WTBA Contractor Engineer Conference

Bureau of Technical Services
And
Wisconsin Asphalt Pavement Association

January 18, 2024

Introduction

- Presenters
  - Dan Kopacz, BTS HMA Engineer
  - Debbie Schwerman, WAPA

Overview

- AASHTOWare Spec. Reorg.
- Manual of Test Procedures (MOTP)
- Stone Matrix Asphalt (SMA)
- Longitudinal Joints
- HMA (PWL/LJD) Data Summary
- BMD Overview

- Perpetual Pavement
- In-Place Nuclear Density Testing
- Successful Testing Protocols
- E-ticketing/Onstation

WisDOT BTS HMA STAFF

Vacant, SUPERVISOR
MARGARET OLSON, BINDER LAB
JEFF ANDERSON, HMA LAB, DESIGNS, DISPUTE RESOLUTION
MATT ANDREINI, HMA LAB, PERFORMANCE TESTING, DISPUTE RESOLUTION
DAN KOPACZ, HMA ENGINEERING
ALBERT KILGER, HMA ENGINEERING CONSULTANT
BRIAN JANDRIN, NUCLEAR DENSITY RSO

Future Specifications - AASHTOWare

AASHTOWare Materials program to help with acceptance process.

- Multi-year effort.
- Pilot projects for 2025
- Will simplify specification organization and reduce the occurrence of contradictions due to existing fragmentation.

Specification “rewrite/reorg” in progress.

- Most of 460 will be moved into 705.

Other parts (construction related) will end up in SS 450, etc. as appropriate.

Quality Assurance Program and materials-related specifications.

Integrates PWL and LJD STSPs.

Future Specifications - AASHTOWare

Manual of Test Procedures (complete for 2024 Construction).

- Manual of Test Procedures (MOTP) will replace all WisDOT Modified procedures in CMM.
- All references in Standard Spec will reference either the AASHTO (if unmodified) or the MOTP (for WisDOT modified procedures and methods).
- Remainder of CMM to be guidance only.

New HMA QAP Programs

Normal PWL for higher tonnages

- Contracts with bid item 9,750 tons or greater

Lower tonnages

- PWL Lite (contractor data used)

Replacement for QMP

- Department Acceptance (no contractor data used)

Small tonnage (500 tons or less)

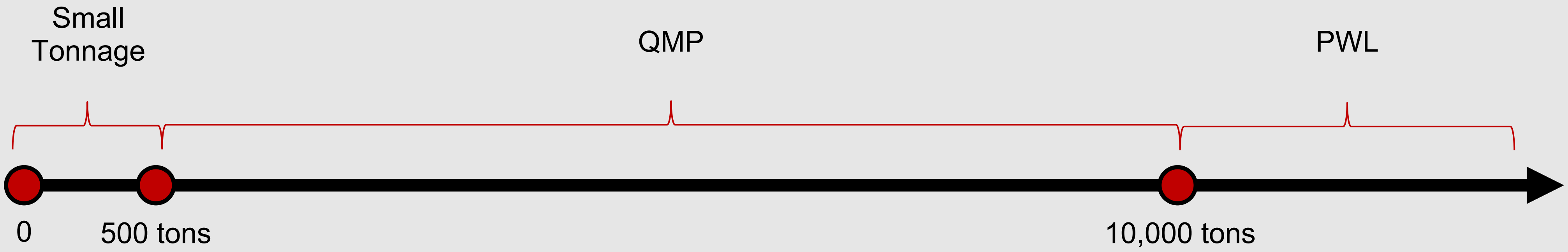
- Visual Inspection

Disclaimer

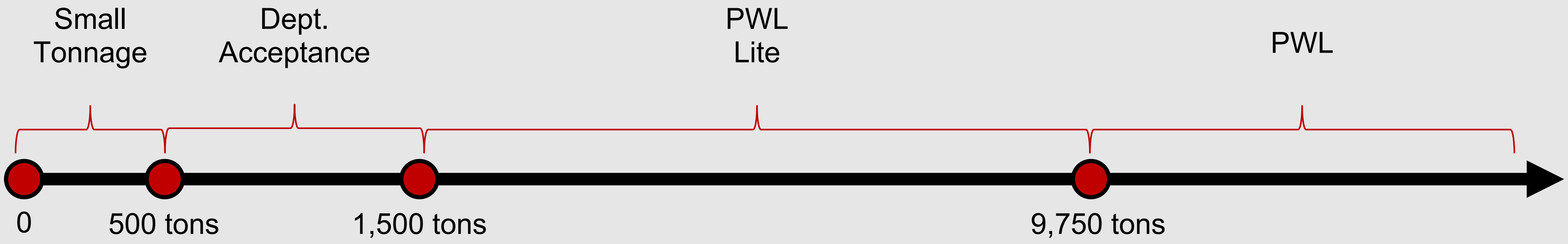
The concepts presented herein are still works in progress and are subject to change before the final rollout of the new AWP reorganized specifications.

Mixture / Volumetric Testing

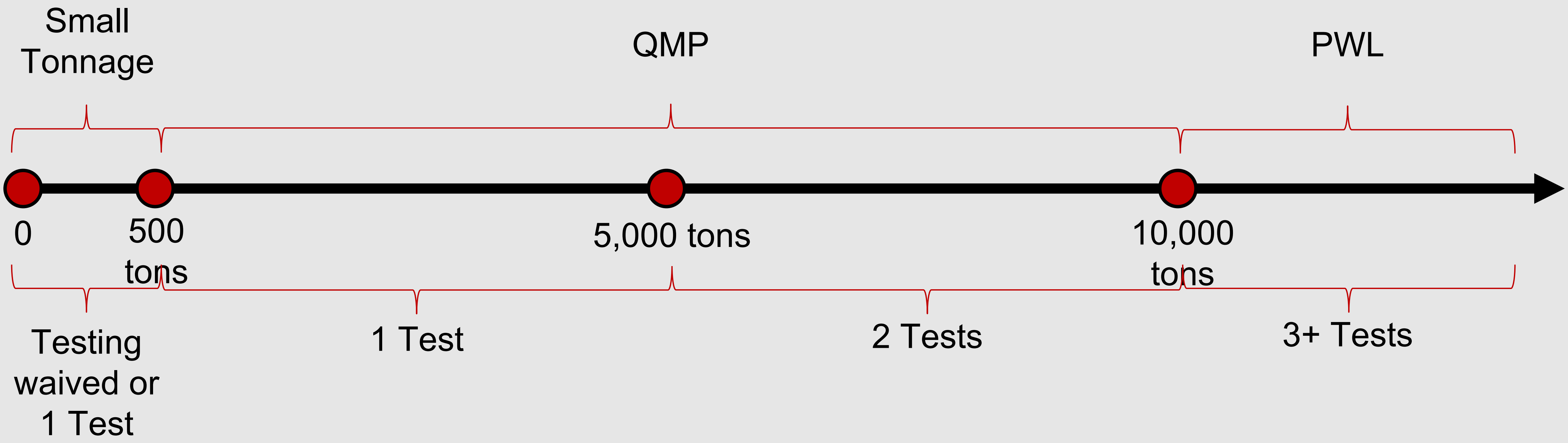
Existing QMP



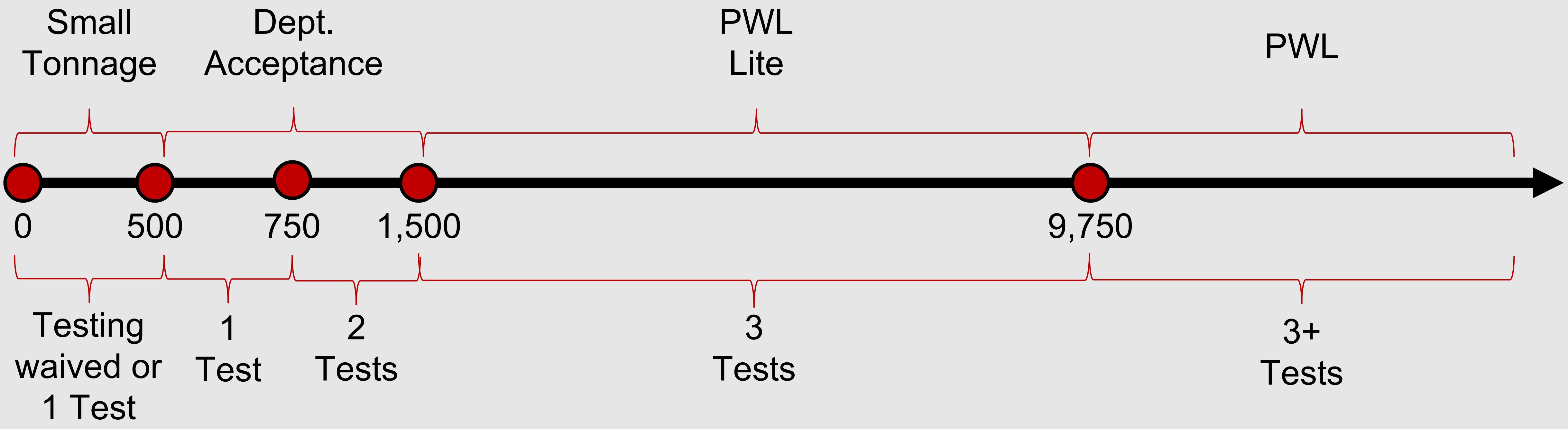
New QAPs



Existing QMP QV Testing Breakdown



New QAP QV Testing Breakdown



Density Testing

Density / Correlation Test Strips

Future will either be Correlated Gauges or Cores

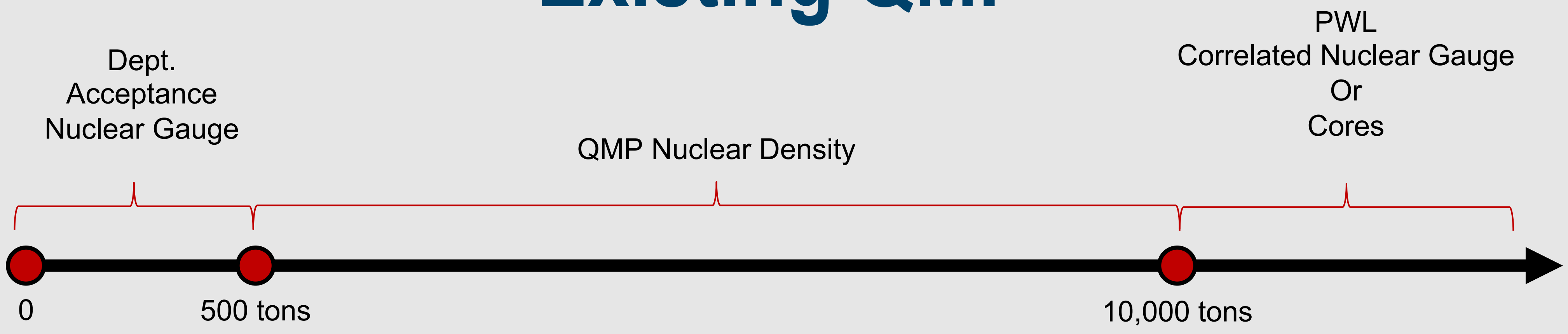
ONLY required for correlation purposes **when** using a nuclear gauge.

- Density Correlation/Test Strips to be either 2 density sublots (3,000 LF) or 750 tons.

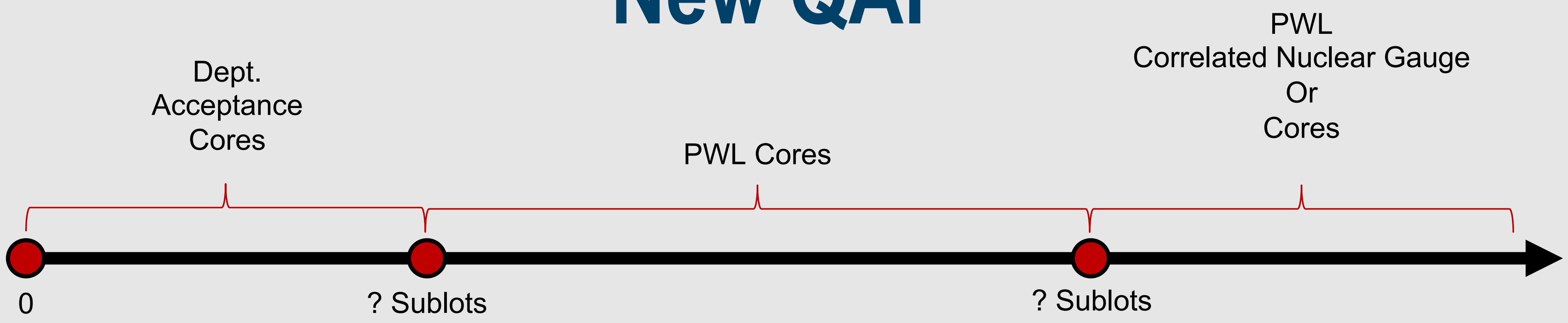
Use 750 tons when performing combined volumetric/density test strip.

Use 2 sublots otherwise.

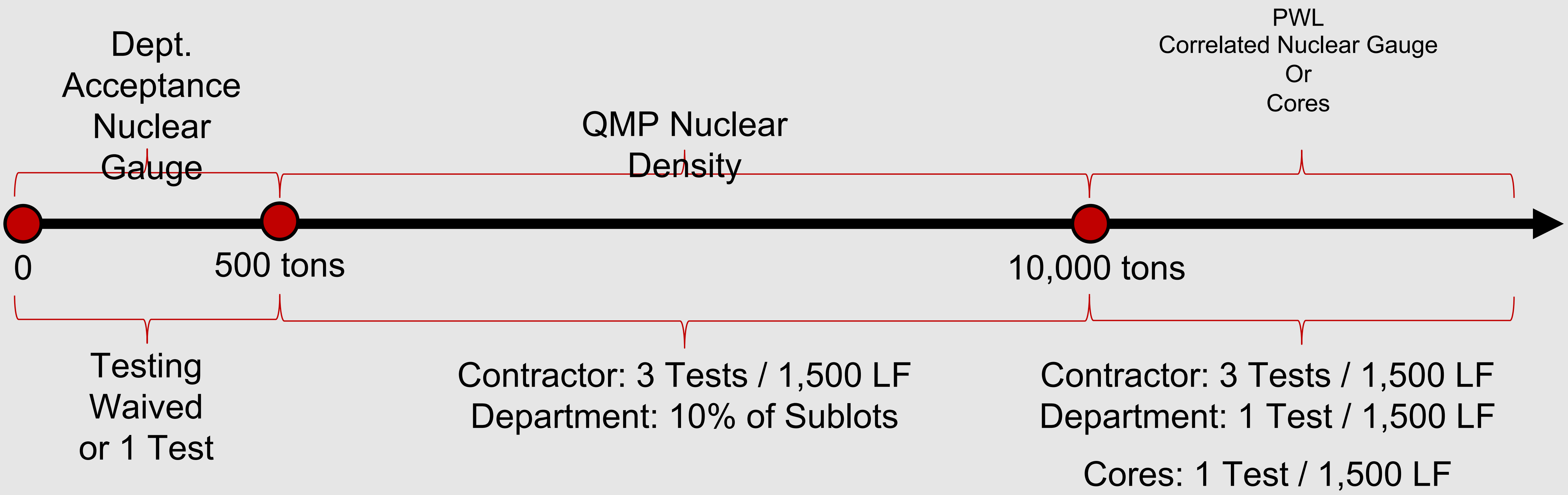
Existing QMP



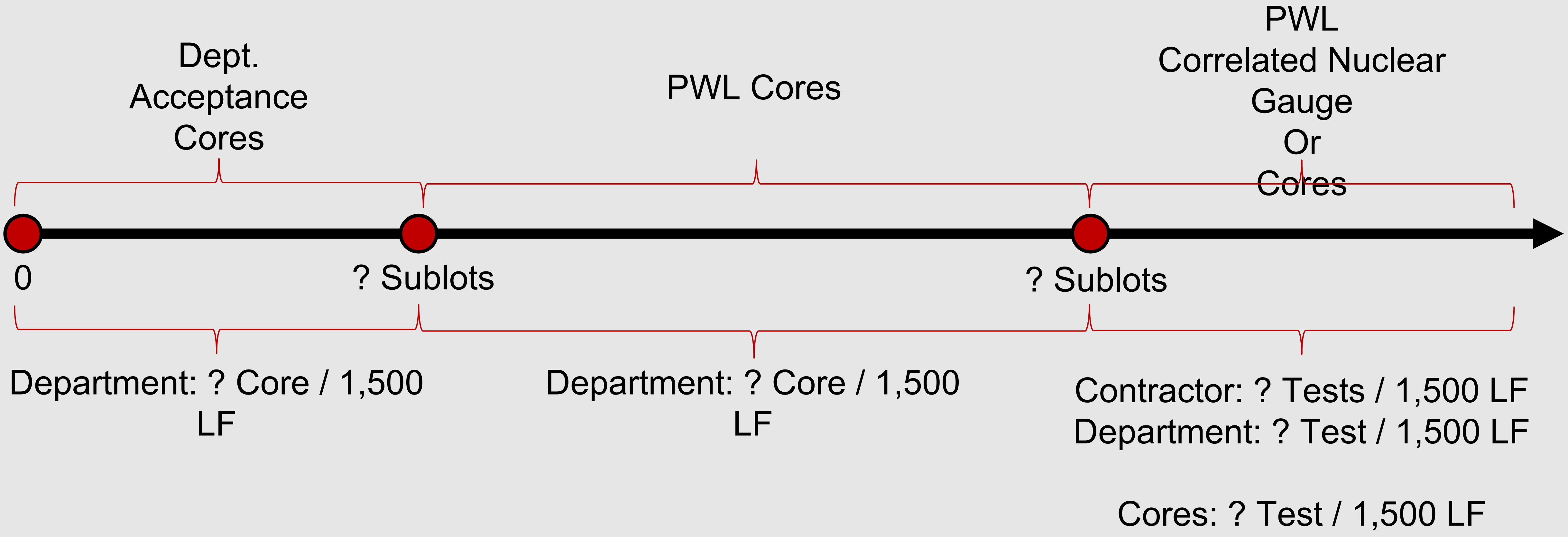
New QAP



QMP Density Testing Breakdown



New Density Testing Breakdown



PWL for SMA

Volumetric and Density Data is currently being analyzed

Review F&t analysis

- Review potential for additional dispute resolution

Review air void targets

- +/-1.3 from 4.5% target? (3.2 – 5.7%)

Mixture Use Table

Currently required for all PWL contracts

- See FDM 19-21

Future - will be required for all HMA contracts

- Clearly shows in plans which QAP will be used for acceptance

FDM 19-21 Quality Management Program

Table 5.3 HMA PWL Mixture Acceptance

PWL Mixture Use Table

The following acceptance criteria are applicable for this project:

Location	Station	Mixture Use:	Underlying Surface	Bid Item	Tons	Thickness	Quality Management Program to be used for:	
							Mixture Acceptance	Density Acceptance
12 foot Driving Lane	1+00 to 20+39	Upper Layer	3 MT 58-34H	4 MT 58-34H	12,000	1 ¾ "	PWL Incentive Air Voids HMA Pavement 460.2010	Incentive Density PWL HMA Pavement 460.2005
12 foot Driving Lane	1+00 to 20+39	Lower Layer	Milled Existing HMA Surface	3 MT 58-34H	15,400	2 ¾"	PWL Incentive Air Voids HMA Pavement 460.2010	Incentive Density PWL HMA Pavement 460.2005
3 foot shoulder	1+00 to 20+39	Upper Layer	3 MT 58-34H	4 MT 58-34H	2,450	1 ¾ "	PWL Incentive Air Voids HMA Pavement 460.2010	Acceptance testing by the department; Not eligible for incentive or disincentive
3 foot shoulder	1+00 to 20+39	Lower Layer	Milled Existing HMA Surface	3 MT 58-34H	3,850	2 ¾"	PWL Incentive Air Voids HMA Pavement 460.2010	Acceptance testing by the department; Not eligible for incentive or disincentive
Various		Culvert patches	Base Aggregate	Asphaltic Surface	550	6" total	QMP as per SS 465.	Acceptance by ordinary compaction
12 foot Driving Lane	20+39 to 23+00	Upper Layer	3 MT 58-34H	4 MT 58-34H	1000	1 ¾ "	QMP as per SS 460.	Incentive Density HMA Pavement 460.2000
12 foot Driving Lane	20+39 to 23+00	Lower Layer	Existing Concrete Pavement	3 MT 58-34H	1,570	2 ¾"	QMP as per SS 460.	Incentive Density HMA Pavement 460.2000
10 foot shoulder	20+39 to 23+00	Upper Layer	3 MT 58-34H	4 MT 58-34H	830	1 ¾ "	QMP as per SS 460.	Incentive Density HMA Pavement 460.2000
10 foot shoulder	20+39 to 23+00	Lower Layer	Existing Concrete Pavement	3 MT 58-34H	1,310	2 ¾"	QMP as per SS 460.	Incentive Density HMA Pavement 460.2000

SMA (Stone Matrix Asphalt)

Consider on important corridor (backbone) routes with heavy truck traffic (HT)

Can be used on new construction or resurfaces

Performs very well on the rutting and cracking torture tests

Performs well where reflective cracking is expected

SMA Spec. highlights

Cellulose fiber stabilizing additive required

Asphalt binder content testing required

SMA minimum density

- 93.0% for mainline
- 92.0% for shoulders and appurtenances (offsets applied to all)

SMA test strip approval criteria

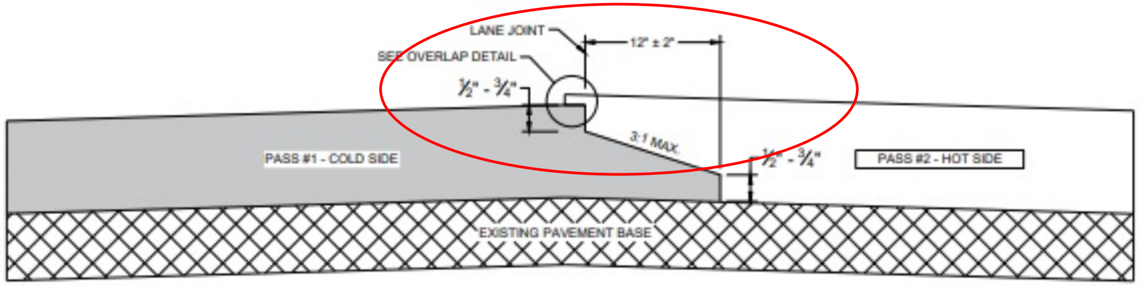
- Correlate nuclear gauge to cores to develop offset
- Department will test one of the two mixture split samples for volumetrics
- QV test fails Va or QV / QC test results exceed testing tolerances (0.015 for Gmm or Gmb), dispute resolution by BTS

Additional Guidance for Selection of SMA

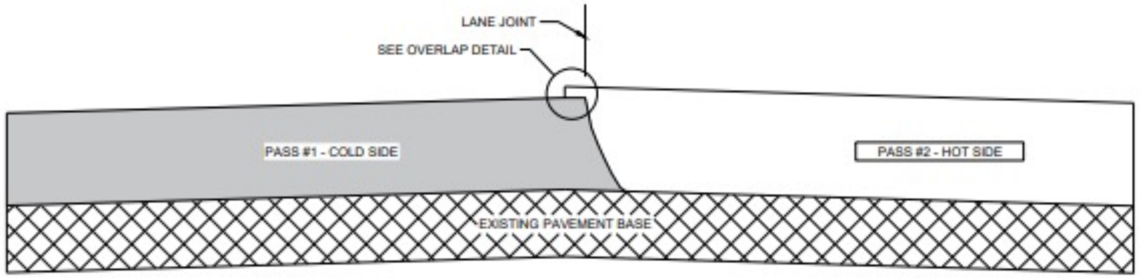
- Only use as an upper layer
- Should be considered for divided highways, freeways and interstates (i.e. backbone projects)
- In addition to ESAL recommendations
    - Consider especially when lower maintenance is beneficial (high-traffic areas)

Implementation of Longitudinal Joint Construction

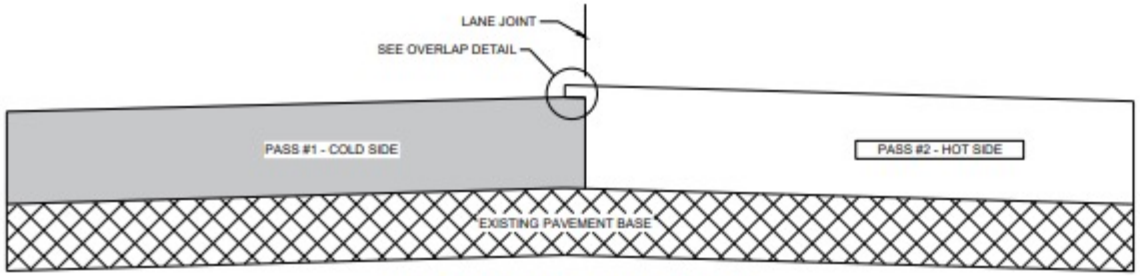
- Started with the May 2020 Lettings
  - Notched wedge joint on all mainline HMA layers ≥ 1.75”
  - Wedge only milled out for SMA and when joint is damaged by traffic as directed by the engineer
    - Statewide STSP 204-045 used for wedge removal (rarely)
  - Longitudinal Joint Density (LJD) STSP included on all PWL contracts
  - Discontinue use of longitudinal joint heater STSP



TYPICAL PAVEMENT CROSS SECTION
NOTCHED WEDGE JOINT



TYPICAL PAVEMENT CROSS SECTION
VERTICAL JOINT



TYPICAL PAVEMENT CROSS SECTION
VERTICAL JOINT (MILLED)

GENERAL NOTES

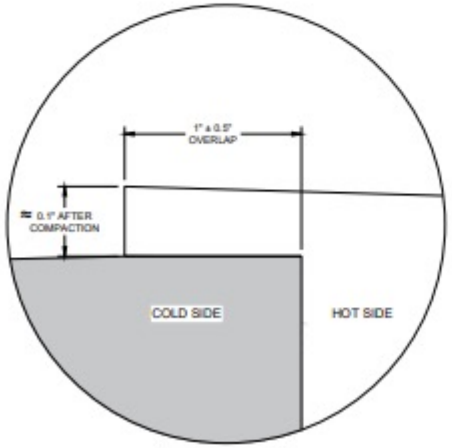
IN ADDITION TO THE DETAILS PROVIDED IN THIS DRAWING, CONFORM TO STANDARD SPECIFICATION 450.3.2.8 FOR WHEN A NOTCHED WEDGE JOINT IS REQUIRED AND FOR GENERAL JOINT CONSTRUCTION REQUIREMENTS.

FOR ALL LONGITUDINAL JOINTS, ENSURE THE PAVER SCREED OVERLAPS THE PREVIOUSLY PLACED PAVEMENT BY 1" ± 0.5" AND THE HOT SIDE OF THE JOINT REMAINS HIGHER THAN THE COLD SIDE BY APPROXIMATELY 0.1" AFTER FINAL COMPACTION. (IT WILL BE FLUSH WHEN PAVING IN ECHELON.)

ONLY REMOVE THE LONGITUDINAL NOTCHED WEDGE JOINT FOR SMA PAVEMENT OR AS DIRECTED BY THE ENGINEER TO ADDRESS SPECIFIC LENGTHS OF JOINT DAMAGED BY TRAFFIC.

WHEN MILLING BACK OR REMOVING ANY LONGITUDINAL JOINT, LIMIT THE MATERIAL REMOVED TO 2" FROM THE TOP NOTCH OR FROM THE VERTICAL JOINT EDGE ON THE COLD SIDE OF THE JOINT.

USE LONGITUDINAL MILLED JOINT AS PLANS SHOW OR THE AS THE ENGINEER DIRECTS.



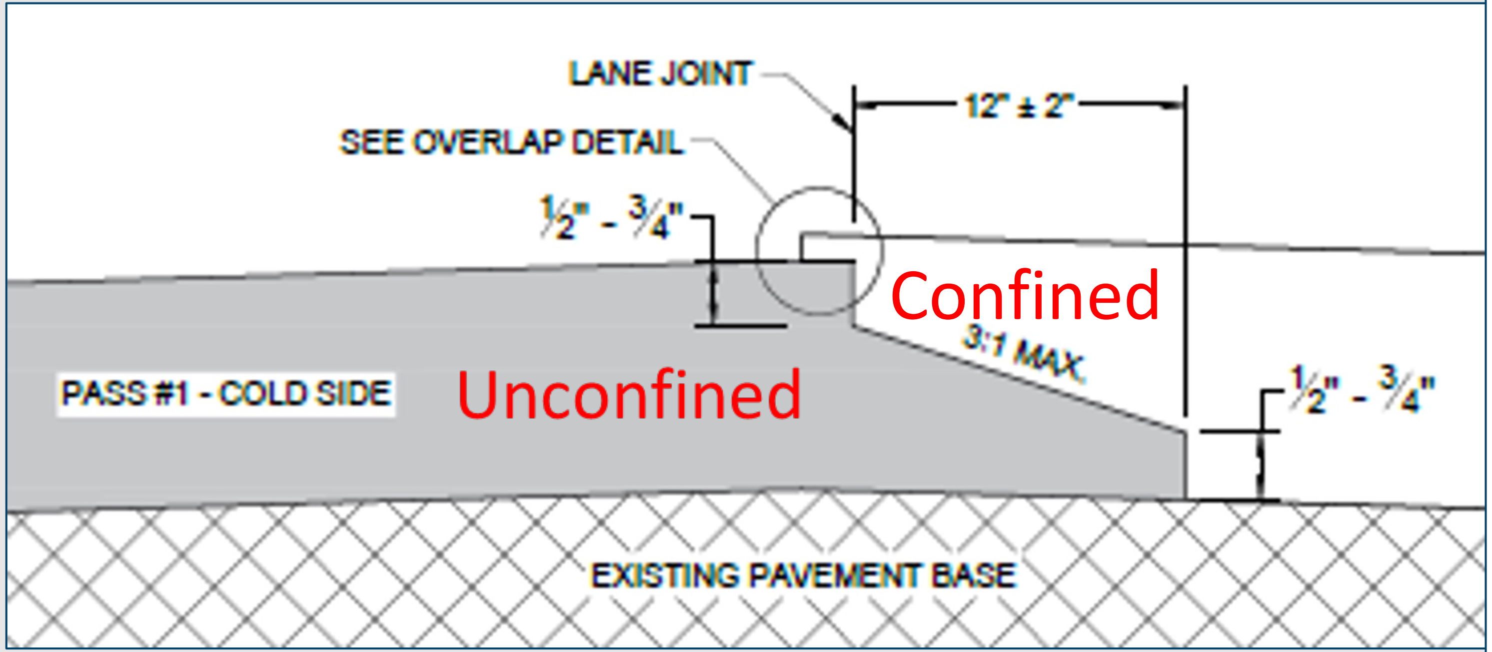
OVERLAP DETAIL (TYPICAL)

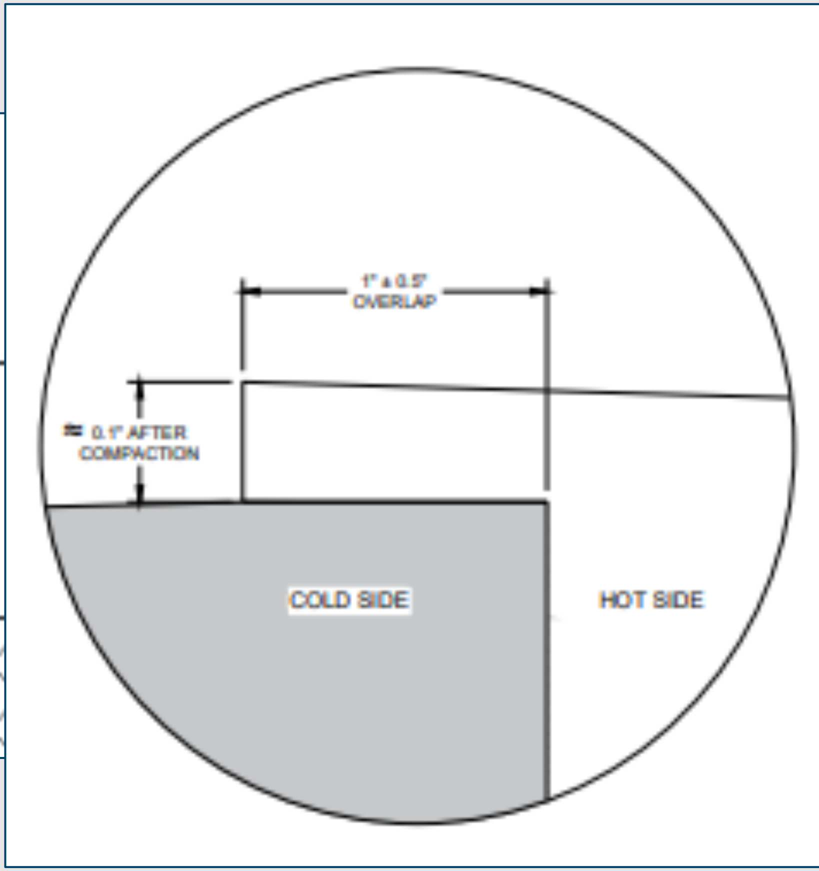
HMA LONGITUDINAL JOINTS

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

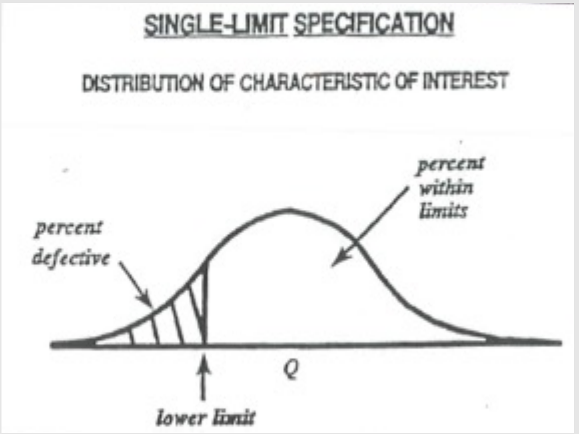
APPROVED
November 2020 /S/ Steven Hefel
DATE HMA PAVEMENT ENGINEER

Notched Wedge Joint detail

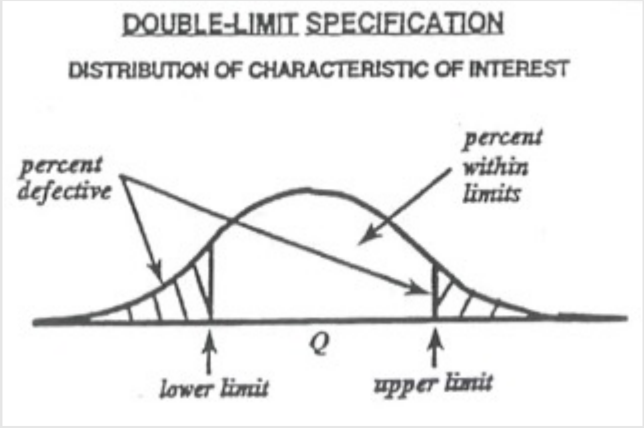




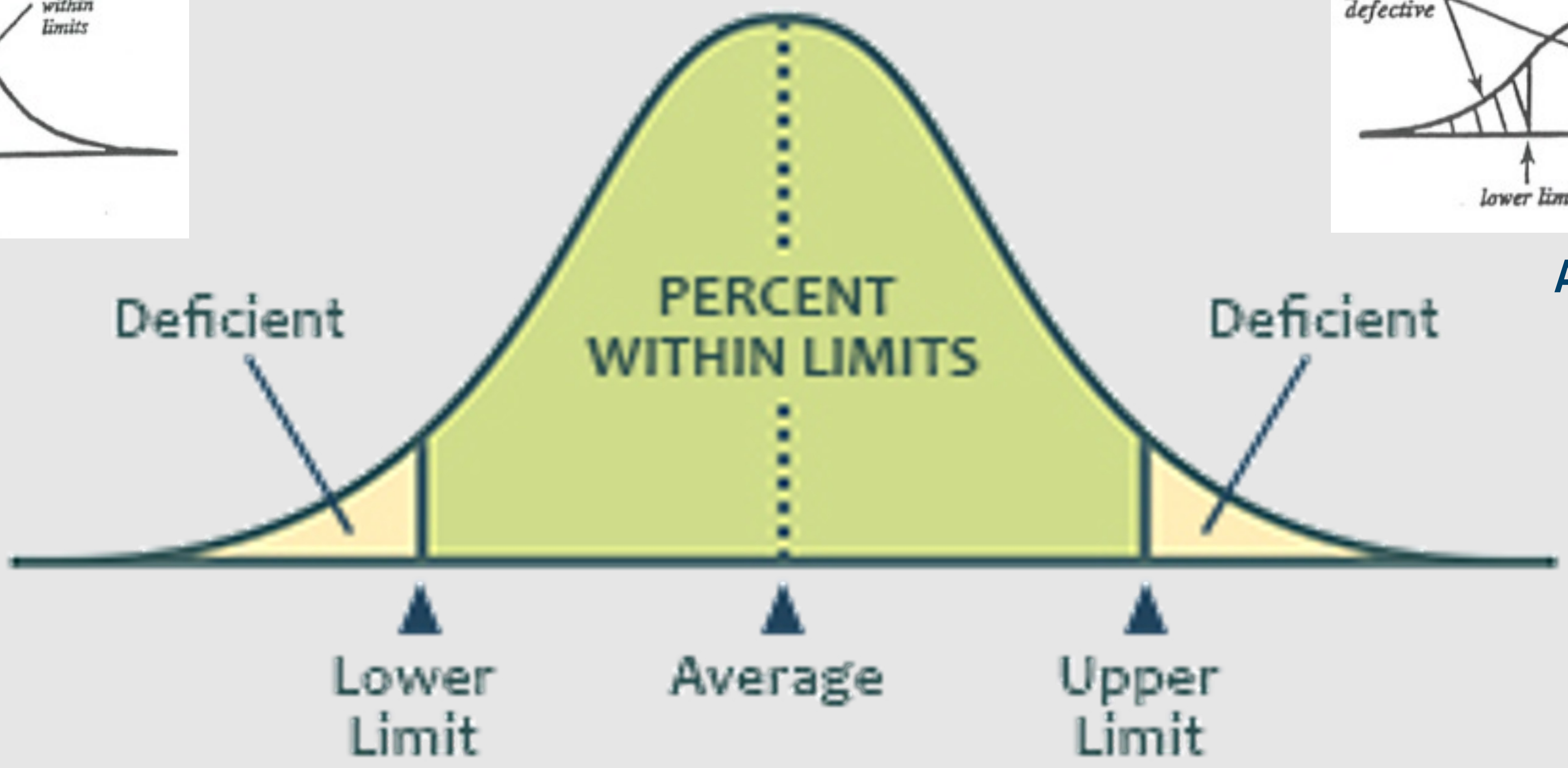
Percent Within Limits
Project Data



Density



Air Voids



Background

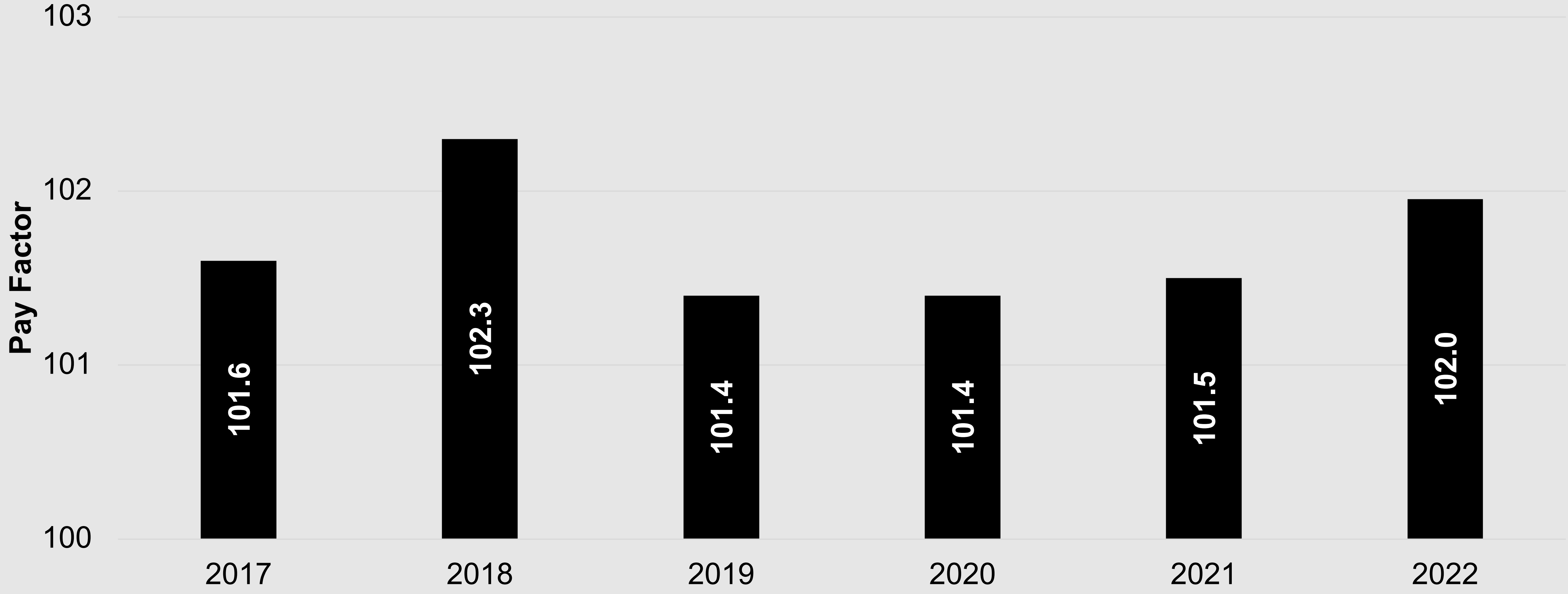
A PWL value is calculated using lower limits for density (usually 93%) and lower and upper limits (2.0 and 4.3 respectively) for Air Voids.

The PWL value is used in a pay equation to determine the Pay Factor (PF).

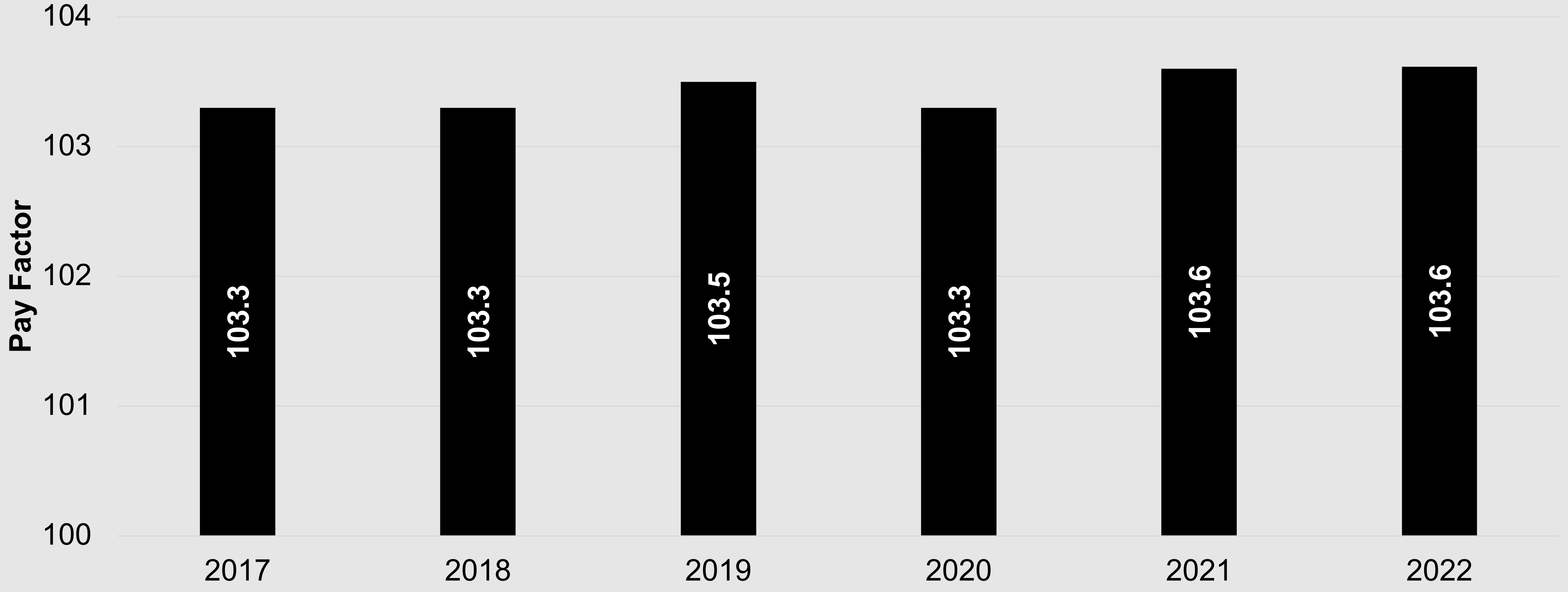
Incentives and disincentives are calculated using $65/ton with the ability to get up to 4% in incentives (PF = 104).

- PF > 100: Incentive
- PF = 100: No incentive or disincentive
- PF < 100: Disincentive
- PF = 50: Contract unit price is used instead of $65/ton and paid at 50% or remove and replace.
- Max possible incentive per ton is $2.60 ($65/ton * 0.04) or $1.30 each for density and air voids.

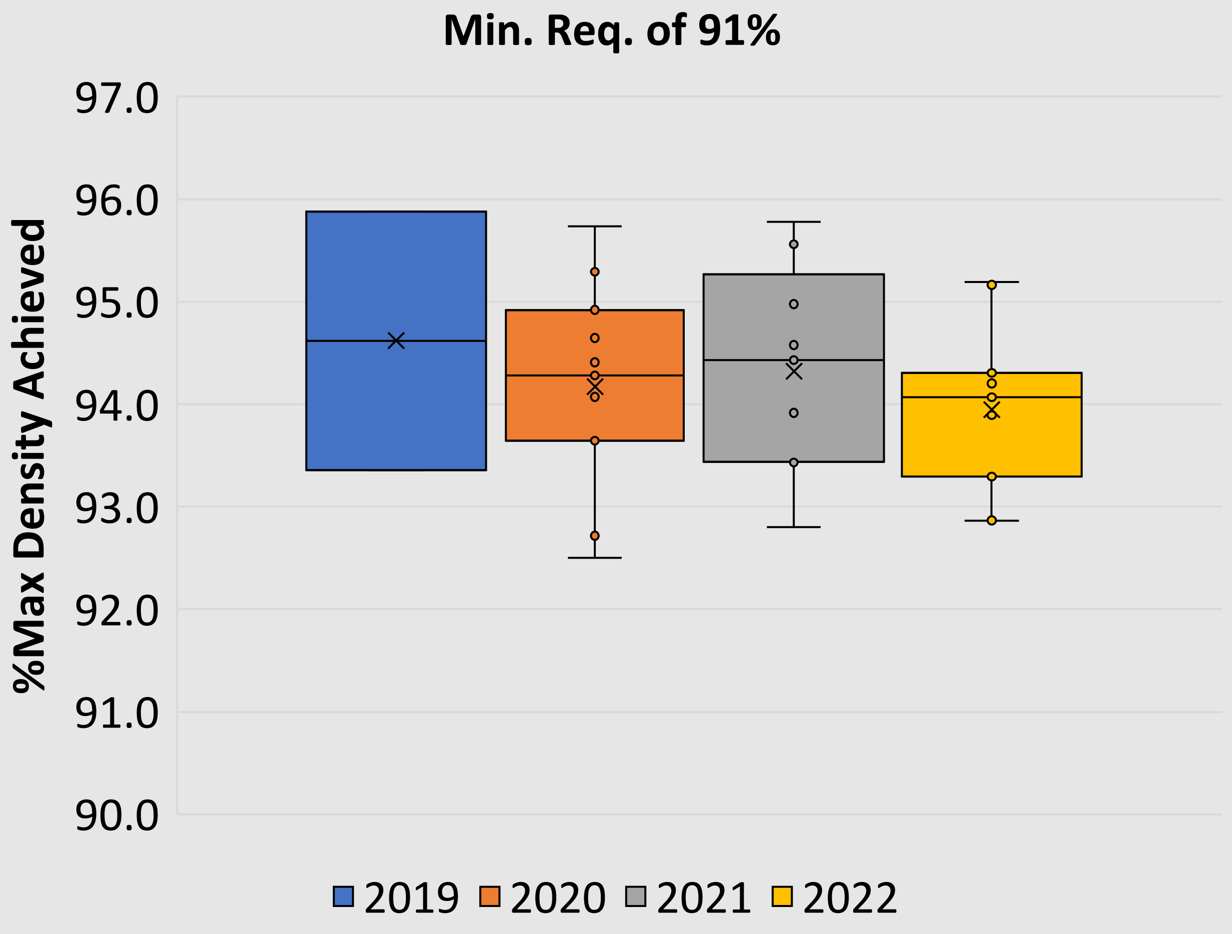
Average Annual Pay Factors - Density

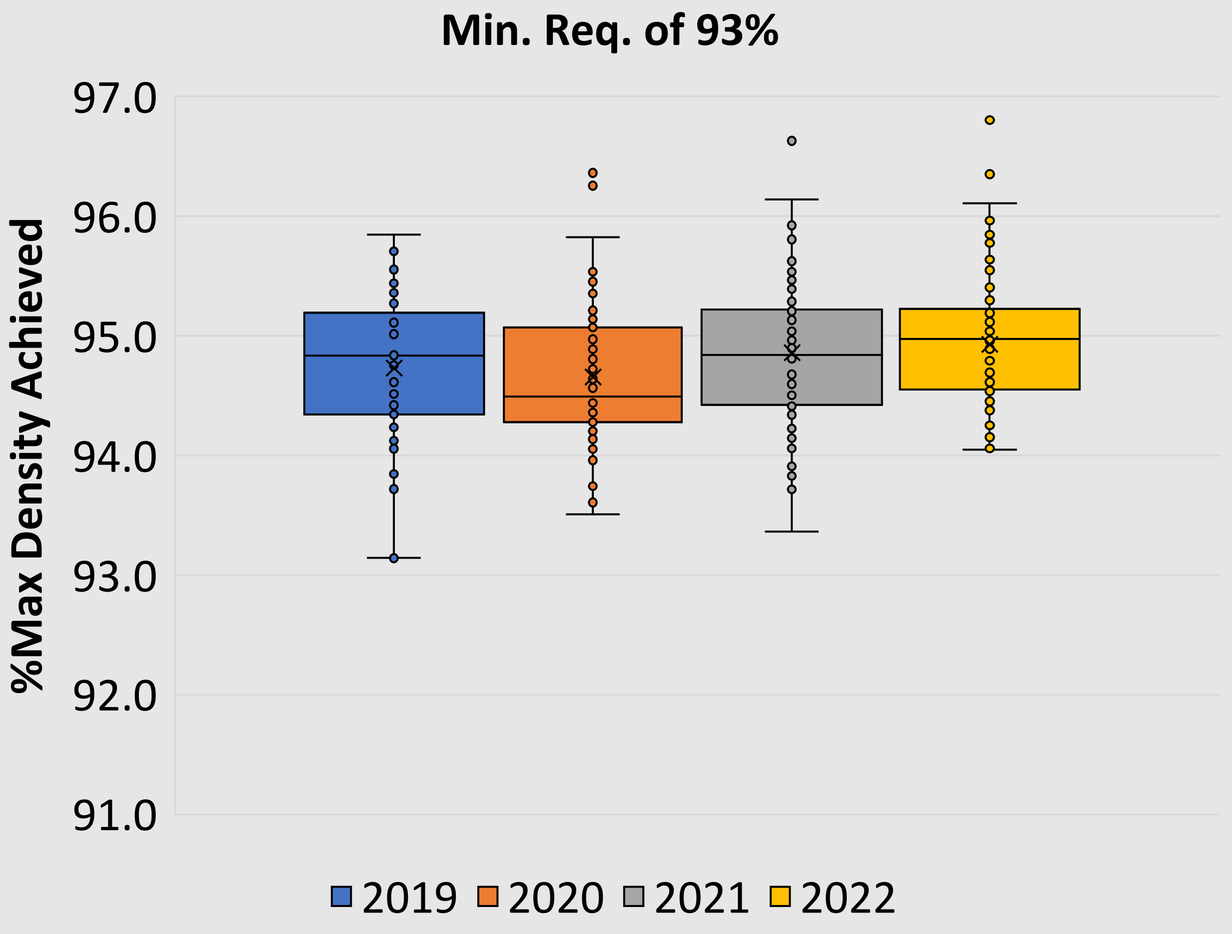


Average Annual Pay Factors – Air Voids

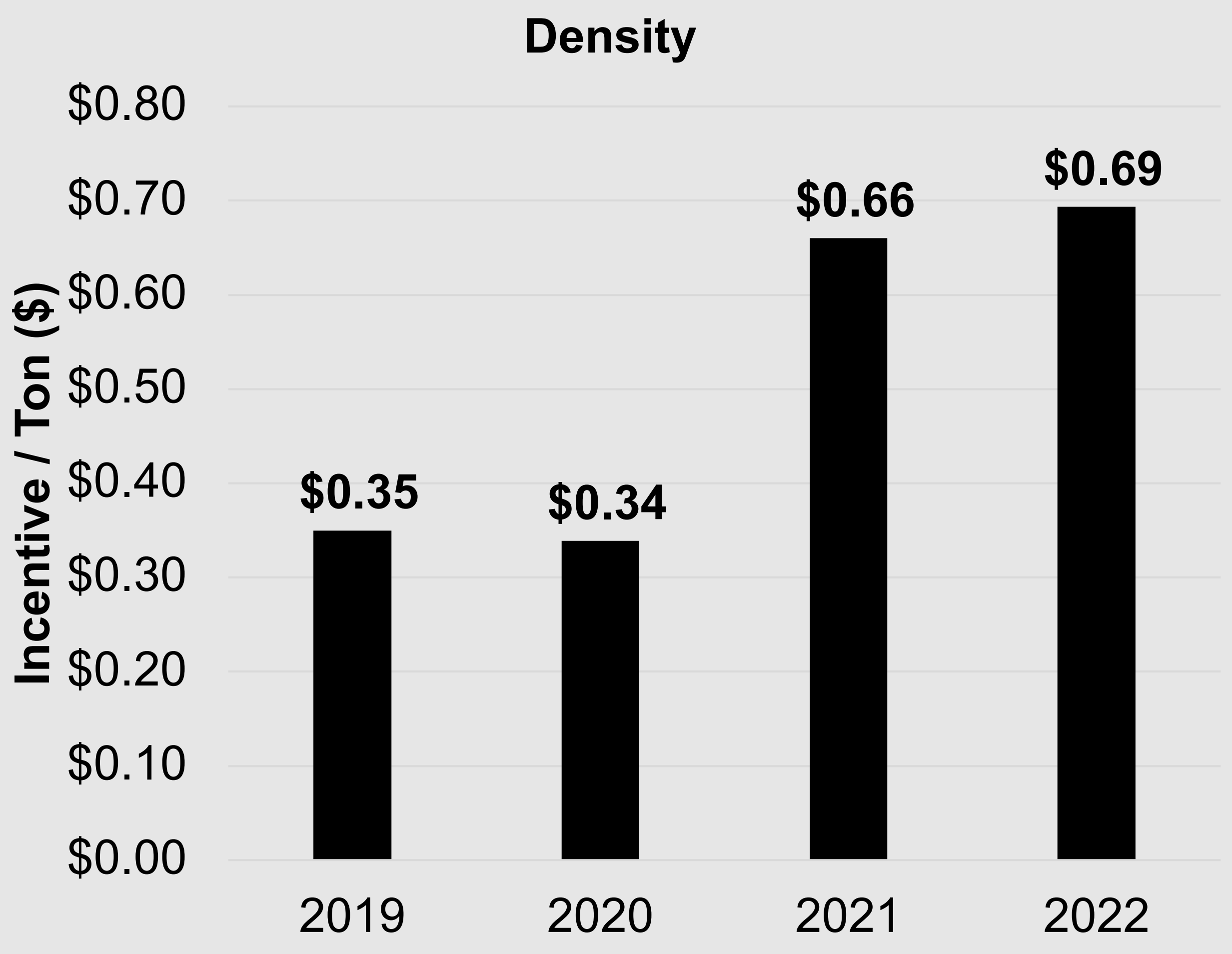


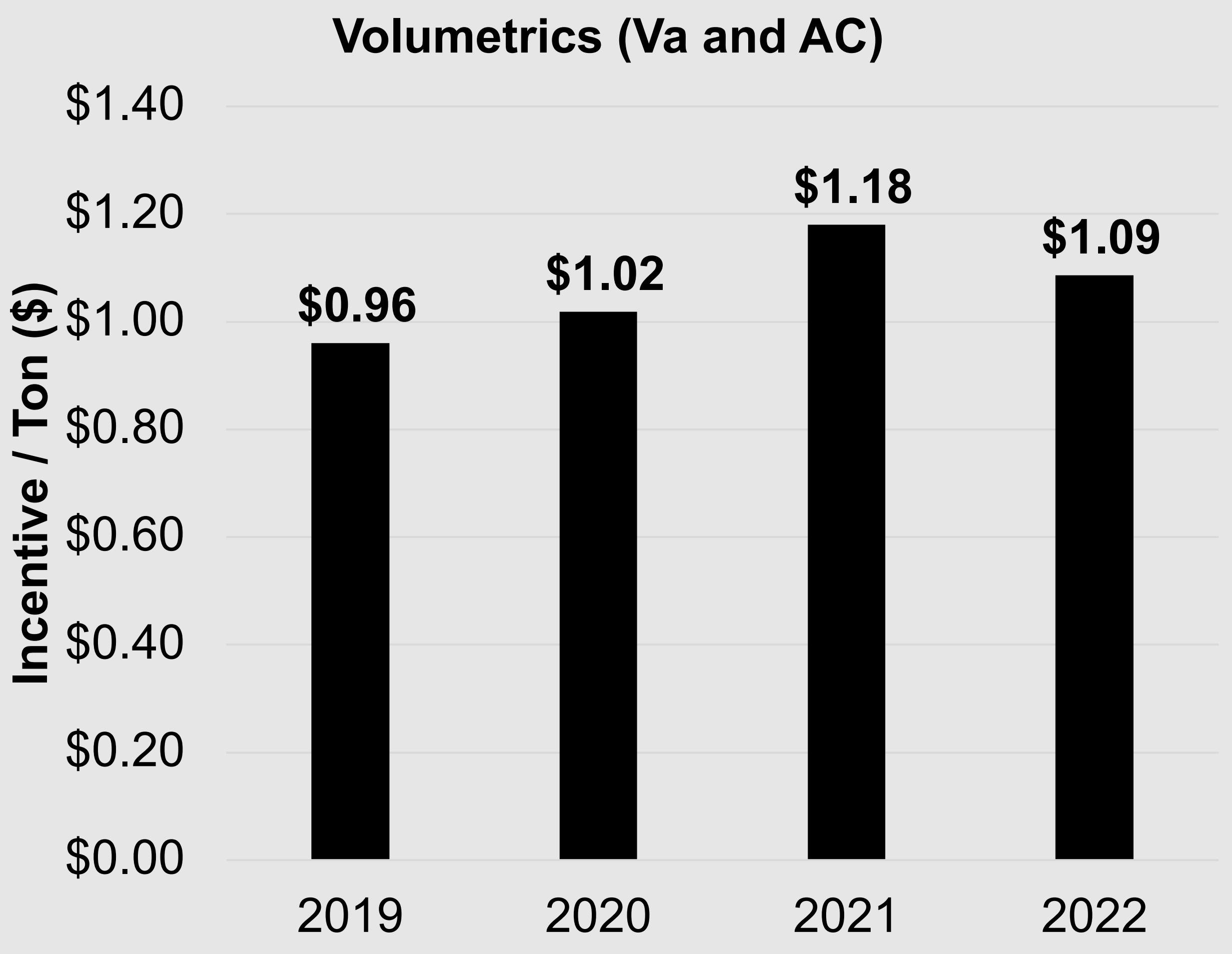
Annual Density Distribution Comparison





Incentive / Ton

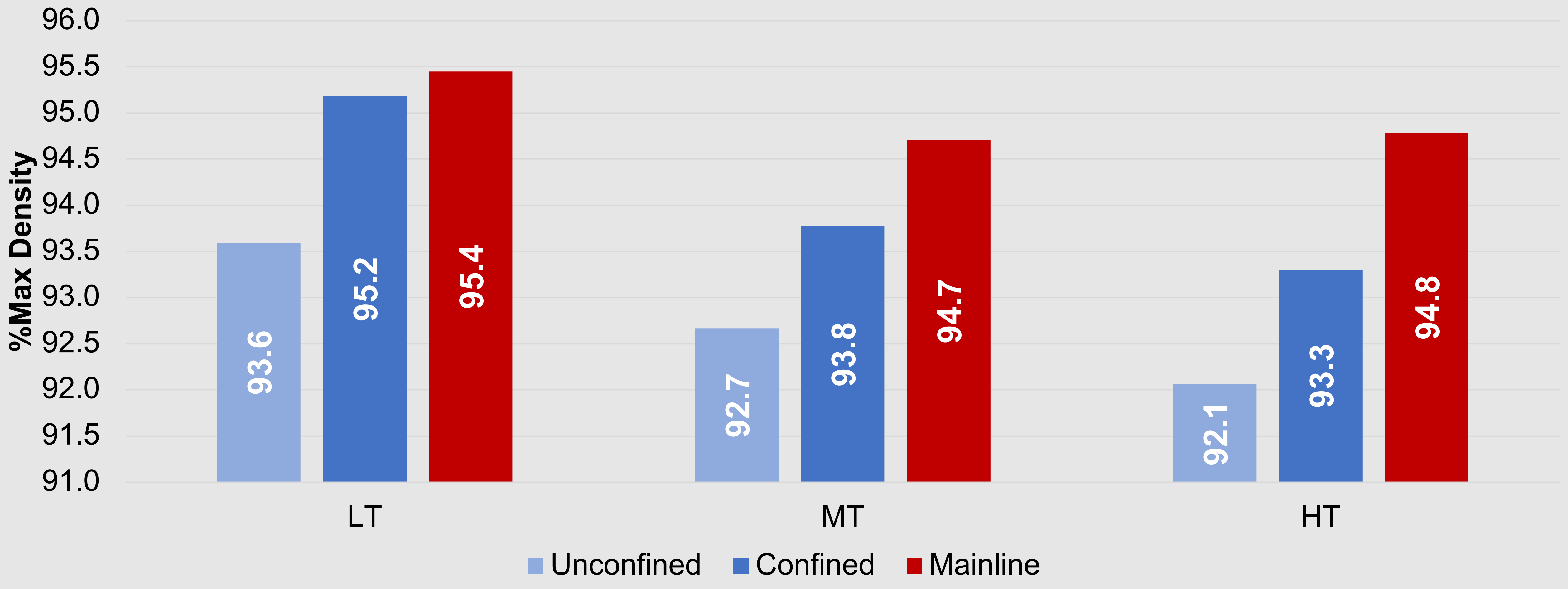




Longitudinal Joint Density

The Laws of Confinement

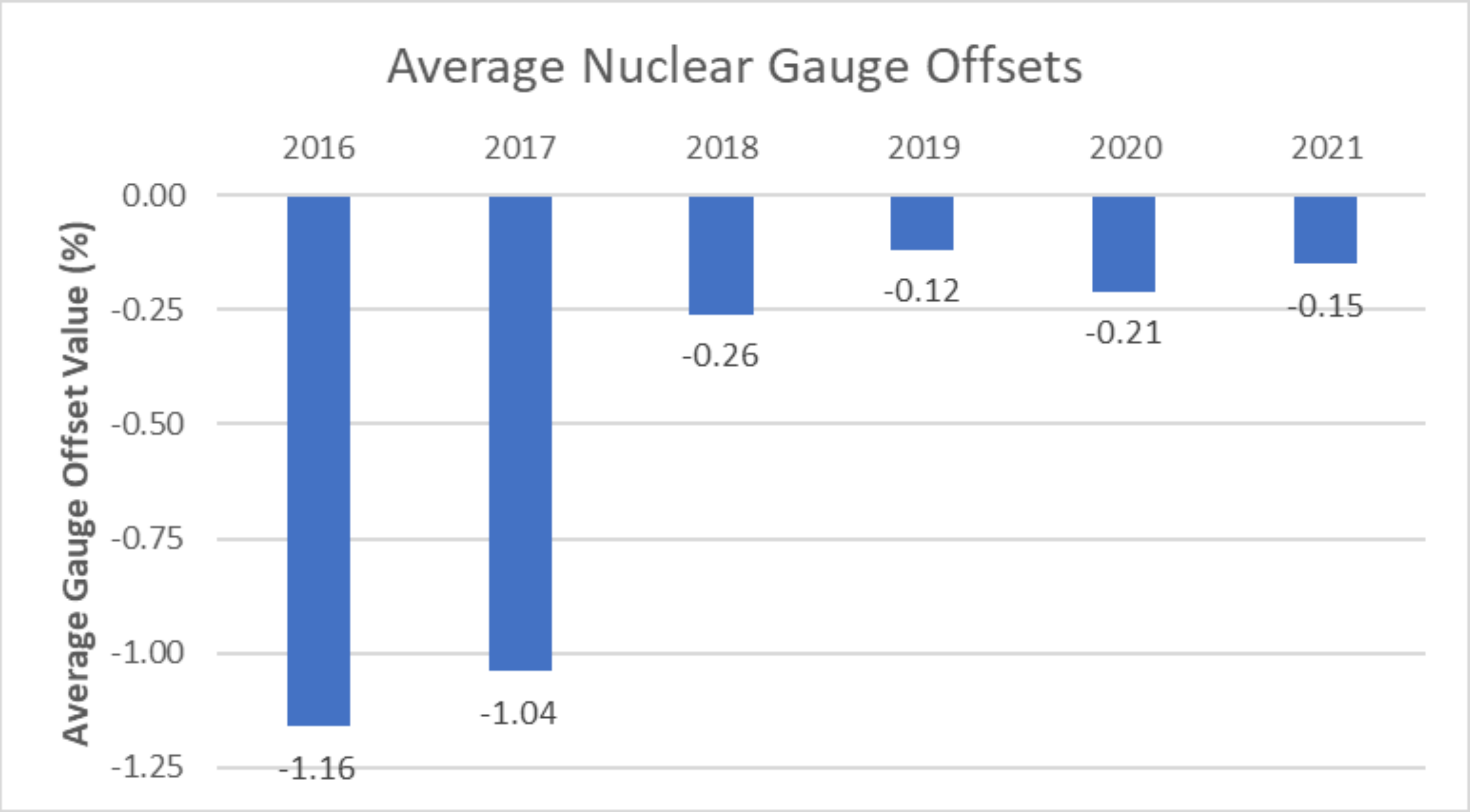
Unconfined < Confined < Mainline



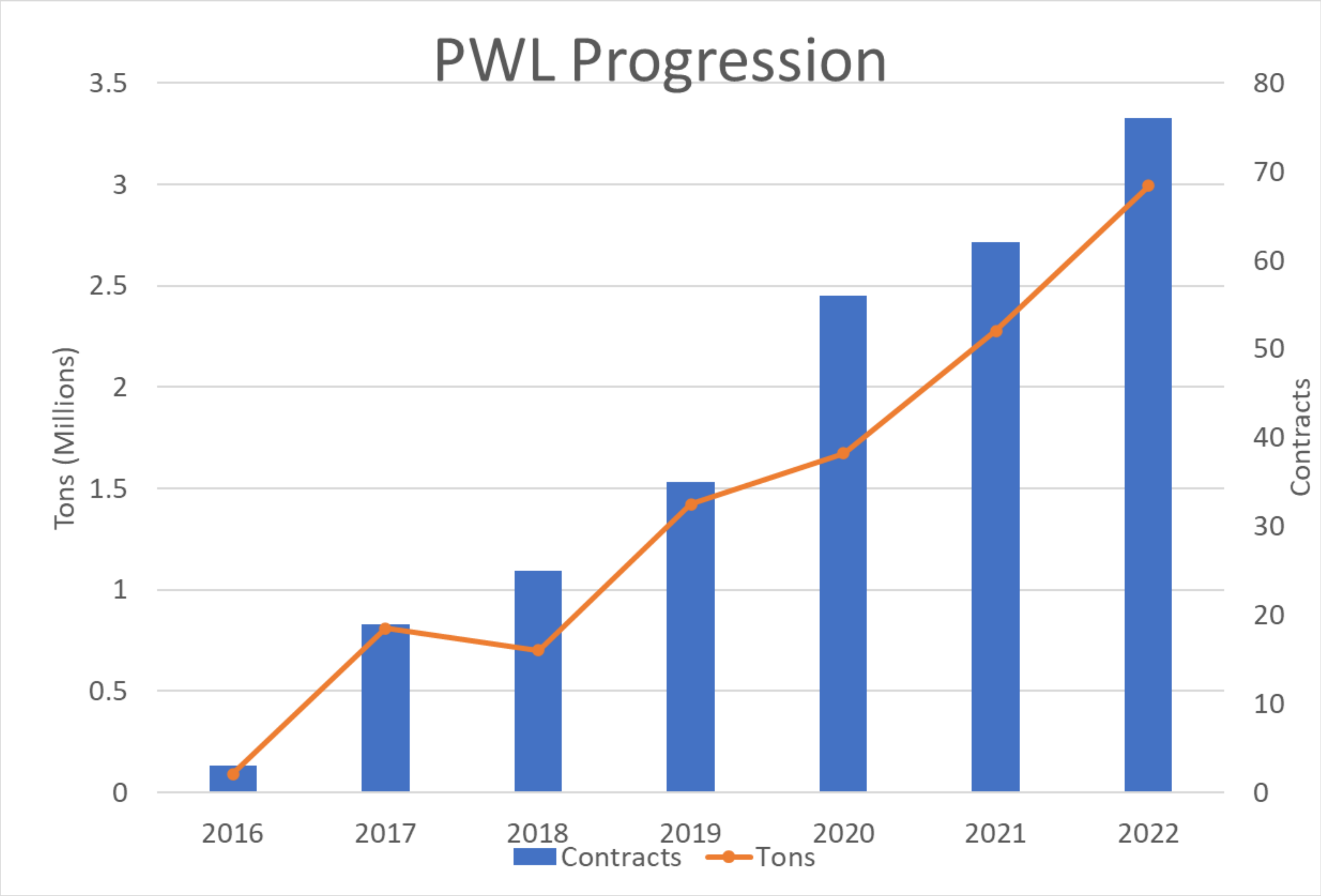
Tables

Longitudinal Joint Density						
Joint Type	**Number of Projects**	**Total Possible Incentive**	**Incentive Paid**	**Joint Length**	**Incentive/LF**	**%Max Incentive**
Butt	19	$430,642.80	$255,468.40	1,005,669.0	$0.25	59.3%
Notched Wedge (left in place)	74	$2,649,926.35	$2,109,929.81	6,035,502.7	$0.35	79.6%
Notched Wedge (milled out)	0	$-	$-	0.0	N/A	N/A
Mill and Inlay (one lane at a time)	19	$700,089.60	$521,493.60	1,449,354.0	$0.36	74.5%
Over-pave/Mill Excess	7	$207,097.20	$160,259.60	519,743.0	$0.31	77.4%
Combined	119	$3,987,755.95	$3,047,151.41	9,010,268.7	$0.34	76.4%

Gauge offsets



PWL - Percent Within Limits



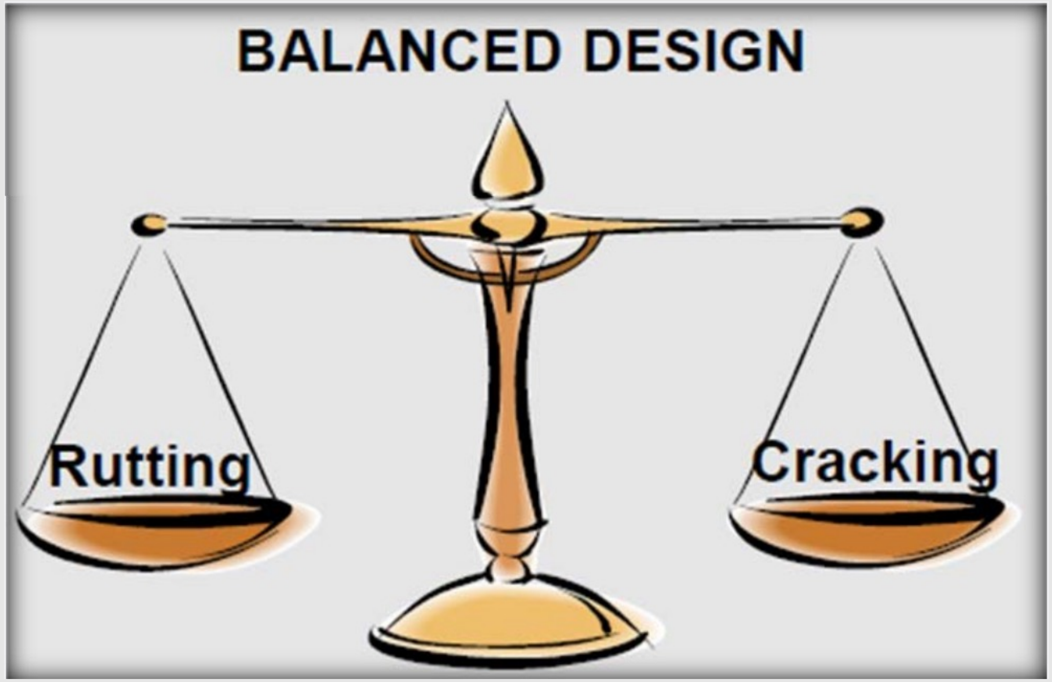
PWL - Percent Within Limits

	2016	2017	2018	2019	2020	2021	2022
Number of PWL Contracts	3	19	25	35	56	62	76
Tons	91K	811K	701K	1,423K	*1,673K ~55% of program*	*2,278K ~65% of program*	*2,994K ~63% of program*

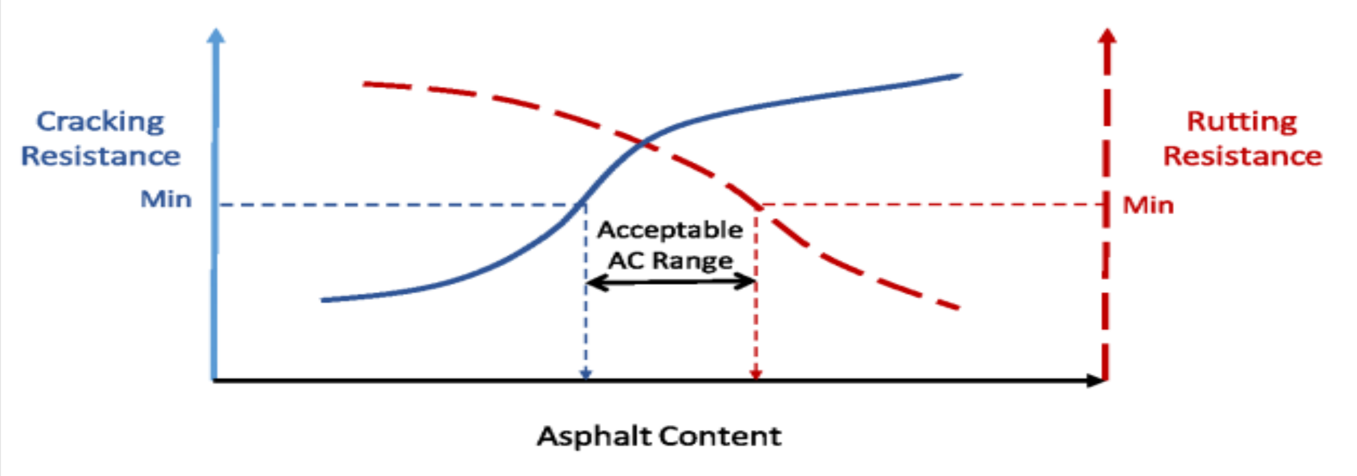
BMD: a method for increasing the durability of asphalt mixtures in WI

BMD concept

- A balance between cracking and rutting resistance



Buchanan, 2017



Newcomb et al., 2018

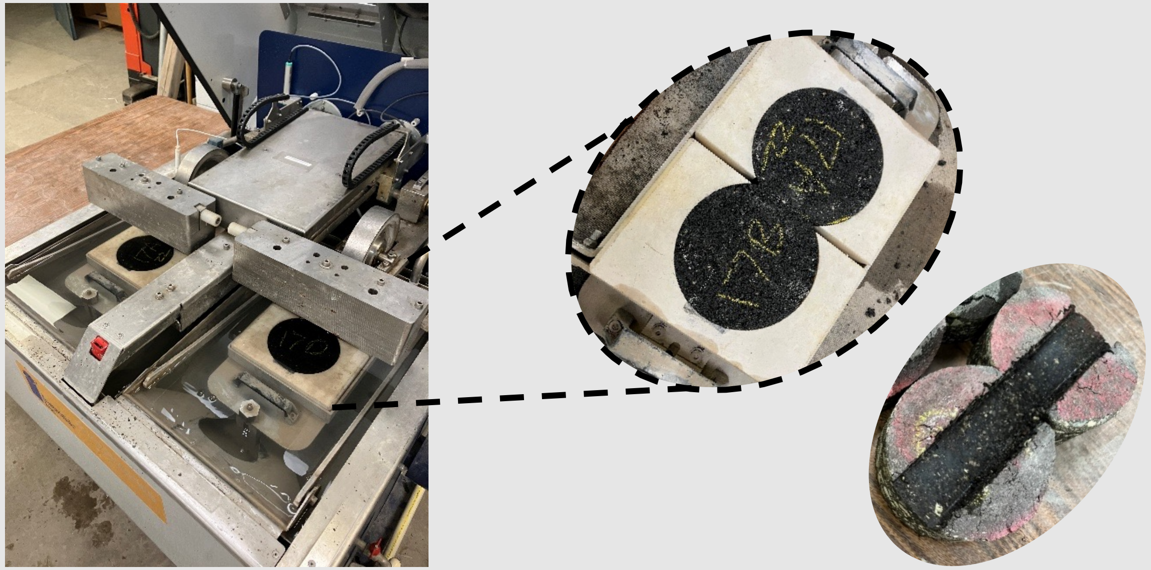


Buchanan, 2017

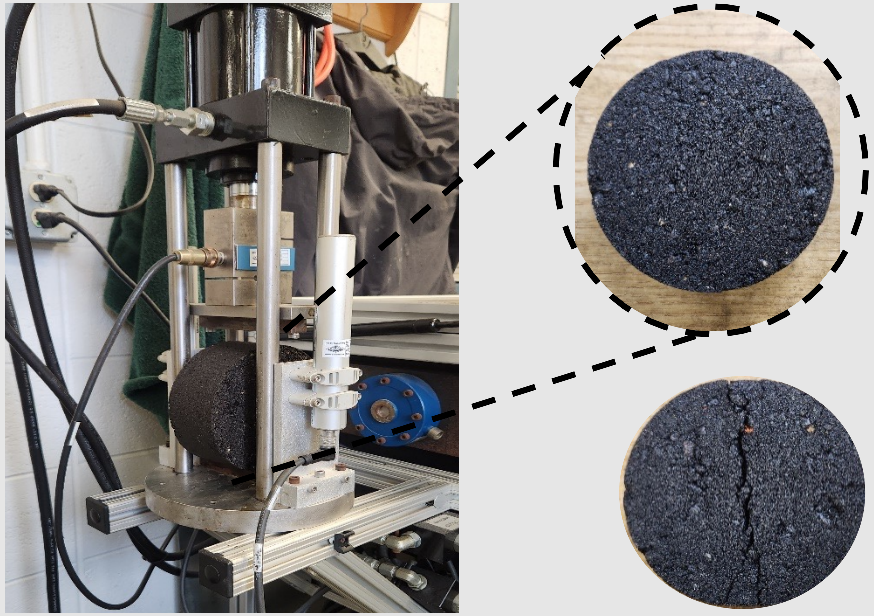
BMD Performance Tests Used in WI

There are many different types of performance tests WisDOT uses:

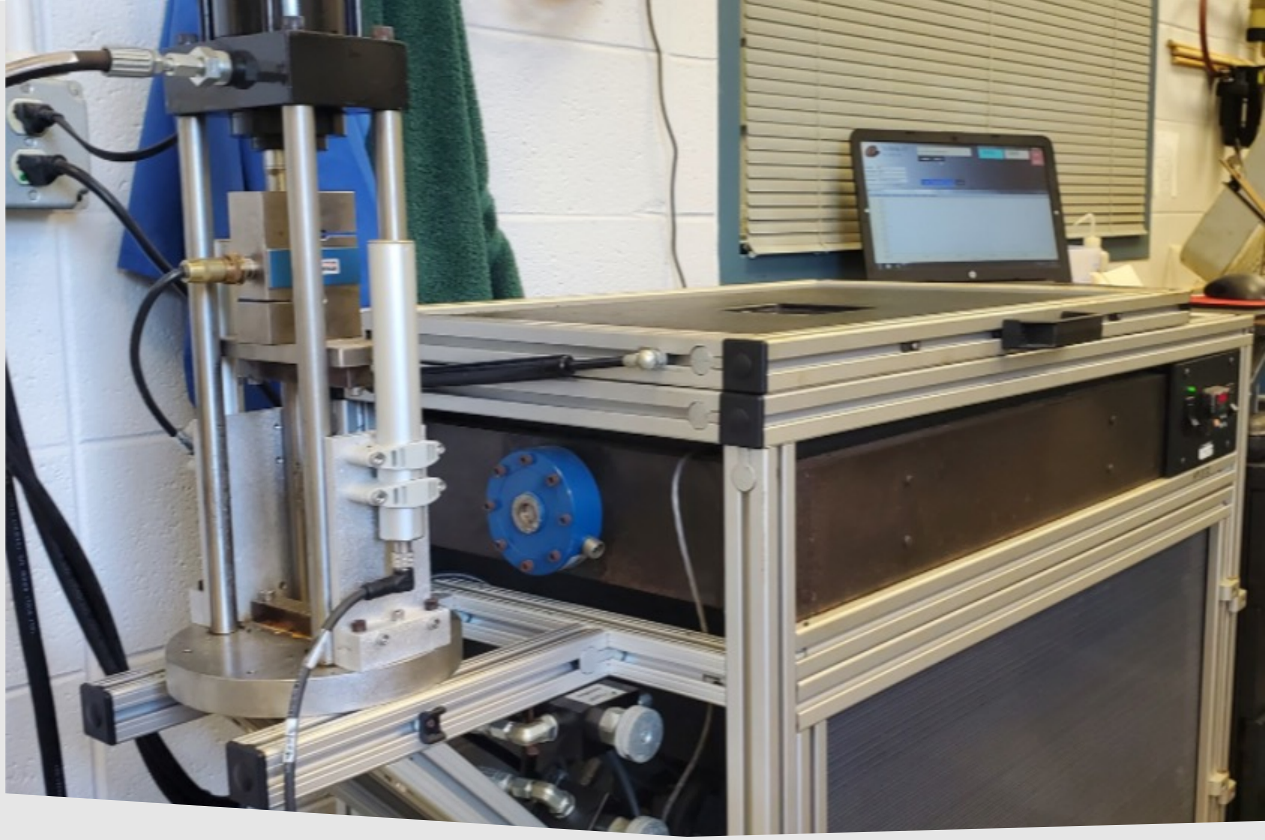
- Hamburg wheel tracking test (HWTT)
- Indirect tensile asphalt cracking Test (IDEAL-CT)



HWTT @ 46° C



IDEAL-CT @ 25° C

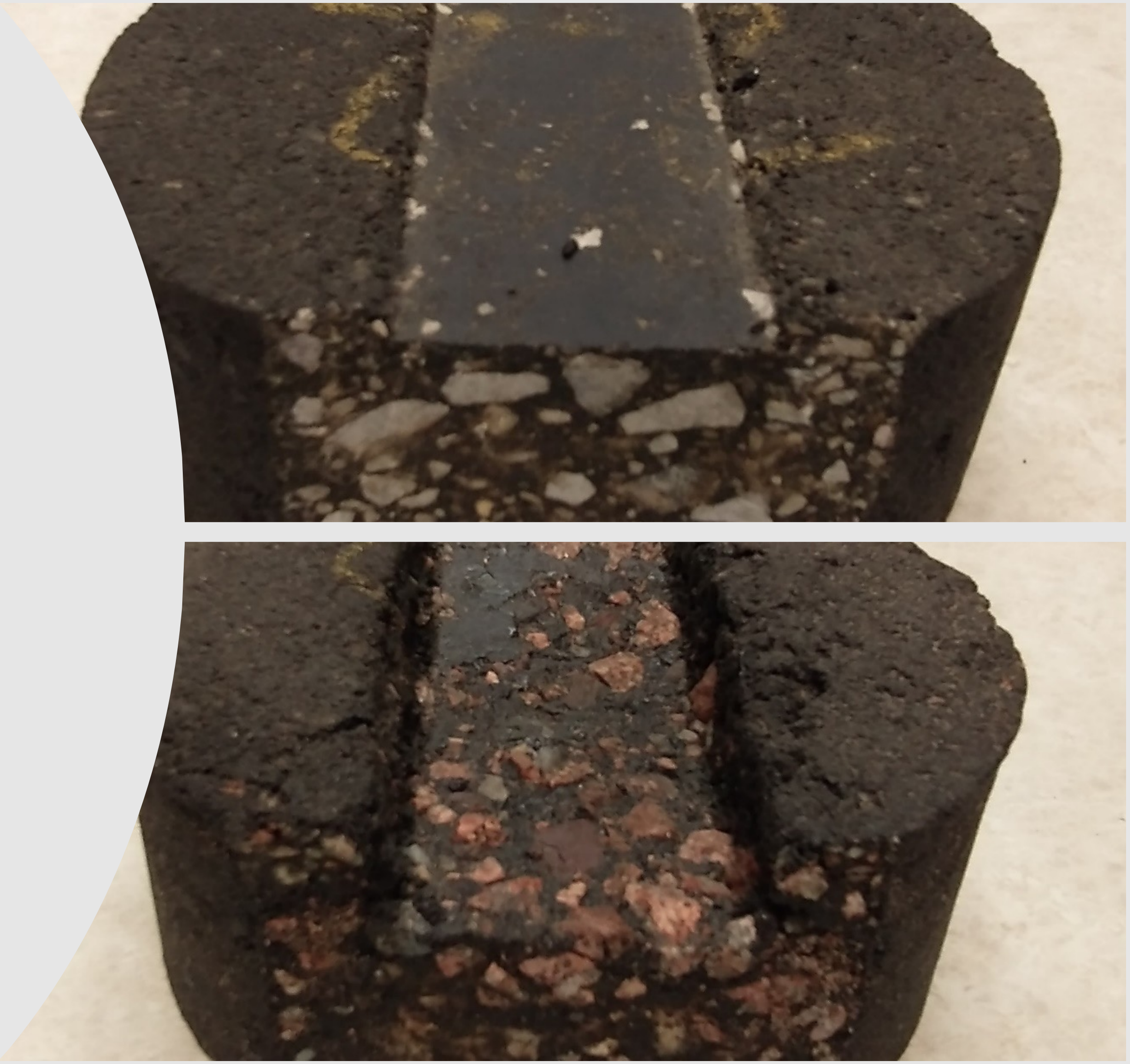


Lab Equipment

Rutting **Cracking**

Hamburg Wheel Tracker

Shows moisture damage potential
(Stripping potential)



BMD Pilot Projects in WI

SPV used for pilot BMD projects since 2020

HMA Pavement Balanced Mix Design

A Description

Conform to standard specification 450 and 460 except as modified in this special provision.

This special provision incorporates balanced mix design (BMD) into the mix design procedures specified in standard specification 460. This specification applies to the primary upper layer mixture under the following bid item: Enter Bid Item #. Mix designs will be tested by the Hamburg Wheel-Track Test (HWT) according to AASHTO T 324 as modified by CMM 836.6.10.1 and the Indirect Tensile Cracking Test at Intermediate Temperature (CT-Index) according to ASTM D8225 as modified by CMM 836.6.10.2.

- BMD is incorporated at the mix design stage for certain PWL projects
- Applies to upper layer mixtures
- Mix designs are tested using HWTT and IDEAL-CT methods

BMD Pilot Projects in WI

SPV used for pilot BMD projects since 2020

- Mix design testing criteria from 2021 to 2023

Binder Designation Level[1]	S	H	[illegible]	E
Ham[illegible] Tracking (AASHTO T 324 as [illegible] CMM 836.6.10.1) Passes to [illegible] rut depth [illegible] Inflection Point	10,000 8,000	[illegible] 8,000	20,000 [illegible]	20,000 8,000
IDEAL-CT[2] (ASTM D8225 as modified in CMM 836.6.10.2) CT-Index	30	30	30	30

To ensure rutting and moisture damage resistance

To ensure cracking resistance

- Mix design testing criteria from 2023 to present

Mixture Type	LT	MT	HT	SMA
Hamburg Wheel Tracking (WTM T324) Corrected Rut Depth @ 20,000 Passes (mm) Stripping Number (LC_{SN})	≤ 12.0 ≥ 3,000	≤ 7.5 ≥ 3,000	≤ 5.0 ≥ 3,000	≤ 4.0 ≥ 3,000
IDEAL-CT (ASTM D8225 as modified in CMM 836.6.10.2) CT-Index	≥ 30	≥ 30	≥ 30	≥ 80

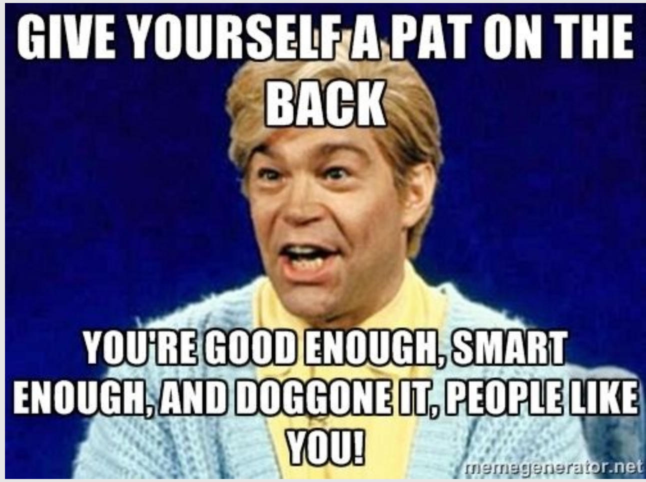
To ensure rutting and moisture damage resistance

To ensure cracking resistance

- Testing during the production was for information purpose only

What Does It All Mean?

- Each of the improvements to the specification over the last decade have been instrumental in building better asphalt pavements.
  - Increased density = longer lasting pavements.
  - Additional asphalt = reduced cracking and aging.
  - PWL = more consistent, quality material.
  - Joint density testing = better performing joints.



- Overall: longer lasting pavements = greater return on investment
- Good stewards of the taxpayer's dollars

Overview

- Perpetual Pavement
- In-Place Nuclear Density Testing
  - Non-nuclear Options
- Successful Testing Protocols
  - Round Robin Testing
  - Independent Assurance Program/HTCP
  - Nuclear Gauges/Blocks
  - Random Sampling, Custody/witness, Splitting
- E-ticketing/OnStation

Perpetual Pavement

- Definition

  Perpetual Pavement is a term coined to describe a specific type of long-lasting asphalt pavement designed to endure for more than 50 years without requiring major structural rehabilitation or reconstruction. It is engineered to sustain its structural integrity over an extended period while only needing periodic surface renewal to address any distresses that are confined to the top layer of the pavement.

Goal of Perpetual Pavement Design

- Bottom-up fatigue cracking

- Structural rutting

Design against deep, structural distress

Characteristics of Perpetual Pavement

1. **Layered Structure**: Perpetual Pavements are constructed with multiple layers that each serve specific functions, such as distributing loads, resisting deformation, and providing a smooth driving surface.
2. **Maintenance Strategy**: The maintenance for Perpetual Pavements typically involves milling the top layer and applying a new overlay. This process allows the base to remain intact, thus significantly reducing the cost and environmental impact associated with complete pavement reconstruction.
3. **Sustainability**: The design and maintenance approach of Perpetual Pavements reduces the use of virgin raw materials and minimizes greenhouse gas emissions over the pavement's lifecycle.

Characteristics of Perpetual Pavement

4. **Economic Efficiency**: They offer a lower life-cycle cost compared to traditional pavements by avoiding deep repairs or reconstruction and by reducing user-delay costs associated with maintenance.
5. **Environmental Benefits**: The reduced frequency of rehabilitation, combined with the practice of recycling the milled material, leads to a decrease in the environmental footprint of the roadway.
6. **Performance**: Perpetual Pavements are designed to minimize the occurrence of common distresses like bottom-up fatigue cracking and rutting, ensuring that the pavement remains smooth and functional for the long term.

Summary/Conclusions

- Perpetual pavements are widely recognized across the U.S.
- Perpetual pavements don’t have deep structural problems
  - Surface remedies make them an attractive option
  - Maintains ride quality
  - Minimal rutting
- Perpetual pavements can be designed using mechanistic principles
- Cost effective

New Perpetual Pavement Projects in WI

Project 1of 2

Highway Name	IH 94
Roadway Name	Northfield to Osseo
Project Termini	Bridge on South Fork Buffalo River - Near West County Line
Region	NW
County	Jackson
Functional Classification	Interstate/Freeway

There is a pavement section in Trempealeau County on interstate 94 near Osseo Wisconsin where a deep strength hot mix asphalt (HMA) pavement was placed in the Fall of 2023 (Figure 1). WisDOT instrumented this pavement as part of a National Road Research Alliance (NRRA) in cooperation with MNDOT to develop a fatigue transfer function that can be used in the PerRoad software for perpetual pavement design. Phase II of the NRRA research project is under development and expected to be advertised this spring. This would take data collected to develop equations or transfer functions best representing current Wisconsin HMA mixes.

New Perpetual Pavement Projects in WI

Project 2 of 2:

Project I.D	1130-68-71
Region	NE
Roadway	Appleton - DePere
Termini	STH 96 - CTH F
Highway Number or indicate if local road	IH 41
County	Brown & Outagamie

NER had agreed to pilot a section of the IH 41 corridor expansion project. A one mile segment on both sides of Interstate 41 will be constructed as a perpetual pavement. The letting date for this section is 11/9/27, potentially advanceable to May 2027. This will be 10.5 inches of HMA over 7 inches of a dense graded base. The typical concrete pavement in this section was to be 10.5 inches over a 6 inch dense graded base.


Compaction Operations

Why is density so important

- Less oxidation of the asphalt binder, a slower rate of pavement deterioration
- Minimizes the permeability of the pavement, which reduces the potential for moisture damage
- Increased resistance to deformation such as rutting
- Enhances fatigue resistance, reducing the likelihood of cracking under repeated traffic loading
- Lower maintenance and rehabilitation costs over the pavement's life cycle, making it more cost-effective
- 1% density increase = 10% more pavement longevity

How is In-Place Density Measured

Nuclear Density Gauges

- Nuclear density gauges operate based on the principles of nuclear physics, where a source of radioactive material is used to emit particles, and a detector measures the scattering or absorption of these particles by the tested material to determine in place density

How is In-Place Density Measured

Pavement Cores

- Pavement coring for density is a destructive testing method used to obtain direct, accurate density measurements of asphalt pavement in the field.
- Cylindrical samples of existing pavement layers are removed using a core drill to calculate the in-place air void content.

How is In-Place Density Measured

Non-Nuclear Density Gauges

- Non-nuclear density gauges are used to measure the density of asphalt pavement materials without the use of a radioactive source, including electromagnetic, electrical, and mechanical methods.

Non-Nuclear Density Gauges

1. **Electromagnetic Gauges**: These gauges send electromagnetic waves into the pavement and measure the response. The dielectric constant of the material, which is related to its density, affects the propagation of these waves. By measuring parameters such as the wave's velocity, reflection, or transmission, the gauge can estimate the density of the pavement.
2. **Electrical Property Gauges**: These devices measure the electrical properties of the asphalt, such as capacitance or resistance, which correlate with the material's density. The gauge applies an electrical current or signal to the pavement and measures the response, which depends on the density and composition of the material.

Non-Nuclear Density Gauges

Benefits:

Simple, easy to use

- Little to no training needed

No licensing requirements with no radioactive source

Real time results in seconds

Coming to a project near you

- Comparison data is being collected for evaluation

Drawbacks:

Requires calibration against known density values (using cores)

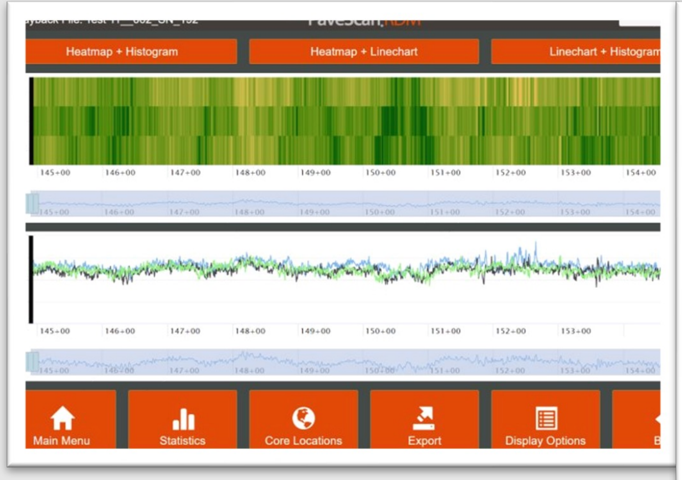
Often requires more frequent calibration

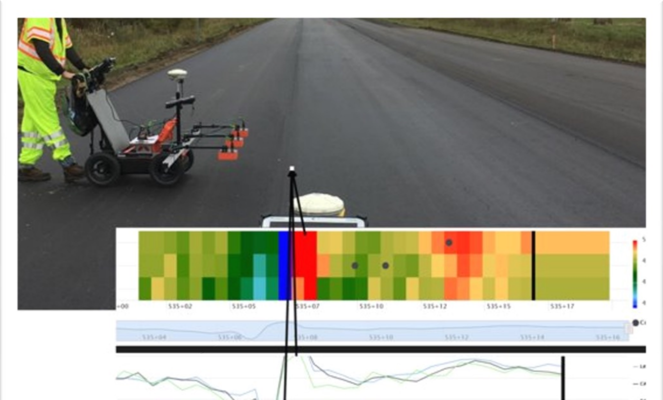
Accuracy may be affected by factors such as moisture content, material composition, and temperature

How is In-Place Density Measured

Dielectric Profile Systems (DPS)

- Dielectric Profiling Systems (DPS) work based on the principle that materials have a characteristic dielectric constant which is indicative of their electric permeability. In the context of asphalt pavements, DPS uses Ground Penetrating Radar (GPR) technology to measure the dielectric constant of the asphalt mat.





Dielectric Profile Systems (DPS)

- Correlated dielectric values PRIOR to project start
- Much more data than cores, nuke gauge, or non-nuke gauge
- Mapping visual aids makes trouble shooting density issues easier
- Forensic investigation
- Improve quality/consistency
  - Can lead to additional more incentives
- Monitor paving operations
- Training tools
  - Constant improvement
- Drawbacks
  - Traffic & Traffic Control
  - Weather
  - GPS Connectivity/Sensor Connectivity
  - Other Equipment Nuisances
  - Data Management
  - Training
  - Fatigue

Successful Testing Protocols for WisDOT

1. We know variability exists within laboratories
2. We know variability exists within technicians
3. We know variability exists within testing procedures
4. We know variability exists with equipment
5. We know variability exists within materials

So what do we do…limit that variability

- For labs…Lab Qualification Program
- For technicians…Highway Technician Certification Program (HTCP), Independent Assurance Program (IAP)
- For testing procedures…Manual of Test Procedures (MOTP)
- For equipment…Approved Products List (APL), Profiler Rodeo for IRI Ride
- For materials…Round Robin Program

Limit Nuclear Density Gauge Variability

- Gauges must be calibrated annually by the manufacturer, placed on the APL
- Gauges are checked on the DOT blocks in Green Bay and adjusted accordingly
- Reference Blocks used daily when testing is done
  - Project or Laboratory
- Percent Within Limits (PWL)
  - Gauges are correlated with a Test Strip (offsets)
  - Project startup:10 QV locations following QC
  - Footprint testing daily
- Quality Management Program (QMP)
  - MOTP QC/QV Gauge Comparison

Round Robin Testing

Limiting Mixture Variability

Over 100 individual labs participate (HMA)

- Gmm & Gmb is tested and analyzed

Outliers are identified from the statistical analysis

- Independently as Gmb and Gmm

Corrective action is documented, retesting of the outliers is performed until resolved

Same process is followed for the following:

- Asphalt content-asphalt analyzer
- Performance testing-Hamburg Wheel Tracker & IDEAL-CT

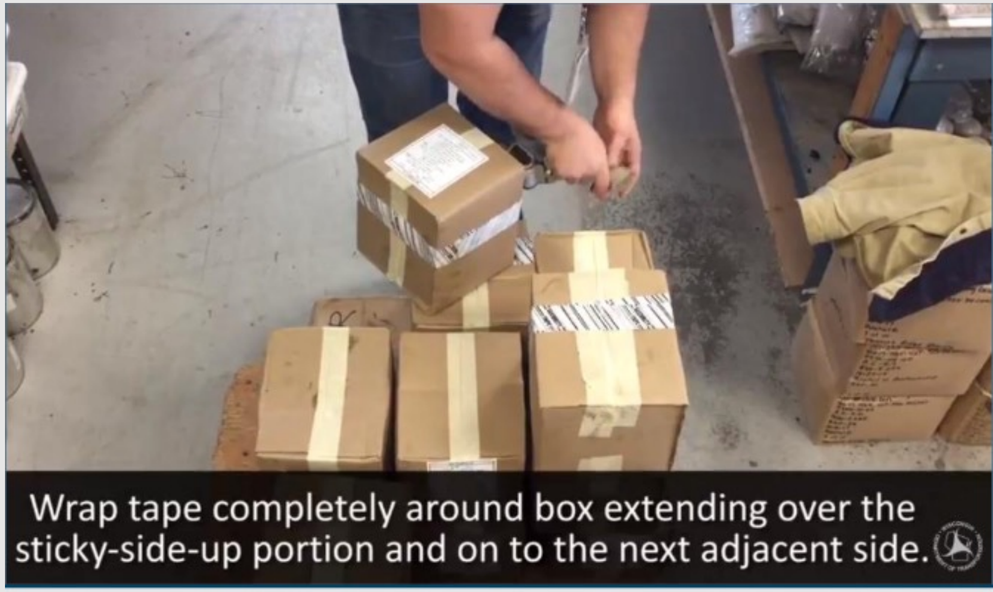
Random Sampling

- Mixture sample is taken at the plant from the truck box
- Both QC/QV samples (independent samples unless PWL)
- QC – Contractor sample
  - Tested at the plant lab
- QV – Department sample
  - Tested at the department lab
- Must be HTCP certified (sampler & observer)

- There are minimum amounts of material required for each QC/QV testing requirements and their retained split sample (MOTP)
- Samples must be placed in an 10” x 8” x 8” box (such as Uline S-19062)
  - Samples must be labelled with the 12 requirements per MOTP

Mixture Sample Security

- QC-Retained Samples
  - Implemented in 2018
  - Contractor must sample, split and label mixtures
  - Contractor will provide the Department with retained samples in a designated storage area, on a pallet or rack
  - Department representative will secure retained samples when they come to the plant to collect a QV sample
  - Sample security video can be found on the WisDOT QMP webpage




Technology
Heading
Your
Way

WisDOT E-Ticketing Team

- NC –Jed Peters & Adam Holquist
- NE –Jesse Hanson & Rebecca Rooyakkers
- SE –Eric Hanson
- SW –Cody Kammerzelt & Adam Kopp
- BTS –Erik Lyngdal & Barry Paye
- BPD –Brandon Lamers, Wayne Chase, David Castleberg, Drew Kottke
- OBOEC –Teresa Rademacher
- FHWA –Nick Perna

Friday morning's General Session:
Emerging Technology in Construction Management and E-Ticketing

Standard Specifications

In 2024 Design Standard Specifications

- 109.1.4.3 Add option for electronic load tickets.
- (1) Electronic load tickets may be provided as a substitute for printed tickets. Include the information as specified in 109.1.4.2 on each electronic ticket.
- (2) Automatically generate electronic tickets using a system that is fully integrated with the load-out scale system being used to weigh the material. Ensure data input cannot be altered and provide offline capabilities to prevent data loss.
- (3) Provide electronic tickets in real-time by allowing the department access to the tickets utilizing a web based or app-based system compatible with iOS and Android.
- (4) Provide the capability to record information and comments on each ticket.
- (5) For each project ID and bid item, submit an electronic daily summary of the individual tickets daily as work is completed. In the daily summary, include the unique information for each individual load ticket. Provide the daily summary data in an importable format, such as comma separated values (.csv).

E-Ticketing Takeaways

- Safer projects and shorter work zone traffic impacts
- Improve efficiency and accuracy in recording and sharing material ticket information
- Seamless project collaboration through digital communication across plants, job sites, and transportation agencies
- Enhance data integrity and reduced risk of errors and disputes with audited secure permissions for every teammate
- Real-time access to ticket data for better project management

OnStation Mobile App

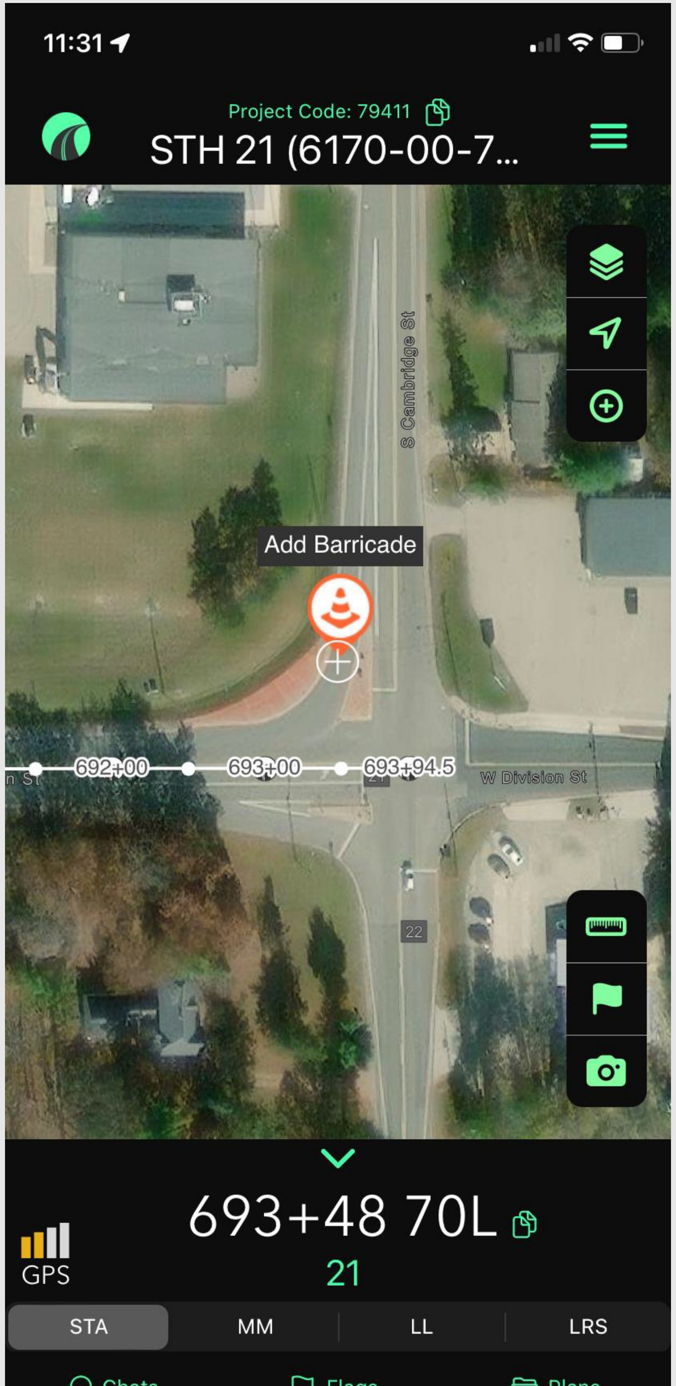
Digital Station Tool

- Utilizes phone-based GPS to give real time on project location
- Compatible with any type of Apple or Android mobile device iPhone, iPad, Samsung, Motorola, Google

OnStation Mobile App

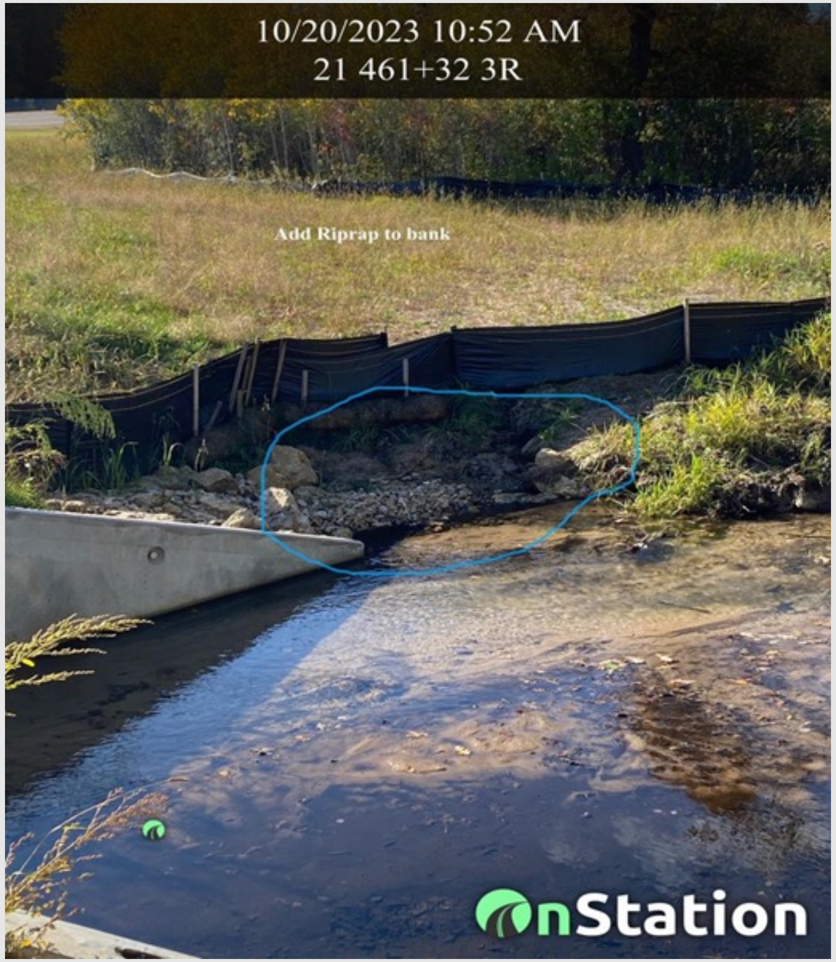
Collaboration

- Tags can be shared between all users
  - Traffic Control Modifications
  - Photos of issues
  - Punchlist locations
- Improved Communication
  - Reduces redundant data collection by sharing data across team



WisDOT Feedback

- What does WisDOT use OnStation for:
  - Project location (General Location Only)
  - Collaboration
  - Photos
- Benefits
  - Finding where you are on the project
  - Time savings
  - Better communication
  - Less costly alternative to determine estimated location
- WisDOT concerns with use of OnStation
  - Accuracy
  - Consistency of Accuracy
  - Wi-Fi Connection
  - Blurry Images




THANK YOU!!!!