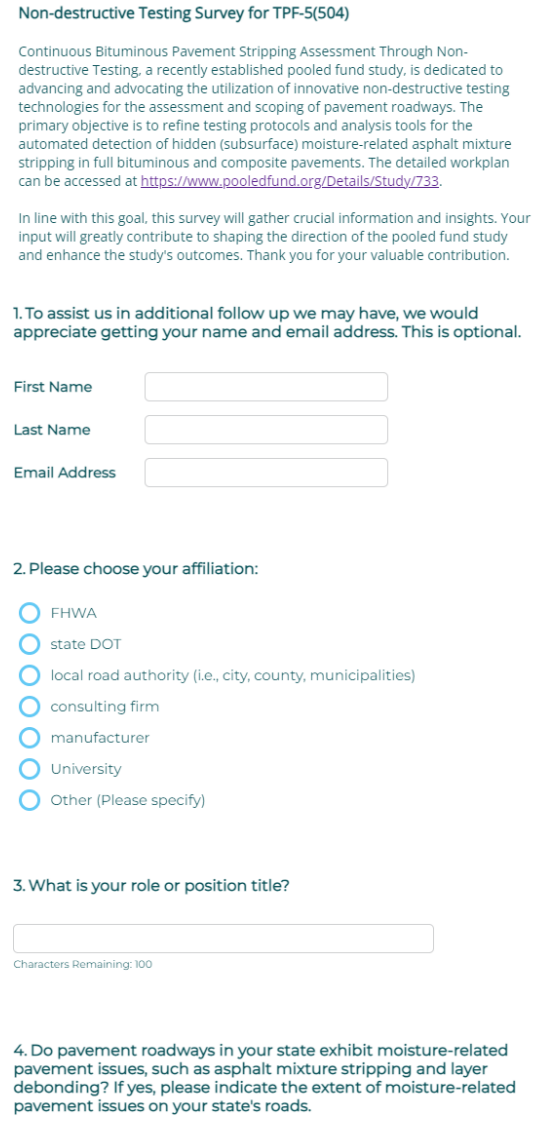
TPF-5 (504): Task 2 Summary of Survey Responses

TPF-5 (504): Summary of Survey Responses

- **Survey**
  - Survey goals
    - Gather information and knowledge
    - Validate or reject some our initial assumptions
    - Steer or guide our plans
    - Identify & connect with potential partners
  - Questionaries
    - Questions and comments from the Post R06D meetings
      - QES (Steve Koser and Denis Morian), MnDOT, FHWA
    - Online survey (Lauren Dao, MnDOT)
    - Survey distribution
      - TPF-5(504) members and friends list
      - AASHTO Comp members (Curt Turgeon)



Non-destructive Testing Survey for TPF-5(504)

Continuous Bituminous Pavement Stripping Assessment Through Non-destructive Testing, a recently established pooled fund study, is dedicated to advancing and advocating the utilization of innovative non-destructive testing technologies for the assessment and scoping of pavement roadways. The primary objective is to refine testing protocols and analysis tools for the automated detection of hidden (subsurface) moisture-related asphalt mixture stripping in full bituminous and composite pavements. The detailed workplan can be accessed at https://www.pooledfund.org/Details/Study/733.

In line with this goal, this survey will gather crucial information and insights. Your input will greatly contribute to shaping the direction of the pooled fund study and enhance the study's outcomes. Thank you for your valuable contribution.

1. To assist us in additional follow up we may have, we would appreciate getting your name and email address. This is optional.

First Name

Last Name

Email Address

2. Please choose your affiliation:

- FHWA
- state DOT
- local road authority (i.e., city, county, municipalities)
- consulting firm
- manufacturer
- University
- Other (Please specify)

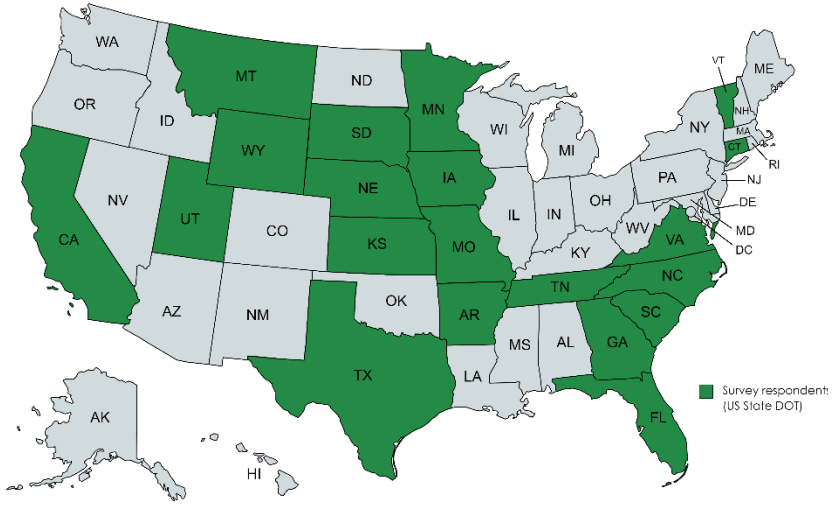
3. What is your role or position title?

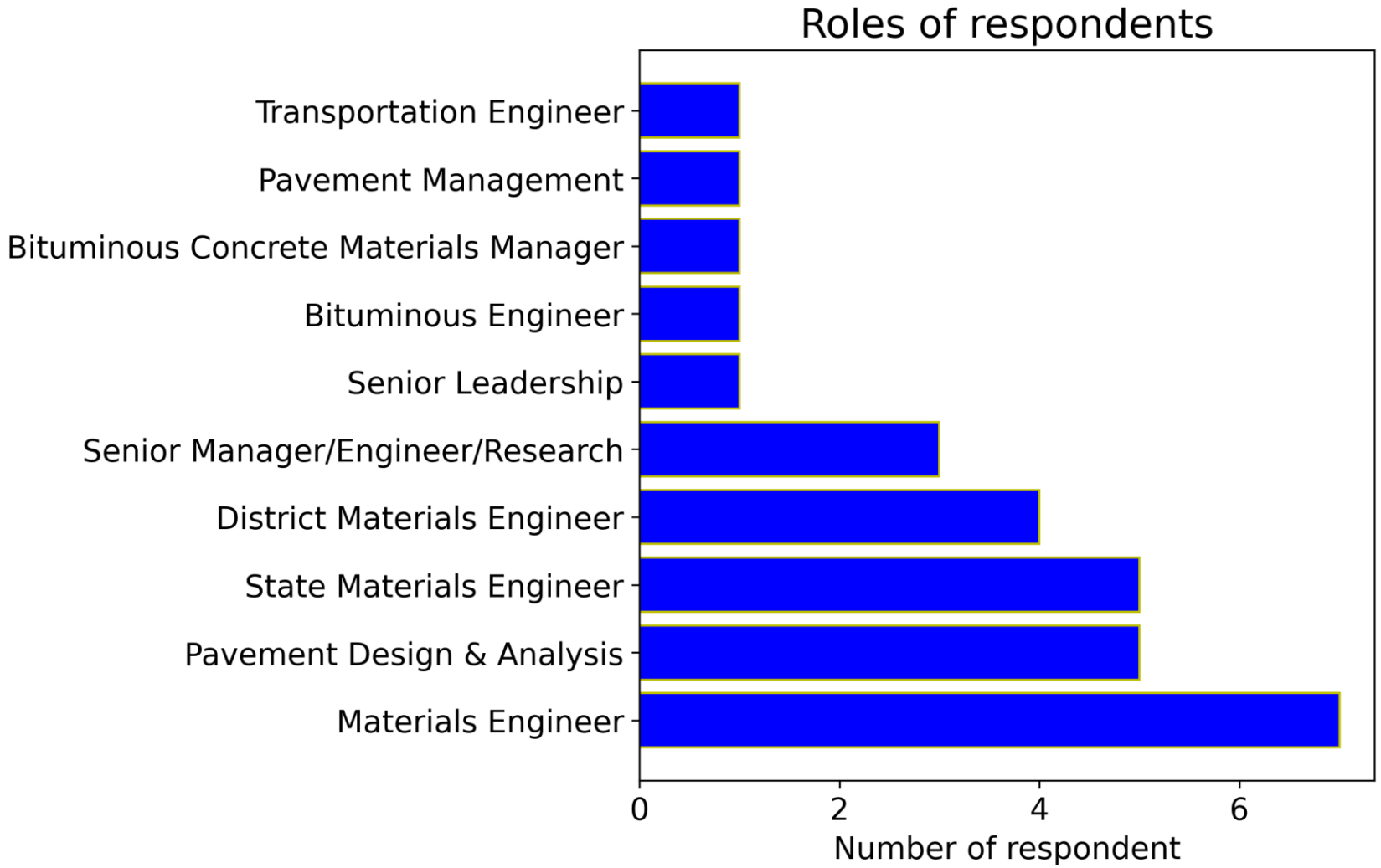
Characters Remaining: 100

4. Do pavement roadways in your state exhibit moisture-related pavement issues, such as asphalt mixture stripping and layer debonding? If yes, please indicate the extent of moisture-related pavement issues on your state's roads.

TPF-5 (504): Summary of Survey Responses

- **Respondents**
  - **29** Total responses
  - **20** from the USA
    - State DOTs
    - Research institutions
  - **2** from outside the USA
    - AARB (South Africa)
    - Ontario (Canada) Provincial Gc





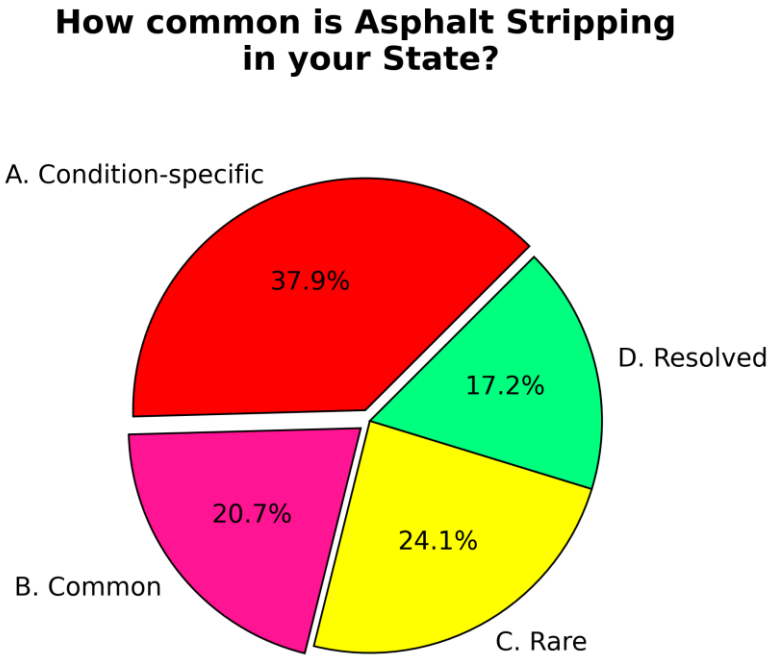
TPF-5 (504): Summary of Survey Responses

Q5. How does your state or organization define or understand asphalt mixture stripping conditions? Is a distinction made between asphalt mixture stripping and other concerns like delamination (debonding) and raveling? Please explain.

- Asphalt stripping is a distinct form of pavement distress. However, stripping can act as a contributing or accelerating factor for issues like rutting, delamination and raveling
- **Stripping**: loss of adhesion between aggregate particles and binder due to moisture infiltration and is associated with:
  - Loss of stability
  - Deterioration of entire sections (difficult to retrieve whole core samples)
  - Occurs inside the pavement, generally at the mid or bottom depth of pavement layers
  - There are no defined stripping severity levels. However, Montana uses a stripping severity measured on a scale 1 to 4 from cores taken from the project and analyzed in the laboratory
- **Debonding**: loss of bond between pavement layers. Primarily attributed to issues related to tack coat applications

TPF-5 (504): Summary of Survey Responses

Q4. Do pavement roadways in your state exhibit moisture-related pavement issues, such as asphalt mixture stripping and layer debonding? If yes, please indicate the extent of moisture-related pavement issues on your state's roads.



Mentioned conditions

Design

- Old AC pavements buried under new AC
- Mix placed in the 1970s & 1980s
  - Before Superpave & antistripping treatments
- Full depth bituminous pavements
- Multiple overlays
- AC overlays on concrete
- Aggregate quality
  - River gravel,
  - Uncrushed
- Porous AC with inadequate bitumen
- Areas difficult to compact
  - Longitudinal joints
  - Open-graded friction course

Climate

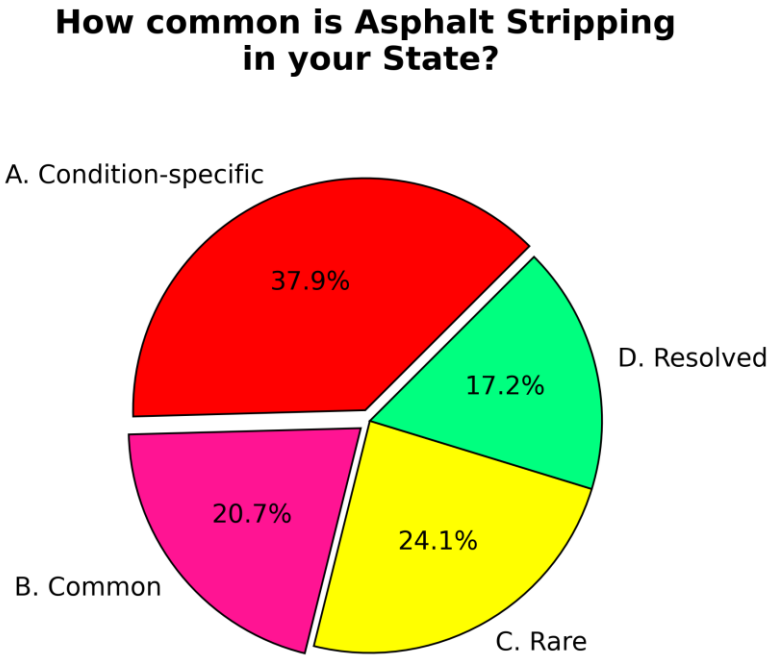
- Wetter climatic area
- Higher annual precipitations
- Flood prone regions
- Limited to specific regions

Maintenance

- Poor/clogged drainage
- Shallow ditches
- Joint & water access points

TPF-5 (504): Summary of Survey Responses

Q4. Do pavement roadways in your state exhibit moisture-related pavement issues, such as asphalt mixture stripping and layer debonding? If yes, please indicate the extent of moisture-related pavement issues on your state's roads.

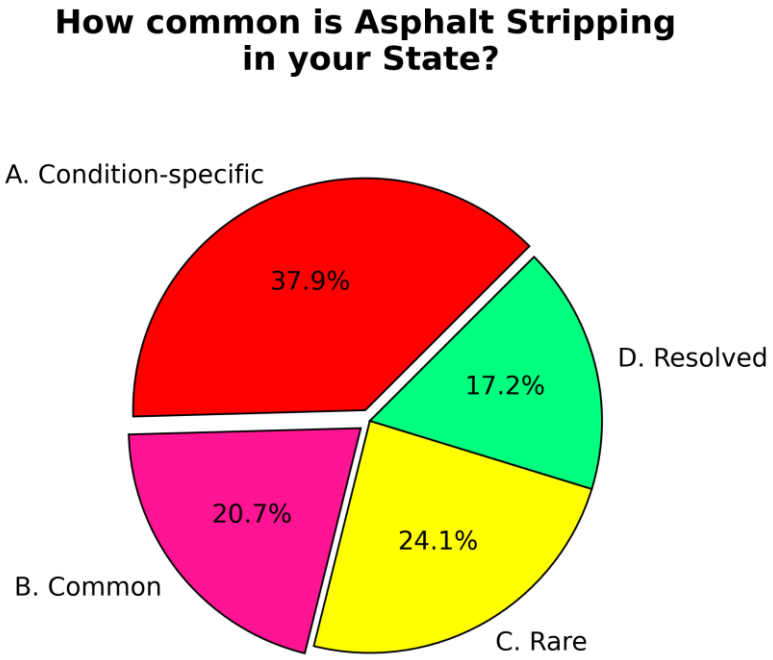


<u>Other shared insights….</u>

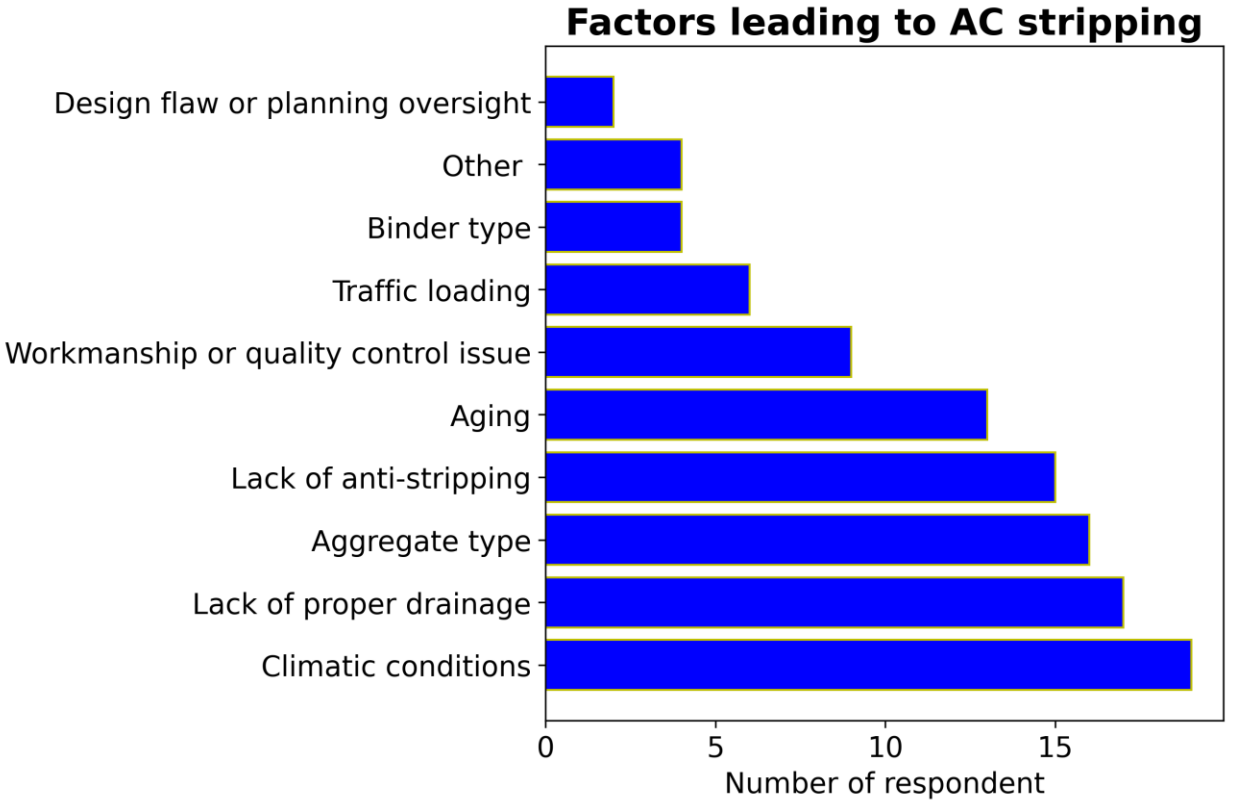
- Sometimes, moisture related asphalt stripping is confused with issues observed in **<u>perpetual pavements</u>**. Stripping in perpetual pavements is due:
  - Thick lifts (reduced of compaction efforts)
  - Low asphalt contents
  - Vertical segregation of coarse mixes

TPF-5 (504): Summary of Survey Responses

Q4. Do pavement roadways in your state exhibit moisture-related pavement issues, such as asphalt mixture stripping and layer debonding? If yes, please indicate the extent of moisture-related pavement issues on your state's roads.

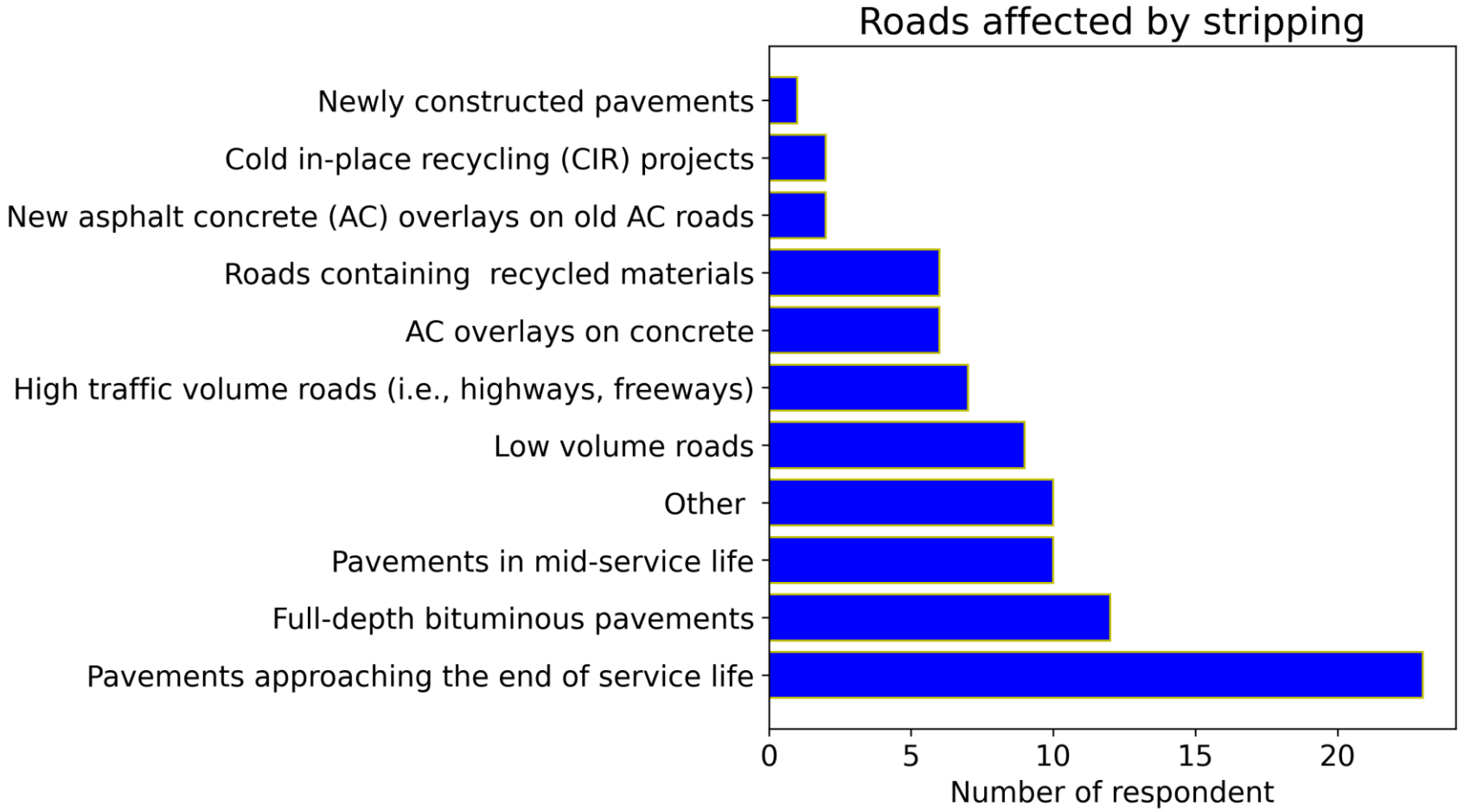


Q7. What primary factors contribute to asphalt mixture stripping conditions observed in your state? Select all that apply.



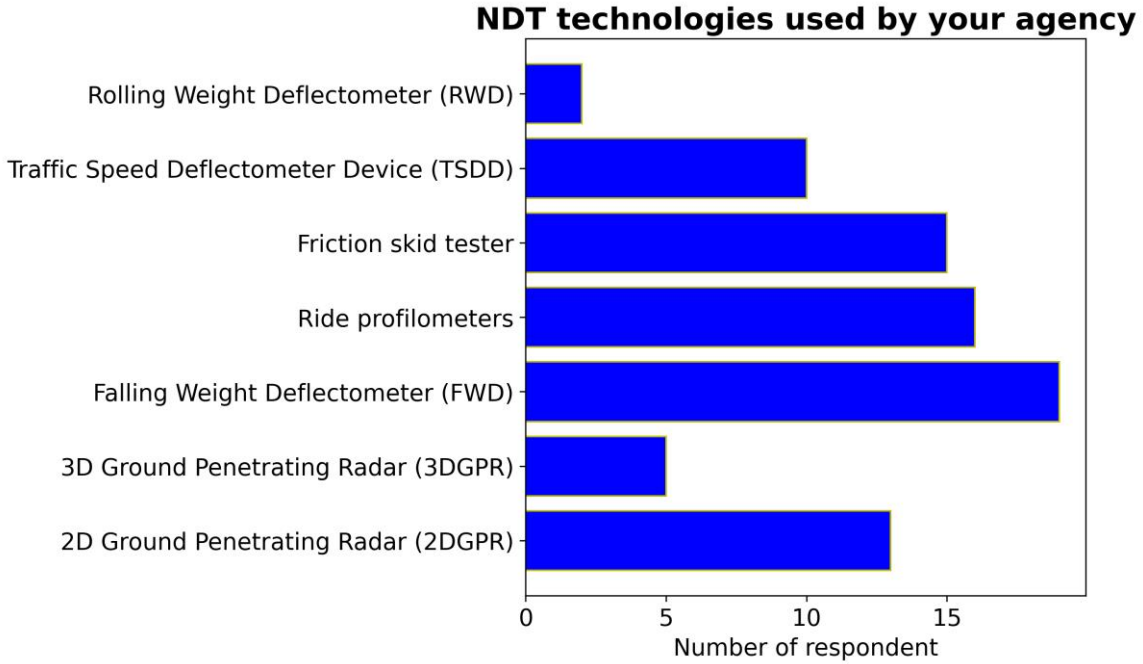
TPF-5 (504): Summary of Survey Responses

Q6. In which road types are asphalt mixture stripping conditions most observed? Please select all that apply.

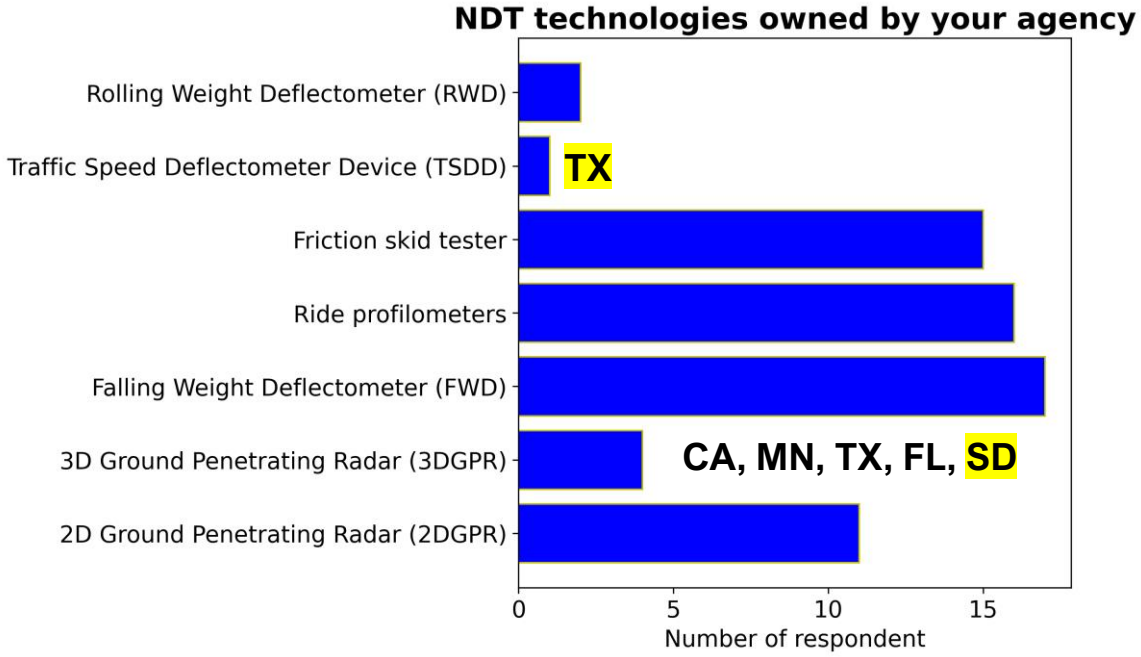


TPF-5 (504): Summary of Survey Responses

Q8.Which non-destructive testing (NDT) technologies does your State DOT or agency use to scope and assess pavement conditions in conjunction with or separate from traditional coring and geo-probing? Please select all that apply.



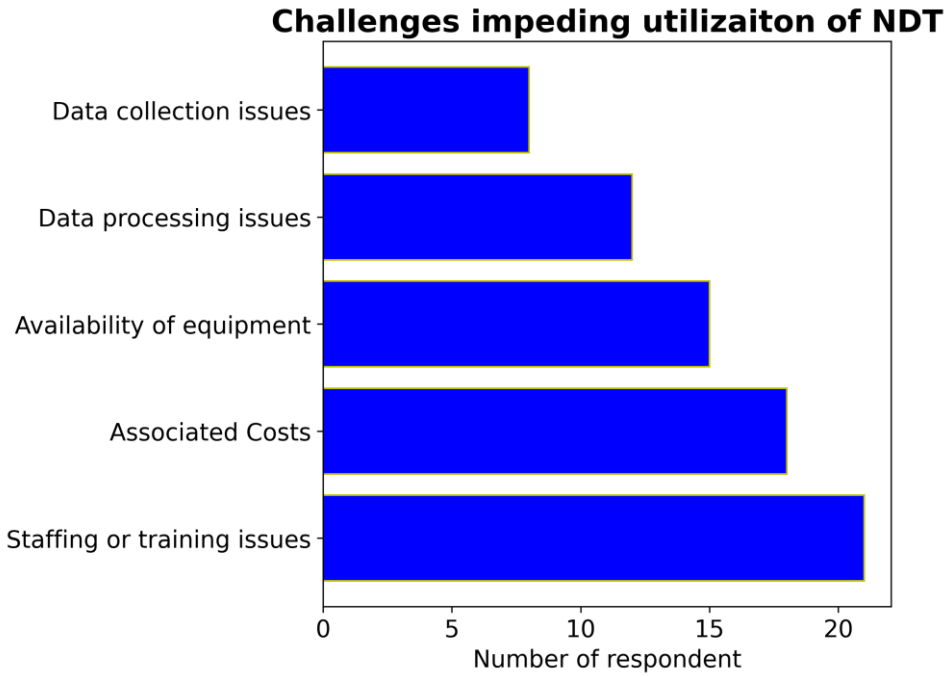
Q9.Does your state or organization own and operate any of these non-destructive technologies? Please select all that apply.



KY (not in the survey)

TPF-5 (504): Summary of Survey Responses

Q10. Based on your opinion or experience, what significant challenges impede the utilization of these NDTs for scoping and evaluating pavement projects? Please select all that apply.



Other challenges….

- Traffic control restrictions
- None. TXDOT and TTI own the equipment and we use them all
- Issues with aging equipment
- Not having enough operational equipment to support the state
- Specification (lack of)
- Lack information regarding time/cost associated with the use of NDT for project scoping

TPF-5 (504): Summary of Survey Responses

- **Key takeaways**
  - The survey validates the pool fund studies initial assumptions:
    - Stripping is predominately found in older pavements or those with susceptible moisture-prone layers underneath
    - Is hard to quantify the extent of stripping issues
  - The survey puts spotlights on
    - Target audience: project scoping and pavement design & analysis phases
    - Growing use of NDT technologies by road agencies
    - Challenges:
      - Training and staffing key challenges
      - Lack of specification (cost, time, expectations and accuracy)