Reference Sheet—
Western Treasure Valley
Electrical Plan (WTVEP) Update

2022-2023

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REFERENCE SHEET—WESTERN TREASURE VALLEY ELECTRICAL PLAN (WTVEP) UPDATE

Purpose

The purpose of the Western Treasure Valley Electrical Plan (WTVEP) Update Community Advisory Committee (CAC) is to do the following:

- Update community goals and siting criteria for future transmission and substation electrical facility sites within the WTVEP study area.
- Use the updated community goals and siting criteria to select a preferred alternative for future transmission and substation electrical facility sites in the WTVEP study area.
- Discuss 2022 WTVEP integration in local comprehensive plans.

The recommendation of this committee will be used as a starting point when additional infrastructure is required on Idaho Power's electrical system. The normal public process will still be followed.

Please share your unique perspectives throughout this process—we value your input.

Meeting Schedule

September:	Generation, substations, transmission, 2011 WTVEP review, community goals and siting criteria
October:	Siting criteria alignment, small-group mapping
November:	Small-group mapping - Select preferred alternative for substation and transmission line sites
December:	Small-group mapping - Select preferred alternative for substation and transmission line sites
January:	Finalize mapping
March:	Review draft update, discuss comprehensive plan integration

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Power Terms

- **Voltage** (kilovolts [kV])—The pressure that moves a current of electricity. One kV equals 1,000 volts.
- **Power** (megawatts [MW])—The rate at which work is performed. One MW equals 1,000,000 watts.
    - One MW can power 650 homes on an average day, but only about 300 homes on a peak day, which occurs in the heat of the summer.
    - One MW can power one to two large box stores
- **Energy** (kilowatt-hours [kWh])—The amount of power used over time. A 100-watt light bulb on for 10 hours will consume this much energy:

$$\text{Energy} = 100\ \text{W} \times 10\ \text{hours} = 1{,}000\ \text{Wh} = 1\ \text{kWh}$$

- **Capacity** (MW) —The maximum amount of power an element of the power system can handle or produce. For example, in a freeway analogy, capacity is represented by the number of cars that can cross a line on a freeway at the same time, while energy is represented by the number of vehicles that cross the line over time. Capacity constraints can be alleviated by the following:
    - Decreasing the power required during peak hours (demand response)
    - Decreasing the power required with energy efficiency measures
    - Adding transmission lines, substations, and generators
- **Peak demand** (MW)—The amount of power used during a peak day in summer or winter.

Unit Summary Table

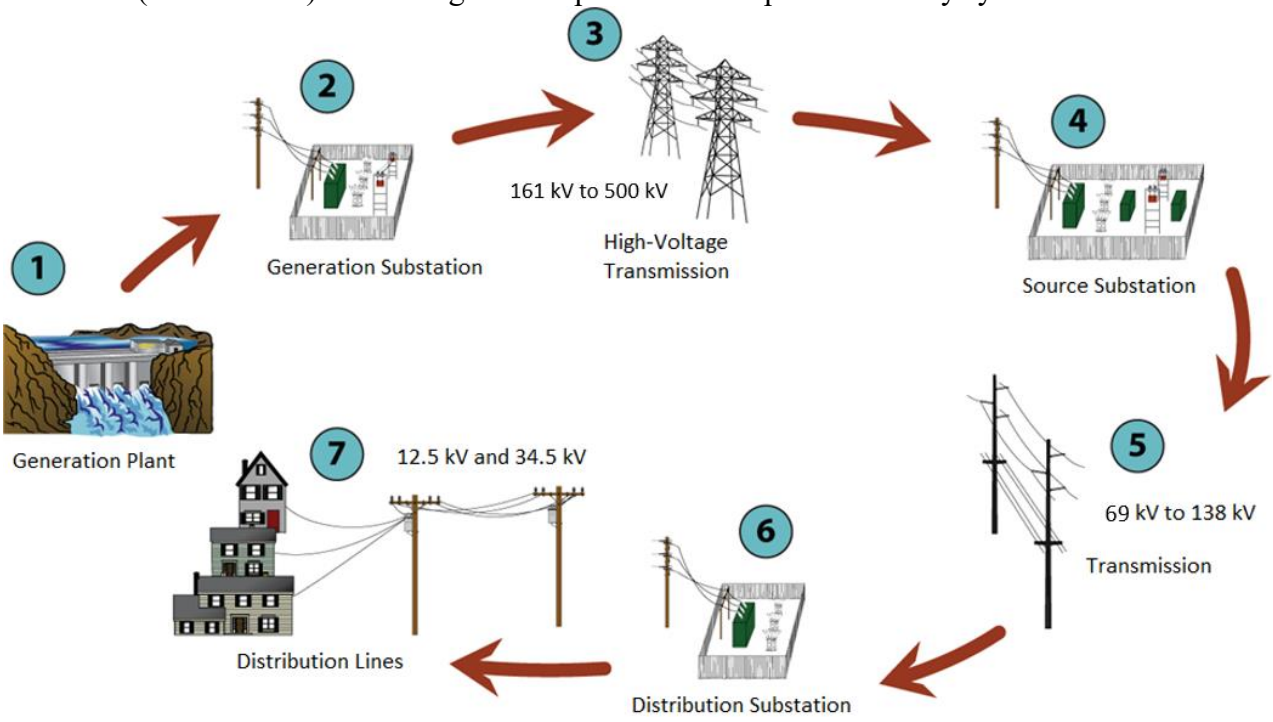
	Base Unit	Typical Unit
Voltage	Volt (V)	kilovolt (kV)*
Power	Watt (W)	megawatt (MW)**
Capacity	Watt (W)	megawatt (MW)**
Energy	Watt-hours (Wh)	kilowatt-hours (kWh)

*kilo = 1,000

**mega = 1,000,000

Power Delivery System

The electrical power delivery system is made of different elements. Power is drawn toward the load, as a mouse is drawn to cheese through a maze. The energy will find the path of least resistance (easiest route). Following are components of the power delivery system:



1. **Generation Plant**—Energy is produced by generators at power plants.

2. **Generation Substation**—The voltage is increased to make long-distance transmission more economical because the amount of energy loss due to resistance in the line is reduced.

3. **High-Voltage Transmission** (230 to 500 kilovolts [kV])—High-voltage transmission lines can transfer large amounts of power long distances. They are used to interconnect large cities and transfer power between states. The CAC will have the opportunity to review 230 kV high-voltage transmission lines that interconnect future source substations.

4. **Source Substation**—Transforms or converts high-voltage transmission voltage to lower voltage transmission to serve distribution substations located throughout communities. They use 5 to 10 acres.

5. **Transmission (**69 to 138 kV)—Transmission lines bring power to and interconnect distribution substations

6. **Distribution Substation**—Distribution substations are located throughout communities and are common in both urban and rural areas. They typically cover 2 to 3 acres. Substations are used to transform one voltage to another and protect and control power lines. They include transformers, circuit breakers, switches, support structures, and large metallic pipe called bus to connect the components together.

7. **Distribution Lines** (12.5 and 34.5 kV)—Distribution lines carry power from substations to homes and businesses. Because of the local nature and the quantity of distribution lines, they are out of the defined scope of the WTVEP.

    - **Underground Distribution**—34.5 kV distribution is typically overhead, but 12.5 kV distribution can be underground or overhead. Typically, installing underground distribution is more expensive than overhead distribution. The difference in cost is usually borne by the party that requests the underground line.

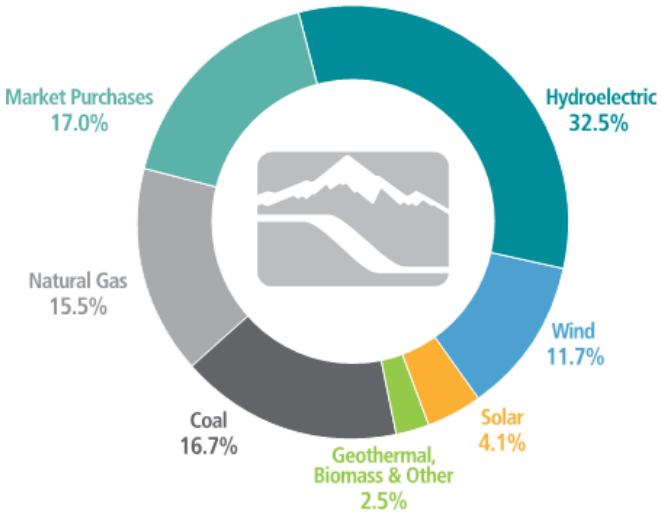
Generation Resources

Idaho Power's generation resources include the following. See Table 4.2 on page 37 of the company's 2021 Integrated Resource Plan (IRP) for a detailed list.

- Seventeen hydroelectric facilities along the Snake River and its tributaries. They vary in size. The Hells Canyon Complex (HCC) is the largest.
- Part ownership of two coal-fired generation plants.
- Three natural gas-fired plants.
- One small diesel generator (infrequently used).

Idaho Power also has many customer-owned generation resources feeding into our system, many of which reside in the Western Treasure Valley. These generation sources use transmission and distribution lines to deliver energy to our customers.

In 2021, 64.7% percent of Idaho Power's supply of electricity came from company-owned generation resources.



Alternative Resources

Energy Efficiency

Energy efficiency—Methods or appliances that assist in saving energy.

Examples include the following:

- Efficient appliances use less energy (e.g., LED bulbs and new appliances).
- Switching devices can save energy by controlling when other devices operate (e.g., smart switches that turn off the light when no one is in the room).
- Construction materials can reduce the amount of energy loss from homes (e.g., insulation).

Demand Response

Demand response (DR)—Programs designed to shift load from peak demand hours to when there is ample capacity. The goal is to delay or eliminate the need to build new generation resources. Net energy consumption may or may not be reduced.

Demand response programs can take different forms:

- Some programs incent customers to reduce energy usage during peak hours or shift the energy use to non-peak hours. An example is setting a timer on a dishwasher to delay operation.
- For other programs, customers agree beforehand to have certain loads switch off or cycle, as with irrigation pumps or air conditioners.

Current demand response programs include the following:

- **A/C Cool Credit**—Participating residential customers' air conditioners are cycled on and off, typically over a three-hour period.
- **Irrigation Peak Rewards**—Participating irrigation customers agree to have their irrigation pumps turned off when needed.
- **Flex Peak Program**—Some large commercial and industrial customers agree to use less energy during peak hours.

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Distributed Generation

Distributed generation—Small generators connected to the distribution system (e.g. Solar Generating Facility).

The West Treasure Valley has the following types of distributed generation:

- Solar
- Hydro

Market Purchases

Market purchases—Power purchased from the market by Idaho Power to augment its own generation.

Idaho Power purchases power from the market to augment its own generation.

- The cost is high when demand is high (middle of summer).
    - Highest in late afternoon when Idaho Power's peak hits.
    - Sometimes we must purchase power from the southeast (Utah, Arizona, New Mexico). This power can be quite expensive.
- The cost is low when demand is low (spring and fall).
- In 2021, Idaho Power purchased about 25% of its energy on the market. The percentage is typically between 15% and 35% and depends on many factors, including hydro conditions.

Notes:

Integrated Resource Plan (IRP)

Idaho Power's IRP examines the demand for energy over the next 20 years and the best ways to meet that demand for our customers. The plan is updated every two years. The 2021 IRP was submitted to the Idaho Public Utilities Commission and the Public Utility Commission of Oregon in December 2021.

The IRP describes the company's projected need for additional electricity and the resources necessary to meet that need while balancing reliability, environmental responsibility, efficiency, risk and cost.

Idaho Power enlists the assistance of its customers in developing the IRP through an advisory council—the Integrated Resource Plan Advisory Council (IRPAC)—which consists of members of the environmental community, major industrial customers, irrigation representatives, state legislators, public utility commission representatives, and other interested parties. The IRPAC's responsibilities include the following:

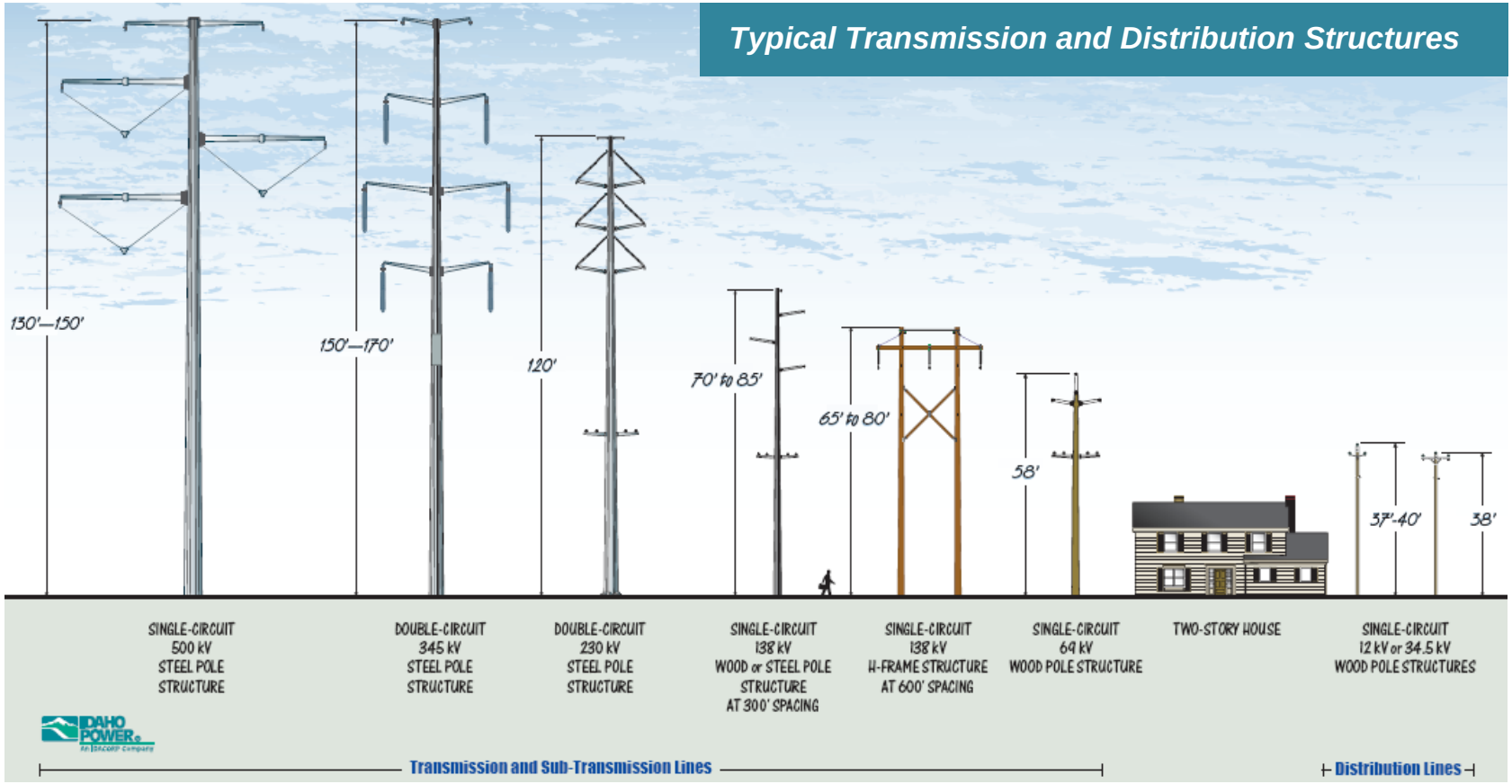
- Representing the interests of Idaho Power's more than 600,000 customers
- Participating in open and active discussions of relevant issues
- Working with Idaho Power to develop ways to engage the public in the IRP process

The IRPAC meets with Idaho Power regularly over a period of several months during the development of the company's IRP. These meetings are public. The current plan is posted on Idaho Power's website (under Energy > Planning). The table below from the current plan lists the plan's additional generation resources.

Base B2H (MW)									
Year	Gas	Wind	Solar	Storage	Trans.	DR	Coal Exits	EE Forecast	EE Bundles
2021	0	0	0	0	0	0	0	23	0
2022	0	0	0	0	0	300	0	24	0
2023	0	0	120	115	0	20	-357	24	0
2024	357	700	0	5	0	0	0	25	0
2025	0	0	300	105	0	20	-308	27	0
2026	0	0	215	0	500	0	0	28	0
2027	0	0	250	5	0	0	0	27	0
2028	0	0	120	55	0	0	-175	27	0
2029	0	0	100	255	0	0	0	26	0
2030	0	0	0	55	0	0	0	24	0
2031	0	0	0	55	0	0	0	24	0
2032	0	0	0	55	0	0	0	23	0
2033	0	0	0	100	0	0	0	22	0
2034	-357	0	100	150	0	0	0	21	0
2035	0	0	100	305	0	0	0	20	0
2036	0	0	0	55	0	0	0	16	0
2037	0	0	0	105	0	0	0	14	0
2038	0	0	100	155	0	20	0	12	0
2039	0	0	0	55	0	20	0	11	3
2040	0	0	0	55	0	20	0	10	9
Subtotal	0	700	1,405	1,685	500	400	-841	428	12
Total	**4,289**								

Notes:

Transmission



Capacity, height, right-of-way requirements, and cost vary by voltage and construction. Typical values are as follows:

Voltage (kV)	Capacity (MW)	Typical Height (feet)	Right-of-Way (feet)	Cost (per mile)
500	1,500	150	–	$ millions
230	500	100–120	60–120	$1M–$1.2M
138	200	65–85	50–100	$450k–$500k
69	70	58	50	$250k–$300k

Substations

Substations are used to transform one voltage to another and protect and control power lines. They include transformers, circuit breakers, switches, support structures, and large metallic pipe called bus to connect the components together.

- **Source substation**—Converts high-voltage transmission lines (230 kilovolts [kV] and above) to lower voltages (69 to 138 kV). Acts as a power source for distribution substations.
- **Distribution substation**—Substations that serve local loads in urban and rural neighborhoods.

Substation Type	Capacity (MW)	Area (acres)	Cost
Source	200–600	5–10	$12M–$18M
Distribution	5–88	2–3	$6M–$8M

Notes:

2011 WTVEP

The 2011 Western Treasure Valley Electrical Plan Final Report is posted on Idaho Power's website (under Energy > Planning). The study area (shown below) encompasses all or part of six counties: Canyon, Gem, Malheur, Owyhee, Payette, and Washington.

Original Spatial Load Forecast

- Defined the area (Idaho Power's service area).
- Determined property ownership— Assume private land will fill in and that public land will require very little electrical load.
- Assigned land use/zoning designations to all private land; land use/zoning maps were obtained from the county and city jurisdictions.
- Assigned a load density to land-use/zoning designations for all private land (= MW/mi^2).
- Used the private land and load density to determine the buildout load requirement for the area—**2,980 MW**

Buildout

Buildout is defined as the point in time when all available land is developed according to the land-use ordinances. Growth is driven by industry, transportation, and population, but is bounded by the amount of available land and water.

- Buildout load by county:

County	2011 Load (MW)	Buildout Load (MW)
Canyon	422	1831
Gem	26	181
Malheur	86	336
Owyhee	24	252
Payette	74	325
Washington	35	55
Total	**667**	**2,980**

Developed Community Goals and Siting Criteria

The CAC created goals that set forth criteria to guide their choices for the alternatives for siting transmission lines and substations. The 2011 Community Goals and Siting Criteria can be found in Appendix B.

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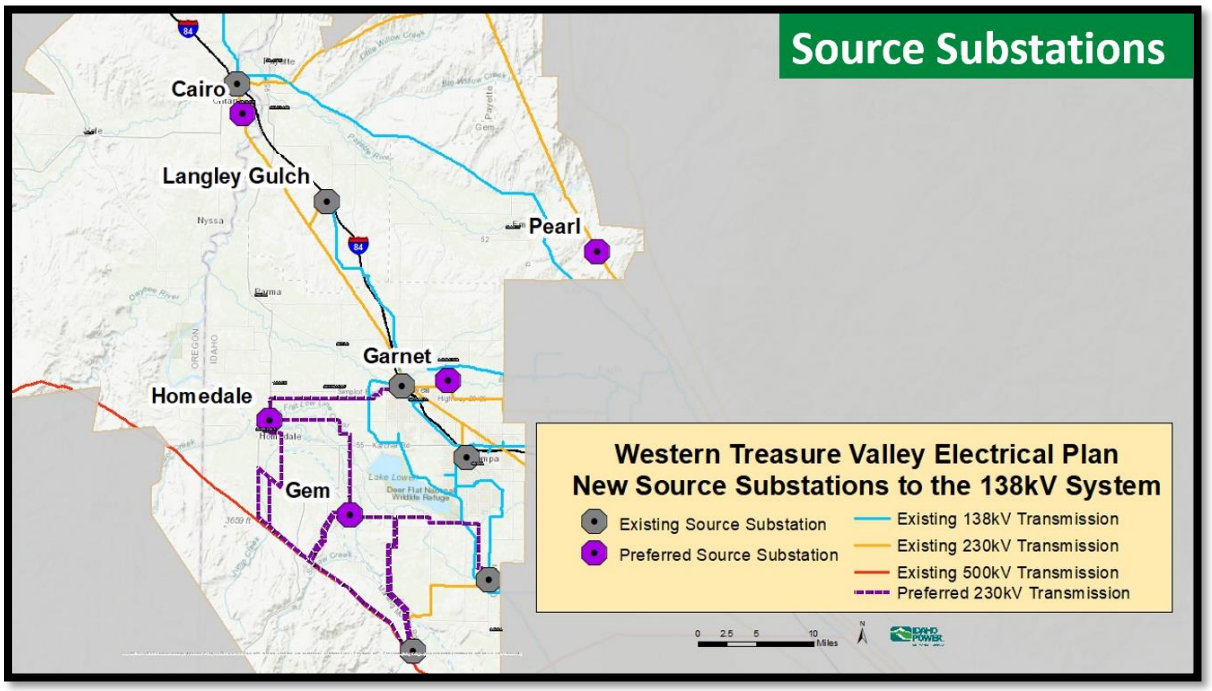
Buildout Requirements

Source Substation Requirements

Six source substation sites and connecting high voltage transmission lines.



- **Cairo** Source Substation
  - Create a source to the 138kV system by adding a transformation at the existing Cario substation South of Ontario.
- **Pearl** Source Substation
  - Proposed site is tentatively located southeast of Emmet on Pearl rd. near 116°21'10"W 43°50'53"N for mapping purposes. The siting of the Pearl 230 kV substation is out of scope for the WTVEP update.
- **Langley Gulch** Source Substation
  - Created a source to the 138kV system by adding transformation at the Langley Gulch powerplant. Langley Gulch source substation began operation in 2012.
- **Garnet** Source Substation
  - Create a source to the 138kV system by adding a transformation at the future Garnet substation site substation East of Caldwell.
- **Homedale** Source Substation
  - Create a source to the 138kV system by adding a transformation at the existing Homedale substation Northeast of Marsing.
- **Gem** Source Substation
  - Create a source to the 138kV system by adding a transformation at the existing Gem substation Southeast of Marsing.

138 kV Requirements

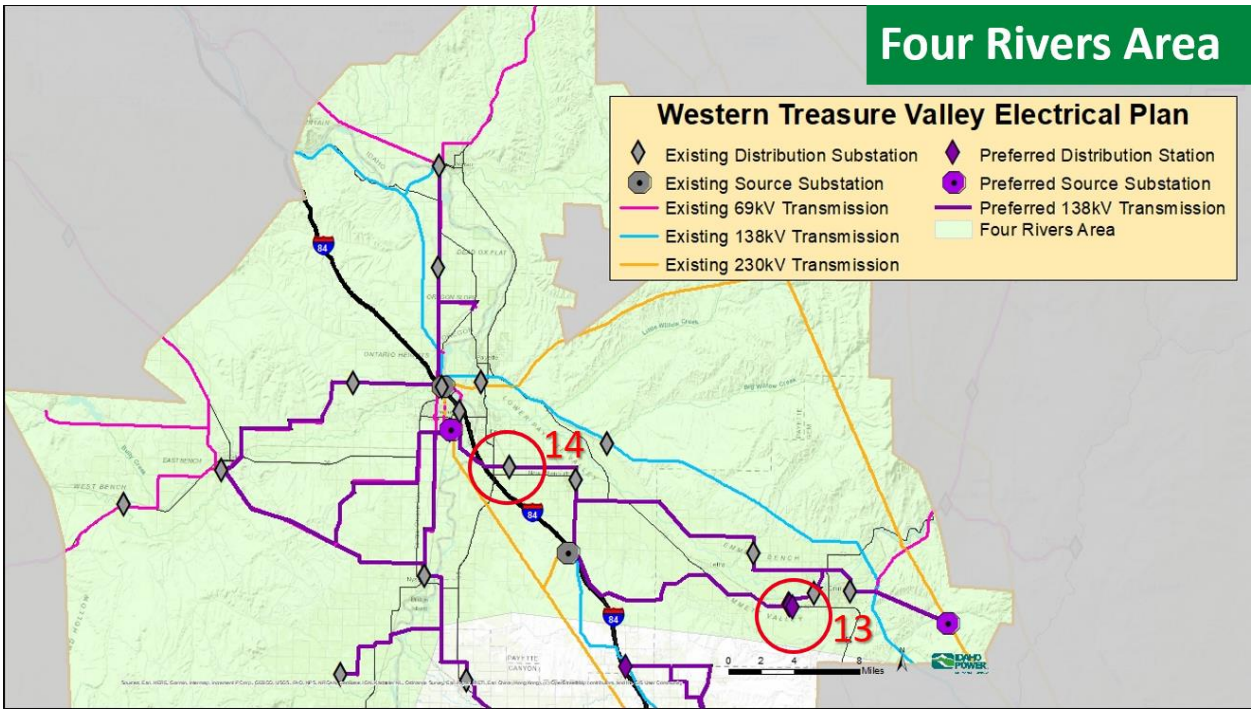
Eighteen distribution substations and connecting 138 kV transmission lines.

Study Areas

The 2011 WTVEP was divided into three areas, the Four Rivers, North Canyon and South Canyon areas. For a diagram of the 2011 study areas, see Appendix A Figure 1. The 2022 WTVEP update will splits the North Canyon area into two smaller areas as described below.

- The **Four Rivers** area encompasses Ontario, Emmett, and New Plymouth.
- The **North Canyon** area encompasses Middleton, Greenleaf, Homedale, and Parma.
- The **East Canyon** area encompasses Nampa and Caldwell,
- The **South Canyon** area encompasses Marsing and land south of Lake Lowell.

Four Rivers Area



- **Distribution Substation 13** - Located in southwest Emmett near Highway 52. The Committee provided three equally acceptable alternatives for consideration.
- **Distribution Substation 14** - Located between Fruitland and New Plymouth near the corner of NW 1st Ave. and Elmore Road. This substation currently under construction.

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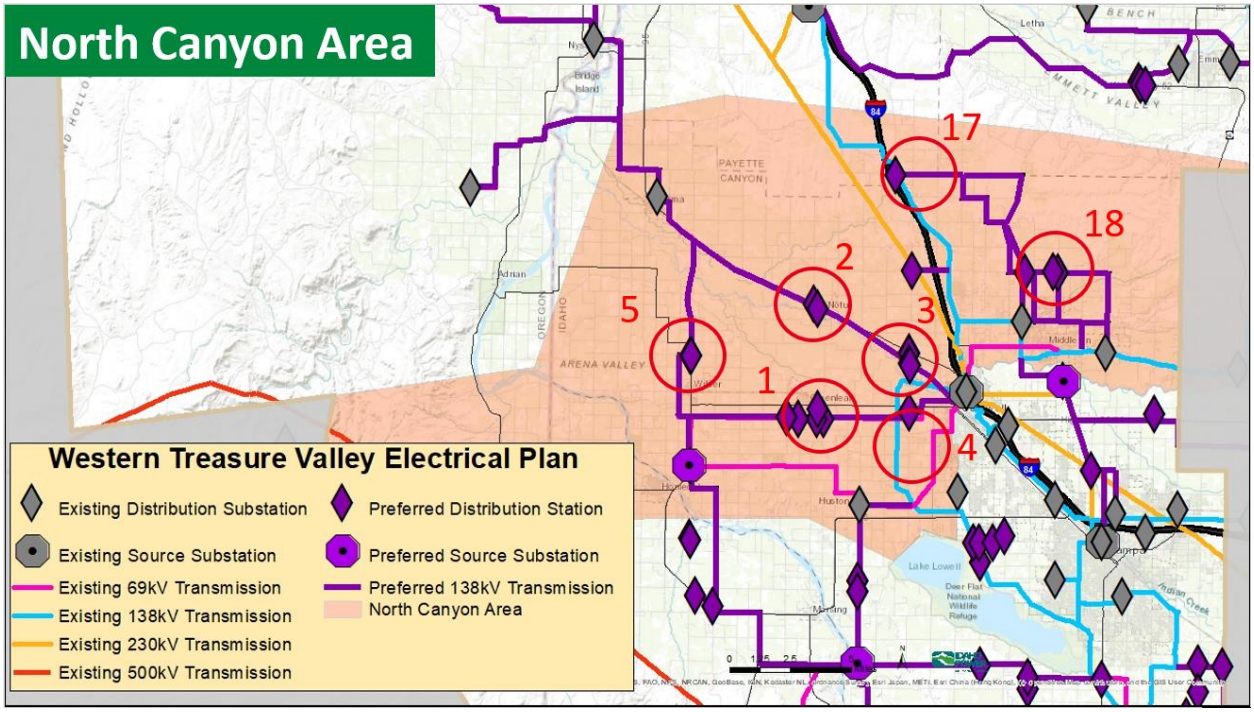
North Canyon Area



- **Distribution Substation 1** - Located south of Greenleaf. The Committee did not choose a single alternative as the preferred but instead provided five equally acceptable alternatives for consideration.

- **Distribution Substation 2** - Located northwest of Notus. The Committee provided two equally acceptable alternatives for the substation site.

- **Distribution Substation 3** - Located northwest of Caldwell, the Committee identified four sites, each considered equal in preference to the others.

- **Distribution Substation 4** - The existing Simplot Substation, west of Caldwell would be expanded to serve the needs of Substation 4. This alternative may be contingent on Idaho Power receiving permission from the Simplot Company to enlarge the substation area. The Committee also provided two secondary alternatives.

- **Distribution Substation 5** - Located north of Wilder at the corner of US-95 and Fern Lane and across the street from the existing Wilder Substation. Wilder Substation is located on property adjacent to the SSI beef packing plant and does not have space to expand. A secondary alternative was also identified approximately ½ mile to the east.

- **Distribution Substation 17** - The preferred alternative for Substation 17 is near the Payette – Canyon County line at the intersection of Sand Hollow Road and Oasis Road. This is in an area zoned for industrial use and near Interstate 84. A secondary alternative was identified ½ mile east.

- **Distribution Substation 18** - The Committee identified three equally acceptable alternatives north of Middleton, all located along Galloway Road.

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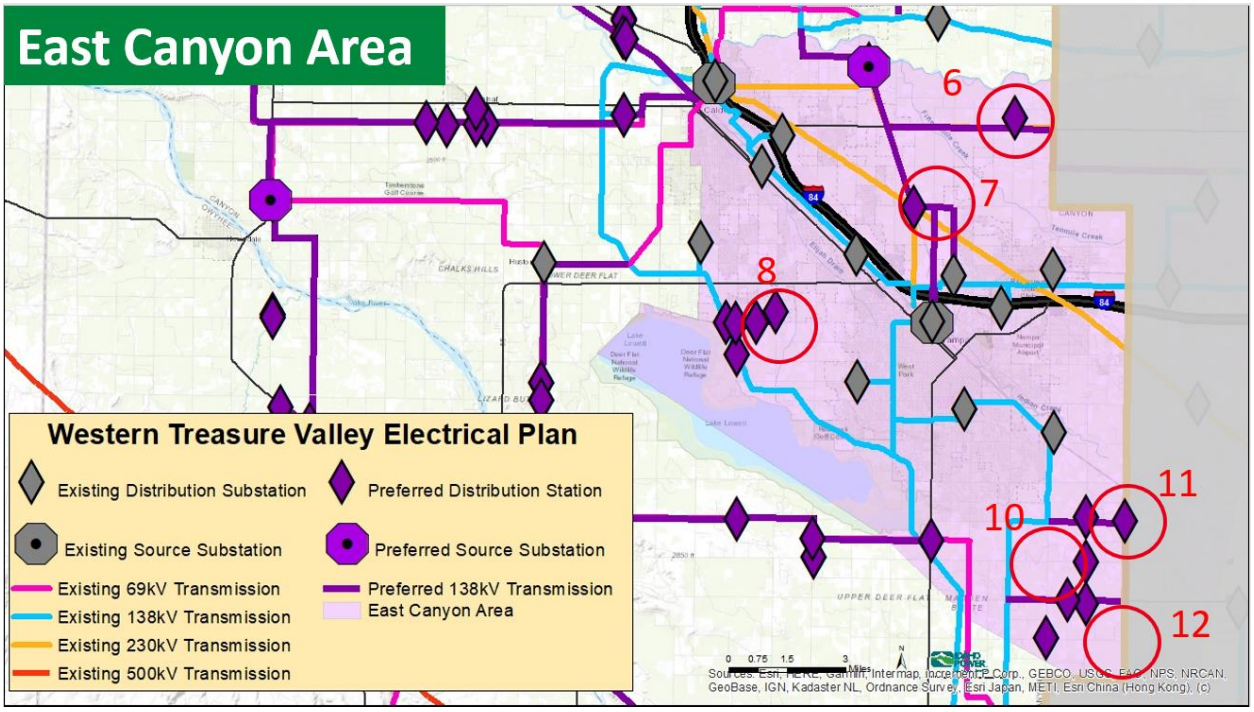
East Canyon Area



- **Distribution Substation 6** - Located southeast of Middleton near Highway 20/26 on IPC-owned property that was purchased for a future substation. The Committee also provided two secondary alternatives nearby.

- **Distribution Substation 7** - Located in north Nampa near the railway line as it crosses Ustick Road. The Committee also provided two secondary alternatives nearby.

- **Distribution Substation 8** - Five substation sites were identified as equally acceptable alternatives by the Committee. The sites are located in west Nampa near Orchard Avenue and South Indiana Avenue.

- **Distribution Substation 10/12** - The Committee provided four equally acceptable alternatives for this substation located southeast of Nampa in the Kuna Road – Robinson Road area.

- **Distribution Substation 11** - Two equally acceptable alternatives were identified by the Committee, both located along East Lewis Road in south Nampa.

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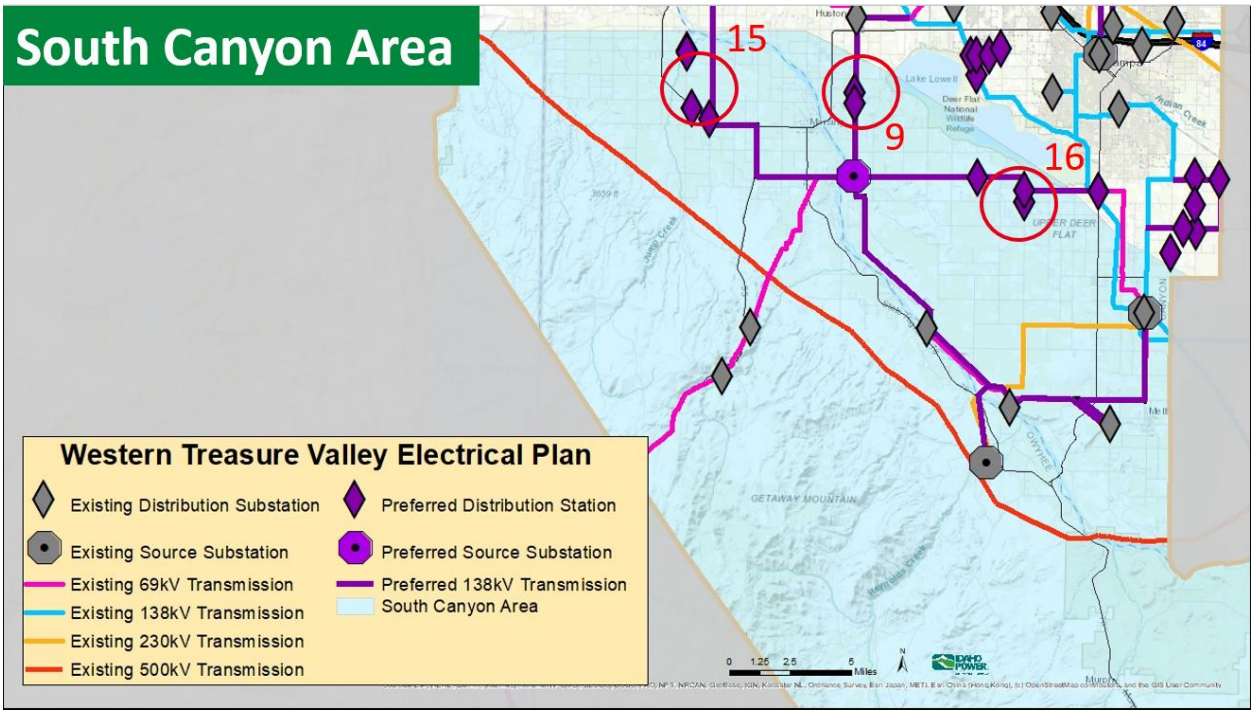
South Canyon Area



- **Distribution Substation 9** - Two equally acceptable alternatives were provided for Substation 9, both along Chicken Dinner Road near the intersection with Symms Road northeast of Marsing.

- **Distribution Substation 15 -**The Committee provided four alternatives for Substation D15 south of Homedale. The first alternative is near the intersection of N. Hogg Road and US-95. The second alternative is located along US-95 between N. Hogg Road and N. Jump Creek Road. The third and fourth alternatives are both located near the intersection of E. Market Road and N. Jump Creek Road. No new distribution substations required

- **Distribution Substation 16** - Three equally acceptable alternatives were provided for Substation D16 south of Lake Lowell. The first alternative is near the intersection of W. Lewis Lane and Pump Road, the second alternative is near the intersection of Emerald Road and Rim Road, and the third alternative is near the intersection of Deer Flat Road and Rim Road.

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Need to Update the WTVEP

The following drive the need to update the WTVEP

- Evolving community goals
- Changing future land use and zoning
- Growth not always occurring where and when it is anticipated

WTVEP Ten Year Implementation Plan

Completed

- Langley Gulch Source Substation and generation was constructed in 2012.
- Construct Substation 14 at the location designated by the Committee. Fruitland substation will be energized before the end of 2022.

Completed with Alterations

- Constructed Skyway Substation in 2019. This substation was driven by industrial customer needs and was not part of the 2011 WTVEP.
- Construct Cherry Substation. Can-Ada Substation was constructed roughly one-half mile south of the intended Cherry Substation.
- Construct a new 69 kV substation near the existing 69 kV transmission lines in the Montour, Idaho area. Substation has been constructed, but currently does not serve the low-voltage distribution system.

Not yet Completed

- Northside Substation is planned to be constructed in 2024.
- Construct Lakeshore Substation. Land has been purchased for this substation. The new substation will be located along Highway 45 between East Lewis Lane and Deer Flat Road in south Nampa.
- Construct a new 138 kV transmission line from Parma Substation to Wilder Substation.
- Add a new 230 kV to 138 kV transformer at Cairo Substation and tie into the existing 230 kV transmission line between Ontario to Caldwell substations. Project slated to be complete in 2024.
- Construct Wagner Substation. Land has been purchased for this substation. The new substation will be located at the corner of Galloway Road and Wagner Road, northwest of Caldwell.

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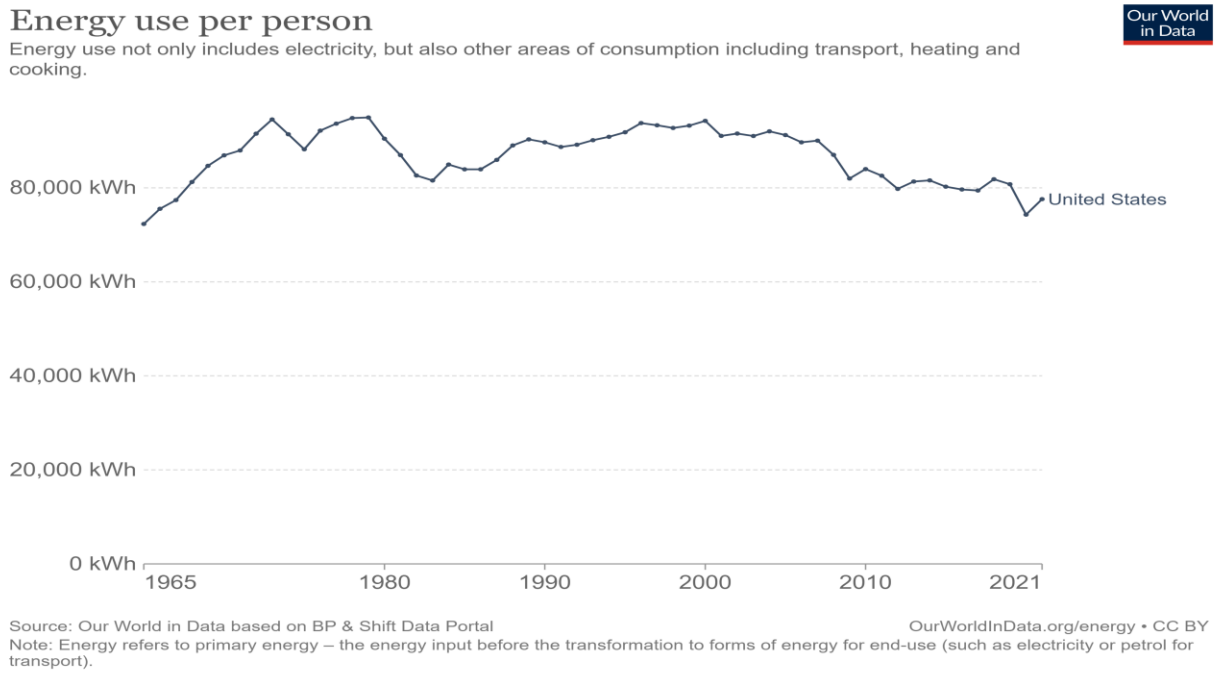
Buildout Considerations

Energy Use Per Customer Over Time

Energy efficiency, plug-in load and building size affect average energy use in eastern Idaho.

- **Energy efficiency** — New technologies lead to efficiency gains. An example is our migration away from halogen lighting to compact fluorescent lighting and now to LED lighting. Energy efficiency helps to bring down average energy use.
- **Plug-In Load** — As new technologies are commercialized and as prices drop, people tend to purchase more plug-in devices. An example is the trend from having one small television per household to having larger televisions more rooms.
- **Building Size** — According to the Census Bureau, new homes are more than 1,000 square feet larger than they were 42 years ago and there are fewer persons per household. Larger homes require more energy to heat and cool than smaller homes.

The combination of these three elements and others have flattened energy usage per customer, which hasn't changed significantly since the late 60s.



Results of the WTVEP Update

County	WTVEP Buildout Load (MW)	WTVEP Update Buildout Load (MW)
Canyon	1,831	2,558
Gem	181	166
Malheur	336	430
Owyhee	252	202
Payette	325	439
Washington	55	118
Total	2,980	3,913

- Buildout loads grew due to increased industrial zoning and better future land-use and zoning data
- Four new source substations will be required (Two less than the original WTVEP)
- Seventeen new distribution substations will be required (One less than the original WTVEP)
- Purpose of the 2022 WTVEP Update CAC will be to review the prior CAC's recommendations for source substations, distribution substations, and connecting 230 and 138 kV transmission lines and select a single preferred alternative for each substation and line route.
- The preferred alternative should be in accordance with the updated community goals and siting criteria.

Notes:

Glossary

Buildout – The point in time when all available land is developed according to the land-use ordinances.

Capacity—The maximum amount of power an element of the power system can handle or produce. Measured in megawatts (MW).

Demand response (DR)—Programs designed to shift load from peak demand hours to when there is ample capacity. The goal is to delay or eliminate the need to build new generation resources.

Distributed generation—Small generators connected to the distribution system (e.g. wind turbine).

Distribution substation—Substations that serve local loads in urban and rural neighborhoods.

Energy—Amount of power used over time. Measured in kilowatt-hours (kWh).

Energy efficiency—Methods or appliances that assist in saving energy.

Kilovolt – Unit of measurement of voltage. 1 kV = 1,000 volts.

Load – Cumulative electrical demand from customers in an area.

Market purchases—Power purchased from the market by Idaho Power to augment its own generation.

Megawatt – Unit of measurement of power. 1 MW = 1,000,000 Watts.

Peak demand—The amount of power used during a peak day in summer or winter. Measured in megawatts (MW).

Power—The rate at which work is performed. Measured in megawatts (MW). One MW = 1,000,000 watts.

Source substation—Converts high-voltage transmission lines (230 kilovolts [kV] and above) to lower voltages (69 to 138 kV). Acts as a power source for distribution substations.

Substations—Substations are used to transform one voltage to another and protect and control power lines. They include transformers, circuit breakers, switches, support structures, and large metallic pipe, called bus, to connect the components.

Voltage—The pressure that moves a current of electricity. Measured in kilovolts (kV) for power lines. One kV = 1,000 volts.

Appendix A – 2011 WTVEP Executive Summary

The electric utility industry is one of the most, perhaps the most, capital intensive industries in the United States. Electrical facilities are expensive and take a long time to plan and build. To many people, electrical facilities are visually and environmentally intrusive. But, electricity has become as much a necessity to modern day life as are clean water and efficient transportation infrastructure.

The Western Treasure Valley's population and industrial base have grown significantly over the past 20 years and Idaho Power (IPC) has continually added new infrastructure to meet the needs of this growth. Even with the recent slower growth rate, IPC's existing customers continue to purchase devices that consume more and more energy on a per capita basis. Even though these devices are becoming more energy efficient, customers seem to have more of them. Where 20 years ago few homes had personal computers, now many homes have multiple PCs along with larger (and multiple) televisions, central air conditioners and chargers for personal electronics. Industry, businesses, farms, and residences are becoming more dependent on a reliable supply of electricity with every passing year. Businesses and the agriculture industry depend on electronic and computer controlled devices for many activities today. Western Treasure Valley citizens expect a reliable power supply for everything from plasma televisions to hospitals, and from communication systems to computer networks.

The latest studies show that the United States may have turned the corner and energy use per capita is slowly decreasing. This is good news and will result in slower electrical load growth in the long run. IPC is also trying to reduce load through multiple energy efficiency programs, but as long as we add customers, we will likely need new infrastructure. Therefore, it is important for IPC to take a long-term view of the future and plan new generation, transmission, and substation facilities so they not only serve their electrical need, but also fit the desires of the communities within which they reside. Each facility location needs to address property owner concerns, jurisdictional siting requirements, environmental laws and regulations and federal reliability standards. A long-term plan is necessary to ensure the transmission lines and substations are there when they are needed and it is important to locate the facilities so they fit into a larger strategy to serve the area. This larger strategy or plan should accommodate the vision and perspective of local communities.

In September, 2010, IPC invited members of the Western Treasure Valley community to participate in a Community Advisory Committee (the Committee) to help plan for the new electrical facilities that will provide for growth. The Committee, made up of local elected officials, city and county planning representatives, environmental and agricultural interests, Bureau of Land Management, Idaho Department of Fish and Game, developers, local businessmen, industrial representatives, and community members, met monthly for a year. The inside cover of this report shows a complete list of Committee members. Developed in concert with the Committee, the Western Treasure Valley Electrical Plan (Plan) describes infrastructure improvements and additions that will be needed to provide an adequate and dependable power supply far into the future. It provides a long-range — buildout — strategy to serve the electrical power needs of Idaho Power's customers in a six county region, including Malheur County in Oregon and Canyon, Gem, Owyhee, Payette, and Washington counties in Idaho. It must be noted that the new 500,000 Volt transmission lines that are planned to be built in western Idaho and

eastern Oregon in the next few years were beyond the scope of this Committee. Additionally, the Committee did not address any transmission external to Western Treasure Valley that might be used to deliver energy to the area.

The Western Treasure Valley Electrical Plan Community Advisory Committee started its work in September 2010 with a bus tour of generation and transmission facilities, beginning a series of primarily educational sessions that were held monthly through December 2010. Through these educational sessions, committee members were introduced to electrical power concepts, generation, transmission, substations, energy efficiency, and regulatory affairs. Additionally, the Committee was introduced to Idaho Power's electrical system, from production to delivery.

Preferred Alternatives

The Committee's preferred alternative to serve the Western Treasure Valley service area at buildout is shown in Figure 1. Instead of narrowing the facility locations down to one alternative, the Committee preferred to eliminate "no go" alternatives and indicate if the remaining alternatives were preferred over others. The Committee generally recommended that IPC refer to their goals and evaluation criteria when siting any new facilities in the Western Treasure Valley. The shaded areas in Figure 1 represent the three geographical areas used in the Committee's mapping sessions, Four Rivers Area (shaded purple), Canyon North (shaded green) and Canyon South (shaded blue). Maps of each individual area are shown for reference.

Four Rivers Area (See Figure 2)

> The Committee's preferred alternative for the Four Rivers area includes three new hub substations plus one distribution substation upgraded to a hub substation. The Committee also sited two new distribution substations along with the associated 138 kV transmission to interconnect them. Additionally, a number of 69 kV transmission lines were upgraded to 138 kV. For a more detailed description of the new facilities in the Four Rivers Area, see the Committee Preferred Alternative section of this report.

North Canyon Area (See Figure 3 for 138 kV facilities and Figure 4 for 230 kV facilities).

The Committee's preferred alternative for the Canyon North area includes two new hub substations plus additions to an existing hub substation. The Committee also designated routing for 230 kV transmission lines to interconnect the new hub substations. Additionally, the Committee's preferred alternative includes siting for 12 new distribution substations with the associated 138 kV transmission to interconnect the new substations. A number of existing 69 kV transmission lines in the North Canyon area were upgraded to 138 kV. A more complete description of the new and upgraded facilities in the North Canyon area can be found in the Committee Preferred Alternative section of this report.

South Canyon Area (See Figure 5 for 138 kV facilities and Figure 6 for 230 kV facilities).

The Committee's preferred alternative for the South Canyon area includes one new hub substation, one distribution substation upgraded to a hub substation, and expansion of an existing hub substation. Three new distribution substations were sited by the Committee in the South

Canyon area. Additionally, the Committee sited 230 kV and 138 kV transmission line routes to interconnect the hub and distribution substations. Again, details can be found in the Committee Preferred Alternative section of this report. It should be noted that there are two routes identified by the Committee for 230 kV transmission to connect between Hemingway Substation near Melba and the Homedale hub Substation. It is likely that only one of these alternatives will be needed at buildout, but the Committee included both to give Idaho Power a couple of options should one be more difficult to permit and build than the other.

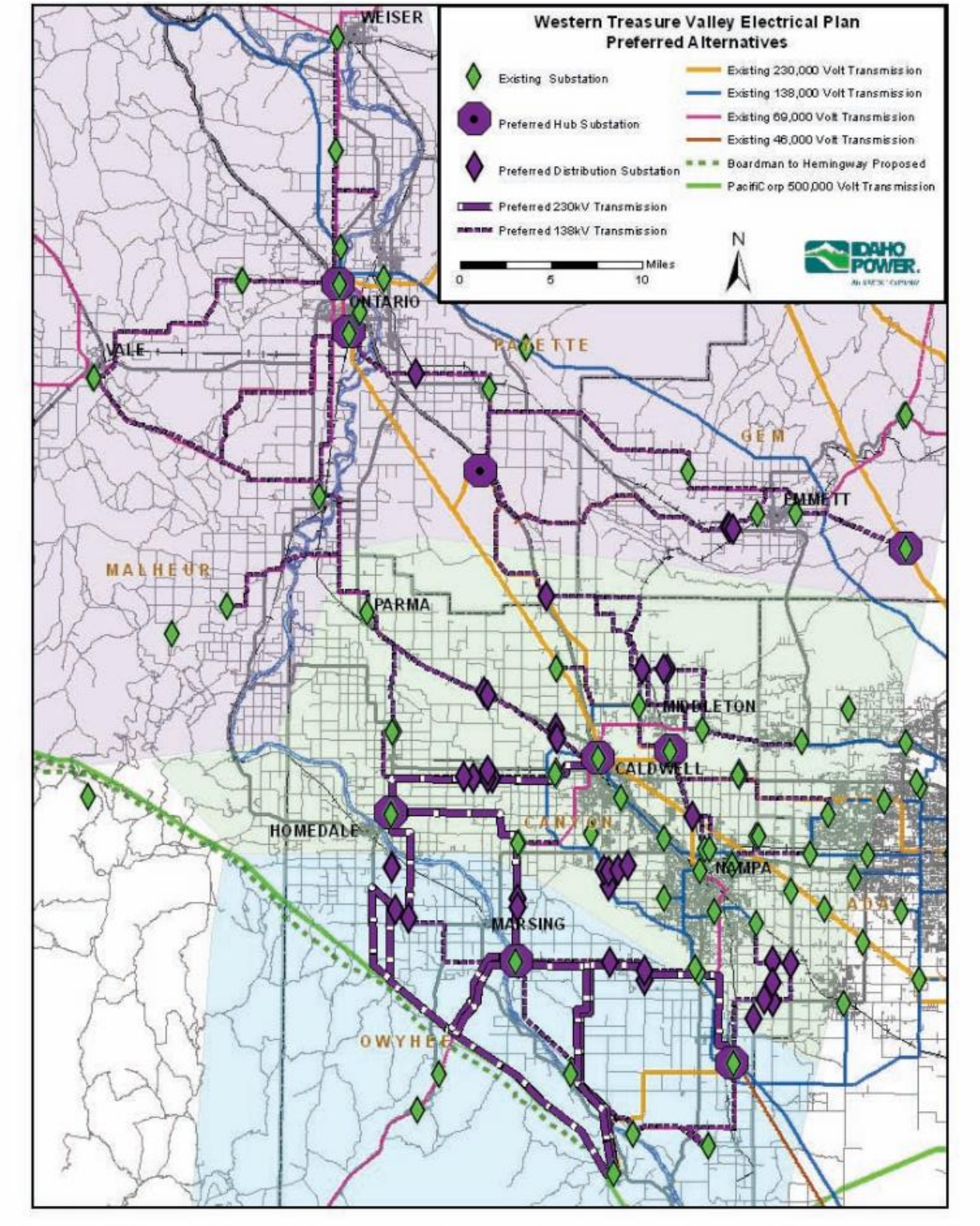


Figure 1: Western Treasure Valley Electrical Plan Preferred Alternatives

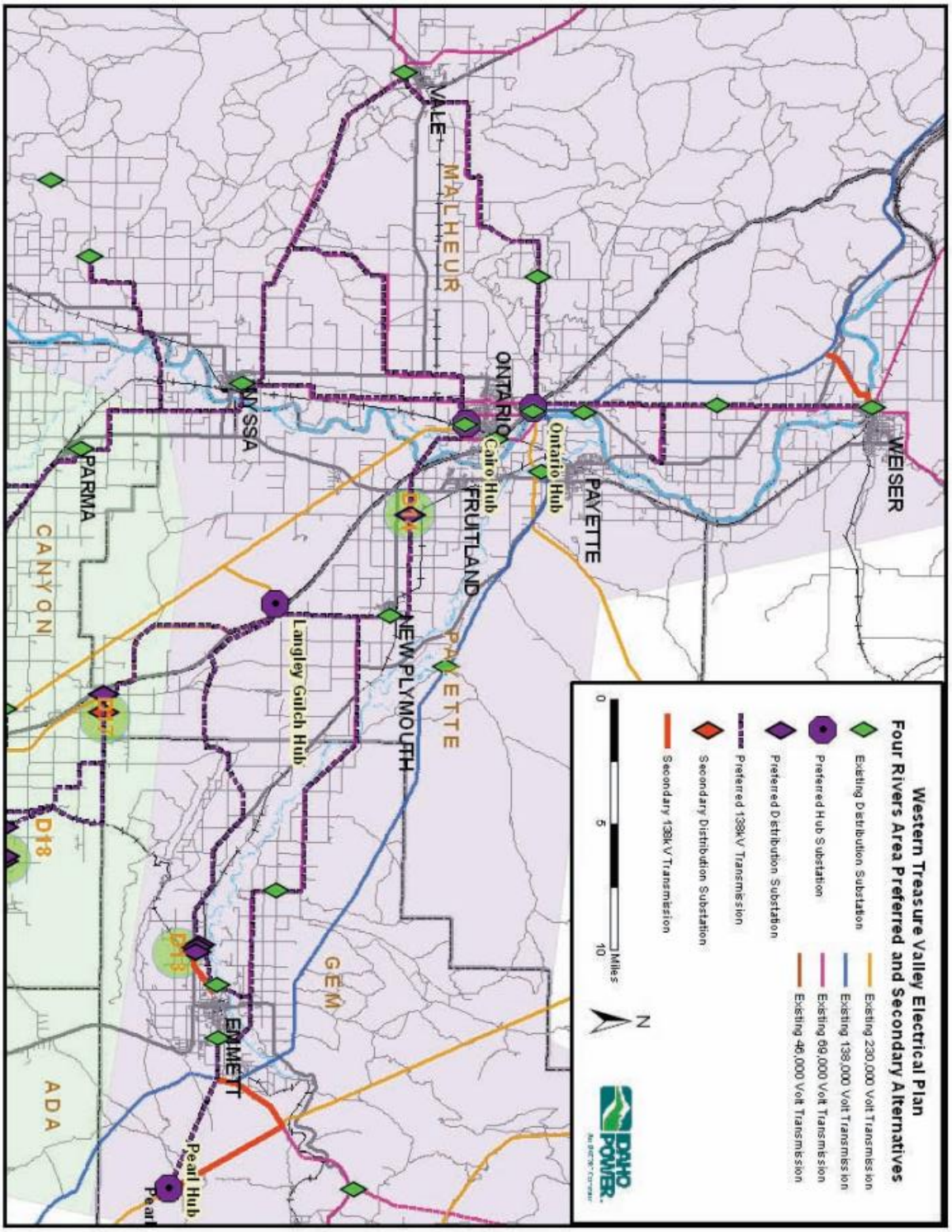


Figure 2: Four Rivers Area Preferred and Secondary Alternatives

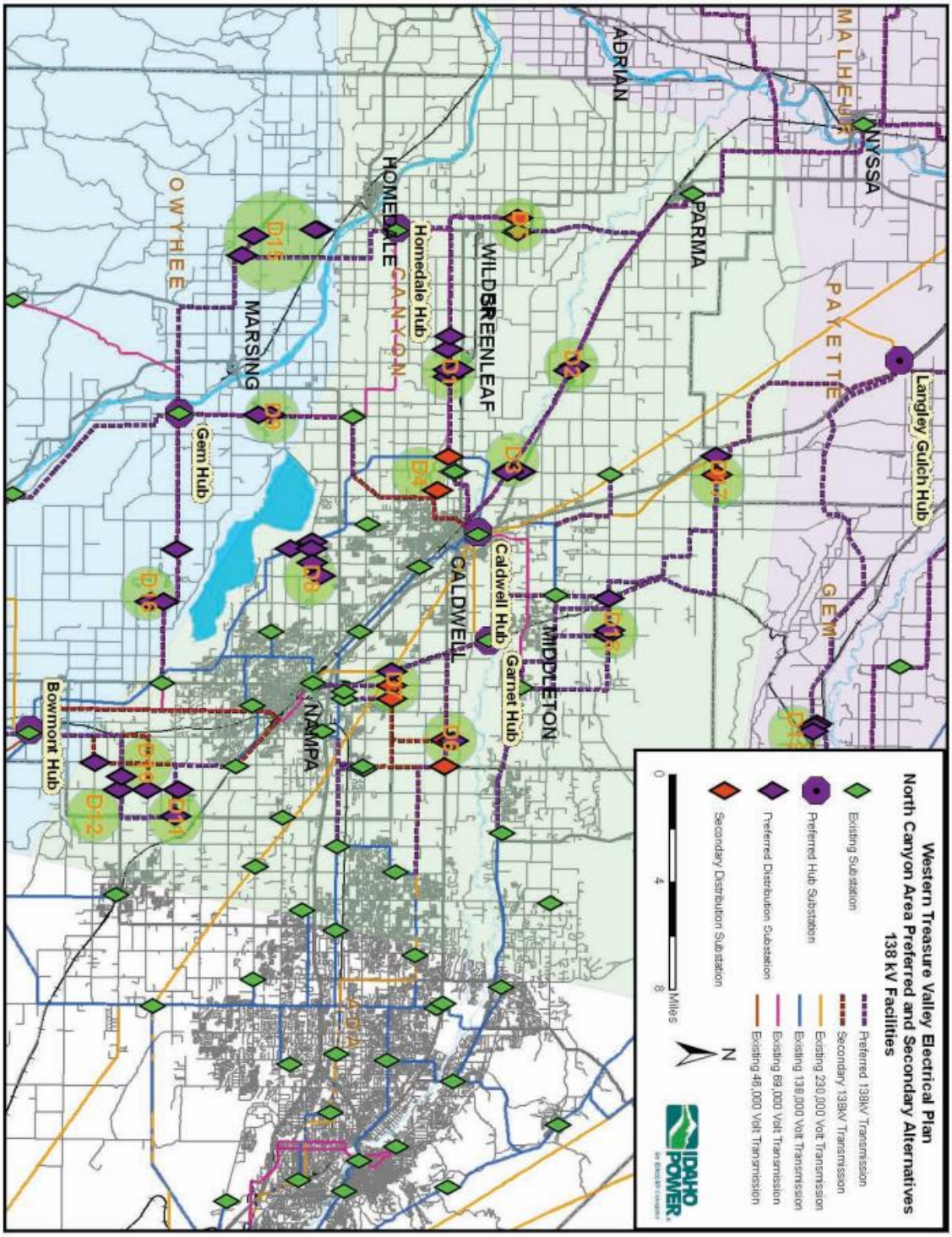


Figure 3: North Canyon Area Preferred and Secondary 138 kV Alternatives

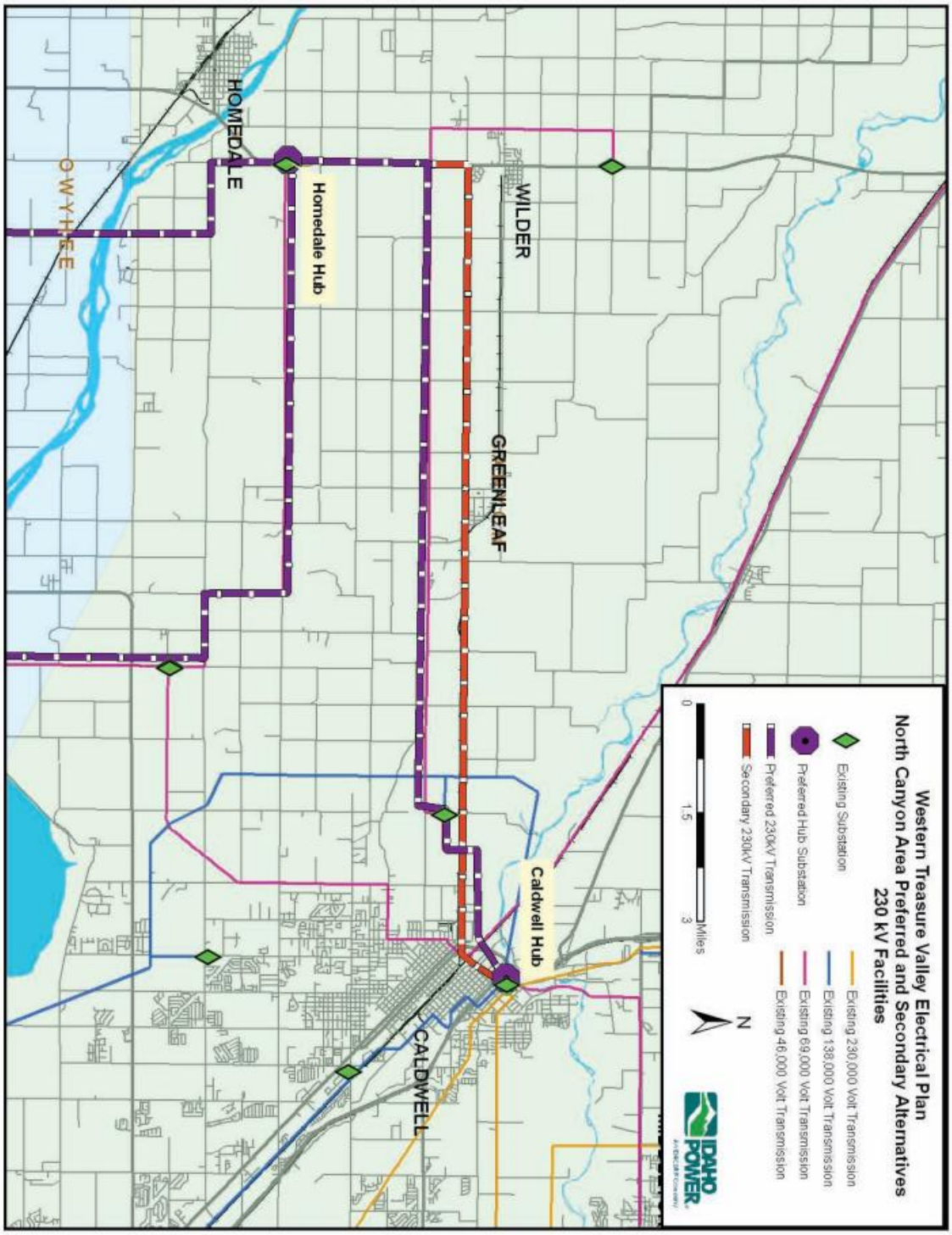


Figure 4: North Canyon Area Preferred and Secondary 230 kV Alternatives

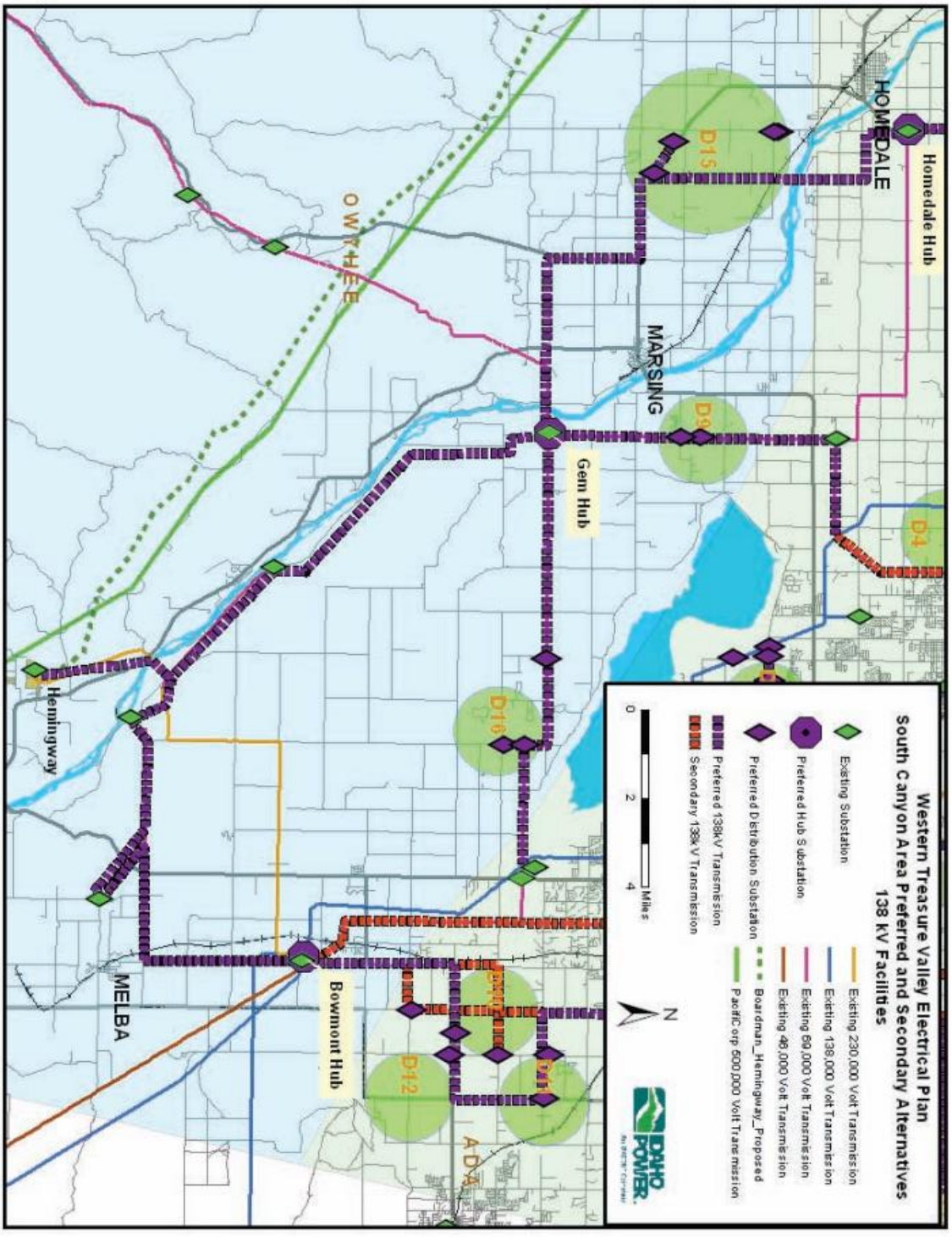


Figure 5: South Canyon Area Preferred and Secondary 138 kV Alternatives

Not all the facilities proposed by the Committee will be needed in the near term; facilities will be phased in based on load growth rates, reliability, system capacity, available budget, and Committee recommendations. If all or some parts of the preferred alternative become unbuildable or unfeasible because of future constraints, the Committee identified some secondary alternatives that are also acceptable. Idaho Power will pursue the secondary alternatives as necessary to meet future electrical service requirements. Additionally, Idaho Power will make every effort to honor the Committee's goals and evaluation criteria when siting new infrastructure. Details for the preferred option and the secondary options are found in the body of this report in the Committee's Preferred Alternative section.

The Western Treasure Valley Electrical Plan is conceptual, and thus the first step in planning for new and upgraded transmission lines and substations. Individual projects resulting from this plan will still require jurisdictional approval and will be subject to the public siting process. Before IPC does any siting or places infrastructure, open houses and perhaps community meetings (for projects that have significant local impact) will be held to provide information on specific proposed projects and to gather input. Substations and transmission lines associated with this plan are subject to change due to land availability, jurisdictional objections, or other needs discovered during the project development phase. This first step, however, will give the jurisdictions and citizens advance notice as to where high-voltage transmission facilities may be located, and will allow the jurisdictions and citizens to plan accordingly. It is also IPC's request that this plan will be incorporated into jurisdictional comprehensive plans.

In preparing the Western Treasure Valley Electrical Plan, IPC has accounted for the anticipated effect that energy efficiency will have on future electrical load in the Western Treasure Valley. Idaho Power is committed to reducing electrical load through the use of energy efficiency at all customer levels. In conjunction with activities outside Idaho Power's control — such as expected improvements in local building standards, customer involvement, distributed generation, and energy efficiency technology advancements — Idaho Power expects new electrical load will be significantly reduced between now and the time the area is built out. Appendix B of this report discusses the various energy efficiency programs offered by Idaho Power.

The minimum estimated cost in 2011 dollars for the infrastructure identified in the preferred alternatives in this plan to serve the projected buildout load is approximately $300 million. Future changes in technology may make some of these improvements unnecessary or, at least, delay their need. These types of shifts, however, are difficult to predict. Idaho Power will monitor these potential shifts, recognizing that external forces can force change in even the best plans. The Western Treasure Valley Electrical Plan is a flexible plan that will be maintained and kept viable through continued public involvement.

Idaho Power sincerely thanks every member of the Community Advisory Committee. The time and effort the Committee gave to this project will enable IPC to go forward with plans to serve the Western Treasure Valley and gain public acceptance of the specific pieces that must, through further public collaboration, be put in place to make this plan a reality. This Plan is a result of the Committee's efforts and will serve as the basis for further studies to refine, stage, and request permitting for future infrastructure improvements in the Western Treasure Valley.

Appendix B - 2011 WTVEP Community Goals and Siting Criteria

As a first step in determining the feasibility of individual transmission line routes and substation locations, the Committee members created a Siting and Design Goals/Criteria document. This document set forth various measurable and non-measurable goals to guide their choices for the alternatives they would develop as well as associated evaluation criteria that can be used to measure the degree to which an alternative meets the goals.

The final list of goals and evaluation criteria were split into two categories: 1) Siting and Design Goals/Criteria and 2) Overarching Goals/Criteria. The Siting and Design Goals/Criteria were pertinent to the siting of new electrical infrastructure and could be directly measured during design or construction. The Overarching Goals/Criteria were more general, not necessarily measurable, but nonetheless represent issues important to the Committee. Both the Siting and Design Goals/Criteria and the Overarching Goals/Criteria represent the Committee's instructions and desires for Idaho Power in implementing the plan and serving the communities in the Western Treasure Valley area. The Siting and Design Goals/Criteria category included 8 goals with criteria (listed in no particular order):

1. **Cost:** Provides power at the least cost to customers.
2. **Economic Development:** Supports economic development opportunities.
3. **Energy Needs:** Provides adequate power to meet needs now and in the future, and complements needs of business and other non-residential users.
4. **Environment:** Protects important viewsheds, protects cultural/historic resources, protects crucial plant and wildlife habitat on public and private lands, keeps water clean and keeps agricultural lands functioning.
5. **Impacts:** Minimizes impact to private property values and minimizes impacts to any one county within the planning area.
6. **Planning:** Is consistent with local plans and codes, and upgrades existing substations and transmission lines to accommodate load before building new ones.
7. **Reliability/Dependability:** Is a reliable electrical system.
8. **Siting:** Sites facilities within existing/designated energy and transportation corridors, locates facilities within existing industrial and commercial sites as much as possible, minimizes adverse impacts to existing communities, locates transmission lines close to alternative energy sources where possible, and produces energy closer to where it is used (local source).

The Overarching Goals/Criteria category included 6 goals with criteria (listed in no particular order):

1. **Communication:** Facilitates Idaho Power's communication throughout the process with the public and elected officials and facilitates inter-jurisdictional communication.
2. **Community/Political Support:** Reflects all interests in electrical system planning and implementation, and provides the public with an opportunity to understand the electrical system "big picture."
3. **Energy Efficiency/Conservation:** Welcomes sustainable, cost efficient, renewable energy production, exhibits greater efficiency and reliability than the current

facility/system, and utilizes demand response/technology to minimize additional energy generation needs.
4. **Public Health:** Protects public health.
5. Environment: Complies with environmental quality standards and minimizes impacts on agricultural lands.
6. **Marketing:** Communicates the importance of demand response to the public.

The Committee developed a list of associated ways to measure the extent to which an alternative meets individual goals and criteria. A complete table of the goals and evaluation criteria can be found in Appendix C. A more complete description of the process the Committee used to determine the goals and criteria can be found in the Goals and Evaluation Criteria section of this report.

Notes: