

# NDDOT HMA Update

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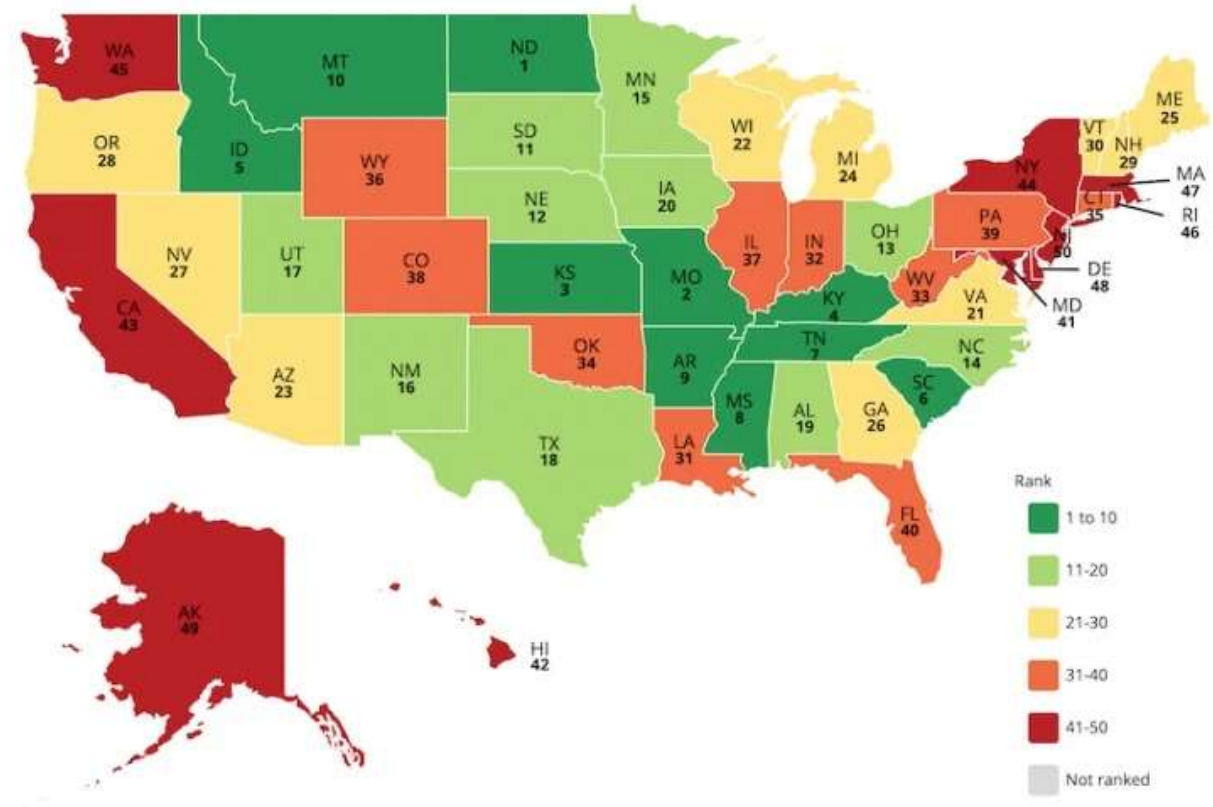
# FUNDING UPDATE

- \$345 million IJA 5-year bill
- \$61 million August redistribution
- \$125 million ARP remaining
- \$17 million bonding remaining



# GRANT UPDATE

- \$22 million - BUILD Grant
- \$16.75 million - INFRA Grant
- \$19.75 million - RAISE Grant





# HMA UPDATE

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- 1,909,827 Tons of Asphalt bid in 2022
- 1,093,619 Tons included RAP = 57%
- Binder Used
  - 33% 58S-28
  - 9% 58H-28
  - 25% 58S-34
  - 33% 58H-34



# HMA SELECTION GUIDE

- Superpave FAA Type
- Binder Grade

## Hot Mix Asphalt (HMA) Selection Guide

### Superpave FAA Type

Daily One-way ESAL's	Superpave FAA Type
< 100 & Interstate shoulders	FAA 42
100 – 300	FAA 43
> 300 & Roundabouts	FAA 45

### Performance Graded (PG) Asphalt Binder Selection Guide with MSCR

Daily One-way ESAL's	PG Binder Grade
< 100 & Interstate shoulders	PG 58S-28
100 – 200	PG 58S-28 with < 20% RAP PG 58S-34 with ≥ 20% RAP
200 – 1000	PG 58H-34
> 1000 & Roundabouts	PG 58V-34

- Daily One-way ESAL's are published each year by Planning/Asset Management Division and can be found in the District Highway Information book for each Hwy segment.



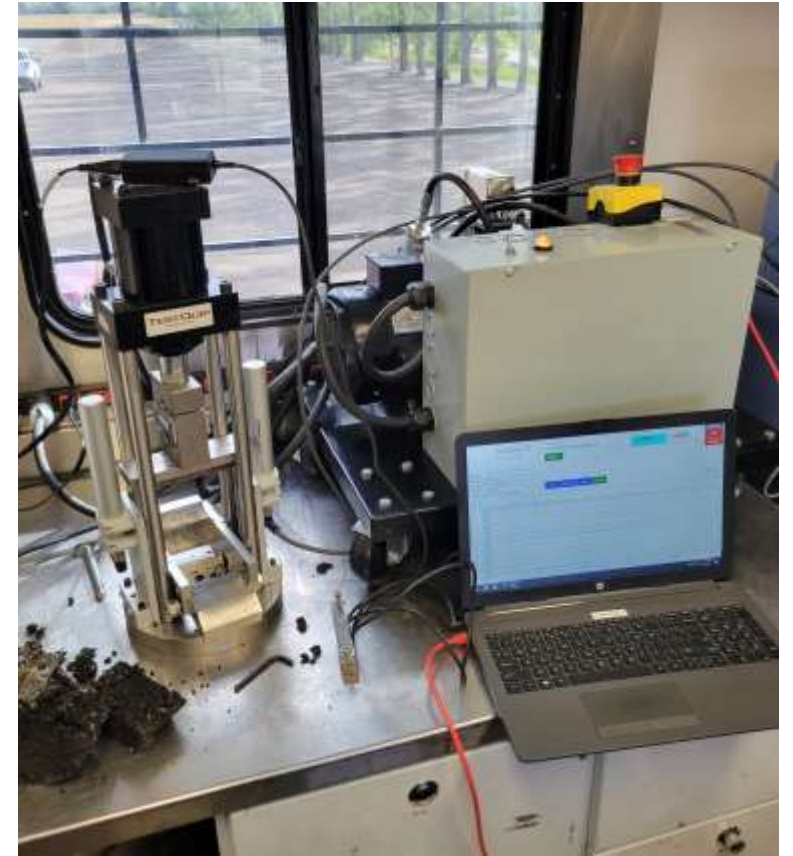
# DENSITY RESULTS

- 2022 Avg Mainline Density: 93.8
  - 2021 Avg 93.6
  - 2020 Avg 93.4
  - 2019 Avg 93.4
  - 2018 Avg 92.9
- 2022 Avg Joint Density: 92.3

# HMA INCENTIVE \$

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- Ride Incentive \$571,000
  - Avg MRI 44.7
- Mainline Density
  - Avg Pay Factor 102.5%
- Longitudinal Joint Density
  - Avg Pay Factor 102.4%





# PILOT PROJECTS 2022

- Superpave 5 - Minot District
- 5 Projects with IC & PMTP

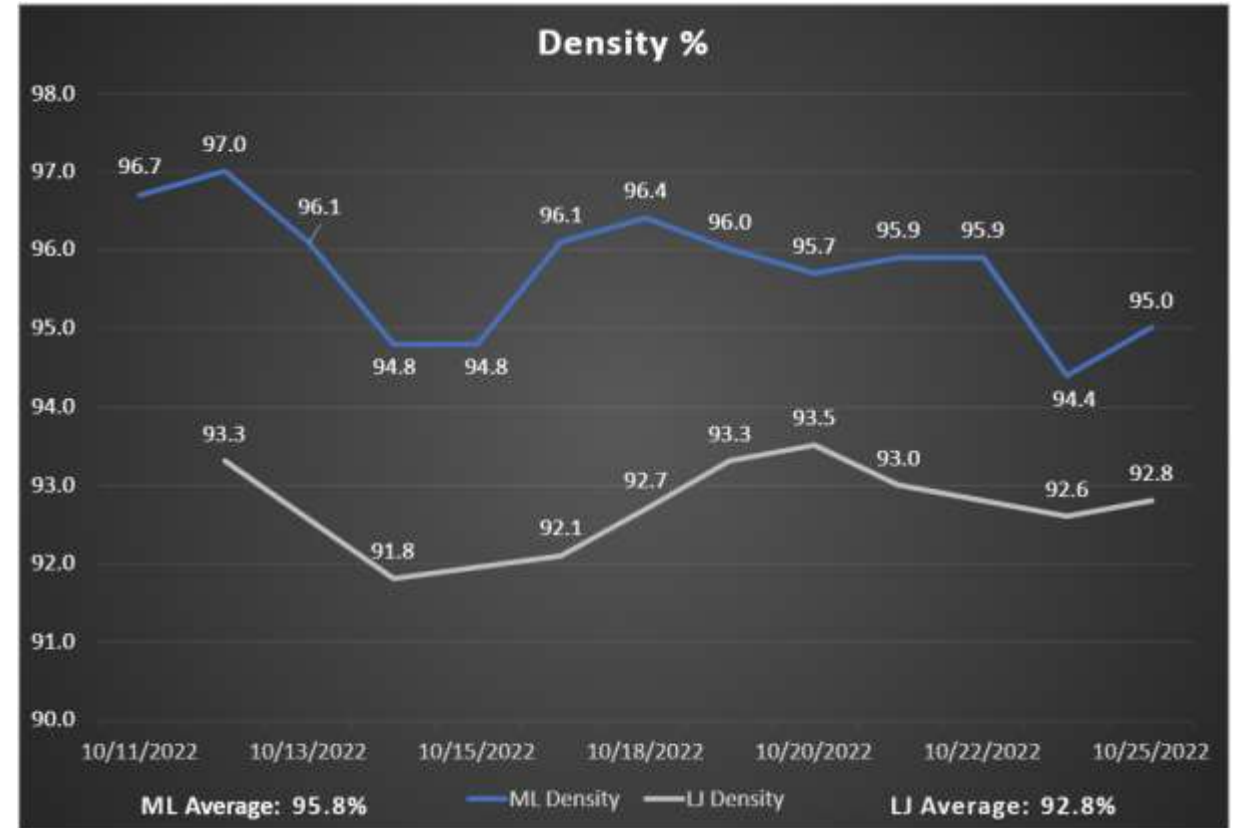




# SUPERPAVE 5

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- Target 5% air voids at mix design and compact to 95%
- Reduced gyrations increases binder content
- Minot District project
  - Avg density: 95.8% mainline & 92.8% long joint

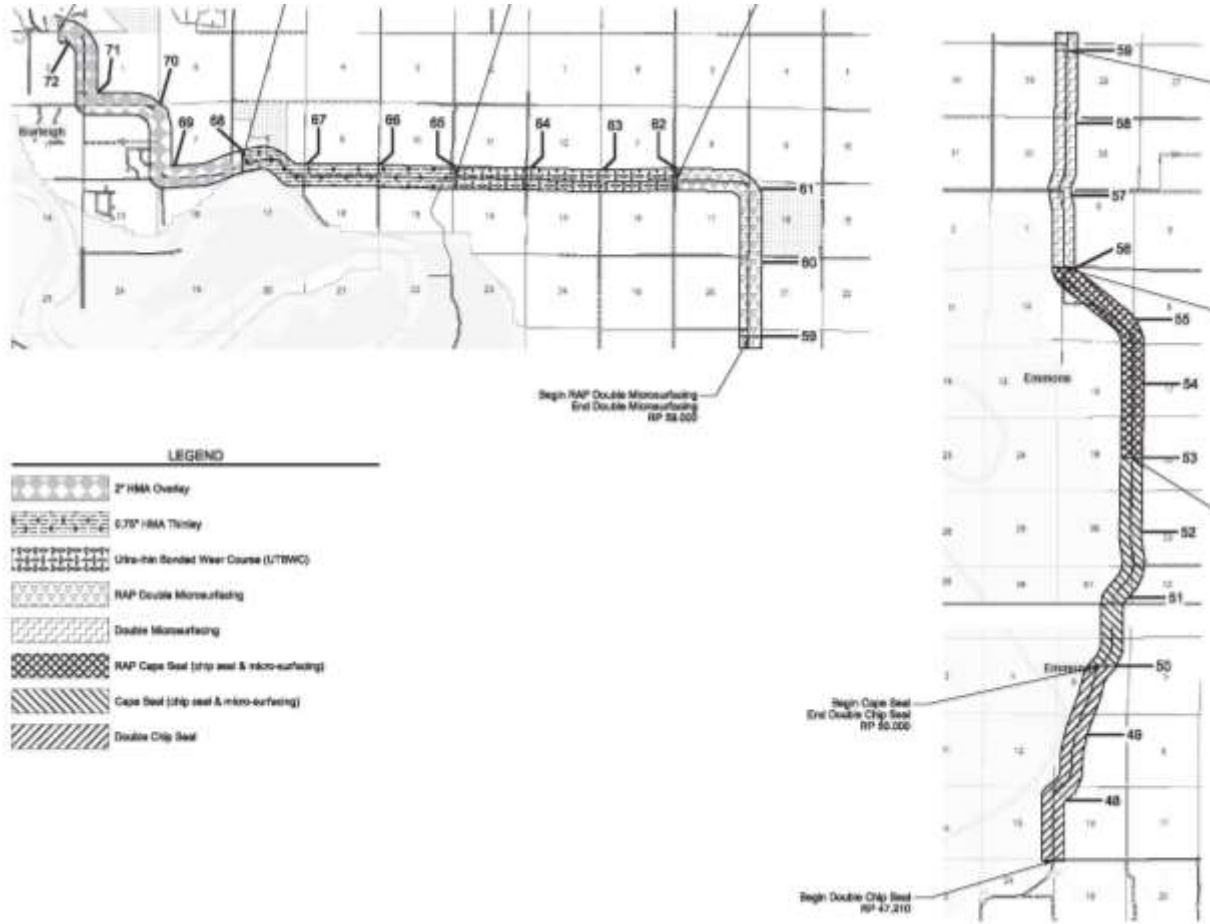




# PILOT PROJECTS 2023

- Superpave 5 2 projects
- Intelligent Compaction 18 projects
- Paver Mnt. Thermal Profiler 17 projects
- Percent Within Limits 9 projects
- Higher RAP % 1 projects

# TEST SECTION PROJECT



- Double Chip Seal
- Cape Seal
- RAP Cape Seal
- Double Micro-surfacing
- RAP Double Micro
- Ultra Thin Bonded
- 4.75 mm HMA Thinlay
- 9.5 mm HMA Thinlay
  
- 3 miles each



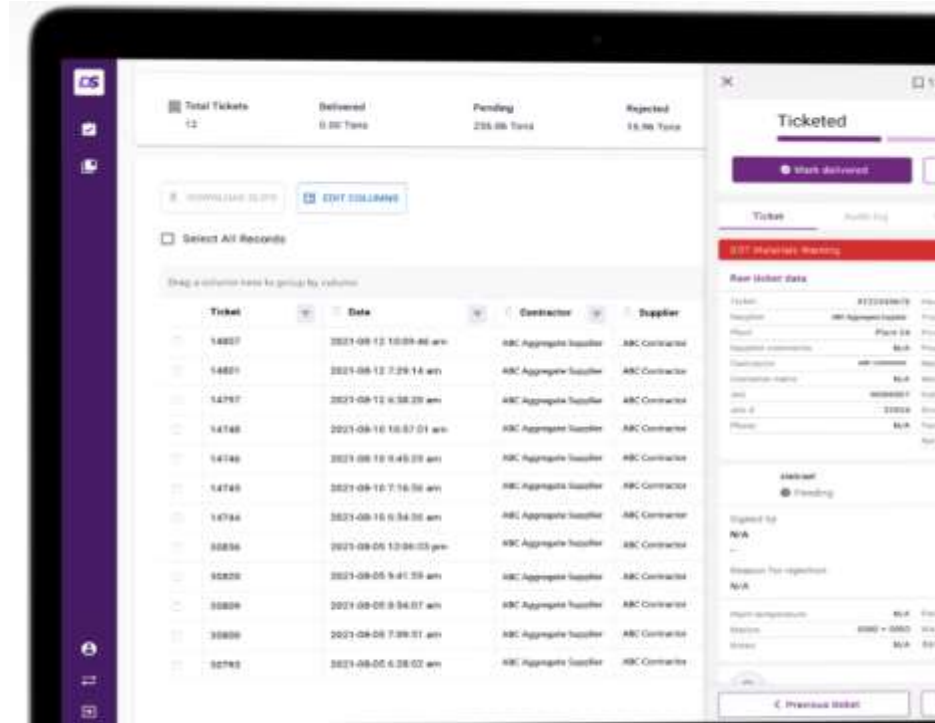
# DENSITY PROFILING (DPS)



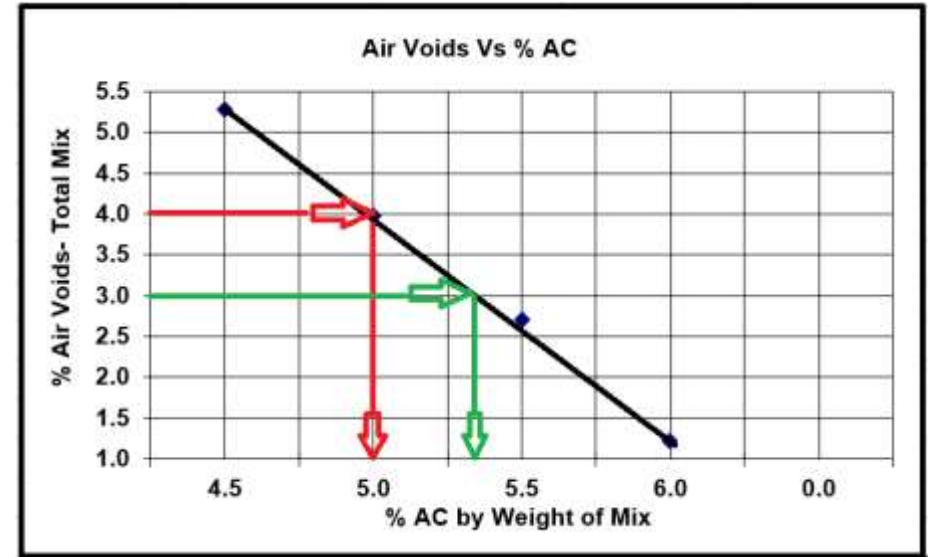
- ND Hwy 6
- Profiled entire project
- 3 passes each lane
- About 120 miles walked

# E-TICKETING

- Successfully used on 3 projects during 2021 and 2022
- Special provision that allows for e-tickets on all projects
- Adding e-ticketing requirement to 15 projects in 2023
- Acquired DOT Portal by HaulHub to pilot this year
- Plan full implementation of e-ticketing by 2026



# HMA SPEC CHANGES 2023



- Mix design procedure standardized
- Density tables combined into 1 table
- 3 FAA Grades will be used moving forward: 42,43,45
- 1% increase in density requirement for 100% pay for FAA 42&43



# FHWA CLIMATE CHALLENGE

- NDDOT applied for a Grant in 2022 and received \$240,000
  - Training
  - Proposal Development
  - Develop a Sustainable Pavements Evaluation Process

# TPF-5(478) DEMO TO ADVANCE NEW PAVEMENT TECH

- FHWA Pooled Fund
  - State contribution of \$10,000 per year
  - Funding for a project: up to \$250,000
  - 100 hours of technical assistance from FHWA
  - NDDOT selected project: Implementation of Balanced Mix Design



# TPF-5(478) DEMO TO ADVANCE NEW PAVEMENT TECH

- Proposal from National Center for Asphalt Technology (NCAT)
  - Project Timeframe: 2023 to 2026
  - Benchmark ND mixes in 2022 and 2023
  - Total Proposed Cost: \$350,000
    - \$250,000 from Pooled Fund
    - \$100,000 research funds approved by RAC
  - Build BMD test sections for field verification
  - Develop BMD specifications and implement through pilot projects





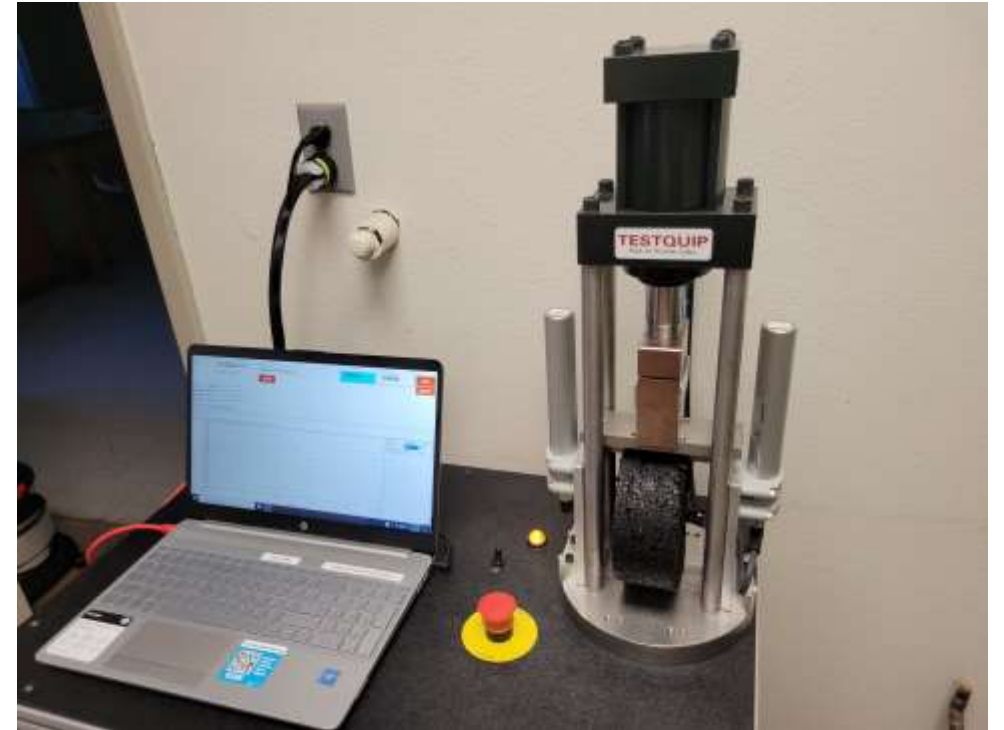
# HMA PERFORMANCE TESTING 2022

- 39 projects tested by Bituminous Mix lab
  - 12 projects from 2021, 27 projects from 2022
- Hamburg wheel tracker, Ideal CT, DCT
- Benchmarking ND mixes



# HMA PERFORMANCE TESTING 2022

- Ideal Cracking Test
  - Test 5 specimens to get Avg Index
  - Index Range: 8 to 444
  - Index Avg: 66



# HMA PERFORMANCE TESTING 2022

- Disc shaped Compact Tension
  - Range: 300 to 759
  - Avg: 481
  - Cold weather cracking test, run at  $-18^{\circ}\text{C}$  or  $-24^{\circ}\text{C}$





# HMA PERFORMANCE TESTING 2022

- Hamburg wheel tracker
  - Rutting test, 20,000 passes in hot water at 46°C
  - Equivalent to 10 million ESALS of truck traffic
  - Measures rutting depth and stripping inflection point



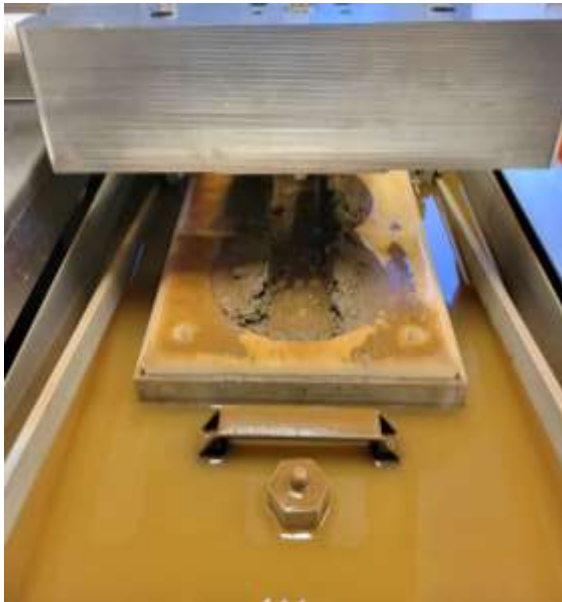
# HMA PERFORMANCE TESTING 2022

- Hamburg wheel tracker
  - Avg. passes to 12.5 mm: 17,362
  - Range to 12.5 mm: 9,323 to 20,000
  - Avg. passes to SIP: 13,701
  - Range to SIP: 5,172 to 20,000



# HMA PERFORMANCE TESTING 2022

- Hamburg wheel tracker
  - Identified an area of SW ND with an aggregate stripping issue
  - Torture test that gives insight into aggregate quality



# HMA PERFORMANCE TESTING 2023

- 1 project per District
- 3 samples each, first 1/3, middle 1/3, last 1/3
- Identify production variability







# QUESTIONS?

NORTH  
**Dakota** | Transportation  
Be Legendary.