San Mateo Replacement Parking Track
Caltrain Technical Assessment of Resident Suggestions from January 21, 2020

Background
Since summer 2019, Caltrain has worked closely with the City of San Mateo to evaluate 29 options for the location of the San Mateo replacement parking track. At the City Council Study Session on January 21, 2020, residents presented three new suggestions. Below is a technical assessment of these options.

Resident Suggestion: Option 4A
Location: 25th to 20th Avenues

Image presented by resident on January 21, 2020
Caltrain Technical Assessment of Option 4A

SUMMARY

The proposed alignment is not technically feasible.
- The spacing between two tracks is insufficient to allow two trains to pass one another.
- The use of multiple cross-overs would likely cause a train to derail.
- The northernmost switch is in conflict with the columns for SR-92 and the Hayward Park Station signals.

Figure 2

DETAILS

Option 4A shows tracks approximately five feet from each other. This is not adequate space for trains to pass one another (Caltrain Standards require a minimum of 15 feet between tracks). Option 4A also uses 13 foot track centers in order to avoid the creek (Caltrain Standards require a minimum of 18 feet between a parking track and mainline track).

A switch is a mechanism to begin a new track. The angle of a switch used by all Class I railroads is 5 degrees 43 minutes 29 seconds. A cross-over is comprised of two switches in close proximity to one another to allow trains from one section of straight track to move to an adjacent section of straight track running parallel with the first track (railroads do not build cross-overs to access a spur of track). Cross overs are never used “back to back” as shown, nor are they acceptable for this application. Switches and cross-overs require a high level of attention in terms of maintenance and operations. A 5 degree alteration in a train’s course is abrupt for both train and track; therefore, switches and cross-overs are not used gratuitously by railroads or as
a work-around for track geometry standards. Option 4A uses two cross-overs in close proximity, which would force the train to a 10 degree angle, likely derailing a train.

Since a switch does not work on a curve, a segment of straight track is needed. A switch needs an absolute minimum of 116 feet of straight track; thus, a significant portion of the mainline would need to be redesigned, including the new alignment of the grade separation. To straighten this segment of track a sharper curve would most likely need to be introduced in another portion of the mainline. As part of the grade separation funding agreement with High Speed Rail, the project will not preclude High Speed Rail’s future use on the corridor, including the potential for a 110 mph train. A sharper curve could potentially impact this ability.

The proposed northernmost switch is in conflict with the SR-92 columns and Hayward Park Station signals. The signal is needed to communicate to the train that there is a pedestrian crossing at the station. Without the signal, a person would not be able to cross between the northbound and southbound platforms.

Resident Suggestion: Option 4B

Location: 25th to 20th Avenues

Figure 3

Image presented by resident on January 21, 2020
Caltrain Technical Assessment of Option 4B

SUMMARY

Option 4B is not feasible as it depends on the feasibility of Option 4A. In addition, the access point is not on Caltrain-owned property and there is not enough room for the parking track spur and access road.

Figure 4

DETAILS

As detailed in the original feasibility assessment, the area between CA-92 and 25th Avenue (Option 4) was not financially feasible ($13M) due to extensive mitigation (i.e. hundreds of feet of covered canal, new bridge) that would be required to construct the parking track at the site.

The above illustration is not an exact replica of the resident’s drawing, as they were unclear regarding how the train would access the main track. The CAD drawing depicts the least problematic approach; however, that does not overcome the infeasibility described in above Option 4A.

As the following image illustrates there is not sufficient space for the two mainline tracks and the parking track spur and access road. Insufficient space means, when considering the spur only, the tracks would be too close together and/or a track would be outside of Caltrain’s right of way. The access road would require additional space. In addition, Caltrain does not own the land where access is indicated.
Figure 5

Image by Caltrain
Blue = Resident proposed parking track spur
Red = New grade separation rail alignment
Resident Suggestion: Option 29B

Location: Between 5th and 9th Avenues

Figure 6

Image presented by resident on January 21, 2020

Caltrain Technical Assessment of Option 29B

SUMMARY

Not operationally feasible. There is not enough space for a parking track due to the required gate activation zone. Adding a third rail through 9th Avenue would decrease safety and would not be approved by the CPUC as there are other feasible alternatives that do not affect the grade crossing.
Option 29B is not operationally feasible. At-grade crossings have gates and bells that warn motorists, pedestrians, and cyclists that a train is coming. The gates prevent people from entering the track zone, keeping them safe while a train passes through the crossing. The gates are activated by a physical device on the tracks called shunts. These set the outer limits of detection for a particular grade crossing.

Gates are required to be down at least 20 seconds in advance of an approaching train. In addition to these 20 seconds, a shunt needs to be placed at enough distance to account for the gates operational time, the time an individual would need to clear the crossing, and the time a train takes to accelerate.

In this location, the approximate distance needed between the gate and shunts is 700-800 feet. Any train or on-rail vehicle temporarily parked in this 700-800 feet section of track would trigger the gates to go down and the crossing at 9th Avenue would be closed to through traffic until the train or vehicle was moved out of this section of track.

The space between 5th and 9th Avenues is just over 1,000 feet. If 700 to 800 feet are needed for the shunt/gate activation zone, that leaves less than 200 to 300 feet of usable space. The Caltrain Standard for Parking Tracks is 950 feet; therefore a 200 to 300 foot section is not operationally viable.

In addition, Option 29B requires a third track to be constructed through the 9th Avenue intersection (see purple line). Ninth Avenue is currently an at grade crossing, an intersection where the roadway/pathways cross railroad tracks. Constructing a third track at this intersection would decrease safety at the crossing for pedestrians, cyclists and motorists, and would not be
approved by the California Public Utilities Commission (CPUC), the regulatory body with exclusive jurisdiction over at-grade rail crossings in California. CPUC will not approve any changes to a grade crossing if other feasible alternatives exist.