# Safety Scoring Tool – Rural 2-Lane and Multi-Lane Highways
# Frequently Asked Questions

1. Are projects with minor changes such as pavement markings, signs, seal coat, overlay, etc. required to report a safety score?

    a. *Scores are required for Rural PM, 2R, 3R and 4R projects. For PM projects, note the caveats below:*
        i. *It is not currently expected to be used on MNT projects, or Districtwide signing or striping projects that are only re-placing signs/striping to bring up to standard.*
        ii. *It is required on pavement projects, including seal coats and overlays, and any signing, striping or traffic control projects that involve a change to the existing roadway cross section.*
        iii. *The Safety Scoring tool, which is intended to aid designers in making safety-driven decisions, is required to be used on District-wide Seal Coats. With much of the districts' seal coat program focused on Rural 2-lane roadways with higher fatality rates, this tool provides the opportunity to assess what additional elements or safety-related improvements can be made on these roadways. It may be seven years, or more, before many of these roads are looked at again, given the current cycle. Even if districts do not address the elements identified in that specific seal coat project letting this year, the assessment allows districts to become more aware of and plan for those future improvements.*
        iv. *Intersections and traffic signal projects are currently excluded from this tool. A similar tool is under development for urban intersections. In future a similar tool will be developed for rural intersections.*
    b. *Please see the below matrix of project types that are currently required to use the Scoring Tool. Please note, even though a category may show as exempt, you may still find value in using the scoring tool.*

2. Will scores be required to be communicated to DES on 2R projects?

    a. *Yes. Scores are required for Rural PM, 2R, 3R and 4R projects beginning with the April 2020 Letting. Please see response to question #2 above for additional notes on PM project requirements.*
    b. *The scores may appear lower for PM or 2R projects. The goal of the tool is not to achieve a certain score, it is to assist designers in making safety-driven decisions to enhance the safety of the roadway.*
    c. *Tool currently does not have 2R dropdown. 3R should be used to select the design standards for 2R projects*

# Safety Scoring Tool – Rural 2-Lane and Multi-Lane Highways
## Frequently Asked Questions

| Scope of Work | Scoring Tool Applies | Scoring Tool Currently Exempt | SII Applies |
|---|---|---|---|
| Added Capacity/Mobility | ■ | | |
| Major Rehab/widening | ■ | | |
| Super 2 | ■ | | |
| Bridge Replacements (On System) | ■ | | |
| Bridge widening/major rehab | ■ | | |
| Seal Coats/Overlays | ■ | | |
| Full Depth Spot Repair | ■ | | |
| Intersections/Intersection work | | ■ | |
| Traffic Signals | | ■ | |
| Replacing existing signs/striping | *See Note 1* | ■ | |
| Any Urban facility | | ■ | |
| Rural Interstate, Freeway or Frontage | | ■ | |
| Bridge Maintenance/Repair | | ■ | |
| Shared Use/Bike Path | | ■ | |
| Bridge Replacements (Off System) | | ■ | |
| Park Road | | ■ | |
| Locally Let Projects | | ■ | |
| Border Infrastructure | | ■ | |
| Category 8 Widening projects | ■ | | |
| Category 8 HSIP (non-widening) | | ■ | ■ |

*\*RTZ projects will be reported separately.*
*Note 1: Will be required if changes to signing/striping alter roadway cross section*

3. Is there a list of definitions or what your meaning by the terms used in this excel tool? Such as lateral clearance and other fixed object?

   a. *Yes, a "Definitions" tab is included in the updated tools.*

4. Is this mostly for schematic development or PS&E?

   a. *The tool can and should be used for all phases of development. The most value will be gained using it during the initial project scoping. It is suggested to run when completing the DSR. Initial (existing condition of the roadway) and final scores will be required for reporting purposes.*

5. What is considered as a good score?

   a. *Scores are not being compared across projects or districts, and there is not a specific score to aim for. The question is, "what is the highest score I can get out of this particular project, given the constraints I have?" The goal is for the tool to assist in those discussions and help Districts maximize the expected safety performance in each project.*

6.  Is this tool applicable only for rural projects?

    a.  *At this time, the only scoring tools available are for Rural 2-lane and Rural Multi-Lane projects. Another tool for urban intersections is near completion. After that, tools will be developed for urban segments and rural intersection projects.*

    b.  *If a project lies within the rural area and/or is designed as rural facility, the tool applies.*

7.  What if you have a curve within the end of one segment and the beginning of another segment? Would you treat both configurations as curves and add the curve data to both configurations?

    a.  *In this case, you will have two segments with the same controlling curve data. Assuming all other data and controlling elements within the segments are the same, you can set this up as just one configuration that is applicable to multiple segments in the tool.*

8.  How would you handle the projects with S curves or multiple curves?

    a.  *Whichever is the controlling curve (sharpest radius) will need to be entered. For a vertical curve, whichever has the smallest K factor is considered the controlling curve. You can type in both if you are unsure to see which has the biggest effect on your score.*

9.  What if there are multiple curves in one mile segment roadway?

    a.  *The worst-case scenario would be the controlling curve to input into that configuration. For any number of curves within a segment, you are entering only the controlling curve data (or worst/most severe).*

10. Also with using the worst curve per mile, what if you correct 4-5 curves within this mile versus correcting only one? Would this not result in a greater safety improvement score correcting multiple curves versus the tool only assuming you are fixing one?

    a.  *You would still input the controlling curve (worst case in proposed design) into the segment configuration. You may correct several curves along a mile, which would result in the controlling curve in the segment your proposed design may change, depending on which you can address. The tool would still reflect a change in score if, for example, you correct 4 curves (option 1) or 5 curves (option 2), because the controlling curves in the proposed designs would be different for each of these options: presumably, the 5th sharpest curve in the initial condition would be the controlling curve for option 1, while it would be the 6th for option 2*

    b.  *The tool does not assume that you are addressing only one curve. The tool bases the score on the worst condition curve. So if you improve 4 curves and leave the fifth one below standard, the score is based on that one curve. Therefore, the worst-case curve would need to be improved in order to improve the score. And, because we are trying to improve safety, not just improve the score, all curves should be improved.*

11. Is the score realistic having one-mile segments rather than shorter segment lengths that would better reflect additional design elements in the score?

    a. *Having shorter segments would yield a more accurate score indeed, but that would come at the cost of demanding more time collecting and entering data into the tool. The tool was calibrated based on a sensitivity analysis on segment length. Based on those results, it was determined that 1 mile was the shortest length that yielded scores with adequate accuracy.*

12. I understand the simplicity of the mile segments but in certain areas with multiple vertical curves, if you use the worst curve as the controlling factor for the whole mile segment, is there not a concern of this being overestimated assuming this is the case representing the mile?

    a. *A segment longer than 1 mile would further over-estimate the impact of the curve on the project's core, while the over-estimation would be curbed using shorter segments. Smaller segment lengths, while more accurate, would increase the amount of data entry required. The 1-mile segment lengths was chosen based on a sensitivity analysis.*

13. If you have an 18-mile super 2 project, do you break this down to 18 one-mile segments? Or do we just look at segments that we have had crashes on?

    a. *Yes, you would break it down to 18 one-mile segments. Please note, the tool was calibrated to a maximum of 15 miles, so you will need to use two spreadsheets to accommodate the total length of this project. A merger tool is provided with the update which can be used to combine the scores from both/multiple sheets and provide weighted average. .*
    b. *This tool is not focused only on locations where there is a crash history, but on the entire project and how we can maximize safety.*

14. Will these scores carry much weight when asking for more money to design a project?

    a. *This tool is not being used for project selection or funding distribution. This is a scoping tool and focused on how much we can improve safety on each individual project. We understand scoping decisions may impact project cost and overall District programming.*
    b. *Note, this tool can be used proactively and is not dependent on crash history to return a score.*

15. MBGF etc improvements/upgrades to existing standard is not included. Does this mean they are one of the elements that are not considered as having a large impact to the score.

    a. *The tool takes guardrail into account; however, upgrades of existing safety hardware are not included as a separate scoring element at this time. MASH standards are new and not all have been tested yet. This is an identified item planned to be incorporated in a*

*future update to the tool if research becomes available. The tool development team is updating the tool periodically as new safety results become available.*

16. Is it expected that the Safety Score improves on every project submitted to DES? Is a Proposed score equal to the existing score acceptable?

    a. *The initial and final scores will need to be reported to DES, but there is not a specific score to aim for or that we are expecting to see per project. Although we do anticipate the final scores to be higher on most projects, there may be cases where the proposed score is equal to the existing if the scope of work is limited (for example, PM type work). The age of the roadway will also factor into this, as the standards may have changed since the time the roadway was constructed.*

17. We are considering taking a four-lane divided to a two lane because of other highways close by that have taken over the majority of the traffic and this roadway is way underused and takes up a lot of maintenance money to maintain. These excel tools will reflect a bad score, is that an issue?

    a. *That may be an exceptional case to how the tools are configured. Using the 2-lane tool will help you to enhance the safety of the ultimate 2-lane facility. For example, if you take a 4-lane undivided and turn it into a 2-lane with a turn lane, you may improve safety substantially.*

18. Where are you getting proposed skid values for design considerations?

    a. *Each District's pavement engineer, Section supervisors and AE's should be able to access their skid data on MNT Division's Pavement Analyst software. If you need access, you can put in a NTT Data ticket to request PA access. MNT Division provides both online and in classroom PA training if District's are interested. Please contact Jenny Li (Jenny.Li@TxDOT.gov) in MNT Division if you have any questions.*

    b. *Currently only TxDOT employees will input the skid information as we do not release skid data to consultants.*

19. Are District Seal Coat projects included?

    a. *Yes. The Safety Scoring tool, which is intended to aid designers in making safety-driven decisions, is required to be used on District-wide Seal Coats. With much of the districts' seal coat program focused on Rural 2-lane roadways with higher fatality rates, this tool provides the opportunity to assess what additional elements or safety-related improvements can be made on these roadways. It may be seven years before many of these roads are looked at again, given the current cycle. Even if districts do not address the elements identified in that specific seal coat project letting this year, the assessment allows districts to become more aware of and plan for those future improvements.*

    b. *If the project is part of your Category 1 program, then yes. If it is part of your MNT budget, then no.*

20. This safety tool looks similar to the IHSDM, should we use both or choose one?

    a. *The initial and final scores from the safety scoring tool is required to be reported to Administration and Commission.*
    *This tool is not intended to replace IHSDM. Interactive Highway Safety Design Model or IHSDM is software developed by FHWA and is used for predictive crash and economic analysis, and the use is currently limited to Major Projects and Interstates that require FHWA approval. For applicable projects, you may use both tools.*

21. Where can I find more information on the Safety Edge?

    a. *The Safety Edge Guidance is available on [DES/Roadway Design webpage](DES/Roadway Design webpage).*

22. Where are you getting SKID values for standard/optimal designs?

    a. The skid values for standard and optimal designs are 37.0 and 54.0, respectively. They represent the typical skid numbers on two pavement types: hot mix, and seal coat.

23. Part of project is urban, part is rural; Is the scoring tool applicable?

    a. *Use the tool for the applicable part of the project.*

    b. *If a project is less than 50% rural, a score is not required to be reported.*

24. If there are two different types of pavement surface in a 1-mile segment (2 different SKIDs), which one should I use?

    a. *The lower SKID should be entered in the tool.*

25. If project is HSIP (non-widening) and seal coat, does the tool apply?

    a. *Yes, due to the seal coat; if the tool can be used – it should be used!*

26. For new location, how do you compare the proposed score?

    a. *Existing is not applicable "N/A", but the proposed score can be compared with the standard.*

27. What is the criteria for sag vertical curve; Light or Comfort?

    a. *The criteria for sag vertical curves were based on the TxDOT Roadway Design Manual (RDM). Light beam distance was used to determine the design controls.*

28. Is Super 2 the optimum for passing lane?

    a. *Yes, in the current tool, the optimum design configuration for passing lane is Super 2, because the latest research result indicates that Super 2 roadways are associated with fewer crashes.*

29. Can cost estimate be included in the tool?

    a. *Project cost varies depending on various situations. The current tool does not include cost estimation.*