Kansas
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Pavement Treatments Tried in Sedgwick County

Sedgwick County's proactive approach is saving them money.

By Lynn Packer, P.E., Transportation Engineer, Sedgwick County, KS

Sedgwick County currently maintains over 1,200 lane miles of asphalt roads—and these are costly to maintain. This necessitates that we employ a pavement preservation program as the driving force behind our road maintenance to help extend the service life of our asphalt roads. The program consists of a series of preventive maintenance treatments and minor rehabilitations. Various treatments are applied over time because we have learned that the true benefits of pavement maintenance are realized when there is a consistent schedule.

Our goal is to be proactive in maintaining our existing roads so that, besides extending pavement life, we can reduce delays for the traveling public and provide improved safety and mobility.

Benefits of preservation

Cost savings. The cumulative effect of our systematic, successive preservation treatments is to postpone costly rehabilitation and reconstruction, which can cost between $375,000-$500,000 per lane mile.

Predictability. By extending the life of a road until it can be rehabilitated, the maintenance needed for that road becomes more predictable. Preventive maintenance allows us to even-out our maintenance budget from year to year, which otherwise can vary greatly.

Pavement preservation techniques used in Sedgwick County

We use conventional treatments such as crack sealing and chip sealing, and others such as:

- ultrathin bonded asphalt surfacing,
- thin overlays,
- latex-modified slurry seals, and
- hot in-place asphalt recycling.

Aside from crack treatments, all of these treatments leave the pavement with a new wearing surface with a minimum effective life of at least five years, and sometimes up to 10 years.

To help determine which treatment is needed, we use a 5-year cyclical approach combined with a 5-point road grading system (5 is good condition and 1 is poor condition). This approach helps ensure we evaluate a specific mile of road at least every five years, allowing us to address pavements while they are still in good condition and before the onset of serious damage. The type of treatment we use depends on the condition rating of the road and whether it is hot mix or cold mix.

Hot mix maintenance strategy. Our hot mix asphalt roads are maintained through contract work. Although we continually experiment with new processes and surface treatments, such as rubberized seals and cold mix recycling, the heart of the pavement preservation program is a combination of latex modified slurry seals, ultrathin bonded asphalt surfaces, and hot in-place asphalt recycling.

Slurry seals are applied to roads rating 4 or 5 on our grading system; they are in very good to good shape with some small thermal cracking. This is often the first maintenance treatment after construction or reconstruction, and is an effective, low-cost treatment at about $16,000 per lane mile. We typically experience about a 5-year service life from our latex-modified slurry seals.

Ultrathin bonded asphalt surfacing is used on roads that typically rank a 3 or 4. The pavement may have somewhat larger cracks, but it is still in good condition and is structurally sound. The emulsion membrane seals the existing surface and produces high binder content between the existing roadway surface and the gap-graded ultrathin hot mix all in one pass. This treatment works well for us on higher-traffic areas because of the single-pass process and the ability to reopen the road quickly after application. Ultrathin bonded asphalt surfacing costs about $28,000 per lane mile in Sedgwick County and has a service life of between 5-10 years.

Rounding out our preventive maintenance treatments is *hot in-place asphalt recycling.* The process recycles in-place asphalt with a single machine by performing a multi-step process of heating, scarifying, applying an asphalt recycling agent and thoroughly remixing and reshaping the old asphalt surface as

a leveling course. This is immediately followed by a minimum one-inch virgin hot mix asphalt overlay placed over the recycled leveling course. This type of treatment corrects many types of surface distresses, and the additional aggregate provides increased strength. This process is typically reserved for roads with a grade of 1 or 2, and is our most expensive preservation treatment at a cost of about $50,000-$56,000 per lane mile. Depending on traffic loads, this treatment has a service life of anywhere from 5-10 years in Sedgwick County.

Cold mix maintenance strategy. Sedgwick County has a long history of using cold mix asphalt. It has traditionally been used as the first step when upgrading a gravel road to a paved road. The strength added by the cold mix asphalt allows time to incorporate a road reconstruction project into the Capital Improvements Program (CIP). We recently discontinued the cold mix asphalt program, however, because of budget cuts.

Maintenance can be burdensome with our cold mix asphalt roads. We have learned that the adage "build it and they will come" is true of any paved road. Paved roads are the preferred route for local residents and all manner of trucks, including grain trucks. Additional traffic loading causes deficiencies in the pavement structure much faster on cold mix roads. Therefore, maintenance is needed despite the intention of constructing further improvements with a CIP project.

The County still maintains over 290 lane miles of cold mix asphalt roads, with county forces. We don't rate these roads, but when needed, we patch them and apply *skim coats* to reduce aging, restore serviceability, and add strength. Typically, a *chip seal* is applied later in the same year for additional protection. The skim coat treatment costs about $38,000 per lane mile when county labor and equipment are added. The chip seal runs about $8,000 per lane mile and will last anywhere between 3-6 years depending on traffic loads.

Light repair for hot mix roads:
Latex modified slurry seal, *before (left) and after (right).*

Moderate repair for hot mix roads:
Ultrathin bonded asphalt surfacing *before and after.*

Significant repair for hot mix roads:
Hot in-place recycling *before and after.*

Photos from Sedgwick County, KS.

Repair for cold mix roads:
Skim coat and chip seal, *before and after.*

Conclusion

Regardless of the type of treatment used, timely maintenance is the critical element in extending the service life of a road. Having a pavement preservation program in place has helped Sedgwick County bear the burden of severe funding cuts without dramatically reducing the quality of our road network.

For more information on Sedgwick County's pavement preservation program and strategies, contact Joe Brand, P.E., supervisor, Inspection and Survey, (316) 660-1754, jbrand@sedgwick.gov. ■

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