



WEBINAR SERIES – DIGITAL DELIVERY TOOLKIT OVERVIEW QUESTIONS

Project: TxDOT Digital Delivery Program
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QUESTIONS/RESPONSES	
1.	<p>Would bridge models also be included for information only (FIO)? (Alex Mabrich)</p> <p>We are going to work with our bridge division and see what the recommendation is. Bridges are different and are a component we have to continue to explore.</p>
2.	<p>Can you elaborate on how extensive the check of the DGN files is meant to be, and how you plan on implementing/supporting this check? I ask because unless there is a very strict and limited scope on this check of the DGN files, that check alone will take a HUGE amount of time to go through for every file. That would essentially take up a full-fledged designer off of a project to check another as most plan reviewers do not have the CAD skills. (Isaac Stilwell)</p> <p>The intent of this is to make sure that the basic elements are taken care of. This is actually something that should be done anyway. If you have a model that is being designed, it should be done completely. That has been the expectation for several years now. So this is a way to verify that now, designers or someone can be doing it, in interim steps. But the expectation is that these models are complete and that they meet with this checklist. Now we've gone through the checklist ourselves, we've tested this out. It is not a huge level of effort. It is something very doable and it did not take any of our designers off of another project fully or for several weeks in order to do this. But again, we're open to feedback. As we start looking at this and it becomes something that is too much for designers or for another team member, then we want to hear that so that we can modify as we need to. Again, it is an interim step. The goal is to have a plan reviewer be responsible. With the goal that a plan reviewer checking a model is no different than them checking their plan sheets. They're going to be looking for the same information once we get to that point.</p>
3.	<p>Is this going to be an iModel or ORD 3D model? Is the model for the contractor going to be an iTwin model? (Christopher Garcia)</p> <p>We have not yet determined what our review mechanism is so we are not going to submit iModels. There's a little bit more complexity to that when it comes to licenses and things like that. What we have been delivering and what we delivered for our pilot project is a DGN, an ORD model. We have tested how those go into construction software, and they come in just fine. There are some modifications, similar to the new ITL, that we're pushing out and that will really help with that translation. We are also delivering XML files for certain things like the surfaces. So those are things that we're going to deliver. iModel is most likely not going to be something we deliver basically due to licensing.</p>
4.	<p>Will the contractor need to have a CAD software to use and understand the 3D models? (Taylor Panos)</p> <p>The goal of that is no. Applications are beginning to be able to talk to each other. This was not the case several years ago. However, the industry is learning that this is the direction we're going, and they know they must be interoperable. One of the items thoroughly tested was how a DGN model going into Trimble Business Center to Topcon to Leica to AGTEK, to all these different construction software applications. And they work well. Now part of what we're trying to do is make sure that it comes in even more helpful for the contractor. But it is something that we have tested and know that it will work. One recent comment we heard from a contractor, based on our lessons learned from our bidding, is that our models don't communicate well into AutoDesk products. This is something that we're looking into. But the goal is for them not to have to buy software, go to design software, anything like that. It's for them to be able to utilize the applications they already use and for them to just have more information.</p>



5.	<p>Is there coordination with PEPS to include language for Digital Delivery in contracts that will be coming in 2026? (Eduardo Garcia)</p> <p>We have reviewed the PEPS contracts. We are going to be working with them more closely to see what deliverables will need to be included. Again, we know that some of those deliverables aren't in PEPS contracts right now. That's why phase one is internal only because we know that there are scopes in there that don't include those deliverables. Once we determine the level of effort for scoping, we want to see how reasonable it would be for us to expect consultants to complete the same scope that they currently have on their contract.</p>
6.	<p>What work is being done with contractors, specifically the smaller contractors (those who typically work on projects with a Let cost of less than \$12 million), to assure that they will be able to implement these 3D models? (Isaac Stilwell)</p> <p>TxDOT is having conversations with AGC, but we are aware that a lot of smaller contractors aren't in AGC. We are reaching out to the contracting community in other ways to see how we can help solve this. Other DOTs are creating pay items, as one example, to incentivize the primes and to help the subcontractors move along this direction. We are focused on this and trying to find the best way to address. The recent letting on our SAT Pilot Project was very eye opening for many subcontractors and we are having conversations with them as well.</p>
7.	<p>It does make sense to try and work on this 3D delivery in pieces. Can we assume that there will be iterations of plan delivery where the plan and profile layouts are being replaced with the model and we still have printed culvert layouts then slowly move to all 3D deliverables? I did see the 3D pipe and SETs in your pilot so are those drainage features already being incorporated? (Bryson Lawrence)</p> <p>Yes, those drainage features are already being incorporated. The goal of this is to try to move with what makes the most sense. It depends on the scope and on the scenario. We want to be able to try to model all these. Our hydraulic section has worked hard to accommodate most everything that we have as far as wing walls, head walls, and others. But we know we don't have all of them. We have been modeling the drainage, storm drains, etc. We are open to having culvert layouts, for example, but we've also modeled them. Long term is to have all the information in the model.</p>
8.	<p>Where can we find additional information on how to combine the 1-to-1.5-mile model segments into one "master model"? (Deyton Riddle)</p> <p>We will have documentation on best practices. But when we start talking about master models, I think all that means is that it is a Federated model that has things referenced into it. The intent is not to have mile long corridors all in one model. For one, that's just not best practice because if something gets corrupted, the whole thing goes away. Secondly, it just taxes the computer and the processing system. It amounts to referencing into one master corridor to where everything isn't in the same file and instead just be referenced into that file.</p>
9.	<p>How would the TCP phasing be submitted? Would it also need to be shown as a model breakdown? (Matthew Garnett)</p> <p>We have been exploring modeling by phase and we do understand that it is a bigger level of effort. In talking with our AGC and ACEC work groups, they are helping us understand better from the industry what their thoughts are on this process. It is a big topic. Contractors really do want to see models by phase. It helps them with their quantities. It helps them understand the intent of how we want to build, but we also understand that modeling phases is a lot more effort. We are continuing to explore. Our pilot, which is a tiny job compared to most, was modeled by phase. It was more effort, but the benefits were shown. We need to determine how best to do this in an efficient manner. Ultimately, we can likely expect to model by phase. To what extent will be the question.</p>
10.	<p>Are you currently using Bentley's iModel/iTwin software to review digital delivery and for asset management? (Francisco Garcia)</p>



	<p>We are not using Bentley software for asset management as of yet, but we are piloting that right now. It is a good software for review, with some hang ups on the administrative side that would need a solution before we could push it enterprise wide. Like Bluebeam, it has capabilities to add comments, assign comments to people, review the model, point to things, get elevations and other tools. However, we are not confident in pushing out to the state yet. We are looking at other review methods, including GIS, so that we can really figure out what is the best review mechanism for the state.</p>
<p>11.</p>	<p>What is expected impact on land surveying deliverables? And ground truthing process? (Rene Rullan) One thing we are familiar with is getting topography back when we were doing 2D plan sets is that our surveyors would sign benchmarks and that's all they would sign. As part of this initiative, since we are going to be delivering our existing terrains to contractors, we need to have a better way of people saying that this existing terrain is what is there when it was surveyed. We are looking at ground truthing and how to incorporate that into all of our existing terrains. This is a very good topic, and we are working with our remote sensing and the survey sections at TxDOT for us to determine the best way forward.</p>
<p>12.</p>	<p>Is this going to start on all plans? (James Wigington) In the long term, yes. Every model, every project that has alignment data or needs a cross section will have this method. We are aware this will take time. So that's why whenever I was showing models of legal document on the slides, we have TBD there. We're not going to put an arbitrary date on this and try to race to it and then fumble only to make it not successful. We're going to take the time it takes, but we're going to try to expedite it the best we can. Part of it may be in phases, where we pick a particular project type and say widenings will be model as legal document as of this date. Once we have done the necessary testing and have the necessary training and have the necessary documentation out there to make sure that everybody, not just internal, but external folks are successful as well. A quick note that everything we have as far as training, is going to be posted on our digital delivery web page. So there's not going to be something that's just internal and you know, consultants, go figure it out for yourselves. We want to make sure that everybody at least understands what our vision is and how we're teaching the people internally because we know that anything we teach internally can be pushed out to everybody so that they can accomplish the goals that we have.</p>
<p>13.</p>	<p>I would like to see the schematic (files) submittal streamlined w.r.t directory/sub directory structure in the PW. (Nazrul Chowdhury) We would like to have schematics streamlined as well. One of our goals is to have all people involved in projects in our internal ProjectWise. So that means consultants, contractors, CEI, all of them will be in our internal ProjectWise. That is one of our initiatives that we have when we start talking about schematics. We have an opportunity to really make these schematics a lot more user friendly. If you've ever reviewed a schematic or if you've ever been to a public meeting, most people, especially in the public don't understand what they're looking at. And I think the intent partially at least is to convey the information of the project. We are looking at other methods of delivering schematics as well. For one of our pilots for the Laredo District, we are going to be seeing how we can utilize GIS model as a way to deliver it with the same information but being able to make it a little more user friend.</p>
<p>14.</p>	<p>How are drainage reports catalogued within the model review process? (Antonio Leyva) That's something that we're looking at right now. Something that we developed for the pilot project was a drainage report, but it looks just like all of our drainage stuff does right now. We have a culvert sheet, we have all the calculations, the tables, and the drainage areas in a document that's going to accompany the files, the models. It is going to be in PDF format because I think that's how it has to be. We are still exploring what the best way is to deliver the information for drainage reports.</p>
<p>15.</p>	<p>Will TxDOT define the level of details in a BIM execution plan for each project? Is there a plan to update the current OpenRoads/OpenBridge workspaces and add more standards/features to accommodate the digital delivery requirements? (Michael Megalla)</p>



	<p>Yes, there is a goal to do that. One of our goals is to standardize but we do not want to have a project-by-project standardization. We want to have statewide standardization. Now I understand what the question is. It's like if we have a 2R job or 3R job versus a 4R job and there's more components to it. Those are things that we're looking at to how we can clearly say what the standards are for each one of those.</p>
16.	<p>For the CE&I/Inspection team, what types of software would be needed for this addition to work? (Kenny Porter)</p> <p>We are looking into which inspection software will be used for our pilot project. We are exploring Bentley Synchro and Trimble Sight Vision. We are open to explore others, but that's what we're going to use for inspection. When it comes to our CEI partners, we're still trying to explore what that looks like, as far as licensing, etc. When we decide on a software for our internal inspectors, it will most likely be what we ask our CEI folks to also abide by.</p>
17.	<p>We are using ORD, MicroStation, OBM, OBD, etc. from Bentley, large investment. Why not use iModel/iTwin? It seems the logical choice. They all involve licensing. (Francisco Garcia)</p> <p>Agreed, but it's not just about the licensing, it's about the functionality. While we agree with you on having the ability to bundle our licenses, those are different. We have ORD licenses, but it's not a license for the Infrastructure Cloud platform, which is used for iModel and they're not the same. It would be additional cost anyway. We want to explore all we can to make sure that we're getting for one, the functionality that we need and two, that it is something we feel that we are being financially responsible about considering the funding that we have. We do not want to make a decision based off of a certain vendor that we have. We want to make sure we have the best for what we need.</p>
18.	<p>Is this effort being coordinated with the Board of Engineers for any necessary language regarding how to seal and control the version of a model? Will the model need to be maintained during construction for example? (Jim Langston)</p> <p>Yes. We did work with the board several years ago on language they issued on what constitutes signing and sealing a model. Basically, it amounts to version control. What we are using on the pilot and what we're looking at moving forward is hashing all of the files. And what that is, is an individual numeric fingerprint per file that is specific to that file. Whenever that anything in that file changes, the hash code will be broken, and a new one will be assigned to it. That's how we're going to see if things have been altered. Even if you were to just move something half an inch, it would still break that hash code because it's not the exact same. We are exploring applications that can do this more robustly. And yes, we did work with the board on it.</p>
19.	<p>Are all these models going to be stored in a central location that has any sort of viewer so that authorized users can see project files from anywhere in the state? (Travis Scruggs)</p> <p>All files will eventually be housed in ProjectWise. There is a viewer that we're looking into, but we don't have a great answer for that right now. We would likely consider a free viewer which are out there.</p>
20.	<p>Will existing utilities be part of the 3D deliverable and if so, will that require more Level A SUE? (Rick Carle)</p> <p>For the 3D models, we are currently working with Right of Way Division on the RULIS program and what the next version is as far as deliverables for as-builts. Part of the goal would be to survey in a utility that is to be relocated, so that we know exactly what the X, Y, and Zs are. In the interim, we don't necessarily have to have more level A, we just have to notate what the level is. If it's a level D that we have as far as utilities goes, we'll have to notate it for the designer to know, yes, we have this level D, we have an X, Y that may or may not be right, and we don't have a Z. So we're going to put it at TAC depth so that the designer knows that this may not be exactly where this is, but we have representation in there. So yes, we want to have utility models in there for class detection, especially when it comes to underground items like storm drain or foundations, etc. But it just depends on how we're going to address it moving forward and trying to make sure that the people that are designing understand the information they're getting. It is not</p>



	a lot different than what we're doing right now with level A, B, C, and D, but moving forward, I think there's an opportunity for us to get better information.
21.	<p>Adding to the previous question, what about joint bid utility design? Some of those are designed and produced outside of ORD (Ignacio Izaguirre)</p> <p>The goal with this is that even though there are some things like AutoCAD that people use, is for us to be able to import those into our design files. If it's something that is designed externally and we have the information for it, then we need to be able to bring that in. We plan to also work with Right-of-Way Division on what requirements exist when someone externally is designing something that is going to be part of a joint bid. In other words, how are we understanding where things are or how it translates into different applications?</p>
22.	<p>How are you using GIS for review? Can you expand on the GIS and models? (Christopher Garcia)</p> <p>There is an application that was developed for the Utah Department of Transportation that they utilize 3D capabilities of ESRI GIS to review. It's very similar to the way that the Bentley Design Review platform looks and works. It has not been built out as much yet, but we are going to explore that and work with ESRI to see if they are planning to build it out even more to accommodate our needs.</p>
23.	<p>Regarding the GIS comment, what is the program named created for Utah. (Christopher Garcia)</p> <p>It's a proprietary system that they use that one of their contractors created using FME to translate between ORD and GIS. It is not something that we can access. We have received a demo on the program and we've seen it in the past. It is available on UDOT's website but it is programmed specifically for UDOT's website and their ORD workspace. We are asking ESRI how they can accommodate it for our environment.</p>
24.	Comment, not a question. Agree on the schematic streamline as well. (Dominique Lornng-Nibaud)
25.	<p>Can a district ask us to deliver digital documents on a current project that is under negotiation? (Doug Huneycutt)</p> <p>This is still to be determined. We have to work with PEPS and the districts to see what is feasible. We want to make sure that if we do ask for documents, that they still fall within the scope. So that's one of the reasons that we paused when we talked about the 3D model curation knowing that it's a little bit bigger level of effort. If it's reasonable and it can fit within the scope, then yes.</p>
26.	Comment, not a question. The TxDOT Committee on Geomatics and Surveying is working on a Surveyor's Report Template that the surveyor will sign and seal attesting that any topographic survey meets our standards and specifications. The report template should be approved, implemented and available on the Surveyor's Toolkit within the next couple of months. (Richard Walters)
27.	<p>How would open records request work, would we hand over the model to someone requesting open records? (Amy Causey)</p> <p>We are still deciding on what that looks like. Part of what we're looking at doing is seeing what the level of effort is to produce a GIS model from our plan sets as part of the deliverables to help contractors. Most likely, we could deliver a GIS model to them for open records request.</p>
28.	<p>Is Design-Build going be required have the requirements as DBB? (Bruce Nipp)</p> <p>We are working very closely with our Alternative Delivery Division to see what requirements would be needed. There are great opportunities for a design build project to utilize these because of the efficiencies that can be had. We are going to explore that as we see a lot of advantages.</p>
29.	<p>Could you please explain the process for submitting a different solution when a change is required? Clarified this is regarding a change order during construction (Wilmer Soto Mercado)</p> <p>A change order will be handled very similar. We are exploring, especially for consultants, extending construction phase services all the way through the duration of the construction so that the company is able to help with any sort of change orders that happen for the model. Since we internally designed our current pilot project, we will be doing the construction phase services. But if an update or change order</p>



	<p>needs to happen, we will update the model and resubmit that to the contractor, similarly to now, labeled as change order one, change order two, etc. We will most likely have the original model that retains the original hash and then we can rehash the model for the change order to notify others what has been changed.</p>
30.	<p>How would we get as-built/final plans after construction is complete? (Cathy Loerch) That is something that we're looking at right now. From the pilot perspective first, Design Division will handle the as-built. We are going to update the model to what has been built out in the field so that we have a true as-built in an ORD model. Moving forward, we are still trying to determine the best way. Once we go statewide, we will have this figured out. Some states have a bid code and they have a lump sum for the contractor so that they can expect an as-built back in a certain format with certain standards, etc. And the contractor will provide it because they're getting paid to. It could be included as part of construction phase services where the consultant continues throughout the duration of the project to then work with the contractor and develop an as-built. We plan to test different options to see what's best for us.</p>
31.	<p>Is there any intention of getting letting materials out earlier than the current 21 day letting schedule? (Brandan Lewellen) We've had conversations on this too. We are exploring it because it is a new delivery method, and how do we make sure the contractor understands what these files are and what they include. On our pilot project, we delivered them on the FTP site at 60%, 90%, and 100% before letting to allow the contractors access to review as we do with big projects when they get advanced looks at the plan sets. Now if the question is whether we are going to extend beyond 21 days, then it is difficult to answer because at some point, this <u>will</u> become the delivery method. For now, we will continue to utilize early looks at the plans, models for our pilots and then determine what is the best way for us to move forward.</p>
32.	<p>How does the state plan on governing ALL the rapidly evolving software versioning? It might impact the ability to open / edit / view design files. (Wayne Guo) Wayne, you are absolutely correct. This is one of the biggest things that we are looking at. If you work for the state and you keep hearing that you're not allowed to download certain versions of our software, this is why. Because we're trying to get all the versioning that's out there under control. We do not update our design software every year based on different versions released by the vendors. We don't want to do that. We want to make sure that at each update, there is a significant beneficial change for the people that are using the software. So, we're trying to be very strategic in this regard. For everyone using GeoPak SS10, that is going to be deprecated. It does not work well with Windows 11, which everyone is going to. This information came from Bentley. We are trying to get this out of the environment and start utilizing the software. Trying to make sure that everybody is on the same software path can be a challenge sometimes. But one of our goals is making sure we have a very strategic way of updating our applications. This is for the design software. Once we start introducing other applications, we'll have to have a robust plan for those as well.</p>
33.	<p>Building on your response to Wayne's question, does this mean that the industry at large will be similarly limited to use of newer platforms, e.g., TxDOT is standardized on ORD 10.12 and 2024 is out, are we not allowed to use newer versions for delivery? (John Padilla) If you're using our workspace, our workspace has only been tested to what we've released. We don't know how it works with other things. Meaning, it would be at your own risk because if there's something that does not work or something has changed in the newer version, that will not be something we take accountability for. That would be something that anyone that does not use what is approved as far as the, the application versioning that, that would be the risk that they have to take. If it works out, then that is fine. But if a designer comes back and says, this doesn't work the same, then that's not on us and we are not going to amend anything because you decided to use something that was not approved.</p>



34.	<p>In regard to GIS, I believe you said you are currently testing a GIS process to view the digital files, if so how did you convert the files to GIS, I heard Utah has proprietary software, are you looking at developing this type of software for all consultants to use? (Francisco Garcia)</p> <p>Yes. Utah DOT has converted from ORD to GIS using FME. That's one of the things that we're looking at. We haven't gotten our hands on it yet because that is proprietary to Utah. We are looking at what options we have and if we want to develop a proprietary system. We would then need to see what it looks like to have consultants use it. We may not have a review software that we mandate like we do with ORD, this is uncertain. It may be that the model that gets reviewed must be reviewed in this way and to make sure all these things are checked. Maybe we let consultants decide for themselves what is their best way. For the state, we will have it internally but likely won't be mandated for them either as long as they can get it done in the way that we need it to. There are still a lot of questions out there when it comes to review software. And that's one of the reasons that we are talking about Utah's proprietary system. If that's something we want to use and get developed, we are talking with Esri about it. Or if we're going to use the Bentley Review System. If anything comes online here soon, then we'll look at that as well.</p> <ul style="list-style-type: none">- A sample zip file of the mentioned UDOT GIS tools is available at the bottom of the following linked page for anyone to access: https://digitaldelivery.udot.utah.gov/pages/conversion-tools (Ariel Froerer)- We still don't have access to the program to be able to convert ourselves. We can only see the set up. (Christopher Garcia)- There are new developments in ESRI's CAD interoperability toolbox where dgns come in largely without any changes. The 3D files come in as multi patches. And attribution from the fields are largely compatible. These changes in ESRI's tools are a direct result of their work on digital delivery with UDOT and TxDOT. – (Stephanie Marquez)
35.	<p>A project in construction right now has a contractor that used the 3d model/xs's to set the depth of flexbase on a project with GPS instead of the typical section. However, they found out that the survey was 1.5" off because it was a flight/lidar only survey and now their flexbase layer is thicker than design and they want additional compensation. Will situations like this become the norm, or will requiring more detailed surveys prevent this? (Blake Knox)</p> <p>Requiring more detailed surveys will prevent this. Having surveyor ground truth is a way that we can make sure that the whole process that Randall outlined, is going to help get better existing terrains and ensure better utilization of GPS and all these other elements out in the field. If we think about it, the survey is the most important part of what we're doing now because everything we do is based on this existing terrain. If we build off of something that isn't true to what's out there, everything is going to be off. One of our major goals is to make sure that existing terrain is as tight as possible. And reduce instances described above.</p>
36.	<p>As you mentioned, currently the contractor is recreating the model. What's to ensure that the model we provide to the contractor IS the model we provided and not mere what they are recreating? (Leticia Estavillo)</p> <p>When the model goes into contractor software, how do we know that it's the same model it is intended to be. This will have to be checked. We're going to have to make sure that when they import it, that it is checked. There will need to be some sort of partnership with contractors because if we're providing them a model that's hashed and it gets changed, we can look at their model to see what is off versus the one that we have hashed. And if there's something that's off, meaning they didn't build according to plans, then they have to replace that themselves. We are going to continue exploring how to make sure that things are being completed in the field the way they are shown via the model. We have some ideas, but it's still something to vet out.</p>



<p>37.</p>	<p>This sounds like there will be more standard configuration items for open products. What is the current roll out of these updated standards and how do they tie into Bentley releases - what is the ETA for the next update and what version will it use? (Jerry Jahn)</p> <p>These standards are going to be updated as we find that they need to be updated. We're going to have our model development standards and when they are released, they're going to be in draft form, just like everything on our website is in draft form because we know that we don't know everything yet. We only have one pilot that is about to go to construction. We are not going to jump ahead and say, well, we know that this is what it needs to be because we have one project out. We're going to continually adapt that. How does it align with Bentley releases? It may not. We are worried about how things work for the system at TxDOT and then we test them. If our configurations work right now for the version that we have, the next version we go to, part of our testing process is to make sure everything in our workspace still works the way it is intended, or we updated according to what the new version is. When the workspace is released, everything will have been tested thoroughly, and it will be to where there are no issues with that. What is the next update and what version will it use? We don't know yet what the next version of software we're going to be using. I think that's what the question is. We are going to explore the ORD 2025 version, but we will have to see what is included in that. Traditionally, those come out at the end of the year and we will be able to talk with our Bentley partners to see what is released in this version or what would they anticipate to be released and then we'll have to vet it like that.</p>
<p>38.</p>	<p>Comment: If we can establish templates to use during the initial stages, utilizing tools like FME to automate and convert spatial data, we will have the opportunity to create multiple data outputs. Depending on data security, we can publish to TxDOT's Open Data Portal, allowing users to export various versions of spatial data. (Autumn Carter)</p>
<p>39.</p>	<p>To show how the project evolves from existing to complete, are these models capable of communicating the 4th dimension -Time i.e. TCP/MOT? (Stephen Smiley)</p> <p>They can but it's not something we're exploring right now. We have reservations about doing a time model. If we deliver a time model or a 4D model to a contractor and they have a better way of doing it than what happens? Someone would have to update that. Right now, we're focusing on just the three dimensions and the delivery. We know that there are advantages of doing 4D and even 5D, but those are things that we have further down on the priority list for us to explore.</p>