



RIVERSIDE TRANSMISSION AND RELIABILITY PROJECT LOWER VOLTAGE ALTERNATIVES

Public Utilities Department

City Council
May 13, 2025

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BACKGROUND

1. RTRP was approved by the CPUC in 2020
2. RTRP designed as transmission to minimize impacts and costs while increasing reliability
 - a. Double-circuit 230kV transmission line (SCE)
 - b. 69kV lines (within RPU's service territory).
 - c. New SCE 230kV substation (Wildlife Substation)
 - d. A new RPU 230/69kV electrical substation (Wilderness Substation)
3. Prior to the CPUC approval, the CPUC requested additional alternatives be analyzed including low voltage alternatives



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LOWER VOLTAGES MEAN MORE LINES

1. Transmission lines carry electricity over long distances
2. Electricity in transmission lines is transported at voltages of over 200 kV to maximize efficiency and minimize losses
3. Losses, in the form of heat, result from the resistance on the flow or current of electricity on a line
4. The higher the voltage, the lower the current needed to deliver the same amount of power (measured in Watts)
5. Power loss is proportional to the current flowing through it. Higher the current, greater the power loss will be.



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230KV VS 69KV

1. For the same Watts more current would flow on a 69kV system vs. a 230kV system
2. Wire size used is proportional to the current flow. The greater the current the larger the wire OR the need for multiple wires
3. The larger the current the more losses on the system, in the form of heat



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RTRP LOWER VOLTAGE ALTERNATIVES

1. Multiple 69kV routes analyzed - Alternatives A, B, and C
 - a. Expanding Vista Substation was evaluated but was infeasible due to lack of space and site constraints
2. To provide the equivalent watts (560MW) from 230kV system to a 69kV system
 - a. Seven 69kV lines would have to be constructed on up to three routes/corridors
 - b. Would require 3 separate routes for the power lines – combinations of overhead and underground and land for other infrastructure improvements
3. **CPUC modified the RTRP project after this analysis to include additional undergrounding in Jurupa Valley – similar increases to underground are expected for all the alternatives**



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LOWER VOLTAGE ALTERNATIVES

	RTRP Hybrid	Alternative A	Alternative B	Alternative C
Miles of Power Lines	9.7	43.8	30.3	20.2
Number of Structures	63	654	335	409
Cost	\$405.3 million	\$499.1 million	\$1,064.2 million	\$503.4 million
Additional Infrastructure	<ul style="list-style-type: none"> Construction of the Wilderness and Wildlife Substations 	<ul style="list-style-type: none"> Requires expansion of SCE Mira Loma Substation Modification of RPU Substations not included in the cost 	<ul style="list-style-type: none"> 11+ miles of 230 kV transmission and construction of a substation in Corona Modification of RPU Substations 	<ul style="list-style-type: none"> Requires expansion of SCE Mira Loma Substation Requires a 60 Mw PV facility with battery energy storage in Riverside (360 to 500 acres) Modification of RPU Substations not included in the cost



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REDUCTION OF FIRE RISK

1. Undergrounding of electrical lines reduces wildfire risk
 - a. Underground lines are protected from weather, debris, etc. that minimizes the chance of sparks that could ignite a fire
2. Utilizing underground 69kV for RTRP is:
 - a. Infeasible, higher costs, greater environmental impacts, and significantly increases the timeframe to complete the project.
3. CPUC Administrative Law Judge stated:
 - a. "The Commission's SEIR determined the project poses a less-than-significant risk of wildfire. Considered and eliminated "Alternative 8," which was a proposal to underground the entire transmission line."



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RESULTS OF LOWER VOLTAGE ANALYSIS

1. Technically Infeasible
2. Increased Environmental Impacts in all areas – aesthetics, population/housing, noise, natural habitats, emissions & more
3. Costs are significantly higher due to the significant increase in the underground/overhead infrastructure and land area and permitting needs for multiple routes
4. Riverside is likely to incur all costs of a lower voltage alternative due federal tariff rules under FERC
5. Significant delays in time of 5 years or more due to engineering and design, modification of the environmental analysis and CPUC licensing



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STRATEGIC PLAN ALIGNMENT



Priority 6 – Infrastructure, Mobility, & Connectivity

Goal 6.2: Maintain, protect and improve assets and infrastructure within the City's built environment to ensure and enhance reliability, resiliency, sustainability and facilitate connectivity.

Cross-Cutting Threads



Community Trust



Equity



Fiscal Responsibility



Innovation



Sustainability & Resiliency



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RECOMMENDATIONS

That the City Council receive information on lower voltage alternatives for the RTP.



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