

Center for Strategic and International Studies

TRANSCRIPT
Online Event

U.S. Innovation Competitiveness Summit – Panel 1
**“Redistributing the Innovation Landscape: Creating New
Regional Technology Hubs”**

DATE
Monday, September 13, 2021 at 2:00 p.m. ET

FEATURING
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Ian McClure (In progress) – for joining us here for this discussion around redistributing the innovation landscape, creating new technology hubs. We're going to take just a couple more seconds to let everyone join the room and then we will get going in just about 30 seconds.

(Pause.)

All right. I'm going to kick us off. My name is Ian McClure. I'm the Associate Vice President for Research, Innovation, and Economic Impact at the University of Kentucky.

I want to welcome everyone to our U.S. Innovation Competitiveness Summit co-hosted by the Center for Strategic and International Studies, UK Innovate for the University of Kentucky, Columbia University through Columbia Technology Ventures, and AUTM Global Association for Technology Transfer Professionals.

Truly, this has been a really neat collaborative event and discussion throughout the week, and I hope if you were able to participate in our welcome session this morning it was fantastic and laid the groundwork for the discussions that will happen throughout this week for this event.

Today, we have some fantastic speakers to talk about a really interesting topic, redistributing the innovation landscape and creating new regional technology hubs throughout our country for the purpose of competitiveness through innovation.

The people that we have on this panel today represent six potential technology hubs in our country and, in fact, all six of these places that are represented here – Lexington and Louisville, Kentucky, Madison, Wisconsin, Tucson, Arizona, Buffalo, New York, Jackson, Mississippi – all six have been identified as a high-growth potential region or a top technology hub candidate by esteemed institutions like the Brookings Institution or Jumpstarting America Project, and we have the top of the totem pole from an innovation and research leadership perspective from each of those jurisdictions here represented through the research institutions in those regions.

Our panelists today – I'm going to just very briefly describe who they are, but they're going to describe themselves in more detail here in a minute.

We have Dr. Lisa Cassis, Vice President for Research at the University of Kentucky. We have Dr. Kevin Gardner, Executive Vice President for Research and Innovation at the University of Louisville. We have Christina Orsi, Associate Vice President for Economic Development at the University of Buffalo. We have Almesha Campbell, Associate Vice President at Jackson State University, a premier research HBCU institution in Jackson, Mississippi. We have Elizabeth Cantwell, Senior Vice President for Research and Innovation at

the University of Arizona, and Erik Iverson, the Chief Executive Officer at the Wisconsin Alumni Research Foundation in Madison, Wisconsin.

So why is today's topic so important? Well, as the development of this summit alone evidences, innovation is squarely at the center of the discussion around national security. This is sort of an intersection of policy fields that we don't get to address in an alignment the way that we will throughout this week. That's innovation and intellectual property policy and national security policy, as those two are center of discussion now across the country and on Capitol Hill.

One of the things that we're going to – the reason we're going to address this new regional technology hub conversation today, of course, the recent passing of the United States Innovation and Competitiveness Act by the Senate in June brought this to the forefront. It was premised by studies like the one by the Brookings Institution in 2019 that proposed a case for growth centers and place-based intervention and investment to intentionally create new technology hubs across our country.

So that's all important, but let's put some data and just some anecdotal evidence behind some of this. While the United States has often thought of itself as a leading country for innovation, oftentimes we rely on discussion that centers around our supercenters of innovative activity, right? San Francisco, San Jose, San Diego, Boston, Seattle. Those five are, largely, the five supercenters we talk about. There's some other new ones like Austin and Research Triangle.

But one of the issues, of course, is that the economies of scale, as recent empirical studies have shown, that are achieved through such concentration of some of that activity and investment, most pointedly, limits the – the economies of scale become limited because of the widening gap between those supercenters and the investment there and the rest of this country that is the majority of our population.

As John Hamre, president and CEO of CSIS, very eloquently wrote in his foreword for this event – and if you haven't read it, please go to the website for this event and you can read the entire foreword – but a little excerpt from his writing. He wrote: "America faces two great economic challenges in the coming years. The first concerns ensuring our country's leadership role as a world-class innovator second to none. There is a second, even more significant challenge. America is bifurcating into two economies. High-technology centers have become dynamic and creative, while more conventional economic activity in rural and Rust Belt communities is falling further behind. America cannot succeed if we are to become a divided nation with prosperous professionals living in urban and high-tech hubs and the rest of the country lagging in old-industry activities. We know there is innovative capacity in the heartland of America and it requires intentional investment to equip regional hubs in mid-America to catalyze this resource."

Some data behind some of this. Most notably, in those five supercenters I mentioned recently – Boston, San Francisco, San Jose, Seattle, and San Diego – those five places accounted for more than 90 percent of the nation's innovation sector growth between the years 2005 and 2017. In that fashion, they increased their share of the nation's total innovation employment from 17 percent to 23 percent. So one-third – or, excuse me, one-fourth of our innovation employment in those five places.

In contrast, the bottom 90 percent of the other 343 metro areas lost share in innovation employment. And, of course, the venture capital follows some of the talent and that activity, right? For example, Midwest universities, although they produce 26 percent of university patents, conduct 31 percent of university research, and graduate 33 percent of the country's STEM graduates, in the Midwest, the states where those Midwest universities from those stats are housed, had only 98 total venture capital funds, as was published recently by Crunchbase. While New York, Massachusetts, and New York (sic), three states, have 1,503.

And it's not the number of funds that is, perhaps, one of the best pieces of data here. It's the fact that the size of deals, the amount of capital put into similar-sized deals at similar maturation points in tech development or startup development, the size of the deals in those three states is 12 times the size in those Midwest states. And, of course, this is not all just about the Midwest. That's used as an example here.

But it's interesting, the tides are turning. There's momentum for greater diversity and inclusiveness in the way that venture capital is being deployed. Last year, for example, 14 states – 14, not just those three – 14 states saw at least 1.5 billion (dollars) of venture capital flow into startups that were headquartered in those states. That was up from 10 the year before. So there is some increased diversity of where some of these funds are flowing and, hopefully, following some new talent channel.

As Steve Case said – and Steve Case will be providing keynote remarks on Thursday this week, if you are able to attend – he calls this – maybe this is currently the “shake the snow globe” moment, right? So momentum is right, the conversations on Capitol Hill, the venture investments that might be moving in a certain direction.

So we do know that localization of innovative industries clustered together does produce more productivity. In those five supercenters I named recently, as an example, the average innovation industry worker produced more than a hundred thousand dollars more than the average innovation industry worker that were not in those non-supercenter regions. But the point being is that if we continue to invest just in those supercenters, the consolidation limits the economies of scale, the point being that we need to create more of those potential supercenters.

So what is a regional technology hub? We're going to talk about that today with the experts we have here, leaders in innovation and research that represents new potential technology hubs.

A regional hub, a regional technology hub, as I might premise – and I'm going to get some feedback here from my panelists – is one where more of the technology has one or more of the key technology focus areas that serve one or more of the priority industries of the U.S., clusters their research innovation capacity in highly-skilled talent and capital, and creates economies of scale that heighten productivity for the country thereby.

So what characteristics do they have? Well, perhaps first and foremost for this conversation is that they have research institutions, high-capacity research institutions. We know of the ones, for example, in San Francisco: Stanford and UC Berkeley, and in Boston: MIT and Harvard.

So that's a core centerpiece of one of these technology hubs. They have to have industry that follows that talent and that research, government and economic development organizations that support them, venture capital formation around them. They have to have those attributes or at least the capacity to create those attributes.

And, importantly, we're going to talk about what is a region. Is it just a municipality? Can it be an expanded region, multiple institutions, multiple states, multiple regions? We'll talk about that as well today.

So we have here esteemed research and innovation leaders, as I've said, and we're going to get their thoughts. And, first, we're going to have each of them introduce themselves and talk a little bit about their current regional innovation hub and the role that they or their institution play in that.

And I'm just going to go down the line. I'm going to first just call upon our panelists here that I see first in my Brady Bunch line of pictures. So Erik Iverson from WARF in Madison, Wisconsin, please kick us off.

Erik Iverson Thanks, Ian. I drew the short straw there. But that's OK. I'm happy to take this one on.

Thanks for that background. I really appreciate setting both the tone and the context for our conversation and, again, thank you for your invitation for me to join this esteemed panel.

I'm Erik Iverson. I'm CEO of what is known as WARF, the Wisconsin Alumni Research Foundation. What WARF is, is we're a supporting organization to the University of Wisconsin Madison, which is the flagship university to the University of Wisconsin system. We do service just Madison campus. The rest

of the campuses are served by sister organizations that do something very similar to WARF.

WARF has been around for about a hundred years, not quite but pretty close. We are independent of the university. We don't report up through the Chancellor's Office. We're not state employees, and as a result, we're an independent organization with a board and a balance sheet, and over the hundred years we've been blessed to accumulate a significant amount of assets, both in cash as well as technologies that we're responsible for commercializing.

And one thing that we are consistent with is that we subscribe to an idea here called the Wisconsin Idea. That is, all activities associated with the university stretch beyond the borders of the campus well into the entire state and we're here to service the entire state. I suggest, being a global citizen, that we are here to serve the country and the entire world, quite frankly.

What we are able to do by being separate is we are very flexible and we adapt, and so we can use our cash to make venture investments, which we do, and set up a venture fund internally. We do some drug development with the team that we've hired inside of our organization, and we adapt to the changing environment of industries and verticals wherever they may be geographically.

So it's a – WARF is a wonderful place. I'm not a graduate from University of Wisconsin. I grew up in northern Minnesota and then spent the vast majority of my career out in Seattle and participated in that growth of that hub, if you will, from the early '90s until I left in 2016.

So if I kind of move myself into reflecting on a hub, experiencing what Seattle went through, which was enjoyable and quite the experience, but it was very small geographically. Certainly, Seattle has Bellevue, the city across Lake Washington from it. We know Microsoft is out in Redmond, but it is a very small geographic area and it made plenty of missteps like we know so many other hubs have, whether it's – traffic has become insane. It has outpriced just about anybody who you need as part of your workforce. The homelessness problems in each one of these is just incredibly insane.

And so there's an opportunity that each – not just an opportunity but a responsibility that each of us has, those of us on the panel here, as we participate and are players in building our respective hubs, we have a responsibility to attend to those problems that have been the bane of so many of those existing ones – again, homelessness, lack of affordability, traffic, and those kinds of matters – to the extent that we're able to.

Madison is a much smaller city than Seattle but, quite frankly, when I moved there in the early '90s, it was a smaller city out in the middle of nowhere. Madison happens to be a smaller city sitting in the Midwest. And so Madison is doing very well in itself, but it also is acting rather insularly of just Madison,

and I'll hold comments about what future hubs I suspect will look like and I hope will look like.

But for the moment, Madison is doing well and it was reflected in the Brookings report as the number-one city ripe for this kind of activity, and they kindly noted that the country needs 10 more Madisons. And I don't disagree with that, but Madison is just simply one city.

So those are my thoughts, Ian, so far.

Mr. McClure

Thanks, Erik. Appreciate that.

Next, I'm going to go to Dr. Kevin Gardner from University of Louisville.

Kevin Gardner

Thank you. Appreciate going second instead of first. Thanks, Erik, for that.

So my name is Kevin Gardner. I'm the executive vice president for research and innovation at the University of Louisville. U of L is an R-1 Carnegie-engaged research institution with about 22,000 students in the city of Louisville, Kentucky, which is the largest metropolitan region in the state. The metro population is about 1.4 million or so, and the mission of U of L is to be a premier anti-racist metropolitan research university.

So I have a few examples of kind of trying to describe our innovation hub. It's a little bit like maybe describing the elephant but I'll use some examples. But I would say that these are the things – to start off with, these are the things that kind of define the innovation hub as it exists today.

So, one, is that we have a university with a strong tech transfer engine, and it's not just that we have that engine but we celebrate that as a university. So we recognize it. We celebrate it. We focus on translational research and prioritize that for our faculty. So there's that culture within the university.

We have sufficient local talent and areas of strength, both for the university and its training at all levels as well as the types of employers in the region, the talent that they have and that they've developed and that they hire and so forth. We have in a few areas these critical ecosystems, critical mass kind of – critical mass of companies that provide the competition that you get in these larger areas.

We have strong connections nationally and globally, right? We don't exist as some island in wherever Louisville is in Kentucky. I hardly – I know I've only been here for a year and a half and it's been a pandemic the whole time. But, anyway, you know, it's not – you know, we work closely with companies and licensees in California and in Europe and so forth.

So and then I would say state and local support. We've got space. When a startup needs lab space, when they need clinics, when they need to partner

with the university, we have, you know, benefits from a tax perspective in the state and, you know, but this is the same – these are the same lists that anybody would say and so we also lose out when somebody moves across the river to Indiana or something like that because of the tax or the benefits or whatever it is that they're being wooed away from for that – from that perspective.

So we have three innovation-based industries that are more significant than others: health-care, logistics and distribution, and advanced manufacturing. So I'm just going to provide these little kind of snapshots.

So number one, Louisville is a global hub for UPS. That makes a difference. University of Louisville has a logistics and distribution institute that crosses multiple colleges in the university and we have various partnering relationships with UPS around education and development of their workforce. And this is a long history, and so we have a lot of graduates. We have an entire ecosystem of companies in the city and the region that have grown up around this and around the fact that UPS is here and there's good customers and an ability to get things out quickly across the world.

Just one example: Material Handling Systems, Inc., is one company. It's got three – it's made up of three grads from the engineering school. They make, you know, automation – material-handling automation, robotic types of solutions, and they had over 5 billion (dollars) in sales last year.

The Louisville Healthcare CEO Council is founded in order to spur innovation in health care – in health care, broadly speaking, and the Louisville Healthcare CEO Council is made up of 13 companies with over \$100 billion in revenue, two academic institutions. And we – while the Healthcare CEO Council partners directly with University of Louisville to support research needs, they also search globally for innovations, and just as one example, from last year's search they bought a new company called Familio (ph), which is a French-based company that has its U.S. headquarters in Louisville now and, you know, was able to attract them because of the density of those companies, because there's a skilled workforce, and so forth.

And then the last example that I'll provide is that this – maybe it's more of a wish than a – it's a little bit more towards the future look, but the – you know, I kind of – I would like for our innovation hub to build on the creativity and talent and life experiences of all of the people in the city and the region, and it's just not true with the disparities in education and economic opportunities and so forth that we have.

But I feel like it's a – this issue that we're, you know, really trying to address is the same issue. It's a microcosm of the national issue, where we've got pockets of kind of innovation wealth and so forth, and then other parts of the innovation ecosystem that could be great, that could make great contributions, but are limited in their ability to do so.

And just one example of that, we received a grant just recently from the Department of Commerce, Minority Business Development Agency, for the Louisville Additive Manufacturing Business Development Alliance to innovate, train, and commercialize minority business enterprises in 3-D printing technologies.

I'll stop there. Thanks.

Mr. McClure Thanks, Kevin. Appreciate it.

Next on my screen I see Betsy Cantwell from University of Arizona.

Betsy Cantwell Thanks, Ian. Hi, everyone. It's a pleasure to be here. Given that I get to go third, I think what I'll do is highlight, because there are so many differences in our regions, some of the aspects of the innovation ecosystem and the regionality for the University of Arizona that set us in our region.

So we're not only Western, we're Southwestern. We live in Tucson, Arizona, in one of the most arid parts of the United States and a place that will only get hotter and drier as time goes on. This university was established before Arizona was a state, and so when Arizona was a territory the University of Arizona was established and it is a R-1 land grant university. We take our land grant mission enormously seriously, and we exist in a state that has only three major institutions of higher education and so each of us is actually rather large by many universities' standards. And so that sort of historical context.

The university itself has over a hundred-year legacy in things like space science and astronomy and defense research. We have two of the largest bases in the US, right – literally, right next door. We are the largest employer in our 1.2 million citizen area, so not small. This is not a tiny town. This is a good solid mid-sized city. The other largest employer is the biggest arm of Raytheon, which is Raytheon Missiles and Space. And yet, there are a large number of mid-sized companies, small companies, and now a burgeoning group of startups.

So how we got to that, and my job is not only – I'm the senior vice president for research and innovation, so I own a prodigious amount of acreage in Technology Park. And our tech transfer arm and our new arm called the Forge, which is really both community based and university based to deliver entrepreneurial mindset to our students, our faculty, and our local community – is to really look at our ecosystem right now and the places where you will typically – where we have and you will typically see for a metropolitan area of our size challenges are in the investor population.

What we have been able to do in the last five years in Tucson is bring back to Tucson people who were graduates of the University of Arizona and went off and, largely on the West coast created their own startups, who want to come

back here for a number of reasons and have started, really, quite viable funds. So we're beginning to build what I call an indigenous investor community.

We also have – we are not the largest metropolitan area in Arizona, but we are not very far away from the city of Phoenix and Maricopa County, which has – you know, about five-sevenths of the population of the state of Arizona lives in Maricopa County, and we have developed an investor community there as well.

That, for us, was the hardest component. We have 45,000 students. We graduate an awful lot of people, many of whom wish to stay here. We have worked regionally with our – with our real estate community as well as our own many different versions of third parties to create incubation spaces of all sorts. We are the entity in the state of Arizona that educates all of our – we have two medical schools, one in Phoenix here and one in Tucson here.

So our area has over – for 70 years had this kind of nascent startup community in health care, which has really kind of focused down into devices, data, and drug discovery. So we have little ecosystemettes, if you will, there.

So all of those components have found a home in Tucson and that's where we sit today. And I'd love to talk about sort of what does that mean for a region like ours. I think I'll end, Ian, by saying that, going back to the land grant mission and encouraging everyone to think along the following lines, we have begun to partner with other Pac-12 land grant universities to look at in the – we have many common problems in the West, many common economic problems in the West. How do we utilize the capacities that exist in all of our extension offices to change the game economically in our Western states?

And I'll leave it there. Thanks for the opportunity, Ian.

Mr. McClure

I love that, Betsy, and that's a really neat segue. I'll defer that segue to later when we talk about what a region looks like and how a region can work together with multiple institutions.

Alright. Next, I see on my list Dr. Lisa Cassis from the University of Kentucky.

Lisa Cassis

Hello, everybody. Good afternoon. Yes, and thank you, Ian.

I've been serving as the vice president for research here at the – at UK since 2014, and I guess I'd start by just introducing our institution by saying we've experienced tremendous growth in grants and contracts here at UK. We've gone up by 81 percent since 2014 to a record now this year of 468 million (dollars).

But what's important in that is that we've also been ever increasing things like industry-sponsored contracts, grants that support the infrastructure for

technology and innovation, and I'll talk a little bit about that with our global partners.

So now, I guess, on to what my other colleagues have been talking about was what would a hub look like in our region. Well, you know, we – just like Betsy just discussed, we are the land grant flagship institution of higher education for Kentucky, and similar to what I heard from my colleague at Madison, we were in the Brookings Institute as a number-four ranked city, Lexington, in Fayette County.

Why were we there? You know, things like we have a high density of STEM talent in our region for places over 300,000. We have the fifth highest number of Ph.D.'s per hundred thousand people. Thirty-four percent of our population have a bachelor's degree. We conduct research at a high rate per capita compared to other similarly-sized institutions. And another really nice feature about Kentucky is that we're regionally located within 250 miles from nine other R-1 institutions. So we have a nice geographic location that can help us work with partners.

So Ian has kept us very busy in his role as associate vice president for research and innovation at UK. Some of the things that he and all of his colleagues and partners have been doing at our institution that have just ramped up our commercialization and entrepreneurship, like inventions increased by 200 percent, licenses by 350 percent, patent applications by 400 percent, startups by 50 percent. All of that, I'm sure, contributed to Ian, who is now serving in his role as chair-elect of AUTM. So we are highly represented nationally in research, innovation, and economic development.

So our hub, as that land grant flagship institution, has a very heavy partnership with the state, which is another attribute. In this picture behind me in my backdrop, you can see our new Healthy Kentucky research building, a \$265 million building of which 128 million (dollars) came from the Commonwealth of Kentucky in trying times for our state.

This particular facility, amongst other things, is serving as the home of biotech innovation across our campus. We also have other interesting interactions with the state and this is in partnership with the University of Louisville, our other R-1 institution in Kentucky, where we have the Kentucky Commercialization Ventures program, and this is in partnership with the Kentucky Cabinet for Economic Development. And what we do is we provide the infrastructure to build innovation in commercialization at all institutions across our state.

We have another partnership with the same economic development cabinet through a program called Launch Blue, and this serves as the state's premier or pre-seed startup accelerator for any startups that are promising across the state. And I guess what we've done is take some of these types of programs and work them into federal grants and contracts, which are quite an

interesting model for us and, again, in partnership with the University of Louisville. For example, we have a grant from the National Institutes of Health. We are an EPSCoR state. We're the NIH equivalent an IDeA state. And this particular grant is to lead 25 universities within the Southeast region and help them build the infrastructure for innovation.

We also have another NIH-funded grant as part of what's called the REACH mechanism, and that's in collaboration with our U of L partners and that also has a huge emphasis on taking inventions and ideas and seeding them and getting them out into the community.

And most recently, I think, something we're very, very proud of is that we are co-founding and leading the nation's only accelerator program for HBCU innovators. So we're really working not just within our region but beyond our borders, and I'd say that we are ready to go and we are poised and excited to be part of this conversation today.

So I want to thank Ian and CSIS and all my colleagues for joining us in the conversation, and I'll stop there.

Mr. McClure

Thanks, Lisa. Another thing that we heard from in your conversation and others is the theme of partnership, and I think we'll, certainly, explore that from our regions and how that makes a difference.

Next, Christina Orsi from the University of Buffalo.

Christina Orsi

Thanks, Ian.

Hi. Christina Orsi. I'm the associate vice president for economic development, which sits within our Office of Research and Economic Development at the University of Buffalo.

A quick overview of UB. We are one of the 64 campuses in the New York State SUNY system. We're the largest amongst all of the New York State SUNYs. About 30,000 students, 200 million (dollars) in annual research, one of the top 40 public research universities and also, interestingly, one of the top in international students, which has been an intentional focus of UB and has been one of our, I think, many great assets, frankly, are the international students that come and stay in our region afterwards.

So our innovation hub, really, has been part of a partnership with our region on developing an economic development strategy that began about 10 years ago with a focus around really doubling down on growing three industry sectors, and it was very intentional to build those around strengths but also build them in very diverse industry sectors because, you know, Buffalo's history, like many Northeast former industrial corridors, you know, historically, we were so concentrated and heavy in industry that when that

industry went down, our community just went through, really, 40 years of really hard times.

And so it's been very intentional that we diversify our industry and don't come – while we build on strengths and we have concentrations, we don't over concentrate in just one sector again. So we really built our strategy around – we certainly still had a great base of manufacturing but focusing it more on enabling, especially some of the smaller and mid-size manufacturers to incorporate technology and innovation into their operations, and that's everything from additive manufacturing to thinking about implementing robotics in their processes to how they use data to improve their efficiencies and enable them to be more competitive in new material applications. So advanced manufacturing.

The second sector is, really, around health and life sciences where, certainly, we have a very strong core at the university between, you know, schools of medicine, public health, pharmacy, dental, nursing, but we also have a top cancer research center, Roswell Park Comprehensive Cancer Center, that's a partner of ours. And so we had seen quite a bit of growth in the life sciences sector around both, you know, drug development, diagnostics, and medical devices, and again, continued to kind of double down in how we can enable and facilitate more of that.

And then the third is, really, thinking about what I'll call tech-enabled growth areas, so meaning software tech-enabled, and we have had a strong financial services sector. M&T Bank, I think, now the seventh largest bank in the nation, is headquartered in Buffalo and recently actually announced that their entire tech hub is going to be grown in Buffalo with thousands of jobs.

And then we also had one of our first new companies go public. ACV Auctions, which was just formed five years ago, went public a year ago and they're in the marketplace of wholesale online auto trading. So tech-enabled and continuing to support those type of companies is kind of our three areas.

And then we looked across and said, OK, so what are some of the enabling infrastructure we need to invest in. Just like everyone else has talked about, we needed to build up more of that entrepreneur community. We had very little, you know, venture capital, entrepreneur expertise, incubation support. So the region's made very strategic investments in growing that enabling infrastructure.

We also had a huge emphasis on place-making and smart growth, which maybe was a little different than some of the other communities because, again, Buffalo, having gone through a downturn, we lost population for 40 years, and what happened is during that time the community also spread out and sprawled. So we had all this infrastructure base but not the population to support it.

So we made a very conscious decision that it was also important, in addition to investing in innovation and technology and entrepreneurship, we had to invest in places like our waterfronts, parks, urban cities, to make them a place that especially young people would find attractive to come, stay, live, and grow. And so in the latest census, I'm thrilled to say that for the first time in 50 years our – the data shows that we now have population growth and I think a big part of that is the reinvestment we've made in places and place-making.

And then the third piece of that was, really, ensuring that we're partnering with not just UB but there's 30 colleges and universities in our community, to have industry-facing workforce development pathways at all levels to ensure that there's pipelines for people to be able to get the skills they need to get into jobs.

So that's kind of the foundation of what our regional innovation hub looks like.

Mr. McClure

Thanks, Christina.

And last but, certainly, not least, my friend and rock star in innovation, Dr. Almesha Campbell from Jackson State University.

Almesha
Campbell

Thank you, Ian. I'm excited to be here and I'm happy to learn a lot from each of you that's here on the panel, and I would say Ian is a mentor of mine.

And as you know, Jackson State – I'm the assistant vice president for research and economic development at Jackson State University. I've been at the university for 13 years. Spent about 12 of that as director for tech transfer and commercialization. And then, you know, a few years ago received a call from Taunya Phillips at University of Kentucky about the hub – the regional hub for XlerateHealth that they were working with and submitting to NIH, and as Jackson State is an EPSCoR state we also – and Mississippi is also an IDeA state and so we decided to participate.

We didn't know much about what we were getting into. But we thought it was a good challenge for us because we've worked so many years to change the entrepreneurial mindset on our campus and in our community that we're located in, of course, especially in health disparities, one of the biggest areas that we support, and having had the NIH Jackson Heart Study for over 20-something years, we wanted to explore more on the innovation side.

And so that project with Ian gave us the opportunity to explore biomedical technologies and during that process were able to get a \$11.5 million grant from NIH for our Center for Health, this health disparities research. And so working through that with innovation and entrepreneurship and getting that done.

And the other great thing that came out of this XlerateHealth network is the EnRICH program, which is engaging researchers and innovators in

commercialization at HBCUs. This was something that Ian and I worked very hard on to make sure we established that and get that across all the HBCUs in our region.

We initially started with those that are in the IDeA states. But as we started promoting, we started getting calls from other HBCUs in different states that said, what about us? We have a need for that. And so we continue that program. It has been very successful. We send – it's a pre-Xlerate program for health-care technologies. And what we find is that a lot of the faculty and students that come to the process have no idea about startups or anything like that, or even commercialization. And so we were able – we are able to train them and send them back to their different institutions with more knowledge that they can share on their campuses, but more importantly, get them to go on to other programs that they can be successful in and create that pipeline that we can help them through our hub.

But also in the state of Mississippi what we have been doing is working very closely together. So you will see the four tech transfer directors from our state institutions, from the University of Southern Mississippi, Mississippi State University, and from Ole Miss that we work very closely together. I think we check each other more often than we do to our spouses. It's just having that open communication, and people are oftentimes amazed of how close we are and that we're able to have that relationship in order to build the ecosystem that we're working on in the state of Mississippi.

So I think we meet – sometimes I tell my boss that they are my bosses because we meet so often. But it's great because we were able to work together with Mississippi Development Authority, Innovate Mississippi, also with our state Institution(s) of Higher Learning in order for us to craft our science and technology plan and we decided among ourselves how are we going to focus – what are we going to focus on in terms of emerging technologies? What do we want to know – be known as in the state of Mississippi?

So it wasn't what Jackson State wanted to do. It wasn't what Ole Miss wanted to do. It wasn't what Southern want to do, or Mississippi State. It's what the four institutions together wanted to do for the state of Mississippi.

So we selected six emerging technology areas that we thought we all had different expertise in and we chose advanced materials, autonomy, agriculture, because we have land grant institutions in the state of Mississippi, biomedical and health care, data science, as well as sensors and diagnostics. And these are also the areas that we can collaborate in.

So if our strength at Jackson State University, for example, is not in agriculture, then we can also collaborate with Mississippi State or in other institutions that have the agriculture. We may be able to use sensors to help in the agricultural field or some other technologies.

So we have been working very diligently on this and very intentionally, because while we had a relationship prior to us moving in this direction, we are more intentional in creating a more sustainable hub that cannot just serve the four research institutions but our regional schools as well, which a majority of them are Historically Black Colleges and Universities just like Jackson State University.

So how can we, the four tech transfer directors, support all the institutions within the state of Mississippi when it comes to technology transfer and commercialization because we do have the expertise?

I would say with our relationship with the Institution(s) of Higher Learning and supporting what we're doing and working together, we were able to change piece of legislation known as our Smart Business Act, which was focused on giving credit to companies that have research projects with our four research institutions. And we have changed that a little bit, not only to provide that type of rebate but also to provide seed funds for emerging technologies.

So the four tech transfer directors are now working together where we can put forward some of these technologies to get seed funding to continue working on their projects because, oftentimes, we know in the field that a company may just need \$150,000 to make it to the next level and when that funding is not there, they're not able to be sustainable.

And, quite frankly, as an HBCU or historically Black college and university, Jackson State does not have the resources or the capacity to do a lot of this, right? And so this type of opportunity, this type of fund, will help support some of the things we're working on, and we are very grateful that through what we've been doing with the University of Kentucky has now been given opportunities by other institutions to partner with them and work through different processes.

For example, EnRICH received a Lab-to-Market visionary prize for \$25,000 last year. Time is moving so fast. We began working on different initiatives as part of that project. Most of it is around diversity and inclusion to ensure that under-resourced institutions like HBCUs and minority-serving institutions are able to get an opportunity to participate in innovation and commercialization.

I'm happy to be on the board of AUTM with Ian. Never even dreamt of being on AUTM board, being a member for the past 12 years, but with encouraging words by Ian, I decided to give it a try and, as luck would have it, I was elected to the board and I'm pleased to serve on the board because that has given me a lot more insight into what's happening, not just nationally but globally in terms of tech transfer, and being able to work with other persons across the U.K. as well as here in the U.S. to develop a global organization to help with equity and diversity in tech transfer.

And so what we are building here in our hub we are just getting started. But because we have such a strong relationship in the state of Mississippi, I see a lot of potential – a lot of potential in terms of not just what we're doing in the state but capitalizing on the partnerships that we have, the corporate sponsorships that we have.

I would say this: I'm not plugging for HP, but this week we are having an HBCU Technology Conference, the first of its kind, led by HP, Microsoft, Intel, and some various other companies that decided to invest in HBCUs, ensuring that we knew what the new technologies were but also looking at the future of work and also about innovation.

And so I'm highly involved with that process, ensuring that our students are part of it so that the entrepreneurial mindset can be developed and different programming to ensure that our faculty and students are engaged in innovation and entrepreneurship.

So there's a lot of cool things happening and I'm excited about it.

Mr. McClure

Thanks, Almesha. I'm excited for you as well.

All right. We heard some fantastic things about various hubs and different dynamics across the country. We've got about 30 minutes and I'm going to open up sort of an open conversation here on some important topics that we just heard.

One of the first is what is a region, right? So as we look at regional tech hubs, and one of the interesting dynamics and the discussion on Capitol Hill right now, and it's not to be – I don't think it can be, really, overstated, the importance of the cooperation to collaboration that's purported right now between the Department of Commerce and NSF in funding this thing through the USICA Act that was passed in the Senate, and one of the really interesting dynamics is the way that – the difference with which both of those, NSF and Department of Commerce, fund – provide their funding via regions and how they define regions.

And so I'm going to direct it to Erik first to kick us off. What does the future of a regional technology hub look like? What does that region look like that might be differentiated from sort of current supercenters?

Mr. Iverson

Thanks, Ian.

I have to say just it's really impressive to hear each of my colleagues here on the panel speak to what they're doing. It's inspiring. It's really exciting, and I just sincerely appreciate the examples and the stories of what everybody's up to.

Madison – as I note, University of Wisconsin Madison, there is no other – there's not a Wisconsin State University. Certainly, we have Marquette. We have a medical college here in the state, but it's the University of Wisconsin system that really dominates the higher education here. And UW Madison is, as I noted, the flagship, and it is very large; you know, it's a two billion (dollars) to a three billion (dollars) a year in research funding, more if we've got a few billion dollars of cash under management and a whole lot of technology that we commercialize.

And so it's not a surprise that if Brookings is going to point to something, particularly in Madison – I'm sorry, in Wisconsin, it would be Madison. But that sells so much of the rest of the state short and, notably, the region short because I think the Great Lakes itself, from Michigan to Notre Dame, Illinois, and all the other just fantastic universities that are in this region, is the way that I think I appreciate Congress looking at the way that they're thinking about the country.

In our case, I look at everything from Minneapolis down through the 94 corridor into Chicago, which some people refer to as the Badger Belt, and you take the cities just outside of Minneapolis on the Wisconsin side and, of course, you run it down through Madison into Milwaukee and into Chicago. It's really a magnificent area of grand research and human capital.

But the way that I would see a research hub or economic development hub, sure, it can start in Madison, but it's the corner, the southeast corner of the state, that has so much to offer. If I look at – the only R-1 campus in the state is University of Wisconsin Milwaukee, which is significantly smaller, but it's a very powerful university in the context of a city that is – really, has a rich history of manufacturing and other activities.

But then you go up north to Green Bay – of course, everybody knows the Green – not everybody's fans, but everybody knows of the Green Bay Packers – they have a lot going on up there and the companies that are around from autonomous vehicles through advanced manufacturing and other things. And then you just make your way down the lake, Lake Michigan, and you get down to Kenosha, which sits there on the border, as you can just pop over to Chicago from there.

So I think this geographic area, and I think future hubs have got to be more inclusive, both demographically, certainly, with respect to race, gender, age, and otherwise, but then to expand it to be more inclusive from a geographic area and embrace not just the universities, and so many of my colleagues have noted it's really collaboration among universities, governmental policymakers, as well as industry, and ensuring that you're embracing all humans in that process and not squeezing anybody out so we can take care of things like traffic and affordability, all of the just so important DEI activities that, thankfully, the country is beginning to pay greater attention to and it's our responsibility to make sure that we foster that more and more.

So I think regional hubs will be defined, it should be defined, quite differently from an inclusive perspective. And thanks to our policymakers, who are beginning to mandate that that really should be part of the equation when we think about it.

So that's my perspective, Ian.

Mr. McClure

Thanks, Erik.

Yeah, I find something really interesting as I look at, for example, that Brookings report that's been cited a number of times in our discussion here, and the fact that they identify San Francisco and San Jose as two different supercenters. And you just talked about sort of collaboration between municipalities.

I'm going to direct this real quick to Lisa and Kevin. What Erik just talked about sounds fairly familiar, right? Cities working together and then taking sort of this inclusive approach, and I think that's kind of what we heard from all of us, right? I mean, we all – the word inclusiveness sort of resonates with all of us as we talk about our hubs, and I just want to see if anyone has a comment to follow up on that.

Mr. Gardner

I'll just add to that. You know, I was thinking through this particular question and thinking about what does it mean and could a hub be Kentucky, California, and Singapore? I don't know, and why is it or why is that not?

But I think, you know, there are some elements that are really important. You know, density of talent in a certain area, those types of things are really important. I do want to highlight, you know, that what – something that Lisa talked about was the – which was the Kentucky Commercialization Ventures that represents all of the institutions of higher education in the state, all the public institutions in the state.

And I would say, you know, even further than that, something that we've been intentionally working on is engagement of community members in the ways that, you know, that they've got solutions to problems and innovations and so forth that can be tapped. And it was really interesting to hear Betsy's comment about that, about the way they're doing that in Arizona.

So I've got a note to follow up on that. I think that that is part of the regional technology hub also. It's not just, oh, brilliant researchers at universities that have ideas. It's the rest of the entire society that have those valuable ideas.

Mr. McClure

Thanks, Kevin.

Anyone else want to follow up on just the definition of region?

Ms. Cantwell I might add one thought, Ian, because I think about this a lot in the – and that thought is around what's the supply chain for regional – both innovation and regional technology that is regional? So each of us is the supply chain for talent, right, and we're the supply chain for ideas. But those have to become something real in our regions one way or another in terms of economic value associated with the whole other aspects of supply chains. And those are also – we know this – very regional, whether it's the materials that are available or what the distribution and logistics look like, what broadband looks like, etc.

So I wanted to make sure that we, as we were thinking about regional technology hubs, acknowledge that different regions have different pluses and minuses, if you will, on the other components of supply chain. And those are problems that may need to be addressed as well as sort of the knowledge transmission piece.

Mr. McClure Yeah, that's a really interesting point, Betsy, because that's one thing that resonates. As you look at that and you've seen the bill that passed in June, right, one part of the bill is all about supply chain competitiveness. And if you – and one could make the case that this entire potential investment in innovation and infrastructure is about supply chain competitiveness. So you have to align the inputs and the outputs of those two. That's really important.

I want to direct something to Christina. Christina, you talked in your comments about the investments that you're making there in Buffalo and in your region in infrastructure and place. And so I want to ask a question about why is it so important that this type of an investment, a large game-changing type of an investment, happen in a place like any of our regions here represented? And is the ROI on an investment in Buffalo, for example, different than the ROI on just another investment in Boston, right, and why is that so important?

Ms. Orsi Right. Thanks, Ian. And I think, you know, in some of your opening remarks, you know, you started to speak to this. When you think about the existing, you know, major innovation hubs, right, the handful of them, the density has gotten to be so much that, unfortunately, what's happened is that it's pricing people out of the market, right, and the quality of life is going down in those markets.

So while they've had tremendous growth and innovation, no one's going to argue with that in how beneficial that's been, but there's been non-sustainable aspects of the growth. Too much stress on their infrastructure. So I think part of this looking at locations for the next generation of tech hubs, we have an opportunity to really look at a lot of places where, frankly, there's a lot more opportunities in innovation but it's maybe not happening at the pace that it could because you don't have the degree of investment in those areas, right/ Like, we don't have the amount of venture capital. It's concentrated, obviously, in – you know, in New York City or Boston and Silicon Valley.

But, you know, everyone here can speak to just some incredible innovations that have come out of their universities or their communities. So we don't have any less quality of innovation. We just haven't had the breadth of infrastructure to enable that innovation to become – you know, get to the market and create jobs in our community.

So that's going to require some sort of intervention, you know, from probably public monies to sort of catalyze and close a little bit of that gap where private sector is overconcentrated in some areas, their investment, and, you know, to enable the next, you know, handful of those communities, really, investing in some public infrastructure.

And in a way, the state did this several years ago in New York State where they invested – it was called the Buffalo Billion, and when I talked about our regional economic development strategy, we had the foundation for that and then the state invested over a billion dollars in those enablers that I talked about, helping us set up seed funds, helping us set up incubators, helping us, you know, set up new workforce pathways, innovation centers, and I absolutely believe that those strategic investments have started to show the data on the impacts that I talked about that we're having now.

So but you need it at scale, right? I mean, that was, you know, a significant investment over a period of years and you need it in a strategy built around assets. You can't build it from nothing. You really – you have to have strong assets to grow from and be able to kind of double-down on.

But I would say for our country we're going to miss major innovation opportunities if we continue to overconcentrate, you know, in just a handful of areas, because the innovation actually is dispersed. It's just that the supporting infrastructure isn't as dispersed as it needs to be.

Mr. McClure Really good comment, Christina.

And as I mentioned in opening remarks, I talked about there's plenty of evidence of STEM talent, right. I mentioned the percentage of STEM graduates coming out of Midwest universities for the whole country. There's plenty of evidence of innovation coming out of our regions.

But there's also plenty of evidence of venture capital follows where those things end up in the end and that go to, right? And I talked about the disparity of the amount of venture capital in Midwest states relative to the amount of STEM talent being produced in those Midwest states, and it's because they flow to the supercenters where that consolidation happens.

I want to skip to a really interesting question that kind of combines your thoughts with one of my next topics I want to move to, which is the importance of having venture capital or capital around this infrastructure. So the infrastructure is important, and I think we actually all heard here that all

of our regions have been investing in some of our infrastructure here – research capacity and things, facilities, places – for years, so that we're all sort of ready for this giant – this jump that could be coming.

Betsy, in your comments, you mentioned some of the venture capital infrastructure. You called it, I think, indigenous capital or something like that. Maybe talk to the importance of having that infrastructure in your region and how that really puts sort of an acceleration on things and why that's needed.

Ms. Cantwell So I'll give you my very personal perspective, because I spent an awful lot of time in Silicon Valley, is that local venture resources, local investment resources, are really, really important because they have a very different perspective on risk than any of our other partners, and if they're not local that risk is not associated with who we are, what we care about, and, basically, the things that we represent. That risk is taken associated with a whole bunch of measures, which may or may not take cognizance of what we need to do in our areas in order to make them more economically strong.

So for us, those funds have represented a type of risk that we can't take often, that the state does not wish to take, that established businesses have a hard time taking. Even our best partners, they – this is a kind of capital risk associated with innovation driving towards high risk-high reward, which is really, really important in order to go as far as we would like to go in changing the innovation landscape here and, frankly, in creating a community that our graduates want to stay in, because they want to – that is exciting. It's interesting. It's what they're trained to think about, and that's the kind of environment they want to stay in.

Mr. McClure Yeah. Really good point.

Anyone else want to follow up on Betsy's comments about sort of the risk tolerance and the difference between institutions of ours and the risks that we can take and maybe the risks that we do take every day in research, right, pursuing basic research concepts every day, but also capitalists, right, in investing? Anyone else want to follow up on that?

Mr. Gardner Yeah. I would just say that as a state agency, which we are as a public university in Kentucky – (laughter) – that concept of taking risk is, you know, the research risk is one thing, right, with federal funding or even internal funding for – or looking for the next invention or something like that is very different than the big risk that I think that Betsy was talking about. That was a really interesting perspective.

Mr. McClure Yeah. So along the lines of taking risk or maybe even just teaching taking risk, one of the things that we all heard here is the need for technology transfer infrastructure and right now, if you were in this morning's session, you heard Walt Copan talk about the importance of the Bayh-Dole Act of 1980 that allows our universities, our institutions, the performers of this research, to

also own and manage the transfer of those technologies to public use, right, and there's tons of stats – I'm the chair-elect of AUTM. Almesha mentioned she's on the board. There's tons of stats that AUTM collects and reports every year about the impact of that work.

But, Kevin, to you, as we look at the importance of technology transfer to these regional hubs, how important is it? Why is it important, or is it important, that sort of we continue to invest and the federal government continues to think about investing in that technology transfer infrastructure at universities?

Mr. Gardner

Yeah. Thanks, Ian.

I have to say, I think a couple thoughts. Number one is that there's an assumption of magic, that somebody follows their curiosity and bingo, something pops up and then – you know, and then, magically, it finds a home in the marketplace, which is not at all the reality of it.

So, you know, there's a lot of misconceptions, I think, and even around the ways in which technology is matured and then licensed as if it's kind of a hand-off. But it's not typically such a hand-off. It's much more of a cultivation and a continued partnership. And so we really think about the – you know, the licensees that we have as our partners and it requires a lot of care and feeding of those partnerships.

So I think it's important to recognize that technology transfer within universities doesn't just happen, and one of the really important roles of technology transfer – and I know this – I think Lisa mentioned this in her comments – is changing the culture within a university, celebrating the translational research aspects and what comes from that, the societal impact that comes from that, is a really important thing.

I stepped into a culture that has that appreciation here at the University of Louisville, but I've been around enough universities to know it's not something you can just take for granted and it's not true at all universities that that culture exists.

So I think that there's a lot that a tech transfer office functionality at a university can do and I think one of the place that it starts is culture change, providing the educational education to universities about their role in the economic development – tech-based economic development enterprise and ecosystem, training researchers, training graduate students, post-docs, faculty members about all these processes and how they work and how they don't work. And then, I think, making, developing, maintaining relationships between the university, the research community at the university, and the regional innovation ecosystem. Those are really important relationships to have and to build and to maintain.

So those are all really important functions. You know, this – all of the additional functions like having a budget to maintain, you know, to protect IP and things like that, that's important for new innovation is having the resources, staff, tools to establish those relationships and build those relationships.

But it really is a partnership, you know, and the tech transfer function needs to be that partnership between the university research enterprise and the outside world. That's not a very easy relationship to manage. (Laughter.) I'm sure we all have a lot of great stories about, you know, when that's gone really well and when it's not gone really well.

Mr. McClure Yeah. Well, you know, you talked about the culture shift of this, Kevin, and why that's important. So we have – everyone on this panel oversees, to some extent, technology transfer and the research impact enterprise within our institutions.

But two of us, Almesha and Erik, are both in the thick of it, right, and you guys are doing this on a daily basis to ensure that type of impact and you both have very different and – or, I should say temporally different points at which your culture shift happened.

Erik, with WARF, that was established many years ago, has been well equipped and is a leader in this and has been for years. So the culture shift – you're seeing now the benefits of that culture shift that happened for University of Wisconsin Madison a long time ago. And Almesha, your culture shift is newer, right, is more recent. You were appointed the first technology transfer leader at your institution in the past decade and you're seeing the fruits of that right now.

So maybe, first, Almesha, since yours is most the recent you can talk about the importance of that culture shift and what it means to your region.

Ms. Campbell That's a good question, Ian. It's important because, like you said, we've been putting in the work for a while, but you have to be intentional in what you're doing and you have to understand your limitations, right.

So the Historically Black Colleges and Universities have talked about it, about being under-resourced. Not only that, but as you have changing leadership over time, sometimes tech transfer and commercialization is not the focus of the institution, and most institutions are like that, right?

So they focus on research, teaching, and service, and even though tech transfer comes under research, it's not necessarily seen. It's about the money that comes in from research, the faculty getting tenure and promotion. And you know, in an under-resourced institution like ours, oftentimes faculty will not have the time, you know, to engage in innovation and entrepreneurship. They spend most time working on their publication, on their research, because

those are the things traditionally that will take them through the path of tenure and promotion.

And as you know, Ian, we've been working with PTI for a while now in terms of how do we bring that to our campus where faculty can get credit for engaging in innovation and entrepreneurship and we see that – some of us – some of our institutions have adopted that very early but some of us are still struggling because it's new.

So one of the things I found that is very helpful is getting the junior faculty as they come in, not giving them enough time to immerse themselves in the culture that's already there. So almost – you have to become almost like a mentor to those junior faculty and getting them involved in the training, into the commercialization programs, very early on before they realize, I'm not going to get credit for this right now – (laughter) – because then it becomes more difficult to convince them because they have – you know, they have high teaching loads and they have a focus that they have to do for tenure and promotion and a time frame in which to get that done.

So it's exciting to see that the shift is now happening. It took a long time. Like I said, I've been here 13 years, doing this for almost 12, and to see it now coming into fruition where now I have a leadership that says, OK, we get it, right, and a provost that said immediately, we're going to put this a part of our tenure and promotion package where now faculty can get credit for engaging in innovation and entrepreneurship.

Of course, what our credit looks like would be different to what a University of Kentucky looks like, may be different to what an Oregon State look like. But at least it's there in some capacity that they can get credit, and I can convince them a little bit more now to engage in the process.

Some of the challenges, like I said, in the past was more so, you know, we don't have a deep bench of faculty and staff to work with. I've been a one-person tech transfer office for 12 years. But the good thing about it is have partnerships external to our institutions that have been very helpful in moving this forward, not only for the Mississippi Research Consortium members in our state but universities like Kentucky, Georgia Tech, and some others who have embraced Jackson State and work with us to ensure that we can build that capacity on campus.

And so that's when we are seeing it. So I'm not worried about the past 12 years. I'm worried about the future and what we can do now that we have this access that's before us.

Mr. McClure Right. Right. And so to – great points – and now to Erik. You all made this investment in Madison a long time ago and, certainly, you've seen the impact on your region now, right. Maybe speak to just sort of what that means. What does WARF mean to your region? Certainly, a lot.

Mr. Iverson

Yeah, I appreciate that. But a first comment, Almesha is awesome. I really enjoyed hearing her comments and it really also resonates. There are a lot more parallels between her organization and mine and I suggest pretty much everybody's than we might think.

And that is, sure, from a resource perspective WARF stands alone from most others. I'm guessing most tech transfer offices don't have \$3.5 billion and thousands of technologies and venture funds. I have the luxury of grand assets. But at the end of the day, I'm a transient steward of these assets. My job is to ensure that we're around for another hundred years and I'm going to be handing this off to my successor in due course.

So my job is – far more than not screw things up. My job is to set course in a way that I believe the course should be set and, thankfully, my trustees and the campus have bought into it so far and are very, very supportive. But it also means that through these hundred years we have very entrenched bureaucracies, very entrenched faculty who really could care less about translational activities and, quite frankly, very, very, very few have any proclivity to be an entrepreneur. Some do. Most, anyway, should not even if they want to.

And so it's incumbent upon us to ensure that we are acting in a way that industry and the policymakers feel they can play along with, because I don't have to do what other people say but I have to do things that they want to participate in, and unless I – unless we do that, then we are losing an opportunity to embrace far more people and organizations and cultures to be able to do a better job and to build the organizations that we're each responsible for running.

But those entrenched bureaucracies, certainly, I have no misconceptions that I'm going to change a culture of a university. That's just silliness. But what you try to do is find the select champions who really do feel it's important to develop inventions, to seek patent coverage to the extent it's patentable. To the extent it's not, my job to help figure out how to get those things commercialized. Software, for example, is a speed to market issue, not a patentability issue.

So it's – a lot of the things that Almesha noted are very similar to the things that we at WARF and University of Wisconsin are grappling with. So we can all learn from each other and we all should learn from each other on an ongoing basis, that's for sure.

Mr. McClure

Yeah. Yeah. Fantastic comments. I love this conversation.

I want to direct my next question here to Lisa. What we just heard is sort of, you know, anecdotally but also, you know, express case studies of the impact

that institutions and culture shift within those institutions have had on a region.

We know that as sort of eligible consortia is defined and, for example, in the USICA Act that was passed in the Senate in June, that consortia must include research institutions but also can include local governments, economic development organizations. But I think, importantly, at the center of every conversation that I've had around USICA is the need to involve centrally a research institution, right, at these hubs to perform the work, to help lead the work.

And so maybe talk a little bit, Lisa, about the importance of having a research institution like any of ours here at the center of what could be an investment to be a new regional tech hub and why that's critical, because everything we've talked about – the outputs of everything we've talked about flows either from – incubated from or flows through a university. Is that right?

Ms. Cassis

Yeah, Ian, and I have to agree with Erik Almesha, you're amazing. I'm learning a lot listening to you, too.

I think this is kind of an easy question. I feel like I'm preaching to the choir here of universities being a driver of regional innovation. I mean, we are – obviously, we train, and I heard this – we train the STEM talent. I mean, we are that supply chain for the STEM talent. We just talked about the tech transfer. We all have the infrastructure to support that at our institutions. You know, we know how to help people with startup companies. You know, it's not just a required part of our academic mission. It's really, I guess, part of our DNA to be drivers of innovation. And I think, as I heard from someone else talk about, you know, as a public institution, and as I mentioned, you know, we're pretty heavily engaged in being state partners.

In our state, we are bona fide agents of the states in many ways to provide services. You know, as that land grant university we have these extension offices at every county across the region, and all of us are geared at the same thing and that's stimulating the economy by partnership with state and industry and others.

So, you know, I guess another thing I would bring up here the role the university plays is that, you know, we follow the question, right. We follow the question. We don't have the persuasion or other influences that might exist in the private sector. We go after it in whatever form and output that the talent can do.

So we are, I guess I would call, untethered partners and that makes us attractive and well suited to drive innovation, and I'll give you an example of our university. So we are 17 colleges, including six health care colleges, all on one campus one mile from the city center, and we pride ourselves on collaboration. So we go beyond boundaries of discipline, both within and

external to the university to tell people, think outside the box. Come up with something that's different and new.

So we're really kind of structured intellectually in being the driver. So I guess those are my basic thoughts. I could go on for an hour about why universities are well positioned to be leads in these hubs or to be integral partners, and I'll let some of my colleagues speak. But those are the things that come first and foremost to my mind.

Mr. McClure Thanks, Lisa.

So we've got – we have 10 minutes left and I want to give each of us one to two minutes very succinctly to describe, based on everything we've discussed today, what a future tech hub might look like and what are the policy – maybe the single policy that you think is most important, right, to instill in any kind of investment or enactment of legislation that might help create some of that intentional investment. What that – what might that be and what does that – what impact might that have on the future of your hub that you're at the center of?

I'll start with Christina. She gets the privilege of going first here.

Ms. Orsi Right. Thanks, Ian.

So I think, you know, I already talked about our – the current tech hubs. So, you know, I do think it's all around tech-enabled industry sectors in these public-private partnerships, which I think any of the legislation, even some of the earlier things. You know, EDI has just put out their Build Back Better, you know, and it's all looking at public-private partnerships, innovation, entrepreneurship.

And the other theme that I think we've all talked about that is much needed and has to run through the funding is equity. Each of us should be, in our plans and through these tech hubs, thinking about how we truly advance equity in our communities and build more inclusive pathways, and that is going to require us working very differently, building different partnerships than maybe historically we've had, bringing in community-based organizations, reaching out differently.

So, to me, the innovation hubs have those still cores that we all have talked about in some of our strengths, but the piece that we're all going to have to lean in on, I think, a little bit more – and a lot of us, you know, have programs that have begun to start to build that, but probably really lean in a lot more on intentionally building a more inclusive innovation economy.

Mr. McClure Thanks, Christina. Agreed, agreed.

Betsy?

Ms. Cantwell So hear, hear to everything that Christina said. There isn't an element of what you said, Christina, that I wouldn't have said myself and completely agree with.

So just to sort of hang off of that a little bit as a person who has done an awful lot of studying of organizational design, the nation has a number of examples of large-scale research hub creation that have worked to better or lesser extents and they should be examined at some level.

The manufacturing institutes are a great example where there are a lot of – there are a lot of lessons learned from those and an awful lot of money has been expended, FFRDCs in general. They're often regional hubs. They have pluses and minuses.

For me, the one thing I would add is that in any construct that really gets created to scale or capacity to serve the rest of the country that's not the coast is to really understand how to create economic value and that is the heart of what sort of the diversity issue really is, and making sure that instead of focusing just on kind of what's innovation or even what is the infrastructure around that, how do we know we're making a difference to economies?

Mr. McClure Well said. Thanks, Betsy.

Almesha, the person we all agree is awesome, you're up next.

Ms. Campbell (Laughter.) Thank you, Ian.

Of course, you know I'm going to say it has to be equitable, must be inclusive, it must be diverse, and especially here in the state of Mississippi it has to include public-private partnership. It must include our State Development Authority, it must include our Institution(s) of Higher Learning, and it must include our community colleges because they're doing a lot of workforce development. They're doing a lot of stuff that we are not able to do at our institutions. And so that partnership with them and with other entities within the state is very critical for us in order to build this technology hub and make sure that it's sustainable.

And so we also have to create that pipeline. We have to engage our students at a very young age. I firmly believe that we have to start as far back as the K to 12 program and infuse an innovation and entrepreneurship in our young minds, so that by the time they get to college they would already have that ingrained in their systems so that it becomes easier for them to participate in the process.

I think this is one of the ways that we can do that. It also has to work – we also have to work on, especially in the state of Mississippi, that we know we have a brain drain problem. We have to develop programming and opportunities for

some of our people to stay in the state, right. We have to – we have to keep them in the state for them to invest in the state, for them to work in the state because they are our talent. We're building a knowledge-based economy, and in order to do that we have to ensure that we keep the talent in the state.

Mr. McClure Excellent, Almesha. That's really fantastic.

All right, Lisa, you are – you are next.

Ms. Cassis Well, I think we're – I'm running out. They've done such a good job.

I would say, you know, to just emphasize regional. I mean, we have to have regional investment. We've all, on this panel, have been able to speak to why – what's coming out of our institutions and our areas and that is so critically important. And I think we also heard the, you know, matching our innovation to our region where we can have that impact is vitally important.

So that's another reason why the regionality, to me, is absolutely critical because otherwise, you know, all the different issues and areas of innovation that are important to us within our areas may not be the same thing that are on either coast. And so we really have to have that ability to bring our best ideas forward and I think we're all shown today that we're really well poised to do that and ready for whatever mechanism comes our way.

So I would – and I also agree diversity in every – and inclusiveness in everything that we do has been, as you heard, an underlying foundation of Kentucky's approach and I think we just have to continue to build that as we move forward. And I thank you again for letting me be part of this.

Mr. McClure Thanks, Lisa.

Kevin?

Mr. Gardner I'll make three quick points, and most of this is restating what other – ideas other people have offered.

One is that it's important to have collaboration among all institutions and have the humility to engage with community organizations and others that have important pieces of the puzzle to put together. I think it's important that while we have a regional organization, which is so important, as Lisa just said, making the national-international – having those national relationships, international relationships, and making that national impact, economic impact, as Betsy said, I think, is critical.

And then I think that we need a hub that has the ability to be nimble and agile, an ability to change and be responsive to all the voices in the community, which is something that was – struck me when Erik was making some of his comments.

Mr. McClure Thanks, Kevin.

And Erik?

Mr. Iverson Yeah. Thank you, Ian.

Three words come to my mind: collaborative, inclusive, and focused. Collaborative, to me, is policymakers, universities, and industry have got to figure out a common vision and set of goals that they want to accomplish. One example of that would be in Massachusetts with the state putting up original monies for Kendall Square and creating the incubators that are on and around Kendall Square that are associated with MIT and Harvard, of course, with industry, pulling a lot of new companies and workforce out of that. So I think collaborative – policymakers, university, industry.

On the inclusive, that has to be both demographic and geographic. We have to broaden out hubs. This isn't just cities; it has to be quite broad. And people have spoken to the demographic aspect of that. It can't be overstated how critically important that is.

Focused – then the third word is none of us can be all things to all people. We have certain expertise. If there are technologies here coming out of the University of Wisconsin, all of us are subject to whatever comes in the door we got to attend to, from agriculture to engineering to life sciences to you name it. But if there's something that, really, Madison or this geographic area is not good at developing, it should be licensed to somebody in, you know, whether it's Silicon Valley or down in Louisiana or whether it's Mumbai, India, I don't care. It should be developed where it has the best chance to be developed and then have impact on society and this Earth.

So I think collaboration, inclusiveness, and being focused are what's going to be really important, I believe, for strong technology hubs in the future.

Mr. McClure Thanks, Erik, and thanks, everyone on the panel. Fantastic comments. I love that ending piece – collaboration, inclusiveness, and focus.

These are the comments over the last hour and a half from what represents almost 3 billion (dollars) in research per year. That is almost 40 percent of the annual budget of the NSF. So these are important comments, and I hope everyone who listens to them takes heed and understands the importance of what we're saying in redistributing innovation landscape, investing in new regional technology hubs, and importantly, the policies that make them – that will make them impactful.

Thanks to the CSIS, Columbia University and AUTM for joining UK Innovate at the University of Kentucky for hosting this summit. More amazing

conversations coming up tomorrow, Wednesday, and Thursday. I hope that others will attend them.

Thanks again for joining us and have a great one.

(END)