

TRAFFIC AND SAFETY INFORMATIONAL SERIES

FREQUENTLY ASKED QUESTION #5

WHY AREN'T THERE BETTER AND LONGER LASTING STRIPES ON THE ROAD?

Pavement markings guide traffic and inform drivers. The harsh environmental conditions that pavement markings are exposed to, however, make it difficult for any marking material to last a significant length of time. For this reason, the deterioration of pavement markings is a common and expensive problem.

TYPES OF MATERIALS USED

Pavement marking materials are generally either highly durable non-paint-based materials or paint-based materials (sometimes characterized as nondurable). Some common types of materials are listed below.

Highly durable non-paint-based materials:

- Grooved-in tape
- Hot-applied thermoplastic
- Cold-applied thermoplastic
- Epoxy
- Polyester stripping
- Methyl methacrylate
- Reflective raised pavement markings

Nondurable paint-based materials:

- Latex-based paint
- Water-based paint
- Rubber-based paint
- Oil-based paint

The marking materials listed above have different life expectancies.

LIFE EXPECTANCY OF COMMONLY USED MATERIALS

Latex-based paint, for example, can last from six months to one year under normal road conditions. Water-based paint is also expected to last up to one year, and in some cases two years, under normal conditions. Thermoplastic, on the other hand, is a more durable material, and in many areas it can last several years. In Iowa, however, this material is not widely used because snowplows have a tendency to remove it. Epoxy is used in Iowa and is considered an extremely durable striping material. It can last from three to five years, depending on the amount of snowplow use and traffic volumes along a roadway.

Placing longer-lived materials, such as thermoplastic or tape, into grooves in the pavement surface can further enhance the durability and lifespan of these materials. Such grooved-in markings have been used throughout Iowa in different settings and can last for five years or more, depending on the roadway's

traffic volumes, surface conditions, and other characteristics. However, grooved-in markings can be expensive to purchase and apply.

FACTORS INFLUENCING PAVEMENT MARKING LIFE EXPECTANCY

Several factors determine how long pavement marking materials may last on a roadway.

Pavement Type and Surface Condition. The pavement type and surface condition of a roadway determine not only the amount and type of marking material needed but also how long the markings are likely to last. The surface condition also affects the visibility of the materials. For example, an open-graded roadway surface (e.g., an asphalt concrete) requires either thick layers of paint or hot-applied thermoplastic for markings to be visible. In another example, if a roadway needs restriping but will likely need to be resurfaced in the near future, a less expensive paint application should probably be used as a temporary measure before the surface is repaved.

Traffic Volume. Traffic volumes impact the type of pavement marking materials selected and the frequency of application. On roadways with high traffic volumes, the pavement markings do not last as long as those on roadways with low traffic volumes. Therefore, a roadway with high traffic volumes is commonly marked with materials such as raised markers (in areas without snowplowing), hot-applied thermoplastic, grooved-in markings, or epoxy thermoplastic. However, on roadways with low traffic volumes, it is more common to use less expensive and nondurable paint-based products. The lower traffic volumes allow the paint to last an acceptable amount of time, although the service life is still typically under three years.

Traffic Composition. The type of traffic on a roadway impacts the durability of pavement markings. Trucks, buses, and other heavy vehicles and equipment contribute more to pavement marking wear than typical passenger cars.

Season Materials Are Applied. The weather or season when pavement markings are applied impacts their durability. For example, thermoplastics applied to a pavement surface during cold weather may not last as long as those applied during the summer. The same is true for painted pavement markings.

Thickness of Pavement Marking. The durability or lifespan of a pavement marking depends on how much of the material is applied. For obvious reasons, a thicker layer of paint will likely result in longer lasting markings, though thick applications of a material tend to increase costs.

Snow Maintenance. Snowplows increase the wear on pavement markings, and some materials, such as thermoplastic, may peel off the pavement entirely during snowplow passes. Only pavement markings that can withstand the blade of a snowplow should be applied in areas that see snow maintenance activity.

Retroreflectivity. Glass beads scattered across wet paint or reflective materials incorporated into preformed markings (i.e., tapes) make pavement markings retroreflective at night. Over time, however, the retroreflective qualities of the markings deteriorate due to traffic, weathering, and other factors. While grooving in markings can slow this wear to an extent, dirt and abrasion inevitably diminish the retroreflectivity of markings at night and necessitate repainting. Markings may need to be repainted with increasing frequency depending on the minimum levels for pavement marking retroreflectivity that are established in future editions of the *Manual on Uniform Traffic Control Devices (MUTCD)*.