



Broadway Grade Separation Study
Community Meeting
March 31, 2016

Broadway Grade Separation Study

Slide 1



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

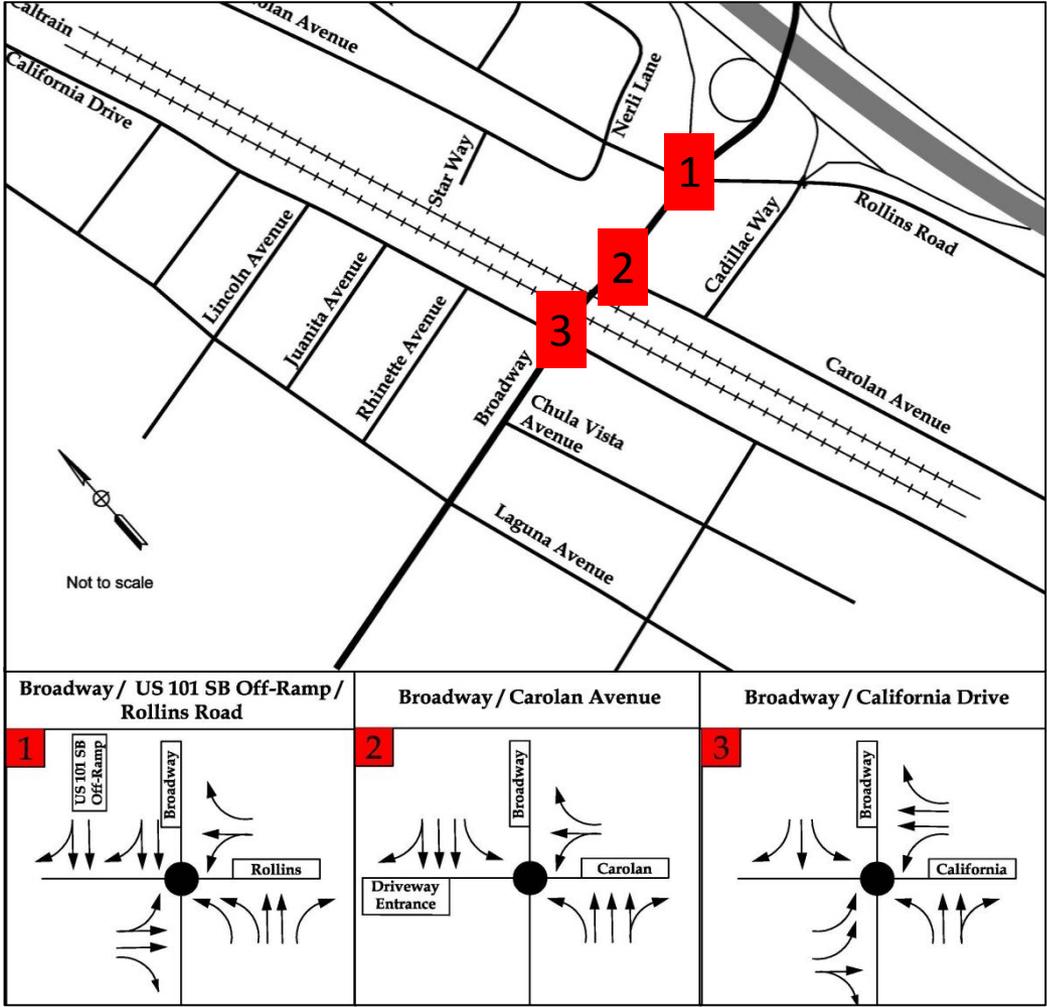


Community Meeting No. 2 - September 16, 2015



City Council Meeting – January 18, 2016

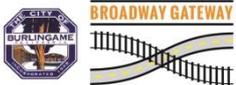
Existing Traffic



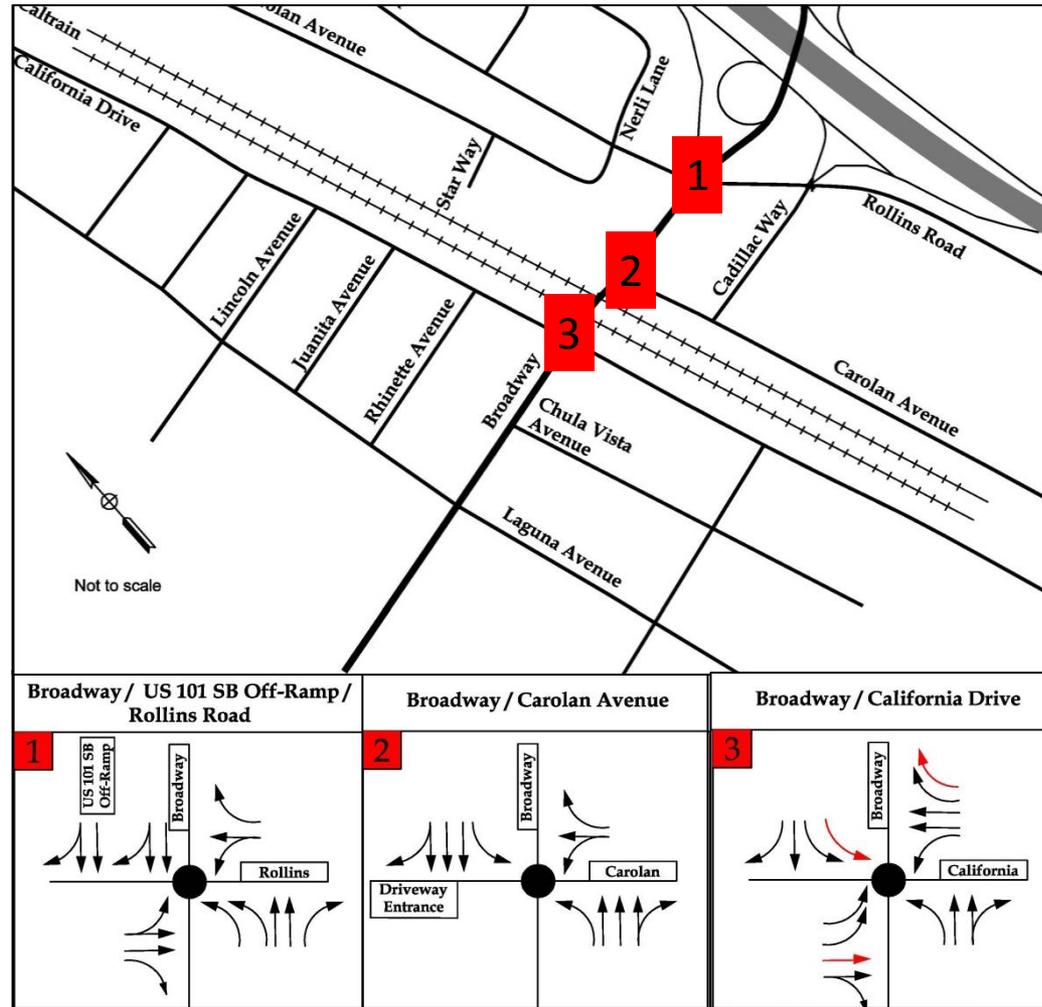
Existing Condition - Traffic Delays

Existing [2015] Delay		Future 2040 Delay with Broadway Station Open					
Intersection	Weekday AM		Weekday PM		Weekend (Midday)		
	Delay* (sec)		Delay* (sec)		Delay* (sec)		
Broadway/US 101 Off-Ramp/ Rollins Road	65	584	243	771	153	381	
Broadway/ Carolan Avenue	26	273	21	47	23	38	
Broadway/ California Drive	68	713	60	632	69	431	

* Average delay per vehicle



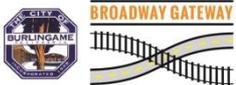
Grade Separation Improvements



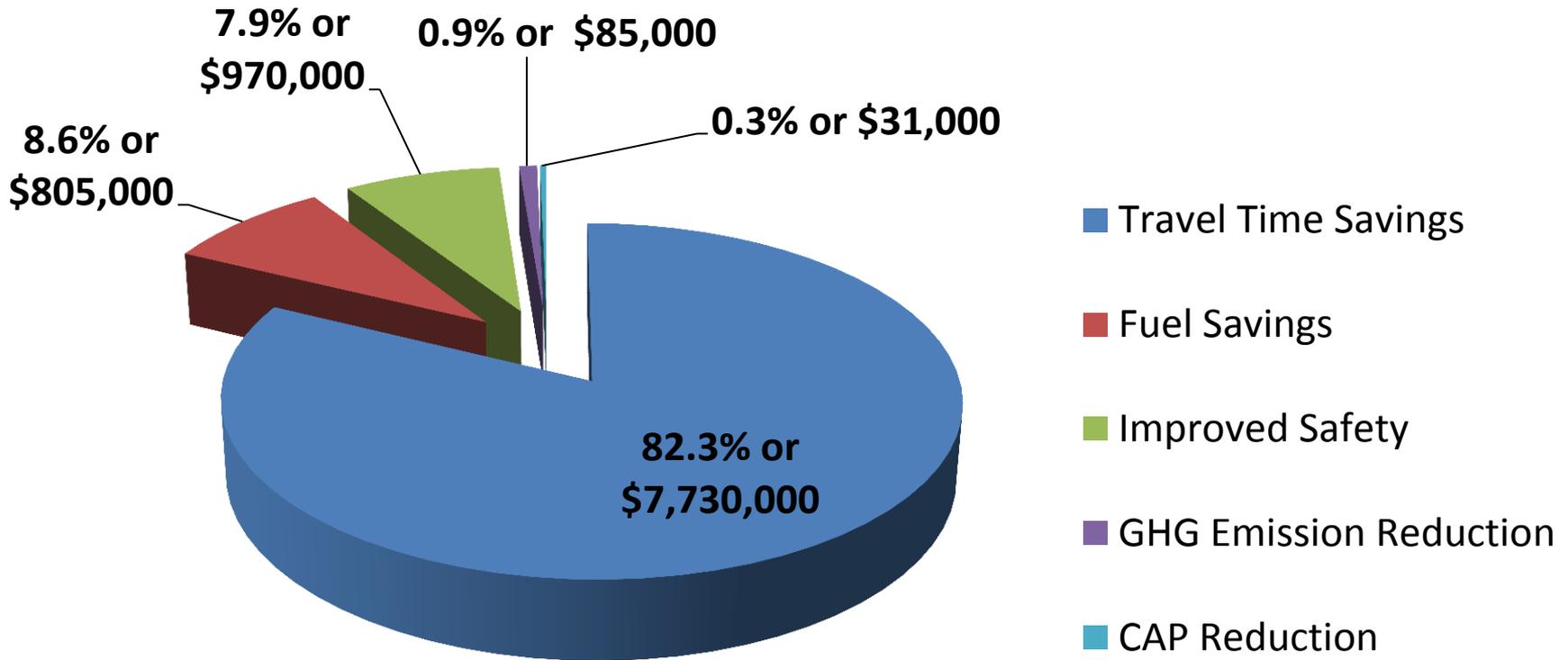
2040 Traffic Delays

Future [2040] Delay without Grade Separation With Broadway Station Open		Future 2040 with Grade Separation	
Intersection	Weekday AM	Weekday PM	Weekend (Midday)
	Delay* (sec)	Delay* (sec)	Delay* (sec)
Broadway/US 101 Off-Ramp/ Rollins Road	584 37	771 48	381 24
Broadway/ Carolan Avenue	273 43	47 22	38 15
Broadway/ California Drive	713 38	631 41	431 33

* Average delay per vehicle



Quantified Benefits



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

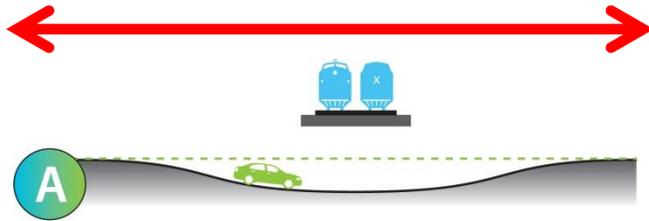
Alternative Analysis

- 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



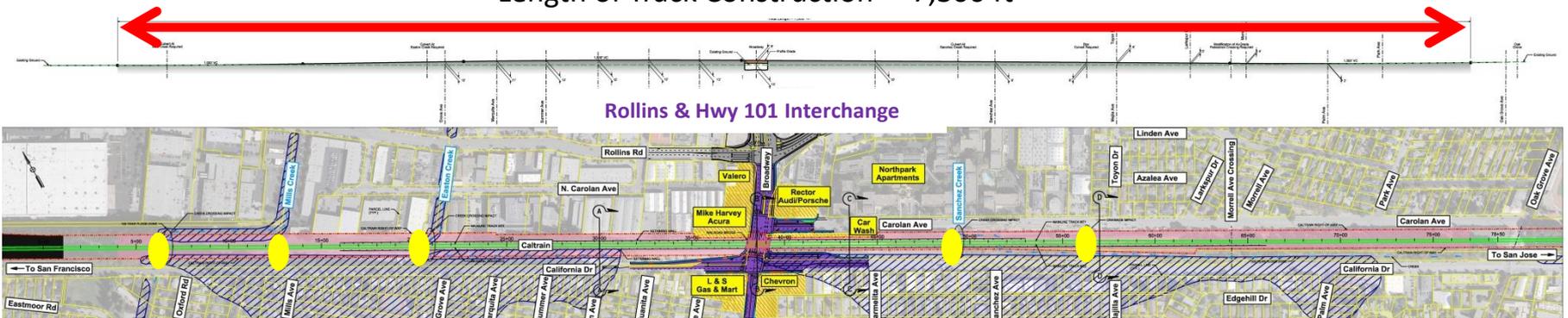
ALTERNATIVE A

RAIL PARTIALLY ELEVATED / ROADWAY PARTIALLY DEPRESSED

Maximum Rail Fill Height = 13 ft

Maximum Roadway Excavation Depth = 13 ft

Length of Track Construction = 7,300 ft

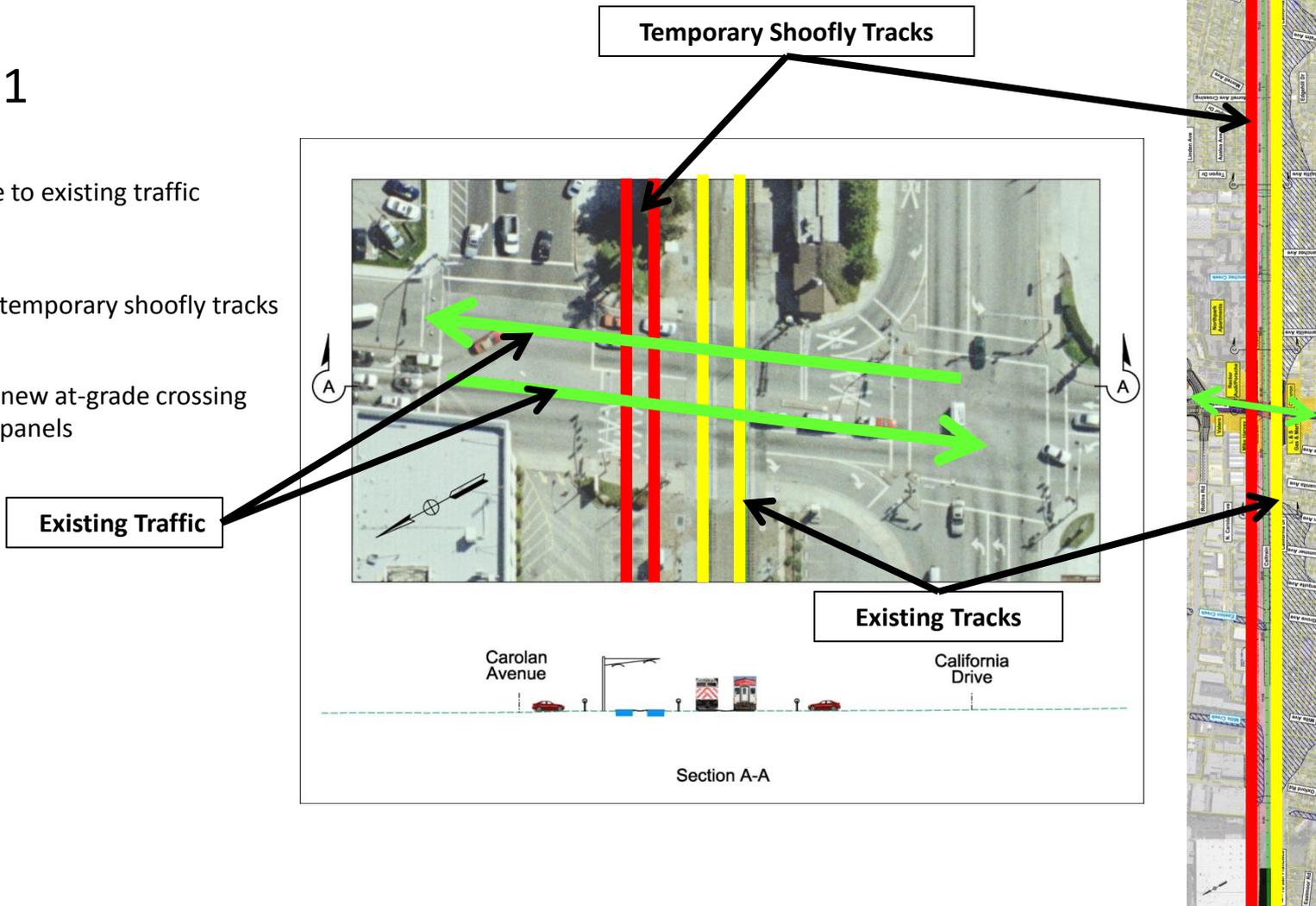


Downtown Broadway Commercial District

Alternative A – Construction Sequence

Stage 1

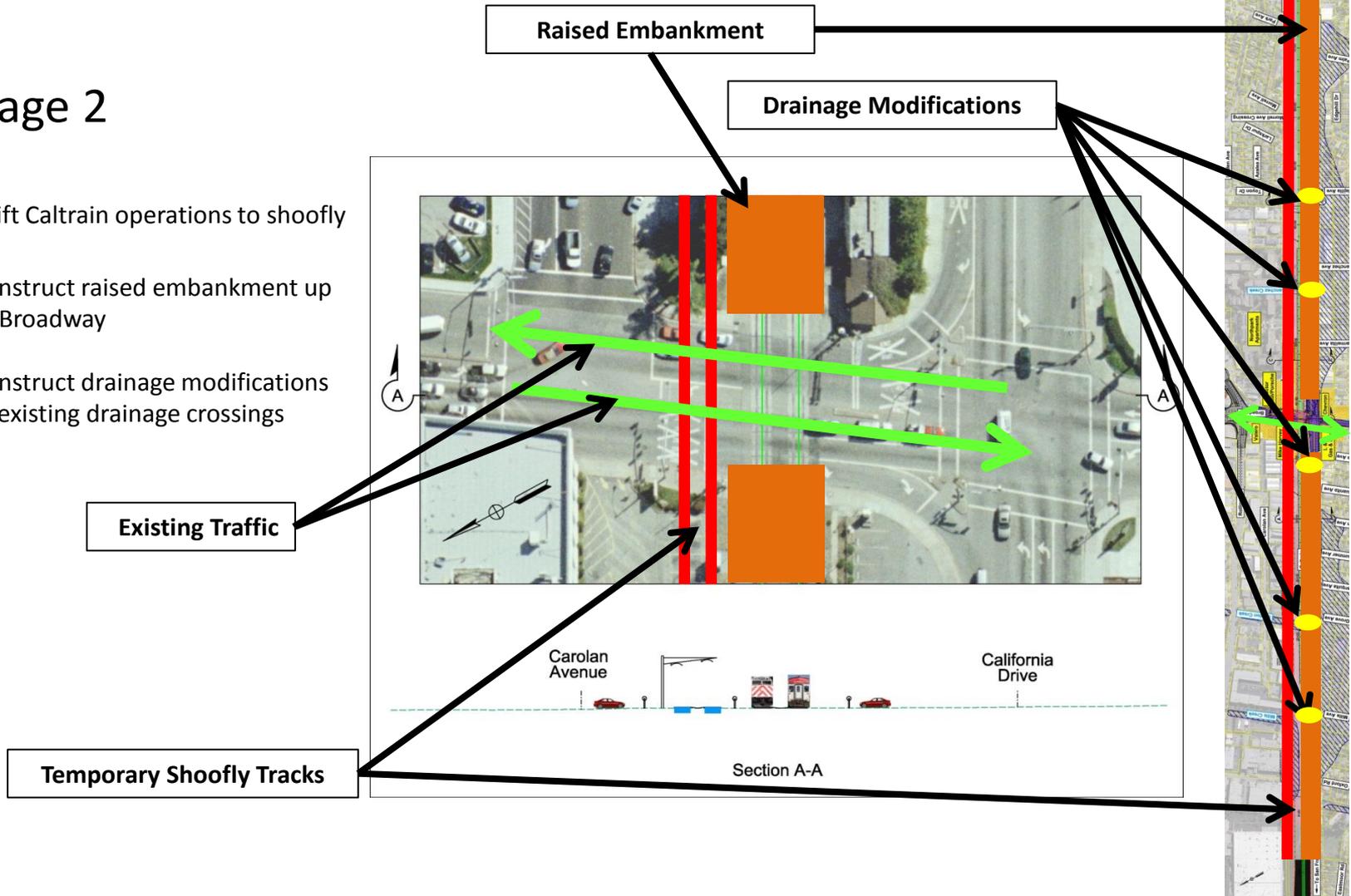
- No change to existing traffic patterns
- Construct temporary shoofly tracks
- Construct new at-grade crossing gates and panels



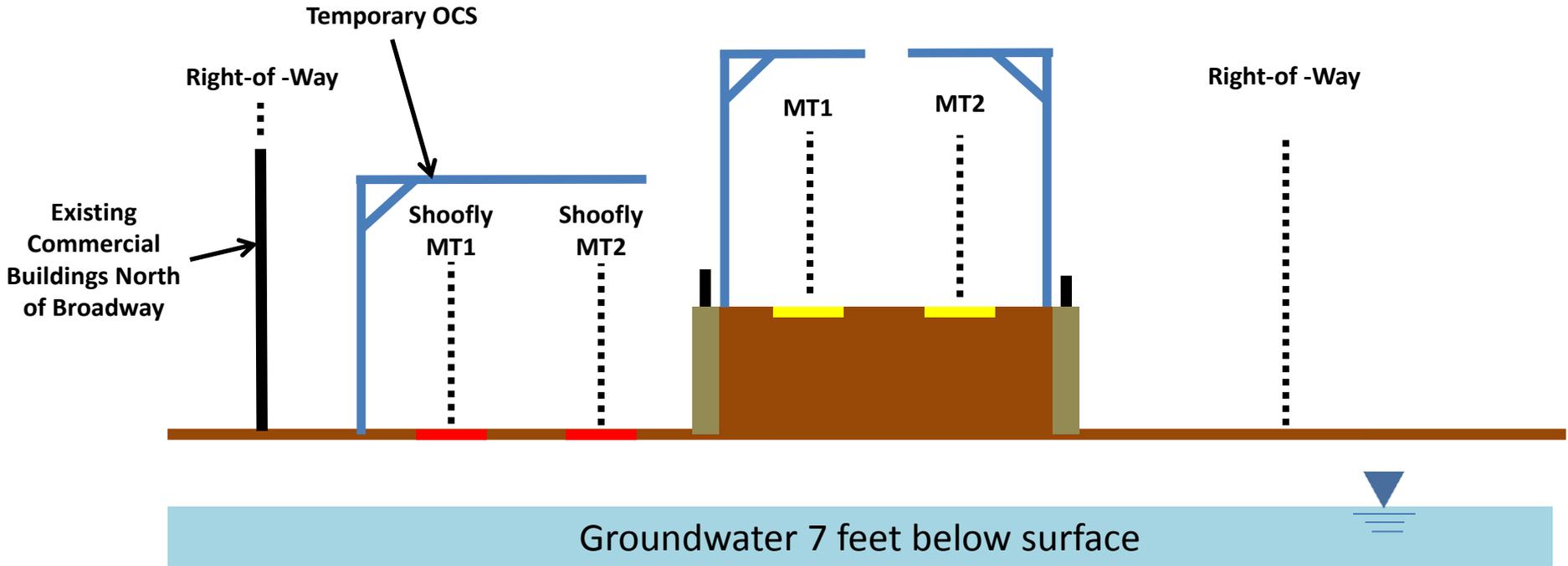
Alternative A – Construction Sequence

Stage 2

- Shift Caltrain operations to shoofly
- Construct raised embankment up to Broadway
- Construct drainage modifications at existing drainage crossings



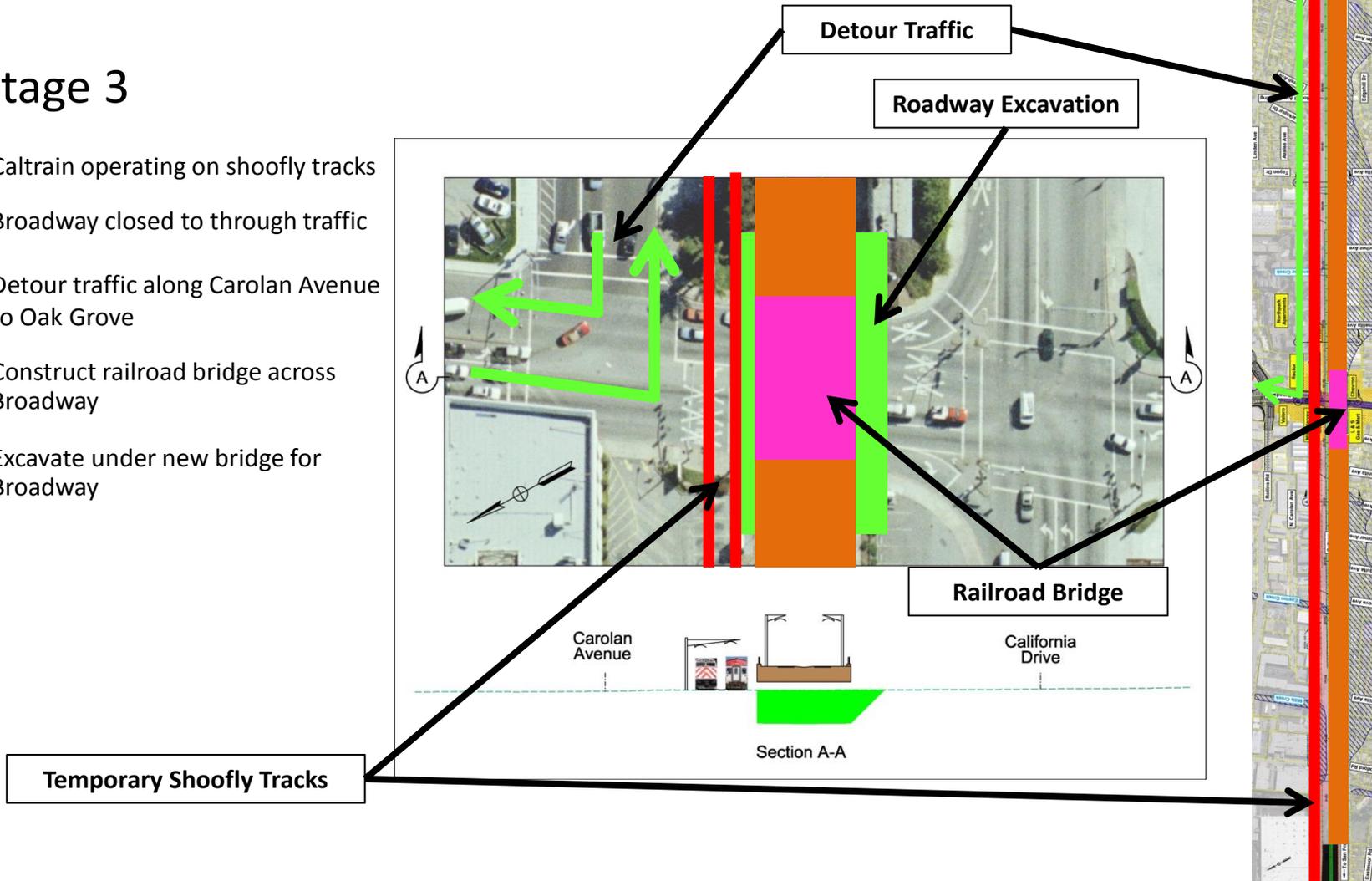
Alternative A – Construction Section



Alternative A – Construction Sequence

Stage 3

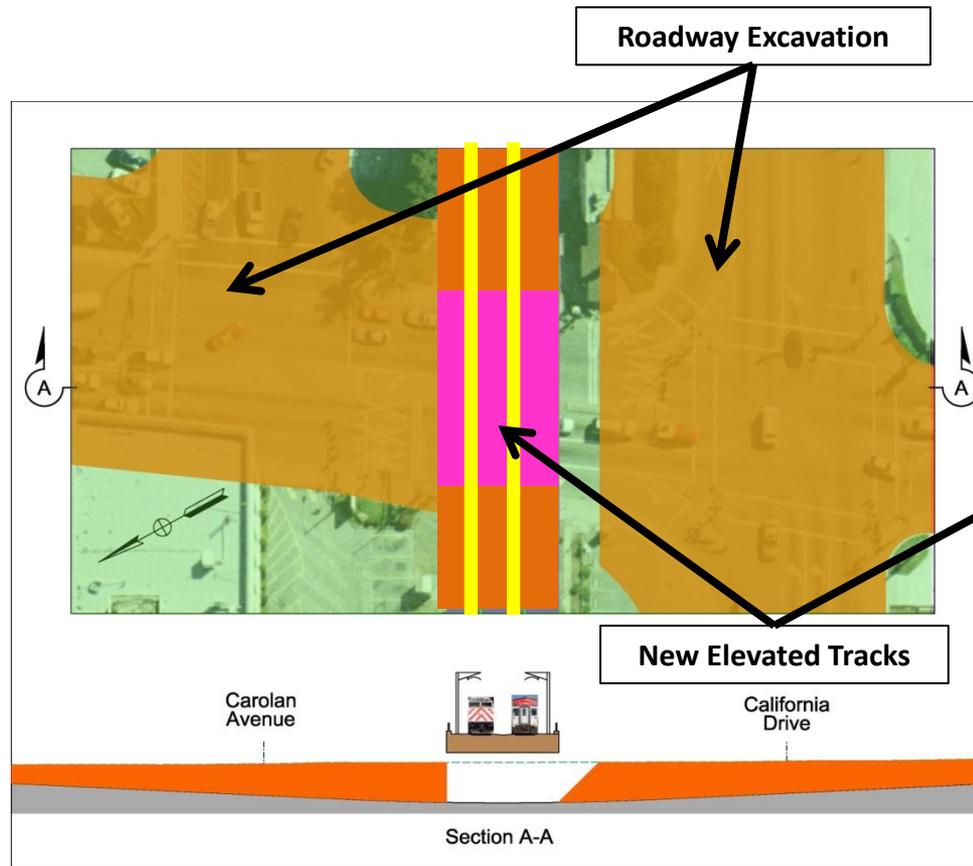
- Caltrain operating on shoofly tracks
- Broadway closed to through traffic
- Detour traffic along Carolan Avenue to Oak Grove
- Construct railroad bridge across Broadway
- Excavate under new bridge for Broadway



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

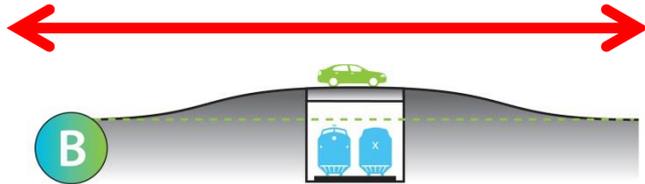
BROADWAY GRADE SEPARATION STUDY



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

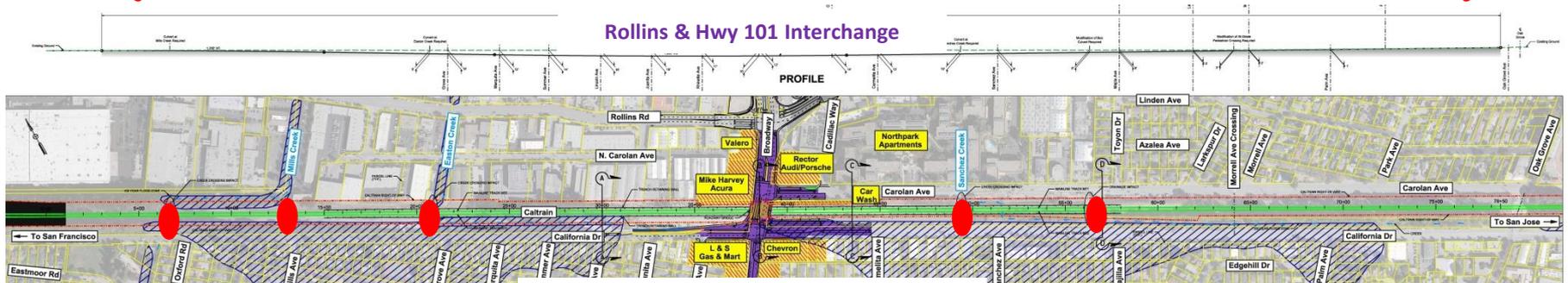


ALTERNATIVE B

RAIL PARTIALLY DEPRESSED / ROADWAY PARTIALLY ELEVATED

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

Length of Track Construction = 7,550 ft

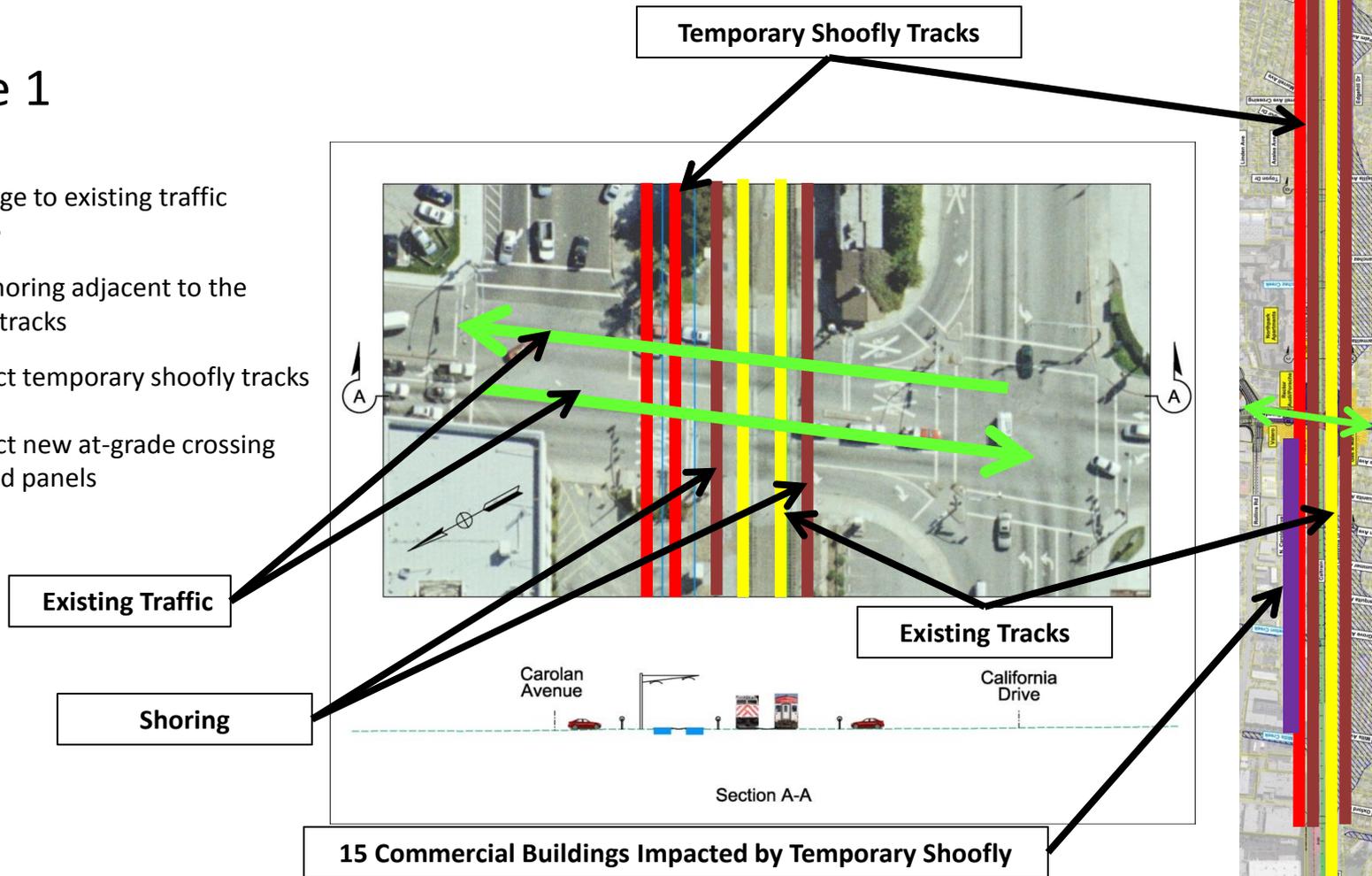


Downtown Broadway Commercial District

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



Alternative B – Construction Sequence

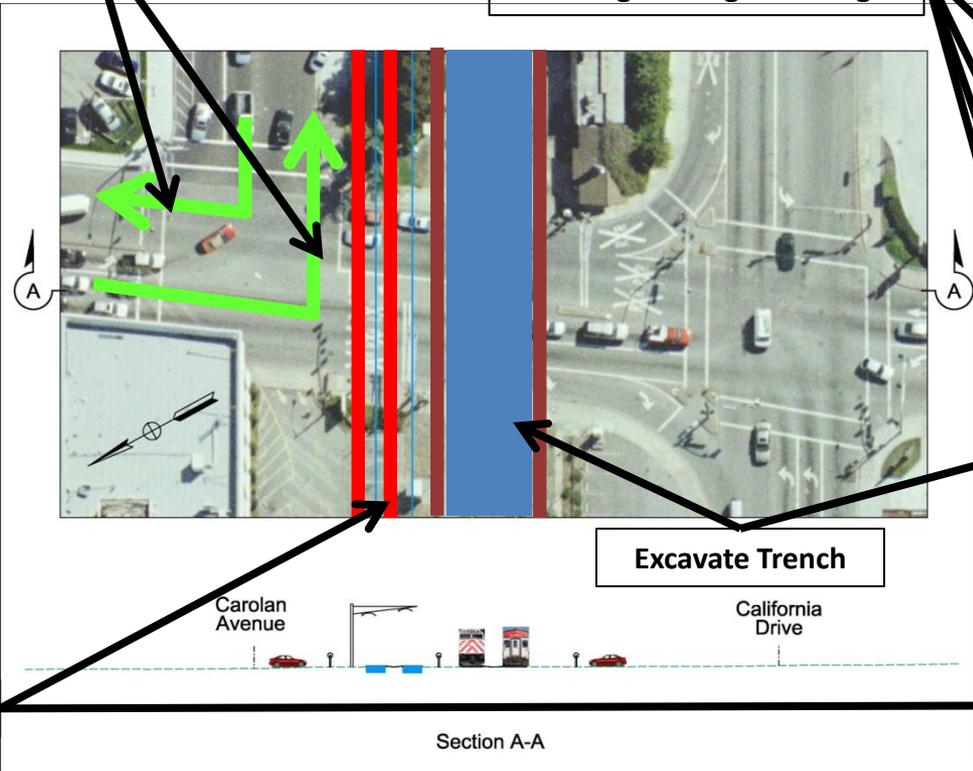
Stage 2

- 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

Detour Traffic

Trees Impacted by Tiebacks

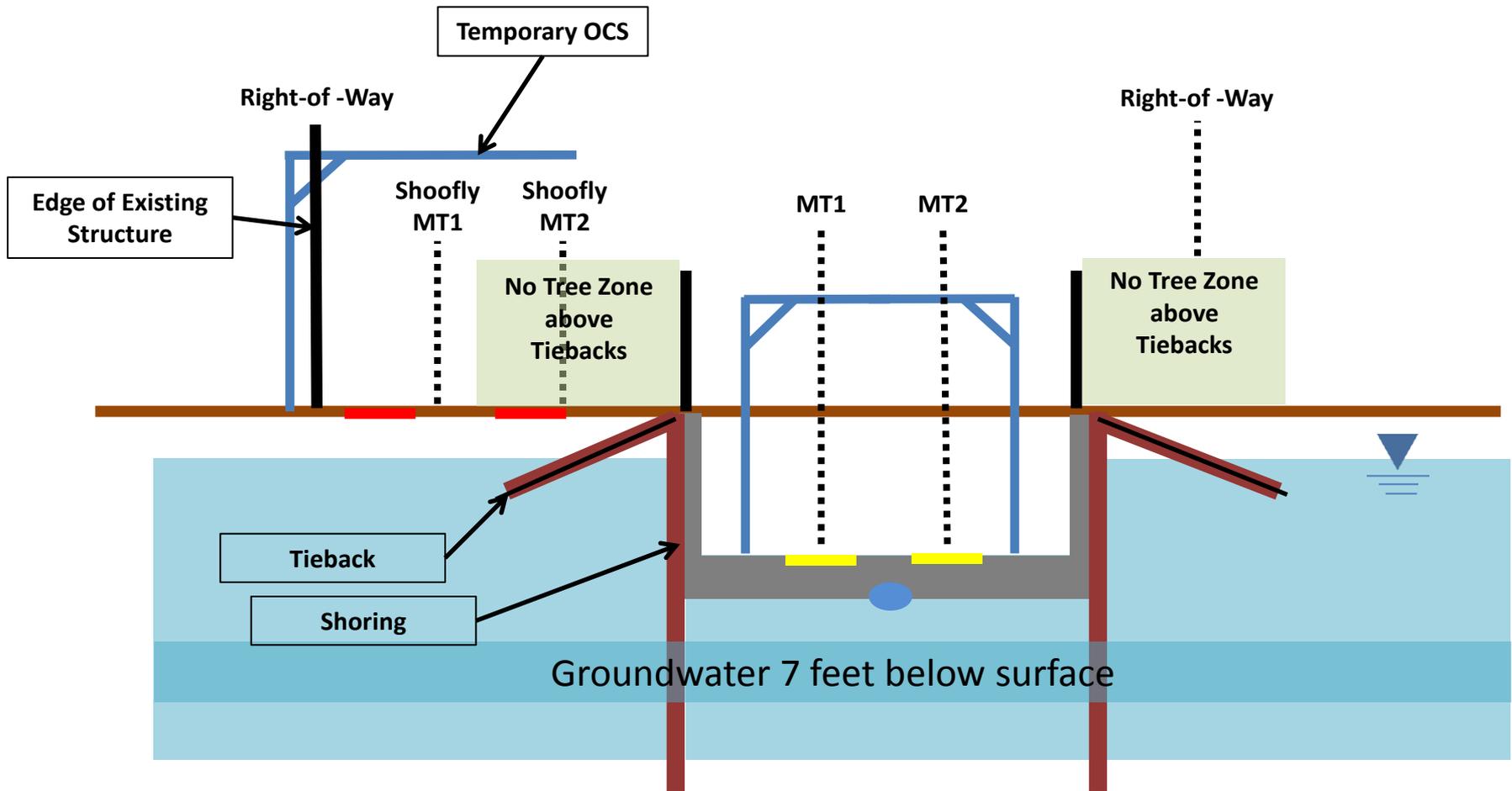
Pump Plants and Syphons at existing drainage crossings



Temporary Shoofly Tracks



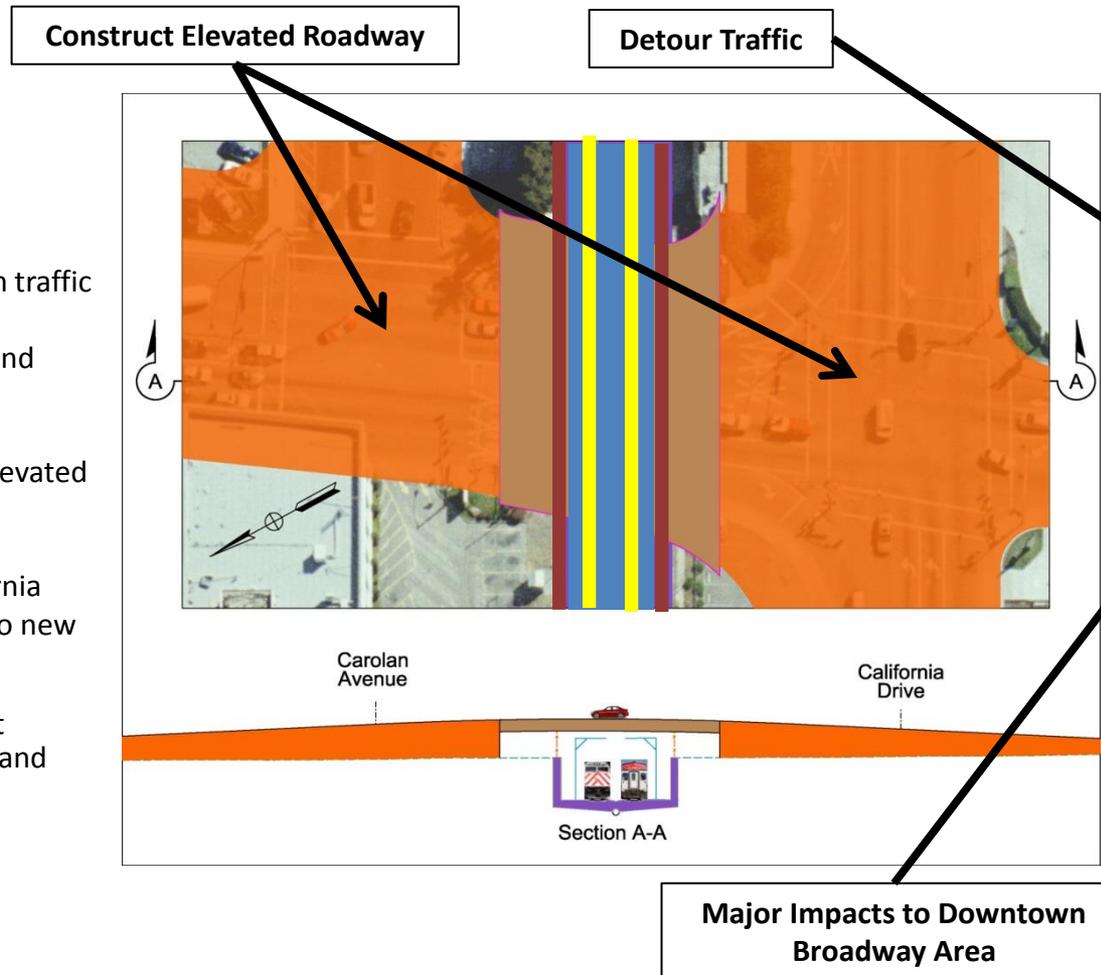
Alternative B – Construction Section



Alternative B – Construction Sequence

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



3D Animation of Alternative B

BROADWAY GRADE SEPARATION STUDY



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



Broadway Grade Separation Study

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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



Broadway Grade Separation Study

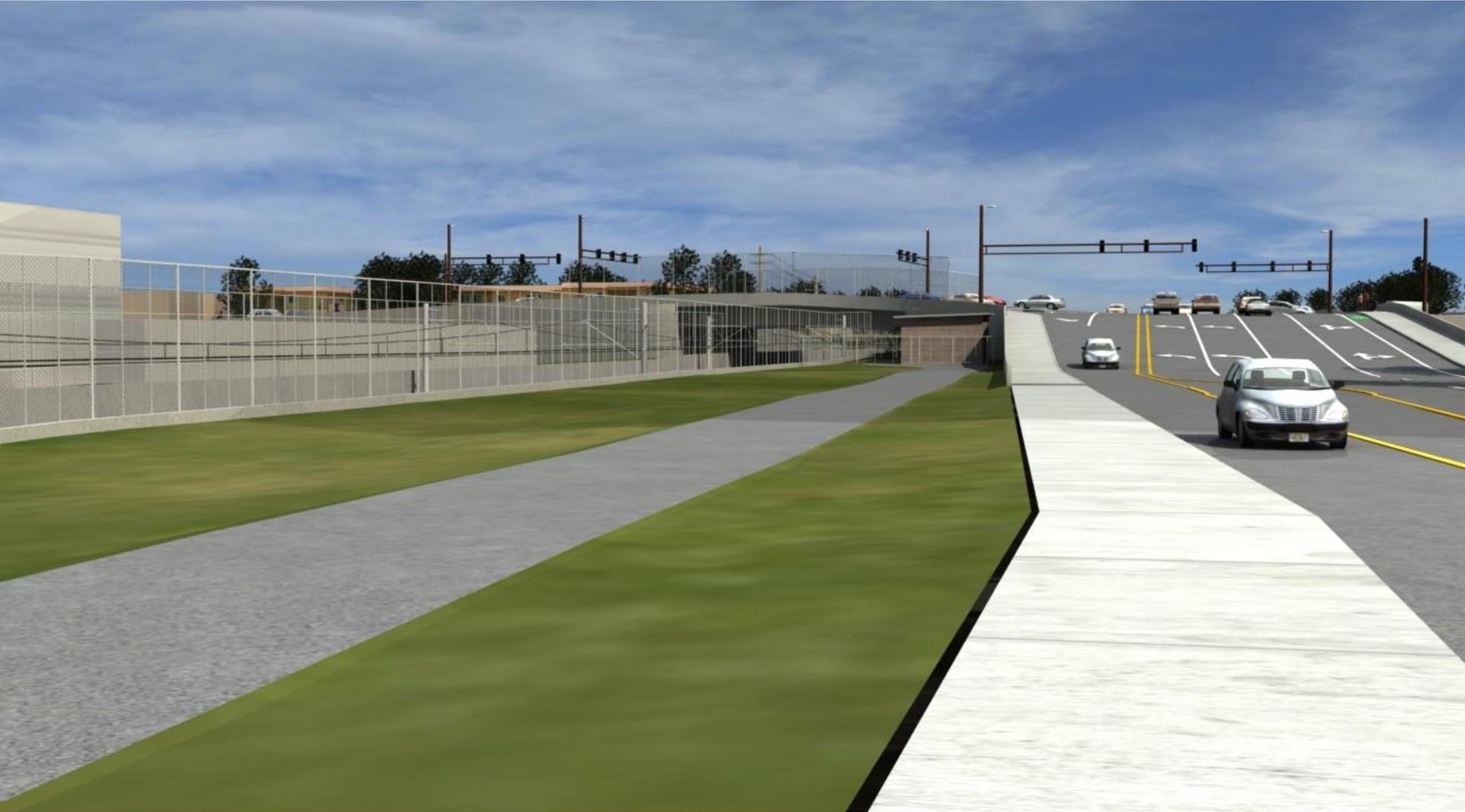
Slide 34



Visual Comparison of Alternatives Location #4 From Pedestrian Eye Level



Visual Comparison of Alternatives Location #4 From Pedestrian Eye Level



Alternative A

Pros	Cons
<ul style="list-style-type: none"> Improved safety 	<ul style="list-style-type: none"> Visual concerns due to partially elevated tracks (can be mitigated through architecture and landscaping)
<ul style="list-style-type: none"> Improved traffic, pedestrian and bicycle circulation 	<ul style="list-style-type: none"> 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.
<ul style="list-style-type: none"> Minimal impacts on adjacent properties 	<ul style="list-style-type: none"> Disruption during construction
<ul style="list-style-type: none"> Minimal impacts to Broadway commercial district and auto dealerships 	
<ul style="list-style-type: none"> Minimal impact to drainage facilities 	
<ul style="list-style-type: none"> No obstruction to natural drainage and risk of flooding to properties 	
<ul style="list-style-type: none"> No safety concern by running electric trains in a potential flooding situation 	
<ul style="list-style-type: none"> No maintenance costs associated with flood protection systems 	
<ul style="list-style-type: none"> Faster construction period & lesser construction related impacts (2 years) 	
<ul style="list-style-type: none"> Significantly less expensive than Alt. B (\$250M v/s \$415M) 	
<ul style="list-style-type: none"> Pedestrian crossing at Morrell Ave can be accommodated 	
<ul style="list-style-type: none"> Minimal impact to trees 	

Alternative B

Pros	Cons
<ul style="list-style-type: none"> Improved safety 	<ul style="list-style-type: none"> Major disruption to traffic circulation in the Broadway commercial district and Auto Dealerships during construction
<ul style="list-style-type: none"> Improved traffic, pedestrian and bicycle circulation 	<ul style="list-style-type: none"> Significant right-of-way impacts to nearby properties
<ul style="list-style-type: none"> No visual impact due to partially depressed railroad tracks 	<ul style="list-style-type: none"> Significantly longer construction period (4 years)
	<ul style="list-style-type: none"> Visual impacts from safety fencing
	<ul style="list-style-type: none"> Safety issues with high-voltage lines that are lowered where they can be reachable
	<ul style="list-style-type: none"> Obstruction to natural drainage from upstream and increased risk of flooding of properties
	<ul style="list-style-type: none"> Long term maintenance costs associated with flood protection facilities
	<ul style="list-style-type: none"> Caltrain service disruption in the event of potential flooding
	<ul style="list-style-type: none"> Significantly more costly than Alt. A <ul style="list-style-type: none"> Alt A - \$250M Alt B – \$415M
	<ul style="list-style-type: none"> Extremely difficult to obtain outside funding
	<ul style="list-style-type: none"> Impact to trees by trench/shoring and shoofly construction

Alternative Comparison Recap

A

B

Project Issues/Concerns		
Visibility of Train from Local Roads		✓
Impacts to Downtown Broadway	✓	
Inconvenience during Construction with Local Roadway Closures	✓	
Construction Duration	✓	
Potential for Flooding & Caltrain Service Disruption	✓	
Long-Term Maintenance Impacts and Cost	✓	
Right-of-Way Impacts	✓	
Acceptance by Caltrain	✓	
Order of Magnitude Cost	\$250M	\$415M

Depressed track less visible but security fencing is more visible and could require removal of mature trees

Many businesses are full takes in Alt B - Relocations needed for many

Alt A Broadway closure estimated at 1-3 months
Alt B Broadway closure estimated at 18 to 24 months

Alternative A Construction Duration : 2 years
Alternative B Construction Duration: 4 years

Alt B more susceptible to flooding and potential to flood tracks causing service disruption

Alt B long term maintenance issues for pump stations, sewer and drainage syphons, flooding

Alt B has major impacts to downtown business and commercial buildings on east side of tracks

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

Alternative B has 60-70% more initial costs (excludes long term maintenance)

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:

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Email Us at: broadwaygradesep@burlingame.org