

# Memorandum



CITY OF DALLAS

DATE February 24, 2017

TO The Honorable Members of the Transportation and Trinity River Project Committee:  
Lee M. Kleinman (Chair), Deputy Mayor Pro Tem Erik Wilson (Vice-Chair), Sandy Greyson,  
Mayor Pro Tem Monica R. Alonzo, Adam Medrano, and Casey Thomas II

SUBJECT Urban Transit Design Guidelines

On Monday, February 27, 2017, you will be briefed on Urban Transit Design Guidelines. Copies of the Urban Transit Design Guidelines Document and briefing materials are attached for your review.

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

A handwritten signature in blue ink, appearing to read 'Alan E. Sims'.

Alan E. Sims  
Chief of Neighborhood Plus

## Attachments

c: T.C. Broadnax, City Manager  
Larry Casto, City Attorney  
Craig D. Kinton, City Auditor  
Rosa A. Rios, City Secretary  
Daniel F. Solis, Administrative Judge  
Mark McDaniel, Acting First Assistant City Manager  
Kimberly Bizer Tolbert, Chief of Staff to the City Manager  
Eric D. Campbell, Assistant City Manager

Jill A. Jordan, P.E., 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

# Urban Transit Design Guidelines

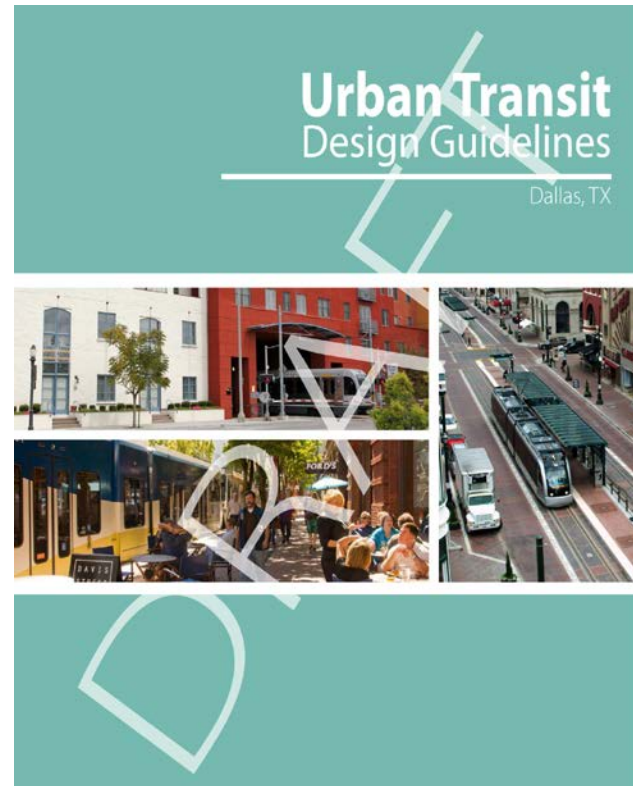
**Transportation and Trinity  
River Project Committee  
February 27, 2017**

**Peer Chacko, Director  
Planning and Urban Design  
City of Dallas**



# Presentation Overview

- Background
- Purpose
- The Vision
- Applicability and Review Process
- Design Guidelines
- Proposed Action
- Next Steps
- Appendix



# Background

- Impetus for *Urban Transit Design Guidelines* came from Downtown stakeholders desire for well designed integration of D2 Light Rail and Central Dallas Streetcar projects into the urban fabric
- Drafted by City staff in partnership with the Downtown Dallas Inc. Mobility Committee with input from DART staff
- Developed based on best practices in consultation with:
  - Downtown Dallas 360 Plan
  - Dallas Complete Street Design Manual
  - Dallas Area Rapid Transit Light Rail Project Design Criteria
  - City of Dallas Tax Increment Financing Districts Urban Design Guidelines
  - National Association of City Transportation Officials (NACTO) *Transit Street Design Guide*

# Purpose

- To present draft *Urban Transit Design Guidelines* to be used for review of transit projects in and around Downtown Dallas
- To receive Committee input on the proposed guidelines and review process prior to scheduling Council action

# The Vision

- Promote the Downtown Dallas 360 mobility goal of creating a balanced multimodal, regional and local transportation system that:
  - Supports the urban design and livability goals for Greater Downtown Dallas
  - Improves inter-district connectivity for all modes including transit, bicycles, pedestrians and automobiles
  - Does not require a car for short trips, and ensures a safe, well-lit, comfortable and accessible environment for a diverse base of users
  - Encourages mixed use, pedestrian-oriented design and development
  - Responds proactively to future trends in technology, demographics and user preferences

# The Vision (continued)

- All future transit projects should emulate the following principles:
  - Creation of pedestrian friendly stations that are accessible, safe, encourage transit ridership and contribute to the public realm through street-level activation and high quality materials and detailing
  - Contribution to a sustainable urban environment by following low impact development standards and incorporating appropriate native landscaping
  - Integration of streetscapes that enhance and encourage pedestrian activity while safely accommodating all modes of transportation
  - Enhancement of economic development potential along transit corridors and transit-oriented development around stations

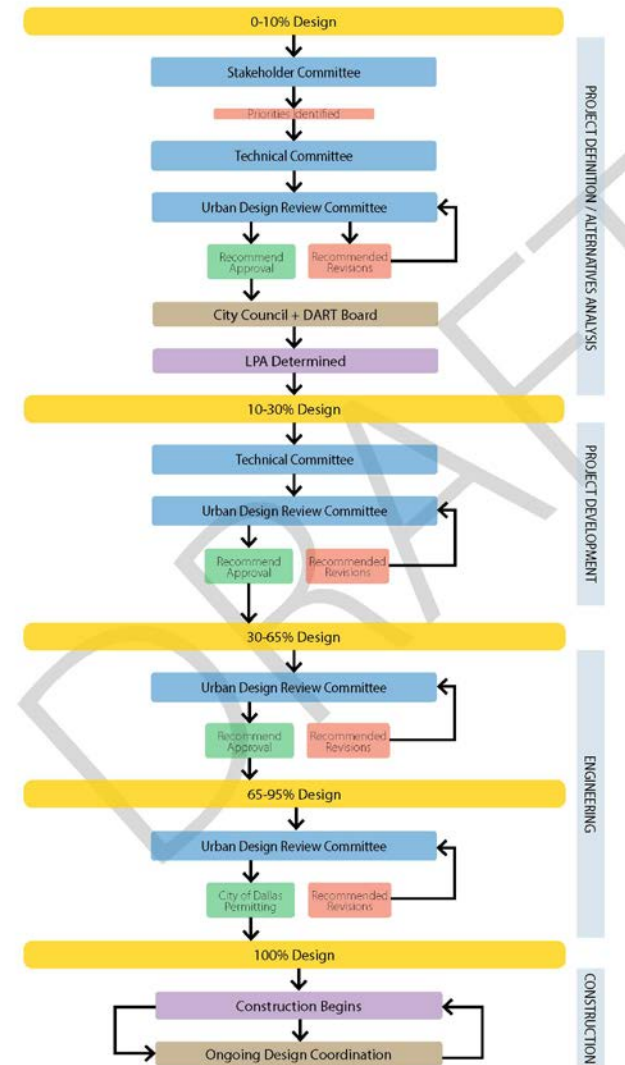
# Applicability

- Guidelines are intended to apply to all future transit projects in and around Downtown, and address City of Dallas and DART rights-of-way for the full length of transit project corridors within this geography.
- Guidelines are intended to be advisory (non-regulatory) and to supplement existing DART Design Criteria in order to address quality of the public realm and experience of the transit passenger through a review process.
- City of Dallas and DART would be responsible for ensuring timely review of all project submittals and for active engagement of appropriate stakeholders.
- Application of the guidelines would be the responsibility of the implementing agency (DART) and its design team.



# Review Process

- The review process is integrated into DART’s Alternatives Analysis process by introducing an Urban Design Review Committee to complement DART’s Stakeholder and Technical Committees.
- Prior to determination of the Local Preferred Alignment (LPA), the Urban Design Review Committee role is to provide urban design input on all options.
- After the LPA selection, the Urban Design Review Committee plays an ongoing advisory role at key stages through project development and engineering, in order to facilitate a desirable urban design outcome.

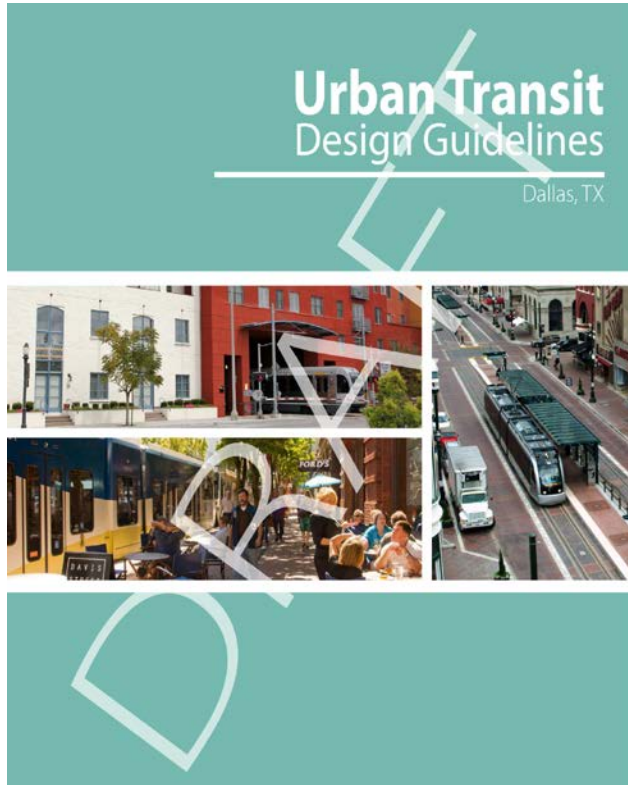


# Urban Design Review Committee

- The existing City of Dallas Urban Design Peer Review Committee is recommended to fulfill this role:
  - Has 5 years of experience reviewing private projects that receive City incentives as well as some public street design projects
  - Consists of 9 members representing expertise in the fields of architecture (4), landscape architecture (2), engineering (2), and planning (1)
  - Members are appointed by the City Manager and serve 2-year staggered terms up to a 3-term limit



# Design Guidelines



- Station Facility Design
- At-Grade Alignment Design Considerations
- Corridor Design Element Considerations
- Additional Design Considerations
- Adjacent Development Considerations

# Station Facility Design

- Underground Stations
  - Station Portal Design
  - Station Portal Placement
  - Platform Design + Amenities
  - Station Artwork
  - Wayfinding
  - Bike Parking and Facilities
- Surface Stations
  - Landscaping
  - Wayfinding
  - Accessibility
  - Lighting
  - Bike Parking and Facilities
  - Station Amenities
  - Layout and Block Design
  - Station/ Shelter Design
  - Passenger vs. Pedestrian Zones



# At-Grade Alignment Design Considerations

- At-Grade Alignment Design
  - Street Grid Fabric
  - Development Potential
  - Infrastructure Improvements
  - Stormwater Management



# Corridor Design Element Considerations

- Corridor Design Elements
  - Intersection Design
  - Track Design
  - Landscaping
  - Sidewalk Design + Amenities
  - Bike Lanes
  - Paving Materials
  - Train Portals
  - Catenary Poles + Lighting
  - Substations + Service Buildings



# Additional Design and Development Considerations

- Additional Design Considerations
  - Land Acquisition and Development
  - Development Air Rights
  - Public Art
  - Sound, Vibration, and Visual Mitigation
  - Operations
- Adjacent Development Considerations
  - Development Character
  - Street and Block Design
  - Pedestrian Level Design
  - Sidewalk and Landscape Design



# Proposed Action

- Adoption of *Urban Transit Design Guidelines* by Council resolution to serve as the basis for design review of transit projects in accordance with Article II Section 6.2 (Applicable City Codes) of the City of Dallas / Dallas Area Rapid Transit Master Interlocal Agreement (ILA)
- Article II Section 6.2 of the ILA provides that DART will comply with all applicable codes, ordinances, permit regulations, review procedures, City plans or other City regulations

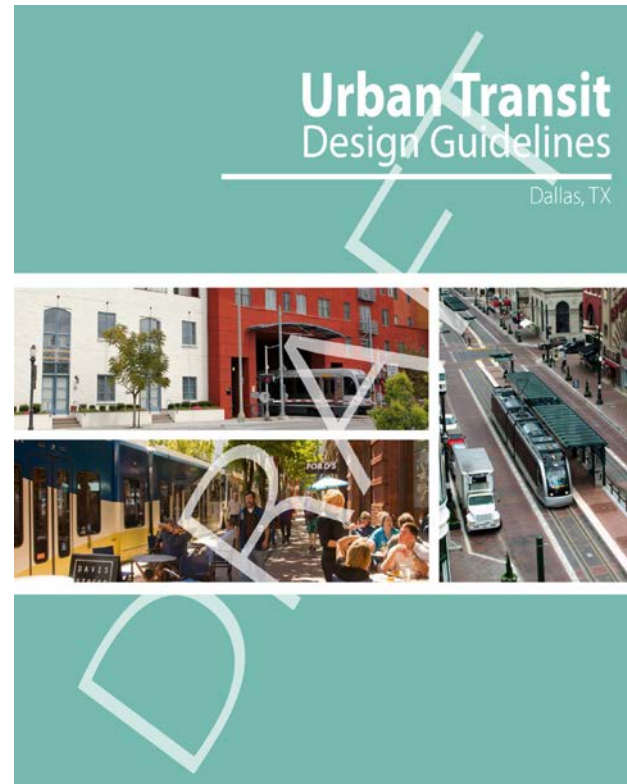


# Next Steps

- Incorporate Committee input on the guidelines and review process
- Schedule Council adoption of the *Urban Transit Design Guidelines* in April 2017
- Institute the design review process for the D2 Light Rail and Central Dallas Streetcar projects

# Appendix

- Draft *Urban Transit Design Guidelines* Document



# Urban Transit Design Guidelines

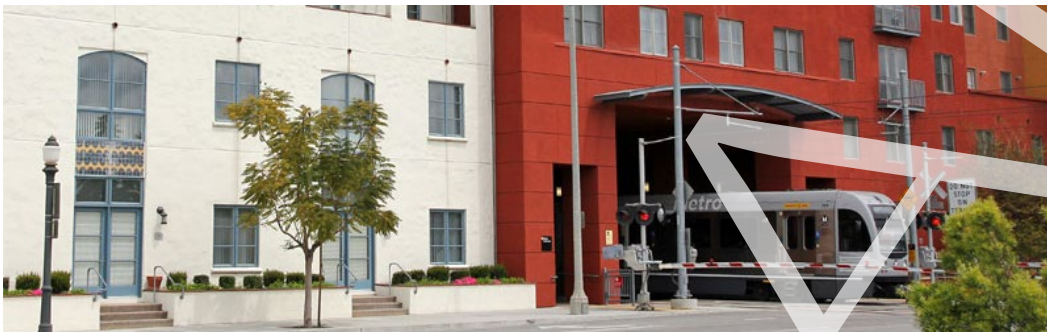
**Transportation and Trinity  
River Project Committee  
February 27, 2017**

**Peer Chacko, Director  
Planning and Urban Design  
City of Dallas**



# Urban Transit Design Guidelines

Dallas, TX



February 22, 2017



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STATION

LEDGETTER

10-8



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# Acknowledgements

## Downtown Dallas Inc

Jacob Browning  
Dustin Bullard  
John Crawford  
Kourtney Garrett  
Shalissa Perr  
Amy Tharp

Mobility Committee

Brian Adams  
Mitch Gatewood  
Larry Good  
Mark Goode  
Jim Harris  
Steve Hulse  
Patrick Kennedy  
Jim Knight  
Ramsey March  
Craig Melde  
Theresa O'Donnell  
Tom Persch  
Ben Reavis  
Scott Rohrman  
Steve Salin  
Jerry Smiley  
Kristian Teleki  
Allan Zreet - Committee Chair

## City of Dallas

Tanya Brooks  
Peer Chacko  
Daniel Church  
Arturo Del Castillo  
Evan Sheets  
Jared White

## Consulted Documents

City of Dallas, Downtown Dallas Inc. (2011).  
*Downtown Dallas 360 - A Pathway to the Future*

City of Dallas. (2016). *City of Dallas Complete Streets Design Manual*

City of Dallas Office of Economic Development. (2012). *Urban Design Guidelines for Projects located in City of Dallas Tax Increment Financing Districts.*

Dallas Area Rapid Transit. (2005). *Dallas Area Rapid Transit Light Rail Project Design Criteria: Volume 1, Facilities Design.*

National Association of City Transportation Officials  
NACTO. (2016). *Transit Street Design Guide.*

\* Quoted guidelines with citations (ex: <sup>NACTO TSDG, 104</sup>) refer to the cited page (ex: Page 104) in the NACTO Transit Street Design Guide (2016)



## Vision

The Downtown Dallas 360 Plan established the mobility goal of creating a balanced multimodal, regional, and local transportation system that supports the urban design and livability goals for the Greater Downtown Dallas area. The intent is to improve inter-district connectivity for all modes, promote alternatives to cars for short trips, encourage mixed-use pedestrian friendly development, and respond to future demographic, user preference, and technological trends.

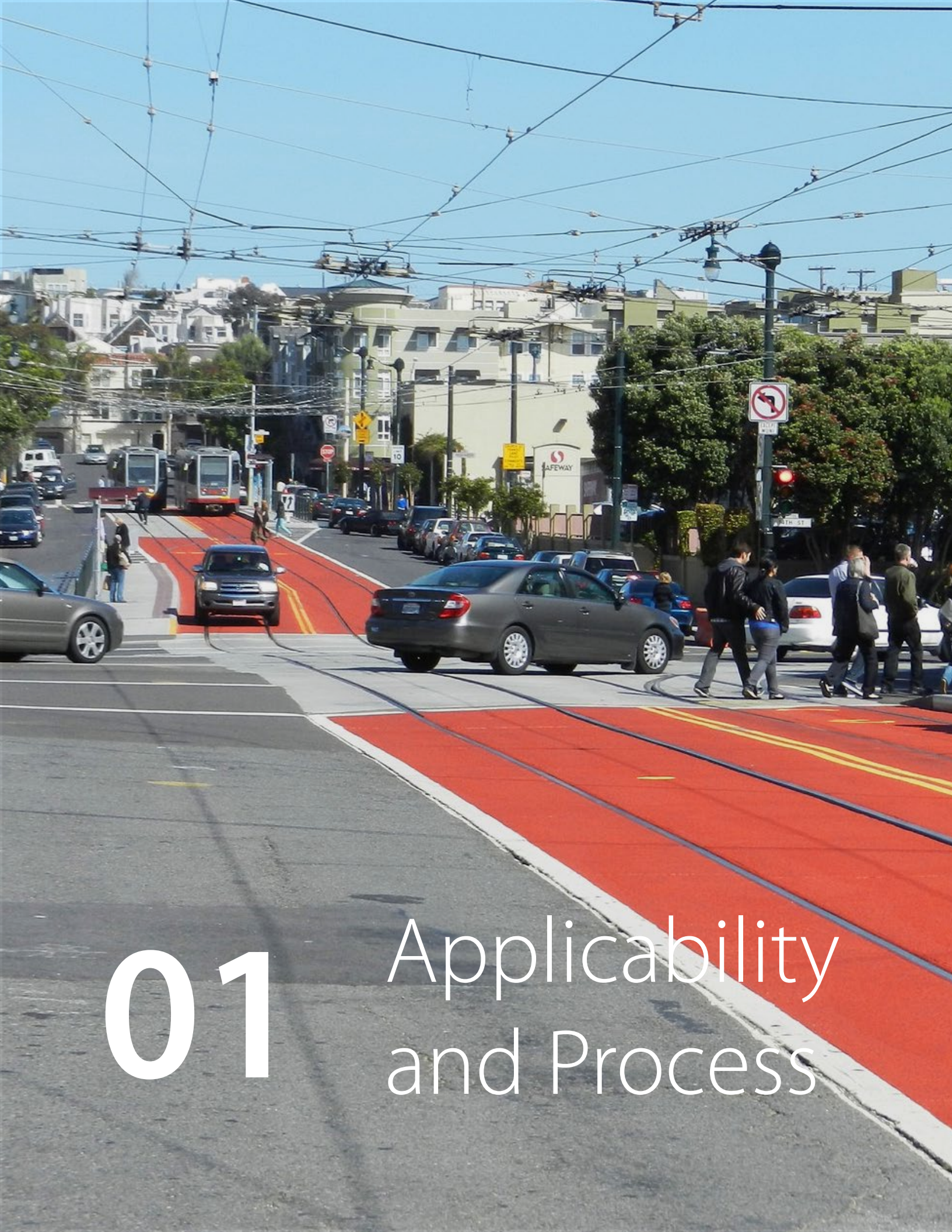
The success of urban transit corridors in the Downtown Dallas area requires balancing high-quality transit service and an inviting environment through welcoming, high-quality design. Urban transit corridors should establish a unifying and distinct identity that may vary by district. In order to achieve the best and most balanced transit outcomes, all future transit projects should emulate the following principles:

- Creation of pedestrian friendly stations that are accessible, safe, encourage transit ridership and contribute to the public realm through street-level activation and high quality materials and detailing
- Contribution to a sustainable urban environment that follows low impact development standards and incorporates appropriate native landscaping
- Integration of streetscapes that enhance and encourage pedestrian activity while safely accommodating all other modes of transportation.
- Enhancement of economic development potential along transit corridors and transit-oriented development around stations

These principles shaped the *Urban Transit Design Guidelines* and will help produce outcomes that benefit the City through economic development and quality of life, as well as DART through increased density, accessibility, and transit ridership. The *Urban Transit Design Guidelines* are intended to provide policy level design guidance for the development of at-grade and below-grade transit corridors and stations in and around Downtown Dallas. Though non-prescriptive in nature, the guidelines establish expectations for the quality of the urban environment in the vicinity of the transit corridors, based on best practices.

The goal is to provide guidance and direction to the urban transit project design team at key decision points in order to ensure desired urban design outcomes and to help facilitate consensus among project stakeholders.





# 01 Applicability and Process



- 8 Applicability
- 8 Process
- 9 Process Diagram



## Applicability

The Urban Transit Design Guidelines outlined in this document apply to all future below and at-grade urban transit corridors in and around Downtown Dallas. They are intended to address the City of Dallas and DART rights-of-way for the full length of the transit corridor, and also address design considerations from adjacent building-face to building face where applicable. Applying these urban design guidelines to future urban transit projects is imperative to creating a city that is inviting, pedestrian-friendly, and transit-friendly.

The Guidelines are intended to be advisory (non-regulatory) and serve as a companion document to the DART Design Criteria. The DART criteria address system compatibility, function, operations, safety and maintenance, while the Guidelines address the quality of the public realm and experience of the passenger. The Downtown Dallas 360 Plan, Dallas Complete Streets Design Manual, and TIF District Urban Design Guidelines are also intended to serve as companion reference documents.

These guidelines are an important piece of the development process, but do not replace the need for continued coordination and partnership between City of Dallas, development partners, and other stakeholders and agencies. It is also not the intent of this document to supercede or take the place of input by affected neighborhoods and/or stakeholders along transit project corridors. While this document provides important guidance and sets expectations for development of urban transit projects, each site and project will have its unique differences. Successful development can only occur if there is ongoing communication between all parties, and a commitment to good design.

## Process

The following process establishes the role of an Urban Design Review Committee and describes the review procedures and expectations for application of the *Urban Transit Design Guidelines*.

The review process has been integrated into DART's typical Alternatives Analysis process by introducing an Urban Design Review Committee to complement DART's Stakeholder and Technical Committees. Application of the *Guidelines* shall be the responsibility of the implementing agency and respective project design team. The City of Dallas and DART will ensure timely urban design review at key decision points during the alternatives analysis, project development, and engineering phases of transit projects. The *Guidelines* should also be used in the development of all design, master planning, site planning and construction documentation activities.

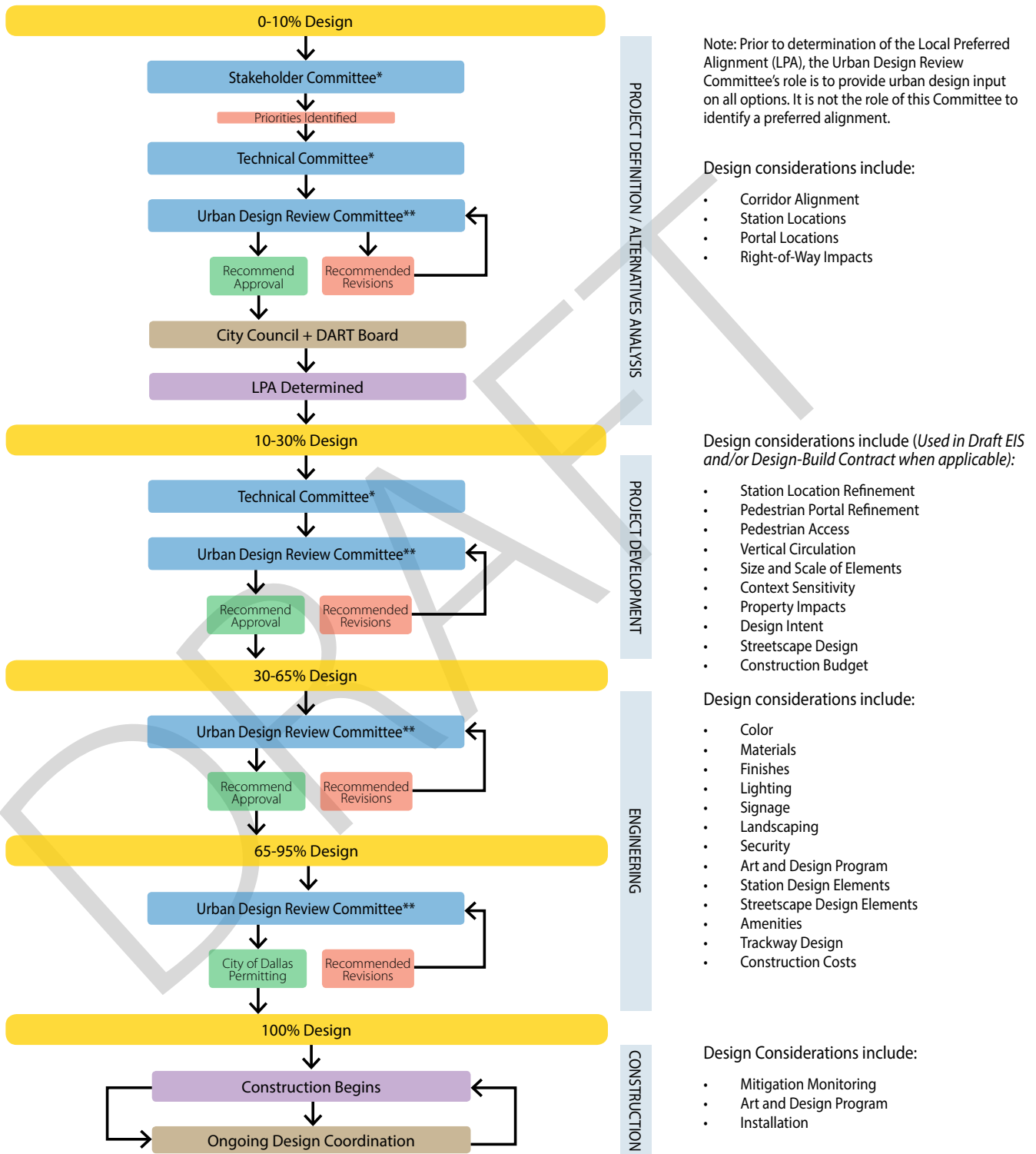
The role of the Urban Design Review Committee (see diagram) will be fulfilled by the City of Dallas' existing, City Manager-appointed, Urban Design Peer Review Panel, which currently performs review functions on private projects receiving City of Dallas incentives as well as public street projects. Prior to determination of the Local Preferred Alignment (LPA), the Urban Design Review Committee's role is to provide urban design input on all options. It is not the role of this Committee to identify a preferred alignment. After the LPA selection, the Urban Design Review Committee plays an ongoing advisory role at key stages through project development and engineering, in order to facilitate a desirable urban design outcome.

After construction begins, City of Dallas and DART staff will have a continuing role to ensure design coordination, particularly for design-build contracts.

# Applicability and Process



This process lays out general expectations for the design review process, using the D2 planning and engineering process, as an example. This process may be modified on a project-by-project basis as needed.



\* "Stakeholder Committee" and "Technical Committee" represent the committees organized by DART as a component of the public input process for choosing the D2 locally preferred alignment alternative

\*\* Urban Design Review Committee role will be fulfilled by the City of Dallas' Urban Design Peer Review Panel

# 02

# Right-of-Way Design Guidelines

**TRI MET**  
**MAX**

Transit Tracker  
7608

**Sept 18:**  
MAX Green Line Service Begins

**Aug 30:**  
MAX Yellow Line Service Begins

**GREEN MEANS GO**

**Sept 12:**  
MAX Green Line Grand Opening

1.1 MAX System

The MAX station area is only for boarding, exiting or waiting for a train. Non-transit use is prohibited.

Be alert and stay safe  
If you see suspicious behavior or a suspicious package, call a transit watchdog at 503.233.3333

SW 5th &  
Jefferson

● ●

Southbound

City Hall  
SW 5th &  
Jefferson

● ●

Southbound

Bus

D

SW Madison ST

12	Station Facility Design
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## Station Facility Design

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Underground station design should integrate seamlessly with the surrounding public realm with pedestrian portal connections designed to provide high quality public places. The relationship of the station to any surrounding development must also be considered to ensure a positive integration that opens up views, sightlines and maximizes connectivity to adjacent development. Subway stations, specifically their portals, should be designed to either fit elegantly and seamlessly into the surrounding neighborhood's character or to make bold architectural statements of their own.

Unlike any other building typology, subway stations are buildings where the distinction between indoor and outdoor is ambiguous. These transitory spaces are complex and require functional efficiency as a minimum to bring order, balance, elegance, and coherence to satisfy the public. Due to this busy and sometimes chaotic station environment, the following environmental factors should be given due consideration:

**Light** - carefully consider the artificial lighting while also maximizing and controlling the amount of natural daylight in the station.

**Color** - the palette of colors must be calm and also compatible with the branding of the station. For people with visual impairments, surfaces must not be too reflective and vertical planes must be well contrasted from horizontal surfaces.

**Sound** - acoustics of the spaces must be well considered and adapted to the use of public announcement systems.

**Spatial Volume** – The spatial volumes must be well proportioned, appropriate for their use and feasible to maintain. Underground stations, pedestrian portals, and transition spaces have an impact beyond their immediate boundary and should be regarded as place makers which influence the local economy, its cultural identity and environmental wellbeing.



## Station Portal Design

- 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.
- Provide bicycle stairways at all stations to ease cyclists and relieve congestion at elevators.
- Elevators should be co-located with primary entrance portal (stairs/ escalator) to the extent possible.

## Station Portal Placement

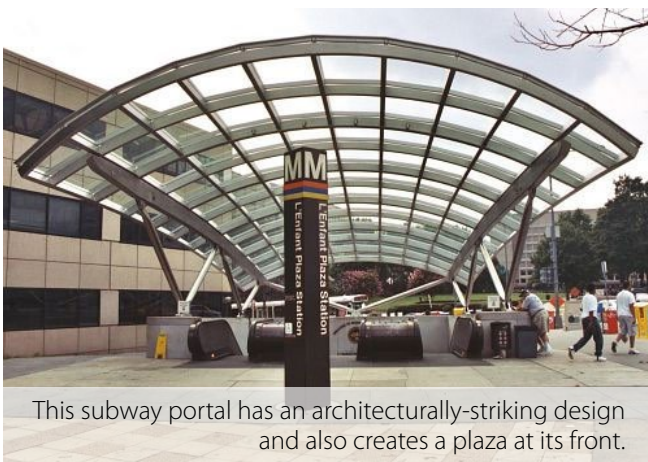
- Station portals that are incorporated into the facade or design of new or existing buildings or adjacent to existing parks or plazas are preferred to portals within existing street right-of-way. Connect station access to building lobbies when feasible
- Ensure that station portal does not obstruct pedestrian clear zone of at least 7'.
- Place fare stations either inside station or in space that provides at least 4' of queuing outside of the pedestrian clear zone in accordance with DART Design Criteria.
- Locate station portals in a manner that supports wayfinding and encourages easy transfer to other transit modes, including bus and streetcar.
- Locate portals in proximity to other transit modes and provide clear wayfinding at-grade to entrance portal locations.



This subway portal maintains a wide sidewalk adjacent to portal while also utilizing a high-quality architectural design.



This subway entry in Seattle is incorporated into the facade of a building above the station.



This subway portal has an architecturally-striking design and also creates a plaza at its front.



This subway portal in New York City has distinct features that enhance the plaza and the adjacent building



## Platform Design + Amenities

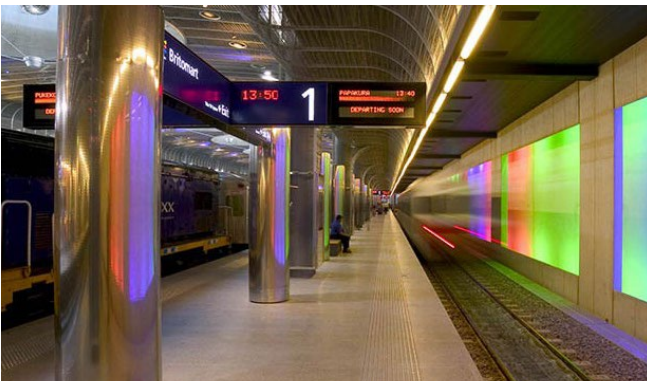
- Provide a spatial volume appropriate to the station function that creates a sense of openness and place.
- Encourage design of underground platforms to reflect the station location and nearby institutions above ground.
- Encourage distinct and durable materials for the platform in accordance with DART Design Criteria.
- Provide adequate seating.
- Allow for cellular service providers to provide high-quality cell service and wi-fi in tunnels and at stations.
- Utilize color and light to create interest.
- Provide high-levels of light to ensure rider safety and comfort.



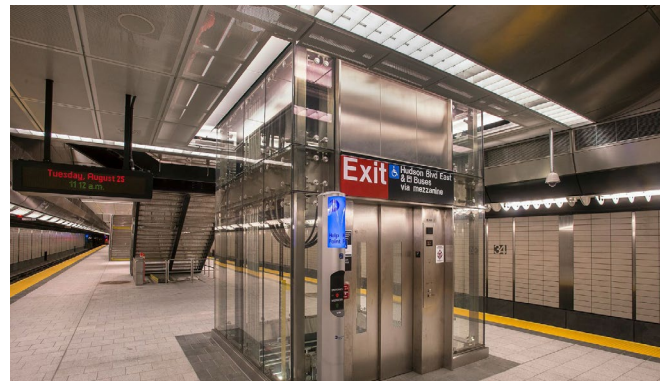
A subway station in Toronto, Ontario incorporates characteristics of the above-ground museum.



A use of high-quality materials in a subway station in Munich, Germany



Art and bright lighting is integrated into station design in Auckland, New Zealand



Wide platforms and a centrally-located elevator make this platform in New York City safe for all users



## Station Artwork

- Encourage and program the placement of public artwork in station portals as well as at station platforms, avoiding conflicts with passenger operations
- Incorporate public artwork into the design of the station platform in accordance with DART Design Criteria.
- Integrate public art with architectural elements and materials to leverage budget.
- Involve City of Dallas Office of Cultural Affairs with the DART Art Program and the selection of artists.



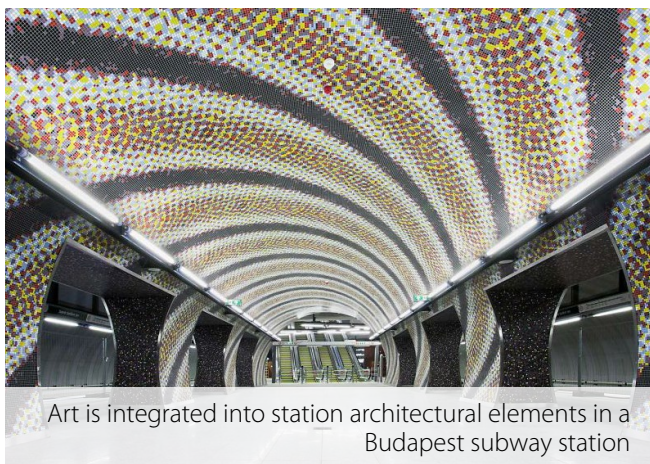
Public art is integrated into station design at Seattle's Capitol Hill light-rail station

## Wayfinding

- Place wayfinding in predictable locations, such as overhead or at eye-level, at regular intervals and near intersections. NACTO TSDG, 101
- Include relevant transportation connections and services, including regional routes and bike share stations, to expand rider options. NACTO TSDG, 101
- To direct riders to and from stations to destinations in the station area, indicate travel direction and times in easily understood units such as walking time. NACTO TSDG, 101
- Provide area maps at all stations.
- Wayfinding should include clear, simple guidance to nearest street intersections, landmarks, and points of interest.



Simple wayfinding with maps are important for helping travelers unfamiliar with a station and the area



Art is integrated into station architectural elements in a Budapest subway station



This wayfinding in Tokyo is beautiful and simple, making transfers easy for all users



## Bike Parking + Facilities

- Consider providing a manned Bike Station at one key light-rail station in each district. The bike station should be immediately accessible from the station platform or portal.
- Bike parking and facilities are applicable to both underground and surface light-rail station design.
- Provide a clear zone around bicycle parking to avoid impeding traffic on adjacent sidewalks.

NACTO TSDG, 105

- Short-term bike parking should ideally be located within 50' of stop or station entrance.  
NACTO TSDG, 105
- Bike storage “shells” should not be used in urban areas or along sidewalks.



The Union Station METRO in Washington DC has a large, protected bike storage facility



The exterior of the Washington DC Union Station METRO bike storage facility



New York City has numerous smaller, covered bike parking facilities adjacent to their subway station entries.



Small parcel cuts caused by track alignment near stations are great locations to place overflow bike parking





Surface station design should integrate seamlessly with the surrounding public realm through sidewalks and plazas designed to provide high quality public places. The relationship of the station and any surrounding development must also be considered to ensure a positive integration that encourages connectivity and transit use.

Surface stations should be seamless with the surrounding urban environment while also providing a well-defined and secure “transit space” that identifies the boarding area and related amenities. The distinction between public space and the transit function should be defined in a manner that provides consideration of the following:

Clear Lines of Sight - Crime Prevention Through Environmental Design (CPTED) principles should be followed to provide a sense of security and safety.

Definition of Space – the functional platform boarding area should clearly defined to the passenger by shelters, planters, railings, amenities, pavement treatments and subtle changes in materials.

Environmental Protection – canopies, trees and other elements should provide station identity and enhance passenger comfort through protection from sun, wind and rain.

Function and Design – Stations should convey an image of simplicity in function and modern timeless design.



## Landscaping

- A high importance should be placed on increasing the “urban forest” through the introduction of trees at regular intervals, wherever possible.
- Provide landscaping and irrigation at platforms with street trees at a minimum of 30’ on center where possible. Additionally, consider tree trenching and structural soil to allow for maximum canopy.
- Consider other methods of shade provision including but not limited to canopies, awnings, and other aesthetically appealing structures.

## Wayfinding

- Place wayfinding in predictable locations, such as overhead or at eye-level, at regular intervals and near intersections. NACTO TSDG, 101
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- To direct riders to and from stations to destinations in the station area, indicate travel direction and times in easily understood units such as walking time. NACTO TSDG, 101
- Provide area maps at all stations
- Wayfinding should include clear, simple guidance to nearest street intersections, landmarks, and points of interest.



This transit mall in Portland has frequently planted trees, providing shade and beauty for waiting passengers



These wayfinding signs provide both an easy-to-read map and up-to-date bus arrival times



This transit mall in San Jose has frequently spaced street trees that produce a pedestrian-friendly street



This wayfinding sign in New York City provides a large, yet graphically-simple map





## Accessibility

- For riders with visual disabilities, provide an alternative to visual display boards. Audible announcements are preferred over braille and other methods that require finding the display. Consider station/street noise and environmental characteristics during implementation. NACTO TSDG, 101
- Where pedestrian crossings traverse tracks and bus transitways, use audible warnings to ensure all pedestrians are aware of oncoming transit vehicles. NACTO TSDG, 32
- Stations and adjacent improvements must meet all Texas Accessibility Standards.
- Where passengers using wheelchairs are directed to specified doors, ensure the accessible doors are clearly communicated throughout the boarding platform using signs and markings. NACTO TSDG, 67

## Lighting

- Use pedestrian-scale lighting, typically including lamps less than 25 feet high, to increase comfort and safety around stops. NACTO TSDG, 67
- Lighting shall be “cut-off” type to avoid illuminating the sky and surrounding development.
- Higher illumination around transit stops should be gradual rather than sudden to avoid creation of virtual shadows as driver and bicyclist eyes adjust. NACTO TSDG, 67



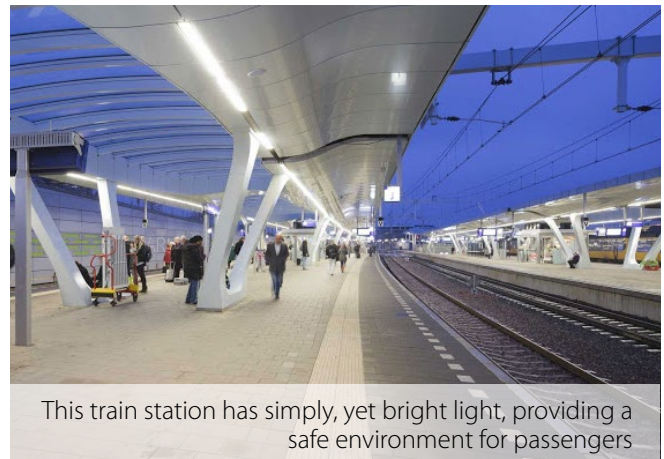
Many bus stops in Washington DC have push buttons reporting bus arrival times for the visually impaired



This light-rail station in Charlotte provides bright, white light incorporated into the train platform roof



Ensuring easy loading for all riders is imperative. At-grade loading such as this is preferred



This train station has simple, yet bright light, providing a safe environment for passengers



## Bike Parking + Facilities

- Consider providing a manned Bike Station at one key light-rail station in each district. The bike station should be immediately accessible from the station platform or portal.
- Bike parking and facilities are applicable to both underground and surface light-rail station design
- Provide a clear zone around bicycle parking to avoid impeding traffic on adjacent sidewalks.  
NACTO TSDG, 105
- Short-term bike parking should ideally be located within 50' of stop or station entrance.  
NACTO TSDG, 105
- Bike storage “shells” should not be used in urban areas or along sidewalks.



The Union Station METRO in Washington DC has a large, protected bike storage facility

## Station Amenities

- Avoid using materials for benches and other sitting areas that retain heat.  
NACTO TSDG, 98  
Additionally, provide shade for all sitting areas.
- Seating shall not conflict with paths, leaving 6' of clear distance on all sides where pedestrians are expected.  
NACTO TSDG, 98
- Install appropriate amount of seating for expected demand at each station.
- Provide passengers with amenities at station area, including seating, trash cans, wayfinding, etc. compatible with the corridor theme.
- Trash cans, seating, and other objects must not block accessible path and boarding areas.  
NACTO TSDG, 99
- Integrate status displays and visual message boards into corridor design elements.



This station platform contains numerous seating options, an open and transparent design, and an arrival board



New York City has numerous smaller, covered bike parking facilities adjacent to their subway station entries.

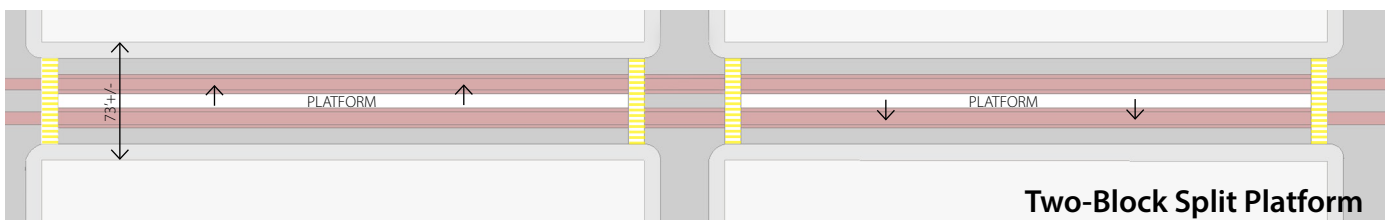
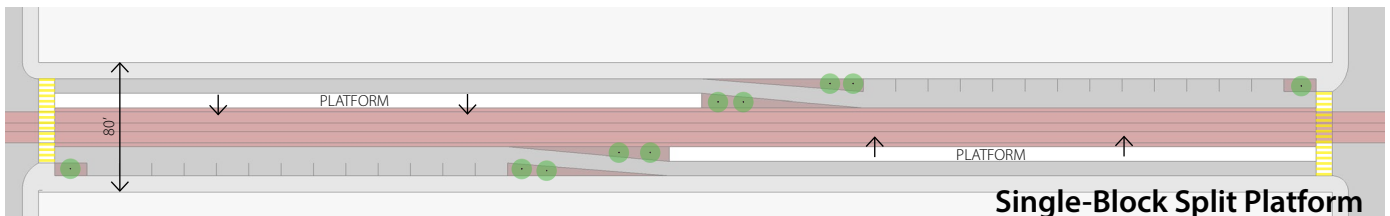


This station platform has a large and shaded canopy, seating, wayfinding, and historical education elements



## Layout and Block Design

- Consider staggering at-grade light-rail platforms between blocks on narrow right-of-way streets, minimizing overall right-of-way required for station.
- Boarding bulb stops for streetcar should be considered where vehicle operates in offset lanes without rightside bike facilities. Boarding bulbs can be installed at near-side, far-side, and mid-block stops, at both signalized and unsignalized locations. NACTO TSDG, 70
- At all stops, provide at least 10' of clear sidewalk space, ahead of transit vehicle at near-side stops and behind transit vehicle at far-side stops. NACTO TSDG, 71
- If shelters are placed on boarding bulbs, they must be placed clear of front and back-door boarding areas. NACTO TSDG, 71
- An accessible boarding area, typically 8' x 5' long, must be provided to permit boarding maneuvers by a wheelchair, generally requiring islands to be at minimum 8' wide. Islands with railings along the rear side will require an extra foot of space, making total width 9'. NACTO TSDG, 83
- Ensure that pedestrian refuge islands crossing transitways are wide enough to allow crowds of people to wait, particularly near stations. Place detectable warning strips on both sides of every flush pedestrian crossing. NACTO TSDG, 83
- Railings shall be installed along platforms adjacent to the through lane to control pedestrian access and discourage dangerous crossings. Channelize pedestrian movements to platform entrances with enhanced crossing treatments. NACTO TSDG, 83





## Station/ Shelter Design

- Shelter design should reflect the architectural characteristics of the surrounding neighborhood while also maintaining an identity established by DART for the corridor.
- Platform shelters must be permeable to allow for freedom of movement between each side of platform or adjacent sidewalk.
- Platform windscreens are not encouraged in order to reduce visual clutter, improve movement when boarding/ off-boarding, and limit vandalization potential.
- Placement of shelters' supporting posts/walls must not conflict with accessible travel paths, boarding areas, or transit vehicle door zones. NACTO TSDG, 16



This light-rail platform in Salt Lake City is permeable, allowing for free pedestrian movement at the station



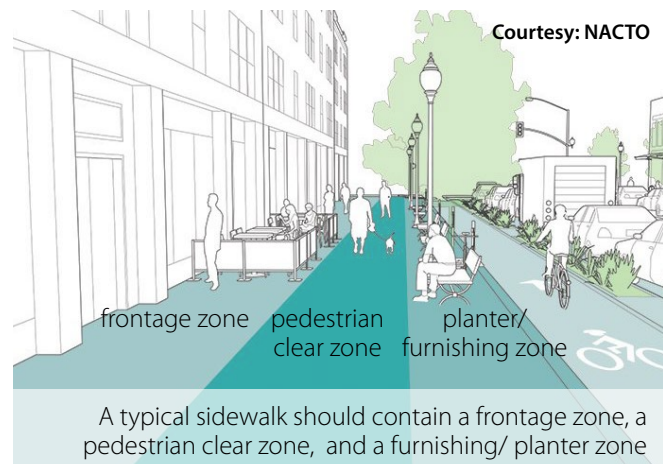
This light-rail station in Austin is both permeable and has a unique and distinct paver pattern

## Passenger vs. Pedestrian Zones

- Shelter placement must allow a minimum of 6' through-path between obstructions and warning strips at platforms and around all sides when at the level of the sidewalk, or around the street side if on an elevated platform. NACTO TSDG, 16
- Sidewalk adjacent shelters/ platforms should allow for minimum of 7' pedestrian clear zone in the rear in adherence with Complete Streets Manual and Downtown Pedestrian Overlay. Dimensions may vary by location context.
- Clearly delineate passenger zones from pedestrian zones and provide fully accessible pedestrian areas with sloped walkways in lieu of stairs or ramps



This transit mall has numerous amenities such as trees and trash cans, yet keeps them out of the pedestrian zone



A typical sidewalk should contain a frontage zone, a pedestrian clear zone, and a furnishing/ planter zone



NO TURN ON RED

ONE WAY



## At-Grade Route Alignment Design

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- 29 Infrastructure Improvements
- 29 Stormwater Management

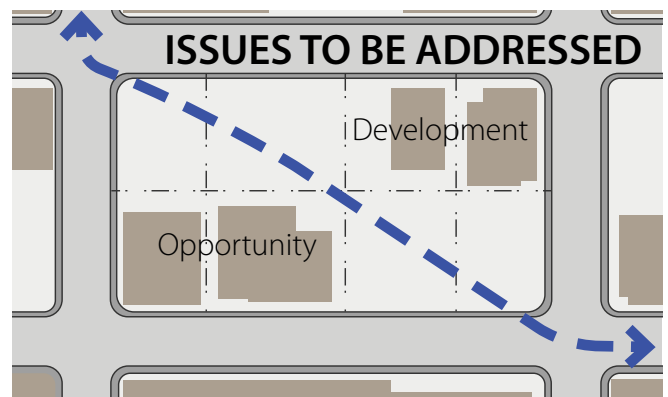
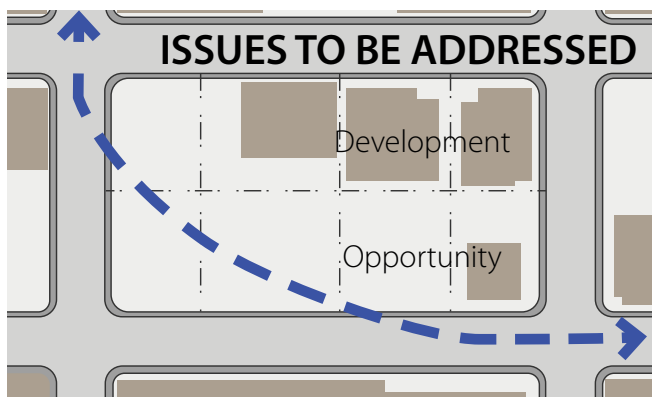


## Street Grid Fabric

- Maintain the existing street grid to the extent possible by minimizing closure or interruption of existing streets that cross the rail alignment.
- Maximize extent to which DART light rail operation can occur within right-of-way when at-grade.

## Development Potential

- Ensure maximum development potential of or enhancement to adjacent full and partial parcels by minimizing impact to development parcels used for rail operations.
- Provide mitigation of undesirable property conditions and partial parcels created by the alignment.
- Air rights development strategies should be pursued when ideal track alignment is not possible in order to maximize development opportunity.



At-grade Rail alignment should consider the possibility for adjacent development to occur. This diagram demonstrates ideal alignment conditions as well as rail conditions that would need improvement or mitigation.



## Infrastructure Improvements

- Integrate infrastructure improvements with existing development adjacent to corridor through materials used and/or through physical design.
- Coordinate with other public capital projects and private development infrastructure improvements to extent possible.
- Assign a City of Dallas utilities facilitator to act as a point person to ensure consistent coordination between DART and the various city departments.

## Stormwater Management

- Provide integrated stormwater management (iSWM) adjacent to and incorporated with tracks where possible.
- Provide bioswales with a slight longitudinal slope that moves water along the surface to allow sediments and pollutants to settle out. In place infiltration then allows localized groundwater to recharge. NACTO TSDG, 104
- Bioswales should drain within 24 hours; this is especially critical near transit stops where pooling can degrade transit access. NACTO TSDG, 104
- Incorporate updated City of Dallas Pavement and Drainage Manual requirements into stormwater management design for transit corridors.



This Portland infill development has integrated infrastructure improvements with the adjacent rail



Light rail in Portland is built with iSWM adjacent to many of their tracks



The light rail in Phoenix helped foster adjacent development such as the ASU Journalism School.



Light rail in Salt Lake City is also built with iSWM adjacent to many of their tracks







## Corridor Design Element Considerations

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## Intersection Design

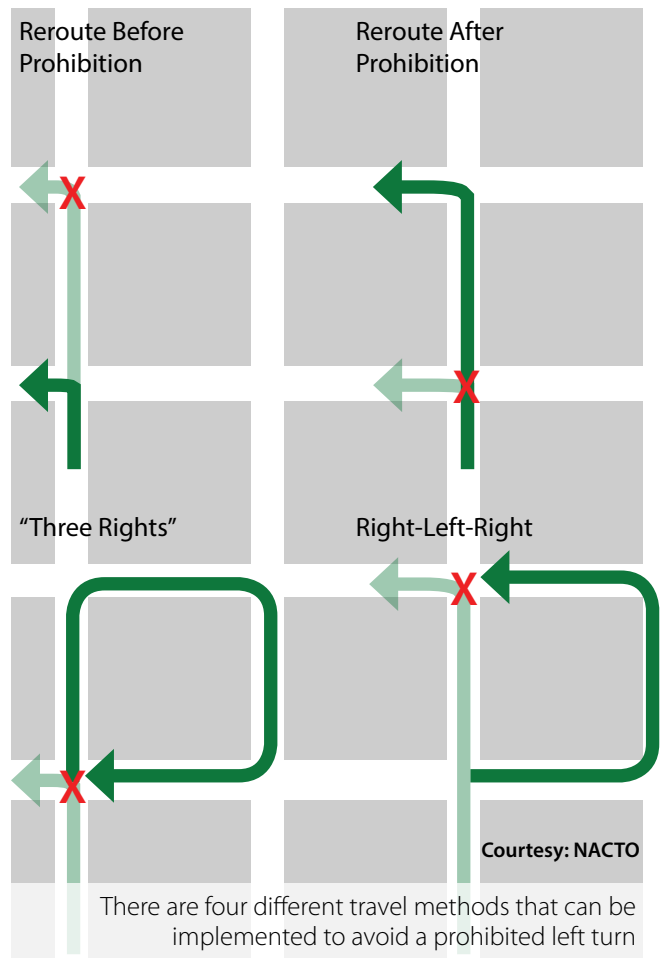
- For center-running fixed guideway transit, at intersections, use separate turn phases, prohibit left turns across median transitway, or prohibit left turns when transit vehicles are present. Extend vertical elements to the intersection edge where turns are prohibited. Use transit signals and either active Transit-Signal Prioritization or transit signal progressions (TSP). NACTO TSDG, 32
- Crosswalks must be accessible, with special attention to both people using wheelchairs and wheeled mobility devices and people with no or low vision. Curb ramps must be provided at all street crossings that involve a change in grade. Do not obstruct the top of the curb ramp. NACTO TSDG, 66
- All intersections with pedestrian, bicycle, or motor vehicle traffic must be signalized. To avoid conflicts with transit vehicles, left- and right-turning traffic across the transitway must be either prohibited or accommodated using turn lanes with dedicated signal phases. Additionally, consider TSP for intersections along route. NACTO TSDG, 130
- Clearly designate mid-block crossings where applicable to ensure pedestrian safety.
- Bike lanes shall cross tracks as close to 90° as possible (at a minimum 60°) to ensure safety for cyclists. NACTO TSDG, 166



This bike lane crosses the light rail track at a near 90° angle, protecting cyclists from falls



This light-rail platform leads to a large crosswalk that is paved with a different, distinguishable material





## Track Design

- Consider a shared transitway for non light-rail modes in places where a low-curb or rumble strips increase pedestrian permeability across the entire street, maximizing available public space and emphasizing the shared condition of the street. Pedestrians can cross a shared transit street at any point, but are discouraged from walking along the central transitway by the high volume of transit vehicles. NACTO TSDG, 28
- Auto traffic is either prohibited or limited using volume management techniques that filter out thru-traffic and permit local vehicle access, especially for deliveries. NACTO TSDG, 29
- A minimum width of 12' and a maximum width of 15' for each LRT lane (24'-30' for dual-running lines) and maximum width of 11' for each streetcar lane should be adhered to.
- To avoid conflicts with center-running transit vehicles, left turns should be prohibited, or accommodated using left-turn lanes and dedicated signal phases. NACTO TSDG, 119
- Use either rumble strips or low vertical elements between travel lanes and DART lanes. NACTO TSDG, 137



This light rail runs slowly through a plaza in Germany, creating a functioning plaza that is safe for pedestrians



The light rail in Houston has large truncated domes protecting the transit lane from the travel lane



The light rail in downtown Denver runs along side vehicles, functioning much like a streetcar



This light rail has rumble strips adjacent to the tracks to warn motorists not to enter the lane



## Landscaping

- Consider providing a continuous green space between tracks and adjacent road beds if appropriate. Discontinue green space at intersections and pedestrian crossings, and provide accessible paths for pedestrians through the transitway. NACTO TSDG, 133
- Consider providing landscaping & irrigation along track where possible, with street trees at a minimum of 25' on center where possible. Additionally, consider tree trenching to improve canopy.



Landscaping beneath the tracks and along the tracks is preferred due to aesthetics and stormwater management



These light rail tracks run above grass, increasing pervious surface while also improving overall aesthetics

## Sidewalk Design + Amenities

- Provide street furniture (bollards, benches, planters, street lights, bicycle parking, etc) to define shared space and integrate it into the cohesive street design. Design elements provide guidance for the visually impaired and delineate the traveled way from the pedestrian-exclusive area. Where less permeability is desired, such as just ahead of stations, use plantings, railings, and furniture to concentrate activity in desired areas and channelize pedestrian travel paths. NACTO TSDG, 28
- Sidewalk design/width and clear width to be compatible with City of Dallas sidewalk requirements for the CBD, the City of Dallas Complete Streets Design Manual, and the Downtown 360 Street Typology Guidelines.



A wide sidewalk, ideally with street trees and lighting, is preferred to protect pedestrians from the adjacent train



San Jose's transit mall has numerous sidewalk amenities including trees, planters, trash cans, and newspaper racks



## Bike Lanes

- Integrate bike lanes with transit corridors and clearly designate bikeway from automobiles and transit where applicable. Bicycles may also be accommodated in shared travel lanes where speeds are low. Accommodate bicycle turns at right angles using two-stage turn queue boxes. Where motor vehicle through-traffic is prohibited, consider providing a cycle track through the plaza. NACTO TSDG, 33
- Consider bi-directional bike lanes paralleling the DART alignment on one-way streets.



These bike lanes slip behind a train and bus platform, protecting cyclists and providing a buffer to the sidewalk

## Paving Materials

- The trackway should be designated using red or alternate, distinct color to deter drivers from entering the guideway. Also consider using distinct pavers. NACTO TSDG, 134
- Durable materials such as brick, stone, and unit pavers shall be used on the transitway or across the entire right-of-way. NACTO TSDG, 32 No non-traversable surface such as ballast shall be used.
- Provide special paving at street intersections. Consider the durability of materials based on lessons learned on the Downtown Transit Mall.
- Provide quality unit paver or integral colored concrete at pedestrian areas.
- Paving materials are to be used to clearly define transit /pedestrian/vehicle areas.



Red-painted transit lanes let drivers know that the lane is not for driving



These bike lanes are well-marked and physically separated, protecting cyclists from the rail and cars



The light rail in downtown Houston incorporates well-designed brick paving that provides a cohesive feel



## Train Portals

- Consider locating stations adjacent to entrance to train portal. Additionally, consider placing portal in center of road/ boulevard.
- 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.
- Provide aesthetically appealing safety measures to prevent access into tunnel by pedestrians and vehicles.



This tunnel portal in San Francisco is incorporated into an adjacent park

## Egress + Ventilation Design

- 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.



Disguised emergency egress such as this trap door in the sidewalk are preferred



The light rail along the Embarcadero in San Francisco descends underground in the middle of the street



This emergency egress and service building is disguised through artful design in an existing park



## Catenary Poles + Lighting

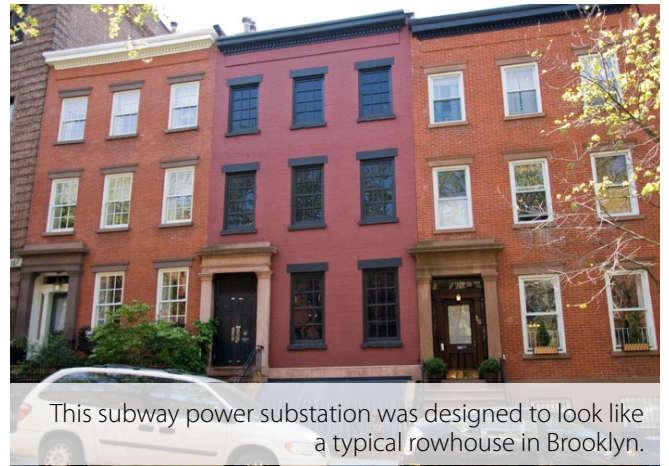
- Catenary poles and lighting are to be integrated wherever possible to avoid cluttering right-of-way.
- Catenary poles should fit the surrounding neighborhood context and should introduce minimal visual intrusion.



Catenary poles and wiring should incorporate street lighting and be aesthetically appealing

## Substations + Service Buildings

- Do not place service buildings adjacent to development unless fully contained within development.
- Fully screen all service buildings with masonry walls or landscaping.
- Place service buildings on parcels that do not preclude future development.



This subway power substation was designed to look like a typical rowhouse in Brooklyn.



These catenary poles are artful and incorporate lighting into their design



The proposed subway service building matches the architectural character of the surrounding district





*R & J*  
**JEWELRY  
DIAMONDS**  
BUY-SELL-PAWN  
MONEY TO LOAN  
ON ALL JEWELRY  
• JEWELRY REPAIR  
• WATCH REPAIR & BATTERIES  
• APPRAISALS

VTA  
5:30 PM



## Additional Design Considerations

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### Sound, Vibration, and Visual Mitigation

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### Operations

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## Pocket Parks + Plazas

- Utilize remaining parcels and partial takes along corridor as opportunities to develop pocket parks or plazas as appropriate to land use.
- All pocket parks and plaza shall provide shade and other comfortable amenities for users.
- At stops/ stations/ station portals, provide public plazas and/or incorporate station portals into existing parks and plazas where possible to encourage activity, security, and connectivity.
- Coordinate public spaces/ plazas with City of Dallas Parks Department and consider Downtown Parks Master Plan.



Excess land between rail tracks can be designed to be enjoyable plazas for pedestrians

## Development Air Rights

- Maximize opportunities for developable parcels and allow development of air rights over DART right-of-way.
- Allow for development above light-rail train tunnel portals to maximize economic development, shielding tunnel portal from view while also discouraging devaluation of adjacent properties.



Allowing the development of air rights above the tracks can create great spaces atop would-be eyesores



This light rail in Portland runs beneath a building and through a plaza.



Air development rights produce increased economic development where otherwise no development could exist

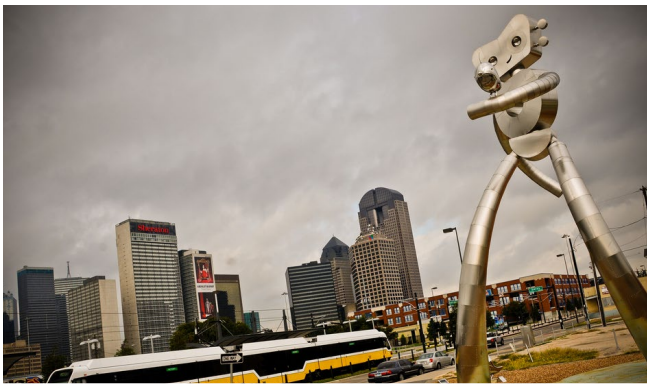


## Budget

- Consider a separate budget for programming and execution of corridor level public artwork to enhance the corridor as a whole. Coordinate all artwork with the City of Dallas' Office of Cultural Affairs.
- Seek out opportunities for public/ private partnerships for art programs or installations.

## Opportunities

- Consider creating a specific Art Advisory Committee for each district corridor in addition to the Station Committee.
- Provide public art along corridors in addition to at stations.
- Follow DART Art and Design Criteria at stations.



Art at a transit stop and along the route provides enjoyment for waiting passengers and people passing by



This light rail station in Minneapolis incorporates art into the facade of a stairwell



This station in Portland has a striking art piece in the center of the station

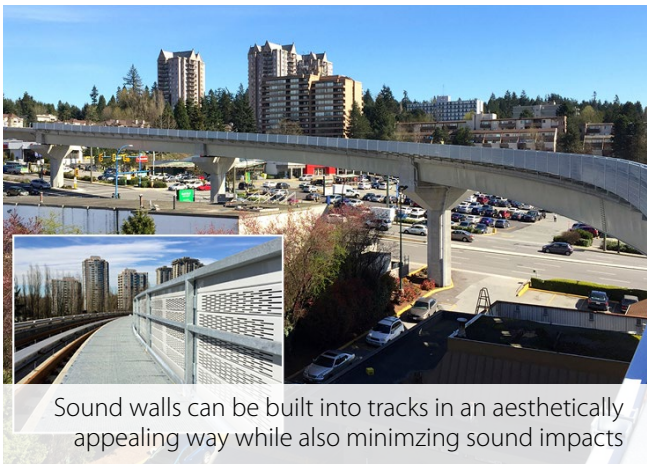


Artwork can be incorporated into the structure of the station platform, as seen here.



## Sound Walls

- Provide context sensitive sound walls / landscape screening where needed to prevent visual intrusion of utilities and other elements .
- Address future development impacts as well as existing conditions where possible.



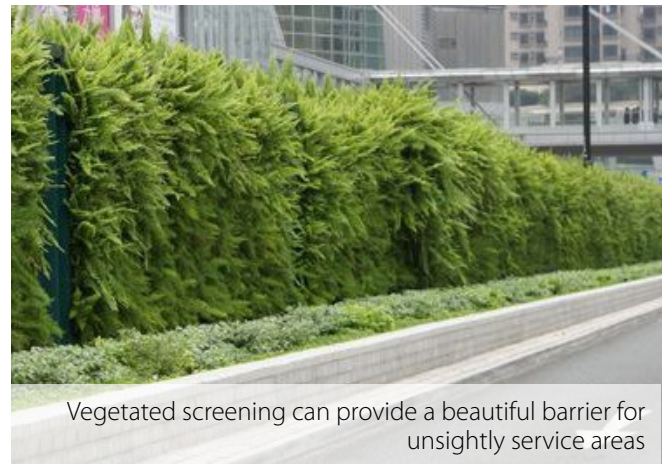
Sound walls can be built into tracks in an aesthetically appealing way while also minimizing sound impacts



These sound walls in Seattle help block sound from the train tracks from the surrounding neighborhood

## Preventative Landscaping

- Provide landscape screening where needed to prevent visual intrusion of utilities and other elements .
- Provide landscaping & irrigation appropriate to the location (provide street trees at minimum 25' on center, where possible).
- Integrate landscaping into soundwalls, fencing, and screening elements.



Vegetated screening can provide a beautiful barrier for unsightly service areas



Vegetated buffers can also be designed with local plant species and serve to improve stormwater management



## Safety and Security

- Coordinate pedestrian safety at crossings and along corridor with City of Dallas.
- Provide vehicle crossing protection that is fully integrated with traffic signal system in the corridor.
- Provide active surveillance in all areas that are not highly visible. Enhance surveillance in below-grade stations.
- Follow CPTED (Crime Prevention Through Environmental Design) Principles in all station and transitway design

CPTED Principle #1: Natural Surveillance--"See and be seen". Lighting and landscape play an important role. Minimize or eliminate physical obstructions that obscure views.

CPTED Principle #2: Natural Access Control-- Utilize walkways, fences, lighting, signage and landscape to clearly guide people and vehicles to and from the proper entrances.

CPTED Principle #3: Territorial Reinforcement-- Utilize pavement treatments, landscaping, signage, etc. to distinguish private and public areas.

CPTED Principle #4: Maintenance-- Neglected and poorly maintained properties are breeding grounds for criminal activity.

## Durability + Maintenance

- Materials should be selected based upon durability and low maintenance requirements.
- Materials should incorporate integral color wherever possible.
- Materials should deter vandalism as outlined in DART Design Criteria.
- Long term maintenance agreements for all improvements are encouraged to clearly identify maintenance responsibility. These entities include but are not limited to organizations such as City of Dallas, Downtown Dallas Inc., and DART.



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## Adjacent Development Considerations

- 46 Development Character
- 46 Street and Block Design
- 47 Pedestrian Level Design
- 47 Sidewalk and Landscape Design

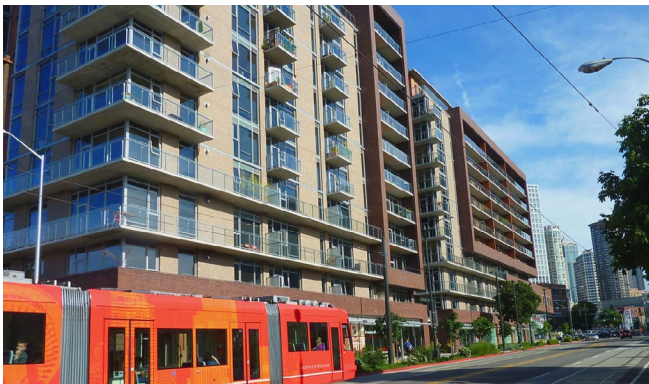




## Development Character

Transit corridor design should:

- Allow for greater density near light rail stations.
- Not preclude the ability for adjacent development to maintain a consistent and continuous street wall with a pedestrian-oriented edge.
- Enhance the ability for adjacent development to collectively create spaces where pedestrians feel comfortable and protected rather than overwhelmed or vulnerable.
- Not preclude adjacent development from creating continuously lively and inviting street-level façades with storefronts, display windows, entrances, or other forms of architectural relief.
- Allow adjacent development to provide awnings and/or architectural detail.

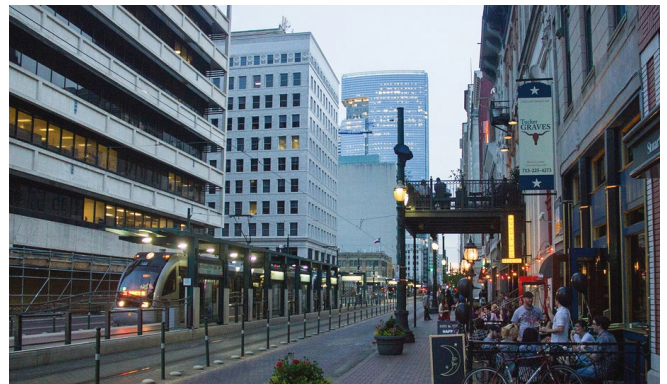


Transit-oriented development near light rail helps increase ridership and overall residential density

## Street and Block Design

Transit corridor design should:

- Allow adjacent development to maintain or create short blocks with frequent intersections, avoiding super-blocks and multiple block developments that close streets.
- Allow for adjacent development to provide on-street parking where possible.
- Preserve important views.
- Not increase the number of curb cuts and vehicular access points to adjacent development.
- Consider local TIF district guidelines, including TIF district goals, character, and other special considerations, when designing DART lines through these particular geographies.



The light rail in Downtown Houston has an active public realm with numerous cafes with outdoor dining



Storefronts in Downtown Portland open out to the light rail very similar to streets with vehicular traffic



Providing alleyways, such as Linden Alley in San Francisco, increase connectivity on large sites



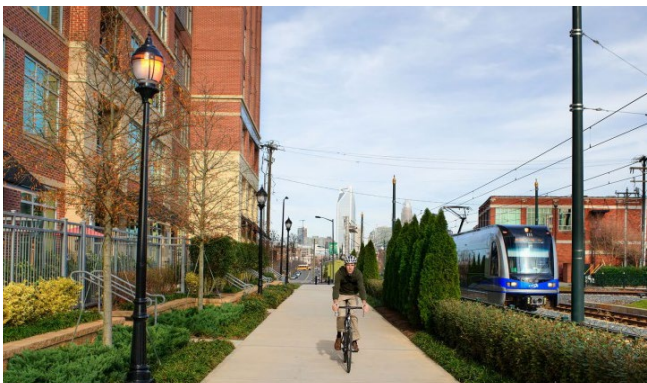
## Pedestrian Level Design

Transit corridor design should:

- Not preclude the ability for adjacent development to provide raised or setback ground-level entries such as stoops and porches. Additionally, design shall not preclude adjacent buildings to provide prominent and accessible entrances connecting the private and public realms.
- Allow for a variety of signage at ground level including awning signage, projecting signage, window signs, blade signs, and temporary sandwich boards. Additionally, design shall not obscure sight lines of building entrances and signage.
- Not preclude adjacent development from providing sidewalk vendors, cafes, or restaurant patios adjacent to the curb where space permits.



Portland's light rail transit mall has a design that allows for numerous entrances to retail and commercial spaces



This development in Charlotte provides a trail and residential stoops that look onto the adjacent rail line

## Sidewalk and Landscape Design

Transit corridor design should:

- Preserve significant trees within public right-of-way and on adjacent property.
- Allow for proper drainage and irrigation for street trees and trees on adjacent properties.
- Allow adjacent development to locate benches and seating near building entrances and in public realm away from street. Additionally, the design shall allow for non-permanent amenities such as seating and tables.
- Not preclude adjacent development to provide ample lighting on sidewalks, streets, walkways and plazas to enhance safety, including street lights spaced a maximum of 75' apart.



Wide sidewalks provide a large clear-zone as well as street trees and other street furniture



This light rail station in Charlotte has flexible furniture and cafe seating adjacent to private development



DOWNTOWN  
DALLAS INC