Churchill Closure with Mitigations

About the Closure

For the Churchill closure alternative, the railroad tracks will remain at their existing location and elevation (as is). Churchill Avenue will become a T-intersection with Alma Street on the east side and will end at Mariposa Avenue on the west side. A pedestrian/bike only undercrossing will be constructed. Two options are proposed: one crosses under the railroad tracks only (Option 1) and the other crosses under both the railroad tracks and Alma Street (Option 2). Ramps and stairs in varying configurations will provide access to the undercrossing for pedestrians and cyclists.

There are several intersection modifications associated with the Churchill Avenue closure to mitigate the anticipated diversion in traffic. These modifications will include:

- **Embarcadero Road/Alma Street**: constructing a pedestrian/bike overcrossing at Embarcadero Road, widening Alma Street on the Embarcadero underpass, adding a left turn lane from southbound Alma Street, and installing a new signal at the Embarcadero Road/Kingsley Avenue/High Street intersection.

- **El Camino Real/Embarcadero Road**: optimizing signal timing and installing an additional westbound left turn lane and northbound right turn lane.

- **Alma Street/Oregon Expressway**: signalizing both on/off ramps.

- **El Camino Real/Oregon Expressway-Page Mill Road**: optimizing signal timing and installing a westbound right turn lane and northbound right turn lane from Oregon Expressway to El Camino Real Road.

For more Rail Fact Sheets visit: https://connectingpaloalto.com/fact-sheets/
By the numbers
- Churchill Avenue is designed for 25 mph.
- Maximum grade on pedestrian/bike ramp is 8% with 5-foot landings.
- The pedestrian/bike ramp is 8-10 feet wide and approximately 230ft long with a maximum grade of 8%. 5-foot landings are spaced 35 feet apart. Dimensions are subject to change in the next phase of design.
- Travel lane widths are 10-12 feet.
- Bike lane widths are 5-6 feet.
- Construction period is approximately 2 years.

Engineering Challenges
- Pedestrian/bike undercrossing will require a sump pump.
- Relocation of pump house at Embarcadero Road will be required to widen Alma Street.
- Utility relocations will be required for pedestrian/bike undercrossing.
- Additional environmental review may be required for the Embarcadero Road underpass, which has been identified as eligible as a historic resource.
- For Option 1, the pedestrian/bike ramps on the both sides of the tracks for the underpass at Churchill Avenue will require encroachment inside Caltrain's right-of-way.

Neighborhood Considerations
- During construction, Embarcadero Road, Alma Street, and Churchill Avenue will be closed intermittently at night and on weekends.
- Vertical clearance of the pedestrian undercrossing will be 8-10 feet.
- The railroad tracks will remain at the existing grade at Churchill Avenue.
- Traffic mitigations will be implemented to improve traffic at nearby intersections and reduce traffic on residential streets.

Evaluation with City Council-Adopted Criteria
- Facilitate movement across the corridor for all modes of transportation
  Churchill Avenue will be closed to vehicles at the railroad tracks. Pedestrians and cyclists will be grade separated from the railroad in Option 1. For Option 2, pedestrians and cyclists will be grade separated from the railroad and vehicle traffic on Alma Street.
- Reduce rail noise and vibration
  Train horn noise and warning bells will be eliminated with the removal of the at-grade crossings with roadway closure. Utilizing EMU trains instead of diesel engines will also reduce noise. There would be no change to vibration levels at nearby receptors.
- Reduce delay and congestion for vehicular traffic at rail crossings
  With closure of Churchill Avenue, the traffic at nearby intersections will be impacted. However, this can be mitigated.
- Provide clear, safe routes for pedestrians and cyclists crossing the rail corridor, separate from vehicles
  Pedestrians/cyclists will be separated from train traffic and vehicles.
- Support continued rail operations and Caltrain service improvements
  A temporary railroad track will not be required.
- Finance with feasible funding sources
  Order of magnitude cost
  The closure would require the lowest levels of local funding, with a substantial portion of capital costs covered by Regional, State and Federal sources.

Cost Breakdown
<table>
<thead>
<tr>
<th>Item</th>
<th>Cost Range</th>
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</thead>
<tbody>
<tr>
<td>Roadway &amp; Railroad Items</td>
<td>$22M to $24M</td>
</tr>
<tr>
<td>Structure Items</td>
<td>$4M to $9M</td>
</tr>
<tr>
<td>Right-of-way &amp; Utilities</td>
<td>$4M to $7M</td>
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<tr>
<td>Support Costs</td>
<td>$11M to $14M</td>
</tr>
<tr>
<td>Escalation from 2018 to 2025</td>
<td>$9M to $11M</td>
</tr>
<tr>
<td>TOTAL PROJECT COSTS</td>
<td>$50M to $65M</td>
</tr>
</tbody>
</table>

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

Proposed Churchill Avenue Undercrossing Concept Overview - Option 2

Engineering Challenges
- Pedestrian/bike undercrossing will require a sump pump.
- Relocation of pump house at Embarcadero Road will be required to widen Alma Street.
- Utility relocations will be required for pedestrian/bike undercrossing.
- Additional environmental review may be required for the Embarcadero Road underpass, which has been identified as eligible as a historic resource.
- For Option 1, the pedestrian/bike ramps on the both sides of the tracks for the underpass at Churchill Avenue will require encroachment inside Caltrain's right-of-way.

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- During construction, Embarcadero Road, Alma Street, and Churchill Avenue will be closed intermittently at night and on weekends.
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Proposed Embarcadero Road/High Street/Kingsley Avenue Plan View

Proposed Churchill Avenue Undercrossing Concept - Option 2 - Looking East