



# 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-23**

## **Extended Commerce / Two Portal Alignment Option 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)

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: Extended Commerce / Two Portal Alignment Option Technical Memorandum

## 1.0 Purpose

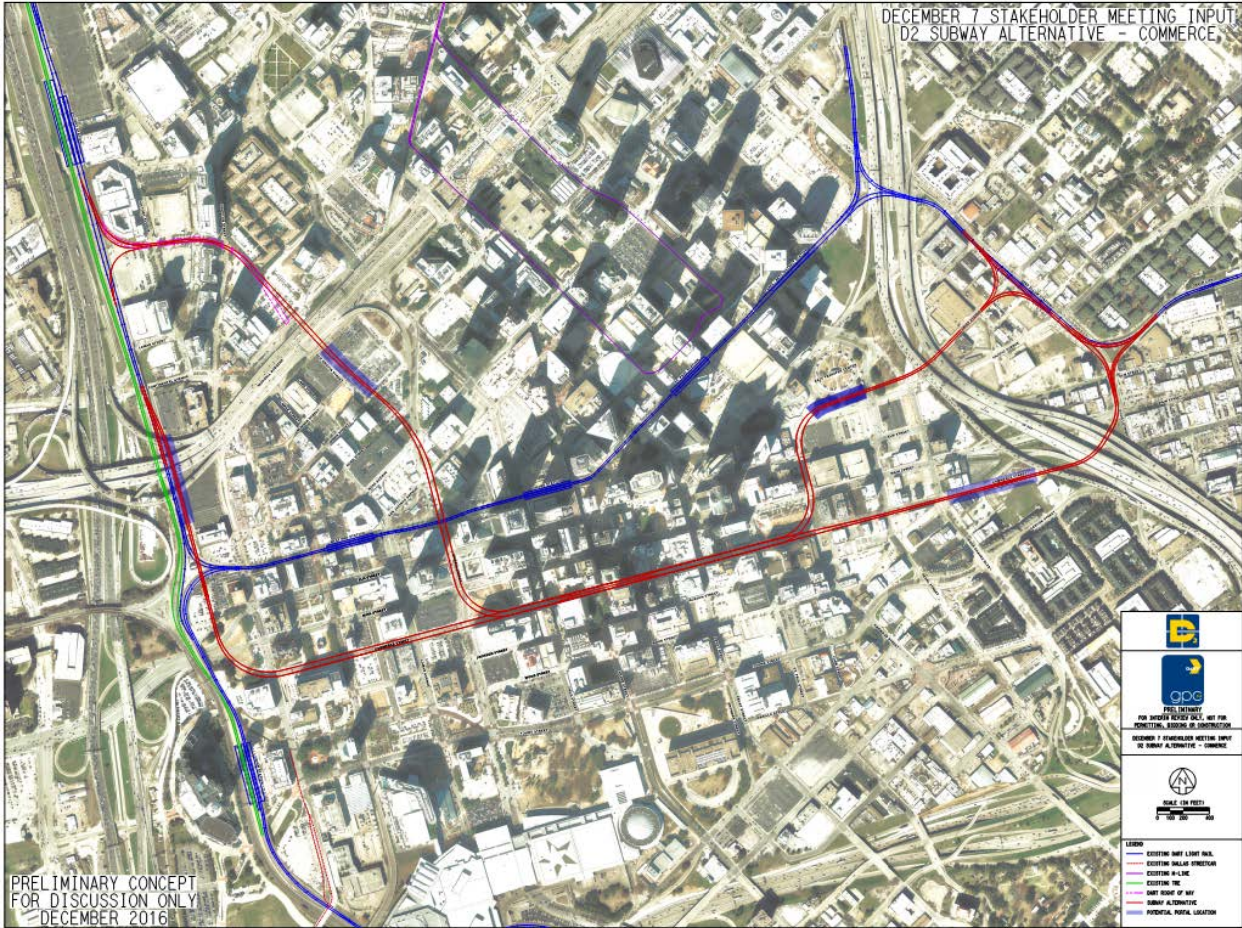
The purpose of this technical memorandum is to document an extended Commerce tunnel option for the D2 Subway which would include a two-portal connection to the Green Line in the Deep Ellum Area. This is known as the Extended Commerce/Two Portal Alignment Option. This concept was evaluated during the 2017 D2 Subway Locally Preferred Alternative (LPA) Subway Refinement phase. During Project Development for the D2 Subway in 2018-2019, a stakeholder suggested this be re-examined.

The following sections describe the D2 Subway LPA alignment, and document the extended tunnel options reviewed with stakeholders and the DART Board. This memorandum documents the recommendation to advance the refined LPA alignment in this area, rather than an extended tunnel option. A reference to this extended tunnel option will be included in the Supplemental Draft Environmental Impact Statement (SDEIS).

## 2.0 Extended Commerce/Two Portal Option Background

In September 2015, the DART Board and Dallas City Council approved a mostly at-grade LPA alignment for the D2 Project. During planning for that alignment, stakeholder feedback was to pursue a subway project. In October 2016, both the Dallas City Council and the DART Board directed staff to develop a subway alignment. DART began a D2 Subway LPA Alignment Refinement phase in December 2016 to establish a new subway LPA for the project. Stakeholder meetings were held in late 2016 and early 2017 to get input on alignment alternatives. Figure 1 shows the Commerce-based alignments that were derived from suggestions in the December 2016 Stakeholder Meeting. The Commerce alignments included two connections on the west end of the project and two connections on the east end of the project. Focusing on the east end of the project, the two connection options included either: 1) Going under Main Street Gardens up to Pacific Ave then over to Swiss Avenue and connecting to the Green Line in Good Latimer, known as the Swiss Avenue connection; or 2) extending along Commerce, under IH 345 at-grade, then turning north on Good Latimer and connecting to the Green Line at-grade.

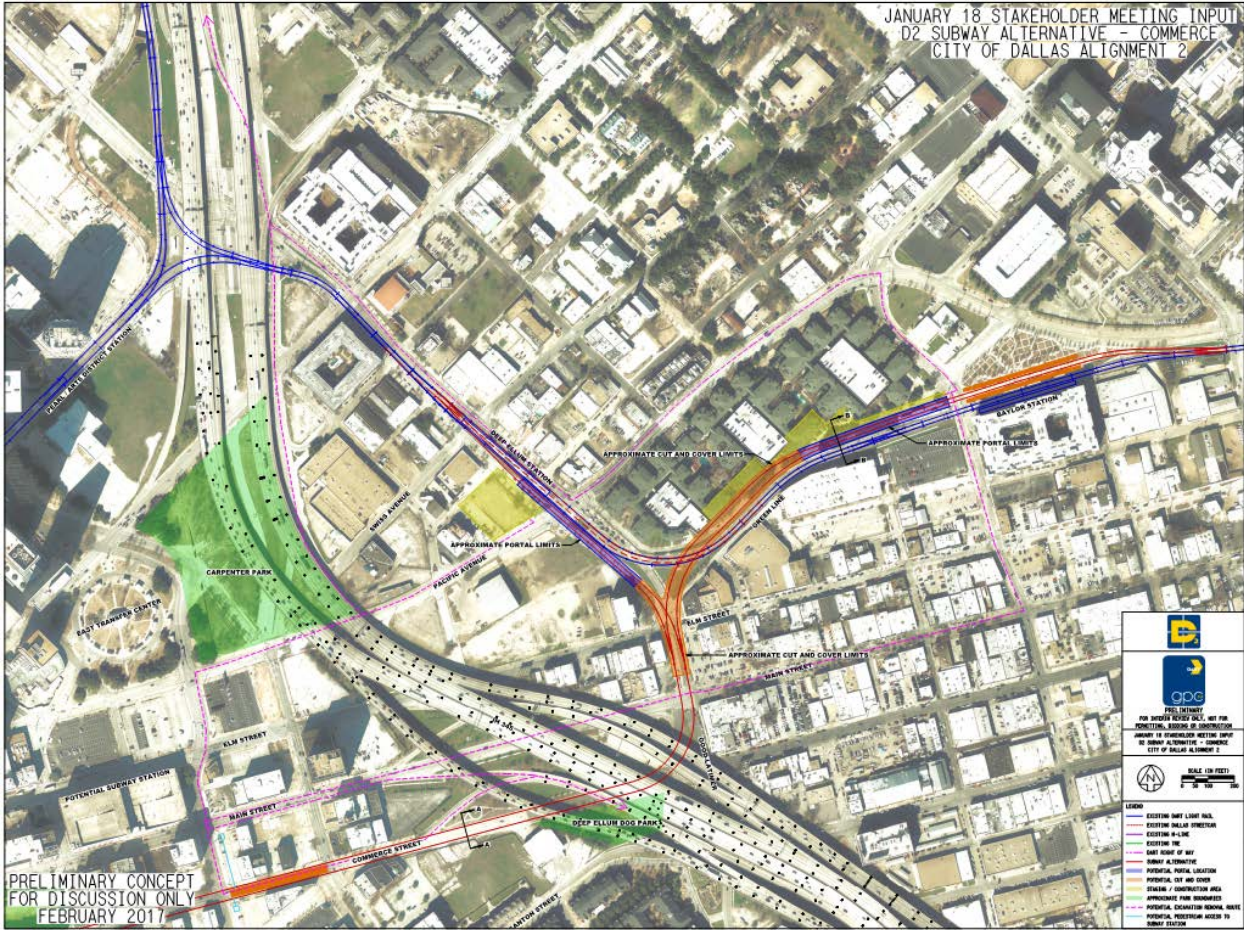
**FIGURE 1. Commerce-Based Alignments from December 2016 Stakeholder Meeting**



At the January 2017 Stakeholder Meeting, a different version of the extended Commerce alignment was suggested. This option can be seen in Figure 2. This option would extend along Commerce underground until it connected to the Green Line where it rises from underground to connect at-grade. This became known as the Extended Commerce Tunnel/Two Portal option. This initial concept placed portals adjacent to the existing Green Line, allowing for an at-grade junction of the tracks.



**FIGURE 2. Extended Commerce Alignment from January 2017 Stakeholder Meeting**



**2.1 Deep Ellum Charette (April 2017)**

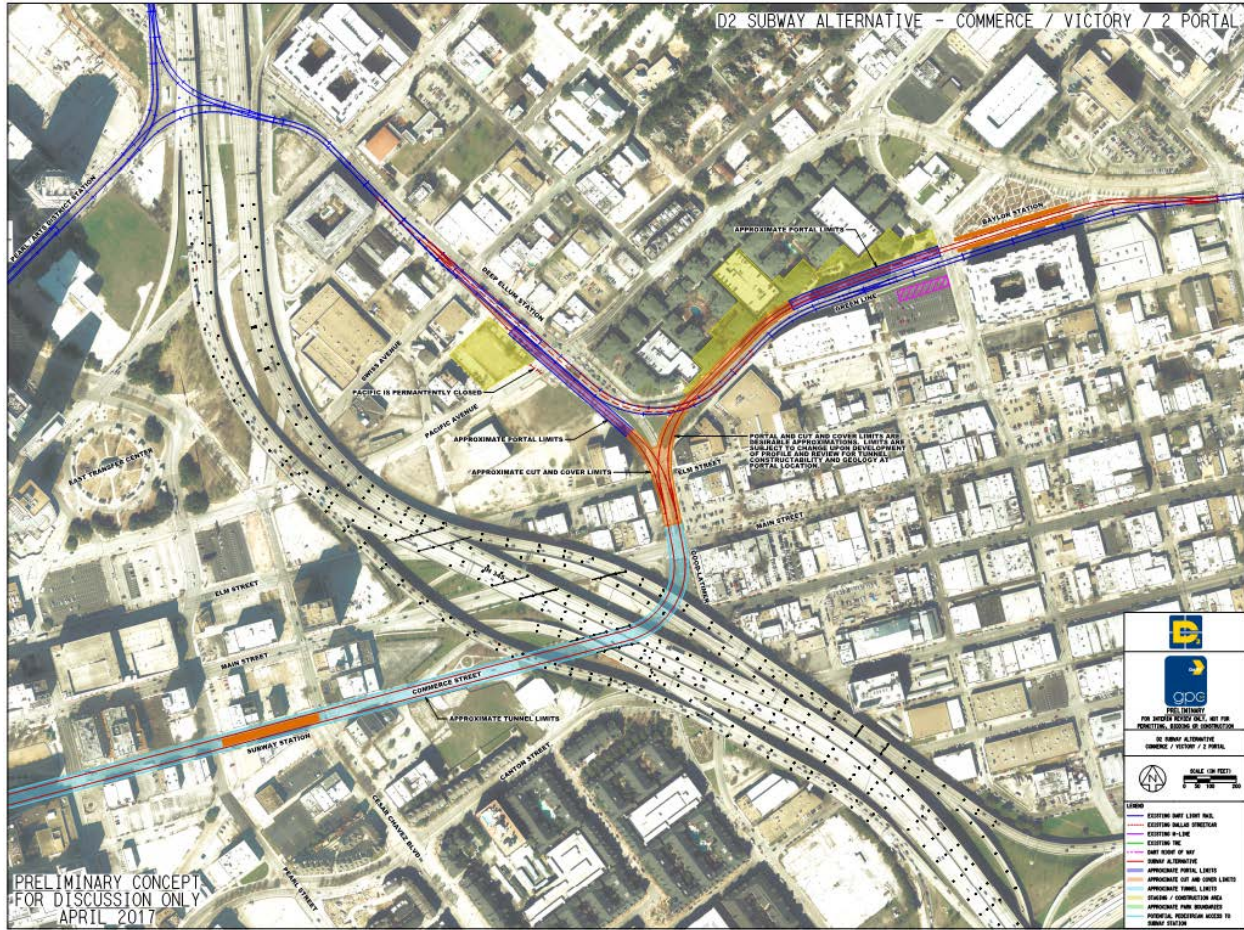
In April 2017, a charette was held in Deep Ellum to focus on the east end connection area with stakeholders to further refine the connection options. Figures 3 through 5 show east end connections that were presented by the D2 Team at the Deep Ellum Charette.







**FIGURE 4. Extended Commerce Alignment from April 2017 Deep Ellum Charette**



**FIGURE 5. Extended Commerce Profile from April 2017 Deep Ellum Charette**

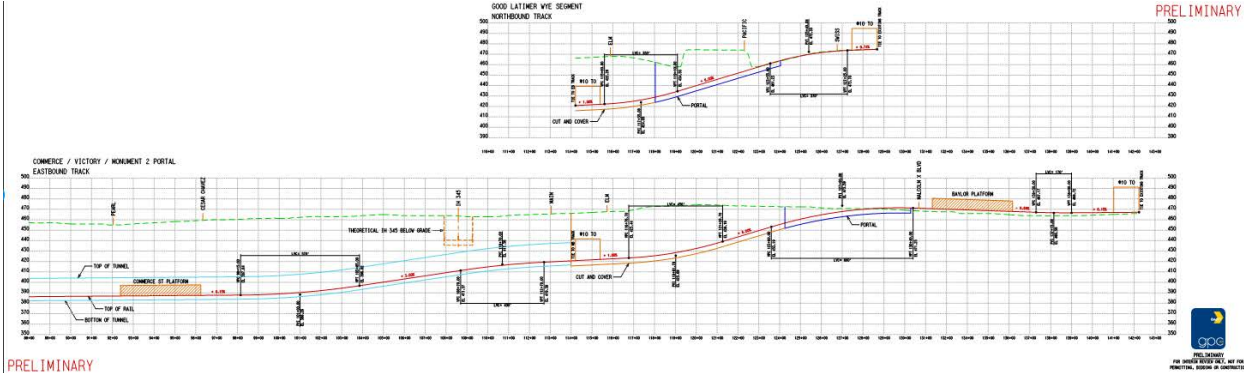
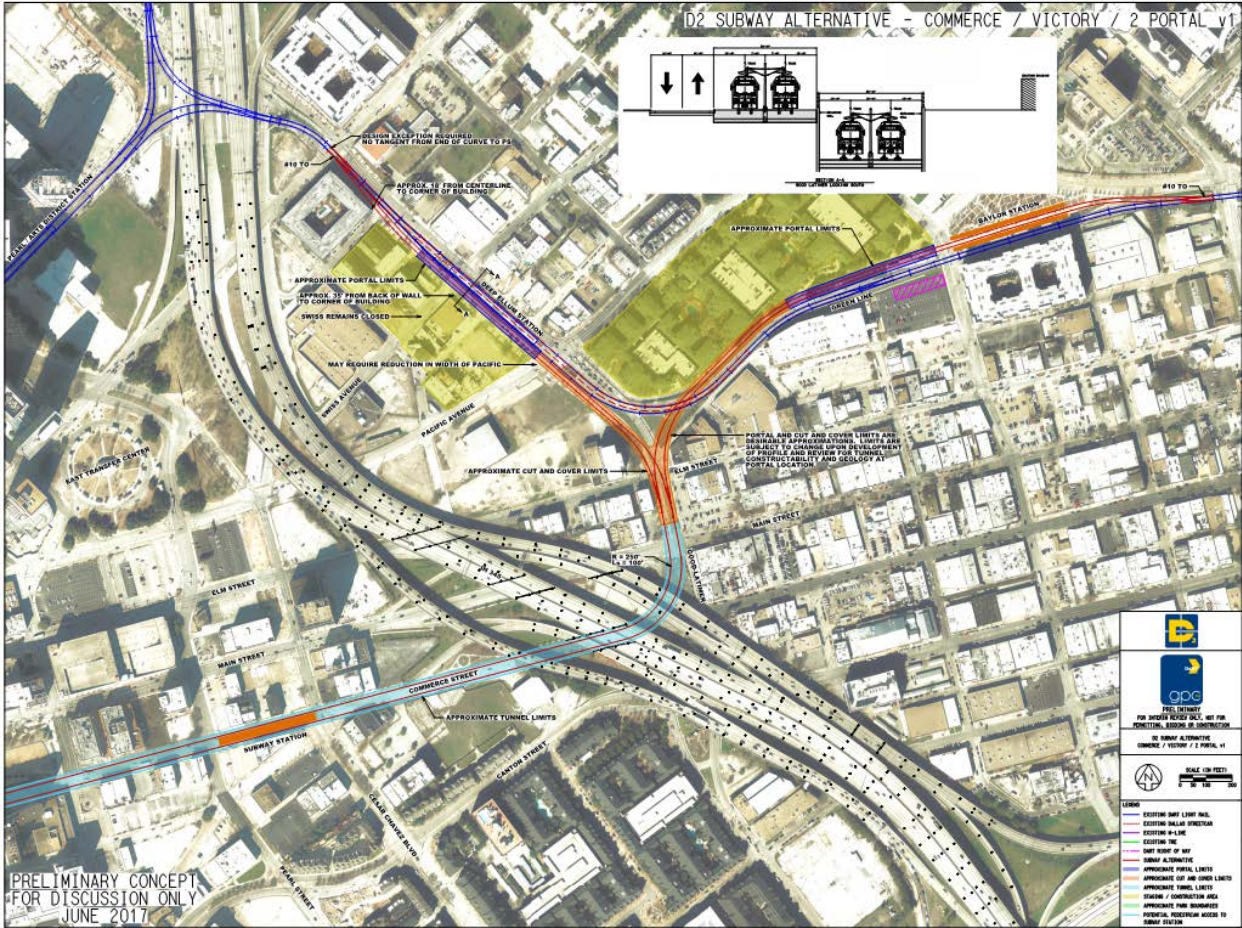




Figure 6 shows a refinement of the two-portal concept shown in Figure 4 by adding a typical section along Good-Latimer showing the interface between the guideway, portal and road. The yellow highlighted areas represent probable real estate needs. The focus of this concept was to minimize impacts to the operational Green Line.

**FIGURE 6. Extended Commerce Alignment from June 2017**



Based on stakeholder and technical review and an evaluation process documented in the D2 Subway LPA Refinement Phase – LPA Report, the decision was made to advance an at-grade connection along Swiss Avenue to connect with the Green Line.



### **3.0 D2 Subway Project Development Stakeholder Input (2018)**

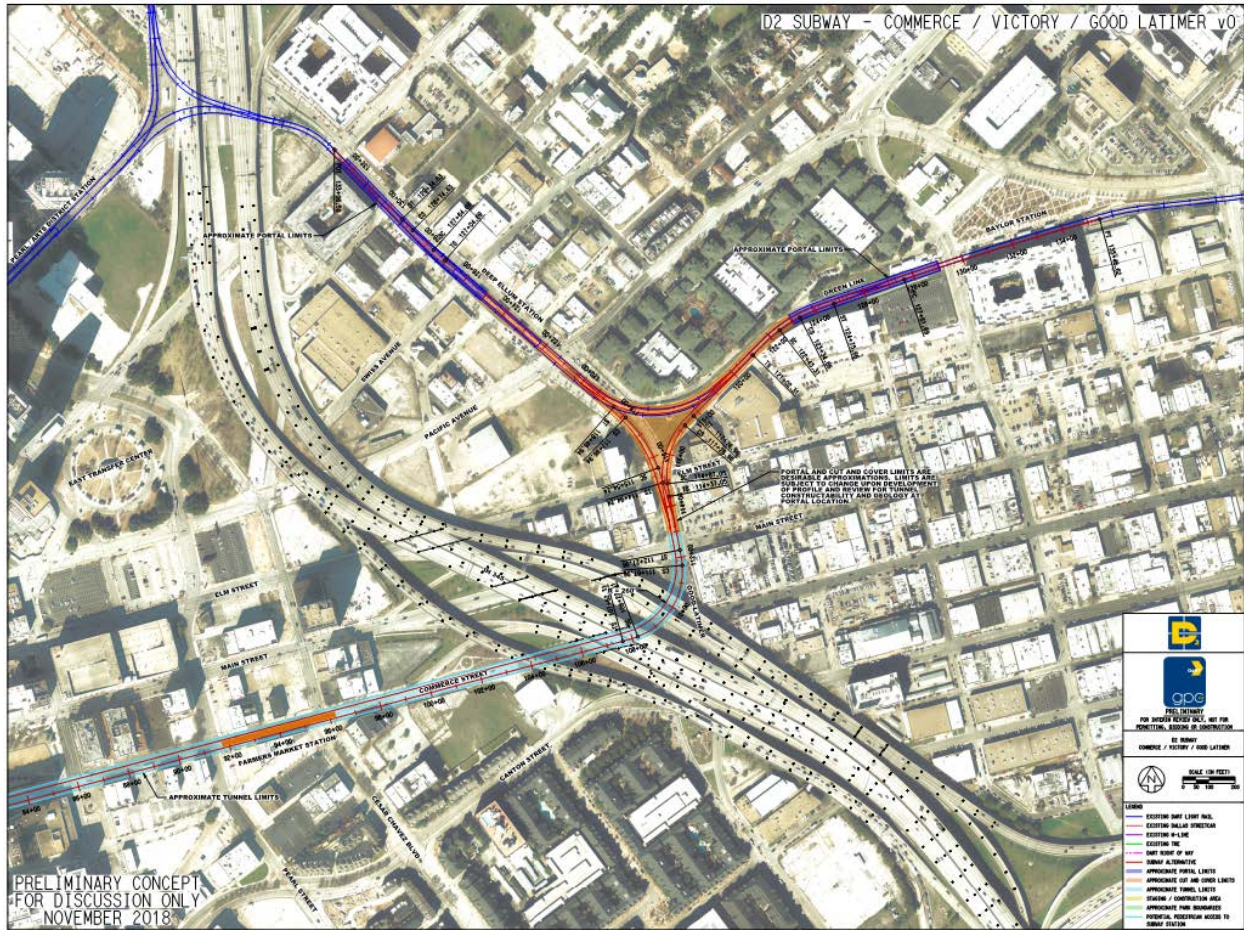
Project Development for the D2 Subway using the approved Victory/Commerce/Swiss alignment was initiated in Spring 2018. In Fall 2018, further refinement and development of the two-portal concept was advanced due to input from a stakeholder in the CBD East/Deep Ellum area.

Figures 7 to 10 show plan view and profile views for two concepts. Where the concept shown above in Figure 6 attempted to minimize impact to existing light rail tracks and service, the concepts below propose removal and reconstruction of a significant portion of the Green Line to accommodate portal connections. The new concepts put the tunnel portal and underground guideway in the same location as the existing tracks with junction being underground at Elm and Good Latimer.

The concept shown in Figure 7 removes Deep Ellum Station and attempts to get as deep as possible as quickly as possible in order to reduce the limits of the cut and cover and get far enough under IH 345 to allow for all possible IH 345 options. With the portal in the median of Good Latimer and associated grades, there would not be potential to retain a station in this area.

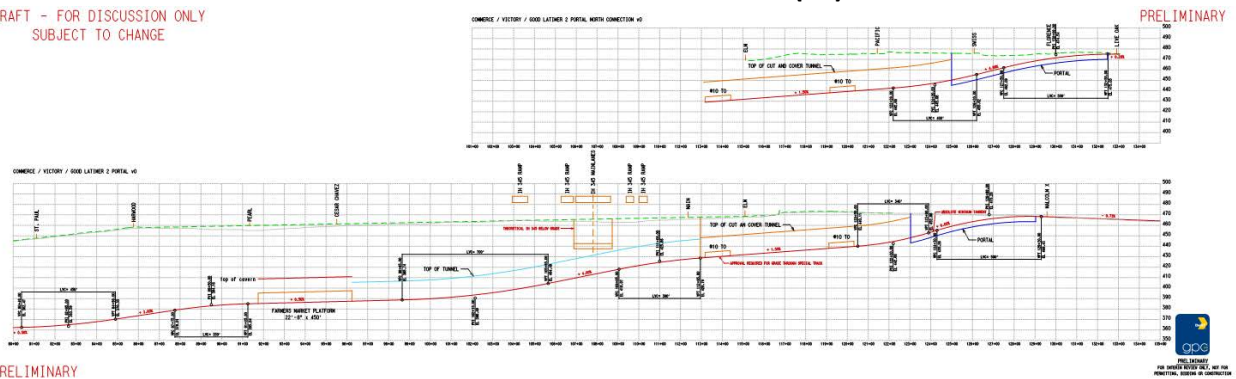
The concept shown in Figure 9 has the same horizontal geometry as that in Figure 7, however it attempts to include an underground Deep Ellum Station. Inserting the station platform requires a tangent section that limits getting deep as quickly as possible and increasing the cut and cover limits. Additionally, the profile would potentially interfere with one of the IH 345 options given its proximity to the IH 30 interchange, as can be seen in Figure 10.

**FIGURE 7. Extended Commerce Alignment from November 2018 (v0)**



**FIGURE 8. Extended Commerce Profile from November 2018 (v0)**

DRAFT - FOR DISCUSSION ONLY  
SUBJECT TO CHANGE



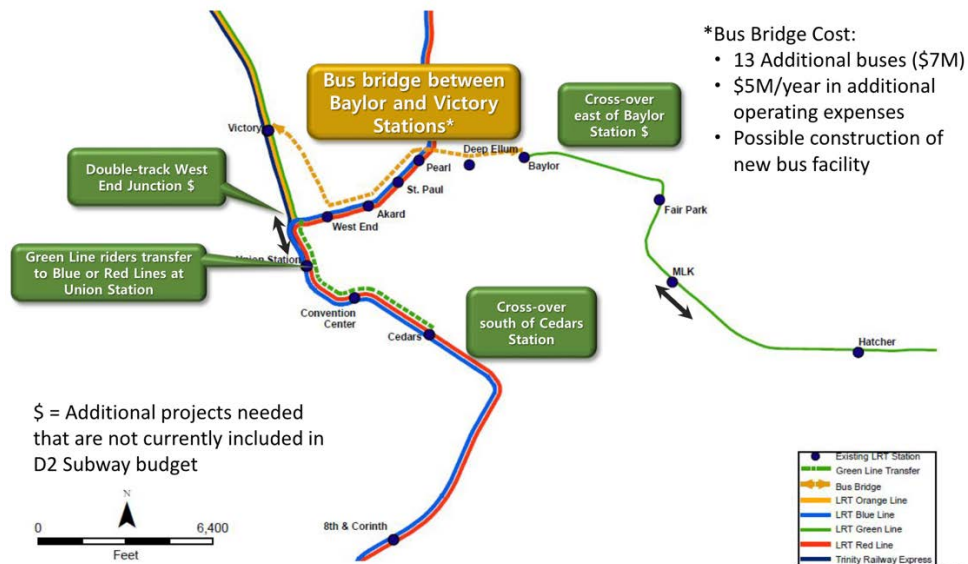




## 4.0 Key Considerations

In developing and reviewing the Extended Commerce Two-Portal concepts, the D2 team identified issues and constraints with implementing the concepts. These include: (1) impact to Green Line service resulting in bus bridges, (2) significant disruption to auto travel through the Good Latimer area, (3) significant increased construction cost, (4) increased construction schedule and (5) the funds for increased construction cost would need to be secured, which could result in delaying the project for many years.

The two portal concepts as shown in Figures 7 and 9 require the removal of the existing track from Live Oak Street to Baylor Station in order to construct the new track. The removal of this track would disrupt Green Line service between Pearl and Baylor Stations. The disruption would require a bus bridge be in place to provide the same level as service for DART riders (see graphic below). It is anticipated that this track closure would be for 18 to 24 months. The bus bridge is not required for the LPA and adds additional cost and service inconvenience to DART riders.



These design options also require cut and cover along Good Latimer, which would result in disruption to auto travel through the Good Latimer section between Elm Street and Pacific/Gaston and temporarily affect accessibility to adjacent developments.

The extended tunnel/two-portal concepts would increase construction cost and construction schedule when compared to the LPA. Cost and schedule are impacted due to additional tunnel length as well as increased cut and cover in the Deep Ellum area. The significant increase in capital cost would delay the project beyond just the additional time associated with an extended tunnel. The DART 20-Year Financial Plan includes a \$1.4 billion project budget, of which up to \$1.1 billion has been approved from local funds although DART is pursuing an approximately 50% Federal grant share. The additional cost associated with an extended tunnel is beyond what would likely be available and/or affordable. It would also require DART approach FTA again about changing the project scope and budget.

The DART Planning Committee was briefed on December 11, 2018 on what the additional cost, schedule, and service impacts would be with an extended tunnel alignment. In addition to the bus bridge, key discussion items were:



- Revenue service delay of 4 to 7 years from 2024
- Substantial overall cost increase of up to \$400 million
- Cost escalation of up to \$500 million due to the delay of 4 to 7 years
- Unknown information on cost drivers such as:
  - Drainage issues
  - Depth of rock
  - Lack of IH-345 design
  - Complexity of the below-grade light rail junction
  - Complexity of twin portal locations

## **5.0 Recommendation**

Based on the evaluation and discussion with the DART Board, City of Dallas staff, and stakeholders, DART staff recommended advancing the LPA as approved in September 2017, including the CBD East alignment refinement. An extended tunnel option was determined to have additional impacts, costs and risks as compared to the LPA.