Reference Sheet—
Eastern Treasure Valley Electrical Plan (ETVEP) Update

2023-2024

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REFERENCE SHEET—EASTERN TREASURE VALLEY ELECTRICAL PLAN (ETVEP) UPDATE

Purpose

The purpose of the Eastern Treasure Valley Electrical Plan (ETVEP) 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 ETVEP study area.
- Select a single preferred option for future transmission and substation electrical facility sites in the ETVEP study area.
- Discuss 2023 ETVEP 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.

Tentative Meeting Schedule

October: Generation, substations, transmission, 2012 ETVEP review, community goals and siting criteria.

November: *(Two meetings)* Siting criteria alignment, small-group mapping.

December: *(Tentative)* Small-group mapping - Select preferred option for substation and transmission line sites.

January: *(Two meetings)* Finalize mapping.

March: Review draft update, discuss comprehensive plan integration.

April: *(Tentative)* 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

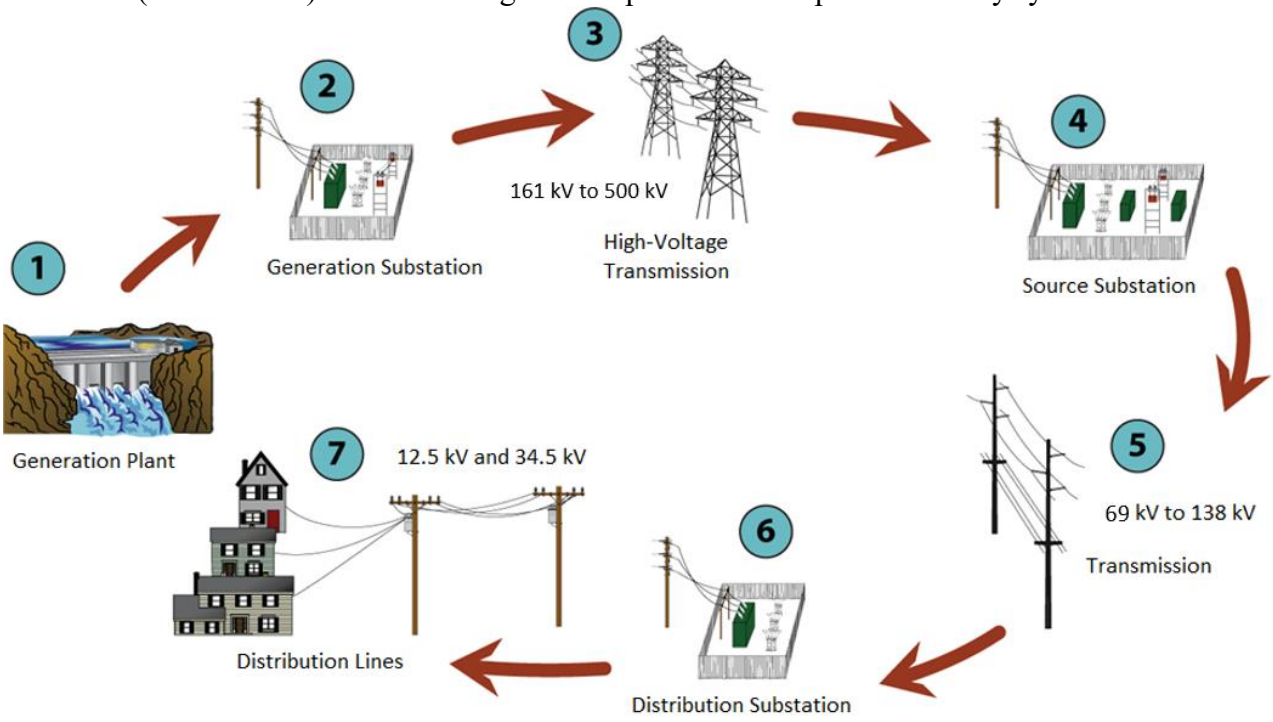
	Base Unit	Typical Unit
Voltage	Volt (V)	kilovolt (kV)*
Power	Watt (W)	megawatt (MW)**
Capacity	Watt (W)	megawatt (MW)**
Energy	Watt-hours (Wh)	kilowatt-hours (kWh)

*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). The 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 ETVEP.

    - **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.

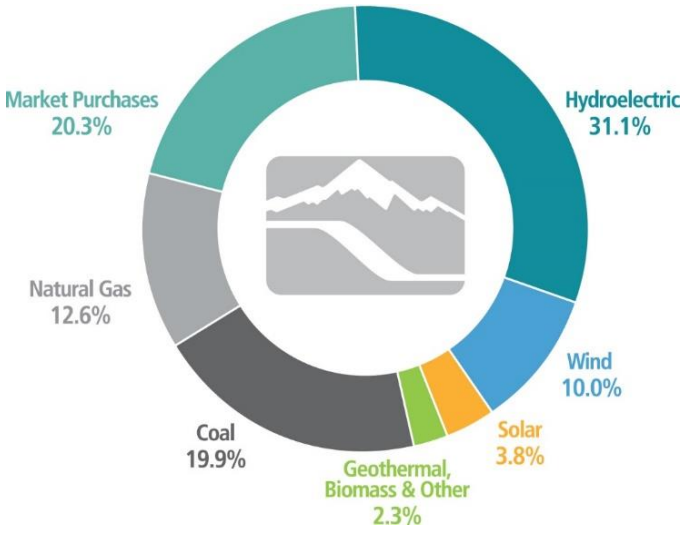
Generation Resources

Idaho Power's generation resources include the following. See Table 4.2 on page 46 of the company's 2023 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 Eastern Treasure Valley. These generation sources use transmission and distribution lines to deliver energy to our customers.

In 2022, 63.6% 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 East Treasure Valley has the following types of distributed generation:

- Biomass
- Hydro
- Solar
- Batteries (Future)

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 2022, Idaho Power purchased about 20% of its energy on the market.

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 2023 IRP was submitted to the Idaho Public Utilities Commission and the Public Utility Commission of Oregon in September 2023.

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:

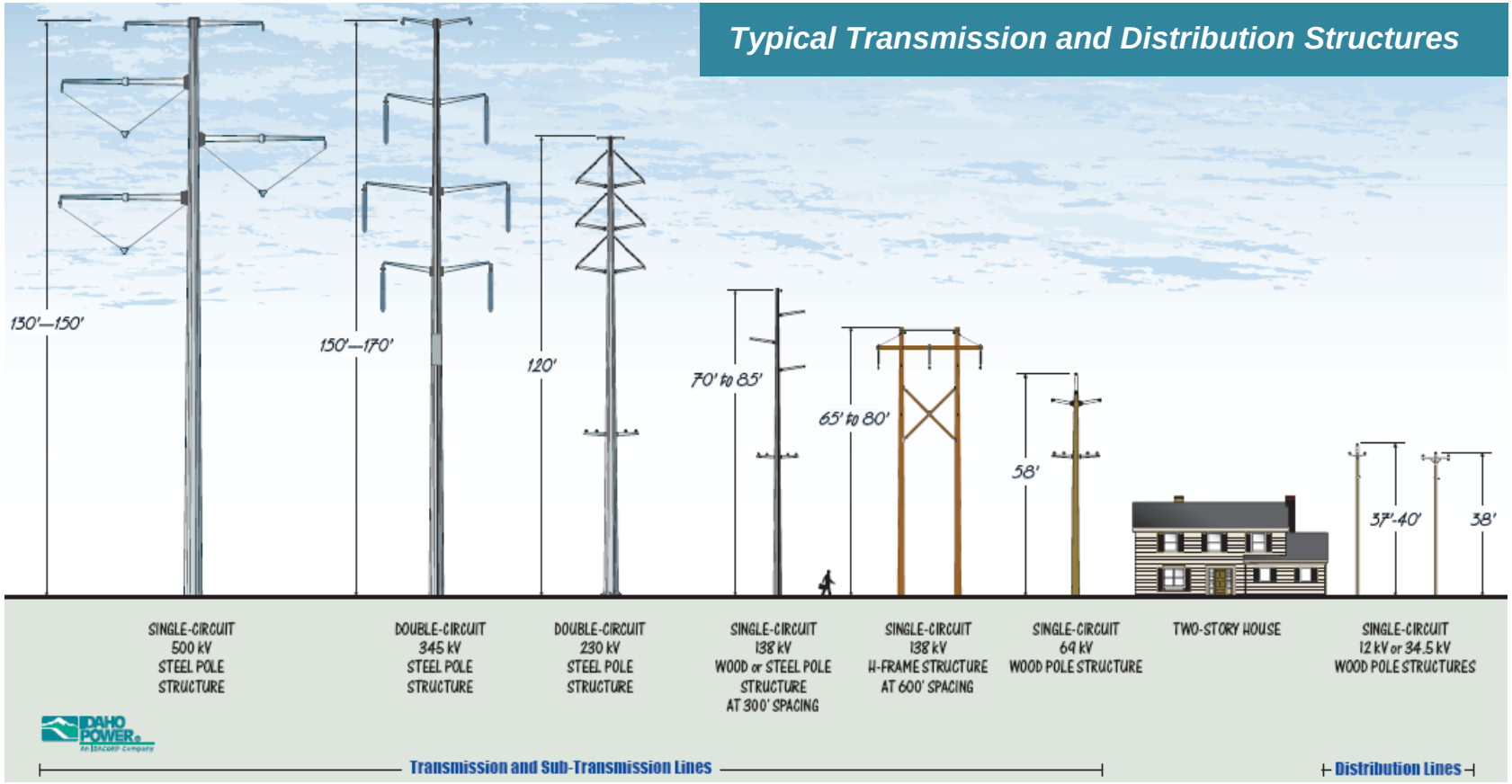
- Representing the interests of Idaho Power's more than 600,000 customers
- Participating in open and active discussions of relevant issues
- Working with Idaho Power to develop ways to engage the public in the IRP process

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 now posted on Idaho Power's website (under Energy > Planning). The table below from the 2023 plan lists the plan's additional generation resources.

Preferred Portfolio—Valmy 1 & 2 (MW)												
Year	Coal Exits	Gas	H2	Wind	Solar	4Hr	8Hr	100Hr	Trans.	Geo	DR	EE Forecast
2024	-357	357	0	0	100	96	0	0	0	0	0	17
2025	0	0	0	0	200	227	0	0	0	0	0	18
2026	-134	261	0	0	100	0	0	0	Jul B2H	0	0	19
2027	0	0	0	400	375	5	0	0	0	0	0	20
2028	0	0	0	400	150	5	0	0	0	0	0	21
2029	0	0	0	400	0	5	0	0	GWW1	0	20	22
2030	-350	350	0	100	500	155	0	0	0	30	0	21
2031	0	0	0	400	400	5	0	0	GWW2	0	0	21
2032	0	0	0	100	100	205	0	0	0	0	0	20
2033	0	0	0	0	0	105	0	0	0	0	20	20
2034	0	0	0	0	0	5	0	0	0	0	40	19
2035	0	0	0	0	0	5	0	0	0	0	40	18
2036	0	0	0	0	0	5	0	0	0	0	40	17
2037	0	0	0	0	0	55	50	0	0	0	0	17
2038	0	-706	340	0	0	155	50	200	0	0	0	17
2039	0	0	0	0	0	5	50	0	0	0	0	15
2040	0	0	0	0	400	5	0	0	GWW3	0	0	14
2041	0	0	0	0	200	5	0	0	0	0	0	14
2042	0	0	0	0	200	55	0	0	0	0	0	14
2043	0	0	0	0	600	0	0	0	0	0	0	14
Sub Total	-841	261	340	1,800	3,325	1,103	150	200		30	160	360
Total	**6,888**											

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	160-250	$ 4M-$4.2M
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	$15M–$22M
Distribution	5–88	2–3	$10M–$12M

Notes:

2012 ETVEP

The 2012 Eastern 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 three counties: Ada, Elmore, and Owyhee.

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—**3,995 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)
Ada	935	3500
Elmore	132	360
Owyhee	31	135
Total	**1078**	**3995**

Developed Community Goals and Siting Criteria

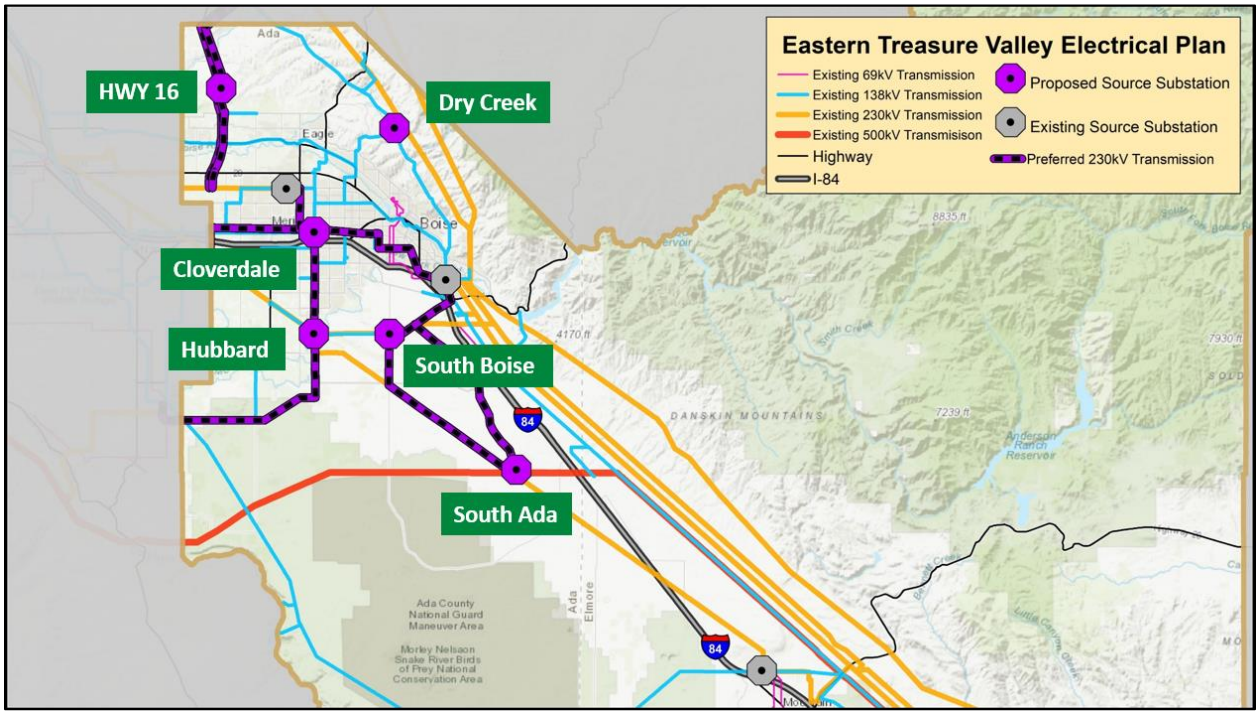
The CAC created goals that set forth criteria to guide their choices for the alternatives for siting transmission lines and substations. The 2012 Community Goals and Siting Criteria can be found in Appendix C.

Notes:

2012 Buildout Requirements

Source Substation Requirements

Six new source substation sites and connecting high voltage transmission lines.



- **Highway 16** Source Substation
  - The 2012 ETVEP Committee provided three equally valued alternatives along Highway 16 northeast of Star. Each option is within 1 mile north of West Deep Canyon Drive.
- **Dry Creek** Source Substation
  - Create a source to the 138 kV system by adding transformation at the existing Dry Creek Substation north of Boise along Highway 55.
- **Cloverdale** Source Substation
  - Created a source to the 138 kV system by adding transformation at the existing Cloverdale Substation. Cloverdale became a source substation in 2021.
- **Hubbard** Source Substation
  - Create a source to the 138 kV system by adding transformation at the existing Hubbard Substation south of Boise along Cloverdale rd. and south of the New York Canal.
- **South Boise** Source Substation
  - Create a source to the 138 kV system by constructing a new substation near where the existing 230 kV transmission line crosses South Pleasant Valley Road.
- **South Ada** Source Substation
  - Create a source to the 138kV system by constructing a new substation south of Boise, northeast of where rail line crosses under the existing Danskin Substation to Hubbard Substation 230 kV transmission line.

138 kV Requirements

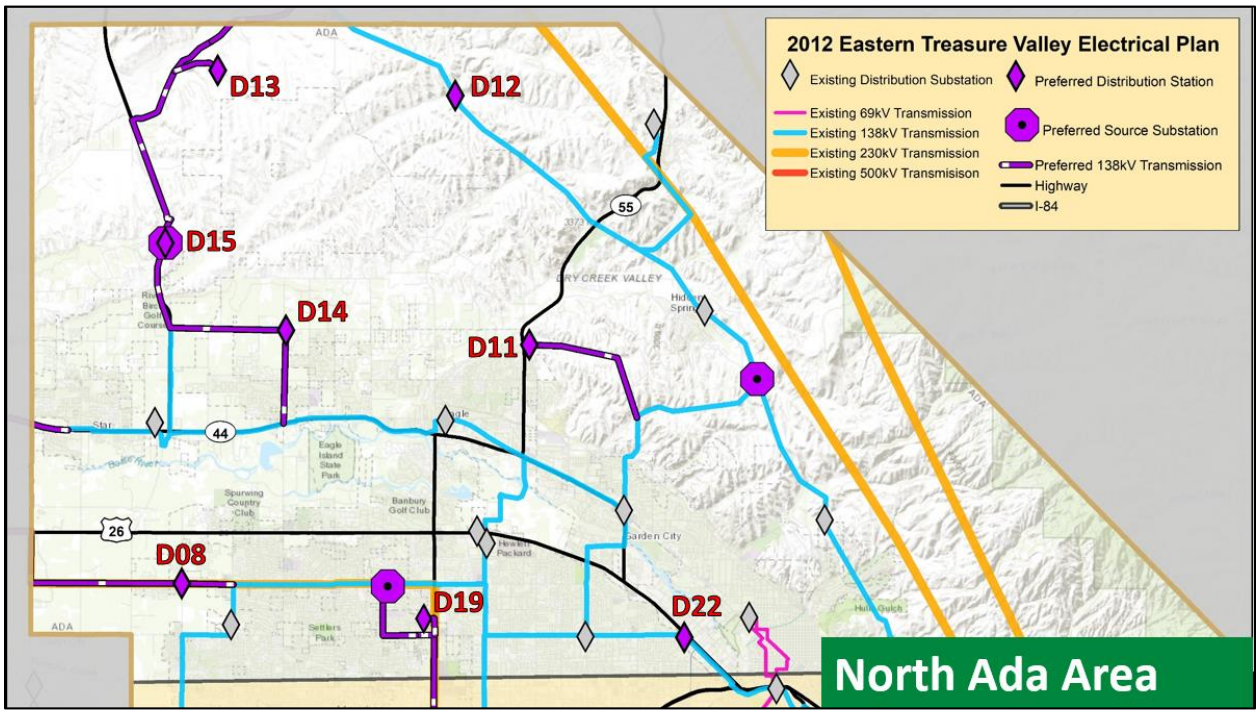
Twenty-two distribution substations and connecting 138 kV transmission lines.

Study Areas

The 2012 ETVEP was divided into three areas: North Ada, South Ada, and Elmore/Owyhee areas.

- The **North Ada** area encompasses the portion of Ada County North of Fairview Road/Cherry Lane.
- The **South Ada** area encompasses the portion of Ada County South of Fairview Road/Cherry Lane.
- The **Elmore/Owyhee** area encompasses all of Elmore County, and a portion of Owyhee county east of Wildhorse Butte.

North Ada Area



- **Distribution Substation 8** – The committee selected a location in Meridian, at the corner of West McMillan Road and North Black Cat Road. This substation will be constructed within the next five years a mile and a half west of the committee's preferred location and will be named "McDermott Substation."
- **Distribution Substation 11** – Located northeast of Eagle, along N. Horseshoe Bend Road and W. Goose Creek Road.
- **Distribution Substation 12** – Located north of Eagle, near where Aerie Lane crosses the existing 138 kV transmission line.

- **Distribution Substation 13 –** Located north of Eagle, 2 miles east of W. Chapparral Road. The committee identified two equally acceptable alternatives.
- **Distribution Substation 14** – Located in east Eagle at the corner of North Linder Road and West Beacon Light Road on existing Idaho Power owned land. This substation has been constructed and named "Beacon Light Substation."
- **Distribution Substation 15** – The Committee provided three equally acceptable alternatives, all northeast of Star along Hwy 16 within 1 mile of north of West Deep Canyon Drive.
- **Distribution Substation 19** – The committee provided six equally acceptable alternatives near Ustick and Eagle Road. The committee noted that Idaho Power should work with City of Meridian and developers to select a preferred alternative.

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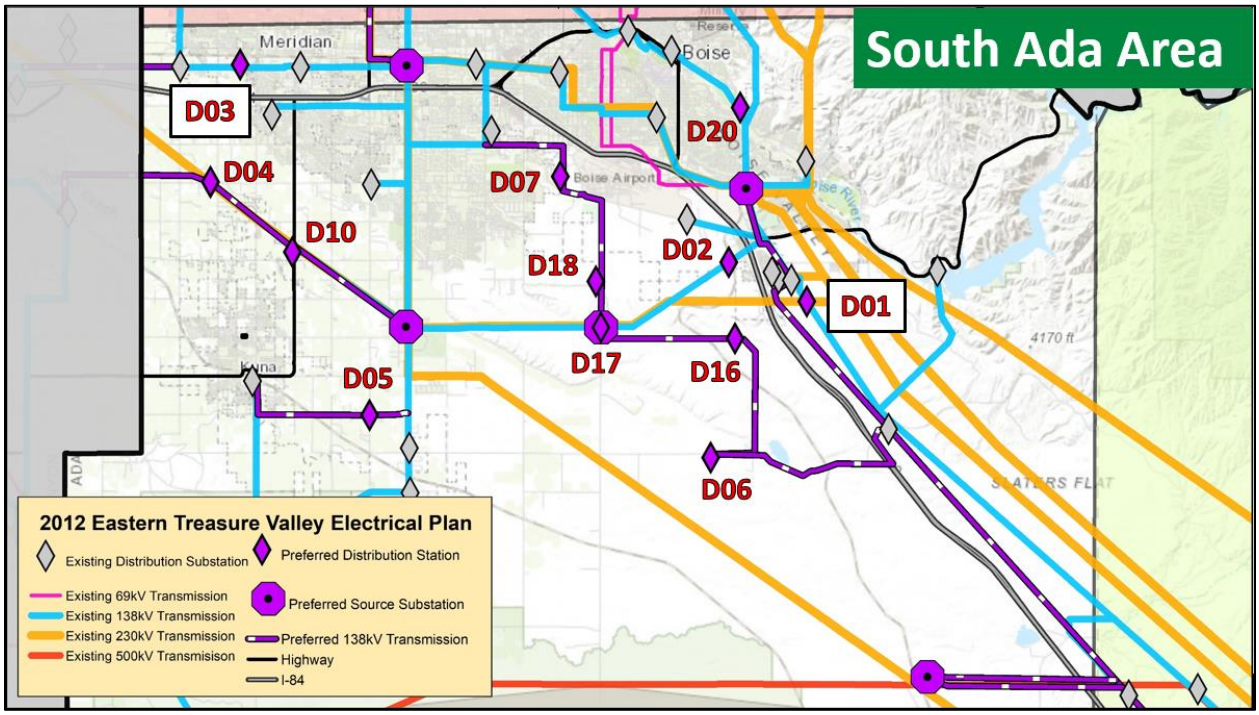
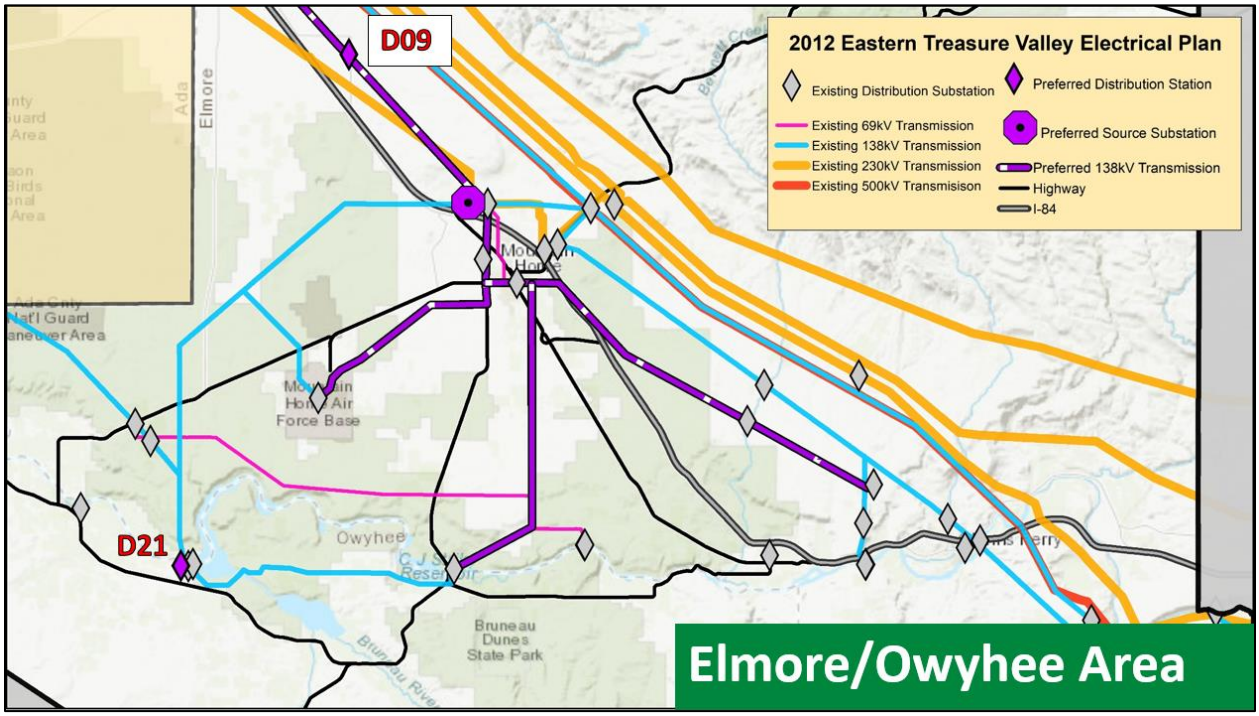
South Ada Area



- **Distribution Substation 1** – Located in southeast Boise, southeast of Micron where existing Boise Bench Substation to Hubbard Substation 230 kV transmission line crosses existing 138 kV transmission line.
- **Distribution Substation 2** – Located in southeast Boise, near existing Boise Bench Substation to Mora Substation 138 kV transmission line southwest of Boise Factory Outlet Mall on west side of railroad track.
- **Distribution Substation 3** – Located in Meridian, just off Franklin Road west of the waste transfer station on school district owned land.
- **Distribution Substation 4** – Located on Amity Road west of South Ten Mile Road, on existing Idaho Power owned land.
- **Distribution Substation 5** – Located southeast of Kuna at S. Eagle Road and E. King Road. A substation was constructed in 2023 near the intersection of Kuna Mora Road and Cloverdale Road and named "Hawk Substation."
- **Distribution Substation 6** – Located along Kuna Mora Road, 2.9 miles east of S. Pleasant Valley Road.
- **Distribution Substation 7** – Located west of Boise Airport near intersection of S. Curtis Road and Albatross Street.
- **Distribution Substation 10** – Located north of Kuna along South Meridian Road north of East Columbia Road, on existing Idaho Power owned land. This substation was constructed in 2022 and named "Columbia Substation."
- **Distribution Substation 16** – Located in south Boise, 0.9 miles southwest of the Eisenman Road interchange
- **Distribution Substation 17** – Co-located with South Boise (hub) Substation near where the existing 230 kV transmission line crosses South Pleasant Valley Road

- **Distribution Substation 18** – Located in south Boise, 0.15 miles west of S. Pleasant Valley Road, 0.12 miles north of W. Hollilynn Drive.
- **Distribution Substation 20** – Located in southeast Boise, along East Warm Springs Avenue just southeast of Warm Springs Golf Course and along existing Boise Bench Substation to Grove Substation 138 kV transmission line.

Elmore/Owyhee Area



- **Distribution Substation 9** – Located northwest of Mountain Home at the intersection of Ditto Creek Road and West Martha Avenue on private land.
- **Distribution Substation 21** – Located 1/2 mile west of CJ Strike Dam on Idaho Power owned land off River Road.

Notes:

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Need to Update the ETVEP

The following drive the need to update the ETVEP.

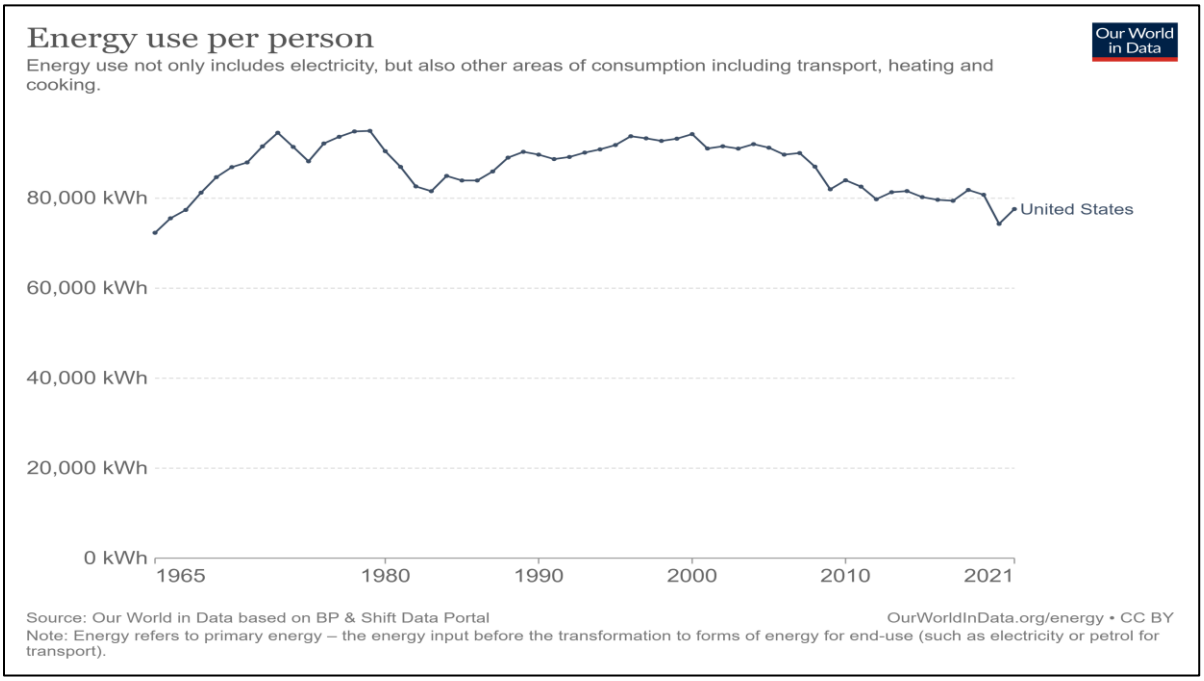
- Evolving community goals
- Changing future land use and zoning
- Growth not always occurring where and when it is anticipated

Buildout Considerations

Energy Use Per Customer Over Time

Energy efficiency, plug-in load and electrification affect average energy use in 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.
- **Electrification** —As time goes on, appliances like water heaters and home HVAC units are moving from natural gas powered to electric powered. Battery technologies becoming cheaper over time makes electric vehicles an increasingly affordable option. These transitions are expected add additional load to the electrical grid over time.



Results of the ETVEP Update

County	2012 ETVEP Buildout Load (MW)	2023 ETVEP Update Buildout Load (MW)
Ada	3,500	5,160
Elmore	360	800
Owyhee	135	165
Total	3,995	6,125

- Buildout loads grew due to increased mixed use, commercial, and industrial zoning using updated future land-use and zoning data.
- Purpose of the 2023 ETVEP Update CAC will be to review the prior CAC's recommendations for source substations, distribution substations, and connecting 230 kV and 138 kV transmission lines and select a single preferred option for each substation and line route.
- The selection of the preferred option should be guided by 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.

ETVEP – Eastern Treasure Valley Electrical Plan

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.

WTVEP – Western Treasure Valley Electrical Plan

Appendix A – 2012 ETVEP Executive Summary

Electricity: it lights our homes, runs our computers, cooks our food and entertains our kids. It can be used to save a life and it can ease our work. But we don't often think about how much effort is put in every day to keep the electricity flowing and how much planning must take place to ensure electrical facilities are built when they are needed. And the cost for electrical facilities is tremendous. The electric utility industry is one of the most, perhaps the most, capital-intensive industries in the United States.

The eastern Treasure Valley's population and industrial base have grown significantly over the past 20 years and Idaho Power (IPC) continually adds new infrastructure to meet the electricity needs resulting from this growth. Even with the economic recession that began in 2007, 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. And industry, businesses, farms, and residences are becoming more dependent on a reliable supply of electricity with every passing year. Now in 2012, growth is picking up in this region and new facilities will be needed to supply the energy the new businesses and homes will need. It is important that IPC takes 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.

Even though electricity has become a necessity to modern life, to many people, electrical facilities are visually and environmentally intrusive. Each new facility location needs to address safety, 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 October, 2011, IPC invited members of the eastern Treasure Valley 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, agricultural interests, developers, industrial representatives, community members, and representatives from the Bureau of Land Management and the Idaho Department of Fish and Game, met monthly for a year. The inside cover of this report shows a complete list of the Committee members. Developed in concert with the Community Advisory Committee, the Eastern Treasure Valley Electrical Plan (the 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 IPC's customers in a region consisting of Ada and Elmore counties and the Grand View area of Owyhee County. It must be noted that the new 500 kV transmission lines planned for the area in the next few years were beyond the scope of this Committee. Additionally, the Committee did not address any transmission external to the eastern Treasure Valley that might be used to deliver energy to the area.

From 2005 through 2006, Idaho Power convened a community advisory committee to site buildout facilities for the Treasure Valley and named the plan the Treasure Valley Electrical Plan (TVEP). The TVEP laid out 230 kV and 500 kV substation locations and transmission line routes in Ada, Canyon and Owyhee counties in Idaho and Malheur County in Oregon. The TVEP did not consider 138 kV facilities. The Eastern Treasure Valley Electrical Plan uses the TVEP 230 kV substation locations and 230 kV transmission line routes as a starting point to plan 230 kV hub substation locations and transmission line routes with the Committee confirming nearly all locations sited in the TVEP.

From 2010 through 2011, Idaho Power convened another community advisory committee to site 138 kV and 230 kV facilities in the western part of the Treasure Valley (including Canyon, Gem, Owyhee, Payette and Washington counties in Idaho and Malheur County in Oregon). Like the ETVEP, the Western Treasure Valley Electrical Plan (WTVEP) used the TVEP 230 kV substation locations and transmission line routes as a starting point in planning their 230 kV hub substation locations and transmission line routes and also the WTVEP committee confirmed nearly all the locations sited in the TVEP. Taken together, the ETVEP and the WTVEP form the basis of a Treasure Valley encompassing plan that ties the power systems between the two plans together.

The Committee started its work in October, 2011 with a general education session followed in November with a bus tour of generation and transmission facilities. The following two months were also devoted to providing the Committee a good background relating to electrical power systems. Through these educational sessions, the Committee was introduced to the concepts of electrical power generation, transmission, substations, energy efficiency, and regulatory affairs. Additionally, the Committee was introduced to IPC's electrical system from production to delivery.

Preferred Alternatives

The Committee's preferred alternatives to serve the eastern Treasure Valley service area at buildout are shown in the following figures. 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 Guiding Principles and Community Criteria when siting any new facilities in the eastern Treasure Valley.

For clarity, the eastern Treasure Valley in the following drawings is split between Ada County and Elmore/Owyhee counties. Further subdivisions are shown in the Committee's Preferred Alternatives section of this report and in Appendix D.

Ada County Area: (See Figure 1 for 230 kV facilities and Figure 2 for 138 kV facilities). Because proposed locations for 230 kV Hub substations were already determined by the TVEP Community Advisory Committee in 2006, the ETVEP Committee was asked to validate their locations and make changes if they found it necessary. Only the Highway 16 (hub) Substation location was changed by the Committee and then only slightly. The Committee was also asked to validate the 230 kV transmission routes designated in the TVEP. The only change made by the Committee was the route of the 230 kV transmission line from the Highway 16 (hub) Substation

heading south, changing it to match the planned Highway 16 road alignment as planned by the Idaho Transportation Department.

The Committee's preferred alternative for the Ada County area includes 19 new distribution substations and the associated 138 kV transmission to interconnect them. It is noted that because of the high growth rate of commercial properties in and around Meridian, committee members representing the City of Meridian recommend that Idaho Power obtain substation properties as soon as possible before they are purchased for commercial development.

Elmore and Owyhee Counties Area: (See Figure 3 for 230 kV facilities and Figure 4 for 138 kV facilities). The Committee's preferred alternatives for the Elmore and Owyhee counties area includes expansion of the existing Danskin (hub) Substation in Mountain Home and two new distribution substations: one in Elmore County and one in Owyhee County.

The Committee also recommended upgrading most 69 kV transmission lines in Elmore County to 138 kV when conditions warrant. The Committee sited an additional hub substation east of Mountain Home for the stated purpose of providing capacity should load growth warrant it. The location was not specific but was only a general area located near the existing 230 kV transmission lines east of Mountain Home. Based on comments received from the Elmore County Growth and Development Department relating to its proximity to land designated as agricultural ground, the second hub substation location has been removed from the map. If load growth warrants it, siting of an additional hub substation will be pursued in future Eastern Treasure Valley Electrical Plan committee processes. It is noted that the Danskin (hub) Substation location is forecast to be adequate for future load growth and an additional hub substation location is not needed unless growth greatly exceeds Idaho Power's forecasts.

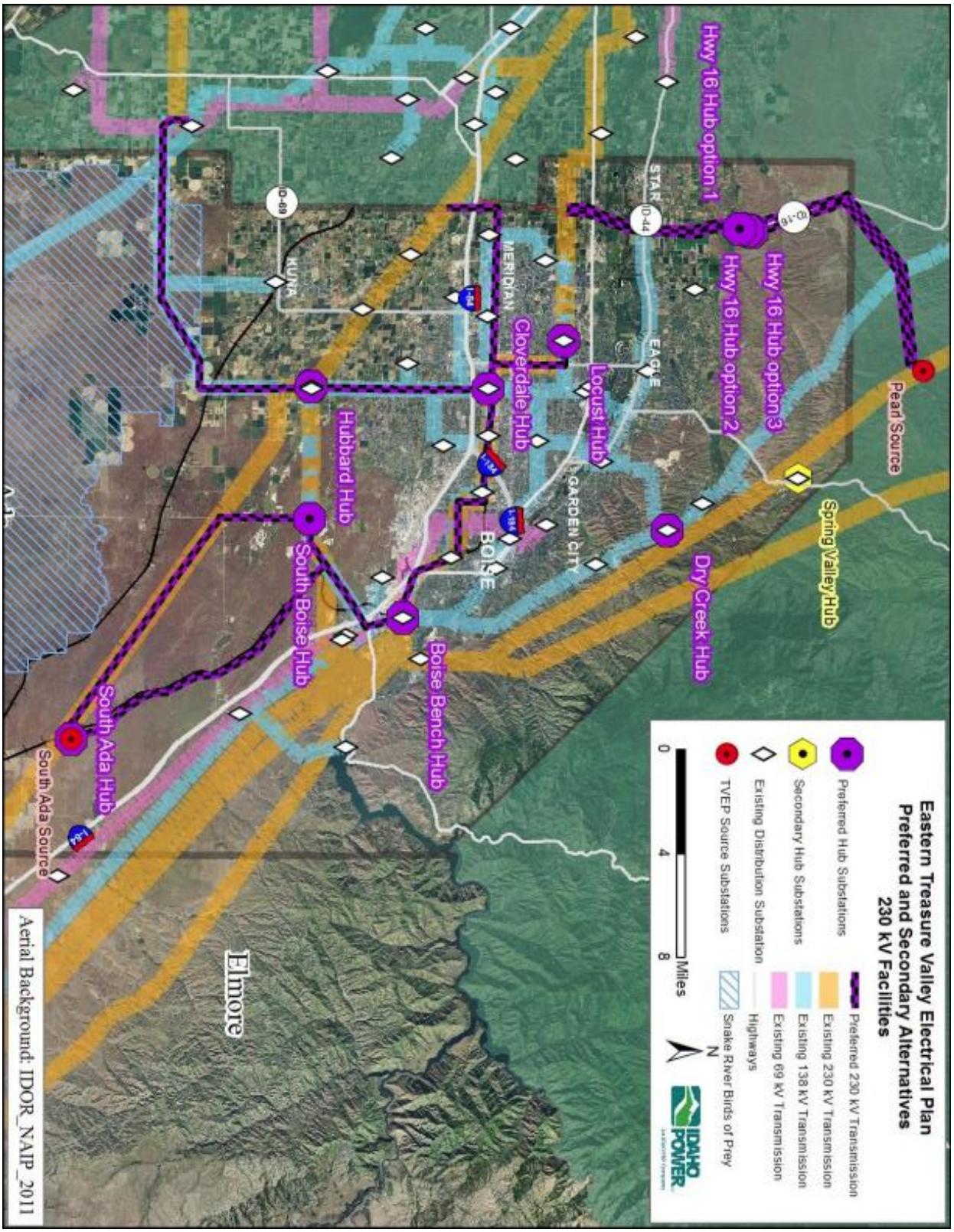


Figure 1: Ada County Preferred and Secondary 230 kV Alternatives

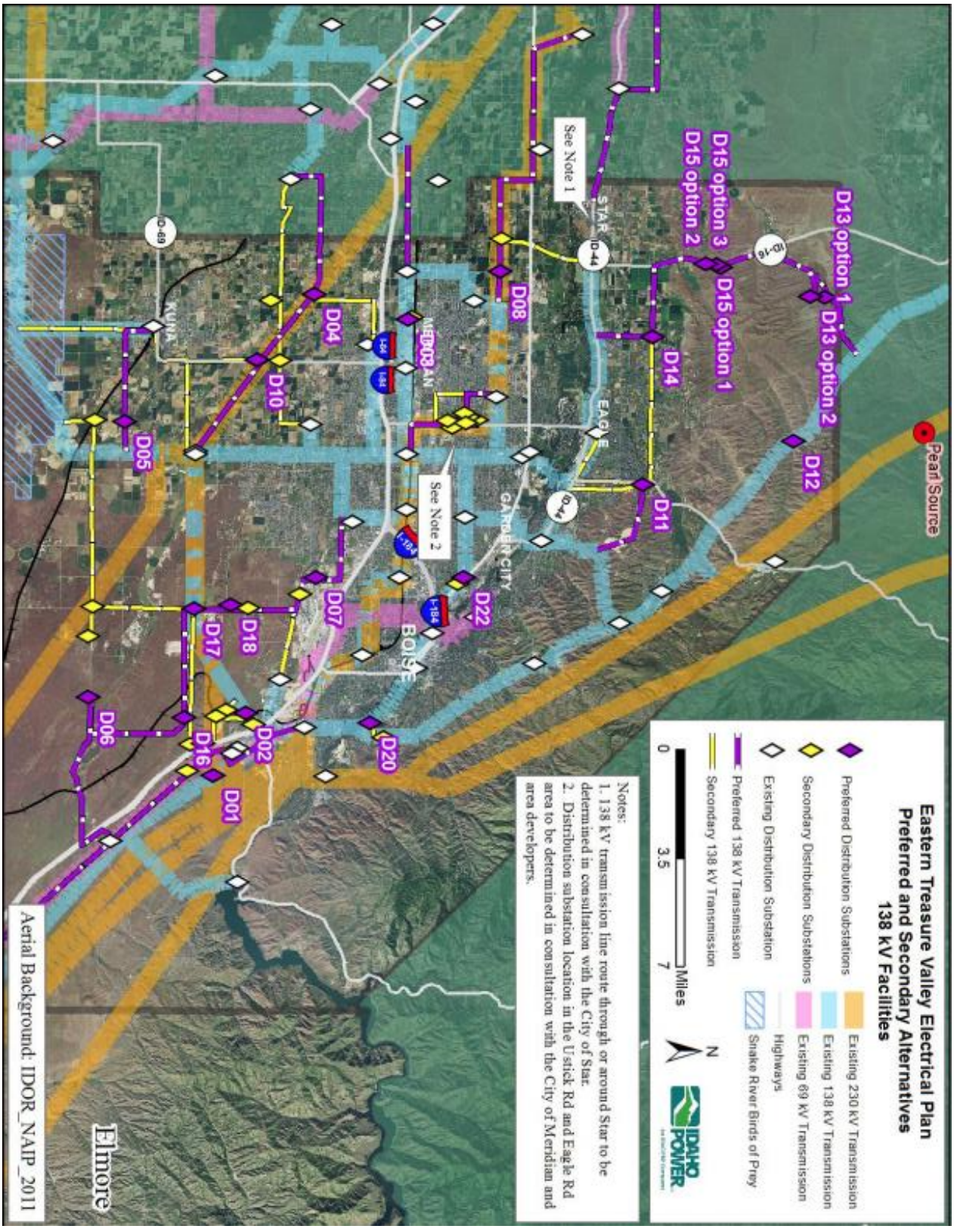


Figure 2: Ada County Preferred and Secondary 138 kV Alternatives

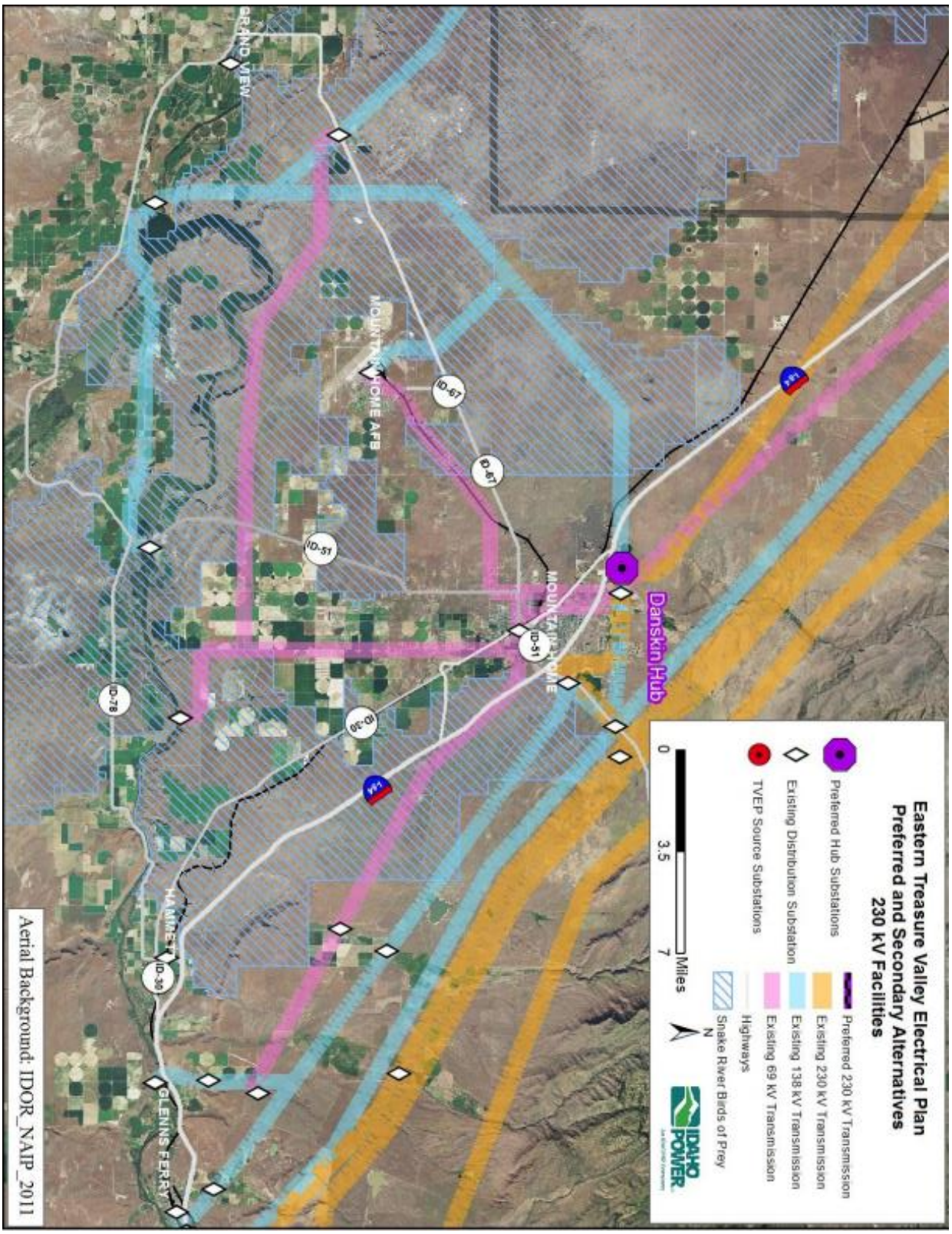


Figure 3: Elmore and Owyhee Counties Preferred and Secondary 230 kV Alternatives

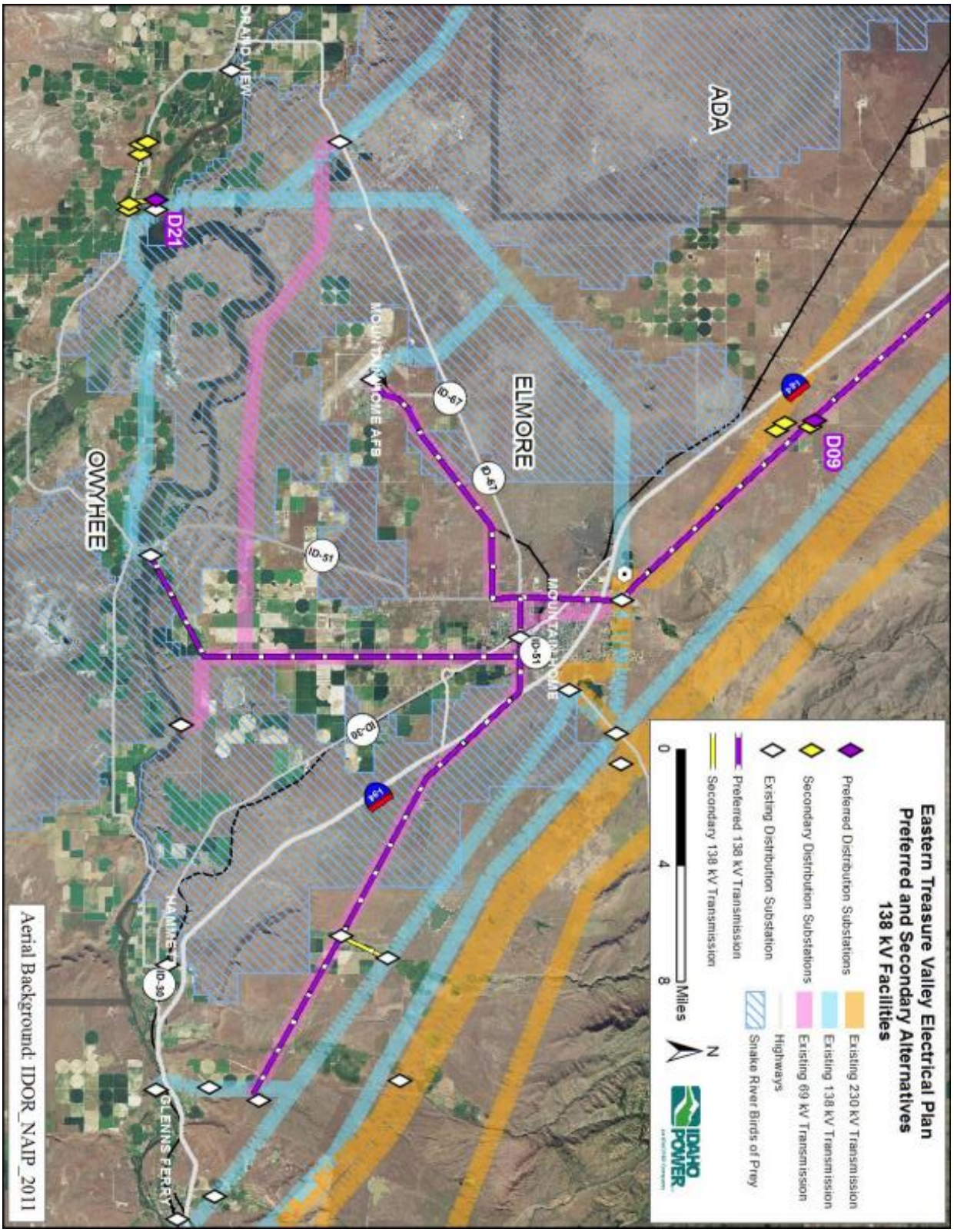


Figure 4: Elmore and Owyhee Counties Preferred and Secondary 138 kV Alternatives

Not all the facilities proposed by the Committee will be needed in the near term; facilities will be phased in based on load growth, reliability, system capacity, available budget, and Committee recommendations. If all or some parts of the preferred alternatives 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 Guiding Principles and Community Criteria when siting new infrastructure. Details for the preferred and secondary options are found in the body of this report in the Committee's Preferred Alternative section.

The Eastern Treasure Valley Electrical Plan is conceptual, and is 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 and gather input on specific proposed projects. 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 be incorporated into jurisdictional comprehensive plans.

In preparing the Eastern Treasure Valley Electrical Plan, IPC has accounted for the anticipated effect that energy efficiency will have on future electrical load in the eastern 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. That is, on a per capita basis, the rate of electrical load growth will be much slower when compared to today's load growth. Appendix B of this report discusses the various energy efficiency programs offered by Idaho Power.

The minimum estimated cost in 2012 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 Eastern 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 eastern 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 eastern Treasure Valley.

Appendix B - 2012 ETVEP 10 Year Plan

ETVEP Ten Year Implementation Plan

The Eastern Treasure Valley Electrical Plan is a long-term plan that (1) outlines the expected growth in electrical demand in the eastern Treasure Valley region of IPC's service area and (2) delineate the upgrades and additions to the power system needed to serve this growth. This Plan is the result of the Community Advisory Committee process where IPC collected and incorporated the local community's vision and perspective in the earliest stages of the planning process. Creating this Plan is only the first step in building and maintaining a power system that meets the needs of Idaho Power customers in the area. Continued coordination between Idaho Power and the local community is critical when implementing this Plan. There are three principle elements that will be used to successfully implement the Plan:

1. Introduce the Plan to the public.
2. Integrate the Plan into local comprehensive plans.
3. Phase in the construction of the power system outlined in the Plan.

System Implementation

The recommendations of the Eastern Treasure Valley Electrical Plan cover sufficient infrastructure improvements to the IPC system to deliver power for eastern Idaho's projected load buildout. Individual projects will be designed and constructed when needed based on future load growth and reliability requirements. As the need for each project nears, IPC will proceed through a detailed design, siting, and permitting process. The recommendations included in this Plan define the optimal location to start the siting process for each individual project in the eastern Treasure Valley. The current zoning ordinances, land use restrictions and availability of the property or right-of-way will be included in the siting analysis for each project. The Eastern Treasure Valley Electrical Plan is only the first step in the power system planning process. Idaho Power endeavors to keep the public informed and involved throughout each project's development. The public siting process is adjusted as needed to fit the local community needs as well as the unique technical and regulatory requirements of each project. Comments from local residents and business owners in the general vicinity of specific projects are gathered through public open houses as necessary. All concerns and recommendations from citizens and jurisdictional representatives will be addressed and considered in choosing the final site or right-of-way. Final transmission line routes and substation locations are subject to obtaining required permits, easements, and rights-of-way.

Although a schedule for implementation is listed below, the final implementation of the Eastern Treasure Valley Electrical Plan is dependent upon several factors including:

- Load growth rates (resulting from population changes, energy use characteristics, and technology changes)
- Reliability requirements
- Transmission line and transformer capacities (adequacy)
- Budget
- Community Advisory Committee recommendations

The following is a timeline of IPC's recommended near-term implementation plan:

0-10 Years (see Figure 5).
The siting for the following two projects was underway prior to the formation of the Eastern Treasure Valley Electrical Plan Community Advisory Committee and was thus outside the scope of the Committee's work.

- Construct a double-circuit transmission line between Bowmont Substation and Hubbard Substation in southwest Boise. Currently, there is a 138 kV transmission line between Bowmont Substation and Hubbard Substation with a tap proceeding north from it into Kuna Substation. The new double-circuit configuration would have a 230 kV transmission line that feeds between Bowmont and Hubbard substations and also the existing 138 kV transmission line that runs from Bowmont Substation to Hubbard Substation. The new double-circuit line would replace the existing 138 kV line and use the same right-of-way. This project is tied to the Boardman to Hemingway 500 kV transmission project and must be energized 3 months prior to completion of the 500 kV project in order to deliver power into the east end of the Treasure Valley.
- Cloverdale (hub) Substation — Install a 230kV source by (1) installing a new 300MVA 230- 138kV transformer, (2) installing two 230kV bays, and (3) upgrading existing facilities at the substation. Currently there is a 230 kV transmission line that passes nearby to Cloverdale Substation and it will be connected to Cloverdale (hub) Substation via the aforementioned equipment.
- It is noted that because of the high growth rate of commercial properties in and around Meridian, committee members representing the City of Meridian recommend that Idaho Power obtain substation properties as soon as possible before they are purchased for commercial development and preferably within the next two years. In particular, Idaho Power should consider purchasing property for substations in the Ustick Road/Eagle Road area and the Franklin Road area between Linder Road and Ten Mile Road.

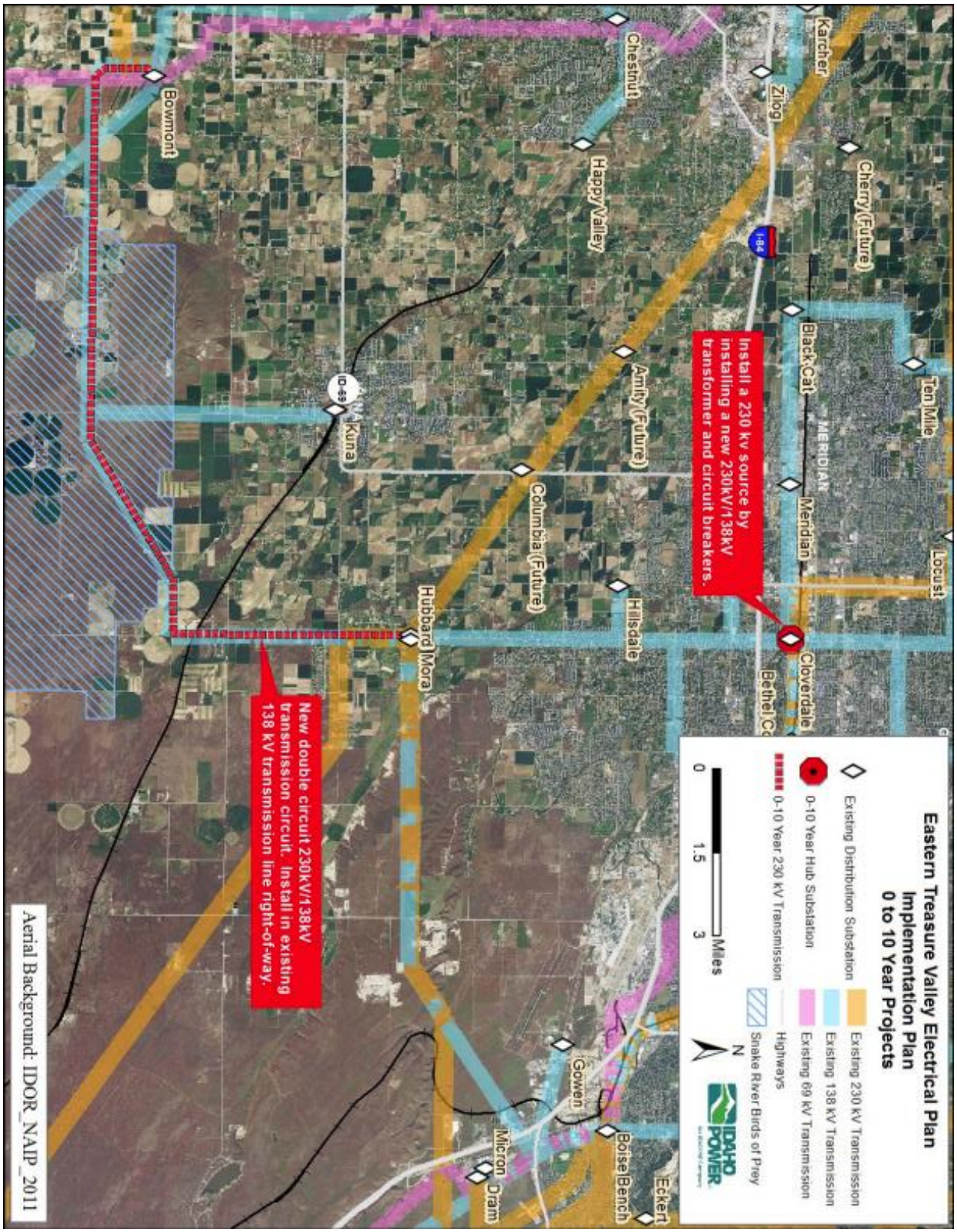


Figure 5: 0 to 10 Year Implementation Plan

Appendix C - 2012 ETVEP Guiding Principles and Community Criteria

As a first step in determining the feasibility of individual transmission line routes and substation locations, the Committee members created a Guiding Principles and Community Criteria document that set forth various measurable and non-measurable principles to guide their choices for the alternatives they would develop.

- **Guiding Principles** are key themes that serve as a foundation for making decisions concerning the eastern Treasure Valley electrical system.

- **Community Criteria** were used more specifically for locating transmission lines and substations by providing land use characteristics that are either more favorable or less favorable to electrical infrastructure siting.

The effort to define guiding principles and community criteria began in December, 2011, when the Committee separated into small groups facilitated by RBCI to discuss issues that are important to Committee members when planning to meet the eastern Treasure Valley's future energy needs. The small groups were asked to discuss the following questions:

- What are the principles important to you when siting future transmission lines and substations?

- Where should future transmission lines and substations be sited in your community?

- Are there areas in your community to avoid when siting future transmission lines and substations?

The issues recorded during the small groups' discussions were refined and synthesized by RBCI staff and were then formatted to fit into the "Guiding Principles" and "Community Criteria" format. The Committee used the Guiding Principles and Community Criteria when they developed the proposed siting alternatives. Both the Guiding Principles and Community Criteria represent the Committee's instructions and desires for IPC in implementing the plan and serving the communities in the eastern Treasure Valley area.

If the Committee's preferred substation and transmission line locations as shown in the Committee's Preferred Alternatives section of this report cannot be obtained, Idaho Power will use the Committee's guiding principles and community criteria for siting transmission lines and substations in the eastern Treasure Valley.

The final guiding principles were divided into 9 categories (listed in no particular order):

1. **Promote economic development**
   - Plan for potential growth (residential, commercial and industrial)
   - Recognize and promote the benefits of a healthy electric system

- Encourage prosperity by working to ensure that our electrical system is ready to meet requests for future growth
- Balance costs and rewards of economic development opportunities (i.e., the number of jobs provided versus amount of power needed for facility)

2. **Support existing businesses, property rights and land uses (e.g. historic sites, industries, Air Force Base)**
   - Accommodate existing growth
   - Plan for change in existing growth areas
   - Support future community development
   - Consider what would be impacted if a disaster were to occur
3. **Be sensitive to agriculture**
   - Take into account irrigation practices
   - Take precautions to minimize stray voltage at dairies and feedlot operations.
4. **Encourage positive interaction between communities**
   - Foster inter-jurisdictional communication regarding future electrical infrastructure needs to make the siting process easier and more successful
   - Be aware of neighboring communities' growth plans
5. **Comply with comprehensive plans**
   - Be flexible for future unplanned changes • Site infrastructure consistent with local agency plans
   - Actively participate in updates of comprehensive plans
6. **Be aware of environmentally sensitive areas**
   - Consider the Birds of Prey area
7. **Consider community character**
   - Take urban visual impacts into account
   - Avoid cutting communities in half
   - Be sensitive to each community's unique environment
   - Be sensitive to downtowns areas
8. **Continue to meet power needs and prepare for future unknowns**
   - Ensure all future electrical infrastructure is operational and reliable
   - Keep construction realistic
9. **Be as efficient as possible**
   - Consider monetary costs to all stakeholders
   - Take into account the impact of the line or substation
   - Consider upgrading existing infrastructure as much as possible The Community Criteria were divided into two lists that provide guidance for the specific placement of substations and transmission lines. The first list shows areas that can be deemed favorable to electrical infrastructure placement (Table 10) while the second list includes areas that should be avoided (Table 11).

Areas to Site Electrical Infrastructure	Areas to Avoid Siting Electrical Infrastructure
Industrial areas	Parks
Public lands	Schools
Near areas where energy is generated	Highly populated areas
Areas that need (or will need) more power	Irrigated farmland
Vacant areas	Airport approach zones
Upgrade existing electrical infrastructure	City corners
Along existing and/or planned electrical corridors	Near natural waterways and existing canals
Along transportation corridors and roadways	Sensitive wildlife habitats
Along rail corridors	The Air Force Base and Base flight corridors
Areas where transmission and/or substations will be of the highest and best use	Military training areas (e.g. Gowen Field, Owyhee County bombing ranges)
Along irrigations and/or drainage facilities, where practical	Viewsheds
Underground where possible	Pedestrian areas
Buffer around military installations	Historically sensitive areas (e.g. intact sections of the Oregon trail)
Plan for change within existing growth areas	Already approved uses
Canals (decisions will be made at the local level for this criterion)	Ridgelines
Subdivision areas (decisions will be made at the local level for this criterion)	Preserved foothills property
	Foothills open space (both owned and anticipated)
	Gateway corridors
	Zoos
	Cemeteries
	Historic properties, structures, and buildings
	Low-lying areas that could be prone to flood every few years (for substation)
	Canals (decisions will be made at the local level for this criterion)
	Subdivision areas (decisions will be made at the local level for this criterion)

Notes: