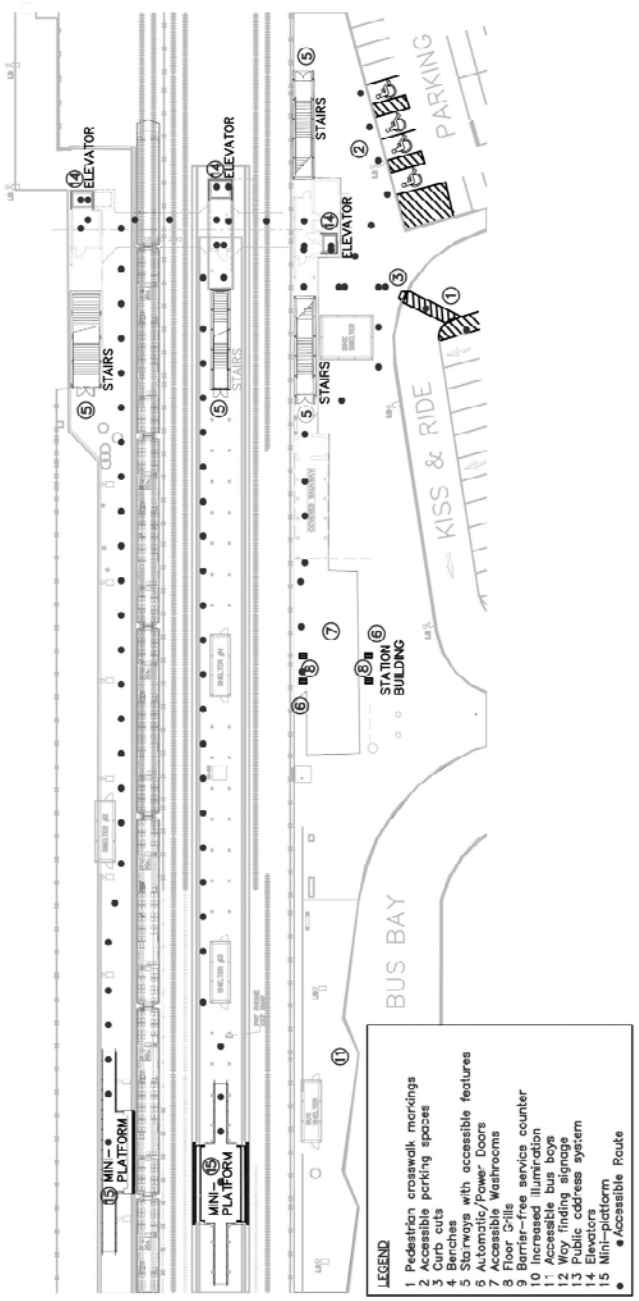
7. Accessible washrooms;
8. Floor grilles compatible with the use of canes and crutches and grating located away form the main pedestrian traffic flow;
9. Barrier-free service counters and accessible audio communication systems;
10. Increased illumination near customer loading and waiting areas;
11. Accessible Bus Bays and platform areas;
12. Signage for Station Way finding;
13. Public Address System;
14. Elevators with accessible features, where the station or facility requires an elevator; and
15. Elevated Accessible Rail Platform (Mini-Platform).

FIGURE: ACCESSIBLE ROUTE & EASIER ACCESS FEATURES

SECTION:
Tab 1: Guiding Principles

FIGURE:
Accessible Route & Easier Access Features

FIGURE: ACCESSIBLE ROUTE & EASIER ACCESS FEATURES



Mobility Hub Objective	Mobility Hub Approach	Existing Related DRM Design Requirement
	customer amenity: convenience, comfort and safety, and information.	station building area by each of the modes should have convenient access to: > Direct access from parking or Kiss n Ride to platform where possible. > An information display providing service information at the approach to the station area; >Service Area (attended, Presto or TVM); > Newspaper boxes and, if appropriate, concessions; > Customer amenities including benches, pay phones and waste bins
	4.7.1 Provide high-quality and safe accessible parking spaces.	CI-0203 Parking Infrastructure – Barrier Free Parking > Barrier Free Parking shall be located close to the station building entrance and/or rail/bus platform access. Parking spaces designated for persons with disabilities and accessible passenger pick-up areas that serve GO facilities should be located on the shortest possible circulation route to an accessible entrance (preferably 30m or less). > Parking lots shall have the minimum number of designated Barrier Free Parking spaces for passengers with disabilities

STATION BUILDINGS

[Per Rail Line Stations Level of Service Policy - February 2011]

✓ Accessible and easily accessed

✓ Located as the central focus of all transit related activity

✓ Well integrated with surrounding community and local transit

✓ Clear linkages displaying modal split

Key Performance Indicator (KPI) (◆ The station design will include...)	KPI Measure (☐Mandatory for next level) Ref. Standards documents for dimensions and details)	Level of Service (LOS)			
		A	B	C	F
Redundant station building access points	Minimum two (2) entrance/exit double doors	☐	**80% LOS A** plus mandatory KPIs	**65% LOS A** plus mandatory KPIs	**40% or less LOS A** plus mandatory KPIs
Sight line to drop off area	Clear, unobstructed view from station building waiting area to customer drop off area	◆			
Climate controlled waiting areas	Heating, cooling, and ventilation systems in accordance with OBC	◆			
Energy efficient illumination	Minimum 5 FC (50 LUX) at rail platform access points (i.e. tunnels, pedestrian walkways, etc.)	☐			
Convenient fare handling systems	Located at tunnel, bridge, and platform access if Service Counter has:	☐			

CI-0107 SYSTEM SAFETY

OVERVIEW (TBD)

SYSTEM SAFETY AND CRIME PREVENTION THROUGH ENVIRONMENTAL DESIGN (CPTED) PRINCIPLES

Application of Crime Prevention through Environmental Design (CPTED) principles should be used to enhance site security and, where feasible, designers should incorporate the following CPTED principles at a minimum into facility designs:

- Natural Surveillance
- Natural Access Control
- Territorial Reinforcement

Security design guidelines follow these CPTED principles:

- HUMANIZE station and terminal environments, in order to enhance individuality and autonomy in an otherwise anonymous mass-movement context.
- MAXIMIZE staff and passenger visibility for passive and active surveillance so as to eliminate isolation;
- FACILITATE access to communication /monitoring devices.

SECURITY DESIGN GUIDELINES

Design Area	Guidelines
Buildings	> **Stations, terminals, concessions:** open plan; maximize windows and sight-lines. > **Grade level:** maintain and enhance the natural grade level as the human-scale reference level, particularly for future open-air parking garages. > **Sight lines:** locate service counter at exterior wall(s) and maximize fenestration for sight lines inside and outside. Sight-lines shall be extended by mirrors where necessary (example: tunnel corners). > **Service Area:** clear tempered glass, with openings and sliding glass panel: electronic voice communication system, recessed cash scoop, staff washroom within; > **Public washrooms:** to be single-use washrooms, doors visible from station attendant room (multi use washrooms: without doors if possible); > **Light:** to improve outward vision, luminaires shall not reflect in windows.

SECURITY DESIGN GUIDELINES

Design Area	Guidelines
	Glare from glass shall not obstruct service attendant/passenger vision or visibility at any time.
Vertical Spaces	> **Stairs and elevators:** shall be in close proximity to each other, for acoustical and visual continuity. > **Guards and balustrades:** shall be glazed where sight lines are required and in order to maximize illumination to lower levels, Photoluminescnet strips to be installed above stair guards as required. Refer Tab 4 and Tab 7 for details > **Perimeter walls:** of stairs and elevator vestibules shall be fully glazed where possible; > **Stairwell openings:** shall be extended across tunnels where possible, for day-lighting, and to reduce the apparent tunnel lengths; concrete sealed walls to be protected by clear non-sacrificial anti-graffiti coating. Photoluminescnet strips to be installed above the nosing and at top, bottom and intermediate landings for entire stair run length. Refer Tab 4 and Tab 7 for details. > **Stair centre handrails:** shall terminate at landings to permit crossover.
Tunnels and Overpasses	> **Open overpasses:** shall not have solid guards. Enclosed overpasses and stairs shall have windows/skylights, including at the ends, or shall have mesh type enclosures; > **Tunnel corners:** shall be 45° angled and internal 90° corners shall have, at a minimum, convex mirror units and concrete sealed walls to be protected by clear non-sacrificial anti-graffiti coating. > **Heights of tunnels and overpasses:** shall be compatible with CCTV requirements. > **Photoluminescnet strips** to be installed along the entire length of tunnels. Refer Tab 4 and Tab 7 for details
Shelters	> **Shelters:** shall have clear-glazed walls; > **Large shelters:** for large shelters, doors shall be at opposite ends (one door at each end) and swing out; > **Roofs:** shelters shall have translucent roofs and internal and external luminaires that do not reflect/glare in glazed walls. Translucent roofs also borrow illumination from platform light standards and provide sun shade; and > **Platform shelters:** platform shelters remote from public announcement speakers shall have internal speakers.
Human Scale	> **Entrance-waiting areas:** shall have indirect illumination as the main source, plus a variety of accent luminaires. > **Shelters**: shall have illumination.

WAITING ROOM

Room Name	Waiting Room
Location	> Terminal waiting rooms are similar to station waiting rooms. However, they shall be larger, to suit ridership. GO Transit will advise the consultant of area requirements. A rule of thumb is to provide one 4-seat bench per bus bay (GO Transit standard interior bench), queuing for 20 at each service counter location, and circulation/waiting space on the basis of 0.7 m2 for each passenger. GO Transit to advise consultant on passenger capacity in accordance with ridership projections.
Features	> Window walls for sight lines to bus bays: insulating glass in aluminum thermal break frames; > More space for queues in front of service counter than in station buildings. A rule of thumb is to provide double the space at stations. Minimum: 20 passengers; and > The concession space may also need to be larger than at stations (minimum 6 m2), requiring also an exterior table/seating area. GO will advise the consultant of concession requirements accordingly.
Doors	> n/a
Fixtures and Fitments	> Minimum 3 lineal metres wall space for GO Information displays; > More pay telephones than in station waiting rooms, as will be advised by GO Transit, to suit ridership. Rule of thumb: one phone per bus bay, minimum four (4) phones; > Window blinds and/or solar film if required, particularly for the concession area; > Concession signs – by Tenant (shall not interfere with Station Attendant sight lines); > GO standard interior benches with armrests; > Waste containers; and Digital clock, etc. (see Station Program).

CI-0401 STATION BUILDINGS

BASIS OF CRITERIA

The standard Rail Line Station is based on the following functional areas:

STATION BUILDING

The Station Building provides attended services, waiting area, retail area, washrooms, storage room and accommodation for station systems; refer to Table for Station Typology and associated amenities.

SERVICE AREA/TVM

All GO service counters and fare vending machines shall be barrier free to the public with clear floor area; heights and adequate manoeuvring space to approach them.

RAIL PLATFORM

The Rail Platform includes mini-platform and passenger shelters, including platform maintenance access.

PLATFORM ACCESS

Platform Access includes pedestrian tunnel or bridges, at grade crossings, stairs, ramps or elevators. The location of the platform access (tunnels and stairs, parking access and pedestrian routes) and station facilities with respect to the platform length should be considered in relation to other stations on the same corridor in order to distribute activity within the corridor along the full length of the train.

STATION LAYOUT

Queuing areas shall be wide enough for people using mobility aids including electric wheelchairs and scooters.

Public telephones, display shelves shall be accessible to and easy to use by patrons with various disabilities, e.g. wheelchair users, persons with low vision or hearing loss. Appropriate lighting shall be installed to ensure that people with vision disabilities may clearly identify colours, patterns and signage.

Open-concept, accessible routes shall be marked by bright colour or textural changes at floor level, to provide directional cues for people with vision disabilities

There shall be no protruding objects or tripping hazards in accessible routes, and if so, they shall be clearly marked with a bright colour, a cane-detectable floor finish, or a guard.

EXTERIOR STATION SERVICE AREAS AND PASSENGER SERVICE SYSTEMS

The Exterior Station Service Areas and Passenger Service Systems include related accommodation, servicing, and infrastructure:

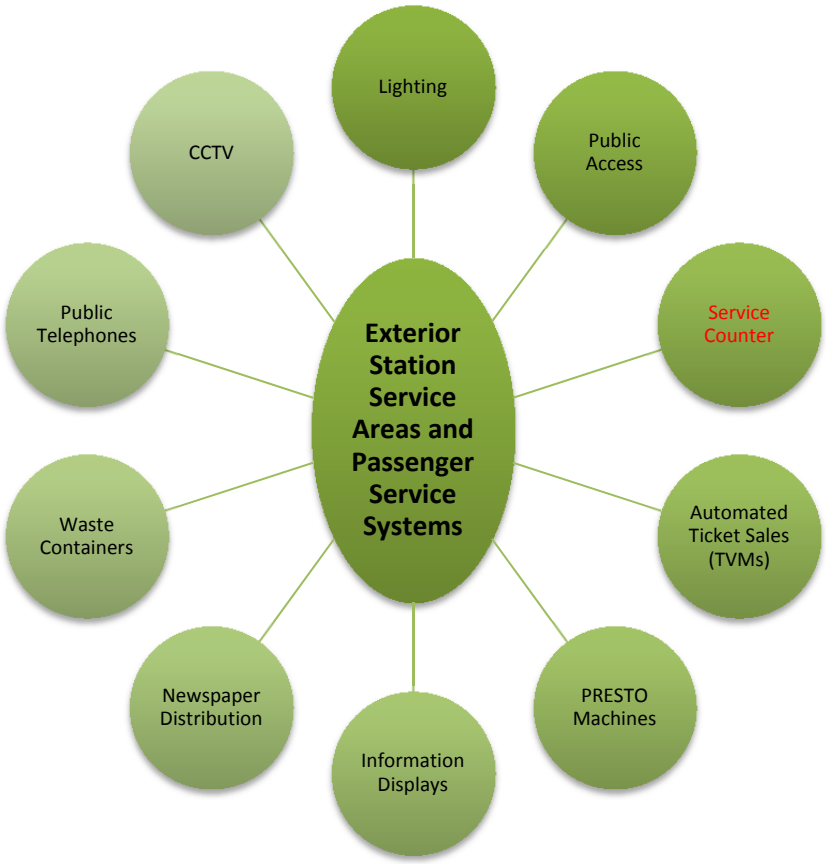


Chart: Exterior Station Service Areas and Passenger Service Systems

PARKING FACILITIES

Parking Facilities are located centrally with respect to the station building, taking into account future likely expansion (parking growth.,tunnels, etc.).

CUSTOMER SERVICES

Customers approaching the station building area by each of the modes should have convenient access to:

- Direct access from parking or Kiss n Ride to platform where possible.
- An information display providing service information at the approach to the station area;
- Service Area (Attended, Presto and TVM);
- Newspaper boxes and, if appropriate, concessions;
- Customer amenities including benches, pay phones and waste bins

The arrangement of the station should ensure that all needed facilities are available for customers using the station at times when it is not attended and portions of the station are locked. In addition to automated ticket vending and access to public telephones and information, a shelter should be provided for customers waiting for trains, buses, and rider/taxis as appropriate after staffed hours.

PLATFORM ACCESS

The Platform Access Section covers platform access buildings, including Tunnels, Stairs and Stair enclosures, Ramps, Elevators, Bridges and Pedestrian Overpasses, and At Grade Pedestrian Crossings.

The architecture of the Platform Access Buildings can be compatible with the Station Building (principally the roof-forms) or it can be completely diverse, depending on site and municipal requirements (as directed by GO).

Platform Access Buildings shall not visually overpower the Station Building.

DESIGN REQUIREMENTS

The following tables (and/or figures) refer to the detailed room design program for individual rooms in a typical station building:

WAITING AREA

Room Name	Description
Location	The waiting area shall project beyond the main building, with sight lines along the length of the building and maximized sight lines to the exterior.
Features	> Minimum queuing space in front of service counter shall be 5-7 passengers per attendant; queuing space shall be increased based on historical peak station demand information provided by GO staff. > Combined circulation/waiting space shall be provided beyond the queuing space on the basis of 0.7 m^2 for each passenger. Concession space (staffed kiosk or vending alcove); > High ceiling to a maximum of 4 m with daylighting (clerestory bay gable windows, or skylights);peaked or shallow arch ceiling for perimeter illumination (cove lighting); > Service counter complete with purse shelf, with fixed and sliding glazing from the counter top to the bulkhead soffit. > A minimum of 3% of new seating must be accessible with a minimum of one accessible space when constructing a new waiting area or are redeveloping an existing waiting area, where the seating is fixed to the floor.
Doors	> Glazed aluminum frame single door entrances at right angles to the main building, to minimize drafts, protected by the roof overhang, with doors hinging to open against exterior walls. > Two (2) adjacent doors without a post between, with a guard rails. Guardrail to have rubber doughnut bumpers. Power operated doors, where they open into a route of travel, shall have cane-detectable guardrails or other barriers at right angles to the wall containing the door.

CI-0401	**TAB 4: STATION INFRASTRUCTURE** Station Buildings

STAFF WASHROOMS

Room Name	Description
Location	> Within back of house GO Service Area and Bus Drivers Room.
Doors	> Where washroom doors have an air transfer grille, dimensions to be determined by the H.V.A.C. Consultant. Single use washroom doors shall be undercut.
Fixtures and Fitments	> Staff washroom accessories (mirror, recessed stainless steel combined work receptacle and paper towel dispenser with capacity 6L, soap dispenser, coat hook, air freshener and single roll toilet paper dispenser); > Staff washroom with a vanity lavatory and floor mounted tank type WC, mirror.
Finishes	> Floor: Porcelain Tile; > Base:Porcelain Tile (coved). > Wall:Ceramic Tile (full height). > Ceiling:Painted Drywall, painted latex eggshell enamel. > Recessed LED lighting with lens or linear LED in ceiling-recessed cove along the plumbing fixture wall for indirect illumination.

CI-0402 STATION SIZING

STATION SIZING

The following table shows typical space allocations for components of a GO Transit Rail Station building with a two (2) service attendant layout. These spatial allocations are a guide for design and layout of the GO Station Building. The information provided below should be read in conjunction with the functional figure showing spatial relationships. Further analysis is required based on specific site conditions such as ridership projections, arrival modes, interface with other Transit Services, stations designated as "Mobility Hubs", line station, or terminal station, bus terminal or Lay-By requirements (including drivers facilities), and other station specific requirements.

When more than two service attendants are required, provide incremental space allocations subject to GO approval.

ROOM	MIN. SIZE	REMARKS
Waiting Area	40 m²	This consists of 20 m² of waiting area and 20 m² of queuing area* (for two service attendants). * 1 m² per person queuing
Concession/Retail	16 m²	Adjacent to the waiting area and includes 4 m² for retail storage.
Service Counter	2.25m x 1.89m	*Space allocation per service counter for each attendant wicket (access and back counter space not included here). Mandatory view to Kiss & Ride. View to platform area where possible.
	20 m²	Total service counter area for two attendants, including back counter space, wickets, and entry with coat closet.
Station attendants back office	20 m²	Attached to the station attendants area includes lockers, kitchenette, safe and counting area hidden from view of the public. (Station washroom not included in total)

Staff Washroom	7 m²	Staff washroom attached to the station attendants back office.
Multi-Use Public Washroom	16 m² each sex	Door-less multi-use male or female accessible washroom having two water closets each. Determination of multi-use washroom design is based on station ridership, bus-meets-train service, and code requirements and subject to direction from GO staff.
Single-Use Public Washroom	5 m²	Universal, barrier free washroom. Determination of single use washroom design is based on station ridership, bus-meets-train service, and code requirements and subject to direction from GO staff.
Maintenance Room	15 m²	3.0 m x 5.0 m
Electrical Room	Minimum 17 m of linear wall space for mounted material.	Electrical Room size will be based on the project specific electrical equipment space requirements. Ensure that 25% of extra space is designated for future expansion.
Communications Room		Minimum 3.2 m x 4.8 m Communications Room size will be based on station type and project specific IT requirements.
Mechanical Room	Approx. 8 m²	Mechanical Room size will be based on the project specific mechanical equipment required.
Snowmelting Boiler Room		Boiler Room size based on snowmelt mechanical equipment space requirements. Ensure that 25% of extra space is designated for future expansion.

CI-0701	**TAB 7: TECHNICAL DISCIPLINES** Architectural

DESIGN REQUIREMENTS

Area	Description
Grilles, Covers, etc.,	> Cover panels, screens, grilles, etc. and outlet plates shall be flush-mounted using a vandal resistant security system which can be unlocked only by authorized maintenance personnel, or tamper resistant screws shall be used for smaller items. > This applies also to the exterior and the interior, and to signs, light standard or shelter column electrical access covers, hose bibs, soap dispensers, coat hooks, etc.
Door Hardware	> Key items are linear hinges, heavy duty closers, brush sweeps, guardrails with door hold-opens and power assisted door buttons, etc.
Station Furniture	> Most station furniture is supplied by GO Transit and shall be of salt-resistant and durable materials and finishes, and amenable to relocation by staff but secured in place or weighted to resist vandalism. > Furniture items include fare equipment, bicycle racks, salt bins, waste receptacles, information displays, benches, newspaper boxes, recycling bins, and free-standing advertising assemblies. > The consultant shall locate all such items on the interior and around the exterior of station and terminal buildings as part of the general arrangement plan, incorporating them into the architectural/electrical design.
Foot Grilles	> Foot grilles inside public doors shall be recessed flush with the finished floor and the recess. Foot grilles shall be fabric type, closely spaced so as not to trap high heels, and shall have stainless steel or aluminum frames. The pans shall be removable for cleaning;
Toilet Partitions	> Embossed, ceiling hung stainless steel toilet partitions shall be provided at all facilities.
Millwork	> See Station Buildings,– Typical Service Area Layout for general arrangement of millwork; > The key millwork and related features are a solid laminate (solid surfacing polymer) counter top for all items in the station attendant rooms, with an abrasion resistant plastic laminate finish on all cabinets, and a standard plastic laminate cabinet interior finish. All drawers are to be on high quality metal glides. All hinges are to be concealed. All pulls are to be stainless steel (unless otherwise noted). Eases shall be aluminum or stainless steel wall-hung cabinets are to have task-lighting for counters below; > Millwork relates mostly to the back of house service area and the service counter shared with the waiting room. > Millwork is also located in the dispatch room: a window wall built-in counter, with side or back counters and wall-hung cabinets;

Area	Description
	> Other millwork comprises the driver room kitchenette counter and cabinets, similar kitchenettes in the Maintenance Facility kitchens, and various office and workstation counters and cabinets; > All station building window sills shall be solid laminate sills; > For standard laminate colours and finishes, seek GO staff approval. > Footrests shall have a non-slip rubber finish; > Cash scoop plugs shall be supplied as part of the service counter delivery; > Wall cabinets shall have in-fills to ceiling height, to prevent dust collection; > A back-splash shall be provided along counter walls, and counters fronting windows with lower window sills; > Grommets shall be inserted in counter tops for electrical and communications plugs to go through (diameter to suit; extra-large); > Adjustable tilt pull-out keyboard trays required at service area back of house work station; > No sharp corners or edges in or near the station attendant knee-spaces; > Cabinet doors shall have the same laminate finish on both sides, and on edges. Cabinet and drawer interiors shall be laminate finish; > Coat closet to have a removable corrugated rubber raised-edge floor-mat for footwear, to collect dirt and water; > The communications cabinet to have concealed touch-latches (push doors to release) and separately keyed lower cabinets for secured hard drive storage; > Staff lockers may be prefabricated, pre-finished metal lockers with recesses to house padlocks (staff private padlocks) > The CCTV rack recess shall be finished with the same plastic laminate as cabinet fronts; > The Communications cabinet top part interior shall be laminate; > Pull handles shall be accessible stainless steel contemporary smooth and streamlined design fastened from the inside with tamper-proof screws (unless noted otherwise); > The staff washroom vanity shall have back and side-splashes and the same lower cabinet door pulls as noted above; > The fixed glass in the service counter shall be set into a groove in the countertop. All glass edges shall be polished and bull-nosed continuously. If securement of the glass is by clear silicone there shall be no residue on the countertop or into the cash scoops spanned by the glass.

ROOM	° C WINTER MIN.	° C SUMMER MAX.	NOTES
Workshop	22*	22	Ventilation
Storage	20	22	Ventilation
Station secondary entrances and tunnels	N/A	N/A	Natural Ventilation
Hydro Vaults	N/A	N/A	per Electrical Authority
Shelters	N/A	N/A	Natural Ventilation/Heating

* Electric heating if required (supplementary) to maintain 18°C winter temperature.

Note 1: High wall, heat pump with hyper heating and low ambient cooling (no night-time set-back).

STATIONS

- Radiant heating should be considered in new Station buildings on a project by project basis.
- Otherwise, Heating and Air Conditioning of the waiting area and the service area shall be achieved by one high efficiency, premium quality furnace c/w outdoor condensing unit.
- The service area will have a VAV box controlled by a thermostat, while the main thermostat should be located in the janitor room and interlocked with the waiting area temperature sensor.
- Communications room and Electrical room shall have dedicated split Heat Pump A/C unit for each room. Refer to Communications room section for HVAC and ventilation details.
- Depending on area, washrooms shall be ventilated by Energy Recovery Ventilators or exhaust fans, and shall be heated by radiant heating (if available in the building) or by electric baseboard heating.
- Refer to Elevators section for Elevator hoistway HVAC.

- Auto restart after power failure
- Hot start.

FANS

- In public area and occupied spaces, low noise centrifugal fans shall be used.
- Public area fan systems shall be provided with suitable attenuating silencers capable of maintaining space noise level no greater than NC40.
- Airfoil or backward inclined design is preferred. Forward curved wheels may be used for low pressure applications.
- Variable pitch axial fans should be considered for fan wheel diameters greater than 610mm and where system air volumes vary, due to control characteristics of summer/winter operation.
- Propeller fans may be used where they serve non-public or unoccupied areas.
- Additional ventilation with emergency power back-up may be required in large facilities, such as Willowbrook or Steeprock.

ENERGY RECOVERY

Energy Recovery Ventilators (ERV) shall be specified for energy conservation in all GO facilities, where practical and cost effective. In station buildings they shall be above the public washrooms or the janitor room, in the attic space, where applicable. Access by ceiling hatch.

FILTERS

Filters used in supply air systems shall be 50mm (2”) thick throw-away type, with minimum efficiency of 30%.

HEATERS

Electric fan forced heaters shall be considered in the waiting area and entrances. Heaters can be wall or ceiling mounted. Heaters should be controlled by wall mounted space sensors. No built-in thermostats should be allowed.

Supplemental electric fan forced heater should be considered in the service area.

Electric resistance duct heaters shall have Silicon Control Rectifiers (SCR), minimum airflow switch, and two high-temperature limit sensors.

Gas fired unit heaters and infrared heaters shall be considered in large facilities.

ESSENTIAL LOADS

The following table shows a list of items that are considered to be essential. The table shows both backup power system conditions (i.e. Generator + UPS OR UPS only) and provides an estimated power draw for each item. The actual power draws shall be considered in the detail design and specification must be verified on a project by project basis.

ESSENTIAL LOADS

Essential Load	Estimated Power Draw	With Generator		With NO Generator
	(Watts)	Diesel Generator	UPS System	UPS System
Life Safety				
Exit signs - buildings, tunnels and similar structures (LED type)	100	x		x + Life Safety
Public Address System	2,000	x	x	x
CCTV System	2,000	x	x	x
Any additional rack in the Comms Room	2,000	x	x	x + Life Safety
GO Transit telephone System	500	x	x	x
Elevator (only one elevator operating at a time)	4,500	x		
Elevator controls	2,000	x		
Alarm Monitoring Systems	400	x	x	x + Life Safety
Lighting				
Tunnels, bridges and stairwell illumination (at least 1fixture on normal power)	2,000	x		x + Life Safety
Electrical Room Illumination (at least 1 fixture on normal power)	100	x	x	x
Communications Room Illumination (at least 1 fixture on normal power)	100	x	x	x
Service Area Illumination	300	x		x
Waiting Area Illumination - minimal	1,000	x		x + Life Safety
Platform Lighting	9,000	x		

ILLUMINATION LEVELS

ILLUMINATION LEVELS

Location	Working Plane Height
Circulation areas both public and non-public including exterior traffic areas.	Floor level
Public seating (waiting) areas	850mm
Workshops	850mm
Vertical illumination (task lighting)	At the task

Interior Lighting

Minimum average maintained illumination levels as per IES / CNIB or as directed by GO:

INTERIOR LIGHTING ILLUMINATION LEVELS

Location	Illumination Level
Waiting Room	20 Fc (200 LUX)
Station Attendant Room	20 Fc (200 LUX)
Service Counter task lighting	40 Fc (400 LUX)
Staff Washroom	20 Fc (200 LUX)
Public Washroom	20 Fc (200 LUX)
Electrical Room	75 Fc (750 LUX)
Communications Room	75 Fc (750 LUX)
Janitorial/Storage Room	20 Fc (200 LUX)
Elevator/Escalator (incl. elevator vestibules)	20 Fc (200 LUX) (Note 1)
Shelter	5 Fc (50 LUX) (Note 2)
BRT Building (Bus Rapid Transit)	15 Fc (150 LUX)
Shop/Workbenches	30 Fc (300 LUX)
Electronic Shop Workbenches (task lights)	As per IES
Garage	30 Fc (300 LUX)
Mechanical Room	20 Fc (200 LUX)
Dispatch Room	15 Fc (150 LUX)
Hallway/Corridor/Tunnel/Stairwell	20 Fc (200 LUX)
Office	As per IES or CIBC
Other	As per IES or as directed by GO or CNIB

Note 1: Elevator Code to govern

- Bus loop and bus loop shelter lighting to be 100% OFF.
- Parking lot lighting to be further reduced to 100% OFF.
- Illuminated facility ID sign to turn OFF.

EXTERIOR LIGHTING ON/OFF CONTROLS

The lighting controls shall be designed to provide the following functions:

- The lighting controller (i.e. timer) shall be programmable controlled, PLC, complete with automatic daylight savings adjustment.
- Provide a photocell control on all control designs where the default is “dusk to dawn”.
- Sites that are being rehabilitated should have their lighting controls modified to meet these requirements.

OVERRIDE SWITCHES

Station lighting is to be wired into separate zones and each zone shall be controlled independently by one of three master override switches. Switches shall be strategically located at the service counter, electrical room and exterior of the station. Override switch will be accessible to GO staff and GO approved contractors/agents.

Zones shall include Station building, surface parking, multi-level parking, bus loop, rail platform, Kiss and Ride and access road at a minimum. An overall master shut off switch is also to be provided. Switches shall be housed in a weather tight, PVC lockable box accessible to GO staff, and GO approved contractors/agents. All switches shall have the ability to control any lighting zone. All switched to be labeled with the zone it is controlling.

Remote parking shall have its own override switches following the same guidelines as above. The locations shall be inside the local power cabinet and outside the cabinet housed in a weather tight, PVC lockable box.

EXIT LIGHTS

Exit lights shall be of the fully self-contained and low energy LED type.

EMERGENCY LIGHTS

Emergency lighting shall be in accordance with the OBC, the Ontario Electrical Safety Code, and the latest CSA standards.

GLARE

Adjacent properties shall be shielded from glare or light trespass. There shall be no interference with railroad signal or operations systems due to glare.

The discomfort Glare Rating shall have a Visual Comfort Probability (VCP) of 65% or greater for interior lighting.

Station attendants and passengers at service counters shall be able to see each other 100% when

the sliding glass panel is in the closed position. Luminaries in this location shall have parabolic egg crate lenses, with all illumination directed vertically down to the task.

Passengers and station attendants shall be capable of seeing out to the exterior at night. All glass shall be clear and not tinted, for maximum visibility, also of the interior.

Luminaries' placement shall take into account viewing angles and fields of view of close circuit television cameras. Luminaries shall not present a source of glare to surveillance cameras.

DAYLIGHT

Particular attention shall be directed to parking structure, rail station and bus terminal entrance/exit areas, especially on large projects. Illumination shall provide for a visually comfortable transition from outdoors to facility entry areas during all hours of system operation. Illumination levels will likely have to be graduated during the daylight hours to minimize otherwise abrupt changes from outdoors to indoors, and vice versa. Photoelectric cells for the automatic operation of additional lighting fixtures may be utilized.

MINIMUM HEIGHT

Light fixtures shall generally be mounted at least 2.44 m above floor level. Exceptions are task lights under cabinets or above counters (including shop maintenance counters). Tunnel-stair fixtures shall be wall recessed below stair handrails, or at tread level.

SUNDRY

All rail platform poles shall be hinged to avoid flagman services. Hinged poles shall be installed in such a manner to avoid obstructions when lowered. Hinging shall be always parallel to the track.

CCTV camera(s) shall have dedicated split pole(s).

PA speakers can—— be installed on existing lighting poles only if they are split.

High-mast lighting poles shall have no objects attached onto (e.g. parking identification, PA speakers, etc) to avoid obstruction of the lowering device.

DESTINATIONS ID

Service ID "XXXX"	Source ID " YYYY"	Destination ID " DDDD"
	the primary.) or CC - Communications Closet (Typically located in the Service area.)	Communications Closet (Typically located in the Service area.)
"IS" for information signage	"SS" for substation	"SS" for substation
"EVC" for electric Vehicle charging and recovery system	"ES" elect closets / sub elect room	"ES" for elect closets/sub elect rooms
"PARK" for Parking Systems (car counting)	"HUB" communication hub room	"HUB" for communication hub room
"LFS" for Layover Fuelling Station	"Bell D" for BELL DEMARCATION	
"LCS" for Layover compressor Station	"PX" for patch panel	"PX' for patch panel
"LWS" for Layover Wayside Station	"SEL" sub electrical rooms	"MHC" for Manhole communications
"LPMB" for Preventive Maintenance Bay	"RDC" for Rectifier	"HHC" for Hand well Communication
"LWR" for Wheel Maintenance House	"INV" for Inverter	"MHE" for Manhole Elect Power
"LWL" For Locomotive Wash	"DPLS" for Emergency Distribution for Life Safety	"HHE" for Hand well Elect Power
"BSM" for Boiler Snow Melt	Building Out Building to be determined	"PL" for Pole

GENERAL

OVERVIEW

Communication design is meant to be a proactive, preventive approach to security through the identification and development of strategies that minimize potential threats and vulnerability to employees and customers, protects company assets from theft, abuse and vandalism and reduces unnecessary damage or waste.

The level of design and installation at each station, facility or wayside layover will depend upon the unique conditions of each site and in accordance with GO Metrolinx corporate policy. Monitoring and recording requirements will be determined by the stakeholders.

This Tab is a guide to the design requirements for Communications of GO Transit fixed facilities in terms of the following subjects:

- Close Circuit Television (CCTV)
- Public Address System (PA)
- Information Technology (IT)
- Telephone Network
- Security System
- Fare Handling Systems
- Service Counter Talk Thru Systems
- Building Automation Systems
- Radio

- Colour Monitors – 24” or 32” display monitor inside station service area, 32” or 50” at Transit Safety Dispatch, wall or ceiling mounted each site is dependant on local requirements and conditions. This will include all hardware required for the installation.
- Outdoor grade platform monitors to assist CSA to ensure doorways are clear of passengers. Typically used on curved platforms with obscured vision and installed on mini-platform on dedicated pole.
- Cameras – Fixed or Pan/Tilt/Zoom, high sensitivity (0.08fc) and other new technology compatible and approved with the corporate standard system.
- Camera Housings – weatherproof (outdoor), moisture and dust-proof, maintain the ambient temperature within the housing in the camera operating temperature range of –10°C to +50°C. A sunscreen is fitted to protect the camera from direct sunlight. Indoor housings are either high impact polycarbonate or epoxy coated steel, dust-proof, with top mount assembly, suitable for cameras with fixed focal length.
- Lenses – Fixed with auto-Iris. Aspherical lenses are used on platforms to suit lighting conditions.
- CCTV Head End System.

DESIGN/INSTALLATION CRITERIA

CCTV system implementation is part of the overall facility design. The level of design and installation at each station, facility or wayside layover will depend upon the unique conditions of each site and in accordance with GO corporate needs. Monitoring and recording requirements will be determined by the user groups.

STATION OPERATIONS

Area	Activity	Primary Purpose(s)	Image Quality
		Maintenance.	
Platform Monitors for CSA	Assist CSA to ensure doorways are clear of passengers. Typically used on curved platforms with obscured vision. Camera shall not be used for any recording.	Rail operations, safety. Passenger safety	Detect.
Ticket Vending Machines (TVM)	On lakeshore stations, one camera visible to customers. Identify customers using the TVM machines. New TVM's will have their own cameras. RECORDING (FIXED)	Security, public confidence, deterrence. Investigations	Recognize.
Hold-up	One camera per service attendant to identify the customer currently at the window. RECORDING (FIXED)	Security, public confidence, deterrence. Investigations	Recognize.

PUBLIC ADDRESS SYSTEM (PA)

BASIS OF CRITERIA

Public Address Systems are provided at bus terminals and rail stations for direct communication to passengers. These systems are used by Station Operations and Rail Operations and predominantly include rail and bus platforms, bus loops, passenger waiting areas, tunnels/stairways and shelters. Announcements are made from a wall-mounted touch-tone DTMF paging phone located in the Station Service Area. This phone is compatible with the zone selection equipment in the Communication Control enclosure.

DESIGN REQUIREMENTS

COVERAGE

Local

A system of speakers divided into zones enable announcements from the service counter throughout the station or to specific areas, e.g., tunnels or platforms. Under normal working conditions pages are made using the all call feature to all areas.

Remote

Rail Station P.A. Systems can be accessed through a Bell Canada SST Red phone interface to enable announcements to be made by Rail Operations at Union Station. This allows GO Operations personnel to access rail stations P.A. systems to make announcements.

PAGING

Paging is presently conducted manually throughout the Rail System P.A. Network. However, both Union Bus and Rail Stations have the capability of automatically making pre-recorded announcements. An IP Ethernet link between these stations also allows access to either system. Replacement or new systems at bus and rail stations will contain provision for connection for any future system-wide IP network.

REFERENCES

The design and installation of the P.A. System will comply with the following:

- GO Transit Station Telecommunications and Electronics Systems Document.
- Electrical Specifications

DEFINITIONS

Controller

- Provides, through a system processor, audio input to the various groups of speakers, referred to as zones. This is accomplished by means of Zone Drivers and Zone Relay Cards. It also interfaces with the Red and Local Paging Phones.

DTMF

- Dual Tone Multi Frequency

Red Phone

- A Bell Canada SST system, serves as an emergency communications network and provides a direct link with the Meridian phones at the stations and terminals. Both Red phones are interfaced with the P.A. system at each facility.

EXISTING SYSTEMS

If required by GO Transit to phase out, disconnect and remove an existing system, the Consultant shall specify that the Contractor turn over all removed and unused equipment to GO Transit. The process of phasing in the new system shall not cause any undue disruption to the services of the existing system.

CODES AND STANDARDS

The Consultant shall specify that the equipment, materials, installation methods and workmanship shall be equal to or exceed the standards specified by the Canadian Standards Association, Electrical and Electronics Manufacturers Association of Canada, Ontario Electrical Safety Code, OBC, ULC, NFPA, Electrical Safety Authority Bulletins, CSA Standards and all other current applicable codes.

Consultants for specific projects shall define codes as applicable and list them in the contract tender documents.

SYSTEM REQUIREMENTS

The P.A. System generally consists of zone-grouped speakers strategically located in or at GO Transit facilities, buildings, tunnels, stairwell entrances, elevator vestibules, rail platforms, Kiss and Ride Areas, and Bus Loops, and a System Controller located in the Communications Room of the facility.

For Station and Terminal Facilities, the System shall accept local inputs from local RED phone and DTMF paging phone in the Service Area and a remote input from GO Transit ‘RED’ phone system (Bell Canada SST System).

EMERGENCY POWER

P.A. System equipment shall be supplied from the emergency power panel located inside the station communication room.

PRIORITIZED PAGING

The P.A. system shall be user configurable to provide prioritized paging announcements when announcements are generated simultaneously from different inputs. Initial configuration shall establish to the following priority level.

Highest Priority	GO Operations 'Red' phone
↕	Local 'Red' phone
Lowest Priority	Other paging telephones including service area

The system shall provide for a separate 600 ohm audio input whose priority access level in the system is also user configurable.

TIME CLOCK

The system shall provide for volume adjustment of the P.A. announcements using an internal real time clock. Automatic adjustment of clock changes shall be provided for daylight savings time.

GENERAL FEATURES

1. The P.A. system shall interface with a maximum of seven and minimum of four P.A. paging phone inputs and up to three - 600 ohm audio circuits. All three audio inputs shall provide independent audio adjustment of the incoming signal. A common audio adjustment shall also be provided for the P.A. paging phone inputs. Signal levels for the local paging and remote paging shall be separate inputs requiring individual adjustments. The equipment provided shall be capable of adjusting all audio inputs over a range of -30db to +6db.

2. A solid state controller shall provide the switching and signalling required for priority calls, selective zone paging, zone "group" paging, all call, background music mute, paging alert tones and emergency override.

3. On-site user-configurable, prioritized paging access for all audio inputs shall be provided.

4. The P.A. system shall interface with the GO Transit 'RED' phone system to allow both 'RED' phone paging from Union Station and local 'RED' phone paging from the service counter. The local 'RED' phone paging facility shall automatically provide service counter paging speaker override whenever the local □RED□ phone system is used.

DESIGN REQUIREMENTS

LOCATIONS

The STI's Interac equipment and calculator are generally situated at the station service counter. STC's Smart card equipment and TVM's may be located either in the station building, platforms and accesses to platforms or in tunnels.

CONDUITS

Conduits designated for fare handling equipment wiring will be clearly identified and will be installed well clear of power conduits. Conduits will be RSG or EMT depending on the location with a minimum size of 19 mm.

WIRING

Most fare handling equipment operates with low voltage electrical circuits. Conduits carrying wiring operating at higher voltage must be kept well clear to avoid any possibility of interference. For maximum communications wiring distances see TAB 7. Any of the above machines that are located outside of heated areas such as the station building will necessarily be fitted with anti-condensation heaters. Wiring and circuit protection will be sized to suit the wattage of heater supplied.

PRESTO OVERVIEW

Presto Fare Handling System is a smartcard-based fare payment system designed to support the use of one common fare card for fare payment on the various participating public transit systems. PRESTO equipment is proprietary, provided and installed by the appropriate supplier, and comprises:

- SPOS (Station Point of Sale) – located at the Service Counter
- SFTP (Station Fare Transaction Processor)
- CQD (Card Query Device)
- HCR (Handheld Card Reader) and the HCR Cradles – located in Safety Systems Offices
- WAP (Wireless Access Points) – located at bus facilities
- CC (Concentrator Complex) – installed in main racks.

See standard diagram number P1 for Presto System Architecture.

- Multimode fibre patch cords to be c/w LC/LC connectors; cords minimum 1m in length.
- Four patch cords for each fiber transceiver plus 20% spare to be provided.

DEVICE (SFTP/CQD) MOUNTING

SFTPs/CQDs are designed for both stand and wall mounting.

Wall mounted devices do not require any special boxes and will be mounted directly on the wall as shown on standard diagram P10.

Custom made Base Boxes are required to mount SFTP and CQD devices when using 'stand mounting' method. Stainless steel two-piece base box under SFTP and CQD shall be supplied and installed by contractor. Box manufactured by Commex Group Manufacturing Inc. (905-890-0077).

See standard diagrams P6, P7, P8, P9 and P10 for fare device (SFTP and CQD) installation details.

DEVICE (SFTP/CQD) SIGNAGE

Standard signage for SFTPs and CQDs shall be provided; refer to Static Signage Catalogue, performance Spec (10400) and Design Requirement Manual (DRM) for design, material and installation details on signage.

SERVICE COUNTER MODIFICATIONS TO ACCOMMODATE SPOS

All required modifications shall be performed in wicket's millwork, including adequate ventilation provisions, to accommodate the SPOS equipment.

The SPOS dimensions of the central unit and its peripherals are shown in Table 2:

Components	Physical dimensions (Width x Height x Depth)
Computer	177 x 400 x 530 mm
Touch screen	434 x 430 x 238 mm (Including base)
CID (Card Interface Device)	151 x 37 x 191 mm
Receipt Printer	147 x 148 x 213 mm
UPS	147 x 236 x 419 mm
PID (Process Identifier)	Base: 220 x 41 x 110 mm Display Head: 260 x 70 x 60 mm Overall Height: 291 ~ 426mm

SERVICE COUNTER TALK THRU SYSTEMS

BASIS OF CRITERIA

The talk-thru system provides instant 2-way voice communication between the public and station attendants through the glass divider at the station service counter.

DESIGN REQUIREMENTS

FUNCTION

The talk-thru unit provides hands free and effective duplex communication between the station operator and the passengers. The voice switching function is automatically biased in the direction from the passenger to the operator. Noise cancelling and omni-directional microphones will be mounted on the passenger and service attendant sides respectively, of the booth glass divider. Two rotary encoded controllers will be provided to adjust the volume of each microphone. The operator's boom microphone will automatically override the passenger microphone when activated. Provision will be made for inter speech pause time.

COMPONENTS

- Microphone Override Pushbutton
- Power On/Off L.E.D. Switch
- Noise Cancelling Microphone
- Seller's Mike-Off Switch

WIRING

- Conduits and 120 volt A/C source power outlets for each voice link assembly.

3.4 COMMISSIONING AND ACCEPTANCE

All communications systems are required to be commissioned and tested. In addition to the Metrolinx DRM requirements for testing and commissioning the Metrolinx I&IT department must be present for the commissioning of any communications systems. This includes but is not limited to CCTV, Network & Bell Services, PA Systems, Ticket Vending and Service Counter systems, Access Control and Security systems, Fuel Management systems and others listed in this document.

3.5 QUALIFICATIONS OF THE QUALIFIED COMMUNICATIONS CABLING INSTALLER (QCCI)

The Consultant shall ensure that the communications cabling installer is experienced in his/her trade. The ideal qualifications of the qualified communications cabling installer (QCCI) could be: a licensed electrician with communications or electronics specialization and/or a licensed electrician with BICSI registration as Installer Level However, the “licensed electrician” requirement may be waived if the installer demonstrates superior communications and electronics cabling knowledge or other trade specific certifications relating to cable installation. The qualified communications cabling installer is referred to as QCCI throughout this document.

3.6 SITE CLEAN-UP

A full cleaning of the communications room is required prior to systems installations. Upon completion of the cleaning and preparation of systems installations this room must be kept in a clean and tidy fashion. Regular inspection and cleaning is required to protect the equipment during installation. This includes regular vacuuming for dust and debris, maintaining air circulation filtration to ensure dust is not circulated, and general cleanliness of the area including removal of packaging materials, and cable debris.

These spaces are not to be used for tool or other storage during the systems installation nor are these spaces to be used for machining or work other than systems installation. This includes threading pipes, bending conduits, general fitting of any other material.

Final cleaning shall follow Metrolinx Close-Out Specifications as per contract documents. In addition to the standard close-out procedure cleaning, the Consultant shall ensure that the cleaning of the systems equipment, such as CCTV racks, P.A. racks, etc., is carried out by a qualified technician.

5.1.2 COPPER CABLING REQUIREMENTS

5.1.2.1 COPPER BACKBONE CABLING

This type of cabling is to be used only for communications structured cabling where more than 4 pairs are required. This is not to be used for runs to the desk or end devices. CAT-5e Telephone Backbone cable is to be used for backbones. A minimum of 25 pairs is required between all telecommunications rooms. In some cases 50 Pair or multiple 25 pair cables will be specified as needed.

Each Telecommunications room is to be connected with a 25 Pair (50 Conductor) CAT-5e Cable. See Cabling Standards for details on termination and cable type.

5.1.2.2 COPPER HORIZONTAL CABLING REQUIREMENTS

CABLING TO THE DESK / CUBICLE

Each desk requires two CAT-6 data cables. These are to support both voice and data. Some situations require additional network outlets and will be identified during the design phase. All horizontal network / voice cables are to be blue in colour.

CABLING TO THE SERVICE COUNTER

Each service booth selling position is to have a minimum of eight (8) Category-6 data / voice outlets. These are to be terminated using Category-6 RJ-45 outlets with dust guards or caps. All of these outlets are to be mounted in a patch panel type frame which is mounted below the millwork. These patch panels are to be equivalent to Panduit CWPP12WBL and include the following features:

- Release snap feature on faceplate allows simple front access for termination and accessibility to installed modules
- Accept Modules for UTP, fibre optic, and audio/video, which snap in and out for easy moves, adds, and changes
- Mount directly onto wall
- Modular design for easy cabling revisions
- Have 12 Module Spaces
- Be no more than 9.5” x 2.5” x 1.75” in size.
- Mount directly to wall or millwork surfaces

These are to be located in a convenient location to reach all networked and phone devices within the service position.

All of these cables are to be direct home run cables to the nearest telecommunications room. These are to be terminated on a flat RJ-45 patch panel. (See Patch Panel Specifications for Station Telecommunications Rooms).

APPENDIX A
IT Telecommunication and Systems Document

6 LABELLING STANDARDS

All of Metrolinx Cabling is to be labeled according to the ANSI/TIA/EIA 606A - Administration Standard for Telecommunications Infrastructure.
All cables are to be labeled and recorded as per the 'CLASS III' requirements under the 606A standard.

6.1 TELECOMMUNICATIONS ROOM / RACK NAMING AND SIGNAGE

Each communications room is to be named, and signed as a Telecommunications Room. Each Site is to have one MCR (Main Telecommunications Room) and subsequent rooms being labeled with the following syntax.

<BUILDING>-<FLOOR #><SPACE>-

<RACK> Building Variables:

- ST - Station
- PG - Parking Garage
- PF – Platform
- OB - Outside Building (aka Bunker, Kiosk etc)

Facilities with only one building may omit this field.
Floors:

- B9-B1 - Sub Grade Floors
- 1 - 99 - Above Grade Floors

n.b. Floor identification numbers are to include only the floor number the room is located on, and not the floors it serves.

Spaces:

- MTR - Main Telecommunications Room
- TR - Telecommunications Room (Any other space designated as a communications room which is not the primary.)
- TC - Telecommunications Closet (Typically located in the Service Counter area.)

Racks:

Racks at Station Facilities are to be labelled by their use. For example the following rack names are acceptable in station facilities. Should there be multiple cabinets or racks for a single system in the same room – i.e. two CCTV racks, each rack name is to include an index number CCTV1, CCTV2.

- CCTV CCTV Cabinets
- NET Network Cabinets

APPENDIX A
IT Telecommunication and Systems Document

7 SYSTEM DESCRIPTION AND DETAILS

7.1 CCTV

Each head end system shall include, but not be limited to, the following:

- HP Server Console and KVM if required
- HP DL320 Server (Used for Indigo Vision Windows NVR)
- Indigo Vision NVR License Dongle
- Indigo Vision VB 9000 Series Encoder Hardware
- Cisco 2960G Series Switch

In addition to the head end system, monitoring at our Station facility service counter is required. Each monitoring system shall include, but not be limited to the following:

- Current model monitoring PC (See attached BOM for details)
- 32” or 24” LCD monitor / panel wall or ceiling mounted depending on local requirements

7.1.1 EQUIPMENT INSTALLATION

No equipment shall be installed in the CCTV rack unless directly related to CCTV. This equipment will also be installed in the rack in designated rack units, and may not overlap into other rack units.

7.1.2 RACK CONSOLE

The rack console is to use the 23rd Rack Unit from the base of the rack. The KVM is to be installed in the same RU on the rear of the console. See installation instructions for details on mounting these in the same RU.

7.1.3 SWITCH GEAR

The Cisco switch shall be configured by the IT Network Engineering team. Two weeks’ notice prior to installation is to be given to the Metrolinx IT Network engineering department for configuration of this equipment.

The Cisco switch, if required is to be installed at the uppermost RU of the rack, with the network ports facing the rear of the rack. This is to be installed by the CCTV Installation Vendor. This switch is to be uplinked to the Metrolinx corporate router to the designated port. This is to be done under the supervision (either onsite, or remotely) of a Metrolinx IT Network Engineering specialist.

7.1.4 NVR SERVER

Each NVR is to be installed directly above the console, and placed without spacing in between. In cases where multiple NVRs are required, the second NVR will be installed directly above the previous, again with zero spacing between. All manufacturer supplied rails are to be used.

Resolution	1366 x 768
Brightness (cd/m^2)	500
Contrast Ratio	4,000:1
Minimum Response Time	8ms
Minimum Viewing Angle	178^0 Horizontal & Vertical
Display Colours	16.7 Million
Min. Speaker Output	10 Watt Total
Weight Limit	75 Lbs
Physical Maximum External Dimension	810(W) x 515(H) x 120(D) mm

7.1.8 STATION SERVICE COUNTER OR OTHER MOUNTED CCTV SCREEN LOCATIONS

Each screen is to be mounted within the service area where each attendant may see the screen without strain, or discomfort. At the same time the screens are to be kept in a position that does not allow the public to see the contents of the screen. An approved location should be agreed upon at the time of design by Station Operations and Information Technology, Occupational Health & Safety and System Safety

7.1.9 SERVICE AREA / MONITORING PC

Each pc must be installed within close proximity of the service attendants and the monitor.

Each service area / monitoring PC must be connected to the network switch in the telecommunications room and port designated by Metrolinx.

The service area PC must be configured with Metrolinx provided user accounts and specifications. This will be provided at the time of installation.

A network outlet and two duplex receptacles are required for the monitoring PC.

7.1.12 CAMERA CONNECTIVITY AND CONTROL

Each camera connected to the Indigo Vision system must be visible from the corporate network. Working with an IT Representative, each camera will be tested for PTZ control and image quality using the Indigo Vision Client Application

Metrolinx requires two weeks' notice prior to the anticipated completion of the CCTV system to verify and test all camera connectivity and control. Contact the IT Network Engineering department to schedule testing of this system.

7.1.13 REPORTING

Upon completion of the CCTV installation, a complete list in Excel format is to be submitted to the IT Department with the following details for each camera:

- Make
- Model
- Serial Number
- PTZ Protocol Settings
- IP Address
- Description of Location
- Date of Installation (For warranty Purposes)

7.2 TELEPHONE NETWORK

7.2.1 STATION PHONE

The function of the station telephone is to provide voice communication capability between the station attendant and other Metrolinx staff.

Station telephones are PSTN commercial line telephones located in the service counter. These phones are supplied and installed by Metrolinx. Phone Lines will be ordered by Metrolinx IT department. The phone sets must be cabled to the service counter cabling jacks. Locations are defined by the service counter standard in the DRM.

7.2.2 STATION RED-PHONE

The function of the red phone is to provide voice communication capability between the station attendant and the Metrolinx' Rail Operations Control Center GTCC at Union Station as well as to provide connection to the local PA system for emergency announcements. The signalling integration of the Red Phone with the PA system is included in the PA system.

This telephone set is on a separate 2 wire line connected through a 4 wire circuit to the GTCC. The Red Phone line is ordered by Metrolinx IT. The Red Phone should be cabled to the service counter jacks.

7.2.3 PAY PHONES

7.2.3.1 PAY PHONE - STATION

The function of the pay phone-station is to provide telephone service for the use of the passengers.

This telephone is on a regular PSTN circuit and is typically located in a convenient area for passenger access. Usually each station has one internal pay phone and one external pay phone; however, at larger stations the number of pay phones is increased. The telephone is supplied and installed by Bell Canada. The conduit from the telecommunications room to the payphones is to be designed by the Consultant.

At the 25% design stage the Consultant shall request Metrolinx to provide the number and locations of pay phones. Metrolinx will contact Bell Canada to identify the number of pay phones Bell Canada is to provide. Metrolinx Station Operations will select the pay phone locations. The Consultant shall ensure that the appropriate sub-trades provide the telecommunications conduit, pay phone footing and power. The footing template will be provided by Metrolinx. Cable and connections are to be provided by Bell Canada.

7.2.3.2 PAY PHONE - PLATFORM

The function of the pay phone-station is to provide telephone service for the use of the passengers.

These telephones are on regular PSTN circuit and are located near the mini-platform in a well-lit location on each platform. Locations are to be provided by the site specific design Consultant and approved by Metrolinx. The telephone is supplied and installed by Bell Canada. The conduit from the telecommunications room to payphones is to adhere to DRM for communication conduit standards. The footing template will be provided by Metrolinx.

7.2.4 ELEVATOR PHONE & ELEVATOR LOBBY INTERCOM

The function of the elevator phone is to provide voice communication capability for elevator passengers. It is used for elevator emergencies and passenger safety. When activated; emergency calls are placed directly to the Metrolinx' Security Company.

Elevator Phones must meet all of the requirements of the TSSA and other codes and regulations relating to elevator telecommunications.

Elevator Lobby Phones when activated; phones are calls are placed directly to the Metrolinx System Safety Dispatch Office located at the Wolfedale Facility.

7.2.4.1 NETWORK CONNECTIVITY

All security systems require connectivity from the main alarm panel onto the Metrolinx IP Network. Exact location of this system is to be coordinated through the security system provider. At each main panel location two network outlets are required and are to be cabled back to the nearest telecommunications room network rack. These cables are not to be more than 90m in length.

7.3 FARE HANDLING EQUIPMENT

Fare handling equipment refers to POS, TVM, STC and STI equipment and does not include Presto.

7.3.1 POS DEVICES

Each POS or Moneris devices require a network outlet. These devices are to use the outlets provided in the service counter cabling. (See “Cabling to the service counter”).

7.3.2 TVM EQUIPMENT

7.3.2.1 POWER REQUIREMENTS

The TVM is powered by 120V 60 Hz. The incoming cable has 3 wires of 4 mm² (AWG 10) diameter.
The main specifications are:

- Hot, Neutral and Ground (Black, White and Green/Yellow),
- Useful length at the pipe outlet = **2000 mm** / 78.7402 inch, Circuit Breaker (out of the machine) 30A bipolar*.
- Maximum power consumption: 24A with 120V,
- Earth cable will be connected to the TVM cabinet using a bolt and nut, Standard ESA
- Earth resistance: 10 Ohms maximum; test each machine with respect to a reliable reference after wiring.

*: Bipolar is recommended by PARKEON, but unipolar is accepted in regards to the Canadian electrical network

7.3.2.2 NETWORK CONNECTIVITY

Each TVM requires a network outlet within the TVM. Conduits for power and telecommunications are to be included in the design and construction. Installation of the cabling is to be done prior to the arrival of the TVM, and should be coordinated with the TVM installer. Connectivity of this device is to be done by Metrolinx IT department.

7.10 BUILDING UPS TELECOMMUNICATIONS

All Metrolinx UPS systems must be connected to the Metrolinx network infrastructure for future monitoring.

7.10.1 NETWORK CONNECTIVITY

Each of these devices requires a minimum of two network outlets. These network outlets are to be cabled back to the nearest telecommunications room network rack and terminated as per the copper horizontal cabling standard.

7.11 SERVICE COUNTER AREA FAX / PRINTER DEVICES

Each service counter booth will have a network printer, fax and copier device. This device shall be located on the electrical drawings along with the location of the below network and power outlets.

7.11.1 MILLWORK REQUIREMENTS

A location for this device must be identified within the service counter area. This location is to be determined by Station Operations. The physical dimensions of this unit are (WxDxH): 22 x 762 x 26 in. (558 x 665 x 660 mm) and is to be accommodated within the millwork space. Additional clearance above the unit is necessary for operation of the top tray of the MFP. There shall be no obstructions within 24” or 610mm above this unit.

7.11.2 NETWORK CONNECTIVITY

Each of these devices requires a minimum of two network outlets. These network outlets are to be cabled back to the nearest telecommunications room network rack and terminated as per the copper horizontal cabling standard. These are to be used for both fax and data lines from the telecommunications room.

7.11.3 POWER REQUIREMENTS

Each of these device locations requires a single 20amp duplex receptacle. Emergency / Backup power is required but does not need to be a dedicated circuit.

7.12 STATION ATTENDANT PC

The Station PC is required for each station attendant. The current PC model is an HP DC8200 SFF PC. The PC is intended to provide ATLS Snagit View and PC Whiteboard Services to the station attendant. This computer requires a Keyboard and Mouse as well as a monitor on-top of the station attendant’s desk. The purchase and installation of this PC is the responsibility of the Metrolinx I&IT Department.

7.12.1 MILLWORK SIZE REQUIREMENTS

The PC's dimensions are as follows: 4.0 x 13.3 x 14.9 in (100 x 338 x 379 mm). This unit is oriented vertically under the service attendant's desk. The PC requires a minimum of 200mm at the rear of the machine and a minimum of 80mm in-front to allow for cabling and other devices to be connected front and back. An additional
75mm is required on either side of the unit as well for proper ventilation. This unit requires proper ventilation when placed under the desk. This is not to be installed in any location which does not allow proper air movement.

7.12.2 POWER REQUIREMENTS

Including Monitor, PC, KVM, and other devices a minimum of two 20a Duplex Receptacles on UPS Power are required. These receptacles may not be ganged into a single box and must allow for a minimum of 100mm between outlets. These outlets must be within close proximity to the PC location within the desk. Refer to DRM Service Counter Standards for details.

7.13 FUEL MANAGEMENT SYSTEMS (RAIL)

Fuelling Systems require an isolated facility room for their control and management systems. These are to be isolated from the telecommunications and electrical rooms. Within these rooms adequate space for a half height network and server rack is required. This is to be a floor standing rack with a minimum of 1m clearance on three sides. One side may be placed against the wall.

2 x minimum 53mm conduits are required from this location to the nearest telecommunications room for telecommunications and integration into the GO Transit network infrastructure. See Metrolinx DRM for conduit specifications and requirements.

1 x minimum 27mm conduit is required from this rack to the location of the Fuel Management System Network Switch for network data cables. This is to be coordinated with the Fuel Management System integrators. See Metrolinx DRM for conduit specifications and requirements.

7.13.1 POWER REQUIREMENTS (IT RACK)

Each rack Location requires 2 x 20amp NEMA L5-20P outlets on The Emergency UPS panel from the telecommunications room. These outlets are to be on separate breakers and follow all electrical standards outlined in the Metrolinx DRM.

One APC – Model AP 7752 is to be installed in the lowest rack unit of the rack. This is provided my Metrolinx IT.

7.13.2 RACK SPECIFICATIONS AND ELEVATION