

TRANSIT DESIGN GUIDE

City of Toronto
Transit Design Guide

Acknowledgements:
Access Planning
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Figure 1: Cover photo - of Guildwood GO Station (Photo Credits: Bob Gundu)

Figure 2: Highway 407 Bus Terminal, Toronto (Photo Credits: Toronto Star)



Figure 3: Highway 407 Station, Toronto (Photo Credits: Gordon Inc)

Introduction and Background

The expansion of Toronto's rapid transit network has the opportunity to bring about a positive transformation in mobility and residents' experience of the city, provided the infrastructure is designed and integrated into the city's public realm in an appropriate and thoughtful manner. The Transit Design Guide (the Guide) is a tool and resource to aid in the design and development of rapid transit projects and infrastructure across the city. Each component or element of a transit project – from a station site, to an electrical substation building, to linear infrastructure – can have an impact on surrounding

communities and the public realm. This document is intended to inform how transit can enhance and contribute to the city's public realm and surrounding context. The Guide provides design guidance and process direction for consideration in the design of both new and upgraded transit infrastructure. The Guide brings together new design and process direction, as well as reference to existing guidance for the various subject matter. The purpose is to bring expediency and clarity around the City's expectations for the design of transit infrastructure.

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1.0 DOCUMENT PURPOSE AND SCOPE

1.1 Purpose of the Guide

The Guide is intended to safeguard the public interest by establishing a design vision, principles, strategies and guidelines to consistently achieve high-quality outcomes for the urban, architectural, and landscape design of rapid transit infrastructure and service in Toronto.

More specifically, the Guide:

- Establishes shared objectives and design principles, developed in collaboration with City Divisions, the Toronto Transit Commission (TTC), Metrolinx, CreateTO, and other stakeholders involved in the delivery of rapid transit;
- Applies local and global best practices that are responsive to Toronto's varied and complex urban conditions and communities;
- Addresses outstanding gaps in the transit planning and design framework, relative to the established design principles and reconciles disparate guidance to develop a unified City position in the context of transit stations;
- Recommends strategies and/or processes to support the resolution of complex, multi-disciplinary design challenges; and
- Informs decision making by project teams, from initial business case to construction and operations.

1.2 Scope of the Guide

The Guide applies to the urban, architectural, and landscape design of new and upgraded rapid transit sites and related public-facing infrastructure within Toronto.

The Guide does not apply directly to the engineering, construction, or operations of rapid transit facilities and lines. Where appropriate, it includes strategies and processes to resolve complex, multi-disciplinary design challenges, when the Guide's design principles and objectives are impacted. It is intended to supplement and create consistency amongst the large body of direct and indirect design guidance for transit projects, rather than replace existing policies, guidelines, regulations and standards.

The Guide provides design direction for various subject matter, but project teams will still need to ensure that each project responds to its unique project-specific requirements and urban context. In this regard, the Guide does not generally provide metrics or specification level guidance, but rather performance-based design direction, leaving room for project teams to adapt the design direction and apply creativity and professional judgement.

1.3 How to Use the Guide and Intended Audience

The intent of the Guide is to encourage the integration of design considerations for transit infrastructure at the earliest stage in the planning process. This Guide should be read comprehensively and together with other City, Provincial and agency documents that provide direction on the planning and design of transit infrastructure. The design guidance in each chapter addresses a specific element, and should be read together with the Introduction section of this Guide.

Responsibility for delivering transit projects in Toronto is shared between many stakeholders, including but not limited to, the Province, City, TTC, private developers, and other agencies. With so many different stakeholders potentially involved in the design and delivery of transit projects, this Guide serves as a reference for ensuring design consistency and excellence across all projects, modes and contexts.

The Guide is useful to a broad audience of professionals involved in the planning, design, and implementation of rapid transit projects in the City of Toronto, including but not limited to: City staff and/or consultants, Metrolinx, the TTC, members of City Council, third party development partners and other stakeholders.

1.4 Structure

The vision and principles section of the Guide sets out at a high level, the planning and design objectives that elements of transit projects should achieve in the context of the City's policy framework. The Guide's design guidance is organized around five principles – urban integration, user experience, resilience and sustainability, intermodal operations, and accountability – that define the broad objectives that transit infrastructure is intended to achieve.

The chapters that follow the Introduction provide the guidance for the design of various elements of transit infrastructure covered by the Guide, couched in the overarching vision and following the five principles identified. While chapters for each element are intended to stand on their own, they have linkages to other chapters of the Guide for related elements. The Guide is intended to be an organic document, for which additional chapters will be developed over time, as needed.

Overall TDG Structure

Introduction and Background

Element Specific Guidance

Elevated Guideways

Future Elements

Elevated Stations

Future Elements

Portals and Retaining Walls

Future Elements

Ancillary Structures

Future Elements

Bus Terminals

Future Elements

Figure 4: This Transit Design Guide is a living document and future elements will continue to build on the guidance existing in this Guide today.

2.0 THE PLANNING FRAMEWORK

The Guide is informed by, and aligns with, a variety of applicable City and Provincial policies, guidelines, regulations, codes and standards. In the event of a conflict between the guidance of this document and regulations, standards or legislation enacted by the federal, or provincial, or municipal governments, those will prevail.

This document is intended to be read together with the following policies, regulations and standards.

Applicable Planning Framework

The following is a non-exhaustive list of applicable documents, subject to change, developed in consultation with City Staff.

City of Toronto (Policies, Guidelines and Standards)	Provincial Transportation Guidelines	Metrolinx	Toronto Transit Commission (TTC)
- Official Plan - City Planning: Applicable Guidelines and Standards - Green Streets Technical Guidelines - Transportation Services: Applicable Guidelines and Standards (i.e. Complete Streets Guidelines) - Parks, Forestry and Recreation: Applicable Guidelines and Standards - Toronto Parkland Strategy Report - Toronto Multi-Use Trail Design Guidelines - Ravine Strategy Implementation Plan - Toronto's Strategic Forestry Management Plan - Toronto Facilities Masterplan	- Provincial Policy Statement - Growth Plan for the Greater Golden Horseshoe - MTO Transit Supportive Guidelines	- GO Design Requirements Manual - Metrolinx Design Standards - DS-01: TOC Design Guidelines- Subways - DS-02: Universal Design Standard - DS-03: Wayfinding Design Standards - DS-04: GO Station Architecture Design Standard - DS-05: Sustainable Design Standard - DS-07: Bike Infrastructure Design Standard - DS-09: Subway Station Architecture Design Standard - DS-11: Third Party Entrance Connection Requirements	- TTC Design Manual - TTC Service Standards - TTC Developer's Guide - Entrance Connection Guide - Entrance Connection Policy

City of Toronto (Policies, Guidelines and Standards)	Provincial Transportation Guidelines	Metrolinx	Toronto Transit Commission (TTC)
• Best Practices for Effective Lighting • Accessibility Design Guidelines • Tree Protection Policy and Specifications for Construction Near Trees • Standards for Designing and Constructing City Infrastructure – Utility Cut Permit Applications and Municipal Consent Requirements (MCR): Third Party Vicinity Bridge Structures		• DS-25: Climate Change Data Standard • Metrolinx Sustainability Strategy	

Figure 5: Table of applicable planning frameworks to compliment the contents of this Transit Design Guide

3.0 VISION

The public facing elements of rapid transit systems, including station sites and related facilities and infrastructure, should be designed not only for efficient movement and to encourage transit use, but to integrate into the existing and planned context, provide a high-quality experience for pedestrians and other users, and ultimately to help build more complete and sustainable communities

In addition to the Public Realm, Built Form and other related policies, the City's Official Plan sets out the vision for higher-order transit as follows:

"Higher-order transit contributes to the public life of the communities it serves, and helps promote a connected, inclusive and resilient city. The public facing elements, including station sites and related facilities and infrastructure, should be designed not only for efficient movement and to encourage transit use, but to integrate into the local community in a manner that provides a high-quality pedestrian experience, supports the envisioned context, facilitates the creation of complete communities and contributes to placemaking." (excerpt from OPA 456 Section 3.1.X. Public Realm – Higher-Order Transit)

An overarching principle of the Guide is ensuring equitable outcomes in transit design across the city. Design resources should be equitably allocated to ensure high-quality urban integration, user experience, resiliency and sustainability, operations, and accountability in those communities that need it most. These equity-seeking groups should not disproportionately bear negative transit design externalities, and particular attention should be paid to the process of engaging these communities through the design process.

Some communities have differing abilities or capacities to engage with and shape the design process of transit infrastructure, and as such particular attention and resources should be allocated for those areas least able to otherwise participate. Investment in transit design for these communities can go beyond the benefits of increased transit access and support expression of community identity, well-being, and culture. As many of these communities may rely more heavily on transit than others, the design outcomes described in the Guide are of priority for equity-seeking communities.

Figure 6: Highway 407 Bus Terminal (Photo Credit: Access Planning)



4.0 RAPID TRANSIT DESIGN PRINCIPLES

The following five headings outline design principles that were developed to inform the content of the Transit Design Guide. To ensure broad consistency and applicability with key stakeholders, these principles were developed in collaboration with multi-disciplinary professional staff from various City Divisions involved in the delivery of transit projects, CreateTO, TTC, and Metrolinx. These principles are intended to be consistent and read in conjunction with, other applicable principles having jurisdiction.

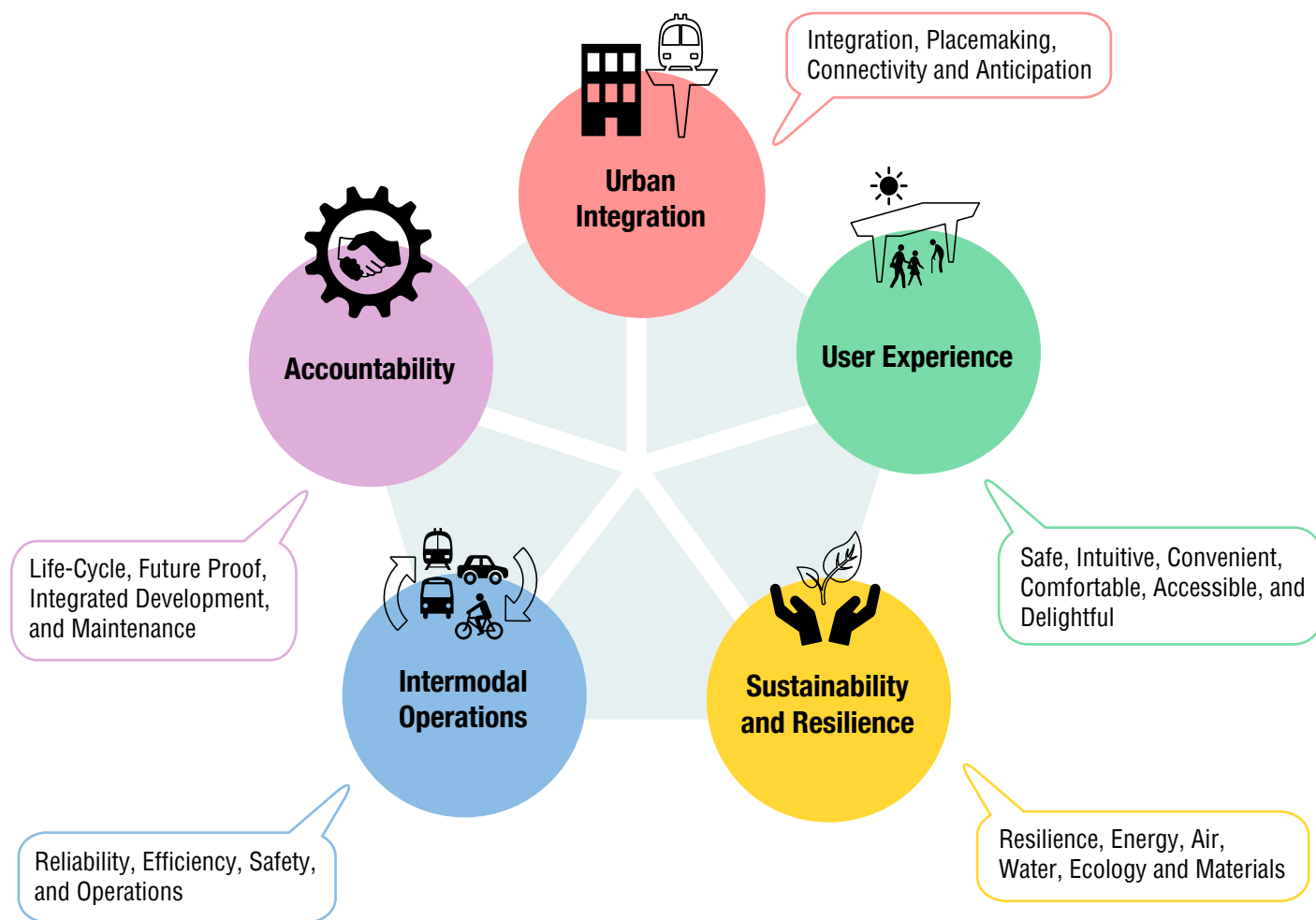


Figure 7: Illustrative diagram of the five design principles that were developed to inform the content of the Transit Design Guide

4.1 Urban Integration

Rapid transit station sites, facilities and related public-facing infrastructure should be designed to support and physically express the existing and/or planned context of the communities they serve. Such expression should achieve, but not be limited to:

- **Integration:** Fit into the existing character of natural or built areas, including heritage resources and heritage conservation districts, and also support the planned character of areas planned for growth or change.
- **Place-making:** Create or enhance the function, accessibility, identity and quality of civic places.
- **Connectivity:** Provide seamless connections and access to and from surrounding communities and other existing or planned transit facilities connecting mobility networks/systems, including local transit and active transportation. Access to transit by sustainable and active modes including walking and cycling should be prioritized.
- **Anticipation:** Enables future development and public infrastructure that is integrated with, or physically connected to rapid transit station facilities.

4.2 User Experience

To encourage public transit use, rapid transit stations, stops, and related public facilities should be designed to optimize the experience for pedestrians, cyclists, and transit users. For all, the experience should provide for:

- **Safety:** Support personal safety and security by mitigating both perceived and real threats and risks across diverse lived experiences.
- **Intuition:** Apply intuitive design principles to minimize the need for formal wayfinding tools (e.g., signage, maps, etc.).
- **Convenience:** Expedite the movement of users, and similarly facilitate efficient access and connections to, through and between rapid transit station sites, facilities, and modes.
- **Comfort:** Support the comfort of all users – whether moving, standing, seated, ascending, descending, or waiting – by including and designing facilities, amenities, spaces and services to mitigate the impacts of temperature, precipitation, visibility, and exertion, amongst others.
- **Accessibility:** Ensure that users of all abilities and means experience equitable access to station sites, entrances, facilities and transit services.
- **Delight:** High-quality design that enhances a sense of civic space and supporting an uplifting and inspiring experience.

Figure 8: Union Station Bus Terminal, Toronto (Photo Credits: JL Images, Shutterstock)



4.3 Sustainability and Resilience

Rapid transit is an essential service, critical to sustaining the normal functioning of the city, particularly during times of acute stress or emergency. The aim is two-fold:

1. To ensure that transit systems can survive, adapt and continue to operate in response to key challenges; to achieve a sustainable future for the city and its residents, and;
2. To deliver co-benefits in coordination and alignment with related City policies, including but not limited to the [City of Toronto Resiliency Strategy](#), [TransformTO Net Zero Strategy](#), [City of Toronto Zero Emissions Building Framework](#), the [Toronto Green Standard](#), [Toronto Parkland Strategy Report](#), [Toronto Ravine Strategy](#) and [Toronto's Strategic Forestry Management Plan](#)

Accordingly, the design of stations and related public-facing infrastructure has a responsibility to advance resilience and sustainability objectives.

- **Resilience:** Rapid transit facilities and infrastructure should be located, planned and designed to: be resilient to climate change, including the hazards of flooding and heat, and; contribute to a transportation network that provides multiple reliable, affordable, and safe mobility options that reduce the amount of time it takes to get around.
- **Energy:** Optimize the efficiency of heating and cooling, lighting and other systems for transit facilities and infrastructure, including through passive means through architectural design of facilities.
- **Air:** Design facilities and infrastructure to improve air quality, reduce greenhouse gas emissions, and protect public health.
- **Water:** Design transit sites and facilities to capture and manage stormwater, and minimize water consumption.
- **Ecology:** Conserve, sustain and be sensitive to the quality, character and functions of natural heritage systems.
- **Durability:** Specify durable, renewable and resilient materials, with consideration for life-cycle costs of materials.

4.4 Intermodal Operations

At stations and stops, particularly in a context where space is limited, layout and design of facilities and services must balance three, sometimes competing, operational objectives:

1. Prioritize the safety and convenience of pedestrians, cyclists, transit users and employees;
2. Provide reliable transit journey times and facilitate frequent service, and;
3. Minimize the space required to facilitate station operations by coordinating and seeking to share transit facilities, infrastructure and resources.

To do so, design of stations and stops shall balance and coordinate:

- **Reliability:** Facilitate safe and convenient connections between modes, to support reliable and frequent transit services.
- **Efficiency:** Optimize the space required to accommodate transit services through coordination and sharing of facilities, infrastructure, and resources.
- **Safety:** Minimize potential conflicts between pedestrians, cyclists, and transit vehicles, while providing convenient and efficient access to station entrances, and platforms.
- **Operations:** Ensure integrated multi-modal reliable transit that meets operating requirements.

4.5 Accountability

Design of transit facilities should deliver good value for public investment of funds. To be fiscally responsible and maximize long-term public value, design should address the following:

- **Life Cycle:** Address the whole life cycle cost of infrastructure and materials.
- **Future Proof:** Design to be flexible, responsive to innovations, or anticipate foreseeable changes in technology, mobility, ridership, customer needs/demands, and regulations (safety/climate change/public health), etc.
- **Integrated Development:** Design transit facilities and infrastructure to enable future transit-oriented development, that is integrated, physically connected, or adjoining the station site, where appropriate.
- **Maintenance:** Ensure consideration of maintenance, including through agreements between parties, and appropriate consultation process with responsible parties.

Figure 9: Emergency Exit Building along the Toronto-York Spadina Subway Extension (Photo Credit: Ben Rahn/A-Frame Studio)



5.0 ZONES OF INFLUENCE

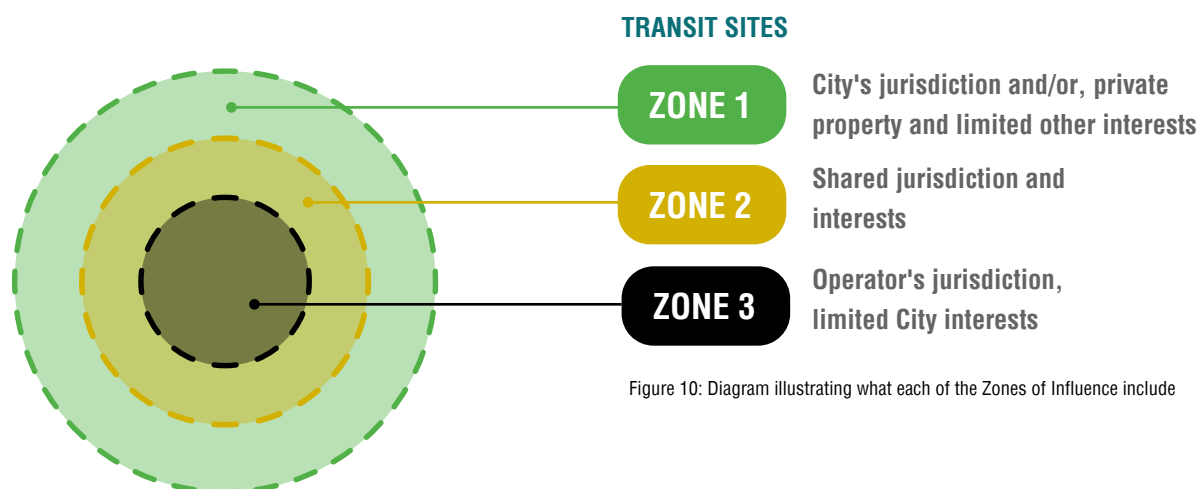


Figure 10: Diagram illustrating what each of the Zones of Influence include

The Transit Design Guide considers three key zones of influence around transit infrastructure, being:

Zone 1, where the jurisdiction falls under the City or private property. This zone encompasses the areas outside of transit infrastructure and facilities that support access to transit and create its urban context. This may include streets and sidewalks leading up to the transit station, surrounding park space, private property, or the public right of way in which linear infrastructure is situated. Examples: road rights of way used for accessing a transit station, adjacent municipal park land.

Zone 2, where the City shares jurisdiction and interests with transit operators. This zone encompasses areas where the transit station transitions or serves as an extension of the broader public realm. This may include design elements that have significant impacts on the public realm such as elevated guideway structures or transitional spaces around the transit system area such as entry buildings and forecourts or connecting passageways. Examples: Transition spaces to station headhouse buildings, public plazas or station forecourts used for site circulation accessing a station, community connections within the station such as areas outside of the fare-paid zone.

Zone 3, where transit operators maintain jurisdiction and City interests are limited. The Transit Design Guide is primarily interested in questions of urban design, urban planning, architecture and landscape architecture. Questions around engineering, construction, and operational requirements for the

transit infrastructure fall largely within zone 3 and are generally outside the scope of this guide. Examples: Platforms and track systems.

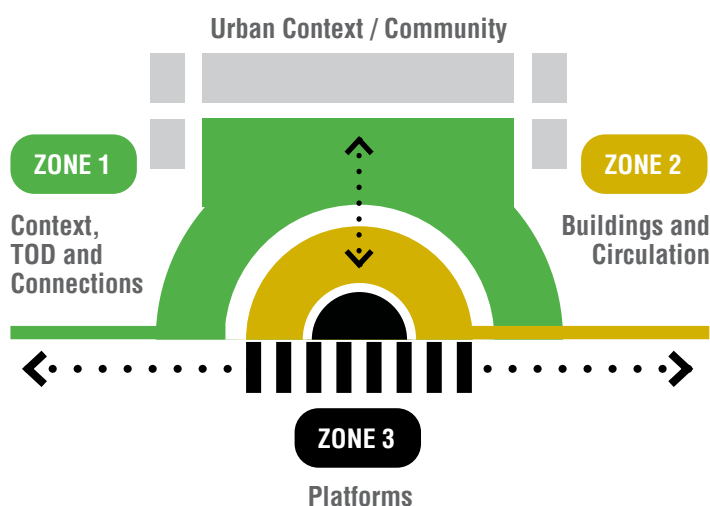


Figure 11: Diagram illustrating how the Zones of Influence apply to transit infrastructure

While the zones are intended to provide a delineation of guide applicability that respects jurisdictions, it is also recognized that all the zones have fundamental impacts on each other and that none can be viewed in isolation. While the Guide does not seek to provide guidance in zone 3, it does consider the impacts, such as footprint and orientation, that those may have on zones 1 and 2.

6.0 TRANSIT DELIVERY PROCESS

Design and implementation of a transit project take place through many different stages over multiple years. The diagram below outlines some of the key stages of project delivery considered in the Guide along with some of the key tasks undertaken at each stage. Each element specific guidance document includes distinct considerations for design at different stages of the process. In general, the Guide focuses on the early and later stages of the process; however, it can be referenced to help guide incremental decisions throughout the process.

During the Strategic Planning and Initial Business Case stage of the planning process key design, alignment, siting, and context decisions are made that can be difficult to change as the project progresses. Consultation with various City divisions and agencies is critical to ensure that the foundational interests of the Guide are realized. As the project continues through design refinement and master planning, the Guide may be referenced to help maintain the key benefits of the project. During the Design Development and Pre-Procurement stage, reference to the Guide is important to support the creation of design specifications. As the process moves into full procurement, the Guide may be referenced to help inform understanding of specification compliance during the design review process.

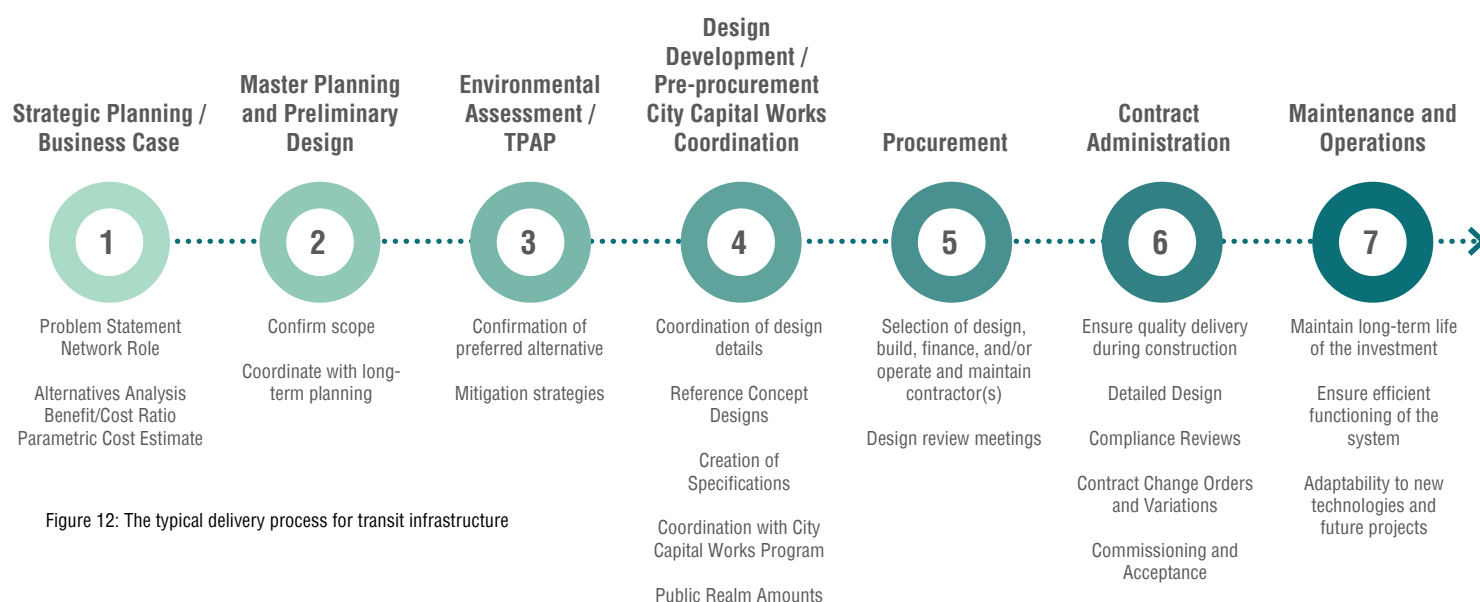


Figure 12: The typical delivery process for transit infrastructure

The process stages described above correspond roughly to the typical transit project development process. Particular attention should be paid to ensure that design review aligns with the business case milestones of the process. The Guide is agnostic to the procurement process used to deliver the transit project.



Figure 13: Highway 407 Bus Terminal, Toronto (Photo Credits: Shai Gil)