

Memorandum



CITY OF DALLAS

DATE February 10, 2017

Honorable Members of the Transportation & Trinity River Project Committee:
TO Lee Kleinman (Chair), Eric Wilson (Vice-Chair), Sandy Greyson, Monica R. Alonzo, Adam Medrano,
Casey Thomas II

SUBJECT Dallas CBD Second Light Rail Alignment (D2) Subway Project Refinement

On Monday, February 13, 2017 you will be briefed on Dallas Central Business District (CBD) Second Light Rail Alignment (D2) Subway Project Refinement. Briefing materials are attached for your review.

Please feel free to contact me if you have any questions or concerns.

A handwritten signature in black ink, appearing to read 'Jill A. Jordan'.

Jill A. Jordan, P.E.
Assistant City Manager

c: T.C. Broadnax, City Manager
Larry Castro, City Attorney
Craig D. Kinton, City Auditor
Rosa A. Rios, City Secretary
Daniel F. Solis, Administrative Judge
Mark McDaniel, Acting First Assistant City Manager

Eric D. Campbell, Assistant City Manager
Joey Zapata, Assistant City Manager
M. Elizabeth Reich, Chief Financial Officer
Sana Syed, Public Information Officer
Elsa Cantu, Assistant to the City Manager – Mayor & Council
Directors and Assistant Directors



Dallas CBD Second Light Rail Alignment (D2)

Subway Project Refinement

City of Dallas
Transportation and Trinity River Project Committee

February 13, 2017



Discussion Items

- Background
- Schedule
- Public/Stakeholder Involvement
- Subway Construction Overview
- Potential Subway Alternatives
 - Technical Committee Input
 - Stakeholder Committee Input
- Next Steps

Redefining D2 as a Subway

- Concerns with D2 mostly at-grade
- October 2016 Actions:
 - Dallas City Council approved resolution to pursue subway option from Woodall Rodgers to IH-345
 - DART Board approved FY17 Financial Plan with increased budget (\$1.3 Billion YOY) for subway and larger FTA grant amount
- Now advancing D2 as a subway

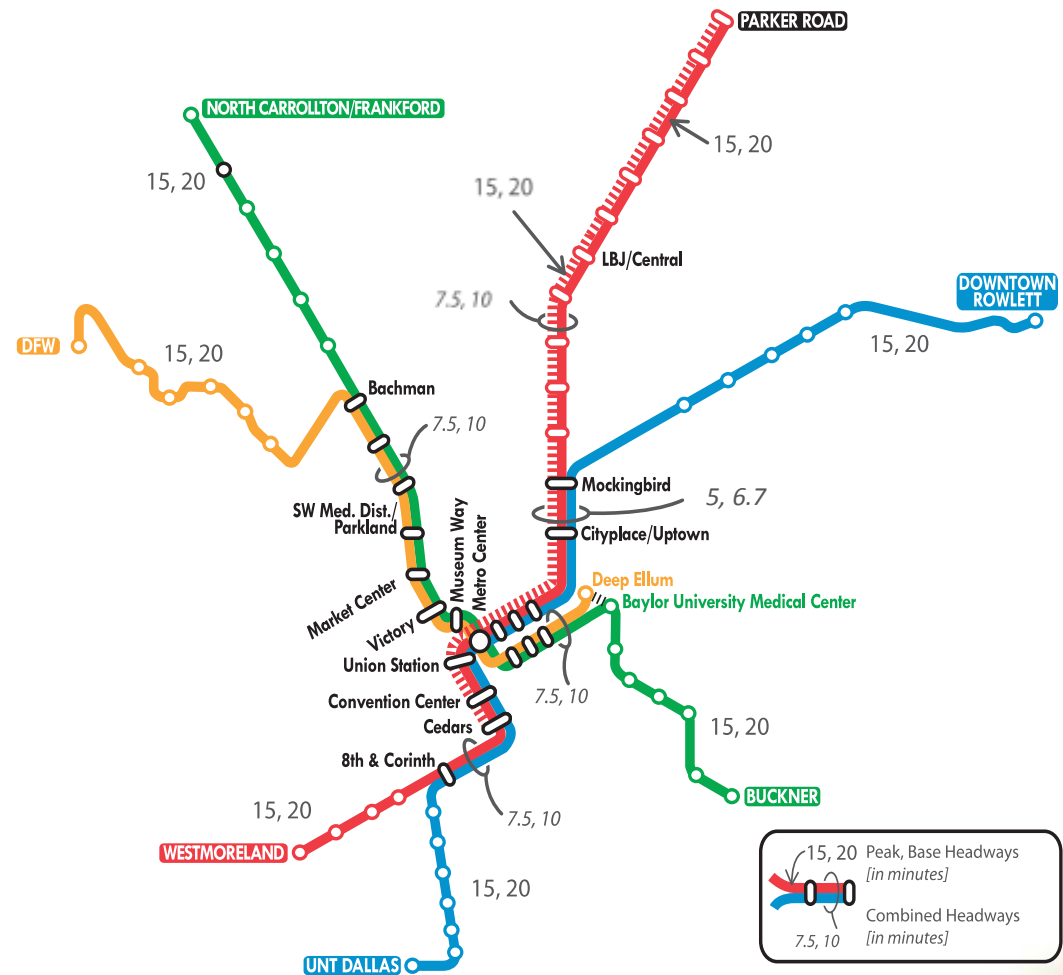
Why is D2 Important?

- Add **Core Capacity** to and through downtown
 - Some trains will be at capacity within a few years
- Provide **Operational Flexibility** for the system
 - Continuity of service during incidents
 - System expansion/added service
- Enhance **Mobility and Access** for existing and future riders
 - Get our riders where they need to go

How will D2 Affect Today's Riders?

Operating Plan Concept

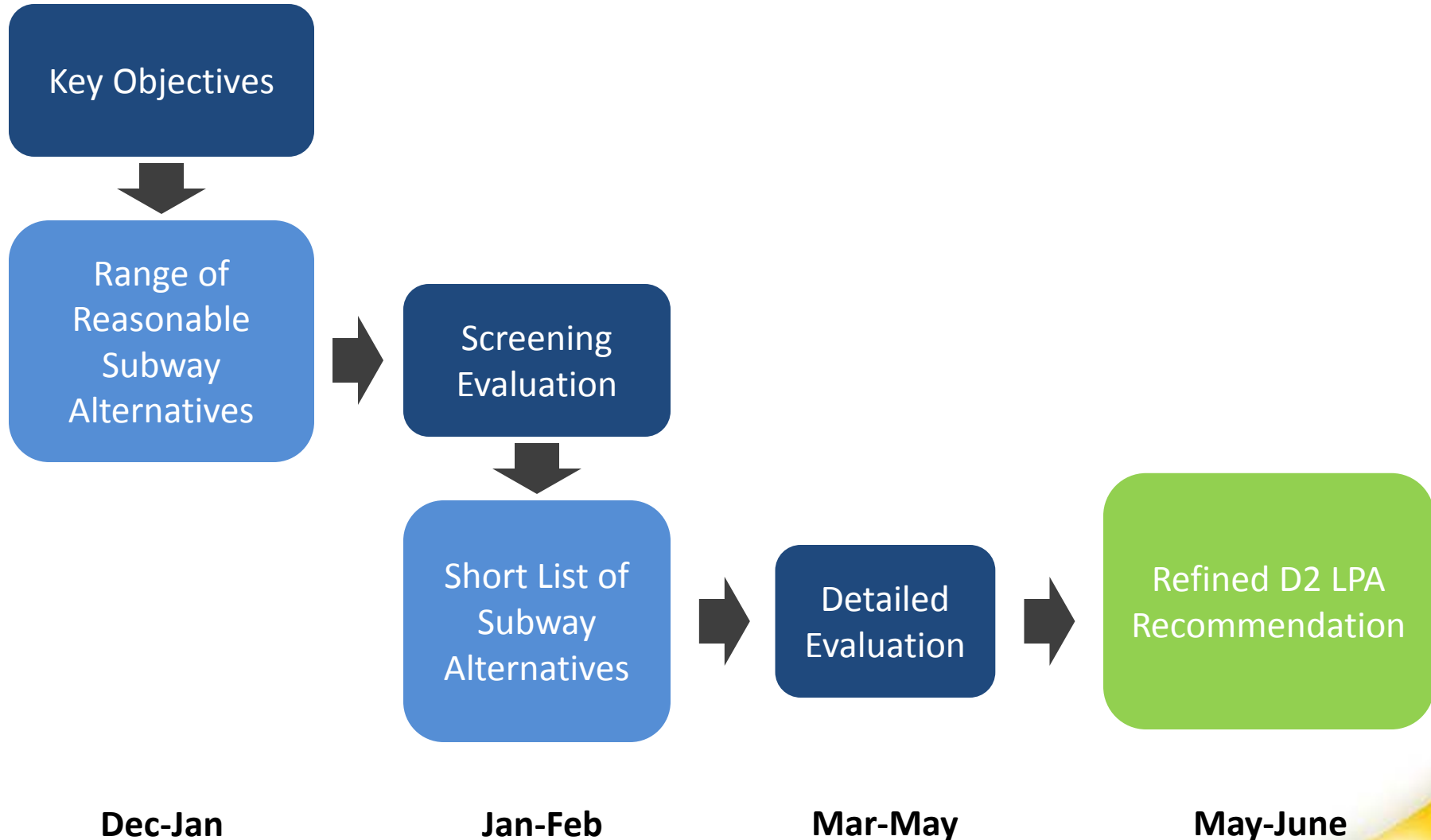
- Green and Orange to shift to D2
- Orange Line terminus to be determined
 - Deep Ellum
 - Lawnview
 - Other
- Red Line loads addressed by extra insert trains



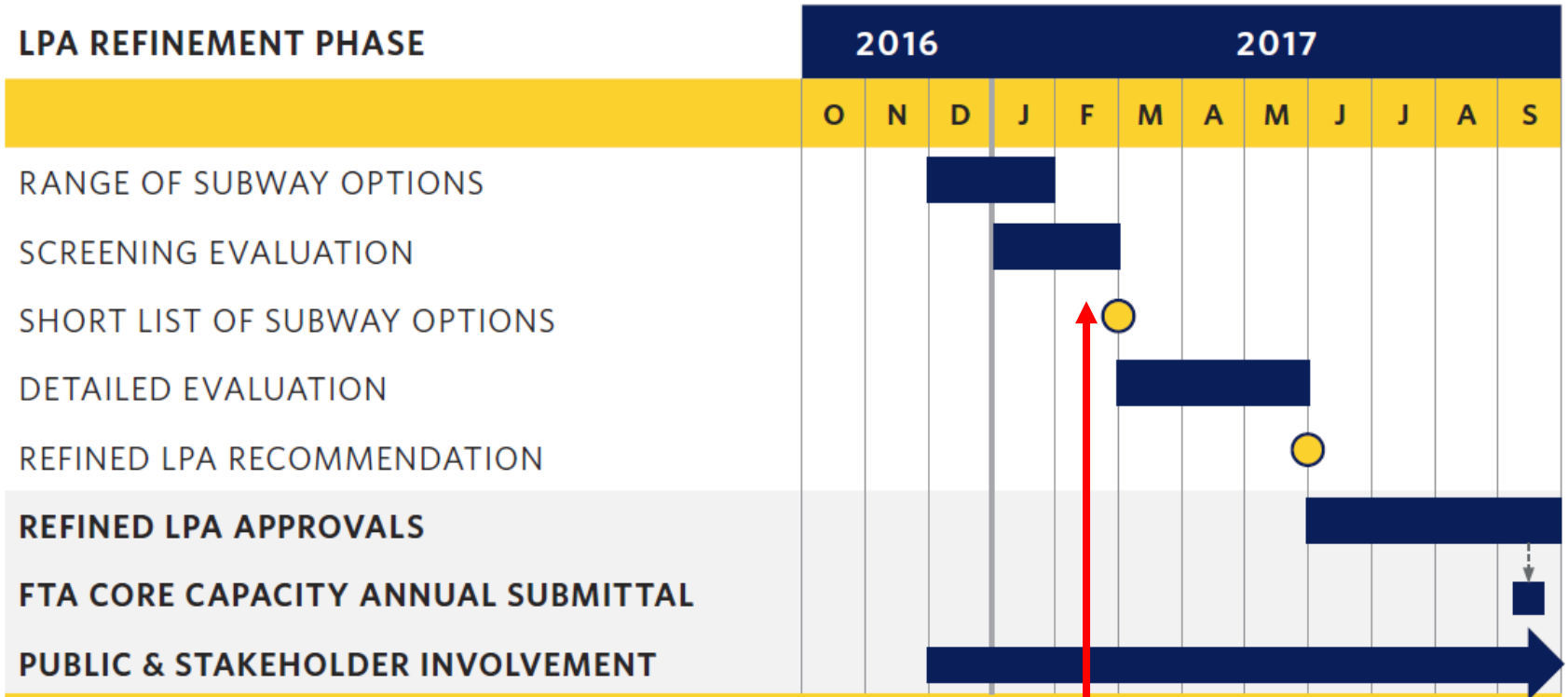
FTA Core Capacity Funding

- November 2015
 - FTA authorization to enter two-year Project Development (PD) phase to complete PE/EIS
- February 2016
 - D2 receives “**Medium-High**” rating from FTA
- September 2016
 - DART submitted annual update to FTA
 - FTA held its review pending subway discussion
 - D2 will receive “not rated” in next report to Congress

LPA Refinement Evaluation Process



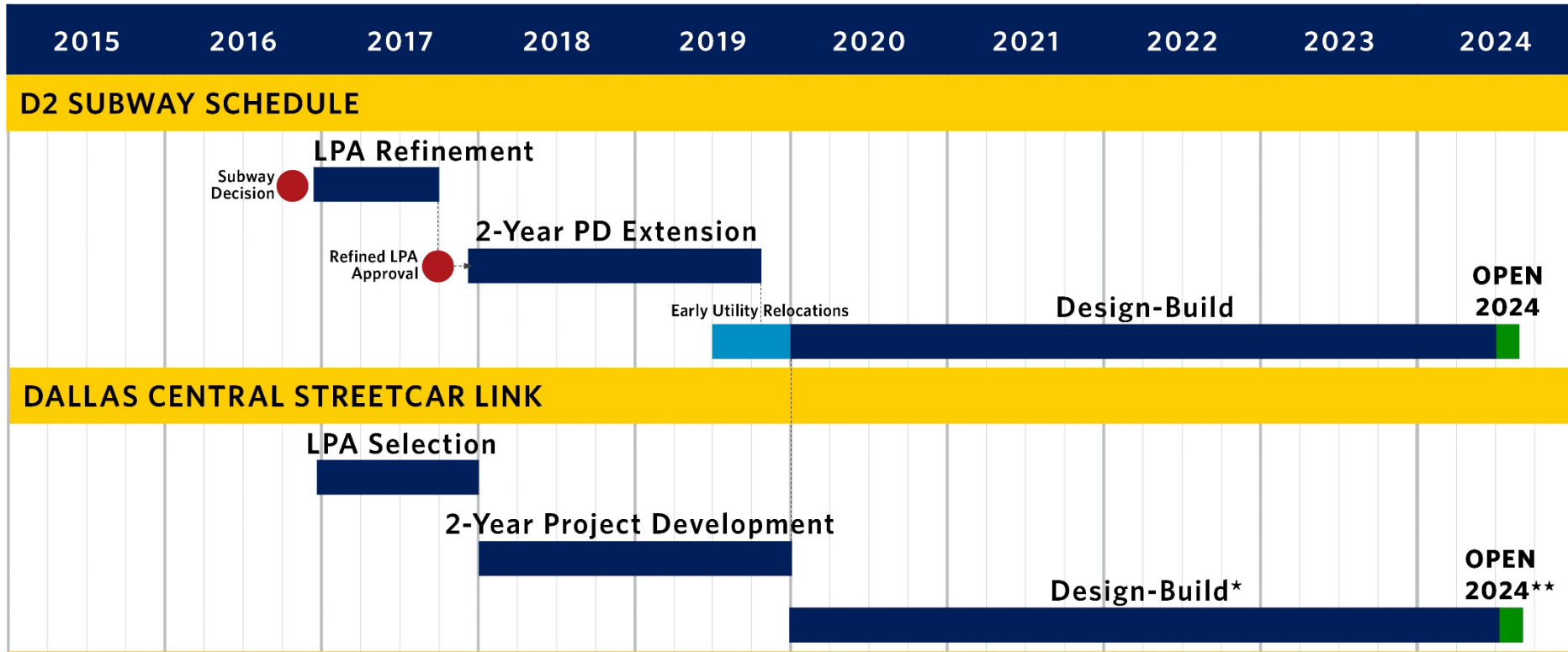
LPA Refinement Phase



● DECISION MILESTONE

WE ARE HERE

D2/Streetcar Connected Schedule



Preliminary Schedule subject to determination of subway alignment and construction methods

* To Be Determined

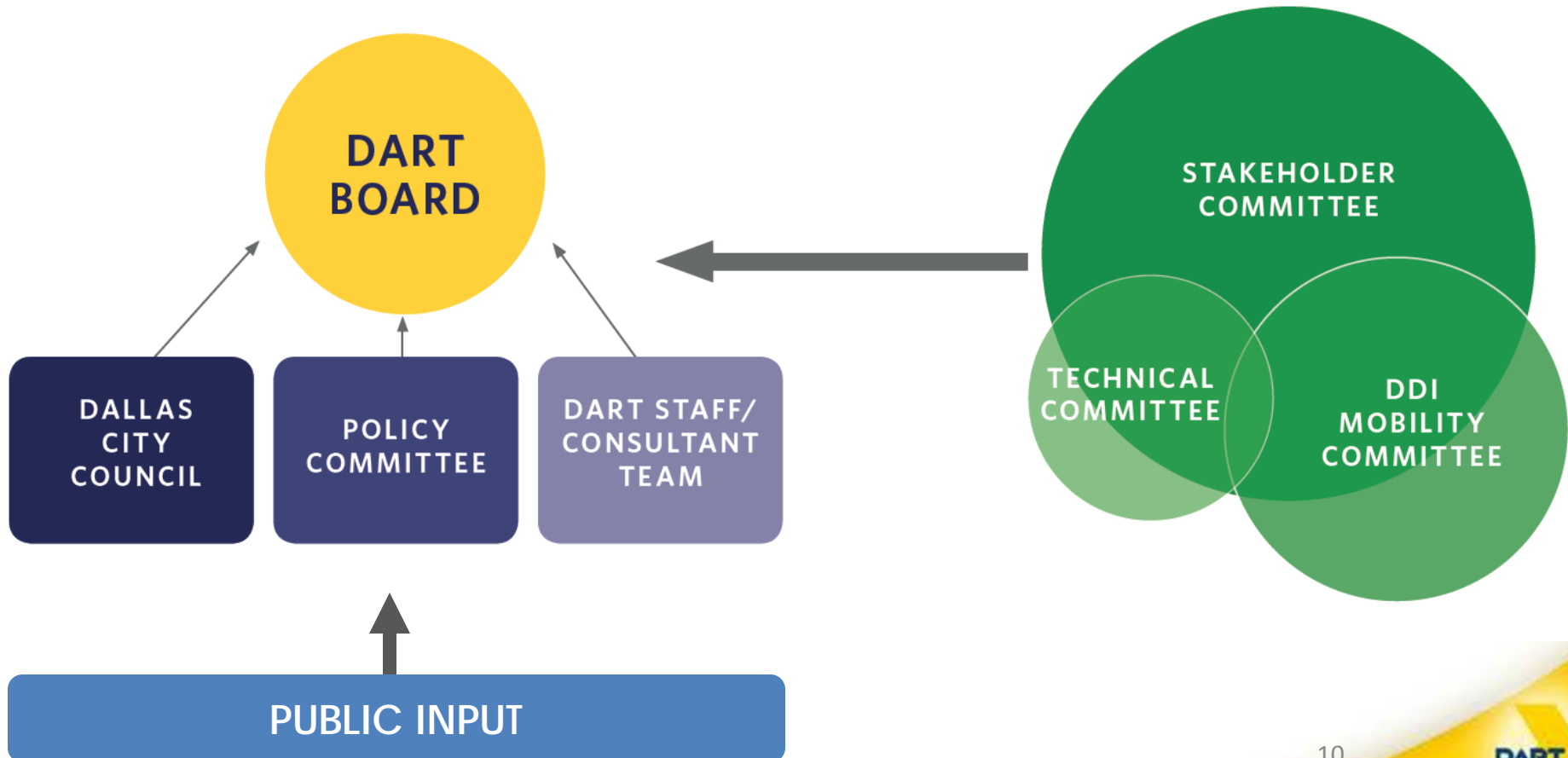
** Tied to D2 Schedule

Public and Agency Involvement

Key to Success

POLICY & MANAGEMENT

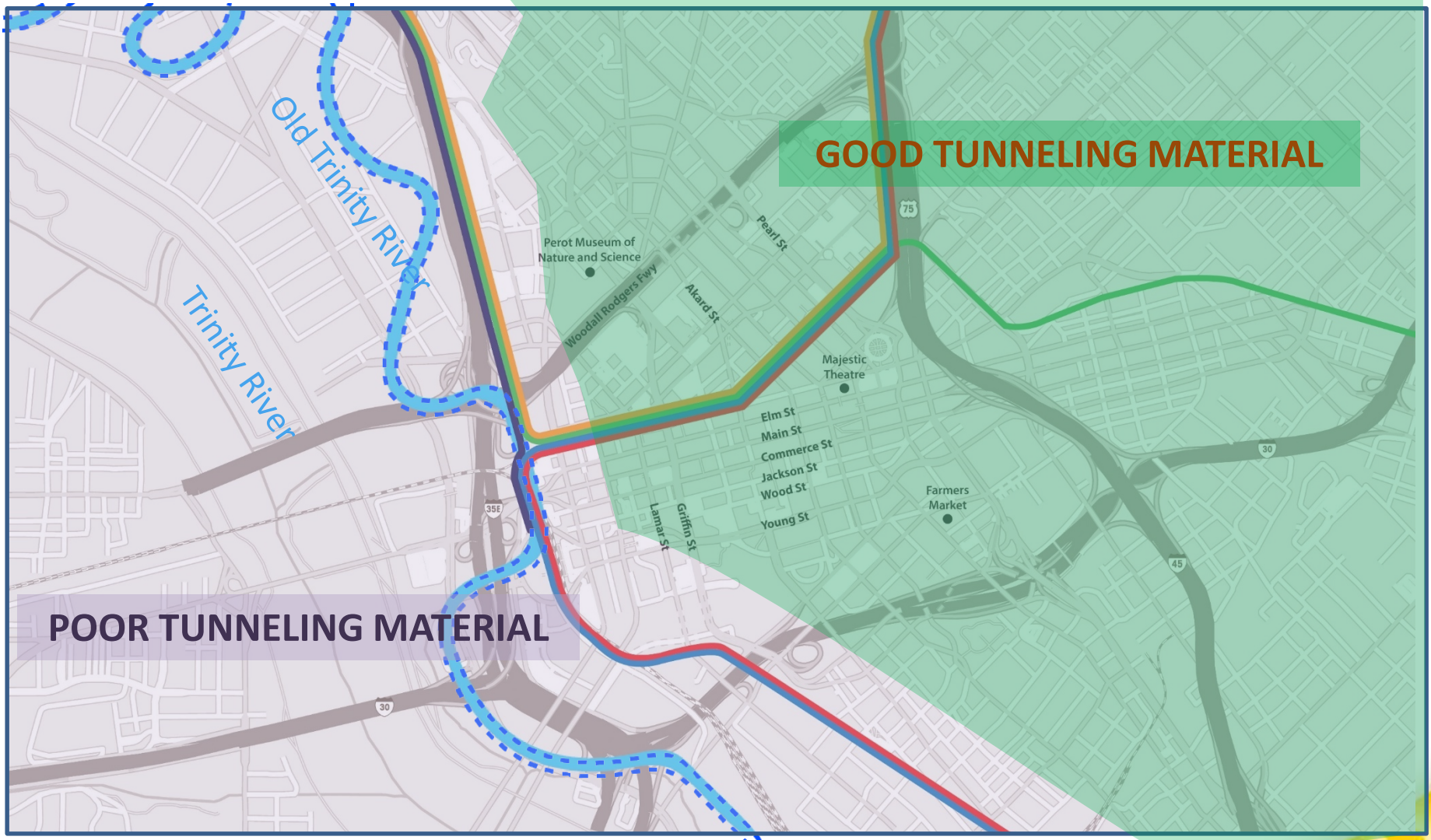
STAKEHOLDERS



Subway Construction Overview

- Geology of the CBD
- Portal Transition Areas
- Subway Construction Methods
 - Tunnel Boring Machine (TBM)
 - Sequential Excavation Method (SEM)
 - Cut and Cover Method
- Station Construction and Access

Geology



Subway Station Access

- Multiple access points are possible
- Integrate into building
- Station plaza
- Sidewalk / Public right-of-way
- Connections to pedestrian tunnel system
- Urban design opportunity at station access points

Station Integration into Adjacent Building Site or Plaza

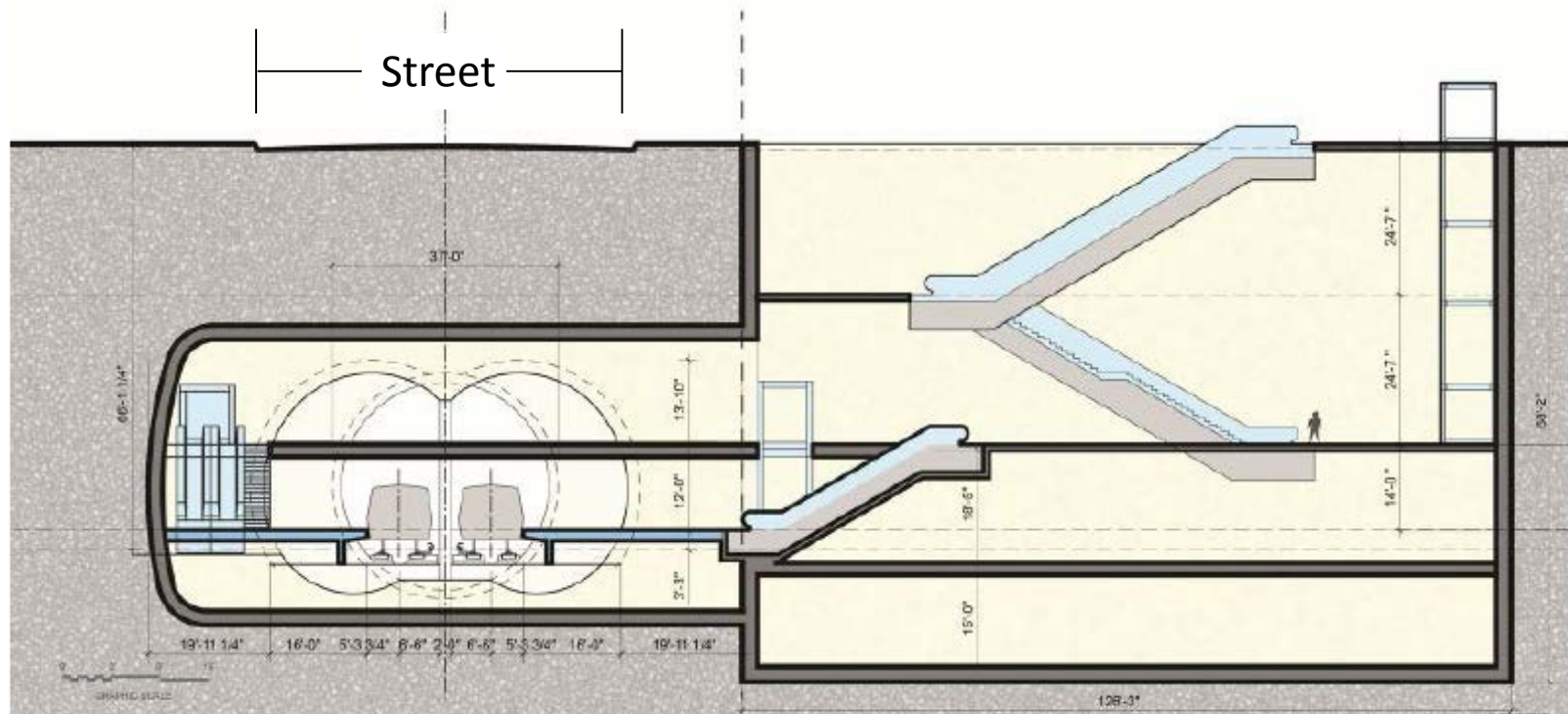
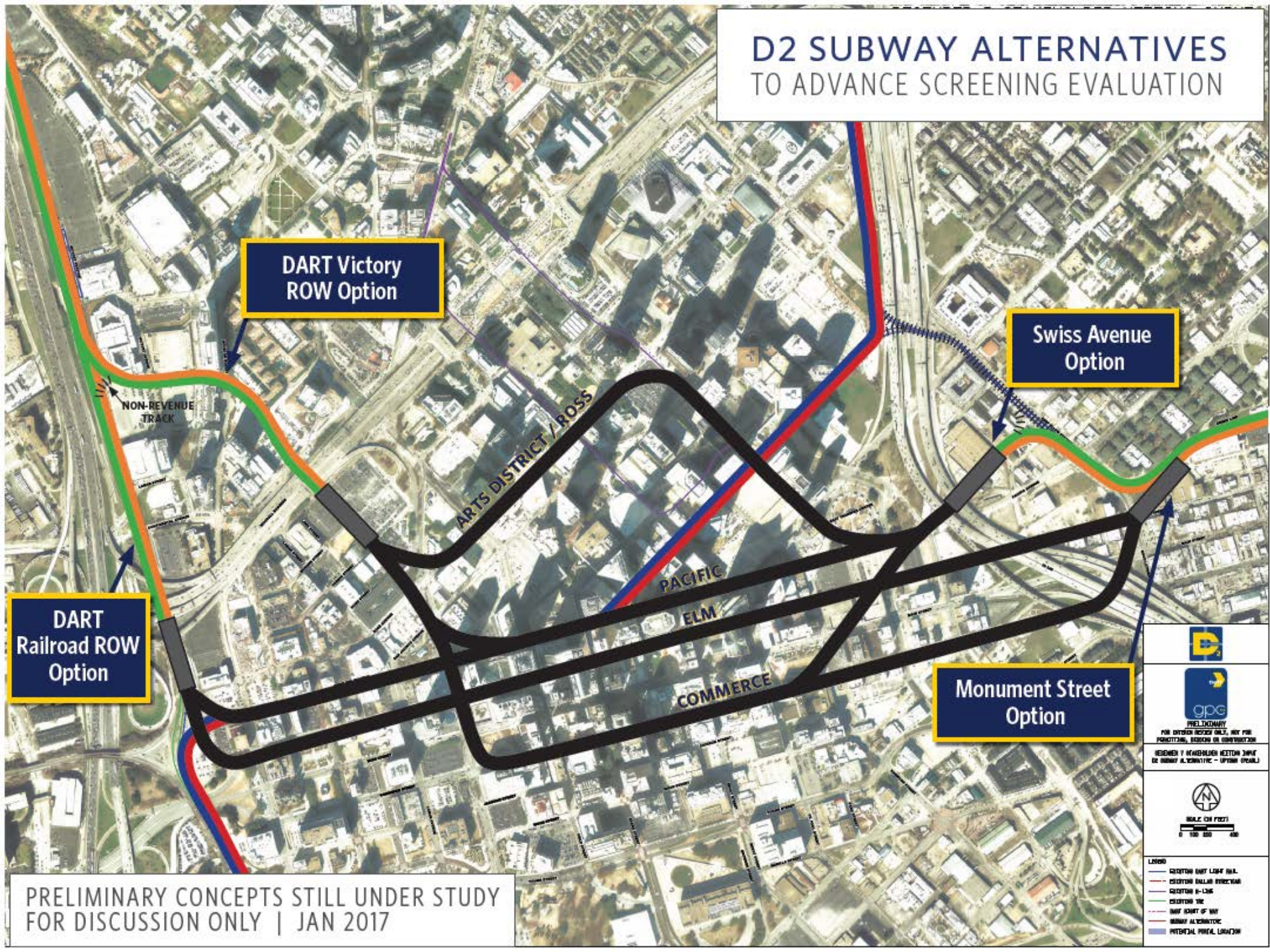




Figure 2-39. Proposed Entrance for the Wilshire/La Cienega Station



D2 SUBWAY ALTERNATIVES TO ADVANCE SCREENING EVALUATION



PRELIMINARY CONCEPTS STILL UNDER STUDY
FOR DISCUSSION ONLY | JAN 2017



PRELIMINARY FOR DESIGN REVIEW ONLY, NOT FOR PERMITTING, RECORD OR CONSTRUCTION. DESIGNER'S RESPONSIBILITY EXTENDS ONLY TO WHAT IS SHOWN ON THIS PLAN - UPON SCALE.

SCALE ON FOOT

0 100 200

Range of Subway Ideas

Corridors

- Arts District
- Pacific
- Elm
- Commerce

West/Victory Connection

- Existing rail corridor
- DART-owned Victory ROW

East/Deep Ellum Connection

- Swiss



REASONABLE ALTERNATIVES ASSESSMENT

ADVANCE TO SCREENING EVALUATION

	ALTERNATIVE	TECHNICAL COMMITTEE RECOMMENDATION	STAKEHOLDER COMMITTEE RECOMMENDATION
PACIFIC	RR ROW	YES	YES ✓
	VICTORY ROW	YES	YES ✓
ELM	RR ROW	YES <i>*Needs Refinement</i>	YES <i>*Refine alignment</i> ✓
	VICTORY ROW	YES	YES <i>*Refine alignment</i> ✓
COMMERCE	RR ROW	NO	NO
	VICTORY ROW	YES	YES ✓
	GOOD LATIMER	NO <i>*Unless There is Feasible Below-Grade</i>	NO <i>*Unless there is feasible below-grade</i>
	SWISS	YES	YES ✓
WOOD	GOOD LATIMER	NO	NO
	SWISS	NO	NO
YOUNG	GOOD LATIMER	NO <i>*Unless There is Feasible Below-Grade</i>	NO
	SWISS	YES	NO
CANTON	GOOD LATIMER	NO	NO
UPTOWN	PEARL	NO	NO
	ROUTH	NO	NO
	ARTS DISTRICT	YES <i>*Work With City on East Junction Options</i>	YES <i>*Work with City on East Junction Options</i> ✓

Summary of Technical Committee and Stakeholder Committee Findings

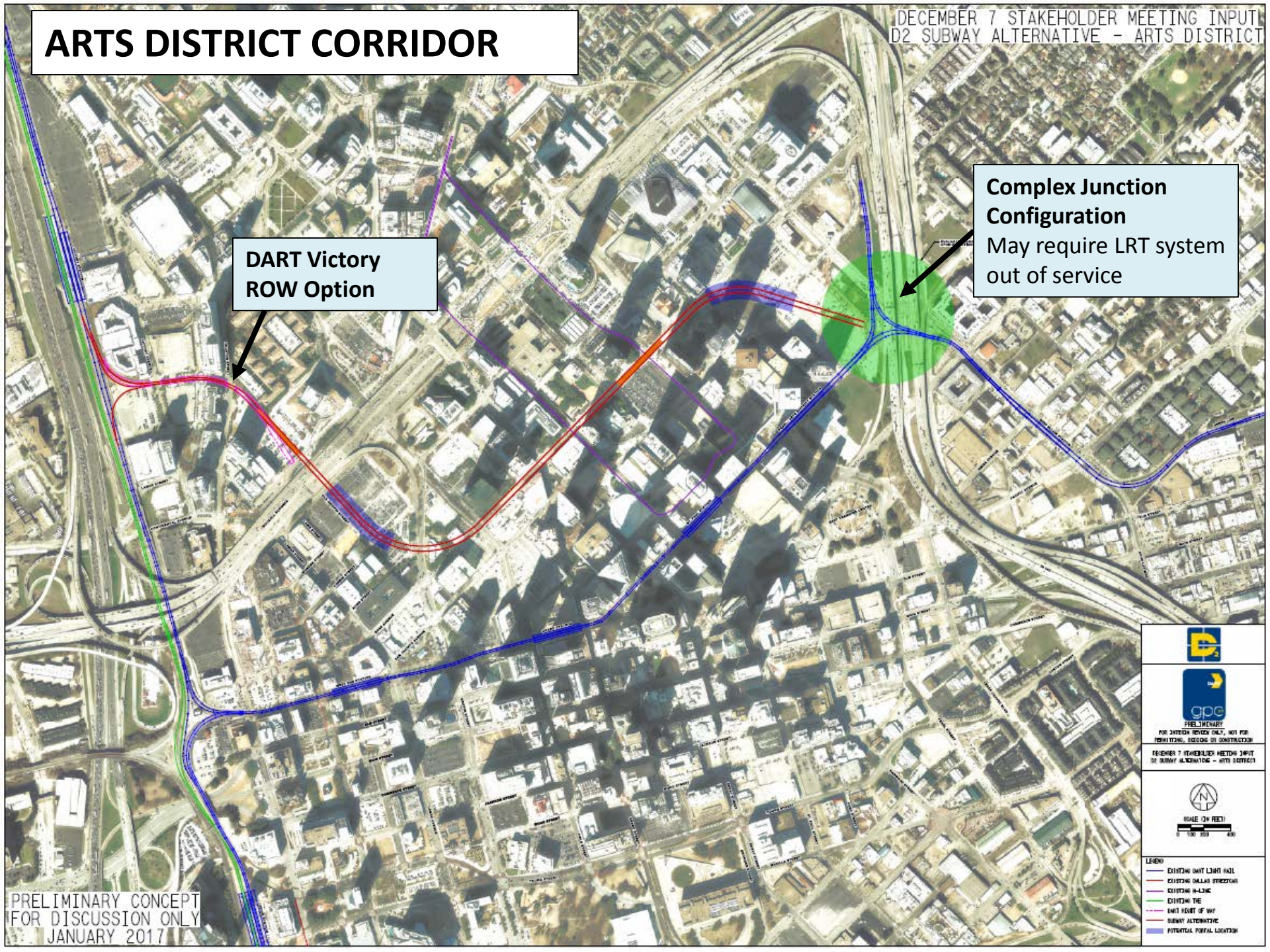


ARTS DISTRICT CORRIDOR

DECEMBER 7 STAKEHOLDER MEETING INPUT
D2 SUBWAY ALTERNATIVE - ARTS DISTRICT

DART Victory
ROW Option

Complex Junction
Configuration
May require LRT system
out of service



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DECEMBER 7 STAKEHOLDER MEETING INPUT
D2 SUBWAY ALTERNATIVE - ARTS DISTRICT

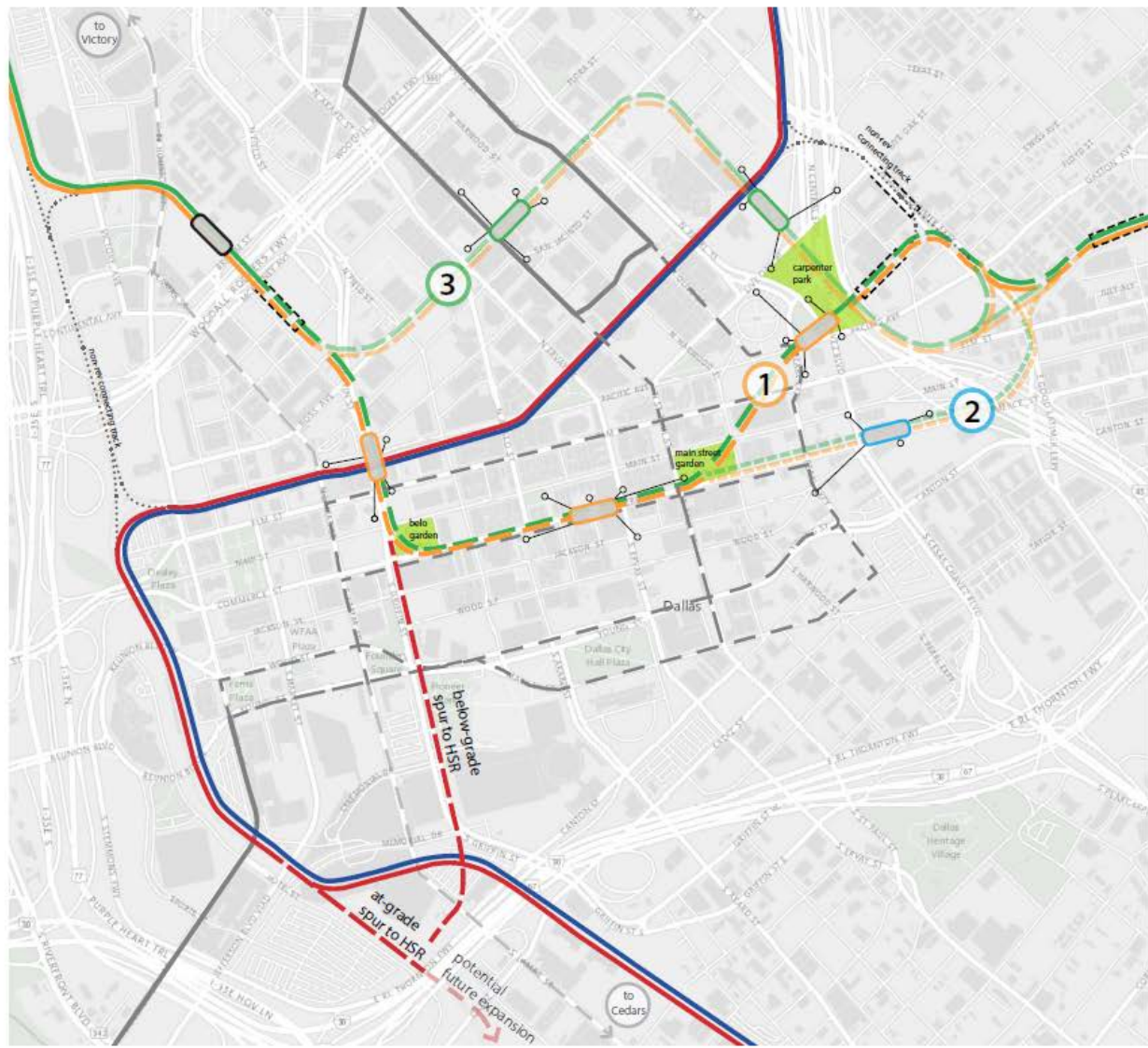
SCALE (IN FEET)
1" = 500'

LEGEND

- EXISTING DART LIGHT RAIL
- EXISTING DALLAS STREETCAR
- EXISTING M-LINE
- EXISTING THE
- DART RIGHT OF WAY
- SUBWAY ALTERNATIVE
- POTENTIAL SIGNAL LOCATION

PRELIMINARY CONCEPT
FOR DISCUSSION ONLY
JANUARY 2017

CITY OF DALLAS D2 ALIGNMENT COMMENTS - PROPOSED MODIFICATIONS FOR CONSIDERATION



LEGEND

- Red Line
- Blue Line
- Green Line
- Orange Line

— **1** Commerce St. A: Swiss Ave. Option
 Potential Station/ Pedestrian Portal Location
 Approx. 9,900' long (7,200' underground)

— **2** Commerce St. B: Below-Grade Junction Option
 Potential Station/ Pedestrian Portal Location
 Approx. 11,600' long (9,300' underground)

— **3** Ross Avenue
 Potential Station/ Pedestrian Portal Location
 Approx. 11,200' long (8,200' underground)

- - - Proposed Spur to High Speed Rail
- ⋯ Non-Revenue Track
- Existing Streetcar/ Trolley
- - - Potential Streetcar Route
- Train Portal
- Potential At-Grade Station for All Alignments



PACIFIC CORRIDOR

**DART Victory
ROW Option**

**Swiss Option
Portal west of IH 345**

**Green Line track reconstruction
(embedded track) and Deep Ellum Station
removal/relocation**

**Rail
Corridor
Option**

**Swiss Option
Portal east of IH 345**

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FOR DISCUSSION ONLY. NOT FOR
DECISIONS. RECORD OR CONSTRUCTION.

ISSUES: STAKEHOLDER MEETING INPUT
D2 SUBWAY ALTERNATIVE - PACIFIC

SCALE (IN FEET)
0 200 400

LEGEND

- EXISTING DART LIGHT RAIL
- EXISTING DALLAS FREETRA
- EXISTING I-10
- EXISTING TIE
- DART RIGHT OF WAY
- SUBWAY ALTERNATIVE
- POTENTIAL PORTAL LOCATION

ELM CORRIDOR

DART Victory
ROW Option

Green Line track reconstruction
(embedded track) and Deep Ellum Station
removal/relocation

Rail
Corridor
Option

Swiss Option
Portal east of IH 345

PRELIMINARY CONCEPT
FOR DISCUSSION ONLY
DECEMBER 2016



FOR INTERIM REVIEW ONLY. NOT FOR PERMITTING, BIDDING OR CONSTRUCTION.

DECEMBER 7 STAKEHOLDER MEETING INPUT
D2 SUBWAY ALTERNATIVE - ELM



SCALE (IN FEET)
0 100 200 400

LEGEND

- EXISTING DART LIGHT RAIL
- EXISTING DALLAS STREETCAR
- EXISTING M-LINE
- EXISTING TFC
- DART RIGHT OF WAY
- SUBWAY ALTERNATIVE
- POTENTIAL PORTAL LOCATION

COMMERCE CORRIDOR

DART Victory ROW Option

Green Line track reconstruction (embedded track) and Deep Ellum Station removal/relocation

Swiss Option
Portal west of IH 345

Rail Corridor Option

Good Latimer Option
Portal west of IH 345

PRELIMINARY CONCEPT FOR DISCUSSION ONLY
DECEMBER 2016



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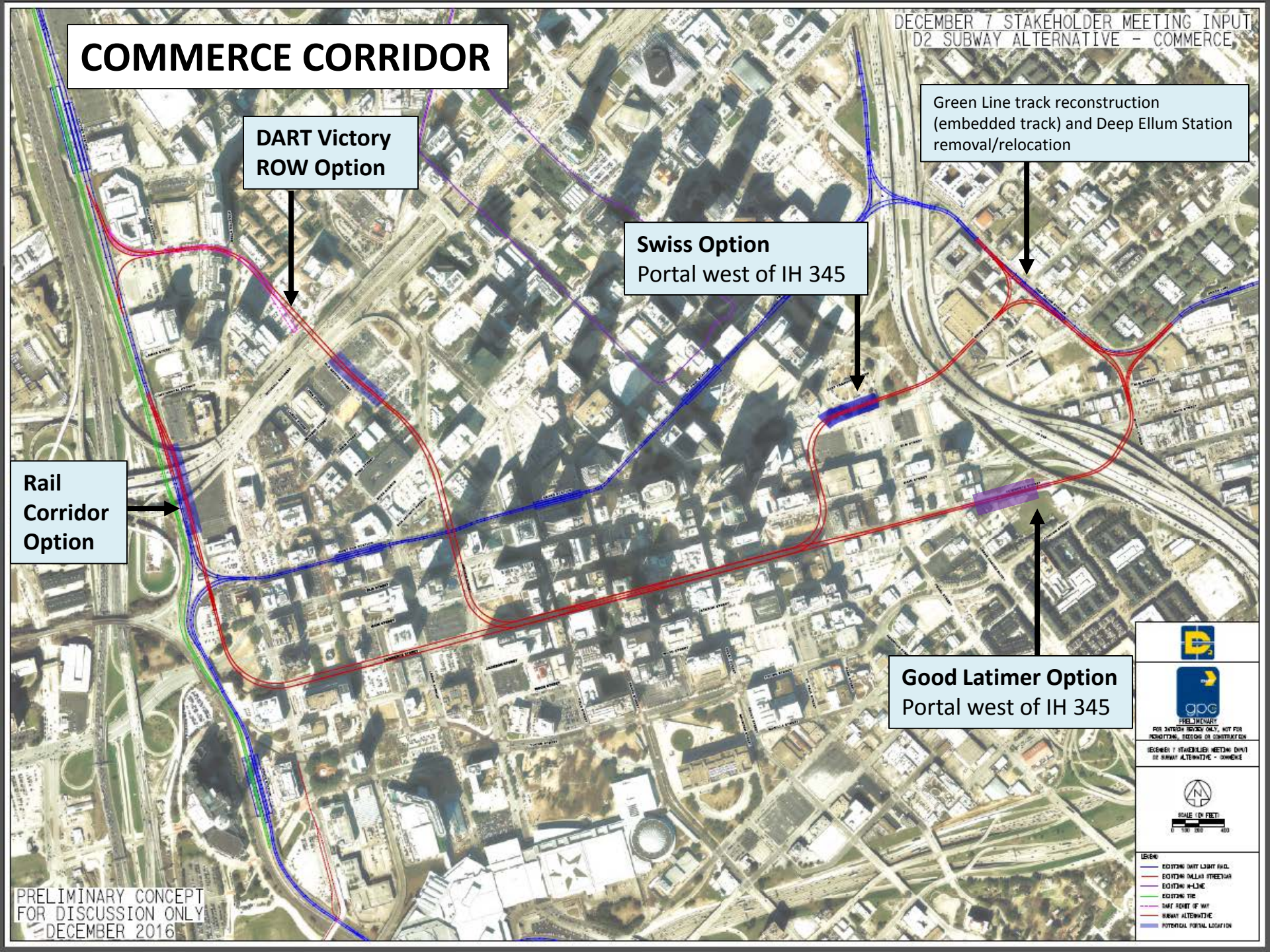
ISSUED AT STAKEHOLDER MEETING INPUT
BY SUBWAY ALTERNATIVE - COMMERCE



SCALE (IN FEET)
0 100 200 400

LEGEND

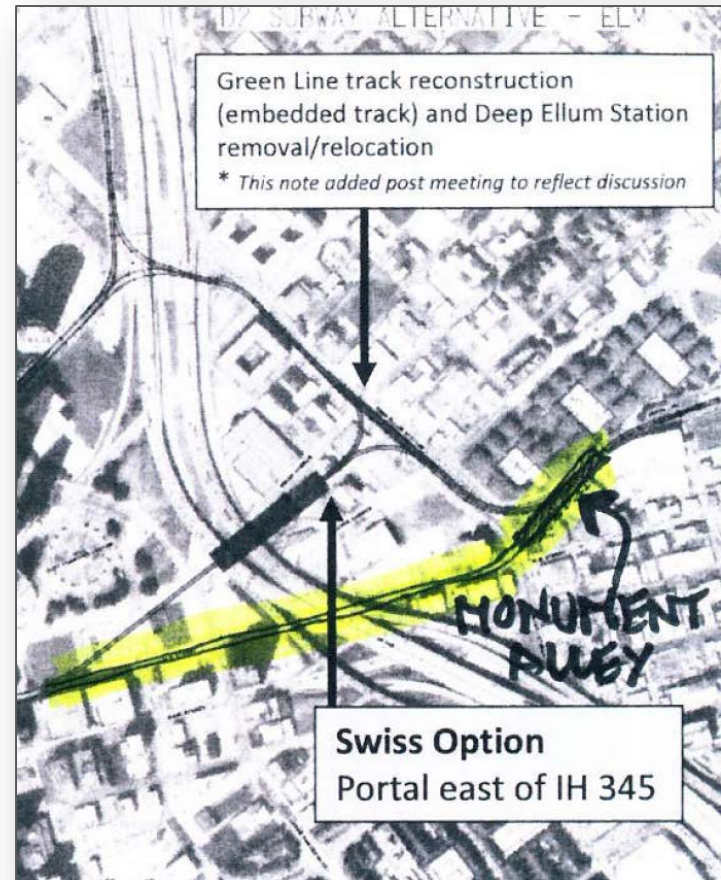
- EXISTING DART LIGHT RAIL
- EXISTING DALLAS STREETCAR
- EXISTING M-LINE
- EXISTING TRM
- DART RIGHT OF WAY
- SUBWAY ALTERNATIVE
- POTENTIAL PORTAL LOCATION



Proposed Elm Refinements

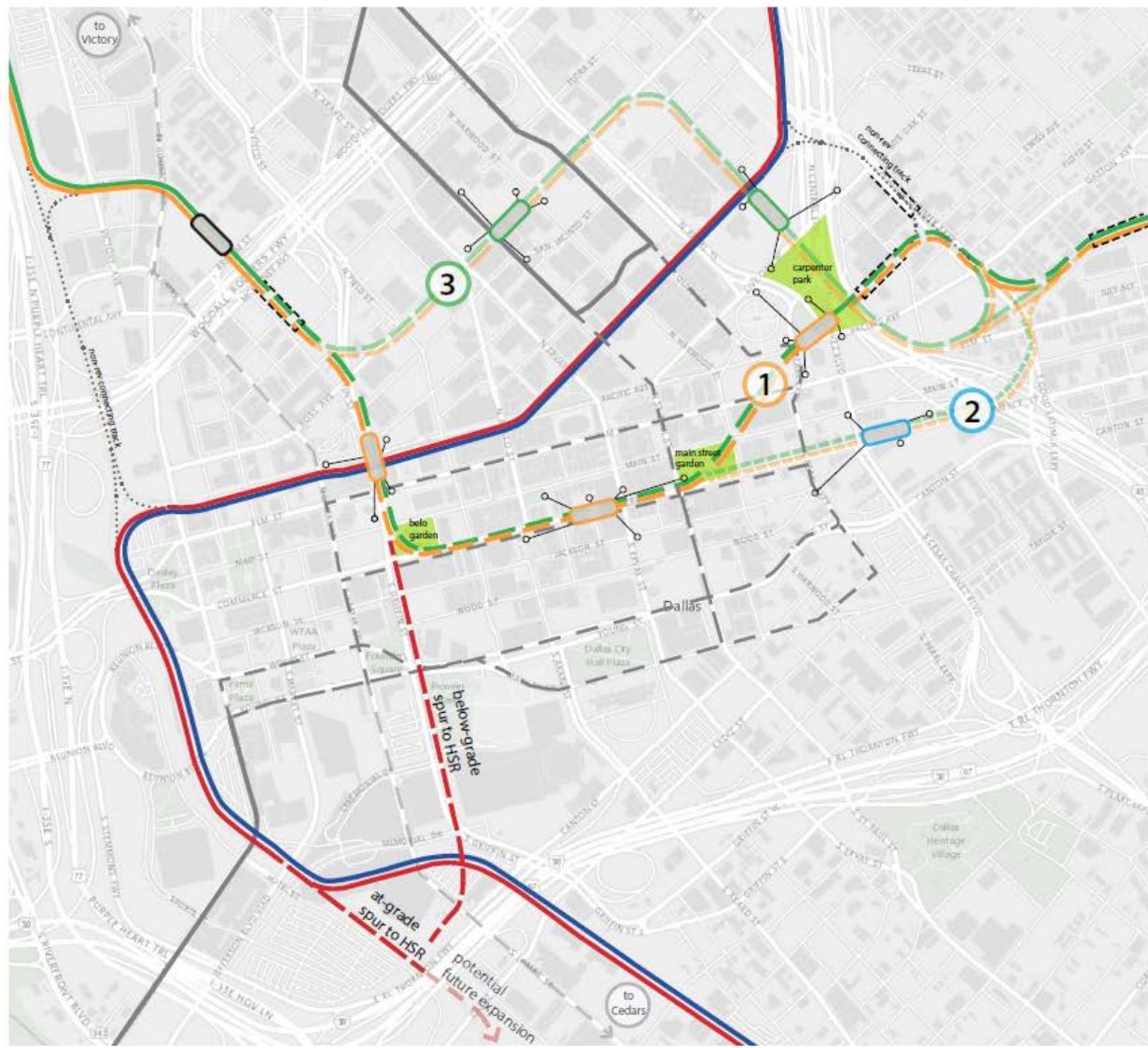


West adjustment to Elm RR Corridor option will be assessed



Monument Street option will be assessed

CITY OF DALLAS D2 ALIGNMENT COMMENTS - PROPOSED MODIFICATIONS FOR CONSIDERATION



LEGEND

- Red Line
- Blue Line
- Green Line
- Orange Line

	1	Commerce St. A: Swiss Ave. Option Potential Station/ Pedestrian Portal Location Approx. 9,900' long (7,200' underground)
	2	Commerce St. B: Below-Grade Junction Option Potential Station/ Pedestrian Portal Location Approx. 11,600' long (9,300' underground)
	3	Ross Avenue Potential Station/ Pedestrian Portal Location Approx. 11,200' long (8,200' underground)

- - - Proposed Spur to High Speed Rail
- ⋯ Non-Revenue Track
- Existing Streetcar/ Trolley
- - - Potential Streetcar Route
- Train Portal
- Potential At-Grade Station for All Alignments



Objectives to Identify Reasonable Set of Subway Alternatives

Objectives	Source
Within \$1.3 Billion Budget (YOE)	DART
Constructability/Favorable geology conditions	DART
Subway between Woodall Rodgers and IH 345	City Council
Ability to shift Green/Orange Line operations to D2	FTA (Core Capacity)
Ease of transfers (Proximity to Existing Bus/Rail)	City Council/DART
Access to Jobs (Employment density)	City Council/DART
Interoperability between both downtown LRT lines	DART
Minimize curves (travel time, O&M, construction)	DART

Key Committee Findings

- When considering the RR corridor versus the DART Victory right-of-way:
 - Victory provides benefit of station near Perot that can serve that growing area of downtown
 - RR corridor presents cost/risk issues due to poor geology
 - If using RR corridor:
 - Pacific is the only option that avoids Sixth Floor Depository/Dealey Plaza area
 - Elm presents risk unless alignment can be refined
 - Commerce presents the most risk

Key Committee Findings

- When considering Swiss versus Good Latimer:
 - Swiss is preferred due to Deep Ellum concerns with Good Latimer route:
 - A portal east of IH 345 is preferable
 - Avoid impacts to Carpenter Park
 - Good Latimer should only advance if a feasible below-ground option can be developed
 - Monument Street portal option will be assessed

Next Steps

- February
 - Technical Committee Meeting
 - Stakeholder Committee Meeting
 - Screening Evaluation/Short List Recommendation
- March-May
 - Public Meetings
 - Define and Evaluate Short List Options
 - Initiate Streetcar Alignment Discussion

Public Feedback

- Do you agree with the Technical and Stakeholder Input?
- What are your thoughts on issues and opportunities for the alignments?
- Do you have ideas on station locations?
- What are your ideas on a downtown streetcar alignment?



How to Stay Involved

- Attend project meetings
- View materials and progress on www.DART.org/D2
- Comments? Email D2@DART.org
- Provide comments on key issues that DART should address in the process



214.979.1111
www.DART.org

Appendix

Subway Construction Methods

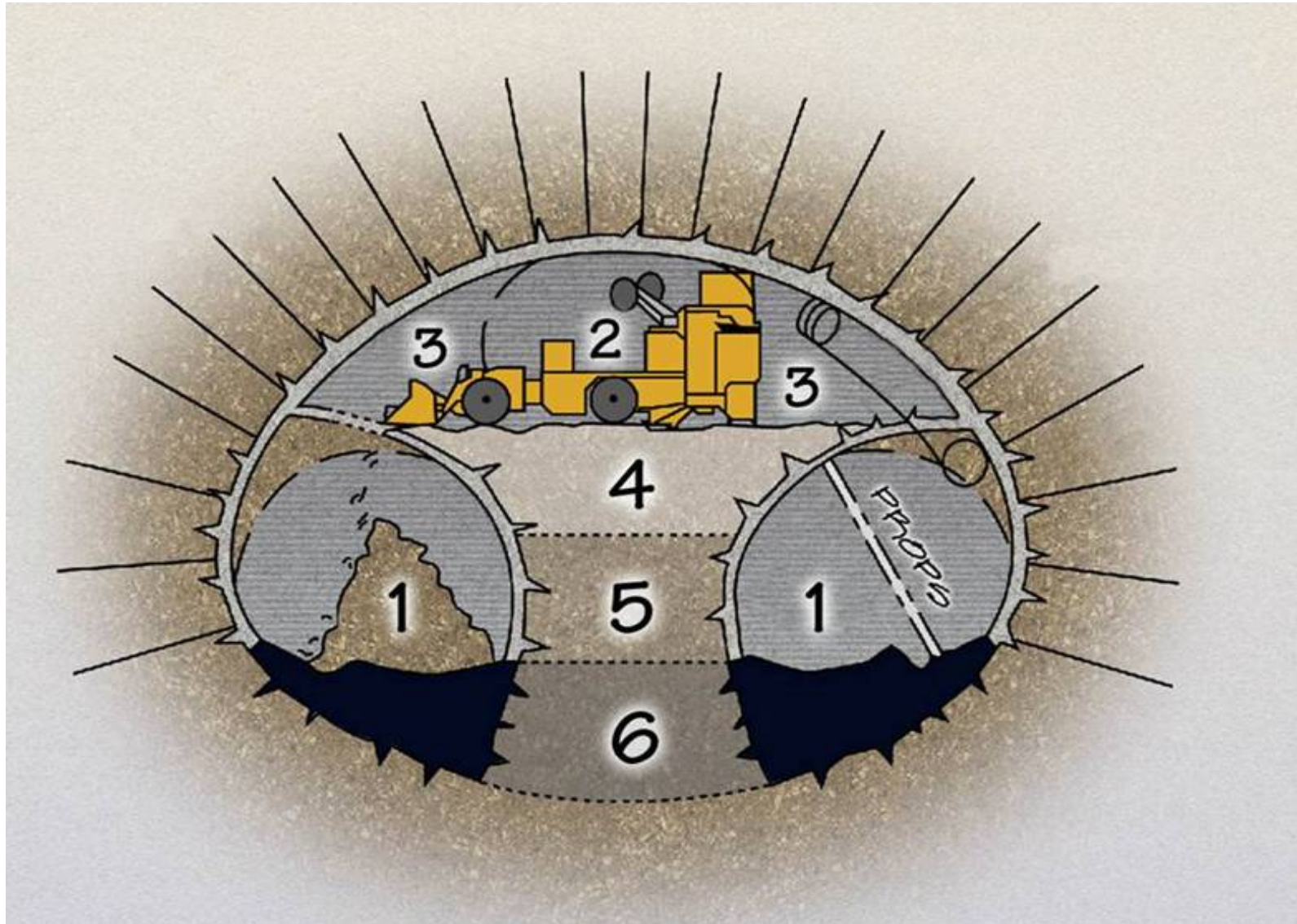
Tunnel Boring Machine (TBM)



“Tunnelling underground - Melbourne Metro Rail Project” courtesy of Melbourne Metro Rail Authority

Subway Construction Methods

Sequential Excavation Method (SEM)



Subway Construction Methods

Sequential Excavation Method (SEM)



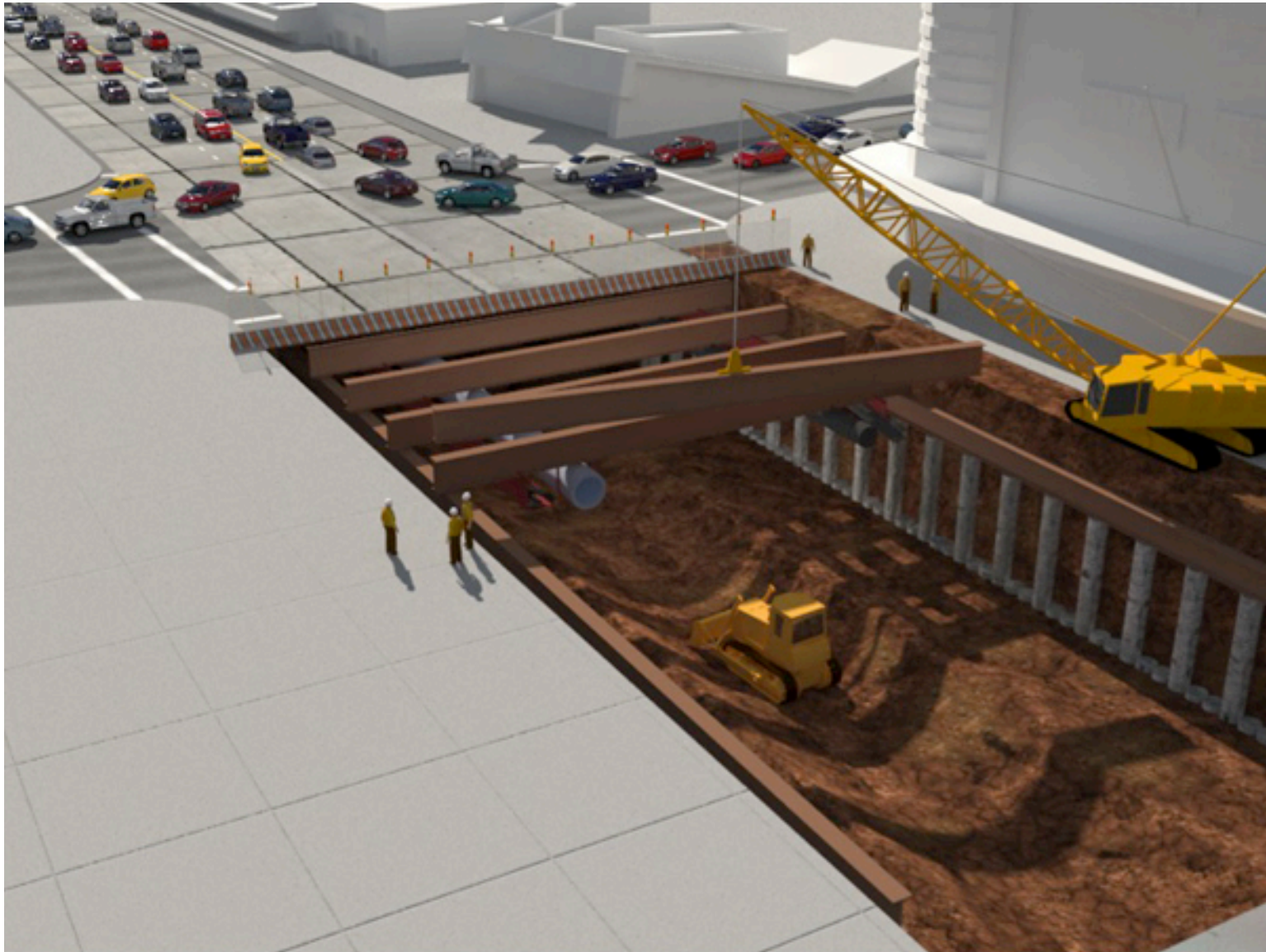
Cut and Cover Construction Method

- Can be used for portions of subway
- Common construction method for stations, ventilation shafts, emergency access
- Requires temporary and/or permanent use of surface right-of-way

1. Utility relocation and initial street excavation



2. Install concrete decking/ temporary street surface



3. Station or subway construction and street restoration



Tunnel Earth Removal



Muck house

Key Committee Findings

- Canton is too far south to meet Core Capacity objectives and serve existing ridership
- Uptown options would have significant real estate impacts and would not meet Core Capacity objectives
- Wood Street is too narrow and presents constructability issues
- Pacific, Elm, Commerce best meet project objectives
- Young meets objectives, but not as well as those to the north

UPTOWN (PEARL) CORRIDOR

DECEMBER 7 STAKEHOLDER MEETING INPUT
D2 SUBWAY ALTERNATIVE - UPTOWN

Portal north of
Victory Station

Swiss Option



PRELIMINARY
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FINALIZING, SECTION ON CONSTRUCTION

DECEMBER 7 STAKEHOLDER MEETING INPUT
D2 SUBWAY ALTERNATIVE - UPTOWN



SCALE (IN FEET)
0 100 200 400

- LEGEND
- EXISTING DART LIGHT RAIL
 - EXISTING DALLAS FREETOWN
 - EXISTING I-410
 - EXISTING TIR
 - DART ROUTE OF 2017
 - D2 SUBWAY ALTERNATIVE
 - POTENTIAL PORTAL LOCATION

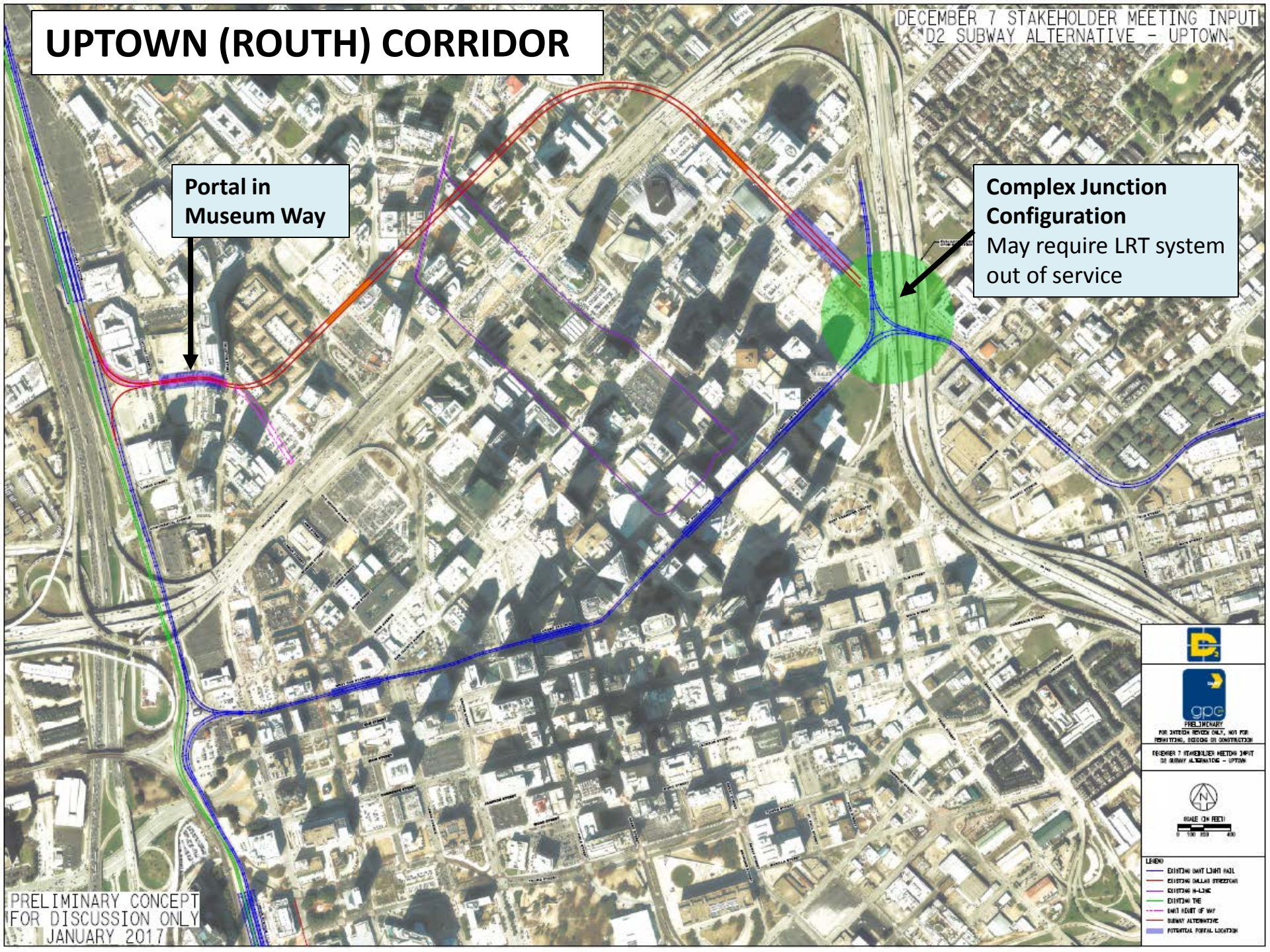
PRELIMINARY CONCEPT
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JANUARY 2017

UPTOWN (ROUTH) CORRIDOR

DECEMBER 7 STAKEHOLDER MEETING INPUT
D2 SUBWAY ALTERNATIVE - UPTOWN

Portal in
Museum Way

Complex Junction
Configuration
May require LRT system
out of service



PRELIMINARY CONCEPT
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JANUARY 2017

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DECEMBER 7 STAKEHOLDER MEETING INPUT
D2 SUBWAY ALTERNATIVE - UPTOWN

SCALE (IN FEET)
0 100 200 400

LEGEND

- EXISTING DART LRT RAIL
- EXISTING DALLAS STREETCAR
- EXISTING M-LINE
- EXISTING THE
- DART LIGHT RAIL
- SUBWAY ALTERNATIVE
- POTENTIAL PORTAL LOCATION

WOOD CORRIDOR

**DART Victory
ROW Option**

**Swiss Option
Portal west of IH 345**

Green Line track reconstruction
(embedded track) and Deep Ellum Station
removal/relocation

**Good Latimer Option
Portal west of IH 345**

PRELIMINARY CONCEPT
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DECEMBER 2016



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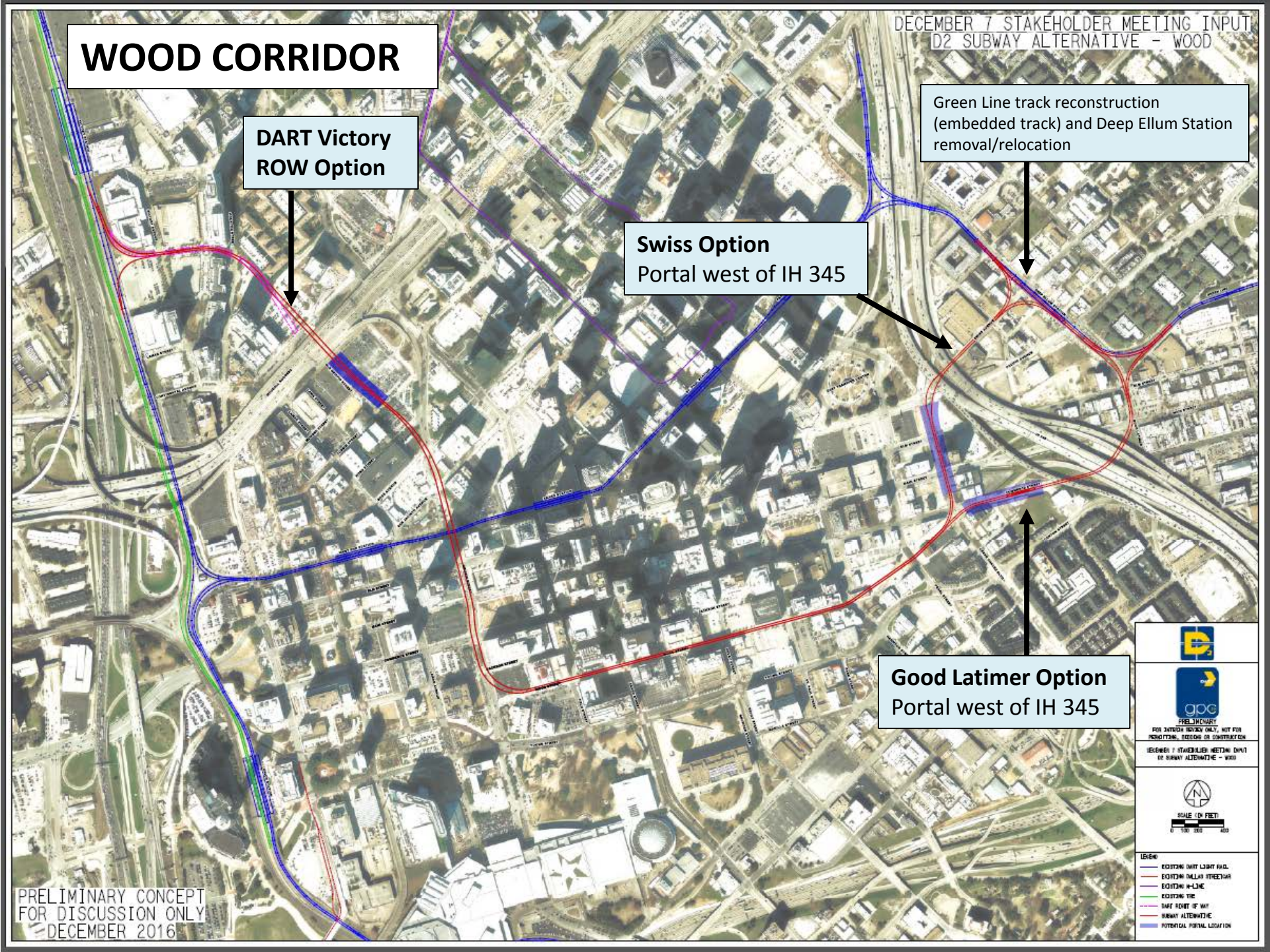
DESIGNED BY STANTEC CONSULTANTS DIVISION
OF RAILWAY ALTERNATIVE - WOOD



SCALE (IN FEET)
0 100 200 400

LEGEND

- EXISTING DART LIGHT RAIL
- EXISTING DALLAS STREETCAR
- EXISTING IN-LINE
- EXISTING TIE
- RAIL RIGHT OF WAY
- RAILWAY ALTERNATIVE
- POTENTIAL PORTAL LOCATION



YOUNG CORRIDOR

DART Victory ROW Option

Swiss Option
Portal west of IH 345

Green Line track reconstruction
(embedded track) and Deep Ellum Station
removal/relocation

Good Latimer Option
Portal west of IH 345

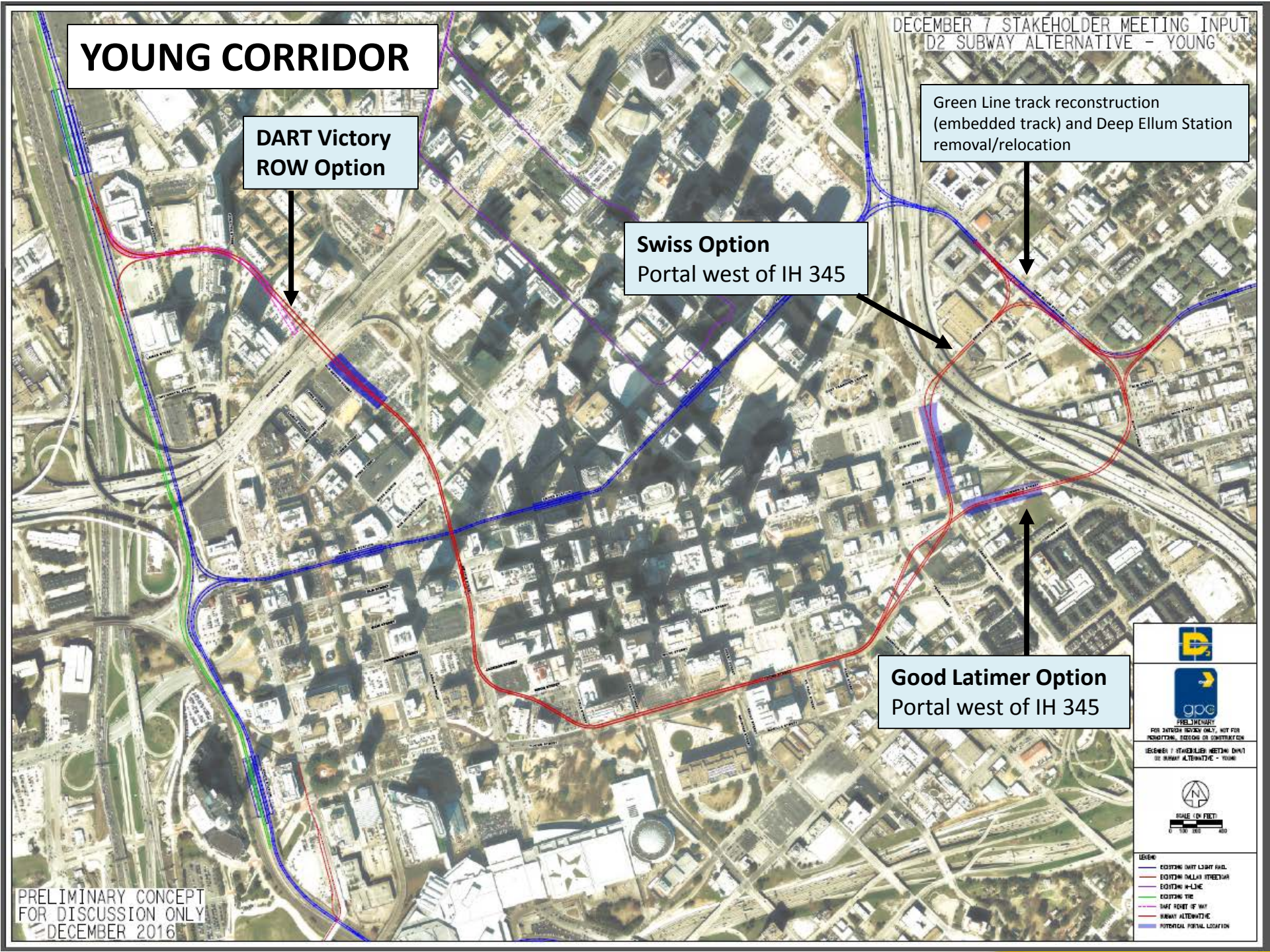
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DECEMBER 2016

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PROPOSING, BIDDING OR CONSTRUCTION

DECEMBER 7 STAKEHOLDER MEETING INPUT
D2 SUBWAY ALTERNATIVE - YOUNG

SCALE (IN FEET)
0 100 200 400

- LEGEND
- EXISTING DART LIGHT RAIL
 - EXISTING DALLAS STREETCAR
 - EXISTING M-LINE
 - EXISTING TIE
 - EXISTING RTW
 - DART RIGHT OF WAY
 - HEAVY ALTERNATIVE
 - POTENTIAL PORTAL LOCATION



CANTON CORRIDOR

DART Victory
ROW Option

Good Latimer Option
Portal west of IH 345

PRELIMINARY CONCEPT
FOR DISCUSSION ONLY
- DECEMBER 2016

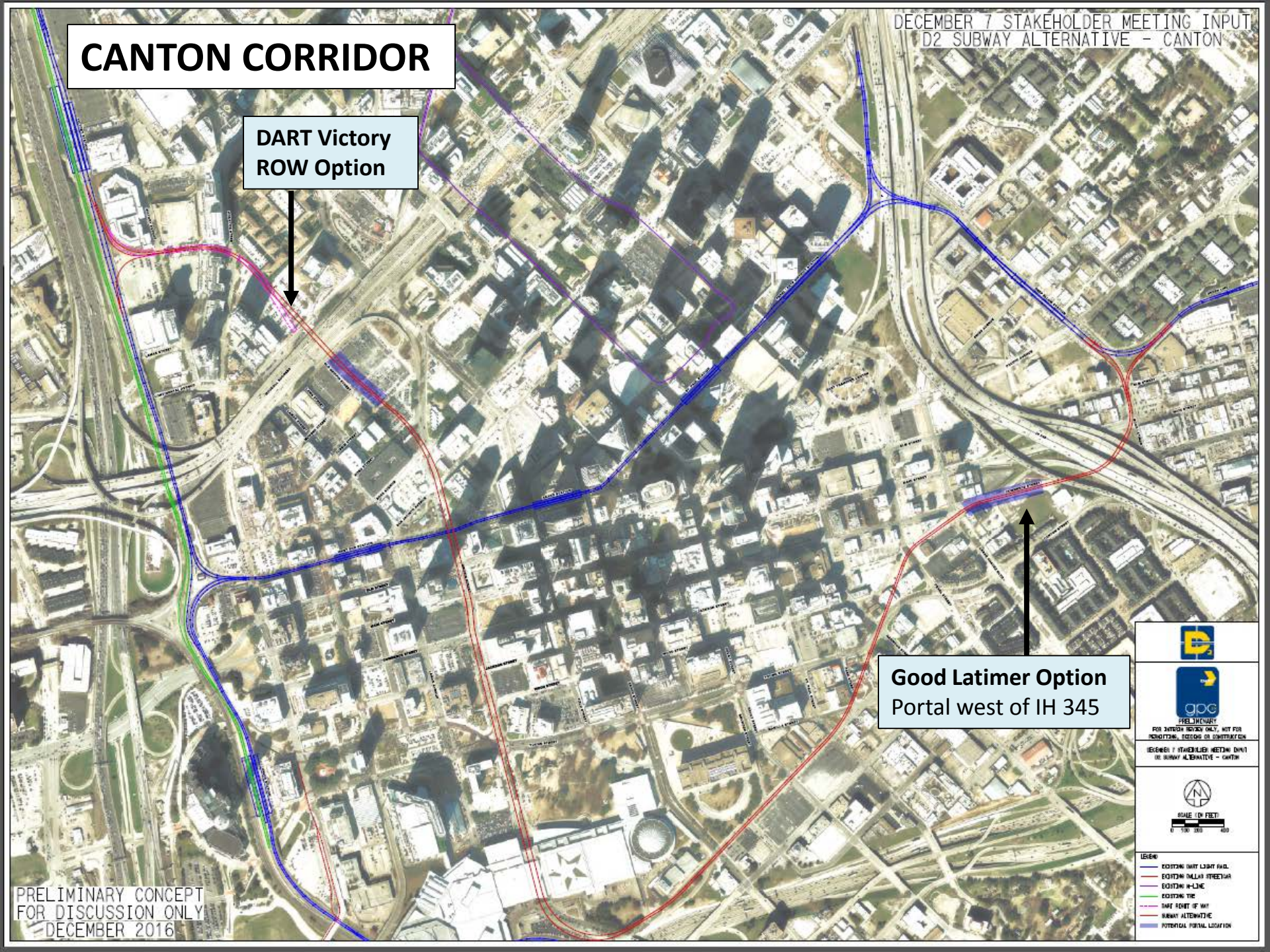


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CONSTRUCTION, EROSION OR ENVIRONMENTAL
DESIGN / UTILITIES DESIGN DRAWING
D2 SUBWAY ALTERNATIVE - CANTON

SCALE (IN FEET)
0 100 200 400

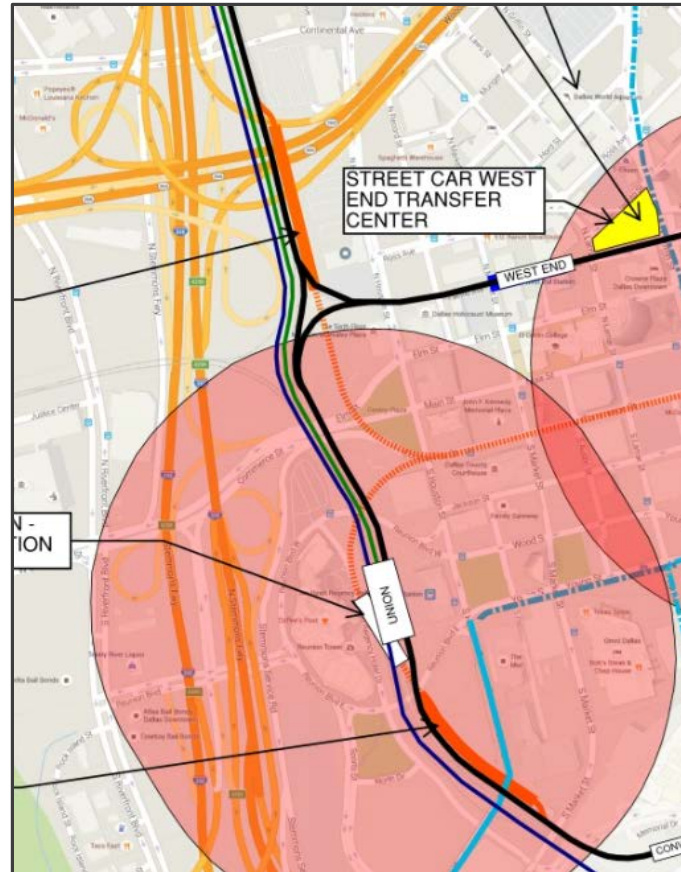
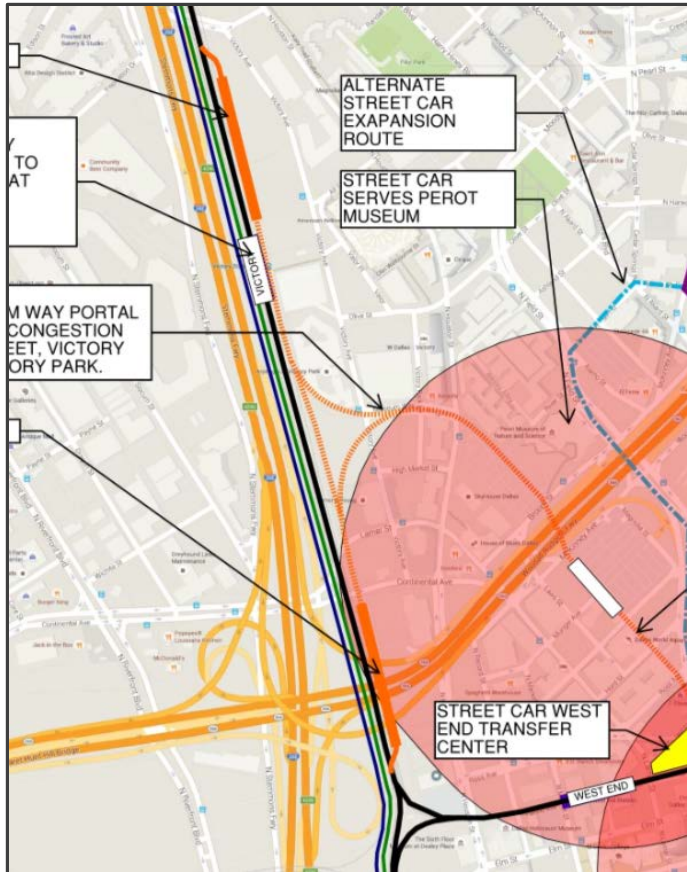
LEGEND

- EXISTING DART LIGHT RAIL
- EXISTING DALLAS AVENUE
- EXISTING W-LINE
- EXISTING TRM
- DART RIGHT OF WAY
- SUBWAY ALTERNATIVE
- POTENTIAL PORTAL LOCATION



Ideas Not Developed

West Junction in Subway



- Beyond Core Capacity scope
- Exceeds available budget
- Constructability issues
- Existing rail service impacted during construction

Ideas Not Developed

East Junction in Subway

- Beyond Core Capacity scope
- Exceeds available budget
- Constructability issues
- Existing rail service impacted during construction

