COMMUNITY MEETING
August 23, 2018
Welcome & Introduction
Project Background & Purpose
Project Overview
Q & A
Stations
  • Charleston / Meadow
  • Palo Alto
  • City-Wide Tunnel
  • Ideas No Longer Considered
  • Caltrain
  • Traffic
Survey
Next Steps
Welcome & Introduction

Rob de Geus
Deputy City Manager

Community Meeting on Rail Grade Separation

Thursday, August 23
6 p.m. - 8 p.m.
Mitchell Park Community Center
3700 Middlefield Road, Palo Alto
Goals for Meeting

- Education the public about the project
- Identify existing features and constraints
- Answer questions
- Obtain your input about ideas and options
Community Meeting Topics

Community Meeting – Today
- Why separating the road from the tracks?
- Review current design ideas

Community Meeting – November 28, 2018
- Feedback on the refined project ideas
- Develop pros and cons
- Traffic impacts and construction staging
- 3D photo visuals

Community Meeting – January 23, 2019
- Feedback on preferred solutions
- Refined 3D visuals
- Next Steps

Comments from each Community Meeting will be summarized and posted on the project web page for review along with the materials and PowerPoints used at the meetings for those who cannot attend or for people who do attend to be able to refer back to the materials.
Caltrain Community Meeting

When: Tuesday August 28, 2018
6 pm to 7 pm

Where: Lucie Stern Community Center, Fireside Room, Palo Alto CA
34 Ideas Apr 2018
10 Ideas May 2018
8 Ideas Jun 2018
6 Alternatives for Study Sep-Oct 2018
1 Preferred Solution Jan 2019

WE ARE HERE
What is an at-grade crossing?

Also known as a “railroad crossing”... a location where a roadway and sidewalk cross railroad tracks at grade (same level as the street). Drop-down gates and red flashing lights are used to stop traffic when a train approaches.
Near Miss: U-Turn on Tracks
Near Miss: Vehicle Stopped on Tracks
Near Miss: Backing Up
Near Miss: Speeding Up
Why is the City undertaking this effort?

**Improve Traffic Circulation/Mobility**
- Reduce traffic delays caused by gate down times
- Improve traffic flow across railroad crossing

**Increase Public Safety (vehicular, bicycle, and pedestrian)**
- Eliminates pedestrian, bicyclist and motor vehicle conflicts with the railroad... this eliminates the potential for accidents
- Improve pedestrian and bicycle access

**Safer Facility + Less Congestion = Higher Quality of Life**
<table>
<thead>
<tr>
<th></th>
<th>Northbound (NB)</th>
<th>Southbound (SB)</th>
<th>Total</th>
</tr>
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<tbody>
<tr>
<td><strong>Caltrain (2018)</strong></td>
<td>AM: 20</td>
<td>AM: 20</td>
<td>AM: 40</td>
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<tr>
<td></td>
<td>PM: 26</td>
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<tr>
<td></td>
<td>Total: 46</td>
<td>Total: 46</td>
<td>Total: 92</td>
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<tr>
<td><strong>Caltrain (2022 Projection #)</strong></td>
<td>57</td>
<td>57</td>
<td>114</td>
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<td><strong>High Speed Rail (2029 Projection +)</strong></td>
<td>128 trains per day to/from San Francisco with an additional 24 trains starting at San Jose</td>
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<td><strong>Union Pacific</strong></td>
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* # 2022 Projected Values based on Completion of the Peninsula Corridor Electrification Project (from FEIR, December 2014) (Prototypical Schedule)
  + 2029 Projected Values based on Blended Service and Completion of the High Speed Rail Project and 2014 CHSRA Business Plan*
What is a grade separation?

A bridge or structure that allows the public to travel under (or over) the railroad or a railroad to travel under (or over) the roadway.

**Hybrid**
- Partially lower the roadway and partially elevate the railroad tracks

**Shallow Trench**
- Partially elevate the roadway and partially lower the railroad tracks in a trench

**Full Trench**
- Lower the railroad in a trench and leave the roadway at its existing elevation

**Viaduct**
- Raise the railroad tracks above the roadway on structure and leave the roadway at its existing elevation

**Tunnel**
- Lower the railroad below the roadways in a tunnel
Example Hybrid Grade Separations

Holly Street, San Carlos

Ralston Ave, Belmont

42nd Ave, San Mateo
Example Trench Grade Separations

Alameda Corridor East (ACE) Project
San Gabriel, CA

Alameda Corridor East (ACE) Project
Compton, CA
Example Viaduct Grade Separations

Ohlone Greenway
BART Viaduct, El Cerrito, CA

BART Viaduct, Concord, CA
Refining Process for Decisions

**Tier 1 Criteria: Most Important**
- East-West connectivity: facilitate movement across the corridor for all modes of transportation
- Traffic congestion: reduce delay and congestion for automobile traffic at rail crossings
- Ped/Bike circulation: provide clear and safe routes for pedestrians and bicyclists seeking to cross the rail corridor, separate from automobile traffic
- Rail operations: support continued rail operations and Caltrain service improvements
- Cost: finance with feasible funding sources

**Tier 2 Criteria: Also Important**
- Environmental Impacts: reduce rail noise and vibration along the corridor
- Environmental Impacts: minimize visual changes along the rail corridor
- Local access: maintain or improve access to neighborhoods, parks, schools and other destinations along the corridor while reducing regional traffic on neighborhood streets
- Cost: minimize right-of-way acquisition by eminent domain
- Construction: minimize disruption and the duration of construction
### Connecting Palo Alto: Rail Program

**Matrix of Ideas for Alternatives for Study – Approved by City Council on June 19, 2018**

<table>
<thead>
<tr>
<th>Type of Separation (Alphabetical Order)</th>
<th>Citywide</th>
<th>Palo Alto 2017 ADT (vehicles/day) = 16,200 (+ 550 bikes)</th>
<th>Churchill 2017 ADT (vehicles/day) = 9,200 (+ 1,020 bikes)</th>
<th>Meadow 2017 ADT (vehicles/day) = 8,900 (+ 900 bikes)</th>
<th>Charleston 2017 ADT (vehicles/day) = 17,900 (+ 240 bikes)</th>
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</thead>
<tbody>
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<td>Closure</td>
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<td>Palo Alto Ave Closed, Add Improvements (PCX)</td>
<td>Churchill Ave Closed, Add Improvements (CAX)</td>
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<tr>
<td>Hybrid (Road over Rail)</td>
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<td>Meadow + Charleston Shallow Trench, Loma Verde Bike/Ped (MCR)</td>
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<tr>
<td>Hybrid (Road under Rail)</td>
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<td>Palo Alto Ave Hybrid (PAH)</td>
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<td>No Build / Do Nothing</td>
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<tr>
<td>Rail under Road (Trench)</td>
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<td>Meadow + Charleston Full Trench (MCT)</td>
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<tr>
<td>Rail under Road (Tunnel)</td>
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<td>City-Wide Tunnel within Palo Alto (WBP)</td>
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<tr>
<td>Rail over Road (Berm/Viaduct)</td>
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<td>Meadow + Charleston Viaduct (MCV)</td>
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<td>Road over Rail</td>
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Ideas to Review – Finding Solutions

Meadow / Charleston Hybrid
- Partially lower the roads and partially elevate the tracks at Meadow and Charleston

Meadow / Charleston Shallow Trench
- Partially elevate the roads and partially lower tracks at Meadow and Charleston

Meadow / Charleston Full Trench
- Lower the railroad below the roadways at Meadow and Charleston

Meadow / Charleston Viaduct
- Raise the railroad above the roadways at Meadow and Charleston on structure

Palo Alto Avenue Hybrid
- Partially lower the road and partially elevate the railroad at Palo Alto

City-Wide Tunnel
- Lower the railroad below roadways, structures and waterways within the City of Palo Alto City limits
Meadow / Charleston Hybrid

1.0% Maximum Grade Length = 4700 ft
1.7% Maximum Grade Length = 4725 ft

Temporary Track (Shoofly) Length for 1.0% = 7000 ft
Temporary Track (Shoofly) Length for 1.7% = 6600 ft
Hybrid Typical Section with Shoofly

Caltrain San Bruno, CA
Trains operating on new embankment with shoofly shown to right

Embankment or Retaining Wall
Height Varies from 0 to 14 feet
Meadow Drive Hybrid

Rail Embankment Fill at Meadow = 14 ft
Roadway Excavation at Meadow = 7 ft

-1.0% Grade
+1.0% Grade

Start lowering road

Existing Driveways

Alma St

Start lowering road

Meadow Dr

New Rail Bridge

Rail on Embankment

Park Blvd

Start lowering road

Start lowering road
Charleston Road Hybrid

- Rail Embankment Fill at Charleston = 14 ft
- Roadway Excavation at Charleston = 6 ft

- Start lowering road
- New Rail Bridge
- Rail on Embankment
- Start lowering road

Locations:
- Charleston Rd
- Lindero Dr
- Park Blvd
- Ely Pt
Meadow / Charleston Shallow Trench

1% Maximum Grade Length = Not Feasible

2% Maximum Grade Length = 6330 ft

Temporary Track (Shoofly) Length with 2% = 7600 ft

Rail Excavation: 0 to 31 ft

1% Maximum Grade Length = Not Feasible

2% Maximum Grade Length = 6330 ft

Temporary Track (Shoofly) Length with 2% = 7600 ft
Shallow Trench Typical Section with Shoofly

San Gabriel, CA
ACE Trench with train operating on shoofly on the right
Meadow Drive Shallow Trench

Rail Excavation at Meadow = 31ft
Roadway Fill at Meadow = 2 ft

- Start raising road
- Existing Driveways
- Meadow Dr
- New Road Bridge
- Park Blvd
- Park Blvd
- Start raising road

Alma St

+1.7% Grade
-0.8% Grade
Charleston Road Shallow Trench

Rail Excavation at Charleston = 31 ft
Roadway Fill at Charleston = 1 ft

- Start raising road

- New Rail Bridge

- Rail in Trench

- Park Blvd

- +0.5% Grade
Meadow / Charleston Full Trench

1% Maximum Grade Length = Not Feasible
2% Maximum Grade Length = 6380 ft
Temporary Track (Shoofly) Length with 2% = 7600 ft

Rail Excavation: 0 to 33 ft

1% Maximum Grade Length = Not Feasible
2% Maximum Grade Length = 6380 ft
Temporary Track (Shoofly) Length with 2% = 7600 ft

 Rail starts to lower
Rail starts to lower
Rail starts to lower

To San Francisco
To San Jose
Full Trench Typical Section with Shoofly

San Gabriel, CA
ACE Trench with train operating on shoofly on the right

TYPICAL SECTION – FULL TRENCH
Rail starts to rise

Meadow / Charleston Viaduct

1% Maximum Grade Length = NOT FEASIBLE
2% Maximum Grade Length = 5900 ft
Temporary Track (Shoofly) Length with 2%= 6700 ft (if needed)

Rail Height: 0 to 22 ft

To San Francisco
To San Jose
Viaduct Typical Section

BART Viaduct, El Cerrito, CA
Ohlone Greenway below viaduct
1% Maximum Grade Length = NOT FEASIBLE
1.3% Maximum Grade Length = 3430 ft

Temporary Track (Shoofly) Length = 4300 ft
Hybrid Typical Section with Shoofly

Caltrain San Bruno, CA
Trains operating on new embankment with shoofly shown to right

Embankment or Retaining Wall
Height Varies from 0 to 7 feet
Rail Embankment Fill at Palo Alto = 7 ft
Roadway Excavation at Palo Alto = 15 ft

New Track Alignment
New Rail Bridges
Rail Embankment Fill at Palo Alto = 7 ft
Roadway Excavation at Palo Alto = 15 ft

Palo Alto Avenue Hybrid

Existing Driveways

-7% Grade

Start lowering road

Stanford Park Hotel
Historic RR Bridge
El Palo Alto Tree
Palo Alto Condos
Underground Reservoir

Sand Hill Rd
El Camino Real
Alma St
Tunnel Examples

- Tunnel Boring Machine (TBM)
- Underground Station Excavation and Launch Box for Twin Bore Tunnels Gold Line Doha Qatar
- Evergreen Line Single Bore Tunnel Vancouver
- Typical Tunnel Boring Machine Launch Site
- Rendering of TBM
Cut and Cover Rail Tunnels
Dublin, Ireland

Cut and Cover Station Excavation
Singapore

Cut and Cover Station Box Excavation
Los Angeles Purple Line
City-Wide Tunnel Typical Section

China Town Station SF – Twin Bored Tunnels with underground excavated station

Rendering of Station Connecting to Single Bore Tunnel
Summary of Ideas

**Meadow / Charleston Hybrid**
- Partially lower the roads and partially elevate the tracks at Meadow and Charleston

**Meadow / Charleston Shallow Trench**
- Partially elevate the roads and partially lower tracks at Meadow and Charleston

**Meadow / Charleston Full Trench**
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**City-Wide Tunnel**
- Lower the railroad below roadways, structures and waterways within the City of Palo Alto City limits
NEXT MEETING
November 28, 2018, 6-8pm
Stay Engaged

Visit our re-designed website at:
www.cityofpaloalto.org/ConnectingPaloAlto

Contact us at:
transportation@cityofpaloalto.org
(650) 329-2520
Stations

- Charleston / Meadow
- Palo Alto
- City-Wide Tunnel
- Ideas No Longer Considered
- Caltrain
- Traffic
Community Questionnaire

Using your cell phones:

1. Text **ConnectingPA to 22333** to join the session
2. Then text in the letter (A or B) that corresponds with your answer.

1. Do you like this meeting venue/location?
2. Was the format of the meeting easy to follow?
3. Were the graphics effective?
4. Do you know where to find information about the study?
5. Were your questions answered?
6. Do you know when the next meeting is?
7. What topics do you want to discuss most?
Thank You