

Rep. Warren, Chair: Now, begin. On this first meeting of the Oversight and Reform Committee, it seems appropriate to say a little bit more than what's typical at the beginning of a committee meeting. People don't seem to trust institutions. In a Gallup poll last summer, news outlets, the business industry, the medical industry, public schools, the criminal justice system, even the police registered low in a Gallup poll. Since 2007, according to Pew Research Center, public trust in government has rarely been above 25%. Except for a short period during the COVID pandemic, it hasn't registered above 20% in years.

Now, we could all individually probably point to reasons for our own diminished trust in various institutions over the past few years, but in a way, this committee exists to begin trying to restore trust in government. Not every problem has a legislative solution. Many problems will never have a legislative solution. Some of our hearings, like today's, will look at efforts that seem to be succeeding. Others will hone in on specific issues or specific agencies. All of them will shed light on places and practices that have been overlooked. Although we cannot look at everything, we are planning an active agenda to cover a wide range of issues over the next two years. Today, we will learn how state agencies are tapping the academic research expertise in our universities to plan for the future and to evaluate past decisions.

With that, I'd like to begin the meeting by recognizing our sergeant of arms, and we are very privileged today to have Mark Douglas in the back there, Russell Salisbury, and back over here, Glenn Wall and everybody's favorite, David Leyton. Our pages today are Sean Blackwell. Where's Sean? There you go. And Todd Bond. That's Bond, Todd Bond, and Lillian Burton and Cameron Cooper. We thank you all. Sergeant of arms, thank you all for your service and being here to help us out today. Our first speaker today is going to be Curtis Bradley. Mr. Bradley, would you like to take the podium? Mr. Bradley's filling the role of Director for the Division of Research and Development. Mr. Bradley, if you'd please stand and raise your right hand. Do you affirm that your testimony is the truth, the whole truth, and nothing but the truth?

Curtis Bradley, Ph. D.: Yes, sir.

Rep. Warren, Chair: You may be seated to begin. Thank you, sir.

Curtis Bradley, Ph. D.: Good morning.

Rep. Warren, Chair: Good morning.

Curtis Bradley, Ph. D.: My name is Curtis Bradley, and I will be presenting on the research program. I am the research implementation manager for the North Carolina Department of Transportation Research and Development Unit. In our program... Yes, ma'am.

Speaker 1: [inaudible 00:18:16]

Curtis Bradley, Ph. D.: Do you need me to speak louder?

Speaker 1: Yes.

Curtis Bradley, Ph. D.: Okay.

Speaker 1: [inaudible 00:18:26]

Curtis Bradley, Ph. D.: I apologize. Is this better?

Speaker 1: Yes.

Curtis Bradley, Ph. D.: All right, thank you very much. In this, I will go over how our program is funded, what do we research, as well as our oversight and selection, our program, university engagement, and we also have a library, so I wanted to make sure to throw that in, and if you all have any questions, I'll be more than happy to entertain them. How are we funded? Our primary funding comes from the federal, state and planning research that comes from the United States Code Title 23, section 505, which is 2% of the federal apportionment, which is separated between planning and research. We get 25% of that apportionment. That's primarily how we are funded, but we do have access to federal project grants, state highway funds, and discretionary funds. What do we research? The short answer is, any NC DOT business need we are capable of researching, whether it be pavement conditions, bridge structures, rail noise propagations, CAVs or UAVs, which is a connected and automated vehicles or unmanned aerial vehicles, as well as multimodal initiatives. We are capable of researching that. How is our research selected and what does our oversight look like?

As a research and development unit, we have between four to seven full-time equivalents. We're currently operating at four full-time equivalents. Our responsibility is to manage the overall program, to solicit research ideas and proposals to the universities, as well as to coordinate between subject matter experts at NC DOT and university personnel. Then we have the research subcommittees. The subcommittees, which I'll go over later on in the presentation, they're responsible for reviewing the research idea and proposals as well as the recommendation of proposals for funding. Once that's completed, it goes to our research executive committee, which is NC DOT senior personnel. They look at the overall program. We put the overall work program, including all of our funding abstracts, what the funding's going to look like, how much, things of that nature, and then they approve that, and because we are a federally funded research program, it goes through the Federal Highway Administration's Division Office and they approve our overall work program, and it bears mentioning that most of our research starts in August. Excuse me, but our research for that work program cannot start before the state fiscal year, which is July 1st.

Our research subcommittees, as I mentioned before, we're designed to accommodate NC DOT business practices. That can be encompassed, but it's not exclusive to environmental hydraulics, pavement and materials, structures construction in the geotechnical, traffic, roadway and design, as well as planning, programming, policy, and multimodal. One thing to note is that any research idea or proposal can go to any one or multiple committees. Sometimes there's research that touched a bunch of different factors, so we want to make sure that each committee has an opportunity to review and provide comments as necessary. In the research and development unit, we take the responsibility of making sure that, that's coordinated accurately. What does our research program look like? Typically, our annual research program is 18 months from research idea to project start date, and the reason being is that, as you saw before, it goes through a lot of hands and we have a lot of checks and balances to make sure that we're picking research appropriately.

We typically fund between 18 to 20 research projects, and that's our annual research program. Every now and again, we'll get a request for short term research that needs an immediate answer, whether it be a white paper, a survey, or a quick survey to different DOTs to understand what's going on. We'll use our technical assistance program, which we can work with any university professor at up to 120 hours of work. Then we have our technology transfer program. That's a program that I personally manage, and the reason for this program is that we are an applied research program, and what separates that from basic research is basic research can tend to be a bit more abstract and forward-thinking. Applied research is, we have a full intention on once the project is done, it provides an answer, we use the methodology, we're capable of using it. Excuse me. Research does not always work out that way, and sometimes you need further development pilots, trainings, workshops. We have set aside funding specifically for that so that we can get project research from completion to actual implementation.

Finally, we have pooled funds. This is not an exhaustive list, but this is our primary list. Pool funds are where we, each state DOT pools funds together and we're capable of doing common research. The primary one is the National Cooperative Highway Research Program. Everybody puts their money together. We evaluate common research, and it's a more efficient way of us using our funding. Excuse me. How do we engage universities? These are the universities that we have engaged research. This is not an exhaustive list, but primarily how we engage our universities is we operate through master agreements. That's where all of the terms and agreements are established on the front end. Funding is not tied to the master agreement, but if we do move forward with the project with the funding, the FNA rates or any sort of intellectual property or final reports, all of that is established on the front end, so all we're focused on is the scope of work, budget, and deliverables.

Finally, we have a research library located at Century Center off of Pool Road, and we actually have a librarian. The reason why this is important is that research can be very robust, and so one of the things that we ask all the

researchers do on the research idea phase is to provide a literature search. This is to ensure that certain research hasn't already been completed, or if it has been completed, is there a justifiable reason to continue with that research? That is a criteria before we even select that, and we do have a librarian to help out with that. They also have journal articles and board of transportation minutes dating back to the 1950s. That is my time. I thank you all for having me here. If you'd like to know more about our program, I have the link there. Feel free to take a look around and let us know what you think. Thank you very much.

Rep. Warren, Chair: Thank you, Mr. Bradley. Members, do we have any questions for Mr. Bradley? Representative Stevens, you're recognized.

Rep. McNeely: [inaudible 00:25:03].

Rep. Stevens: Who's going to ask my question?

Rep. McNeely: [inaudible 00:25:08]

Rep. Warren, Chair: Well, let's not fight. Just somebody ask a question.

Rep. McNeely: Dr. Bradley, how are you this morning?

Curtis Bradley, Ph. D.: Very well, sir.

Rep. McNeely: I got quite a few.

Curtis Bradley, Ph. D.: Yes, sir.

Rep. McNeely: They've put me on transportation, and so I'm learning, so I'm asking a lot of questions. Approximately, total funding for DOT research, do you have any idea what we're total is?

Curtis Bradley, Ph. D.: Federal side would be approximately 6.3 and then there's a 20% match for state side.

Rep. Stevens: 6.3 what?

Rep. McNeely: Million.

Curtis Bradley, Ph. D.: About 1.5 million.

Rep. McNeely: The state match.

Curtis Bradley, Ph. D.: Yes, state match.

Rep. McNeely: So total, seven to eight?

Curtis Bradley, Ph. D.: I would say about 7.5 would be an accurate number.

Rep. McNeely: 7.5, okay. All right, and you said 25% state match, right?

Curtis Bradley, Ph. D.: No, sir, When I was referring to the 2% federal apportionment, the 2% federal apportionment, it's SPNR, part A and part B, and actually, due to the recent IJA Act, it actually separated into three. You have 72.5, which goes to planning. You have 2.5 that goes to Complete Streets and NPOs, and then 25% goes to us. Of that 25%, is an 80/20 split. Does that make sense? I am so-

Rep. McNeely: Does that equal a hundred?

Curtis Bradley, Ph. D.: Yes, sir.

Rep. McNeely: It sounded like it equaled about 190.

Curtis Bradley, Ph. D.: Basically, of the 25% of the federal apportionment, of that 2% comes to us.

Rep. McNeely: Okay, so of the 2%, y'all get 25% of that.

Curtis Bradley, Ph. D.: 5% of that.

Rep. McNeely: Okay.

Curtis Bradley, Ph. D.: Yes, sir.

Rep. McNeely: All right. I guess the next question I got is, has it been fairly consistent as far as the amount y'all got to invest or has it been moving up or down? Which way would you say the air is pointing right now?

Curtis Bradley, Ph. D.: I would say it's been consistent from the perspective of the amount that is apportioned to us. That has been consistent. Obviously, if there's anything that goes federally where there's a slowdown in funding or something of that nature, that might affect it, but as far as the actual funding that's programmed to us, it's been fairly consistent and it has gone up with the new federal bill.

Rep. McNeely: Looking at all the different types of research that y'all are doing, I'm always big about return on investment, so we're spending this money, are we've coming up with stuff that's new and innovative or are we kind of disproving the wheel still is round? Where are we at? What would you say is one of the biggest things in the last couple years? I know COVID has messed you up. Say the last five, that y'all been able to do you think's innovative through research at DOT to help the state?

Curtis Bradley, Ph. D.: I'll answer the question in this way. What I actually do is, as part of the implementation manager, my role is-

Curtis Bradley, Ph. D.: As part of the implementation manager, my role is to evaluate the return on investment. So the first thing copy that I always give is that looking at a return on investment monetarily might not necessarily be the best metric. And the reason why I say that is because when you're looking at reduced time, how do you evaluate that according to a metric? Yes, there's a monetary investment to that, but is that an accurate definition?

There's also safety. So there's been proven data that shows that with the investments of certain highway designs, that it has reduced crashes or things of that nature. So there's also the decisions of making a poor decision. So that is also proven to be a very important factor. As far as the best one that I've seen thus far is the improvement in understanding of connected and automated vehicles and what it looks like from the DOT's perspective, not just looking at it from a technological perspective, but what does the DOT, the government look like? How do those things engage? Where do we put these in the communities? How does it affect a rural, suburban, or urban community? And how do these technologies talk to each other? We've learned a vast amount of information on that. So if I could point to any place, it would be on how we've engaged new and innovative vehicles, I mean new and innovative technologies.

PART 1 OF 4 ENDS [00:28:04]

Rep. McNeely: We've changed secretaries here not too long ago for the department. And I guess, is Secretary Boyette, is he more involved and wanting to see more research done than Truden did or, where's upper management telling y'all to push the needle to?

Curtis Bradley, Ph. D.: I can say that upper management has been very consistent in leaning on research and engagement with universities. So there has not necessarily been a noticeable difference, but that has, it is neither positive or negative. They've leaned on us heavily. They've, where we've been able to help out, we have. And so can't an answer that and say, one, it's been better than the other, or one that's been more engaged in the other. The engagement with research has been relatively consistent, and due to the way that our program is structured, we've structured it so that senior management is consistently engaged. We have a bottom-up approach when it comes to research. And so we have the people that are boots on the ground that are engaging the research and asking the questions, but we also have senior management that's engaged to make sure that that pipeline is consistent.

Rep. McNeely: And I guess the structure you put in place as far as going about doing your research, is this something that y'all have developed innovatively amongst yourself or are you following more of a template of what's on the federal side? I guess my thing is, are we shining? Are we a shining star in the state or in the nation as far as our DOT research, or we kind of just seeing what everybody else is doing and seeing if that's true or not true as far as proving?

Curtis Bradley, Ph. D.: I'm going to publicly say that we are a shining star when it comes to innovation.

Rep. McNeely: I'm just curious to see how you felt about yourself.

Curtis Bradley, Ph. D.: I will say one of the things that does make us unique is that we constantly evaluate our program. So another part of my role is that I do a statistical analysis on how projects are selected. I want to make sure that the methodology is consistent. We've just completed a Lean Six Sigma effort where we're evaluating, okay, how are we communicating with researchers? How are we communicating with our constituents? What are we doing ourselves? How can we constantly improve? So it's not necessarily a set it and forget it template. It's a constantly moving, documenting, and ever-changing a commitment to make sure that we're staying up to date, not only on the research, but how we apply and how we articulate the research and how we move things forward.

Rep. McNeely: Well, and I think it's critical. I watch this a lot of times in agriculture that I'm more based in than transportation, but trying to learn, and we tend to keep proving the same thing over and over again. And I think that's the definition of crazy, doing the same thing over and over again, yet expecting different results. So the-

Rep. Warren, Chair: Representative McNeely, if you don't mind, I'm going to move on to-

Rep. McNeely: One more question.

Rep. Warren, Chair: Just one more? All right, we'll let you continue with your interrogation.

Rep. McNeely: One more question. I told you I was trying to learn here. You mentioned on this though, the research subcommittee. Is that DOT inner employee or is these appointees?

Curtis Bradley, Ph. D.: So typically the subcommittees are, consist of directors of different departments. So structures, pavement, materials, and so it's-

Rep. McNeely: Inter-department?

Curtis Bradley, Ph. D.: Yes, interdepartmental, but then there's also different facets of each department that are engaged. The whole goal is to make sure it's as comprehensive of a committee as possible. And where it does not make sense, it may go to another committee for them to evaluate as well. One thing that we do, that we do, for example, is in the planning and the traffic committee, we have someone from planning that sits on the traffic committee. We have someone from traffic that sits on the planning committee just to make sure where we may fall short, the subject matter experts will catch it.

Rep. McNeely: Dr. Bradley, I appreciate your information and time.

Curtis Bradley, Ph. D.: Thank you so much.

Rep. McNeely: [inaudible 00:33:16], Mr. Chairman.

Rep. Warren, Chair: Absolutely. Representative Stevens, you're recognized.

Rep. Stevens: Thank you, Mr. Chair. And I have several questions. I'm probably more of a money person. So let's talk about some money. You say your budget's 7.5 million-

Curtis Bradley, Ph. D.: Approximately, yes ma'am.

Rep. Stevens: And then I heard research and development has four people, four full-time employees.

Curtis Bradley, Ph. D.: Currently, right now, yes ma'am.

Rep. Stevens: Okay. Are you, well currently, are you anticipate hiring more?

Curtis Bradley, Ph. D.: Yes, we do. We're in the process of hiring a manager, and then it will be up to the manager how they backfill and how that time, how that moves forward. But currently we're at four.

Rep. Stevens: And so you're talking about adding one?

Curtis Bradley, Ph. D.: We're talking about adding two more, maybe three.

Rep. Stevens: Two, okay.

Curtis Bradley, Ph. D.: But it depends on whoever comes in as a manager, they're going to be the one to make that call.

Rep. Stevens: And then I understood that the research subcommittee is basically existing employees that come together?

Curtis Bradley, Ph. D.: Yes, ma'am.

Rep. Stevens: None of those are paid separately from this fund?

Curtis Bradley, Ph. D.: No ma'am, no. All of this is volunteer and one of the reasons why we try to make sure that it's applicable is because it is a volunteer effort. So we want to make sure that it solves a problem that they need, and it's not just something that is not useful, just to be plain.

Rep. Stevens: And then you said there's a research executive committee?

Curtis Bradley, Ph. D.: Yes, ma'am.

Rep. Stevens: Is that again volunteers or are those paid positions? Who's on that executive committee?

Curtis Bradley, Ph. D.: So everybody is a paid position as far as their current position, but to be on the committee, it's not paid. And let me make sure I make that clarification. So you have the chief engineer, chief operating officer, director of planning, director of multimodal, things of that nature. So all of them are paid positions within DOT-

Rep. Stevens: But not from your fund?

Curtis Bradley, Ph. D.: But not for my fund, our funds.

Rep. Stevens: Okay. And the FHWANC division?

Curtis Bradley, Ph. D.: Yes ma'am.

Rep. Stevens: What is that again? Something that's paid for by DOT that just coordinates with you, or is that a separate group of people that you have working for you?

Curtis Bradley, Ph. D.: So FHWA is where we, so we get our money from the United States Department of Transportation, and FHWA, Federal Highway Administration is within the United States Department of Transportation. So they're the federal side.

Rep. Stevens: All right.

Curtis Bradley, Ph. D.: So you could look at them as oversight because they do fund 80% of our program. So they're the ones that check our programs, look after it, make sure it's appropriate use of funding and things of that nature. So they really don't, they really are more oversight than anything.

Rep. Stevens: So what is your payroll? I'm trying to figure out where seven and a half million dollars goes.

Curtis Bradley, Ph. D.: Okay, so I'll give you a very high end. So let's say roughly \$5.5 million goes towards research, our annual research program, you have another approximately 1.4, 1.5 that may go towards pooled funds.

Rep. Stevens: Goes toward what, I'm sorry?

Curtis Bradley, Ph. D.: Pooled funds. So NCHRP pooled funds where we actually send it out and where things are pooled together. You have another portion that goes towards our employees that are paid, and then you have another that goes towards subscriptions, library funds, things of that nature.

Rep. Stevens: All right. Now the \$5.5 million for research, do you do this like a grant basis to colleges? Do people apply for grants? You say, we want somebody to research this issue and people apply and say, this is how much we charge.?

Curtis Bradley, Ph. D.: It would actually be better if I went about it this way.

Rep. Stevens: Okay.

Curtis Bradley, Ph. D.: This may help you out a little bit better. So we have, every April we send out a research idea solicitation. Universities and NCDOT may submit research ideas. The only caveat with universities is that they must have an NCDOT representative to sponsor that idea, but universities can submit ideas. It goes through our process, it goes through the review process, and then the proposals are sent out again. Now bears mentioning that if NCDOT comes up with the idea, we send it out to the university partners en masse. If a university representative's idea is selected, we treat that as proprietary. So that's their intellectual property to go through our process. Then that's where we go through the selection process and how ideas are selected into proposals, and proposals are selected into funding. So it's more of a project authorization, a sponsored agreement. I wouldn't necessarily call it a grant, but you do have to write and it is competitive.

Rep. Stevens: Okay. And so each, I'm sort of roughly doing the math in my head. Each research project grant is around \$500,000?

Curtis Bradley, Ph. D.: It can float between \$200,000 to \$500,000 depending on the scope of work.

Rep. Stevens: All right. And then I just have one last question. I understand one of your research projects was Medicaid transformation, no?

Curtis Bradley, Ph. D.: Medicaid transformation for urban transit. Yes, for urban transit.

Rep. Stevens: Can you explain further what that, I don't understand it, but can you explain to me why it was a research project for DOT to look at Medicaid transformation?

Curtis Bradley, Ph. D.: Well, I can give you a very high end answer because I am not the subject matter expert for that, so I don't believe I would do it justice. But it does, it is one of those cross intersections where we have paratransit, and so that does go into the multimodal phase of what we do, and then it also engages the health side. So that's one of the things that we talk about, where there's an interconnection between activities, public sector, private sector, and other public sectors where we do engage that type of research. So from a DOT perspective, we have a transit portion in there, which does fall within our scope of work.

Rep. Warren, Chair: Representative Stevens, did you have a follow-up question?

Rep. Stevens: I think my last question is, you said return on investment is something that you can't measure. How do you measure success?

Curtis Bradley, Ph. D.: So how we measure success is, so what we do is we send out a research follow up survey. And what we ask is some very basic questions we ask is what is the tangible measure? What is the tangible benefits? So we have four categories. There is monetary revenue, there is safety, there's operation and maintenance in business, and there is knowledge gained. And so then once we ask that question, and once they identify it, we also ask, can you follow this up with, do you have data? Do you have information to back this up? If they do, then we delve a little bit deeper into saying, okay, how did you measure success? Okay, we measured it because there was knowledge gained that we didn't want to make this investment in this type of product because it would have an adverse effect on aggregate. I'm not, that's just a hypothetical, that's not directly.

But then it said, okay, so what did that benefit? Well, we developed a new methodology that sped up how we measured the aggregate by two weeks. Once again, this is hypothetical, not direct. So that's an operation and maintenance issue. So then there's also a safety, "Hey, we don't have to go out to a highway to measure this. We only have to go out a certain amount of times." Okay, that's a safety inspection. Okay. We don't have to spend as much time. That is a monetary investment. So that's where I say that, it's kind of a, I won't don't want to say it's a sliding scale, but there's a lot of different aspects to it. The one thing I will mention though is that I do not make that measurement myself. It is up to the subject matter experts to communicate to me, this is how we measure this.

Rep. Warren, Chair: Thank you, Mr. Bradley. Co-chair Jake Johnson, representative Johnson has a question for you.

Rep. Johnson: Dr. Bradley, thank you for being here. We appreciate the presentation. My question is if you're like every other state department, you've probably got some openings and trying to fill them. And you even mentioned that you're looking to fill some spots there. It looks like a lot of this money's going to collaboration with the universities. Has there been any, we'll call it recruitment for lack of better words, people coming to work for the department after they've done projects that have been funded through these state or federal funds coming to work with the department either that are on staff now or have been, or looking to be?

Curtis Bradley, Ph. D.: So that is a current ongoing initiative that we are doing. So when we do send out the project authorizations, we do ask what students are participating in that. We also do within our funding, we do fund the students as well as a portion of the tuition to do our research. And so we are, it's an ongoing initiative. I don't have any hard numbers for you right now, but that's an ongoing initiative that we're working on with the research unit as well as other departments around NCDOT. So I don't have a straightforward answer for you right now.

Rep. Johnson: Perfect, thank you sir.

Rep. Warren, Chair: All right. We certainly appreciate your patience. We just have a couple more members who have a couple questions. And members, in interest of time, I'm going to ask you to let me know if you have a follow-up question. Representative Arp, you are recognized for a question.

Rep. Arp: Thank you, Dr. Bradley. One of the questions, I'm a structural engineer, so I'm coming at it from the technical aspect and I see you've got pavement conditions, connected automations, I know those areas. Do you ever research people systems, like how to get more appointments into DMV for people to get licenses and systems analysis so that we can maximize? The number one complaint I think I hear is people can't get their licenses or get things, get the necessary things that they need to do. Systems analysis, do you ever do that for DOT and DMV particularly?

Curtis Bradley, Ph. D.: I am familiar with two research projects. I cannot name them specifically off the top of my head, but I can get your information a little bit later on and point you directly to the two projects. There was one where we did a systems analysis on our DMV expansions, and that was done during Covid, so we actually had to implement the scheduling effort into there. And then there's another one that I'm not as familiar with. So yes, we do. As far as what they specifically entail, I can't answer that question at this time.

Rep. Warren, Chair: Thank you, Representative Arp. Thank you, Dr. Bradley. Representative Torbett, you're recognized.

Rep. Torbett: Thank you. To address some of the return on investments over the last decade, I was very honored to be able to work very intensely with NCDOT, and I have two just popped in my mind. I want to allow members to understand. One was along Highway 12 and the outer banks, we are constantly rebuilding dunes from normal storm washout of the dunes. And one of the things the department was looking at back then was researching dune stabilization efforts, projects, or products that could be put in the sand dune to help it from keeping it from being washed out. Everybody would save a tremendous amount of money and a tremendous amount of transport back and forth, up and down highway 12. That was one that was working on. The other one, which it was fascinating, was they're constantly looking at different road surfacing techniques.

And one in particular they developed back then was, we'll call it like a sponge asphalt. In a heavy rain area, they will put this surface down and the surface allows the water to go through the surface and leach out on both the sides of the road. So think of it like a sponge. What that does that reduces ponding on a highway, which also saves lives to keep cars from hydroplaning. And so that's two of the projects they were working on that came to fruition. I've seen them in application, I've gone out and witnessed the performance of those projects and was very satisfied with the outcomes. So that's just two that I know of

working with DOT over the last decade through the research to bring out a research into actual application. Thank you, Mr. Chairman.

Rep. Warren, Chair: Chair recognizes Representative Chesser.

Rep. Chesser: Thank you, Dr. Bradley. I appreciate you guys coming out. Torbett down there just stole some of my thunder, I was going to give you the opportunity to speak. I have a background in DOT as well, but I wanted to give you an opportunity to speak about some success stories that you guys have had with the research. So I was just going to see if you had any off the top of your head where you could show where the research actually led to policy change.

Torbett stole it from you already.

Curtis Bradley, Ph. D.: I will say that there is one project that I always champion because it shows the, what I like to call the cradle to cradle side of research, from an idea to application to how we're moving forward. So as some people may know, workforce development is certainly a more urgent need, and so how do we retain that intellectual knowledge? Well, the value management office is working on a CLEAR program. Please don't ask me to explain what the acronym is because I tend to forget it. But what it is is a knowledge gain, or it's a knowledge access program where different construction units, hydraulics, whatever they've learned on a project, they're able to put it into a database, it's able to get filtered. And so it's archived and that information, so when we have new engineers or people that are coming to work on that, they have that intellectual knowledge, put it put in there. So it started from an idea and it's definitely morphed into something that NCDOT, at least in my eyes, can be proud of, because it's addressing a tangible need on something, that's urgent at this point in time.

Rep. Chesser: Okay,

Curtis Bradley, Ph. D.: Follow-up?

Rep. Chesser: Just one follow-up. If you would, what are some key takeaways that us as legislators can take away? Because there's always organizations and groups that are coming to us to look for funding, to fund research in varying areas. You guys are the longest standing, probably one of the more successful organizations as far as history goes and being able to do this. So for us as legislators, what are some successes in the process that you guys implement that you think we need to be looking for when we evaluate others?

Curtis Bradley, Ph. D.: So the successes that I could certainly say in the process is the diversity of thought. And so when I come with the diversity of thought, when we allow research ideas to go through different hands, you have people that see different points and may be able to identify certain pinch points, or things that are not necessarily feasible. So that connection or that coordination between different units has definitely been very critical in the successes of research.

And then the second thing is constantly evaluating our own process to make sure that it's doing what it's supposed to do. I'm very proud of the fact that DOT, not only are we very good at executing and communicating, but there's also processes as far as looking at ourselves, what can we do better? How can we do things better? And being able to implement those processes. And so I would say as a lessons learned, communication is key, honesty is key, and being very, very tangible and honest about what are we trying to solve? Are we capable of solving it at this time? And if not, being very transparent about that.

Rep. Warren, Chair: Thank you. Representative Cervania?

Rep. Maria Cerv...: Thank you Chair. I'd like to ask a question of our speaker. It springboards off representative Chesser's question. I wanted to know about the future and the nimbleness of your department when it comes to evaluating projects. You say you use an algorithm of some sort to evaluate the different projects that you will approve. And I'm curious to ask about your criteria, if it integrates our economic development in our state and how that affects our rural areas and evaluating projects towards the future of those areas to be accommodating of that future economic development in that space. And also if you integrate any of the criteria of workforce availability and housing because transportation is only one piece of this whole picture, correct? So do you all consider those things when you are constantly evaluating how well your success is?

Curtis Bradley, Ph. D.: I would say the best way I can answer that is that I am not the appropriate person to answer that direct question because that does go through certain subject matter experts. Our job is to facilitate the process. And so when it comes to the evaluation of research, we're evaluation, does it have tangible benefits? What are the probability of successes? Is it an urgent need? Is it innovative? Is a literature search robust? These are the certain pinch points of what we're looking for to be able to articulate the subject and make sure that it lines up with the needs of whoever the subject matter expert is. So as far as economic multi-mobility interaction, things of that nature, I'm not the appropriate person to ask that. But if someone comes to us with that question and wants to look for a research project, then we do have the ability to facilitate that process, get it through appropriate committees, and make sure that everybody is on the same page when selecting that. So I'm not saying there isn't, but I'm just not the person to answer that question.

Rep. Warren, Chair: Dr. Bradley, our final question is going to come from Representative Cunningham.

Rep. Cunningham: Thank you so much, Mr. Chair. And I'm going to be real simple. The poles that separate the lanes, I notice on the express on the center, they're like a white gray, but if I'm in Alvamar or Stanley County, they're orange or they're like a golden yellow. And I wanted to know if any research or anything's been done on that. I totally lost my car not long ago with the poles on the express because I just didn't see them because of the color being so white and blending in. But I did notice when I was in Stanley County, they were plowed through too. So I

didn't know if the color made a difference, and they seemed to be concrete on the inside, but may look plastic on the outside. What are those?

Curtis Bradley, Ph. D.: I hate to give you this answer, but unfortunately that's not my area of expertise. I do know that we do have people that focus on retro-reflectivity. We do have people that focus on project medians and things of that nature. So those things can be researched, but as far as what they are, the specific projects, I just simply cannot give you a straightforward answer with that. So I'll-

Rep. Cunningham: Follow-up, Mr. Chair. Would you relay it to the appropriate person? Because I would like to see how much money we are spending to replace them every time we hit them, and what it is actually costing the department as well as the constituent as well.

Curtis Bradley, Ph. D.: Yes ma'am. I will.

Rep. Cunningham: I thought I was going to get a bill, but I didn't.

Curtis Bradley, Ph. D.: Yes ma'am, I certainly will.

Rep. Cunningham: Thank you.

Curtis Bradley, Ph. D.: Thank you.

Rep. Warren, Chair: Dr. Bradley, we appreciate you and your time this morning. Thank you very much.

Curtis Bradley, Ph. D.: Thank you very much.

Rep. Warren, Chair: Members, our next speaker will be Dr. Jenni Owen. And for little background, she is the director of the Office of State Budget Management and Strategic Partnerships. For those listening in at home, Dr. Owen was a policy advisor to Governor Hunt and an active member of the Stanford School of Public Policy before becoming the policy director for Governor Cooper in 2017. And she became director of Strategic Partnerships in 2018. And in the past three years, she's expanded the role from philanthropies to universities. Dr. Owen, would you please raise your right hand, and do you affirm that your testimony is the truth, the whole truth, and nothing but the truth?

Jenni Owen, Ph.D.: I do.

Rep. Warren, Chair: Thank you very much. You may be seated or begin your presentation.

Jenni Owen, Ph.D.: Good morning. Thank you very much, Mr. Chair and members of the committee. In case state budget director Kristen Walker is concerned, I am not the office of State Budget and Management director, and that's not to correct you, Mr. Chair, but just to make sure people understand that I'm not the state

budget director, I'm the director of the North Carolina Office of Strategic Partnerships, which is housed within the Office of State Budget and Management. So I very much appreciate the opportunity to talk with you about the Office of Strategic Partnerships. As a chair mentioned, we are a relatively new endeavor housed again within the Office of State Budget and Management. I'll give you a brief overview and some specific examples of the work that we do. And like Curtis, Dr. Bradley, be happy to answer any questions that you have. And let's see here, where is...not for me? You going to...thank you very much. Great, thank you.

So the North Carolina Office of Strategic Partnerships was established to fill a huge gap recognized nationally in the state and locally between what research does and what government needs. We've seen increasing demand across state government, within agencies, across agencies at every level of government. How do we know what we do is working, what do we need to know? And as Representative Cunningham just alluded to a perfect example of, what keeps you up at night? And so we are working with agencies to help answer questions. We don't do the research internally for the most part, but we do some of that to answer questions to help residents, agencies, driven by agencies, what keeps you up at night? What do you want to know that you can't answer? Why can't you answer that, and can we help you get an answer to those questions? So we were started to increase government research and government philanthropy, communication, coordination, and partnership.

I'm not going to read every bullet, but I will refer to these. They're on here for a reason, to help focus your attention on what we focus our work on to help facilitate agencies' work. And this is across cabinet and Council of State, which I'm happy to speak to as specifically as would be helpful.

So we develop, launch, and enhance partnerships between the research sector and North Carolina state agencies. There's a philanthropic stream of work as well, which I'm happy to speak to. The chair mentioned initially tapping university expertise. That's a huge component of what we do. We have 110 institutions of higher education in North Carolina, including the 58 community colleges. In every single one of those institutions of higher ed, there are faculty and researchers and students who are doing what they call policy relevant research. It is often policy relevant research that doesn't specifically connect with what government is asking to learn about and know, though they would greatly like to do that, and we're trying to facilitate and open up those lines of communication to make that more possible.

So what we do increases government transparency, it demystifies government, it opens opportunities for government to engage again with colleges, universities, and other partners.

We developed and implemented processes for doing this work. Some of it we made up in consultation with agencies, some of it we learned from our state partners across the country, and I'll say something about the interest in state

partners and what we do as well. We are nimble and tailored to different agencies' needs. So if one agency comes to us and they have a quick turnaround question, another agency comes to us, they have a six-month question, another agency comes to us and says, we want this question answered.

Jenni Owen, Ph.D.:

... a six-month question. Another agency comes to us and says, "We want this question answered in the next two years, before the next legislative session." We try to adapt what we do and the research expertise that we find and help them find across the state to meet their needs in the timeframe and the manner that is most useful for them. So we leverage, again, North Carolina's vast and deep capacity. Everything we do is publicly available. We record our sessions if you wanted to hear about a potential opportunity to engage with the Department of Insurance or the Department of Revenue or the Department of Administration but you couldn't come to that meeting, it's recorded. You can learn about it afterwards, so we really try to make it openly accessible to anybody who might be interested at any level of institution of higher ed or other organization.

We now have widely attended virtual sessions. Serendipitously before COVID, we started doing these virtually from the beginning because we wanted people at Elizabeth City State, at Mars Hill, at NC State... Wherever you were located, we didn't want you to have to drive to Raleigh in order to find out about these opportunities. So we recorded them from the beginning, and that obviously has served us swell since then, even though it's unfortunate for the reason that we had to do virtual for so long. We now have roughly 150 people attending these sessions every month. Some of those are just basic education and training sessions that anyone can attend, and we try to expose and open up opportunities for engaging with government and for government to engage with research and vice versa.

And I'm trying to move quickly here, and then I'll have you happy to go back to anything specific if I don't cover it, every single bullet. So we receive regular requests. Every single day probably we receive regular requests from within government, from outside government. Who can we contact about this? I'm interested in doing research about that. Is there anybody at this agency I can talk to about the following? Can you help us find somebody at a university who can assist us with this particular research project? And that's a lot of what we do.

I'll move now just to quickly tell you how we're organized. We have a lean staff. We are seven full-time staff. I'll let you read for yourselves who we consist of. One of them is here with me, so Dr. Caitlin Anderson, who was a former university professor but came into state government, which I'm very happy about. She's an evidence advisor on our team, and she does a lot of the internal research work that we are now just ramping up to help increase government's capacity to do this. And again, these are not questions that we

generate. These are the questions that come from the agencies that they're interested in having somebody pursue.

We do our best to raise funds to help agencies be able to fund these projects. We're not looking for free labor. If it comes to us for free, that's great, but we don't expect faculty, students, and others to do this for free. There's a cost of doing this work, and so we try to figure out the most economical way possible to get the questions answered in the timeframe that the agencies need it and try to raise funds to do that. But we are not raising funds for specific projects. We're trying to raise a very, very small pool of funds to be able to be responsive to agencies' requests and needs, but it's not nearly the amount that we need. And there are several projects right now across Council of State and Cabinet agencies that are ready to go. They've even found a research partner, but they don't have the funds to be able to launch. Just to be clear, we are not charged with making sure that each of these projects between agencies and researchers have funding, but when we can facilitate that process, we try to do that.

The in-kind contributions we get are vast. We get student support, so despite saying that we don't want to get free labor, we also rely heavily on expertise from people as part of their jobs who provide this. So two of our advisory group members are sitting in here, so Curtis Bradley and Jeff Warren are both on our advisory group. They do informal guidance, responding to our questions about how might we do one thing or another, do you know if there's a particular practice that works somewhere, and so on.

So now I'll just take a couple of minutes to talk about some of the types of impact, then show you a couple of different projects in specific. So the types of impact include research results that change processes. They might be something simple, like changing forms. You mentioned somebody mentioned DMV. We actually worked with DMV to modify some forms. We worked with DOR, Department of Revenue, to modify some forms, very simple changes potentially that can have a big impact on residents' use of the systems. We have not yet measured the impact of those changes, but that's something that we're interested in doing with the agencies.

We have a substantial increase in awareness and opportunities for all of North Carolina's colleges and universities to partner with state agencies. That's a real success. So we have people engaging with us now and then, in turn, through two agencies from 50 plus universities and colleges regularly. Then sometimes we hear from one we haven't heard from before. We reach out very deliberately to every single institution of higher ed. Like I said, we can't guarantee that they're always going to want to engage with us or an agency, but we try to make that opportunity as widely available as possible. So just a little bit now on the use of results, and again, this comes directly from the agency. We work with them to try to refine their research questions to make it something that is answerable. So this is not sort of our ideas of what DIT, DOI, DOR and Wildlife Resources Commission should do. These are the what keep

you up at night questions that they have come to us with, saying, "Can you help us get some external expertise?"

And I should say, and you all know this already, that agencies have incredible, incredible staff, and in some cases they have staff that can do this work. They just don't have the capacity to do the work internally given what they're trying to accomplish every day. So we try to come in and help them think a little bit further down the road if possible for how they can answer some questions that will have an impact on the work that they're trying to do. I'm not going to read these slides to you, which you'll be thankful for, but I will just read the questions that the agencies were interested in answering, and a couple of these are examples of those that are ready to go but don't have the funding to do so. What are the best practices in digital literacy, and what additional research and innovation are needed because evidence isn't yet available? That's very much a tapping into evidence-based research from universities type project. How many code enforcement officials does North Carolina need to perform inspections within two business days statewide? How can North Carolina Department of Revenue improve and simplify communications to North Carolina residents? And how can the North Carolina Wildlife Resources Commission improve compliance with wildlife regulations and, in turn, improve public safety?

They've been some statements from a few of our partners, just to give you an example of the engagement we have, again, with agencies, universities, and philanthropy partners. And again, I'm not going to read these to you, but happy to share more or tell you more about those particular engagements if that would be helpful. And then not coincidentally, one of the projects or one of the engagements that I thought would be helpful to feature today involve two of your other speakers, Jeff Warren and Jeni Corn. So we partnered with a Collaboratory in the Department of Public Instruction on a project that I think Jeni will be speaking to, so I'm not going to take any time on that. But that was a really nice three-way engagement with the Collaboratory, with the division within the department and office within the department, and with our office to bring people together from across the state who might be good research partners. And again, Dr. Jeni Corn will say more about that.

The DIT and the Duke Endowment Project, that was the literature review that as I was referring to before, where the Duke Endowment actually offered funding to the state to be able to do a literature review with university expertise to figure out what we know about the project that Digital Equity and Literacy Office is trying to do. So instead of simply investing those funds without knowledge of what works, find out what exists about what's known about what works, and use that information to invest accordingly.

And then third, with a newly created, as you all know, Department of Adult Correction, they have asked for our assistance in developing basically a list of research priorities. So there's so many things they want and need to know to do their work as effectively as possible, but again, before jumping in and just

doing it, what can we learn from what research says? What questions should we be researching new? And our evidence advisors probably with partners from universities, we're at the very beginning of that process.

And then finally, you asked us to talk a little bit about lessons to be learned from this, and I have seven been listed here. And I'm not going to do them quite in order here. Being inside government is really, really critical to the work we do, really critical to the work we do, because we are all on the same team here. And we engage with agencies, again, across Council of State and Cabinet. We follow their lead for what questions they want answered by external research support. And we're not coming from the outside saying, "We think this is what you should study," agency X, agency Y, agency D, agency Z, and here's how we can help you. So doing that bridging work from within government is really critical.

There's increasing demand for this, so we are, I don't want to say we're over capacity, at capacity. We can't possibly continue to fill all the requests we get. We get a lot of help, again, in kind and otherwise, but we have a hard time keeping up with the increasing demand, which I think is a really great, great problem to have. This is replicable work, so there's no secret about how we're doing this, and if anyone else wants to do it, we welcome sharing everything we do. We do that all the time and are increasingly asked to do that. Researchers and government are really eager to part with each partner with each other but often don't know how to do that, and we're trying to facilitate that process to make it easier in both directions.

And then importantly, very importantly, enhancing government's use of evidence, which we're all here to talk about today, can increase government efficiency and save taxpayer dollars. And there are many, many examples of that across our respective work within and outside of government. And that's something that we're trying to reinforce with all of our processes and approaches. And then finally, apologize for not being where I was in the slides. Finally, a slide of resources that all of them you can click on, learn more about what we do. As I said, we try to put everything out there as publicly and transparently and openly as possible across the state and more broadly. So thank you very much. Be happy to take any questions.

PART 2 OF 4 ENDS [00:56:04]

Rep. Warren, Chair: Thank you, Dr. Owen. Representative Cleveland, you're recognized.

Rep. Cleveland: Thank you, Mr. Chairman. Could you tell me what resources OSBM itself is devoted to research this fiscal year?

Jenni Owen, Ph.D.: Sure. Our work within the Office of Strategic Partnerships is very much in sync with and keeping with the broader OSBM efforts on operational excellence. So I guess, are you asking about dollars committed?

Rep. Cleveland: I'm sorry.

Jenni Owen, Ph.D.: Sorry. I think you were going to ask me a question before I went on.

Rep. Cleveland: I'm not sure you answered my first question. I'm pondering that.

Rep. Warren, Chair: Follow-up.

Rep. Cleveland: Okay. What OSBM is presently doing, how would that compare to two years ago?

Jenni Owen, Ph.D.: Right. Sorry. And I just wanted to make sure I understood. You're right. I did not finish answering your first question. So it's increased greatly in terms of the effort to invest in work that brings in research and evidence into government and that work being done internally. So an example would be a really very, very well-received, which has not an Office of Strategic Partnerships effort, but we've been involved. Something called the Performance Management Academy, which is a cross-state effort that invites different individuals in particular positions to cross-state agencies to participate in a five-week. I'm not going to get the specifics exactly right. That would be one example. The work that we are doing in the Office of Strategic Partnerships, obviously, is a huge example because it's full-time. What we do is to focus on us using evidence and research, increasing that in government. And there are other examples as well. Does that answer your question?

Rep. Cleveland: Somewhat. Thank you. Follow-up.

Rep. Warren, Chair: Follow-up.

Rep. Cleveland: We started the Results First program a while back. Could you explain it simply, and how does it match with the Evaluation Fund and other resource problems?

Jenni Owen, Ph.D.: Sure. Happy to.

Rep. Cleveland: Or questions, not problems.

Jenni Owen, Ph.D.: Yep. So the representative asked about Results First, which is a program of the Pew Charitable Trust, which I know the chair mentioned earlier. So the Pew Charitable Trust and the MacArthur Foundation established something called Results First 10-ish years ago and have worked with 37 states, I believe, including North Carolina. Legislation was introduced and had to be agreed to by the governor at the time. So whoever the governor was at the time had to agree to that, and that happened under Governor Cooper's administration. And that was legislation to bring technical assistance into North Carolina to work with a couple of agencies. In this case, it was Health and Human Services and Public Safety. They did inventories of particular types of programs, and I was not the point person on this, but I'm familiar with it. They did inventories of certain sections of programs within those two agencies to get evidence of what

works. So very much meshes with this. The staffing for that does sit within the Office of State Budget Management in partnership with, in that case, DPS and HHS.

The national version of that is in the process of phasing out, actually, this month. North Carolina is continuing to learn from that and embed certain types of approaches from Results First in the agencies. But I would have to ask somebody at OSBM or the agencies specifically how they're using that work.

Rep. Cleveland: Follow-up.

Rep. Warren, Chair: Follow-up.

Rep. Cleveland: I'd like to know whether we're going to continue Results First, and does it work with the Evaluation Fund? Is there any cross?

Jenni Owen, Ph.D.: Yes. So I would say related but quite different, so it's not duplicative at all. So the Evaluation Fund, just to remind others who are listening, was \$1 million that was appropriated by the General Assembly last session to run a process for inviting state agencies to submit proposals for evaluations of state policies and programs and so on. And so our office works closely with OSBM point person for that to develop the process, to have reviewers of the proposals, to try to solicit proposals from agencies. So Results First and the Evaluation Fund are completely different programs and processes and funding sources and people, but they're in the same spirit of increasing the use of evidence and research in government.

Rep. Cleveland: So there's no cross references between the two?

Jenni Owen, Ph.D.: There's learning from between the two. There's not duplication at all.

Rep. Cleveland: Thank you.

Jenni Owen, Ph.D.: I'm very confident of that, but there's learning between the two to make them both stronger.

Rep. Cleveland: Thank you.

Rep. Warren, Chair: Representative Johnson, you're recognized for a series of questions.

Rep. Johnson: Thank you, Mr. Chair. Thank you, Mr. Chairman. Dr. Owen, thank you so much for being here and especially in a different building in a small room I chair of the IT Appropriations Committee, so we hear digital literacy a lot in the request from the department. So I know firsthand we'll probably be seeing the results of that when that's presented to us by the agency. My question is around the financing of projects. When you pick out a project like that, I'm just trying to track in my head the money. So there was \$1 million given from the General

Assembly to your office to conduct these projects, I assume. And then is there any matching part from the agency when they ask for a project to be funded or research to be done? Can you just help me track the financing on that?

Jenni Owen, Ph.D.: Sure. So I'll distinguish between two things. The million dollars that Representative asked about was specifically for the North Carolina Evaluation Fund. That went to OSBM broadly, not to the Office of Strategic Partnerships. I think the distinction is important, to your point. We partnered with OSBM, and were part of OSBM, to help develop the process, encourage people to put proposals in, and so on. But that money goes from OSBM to the agencies. Agency matching specifically, there wasn't a dollar requirement, but I know that the agencies and their research partners are certainly contributing staffing and other types of expertise to make this happen. But that is really very related but separate. What we do within the Office of Strategic Partnerships, we don't run the evaluations, with the exception, as I said, of starting to do some of that in-house at the request of agencies. And that's what Caitlin and others are doing as the evidence advisor. But we don't pick the projects. We respond to agencies' requests for the research that they need.

Rep. Johnson: Perfect. And follow-up, Mr. Chairman.

Rep. Warren, Chair: Follow-up.

Rep. Johnson: When you're partnering with universities and things like that, does the funding usually come from your office out of a pot of money you have allocated from the General Assembly and then you approach a university and say, "This is a project we're looking at either for an agency or that's been requested by a university," or something like that? Can you help me track that and how the split on the funding is?

Jenni Owen, Ph.D.: Sure. We do not have any direct appropriation from the General Assembly. So the Office of Strategic Partnerships gets no funding right now from the General Assembly.

Rep. Johnson: Aside from the Evaluation.

Jenni Owen, Ph.D.: Right. That money did not go literally to me and my team. It went, to help you think about it this way, to Budget Director Kristen Walker at OSBM, who has staff that we are all work very closely together. But that was OSBM allocating \$1 million across projects at the direction of the General Assembly. That was not money that went to staffing that process.

Rep. Johnson: Perfect.

Jenni Owen, Ph.D.: Our office, the Office of Strategic Partnerships housed within OSBM, which makes a lot of sense and works quite well, we don't have a structured pot to pull from. We get some grant funds not directed to do certain projects, but if your foundation is interested in investing in ... because there hasn't, frankly,

been a lot of internal to government investment in this yet, and so we are doing our best to raise funding to help make this work. But it's not a sustainable model. It is not external funds. So if your foundation were to give us \$100,000 to help do research projects, we would try to allocate that as well as possible to make as many of these projects work. And there's not a formula that we follow because that's not possible. So some of these projects are \$7,500. Some of them might be \$150,000, and that's not our decision to make.

Rep. Johnson: Perfect. Thank you so much.

Rep. Warren, Chair: Representative Stevens, you're recognized.

Rep. Stevens: Thank you. You just said you don't get any state appropriation, but clearly, your positions are funded by the state. Is that right?

Jenni Owen, Ph.D.: Right. They're funded partly by the state. That's right.

Rep. Stevens: Okay. How many people are in the Office of Strategic Partnership?

Jenni Owen, Ph.D.: Seven.

Rep. Stevens: And how are they paid?

Jenni Owen, Ph.D.: Some of us are 100% state funded with lap salary and funding thanks largely into former Budget Director Charlie Perusse, who was trying to figure out a way to make this work and continue this investment and make this possible at all. So we have agencies that contribute, and some positions are either partially or almost entirely funded by external dollars.

Rep. Stevens: Okay. How many are funded by external dollars?

Jenni Owen, Ph.D.: Four positions are partly or almost entirely funded by external dollars.

Rep. Stevens: Okay. And then how do you measure the return on investment of the projects that you do?

Jenni Owen, Ph.D.: I mean this respectfully. We do ask the agencies, has this made any difference? How has it made a difference? Has it changed your operations? Is something faster or more running more smoothly or costing less or more efficient? And so we ask them. We don't have a formal internal evaluation process. That's something that, again, we're constantly asking agencies to give us feedback on the process of working with us, on the process of working with the researchers. So there are a number of different ways that we solicit input and feedback on that. And some of the, I say, testimonials that I've shared with you, and we have many more speak to specific projects.

Rep. Stevens: So it's really more anecdotal. There's not a specific process to measure it?

Jenni Owen, Ph.D.: Right, although there's some exception... Or not exceptions to that. Examples that aren't just anecdotal would be... And the Department of Revenue has not said technically speaking that the new forms have made a difference in the calls they've received, so I want to be careful about saying that they have claimed that directly. But talking about, for example, new communications from a department in a better form or a faster process, and does that reduce the number of calls that they're getting or reduce the number of questions they're getting from customers? Again, we're pretty new in our existence, but those are the types of things we'd like to learn more about as well.

Rep. Stevens: What kind of differences have you seen from agencies in their priorities and support, I guess, from executive leadership?

Jenni Owen, Ph.D.: It's pretty remarkable, in a good way remarkable, the range and diversity of questions that agencies have. And there's no telling what agency might reach out to us tomorrow or next week or next month about what type of question. And sometimes it is a personal experience, again, going back to Representative Cunningham's example, where something alerts them to something they're interested in that has relevance for state government operations and operational excellence. Sometimes it's something they were charged to do, so it could be a directive from the General Assembly that they work on a particular issue and they realize they need external expertise to do that. But it is anything. I tried to give some examples of the diversity, so anything from human resources allocation of building inspectors, which may not sound particularly a massive priority, but really, it has an impact on construction and economic development and labor and everything else, to something like boating while intoxicated and the fact, if I believe I'm correct in saying, that North Carolina issues more citations than almost any other state. Why is that? Is that a good thing or is that a bad thing? It depends on what's behind that. And so those are examples of a real diversity of questions that we get from agencies.

Rep. Stevens: If an agency sends you a research agenda and it doesn't look very productive, how do you respond or how do you redirect that agency? How do you get them to be more focused?

Jenni Owen, Ph.D.: And I'm sorry. You're saying if they do have a research agenda?

Rep. Stevens: If they have a research agenda, they bring it to you, and it's not very productive, doesn't look productive to you, I guess, do you just have the ability to reject them outright, or do you try to help redirect them?

Jenni Owen, Ph.D.: We don't reject them outright. We would never do that for any agency. We're just not in a position to question why an agency wants to know something or whether it's a smart thing to want to know, so we don't do that. But we would say to leadership of an agency or somebody deep within the agency, they come from lots of different places with leadership support, we would say, well, why do you want to know that? So if you just want to know it because it's

interesting, that's great, but that's not really what we're about. We want to help you answer questions that will help change the way you do business, do business more efficiently, help you in whatever the issue is that you might have. So there are lots of things that we're all really interested in that we would probably say recommend. Again, we're not telling them how to prioritize, but we would recommend that they might think about the feasibility, what they would learn from it. What are you going to do? The reason we have this planned use of results piece that I was showing you before is, what are you going to do with what you learn? And if the answer is we don't know, that's helpful to them to realize they don't know, and then maybe they take that question off their list.

And I'll give you a very specific example. We had a researcher interest meeting. I don't even remember what the topic was, but there was an agency. And we brought researchers together virtually to talk with the agency about this question they had. And the agency's decision at the end of that discussion was we need to go to a different agency and talk with them more about what this question is that we're asking because we're not sure we're asking the right question. So thank you, researchers. We don't need your help right now, but what you did is help us figure out that we need to work harder on what it is we're trying to learn. So that was a valuable process in itself.

Rep. Stevens: One more final follow-up. Can any state employee bring you an idea, or does it need to be the head of a department or the head of an agency? What's the chain of command?

Jenni Owen, Ph.D.: I understand. I understand your question. Yeah, thank you for that. We will always ask whoever it is that is coming to us with a request to help them find external research expertise, who is behind it and supporting it. So as people, we welcome anybody coming with any question, and we would say, is this something that your agency has prioritized or that your agency knows? And we defer to that person to know what the chain. We do not call the cabinet secretary or call the commissioner and say, "Did you know that your employee is asking us to do this," but we let them use their own agency process. And then the other thing I would just say is that there are increasingly opportunities for agencies to look at their other ways and places where they have prioritized some of their interests, which would be through agency strategic plans, through what you all budget, so what comes out in the budget and things that they are required to do. I said, what keeps you up at night? But there are also things that they have to do that you have directed them to do or someone else has directed them to do. That is often an area that they need research expertise for it as well.

Rep. Stevens: Thank you.

Rep. Warren, Chair: Representative McNeely, you're recognized for a question.

Rep. McNeely: Thank you, Mr. Chairman. How are you today, ma'am? Doing a good job. Thank you. I do have a question. How long has OSP been established? How long have your division been active?

Jenni Owen, Ph.D.: So we went from one person to the group we are now over the past four years.

Rep. McNeely: Okay. So basically, four-year life, then. And listening to what your presentation is and looking through the documentation, y'all were the Google of the North Carolina State government, it looks like. Somebody has a question.

Jenni Owen, Ph.D.: I don't know. Is that a good thing or a bad thing? And then I'll respond.

Rep. McNeely: I ain't sure. I'm just saying that's my comparison I'm seeing here it looks a lot like. And so I guess my question is, how did we go about these questions before y'all, and at what point in time do we set up some kind of a actual, I guess, information-driven Google type system where it's a type in and it takes an agency from one to somebody else doing it? You understand?

Jenni Owen, Ph.D.: Yeah.

Rep. McNeely: I'm not saying I'm putting you out of business, but there's a model here that kicks in that looks to me like that can pretty much... You type in something somewhere or another in our ability to do software. It spits you to the right agency or the right research or the right whatever.

Jenni Owen, Ph.D.: I wouldn't mind being put out of business at all if we didn't have a need for it anymore. And I mean that sincerely. So if this isn't needed, then we don't need it. I think what would be missing from the put it in and it spits out process that you're describing is even though we have tried to automate some things and make it so everybody sees everything at the same time or can see everything at the same time so it's totally accessible in the same way as much as possible, there are people behind that. And so you have the example that Representative Stevens was asking about. If somebody comes to you with a question, do you push back, or do you say that's not the right research agenda? That's where there are just humans who have to help other humans figure out, is that a good question to be asking? Can you even answer that question? What if we find out that South Carolina or Alabama, and I'm thinking of states that have asked us what we do when are trying to learn from the processes we've set up, what if they just did this? That's an example that we would say. We're not going to do exactly what that state did, but can we learn from that state and adapt it to North Carolina and not start from scratch?

So I believe we are all collectively interested in automating this more but not removing. And there have been efforts to do that, that have failed in the world to try to take out the human need and just automate it, and that's not something I personally believe would accomplish what we're trying to do here.

Rep. McNeely: Ballpark, I know you're getting funding from different ways for your payroll, but what would you say your y'all's total seven employee payroll is?

Jenni Owen, Ph.D.: So with benefits, roughly \$1 million.

Rep. McNeely: \$1 million. Okay. All right. That's all I have. Thank you, ma'am.

Rep. Warren, Chair: Thank-

Rep. Jeff McNeel...: Okay. All right. That's all I have. Thank you, ma'am.

Rep. Warren, Chair: Thank you, Representative McNeely. Representative Torbett, you're recognized for a question. In the interest of time, I'll ask you to be concise.

Rep. Torbett: I didn't hear what you said in the last part, Mr. Chairman, so I'll just ignore it. Anyway, thank you. No. My questions wrap around a philanthropy. Is most of that coming in or going out? I missed the understanding of that.

Speaker 2: Coming in from philanthropy to support the work that we're collectively trying to do.

Rep. Torbett: Okay. Would it be possible to get a list of people that would offer funds for your efforts over there?

Speaker 2: These are the people who... These are the funders. I'm happy to hand it to you right now and give it to the Chair afterwards.

Rep. Torbett: Can we receive that information, Mr. Chairman?

Rep. Warren, Chair: Yes, that'd be fine.

Rep. Torbett: Thank you. Thank you. That's the extent of my questions.

Rep. Warren, Chair: Okay.

Speaker 3: Mr. Chair, can she not just email it to all of us please, to the committee members?

Rep. Warren, Chair: Okay, everyone. Thank you very much. I believe we're out of questions here. I appreciate your time very much.

Speaker 2: Thank you all very much.

Rep. Warren, Chair: Our next presenter's going to be Dr. Jeffrey Warren with the NC Policy Collaboratory. Dr. Warren, if you please raise your right hand, and do you affirm that your testimony is the truth, the whole truth, and nothing but the truth?

Jeff Warren, Ph.D.: I do.

Rep. Warren, Chair: Thank you sir. You may begin.

Jeff Warren, Ph.D.: All right. What was the magic button to make this full screen?

Speaker 4: Top right. [inaudible 01:25:52].

Jeff Warren, Ph.D.: Well, how about that? Thank you. Thank you, Chairman Warren, co-Chairman Johnson, members of the committee. My name is Jeff Warren. I am the Executive Director of the North Carolina Collaboratory, and I thank you for your time today. In 2016, the legislature embarked on a bold science experiment itself, when you created the North Carolina Collaboratory, to be headquartered at Chapel Hill. Established that summer in the budget, the Collaboratory is mandated and authorized and challenged to disseminate state appropriated funding to researchers across the UNC system and other institutions of higher learning within North Carolina. So even though we are headquartered at Chapel Hill, we have begrudgingly sent checks to Duke University.

So the mission of the Collaboratory is very unique. We're the only state in the nation that has a front porch to the UNC system for the legislature. We do two types of research. What I call reactive research, which are study mandates or unofficial requests that we don't get officially in a legislative language, but we know there's a member interested, and we'll try and stand that project up. And we also do proactive research as well. And those are timely, relevant projects, that we think are worthwhile investing in after talking to the researchers and the members in our advisory panel.

And we will launch those and then, provide the results online to the public and the legislature. And the whole goal is to provide the data that you all need, and other state policy makers, to help assist you in decisions, in sometimes very complicated matters. And while we began in the natural resource and environmental space, COVID changed our fairway quite a bit, and we got involved in the public health space. We were codified last year in statute, in chapter 116-255. And really, we're extremely broad. We can really research anything that we think is timely and appropriate for the state. In terms of legislative appropriations, since 2016, we have received approximately 158 million dollars in appropriations directly from the NCGA. Half of that is COVID related. Okay, about 74 million came out of CARES Act and supplemental funding and then ARPA. And so, that was a big game changer for us.

The other big game changer is, at that time, really until about a year and a half ago, I was the only full-time employee, and I had a halftime outreach director that I share with the Institute of Environment. And I had a halftime financial manager, that we shared with Finance and Operations, which is where we're located. Which, in the beginning, there were many skeptics wondering why we're on the F&O side of the university and not the academic side. But that has

been addressed, because we have an advisory board appointed by our provost. So we get to talk about academic integrity and keeping that alive, but we spend most of our time moving money around. But you can see, from this curve, exactly when COVID happened and tying to those dollars. 400 projects, over 400, have been funded, and that includes 20 institutions of higher education, including our School of Science and Math and our UNC School of the Arts, which you would think, "Oh, that's not a research institution," but it is.

And I'll tell you more about that later. The university, two years ago approximately, shifted to start paying for our operations. So our day-to-day operations, our travel, our salaries, our office supplies, are covered by non-state funds that the university has from federal grants, the F&A indirect from those grants. So at that time, I realized it was time to build a team, and I felt a lot better about building a team. Because we were not cutting into the research dollars you send us. So to this day, 100% of the dollars coming from the legislature go directly to research, and we do not allow indirect costs to come off of those. So there's no magic 55% going into the F&A line item at a university. It goes straight to the researcher and their team. And this is our team up here. Not all of these are full-time employees.

We have two wonderful graduate students that assist us, and our advisory board chair, Dr. Al Segars, is a professor over at Kenan-Flagler. And we have an amazing body of undergraduate interns. Every year, Steve Wall runs this program for us. They get wonderful experience in the science policy space. So in addition to providing you all data to help with your decisions, we also feel, and it is part of our mandate to teach folks about science policy and how to do unbiased approaches in this space. And this is just our current class, and for the first time, we have an exchange student from Australia that's joined our ranks. So that's pretty awesome. Some of the research mandates you've sent us, the Water Safety Act has been PFAS, and you have a PFAS brochure on your desk in front of you, that lists some more details and highlights that 22 million dollars of investment that we've made.

We received a portion of the opioid settlement fund last year. Obviously, COVID-19 was 74 million across three different years. We've led a flood resiliency program that you've mandated. We've just finished up a seven year nutrient management program at Jordan and Falls Lake, that is almost 5 million dollars. We're currently in the middle of a fisheries and coastal habitat study, which appropriately comes right at the 25 year anniversary of the Fisheries Reform Act and the 50th anniversary of the Coastal Area Management Act. And we're also doing a highly treated wastewater pilot program that was part of the ARPA money we received last biennium. We've got numerous executive branch partnerships, and a lot of these have happened by us building relationships. And sometimes, the agencies have come to us, so obviously, the Office of Strategic Partnerships, we've worked with as well.

One great story I have about that is Dr. Owen called me one day and said, "We've got this wonderful researcher at A&T. We were able to give her a little bit of money for COVID wastewater work." And I said, "Oh great, we've got a much bigger COVID wastewater surveillance team. We can get her another 30, \$40,000 out the door. And in fact, we have a digital PCR machine that was purchased for our wastewater surveillance, that did not need to be deployed." And so, Dr. Dang drove over from Greensboro and picked it up in the Starbucks parking lot, and we were able to pass along a \$30,000 piece of equipment, so it could be utilized, still in the box. So those are great types of conversations to be having, and OSP's been great. You'll hear from Dr. Corn here shortly. We've got a 5.7 million dollar learning recovery project going with DPI. We're working in the opioid space on the dashboard that the AG's office is relying on for how the dollars from the opioid settlement are being spent. And that's being run out of Chapel Hill.

We've done flood gauge work for Department of Public Safety. We did a 15 million dollar statewide coronavirus variant sequencing network, that had 64 hospital partners and five academic sequencing hubs for that. That program is winding down now. The contract ends on June 30th, but we have sequenced over 50,000 variants. It's been very helpful for DHHS for us to be tracking. So every time there's a positive sample, we put it in the sequencer, and we tell you exactly what variant it was. And when I had COVID, I was able to figure out my variant as well. So that was pretty cool. Not the COVID, but the variant part.

We've worked with the zoo. We're working with the Office of State Fire Marshal right now in the PFAS Space and DEQ, Wildlife Resources, Department of Ag. We've worked with hemlock woolly adelgid issue. The highlight of that project was we were working with the Laricobius beetle, which is a Pacific Northwest beetle that eats this aphid-like adelgid, that has decimated our hemlock population out west. We work with Department of Ag, and we were hatching them in their Cary facility. And I joke that the only way you know these beetles were hatched in Cary is that they're beige.

That joke never ceases to disappoint me. But what we found out, from one year to the next, is we were hatching them in Cary and deploying them to the wild. And then, the next year, we decided to put the eggs, don't hatch them in Cary, but put the eggs in the wild to let them hatch. And the mortality rate was cut in half. So twice as many beetles were surviving when they hatched in the wild and then, going after the aphids. And we're currently working with a lantern fly, which is an invasive species that's impacting our viticulture industry. Like I said, funding is across the state. So not only are we on every campus of the UNC system, including Science and Math and School of the Arts, but we're also at Duke, Campbell, and Wake Forest.

And I will say, getting the back office functions efficient was our biggest challenge, but now all that is set in place. So one thing I always like to suggest to the legislature is, if you want to move money around to a certain campus, that's great. Just let us know what that campus is, and we can move it for you

and we can move it a lot quicker. Because we have all the accounts and the processes set up, and if it goes through the Collaboratory, you don't have to argue about the indirect F&A costs. So I throw that out there. One thing I'm extremely proud of in our team is, at last budget cycle, we received 1.5 million recurring for a grant program specific to our six historically minority serving institutions in the system. So that's Elizabeth City State, Fayetteville State, N.C. A&T, NC Central, UNC Pembroke, and Winston-Salem State.

So that equates to about a quarter million dollars a year now in grant funding in that, give or take. We've got a really cool virtual reality project with Winston-Salem School of Nursing and UNC School of the Arts Media Lab. They were the belles of the ball back in December. We've quickly learned that all of these nursing programs and hospitals have VR hardware. They don't have content. And so, what's really cool is, working with Winston-Salem School of the Arts, they used Epic Games, headquartered here in Cary, their Unreal Engine, to build a virtual training space to help prepare our nursing students at our HBCUs for the NCLEX exam. Very successful. We just funded phase two. That's about a half a million dollar investment now, at this point. I heard on NPR one morning about the \$1 million DOD grant that NC A&T and UNC Greensboro got for nano technology work in the military space. And picked up the phone about that afternoon, said, "We're going to give you another quarter million for that. Let's talk next year. We might have another quarter million."

And so, we think leveraging those dollars, it makes it easier for them to go back to DOD and say, "You gave us a million. The state gave us a half million." What a great partnership. It may move them up the line and the ranking to get the next million. The PFAS Testing Network has been our most visible programs. Eight universities working statewide, since about 2019, in earnest. I mentioned before, 22 million dollars. Where are the hotspots been? So we essentially look at, we're looking at water, we're looking at air contamination, we're looking at toxicology and human exposure, and we're looking at mitigation and destruction. So where are the hotspots? And we found many that we did not know existed before. How do people get exposed? We're finding that there are now some concerns in the air monitoring work we're doing, both at fire stations and people's domiciles and workplaces, that there is a lot of PFAS in the air, that's coming off of upholstery and carpet and GORE-TEX that you're wearing and non-iron shirts and the inside of popcorn bags for the microwave.

They're ubiquitous. They're everywhere. How do they affect the health? One thing we look at the toxicology is mouse models, but we also have some human exposure studies that are being led by Duke University and NC State and how we could protect people from them. I forgot to bring the resin that we've developed, but UNC Chapel Hill Chemistry and Environmental Engineering, we have a resin in the lab that, at least at the bench scale, outperforms the best PFAS removal technology, which is granular activated charcoal, by a factor of two, and it's recyclable, simply running hydrogen peroxide over the beads and regenerating the resin. And ironically, it's made

from PFAS, but there's no PFAS leaching off the resin. So we received a 10 million dollar appropriation from the legislature to scale that up now and commercialize that technology. We now have a manufacturing facility in RTP, that is now making enough resin for us to deploy it.

A few pilot sites are going to be done in New Hanover County and Alamance County. We're going to look at both drinking water, well water, and wastewater treatment and the effluent coming out of that. So stay tuned for that. Another great story is Maysville, North Carolina, in the middle of Jones County, population about 2000. If not for the PFAS Testing Network funded by you and run by the Collaboratory, Maysville and their sole groundwater supply well, they would not have known that it was contaminated with extremely high levels of PFAS, which are per- and polyfluoroalkyl substances, like GenX. But GenX is only one of 10,000 plus of these PFAS compounds. And there were a handful of compounds in the Maysville well, and we were able to contact them immediately within a week and say, "Probably time to shut that well in, do you have another water supply?"

They said, "Yeah, we do. Jones County Regional." We were able to go back to our samples and say, "Great, that's PFAS free. So you can tell your folks why you're shutting it in and that they're going to be drinking clean water." This was from a few weeks ago, EPA Administrator, Regan, DEQ Secretary Advisor, Biser, Dr. Ferguson on the far right from Duke University, Schumata Brown, the town manager on the far left, and myself, at a press conference in Maysville to announce a new round of funding for infrastructure for small towns to remove PFAS. But we were standing in the firefighter bay right there, but just down the street from the facility that's about to go online and filter their PFAS out of their well. They're also going to be drilling another well, and I'll finish up here. This is very much along the lines and inspired by the Office of Strategic Partnerships.

Last year, in collaboration with Secretary Advisor Biser at DEQ, we created the Collaboratory Academic Fellowship Program. And so, it's as simple as the Collaboratory buying out the teaching load for faculty members and then, giving them the ability to embed themselves in the agency about two days a week for a semester. And so, we had Doctors Lee Ferguson from Duke and Jamie DeWitt from East Carolina that were the first fellows last semester. Detlef Knappe from NC State is currently a fellow. And then, Ralph Mead from UNCW will be a fellow this summer, and he's an air expert. Just had breakfast with Secretary Biser last week. We're going to continue the program next year, and we're going to look at toxicology and human exposure experts and embedding two more faculty members. And that's a great way for the faculty to understand how their data are being used.

And it's also a great way for the regulators to understand how best to maximize their field sampling techniques, their lab techniques, and how to better read the data as well. The opioid project is quite a large project that we've gotten out there, partnering with Eshelman Pharmacy, Eshelman Institute, North Carolina Central. We've already gotten about 5 million dollars out the door for

this program. We had 11 point something million dollars in grants we could not fund. So we're looking forward to potentially another round of opioid recovery money coming in this year, that we've got shovel-ready projects, and we can fund projects within a period of a week, instead of months, that takes most typical universities to do, because of the way we built the back office flow. COVID-19 research, we're very proud of a business partnership called for in legislation. 15 million dollars went out, did a competitive grant funding program.

We were actually able to fund everybody that applied. And so, each of those companies listed in that box on the right are partnered with the universities, and you can see some that are even North Carolina, Centric SaaS, Codetta, EmitBio, [inaudible 01:43:33], in Elon, Hallard, North Carolina. And then, the big one that Dr. Corn will talk about, 6.7 million in the Education Recovery Network. So when we got our COVID money, 15 million of it was discretionary, and we started talking to people like Representative Torbett, Senator Ballard, and said, "How should we best spend this money to address learning recovery?" And the suggestion was a great one, "Go talk to DPI. They have an Office of Learning and Recovery."

And so, we were able to say, "Hey DPI, what questions do you need answered? I've got researchers that'll go answer questions, but what do you need answered, that will help you make decisions?" And that's how we set up the program and chose the grants. One of the highlights of this, this is Dr. Tanya Hudson from Fayetteville State, and Chandrika Johnson is also her colleague in this project. She's received a million dollars to do learning loss down in Cumberland County, and she is just one of many delightful researchers we work with. So with that, I will wrap up. Any questions you may have.

Rep. Warren, Chair: Thank you, Dr. Warren. We have one question from Representative Cunningham and then, Representative Stevens has a question.

Rep. Cunningham: Thank you, Mr. Chair. The funding across the state, would you please send my office the pacific funding for each of the institutions?

Jeff Warren, Ph.D.: We can do that.

Rep. Cunningham: Pacific, because I'm not going to say why. You probably already know why. A follow up, for the PFAS Testing Network, we spent 21 million dollars already. Have we found a solution? And are we expecting to spend more money to do that? Because I understand if we would transition from using the plastic in certain items. So where are we? Are we going to need to be spending more money to get to the solution?

Jeff Warren, Ph.D.: So it's the forever chemical and probably will require some extended funding in this space. Now, we have made great strides in creating a filtration resin to get it out of the water, but we also have it in the air. So that is something, I think, we need to pursue, certainly with our textile engineers at NC State to see

if there's a better way to make an HVAC filter. The other challenge of that though is, with your GAC that's under the sink or your air filter, what do you do with it? You throw it out. So you're just basically transporting PFAS from one location to another. So there is also a spinoff technology from Duke University, and there's a company now called 374 Water based in Durham. They use super critical water under tremendous pressure, 4,000 PSI and 600 degrees Celsius. They're able to break down PFAS into its elemental form.

So you end up with water, carbon dioxide, and fluoride, so you're ready to brush your teeth. So we are trying to explore those opportunities, and I've spoken at length with Minority Leader Reedstaff about this is we've got, for example, we've got firefighting foam all over the state. Currently, most of it contains PFAS. A lot of those stations don't want it anymore. So we'd like to collect it as a buyback program, but then, we just don't want to ship it to a landfill. We want to utilize the technologies. We have to destroy it completely. That's just one of thousands, if not tens of thousands, of products. This is going to be an ongoing challenge for the nation and the world, but we can start addressing it one at a time. Kind of like DARPA, I like the fact that, while people decide how to regulate it and how to manufacture it, at least we're looking at ways to remove it from the environment and reduce human exposure.

Rep. Cunningham: So last follow up, since we know it's going to be in existence all the time, what health data have you all collected on the impact on human beings? Can you share that? So I can see how many people are dying from people from PFAS. I'm certain that it's different from how many people died from COVID.

Jeff Warren, Ph.D.: Absolutely.

Rep. Cunningham: Thank you.

Jeff Warren, Ph.D.: What we'll probably do there is put you in touch with our toxicology and human exposure experts, because that is a great question. It's a very, very complicated question.

Representative Stevens.

Rep. Stevens: Thank you. And I've heard a lot about your research and even a couple of things where you've come to some solution. You had a product you said that helps with the PFAS, and that's now being gone to commercial. What, in turn, does the commercial give back to the Collaboratory? Is it a patent you sell? Is it somehow you get reinvestment?

Jeff Warren, Ph.D.: So not yet commercial, but trying to move it in that direction. So what we're doing is we're manufacturing it. It is university leased space. This is still a university product. We'll remain a university product unless it is sold or licensed. That's down the road. When we spoke with the general assembly about this funding, it was "Okay, this performs great in the lab." This is the point in time we would go and look for additional investment to scale it up and

add value and prove its efficacy. We can either go for private money and give half of the ownership away in that process, or we can get state funding and retain 100% of the ownership. What's really cool about the language they came in for that specific 10 million dollars, typically at Chapel Hill, that's all I will speak to, because I understand their tech transfer better than other campuses, it is a net revenue distribution through any money that it's made, that is made off of that product.

So the dollars come in, Office of Tech Transfer pays their expenses, what's left is 40% to the researcher, 40% to the department that the researcher or researchers are in, and 20% to the university itself. Under this new model for this specific project, it is a gross revenue distribution. So for every dollar that comes in, 40% goes to the inventors, 20% goes to their department, 20% goes to the university, and they have to pay their expenses of managing that program and that technology out of that 20%, 10% goes to the Collaboratory for additional PFAS research on a sustainable research model, and 10% comes back to the general fund. That's the first time that I have heard anecdotally that this has ever been a model used where general assembly investment has a percentage coming back to the general fund. Now, that is years away, but that is where we're headed. And that is the agreement in place right now as we get ready to deploy this in a scaled up project and, hopefully, license or sell it. I'm hoping it's licensure.

Rep. Stevens: And if you do other public-private partnerships, do we have some kind of clawback? If we fronted the research, but then, it's public private, how are we getting our benefit?

Jeff Warren, Ph.D.: So where it would stand now is we would go with each campus's... Any other technology would be each campus's technology transfer policies on IP. I have talked to some members in the House and the Senate, that it might be time to look at, because we're such a unique funding agency, having a line item in our statute, that gives us the ability to manage that from a high level and negotiate our own return and how that money will be distributed. Because I'm a very big fan, and if the taxpayers are taking the risk on some of these investments, that the taxpayers should also share in the windfalls.

Rep. Stevens: Thank you.

Rep. Warren, Chair: Representative Cervania.

Rep. Cervania: Thank you, Chair. A question and a follow-up. I'm so impressed by your research mandates. I come from local government, and these are exactly all the priorities, even at the local level, including the fire foam. So, I'm wondering how much involvement do you have with the local governments, or when you do your research, provide this information so solutions can be made at that level?

Jeff Warren, Ph.D.: I love this question because that is a big part, as we've grown out, and the first new employee we had was our research director, Dr. Greer Arthur, who has the loveliest UK accent, so I hope you get a chance to meet her afterwards. And we are now requiring in every funding agreement how this will impact local folks, local governments, citizens of North Carolina and have a public engagement component. In certain projects, we're also trying to facilitate that, like North Carolina Central, with our opioid program, they are managing the public-facing partnerships that will be required in these other grants we gave out. So, they will be the conduit. Sometimes we have a local government reach out to us directly. There was a case in Iredell County where their public health director wanted to know if the fill that they built schools on during the time period where fill could be coal ash combustion residue actually had coal ash in it. We went to the six schools that were built during that time frame and sampled all the soil, and no, we found out unequivocally, there was no coal ash residue at all. And that was a nice way to answer the local government's question and say, "no, your folks can not worry about that."

Another example is the concern, if you've heard about ocular melanoma issues in Huntersville just north of Charlotte. We, luckily a year and a half ago, were looking at potential projects that other folks were trying to fund at Carolina and couldn't find the money, and there happened to be an ocular melanoma gene therapy experimental treatment they wanted to explore, and we jumped at that and said "heck yeah, we'll fund this. We've got the issue in North Carolina." So, that's a two-year project, we're one year into it. That's a \$380,000 investment.

So, it's something we're getting better at, but we are now building accountability for that and tracking that. And now that we have a bigger staff to support this, we can now do a lot more drilling down and tracking the metrics and making the data available to local governments. We work a lot with our School of Government at Chapel Hill as well.

Rep. Maria Cervania: Wonderful. Thank you so much for that. And the follow-up comes from a comment you had made—I represent Cary. (Laughter) And your beige beetles are actually hatched inside lab. If you hatched them wild in our Hemlock Bluffs, I think they would have color. (Laughter)

Jeff Warren, Ph.D.: That would be great. I also live in Cary. But you know, Hemlock Bluffs does not have a Woolly Adelgid infestation, and so here's the deal, you could release the beetles if there's nothing for them to eat, they die. So, you've got to figure out where the Woolly Adelgid are so that the beetles have something to feed on, but you're also taking one invasive species to eat another invasive species, so, what could go wrong?

Rep. Harry Warren: Seeing no further questions, thank you for your time. Thank you very much.

Rep. Warren: Our final presenter is going to be Dr. Jeni Corn. Dr. Corn is the Director of Research and Evaluation in DPI's Office of Learning Recovery and Acceleration. Dr. Corn, would you please raise your right hand and do you affirm that your testimony is the truth, the whole truth, and nothing but the truth?

Jeni Corn, Ph.D.: Yes, sir.

Rep. Warren: Thank you very much. You may continue.

Jeni Corn, Ph.D.: Thank you. Thank you so much for having me. As you just said, my name is Dr. Jeni Corn. Let me lower this just a little bit. And I am the Director of Research and Evaluation at the Department of Public Instruction, and I'm housed within the Office of Learning Recovery and Acceleration. Prior to this, I was one of the... I was somebody who transitioned from the university system into public service and state government. I worked at NC State over at the Friday Institute as the research and evaluation lead over there after having done a lot of work in partnership with the department. And just wanted to start today by giving a little bit of background, the superintendent created the Office of Learning Recovery in response to the pandemic, in response to the enormous amount of funding that came into K-12 to the state as a result of the ESSER funds.

We received in total about \$5.5 billion, recognizing that having an office that was uniquely and totally focused on serving the K-12 public school system, serving the local superintendents, serving and being responsive to both as a state agency and to the legislature, we were created to combat the impact of that lost instructional time and accelerate learning for all students. And one of the roles that I've been playing, I've been very proud and very excited about this opportunity, is to evaluate the implementation and impact of those COVID dollars, of the recovery funds that came into our state. We wanted to make sure that all along the way, we were collecting evidence and data that could help drive decisions that were being made at every level of the K-12 public school system. We wanted to know what was working, for whom, and where across our state. As you all know, every school and every community is very unique across North Carolina.

And we wanted to be able to share promising practices in real time. We wanted to use that research to not just say what was working, but also understand what was not working and why. So, the way that our office is funded, and Dr. [Michael] Maher spoke earlier today to the Joint Education Appropriations Committee about this, is our office in particular had a couple of line items in ESSER II. So as you all know, there was a series of funds that came down from the federal government. ESSER I folks tend to think about triage. It was an emergency situation trying to support as quickly as we could safety and practices in the school system. ESSER II was really about a transition. We were

thinking about what was working to help people get back into school and get back to business as usual and support the students that had lost instructional time for a number of years.

So we had two kinds of line items. One, directed by the General Assembly, was a million dollars for quantitative research. We use this to partner with the EVAAS team at SAS and do a comprehensive lost instructional time report, first of its kind in the nation, most comprehensive, most transparent. We did a statewide population analysis using every single standardized assessment score that we had for every single student to understand overall what was the impact of the pandemic. And then to use that data to pivot and prioritize funding both from the state and at the local level. We were released that data first. And best, if I don't mind saying with that, that partnership has been very successful. And then in addition to that, a lot of the quantitative, the numbers data that we get, the very statistical kind of questions that we ask, they can tell us what is happening, but very rarely do they tell us why things are happening.

So in addition to that, we decided, the department decided to use half a million dollars to do a statewide qualitative study too. So we sent researchers out from our North-Carolina-based institutions to talk to people, talk to teachers, talk to students, talk to parents, to elevate that voice and really understand what was happening from their perspective and gather those stories in a systematic way. We used our ESSER III funds. We have a million dollars set aside to do a follow-up to that first year lost instructional time report, which we're pivoting to really focus on our recovery and recovery analysis and the remainder of that funds we use to support our staff. So we are completely federally funded. When the funds expire in September 2030, our staff goes away. We do not have remaining and recurring dollars. So that's because of the success of the work that we've had because we've been so data focused and evidence oriented, our state superintendent has prioritized transitioning our office into a permanent one, so that's part of our expansion budget request, our larger expansion budget request.

This is a list of accomplishments for our office. I'm very proud of the folks we've been able to hire. We have a quantitative methodologist and a qualitative methodologist. This is not something that we get to have a lot in state government. It's not just about data analysts. It's about somebody that knows how to design research and do very complex analysis. That's been very beneficial. And then we've also been able to hire folks directly from our school districts to then take those results that our researchers find and then pivot and go out into the local communities and talk about what interventions could help address some of what we're finding in the data. We've been very, very committed to supporting our districts and charter leaders.

They have been struggling, as you all know, and making sure that they have the information they need to make very strategic decisions with about the dollars that they have at the local level. We work to develop a comprehensive research plan, without which it's very difficult to identify what priorities. We

convened districts in the summer when they're not in school and they're not in teaching students when students are not in school. I also would direct your attention to the Promising Practices Clearing House. This work was just highlighted by the US Department of Education for sharing promising practices around our state. And then we have leveraged external resources from our North Carolina institutions. This is a list of research studies that we are helping to coordinate in partnership with leadership at DPI as well as districts and charters around North Carolina. And you can see a mix of public and privately funded research studies, but it takes a lot of work to both manage and coordinate as well as disseminate information back to the folks that need it the most.

One of the most exciting partnerships that we have had an opportunity to do is with Dr. [Jeff] Warren and his team at the North Carolina Collaboratory. So the way that this worked is my office worked inside the agency to define a research agenda for recovery. And then once we got this opportunity to work with Dr. Warren, we developed together collaboratively a request for proposals, and we then were able to fund almost \$7 million out of ARPA funds around the priorities that our district, that our Department of Public Instruction leadership had identified. We awarded 20 research projects across 14 institutions of higher education. And having come from that space, I really do feel like the work that I did at the Friday Institute and NC State really helps me to serve as a translator, a translator between policy makers and local level leaders and academics because we don't always speak the same language.

And one thing that Dr. Warren and I have been very clear about is that when we're working with our academic partners that this is not an academic exercise. This is not on a timeline that maybe is typical for a university research study. This is to help policy makers in very important leadership positions make decisions about funding that is going away. There is a funding cliff coming with the ESSER funds with our federal funds, and we need to know from a policy standpoint, what should be recommended going forward. So this is just a list of the priorities that we funded. So one group of the projects was really about the effectiveness of ESSER III funded policies and programs. And you can see here we have a study about the state and local teacher bonuses, the \$100 million that was invested in that as a result of the pandemic, the statewide rollout of the LTRS training.

We also have supporting educators in North Carolina's recurring lowest performing schools. There's some coaching going on there. Also, this body was really interested in how software could be used to mitigate some of the cyber bullying and protecting students when they're online. So we wanted to make sure we included a study about that, the school psychologist grant program. And then finally, one of our biggest, and I think most critical studies is this funding deployment and efficacy of how ESSER dollars were used at the local level. \$3.2 billion went to our local school districts and our charter schools. And it's really important as a state, we understand what they did with those dollars and what was useful, what is our return on investment. And then finally, we

also were pretty interested in the longitudinal impact on North Carolina's public school students because of the pandemic.

And so we're really looking at the impact of the pandemic on the educator workforce on post-secondary pathways for high school juniors and seniors, looking at effective practices in virtual learning now that the entire state is one-to-one, there's a device for every kid and every teacher in the entire K-12 system. So understanding given that, what does a modern, robust kind of technical infrastructure like that, how does that look in our public schools? Understanding students and families who left the public school system and then returned. And then we had two more, one about those persistently low performing schools and what exactly happened to them during the pandemic and how are they recovering?

And then local really having some researchers focus in on local interventions, kind of homegrown, very tailored to the needs of local communities. So we were asked a little bit earlier about what are some of the lessons learned from having this opportunity to have this office, focused, really driven by research and by data. I think we learned a lot of lessons during Race to the Top. I was part of the external evaluation team that did that work in partnership with the department and this notion of not overstaffing, not having a huge staffing team in place as a result of federal funds and then having the staffing cliff at the end.

So we really tried to stay nimble and small. Our office only has seven full-time staff and trying to manage and report on billions and billions of dollars doing that in partnership with a lot of the other divisions inside DPI.

So some of the lessons learned as I was reflecting and preparing for the presentation is that I know that our local and state leaders have benefited from having relevant and timely information to be able to guide those decisions, both at the state and the local level, that coordinating internal efforts inside DPI takes a lot of time. I think my colleague from the Department of Transportation talked a lot about this. There are content experts all over DPI, but they are not necessarily research experts. They do not necessarily have that research and design background. They're policy makers and practitioners. And so doing that work of coordination inside the agency requires a lot of intentionality.

We want to maintain the highest levels of research integrity in protecting student data and student confidentiality. That's something that as a researcher I'm trained to do. And then also thinking about how we can leverage and maximize our research resources. We are blessed in North Carolina. We, and Dr. Owen mentioned this with 110 institutes of higher education, there is an enormous amount of research resources in those institutions, but reaching out and maintaining and making sure that those conversations and partnerships are going on is the work I think that has been like the driving thread through all the presentations you guys have heard this morning. And so next steps, our

current ESSER resources expire in 2024, and again, have worked very closely with the leadership at the department and our State Board of Education to include an expansion budget request specific to the research and data office. I'm very pleased and excited about that opportunity to transition into a permanent office at DPI.

So just some examples about some future work if funded. As you all know, there's a number of very large policy initiatives and considerations going on right now. One of which is the school performance grade reform, another one, the Pathways licensure and compensation, the impact of high school programs and Pathways on post-secondary success using the new data set that this legislature put a recurring line item for with the National Student Clearing House. Also, really interested in the impact of LTRS training and the science of reading. We all have heard some about the competency based education implementation and middle grades math recovery analysis. And so having an arm that is responsive to the legislature and other leaders at the state and local level to really have a coordinating body, a coordinating office inside the agency. I think with that, I'm done.

Rep. Warren: Thank you, Dr. Corn. I congratulate you on such a thorough presentation. I did have a list of questions myself, but you've answered them in your presentation.

Jeni Corn, Ph.D.: Oh, good.

Rep. Warren: But I believe Representative Johnson has a couple for you.

Rep. Johnson: Dr. Corn, thank you so much for being here to present. And this will come off as more of a comment than a question, but it's probably where we're sitting. It's so frustrating because the research is so good and it's being relayed in such a good fashion, and we know it's helping on the ground. But the question we all want to ask is, were things handled the way they were supposed to? If this happens again, is it going to be handled the same way again, or did we learn lessons that are going to make us handle this different?

We hope this never happens again going forward, but 100 years from now, if something like this happens, can we look back at this research and say, "We got this right, we got this wrong"? Obviously, all states were doing this completely different and has led to different levels of learning loss across and because there was difference experience happened in different states. But can you say, and probably my question is, can you say looking at the 30,000-foot scope of the data, can you look at it and say, we've learned enough that going forward we can confidently handle this better than we... I mean, hopefully handle it better because this was unprecedented? But can you look at some quantitative things and say, we can make adjustments going forward to handle these things better?

Jeni Corn, Ph.D.: Let's see, what is the best—

Rep. Johnson: That's a lot to unwrap. I'm sorry.

Jeni Corn, Ph.D.: No. So I would say that the work that's been done and the pivots that all of our school districts had to make in an instant that it was totally unprecedented. They had no playbook. And I think, I don't want to say now that we do, but there are counties that lose a lot of days out of school for floods and hurricanes, for snow. I think we have learned an enormous amount about how to maximize learning when you're remote, about what sort of content areas seem to transition most easily to a more blended learning environment. I think we've learned a lot of good stuff about that in order or where students seem to have the greatest difficulty, whereas middle grades math and science, those middle grade and upper level science because there's so many hands-on activities and getting in a classroom with your teacher and with your peers.

But we really did not see the same loss, Dr. Maher mentioned this earlier today in higher levels of reading, high school English classes and that sort of stuff, and some of the history. And so thinking about how we can take what we learned from this once-in-a-lifetime, once-in-an-ever experience and apply that to things that will happen in North Carolina again and again, like we said with hurricanes. So I think a lot has been learned, and I think our districts have done an unbelievable job. We're about to release in probably the next two weeks, the follow-up to the lost instructional time report and really focused on recovery analysis and the work that's been done at the local level to help those kids get... we're not back to where we were before the pandemic, but on average, the gains that we've made in those middle grades math and science is, I mean, they have done a ton of work and it's paid off at the local level.

Rep. Johnson: Perfect. And as a quick follow up, I think you would certainly be worth following up and just saying, we know a lot of this is still kind of in the process of being looked into and when there's some results found coming back and seeing how we stacked up against other states. And just from policymaker point of view, that's that those are the kind of quantitative things we want to see that policy implemented here, results on the back end here, and seeing how we can make better policy decisions going forward.

Jeni Corn, Ph.D.: And Dr. Warren mentioned this, from a national perspective, no other state that I'm aware of has such a tight connection between the legislature, state agencies, and researchers. I really feel like North Carolina's at the top of the heap there.

Rep. Johnson: Perfect. Thank you Dr. Corn.

Rep. Warren: Representative Dahle, You're recognized for a question.

Rep. Dahle: Thank you, Mr. Chair. And thank you. So I'm not an education expert, so LTRS. What's that?

Jeni Corn, Ph.D.: Oh, LTRS training. So the state invested in early literacy training for every single elementary teacher and administrator in the whole state over the next three years.

Rep. Dahle: All right. Thank you. Follow up. (He's not paying attention. He is, but...) So the gentleman that went before you was talking about virtual learning and virtual. Have there been any studies or do you know of any studies for virtual work in science like the dissection or the... I don't know. Do they still dissect frogs in...

Jeni Corn, Ph.D.: They do.

Rep. Dahle: Okay. Any of those. So that if for example, especially with COVID, you've got and or a longer symptomatic when you don't feel bad, but you still can't go back to school, has there been any research in that or are y'all planning on doing anything in that?

Jeni Corn, Ph.D.: Yes. So the work that I had the opportunity to lead at the Friday Institute really did focus on digital learning. And we created a digital learning plan for the state, did a ton of work defining best practices with digital learning and K-12 systems. Although one of the studies that I referenced earlier, prior to the pandemic, it was very mixed across the state. Some districts were one-to-one, one laptop for every child, and had been that way for 10 years.

Other districts, it was not a lot of technology, but when the pandemic happened, a lot of the funds, especially in ESSER I, it was that triage they were trying is they bought laptops. So, we at this point, as a state, have a pretty robust system in place so that if kids are doing a ton of online and blended learning, they're doing some things, they have their laptops in class. So I think we stand at the ready, and the department, DPI, just updated the digital learning plan for the state. They just released it maybe a couple of months ago. But I think it really does represent kind of what the target instructional practices, kind of leadership practices, networking, security, and infrastructure practices should be. It does a really good job defining that for the state.

Rep. Warren: Follow up?

Rep. Dahle: Follow up. So I wasn't speaking specifically of computers. I guess what I was talking about was, and now I've lost the word, but when you have the...

Jeni Corn, Ph.D.: Oh, the virtual reality?

Rep. Dahle: Virtual reality as far as being able to actually, I mean, they're doing it in training nurses, and so I didn't know if there was any of that going on.

Jeni Corn, Ph.D.: There is. A lot of it is kind of, I don't want to say isolated, but those districts that were probably farthest along and thinking about innovative practices. For example, I saw virtual reality being used in Greene County four years ago. So it is in pockets around the state and they were using it as a way to let maybe

some of the higher needs schools let kids visit places all over the world. It was really not just for science, but really very innovative uses in a lot of our schools.

Rep. Warren: Representative Cunningham, did you have a question?

Rep. Cunningham: Question comment. One of my greatest concerns by us doing so much digital is the psychological, the social behavior, and emotional controls for children. And I know we want to do digital, but we are creating another type of society to interact. What are you all doing in that aspect?

Jeni Corn, Ph.D.: So, in one of the research priority areas was about local level interventions around to address and support student social, emotional, mental health. And teachers, too. We have had... there's a lot of concern about staff mental health and social emotional needs. And it was really based on what the local researchers, so one of the researchers at ECU is partnering with, I think, ten counties in the rural part of the state to really drill in on what worked to support students' mental health not just during this time, but what can we learn from that going forward. And then similarly, there's a community school in Fayetteville that really, again, it's really driven by the needs of the local community and partnership with the research team.

Rep. Cunningham: Thank you. I want to make a comment. When she started talking about quantitative, I'm a nurse. I believe in the evidence based and I want to see outcomes. And if everybody had that, they could really teach us how to be better policy makers because we can look at the numbers, we can look at the analysis that's been done or the final conclusion and make decisions. But everybody don't have that. Thank you.

Rep. Warren: Seeing no further questions from the committee. Dr. Corn, thank you very much for your time and your presentations. Very educational, very informative. Thank you.

Jeni Corn, Ph.D.: Thank you.

Rep. Warren: I'd like to advise all the attendees here and folks tuning in at home. You saw different members leave through the meeting. I want to reassure you, they didn't lose interest. We were blessed to have some of the appropriations chairs here attending on this committee. And we had an overlap with the appropriation chairs meetings that were going on at this time too. This concludes our business for the meeting. And the meeting stands adjourned.