2023 Avista System Plan

Sunset Station, Spokane, Washington

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V0	2/7/2024	Released	David Thompson	John Gross

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1. System Planning Overview

Avista's System Planning department's core responsibilities include the development of a system plan for system reinforcements to meet transmission system needs for load growth, adequate transfer capability, requests for generation interconnections, line and load interconnections, and long-term firm transmission service.

The development of the system plan follows a two-year process with four phases. Stakeholders have opportunities to participate in the development of the system plan by collaborating with System Planning and providing comments.

- Phase 1 includes establishing the assumptions and models for use in the technical studies, developing and finalizing a Study Plan, and specifying the public policy mandates planners will adopt as objectives in the current study cycle.
- Phase 2 includes performing necessary technical studies and development of the Planning Assessment. The results of the technical studies are documented in the Planning Assessment, including conceptual solutions to mitigate performance issues.
- Phase 3 includes providing the Avista System Plan report to stakeholders. The Avista System Plan will include documentation of the electrical infrastructure plan with preferred solution options. The resulting project list will include additional information regarding projects and system modifications developed through means other than the technical studies.[1]
- Phase 4 comprises most of the year two in the two-year process and includes refining the preferred plan of service. Conceptual projects identified in Phase 2 which have not been fully developed in Phase 3 will be addressed in Phase 4.

Figure 1 provides a visual representation of the four phases through the two-year process.

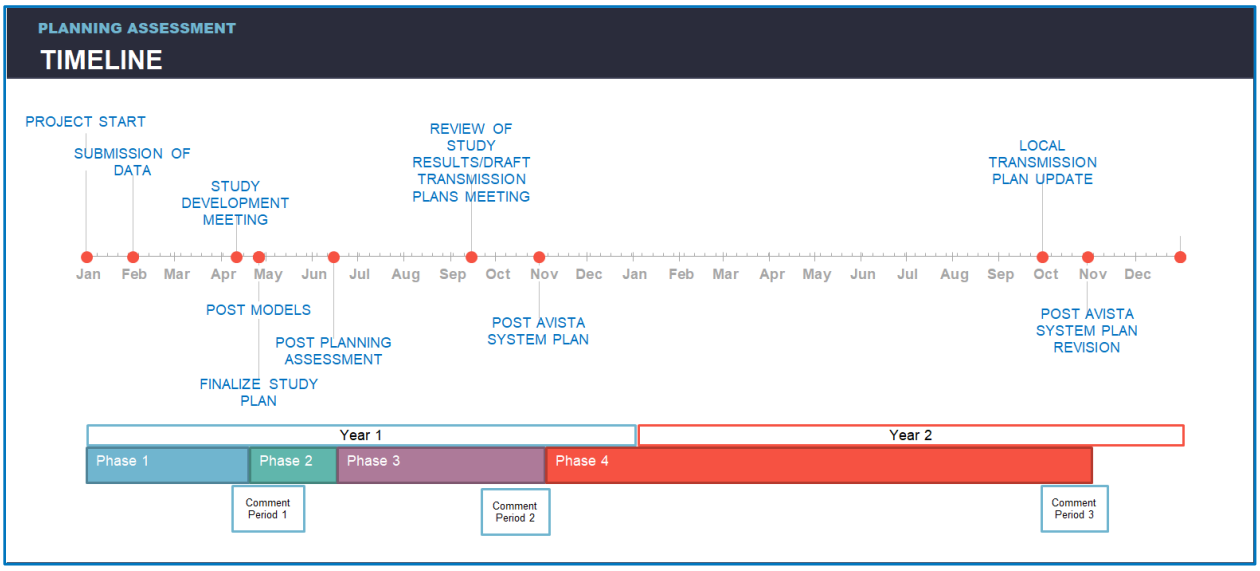

Figure 1: Avista Planning Assessment Timeline

[1] Such other means may include, for example, generation interconnection or transmission service request study processes under the OATT, or joint study team processes within the region.

2. System Project List

The System Project List in Table 1 is compiled by Avista's Engineering Roundtable (ERT). The list includes projects identified in the 2023-2024 System Assessment with additional projects evaluated and prioritized by the ERT. New projects identified in the 2023-2024 System Assessment which have not been vetted by the ERT are not included in the System Project List. TPL CAP refers to Corrective Action Plans (CAPs) to be implemented in accordance with TPL-001-5.

ERT #	Project Name	Driver	Scope	Status	TPL CAP
12	Carlin Bay Station	Performance and Capacity	Construct new distribution station to include single 20MVA transformer and two feeders. Transmission integration to include constructing a new radial transmission line from O'Gara Station to Carlin Bay. The second phase of the project includes rebuilding the existing O'Gara Station to a switching station. New microwave communication paths will be established to O'Gara Station.	Budgeted	
32	Davenport Station Rebuild	Asset Condition	Rebuild existing distribution station at nearby greenfield site. Initial construction will include single 20MVA transformer with three feeders.	Complete	
38	Metro Station Rebuild	Asset Condition	Rebuild existing substation at new location. 115kV bus to be a 6-position ring: 2 – 30MVA transformers, 2 – 115kV UG lines from PST, 2 – 115kV OH lines; switchgear on the 13kV side, both Network and Distribution feeders	Construction	
40	Northwest Station Rebuild	Asset Condition	Scope not complete. Rebuild existing Northwest Station.	Budgeted	
43	Valley Station Rebuild	Asset Condition	Scope not complete. Rebuild existing Valley Station.	Budgeted	
46	Poleline (Prairie) Station Rebuild	Performance and Capacity	Scope not complete. Construct new distribution station to replace Avista facilities at existing Prairie Station. New station to include two 30MVA transformers, four feeders, and looped-through transmission without circuit breakers.	Budgeted	
56	Bronx Station Rebuild	Performance and Capacity	Scope not complete. Reconstruct existing Bronx Station to include distribution facilities.	Budgeted	
58	Westside Station Rebuild	Performance and Capacity	Replace the existing Westside 230/115kV Transformer 2 and construct necessary bus work and breaker positions. Reconstruct 230 and 115kV buses to double bus double breaker 3000/2000 Amp standard. Phase 4: Complete bus work to double bus, double breaker on both the 230kV and 115kV buses	Construction	Yes
60	Ninth and Central - Sunset 115kV Transmission Line Upgrade	Performance and Capacity	Replace the 795 AAC and ACSR conductor on the Ninth and Central – Sunset 115kV Transmission Line with 795 ACSS with E3X coating to match the rest of the line.	Complete	

ERT #	Project Name	Driver	Scope	Status	TPL CAP
61	Post Falls Station Rebuild	Customer Requested	Rebuild existing Post Falls Station in green field location adjacent to existing station. New station will be a ring bus configuration with three transmission line positions, a metered GSU position, and two 115/13kV distribution transformers. The distribution transformers will have four feeders connected.	Budgeted	
62	Lolo Transformer Replacement	Performance and Capacity	Replace Lolo #1 230/115kV transformer with 250MVA rated transformer. Replace Lolo #2 230/115kV transformer with 250MVA rated transformer. 115kV circuit breakers, bus work and other capacity-limiting elements will be replaced. Circuit switchers at Clearwater, Lolo, and Sweetwater stations will be replaced.	Construction	
80	Huetter Station Expansion	Performance and Capacity	Add new 30MVA transformer and two distribution feeders to the existing Huetter Station. Scope includes a new panel house and rerouting the transmission line to the east side of the station. 13kV bus tie switch and a 115kV bus tie switch located on transmission structures outside the substation will be added.	Construction	
95	Clearwater Station Upgrades	Customer Requested	Scope not complete. New 115kV relay panels installed on all line positions. Existing circuit switchers will be replaced as part of the Lolo Transformer Replacement project.	Budgeted	
96	Kettle Falls Protection System Upgrades	Mandatory and Compliance	Upgrade existing protection schemes on the Addy – Kettle Falls and Colville – Kettle Falls 115kV Transmission Lines. New relays at Kettle Falls Station and a new communication path from Kettle Falls to Mount Monumental are required.	Construction	Yes
100	Melville Station	Performance and Capacity	Scope not complete. New switching station near existing tap to Four Lakes Station off the South Fairchild Tap 115kV Transmission Line. Construct new transmission line from Airway Heights to Melville including passing through Russel Road and Craig Road distribution stations. Requires new transmission line terminal at existing Airway Heights Station.	Budgeted	
111	Lyons and Standard Station Expansion	Customer Requested	Add new feeder to existing Lyons and Standard Station.	Construction	
124	Pine Street - Rathdrum 115kV Transmission Line Upgrade	Asset Condition	Rebuild transmission line.	Construction	

ERT #	Project Name	Driver	Scope	Status	TPL CAP
131	Garden Springs Station	Performance and Capacity	Construct new 115kV portion of Garden Springs Station at the existing Garden Springs switching location. New station will terminate Airway Heights – Sunset and Sunset – Westside 115kV Transmission Lines including the South Fairchild Tap. Construct new 230kV portion of Garden Springs Station including two 250MVA nominal 230/115kV transformers. Construct new 230kV transmission line from Garden Springs to a new switching station, Bluebird, at an interconnection point on the BPA Bell – Coulee #5 230kV Transmission Line.	Budgeted	Yes
134	Craig Road Interconnection	Customer Requested	Customer will construct new distribution station. Avista will provide new radial 115kV transmission line from Airway Heights Station as part of the Melville Station project.	Budgeted	
136	IEP Transformer Replacement	Asset Condition	Replace existing transformer located at IEP.	Budgeted	
140	Bunker Hill Customer Capacity	Customer Requested	Install new 20MVA transformer to replace existing transformer and construct new dedicated customer distribution feeder.	Budgeted	
143	Waikiki Capacity Mitigation	Performance and Capacity	Add new 20MVA transformer and two feeders to existing Indian Trail substation.	Budgeted	
148	Barker Capacity Mitigation	Performance and Capacity	Add new 30MVA transformer and three feeders to existing Greenacres substation.	Budgeted	
151	Pleasant View Capacity Mitigation	Performance and Capacity	Scope not complete. Add new 30MVA transformer and two feeders to existing station.	Budgeted	
156	Safely Interrupting Faults	Performance and Capacity	Replace South Othello A57 circuit switcher with 1220kA or greater rated equipment. Replace Barker Road A316 circuit switcher with 40kA or greater rated equipment. Replace Francis and Cedar A676 and A677 circuit switchers with 40kA or greater rated. equipment. Replace Lakeview R330 circuit switcher with 20kA or greater rated equipment. Replace Garfield EG-1 transformer fuse with 10kA or greater rated fuse. Replace Leon Junction SMD-2B transformer fuse with 15kA or greater rated fuse. Replace Long Lake SMD-2B transformer fuse with 15kA or greater rated fuse. Replace North Moscow SMD-2B transformer fuse with 15kA or greater rated fuse.	Budgeted	

ERT #	Project Name	Driver	Scope	Status	TPL CAP
157	Colbert Feeder Extension	Performance and Capacity	Rebuild the existing Colbert Tap 115kV Transmission Line to accommodate new distribution underbuild. New underbuild to be an extension of COB12F2 which will offload COB12F1. Load from COB12F2 will be transferred to MEA12F3.	Construction	

Table 1: Avista System Plan project list[2]

The Generation Interconnection process evaluates Interconnection Customer requests to connect to Avista's transmission or distribution system at a specified Point of Interconnection (POI) through an annual Cluster Study. Table 2 lists the senior-queued projects represented in the electrical system models used for the Cluster Study analysis.

Queue Number	MW Output	Type	Scope	Status
Q59	60MW	Solar/Storage	Construct new 115kV station adjacent to existing Roxboro Station for the POI	Drafted LGIA
Q60	150MW	Solar/Storage	230kV POI at Dry Creek Station	Suspended
Q63	26MW	Hydro	Rebuild of station, distribution, and transmission infrastructure	LGIA
Q66	71MW	Wood Waste	Efficiency improvements and GSU upgrade at Kettle Falls Generation Station	LGIA
Q80	19MW	Solar/Storage	115kV POI on South Fairchild Tap at customer collection station	PURPA
Q84	5MW	Solar/Storage	13.8kV POI adjacent to Chewelah Station	PURPA
Q97	100MW	Solar/Storage	230kV POI at Lolo Station	Suspended
TCS-03	80MW	Solar/Storage	115kV POI at Warden Station	Suspended
TCS-14	375MW	Wind/Storage	230kV POI at Dry Creek Station	Construction

Table 2: Interconnection Generation Projects

3. Major System Projects

The following list is a subset of the project list provided in Section 2. These projects were selected based on their relative impact to the system performance and the project scope has been substantially determined. A general problem statement and summary of project scope is provided. Detailed project reports may be available, containing additional scope and technical information.

3.1. ERT #12: Carlin Bay Station

The population and load demand growth on the east side of Lake Coeur D'Alene has resulted in rising concerns for Avista to reliably support new customers at the far-reaching end of two distribution feeders. These feeders cannot support additional growth in the area considering the increased distances are currently pushing limitations of the 13.8kV distribution system. Issues have emerged, including voltage drop,

[2] Accessed from the Engineering Roundtable SharePoint site December 18, 2023.

reduced fault current, and cold load pickup, all contributing to system protection challenges.

The complete scope of the Carlin Bay Project will be executed in a phased approach so immediate concerns are mitigated and operational while the remainder of the scope can be completed. The complete scope includes the following:

- Phase 1 includes construction of the Carlin Bay Station and a 115kV transmission line tap from the Benewah – Pine Creek 115kV Transmission Line near O'Gara to the Carlin Bay Station. The expected in-service date is 2028.

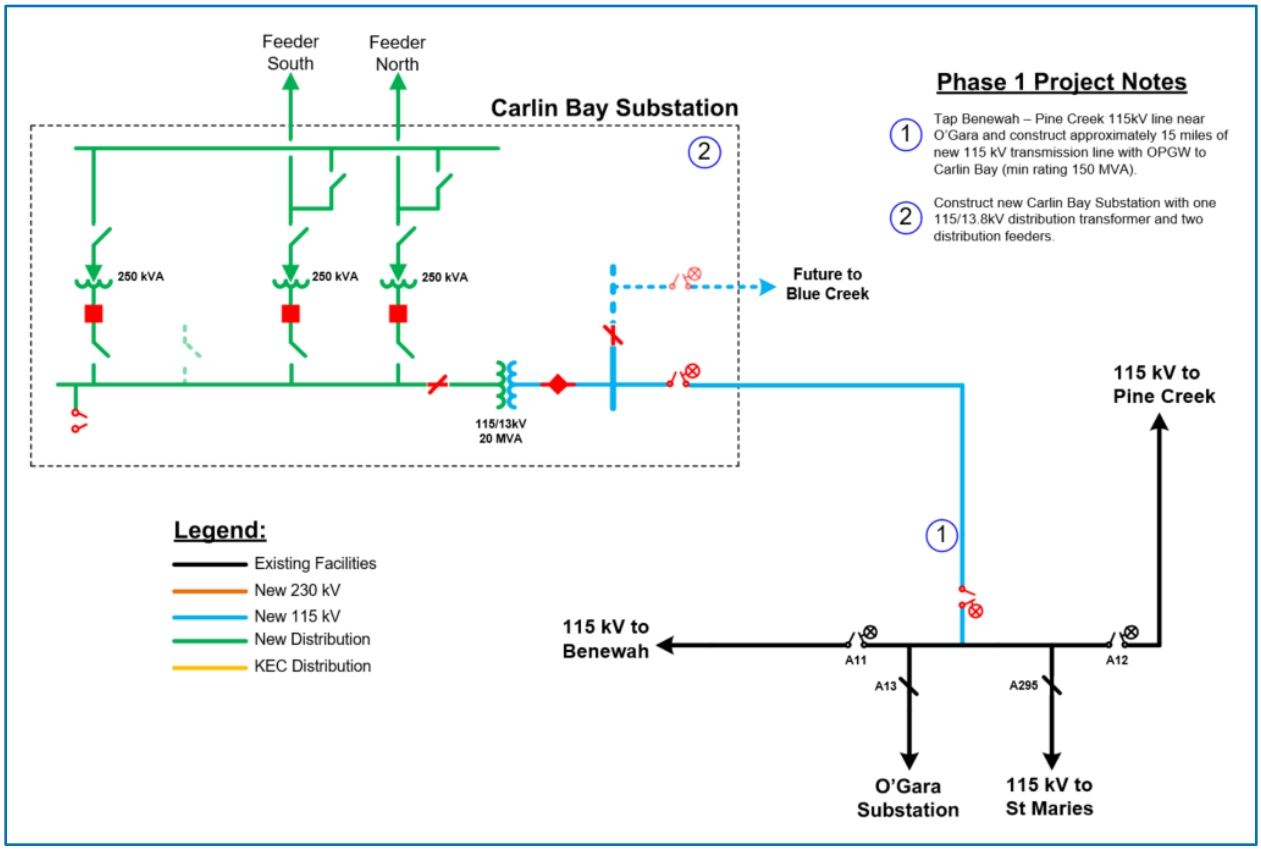

Figure 2: Carlin Bay Station Phase One Diagram

- Phase 2 includes a rebuild of the O'Gara Station to a breaker and a half configuration with space for a future line position and future capacitor bank. The expected in-service date for this work is 2029.

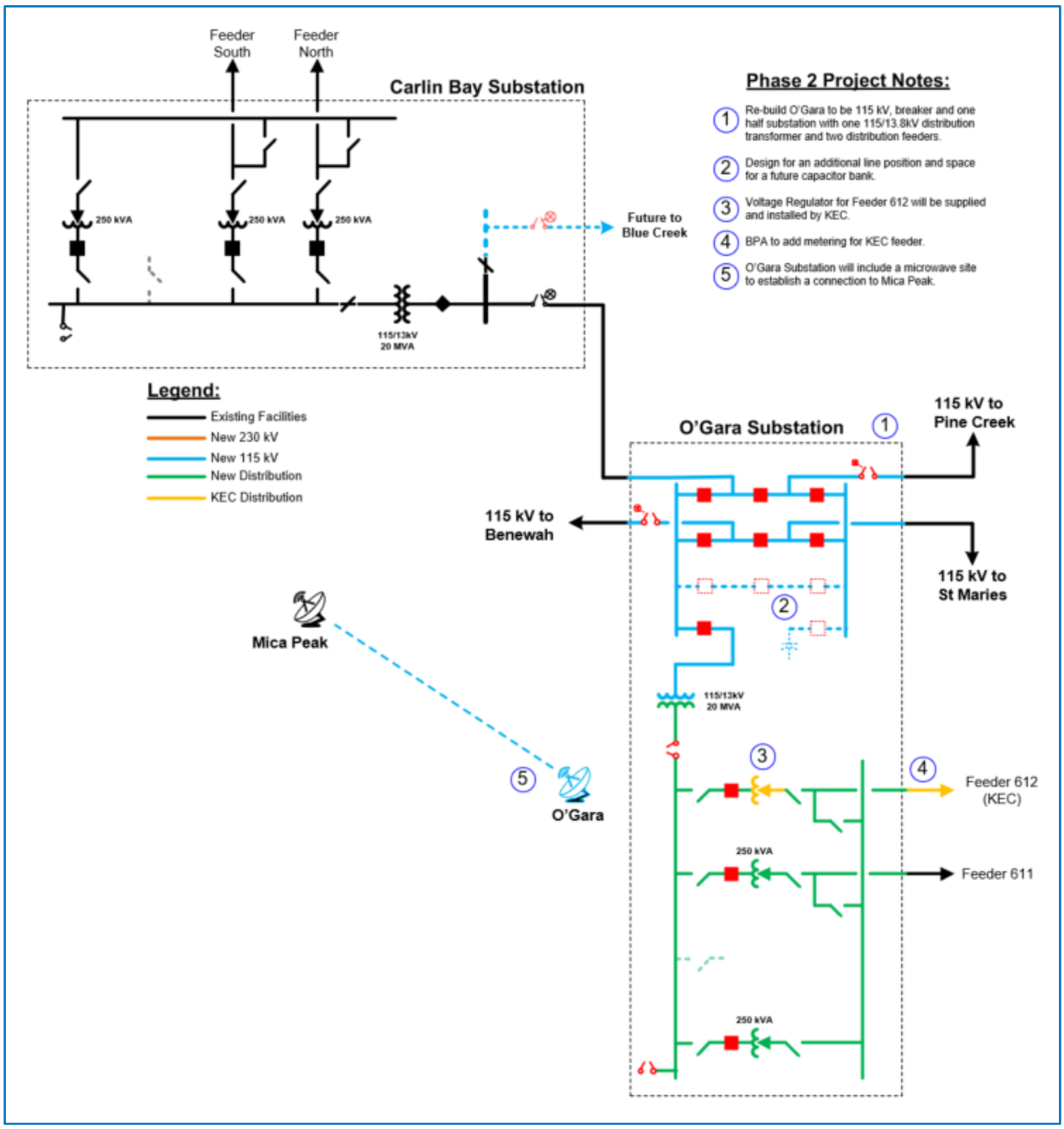

Figure 3: Carlin Bay Station Phase Two Diagram

3.2. ERT #58: Westside Station Rebuild

Outages causing loss of 230/115kV transformers at the BPA Bell or Avista Beacon Station, or outages causing increased impedance from the Bell and/or Beacon Stations to the area's distribution stations cause the Westside #1 and #2 230/115kV transformers to exceed their applicable facility ratings. The Westside Station Rebuild project is a complete station rebuild which includes the replacement of the existing Westside #1 and #2 230/115kV transformers with 250MVA nominal capacity transformers. Both the 230kV and 115kV configurations will be double bus, double breaker.

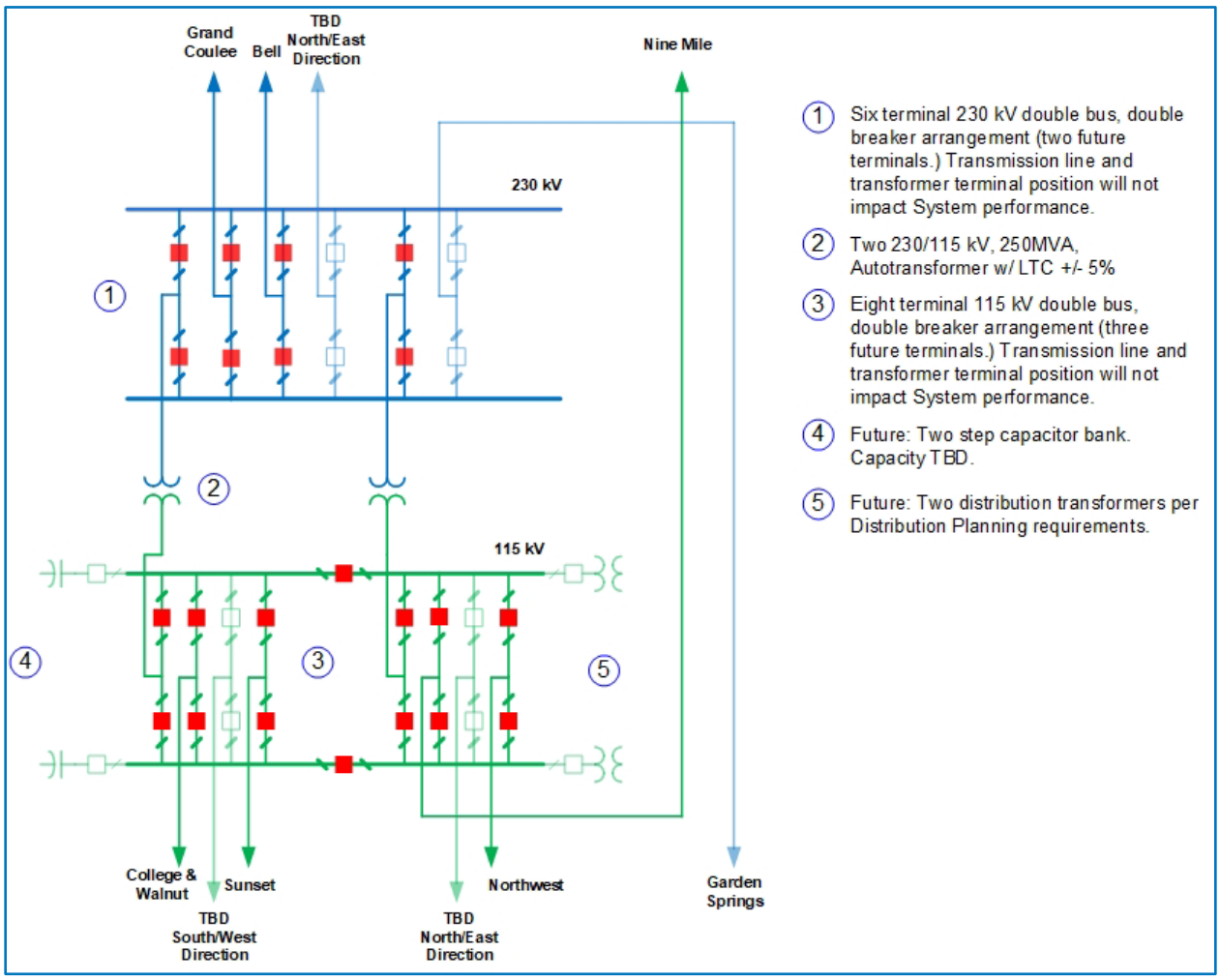

Figure 4: Westside Station Rebuild Project Diagram

3.3. ERT #62: Lolo Transformer Replacement

The two 230/115kV, 125MVA transformers at Lolo Substation were identified for possible overload per TPL-001-5 R2.1.5, which pertains to outages for equipment with long lead times relative to available spares. When the project was under development, Avista did not maintain a spare transformer of this size.

The Lolo Transformer Replacement project is the replacement of the existing 125MVA transformers with 250MVA units as well as replacement of their respective 115kV circuit breakers to accommodate the increased transformer capacity. The circuit switchers on the Lolo distribution transformer and the nearby Sweetwater Substation distribution transformer will also be replaced to meet the additional fault duty associated with the transformer upgrade.

Additionally, the 115kV bus will be replaced due to inadequacy for existing fault duty levels. The remaining 115kV breakers will be replaced as part of the bus rebuild.

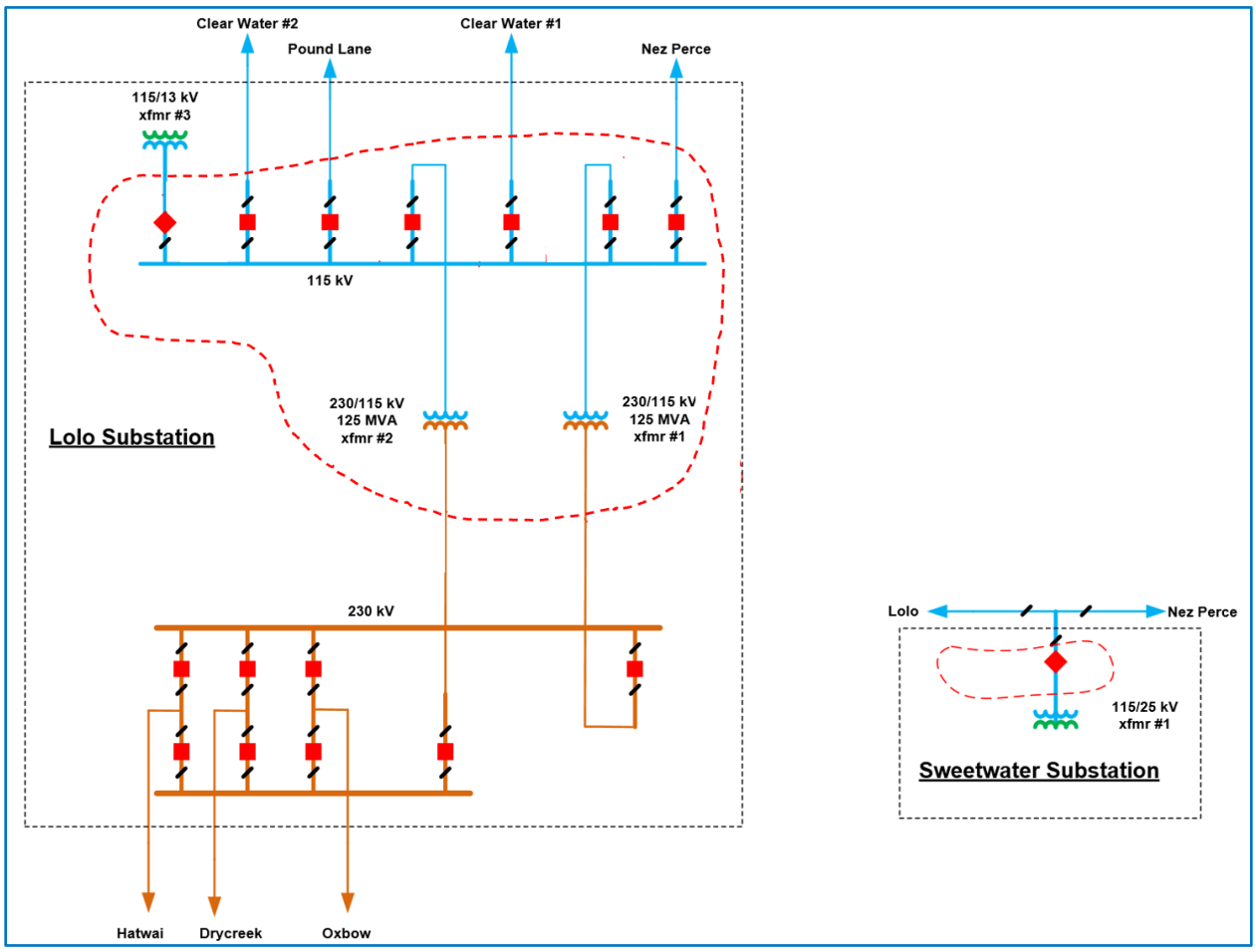

Figure 5: Lolo Transformer Replacement Project Diagram

3.4. ERT #131: Garden Springs Station

The West Plains and Sunset area (up to 245MW) is served by four 115kV transmission lines, which may overload for multiple contingency events during summer loading. Existing mitigation projects (Garden Springs – Sunset 115kV Transmission Line rebuild and the Ninth and Central – Sunset 115kV Transmission Line rebuild) help reduce the amount of overloading, but do not correct known contingency issues.

The West Plains System Reinforcement initiative includes the construction of a new 230kV transmission source into the area to mitigate reliability and operability constraints. A new transmission line is proposed to connect the Bell – Coulee corridor to a new Garden Springs Station. The Garden Springs Station will include two 250MVA nominal 230/115kV transformers and intersect the Sunset – Westside and Airway Heights – Sunset 115kV Transmission Lines.

Additional reinforcements in the area to support distribution system expansion and interconnect new distribution stations includes a new 115kV transmission line from Airway Heights Station to a new Melville Station which intersects the South Fairchild 115kV transmission line Tap near Hallett and White Station. New distribution stations at Flint Road and Russel Road will increase transformation capacity and provide additional feeders to serve the increased distribution system demands. These additional

reinforcements will be included in subsequent projects with the intent of providing a comprehensive approach to meet increased customer demand in the West Plains area.

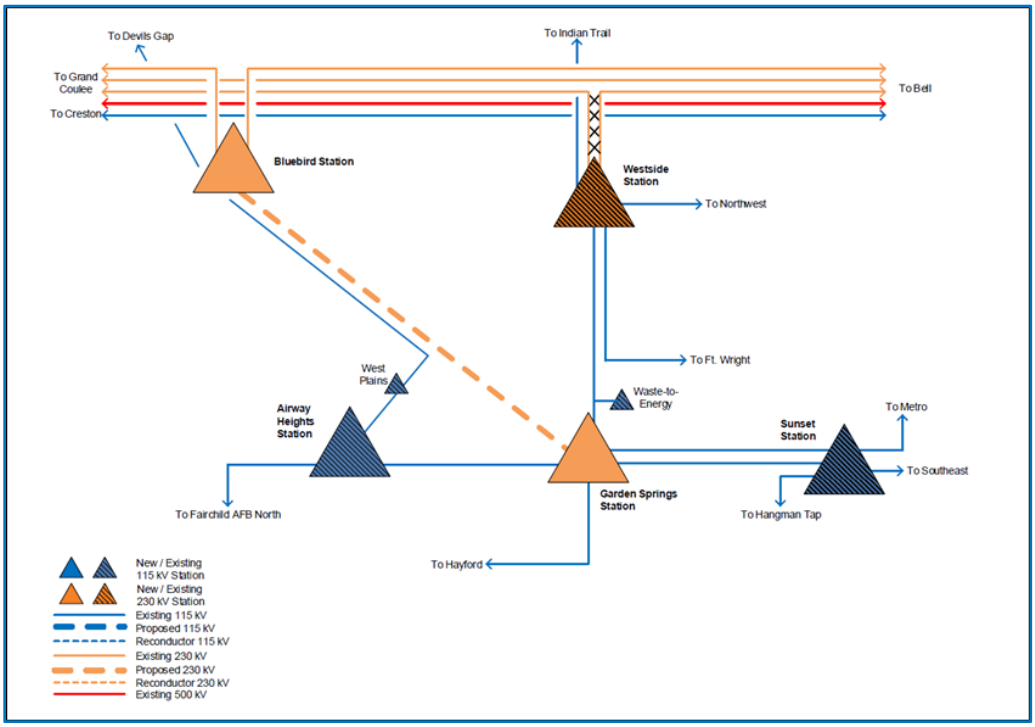

Figure 6: Garden Springs Station Project Diagram

3.5. ERT #143: Waikiki Capacity Mitigation

The Waikiki Capacity Mitigation project addresses issues in the North Spokane by installation of a new 20MVA transformer at the Indian Trail Station. This location can accommodate the additional lineup as it was originally designed for future expansion as shown in Figure 7. This project also proposes an upgrade to the INT12F1 voltage regulator. Distribution buildout and load transfers are needed to distribute the additional transformation capacity.

The project diagram provided in Figure 7 summarizes the project scope, including the necessary modifications to the distribution system to integrate the new Indian Trail feeders and mitigate the identified performance issues. Principal projects elements include the construction of a 1.5-mile feeder tie between INT12F3 and WAK12F4, a 1.2-mile feeder tie between WAK12F4 and WAK12F1, load transfers, additional feeder tie switches, and default configuration changes.

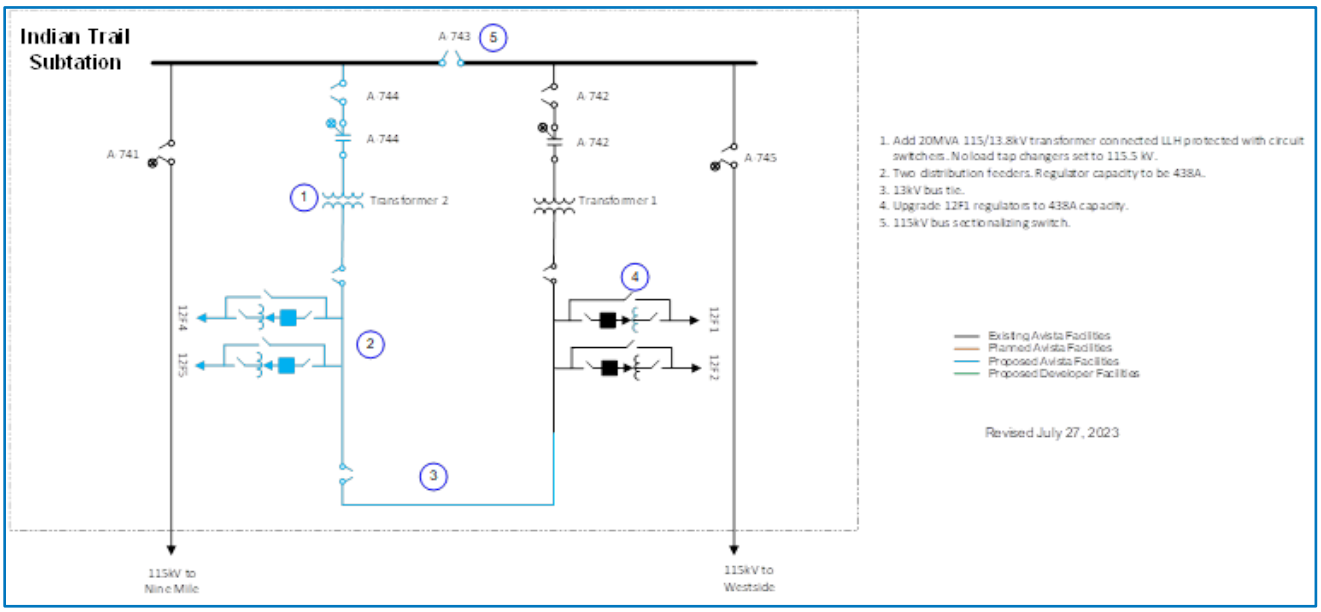

Figure 7: Waikiki Capacity Mitigation at Indian Trail Station

3.6. ERT #148: Barker Capacity Mitigation

This project expands the distribution capacity at Greenacres Station, including the installation of a new 30MVA 115/13kV transformer, 13kV bus tie, three 13.2kV distribution feeders, and associated controls, communication, and facilities equipment. No new transmission work will be required for this project.

Figure 8 provides a preliminary scoping drawing based on the original Greenacres design and the expansion. The existing distribution lineup, 30MVA transformer, and grounding will remain in place. The new lineup includes the second 30MVA transformer and three additional feeders. The regulator capacity will be 438A.

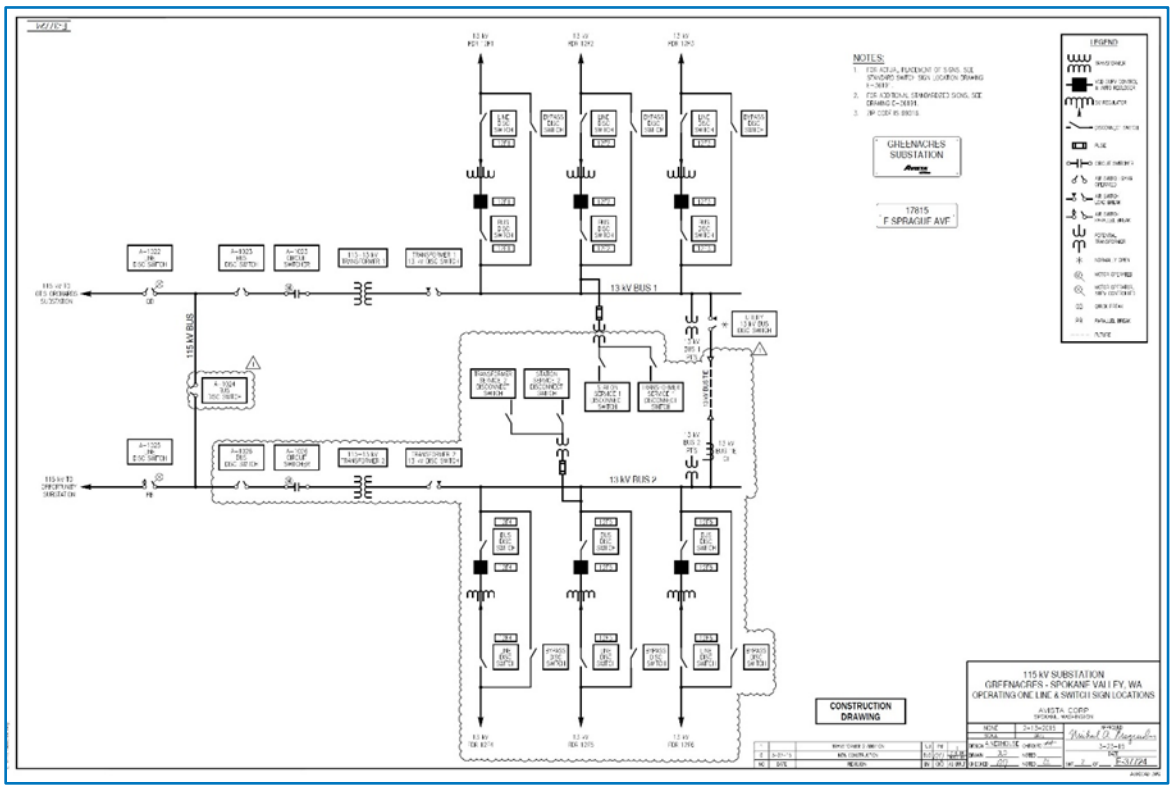

Figure 8: Barker Capacity Mitigation at Greenacres Station

4. Project Prioritization

Avista's ERT serves to evaluate proposed solutions for recognized system deficiencies or necessary expansion while considering alternatives, collaborative approaches, and project prioritization. The ERT considers any transmission, distribution, or substation project requiring a capital investment greater than $1,000,000, providing validation of scope and concept.

Projects deemed to be prudent are prioritized and submitted to the Project Delivery functions to guide the development of work plans, schedules, and budgets. Project priorities are expected to remain consistent relative to the dynamic needs of the business.

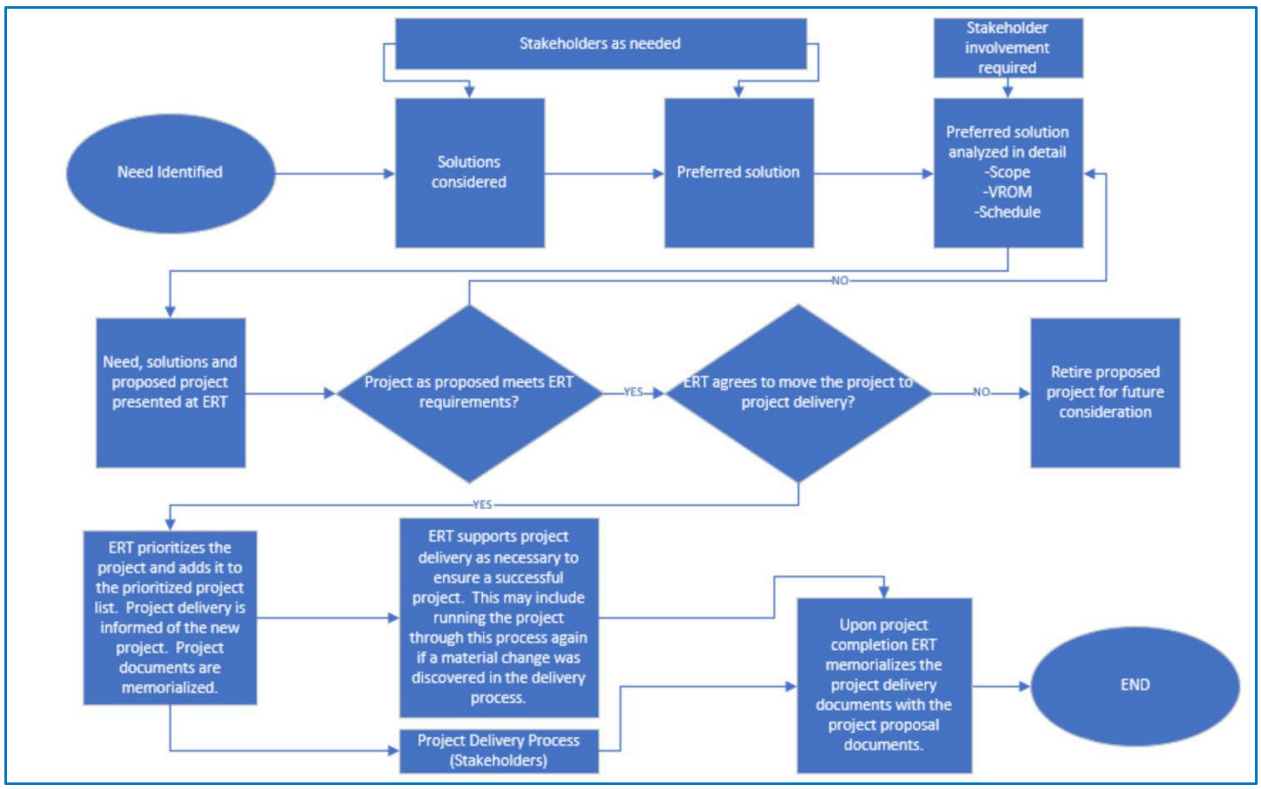

Figure 9: Engineering Roundtable Process

The ERT project prioritization process evaluates a combination of Technical Importance and Initiation Urgency perspectives. Scoring metrics consider the opportunities and potential impact to the system within a 10-year horizon. The project portfolio as presently prioritized and scored is summarized in Figure 10.

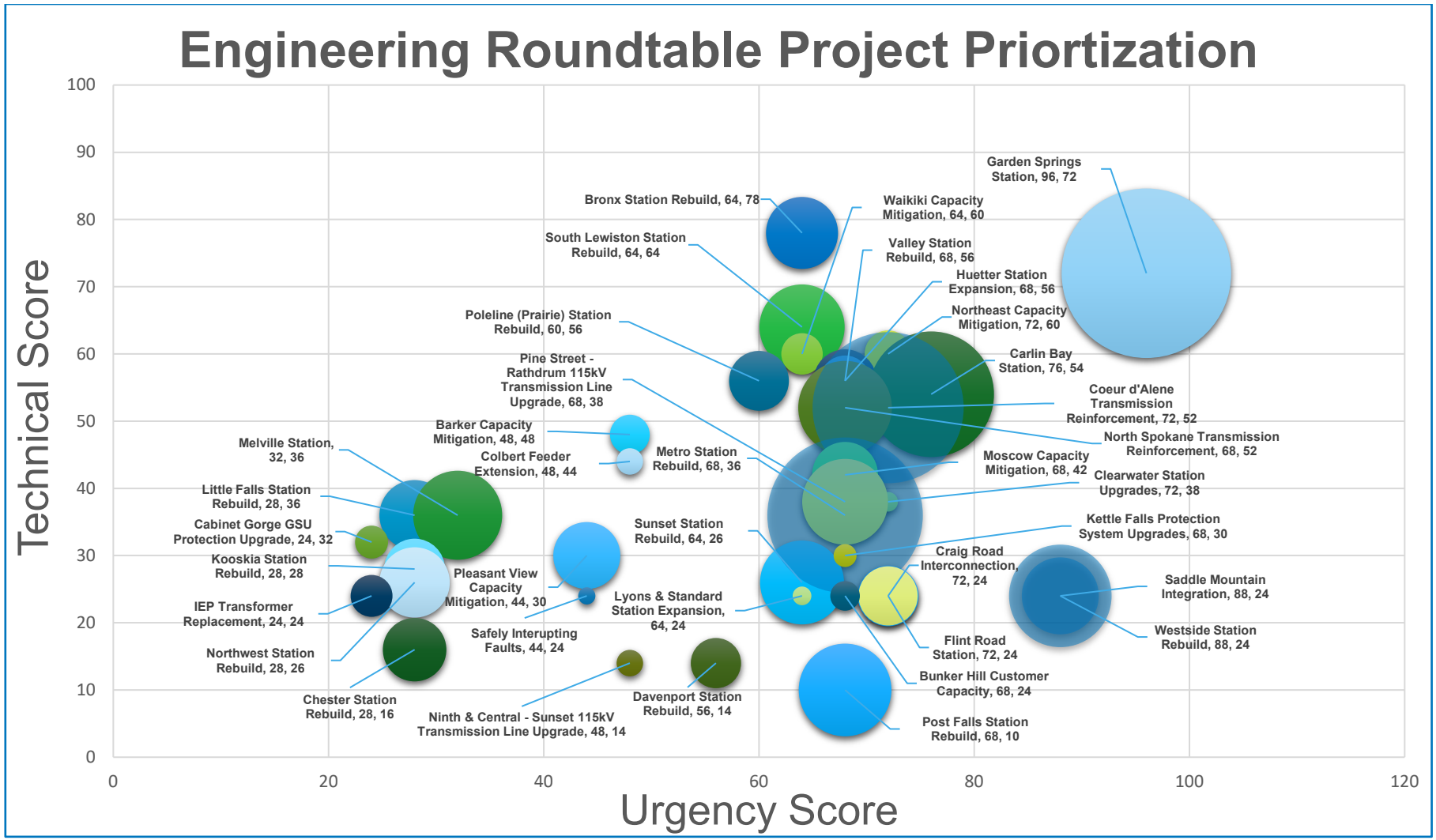

Figure 10: Engineering Roundtable Project Prioritization and Scoring

5. Project Schedule

The Project Delivery Roundtable (PDRT) reviews the substation, distribution, and transmission projects as prioritized by the ERT and aligns internal resources and coordinates project scheduling within the five-year capital plan and construction resources. The PDRT construction schedule is shown in Table 3.

Project	ERT Reference	Start	Finish
2024			
Lyons & Standard Capacity Increase	#111 Lyons & Standard Station Expansion	May 2023	April 2024
Westside Substation Rebuild - Phase 3	#56 Westside Station Rebuild	October 2020	October 2024
2025			
Huetter 115kV Substation – Expansion	#80 Huetter Station Expansion	August 2022	February 2025
Indian Trail 115kV Substation	#143 Waikiki Capacity Mitigation	December 2022	March 2025
Greenacres 115kV Substation	#148 Barker Capacity Mitigation	September 2022	April 2025
Poleline 115kV Substation	#46 Poleline (Prairie) Station Rebuild	February 2023	September 2025
Cloudwalker/Dry Creek Interconnect	TCS-14	May 2024	November 2025
2026			
Valley Substation	#43 Valley Station Rebuild	April 2024	February 2026
Airway Heights to Craig Road	#134 Craig Road Interconnection	March 2025	April 2026
Metro 115-13kV Substation Rebuild	#38 Metro Station Rebuild	June 2022	August 2026
2027			
Bunker Hill Substation	#140 Bunker Hill Customer Capacity	December 2024	January 2027
Bluebird Substation	#131 Garden Springs Station	June 2024	January 2027
Bronx Substation	#56 Bronx Station Rebuild	September 2025	November 2027
Post Falls Substation (New)	#61 Post Falls Station Rebuild	January 2024	December 2027
2028			
Garden Springs Substation	#131 Garden Springs Station	July 2023	April 2028
Metro 115-13kV Substation Rebuild	#38 Metro Station Rebuild	July 2020	May 2028
Pleasant View Substation	#151 Pleasant View Capacity Mitigation	October 2025	June 2028
Carlin Bay Substation	#12 Carlin Bay Station	July 2023	September 2028
2029			
Melville Switching Station	#100 Melville Station	August 2026	April 2029
O'Gara Substation	#12 Carlin Bay Station	September 2022	August 2029
2030			
Northwest Substation	#40 Northwest Station Rebuild	February 2026	March 2030

Table 3: PDRT schedule