

RAIL FACT SHEETS

South Palo Alto Tunnel with At-Grade Freight

What is a tunnel with at-grade freight?

For the tunnel alternative, the railroad tracks will be lowered in a trench south of Oregon Expressway to approximately Loma Verde Avenue. The twin bore tunnel will begin near Loma Verde Avenue and extend to just south of Charleston Road. The railroad tracks will then be raised in trench to approximately Ferne Avenue. The new electrified southbound railroad tracks will be built at the same horizontal location as the existing railroad track, however, the northbound track will be moved to the east within the limits of the tunnel to accommodate the spacing required between the twin bores. The railroad tracks in the trench and tunnel will carry only passenger trains. The freight trains will remain at-grade.

The roadways at Meadow Drive and Charleston Road remain at their existing grade and will have a similar configuration that exists today with the addition of Class II buffered bike lanes on Charleston Road. This will require expanding the width of the road to maintain bike lanes through the overpass of the railroad.

By the numbers

- Diameter of twin bores is 30 feet.
- Railroad track is designed for 110 mph.
- Meadow Drive and Charleston Road are designed for 25 mph.
- Maximum grade on railroad is 2%.
- Travel lane widths are 10-12 feet.
- Bike lane widths are 5-6 feet.
- Construction period is approximately 6 years.

Engineering Challenges

- A non-standard grade of 2% will be required on tracks. Caltrain’s preferred maximum grade is 1%.
- Lowering of the tracks will require diversion of Adobe and Matadero creeks, resulting in the need for lift stations/siphons and numerous regulatory agency permits/approvals. Negotiations with the regulatory agencies will be lengthy and difficult since there are other “least impacting” alternatives that could be considered.
- Pump stations will also be needed for dewatering since the tunnel will be below the ground water level.
- Increased long term maintenance costs and risk of flooding due to pump stations.
- Major utility relocations are required for the lowered railroad.

Neighborhood Considerations

- Alma Street will permanently be reduced to one lane in each direction from south of Oregon Expressway to Ventura Avenue and from Charleston Road to Ferne Avenue.
- The train tracks will be approximately 70 feet below the existing grade in the tunnel section. A high fence will be required along trench walls.
- With grade separations at Meadow Drive and Charleston Road the traffic at nearby intersections is expected to improve.

Cost Breakdown

Roadway & Railroad Items	\$735M to \$1,102M
Right-of-way & Utilities	\$7M to \$10M
Support Costs	\$227M to \$340M
Escalation from 2018 to 2025 dollars	\$204M to \$307M
TOTAL PROJECT COSTS	\$1,173M to \$1,759M

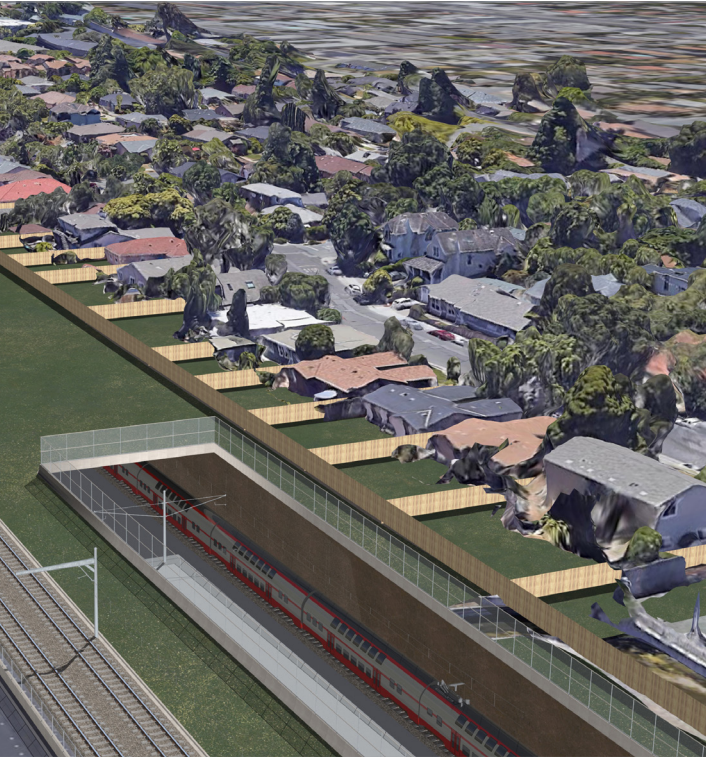
Preliminary and subject to change. Maintenance costs and relocation of fiber optic lines not included.



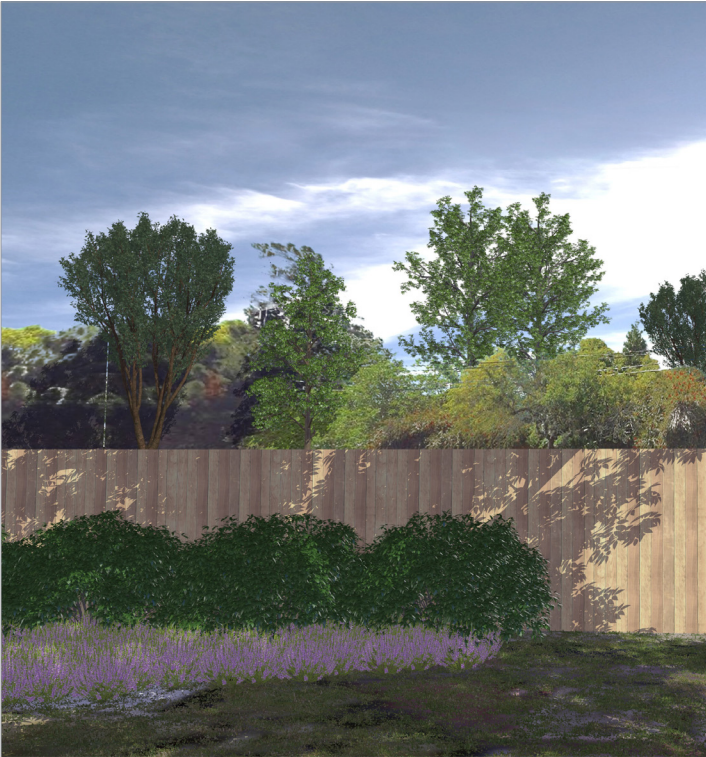
Alameda Rail Corridor, Long Beach



Proposed Ground Level View - Looking Southwest
Charleston Road Intersection



Proposed Tunnel Aerial View - Looking South



Proposed Backyard View - Looking East
Typical Property West of Tracks

For more Rail Fact Sheets visit:
<https://connectingpaloalto.com/fact-sheets/>

Evaluation with City Council-Adopted Criteria

Facilitate movement across the corridor for all modes of transportation

Meadow Drive and Charleston Road will be grade separated from the passenger trains for all modes and will remain open. At-grade crossing will remain for the freight trains.

Reduce delay and congestion for vehicular traffic at rail crossings

The railroad crossing gates and warning lights at Meadow Drive and Charleston Road will be remain. Thus, the traffic will be interrupted by railroad crossing gates.

Provide clear, safe routes for pedestrians and cyclists crossing the rail corridor, separate from vehicles

Pedestrians/cyclists will be separated from passenger train traffic only.

Support continued rail operation and Caltrain service improvements

A temporary railroad track will be required at the boring pit areas to the north and south. A siding track will be relocated north of the California Avenue Caltrain Station. Due to the pump stations, there will be potential risks to train operations due to flooding.

Finance with feasible funding sources

The tunnel will require the greatest levels of local funding in the form of fees, taxes or special assessments, the feasibility of which are still being studied in the context of overall citywide infrastructure funding needs. However, this alternative would not be eligible for grade separation funding as the at-grade crossing for freight would remain.

Reduce rail noise and vibration

Train horn noise and warning bells will remain for the at-grade crossings to accommodate the freight trains. Utilizing electric engines instead of diesel engines will also reduce noise. In the trench section, train noise could reflect off walls and impact properties farther away, which can be mitigated. In the tunnel section, train wheel noise will be contained.

Minimize visual changes along the corridor

Passenger tracks will be below grade and freight tracks will be at-grade with high fencing. Landscaping options will be limited to plants with shallow roots in areas where ground anchors are required for the trench section.

Maintain access to neighborhoods, parks, and schools along the corridor while reducing regional traffic on neighborhood streets

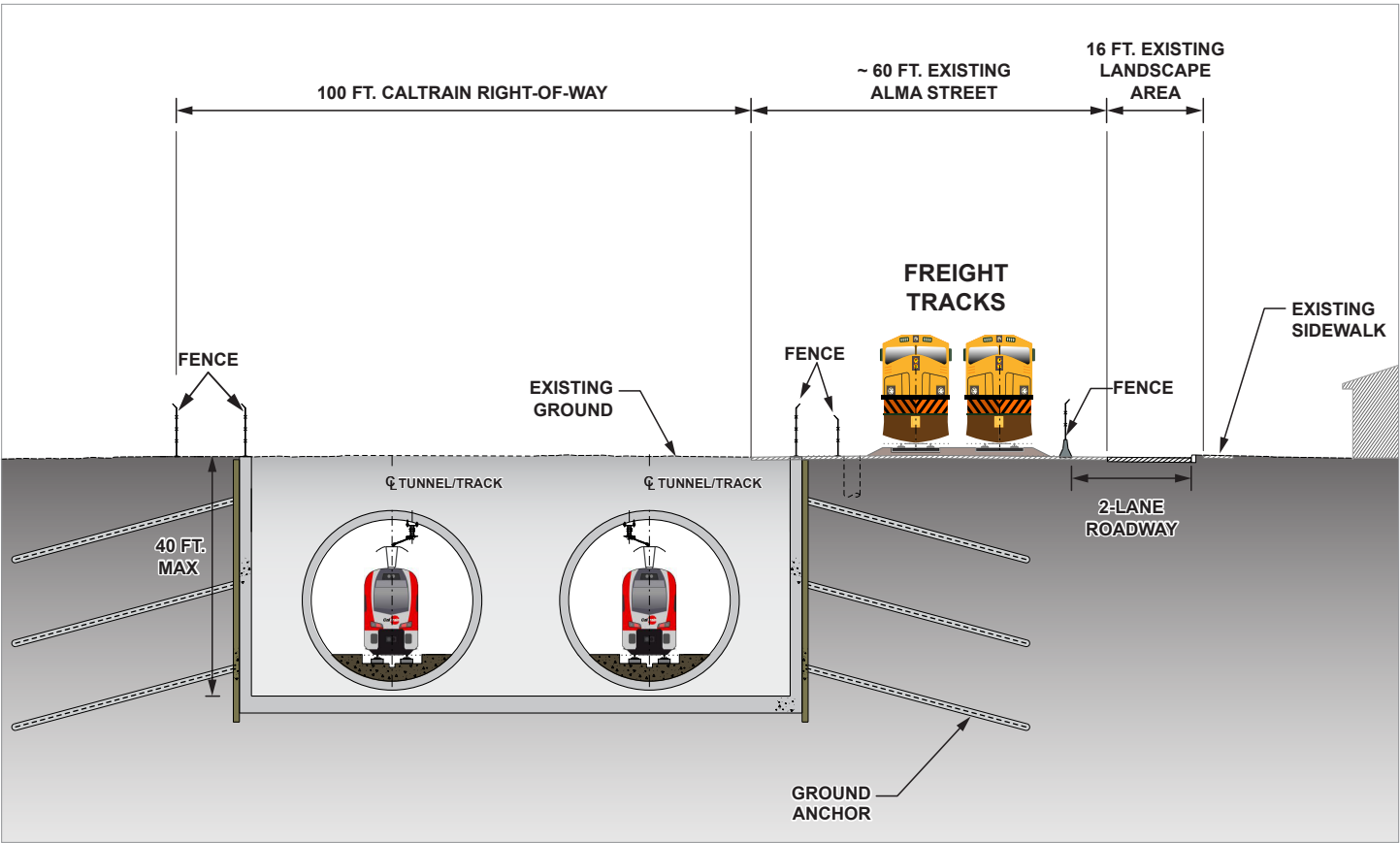
Diversion of regional traffic with the permanent lane reduction on Alma Street will impact residential streets.

Minimize right-of-way acquisition

Subsurface acquisitions will be required for the ground anchors for the trench retaining walls and right of way acquisitions will be required to construct pump stations.

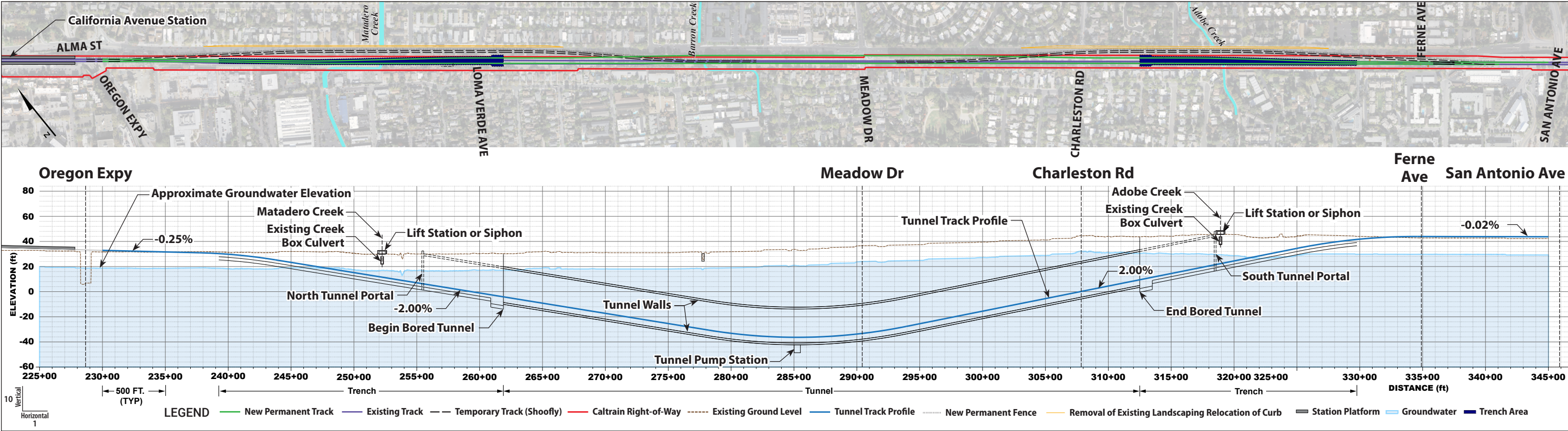
Minimize disruption and duration of construction

Extended lane reductions on Alma Street are required. Construction would last for approximately 6 years.



Example Section - South Portal Tunnel - Looking North

Concept Plan and Profile



For more renderings, plans and animations visit: <https://connectingpaloalto.com/renderings-plans-and-animations/>