# Meadow + Charleston Evaluation Matrix

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Trench (MCT)</th>
<th>Hybrid (MCL)</th>
<th>Viaduct (MCV)</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>A Improve East-West Connectivity</td>
<td></td>
<td></td>
<td></td>
<td>Same connectivity for all three in final configuration</td>
</tr>
<tr>
<td>B Reduce traffic congestion and delays</td>
<td></td>
<td></td>
<td></td>
<td>Same traffic improvements for three in final configuration</td>
</tr>
<tr>
<td>C Provide clear, safe routes for pedestrians and bikes</td>
<td></td>
<td></td>
<td></td>
<td>Reduced conflicts for bikes/peds for all three in final configuration</td>
</tr>
<tr>
<td>D Support continued rail operations</td>
<td></td>
<td></td>
<td></td>
<td>Viaduct can be built without a temporary detour (shortly)</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td>Viaduct and Hybrid do not increase long-term maintenance cost or risk to operation</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Tremont will have higher maintenance costs and risks to train operations</td>
</tr>
<tr>
<td>E Finance with feasible funding sources</td>
<td></td>
<td></td>
<td></td>
<td>Based on estimated phase of construction costs/11</td>
</tr>
<tr>
<td>F Minimize right-of-way acquisition</td>
<td></td>
<td></td>
<td></td>
<td>Trench requires surface acquisition for structural elements and impacts to creeks; rail requires right-of-way to construct tunnels; Hybrid requires only modifications to existing structures.</td>
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<td></td>
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<td></td>
<td></td>
<td>Viaduct does not impact private properties</td>
</tr>
<tr>
<td>G Reduce rail noise and vibration</td>
<td></td>
<td></td>
<td></td>
<td>All alternatives eliminate train noise and warning bells</td>
</tr>
</tbody>
</table>
|                                 |              |              |               | All options have some degree of noise impact;访谈; such as
|                                 |              |              |               | - In a trench, noise could affect off-site and impact properties farther away – can be mitigated
|                                 |              |              |               | - In a viaduct and Hybrid, rail noise could radiate out – can be mitigated |
| H Maintain or improve local access |              |              |               | Same improvement for all three in final configuration                    |
| I Minimize visual changes along the corridor |              |              |               | Trench has rail noise barrier – landscaping may limit noise or plants with shallow root systems
|                                 |              |              |               | - Yard has trees approximately 15 feet above grade – fencing along with noise or screening feasible
|                                 |              |              |               | Viaduct has trees approximately 20 feet above grade – landscaping with noise or screening feasible |
| J Minimize disruption and duration of construction | 6 years  | 4 years | 2 years       | Trench has extended road closures at Meadow and Charleston during construction
|                                 |              |              |               | - Yard has reduced truck traffic at all four points during construction |
| K Order of Magnitude Cost        | $800M to 950M* | $200M to 250M* | $400M to 500M* | * Total Preliminary Construction Costs in 2018 dollars (Subject to Change) |

**Legend:**
- Improvement: 
  - Light Blue: 
  - Medium Blue: 
  - Dark Blue: 
- Impact: 
  - Light Red: 
  - Medium Red: 
  - Dark Red:
Look Ahead Schedule - Traffic

- **City Community Meeting**
  - Nov. 28th, 2018
  - Present Origin-Destination Analysis

- **Data Collection**
  - Dec. 12th, 2018
  - Collect turning movement and 24-hour bi-directional traffic volumes

- **CAP Meeting**
  - Dec., 2018
  - Present ADT and Turning Movement Counts

- **Present Results of Traffic Analysis**
  - Jan. 23rd, 2019
  - For Churchill Avenue Closure
PROPOSED TRAFFIC STUDY LOCATIONS

GENERAL NOTES:
1. TRAFFIC STUDY WILL EVALUATE THE CLOSURE OF CHURCHILL AVE.
2. AVERAGE DAILY TRAFFIC (ADT) COUNTS WERE CONDUCTED IN FEBRUARY 2017.

ABBREVIATIONS:
ADT: AVERAGE DAILY TRAFFIC
THE AVERAGE 24-HOUR VOLUME OF TRAFFIC, BEING THE TOTAL NUMBER DURING A STATED PERIOD DIVIDED BY THE NUMBER OF DAYS IN THAT PERIOD. UNLESS OTHERWISE STATED, THAT PERIOD IS YEAR.
Figure 2042-059

Origin - Destination (3pm - 7pm)

Legend:
- X% Origin
- X% Destination
- O/D Zones

- Embarcadero Rd.
- Middlefield Rd.
- Oregon Expwy.
- Stanford Ave.
- El Camino Real
- Serra St.
- Churchill Ave.
- Webster St.
- Cowper St.
- Waverly St.
- Bryant St.
- Emerson St.
- Alma St.
- Serra St.
- Stanford Ave.
- El Camino Real
- Oregon Expwy.
- Middlefield Rd.
<table>
<thead>
<tr>
<th>Loan/Grant</th>
<th>Source</th>
<th>Funding/Financing Program</th>
<th>Description</th>
<th>Funding potential</th>
<th>Requirements/Thresholds</th>
</tr>
</thead>
<tbody>
<tr>
<td>Federal</td>
<td>Federal</td>
<td>Transportation Finance and Innovation Act (TIFIA) Program Loans</td>
<td>Direct loans, loan guarantees, and standby lines of credit provided to public and private transit, highway, rail, and port projects. Up to 33% of project cost. The average assistance value is $384 million.</td>
<td>- The loan requires a 25% non-federal matching funds. - Projects must have at least $50M in eligible cost. - A draft Environmental Impact Statement (EIS) must be included in the application.</td>
<td></td>
</tr>
<tr>
<td>State</td>
<td>State</td>
<td>Highway Railroad Crossing Safety Account (HRCSA),</td>
<td>The HKCSA provides $150 million annually for grade separation projects throughout the state.</td>
<td>$150M available annually for the overall program.</td>
<td>- City needs to match these funds received dollar for dollar using non-state funds.</td>
</tr>
<tr>
<td>Regional</td>
<td>Regional</td>
<td>Measure H</td>
<td>Current railroad crossing safety account that will allocate $700 million to fund 8 grade separation projects for Sunnyvale, Mountain View, and Palo Alto. Palo Alto could receive up to $350,000,000 for projects. Up to $350,000,000</td>
<td>- This funding is a reimbursement because the full amount is awarded over 30 years. - Each project will require a 10% outside contribution. The timing of the deployment of the funds is to be determined.</td>
<td></td>
</tr>
<tr>
<td>Local</td>
<td>Local</td>
<td>Public-Private Partnership</td>
<td>The City would collaborate with Caltrain and share gains and risks from the project.</td>
<td>TBD</td>
<td>Coordination with Caltrain to determine the feasibility of such a partnership could be time consuming. - This action requires City Council approval.</td>
</tr>
<tr>
<td>Local</td>
<td>Local</td>
<td>Mello-Roos Community Facilities District (CFD)</td>
<td>A special tax will be applied to property owners within two blocks of the Caltrain corridor.</td>
<td>$11,518,457-$34,556,372</td>
<td>Requires 2/3 voter approval of residents in the specified area.</td>
</tr>
<tr>
<td>Local</td>
<td>Local</td>
<td>Property Tax Increase</td>
<td>Increase property taxes for city residents by 0.15% to 0.25%.</td>
<td>$10,836,061-$32,008,192</td>
<td>Requires 2/3 voter approval of residents in the specified area.</td>
</tr>
<tr>
<td>Local</td>
<td>Local</td>
<td>Business License Tax</td>
<td>A business license tax per employee between $18-$40.</td>
<td>$895,744-$3,582,976</td>
<td>Requires 2/3 voter approval of residents in the specified area.</td>
</tr>
<tr>
<td>Local</td>
<td>Local</td>
<td>Progressive Business License Tax</td>
<td>A progressive headcount tax between $75-$150 per employee. Maximum of $6,331,975.</td>
<td>Requires 2/3 voter approval of residents in the specified area.</td>
<td></td>
</tr>
</tbody>
</table>

### Probability

- **High**
- **Medium**
- **Low**
Noise / Vibrations

What is Noise?
- Noise is generally considered to be unwanted sound.
- Sound is what we hear when our ears are exposed to small pressure fluctuations in the air.
- There are many ways in which pressure fluctuations are generated, but typically they are caused by vibrating movement of a solid object.

Typical A-Weighted Sound Levels

Train noise varies from multiple sound sources, including:
- Engine (fuel noise, idling, high speeds).
- Whistle (low frequency, high speed).
- Horn (long duration, near grade crossings).
- Train noise is usually speed dependent.
- Faster trains generate higher noise levels for a shorter duration.
- As speed increases, wheel/fluid noise becomes more dominant over engine noise.