Engineered Emulsion for tack/bond coat and fog/ mastic seal

TROY TINDALL

BLUE LINE TRANSPORTATION / ENVIROAD LLC

Engineered Emulsions

- Engineered emulsions are designed to address performance challenges faced when utilizing specification emulsions.
  - Tracking
  - De-bonding
  - HMA compaction
  - Loss of coating
  - Loss of skid resistance

Specification Tack Coat

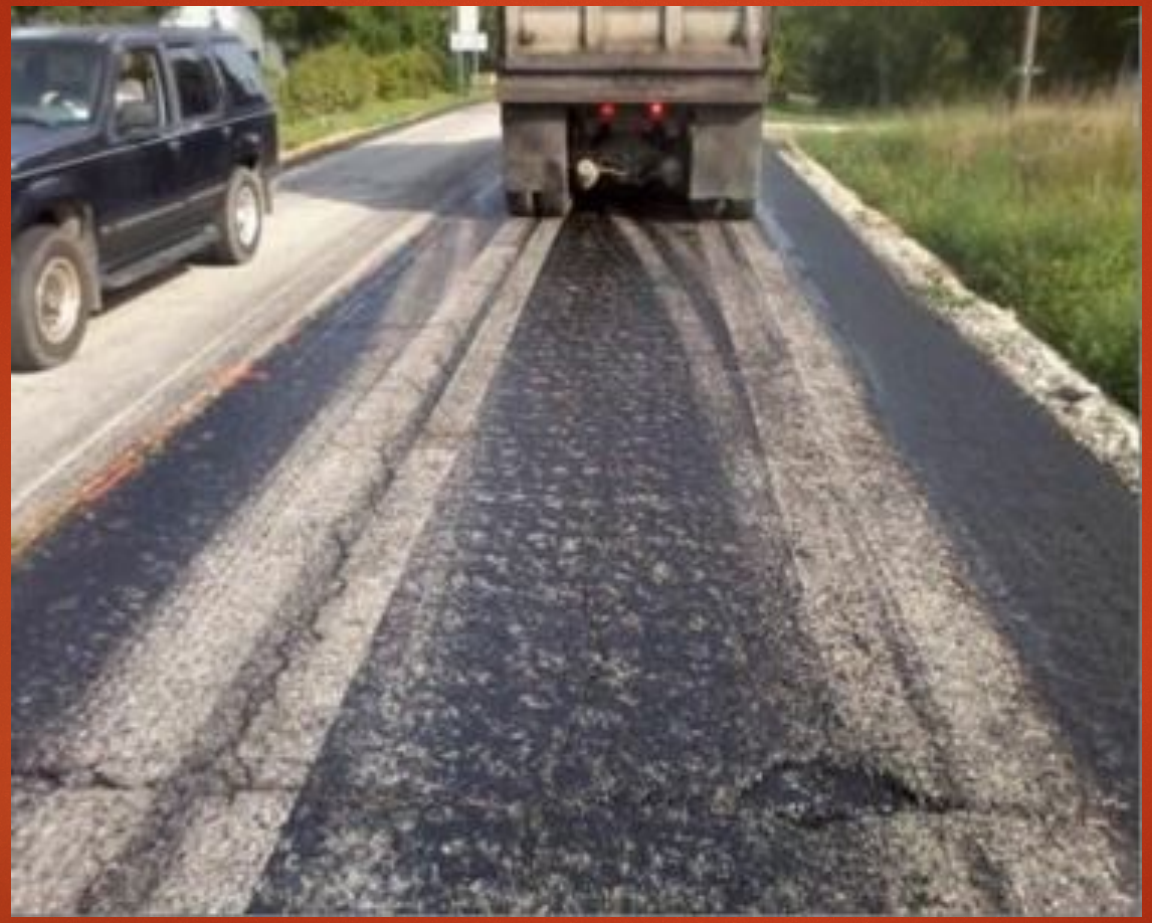
- Specification tack coats are asphalt emulsions that conform to a wide specification range and have been the the industry standard over many years.

Specification CSS-1H

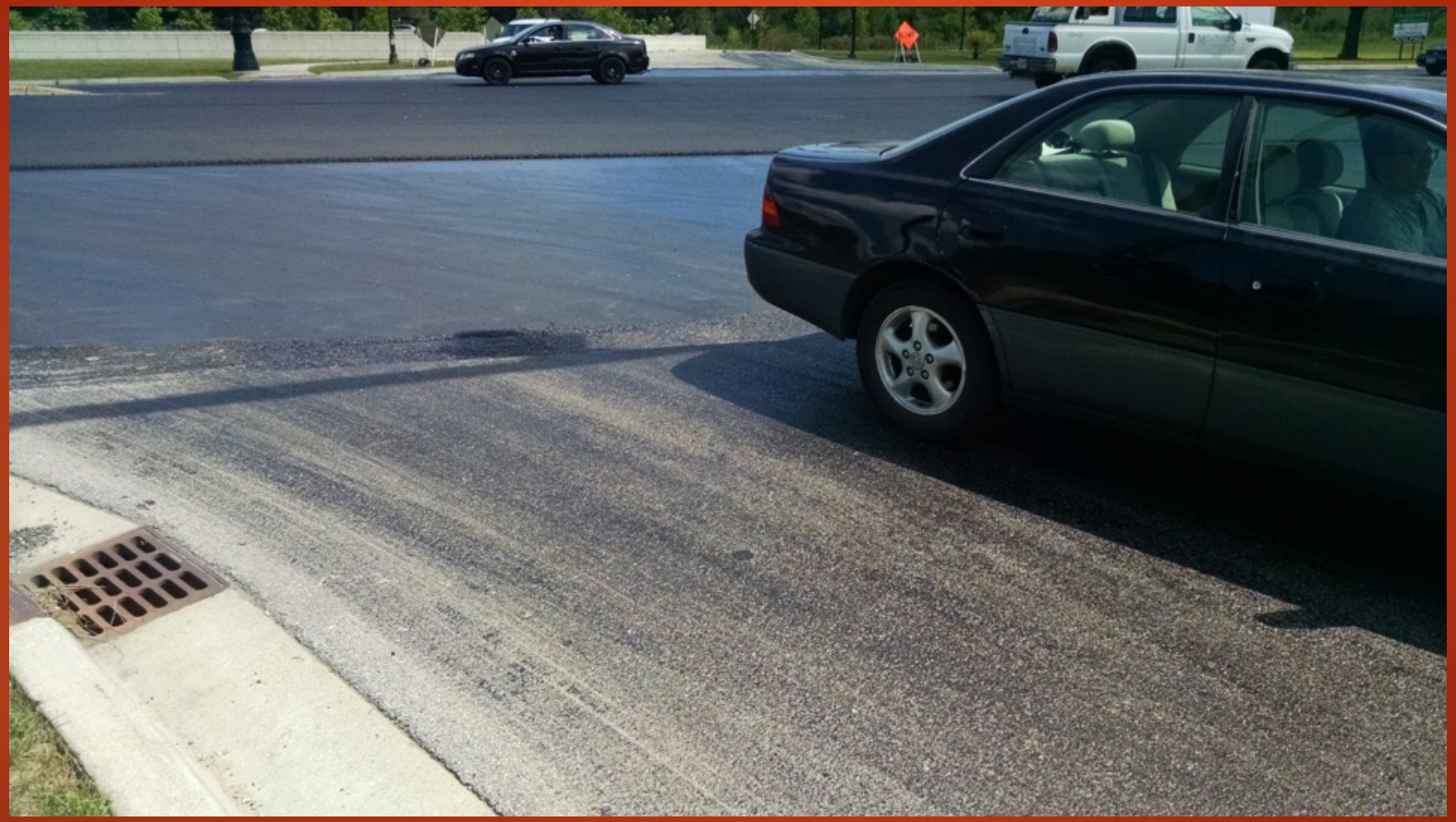
CSS-1H	Test Method	Specification	
Tests on Emulsion:		MIN	MAX
Saybolt Viscosity @ 25^{0}C (77^{0}F), SFS	AASHTO T 59	20	100
Storage Stability[1], % (1 day)	AASHTO T 59	-	1.0
Sieve Test, %	AASHTO T 59	-	0.10
Cement Mixing Test, %	AASHTO T 59	-	2.0
Particle Charge Test	AASHTO T 59	Positive	-
Distillation[2] to 260^{0}C (500^{0}F) Oil distillate % (by volume of emulsion)	AASHTO T 59	-	3.0
Residue, % (by weight)	AASHTO T 59	57.0	-
Tests on Residue by Distillation:			
Penetration @ 25^{0}C, (77^{0}F), 100g, 5s dmm	AASHTO T 49	40	90
Ductility @ 25^{0}C, (77^{0}F), 5.0cm/min, cm	AASHTO T 51	40	-
Solubility in TCE, %	AASHTO T 44	97.5	-

CSS-1H - Tracking

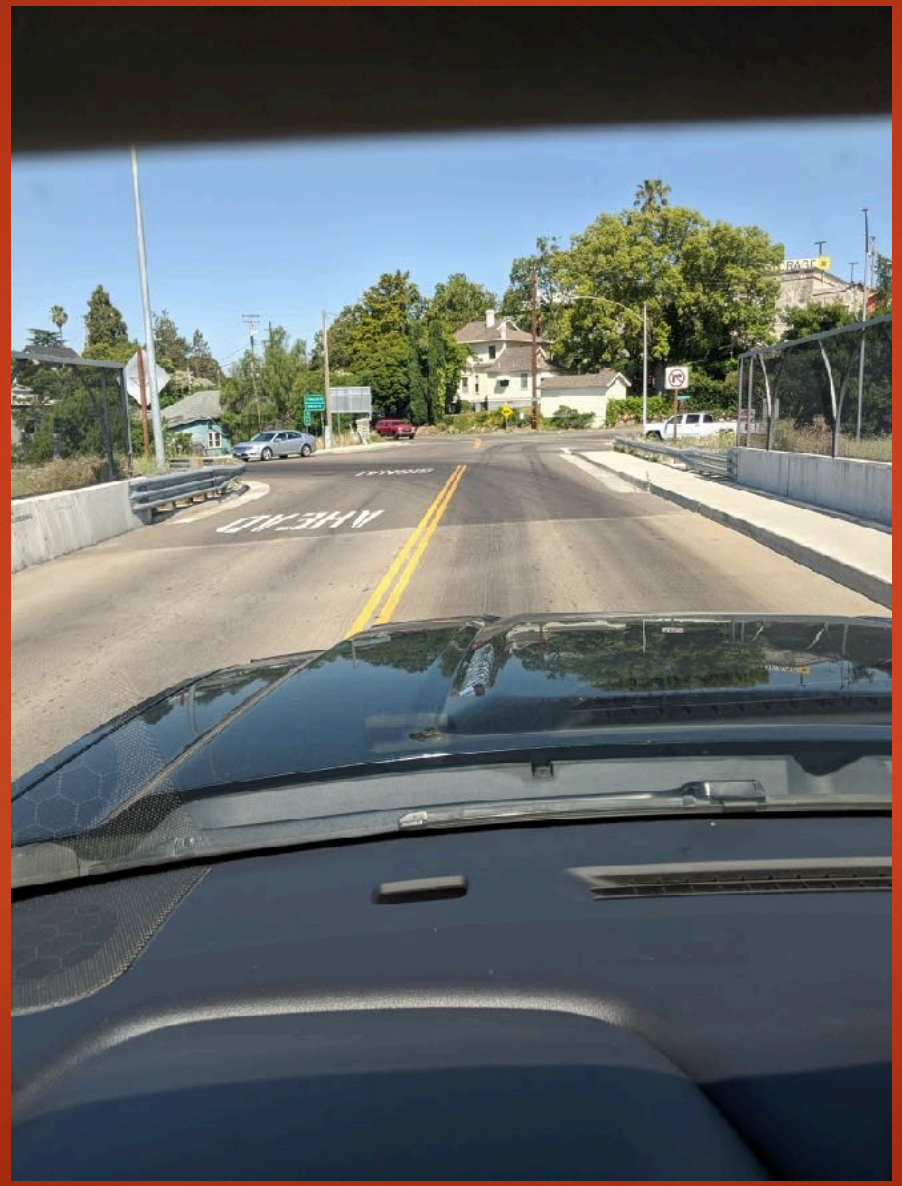
CSS-1H - Tracking



CSS-1H - Tracking



CSS-1H - Tracking



CSS-1H - De-bonding in wheel path

CSS-1H - De-bonding in wheel path

CSS-1H - HMA creep during compaction

ODOT High-Performance Tack Coats (HPTC)

- In 2015 Oregon Department of Transportation initiated the HPTC study. Working in conjunction with Oregon State University and interested asphalt suppliers, ODOT challenged the idea that engineered emulsions could provide the bond coat that just couldn't be attained with specification tack coats.
  - No specification – bring your game
  - In-field laboratory controls
  - Consistent application and testing equipment
  - Laboratory testing of emulsions and bonding characteristics

HPTC

HPTC

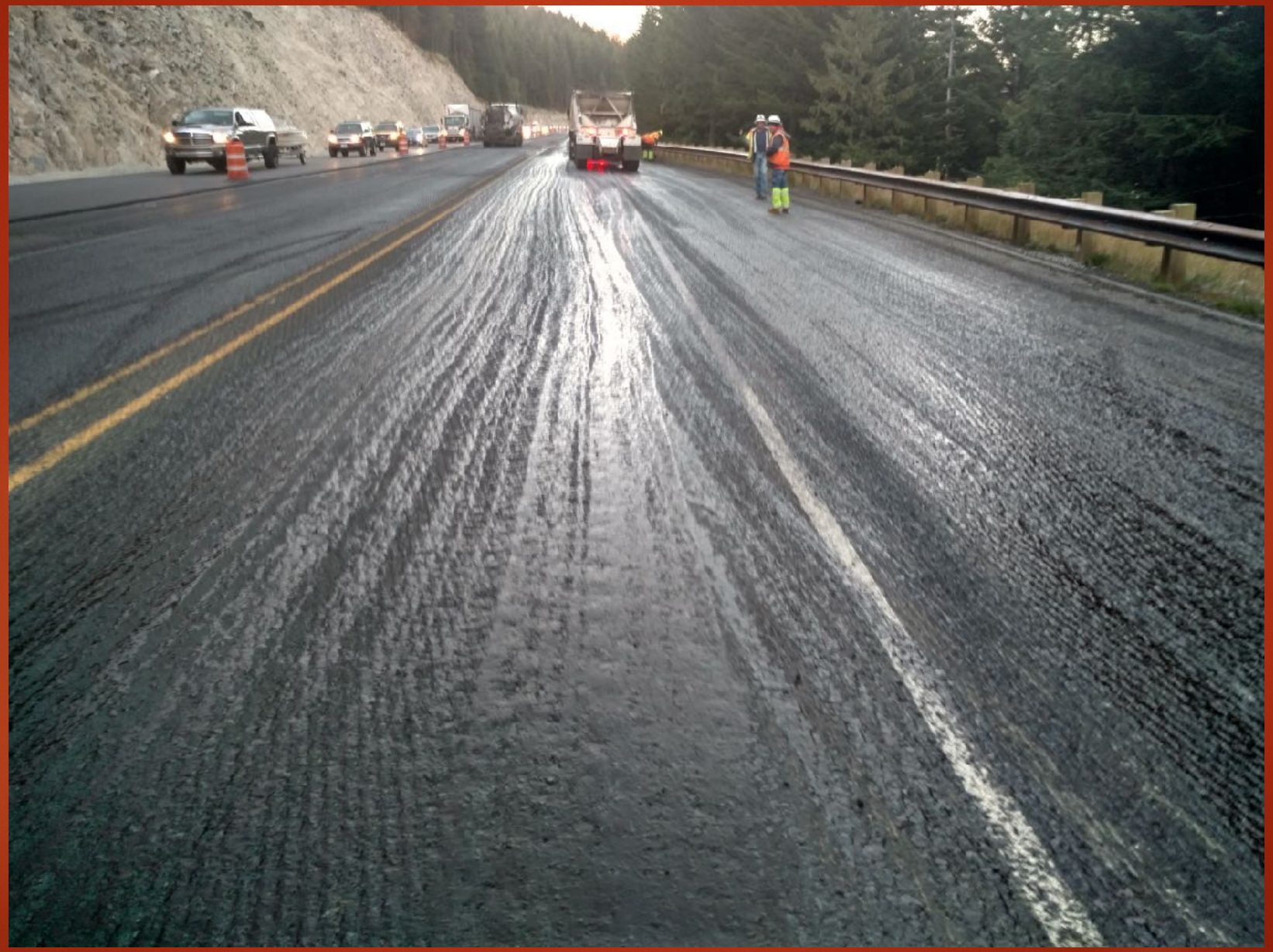
HPTC

HPTC

HPTC

HPTC

HPTC



HPTC

Engineered Bond Coat

- Engineered bond coats address the primary issues faced when using specification tack coats by ensuring the bond is maintained during paving operations. Eliminating tracking insures the desired bond between layers is achieved and promotes compaction through reduction of mix creep.
  - Project type – overlay or mill & fill
  - Temperatures - Day or night paving
  - Traffic requirements
  - Storage requirements

EARTHBIND® **NTBC-41**
NON-TRACK BOND COAT

	Test Method	Specification	
Tests on Emulsion		MIN	MAX
Saybolt Viscosity @ 25^{0}C (77^{0}F), SFS	ASTM D7496	10	75
Sieve Test, %	ASTM D6933	-	0.1
Residue, % by Evaporation (weight)	ASTM D6934	10	-

EARTHBIND® **NTBC-41**

EARTHBIND® **NTBC-41**

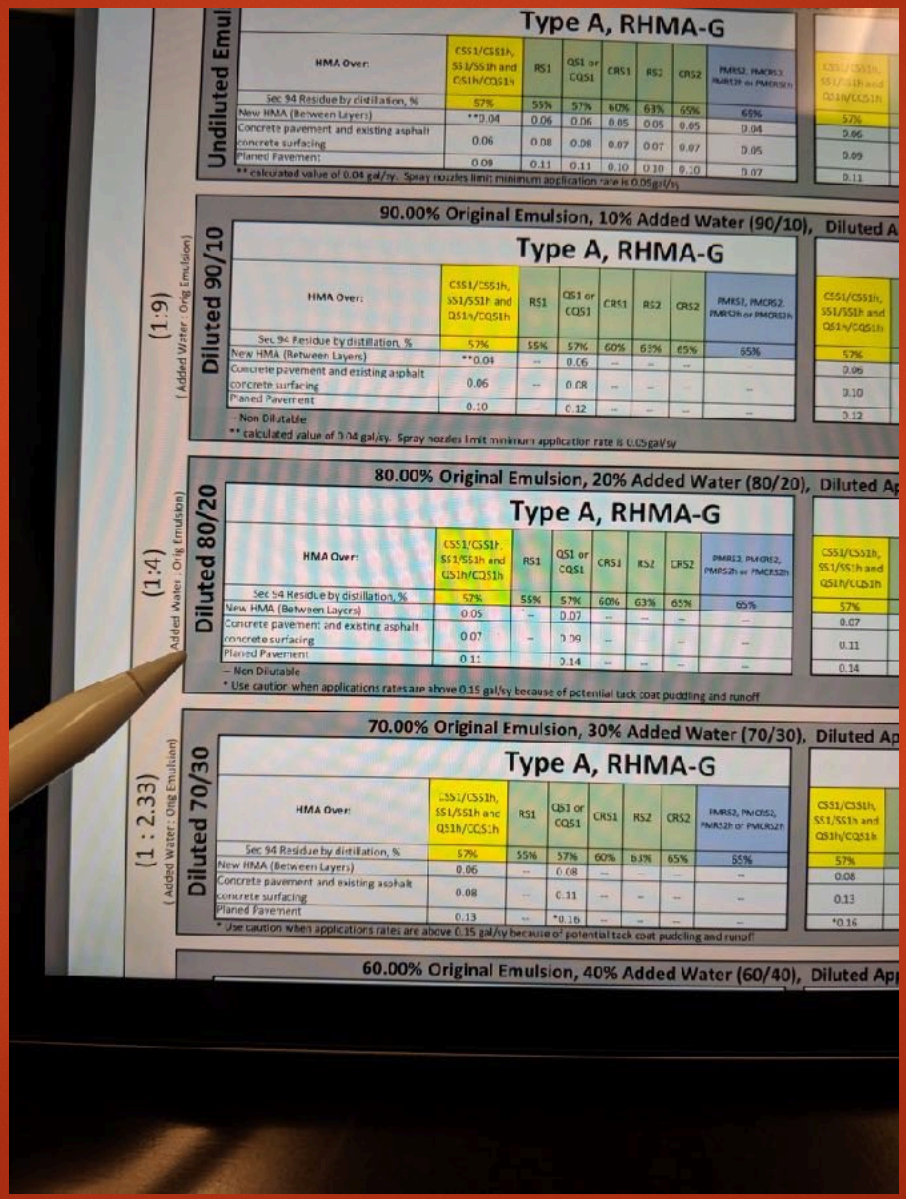
EARTHBIND® **NTBC-41**

EARTHBIND® **NTBC-41**

EARTHBIND® **NTBC-41**

EARTHBIND® **NTBC-41**

EARTHBIND® **NTBC-41**



EARTHBIND® **NTBC-41**

EARTHBIND® **NTBC-41**

EARTHBIND® **NTBC-41**

Specification Fog Seal

- Specification fog seals are asphalt emulsions that conform to a wide specification range and have been the the industry standard over many years.

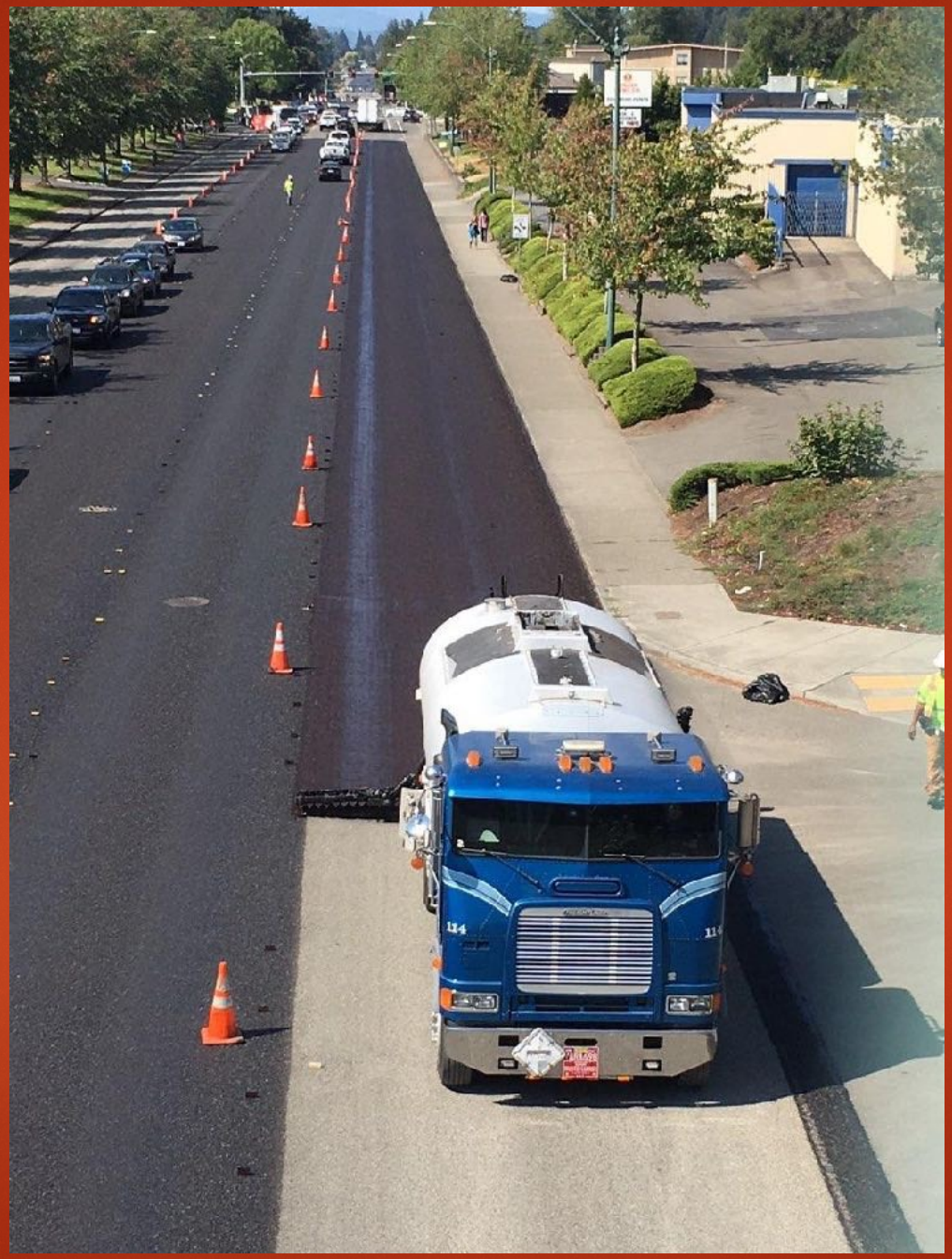
CSS-1 Dilute

CRS-2P / HFRS-P1 Dilute

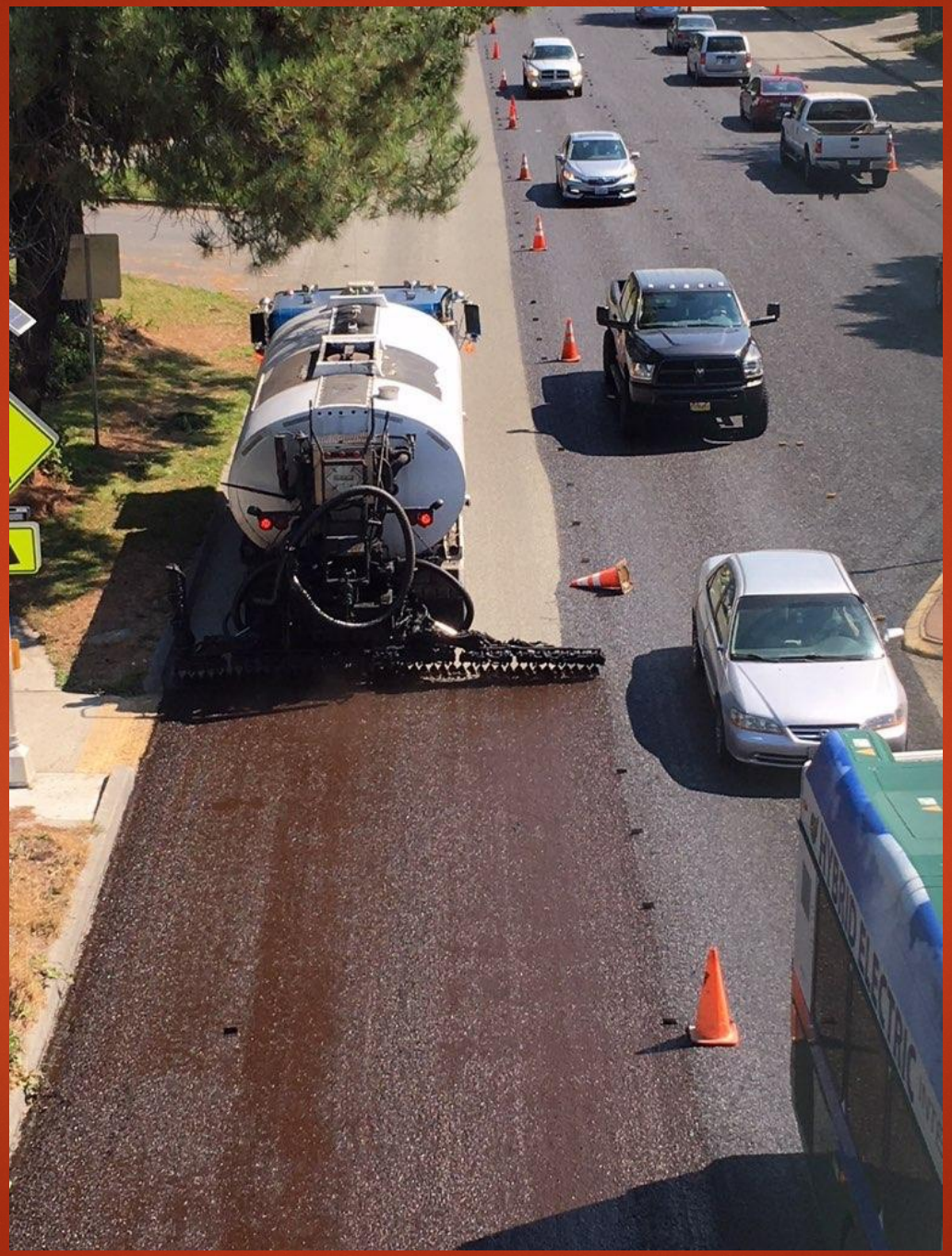
Engineered Fog / Mastic Seal

- Engineered fog / mastic seals are formulated to meet customer expectations utilizing project data.
  - Average daily traffic
  - Type of traffic
  - Environmental / Time of day considerations
  - Road condition
  - Skid resistance
  - Return to traffic requirements

BL-Fog



BL-Fog



BL-Fog

BL-Fog

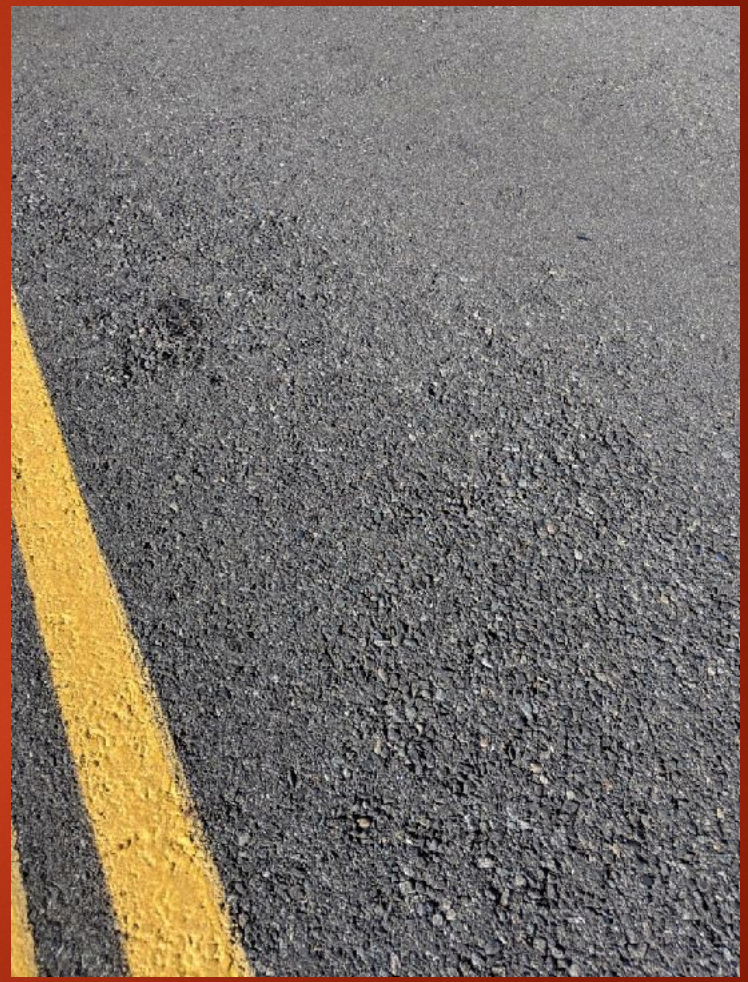
BL-Fog

BL-Fog

BL-Microcoat

BL-Microcoat

BL-Microcoat



BL-Microcoat

BL-Microcoat

BL-Microcoat

BL-Microcoat

BL-Microcoat

BL-Microcoat

Questions?

- Troy Tindall
- Blue Line Transportation / Enviroad LLC
- troy@bluelinetrans.com
- 503-702-1236