

The logo for Edmonton Transit Service, featuring the word "Edmonton" in white text on a dark blue square background.

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Edmonton Transit Service

Transit Centre Design Guide

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CONTENT, REVISIONS AND APPROVALS

The contents of this Design Guide have been modified, modernized and updated from the 2019 *Transit Centre Design Guide, originally developed in 2012*. This updated Design Guide is intended to be an interim document to support ongoing design of Transit Centres until a comprehensive transit facility design framework is developed to address all Edmonton Transit Service (ETS) infrastructure. Efforts to develop a comprehensive transit facility design framework was previously updates were added in in 2019 until 2021. This document was thoroughly reviewed and revised in 2026.

Contents were updated with input from the representatives identified in the following table. Please direct inquiries to Dustin Creviston with ETS Transit Planning Ridership & Revenue.

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VER	Date	Revision Summary	Author	Review	Check
01	2026-02-27	Original Issue	DUSTIN CREVISTON	DUSTIN CREVISTON	MICHAEL PAPPAS
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1.0 INTRODUCTION

1.1 Guide Purpose

The purpose of the Transit Centre Design Guide (hereinafter called the Guide) is to outline the basic requirements for Transit Centres. This Guide is not intended to be a comprehensive or exhaustive specification, but rather a summary and explanation of the core elements that are necessary to construct and operate safe, customer-friendly, accessible and efficient facilities. As new transit centres are constructed, and existing facilities retrofitted, the contributions of City Staff to this guide summarizes lessons learned to construct a safer and less expensive facility to own and operate. The final design of the Transit Centre is the ultimate responsibility of the Design Team (City and Consultant) per guidance from the City's Project Manager and ETS, pursuant to the following:

- site context;
- industry best practices;
- proven design features adopted by similar transit agencies; and
- in compliance with relevant acts, bylaws, policies, codes and City initiatives. Key or relevant bylaws, policies and guidelines impacting Transit Centre design are referenced in **Section 7. Bibliography and References**.

This Guide does not address transportation network connections, such as bike network connectivity, land use planning, integration with parks and open spaces, aesthetic issues or architectural styling. It is the Design Team's responsibility to integrate these considerations within the Transit Centre design and work with other departments and groups, as required. In addition, LRT stations and stops lie outside the scope of this guide.

ETS branding requirements must be upheld where standard signage and identification methods are anticipated, and the current ETS colour palette must be incorporated to maintain brand adherence.

1.2 Hierarchy of Design Goals and Objectives

Though the design process is governed by several goals and objectives, Transit Centres must, above all else, be safe and accessible for all users. Once safety and accessibility are confirmed, other major design goals and objectives shall be addressed including, but not limited to, sustainable urban integration (SUI), community integration and place-making, non-fare revenue opportunities, public space enhancement, supporting amenities, etc.

1.3 Site Context

The layout of a Transit Centre depends on the site context, which includes the site size, layout and dimensions, adjacent road network, access and anticipated utilization in terms of vehicles and riders. The following high-level considerations for Transit Centre design are explored in this Guide:

- expected utilization of the Transit Centre in terms of type and number of vehicles, layover needs, rider volumes and connection requirements;
- vehicle and rider circulation within the transit centre;
- vehicle and rider access to/from the adjacent transportation network;
- integration with nearby parking and/or drop-off areas;
- rider amenities, including amenities supporting multi-modal connections, such as bike racks and/or lockers, and measures to reduce modal conflicts;
- signage and wayfinding;
- operator amenities; and
- amenities supporting facility operations, such as janitorial, technology and security.

1.4 Transit Centre Design Requirements

All new and replacement Transit Centres must address the design elements presented in this Guide and summarized in **Appendix A**. However, exceptions or deviations are sometimes required to ensure the design is appropriate for the site context. Therefore, where exceptions or deviations from design requirements are proposed, the design team shall conduct appropriate review to ensure the proposed design maintains safe, customer-friendly, accessible and efficient facilities.

Review requirements will be determined in consultation with ETS and will be flexible to the desired exception or deviation. Depending on the specific design context of the proposed exception or deviation, such review might include, but is not limited to, the following:

- a summary of the proposed design exception or deviation;
- assessment of experiences from other transit agencies operating similar transit infrastructure and/or best practices review supporting the proposed design exception or deviation;
- articulation of anticipated transit centre accessibility and operations resulting from the proposed design exception or deviation, including analysis of potential operational and customer impacts;
- review of alternatives to the proposed design exception or deviation; and/or
- identification of potential measures to mitigate risk associated with the proposed design exception or deviation.

Proposed exceptions or deviations shall be submitted with the above-noted supplemental analysis to ETS for approval per the process presented in **Appendix B**.

2.0 BUS BAYS, CIRCULATION LANES AND PLATFORMS

The Design Consultant shall contact the **Senior Engineer, Facility Design and Operations (ETS Planning & Scheduling)** to obtain input, guidance and concurrence for any design pertaining to Bus Bays, Circulation Lanes and Platforms.

Typical off-street Transit Centre layouts are illustrated in **Appendix C** for reference. ETS generally prefers off-street Transit Centre facilities, particularly for higher utilization Transit Centres, because they allow for control of facility operations, accessibility and safety, as well as integration with technical management systems. Proposed deviations, such as on-street facilities, will be considered, particularly for lower utilization Transit Centres. Such deviations will require the Design Team to complete additional review as outlined in this section, **Section 1.4. Transit Centre Design Requirements**, and as identified in consultation with ETS.

2.1 Bus Bays

Number of Bus Bays

ETS Planning will identify the number of bus bays required for the Transit Centre based on current and projected service levels and number of bus routes in the area.

Bus Bay Assignment & Configuration

ETS assigns specific routes to bays to promote ease of use and consistency for riders. In particular, dedicated bays are paramount to ensure accessibility of transit service for riders with limited vision or different cognitive abilities. Ideally, one route should be assigned per bus bay, but can be revisited on a case-by-case basis. Further, sawtooth bays are preferred because they require a shorter platform length when each route is provided with its own bay. Sawtooth bay dimensions can be found in standard drawing #4400 of the City's *Complete Streets Design and Construction Standards* (included in **Appendix C**).

Deviations from the City's standards will require swept path analysis per ETS fleet characteristics outlined in **Appendix D** to confirm that the appropriate design vehicle can complete the following manoeuvres:

- navigate into and out of the bus bay from all Transit Centre access(es) without conflict from other vehicles, including moving and stationary vehicles; and
- utilize the bus bay with all vehicle doors flush to curb, as required to reduce risk of slips, trips and falls while riders are boarding and alighting the bus.

Where parallel (straight) loading platforms are needed due to site or other operational constraints, consideration should be given to providing sufficient bay length for dedicated-route stop operations, as much as possible, to support accessibility, ease of use, adequate sightlines between stopped buses (to mitigate risk of collision between buses and pedestrians) and service reliability. Given the accessibility and customer service impacts of not maintaining dedicated-route stops, utilization forecast and impact analysis will be required to support bus bay configurations that are not sawtooth.

2.2 Curbside

A clear zone of at least 0.6m from the concrete curb face to any infrastructure installed on the platform or adjacent to a stop area must be provided to prevent pedestrian injury resulting from a pinch point, or vehicle damage resulting from conflict with a stationary platform object. Deviation will require swept path analysis, per ETS fleet characteristics outlined in **Appendix D**, to confirm that the appropriate design vehicle may navigate the curbside without conflict and/or risk of injury.

2.3 Circulation Lanes

Busway Width

Transit Centre circulation lanes should be sufficiently wide to allow for bus circulation without obstruction resulting from an adjacent stopped bus or approaching bus where two-way traffic is expected. Typically an 18m wide circulation lane is the minimum clear width, shown in **Appendix C**, required for two-way bus traffic or a 10m wide circulation lane is required for one-way bus traffic. However, these widths are highly dependent upon Transit Centre configuration, access/egress configuration, adjacent roadway geometry, site-specific context and anticipated operational volume of buses and people.

Swept Path Analysis

A swept path analysis shall be conducted per ETS fleet characteristics outlined in **Appendix D** for buses entering and exiting the site, circulating the busway and pulling into/out of bus bays. For this analysis, a sufficient buffer is required recognizing potential for variation in bus placement, both in lane and at stop, due to human interactions, front-loaded bike racks and/or other environmental conditions.

The swept path analysis shall:

- account for mirrors (up to 0.32m wide) on either side of the bus body;
- ensure sufficient space is provided between vehicles to maintain sightlines of potential hazards, such as crossing pedestrians, when buses are passing;
- identify major stationary barriers, such as planters, walls and poles, and maintain at least 1.0m lateral clearance from the vehicle sweep; and
- utilize a smooth turning path that reflects typical operational practices and does not require stopping to adjust path.

Construction Requirements

The busway and circulation lane grades, cross-slope and slab shall be built according to City of Edmonton concrete pavement standards.

2.4 Post-Construction Testing

Physical testing with an appropriate vehicle will be required and completed by ETS, in cooperation with the Design Team, prior to acceptance of the constructed Transit Centre.

2.5 DATS Areas

At all new Transit Centres, an area shall be provided to facilitate the drop-off and pick-up of DATS riders. The following criteria for locating DATS drop-off / pick-up areas (areas) shall be applied:

Accessibility

The DATS area shall be fully accessible and barrier free. All connections to and from the DATS area shall have hard surfacing and curb ramps appropriate for all types of mobility devices. Though amenities for shelter and/or security, such as emergency phones, are desirable near the DATS area, other amenities should be placed with caution and/or avoided because they may hinder mobility in and around the DATS stop, such as bike racks, advertising boards/stations, vegetation and/or plantings creating vertical obstructions in the travel surface, etc. Where DATS areas cannot be accommodated reasonably close to the Transit Centre building, adequate space for an accessible ETS-supplied shelter must be provided.

Location

Congestion should not impede bus or local traffic movements. DATS vehicles are generally stopped for longer periods of time than conventional buses given boarding and alighting protocol. Therefore, the DATS area should be located in lower volume and lesser utilized areas of the Transit Centre. Bay assignments for DATS buses will be revisited upon request from DATS operations, should issues be identified.

DATS areas may be shared with lower volume transit routes. However, depending on adjacent land uses, such as hospitals or health service centres, and/or intermodal connections, such as proximity to LRT stations, dedicated space may be required to accommodate DATS areas, as identified by ETS.

Dimensions

Any transit centre bus bay that is suitable for a 40-foot bus will be satisfactory for a DATS vehicle. Curbside stops, or stops at post-secondary institutions, are outside the scope of this document, and would require a site visit from DATS operational staff to determine suitability.

Identification

The DATS stop will be identified by destination tabbing on the bus stop blade, same as other transit routes on transit centre bay signage. Unique DATS signage may be added to the bus stop pole on a case-by-case basis.

2.6 Passenger Platform

The passenger platform is the waiting area and interface to the Transit Centre bus bays.

Vehicle Circulation

Since a Transit Centre often requires buses to circulate a central island, the platform should be sufficiently wide to allow buses to navigate around the island. In conducting swept path analysis for bus circulation around the platform, sufficient buffer should be incorporated to accommodate variations in vehicle placement entering and exiting the turn, front end bike racks, mirrors, ETS fleet variety and other realistic operational conditions that may be present, such as snow, ice, etc. A minimum clearance of 1.0m should be provided between the vehicle sweep and physical objects, and, where visibility is restricted or the bus is beside a structure, such as a column, building edge or wall, the lateral clearance should be greater than 1.0m.

Platform Width and Height

To facilitate passenger flow, passenger amenities and snow clearing, a typical island platform shall be a minimum of 14.0m in width, and straight-face curb height of 200 mm.

Delineation of Barrier-Free Travel Path

The platform design shall include tactile guidance strips in accordance with the *Tactile Guidance Design Memo* provided in **Appendix E**.

Platform Amenities and Barrier-Free Travel Path

Amenities such as garbage receptacles, benches or advertising signs, shall be located towards the center of the platform or otherwise out of the natural corridors for passenger traffic flow and in accordance with the *TRANSIT CENTRE TACTILE GUIDANCE DESIGN MEMO*. Seating shall face transit activity and comply with seating guidelines per the City's *Access Design Guide* and the Accessibility Advisory Committee's *Checklist for Accessibility & Universal Design* provided in **Appendix F**. Further, all surfaces shall be smooth, firm and slip-resistant, and grade changes shall be minimized. Where required, ramps shall be designed per the City's *Access Design Guide*.

The platform width at the head of the bus stop and adjacent to any major vertical obstructions, such as a building, windows or walls, shall be 3.0m measured from the face of curb to the vertical obstruction to accommodate a barrier-free travel path that supports platform mobility, bus accessibility/ramp deployment, and reduced tripping hazard when the bus ramp is deployed. Further, this clear width shall be free of all minor stationary obstructions, such as gas meters attached to buildings, etc. Otherwise, the clear width of the travel path and vertical clearances on a platform shall abide by the City's *Complete Streets Design and Construction Standards* and *Access Design Guide*. For clarity, the desired clearance is 2.5 - 3 m, with an absolute minimum clear width of 2.1m adjacent to a boarding/alighting area is only intended for use in highly-constrained design environments where supplemental corridors for passenger flow are incorporated elsewhere, and will be reviewed on a case-by-case basis in terms of the specific site design context. These clearances should be applied to any obstacles, such as poles, utilities, landscaping, benches, public art, or any other amenities or stationary objects.

Sightlines

Sightline obstructions shall be avoided adjacent to preferred pedestrian crossing locations (reference **Section 2.7 Crosswalks**). Depending on the site context, the building and/or other amenities may need to be shifted away from the edge of the platform to maximize available sight distance.

Drainage

For positive drainage, all platforms shall have a 2% slope to a curb with gutter. The design of concrete for platforms shall include provision for under-slab drainage and dowels shall be provided at control joints to prevent uneven slab movement.

2.7 Crosswalks

Crosswalk Placement

Crosswalks shall be provided at key locations where pedestrian travel and desire lines are anticipated per adjacent development and transportation network connections. The goal of crosswalk placement and platform design is to safely channelize pedestrian crossings to reduce potential conflict within the Transit Centre and improve barrier-free travel paths. Further, crosswalks shall be placed perpendicular to the curb, as much as possible, to reduce crossing length and subsequent pedestrian exposure to potential conflict, while also ensuring that pedestrians do not have their backs to oncoming buses or other traffic.

Crosswalks shall be designed to ensure that pedestrians entering the crosswalk will be visible to all approaching vehicles under all conditions, particularly during periods of highest congestion and workload for the Transit Centre. Locations of lower visibility and/or higher user workload should be avoided when placing crosswalks, including uncontrolled accesses to the adjacent transportation network and/or circulation areas with tighter radii that require more complex movements, such as around island ends.

Platform Curb Configuration at Crosswalks

Per Standard Drawing 4400 in the City's *Complete Streets Design & Construction Standards (2025)*, crosswalks within the Transit Centre that are located between two bus bays shall be accommodated by providing a 4.0m length of straight curb between the consecutive bus bays to ensure sight lines are maintained and stopped buses do not interfere with the crosswalk. Curb extensions may be incorporated, particularly at each end of the platform, to improve visibility of pedestrians at crosswalks placed in front of a bus stop.

Crosswalk Specifications

- Zebra crosswalk pavement markings and curb ramps shall be provided at all locations where Transit Centre busways intersect sidewalks.
- Curb ramps shall be aligned with crosswalks and include Tactile Walking Surface indicators (Appendix E).
- Crosswalk markings shall be 4.0m wide, constructed of yellow plastic inlay (thermoplastic or other durable marking) for improved visibility and wear on the concrete circulation lanes, and laid out so they are not run over by tires to minimize wear of pavement markings.
- Surfaces shall be smooth, firm and slip resistant.

2.8 Accessibility

Accessible design considerations and accepted practices are ingrained throughout this Guide and associated reference documents listed in **Section 7**. All Transit Centres shall be accessible to persons with physical, sensory and mental disabilities and designed as barrier-free in accordance with the relevant codes, guides, policies and best practices.

In particular, the City's *Access Design Guide* referenced in **Section 7, Tactile Guidance Design Memo** presented in **Appendix E** and Accessibility Advisory Committee's *Checklist for Accessibility & Universal Design* presented in **Appendix F** shall be applied to all Transit Centre design. Proposed deviations from accepted practices, particularly those outlined in the City's *Access Design Guide* and *Tactile Guidance Design Memo*, will be reviewed on a case-by-case basis per the process outlined in **Appendix B**.

In 2025, ETS worked with the Canadian National Institute for the Blind (CNIB) to trial various curb markings, patterns, and colours and how they are interpreted by people with various vision impairments. The final agreed-upon design, which will be carried forward into future designs, is an alternating black and yellow pattern with 3-foot segments around the perimeter of the transit island.

2.9 Landscaping

All landscaping for Transit Centres shall be designed in accordance with relevant City bylaws, policies, processes and initiatives. Please contact **Urban Planning and Economy**, in coordination with the City's Transit Centre Design Project Manager, upon commencing design to confirm requirements for landscaping.

ETS prefers raised planters and/or landscaped features that help to delineate pedestrian and cyclist travel paths while promoting ease of maintenance. Safety and security issues must govern any design and landscaping requirement, and trees and shrubs shall not obscure sight lines where it is reasonably believed that a decreased level of security may result due to the sightline obstruction.

2.10 Bicycle and Micromobility Parking

For the convenience of riders, bicycle parking (racks and lockers) and E-Scooter/E-Bike corrals shall be provided at each Transit Centre where space is available and in following with the requirements outlined in the *LRT Design Guidelines* (Section 10.6.6), applicable sections of *Zoning Bylaw 12800* and the City of Edmonton *Bike Plan*, and per consultation with **Policy Development - City Planning** at the onset of design.

2.11 Kiss and Ride / Taxi Areas

Where space permits at large Transit Centres and/or where demand is expected, a drop-off/pick-up area (Kiss and Ride) shall be provided. Kiss and Ride infrastructure shall be designed to mitigate potential conflict with adjacent bus stops, bus manoeuvres, and pedestrian desire lines and travel paths. The Kiss and Ride / Taxi area must never be located within a bus loop. The size of the area, proximity to the Transit Centre and connectivity with the adjacent transportation network will be addressed on a case-by-case basis recognizing the specific context of each site and design environment.

2.12 Clock Tower

A clock tower and supporting data conduit shall be provided at each new centre. Though conduit will depend on camera and security requirements associated with the clock tower and overall site

configuration, typically two Cat6 and 120V power are required in two separate conduit (typ. 2 x ¾”), to be confirmed with Facility Engineering prior to detailed design and tender development. Depending on the length of conduit, this span may need to be powered. The clock tower shall function as a highly visible location for the ETS brand in accordance with the *ETS Visual Identity Manual*. Refer to the *Clock Tower Design Report and Specifications* identified in **Section 7** (to be provided by the City’s Project Manager and/or ETS at the onset of design).

2.13 Snow Clearance

ETS does not typically stockpile snow at Transit Centres, but rather removes snow immediately after it is cleared. Therefore, Transit Centre design shall accommodate efficient snow removal and vehicle access for snow removal. However, it is recognized that some Transit Centre configurations may necessitate designed accommodation of temporary snow storage depending on the site context, such as very elongated and narrow facilities (e.g. Mill Woods Transit Centre).

3.0 BUILDING

The Design Consultant shall contact the **General Supervisor of Transit Facility Maintenance (LRT Operations and Maintenance)** to obtain input, guidance and concurrence for any design pertaining to building design features outlined in Sections 3.1 (Space Requirements), 3.2 (Power Operated Doors), 3.6 (Key Access to Buildings), and 3.8 (Other Requirements).

The Design Consultant shall contact the **Director of ETS Transit Planning, Ridership and Revenue** to obtain input, guidance and concurrence for any design pertaining to building design features outlined in Sections 3.3 (Kiosks and Vending Machines) and 3.4 (Advertising Considerations).

The Design Consultant shall contact the **Director of ETS Technical Services** to obtain input, guidance and concurrence for any design pertaining to building design features outlined in Sections 3.1 (Space Requirements), 3.5 (Accommodation for Future Enhancements), 3.7 (Digital Clocks), and 3.8 (Other Requirements).

3.1 Space Requirements

The primary purpose of the Transit Centre building is to provide a safe waiting area for Transit riders while they await arrival of their buses. The Transit Centre building is also needed to provide Transit Operators with appropriate washroom facilities and at least one, but preferably two, public washrooms unless such facilities are available in an adjacent LRT Station. Public washrooms shall incorporate amenities that allow for gender neutral utilization and facilitate redundancy during washroom closures for cleaning and/or other maintenance activities.

Appendix G summarizes the space, area and feature requirements for specific areas required in each Transit Centre. The entire *ETS Wiring Closure & Bus Transit Centre Communications Room Technical Recommendations* (2017) report will be made available to the consultant upon project award.

3.2 Power Operated Doors

At least one set of power sliding doors should be used to provide barrier free access to the facility. The power sliding doors shall use a hand motion actuator on both sides to prevent unnecessary door cycles caused by people walking by overhead sensors. The power sliding doors shall also have the breakaway feature disabled and not signed as an emergency exit to help prevent vandalism incidents from the door being pushed out of its track. Door controls shall be located out of view and shall be resistant to vandalism. Refer to the City of Edmonton *Facility Design and Construction Manual* and confirm hardware and door selection with the Architect prior to detailed design and tender development.

3.3 Kiosks and Vending Machines

In order to maximize rider convenience while waiting at a Transit Centre, each new Transit Centre should make provision for a coffee/snack food kiosk or a minimum of two vending machines. Kiosks shall be located in high visibility areas, in order to attract potential retailers providing public transit complementary services and/or products, as well as to make patrons aware of the facility. The preferred location of vending machines is the heated waiting area.

Consult with the **Director of ETS Transit Planning, Ridership and Revenue** for more information and guidance regarding the Kiosk and Vending Machine requirements.

Kiosks shall be operated by an external vendor and shall have the following amenities:

- separate exterior entrance with C-Cure system;
- roller shutter and counter opening to heated waiting area with BMS monitoring capability;
- separately metered electrical panel;
- rough-in hot and cold water plumbing. If hot water is not available, provide an instant hot water device;
- ventilation and AC; and
- floor drain.

Please note that the kiosks are not submetered.

3.4 Advertising Considerations

ETS is currently updating advertising standards, requirements and guidelines. Please confirm specific requirements with the **Director of ETS Transit Planning, Ridership and Revenue** to confirm advertising opportunities in the Transit Centre.

3.5 Accommodation for Future Enhancements

Transit Centres should be designed to accommodate the installation of future enhancements for customer information. These enhancements may include floor or ceiling mounted interactive centres, video displays to provide bus or schedule information. Space shall be provided in the heated waiting area and accommodation for 120V electrical power and a high-speed data line should be made.

Conduit should be provided to accommodate possible future electrical power connections to facilitate advertising apparatus. Additionally, one conduit for power and one conduit for communications shall be provided to each of the stops in the Transit Centre to support future electronic signage. ETS will assist with identifying bus stop signage locations for conduit design.

Specific accommodations for future enhancements shall be confirmed in consultation with the **Director of ETS Technical Services** at the onset of Transit Centre design.

3.6 Fare Equipment

ETS has implemented Smart Fare Vending Machines (SFVMs) and validators (LRT only), which impacts Transit Centre design in terms of footprint and placement, as well as systems requirements, including communications, power, alarms, CCTV monitoring and other building management systems. Specific requirements shall be confirmed with the **Director of Technical Services** at the onset of Transit Centre design.

3.7 Key Access to Buildings

All Transit Centres must permit access to Operators and maintenance staff in a consistent manner. Specifically, all public facing doors require card access and, per ETS Technical Services and Safety review, some internal (non-public facing) doors may also require card access. The key access requirements and additional details regarding card access panel installation are presented in the City of Edmonton *Facility Design and Construction Consultant Manual* Appendix C.

3.8 Digital Clocks

Digital clocks will be installed in all Transit Centres in locations where they are clearly visible to patrons. The following table outlines basic requirements of indoor digital clocks:

Table 3.8 Requirements for Interior Clocks in Transit Centres

Requirement	Details
Display	4-Digit, 101.6mm (4.0") characters, Blue LED
Dimensions	Height: 210mm (8.25") Width: 387mm (15.25") Depth: 57mm (2.25")
Accuracy Insurance System	Tie to ETS Network NTP time source to ensure synchronization with the Clock Tower
Installation	Recessed into surface for clean look
Power	Power over Ethernet

3.9 Other Building Requirements

- Fire extinguishers shall be located inside Operator washrooms in lieu of public areas to reduce vandalism of safety equipment.
- Uninterruptible Power Supply (UPS) to support Communications shall be provided, as specified in the *LRT Design Guidelines*, and suitable for two hours of emergency service. Detailed design requirements shall be set per consultation with the **Director of ETS Technical Services** at the onset of design and as outlined in the *ETS Wiring Closet & Bus Transit Centre Communications Room – Technical Recommendations*.
- Building Management System (BMS) capable of the following shall be provided per guidance specified in the *LRT Design Guidelines* and in consultation with the **Director of ETS Technical Services** and the **General Supervisor of Transit Facility Maintenance** at the onset of design:
 - controlling and providing a status of all mechanical equipment;
 - scheduling mechanical equipment and setpoints;
 - initiating alarm when mechanical equipment or variables are out of acceptable range;
 - controlling lighting system; and
 - recording and trending equipment status, operation and setpoints.
- Incorporating a Heat recovery system for building exhaust air.
- Incorporating an appropriate connection for a portable backup generator.
- Please refer to **Appendix H** for detailed information regarding the typical division of responsibilities for low tension systems required at Transit Centre buildings and confirm requirements in consultation with the **Director of ETS Technical Services** at the onset of design.

4.0 SECURITY

The Design Consultant shall contact the **ETS Supervisor of Security** to obtain input, guidance and concurrence for any design pertaining to site security and safety features outlined herein.

Security features outlined in **Appendix G** shall be provided in all Transit Centres, particularly pertaining to Security Office and Washroom spaces.

4.1 (Crime Prevention through Environmental Design) CPTED

All new Transit Centres shall apply design concepts and features that maximize the safety of transit patrons and transit employees. These features shall include, but are not limited to, the following:

Maximized Sight Lines

- Use straight walls with plenty of non-opaque glass (down to 400mm above floor or less).
- Avoid recesses, alcoves, or concealed areas suitable for hiding, including under stairwells.
- Avoid horizontal mullions in glass walls that appear at eye level height for standing and sitting patrons.

- Provide mirrors at transition points where sight lines are obstructed.

Minimized Entrapment Areas

- Avoid dead end corridors or areas which have only one exit.

Natural Surveillance

- Achieve high visibility of the Transit Centre from adjacent public areas.
- Avoid landscaping features or architecture that impede sight lines or offer hiding places.
- Locate Transit Centres, as much as possible, away from isolated areas such as parking lots, vacant land, alleys, ravines or buildings set back from the street.
- Maximize direct pedestrian pathways to match line of sight and desired lines.

Natural Access Control

- Provide appropriate fences and landscaping for pedestrian channelization and discourage public access into dark or unmonitored areas, or to prevent inappropriate travel paths (i.e. jaywalking, cutting through landscaped areas, etc.).
- Proactively design and construct access control, such as architectural features, planters, transportation network connections and fences, to promote safe, accessible and integrated facility operations.

Incorporate Daylight into Lighting Design

- Maximize natural lighting throughout the Transit Centre, including all accesses, during daylight hours.
 - Using natural light can also reduce energy consumption in terms of lighting and heating operating expenses
- Proactively assess and incorporate artificial lighting needs into the Transit Centre Design in consideration of safety and security, maintenance, and accessibility impacts.

4.2 Closed Circuit Television (CCTV)

Camera Placement

A Closed Circuit Television System (CCTV) shall be provided for each Transit Centre to the current standard and technology maintained by ETS. The CCTV system shall provide low light color cameras at strategic locations in sufficient quantities to eliminate blind spots and enable the following coverage:

- all public areas in the centre interior and exterior;
- washroom entrances;
- entrances and exits to the Transit Centre building;
- fare vending equipment;
- emergency phones;
- bus bays and platform;
- Park and Ride lot, if present; and

- stairs, elevators and any location with potential for slips, trips or falls.

ETS and Corporate Security shall be contacted to review camera placement during the Transit Centre design process.

Camera System

The system shall be compatible with existing CCTV equipment and shall be configured to transmit images to a remote monitoring site at ETS Control Center. All cameras must be of the IP PoE type. Interior cameras shall be of the low-light type (min. 1 lux) and fixed mounted vandal-resistant dome enclosures. Please refer to *LRT Design Guidelines* for additional Camera System requirements. All components of the communications/CCTV system must be fully remote controlled, including remote power cycling via IP power bars and/or POE network switch ports, and activated on alarm and emergency phone activation and fare dispensing equipment. In addition, provisions must be made for auxiliary network switches such that all devices are within 70m of a switch; greater than 70 metres require powered fiber. Ethernet and PoE extension devices may be considered. Table 4.2 indicates features the CCTV system shall also include:

Table 4.2 Additional CCTV System Features

Item	Feature	Description
1	Emergency Phone Interlock	Each camera in nearest proximity to an Emergency Phone shall be configured to zoom to that Emergency Phone and record high-resolution images in real time mode (min. 10 frames per second) from the moment the phone is activated until the resulting call is terminated from ETS Control Center. This camera can be fixed but ideally be a pan-tilt-zoom (PTZ) model.
2	Vandal Resistant Measures	All external pan and tilt cameras shall be mounted 5.0m above the platform level and all other cameras shall be mounted at least 3.0m above platform level (with max. 5.0m) unless vandal resistant dome housings are provided. Using equipment such as PoEvator™ will reduced maintenance time and expense for camera maintenance.

4.3 Paging System

A paging system shall be installed within each transit center. The system shall enable voice paging from ETS Control Center and provide two zones – heated and unheated shelter areas – with separate volume and selection controls (zone 1, zone 2, both) selectable from ETS Control Center. ETS requires that the system is r2p Netspire PA to align with current programming at new transit centres and be suitable for the elements the speakers are installed in.

4.4 Phones

Emergency Phones

Per **Appendix G**, each Transit Centre shall be equipped with at least one Emergency Phone within the interior heated public area and at least one Emergency Phone at a location on the

platform in an area that is accessible by the public during hours when the Transit Centre may be locked. The number of emergency phones will be dependent on the design of the Transit Centre and platform area and shall be determined per review of **ETS Supervisor of Security**.

Emergency phones will also be placed in each public washroom. The phones shall be readily identifiable through the use of high visibility lettering/markings and locations and the employment of supplementary signs and at a height and location accessible to all.

Each Emergency Phone shall provide a direct telephone or VOIP connection to ETS Control Center upon the activation of a push-pad and shall provide a vandal-resistant microphone and speaker in lieu of a telephone handset. An indicator light shall be provided on each emergency phone to indicate initiation of the connection to the ETS Control Center. The Emergency Phones shall also be equipped with a CCTV interlock (see **Section 6.2 Closed Circuit Television (CCTV)**) and termination of a call, once initiated, shall only be possible from ETS Control Center. Braille labeling and instructions for use of all Emergency Phones shall also be provided. A mounting template for labeling and instructions will be provided by ETS. All Emergency Phones shall be VoIP with CAT6 cabling.

Operator Washroom Phones

As noted in **Appendix G**, phones shall be provided in all Operator washrooms.

4.5 Automated Locking/Unlocking

All Transit Centre doors and accesses (i.e. washrooms, exterior doors, communications and maintenance rooms, etc.) shall be connected to ETS Security for remote and automated locking/unlocking. All exterior door locking mechanisms shall be in default position locked when not powered. Further, all swing doors shall have metal astragals to prevent them from being pried open.

4.6 Lighting

LED lights are the preferred lighting source but other sources may be considered if special circumstance requires. A white light source is required to provide improved visibility and colour rendering at Transit Centres.

All lighting fixtures and configurations shall be selected to minimize glare. Exterior lighting standards must still be met during least optimal lighting conditions with buses parked in all available zones.

Lighting for crosswalks and platform areas not covered by the island building area shall meet standards outlined in the City's *Policy No. C576 - Light Efficient Community Policy*. Given the potential for pedestrians to cross anywhere within an off-street busway, including outside of marked crosswalks, the busway area shall be considered as equivalent to the platform area in terms of lighting requirements.

Lighting for other areas shall meet Station Interior and Exterior Areas lighting levels outlined in the *2017 LRT Design Guidelines* - Section 11.10.4 Illumination Levels. Please note that the

interior of the Transit Centre shall be considered as equivalent to a Platform and Platform Shelter identified for the Station Interior.

Light should be evenly distributed to minimize shadow on indoor circulation routes. Lighting should be increased to emphasize areas of potential hazard and information (entrances, exits, stairs, ramps, escalators and signage). Consistency in the level of illumination is a primary concern for people with vision loss (*Accessible Design Guide*, Section G. 7 page G-53).

Table 4.6 ETS Standards for Lighting

Location	Average Minimum Lux
Interior of Transit Centre	200
Busway	30
Platform	30
Park and Ride lot	30

5.0 WAYFINDING, SIGNAGE AND TRAFFIC CONTROL

The Design Consultant shall contact the **Director of ETS Transit Planning, Ridership and Revenue** to obtain input, guidance and concurrence for any design pertaining to Sections 5.2 (Identity Signage), 5.4 (Wayfinding) and 5.7 (Information Panels and Schedule Boards).

The Design Consultant shall contact the **Senior Engineer, Facility Design & Operations (ETS Planning & Scheduling)** to obtain input, guidance and concurrence for any design pertaining to Sections 5.1 (Bus Stop Signage), 5.3 (Transit Centre access) and 5.4 (traffic control).

The Design Consultant shall contact the **General Supervisor of Transit Facility Maintenance (ETS Engineering & Maintenance)** to obtain input, guidance and concurrence for any design pertaining to building design features outlined in Section 5.5 (Interior Wayfinding and Other Signs).

5.1 Bus Stop Signage

Bus Stop signs shall be placed at the head of stop in alignment with the front bumper position when a bus is at full service stop, as much as possible. The bus stop sign shall have an offset of 0.6m from the edge of the curb to the sign post to avoid potential pinch points. Bus stop signs will be manufactured and installed by the City. If installed on a post, bus stop signs shall point away from the bus to reduce potential for mirror impact. All signage shall be mounted to provide a 2.1m vertical clearance.

Per **Section 3.5**, ETS is future proofing for an at-stop, real-time digital messaging program and requires that conduit for data and power is pulled to all bus stops. An in-slab junction box shall be provided either under the bus stop sign or as close as possible to the bus stop sign, to be determined on site in consultation with ETS during construction.

5.2 Identity Signage

The *ETS Brand Guide - Visual Identity Manual* shall be used to develop ETS identity signage for all Transit Centres. The manual provides details of the ETS wordmark, colour, and dimensional

requirements for standard signage and clock tower features. The clock tower concept is an important identity feature that shall be included in all future Transit Centre designs.

Large, high visibility ETS logo/brand signage will be on the exterior building for high recognition. Preference is given to locations adjacent to the building entrance points and large scale walls or flat surfaces. The signage is to be constructed of anodized or powder coated metal letters pinned to the building surface with diffused halo LED lighting placed behind the lettering. Transformers and electrical access for all signage is to be placed inside the building. Standard ETS corporate colours, blue and silver, are to be used in construction materials to support the brand image.

5.3 Transit Centre Access

Traffic signals with appropriate phasing and timing scheme to support transit centre access and egress shall be provided to facilitate the smooth flow of buses in and out of each new Transit Centre if for access to an arterial roadway or busy collector roadway. Bus loops or detection cameras are also recommended at exit points to ensure transit priority and reduce delays and congestion within the transit centre. Depending on the Transit Centre configuration, forecast utilization, and adjacent road network and land use context, at least two independent all-direction accesses shall be provided.

5.4 Traffic Control and Exterior Wayfinding Signs

A signage plan shall be developed by the designer to be included with the standard drawings set. The signage plan shall consider all traffic control signs required within the Transit Centre busways and on adjacent roadways that will be utilized to access the Transit Centre. The plan shall also provide for bases and posts for bus stop signs at each bus bay. Bus stop tabs will be provided by ETS outside of the construction contract.

The signage plan shall also include appropriate wayfinding to identify barrier-free paths of travel (where all possible paths of travel are not barrier-free), barrier-free entrances, designated parking spaces (including bicycle parking), accessible telephones, as well as adjacent transportation network connections and points of interest and/or common adjacent destinations.

The City's *Wayfinding Design Standard, Design Specifications* identified in **Section 7** shall be referenced for design and the City's Standard, internationally recognized pictograms shall be used for accessibility signage. The *ETS Light Rail Transit Graphics Standards Manual* shall also be used as a reference. However, please note that ETS and LRT Delivery will be updating wayfinding guides in the near future, so specific signing and wayfinding requirements shall be confirmed with ETS during design.

5.5 Interior Wayfinding Signs and Other Signs

A provision for interior wayfinding signs and other miscellaneous signs shall be made as part of the detailed layout and design of the Transit Centre building. The following table outlines typical requirement for these types of signs.

Table 5.5 Typical Requirements for Wayfinding and Other Signs

Sign Type	Purpose	Location	Approx. Qty
Emergency Phone Icon and Arrow	Wayfinding	Above emergency phones	2
“Fire Extinguisher Located Inside Operator Washroom, Janitor Room, Kiosk, Electrical and/or Mechanical Room” c/w icon	Wayfinding / Identification	Washroom Doors	2
Operator Washroom (Female) c/w icon	Identification	Washroom Door (Female)	1
Operator Washroom (Male) c/w icon	Identification	Washroom Door (Male)	1
Public Washrooms c/w icon and Braille	Identification/ Wayfinding	Public Washroom Door and beside handlebar	2
Janitor	Identification	Janitor Room Door	1
Mechanical	Identification	Mechanical / Electrical Room Door	1
Private	Identification	Kiosk Entrance	1

Operator Washrooms Doors

If operator washroom doors are visible to the public, a *Staff Only* sign and symbol with male/female icon shall appear on the appropriate doors. If operator washroom doors are accessible via a small front room, a *Staff Only* sign shall be placed on the outside door to the front room, and male/female icons shall be placed on appropriate inside doors.

5.6 Information Panels and Schedule Boards

ETS provides information panels and schedule boards at each Transit Centre to provide patrons with service, route and schedule for each bus that visits the centre. The boards are standardized in size, and since the number of buses that visit any particular centre varies, the number of boards required also varies. However, wall space needs to be provided for a minimum of four boards at each Transit Centre, taking into account adequate spacing for aesthetics. These boards must be well lit for readability at any time of day or night, and enclosed in suitable cases for protection from weather and vandalism.

The most current dimensions for required information panels and schedule boards should be confirmed with ETS at the start of design. At the date of revision of this manual, the standard size for information panels and schedule boards is 822mm wide x 1075mm high.

In concurrence with **Section 3.5**, new Transit Centres must also provide necessary requirements for future electronic scheduling and information displays. This includes conduit for power and connectivity to ceiling locations, the location of which will be dependent on the design of the specific Transit Centre and shall be confirmed with ETS Technical Services. Ceiling mounting points and appropriate hardware for monitors must be provided. Connectivity requirements include appropriate conduit for fibre, space in the communication room for a CPU and a surge protected power source.

6.0 PREFERRED CONSTRUCTION MATERIALS

The Design Consultant shall contact the **General Supervisor, Transit Facilities Maintenance (LRT Operations and Maintenance)** to obtain input, guidance and concurrence for any construction materials impacting or specified for design.

Experience has shown that the performance of particular materials in some applications reduces operating or maintenance costs to the extent that these materials should always be specified for new Transit Centres. For these particular materials, listed below, substitutions shall not be accepted.

Table 6.0 Preferred Construction Materials

Item	Material	Description	Location
1	Power Operated Doors	All power-operated doors and controls shall be manufactured by Dura Glide 3000.	Shelter Entrance/ public washrooms
2	Glass Fibre Reinforced Plastic (FRP) Panels	Pre-finished FRP panels shall be used to line all washroom walls and ceilings.	Washrooms and kiosk counter areas.
3	Aluminum Window and Door Extrusions	All window and door fittings and fixtures shall be of aluminum construction with a store-front style glazing. Use 10mm laminated safety glass and standardized pane sizes where possible. Windows that span more than 2000mm vertically should be split into multiple panes to ensure ease of maintenance and replacement.	All windows and doors

4	Split-Face Concrete Block	Where exposed concrete block is utilized, the block shall be of the split-face type for improved appearance and resistance to graffiti/vandalism.	All concrete block
5	Floor Tile	Provide non-slip ceramic floor tiles in all floor tiled areas.	Floors of heated shelter, washrooms and kiosks
6	Wall Tile	Provide full bodied porcelain tiles in all wall tiled areas.	Walls of heated shelter, washrooms and kiosks
7	General	Provide graffiti and vandal-resistant materials and coatings for all areas. (Up to 2.5m in height)	All areas
8	LED Lighting	Use LED for outdoor lighting	Outdoor luminaries

7.0 DESIGN RESOURCES

7.1 City of Edmonton

Complete Streets Design and Construction Standards (2025)

ETS Brand Guide-Visual Identity

ETS Wiring Closet & Bus Transit Centre Communications Room – Technical Recommendations

City of Edmonton Access Design Guide

Accessibility Advisory Committee Checklist for Accessibility & Universal Design

2017 LRT Design Guidelines

ETS Signage Standards - LRT Graphic Standards Manual

TOD Guidelines

Pedestrian Wayfinding Design Standard, Design Specifications

Light Efficient Community Policy (Policy Number C576)

Clock Tower Design Report

Clock Tower Design Spec

City of Edmonton Facility Design and Construction Consultant Manual

7.2 Other Agencies / Jurisdictions

TransLink Bus Infrastructure Design Guidelines (Sept 2018)

BC Transit Infrastructure Design Summary (Mar 2018)

BC Transit Infrastructure Design Guidelines (Nov 2010)

NACTO Transit Street Design Guide

CNIB's Design Guide

Guidelines for Barrier-Free Design of Ontario Government Facilities (Dec 2014)

ADA Standards for Accessible Design (2010)

2017 Geometric Design Guide for Canadian Roads (TAC)

APPENDIX A: TRANSIT CENTRE DESIGN REQUIREMENTS CHECKLIST

Transit Centre Design Guide Section 2.0 - Bus Bays, Circulation Lanes and Platforms	
Bus Bays have been designed per Section 2.1 and Appendix C .	Y N N/A
Transit Centre curbside conditions have been designed per Section 2.2.	Y N N/A
Circulation lanes have been designed per Section 2.3 and assessed using ETS Fleet per Appendix D .	Y N N/A
DATS areas, if required, have been addressed per Section 2.5.	Y N N/A
Passenger platform accommodates vehicle circulation, barrier free travel, amenities, sightlines and drainage per Section 2.6.	Y N N/A
The platform includes a tactile guidance strip (Appendix E).	Y N N/A
Crosswalks are located per anticipated desire lines, sightline and crossing requirements, curb configuration and other criteria per Section 2.7.	Y N N/A
The Checklist for Accessibility & Universal Design discussed in Section 2.8 and presented in Appendix F has been completed to the satisfaction of the Design Team and ETS.	Y N N/A
Transit Centre landscaping has been designed per Section 2.9.	Y N N/A
Bicycle parking is addressed per Section 2.10 and Policy Development has been consulted for direction.	Y N N/A
Appropriate Kiss and Ride/Taxi Area accommodations have been provided per Section 2.11.	Y N N/A
A clock tower has been incorporated into the Transit Centre design per Section 2.12.	Y N N/A
Snow clearing accommodations have been incorporated into the Transit Centre design per Section 2.13.	Y N N/A
Transit Centre Design Guide Section 3.0 - Building	
Building Space, Area and Feature requirements presented in Appendix G have been addressed.	Y N N/A
Building design includes power operated doors per Section 3.2.	Y N N/A

Transit Centre design includes appropriate accommodation for kiosks and/or vending machines per Section 3.3.	Y N N/A
Advertising considerations have been addressed per Section 3.4.	Y N N/A
Potential for future enhancements have been addressed per Section 3.5.	Y N N/A
Fare equipment has been addressed per Section 3.6.	Y N N/A
Building key access has been addressed per Section 3.7.	Y N N/A
Building digital clocks have been addressed per Section 3.8.	Y N N/A
Other building requirements have been addressed per Section 3.9, Appendix H .	Y N N/A
Transit Centre Design Guide Section 4.0 - Security	
Security features outlined in Appendix G have been addressed.	Y N N/A
CPTED concepts and principles per Section 4.1 have been applied.	Y N N/A
CCTV requirements have been addressed per Section 4.2.	Y N N/A
Paging system requirements have been addressed per Section 4.3.	Y N N/A
Emergency and Washroom phones have been addressed per Section 4.4.	Y N N/A
Automated/remote facility locking and unlocking has been accommodated per Section 4.5.	Y N N/A
Transit Centre and Building lighting has been designed per Section 4.6.	Y N N/A
Transit Centre Design Guide Section 5.0 - Wayfinding, Signage and Traffic Control	
Bus stop signage has been designed per Section 5.1.	Y N N/A
Transit Centre identity signage has been addressed per Section 5.2.	Y N N/A
Access to the Transit Centre has been addressed per Section 5.3.	Y N N/A
Traffic control and exterior wayfinding has been addressed per Section 5.4.	Y N N/A
Interior wayfinding and other signs have been addressed per Section 5.5.	Y N N/A

Information panels and schedule boards have been accommodated per Section 5.6.	Y N N/A
Transit Centre Design Guide Section 6.0 - Preferred Construction Materials	
Preferred construction materials have been addressed per Section 6.	Y N N/A

APPENDIX B: DESIGN EXCEPTION / DEVIATION PROCESS

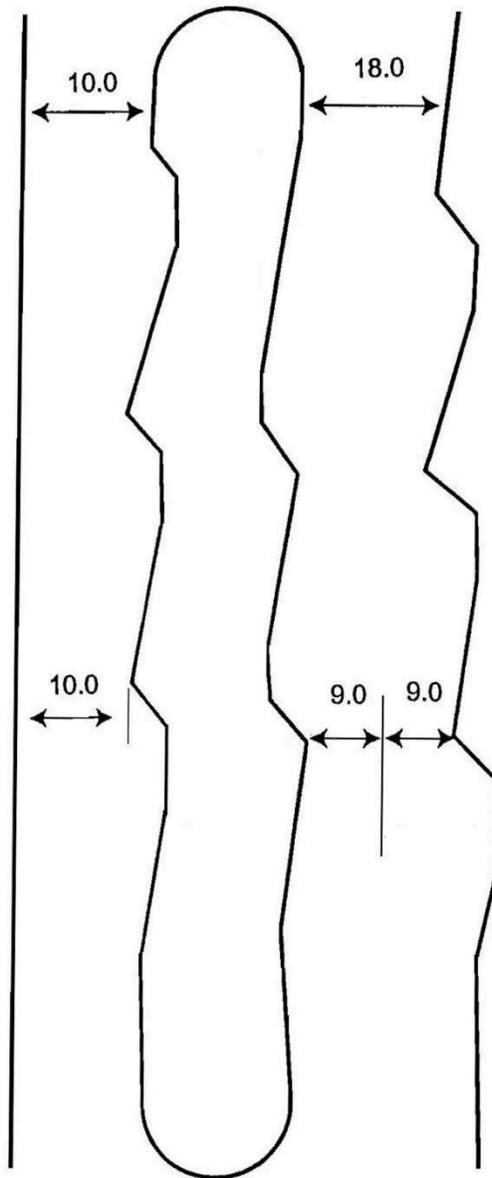
Exceptions or deviations from typical design requirements are sometimes necessary to ensure the design is appropriate for the site context. In such cases, the Design Team shall conduct appropriate review, as identified in cooperation with ETS, to ensure the proposed design maintains safe, customer-friendly, accessible and efficient facilities. Such review might include, but is not limited to, articulation of anticipated Transit Centre accessibility and operations, assessment of experiences from other Agencies operating similar transit infrastructure, analysis of forecast operational and/or customer impacts, and/or identification of potential mitigation measures, as necessary. The proposed exception or deviation and supplemental review shall be documented and submitted to ETS for approval with a summary presenting the following information.

Project Name	
DESIGN EXCEPTION / DEVIATION INFORMATION	
Proposed Design Exception	<i>What design element or combination of elements is the design exception for (i.e. curb radius, lane width, platform width, etc.)?</i>
Rationale	<i>What is the rationale for the design exception? Include supporting drawings, such as swept path analysis and cross-sections, to support proposed design exception.</i>
Alternatives Considered	<i>What alternatives, if any, were considered in the decision? What are the benefits and impacts of the proposed design exception and alternatives?</i>
Risks and Mitigation	<i>What are the potential risks associated with this exception and what will be done (or are proposed) to mitigate those risks?</i>
Supporting Information	<i>What supporting resources were used in making this decision (i.e. research papers, emerging best practice, new guidelines, etc.)?</i>
SUBMITTED BY	
Name	
Title/Company	
Date	
APPROVED BY	
Name	

Title	
Date	

APPENDIX C: TYPICAL OFF-STREET TRANSIT CENTRE LAYOUTS

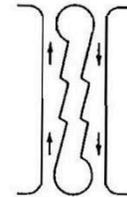
(All units shown in metres)



Single Side Platform



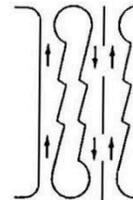
Island Platform



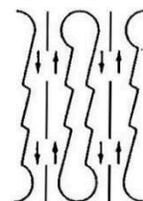
Two Side Platform



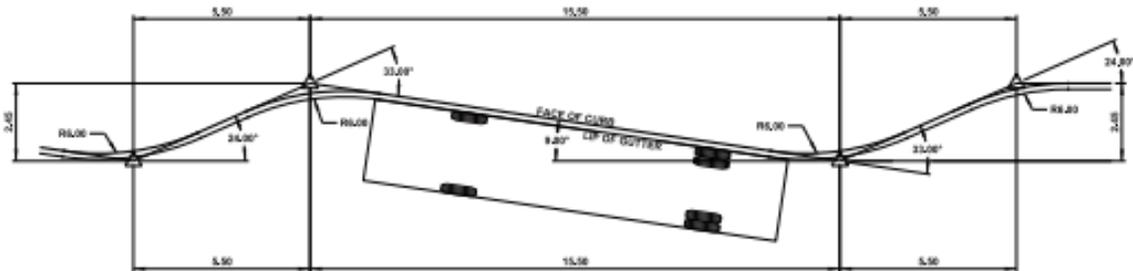
Island and One Side Platform



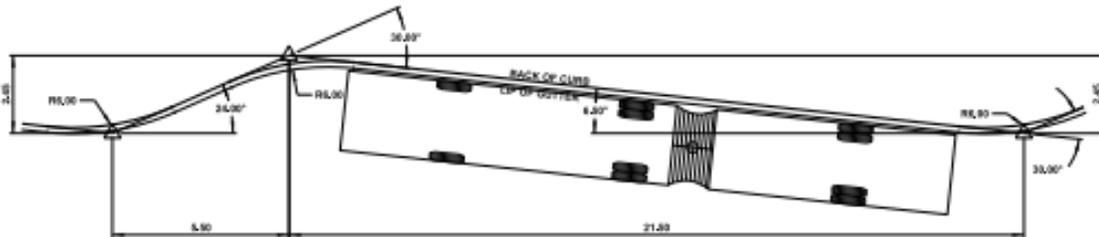
Island and Two Side Platform



Note:
This illustration is provided for general illustrative purposes only.



BUS SAWTOOTH TRANSIT BAY
STANDARD (12.00)



SAWTOOTH TRANSIT BAY
ARTICULATED (18.00)

NOTE:

1. CROSSWALKS SHALL BE ACCOMMODATED BY PROVIDING 4.00m LENGTH OF STRAIGHT CURB BETWEEN CONSECUTIVE BAYS.
2. ALL RADII ARE TO LIP OF GUTTER.

ALL DIMENSIONS
IN METRES UNLESS
OTHERWISE NOTED



STANDARD DRAWING

SAWTOOTH TRANSIT BAY
TRANSIT TERMINAL SITE

DATE APPROVED: 2018

DESIGNED BY: KSYC

APPROVED BY: *MJR*

DRAWING NUMBER: 4400

SCALE: N.T.S.

CHECKED BY: JN

APPENDIX D: ETS FLEET CHARACTERISTICS AND SPECIFICATIONS

	Community Bus (Vicinity)	Standard Bus (New Flyer Low Floor)	Articulated Bus (New Flyer Low Floor)	Electric Bus (Proterra – new ETS fleet)	Double Decker Bus (Strathcona)	Electric Bus (St Albert Transit)
Length with bumpers (m)	9.4	12.6	18.8	13.2	in progress	
Front Overhang (m)	2.3	2.2	2.2	2.6		
Rear Overhang (m)	2.2	2.9	3.1	3.1		
Wheelbase (m)	4.9	7.5	5.8 / 7.7	7.5		
Width without mirrors / with mirrors (m)	2.5 / 2.9	2.6 / 3.2	2.6 / 3.2	2.6 / 3.0		
Height (m)	3.0	3.2	3.2	3.4		
Min. Radius - outer curb (m)	8.9	13.4	13.4	12.8		

Notes:

- The standard low floor bus is typically the governing design vehicle in terms of swept path.
- Though bike racks may vary, the typical horizontal projection to be added to bus length is 0.2m in stowed position and 1.2m in use, and should be added to standard bus length to assist with swept path analysis, as appropriate.
- The Articulated bus (low floor) is typically the governing design vehicle in terms of lengths. Confirm with ETS Planning & Scheduling where articulated buses will need accommodation.

APPENDIX E: TRANSIT CENTRE TACTILE GUIDANCE DESIGN MEMO

The logo for the City of Edmonton, featuring the word "Edmonton" in white sans-serif font on a dark blue rectangular background.

Edmonton Transit Service

Transit Centre Tactile Guidance Design Memo

Content, Revisions and Approvals

The contents of these Guidelines were created with input and approval from the representatives identified in the following table.

Department	Representative	Role
Edmonton Transit System	Vicki Gudelj	Accessible Transit Coordinator
Edmonton Transit System	Lee Thomas	Senior Engineer
City of Edmonton	Benjamin Johnson	Engineering Project Manager

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1.0 DOCUMENT BACKGROUND

1.1 Federal Legislation

Federal legislation on universal accessibility was passed in 2018. It is unclear, however, exactly how this legislation will impact the requirement for TWSI features in Canada. We anticipate that requirements will build on existing standards such as ISO, CSA, and AODA, or locally developed models.

The legislation will likely describe at a high level key areas of focus for which standards may be developed, rather than set out a set of geometric design guidelines.

1.2 Existing Standards Review

Our review has not found there to be standards specifically related to transit centres, as separate from right-of-way transit or general applications of TWSI features.

Our review has identified that the standards for the application of warning in North America are fairly uniform but that there do not appear to be standards for TGSIs and they are not commonly in use.

1.3 Process of Guideline Development

These guidelines were initiated based on concepts from the new model for TWSI features at City of Halifax transit centres. After reviewing the Halifax examples, international accessibility standards (such as ISO, CSA, ADA, AODA, etc...) were used to form a baseline for the application of TWSI features in Edmonton transit centres.

These guidelines were then tested through a series of stakeholder consultation sessions with mock-ups which allowed for revisions to develop the final guideline package.

Our initial document development began with various standards documents, background studies including research and direct contact other municipalities as stakeholders including the following:

Guideline Base Documents

- ISO 23599 - Assistive products for blind and vision – Impaired persons — Tactile walking surface indicators
- CSA – B651-12 – Accessible Design for the Built Environment
- Clearing Our Path – CNIB (TWSI and TWGI sections)

Other Documents And Guidelines

- Infrastructure Design Guidelines – BC Transit
- Testing Different Materials for Tactile Walking Surface Indicators – City of Toronto
- Universally Accessible Bus Stop Design Guidelines – TransLink BC

Precedent Research and Conversations

- Review of Halifax Transit Terminals
- Review of Toronto Transit Commission TWSI Applications
- Access Design Guide 2017 – City of Edmonton
- Accessibility Design Guidelines – City of Toronto
- Accessibility Design Standard – City of Winnipeg
- Alberta Barrier-Free Design Guide – Government of Alberta
- Built Environment Compliance Guide – Kinesik Engineered Products
- Design Guidelines for Pedestrian Accessibility – Alberta Transportation and Utilities
- Access Design Standards – Calgary
- Tactile Walking Surface Indicators Design Considerations – Bob Topping, OAA

International Examples Reviewed

- Guidelines for Facilities for Blind and Vision Impaired Pedestrians – New Zealand Government
- Accessible Shared Streets – U.S. Department of Transportation – 2017
- ADA Standard - 2010

External Municipality Interviews

- Conversation with Erin Blay and Darren Young – City of Halifax
- Conversation with Judy Redmond – City of Winnipeg
- Conversation with Robyn Newton – City of Vancouver

1.4 Local Stakeholder Engagement

Our next step in the document development process was to conduct initial a stakeholder meeting discuss the information researched and understand the local user base’s needs.

The stakeholders that were engaged at this meeting were then invited to subsequent update guidelines development meetings to advise the team on various different changes to the standards. Local stakeholders included the CNIB, the ETS Accessibility Advisor, the City of Edmonton Accessibility Committee, and DATs. The guidelines development have included 4 meetings with the stakeholder group and an additional 2 mock up reviews.

The mock up reviews were requested by the stakeholders and used to test and confirm the organization of various TWSI and TWGI elements. Minor adjustments were made based on the mock up reviews. The project also reviewed options for materials and construction implementation methods.

2.0 TERMS AND DEFINITIONS

2.1 Tactile Walking Surface Indicator (TWSI)

TWSI is a blanket term for assistive products for blind and visually impaired persons including attention and guidance patterns, and decision points.

2.2 Attention Pattern

A warning feature employing raised, truncated domes that calls attention to an upcoming hazard. These features are detectable visually by contrast, and can be felt both underfoot and by cane. See image below.



Figure 1. Example of attention pattern.

2.3 Tactile Ground Surface Indicator (TGSI, also referred to as Guidance Pattern)

A directional guidance feature employing raised, elongated bars that form a pathway or route. These features are detectable visually by contrast, and can be felt both underfoot and by cane. See image below.

2.4 Non-tactile Attention Pattern (Decision Point)

An interruption or gap in a guidance pattern that alerts users to a decision point, indicating either an intersection or a sharp change in direction. This is a non-tactile pattern using a continuation of the adjacent surface materials. See image below.

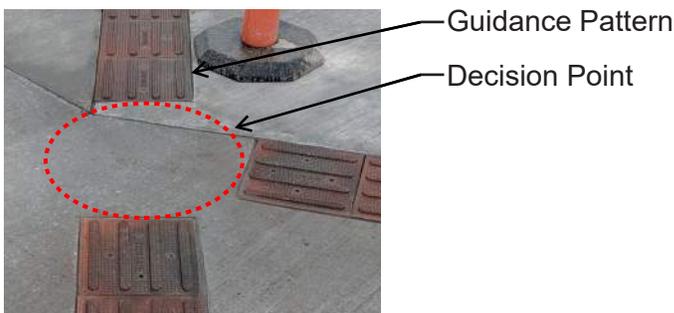


Figure 2. Example of attention pattern, guidance pattern, and decision points.

2.5 Detectable

A detectable feature is one that any member of the user group with visual impairments is able to find against the backdrop of the surface it is applied to.

2.6 Discernible

A discernible feature is one that is able to communicate its meaning to a member of the user group with visual impairments. A feature may be able to be detected without properly being able to convey its meaning.

3.0 INTENT FOR APPLICATION OF TWSI FEATURES IN TRANSIT CENTRES

The Tactile Walking Surface Indicator guideline provides design and construction direction for the navigation aids for exterior areas of transit facilities. This focuses on infrastructure improvements for pedestrian users, with particular attention to those who have limited mobility, vision, or cognitive abilities.

The infrastructure that is evident to users as part of the transit facility is included in design scope, such as transit facility platforms, adjacent “kiss and ride” areas, and connection to adjacent public walks.

This section is intended for exterior purposes only and includes navigation aids used for access to transit facility buildings, guidance on the platforms, guidance to each bus stop and at pedestrian crossings the bus ways. These systems are intended to be complementary to internal, building specific accessibility systems. The Guide is based on existing legislation, industry standards, best practices, and currently used products in other municipalities in North America, with particular attention to Canadian cities. The Guide was customized to our particular conditions in Edmonton and requirements through stakeholder consultation with the City’s Accessibility Committee, ETS and the CNIB.

Keys for Successful Implementation

1. Consistency of the system and its implementation is key for successful legibility at both the level of the overall transit system and the local level for individual transit centres.
2. Simplicity of the system is important to reduce tactile noise for users.
3. The system must be designed in a logical and consecutive manner.

4.0 KEY ELEMENTS OF ISO 23599 INTERNATIONAL STANDARD

TWSI installation within ETS transit centres shall be in compliance with ISO 23599, unless otherwise noted in this guideline.

Way finding and mobility can be achieved through good design of facilities, including clear accessible paths of travel with built and natural guiding elements, such as edges and surfaces that can be followed tactually and visually. TWSIs shall be installed where no built or natural guiding elements can be provided. Though TWSIs are used by blind or vision-impaired persons, the design and installation of TWSIs shall take into consideration the needs of people with mobility impairments.

Key Elements of ISO 23599 include that all TWSI features shall:

Be easily detectable from the surrounding or adjacent surface by raised tactile profiles and visual contrast;

Be discernible in what they are communicating to user groups;

Maintain detectability throughout their life cycle;

Be designed to prevent tripping;

Be slip-resistant;

Be used in a logical and sequential manner;

Be installed consistently to enable them to be interpreted by users; and

Be of sufficient depth or width in the direction of travel to provide adequate detectability and appropriate response by the users, such as stopping and turning.

Attention Pattern TWSI features shall:

Be distinguishable from TGSIs; and

Extend across the full width of an accessible path of travel and perpendicular to the direction of travel when approaching a hazard.

5.0 SYSTEM FRAMEWORK

The tactile guidance system framework is designed to be as simple and direct as possible, and above all consistent, so that users know what to expect. This framework is specifically developed for transit centres to help users easily navigate during high pedestrian volume periods of the day.

The tactile guidance system framework aims to provide a consistent and reliable base of navigation that will be effective for as many users as possible, recognizing the diversity of this user group. The System uses a series of tactile patterns embedded in the walking surface to guide users through the transit centre, draw attention to an upcoming hazard or hazard area, to identify bus stop locations and to identify decision making points that are key to the navigation system.

5.1 Hierarchy of System Elements

The framework provides a hierarchy of information through the features, taking into account that most users have strategies for navigation, good spatial awareness, and methods for finding important points and features within the transit centre. The primary Guidance Pattern helps to direct users to and from the transit centre access points, across bus way crossings and to major destinations of the transit centre. The secondary Guidance Pattern provides branches off of the primary Guidance Pattern towards peripheral destinations such as bus stops, elevators, escalators, and validators. The figure on the following page illustrates how the elements are coordinated.

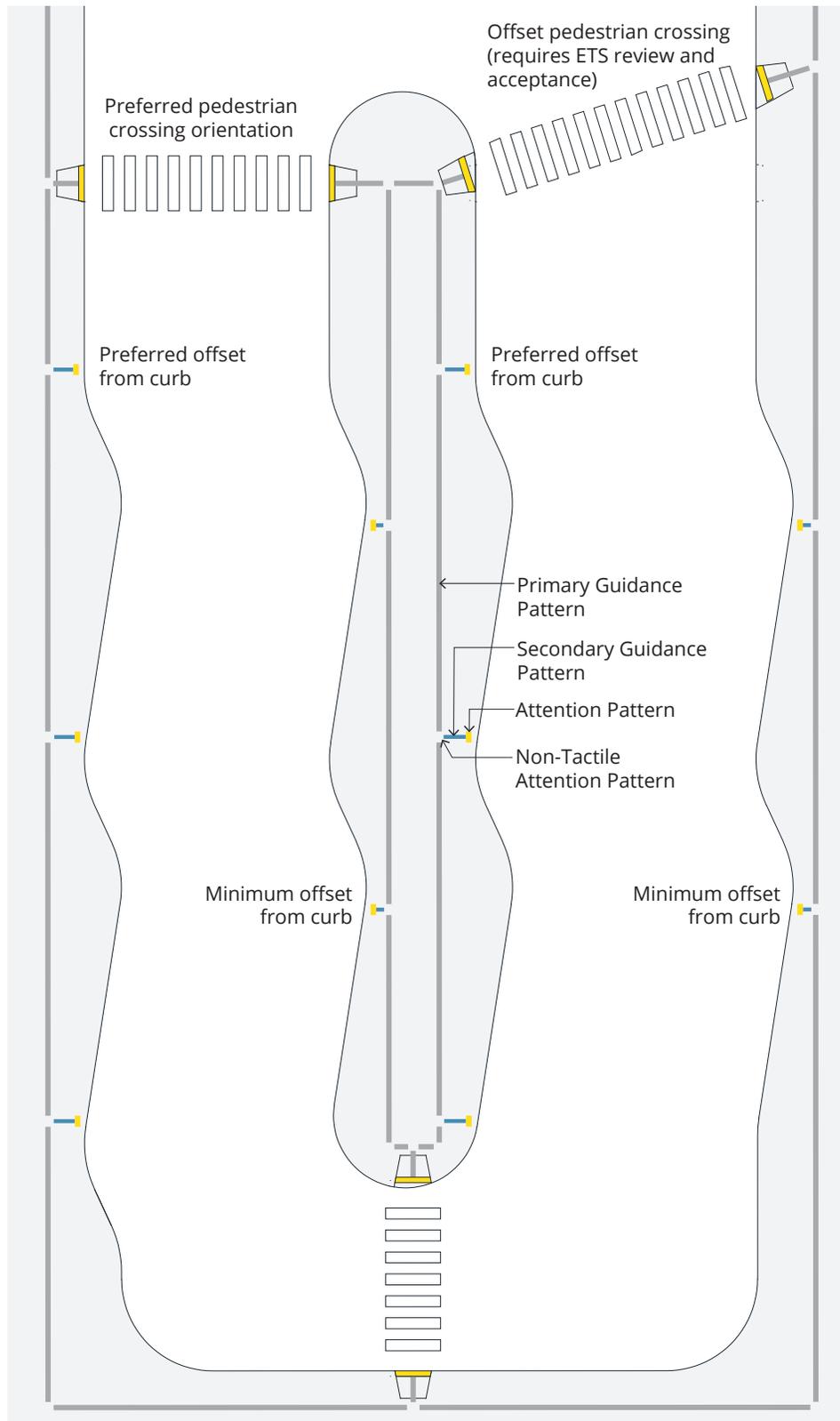


Figure 3. System framework diagram.

5.2 System Elements

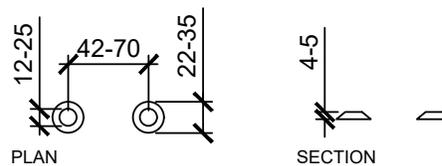
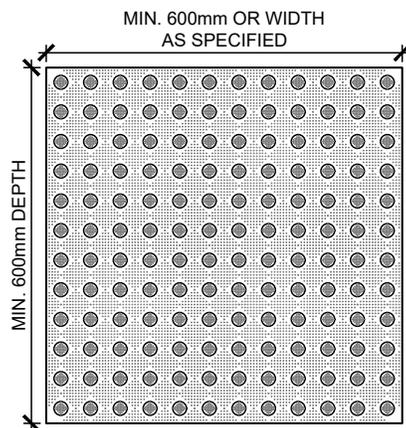
The system elements are distinguished by their different dimensions and tactile patterns. These elements shall be ISO compliant.

5.2.1 600mm Depth, Varying Width Attention Pattern (Transit Bus way Crossings)

A warning feature employing raised, truncated domes that calls attention to an upcoming hazard. These features are detectable visually by contrast, and can be felt both underfoot and by cane. The width will vary depending on the width of the pedestrian crossing.

5.2.2 300 X 600mm Attention Pattern (Bus Stops)

A warning feature employing raised, truncated domes that calls attention to an upcoming hazard. These features are detectable visually by contrast, and can be felt both underfoot and by cane. The 300 x 600mm size is used at bus stops to draw attention to the approximate location of the front door of the bus.



Top Dimension (mm)	12	15	18	20	25
Base Dimension (mm)	22	25	28	30	35
Spacing (mm)	42 to 61	45 to 63	48 to 65	50 to 68	55 to 70

Figure 4. Attention pattern unit.

Figure 5. Attention pattern truncated dome dimensions.

5.2.3 600 X 600mm Non-tactile Attention Pattern

A break in the tactile guidance system indicating a key decision point employing a 600 x 600mm Non-tactile Attention Pattern (a gap in the tactile guidance system matching the surrounding surface material) is used along the primary pathway at this point to call attention to the junction and ensure that users do not walk past the secondary Guidance Pattern without detecting it.

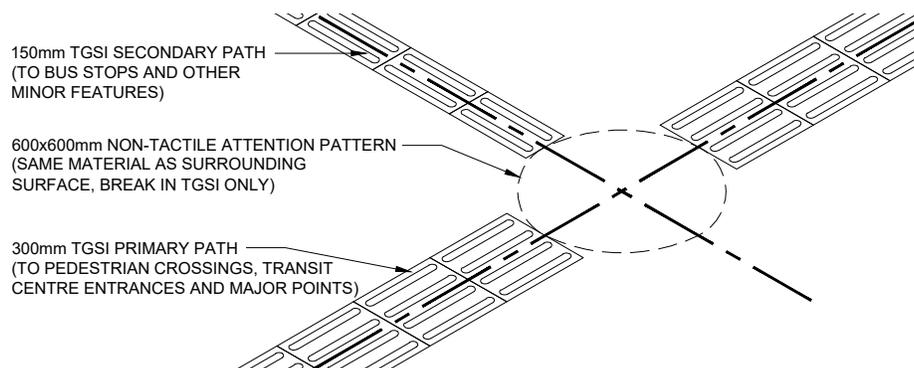


Figure 6. Typical intersection of primary and secondary TGSI.

5.2.4 300mm Wide Primary Guidance Pattern

A directional guidance feature employing raised, elongated bars that form a pathway or route. These features are detectable visually by contrast, and can be felt both underfoot and by cane. The primary Guidance Pattern provides guidance to and from the major access points to the transit centre, the transit centre or shelter itself, bus way crossing locations and along the platform to points of bus stop access. Refer to the figures below.

5.2.5 150mm Wide Secondary Guidance Pattern

The secondary Guidance Pattern provides guidance from the primary Guidance Pattern to bus stops, and other destinations off of the main circulatory routes of the transit centre, and is only used for this purpose. The narrower width is discernible from the primary pathway allowing users to quickly recognize they are at a junction leading to a bus stop. Refer to figures below.

Top Dimension (mm)	17	20	25	30
Base Dimension (mm)	27	30	35	40
Spacing (mm)	57 to 78	60 to 80	65 to 83	70 to 85

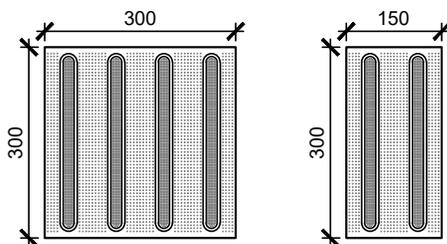


Figure 7. Primary and secondary guidance pattern unit.

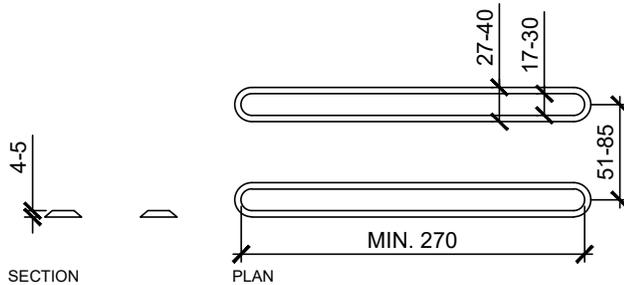


Figure 8. Guidance pattern elongated bar dimensions.

6.0 DIMENSIONAL STANDARDS, OFFSETS, AND PATTERN DESIGN

The following dimensional standards and offset provide guidance for laying out the tactile guidance system for Transit Centres within the City of Edmonton. Both preferred and minimum guidelines are provided to allow for flexibility for non-standard applications. Any non-standard application of the tactile guidance system required the acceptance by the ETS Accessibility and Facilities Design, Accessibility, and Operations and Maintenance.

Order of application of preferred and minimum guidelines shall be: make every effort to meet the preferred dimensions, use minimum where flexibility is required due to constrained spatial conditions. The minimum dimensions have been determined to accommodate guide dogs and use of canes, in either the sweeping or touch techniques. The clear zone also provides a clear path for all users.

These guidelines adapt the ISO standards to create a hierarchy that improves legibility and navigability within the specific context of transit centres. Sample adaptations include the use of angles without Attention Pattern, and a hierarchy of different Guidance Pattern widths to denote primary and secondary pathways.

While not part of the guidance system, a high visibility application to the transit stop poles at eye level (1.5m height) is recommended to increase the visibility of the poles. Galvanized poles often blend into the grey concrete surfacing, presenting a hazard for the visually impaired.

The figures on the following page detail the layout of a typical bus stop including offsets from the curb and bus stop poles and clear zones.

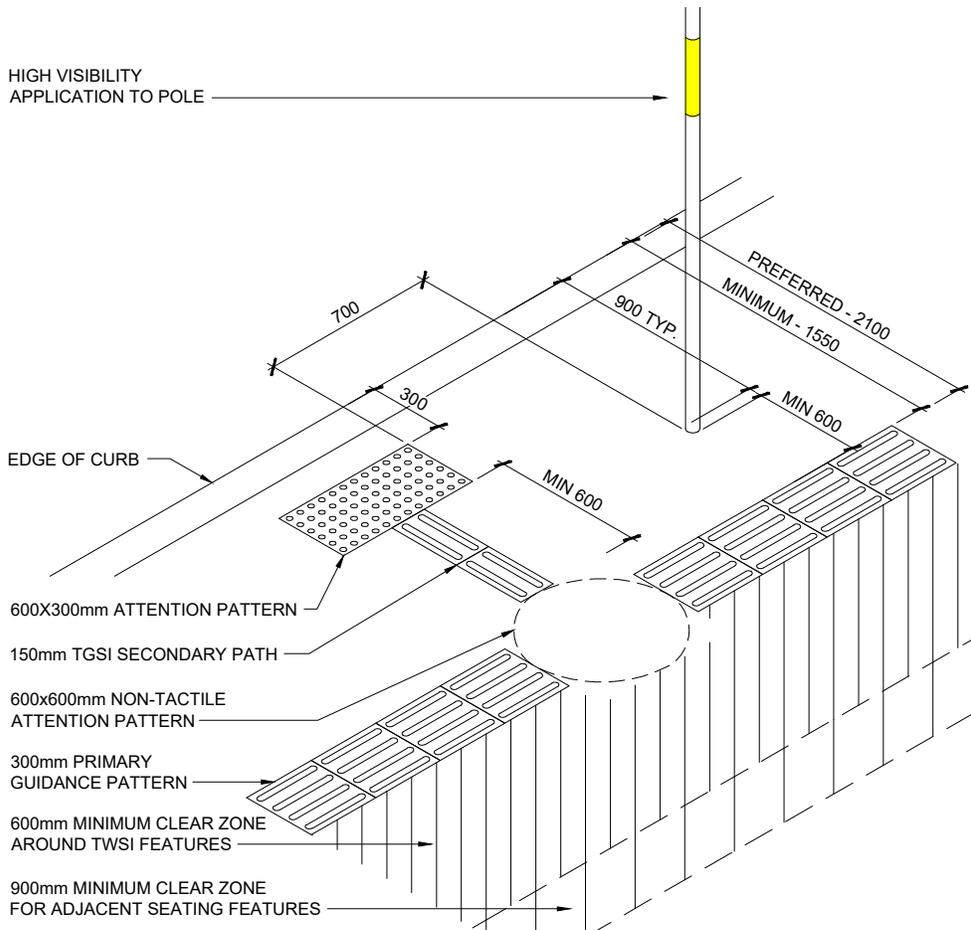


Figure 9. Typical stop layout.

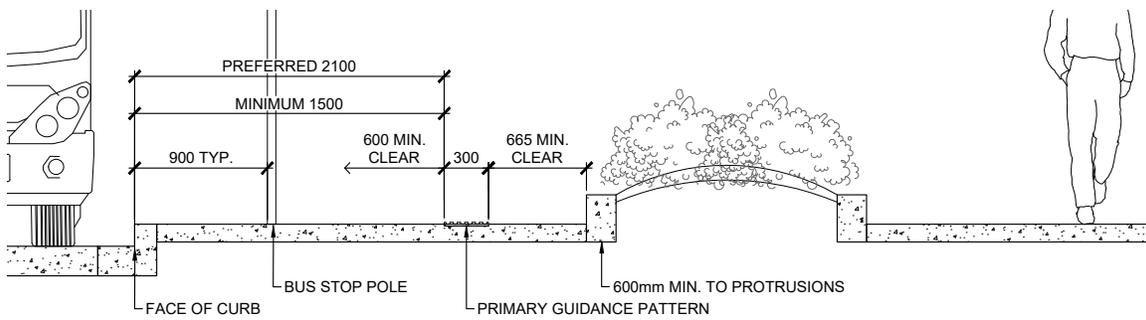


Figure 10. Typical stop layout section.

6.1 Primary Guidance Pattern

The primary pathway Guidance Pattern TWSI shall use the following preferred dimensions and offsets:

Units

- 6.1.1 Consist of a continuous line of Guidance Pattern TWSI, 300mm wide between Attention Patterns and/or Non-tactile Attention Patterns. Where Guidance Pattern pathway dimensions are not in equal unit dimensions, cut and splice two units together, no gaps between tiles are acceptable. All cuts shall be ground smooth. Sharp or protruding edges of the cut tactile are not acceptable.
- 6.1.2 Use Guidance Pattern units that are 300mm x 300mm as detailed in Section 5 and shall be ISO compliant.

Clearances

- 6.1.3 Maintain a minimum of 1200mm from the face of curb to the edge of the Guidance Pattern.
- 6.1.4 Maintain a 600mm clear zone on either side of the guidance pathway with no objects (including protrusions) within that zone.
- 6.1.5 Maintain a minimum 900mm clear zone between the guidance around seating features or seating furnishings taking into account space requirements for users of those features.

Preferred: No encroachment into the 2100mm clear zone from the edge of the platform as defined by ETS, specifically Facilities Design, Accessibility, and Operations and Maintenance.

Explanation: The preferred option provides the best integration of the Guidance Pattern units while maintaining clear paths of travel, however existing transit centres rarely can accommodate these dimensions. The minimum Primary Guidance Pattern pathway offset accommodates the variation in the bus way resulting from the saw tooth bus way layout and allows for clear zones from bus stop poles.

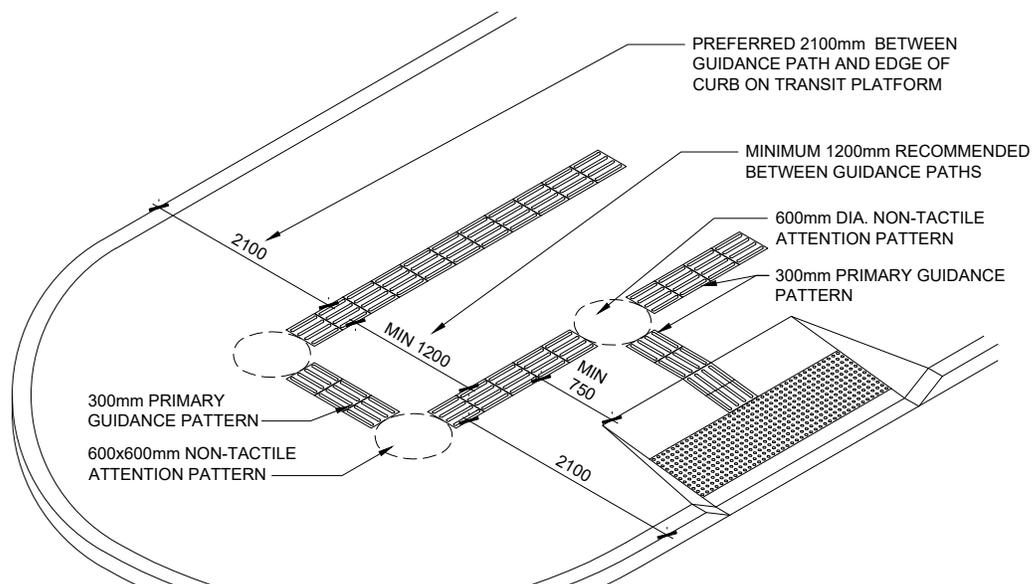


Figure 11. Preferred guidance pattern layout on bus platform.

Directional Changes

- 6.1.6 At 90 degree changes of direction, a 600mm x 600mm Non-tactile Attention Pattern is used. Where possible, 90 degree angle changes are preferred.
- 6.1.7 Direction changes up to 30 degrees use a seamless directional Guidance Pattern rather than a Non-tactile Attention Pattern. The Guidance Pattern units shall be equally cut and spliced together to create continuous guidance at the point of angle. Gaps between tiles are not acceptable to make create angles. All cuts shall be ground smooth. Sharp or protruding edges of the cut tactile are not acceptable.
- 6.1.8 Multiple single angles of up to 30 degrees each may be employed to attain an overall change of direction of greater than 45 degrees with the vertices of the individual angles being no closer than 2400mm.
- 6.1.9 Except for a 90 degree change in direction, there should not be angles greater than 45 degrees.

Preferred: Maintain straight alignment of Guidance Pattern pathways between Attention and Decision Points. Changes in direction of the Guidance Pattern pathways shall use Non-tactile Attention Patterns and 90 degree angles wherever possible. Minimum: Where minor changes in direction are required, angles of up to a maximum of 30 degrees permitted using a seamless Guidance Pattern.

Explanation: Use of the seamless Guidance Pattern up to a 30 degree angle is based on a preference from ETS and local stakeholder input and is not consistent with the ISO 23599 standard. Minimized instances of angles up to 45 degrees maybe considered at the discretion of ETS, specifically Facilities Design, Accessibility, Operations and Maintenance.

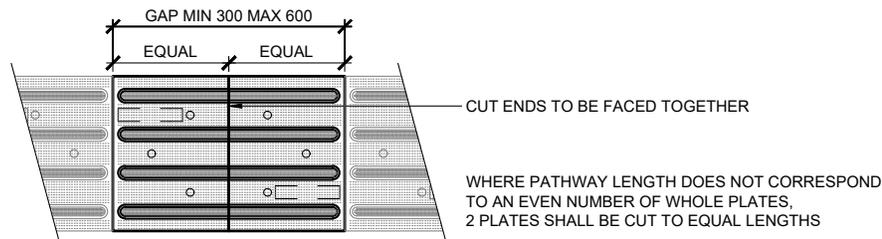


Figure 12. Splicing of two guidance pattern units.

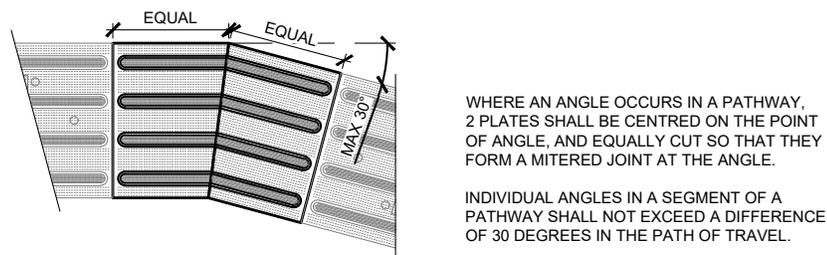


Figure 13. Change in direction of guidance pattern less than 30 degrees.

6.2 Secondary Guidance Pattern

The secondary pathway Guidance Pattern TWSI shall use the following preferred dimensions and offsets:

Units

- 6.2.1 Consist of a continuous line of Guidance Pattern 150mm wide between a Non-tactile Attention Pattern along a primary pathway and a 600x300mm Attention Pattern at a bus stop.
- 6.2.2 Use units that are typically 150mm x 300mm as detailed in Section 5 and shall be ISO compliant.

Clearances

- 6.2.3 Maintain a 600mm clear zone on either side of the pathway with no objects (including protrusions) within that zone.
- 6.2.4 Maintain a minimum 900mm clear zone between the guidance around seating features or seating furnishings taking into account space requirements for users of those features.

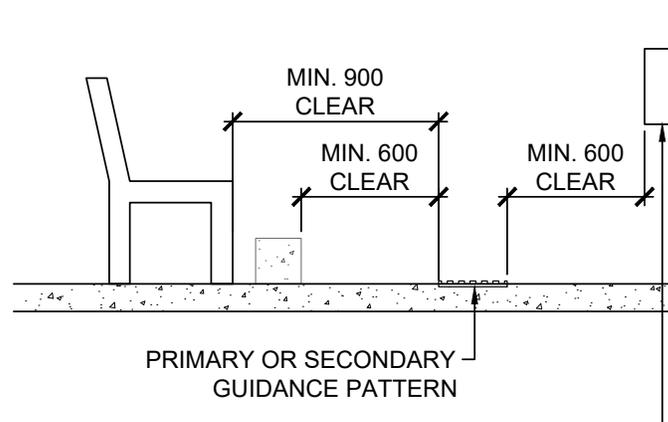


Figure 14. Typical clear zone from edge of TGS.

6.3 Attention Pattern

The Attention Pattern TWSI shall use the following preferred dimensions and offsets. Stop placements are to be confirmed by ETS, specifically Facilities Design, Accessibility, Operations and Maintenance.

Units

- 6.3.1 Be a minimum of 600mm deep, except at bus stop locations.
- 6.3.2 Employ truncated domes as the tactile features that are compliant with ISO.
- 6.3.3 Be employed at all curb ramps.
- 6.3.4 Be offset 300mm from the face of curb to the edge of the tactile unit.
- 6.3.5 Be the full width of curb ramps and a minimum of 1200mm.

Layout

- 6.2.4 An Attention Pattern shall be centred on the bus door when parked with it's bumper stopped in line with the transit stop sign (1000mm between the centre of pole to centre and centre of directional strip).

6.4 Non-tactile Attention Pattern

Non-tactile Attention Pattern TWSI (a gap) shall use the following preferred dimensions and offsets to delineate decision making points and of changes in direction over 30 degrees:

UNITS

- 6.4.1 Consist of a gap in the Guidance Pattern that is 600mm radius in dimension. The gap shall be centred on the primary Guidance Pattern.

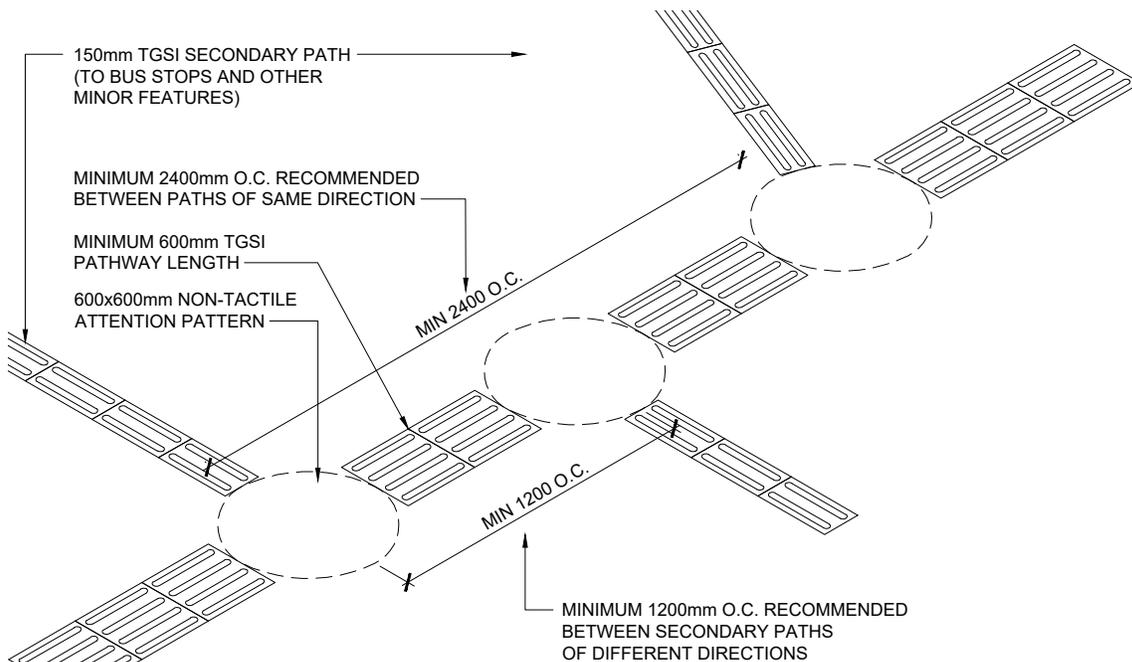


Figure 15. Typical Non-tactile Attention Pattern layout.

6.5 Bus Way Crossings

Perpendicular crossings are the preferred orientations of crossings of bus ways at transit centres as they are the safest. Non-perpendicular crossings may be permitted with review by ETS, specifically Facilities Design, Accessibility, Operations and Maintenance

6.5.1 Perpendicular Crossings

6.5.1.1 Perpendicular crossings of bus ways should be highly prioritized, as they provide the safest crossing paths.

6.5.2 Non-perpendicular Crossings

6.5.2.1 Where perpendicular crossings angles cannot be attained, a minimal crossing angle should be used.

6.5.2.2 The TWSI Attention Pattern at the base of the curb ramp should always be kept perpendicular to the crossing, with the angle being measured between the direction of crossing and the width of the Attention Pattern.

6.5.2.3 Where the Attention Pattern is angled, the required setback of 300mm to the face of curb will be to the nearest point of the Attention Pattern.

6.5.2.4 Where possible, especially in non-perpendicular crossings at an angle above 15 degrees, a flattened curb ramp pan should be designed and detailed by the consultant to take into account wider Attention Pattern features and to minimize cross-slopes.

6.5.2.5 A maximum cross slope of 2% is recommended, although up to 5% is allowed, to prioritize perpendicular alignment of TWSI features.

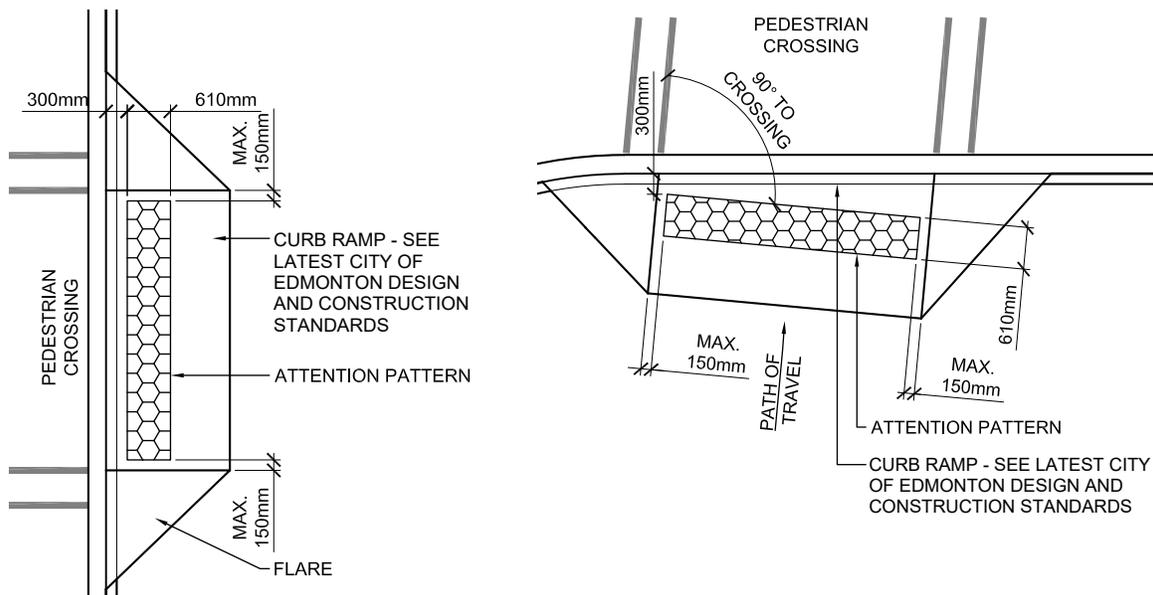


Figure 16. Typical TWSI layout at perpendicular and non-perpendicular crossing.

7.0 RECOMMENDED MATERIALS

Materials have been selected to maximize durability within Edmonton's urban environment. Raw Cast iron has been selected as the preferred material due to the minimal long term maintenance and surface durability. Painted surfaces require an option for removal to minimize repair cost if the units are damaged or subject to corrosion.

Coated (coloured) cast iron provides an unknown maintenance element if surface coating is damaged rust on the cast iron base may start to delaminate the coloured finish.

- 7.1 All TWSI pattern units shall be cast in place.
- 7.2 All TWSI pattern units shall be cast iron. Where non abrasive snow clearing methods are confirmed by ETS for clearing transit islands, platforms and walkways (i.e. broom, brush or shovel), Poly TWSI units may be considered, at the discretion of ETS, specifically Facilities Design, Accessibility, and Operations and Maintenance.
- 7.3 Where Poly TWSI (both attention and guidance) are deemed acceptable by ETS, 7.3 all units shall be removable/replaceable.
- 7.4 Cast iron for all Attention Patterns and Guidance Patterns shall meet applicable CSA, ANSI or ASTM standard for cast iron.
- 7.5 All Attention Pattern units shall be painted Federal Yellow and shall be replaceable, with easily accessible fasteners.
- 7.5 Where Poly TWSI units are deemed acceptable use yellow for Attention Pattern units and black for Guidance Pattern units.
- 7.6 All Guidance Pattern shall be raw cast iron or black coloured to contrast adjacent concrete. Cast Iron shall be pre-patinated prior to placement in the concrete to minimize rust staining on adjacent concrete. Consider storing in an exterior, exposed environment.
- 7.7 Paint coatings for all coloured cast iron TWSI products should meet minimum standards for painting including white metal blast, primer, and application of a multi layer epoxy paint and powder coat system.



Figure 17. Pre-patinated guidance unit.



Figure 18. Painted attention units.

8.0 TACTILE GUIDANCE SYSTEM APPLICATION - INSTALLATION

8.1 Tolerances

- Surrounding or adjacent surfaces shall be smooth to enable TWSIs to be detected and distinguished.
- Joints between units should be avoided and shall have a maximum of 10 mm in width and 2 mm in depth.
- Grind unit connectors as required to permit unit interlock and allowing for each adjacent unit to be level.



Figure 19. Unit connector that has been ground for level connection.

8.2 Surface Drainage

Installation of TWSI shall be designed and installed to ensure positive drainage.

8.3 Survey and Layout

- Survey in alignment of units to ensure accurate placement and confirm offset dimensions prior to concrete pours.
- Support units along one side with form work to create a construction joint on one side.
- Support units so they remain level and true with the anticipated adjacent surfacing.
- Where units are between pour breaks, support each unit with a minimum of four connection points to underlying grade to keep units level and true.



Figure 20. Layout of primary guidance pattern.



Figure 21. Leveling of attention pattern units between pour breaks.



Figure 22. Supporting guidance pattern units at edge of pour.

8.4 Gaps Between Units

- Set units starting from a gap and work to the center between gaps. Cut the last two units to be of equal size.
- Where units are spliced together and connection tabs removed, ensure units remain level aligned and true.
- Predetermine joints at changes in direction prior to first concrete pour to establish logical jointing that limits cracking potential.



Figure 23. Construction between gaps

8.5 During Concrete Pours

- Cover and protect painted TWSI units during installation.
- Protect cast iron surfaces from excessive concrete splatter and clean all concrete by brush when concrete is cured enough to walk on.
- Vibrate concrete to fill voids under units until concrete seeps up through vent holes.
- Provide clean edges along units that are even and level with each unit.
- Provide dowel connections into adjacent concrete pours.



Figure 24. Protection of units during pours



Figure 25. Guidance pattern units to be cleaned of concrete splatter.



Figure 26. Adjacent pours to have dowel connections.

APPENDIX F: ACCESSIBILITY & UNIVERSAL DESIGN CHECKLIST

The following [City of Edmonton Accessibility Advisory Committee Checklist for Accessibility & Universal Design](#) shall be applied for all Transit Centre design.



ACCESSIBILITY ADVISORY COMMITTEE

Edmonton

CHECKLIST FOR ACCESSIBILITY & UNIVERSAL DESIGN

The City of Edmonton Accessibility Advisory Committee (AAC) has created this checklist to promote the concepts of Universal Design. Alberta Building Code requires the minimum standards for accessibility. The City of Edmonton's [Accessibility for People with Disabilities Policy C602](#) defines accessibility as the absence of barriers that prevents individuals from fully participating, contributing and benefiting from the many aspects of society. In order to ensure that everyone can engage fully in the community and are treated with dignity and respect there is a need to exceed minimum standards for accessibility where possible. For example, a wider turning radius and wider doors are required by many wheelchairs and scooters today. Strollers for children are larger and require more room for maneuverability.

Good design should incorporate principles of Universal Design, offering solutions as to how spaces can be designed and developed to meet the needs of all users. For example, people with low vision, people who use different mobility devices (scooters/walkers/wheelchairs) etc.

The following checklist draws attention to several areas where accessibility can be improved by good design. Another resource would be the City of Edmonton's [Access Design Guide](#) for best practices. For additional information or alternate formats, please call 311 or email 311@edmonton.ca.

THE AAC MANDATE:

The Accessibility Advisory Committee provides advice and recommendations to City Council about facilities and other infrastructure, programs, services, activities and policies, for the purpose of improving the City's livability, inclusiveness and accessibility for individuals with disabilities.

LEGEND

Code (required)

Best Practice

CHECKLIST FOR ACCESSIBILITY & UNIVERSAL DESIGN

1. PARKING AREAS	Y/N N/A
1.1 Designated barrier-free parking spaces located closest to barrier-free entrance	
1.2 Barrier-free unobstructed path of travel (minimum width of 1500mm/59") from parking area to building entrance (clear of snow, garbage cans, sign posts and other obstacles; pathway well lit; not behind vehicles). Pathway shall have colour contrast and distinctive patterns where there are changes in level and surface material	
1.3 Curb ramp to sidewalk located between parking spaces	
1.4 Access aisle painted on pavement between barrier-free parking spaces	
1.5 Accessible parking symbols painted on pavement at the entrance of each stall. The symbol and any associated background paint should not occupy the entire area. The more painted surface, the more likely pavement will become slippery	
1.6 Vertically mounted sign showing accessibility symbol located near the centre line of each designated stall (minimum 1500mm/60" from ground to mid sign, max 2500mm/98" high)	
1.7 Number of designated accessible parking spaces per number of parking stalls: 1 accessible stall per 2-10 spaces, 2 per 11-25 spaces, 2 per 26-50 and 4 per 51-100. One additional accessible stall for each additional increment of 100 or part thereof	
1.8 Passenger loading zones need: an access aisle not less than 1500mm/59" to 6000mm/236" long adjacent and parallel to the vehicle pull-up space, a curb ramp where there are curbs between the access aisle and the vehicle pull-up space and a clear height of not less than 2750mm/108" at the pull-up space and along the vertical access and egress routes	
1.9 If the location of designated parking stalls is not easily visible from the approach viewpoint, appropriate directional signs showing location of designated stalls shall be provided	

CHECKLIST FOR ACCESSIBILITY & UNIVERSAL DESIGN

1. PARKING AREAS	Y/N N/A
1.10 Ensure there is a clear accessible path between accessible stalls and the payment machine	
1.11 Information for parking payment is easy to understand and clearly visible for accessible stalls	
2. ENTRANCES	Y/N N/A
2.1 Barrier-free path of travel from parking and/or drop off zone to entrance	
2.2 Signage at all non-accessible entrances should clearly indicate location of barrier-free entrance	
2.3 Doorway clearance is 850mm when the door is in the open 90 degree position (920mm/36" preferred)	
2.4 Door operating device should not require tight grasping or twisting of the wrist (doors should have lever handles)	
2.5 The primary entrance is barrier-free (automatic sliding doors are optimal; power doors with large paddle/push plate is the next best alternative, wave to open preferred where feasible)	
2.6 In addition to the barrier-free entrances required, not less than 50% of the pedestrian entrances, including the primary entrance of a building, including walkways leading to the entrances from a public thoroughfare and from on-site parking areas, shall be barrier-free	
2.7 If entrance is through doors in a series, leave enough room (1200mm/47" plus the width of the door) for a wheelchair to occupy the vestibule while opening the 2nd door	
2.8 Automatic door operator button is 800mm/31.5"-1500mm/59" from the ground and is located 1500mm/59" back from the door. Large well marked opener/button	
2.9 Level, or beveled doorway threshold (maximum of 13mm/0.5" rise)	
2.10 Colour contrast to identify doorway threshold, frame or entrance. Corridors should be 1100mm/43" (recommend 1800mm/71")	

CHECKLIST FOR ACCESSIBILITY & UNIVERSAL DESIGN

3. SIGNAGE	Y/N N/A
3.1 Facilities and services for persons with disabilities identified with appropriate symbols (e.g. availability of assistive listening devices)	
3.2 Signage available in symbol form for those with visual processing difficulties or who are unable to read	
3.3 Signage includes braille as well as large print, high colour contrast tactile lettering that is a mix of caps and lower case letters and is designed to prevent glare	
3.4 General and way-finding signage consistent in design and easily identifiable	
3.5 Braille signage mounted at appropriate height (chest level) and location	
3.6 Signage font in Sans Serif (e.g., Verdana, Arial) for reading ease. Signage should be 1350mm/51" high from floor level and not located on a door (should be 150mm/6" from the door frame). If tactile signage is installed it should be 1200mm/47" from floor level (building directories should be tactile)	
4. STAIRS/ESCALATORS	Y/N N/A
4.1 Slip-resistant, tactile finish or strips contrasting in colour and texture on all landings, tread edges/stair nosings, and the beginning and end of a ramp. Changes in elevation at stairwells shall be indicated by tactile strips, which are as wide as the stair and have colour contrast	
4.2 Step demarcation in yellow on sides and back of escalator steps	
4.3 Steps for stairs have a rise between 125mm/5" and 180mm/7" and a run of not less than 280mm/11" (should not be open between steps). Avoid single isolated steps	
4.4 Illumination shall be positioned to minimize glare and shadow	
4.5 Ensure any open area beneath the stairs is enclosed with planters, railings, benches, fencing etc to ensure no access. Tactile strips under the stairs on the ground and a contrasting colour on the back of the stairwell above the tactile strips to alert a potential safety hazard	

CHECKLIST FOR ACCESSIBILITY & UNIVERSAL DESIGN

4. STAIRS/ESCALATORS	Y/N N/A
4.6 Carpet is securely attached	
4.7 A stairway shall have a handrail on at least one side, but if it is 1100mm/43" or more wide, it shall have handrails on both sides. Handrails should be splinter and rust proof, located on both sides of the stairs and ramps, and have a colour contrast from wall and surrounding environment. A ramp shall have handrails on both sides	
4.8 Handrails should have a system of tactile cues (texture changes) within 300mm/12" from each end	
5. ELEVATORS	Y/N N/A
5.1 Doors have clear colour contrast from door surroundings	
5.2 Location of elevators clearly identified at main entrance	
5.3 Preferred dimension of elevator car to allow for optimal turning radius of 1500x1500mm/60x60" with elevator door at least 910 – 915mm/36" wide (one elevator has inside dimensions that will accommodate a stretcher at 2010mm/79" long and 610mm/24" wide) 1828mm/72" by 2032mm/80"	
5.4 Elevator buttons and emergency controls mounted at an accessible height (1045mm/41"-1095mm/43" from ground)	
5.5 Elevator buttons and emergency controls incorporate large print tactile numbers and Braille mounted in a raised fashion (not flush or recessed). Colour contrast shall be used to identify the floor registration button panel from background, call buttons should protrude from adjacent surface	
5.6 Braille and tactile numbers placed on both sides of door jambs at appropriate height to identify floor level	
5.7 Visual indicator in elevators to indicate "help on the way" for use in an emergency	
5.8 Audible communication system shall be available for accessing elevators, inside the car and have an announcement identifying the direction of travel and floors	
5.9 Elevator waiting areas should have seating in close proximity	
5.10 Elevator doors shall begin to close after a minimum of 8 seconds from the fully open position	

CHECKLIST FOR ACCESSIBILITY & UNIVERSAL DESIGN

6. RAMPS	Y/N N/A
6.1 Ramps are used for any slope steeper than 1 in 20 in a path of travel. Preferred maximum slope is 1 in 16 (1 in 12 in AB building code)	
6.2 With the ramp at any point shall not be less than 1500mm/60"; 870mm/34" min clearspace between handrails. Level landings/ resting areas provided at 9m/10yd intervals along ramp	
6.3 Minimize or avoid tight turns or switch-backs	
6.4 Strong colour contrast and tactile surfacing on all ramp landings and a 15mm/0.6" wide strip in contrasting colour and texture at the top of ramp to warn users of a change in elevation	
6.5 Landings designed to accommodate larger chairs and scooters (able to open doors without backing onto ramp). Landings must be min 1200mm/47"long and same width as the ramp	
7. HANDRAILS	Y/N N/A
7.1 A stairway should have a handrail on at least one side but if it is 1100mm or more wide it shall have handrails on both sides and are continuously graspable. Ramps should have handrails on both sides (recommend handrails on both sides of the stairwell regardless of width). Handrails should have a diameter not less than 30mm/1.18" or more than 43mm/1.69"	
7.2 Handrails in contrasting colour to wall or surrounding area	
7.3 Handrails provided at two heights with an unobscured view between. Handrail height should be 865mm/34" and no more than 965mm/38"	
7.4 Handrails extend horizontally beyond last stair and terminate to wall or ground	

CHECKLIST FOR ACCESSIBILITY & UNIVERSAL DESIGN

8. WASHROOMS	Y/N N/A
8.1 Single door entrance is optimal. Have a wave to open or push button available	
8.2 For washrooms without entrance door, there is only one turn with clear corner so persons who are blind do not become disoriented	
8.3 Proper signage located outside the entrance and stall door	
8.4 Sinks, garbage cans, etc. located around perimeter rather than in the centre of the room	
8.5 Accessible sink (minimum knee space of 735mm/29") with soap and towel dispenser close to sink at preferred height of 1200mm/47". Include a low mounted or tilt mirror 1000mm/39" above floor and insulate any exposed pipes. Automatic or sensor operated faucets preferred	
<p>8.6 ACCESSIBLE WASHROOM STALL:</p> <ul style="list-style-type: none"> • minimum 1700mm x 1500mm/70 x 60" • door that swings outward so person with limited mobility can close it independently • equipped with door pull handle, coat hook, grab bars at various appropriate heights and placement • can be locked from the inside with a large, sliding latch (not thumb-turning) • toilet paper reachable without leaning too far off toilet • accessible toilet height between 400mm-460mm/16"-18" • various toilet size and heights. Or adding a step stool option if unavailable. • at least one urinal should have a vertically mounted grab bar installed on each side • Call buttons shall be installed in all barrier-free washroom stalls for facilities (which are staffed with security) during open hours 	
8.7 Self-contained, gender inclusive/family washroom available, with proper signage provided in an accessible location	

CHECKLIST FOR ACCESSIBILITY & UNIVERSAL DESIGN

9. INTERIOR BUILDING ELEMENTS	Y/N N/A
9.1 Public and emergency phones mounted at an accessible height with a minimum of 865mm/34” and a maximum of 1370mm/54 above the floor	
9.2 TTY (built in typewriter) phone for users who are Deaf or hard of hearing. Video Relay Service (VRS), Video Relay Interpreting (VRI) or other live captioning app are other available options	
9.3 At least one drinking fountain at accessible height (610mm/24” from ground preferred) spout located near front, controls either automatic or easily operated, cane detectable. Proper knee space below	
9.4 One accessible section of counter in all areas that serve the public. A barrier-free counter surface shall not be more than 865mm/34” above the floor	
9.5 Shelving, coat hooks and light switches at an accessible height	
9.6 Have a variety of seating options available, including space for persons using wheelchairs to sit/park in all public seating areas, including companion seating (without blocking walk through areas). (i.e. seats with a variety of widths, adjustable armrests and backrests). Have designated priority/accessibility/priority seating clearly marked	
9.7 Level wheelchair seating area (in theatres, lecture halls, sports arenas, etc), to also include companion seating and unobstructed views	
9.8 Glass doors or partitions include a contrasting strip of colour across at eye-level	
9.9 Hearing loops provided (counter loop or portable hearing loop)	
10. ALARM SYSTEMS/EMERGENCY EXITS	Y/N N/A
10.1 All alarm systems to include an audible and visual signal	

CHECKLIST FOR ACCESSIBILITY & UNIVERSAL DESIGN

11. FURNITURE	Y/N N/A
11.1 Well anchored furniture should only be placed outside the main path of travel (inside or outside) and is detectable by someone who uses a cane	
11.2 There should be good colour contrast between street furniture and background surfaces (generally, grey colours should be avoided as they blend into the general background)	
11.3 Variety of benches should be provided (some including a back and an arm rest)	
11.4 Have a quiet space available	

INCREASED ACCESSIBILITY TRANSLATES INTO AN INCREASED CLIENT BASE

Refer to the BARRIER-FREE DESIGN GUIDE for details regarding appropriate dimensions. The [Barrier-Free Design Guide](#) is available as a free download from the Safety Codes Council.

PHONE 780-442-5311

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APPENDIX G: BUILDING SPACE, AREA AND FEATURES REQUIREMENTS

Item	Space Required	Min Space (m ²)	Features
1	Heated Waiting Area	60	<ul style="list-style-type: none"> • Thermostatically controlled to maintain indoor temperature of at least 10 °C at outside winter design temperature of –32 °C. Natural gas heating preferred. • Slip-resistant, easy-clean flooring maintained at temperature warm enough to prevent the formation of ice. • Seating with armrests for 15 - 20 persons. • Large garbage receptacles for each area – Wabash Valley LR 300, grey in color, 32 gallon, with FT200N lid and 8” opening. • Ventilation system for summer cooling. Summer ventilation shall be designed for a maximum temperature differential of two degC between exterior drybulb temperature and interior drybulb temperature.
2	Unheated Waiting Area	120	<ul style="list-style-type: none"> • 60 m² area on each side of platform • Slip-resistant flooring • Seating with armrests for 15 - 20 persons • Large garbage receptacles for each area – Wabash Valley LR 300, grey in color, 32 gallon, with FT200N lid and 8” opening.
3	Male Operators Washroom	11	<ul style="list-style-type: none"> • 2 urinals, 2 tankless toilets, 1 sink • Entrance from the heated waiting area • Operator telephone • Vandal-resistant FRP paneling • Lighting and exhaust fan controlled by motion sensor and timer through BMS • Water bottle filler
4	Female Operators Washroom	10	<ul style="list-style-type: none"> • 2 tankless toilets, 1 sink • Entrance from the heated waiting area • Operator telephone • Vandal-resistant FRP paneling • Lighting and exhaust fan controlled by motion sensor and timer through BMS • Water bottle filler

5	Kiosk	19	<ul style="list-style-type: none"> • Separate exterior entrance and separate meters for utilities • Roller shutter and counter opening to heated waiting area • Ventilation as required by Alberta Building Code / ASHRAE and A/C system capable of maintaining 20 degC drybulb space temperature with a 35 degC drybulb exterior temperature.
6	Communications Room	3.0m x3.5m	<ul style="list-style-type: none"> • Refer to Wiring Closet and Bus Transit Centre Communications Room - Technical Recommendations
7	Electrical Room	3.0m x 3.0m	<ul style="list-style-type: none"> • Secure entrance from the waiting area • Environmental control in accordance with ANSI/TIA-942: dry bulb temp 20-23°C, maximum rate of temperature change 5°C/hr, RH 40-55% • Positive pressure room with filters on air inputs and sweeps on bottom of door to minimize dust • At least one panel measuring 1.22m x 2.44m for C-Cure. • Walls to be covered with 20 mm thick 1 hour fire rated plywood painted grey • For equipment maintenance requirements, the minimum room width is 3m and minimum room depth is 3m.
8	Janitorial Room	6	<ul style="list-style-type: none"> • Secure entrance from the waiting area • Contains custodial sink and storage shelves.
9	Mechanical Room	8	<ul style="list-style-type: none"> • Furnace / HRV • Hot water tank
10	Public Washroom	10	<ul style="list-style-type: none"> • 1 tank-less barrier-free toilet • 1 urinal • 1 sink • Vandal-resistant FRP paneling • Baby changing station • Fully accessible powered door • Lighting and exhaust fan controlled by motion sensor and timer through BMS • Emergency phone inside washroom

			<ul style="list-style-type: none">• Independent access phone outside washroom
11	Security Office	12	<ul style="list-style-type: none">• Reflective windows to allow for outside viewing from the inside• Thermostatically controlled heating, air conditioning and ventilation• Electronic security roller blind• Peep-hole door with overhead camera• Desk for computer use and associated I.T. plugs• Washroom Access

APPENDIX H: DIVISION OF RESPONSIBILITIES FOR LOW TENSION SYSTEMS MATRIX

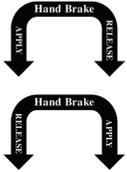
System Description	Supply and Install Electrical Rough-In (Conduits, Device Boxes and Pull Strings)	Supply and Install Cabling and Wiring	Supply and Install Devices, Equipment, Hardware and Final Connections and Testing
Card Access Control	Electrical Contractor	Electrical Contractor	COE FMS
Paging System	Electrical Contractor	Electrical Contractor	ETS / Contractor
Security Camera System	Electrical Contractor	Electrical Contractor	ETS / Contractor
Visual Messaging System	Electrical Contractor	Electrical Contractor	ETS / Contractor
Ticket Vending Machines	Electrical Contractor	Electrical Contractor	ETS / Contractor
Emergency Call Stations	Electrical Contractor	Electrical Contractor	ETS / Contractor
Help Phones	Electrical Contractor	Electrical Contractor	ETS / Contractor
Digital Clocks (inside building)	Electrical Contractor	Electrical Contractor	ETS / Contractor
ETS Operator Phones	Electrical Contractor	Electrical Contractor (supply, install and terminate with standard phone jack)	Phones supplied and installed by ETS
Clock Tower	Electrical Contractor	Electrical Contractor (terminations also by Electrical Contractor)	Clock tower requires power and IP connection to NTP network. All other accessories (clock, temp display, etc.) are supplied with tower.
WiFi	Electrical Contractor	Electrical Contractor	CoE IT / ETS

APPENDIX I: EDMONTON TRANSIT CATALOGUE

EDMONTON TRANSIT CATALOGUE

Sign Type	Description	Traffic Code	Specifications	Picture
Accessibility Signs	Handicap Access Sign		Handicap Access Sign.pdf	
Accessibility Signs	Handicap Access Sign - Blind		Handicap Access Sign Blind.pdf	
Accessibility Signs	Handicap Access Sign - Ramp Up		Handicap Access Sign Ramp up.pdf	
Accessibility Signs	Handicap Access Sign - Ramp Down		Handicap Access Sign Ramp Down.pdf	
Accessibility Signs	Handicap Access Sign - Hearing		Handicap Access Sign Hearing.pdf	
Accessibility Signs	Handicap Access Sign - Volume Control		Handicap Access Sign Volume Control.pdf	
Accessibility Signs	Handicap Access Sign - Telephone Typewriter		Handicap Access Sign Telephone Typewriter.pdf	
AFR	Kiss n Ride Left and Right	AFR-14	Kiss n Ride Left & Right_AFR-14.pdf	
AFR	Train Platform	AFR-13	Train Platform_AFR-13.pdf	
AFR	VIA Tab	AFR-13S	VIA Tab_AFR-13S.pdf	
Decal	Bus Shelter Decal		Bus Shelter Decal.pdf	
Decal	ETS Decal		ETS Decal.pdf	

Decal	For Your Security Surveillance Cameras		For Your Security Surveillance Cameras.pdf	
Decal	LRT Operations LRT Inspector		LRT Operations LRT Inspector.pdf	
Decal	Temporarily Out of Service		Temporarily Out of Service.pdf	
Decal	This Stop is Closing		This Stop is Closing.pdf	
Decal	Bike Locker		Bike Locker.pdf	
Decal	Please Yield		MMR#19612_Please Yield.pdf	
Decal	Exact Coin Fare Only		MMR#255223_Exact Coin Fare Only.pdf	
Decal	Bike Rack Equipped		MMR#203028_Bike Rack Equipped.pdf	
Decal	Priority Seating		MMR#241491_Priority Seating.pdf	
Decal	Do Not Pass on Right		MMR#5706_Do Not Pass on Right.pdf	
Decal	Zero Tolerance		MMR#257903_Zero Tolerance.pdf	
Decal	Illegal to Pass on Right When Signal On		MMR#19631_Illegal to Pass on Right When S	
Decal	Priority Seating Square		MMR#241489_Priority Seating Square.pdf	
Decal	Arrow		MMR#79070_Arrow.pdf	

Decal	Kneeling Bus		MMR#79067_Kneeling Bus.pdf	
Decal	Ramp		MMR#79063_Ramp.pdf	
Decal	Liability		MMR#203029_Liability.pdf	
Decal	These Seats Must be Vacated when Wheelchair Users Need Space		MMR#229887_These Seats Must be Vacated	
Decal	Watch Your Step		MMR#235423_Watch Your Step.pdf	
Decal	Edmonton Transit Service Decal		MMR#209863_Edmonton Transit Service Decal	
Decal	Call Control for Clearance to BMYN Signal		Call Control.pdf	
Decal	Check Sling Straps and Lifting Devices		Check Sling Straps and Lifting Devices.pdf	
Decal	Check Your Door Switch		Check Your Door Switch.pdf	
Decal	Hand Brake Release		Hand Brake Release.pdf	
Decal	Pedway Location		Pedway location.pdf	
Decal	Pedway PE		Pedway PE.pdf	
Decal	Pedway PE 12x12		Pedway PE 12x12.pdf	

Decal	No Smoking Fine for Violation Decal		No Smoking Fine for Violation Decal.pdf	
Decal	Entrance Door Information Bands		Entrance Door Information Bands.pdf	
Decal	Automatic Door Decals		Automatic Door Decals.pdf	
Decal	Manual/Automatic Door Decals		Manual_Automatic Door Decals.pdf	
Decal	Escalator Safety Sign		Escalator Safety Sign.pdf	
Decal	Help Phone Numbers		Help Phone Numbers.pdf	
Decal	Wayfind Circle Floor Decal		Wayfind Circle Floor Decal.pdf	
Graphic Elements	Directional Arrow Graphic		Directional Arrow Graphic.pdf	
Graphic Elements	Directional Exit Arrow Graphic		Directional Exit Arrow Graphic.pdf	
Information	Door Nameplate Large		Door Nameplate Large.pdf	
Information	Door Nameplate Small		Door Nameplate Small.pdf	
Information	Transit Watch		Transit Watch.pdf	

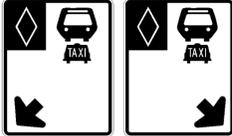
Information	Call or Text to Report Safety Concerns	Call or Text to Report Safety Concerns.pdf	
Information	Elevator is not Working	Elevator is not Working.pdf	
Information	Platform Closed and Open	Platform Closed and Open.pdf	
Information	Station Bus Route Information	Station Bus Route Information.pdf	
Information	Station Identification Entrance Doors	Station Identification Entrance Doors.pdf	
Information	Station Identification Platforms	Station Identification Platforms.pdf	
Information	Station Wayfinding Approaching an Exit	Station Wayfinding Approaching an Exit.pdf	
Information	Washroom Access Control	Washroom Access Control.pdf	 <i>*Braille shown in yellow for presentation only*</i>
Information	Call	Call.pdf	 <i>*Braille shown in yellow for presentation only*</i>
Information	Elevator Service Info	Elevator Service Info.pdf	

Information	Payphone		Payphone.pdf	
Information	Directory Major Downtown Hotels		Directory Major Downtown Hotels.pdf	
Information	Washroom Street Blade		Washroom Street Blade.pdf	
Magnet	DATS ETS Contracted Vehicle		DATS ETS Contracted Vehicle.pdf	
Regulatory	Bus Lane Advanced		Bus Lane Advanced.pdf	
Regulatory	Except Transit		Except Transit.pdf	
Regulatory	Give Right of Way to Exiting Buses		Give Right of Way to Exiting Buses.pdf	
Regulatory	No Skateboarding		No Skateboarding.pdf	
Regulatory	ETS Inspector Vehicle Parking Only		Vehicle Parking Only.pdf	
Regulatory	Private Property	RCE-201	Private Property.pdf	

Regulatory	Danger Stay off Tracks No Trespassing Exterior	Danger Stay off Tracks No Trespassing Exterior	
Regulatory	Danger Stay off Tracks No Trespassing Interior	Danger Stay off Tracks No Trespassing Interior	
Regulatory	STOP All Trucks	STOP All Trucks.pdf	
Regulatory	Do Not Block Buses	Do Not Block Buses.pdf	
Regulatory	Bicycle Yield to Buses	Bicycle Yield to Buses.pdf	
Regulatory	Bus Parking Only	Bus Parking Only.pdf	
Regulatory	Train Call Light	Train Call Light.pdf	
Regulatory	No Loitering	No Loitering.pdf	
Regulatory	No Smoking Fine for Violation	No Smoking Fine for Violation.pdf	
Regulatory	Emergency Exit Only	Emergency Exit Only.pdf	
Regulatory	Bicycles Welcome Here	Bicycles Welcome Here.pdf	

Regulatory	Walkways can be Slippery when Wet		Walkways can be Slippery when Wet.pdf	
Regulatory	For Your Security - Non Reflective		For Your Security - Non Reflective	
Regulatory	For Your Security - Reflective Small		For Your Security - Reflective Small	
Regulatory	For Your Security - Reflective Large		For Your Security - Reflective Large	
Regulatory	No Parking ETS Service Support Vehicles Only		No Parking ETS Service Support Vehicles Only	
Regulatory	Handicap Parking	RB-71	MMR# 66524_Handicap Parking_RB-71.pdf	
Regulatory	Park and Ride Customers Only		Park and Ride Customers Only.pdf	
Regulatory	Look Both Ways for Approaching Trains		Look Both Ways for Approaching Trains.pdf	
Regulatory	Look		Look.pdf	

Regulatory	Elevator to Trains		Elevator to Trains.pdf	
Regulatory	Entering Proof of Payment Area		Entering Proof of Payment Area.pdf	
Regulatory	Exit Only		Exit Only.pdf	
Regulatory	LRT Address Marker		LRT Address Marker.pdf	
Regulatory	Restricted Area Fleet Services		Restricted Area Fleet Services.pdf	
Regulatory	No Dumping		No Dumping.pdf	
Regulatory	No Entry Authorized Personnel Only		No Entry Authorized Personnel Only.pdf	
Regulatory	No Littering		No Littering.pdf	
Regulatory	To Trains		To Trains.pdf	
Regulatory	X-Over Speed		X-over Speed.pdf	
Regulatory	Single Tracking Ahead		Single Tracking Ahead.pdf	

RB	Reserved Lanes	RB-80	Reserved Lane_RB-80.pdf	
RB	Reserved Lanes - Ends and Begins	RB-80	Reserved Lanes - Ends and Begins_RB-80.pdf	
RB	Reserved Lanes - This Lane	RB-80	Reserved Lanes - This Lane_RB-80.pdf	
RB	Reserved Lanes Times	RB-81	Reserved Lanes Times_RB-81.pdf	
RCE	Bus Signal	RCE-81	Bus Signal_RCE-81.pdf	
Safety	In Case of Fire - Do not use Elevator		In Case of Fire Do not use Elevator.pdf	
Safety	Severe Weather Shelter Area		Severe Weather Shelter Area.pdf	
Safety	Emergency Phone		Emergency Phone.pdf	
Safety	Danger Do Not Operate		Danger Do Not Operate.pdf	
Safety	Do not stack anything on top of this cabinet		Do not stack anything on top of this cabinet.pdf	
Safety	Product Identifier		Product Identifier.pdf	
Safety	AED 3-Way Sign		AED 3 way Sign.pdf	
Safety	Emergency Eye Wash		Emergency Eye Wash.pdf	
Safety	Emergency Shower & Eye Wash Test Record Tag		Emergency Shower & Eye Wash Test Record.pdf	

Safety	Fire Extinguisher		Fire Extinguisher.pdf	
Safety	Fire Extinguisher 3-Way Sign		Fire Extinguisher 3-Way Sign.pdf	
Safety	First Aid Station		First Aid Station.pdf	
Safety	GHS Tag Gasoline		GHS Tags Diesel	
Safety	GHS Tags Diesel		GHS Tags Diesel	
Safety	GHS Tags Propane		GHS Tags Propane	
Safety	GHS Tags Mixed Gas		GHS Tags Mixed Gas	
Safety	Hose Under Pressure		Hose Under Pressure.pdf	
Safety	Mandatory Worksite PPE		Mandatory Worksite PPE.pdf	
Safety	Muster Point		Muster Point.pdf	
Safety	No Smoking		No Smoking.pdf	
Safety	No Smoking - 3in		No Smoking - 3in.pdf	
Safety	PPE Protection Area - Coverall_Footwear		PPE Protection Area - Coverall_Footwear.pdf	
Safety	PPE Protection Area - Eye Protection_Coverall_Footwear		PPE Protection Area - Eye Protection_Covera	
Safety	PPE Protection Area - Eye Protection_Footwear		PPE Protection Area - Eye Protection_Footwe	
Safety	PPE Protection Area - Footwear		PPE Protection Area - Footwear.pdf	
Safety	PPE Protection Area - Hard Hat_Eye Protection_Vest_Footwear		PPE Protection Area - Hard Hat_Eye Protectio	
Safety	PPE Protection Area - Hearing Protection_Eye Protection_Footwear		PPE Protection Area - Hearing Protection_Eye	

Safety	Flammable 2 Placard		Flammable 2 Placard.pdf	
Safety	Flammable 3 Placard		Flammable 3 Placard.pdf	
Safety	Flammable 4 Placard		Flammable 4 Placard.pdf	
Sandwich Board	Escalator Out of Service		Escalator out of service.pdf	
Stop	BNR Large		BNR Large.pdf	
Stop	BNR Medium		BNR Medium.pdf	
Stop	BNR Small		BNR Small.pdf	
Stop	Bus Stop Limit		Bus Stop Limit.pdf	
Stop	DATS Stop		DATS Stop.pdf	
Stop	BNR Bay		BNR Bay.pdf	
Stop	K Day Bay		K Day Bay.pdf	
Stop	No School Special Pickup at This Stop		No School Special Pickup at This Stop.pdf	

Stop	On Demand Transit		On Demand Transit.pdf	
Stop	On Demand Transit Large		On Demand Transit Large.pdf	
Stop	On Demand Transit Medium		On Demand Transit Medium.pdf	
Stop	River Cree Shuttle Bus Stop		River Cree Shuttle Bus Stop.pdf	
Stop	Stadium Bus Signs		Stadium Bus Signs.pdf	
Stop	LRT Replacement Blade		LRT Replacement Blade.pdf	
LRT	Security Camera Identification Numbers		Security Camera Identification Numbers.pdf	
LRT	Additional Fare Machines on Platform Level		Additional Fare Machines on Platform Level.pdf	