



Helpful Facts

Transmission System

- The existing electrical load in the Magic Valley is about 700 MW. At buildout, the Magic Valley load will be 2,000 MW (includes 20% reduction because of energy efficiency). This means that the MVEP must design for **1,300 MW** of new load through buildout
 - See “bubble” drawing for detailed buildout requirements
- 9 new *distribution* substations will be needed at buildout
- 2 new *source* substations will be needed at buildout
- A 230,000 Volt substation must have at least two 230,000 Volt lines connecting to it
- More than one transmission line can be placed in the same corridor
 - Sometimes a wider corridor is used and multiple transmission lines are placed alongside each other
 - A lower voltage line is often placed below (closer to the ground) a higher voltage line on the same pole. This requires a taller pole
- Transmission Line Capacity Summary for New Transmission Lines (transmission line capacities can vary depending on wire size, circuit length and tower construction)
 - 230 kV – 300 to 500 MW
 - 138 kV – 100 to 200 MW
 - 69 kV – 25 to 75 MW

System Funding

- Typically Idaho Power funding, which is included in the ratepayer base, includes costs for overhead transmission systems and facilities
- Underground transmission facilities are typically paid for by others: Cities, counties, private developments, etc.
- Routes and designs for transmission systems that vary substantially from the most straightforward routes and designs, may require all or partial funding from sources other than Idaho Power

Community Advisory Committee Siting Criteria

- **Siting:** Site new facilities with an effective balance between system needs and area resident concerns
 - *Utilize existing electrical and transportation corridors where feasible when siting new electrical transmission facilities*
 - *Avoid siting new facilities in residential areas*
 - *Place substations out of developed areas where feasible*
 - *Site new substations early to minimize conflicts with development*



Goals for Developing and Evaluating Alternatives

Reliability: Provide reliable electric service to all Idaho Power customers in the Magic Valley service area.

- *Provide adequate system capacity to satisfy N-1 conditions (for main grid transmission) throughout the Magic Valley service area*
- *Provide redundant systems that provide a minimum of N-1 capability (for main grid transmission) throughout the Magic Valley service area*
- *Continue maintenance and operation programs that ensure optimum reliability*

Efficiency: Plan, manage and operate the Magic Valley electrical system for optimum efficiency

- *Plan and develop efficient systems that require fewer new lines, fewer line miles and fewer substations, including consideration for distributed generation*
- *Maintain reasonable costs to customers for electrical service*

Energy Conservation: Optimize conservation of electrical energy resources

- *Design and operate the electrical system to conserve electricity*
- *Provide effective public education programs regarding efficient use of electricity, conservation, etc.*
- *Develop and offer all feasible and applicable energy conservation programs and incentives throughout the Magic Valley service area*
- *Encourage as much as feasible, the use of energy efficient design and operation in new building construction*

Environment: Avoid or minimize impacts to the environment from the electrical system

- *Avoid negative impacts from electrical facilities and system operation on the natural environment, sensitive resources and wildlife habitat ; mitigate unavoidable negative impacts where appropriate*
- *Avoid or minimize the negative aesthetic and visual impacts caused by the development and operation of electrical system facilities; mitigate unavoidable negative impacts where appropriate*
- *Do not construct / operate electrical facilities in designated scenic byways or that negatively affect other tourism assets*
- *Support the burying of electrical transmission lines where feasible to avoid undesired visual impacts and support desired community design and function*
- *Avoid negative impacts and interference to agricultural lands and operations; mitigate negative impacts where appropriate*
- *Utilize generation resources available in the Magic Valley where feasible*

Planning and Design: Plan and design of electrical system facilities that effectively meet the Magic Valley's current and future electrical demands

- *Identify and accommodate the electrical needs of defined growth areas*
- *Minimize the physical "footprint" of electrical facilities*
- *Utilize distributed generation wherever feasible to minimize the amount and extent of new electrical facilities*
- *Upgrade / expand existing electrical facilities wherever feasible to minimize the need for construction of new facilities*
- *Incorporate multiple lines (transmission and distribution) on each pole system when feasible to reduce the need for additional / new pole systems*



- *Accommodate / incorporate the use of cogeneration projects as much as feasible, while meeting other system goals*
- *Plan, design and construct facilities on an as needed basis, with consideration to anticipated needs*
- **Protect and minimize impact to existing structures from new facility design**

Transmission Line Mapping Information

230 kV Transmission

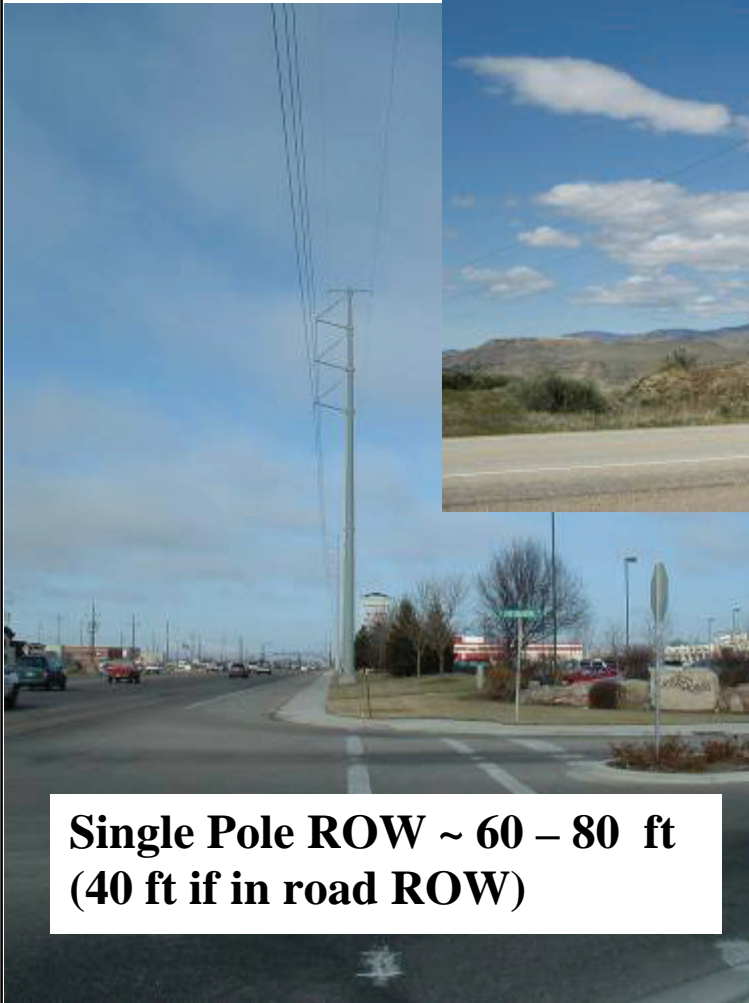
OH

tape color = orange

Capacity = 300 – 500 MW

Cost ~ \$350k - \$500k per mile OH
(plus ROW and permitting)

H-Frame ROW ~ 100 – 120 ft



**Single Pole ROW ~ 60 – 80 ft
(40 ft if in road ROW)**

Transmission Line Mapping Information

138 kV Transmission

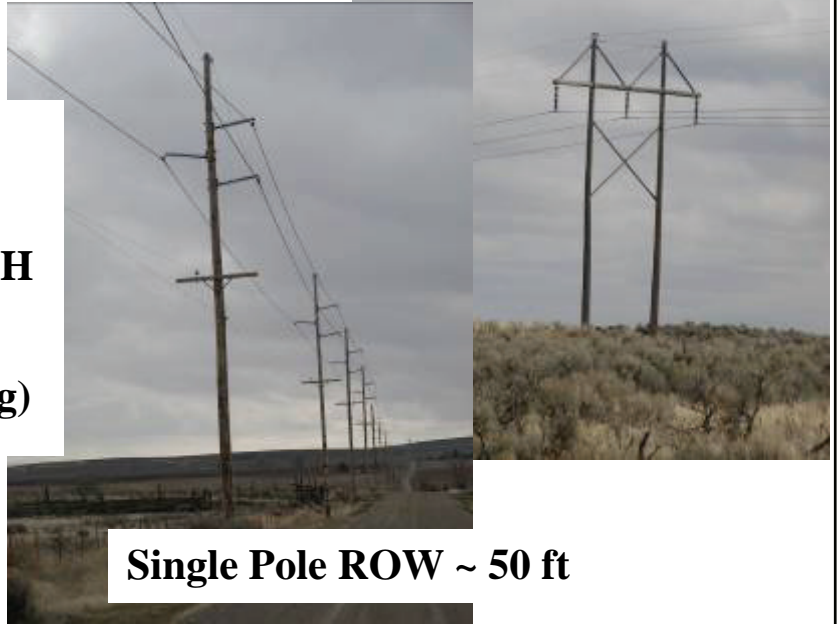
OH

tape color = blue

H-Frame ROW ~ 100 ft

Capacity = 100 – 200 MW

Cost ~ \$200k – 300k per mile OH
\$3M per mile UG
(plus ROW and permitting)



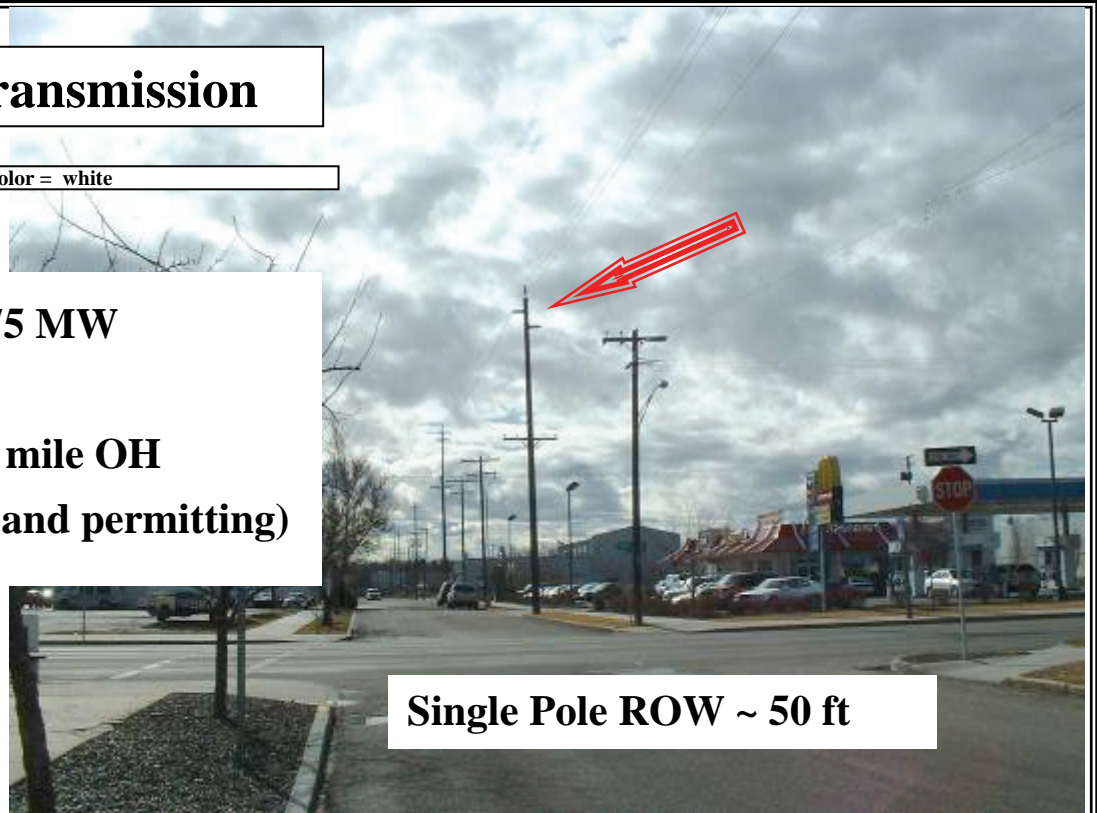
69 kV Transmission

OH

tape color = white

Capacity = 25 – 75 MW

Cost ~ \$175k per mile OH
(plus ROW and permitting)



Substation Mapping Information

Distribution Substations



Need 9 new distribution substations
Land required: 2 to 3 acres
Load served: 40 to 80 MW
Cost each: \$2.5M to \$4M

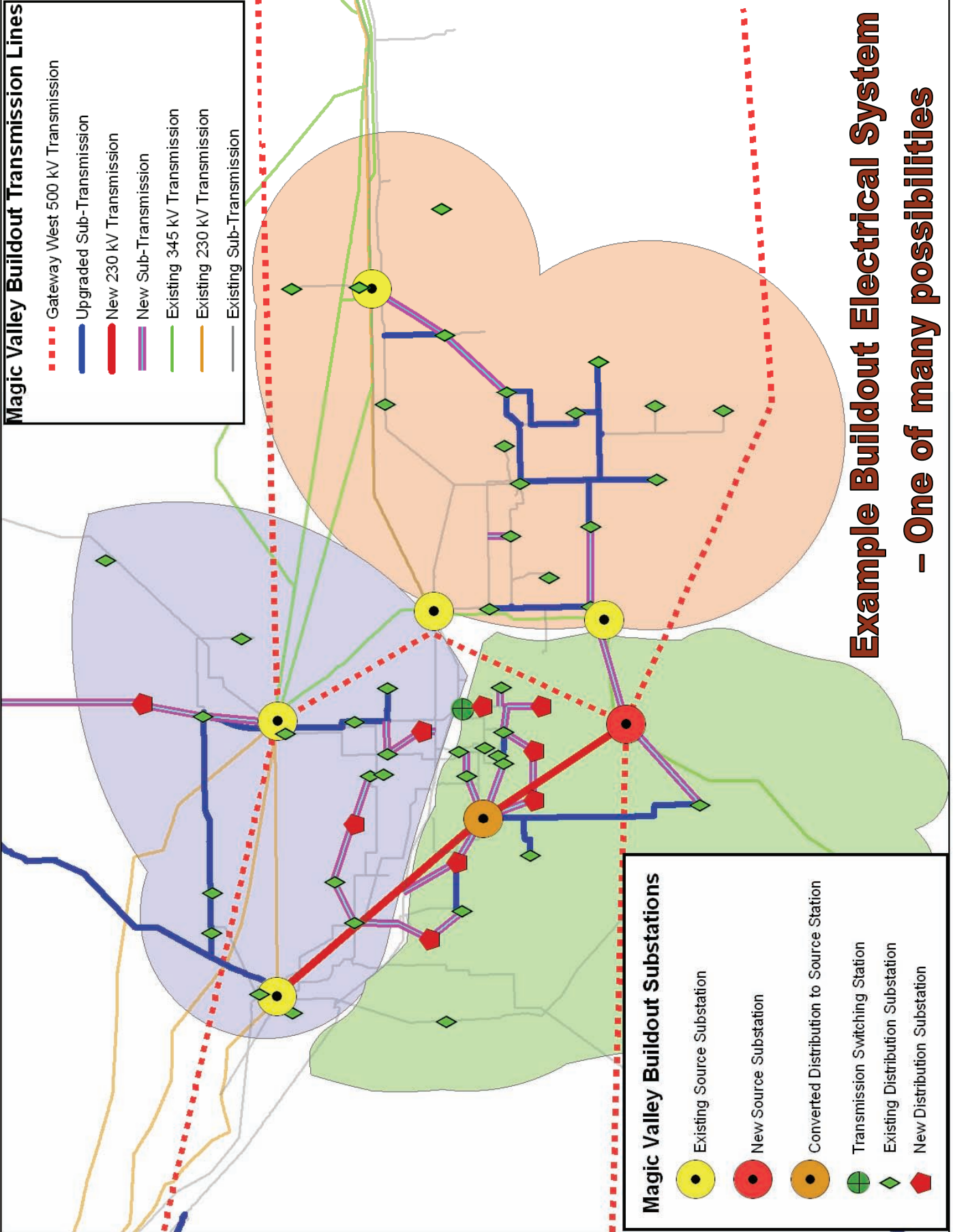


Source Substations



Need 2 new source substations
Land required: 5 to 10 acres
Load served: 400 to 600 MW
Cost each: \$7M to \$10M





Example Buildout Electrical System
- One of many possibilities