Announcer:

Hello and welcome to Federal Highway Administration's or FHWA’s R&T Now Interchanges. The host of today's audio cast is Craig Thor. Craig serves as the Chief Scientist in FHWA’s Office of Research, Development and Technology. Please welcome Craig Thor.

Craig Thor:

Thanks. I'm really looking forward to another conversation today. We're going to talk about artificial intelligence and how we can use it as a business tool to help us be successful as an agency.

This means looking at large amounts of data to help us maintain, operate, and keep the nation's roads safe. Joining us today is someone who knows a lot about artificial intelligence and is very active in this area. From the Office of Information and Technology, the services team, I want to welcome Mangesh Hirave. Mangesh’s career spans several industries including telecommunications, consulting, product development, and government contracting.

For the past 24 years, he has served the Federal Highway Administration as a contractor and a federal employee. Mangesh holds a master's degree in computer science from the University of Pune in Pune, India, and he brings more than 30 years of diverse experience in information technology. So it's a pleasure to have you here today, Mangesh, and I'm looking forward to talking to you.

Mangesh Hirave:

Thank you for the introduction, Craig. I'm happy to be here today.

CT:

So, in our conversation today, we want to talk about how we're going to use artificial intelligence to move the agency forward and how can we work better as an agency by using these new tools. So I want to start by asking, what are you most excited about as far as AI, and how we can use it to be better as an agency?

MH:

The exciting part of this journey is so new as everybody is trying out. They are trying to figure it out first, understand it and then use it. But that excitement is there. And this is going to stay with us for quite some time because we will know how we can mature this, how we can use it, where we should be using it, and all those questions and answers, we are trying to explore.

This is like a venturing into a new territory, new region, new expedition, a space exploration. We don’t know exactly what we are dealing with. But here we are using it and trying to figure it out at the same time.

CT:

So, I agree with you that this is really exciting and there's lots of opportunities, lots of challenges.

How are you working to make sure that we can move forward in a way that's productive? What are the goals we're going to have for this program as we move forward?

MH:

Very good question indeed. So, for that, I think we have to define a vision first. How we will be using AI and how that AI should be applied.

And then we can define the goal. We are in the process of doing that. But there are four goals that we would like to address. First one is support and amplify mission delivery. Goal number two, enable innovations and increase AI maturity at the same time. Third one is AI-ready workforce. And fourth is responsible use of AI. And let's delve into, deep into those.

So supporting and amplifying mission delivery, or as we said is AI is in the hype cycle right now. Everyone wants to use AI and start managing the expectations. So, we need to start something called identifying. And this is also mentioned in OMB, 2410 memo that how one should be doing, managing AI. If I have a use case and have them developing a chat bot, and say Craig, you have wanted to develop a similar use case.

You don't have to reinvent the wheel. I could tell the person who is submitting the use case, they a talk to Craig. He has already done that, or they are already way ahead of you. They can help you out. So that will avoid the rework of the aspect. At the same time, we can start looking at the governance, what use cases we should not be using.

So, as we are talking about governance, we also talk about the categorization. Generally, you apply the three Cs of AI is to, most of the use cases, compute. I want to calculate large amount of data. The second one is cognitions. I want to scan my images. And third one communication. I want to build a chat bot which is standard of that.

 So, when we are getting all these use cases, categorizing, establishing governance “unknown” and sharing across the user community, that will help us to make sure that we are going to the second goal of ours, AI maturity. When I say enabling innovation, we should have a safe space or one to try out the concepts by rejecting the concept on the first shot, like this is not right, and you're stifling the innovation. So, enable the innovation, accept the ideas, try out those in a safe space. So that way people will know, yeah, we should not be do that. And Turner is great place for that. You know innovation happens here and failures are not looked at, oh my God, you fail.

But here they looked at, that didn't work. Since we talked about use cases creating inventory of use cases and enabling innovation. At the same time, we need to talk about how we will make sure our workforce is ready. So, for that, we had to commit, we had to come up with community of practices. We had to create awareness.

So, we had to start with a standard training for all first. So that way they know what they can, they cannot do with AI. And then we can have certain programs available for them. So that way they can apply those skills in the safe place that we had created and address their use cases accordingly. And finally, to put the bow on the top is the responsibility.

 We need to make sure that we follow the five basic principles of AI transparency, fairness, security and privacy, reliability and accountability. We have to adhere to those principles, because those are really essential for us to make sure that every use cases, every use case, every AI initiative we are doing, it's doing the right way.

CT:

So, in your answer, you reference the OMB memo that came out in the spring.

And there's also the executive order that came out last fall from the White House on the use of AI within the federal government. And one of the things that I noticed from looking over those, is obviously they want us, when we look at using these tools in how we conduct our business as a federal agency, they want us to be careful.

You know, we want to be looking for those things like bias, like you mentioned, but they also do want us to innovate. Like you said, we are being encouraged to try new things with AI. And in fact, I would go so far as to say that the public is expecting us to use AI to deliver our mission more efficiently and better.

Right? And so, I was really encouraged to see that in those documents as not all fear around AI. It's embracing AI. So, I think that's great. So, in that spirit, can you provide some examples of things that we're really focusing on as opportunities to leverage the opportunities of AI to make sure that Federal Highways is doing the best job that it can to deliver for the public, and maybe even talk a little bit about what those anticipated benefits to the public would be.

MH:

We have so many policies, so many PDFs, we have. We have information at our fingertips, but it's buried into documents. LLM, a chat bot over that will definitely help us to address specific questions on any topic they want. At the same time, we are to make sure that data is grounded. So we are not going beyond our sources to reach out the answers.

So, the answer should come from a specific data set or grounded data set. So LLM definitely will help any public users to when they are asking for information. Right now, if your go to the federal highway website and search permits, I would get hundreds of document that have all that information, but it will not answer, it not answer my question. It is providing a feedback, of just give me a list of documents. But it's not answering my question. But the bot will help us to answer specific question with citation of the document when they can refer to. So that way they can do a deep dive if needed, but at the same time answering the question instead of going to thousands of document.

So, we have to make sure, however, those policies are up to date. They are current and somebody reviewing that, that accurate because the bot is going to use that data. So data is essential. AI comes first, AI comes later. But your data needs to be really verified and curated before you expose it.

CT:

You mentioned that the human always needs to be in the loop, and I think that's a critical part of a general understanding of what AI is going to be, at least in the near future, whether at Federal Highways or more generally, is that it's not replacing us, it's augmenting our abilities.

 It's a copilot in a lot of the things that we want to do. So, these challenges that come along with the use of AI, and we want to make sure that we are being smart about that, that we're paying attention to potential bias in the data, and that we are giving the public good answers based on good information.

And so, what are we putting in place to ensure that we are being as effective as we can be when we're using these new tools, given some of the challenges that exist?

MH:

I would say so I would start with a declarative statement in the beginning, at least for next few years, until our AI maturity levels are high enough, that anytime, anywhere you are using AI, first declare that this response has been generated using AI.

Second is a focus on transparency aspect of it. As for the transparency, from the transparency perspective, we need to make sure that everything that we are using AI for, we can stand by it, stand behind it. So that we may get a FOIA request to explain how a particular decision was made. We need to show the data that has been used to generate that, what model we have used to generate that, and what the human factor did with that outcome.

CT:

That was excellent, Mangesh. I really appreciate this conversation. I know I'm excited about the opportunities of artificial intelligence. I'm fully aware of some of the challenges, and that this is not something that's going to happen overnight. But I'm encouraged by the fact that people like you are looking into it and are trying to find ways to make sure that we can deliver our programs more effectively.

And I think in the end, that's going to be a benefit to the taxpayers and the people that we work for. So I think what you're doing is important, and I appreciate it. And I appreciate you joining us for the conversation today.

MH:

Thank you so much for inviting me and share my thoughts. This is as I said, this journey is very exciting and I'm glad that we're in the really perfect time right now. So, thank you so much for that.

Announcer:

Thanks, and we'll be back soon. Want to see a topic covered in a future episode? Please send an email to FHWA-NOW@dot.gov. To download new episodes of our conversations, go to our R&T Now Interchanges web page. Take care everyone. Until next time.