



Appendix B

Technical Memoranda and Reports

Disclaimer:

Technical memoranda and reports were prepared as independent documents to support the preparation of the Supplemental Draft Environmental Impact Statement (SDEIS) for the Dallas CBD Second Light Rail Alignment (D2 Subway). Information from these documents was incorporated into the SDEIS to provide information on existing conditions, and in some cases, assess potential impacts to the resources. Information contained in the SDEIS is the most current and supersedes information in the technical memoranda and reports.



B-20

CBD East Alignment and Station Refinement Technical Memorandum



Technical Memorandum

Date: Friday, August 23, 2019

Project: GPC6, C-2012668-02, Task Order #39 Dallas CBD Second Light Rail Alignment (D2 Subway)

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Subject: CBD East Alignment Refinement Technical Memorandum

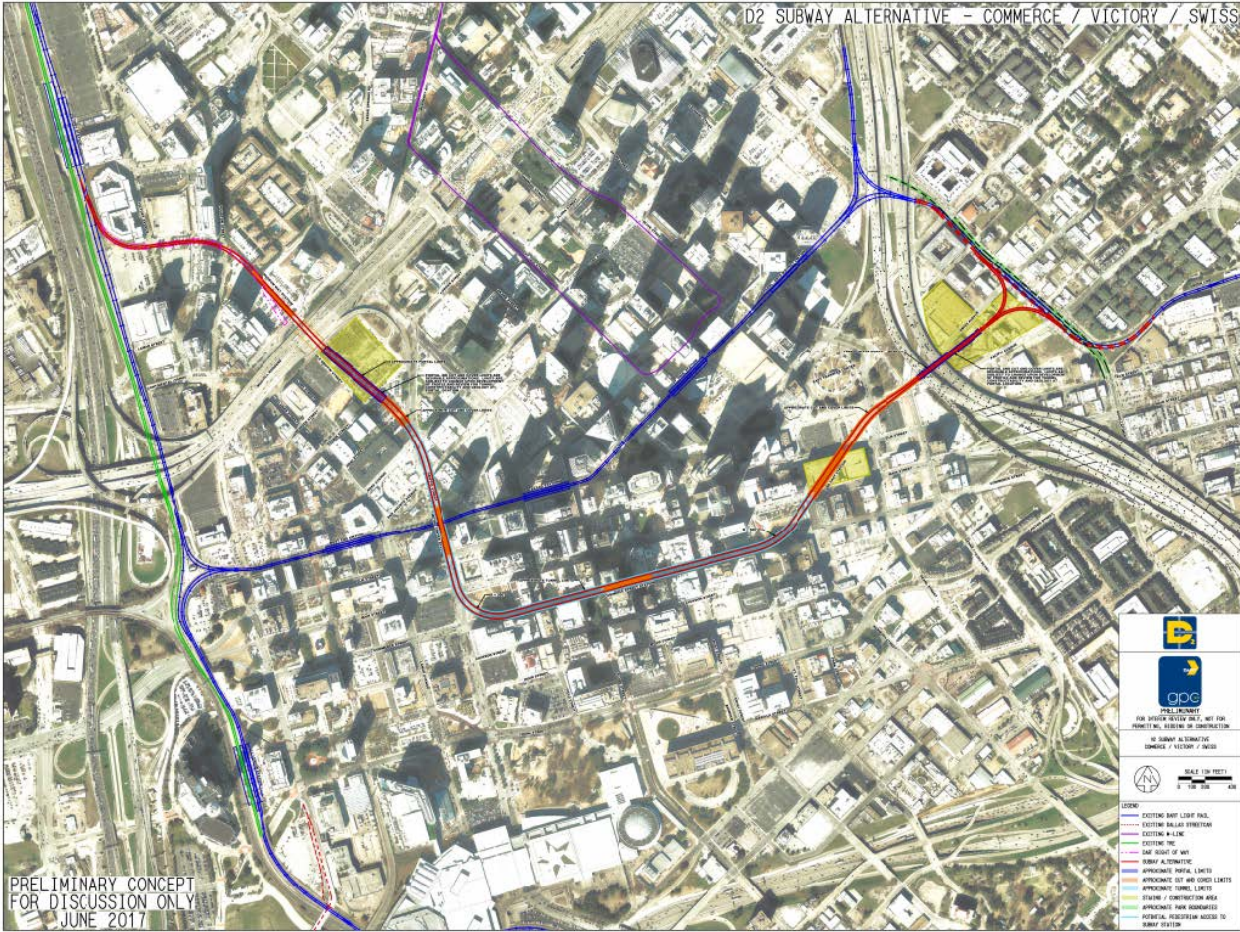
1.0 Purpose

The purpose of this technical memorandum is to document the stakeholder input and technical considerations that led to a recommendation to refine the D2 Subway alignment in the Central Business District (CBD) East area. The following sections describe the original CBD East alignment associated with the Locally Preferred Alternative (LPA), engineering constraints and stakeholder feedback that led to the development of the refinement, and communication to stakeholders, the DART Board of Directors and the City of Dallas regarding the proposed refinement. This memorandum documents the recommendation to advance the CBD East alignment refinement as part of the proposed D2 Subway Build Alternative documented in the Supplemental Draft Environmental Impact Statement (SDEIS) and associated preliminary engineering plans.

2.0 D2 Subway Locally Preferred Alternative (LPA)

The D2 Subway LPA alignment (see Figure 1) was approved in September 2017 by both the DART Board of Directors and the Dallas City Council. In the CBD East area, as the alignment continued east under Commerce Street it would turn northeast under Main Street Garden park and include a CBD East station under the Elm Street Parking Garage, one block south of the East Transfer Center. The alignment then would have turned northeast parallel and south of Swiss Avenue and begin transitioning from subway to at-grade via a train portal under IH 345 and immediately east of Cesar Chavez Boulevard. The alignment would continue parallel to Swiss Avenue at-grade before tying back into the existing light rail system to the north and south at Good Latimer Expressway.

FIGURE 1. D2 Subway LPA Victory/Commerce/Swiss Alignment (June 2017)

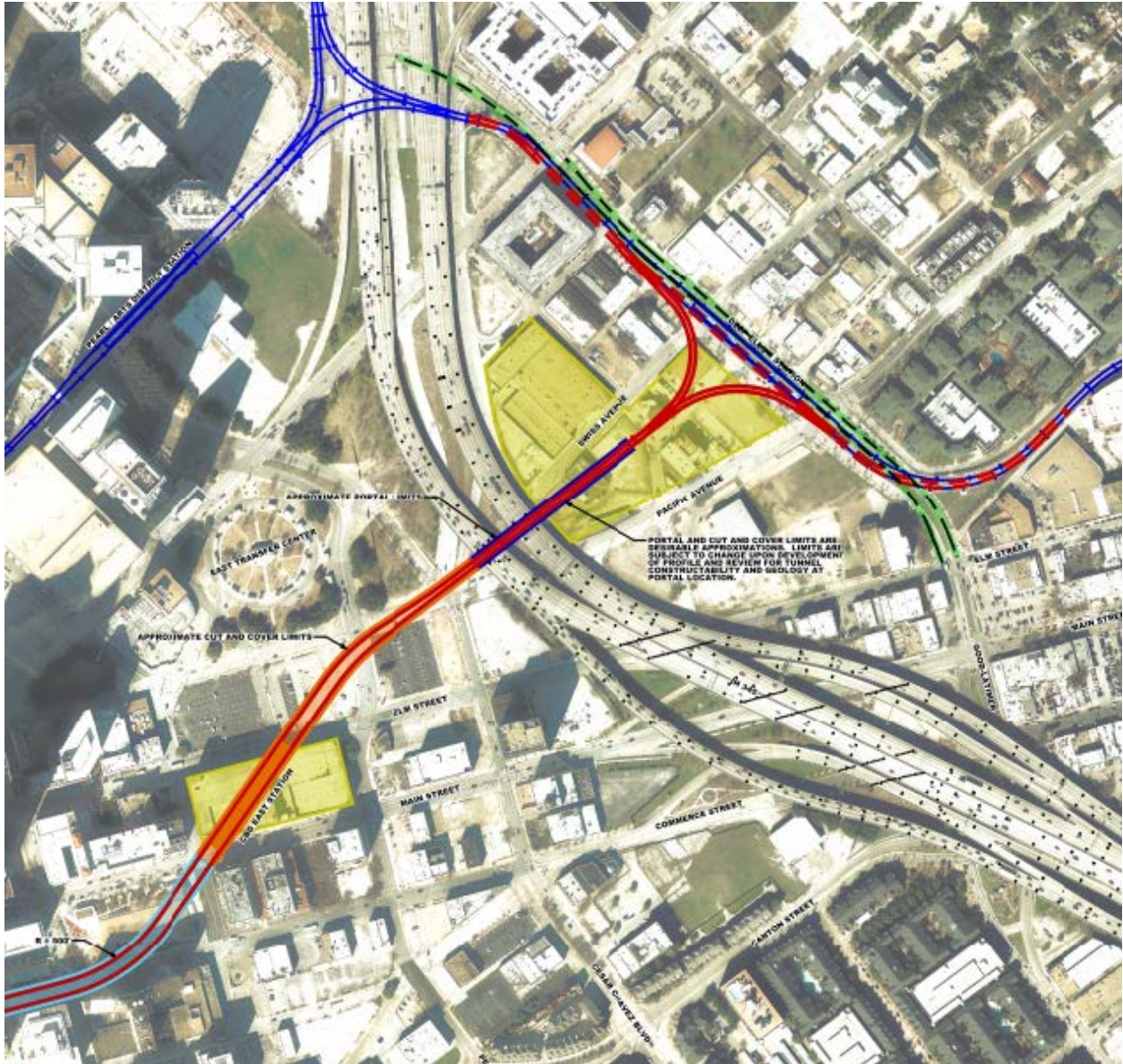


2.1 CBD East Alignment

Figure 2 is an enlarged view of CBD East portion of the 2017 LPA alignment, showing the tunnel portion under Main Street Garden (blue shading) and cut-and-cover and mined construction (orange shading) near and under two adjoining Elm Street parking garages. The CBD East station platform would be directly under the western garage and partially under the eastern one, presenting challenges related to construction.

In addition, there would be potential for minor cut-and-cover construction impacts to the southern boundary of future Carpenter Park improvements. This section of the alignment would pass through surface parking lots and would not impact any existing structures except for the parking garages.

FIGURE 2. LPA CBD East Alignment Area (June 2017)



2.1.1 Engineering Considerations

As part of the Methods of Construction Report, a draft technical memorandum was developed to assess construction of the alignment and station under the Elm Street garages assuming use of the Sequential Excavation Method (SEM). The memorandum documented as-built drawings available for one of the garages and recent geotechnical boring data. Three alternatives were considered to address the conflict of the existing building foundations and mined construction of the CBD East Station:

1. Temporary underpinning and building foundation load transfer to station’s final lining. This approach is not recommended due to the extensive underpinning that will be required and the magnitude of the loads that will need to be supported by the station’s final lining.

2. Permanent underpinning of existing foundations outside the station limits. This requires the use of a permanent framing system and foundations outside the station's limits. This approach is also not recommended since it is considered not practical and of high risk to the existing parking structure.
3. Revising the vertical alignment and relocation of the station. Lowering the vertical alignment and relocating the station in the southwest direction will result in avoiding the underpinning of the existing garage structure and permit the excavation of the station with competent rock cover. Shifting the station and lowering the vertical profile avoids interference with the heavily loaded foundation piers above the station, where the rock cover is less; however, the foundations piers would now be situated above the running tunnel and their impact on the running tunnel will need to be also evaluated. However, shifting the station to the east locates it too close to Commerce Station, and would not be feasible given the alignment curve under Main Street Garden park.

For both underpinning alternatives, in addition to the large number of columns and magnitude of loads that will need to be supported, at least 20 columns would be impacted and could create damages to the existing structure due to extensive structural reframing, jacking and load transfer operations. There would also be time restrictions and parking garage closures to perform the work.

2.1.2 Stakeholder Feedback

In August 2018, DART conducted a series of Focus Area meetings with stakeholders to discuss specific segments of the alignment. The CBD East focus Area meeting was held on August 21, 2018. Approximately 15 stakeholders from the area attended, including businesses and venues that rely on the Elm Street garage, and City of Dallas park representatives. In reviewing the alignment, it was noted that:

- The tunnel under Main Street Garden Park would require a subsurface easement creating potential 4(f) de minimis impact. No direct impacts would be expected.
- The tunnel and subway station under Elm Street Parking Garage presents challenges and the parking garage would require foundation underpinning. Construction activities under the parking garages may require closure of the garages for an extended period, pending further analysis.

Stakeholder input confirmed the critical importance of public parking for the area for both businesses that lease spaces, and for venues such as the Majestic Theater. Owners of the Elm Street parking garages recently confirmed plans for expansion and further development, including the addition of seven floors of parking on the east garage. This expansion is anticipated to occur in 2020.

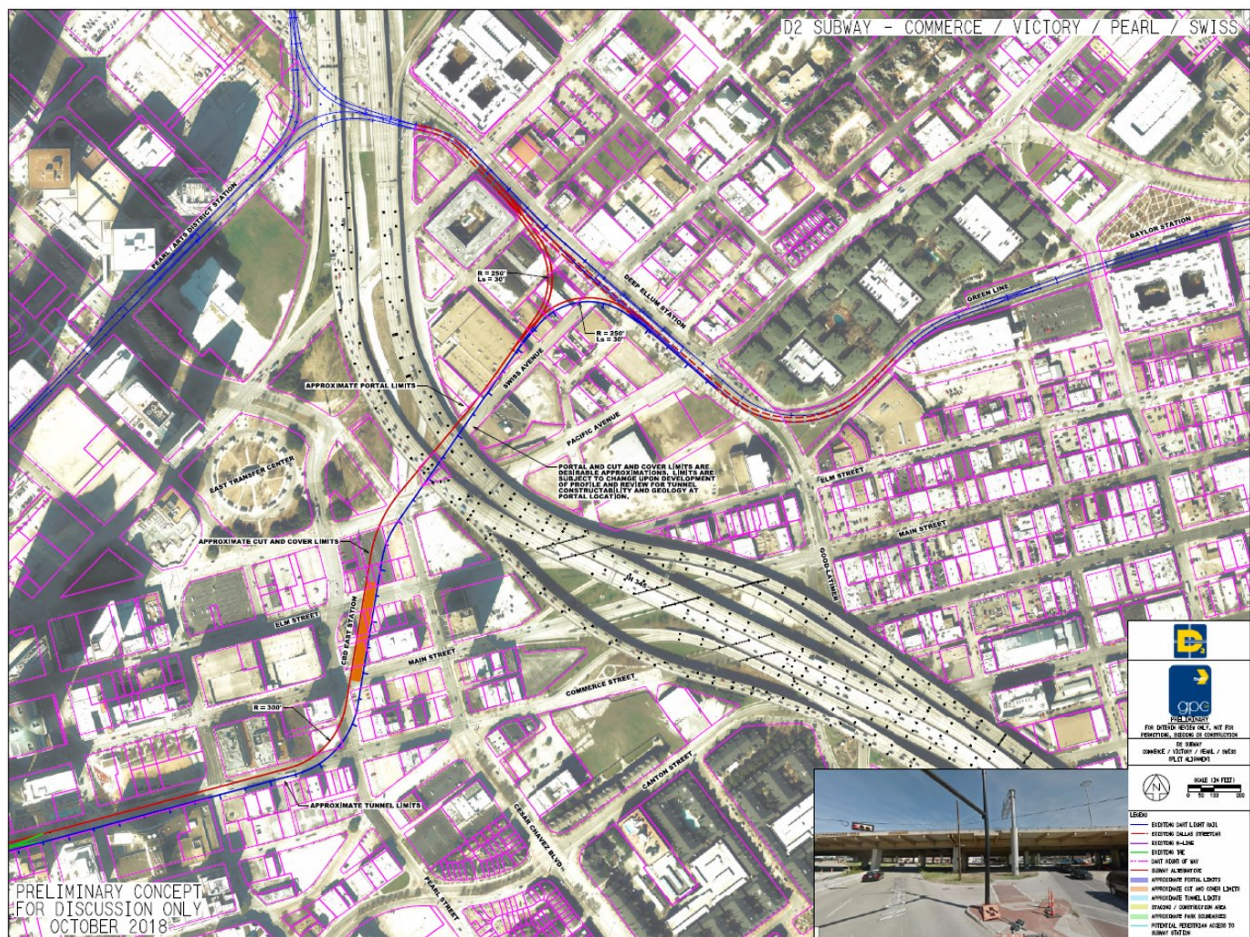
Park representatives also voiced concern with the potential for tunnel-to-surface transition impacts along the southern edge of future Carpenter Park. Park construction will begin soon and there would be a need for a subsurface easement with potential 4(f) de minimis impact.

Stakeholders supported the location of the CBD East station based on its proximity to existing DART East Transfer Center, for ease of transfer from bus to rail. They also believe there are significant development opportunities in the area given the underutilized parking lots nearby.

3.0 CBD East Alignment Refinement

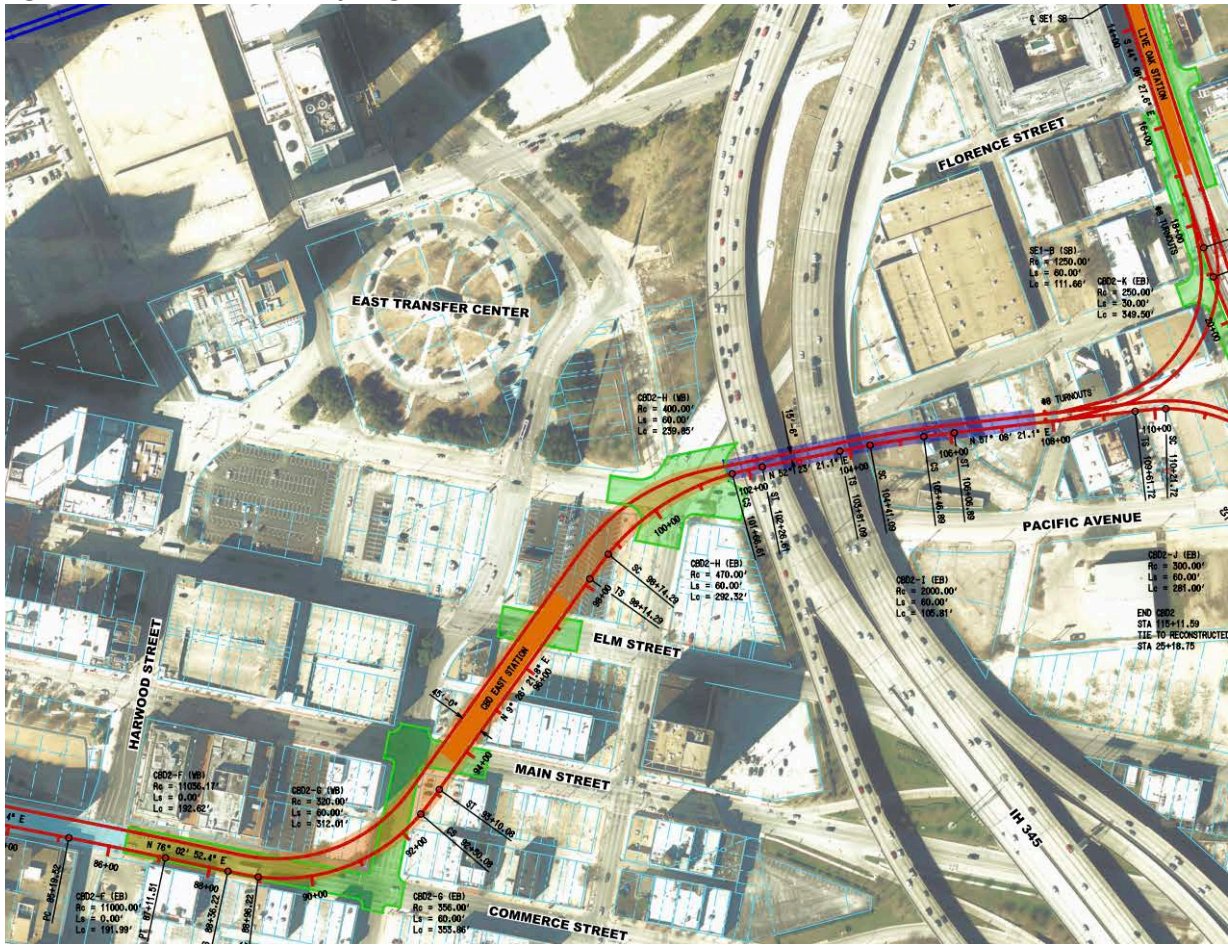
In response to comments from CBD East stakeholders, as well as due to engineering concerns with underpinning the garages and potential park impacts, a CBD East alignment refinement was developed. The refinement was developed with a focus of avoiding any potential impact to both the Elm Street garages, existing Main Street Garden Park and future Carpenter Park. This alignment would begin to curve north at Pearl Street instead of Harwood. Figure 3 depicts the CBD East alignment refinement concept presented in October 2018. Figure 4 illustrates the latest CBD East alignment which was adjusted to allow for a station at Live Oak and to accommodate operational needs between the two junctions.

FIGURE 3. CBD East Elm Street Garage Avoidance Concept (October 2018)



Note: Above graphic was subsequently changed to include south of Swiss connection with Live Oak Station.

Figure 4. Current D2 Subway Alignment in CBD East Area



The refined alignment offers several advantages and new opportunities, but also presents new impacts to private property. A summary of key observations with the refinement are as follows:

- Avoids any potential impact to Main Street Garden park.
- Realignment of tunnel and relocation of subway station location avoids any impact to the Elm Street parking garages.
- Cut and cover portion of alignment avoids any potential physical impacts to the planned Carpenter Park improvements.
- Avoids any impact to the large surface parking lots along Main Street immediately to the north of the Elm Street Parking Garages, which have potential development opportunity. However, the refined alignment would impact smaller surface parking lots between Pacific Avenue and Commerce Street. The alignment would still allow for air rights development.
- Acquisition of at least two small buildings at 2107/2109 Main Street (printing business) and 2204 Elm Street (small nightclub) would be required, including relocation of businesses. These structures were surveyed as part of the historic resource documentation.
 - The Texas Historic Commission (THC) concurred on April 12, 2019 that 2107/2109 Main Street and 2202 Elm Street are not eligible for the National Register of Historic Places (NRHP) listing due to being architecturally altered.

- Impacts to 2121 Main Street, which was the original Central Fire Station, are not anticipated. This structure is also not eligible for the NRHP.
- The relocated CBD East Station has similar transfer distance to DART East Transfer Center as the original LPA Alignment.
- Location of the CBD East Station would improve accessibility to Deep Ellum, Farmers Market and the redeveloping East Quarter area.
- The refined alignment introduces tight radii and minimum tangents at ends of the platform; however, speeds will be slower coming in and out of the station.
- The cost of the refined alignment would likely be slightly lower given the avoidance of significant engineering requirements or potential acquisition or closure of the Elm Street garages.

4.0 Communication to DART Board, City of Dallas, and Stakeholders

The CBD East alignment refinement was developed in October 2018 after the August 2018 CBD East focus area meeting and follow up one-one meetings regarding alignment concerns with owners and users of the Elm Street garage as well as Parks for Downtown Dallas representatives. The modification was first reviewed with the DART Planning Committee on October 30, 2018 and was discussed with City staff at bi-weekly meetings and the City Council Mobility Solutions, Infrastructure and Sustainability (MSIS) Committee Chair on December 13, 2018 and January 10, 2019. After that, several meetings were held to communicate the proposal to move forward with this modified alignment. There has been support for this proposal as a reasonable modification, and advancement was discussed at the February 26, 2019 Planning Committee meeting.

The list below reflects the broad range of stakeholders involved in this process.

- Federal Transit Administration (FTA) Quarterly Meetings
- FTA/Project Management Oversight Contractor (PMOC) Bi-weekly phone calls
- PMOC monthly meetings
- DART Planning Committee presentations
- Chair of the MSIS Committee
- City of Dallas Staff
- Downtown Dallas Incorporated (DDI) management team
- DDI Mobility Committee
- Parks for Downtown Dallas
- TXDOT
- Deep Ellum Foundation
- Individual property owners and stakeholders

Key meeting dates where the alignment refinement was presented and discussed is as follows:

- Stakeholder Meeting – October 24, 2018
- DART Planning Committee Presentations
 - October 30, 2018
 - November 13, 2018
 - December 11, 2018
 - February 26, 2019
 - March 26, 2019

During the course of review with the DART Planning Committee, DART provided a letter to the City of Dallas dated February 22, 2019 that this refinement would be incorporated into the project. This recommendation was subsequently reviewed with the public and stakeholders at the following meetings:

- CBD East Focus Area Meeting – March 28, 2019
- Stakeholder Meeting – April 18, 2019
- Public Meeting – April 25, 2019
- City of Dallas – April 26, 2019 Meeting with Dallas Committee Chair Kleinman, and Transportation staff Michael Rodgers, Gus Khankarli, Raymond Chong

5.0 Recommendation

In summary, the recommendation to refine the alignment in the CBD East area is based on several factors:

- Technical review of the vertical and horizontal alignments, geology, size and geometry envisioned for the mined station, potential cover of competent rock, proximity and interference with the existing garage foundations and an assessment of the possible loading conditions for the CBD East Station at its planned location led to a determination that modifications to the vertical alignment and a relocation of the station would be necessary.
- Stakeholder feedback supported not disrupting the existing parking at Elm Street garages, given the strong need for parking for business and venues in the area. Overall stakeholder feedback on the refinement was positive although there was concern from newly affected property owners.
- The DART Board of Directors, and City of Dallas management staff reviewed the refinement and indicated support to continue to advance it as part of the project.

The slight modification to the alignment in the CBD East area is similar enough to the approved LPA in terms of location, scope and cost that new LPA vote was determined to not be necessary. Project refinements are typical during this phase as more design details are known. A more significant change that would re-route a larger segment of the alignment and affect scope and cost beyond what is contained in the DART Financial Plan would likely require a vote by the DART Board and an amendment to the Financial Plan.

Once the SDEIS document is available for public review, a public hearing will be held to obtain comments for on the SDEIS, as well as on a DART Service Plan amendment. DART Board approval of this amendment will outline the alignment, stations and grade separations that will be advanced in the FTA Engineering phase. The Dallas City Council will need to approve the addition of the project to the Service Plan.