The Project

- Improves Traffic Circulation and Safety
- Improves Pedestrian and Bicycle Circulation and Safety
- Provides an opportunity for a Gateway Treatment
- CPUC Ranked Broadway as the #2 Grade Separation Project in the entire State
- Ranked #1 Priority Grade Separation in Northern CA
- Not a High Speed Rail Project
Community Meeting No. 1 - March 11, 2015

Community Meeting No. 2 - September 16, 2015

City Council Meeting – January 18, 2016
**Project Area**

**Major Constraints**
- Millbrae Station to the north
- Burlingame Station to the south
- Highway 101 to the east
- Downtown Broadway Commercial District to the west
- Caltrain Operational Constraint
Existing Traffic
Existing Condition - Traffic Delays

<table>
<thead>
<tr>
<th>Intersection</th>
<th>Weekday AM</th>
<th>Weekday PM</th>
<th>Weekend (Midday)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Broadway/US 101 Off-Ramp/Rollins Road</td>
<td>65</td>
<td>243</td>
<td>153</td>
</tr>
<tr>
<td></td>
<td>584</td>
<td>771</td>
<td>381</td>
</tr>
<tr>
<td>Broadway/Carolan Avenue</td>
<td>26</td>
<td>21</td>
<td>23</td>
</tr>
<tr>
<td></td>
<td>273</td>
<td>47</td>
<td>38</td>
</tr>
<tr>
<td>Broadway/California Drive</td>
<td>68</td>
<td>60</td>
<td>69</td>
</tr>
<tr>
<td></td>
<td>713</td>
<td>632</td>
<td>431</td>
</tr>
</tbody>
</table>

* Average delay per vehicle
Grade Separation Improvements

Broadway Grade Separation Study

Slide 7
## 2040 Traffic Delays

<table>
<thead>
<tr>
<th>Intersection</th>
<th>Weekday AM</th>
<th>Weekday PM</th>
<th>Weekend (Midday)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Broadway/US 101 Off-Ramp/ Rollins Road</td>
<td>584 37</td>
<td>771 48</td>
<td>381 24</td>
</tr>
<tr>
<td>Broadway/Carolan Avenue</td>
<td>273 43</td>
<td>47 22</td>
<td>38 15</td>
</tr>
<tr>
<td>Broadway/California Drive</td>
<td>713 38</td>
<td>631 41</td>
<td>431 33</td>
</tr>
</tbody>
</table>

* Average delay per vehicle
Quantified Benefits

- **Travel Time Savings**
  - 82.3% or $7,730,000

- **Fuel Savings**
  - 7.9% or $970,000

- **Improved Safety**
  - 0.9% or $85,000

- **GHG Emission Reduction**
  - 0.3% or $31,000

- **CAP Reduction**
  - 8.6% or $805,000
Safety Benefits

Emergency Response
- Reduced response times for police
- Reduced response times for emergency services

Accidents
- 23 accidents per year at the adjacent Broadway intersections
- 7 with injuries
Alternative Analysis

- 6 Alternatives Evaluated – 4 eliminated
- 2 Alternatives Remaining
Alternative A

Order of Magnitude Cost
$250M

Length of Broadway Construction = 733 feet
Length of Carolan Avenue Construction = 260 feet
Length of California Drive Construction = 520 feet

Maximum Rail Fill Height = 13 ft
Maximum Roadway Excavation Depth = 13 ft

Length of Track Construction = 7,300 ft

Downtown Broadway Commercial District
Rollins & Hwy 101 Interchange
Stage 1

- No change to existing traffic patterns
- Construct temporary shoofly tracks
- Construct new at-grade crossing gates and panels

Temporary Shoofly Tracks

Existing Traffic

Existing Tracks

Section A-A

Carolan Avenue

California Drive

Broadway Grade Separation Study
Stage 2

- Shift Caltrain operations to shoofly
- Construct raised embankment up to Broadway
- Construct drainage modifications at existing drainage crossings
Alternative A – Construction Section

- Groundwater 7 feet below surface
- Right-of-Way
- Temporary OCS
- Existing Commercial Buildings North of Broadway
- Shoofly MT1
- Shoofly MT2
- MT1
- MT2
### Stage 3

- Caltrain operating on shoofly tracks
- Broadway closed to through traffic
- Detour traffic along Carolan Avenue to Oak Grove
- Construct railroad bridge across Broadway
- Excavate under new bridge for Broadway

**Detour Traffic**

**Roadway Excavation**

**Railroad Bridge**

**Temporary Shoofly Tracks**

---

**Broadway Grade Separation Study**

Slide 16
Alternative A – Construction Sequence

Stage 4

- Shift Caltrain operations to elevated track
- Broadway closed to through traffic
- Limited access on Carolan Avenue and California Drive
- Detour shifted to Cadillac Way and/or Toyon Drive
- Construct Broadway, California Drive, and Carolan Avenue to new (lower) elevation
3D Animation of Alternative A
Alternative B

Order of Magnitude Cost
$415M

Length of Broadway Construction = 782 feet
Length of Carolan Avenue Construction = 315 feet
Length of California Drive Construction = 650 feet

Maximum Rail Excavation Depth = 17 ft
Maximum Roadway Fill Height = 18 ft

Length of Track Construction = 7,550 ft

Downtown Broadway Commercial District
Rollins & Hwy 101 Interchange

ALTERNATIVE B
RAIL PARTIALLY DEPRESSED / ROADWAY PARTIALLY ELEVATED
Alternative B – Construction Sequence

Stage 1

- No change to existing traffic patterns
- Install shoring adjacent to the existing tracks
- Construct temporary shoofly tracks
- Construct new at-grade crossing gates and panels

15 Commercial Buildings Impacted by Temporary Shoofly

Temporary Shoofly Tracks

Existing Traffic

Existing Tracks

Shoring

Section A-A

Carolan Avenue

California Drive
Alternative B – Construction Sequence

Stage 2

- Shift Caltrain operations to Shoofly
- Broadway closed to through traffic
- Extended (2 + years) Detour Traffic along Carolan to Oak Grove
- Construct Trench with Tiebacks
- Construct retaining walls and dewatering system
- Construct ground/storm water pump plants and syphons for existing drainage crossings

Temporary Shoofly Tracks

Detour Traffic

Trees Impacted by Tiebacks

Pump Plants and Syphons at existing drainage crossings

Excavate Trench

Section A-A
Alternative B – Construction Section

- **Right-of-Way:**
  - Edge of Existing Structure
  - Shoofly MT1
  - Shoofly MT2
  - No Tree Zone above Tiebacks
  - No Tree Zone above Tiebacks

- **Temporary OCS**

- **Groundwater:** 7 feet below surface

- **Shoring:**
  - Tieback

- **MT1**
- **MT2**
Stage 3

- Shift Caltrain operations to depressed track section
- Broadway closed to through traffic
- Limited access on Carolan and California
- Demolish Building due to elevated roadway
- Construct Broadway, California Drive and Carolan Avenue to new (higher) elevation
- Impacts 15 parcels adjacent Broadway, California Drive and Carolan Avenue

Major Impacts to Downtown Broadway Area
3D Animation of Alternative B
Visual Comparison of Alternatives Location #1
From Pedestrian Eye Level
Visual Comparison of Alternatives Location #1
From Pedestrian Eye Level
Visual Comparison of Alternatives Location #1 From Pedestrian Eye Level
Visual Comparison of Alternatives Location #2 From Pedestrian Eye Level
Visual Comparison of Alternatives Location #2
From Pedestrian Eye Level
Visual Comparison of Alternatives Location #2
From Pedestrian Eye Level
Visual Comparison of Alternatives Location #3
From Pedestrian Eye Level
Visual Comparison of Alternatives Location #3
From Pedestrian Eye Level
Visual Comparison of Alternatives Location #3
From Pedestrian Eye Level
Visual Comparison of Alternatives Location #4
From Pedestrian Eye Level
Visual Comparison of Alternatives Location #4
From Pedestrian Eye Level
Visual Comparison of Alternatives Location #4
From Pedestrian Eye Level
## Alternative A

<table>
<thead>
<tr>
<th>Pros</th>
<th>Cons</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Improved safety</td>
<td>• Visual concerns due to partially elevated tracks (can be mitigated through architecture and landscaping)</td>
</tr>
<tr>
<td>• Improved traffic, pedestrian and bicycle circulation</td>
<td>• Slightly higher train noise than depressed tracks (new electrical trains will have much less noise compared to diesel engines). Noise can be mitigated with acoustical panels placed at wheel level.</td>
</tr>
<tr>
<td>• Minimal impacts on adjacent properties</td>
<td>• Disruption during construction</td>
</tr>
<tr>
<td>• Minimal impacts to Broadway commercial district and auto dealerships</td>
<td></td>
</tr>
<tr>
<td>• Minimal impact to drainage facilities</td>
<td></td>
</tr>
<tr>
<td>• No obstruction to natural drainage and risk of flooding to properties</td>
<td></td>
</tr>
<tr>
<td>• No safety concern by running electric trains in a potential flooding situation</td>
<td></td>
</tr>
<tr>
<td>• No maintenance costs associated with flood protection systems</td>
<td></td>
</tr>
<tr>
<td>• Faster construction period &amp; lesser construction related impacts (2 years)</td>
<td></td>
</tr>
<tr>
<td>• Significantly less expensive than Alt. B ($250M v/s $415M)</td>
<td></td>
</tr>
<tr>
<td>• Pedestrian crossing at Morrell Ave can be accommodated</td>
<td></td>
</tr>
<tr>
<td>• Minimal impact to trees</td>
<td></td>
</tr>
</tbody>
</table>
## Alternative B

<table>
<thead>
<tr>
<th>Pros</th>
<th>Cons</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Improved safety</td>
<td>• Major disruption to traffic circulation in the Broadway commercial district and Auto Dealerships during construction</td>
</tr>
<tr>
<td>• Improved traffic, pedestrian and bicycle circulation</td>
<td>• Significant right-of-way impacts to nearby properties</td>
</tr>
<tr>
<td>• No visual impact due to partially depressed railroad tracks</td>
<td>• Significantly longer construction period (4 years)</td>
</tr>
<tr>
<td></td>
<td>• Visual impacts from safety fencing</td>
</tr>
<tr>
<td></td>
<td>• Safety issues with high-voltage lines that are lowered where they can be reachable</td>
</tr>
<tr>
<td></td>
<td>• Obstruction to natural drainage from upstream and increased risk of flooding of properties</td>
</tr>
<tr>
<td></td>
<td>• Long term maintenance costs associated with flood protection facilities</td>
</tr>
<tr>
<td></td>
<td>• Caltrain service disruption in the event of potential flooding</td>
</tr>
<tr>
<td></td>
<td>• Significantly more costly than Alt. A</td>
</tr>
<tr>
<td></td>
<td>• Alt A - $250M</td>
</tr>
<tr>
<td></td>
<td>• Alt B – $415M</td>
</tr>
<tr>
<td></td>
<td>• Extremely difficult to obtain outside funding</td>
</tr>
<tr>
<td></td>
<td>• Impact to trees by trench/shoring and shoofly construction</td>
</tr>
</tbody>
</table>

- Alt A - $250M
- Alt B – $415M
## Alternative Comparison Recap

<table>
<thead>
<tr>
<th>Project Issues/Concerns</th>
<th>A</th>
<th>B</th>
</tr>
</thead>
<tbody>
<tr>
<td>Visibility of Train from Local Roads</td>
<td>Depressed track less visible but security fencing is more visible and could require removal of mature trees</td>
<td>Many businesses are full takes in Alt B - Relocations needed for many</td>
</tr>
<tr>
<td>Impacts to Downtown Broadway</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Inconvenience during Construction with Local Roadway Closures</td>
<td>Alt A Broadway closure estimated at 1-3 months</td>
<td>Alt B Broadway closure estimated at 18 to 24 months</td>
</tr>
<tr>
<td>Construction Duration</td>
<td>Alternative A Construction Duration: 2 years</td>
<td>Alternative B Construction Duration: 4 years</td>
</tr>
<tr>
<td>Potential for Flooding &amp; Caltrain Service Disruption</td>
<td>Alt B more susceptible to flooding and potential to flood tracks causing service disruption</td>
<td>Alt B long term maintenance issues for pump stations, sewer and drainage syphons, flooding</td>
</tr>
<tr>
<td>Long-Term Maintenance Impacts and Cost</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Right-of-Way Impacts</td>
<td>Alt B has major impacts to downtown business and commercial buildings on east side of tracks</td>
<td></td>
</tr>
<tr>
<td>Acceptance by Caltrain</td>
<td>Caltrain strongly prefers Alt A because it minimizes construction impacts to operations, less flooding risk, less risk to operations, less long term maintenance costs and issues</td>
<td></td>
</tr>
<tr>
<td>Order of Magnitude Cost</td>
<td>$250M</td>
<td>$415M</td>
</tr>
</tbody>
</table>

Checkmark (✔) indicates this alternative is preferred with respect to specific project issue.
Next Steps

- Follow-up City Council Presentation in May 2016

For More Information:

Visit Us at: www.burlingame.org/broadwaygradesep

Email Us at: broadwaygradesep@burlingame.org