

Applicable Urban Design Priorities Project Should Achieve

[1] Underground station and facility design (p. 14) -

Underground station portal placement as well as station portal design should be evaluated by their architectural character, size and scale, and accessibility.

[2] Surface station and facility design (p. 20) -

The one planned at-grade station planned for Victory Park should be considered and evaluated by its layout and block design.

[3] At-grade route alignment design, including the street grid fabric and development potential (p. 28) -

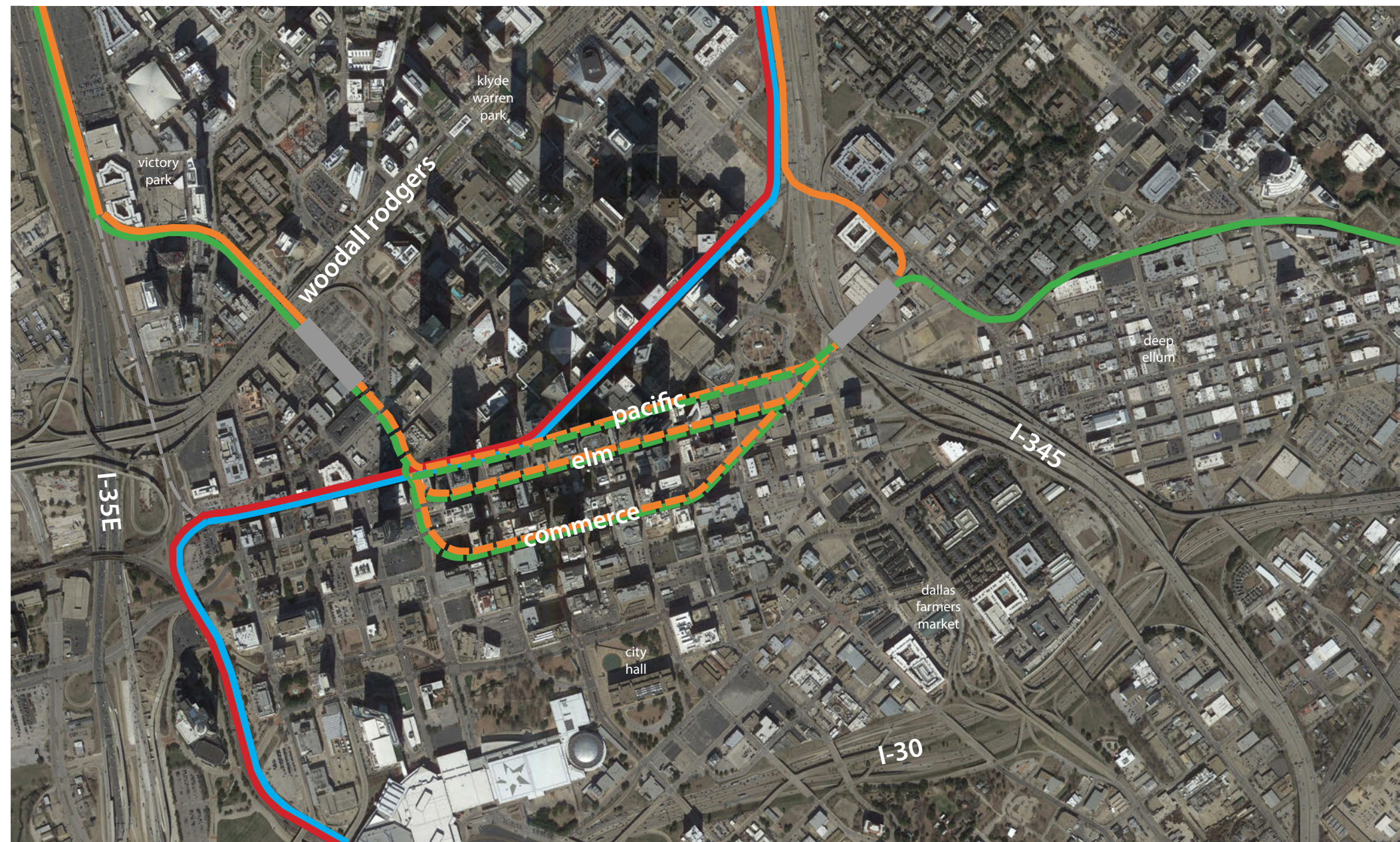
The general route alignment, both at-grade and below-grade, should be evaluated in how it affects the existing street grid as well as the potential for transit-oriented development it could produce around proposed station locations.

[4] Corridor design elements, including intersection design, train portals, and egress and ventilation design (p. 32) -

The general route alignment, both at-grade and below-grade, should also be evaluated in how it affects existing intersections. Additionally, the proposed train portal and emergency egress and ventilation design locations should be evaluated for their contextually and design.

[5] Additional design considerations, including development air rights potential (p. 40) -

The ability to develop over the proposed train portals as well as over potential station locations and/or track alignments should be considered to maximize economic development potential for the City.



Policy References

Forward Dallas!
Section 5 [urban design element]

Urban Transit Design Guidelines
Part II [Right-of-Way Design Guidelines]

Context Description

The second DART light rail alignment through downtown Dallas, known as D2, is a major infrastructure investment that will move the existing orange and green DART lines from the Transit Mall to a separate alignment, relieving congestion on the transit mall and improve safety and efficiency of the system. Currently, there are three proposed alignments being explored, one beneath Pacific Avenue, one beneath Elm Street, and one beneath Commerce Street.

Primary considerations for the project include at-grade and below-grade station and facility design, at-grade alignment design, transit-oriented development potential, train portal location and design, and development air rights potential.

Dallas D2 Light Rail Alignment

Neighborhood:
Victory Park, CBD, Deep Ellum

Program:
Transportation



Dallas CBD Second Light Rail Alignment (D2)

Urban Design Peer Review

May 26, 2017

Steve Salin, Vice President,

DART Capital Planning

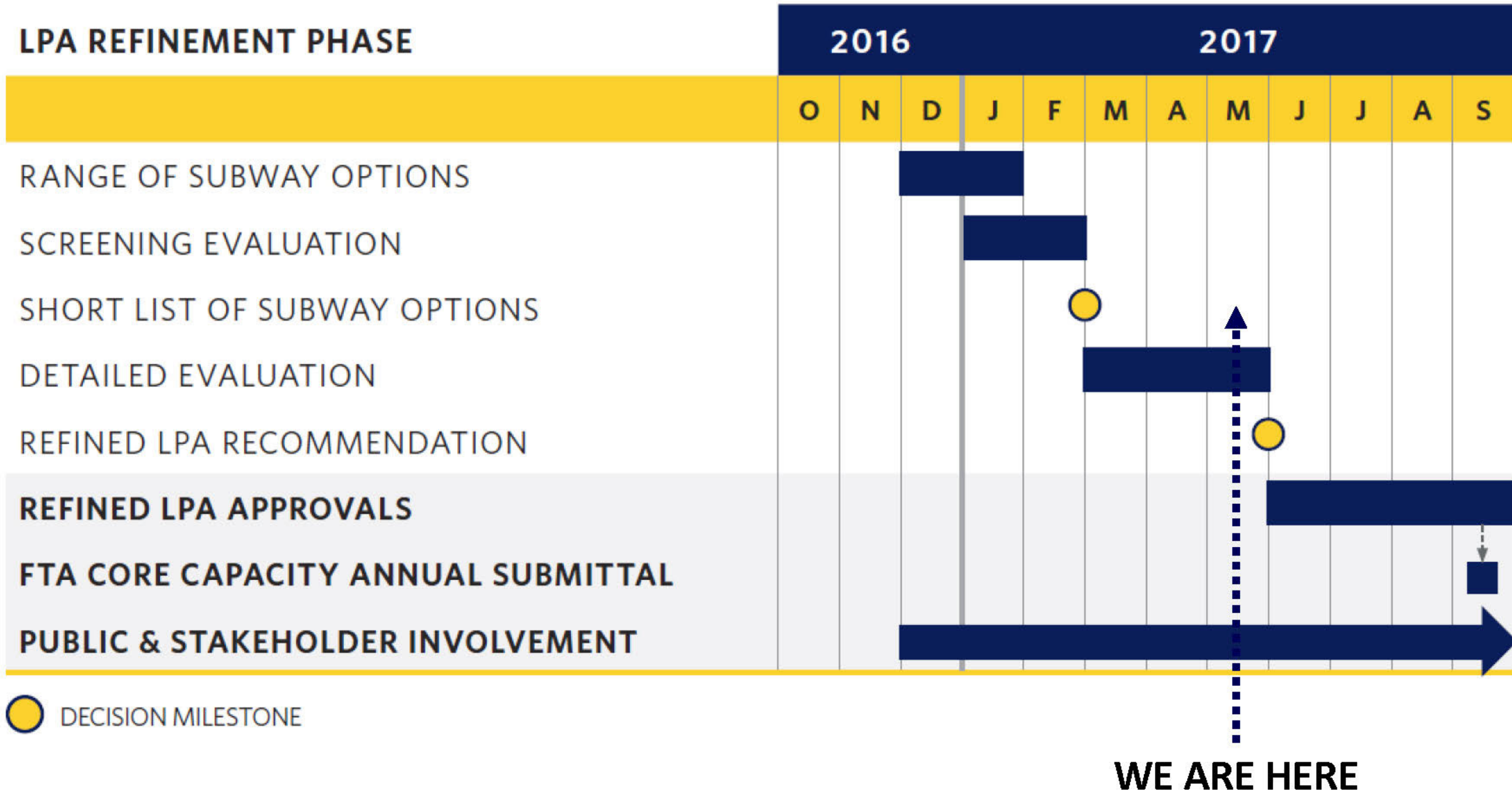
ssalin@dart.org



Outline

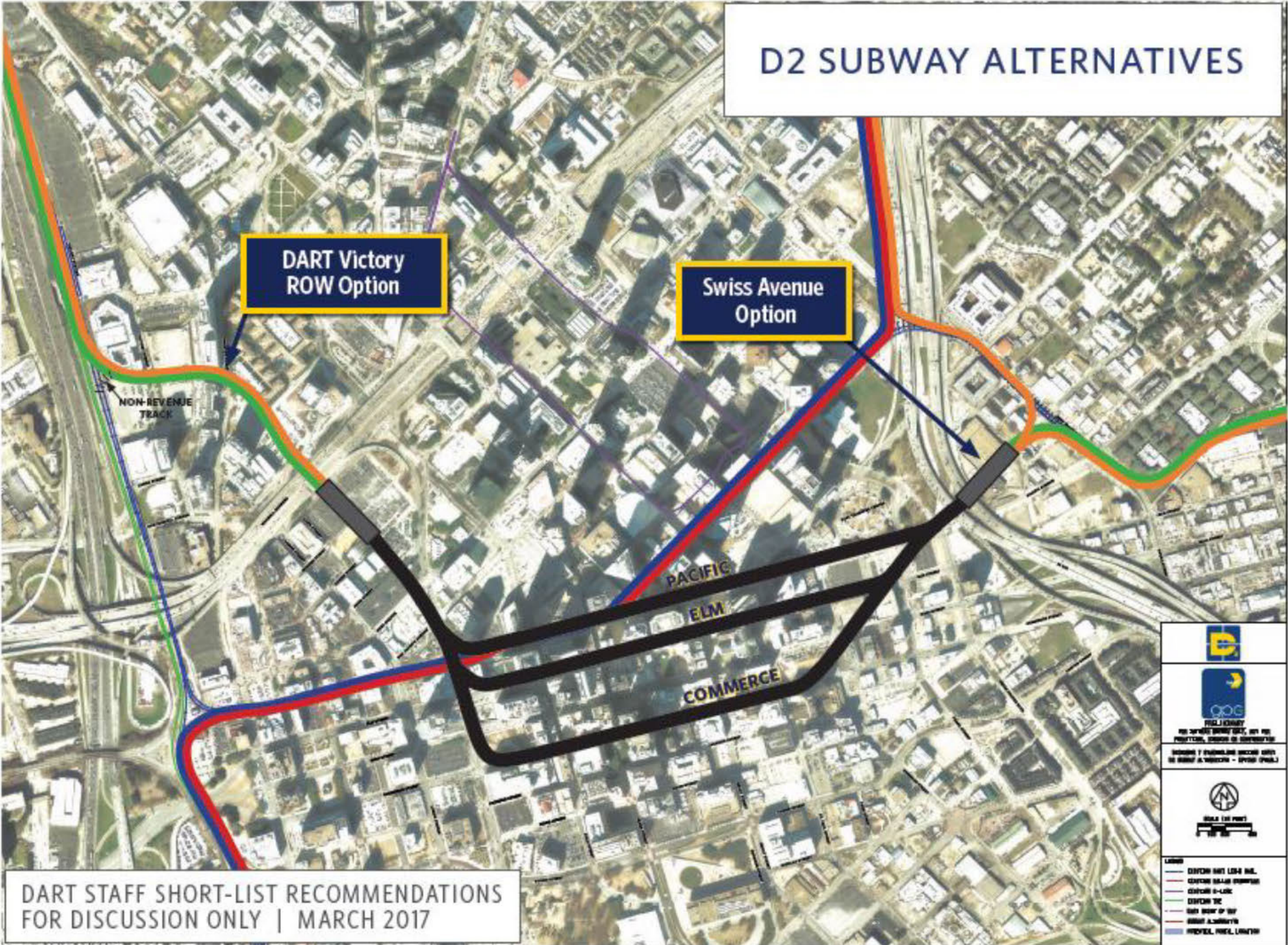
- Project Status
- Review of Short-List of Alternatives
 - Corridor Information Sheets
- Rail Portal Concepts
- Station and Pedestrian Portal Concepts
- Next Steps

Project Status



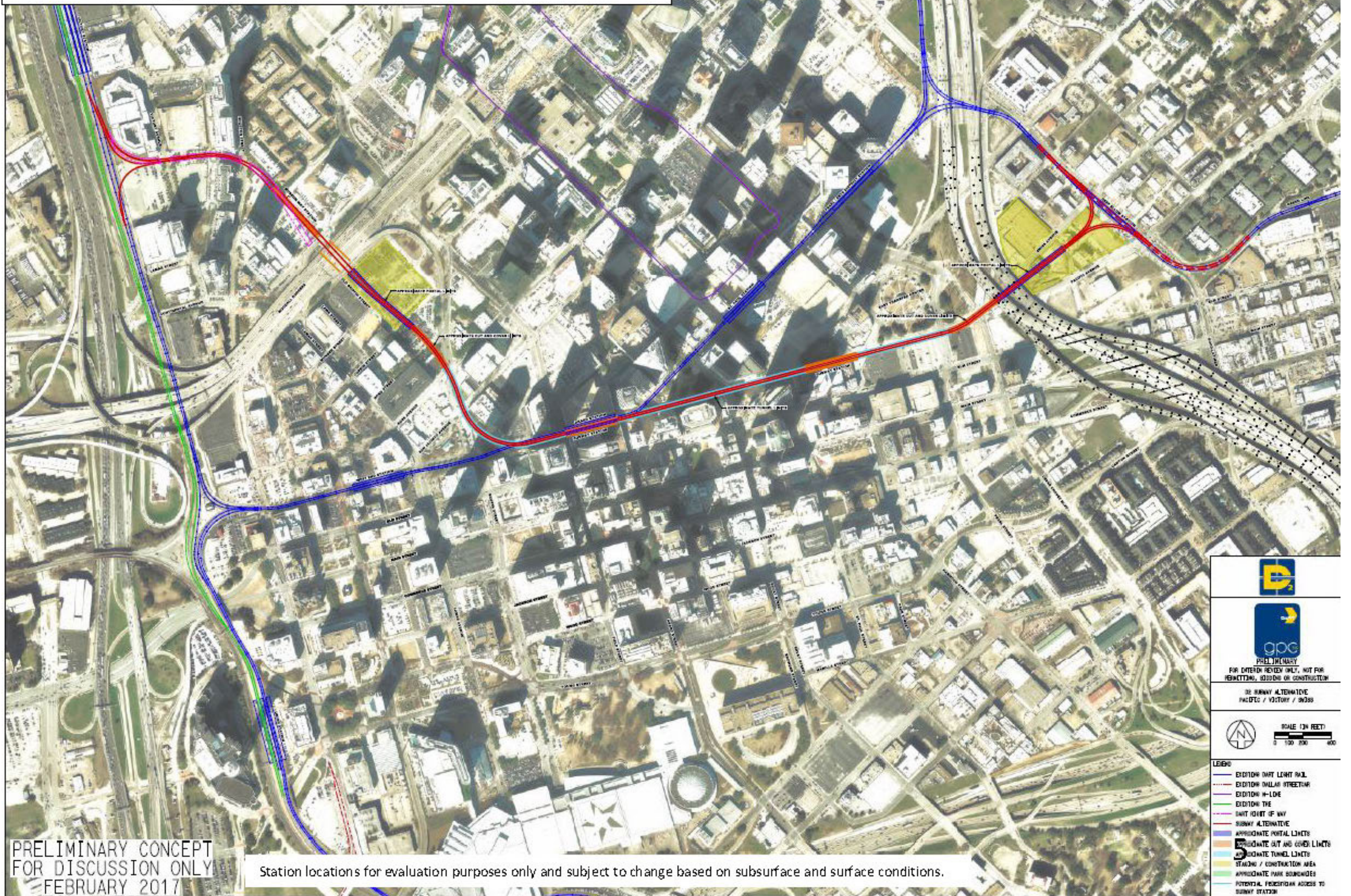
Short-List of Alternatives

DART Victory ROW



Pacific Alternative via Victory-Swiss

D2 SUBWAY ALTERNATIVE - PACIFIC / VICTORY / SWISS



PRELIMINARY CONCEPT
FOR DISCUSSION ONLY
FEBRUARY 2017

Station locations for evaluation purposes only and subject to change based on subsurface and surface conditions.

PRELIMINARY
FOR DESIGN REVIEW ONLY, NOT FOR
PERMITTING, BIDDING OR CONSTRUCTION

DART
GPC

DART LIGHT RAIL
DALLAS STREETCAR
H-LINE
THE
DART LIGHT RAIL
SUBWAY ALTERNATIVE
APPROXIMATE PORTAL LIMITS
APPROXIMATE CUT AND COVER LIMITS
APPROXIMATE TUNNEL LIMITS
STAGING / CONSTRUCTION AREA
APPROXIMATE PARK BOUNDARIES
POTENTIAL FUTURE ACCESS TO
SUBWAY STATION

SCALE 1/4" = 100 FEET
0 100 200 400

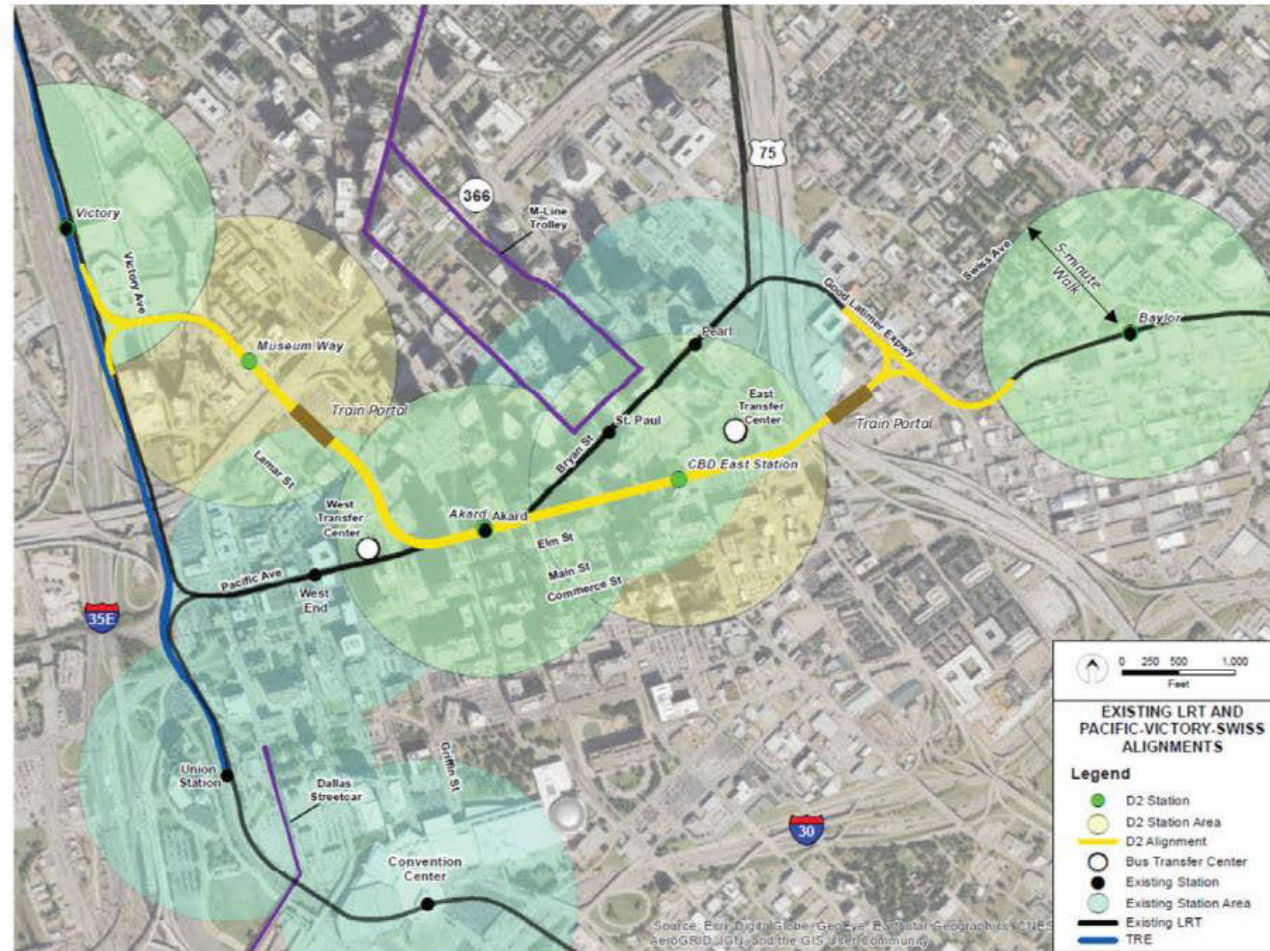


D2 SUBWAY OPTIONS

PACIFIC/VICTORY/SWISS

CORRIDOR DESCRIPTION

This alignment follows DART right-of-way through the Victory Park development, enters a tunnel south of Woodall Rodgers, follows Griffin to Pacific, and then connects to the Green Line with an at-grade junction near Deep Ellum.



CORRIDOR FACTS

LENGTH (MILES)	% TUNNEL	CAPITAL COSTS ESTIMATE/ FY17 BUDGET (YOE\$)	STATIONS AT-GRADE	STATIONS IN TUNNEL
2.12	42%	\$0.938B/\$1.32B	1	2

DEMOGRAPHICS WITHIN 1/4-MILE OF STATION		
	EMPLOYMENT	POPULATION
Existing 2014 (NCTCOG)	150,842	8,430
Projected 2040 (NCTCOG)	150,148	23,295
Projected 2040 (Dallas)	165,042	29,253

EVALUATION SUMMARY

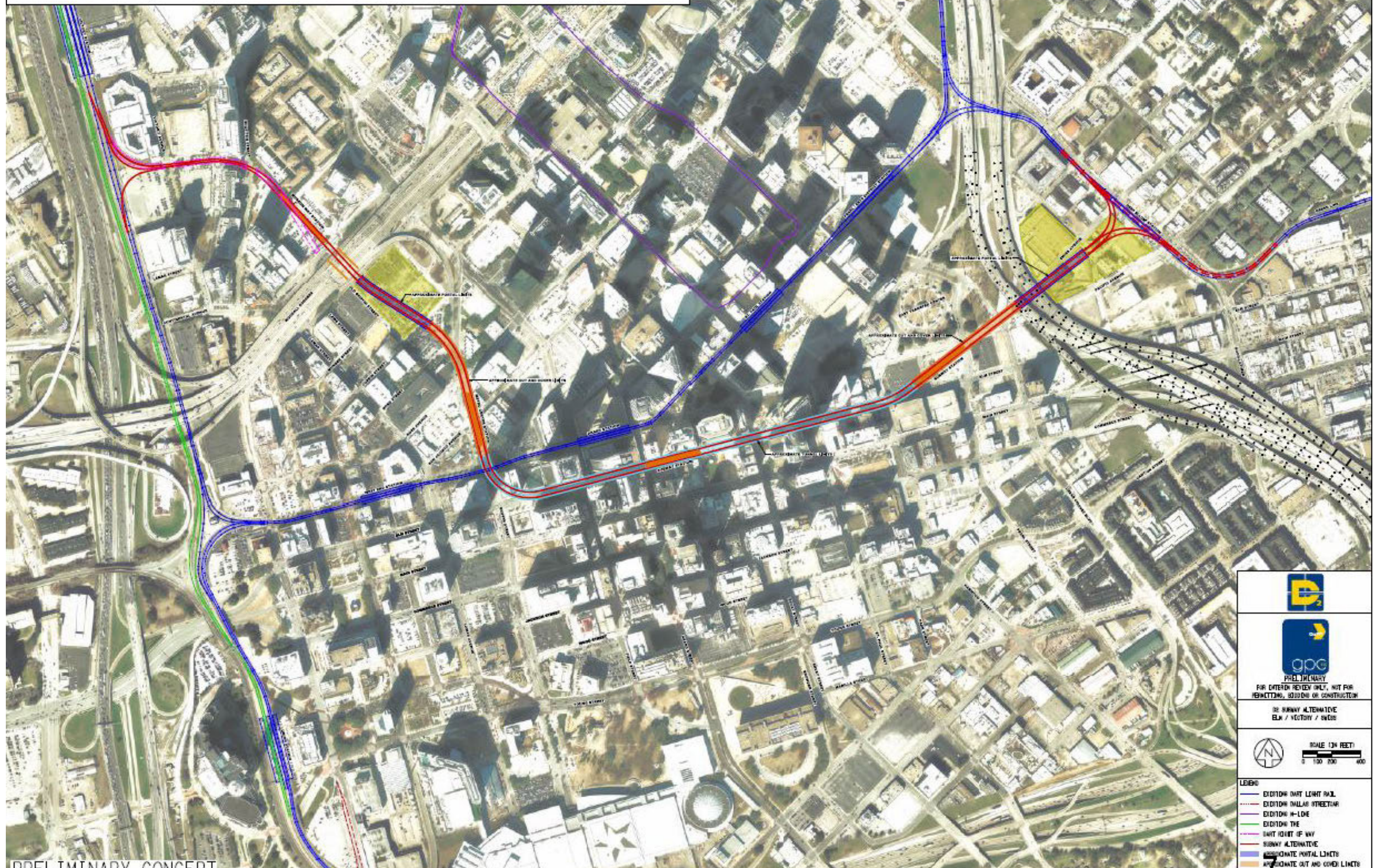
CHARACTERISTICS	ADVANTAGES	DISADVANTAGES
CAPITAL COST/ AFFORDABILITY	Capital cost estimate is approximately \$0.938B (YOE\$). Project budget is \$1.32B (YOE\$); Estimated capital costs under budget by approximately \$380M (YOE\$)	-
SERVES HIGH-DENSITY EMPLOYMENT AREA	Penetrates highest employment density area within the Central Business District: Approximately 150,000 jobs within 1/4 mile of stations with City of Dallas growth forecast of approximately 9% by 2040	-
RIDER TRANSFERS	Accommodates direct transfers between 4 light-rail lines at existing Akard Station and proposed Akard Subway Station; New CBD East Station located near existing East Bus Transfer Center provides for multi-modal transfers	Two block walk to West End Bus Transfer Center; One block walk to East Bus Transfer Center
NUMBER OF STATIONS	3 stations (Museum Way, Akard Subway, CBD East); Only 2 subway stations (Akard Subway, CBD East) which minimizes capital costs	3 stations; One fewer station than the 4 stations along Elm and Commerce alignments; Eliminates, or relocates the existing Deep Ellum Station
ACCOMMODATE EXISTING RIDERS	New alignment keeps existing riders closer to current destinations along Transit Mall; Akard Station becomes central rail transfer location for all routes	-
SERVES NEW MARKETS	Within a 5-minute walk: » Perot Museum of Nature & Science » Klyde Warren Park » Farmers Market Area (northern edge) Within 10-minute walk: » Dallas City Hall » Farmers Market Area	Primarily serves existing market areas; Minimal access to new market areas in CBD
TRAVEL TIME THRU CBD	4 minutes faster than existing travel time between Victory and Baylor Stations; Approximately 1 minute faster than Elm and Commerce alignments between Victory to Baylor Stations (10 minutes); Existing travel time is 14 minutes using existing Transit Mall	-
DEVELOPMENT OPPORTUNITIES	Potential activation of parking lots near Woodall Rodgers Freeway; DART is major property owner along corridor with West Bus Transfer Center, DART HQ and East Bus Transfer Center; provides opportunity for redevelopment at all locations; Potential activation of properties near IH 345; Station access points to be determined	Possible demolition and relocation of DART HQ would have to be coordinated with construction
POTENTIAL IMPACTS TO BUILT ENVIRONMENT	Minimal impacts; Potential utilization of DART-owned property for station construction area; Environmental Impact Statement will identify specific impacts when prepared	Potential conflict with underground Bullington Truck Terminal and pedestrian tunnel across Pacific; Potential conflict with 66" water line; Potential conflict with 7" storm water pipe across Pearl
AVAILABLE PROPERTY FOR CONSTRUCTION STAGING AREA	Potential utilization of DART-owned property; Utilization of existing private parking lots near Woodall Rodgers Freeway; Utilization of properties along Swiss Ave	Property acquisition required for portal construction and staging areas



Elm Alternative

via Victory-Swiss

D2 SUBWAY ALTERNATIVE - ELM / VICTORY / SWISS



PRELIMINARY CONCEPT
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FEBRUARY 2017

Station locations for evaluation purposes only and subject to change based on subsurface and surface conditions.

D2
GPC
PRELIMINARY
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PERMITTING, BIDDING OR CONSTRUCTION
RE: SBNVY ALTERNATIVE
ELM / VICTORY / SWISS

SCALE (IN FEET)
0 100 200 400

LEGEND

- EXISTING DART LIGHT RAIL
- EXISTING DALLAS STREETCAR
- EXISTING H-LINE
- EXISTING THE
- DART RIGHT-OF-WAY
- SBNVY ALTERNATIVE
- APPROXIMATE PORTAL LIMITS
- APPROXIMATE CUT AND COVER LIMITS
- APPROXIMATE TUNNEL LIMITS
- STATIONS / CONSTRUCTION AREA
- APPROXIMATE PARK BOUNDARIES
- POTENTIAL PEDESTRIAN ACCESS TO SBNVY STATION

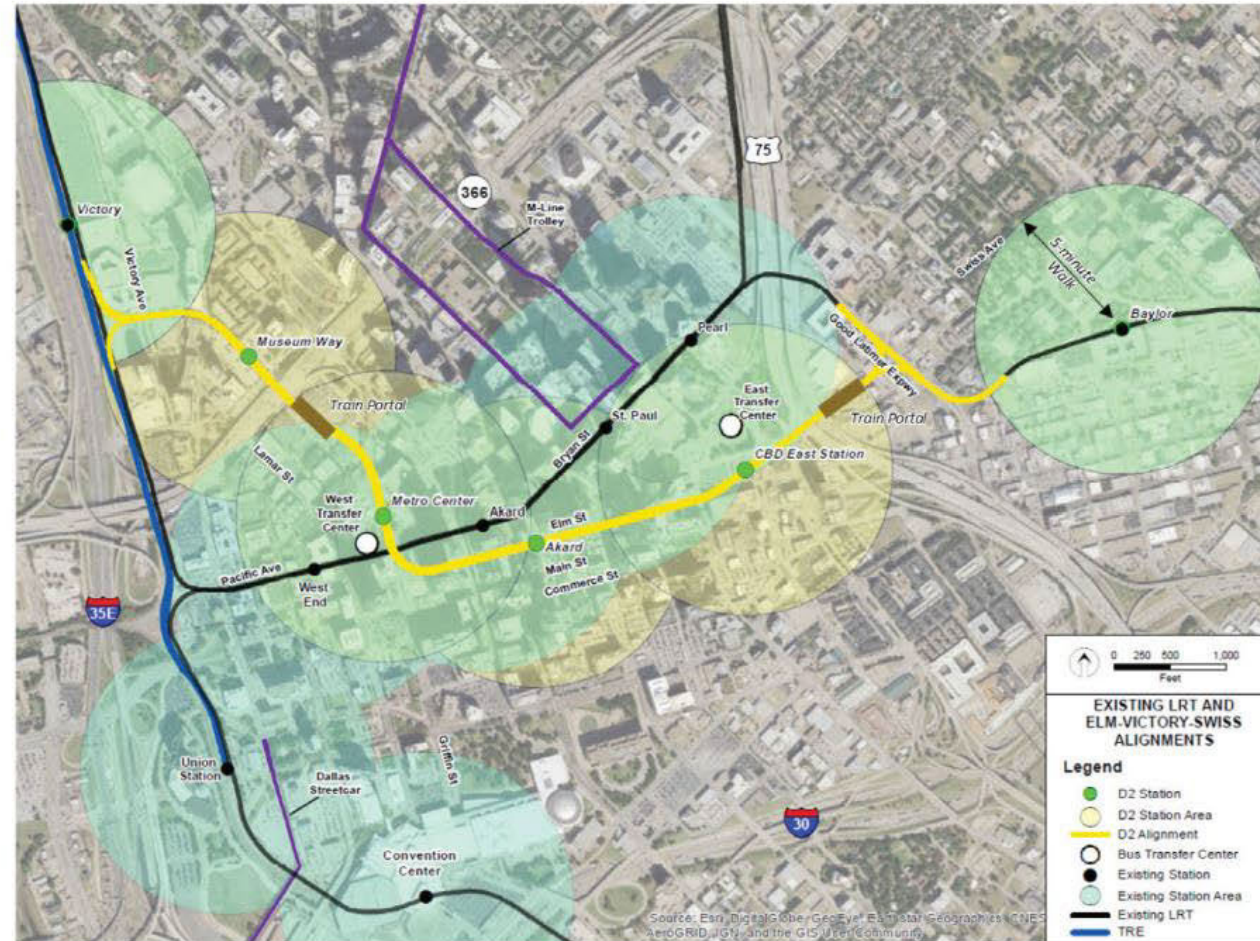


D2 SUBWAY OPTIONS

ELM/VICTORY/SWISS

CORRIDOR DESCRIPTION

This alignment follows DART right-of-way through the Victory Park development, enters a tunnel south of Woodall Rodgers, follows Griffin to Elm, and then connects to the Green Line with an at-grade junction near Deep Ellum.



CORRIDOR FACTS

LENGTH (MILES)	% TUNNEL	CAPITAL COSTS ESTIMATE/ FY17 BUDGET (YOES)	STATIONS AT-GRADE	STATIONS IN TUNNEL
2.18	49%	\$1.29B/\$1.32B	1	3

DEMOGRAPHICS WITHIN 1/4-MILE OF STATION		
	EMPLOYMENT	POPULATION
Existing 2014 (NCTCOG)	150,572	8,403
Projected 2040 (NCTCOG)	151,380	23,820
Projected 2040 (Dallas)	166,189	29,967

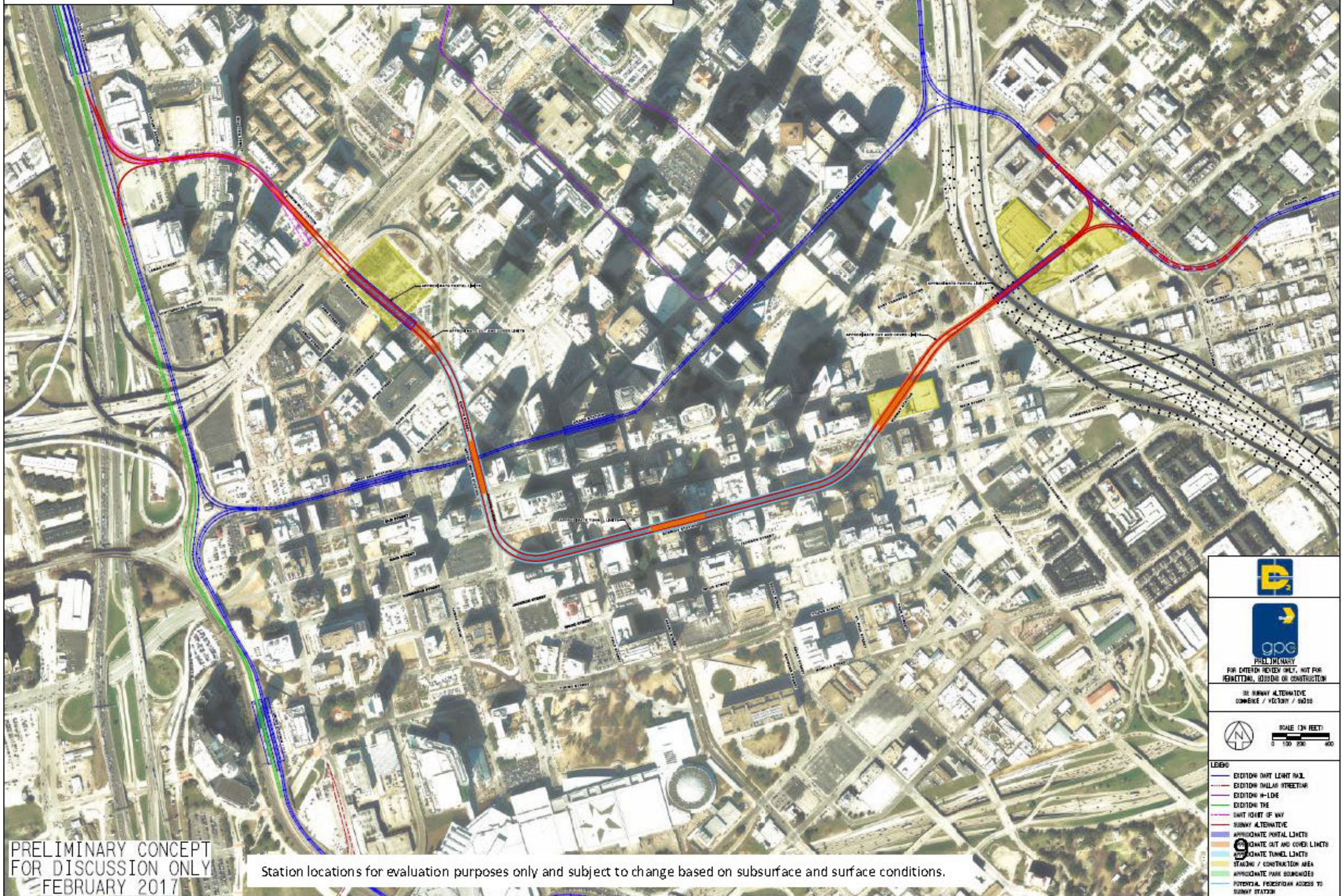
EVALUATION SUMMARY

CHARACTERISTICS	ADVANTAGES	DISADVANTAGES
CAPITAL COST/ AFFORDABILITY	Capital cost estimate is approximately \$1.29B (YOES). Project budget is \$1.32B (YOES)	Fully utilizes available FY17 budgeted funds; Limits flexibility
SERVES HIGH-DENSITY EMPLOYMENT AREA	Penetrates highest employment density area within the Central Business District; Approximately 150,000 jobs within 1/4 mile of stations with City of Dallas growth forecast of approximately 10% by 2040	-
RIDER TRANSFERS	Accommodates multi-modal transfers between West End Station and proposed Metro Center Station; Accommodates transfers between LRT and bus along Elm corridor and East Bus Transfer Center; Transfers from Metro Center Station to West End/Akard Stations decentralizes rail-to-rail activity	One block walk to East Bus Transfer Center
NUMBER OF STATIONS	4 stations (Museum Way, Metro Center, Akard Subway Station, CBD East); One more station than Pacific alignment	Eliminates, or relocates the existing Deep Ellum Station
ACCOMMODATE EXISTING RIDERS	New alignment keeps existing riders close to current destinations along Transit Mall; Provides opportunity for some riders to have a shorter walk to Elm St businesses when using Orange/Green Lines	Potentially changes travel patterns for existing Orange/Green Line riders; requiring transfer or longer walk
SERVES NEW MARKETS	Within a 5-minute walk: » Perot Museum of Nature & Science » Klyde Warren Park » Farmers Market Area (northern edge) Within 10-minute walk: » Dallas City Hall » Farmers Market Area	Primarily serves existing market areas; Minimal access to new market areas in CBD
TRAVEL TIME THRU CBD	3 minutes faster than existing travel time between Victory and Baylor Stations	Approximately 1 min. slower than Pacific alignment between Victory to Baylor Stations (11 min.); Existing travel time is 14 min. using existing Transit Mall
DEVELOPMENT OPPORTUNITIES	Potential activation of parking lots near Woodall Rodgers Freeway; Provides opportunity for redevelopment at all station locations; Potential activation of properties near IH 345; Station access points to be determined	Impacts Homewood Suites; Proposed Shraman Asian Museum site needed for construction staging/portal
POTENTIAL IMPACTS TO BUILT ENVIRONMENT	Minimal impacts; Potential utilization of DART-owned property for station construction area; Environmental Impact Statement will identify specific impacts when prepared	Potential impact to underground pedestrian tunnels across Griffin and Elm; Potential conflict with 7" storm water pipe across Pearl; Temporary shut down Griffin with cut-and-cover for station construction and roadway replacement; Temporary shut down Pacific, Cesar Chavez, Elm, Pearl with cut-and-cover for station construction and roadway replacement
AVAILABLE PROPERTY FOR CONSTRUCTION STAGING AREA	Staging areas identified require the use of parking lots for the west portal; Areas for the east portal would require acquisition/displacement of a few commercial buildings; Additional evaluation need for vertical access and ventilation shafts	Property acquisition required for portal construction and staging areas



Commerce Alternative via Victory-Swiss

D2 SUBWAY ALTERNATIVE - COMMERCE / VICTORY / SWISS



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DE SUBWAY ALTERNATIVE
COMMERCE / VICTORY / SWISS

SCALE (IN FEET)
0 100 200 400

LEGEND

- EXISTING DART LIGHT RAIL
- EXISTING DALLAS STREETCAR
- EXISTING H-LINE
- EXISTING T-REX
- DART RIGHT-OF-WAY
- SUBWAY ALTERNATIVE
- APPROXIMATE PORTAL LINES
- APPROXIMATE CUT AND COVER LINES
- APPROXIMATE TUNNEL LINES
- STATIONS / CONSTRUCTION AREA
- APPROXIMATE PARK BOUNDARIES
- POTENTIAL PEDESTRIAN ACCESS TO SUBWAY STATION

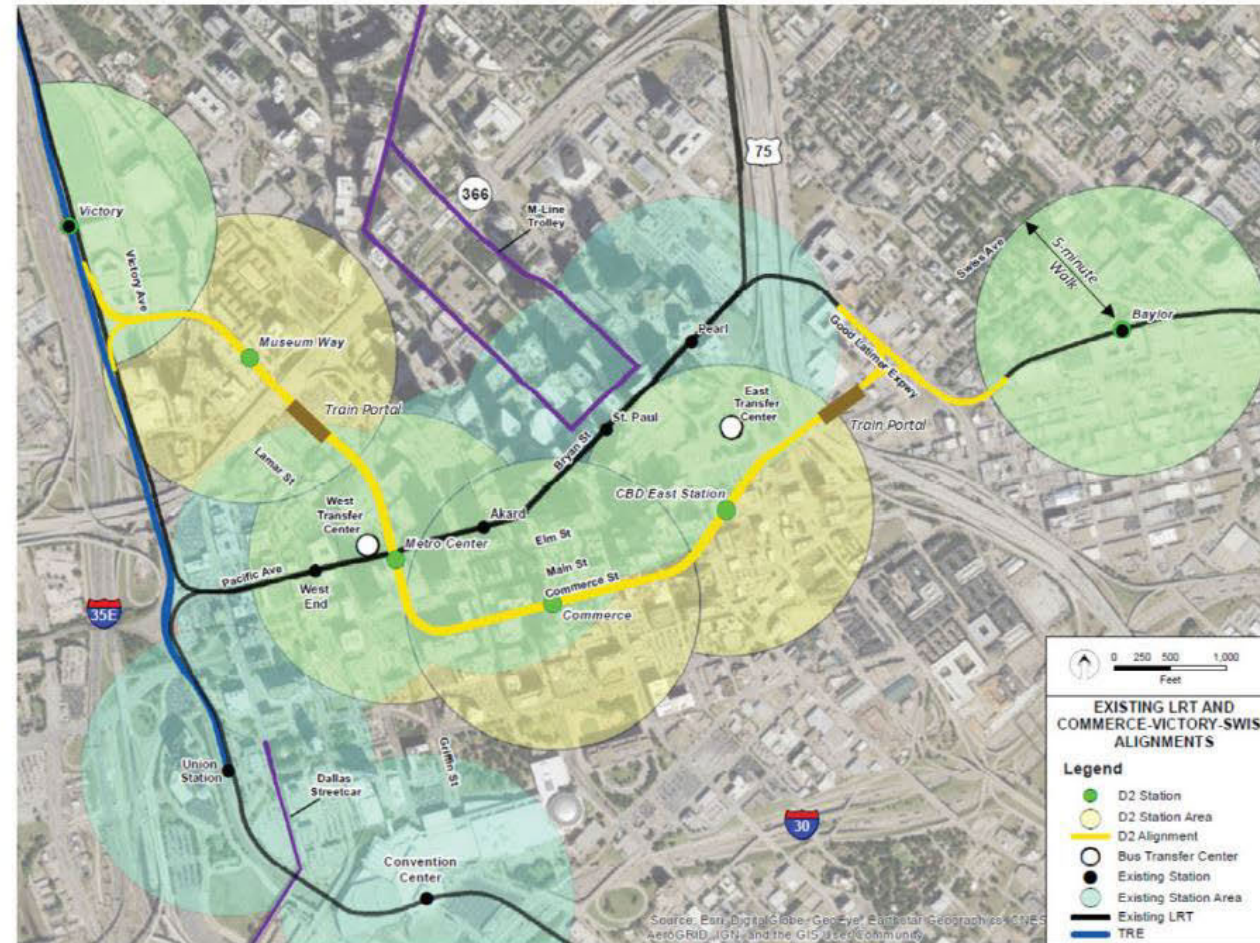


D2 SUBWAY OPTIONS

COMMERCE/VICTORY/SWISS

CORRIDOR DESCRIPTION

This alignment follows DART right-of-way through the Victory Park development, enters a tunnel south of Woodall Rodgers, follows Griffin to Commerce, and then connects to the Green Line with an at-grade junction near Deep Ellum.



CORRIDOR FACTS

LENGTH (MILES)	% TUNNEL	CAPITAL COSTS ESTIMATE/ FY17 BUDGET (YOE\$)	STATIONS AT-GRADE	STATIONS IN TUNNEL
2.34	48%	\$1.26B/\$1.32B	1	3

DEMOGRAPHICS WITHIN 1/4-MILE OF STATION		
	EMPLOYMENT	POPULATION
Existing 2014 (NCTCOG)	142,608	8,572
Projected 2040 (NCTCOG)	147,297	23,569
Projected 2040 (Dallas)	165,761	29,769

EVALUATION SUMMARY

CHARACTERISTICS	ADVANTAGES	DISADVANTAGES
CAPITAL COST/ AFFORDABILITY	Capital costs estimate is approximately \$1.26B (YOE\$). Project budget is \$1.32B (YOE\$)	Fully utilizes available FY17 budgeted funds; Limits flexibility
SERVES HIGH-DENSITY EMPLOYMENT AREA	City of Dallas projects significant employment growth in this area; Approximately 140,000 jobs within 1/4 mile of stations with City of Dallas growth forecast of approximately 16% by 2040	Borders southern end of highest employment density area in Central Business District
RIDER TRANSFERS	Accommodates multi-modal option for rail-to-rail transfers at West End and Akard; Accommodates transfers between 2 light-rail lines and buses along Commerce Street; new CBE East Station located near East Bus Transfer Center; Transfers from Metro Center Station to West End/Akard Stations decentralizes rail-to-rail activity	Two block walk to East Bus Transfer Center
NUMBER OF STATIONS	4 stations (Museum Way, Metro Center, Commerce, CBD East); One more station than Pacific alignment	Eliminates, or relocates the existing Deep Ellum Station
ACCOMMODATE EXISTING RIDERS	Provides opportunity for some riders to have a shorter walk to Commerce St businesses when using Orange/Green Lines	Potentially changes travel patterns for existing Orange/Green Line riders; requiring transfer or longer walk
SERVES NEW MARKETS	<p>Within a 5-minute walk:</p> <ul style="list-style-type: none"> » Perot Museum of Nature & Science » Klyde Warren Park » Dallas City Hall, Dallas Public Library » Farmers Market Area (northern edge) <p>Within 10-minute walk:</p> <ul style="list-style-type: none"> » Farmers Market Area 	
TRAVEL TIME THRU CBD	3.5 minutes faster than existing travel time between Victory and Baylor Stations	Approximately 1.5 minutes slower than Pacific alignment between Victory to Baylor Stations (11.5 minutes); Existing travel time is 14 minutes using existing Transit Mall
DEVELOPMENT OPPORTUNITIES	Potential activation of parking lots near Woodall Rodgers Freeway; Provides opportunity for redevelopment at all station locations; Potential activation of properties near IH 345; Station access points to be determined	Proposed Shraman Asian Museum site needed for construction staging/portal; Possible demolition and relocation of parking garage(s) at Elm and Harwood
POTENTIAL IMPACTS TO BUILT ENVIRONMENT	Able to conduct tunneling under existing parks without significant impacts; Opportunities exist for pedestrian access to underground station; Environmental Impact Statement will identify specific impacts when prepared	CBD East Station impacts parking garage(s) on east end of CBD; Potential impact to underground pedestrian tunnels across Griffin; Potential conflict with 7" storm water pipe across Pearl; Temporary shut down Griffin with cut-and-cover for station construction and roadway replacement; Temporary shut down Pacific, Cesar Chavez, Elm, Pearl with cut-and-cover for station construction and roadway replacement
AVAILABLE PROPERTY FOR CONSTRUCTION STAGING AREA	Staging areas identified require the use of parking lots for the west portal; Areas for the east portal would require acquisition/displacement of a few commercial buildings; Additional evaluation needed for vertical access and ventilation shafts	Property acquisition required for portal construction and staging areas



Rail Transition Portals

- Concepts developed for the North and Swiss Avenue (East) Portals
- Intended to support discussion of how the alternatives can be integrated into development
- Accounts for IH 345 modifications
- Rail portal locations will be refined during Project Development
- Design Considerations:
 - Shield entrance to tunnel with decorative, yet protective fencing and roof cover as well as buffering with landscaping
 - Consider making excess land adjacent to tunnel portal a harmoniously designed open space, plaza, or activated, developed parcel
 - Encourage air rights development over portals

North Portal Concept



Draft

Conceptual Rendering



North Portal Concept

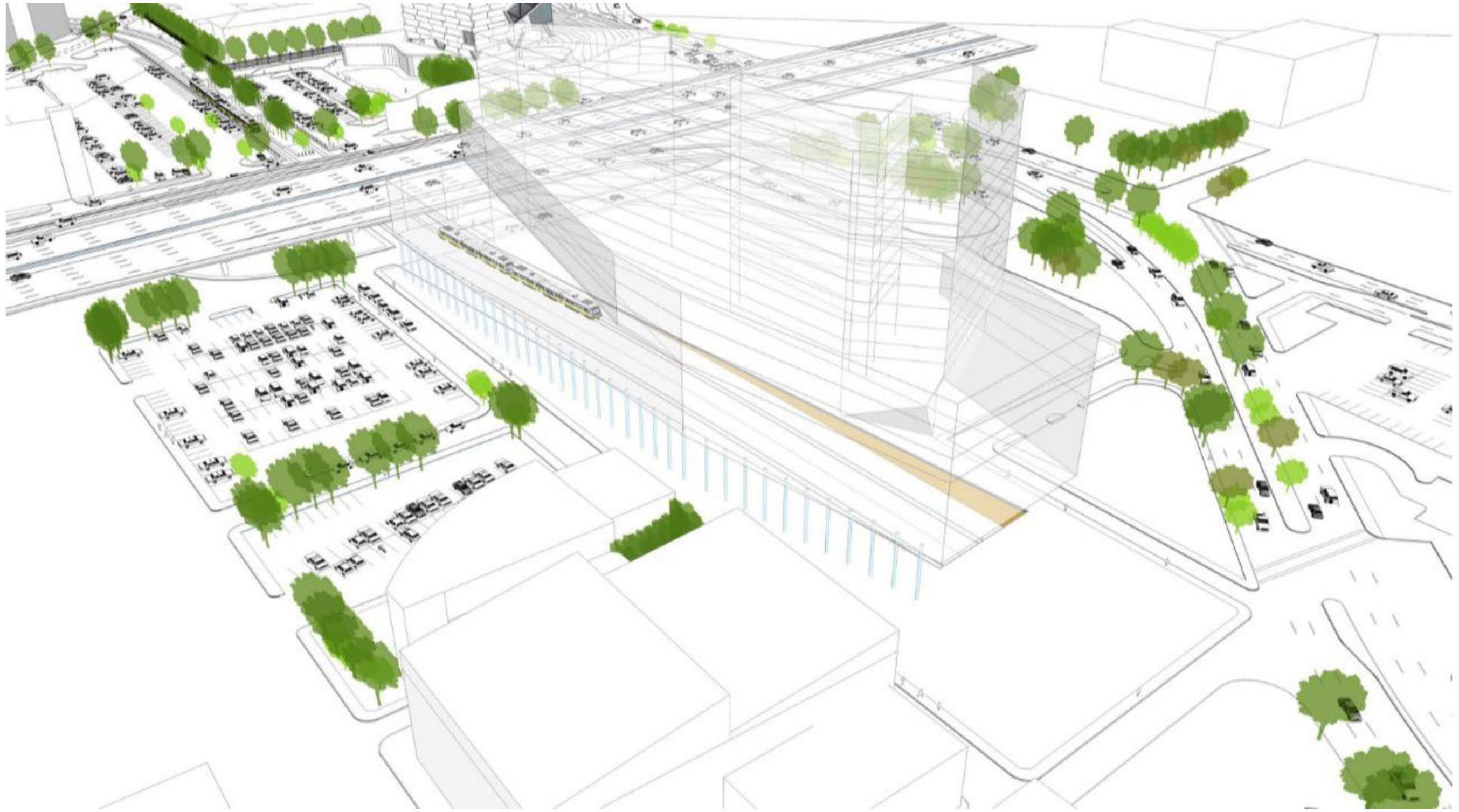


Draft

Conceptual Rendering

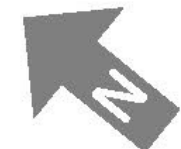


North Portal Concept

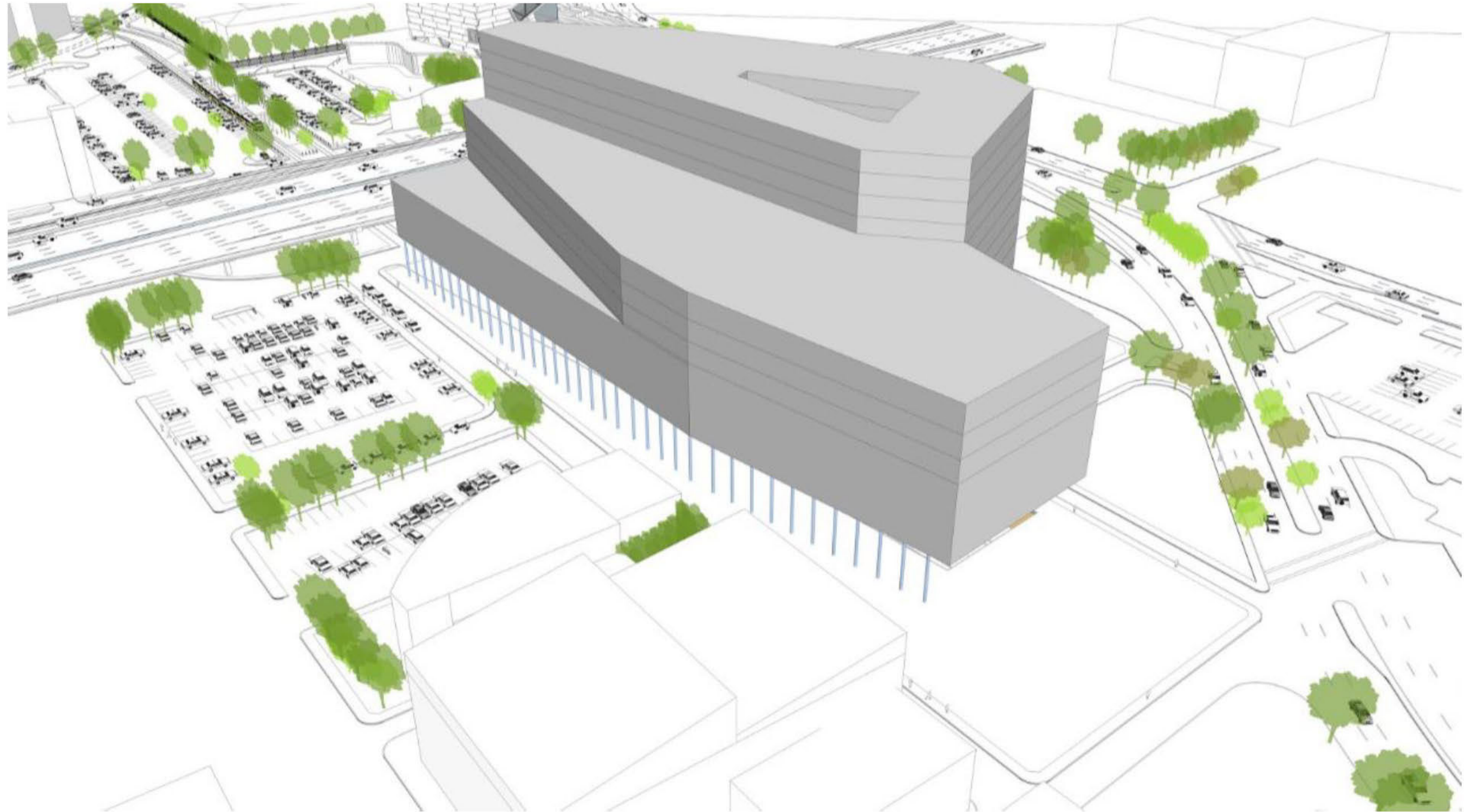


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Conceptual Rendering

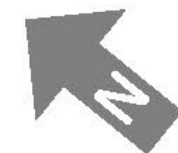


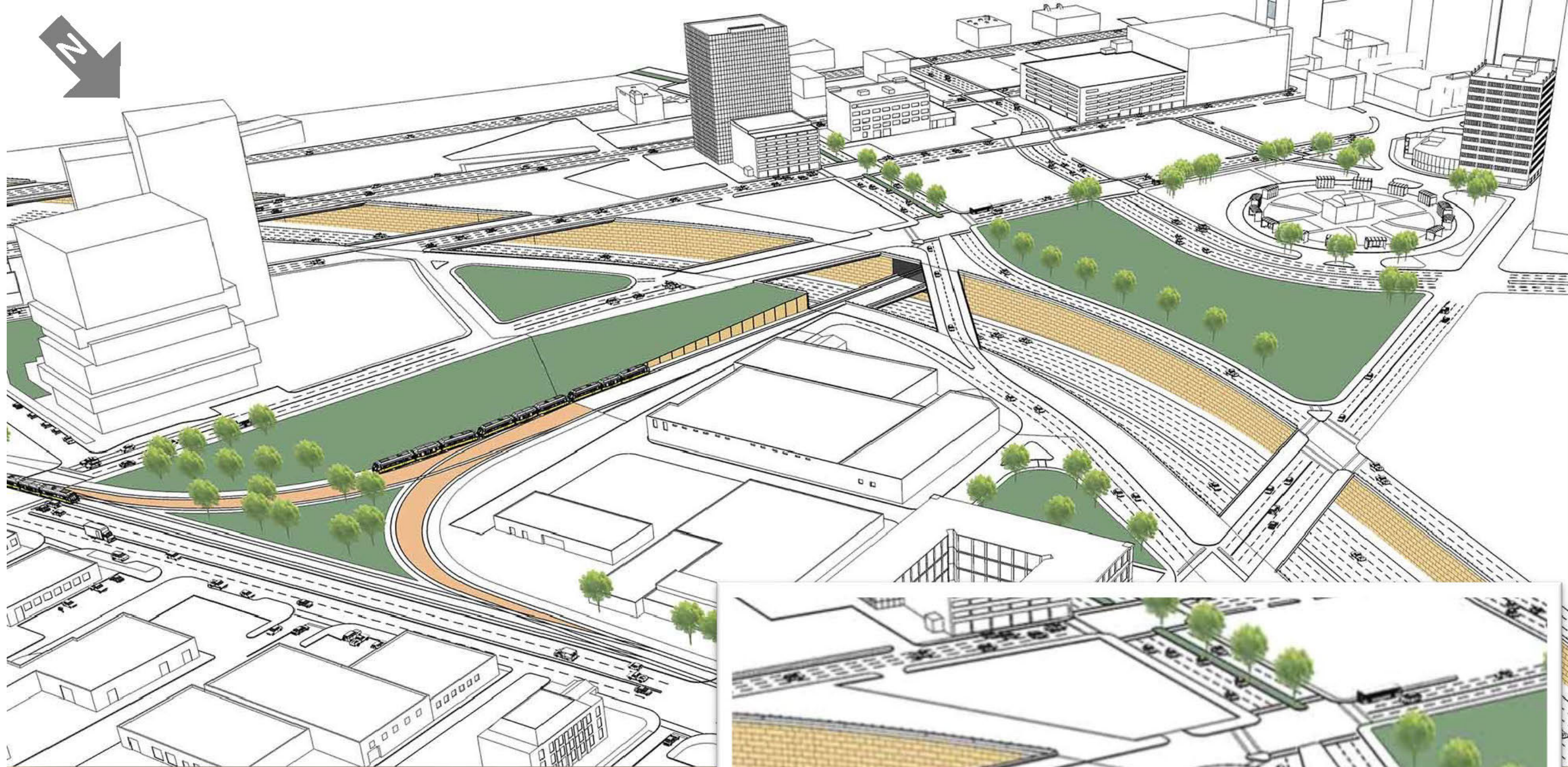
North Portal Concept



Draft

Conceptual Rendering





Conceptual Rendering
Swiss Avenue Portal with Depressed IH 345



Swiss Ave Train Portal Conceptual Rendering, March 2017



Swiss Ave Train Portal Conceptual Rendering, March 2017

Station and Pedestrian Portals

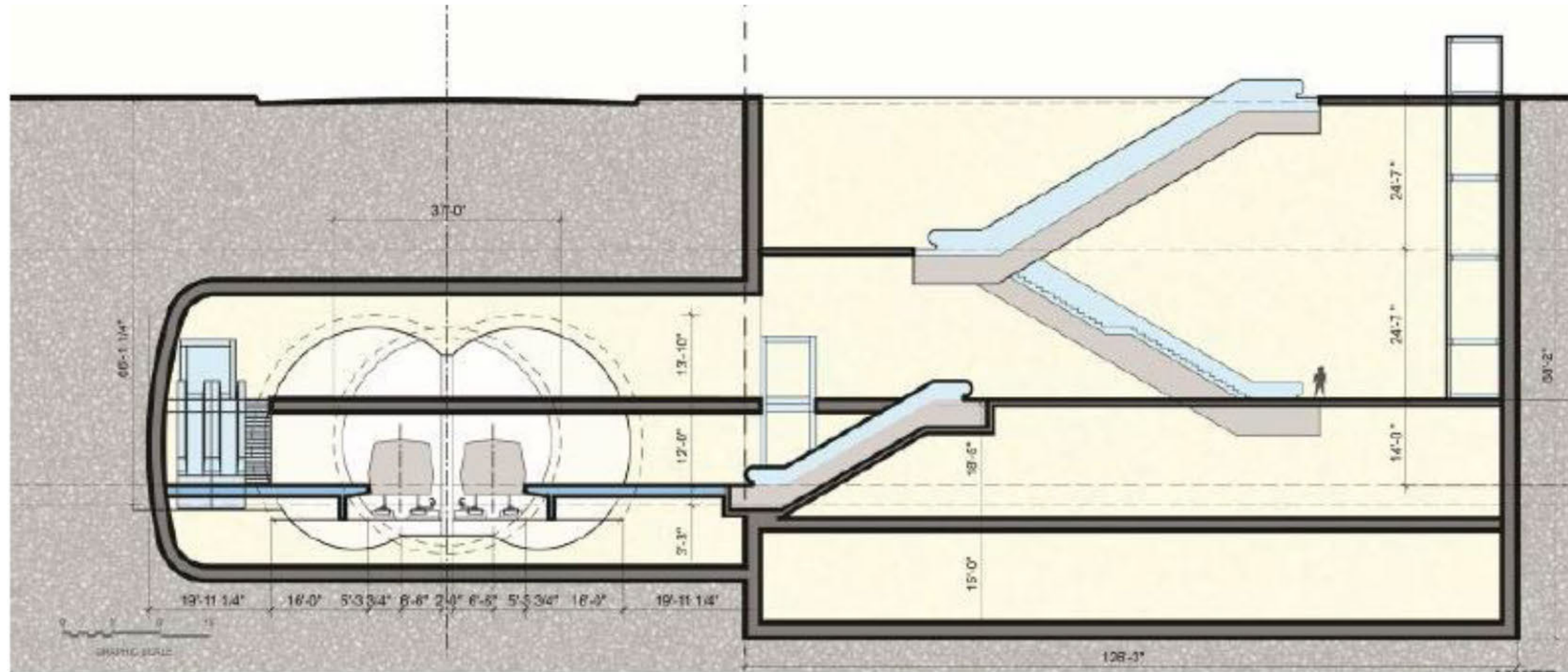
- Concepts developed for sample of stations
- Intended to support discussion of how the alternatives can be integrated into downtown
- Pedestrian portal locations will be refined during Project Development
- Design Considerations:
 - Design underground station entrance portals to compliment the surrounding architectural character of the area, paying particular attention to historic districts.
 - Scale the size of the portal to the projected amount of boarding/arrivals at station.
 - Provide easily accessible elevator entries that compliment surrounding architectural context.
 - Consider providing secure entry portals with paid patron control.
 - Elevators should be co-located with primary entrance portal (stairs/escalator) to the extent possible.

Station with Plaza



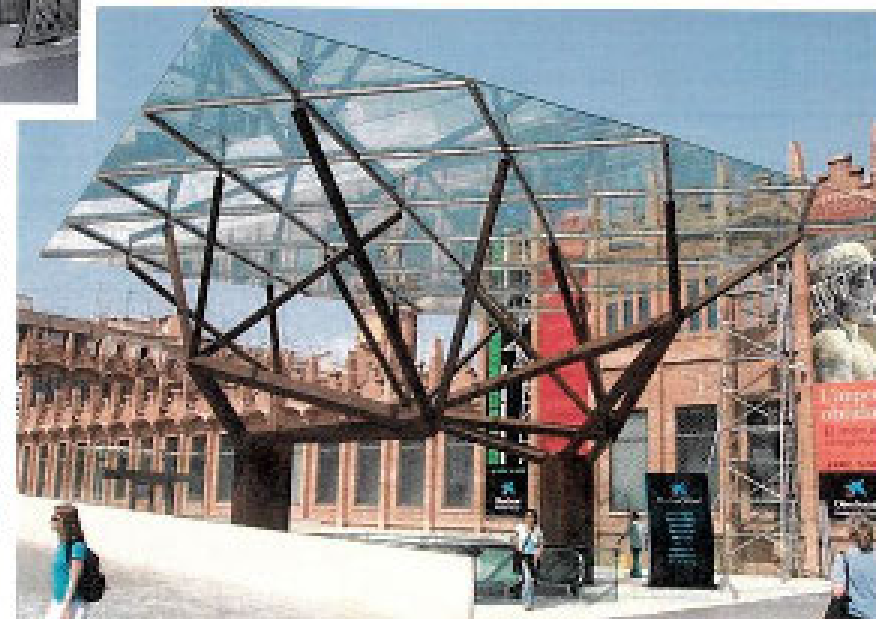
Figure 2-39. Proposed Entrance for the Wilshire/La Cienega Station

Station Integration



STREET PORTAL - CANOPY

PRECEDENTS

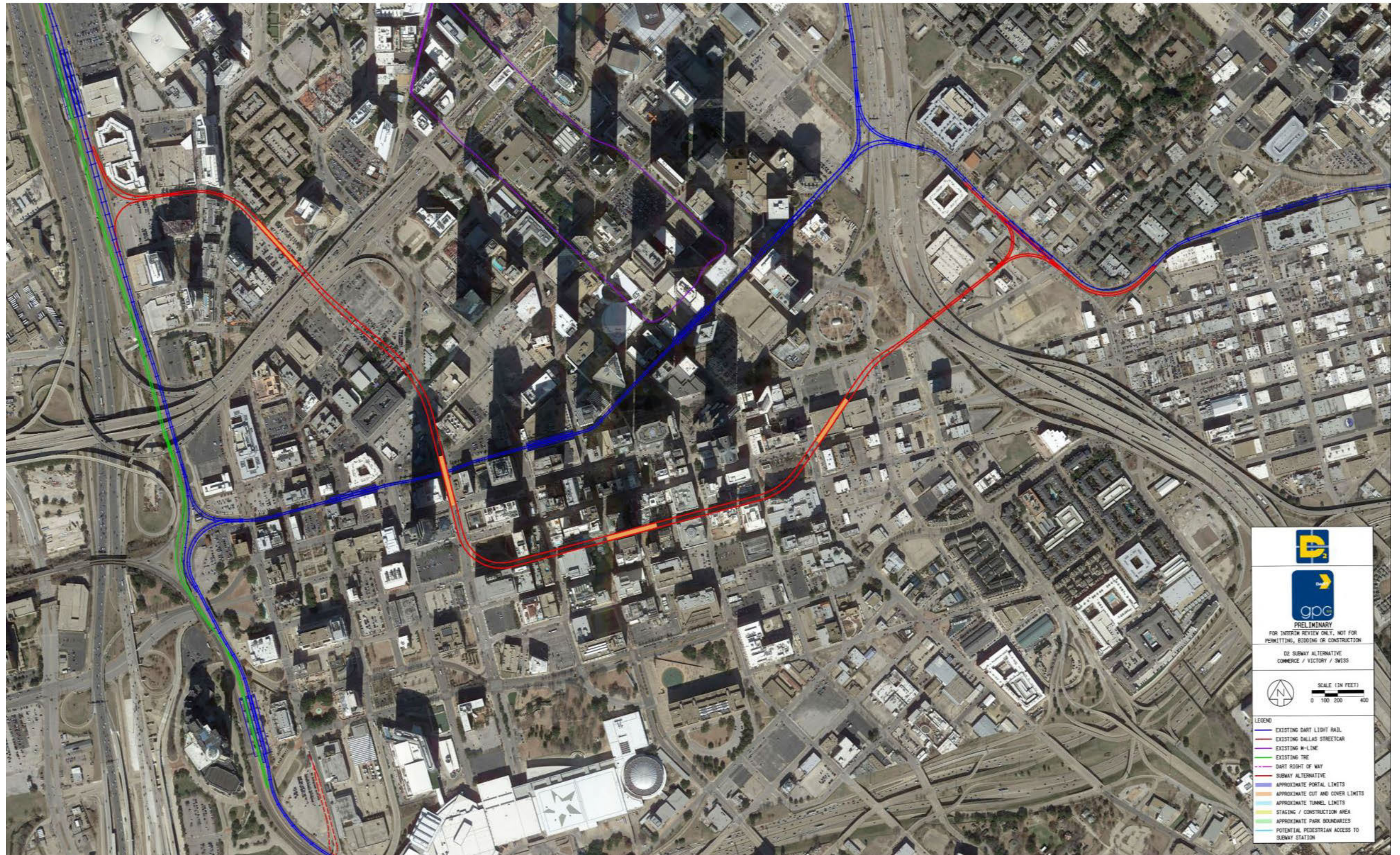


STREET PORTAL - OPEN

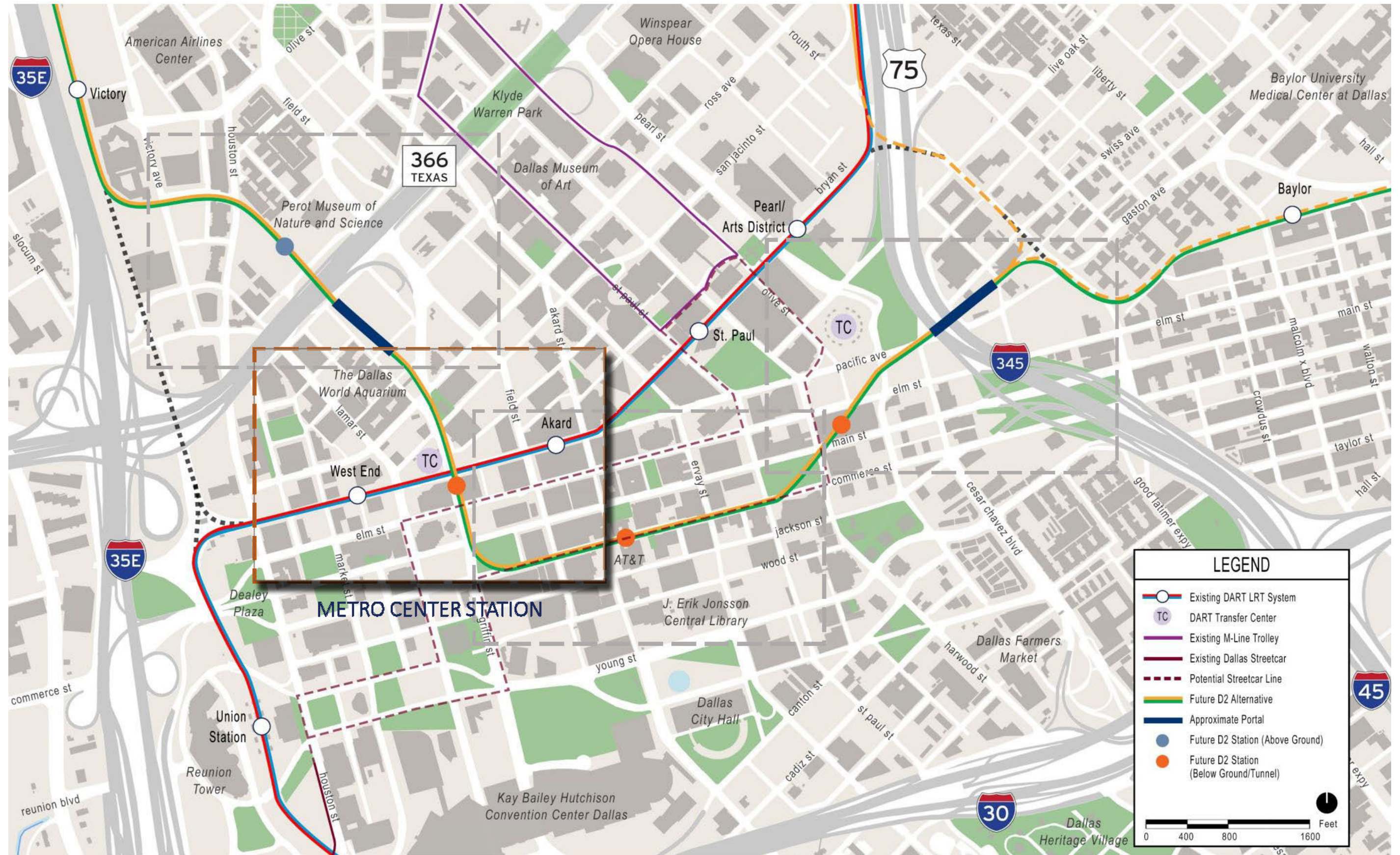
PRECEDENTS



D2 SUBWAY ALTERNATIVE | *Commerce / Victory / Swiss*



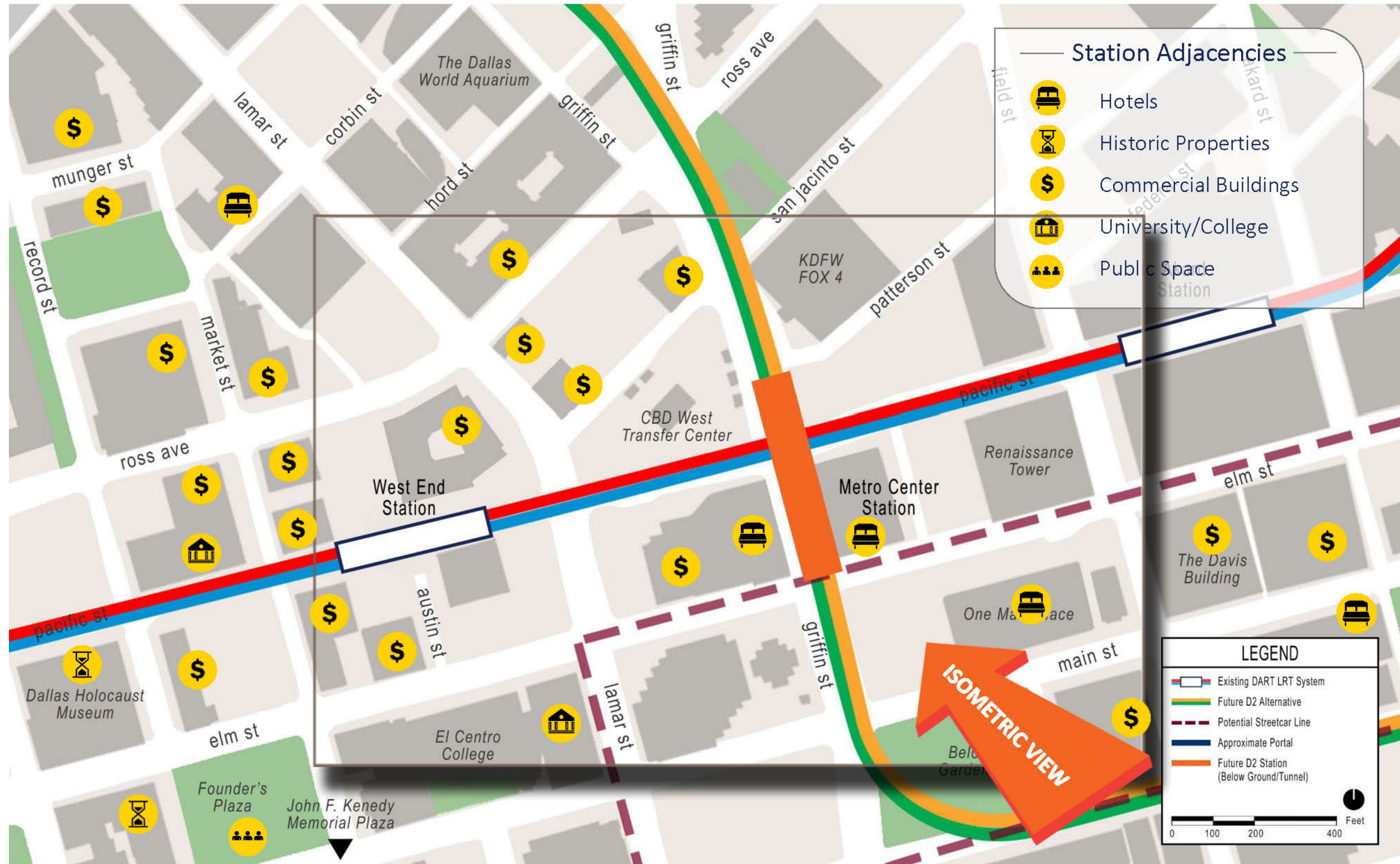
D2 SUBWAY ALTERNATIVE | *Commerce / Victory / Swiss*



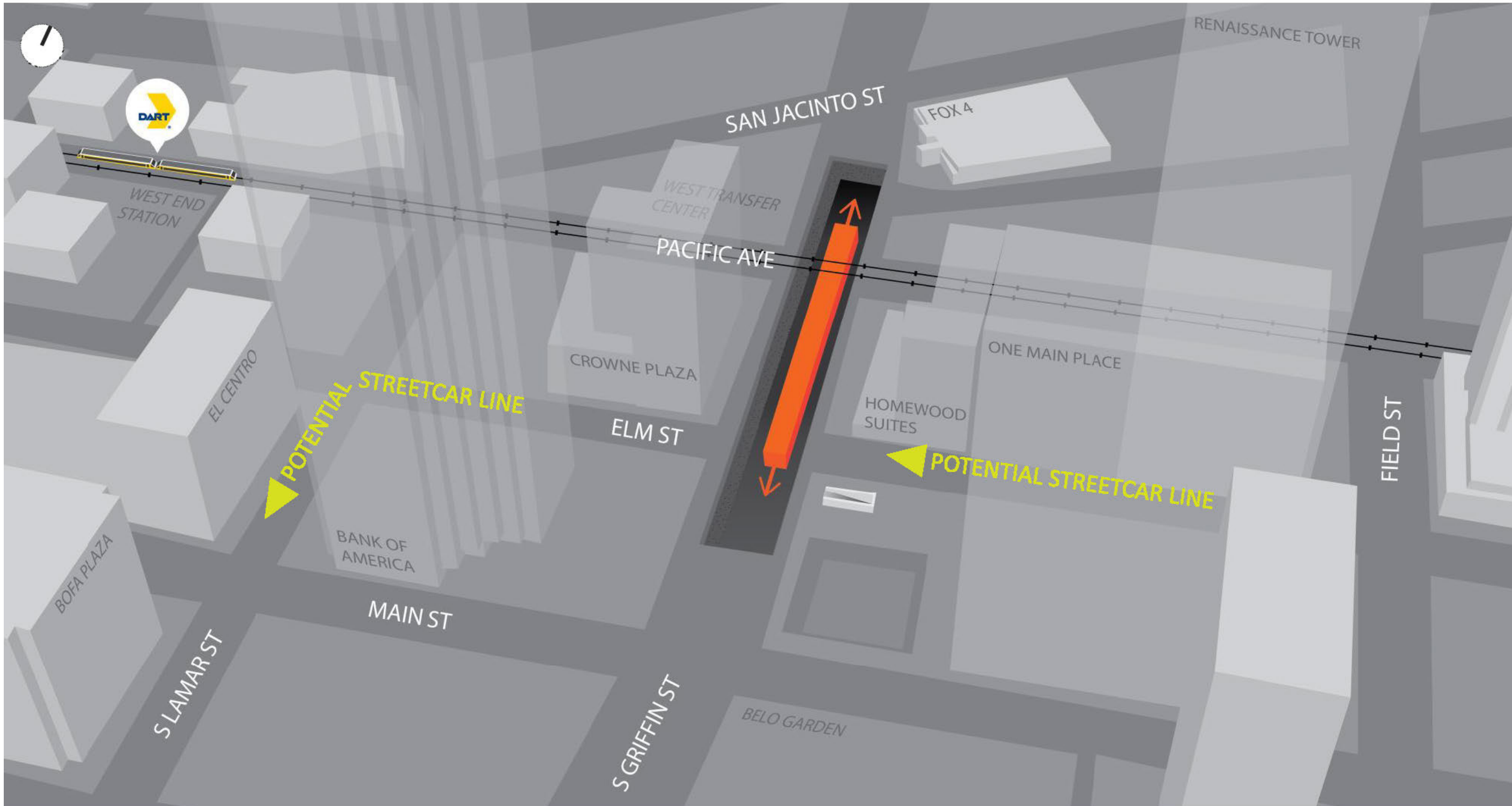
Metro Center Station Focus Area

CONCEPTUAL FOR DISCUSSION PURPOSES ONLY

D2 SUBWAY ALTERNATIVE | *Commerce / Victory / Swiss*



Metro Center Station | 500 – 700 ft Length Under Griffin Street

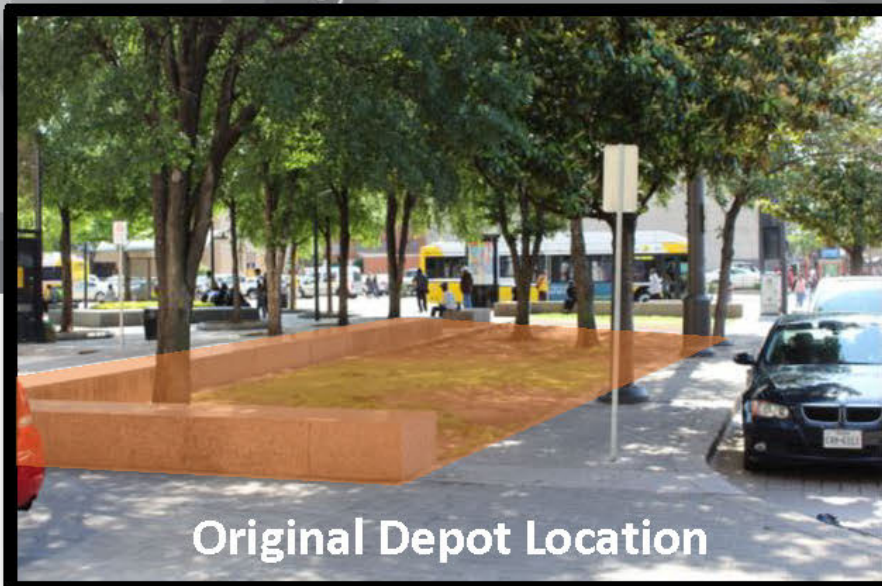


CONCEPTUAL FOR DISCUSSION PURPOSES ONLY

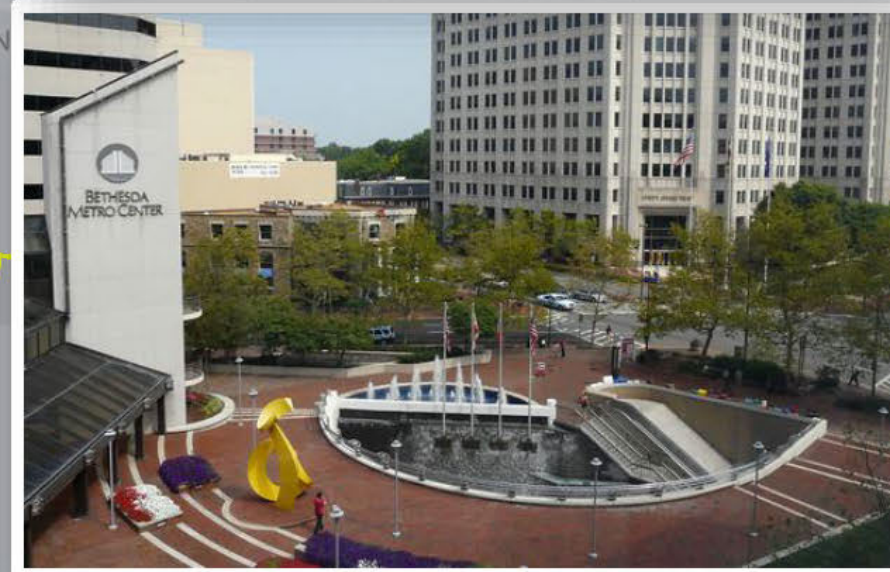
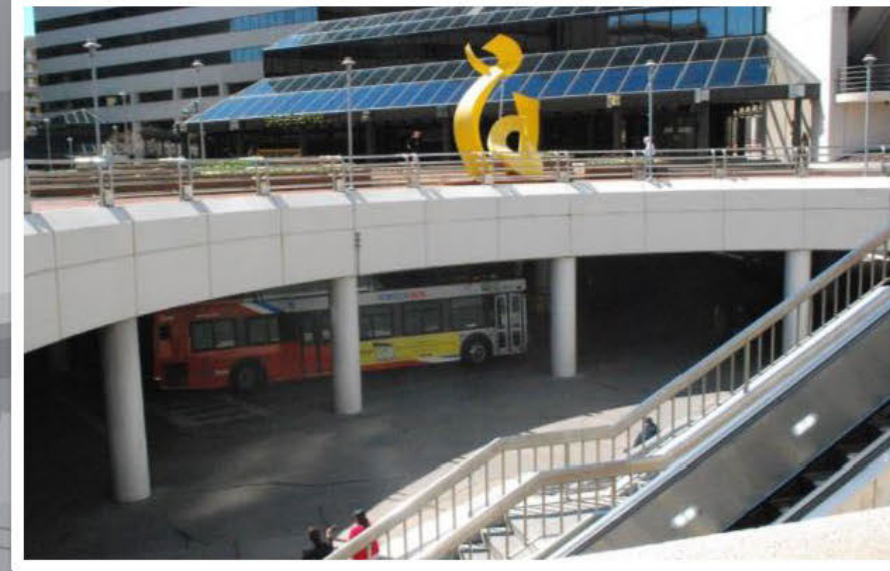
D2 SUBWAY ALTERNATIVE | *Commerce / Victory / Swiss*



Rosa Parks Plaza Pedestrian Portal Access



CBD West Transfer Center Pedestrian Portal Access



- CBD West Transfer Center**
- Space re-design promotes better operations and customer experience.
 - Allows multiple transit choices at one site.
 - Provides for multi-level transit facility.
 - Potential for future transit oriented development opportunity.

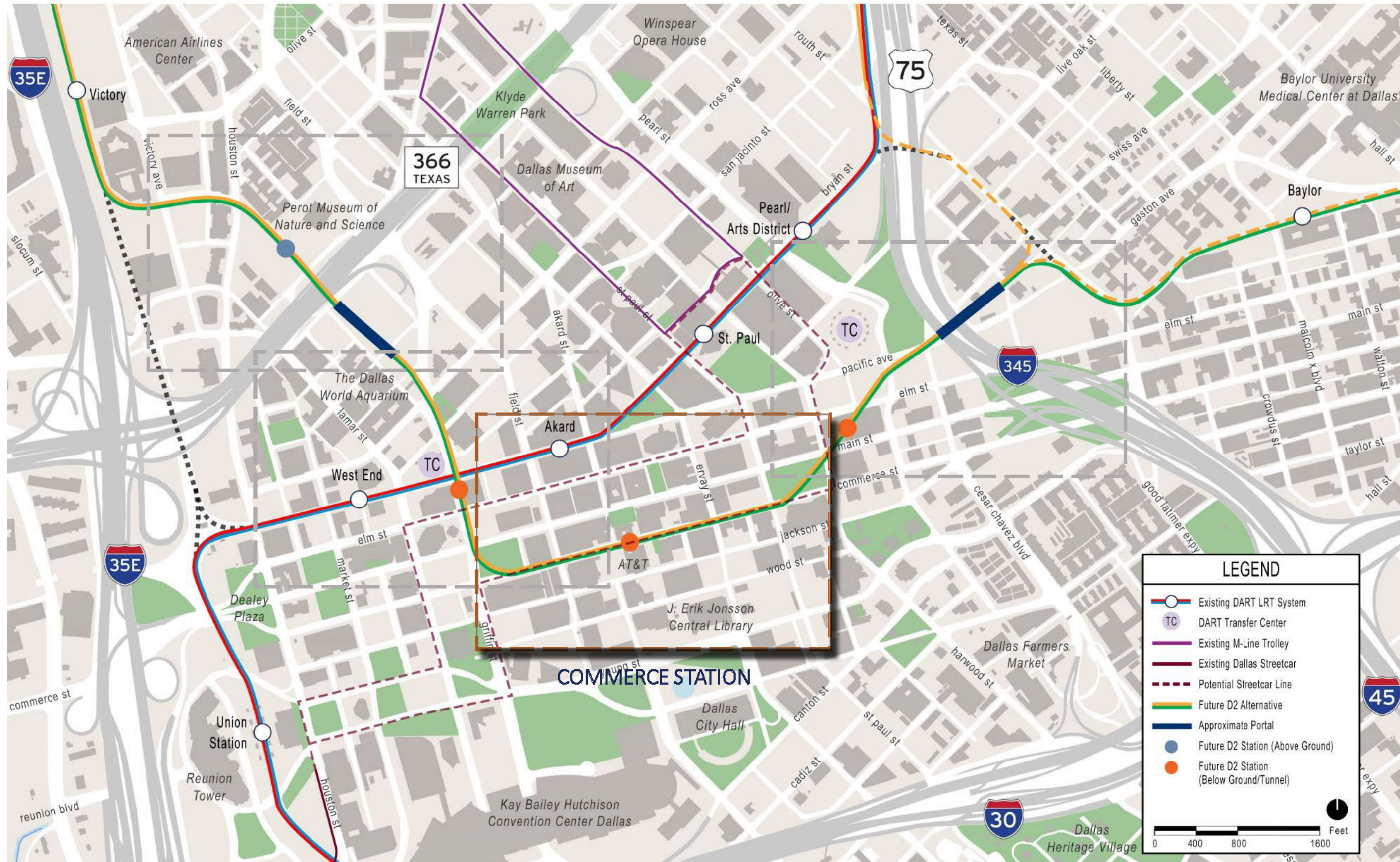


Main Building

D2 SUBWAY ALTERNATIVE | Commerce / Victory / Swiss

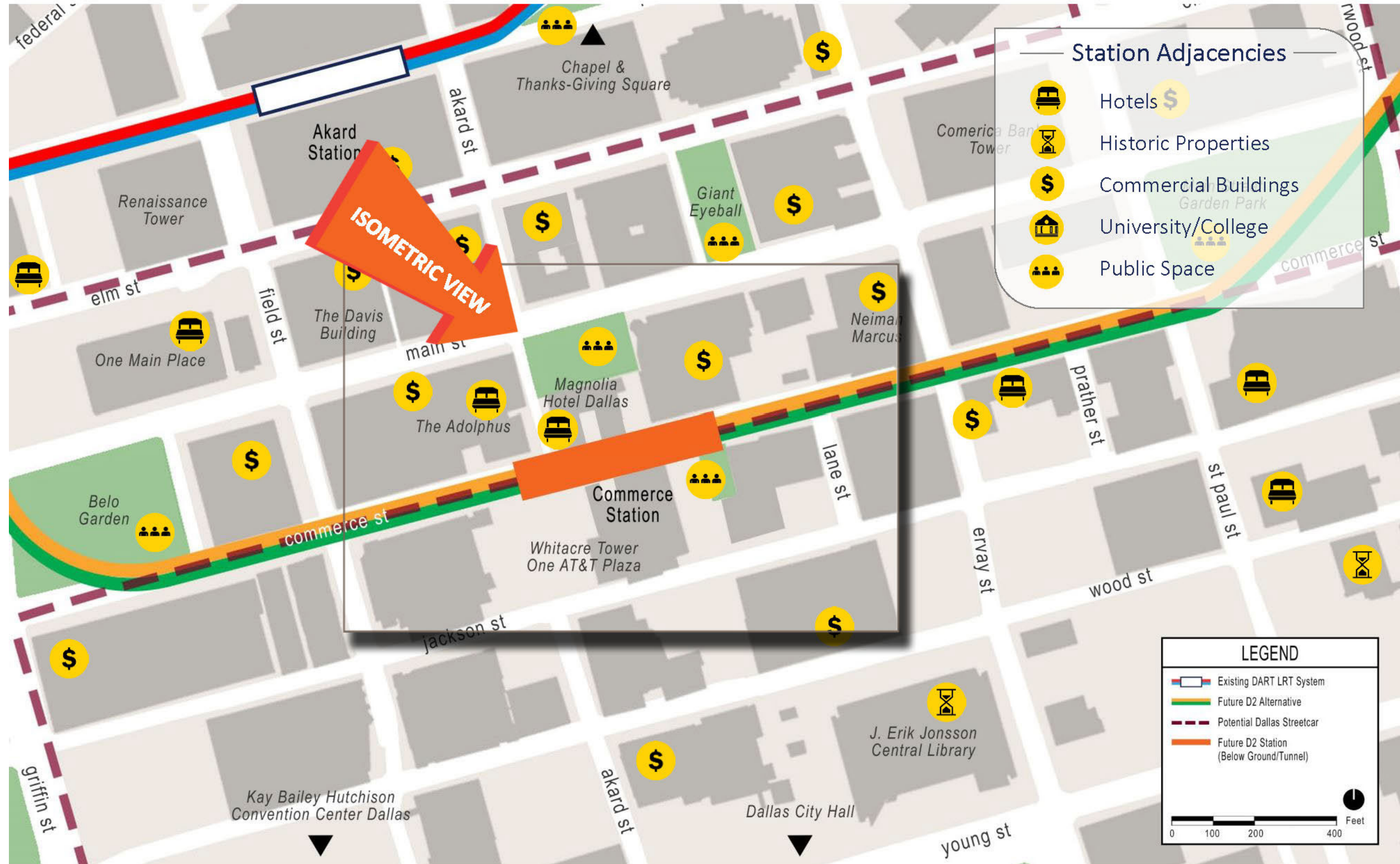


D2 SUBWAY ALTERNATIVE | *Commerce / Victory / Swiss*

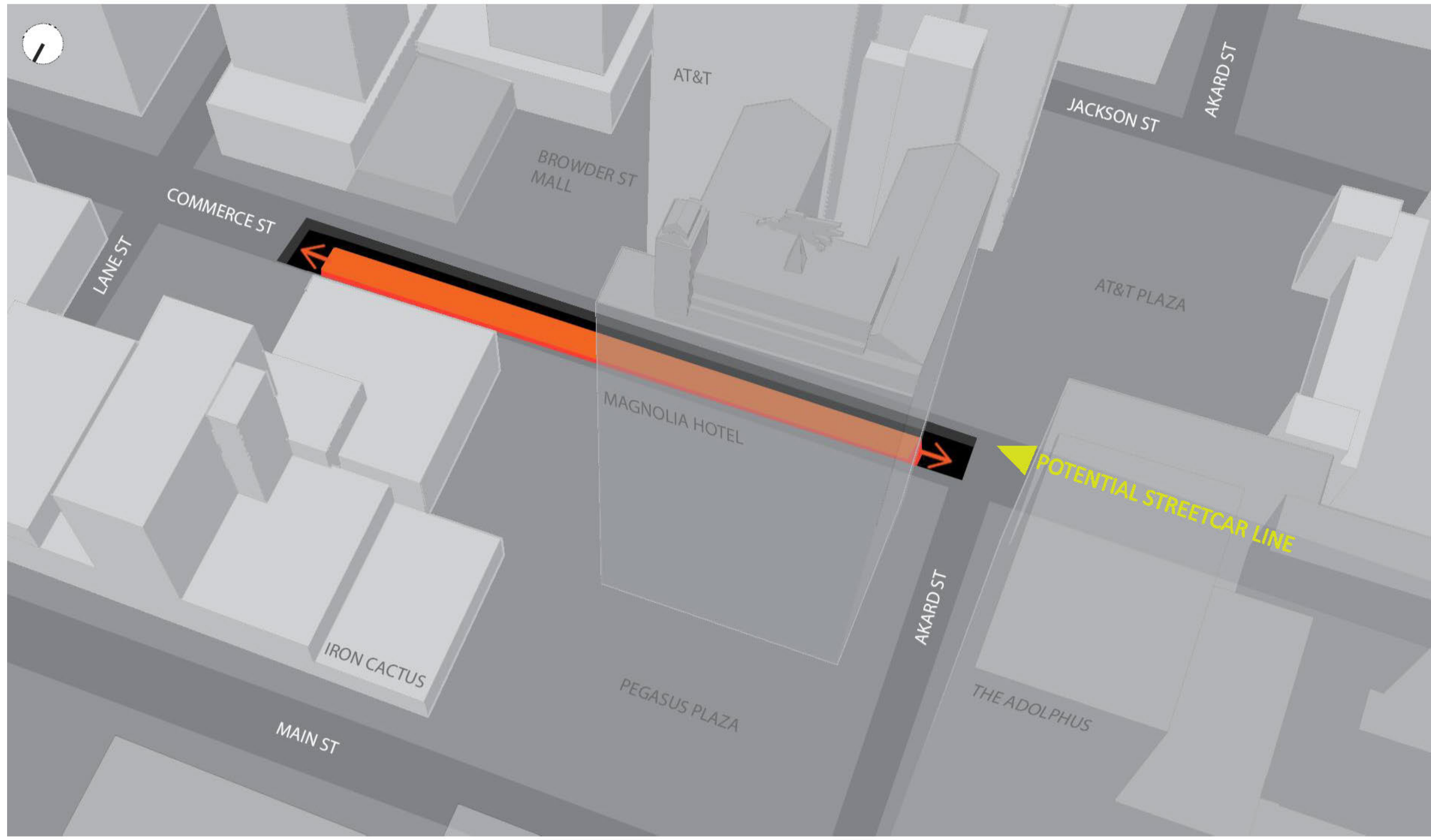


Commerce Station Focus Area

CONCEPTUAL FOR DISCUSSION PURPOSES ONLY D2 SUBWAY ALTERNATIVE | Commerce / Victory / Swiss

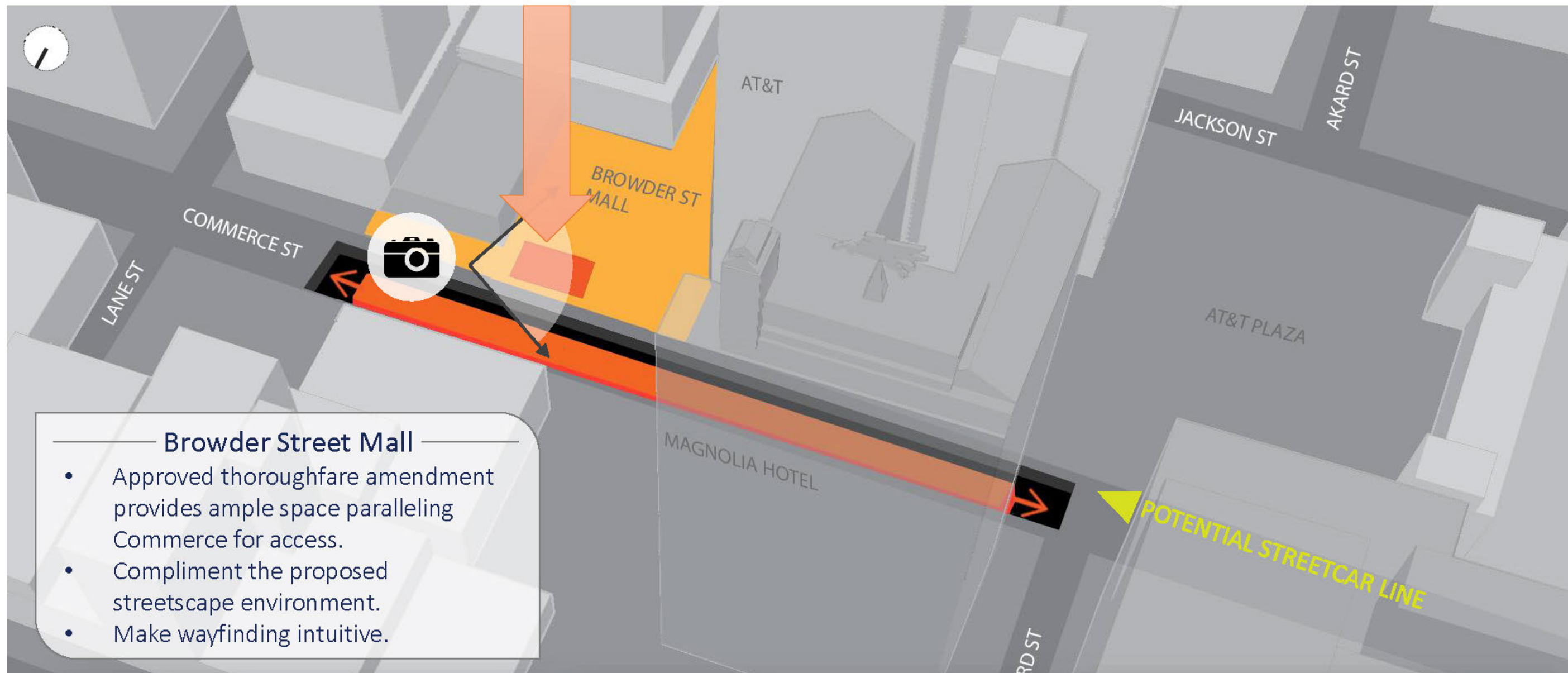


Commerce Station | 500 – 700 ft Length Under Commerce Street

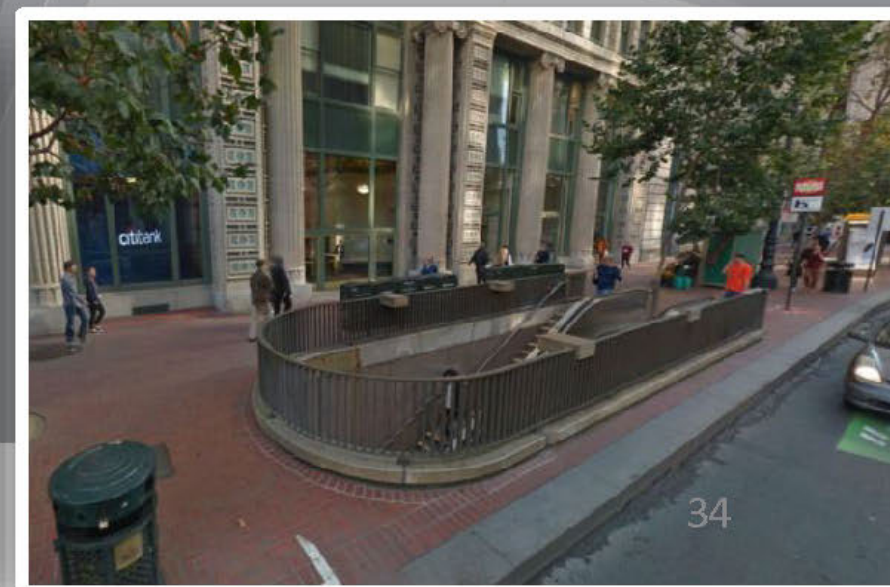
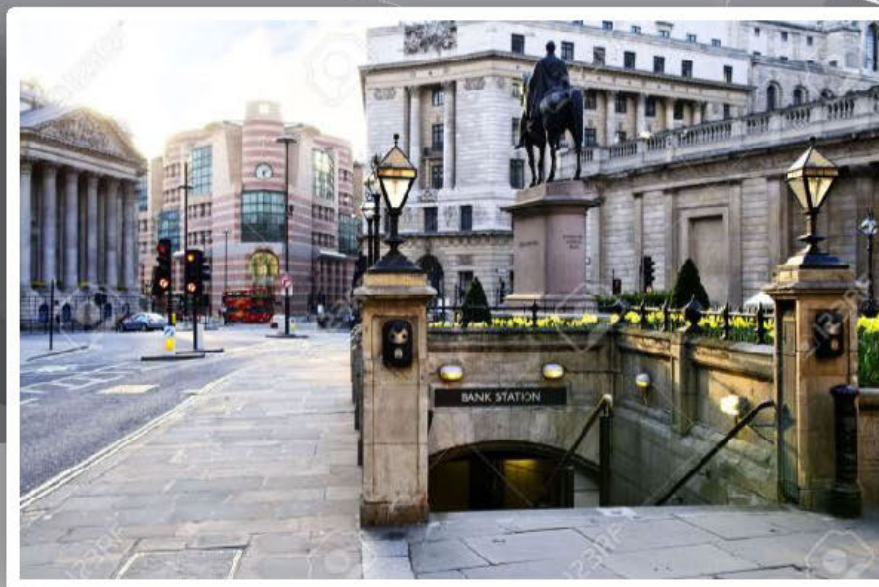
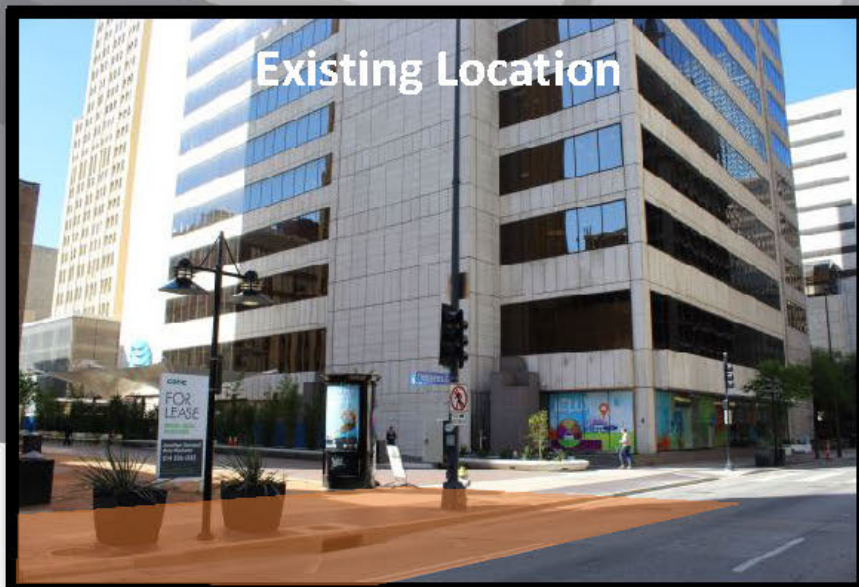


Commerce Station | Focus Area Isometric

Browder Street Mall Pedestrian Portal Access



- Browder Street Mall**
- Approved thoroughfare amendment provides ample space paralleling Commerce for access.
 - Compliment the proposed streetscape environment.
 - Make wayfinding intuitive.



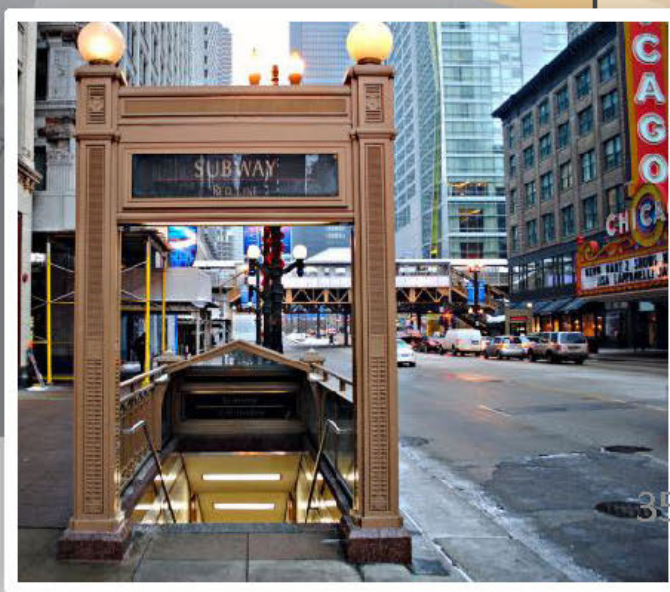
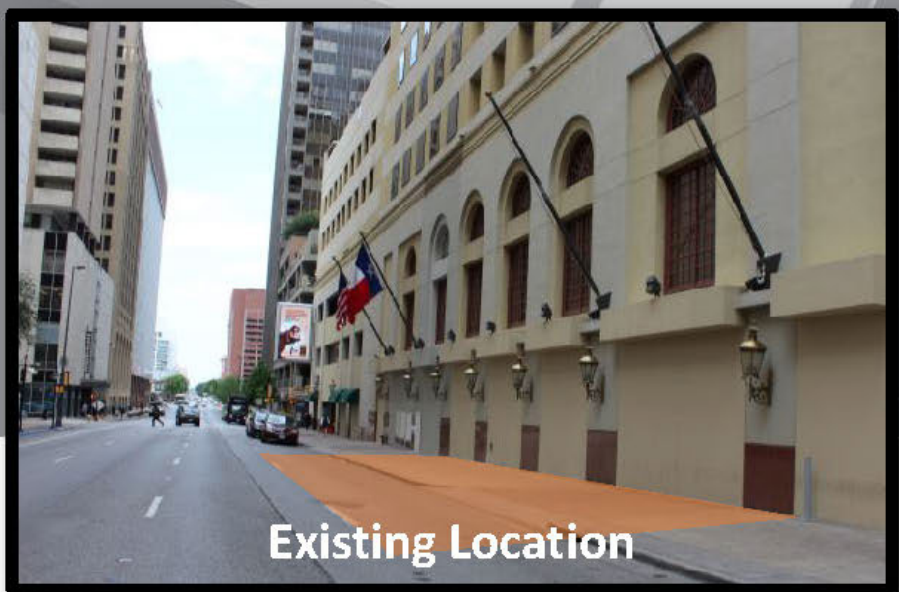
D2 SUBWAY ALTERNATIVE | *Commerce / Victory / Swiss*



Commerce Street at The Adolphus Pedestrian Portal Access



- Commerce Street**
- Approved thoroughfare amendment provides ample space paralleling Commerce for access.
 - Compliment the proposed streetscape environment.
 - Make wayfinding intuitive.



Pegasus Plaza Pedestrian Portal Access



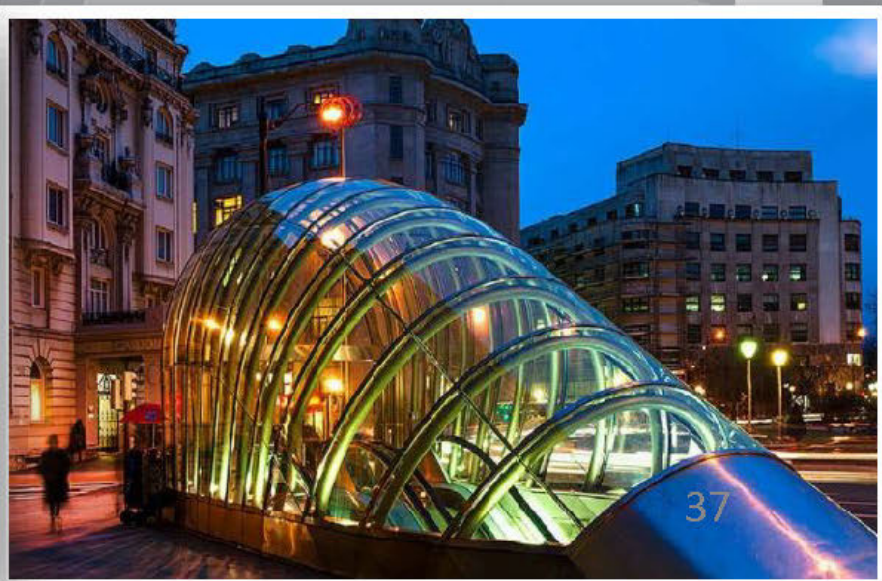
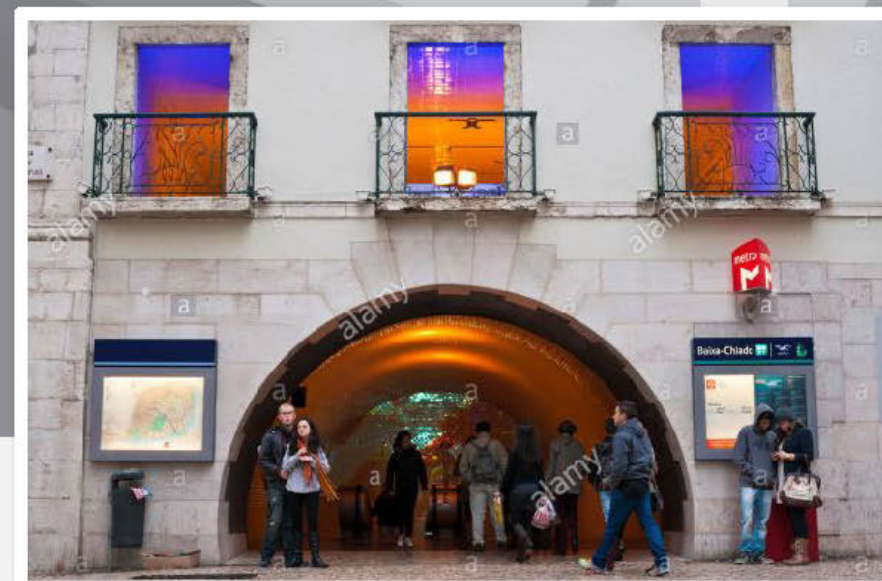
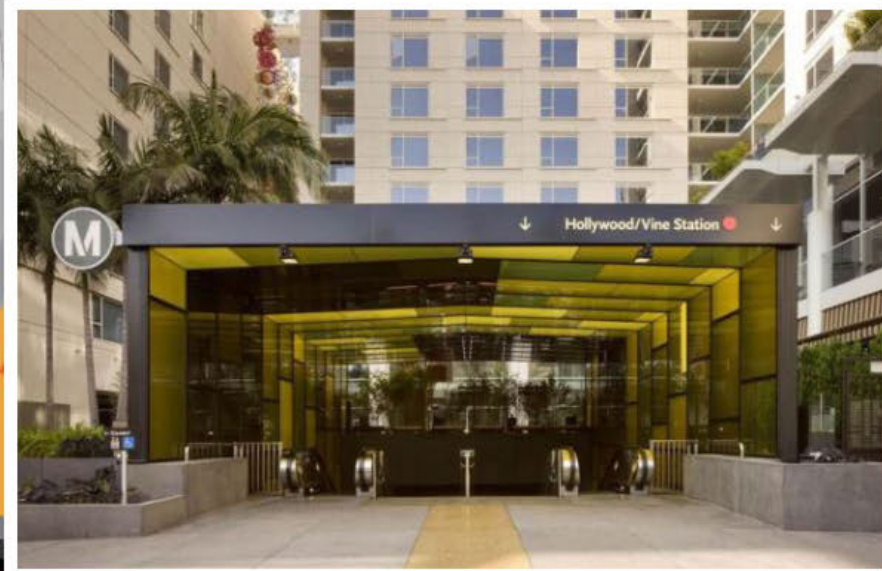
- Pegasus Plaza**
- Added amenity at plaza.
 - Potential placement along Akard.
 - Access point stretches to Main Street to accommodate users to the north of the station.



D2 SUBWAY ALTERNATIVE | *Commerce / Victory / Swiss*



Other Potential Pedestrian Portal Access



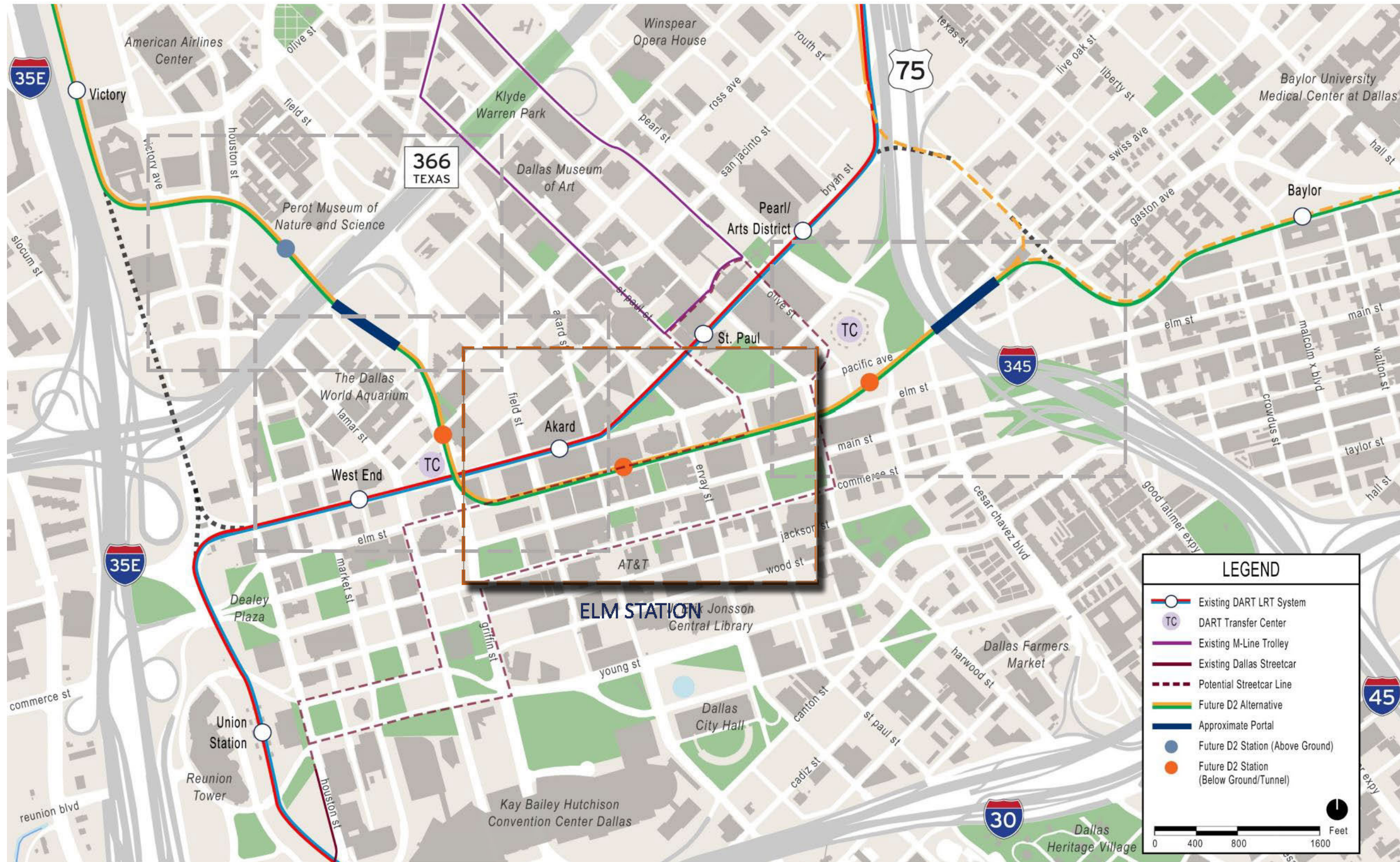
CONCEPTUAL FOR DISCUSSION PURPOSES ONLY

D2 SUBWAY ALTERNATIVE | *Elm* / Victory / Swiss



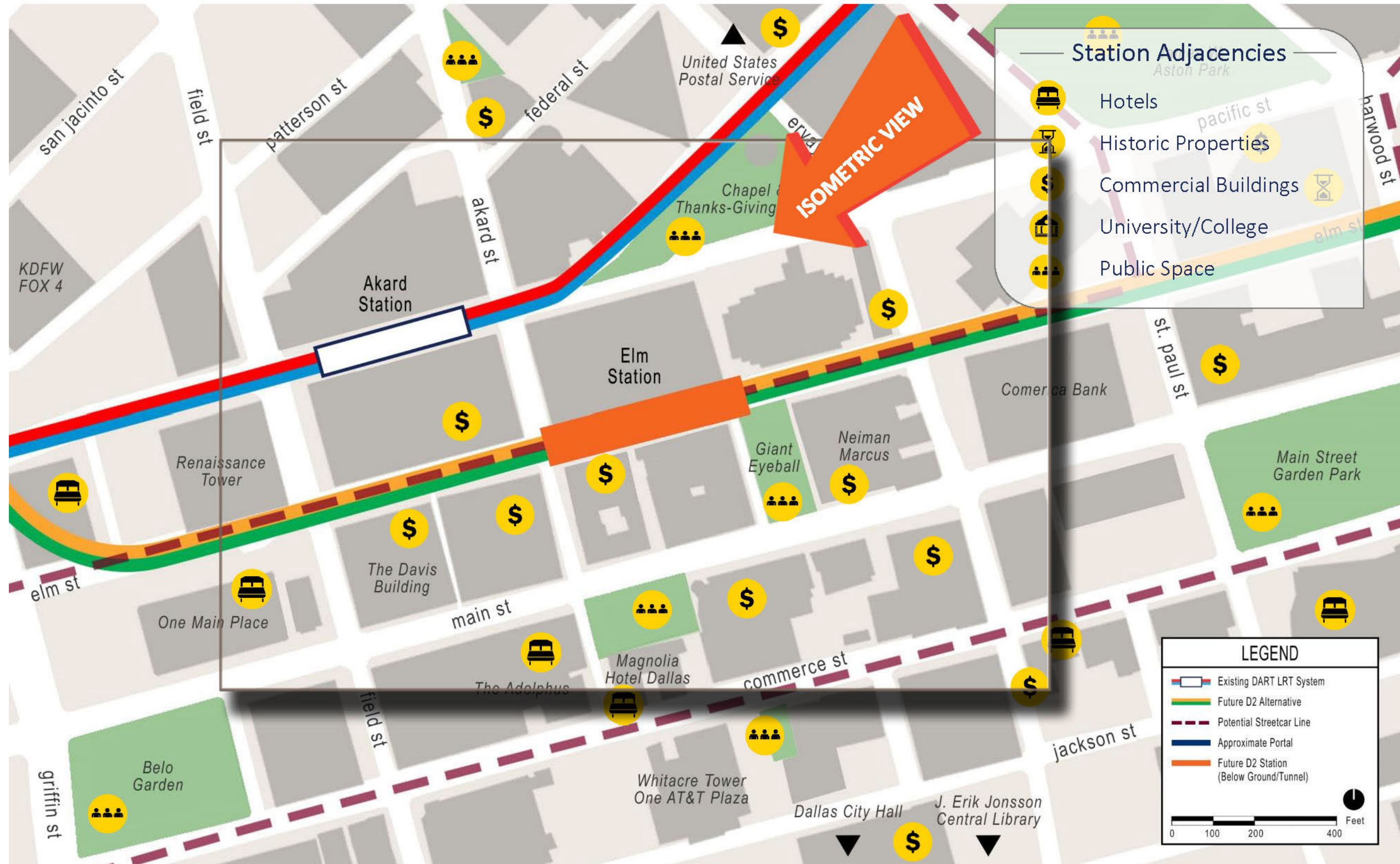
CONCEPTUAL FOR DISCUSSION PURPOSES ONLY

D2 SUBWAY ALTERNATIVE | *Elm* / Victory / Swiss

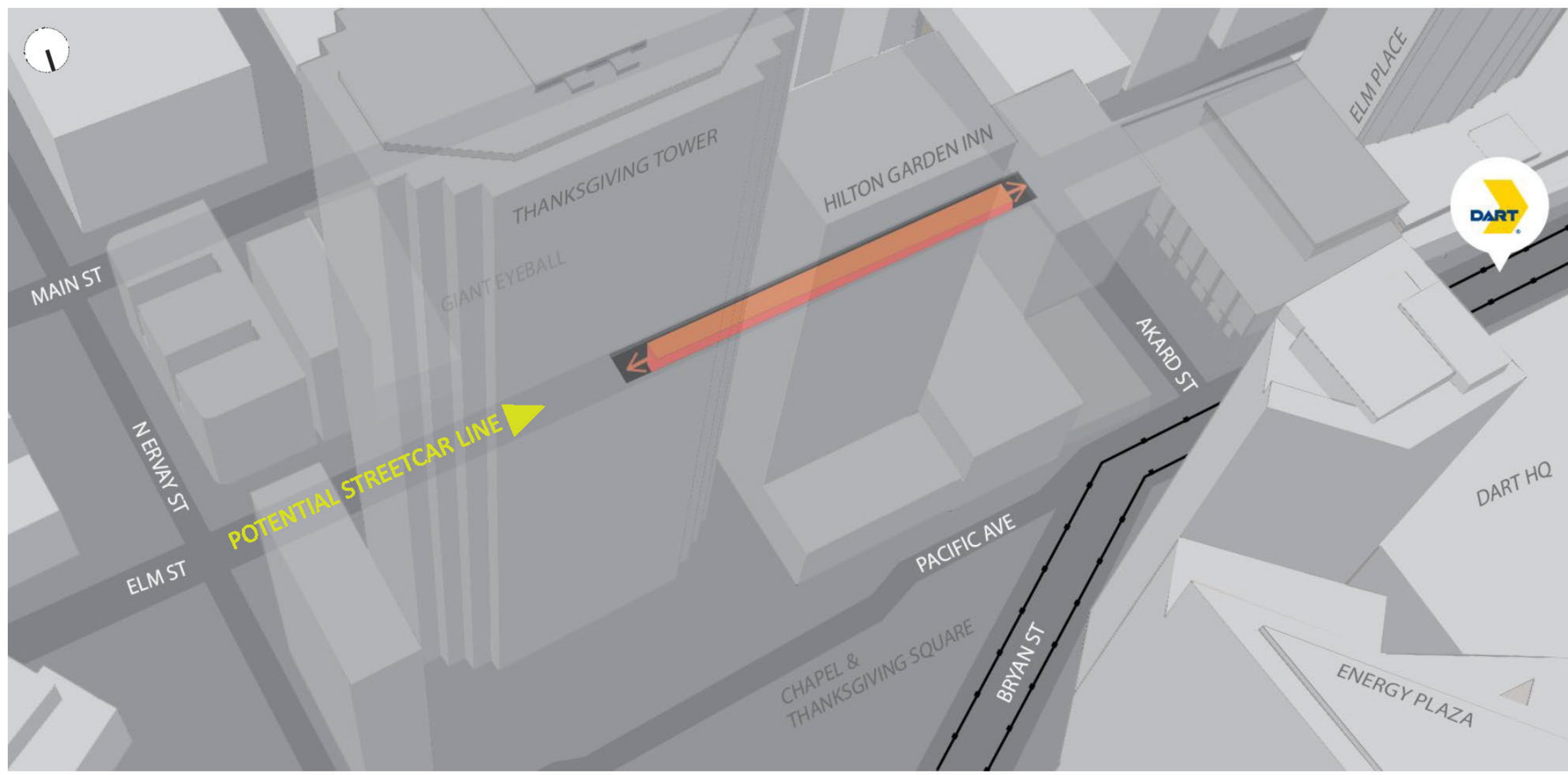


Elm Station Focus Area

CONCEPTUAL FOR DISCUSSION PURPOSES ONLY D2 SUBWAY ALTERNATIVE | *Elm* / Victory / Swiss



Elm Station | 500 – 700 ft Length Under Elm Street

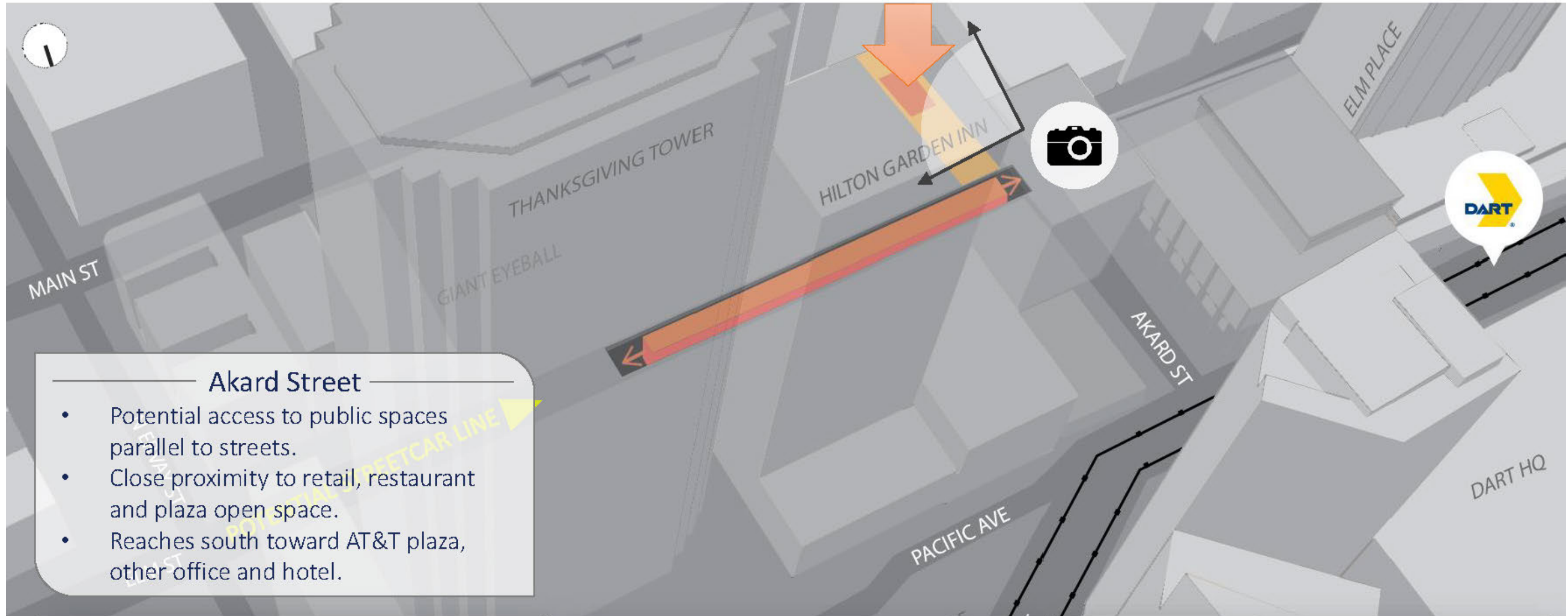


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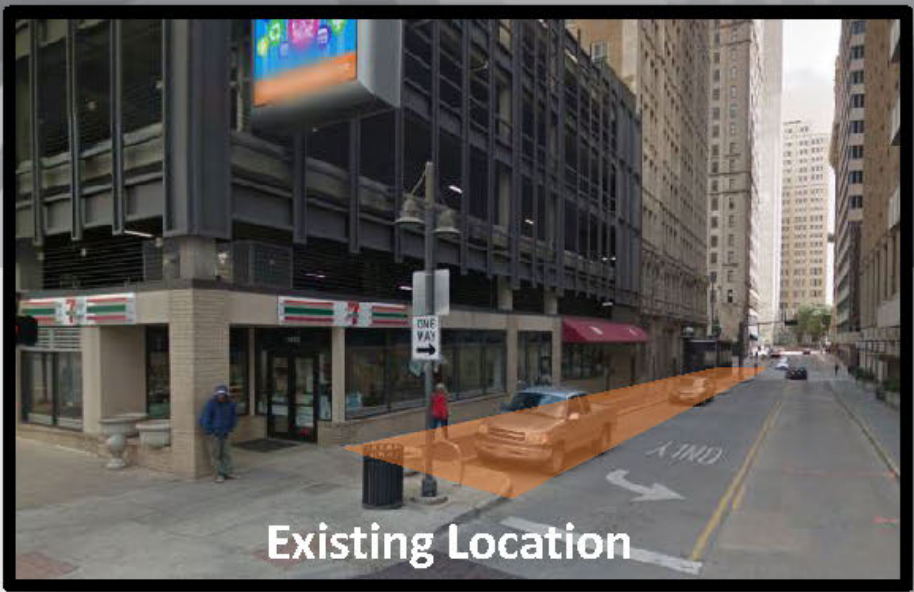
D2 SUBWAY ALTERNATIVE | *Elm* / Victory / Swiss



Akard Street Pedestrian Portal Access



- Akard Street**
- Potential access to public spaces parallel to streets.
 - Close proximity to retail, restaurant and plaza open space.
 - Reaches south toward AT&T plaza, other office and hotel.

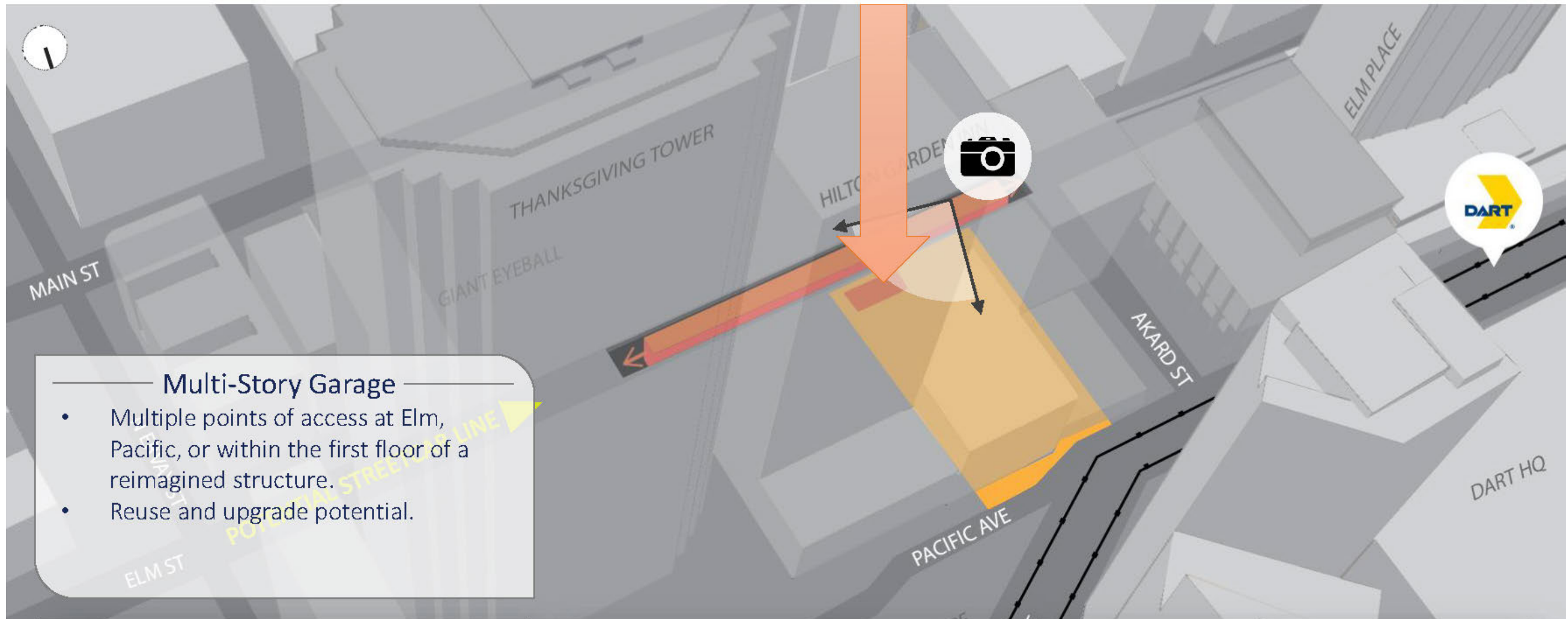


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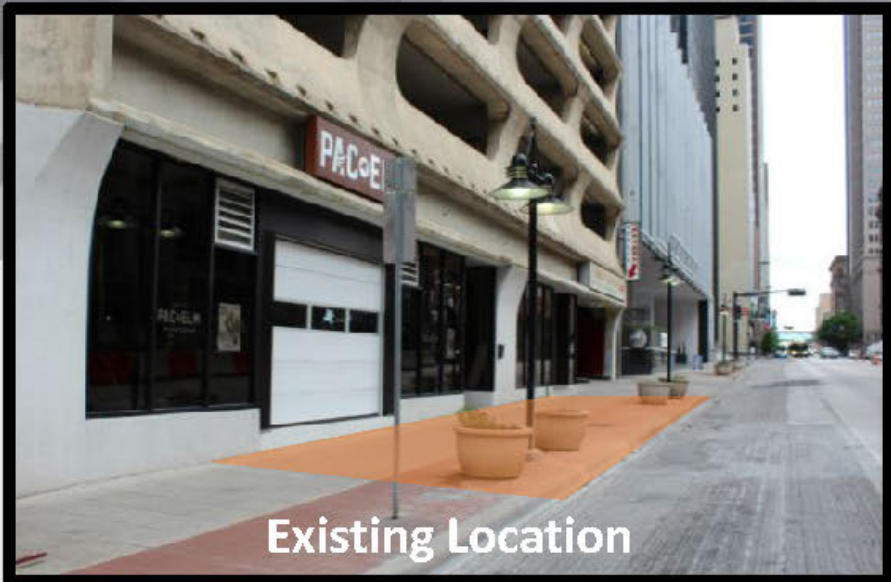
D2 SUBWAY ALTERNATIVE | *Elm* / Victory / Swiss



Multi-Story Garage Pedestrian Portal Access



- Multi-Story Garage**
- Multiple points of access at Elm, Pacific, or within the first floor of a reimagined structure.
 - Reuse and upgrade potential.



CONCEPTUAL FOR DISCUSSION PURPOSES ONLY

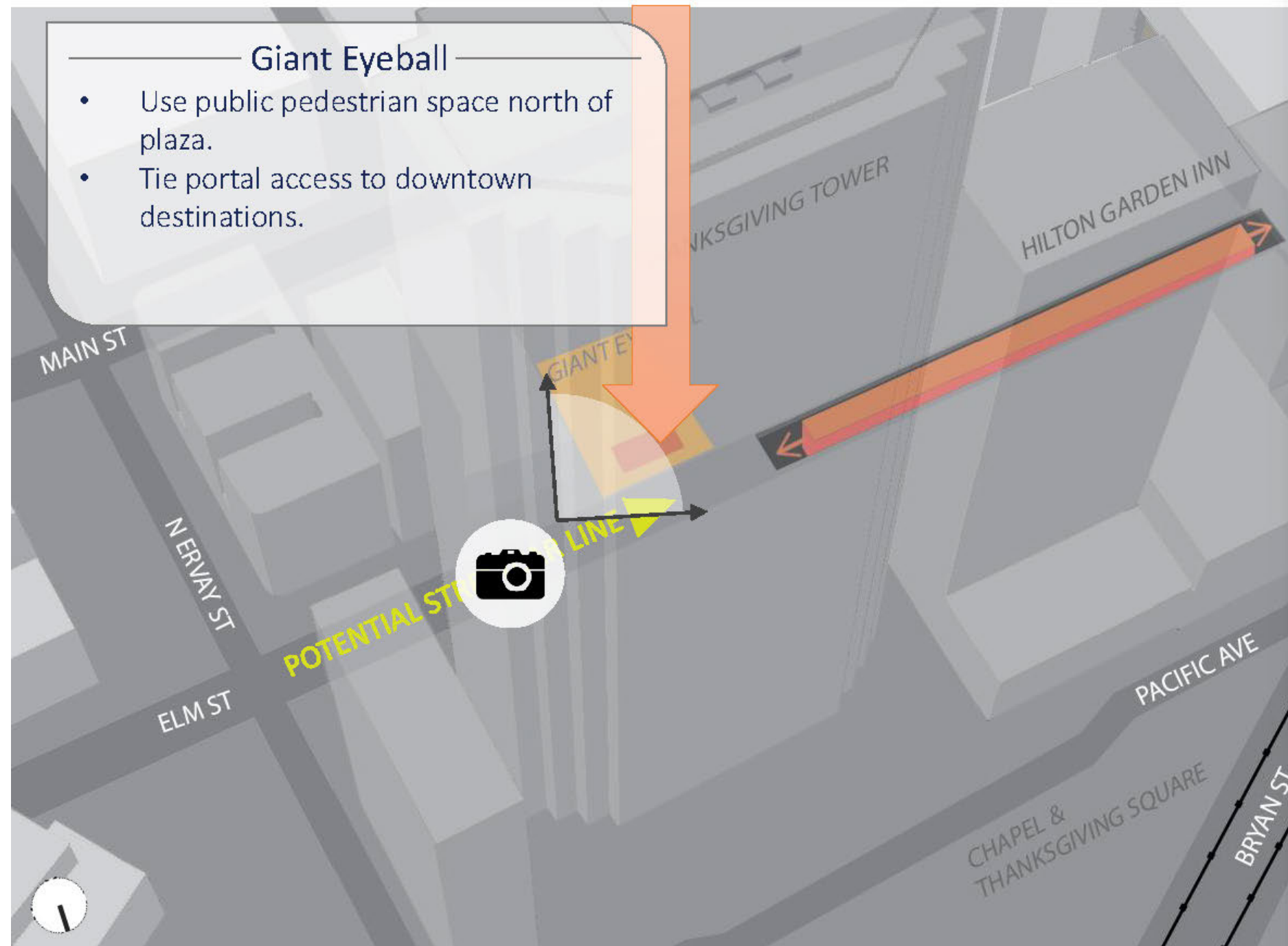
D2 SUBWAY ALTERNATIVE | *Elm* / Victory / Swiss



Giant Eyeball Pedestrian Portal Access



Existing Location



CONCEPTUAL FOR DISCUSSION PURPOSES ONLY

D2 SUBWAY ALTERNATIVE | *Elm* / Victory / Swiss



1700 Pacific Plaza Pedestrian Portal Access

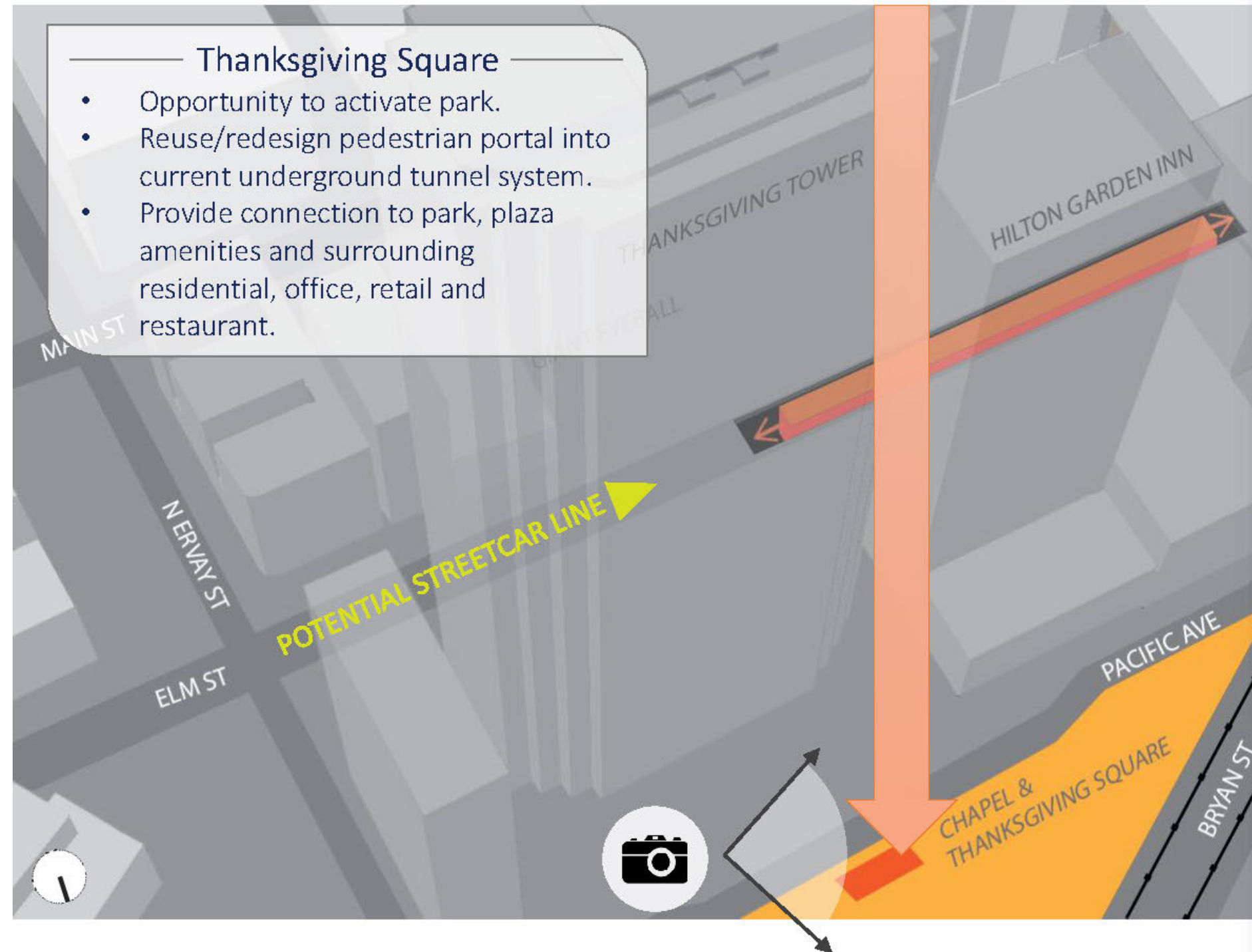


CONCEPTUAL FOR DISCUSSION PURPOSES ONLY

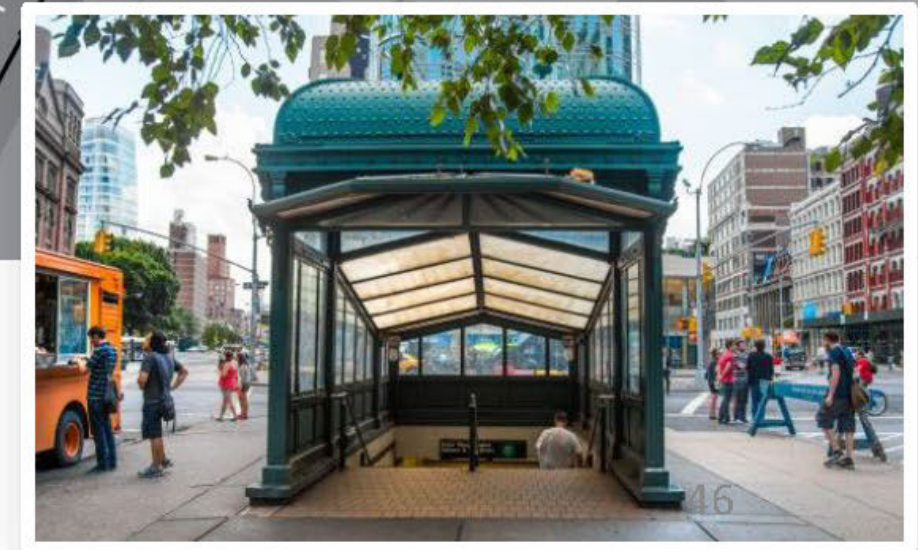
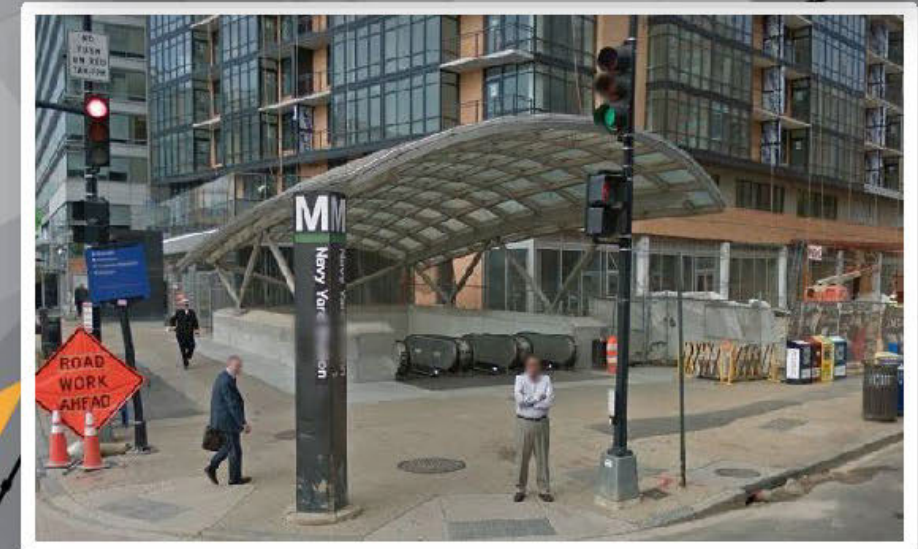
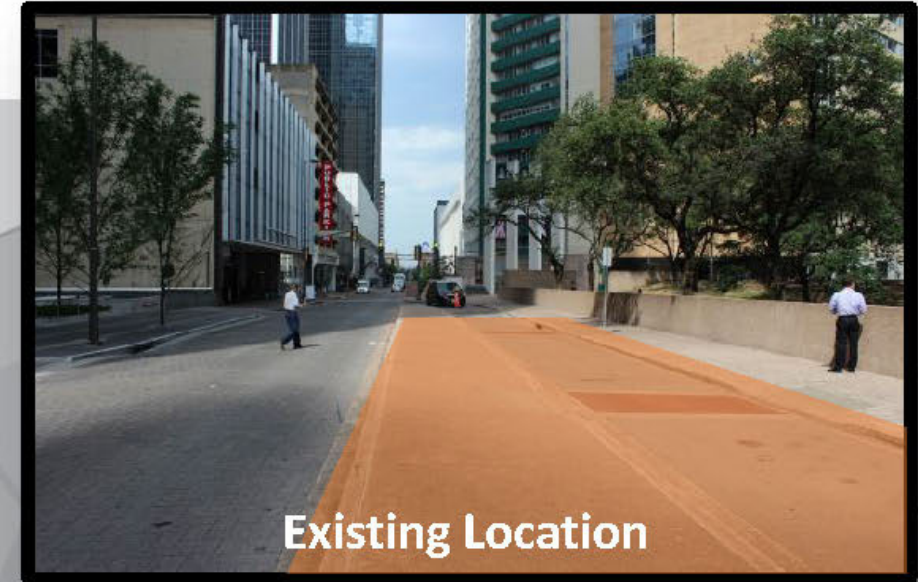
D2 SUBWAY ALTERNATIVE | *Elm* / Victory / Swiss



Thanksgiving Square Pedestrian Portal Access



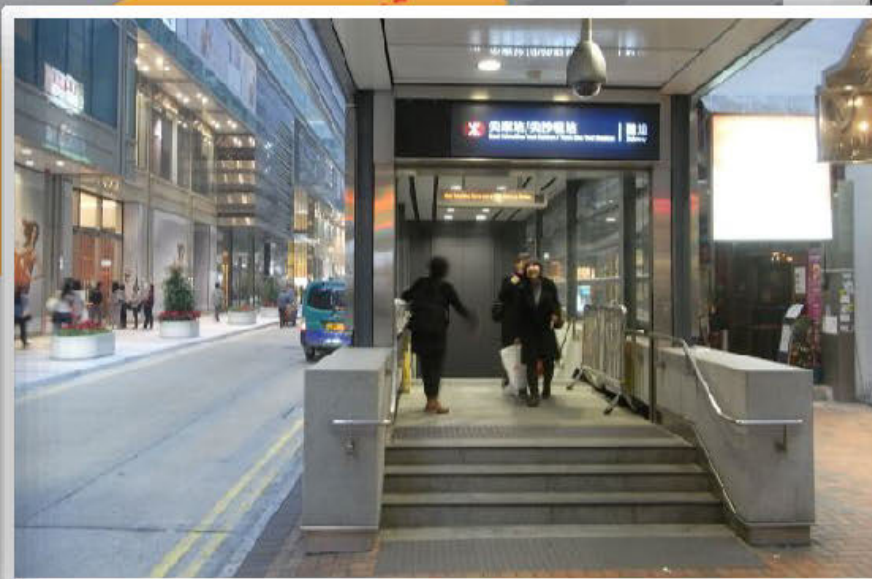
- Thanksgiving Square —
- Opportunity to activate park.
 - Reuse/redesign pedestrian portal into current underground tunnel system.
 - Provide connection to park, plaza amenities and surrounding residential, office, retail and restaurant.



CONCEPTUAL FOR DISCUSSION PURPOSES ONLY D2 SUBWAY ALTERNATIVE | *Elm* / Victory / Swiss



Other Potential Pedestrian Portal Access



Ventilation and Emergency Access

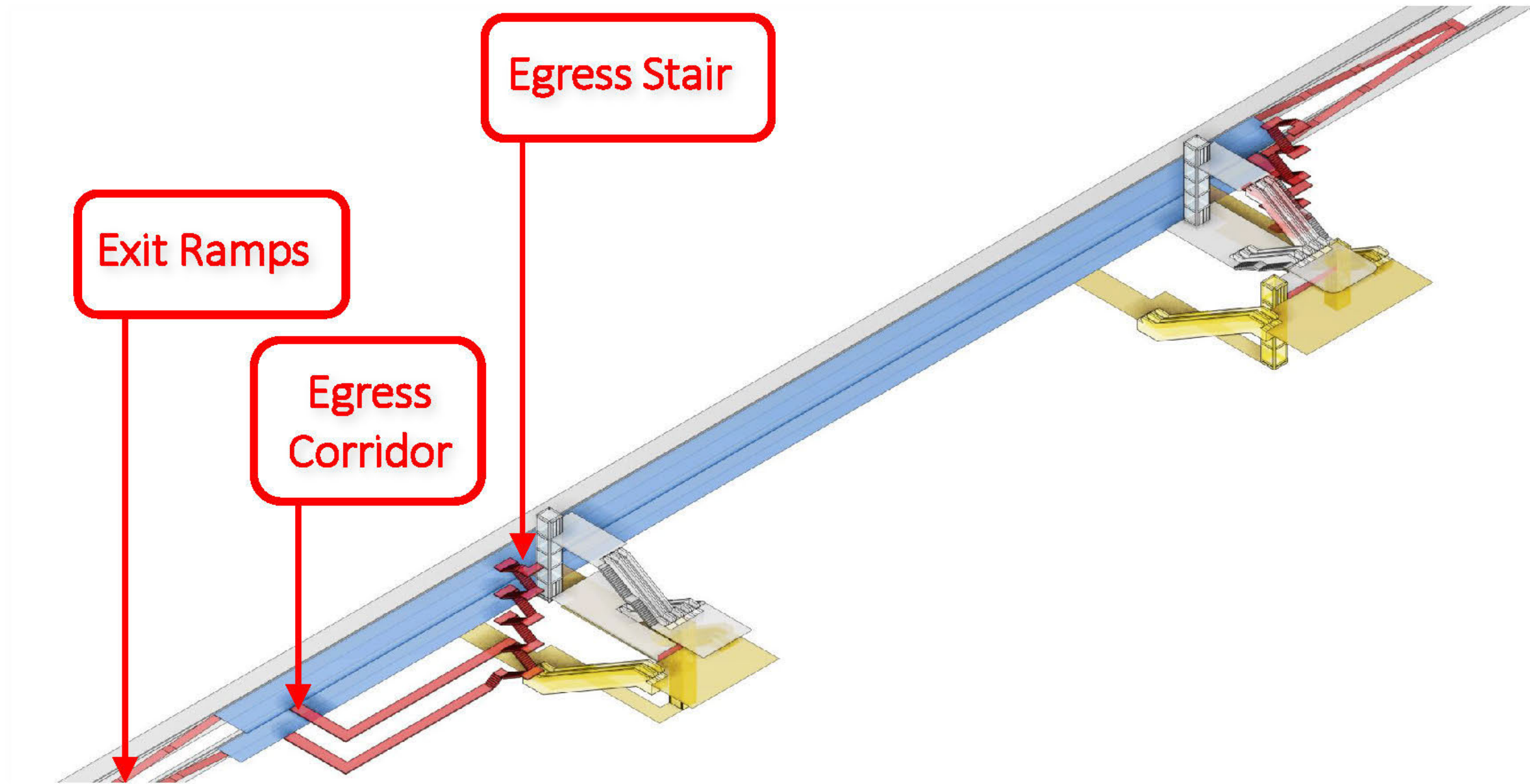
- Fully integrate ventilation and emergency egress structures into new or existing development where possible.
- Full screen any ventilation structures in the right-of-way or provide flush gratings. Do not place gratings in sidewalks where possible.
- Where ventilation shafts cannot be incorporated into new or existing construction, provide context sensitive architectural design and incorporate artwork where possible.

National Fire Protection Association

- NFPA 130: Standard for Fixed Guideway Transit and Passenger Rail Systems
- Fire protection and life safety requirements for fixed guideway transit
 - Ventilation shafts
 - Emergency egress at least every 1,250 feet



Ventilation/Emergency Access





let's go.

DART.org⁵¹