

COLORADO DEPARTMENT OF TRANSPORTATION
TRANSPORTATION SAFETY AND TRAFFIC ENGINEERING BRANCH

RECOMMENDED PAVEMENT MARKING PRACTICES
Revised September, 1998

I. INTRODUCTION

Numerous studies and project evaluations have repeatedly demonstrated the cost-effectiveness of pavement markings as a means of enhancing both traffic safety and mobility. Pavement markings separate travel lanes and help delineate travel paths and the edge of the roadway. They may stand alone to indicate certain traffic rules and regulations or may be used to supplement regulations or warnings given by other traffic control devices. For a myriad of reasons the value of viable, visible pavement markings cannot be overstated.

In recognition of the value of pavement markings, the Colorado Department of Transportation (CDOT) provides center line, edge line, auxiliary lane, crosswalk and other pavement markings on all roads under its jurisdiction. All such markings are designed and installed in accordance with the guidelines and standards contained in the federal Manual on Uniform Traffic Control Devices (MUTCD), the Colorado Supplement to the MUTCD, CDOT Standard Specifications for Road and Bridge Construction and CDOT Standard S-627-1.

II. SELECTION OF PAVEMENT MARKING MATERIALS

Colorado's unique combination of traffic, weather and necessary snow and ice control measures can be quite detrimental to the longevity of pavement markings. "Durable" pavement marking materials are those materials capable of providing a longer service life than conventional traffic paint. Use of durable materials not only provides longer-lived markings, it can reduce the frequency of exposure of workers and the traveling public to the hazards of the pavement marking operation itself.

IT IS CDOT'S POLICY TO EMPLOY DURABLE PAVEMENT MARKINGS ON ALL MAINLINE INTERSTATE PROJECTS AND ON OTHER SELECTED ROADWAYS BASED UPON TRAFFIC VOLUMES AND/OR THE NEED FOR DURABLE MARKINGS.

During the project design phase, the pavement and existing markings should be inspected and the ADT reviewed to select the appropriate pavement marking material; Tables I and II (attached) provide general guidelines for the selection. Other considerations in the selection process may include the desire to employ lead-free materials and/or those not containing volatile organic compounds (VOC's). **In addition, unique climatic conditions may require the use of a more durable type marking.** The pavement marking marketplace is very dynamic with new materials constantly becoming available. CDOT supports and encourages the testing, evaluation and use of these new materials.

III MAINTENANCE OF PAVEMENT MARKINGS

Existing markings should be replaced with the same or higher-type of durable material, pavement condition permitting. Maintenance is encouraged to upgrade the type of material used as may be appropriate and economically feasible.

IV. TEMPORARY PAVEMENT MARKINGS

"Temporary Pavement Markings" are those markings used during construction projects or ongoing maintenance operations. To discuss this subject some definitions must first be established:

- "Full -Compliance" markings are those meeting all the requirements of part III of the MUTCD.
- "Interim" markings are those that may be used until the earliest date when it is practical and possible to install full-compliance markings.
- "Control Point" is an (approximately) four-inch by onefoot mark on 40-foot centers placed for the purpose of guiding the installation of interim or full-compliance pavement markings. A raised pavement marker may be substituted for this mark. Control points cannot be used as a substitute for any required marking.

The following describes the pavement marking procedures to be used under three different construction scenarios:

A. Projects Closed to Traffic During Construction

- Full-compliance markings must be in place prior to opening the roadway to traffic.
- Pavement markings on detour routes must be fullcompliance.

B. Projects Constructed Under Traffic

- Full-compliance markings may be installed at the end of each work day; or
- Interim markings for center/lane lines, consisting of four-inch by four-foot segments and 36-foot gaps, must be installed at the end of each work day (interim edge lines are not required unless specified in the plans). No-passing zone restrictions must be identified by either full compliance no-passing zone markings or R4-1 and R4-2 signs, as specified in the plans. Interim pavement stencils (SCHOOL, RR xing, etc) are not required unless specified in .the plans.

C. Special Procedures for Seal Coats

For purposes of seal coat projects, it is recognized that it is not always reasonable or even possible to provide full-compliance or interim pavement markings due to financial, logistical and physical constraints. To address the issue of proper notice to motorists and to provide travel path delineation during the work the following traffic control procedures should be followed:

- Raised flexible pavement markers, suitable for use on seal coats, should be installed along the center line on 40-foot centers (closer spacing may be used on curves, as deemed appropriate). Flexible raised pavement markers installed on 40-foot centers may also be used to mark lane lines through multi-lane roadway sections. Auxiliary lanes and shoulder lines may be marked with flexible markers on 80-foot centers or as appropriate). The purpose of the flexible markers is primarily as control points to guide marking crew personnel during final striping operations; prior to final striping, they also provide some minimal travel path delineation to motorists. (NOTE: THIS PARAGRAPH DOES NOT APPLY IN THE CASE OF SQUEEGEE SEALS).

- In addition to the usual ROAD WORK (distance), speed limit, and LOOSE GRAVEL/FRESH OIL, etc. signing, signs reading NO CENTER STRIPE (W8-12) should be installed at approximately 2-mile (maximum) intervals through the work zone. Optionally, the W8-12 sign may be installed in the approach to the work zone with a supplemental plaque reading NEXT XX MILES; if this signing method is used, additional W8-12/supplemental plaque assemblies should be installed downstream of major intersections within the work zone limits.
- No-passing zones should be marked with R4-1 (DO NOT PASS) and R4-2 (PASS WITH CARE) signs. Optionally, longer roadway sections may be signed no passing by placing R4-1 signs at approximately 2-mile (maximum) intervals through the work zone and downstream of major intersections within the work zone limits.
- Full-compliance pavement markings should be installed within 14 days of completion of the seal coat project.

TABLE I - PAVEMENT MARKING MATERIAL SELECTION GUIDELINES LONG LINES

CONDITION	ADT > 25000			ADT 6000 - 25000			ADT < 6000		
	CENTER/SKIP/ CHANNELIZER	EDGE/ GORE	CENTER/SKIP/ CHANNELIZER	EDGE/ GORE	CENTER/SKIP/ CHANNELIZER	EDGE/ GORE	CENTER/SKIP/ CHANNELIZER	EDGE/ GORE	
A S P H A L T	New	Tape Thermo Epoxy	Thermo Epoxy	Tape Thermo Epoxy	Thermo Epoxy	Epoxy Paint	Epoxy Paint	Epoxy Paint	
	Good/ Fair	Thermo MMA Epoxy Paint	MMA Epoxy Paint	Thermo MMA Epoxy Paint	MMA Epoxy Paint	Epoxy Paint	Epoxy Paint	Epoxy Paint	
	Poor	Paint	Paint	Paint	Paint	Paint	Paint	Paint	
C O N C R E T E	New	Tape Epoxy	Epoxy	Tape Epoxy	Epoxy	Epoxy	Epoxy Paint	Epoxy Paint	
	Good/ Fair	MMA Epoxy Paint	MMA Epoxy Paint	MMA Epoxy Paint	MMA Epoxy Paint	Epoxy Paint	Epoxy Paint	Epoxy Paint	
	Poor	Paint	Paint	Paint	Paint	Paint	Paint	Paint	

TABLE II - PAVEMENT MARKING MATERIAL SELECTION GUIDELINES TRANSVERSE MARKINGS AND SYMBOLS

MARKING TYPE		WORDS/SYMBOLS	
CONDITION	CROSSWALKS/STOP BARS	WORDS/SYMBOLS	
A	New Intersection Grade Tape, Preformed Thermoplastic, Thermoplastic	Intersection Grade Tape, Preformed Plastic Tape, Preformed Thermoplastic, Thermoplastic	
S			
P H A L	Good/ Fair Preformed Thermoplastic, Thermoplastic, Methyl Methacrylate (MMA), Paint	Preformed Thermoplastic, Thermoplastic, Methyl Methacrylate (MMA), Paint	
T	Poor Thermoplastic, Paint	Thermoplastic, Paint	
C O N	New Intersection Grade Tape, Preformed Thermoplastic	Intersection Grade Tape, Preformed Plastic Tape, Preformed Thermoplastic	
C R E T	Good/ Fair Preformed Thermoplastic, Methyl Methacrylate (MMA), Paint	Preformed Thermoplastic, Methyl Methacrylate (MMA), Paint	
E	Poor Paint	Paint	

* Includes Railroad Crossing Symbols