

The Art of Line Painting

It takes more than a few cans of spray paint or a bucket and brush to keep up with the needs for lines along Pennsylvania's state-owned roadways.

Annually, the state uses about 1.8 million gallons of white and yellow paint to complete more than 110,000 miles of roadway markings across the state, so it's no wonder the Pennsylvania Department of Transportation (PennDOT) has line painting down to an art form.

The state uses specialized waterborne paints to mark pavements with lines, arrows, railroad crossings and more. The paint dries as quickly as 90 seconds and has durability to last more than a year depending on traffic volumes.

It is sprayed onto the road from a large specialty truck or a walk-behind machine.

While the paint is designed to easily offer drivers guidance and safety awareness during the day, it takes a something little extra to provide line



brightness at night. That is why PennDOT mixes glass beads into its roadway paint.

The beads are smaller than a pinhead. Their size is such that hundreds can fit on every inch of painted roadway lines and markings. The tiny rounded glass pieces placed at a high-density level make the line more visible at night by shining back the glow of headlights from vehicles. In short, the beads greatly increase a line's reflectivity.

In order to maximize that reflectivity, the beads are placed

on top of the paint after it has been sprayed on the roadway but is still wet. The beads are shot from a special gun at an angle to ensure that 60 percent of the bead is embedded in the paint. This helps keep the beads in place on the roadway while exposing enough of the bead to generate the needed reflection.

PennDOT paint trucks are equipped to place the paint and the beads almost simultaneously and can paint white and yellow lines at the same time along the roadway. To accomplish the dual line placement, typically

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Covered in this issue:

Embedded Tech and Engineering Topics – Waterborne, Reflectivity, Durability

Vocabulary Terms – Recessed, Density, Innovation

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EACH YEAR PENNDOT USES ENOUGH LINE PAINT TO FILL NEARLY 2 1/2 OLYMPIC-SIZED SWIMMING POOLS



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one employee handles the white edgelines while another focuses on the yellow centerlines.

In the northwest district of PennDOT, the majority of line painting is done during the day. The exception is Presque Isle State Park, where traffic volumes demand the painting be done at night when it is closed to the public.

Wear and tear from daily traffic and winter snow plows often means that roadway lines and markings last about one year before needing done again.

PennDOT is also studying the

possibility of extending that lifecycle on the interstates by replacing center line paint with reflective all-weather tape.

The tape is glued inside a very shallow rut milled into the roadway. The recessed design causes the tape to sit just below the pavement surface, increasing the marking's durability even during winter plowing operations.

As part of a pilot project, the tape was used to mark the dashed or skip centerlines on portions of Interstate 80 and Interstate 376 in Mercer County, Interstate 80 in Venango County, and Interstate 79 in Erie County.

DID YOU KNOW...

PennDOT painted 9,956 miles of centerlines and edgelines on state-owned roads in Crawford, Erie, Forest, Mercer, Venango, and Warren counties. The department also painted 315 miles of local roads through municipal partnerships.

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