



# California High-Speed Train System



- Provide a new mode of high-speed intercity travel to link major metropolitan areas
- Forecasted to carry as many as 100 million passengers annually by the year 2035
- 800-mile system with stations built to allow for express service
- Service linking the San Francisco Bay Area, Central Valley and Southern California
- 100% clean electric power
- Estimated travel time from San Francisco to Los Angeles: less than 2 hours 40 minutes



# What are High-Speed Trains?

- **Intercity passenger trains** operating at speeds up to 220 miles per hour
- **Tracks separated** from roads and highways
- **Proven Technology**
  - Safe and Reliable
  - Successfully operating throughout Europe and Asia



California High-Speed Train Concept

## *Other High-Speed Trains Around the World*



Shinkansen, Japan



TGV, France



Intercity Express, Germany





# Regional Contacts





# Purpose and Objectives of the Statewide HST System



## Purpose

- Link Southern California cities, the Central Valley, Sacramento and the Bay Area
- Provide new transportation option that increases mobility throughout California
- Provide reliable HST service that delivers predictable and consistent travel times using electric powered steel wheel trains
- Provide a transportation system that is commercially viable



## San Jose to Merced Section

To provide reliable high-speed electric powered train service from San Jose to Merced through the Pacheco Pass that delivers predictable and consistent travel times. The San Jose to Merced section will connect to the San Francisco to San Jose section to the north and the Central Valley section in the east. The system will:

- Provide access to a new transportation mode
- Connect to and be part of the statewide system
- Contribute to increased mobility throughout California





# Design Objectives and Evaluation Criteria

<b>Objective</b>	<b>Criteria</b>
Maximize ridership & revenue potential  Maximize accessibility  Minimize operating and capital costs	Minimize travel time  Intermodal connections  Minimize route length

## Evaluation Measures

- Minimize disruption to neighborhoods and communities
- Minimize impacts to environmental resources
- Minimize impacts to natural resources
- Land use
- Construction feasibility



# Environmental Review Process

The Environmental Review Process and planning activities associated with the California Environmental Quality Act (CEQA) and the National Environmental Policy Act (NEPA) will:



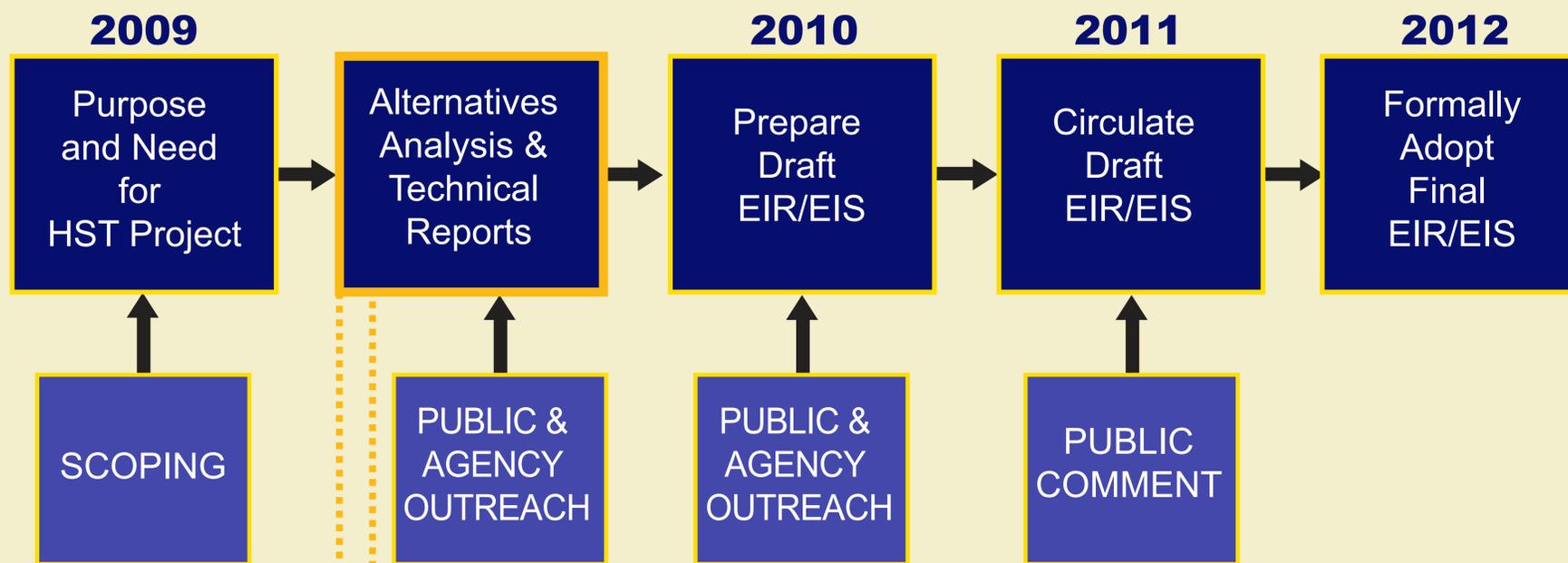
- **Identify** all environmental impacts
- **Evaluate** reasonable alternatives that could avoid or minimize environmental impacts
- **Develop** detailed mitigation (ways to reduce or avoid environmental impacts)
- **Provide** information for public review and comment
- **Disclose** to decision makers the impacts, mitigation, and public comments



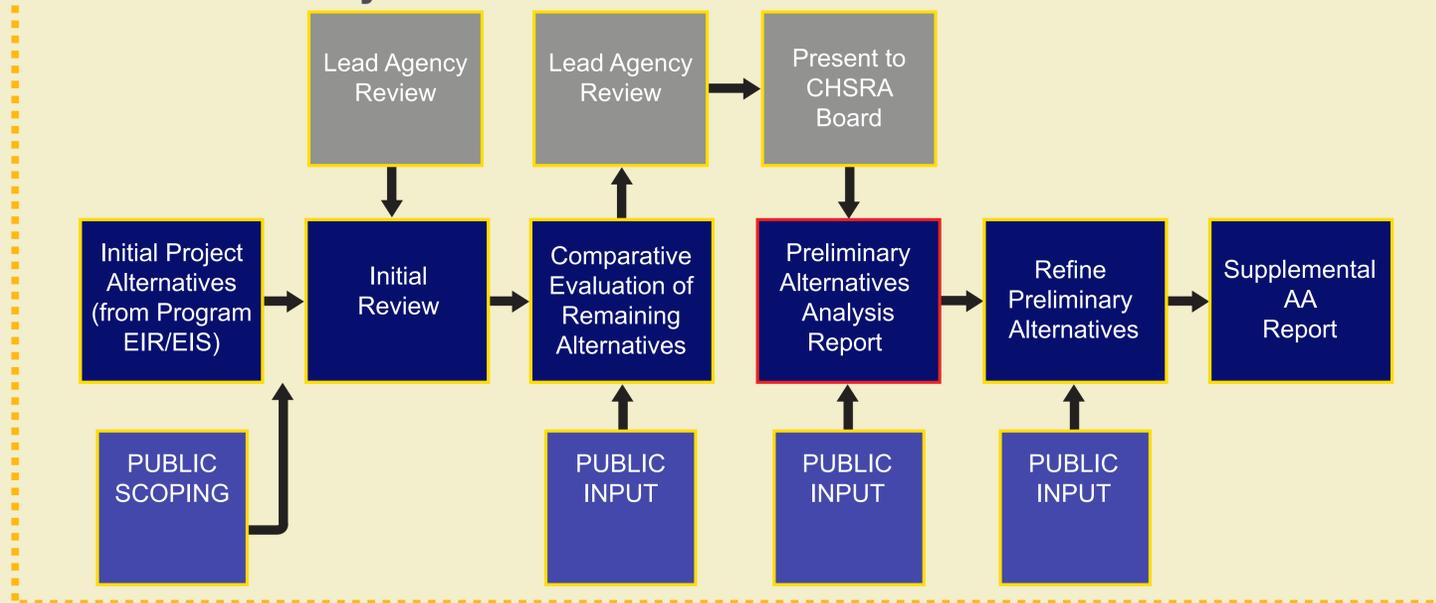


# Project Environmental Review Schedule and Alternatives Analysis Process

## Environmental Review Schedule



## Alternatives Analysis Process

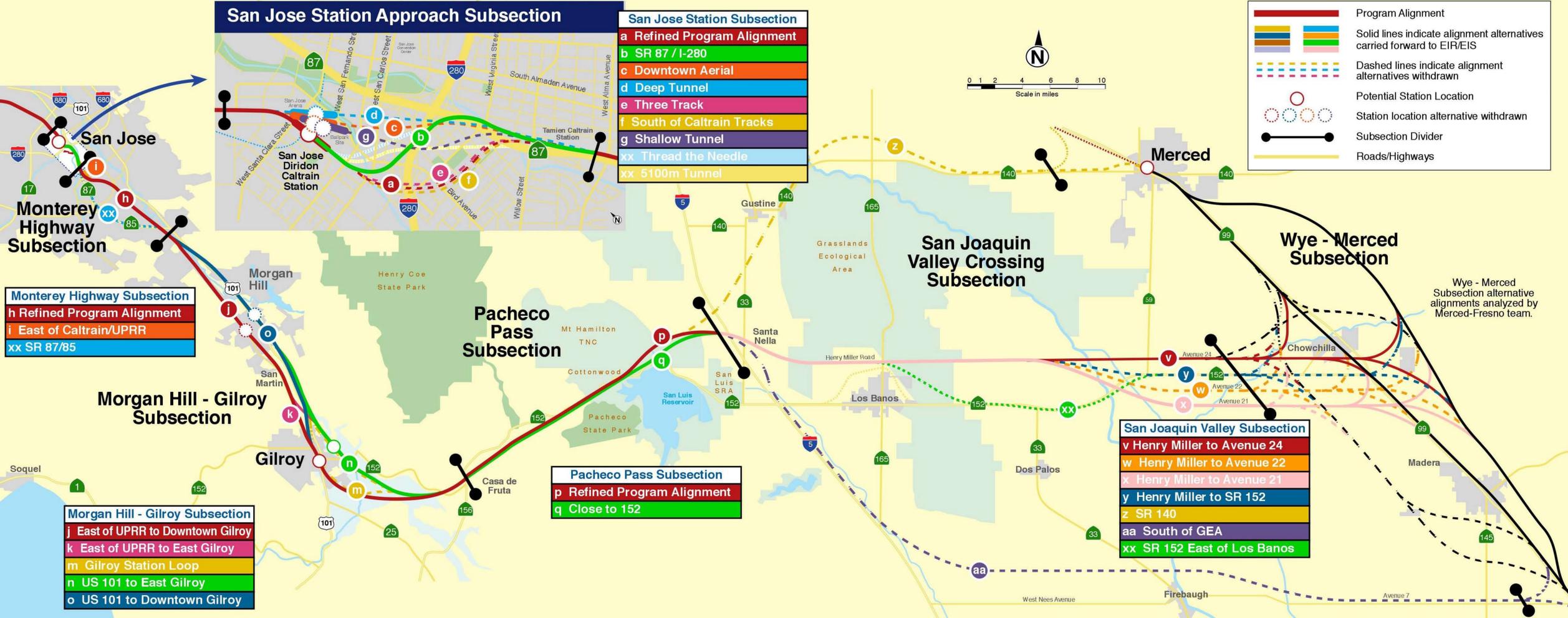


Ongoing Community & Agency Meetings, Interviews, Communications





# San Jose to Merced Section Range of Alternatives Considered



Planned Stations
San Jose
Gilroy
Merced

ESTIMATED TRAVEL TIMES
• SAN FRANCISCO TO SAN JOSE: <b>30 MINS</b>
• SAN JOSE TO GILROY: <b>15 MINS</b>
• GILROY TO MERCED: <b>33 MINS</b>
• SAN FRANCISCO TO MERCED: <b>1 HR 14 MINS</b>





# Alternatives Analysis Evaluation Measures

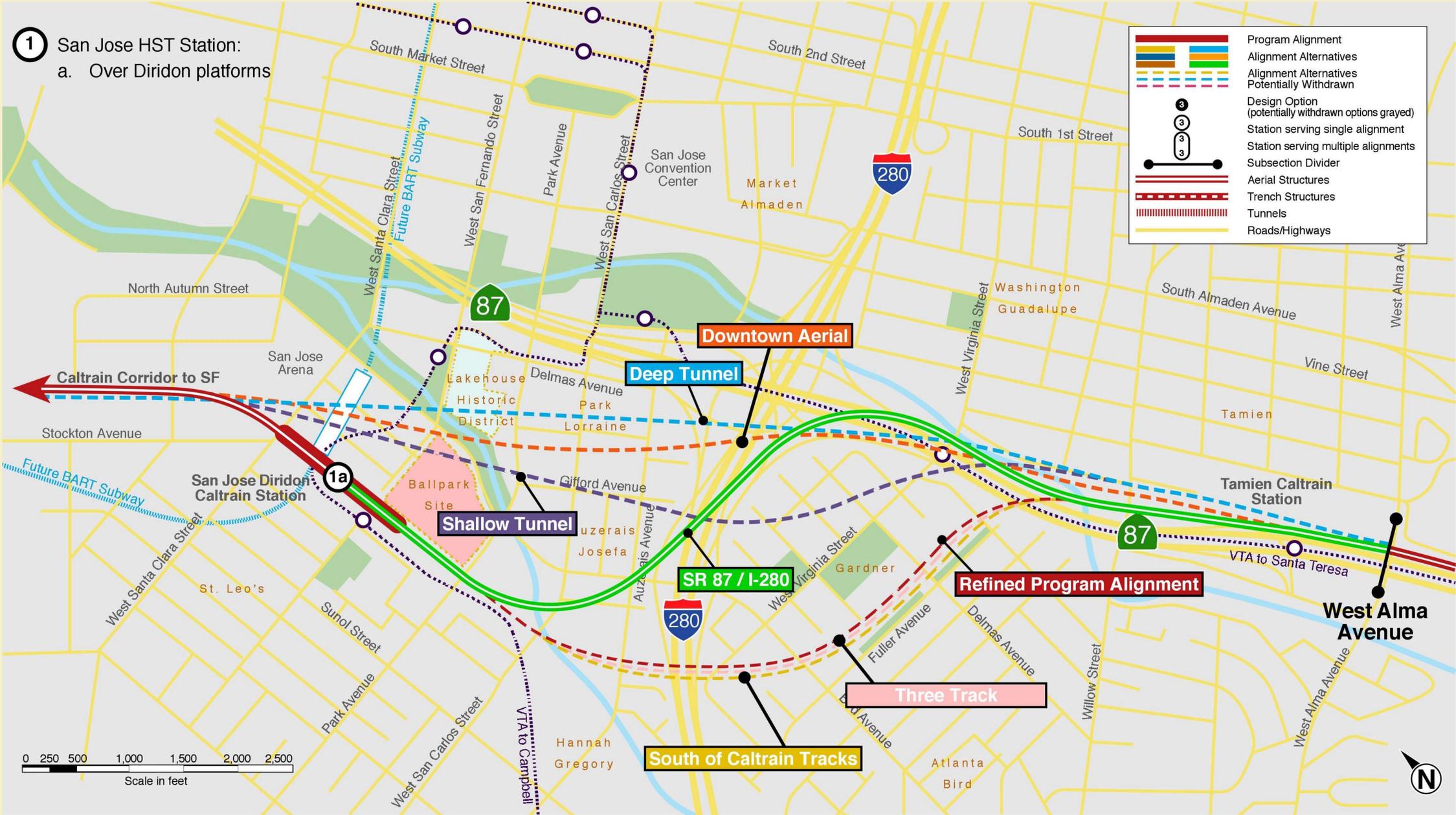
<b>Category</b>	<b>Measures</b>
<b>Design objectives</b>	Travel time, cost
<b>Land use</b>	Consistency with land use and general plans
<b>Constructability</b>	Track type construction and access to the corridor
<b>Community impacts</b>	Amount of land acquisition
<b>Natural resources</b>	Impacts to wetlands, potential threatened and endangered species habitat, important farmlands
<b>Environmental quality</b>	Number of sensitive noise receptors
<b>Additional considerations</b>	Ability to meet project purpose and support by public and agencies





# San Jose Station Approach Subsection

1 San Jose HST Station:  
a. Over Diridon platforms



**SR 87/1-280**

- Suggested by City of San Jose
- Minimizes impacts by utilizing existing freeway corridors
- Moves HST line away from the Gardner neighborhood and avoids impacts to the community

**Three Tracks**

- Unacceptable operating constraints for Caltrain (requires reduction from two Caltrain/UPRR tracks to one)

**Downtown Aerial**

- Numerous property takes
- Impacts the City of San Jose's planned development in the area
- Visual impacts

**Deep Tunnel**

- Construction complexity and risks, including: construction in poor soils at a depth of 140' with the chance of potential settlement; ground water issues; soil improvements required from the surface; no existing HST mined station in world; and would require 7-16 years to build.
- National Register archaeological site
- Would require reconstruction of Tamien Station and the SR 87 northbound ramp
- Costs 7 times the base case

**Refined Program Alignment**

- Impacts to Greater Gardner neighborhood (noise, vibration, visual, community cohesion)
- Impacts on Fuller Park and displacement of a nonprofit (house of worship)

**South of Caltrain Tracks**

- Numerous property takes greater than Refined Program Alignment
- Impacts to Fuller Park

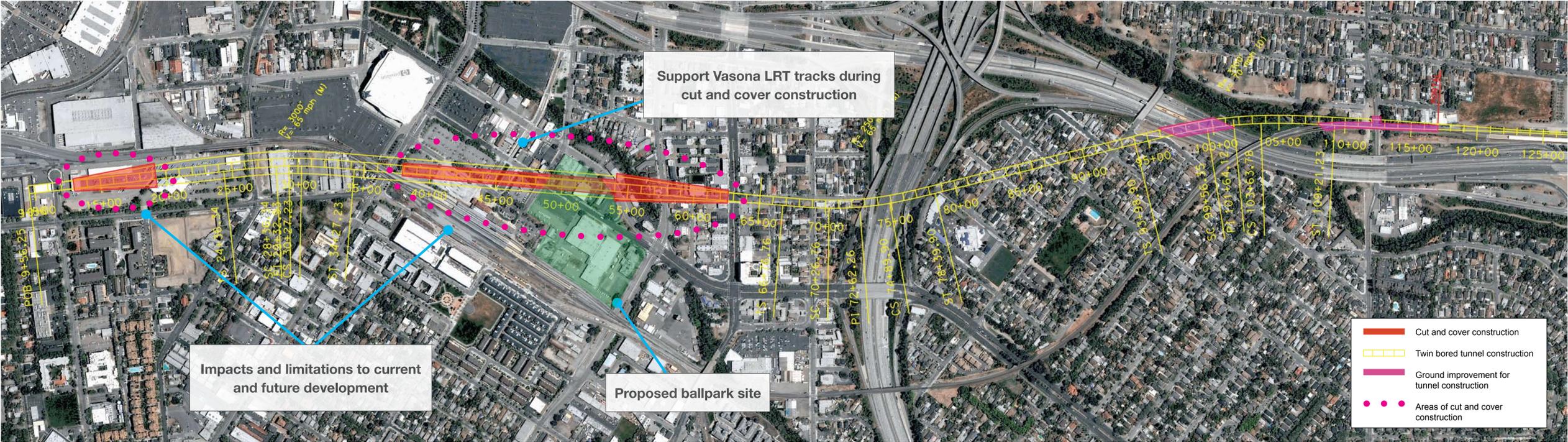
**Shallow Tunnel**

- Requires the redesign and lowering of the planned BART station/tunnels 140' underground in poor soils with groundwater issues
- Impacts to new residential development
- Need to support future development over HST
- Impacts to Los Gatos Creek
- National Register archaeological site
- Would require reconstruction of Tamien Station and the SR 87 northbound ramp
- Costs 5 times the base case (plus additional BART costs and development support costs)





# San Jose Shallow Tunnel Alignment



DRAFT – subject to change

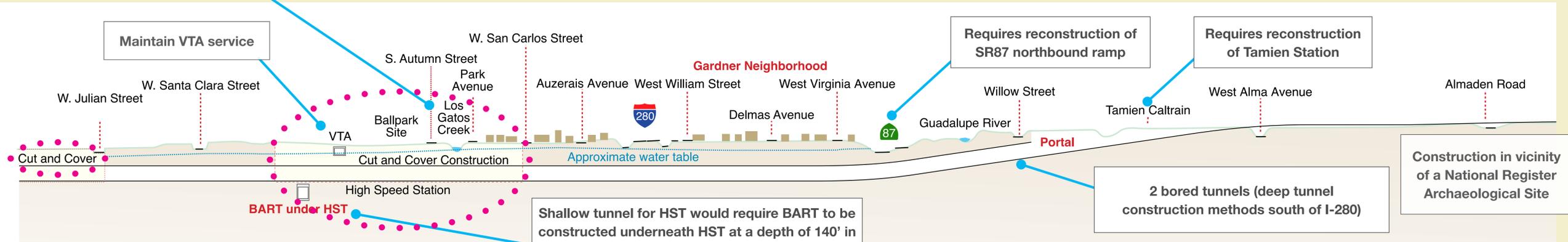
### SURFACE IMPACTS

- Open cut at station and track transitions, ventilation structures and access shafts, ground stabilization, traffic/bus/emergency vehicle detours, additional right-of-way and construction noise and vibration

### IMPACTS TO DEVELOPMENT

- Requires construction of a 5-foot deep concrete slab supported by piles spanning HST facilities for protection of HST (cost approximately \$85 million to \$100 million)

Los Gatos Creek flows must be maintained during cut and cover construction



DRAFT PROFILE VIEW – subject to change





# Shallow Tunnel / Station Impacts Overview

## IMPACTS TO BART

- The currently proposed San Jose BART station would be constructed using cut and cover methods at a depth of approximately 60' deep
- A shallow HST tunnel/station would necessitate the lowering of the BART station to a depth of 140' underground (effectively requiring BART to address similar challenges identified with a deep HST tunnel/station)
  - A deep BART station would be mined in an area with poor soils and the presence of a high groundwater table
  - Deeper BART tunnels would result in steeper tunnel grades for the trains



L.A. Metro (Wilshire to Vermont)

## CONSTRUCTION IMPACTS

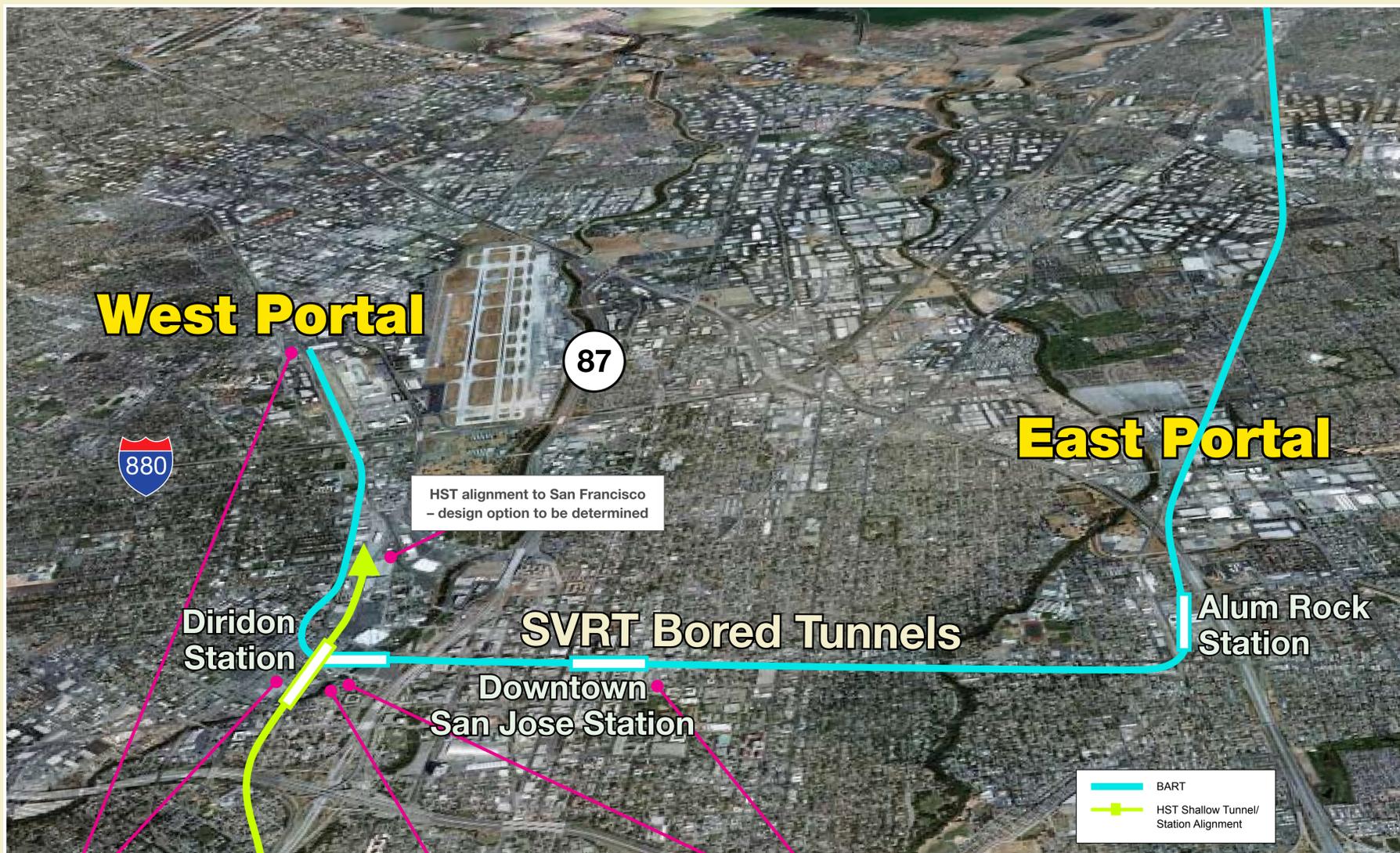
- Site preparations, including soil stabilization, utility relocations, dewatering, and muck removal would occur at all portal locations, access points, and where needed for safety
- Construction in a National Register archaeological site
- Los Gatos Creek flows need to be maintained during construction
- Disruption to VTA Vasona light rail line
- Requires reconstruction of both the SR 87 northbound on-ramp and Tamien Station
- Extensive right-of-way required for construction and staging, including possible relocation of large numbers of businesses and residents
- Ground movement, settlement and vibration
- Minimum 7 years to construct, eliminating development options during construction
- Extensive cost (5 times the base case, plus BART tunnel/station lowering costs and construction of a concrete slab above HST facilities for development)





# Implications of a Deep BART Tunnel / Station Underneath HST

A shallow HST tunnel alignment would require BART to construct its station and tunnels below the HST shallow tunnel/station at Diridon Station. It is anticipated that a deep BART tunnel and station would face some of the same challenges and risks identified with the downtown deep tunnel alignment for HST, and would likely have higher construction costs and longer construction schedules.



DRAFT - subject to change

BART would experience the same construction impacts and challenges identified for the deep HST station and tunnels, including:

- Excavation of station and tunnels in an area with poor soil and a high water table
- Soil stabilization
- Ground improvements
- Extensive right-of-way
- Vibration
- Ground movement and settlement
- Limited future development in some areas above the tunnel and station

Large vertical grade difference between Diridon Station and BART West Portal

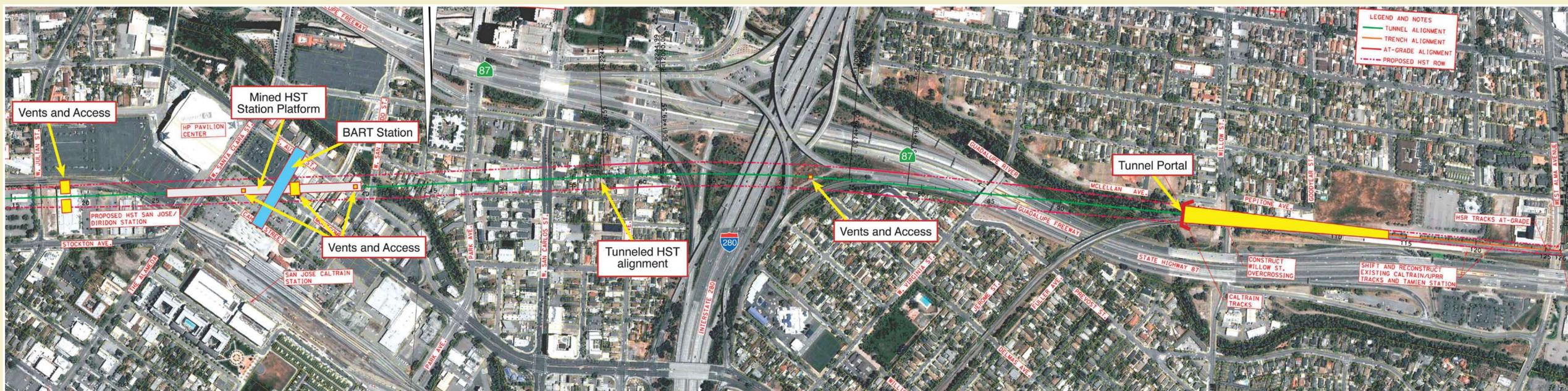
BART would be built underneath HST shallow station, approximately 140-160 ft. below ground

Large vertical grade difference between proposed Downtown Station (1st & Santa Clara) and Diridon Station, a distance of less than 1 mile that requires increasing track grade up to 1.5%





# Deep Tunnel Impacts



## Station Area

- The station box (1,380' long, 70' wide and 40' high) would be constructed in poor soils at a depth of 140' with the potential of ground settlement (additional risks and costs for repairs and damages)
- Extensive surface impacts for access, stairs, emergency access, ventilation, etc. would affect residences and businesses and possibly require relocation
- No precedent of a HST mined station anywhere in the world to follow

## Entire Alignment

- Poor soils and presence of a high groundwater table increases risk of groundwater infiltration and settlement during construction
  - Unsafe mining conditions for craftsmen and equipment
  - Extensive soil improvement measures required from surface
- Requires construction underneath SR 87 and I-280 foundations
- Requires reconstruction of SR 87 northbound ramp and Tamien Station
- Construction estimated to take between 7-16 years
- Construction in a National Register archaeological site
- Higher capital costs (7 times the base case)
- Higher operating costs





# San Jose Station Options Considered

## ✓ Over Diridon Platforms

- Compatible with SR 87/I-280 alignment alternative
- No residential or business displacements
- Potential effects to 2.4 acres of biological resources
- Impacts to existing railroad operations during construction
- Potential visual impacts to the existing historic depot

## ✗ Aerial Station (East of Existing Diridon Station)

- Potential effects to a large area of biologically sensitive habitat
- Impacts to cultural resources, including the Diridon Station
- Potential interference with the City of San Jose's redevelopment plans for the areas north, east, and south of the Diridon Station

## ✗ Underground Station (East of Existing Diridon Station)

- Major constructability impacts
- No residential or nonresidential displacements
- No impacts to sensitive biological habitat, cultural resources or the visual character of the area



San Jose Diridon Station at Alameda Simulation



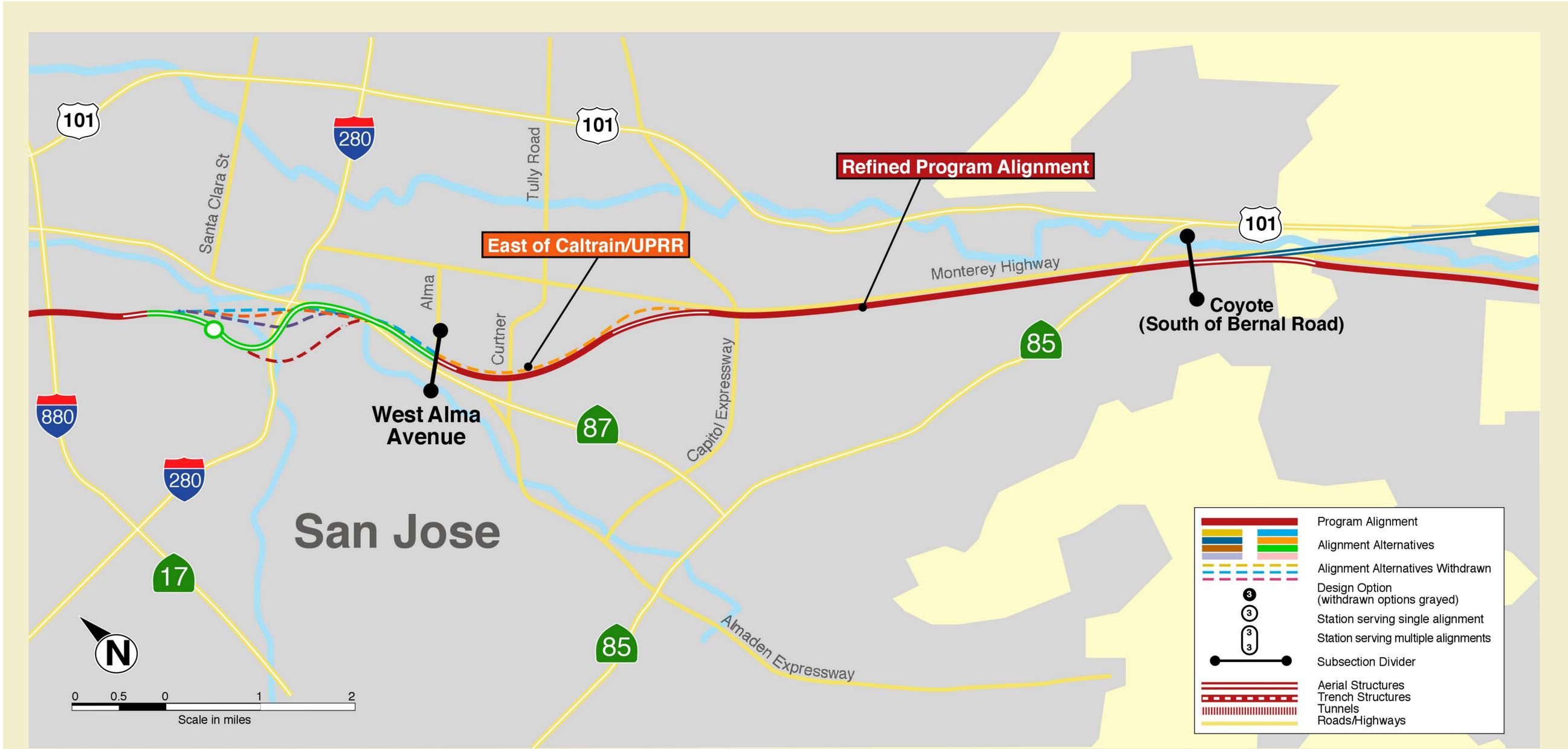
San Jose Diridon Station Simulation

*Note: Draft simulations are subject to change*





# Monterey Highway Subsection



**Refined Program Alignment**

- Fewer constructability issues
- Faster speeds along HST curve: 125 mph

**East of Caltrain/UPRR**

- Continuation of withdrawn tunnel alternatives
- Would require the reconstruction of Tamien Station and SR 87 northbound ramp
- Slower speed along HST curve: 85 mph





# Morgan Hill-Gilroy Subsection



<p><input checked="" type="checkbox"/> <b>US 101 to Downtown Gilroy</b></p> <ul style="list-style-type: none"> <li>Suggested by City of Morgan Hill</li> <li>Aerial structure minimizes impacts to wildlife crossings</li> <li>East of UPRR operating right-of-way (ROW)</li> </ul>	<p><input checked="" type="checkbox"/> <b>US 101 to East Gilroy</b></p> <ul style="list-style-type: none"> <li>Eliminates impacts to downtown Gilroy</li> <li>Wildlife crossing benefits</li> <li>Higher operating speeds</li> </ul>	<p><input checked="" type="checkbox"/> <b>East of UPRR to Downtown Gilroy</b></p> <ul style="list-style-type: none"> <li>Program alignment</li> <li>Follows existing transportation corridors to the extent possible</li> <li>East of UPRR operating ROW</li> </ul>	<p><input checked="" type="checkbox"/> <b>East of UPRR to East Gilroy</b></p> <ul style="list-style-type: none"> <li>Eliminates impacts to downtown Gilroy</li> <li>Potential to reduce residential and business displacements</li> <li>Moderate effects to biological, cultural and agricultural resources</li> </ul>	<p><input checked="" type="checkbox"/> <b>Downtown Gilroy: HST Trench Design Option</b></p> <ul style="list-style-type: none"> <li>Suggested by City of Gilroy</li> <li>Can include or exclude UPRR ROW</li> <li>Reduces visual impacts in downtown Gilroy</li> </ul>	<p><input type="checkbox"/> <b>Gilroy Station Loop</b></p> <ul style="list-style-type: none"> <li>Additional track miles, impacts and costs</li> </ul>
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# Morgan Hill-Gilroy Station Options Considered

## ✓ Downtown Gilroy (Four-Track) Station

- Minor impacts to the Caltrain storage track
- Potentially involves up to two displacements
- Aerial structure and a large parking garage would result in visual intrusion in the downtown area
- Allows for interconnectivity with proposed train service from Monterey County to the south
- Compatible with alternative alignments being carried forward

## ✓ East Gilroy (Four-Track) Station

- Would not disrupt existing station service during construction
- Potentially requires up to one residential displacement
- Would affect among the most biological and agricultural resources
- Major visual intrusion in an agricultural area
- Station would not allow for direct interconnectivity with proposed train service from Monterey County to the south
- Compatible with alternative alignments being carried forward

## ✗ Morgan Hill Downtown (Four-Track) Station

- Impacts to existing Caltrain parking during construction
- Potentially displaces two businesses
- Requires a large parking structure in the downtown area
- City of Morgan Hill does not want an aerial alignment through downtown

## ✗ Morgan Hill US 101 at Cochrane (Four-Track) Station

- Would not disrupt existing Caltrain station service
- Potentially displace one residential unit
- Requires seven acres of agricultural lands of status
- Visually compatible with the surrounding development (big box retail)
- No direct interconnectivity with proposed train service from Monterey County to the south
- A joint resolution between the cities of Morgan Hill and Gilroy states a preference for a HST station in Gilroy

## ✗ Downtown Gilroy (Two-Track) Station

- Requires relocation of the Caltrain storage track
- Few displacements
- Aerial structure and a large parking garage would result in visual intrusion in the downtown area
- Impractical because Gilroy Loop alignment alternative is withdrawn



East Gilroy Leavesley Station Simulation



Downtown Gilroy Aerial Simulation



Downtown Gilroy Trench Simulation

Note: Draft simulations are subject to change





# Pacheco Pass Subsection



**Refined Program Alignment**

- Conforms to all criteria for grades, curves, tunnel length and bridge height
- No relocations required
- Moderate visual impacts
- Potentially high impacts to biological resources, parkland and important farmland

**Close to SR 152**

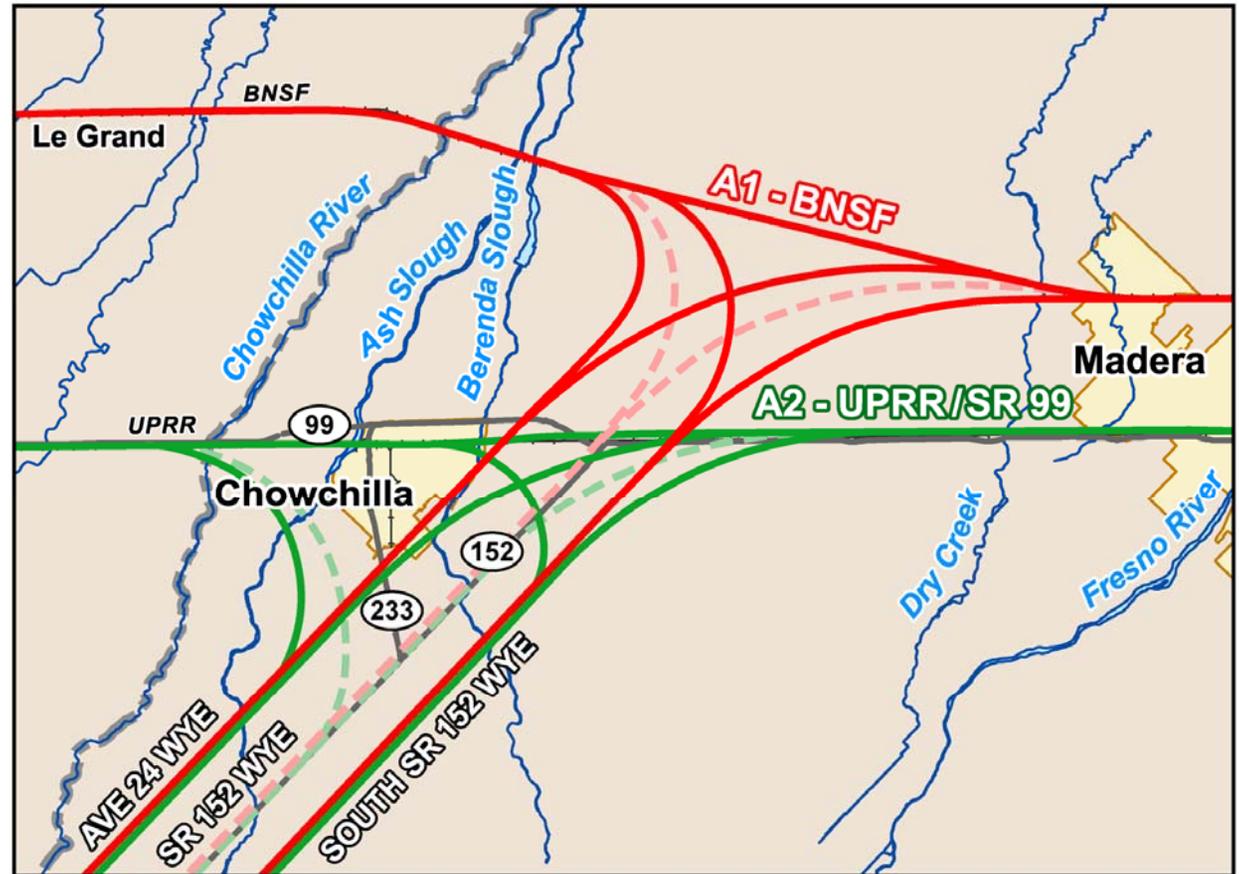
- Reduced tunnel access road impacts
- Closest to existing highway corridor





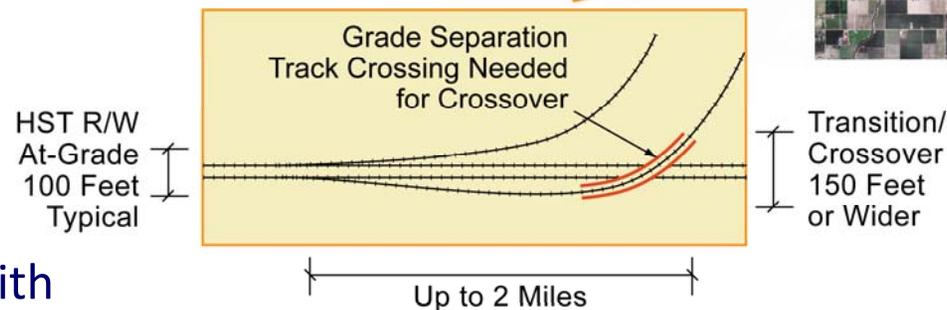
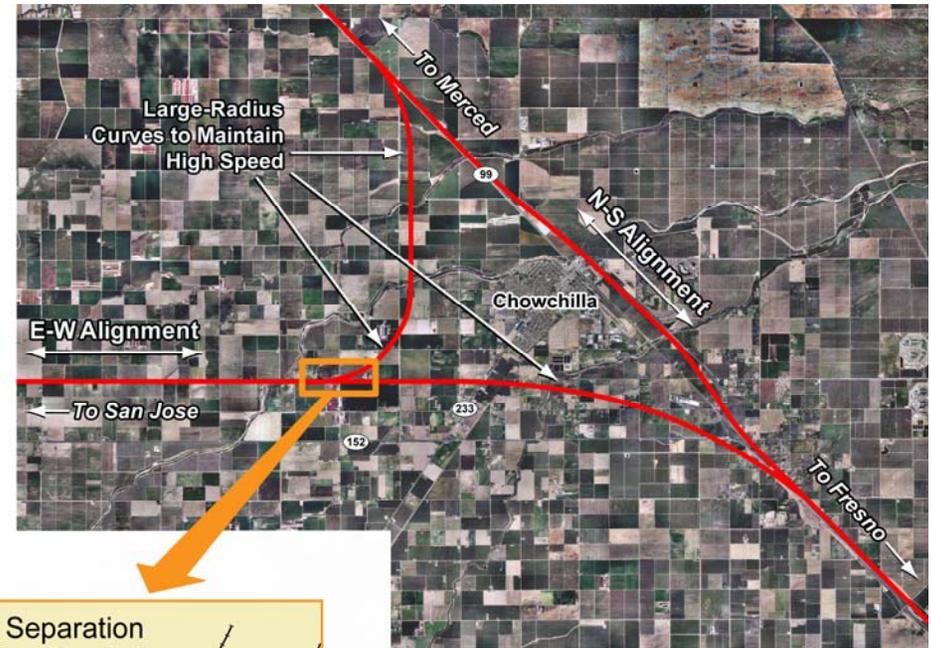
# Range of Wye Design Options

- Henry Miller/Ave 24 Wye
- SR 152 Wye (*not carried forward*)
- South SR 152 Wye (both Ave 21 and Ave 21 ¼ under consideration)



# Wye Design Elements

- WYE (“Y”) track arrangements connect E-W alignment to N-S alignment
- At WYE transitions, the 2-track system widens to a 4-track system to form a second 2-track system
- A grade separation track crossover is needed for one of the transitional tracks at each of the three corners of the wye
- Up to 5 miles are required for transition to 4-track and elevated guideway for crossover
- Design speeds of 150 to 250 mph require tracks with large-radius curves to meet operational and passenger comfort requirements



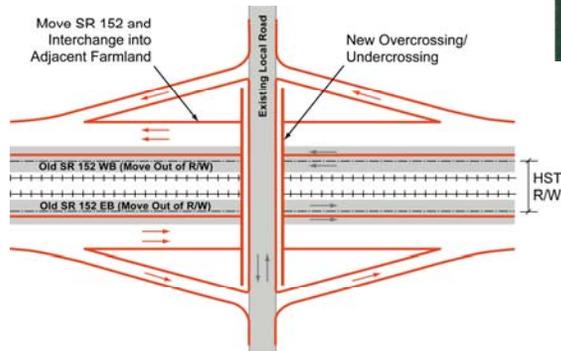
# SR 152 Wye: HST in Median

## Narrow Median

- Median only about 12 feet wide; HST requires 100 to 200 feet

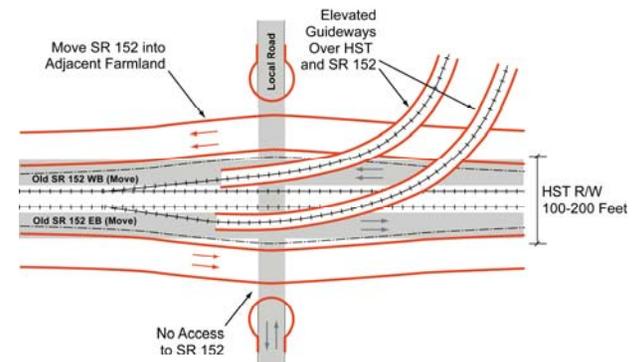


- SR 152 would be realigned outward into adjacent farmland to make room for HST in median



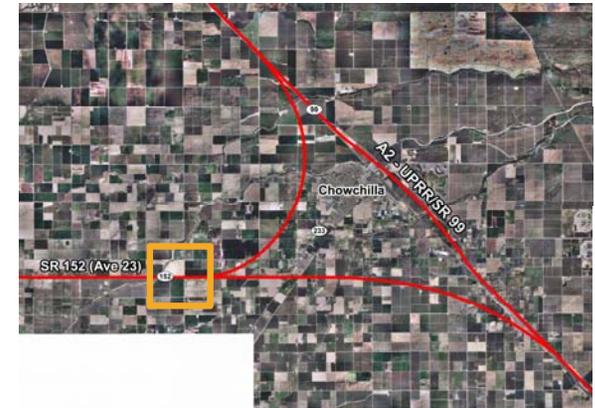
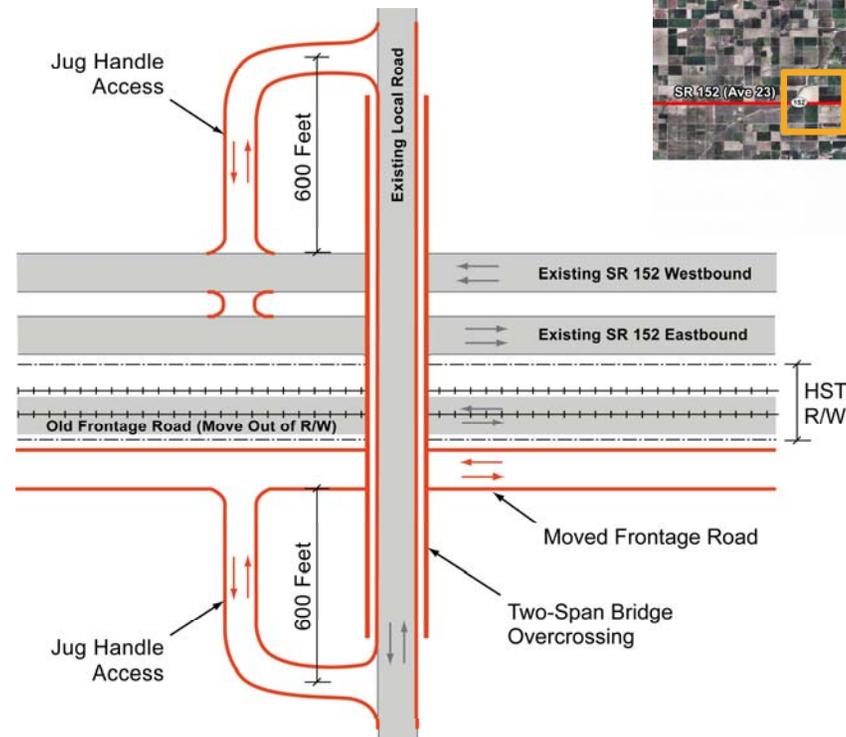
## Interchange Issues

- Local road intersections with SR 152 in the vicinity of the grade separation track crossing would be eliminated
- Other intersections would require an overcrossing or undercrossing
- Existing circulation would require major interchange construction



# SR 152 Wye: HST Adjacent

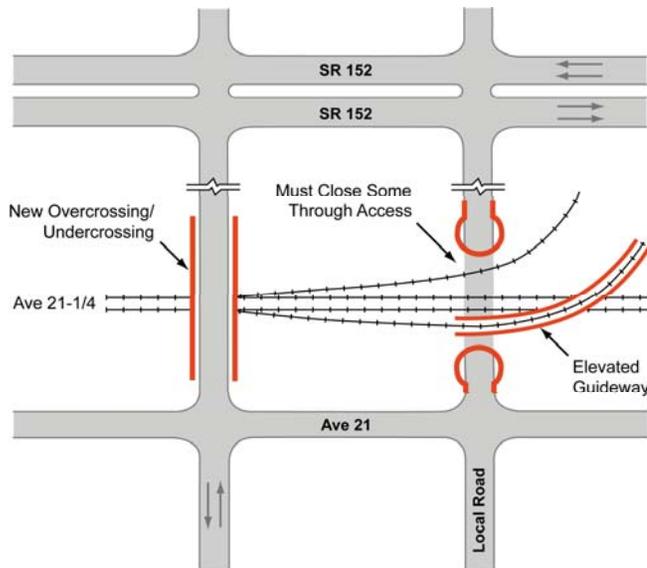
- Avoids narrow median issues
- Existing circulation would be disrupted
- Braid for wye may require closing several intersections
- Frontage roads would require relocation
- Jug handle connections and overcrossings would re-establish circulation



# South of SR 152 Wye at Ave 21 ¼ vs. Ave 21

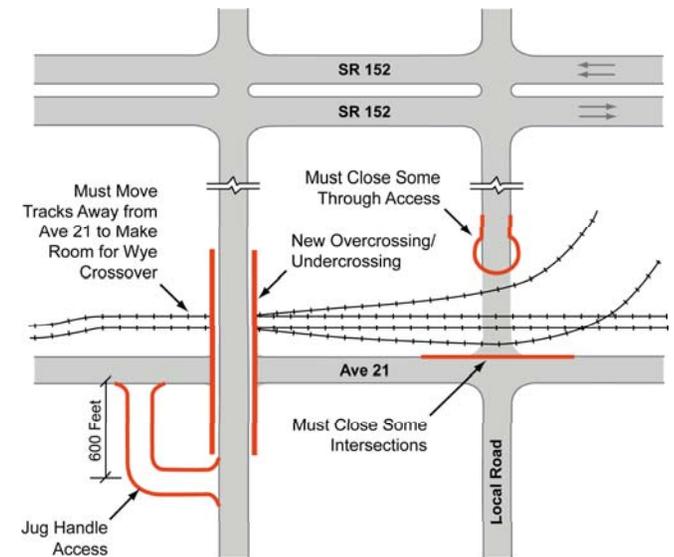
## Aligned to Ave 21 ¼

- Preserves intersection movements at Ave 21
- Overcrossing (or undercrossing) at intersections, every 2 miles
- Minimizes impacts on farmland



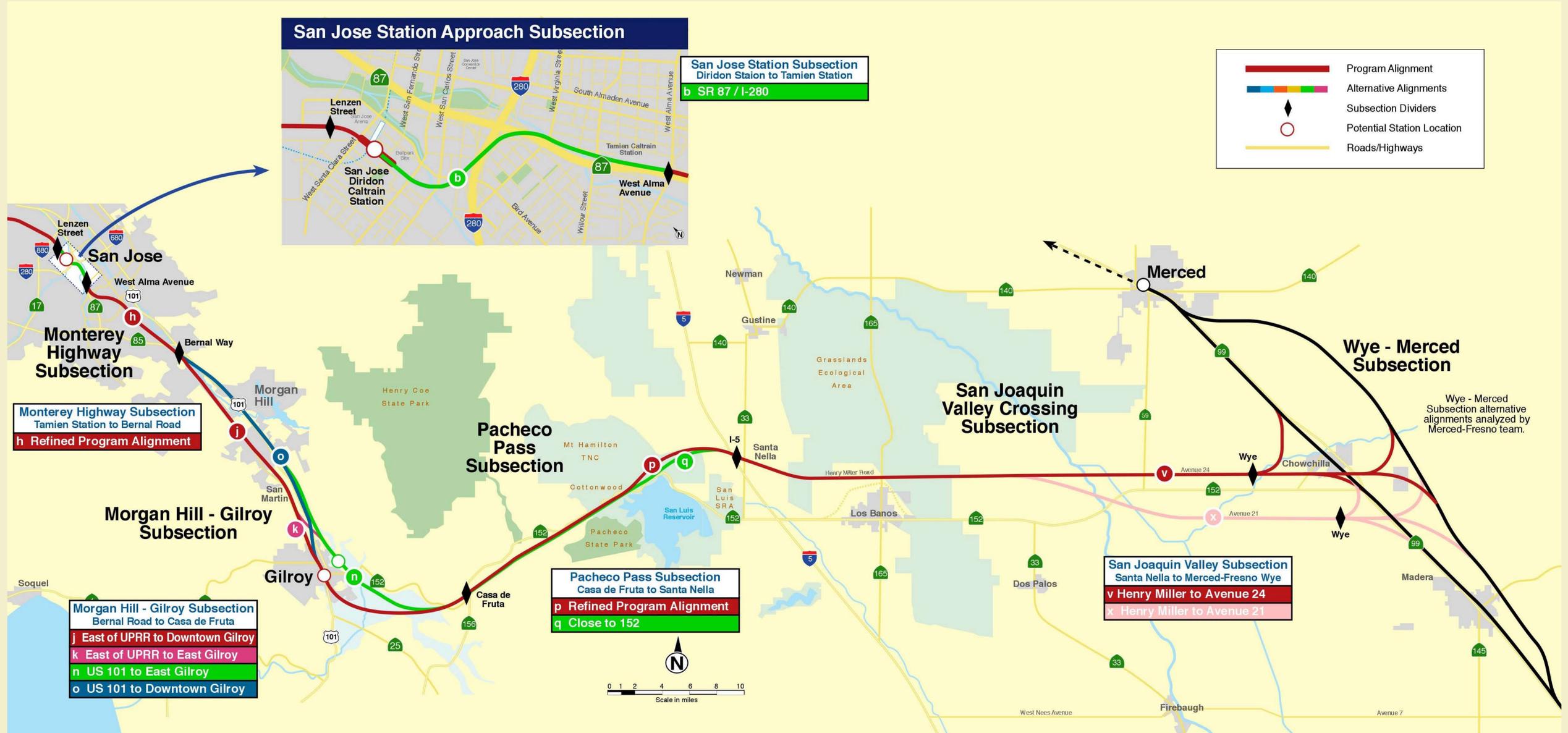
## Adjacent to Ave 21

- Circulation would be affected at Ave 21 intersections
- HST/Ave 21 overcrossing requires longer bridge
- Simple intersection becomes overcrossing with jug handle connection (increases impacts on farmland)



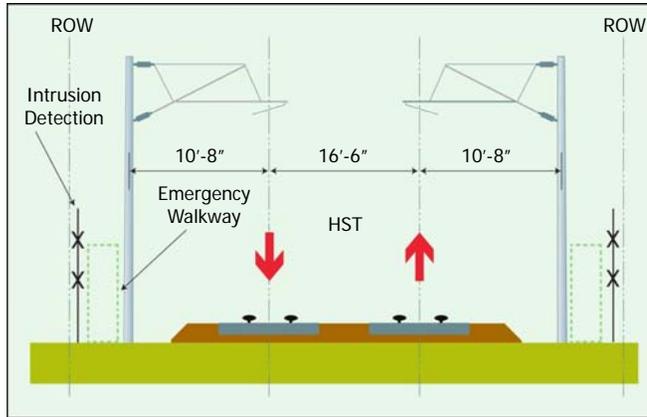


# San Jose to Merced Section Alignment Alternatives to be studied in the Draft EIR/EIS

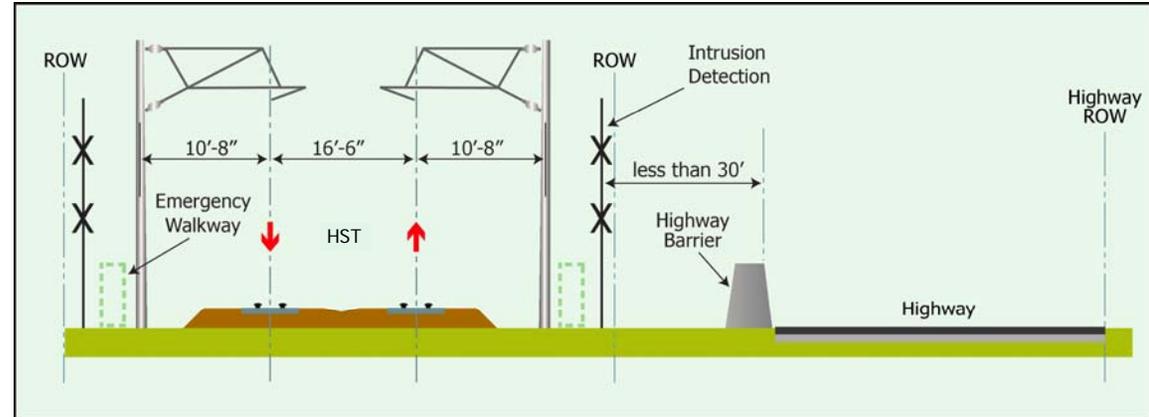


# Typical Sections Along Alignment

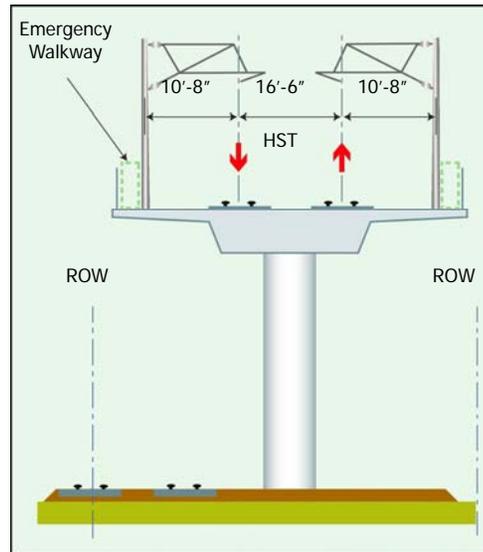
## At-Grade Section



## Shared Highway Corridor

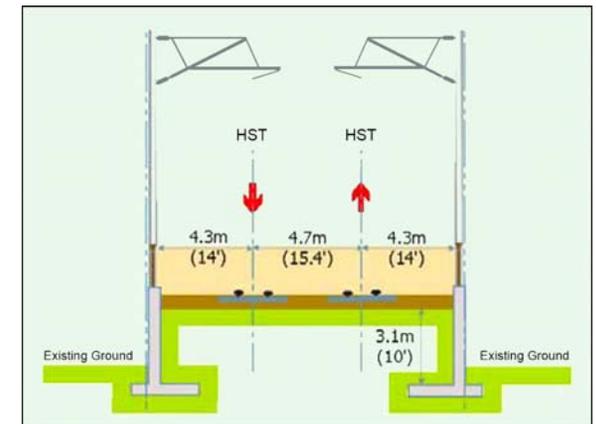


## Aerial Structure



- Portions of the alignment will need special structures to fit into built environment
- Structures could include:
  - Aerial structures (bridges)
  - Embankments (retained fill)
  - At grade

## Embankment (Retained Fill)



# Flexibility of Design



# Flexibility in Design



# Grade Separations



*Before*  
**Typical Underpass**  
*After*



- Grade separations are underpasses and overpasses where roadways cross railroad tracks
- Grade separations reduce congestion and noise and improve safety
- California High-Speed Train tracks will be grade-separated from adjacent roadways

## Typical Overpass



## Grade Separated from Roadway



# Mitigation Measures Under Elevated Guideway

- FRA has approved joint use under HST Guideway
- Linear parks, paths and roadways may be considered



Rendering Example



Joint Use in Italy



Agricultural use under guideway



# California High-Speed Train - Creates Jobs

- Equivalent of nearly 600,000 full-time, one-year jobs over the course of construction
- About 4,400 full-time jobs from San Francisco to Anaheim
- Operations Jobs
  - Service planning & fare setting
  - Operations planning, scheduling, fares
  - Train driving & dispatching
  - On-board passenger services
  - Ticketing & revenue accounting
  - Station services & security
- Maintenance Jobs
  - Train servicing & inspection
  - Train maintenance
  - Fixed core system & infrastructure inspection & maintenance



# California High-Speed Train – Creates Jobs

- ~880 people: 1/5<sup>th</sup> of the project's work force
  - Drivers
  - Conductors
  - On-board service
- ~1,100 people: 1/4<sup>th</sup> of the project work force
  - Ticketing
  - Security
  - Passenger service
  - HQ management and administration

Positions include a broad range of personnel from security staff to ticket machine maintenance, to customer service, accounting, finance, scheduling, administration

- ~100 people
  - Operations control
  - Power management
- ~440 people: 1/10<sup>th</sup> of the project's work force
  - Track
  - Ballast
  - Power systems
  - Signaling/telecommunications
  - Structures maintenance
- ~1,500+ people: 1/3<sup>rd</sup> of the project's work force
  - Train maintenance and overhauls
  - Basic body and paint shop work
  - Upholstery and fabric people





# How to Participate

**TALK** to high-speed train staff

**FILL** in and drop off comment cards

**ADD** your e-mail to our mailing list

**FOR** more information after this meeting:

**CALL:** (800) 881-5799

**VISIT:** [www.cahighspeedrail.ca.gov](http://www.cahighspeedrail.ca.gov)

**E-MAIL:** [san.jose\\_merced@hsr.ca.gov](mailto:san.jose_merced@hsr.ca.gov)

