Welcome back to Bush School Uncorked! We are recording or taping live again at downtown uncorked, so thanks again to our hosts for giving us a space to have these conversations. We have a number of people in the audience, many thanks to y'all for being here today and we have a wonderful panel, there's 5 of us. We convinced a whole three people to come with us today, Greg. I think that's pretty impressive. And today we are going to start with a conversation with Professor Kent Portney and he's our honored guest today. And as part of our panel, we're going to have Professor Rob Greer and Professor Ann Bowman join us in for a rowdy conversation at the tail end. And also feel free, panel, if you just have something that you can't keep in and you would like to ask of Dr. Portney as we are getting started, certainly feel free to jump in.

Alright, I'm going to shift to Kent now, if that's okay. So, I thought we would start first by letting you introduce yourself, and what your position is at the Bush school, and then a little bit of your own intellectual history, the things you're interested in, and then I want to shift to talking about your institute. But to begin, tell us a little bit about you.

Okay, thanks for having me Justin, and Professor Gause, thank you for arranging this to happen, I really appreciate it. I've been at the Bush school for almost five years now, I came about the same time as both Justin and Greg came. I'd like to credit Professor Bowman with my being here, so if you'd like somebody to credit or to blame, she's the one.

That's right, I picked him up at the airport.

Oh really?

That sealed the deal right there.

I think I've known you longer than anyone else on the faculty, so even though she went to the University of Florida, I went to Florida state -

It's good you could overcome those ancient [crosstalk 00:01:54]

Exactly, its one of our great accomplishments. My own personal research for like 20 years now has been on urban sustainability, sustainable cities, primarily in the United States and Canada. I've done research on lots of other areas, including public participation, analyzing systems of neighborhood associations and some other related issues. But urban sustainability is really at the heart of what I've been doing really for the last 20 years.

I'm a Professor in the Department of Public Service and Administration, and I'm the director of the Institute for Science Technology and Public Policy at the Bush School. The institute conducts primary research on lots of different areas in practically any area that involves science and technology issues on one side and public policy on the other. We feel like we have license to get into research on any of those areas.

Right now we've got at least a dozen major projects underway. All the projects we do at the institute are team based and they are all multidisciplinary. Almost all involve scholars and researchers from outside the Bush School as well others from in the Bush School. I'd be happy to talk about what some of those are if you want, but we hope that most of them are funded from outside resources or from some internal grants, but we pretty much do have to limit ourselves to what we can get money to support. That's always a major concern. I keep telling the dean we need more money from the dean's office to support our research but -

How does that go?

It usually doesn't go well.

He tells you you can only eat what you kill.

Something like that.

So, for people who might not know what types of grants the Institute might get to bring in money, what types of funding sources have you found, and what types of projects is the Institute a part of? Maybe just give a few of the types of grants that you're on?

The outside granting agencies that we compete in are the National Science Foundation, the National Institute of Health, we have a grant from the US Department of Agriculture. Internally we have both a T-3 grant and an X grant from the provost's office. Those are the kinds of things ... there are a variety of others. Over the years we've had grants from the Environmental Protection Agency, from National Oceanic and Atmospheric Administration, from NASA, from others as well.

And you partner with other colleges, Texas A&M, right? That's one of the signature elements of ISTBB?

Absolutely. All of our projects are multidisciplinary and involve people from the School of Engineering, from the Mays Business School, from the College of Agriculture and Life Sciences, a lot of projects with Agrolife research and Agrolife extension.

I mention that there ... and the audience would probably see this as well ... there's a lot of issues that center around science, technology, and public policy, and so I imagine that the Institute would have a hard time addressing all of them, even if you're open to the intersect of all of those in any way that's interesting. But is there anything that the Institute kind of specializes in? Some specific longterm projects or groups of people that you have working together? I know for example you've done some stuff on the water and energy food nexus, some stuff that we've done together on that, I know we've talked about the Resilient Cities project, I know that there's some specialized projects specifically in water, given the unique water challenges to Texas, so could you maybe give me an example of a few projects that kind of capture some of the things the Institute is focusing on or some of the work that you're doing?

Well you actually captured a good bit of it -

I'm an informed host.

We've been doing work on water related policies and programs including the water, energy, food nexus. As you probably know the Texas A&M has over 150 different scholars working on some aspect of the water, energy, food nexus. It turned out that nobody was particularly interested in studying the governance of water, energy and food, so as soon as we figured that out we jumped into that void and we now think of ourselves as being the place, not just at A&M, but the place anywhere in the country, that has a major project on the water, energy, food nexus governance.

We did a project studying the Texas ground water conservation districts. One of my classes worked on that project. So water figures prominently in a lot of what we do. Also, we've developed a specialty in biomedical engineering policies, specifically focused on remote sensing devices that monitor peoples' health. We're part of the Texas A&M ERC project on remote sensing of health ...

Indicators?

Indicators, yeah. Where the engineers are designing these devices that can be worn by people, implanted in people, and we are doing the studies of the regulation of those devices and the policies that underlay those, and the social science of that, which is why would anybody ever want to have one of these systems implanted in them? Is an insurance company ever going to pay for these things? Fun things like that. So -

Or is the insurance company going to make you have one of those, before they'll write a policy?

That's right. And of course, that immediately raises issues about privacy, because if you have a device implanted in you and it's broadcasting information about you in real time, to some doctor or some doctor's office, how do you protect peoples' privacy, you know? The people who design the medical devices don't really like to think about those issues but they know they have to.

Conversations Kent and I have had over the years ... him talking about doing work with engineers ... I just didn't hardly believe him that they weren't thinking about these governance and policy issues, and I've started looking around at some of this autonomous vehicle stuff, and when you start kind of having conversations it really is an afterthought if it's a thought at all. It's just a race to kind of actually create the technology and make it a useful tool. How we might use it, and what are some of the governance concerns, definitely isn't at the forefront of their minds.

That's right. So one of the other areas we've gotten into ... I've mentioned the US Department of Agriculture grant. That is to support analysis related to what we call gene drives. It's the use of gene editing technologies to change the genes of ... I call them critters ... agricultural pests so that you put some critters out into the population and it changes the whole population, the genetics of the whole population. So it could involve, in our case, the mosquito that promises to carry the Rift Valley Fever. Not Zika, not any of the other viruses, but Rift Valley Fever.

Rift Valley Fever is a potential problem for agriculture in Texas, because if it were to show up here, as it has in Africa and South America, it could wipe out the cattle industry in a matter of weeks. And so ranchers are pretty concerned about that. So we're doing work on that, we're doing work on the boll weevil, the Indian meal moth. Have you ever gotten moths in your flour, or your oatmeal? Have you ever? Anne, have you ever gotten -

Yes.

I had to wake Anne up. She seemed like she was fading on us here.

Your voice tells us that ... does it do that to the students, too?

Yes, it does.

Does it lull them right to sleep?

Yeah, yeah. I have to promise to -

It's because no one was interested.

I've wired the chair to an electrode, so that if they fall it'll give them a zap, you know.

So, the Indian meal moth is what that's called. It's a big ... it's not just a consumer problem, it's a big problem for growers, and wholesalers, and others. And finally we're interested in something called pigweed, which is a pernicious weed that crowds out food crops. Right now the only way to deal with it is by using copious amounts of Roundup on the crops, and of course Roundup ... you've probably heard in the news ... being exposed to Roundup is not such a good thing, and the pigweed is developing resistance to it. Farmers are very anxious about how to deal with pigweed once Roundup doesn't work or can't be used anymore.

That's an interesting project. I mean, we're dealing with entomologists who are the ones who actually do the gene editing of the critters, and talking to them ... they know they need to worry about regulatory issues, they know they need to worry about how people will accept or not accept these technologies parallel to GMOs. People don't want GMOs, well if they don't want GMOs are they going to want food that has been exposed in some way to these critters that have had their genetics changed? These are open questions and we're the only ones really researching it anywhere in the country, so. We're very happy and proud about that.

That's all kinds of things that maybe wouldn't be immediately obvious, the types of governance questions that needed to be addressed. What kind of things does the institute do to go about thinking about how to address some of these governance issues? Do you survey the citizens? Do you work with the stake holders? What types of things -

All of the above.

All of the above?

Talk to regulators, government officials, other stake holders. We have ... a lot of our projects have stake holder engagement processes, and stake holder surveys. We're doing lots of interviews for the gene drive project with the agricultural industry as well as farm workers and others who are first line ... who promise to be first line exposed to these things.

To other projects, we have actually three different projects on Resilient Cities, or urban resilience. Professor Bowman is involved in one of those. The one I like the most of those three, of course Professor Vedlitz is getting it together to, so. [crosstalk 00:12:48]. We call this one project Resilient Cities Policies and Programs Project Online, which gives us the acronym RC3PO. Which is great.

For the audience, the rest of you, on the recording you can't see -

That's our -

There is a C3PO. Which I was pretty excited about.

And even - [crosstalk 00:13:08]. No, I just stole it from the internet.

So the podcast is only ... it's not visual, so we want to explain to the listeners that there's a picture of the Star Wars character C3PO on the board.

You mean they can't see what I was showing?

No, believe it or not.

I'm sure I'll get a cease and desist letter since you wrote that -

Lukas Films is going to be on you pretty quick.

But I should also say, even more importantly, that Professor Bowman is involved with this. Of course, she goes by the name Ann O'Malley Bowman, so we've given her the name AOB1 Kenobi, that's her name.

That's right.

Also, another Star Wars reference. Just in case people were confused.

You have to explain it, yeah.

That's the thing about my comedian efforts. People can look it up.

What types of things are you doing with ... so you've had a lot of experience with urban sustainability which is one of the things you mentioned early on. Resilient Cities seems pretty, of the ones you mentioned, the most clearly right in your wheelhouse. So what does that project look like, what are y'all trying to accomplish with the Resilient Cities project?

What we're trying to do is get a sense from a large number of cities around the country of what kinds of policies and programs they've actually created, enacted and implemented in an effort to try to become more resilient. We know a lot about what cities are doing in planning processes, but we don't know what those planning processes have produced in terms of policies and programs, and we need to understand that before we can begin to understand the "so what?" What did they get, how did they manage to become more resilient, if they do become more resilient? So we've spent a lot of time over the last six or eight months studying the city websites of the 101 largest cities in the United States, and we created a bit of a checklist if you will of policies and programs ... how many items are on that now, like 150?

Yeah, oh yes, it's massive.

It's a 150 different possible policies and programs, and we had a team of students working to understand what those city websites were telling us about the policies and programs. The second part of that project is we're going to survey officials in those cities and ask them questions about the policies and programs they have. We're going to be able to put those two sources of information together, and develop a comprehensive understanding of the policies and programs.

Which really just begs the question, though, of "What do you mean by resilient?" What makes a city ... a city that is resilient, versus one that isn't. What's the difference?

Well, it's not a simple question to answer. The literature if you will on resilience is all over the place. For some people it's making sure you have critical infrastructure that can resist disasters, hurricanes, storms, earthquakes, and such things. Sometimes it's defined as the ability to bounce back from those kinds of issues. Sometimes it's defined as what planners like to call bouncing forward, to improve, using those disasters as an opportunity to improve on the way things were before. So we've tried to create this checklist of 150 different policies and programs to cover the whole swath of possibilities, given what people say that resilience is. Certainly critical infrastructure is a big part of it. What have cities done to try to improve their critical infrastructure, to be able to resist the impact of disasters? What kinds of preparation have they taken? And so on. It would take me quite a while to go through the 150 policies and programs.

We've got plenty of time, just list it.

I'll ask Professor Bowman to do that.

I'd be delighted.

Because my mind can't quite ... keep those all in there at the same time, so.

I guess that the cities have differences in what they report as being resilient. I mean to each -

We ask them on the survey what their definition is, so we get a sense of how they see it, how constrained or broad it might be.

Oh, that's really interesting.

Yes.

And then you'll be able to put the strategies with it based on how they're defining it. That's right?

Yeah.

Interesting. Okay. So, I think we got Resilient Cities, we got water, is there any other things, particularly from the Institute or from your research, before we broaden it up to the panel about maybe thinking about science and technology policy more broadly? Is there anything else that we should hit on since you have the stage?

Well, the only other thing I would mention is that we haven't had the opportunity to do much in the way of energy related projects. But we're hoping to change that in the not too distant future. We're contemplating doing a couple projects, one of which would involve comparing the renewable energy initiatives in San Antonio and in Austin. Both San Antonio and Austin have embarked on very aggressive and ambitious renewable energy policies. But nobody has really studied what they do, how they do it, what I call the "Business Case," why they were able to do it and it make financial sense doing that, so we're hoping to get a project done on that. And we also have a project that we're contemplating investigating the social and political impacts of fracking.

Can we say fracking here? Is that allowed, fracking?

Yeah.

The impact of -

This is Texas, we love fracking. Of course you can say fracking.

Well, some people require that you say "hydraulic fracking."

Oh it's "hydraulic fracking," or "hydraulic fracturing," maybe. Yeah.

So there are two cities that have experienced pretty substantial impacts from the boom and bust cycles associated with national gas and petroleum exploration, and that is Midland and Odessa, and we want to do a project that works with the local officials in those two cities to see how the impacts can be mitigated, so that people who are there are not detrimentally affected, or minimize the effects of fracking on them. Those are two things that we have down the line. We're also talking with a colleague in Professor Gause's department about a cyber security project, so that might come to task too.

Well, that means we're just going to have to check back in and have you as a guest again, in the fall, and see how these projects are coming along.

Alright.

Thanks, Kent. Thanks for taking the time, and with that we'll wrap up this segment, take a brief break, and shift to the panel. Thank you.

Alright welcome back. We're gonna shift to the panel discussion, and as always I'll let Greg take the lead on this.

Yeah. This is fascinating stuff. I think that the whole idea of resiliency, it sounds like a good government concept. Who could be against resiliency? But there have to be choices that are made, and some people might see resiliency as we gotta prepare for the terrorist attack, right? Some people might see resiliency as we've gotta prepare what the horrors of climate change are gonna bring on us. Those of us who live down here in Texas close to Houston, I mean we look at what happened with Hurricane Harvey in Houston, and you might think of resiliency as a natural disasters thing. But other people might see resiliency as we have to prevent a cyber attack from the Chinese or the Russians that might disrupt our critical infrastructures, right?

So I wanna see if I can get you guys to talk a little bit about how partisanship comes into this notion of resiliency. Where are the divisions? Where are the arguments? And Kent we've heard a lot from you today, so I thought that we'd start maybe with Rob Grier, who is also part of the projects at ISTTP and works on cities, and issues in cities. Rob, is there partisanship here? Where are the divisions? It just sounds like everybody should be in favor of resilience.

So there are certainly divisions when it comes to some of the root causes. You mentioned climate change. There are certain partisan divides on climate change and its causes and its effects, right? What we've seen over the last couple of years though is a real shift in conjunction with a recognition by the business community, that no matter what the causes are the effects are real, and those effects have real financial and human impacts that cities have to prepare for.

One interesting project that I've been working on is the recognition of credit rating agencies, that cities that aren't preparing, that aren't taking these 150 possible steps to become more resilient, are therefore higher risk. And that risk is then priced in to their bonds and they have to pay for it, and that's a real thing that they're paying in their debt service payments every year. So we know Moody's and SNP and the other, Fitch, the big rating agencies have come out and said, you need to be preparing yourselves for these risks. Climate related risks, as well as security related risks. And if you're not, we'll take notice and you'll be penalized for that.

So while there is still a partisan divide, the market has spoken that you need to be preparing for these things.

So there's not a difference between Republican-run cities and Democratic-run cities? If the lords of the bond market come to you and tell you, you have to do these things, you do these things. So are cities raising taxes to do this?

That's a good question. Anne, do you have ...

Well let me kind of get to the answering that by, a little circuitously. First thing that I would start with is the organization of cities to actually address the resilience question. There's a debate in the literature whether it's resilience or resiliency.

Resiliency is the European word.

Right.

Well then we are not gonna use that in Texas.

Resilience it is.

Resilience it is.

So, how do you organize for that within city government? Do you have a chief resilience officer, a CRO if you will? Or do you actually work at the departmental level and integrate resilience into everything that's going on regardless of the department? And we are seeing different models for that, it really does vary. In terms of funding there's some outside money, there's some foundations that are very interested in this issue. And they are providing some seed money to local governments to begin to address it. But in terms of raising money for resilience, raising taxes for resilience, no.

I mean you raise taxes for something else. And in effect, become more resilient as you do. But the topic really, the issue hasn't galvanized the public in the sense that we must become more resilience. They just say, we must do something about flooding, and therefore become more resilient. But I guess I also wanna add to this, this whole question of levels of government, and which level of government is primarily responsible? It's the cities that have to do this, of course, that have to take these actions. But should the financial burden fall upon them? They have the least ability to raise revenue.

So typically you then look to state governments to begin to stimulate local governments in some way to take up these issues by oftentimes, providing funding, grants, loans, whatever it might be. So financially if it ends up with the cities it's gonna be too much of a challenge for them to really address.

So is there resistance at the state level? I mean there's almost always resistance at the state level, they're doing what cities say they need to have done.

Well there's always tension, or tug-of-war between states and their municipalities concerning who's gonna pay for what. And sometimes a lot of things fall through the cracks, Professor Bowman is the real expert on this. But you see that played out in resilience issues all the time. Disaster planning and who's paying for first responders, and so on.

Let me go back to your question about the political divides. There are a number of them that you see present almost everywhere, and they include things like, if you want your city to be resistant to severe damage in a storm you probably have to consider how your land is being used. Right? And so in Houston, and Harris County, which experienced so much flooding as a result of Hurricane Harvey. A lot of people are saying, well one of the problems is that city of Houston allowed homes to be built in flood plains.

Because there was no zoning in Houston.

'Cause there's very limited use of zoning. And it's not just about, should you use zoning? It's about, who gets to decide whether you're gonna build a house or not? And in Texas as you know, individual liberty tends to be something that takes precedent over government intervention, or planning, or zoning, or related issues. So if you have a piece of land and it's on a flood plain, who gets to decide whether houses get built there? In Texas we tend to think that it oughta be developers, not the government. Right?

Other places, the opposite is true. The government will step in and say, no you can't build homes on a flood plain. But that's something people disagree about. It's a divide. Another one is always about who pays how much, right? I like to tell the story about 20 years ago, before super storm Sandy hit New Jersey and New York City. The city of New York knew full well what is vulnerabilities were, lower Manhattan in particular. They did a comprehensive study that showed that they needed about $40-50 billion to prepare for the possibility of a major storm.

And of course their response was, we don't have $40 or $50 billion we can spend on this. They tried to get the state to pay for it in Albany. And the state said, no we're not paying for that. They tried to get private sector to pay some of it. The private sector said, no we're not gonna pay for that. So nothing got done. They had a plan, and nobody ever did anything about it. And then super storm Sandy hit and caused billions of dollars worth of damage, right? So somebody ended up paying for that damage, and they're still vulnerable, right?

And so now they're starting to [crosstalk 00:07:42].

So they're still vulnerable because in reaction to the storm they only did clean up, they didn't get resilient.

Well, they didn't do the things that you would expect them to do in response. What I like to point to is in New Jersey, northern New Jersey just outside of Manhattan. A good part of the Jersey Shore was wiped out by super storm Sandy. And immediately a group formed that was called, Restore the Shore. Where all they wanted to do was put things back, the boardwalk, put it back the way it was. And Governor Christie, the governor of New Jersey at the time, visited them and said, you know we're going to help you put things back the way they were, except we're gonna be smarter about it this time. For the boardwalk we're not gonna use wood, we're gonna use concrete.

That was smarter?

I don't think that's what people are talking about resilience have in mind, but he thought that was the way to deal with resilience. Okay. And in fact they did rebuild it with concrete.

So is Houston doing it better?

I was just on a panel at the southern political science association and one of the papers that was presented was really analyzing the city of Houston in its response to Hurricane Harvey. And the suggestion from the researchers, and it was a political scientist and some soil scientist person. And they argued that new development is going to be smarter than it was. Old development, are they ever gonna retrofit? That was unclear. But with new development they are putting in additional regulation, I use the word lightly. Regulations where they design, where they put storm cuts, curb cuts and the drains and the things that we're really linked to.

Because back to Kent's point about flood plain, if you're not gonna build a new flood plain, you're not gonna build much in Houston. Because so much of the city is part of the flood plain. And so as a consequence you gotta do things, okay we're in a flood plain, now how do we mitigate that to some degree? So a lot a of it is where they put these retention ponds, and where they locate all these drains. Bottom line, if you're listening in Houston, buy above the drain, okay? Make sure your land is above the drain.

That's a great piece of advice.

Maybe it's some good practical advice.

Yeah I was gonna say [crosstalk 00:10:03]. News you can use on [crosstalk 00:10:06] uncorked.

But Rob brought up the idea of the bond market. So where's the private sector in that? I mean, where's the insurance companies in this? Why would an insurance company write a policy for a house that's been built in the flood plain, has been wiped out three times, and three times they've paid the owner to rebuild?

The answer is they won't. Private insurance companies have gotten very good in factoring these kinds of things into their calculations of what the rates should be. So even if you can buy flood insurance, your rates are gonna be very high. Of course, at the same time, the federal government-

But the federal government will-

-has flood insurance and subsidizes people's decisions to buy houses in flood plains. And there's always a lot of debate, that's another one of these divides about whether the federal government should be offering flood insurance to help subsidize and underwrite people's bad decisions, right? And of course there are limitations, and people don't always get the benefits from flood insurance that they think they're gonna get. But the question is still there.

Which builds on Dr. Bowman's point about levels of government, right? And so these are municipalities that allow development in certain areas, with the assumption that the federal government's going to be offering an insurance plan that will cover them because the private market will not. But the federal flood insurance program has gone bankrupt, almost gone bankrupt several times. And is constantly under threat because it's not solid. Right? So it requires federal appropriations to keep it afloat, which is sort of an indirect subsidy to [crosstalk 00:11:44].

No pun intended. Or maybe intended. Then Houston gets the benefit from that because then they see more development because of an indirect subsidy from the federal government.

Exactly.

That doesn't make any sense at all. [crosstalk 00:11:58].

That's more wishful news.

Yeah. News you can use, the government doesn't make any sense at all.

How big do you have to be to be resilient? We're in Brian, Texas right now. How many people live in Brian? 80,000. The whole Brazos Valley, what are we at? Quarter of a million. Right? Can the Brazos Valley be resilient? Or is that something that requires a scale for revenue and for organization and administration that says that a place like Houston can try to tackle these things, but a quarter of a million people in the Brazos Valley, we can't do it?

You have to do it. We have critical infrastructure, we have to-

Okay, we've talk about critical infrastructure and all that, what's the critical infrastructure here?

Power plants, clean water, treatment facilities. [crosstalk 00:13:01].

Hospitals.

Hospitals, and depending on your definition, communication. So we don't have any new [crosstalk 00:13:09].

If the internet goes down, no podcasting.

That's a real problem.

Right.

It's a real problem.

That's super critical.

Yeah.

Yes it is, it's very important.

I mean you have to know your vulnerabilities. And so you assess your vulnerabilities and so we may not have in the Brazos Valley the range of vulnerabilities that Houston might, but given the vulnerabilities, can this place be resilient? Yeah. And Rob's right, it has to be.

And in some ways it's easier on a smaller scale, right? The larger the city, the larger the metroplex, the more complicated these issues get because the systems become more intertwined. Transportation would be another critical infrastructure. And so in DFW or in Austin, their resilience programs, it's not clear to me anyways that there's an economy of scale to being resilient. It gets more complicated before it gets more expensive. So on a smaller scale like in Brian college station, it's almost easier to wrap your hands around how to be resilient, than it would be in a larger area.

You said transportation. So what does resilience of transportation mean? Does it just mean keeping the major roads open? We have a little bit of public transit in the Brazos Valley, but I don't know if that's critical. For some people it might be critical.

Right. Transportation [inaudible 00:14:26] would be able to give you a much better definition, right? But at the basic level if your ambulances can't get to people and then back to the hospital, if your maintenance trucks can't get to transformers to get power back online, then it doesn't matter how resilient your power plant is, or your water treatment facility is, nobody can get to and from it. And therefore, you can't fix anything. So transportation on a very basic level allows you to fix anything else that's going wrong.

Yeah. We're recording on what? The 29 of January, right? So just today the intelligence officials of the United States testified before congressional committee about the major threats that they perceive the United States face. And cyber security was way up at the top, right? Can you guys talk a little bit about what resilience in the cyber world means? And here, we're kind of coming over into the international side because we see foreign sources of threat to our cyber security. But there's also resilience issues there too, right?

So this is an interesting issue where they really star to overlap. It was not that long ago we saw the city of Atlanta was subject to major cyber attacks and was holding people's logins ransom.

I forget. That rings a bell, but I forget the details. Fill me in.

I'm gonna be fuzzy on the details as well, right? But basically the city of Atlanta, a major organization and largest cities in the country, probably in your study, right?

Absolutely.

Was under cyber attack, some version of a ransom some sort of attack. And it really shut down city operations. They couldn't do anything until they figured that out. And so back to the conversation of what is resilient? We have both the policies in place to try to prevent things like that from happening, and then you have policies that sort of gauge how you respond during the situation. And then post situation, how do you prevent things like that from happening again? Or get back up to normal operating capacity?

And so there are-

How did the Atlanta story end? Do you remember?

They're still running today, so it was okay.

The city wasn't closed down. I hear the Super Bowl's going to be [crosstalk 00:16:45] this Sunday. So yeah I guess they're up and running.

It didn't just fall into a black hole or anything. So when you're thinking about resilience from cyber attacks, we think about national issues a lot, right? But these are local government municipal issues as well.

So this was just some hackers who were trying to get some ransom? And we're gonna reveal all sorts of social security numbers or something unless you give us money?

I don't think it was super clear at the time who the actor was.

I don't think it is still to this day.

To this day, not clear.

And the challenge for municipalities is, they don't have the technical expertise to be prepared or to respond in a comprehensive way, they have to rely on somebody else to do it. And I would say probably state governments are not far behind. We see that played out with conservatives about hacking into secretaries of states election [crosstalk 00:17:42] and things like that.

Which is not a hypothetical problem.

That's right.

Right.

None of these things is totally hypothetical. I mean so much of our infrastructure and our government services are reliant on web based services that everything's vulnerable, from our power grid, and who manages the power grid. To our water systems and wastewater treatment systems. It's all vulnerable.

And most of it, I'll add, owned by state local entities, not federal entities.

Exactly.

Right? And so owned and operated. And so back to this level of governance issue, it may be a national level security priority, but in implementing those policies these are local actors. Sometimes very small special districts that are delivering wastewater treatment or responsible for a single grid for electricity. So when you're talking about capacity to deal with these issues, we think about it on a national level, but implementing it is really at a local level.

Well thinking about it at the national ... If we go back to the national level, I mean this really is an arms race of coming up with advanced cyber security tools to deal in that space. And there's this artificial intelligence arms race across the US and China, in particular the two big players. Russia is playing a real role in hacking and cyber attacks. And so it's an open question of how to respond to that. And there's a lot of dialogue on this, but some of the stuff I've been reading and thinking about, and really the only way to keep up is to double down on basic research. And double down on your investments in computer science, and your investments in the cyber security tools.

Right. But that can't be done at the municipal level. And in most states it can't be done at the state level, I mean that has to be done at the federal level, right?

Yeah, I think so. The amount of resources needed to-

That's always the challenge, right?

[crosstalk 00:19:33].

Trying to protect yourself from cyber attacks is very expensive.

So I think that is a nice spot to pause and we do have a number of audience members. And we wanted to leave time for them to ask some questions after taking the time to come out and be with us tonight. So does the audience have any questions? Yes sir.

So going back to the resiliency question, Dr. Grier you hit on it a little bit, actually everybody hit on it. In Houston, they've built up so far that they've kind of built themselves into a corner. I mean they're in a bowl, there's not much more they can do outside of tearing up and starting all over. And then the smaller areas outside of Houston, the smaller mud districts and municipal utility districts, they don't have the money to upgrade. Their wastewater treatment plants are vulnerable. And not just from cyber security, but from everything.

And even the city of Houston doesn't have the money, doesn't have the funds available to totally revamp the city to be resilient. So what steps can they take, not just from a policy ... I'm an engineer, so I'm looking at this very practically. But what steps can they take right now to be ... 'Cause Harvey's gonna happen again. What can they do to lessen the impact of the next Harvey?

[inaudible 00:20:50].

Yeah that's a great question, it's a hard question. Some things can be done in terms of market financing mechanisms. So the state has a revolving loan fund set up for water infrastructure. Sorry.

I mean I feel like you should talk to the [crosstalk 00:21:08].

I know he asked the question and I wanna address the question here.

We're mass communicators.

Sorry. So there are state revolving funds that are available. Unfortunately, the need far out seeds the amount of funds that can be loaned out under that. The low interest loans that are backed by the state. The bond market has recognized this as well, and so you can get certified green bonds now that go to a certain pool of investors who want to put their money into projects that they know will contribute to sustainability issues. And there could be some interest rate advantages to doing that. So the market has a few mechanisms, it's unclear at this time because they're so new, how effective that will be. What sort of cost savings will actually accrue to the muds or the cities.

But we area starting to recognize that from a market perspective, and try to develop some tools. But you're absolutely right, they do not have the fiscal capacity to really make the investments necessary to prepare for the next one, let alone keep up with current demands. Right? Which is the issue right in front of them, the one they're more likely to solve. So I don't have any great answers for you, I wish I did.

How do you think is resilience also a function of democrative governance [inaudible 00:22:28] in a sense that how people are participating in addressing local [inaudible 00:22:34]?

That's a great question. Does resilience require local democracy? Or does local democracy work against resilience because nobody wants changes in their backyard? Or everybody wants the boardwalk restored exactly as it was.

Well that's a really good question. And it's a question that has been addressed in a lot of different ways. What I would point to is in the Jersey Shore case, after the group formed, Restore the Shore, which just wanted to put everything back the way it was. Not improving things, not getting improving resilience, or not protecting themselves. A number of organizations got active and started meeting with community organizations and creating what they call scenario planning. Where they put to the people a number of different scenarios along with the cost and consequences of pursuing those scenarios. And they used that as the participatory processes to get people to buy-in to making significant changes, and that they didn't even think about.

There's a nice little literature that documents how those processes work. And it's very encouraging, but it takes somebody, it takes an institution, it takes a government to get that whole thing organized.

But what that government that started that?

Yes.

So it was local governments.

Metropolitan planning agencies mainly.

Metropolitan. And they would bring together almost like citizen juries to say, how do we think about this?

It's not that formalized. It's community groups, it's neighborhood organizations.

But it was a bottom up process?

Yes.

It hasn't been specific to resilience issues, but there is a history of cities engaging in participatory budgeting, specifically for capital projects. So they'll go out to neighborhoods and say, we would spend a million dollars on projects related to parks, but it's up to you how you want to divvy that money up.

I wrote a book about that once.

Oh really.

So we have the expert here. I shouldn't be talking about it, you should be talking about it.

What was the name of that book, professor [inaudible 00:24:31]?

The Rebirth of Urban Democracy.

So the Rebirth of Urban Democracy published by?

Brookings Institution-

The Brooking Institution's press. So everyone take out their phones and-

Didn't that book win an award?

It won a couple of awards.

Okay. [crosstalk 00:24:45].

There we are. And there are these old things called libraries, you could actually go and maybe get that book out of the library. Don't even have to order it online.

I think you can buy it for like $3 on Amazon. Used copy.

Even better.

What is this library?

What is a library?

It will improve your resilience to have a copy of that.

Yeah, a library's critical infrastructure. Right?

I think we have time for one more before we wrap up. Anybody else? Not all at once now. Sure, please.

A followup to that, as your friendly neighborhood librarian, how much of your resiliency study is looking at culture? And looking at the social aspects? 'Cause I would argue that the work I do is critical to resiliency, but perhaps that's my definition.

So the question was, how important of a role does culture play in thinking about resiliency?

And is the library part of the critical infrastructure?

I like books. What do you think Rob, library?

You write the book.

Our project is in its infancy.

But we are looking at-

Absolutely.

-at the social vulnerability of communities. And some of the questions are specifically targeted to the impact on low income groups and marginalized groups in the population. And we would argue I think that true resilience efforts really does need to identify vulnerable populations and address the needs that they might have, rather than assume kind of a one size fits all approach would be affective.

So if we look at New Orleans, right? One of the impressions one, as just somebody who was looking at Hurricane Katrina in New Orleans. Is that poorer people lived in lower places, right? The lower ninth kind of wiped out in New Orleans and that was a poor African American community in the city. But in Houston, I mean Hurricane Harvey wiped out the rich and the poor kind of irrespective of class differences. So in some places the rich people in the bowls, and they get wiped out.

And just to finish this off-

The roots have more capacity in the phrase we used earlier in responding to that. And fixing the problems that are addressed [crosstalk 00:26:59].

They've got the bank accounts.

Yeah low income populations struggle. [crosstalk 00:27:04].

-a really good one too. I mean it also determines the current culture determines what types of options you have. Based on what the citizens are interested in, and what types of tools they would be okay with. And so even if it's not a direct point of making sure our culture is resilient, it certainly informs the strategies and tools that you can use at the local level to be resilient, I would think.

It's not just the libraries, are the schools part of the critical infrastructure? And then at some point you kinda ask yourself, where do you draw the line between the critical infrastructure and the important infrastructure that's not critical?

I think roads do count though.

Yeah.

To answer your question, libraries aren't typically added in the standard definition. But it is a recognized important contribution that we have to be able to disseminate information, and people have to be able to access information. And libraries are increasingly the place where a lot of communities do that. And so if you have to get everybody registered for FEMA, or is you have to ... people need to be able to check their bank accounts or anything like that, and the only place they have access to the internet is the library, then it starts to become a much bigger deal that your libraries are up and running as soon as possible.

So I will say it's not completely ignored.

That's a good answer.

So I'd like to thank the audience for coming out again for our second live taping, and asking some questions. So many thanks to each of you for being here. And also many thanks for our panelists, thanks for professor [inaudible 00:28:36] for letting me focus on you for the first 20 minutes. And then for professors Grier and Bowman for being here and hanging out with us for the panel.

And to my co-host.

As always, thanks of Justin for organizing this. Thanks to our friends at downtown on Court for providing us the space.

And by [inaudible 00:28:52] we enjoyed coming out and hanging out at.

That's for sure.

And we have a couple of other episodes coming up over the next couple of weeks. We'll have another student panel, will be our next episode. And then we'll do another live taping in about two weeks with professor Erin Snyder I believe.

And we'll talk about the middle east.

And we'll talk about the middle east. Somebody here knows something about that. At least one of us.

Really?

No me. No, goodness.

Well we'll see how all that goes. Thanks for listening everybody.

Thank you.

Thanks for coming. [crosstalk 00:29:22].