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Information from the City of Battle Creek

Pavement 101

City street maintenance treatments

Maintaining city streets takes a variety of treatments

The City of Battle Creek uses a variety of pavement treatments and a lot of planning to achieve the goal of keeping our road system — at more than 300 miles — at an acceptable standard of use.

Fluctuating temperatures from season to season often is the start of road deterioration, by way of preliminary cracks. The asphalt, flexible when first laid, becomes hard and brittle, which results in cracks across the width of the road.

This allows the possibility of water seeping into the cracks and into the road base. The water can expand the cracks and soften the base underneath the road, causing further failure in the asphalt above.

Proper planning helps us address this deterioration. We treat roads that have worn out, but also that are just beginning to show wear and tear.

This is no different than fixing a leaky roof or performing maintenance on a car. Giving attention to a minor problem today prevents a much larger, more costly rehabilitation in the future. The proper use of a variety of road treatments can keep the number of roads in need of greater repair to a minimum.

Read on to learn more about our various treatments.

1. RECONSTRUCTION

Summary: Replacement of the road base and surface, curb and gutter, sidewalk and, often, underground utilities. With the exception of newly-laid sidewalk, all road parts are removed and replaced, starting with a six-inch aggregate base. The road is paved using a variety of layers, depending on whether it is major or local.

Life cycle: At least 15 years.

Road type: Typically with a surface condition in the bottom 2 percent, with large cracks, failing patchwork and pot holes. Age of utilities also is considered.

2. PAVEMENT REPLACEMENT

Summary: Full pulverization of the asphalt and six inches of base; the mixture will be used as the base for the new pavement. Layers of asphalt may vary.

Life cycle: 10 to 12 years.

Road type: Streets with obvious structural defects present along the entire length (cracking, rutting).

3. RESURFACING

Summary: A quick process in which 1.5 to 2 inches are milled off the top, enough to remove defects, after which a new layer of asphalt is laid.

Life cycle: Up to 10 years if the base has retained structural integrity.

Road type: Transverse cracks and wearing down of the top surface of the road. Many city roads qualify for this treatment, so other factors may be used in choosing the schedule (such as the road's last treatment).

4. CHIP SEAL

Summary: Inexpensive, effective method to extend pavement life, by applying small chips in a liquid asphalt. A street must first receive hot-in-place recycling or have defects sealed, or the chips fall through the cracks and the treatment is pointless. The road is swept to remove dust, a liquid layer is sprayed onto the road, and chips are applied and rolled over.

Life cycle: 5 to 6 years. Up to 10 years for low-volume roads.

Road type: Used on residential roads that appear to be in good structural condition. With the right timing and on the right streets, this program can save hundreds of thousands of dollars by preserving the life of the road, thus prolonging the need for reconstruction.

5. MICROSURFACING

Summary: Placement of a 3/8– to 1.5-inch layer of a mixture of aggregate (rock), liquid asphalt, water and other additives. A large sled places the mixture and can fill cracks and defects. Sets in an hour or two.

Life cycle: 5 to 8 years.

Road type: Streets typically have minor defects, like tight cracks, minor rutting and early signs of block cracking. A good treatment on residential streets.

6. HOT-IN-PLACE RECYCLING

Summary: Uses the existing pavement to create a new surface, which improves the road surface before the city uses another pavement treatment. About 1.5 inches is shaved off the top, mixed with liquid asphalt, and replaced.

Life cycle: 3 to 5 years.

Road type: Streets that have been chosen for chip seal, microsurfacing or resurfacing. From those, streets with more visible structure distress are the best candidates.

7. CRACK FILLING

Summary: Filling of 3/8-inch or wider preliminary cracks on recently-treated roads. This prevents cracks from widening and spreading, keeping out water. The filler is a cold liquid asphalt.

Life cycle: 2 to 3 years in cracked areas.

Road type: Those treated in the last five years. Cracked streets are classified as high or low priority and filled accordingly.