City of Palo Alto (ID # 10345)

City Council Staff Report

Report Type: Action Items **Meeting Date: 5/13/2019**

Council Priority: Grade Separations

Summary Title: Connecting Palo Alto Rail Grade Separation Followup: Alternatives and Criteria

Title: Connecting Palo Alto Grade Separation Planning: Revision of Alternatives for Further Study and Direction to Staff Regarding Evaluation Criteria Weights

From: City Manager

Lead Department: City Manager

Recommendation

Staff recommends that the City Council discuss and direct staff to proceed on the following issues:

A. Future handling of a Citywide tunnel as an alternative to study, either:
   i. Removing the citywide tunnel from further study and consideration;
   ii. Refining the description of the alternative that will continue to be studied and considered to "Tunnel from Channing Avenue and the southern City limit"; or
   iii. Making no change.

B. Weighting of evaluation criteria to guide discussion and decision-making.

Background

At the April 22, 2019 City Council meeting, the City Council adopted a rail workplan and modified the list of alternatives for further study and consideration. The alternatives, after City Council action on April 22, includes the following:

1. South Palo Alto | Rail Tunnel (passenger and freight in tunnel) [eliminated the separate freight variation];
2. Churchill Avenue | Full Closure [added the ability to consider all street mitigation options including Embarcadero];
3. Churchill Avenue | Viaduct [added this alternative of a viaduct in the Vicinity of Churchill]
4. Meadow Drive and Charleston Road | Hybrid;

5. Meadow Drive and Charleston Road | Rail Trench;
6. Meadow Drive and Charleston Road | Viaduct;
7. Citywide Tunnel

In addition to those actions, the City Council also directed staff to return to City Council with an update on the Citywide Tunnel alternative. Councilmembers were also invited to identify any further information needed to fully understand the Citywide Tunnel alternative.

At the March 18, 2019 Committee of the Whole (COTW) meeting, the COTW recommended a set of actions relating to rail grade separation including direction to prepare a dynamic model that orders alternatives based on Council-approved criteria. Staff included a recommendation in the rail workplan to bring the evaluation criteria to the City Council through an iterative approach where City Council would provide an initial weighting scale to review the alternatives under consideration. A possible weighting model is presented in this report.

Discussion

Citywide Tunnel Information

The Citywide tunnel animation is available online at: (https://pagradesep.com/wp-content/uploads/2019/04/Palo-Alto_Full_Tunnel-05.wmv). The animation illustrates where the tunnel would need to start and where the temporary tracks would need to be located in order to build the tunnel. Specific details about the tunnel are provided below:

1. **Tunnel start location:** Running north to south, the proposed tunnel north portal would begin 500 feet north of Churchill Avenue.
2. **Reason for starting location:** In order to avoid major impacts and complete re-construction of the Palo Alto Caltrain Station and University Avenue underpass, the north end of the tunnel begins south of the Palo Alto Station. The tunnel requires that the tracks descend in a trench to a depth of 44 feet below ground for the tunneling operation to commence. Because there is not enough room to do construction right at the end of the Palo Alto (University Avenue) Caltrain Station, in order to begin constructing the descending trench section, the temporary (shoofly) tracks need to swing away from the Palo Alto Caltrain Station for an approximate length of 800 feet before the trench construction begins. Then the length of trench then required to reach a depth of 44 feet below ground is approximately 2,300 feet (assuming a 2 percent grade[1] and the required length of vertical curve[2]). The distance between Palo Alto Avenue and University Avenue is 1,975 feet which is much shorter than the required distances listed for the trench. Consequently, if the trench were to begin at Palo Alto Avenue, the vertical curve and trench would cut through the Palo Alto Caltrain Station

[1] Caltrain has not given the City any indication that they would accept a design exception for more than 1%. Their response letter to the City can be found online at: _____

[2] Vertical curve is a smooth curve drawn tangent to two intersecting grade lines to provide a smooth transition from one grade to another.

and University Avenue underpass. Therefore, in order to avoid rebuilding the Palo Alto Caltrain Station, the proposed Citywide Tunnel design begins the trench just south of the Palo Alto Caltrain Station.

3. **Tunnel end location:** The southern portal of tunnel is defined (constrained) by the city boundary with Mountain View. This complies with the City Council direction to keep the tunnel within the City limits of the City of Palo Alto.
4. **Why can't you build the tunnel adjacent to the existing rail line and use the existing tracks as the temporary tracks during construction (similar to the plan for the viaduct at Meadow-Charleston)?:** The impact of building the tunnel along Alma instead of on the existing tracks would be the same as the impact of building the tunnel along the existing tracks since the overall width of construction is equivalent for above ground considerations related to the tunnel. This is because the open trench required to launch the Tunnel Boring Machine is approximately 100 feet wide and 44 feet deep. Each single bore is 34 feet in diameter outside dimension and the two bores are positioned with a minimum of 15 feet between them. The temporary (shoofly) trackway is 40 feet wide and there is a 5-foot separation between the pit wall and the temporary (shoofly) fence (***Attachment A***). If the tunnel launch pit were located on Alma Street it would also have significant underground utility impacts.
5. **Are there any alternative locations for the temporary (shoofly) tracks?:** Placing the shoofly on the west side of the existing tracks would require significant property acquisition, with most of the impacted properties residential. No other location for the temporary (shoofly) track is feasible without greater impacts.
6. **Is there an opportunity for value capture to pay for the tunnel?**: "Value capture" is the strategy of using increased land values associated with a public project as the basis for financing the project. Land values rise when development potential increases, typically through higher density. This approach was discussed in the white paper "Funding for Palo Alto Grade Separation and Crossing Improvement" prepared by Economic & Planning Systems, Inc. in November 2017 (https://pagradesep.com/wp-content/uploads/2018/08/Palo-Alto-Grade-Separation-Financing-White-Paper-1.pdf).

   The report also states:

   > "The value capture funding potential increases with the amount of new development that is assumed to be directly attributable to grade separation and related improvements. For example, assuming 1,000 new residential units and 500,000 square feet of new commercial space (e.g., office and retail) is developed, approximately $130 million might be available for infrastructure. Under a more aggressive scenario, 3,000 new residential units and 1 million in new commercial square feet might generate about $340 million of value capture funding. While the potential funding levels illustrated above are relatively significant, the timing and predictability of future revenue streams is often a critical challenge to effective use of most value capture tools. The level of development illustrated in all of the scenarios would likely take many years to materialize and be subject to market fluctuations, challenging entitlement and

land assembly issues, and other uncertainties. Indeed, a substantial portion of the development is premised on prior completion of the grade separation improvements, presenting a phasing and financing dilemma."

The level of development and the timing of it may also make the value capture option less viable for the City as a tool in the tunnel discussion.

Options for the Citywide Tunnel given the information above:

(i) Remove all forms of the tunnel from further study and consideration.

(ii) Refine the description of the alternative to be further studied and considered to "Tunnel from Channing Avenue and the southern City limit" confirming that the City is not studying or considering a tunnel alternative between the Menlo Park boundary and Channing Avenue.

(iii) Make no change.

Evaluation Criteria Weighting and Modeling

City Council adopted evaluation criteria in September 2017 to provide staff with guidance for narrowing down the list of grade separation ideas from the initial list of 34 ideas. As staff continued to work with the criteria, staff and the consultant team illustrated the differences between alternatives under each criterion using a color spectrum. With the City Council progressing forward and even further narrowing the alternatives, the Council directed staff to develop a way to apply the evaluation criteria using a dynamic evaluation model.

Based on this discussion, a current Community Advisory Panel (CAP) member drafted an online evaluation matrix allowing anyone to weigh the alternatives based on the evaluation criteria.

Staff drafted some initial weights that can be easily incorporated into the online interactive model and is seeking City Council confirmation on the weighting. Using the City Council's weighting, staff will follow up with the Expanded Community Advisory Panel to use this tool as a basis for evaluating the alternatives and reporting to the City Council their recommendation regarding a quantitative comparison of the alternatives.

The model below shows an example of the southern segment with the criteria listed and possible weights given for each criterion with the exception of two (2) criteria that are pass/fail. The idea of the pass/fail criteria an acknowledgement that some criteria are less about a scale and more about whether the criteria is met or not. The two criteria listed as pass/fail in the example below are "support continued rail operations" and "finance with feasible funding sources." If the alternative does not allow for Caltrain to continue its operations or the City feels that the cost is out of reach for any given alternative, then the alternative would be given a "fail" for each of those criteria.

The rest of the criteria are given sample percentages and weights that the City Council can discuss together to come up with the first round of weights which can be later reevaluated after testing them out and sharing them with the Expanded Community Advisory Panel.

Model that orders the alternatives based on the City's criteria

For purpose of illustration only – Southern Segment

EXAMPLE ONLY: SOUTHERN SEGMENT: CHARLESTON AND MEADOW CROSSINGS											
Criteria		Relative Weight	Value/Score (Score = value times relative weight)								
			Viaduct		Southern Tunnel		Trench		Hybrid	City Tunnel	
D	Support continued rail operations	Pass/Fail									
E	Finance with feasible funding sources	Pass/Fail									
A	Improve east-west connectivity	10%									
B	Reduce traffic congestion and delays	15%									
C	Provide clear, safe routes for pedestrians and bikes	10%									
F	Minimize right-of-way acquisition	15%									
G	Reduce rail noise and vibration	5%									
H	Maintain or improve local access	15%									
I	Minimize visual changes along the corridor	5%									
J	Minimize disruption and duration of construction	10%									
K	Order of magnitude of (City) cost	15%									
Total		100%									

The table below contains the same information but goes a step further and shows a score for each criterion and then the additional box is used for the total points (relative weight times the value chosen). Council is being asked to provide the relative weights.

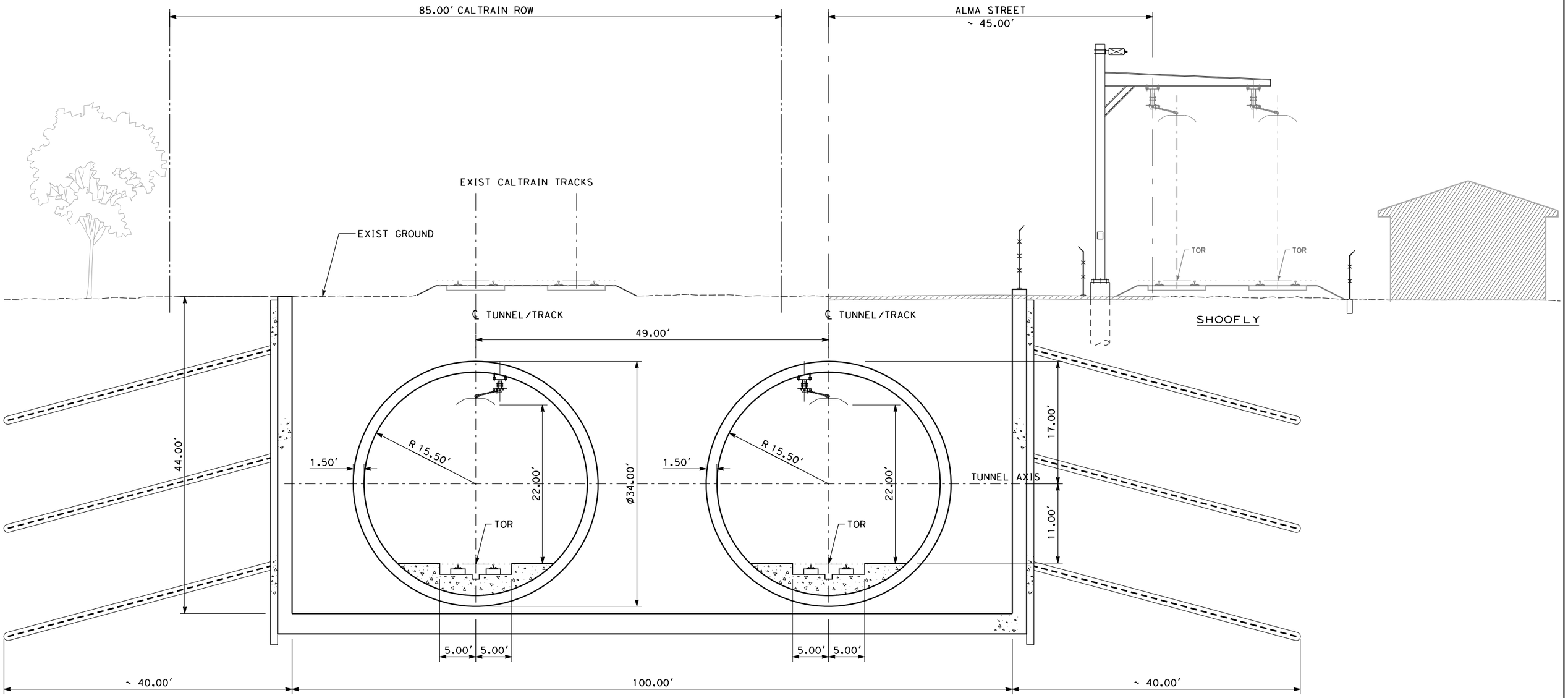
EXAMPLE ONLY: SOUTHERN SEGMENT: CHARLESTON AND MEADOWS CROSSINGS										
Criteria		Relative Weight	Value/Score (Score = value times relative weight)							
			Viaduct		Southern Tunnel		Trench		Hybrid	City Tunnel
D	Support continued rail operations	Pass/Fail	Pass		Pass		Pass		Pass	Pass
E	Finance with feasible funding sources	Pass/Fail	Pass		Pass		Pass		Fail	Fail
A	Improve east-west connectivity	10%	10		10		10			
B	Reduce traffic congestion and delays	15%	10		10		10			
C	Provide clear, safe routes for pedestrians and bikes	10%	10		10		10			
F	Minimize right-of-way acquisition	15%	10		10		2			
G	Reduce rail noise and vibration	5%	5		6		9			
H	Maintain or improve local access	15%	10		10		10			
I	Minimize visual changes along the corridor	5%	4		5		10			
J	Minimize disruption and duration of construction	10%	7		7		3			
K	Order of magnitude of (City) cost	15%	6		5		1			
Total		100%								

Resource Impact

No resource impacts at this time though changes to alternatives for study could possibly result in a savings with the AECOM contract.

Attachments:

- Attachment A-Citywide Tunnel-N Portal Launch Pit



TYPICAL SECTION
NORTH PORTAL LAUNCH PIT
(LOOKING NORTH)

PRELIMINARY
FOR DISCUSSION PURPOSES ONLY
February 07, 2019

CITY OF PALO ALTO

AECOM