

## EXECUTIVE SUMMARY

This Supplemental Environmental Impact Statement (SEIS) was prepared to address the Order of the United States District Court for the Central District of California in *Today's IV, Inc. vs. Federal Transit Administration et al* and *515/555 Flower Associates, LLC vs. Federal Transit Administration et al*. The Judgment and Order for Partial Injunctive Relief by the Honorable John A. Kronstadt on May 28, 2014 and September 9, 2014, respectively, require that the Federal Transit Administration (FTA) as the federal lead agency pursuant to the National Environmental Policy Act (NEPA) with the Los Angeles County Metropolitan Transportation Authority (Metro) explain why open-face tunneling alternatives were rejected on the Lower Flower Segment in downtown Los Angeles. This SEIS is intended to provide more information on the tunnel construction alternatives on Flower Street that were withdrawn from consideration, specifically Open-Face Shield and Sequential Excavation Method (SEM) tunneling for the Flower Street portion of the Regional Connector project alignment between 4th Street and the 7th Street/Metro Center Station, as required by the Judgment.

### Alternatives Evaluated in this Supplemental Environmental Document

The two tunneling method alternatives identified and evaluated in the SEIS propose different combinations of underground construction as options to the cut and cover method planned for the Project between south of 4th Street and south of 6th Street along Flower Street:

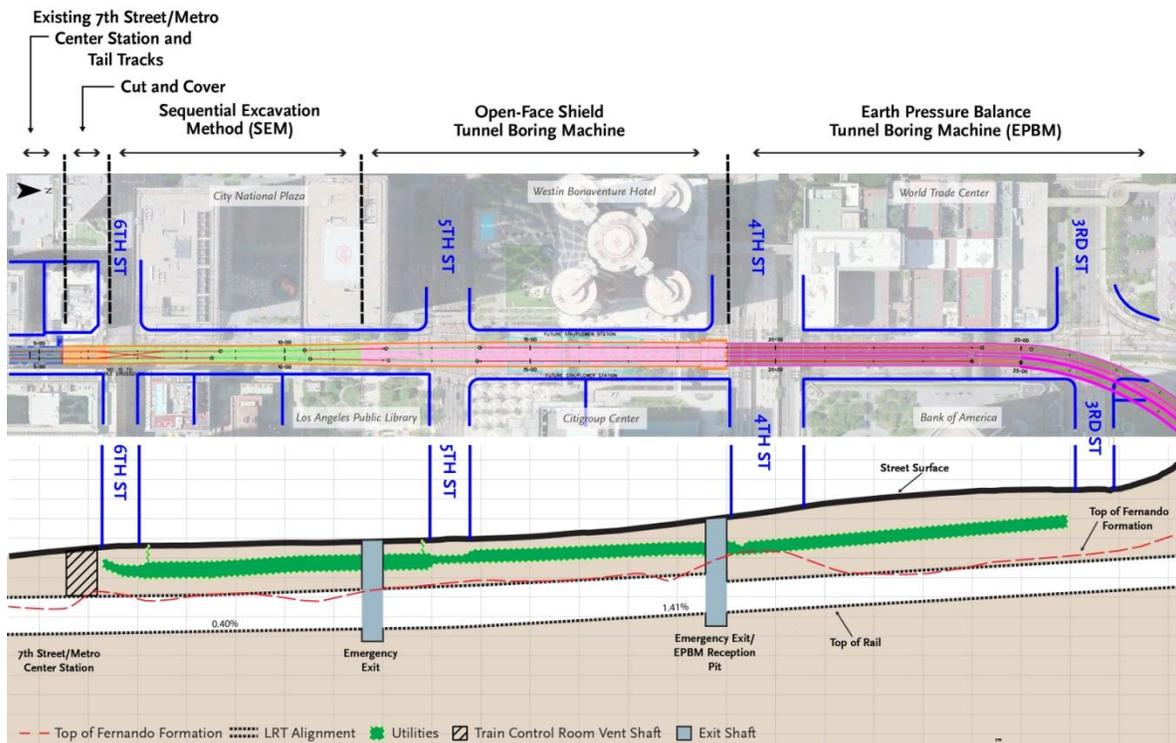
- Alternative A – a combination of Earth Pressure Balance Tunnel Boring Machine (EPBM), Open-Face Shield, and SEM construction methods; and with similar horizontal and vertical alignment profiles to that of the Project.
- Alternative B – a combination of EPBM and SEM construction methods with a similar horizontal alignment profile, but a lower vertical alignment profile, than that of the Project.

The tunneling alternatives have the following alignment variations from that of the Project in order to address geologic conditions and other subsurface project constraints along Flower Street:

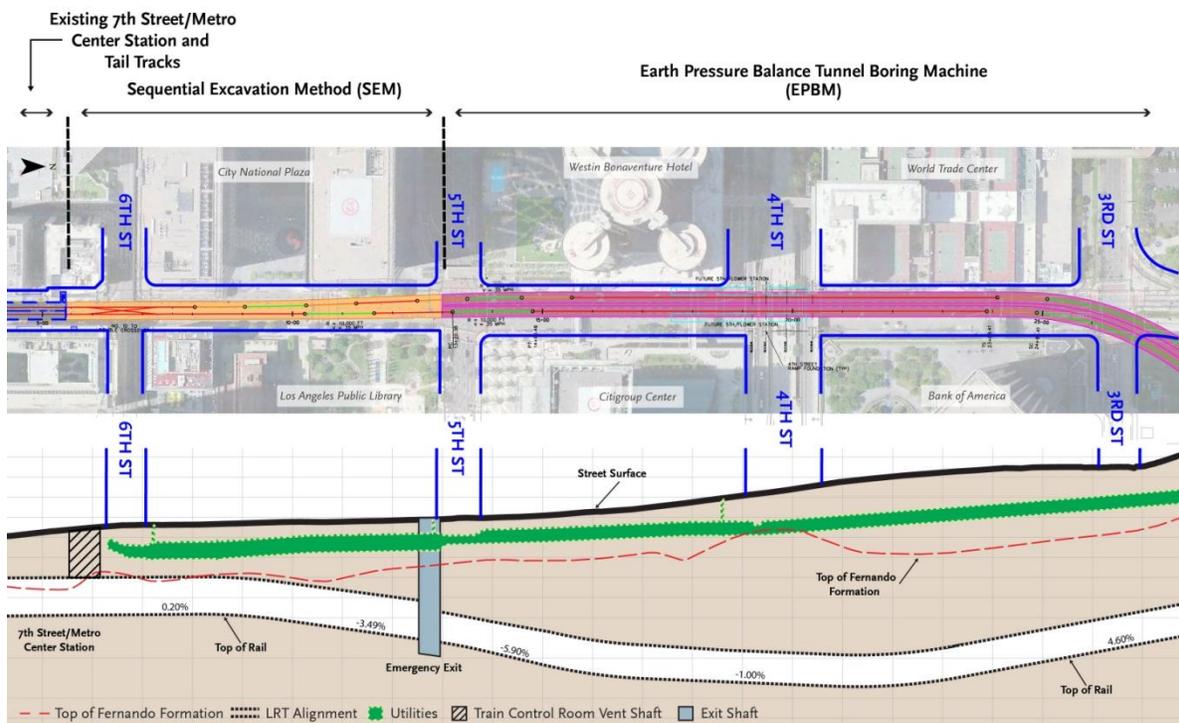
- Horizontal alignment – Along Flower Street, Alternatives A and B remain located under the existing street right-of-way. The horizontal alignments of these alternatives continue on tangent track from the 2nd/Hope Station south through the 4th Street Bridge foundation piles to 5th Street. The alignments then would transition from a wider oval track center to a narrow track center as the alignment approaches the planned double crossover immediately north of the narrow, rectangular 7th Street/Metro Center Station tail tracks structure.

The tunneling method alternatives would have a short horizontal transition distance from the 5th Street section of the alignment to the double crossover located before the existing tail tracks structure which would limit the operating speed to 35 miles per hour (mph) as compared to the 55 mph provided by the Project.

**Figure ES.1: Alternative A – EPBM/Open-Face Shield/SEM Project Profile Alternative**



**Figure ES.2: Alternative B – EPBM/SEM Low Alignment Alternative**



- Vertical alignment – Alternative A would have the same vertical profiles as the Project with an average depth of 40 feet to top of rail (TOR) below ground level. The vertical alignment of Alternative B has a “sag” or low point of 105 feet to TOR below ground level. The sag alignment reduces the probability of the tunnel alignment impacting the 4th Street Bridge foundations, and encountering tie-backs located under Flower Street between 4th Street and just south of 5th Street. Alternative B’s lower alignment profile results in a greater depth for the 2nd/Hope Station (128 feet) compared to the Project and Alternative A (96 feet).

## Summary of Findings

Based on the environmental analysis in the SEIS and the engineering analysis documented in the *Draft Flower Street Tunneling Methods Alternatives Report*, the construction method alternatives would not perform as well as the Project in meeting purpose and need, would impact Metro operations, would pose construction and safety risks, and would result in environmental impacts, as summarized below.

- **Purpose and Need** – Alternatives A and B would not perform as well as the Project in meeting the purpose and need identified for the Regional Connector project. While they would provide an improved regional connection, implementation of these options would result in reduced operating speeds on the Flower Street segment – 35 mph compared to 55 mph provided by the Project. There would be a corresponding increase in travel times for Gold, Blue, and Exposition Line passengers, as well as for passengers transferring from the Red and Purple Lines. The speed reduction resulting from the tunneling method alternatives would have permanent negative operational effects over the Project due to increased travel times for the operational life of the Regional Connector project.
- **Construction and Risk Considerations** – Construction along the Flower Street segment must address significant challenges including physical operational challenges, difficult surface and underground conditions, and challenging geologic conditions. The geologic conditions include the presence of groundwater, unstable soils, a challenging geologic interface between different soil and rock strata (mixed-face), and hazardous gases. The Project was defined to address those constraints given the segment’s high risk and challenges. The tunneling methods proposed by Alternatives A and B would result in significantly higher construction risks, a longer construction schedule, and a higher project cost. The higher construction risks include increased risks of ground instability, loss, and settlement which could threaten public and worker safety.
- **Operational Considerations** – The speed reduction resulting from Alternatives A and B would have negative impacts on rail service headways, run times, and operations over the Project. With a slower operating speed – one-third slower than Metro operational requirements – Alternatives A and B would negatively impact passengers using the Gold, Blue, and Exposition Lines, as well as passengers transferring from the Red and Purple Lines at the 7th Street/Metro Center Station. Metro would be required to operate additional trains and increase the fleet size by approximately six vehicles with a corresponding increase in capital and operational costs. It should be noted that the Project and Alternatives A and B have been

designed to allow for a future 5th/Flower Station. Construction of this station would result in slower operating speeds in the Flower Street segment as the closer station spacing would not allow the LRT trains to reach the desired 55 mph speed. While both alternatives would allow for a future 5th/Flower Street Station, the resulting station configuration for Alternatives A and B would not allow for cross-platform transfers negatively impacting passenger convenience, especially for visitors and infrequent users. Implementation of Alternatives A and B would result in a permanent, substandard operating segment at the heart of the region's LRT system.

- **Schedule Impacts** – Implementation of Alternatives A and B would delay start of revenue service by a minimum of 3.0 years beyond the Project's schedule. The increase in schedule is partially due to longer construction timeframes – 15 and 7 months for Alternatives A and B respectively. In addition, both alternatives would require an additional 29 months over the Project's schedule for pre-construction activities required to revise the engineering design and re-procure the design-build construction contract. A longer construction time would increase the project cost and delay operation of this much needed segment in the region's LRT system.
- **Cost and Funding Considerations** – Based on a cost analysis similar to that performed for the Project, the higher risk for Alternatives A and B translates to \$67 to \$123 million more for the baseline Year of Expenditure (YOE) cost for the Flower Street segment beyond the cost identified for the Project. Given the higher risk level, a range of an additional \$276 to \$403million would be required for the construction of Alternatives A and B beyond that identified for the Project. Funding for these additional costs will need to be identified among limited federal, state, and local sources.
- **Environmental Considerations** – The two tunneling method alternatives shift a majority of the effects resulting from the handling of excavation materials from the Flower Street segment, a high-rise commercial district with wide streets, to Little Tokyo, a low to mid-rise mixed use district with visitor and cultural destinations, and identified as an environmental justice community. Use of grouting equipment, required for Flower Street segment ground stabilization for construction of the two alternatives would result in adverse visual, noise and vibration, air quality, and traffic effects during construction that may not be mitigated.

Based on the above conclusions, it was determined that the proposed tunneling alternatives in Alternatives A and B would result in a higher safety risk, would cost more money, would take longer to construct, and would result in additional adverse environmental effects than the Project. Even with the proposed methods to reduce construction risk associated with tunneling in the weak ground conditions under Flower Street, the tunneling method alternatives have a high risk of ground settlement problems. While implementing Alternatives A and B may be technically possible, for the reasons stated in this paragraph and above, those alternatives were considered infeasible as a matter of sound public policy, and thus were withdrawn from further consideration.<sup>1</sup>

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<sup>1</sup> See *Res. Ltd., Inc. v. Robertson*, 35 F.3d 1300, 1307 (9th Cir. 1997)

**Table ES.1: Overview of Environmental Impacts Due to Construction of the Tunneling Method Alternatives**

Resource Area	The Project	Alternative A	Alternative B
<b>Transportation/ Circulation</b> Flower Street Impacts  Little Tokyo Impacts	<ul style="list-style-type: none"> <li>3 to 4 travel lanes available on Flower Street during construction</li> <li>Even with mitigation, the intersections of 4th, 5th and 6th and Flower Streets would be adversely affected during the AM peak hour. With mitigation, the resulting effect would not be adverse under NEPA.</li> </ul>	<ul style="list-style-type: none"> <li>2 travel lanes available on Flower Street during grouting and construction.</li> <li>Longer duration of traffic lane closure due to 12 months (possibly up to 24 months) of grouting activities.</li> <li>Increases and extends construction truck impacts on Little Tokyo by 15 months.</li> </ul>	<ul style="list-style-type: none"> <li>3 travel lanes available on Flower Street: 4th to 5th Streets; 2 travel lanes 5th to 6th Streets.</li> <li>Longer duration of traffic lane closure due to 8 months (possibly 16 months) of grouting activities.</li> <li>Increases and extends construction truck impacts on Little Tokyo by 7 months.</li> </ul>
<b>Visual Quality</b>	<ul style="list-style-type: none"> <li>Construction staging area along the east side of Flower Street would have negative impacts on the visual quality/character that can be screened.</li> </ul>	<ul style="list-style-type: none"> <li>Construction and grouting staging areas along east side of Flower Street would have adverse impacts on visual quality/character.</li> <li>Impacts cannot be mitigated due to size of grouting and plant equipment (over 100 feet tall).</li> <li>With two grouting areas, this alternative would have a more adverse effect than Alternative B.</li> </ul>	<ul style="list-style-type: none"> <li>Construction and grouting staging areas along east side of Flower Street would have adverse impacts on visual quality/character.</li> <li>Impacts cannot be mitigated due to size of grouting and plant equipment (over 100 feet tall).</li> <li>With only one grouting area, this alternative would have less impact than Alternative A, but more than the Project.</li> </ul>
<b>Air Quality</b> Peak daily emissions	<ul style="list-style-type: none"> <li>During construction, regional construction emissions of VOC, NO<sub>x</sub>, and CO will be adverse, significant and unavoidable under NEPA. With mitigation, localized construction emissions will be reduced to less than significant.</li> </ul>	<ul style="list-style-type: none"> <li>Higher emissions during construction due to use of grouting equipment.</li> <li>Longer duration of construction emissions by 12 months (up to 24 months) on Flower Street; and by 15 months over the Project.</li> </ul>	<ul style="list-style-type: none"> <li>Higher emissions during construction due to use of grouting equipment.</li> <li>Longer duration of construction emissions by 7 months (up to 16 months) on Flower Street; and by 7 months in Little Tokyo over the Project.</li> <li>With only one grouting area, this alternative would have less impact than Alternative A.</li> </ul>
<b>Climate Change</b> MTCO <sub>2e</sub> /year	<ul style="list-style-type: none"> <li>2017<sup>1</sup> GHG emissions would be 4,870.</li> </ul>	<ul style="list-style-type: none"> <li>2017<sup>1</sup> GHG emissions would be 8,040.</li> <li>Higher GHG emissions than the Project due to use of grouting equipment.</li> </ul>	<ul style="list-style-type: none"> <li>2017<sup>1</sup> GHG emissions would be 4,950.</li> <li>Higher GHG emissions than the Project due to use of grouting equipment.</li> <li>Less GHG emissions than Alternative A due to need for only one grouting area.</li> </ul>
<b>Noise and Vibration</b> Flower Street Impacts	<ul style="list-style-type: none"> <li>Noise may inadvertently exceed FTA significance criteria during construction; mitigation measures will control exceedances.</li> </ul>	<ul style="list-style-type: none"> <li>Results in increased construction noise level over the Project due to use of grouting equipment.</li> <li>Possible minor increase in vibration impacts due to TBM use further south on Flower Street.</li> </ul>	<ul style="list-style-type: none"> <li>Results in some noise level increases over the Project due to use of grouting equipment.</li> <li>Results in lower noise level than Alternative A due to need for only one grouting area.</li> </ul>

Note: <sup>1</sup> Mid-point of construction.