

PMED Updates and Enhancements – Improving the User Experience in Pavement ME Design

Questions and Answers



JAY GOLDBAUM (goldbaum@rocksol.com)

Q: Will you be including BOCA in these scenarios?

A: I'm not sure what BOCA means, did you mean BCOA? It is not on the list of overlays right now, but we will look into it. The answer for FY24 is no, BCOA will not be in those scenarios.

Greg Zeihen (gzeihen@mt.gov)

Q: Can the AC over AC work with a mill/fill option-thin up the original mix and then add the overlay?

A: Milled thickness is a user defined input for AC over AC design strategies. This does not change for multiple asphalt overlays.

Jaime Hernandez (jaime.hernandez@marquette.edu)

Q: Is it possible to access the mechanistic responses?

A: The structural response is available when selecting "General structural response" in Version 3.0 and is a workspace setting. If you go to your tenant management, your current workspace, your system or user generated workspace will have "Generate Structural Response" and you can set that to yes or no.

A: To further answer Jamie's question: Only a limited number of pavement responses are available to the designer or user, as in previous versions of the software. This is mainly due to the sheer amount of data computed as part of the responses and moving that back and forth across the web application can be time and cost expensive. That's something we looked at in the past, making more of that data available, but it's not currently all available.

Faizan Lali (lalifaiz@msu.edu)

Q: Is Backcalculation Tool able to accept xlxs or csv files?

A: The BcT currently accepts the raw data formats from various FWD devices. It does not currently support importing deflection data from xlsx or csv directly. The FWD device file types were selected because they have a standard format.

Q: Does the backcalculation tool require a separate license?

A: It does not. If you purchase Pavement ME Design, you have access to the Backcalculation Tool as part of your purchase. You can purchase additional BcT licenses.

Prajwol Tamrakar (ptamrakar@tensarcorp.com)

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Q: How to access BTC [BcT] web app?

A: Great question. You can't yet because it's not done. It will be done at the end of this month and in early July we will do a release that will have the web application BcT.

When you access the Pavement ME Design site, you will see a new icon in the web app - nine little squares. When you click on those, you'll have the option to switch between working in Pavement ME Design and working in the Backcalculation Tool. That is how you'll access it when available. [It will be available July 1st].

JAY GOLDBAUM (goldbaum@rocksol.com)

Q: Will the BcT imported data work with a local calibration in PMED?

A: If the input files generated from the BcT are imported to the CAT it can be used for local calibration.

A: That was how I interpreted Jay's question. But I think the other interpretation is, if local calibration coefficients can be used when generating those BcT files, I think maybe it's from a workspace setting or something like that. I'm not sure if that software takes the information or does it just use the global coefficients.

When it generates the DGPX file, it's just going to take the system defaults. That's a good question. There's currently no communication set up between the PMED app and the BcT app with respect to the calibration coefficients.

That's probably a good feature for us to add. As we as we mature the BtC web application, these are the types of features that will tighten the integration between the two systems. So yes, that's definitely something that we could look at adding, but no, right now it generates the whatever the system defaults are, and then you'll need to import from a library (your calibration coefficients) to that generated DGPX file if I'm understanding the question correctly.

Jewell Stone (jestone@dot.ga.gov)

Q: Can the BcT be used with TSD data? If not, are there plans to incorporate it?

A: Not at this time.

Prajwol Tamrakar (ptamrakar@tensarcorp.com)

Q: In BCT, do we have a plan to add a feature to back-calculate layer thickness as well? Currently, only layer moduli can be back-calculated. If we are not sure about the layer thickness, this could be good a feature (ps. I totally understand that it will increase non-uniqueness/uncertainty of solution).

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A:. We might need to come back to that question. Probably have Harold answer that one. I'll make a note to come back to that and get that answered for you.

A: Harold has an answer to the layer thicknesses question. So I'll go [ahead and] read that. Layer thickness cannot be back calculated with the BcT. This is assuming this refers to using the time series deflection data. Time series deflection data is not used by the BcT. There are no plans to determine the layer thickness from the BcT. The layer thicknesses need to be determined from the GPR data prior to using the BcT. Also, he does not believe there is a standardized tool for back calculating layer thickness, similar to the back calculation of elastic layer modulus tools.

Mohammad Hossain (mihossain@fsmail.bradley.edu)

Q: Does this web-based software available in academic version for teaching purposes?

A: Yes. PMED v3.0 does have an educational version just like the desktop version. This has been available the whole year and will continue to be available in the future for educational use. So your educational licenses or subscription that you get for Pavement ME Design, that gives your agency access to the web application. And then whoever's in charge of your tenant, which is typically the primary end user designee, that person can invite via email within the app, folks to join the tenant. So you just log in, and then you invite your students.

Q: When can we expect the in depth technical documentation on the JULEA refactor[ing effort]?

A: Great question-that will be available at the end of June. I'm not sure what review process that needs to go through. So that will go to AASHTO first, and then AASHTO will [decide] on what they are going to release.

Greg Zeihen (gzeihen@mt.gov)

Q: How does the program calculate ESALs from the traffic data?

A: Basically it's the same procedure as how ESALs are calculated normally, the main differences that assumes a load equivalency factor for your different loading bins, those valleys are hard coded. And it doesn't really change. The help manual does go into a little bit more detail for that. That was a feature we added last year. But mostly just calculate your total number of single or total number of axles. There is not a big difference between how it was calculated before for basis for AASHTO 93 versus PMED. But the analysis does not use ESALs directly. What you need to remember that it's going to use the actual or the actual load distribution data that's entered into the software. This is just to compare with agency values that have relied on a comparison. And I'll reiterate it. The analysis does not use ESALs, that is just for comparison purposes.

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Hailey Goodale (hailey.goodale@state.co.us)

Q: How can PMED v3.0 be accessed?

A: <https://pavementmedesign.com/>

Great question. You just go to the website. Typically, what happens is you purchase your subscription from AASHTO. If you're an international organization, there's a slightly different process you go through but either way, you purchase the subscription.

Once you purchase the subscription, you'll get an email from the basically from the production server. That email will have some instructions for how you set up and register your account. And then once your agency's account is set up as a tenant in the system, which is just a few simple steps that are detailed an email that gets sent to you, you can sign in and start using the application.

If you have an active subscription to payment, any design and you want to access the web application and you're having any trouble with that, please send an email to pavementmedesign@ara.com or contact me directly and I can step you through that process.

Justin Stoffel (justin.stoffel@shanwil.com)

Q: Our local DOT hasn't moved past version 2.6. If we choose to use the web application, which is version three, are there any known calibration coefficient differences that will affect the analysis?

A: There aren't significant differences between version 2.6 and version 3 for flexible pavements. For rigid pavements, the models were recalibrated after incorporating the NCHRP 151 model changes. We had multiple webinars last year on this which go into more detail on the differences between version 2.6 and 3.0. Swing by the PMED customer (<https://me-design.com>) website and there's a webinars tab that you can look at the webinars done on this topic.

Q: Can we expect at some point in the future a more comprehensive description of intermediate files, the variables, and the units, more than what the current help manual provides?

A: That's a good question. The answer right now is probably no. There is currently no need to utilize the data in the intermediate files by state agencies. Prior to any improvements to the intermediate files, we need to understand the value they have to designers.

One of the things that would help us move forward on a comprehensive description of intermediate file data is understanding which of the large set of intermediate files provide value to designers, and what information they need to get out of those intermediate files.

The other side of that coin, is, as we go through the refactoring process for the analysis modules, that process is going to produce much more descriptive intermediate file data. That was part of the part of the problem with the technical debt that we discussed earlier, is that the intermediate file data is kind of, as you said, it's a non-comprehensive description of the information coming out, you know, at

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intermediate steps in the analysis, and as we refactor the analysis modules, sort of an automatic something that you just get as a part of that process is a more descriptive set of intermediate file data. There is not a separate effort to do that, but some of what you're asking for is going to come because of the analysis module refactoring.

Q: If the subscription for the web application Version 3.0 also includes a standalone license, which version is the standalone version?

A: It's a great question. Just to make sure I understand this correctly. If you purchase the subscription for FY 24, or if you get the desktop application, both of those things give you access to the web application. That was a decision that AASHTO had made in order to help the DOT's to transition from previous versions of the application to the web application. If you purchase a license for the desktop application, you will also get access to the web application, same number of seats that you purchased, or the desktop apps, if you purchase one license, you'll get one concurrent use license seat on the web application. Hopefully that answers that question.

Halil Ceylan (hceylan@iastate.edu)

Q: Can an agency have multiple versions of the software at the same time (e.g., half the licenses for v.2.6 and other half for v.3.0)?

A: That's a little bit of a tricky question, because the version 2.6 is a desktop application. If you purchase any license of the desktop application, you get access to the web application and again, that's to help DOT's make the transition to the web application because that's not just flipping a switch. They need to have access to both. So, the answer is yes. If you buy a license for the desktop application, you will have access to the web application with an equivalent number of license seats, to concurrent seats in the web app.

Q: Can you please explain LTE inputs for flexible pavements as part of rehab design?

A: I'm guessing we're going to need to come back to that one with a longer answer. With the next webinar we think there'll be an additional explanation of the LTE of those existing pavements.

It applies to both the first overlay and multiple overlays, but it's what it really affects how quickly any existing distress propagates through the overlay layers for reflection, cracking. That's where LTE is used for rehab. We will get back to you with a memo on that question.

Greg Zeihen (gzeihen@mt.gov)

Q: When will the stabilized base selections be available for use?

A: I'm not sure I understand that question.

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A: It might be the stabilized base layer type, which is kind of combined with the cement base, which includes both, which is your stabilized base materials. If that's what they're referring to. The stabilized base specifics, how some of the layers were characterized, but for the most part, like cement base includes your as your cement stabilized.

Those are already available [in the app].

Halil Ceylan (hceylan@iastate.edu)

Q: Can an agency user access the web version of the software from anywhere using any capable computer?

A: Yes. The only requirements are you must have either the Chrome or Edge browser. Technically, you could do it with Safari, but some of the features won't work. We are using the file access API, so it has to be either Chrome or Edge.

Q: For conceptual questions, is the correct channel the helpdesk?

A: Yes. Please send conceptual questions to the helpdesk. We have a system in place to handle those customer support tickets. We'll generate a support ticket, and we will get a response back to you.

A: Harold is responding to the LTE question. This is covered in the manual of practice, the LTE can be measured in the field for transverse cracks. But for alligator cracks, LTE is more of a calibration variable for reflection alligator cracks.

Greg Zeihen (gzeihen@mt.gov)

Q: Will a chip seal be added to the maintenance activities, and can multiple chip seals be added to the program?

A: Chip seals are a part of the maintenance activities or strategies for flexible pavements but only one maintenance strategy is used. Multiple maintenance strategies are not currently in the long range plan.

Justin Stoffel (justin.stoffel@shanwil.com)

Q: How does BcT address temperature dependency in the AC layer? I see when the BcT data is imported to PMED a reference temperature of 77 degrees is assumed, but what if the pavement is 90 degrees during testing?

A: From the back calculation tool, if you have pavement temperature included in your FWD file, then it can take into account the actual temperatures. You can actually specify a reference temperature as well.

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There are additional features coming in for predicting pavement temperatures if you don't have a value. Hopefully that answers the question.

Manik Barman (mbarman@d.umn.edu)

Q: Is there any updates the academic license? As the university's computers are mostly managed by a centralized server, we need to activate the software each time we work on the software.

A: There's no updates to the license, but I would recommend that the university move to the web application, then there's no installation on any machine anywhere, you just access the software as a service.

Q: Will the user be able to access multiple versions in the web based interface, for example, Version 3 and then Version 4 in the future?

A: The answer to that is yes, we're going to stand up multiple instances of different versions of application in order to allow agencies time to switch from one version to another version, and to give time for folks to do the necessary calibration work. You'll be able to access that and there's a couple of different ways that that's going to work. One, when you upload a design, the design will automatically, it knows what version it is. So, it'll automatically take you to the right place, where you can manually navigate to a specific version within the UI and generate designs in that version of the application.

Halil Ceylan (hceylan@iastate.edu)

Q: If an agency needs to make large number of runs for local calibration purposes, do they need to purchase additional server time, or does having a valid license allow them to make as many runs as they need to?

A: That's a great question. There are two different answers here. One is if you're going to be doing, let's say, calibration runs, I recommend using the calibration assistance tool to do that. The server that runs the analysis for the CAT is specifically set up as a compute instance. So it will be much faster to use that server. Use the CAT for calibration.

If you do have a lot of runs, say for sensitivity or something the server's going to queue up your runs. Right now, we have one production server, and it can run up to five designs at a time typical design 25 year, design life takes about two little over two minutes to run. We've set up a fair queue in the system, so that there are no blocking operations. Nobody could queue up 1,000 designs, and then other people can't get their designs run until those finish. That's not the way that that works. The system is going to look at the analyses in the queue if there are any. And it's going to pick the one from the next tenant, and sort of interleave all of [the tenants design run requests] that way together that have queued up designs. So, if somebody does run a substantial number of designs, the systems going to ensure that that's not blocking people from you know, running one or two designs for example.

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Additionally, you only have 10 gigabytes of space per tenant available to you on the Pavement ME Design production server. Each design is about somewhere between 15 and 20 megabytes. So, if you run many of those, you're going to quickly run into your limit and then the server won't allow you to submit more designs until you have deleted some. Periodically, every five days, the server goes Through and automatically deletes completed designs. So you, once your design has finished running, you need to download the results because the server is going to clear that off because we don't manage any user data. That's all up to you to do that.

The answer is you can run as many runs as you want, up to certain data transfer and physical memory limits that have been set on the production server. The CAT, you can run as many as you want, I think you can run up to 60 hours of data, per run per calendar for calibration run in the CAT, but I need to double check with Yanbin on that. That has far less let's call it permanent data storage requirements so we don't have any of those types of constraints built into the system. So hopefully that answered your question.

Rahul Raj Singh (singhr21@msu.edu)

Q: There is a limit of 1000 sections in CAT and you cannot delete sections once you upload it. This will make CAT not useful after a certain point of time. Will we be able to delete sections in CAT in future updates?

A: If I'm not mistaken you can archive and run the CAT. I can follow up with Yanbin on this, but I think you can archive designs. [We will be introducing a capability in FY24 that addresses this issue].

A: Because uploaded projects could have been used in previous calibration project, deleting them could make the existing calibration project "obsolete" [or just invalid]. We could implement something so that if you uploaded the DGPX file that's not used in any calibration projects that can be deleted. We just need to figure out and know how to address that for the users. If you could send an email to me, we can sit down with Yanbin and have a longer discussion about that.

Syed Haider (syedwaqa@msu.edu)

Q: Any change in top-down or longitudinal cracking model?

A: No changes to the top-down cracking model from version 2.6.

A: Top-down cracking can be longitudinal cracks and/or alligator cracks. They are entered/calculated as percent total lane area.

Halil Ceylan (hceylan@iastate.edu)

Q: Are there any upcoming webinars planned for local calibration purposes (utilizing CAT, etc.) using the latest version of the software?

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A: I don't think there are. There will be training at the user group meeting and we're updating the local calibration guide [in FY24], that is, the AASHTO published document, and I think from that there will be additional webinars regarding the local calibration procedures and focusing on the CAT and then also transitioning from different versions and what to look for. That guidance will be in the updates to the local calibration guide.

Q: We had a question of somebody wanted to have access to the new design manual for the web application.

A: If they're talking about either the help manual or the manual of practice, those are both available directly in the web application. There's a little question mark icon on the top right of the web application, you can just click on that. And it'll provide you access to the help manual and the manual of practice-the most up to date one.

Gabriel Orozco (gabriel.orozco.1@ens.etsmtl.ca)

Q: The default calibration in bottom-up fatigue cracking has changed a lot with V3.0. 100% of AC damage does not correspond to 50% of FC anymore (for the average 50% reliability level). It was a key conceptual feature of the original MEPDG. What happened?

A: Most of the calibration coefficients didn't change in Version 3, it changed back in version 2.5, where the mix coefficients and field shift factors were adjusted, separated out. But Harold will probably have more information on that. And it was also found that there was a bias between different thickness values. So that's why the bottom of fatigue cracking coefficients, both the C field shift factors, the transfer function, plus the damage functions were adjusted to be based on the thickness of the asphalt layers.

If you need more information, be happy to provide that just send an email to the help desk and we'll get that routed over to the research team for an answer. Harold can't unmute himself, but he'll answer that that question in more detail on the webinar report. And then we'll make that available for download from the AASHTO website.

Questions/Comments not verbally directly communicated but possibly answered from other questions

Ereng David (erengdavid@gmail.com)

Q: I am Ereng David, From Materials Testing Division from Kenya. How do I get version for training so that we have license but don't know the number of pc it supports we have not yet installed i got stacked i need to have educational or trial version for some time to familiarize with software working and how to input data from machines

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A: Eren, I will send you an email with instructions for requesting a trial version of the application. The evaluation license is good for 30 days.

Gabriel Orozco (gabriel.orozco.1@ens.etsmtl.ca)

Q: Comment Only: Those intermediate files are essential for research purpose, though. When you'll be working on making essential files more comprehensive to engineers, please consider keeping less important files available.

A: Understood. The decisions to work on transforming the intermediate file data to ensure they are comprehensible for research purposes are made by the AASHTOWare PMED Task Force. Neither the format or output of the intermediate files has been altered since very early on in the life cycle of the application. Specifically, the stress/strain data was limited to ensure reasonable output data sizes could be achieved.

It may be possible to revisit those outputs and attempt to compress the data to a more manageable size. Additionally, we can eliminate the process of having to move these large data sets from client to server and vice versa by creating a client side analysis option in the application. The Task Force is looking at these types of options to see how they will benefit designers and prioritizing them with the other requested features for the system.

Mesbah Ahmed (mesbah.ahmed@vdot.virginia.gov)

Q: Does the V 3.0 have project specific calibration factor option similar to V 2.6?

A: Yes, design specific calibration factors are a feature in the web application.
