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.

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

c: T.C. Broadnax, City Manager
Larry Castro, City Attorney
Craig D. Kinton, City Auditor
Ross 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 YOE) 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

Key Objectives

Range of Reasonable Subway Alternatives

Screening Evaluation

Short List of Subway Alternatives

Detailed Evaluation

Refined D2 LPA Recommendation

Dec-Jan

Jan-Feb

Mar-May

May-June
LPA Refinement Phase

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<tr>
<th>LPA REFINEMENT PHASE</th>
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<td>Decision Milestone</td>
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WE ARE HERE
### D2/Streetcar Connected Schedule

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**D2 SUBWAY SCHEDULE**

- **LPA Refinement**
- **Subway Decision**
- **Refined LPA Approval**
- **2-Year PD Extension**
- **Early Utility Relocations**
- **Design-Build**

**DALLAS CENTRAL STREETCAR LINK**

- **LPA Selection**
- **2-Year Project Development**
- **Design-Build***

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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

PUBLIC INPUT

POLICY & MANAGEMENT

DART BOARD

DALLAS CITY COUNCIL
POLICY COMMITTEE
DART STAFF/CONSULTANT TEAM

STAKEHOLDERS

STAKEHOLDER COMMITTEE
TECHNICAL COMMITTEE
DDI MOBILITY COMMITTEE
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

GOOD TUNNELING MATERIAL

POOR TUNNELING MATERIAL
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

Street
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
## Summary of Technical Committee and Stakeholder Committee Findings

<table>
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<tr>
<th>ALTERNATIVE</th>
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<td>ROUTH</td>
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ARTS DISTRICT CORRIDOR

DART Victory ROW Option

Complex Junction Configuration
May require LRT system out of service
Discussion of Subway Alternatives

Primary Corridors

PACIFIC CORRIDOR

- DART Victory ROW Option
- Swiss Option
  - Portal west of IH 345
- Swiss Option
  - Portal east of IH 345

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

Rail Corridor Option
Discussion of Subway Alternatives

**Primary Corridors**

**ELM CORRIDOR**

- **DART Victory ROW Option**
- **Swiss Option**
  - Portal east of IH 345

**Rail Corridor Option**

- Green Line track reconstruction (embedded track) and Deep Ellum Station removal/relocation
Discussion of Subway Alternatives

Primary Corridors

**COMMERCE CORRIDOR**

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

- **Swiss Option**
  - Portal west of IH 345

- **DART Victory ROW Option**

- **Rail Corridor Option**

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

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

Portal north of Victory Station

Swiss Option
Portal in Museum Way

Complex Junction Configuration
May require LRT system out of service
Discussion of Subway Alternatives

Primary Corridors

WOOD CORRIDOR

DART Victory ROW Option

Swiss Option
Portal west of IH 345

Good Latimer Option
Portal west of IH 345

Green Line track reconstruction (embedded track) and Deep Ellum Station removal/relocation
Discussion of Subway Alternatives

**Primary Corridors**

- **YOUNG CORRIDOR**
  - **DART Victory ROW Option**
  - **Swiss Option**
    - Portal west of IH 345
  - **Good Latimer Option**
    - Portal west of IH 345

- **Green Line track reconstruction (embedded track) and Deep Ellum Station removal/relocation**
Discussion of Subway Alternatives

Primary Corridors

CANTON CORRIDOR

DART Victory ROW Option

Portal west of IH 345

Good Latimer Option
Portal west of IH 345
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