



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-22

North vs. South of Swiss Good Latimer / Green Line Connection Technical Memorandum



Technical Memorandum

Date: Friday, October 11, 2019

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

To: Kay Shelton, DART Capital Planning
Ernie Martinez, DART D2 Project Manager

From: Tom Shelton, GPC6 Program Manager
James Frye, D2 Subway Project Manager
Israel Crowe, D2 Subway Engineering Manager

Subject: North vs. South of Swiss at the Good Latimer / Green Line Connection

1.0 Purpose

This purpose of this technical memorandum is to document the recommended alignment for the D2 Subway project along the Swiss Avenue Corridor for the connection to the Green Line. The following sections describe the September 2017 Locally Preferred Alternative (LPA), which included a connection to the Green Line using an alignment south of Swiss Avenue, and also describes an option of using an alignment north of Swiss Avenue. The north of Swiss Avenue option was developed in response to the concerns of property owners south of Swiss. This memorandum documents the recommendation to remain south of Swiss Avenue as part of the proposed D2 Subway Build Alternative as documented in the Supplemental Draft Environmental Impact Statement (SDEIS) and associated preliminary engineering plans.

2.0 D2 Subway Alignment

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 eastern end of downtown, the original alignment continued under Commerce Street and turned northeast under Main Street Garden park and included a CBD East station under the Elm Street Parking Garage. Once it passed under Cesar Chavez it continued east, parallel to and south of Swiss Avenue and began transitioning from subway to at-grade via a train portal under IH 345. The part of the alignment west of Cesar Chavez was refined in late 2018 (see CBD East Alignment Refinement Technical Memorandum) to avoid impacts to the Elm Street parking garage. As shown in Figure 2, the refined alignment shifts to the east by one block and continues to follow parallel to and south of Swiss Avenue at-grade before tying back in to the existing light rail system through a wye junction that allows travel to the north and south on the existing tracks on Good Latimer Expressway. The existing Deep Ellum Station would be removed due to the new junction. Figure 2 shows the alignment with a potential infill Live Oak Station that was being evaluated in summer 2019 due to public support to retain a station in this area.

FIGURE 1: D2 Subway Original LPA - Victory/Commerce/Swiss Alignment – June 2017

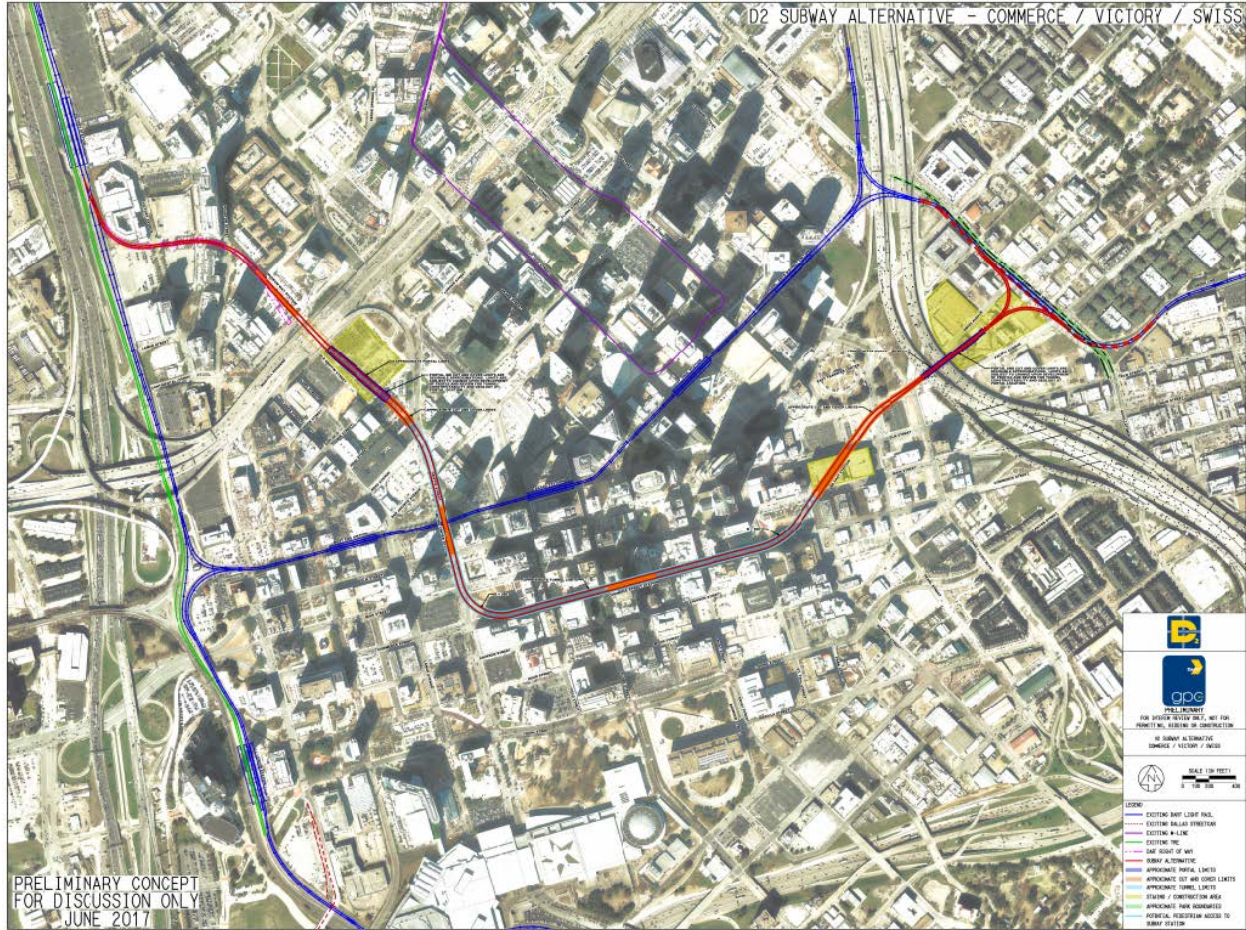
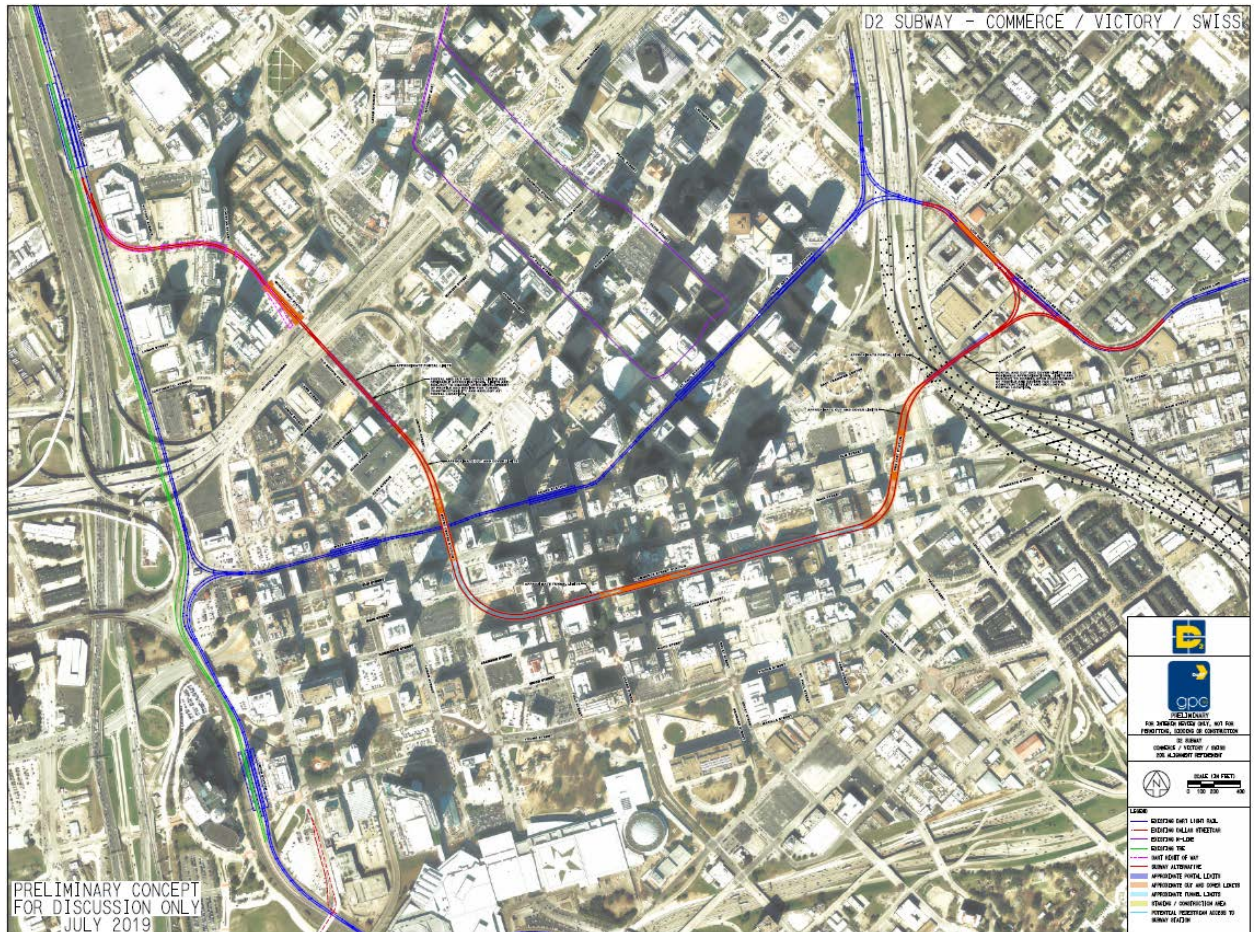


FIGURE 2: D2 Subway Refined LPA Alignment – July 2019



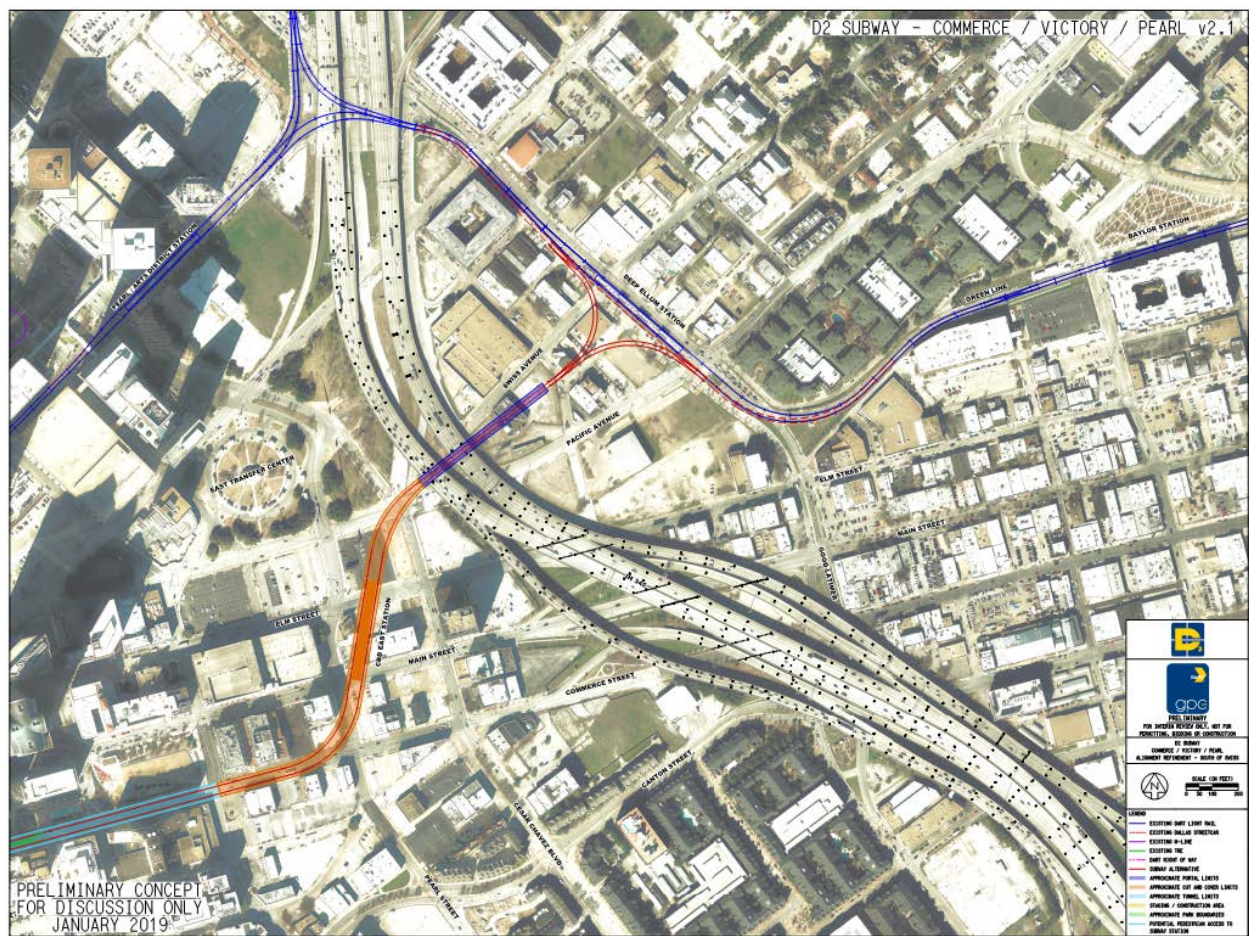
3.0 Swiss Avenue Options

A design charrette was held with Deep Ellum Stakeholders in April 2017 during the D2 Subway LPA Refinement Phase to assist in determining how D2 would connect to the existing Green Line. The charrette resulted in many suggestions for the Swiss Avenue connection, ranging from north of Swiss, along Swiss, and south of Swiss. The south of Swiss option was discussed at the charette and incorporated into the LPA that was approved in September 2017.

3.1 South of Swiss Option

The south of Swiss alignment has evolved over time to include the Live Oak Station. Figure 3 is an enlarged view of this segment prior to the inclusion of the Live Oak Station. This south of Swiss option was included in the 10% preliminary engineering plans to connect to the Green Line. Subsequent to the 10% design submittal, the alignment was adjusted slightly to allow for the addition of the Live Oak Station as shown in Figure 2.

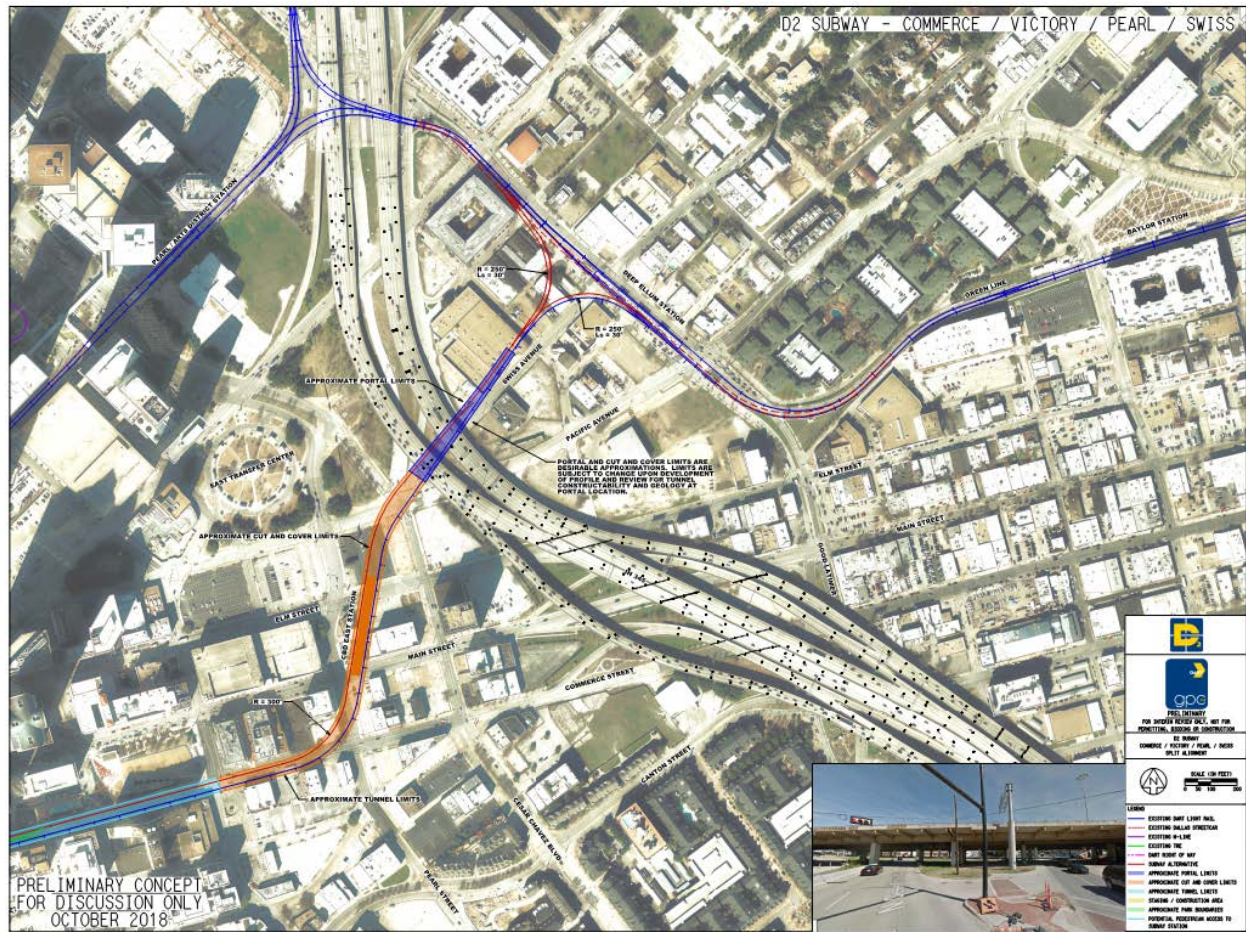
FIGURE 3: South of Swiss Option with Refined LPA Alignment (as of January 2019)



3.2 North of Swiss Options

North of Swiss options were also developed during the subway refinement phase in 2017. During early Project Development outreach activities in 2018, stakeholders along Swiss Avenue asked about shifting the alignment to north of Swiss Avenue to minimize impacts to existing and planned developments south of Swiss. DART developed a variety of north of Swiss options and carried one option through early preliminary engineering as a design option along with the south of Swiss option. Figure 4 illustrates the north of Swiss option with the refined alignment. This north of Swiss option splits the alignment tracks (eastbound, westbound) around the IH 345 piers to avoid direct impact to the highway facility, but it would require some slight reconfiguration and raising of Cesar Chavez Boulevard, potentially with a narrower cross section. Impacts to Carpenter Park would be minimal and would likely be temporary due to cut-and-cover construction on the southern edge.

FIGURE 4: North of Swiss Option with Refined LPA Alignment



3.2.1 North of Swiss Options with Original LPA Alignment

Several other variations of the north of Swiss option were examined during the subway refinement phase in 2017 prior to LPA approval and prior to the CBD East refinement. These are documented in this memorandum to illustrate the history of this option and the potential impacts associated with a north of Swiss alignment under the original LPA. Figures 5 through 7 show three north of Swiss connection options developed in 2017. Some of these shifted the alignment even further north to minimize property impacts south of Swiss Avenue. As shown, these “north of Swiss” options all had significant impacts to Carpenter Park and would require closure of Cesar Chavez Boulevard. As a result, they were not favorably received by Parks for Downtown Dallas and the City of Dallas.

FIGURE 5: North of Swiss Option (Commerce-NS1) – June 2017

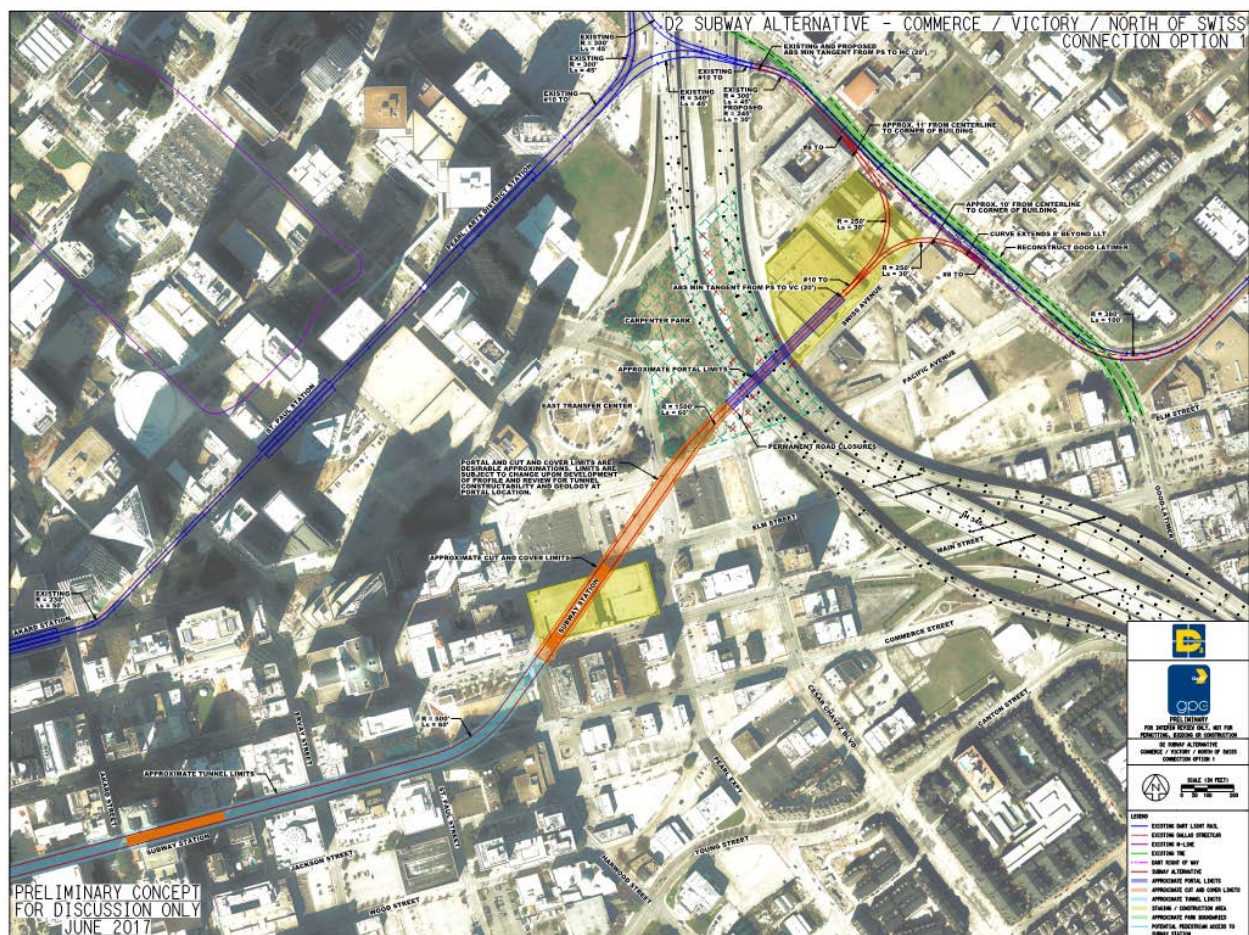


FIGURE 6: North of Swiss Option (Commerce-NS1A) – June 2017

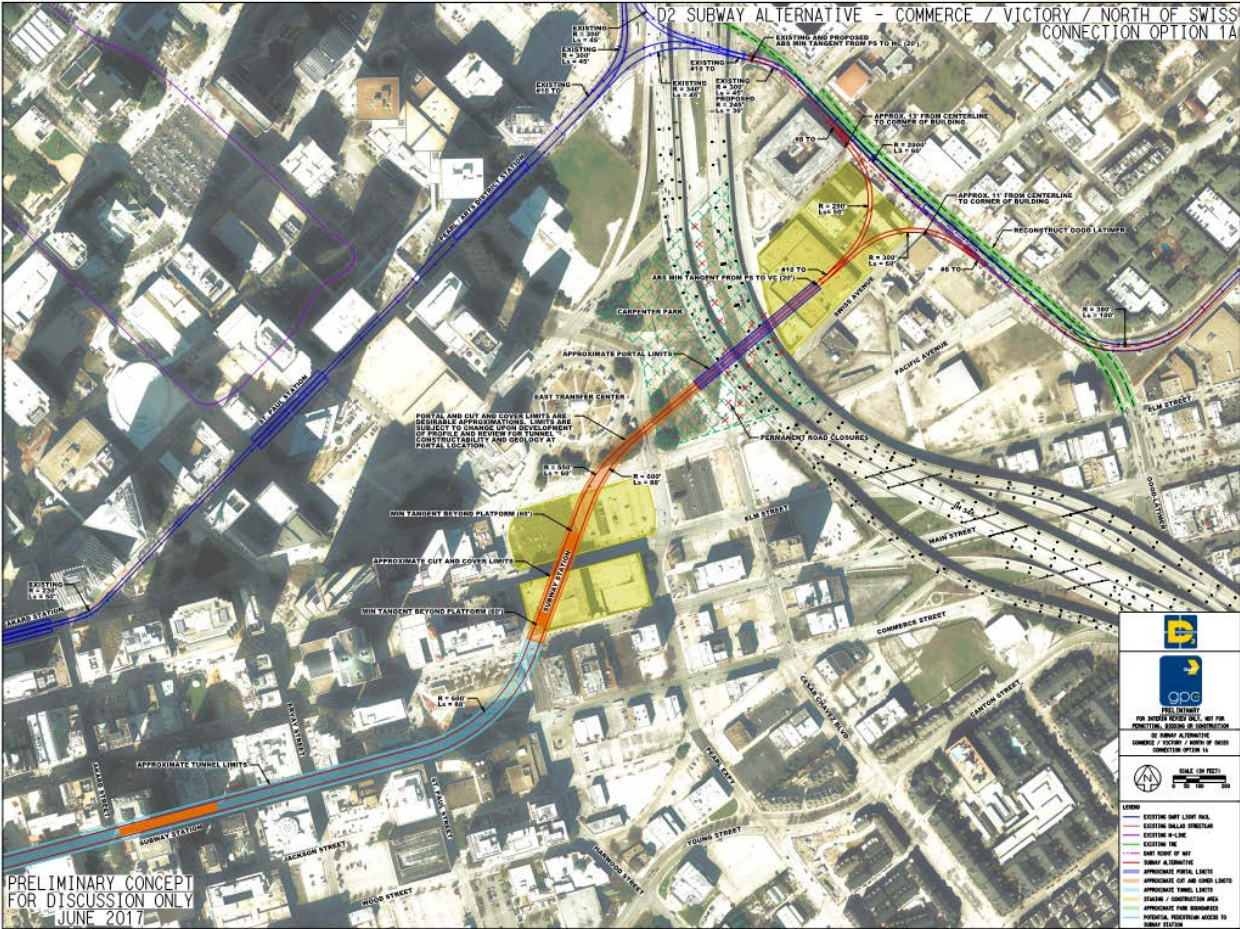
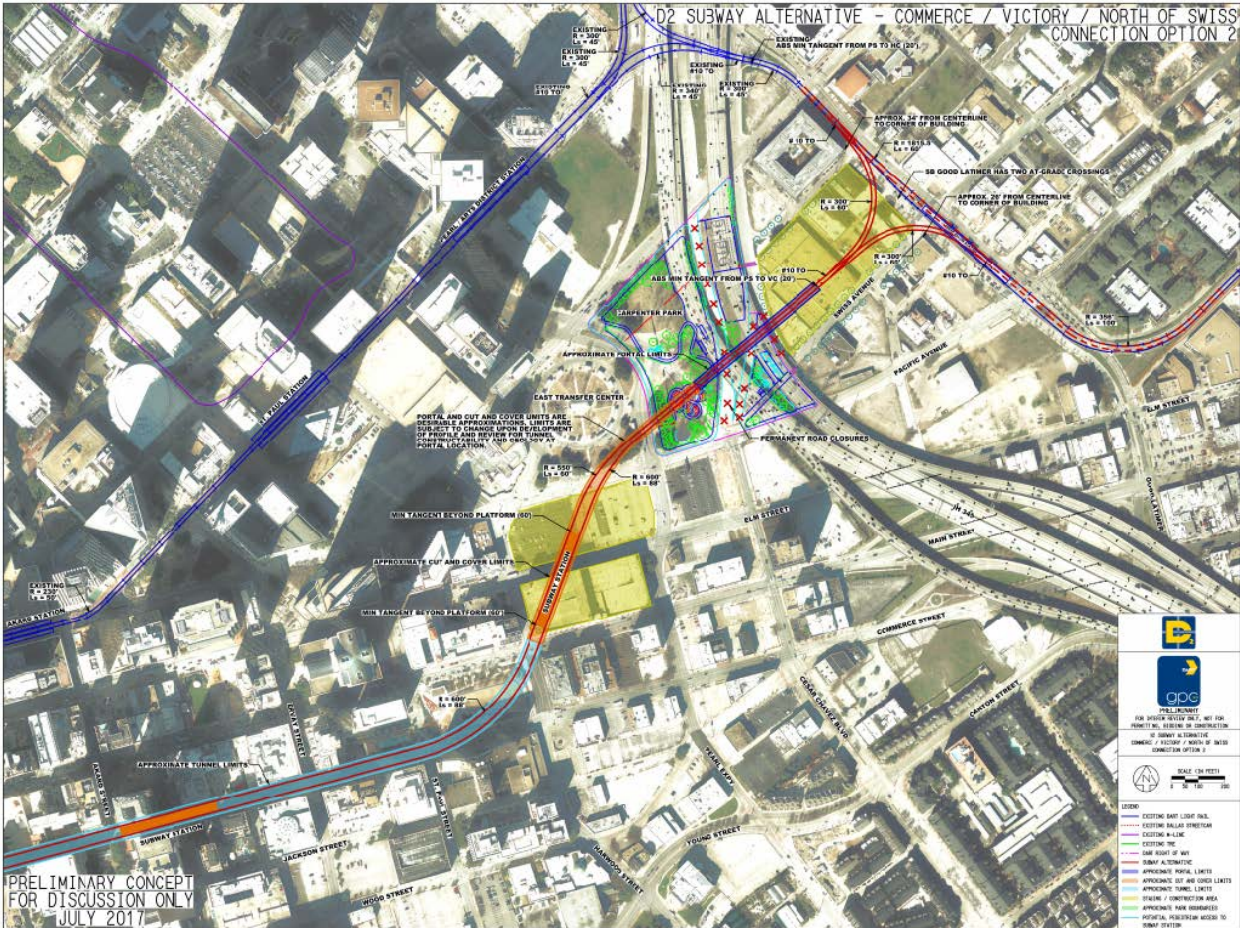


FIGURE 7: North of Swiss Option (Commerce-NS2) – June 2017



4.0 Review of Swiss Options

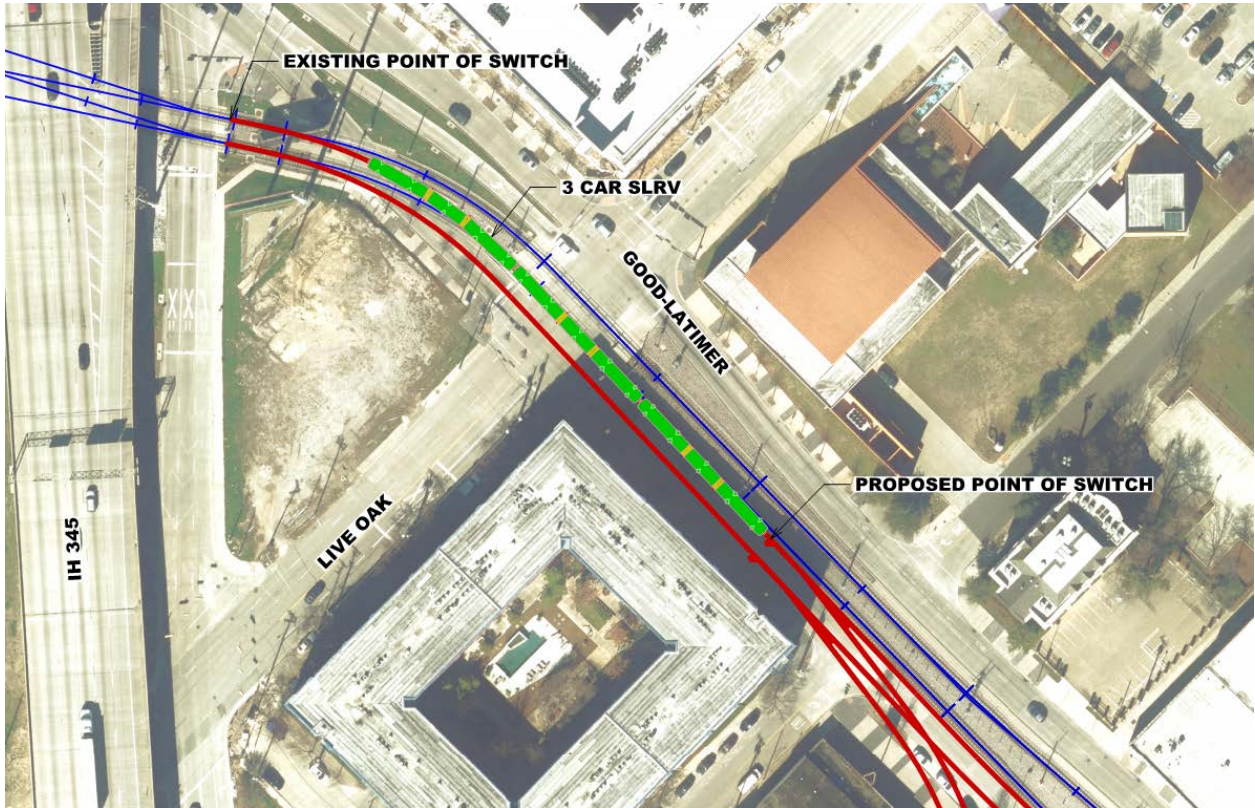
In late 2018 through early 2019, prior to submitting the 10% preliminary engineering plans, a variety of coordination meetings were held with the D2 Subway Team and DART Department staff to receive feedback on the Swiss options, as well as the CBD East refinement, in order to advance one Swiss option. Key considerations discussed with the Operations, Maintenance and Engineering staff are documented below.

4.1 Operational Concerns with the North of Swiss Option

A key concern expressed by DART staff related to operations with two junctions spaced closely together, specifically the availability of space to park a 3-car train between the junctions. Although there is enough space, stopping a train between the junctions would block Live Oak Street, a major east-west cross street (see Figure 8). Live Oak Street carries significant vehicular, bicycle and pedestrian traffic in and out of downtown. Stopping a train within Live Oak Street would be unacceptable to the City of Dallas and the local community. A related concern was whether the train could be stopped south of Live Oak

Street without any impacts. It was concluded that stopping the northbound train at Live Oak Street would block southbound Good Latimer auto traffic and southbound trains that may be destined to toward Fair Park. Figure 8 shows this situation. Therefore, it was determined there is not enough room to safely store a vehicle between junctions for the north of Swiss alignment option without significant impacts to Live Oak Street and the adjacent community, and that a train cannot be parked south of Live Oak without affecting southbound auto and train movements.

FIGURE 8: North of Swiss Alignment with LRT Vehicle Blocking Live Oak auto traffic



In addition to introducing auto/train conflicts, placing the junction north of Swiss Avenue also impacts the efficient movement of trains through the existing Southeast Junction and the new Good Latimer/Swiss Junction. Because no refuge exists on Good Latimer between Live Oak Street and the Good Latimer/Swiss Junction for the 3-car train to stop, an Orange Line train traveling through the D2 corridor and turning northbound along Good Latimer and destined for the North Central Corridor would need to make a single, continuous movement between the two junctions. The distance between these two junctions is 1,400 feet. Due to train speeds operating through the curves of both junctions, the run time for this movement will be long if both junctions are tied together. This along with the advance stoppage of train movement made at the new junction and the clearance time associated with fully getting through the existing Southeast Junction, means all northbound Red and Blue Line service leaving downtown must wait for this extended duration. Ideally, train movements through these junctions would be blocked separately, to minimize the stoppage of movements. During peak hour operations, this may result in trains queuing on the transit mall and North Central corridor waiting to be able to enter the Southeast junction to continue on their routes.

4.2 Ability to Include Live Oak Station

In addition to operational concerns of the junction proximity, the inclusion of a station to be able to hold a train and coordinate it with the signaling system at both junctions was desirable. Input from the local community supported a station at this location. An option north of Swiss does not provide this option.

5.0 Recommendation

Remaining south of Swiss allows for a train to stop between the junctions without blocking or locking them out for other movements and not blocking Live Oak Street. This helps to maximize the throughput and capacity of the junctions and better flexibility for special events and emergency operations. This option also allowed the incorporation of the Live Oak Station, which is supported by area stakeholders. Capital costs would be about the same for the two options and is not a factor in selecting the south of Swiss alignment. Based on the above considerations, DART advanced the south of Swiss alignment with Live Oak Station in the 20% design submittal.