Asphalt Pavements - Your Best Value
Uses for Asphalt

Highways

Airports

Intersections

Recreational

Industrial

HMA – Your Best Value
Paved Miles by Surface Type

There’s a reason that 94% of all paved surfaces are ASPHALT!

HMA – Your Best Value
Asphalt Pavements Are

- Smooth
- Quiet
- Economical
- Safe
- 100% recyclable
- Easy to maintain at a high level of serviceability
- Environmentally friendly
- Versatile
- State-of-the-art
- High-visibility markings
- Less user delay

HMA – Your Best Value
Asphalt Pavements Are

SMOOTH
Ride Quality

HMA – Your Best Value
Asphalt Pavements are Smooth

The ability to pave uninterrupted and the absence of joints every 20 feet result in SMOOTH pavements.
Pavement Condition Index

NCHRP 1-31 estimated 15% increase in pavement life for 50% increase in smoothness

HMA – Your Best Value
Smooth pavements, such as the recent Sheldon G. Hayes award winner last longer, are safe, save gasoline, decrease wear and tear on vehicles and are enjoyable to drive.
At WesTrack

The average IRI number decreased by 10%, resulting in a 4.5% increase in miles/gallon
Asphalt Pavements Are Safe

SMOOTH | DURABLE | SAFE | QUIET
Asphalt Pavements are Skid Resistant

Inherently, some aggregates offer better skid resistance over a longer period of time. Asphalt pavements allow the specifying agency to choose a skid resistant aggregate based on traffic volume.
Asphalt Pavements

Provide visibility of pavement markings

HMA – Your Best Value

SMOOTH | DURABLE | SAFE | QUIET
Asphalt Pavements Are ECONOMICAL
Asphalt Pavements are Economical

A review of Ohio’s Interstate compared asphalt and pcc pavements ranging in age from 25 to 34 years old. The asphalt pavements were lower in initial costs with an ever widening gap throughout the life of the pavement.

An important note is the asphalt pavements have provided 25 to 34 years of service without the need for reconstruction or rehabilitation.
Ohio Compares HMA and PCC

Present Worth in 1960 of Total Contract Costs (5% Discount Rate)

Interstate 71
Flexible: FRA-28.92 to DEL-11.50
Rigid: RIC-0.00 to MED-17.46

COST ($/SY)

Interstate 71
Flexible: FRA-28.92 to DEL-11.50
Rigid: DEL-11.50 to RIC-0.00 (Reconstructed in 1988)

COST ($/SY)
Asphalt Pavements Are Economical

FHWA's Price Trends

Note: price for pcc surfacing does not include costs for reinforcing steel and joints.

Source: FHWA Price Trends for Federal-Aid Highway Construction, Annual Average - 2006

HMA – Your Best Value

SMOOTH | DURABLE | SAFE | QUIET
Asphalt Pavements are Durable

“Clearly, the majority of the AC overlays included in the LTPP database have served for 15 years or more before the load related and non-load-related distresses became sufficient to require rehabilitation.”
Asphalt Pavements Can Be

Constructed Quickly
And Efficiently

HMA – Your Best Value

SMOOTH | DURABLE | SAFE | QUIET
Constructed Quickly and Efficiently

ASPHALT VS. CONCRETE

HMA – Your Best Value

SMOOTH | DURABLE | SAFE | QUIET
With an 18-wheeler roaring past, a road crew with Southern Pavers of Pine Bluff works on laying a new concrete section in the left lane of Interstate 40 near Hazen on Tuesday. The approval of a $575 million bond issue will bring repairs and delays for motorists to interstates throughout the state.

**Road work ahead — and so are barrels**

Orange plastic drums can mean difference between life, death for highway crews.

"As you travel, please be patient with the construction inconvenience. They are forewarners of the better roads of tomorrow."

— Introduction in Arkansas highway map, 1987

**BY NOEL L. OMANN**

Arkansas Editor Napierette

To state and civic boosters, the orange barrels that line long segments of interstates in Arkansas can be signs of progress. To see them now is to see a better road later.

To motorists, they signal delay. The congestion, frustration and missed appointments they can prevent belie the notion of the open road.

To Michael Offord, the 65-pound hollow, plastic drums represent the divide between life and death.

"Now I know," Offord said one recent morning over the uninterrupted roar of traffic going past the work site of Southern Pavers of Pine Bluff. "It's kind of scary. You have to stay alert."

Thirty-two people were killed in 1997 in work zone related crashes in Arkansas, according to the National Highway Traffic Safety Administration. Nationwide, the death toll was 55 that year, the latest for which statistics are available. The 75,000 crashes reported nationally in traffic work zones.
Asphalt Can Reduce User Delay by 75%

**MDOT Hourly Distribution** (Off-peak paving)

<table>
<thead>
<tr>
<th>Time (12 AM - 5 AM)</th>
<th>Delay (min)</th>
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<tr>
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<td>22 - 23</td>
<td>2.6</td>
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<tr>
<td>23 - 24</td>
<td>2.1</td>
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</table>

25%
Can Reduce User Delay by 75%

Ability to Mill and Pave in Off-Peak Hours
Asphalt Pavements are Quiet

Shhhhh!
Conclusions: “In general, when dense-graded asphalt and PCC pavements are compared, the dense-graded is quieter by 2 to 3 dB(A)”

A 3dB(A) reduction corresponds to:
- doubling the distance (line source)
- reducing the traffic volume by 50%
- reducing the traffic speed by 25%
“Where traffic noise is just loud enough to justify building noise barriers to protect adjoining homes and businesses, the substitution of an open-graded wearing course can reduce the noise to an acceptable level. The cost is about 1/8 of a noise barrier on one side of the highway, or 1/16 on both sides of the highway. Not only does this technique save tax dollars, but the road is environmentally and aesthetically superior.”
Asphalt Pavements Are Environmentally Friendly

HMA – Your Best Value

SMOOTH | DURABLE | SAFE | QUIET
Environmentally Friendly

California has been specifying asphalt liners for water containment facilities since the 1950s.

After 18 months in the asphalt-lined pond the salmon are released. In Oregon they have “had good results rearing quality fish in the asphalt-lined ponds”.

HMA – Your Best Value
Environmentally Friendly

Ludington Pumped Storage Facility

HMA – Your Best Value
Porous asphalt Pavements

- Conserves water
- Allows for better use of land
- Reduces runoff
- Promotes infiltration
- Cleans stormwater
- Replenishes aquifers
- Protects streams
What are Porous Pavements?

Open-Graded HMA ~ 2 ½”
½” Agg. (#57) ~ 1 – 2” Thick
Clean Uniformly Graded 2”-3” Crushed Agg. (#2) – 40% Voids
Non-Woven Geotextile
Uncompacted Subgrade

HMA – Your Best Value
RAINFALL: 45"
EVAPORATION-TRANSPIRATION: 22"

SOIL
FRACTURED BEDROCK
INfiltration
AQUIFER
RUNOFF: 8"
BASEFLOW: 15" or 1,120 gpd/acre

HMA – Your Best Value
SMOOTH | DURABLE | SAFE | QUIET
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HMA – Your Best Value
Porous asphalt Pavements

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Porous asphalt Pavements

HMA – Your Best Value

SMOOTH | DURABLE | SAFE | QUIET
Porous asphalt Pavements

HMA – Your Best Value
Asphalt Pavements Are

100% Recyclable
100% Recyclable
Asphalt Pavements are 100% Recyclable
AND the Surprise Leader in Recycled Materials

Recycling Rates
- Asphalt pavement: 80%
- Aluminum cans: 60%
- Newsprint: 56%
- Plastic bottles: 37%
- Glass bottles: 31%
- Magazines: 23%
100% Recyclable

Recycling is unique to asphalt pavements.

- Results in an economic savings
- Conserves natural resources:
  - energy
  - aggregate
  - asphalt cement
Recycle (HMA) or Landfill (PCC)

HMA – Your Best Value

SMOOTH | DURABLE | SAFE | QUIET
Asphalt Pavements are State-of-the-Art

Strategic Highway Research Program

- 5 Years, $150 million
- asphalt ($50 million)
- cement and concrete
- long term pavement performance
- pavement effectiveness
- bridge protection
- snow and ice control
Superpave

SHRP Asphalt Binder Spec

- Grading System Based on Climate

Performance Grade → PG 64-22 → Min pavement design temp

Average 7-day max pavement design temp

HMA – Your Best Value
Asphalt Pavements Are State-of-the-Art

HMA – Your Best Value

SMOOTH | DURABLE | SAFE | QUIET
Educational Opportunities

University Professor Training

Technician Training

HMA – Your Best Value

SMOOTH  |  DURABLE  |  SAFE  |  QUIET
Funding for Research

NCAT Test Track

NATC

HMA – Your Best Value

SMOOTH | DURABLE | SAFE | QUIET
Asphalt Pavements Are

Versatile

HMA – Your Best Value

SMOOTH | DURABLE | SAFE | QUIET
Perpetual Pavement

• Not a new concept
  – Full-Depth
  – Deep Strength
  – Mill & Fill
Perpetual Pavement

1.5 - 3” SMA, OGFC or Superpave

4” Zone Of High 6” Compression

High Modulus Rut Resistant Material (Varies As Needed)

Max Tensile Strain

Flexible Fatigue Resistant Material 3 - 4”

Pavement Foundation

HMA – Your Best Value
Perpetual Pavement

- Bottom-up Design and Construction
- Foundation
  - Stable Paving Platform
  - Minimize Seasonal Variability and Volume Change in Service
- Fatigue Resistant Lower Asphalt Layer
- Rut Resistant Upper Asphalt Layers
Perpetual Pavement

Possible Distresses

› Top-Down Fatigue
› Thermal Cracking
› Raveling

Solutions

› Mill & Fill
› Thin Overlay

2 - 4” Structure Remains Intact

High Quality SMA, OGFC or Superpave

20+ Years Later
Rubblize PCC Pavement

Ability to Rubblize worn out pcc pavements and rehabilitate quickly and efficiently with hot mix asphalt.
Rubblize PCC Pavement
Reflection Cracking

• By far, the biggest problem in HMA overlays of PCC pavement
• Caused by movement at PCC joints and cracks
Rubblize PCC Pavement

Larger Pieces = Larger Movement = Cracking

HMA

PCC

HMA – Your Best Value

SMOOTH | DURABLE | SAFE | QUIET
Rubblize PCC Pavement

Smaller Pieces = Smaller Movement = No Cracking

HMA

PCC

HMA – Your Best Value

SMOOTH | DURABLE | SAFE | QUIET
HMA Ultra-Thin

High Value Pavement Enhancement

HMA – Your Best Value

SMOOTH | DURABLE | SAFE | QUIET
HMA Ultra-Thin

HMA – Your Best Value

SMOOTH | DURABLE | SAFE | QUIET
HMA Ultra-Thin

HMA – Your Best Value

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HMA Ultra-Thin

HMA – Your Best Value

SMOOTH | DURABLE | SAFE | QUIET
HMA Ultra-Thin

Fancher Street, Mt. Pleasant – 6 years old

HMA – Your Best Value

SMOOTH | DURABLE | SAFE | QUIET
## Preventive Maintenance Treatment Cost Comparison

<table>
<thead>
<tr>
<th>Treatment</th>
<th>$/syd</th>
<th>Cost/mile (24’ wide)</th>
<th>MDOT Life extension range (years)</th>
<th>MDOT Life extension range average (years)</th>
<th>Cost/mile* per year</th>
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</thead>
<tbody>
<tr>
<td>Double chip seal</td>
<td>$2.35</td>
<td>$33,088</td>
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<td>$7,353</td>
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<tr>
<td>Micro-surface</td>
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<td>$33,088</td>
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<td>Ultra-thin low</td>
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<td>$5,672</td>
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Average Life Extension estimated by APAM
Unit Prices based on MDOT Information

HMA – Your Best Value  
SMOOTH | DURABLE | SAFE | QUIET
Asphalt Pavements

Allow for stage construction

HMA – Your Best Value

SMOOTH | DURABLE | SAFE | QUIET
Asphalt Pavements Are

Easy to Maintain at a High Level of Serviceability
Asphalt Pavements Are

Convenient when making utility cut repairs

HMA – Your Best Value
Asphalt Pavements Are

Architect Friendly

Historical areas, cross-walks, driveways, etc. have the option to choose a variety of brick patterns in varying colors.
Asphalt Pavements Are BEAUTIFUL!

HMA – Your Best Value

SMOOTH | DURABLE | SAFE | QUIET
No wonder 94 times out of 100 “Your Best Value is Hot Mix Asphalt”  

Thank You!