ORIGINATION FORM
Proposed Revisions to the Specifications
(Please provide all information - incomplete forms will be returned)

Date: 7/11/23

Office: Traffic Engineering and Operations

Originator: Derek Vollmer

Specification Section: 660

Telephone: 850-921-7361

Article/Subarticle: 660-2.1,660-2.2.2,660-3,660-4.3

Email: Derek.Vollmer@dot.state.fl.us

Associated Section(s) Revisions:

Will the proposed revision require changes to the following Publications:

Publication	Yes	No	Office Staff Contacted	Date
Standard Plans Index	○	●	Rick Jenkins/Joshua Turley	7/11/23
Traffic Engineering Manual	○	●	Mariano Amicarelli	7/11/23
FDOT Design Manual	○	●	DeWayne Carver	7/11/23
Construction Project Administration Manual	○	●	Patrick Overton	7/11/23
Basis of Estimate/Pay Items	●	○	Ryan Gray	7/11/23
Structures Design Guidelines	○	●	Ben Goldsberry	7/11/23
Approved Product List	●	○	Karen Byram	7/11/23
Materials Manual	○	●	Susan Musselman/Brad Pearson	7/11/23
Maintenance Specs	○	●	Deanna Hutchison	7/11/23

Will this revision necessitate any of the following:

Design Bulletin ☐ **Construction (DCE Memo)** ☐ **Estimates Bulletin** ☐ **Materials Bulletin** ☐

Have all references to internal and external publications in this Section been verified for accuracy? YES

Synopsis: Summarize the changes:

Added requirements for detection systems that use LiDAR technology. Adjusted duration of detection system warranty requirements.

Justification: Why does the existing language need to be changed?

Several pilot projects have demonstrated the feasibility of using LiDAR technology for object detection and classification for the purposes of vehicle detection and data collection as well as detection of other road users for various purposes (signal actuation, near-miss analytics, etc.). Equipment manufacturers have also asked that the TERL consider evaluation of these devices for listing on the APL.

Do the changes affect either of the following types of specifications (Hover over type to go to site.):

Special Provisions ☐ **Developmental Specifications** ☐

List Specifications Affected: (ex. SP3270301, Dev330TL, Dev334TL etc.)

Contact the State Specifications Office for assistance completing this form.

Daniel Strickland 850-414-4130 Daniel.Strickland@dot.state.fl.us, Darla Hunsicker 850-414-4114 Darla.Hunsicker@dot.state.fl.us,
Jennifer Burnsed 850-414-4101 Jennifer.Burnsed@dot.state.fl.us, MaryElizabeth Parker 850-414-4155 MaryElizabeth.Parker@dot.state.fl.us

1. Are changes in line with promoting and making meaningful progress on improving safety, enhancing mobility, inspiring innovation, and fostering talent; explain how?

Changes expand allowable detection technologies to include innovative technologies with the potential to improve safety and enhance mobility.

2. What financial impact does the change have; project cost, pay item structure, or consultant fees?

Pay item structure must be updated to accommodate revisions.

3. What impacts does the change have on production or construction schedules?

No impact.

4. How does this change improve efficiency or quality?

Updates will reduce the need for project specific MSPs and support evaluation of emerging LiDAR devices for possible APL listing.

5. Which FDOT offices does the change impact?

Traffic Engineering and Operations, Program Management, and Construction.

6. What is the impact to districts with this change?

The change will allow FDOT-TERL to evaluate LiDAR systems and eventually allow District deployment of APL products without need for project-specific MSPs.

7. Does the change shift risk and to who?

The changes mitigate rist of LiDAR technology deployment by requiring APL evaluation and approval prior to widespread use.

8. Provide summary and resolution of any outstanding comments from the districts or industry.

Comments and Responses are available on the Track the Status of Revisions hyperlink located on the Specifications landing page: https://www.fdot.gov/programmanagement/Specs.shtm

9. What is the communication plan?

Through the established specification revision process (e.g., Internal and Industry Review).

10. What is the schedule for implementation?

The Standard Specifications e-Book and Workbook are effective July 1st every year.

VEHICLE DETECTION SYSTEM.
(REV 7-11-23)

SUBARTICLE 660-2.1 is deleted and the following substituted:

660-2 Materials.

660-2.1 General: Meet the following requirements:

Traffic Data Detection System- Microwave* .....Section 995
Vehicle Detector- Microwave* .....Section 995
Traffic Data Detection System- Video* .....Section 995
Vehicle Detector- Video* .....Section 995
Traffic Data Detection System- LiDAR* .....Section 995
Vehicle Detector- LiDAR* .....Section 995
Vehicle Loop Detector* .....Section 995
Wireless Magnetometer Assembly* .....Section 995
Automatic Vehicle Identification* .....Section 995
Wrong Way Vehicle Detection Systems* .....Section 995
Loop Sealant* .....Section 995
Highlighted Signs* .....Section 995
*Use products listed on the Department's APL.

ARTICLE 660-2 is expanded by the following new Subarticle:

660-2.2.2.6 Light Detection and Ranging: A light detection and ranging (LiDAR) detection system uses one or more LiDAR sensors and perception hardware and software to detect vehicle presence, provide a detection output, or generate volume, occupancy, and speed data.

ARTICLE 660-3 is expanded by the following new Subarticle:

660-3.8 LiDAR Detection System Installation: Install in accordance with the Contract Documents, manufacturer's recommendations, and as directed by the Engineer.

SUBARTICLE 660-4.1.2 is deleted and the following substituted:

660-4.1.2 Field Acceptance Testing: Verify presence detection accuracy at installed field sites using a reduced method in accordance with 995-2. ~~8.1~~9. Compare sample data collected from the detection system with ground truth data collected by human observation. For site acceptance tests, collect samples and ground truth data for each site for a minimum of five minutes during a peak period and five minutes during an off-peak period. For presence detection at intersections, ensure there are a minimum of three detections for each signal phase. Perform site acceptance tests in the presence of the Engineer.

SUBARTICLE 660-4.3.2 is deleted and the following substituted:

660-4.3.2 Calculation of Speed and Travel Time Accuracy: Verify detector accuracy at installed field sites using a reduced method in accordance with 995-2. ~~10~~11. Calculate speed and travel time accuracy by comparing the speeds and travel times reported by the system against ground truth collected through human observation or another method approved by the Engineer.

ARTICLE 660-5 is deleted and the following substituted:

660-5 Warranty.

Ensure that the detection system has a manufacturer's warranty covering defects for a minimum of ~~2~~1 year~~s~~ from the date of final acceptance by the Engineer in accordance with 5-11 and Section 608.

Ensure the warranty includes providing replacements, within 10 calendar days of notification, for defective parts and equipment during the warranty period at no cost to the Department or the maintaining agency.

ARTICLE 660-6 is deleted and the following substituted:

660-6 Method of Measurement.

The quantity to be paid will be the plan quantity for each inductive loop detector and per assembly for loop assembly completed and accepted.

The quantity to be paid will be the plan quantity for each MVDS, VVDS, WMDS, AVI, ~~or~~ WWVDS, or LiDAR VDS completed and accepted.

The highlighted signs for a WWVDS will be paid for in accordance with Section 700. Only one WWVDS will be paid per exit ramp, regardless of the number of signs.

ARTICLE 660-7 is expanded by the following:

660-7 Basis of Payment.

Price and payment will be full compensation for all work specified in this Section including furnishing, placement, and testing of all materials and equipment, and for all tools, labor, equipment, hardware, operational software packages and firmware, supplies, support, personnel training, shop drawings, warranty documentation, and incidentals necessary for a complete and accepted installation.

Payment will be made under:

Item No. 660-1	Inductive Loop Detector - each.
Item No. 660-2	Loop Assembly – per assembly.
Item No. 660-3	Vehicle Detection System - Microwave - each.
Item No. 660-4	Vehicle Detection System - Video - each.
Item No. 660-5	Vehicle Detection System - Wireless Magnetometer - each.
Item No. 660-6	Vehicle Detection System - AVI - each.

Item No. 660-7	Vehicle Detection System - WWVDS - each.
Item No. 660-8	Traffic Data Detection System - Microwave - each.
Item No. 660-9	Traffic Data Detection System - Video - each.
Item No. 660-10	Vehicle Detection System – LiDAR – each.
Item No. 660-11	Traffic Data Detection System – LiDAR – each.