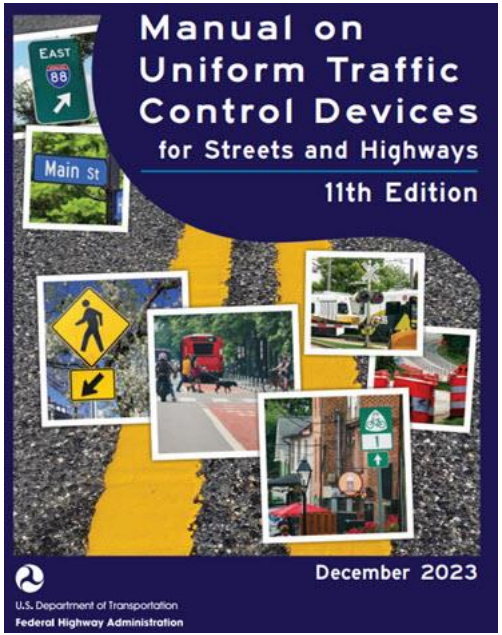
MUTCD & Machine Vision Update

Robert N. Dingess

President, TMMA



Presentation Outline

- Orange Markings – Work Zones
- Highway Standards – NCUTCD
- “New CIE Reference Observer – Non-Biological.”

Presentation Outline

- **Orange Markings – Work Zones**
- **Highway Standards – NCUTCD**
- **Toward a New CIE Reference Observer Non-Biological (CIE)**

Orange Markings – Work Zones

Washington State: “90% Drivers want orange markings used more in work zones.”

California: “84% of drivers said they would like more orange markings in work zones and 60% that orange lane lines made it easier to stay in lanes.

“… a speed reducing effect of 4 mph was found in work zones and a 74% reduction in lane departure crashes (Williamson, Lin).”

Orange Markings – Work Zones

Crash Modification Factors
SPR-4642 Study
Indiana DOT

Site	Condition	AADT	Length	CMF	CMF Average
Sellersburg	Orange	64464	0.75	0.21	0.26
	White/Yellow				
Lebanon	Before	56267	0.5	0.30	
	After				

80% of motorists surveyed felt the orange contrast markings made them more aware of the work zone?

Orange Markings – Work Zones

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"… a speed reducing effect of 4 mph was found in work zones and a 74% reduction in lane departure crashes (Williamson, Lin)."

Orange Markings - Contrast

- No “negative” impacts from orange markings.
- Contrast orange/White strong public support (85% favorable)
- Relatively little speed reduction discernible (4 mph – Indiana)
- Crash reduction impact varies from none to significant (74% Indiana).

NCUTCD Joint Task Force

Recommend 11th Edition MUTCD Amendment:

- *Orange "option" as a supplemental work zone marking*
- *Orange markings applied as a contrast (lead/lag) and longitudinal*
- *Orange color box to reference 23 CFR 655 (Pantone 152)*
- *Minimum Retroreflectivity (3A.05)*

National Committee on
Uniform Traffic Control Devices

National Committee on Uniform Traffic Control Devices NCUTCD

CAV Joint Task Force

PART 5

TRAFFIC CONTROL DEVICE CONSIDERATIONS FOR AUTOMATED VEHICLES

CHAPTER 5A. GENERAL

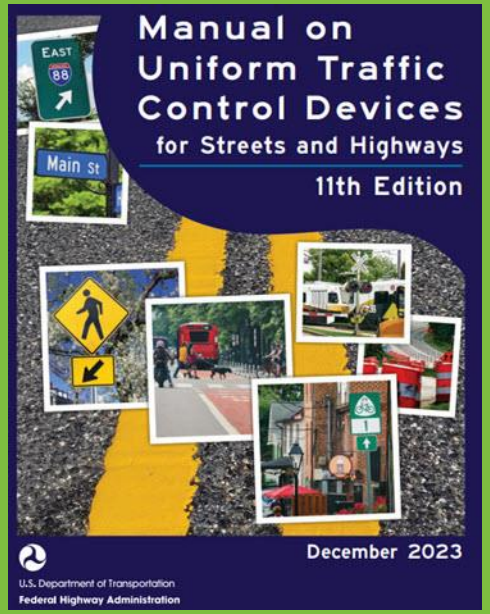
Section 5A.01 Scope and Purpose

Support:

01 The scope of the provisions in this Part are intended for consideration of traffic control devices that are specifically being designed to accommodate automated vehicles capable of performing partial or full real-time operational functions in general traffic on a sustained basis. This Part does not require agencies to use these provisions in their accommodation of automated vehicles on their roadways. Rather, the purpose of these provisions is to provide agencies with general considerations and guidance for traffic control devices that can be more helpful in the accommodation of such vehicles, while at the same time being more beneficial to road users.

02 It is important for early implementers of automated vehicles to understand the ramifications of traffic control devices in a mixed fleet environment and to consider the needs of both human and machine-led road users. Partial automation technologies are already commercially available in the vehicle fleet and are operating under current infrastructure conditions. The overall effectiveness of the automation is impacted by the uniformity and consistent application of the highway infrastructure, including traffic control devices.

03 This Chapter provides an overview of foundational driving automation system (see definition in Section 5A.03) technology terminology, key principles, considerations for traffic control device selection, and topics for agencies to consider. The MUTCD does not address standardization of digital infrastructure, geometric road design, traffic



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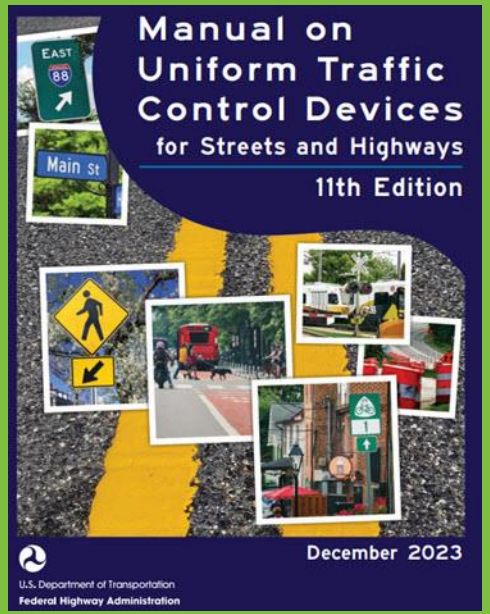
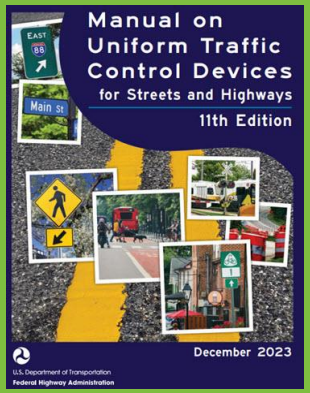
Driving Automation System Technologies:

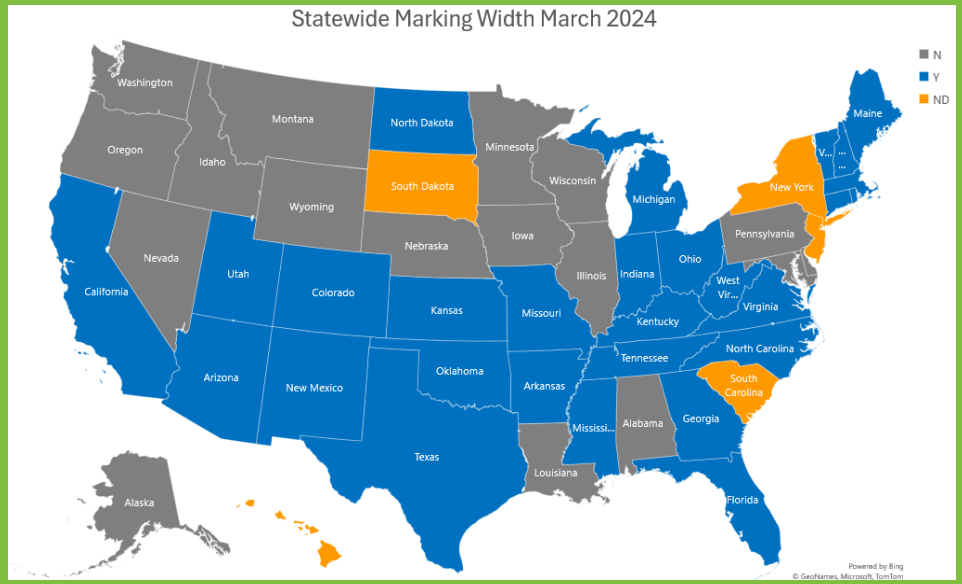
"The hardware and software that are collectively capable of performing part or all of the DDT (dynamic driving task) on a sustained basis; this term is used generically to describe any system capable of Level 1 to 5 driving automation."



Highway Standards – 6” Wide



- 6” wide highway pavement markings
- At least 10” wide (Wider Line)
- Speed ≥55 mph
- ADT ≥6,000



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TOWARD A NEW CIE REFERENCE OBSERVER NON-BIOLOGICAL (CIE – International Commission on Illumination)

"RF Number RF-06 - The scope of this Research Forum is to aggregate all interested parties and provide a road map for the definition of a new reference non-biological observer, especially for road applications."

Paola Iacomussi,
Lighting & Material Characterization SME, INRIM

...photometry and colour spaces based on the human visual system have become more of a burden than a real support for a safer, smarter, and automated road system. Is it time for a non-biological reference observer?

Establishment:
Wednesday, February 21, 2024
Convener Name: Paola Iacomussi
p.iacomussi@inrim.it

QUESTIONS?