

## Standard Specification for Bicycle Signal LED Modules Material

### TTS 808.240.01 SCOPE

This specification covers the requirements for supply and installation of Light Emitting Diode (LED) bicycle signal lamp modules, including all red, amber and green indications.

### TTS 808.240.02 REFERENCES

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

#### City of Toronto Transportation Services Standard Specifications

TS 804	Cables
TS 808	Traffic Signal Equipment
TS 813	Grounding
TS 815	Removals

#### Ontario Traffic Manual (OTM)

Book 12	Traffic Signals
Book 12A	Bicycle Traffic Signals
Book 18	Cycling Facilities

#### Federal Highway Administration of the United States

MUTCD	Manual on Uniform Traffic Control Devices
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#### National Electrical Manufacturers Association (NEMA)

TS1	Traffic Control Systems
TS2	Requirements for Traffic Control Applications

#### Other

ITE Vehicle Traffic Control Sign Heads (VTCSH) – Light Emitting Diode (LED) Circular Signal Supplement (June 2005),  
Vehicle Arrow Traffic Signal Supplement (April 2006)  
International Municipal Signal Association (IMSA)

### TTS 808.240.03 DEFINITIONS

The definitions included in ITE VTCSH standard shall apply to this specification.

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## **TTS 808.240.04      DESIGN AND SUBMISSION REQUIREMENTS**

All modules are to be pre-approved by the City. The Contractor shall supply specification and cut sheets for the modules to the Contract Administrator for review prior to ordering.

**Table 1: LED bicycle size and colour**

<b>ITE spec compliant</b>	<b>Size and colour</b>	<b>Lens</b>
Yes	200mm Red LED Bicycle Module	Clear
Yes	200mm Amber LED Bicycle Module	Clear
Yes	200mm Green LED Bicycle Module	Clear
Yes	300mm Green LED Bicycle Module	Clear
Yes	300mm Green LED Bicycle Module	Clear
Yes	300mm Green LED Bicycle Module	Clear

## **TTS 808.240.05      MATERIALS**

### **TTS 808.240.05.01    LED Bicycle Signal Modules**

All LED bicycle signal modules shall be according to ITE Vehicle Traffic Control Sign Heads – Light Emitting Diode (LED) Circular Signal Supplement, Light Emitting Diode (LED) Vehicle Arrow Traffic Signal Supplement and this specification.

All LED bicycle signal modules shall be according to OTM Book 12, 12A and Book 18.

The LED module shall be a self-contained device, not requiring on-site assembly for installation into existing bicycle signal heads. The power supply shall be integral to the unit.

The assembly and manufacturing process for a module shall be designed to assure all internal LED and electronic components are adequately supported to withstand mechanical shock and vibration due to high winds and other sources.

LED bicycle signal modules supplied shall be capable of retrofitting and replacing the existing modules without modification(s) to the head and shall not require special tools. Installation of the retrofit LED bicycle signal module shall only require the removal of the existing lens, lamp, reflector assembly and gasket. LED modules shall fit securely in the housing and shall be sealed using a one-piece neoprene, soft rubber or silicone gasket. The LED module shall connect directly to the existing electrical wiring, in accordance with section 'Electrical' herein. Modules shall be compatible with existing City bicycle signal heads.

All LED modules must be operationally compatible with traffic controller assemblies, conflict monitors, flashers, and load switches meeting the NEMA Standards publications TS1 and TS2. No further circuit modifications shall be required for system operation.

Selected materials shall be rated for a minimum service period of 72 months.

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### **TTS 808.240.05.02 Module Appearance**

All modules shall have a uniform non-pixelated illumination with "incandescent look"

All modules shall have bicycle 'symbol' as shown in Figure 1 and shall be according with the requirements of the MUTCD and OTM Books 12 and 18.



**Figure 1 – Bicycle Signal**

### **TTS 808.240.05.03 Environmental**

All modules shall be a UV stabilized scratch resistant shell.

All modules shall be rated for use throughout an ambient operating temperature range of -40°C to +74°C.

### **TTS 808.240.05.04 Electrical**

Wiring shall be a minimum of #18 AWG stranded copper type thermoplastic equipment wire (TEW). All wiring shall be according to the Ontario Electrical Safety Code and applicable bulletins. Wiring leads shall be a minimum 1 m in length. The end of all wiring leads shall have 15 mm of insulation removed and be tinned for use with twist-on type connectors for field wiring connection in the head.

### **TTS 808.240.06 EQUIPMENT – NOT USED**

### **TTS 808.240.07 CONSTRUCTION**

The Contractor shall install the modules according to TS 808.

The Contractor shall install wiring and cabling according to TS 804.

The Contractor shall install grounding according to TS 813.

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The Contractor shall remove existing LED modules according to TS 815.

**TTS 808.240.08      QUALITY ASSURANCE – NOT USED**

**TTS 808.240.09      MEASUREMENT FOR PAYMENT**

**TTS 808.240.09.01    Light Emitting Diode (LED) bicycle signal lamp modules**

For measurement purposes, a count shall be made of number of Light Emitting Diode (LED) bicycle signal lamp modules units installed.

**TTS 808.240.10      BASIS OF PAYMENT**

**TTS 808.240.10.01    Light Emitting Diode (LED) bicycle signal lamp modules – Item**

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