SAN JOSÉ
DIRIDON STATION

January 28, 2020

INTEGRATED CONCEPT PLAN

San José City Council Study Session: Diridon Station Concept Plan Decision #3

Caltrain
CALIFORNIA High-Speed Rail Authority
CITY OF SAN JOSE CAPITAL OF SILICON VALLEY
Santa Clara Valley Transportation Authority

PRESENTERS

- John Ristow, Director of Transportation
- Jessica Zenk, Deputy Director – Department of Transportation
- Liz Scanlon, Diridon Station Program Manager
- Michelle Bouchard, Chief Operating Officer, Caltrain
- Sebastian Petty, Director of Policy, Caltrain

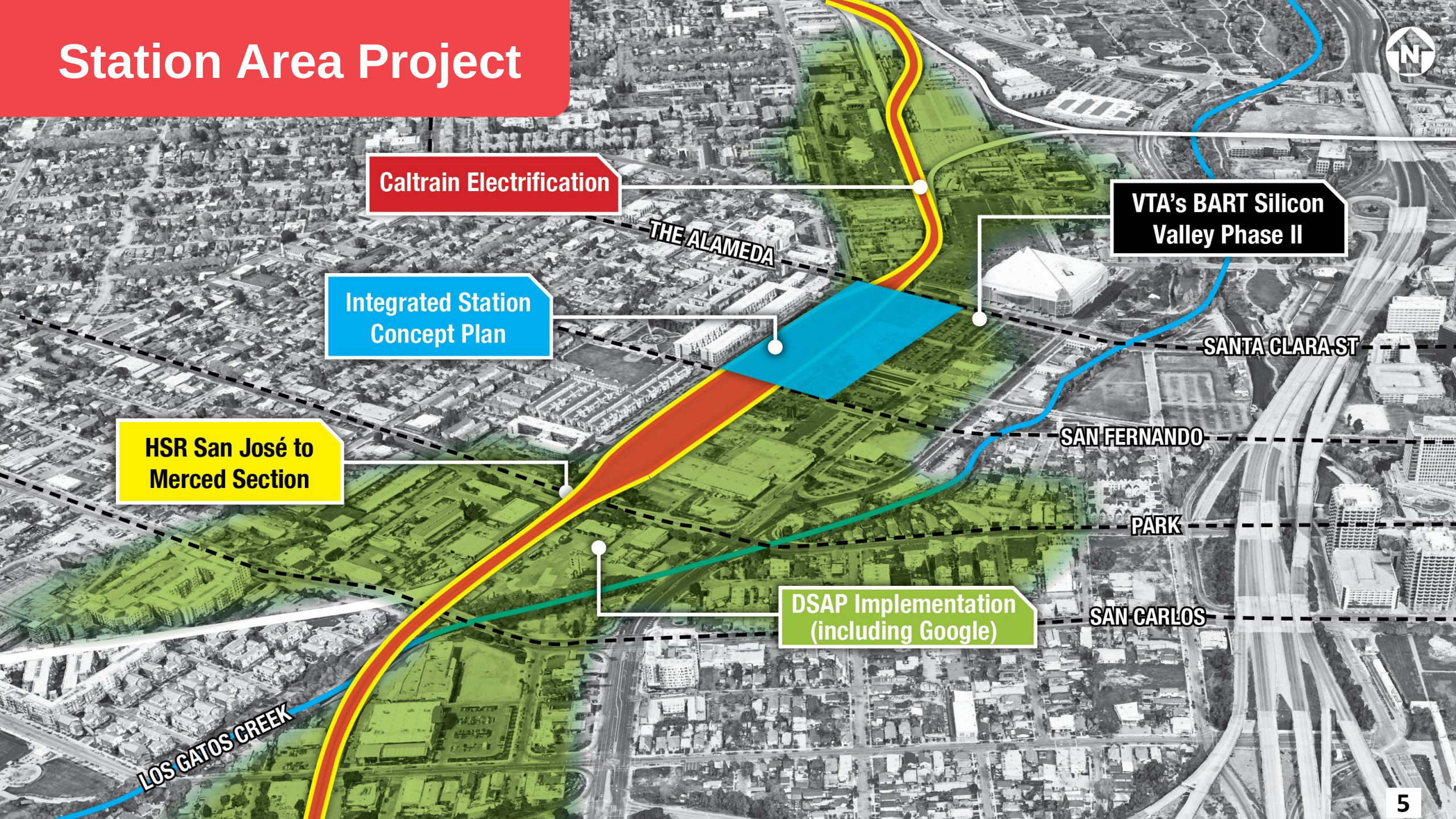
PARTNER AGENCY AND SUPPORT PARTICIPANTS

- Jim Ortbal, Deputy City Manager
- Kim Walesh, Deputy City Manager
- Eric Eidlin, Station Planning Manager
- Boris Lipkin, California High Speed Rail Authority
- Deborah Dagang, VTA
- Martin Brinkhuis, Team ABC
- Kyle Keahey, Kimley-Horn

PARTNER PROJECTS INTERSECTING AT DIRIDON

- **Caltrain:**
  - Electrification
  - Business Plan
- **VTA:** BART Silicon Valley Phase II Extension Project
- **California High-Speed Rail:**
  - San José – Merced Project Segment
  - 2018 Business Plan
- **City of San José:** Station Area Development

Station Area Project



Four Agencies Enter Into A Cooperative Agreement

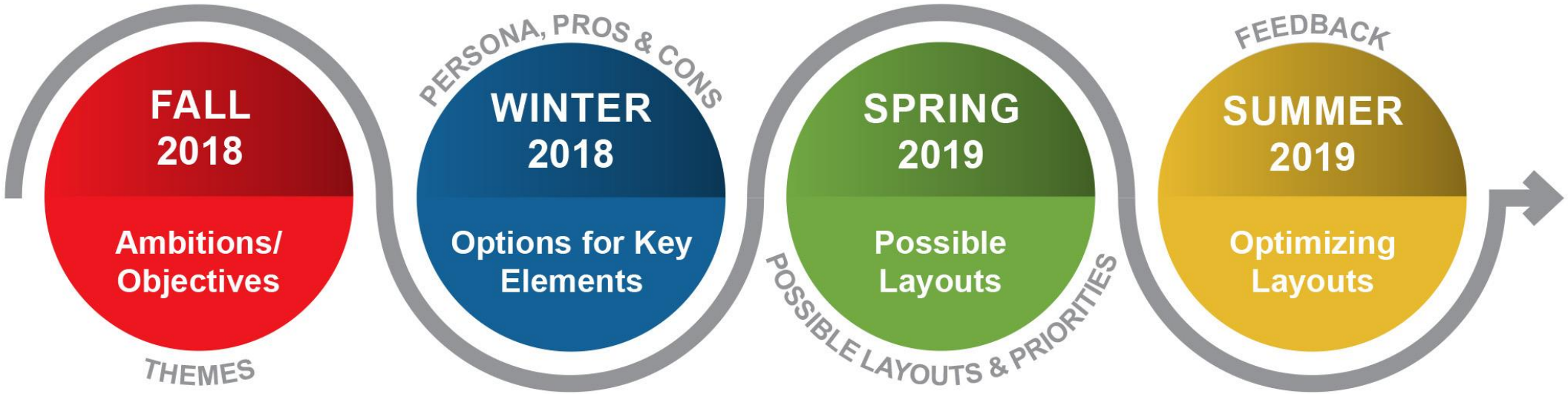
INTEGRATED PROJECT

VISION FOR THE FUTURE STATION

Deliver a world-class transportation hub that provides a seamless customer experience for movement between transit modes within the station and into the surrounding neighborhoods and Downtown.

CONCEPT PLAN PROCESS TO DATE

Phase I Process and Outreach Rounds



Big Moves and Kit of Parts

Northern Rail Alignment

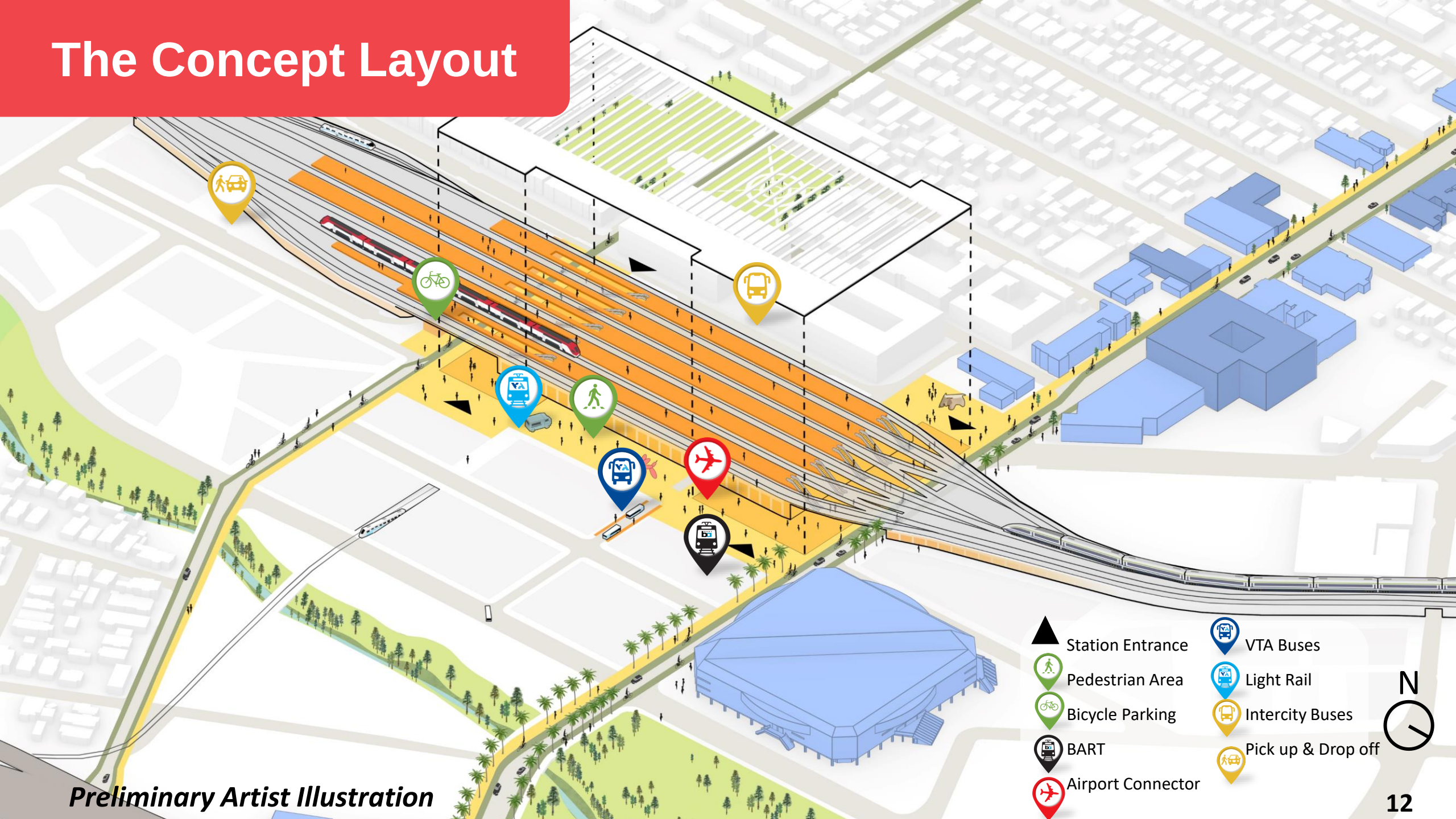
Vertical Platform Position

Station Location

Southern Rail Alignment

RECOMMENDED CONCEPT LAYOUT

The Concept Layout



Preliminary Artist Illustration

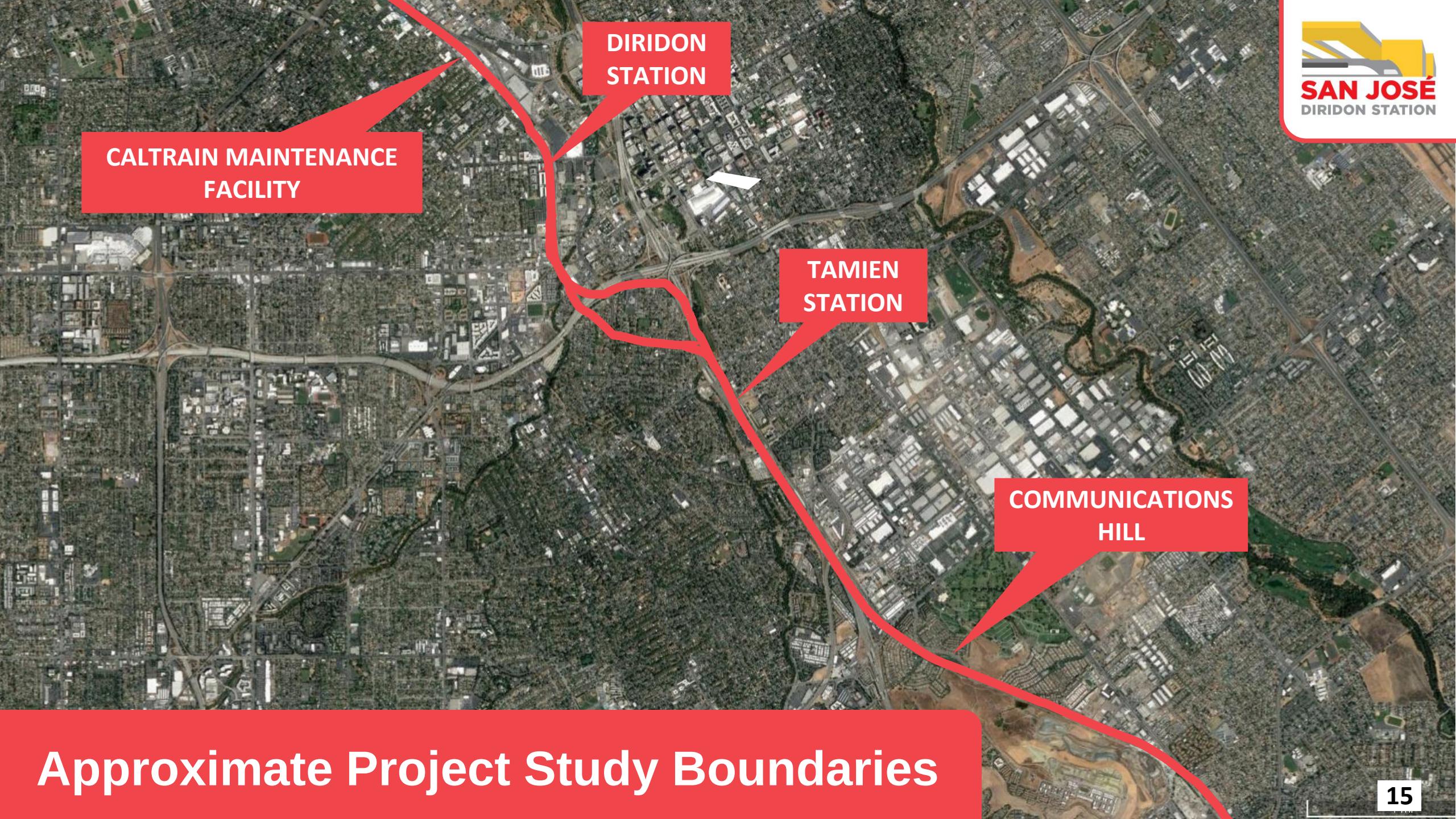
COUNCIL ACCEPTED TWO DECISIONS
ON DECEMBER 3, 2019

- **Decision #1: An Elevated Station Concept**
- **Decision #2: Station Concourse Locations Oriented Toward Santa Clara Street and San Fernando Street**

STUDY SESSION FOCUS

Staff Recommendation for Decision #3:

Maintain the Track Approaches Generally Within the Existing Northern and Southern Rail Corridors



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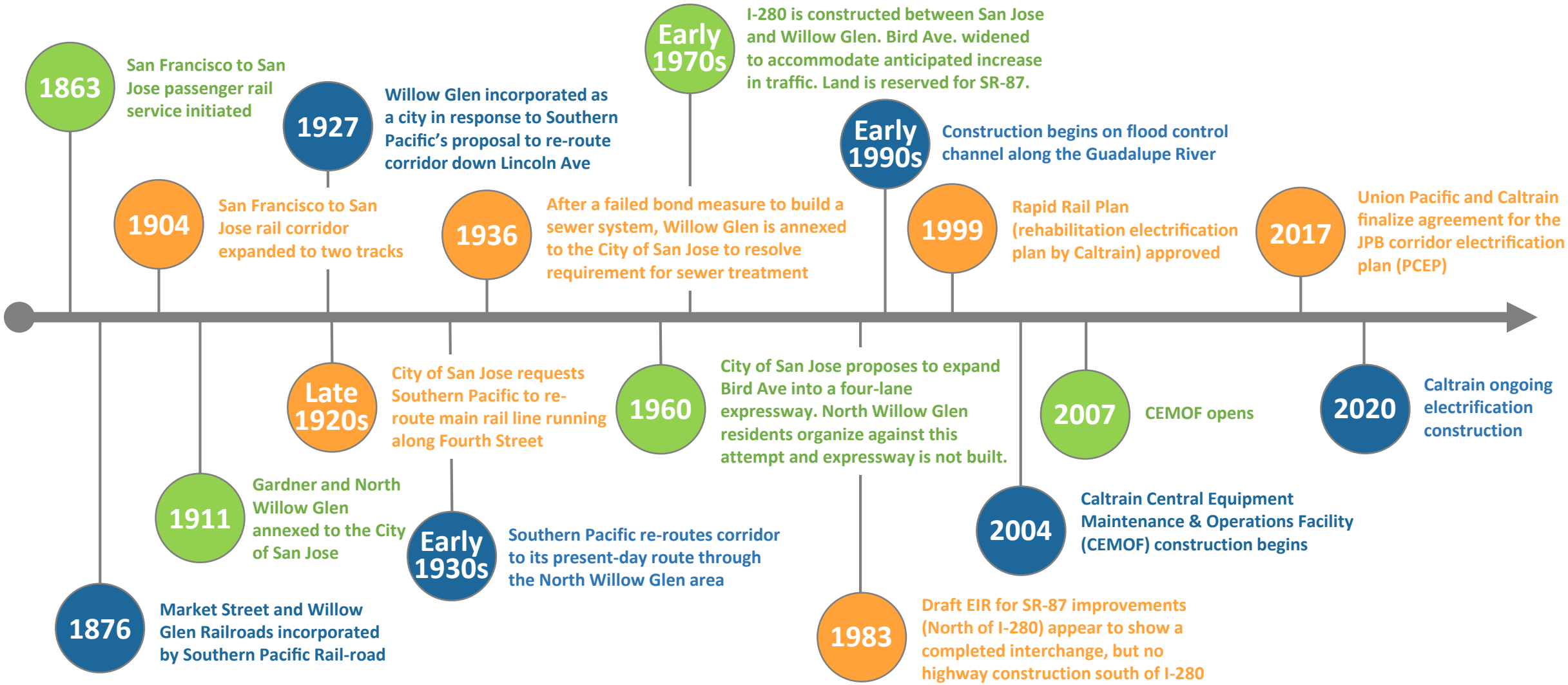
Approximate Project Study Boundaries

History of Infrastructure Projects



Council Requested More Information

- What can be anticipated in terms of the future number of trains and tracks?
- What are the overall property and potential development impacts of a viaduct?
- What infrastructure is required for the flyover that enables the viaduct option?
- What are the potential visual impacts of the viaduct option?
- What are the impacts of a viaduct option to the Tamien Station area?
- Is it possible to shift Caltrain, High Speed Rail, and other rail operators onto a viaduct?
- Union Pacific Railroad requires that freight tracks not exceed a one percent grade. Can the Partner Agencies request a variance?

Council Requested More Information

- What are the overall property and development impacts of the existing corridor option?
- What are the likely impacts to Fuller Park in the existing corridor scenario?
- What is the relative effectiveness of different techniques to mitigate noise and vibration impacts of train travel such as rubber bearings and track slabs?
- What are the maintenance considerations for each of these techniques?
- What are the environmental considerations associated with each track option, particularly on the Los Gatos Creek, the Guadalupe River, and the trails that line these waterways?
- What are order-of-magnitude cost differences for each track approach?

Rail Corridor Analysis and Evaluation

1. Understand Potential Long-Term Train Volumes and Track Needs
2. Investigate and Develop the I-280/SR-87 Viaduct Alignment
3. Investigate and Develop the Existing Corridor Alignment
4. Capital Cost Comparison
5. Noise and Vibration Overview
6. Compare and Recommend Alignment Options

1. UNDERSTAND LONG-TERM POTENTIAL TRAIN AND TRACK NEEDS

Daily Long-Term Train Volumes: Diridon to Tamien

Service	Current	Example Interim Service Levels (est. 2030s)*	Long-Term Potential (50+ years)
Caltrain	34	116 to 166	268 (Adopted Service Vision)
ACE	8	20	20 (ACE Forward, non-electric service)
Capitol Corridor	0	30	30 (CC Vision Plan, non-electric service)
Union Pacific (UP)**	Up to 8	Unknown	Unknown
Amtrak	2	2	2
High Speed Rail	0	44	160 (2018 Business Plan)
Total	Up to 52	212 to 262**	Up to 480**

* Represents possible number of trains running at expected time of opening the new Diridon Station, estimated for the 2030s
** Union Pacific currently runs up to 8 trains daily; future growth or decline is unknown and not reflected in the future totals

Long-Term Potential Track Needs: Diridon to Tamien

- No More Than Four Tracks through Gregory/Gardner/North Willow Glen
- Two Electrified Tracks Allow for All Caltrain and High-Speed Trains
- One or Two Diesel (Non-Electrified) Tracks
  - Track needs for future Capitol Corridor (CC) and Altamont Commuter Express (ACE) potential growth depend on:
    - Number of trains over time (significant corridor-wide infrastructure needed)
    - If/when the services are electrified, and
    - Whether Union Pacific shares track with ACE and CC or not
- Partner Agencies Aim to Grade-Separate Existing At-Grade Crossings in the Existing Corridor

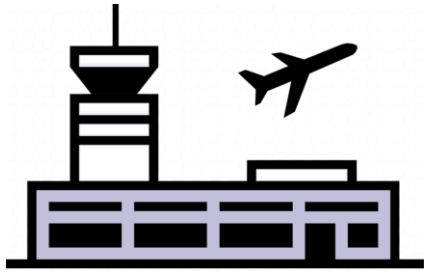
Efficient Capacity Increase at the Station

- Create a “Through Running” Station
- Increase Train Service Capacity Without Significant Increase in Land Footprint
- **Station Today**: 17,000 Travelers
- **Station by 2040**: Accommodates up to 140,000 Travelers
- For example, compares with daily air passenger capacity of San Francisco International Airport, but has a much smaller land footprint

DIRIDON TODAY
17,000 Travelers

DIRIDON 2040:
140,000 Travelers

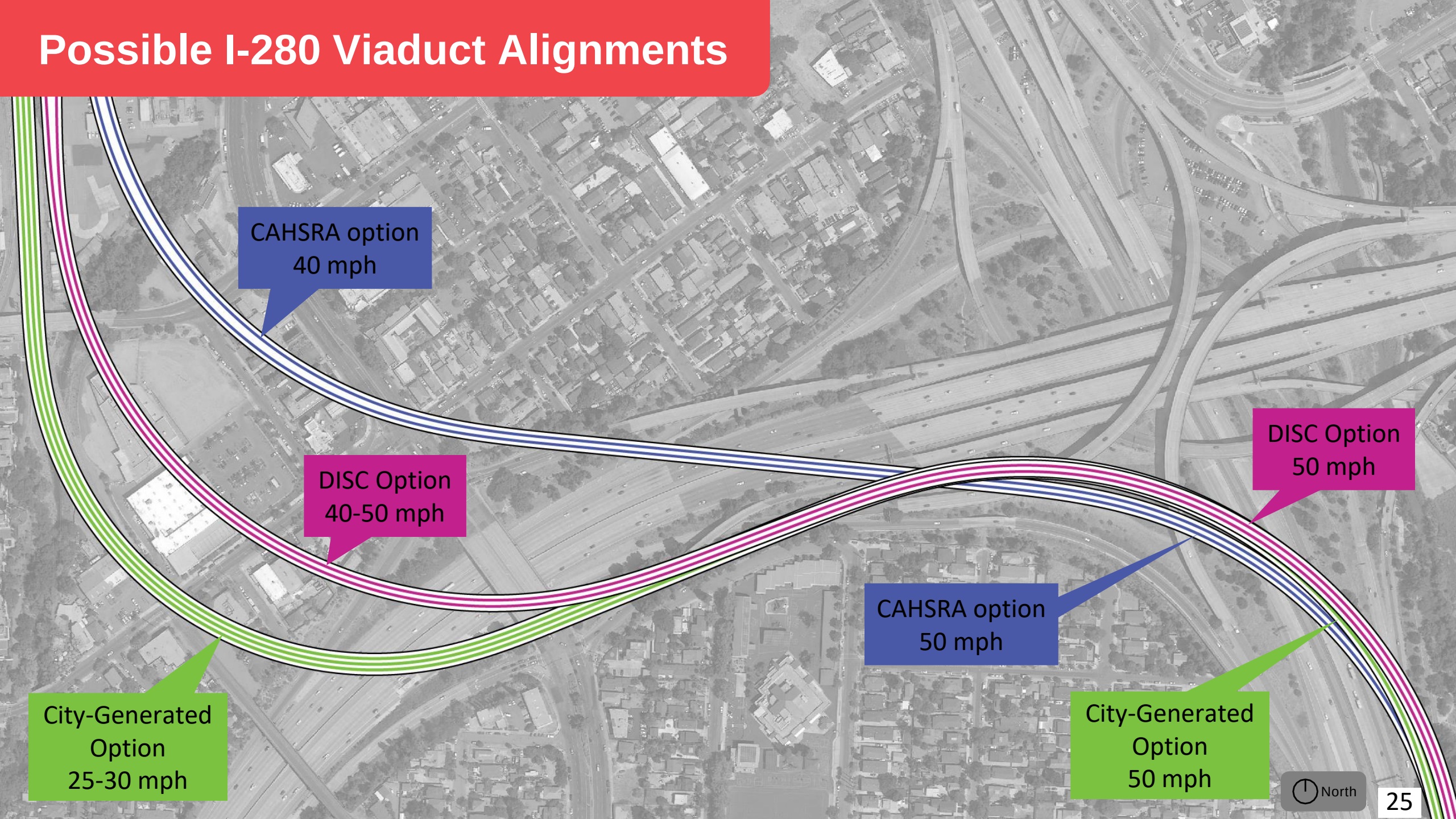
SFO TODAY,
145,000 Passengers



2. INVESTIGATE AND DEVELOP THE I-280 / SR-87 VIADUCT

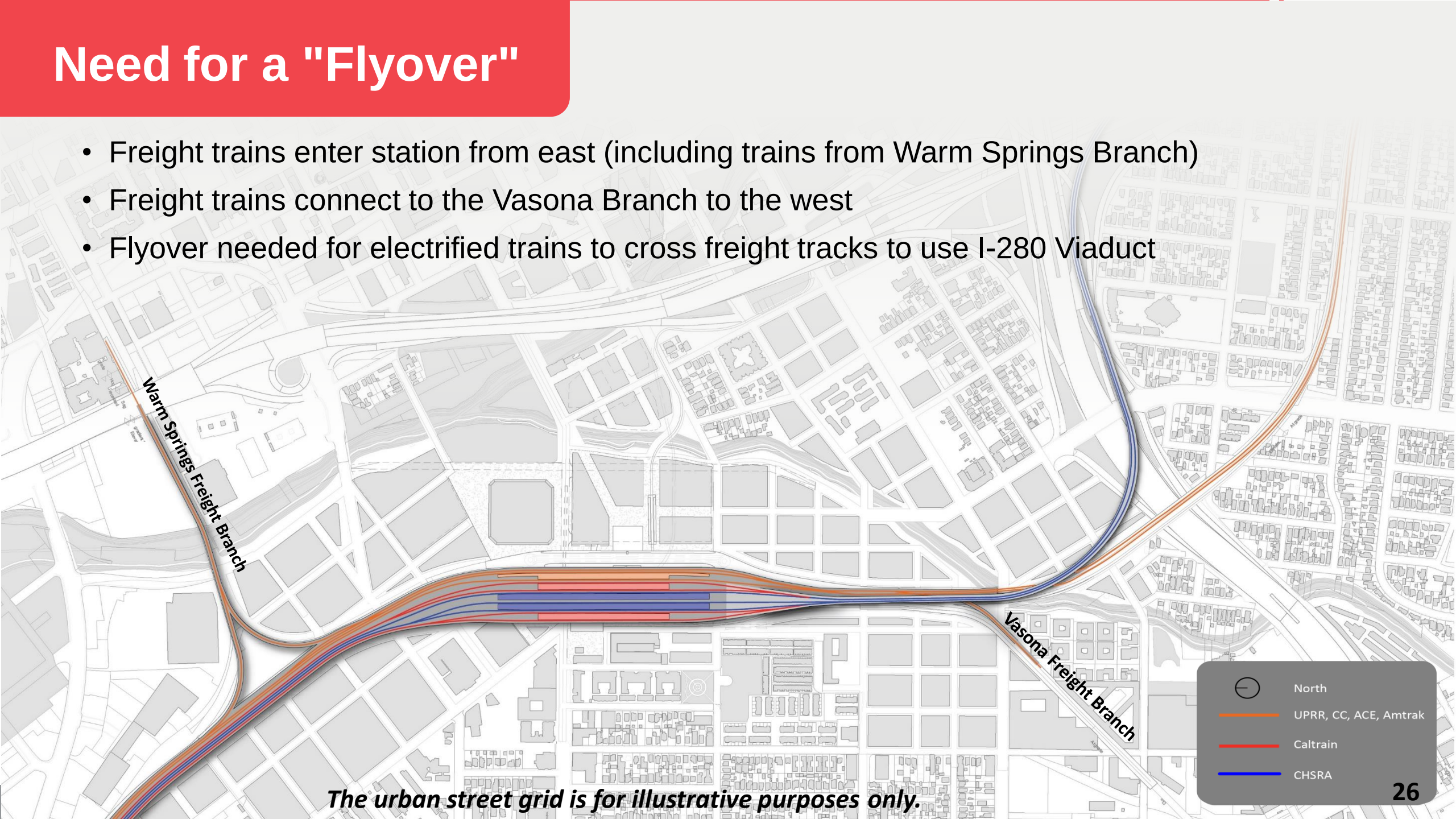
- Viaduct Alignment
- Flyover Above Non-Electrified Tracks
  - North of Diridon Station
  - South of Diridon Station
- Additional/All Trains on Viaduct

Possible I-280 Viaduct Alignments



Need for a "Flyover"

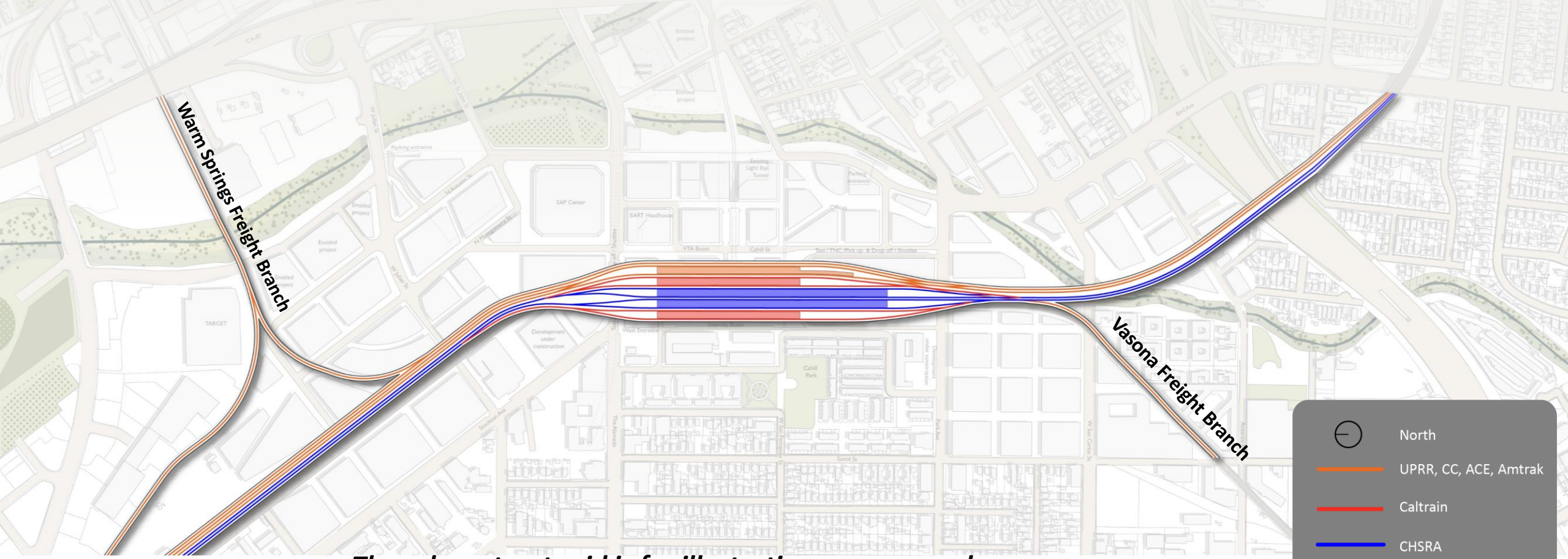
- Freight trains enter station from east (including trains from Warm Springs Branch)
- Freight trains connect to the Vasona Branch to the west
- Flyover needed for electrified trains to cross freight tracks to use I-280 Viaduct



The urban street grid is for illustrative purposes only.

Concept Layout

- No flyover required
- Because of very low Vasona Branch freight train volumes moving across the station



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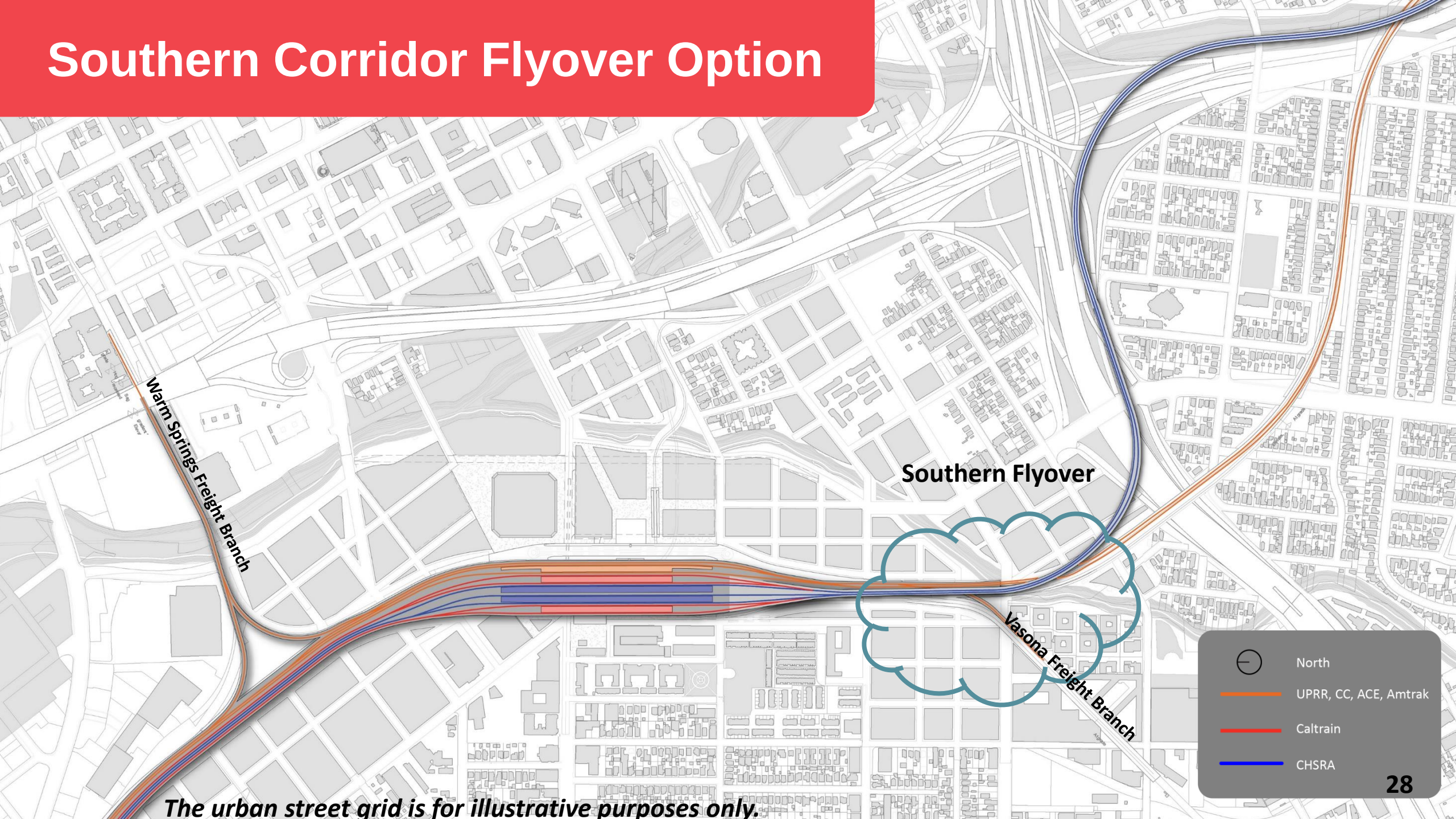
Southern Corridor Flyover Option



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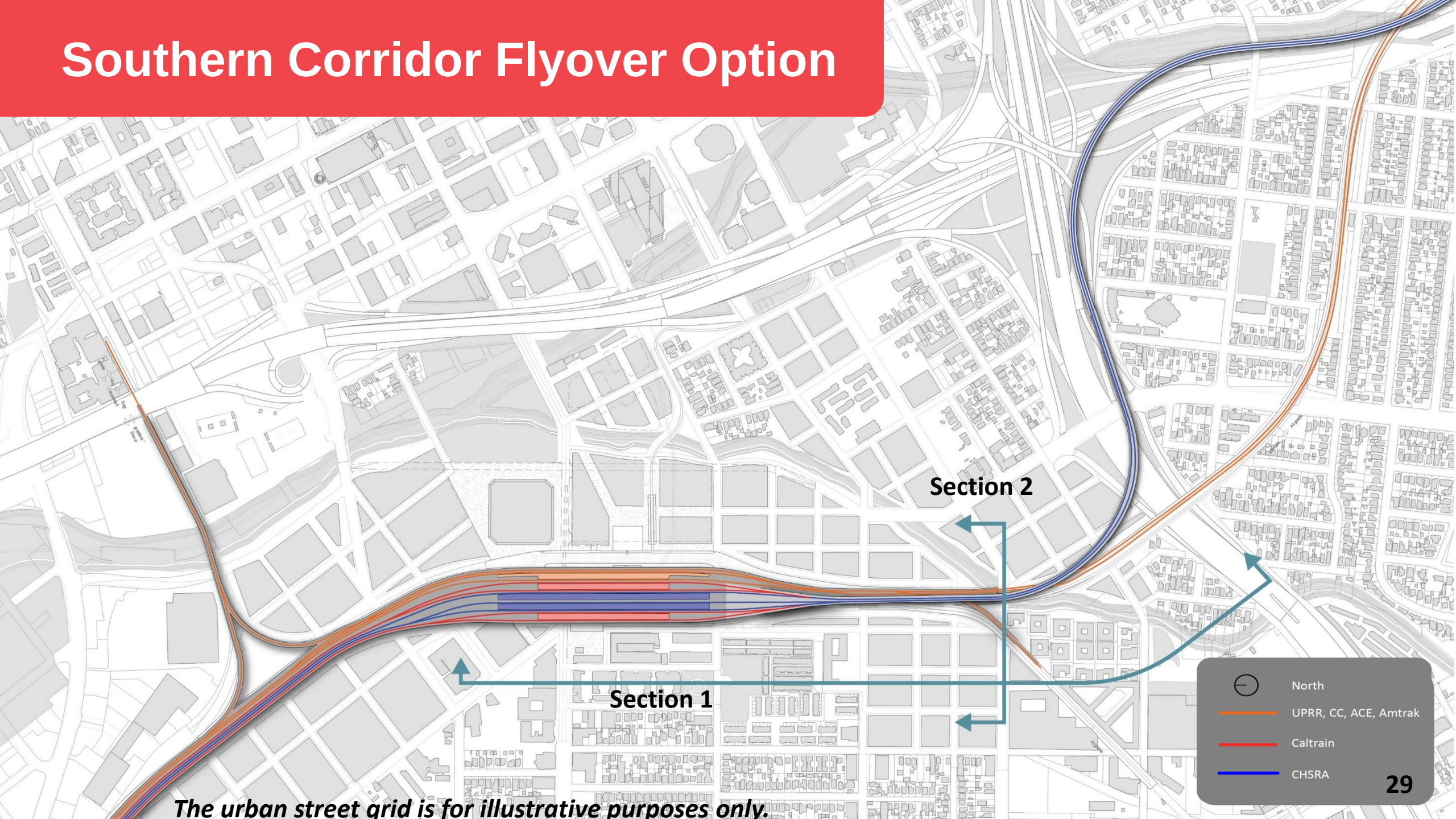
Southern Corridor Flyover Option



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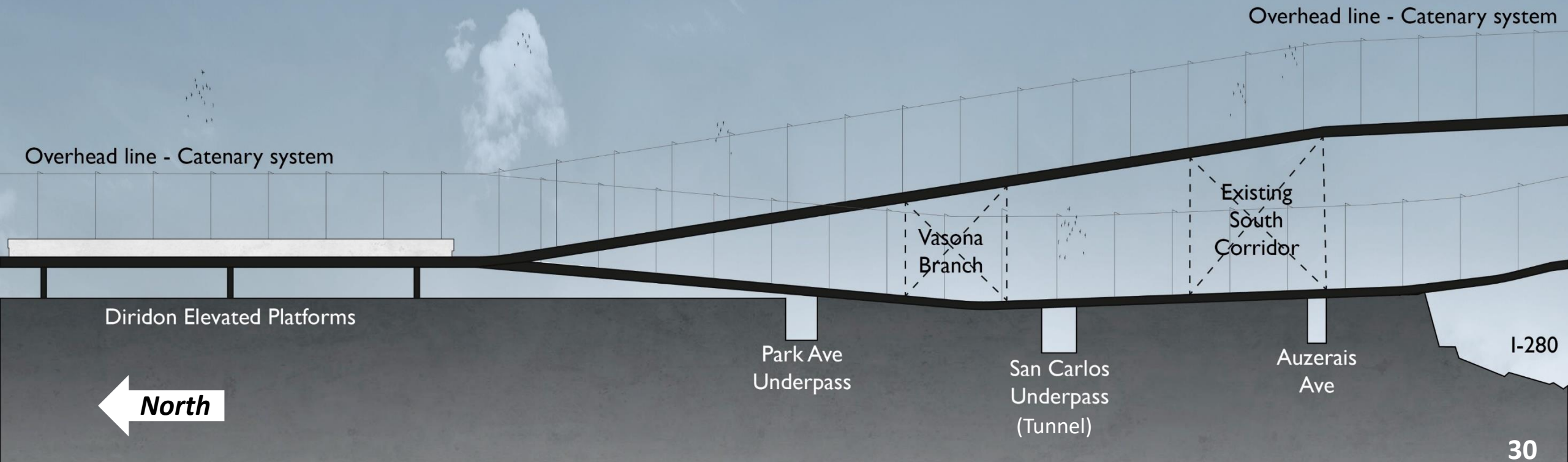
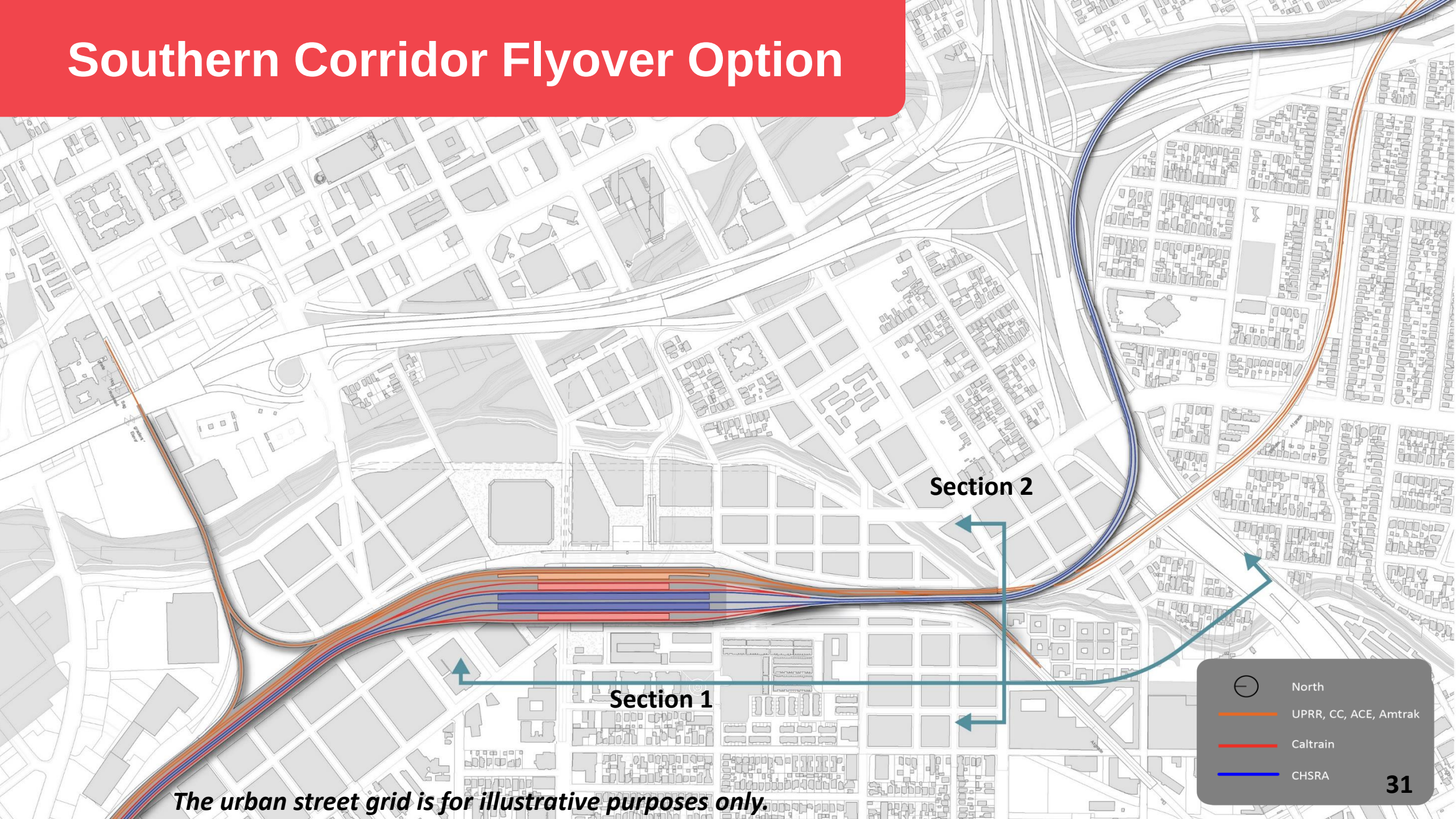
Southern Corridor Flyover Option – Section 1

- Tracks for electrified trains ascend to get over I-280/SR-87 to the southeast
- Tracks for non-electrified trains (freight and other) descend
- Freight trains need to get onto the Vasona Branch to the southwest



Southern Corridor Flyover Option



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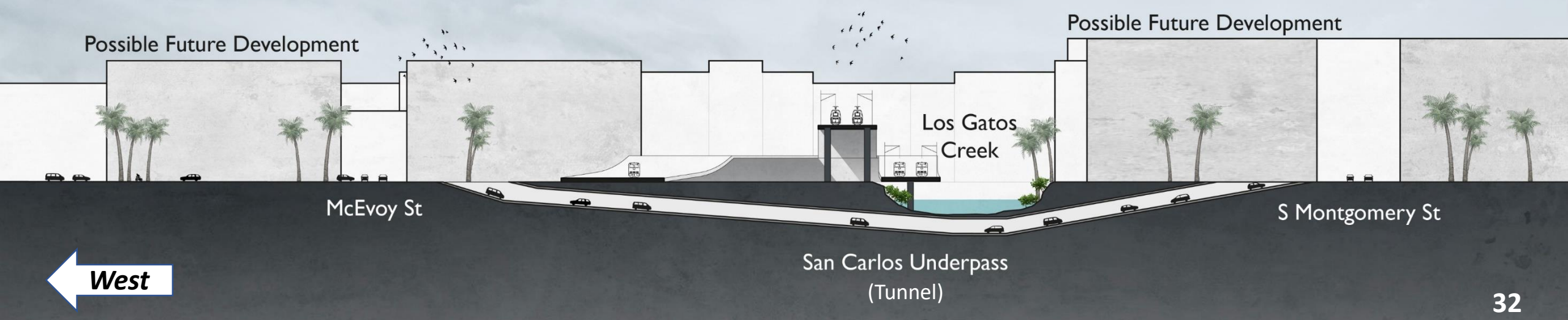
Southern Corridor Flyover Option – Section 2

- Challenge with Southern Flyover is the Number of Corridors (rail, streets, creek) Intersecting in the Same Location around San Carlos Street
- Only Viable Option Is to Put San Carlos (and Park, Auzerais) in a Tunnel Below Los Gatos Creek
- Presents Significant Challenges for Pedestrian and Bicycle Connectivity
- Presents Significant Maintenance, Flooding and Environmental Challenges



Posey Street Tube – Oakland to Alameda

Southern Corridor Flyover Option

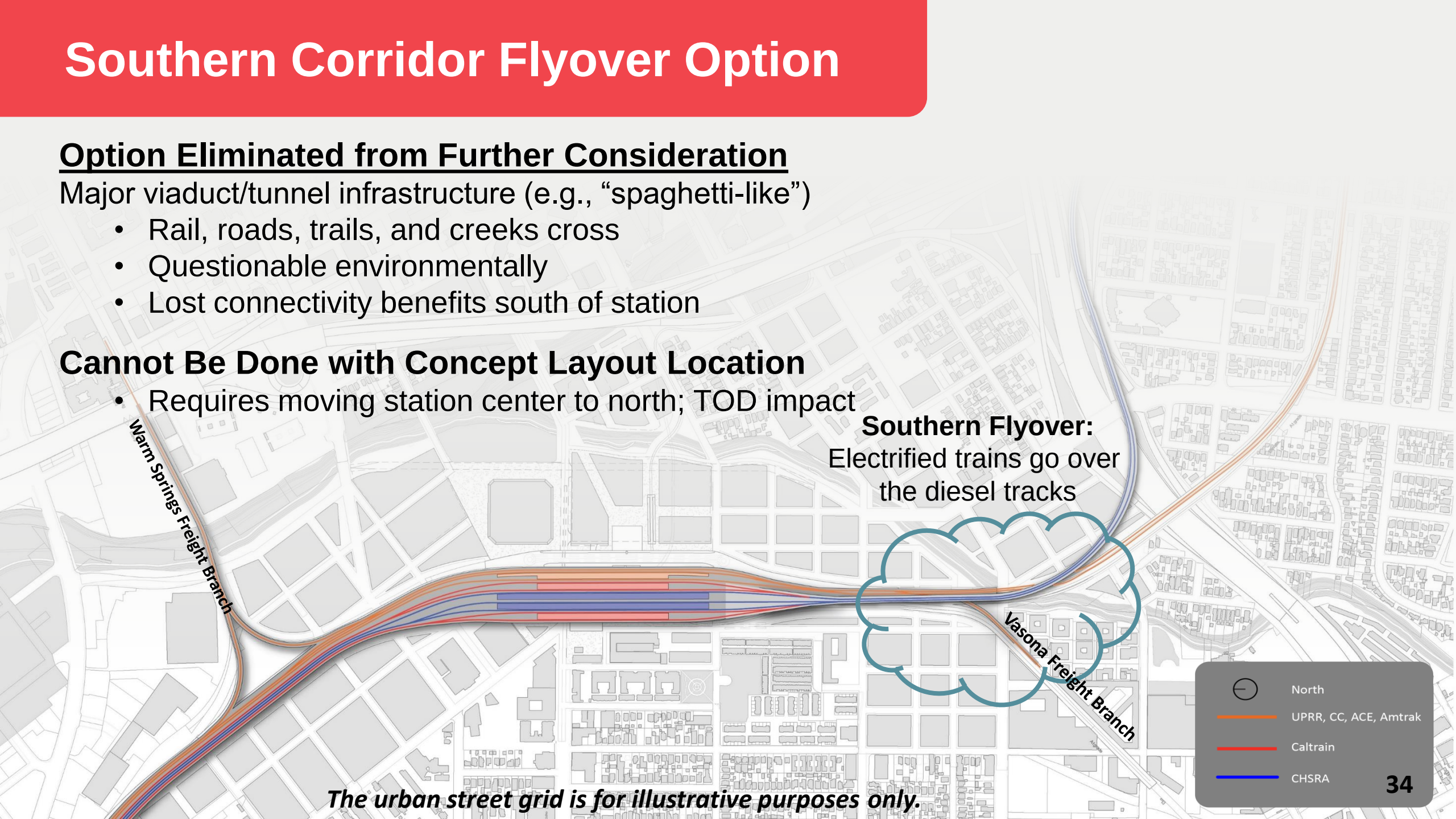
Option Eliminated from Further Consideration

Major viaduct/tunnel infrastructure (e.g., “spaghetti-like”)

- Rail, roads, trails, and creeks cross
- Questionable environmentally
- Lost connectivity benefits south of station

Cannot Be Done with Concept Layout Location

- Requires moving station center to north; TOD impact



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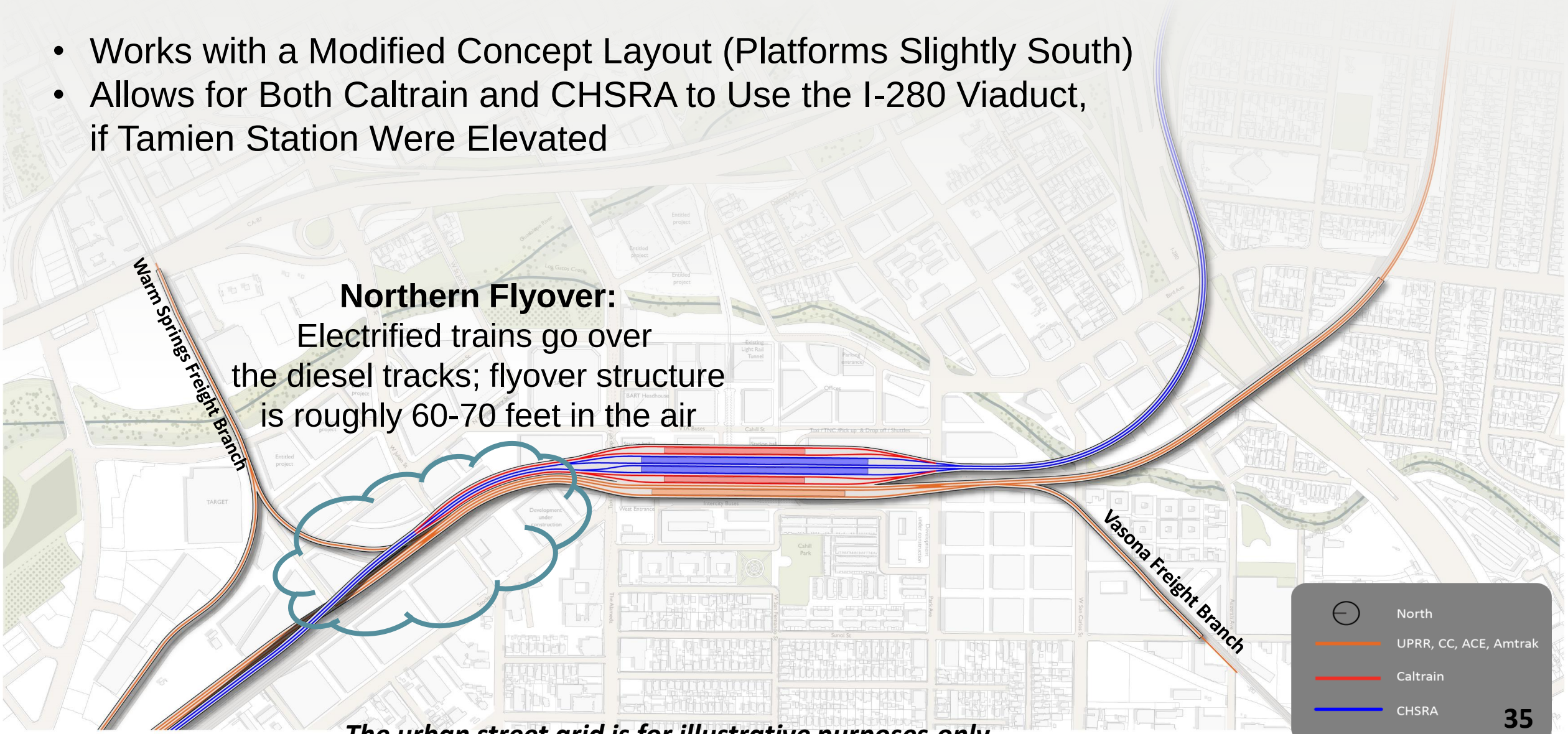
Northern Corridor Flyover Option

- Works with a Modified Concept Layout (Platforms Slightly South)
- Allows for Both Caltrain and CHSRA to Use the I-280 Viaduct, if Tamien Station Were Elevated



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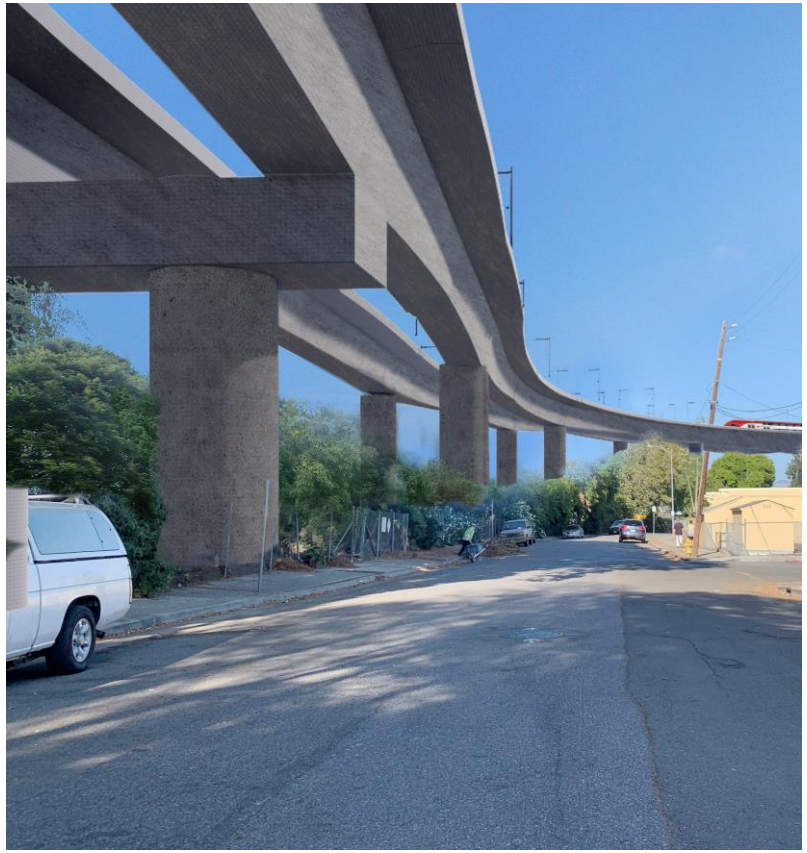
Can We Shift All Trains Onto the I-280 Viaduct?

Concept Layout (Elevated Platforms between Santa Clara and San Fernando Streets) with All Trains, including Freight on Viaduct

Findings

- **Requires Four Tracks (Two Viaducts, Two Tracks Each)**
  - Significantly increased property, river, and visual impacts, as well as maintenance needs
  - Constructability uncertain (e.g., footings, particularly over I-280)
- **Violates Freight Trains 1% Grade Requirement**
  - Steeper grades limit freight operations when hauling large loads
- **Requires Moving UPRR Off Existing Rail Corridor**
  - They own Main Track 1 north of Tamien and own both tracks and the underlying land south of Tamien



Possible View of Widened I-280 Viaduct – West William Street Looking Northeast

Coordination with Union Pacific Railroad

Union Pacific Railroad Would Need Extensive Analysis:

- Overall effect on the UPRR operations
- Engineering standards, which effect rail operations, safety, and have cost considerations
- Commercial implications to the UPRR's overall operation in California and nationally
- Real Estate agreements and considerations, including trackage rights and property arrangements given that the UPRR owns Main Track 1 on the existing corridor. The ownership agreements related to a viaduct would need to be fully worked out.

UPRR would require extensive analysis and analysis would likely yield outcomes that conflict with UPRR standards.

Could cause UPRR to not agree or only agree with substantial design, schedule, or financial considerations that may be at odds with the overall Diridon Station program.

Could All Passenger Trains Run On A Viaduct?

- Requires Construction of Four Total Tracks on Two Distinct Viaducts Structures (Two Tracks on Each Viaduct)
  - Providing two-tracks for electrified services and up to two tracks for diesel passenger rail
  - Practical to construct full width needed for future service levels once
- Could Result in Little to No Mitigation Within the Existing Corridor for the Remaining Freight Train Impacts

Conclusion: A Four-Track Viaduct Is Fatally Flawed

Possible View of I-280 Viaduct –
Guadalupe River Trail looking south

Partner Agencies Have Concluded that Placing All Trains on the I-280 Viaduct Is a Fatally Flawed Design Option:

- Violates freight requirements
- Requires moving UPRR off the existing corridor
- Creates massive infrastructure
- Results in little to no mitigation on the existing corridor

OTHER CONSIDERATIONS OF THE I-280 / SR-87 VIADUCT

- Trail system and natural resources
- Tamien Station area
- Property and potential development impacts
- Maintenance
- New visual impacts

TRAIL SYSTEM AND NATURAL RESOURCES

Guadalupe River Trail Looking South

Possible View of I-280 Viaduct –

Guadalupe River Trail Looking South

TAMIEN STATION AND AREA

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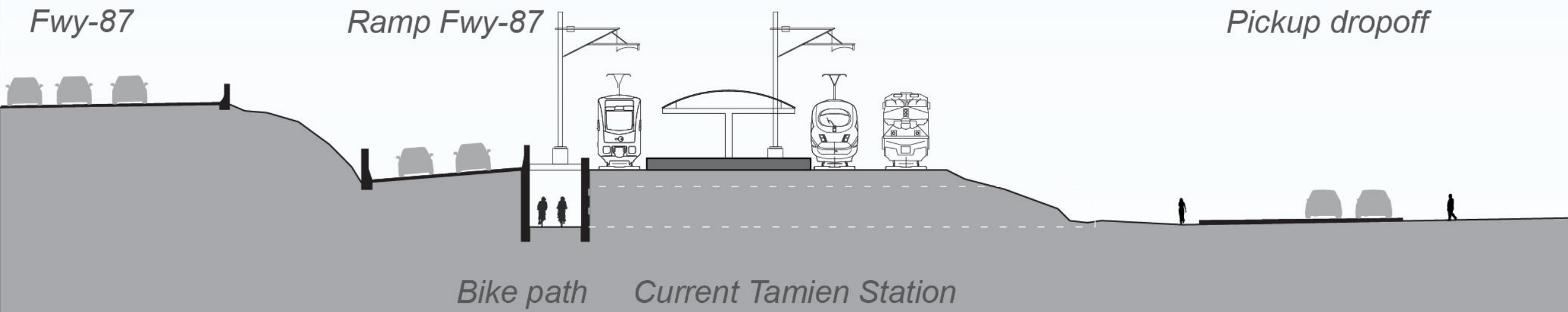
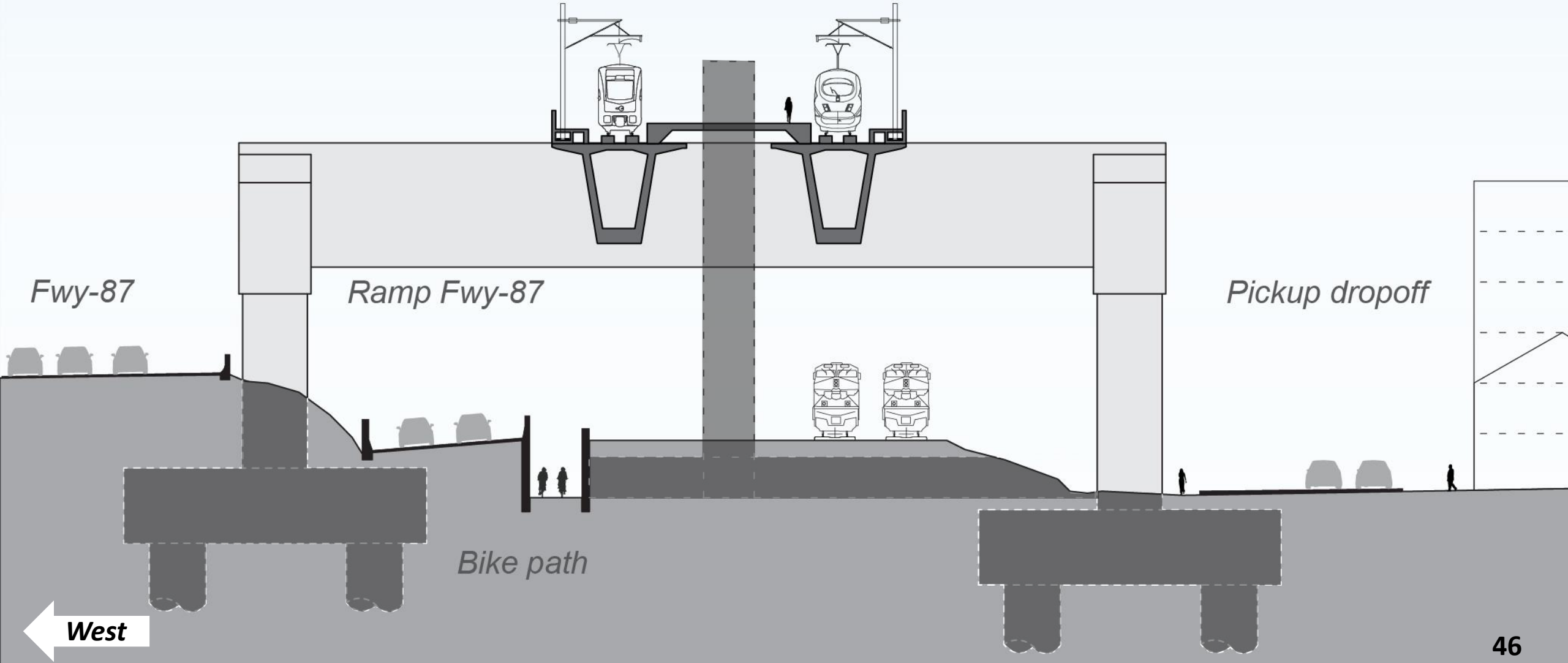
Tamien Station
Future Station with Electrification



West

Tamien Station

Addition of I-280 Viaduct/Demolition of Current Tamien Station



Tamien Station
Summary of Likely Impacts

Environmental Concerns

- Especially Guadalupe River and Trail

Visual Impact of Structure

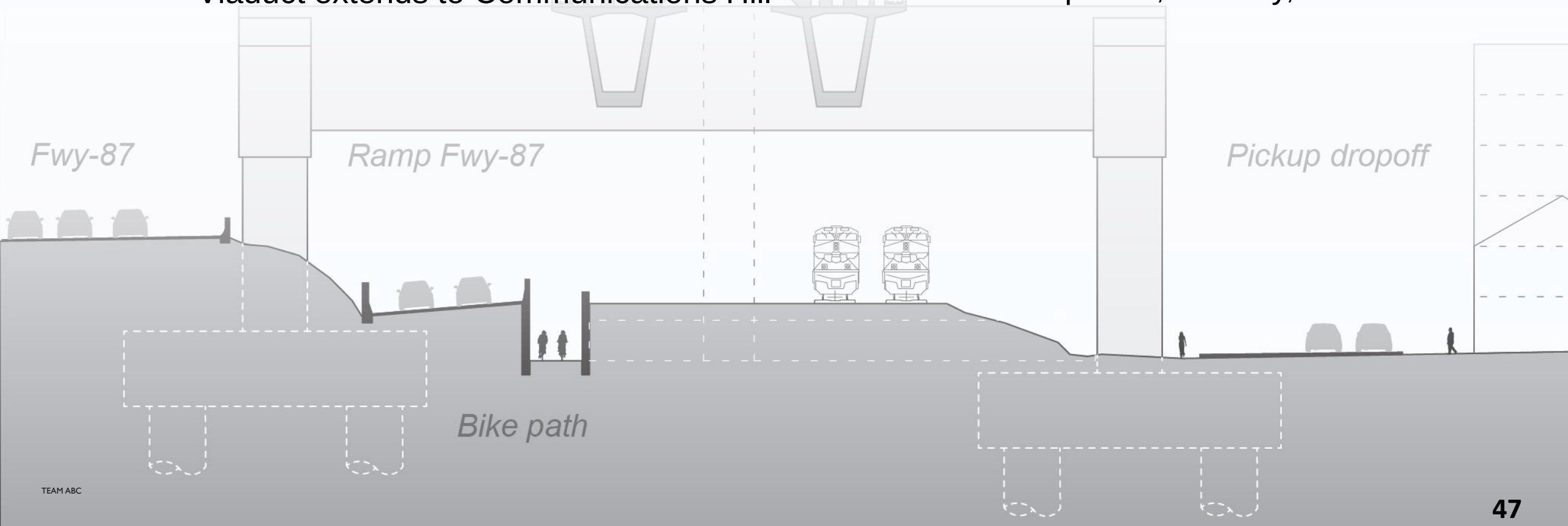
- Structure roughly at roofline of new TOD
- Viaduct extends to Communications Hill

Physical Impacts of Structure

- Guadalupe River and Trail
- Potential Tamien Park and TOD circulation

Significant Constructability Challenges

- VTA development, freeway, etc.



PROPERTY AND POTENTIAL DEVELOPMENT IMPACTS

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I-280 Viaduct Potential Property and Development Impacts – North

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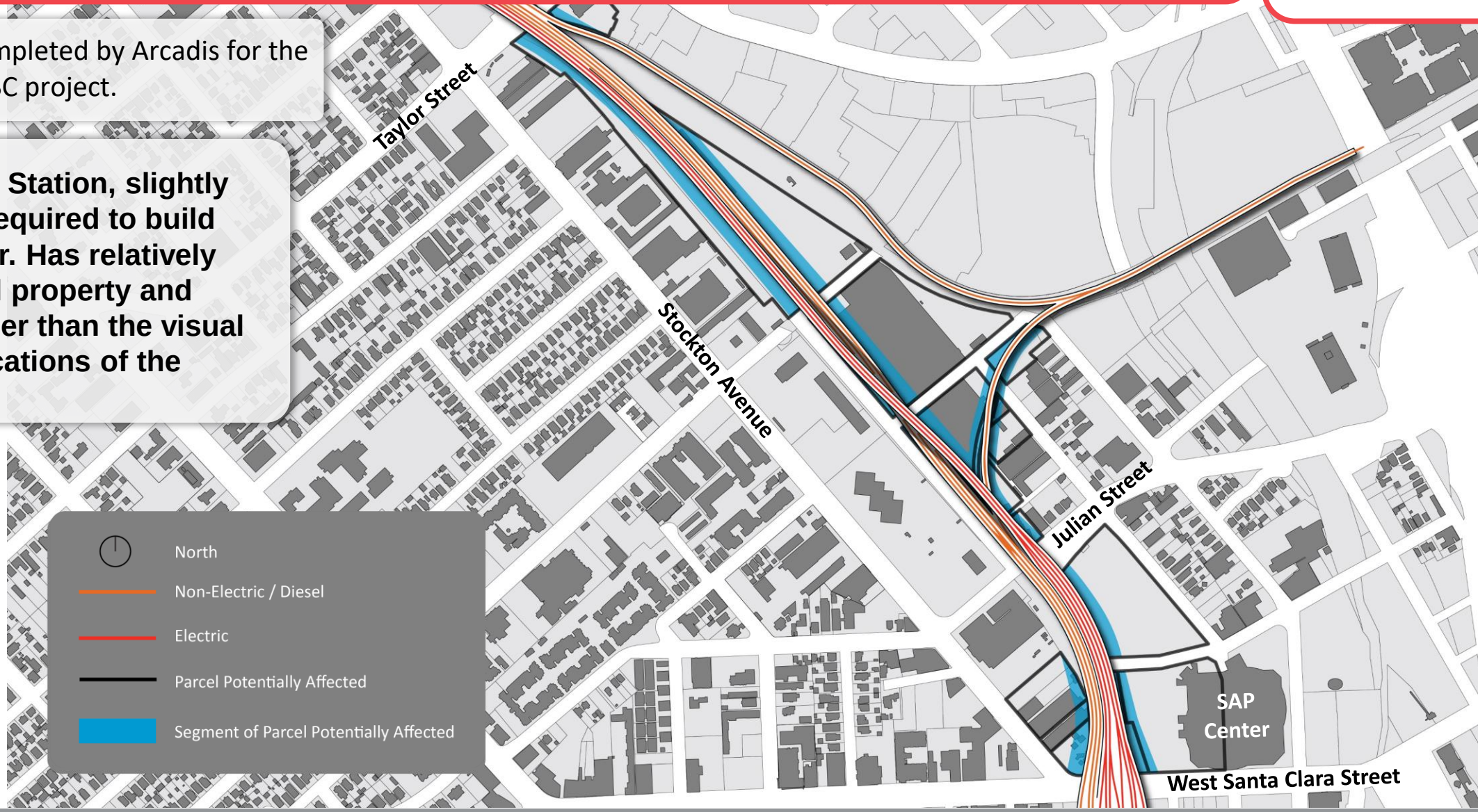
This design was completed by Arcadis for the purposes of the DISC project.

North of Diridon Station, slightly more property required to build Northern Flyover. Has relatively minor additional property and TOD effects, other than the visual and noise implications of the Flyover.

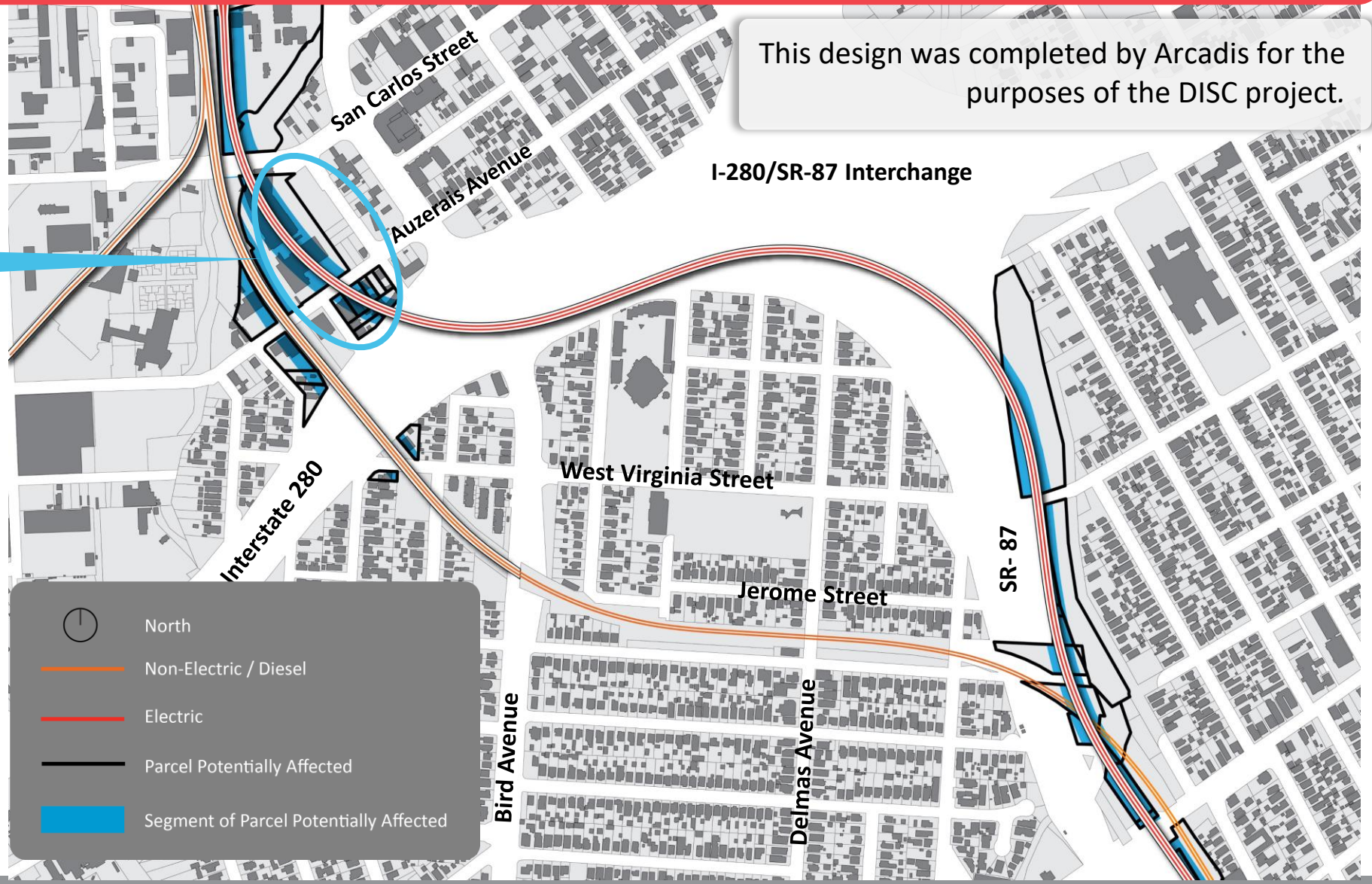


I-280 Viaduct Potential Property and Development Impacts – South

SAN JOSÉ DIRIDON STATION

This design was completed by Arcadis for the purposes of the DISC project.

Potential TOD Sites Impacted



Summary of Property and Potential Development Impacts – I-280 Viaduct

More Potential Impacts South of Diridon Station, Primarily within Two Areas Identified for Potential TOD:

1. Area Bounded By Existing Corridor, W. San Carlos St., Royal Ave., and Auzerais Ave:
   - Up to 1,500 new homes proposed here
   - Property bisected by viaduct structure - reduces development potential & site attractiveness
   - **Viaduct is estimated to result in the loss in the approximate range of 800 units. The impact up to and during the construction of the viaduct would likely be even more.**

2. Area Bounded By Existing Corridor, Auzerais Ave., Royal Ave., and I-280:
   - Over 700,000 sq.ft. new office/commercial development could be realized
   - Property bisected by viaduct structure - reduces development potential & site attractiveness
   - **The remnant parcels may restrict the ability to achieve optimal office floorplates, further diminishing the likelihood of redevelopment for commercial use**

Summary of Property and Potential Development Impacts – I-280 Viaduct

- Preliminary Evaluation By Economic and Development Experts:
  - Viaduct **would likely reduce** attractiveness of both areas to developers
  - Viaduct could **make it more difficult** for potential projects to receive financing
  - Development would **presumably be delayed** until after the viaduct is completed

- South of I-280:
  - Property impacts of viaduct expected primarily within Caltrans right-of-way, the Guadalupe River corridor, and area between existing rail corridor and SR-87

  - Additional property may be required for construction near Tamien Station (including edges of VTA's TOD and Tamien Park) and south of Curtner Avenue near Communications Hill

CONSTRUCTION AND MAINTENANCE

Construction and Maintenance

- Concerns on community impacts of viaduct construction
- Likely that construction **would stretch over years** and construction methods for footings and structures **would be complex**.

Staging areas for construction equipment in sensitive areas or within communities

Impacts to riparian corridor during construction including potential closure of trails

Impacts to SR-87 and to existing rail corridor operations to construct the needed straddle bents for Tamien Station

Construction related impacts throughout communities due to noise, dust, traffic, etc.

Construction and Maintenance

Considerations and Challenges Associated with Maintaining A New Viaduct Structure:

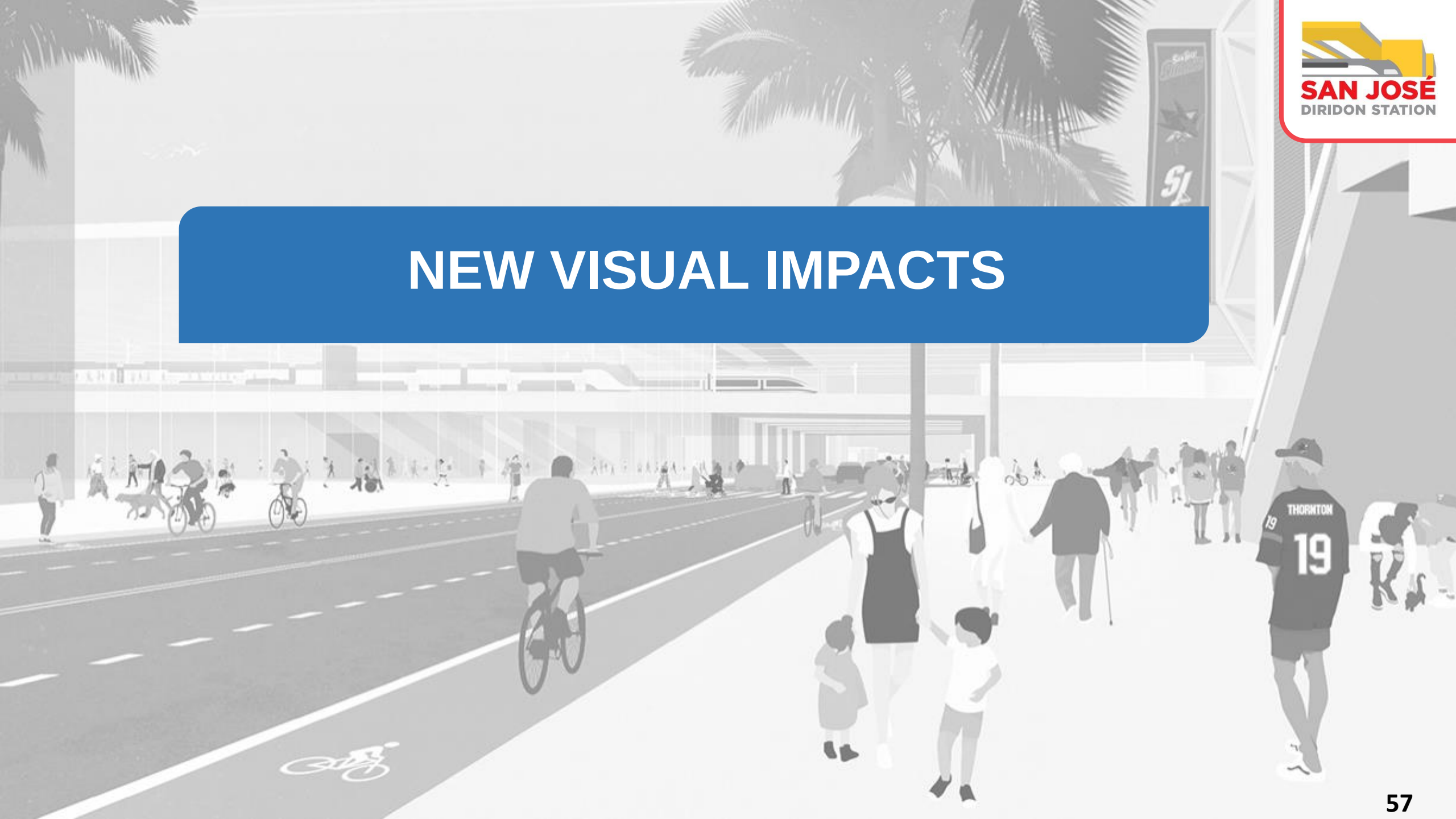
1. A viaduct results in overall increased mileage (approximately 3 miles) of track to maintain.

2. Accessing elevated tracks for maintenance purposes is more difficult than accessing tracks at grade, as there would be limited points of access to the viaduct structure.

3. The viaduct adds more infrastructure (e.g., footings, straddle bent, etc.) to maintain across a substantial distance.

4. The overall cost of maintaining a structure is anticipated to be higher than an at grade corridor due to height, span, and length.

Example of Electric Rail Viaduct: France



NEW VISUAL IMPACTS

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Illinois Ave. Looking North (Gardner Neighborhood)

Potential View of I-280 Viaduct

Illinois Ave. Looking North

Corner of Brown And Willis Street Looking North

Gardner Neighborhood

Possible View of I-280 Viaduct

Corner of Brown And Willis Street Looking North

West Virginia Street Looking West

Washington Neighborhood

Possible View of I-280 Viaduct –
West Virginia Street Looking West from Washington Neighborhood

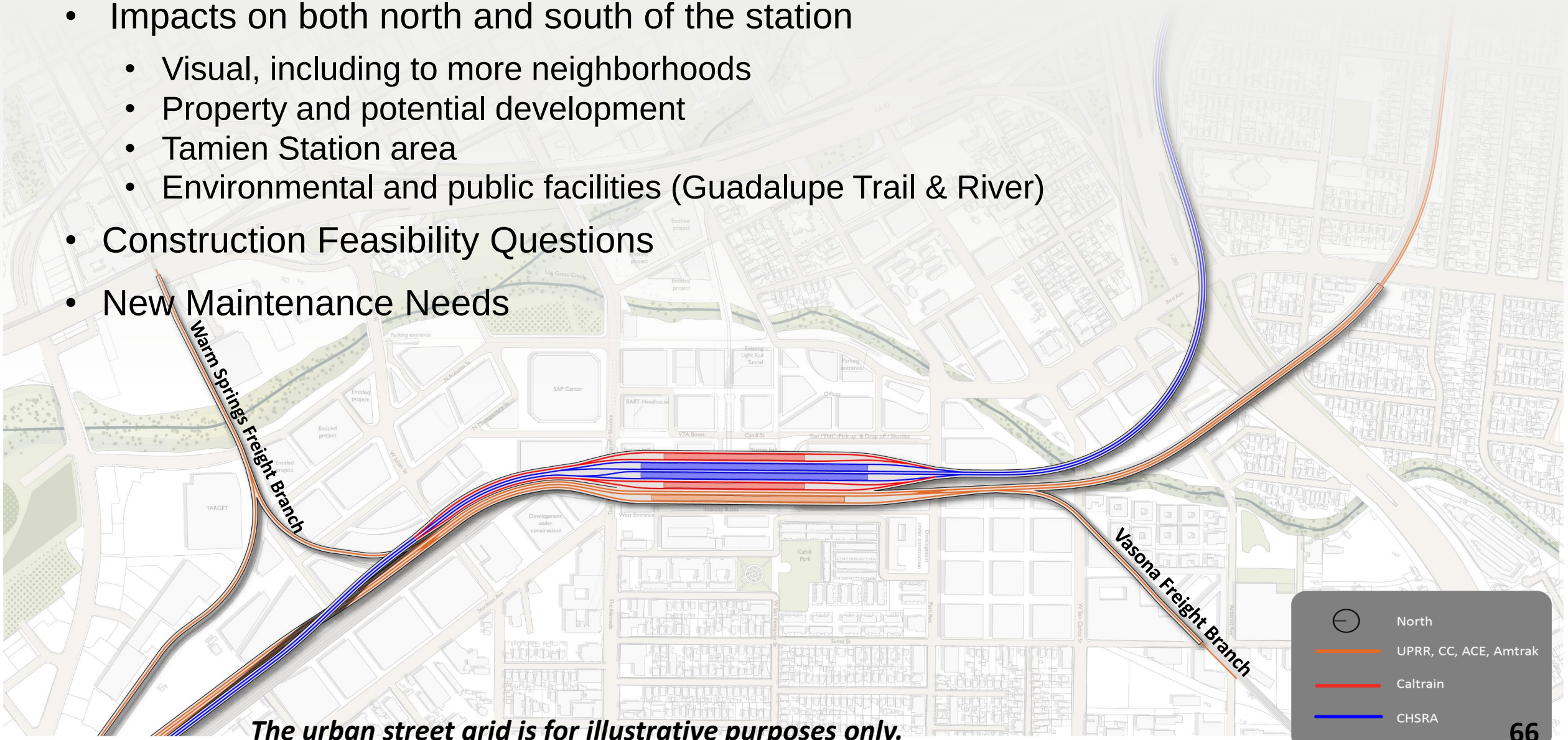
West William Street Looking Northeast

Possible View of I-280 Viaduct

West William Street Looking Northeast

Summary: I-280/SR-87 Viaduct with Northern Flyover

- Impacts on both north and south of the station
  - Visual, including to more neighborhoods
  - Property and potential development
  - Tamien Station area
  - Environmental and public facilities (Guadalupe Trail & River)
- Construction Feasibility Questions
- New Maintenance Needs



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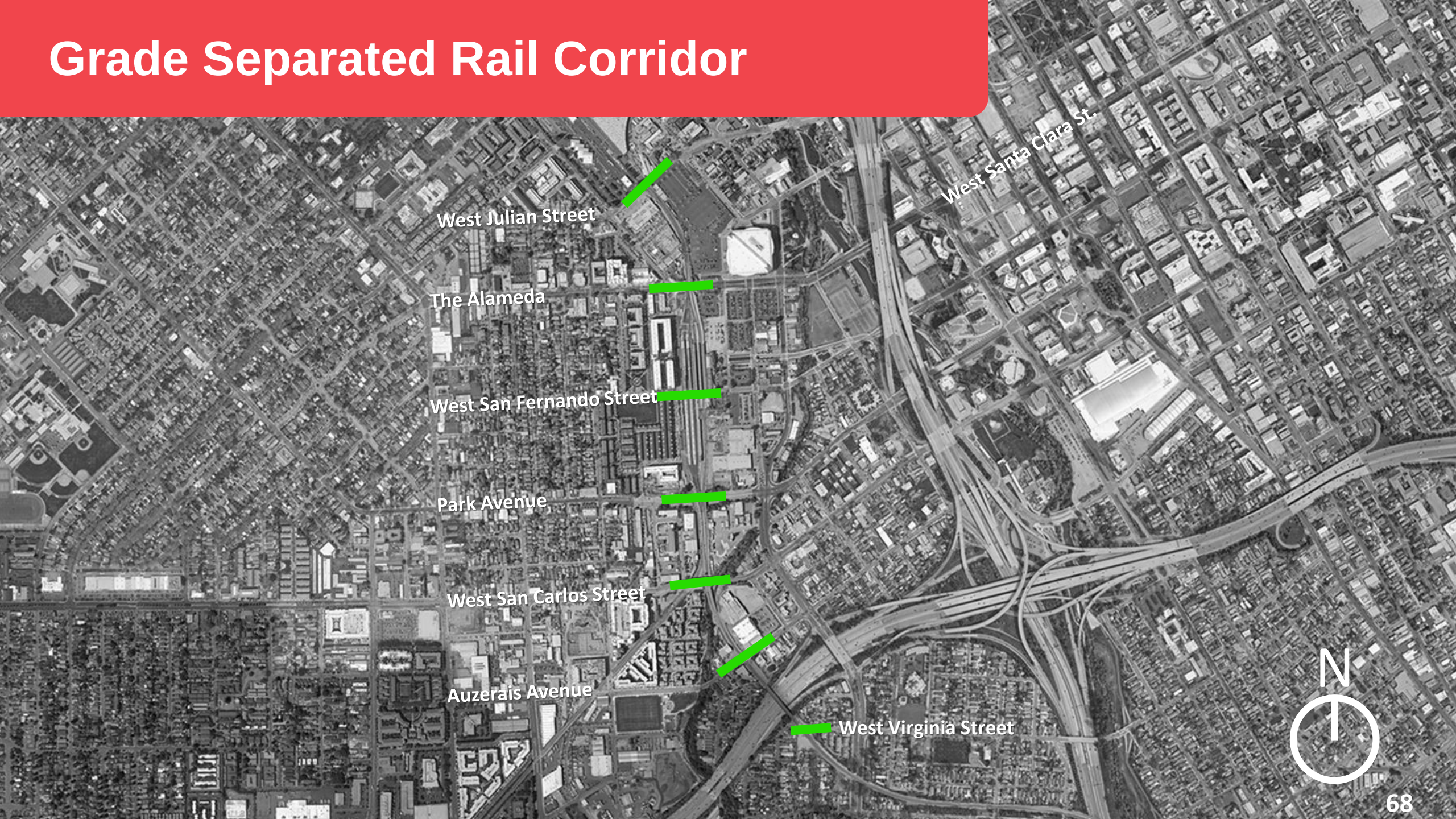
3. INVESTIGATE AND DEVELOP THE EXISTING CORRIDOR

Grade Separated Rail Corridor

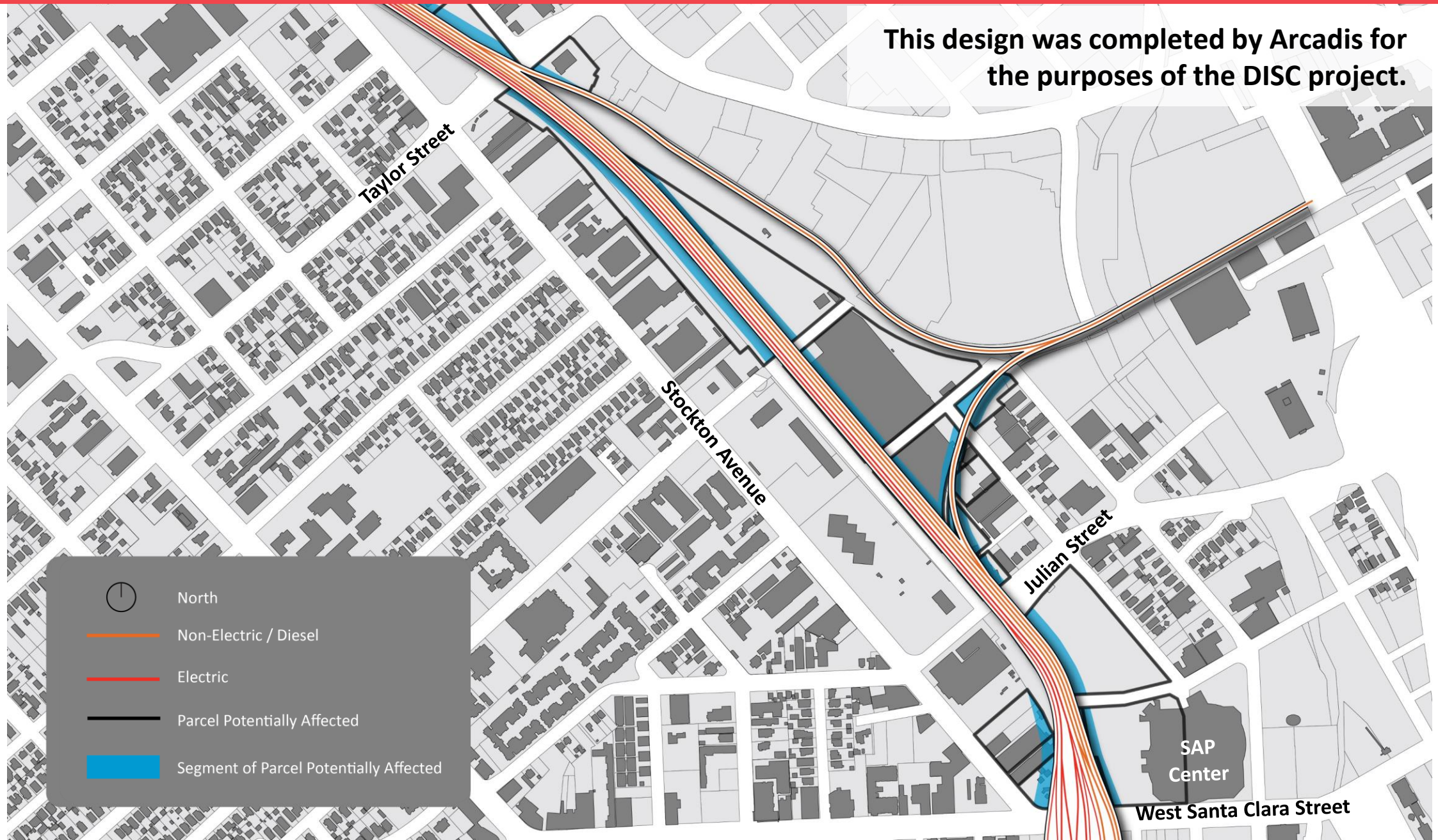


CONSIDERATIONS FOR THE EXISTING CORRIDOR

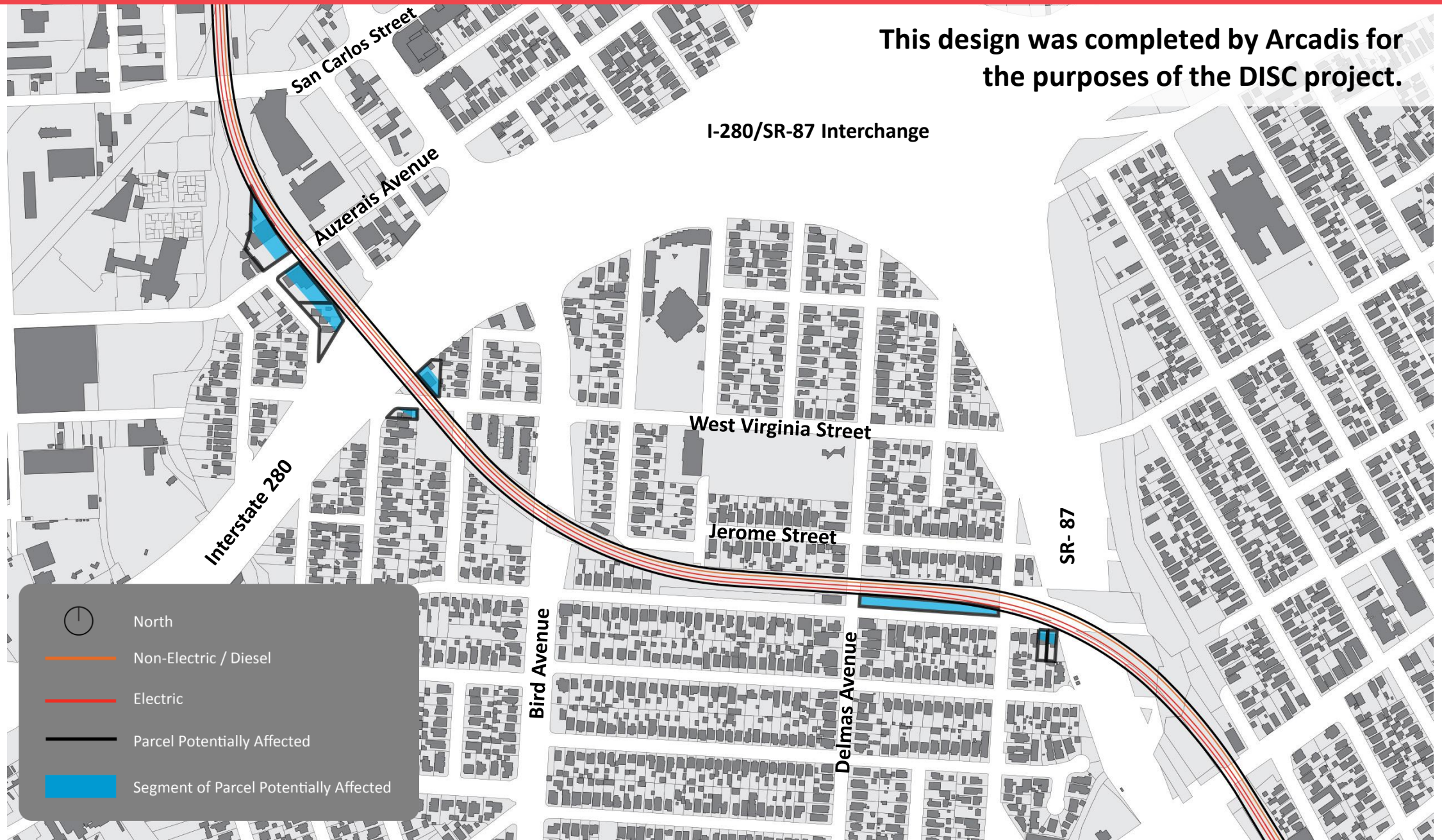
- Property and potential development impacts
- Fuller Park

PROPERTY AND POTENTIAL DEVELOPMENT IMPACTS

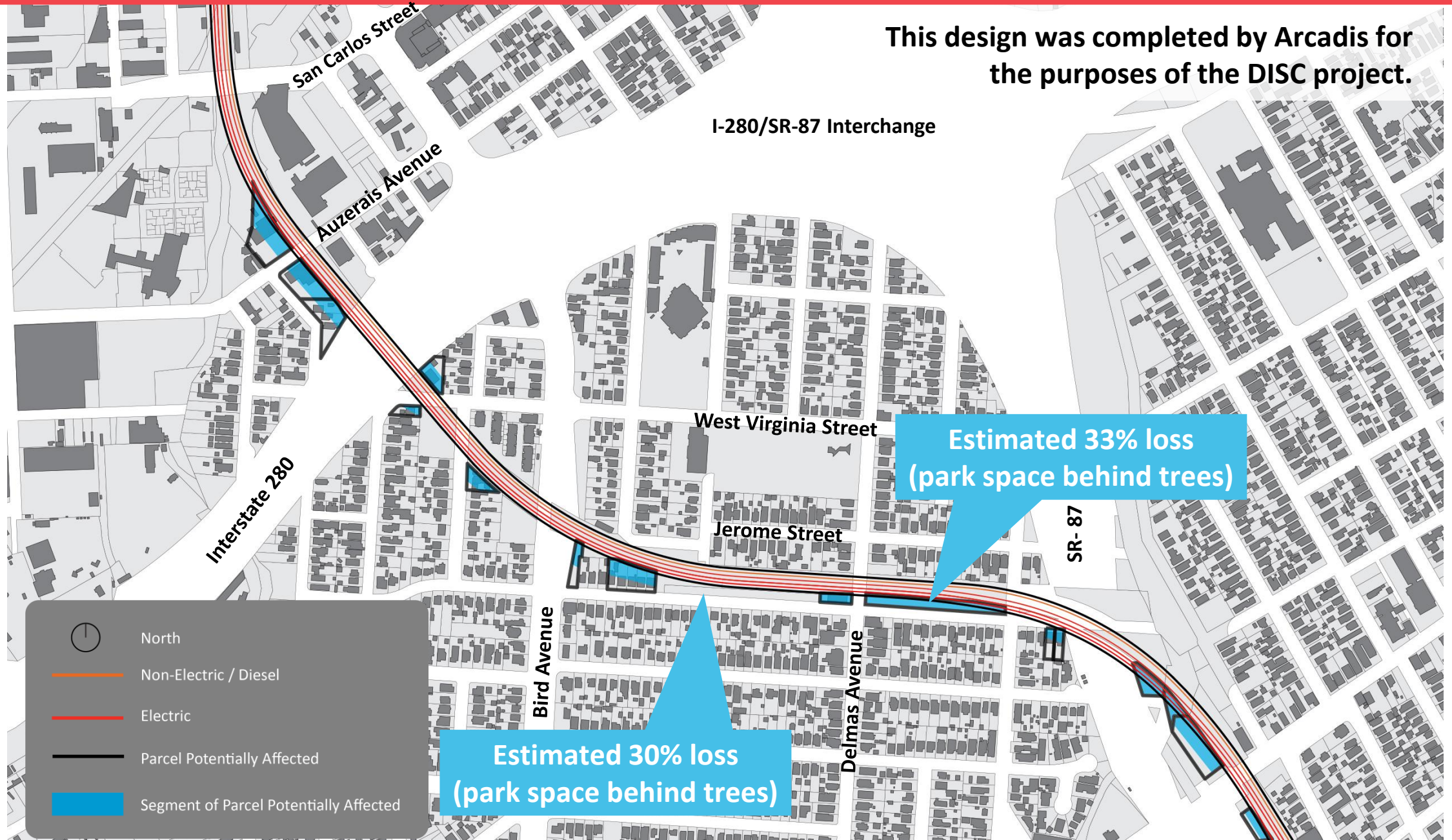
Existing Corridor - Potential Property and Development Impacts, North



Existing Rail Corridor South: Three Tracks



Existing Rail Corridor South: Four Tracks



Summary of Property and Potential Development Impacts: Existing Corridor

Differential Potential Property Impacts of the Existing Corridor Lie Within the Gardner/North Willow Glen Neighborhoods

Preliminary Review of Properties That May Be Affected by a Four-Track Corridor:

- Estimated up to 13 Residential Properties
  - Primary residences may not be impacted - rather, property impacts may be limited to portions of backyards, perhaps driveways, secondary structures, etc.
- Reduction in the Size of Fuller Park by Approximately 30 to 33 Percent
  - Likely behind the current tree line rather than the widely used portion of the park
- Potential Significant Impact to the San José Word of Faith Church
- Up to Two Parcels with Commercial Uses - Main Structures May Not Be Impacted

FULLER PARK

Fuller Park Today

Fuller Park Idea #1

Preliminary Artist Illustration

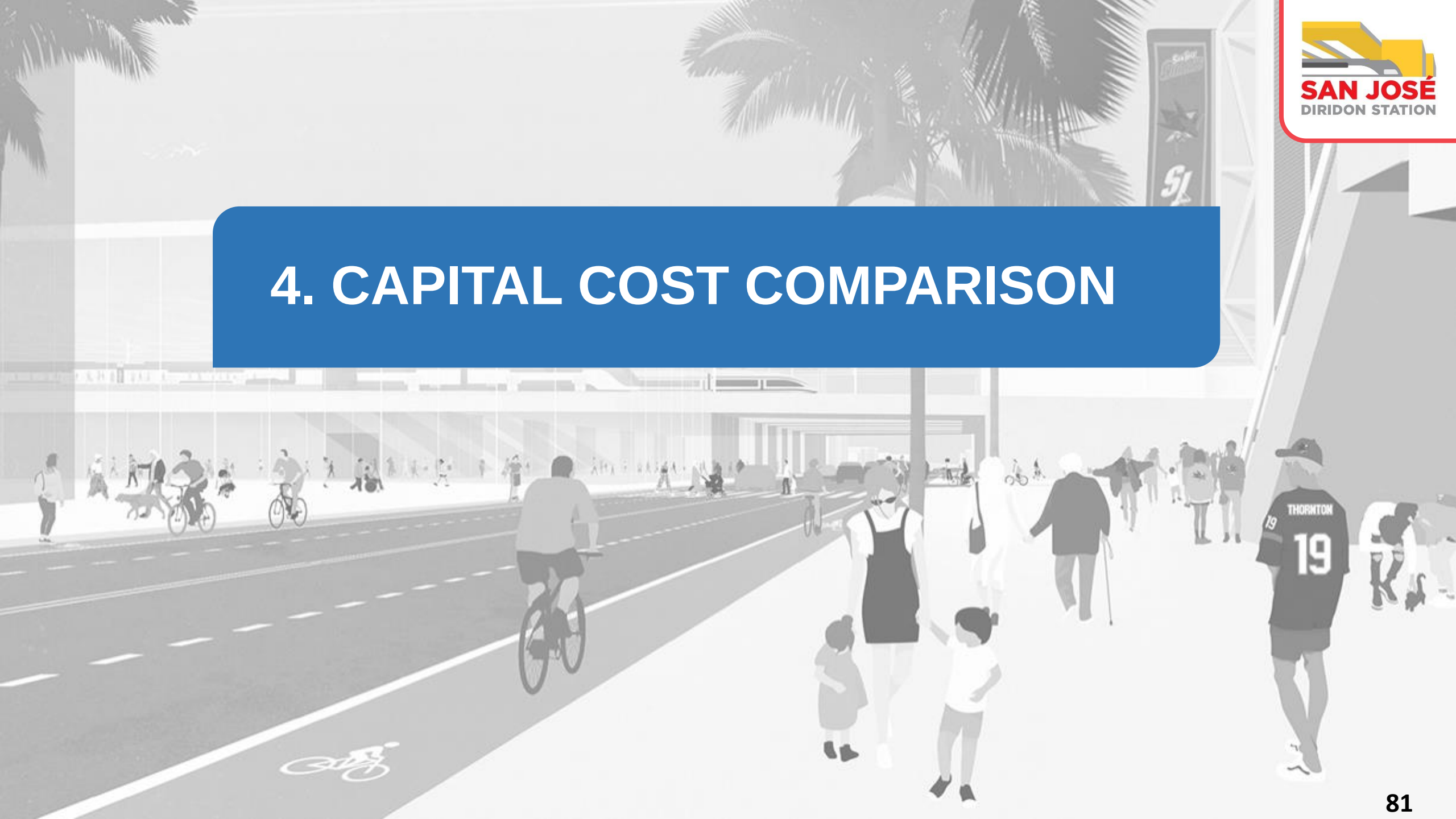
Fuller Park Idea #2

Preliminary Artist Illustration

Fuller Park Idea #3

Preliminary Artist Illustration

Fuller Park: A Community Design



4. CAPITAL COST COMPARISON

Capital Cost Comparison

The Initial Cost Estimates Are Order of Magnitude Comparison to Understand the Relative Differences Between the Two Alignments

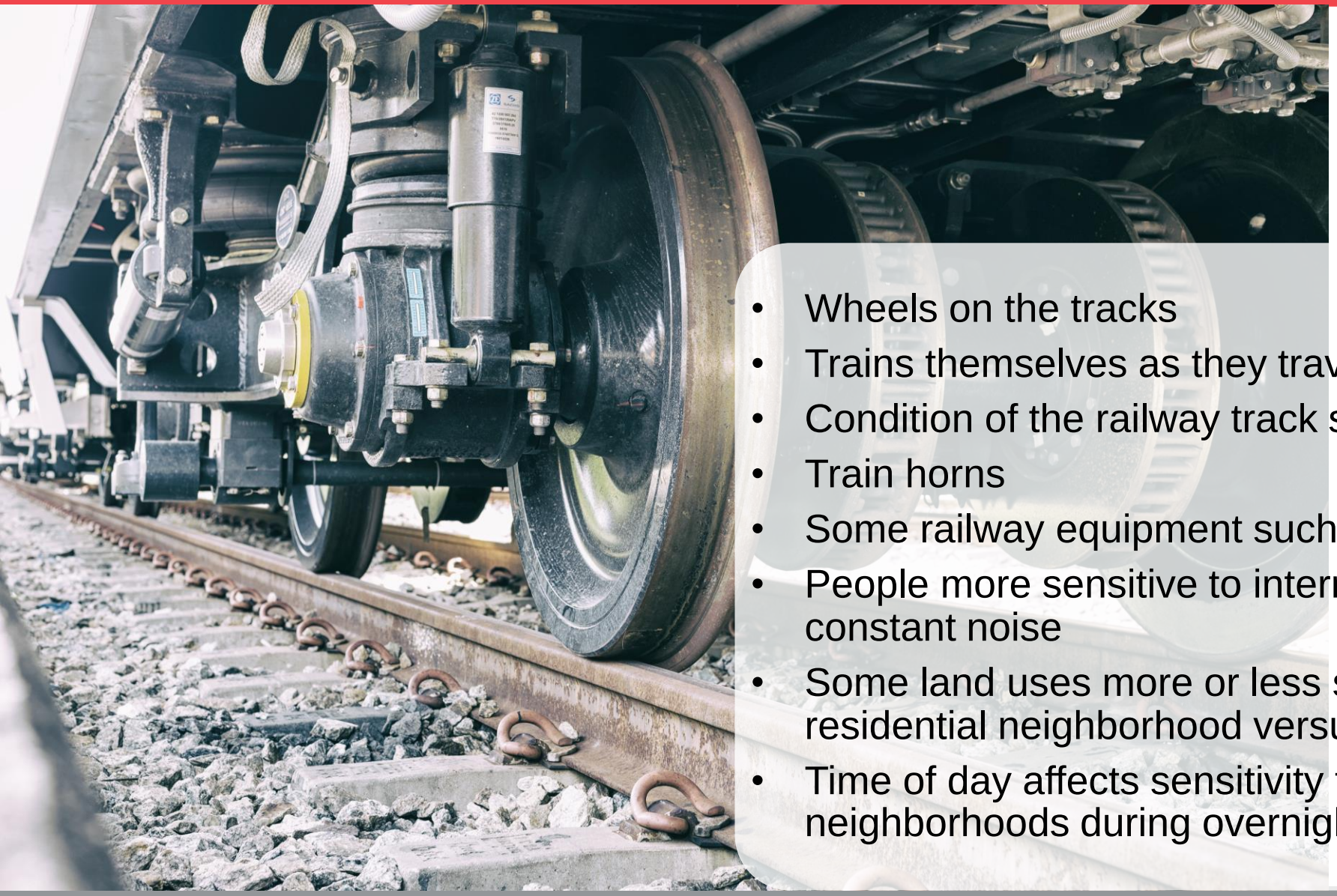
- Include costs associated with the station (station building, tracks, concourses, underpasses, bus facilities, and light rail facilities)
  - Viaduct alignment estimate includes raising tracks and platforms at Tamien Station
  - Do not include the relocation of CEMOF and the PG&E Substation

- **Estimated Cost of Rebuilding Diridon Station with a Four-Track Alignment Utilizing the Existing Corridor Is In the Billions of Dollars**

- **I-280 Viaduct Alignment Would Cost Roughly Double this Amount**

5. NOISE AND VIBRATION OVERVIEW

What Makes Noise On A Rail Project?

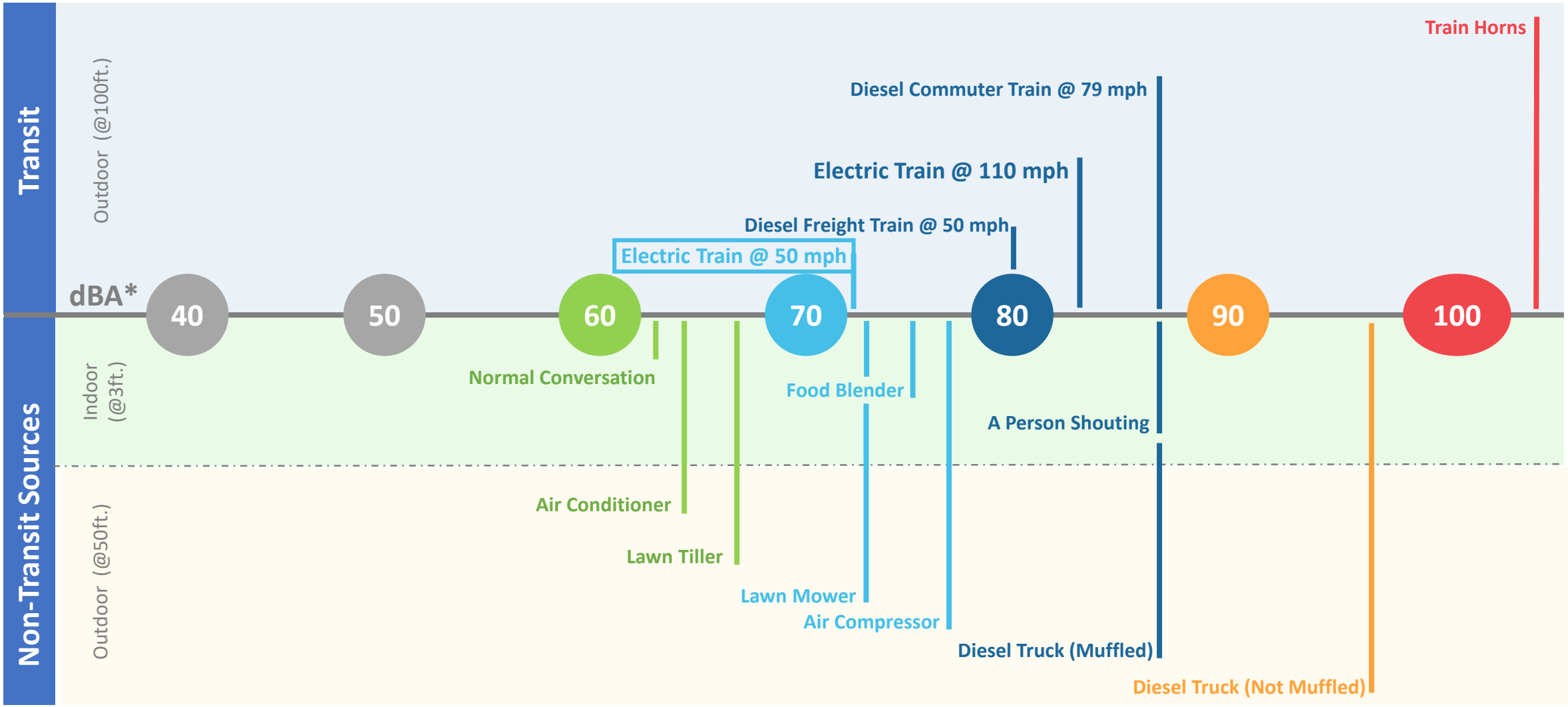


- Wheels on the tracks
- Trains themselves as they travel at different speeds
- Condition of the railway track structure
- Train horns
- Some railway equipment such as at-grade crossing bells
- People more sensitive to intermittent noise than background, constant noise
- Some land uses more or less sensitive to noise (e.g. residential neighborhood versus commercial office building)
- Time of day affects sensitivity to noise (e.g. residential neighborhoods during overnight hours)

What Makes Vibration On A Rail Project?

- Generated by the weight and type of train as it travels across the tracks
- Informed by ground soil conditions, which are very important to how vibration transmits through the ground

How Does the Sound of An Electric Train Compare?



*A-weighted decibels (dBA) are an expression of the relative loudness of sounds in air as perceived by the human ear

How Is Noise and Vibration Assessed for a Rail Project?

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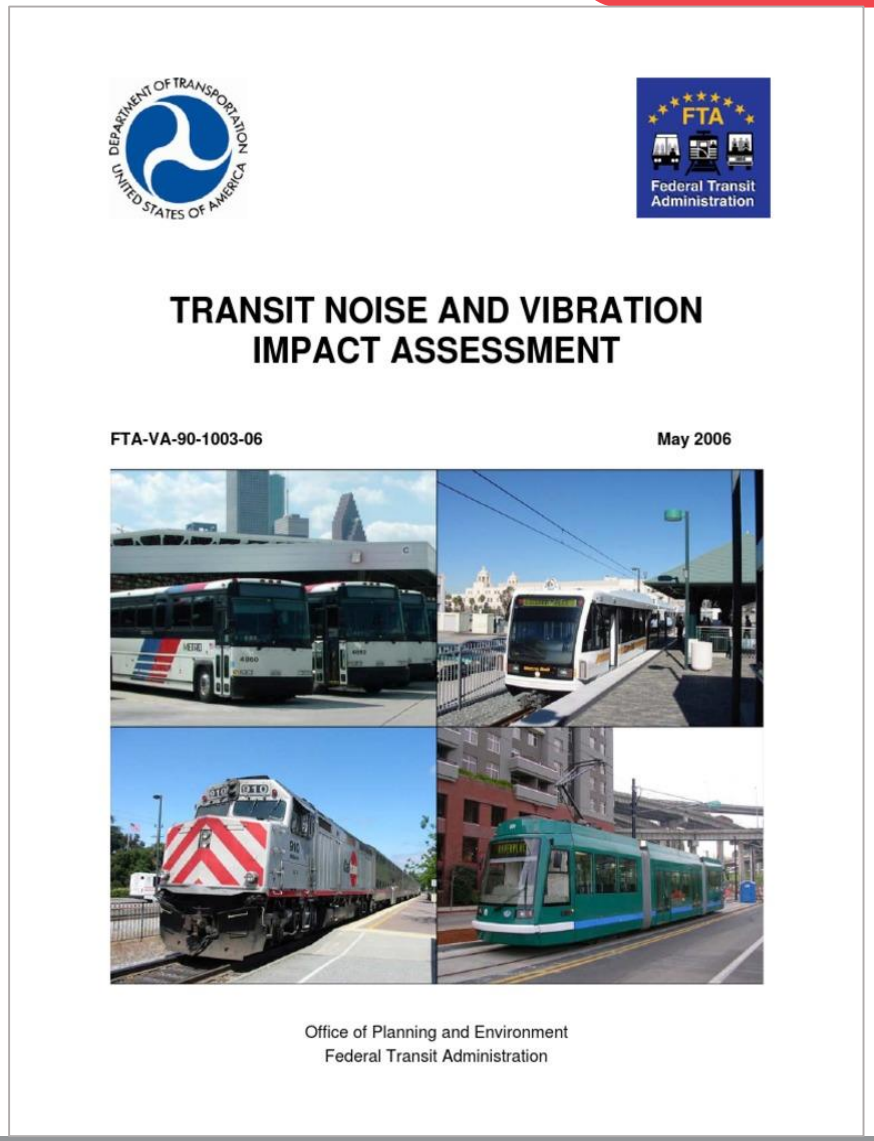
During the Environmental Review Process After:

- A project sponsor is identified
- A project definition is complete
- Funding to prepare the environmental analysis and preliminary engineering

Guidance/Criteria for Both NEPA and CEQA to Conduct the Assessment:

- Federal Transit Administration *Transit Noise and Vibration Impact Assessment*
- Federal Railroad Administration *High-speed ground transportation noise and vibration impact assessment manual*
- CEQA guidelines

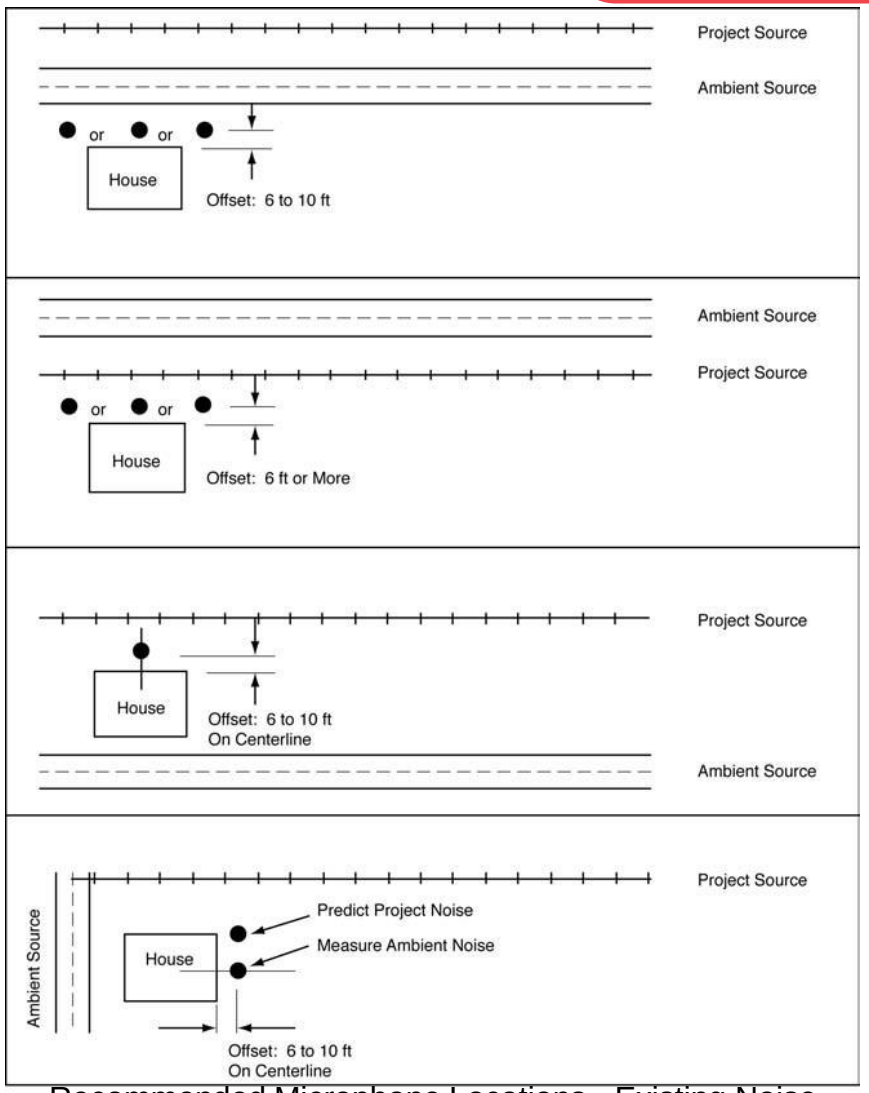


How Is Noise and Vibration Assessed for a Rail Project?

Assessments Typically Include:

- Ambient Noise Setting that the Project Will Travel Through:
  - Determines the existing noise or vibration conditions
  - Done by conducting field measurements

- After Field Measurements, Calculate the Forecasted New Noise or Vibration Impacts:
  - Using FTA, FRA, and State guidelines
  - Determining the severity of impact: low, moderate, or severe



Recommended Microphone Locations - Existing Noise Measurements

Project Features And Mitigation Measures

Project Feature - A design element or component that is solidified as part of the fundamental design of a project. This becomes part of the project's official description that is subject to environmental review.

Mitigation Measure - Defined by California Environmental Quality Act (CEQA) and National Environmental Policy Act (NEPA) as an action to be taken to reduce or avoid a significant impact resulting from a proposed project. Mitigation cannot be proposed or required where there is no impact or less than significant impact.

While there is a regulatory environment that guides project assessments to evaluate potential environmental impacts, communities/cities can decide to pursue additional measures – often called betterments – beyond what is required by legal guidance.

What Abates Noise?

Sound Mitigation Measures Could Include:

- Installation of barriers, walls, or berms
- Adjustment to or elimination of honking horns typically via grade separation or creation of FRA-approved quiet zone
- Improvements to the track itself to eliminate the “click-clack” caused by joints between sticks of rail
- Insulation of homes or sensitive receptors
- Quieter vehicles such as electric trains

What Abates Vibration?

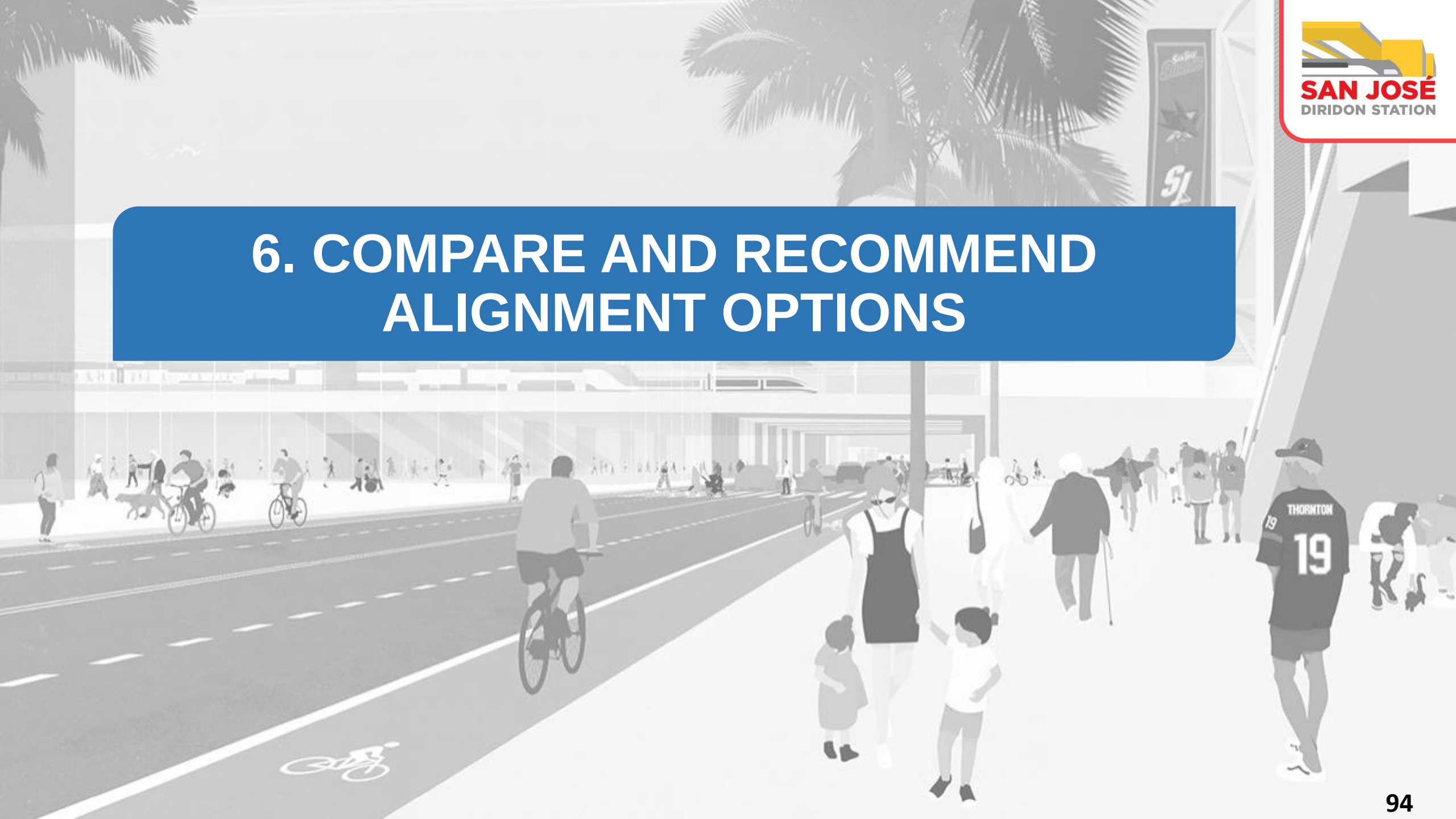
Vibration Mitigation Measures Could Include:

- Constructing modern railway structure strengthening railbed that trains travel over to reduce ground-borne vibration
- Installing vibration absorption materials into track structure or in the ground

Findings and Related Projects

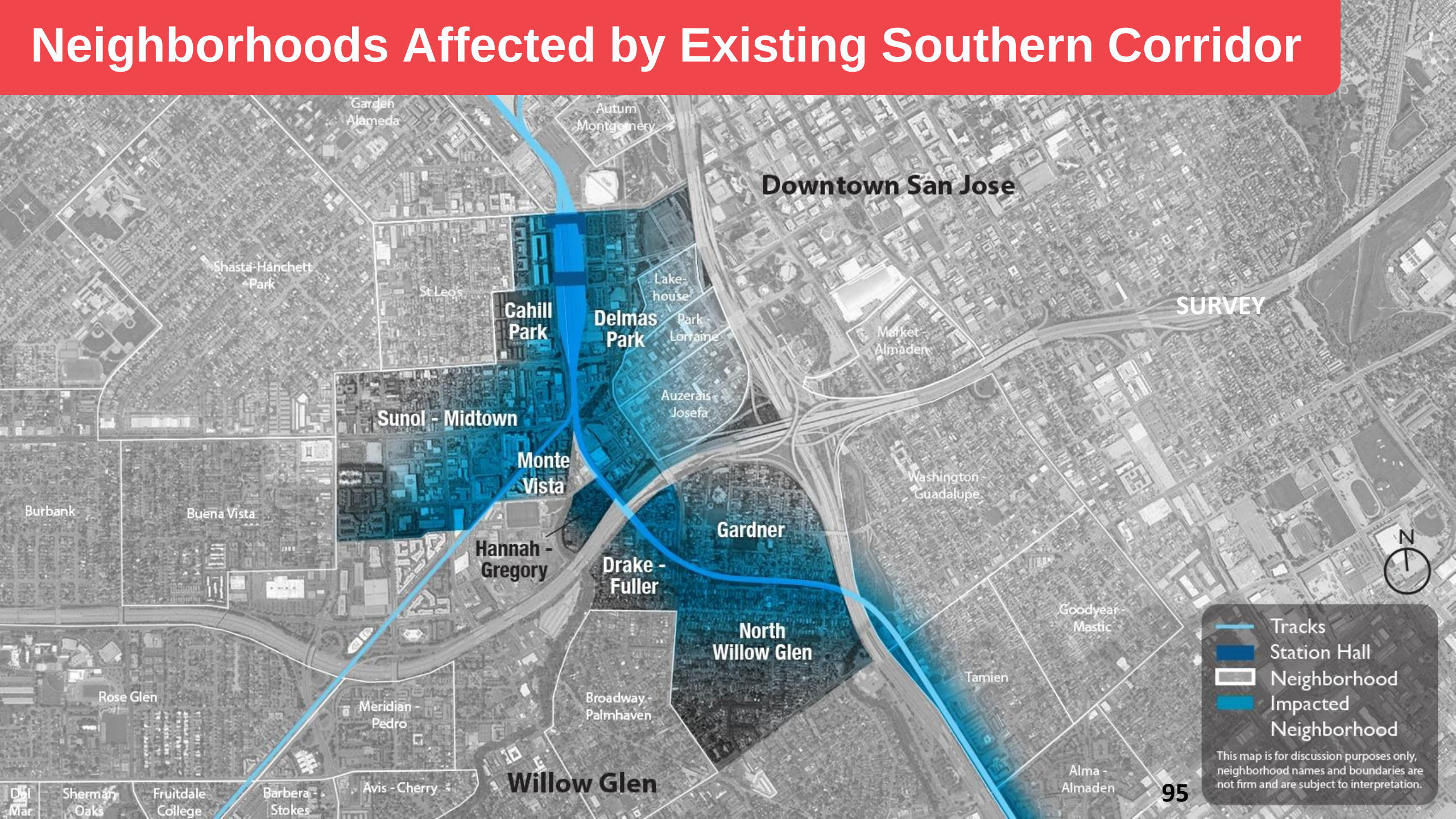
- **Caltrain EIR (2014)**
  - Electric trains relatively quiet at speeds anticipated in corridor (approx. 55mph)
  - Generally much quieter than diesel trains
  - As more trains travel through the corridor it is likely that horn noise at non-grade-separated crossings would be the most significant source of future train noise in this corridor
- **CHSRA Draft EIR (Exp'2020)**

Example: Salt Lake City, Utah

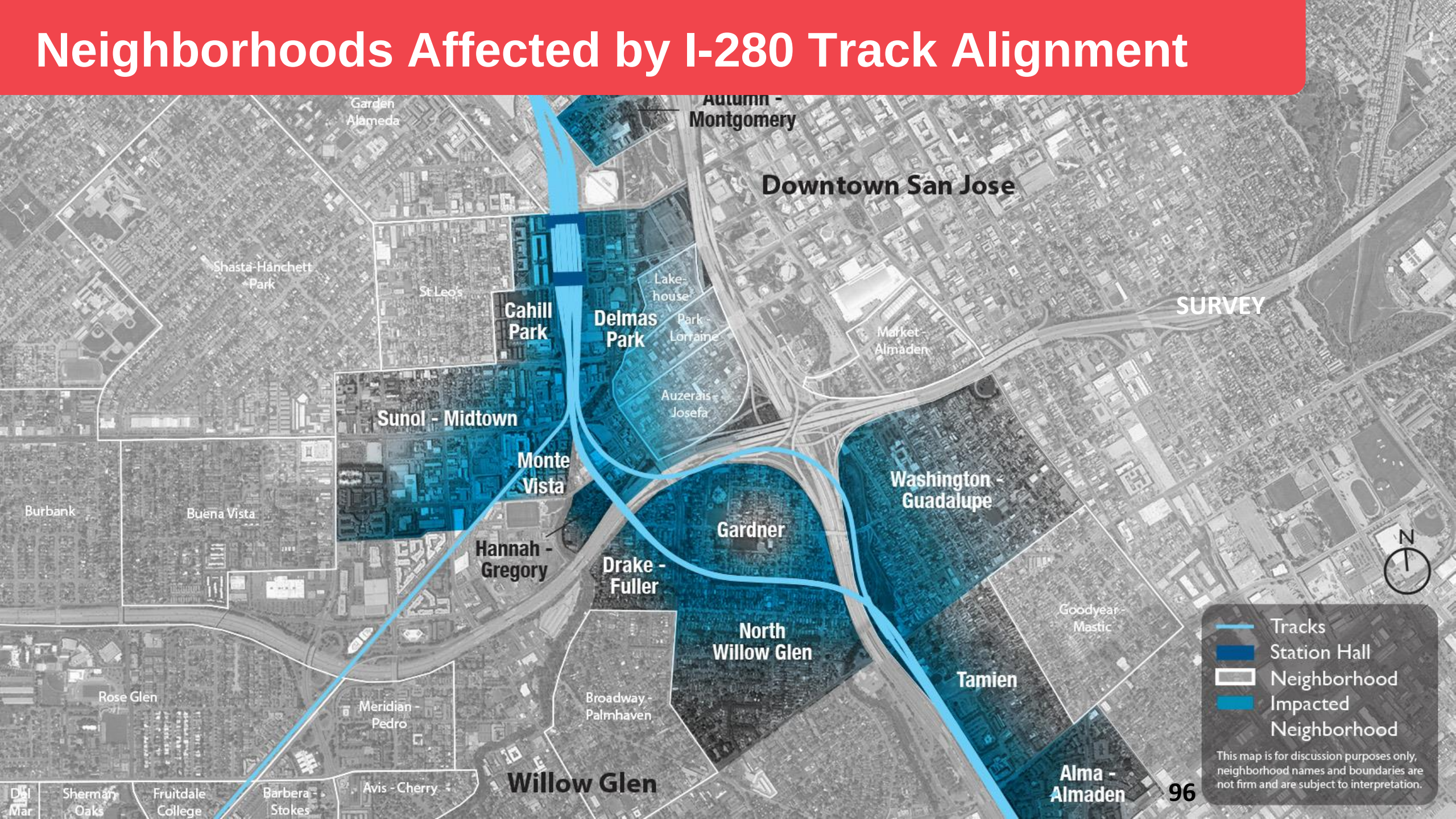


6. COMPARE AND RECOMMEND ALIGNMENT OPTIONS

Neighborhoods Affected by Existing Southern Corridor



Neighborhoods Affected by I-280 Track Alignment



Summary of Benefits and Trade-Offs
Existing Rail Alignment Vs. the Addition of the I-280 Rail Viaduct

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Points of Comparison	Elevated Station/Existing Rail Alignment in 2040	Elevated Station/Existing Rail Alignment Plus I-280 Rail Viaduct Addition in 2040
Train Volumes	Overall Increase	Overall Increase
Neighborhoods Affected	Same as Today	Same as Today Plus Additional Neighborhoods
Infrastructure Footprint	Modest Increase	Significantly More
Noise and Vibration	Modest Increase	May Affect Larger Geography/Population
Visual	Modest	Significant Change to Visual Landscape
Environmental	Some	Significantly More (Incl. Guadalupe River)
Maintenance	Modest	High
Flyover Required	No	Yes
Cost	Base Cost Option*	~2X Base Cost*
Property	Low to Moderate	Medium to High

*Options with Elevated Station

Partner Agencies Recommendations and Follow Up

- Recommend Utilizing Existing Rail Corridor
- Continue Work on Southern Track Approach in Close Consultation with Neighboring Communities, including:
  - Grade separations
  - Sound and vibration dampening treatments
  - Aesthetic and functional treatments
  - Optimize design to minimize need to demolish existing buildings and/or acquire land
  - Community-based design and planning process for Fuller Park

Next Steps

- Decision Scheduled for the February 4, 2020 City Council Meeting
- Decisions by Boards of Other Partner Agencies Scheduled As Follows:
  - Caltrain Board of Directors, February 6, 2020
  - VTA Board of Directors, February 6, 2020
  - CHSRA Board of Directors, February 18, 2020

Upcoming Work Plan

Advance Additional Planning and Conceptual Design Work Over the Next Year, Including:

- **Continue** planning of the multimodal hub
- **Advance** conceptual design of track alignment and rail operations including the tangible improvements for the existing corridor
- **Study** the best options to organize and govern the future station
- **Build** a viable financial plan
- **Develop** a roadmap for implementation including environmental clearance strategy
- Ongoing community and stakeholder **engagement**


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COMMENTS AND QUESTIONS?
For more information, visit: www.diridonsj.org/disc
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