



PAVING PROCESSES THAT ARE EASIER ON THE ENVIRONMENT





A HISTORY OF ENVIRONMENTAL CONCERN



In 1983, E.J. Breneman changed from being a local Hot Mix Asphalt Producer and Construction Operation to become one of the country's most well known and respected Alternative Technologies Companies and an expert in Pavement Preservation and Reconstruction. And in that time we've found that using these alternate technologies is not only environmentally responsible, but also has financial benefits including:

- Lower operating costs
- Reduced waste sent to landfills
- Energy conservation and fuel savings
- Reduced harmful greenhouse gas emissions
- Reduced impact on adjacent roadways
- Roadway remains open
- 100% of old roadway is reused
- Conservation of non-renewable resources
- Reduced congestion
- Time savings

We utilize many special processes that can help both financially and environmentally. Some are pavement preservation processes that use less thickness of material, or are placed by a cold method, not hot, to conserve energy. Others are processes that use all the original asphalt material, correct sub base issues, and dry and modify soils. These processes help agencies deal with budget challenges and help defray the cost of building highways by extending their life. When that life is extended, new life is injected by the use of recycling.

OUR NUMEROUS GREEN PROCESSES INCLUDE:

COLD IN-PLACE ASPHALT RECYCLING – Saves the limited supply of Natural Resources

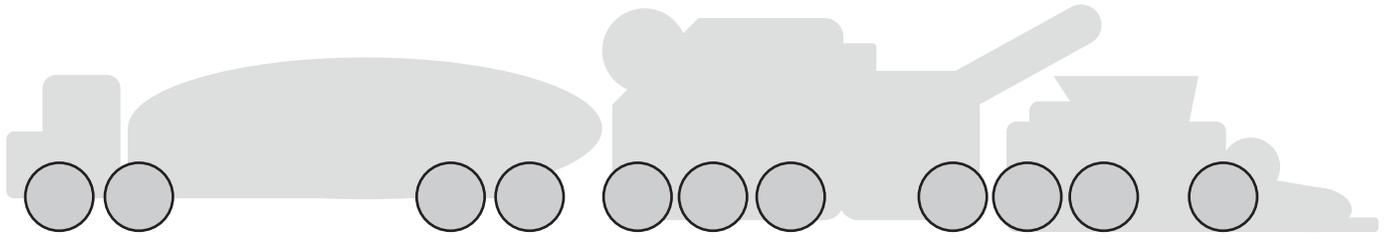
This innovative reconstruction process is a cost-effective alternative to more traditional methods of rebuilding asphalt roadways. It is used when the existing pavement has aged, cracked or deteriorated in other ways beyond the point where normal road maintenance practices are feasible. Cold In-Place Recycling makes use of the original aggregate and some of the old asphalt cement that bound those aggregates into binders and wearing courses. Not only is this older aggregate often the best quality, it eases demand on quality virgin aggregate, which is in limited supply in many areas.



THE COLD IN-PLACE ASPHALT RECYCLING PROCESS

1. Our unique Cold In-Place Recycling Train excavates the existing pavement to a depth of three to five inches to eliminate cracks, ruts and oxidized asphalt.
2. The machine's down-cutting action sizes the material and immediately blends it with a specially formulated asphalt emulsion that rejuvenates the old pavement.
3. The new mixture is re-laid and compacted as a new, more durable four to five inch asphalt base course at the proper grade and cross-slope for proper storm-water runoff.

State-of-the-art Cold In-place Asphalt Recycling can add years to the life of the original pavement. It has been used to reconstruct every type of asphalt-based roadway. Roads built with this process can now handle in excess of 25,000 vehicles. It is also used for airport taxiways and runways, as well as industrial, commercial and institutional roads and parking areas.



FULL DEPTH RECLAMATION – Completely reconstructs existing road material

Full Depth Reclamation deals with the full depth of the pavement, aggregate base, and in some cases, the soil or sub-base below, unlike Cold In-Place Asphalt Recycling that deals with just the old asphalt and sometimes the aggregate base.



Because Full Depth Reclamation reuses 100% of existing road material, no material is exported from the project site and land-filled or discarded as backfill. Roadways that have cracked and deteriorated as a result of poor sub-base structure can be completely reconstructed and strengthened. It is the perfect solution for rebuilding weakened pavements for highways, parking lots, airfields and industrial sites.

THE FULL DEPTH RECLAMATION PROCESS

1. A specially-designed reclaiming machine pulverizes the existing asphalt pavement along with a pre-determined amount of the road's underlying base material. Crack patterns are eliminated and a new, homogeneous stabilized road base is formed.
2. Special additives, such as asphalt emulsion, lime, calcium chloride or Portland cement, are often blended with pulverized materials to further strengthen and stabilize the road base.
3. The new base is shaped by a motor grader to the proper profile and compacted.
4. The new asphalt surface treatment or wearing course is added.

By using all of the in-place materials there is no need to import aggregates or other materials so fuel is saved transporting materials and idling trucks on job sites. The impact on adjacent roadways is also minimized, as the amount of construction vehicles is reduced to the delivery of additives for the mixing and stabilization processes.

SOIL STABILIZATION – For better roadways where the soil is unreliable

Soil Stabilization is used primarily when there is no stability. Stabilizing the soils or Soil Modification can be accomplished without moving the materials, a benefit when the logistics and cost of moving the material would place an unworkable financial and environmental burden on the project. Stabilization can increase the shear strength of soil and/or control the shrink-swell properties of soil, thus improving the load-bearing capacity of the sub-grade to support pavements and foundations.



THE SOIL STABILIZATION PROCESS

1. Soil stabilization is performed in much the same manner as Full Depth Reclamation. A reclaiming machine first pulverizes the soil material in question.
2. An additive is then placed on top of the pulverized material. The additive is mixed with the soil until the desired properties are achieved.
3. The new base is shaped by a motor grader to the proper profile and compacted.
4. The building pad or roadway materials are added to the specifications or design.

This process can vary depending on the soils and additives required. Soil Stabilization can be utilized on roadways, parking areas, site development projects, airports and many other situations where sub-soils are not suitable for construction. Stabilization also can be used to treat a wide range of sub-grade materials, varying from expansive clays to granular materials.

When unimproved roadways are stabilized and treated with the right additives, run-off of storm water will not cause erosion, which in turn sends thousands of tons of silt into our rivers and bays. This erosion clogs and silts vital waterways and silts over fish habitat that would have been spawning grounds for future generations. Soil Stabilization methods help to preserve soils, water ways, unimproved roadways and much more.

At E.J. Breneman we believe that we are the most environmentally aware company in the business, not only in our highway construction and maintenance processes but also in every other business process we use. That's why we can say – E.J. Breneman, AllWays Green.

GREEN HIGHWAYS FOR RED BUDGETS.

In addition to pavement recycling technologies like Cold In-Place Asphalt Recycling and Full Depth Reclamation, the highway system of the future must use other environmentally-friendly technologies and processes.

PAVEMENT PRESERVATION

Pavement Preservation is a strategy including all activities to provide and maintain serviceable roadways. It is a planned system of treating pavements to maximize their useful life. All pavements require some form of maintenance



due to the effects of traffic and the environment on the exposed pavement materials. Many times, the only treatment a pavement receives is crack filling or patching while surface distresses are ignored. Applying a surface treatment to a pavement with light to moderate distress can

greatly increase the life of a pavement. Pavement Preservation takes the maintenance process one step further by carefully choosing and timing treatment to extend the life of a pavement.

CRACK SEALING – A money-saving maintenance technique

Over time every asphalt surface develops cracks. If left untreated, these cracks can lead to serious road deterioration, as storm water will penetrate the pavement and erode the base below. As the base weakens, more cracks form in the surface and potholes occur. Treatment of any pavement should begin when the first crack appears, not when there are so many cracks that a day's work is required.

Crack Sealing is one of the most cost-effective and practical methods to prolong the life of any pavement. The process prevents continued damage to the base. Preventive maintenance can maximize pavement life, and any extended lifespan is environmentally beneficial to all.

We develop comprehensive Crack Sealing programs for customers who need to extend the lifespan of their roads and avoid the high cost of pavement reconstruction. These programs include:

- Polymer and rubber-modified systems
- Fiberized asphalts

MICRO-SURFACING – Time-saving, one-step maintenance

One of the fastest growing, most cost-effective ways to prolong pavement life and provide a safe traveling surface is a process called Micro-surfacing, an innovative environmentally-friendly method of maintaining a roadway surface.



Micro-surfacing applies a durable, polymer-modified asphalt seal to roads that have begun to show signs of aging and minor distress. By retarding the surface's natural breakdown, this process extends the highway's lifespan six to eight years.

We apply the material with specially-designed and calibrated equipment to cover the old pavement quickly and precisely. The materials are mixed and spread in a single, continuous operation, minimizing any disruption to traffic. Roadways can be re-opened to traffic within an hour after Micro-surfacing is applied.

By using Micro-surfacing at the right time of pavement distress, we can eliminate the need to apply additional layers of hot mix asphalt. There is no milling of old asphalt materials, no material is removed from the project site, and the only trucking of materials is from a localized staging area. The only construction equipment on the project site are the application trucks.

ULTRA THIN HOT MIX - Saves fuel, saves time, saves trucks

Our state-of-the-art Ultra Thin Hot Mix system combines the strength of hot mix with the flexibility of thin maintenance treatments. The Ultra Thin Hot Mix process combines a chip seal process with a hot mix process, producing a single-lift overlay that is significantly thinner (0.75 inch) than traditional hot mix asphalt applied at 1.5 inches thick.

In the one-pass process, which requires a specialized laydown machine, a Polymer-Modified Emulsion is applied as a primer to the existing pavement surface. Polymer-Modified Emulsion, which acts as a waterproofing membrane and a bonding agent, is followed immediately by the Ultra Thin Hot Mix.

The number of trucks required for the job is significantly reduced because of the thin mix and less tonnage of material needed. And because the roadways need not be milled, additional trucks needed for the removal and export of the millings from the project site to a storage area will not be needed. The thin lift also minimizes static loading on bridge decks. The Ultra Thin material cools quickly due to the "thin lift" which allows for a quick return to traffic. This application can be used on either an existing bituminous or Portland cement concrete pavement.

Ultra Thin Hot Mix saves valuable fuel and the time the roadway is out of service is minimal. Ultra Thin Hot Mix is an open graded hot mix asphalt so water simply enters the mix and moves between the stone on stone matrix and above the Polymer-Modified Emulsion to the storm water outlets and into storm drains.



America's extensive national highway system contains pavements and buildings that use large quantities of asphalt, concrete, steel and aggregate. Much of the system was constructed in the 60s and 70s and is now in need of rehabilitation or total reconstruction.

Many of the materials used to build that system can be recycled for use in new construction.

The same materials used to build the original highway system can be reused to repair, reconstruct and maintain them. Where appropriate, recycling of aggregates and pavement materials makes sound economic, environmental and engineering sense.

The economic benefits from the reuse of nonrenewable highway materials can provide a great boost to the highway industry. Recycling highway construction materials can be a cost-saving measure, freeing funds for additional highway construction, rehabilitation, preservation or maintenance.

Recycling also presents environmental opportunities which, when appropriately addressed, can maximize the benefits of reuse. The use of most recycled materials poses no threat or danger to the air, soil or water. Furthermore, careful design,

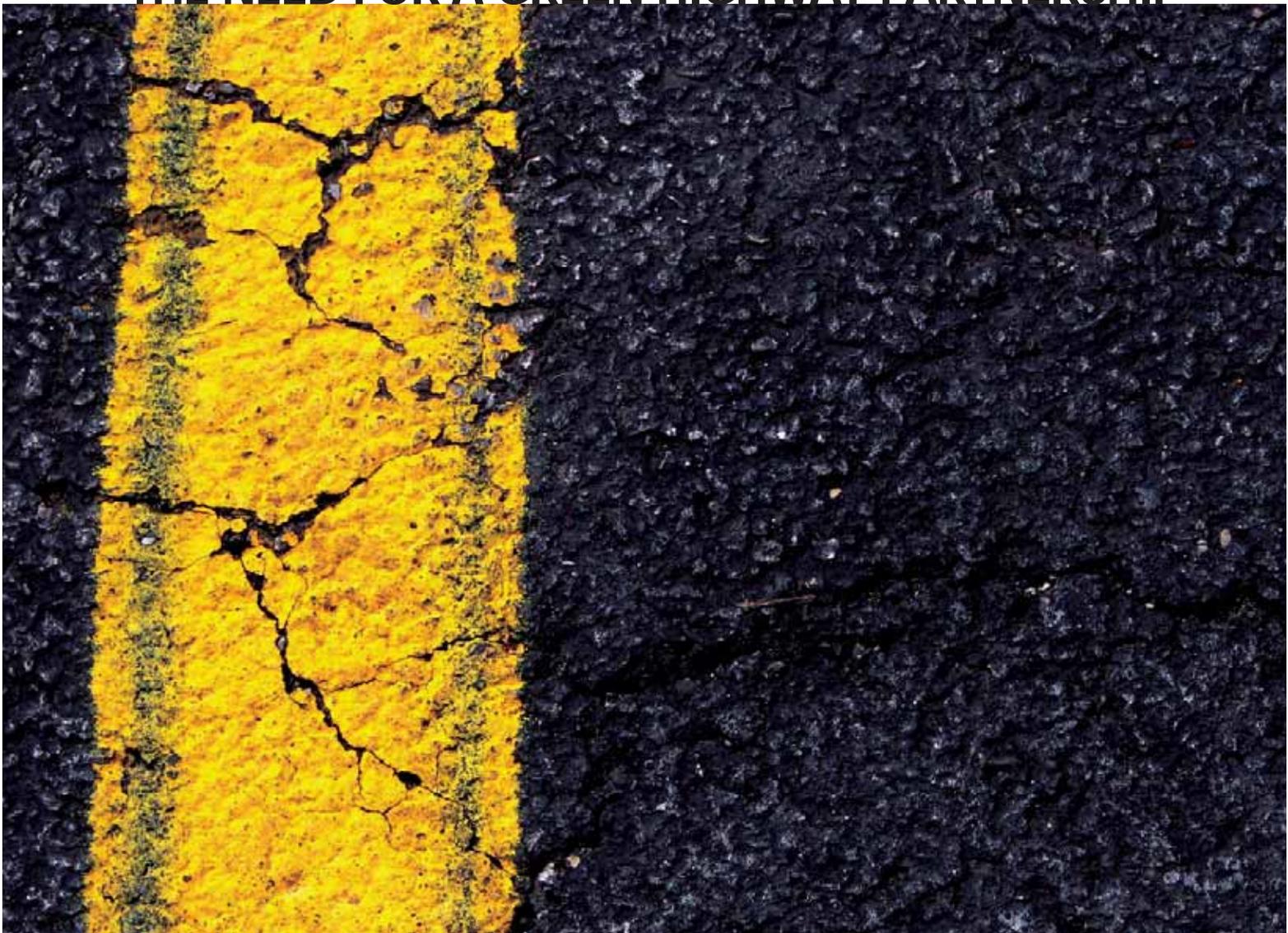
engineering and application of recycled materials can reduce or eliminate the need to search for or extract new, virgin materials from the land. And appropriately used, recycled materials effectively and safely reduce cost, save time, offer equal or, in some cases, significant improvements to performance qualities, and provide long-term environmental benefits.

The Green benefits go beyond recycling.

Until recently, energy costs, although significant, have not been a major cost driver for the road building industry. As a result, the industry has typically done little monitoring of its energy use. This concept is rapidly changing, and along with new and old technologies that re-build roads faster, cheaper and with recycled materials, a new era of energy responsibility is upon us.

Roadway building design and construction can make a major contribution to reducing climate change and can help secure the effort for sustainable highways. The benefits of pursuing green design and construction continue to expand, causing many diverse owner and contractor groups, as well as government agencies, to embrace these technologies in pavement preservation and construction. E.J. Breneman is proud to be a leader in this movement.

THE NEED FOR A GREEN HIGHWAY PARTNERSHIP





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E. J. Breneman, LP believes in being environmentally responsible by utilizing products and processes that are safe for the environment and by promoting recycling at all times.

- We will help to conserve our natural resources by promoting our road recycling process to the fullest extent possible.
- We will adhere to all environmental laws and regulations and will voluntarily apply the best technology and best practices to our operations.
- We believe in protecting the health and safety of our employees and customers.
- We believe in protecting the quality of the environment in which we operate.