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## SFCTA Board meeting Item 8 PAX initiation report

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**Roland Lebrun** <ccss@msn.com>

Mon, Jul 11, 2022 at 4:53 PM

To: "Mandelman, Rafael (BOS)" <rafael.mandelman@sfgov.org>

Cc: SFCTA Board Secretary <clerk@sfcta.org>, SFCTA CAC <cac@sfcta.org>, TJPA CAC <CAC@tjpa.org>, Transbay Info <info@tjpa.org>

Dear Chair Mandelman and Commissioners,

Please find attached my comments on the draft PAX project initiation report and consider directing staff to provide an answer in writing as appropriate.

- Recommendation to drop Alternatives A1, B1 and C (fire/life safety issues)
- Introduction of Alternative B3 (lowest cost and fastest delivery without impact on Caltrain operations)

Thank you in advance for your consideration.

Respectfully,

Roland Lebrun

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 **SFCTA July 12 item 8 PAX Initiation report.pdf**  
868K

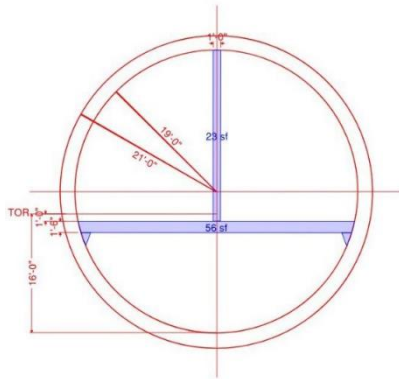
Dear Chair Mandelman and Commissioners,

While the draft report is unquestionably a significant milestone in the right direction, I believe that the report introduces opportunities to substantially accelerate and improve the final outcome if we address the following issues expeditiously:

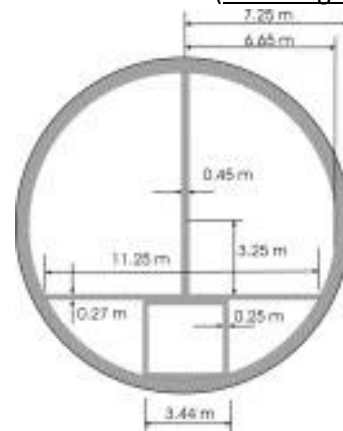
1) **Fire/life safety.**

- The report includes two 42-foot Outer Diameter (OD) single bore alternatives (A1 and B1) allegedly cost-competitive with equivalent twin-bore solutions (B1 and B2). **This 42-foot diameter does not appear to be sufficient to accommodate the two walkways (one on each side of the dividing wall) required for the safe evacuation of mobility-impaired passengers in an emergency.** As an example, the Groene Hart tunnel has an outer diameter of 14.9m (49 feet), including the two walkways.

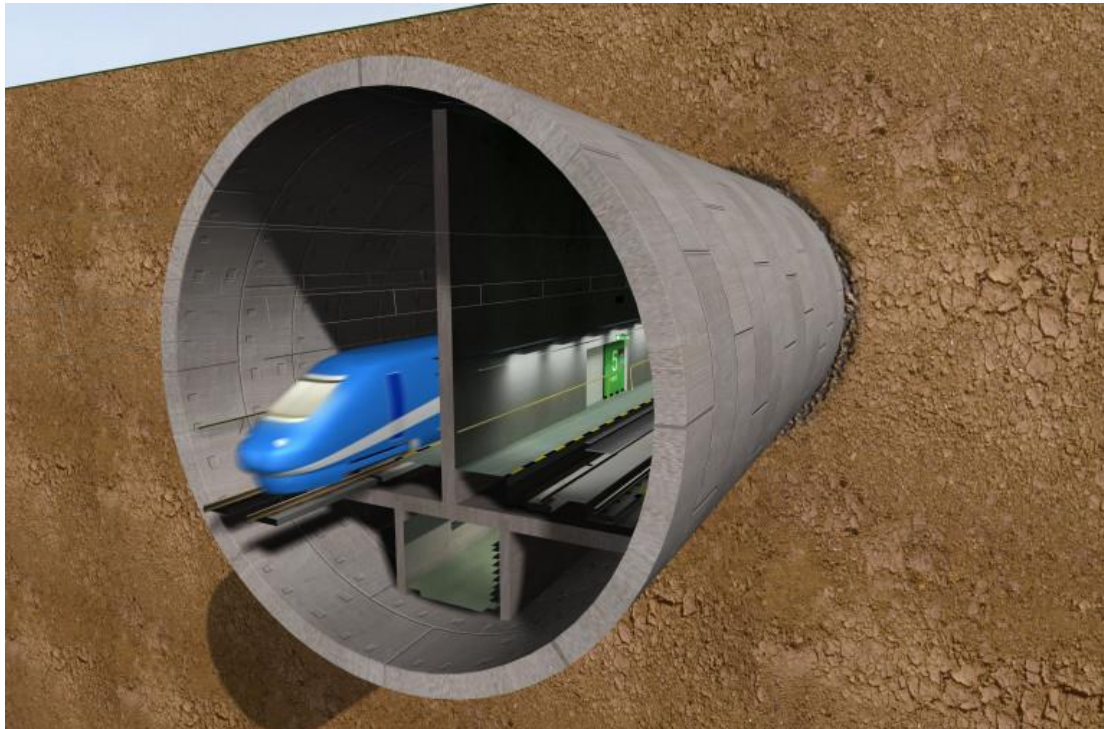
PAX 42-foot OD (Figure 7-14)



Groene Hart 49-foot OD (including walkways)



Groene Hart tunnel dividing wall and walkways connected by cross-passages (green door)



- **4.6.3 Alternative C – Short Alignment** This alternative should be dropped from further consideration because there will be no adjacent tunnel for passengers to escape to in an emergency while “a 1,100-foot-long U-wall trench is constructed north of the Tunnel 1 portal”

## 2) Costs estimates

The single and twin-bore cost estimates were similar (\$2B) which is quite remarkable when considering the following facts:

- The BART extension to San Jose cost estimates DOUBLED (from \$4.7B to \$9.2B) when the project switched from twin-bores to a 46-foot OD single-bore tunnel.
- The depth of the San Jose tunnels increased from 60 feet to 100 feet below the surface to accommodate the larger single bore.
- **The Central subway twin-bore tunnels were constructed in 10 months at a cost of \$238M.**
- Section 7.2.2 on page 65 of the report correctly states: “*Of note, it is less expensive to conduct work from a portal than to conduct work from a launch box because a significant amount of construction-related hoisting is avoided. The savings would be on the order of 5–10% of the cost for tunnel excavation.*” It is therefore unclear why any of the alternatives under consideration would require launching TBM(s) let alone a 42-foot(!) single-bore TBM from the north (Sixth & Townsend) and **any such alternatives should be eliminated from further consideration at the earliest opportunity.**

## 3) Environmental impacts

- Excavated spoils exit TBMs in the opposite direction of travel so it is unclear why alternatives mandating the hauling of excavated soils in the area of Townsend Street were ever considered.
- There is no consideration of rail transportation of excavated materials.
- There is no consideration of ground improvements ahead of a TBM from an adjacent tunnel bore even though this technique was pioneered over 40 years ago during the construction of the channel tunnel (there is little to no opportunity for ground improvements from the surface in a sea crossing 200 feet below the sea floor)
- Known challenges with Sequential Excavation Mining (SEM) of cross-passages in sub-optimal soil conditions are well documented but there is no consideration of cross-passage TBMs(?)



## 4) Operating Speeds:

There does not appear to be any consideration of increased operating speeds as mandated by Streets & Highways codes Section 2704.09(b)(3) San Francisco-San Jose: 30 minutes.

<https://codes.findlaw.com/ca/streets-and-highways-code/shc-sect-2704-09.html>



The northbound tunnel continues parallel to the existing tracks on the opposite (west) side of the I-280 piles and is contained entirely within the JPB's existing subsurface easement (the southbound tunnel may require additional subsurface easements under properties on Pennsylvania Avenue).



The elevation profiles are similar to those in the draft study with a 2% slope starting immediately south of 23<sup>rd</sup> Street. A study of building foundations will inform any requirement to drop the bottom of the abandoned tunnel south of the flared section. It may also be possible to drive the southbound tunnel TBM under Pennsylvania Avenue but this alignment introduces 3 problems:

- Significant drop in maximum operating speed (currently 80 MPH)
- Longer cross-passages
- **Loss of opportunity for ground improvement measures initiated from within the northbound tunnel bore** resulting in potentially significant surface impacts on Pennsylvania Avenue

#### **Alternative B3 station locations**

Alternative B3's 2% slope through the 22<sup>nd</sup> Street area is not suitable for station platforms but Caltrain would continue to provide service at the 22<sup>nd</sup> Street station as long as the at-grade access to the 4<sup>th</sup> & King railyard is maintained. Alternative B3 introduces opportunities for optimal station locations (including crossovers and passing tracks) on either side of Potrero Hill (Cesar Chavez and 7<sup>th</sup> Street).

The potential relocation of the 7<sup>th</sup> & Townsend station to 7<sup>th</sup> Street opens up multiple opportunities:

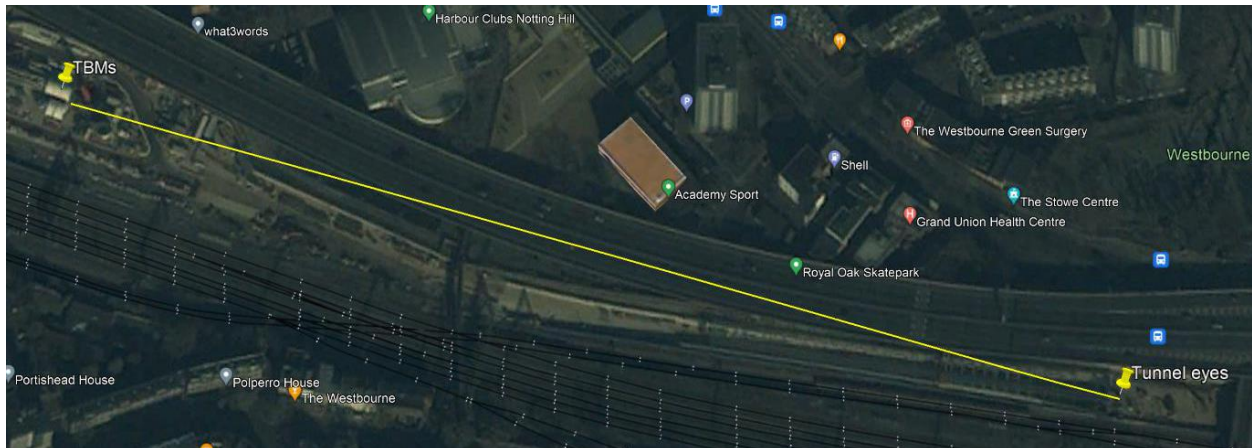
- Seamless (AKA "Vision Zero") transfers between Caltrain and the future MUNI N/T Mission Bay loop (King/4<sup>th</sup>/3<sup>rd</sup>/16<sup>th</sup>) as well as the future UCSF BART station to Alameda.
- Elimination of issues associated with tunnel boring in poor geological conditions in the area (see "grout pillar" discussion in section 7.2.2).
- Opportunity for a "pit stop" before the TBMs continue to the Transit Center via the current DTX alignment or the 7<sup>th</sup> Street alignment which was not viable until the elimination of the third track requirement (opportunities for **significant economies of scale including the deployment of cross-passage TBMs between the 23<sup>rd</sup> Street portal and the Transit Center**)
- Vent shafts and crossovers at opposite ends of the station

## Alternative B3 Construction impacts

Alternative B3 is modelled after Crossrail's Royal Oak Portal which had constraints similar to the 23<sup>rd</sup> St location (69-foot-wide worksite tucked under a freeway overpass) leaving no room for staging which was located on a worksite approximately 1,600 feet east of the portal (the staging area north of Cesar Chavez is approximately 1,000 feet from the 23<sup>rd</sup> St portal).



February 2012 satellite picture showing the two TBMs (including trailing gear) being assembled in the staging area. The first TBM was transported by SPMT to the portal and launched two months later (April 2012).



The second TBM was transported to the portal and launched in June 2012 (after the first TBM and its trailing gear were fully buried) because the ramp leading to the portal was too narrow to accommodate more than one TBM at a time (<https://youtu.be/77x3q6k27k4>)

Most of the surface impacts for Alternative B3 will take place in the area of 23<sup>rd</sup> Street & Pennsylvania Avenue (flaring of the abandoned tunnel to the south of the 23<sup>rd</sup> Street overpass and construction of the evacuation/vent shaft and portal to the north). TBM assembly, tunnel lining segment staging and excavated material hauling will take place in the area of Cesar Chavez).

Respectfully submitted for your consideration.

Sincerely,

Roland Lebrun

## References

- Groene Hart tunnel: <https://www.bouygues-tp.com/en/projects/groene-hart-tunnel>
- Royal Oak Portal: [https://2577f60fe192df40d16a-ab656259048fb93837ecc0ecbcf0c557.ssl.cf3.rackcdn.com/assets/library/document/p/original/pn027-media\\_briefing\\_note\\_royal\\_oak\\_portal.pdf](https://2577f60fe192df40d16a-ab656259048fb93837ecc0ecbcf0c557.ssl.cf3.rackcdn.com/assets/library/document/p/original/pn027-media_briefing_note_royal_oak_portal.pdf)