WAPA
WISCONSIN ASPHALT PAVEMENT ASSOCIATION

Wisconsin Town's Association Town Road School

WTA

April 29, 2026

Wisconsin Asphalt Pavement Association

Statewide, non-profit established in 1948 representing the interests of the asphalt paving industry in Wisconsin including:

- Asphalt Design
- Construction
- Maintenance
- Specifications
- Costs
- Marketing
- Policy (local, state, and federal levels)

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Mission, Vision, Values and Goals

Updated 2017

Mission

Promote quality asphalt pavements, which are safe, environmentally friendly and cost-effective.

Vision

Professional organization dedicated to making asphalt the pavement of choice.

Values

Stewardship

Providing benefits and solutions that are in the best interest of our customers.

Excellence

Providing quality products and services that exceed our customers' expectations.

Innovation

Making well-designed pavements that are smooth to ride and built to last by implementing research and innovation.

Professionalism

Working as a well-respected organization capable of meeting the needs of its membership with the highest level of integrity and standards.

Accountability

Supporting the needs of our membership and serving as a voice for the asphalt industry.

Goals

Communicating the Benefits of Asphalt

The Wisconsin Asphalt Pavement Association (WAPA) represents member interests on a wide range of issues related to asphalt design, construction, maintenance, technical specifications, costs, marketing, and public policy at all levels of government (local, state, and federal). The Association serves as a liaison between the asphalt paving industry and a broad range of stakeholders including government agencies, the transportation industry, asphalt pavement customers, media, and the citizens of Wisconsin.

Education and Outreach

WAPA works to educate professional engineers, government employees, and the public at large about the latest advancements in asphalt technology as well as the advantages and benefits of asphalt pavements.

Partnerships

WAPA maintains strong working relationships at the state and national levels through fostering partnerships with industry leaders, key stakeholders, and asphalt research and development authorities.

Advocacy

WAPA provides information and solutions through proper planning, analysis, design, construction techniques, and maintenance practices to help keep asphalt the number one pavement of choice in the state.

About

Established in 1948, WAPA (wispave.org) is a statewide, non-profit organization representing the interests of the asphalt industry in Wisconsin. WAPA members include asphalt mixture producers, paving contractors, liquid asphalt suppliers, and associate members who support the industry by providing quality pavements, materials, and services.

Our Industry

- Wisconsin Asphalt Members
  - Asphalt Pavement Producers
    - 75 facilities
    - 3,600 employees
  - Aggregate Resource Provider (Pits & Quarries)
    - 275 locations
    - Distributed throughout the state (facility in every county)
  - Others
    - Liquid suppliers, maintenance contractors, equipment manufacturers, engineering consultants, testing facilities, etc.

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Education and Outreach

Education

- Latest advancements in asphalt technology
- Benefits of asphalt pavements
  - Customers
  - Professional Engineers
  - Government Employees
  - General/Driving Public

Education

- Lunch & Learn Sessions
  - Members and Customers
- WisDOT Going Visiting Meetings
  - Each Region
- HMA Inspection Trainings
- WAPA programs
  - Annual Conference and Webinars

WAPA Annual Conference

- December 1-2, 2026
  - Kalahari Resort, Wisconsin Dells
- Over 375 attendees
  - WisDOT/NAPA Updates
  - Work Zone Safety/Perpetual Pavements on IL Tollway/Balanced Mix Designs
  - Technical Breakout Sessions
- Revenue Neutral

Outreach

- WAPA Asphalt Awards
  - Recognize technological advancements and innovations in asphalt pavements for three categories:
    - State (WisDOT Region or Office)
    - Local (City, County, Town, or Village)
    - Business (Commercial, Private or Association)

Outreach

- WAPA Student Scholarships
  - Engineering Scholarship
    - All Civil/Construction Engineering students at Marquette University, UW-Madison, UW-Milwaukee, UW-Platteville, UW-Stout, Milwaukee School of Engineering & Michigan Tech are eligible
  - Engineering Technician Scholarship
    - All Engineering Technician students at Chippewa Valley, Madison area, Mid-State, Northeastern WI & Milwaukee Area Technical Colleges are eligible

Outreach

- Environmental Leadership Award
  - Created with WDNR to recognize asphalt plants that have exceeded the already high environmental standards set for our industry
  - To recognize those that have achieved environmental excellence above and beyond what is required

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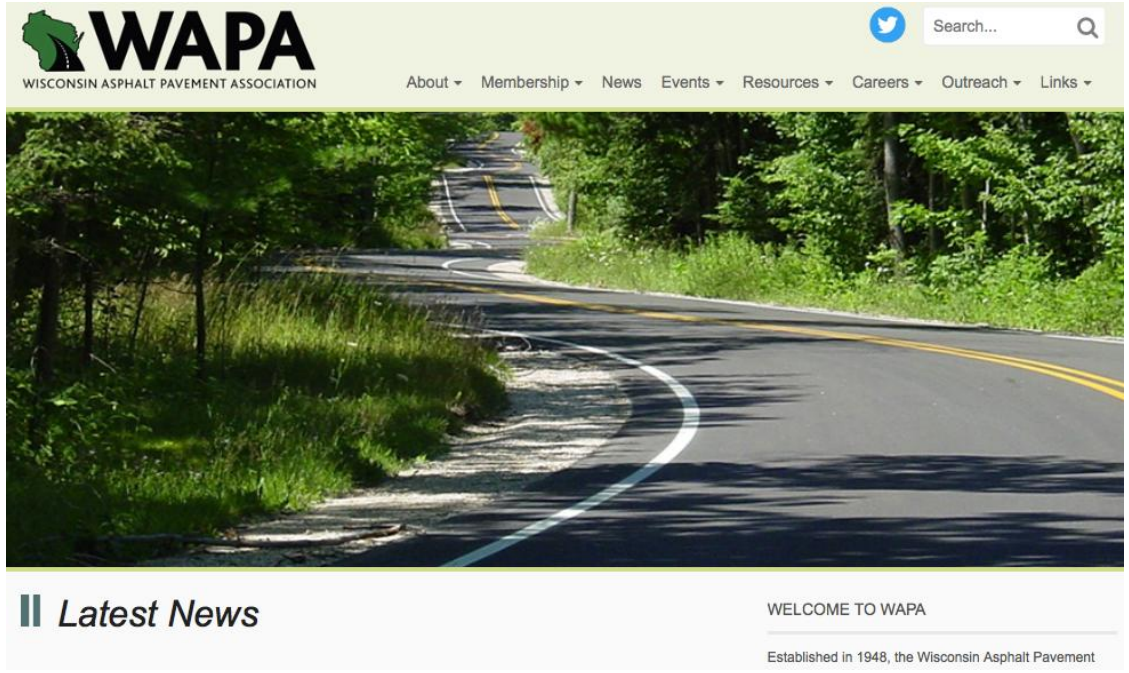
Advocacy

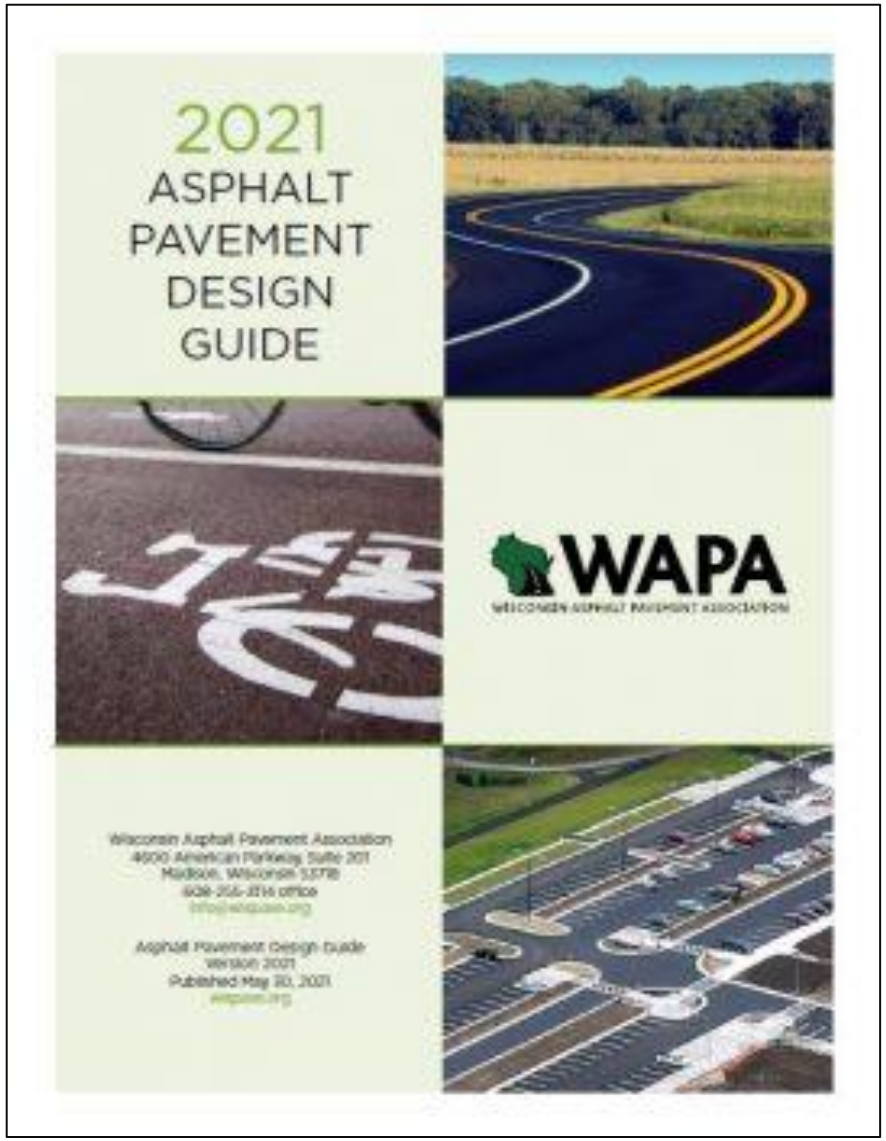
WAPA Resources

- www.wispave.org
  - 11,000 visitors annually
- WAPA News
  - Sent bi-weekly
  - More than 5,200 contacts
- Industry Insider
  - Updates from Associate Members offered twice a year



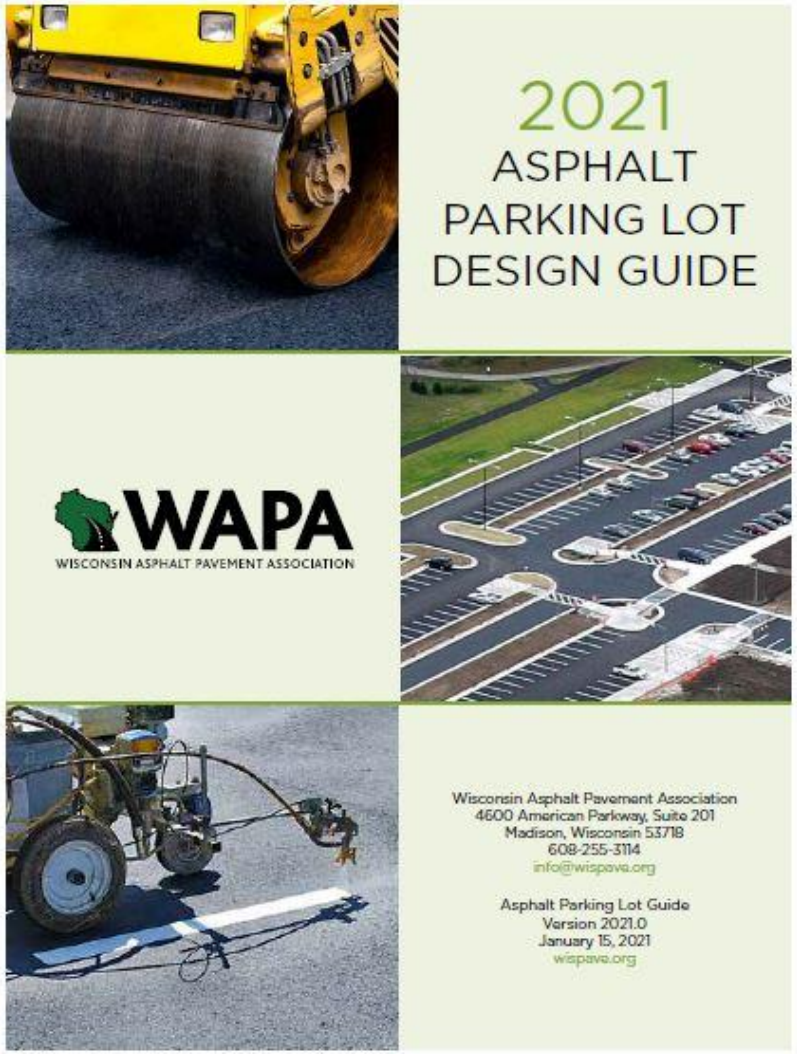
Asphalt Pavement Design Guide

- Updated in 2021
  - This guide builds on core information provided in WisDOT's Standard Specifications to address a wide range of topics related to asphalt pavement design in Wisconsin
  - Incorporation of the latest WisDOT design guidance found in the 2022 standard specifications recently published by WisDOT
  - Additional updated guidance and links throughout the guide



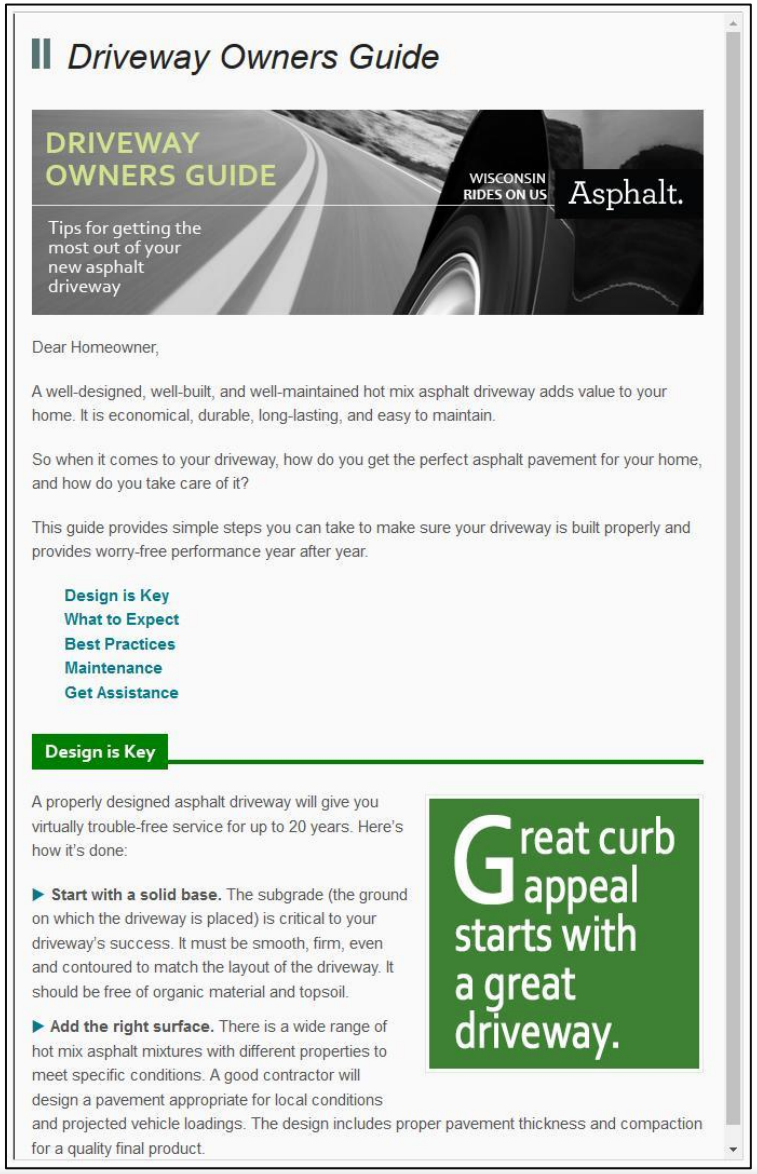
Asphalt Parking Lot Design Guide

- Updated in 2021
  - This companion to WAPA's Asphalt Pavement Design Guide focuses on all phases of asphalt parking lot design
  - Assessment and Planning
  - Subgrade and Drainage
  - Construction
  - Maintenance
  - References
  - Comprehensive 61-point inspection checklist to help an on-site inspector identify key processes and follow best practices



Driveway Owners Guide

- Addresses questions tailored to residential pavement owners
- Provides simple steps anyone can take to make sure their driveway is built properly
- Table of Contents:
  - Design is Key
  - What to Expect
  - Best Practices
  - Maintenance
  - Get Assistance



Driveway Owners Guide

DRIVEWAY OWNERS GUIDE

Tips for getting the most out of your new asphalt driveway

WISCONSIN RIDES ON US Asphalt.

Dear Homeowner,

A well-designed, well-built, and well-maintained hot mix asphalt driveway adds value to your home. It is economical, durable, long-lasting, and easy to maintain.

So when it comes to your driveway, how do you get the perfect asphalt pavement for your home, and how do you take care of it?

This guide provides simple steps you can take to make sure your driveway is built properly and provides worry-free performance year after year.

Design is Key
What to Expect
Best Practices
Maintenance
Get Assistance

Design is Key

A properly designed asphalt driveway will give you virtually trouble-free service for up to 20 years. Here's how it's done:

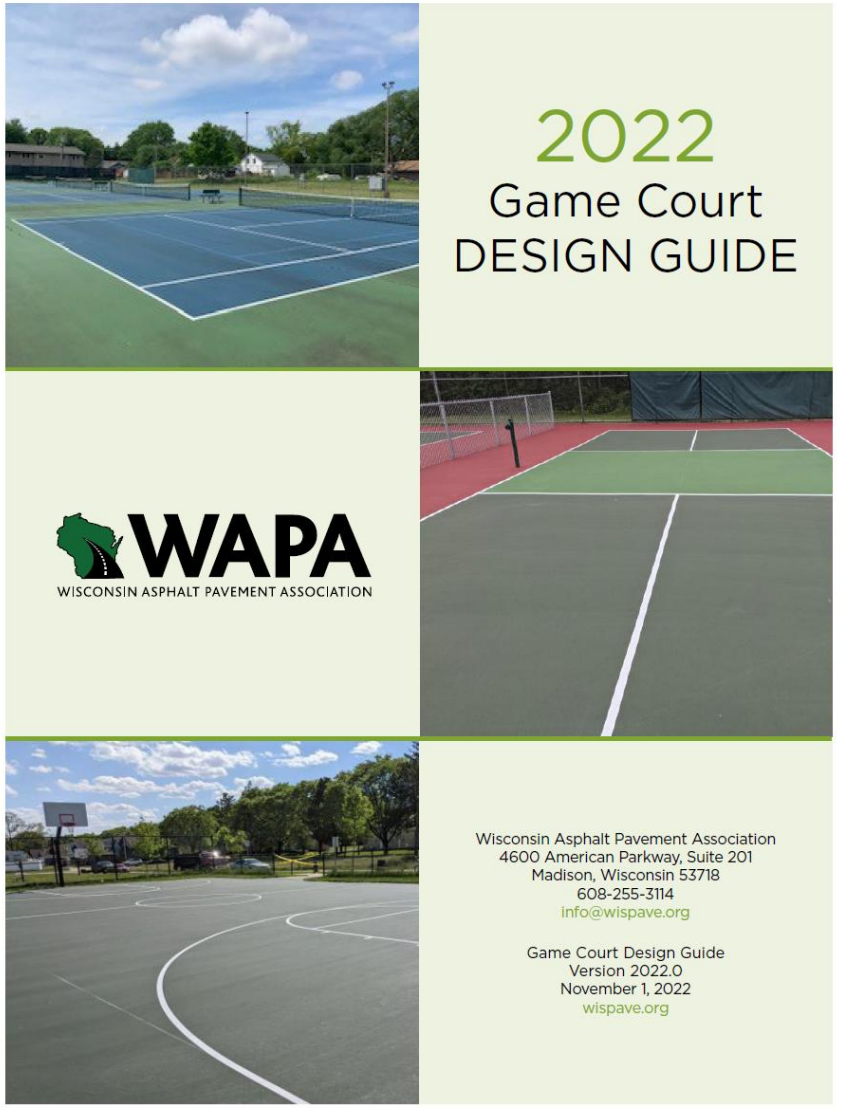
Great curb appeal starts with a great driveway.

▶ **Start with a solid base.** The subgrade (the ground on which the driveway is placed) is critical to your driveway's success. It must be smooth, firm, even and contoured to match the layout of the driveway. It should be free of organic material and topsoil.

▶ **Add the right surface.** There is a wide range of hot mix asphalt mixtures with different properties to meet specific conditions. A good contractor will design a pavement appropriate for local conditions and projected vehicle loadings. The design includes proper pavement thickness and compaction for a quality final product.

Game Court Design Guide

- New in 2022
  - Consumer demand for outdoor game court installations-such as basketball, tennis, pickleball courts, etc.-continues to rise
  - But while the playing surface of these courts may appear different, below the surface they're generally constructed the same way using hot mix asphalt (HMA)
  - We have developed this guide to help owners, contractors, design professionals, and suppliers in the design and installation of HMA for athletic purposes



Porous Asphalt Tech Bulletin

- A detailed guide to the design, construction and maintenance of porous asphalt pavements
- Combines latest national best practices with Wisconsin-specific guidance and will be of value to pavement owners, designers and builders

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TECHNICAL BULLETIN

Porous Asphalt Pavements

Introduction

Porous asphalt pavements with stone reservoirs are a multifunctional, low impact development technology that integrate ecological and environmental goals for a site with land development goals, reducing the net environmental impact for a project.

Not only do they provide a strong pavement surface for parking, walkways, trails, and roadways, they are designed to manage and treat stormwater runoff. With proper design and installation, porous asphalt pavements can provide a cost-effective solution for stormwater management in an environmentally friendly way.

As a result, they are recognized as a best practice by the U.S. Environmental Protection Agency (U.S. EPA) and many state agencies (New Jersey Department of Environmental Protection, 2009; Pennsylvania Department of Environmental Protection, 2006; U.S. EPA, n.d.).

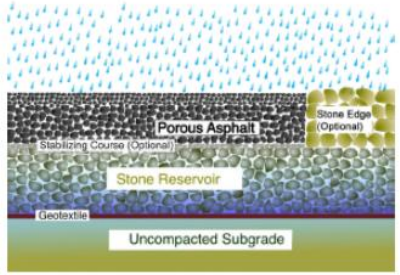

Figure 1. Cross section of typical porous asphalt pavement with stone reservoir (Image courtesy of FHWA)

Unlike conventional pavements, porous asphalt pavements (Figure 1) are typically built over an uncompacted subgrade to maximize infiltration through the soil. Above the uncompacted subgrade is a geotextile fabric, which prevents the migration of fines from the subgrade into the stone recharge bed while still allowing for water to pass through.

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LIST OF FIGURES

LIST OF TABLES

September 2015

Additional Resources

- Economics
  - Life Cycle Cost Analysis for Pavement Selection
  - How Pavement Influences Vehicle Fuel Economy
- Engineering
  - Perpetual Asphalt Pavements
  - Pavement Structure Design
- Environment
  - Asphalt: The Sustainable Pavement
  - Warm-Mix Asphalt: The Future of Asphalt

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The Basics

Asphalt Alphabet Soup

The Mixture Itself…AKA

- HMA-hot mix asphalt
- Hot mix
- Asphalt
- Asphaltic concrete
- Macadam
- Blacktop

What is HMA made of?

- Aggregates
  - Load bearing components
    - Skid resistance, stability, workability
- Asphalt Binder
  - Glue/muscle that holds everything together
    - Flexibility, durability
- Air
  - Accommodates particle alignment
    - Allows proper compaction for the pavement to remain flexible

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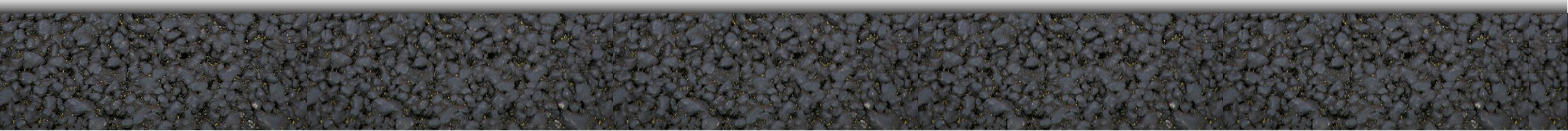
Aggregates

Aggregates

- Limestone/Sandstone/Dolomite/Granite
- Natural Sands (Pits or Quarries)
- Manufactured Sands
- RAM (Recycled Asphaltic Materials)
  - RAP-Reclaimed Asphaltic Pavements
    - Recycled Asphaltic Pavements
    - May be fractionated into different sizes, then identified as FRAP
  - RAS-Recycled Asphalt Shingles
    - Tear offs or manufactured waste
    - Limited to 5% total weight

- Important physical properties:
  - Gradation & Size
  - Particle Shape
  - Toughness
  - Durability / Soundness
  - Cleanliness (deleterious materials)
  - Absorption
  - Specific Gravity
  - Adhesion
  - Surface Texture



Sizes of Aggregates

- Nmas
  - Nominal Maximum Aggregate Size
  - Metric sizes
    - 4.75mm ¼”
    - 9.5mm $^{3}/_{8}$”
    - 12.5mm ½”
    - 19.0mm ¾”
    - 25.0mm 1”
    - 37.5mm 1 ½”

4.75 mm (No. 6)

9.5 mm (No. 5)

12.5 mm (No. 4)

Mixture Nmas Gradations

19.0 mm (No. 3)

25.0 mm (No. 2)

37.5 mm (No. 1)

Asphalt Mixture Determination

- Traffic Levels
  - LT-low traffic (40 gyrations)
  - MT-medium traffic (75 gyrations)
  - HT-high traffic (100 gyrations)

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Asphalt Binders

Asphalt Binder…AKA

- Asphalt
- Binder
- Bitumen
- Oil
- Asphaltic cement
- Tar (incorrect, tar comes from coal)

Performance Graded Binder Grading

PG 58-28

Performance Grade

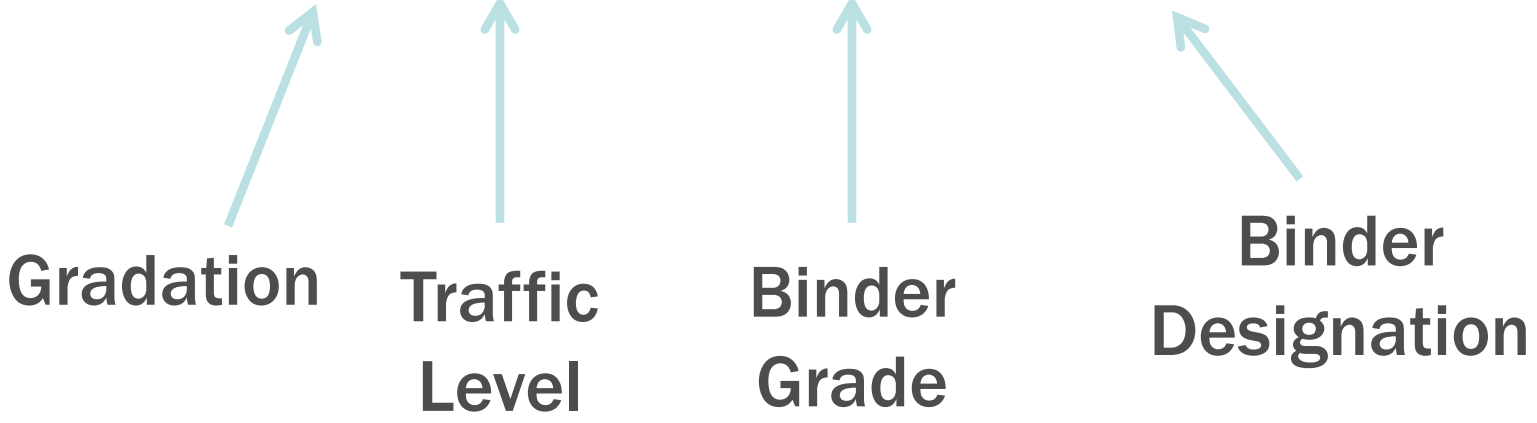
Average 7-day maximum pavement design temp
(58 °C / 136 °F)
To Resist Rutting

Minimum pavement design temp
(- 28 °C / - 18 °F)
To Resist Cracking

Asphalt Binder Designation

- Binder grades to be based on expected traffic level:
  - S – Standard (normal projects)
  - H – Heavy (slow moving traffic, higher truck movements, roundabouts, turn lanes, etc.)
  - V – Very Heavy (extreme traffic, very slow traffic, stopping and starting)
  - E – Extremely Heavy (toll booths, port facilities-currently not part of the WisDOT matrix)

4 LT 58-28 S



Example:

- Gradation = 12.5 mm
- Traffic Level = < 1 million ESALs
- Binder Grade = 58-28
- Binder Designation = Standard

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Mixture Classifications

Mix Classifications

- Open Graded
  - OGFC-open graded friction course
- Gap Graded
  - SMA-stone matrix asphalt
    - Stone mastic asphalt
- Dense Graded
  - HMA-hot mix asphalt
  - WMA-warm mix asphalt

Dense Graded Mixes

- Further be classified as either
  - Fine graded
  - Coarse graded

Simply put, fine graded mixes have more fine sand size particles than coarse graded mixes but both are well blended/graded

*Wisconsin uses fine graded mixtures

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Testing

Benefits of air void regression

- Addition of virgin asphalt binder (approx. 0.3-0.4%)
- Increased durability, increased asphalt film thickness
- Increased in place density/decreased permeability
- Improved workability

Other Binder Material Terms

- Polymer modified asphalts (PMA)
- Ground tire rubber (GTR)
- Rejuvenating agents (RAs)

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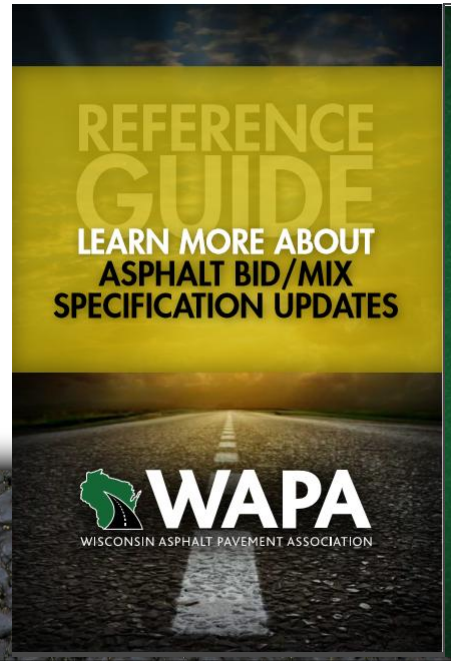

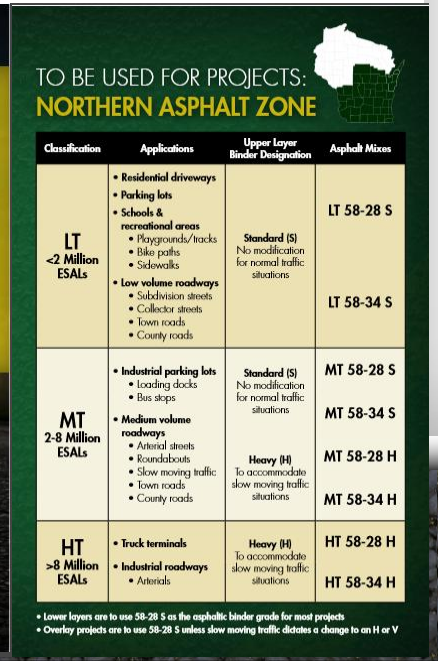

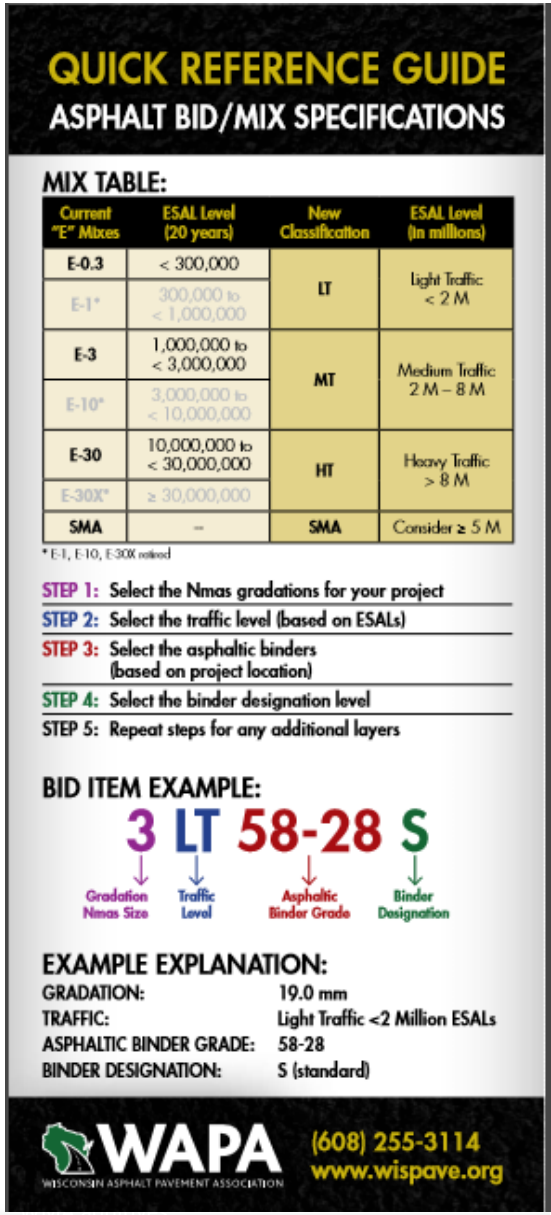

What is WMA made of?

- Aggregates
  - Load bearing components
    - Skid resistance, stability, workability
- Asphalt Binder
  - Glue/muscle that holds everything together
    - Flexibility, durability
- Air
  - Accommodates particle alignment
    - Allows proper compaction for the pavement to remain flexible
- Additive
  - Incorporates warm mix technology

How does the WMA technology work

- WMA technologies reduce the viscosity of the asphalt binder so that aggregates can be coated at lower temperatures
- Reducing the viscosity also makes the mixture easier to compact at lower temperatures

Keeps the mix workable longer

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Warm Mix Asphalt Technologies

WMA Technologies

- Chemical additive
  - Reduces internal friction between the asphalt binder and aggregates
- Organic additive
  - Mainly waxes (natural or synthetic) and fatty amides
- Water-based additive
  - Foaming process: water, which is added to the hot binder, turns into steam allowing the expansion of the binder
- Water-bearing additive
  - Induce foaming mechanisms in the asphalt binder using water bearing additives

WMA Technologies

- Most can be added at the asphalt terminal or added at the plant
- Chemical additive dosage rates depend on the selected additive and purpose of the mixture
  - Mix temperature reduction
  - Compactive aid
    - Cold Weather Paving

Other Asphalt Mixture Types

- Hot Mix Asphalt-HMA
- Warm Mix Asphalt-WMA
- Cold Mix Asphalt-CMA
- Cold Patch Asphalt
- Cold Central Plant Recycling-CCPR
- Cold In Place Recycling-CIR
- Hot in Place Recycling-HIR

Other Asphalt Mixture Types

- Cold Mix Asphalt-CMA
  - Virgin Aggregates
  - Gradation
  - Cutback PG binders
  - Aggregates can be Hot/Warm/Cold
  - Typically overlaid
- Cold Patch Asphalt
  - Same as above, but used for temporary patching

Other Asphalt Mixture Types

- Cold Central Plant Recycling-CCPR
  - Milled Material (mixed through a plant)-ambient temperature
  - Foamed or Emulsified Binder
  - Must be overlaid
- Cold In Place Recycling-CIR
  - Milled Material (mixed in the field)-ambient temperature
  - Foamed Binder
  - Must be overlaid

Other Asphalt Mixture Types

- Hot in Place Recycling-HIR
  - Scarified/Heated Material (Mixed in the field)
  - Rejuvenating Asphalt
  - Must be overlaid

In Summary

- The goals were to explore the world of Hot Mix Asphalt (HMA), focusing on its fundamental components and industry-specific terminology
- Hopefully you gained a clear/clearer understanding of the essential elements making up HMA, as well as to familiarize yourselves with key terms
- Whether new to the field, or looking for a refresher, I hope that this session provided foundational knowledge needed to navigate the intricacies of asphalt paving

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Questions

Thank you

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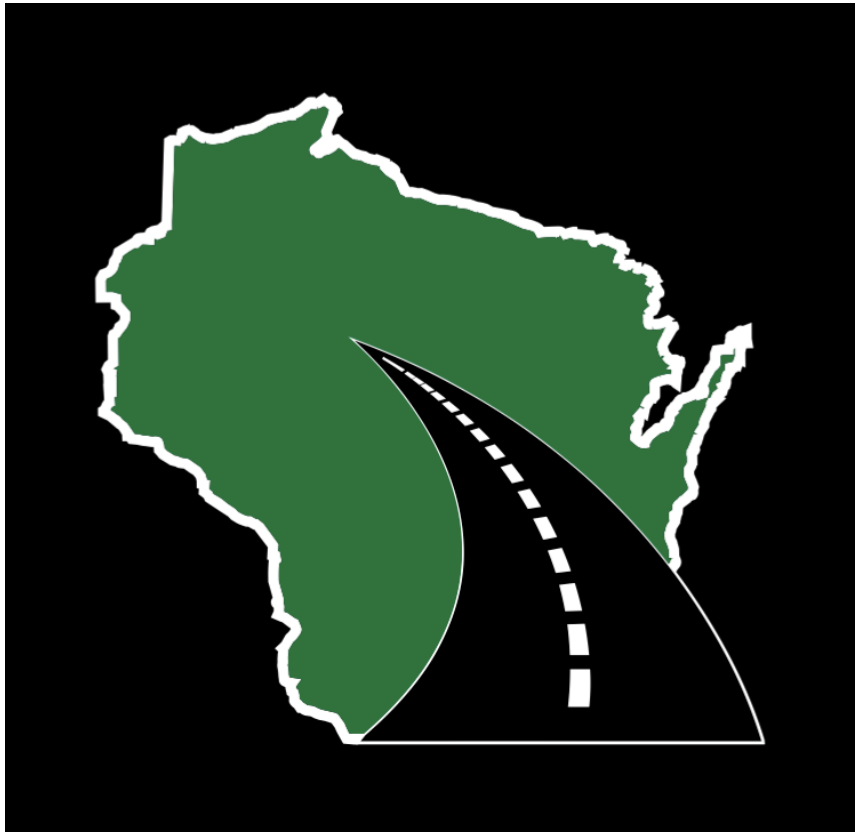

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