Standard Specification for Accessible Pedestrian Signal Equipment

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TTS 810.200.01 SCOPE

This specification covers the functional and physical requirements for the supply, installation and testing of an Accessible Pedestrian Signal (APS) system comprised of pushbuttons and control unit.

TTS 810.200.02 REFERENCES

This specification refers to the following standards, specifications, or publications:

City of Toronto Transportation Services Standard Specifications

T5	Traffic Control Devices and Systems Inspection Manual (September 2019)
TS 801	Electrical Work – General
TS 804	Cabling
TS 805	Poles
TS 810	Traffic Actuation Equipment

City of Toronto Transportation Services Standard Drawings

TTD 810.002	Pushbutton Mounting Details
TTD 804.007	Schematic Wiring Diagram Typical 2 Wire APS Detail

Manual for Unicorn Control Devices (MUTCD)

4E Pedestrian Control Features

National Electrical Manufacturers Association (NEMA)

NEMA 250 Enclosures for Electrical Equipment (1000 Volts Maximum) – NEMA 4 Type
NEMA TS2 Traffic Controller Assemblies with NTCIP Requirements

Transportation Association of Canada (TAC)

Guidelines for Understanding, Use, and Implementation of Accessible Pedestrian Signals

Other

Accessibility for Ontarians with Disabilities Act (AODA)

TTS 810.200.03 DEFINITIONS

APS means Accessible Pedestrian Signals

MUTCD means Manual for Uniform Traffic Control Devices

NEMA means National Electrical Manufacturers Association

Equipment Testing means shall apply to all equipment. Equipment testing shall include test procedures, PIT, and POP, test results for all clauses identified in the Testing Requirements Table (TRT).

PIT means Pre-installation Testing and includes all testing undertaken prior to installation of equipment and may also include testing of mock-ups, prototype testing and normal factory production testing.

POP means Proof of Performance Testing and includes all testing undertaken following the installation of equipment to verify the physical and operational features of each item of equipment.

TOD means Time-of-Day

TTS 810.200.04 DESIGN AND SUBMISSION REQUIREMENTS

TTS 810.200.04.01 Submission Requirements

The Contractor shall supply the specification sheets for the APS equipment to the Contract Administrator for review prior to ordering. The APS System vendor shall have local representation providing both technical support and repair services.

TTS 810.200.05 MATERIALS

TTS 810.200.05.01 System Requirements

The APS System shall be compatible with the City traffic signal plant.

The APS system shall meet the latest Transportation Association of Canada (TAC) Accessible Pedestrian Signals Guideline.

The APS System shall consist of all electronic control equipment, mounting hardware, pushbuttons – at a minimum support 2 to 16 pushbuttons per intersection – controlled by a single control unit in the traffic signal controller cabinet. There shall be no limit on number of buttons per phase.

The APS System consisting of one (1) APS Control Unit shall support operations at intersections with more than four (4) legs and at intersections where two stage crossings are required.

The APS system shall be capable of operating in temperature ranges according to NEMA TS2 standard.

For normal operations, the APS system shall not have any external housings or external devices outside of the traffic signal controller cabinet and the pushbutton housing. All audible sounds shall emanate from the pushbutton housing unit.

TTS 810.200.05.02 APS Pushbuttons

The APS Pushbuttons shall serve as both normal pedestrian pushbuttons and APS pushbuttons.

The APS Pushbuttons must be of a rugged and durable design to withstand the environmental and physical operating conditions to which they are exposed.

The APS Pushbutton frame shall be made of cast aluminum painted yellow with mounting holes to hold a standard City Pedestrian Information Sign.

The APS Pushbuttons must be capable of being installed on all types of traffic and utility poles in use in the City and the housing shall be no wider than 150 mm and provide a low profile on a pole.

The APS pushbutton shall have a nominal 50 mm diameter button with an aluminum tactile raised directional arrow on the button. The arrow on the pushbutton shall be able to be easily changed to one of two directions – to left or to right, or multidirectional. The button shall be physically and substantially depressible when pushed/pressed.

The APS Pushbuttons shall serve as both normal pedestrian pushbuttons and APS pushbuttons.

The APS Pushbuttons shall have all features (audible, visual and tactile) of the APS operation housed within the APS pushbutton unit.

The APS Pushbuttons shall be capable of supporting external speaker connection.

The APS Pushbuttons shall be capable of supporting external pushbutton connection.

The APS Pushbuttons shall require only two wires 2- #14 AWG shielded stranded, PVC jacketed detector cable rated 600 V coming from the traffic controller cabinet for each phase / crosswalk. For more information, see TS drawing 804.007. in addition to communications to the APS Control Unit, APS Pushbutton power shall be supplied via these two wires.

The APS Pushbuttons shall have a latching LED indication within the pushbutton unit providing visual actuation acknowledgement.

The APS Pushbuttons shall provide information and cues via both a vibrating arrow button and audible sounds making the intersection accessible for all pedestrians.

The APS Pushbuttons shall emit an audible sound to confirm normal pedestrian phase and APS actuation.

The APS Pushbutton shall provide vibrotactile APS actuation acknowledgement in the button.

The APS Pushbutton mounting hardware shall be adjustable such that the unit will be parallel to the direction of travel.

The APS Pushbutton shall be capable of contactless actuation achieved via a proximity hand wave motion sensor integral to the unit.

TTS 810.200.05.03 APS Control Unit

The APS Control Unit shall be shelf or side rail mounted and have maximum dimensions of 100 mm wide x 200 mm high x 230 mm deep.

The APS Control Unit shall be installed inside the Traffic Controller Cabinet and be powered by the 120 VAC.

The APS Control Unit shall be compatible with the APS Pushbuttons provided under this specification.

The APS Control Unit shall provide visual indications showing presence of pedestrian actuation, phase status – Walk/Flashing Don't Walk – and fault detection at a minimum.

The APS Control Unit shall be capable of password protected remote connectivity via Ethernet port allowing for SNMP monitoring, status check, access to logs and configuration of both APS pushbuttons and APS Control Unit. The IP address and port shall be configurable. Any software required to connect remotely to the APS system shall be provided at no additional charge or licencing fee to the City.

The APS Control Unit shall interface to the APS Pushbuttons to provide power to the pushbuttons as well as communicate with the APS Pushbuttons.

The APS Control Unit shall interface to the controller cabinet/controller to receive Walk/Don't Walk signal information.

The APS Control Unit shall interface to the controller cabinet/controller to provide pedestrian actuation information to the controller.

The APS Control Unit and associated interfaces shall be designed to allow replacement of the Control Unit without disconnecting field terminals or using special tools. This may be accomplished via harness and terminal board.

The APS Control Unit shall have minimum four (4) optically isolated General Purpose / Pre-Emption inputs to allow for the playing of custom messages or enabling alternate settings/configurations while the input is active.

The APS Control Unit shall have actuation and error logging capabilities.

The APS Control Unit shall actively monitor the health of all APS pushbuttons.

TTS 810.200.05.04 APS System Operations

The APS System shall have the following operational features:

The APS System shall turn off all audible operations during intersection flash operations.

The APS System shall synchronize all sounds.

The APS System shall provide both Contact and Contactless actuation:

Contact

The APS pushbutton must be pressed and held for 3 seconds. This delay feature shall be user selectable and shall have a range of zero (0)—any push—to five (5) seconds.

Contactless

The APS pushbutton shall have a user selectable feature to enable hand wave actuation.

The APS System shall provide the option to enable 'recall / always on' walk sounds, meaning the walk sound plays every walk period, regardless of actuation.

Upon activation of the APS system, the APS Pushbutton arrow/button shall vibrate during the entire walk period, in addition to audible signalling.

At a minimum, sounds levels shall be adjustable in 5dB steps.

The APS System shall allow individual configuration of min and max volume settings for both locate tone and walk tone of each APS pushbutton.

The APS System shall adjust all sounds based on/to ambient noise levels for each individual APS Pushbutton independently.

The APS System shall allow individual configuration of a set volume above ambient noise levels for each APS Button.

The APS System shall provide a locator tone with minimum configurable settings as follows:

- Minimum four (4) locator sounds
- Tone gap, including standard MUTCD 1/sec between

The APS System shall, at minimum, provide choice of walk sounds as follows:

- "Cuckoo"
- "Chirp"
- "Canadian Melody"
- Custom messages, for example street name messaging and so on.

The APS System shall, provide choice of three (3) pedestrian clearance sounds, with features including:

- Locator tone sound with configurable tone gaps
- Countdown messaging

The APS System shall have the following features:

- Ability to program audible settings including audible/volume settings by Time-of-Day.
- Ability to provide direction messaging in conjunction with street name messaging.
- Ability to provide a wait message following actuation (prior to walk indication)
- Ability to set time for walk sound/vibration (less than total walk indication)
- Ability to support Barnes dance (pedestrian scramble) operations
- Ability to support pre-emption messaging (both railway and emergency vehicle)
- Ability to mute sounds on all crosswalks except activated crosswalk
- Ability to cancel or complete audible sounds upon completion of current state of APS operations.
- Ability to mute APS walk sounds of opposite pedestrian phase in 'walk' during advance left turn operations for all intersection button configurations. See Figure 1 below.

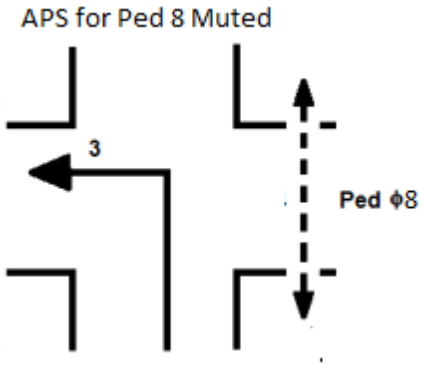

Figure 1 – APS for Ped 8 Muted

The APS System, under rest-in-walk/pedestrian recycle operation, shall provide APS walk sound upon new walk, that is to say after Flashing Don't Walk operation.

TTS 810.200.05.05 APS System Programming

APS System Programming shall also be capable of being achieved from the Control Unit via the Ethernet Port

APS System Programming shall also be achieved via a hand held device. These devices may include smart phones/tablets with appropriate application provided at no extra cost to the City.

APS System Programming, via wireless or laptop:

- Shall provide password protection.
- Shall be capable of setting all volumes and features of the APS system.
- Shall be capable of setting/updating the single pushbutton or all pushbuttons at the intersection from a single pushbutton location (Global updating).

Any associated software shall have no additional charges or licensing fees.

TTS 810.200.05.06 Hardware

All necessary hardware, and software to be implemented the APS system shall be provided. The mounting hardware shall be provided and adjustable to ensure that the pushbutton units are installed parallel to the direction of travel.

All screws, bolts, washers, nuts and other fittings shall be stainless steel.

TTS 810.200.05.07 Training

On request of the City, training on how to configure, install and maintain and troubleshoot the APS system shall be provided to City staff and applicable designates, for example the City Electrical Maintenance Contractor at no extra cost to the City.

Training material shall be provided to the City for review two (2) weeks prior to commencement of the training session.

TTS 810.200.06 EQUIPMENT – NOT USED

TTS 810.200.07 CONSTRUCTION

The APS System vendor shall have local representation providing both technical support and repair services.

TTS 810.200.07.01 Installation

The intersection APS system shall be programmed according to City requirements.

The APS pushbuttons shall be installed to a height of 1.05 m from the ground to the centre of the button, according to AODA requirements.

The APS Pushbuttons shall be mounted such that the button's direction arrow will be parallel to the associated crosswalk.

The APS Pushbuttons shall be mounted according to the manufacturer's recommendations and TS 810.

The APS Control Unit shall be installed inside the Traffic Controller Cabinet and be powered by 120 VAC available via cabinet receptacle.

All wiring in the controller cabinet shall be neatly trained.

Installation shall include mounting of pedestrian information signage to APS buttons.

TTS 810.200.08 QUALITY ASSURANCE

Contractor to provide one year of support services after date of installation in case of failed or inconsistent operations and detection observed by the City. This includes reconfiguration, testing and recalibration at no extra cost to the City. Failure to rectify issue may lead to the City denying use of non-conforming material.

TTS 810.200.09 MEASUREMENT FOR PAYMENT

TTS 810.200.09.01 Accessible Pedestrian Signal Control Unit

For measurement purposes, a count shall be made of the number of accessible pedestrian signal control units installed.

TTS 810.200.09.02 Accessible Pedestrian Push Button

For measurement purposes, a count shall be made of the number of accessible pedestrian push button units installed.

TTS 810.200.10 BASIS OF PAYMENT

TTS 810.200.10.01 Accessible Pedestrian Signal Control Unit – Item
Accessible Pedestrian Push Button – Item

Payment at the Contract Price for the above tender item shall be full compensation for all labour, Equipment, and Material to do the work.