



Pavement Preservation

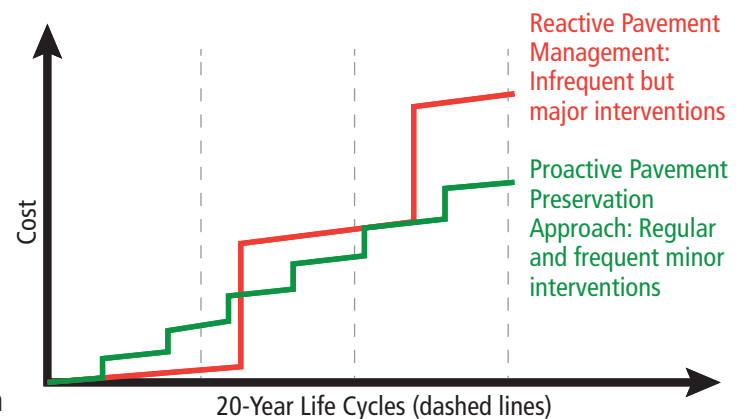
FEDERAL LANDS TRANSPORTATION PROGRAM FACT SHEET

Demands on the road networks in national park units continue to rise with increased visitation. At the same time, funds available for road maintenance grow ever tighter. Pavement preservation maintains roads at a lower cost and keeps them open for visitors better than traditional maintenance—applying the right treatment, to the right road, at the right time.

All roads begin deteriorating as soon as they are built. Water, freeze-thaw cycles, sun, and heat, as well as traffic, cause deterioration. Typically, pavements perform well until a point in their life spans when they begin to deteriorate quickly and eventually fail. Traditionally, transportation agencies allowed the structural condition of roadways to deteriorate substantially before taking preventive action. "Pavement preservation" is a relatively new technique that takes a different approach. It seeks to keep good pavements in good condition rather than allow pavement deterioration to begin. The National Park Service (NPS) has adopted this modern efficient and cost-effective approach to maintaining park roads. This process meets expectations for safety, ride quality, and optimum traffic flow by intervening early in the road deterioration life cycle.

The Pavement Preservation Process

If pavement has not significantly deteriorated, relatively inexpensive treatments can effectively rejuvenate the pavement. Pavement preservation involves applying a series of low-cost treatments every 7 to 10 years to a paved road that is in good or fair condition. This early application halts further deterioration. In addition, the road surface looks attractive, which is important for scenic driving in national parks. Only in the past 10 to 20 years has the Federal Highway Administration (FHWA) and state departments of transportation adopted this approach toward maintenance. FHWA has adopted this approach in their technology transfer program, Every Day Counts.



Comparison of life cycle costs for two alternative maintenance strategies (Source: FHWA and Transport Scotland)

Access to and within the National Park System has been a defining experience for generations of visitors. The National Park Service coordinates the planning and implementation of transportation systems that improve the visitor experience and care for national parks by: **1) Preserving natural and cultural resources** **2) Enhancing visitor safety and security** **3) Protecting plant and animal species** **4) Reducing congestion** **5) Decreasing pollution.**



Typical mill and overlay pavement preservation treatment at Acadia National Park. (Photo credit: NPS)



Pavement preservation treatment at Shenandoah National Park. (Photo credit: NPS)



Kolob Canyon Road at Zion National Park after pavement preservation treatment. (Photo credit: NPS)

New Approach: Proactive Pavement Preservation

Preservation keeps good roads in good condition, rather than allowing them to fully deteriorate through their life cycle. The focus is on strategies that preserve and maintain existing good and fair roads, extending their life span at less cost than traditional approaches. A FHWA pavement preservation study found that a dollar spent on pavement preservation can halve the cost of maintaining a road through its life cycle.

Pavement preservation treatments include chip seals, slurry seals, hot mix asphalt (HMA) overlays, and crack seals, among others. These treatments can be applied to a road segment quickly, relative to major rehabilitation or reconstruction. Pavement preservation provides its best return when roads are in better condition (i.e., low-good and high-fair conditions). **The key to successful pavement preservation is choosing the right treatment for the right road, at the right time.**

Pavement preservation strategies can reduce or eliminate:

- » reactive solutions: costly, time-consuming rehabilitation or reconstruction of roads that have reached or exceeded their useful lives
- » traffic disruptions: a major issue for national park visitors, especially in the many cases where there may be only one road available
- » air pollution: pavement preservation requires less construction and traffic delays, resulting in fewer cars idling a queue and fewer volatile compounds released into the environment than traditional construction
- » work zone dangers: because the preservation treatments can be applied more quickly than full reconstruction, resulting in work zones needed for just days instead of weeks

Reactive Pavement Management Approach

The proactive pavement approach is a much better investment than the traditional “worst first” approach, where maintenance funds were used to perform expensive rehabilitation. Funds not being spent on rehabilitation were spent providing band-aid repairs to pavements that have deteriorated, were already failing, and were waiting their turn for rehabilitation and reconstruction. Soon after cosmetic repairs were made, the existing pavement failures were reflected through to the surface. The worst first approach results in roads in poorer condition, higher life-cycle costs, and diminished visitor experience than pavement preservation.