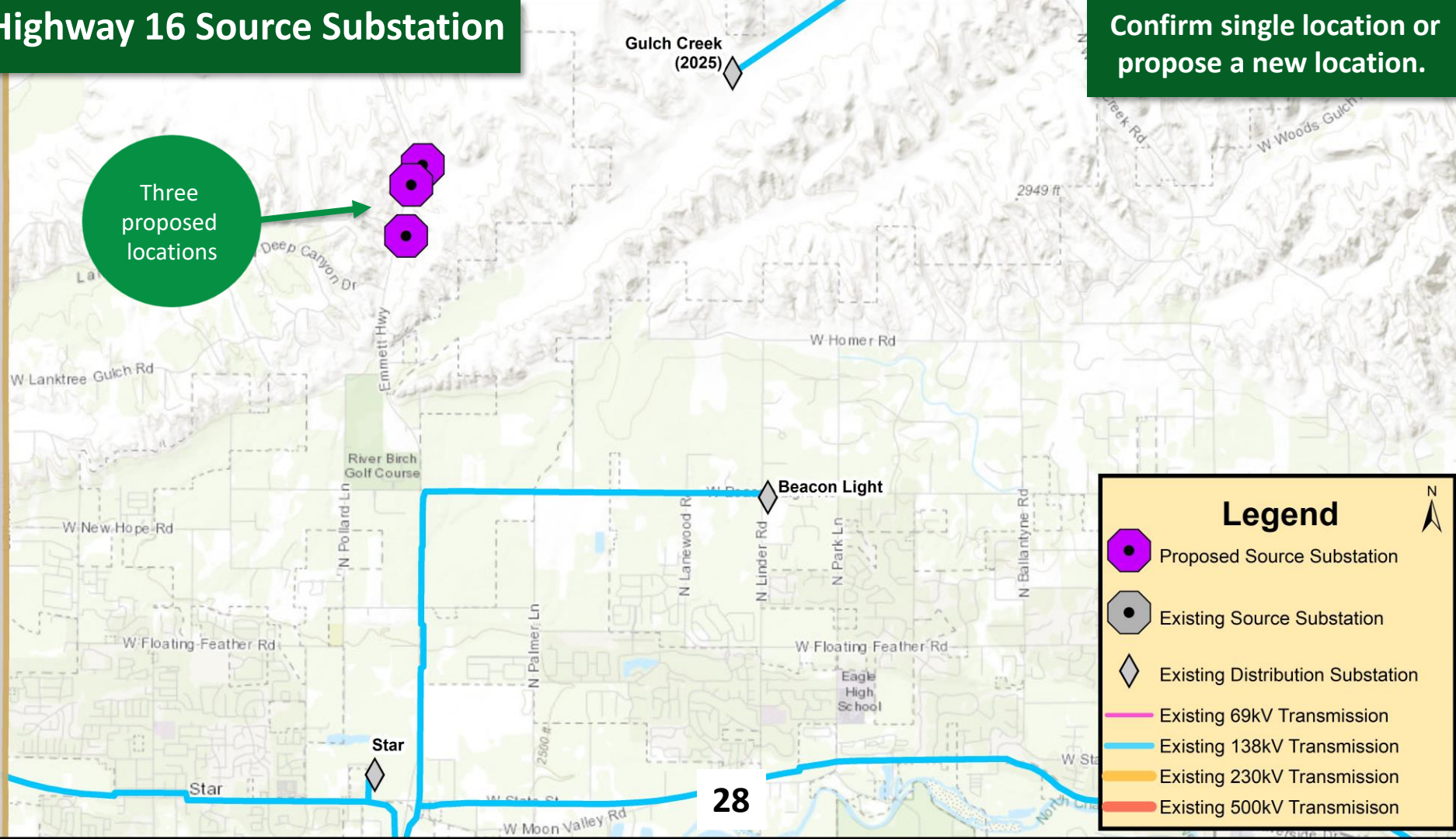
Mapping Step 1

- Review and confirm or adjust proposed **source substation** sites
 - Highway 16 Source Substation
 - Dry Creek Source Substation
 - Hubbard Source Substation
 - South Boise Substation

Highway 16 Source Substation

Confirm single location or propose a new location.

Three proposed locations



Gulch Creek (2025)

2949 ft

Beacon Light

Star

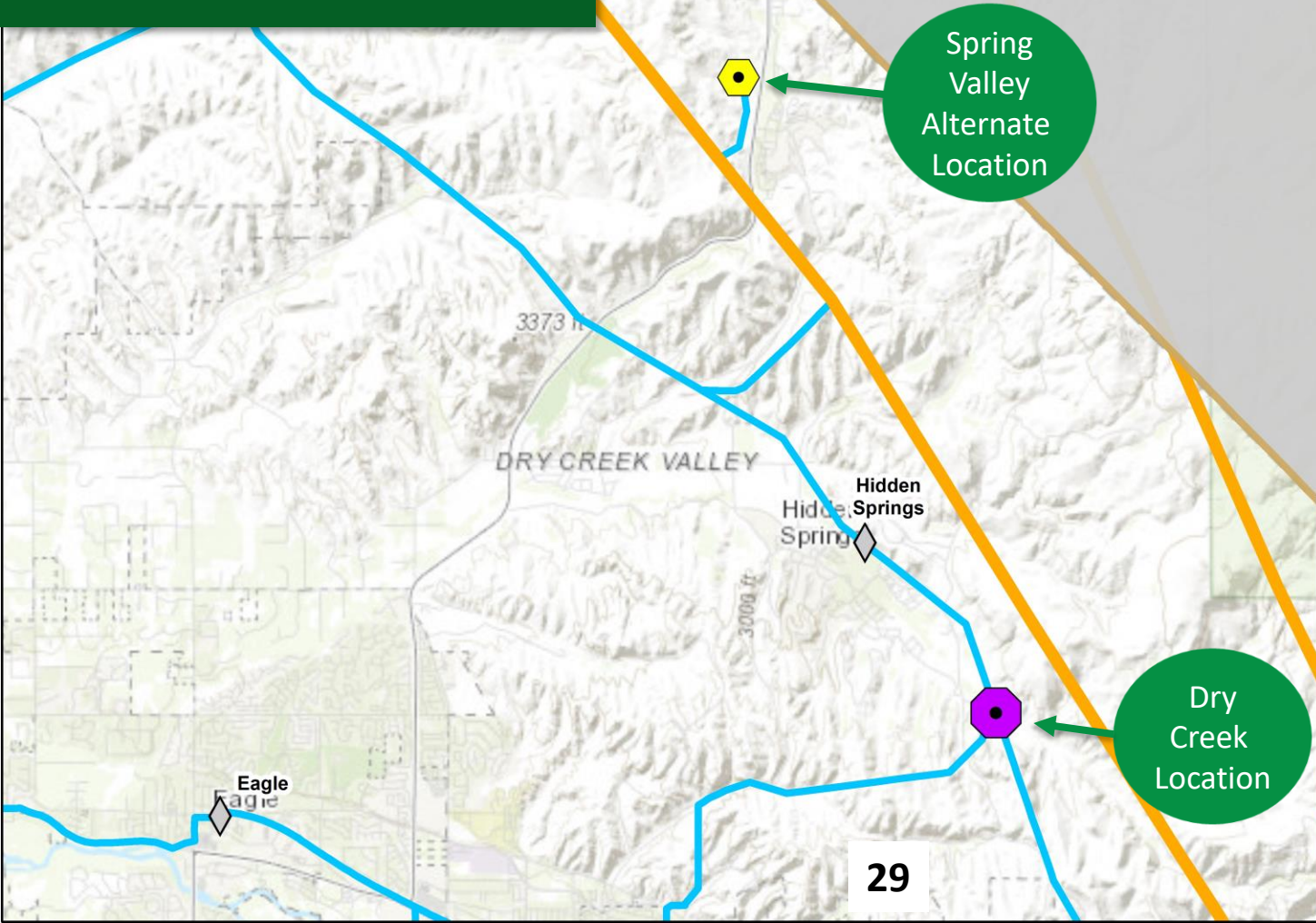
28

Legend

- Proposed Source Substation
- Existing Source Substation
- Existing Distribution Substation
- Existing 69kV Transmission
- Existing 138kV Transmission
- Existing 230kV Transmission
- Existing 500kV Transmission

Dry Creek Source Substation

Confirm or propose new location.



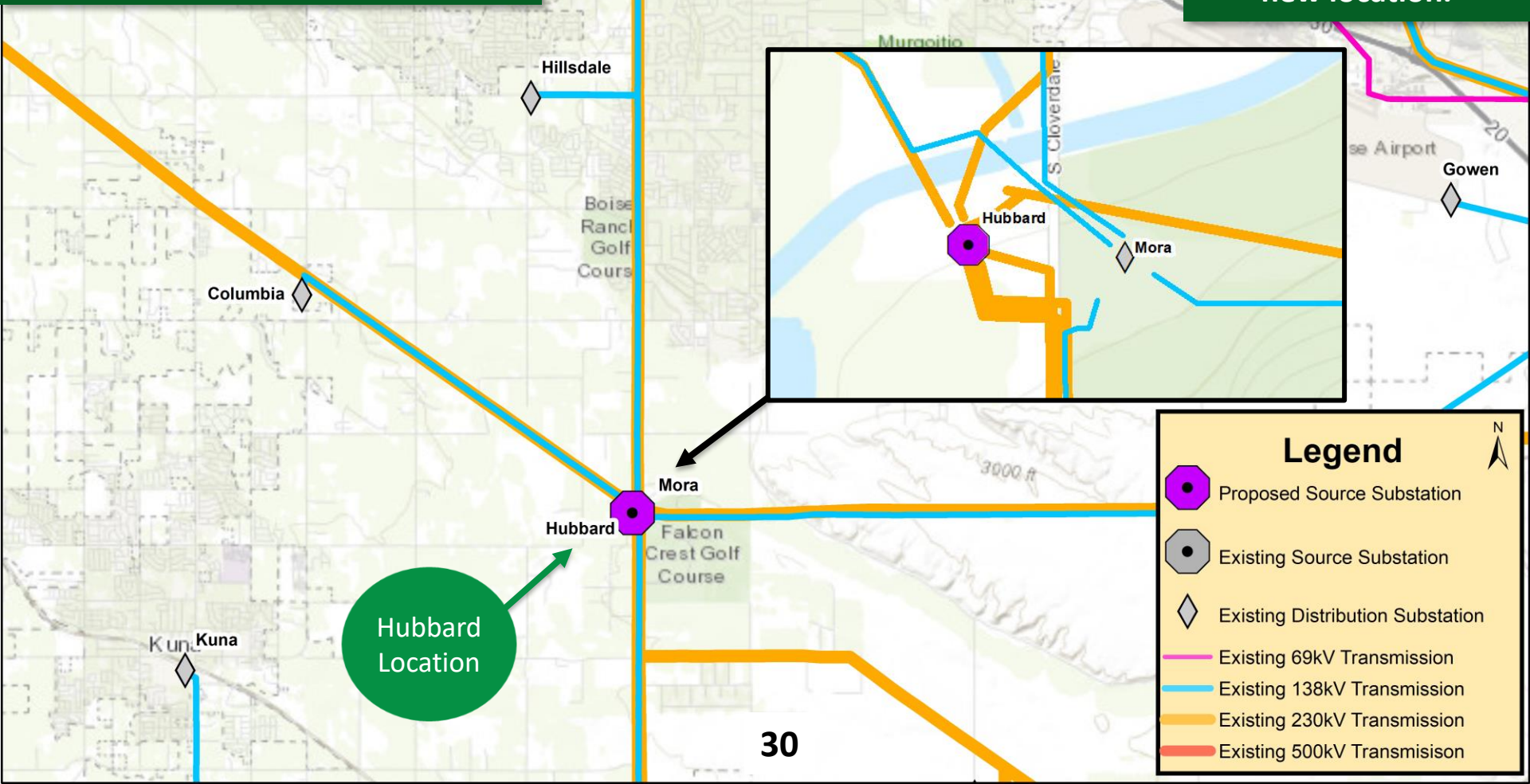
Legend

- Proposed Source Substation
- Existing Source Substation
- Existing Distribution Substation
- Existing 69kV Transmission
- Existing 138kV Transmission
- Existing 230kV Transmission
- Existing 500kV Transmission

N

Hubbard Source Substation

Confirm or propose new location.



Hubbard Location

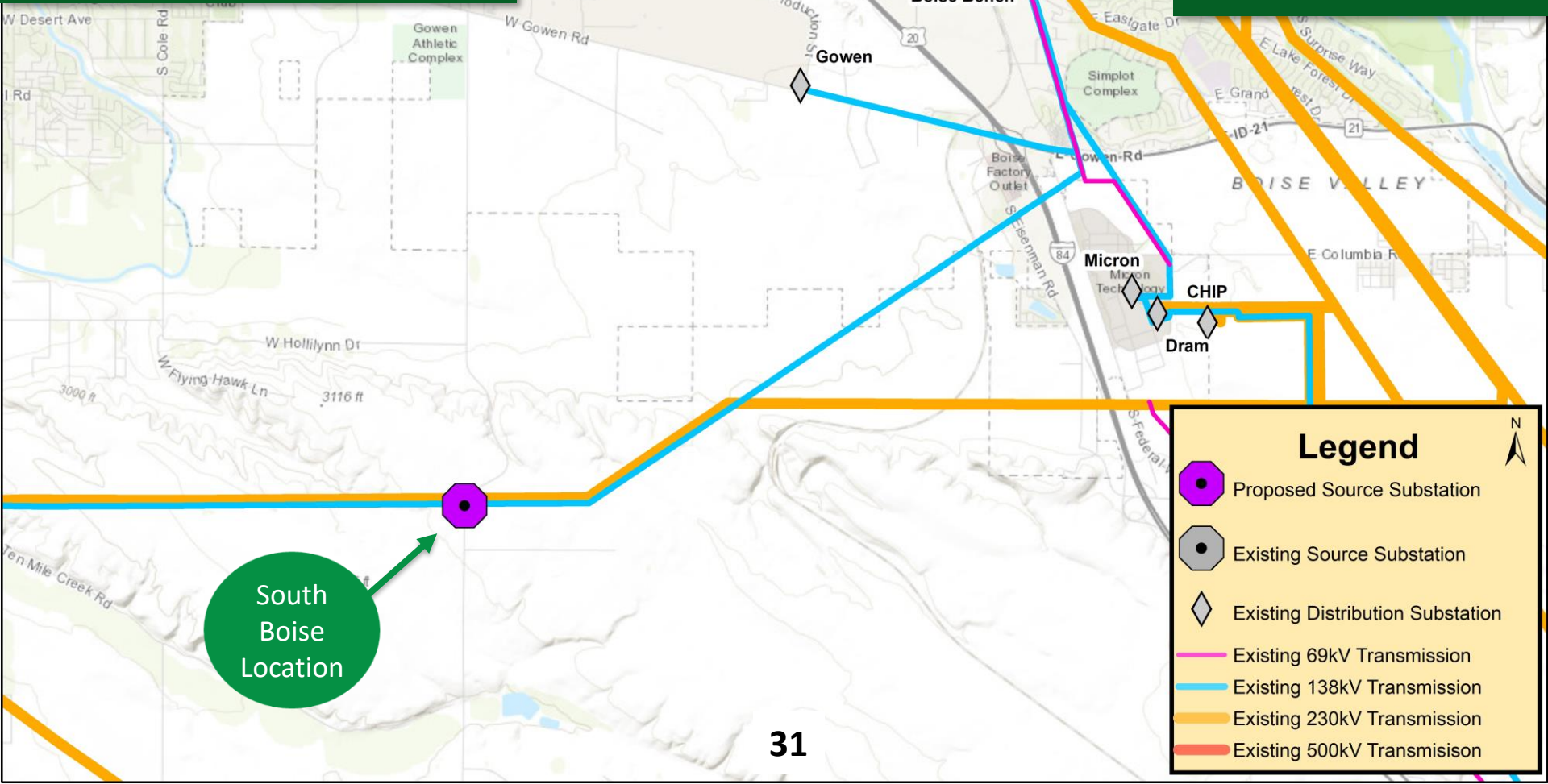
Legend

- Proposed Source Substation
- Existing Source Substation
- Existing Distribution Substation
- Existing 69kV Transmission
- Existing 138kV Transmission
- Existing 230kV Transmission
- Existing 500kV Transmission

30

South Boise Substation

Confirm or propose new location.



Legend

- Proposed Source Substation
- Existing Source Substation
- Existing Distribution Substation
- Existing 69kV Transmission
- Existing 138kV Transmission
- Existing 230kV Transmission
- Existing 500kV Transmission

N

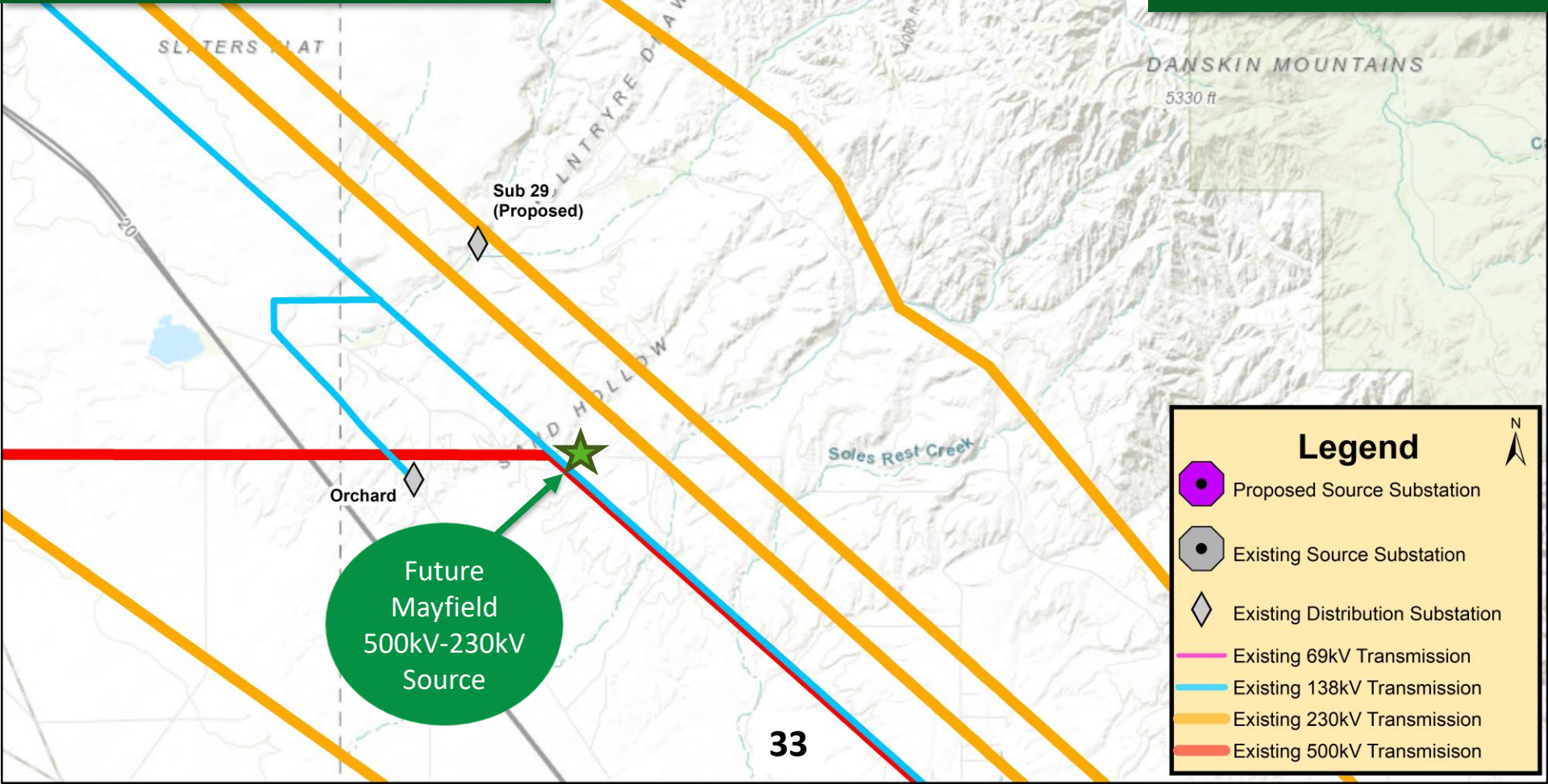


Mapping Step 2








- Propose new **source substation** sites
 - Mayfield Area Source Substation
 - Idaho Power owns land for a future 500kV to 230kV source substation
 - Amity Area Source Substation
 - Idaho Power owns 1.8 acres of land in the area of the proposed distribution substation 2.
 - Idaho Power will need 5-10 acres of land for this source substation.

Mayfield Area Substation

Select a single preferred location.



Legend

-  Proposed Source Substation
-  Existing Source Substation
-  Existing Distribution Substation
-  Existing 69kV Transmission
-  Existing 138kV Transmission
-  Existing 230kV Transmission
-  Existing 500kV Transmission

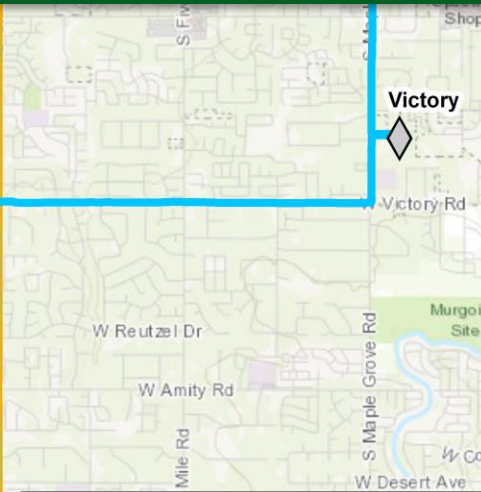
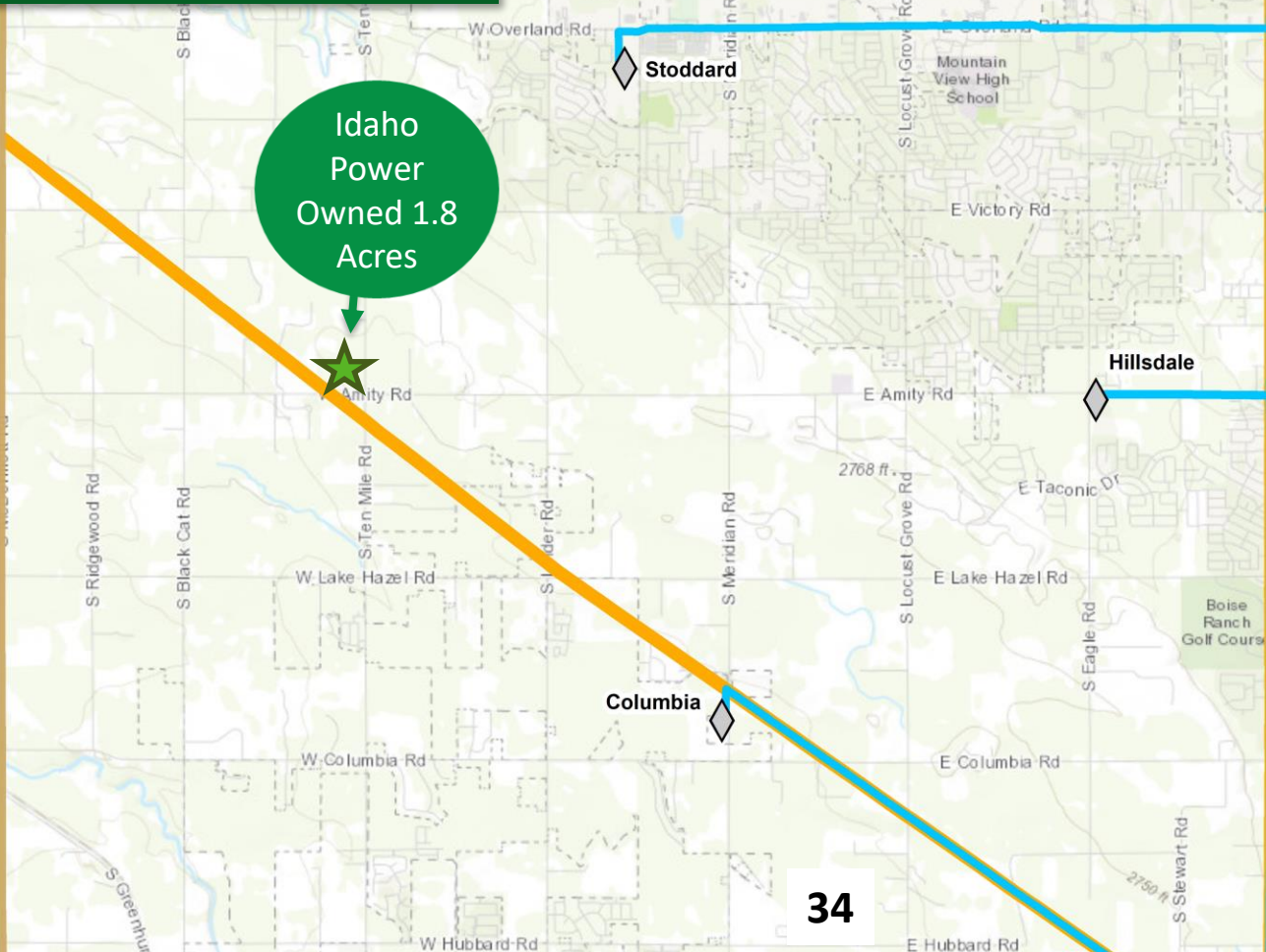


Future
Mayfield
500kV-230kV
Source

Amity Area Substation

Select a single preferred location.

Idaho Power
Owned 1.8
Acres



Legend

- Proposed Source Substation
- Existing Source Substation
- Existing Distribution Substation
- Existing 69kV Transmission
- Existing 138kV Transmission
- Existing 230kV Transmission
- Existing 500kV Transmission



Mapping Step 3

- Confirm or propose at least two **high voltage transmission line** routes to each source substation.

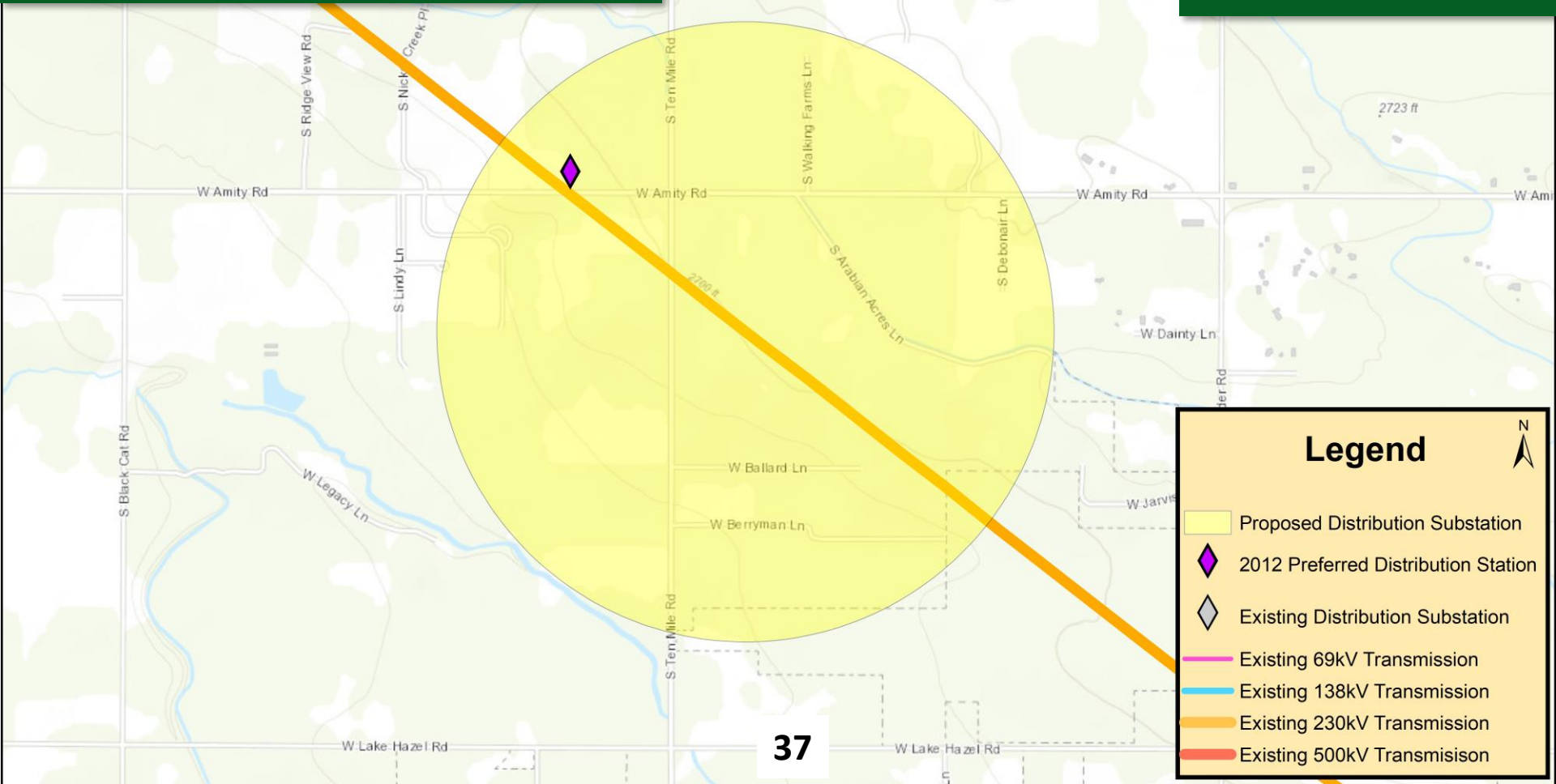


Mapping Step 4

- Confirm or adjust 2012 ETVEP **distribution substation** sites.
 - 11 substation locations to confirm or revise.

Distribution Substation Example

Confirm or propose new location.



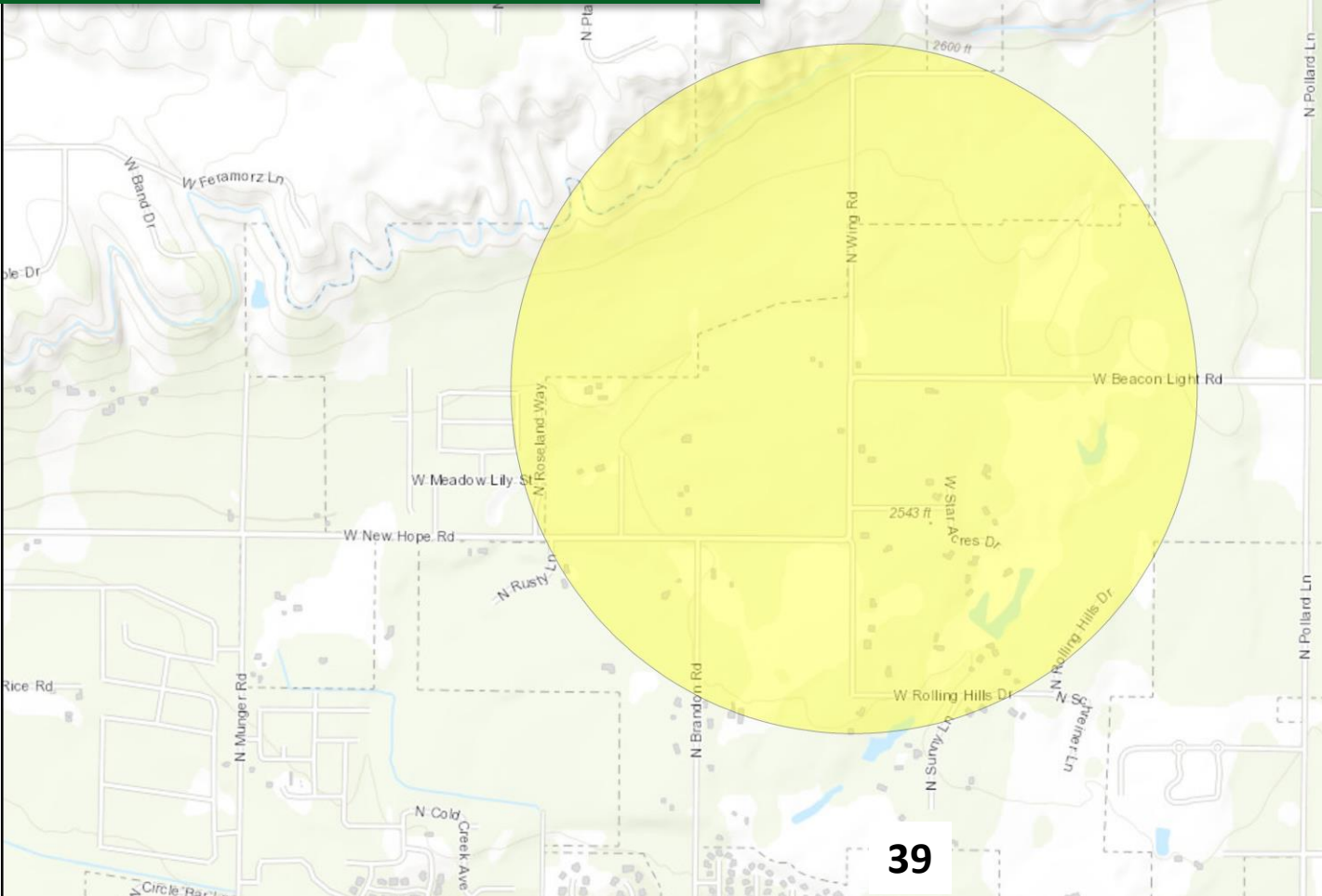


Mapping Step 5

- Propose sites for new **distribution substations**
 - 18 substation circles to identify preferred locations.
 - Relevant information included in notes

Distribution Substation Example

Select a single preferred location.



Legend

Proposed Distribution Substation

Existing Source Substation

Existing Distribution Substation

Existing 69kV Transmission

Existing 138kV Transmission

Existing 230kV Transmission

Existing 500kV Transmission



Mapping Step 6

- Confirm or propose **138 kV transmission line routes** connecting distribution substations to either a source substation or another distribution substation.

Eastern Treasure Valley Electrical Plan Update



Mapping Orientation



Jim Burdick
Engineering Leader
Idaho Power

Eastern Treasure Valley Electrical Plan Update



Next Steps

Jim Burdick
Engineering Leader
Idaho Power

