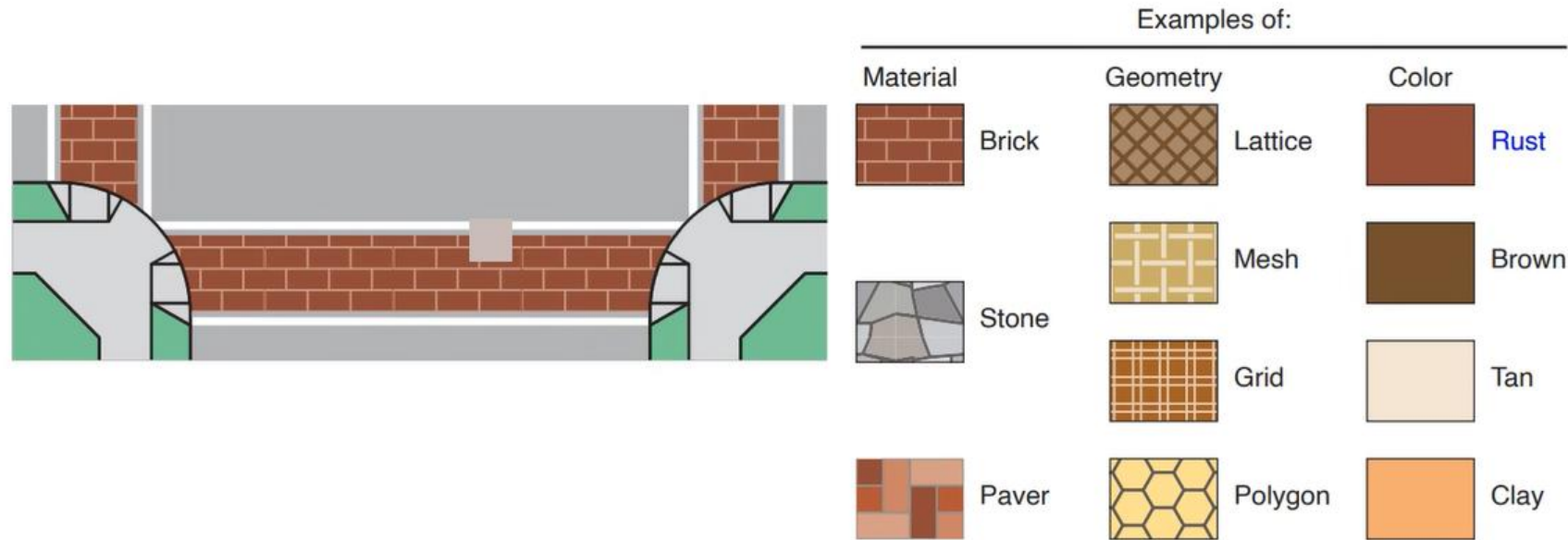


Figure 3H-1 (M). Aesthetic Treatments for Transverse Crosswalks



# Aesthetic Surface Treatments on MnDOT Roadways

Ethan Peterson, PE, Josh Palmateer, PE, RSP2, ENV SP

Office of Traffic Engineering

# Purpose and Outline

- What AST means for MnDOT
- Why guidance is needed now
- Where AST may and may not fit
- Materials, skid resistance, colors, and restrictions
- Application process and next steps



# What is an Aesthetic Surface Treatment

- Decorative pavement treatment used for placemaking and community identity
- Common in plazas, curb extensions, medians, sidewalks, and similar pedestrian-focused spaces
- Must not interfere with visibility, accessibility, or official traffic control devices



# Types of ASTs

## Permanent AST



## Temporary AST



## Infrastructure Aesthetic Treatments



# Types of ASTs

**Permanent AST**



**Temporary AST**



**Infrastructure Aesthetic Treatments**



# Artist Involvement and MnDOT ROW Process

## Early screening question

Is the work being credited to a specific artist?

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- If yes, → Art on the Highway Right-of-Way process
- Intellectual property
- Will not last

# Why Now

- Growing interest in AST nationwide
- More requests on trunk highways
- Minnesota MUTCD now addresses AST
- FHWA research is still evolving
- MnDOT needs a consistent statewide approach



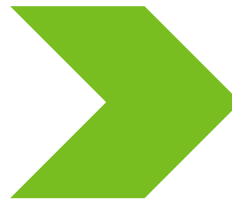
# MN MUTCD: What Changed?

## 10th Edition

Focused primarily on colored pavement as a traffic control device

Limited permitted colors and uses

No clear framework for decorative AST



## 11th Edition

Adds Section 3H.03 for AST

Separates AST from official traffic control markings

Sets clearer guardrails

# MnDOT Technical Memorandum

## What the memo does

Supports community initiatives while protecting safety, uniformity, and operations

### Guardrails

Sets guardrails for permanent AST on trunk highway right of way

### Location

Helps identify where AST may fit — and where it should not

### Materials

Guides material choice, durability, skid resistance, and constructability

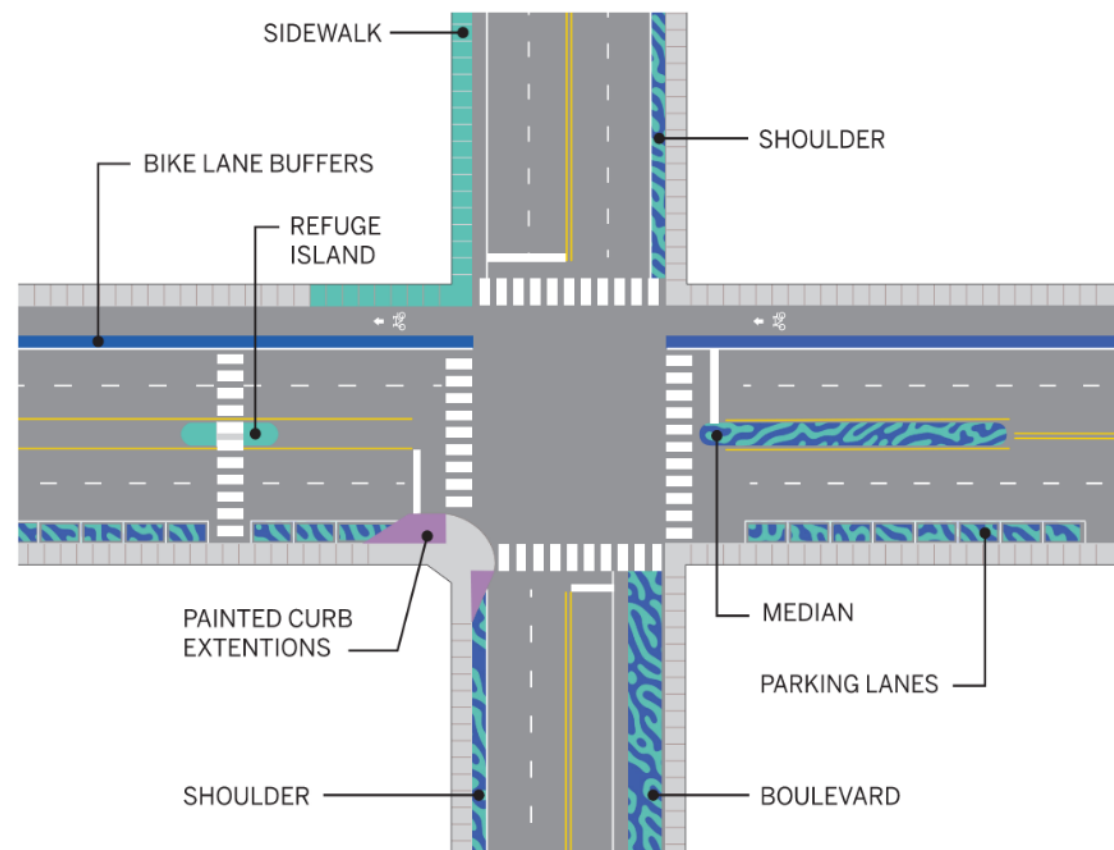
### Responsibilities

Clarifies review, maintenance, repair, and removal responsibility

# Permitted Locations

- Posted speed limit is 40 mph or less
- Simple intersections or midblock areas with no more than 4 through lanes
- Medians, refuge islands, parking lanes, and curb extensions
- Boulevards, buffers next to bike lanes, sidewalks, and shoulders outside primary wheel paths
- Early coordination with MnDOT is required

**Key message: AST is a placemaking tool — not a stand-alone safety device.**



# Restricted Locations

- Vehicle/Bike Traveled
- Pedestrian/bike crossings
- Speeds above 40 mph
- Freeways, ramps, and complex intersections
- Intersections with dual turn lanes
- Locations with visibility, safety, or maintenance concerns



# Materials and Durability

## THERE IS NO FREE LUNCH

Longer life usually means higher cost, more installation control, and harder removal.

### Water-based paint

6–24 mo.

- Lowest upfront cost
- Volunteer-friendly
- Frequent refresh needed
- Easier removal

*Best when short life is acceptable*

### Epoxy / MMA

2–6 yrs

- Higher durability
- Higher cost / trained crew
- Aggregate can be embedded
- More difficult removal

*Best when longer life justifies complexity*

### Preformed thermoplastic

3–5 yrs

- Fast, consistent install
- High durability
- Better for defined shapes
- Hard to remove

*Best when durability is the priority*

**Tradeoff: you can optimize for cost, service life, or ease of removal — but not all three.**

# Synthesis Study, Example Material Costs and Service Life

| Project Name                                 | Material Used                                                         | Cost                                                                               | Program Duration                       | Art Type  |
|----------------------------------------------|-----------------------------------------------------------------------|------------------------------------------------------------------------------------|----------------------------------------|-----------|
| Green Lake Dragonfly (Seattle)               | Latex traffic marking paint                                           | Materials: \$1,000<br>Design Fee: (community designed)<br>Labor: (volunteer)       | Indefinite, maintained every 1-3 years | Roadway   |
| Common Ground (St. Petersburg)               | Latex traffic marking paint, non-slip additive                        | Materials: \$4,000<br>Design Fee: \$1,000<br>Labor: (volunteer)                    | Indefinite                             | Roadway   |
| Walks of Life (West Palm beach)              | commercial-grade driveway paint                                       | Materials: \$15,000<br>Design Fee: (student designed)<br>Labor: (volunteer)        | 3 years                                | Roadway   |
| Intersection Repair (Portland)               | acrylic deck stain, acrylic traffic paint, non-slip additive          | Materials: \$500-\$3,000<br>Design Fee: (volunteer)<br>Labor: (volunteer)          | 1-25 years                             | Roadway   |
| Art Route (Des Moines)                       | Thermoplastic                                                         | Materials: \$240,000<br>Design Fee: \$3,500<br>Labor: (included in materials cost) | 5 years                                | Crosswalk |
| Better Bankside Colourful Crossings (London) | Year 1: Road marking paint;<br>Years 2 and 3: Preformed thermoplastic | Materials: (donated)<br>Design Fee: £2,500<br>Labor: (volunteer)                   | 2 years                                | Crosswalk |

## Bloomberg Asphalt Art Safety Study

# Skid Resistance and Accessibility

- Maintain traction
- Use anti skid grit for paints and coatings
- Detectable warning surfaces or truncated dome pads
- Avoid long straight borders or stripes



# Anti-Skid Aggregate: Practical Options

**Keep it simple: 4 practical ways to add skid resistance to liquid AST systems**

## 1. Mix-in additive

- Fine additive stirred into coating
- Simplest field process and cleanest look
- Usually the lightest friction boost

## 2. Broadcast on wet coating

- Aggregate dropped into wet film
- Higher friction and more visible texture
- More labor, cleanup, and waste

## 3. Broadcast plus lock coat

- Broadcast aggregate, then seal with 2nd coat
- Better retention and more finished surface
- Most controlled and most complex option

## 4. Textured or aggregate-filled system

- Texture comes from product or application method
- Cleaner workflow and more consistent finish
- Often more proprietary and less flexible

# Non Interference with Traffic Control Devices

- No imitation of MUTCD devices (shapes, colors, symbols, legends, sequences)
- Avoid misleading cues (arrows, chevrons, wayfinding patterns)
- No 3D or anamorphic illusions
- No LEDs or illumination
- No raised thermoplastic ridges or textured inlays



# Color Restrictions, FHWA Reserved Ranges

- Proposed colors must fall outside chromaticity ranges
- Confirm proposed colors with supplier or manufacturer
- Fluorescent colors are not allowed

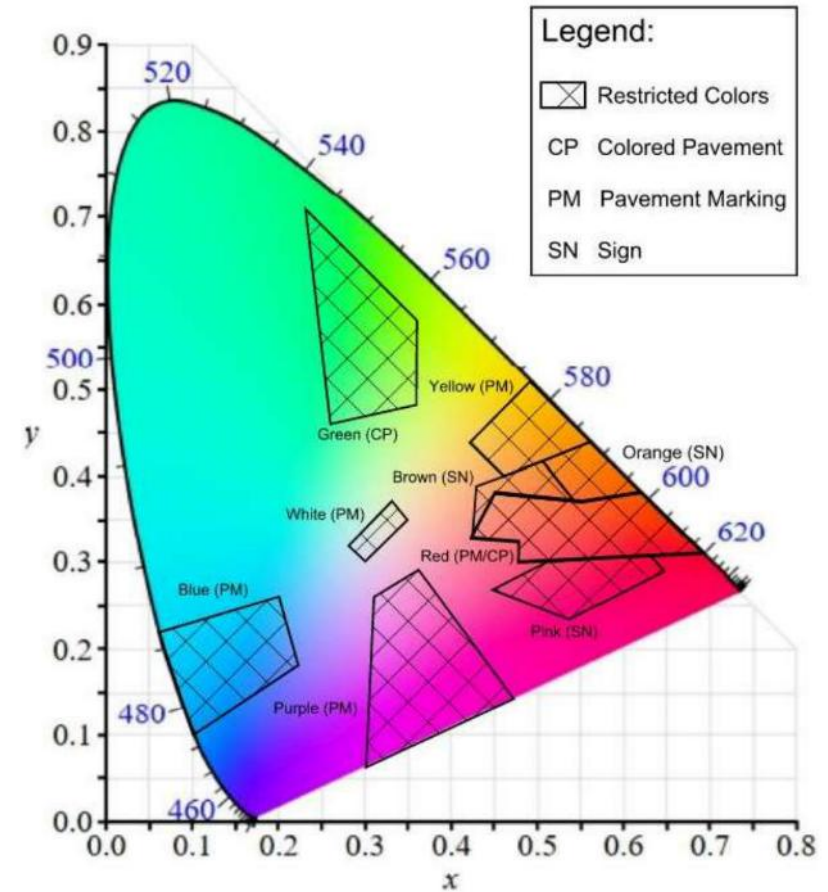


Figure A: FHWA – Restricted Colors for Pavement Markings (CIE 1931 Chromaticity)

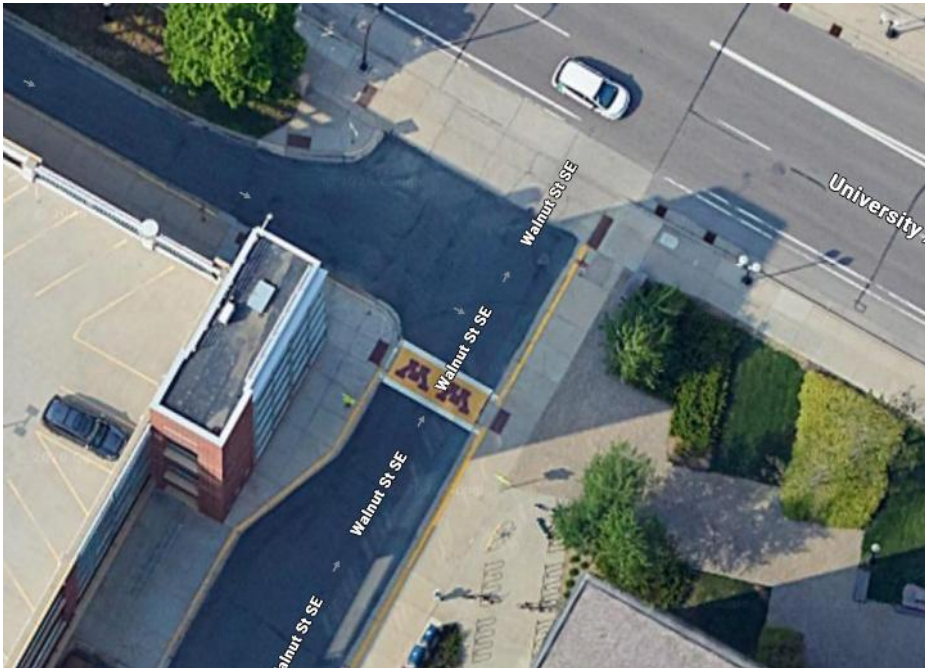
# Contrast and Buffer Standards

- Maintain an unpainted gap of at least 6 inches or the width of the adjacent line
- Keep at least 1 foot of clearance from pavement messages
- Do not extend paint onto curbs, vertical faces, or detectable warning surfaces



# Content Restrictions

- No advertising, logos, trademarks, or sponsor marks
- No text, lettering, numbers, or initials on pavement
- No traffic related symbols such as arrows, route shields, octagons, or triangles
- No games or designs that encourage lingering in the roadway



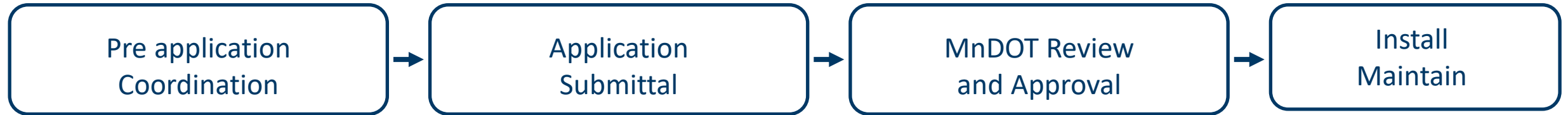
# Maintenance and Operations

- Avoid painting over utilities and drainage features
- Sponsor is responsible for refresh, repair, or removal if the AST fades or becomes unsafe
- MnDOT may remove an AST that interferes with maintenance or operations
- Removal costs may be billed to the sponsor
- MnDOT does not provide traffic control plans



# Application Process

## High level workflow



- Sponsor is a public agency, city, county, tribal government, or state agency
- Coordinate early with the District Traffic Engineer to confirm site eligibility
- Submit a miscellaneous work permit with the required supporting documents
- Installation

# Application Documents

## Complete application package



*Permit  
submittal*

**01**

### Design + location

- Scaled renderings with artwork limits and buffers
- Route, milepoint, and site photos

**02**

### Installation + materials

- Traffic control plan for installation
- Material specifications
- Color swatches or coordinates

**03**

### Stewardship + support

- Maintenance and removal plan
- Evidence of community support, such as a letter or resolution

# Questions

## Contact

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