

Attachment 1

Current Track Configuration

Intermodal Transportation Facility Project Location

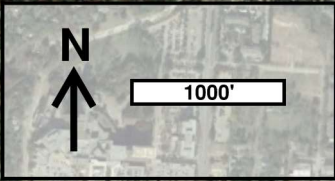


**DOWNTOWN
DALLAS**

**TRINITY
RIVER**

**CONVENTAION
CENTER**

**PROJECT
AREA**



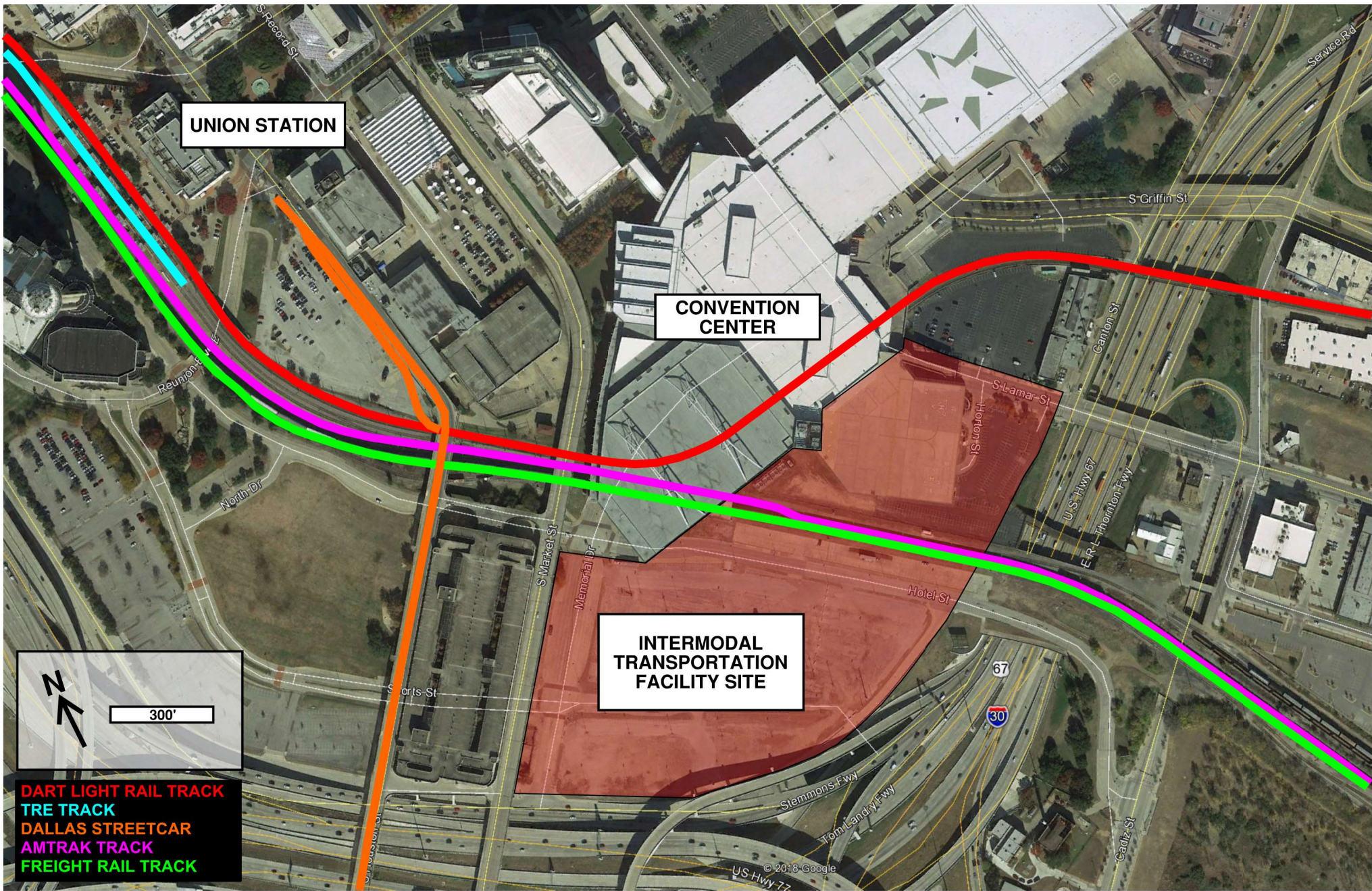
UNION STATION

CONVENTION CENTER

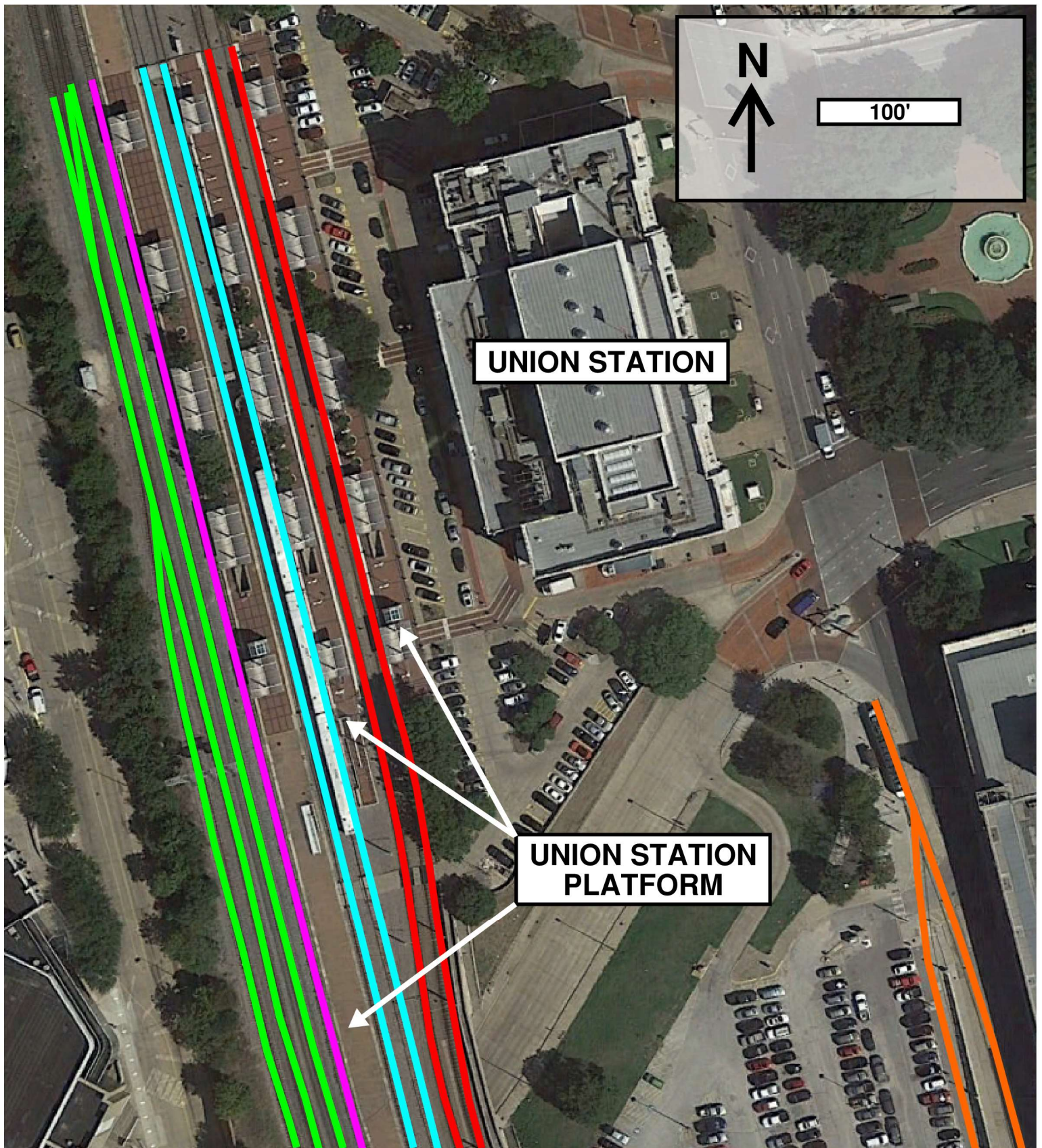
INTERMODAL
TRANSPORTATION
FACILITY SITE



- DART LIGHT RAIL TRACK
- TRE TRACK
- DALLAS STREETCAR
- AMTRAK TRACK
- FREIGHT RAIL TRACK



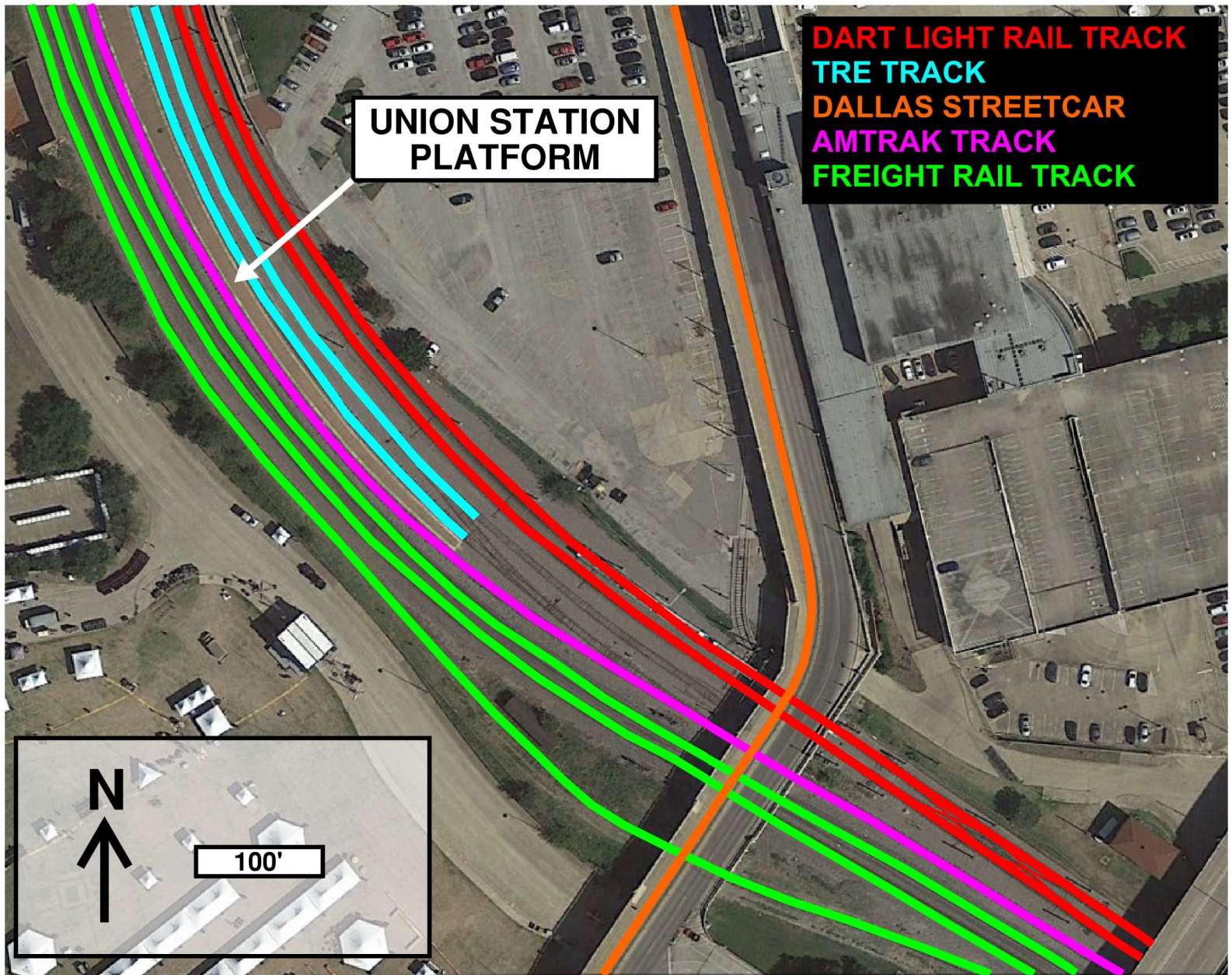
Existing Track Configuration



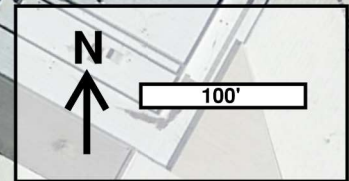
UNION STATION

UNION STATION
PLATFORM

DART LIGHT RAIL TRACK
TRE TRACK
DALLAS STREETCAR
AMTRAK TRACK
FREIGHT RAIL TRACK



DART LIGHT RAIL TRACK
TRE TRACK
DALLAS STREETCAR
AMTRAK TRACK
FREIGHT RAIL TRACK



UNION STATION
PLATFORM

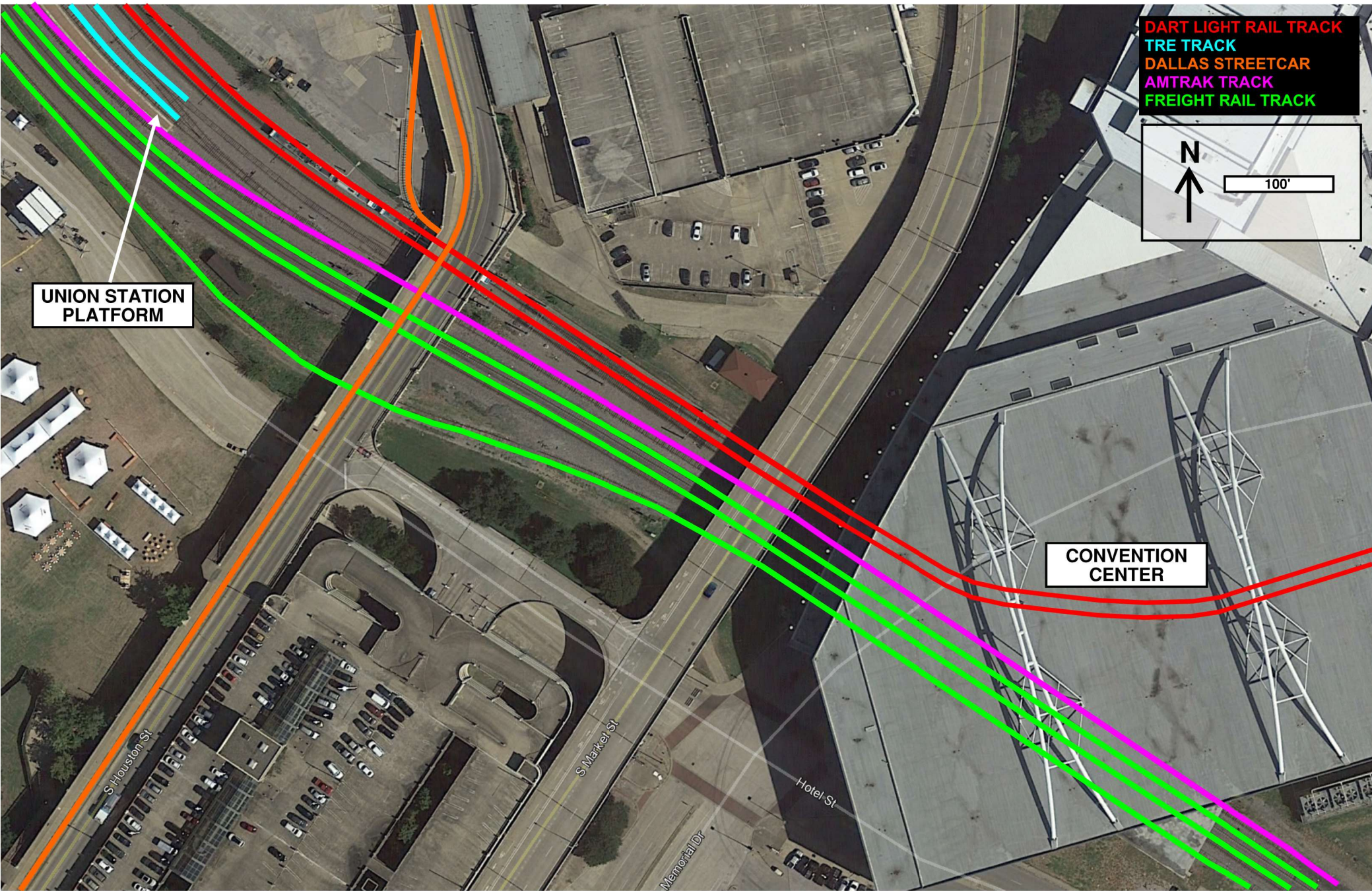
CONVENTION
CENTER

S Houston St

S Market St

Hotel St

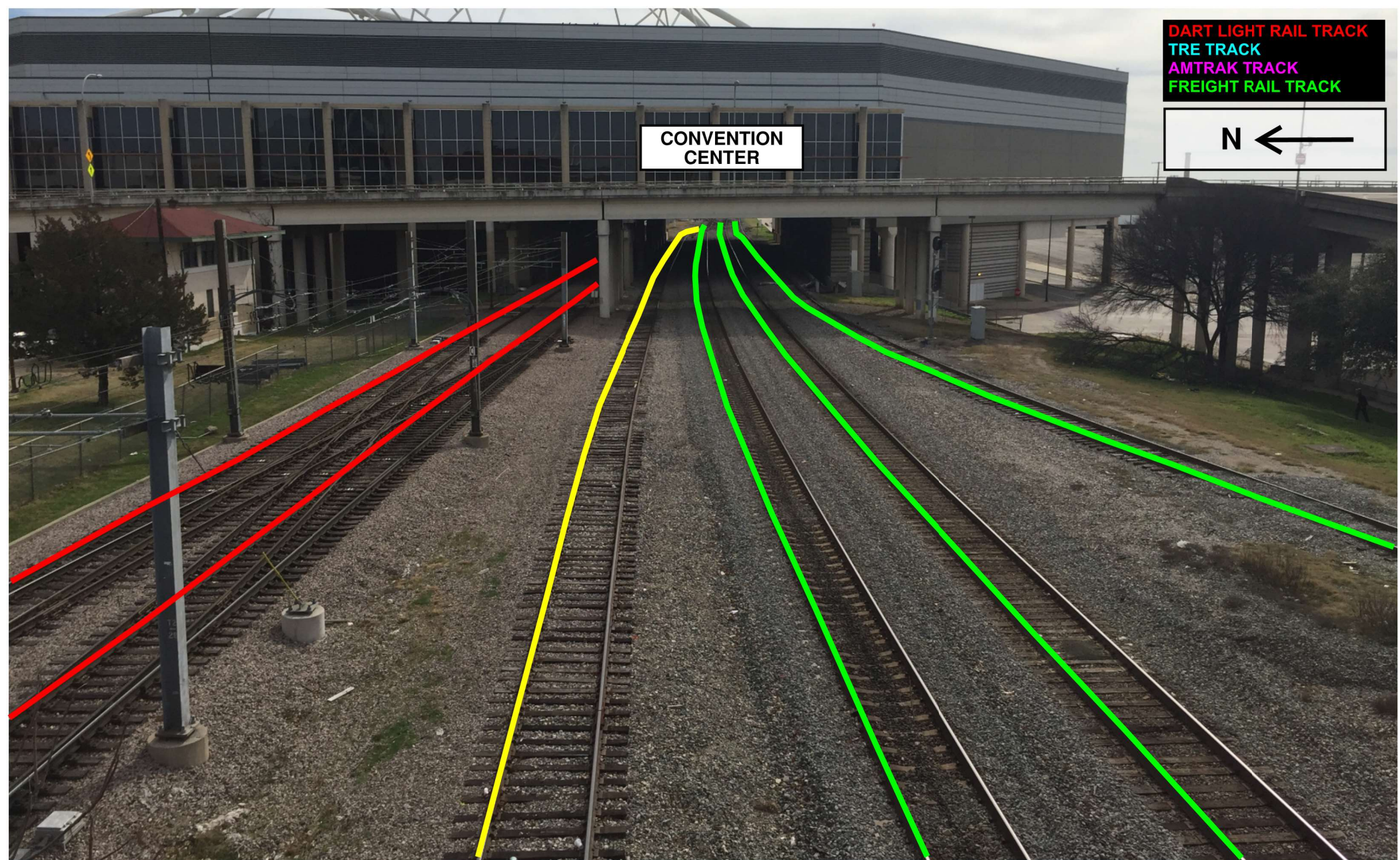
Memorial Dr



DART LIGHT RAIL TRACK
TRE TRACK
AMTRAK TRACK
FREIGHT RAIL TRACK

CONVENTION
CENTER

N ←



AMTRAK TRACK
FREIGHT RAIL TRACK



67

IH-35

IH-35

HELIPORT

CONVENTION
CENTER

Stemmons Fwy

R.L. Thornton Fwy

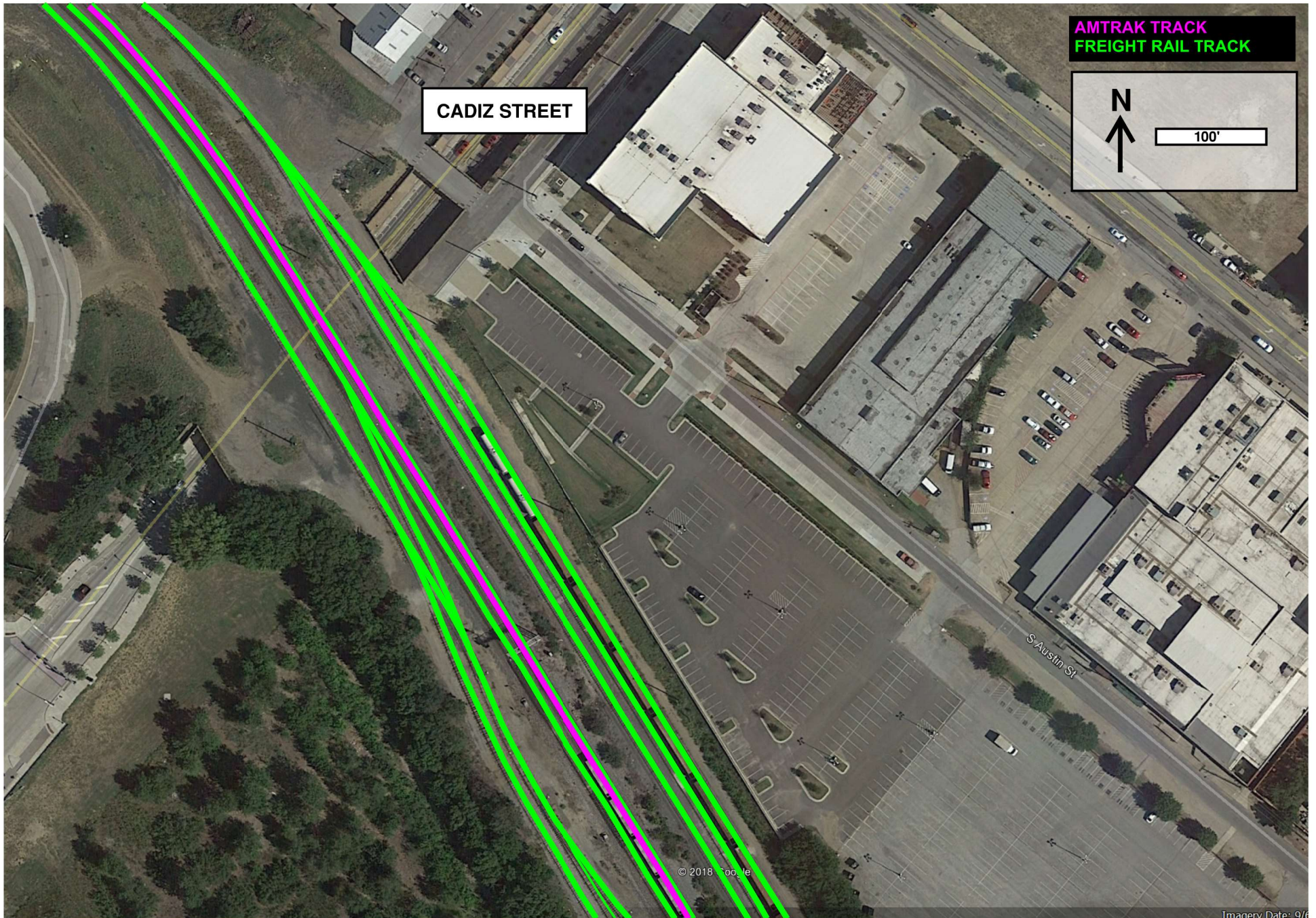
Hotel St

ERL Thornton Fwy

Silvaco St

Horton St

© 2018 Google



AMTRAK TRACK
FREIGHT RAIL TRACK

N
↑

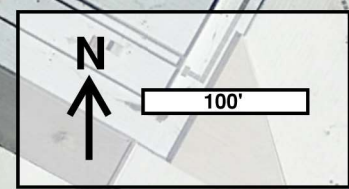
100'

Attachment 2

Proposed Track Modifications

Proposed Track Modifications

DART LIGHT RAIL TRACK
TRE TRACK
DALLAS STREETCAR
AMTRAK TRACK
FREIGHT RAIL TRACK



Route Modification
TRE Converges with Amtrak

UNION STATION
PLATFORM

Track Modification
Reroute Amtrak
(new track)

CONVENTION
CENTER

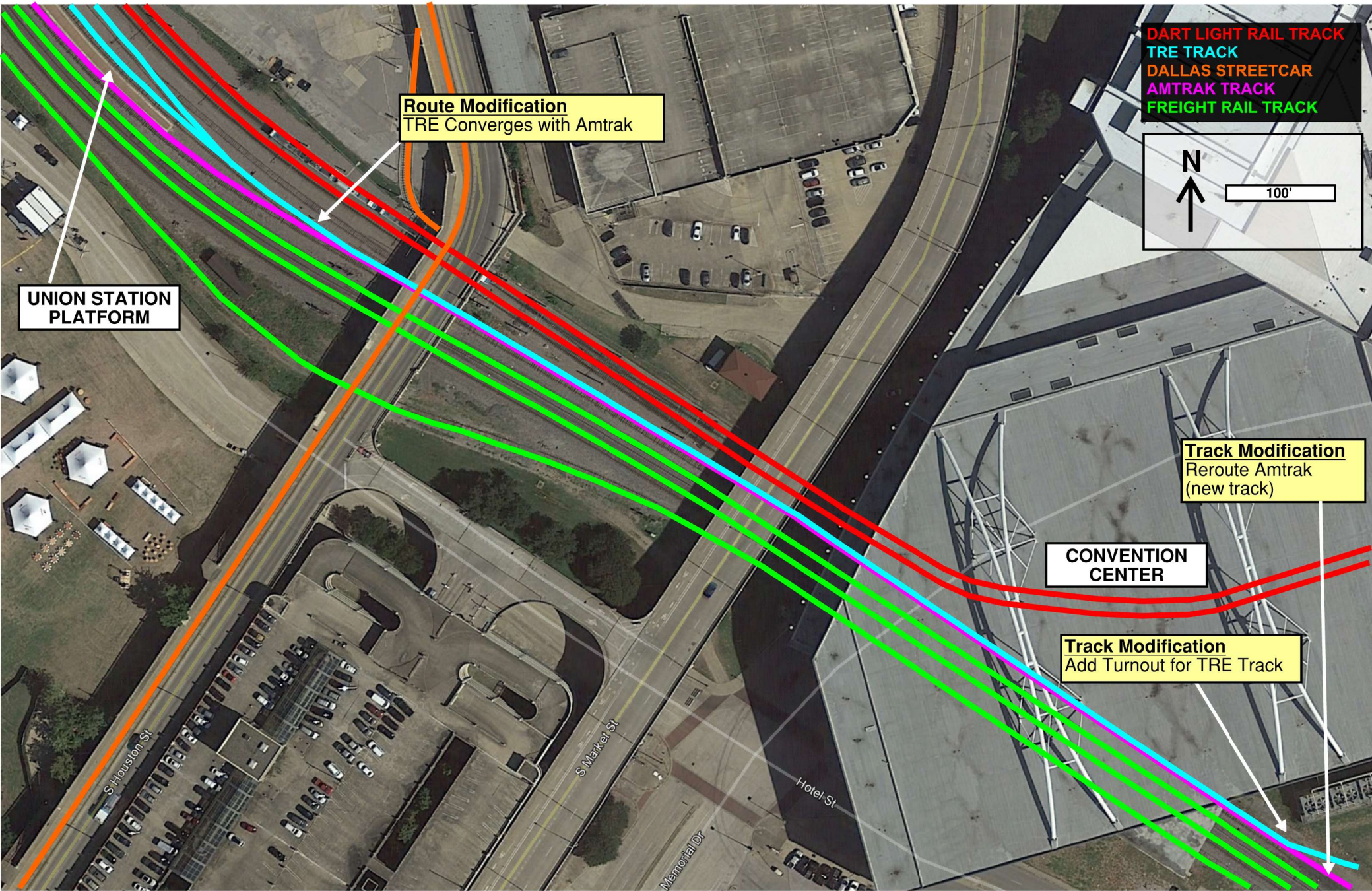
Track Modification
Add Turnout for TRE Track

S Houston St

S Market St

Hotel St

Memorial Dr



TRE TRACK
AMTRAK TRACK
FREIGHT RAIL TRACK



HELIPORT

Track Modification
Add Turnout for TRE Track

CONVENTION
CENTER

Track Modification
Remove Turnout

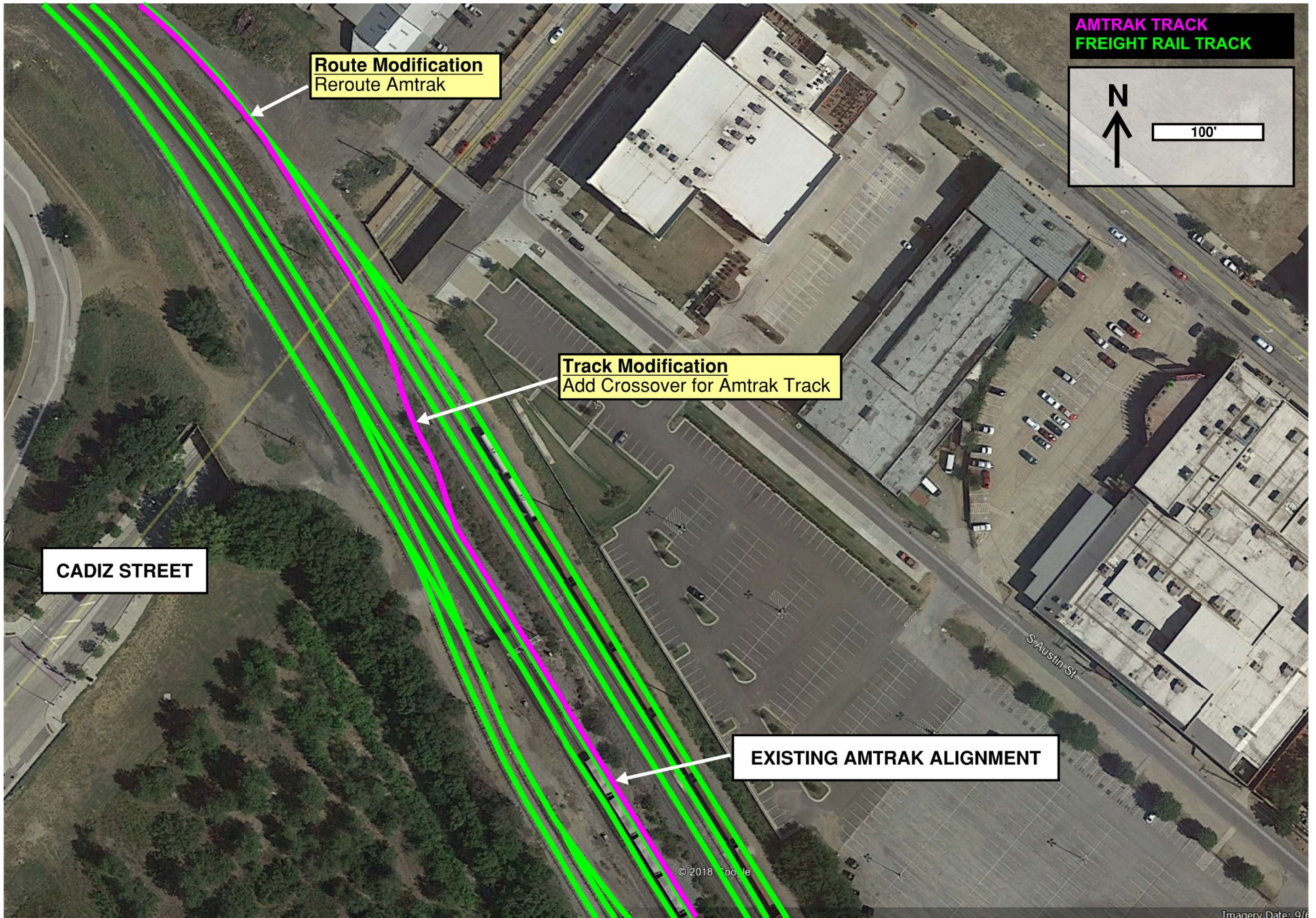
Track Modification
New TRE Track

Track Modification
Reroute Amtrak
(new track)

Track Modification
Add Turnout for Amtrak Track

IH-35

Route Modification
Reroute Amtrak



Proposed Track Modifications (Using UPRR Line Types)

UNION STATION
PLATFORM

TRACK

- Existing Mainline
- Existing Siding or Spur
- Proposed
- Remove
- Shift
- Relay
- Future

CONVENTION
CENTER



100'

S Houston St

S Market St

Hotel St

Memorial Dr

TRACK

- Existing Mainline
- Existing Siding or Spur
- Proposed
- Remove
- Shift
- Relay
- Future

Track Modification
Add Turnout for TRE Track

HELIPORT

CONVENTION CENTER

Track Modification
Remove Turnout

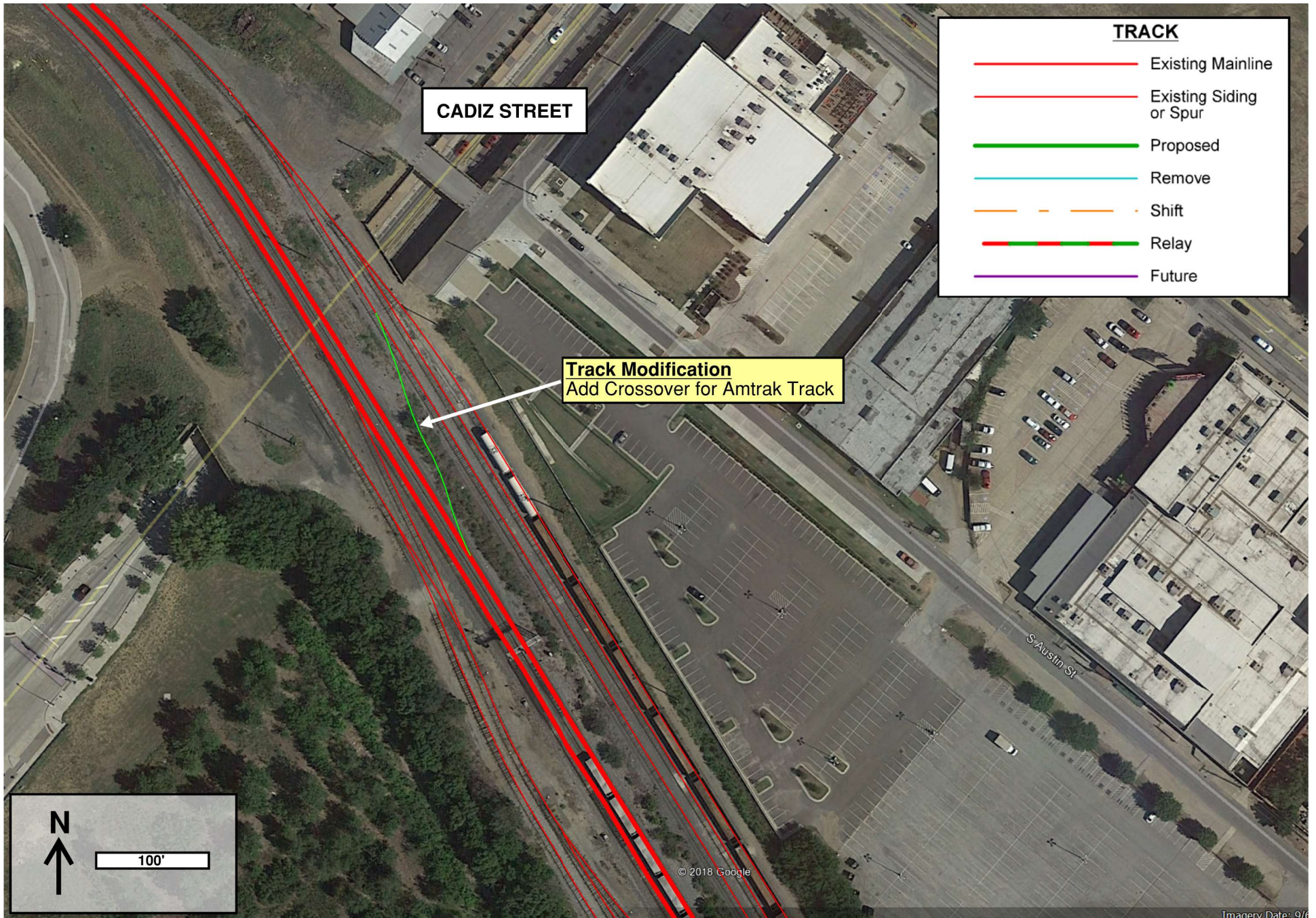
Track Modification
New TRE Track

Track Modification
Reroute Amtrak
(new track)

Track Modification
Add Turnout for Amtrak Track

IH-35

N
↑
100'



Attachment 3

UPRR Coordination

Masters, Chris

From: Clary, David
Sent: Tuesday, April 30, 2019 4:49 PM
To: Douglas Woods (dgwoods@up.com)
Cc: Masters, Chris; 140-11008-000-mailbox
Subject: Dallas TX Dallas Intermodal Transportation Facility MP 213.7 to MP 214.2 Dallas Subdivision

Doug,

The City of Dallas and the North Central Texas Council of Governments (NCTCOG) are considering the development of an Intermodal Transportation Facility (ITF) that will be located adjacent to the Dallas Convention Center. The ITF is intended to create a hub that brings all modes of transportation to a central location, adjacent to the future high-speed rail station.

This concept is in the earliest stages of development and is undergoing a Fatal Flaws Analysis to identify points of ongoing coordination that are essential to project success. Coordination with Union Pacific is critical in order for Amtrak and Trinity Railway Express passenger/commuter rail services to be transferred from the existing Union Station to the new ITF.

Please refer to the concept exhibit found at the following link for a depiction of the Existing Track Condition and Proposed Track Modifications. Please contact me if you have any issues accessing these concept drawings.

[ITF Track Modification \(For UPRR\)](#)

We request Union Pacific's general comments on this concept in order to help guide the City of Dallas and NCTCOG as they consider the next steps for the potential formal advancement of the ITF concept development.

Please contact me if you have any questions.

Thank you for your early-stage feedback on this concept.

David W. Clary, PE
Project Manager



**Lockwood, Andrews
& Newnam, Inc.**
A LEO A DALY COMPANY

8350 North Central Expressway, Suite 1400 • Dallas, TX 75206-1631
T 214.522.8778 D 214.765.8768 C 214.542.7625
www.lan-inc.com • DWClary@lan-inc.com



Intermodal Transportation Facility Project Location



**DOWNTOWN
DALLAS**

**TRINITY
RIVER**

**CONVENTAION
CENTER**

**PROJECT
AREA**

Proposed Track Modifications (Using UPRR Line Types)

**UNION STATION
PLATFORM**

TRACK

- Existing Mainline
- Existing Siding or Spur
- Proposed
- Remove
- Shift
- Relay
- Future

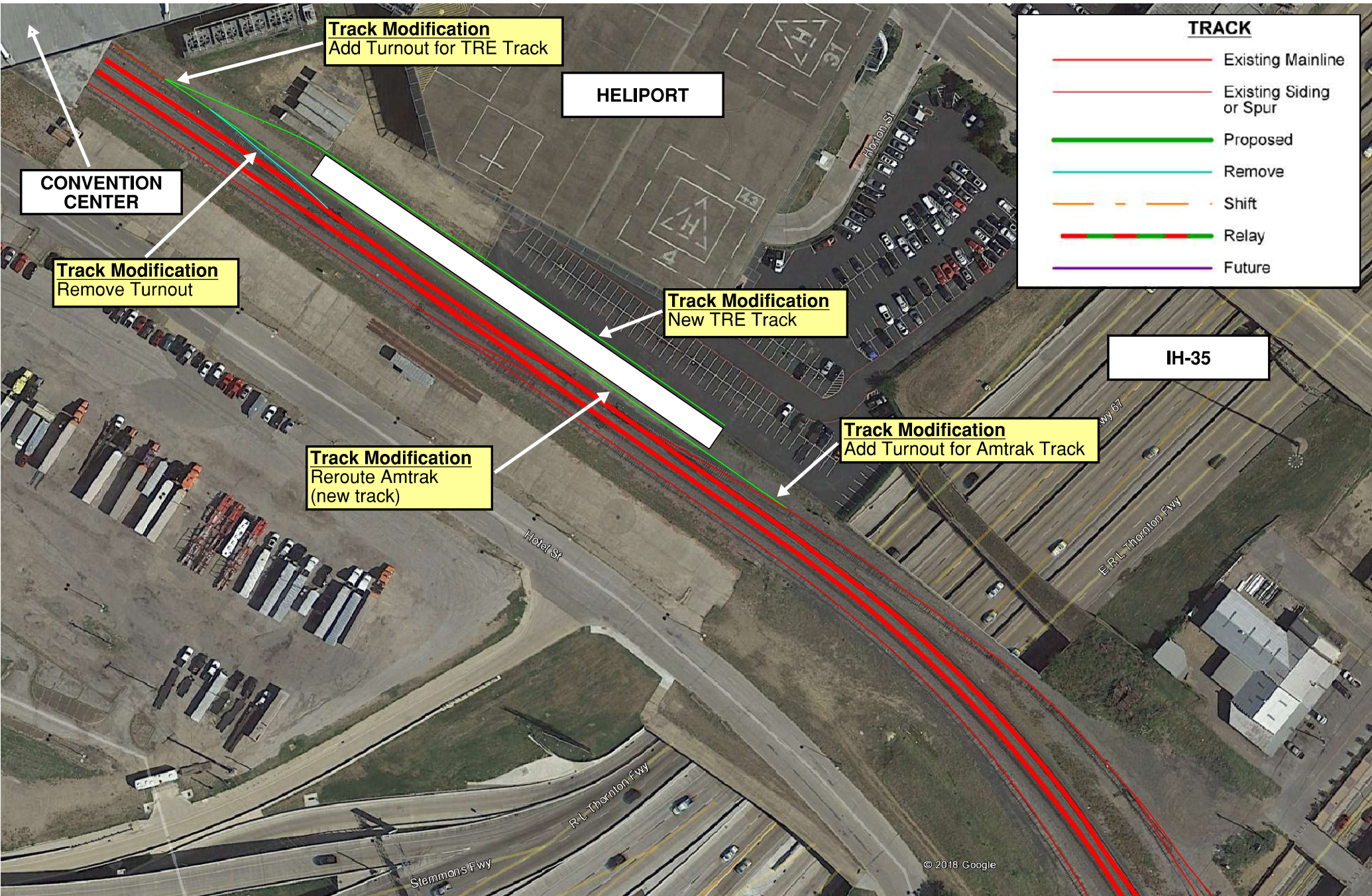
**CONVENTION
CENTER**

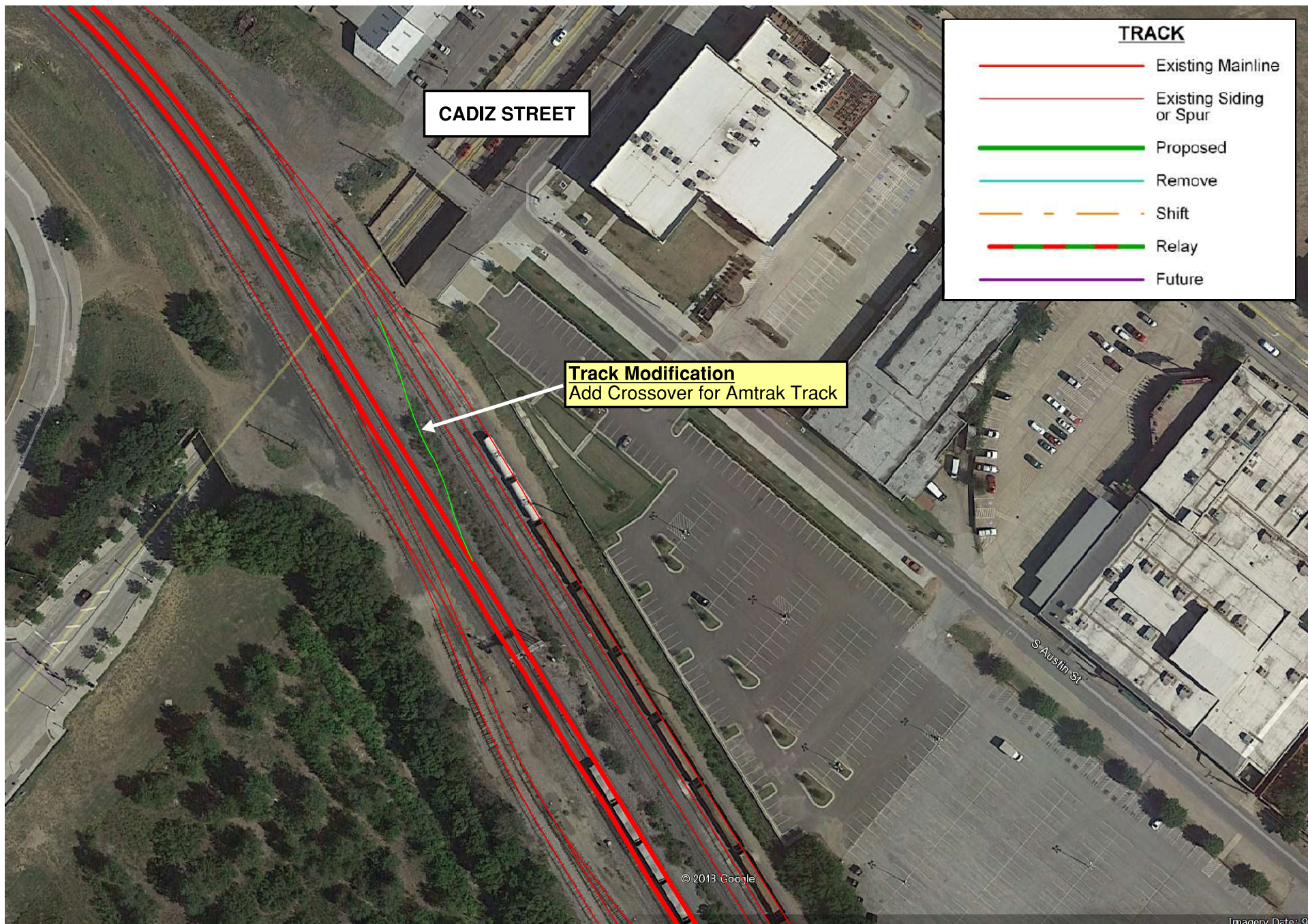
S Houston St

S Market St

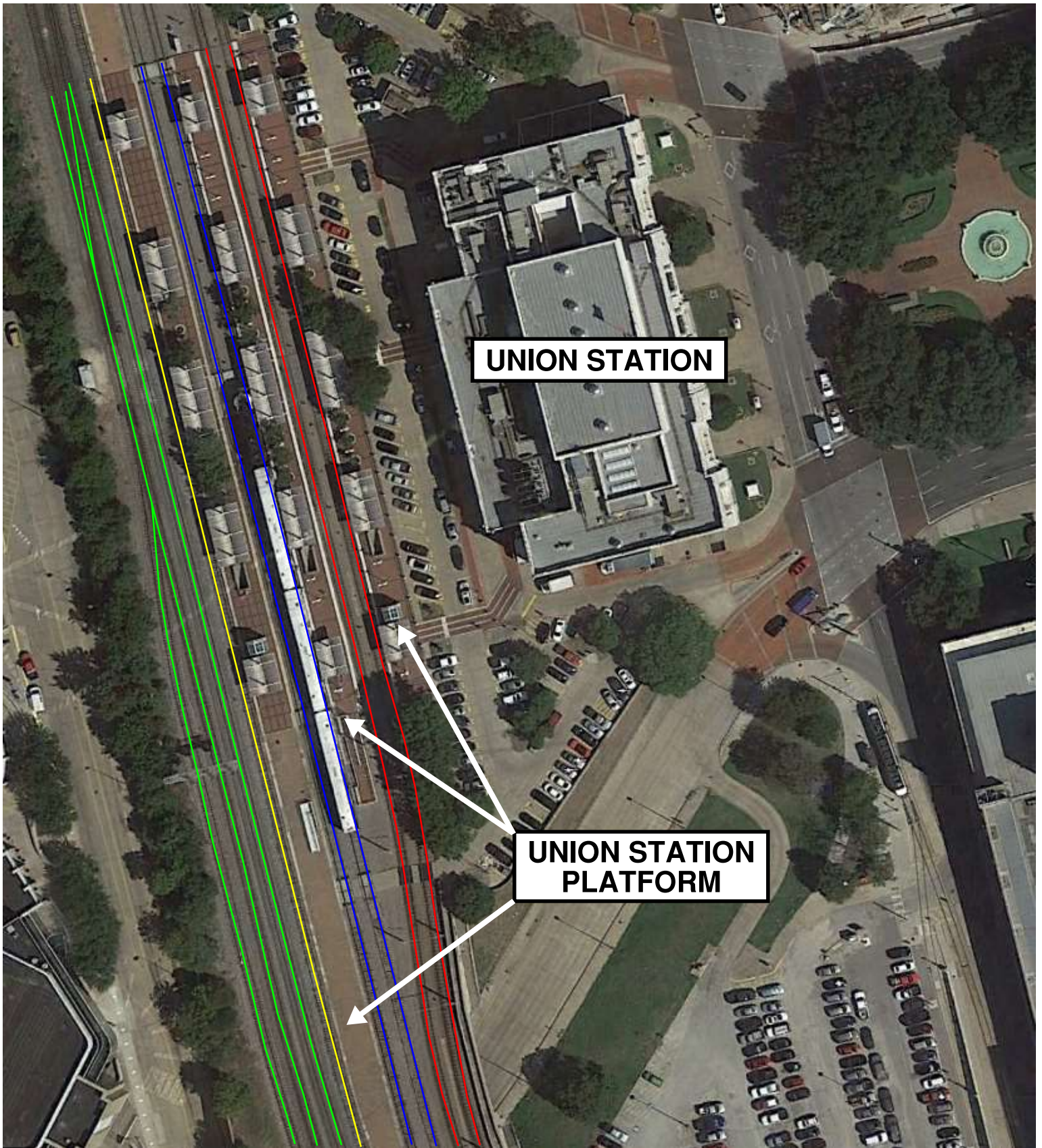
Hotel St

Memorial Dr





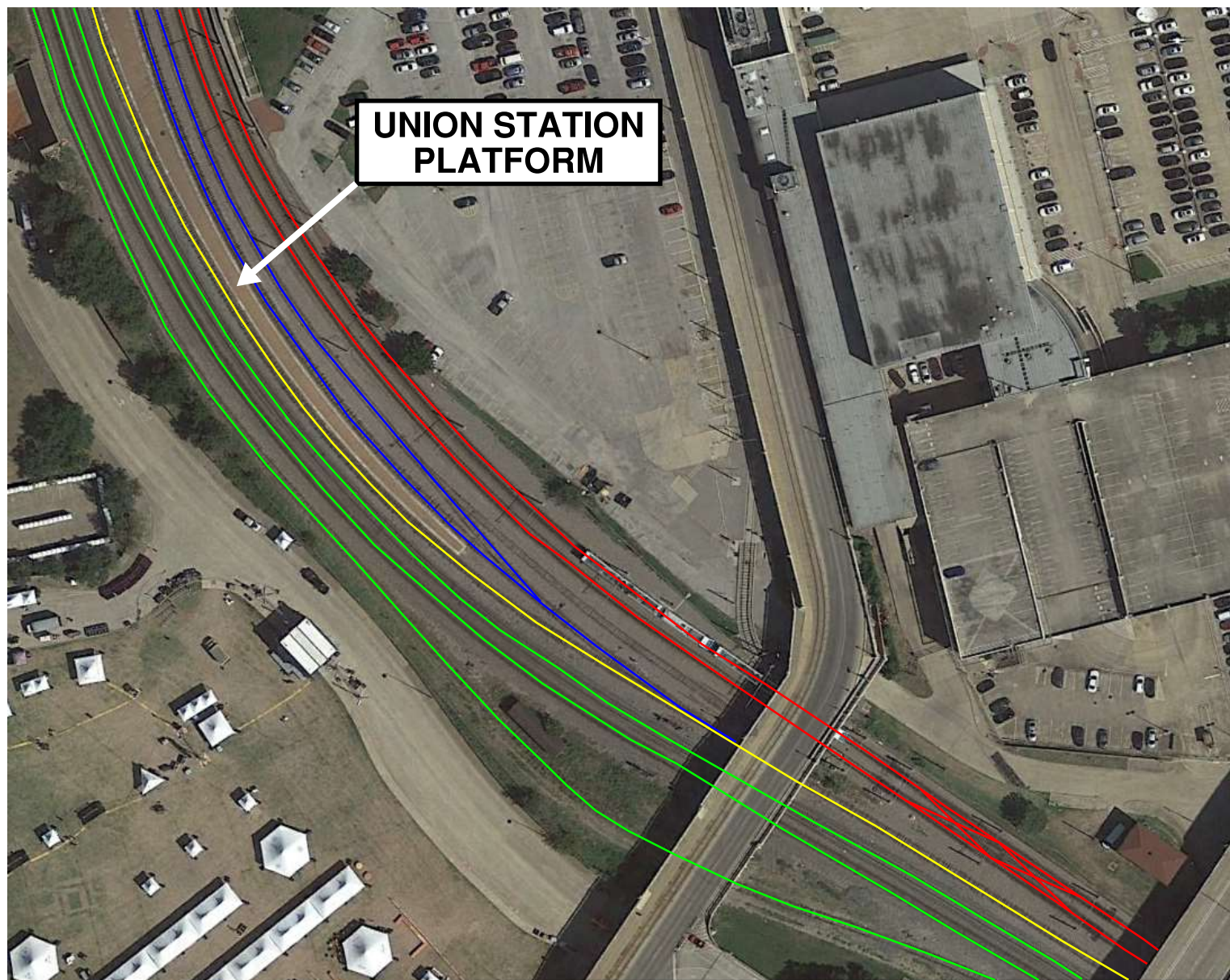
Existing Track Configuration



UNION STATION

UNION STATION
PLATFORM

DART LIGHT RAIL TRACK
TRE TRACK
AMTRAK TRACK
FREIGHT RAIL TRACK



DART LIGHT RAIL TRACK
TRE TRACK
AMTRAK TRACK
FREIGHT RAIL TRACK

DART LIGHT RAIL TRACK
TRE TRACK
AMTRAK TRACK
FREIGHT RAIL TRACK

UNION STATION
PLATFORM

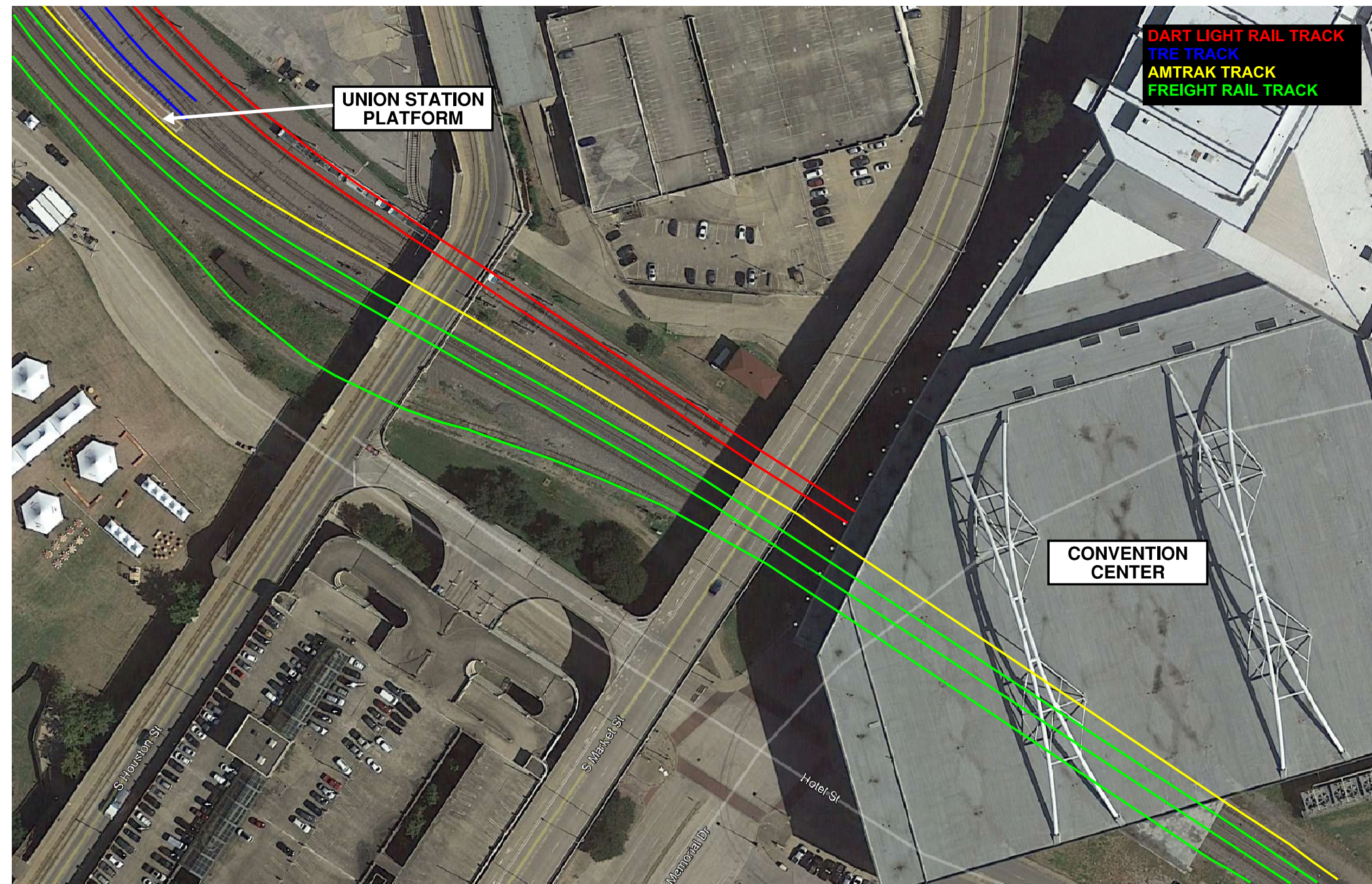
CONVENTION
CENTER

S Houston St

S Market St

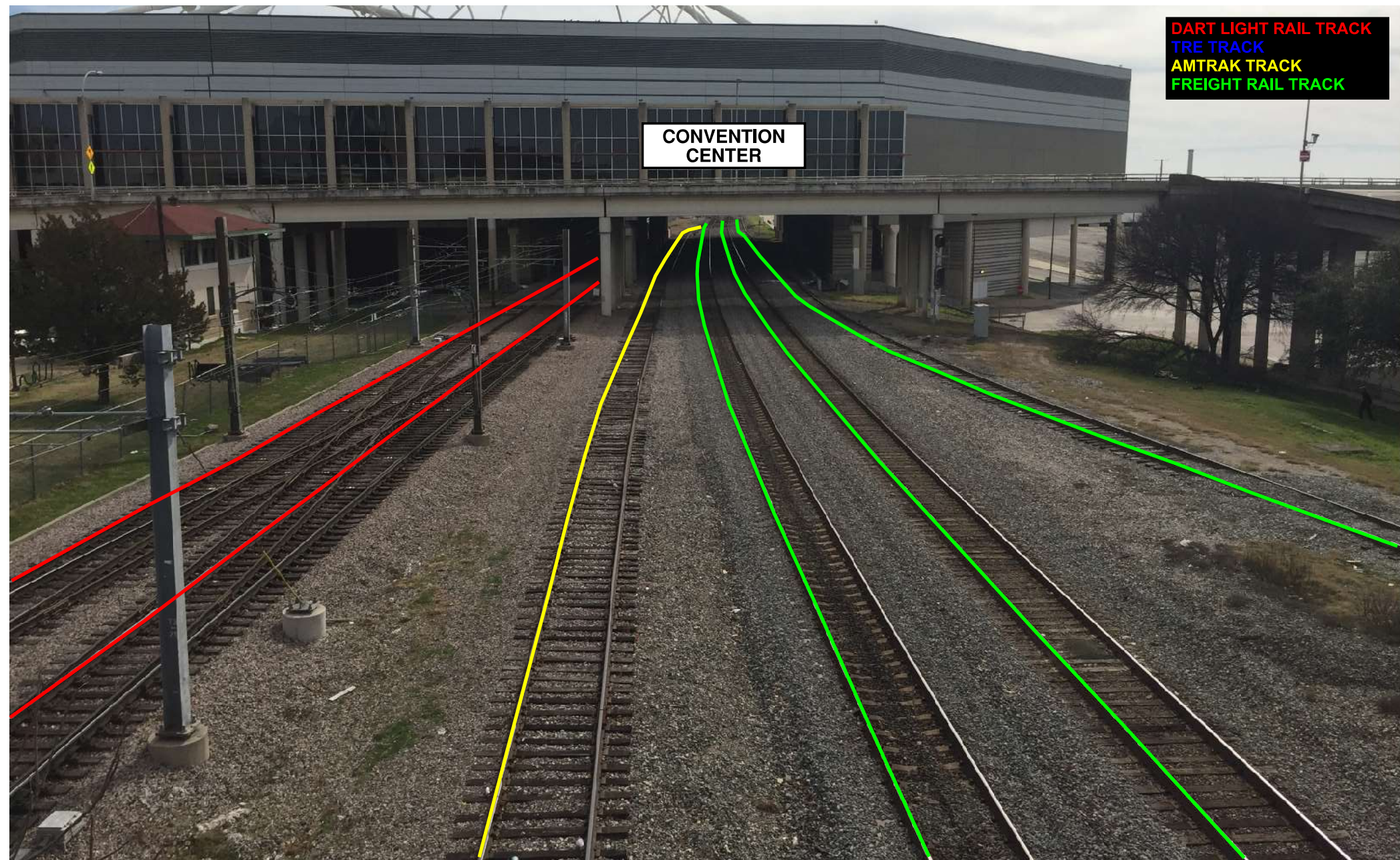
Hotel St

Memorial Dr



DART LIGHT RAIL TRACK
TRE TRACK
AMTRAK TRACK
FREIGHT RAIL TRACK

CONVENTION
CENTER



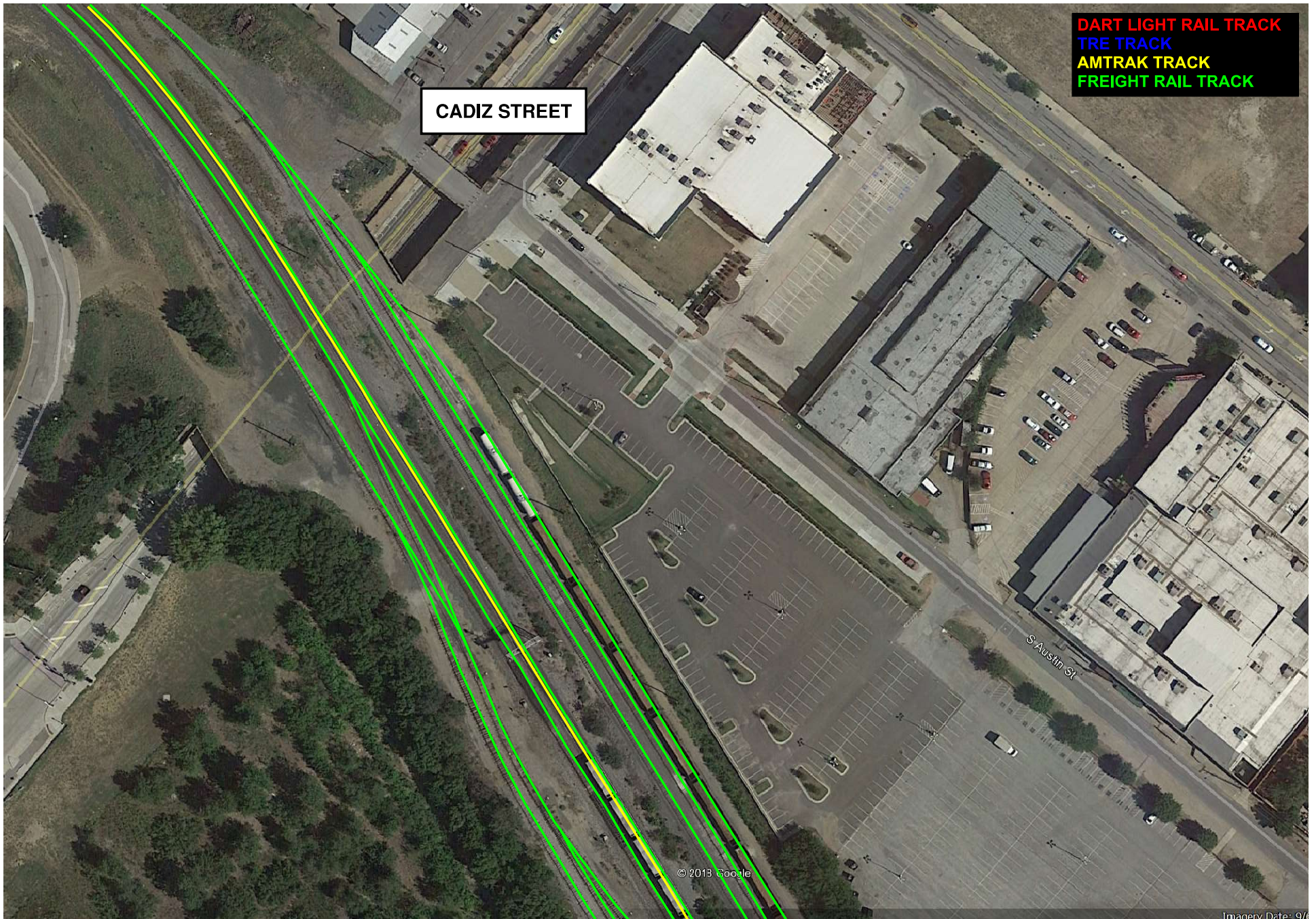
DART LIGHT RAIL TRACK
TRE TRACK
AMTRAK TRACK
FREIGHT RAIL TRACK

HELIPORT

CONVENTION
CENTER

IH-35

© 2018 Google



CADIZ STREET

DART LIGHT RAIL TRACK
TRE TRACK
AMTRAK TRACK
FREIGHT RAIL TRACK

© 2013 Google

Imagery Date: 9/1

Proposed Track Modifications

DART LIGHT RAIL TRACK
TRE TRACK
AMTRAK TRACK
FREIGHT RAIL TRACK

Route Modification
TRE Converges with Amtrak

UNION STATION
PLATFORM

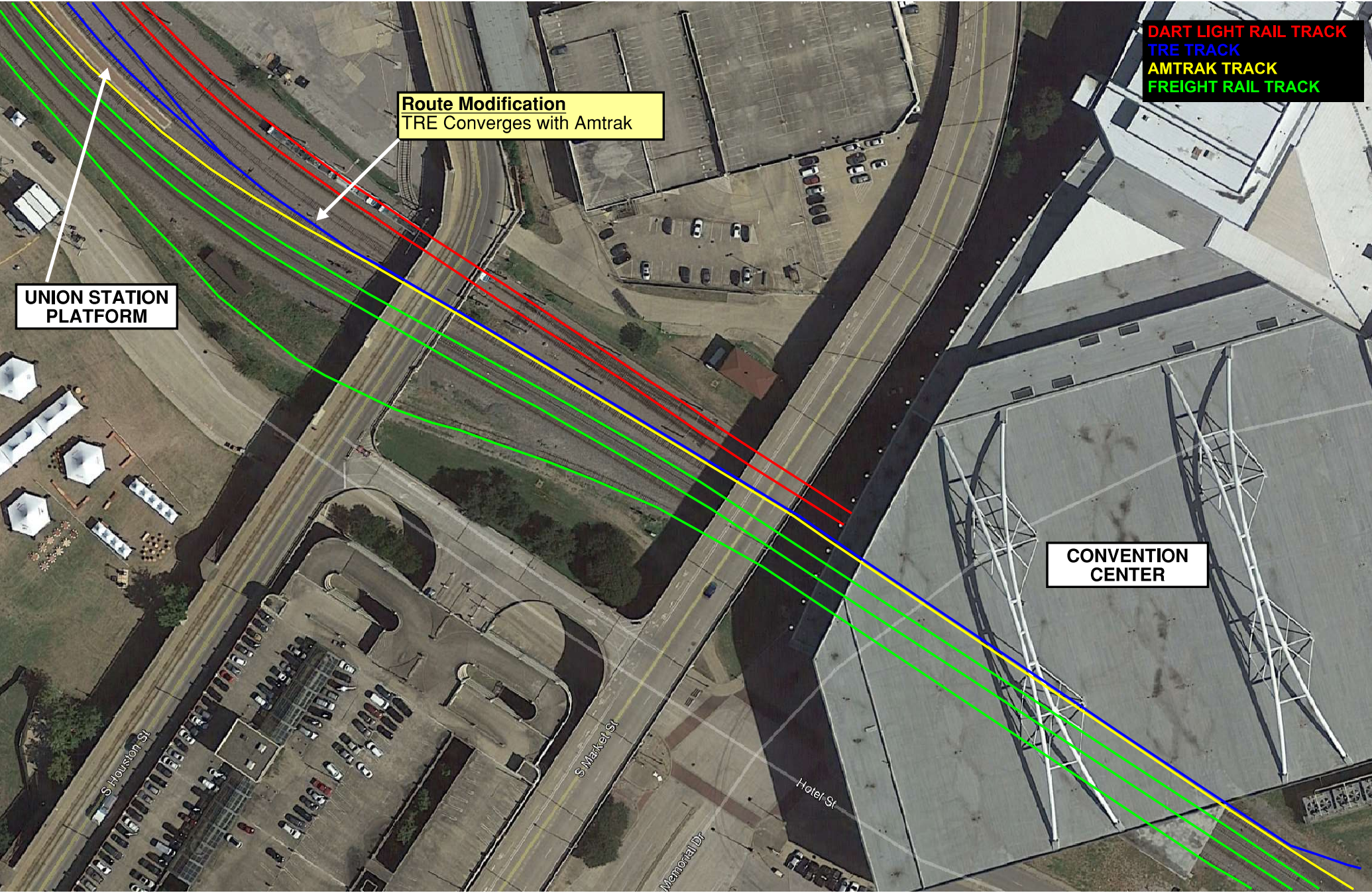
CONVENTION
CENTER

S Houston St

S Market St

Memorial Dr

Hotel St



DART LIGHT RAIL TRACK
TRE TRACK
AMTRAK TRACK
FREIGHT RAIL TRACK

HELIPORT

CONVENTION
CENTER

Track Modification
Remove Turnout

Track Modification
Add Turnout for TRE Track

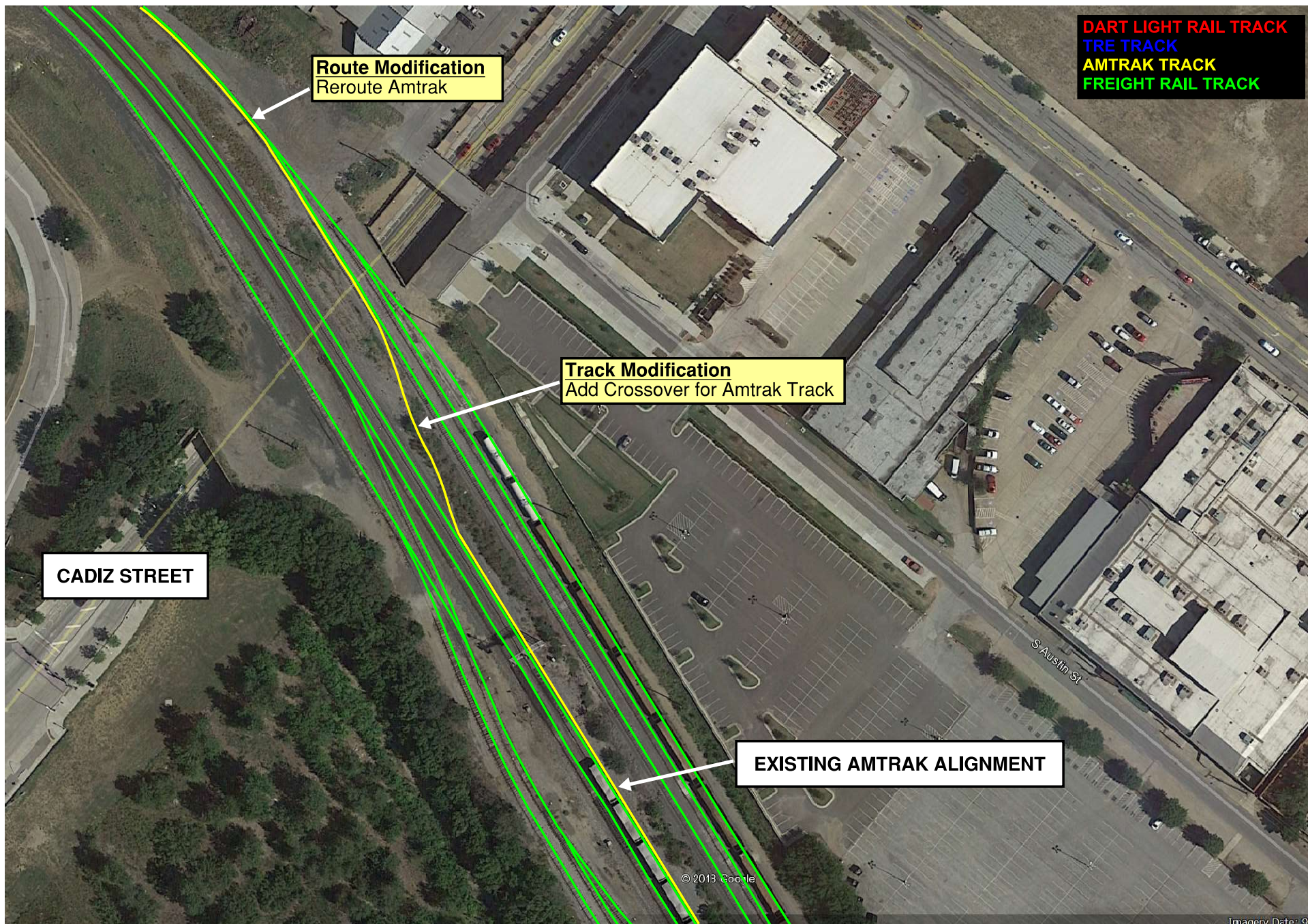
Track Modification
New TRE Track

Track Modification
Reroute Amtrak
(new track)

Track Modification
Add Turnout for Amtrak Track

IH-35

Route Modification
Reroute Amtrak



DART LIGHT RAIL TRACK
TRE TRACK
AMTRAK TRACK
FREIGHT RAIL TRACK

Route Modification
Reroute Amtrak

Track Modification
Add Crossover for Amtrak Track

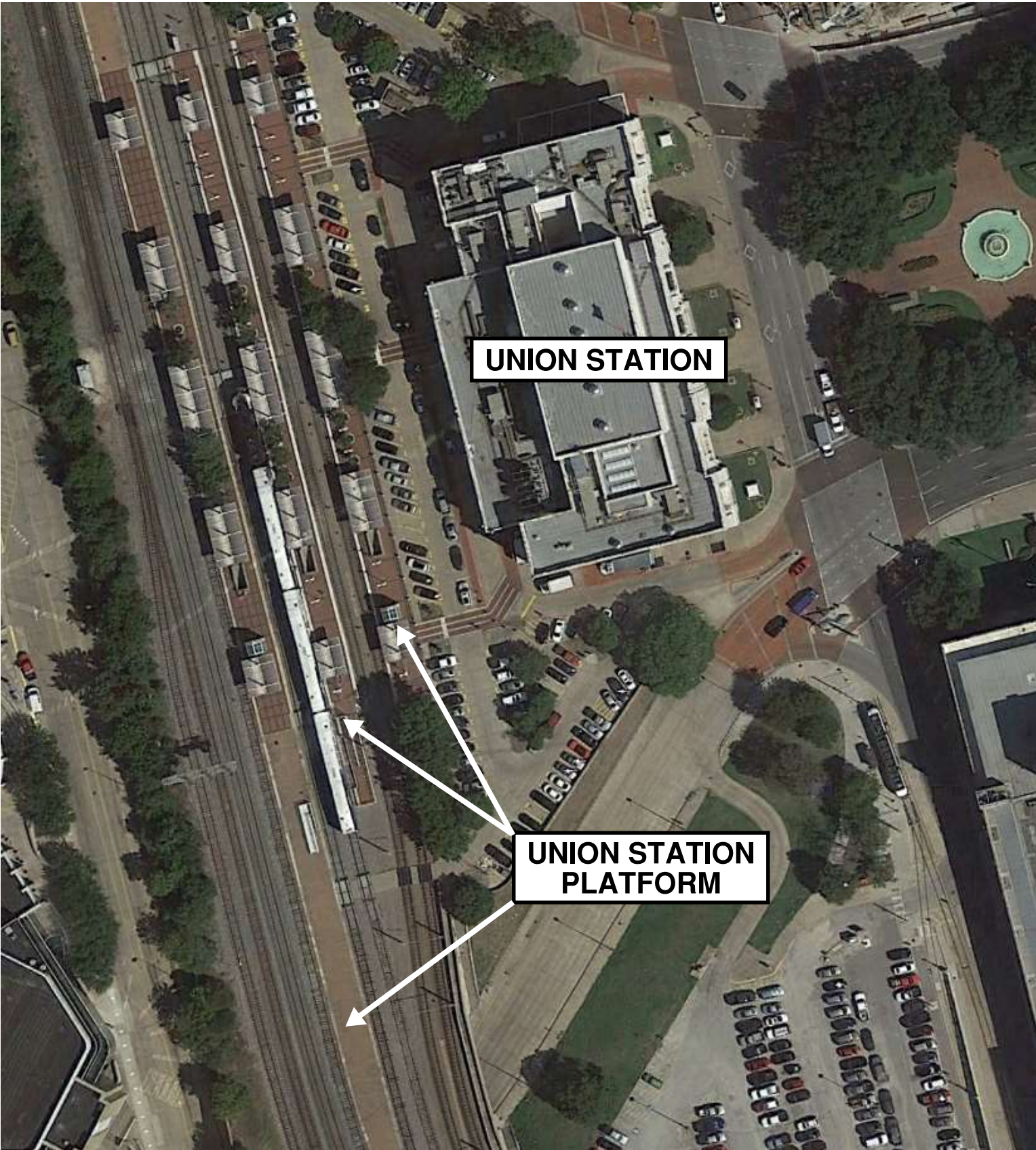
CADIZ STREET

EXISTING AMTRAK ALIGNMENT

© 2013 Google

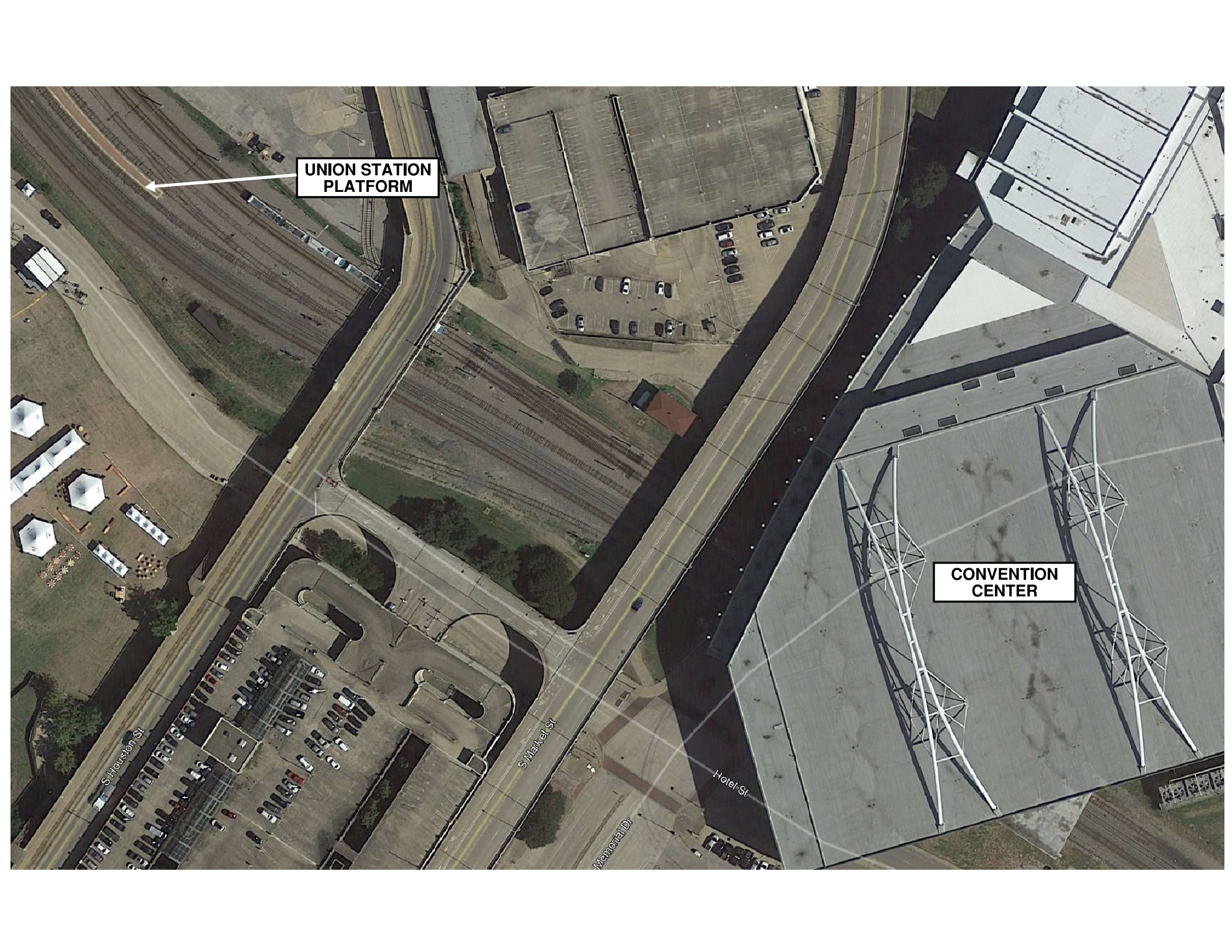
Imagery Date: 9/1

Aerial Photographs - Track Configuration



UNION STATION

**UNION STATION
PLATFORM**

An aerial photograph showing a city area with a large railway yard on the left, a multi-lane highway running diagonally through the center, and a large convention center building on the right. The railway yard contains numerous tracks and some parked trains. The highway has multiple lanes with yellow and white markings. The convention center is a large, modern building with a grey roof and white structural elements. Several streets are visible, including S Houston St, S Market St, Memorial Dr, and Hotel St. A white arrow points from the text label to the Union Station platform area.

**UNION STATION
PLATFORM**

**CONVENTION
CENTER**

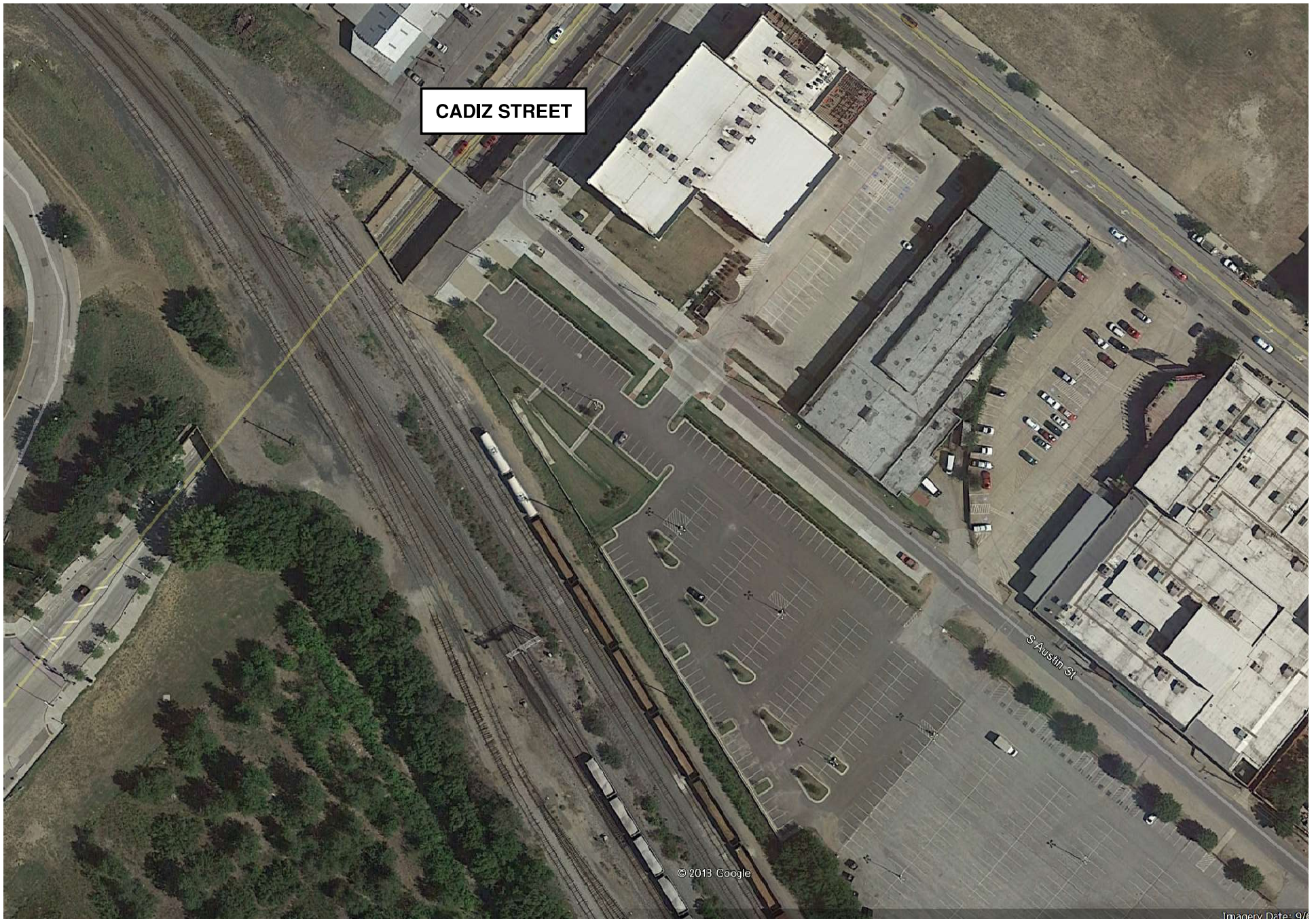


CONVENTION
CENTER

An aerial photograph showing an industrial and transportation area. In the top left, a white arrow points to a building labeled 'CONVENTION CENTER'. To its right is a large paved area with white markings, labeled 'HELIPORT'. Below the heliport is a large parking lot filled with cars. To the left of the parking lot is a large lot filled with shipping containers. In the bottom left, a highway interchange is visible, with labels for 'Stemmons Fwy', 'P.L. Thornton Fwy', and 'Hotel St'. To the right of the parking lot, a multi-lane highway is labeled 'IH-35' and 'Hwy 67'. Further right, 'St. Louis St' and 'Canton St' are visible. The bottom right corner shows some industrial buildings and a '© 2018 Google' watermark.

HELIPORT

IH-35



CADIZ STREET

© 2013 Google

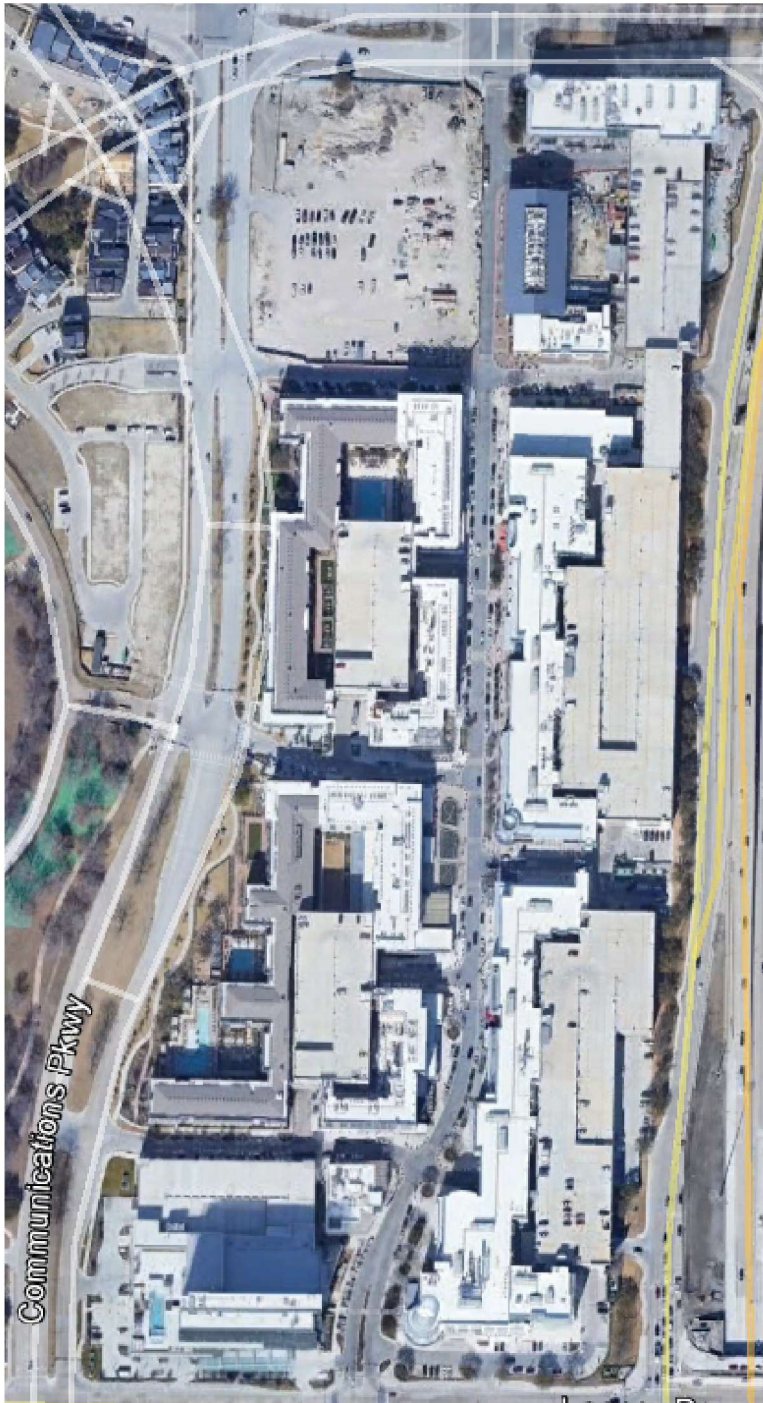
Imagery Date: 9/1

Attachment 4

Site Development Concept

Familiar Dallas Area Developments

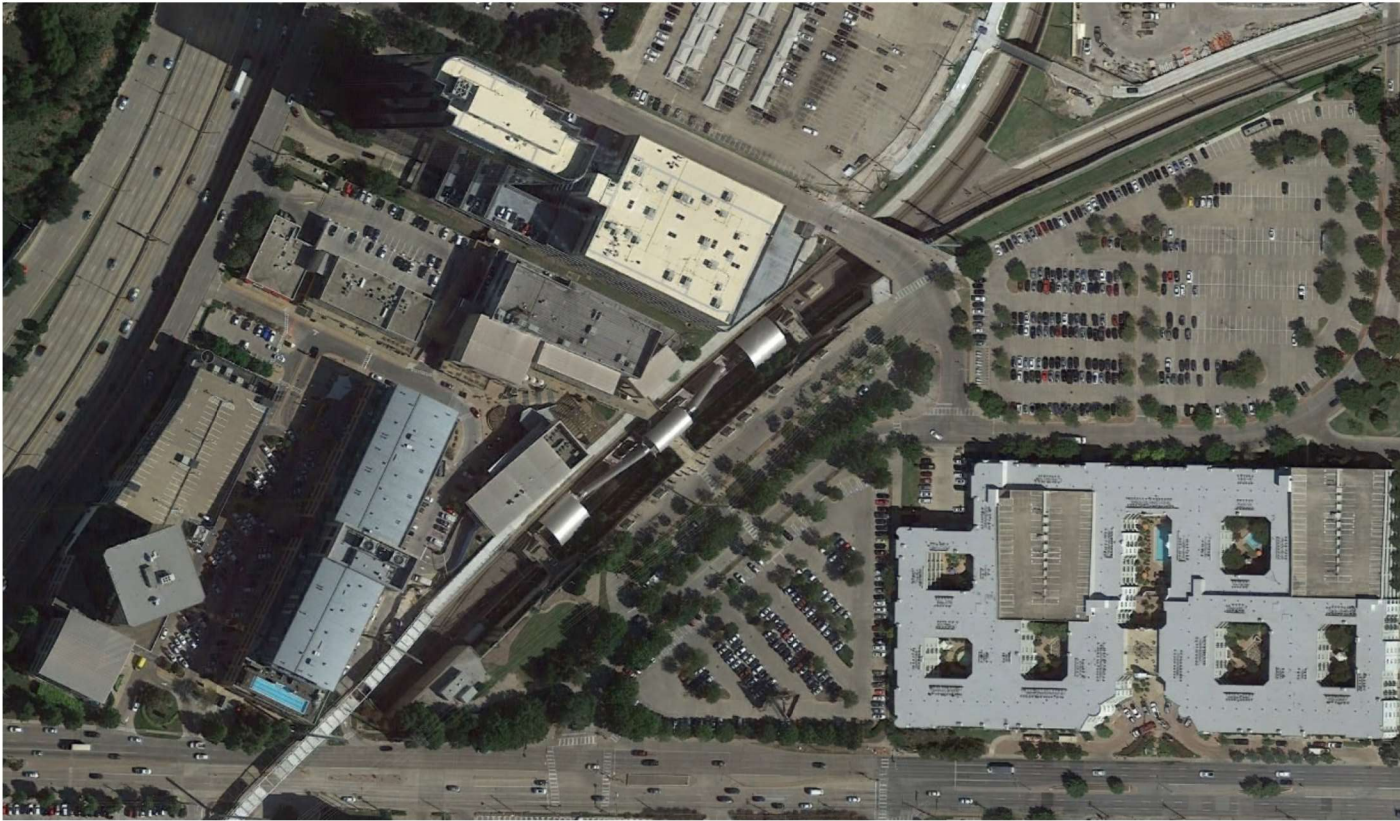
Legacy West



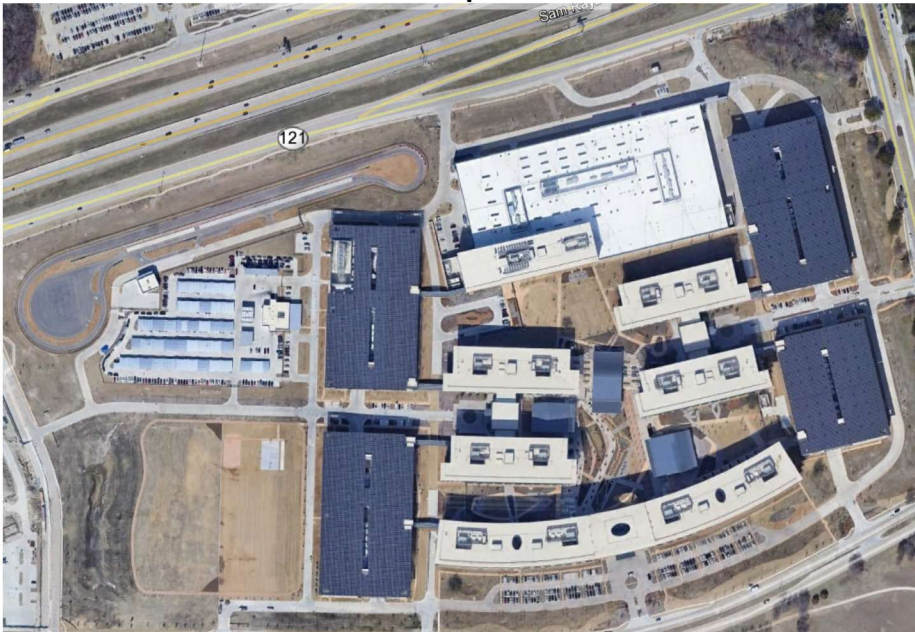
Las Colinas TOD



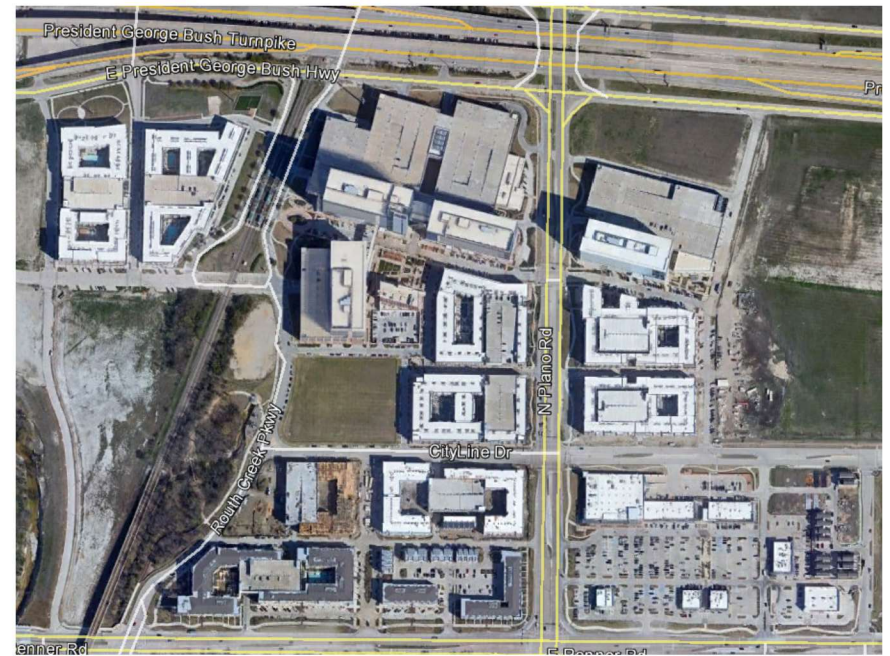
Mockingbird Station



TOYOTA Headquarters

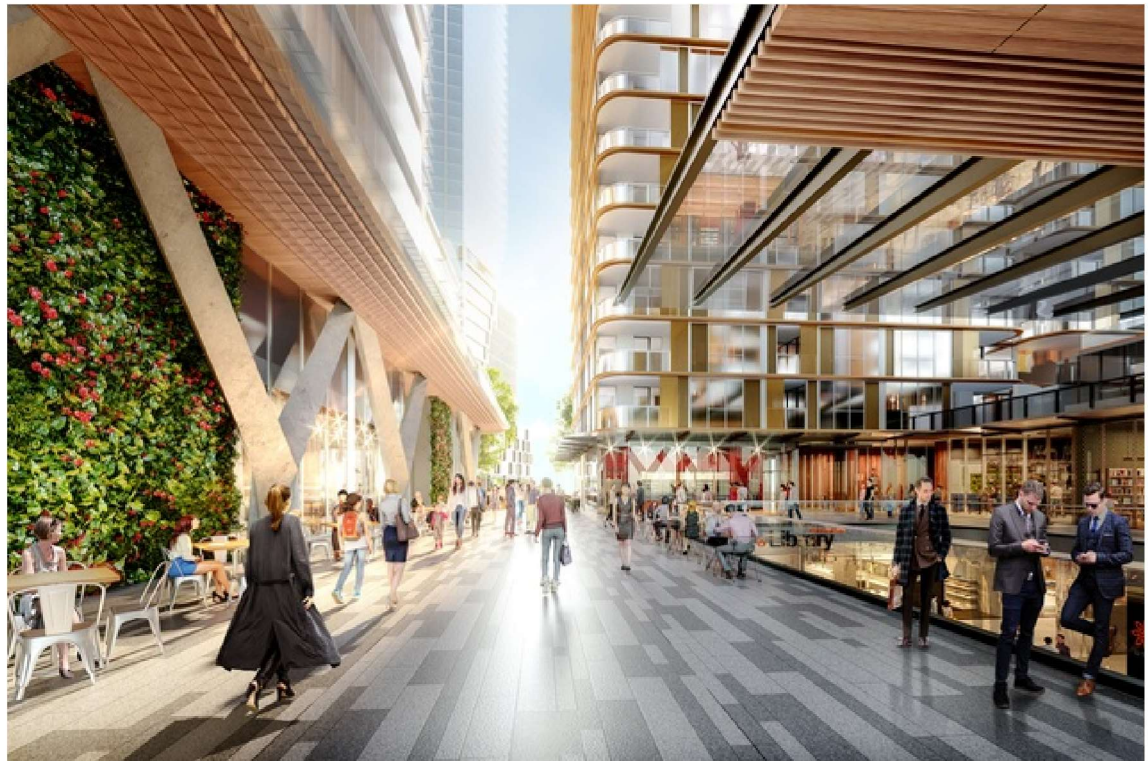
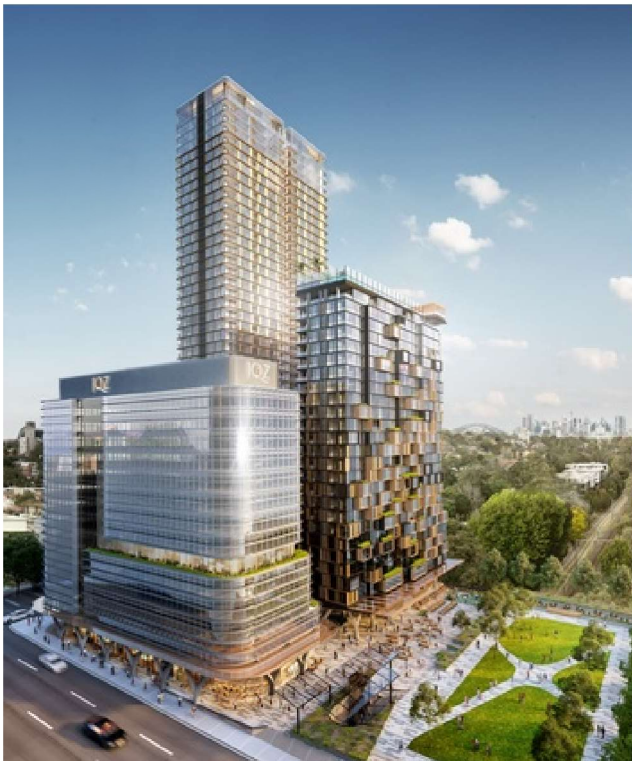


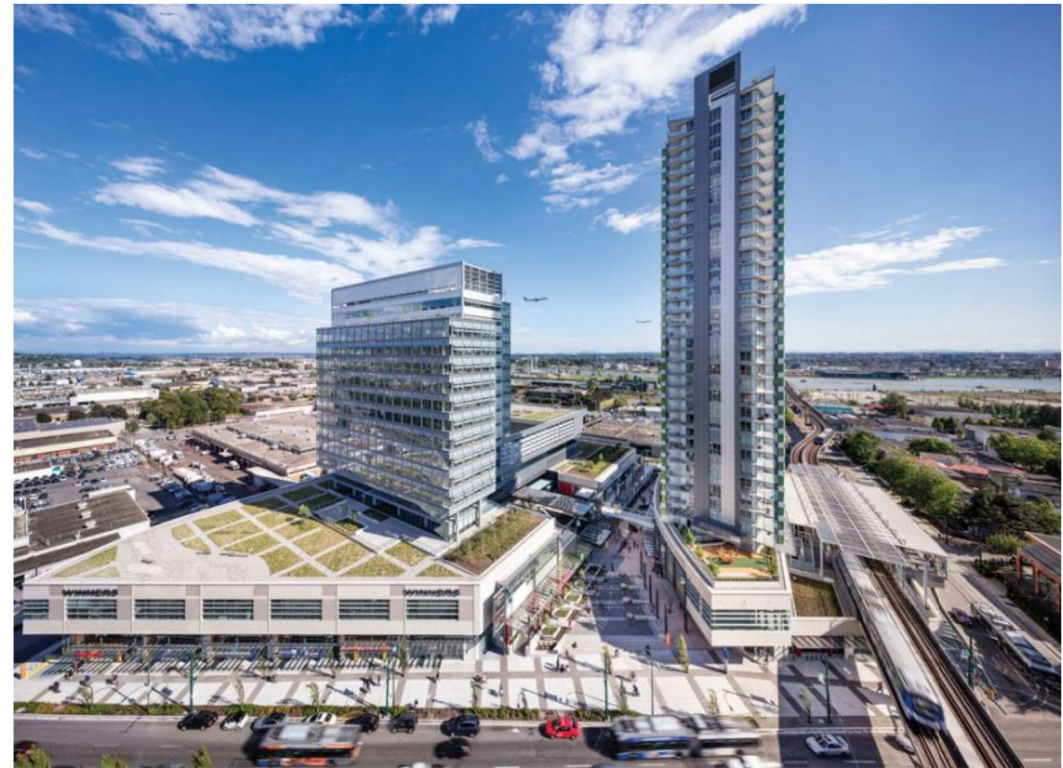
City Line



Development Concepts







City of Vancouver's largest transit-oriented development, Marine Gateway is a mixed-use development that adjoins the Sky-train station of the same name.



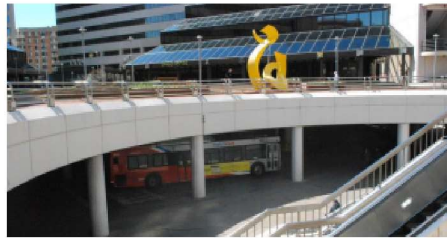


Transit City, the first residential condominium tower within the 100-acre SmartCentres Place, Ontario's largest urban development.

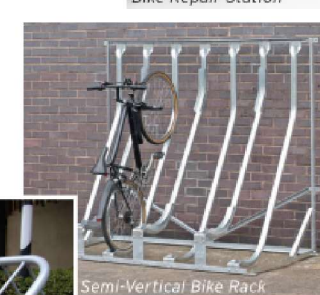


Development Features

BUS TRANSFER CENTERS



BIKE PARKING & FACILITIES



Concepts extracted from
DART D2 Public Meeting
Presentation Boards

ELEVATED CONNECTIONS



Seoul 2017 (Seoul Skygarden), Korea



Buckhead Park over GA400



Vinge Train Station, Denmark



Vinge Train Station, Denmark



Vinge Train Station, Denmark



Yuhang Railway Station, China



Vinge Train Station, Denmark



Vinge Train Station, Denmark

TCP Station Concept

TCP Dallas Station Concept



TCP Dallas Station Concept



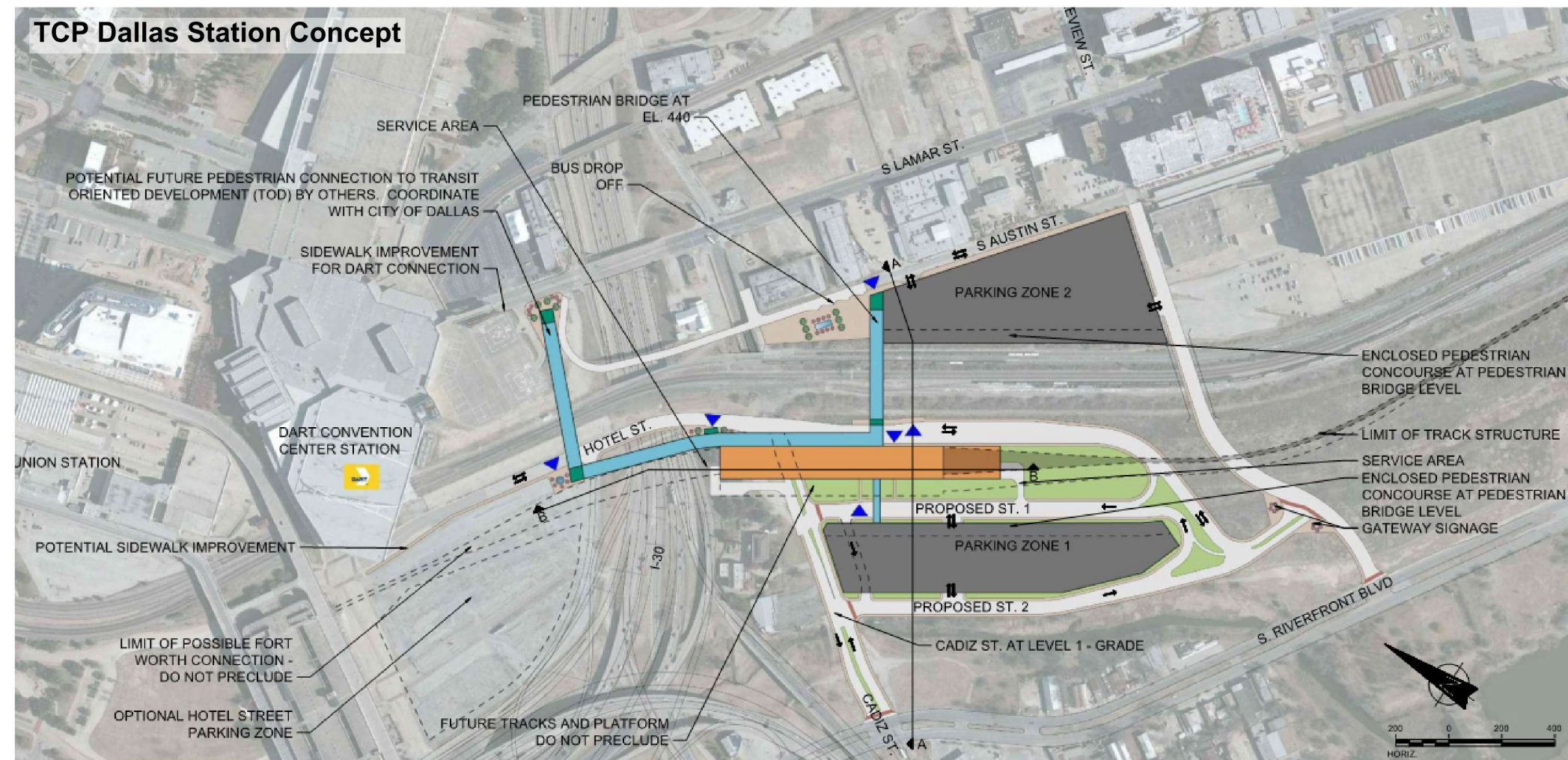
TCP Dallas Station Concept



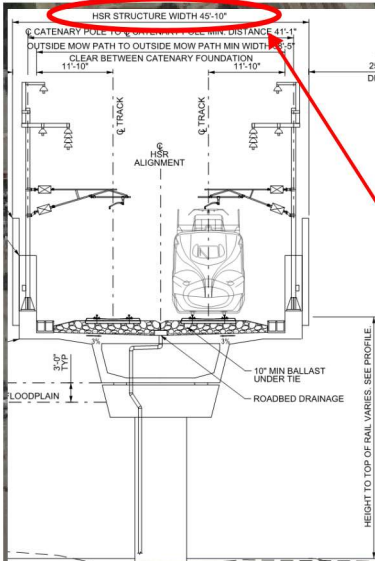
Shinkansen Urban Station



TCP Dallas Station Concept

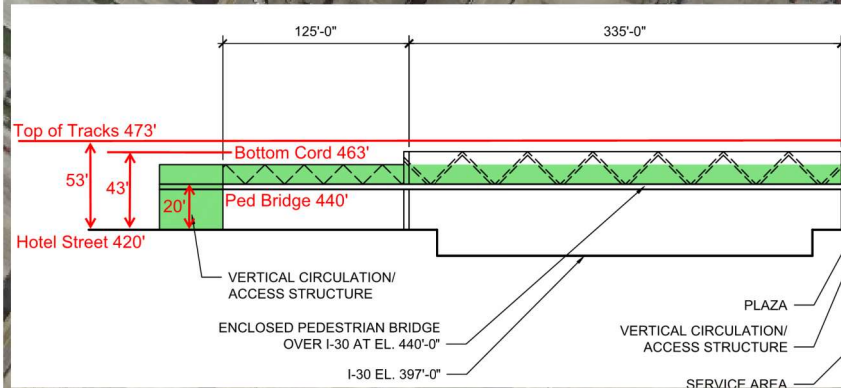
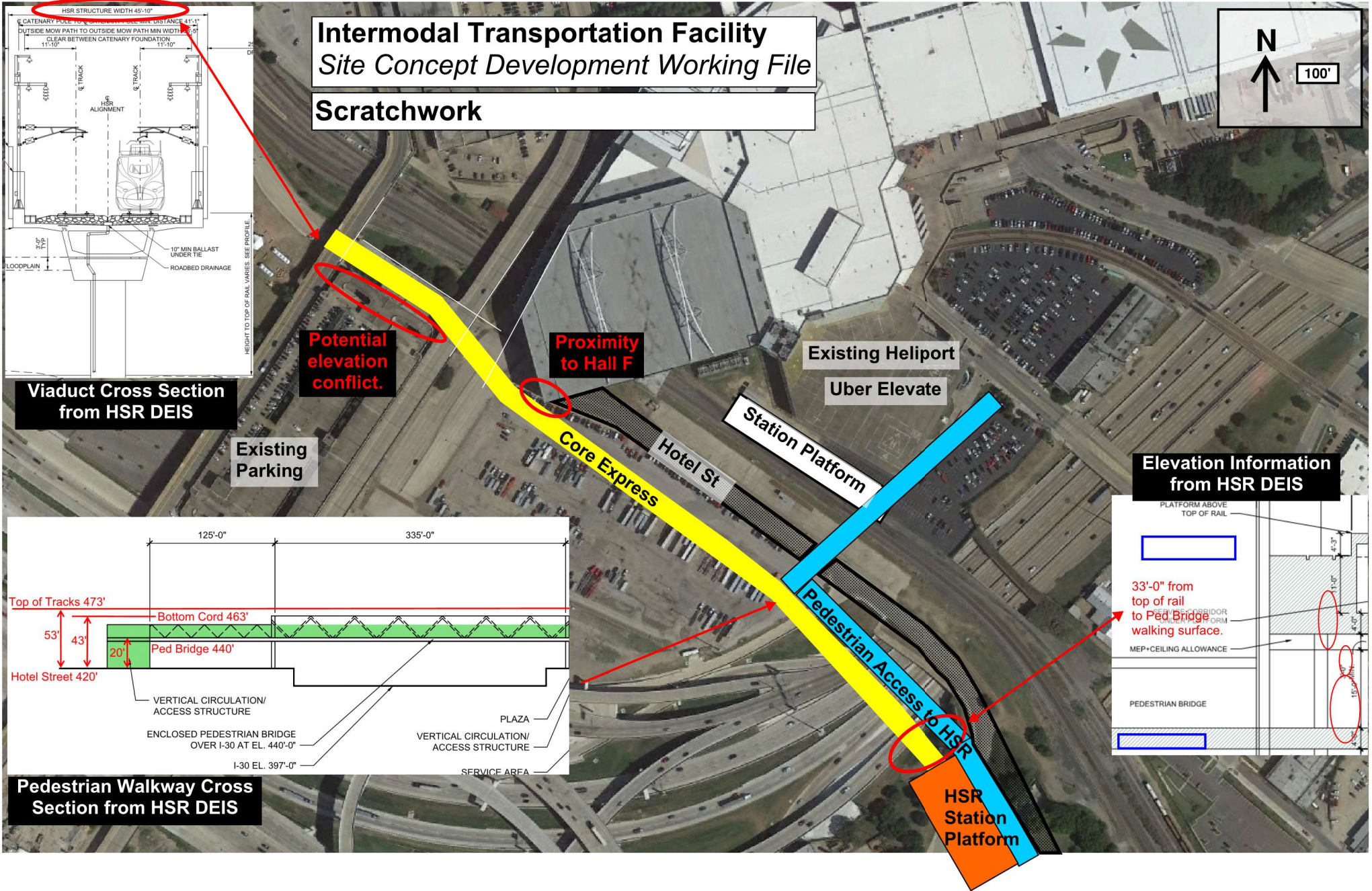
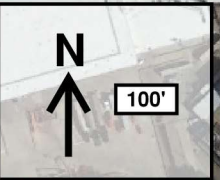


Intermodal Transportation Facility Site Development Concepts



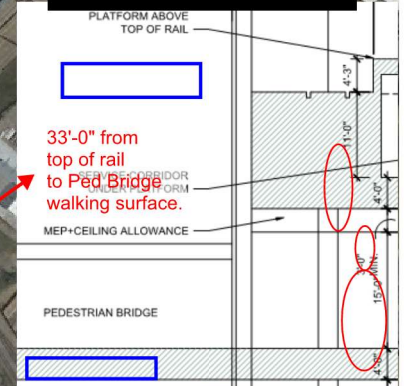
Viaduct Cross Section from HSR DEIS

Intermodal Transportation Facility *Site Concept Development Working File* **Scratchwork**



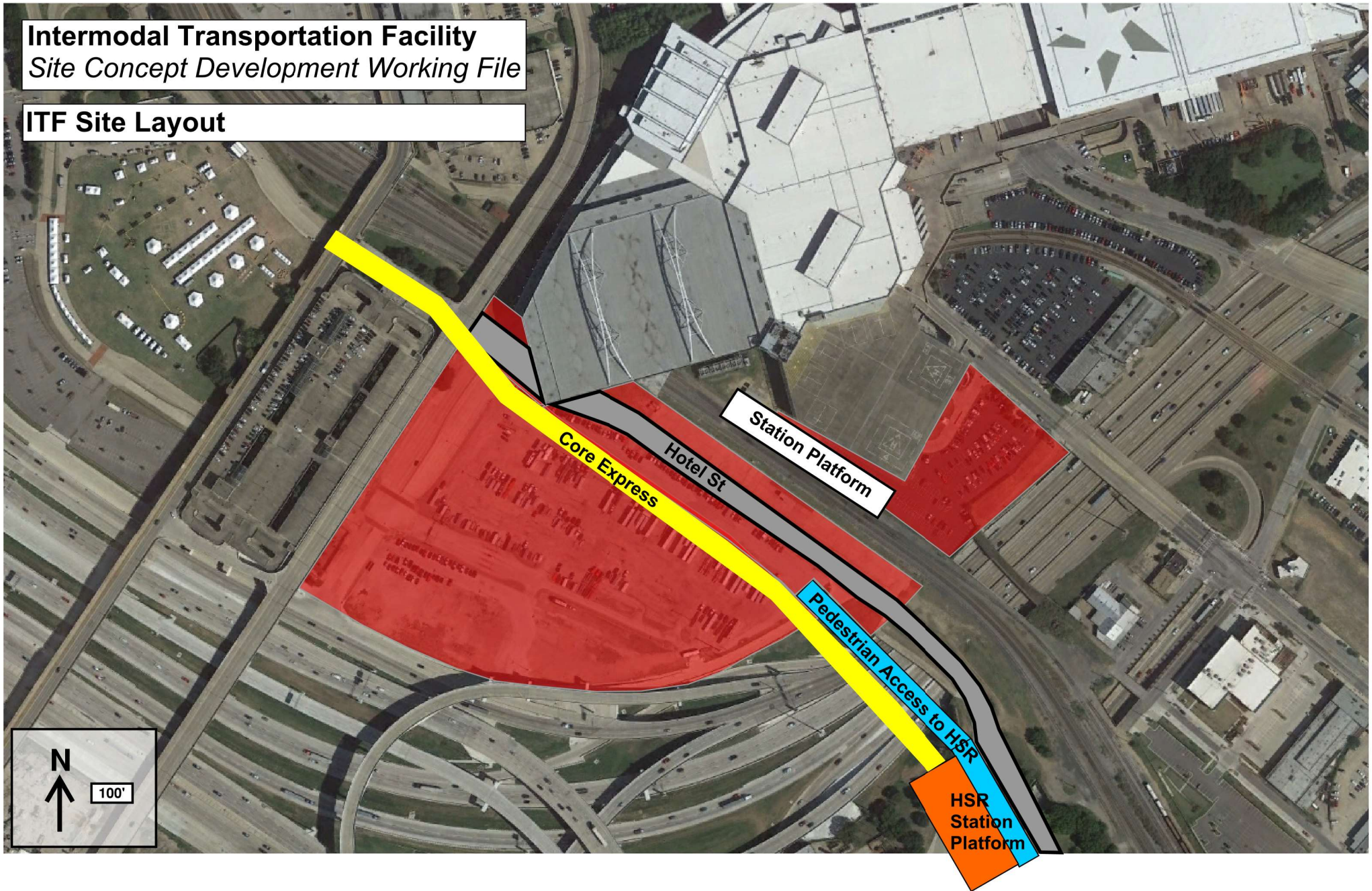
Pedestrian Walkway Cross Section from HSR DEIS

Elevation Information from HSR DEIS



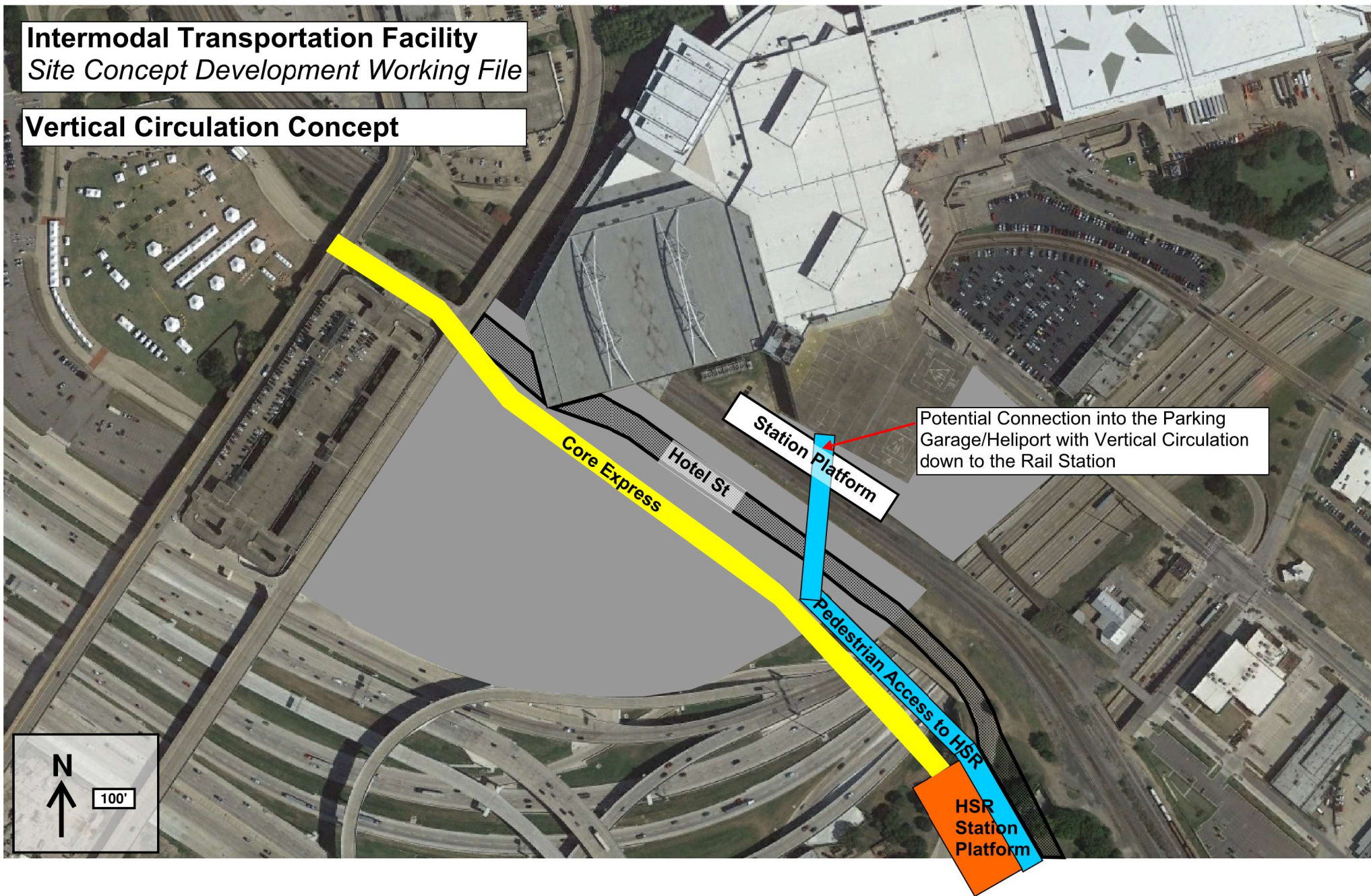
Intermodal Transportation Facility
Site Concept Development Working File

ITF Site Layout



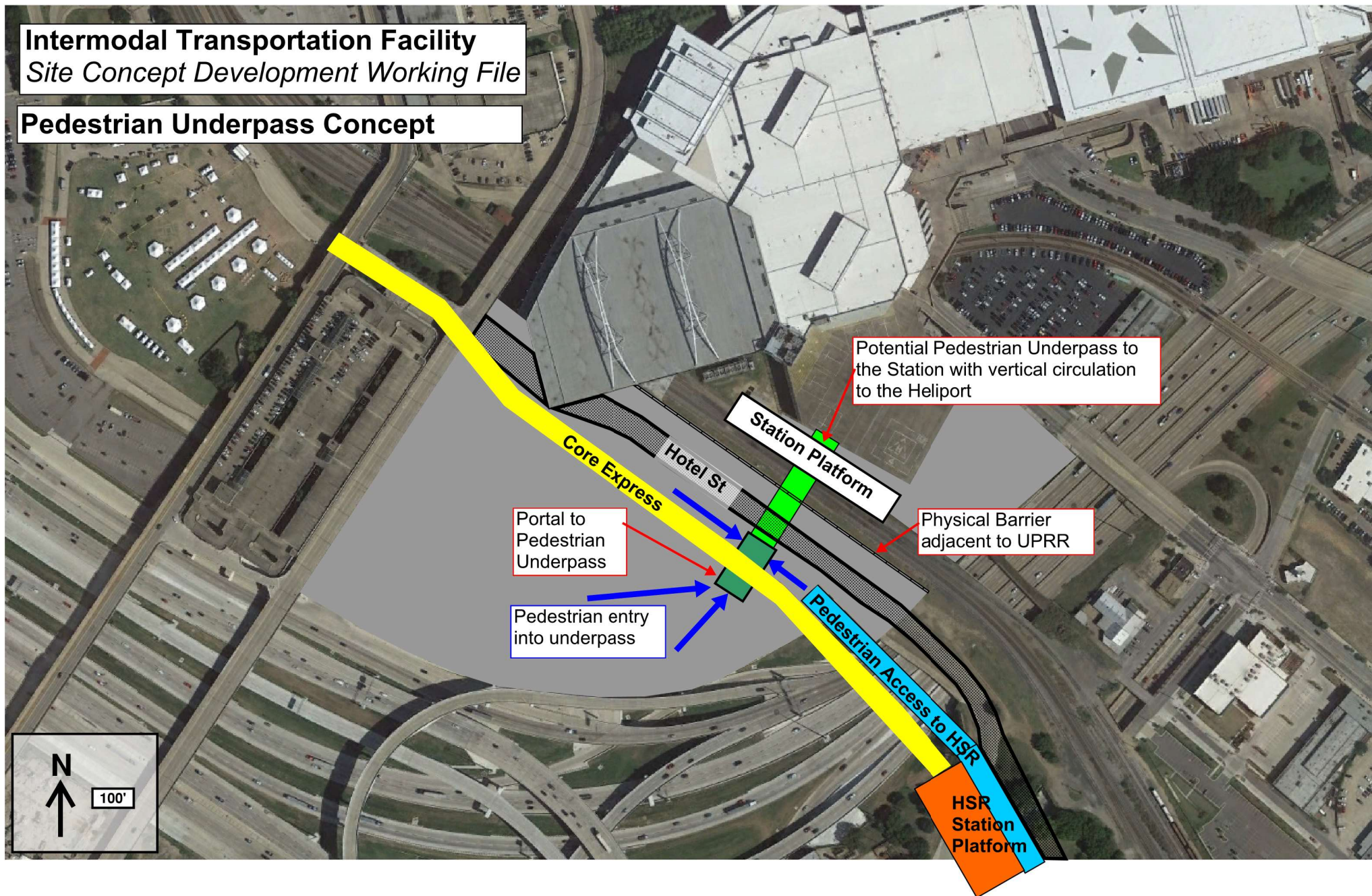
Intermodal Transportation Facility
Site Concept Development Working File

Vertical Circulation Concept



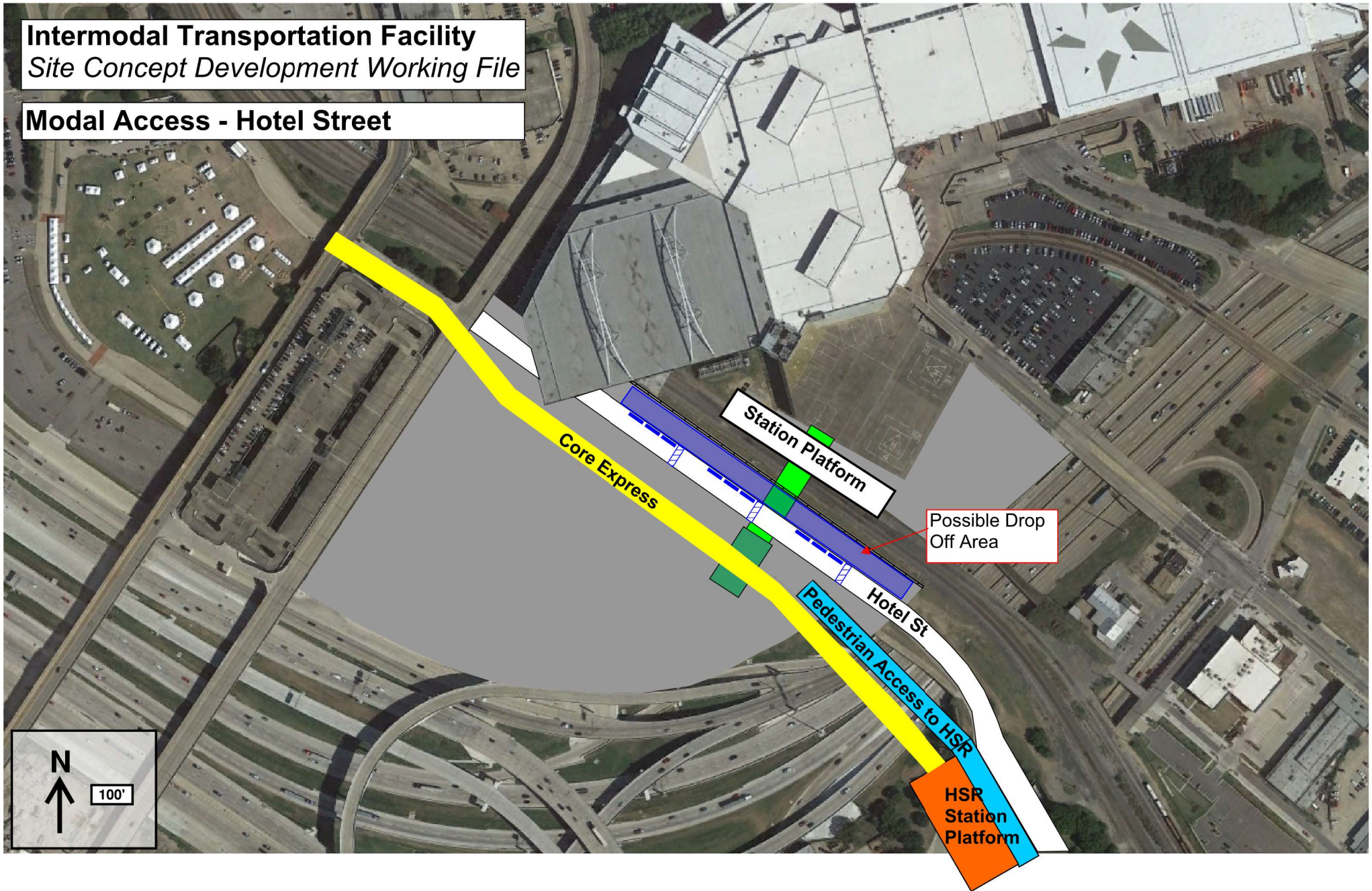
Intermodal Transportation Facility
Site Concept Development Working File

Pedestrian Underpass Concept



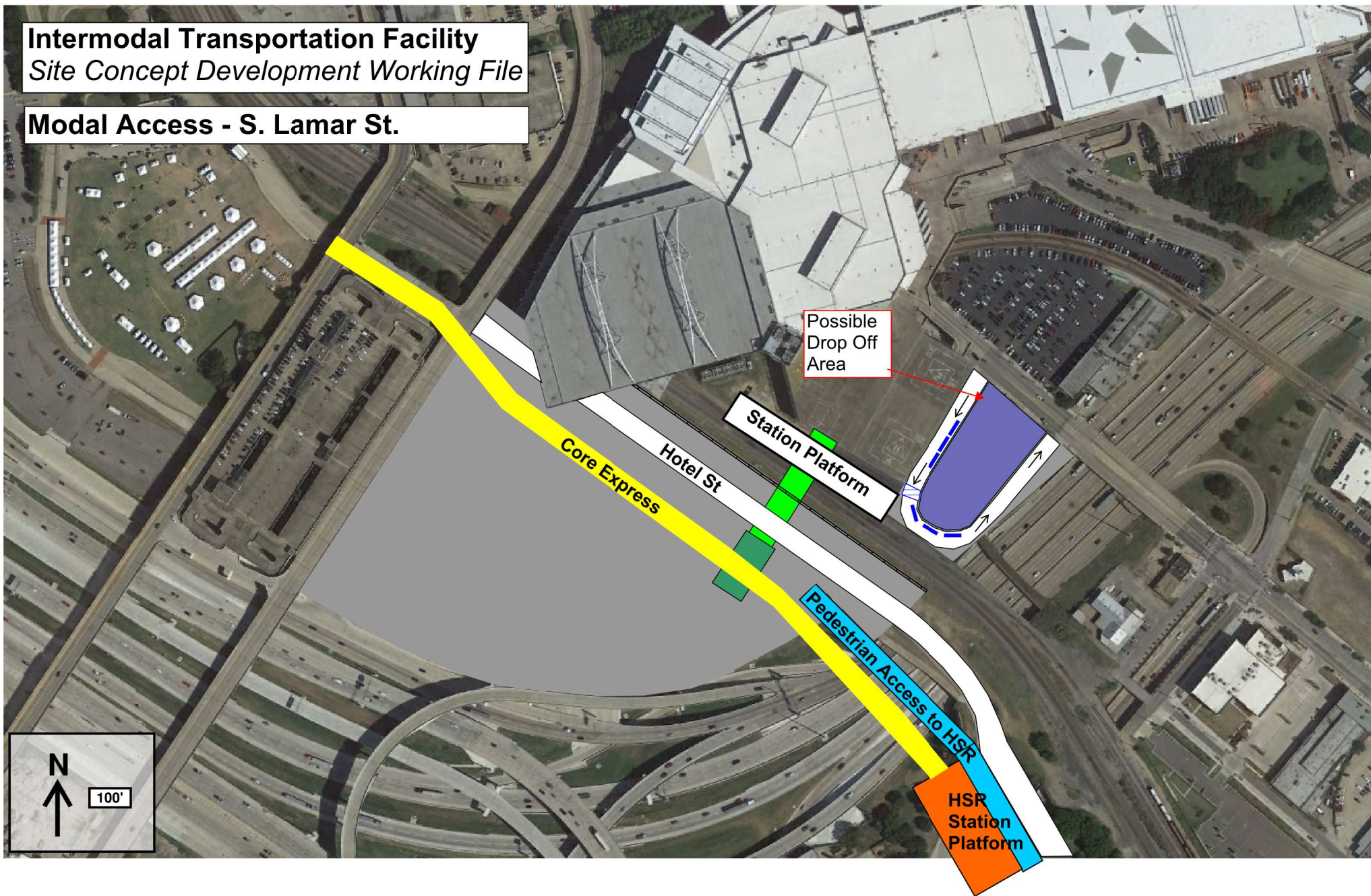
Intermodal Transportation Facility
Site Concept Development Working File

Modal Access - Hotel Street



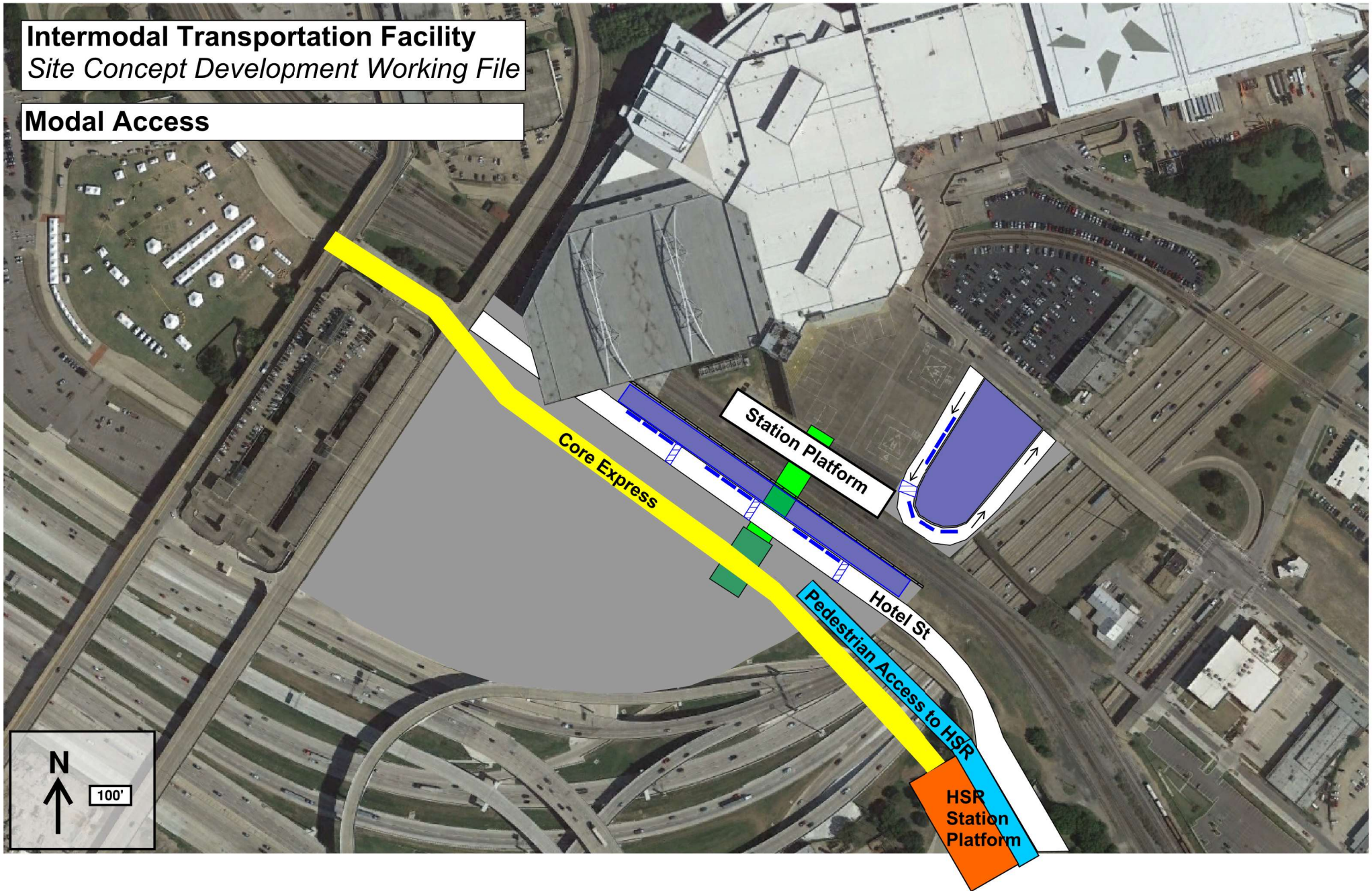
Intermodal Transportation Facility
Site Concept Development Working File

Modal Access - S. Lamar St.



Intermodal Transportation Facility
Site Concept Development Working File

Modal Access



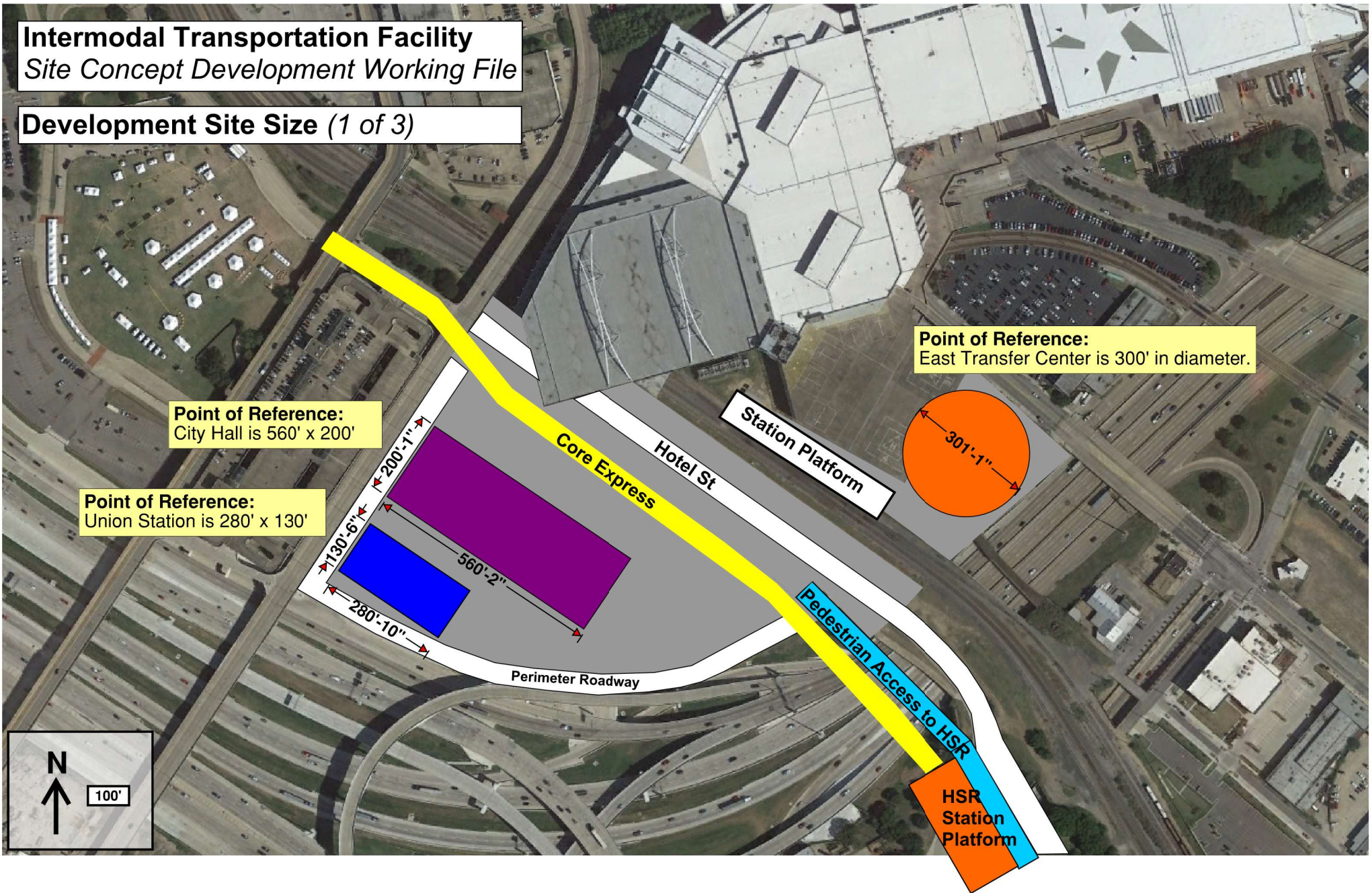
Intermodal Transportation Facility Site Concept Development Working File

Development Site Size (1 of 3)

Point of Reference:
City Hall is 560' x 200'

Point of Reference:
Union Station is 280' x 130'

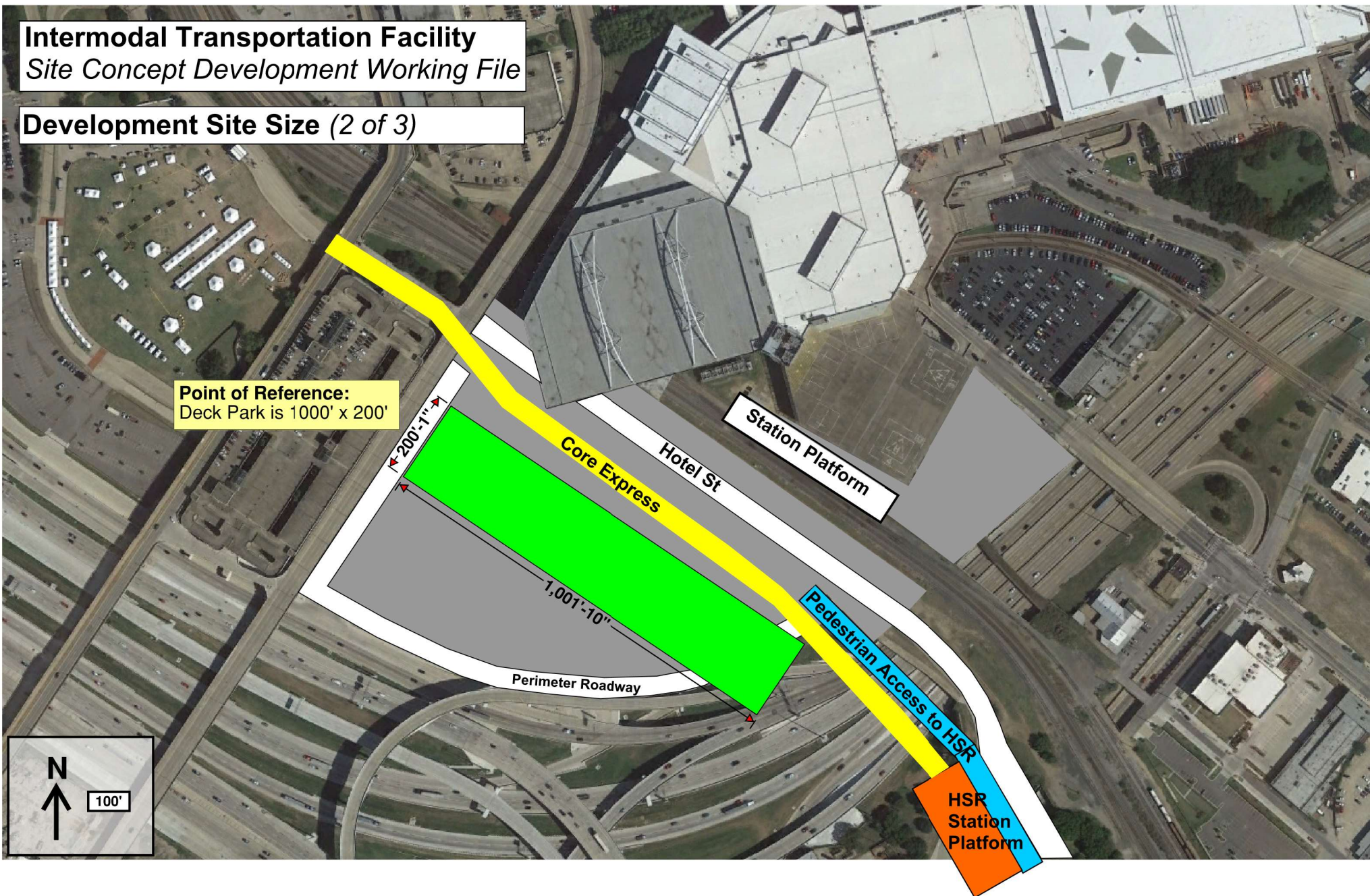
Point of Reference:
East Transfer Center is 300' in diameter.



Intermodal Transportation Facility
Site Concept Development Working File

Development Site Size (2 of 3)

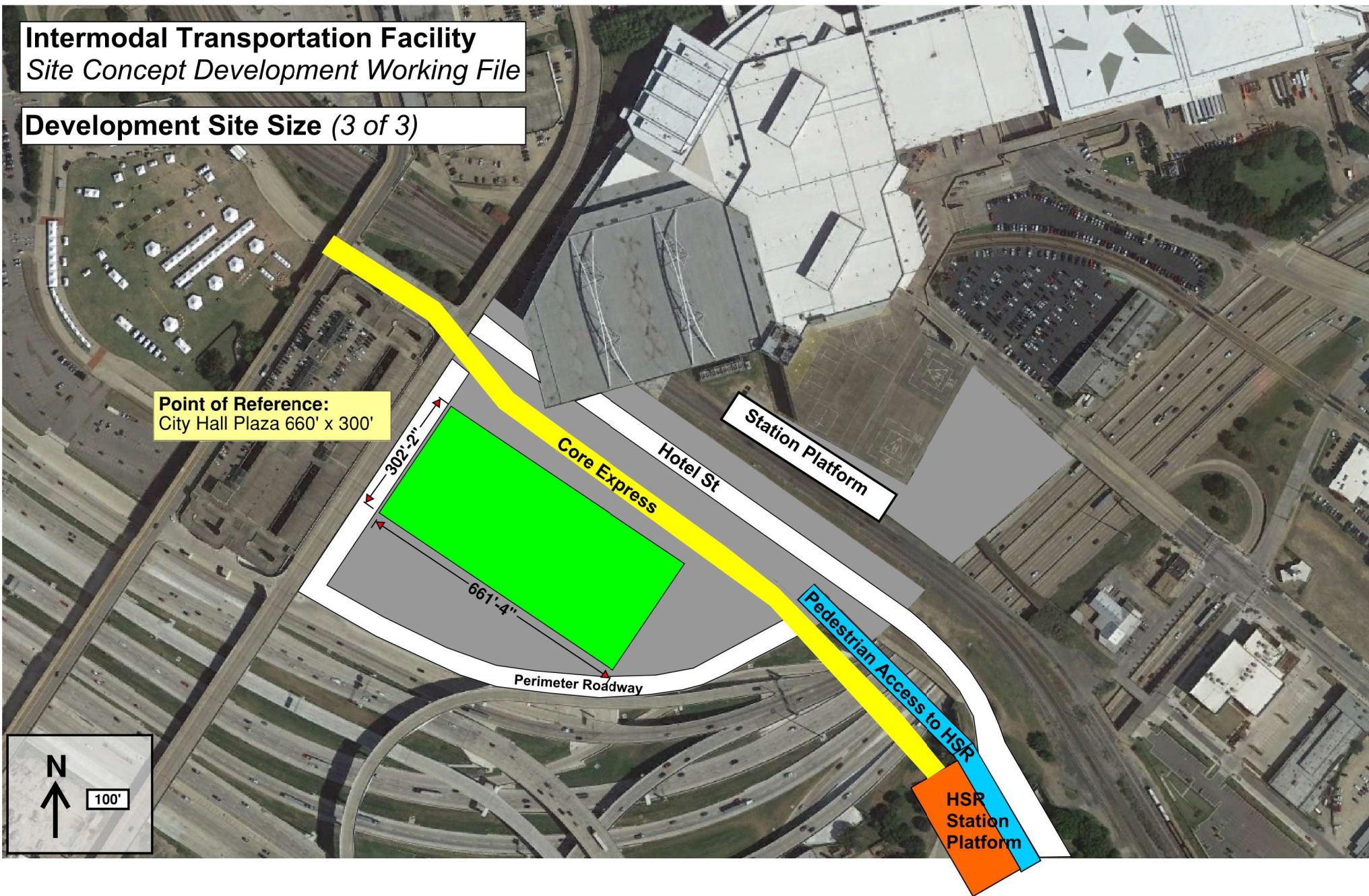
Point of Reference:
Deck Park is 1000' x 200'



Intermodal Transportation Facility
Site Concept Development Working File

Development Site Size (3 of 3)

Point of Reference:
City Hall Plaza 660' x 300'



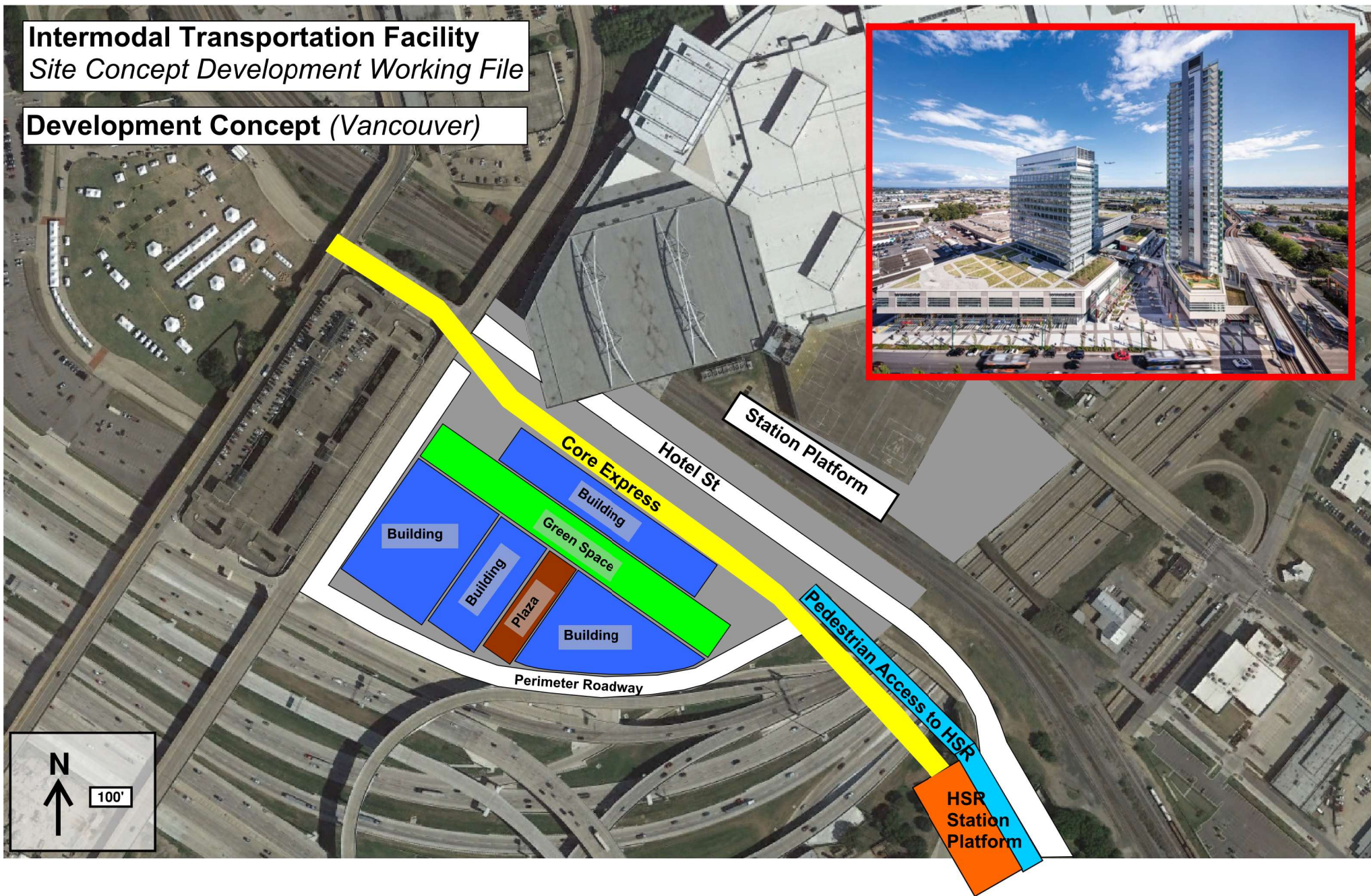
Intermodal Transportation Facility Site Concept Development Working File

Development Concept (Sydney)



Intermodal Transportation Facility
Site Concept Development Working File

Development Concept (Vancouver)



Intermodal Transportation Facility
Site Concept Development Working File

Development Concept (Ontario)

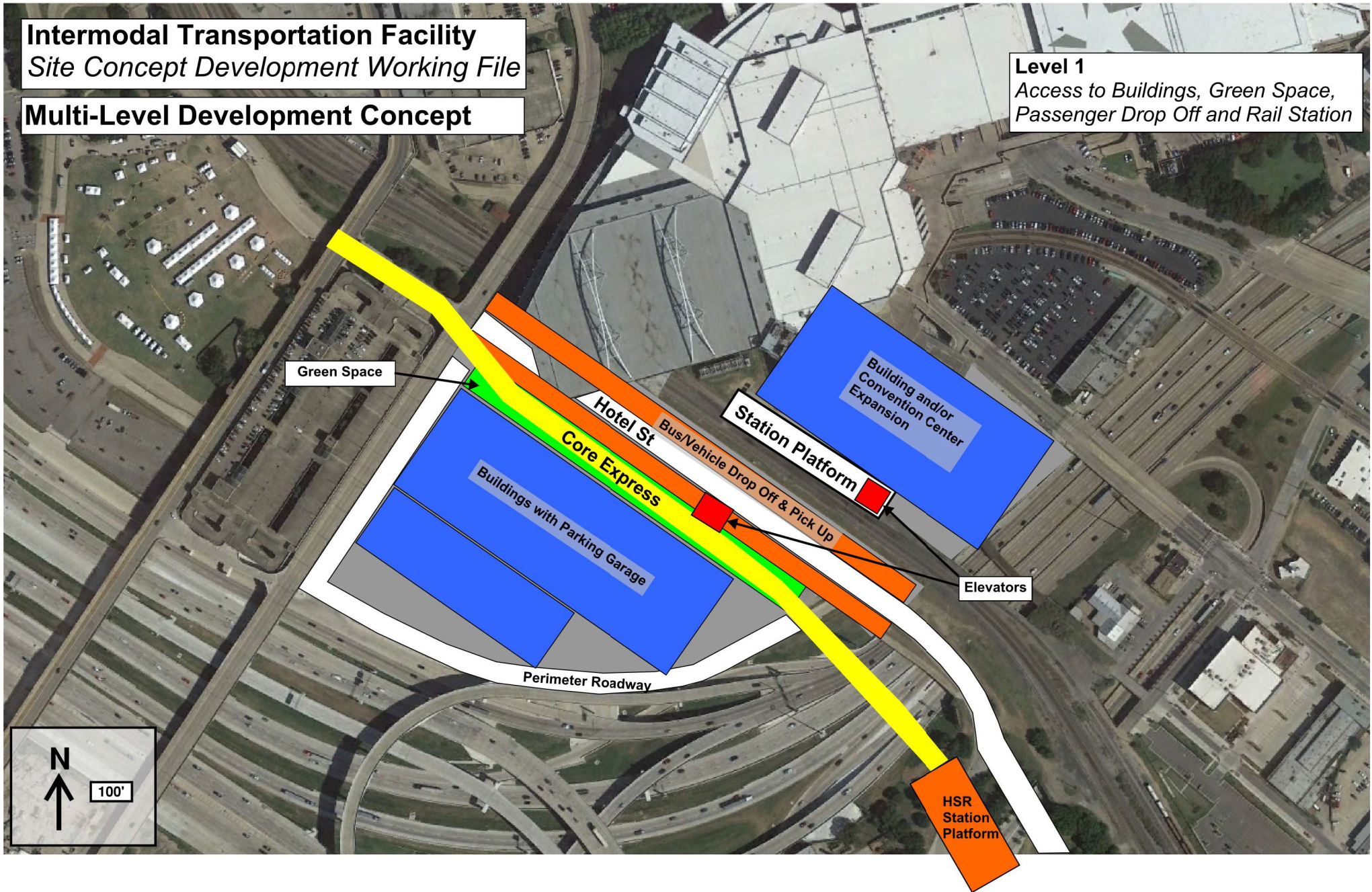


Intermodal Transportation Facility
Site Concept Development Working File

Multi-Level Development Concept

Level 1

*Access to Buildings, Green Space,
Passenger Drop Off and Rail Station*

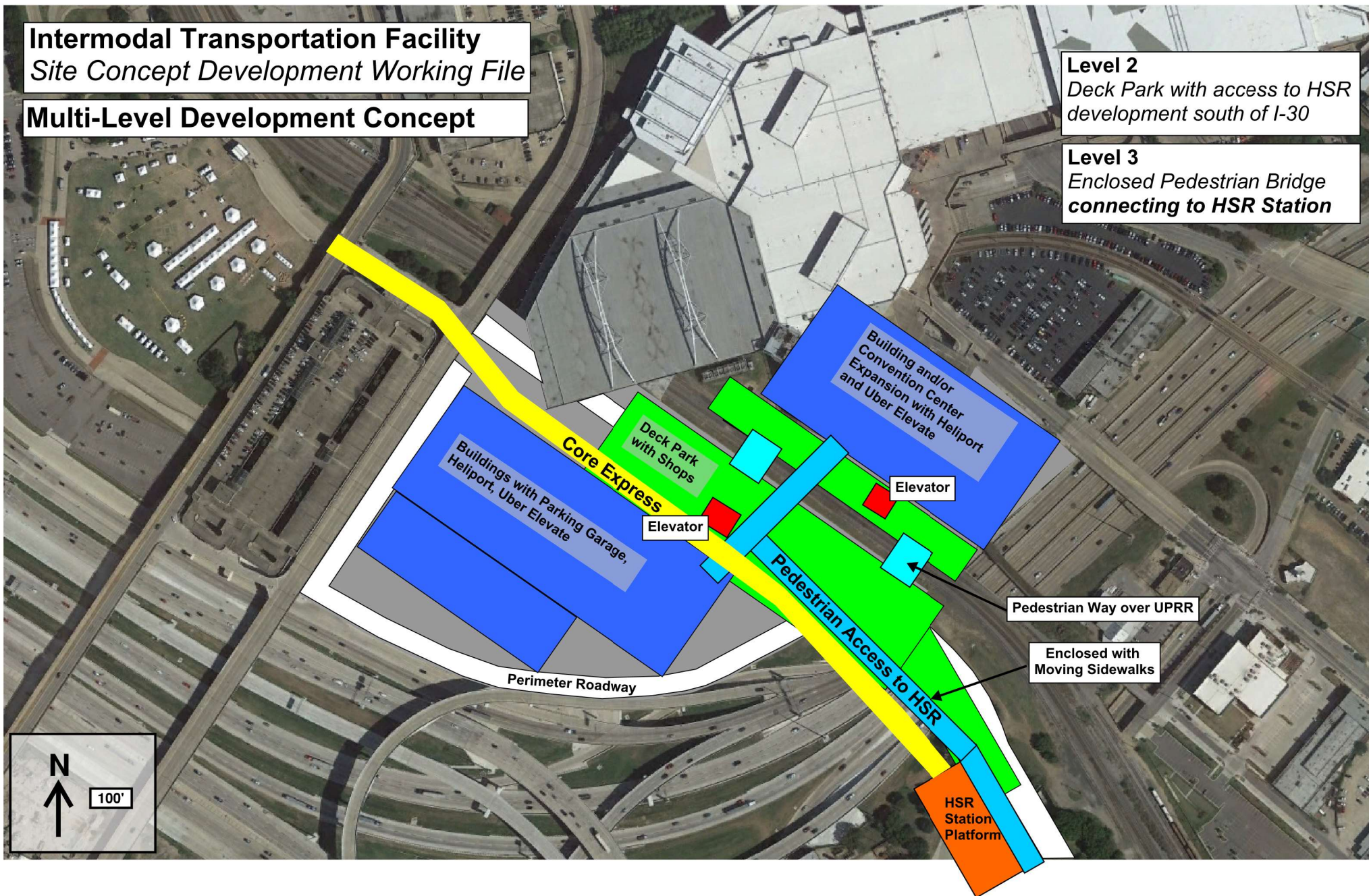


Intermodal Transportation Facility
Site Concept Development Working File

Multi-Level Development Concept

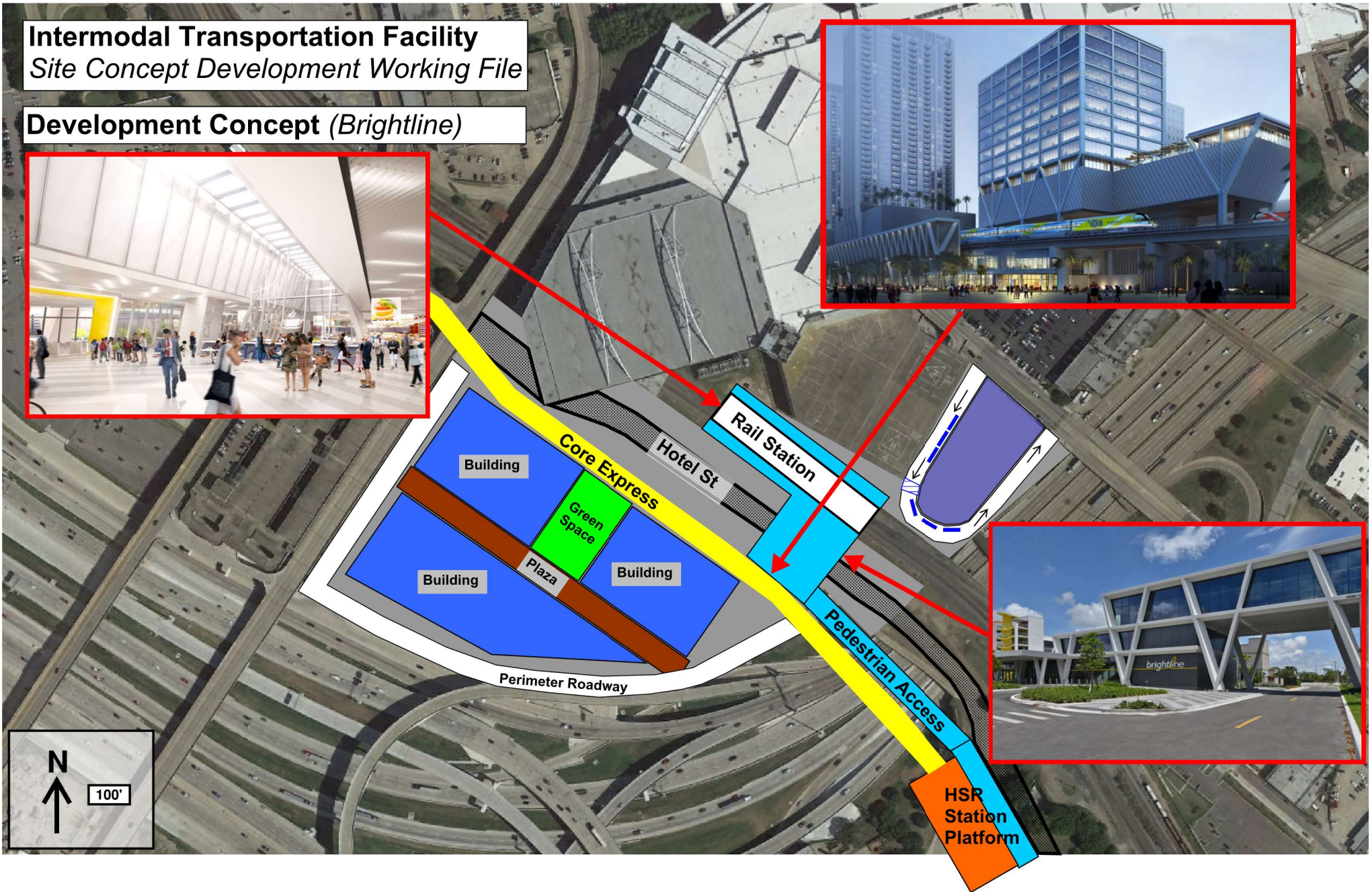
Level 2
Deck Park with access to HSR development south of I-30

Level 3
Enclosed Pedestrian Bridge connecting to HSR Station



Intermodal Transportation Facility
Site Concept Development Working File

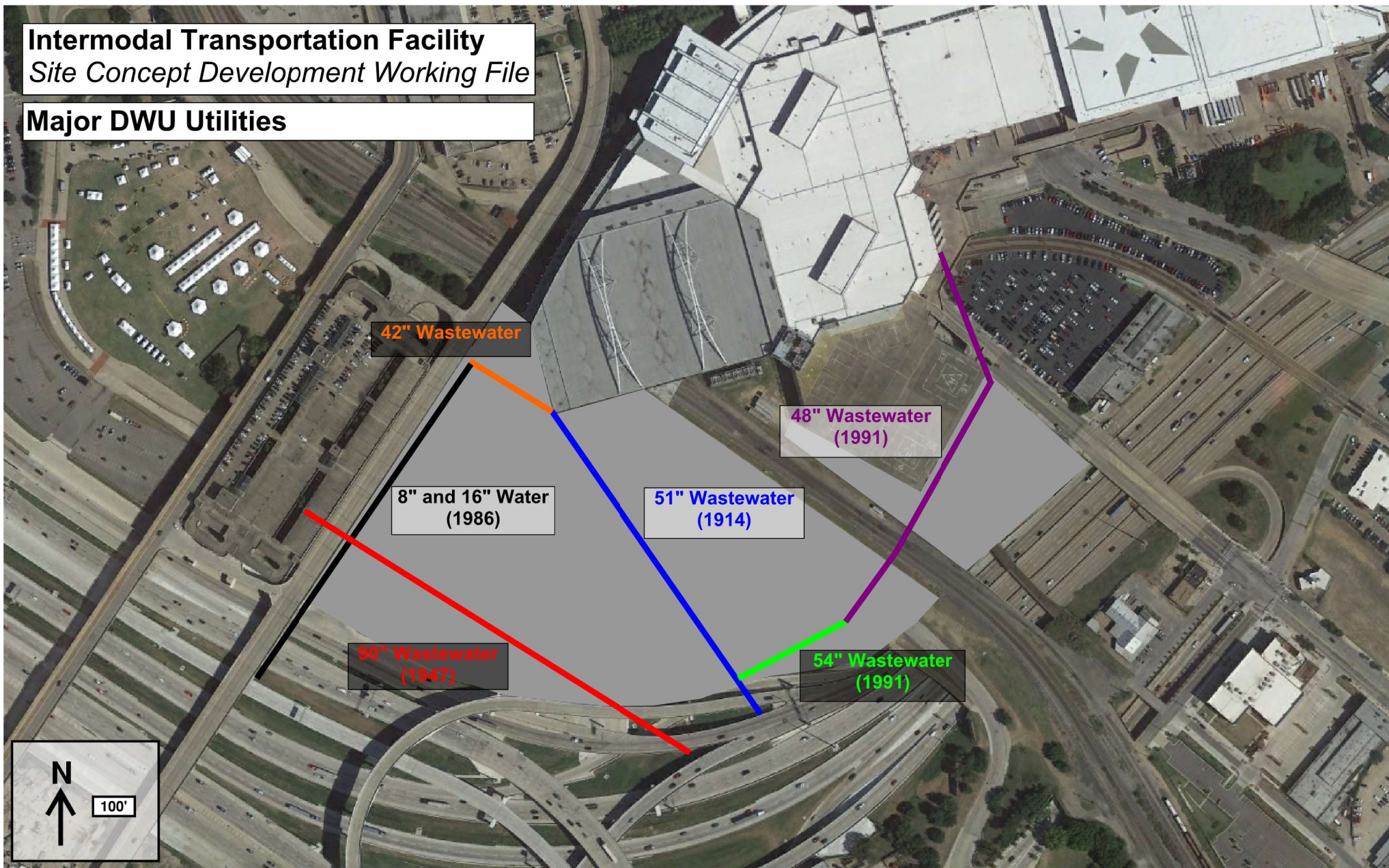
Development Concept (Brightline)



Major DWU Utilities

Intermodal Transportation Facility
Site Concept Development Working File

Major DWU Utilities



Intermodal Transportation Facility Site Concept Development Working File

Major DWU Utilities (Overlaid)

42" Wastewater

8" and 16" Water
(1986)

90" Wastewater
(1947)

51" Wastewater
(1914)

48" Wastewater
(1991)

54" Wastewater
(1991)

Core Express

Hotel St

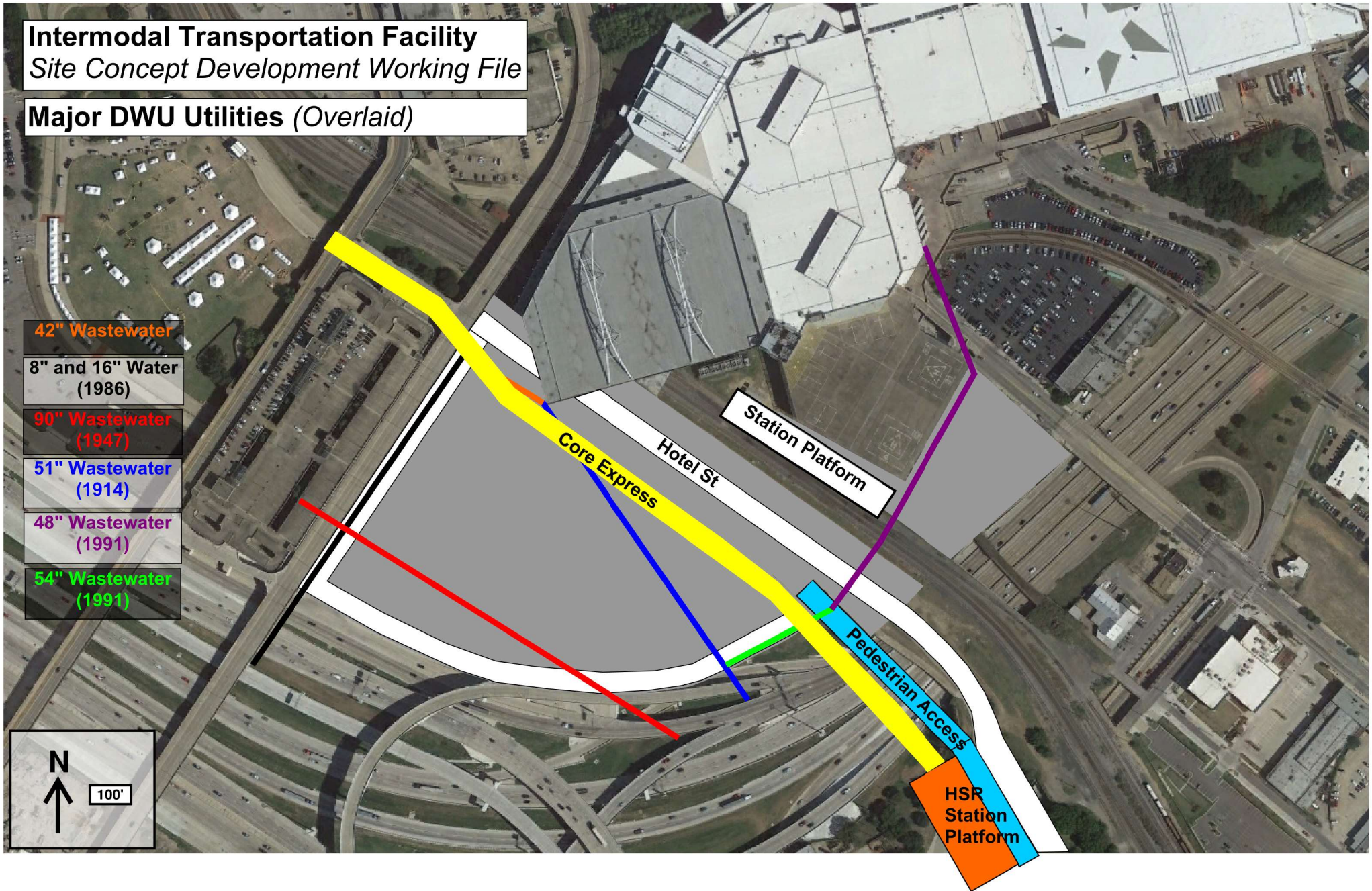
Station Platform

Pedestrian Access

HSR
Station
Platform

N
↑

100'



Station Platform Brainstorming

**CONVENTION
CENTER
Hall F**

HELIPORT

**ITF Rail Station
Location**

70'

Hotel St

100'



Intermodal Transportation Facility

Site Concept Development Working File

Platform Options

- 2 Platforms
- 2 TRE Tracks
- 1 Amtrak Track

TRE TRACK
AMTRAK TRACK
FREIGHT RAIL TRACK

450' platform length
22' platform width
25' between platforms
14.5' track centers

Track configuration is conceptual.
It does not reflect an evaluated track geometry.



100'

75 ft

Intermodal Transportation Facility

Site Concept Development Working File

Platform Options

- 2 Platforms
- 2 TRE Tracks
- 1 Amtrak Track

TRE TRACK
AMTRAK TRACK
FREIGHT RAIL TRACK

450' platform length
22' platform width
25' between platforms
14.5' track centers

Track configuration is conceptual.
It does not reflect an evaluated track geometry.



100'

Intermodal Transportation Facility

Site Concept Development Working File

Platform Options

- 2 Platforms
- 1 TRE Track
- 1 Amtrak Track

TRE TRACK
AMTRAK TRACK
FREIGHT RAIL TRACK

450' platform length
22' platform width
25' between platforms
14.5' track centers

Track configuration is conceptual.
It does not reflect an evaluated track geometry.



100'

Intermodal Transportation Facility

Site Concept Development Working File

Platform Options

- 1 Platform
- 1 TRE Track
- 1 Amtrak Track

TRE TRACK
AMTRAK TRACK
FREIGHT RAIL TRACK

450' platform length
22' platform width

34'-4"

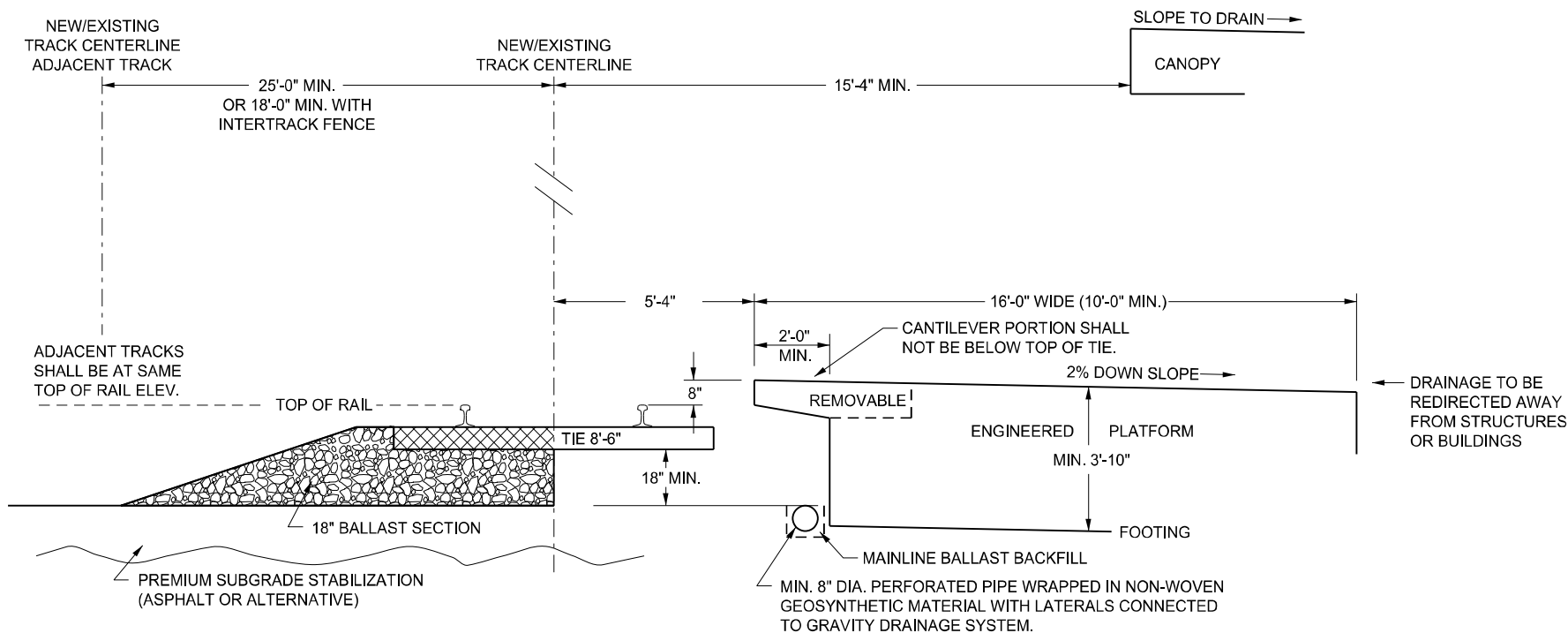
Track configuration is
conceptual.
It does not reflect an
evaluated track geometry.



100'

Attachment 5

UPRR Passenger Platform Guide



NOTES:

- THIS PLAN IS FOR PASSENGER PLATFROMS ON FREIGHT CORRIDORS.
- THIS IS TO BE APPLIED TO ALL NEW, RECONSTRUCTED, OR MODIFIED PASSENGER PLATFORMS. IT SHALL BE FULLY COMPLIED WITH AT THE TIME ANY SIGNIFICANT MODIFICATION OR ENHANCEMENT IS PERFORMED, UNLESS OTHERWISE APPROVED.
- ALL DESIGN DRAWINGS AND CONSTRUCTION METHODS MUST BE APPROVED PRIOR TO CONSTRUCTION.
- APPLICABLE PORTIONS OF AREMA CHAPTER 12, SECTION 4.2 AND CHAPTER 14, SECTIONS 6.2 AND 6.3 SHALL BE INCORPORATED, BUT SHALL BE SUPERCEDED BY THIS STANDARD PLAN IF INCONSISTENT. ADA REQUIREMENTS SHALL BE MET.
- PLATFORM AND DRAINAGE STRUCTURES SHALL BE DESIGNED TO CARRY ALL ANTICIPATED LOADS AND BE SEALED BY A LICENSED ENGINEER. LOADS WILL INCLUDE OFF TRACK MAINTENANCE EQUIPMENT, SUCH AS LARGE LOADERS UNDER LOAD.
- PLATFORM SHALL BE A PERMANENT INSTALLATION: (UTILIZING PRE-CAST CONCRETE MEMBERS IS PREFERRED).
- THE ADJACENT TRACK STRUCTURE SHALL BE UPGRADED/BUILT TO INCLUDE PREMIUM SUBGRADE STABILIZATION, TIES CONSISTENT WITH THE CORRIDOR WITH A MIN. 20-YR LIFE, ELASTIC FASTENERS AND 6" BASE RAIL.
- ART WORK AND LANDSCAPING IS NOT PERMITTED WITHIN 25 FEET FROM CENTERLINE OF ANY TRACK.
- NEW CENTER PLATFORMS ARE NOT ALLOWED UNLESS GRADE SEPARATED PEDESTRIAN WALKWAYS ARE INCORPORATED. NO PEDESTRIAN AT-GRADE CROSSINGS ARE PERMITTED. PLATFORMS SHALL BE SETBACK 300 FEET FROM AT-GRADE ROAD CROSSINGS.
- AN INTER-TRACK FENCE SHALL BE PROVIDED WHEN THERE ARE TWO OR MORE TRACKS. A MINIMUM OF 18 FOOT TRACK CENTERS BETWEEN TWO TRACKS IS REQUIRED FOR A FENCE. THE FENCE SHALL BE A MINIMUM OF 6 FEET HIGH AND EXTENDED TO ADJACENT PUBLIC ROAD CROSSINGS, AND AT A MINIMUM OF 150 FEET BEYOND THE PLATFORM ENDS.
- SECURITY FENCES SHALL BE PROVIDED THE FULL LENGTH (MIN.) OF THE PLATFORM ON BOTH THE TRACK FIELD SIDE AND BEHIND OR ON THE PLATFORM. THEY SHALL BE 6 FEET ABOVE THE GRADE AND A MINIMUM OF 25 FEET FROM THE CENTERLINE OF TRACK(S), IF NOT ON THE PLATFORM
- END RAMPS SHALL BE PROVIDED, AND SHALL BE POSTED WITH SIGNS READING "NO PASSENGERS BEYOND THIS POINT".
- LIGHTING AND SIGNAGE MUST NOT INTERFERE OR VISUALLY IMPAIR RAILROAD SIGHT DISTANCES OR SIGNAL OBSERVATIONS.
- PLATFORMS ARE PERMITTED ON ONLY ONE SIDE OF A TRACK AND SHALL NOT BE PLACED ON A CURVE.
- PLATFORM LENGTH SHALL BE MINIMUM NECESSARY TO SUPPORT SERVICE.
- DEPARTING SIGNALS MUST BE VISIBLE FROM EITHER DIRECTION.
- TEMPORARY SHORING SHOULD MEET BNSF-UPRR "GUIDELINES FOR TEMPORARY SHORING".

BNSF
RAILWAY



COMMON STANDARD PLAN

PASSENGER PLATFORM GUIDELINE

FILE OWNER: BNSF DATE: APR. 30, 2012

REV. NO.: 1 DWG NO: 100100

100100

Attachment 6

DWU Lot E and Riverfront/Forest City Fact Sheet

Lot E and Riverfront/Forest City - DWU FACT SHEETS

February 7, 2019

PLANNED PROJECTS

Dallas Water Utilities has several planned infrastructure projects in the subject areas. The projects focus on replacement and rehabilitation to address aging and deteriorated wastewater infrastructure and provide better access for future internal maintenance. Completion of these efforts will also allow for flexibility to repurpose or potentially decommission the historic Cadiz Street Pump Station. A summary of the projects is included below, and project exhibits are attached.

1. Rehabilitation of Cadiz Pump Station Influent Structure

- Poor structural condition
- Ensures stability of the structure until projects #2 and #3 are completed
- Requires use of Lot E for construction and installation of wastewater bypass to perform internal rehabilitation of structure
- Includes re-route of Cedars West wastewater from Cadiz Pump Station to gravity infrastructure (Route Z in project #3 exhibit)
- Construction Start – February 2019; Complete – October 2019

2. Line “N” Connection to EB Interceptor (90”)

- Connects 51” wastewater upstream of Lot E to 90” wastewater (Route N)
- Allows 51” in Lot E to be abandoned
- Est. Construction Start – Summer 2020; Complete – Spring 2021

3. EB Interceptor (90”) to EB-WB Siphon Tunnel, Line Y, Line CC

- Connect 90” wastewater to new 104” wastewater and siphon system constructed just west of Cadiz Pump Station
- Connects 48-54” to 90” for one highway crossing and eliminates future need for Cadiz Influent Structure (Route Y)
- 15” wastewater serving convention center to be rerouted along Hotel or to existing wastewater north of Lot E
- Requires use of south section of Lot E for tunnel construction
- Construction Start – TBD; Complete – TBD

* Waiting on hydraulic modeling results to be finalized in May 2019 before determining if project is necessary.

4. East Bank Interceptor Diversion System

- Pipeline and Pumping Facilities to allow temporary bypass for future maintenance and rehabilitation of 90” EB wastewater pipeline and resiliency for emergency needs
- Connects 90” EB wastewater to 120” WB wastewater pipeline in Trinity floodway
- Includes construction of bypass pumping facilities at NE corner of Riverfront Boulevard and Woodall Rodgers
- Include internal rehabilitation of portions of 90” EB wastewater pipeline
- Est. Design complete – Early 2020
- Est Construction Start – Summer 2020; Complete – Late 2021

*Schedule is dependent on USACE 408 permit approval (in process) & hydraulic modeling results to be finalized in May 2019

IMPACTS TO LOT E DEVELOPMENT

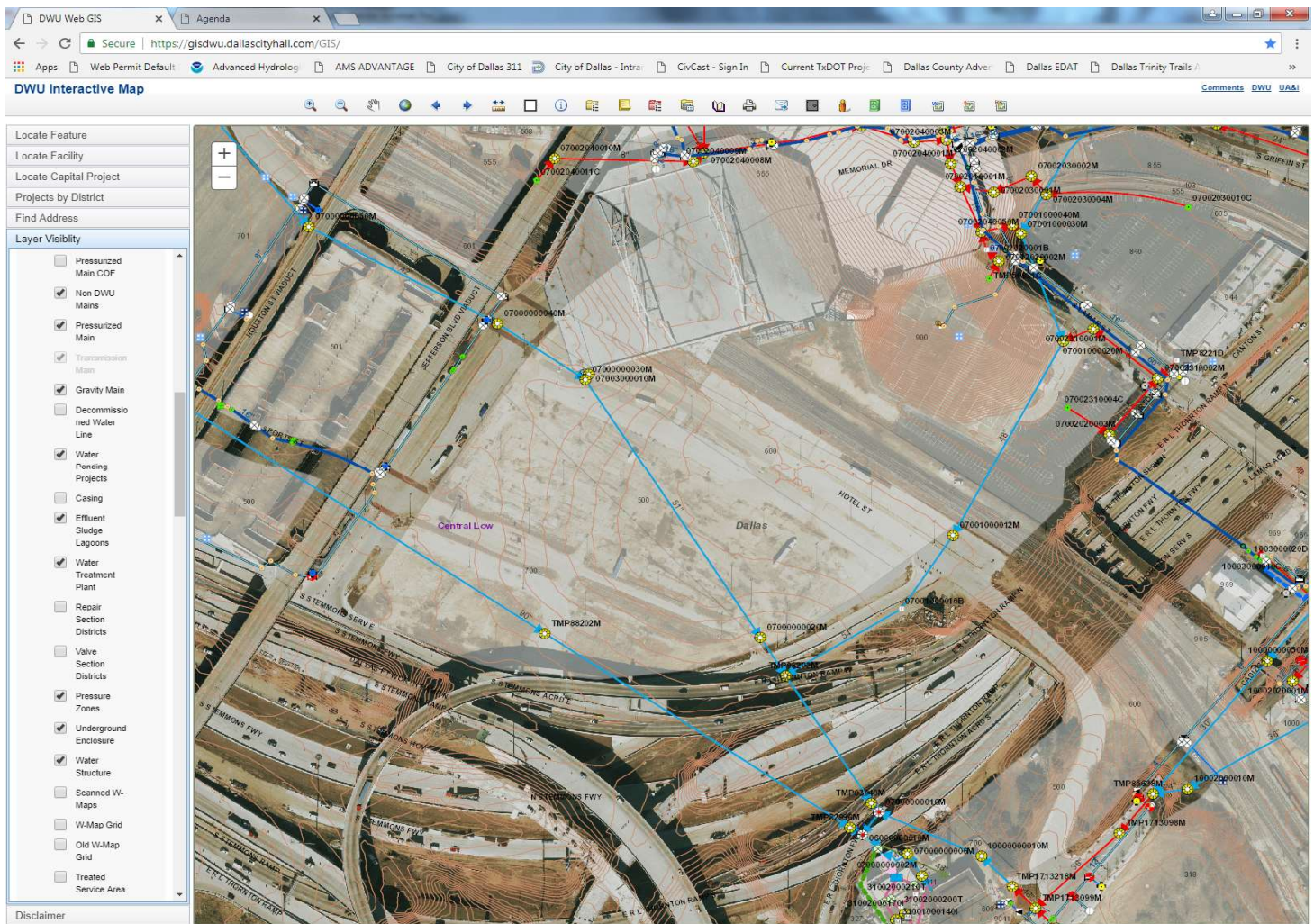
- City construction activity and construction access needed for at least 3 more years (2022)
- 90" wastewater to remain in SW portion of Lot E
- 48" wastewater to remain in southern portion of Lot E (Line Y)
- City to retain permanent easements for 90" and 48" wastewater lines (50-70-foot-wide per current standards)
- 51" wastewater can be abandoned after City construction projects
- 15" wastewater serving convention center to be rerouted along Hotel or to existing wastewater north of Lot E
- Future structural foundations for buildings and decking will need to span 90" and 48" wastewater lines and allow for future internal access via manholes and junction structures

Attachments

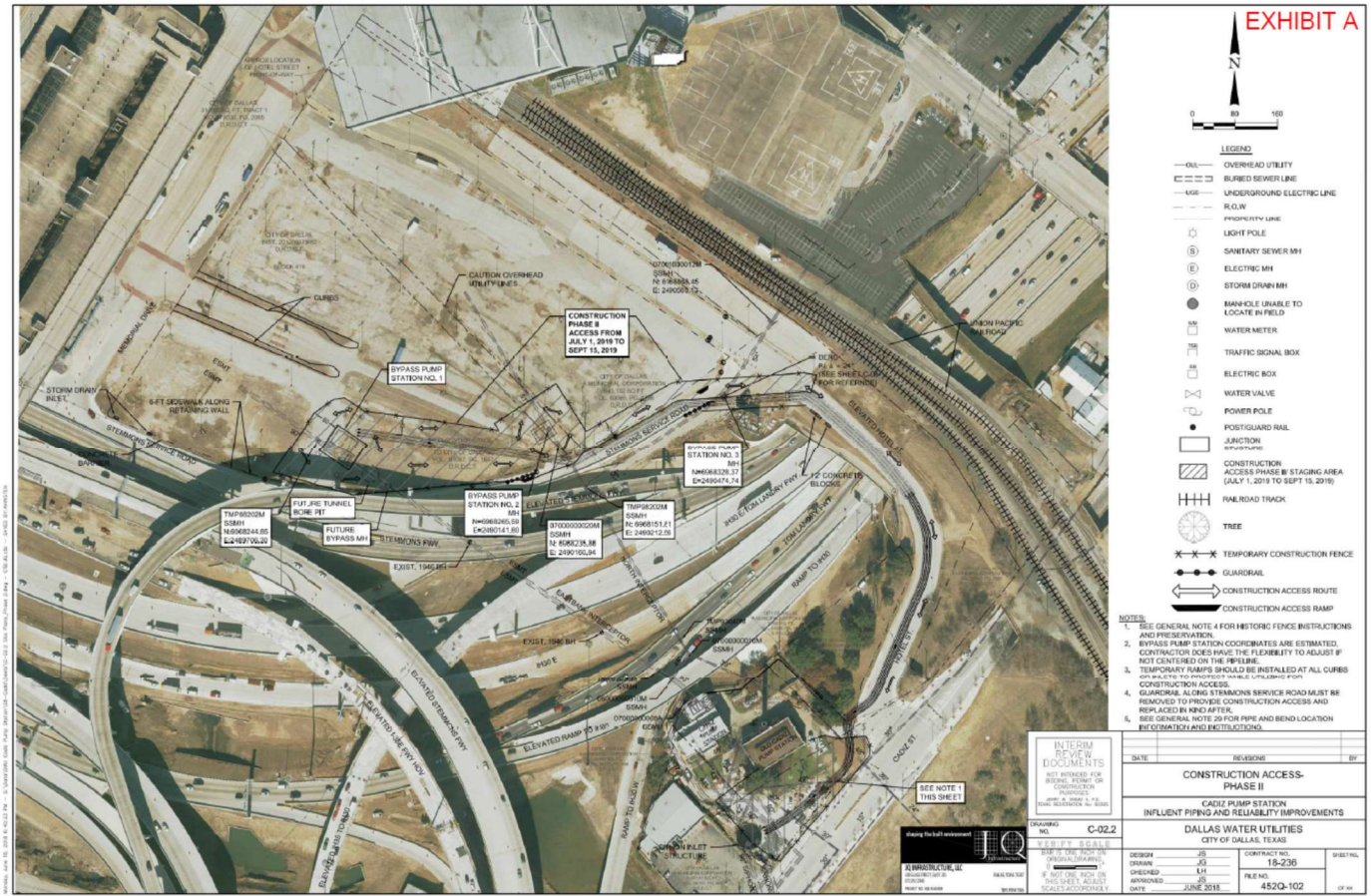
EXISTING UTILITIES – Lot E

- 90" wastewater (horseshoe) – SW portion of Lot E (1947)
- 51" wastewater – central and north portion of Lot E (1914)
- 48-54" wastewater – along service road south of Lot E, crosses Hotel Street (1991)
- 8" and 16" water – Sports Street and along NW boundary of Lot E (1986)
- 12" and 60" water - Lamar Street (1990 and 1973)

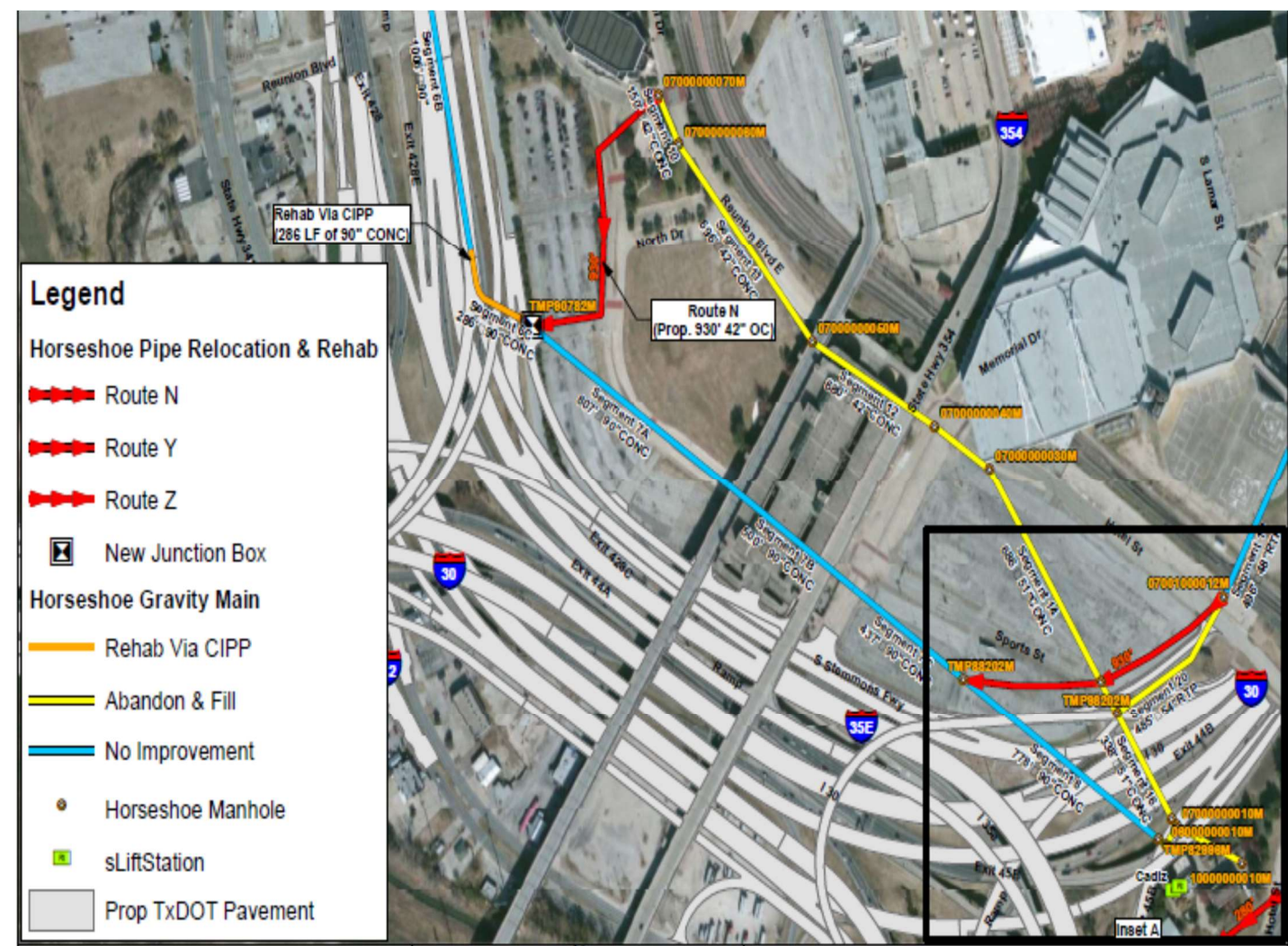
* Wastewater lines converge and outfall to Cadiz Pump Station Influent Structure just south of East I-30 ramp from I-35E North.



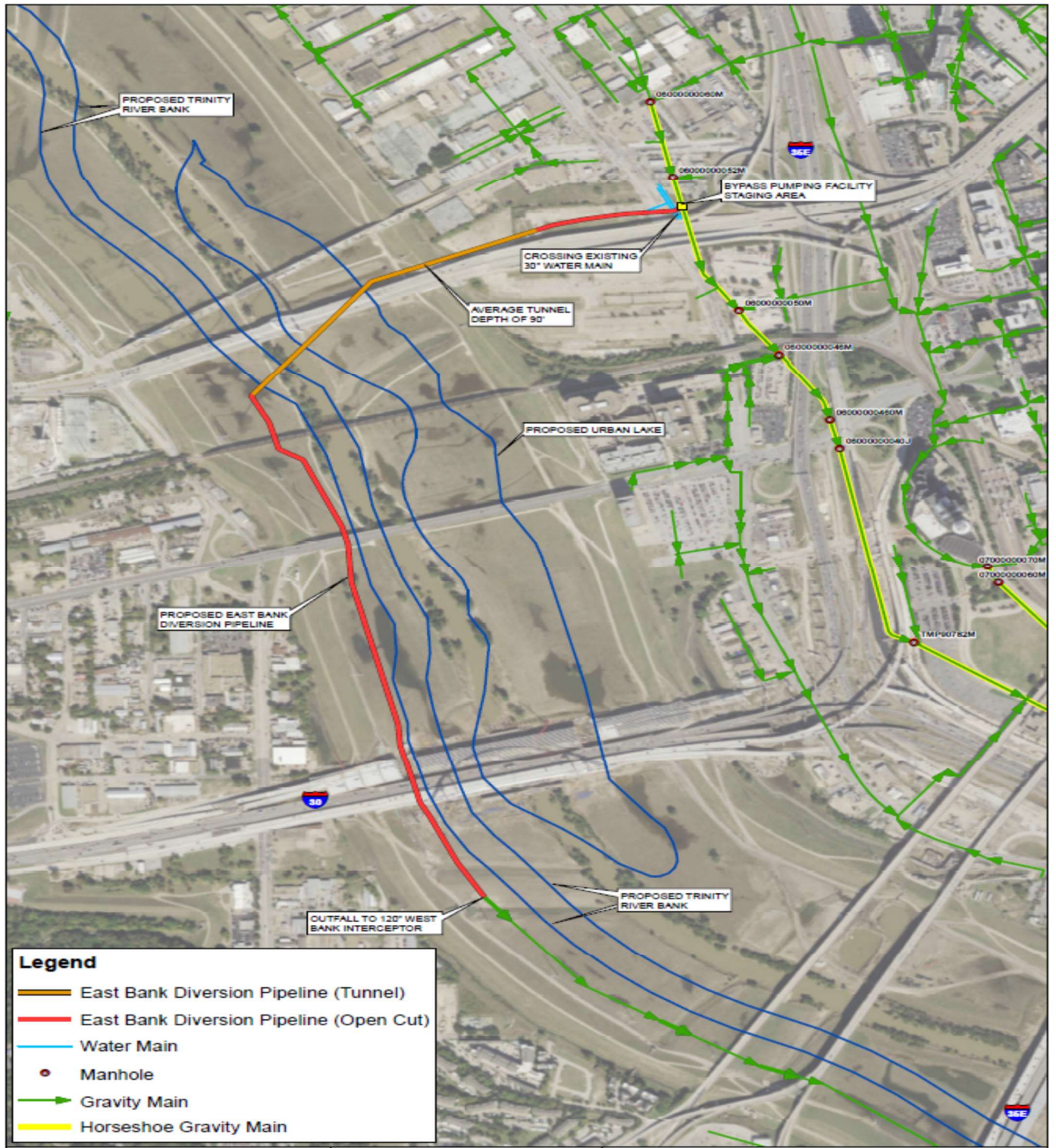
Existing Utilities – Lot E



Project #1



Project #2



Project #4

Attachment 7

Traffic Circulation Table

INTERMODAL TRANSPORTATION FACILITY (ITF) SITE ANALYSIS

addressing Dallas High-Speed Rail Station Area Planning Study

TRAFFIC CIRCULATION

TRANSPORTATION MODE	INGRESS & EGRESS ROUTE EVALUATION		
	Route Description	Potential Fatal Flaw(s)	Potential Mitigation Option(s)
ROADWAY VIA: - Personal / Public / Private Vehicles - Private Bus / Shuttle - School Bus - Automobile Rideshare - Transportation Network Companies - Autonomous Vehicles - Car Share	City / Central Business District (CBD) streets, notably Lamar, Griffin, Cadiz and Hotel Streets and Riverfront Boulevard. TxDOT I-30 and I-35E highways via ramps and frontage roads.	Streets near the ITF / Convention Center lack Kiss & Ride (loading / unloading) and bus bays.	Add bay storage adjacent to Lamar Street north of the I-30 / Lamar Street bridge or widen bridge in each direction (before it undergoes reconstruction by TxDOT) to accommodate a raised median-separated bays. Supplement the bay necessity by allowing bus and drop-off access from Cadiz Street to / from the HSR's Parking Zone 1 located directly adjacent to Cadiz Street. Mitigate via link to proposed Streetcar route down Lamar Street to access the ITF / Convention Center Station site
ROADWAY VIA: - DART Bus - Shuttle Transit	DART Local Bus Routes serving Convention Center Station, notably Local Routes 11, 19, 21, 26, 29, 52, 59, 60, 155, 161, and 749; Express Routes 205, 208, 210, 278, and 283, and 722 (D-Link).	See above bus bay deficits.	See above bus bay mitigation.
ROADWAY VIA: - Bicycle	City / CBD streets.	No notable bike lane other than Jefferson Street Viaduct bike lane and Young Street semi-shared lane(s) which may cause accidents or otherwise hamper this mode's usage / reliability.	Cater the Jefferson Street Viaduct bike lane via the PRT option noted below. Collaborate with TxDOT on is future reconstruction of the Lamar and Griffin Street bridges over I-30 to optimally install bike lanes, as space/ROW allows.
DART LIGHT RAIL: - Existing	Red & Blue Lines at Convention Center Station 722 D-Link: From Wood & Young Streets along Lamar Street to Convention Center Station.	No current circulation fatal flaws.	N/A
DART LIGHT RAIL: - D2	Along Griffin Street and Commerce Street to east of I-345; transitions to tunnel at Woodall Rodgers Freeway to Cesar Chavez Boulevard. Introduces four new Stations: Museum Way at surface and Metro Center (at Pacific Avenue), Commerce Street (between Akard & Ervay) and CBD East (between Main Street & Pacific Avenue) all underground.	Confined downtown area with narrow street (D2) lanes along Jackson.	No mitigation in that DART Express Bus Routes 206, 278 and 283 involving Young Street appear to get passengers to Lamar Street.
DALLAS STREETCAR	Existing along Zang Boulevard and Houston Street Viaduct; from N. Beckley Avenue to Young Street. Proposed along Lamar Street.	No current circulation fatal flaws since DART d-link provides Streetcar passenger access to / from ITF site.	N/A
URBAN AERIAL RIDESHARE (by Transportation Network Companies)	At Convention Center helipads (between Hotel Street & S. Lamar Street)	No designated dropoff location other than the HSR-proposed pedestrian bridge; street congestion may result, for exmaple Cadiz St vehicles will want to acces Lamar Street and the helipad for passenger loading/unloading. Back and for the pedestrian bridge, as opposed to the loop transit system may be cumbersome/inefficient.	Provided more than one means to access the helipad; see PRT mitigation option below.

INTERMODAL TRANSPORTATION FACILITY (ITF) SITE ANALYSIS

addressing Dallas High-Speed Rail Station Area Planning Study

TRAFFIC CIRCULATION

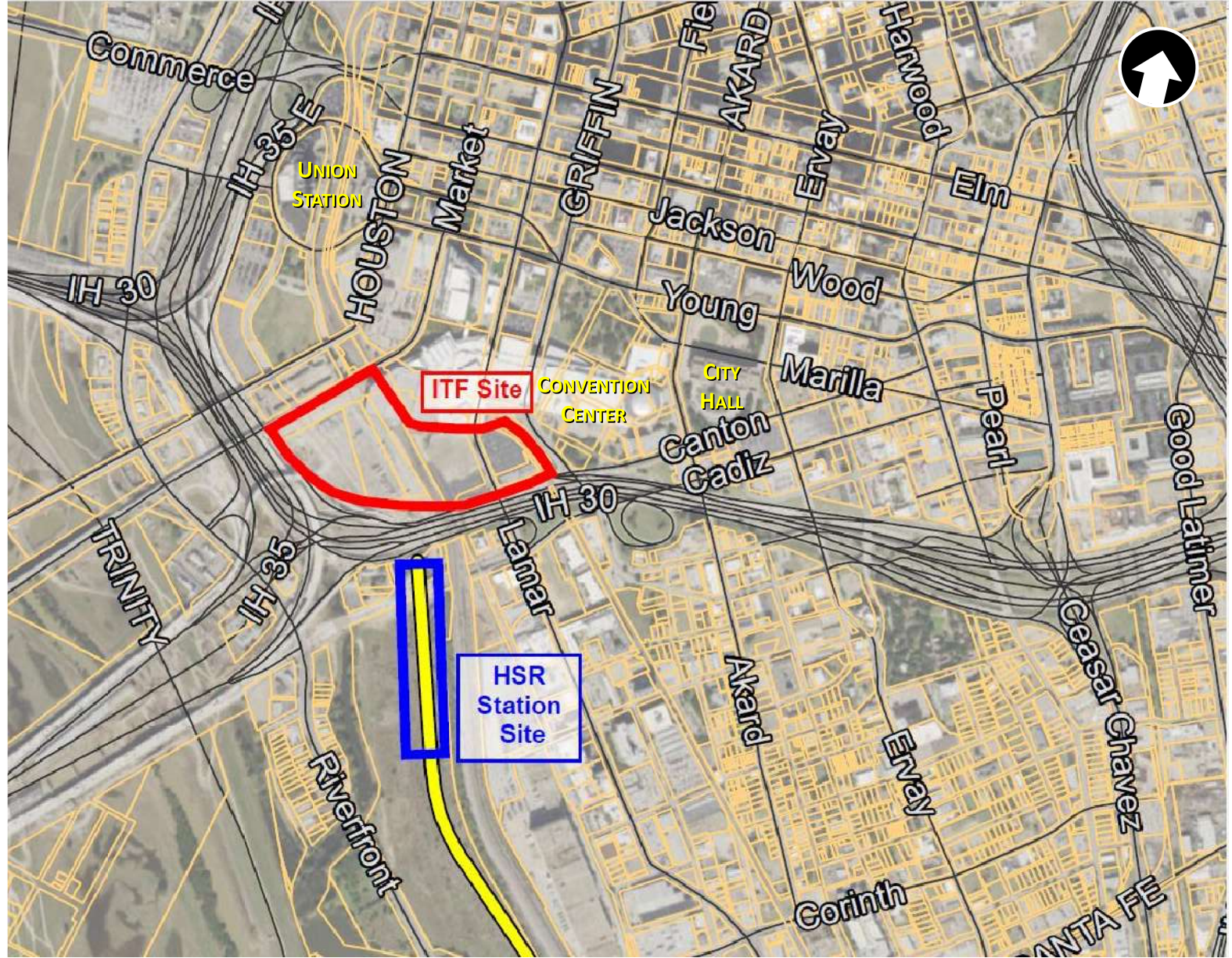
TRANSPORTATION MODE	INGRESS & EGRESS ROUTE EVALUATION		
	Route Description	Potential Fatal Flaw(s)	Potential Mitigation Option(s)
<u>DEDICATED GUIDEWAY / GROUP RAPID TRANSIT (GRT) (People Movers)</u>	Envisioned herein as an elevated GRT podcar loop located adjacent to Hotel Street; from Convention Center to east Cadiz Street at HSR Station.	<p>Current concept (assuming a ground line and the concept portal at Jefferson St Viaduct) appears to conflict with the Conv. Ctr columns, Hotel St travel lane count, Jefferson St bridge columns and adjacent parking garage.</p> <p>Current concept (assuming an elevated line and the concept portal at Jefferson St Viaduct) appears to conflict with the Conv. Ctr building and the Jefferson St parking garage, as well as descending adequately to meet the Union Station at ground level.</p>	Omit the Union Station leg as unnecessary. Make full use of the GRT and have the existing and future development buildings accommodate the PRT as a shared space solution which could be on either side of Hotel Street or directly above the street. The ground level option is not ideal since it takes up space and does not directly link the helipad or HSR at the same elevation that passengers are loading / unloading.
<u>BICYCLISTS, SCOOTERS & PEDESTRIANS</u>	<ul style="list-style-type: none">- Along sidewalks adjacent to CBD Streets.- Potential future I-30 Deck Park	<p>Potential deck park issues via impacts to the existing I-30 overhead highway signs mounted on the S. Lamar Street and UPRR bridges.</p> <p>S. Lamar St sidewalks are obstructed by utility poles.</p> <p>Does the deck Park conflict with the potential future Convention Center expansion over I-30 as shown in the City of Dallas' Convention Center Master Plan (circa 2004)? This expansion over I-30 was located between Hotel Street and Griffin Street and between Griffin Street and Akard Street (TxDOT's Project Pegasus Urban Design Summary).</p>	If necessary, condense or configure the suggested deck park width to allow for continued mounting of the I-30 overhead signage, or mimic signage mounts utilized beneath the Woodall Rodgers Freeway deck park.

Attachment 8

Traffic Circulation Support Materials

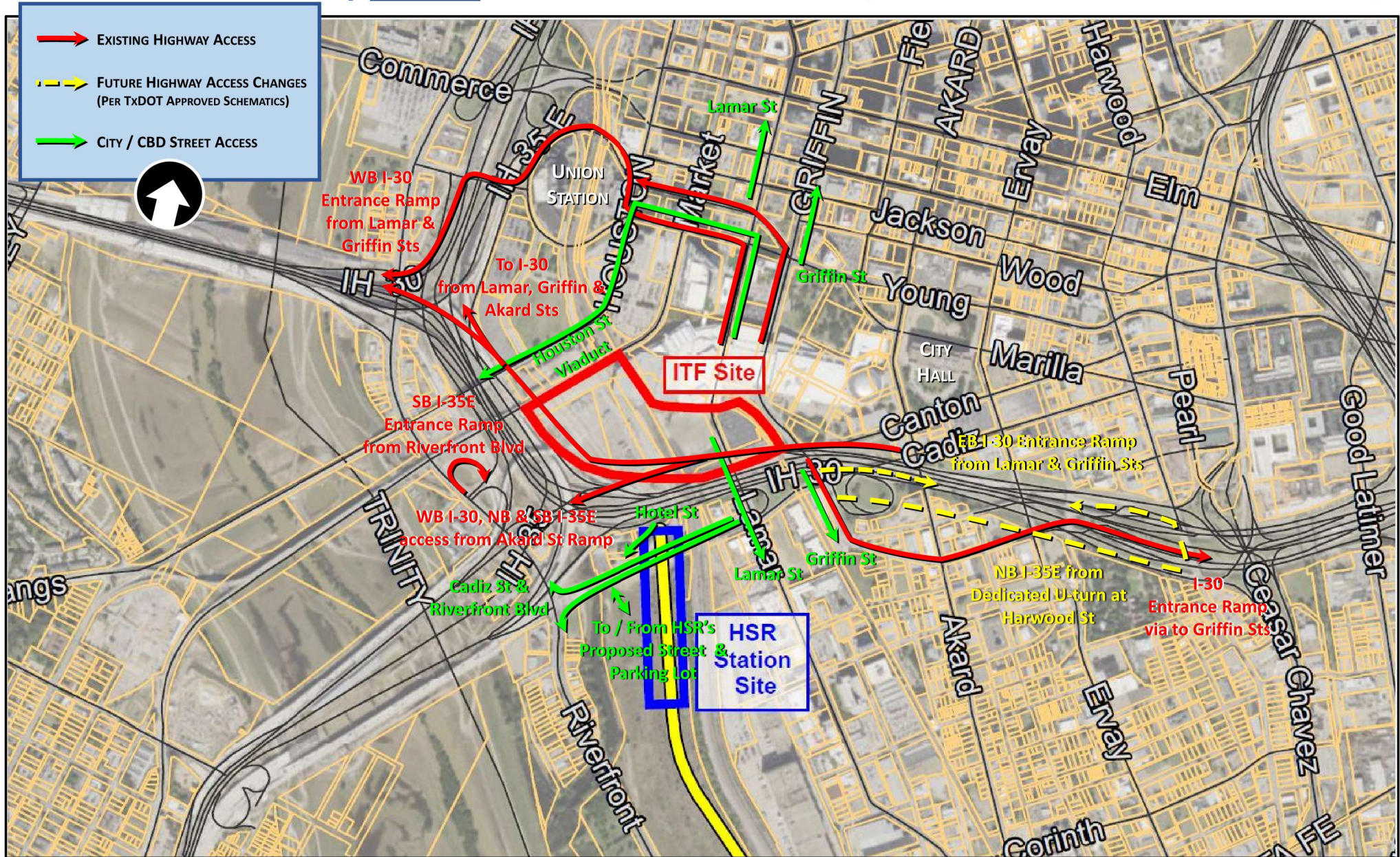
Traffic Circulation Transportation Modes

- > Public & Private Vehicles
 - > Autonomous Vehicles
 - > Automobile Rideshare
(by Transportation Network Companies)
 - > Car Share
-
- > DART & Private Bus /
Shuttle Transit
 - > DART LRT & Preferred DART D2
Orange & Green Lines
 - > Existing Streetcar & Proposed
BRT Streetcar
-
- > Urban Aerial Rideshare
(by Transportation Network Companies)
-
- > Automated Guideway /
Personal Rapid Transit (PRT)
(People Movers)
-
- > Bicyclists, Scooters & Pedestrians

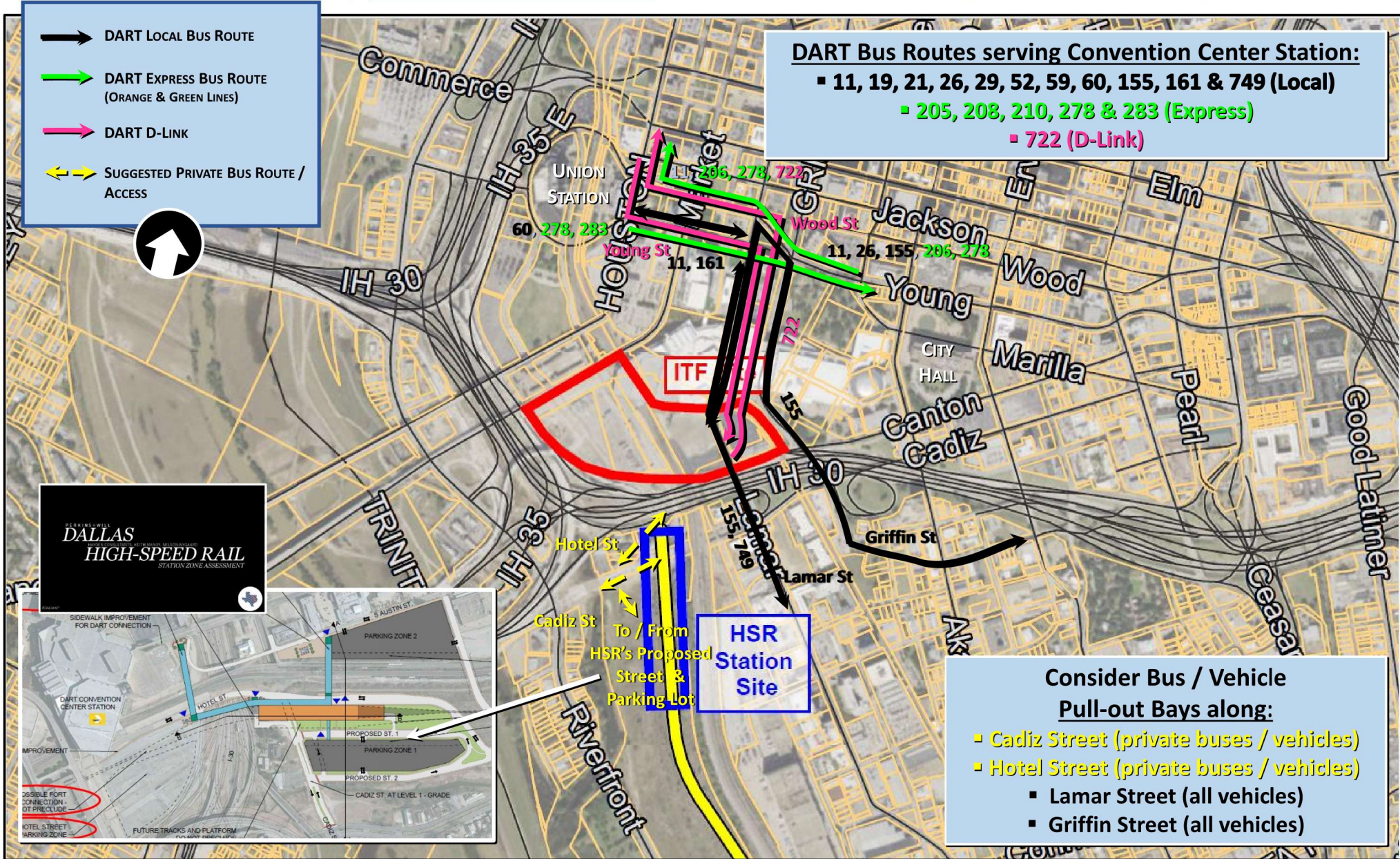


[illegible]

TRAFFIC CIRCULATION | EGRESS ROUTES FOR ROADWAYS (INCLUDES CITY STREET BIKE ACCOMMODATION)



TRAFFIC CIRCULATION | INGRESS & EGRESS ROUTES FOR DART / PRIVATE BUS (INCLUDES SHUTTLE)

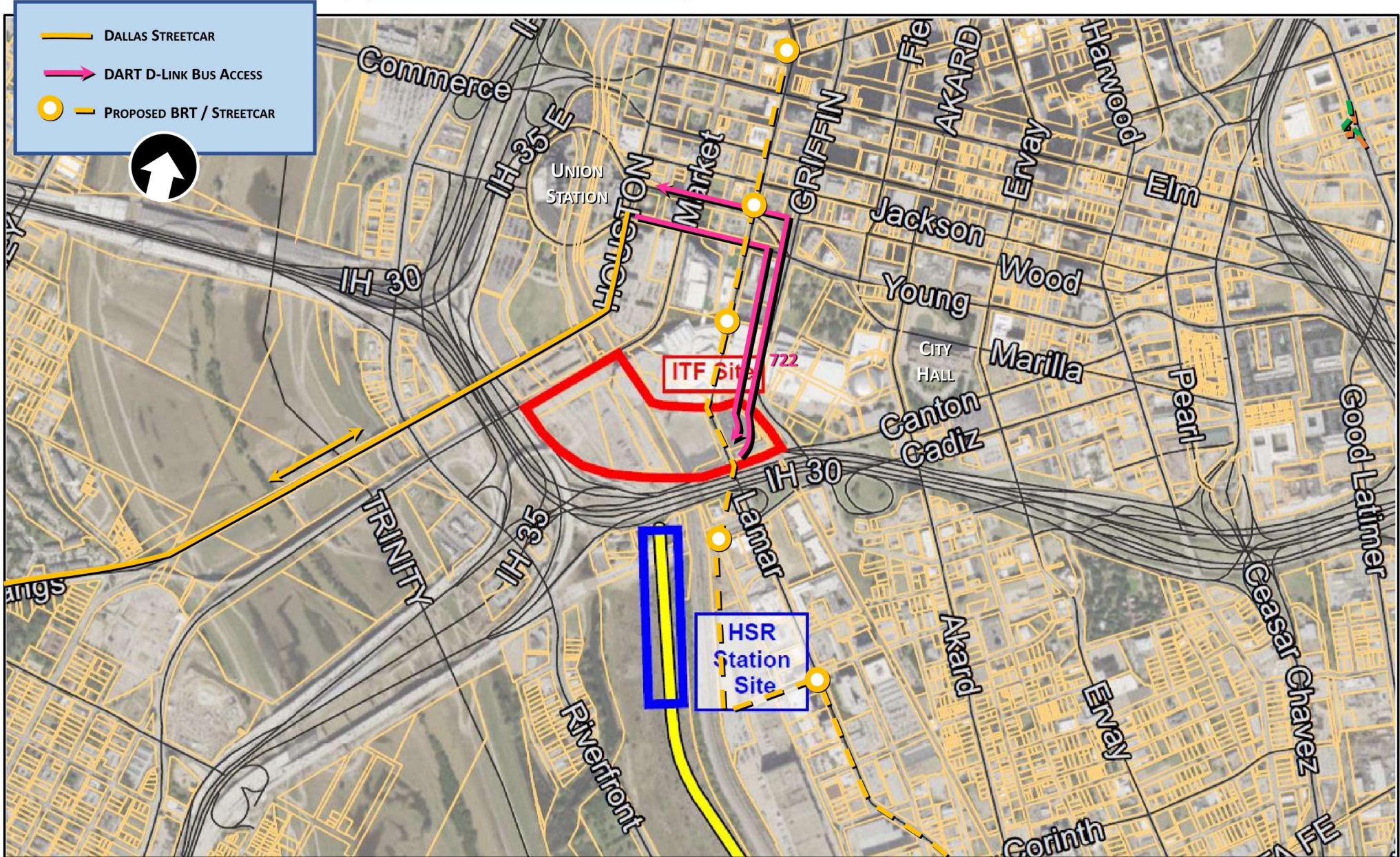


The map displays the proposed streetcar network in downtown Dallas, centered around the HSR Station Site (highlighted in a blue box). Key features include:

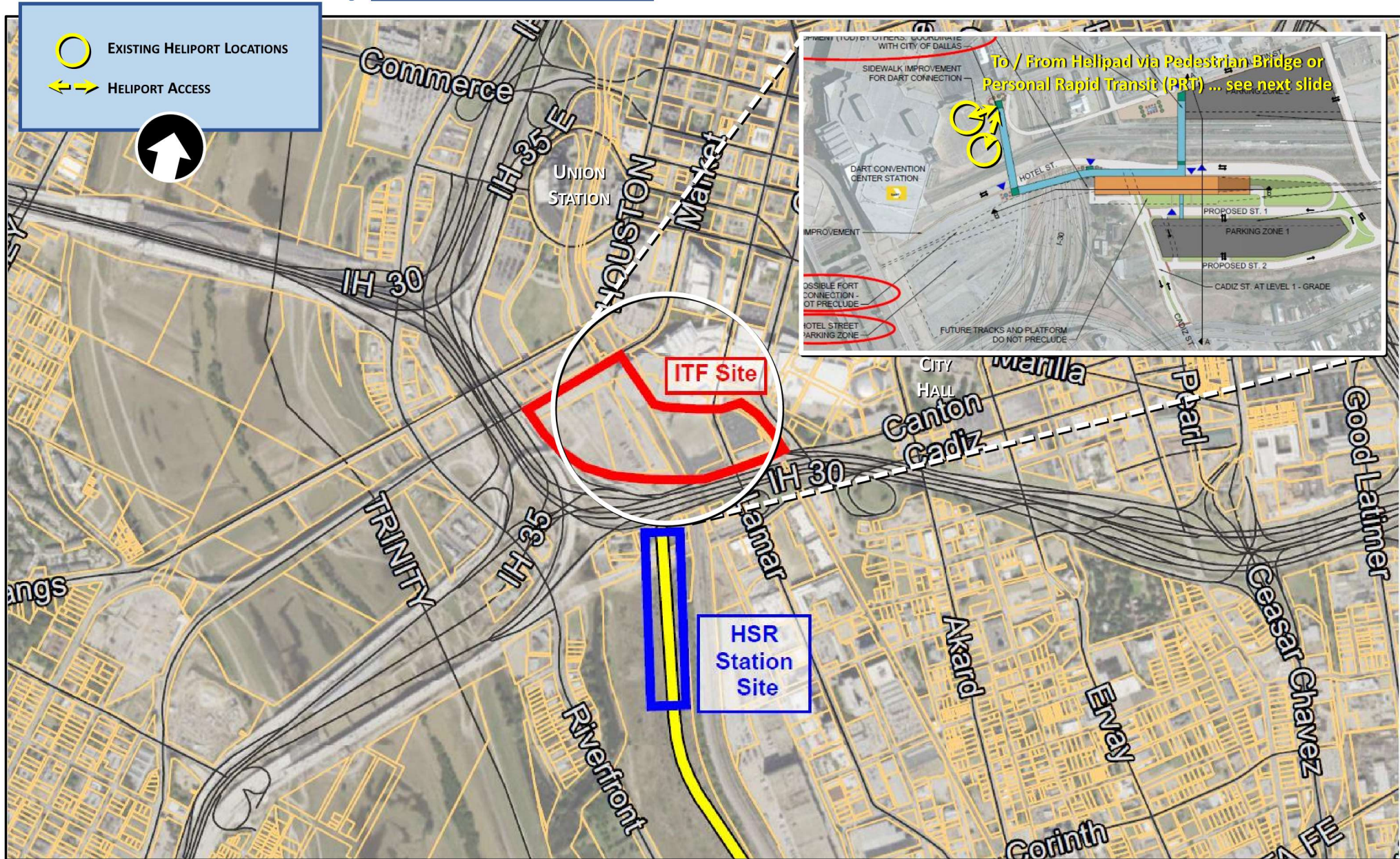
- Legend:**
 - DART RED & BLUE ROUTE:** Indicated by thick red and blue lines.
 - PREFERRED D2 (ORANGE & GREEN LINES):** Indicated by dashed orange and green lines.
 - DART LOCAL BUS ROUTE:** Indicated by a black arrow.
 - DART EXPRESS BUS ROUTE (ORANGE & GREEN LINES):** Indicated by a green arrow.
 - DART D-LINK:** Indicated by a pink arrow.
- Key Locations and Landmarks:**
 - HSR Station Site:** Located near the intersection of IH 30 and Market Street.
 - ITF Site:** Located near the intersection of IH 30 and Market Street.
 - Union Station:** Located near the intersection of IH 30 and Market Street.
 - Pioneer Plaza:** Located near the intersection of IH 30 and Market Street.
 - City Hall:** Located near the intersection of IH 30 and Market Street.
 - East Transfer Center:** Located near the intersection of IH 30 and Market Street.
- Proposed Streetcar Routes:**
 - Red & Blue Routes:** Run along IH 30 and Market Street, connecting the HSR Station Site to Union Station and Pioneer Plaza.
 - PREFERRED D2 Routes:** Run along IH 30 and Market Street, connecting the HSR Station Site to Union Station and Pioneer Plaza.
- Bus Access:**
 - DART LOCAL BUS ROUTE:** A black arrow points from the HSR Station Site to Union Station.
 - DART EXPRESS BUS ROUTE (ORANGE & GREEN LINES):** A green arrow points from the HSR Station Site to Union Station.
 - DART D-LINK:** A pink arrow points from the HSR Station Site to Union Station.
- Other Features:**
 - Trinity Expressway (IH 30):** A major highway running through the center of the map.
 - Market Street:** A major street running north-south through the center of the map.
 - Commercial Street:** A major street running east-west through the center of the map.
 - Other Streets:** IH 35, IH 30, IH 20, IH 10, IH 5, IH 4, IH 3, IH 2, IH 1, IH 0, IH -1, IH -2, IH -3, IH -4, IH -5, IH -10, IH -15, IH -20, IH -25, IH -30, IH -35, IH -40, IH -45, IH -50, IH -55, IH -60, IH -65, IH -70, IH -75, IH -80, IH -85, IH -90, IH -95, IH -100, IH -105, IH -110, IH -115, IH -120, IH -125, IH -130, IH -135, IH -140, IH -145, IH -150, IH -155, IH -160, IH -165, IH -170, IH -175, IH -180, IH -185, IH -190, IH -195, IH -200, IH -205, IH -210, IH -215, IH -220, IH -225, IH -230, IH -235, IH -240, IH -245, IH -250, IH -255, IH -260, IH -265, IH -270, IH -275, IH -280, IH -285, IH -290, IH -295, IH -300, IH -305, IH -310, IH -315, IH -320, IH -325, IH -330, IH -335, IH -340, IH -345, IH -350, IH -355, IH -360, IH -365, IH -370, IH -375, IH -380, IH -385, IH -390, IH -395, IH -400, IH -405, IH -410, IH -415, IH -420, IH -425, IH -430, IH -435, IH -440, IH -445, IH -450, IH -455, IH -460, IH -465, IH -470, IH -475, IH -480, IH -485, IH -490, IH -495, IH -500, IH -505, IH -510, IH -515, IH -520, IH -525, IH -530, IH -535, IH -540, IH -545, IH -550, IH -555, IH -560, IH -565, IH -570, IH -575, IH -580, IH -585, IH -590, IH -595, IH -600, IH -605, IH -610, IH -615, IH -620, IH -625, IH -630, IH -635, IH -640, IH -645, IH -650, IH -655, IH -660, IH -665, IH -670, IH -675, IH -680, IH -685, IH -690, IH -695, IH -700, IH -705, IH -710, IH -715, IH -720, IH -725, IH -730, IH -735, IH -740, IH -745, IH -750, IH -755, IH -760, IH -765, IH -770, IH -775, IH -780, IH -785, IH -790, IH -795, IH -800, IH -805, IH -810, IH -815, IH -820, IH -825, IH -830, IH -835, IH -840, IH -845, IH -850, IH -855, IH -860, IH -865, IH -870, IH -875, IH -880, IH -885, IH -890, IH -895, IH -900, IH -905, IH -910, IH -915, IH -920, IH -925, IH -930, IH -935, IH -940, IH -945, IH -950, IH -955, IH -960, IH -965, IH -970, IH -975, IH -980, IH -985, IH -990, IH -995, IH -1000, IH -1005, IH -1010, IH -1015, IH -1020, IH -1025, IH -1030, IH -1035, IH -1040, IH -1045, IH -1050, IH -1055, IH -1060, IH -1065, IH -1070, IH -1075, IH -1080, IH -1085, IH -1090, IH -1095, IH -1100, IH -1105, IH -1110, IH -1115, IH -1120, IH -1125, IH -1130, IH -1135, IH -1140, IH -1145, IH -1150, IH -1155, IH -1160, IH -1165, IH -1170, IH -1175, IH -1180, IH -1185, IH -1190, IH -1195, IH -1200, IH -1205, IH -1210, IH -1215, IH -1220, IH -1225, IH -1230, IH -1235, IH -1240, IH -1245, IH -1250, IH -1255, IH -1260, IH -1265, IH -1270, IH -1275, IH -1280, IH -1285, IH -1290, IH -1295, IH -1300, IH -1305, IH -1310, IH -1315, IH -1320, IH -1325, IH -1330, IH -1335, IH -1340, IH -1345, IH -1350, IH -1355, IH -1360, IH -1365, IH -1370, IH -1375, IH -1380, IH -1385, IH -1390, IH -1395, IH -1400, IH -1405, IH -1410, IH -1415, IH -1420, IH -1425, IH -1430, IH -1435, IH -1440, IH -1445, IH -1450, IH -1455, IH -1460, IH -1465, IH -1470, IH -1475, IH -1480, IH -1485, IH -1490, IH -1495, IH -1500, IH -1505, IH -1510, IH -1515, IH -1520, IH -1525, IH -1530, IH -1535, IH -1540, IH -1545, IH -1550, IH -1555, IH -1560, IH -1565, IH -1570, IH -1575, IH -1580, IH -1585, IH -1590, IH -1595, IH -1600, IH -1605, IH -1610, IH -1615, IH -1620, IH -1625, IH -1630, IH -1635, IH -1640, IH -1645, IH -1650, IH -1655, IH -1660, IH -1665, IH -1670, IH -1675, IH -1680, IH -1685, IH -1690, IH -1695, IH -1700, IH -1705, IH -1710, IH -1715, IH -1720, IH -1725, IH -1730, IH -1735, IH -1740, IH -1745, IH -1750, IH -1755, IH -1760, IH -1765, IH -1770, IH -1775, IH -1780, IH -1785, IH -1790, IH -1795, IH -1800, IH -1805, IH -1810, IH -1815, IH -1820, IH -1825, IH -1830, IH -1835, IH -1840, IH -1845, IH -1850, IH -1855, IH -1860, IH -1865, IH -1870, IH -1875, IH -1880, IH -1885, IH -1890, IH -1895, IH -1900, IH -1905, IH -1910, IH -1915, IH -1920, IH -1925, IH -1930, IH -1935, IH -1940, IH -1945, IH -1950, IH -1955, IH -1960, IH -1965, IH -1970, IH -1975, IH -1980, IH -1985, IH -1990, IH -1995, IH -2000, IH -2005, IH -2010, IH -2015, IH -2020, IH -2025, IH -2030, IH -2035, IH -2040, IH -2045, IH -2050, IH -2055, IH -2060, IH -2065, IH -2070, IH -2075, IH -2080, IH -2085, IH -2090, IH -2095, IH -2100, IH -2105, IH -2110, IH -2115, IH -2120, IH -2125, IH -2130, IH -2135, IH -2140, IH -2145, IH -2150, IH -2155, IH -2160, IH -2165, IH -2170, IH -2175, IH -2180, IH -2185, IH -2190, IH -2195, IH -2200, IH -2205, IH -2210, IH -2215, IH -2220, IH -2225, IH -2230, IH -2235, IH -2240, IH -2245, IH -2250, IH -2255, IH -2260, IH -2265, IH -2270, IH -2275, IH -2280, IH -2285, IH -2290, IH -2295, IH -2300, IH -2305, IH -2310, IH -2315, IH -2320, IH -2325, IH -2330, IH -2335, IH -2340, IH -2345, IH -2350, IH -2355, IH -2360, IH -2365, IH -2370, IH -2375, IH -2380, IH -2385, IH -2390, IH -2395, IH -2400, IH -2405, IH -2410, IH -2415, IH -2420, IH -2425, IH -2430, IH -2435, IH -2440, IH -2445, IH -2450, IH -2455, IH -2460, IH -2465, IH -2470, IH -2475, IH -2480, IH -2485, IH -2490, IH -2495, IH -2500, IH -2505, IH -2510, IH -2515, IH -2520, IH -2525, IH -253

No current suggestions / changes are recommended to DART's Red & Blue Routes that directly access Convention Center Station

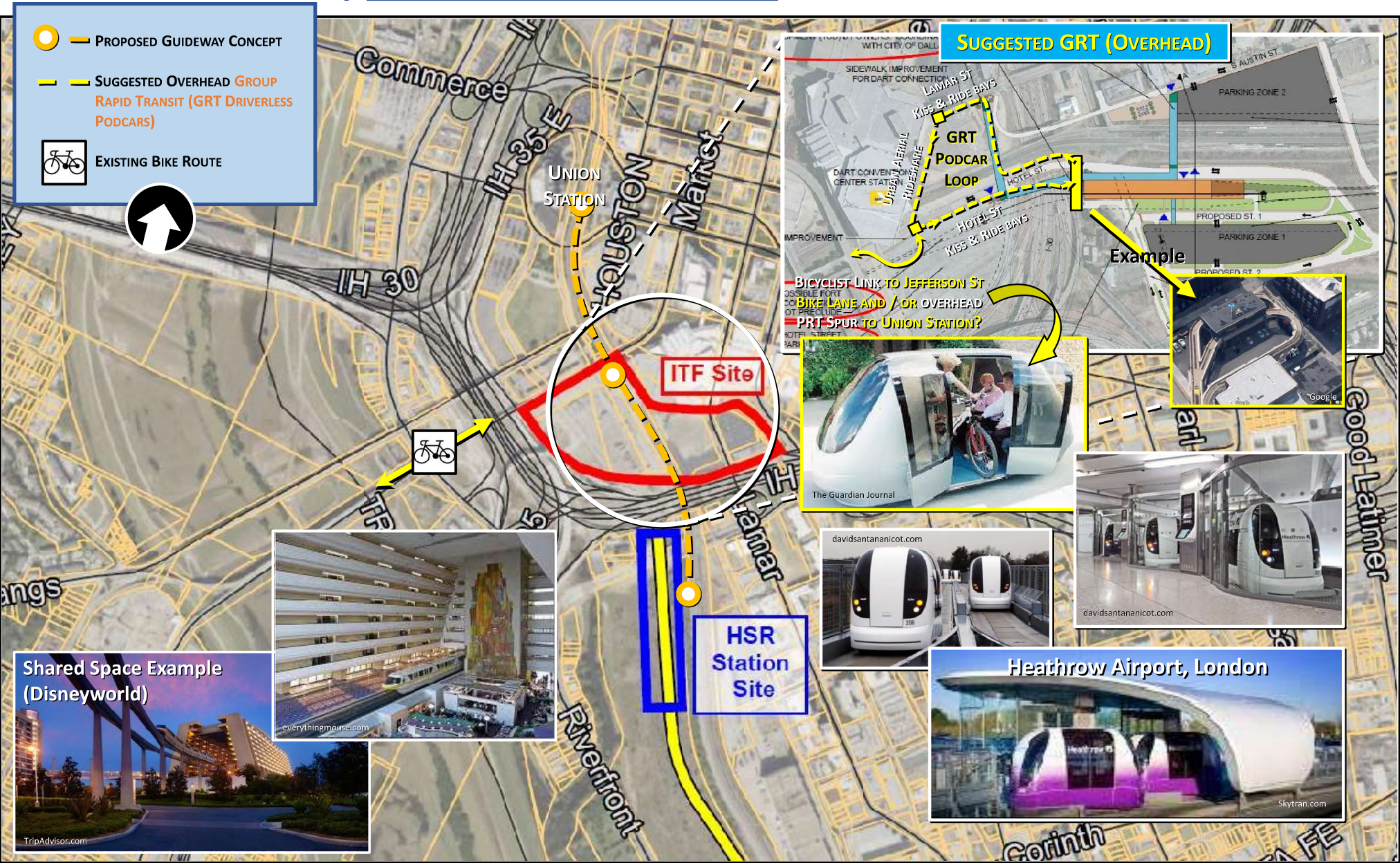
TRAFFIC CIRCULATION | INGRESS AND EGRESS ROUTES FOR DALLAS STREETCAR



TRAFFIC CIRCULATION | INGRESS & EGRESS ROUTES FOR URBAN AERIAL RIDESHARE



TRAFFIC CIRCULATION | INGRESS & EGRESS ROUTES FOR DEDICATED GUIDEWAY, ETC.



TRAFFIC CIRCULATION | INGRESS & EGRESS ROUTES FOR PEDESTRIANS & SCOOTERS

STREETS W/ **SUFFICIENT** SIDEWALK ACCESS

STREETS W/ **INSUFFICIENT** SIDEWALK ACCESS
AND / OR SUGGESTED SIDEWALK ADDITIONS

SUGGESTED PEDESTRIAN ACCOMMODATION /
PASSAGE OVER I-30 ALONG S. LAMAR &
GRIFFIN STREETS

JUMP BIKES / SCOOTERS



"Columns for future Dallas Convention Center Expansion as shown in the City of Dallas Convention Center Master Plan. Information provided by the City of Dallas (Dated December 2004)."
Project Pegasus Mixmaster and Canyon Access to Lamar Street, July 3, 2007



Another opportunity exists to potentially extend the Convention Center structure over IH 30. This would require that the primary enclosed building space be one story above Lamar Street. Secondary space could possibly be at street level in the area just south of the freeway. If feasible, these spaces could potentially accommodate ground level retail uses and secondary building access. A design such as this would require advance coordination of structural column placements and air rights agreements between TxDOT and the City of Dallas. If implemented, this design would have significant influence on potential streetscape improvements on the Lamar Street bridge. It should be noted the design of the Lamar Street and Griffin Street bridges could incorporate similar design motifs to identify this sub-segment of the IH 30 Canyon.

IH 30: Hotel Street/UP Railroad A single bridge accommodates this local roadway and light rail crossing. This bridge would serve as a portal in and out of the IH 30 Canyon. As such, the bridge could receive exterior façade treatments to enhance its perception as a transition point between the Canyon and Mixmaster. On top of the bridge, there may be an opportunity to incorporate a hike/bike trail crossing. This trail could serve as a recreational asset or as an alternative means of access between downtown and redevelopment areas along IH 30.



TxDOT
Urban Design
Summary



IH 30: Griffin Street as a landscaped gateway to the Convention Center, Eastbound Street. Ample right-of-way surrounding the eastbound exit (south of IH 30) could be landscaped to lend identity and to create a positive sense of arrival. This could be achieved primarily through appropriate allocations and arrangements of plantings. It could also be complemented by the placement of a potential hike/bike trail bridge to serve as a structural portal over exiting traffic. Complementary street tree plantings could be incorporated along Griffin Street north and south of IH 30. In between, planters could be incorporated along the sidewalks and edges of the Griffin Street Bridge. These treatments could be developed to incorporate a buffering of the adjacent DART light rail crossing of IH 30. Additional open space and right-of-way north of the bridge could be landscaped to continue the effect described for the eastbound exit. A similar structural portal could be achieved on northbound Griffin through use of a sign bridge providing information on downtown destinations.



TxDOT's future replacement of the Lamar St. bridge is an opportunity to install optimal sidewalk widths / features (note the current sidewalk utility pole obstacles)



HSR
Station
Site

To / From
HSR's Proposed
Street &
Parking Lot

ITF Site

Canton St
Canton
Cadiz

IH 30

Griffin St

Lamar St

Cadiz St

Riverfront

Trinity

IH 35

Young

City Hall

Mar

Griffin St

Lamar St

Cadiz St

Riverfront

Trinity

IH 35

Young

City Hall

Mar

Griffin St

Lamar St

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City Hall

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Griffin St

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Riverfront

Trinity

IH 35

Young

Attachment 9

Preliminary Cost Estimate

F R A MAIN WORKSHEET										Issue Date 5/4/16
City of Dallas / North Central Texas Council of Governments										Today's Date 4/29/19
Project Name and Location: Dallas Intermodal Transportation Facility (Track-Related)										Yr of Base Year \$ 2019
Current Phase : Fatal Flaw Evaluation										Yr of Revenue Ops 2023
Standard Cost Category		Unit	Quantity	Base Year Dollars						YOE Dollars Total (X000) (from Inflation Worksheet)
				Without Contingency (X000)	Allocated Contingency (X000)	TOTAL (X000)	Unit Cost (X000)	Percent of Construction Cost	Percent of Total Project Cost	
10	Guideway & Track Elements	Lineal Feet of Guideway	1,600	2,523	757	3,279	2	31%	22%	3,516
10.01	Guideway: At-grade exclusive right-of-way	Lineal Feet of Guideway	1,600	446	134	580	0			
10.020	Guideway: At-grade semi-exclusive (allows cross-traffic)	Lineal Feet of Guideway		0		0				
10.030	Guideway: At-grade in mixed traffic	Lineal Feet of Guideway		0		0				
10.040	Guideway: Aerial structure	Lineal Feet of Guideway		0		0				
10.041	Bridges	Lineal Feet of Guideway		0		0				
10.042	Viaduct	Lineal Feet of Guideway		0		0				
10.043	Other Structure	Lineal Feet of Guideway		0		0				
10.044	Unspecified	Lineal Feet of Guideway		0		0				
10.050	Guideway: Built-up fill	Lineal Feet of Guideway		0		0				
10.060	Guideway: Underground cut & cover	Lineal Feet of Guideway		0		0				
10.061	Cut & Cover Guideway Soft Soils	Lineal Feet of Guideway		0		0				
10.062	Cut & Cover Guideway Hard Soils	Lineal Feet of Guideway		0		0				
10.063	Cut & Cover Guideway Vent Soft Soils	Lineal Feet of Guideway		0		0				
10.064	Cut & Cover Guideway Vent Hard Soils	Lineal Feet of Guideway		0		0				
10.065	Unspecified	Lineal Feet of Guideway		0		0				
10.070	Guideway: Underground tunnel	Lineal Feet of Guideway		0		0				
10.071	Bored Earth Open	Lineal Feet of Guideway		0		0				
10.072	Bored Earth Close	Lineal Feet of Guideway		0		0				
10.073	Bored Earth Mixed Shield	Lineal Feet of Guideway		0		0				
10.074	Bored Earth Mixes Shield SEM	Lineal Feet of Guideway		0		0				
10.075	Rock Drill & Blast	Lineal Feet of Guideway		0		0				
10.076	Rock Boring Machine	Lineal Feet of Guideway		0		0				
10.077	Sunken Tunnel	Lineal Feet of Guideway		0		0				
10.078	Unspecified	Lineal Feet of Guideway		0		0				
10.080	Guideway: Retained cut or fill	Lineal Feet of Guideway		0		0				
10.090	Track: Direct fixation	Track Feet		0		0				
10.100	Track: Embedded	Track Feet		0		0				
10.11	Track: Ballasted	Track Feet	2,241	876	263	1,139	1			
10.120	Track: Special (switches, turnouts)	Each Turnout	6	1,200	360	1,560	260			
10.130	Track: Vibration & Noise Dampening	Track Feet		0		0				
10.140	Special Structures	Lineal Feet of Guideway		0		0				
20	Stations, Stops, Terminals, Intermodels	Stations	1	4,986	1,496	6,481	6,481	61%	43%	7,194
20.010	At-Grade Station, Stop, Shelter, Mall, Terminal, Platform	Stations	1	4,986	1,496	6,481	6,481			
20.020	Aerial station, stop, shelter, mall, terminal, platform	Stations		0		0				
20.030	Underground station, stop, shelter, mall, terminal, platform	Stations		0		0				
20.031	Cut and Cover	Stations		0		0				
20.032	Bored Earth Soft Soils	Stations		0		0				
20.033	Bored Rock Hard Soils	Stations		0		0				
20.034	Unspecified	Stations		0		0				
20.040	Major stations, landings, terminals: Intermodal, ferry, trolley, etc	Stations		0		0				
20.050	Joint development	Stations		0		0				
20.060	Automobile parking multi-story structure	Spaces		0		0				
20.070	Elevators, escalators	Number		0		0				
20.071	Elevators	Number		0		0				
20.072	Escalators	Number		0		0				
20.073	Unspecified	Number		0		0				
20.080	Passenger Overpass	Number		0		0				
20.090	Underground Interconnecting Tunnel	Number		0		0				
20.091	Cut and Cover	Number		0		0				
20.092	Bored Earth Soft Soils	Number		0		0				
20.093	Bored Rock Hard Soils	Number		0		0				
20.094	Unspecified	Number		0		0				
20.100	Signage and Graphics	Number		0		0				
30	Support Facilities: Yards, Shops, Admin. Bldgs	Number	0	0	0	0		0%	0%	0
30.010	Administration Building: Office, sales, storage, revenue counting	Number		0		0				
30.011	Administrative Building	Number		0		0				
30.012	Central Control Facility	Number		0		0				
30.013	Central Revenue Counting Facility	Number		0		0				
30.014	Unspecified	Number		0		0				
30.020	Light Maintenance Facility	Number		0		0				
30.030	Heavy Maintenance Facility	Number		0		0				
30.040	Storage or Maintenance of Way Building	Number		0		0				
30.050	Yard and Yard Track	Number		0		0				
40	Sitework & Special Conditions	Lineal Feet of Guideway	1,600	48	14	62	0	1%	0%	74
40.010	Demolition, Clearing, Earthwork	Lineal Feet of Guideway	1,600	48	14	62	0			
40.020	Site Utilities, Utility Relocation	Lineal Feet of Guideway		0		0				
40.021	Urban Replacement In-Kind Public Utilities	Lineal Feet of Guideway		0		0				
40.022	Urban Replacement In-Kind Private Utilities	Lineal Feet of Guideway		0		0				
40.023	Urban Replacement Betterment Public Utilities	Lineal Feet of Guideway		0		0				
40.024	Urban Replacement Betterment Private Utilities	Lineal Feet of Guideway		0		0				
40.025	Suburban Replacement In-Kind Public Utilities	Lineal Feet of Guideway		0		0				
40.026	Suburban Replacement In-Kind Private Utilities	Lineal Feet of Guideway		0		0				
40.027	Suburban Replacement Betterment Public Utilities	Lineal Feet of Guideway		0		0				
40.028	Suburban Replacement Betterment Private Utilities	Lineal Feet of Guideway		0		0				
40.029	Unspecified	Lineal Feet of Guideway		0		0				
40.030	Haz. mat'l, contam'd soil removal/mitigation, ground water treatr	Lineal Feet of Guideway		0		0				
40.031	HazMat Abatement	Lineal Feet of Guideway		0		0				
40.032	Contaminated Soil Removal	Lineal Feet of Guideway		0		0				
40.033	Ground Water Treatment	Lineal Feet of Guideway		0		0				
40.034	Unspecified	Lineal Feet of Guideway		0		0				
40.040	Environmental mitigation, e.g. wetlands, historic/archeologic, pa	Lineal Feet of Guideway		0		0				

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					Without Contingency (X000)	Allocated Contingency (X000)	TOTAL (X000)	Unit Cost (X000)	Percent of Construction Cost	Percent of Total Project Cost			
40.050	Site structures including retaining walls, sound walls	Lineal Feet of Guideway		0		0							
40.051	Mechanically Stabilized Earth Walls	Lineal Feet of Guideway		0		0							
40.052	Concrete Walls	Lineal Feet of Guideway		0		0							
40.053	Other Walls	Lineal Feet of Guideway		0		0							
40.054	Unspecified	Lineal Feet of Guideway		0		0							
40.060	Pedestrian / bike access and accommodation, landscaping	Lineal Feet of Guideway		0		0							
40.070	Automobile, bus, van accessways including roads, parking lots	Spaces		0		0							
40.071	Surface Parking Lot	Spaces		0		0							
40.072	Auto Access	Stations		0		0							
40.073	Bus Access	Spaces		0		0							
40.074	Bus Parking and Berthing	Spaces		0		0							
40.075	Unspecified	Spaces		0		0							
40.080	Temporary Facilities and other indirect costs during construction	Lineal Feet of Guideway		0		0							
40.081	Roadway Changes	Lineal Feet of Guideway		0		0							
40.082	Third-Party Work	Lineal Feet of Guideway		0		0							
40.083	Mobilization	Lineal Feet of Guideway		0		0							
40.084	Maintenance of Traffic (Railroad reroute, shutdown, reschedule, stage, phase, worker-protect, work-around)	Lineal Feet of Guideway				0							
40.085	Unallocated Indirect Costs	Lineal Feet of Guideway		0		0							
40.086	Unspecified	Lineal Feet of Guideway		0		0							
50	Systems	Track Feet	1,600	642	193	835	1	8%	6%		1,027		
50.010	Train control and signals	Track Feet	2,241	383	115	498	0						
50.011	Train Control - Wayside	Track Feet		0		0							
50.012	Train Control - On Board Systems	Track Feet		0		0							
50.013	Train Control - Centralized Systems	Track Feet		0		0							
50.014	Unspecified	Track Feet		0		0							
50.020	Traffic signals and crossing protection	Track Feet		0		0							
50.030	Traction power supply: substations	Track Feet		0		0							
50.040	Traction power distribution: catenary and third rail	Track Feet		0		0							
50.041	Catenary	Track Feet		0		0							
50.042	Third Rail	Track Feet		0		0							
50.043	Power Distribution and Connections	Track Feet		0		0							
50.044	Unspecified	Track Feet		0		0							
50.050	Communications	Lineal Miles of Guideway		0		0							
50.051	Wired	Lineal Miles of Guideway		0		0							
50.052	Radio Based	Lineal Miles of Guideway		0		0							
50.053	Unspecified	Lineal Miles of Guideway		0		0							
50.060	Fare collection system and equipment	Stations	1	259	78	336	336						
50.061	Central Revenue Counting Systems	Stations		0		0							
50.062	Revenue Collection - In Station	Stations		0		0							
50.063	Revenue Collection - On Vehicle	Vehicles		0		0							
50.064	Unspecified	Stations		0		0							
50.070	Central Control System	Lineal Miles of Guideway				0							
51	Construction Subtotal (10-50)	Lineal Miles of Guideway	1,600	8,198	2,459	10,658	6,484	100%	71%		11,811		
60	Row, Land, Existing Improvements	Lineal Miles of Guideway		0	0	0			0%		0		
60.010	Purchase or lease of real estate	Lineal Miles of Guideway		0		0							
60.011	Full Takes	Lineal Miles of Guideway		0		0							
60.012	Part Takes	Lineal Miles of Guideway		0		0							
60.013	Easement Acquisitions	Lineal Miles of Guideway		0		0							
60.014	Other Rights	Lineal Miles of Guideway		0		0							
60.015	Donated Value	Lineal Miles of Guideway		0		0							
60.016	Unspecified	Lineal Miles of Guideway		0		0							
60.020	Relocation of existing households and businesses	Lineal Miles of Guideway		0		0							
60.021	Residential (Owners)	Lineal Miles of Guideway		0		0							
60.022	Residential (Tenants)	Lineal Miles of Guideway		0		0							
60.023	Business (Owners and Tenants)	Lineal Miles of Guideway		0		0							
60.024	Others (Personal Property Moves)	Lineal Miles of Guideway		0		0							
60.025	Unspecified	Lineal Miles of Guideway		0		0							
60.030	Services	Lineal Miles of Guideway		0		0							
60.031	Property Management	Lineal Miles of Guideway		0		0							
60.032	Agency	Lineal Miles of Guideway		0		0							
60.033	Contractor R/W Services (Title/Appraisal, etc)	Lineal Miles of Guideway		0		0							
60.034	Legal Services	Lineal Miles of Guideway		0		0							
60.035	Unspecified	Lineal Miles of Guideway		0		0							
60.040	Other Real Estate Costs	Lineal Miles of Guideway		0		0							
70	Vehicles	Vehicles	0	0	0	0			0%		0		
70.060	Non-revenue vehicles	Vehicles		0		0							
70.061	Maintenance of Way Vehicles	Vehicles		0		0							
70.062	Automobiles	Vehicles		0		0							
70.063	Trucks	Vehicles		0		0							
70.064	Unspecified	Vehicles		0		0							
70.070	Spare parts/ Rotable Components	Vehicles		0		0							
70.080	Intercity Passenger Rail	Vehicles		0		0							
70.081	Diesel Locomotive	Vehicles		0		0							
70.082	Cab Car	Vehicles		0		0							
70.083	Bi-Level Coach	Vehicles		0		0							
70.084	Single Level Coach	Vehicles		0		0							
70.085	DMU	Vehicles		0		0							
70.086	EMU	Vehicles		0		0							
70.087	Unspecified			0		0							
80	Professional Services			2,214	664	2,878			19%		3,696		
80.000	Planning and Concept Design		2%	164	49	213							

F R A MAIN WORKSHEET										Issue Date 5/4/16
City of Dallas / North Central Texas Council of Governments				Today's Date						4/29/19
Project Name and Location: Dallas Intermodal Transportation Facility (Track-Related)				Yr of Base Year \$						2019
Current Phase : Fatal Flaw Evaluation				Yr of Revenue Ops						2023
Standard Cost Category		Unit	Quantity	Base Year Dollars						YOE Dollars Total (X000) (from Inflation Worksheet)
				Without Contingency (X000)	Allocated Contingency (X000)	TOTAL (X000)	Unit Cost (X000)	Percent of Construction Cost	Percent of Total Project Cost	
80.010	Preliminary Engineering		2%	164	49	213				
80.020	Final Design		6%	492	148	639				
80.030	Project Management for Design and Construction		6%	492	148	639				
80.031	Agency Project Management			0		0				
80.032	Project Management Oversight Support			0		0				
80.033	Agency Force Account			0		0				
80.034	Unspecified			0		0				
80.040	Construction Administration & Management		5%	410	123	533				
80.050	Professional Liability and other Non-Construction Insurance		2%	164	49	213				
80.060	Legal; Permits; Review Fees by other agencies, cities, etc.		2%	164	49	213				
80.070	Surveys, Testing, Investigation, Inspection		1%	82	25	107				
80.080	Start up		1%	82	25	107				
80.081	Training/Start-up			0		0				
80.082	Safety Certification			0		0				
80.083	Off-Site Vehicle Testing, Test Runs			0		0				
80.084	Commissioning			0		0				
80.085	Unspecified			0		0				
80.090	Other			0		0				
81	Subtotal (10-80)	Lineal Feet of Guideway	1,600	10,412	3,124	13,535	8		90%	15,507
90	Unallocated Contingency	Total Amount		1,562		1,562			10%	2,199
91	Subtotal (10-90)	Lineal Feet of Guideway	1,600	11,974	3,124	15,097	9		100%	17,706
100	Finance Charges	Total Amount		0	0	0			0%	0
101	Total Project Costs (10-100)	Lineal Feet of Guideway	1,600	11,974	3,124	15,097	9		100%	17,706
Allocated Contingency as % of Base Yr Dollars w/o Contingency				30.00%						
Unallocated Contingency as % of Base Yr Dollars w/o Contingency				15.00%						
Total Contingency as % of Base Yr Dollars w/o Contingency				45.00%						

[illegible]

Quantity & Unit Cost Scratchpad

		Units	Unit Cost (2019\$)	ITF Quantity	Cost (2019\$)
10.01	Guideway: At-grade exclusive right-of-way	Linear Foot	\$ 279	1600	\$ 446,400
10.11	Track: Ballasted	Track Foot	\$ 391	2241	\$ 876,231
10.12	Track: Special (switches, turnouts)	Each	\$ 200,000	6	\$ 1,200,000
20.01	At-Grade Station, Stop, Shelter, Mall, Terminal, Platform	Station	\$ 4,985,626	1	\$ 4,985,626
40.01	Demolition, Clearing, Earthwork	Linear Foot	\$ 30	1600	\$ 48,000
50.01	Train control and signals	Track Foot	\$ 171	2241	\$ 383,211
50.06	Fare collection system and equipment	Station	\$ 258,809	1	\$ 258,809
					\$ 8,198,277

Note

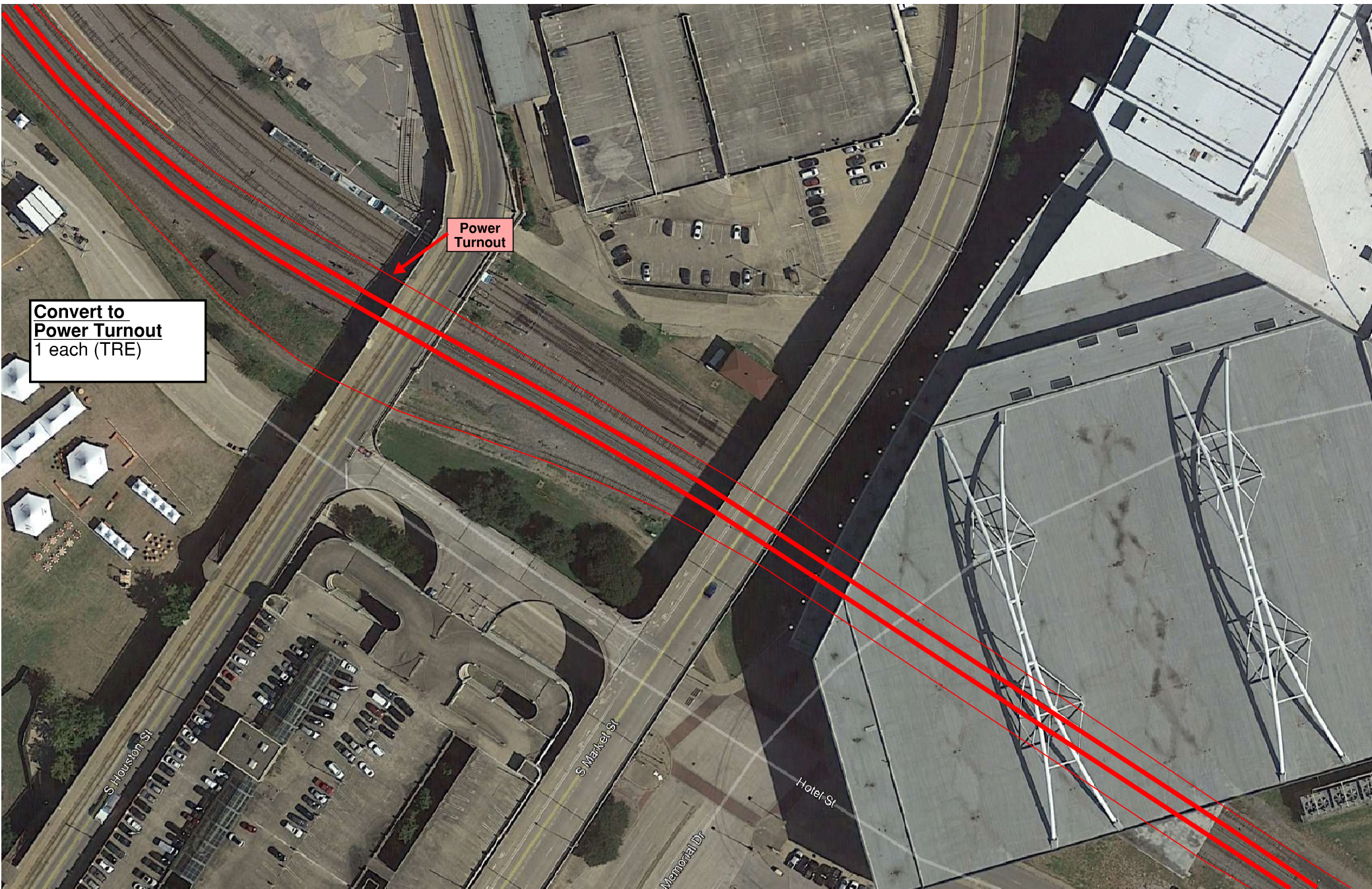
Did not use FTA cost data for Special Trackwork. Used \$200k per turnout

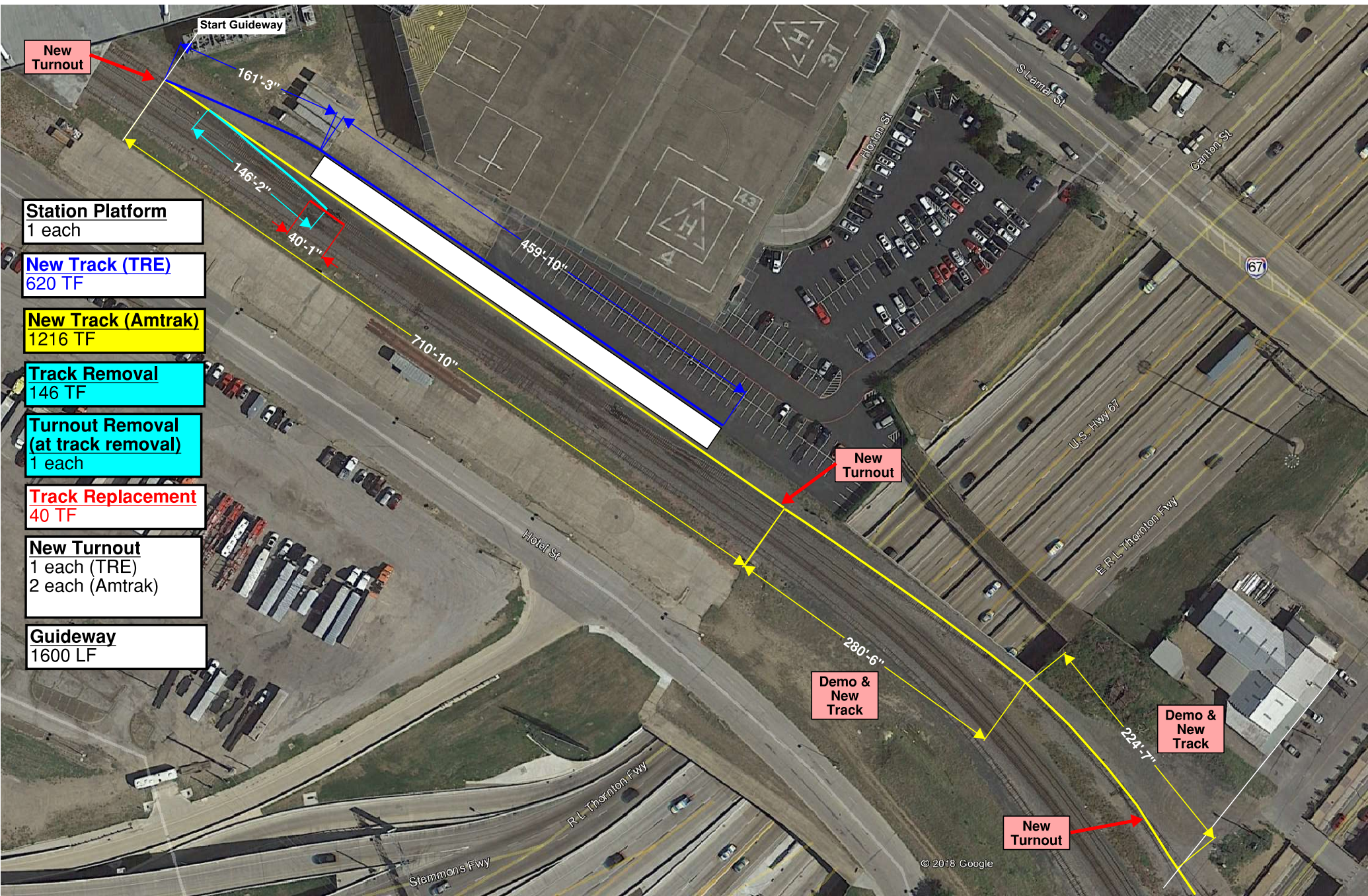
Cost Estimate Quantities

<p>Guideway: 1,600 LF New Track: 2,241 TF Track Demolition: 830 TF New Turnouts: 6 each New Stations: 1 each</p>

**Convert to
Power Turnout**
1 each (TRE)

**Power
Turnout**





New Track (Amtrak)
365 TF

New Turnout
2 each (Amtrak)

Demo &
New
Track

New
Turnout

New
Turnout

End Guideway

130'-5"

114'-5"

119'-10"

S Austin St

CAPITAL COST ESTIMATING

GUIDANCE FOR PROJECT SPONSORS

Developing the Estimate

1 INTRODUCTION

The quality of a cost estimate depends heavily on the estimating team's experience, access to information, assumptions, and the extent to which the team is well grounded in state-of-the-art construction means and methods. Through discussions with the project design and management teams, cost estimators develop an understanding of the project and its conditions, and extrapolate when information is not yet developed or is limited, to produce an accurate, comprehensive, and credible estimate.

Even at the earliest planning stage, an estimate may be organized into typical and non-typical alignment segments and project-wide elements. Typical alignment segments will share a construction condition or relationship to topography. For typical alignment segments, the same composite cross-section applies, as does the same aggregated unit cost. Simple stations and support facilities can also be estimated as typical elements. Complex interchanges and stations, and cuts, fills, and embankments that vary by site condition, are treated individually. Elements that extend along the entire project corridor, such as trackwork and signaling systems, may be estimated on either a project-wide basis or as part of alignment segments. Throughout the estimate, a consistent use of units of measure should be employed.

Sources of cost information include completed passenger rail and rail transit projects. Project sponsors, such as Amtrak, states, transportation authorities, and transit rail agencies, can provide useful as-built construction cost information. Costs can also be obtained directly from host freight railroads and from Surface Transportation Board decision documents. Commercial databases for heavy civil and building construction costs can be valuable references, and of course, the experienced estimator is likely to have his or her own database. The Capital Cost Database, described below, is another source. Note that costs obtained from all databases should be carefully considered for accuracy and applicability.

2 USING FRA STANDARD COST CATEGORIES IN ESTIMATING

2.1 STANDARD COST CATEGORIES FORMAT

The Standard Cost Categories (SCC) are both a structure and a summary for the capital cost estimate.

The SCC format must be used for FRA-funded railroad projects, to obtain important consistency in the reporting, estimating, and managing of capital costs. Often, the SCC format is the foundation or structure for the actual estimate. Sometimes however, the actual estimate is structured differently, and the SCC's categories and line items are cross-walked to the other structure. Either way, the SCC format facilitates comparisons among estimates, and, for an individual project, the consistency of the SCC makes it easier to track, evaluate, and control cost changes over time.

The SCC worksheets are available at <https://www.fra.dot.gov/eLib/details/L16055>.

Both the *FRA Main Worksheet* and *FRA Inflation Worksheet* include ten categories with sub-categories within each. The third worksheet, *FRA SCC - What to Include Where*, provides direction on which categories and line items to use for the various project elements.

The Inflation Worksheet is structured to allow the application of inflation rates specific to each of the 10 cost categories, in each project year.

Sources of historical rates of inflation are the Bureau of Labor Statistics, ENR Building Cost Index and Construction Cost Index, and the Association of American Railroads Cost Index. None of these sources provides projections for the future.

The Consumer Price Index can be a useful reference in projections, but a truly thorough approach to forecasting inflation for a rail project is to engage the same professional organization that is projecting inflation rates for a project's revenues, and operations and maintenance costs, to project inflation rates for the project's construction costs. While not inexpensive, this approach has recently been used for a number of federally-funded passenger rail projects. These projections and market analysis would include an assessment of expected construction volumes in the region to identify overheating.

2.3 CAPITAL COST DATABASE

The Capital Cost Database was established by the Federal Transit Administration (FTA) in 2009, to serve as an as-built capital cost reference, for use by grantees, consultants, and the U.S. Department of Transportation (DOT), in particular, FRA and FTA.

The Capital Cost Database is located at <https://www.transit.dot.gov/funding/grant-programs/capital-investments/capital-cost-database>. The database is structured around the Standard Cost Category format, that is, it pulls information from the SCC Worksheets, so that little cost reconstruction is required to input projects.

The database is currently comprised of costs for heavy, light, and commuter rail projects from across the country. As FRA-funded projects are completed, their as-built costs will be incorporated into the database, making it even more useful as a reference.

Project Sponsors are encouraged to open the database, and explore the information available there.

Sample cost information from the Capital Cost Database, for illustration purposes only, is shown in this table:

Capital Cost Database sample

SCC	Element	Project	Qty	Unit	2015 Unit Cost
10.042	Viaduct	Chicago CTA Blue Line Douglas	26,400	LF Guideway	\$5,901
10.042	Viaduct	Miami Dade Metro Heavy Rail	108,240	LF Guideway	\$5,441
10.061	Cut and Cover, Soft Soils	San Francisco BART SFO Extension	30,242	LF Guideway	\$17,399
50.03	Traction Power Supply: Substations	Hiawatha Corridor LRT	122,496	Track Feet	\$290

Project Name: Salt Lake City - Weber Co. Commuter Rail

Location: Salt Lake City, UT Owner Agency: Utah Transit Authority Mode: Commuter Rail Transit

Dates

Entry to PE: 2003 Entry to FD: 2005 Approval of FFGA: 2006
Start Construction: 0 Revenue Service: 2008 Closeout Contract: 0

Description:

The Weber County to Salt Lake City Commuter Rail project is a commuter rail line approximately 44 miles in length. The project includes eight stations to serve the areas of Pleasant View, Ogden, Clearfield, Layton, Bountiful and downtown Salt Lake City. The commuter rail line would operate within an existing railroad corridor parallel to Interstate 15 (I-15), utilizing right-of-way (ROW) previously acquired by UTA under a rail corridor preservation plan with certain facilities already in place. Approximately 6,300 park-and-ride spaces would be built at corridor stations to expand the transit catchment area beyond the immediate corridor. Project also includes acquisition of 11 locomotives, 12 cab cars, 23 passenger coaches, a maintenance facility and acquisition of real property.

General Details

Delivery Method: NEW Route Miles: 44.03

Vehicles In Service

Peak (Maximum Vehicles in Revenue Operation): 0 Midday (Revenue Vehicles): 0
Total Vehicle Fleet (Total Revenue Vehicles): 0

Headway

Peak (Minutes): 0 Midday (Minutes): 0

Ridership at ROD (Unlinked Passenger Trips)

Weekday Peak Period - Peak Direction: 0 Average Weekday: 17,500
Total Annual: 0

Operating Speed

Maximum Operation Speed (Max. Rev. MPH): 0.00
Scheduled Operating Speed (Sched. Rev. MPH): 0.00

Passenger Throughput

Scheduled Design Capacity (Pass. Per Hour Peak Dir.): 0
Scheduled Operating Capacity (Pass. Per Hour Peak Dir.): 0

URLs:



Average Unit Cost Per Element for a Group of Projects

Cost Per Mile of Alignment (Average) (\$X000): **\$23,693**

Selected Projects: Salt Lake City - Weber Co. Commuter Rail

Cost Per Mile of Alignment (Minimum) (\$X000): \$23,693

Cost Per Mile of Alignment (Maximum) (\$X000): \$23,693

Miles of Alignment (Minimum): 44.00

Miles of Alignment (Maximum): 44.00

Amount is in Selected Base Year: **2019**

				Average Unit Cost in National Average User Selected Base Year 2019
Cost Category and Element	Units	Number of Projects	Average Unit Quantity	
10 Guideway & Track Elements	LF Guideway			\$1,227
10.010 Guideway: At-grade exclusive right-of-way	LF Guideway	1	198,640	\$279
10.020 Guideway: At-grade semi-exclusive (allows cross-traffic)	LF Guideway	0	0	\$0
10.030 Guideway: At-grade in mixed traffic	LF Guideway	1	31,680	\$47
10.040 Guideway: Aerial structure	LF Guideway	1	2,000	\$21,161
10.041 Bridges	LF Guideway	0	0	\$0
10.042 Viaduct	LF Guideway	0	0	\$0
10.043 Other Structure	LF Guideway	0	0	\$0
10.044 Unspecified	LF Guideway	1	2,000	\$21,161
10.050 Guideway: Built-up fill	LF Guideway	0	0	\$0
10.060 Guideway: Underground cut & cover	LF Guideway	0	0	\$0
10.061 Cut & Cover Guideway Soft Soils	LF Guideway	0	0	\$0
10.062 Cut & Cover Guideway Hard Soils	LF Guideway	0	0	\$0
10.063 Cut & Cover Guideway Vent Soft Soils	LF Guideway	0	0	\$0
10.064 Cut & Cover Guideway Vent Hard Soils	LF Guideway	0	0	\$0
10.065 Unspecified	LF Guideway	0	0	\$0
10.070 Guideway: Underground tunnel	LF Guideway	0	0	\$0
10.071 Bored Earth Open	LF Guideway	0	0	\$0
10.072 Bored Earth Close	LF Guideway	0	0	\$0
10.073 Bored Earth Mixed Shield	LF Guideway	0	0	\$0
10.074 Bored Earth Mixes Shield SEM	LF Guideway	0	0	\$0
10.075 Rock Drill & Blast	LF Guideway	0	0	\$0
10.076 Rock Boring Machine	LF Guideway	0	0	\$0
10.077 Sunken Tunnel	LF Guideway	0	0	\$0
10.078 Unspecified	LF Guideway	0	0	\$0
10.080 Guideway: Retained cut or fill	LF Guideway	0	0	\$0
10.090 Track: Direct fixation	Track Feet	0	0	\$0



Average Unit Cost Per Element for a Group of Projects

Cost Category and Element		Units	Number of Projects	Average Unit Quantity	Average Unit Cost in National Average User Selected Base Year 2019
10.100	Track: Embedded	Track Feet	0	0	\$0
10.110	Track: Ballasted	Track Feet	1	464,957	\$391
10.120	Track: Special (switches, turnouts)	Track Feet	1	464,957	\$9
10.130	Track: Vibration & Noise Dampening	Track Feet	0	0	\$0
10.140	Special Structures	LF Guideway	0	0	\$0
20	Stations, Stops, Terminals, Intermodels	Stations			\$4,985,626
20.010	At-Grade Station, Stop, Shelter, Mall, Terminal, Platform	Stations	1	8	\$4,985,626
20.020	Aerial station, stop, shelter, mall, terminal, platform	Stations	0	0	\$0
20.030	Underground station, stop, shelter, mall, terminal, platform	Stations	0	0	\$0
20.031	Cut and Cover	Stations	0	0	\$0
20.032	Bored Earth Soft Soils	Stations	0	0	\$0
20.033	Bored Rock Hard Soils	Stations	0	0	\$0
20.034	Unspecified	Stations	0	0	\$0
20.040	Major stations, landings, terminals: Intermodal, ferry, trolley, etc.	Stations	0	0	\$0
20.050	Joint development	Stations	0	0	\$0
20.060	Automobile parking multi-story structure	Spaces	0	0	\$0
20.070	Elevators, escalators	Number	0	0	\$0
20.071	Elevators	Number	0	0	\$0
20.072	Escalators	Number	0	0	\$0
20.073	Unspecified	Number	0	0	\$0
20.080	Passenger Overpass	Number	0	0	\$0
20.090	Underground Interconnecting Tunnel	Number	0	0	\$0
20.091	Cut and Cover	Number	0	0	\$0
20.092	Bored Earth Soft Soils	Number	0	0	\$0
20.093	Bored Rock Hard Soils	Number	0	0	\$0
20.094	Unspecified	Number	0	0	\$0
20.100	Signage and Graphics	Stations	0	0	\$0
30	Support Facilities: Yards, Shops, Admin. Bldgs	LF Guideway			\$271,959
30.010	Administration Building: Office, sales, storage, revenue counting	LF Guideway	1	232,320	\$0
30.011	Administrative Building	LF Guideway	0	0	\$0
30.012	Central Control Facility	LF Guideway	0	0	\$0
30.013	Central Revenue Counting Facility	LF Guideway	0	0	\$0
30.014	Unspecified	LF Guideway	1	232,478	\$0
30.020	Light Maintenance Facility	Vehicles	0	0	\$0
30.030	Heavy Maintenance Facility	Vehicles	1	54	\$271,305

Cost Category and Element		Units	Number of Projects	Average Unit Quantity	Average Unit Cost in National Average User Selected Base Year 2019
30.040	Storage or Maintenance of Way Building	LF Guideway	0	0	\$0
30.050	Yard and Yard Track	Track Feet	0	0	\$0
40	Sitework & Special Conditions	LF Guideway			\$1,118
40.010	Demolition, Clearing, Earthwork	LF Guideway	1	232,478	\$30
40.020	Site Utilities, Utility Relocation	LF Guideway	1	232,320	\$229
40.021	Urban Replacement In-Kind Public Utilities	LF Guideway	0	0	\$0
40.022	Urban Replacement In-Kind Private Utilities	LF Guideway	0	0	\$0
40.023	Urban Replacement Betterment Public Utilities	LF Guideway	0	0	\$0
40.024	Urban Replacement Betterment Private Utilities	LF Guideway	0	0	\$0
40.025	Suburban Replacement In-Kind Public Utilities	LF Guideway	0	0	\$0
40.026	Suburban Replacement In-Kind Private Utilities	LF Guideway	0	0	\$0
40.027	Suburban Replacement Betterment Public Utilities	LF Guideway	0	0	\$0
40.028	Suburban Replacement Betterment Private Utilities	LF Guideway	0	0	\$0
40.029	Unspecified	LF Guideway	1	232,478	\$229
40.030	Haz. mat'l, contam'd soil removal/mitigation, ground water	LF Guideway	1	232,320	\$2
40.031	HazMat Abatement	LF Guideway	0	0	\$0
40.032	Contaminated Soil Removal	LF Guideway	0	0	\$0
40.033	Ground Water Treatment	LF Guideway	0	0	\$0
40.034	Unspecified	LF Guideway	1	232,478	\$2
40.040	Environmental mitigation, e.g. wetlands, historic/archeologic, parks	LF Guideway	1	232,478	\$22
40.050	Site structures including retaining walls, sound walls	LF Guideway	1	232,320	\$76
40.051	Mechanically Stabilized Earth Walls	LF Guideway	0	0	\$0
40.052	Concrete Walls	LF Guideway	0	0	\$0
40.053	Other Walls	LF Guideway	0	0	\$0
40.054	Unspecified	LF Guideway	1	232,478	\$76
40.060	Pedestrian / bike access and accommodation, landscaping	LF Guideway	1	232,478	\$22
40.070	Automobile, bus, van accessways including roads, parking lots	Spaces	1	6,300	\$6,609
40.071	Surface Parking Lot	Spaces	0	0	\$0
40.072	Auto Access	Stations	0	0	\$0
40.073	Bus Access	Spaces	0	0	\$0
40.074	Bus Parking and Berthing	Spaces	0	0	\$0
40.075	Unspecified	Spaces	1	6,300	\$6,609
40.080	Temporary Facilities and other indirect costs during construction	LF Guideway	1	232,320	\$556
40.081	Roadway Changes	LF Guideway	0	0	\$0
40.082	Third-Party Work	LF Guideway	0	0	\$0
40.083	Mobilization	LF Guideway	0	0	\$0
40.084	Maintenance of Traffic	LF Guideway	0	0	\$0



Average Unit Cost Per Element for a Group of Projects

Cost Category and Element		Units	Number of Projects	Average Unit Quantity	Average Unit Cost in National Average User Selected Base Year 2019
40.085	Unallocated Indirect Costs	LF Guideway	0	0	\$0
40.086	Unspecified	LF Guideway	1	232,478	\$556
50	Systems	Track Feet			\$225
50.010	Train control and signals	Track Feet	1	464,957	\$171
50.011	Train Control - Wayside	Track Feet	0	0	\$0
50.012	Train Control - On Board Systems	Track Feet	0	0	\$0
50.013	Train Control - Centralized Systems	Track Feet	0	0	\$0
50.014	Unspecified	Track Feet	1	464,957	\$171
50.020	Traffic signals and crossing protection	Track Feet	1	464,957	\$47
50.030	Traction power supply: substations	Track Feet	0	0	\$0
50.040	Traction power distribution: catenary and third rail	Track Feet	0	0	\$0
50.041	Catenary	Track Feet	0	0	\$0
50.042	Third Rail	Track Feet	0	0	\$0
50.043	Power Distribution and Connections	Track Feet	0	0	\$0
50.044	Unspecified	Track Feet	0	0	\$0
50.050	Communications	Track Feet	1	464,957	\$2
50.051	Wired	Track Feet	0	0	\$0
50.052	Radio Based	Track Feet	0	0	\$0
50.053	Unspecified	Track Feet	1	464,957	\$2
50.060	Fare collection system and equipment	Stations	1	8	\$258,809
50.061	Central Revenue Counting Systems	Stations	0	0	\$0
50.062	Revenue Collection - In Station	Stations	0	0	\$0
50.063	Revenue Collection - On Vehicle	Vehicles	0	0	\$0
50.064	Unspecified	Stations	1	8	\$258,809
50.070	Central Control System	LF Guideway	0	0	\$0
60	Row, Land, Existing Improvements	LF Guideway			\$488
60.010	Purchase or lease of real estate	LF Guideway	1	232,320	\$487
60.011	Full Takes	LF Guideway	0	0	\$0
60.012	Part Takes	LF Guideway	0	0	\$0
60.013	Easement Acquisitions	LF Guideway	0	0	\$0
60.014	Other Rights	LF Guideway	0	0	\$0
60.015	Donated Value	LF Guideway	0	0	\$0
60.016	Unspecified	LF Guideway	1	232,478	\$487
60.020	Relocation of existing households and businesses	LF Guideway	1	232,320	\$1
60.021	Residential (Owners)	LF Guideway	0	0	\$0
60.022	Residential (Tenants)	LF Guideway	0	0	\$0
60.023	Business (Owners and Tenants)	LF Guideway	0	0	\$0



Average Unit Cost Per Element for a Group of Projects

Cost Category and Element		Units	Number of Projects	Average Unit Quantity	Average Unit Cost in National Average User Selected Base Year 2019
60.024	Others (Personal Property Moves)	LF Guideway	0	0	\$0
60.025	Unspecified	LF Guideway	1	232,478	\$1
60.030	Services	LF Guideway	0	0	\$0
60.031	Property Management	LF Guideway	0	0	\$0
60.032	Agency	LF Guideway	0	0	\$0
60.033	Contractor R/W Services (Title/Appraisal, etc)	LF Guideway	0	0	\$0
60.034	Legal Services	LF Guideway	0	0	\$0
60.035	Unspecified	LF Guideway	0	0	\$0
60.040	Other Real Estate Costs	LF Guideway	0	0	\$0
70	Vehicles	Vehicles			\$2,941,285
70.010	Light Rail	Vehicles	0	0	\$0
70.011	Static	Vehicles	0	0	\$0
70.012	Articulated	Vehicles	0	0	\$0
70.013	Unspecified	Vehicles	0	0	\$0
70.020	Heavy Rail	Vehicles	0	0	\$0
70.021	Small Scale	Vehicles	0	0	\$0
70.022	Large Scale	Vehicles	0	0	\$0
70.023	Unspecified	Vehicles	0	0	\$0
70.030	Commuter Rail	Vehicles	1	54	\$2,889,118
70.031	Locomotive	Vehicles	1	11	\$5,112,011
70.032	Passenger Car	Vehicles	1	43	\$2,320,471
70.033	Bi-Level Passenger Car	Vehicles	0	0	\$0
70.034	Self-Propelled Passenger Car	Vehicles	0	0	\$0
70.035	Unspecified	Vehicles	0	0	\$0
70.040	Bus	Vehicles	0	0	\$0
70.041	Small Bus	Vehicles	0	0	\$0
70.042	Standard 40 Foot Bus	Vehicles	0	0	\$0
70.043	Articulated Bus	Vehicles	0	0	\$0
70.044	Unspecified	Vehicles	0	0	\$0
70.050	Other Vehicles	Vehicles	0	0	\$0
70.060	Non-revenue vehicles	Vehicles	0	0	\$0
70.061	Maintenance of Way Vehicles	Vehicles	0	0	\$0
70.062	Automobiles	Vehicles	0	0	\$0
70.063	Trucks	Vehicles	0	0	\$0
70.064	Unspecified	Vehicles	0	0	\$0
70.070	Spare parts/ Rotable Components	Vehicles	1	54	\$52,167
80	Professional Services	Hard Costs			



Average Unit Cost Per Element for a Group of Projects

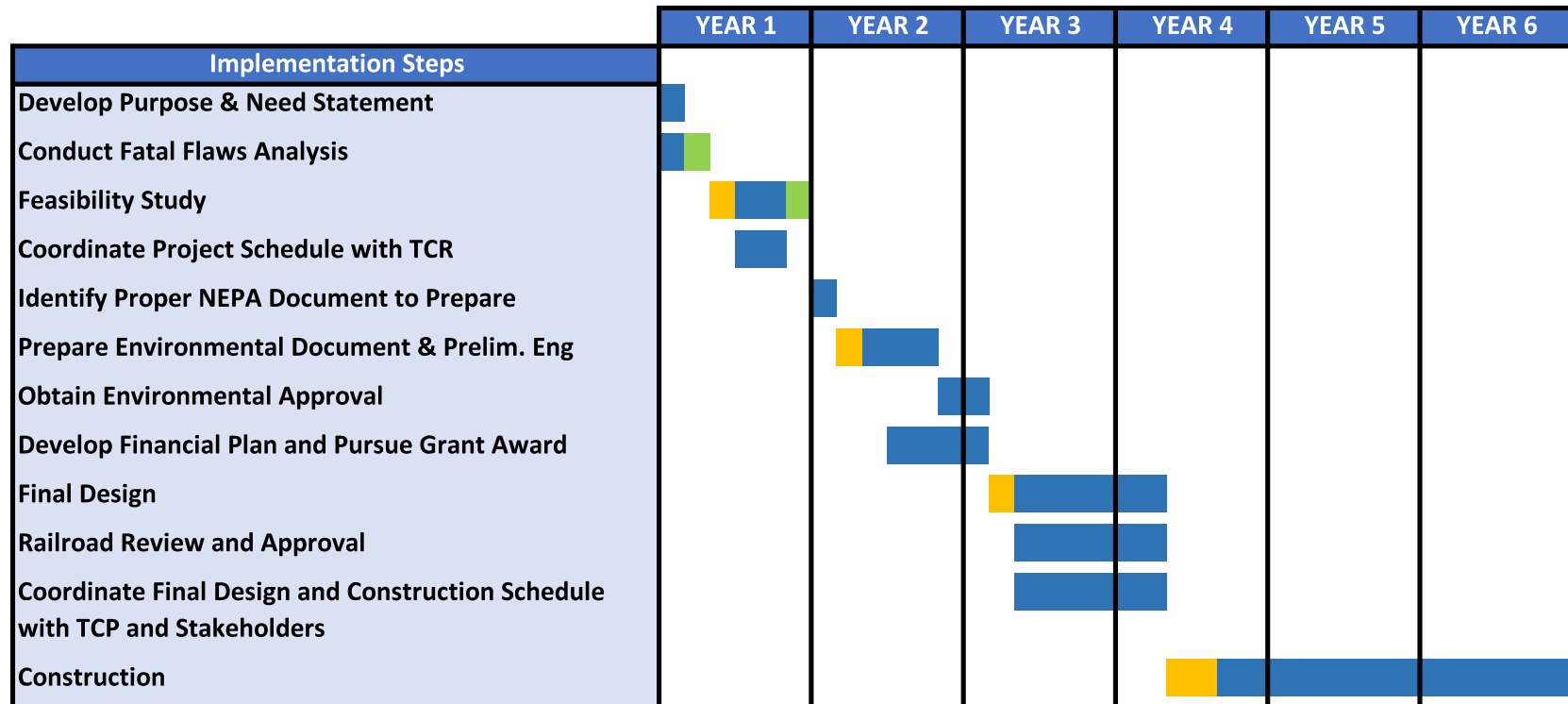
Cost Category and Element		Units	Number of Projects	Average Unit Quantity	Average Unit Cost in National Average User Selected Base Year 2019
80.010	Preliminary Engineering	Hard Costs	1	2.03%	2.03%
80.020	Final Design	Hard Costs	1	0.81%	0.81%
80.030	Project Management for Design and Construction	Hard Costs	1	0.00%	0.00%
80.031	Agency Project Management	Hard Costs	0	0.00%	0.00%
80.032	Project Management Oversight Support	Hard Costs	0	0.00%	0.00%
80.033	Agency Force Account	Hard Costs	0	0.00%	0.00%
80.034	Unspecified	Hard Costs	1	3.32%	3.32%
80.040	Construction Administration & Management	Hard Costs	0	0.00%	0.00%
80.050	Professional Liability and other Non-Construction Insurance	Hard Costs	1	1.74%	1.74%
80.060	Legal; Permits; Review Fees by other agencies, cities, etc.	Hard Costs	0	0.00%	0.00%
80.070	Surveys, Testing, Investigation, Inspection	Hard Costs	0	0.00%	0.00%
80.080	Start up	Hard Costs	0	0.00%	0.00%
80.081	Training/Start-up	Hard Costs	0	0.00%	0.00%
80.082	Safety Certification	Hard Costs	0	0.00%	0.00%
80.083	Off-Site Vehicle Testing, Test Runs	Hard Costs	0	0.00%	0.00%
80.084	Commissioning	Hard Costs	0	0.00%	0.00%
80.085	Unspecified	Hard Costs	0	0.00%	0.00%
80.090	Other	Hard Costs	1	1.57%	1.57%



Attachment 10

Implementation Schedule

Dallas Intermodal Transportation Facility (ITF) Implementation Schedule

Fatal Flaws Analysis



 Solicitation
 Review

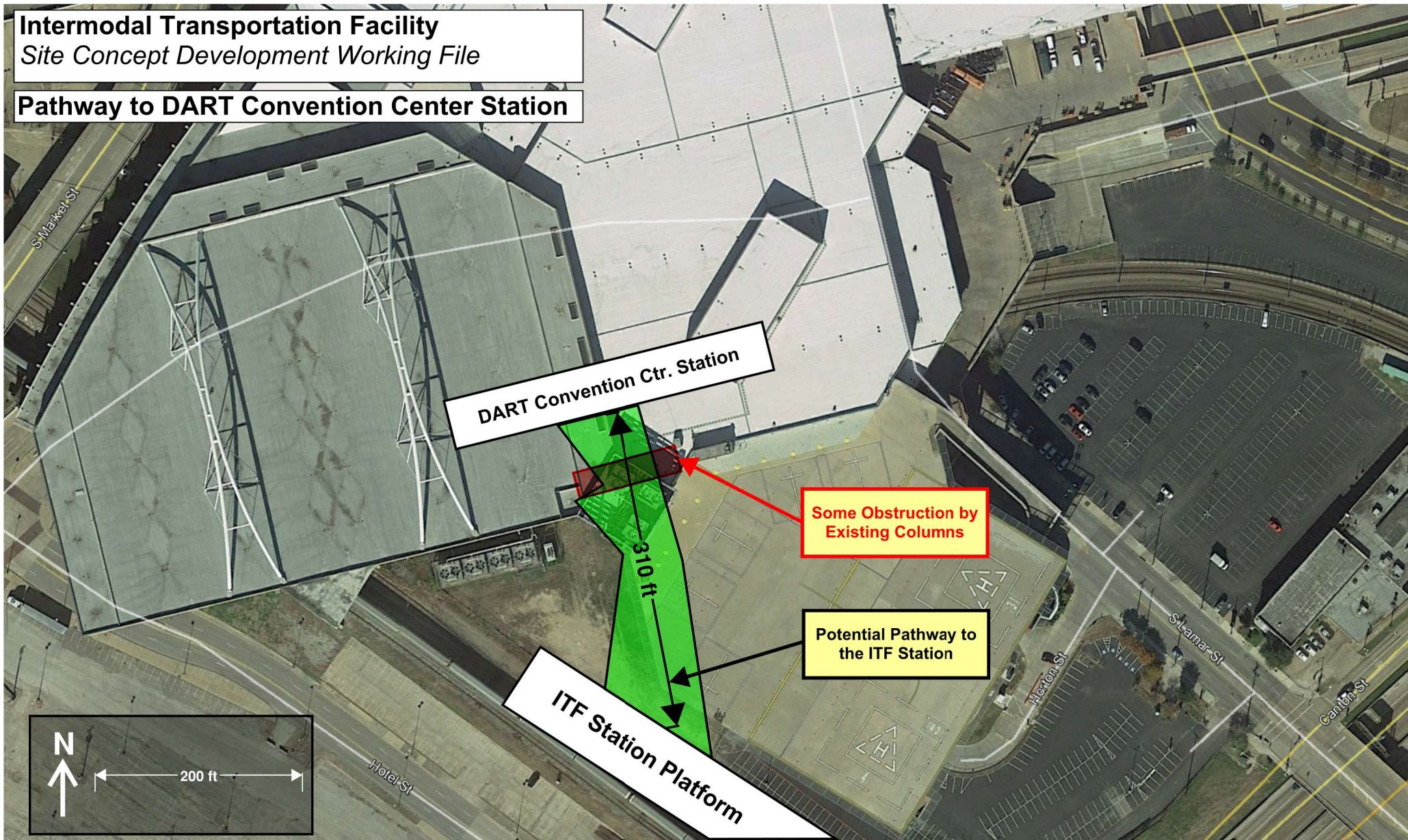
Attachment 11

Concepts for Connectivity to DART Rail Station

Pathway Concept Connecting DART to High Speed Rail

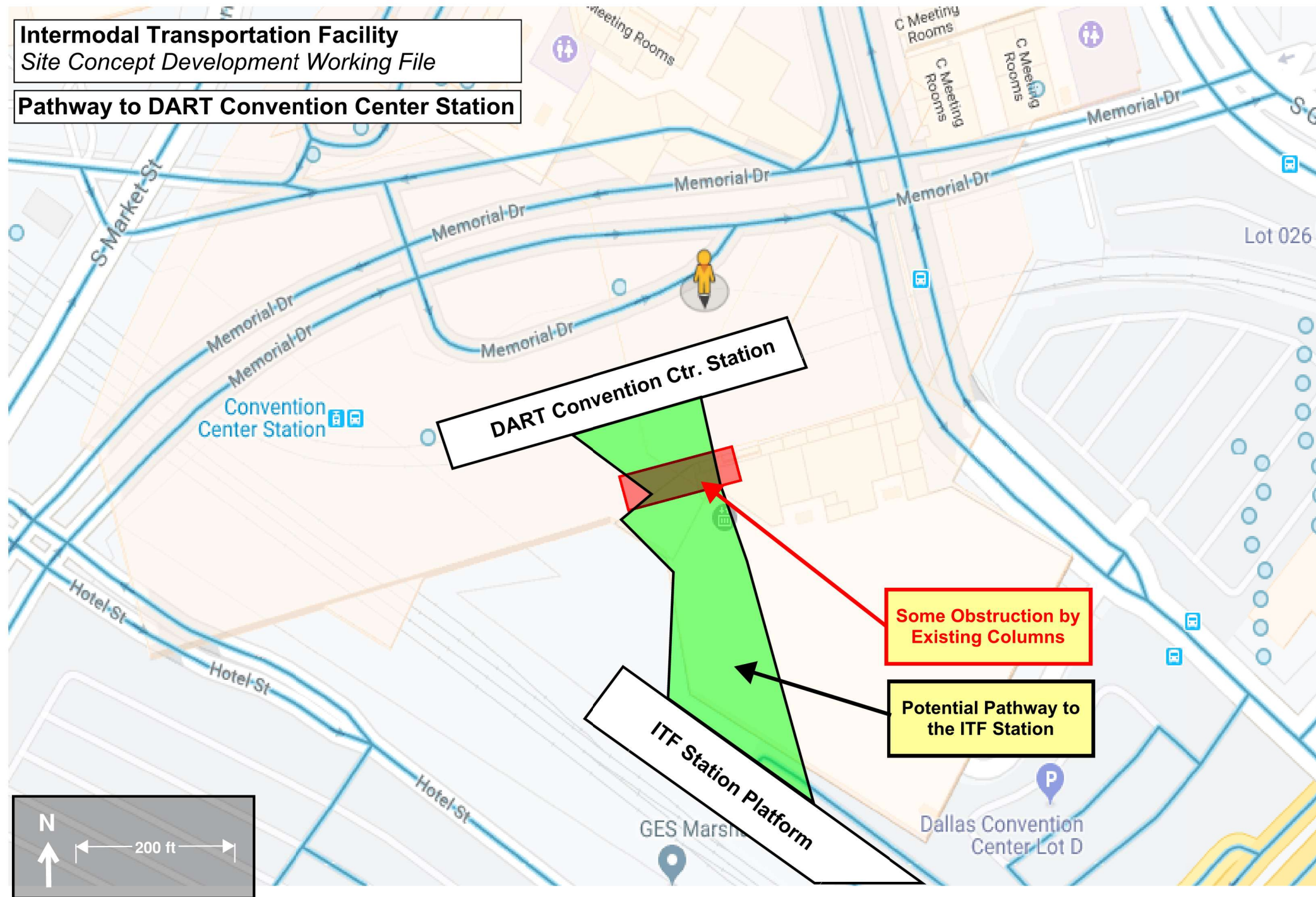
Intermodal Transportation Facility
Site Concept Development Working File

Pathway to DART Convention Center Station



Intermodal Transportation Facility
Site Concept Development Working File

Pathway to DART Convention Center Station



Intermodal Transportation Facility
Site Concept Development Working File

Pathway to DART Convention Center Station

Potential Pathway
to ITF from the
DART Convention
Center Station

Intermodal Transportation Facility Rail Station Platform



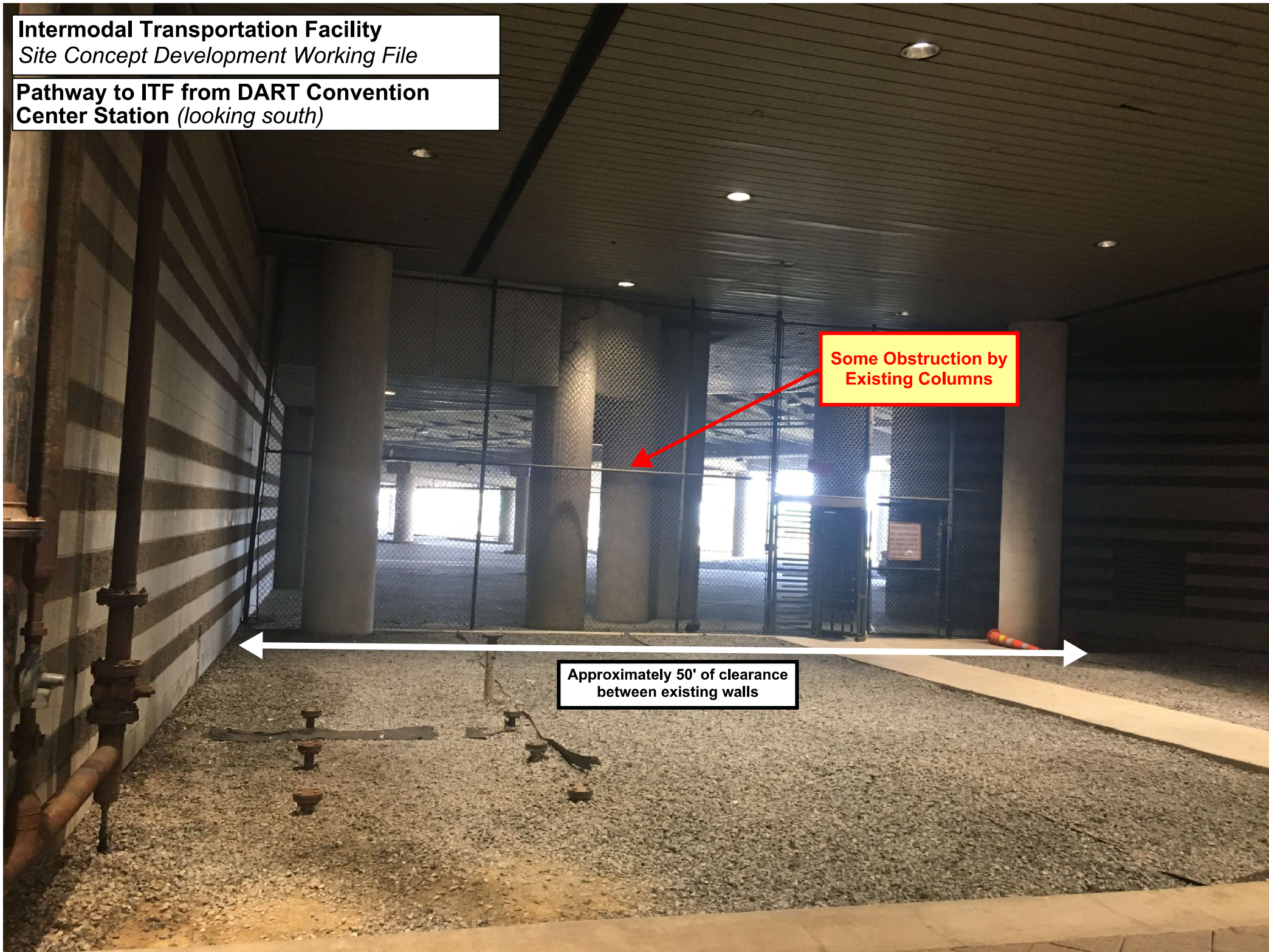
100 ft

Intermodal Transportation Facility
Site Concept Development Working File

**Pathway to ITF from DART Convention
Center Station** *(looking south)*

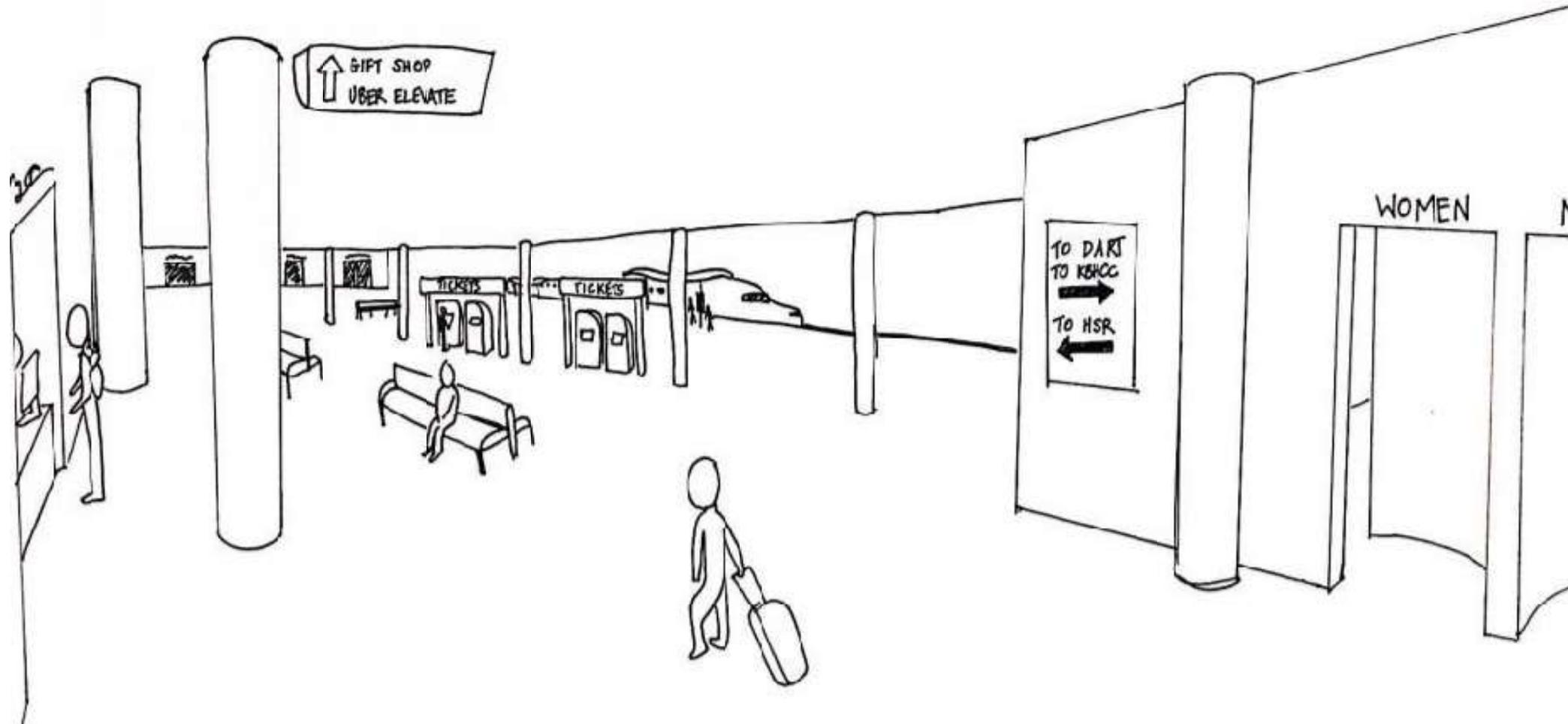
**Some Obstruction by
Existing Columns**

**Approximately 50' of clearance
between existing walls**



Intermodal Transportation Facility
Site Concept Development Working File

**Pathway to ITF from DART Convention
Center Station (looking south)**



Aesthetic Concepts for Connectivity between DART and High Speed Rail

Intermodal Transportation Facility
Site Concept Development Working File

Brightline, Florida



Intermodal Transportation Facility
Site Concept Development Working File

Tianjin Rail Station, China



<https://www.youtube.com/watch?v=xLmVpbiztN4>

Intermodal Transportation Facility
Site Concept Development Working File

West Kowloon Station, Hong Kong



<https://www.hongkongfp.com/2018/09/23/mixed-reactions-first-day-high-speed-rail-way-connecting-hong-kong-china/>

Intermodal Transportation Facility
Site Concept Development Working File

New Delhi Rail Station Concept, India



<https://www.arup.com/projects/new-delhi-railway-station>

Intermodal Transportation Facility
Site Concept Development Working File

Manchester Piccadilly Rail Station, Great Britain



<https://www.networkrail.co.uk/stations/manchester-piccadilly/>